Dream Report User documentation

USER MANUAL

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Welcome to Dream Report

1 Welcome to Dream Report



Dream Report®

Version 2023

Release 2

User's Documentation

www.dreamreport.com

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General Information

2 General Information

2.1 System Requirements

Minimum Hardware Requirements

CPU: Dual Core 2.4 GHz or higher
RAM: 8 GB+
HDD: 2 GB (for installation) minimum, 7200 rpm or higher (or SSD)
Video adapter: Minimum memory 128 Mb
Network adapter: No special requirements
Monitor resolution: 1920x1080

Recommended Hardware Requirements

For medium sized licenses of Dream Report (250, 1000, 5000) ODS recommends the following HW configuration:

CPU: 4 Cores i7 CPU with Hyper-threading support.
RAM: 16 GB of RAM. However, if user is planning to have above 5 Web clients in the license, Dashboard feature in active use and take advantage of product data logging, then 32 GB will be more appropriate fit.
HDD: 1 TB SSD or above
Video adapter: Minimum memory 128 Mb
Network adapter: No special requirements
Monitor resolution: 1920x1080

Operating Systems Supported

- Windows Server 2012 (incl. R2), any SP, (32-bit and 64-bit editions)
- Windows 8.1 Professional and Enterprise
- Windows 10
- Windows 10 for IoT
- Windows Server 2016
- Windows Server 2019
- Windows 11
- Windows Server 2022

Important NOTE: With Windows 2012 users will have to install Chrome Web browser as IE 10 is no longer supported.

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Databases Supported

- MS SQL Server 2005, 2008, 2012, 2014, 2016, 2017, 2019 and 2022 Standard and Enterprise (
  ODBC SQL Native Client 11)
- MS Access 2000, 2003, 2007, 2010, 2013, 2016, 2019
- MySQL 4.x and 5.x versions over ODBC driver 3.51, 5.1
- Oracle 11, 12 over Oracle XE ODBC driver

Validated Web Browsers Support for Web Portal

- Chrome
- Edge

IMPORTANT NOTE: Browsers must support HTML5

Mobile Operating Systems

The Dream Report Web portal is supported in a web browser on Android, iOS (both iPad and iPhone) and Windows Phone 8.1 and 10.

Additional Software Requirements

- To visualize PDF files, you need to install Adobe® Acrobat or other PDF viewer (the latest versions are recommended). The Adobe® Reader installer is located in \ODS\Dream Report\Utilities\
- To use the Dream Report *Web Portal*, a web server (Internet Information Server or other) must be installed before the Dream Report installation. For additional information on configuring IIS for use with Dream Report, please refer to the Web Portal section in Help or the tech note in the Dream Report website (https://dreamreport.net/tech-notes/)
- .NET Framework 3.5 and .NET Framework 4.7.1 or higher has to be installed before Dream Report installation. Please note that for successful installation of .NET 4.7.1 you must ensure that the latest updates are applied for the Operating System!

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For a complete list of supported operating systems and databases for all versions of Dream Report, please refer to the *Compatibility Matrix* on the *Tech Support* > *Tech Notes* section of the Dream Report website (https://dreamreport.net/tech-notes/)

2.1.1 General Information

Dream Report - Enterprise Information Integration. Reporting and Dashboarding Software for Automation

Dream Report is professional software for industrial automation, for real-time data and alarm acquisition, logging to the database as well as data analysis and advanced reporting, based on Dream Report database or any other external history data server.

Dream Report is out-of-the-box Reporting software for the Automation Market which:

- Directly collects Alarms and Raw Data from multiple heterogeneous Data Sources such as I/O, PLC, RTU, SCADA, DCS, MES, etc.;
- Leverages all archives from other solutions and applications such as SCADA, Historians…
- Aggregates and logs to any standard Database all alarms and Data collected facilitating Information Integration within Manufacturing and Enterprise applications;
- Integrates in one user-friendly environment all tools to easily create and generate automated Reports;
- Enables Print, Archive, Email and Reports Publishing over the Web automatically;
- Is intuitive requiring only one-day training and assimilation;
- Compatible with any application in all Vertical Markets;
- Runs in a fully secured multilingual environment;
- Provides an extra tool (Dream Report Project Creating Wizard), that helps to create a turnkey simple project, which can be later edited and developed in the Dream Report Studio.

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To learn how to configure data logging, please, refer to Logger Studio 79 section.

To learn more about database configuration and maintenance, please, refer to Database Configuration 43 section.

To learn more about report graphical design, please, refer to Designer Studio 119 section.

To learn more about report configuration and/or report automatic generation and distribution, please, refer to Report Settings 170 section.

Demo Version Limitations

If you have installed the Dream Report Demo version (i.e., running Dream Report in "*Evaluate*" mode, with no valid license installed), it will have the following limitations:

- Dream Report Studio will show a yellow bar indicating that "*Studio is running without a license*";
- Dream Report runtime will run a project continuously for 30 minutes and then shut down;
- A maximum of 100 unique items (tags) is allowed;
- Web portal is enabled with one concurrent web client connection;
- A red line will be added on top of each report page, which says that report has been generated with the demo version of Dream Report.

Online Help:

The online help contains detailed description about most of Dream Report functionality and is available in 3 different ways.

It can be loaded:

- By pressing *F1* in Dream Report studio;
- From the *Help* menu in Dream Report Designer Studio;
- From *Start* menu in Windows (*Start-->Programs-->ODS-->Documentation-->Dream Report Online Help*).

Contact us to purchase Dream Report:
sales@dreamreport.com

Contact our Technical Support:
support@dreamreport.com

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Dream Report Tech Support Website:
https://dreamreport.net/techsupport

For any other information, please, visit our web site:
www.dreamreport.com

Join our LinkedIn groups:
https://www.linkedin.com/groups/7450756

2.2 Dream Report Installation Tips

Prerequisites

Before installation:

1. Ensure that you follow the requirements covered above in the *Additional Software Requirements* section.
2. It is recommended to close all running programs, as at the end of installation the user will be asked to restart the computer.

Installation process

In order to start Dream Report installation, please use the DVD (supplied by Ocean Data Systems or your Dream Report distributor) with the product installer, or download the latest version of the software from the Dream Report corporate web portal (https://dreamreport.net/downloads/) .

1. Run Dream Report setup executable.

2. Accept the license agreement.

3. Select all required components from the Features Tree (including required communication drivers).

4. Wait while the product installation process is completed.

5. Restart the computer.

Here are some installation tips, which we ask you to read before installing:

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- Selection of Communication Drivers

  When installing Dream Report, it will automatically install only 4 basic drivers: OPC, ODBC, Analytical and Simulation drivers. If you need to use any other drivers in your project, then, during product installation, when you come to the *Select Features* window in the installation wizard, you will see a tree of installed components and communication drivers. There you have to expand a *Communication Drivers* branch of that tree and select (check) all drivers which you may need when using Dream Report.

- Web portal

  During Dream Report installation, the installation wizard will check if Internet Information Services (IIS) are installed in your operating system. Together with IIS you have to ensure that all ASP.NET related components are installed (please refer to Manual Configuration of the IIS 528 guide). If IIS is not installed on your system, then the Web portal and all related components will not be installed. In this case you will get a prompt message that IIS installation is not found, and the Web portal will not be installed, and if you wish to continue product installation.

  If you do not intend to use Dream Report web portal, please, click "*Yes*" and the product installation will continue without installing Web portal. If you do intend to use Dream Report web portal, please, click "*No*", exit Dream Report installation, install and configure IIS (per the documentation) and after that install Dream Report.

  If you have installed Dream Report without the web portal and afterwards you have installed IIS and you wish to start to use the Dream Report web portal, run the install again, click *Modify*, and make sure that the *Embedded Web Portal* option is selected in the *Select Features* window. During new installation, Dream Report installation procedure will recognize that IIS is installed and then all relevant web components will be installed.

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- Additional installed components (OPC Core Components and Visual C++ Runtime)
  During installation of Dream Report, one of Dream Report installation wizard sections is "*Select installation components"*. In this section you will see a tree of components, available for installation, including Dream Report designer studio, Communication drivers and others. This section also has two custom components in that list: OPC Core Component and Visual C++ 2005 Runtime Redistributable. Please, check why and when you may need them:

  - OPC Core Component. This is an official patch, redistributable from the OPC Foundation. It re-installs all necessary Windows components, needed for proper operation of OPC. In many cases, strange OPC operating problems can be solved just by installing this component.
  If you do not use OPC (DA/AE/HDA) in your Dream Report projects, then installation of these components is not required.

  - Visual C++ Runtime Redistributable. This is a component, provided by Microsoft, which is required for proper operation of Web Services communication. In the actual version of Dream Report, Web Services are used in certain communication drivers, such as PcVue SCADA. If you use Dream Report with native communication to PcVue SCADA package, please, install this component. Otherwise, its installation is not required.

- Language Installation
  When installing Dream Report, the installation procedure doesn't provide selection of the installed language. Though Dream Report has true-multilingual environment, you can set your preferred language after installation in the *Project Settings* section in the Dream Report studio. However, also during installation, Dream Report will automatically check for the language of actual operating system and will automatically set product language to it, if that language exists in the product, or otherwise set product language to English (as default).
  Also, it is possible to manually change the current language - open DreamReport.ini file in the *System* folder. This is an ASCII text file, which can be opened using Notepad or other text editors. This file contains section [Current Language]. You will see there the actual defined language. You can change it to any other language, existing in the Dream Report lexicon, save and close the file. The next time you open Dream Report Designer Studio or Runtime Manager, the new language setting will be used.

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Installed tools and utilities

Dream Report installation doesn't install, but provides you with installation files for some free third-party software tools, which you may need while using Dream Report:

- Adobe® Acrobat Reader is needed to open and view files in PDF format. If Adobe Reader is still not installed on your computer and you will generate report files in PDF format, please, find the installation of English version of *Adobe® Acrobat Reader 11.0* (*AdbeRdr11000_mui_Std.exe)* in the *\Utilities* folder in Dream Report installation and install it.

Additional tools:

- *SQL Native client 11* - is required to connect to SQL Server databases;
- *HASP Driver* (installed during the process of Dream Report installation, can be re-installed upon user needs).

User rights.

Dream Report installation requires that current Windows user must have administrator rights on that local machine, where the product is installed. If the current user has only guest or other limited user rights, the installation will not run properly.

Installation folders User access rights.

During the installation of the Dream Report product, the Project folder is set up with full operating system access rights. Due to the architecture requirements of the product, this configuration is automatically set by the product installation process. Therefore, to avoid unintended damage to the Dream Report project, the project administrator must enable user management in the Dream Report project and set restricted access for specific Windows users, giving only those users full access to the project directory.

Firewall Blocking

If your PC has Firewall installed and turned on, please, allow unblocking the following components:

LoggerRT.exe, USC.exe and *Generator.exe*. These are the components of Dream Report and won't do any harm to your computer.

2.3 Uninstall or Modify Installation

It is possible to modify or to remove Dream Report from your computer in two ways:

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1. Open Start menu *(Start - Programs - ODS - Dream Report - Uninstall).*

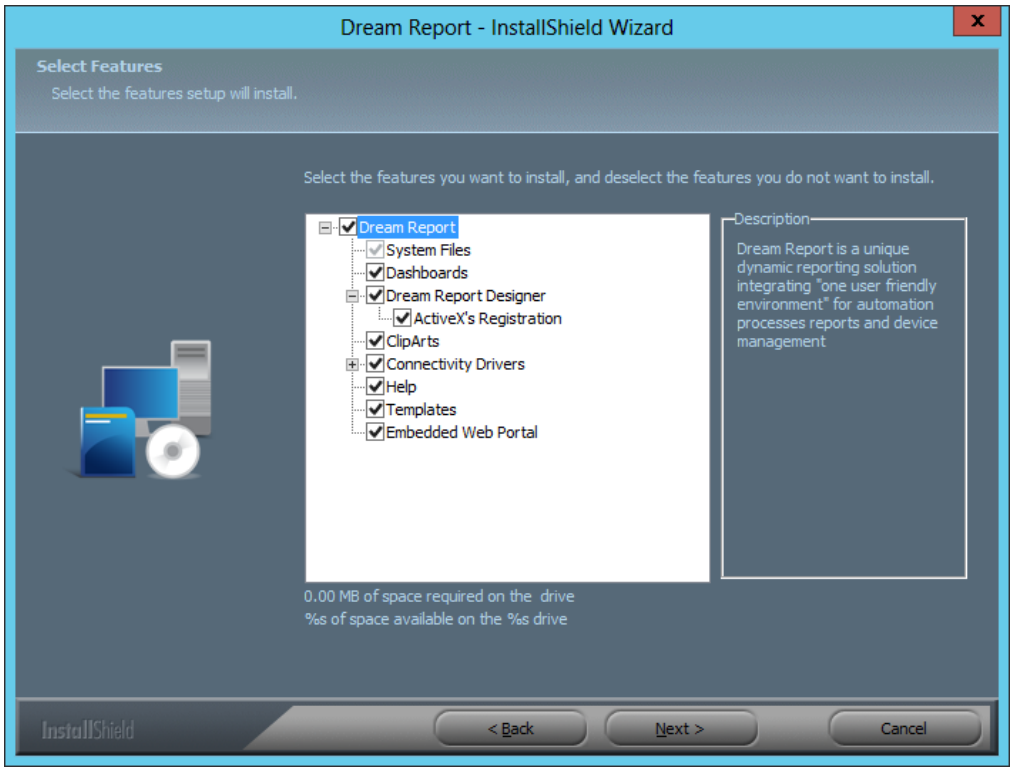
2. Use *Add/Remove Programs* component in the Control Panel of your Windows.

Modifying existing installation

In case you use the same installation to Remove/Modify Dream Report installation, when starting the installation, you will see the dialog window, which will offer you 2 available options - either *Modify* or *Remove* existing product installation.

If you want to *remove Dream Report* from your computer, choose the *Remove* option, click *Next* and the uninstall process will start. Be aware that not all folders will be removed during the uninstall process. Directories, that include all projects developed on that computer, will remain (by default *Project* folder). License and Template directories and all their content will NOT be erased (in order to save your existing license, if any, and also to save your custom ClipArt images, if you have any).

By selecting the *"Modify"* option, the "Installation Components" window will appear. This window will include all installed features as checked and all not installed yet as unchecked:



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2.4 Project Upgrade Procedure

Before Upgrading

Before upgrading, backup your actual Dream Report project. Save a copy of complete project folder including all sub-folders. Dream Report projects are located in the *Project* folder of your Dream Report installation (by default *C:\ODS*\Dream Report*Project*).

If your project is using a SQL Server database for data logging, the SQL database files may be located in the *Database* sub-directory. Since SQL Server locks those files, you will need to omit that folder from the project folder copy (or stop SQL Server during the copy).

Upgrading Dream Report – Important Notes

To install Dream Report, uninstall the previous version first, restart the PC, and then install Dream Report. Restart your computer after installation.

If the *Version Control* feature was used in a project prior to version 4.8, then all project version history will be reset after the upgrade, as a new mechanism for project version control was introduced in version 4.8.

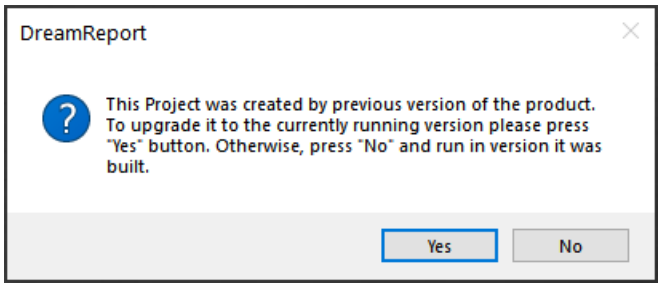
You can find more information on installation process in the *Dream Report Installation Tips* section.

NOTE: IF THE VIBER MESSAGING APP IS INSTALLED ON THE SAME MACHINE AS *Dream Report*:
If uninstalling*Dream Report* prior to new install on a machine that has the Viber messaging/call software installed, please first shut down the Viber Desktop version, as it will prevent a complete *Dream Report* uninstall.

Upgrading Projects from Dream Report Versions 4.x and 5.x

If your project is upgraded from Dream Report versions 4.0 or newer, do the following steps:

- Open Dream Report Studio and load the existing project. You will be warned:



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NOTE: Once you click *Yes*, you cannot downgrade the project to the previous version. Therefore, ensure to that your project is backed up before performing this operation.

- Click *Yes*. The project will be upgraded.
- Save and re-run the project.

Upgrade Procedures for the Projects Configured for Remote and Concurrent Development

The *Remote and Concurrent Development* feature was introduced in Dream Report 4.8. If Remote Development Configuration is being used in a project, a separate approach is needed for the project upgrade. Dream Report project configured for remote development can be upgraded to Dream Report in one of two ways, depending on whether or not the project versioning history needs to be available after upgrade. Approach 1 keeps the existing repository and maintain the version history, whereas Approach 2 creates a completely new repository during the upgrade.

If not using the *Remote and Concurrent Development* feature, this section can be ignored – simply follow the steps in the section above.

Approach 1 Upgrade Procedure:

Perform the *Commit to Repository* command from local project copies into the project repository to synchronize all machines.

- Close and stop all local projects. Then, make backups of all local project folders.
- Install the Dream Report software on all machines, including the server where repository is located. The Dream Report version MUST ALWAYS BE IDENTICAL on all the computers.
- Start Dream Report Studio and open the project on one machine only. Upgrade the local copy of the project, *Save* and *Commit* the project into repository as follow:
  - Select the first option when prompted – *Select to save changes into the local Project's copy;*
  - Once project is upgraded, in Dream Report Studio, go to the *Remote Development* tab and perform *Commit* of the project into the repository;
  - Select *all modules and reports* and press *OK* button.
    NOTE: It is recommended to set a dedicated comment - i.e. "Commit after version upgrade".
- Delete local project copies on all other development computers and on the production server, then do a fresh checkout/deployment from the repository onto those machines.
  NOTE: This step has to be performed carefully in order to avoid any conflicts during the local copies' upgrade.

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LIMITATION: After upgrading to Dream Report the *Revert to previous revision of the project/report* cannot be done. This issue was registered as known issue and will be addressed in an upcoming release.

Approach 2 Upgrade Procedure:

- On all development PC's, perform an *Update from repository* command, and then *Commit to Repository* command from the local project copies into the project repository. This will allow all changes made on the development PC to be synchronized with the central project repository.
- Close Studio and stop all local projects (if running) on all development PC's.
- On the Report Server (Repo), change the Remote Configuration access code to ensure no one can connect, and save the project.
- Install the Dream Report software on all machines, including the server where the repository is installed. The Dream Report version MUST BE ALWAYS IDENTICAL on all the computers.
- Backup the old *<your project>.drrepo* file and remove it from the original location.
- On the server, start Dream Report Studio, open the project and perform the upgrade for the local copy of the project *(<your project>.drpj*).
- After upgrade, open the *Remote Development Configuration* dialog in Dream Report Studio. On the *Server* tab uncheck the option *Enable connections to the project for the concurrent development*. On the *Client* tab clear the *Repository File* path.
- Save and close Dream Report Studio.
- Open the project again, open the *Remote Development Configuration* dialog, ensure that *Remote Access Code* is identical on both *Server* and *Client* tabs. On the *Server* tab activate *Enable connections to the project for the concurrent development* check box and press *OK*. You will be prompted to create a new repository. Follow all the instructions until the moment the project will be reloaded and connected to the repository.
- On all the Development computers, connect to the repository and do a fresh checkout of the local Dream Report project copy.
- On the Production server, install the same version of Dream Report, open Studio and upgrade the local copy of the project, and then start it up. Ensure that proper settings in the *Runtime Configuration* window are done (Run in Service Mode option, project start-up, etc.).
- NOTE: After creation of a new project repository, the old versioning history of the project and reports will no longer be available. Version of the project and revisions of the reports will start from version "1" again.

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Upgrading Projects from Dream Report Versions 3.x

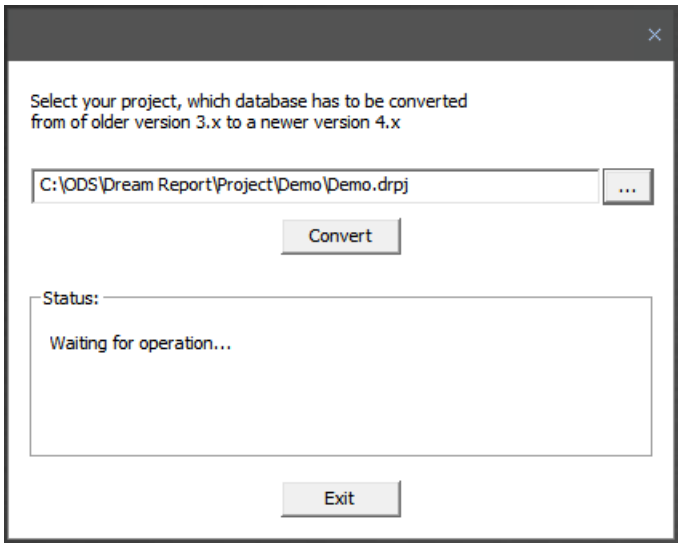
Project Logger Database Upgrade

Starting from version 4. x, the product has the new internal Logger database structure; therefore, if the customer needs to keep previously stored history, the database from previous versions has to be converted/migrated.

If your Dream Report project is configured so that data is logged into the internal project's database, do the following steps:

- Make a backup of your logging database – either copy the file (<project name>.mdb, if using MS Access) or use the database's backup tool to create a database backup.
- Run *Database Convertor* (*DBConverter.exe*) from the ODS\Dream Report\System folder.

Select the path where your project is located and click *Convert*.



Note that the time required to convert the complete database depends on the amount of data stored in the database.

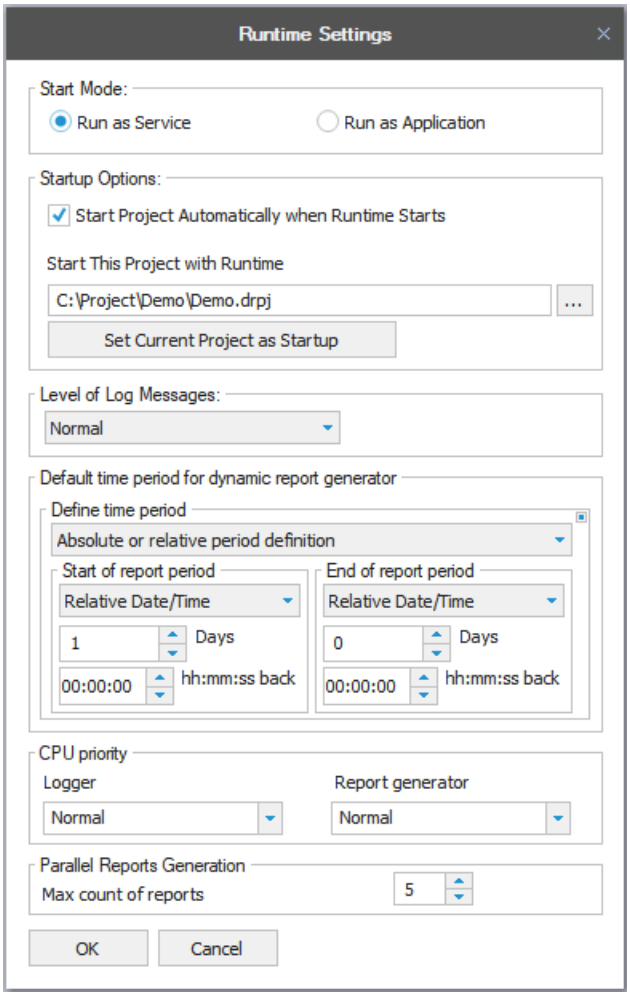
DSN Settings (SQL Server Connection)

If, before upgrading to version 4.7x, ODBC DSNs (Data Source Names) were defined in the Dream Report project to connect to SQL databases (SQL Server 2008, SQL Server 2005, SQL Server 2000, 7.0), then the driver in the DSN definitions must be changed to the *SQL Native Client 11.0* driver.

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Runtime Mode and Start up Options

Starting from Product Version 4.x, it is possible to configure the runtime engine to run as a Windows service or as an application. By default, Dream Report runtime will start as an application. In order to set runtime engine to run as a service, go to *Dream Report Studio -> Runtime* and click on the *Runtime Configuration* button. The *Runtime Settings configuration* window will open:



If your project has to be launched by default when runtime starts, specify this in the *Startup options* section in the *Runtime Settings configuration* window (see picture above).

For details on how to configure the runtime engine, please, see Runtime Configuration 595 section of this manual.

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Licensing and Software Protection

3 Licensing and Software Protection

Dream Report has either software or hardware license protection.

Demo license

When Dream Report is installed without any license, it will automatically run in demonstration mode. Dream Report demo mode sets a limit of 100 tags and enables web portal with 1 web client. Designer Studio will run the unlimited period of time and Runtime manager will operate up to 30 minutes.
The purpose of the Demo mode is to provide the user with the opportunity to evaluate and try to use the product. It is prohibited to use the product in real projects.

Temporary license

Temporary license is a full-functional license with a limited period of service (available for periods of 15-90 days). This license is available only as a software license key (file "license.dat").
Runtime will run continuously with that type of license, until the license period is expired.
Ocean Data Systems can issue temporary license for specific cases on per-case base. Number of items, web options is specified there according to the customer's demand.
Temporary license can be issued on a period up to 90 days. If you have a need for a temporary license, please, contact your local Dream Report distributor or contact us directly at sales@dreamreport.net

Permanent license

Is available either as a hardware USB protection key or as a software protection file license.dat - upon customer's choice.

In case of using a software license, after purchasing a permanent Dream Report license, product activation has to be done in the Dream Report studio, according to the procedure, described below:

- Select menu *Help --> Register in Dream Report studio;*
- Fill correct end-user information in the opened dialog window and press *"OK"* button. It will create the activation file "activation.dat" in Dream Report license folder (e.g. *C:\ODS\Dream Report\License*);
- Send activation file by email to **activate@oceandatasys.com**
- You will receive a permanent Dream Report license shortly, with an unlimited period of use.

If Dream Report permanent license is provided as a hardware HASP USB dongle, then it will not be linked to a specific computer. It will be linked only to that specific USB hardware key,

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and it will allow running product on any computer, where Dream Report USB license key is plugged in.
NOTE: *HASP protection, if running under Windows Server OS types, will work only in console terminal mode if set to run as an application. Otherwise, please set Runtime to run as a service.*

For all additional commercial information regarding different license models, license types, prices and other commercial information, please, ask your distributor or contact us at sales@dreamreport.net

Redundant (Hot Backup) license is a special license, which can be used only with Dream Report project, which is defined as a backup (redundant) and works in redundant mode for the main project. Such a license has a special discount. Please, ask Dream Report reseller for more details.

License linked to the custom external license.

Dream Report license has an option to be linked to the custom external license. Actual version of Dream Report license can be linked to a specific license of iFix license number or to Wizcon license number or to PcVue license. In order to issue a license, linked to another external license, please, ask your Dream Report distributor for that option and provide the ID number of your SCADA license key to be linked to.

Special licenses

System Integrator Pack

This is a full-functional license for Dream Report demonstration and development. This license is intended for Dream Report distributors and systems integrators for internal use. Standard system integrator pack includes:

- 10,000 tags
- 5 web clients
- All license options included (Life Sciences, MES, DBatch, SPC).
- Validity - 1 year.

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System integrator pack license can only be supplied on a USB key.
NOTE: System integrator pack license cannot be used in real projects, but can be used only for project development and demonstration purposes.

MES license option

This special license option enables unlimited calls of SQL queries, SQL stored procedures and other database requests as well as adds 5 web client to the license configuration. This license is designed for use in MES reporting applications, but can be convenient and cost-effective option for other applications, where intensive database interaction is required.

Life Sciences license option

This license option enables functionality, which is required for reporting applications in life sciences industry. This option enables such options, like:

- Setpoint analysis mechanism;
- Pulse analysis;
- F0 calculation (for sterilization validation);
- Electronic signature;
- DBatch (real-time electronic batch recording).

SPC license option

This license option enables SPC (Statistical Process Control) functionality in Dream Report, including SPC definitions, Control Charts, SPC Tables and SPC Statistical Functions for use on reports.

5.5. Concurrent Developer license option. This license option enables additional concurrent reports developer seat for a runtime server license. (Each standard license contains 1 developer seat included).

NOTE: *Permanent software license will operate only on a PC, where activation file has been generated. Software license is linked to the specific PC hardware profile.*

6. Invalid License

If during Dream Report installation the Invalid license message box appears, please, consider the following reasons for this:

1. The software license file ("license.dat") has been installed on the wrong PC, i.e., in case when the activation file ("activation.dat") has been generated for one PC, and the license file is used on another PC;

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2. The software license file ("license.dat") or the hardware USB license key is used with a newer version of the product;
3. The USB license has an error while reading the USB plug. In this case the driver has to be reinstalled and a user should contact the Dream Report technical support team (support@dreamreport.net).

6.1. USB License Upgrade: Invalid License

NOTE: *Please, note that when the hardware (USB key) license is upgraded, the problem with its upgrade may occur due to the incorrect functioning of HASP driver currently installed on the computer where user tries to run the upgrade* of *Dream Report USB plug.*

If this is the case, please do the following:

1. Unplug the key;
2. Uninstall the existing HASP driver as follows:
    a. Run command line (*cmd*);
    b. Set path to *<path to >\ODS\Dream Report\Utilities;*
    c. Run the following command *"<path to executable>\ haspdinst.exe" –kp -r;*
3. Install the new version of HASP driver (it is located in *\Utilities* folder of Dream Report) as follows:
    a. Run command line (*cmd*);
    b. Set path to *<path to >\ODS\Dream Report\Utilities;*
    c. Run the following command *"<path to executable>\ haspdinst.exe" –kp -i;*
4. Plug the key again;
5. Repeat the LUT (*License Upgrade Tool*) procedure and upgrade the USB key.

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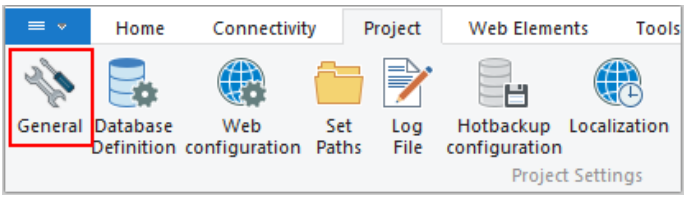
Project Settings

4 Project Settings

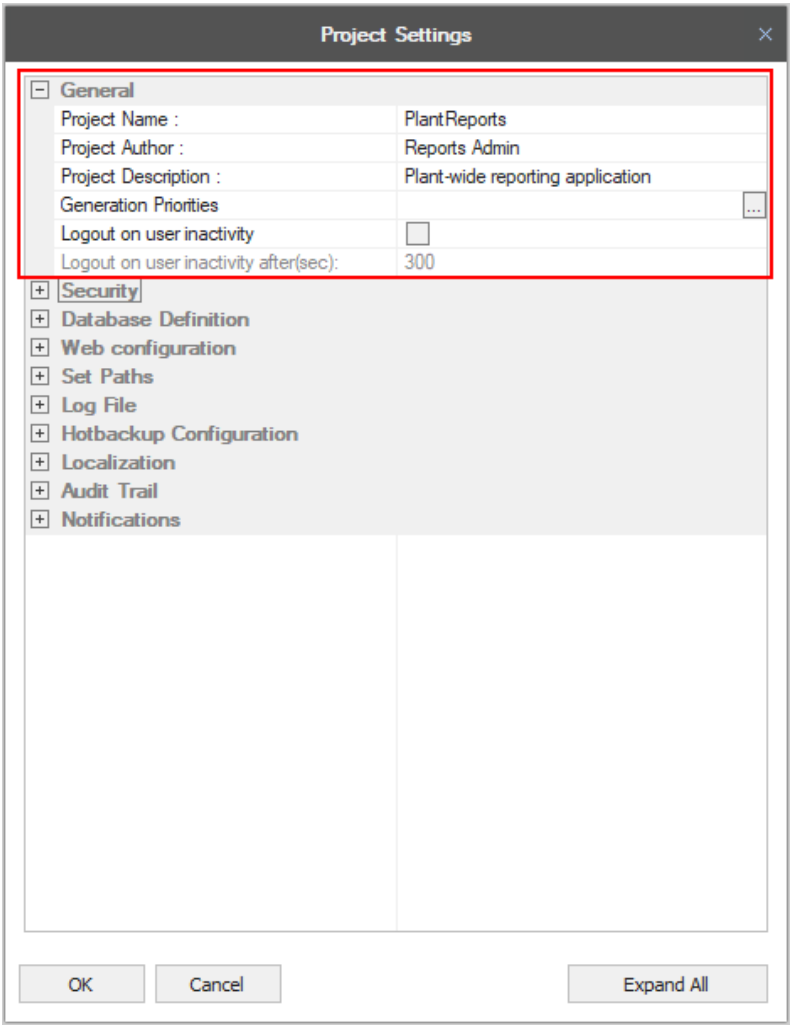
4.1 General

Project Settings

This section allows you to define global (project-level) settings of the current project. To open *Project Settings*, select the *Project* ribbon menu and click the *General* button:



The *Project Settings* window will open:



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From this window, you can configure project-level settings such as:

- Project-related general information (name, author, description);
- Project security;
- Database connection settings;
- Log file definition;
- Web portal configuration settings;
- Project paths to different folders for file management of different modules;
- Hot backup/redundant pair (license-enabled);
- Interface language and other localization settings - all dialog boxes and menus;
- Runtime Audit Trail;
- Notifications.

In the ***General*** tab, a user defines general project-related information, like project name, author and description.

Project configuration files will be saved in a folder, which will have the project name used when initially creating the project. As specific *Project Name* can be entered here.

Generation Priorities allows you to "tune" the priorities of the report generation sources. For example, in a very "active" reporting application, you might want user-initiated reports from the Web portal, to have a higher generation priority over a "behind the scenes" scheduled report. Typically, these priorities do not need to be changed, but if they do, these will be the project default priorities. Generation priorities for individual reports can be set under the report's *Report Settings*, in the *Generation Priority* section.

The *Logout on user inactivity* setting, in conjunction with the *Logout on user inactivity after (sec)* setting, will force Dream Report Studio to close after a set time period (in seconds), if no activity is performed in Studio during that time. This setting prevents unauthorized changes to a project's configuration, if a report developer leaves Studio open and unattended.

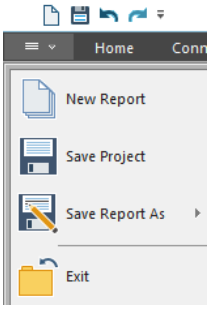
Project Parameters Definition

The *Project Parameters Definition* section on the *Project* toolbar enables you to configure a set of pre-defined internal variables *(Internal Project Parameters* or *IPPs)* for the project, which can be assigned data from report objects (during report generation) or from command lines. Click the *Project Parameters Definition* button to open the "*Internal Project Parameters Dialog"* window, where you can configure parameters that can be passed to reports during report generation.

For details on internal project parameters configuration, please refer to the Project Parameters section of this manual.

By clicking on the main *Dream Report* drop-down in the top left of Dream Report Designer Studio, users can also perform the following operations:

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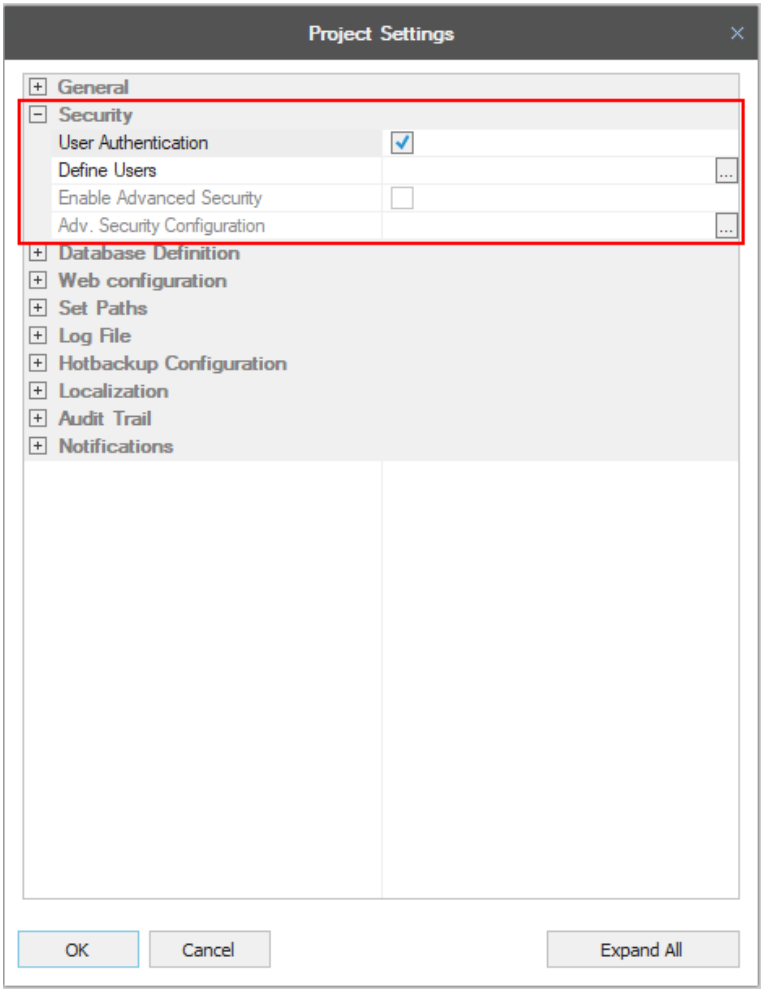
- Create a new (blank) report;
- Save the current project;
- Save the selected report as a Report or Page Template;
- Exit Studio.

4.2 Security

Where applicable to Dream Report, the Dream Report Development team follows the Microsoft Security Development Lifecycle (SDL), which aims to reduce the number and severity of vulnerabilities in software.

Project Settings

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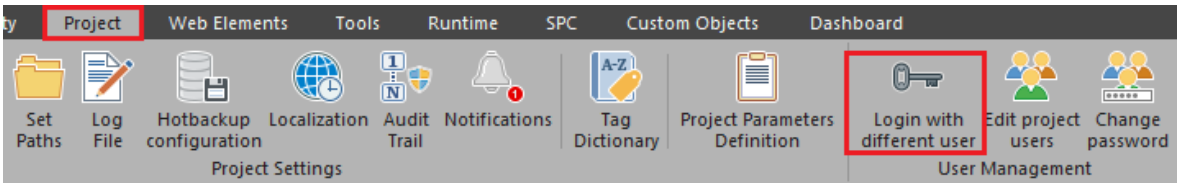
The ***Security*** section of the *Project Settings* window allows you to enable user authorization for the project, define project users and user rights, and enable and configure advanced security settings.

Check the *User Authentication* option to enable project security – i.e., logins required, and access rights enforced, for all modules of Dream Report. *User Authentication* should only be enabled in the project after defining users and assigning access rights.

Click the **[…]** button to the right of *Define Users* to open the *User Management* window. Please refer to the **User Management** section for detailed instructions on adding users and groups, and assigning access rights.

NOTE: If user management is enabled for project, a logged-in user in Studio must have "Full Administrator Rights" in order to access the *User Authentication* and *Define Users* project settings. If the currently logged-on user does not have full administrator rights, then all controls in *"User Authentication"* group (check box and a button) will be disabled. To enable these options, login with an appropriate user, using the Studio menu *(Project > User Management > Log in with different user)*:

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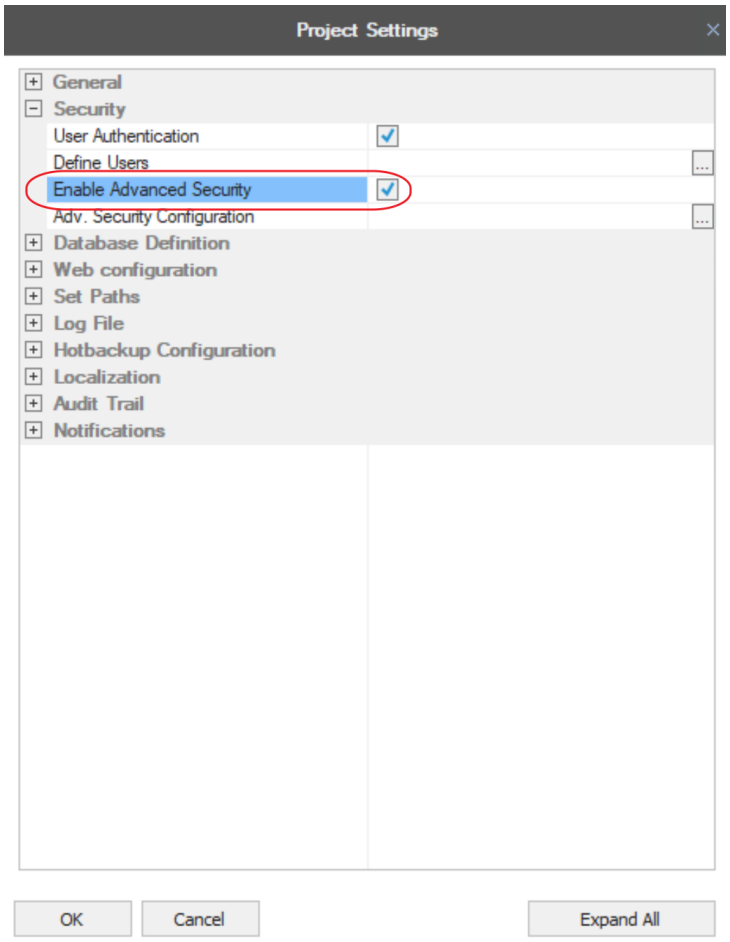


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Advanced Security Settings

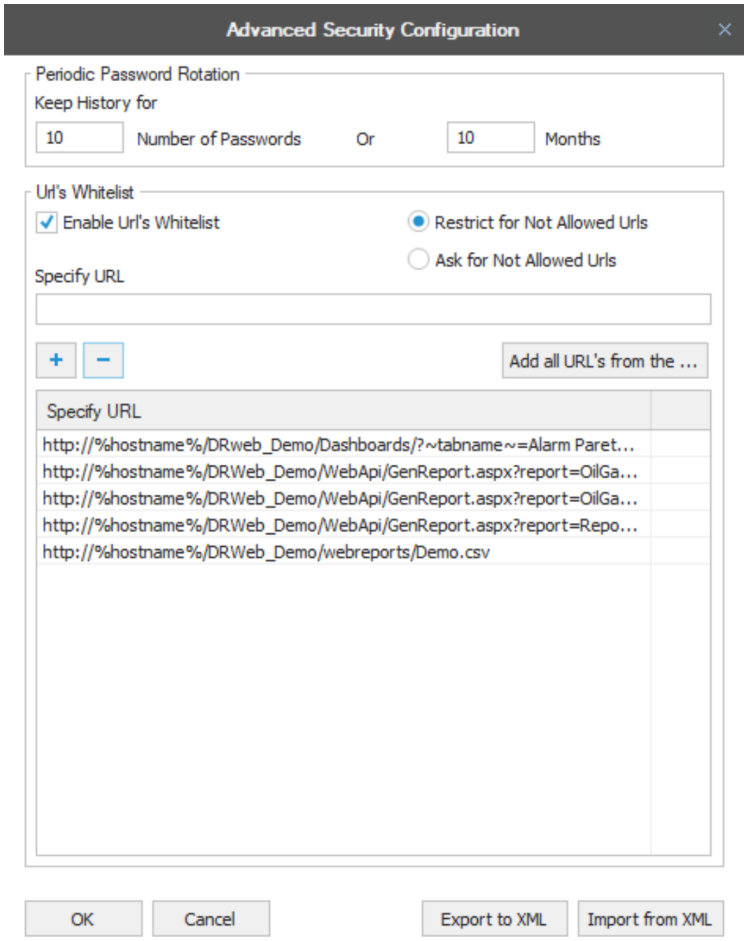
The *Advanced Security* option provides product compliance with Microsoft SDL Security requirements when implementing a Dream Report project.

By default, this feature is not enabled in the project. In order to enable and configure advanced security, *User Authentication* must be enabled for the project, and a user (with Full Administrator rights) must be logged in to Studio. From the *Security* section in the *Project Settings*, check the *Enable Advanced Security* option:



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Once *Enable Advanced Security* option is enabled, click the **[…]** button to the right, which will open the *Advanced Security Configuration* window:



Periodic Password Rotation – specify the "*Number of Passwords*", or the period of time ("*Number of Months*") for which the password history has to be kept in the project in order to avoid use of the same password within the specified period.

Enable URL's Whitelist – enabling this option to manage the list of allowed (or blocked) URLs and domains.

Once you add reporting objects which contain specific URLs (e.g. a hyperlink with a URL, or external web content with specific URL), each such URL has to be manually added to the whitelist.

NOTE: If a whitelist contains a URL, then any URLs, which derive from that URL, will be allowed when defined as follows:

Example 1: Definition such as *://mywebsite.com/* will allow the *http* and *https*, then any URLs, which derive from that http(s)://mywebsite.com/ URL.

Example 2: If the URL www.my_url.com/data/* is allowed, then any derived URLs, e.g. www.my_url.com/data/mydata/april will be allowed. However, any URL, which is one or

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multiple levels “before” the allowed URL, will be restricted. In this example, www.my_url.com will be restricted, as it’s located one level above the allowed URL - i.e., is outside of its scope.

Any place where URLs can be used will support that functionality:

- Hyperlink object,
- External web content,
- Single Data Objects, etc.

Dream Report will check the respective URLs at the moment of opening the report web page or PDF generation, and in the case that the URL is not in the allowed list – it will either restrict such URL - “**Restrict for not allowed URL’s**” or will open a message box, saying, that URL to open is potentially unsafe and will ask, whether a user would like to refrain from opening the target web address or open it anyway – “**Ask for not allowed URL’s**”.

Additionally, the following SDL security rules are enforced:

- *Minimum allowed password length:* 12 characters.
- *Maximum password length:* 64 characters.
- *Password truncation is not allowed.* If user sets a password of more, than 128 characters an error message will be displayed, that the password length exceeds the allowed limit, and the entire password will be not accepted. All consecutive spaces will be replaced by a single space.
- *Passwords blacklist:* the passwords from the black list are not allowed to be used if Enhanced Advanced Security is activated. The list of passwords is encrypted and stored in internal database of the project.

Notes:

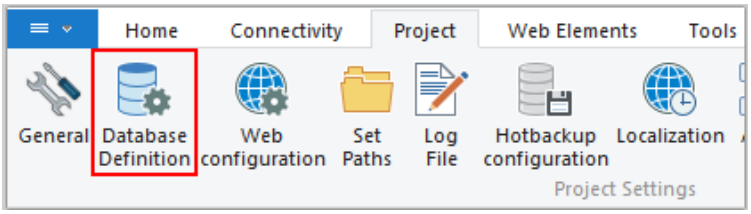
1. *“Show password”* checkbox will let the user to display the password in clear text. This functionality is available in the following sections:
   - Password and password confirmation edit boxes in user configuration (in designer studio);
   - Password field in user login in Designer Studio;
   - Password field in user login page in web portal;
   - New password (password and PIN code reset) page in web portal.
2. Since passwords are stored with an irreversible hash, once a user account has been added, the user will no longer be able to view the associated password with the account.

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4.3 Database Configuration

Database Configuration tab enables users to configure a database for logging of real-time, manually-entered or aggregated data. Database logging is optional.

Data can be logged either to the Dream Report default database (an MS Access file), natively to a SQL Server/SQL Express database, or to any open database using the ODBC interface.

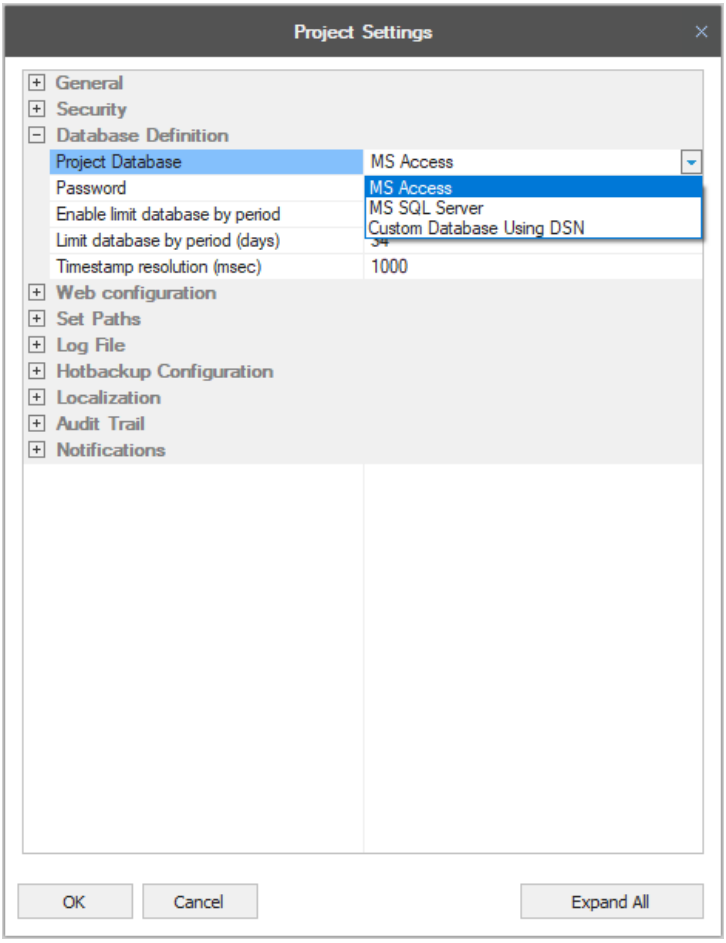


To open *Database Configuration* dialog window, click on the command button *Data Base Definition* on the *Project* ribbon icon on the horizontal toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu (see pic. below):

Default Database (MS Access/MS SQL Server)

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If this option is selected, the project database will be created automatically in the project database folder, defined in the *Project Settings* dialog box.



No user configuration of the database is needed. The database will be created and maintained automatically.

NOTE: It is highly recommended not to use the MS Access for the production applications. Access databases have a 2GB file size limit, and are not secured. Installing the minimum supported version of SQL Server Express edition is preferred, if you wish to use a “free” database platform. And while SQL Server Express Edition is commercially free, as a free tool it is also limited in terms of performance, relative to the full versions of MS SQL Server or Oracle, for example.

When selecting the option to use "*MS SQL Server*" - there is a combo box, where user can select any available local or remote SQL server - either default server or any of its instances.

Custom database using DSN

This option enables users to connect to any predefined custom database, using the ODBC interface.

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If this radio button is enabled, user will have to either select an existing DSN or add a new DSN definition. New DSN definition will be created using the standard Windows wizard window, which will be opened as soon as user clicks on ***Add*** button.

After the DSN selection, the user will have to specify DSN login and password, and click on *Test connection* button to check if the connection to the selected DSN succeeded or failed. If DSN connection failed, a message box with error will be opened. The user will have to check the reasons for the DSN connection failure.

This option also allows users to connect to remote databases over the network. The network connection will be managed by ODBC.

NOTES:

- All DSNs defined in the project are saved and can be managed from one place (for details, please see the DSN Manager 299 section of this manual).
- If, before upgrading from a version older than 4.x, the Dream Report project DSN was defined in order to connect to SQL databases (SQL Server 2008, SQL Server 2005,), then, in version 4+, the driver in the DSN definition should be changed for the SQL Native Client 11 driver (for details, please see the Project Upgrade Procedure 24 section of this manual).

Limit Database by period.

If enabled, this option allows a user to limit the database by the data age, i.e., the maximum number of days for which historical data will be kept. This will be checked by Dream Report each midnight or during project start. All data exceeding the limits will be deleted without being backed up into another database.

This option is recommended to be used especially with databases with limited allowed database sizes, for example SQL Server Express Edition, which is limited to 10 GB.

In the *Data Logging Settings* section you can configure your timestamp settings for a timestamp for logged item values and alarms.

Estimating Size Requirements for the Dream Report Data Logger - Dream Report uses approximately *144 bytes per numeric value logged* (higher with string tags, depending on the length of the string values.) For example, if you had 100 values, set to be logged every 10 seconds in an *Item Group* (covered Item *Group Definition - Logging Schedule* section) the daily storage requirement would be: 100 * 144 / 10 = 1,440 bytes/sec = *124.4 MB/day*

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Data Logging (Timestamp Resolution)

The Dream Report logging system enables you to select timestamp resolution for logged item values. The default timestamp resolution is 1000 msec, which means that, by default, Dream Report logs data with 1 sec resolution and milliseconds are rounded to a second using standard rounding rules. This significantly saves the database space and keeps it more usable. However, if, in any specific cases, second resolution is not enough and milliseconds are required, you can set your resolution in a *Timestamp resolution* edit box. If msec resolution is set, then, all incoming milliseconds will be rounded using standard rounding rules according to the selected resolution.

Here are few examples:

Example 1: If resolution is set to 1000 msec and 2 values are coming: value: 5, ts: 12:01:10.125 and value: 6, ts: 12:01:10.550.
Result: both values will be recorded with timestamps: value: 5, ts: 12:01:10 and value: 6, ts: 12:01:11.

Example 2: If resolution is set to 1000 msec and 2 values are coming: value: 5, ts: 12:01:10.525 and value: 6, ts: 12:01:10.750.
Result: only last value will be recorded with the timestamp: value: 6, ts: 12:01:11, because both values are rounded to the same second and always only the last one will be logged.

Example 3: If resolution is set to 200msec and the following value is coming: value: 5, ts: 12:01:10.750.
Result: the value 5 will be recorded with the timestamp: 12:01:10.800.

IMPORTANT NOTE: Dream Report is not designed to be a high-speed, high-volume process historian. Data should not be logged at sub-second resolution, and the number of tags logged should be kept under 500 (as a rule of thumb). If you have higher data logging requirements, we suggest the use of one of the many dedicated process historians available, and then use the appropriate Dream Report Historical Values communication driver for the specific historian.

Data Logging (Time)

The timestamp of logged item values and/or alarms will be logged using both the local time of the computer, where Dream Report is running, and the UTC/GMT time format.

Data Logging and Database Organization

In Dream Report 4 generation a completely redesigned database structure has been introduced. It allows Dream Report to raise data logging up to 10 times.

Useful tips:

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- *Which database is better to use?*

  - MS Access can be used only for small-size projects. MS Access is limited in size to 2Gb, but when your MS Access database *(*.mdb file)* reaches the size of several hundreds Mbytes, you can start to experience problems, so we recommend to use MS Access where the database size doesn't exceed 100Mb. Generally, *MS Access is not a good choice in a production environment.*

  - MS SQL Server is a good and reliable database, and is recommended for use. MS SQL Server Express is free and is limited in size to 10Gb. So, if your database does not exceed 10Gb, this database type can be also used.

  - MySQL is free and has no limitation. This database type is also recommended for use as good and reliable solution.

- *What is the approximate database size allocation?*

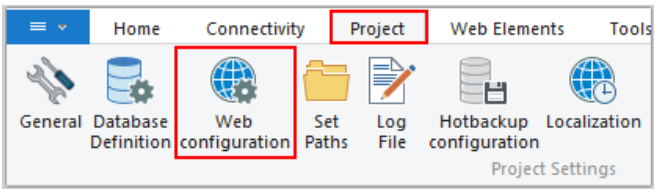
  When numeric data is logged by Dream Report, then the approximate database size allocation is about 16 bytes per record. When string or textual values are logged, this depends on the size of a logged text.

- *What is the supported data logging performance?*

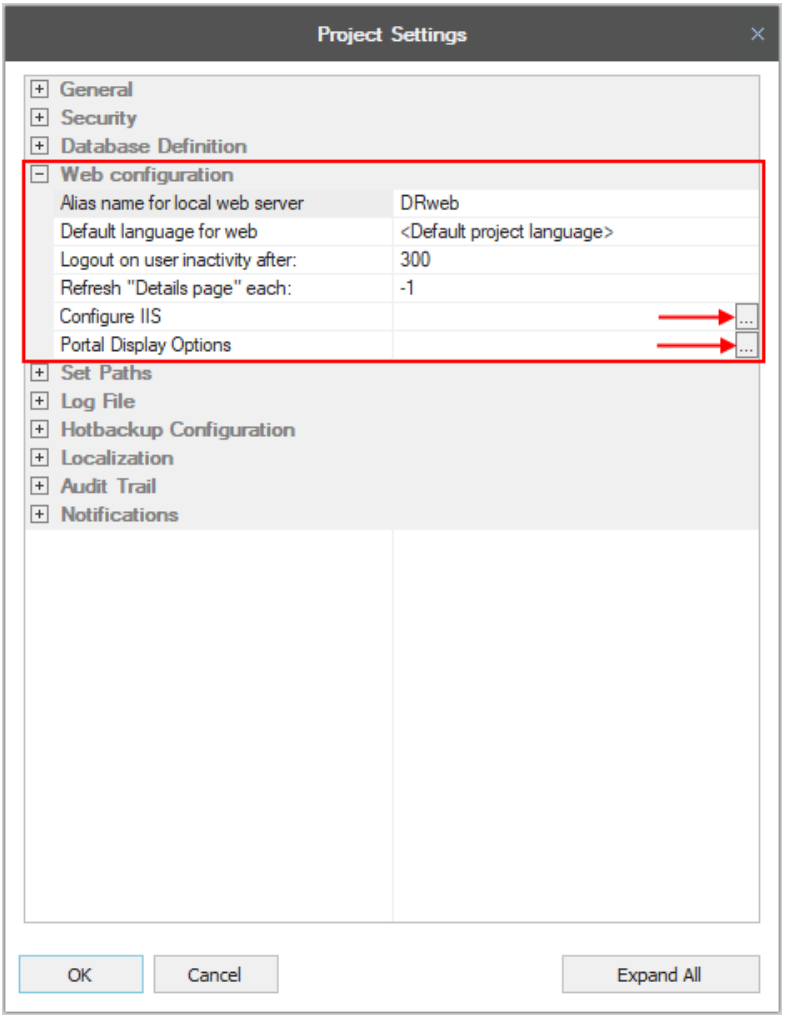
  Actual Dream Report version supports data logging frequency up to 1000 records per second if data provider is capable to provide data at such a high rate.

4.4 Web Configuration

To open the *Web Configuration* window, click on the button *Web configuration* on the *Project* ribbon icon on the top toolbar either in Dream Report Studio:



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The default Alias name for the local Dream Report web server is *DRWeb*, with URL *"localhost/drweb"*. The Alias Name can be changed here.

Alias name for local web server is a name which Dream Report will use for a new virtual folder. It will be automatically created on every project start.

Each time a new project is created, or if the project is changed to another project, you must manually configure IIS (Internet Information Services). Simply click on *Configure IIS* button in the project's Web Configuration (as shown above), or by selecting "*Configure IIS*" from the Runtime Management Console.

If the IIS configuration process succeeds, the message *"IIS configuration has been successfully completed"* will appear. Otherwise, check the reason for the IIS configuration failure – typically this is due to one or more required features or roles in IIS not being selected. Please refer to the section Manual Configuration of IIS for more details.

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NOTE: If Internet Information Services (IIS) is not installed in your operating system, you will get the message box *"Can't configure IIS. Web portal is not enabled"*. You will have to install IIS, configure IIS per Manual Configuration of IIS, and then rerun the Dream Report installation in order for the web portal to be installed (for details, please, see *Installation Tips*).

Internet Information Services (IIS) can be also configured from the Runtime Management Console (for details, please, see Runtime Management Console section).

NOTE:

·For IIS versions 7, 7.5 and 8, if user clicks on *"Configure IIS"* button, the Application Pool *"OdsDrAppPool"* will be automatically created. Thus, for 64-Bit OS this will allow automatic configuration of the Dream Report Web portal.

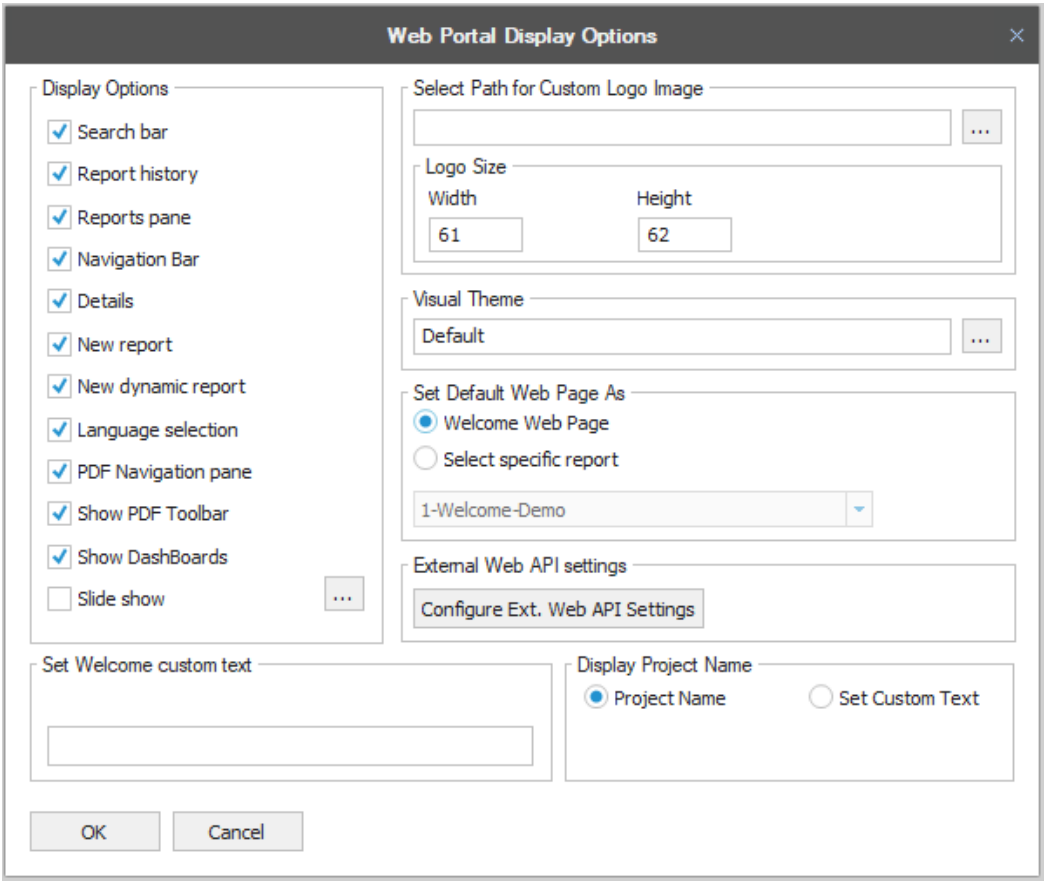
Default language for web clients combo box specifies which language will be used for a web client by default (if a language on a web client web browser does not exist in the product language list).

Logout on user inactivity after parameter specifies a timeout period (in seconds), during which, if a user does not perform any actions in the web portal session (click, mouse move, press key on a keyboard), the web portal will automatically logout a currently logged user. If this occurs, the user will need to login again to continue working on the portal.

Refresh "Details page" each parameter specifies a time period (in seconds) where every such a period, the web portal will automatically check for updates in the reporting project and refresh "Details" page. A value of (-1) will disable auto-refresh of the "Details" page. This value is set by default. The minimum value is 1 second - i.e., the web portal will check for project updates every 1 second and update the "Details" page.

Portal Display Options – click the "Portal Display options" button, to open the display options configuration window:

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In the *Display Options* section, window, select which elements of the web portal to show or to hide. These are global settings for users of the portal, and specific to this project's web portal configuration.

Select path for custom logo image allows users to select an image which will be displayed in the top left corner of the web portal.

Use the *Logo Size* settings to adjust the width and height for the space allotted for the selected logo image.

Visual Theme allows users to select a predefined color scheme for the portal.

Set default web page sets which report will be opened by default when web portal is opened – this report becomes the "homepage". Usually, by default, web portal is opened at the "Welcome page" with the list of all reports in the project. However, if any available report is selected, then, whenever the web portal is opened, it will open at selected page.

NOTE: a different default web page can also be set for specific users or user groups, if User Management is enabled - the *User Management* section covers this functionality.

The difference between the default page setting in this section and the first page per user is that in this Project setting section the default page is set globally per project, independently of a user. And the first page per user is set for specific user without any impact on a global project.

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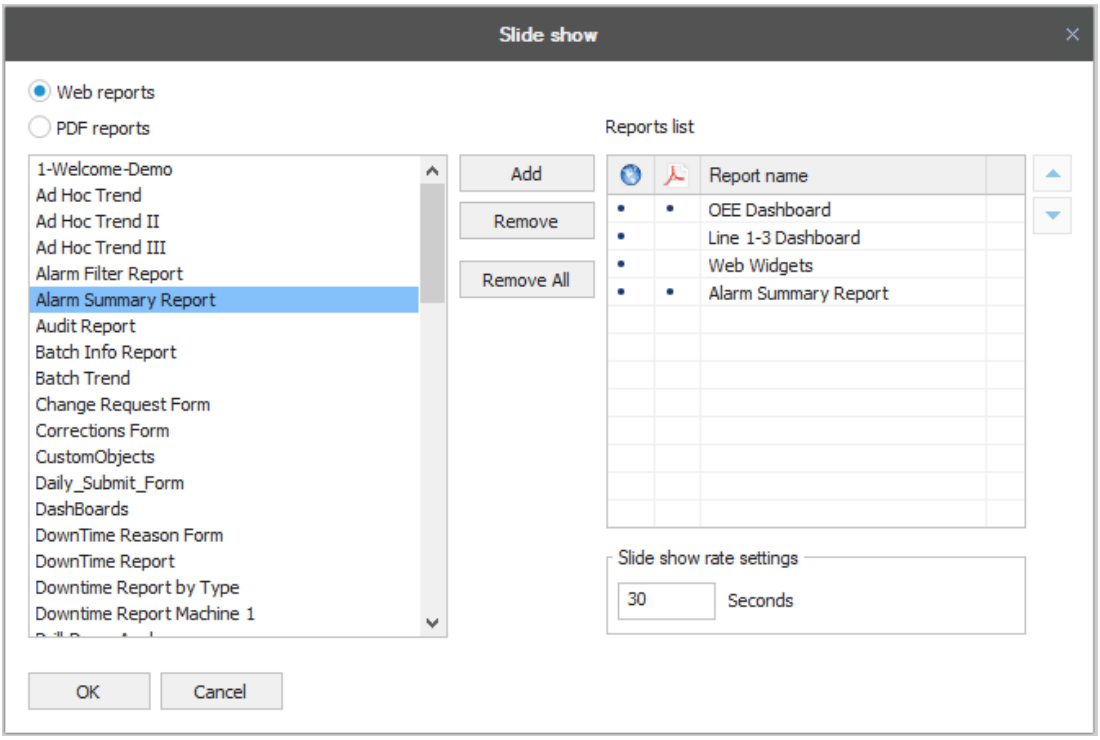
If the project has both options enabled, and if a user (who does not have another Default page defined) logs, then project's default page will be loaded. If a user (who has another Default page defined) logs in, then that user's page will be loaded. The user defined page will have higher priority than a project's global first page.

For example: if the project setting has report A as a default and user Sam has defined default page report B.

So, if user Sarah logs in, the report A will be loaded as the first page (project default page). If user Sam logs in, then report B will be opened as the first page.

Slide Show display option allows users to display reports in Web Portal as a slide show - i.e., a continuous "loop" of reports will be displayed in a specific sequence.

Click on the *Slide Show* button, and the *Slide Show* configuration window will open:

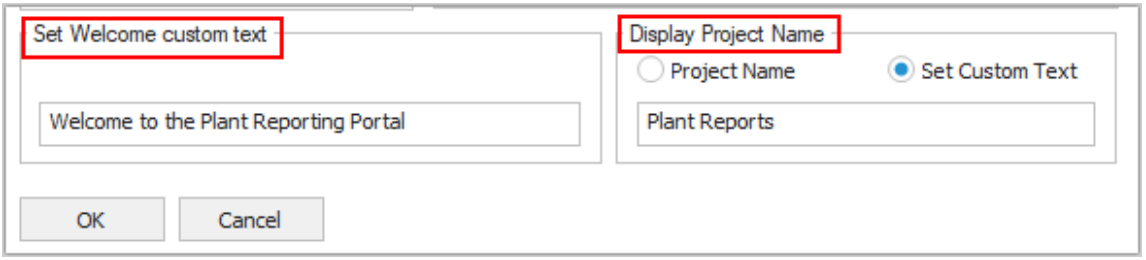


In order to configure a *Slide Show*, first select what kind of reports to display (Web or PDF). Select them from the reports list and *Add* to the *Slide Show list.* Note that PDF reports will not be automatically re-generated each time the report has to be displayed in the slide show – the most recently saved file will open. It is recommended to set a periodic generation interval (in the report's time definition settings) at least as fast as the Slide show rate setting, to ensure up-to-date data when the PDF report opens. Web reports, however, are always rendered dynamically when they are opened.

Slide Show rate settings is the duration (in seconds) each report will be displayed in the slide show.

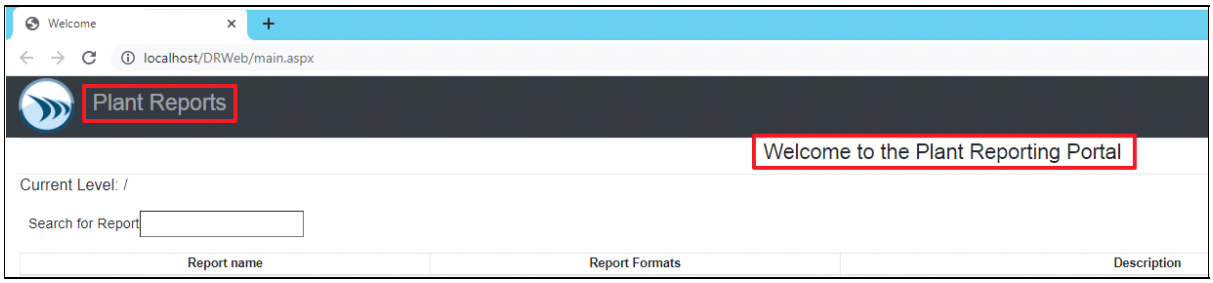
Slide Show display option allows users to display reports in Web Portal as a slide show - i.e., a continuous "loop" of reports

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To customize text on the web portal's home page, you can change the following sections:

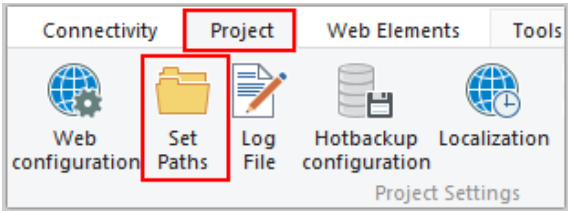
- If you wish to show a custom "welcome" message on the web portal's home page, type in the message string in the *Set Welcome Custom Text* section.



- By default, the project name will be shown in the top left of the home page. To change it, select *Set Custom Text* in the *Display Project Name* section, and enter your text.

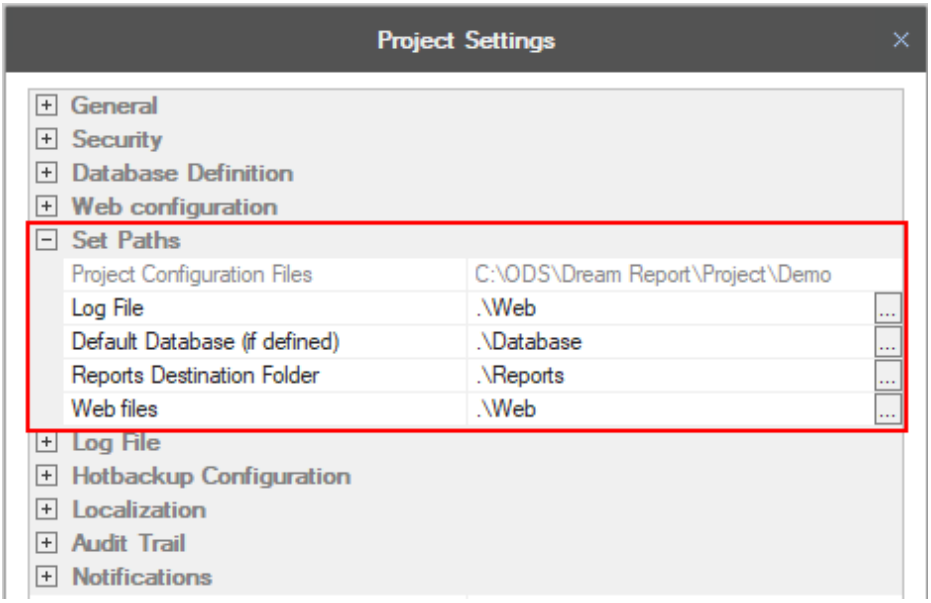
4.5 Folder Selection

In the *Project Paths* dialog window a user can configure destination folders, where different project files will be written to.



To open *Project Paths* dialog window, click on the command button *Set Paths* on the *Project* ribbon icon on the horizontal toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu. The following dialog window will be opened:

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By default, all folders will be pointed to the following directory:
<installation directory>/Projects/<Project name>
However, a user can change working directories as follows:

Project Configuration Files defines where all project files will be stored:
- **.drpj* - Dream Report studio and runtime project file
- other project related files

Log File defines the folder, where project log files will be created and stored.

Default Database defines the folder, where default database files (if defined) of the entire project will be stored.

Report Destination Folder defines the folder, where report files in PDF format will be stored.

Web files defines the folder, where all web portal related files will be copied

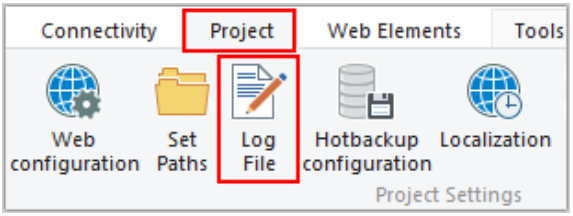
To change the folder, a user has to type a new path in the appropriate edit box, or click on the *Browse* button and select the specific folder.

4.6 Log File Settings

Dream Report has a built-in service to log online errors and information, which may be useful in debugging or auditing a project.

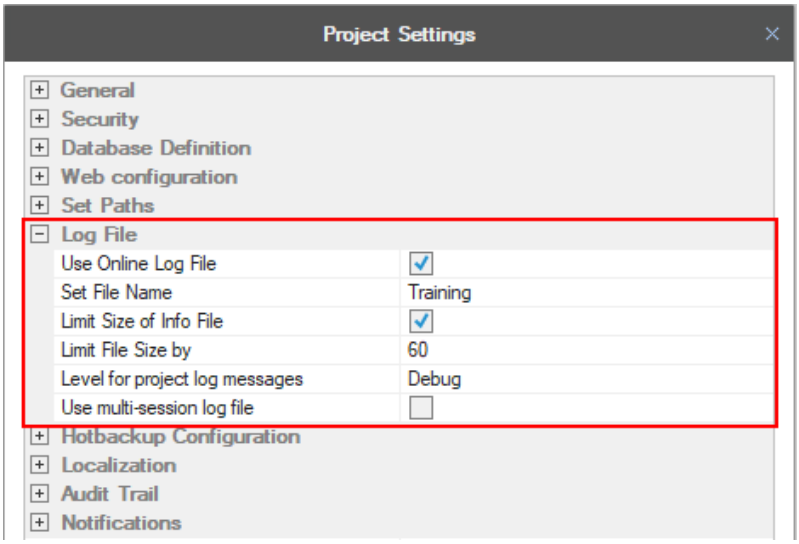
The *log file configuration* is defined in the *Log File* tab of the *Project Settings* dialog box.

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To open *Log File* dialog window, click on the command button *Log File* on the *Project* ribbon icon on the horizontal toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu:

The following dialog window will be opened to the *Log File* section:



The log file is created and written in a .**csv** format, which can be opened by MS Excel as well as by the text editor.
Using MS Excel allows the user to operate with its built-in filtering tools to simplify analysis.
The *Use Online Log File* check box will enable logging of all online data.

The Limit size of Info File option will limit the size of the info file. If this option will be enabled and file size limit is reached, a new file will be started.

Level for project log messages combo box enables configuring the level to control which message of the severity of the event, that has occurred, will be actually printed out to the log.

2 options are available:

Normal - The default log level, where only the events with a severity of NOTICE or greater will be logged.

Debug - The log level, where all events will be logged in detail, and its debugging messages will be very important for diagnosing configuration problems.

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Multi-session log file mode

The Dream Report log file can manage info logging in 2 different ways: Each time a project is started, a new log file will be created *(single-session mode)* and log from old session will be removed. Or, each time a project is started, Dream Report will continue info logging in the same existing log file, just putting a note that a new session was started *(multi-session mode).*

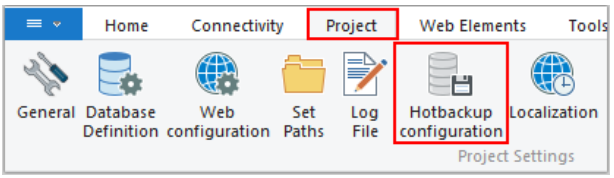
This is managed by the *"Use multi-session log file*" check box. If this check box is enabled, the multi-session mode will be maintained. If this check box is disabled, then the single-session mode will be maintained.

4.7 Hotbackup (Redundancy) Configuration

It's possible to run a local reporting runtime node as a redundant station, coupled with the main station.

There is no special configuration required for the main station - it should run as it is.

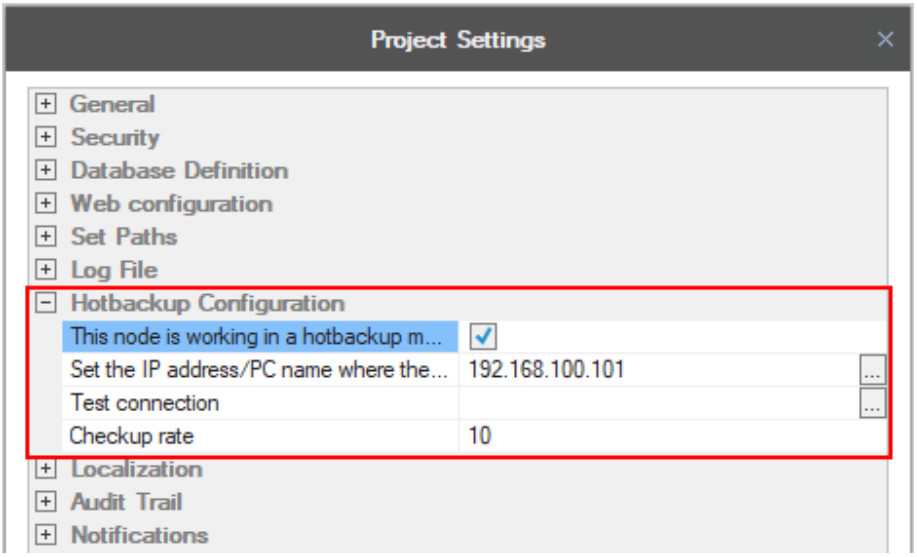
For the backup (redundant) node, first of all, it should run the exact copy of the project, which is running on the main station.



Then, to couple a backup node to the main node, a user will have to open *Hotbackup Configuration* dialog window by clicking on the command button *Hotbackup Configuration* on the *Project* ribbon icon on the horizontal toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu:

The *Hotbackup Configuration* section will open:

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In order to define the local node as a backup for the main node, check the check box *"This node is working in a hotbackup node"*.

Then, specify the *IP address* or *PC name* (without "\\" - just a network PC name) of the PC, which is running as the main station *(Set the IP address or name of the PC where the main node is running)*. This field must contain a valid information and it can't be empty.

If you wish to test the actual connectivity to the main station, you can press the button *Test Connection,* and the Designer Studio will try to connect to the main node. If test connection succeeds, the message box *"Test connection succeeded"* will pop up. If test connection to the main station fails, the message box *"Test connection failed"* will pop up.

Hot-Backup connection check uses *port 57034* on both the main and the backup stations sides. This port should normally be allowed by Windows or any other installed Firewall software when a user unblocks runtime during its first launch. But if the connection test fails, it makes sense to check the Firewall for a proper port configuration.

As soon as you have defined this node as a backup, you have also to specify the *Checkup rate*. It must be a positive, non-zero number between 1 to 86400, which means each time interval in seconds, when this local runtime manager will check the connection to the main station.

Functionality

If the check box *"This node is working in a hotbackup mode"* is checked, then, when starting the runtime manager, it will try to connect to the runtime manager on the PC, which is specified as the main node. If connection check has succeeded, then the backup node will work in a standby mode. It will not record data into a database and will not generate reports, but will only periodically check the connection with the main station every "checkup rate".

Licensing

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If user is using Dream Report in a backup mode, then he use a license with a special "backup" license option. A license with backup option allows users to use that license only on a backup node and such a license will have considerable discount from a regular such license price. More details you can check with your Dream Report reseller.

Tip

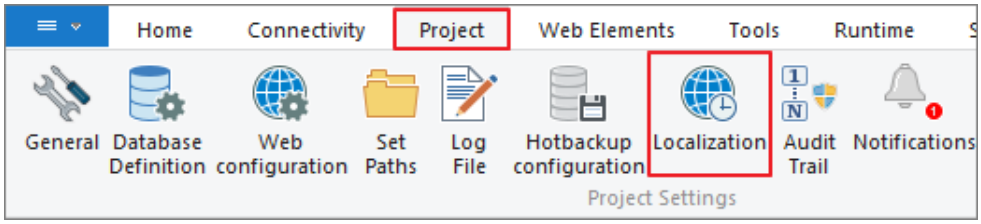
If web portal redirect from master to backup station is required user will be able to configure it manually by following steps below:

1. Go to main Web portal folder. Usually it is located on the following path: "C:\ODS\Dream Report\DR_Web_Portal";
2. Search for "Settings.config" file and open it in edit mode by notepad or similar text editor tool;
3. Add to that file the following attribute: <add key="backupUrl" value="http://backup_station_ip/DR_Web" />, where *"backup_station_ip"* correspond to the IP of the system where backup project is up and running;
4. Save and close "Settings.config" file;
5. Open Internet Information Services (IIS) Manager with administrative rights and restart IIS.

***Important Note:* By pressing "Configure IIS" button in Dream Report Designer Studio or in RMC the web redirect to the backup station configuration will be erased.**

4.8 Localization

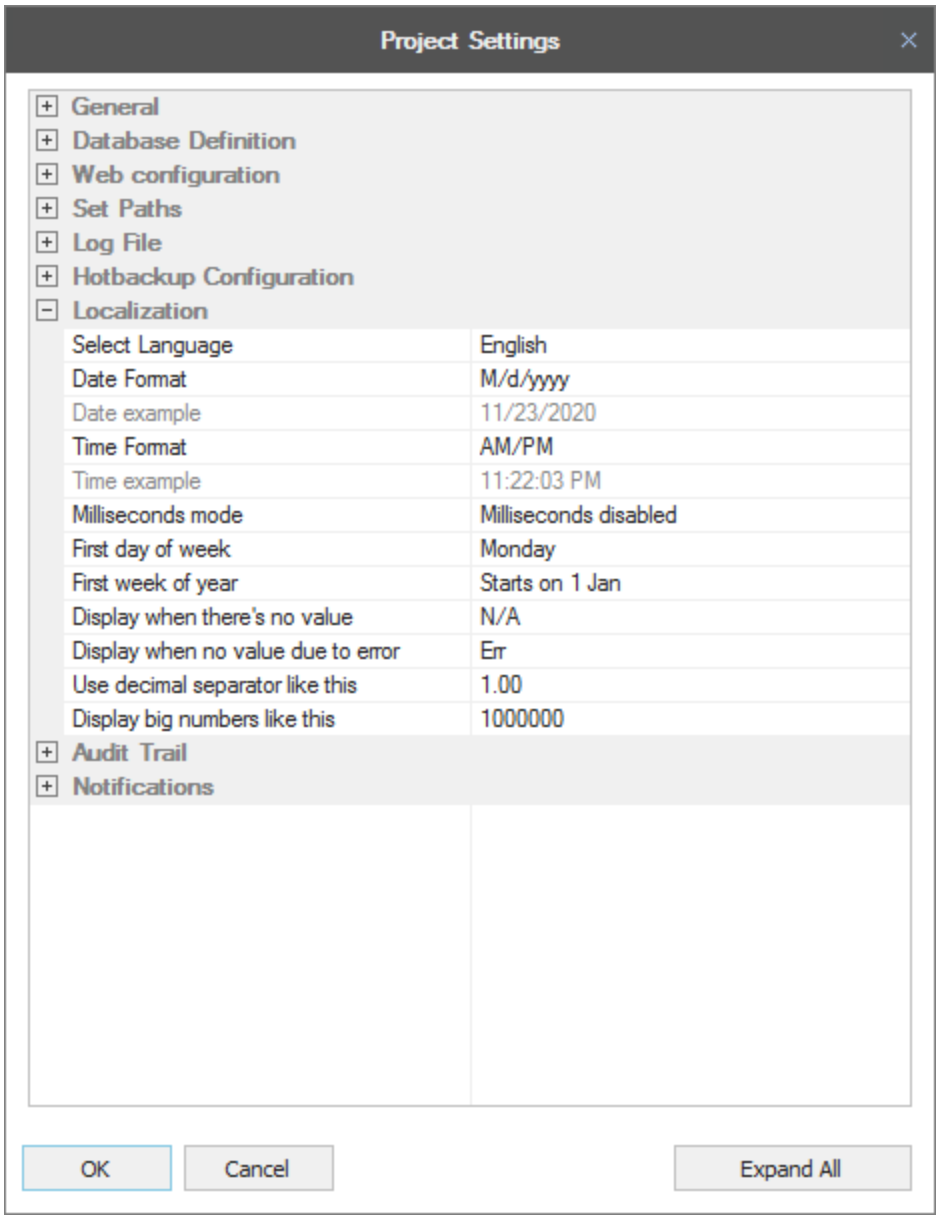
The *Localization* tab allows users to set the interface language (i.e. all dialog boxes and menus), configure date/time/week, and display settings for report objects.



To open *Localization* dialog window, click on the command button *Localization* on the *Project* ribbon icon on the horizontal toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu:

The *Localization* section will open:

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Language Selection

This dialog box allows a user to select the current language of the Dream Report studio interface - dialog boxes, menu and pop up messages.

When a new language is selected and a user clicks on *Apply* or *OK*, a new language will be applied immediately. No project restart is needed.

All strings are loaded dynamically from the language database *(Lexicon.mdb)* file, which is located in the *Database* folder of *Dream Report* installation.

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Each language is implemented in a separate table. The name of the table is the name of the language. The list of tables in the language database corresponds to the list of available languages - it's recognized by Dream Report automatically.

Useful tip:

In order to add a new language, one needs only to add a new table to the database, which has to be the exact copy of the English table (English is a template language), open it and replace all English strings by the translated ones. The new table and new language will be recognized automatically.

Date Format

Dream Report provides users a capability to configure a format of the timestamp, which will be displayed in various report objects. The default date format value will be taken from the local computer's Windows regional settings.

If a user wishes to change the date display format, he can select the desired date format from the *Date format* combo box. If that combo box doesn't contain the desired time format, user can enter any desired date format inside that combo box, using any free format and separators, and applying the following conventions:

- *dd* - day of the month,
- *MM* - month number
- *Mon* - abbreviated month name (3 letters)
- *yy* - short year in 2 digits
- *yyyy* - full year in 4 digits
- *Month* - full month name in the local language.

After the required date format is set, an example will be displayed in the *Result example* edit box. This edit box is not editable and its purpose is only to display the result date representation.

Time Format

Users can also select which time format will be displayed in the timestamps - 24 hour time representation or 12 hour (AM/PM) time representation. The default value is taken from the operating system when a new project is opened. Then a user can change this setting by selecting the desired option radio-button.

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NOTE: Date and time format from this dialog window will be used to display timestamps in item and alarm tables, display the results of the following statistical functions in *Single Data Objects* (Timestamp of Minimum/Maximum/ First/Last values), display timestamps in charts and bar graphs. The timestamp for the report name format is configured in *Report Settings --> Report name format.* The timestamp for step tables is configured in the *Step table* dialog window.

Week Settings

Week Settings section has two combo boxes: *"First day of week"* and *"First week of year"*.

In the *"First day of week"* combo box, select the day of the week, which will be considered as a week start day for weekly reports. By default selection is *"Monday"*.

The *"First week of the year"* combo box defines the mechanism of how weeks enumeration will work. Select one of the three options: *"Starts on 1 Jan", "First 4 day week"* and *"First full week"*. This setting will define the algorithm how to define a week number to display in the report and file names.

Click on *Apply* or *OK.* The new week settings will be applied automatically.

Common Visualization Settings

This group box allows users to do advanced formatting of displayed results in all report objects.

Display ("N/A") *when there is no value*. This parameter defines what will be displayed in the report when Dream Report connected successfully to a data source, but there are no values have been returned in this report. By default it is *"N/A"* (i.e. *"Not Available")*. The user can put there any string (including blank space), which will be displayed in the report when there's no result available.

Display when no value due to error. This parameter defines what string will be displayed in the report, if Dream Report failed to connect to a data source or connection has been established, but request for values returned an error.

Use decimal separator like this. This parameter defines which symbol will be used as a decimal separator that separates the whole part of a number from its decimal part. There are two choices available: "**.**" *(a dot)* and "**,**" *(a comma)*.

Display big numbers like this. This parameter defines whether the result will be formatted with separated groups of digits for better readability, where a digit grouping symbol will be placed between each of digits (either 2 or 3 digits).

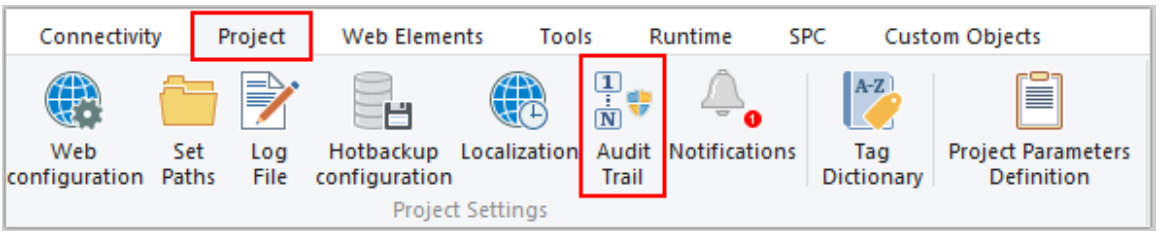
Example: If result number is *31415926535* and digit grouping symbol is <space>, then the displayed number will be: *31 415 926 535*

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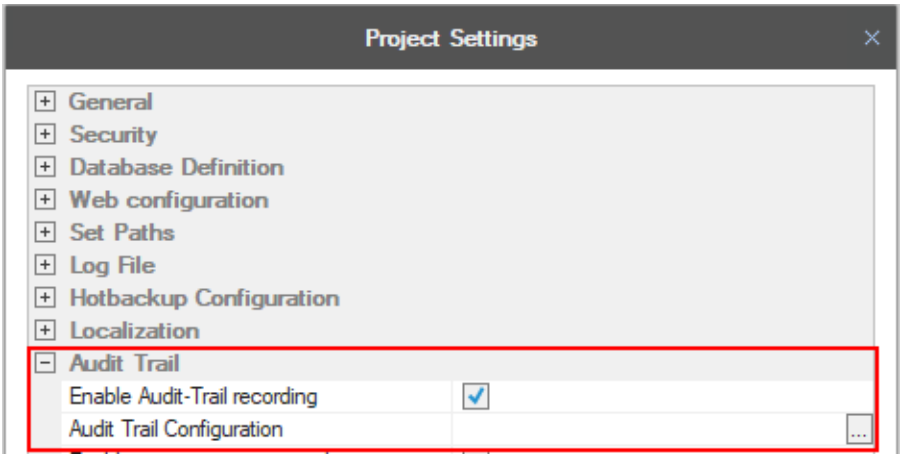
4.9 Audit Trail

Audit Trail module provides ability to log all events from Designer Studio and Runtime into an audit-trail database. The Audit Trail feature is only enabled at Runtime with the Dream Report "**Life Sciences**" license option.

This functionality will be disabled by default when the new project is opened. Since Audit Trail functionality is related to report Version Control, it will become enabled if a user clicks on the "*Version control*" command button in the **User Management** section of the **Project** ribbon icon on the horizontal toolbar in **Studio** (see pic. below):



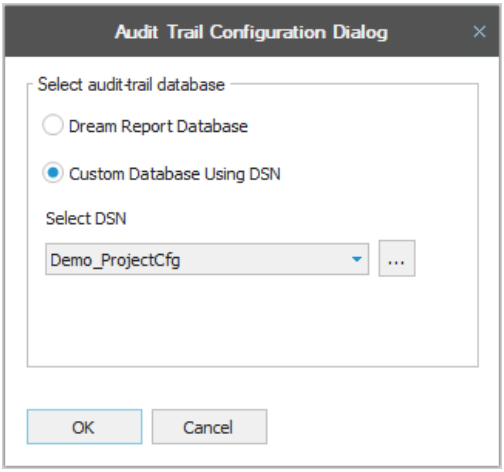
Then the following dialog box will be opened:



The edit box "**Enable Audit-Trail recording**" will enable or disable the **Audit Trail** functionality.

When enabled, click the [..] button to **Select audit-trail database** to choose whether the audit trail will be logged (by default) to the project's **Dream Report database** (defined in the **Project Settings - Database Configuration**), or in a separate database, defined as a **Custom database using DSN**. If a Custom Database is selected, either **Select DSN** from the list of defined data source names, or create a database data source name using the **DSN Manager**.

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Note:

If security is enabled on the selected Audit Trail database, please ensure that the database account used to connect to the database server has both table "Create" and "Insert" permissions enabled.

From V.5 20-1 Audit-trails allows recording of all Commits, Updates and Reverts associated with Remote Development, into a table with timestamps and details.

Click *OK* to close the Enable Audit-Trail recording option.

The next time you run the project in Runtime, Dream Report will first check for the presence of the Audit Trail table in the selected database and, if it doesn't exist, try to create it. Then, any runtime activities will get logged to this table (named [**tOdsAuditTrailEvent**].

Event Types List that product's Designer Studio and the runtime will record into the project's audit trail database:

PROJ_START = 1 - Project Start Event

PROJ_STOP = 2 - Project Stop Event

LOGIN_CHECK = 3 - Login verification Event

GENERATE_REP = 4 - Report generation Event

SIGN_REP = 5 - Signing Report Event

MANUAL_DATA_SUBMIT = 6 - Manual Data Submit Event

MANUAL_DATA_CORRECT = 7 - Manual Data Correction Event

MANUAL_DATA_VALIDATE = 8 - Manual Data Validation Event

MANUAL_DATA_SUBMIT_VALIDATE = 9 - Manual Data Submit and Validation Event

GENERATE_REP_START = 10 - Generation Report start process Event

VER_CTL_REVISION_PROJ_CHANGE = 11 - Change of the revision of the project Event

VER_CTL_REVISION_REP_CHANGE = 12 - Change of the revision of the project Event

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VER_CTL_UPDATE = 13 - Update of the project from repository Event

VER_CTL_COMMIT = 14 - Commit to repository Event

UM_ADD_USER = 15 - User Management - add user Event

UM_DELETE_USER = 16 - User Management - delete user Event

UM_CHANGE_USER_PERMISSION = 17 - User Management - change user permission Event

UM_INACTIVITY_LOGOUT = 18 - Logout on inactivity from DR Studio Event

REPORT_DELETE = 19 - Delete report Event

REPORT_ADD = 20 - New report Event

PASSWORD_CHANGE = 21 - Password change event

LOCK_LOGIN_FAILURE = 22 - Lock after login failure Event

UM_LOGOUT = 23 - Logout event

NOTIFICATION = 24 - Notification event

AUDIT_TRAIL_DISABLE = 25 - Disable audit trail event

AUDIT_TRAIL_ENABLE = 26 - Enable audit trail event

AUDIT_TRAIL_CFG_CHANGE = 27 - Audit trail configuration change event

ES_PIN_CHANGE = 28 - Electronic signature PIN change event

STUDIO_USER_LOCK = 29 - User has been locked from Studio Event

STUDIO_USER_UNLOCK = 30 - User has been unlocked from Studio Event

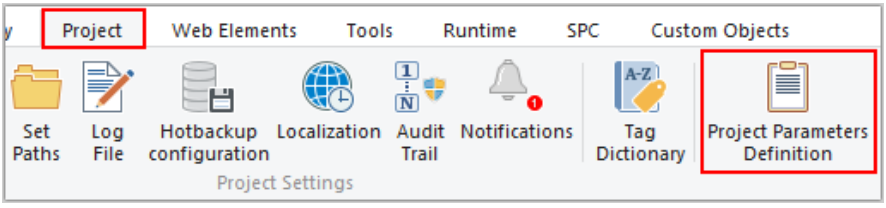
4.10 Project Parameters Definition

Internal Project Parameters

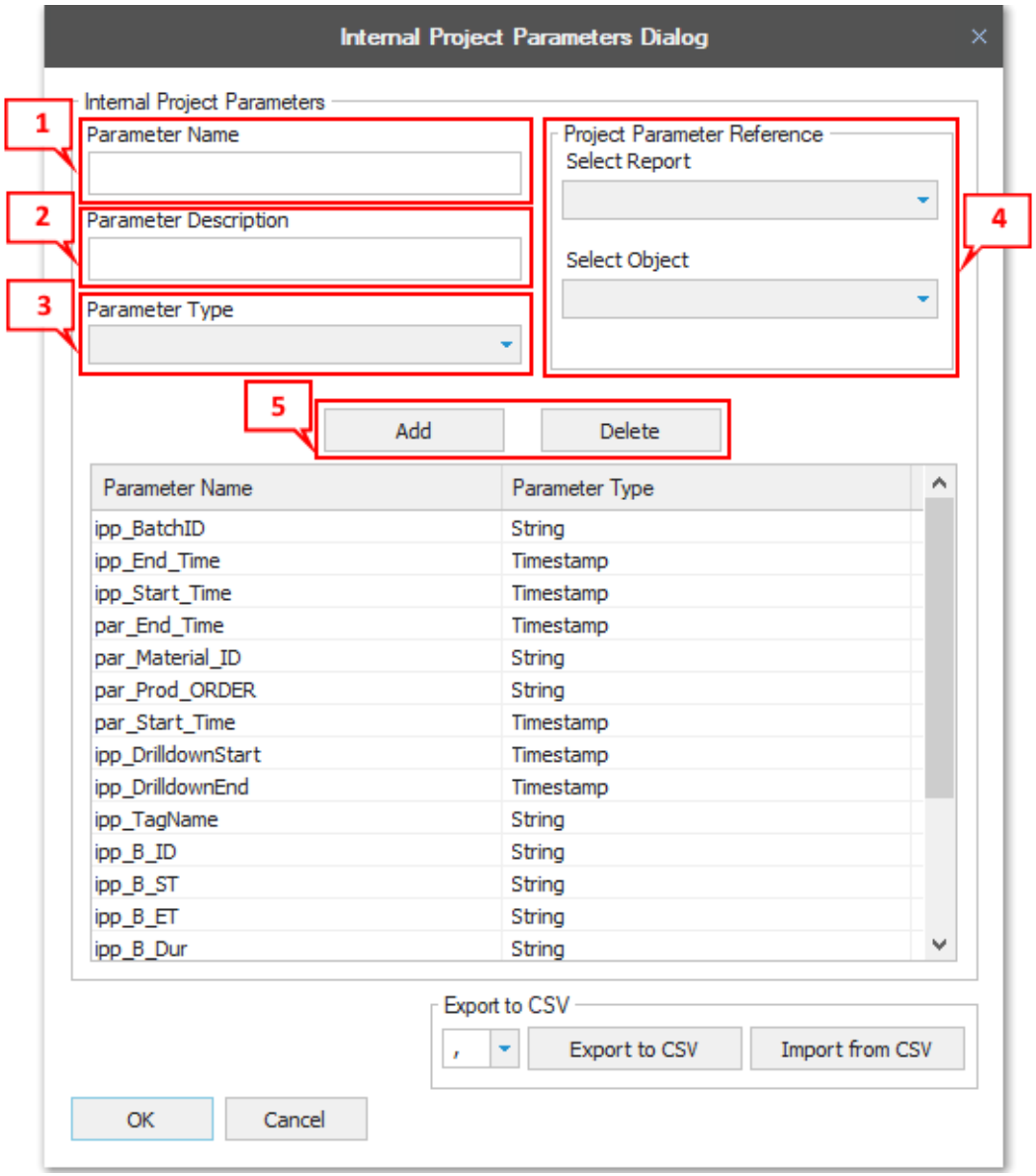
Internal Project Parameters (IPP's) are a set of predefined internal variables which can take data from report objects (on report generation) or from a command line, and can be used to pass the parameter values into "target" reports. For example, if a user clicks a hyperlink on a table on one report, they might want to open another (related) report, and be automatically filtered with a set of values that have been passed in from the first report. You can think of IPP's as "global variables" accessible from any report in a project.

To configure Internal Project Parameters for the project, click on *"Project Parameters Definition"* option on the *"Project"* tab in Dream Report Studio:

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The *"Internal Project Parameters Dialog"* window will open:



In the *"Internal Project Parameters Dialog"* window a user can define multiple IPP's. IPP's are configured as follows:

1. *Parameter Name* - a unique string with a maximum of 32 characters. Name is required.

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2. *Parameter Description* - enter an optional description (up to 128 characters) for the project parameter.
3. *Parameter Type* - depending on the type of data that the IPP will contain, select the type from one of 3 options: *Numeric*, *String* or *Timestamp.*
4. *Project Parameter Reference* - this is an optional feature which allows you to assign a default value for the IPP. To assign a default value reference, first select a specific *Report* name, and then an *Object* on that report that will contain the default value. Those parameters can remain empty. *"Select Report"* combo box will be automatically filled with the list of all reports in the project. Once a report name is selected, the "Select Object" list box will be automatically filled with a list of report objects (from that report) of the following type: *Single Data Objects, Compound Data Objects, Expression Data Objects, Combo boxes, Date/Time pickers.*
5. *Add* and *Delete* - Click the *"Add"* button to add a configured IPP to the list, or click *"Delete"* to delete a configured IPP. Note that if you delete an IPP that is referenced in one or more reports, you will need to manually remove/change the references to that IPP in each report.

Export to CSV/Import from CSV

In order to simplify quick edit of the list of Project Parameters, a user can export the list of parameters into a CSV file- - in the bottom right corner of the window, there is a button "Export to CSV". If a user will click on that button, a standard Windows Save File will be open, where a user can set a name and destination for the CSV file with exported IPP definitions.

To the left from "*Export to CSV"* button, there is a combo box with comma separator symbol. By default, "," (comma) symbol is used. If needed, a user can select another separator from that combo box (a semicolon ";" or a tab). If a user needs a custom separator - any custom separator can be typed manually in that combo box (a user has just to click in and type). When exporting IPPs, that window will use the separator symbol, currently displayed in a separator combo box.

When opening exported CSV file, it will have the following structure:

Parameter Name	Parameter Description	Parameter Type	Parameter Source	Parameter Item	Parameter Item Type
ipp_BatchID		String	DownTime Report	[f#Last_BI]	
ipp_End_Time		TimeStamp			
ipp_Start_Time		TimeStamp			

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par_End_Time		TimeStamp			
par_Material_ID		String			
par_Prod_ORDER		String			
par_Start_Time		TimeStamp			
ipp_DrilldownStart		TimeStamp			
ipp_DrilldownEnd		TimeStamp			
ipp_TagName		String			
ipp_B_ID	Batch Taken from Batch Info Report	String	Batch Info Report	[f#Batch_ID]	
ipp_B_ST	Batch St Time taken from Batch Info Report	String	Batch Info Report	[f#Batch_Start]	
ipp_B_ET	Batch Et Time taken from Batch Info Report	String	Batch Info Report	[f#Batch_End]	
ipp_B_Dur	Batch Dur Time taken from Batch Info Report	String	Batch Info Report	[f#Batch_Duration]	
Util_Type		Number	Utilities Dashboard	[f#exp_gas]	
live_trend_st		TimeStamp	Ad Hoc Trend II	[f#exp_st_7days]	
live_trend_et		TimeStamp	Ad Hoc Trend II	[f#exp_et_7days]	
DT_line_name		String	DownTime Report	[f#Dif_Line_Name]	
Rep_Name		String	Project Info	[f#def_report]	
well_id		Number			

In order to import IPPs from a CSV file, a user has to click on "Import from CSV" button and select a source CSV file in the opened "Open file" windows dialog window. All valid IPP definitions, found in that file will be added to the list of project IPPs, replacing the original IPP definitions in the list.

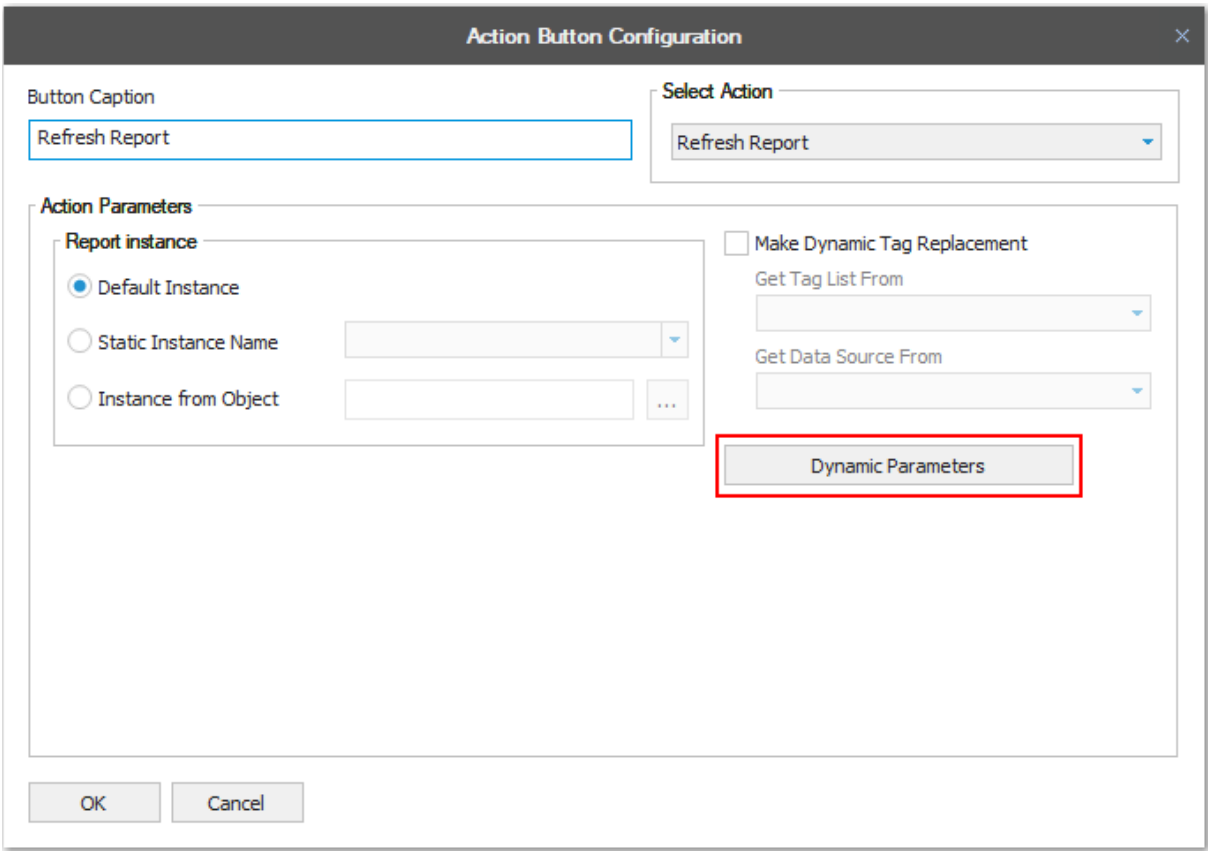
Imported list of IPPs will not be merged with the actual IPPs list. When importing IPP definitions form a CSV file, the actual current list of defined IPPs will be removed and just simply replaced by IPP definitions, read from the CSV file.

Assigning Values to Internal Project Parameters

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Internal Project Parameters are typically assigned a value in an *Action Button* web element, or in a *Hyperlink* on a report - with either way, the IPP is ultimately configured in the *"Internal Hyperlink Parameters Configuration Dialog"* window. Once a value has been assigned to an IPP, it can then be referenced in another report, and used as needed.

When assigning an IPP in a *"Refresh Report"* or *"Generate Report"* action button, click the *"Dynamic Parameters"* button to assign values to the IPP(s):

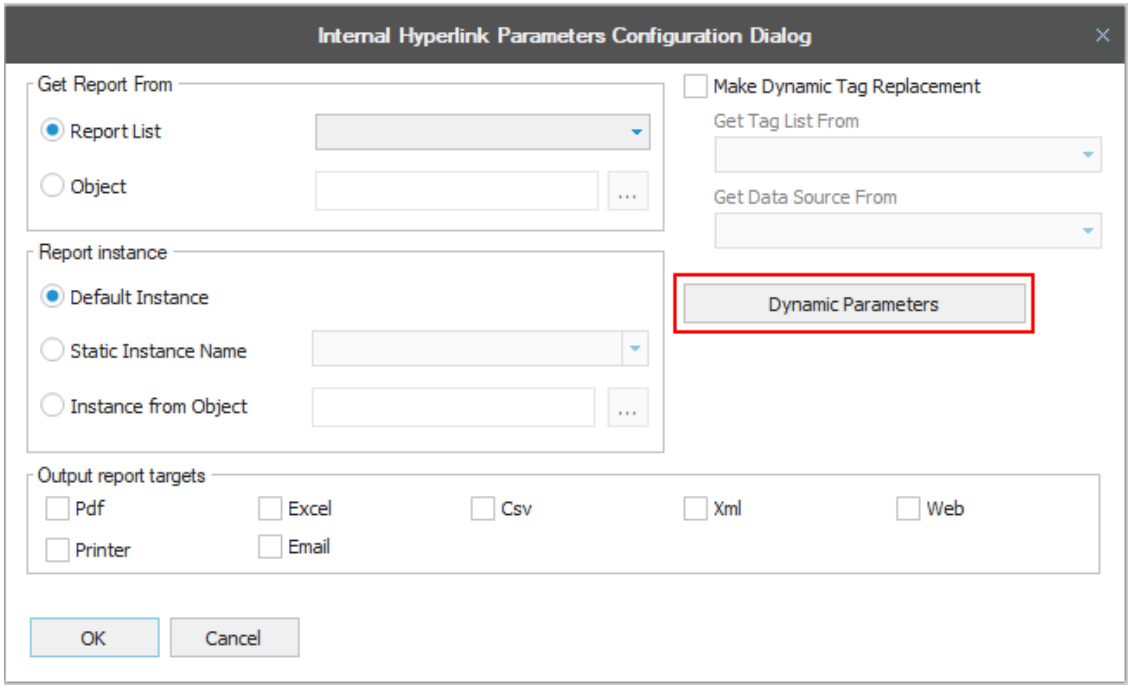


Likewise, when assigning an IPP in a *Hyperlink* 568 web element, or from an *Internal Hyperlink* in a report object (Single Data, Step or SQL Query Table objects), click the *"Internal Hyperlink"* button:



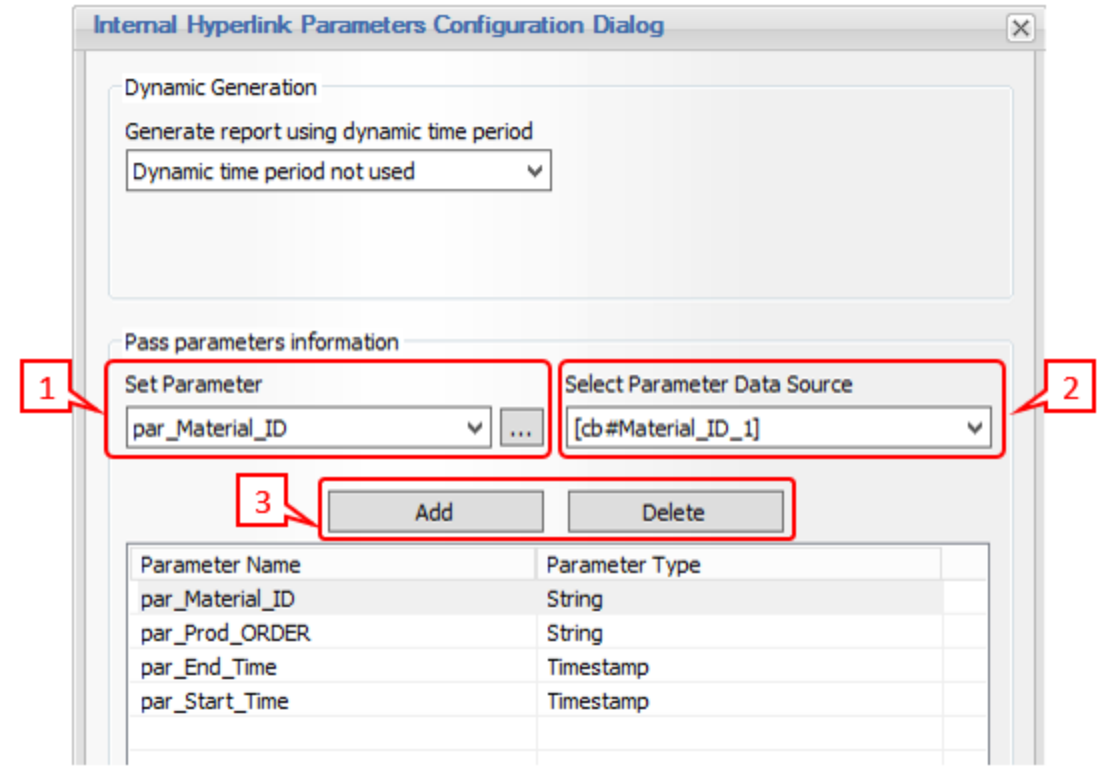
and then, in the opened *Internal Hyperlink Parameters Configuration* dialog window, click *Dynamic Parameters* button:

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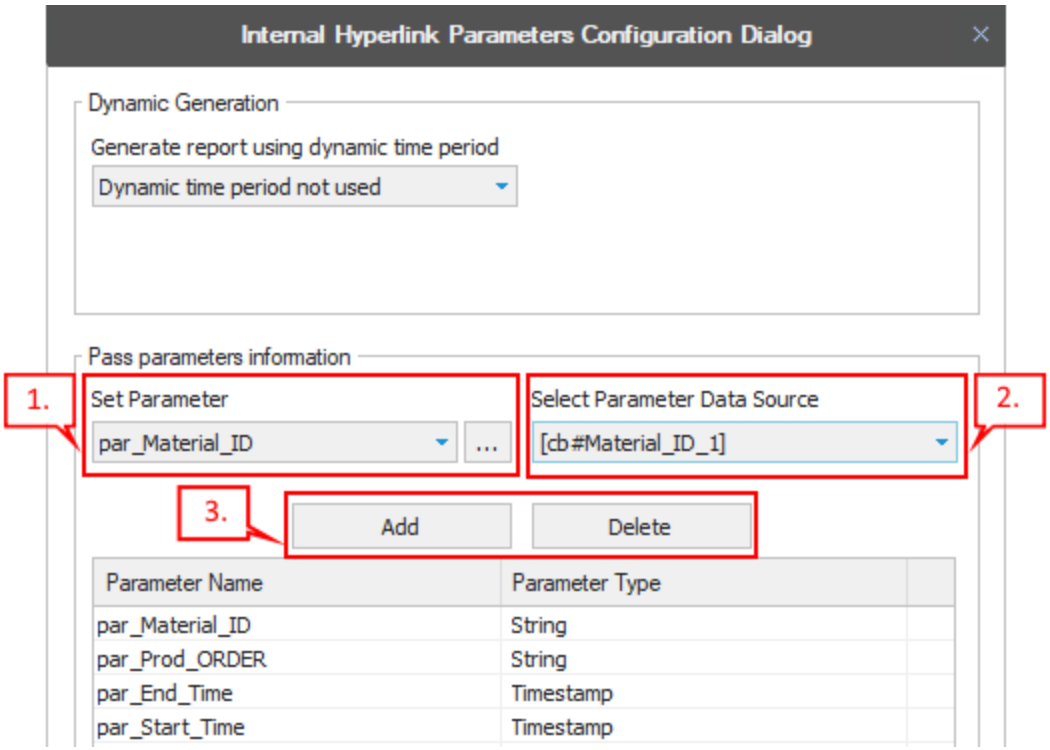


and then, click the *"Dynamic Parameters"* button to assign values to the IPP(s).

The *Internal Hyperlink Parameters Configuration* dialog window will open, where you can assign values to the IPP's:



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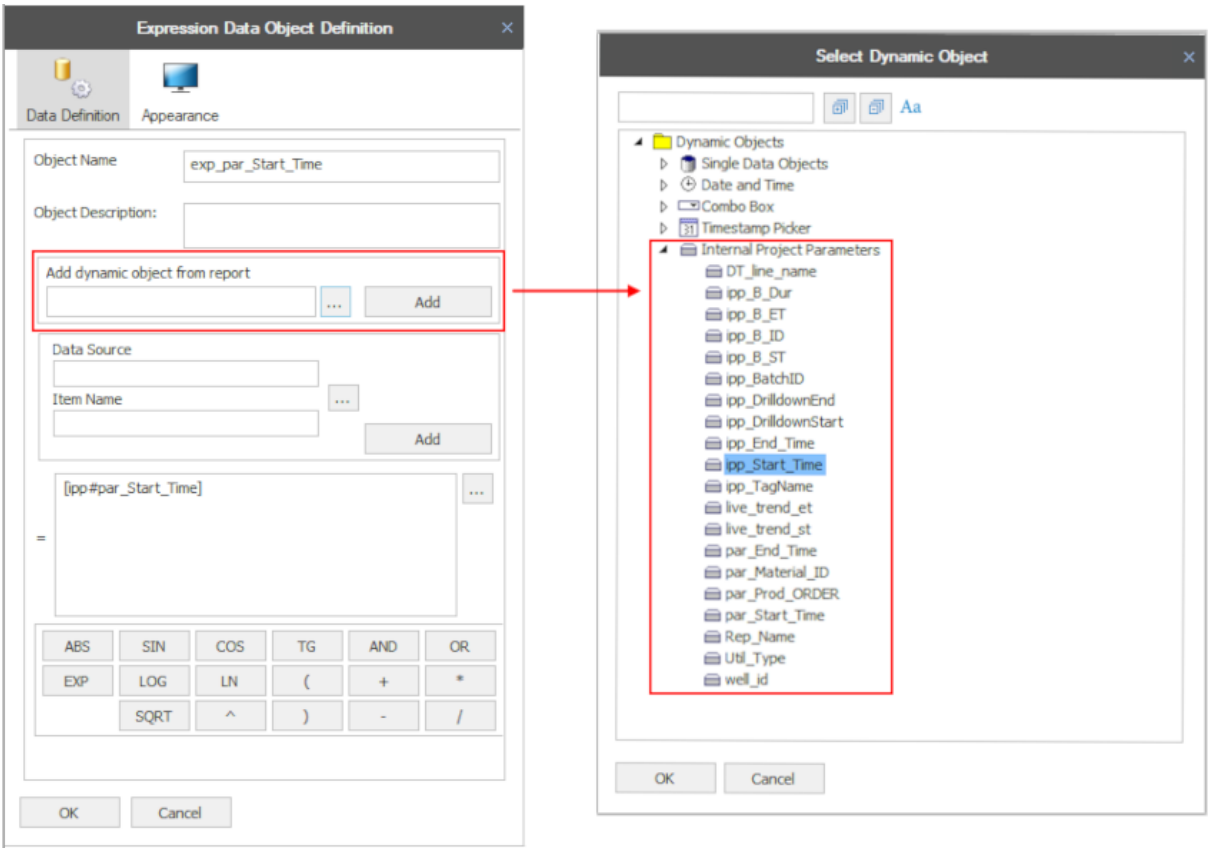
1. *Set Parameter* - Select the specific IPP from the list of configured IPP's you wish to assign a value to when clicking the *"Action Button"*. If the IPP has not yet been defined, click the "**[…]**" button to open the *Project Parameters Definition* window and define a new IPP (as described earlier in this section.)
2. *Select Parameter Data Source* - select the object from the report containing the value you want to assign to the specific Parameter
3. *Add* or *Delete* - click *"Add"* to add the parameter mapping to the list, or to delete a parameter mapping, highlight the specific parameter, and click *"Delete".*

Using Internal Project Parameters in a Report

Once an IPP has been assigned a value, it can be referenced in a "target" report in one of several objects:

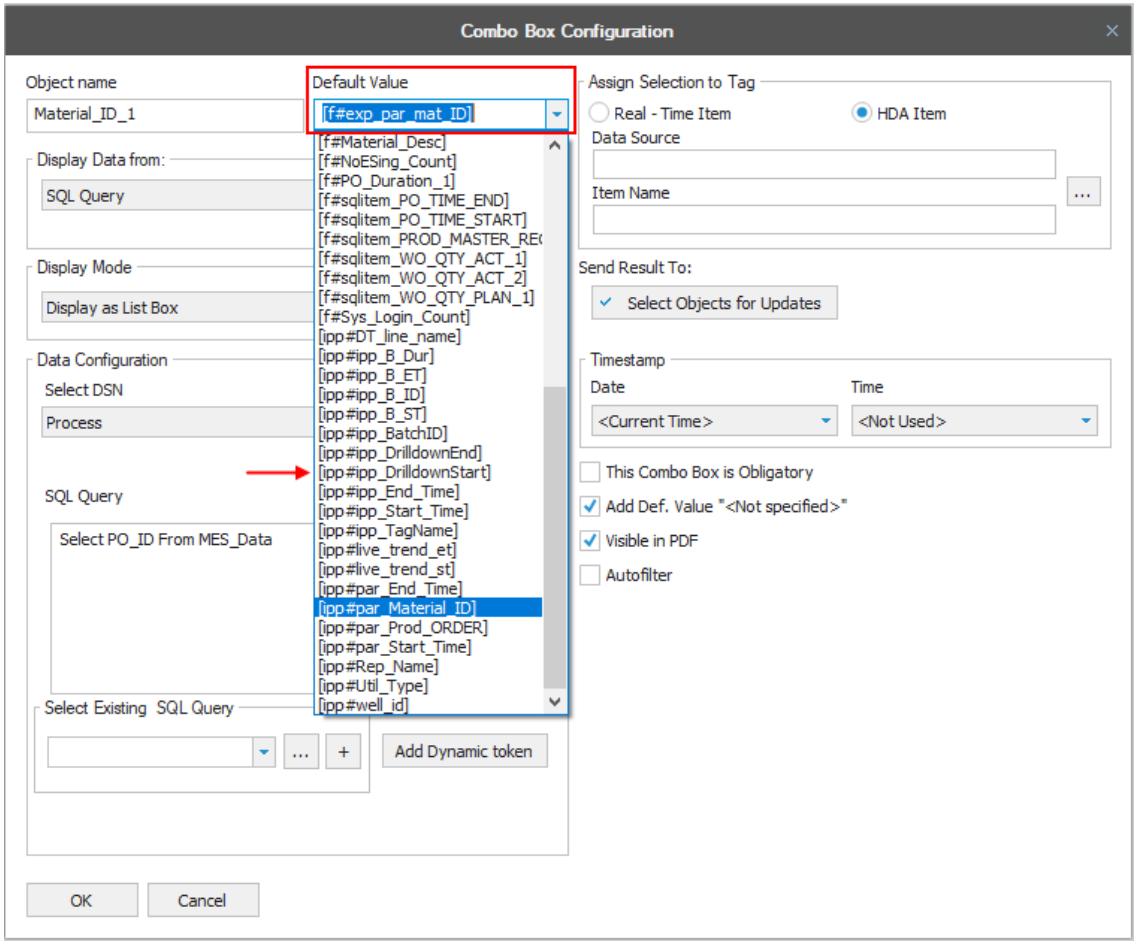
- *Expression Object* 312 - to reference an IPP in an Expression object, select the desired IPP from the *"Add Dynamic Object from Report"* list, and then click the "Add" button to add it to the expression:

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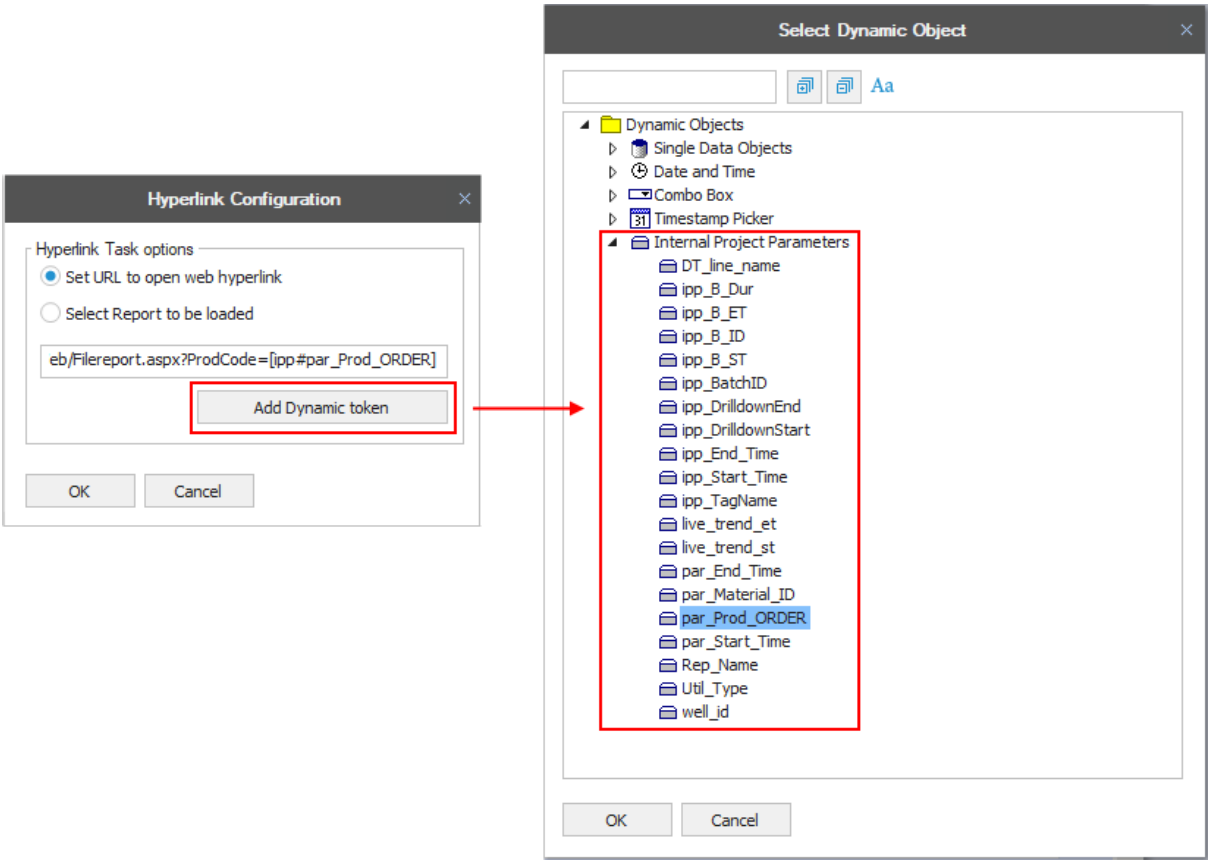
- *Combo Box* 571 - an IPP can be selected as default value for a Combo Box web element:

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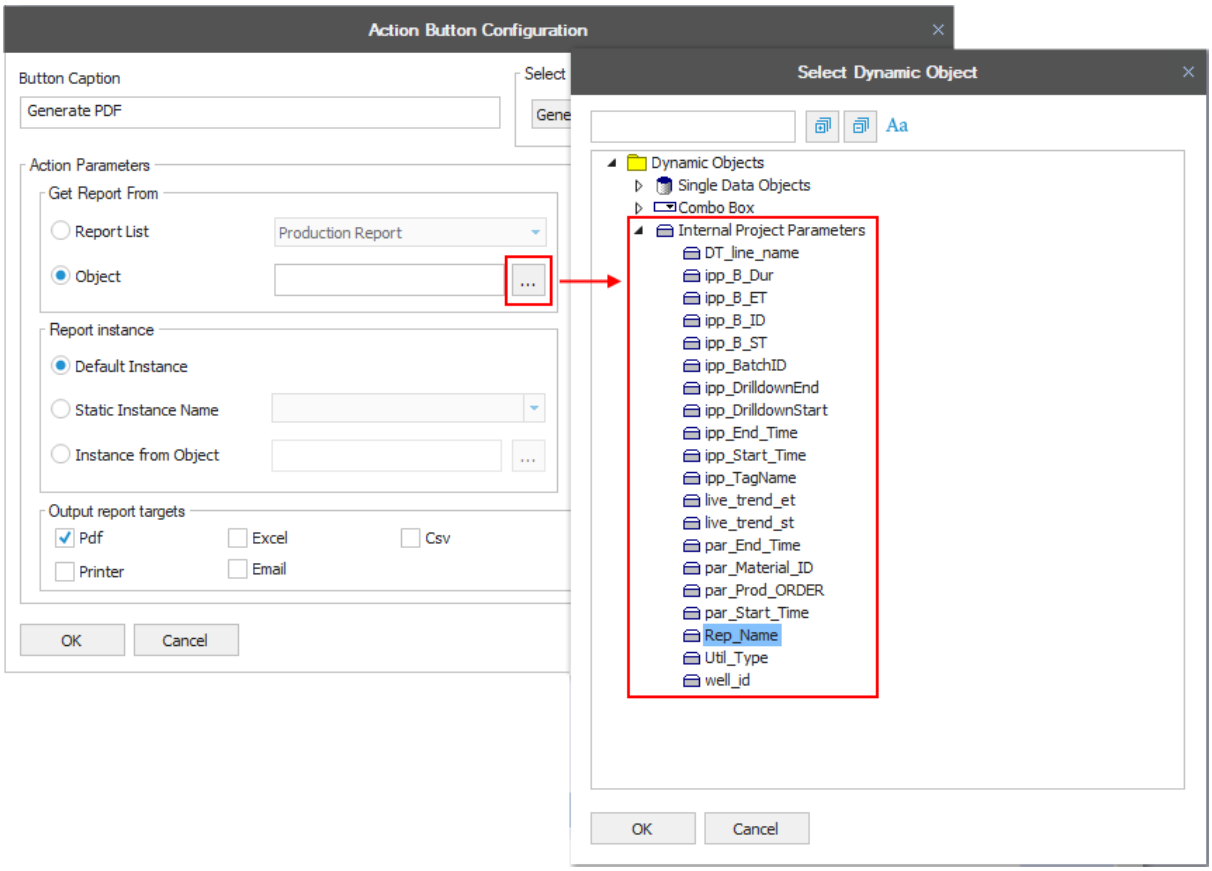
- *Hyperlink URL* 568 - an IPP can be referenced when creating a dynamic URL:

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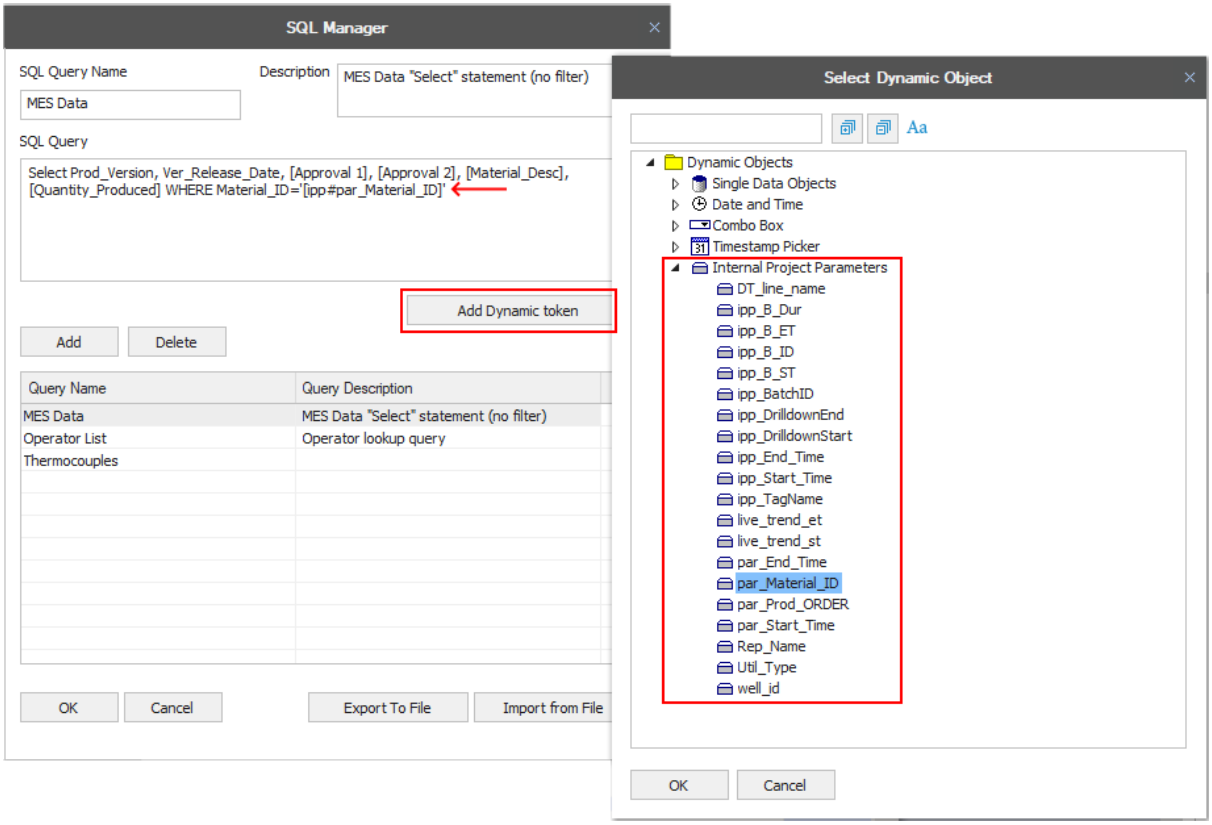
- *Action Button* 582 - certain *Action Button* actions (e.g., *"Generate Report"* and *"Refresh Report"*) allow you to reference an IPP value directly:

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- *SQL Manager* 303 - when defining SQL queries in the Dream Report *SQL Manager* (and most other objects that support SQL queries), you can reference an IPP to create a dynamic query:

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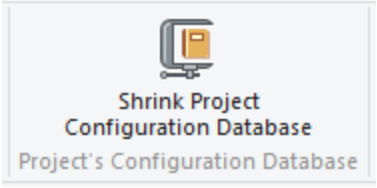


NOTE:

While some objects do not support directly accessing the list of IPPs, a simple workaround is to place a (hidden) *Expression* object on the report that references the IPP, and then other report objects can reference the *Expression* object either directly or through the *Analytics* driver.

4.11 Shrink Project Configuration Database

A project's configuration file (repository) may grow over time, as edits are made, new reports added, reports deleted, etc. Since the project file size will not automatically shrink, it is good practice to periodically shrink the project's configuration database, by clicking the following icon in the *Project* tab of DR Designer Studio.

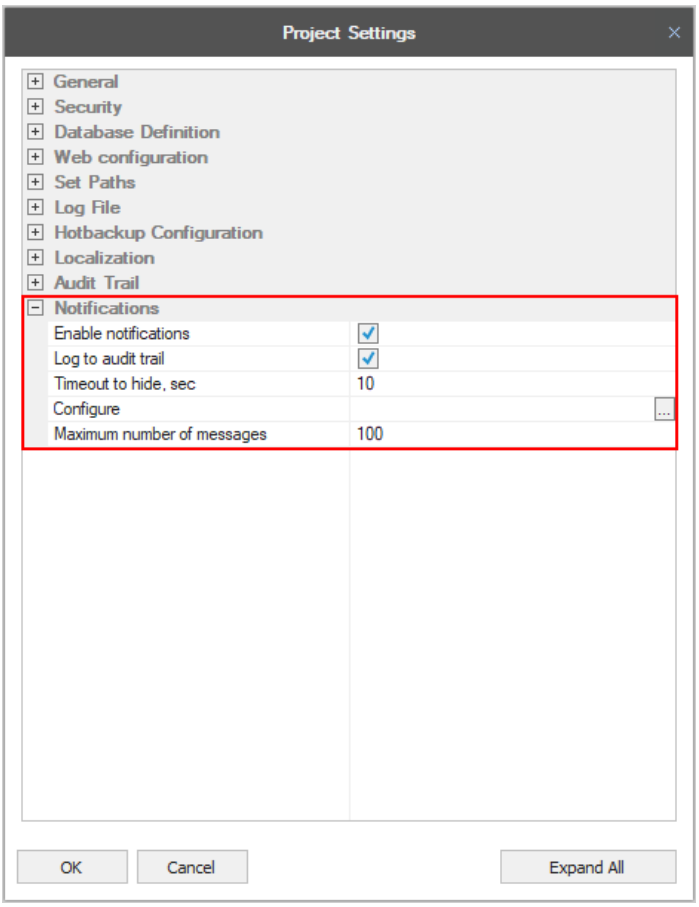


After a few seconds (or longer, depending on the size of the project) the shrink task will be completed, and you can continue working in Studio. Please note that during the shrink process, a temporary file, approximately twice the size of the project configuration file, will be created on the local hard drive, and then automatically removed after completion.

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4.12 Notifications

Project settings section has the section *Notifications*. Also, there is a *Notifications* button in the *Project Setting* ribbon menu. If user will click it, then the "*Notifications*" section of the Project Settings configuration, will be open:



If user is willing to use notification module, then, the user has to open this *Notifications* section of *Project Settings* and check *Enable notifications* check box. That will enable this module in *Dream Report* project.

The option *Log to audit trail* will enable logging of all notifications to the project audit-trail database. If this option is disabled, then all notifications will be not logged.

NOTE: The *Log to audit trail* option will be available only, when audit-trail functionality is globally enabled in the project and when the audit-trail option is available in the license.

Parameter *Timeout to hide* defines, how much time, notification popup window will remain open in a web portal, if user does not close it. The default value is 10 seconds.

The *Maximum number of messages* parameter defines the maximum length of the list of messages, which will be displayed in a user inbox in a web portal. The default value is 100 messages.

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Connectivity

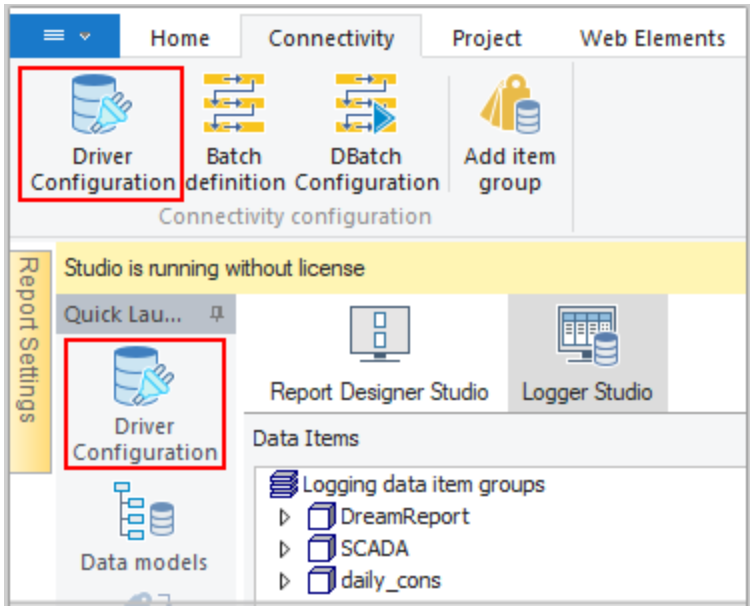
5 Connectivity

Enter topic text here.

5.1 Communication Driver Configuration

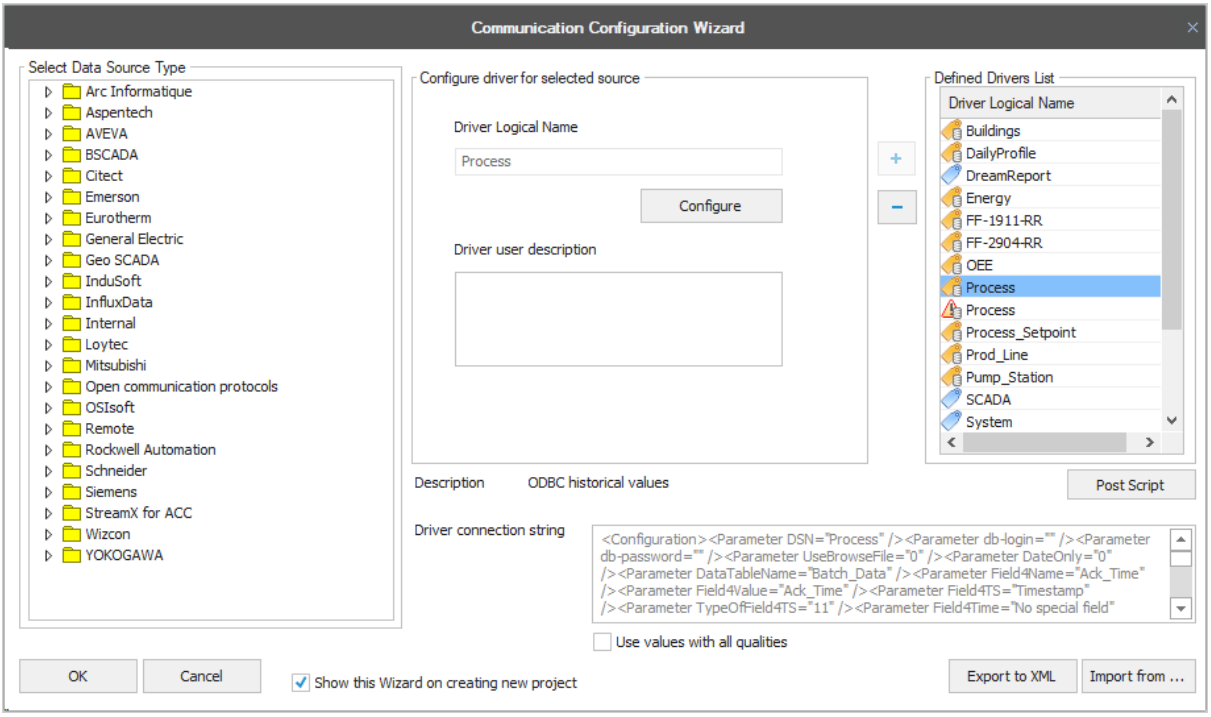
To connect to any data source and acquire live data, alarms or access its history, a user has to select an appropriate communication driver.

Each communication driver is configured via *"Communication Configuration Wizard"* dialog box, which can be opened either from the Logger Studio or from the Report Designer Studio menu. Click on the command button *"Driver Configuration"* either on the *Connectivity* ribbon icon or on the *"Driver Configuration"* button also located on the left vertical toolbar (see picture below):



The following driver configuration dialog box will be opened:

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When the driver configuration window is opened in the *Driver Logical Name* section the Dream Report analytical driver 776 *(Analytics)* will be automatically configured, and you will not need to do its

Data source selection will be displayed as a tree. The first browse level will be the list of the data source vendors. All first level browse will be displayed as folders.

When the type of driver will be selected from the *Data source* tree, it will automatically appear in the *"Driver logical name"* box for configuration. To configure communication settings, button *"Configure"* will open the driver configuration dialog box. Each driver has its own configuration user interface, which depends on the specific protocol needs.

If driver doesn't have any configuration interface, that button will be disabled.

When source is configured, it can be added to the general list of data sources, defined in the project, by clicking on *"Add"* button. The source configured will appear in the *Defined drivers list*. Button *"Delete"* will delete the selected source from the list.

If the check box *Show this wizard on creating new project* is enabled, then each time when user starts a new project, this driver configuration window will be automatically opened with designer studio, so that user will know that first thing to do is to define communication drivers. If user will uncheck this check box, then each time when new project is created, users will not see this window opened anymore.

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Driver connection string section will show internal communication string for already defined drivers. Each time when user adds a new driver to a project, all driver configuration is saved in the project as a configuration string, which is used then by that driver. So, in this "connection string" section users will see selected driver's connection string in pure internal format.

NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the *"Select Data Source Type*" field on any other driver and then go back to the driver that you need to configure.

When all the communication settings for the project are done, click on *OK*, and the driver configuration will be finished.

For help information on a specific driver use, please, refer to the specific driver information in the Communication Drivers section.

NOTE: When changing the definition of an existing driver, please, be aware that the name of the existing driver can *NOT* be changed.

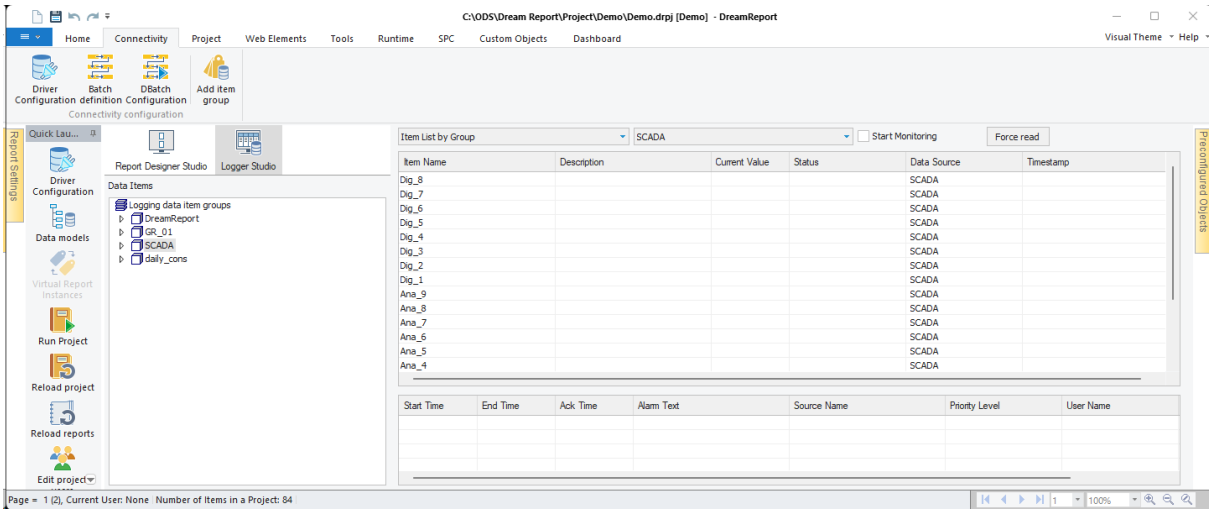
Post Script - This option allows users to write and execute LUA script after each driver instance call. The result data matrix will be taken for the script execution on it and then calculated array of values will be pushed up to be used in report objects.

5.2 Logger Studio

Logger Studio is a user interface to configure all data communication, and data logging to the internal Dream Report database.

Logger studio is split vertically into two parts: the upper part is *data* communication and logging definition and the bottom part is *alarm* communication and logging definition:

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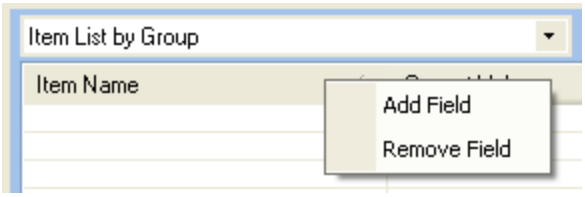
To establish communication, select the appropriate communication drivers. Detailed explanation of data source definition is described in the *Communication Driver Definition* chapter.

The top left list box contains a list of all data items groups for data logging. A detailed explanation of data item group definition is in the Item Group chapter.

The upper list control shows the items from your selected source or selected group. You can define which list of items you would like to see using combo boxes above this list control. The left combo box allows you to select *Item List by Data Source*. Then, the right combo box will be filled with a list of available data sources, defined in a project and the configured source, the item list will be filled with the list of items from that data source. If you will select *Item List by Group,* the right combo box will be filled with a list of item groups defined in a project and selecting a group will list the items from that group.

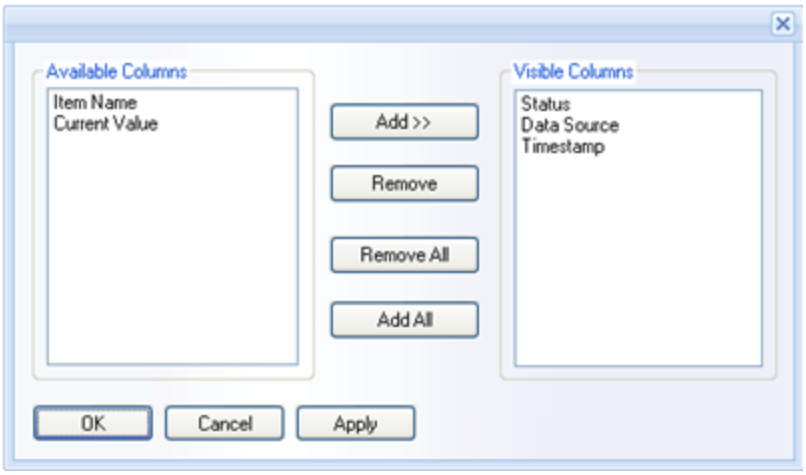
The lower left part contains a list of all alarm logging groups defined in a project. Detailed explanation of data alarm group definition is described in the Alarm Group Definition chapter.

If you right-click on the *item list header,* a popup menu will appear where you can select which columns to show:



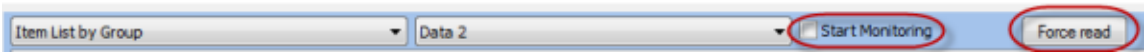
If you will select *Remove Field*, the selected column will be removed from the list. If you will select *Add Field,* then the column definition dialog will be opened, where you can select which columns you would like to add:

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The available columns for the item list header can be: *Item Name, Current Value, Status, Data Source, Timestamp.*

There are 2 options in the Logger Studio which allow to manage the process of data logging: *Start Monitoring* and *Force Read* (as shown below):



If *Start Monitoring* check box is checked, then the whole process of data logging (data logging value changes, status, timestamp) can be monitored, or controlled.

If *Force Read* button is clicked, then the current status details of the data item logging (current value, status and timestamp) will be displayed, i.e. you will see the logging status details, but you won't be able to observe and control the process of data logging (as with *"Start Monitoring"* option).

By default, when *Logger Studio* is opened, both monitoring options will be disabled.

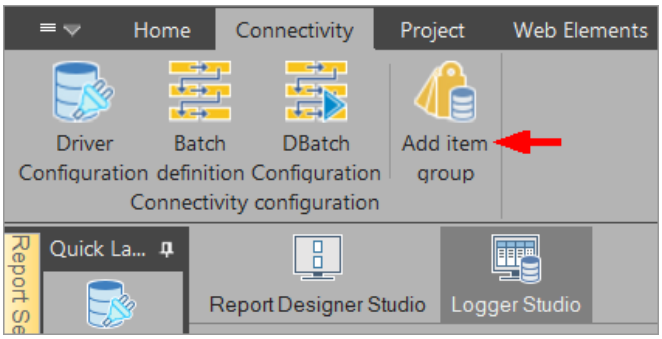
5.2.1 Item Group

5.2.1.1 Item Group - Definition

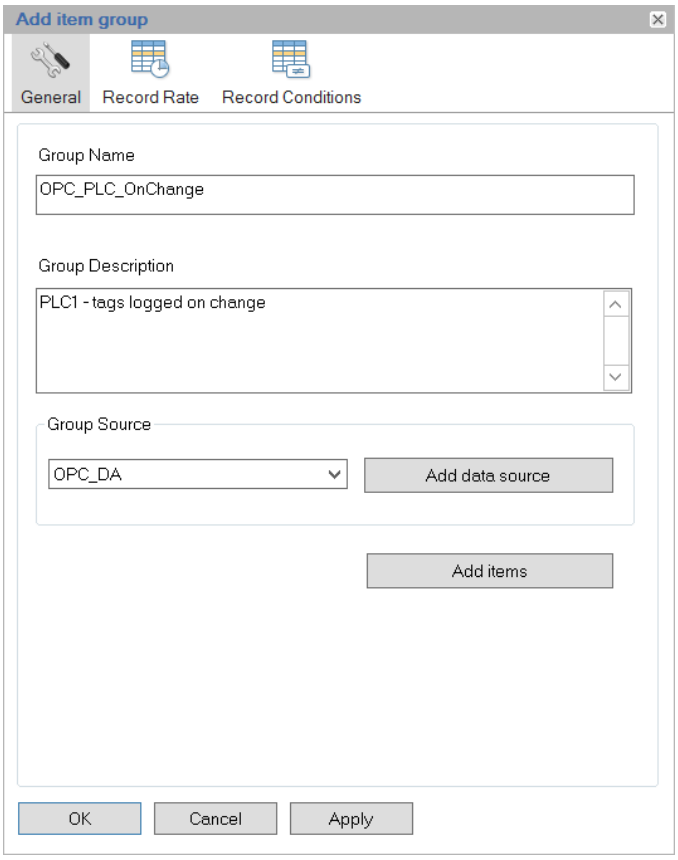
Dream Report Logger Studio enables users to split different data items by groups and define separate logging conditions for each group of data items.

Click on the command button *Add Item Group* on the *Connectivity* ribbon icon on the horizontal toolbar in the Dream Report Logger Studio menu (see pic. below):

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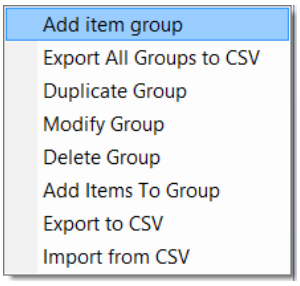
Add Item Group dialog window will be opened (see pic. below).



If no item group has already been created, you can open the Dream Report Logger Studio and right-click on *Add item group* in the left top part of the Logger Studio.

If any item group has already been created, and you want to create a new item group, you can open the Dream Report Logger Studio, *right-click* in the left top part of it:

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The *Duplicate Group* option will clone the selected item group with all settings, driver and list of items, taken from the original group.

If a user wants to edit the definition of an existing group, select the *Modify Group* menu option.

The *Delete Group* menu option will delete the definition of the selected group.

The *Add Items to Group* menu option will open the *Select Data Items (Add Items)* dialog box, which is described below. It will edit the data item list of the entire group.

The *Export All Groups to CSV, Export to CSV* ***and*** *Import from CSV* menu choices allow the user to export or import the Item Group(s) configuration to a text file. This allows for transferring complete Item Group configurations from one Dream Report project to another, as well as the option to make bulk changes to the configurations using Notepad or Excel.

Select *Add item group* from the context menu, and the *Item Group Definition* dialog box will be opened (see pic. below).

Add Item Group dialog box has 3 tab pages:

- **General**
- **Record Rate** (Logging Schedule)
- **Record Conditions** (Log on Condition)

General

This page defines the following general properties of a group:
- Logical name.
- Short description (if needed).
- Selection of data source, from which a user will include items into a group.
- Data items list.

Group Name is a unique logical name, which will distinguish the entire group from others and give a tip to a user about the data content. Each group name must be unique.

Group Description allows the report developer to put comments about the purpose of a group or other useful information.

The *Group Source* combo box is filled with a list of the drivers already defined in the project. The developer has to select a driver, from which data points will be included into a group.

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The *Add Data Source* button will add a new driver to the project. When the user clicks this button, a standard driver configuration dialog box (*Communication Configuration Wizard*) will be opened. When the user clicks *OK* and closes that dialog, the driver list in the *Group Source* combo box will be renewed.

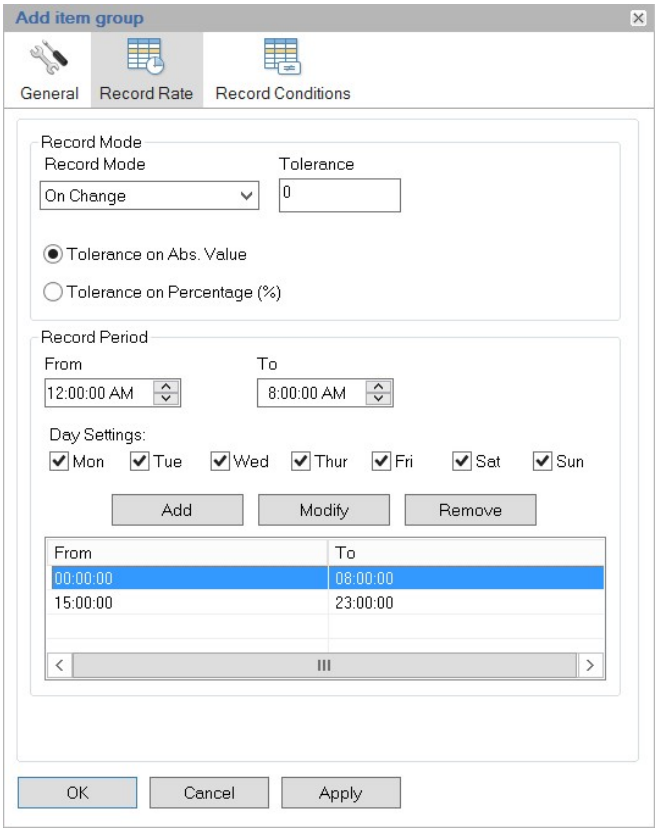
The *Add Items* button will open a new dialog box (*Select Data Items*), containing the complete list of all data items from the selected drivers. User will be able to add or remove items from the entire group.

The left list box of that window will contain a complete list of available items and the right list box will contain a list of items selected for the entire group.

Items Filter enables users to easily find an item in a list. As soon as a prefix is entered, the list will be automatically filtered by the prefix.

Use an asterisk (*) as a wildcard character.

5.2.1.2 Item Group - Logging Schedule



When the group definition dialog box is opened, a user can click on the *Record Rate* floating splitter and the appropriate tab page will be opened.

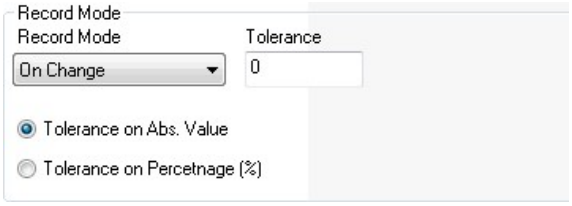
Here a user will have to select logging mode and schedule for the entire group.

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Upper section - *Record Mode* - defines how often values of all data items in the group will be logged in the database during the logging period.

There are 5 options for the data logging mode: *On Change, On Update, Every, On Item Value Change* and *On Absolute Time.*

The *On Change* option will enable logging only on a value update if the value is different from the previous one (please, see the picture below):



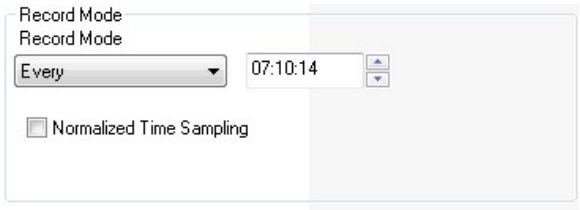
When this logging mode is switched on, the user is able to define *tolerance* in the corresponding *"Tolerance"* edit box. The value entered in this edit box will define how many units of value should be changed in order to log a new value to the database and which value change should be ignored.

It's possible to set tolerance in absolute units or in percentage by selecting the appropriate radio button inside the record mode section (either *"Tolerance on abs. value"* or *"Tolerance on percentage (%)"* (see pic. above).

The *On Update* option will enable logging when any value update is received from the data source, whether or not the new value is different from the previous one (please see the picture below):



The *Every* option will record the item value at the defined rate whether or not the value has changed. The rate can be defined in *hours:minutes:seconds* (please see the picture below):



The option *Normalized time Sampling* allows logging values with normalized timestamps, i.e. rounded to round absolute time.

FOR EXAMPLE: if use will select "Every 20 seconds", then values will be logged every minute at 00 seconds, 20 and 40 seconds of each minute.

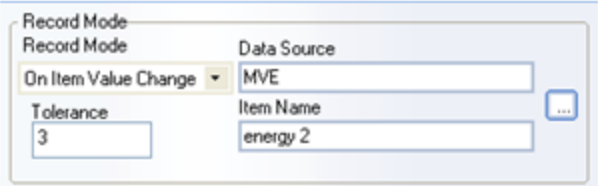
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If user will select logging rate "Every 30 minutes", then values will be logged every round hour (00 minutes) and every 30 minutes of each hour.

This option works only if selected time is even to round hour. If a round hour (3600 seconds) can't be divided by selected record rate with no rest, then this option "Normalized time sampling" will be ignored and logging will be done as usual (as if this option is switched off), just milliseconds will be rounded to a round second.

The *On Item Value Change* option will record item values each time the value of a control item changes. It works as follows:

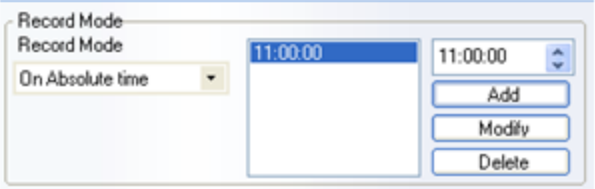
1. You can define an item from the same data source that this group will log data from (as displayed on the picture below):



2. Every time this value changes, Dream Report will log values of all data items defined in that group.

NOTE: Please, note that only items from real-time data sources can be used. If you select a data item from external history server, this option won't work.

The *On Absolute Time* option will record item values at an exact time specified in the list (see example below):



You can add as many time definitions as you need and when the PC clock reaches the time in the list, values for all of items in the group will be logged to the database.

Lower section - *Record Period* - defines a schedule for the logging period.

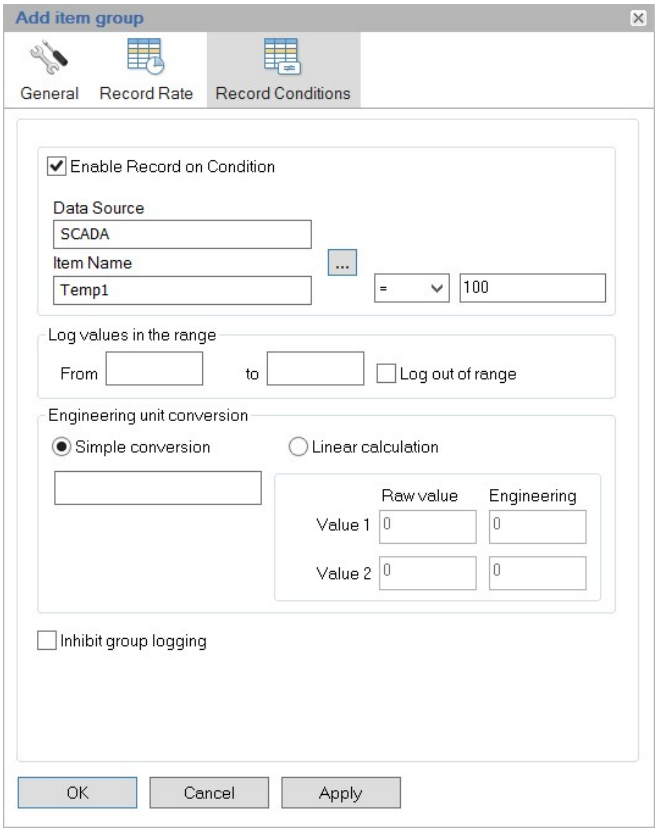
To *add active period,* specify time *FROM* (absolute time format), time *TO* (absolute time format), check which days of a week this period will be active, and click *Add* button to add a record to a list. Each record may have its own weekly schedule.

If you select any record in the list, and click on *Modify* button, then, the selected record will get current values from the edit boxes and check boxes.

Remove button will remove selected record from the list.

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5.2.1.3 Item Group - Log on Event



The comprehensive logging mechanism of Dream Report allows data logging control, based on a pre-defined event.

If the *Enable Record on Condition* check box is checked, then, the values of items from the entire group will be logged only if a pre-defined condition is true. If group logging scheduler is defined, that data will be logged only when the logging period is active and the event is *TRUE*.

If a group has no specific schedule period defined, then, data will be logged when the condition is *TRUE*.

When the check box *Enable Record on Condition* is enabled, users can define the record condition.

A data source can be selected from the source list in the upper combo box. The lower combo box will have a complete list of data items from the selected source. The user will have to select a source and a data item for the condition expression.

After the item name is selected, select a condition sign from the appropriate combo box and a condition value in the edit box. The value can be a floating-point number, using a "**.**" as the decimal separator.

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Data from that group will be logged only when the defined condition is true. When the condition is false, no data from any item within this group will be logged.

Log values in the range defines a value filter for data logging. The check box *"Log out of range"* defines how values, which are out of a defined range, will be recorded.

If this check box will not be enabled, then all values, which are out of range, will be ignored and not recorded into the database.

If this check box will be enabled, then all values out of range will be rounded to the closest range limit and then written to the database (e.g. if range is 10 to 30, a value of 35 will be recorded to the database as 30 and a value of 5 will be recorded to the database as 10).

Engineering unit conversion has 2 options: *Simple conversion* and *Linear calculation.*

Simple conversion option enables users to make simple mathematical operations with raw values and write the result into the database. Allowed calculation operators are: +, -, *, / .

EXAMPLE: A simple conversion of "/1000" will divide each received value by 1000 and log the result from the group. If the received value is 65000, then the logged value will be 65. This will be applied to each value received for each tag defined in the group.

Selecting *Linear calculation* will allow users to perform linear calculation from the raw value. The user enters upper and lower raw values 1 and 2, and upper and lower engineering unit values 1 and 2. Dream Report will scale the raw values to engineering units.

The *Inhibit group logging* check box can disable group logging. It can allow users to define a list of group definitions for future use and optionally disable data recording while doing the maintenance of the site where Dream Report project is running in order to avoid wrong data to be recorded into the Dream Report database.

5.2.2 Alarm Group

Please note that starting from Dream Report version 5 the *"Alarm logging"* is no longer supported.

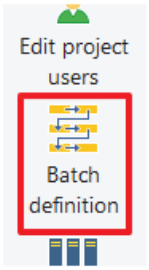
However, for the backward compatibility all upgraded from previous versions projects will continue *Alarm logging*.

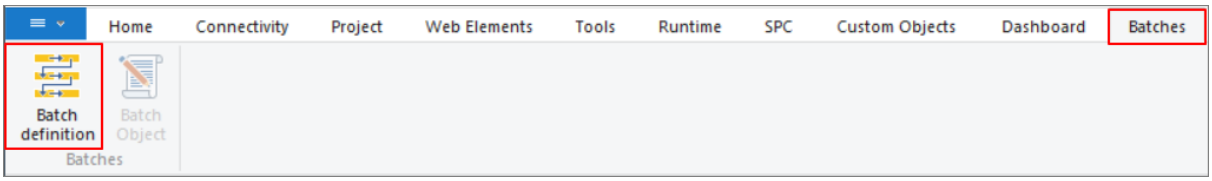
5.3 Batch Definition

Batch Definition enables users to define a rule to dynamically calculate time periods for report generation. If a report is for a batch process (process loop), where the exact time period and duration are not known in advance, use the batch mechanism of Dream Report.

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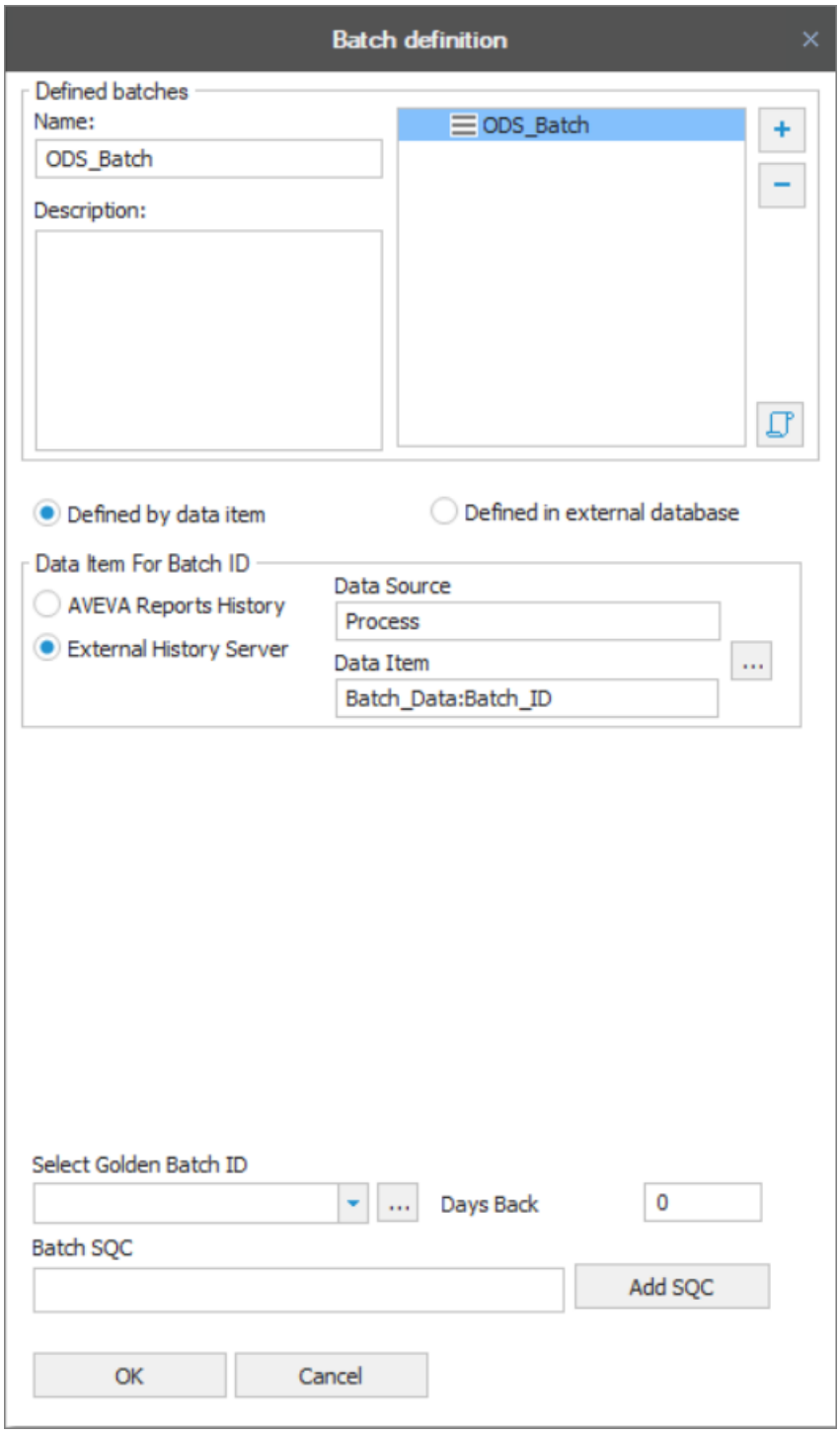
Click on the command button *Batch definition* on the Connectivity or Batches ribbon icons on the horizontal toolbar, or on the *Batch Definition* button located on the left *Quick Launch* toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu (see pic. below):





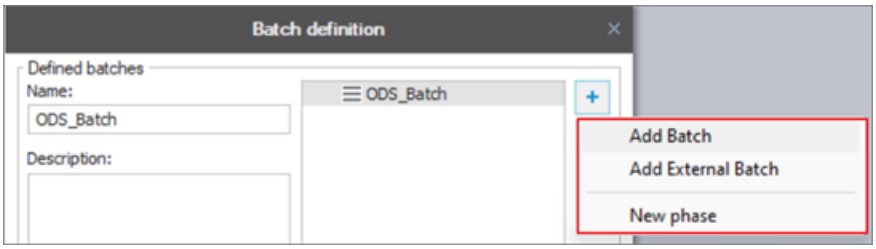
The *Batch Definition* dialog window will open:

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To add a new batch definition or a new phase, click on the *[+]* button. A menu will pop up with the choice of definition types.

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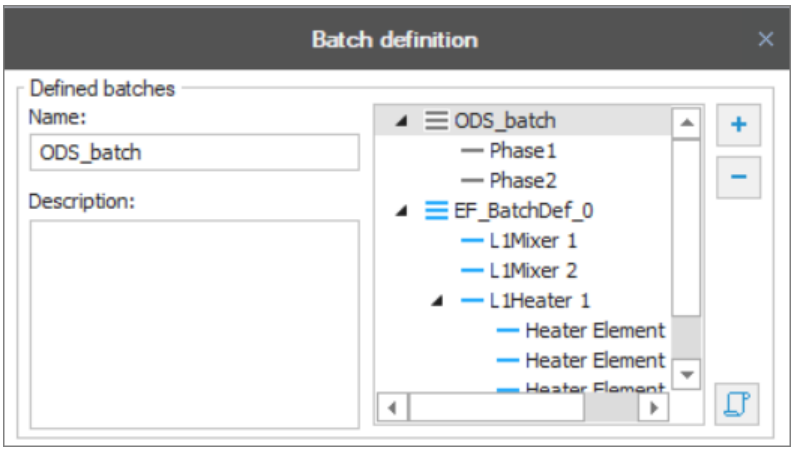


Batch – adds a batch definition which needs to be configured in the Batch definition window as described below in this section.

External Batch – retrieves batch information from one of the specialized communication drivers defined in the project. The driver must be of Batch type, which is marked in Communication Configuration Wizard with icon.

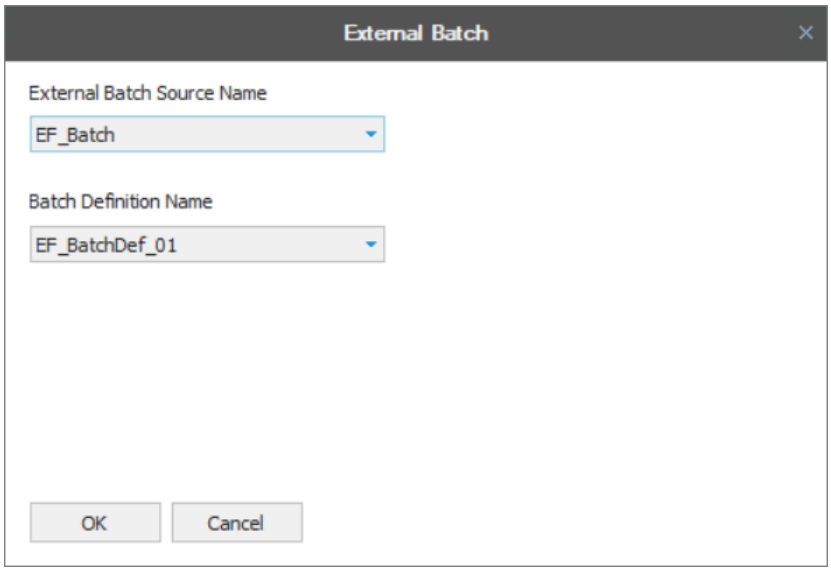
Currently, Dream Report includes two batch drivers: *PI Asset Framework Event Frame data*, which connects to Event Frames feature in PI Asset Framework, and internal *Lua Script Event Frame Driver*, which can be used for testing purposes or for "scripting" custom batch process flow(s).

An External batch definition name and its phases are marked with blue icons, whereas standard batches and phases have black icons.

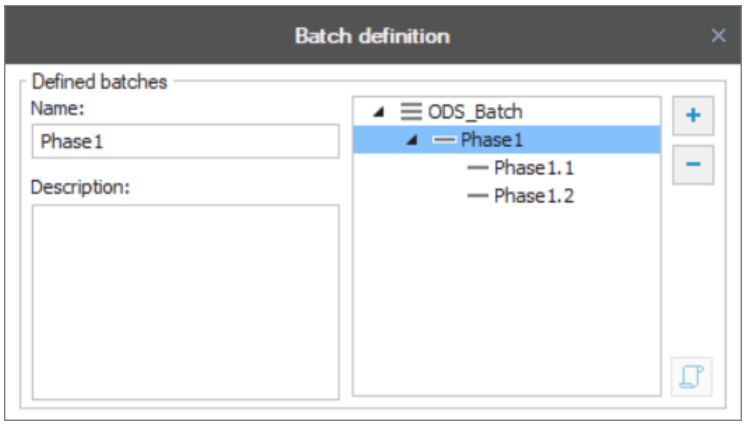


After selecting *Add External Batch*, the *External Batch* configuration window will open. Select the required driver from the *External Batch Source Name* list. All batch definitions created in the driver will be available in the *Batch Definition Name* list. Select the needed definition and click *OK*.

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New Phase – adds a sub-level to the batch or phase selected in the Defined batches list. This option is not applicable for *External Batch* items. Each phase can be configured in one of the ways described below for Batch Definitions.



In the *Name* edit box you can edit the name of the batch field (it will update the name in the batch list automatically).

The *Description* edit box can contain a brief explanation of the batch definition.

Each batch process is marked by a *unique ID* as this ID will be used later to recognize and distinguish batches (process loops). So, in order to track batches, define the source for batch IDs. Batch can be identified by referencing a *data item* (tag) either in Dream Report history or in an external history source, or explicitly from a table in an *external database*.

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NOTE: While each batch must have a unique name (ID), duplicate names are allowed for phases. If a phase definition is based on a data item, a new phase will start every time the reference tag changes its value.

Event Frame List Transformation Script is an advanced feature that assumes some working knowledge of Lua scripting and deep understanding of the Dream Report Batch module functioning. Transformation scripts allow users to define batch logic where clusters can be linked dynamically the phase's instances. For example, if a certain batch phase can be executed on two (or more) equipment units, a phase and cluster are to be created for each unit. In a transformation script, you can substitute a phase (and the corresponding cluster) with another phase and cluster depending on the unit where the actual phase is executed.

To create a transformation script, first create a new batch definition using the Add Batch option and add the necessary number of "virtual" phases as described earlier in this section. Select the *Name* of the definition and click the Event Frame List Transformation to open Script Editor and create/edit the script.

EXAMPLE:

```
function OdsTransformEventFrameInstList(list) -- entry point called by driver layer to get list of the phase instanses and sub instances etc.
	for i, v in ipairs(list) do -- list contains instances of frames that will be recieved for the generated batch
		for iP, vP in ipairs(list[i].listChild) do -- each frame has list of child frames
			local childPhase = vP
			if string.find(childPhase.nameInst,'STARTUP')==1 then
				childPhase.nameDef = 'STARTUP'
			elseif string.find(childPhase.nameInst,'LOADING')==1 then
				childPhase.nameDef = 'LOADING'
			elseif string.find(childPhase.nameInst,'CHECK_LOADING')==1 then
			childPhase.nameDef = 'CHECK_LOADING'
			elseif string.find(childPhase.nameInst,'PREHEAT')==1 then
				childPhase.nameDef = 'PREHEAT'
			elseif string.find(childPhase.nameInst,'COATING')==1 then
				childPhase.nameDef = 'COATING'
			elseif string.find(childPhase.nameInst,'RINCING')==1 then
				childPhase.nameDef = 'RINCING'
			elseif string.find(childPhase.nameInst,'DRYING')==1 then
				childPhase.nameDef = 'AIRING'
			elseif string.find(childPhase.nameInst,'AIRING')==1 then
				childPhase.nameDef = 'DRYING'
			elseif string.find(childPhase.nameInst,'DISCHARGE')==1 then
				childPhase.nameDef = 'DISCHARGE'
			elseif string.find(childPhase.nameInst,'COOL_DOWN')==1 then
				childPhase.nameDef = 'COOL_DOWN'
			end
		end
	end
	return list
end
```


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List of properties for ***OdsTransformEventFrameInstList****(list):*

.nameInst - Phase/Sub-phase instance name

.nameDef - Virtual Phase/Sub-phase Name defined as part of the Batch Definition

.listAttr - Property/Attribute name in the the frame template definition, this attribute can be retrieved in the cluster by calling '[ctx#<attr_name>]' inside defined in the cluster expression object

.timeStart - Phase/Sub-phase instance start time

.timeEnd - Phase/Sub-phase instance end time

.listChild - -- each frame has list of child frames

NOTE: *Any of the mentioned above attributes can be forcibly set with user's assigned value of according to the script logic.*

Each virtual phase/sub-phase has to be associated with the appropriate cluster inside the relevant Batch object.

If the batch definition is from a data item, select the *Defined by data item* option, and then select a tag containing batch (or work order, lot, roll ID, CIP ID, etc.) value from either Dream Report History or an External History Source. If referencing a data item from a data source for the batch definition, note that the batch process must be continuous, with no time interval between subsequent batches. *Batch Start Time* will correspond to the Timestamp of the first value of the defined batch (as explained in the formula below):

Batch_Start_Time(Batch_N) = Timestamp_of_First_Value(Batch_N) (where Batch_N is ID of the defined batch).

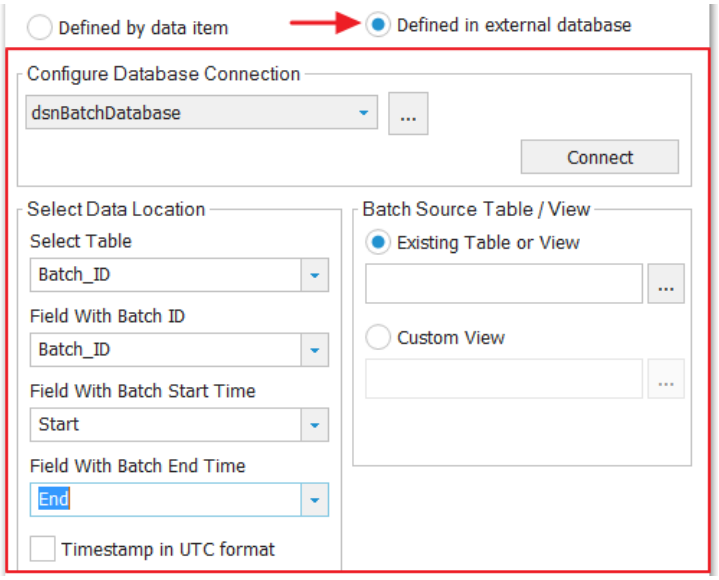
Batch End Time will correspond to 1 second before the timestamp of the first value of the next batch (as explained in the formula below:

Batch_End_Time(Batch_N) = (Timestamp_of_First_Value(Batch_N+1)) - 1s (where *Batch_N* is the ID of the defined batch and *Batch_N+1* is the ID of the next batch).

Batch Start Time and Batch End Time will have a time resolution of 1 second (msec will be ignored).

If the batch is *Defined in External Database,* enter the following information to specify the database, table/view, and the appropriate fields to reference:

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1. *Configure Database Connection* – either select a database connection from an existing DSN (data source name) in the list, or click the **[…]** button to open the *DSN Manager* and configure a connection to a database that contains the batch lookup. Then click the *"Connect"* button to connect to that database.

   - *Select Data Location* – in this section, you can either select an existing table or view from the *Select Table* list; or, in the *Batch Source Table/View* section, select an *Existing Table or View,* or create a *Custom View* by clicking the *[…]* button to open the *Visual Query Builder*, and create your own custom query to present the batch details – the query should return, at a minimum, a field with a unique batch ID, and associated fields for the start and end time of the batch. Then, based on the table or custom view selected…

   - Specify the *Field with Batch ID* from the list of available fields

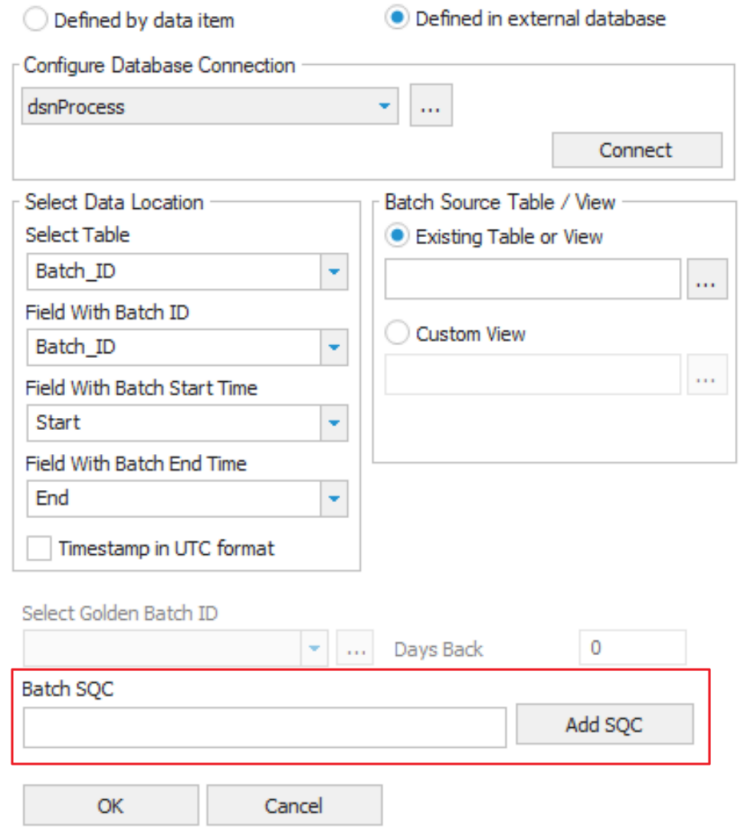
   - Specify the *Field with Batch Start Time* from the list of available fields

   - Specify the *Field with Batch End Time* from the list of available fields

2. Check the *Timestamp in UTC format* option only if the logged timestamps were stored in UTC time. Dream Report will then offset the logged data to the appropriate local time zone.

Batch SQC

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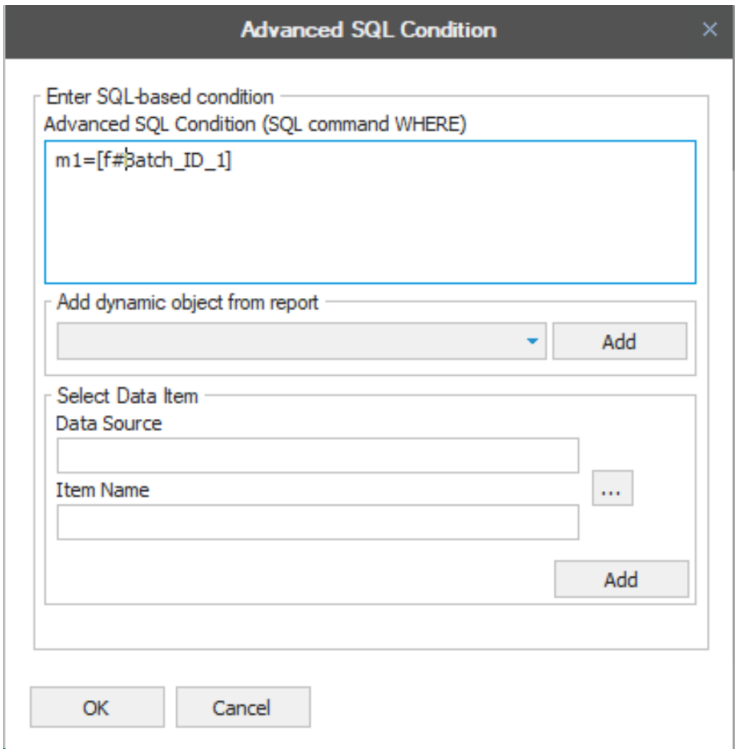


The *Batch SQC* (SQL Query Condition) option allows you to filter the batch data by applying custom conditions that reference dynamic objects on a report, or by manually entering a filter condition. For instance, your source batch values might have a "0" value logged between each actual batch value, that you want to filter out when looking or reporting on batches in Dream Report. Or, on a web report, a user selects a specific Reactor from a listbox, and then the batch ID's can be filtered to only show batch ID's associated with that reactor:

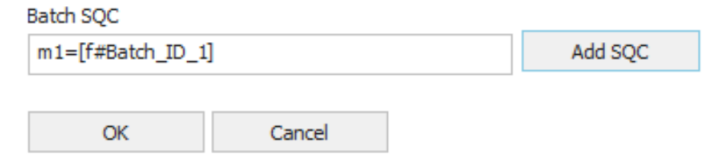
For a dynamic condition, enter the first part of the condition, and click the *"Add SQC"* (SQL Query Condition) button. This will open the standard *Advanced SQL Condition* interface where you can build either a static SQL condition ("SQL *Where…* clause), or select items from a data source or the report to create a dynamic SQL query condition:

to select any dynamic object from the list to complete the condition. Note that a relevant report must be open in Studio while creating this batch definition, to ensure that the dynamic objects are exposed to the Batch SQC editor:

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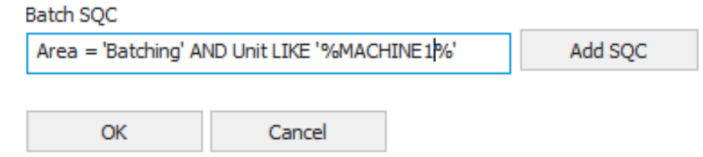


After creating the SQL condition, click *"OK"* to return to the batch definition. The Batch SQC will now include the added the dynamic object:



Repeat the above if multiple conditions are required for the filter, separated by AND or OR conditions.

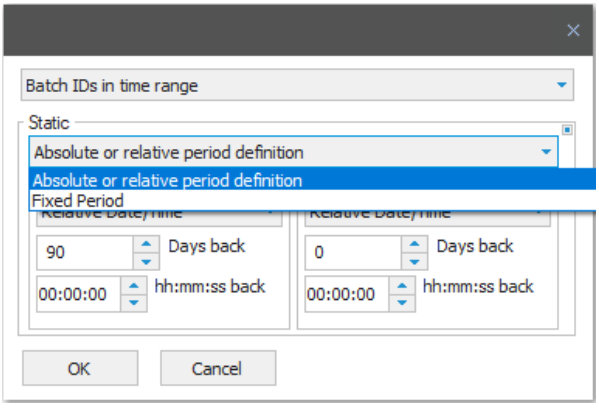
For *a static condition*, manually enter the full condition in the Batch SQC field:



Golden batch

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In the *Select Golden Batch ID* combo box (in the bottom part of the *Batch Definition* dialog window), please, enter the ID of the golden ("reference") batch for the data comparison. To browse for a specific batch ID from the database, click on the *[…]* button, either select *All Batch IDs* or the time period over which to search batch IDs, (*Batch IDs in time range*). Then the combo box *Select Golden Batch ID* will be populated with all available batch IDs during the specified period. Select the appropriate BatchID to be the *Golden Batch ID:*



With the *Golden Batch ID* selected, this batch ID will be taken for calculations in any statistical object throughout the reporting project, where the Time Period definition is configured to be *Batch Based* for the *Golden batch*.

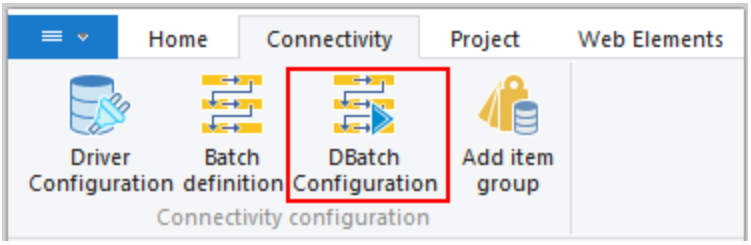
Once the batch definition is completed, click *"OK"* and continue designing your project. During report generation Dream Report will automatically go to the database, analyze the values of a tag defined for the batch, recognize the start and end times of the associated batch, and will then apply those times to the object(s).

5.4 DBatch

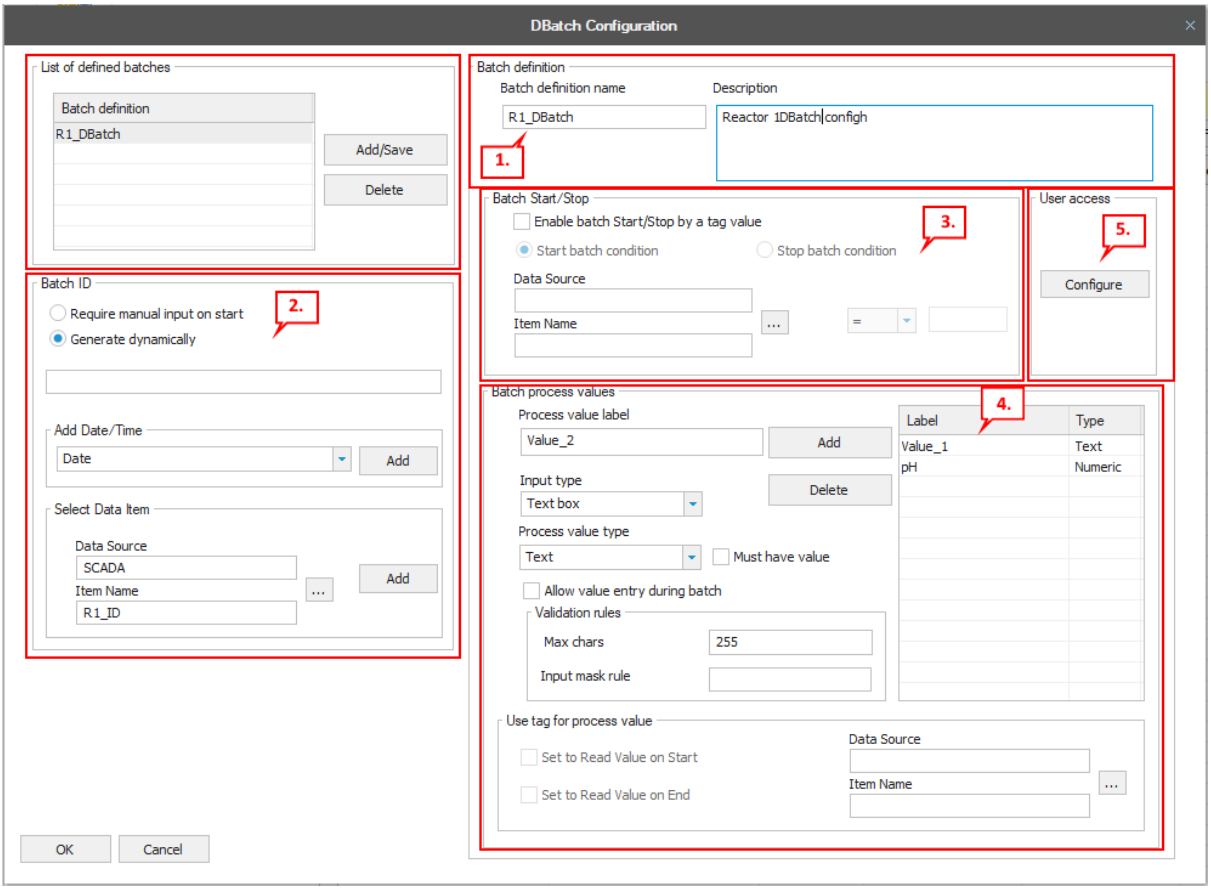
DBatch module enables users to log and track batch data and batch process data.
Due to the DBatch mechanism all batch information (including *Batch ID, Batch start* and *end time, Batch process values*) is logged into a special table in a project database and can be used further for reporting within Dream Report or can provide data to external applications.

To configure *DBatch* in the project you can click on the command button *DBatch Configuration* on the *Connectivity* ribbon icon on the horizontal toolbar in the *Dream Report studio menu* (see pic. below):

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The *"DBatch Configuration"* dialog window will open:



To configure Batch definition, please click on the *"Create batch"* button and a new batch definition will be added for configuration. By default each new batch definition will have the following names: *Batch_1, Batch_2*, etc.

Batch Definition Configuration

Batch definition has the following properties to be configured:

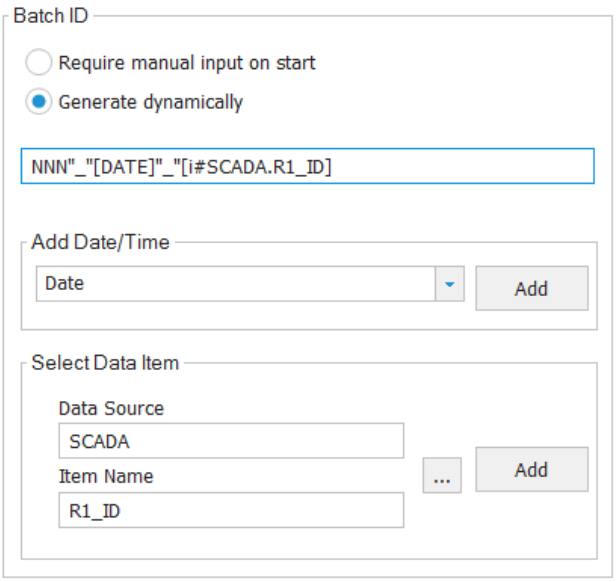
1. Batch definition name (logical name of the batch definition) and *Description* (description of the batch) (please see the picture above);

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2. Batch ID. There are 3 options for batch ID definition available: *Require manual input on start, Generate dynamically, Get Batch ID from a tag value* (please see the picture above).

- *Require manual input on start* – if this option is selected, then you will need to manually enter a new batch ID for the new starting batch. Otherwise you won't be able to start batch recording. No additional configuration is needed for this option.

- *Generate dynamically* – if this option is selected, the following configuration controls will be enabled (please see the picture below):



There are 2 options available for the dynamic generation of Batch ID:

a) *Generate dynamically* using a mask - a new batch ID will be generated automatically using a mask. In the edit box, please define a mask for automatic dynamic batch ID generation. A mask can contain:

- static text in double quotes,
- letters "N", i.e. numeric increment (starting from number "1");
- number of "Ns", i.e. number of digits that will be displayed (e.g. NNN will start numeric increment from 001);
- letters "A", i.e. increment by letters (starting from letter "A");
- number of "As", i.e. number of letters that will be displayed (e.g. AAA will start incrementing index from "AAA");
- Timestamp (*Date, Time, Date/Time*);
- Data Item (*Data Source/Item Name*).

b) *Get batch ID from a tag value* - below the radio button *Generate dynamically* in the *"Select Data Item"* section you can select a tag from any real-time data source. When a new batch is started, DBatch will read that tag value and use it as a batch ID.

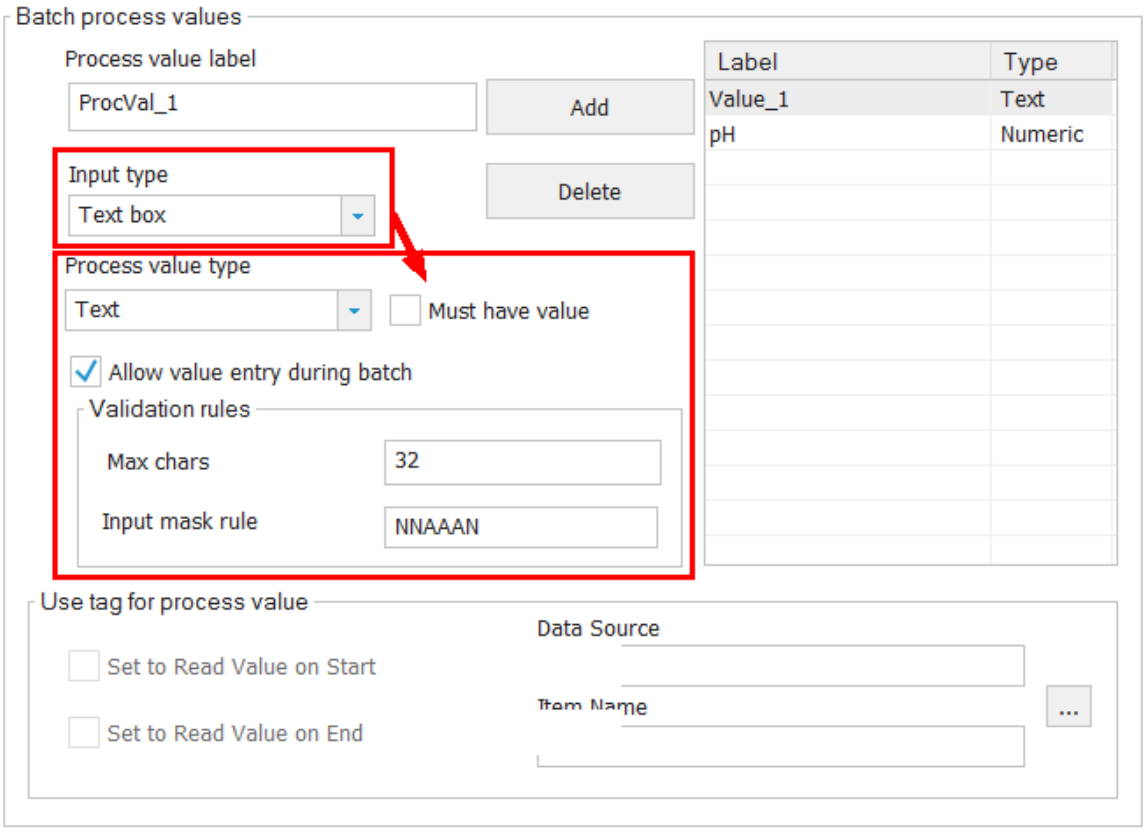
3. **Batch Start/Stop** (rules for start/stop registration of batch data) (please see the picture above).

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By default this can be done manually in real time using *"Start"*/*"Stop"* buttons in the DBatch runtime window (for details please see the *"DBatch Runtime Window"* section below).
You can enable automatic control of batch start/stop recording using a real-time tag value. To do this, please enable check box *"Enable batch start/stop by a tag value"* and select a tag (*"Data Source/Item Name"*) and condition (*=, !=, >, >=, <, <=*) for batch start (*"Start batch condition"*) and stop (*"Stop batch condition"*) event.

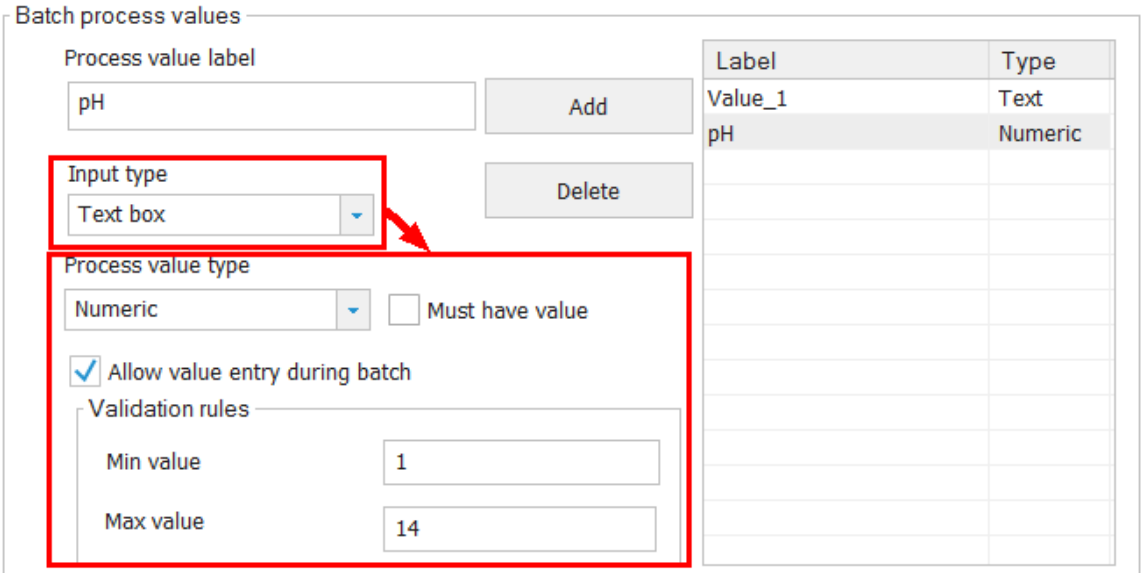
NOTE: Tag browse will provide tags only from real-time data sources.

4. Batch process values (pre-defined list of process values related to the batch) (please see the picture above).
Each process value can have a *Process value label* (logical ID), *Process value type* (numeric or text) and *Validation rules* (data validation). These parameters depend on the type of process value input (*Input type*).
If you select *"Text box"* as an input type and *Text* as a process value type, then you will have to define maximum number of characters (*Max chars*) and the mask (*Input mask rule*) for those string values (please see the picture below):



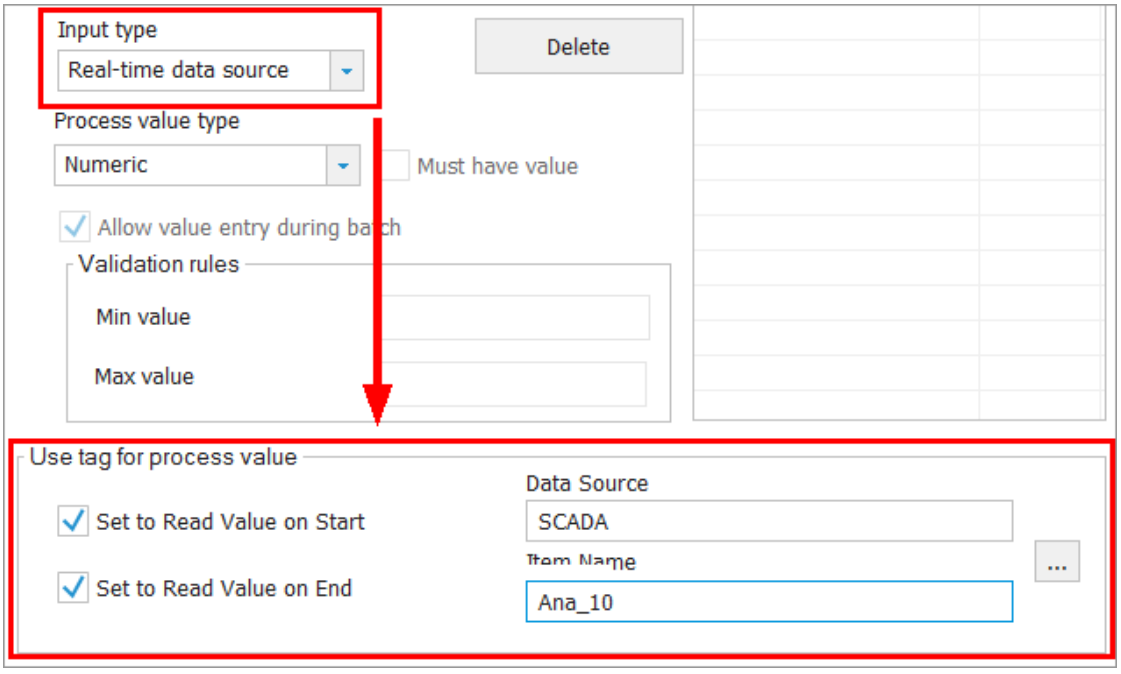
If you select *"Text box"* as an input type and *Numeric* as a process value type, then you will have to define the minimum (*Min value*) and the maximum *(Max value*) values for those numeric values (please see the picture below):

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Check box *"Allow value entry during batch"* defines if edit box for the batch process value will be enabled or disabled during a batch (i.e. allow or restrict value change/entry when a batch is running).

If you select *"Real-time data source"* as an input type, then *Use tag for process value* check box will become enabled (please see the picture below):



Check box *"Use tag for process value"* enables to select a real-time tag, and then its real-time value will be used as an automatic value during batch process.

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If *"Read value on batch start"* is selected, then when batch is started, the selected tag value will be read at the moment of batch start and will be filled into the parameter value edit box. Then, during batch process, it will be available for modifications.

If *"Read value on batch end"* is selected, then, when batch is ended, the selected tag value will be read at the moment of batch end and will be filled into the parameter value edit box and logged into the database.

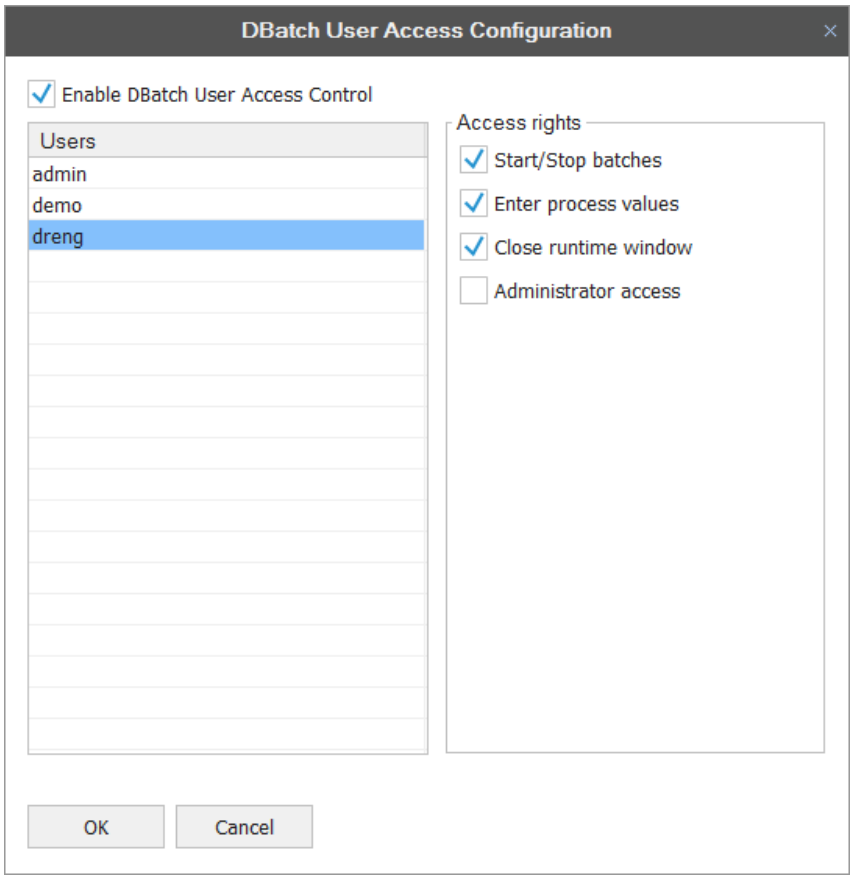
After a new batch definition has been defined, click *"Save batch"* button to save this batch definition and to add it to the *List of defined batches.*

All configurations will be saved into the project database.

NOTE: When a new batch definition is added, its configuration will be first validated to check that all property options are filled correctly and there are no parameters which have empty value.

5. User Access

If you click on *"Configure"* button in the *"User access"* section, the following *DBatch User Access Configuration* window will be opened (see the pic. below):



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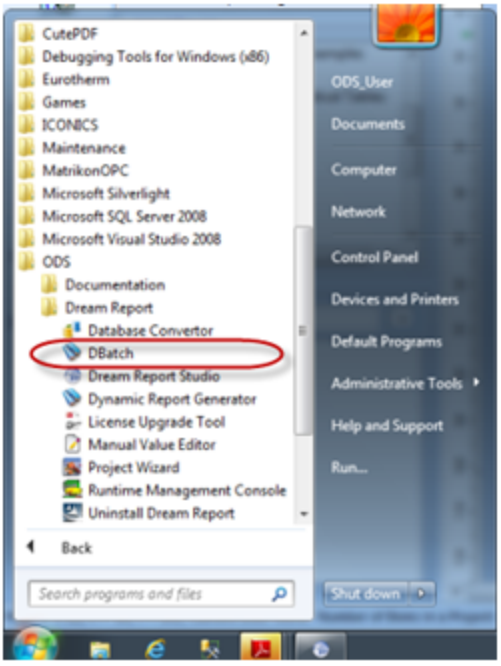
If check box *"Enable DBatch User Access Control"* is unchecked, then all other controls in this window (except for *OK* and *Cancel* buttons) will be disabled. On checking this check box all other controls will become enabled.

The *"Users"* list control will contain all users defined and/or used in the project. You can select a user from the *"Users"* list control and assign different access rights by checking the corresponding check boxes in the *"Access rights"* section. There are 3 options available: *Start/Stop batches, Enter process values, Close runtime window.*
You can select *Administrator access* option and the user will automatically receive all DBatch access rights (i.e. *Start/Stop batches, Enter process values, Close runtime window*) and the corresponding access rights check boxes will automatically become checked.

NOTE: If user management is enabled in the project but no user with administrator rights has been defined, you won't be able to save DBatch user access rights configuration.

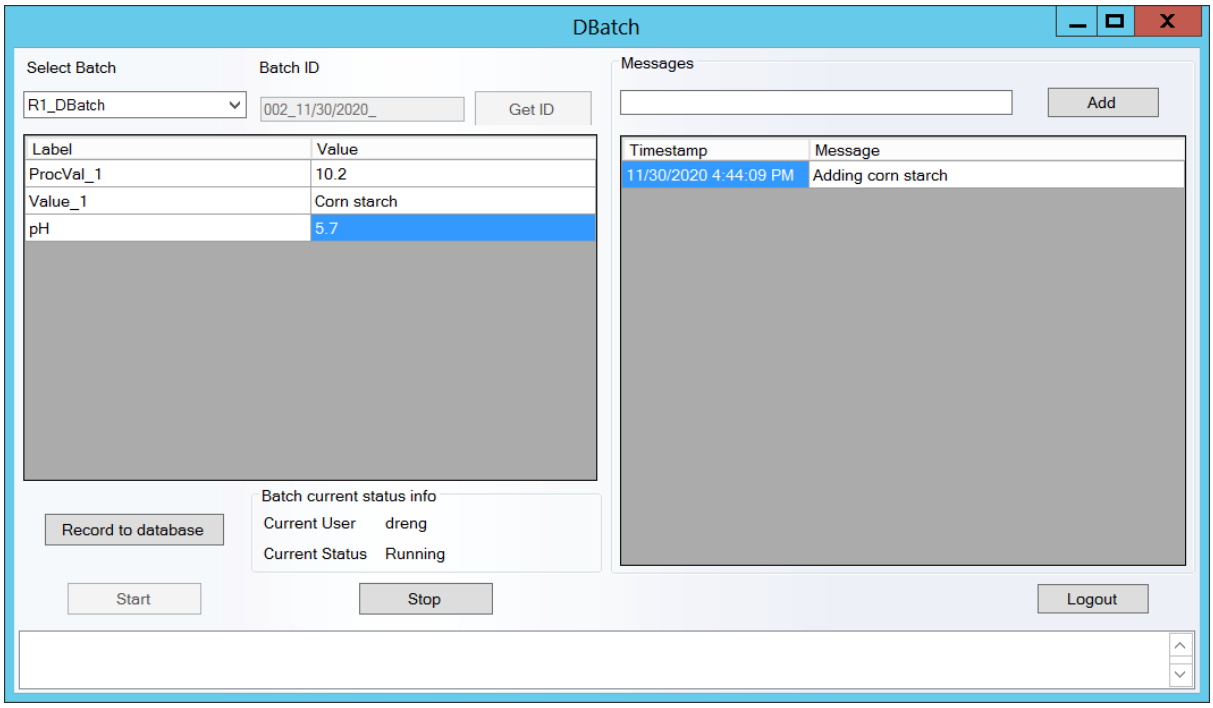
DBatch Runtime Window

DBatch mechanism can also be managed via special runtime window. The *DBatch* runtime window can be launched from *"Start"* menu (please see the picture below):



The *DBatch* runtime window will open:

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DBatch runtime window enables user to:

- Select batch definition from the pre-defined list *(Select Batch*).
- Get dynamic batch ID according to the defined rule by either entering Batch ID (*Batch ID*) or clicking on *"Get ID"* button.
- Check for the unique batch ID

When batch starts, before recording a new batch start, DBatch will check if batch ID, which is going to be used, already exists. If batch starts and input batch ID (either from user input or tag value or command line) already exists in the database, then DBatch will automatically increment it (adding _1 in the end of the batch ID) and check that this incremented batch ID is unique. If "<batch ID>_1" already exists, then it will change increment to _2 etc., so the unique batch ID will be preserved and, if batches are running with the same batch ID, which remains the same, DBatch will always check that every batch will be logged with the unique batch ID.

If no batch record is running, then button *"Stop"* will be disabled and *"Start"* will be enabled. When you click on *"Start"* button, batch recording will start. Button *"Start"* and *"Batch ID"* field will become disabled until this batch is stopped. When you click on *"Stop"*, batch recording will stop and batch info (*Batch ID, start time, stop time and process values*) will be recorded into the project database.

If *DBatch* has multiple batch definitions running, then if batch is running for a current batch definition and you change batch selection for another batch definition, the DBatch runtime window will display the status of a new selected batch definition. Multiple batch definitions will be enabled in the same window simultaneously.

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If you change process values during batch, the project database will also be changed. Values will be considered only on batch stop moment and will be recorded into the database only at that moment of batch stop.

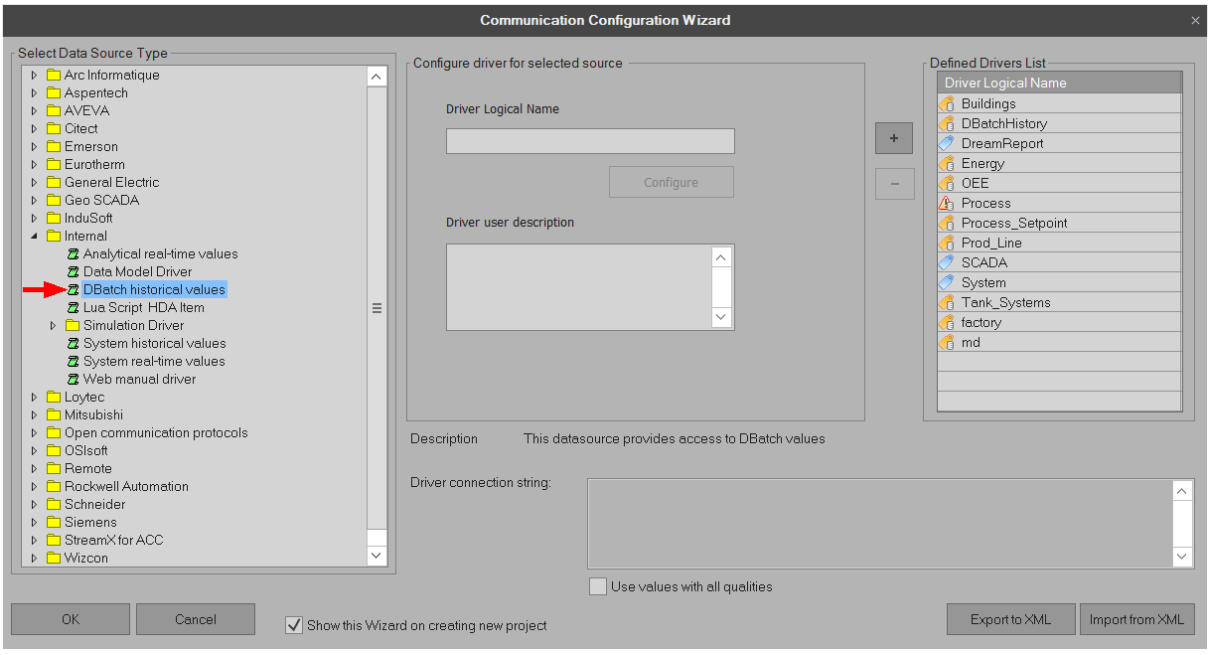
Command line control

DBatch provides users with a possibility to control it from a command line. The format of the command line is :
"dbatch.exe -batchDef <name of batch definition> -command <"start" or "stop"> -batchID <"batch Id>"

You can also pass process values using the following command line format:
"dbatch.exe -param <parameter name> -value <value>"

DBatch historical values driver

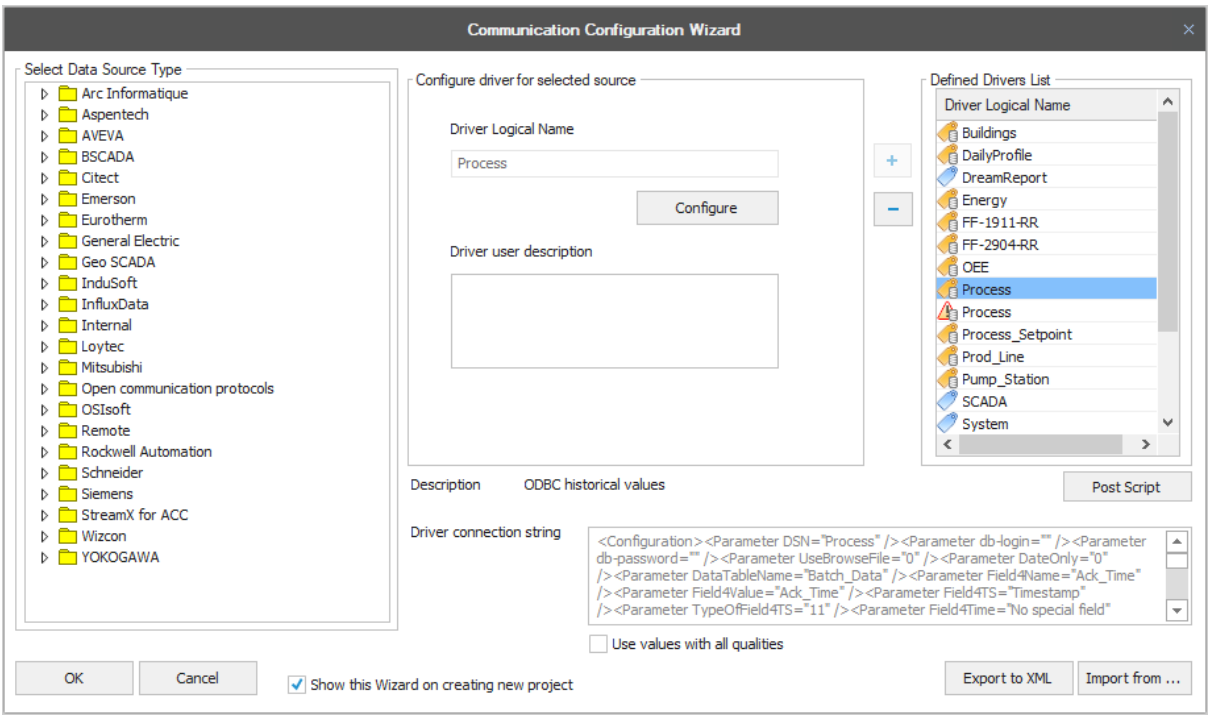
DBatch historical values driver enables users to connect directly to a special project batch database and use its data for reporting within Dream Report or in external applications. The project batch database is created when the DBatch mechanism (described in this section above) is configured. Then the *DBatch* historical values driver will be configured automatically and you will not need any additional configuration in the *Communication Configuration Wizard*:



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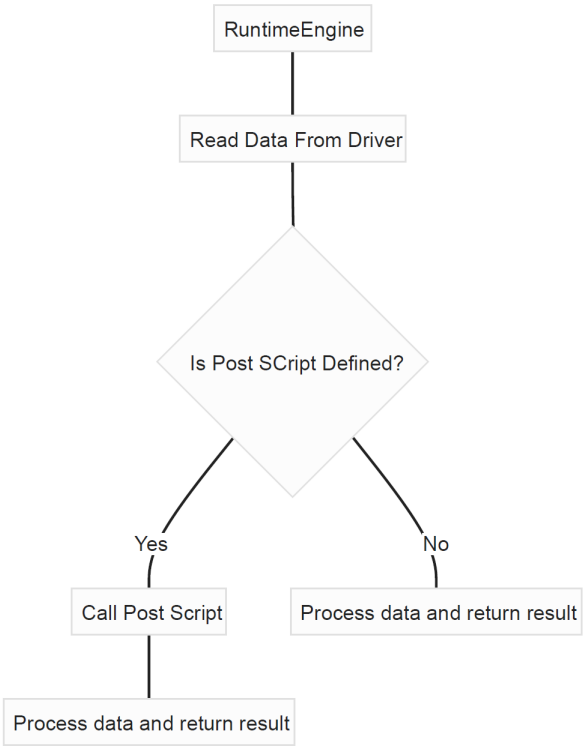
5.5 Post Script

Post Script is a mechanism that can be used to modify answer of historical values or historical alarms driver with help of Lua script. ***This feature is intended to be used by advanced users!***



In order to modify the result of the driver a user has to write Lua script in the Post Script editor or setup Post Script to use a file with Lua script. The file path can be relative and in case it's relative the base folder is a project folder. It means that path: *.\my_post_script.lua* is referencing the file *my_post_script.lua* located in the project folder.
As soon as Post Script is defined for the driver instance the runtime engine will try to call predefined functions in the specified script.

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Name of the function that will be called depends on the request that has been sent to driver, for more details please see sub-topics - Historical Data and Alarms Drivers.

As calculated parameters user can also pass to the script values from reports objects by use of the following LUA script:

```
-- this is a helper function for printing
-- table value into debug output
    function PrintTable(t)
      for k, v in pairs(t) do
        key = tostring(k)
        if type(v) == 'table' then
          Dts.DebugOut('table: '..key)
          PrintTable(v)
          Dts.DebugOut('---')
        else
          Dts.DebugOut('name: '..key..', value: '..tostring(v))
        end
      end
    end

    local valueItem = Dts.GetDataFromToken('[f#item1]')

        if valueItem ~= nil then
                PrintTable(valueItem)
        end
```

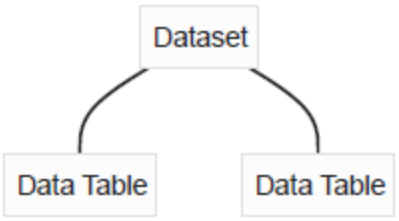

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Where '[f#item1]' is a pointer to item1 single data object in the report. Please also note that it is very important to keep right dependency of the object so the driver's instance where post script is defined will be able to use the value of correspondent object within the script

5.5.1 Dataset and Table Concept

Dataset and Table Concept

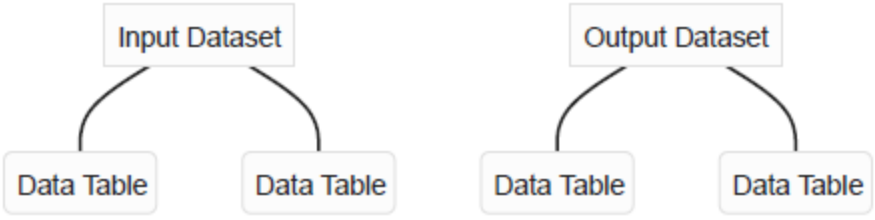
The Lua script code is able to interact with data with help of Dataset concept. Dataset is set of DataTable objects with unique names.



Before starting to execute Lua code the engine will prepare Input Dataset and Output Dataset and these Datasets will be accessible from Lua code with special API function. There is an API to get handle to Input Dataset and to get handle to Output Dataset. Then it's possible to call API to find a DataTable by name and so on.
DataTable is a structure that has a name, list of named columns and list of rows with data. Each row is an array of Values, and each Value is an object that contains code of the value type and the value itself.

There are API functions for working with DataTable: get the name, get list of columns, rows etc.

Input Dataset will contain the data read from driver. Output Dataset will be empty. The script can take data from Input Dataset and transform it according to requirements and then put it into Output Dataset. After execution of the script the engine will extract data from Output Dataset and pass it to the upper layer for further processing.



Before the execution of **TransformDataForAlarmList()** function the Input Dataset will be filled with two tables:
"*data*" - table that contains data received from driver
"*metadata*" - table that contains description of columns of table "data"

The task of TransformDataForAlarmList() function is to fill Output Dataset with two tables - "*data*" and "*metadata*"

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5.5.2 Historical Data Drivers

Historical Values Drivers

If "Value List" request has been sent to driver then the result can be transformed with help of function:

```
function TransformDataForTvqList()


end
```

If "Value List Condition" request has been sent to driver then the result can be transformed with help of function:

```
function TransformDataForTvqConditionList()


end
```

"Value List Condition" request is sent when the following statistic functions are calculated: Availability, Period of Logged Values, Duration in Interval.

The following code shows how to work with historical data values, also for script analyzing and debug purposes user can send traces into log file. :

```
-- this is a helper function for printing
-- table value into debug output
    function PrintTable(t)
      for k, v in pairs(t) do
        key = tostring(k)
        if type(v) == 'table' then
          Dts.DebugOut('table: '..key)
          PrintTable(v)
          Dts.DebugOut('---')
        else
          Dts.DebugOut('name: '..key..', value: '..tostring(v))
        end
      end
    end

    function TransformDataForTvqList()
      local handleInputDataset = Dts.GetInputDatasetHandle()
      local handleTable = Dts.GetTableHandleByName(handleInputDataset, 'data')
      local countRow = Dts.GetTableRowCount(handleTable)
      local handleOutputTable = Dts.AddNewTable('data')

      for i = 1, countRow/2 do
        local row = Dts.GetTableRow(handleTable, i)
        row[1].v = row[1].v + i
        row[2].v = i
        Dts.AddTableRow(handleOutputTable, row)
      end
        local listCol = Dts.GetTableColumns(handleTable)
```


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```
    Dts.SetTableColumns(handleOutputTable, listCol)

    --environment
    local htEnv = Dts.GetTableHandleByName(handleInputDataset, 'environment')
    local rowCnt = Dts.GetTableRowCount(htEnv)
  for i = 1, rowCnt do
    local row = Dts.GetTableRow(htEnv, i)
    PrintTable(row)
  end
  --
    --request
    local htReq = Dts.GetTableHandleByName(handleInputDataset, 'request')
    local rowCnt = Dts.GetTableRowCount(htReq)
  for i = 1, rowCnt do
    local row = Dts.GetTableRow(htReq, i)
    PrintTable(row)
  end
  --
end

function TransformDataForTvqConditionList()
  local handleInputDataset = Dts.GetInputDatasetHandle()
  local handleTable = Dts.GetTableHandleByName(handleInputDataset, 'data')
  local countRow = Dts.GetTableRowCount(handleTable)
  local handleOutputTable = Dts.AddNewTable('data')
  for i = 1, countRow do
    local row = Dts.GetTableRow(handleTable, i)
    row[4].v = 0
    Dts.AddTableRow(handleOutputTable, row)
    Dts.DebugOut('row size: '..#row)
  end
  local listCol = Dts.GetTableColumns(handleTable)
  Dts.SetTableColumns(handleOutputTable, listCol)
end
```

The task of TransformDataForTvqList() and TransformDataForTvqConditionList() functions is to fill Output Dataset with table "data" Input Dataset also contains additional tables: "request" and "environment". These tables are filled with request details and project environment details.

5.5.3 Historical Alarm Drivers

Historical Alarms Drivers

If "Alarm List" request has been sent to driver then the result can be transformed with help of function:

```
function TransformDataForAlarmList()


end
```


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If a post script for historical alarm driver has to create a different set of alarm properties it can be done with help of post script function:

```
function CreatePropertyInfoListForAlarm()

end
```

This function will be called during browse operation when a driver has to return a list of alarm property info structures. Example of the function:

```
function CreatePropertyInfoListForAlarm()
    local handleOutputDataset = Dts.GetOutputDatasetHandle()
    local handleOutputTable = Dts.AddNewTable('data')
    local listCol = {'PropertyName', 'PropertyId', 'PropertyValueType','PropertyVarType'}

    Dts.SetTableColumns(handleOutputTable, listCol)

    local vPN = {c = 4, v = 'StartTime'}
    local vPID = {c = 2, v = 0}
    local vPValueT = {c = 2, v = 1}
    local vPVarT = {c = 2, v = 0}
    local row = {vPN, vPID, vPValueT, vPVarT}
    Dts.AddTableRow(handleOutputTable, row)
    vPN = {c = 4, v = 'CustomTime'}
    vPID = {c = 2, v = 15}
    vPValueT = {c = 2, v = 2}
    vPVarT = {c = 2, v = 19}
    local row2 = {vPN, vPID, vPValueT, vPVarT}
    Dts.AddTableRow(handleOutputTable, row2)
end
```

The code below takes all input data from alarm historical driver and copy it without modifications into Output Dataset. Example of the code:

```
function CopyMetadataTable()
  local handleInputDataset = Dts.GetInputDatasetHandle()
  local handleInputMetaTable = Dts.GetTableHandleByName(handleInputDataset,'metadata')
  local handleOutputMetaTable = Dts.AddNewTable('metadata')
  local listCol = Dts.GetTableColumns(handleInputMetaTable)
  Dts.SetTableColumns(handleOutputMetaTable, listCol)
  local countRow = Dts.GetTableRowCount(handleInputMetaTable)

  for i = 1, countRow do
    local row = Dts.GetTableRow(handleInputMetaTable, i)
    Dts.AddTableRow(handleOutputMetaTable, row)
  end
end
```


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```
function TransformDataForAlarmList()
   local hDatasetInput = Dts.GetInputDatasetHandle()
   local hTableDataInput = Dts.GetTableHandleByName(hDatasetInput, 'data')
   local countRow = Dts.GetTableRowCount(hTableDataInput)
   local hTableDataOutput = Dts.AddNewTable('data')

   for i = 1, countRow do
      local row = Dts.GetTableRow(hTableDataInput, i)
      Dts.AddTableRow(hTableDataOutput, row)
   end

   local listCol = Dts.GetTableColumns(hTableDataInput)
   Dts.SetTableColumns(hTableDataOutput, listCol)
   CopyMetadataTable()
end
```

The code below provides an example of rows filtering bases on the field value criteria:

```
function PrintTable(t)
        for k, v in pairs(t) do
                key = tostring(k)
                if type(v) == 'table' then
                        Dts.DebugOut('table: '..key)
                        PrintTable(v)
                        Dts.DebugOut('---')
                else
                        Dts.DebugOut('---name: '..key..', value: '..tostring(v))
                end
        end
   end

   function CopyMetadataTable()
        local handleInputDataset = Dts.GetInputDatasetHandle()
        local handleInputMetaTable = Dts.GetTableHandleByName(handleInputDataset,'metadata')
        local handleOutputMetaTable = Dts.AddNewTable('metadata')
        local listCol = Dts.GetTableColumns(handleInputMetaTable)
        Dts.SetTableColumns(handleOutputMetaTable, listCol)
        local countRow = Dts.GetTableRowCount(handleInputMetaTable)
        Dts.DebugOut('START METADATA')
        for i = 1, countRow do
                local row = Dts.GetTableRow(handleInputMetaTable, i)
                Dts.AddTableRow(handleOutputMetaTable, row)
        end
        Dts.DebugOut('END METADATA')
   end
```


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```
function TransformDataForAlarmList()
    local hDatasetInput = Dts.GetInputDatasetHandle()
    local hTableDataInput = Dts.GetTableHandleByName(hDatasetInput, 'data')
    local countRow = Dts.GetTableRowCount(hTableDataInput)
    local hTableDataOutput = Dts.AddNewTable('data')
    local countRow1 = Dts.GetTableRowCount(hTableDataOutput)
    Dts.DebugOut('START DATA')

    for i = 1, countRow do
        local row = Dts.GetTableRow(hTableDataInput, i)
            PrintTable(row)
        for k, v in pairs(row[15]) do
            fnd =  string.find(tostring(v),"FAILED")
                if fnd ~= nil then

                    Dts.AddTableRow(hTableDataOutput, row)
                end
        end
    end
    countRow1 = Dts.GetTableRowCount(hTableDataOutput)
    Dts.DebugOut('END DATA')
    local listCol = Dts.GetTableColumns(hTableDataInput)
    Dts.SetTableColumns(hTableDataOutput, listCol)
    CopyMetadataTable()
end
```

5.5.4 Post Script APIs

Available Lua API

Below user can find description of available APIs that can be used in Post Script.

```
-- Value type codes:
-- 0 - EMPTY
-- 1 - NUM_DOUBLE
-- 2 - NUM_UINT_64
-- 3 - NUM_INT_64
-- 4 - STRING
-- 5 - DATETIME

-- ID for alarm properties
-- 0 - ID_START_TIME property id for start time, always presented in alarm
-- 1 - ID_ACK_TIME property id for ack time, always presented but can have empty value
-- 2 - ID_END_TIME property id for end time, always presented but can have empty value
-- 3 - ID_TEXT property id for text, always presented, but can have empty value
-- 4 - ID_PRIORITY property id for priority, always presented but can have empty value
-- 10 - ID_ALARM_ID property id for alarm ID, always presented but can have empty value
-- 11 - ID_ALARM_CAUSE property id for alarm cause, always presented but can have empty value
-- 12 - ID_SOURCE_NAME id for alarm source name, always presented, but can have empty value
```


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```
-- Property value type
-- 0 - PROP_VALUE_TYPE_EMPTY
-- 1 - PROP_VALUE_TYPE_STR
-- 2 - PROP_VALUE_TYPE_VAR

-- Output string into Debug Output, it can be viewed with DbgView.exe utility
-- @param[in] message Message to be printed in debug output
-- @return nil
Dts.DebugOut('message')

-- Retrieve handle to Input Dataset
-- @return nil or handle
Dts.GetInputDatasetHandle()

-- Retrieve handle to Output Dataset
-- @return nil if output dataset is not set
-- example:
-- local outDatasetHandle = Dts.GetOutputDatasetHandle()
Dts.GetOutputDatasetHandle()

-- Add new table into Output Dataset
-- and return handle to the new table
-- @param[in] name Name of the new table to be added
-- @return nil in case of error
-- example:
-- local handleTable = Dts.AddNewTable(tableName)
Dts.AddNewTable('name')

-- Retrieve handle of the table by specific name
-- @param[in] handleDataset Handle of the dataset where to search the table
-- @param[in] name Name of the table to be searched
-- @return handle to the table or nil in case of error
-- example:
-- local handle = Dts.GetTableHandleByName(handleDataset, name)
Dts.GetTableHandleByName(handleDataset, 'nameTable')

-- Retrieve the name of the table by provided handle
-- @param[in] handle Handle of the table from which to retrieve its name
-- @return name of the table or nil in case of error
-- example:
-- local name = Dts.GetTableName(handleTable)
Dts.GetTableName(handle)

-- Retrieve number of columns of the table specified by handle
-- @param[in] handle Handle of the table
-- @return number of columns or nil in case of error
-- example:
-- local count = Dts.GetTableColumnCount(handleTable)
Dts.GetTableColumnCount(handle)
```


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```
-- Retrieve number of rows of the table specified by handle
-- @param[in] handle Handle of the table
-- @return number of rows or nil in case of error
-- example:
-- local count = Dts.GetTableRowCount(handleTable)
Dts.GetTableRowCount(handle)

-- Retrieve a row from the table specified by
-- handle of the table and index of the row, index is 1 - based
-- @param[in] handle Handle of the table
-- @param[in] index Index of the row, 1 - based
-- return array of values, each value is table {c = value type code, v = nil | number
| string }
-- or nil in case of error
-- example:
-- local row = Dts.GetTableRow(handleTable, index)
Dts.GetTableRow(handle, index)

-- Add a row into the table specified by handle
-- row is an array of values, each value is table
-- {c = value type code, v = nil | number | string }
-- @param[in] handle Handle of the table where to add row
-- @param[in] row Row to be added
-- @return index of inserted row, 1 - based, or nil in case of error
-- example:
-- local index = Dts.AddTableRow(handleTable, row)
Dts.AddTableRow(handle, row)

-- Retrieve array of column names
-- from table specified by handle
-- @param[in] handle Handle of the table
-- @return array of strings or nil in case of error
-- example:
-- local listColumns = Dts.GetTableColumns(handleTable)
Dts.GetTableColumns(handle)

-- Set list of columns into the table specified by the handle
-- @param[in] handle Handle of the table where to set the columns
-- @param[in] list List of columns to be set, array of strings
-- @return nil
-- example:
-- Dts.SetTableColumns(handleTable, list)
Dts.SetTableColumns(handle, listCol)

-- Retrieve data from some object in the report that is generated
-- object is specified by token
-- @param[in] token String that represents a token
-- @return value of the token or nil
-- value is represented by table with
-- members:
-- c - code of the type
-- v - value that can be: number | string | array of values
```


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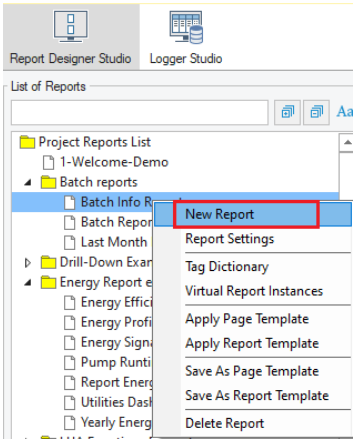
```
-- example:
-- local val = Dts.GetDataFromToken('[f#item_name]')
Dts.GetDataFromToken('token')
```


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Designer Studio

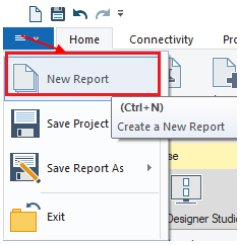
6 Designer Studio

6.1 Create new report



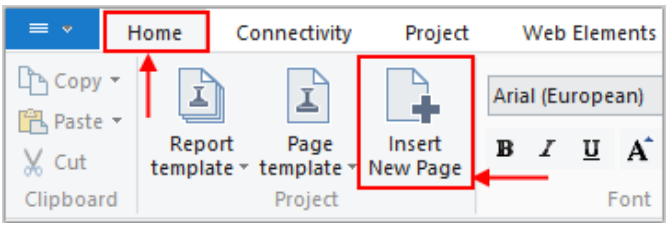
To create a new report, *right-click* on the report tree in the *Dream Report Designer Studio* and select *New Report* from the context menu.

When the new report is created, you can add objects and design your report template.
You can use an existing page template to design your static page layout (header, footer, background etc.).
You can use an existing report template to add statistical objects to your report.



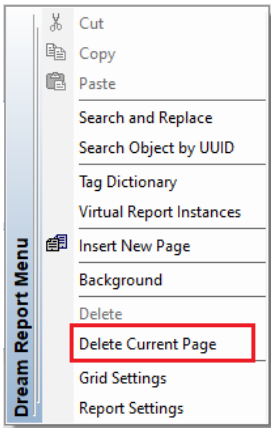
NOTE: New report can be also configured by clicking on the “blank page” icon on the top left of the Designer Studio (/), or from the Dream Report Main Button in the upper left part of the Dream Report Designer Studio (please see the picture below):

To add/ insert a new page, click on *"Insert new page"* icon on the toolbar in the Report Designer Studio (see on a pic. below):



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To delete a page from the report, right-click on that page and select *"Delete current page"* from the pop-up menu:



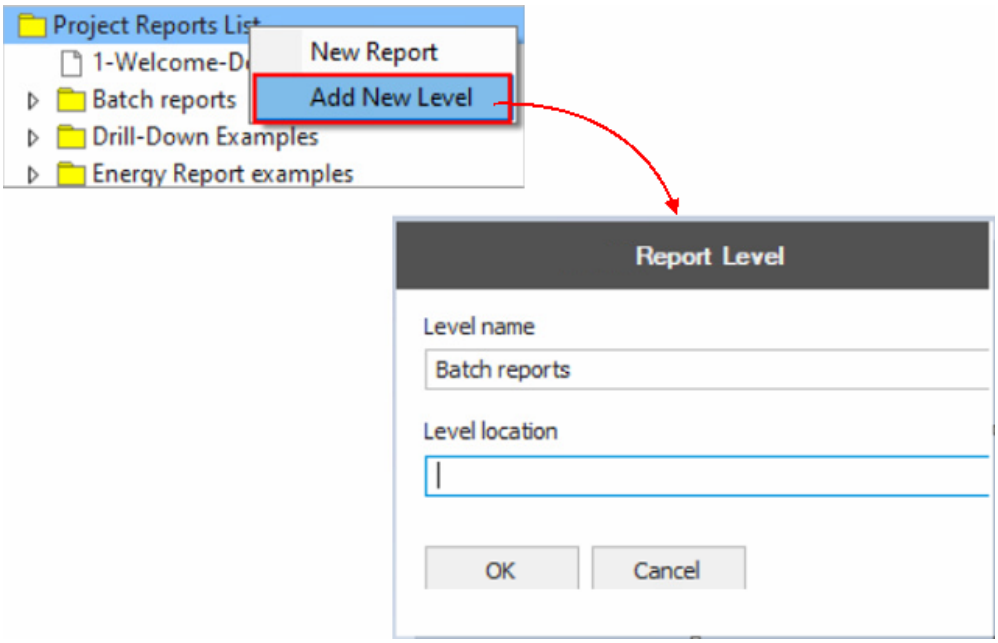
NOTE: The first page of report cannot be deleted and therefore *"Delete Current Page"* will be disabled on the first page of report.

6.2 Report Levels

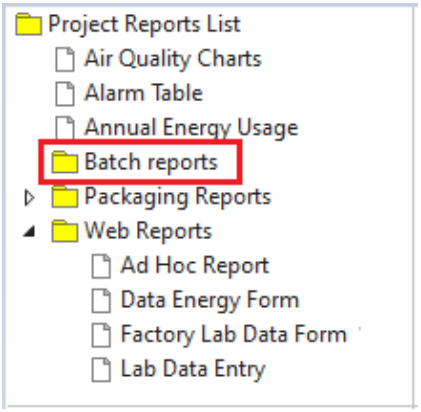
Reports Tree Organization

By default, as new reports are created in Studio, they will be listed and displayed in the *Project Reports List*. A custom tree/folder structure can be configured, in which to organize reports. Such report folders organization is just a logical visual representation, which allows users to visually better organize their reports and be able to easily find/access their reports. The reports level structure configured in the Designer Studio will be reflected in the *Web Portal*, *Runtime Management Console*, and *Dynamic Report Generator.*
To add a new folder (level), right-click below the Project Reports List to open the context menu, and click the *Add New Level* option:

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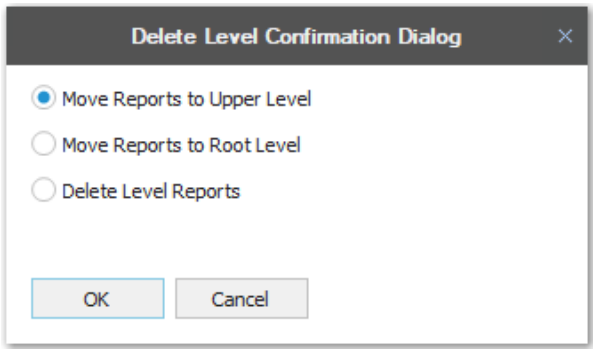
Enter the report folder/level name (*Level name*), optionally, the location of this report level (*Level location*) and click OK. The new report level will be added to the report tree:



Note that new report levels can be added under existing levels. Existing reports can be dragged to a new level/folder, and new reports can be created under a folder by selecting that folder, right-clicking, and select "*Create New Report*".

A report level/folder can be renamed or deleted right-clicking on the corresponding report level. When deleting a level that contains reports, the user will be prompted as to what to do with the reports contained under that level:

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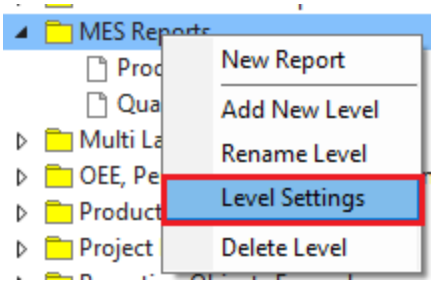


The reports could be moved up to the upper (top-most) level in that branch; moved to the root level of the reports tree; or delete all reports contained in that level.

Note that at least one report must exist in a report level. If no report has been defined under the report level, then this report level won't be saved when the project is saved.

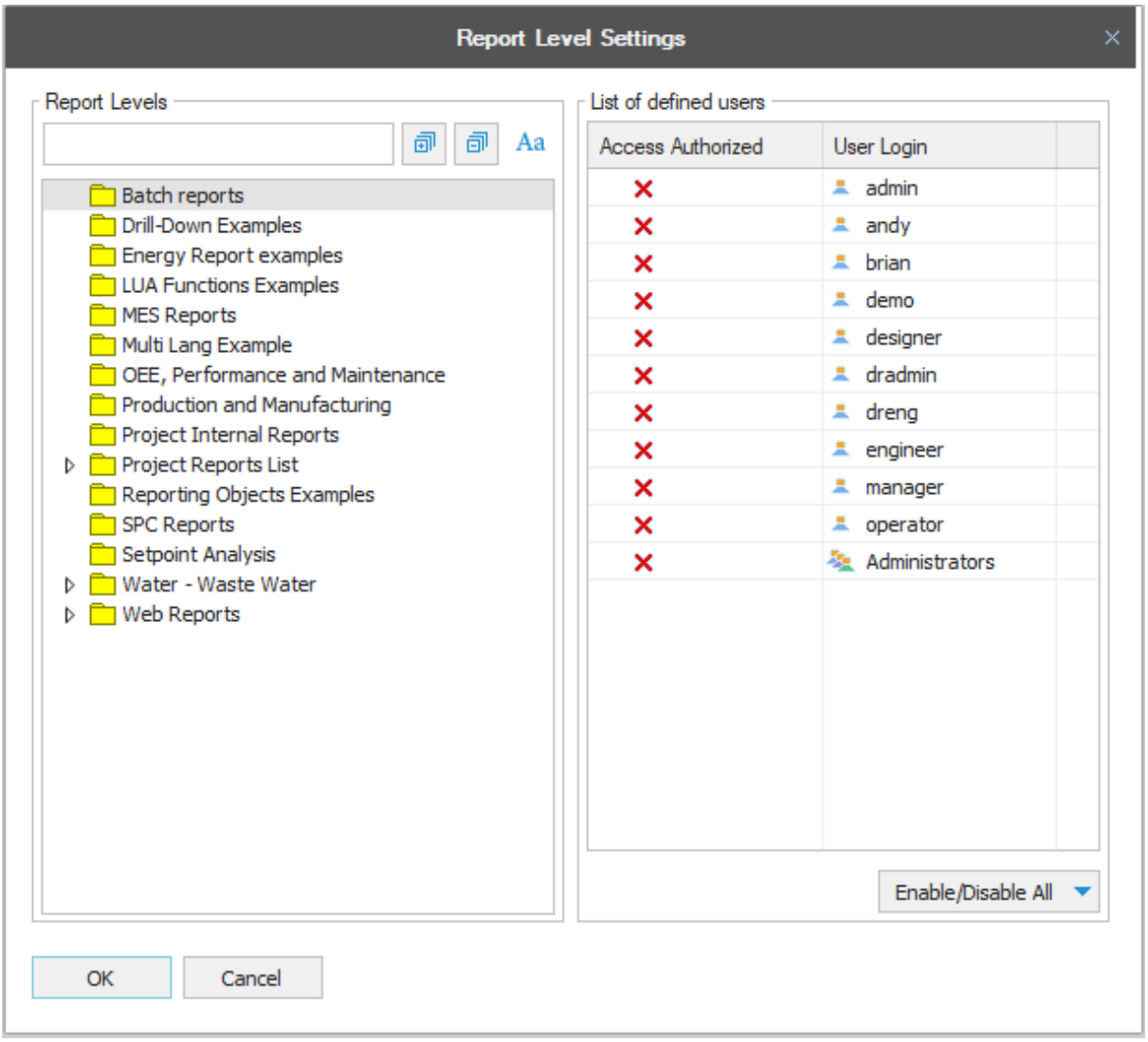
User Authorization for Reports Levels

If *User Management* is configured in the reporting project, user access authorization can be assigned for report levels, in the same way it can be defined for individual reports. To set user authorization, right click on a report level, and select *Level Settings*:



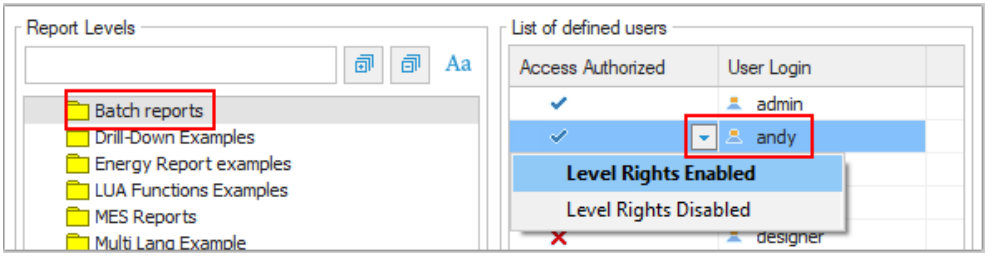
The *Report Level Settings* configuration window will open:

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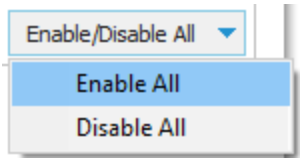
The left panel *Report Levels* lists all report levels that contain reports. The *List of Defined Users* panel on the right side contains all users and groups defined in the project (as exists in the project's *User Management* configuration).

To assign user or group access to a reports level, select the level on the left panel, and then under the *Access Authorized* column, select either *Level Rights Enabled* or *Level Rights Disabled* next to each user or user group:



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A blue “check” indicates that access to that level is granted, and a red “X” indicates that access to that level is denied. To enable or disable access rights to all users/groups for a selected reports level, click the “*Enable/Disable All*” button on the lower right of the window:



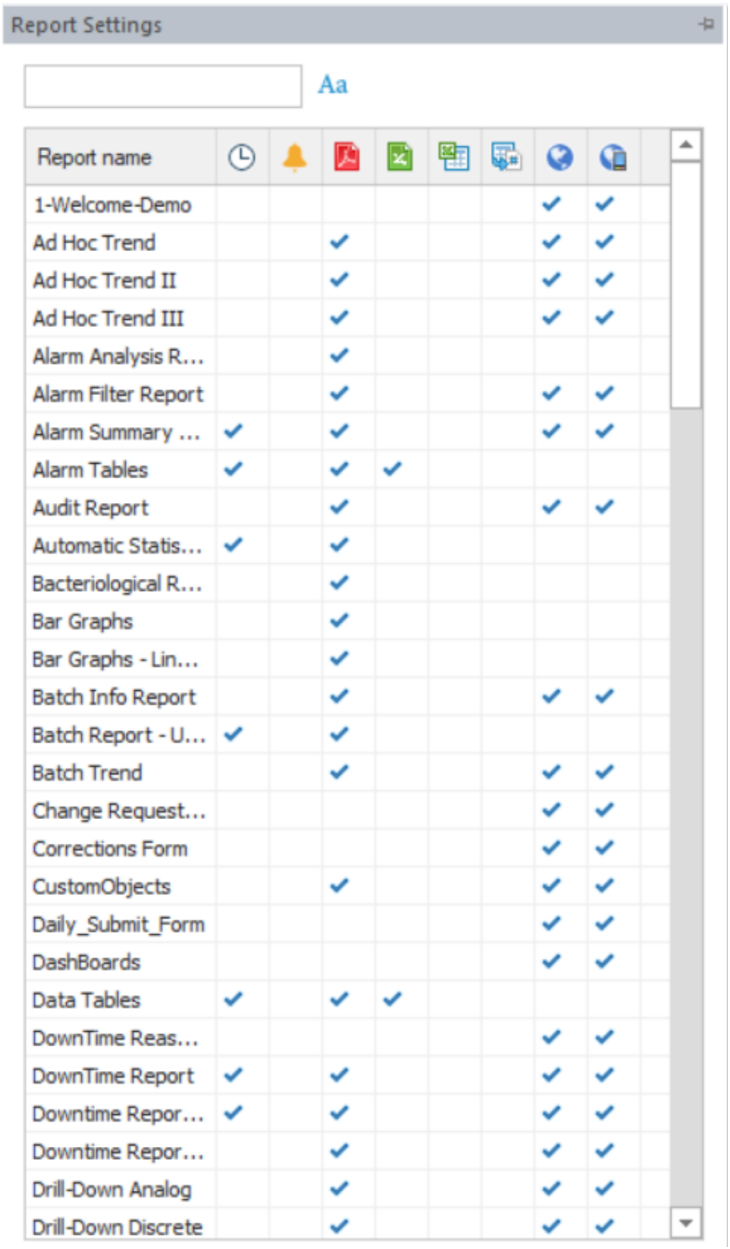
Each new report, which will be created under this level will automatically inherit the authorized list from its level. The level authorization list is the master-template list for all sub-levels and reports. This means the following:

- If a user opens *Report Settings* and adds new users or groups, they will be added to the level list.
- If a user opens *Report Settings* and removes authorization/access for certain users or groups for that report, but they are authorized at the reports level, those users will be authorized to access the report as they still have access at the reports level. To remove authorization for users which are authorized at report level, you must remove access at that reports level only.
- If a user opens *Report Level Settings* of an existing level containing reports, and edits the authorized users list, that new list will be automatically set to enabled for all reports

6.3 Quick Report Info Panel

On the left side of the Dream Report Studio a new panel has been added which lists quick access to the time definition, scheduling and format settings for each report:

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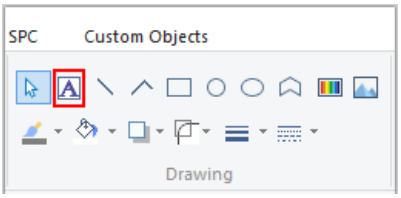
Double-click on an empty (unchecked) setting or on the ✓ to open the corresponding settings window for that report.

6.4 Static Text Object

This object allows users to add static text to a report.

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Add New Text Object



When a user selects a text object in the toolbar or from the menu in the Report Designer Studio:

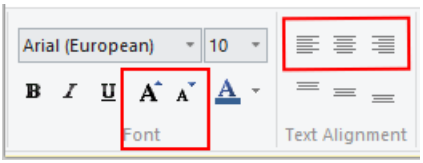
Then left-click on the workspace, and drag the mouse to mark the boundaries of the text area and then release the mouse button. When inserted, the text box will contain the word *"TEXT"*, which can be replaced by typing the desired text.

As soon as the text has been entered, press *ENTER* or click on the workspace outside the text rectangle and the text will be accepted.

Edit Existing Text Object

To edit the properties of the text, click on the text again and the boundary rectangle will be shown. You can change the text properties, e.g. font color, style, size, alignment, background color, or border color (if any).

To edit the text, double-click on the text and the text box will be opened and available for editing.



The font size can be increased or decreased by 1-point size using the appropriate toolbars, and the text string can be aligned within the text box by the right or left edge or centered, using the appropriate buttons on the alignment toolbar:

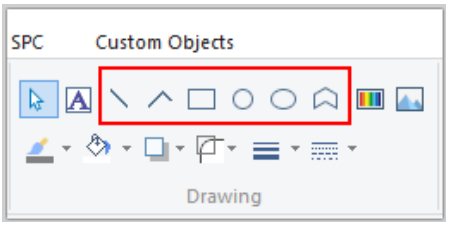
Text Object Manipulation

Dream Report supports changing the direction of the text. The default direction of the text is left-to-right. However, you can make it right-to-left by selecting the text box and using the text direction toolbar buttons (selected button on the image above).

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6.5 Drawing Objects

The Dream Report graphic editor supports drawing most basic shapes in order to add custom graphics to a report.



All drawing of static objects can be done using the Drawing toolbar or using the Designer menu in the Report Designer Studio.

Line. Click the Line button (left one) on the toolbar. Then click the left mouse button on the report page where the line should start. Move the mouse to the point where the line should end and release the mouse button. To edit line properties, click on the line and select a property from the toolbar. The following line properties can be edited: color, width, style. All these properties are accessible from the same toolbar (toolbar on the picture above, see the marked area).

Multi-line. Click the Multi-line button on the toolbar, click and release the left mouse button on the report page where the line should start. Then move mouse to the point where the line segment should end, click and release the mouse button. Then move the mouse again - another line will be drawn from the end point of the previous one. To complete the multi-line, right-click the mouse button. To edit the line properties, click on the line and select a property from the toolbar. The following line properties can be edited: color, width, style. All these properties are accessible from the same toolbar (toolbar on the picture above, see the marked area).

Circle. Click on the Circle button on the toolbar. Then click the left mouse button on the report page where the center of the circle will be. Move the mouse to expand the radius of the circle and release the mouse button when the circle is the correct size. To edit its line properties, click on the circle. The following line properties can be edited: color, width, border line style and background colour. All these properties are accessible from the same toolbar (toolbar on the picture above, see the marked area).

Ellipse. Click on the Ellipse button on the toolbar. Then click the left mouse button on the report page where one corner of the ellipse will be. Move the mouse to expand the ellipse and release the mouse button when the ellipse is the correct size. To edit its line properties, click on the ellipse. The following line properties can be edited: color, width, border line style and background color. All these properties are accessible from the same toolbar (toolbar on the picture above, see the marked area).

Line width. Select a shape, click on the arrow next to the Line Style button on the toolbar and select the desired line style. The selected style will be applied to the line.

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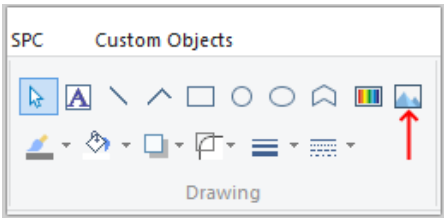
Line style. Select a shape, click on the arrow next to the Line Width button on the toolbar and select the desired line width. The selected width will be applied to the line.

6.6 Insert Picture

Pictures can be added to a report in three different ways:

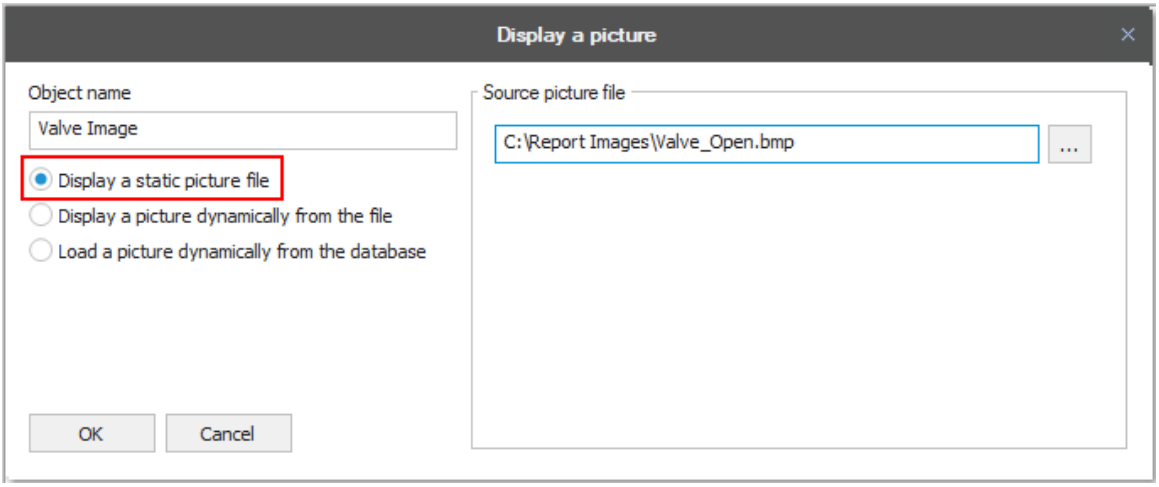
- Reference a *static image file*
- Reference an image *dynamically from a file,* with the option of referencing different image files based on one or more conditions
- Reference an *image stored in a SQL database*, through the use of a SQL query

To add the Picture object on a report, click on the *Insert Picture* button on the *"Drawing"* section of the *Home* toolbar in *Report Designer Studio*, and then click on the report workspace, where the upper left corner of the image should be placed:



The *Display a Picture* dialog box will then open.

Displaying a Static Image

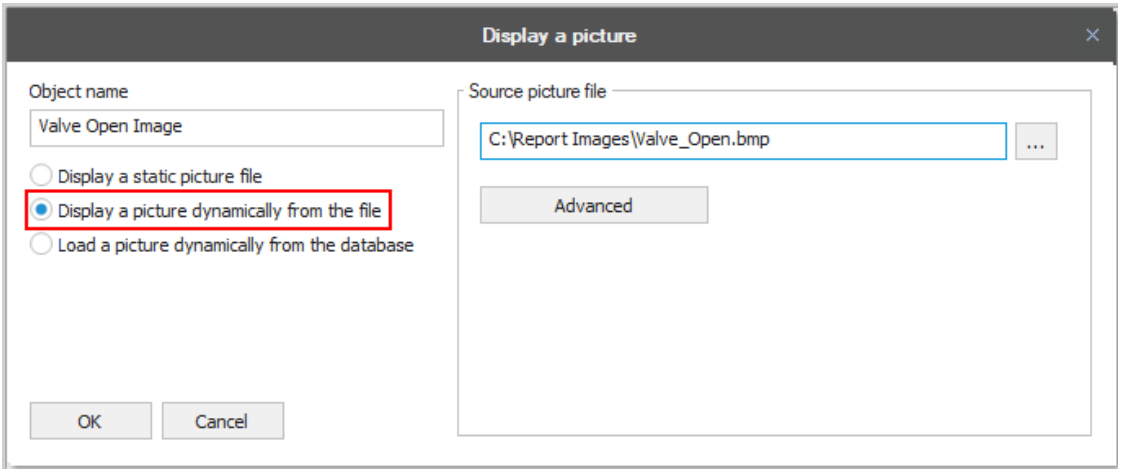


1. When the *Display a Picture* dialog box opens, enter a unique (to that report) *Object Name*
2. Select *Display a static picture file*
3. Browse and select a *Source Picture File* (*.jpg, *.bmp, *.png and *.gif formats are supported)

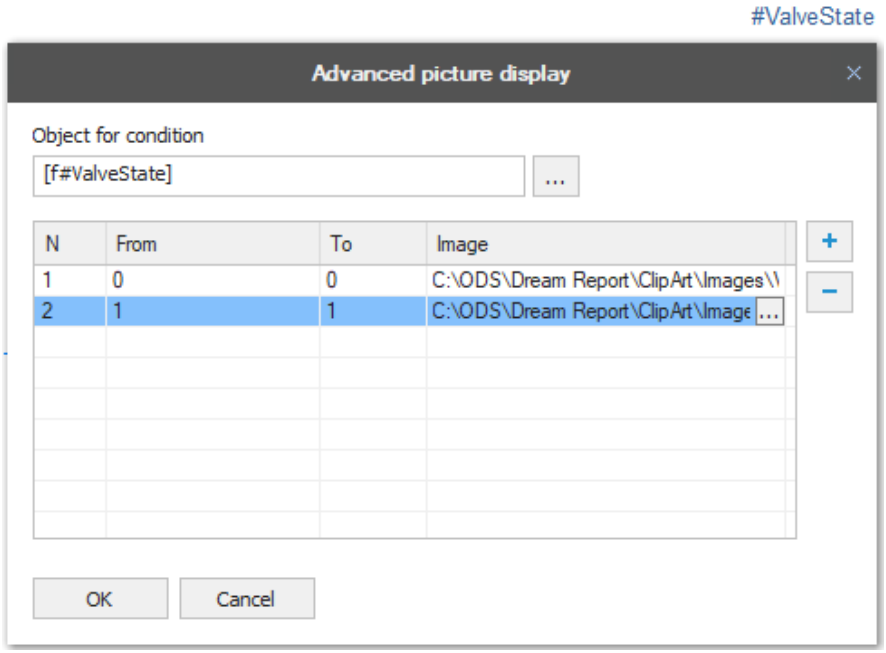
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4. Click *"OK"* and the image will appear on the report. The image can be resized to fit the report, if needed. This exact image will be displayed whenever the report is generated.

Displaying a Dynamic Image from a File



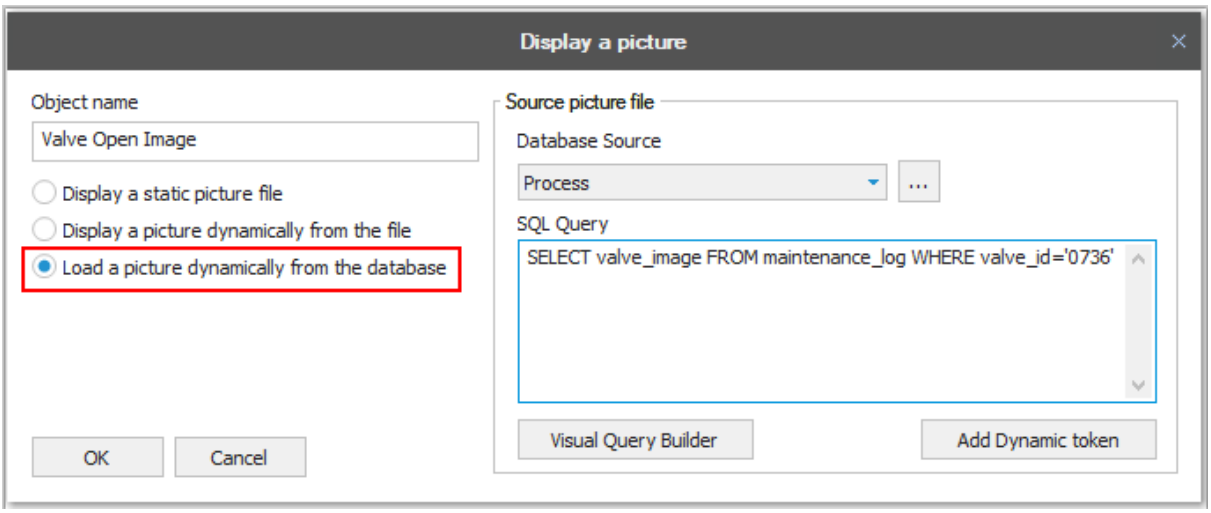
1. When the *Display a Picture* dialog box opens, enter a unique (to that report) *Object Name*
2. Select *Display a static picture dynamically from the file*
3. Browse and select a *Source Picture File* (*.jpg, *.bmp, *.png or *.gif). The current version of this file will be show on the report whenever the report is generated. If the image file is changed (either over-written with a new file, or modified in any way) then the latest version of the file will be used at report generation time.
4. If you need different images to be displayed based on a condition, click the *"Advanced"* button. The *Advanced Picture Display* dialog box will open:



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5. Select the *Object for Condition* by browsing for any single object on a report that you wish to base the conditional display on. The object could be based on a standard Dream Report statistical function, a current value, or an expression object.
6. Click the *"+"* (or "-") buttons to add (or remove) the number of values or value ranges you wish to evaluate. For instance, these could be "0 to 0" and "1 to 1" to evaluate the two states of a discrete tag, or "0-5", "5-10", 10-15", etc. to base the image to be displayed on analog value ranges
7. For each range, browse and select the *image file* to be associated with that condition.
8. Click *"OK"* to close the *Advanced Picture Display* window, and then "OK" to close the *Display a Picture* window
9. When the report is generated, the referenced object will be evaluated, and the appropriate image displayed on the report.

Displaying a Dynamic Image from a Database



1. When the *Display a Picture* dialog box opens, enter a unique (to that report) *Object Name*
2. Select *Load a picture dynamically from the database*
3. In the *Source Picture File* section, select an existing ODBC *Database Source* (or click the […] button to launch the *DSN Manager* to define a new ODBC data source.)
4. Enter a valid *SQL Query* that will select a valid image file (typically stored in a SQL "BLOB" format). Click the *"Visual SQL Query Builder"* button to help with building the SQL query. Note that the SQL query can be a dynamic query, by using the *"Add Dynamic Token"* button to browse for dynamic tokens or "variables" from the report to use in the query.
5. Click *"OK"* to close the Display a Picture window
6. The following "icon" will be placed on the report where the actual image will be displayed at generation time:

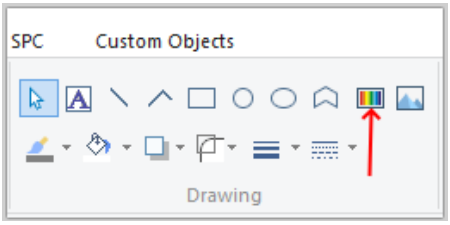
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NOTE: An image, inserted into a report is stored internally in a report layout file as uncompressed, therefore consuming more memory while loaded at runtime. Therefore, use images with size not bigger than 100Kb. The quality of the generated report won't be affected. Likewise, for dynamically-loaded images, the size of the image files could impact report generation time.

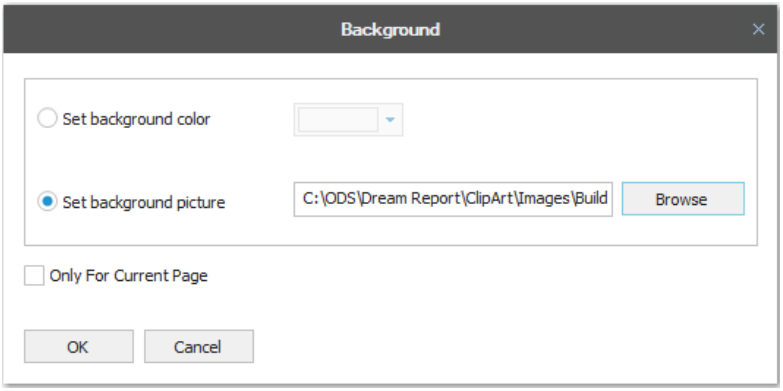
6.7 Report Background

Dream Report supports setting a background image or color.



To define background, click on the *Set background* button on the *Edit* toolbar in the Report Designer Studio:

When the button is clicked, the *Background* dialog box will be opened:



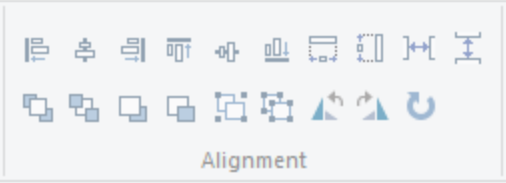
The *Set Background Color* option will set the background color selected in the color selection combo box. The *Set Background Picture* option will set a background from an image file selected using *Browse* button, or by typing a file path and name directly in the edit box.

The check box *Only for Current Page* defines whether the background will be applied to all pages of the report or only applied for the current page.

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6.8 Alignment

The Alignment tools on the *Home* toolbar allow you to align and organize various objects on a report.



Object Alignment, Sizing and Spacing

	Align all selected objects to the **left**
	Align all selected objects to the **vertical center**
	Align all selected objects to the **right**
	Align all selected objects to the **top**
	Align all selected objects to the **horizontal center**
	Align all selected objects to the **bottom**
	Make all selected objects the same **width**
	Make all selected objects the same **height**
	Make equal **horizontal spacing** between selected objects (3 or more selected objects)
	Make equal **vertical spacing** between selected objects (3 or more selected objects)

To use the alignment, size and spacing tools, select two or more objects on your report that you want to align, size, or space equally, and then click the relevant icon (described above.) Objects can be selected by selecting a *"range"* of objects by dragging the mouse over the objects, or by holding the *[Ctrl]* button and selecting individual objects.

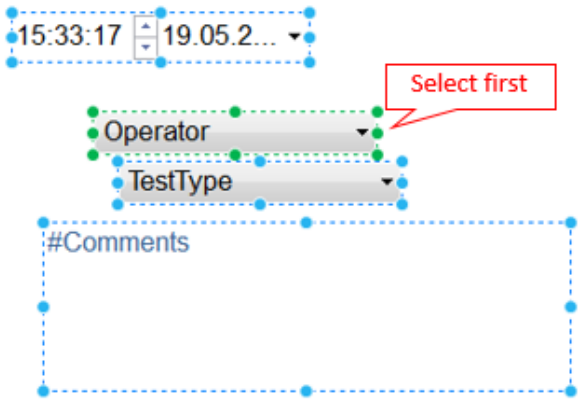
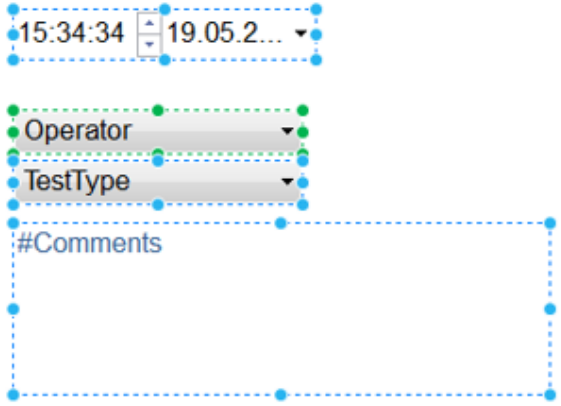
NOTE:

For alignment and sizing actions, the first object selected will be the "anchor" object, that all other objects will be aligned (or size-matched) to. For example, you wanted to align all of the

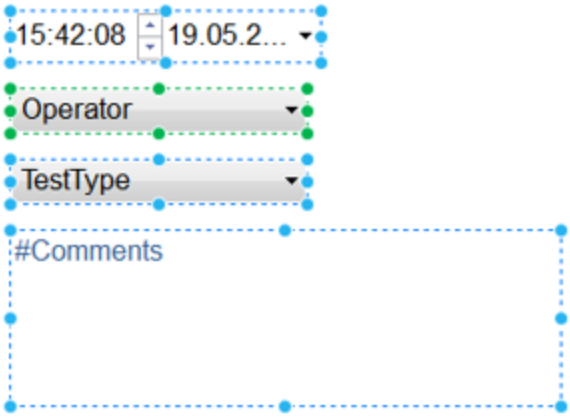
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following objects with the left side of the *Operator* combo box, select the *Operator* combo box first, then the other objects, and then click the *Left* align button:

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Before Alignment	After ***Left*** Alignment
	

For vertical or horizontal interspacing, select three or more objects that you want to space equally. Dream Report will then calculate the available (vertical or horizontal) space between all selected objects, and then move the objects between the furthest objects, with equal space between each object. For example, in the above example, clicking the *Vertical Interspace* button will result in the following layout:



Forward/Backward Placement

Select an object, and then click one of the following options to:

	Bring to **front** - bring object in front of all other objects on the page
	Bring to **back** – send object behind all other objects on the page
	Bring **forward** – bring the selected object forward one level

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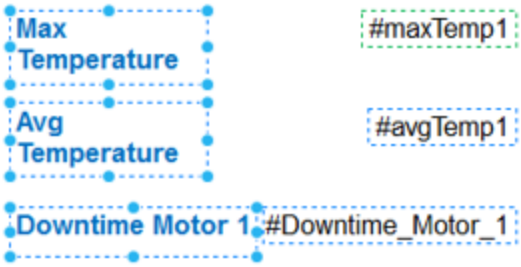
	Bring **backward** – send the selected object back one level

Object Grouping

Select two or more objects you wish to group together (applies to all objects except tables). This might be done so that you can move all grouped objects together, or right click on the group to *"Lock objects' location"* on the page, apply a *"Conditional display"*, or *"Show object on every page"* – these actions will apply to the group as a whole:

	**Group** selected objects together
	**Ungroup** a selected group of objects

FOR EXAMPLE:

Multiple objects selected:	Objects **grouped**:
	

Once objects are grouped, individual objects cannot be edited while part of the group – you will need to ungroup the objects, double-click the specific object to edit, and then re-group the objects.

Object Rotation

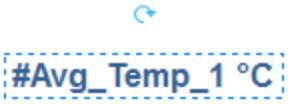
Text objects (text objects and single data objects shown as text) can be rotated on a report by selecting the object, and then clicking on one of the rotation buttons:

	Rotate object **90° counter-clockwise**
	Rotate object **90° clockwise**

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	Activate **free rotation** of object

FOR EXAMPLE,

Select object, click **Free Rotation**	Select rotation "**arrow**" and use mouse to rotate object
	

6.9 Dynamic Text Object

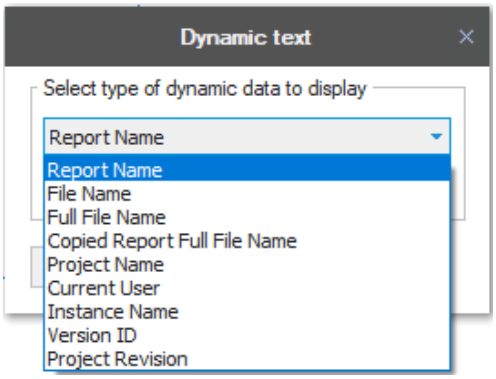
Dynamic Text Object enables users to display a text in a report, where the value will be determined during report generation.



To add this object, click on the *Dynamic text* button on the Report Designer Studio *Elements* toolbar:
Draw a rectangle in the workspace where the output data will be displayed.

The following dialog window will be opened:

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You can select one of the following types of Dynamic Text:

- *Report Name* - the name of the actual report.
- *File Name* - the name of the generated report PDF file.
- *Full File Name* - the name of the generated report PDF file, including its file path.
- *Copied Report Full File Name* - the name of the generated report PDF file, including its secondary (copied) file path, if defined.
- *Project Name* - the name of the actual reporting project.
- *Current User* - the name of the user, who has generated that report.
- *Instance Name* - the name of the instance of the generated report.
- For details of report instances *(Instance Name)*, please, go to the Virtual Report Instances section.
- *Version ID* - ID of the report version a user will need (please, see the description of the *Version ID* section below).

NOTE: The selected dynamic object will be added in the format of *[s#<Field Name>].*
For details, please see List of Dynamic Tokens section.

Dynamic text visual properties can be edited (in the font toolbar) like the properties of other text objects: font size, colour and style.

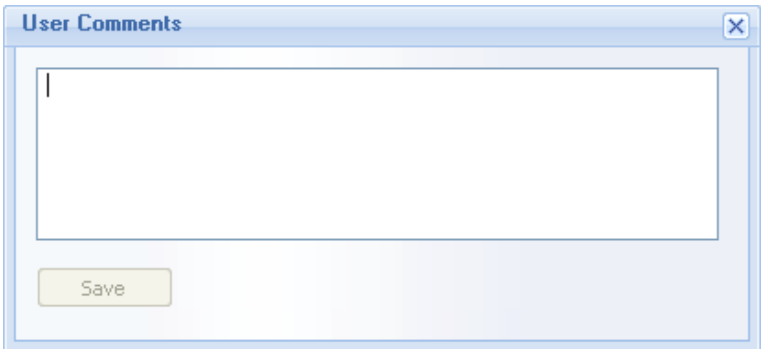
Version ID

If a user selects the *Version ID* option, but Version Control (VC) is disabled, then, the message box *"Version control is disabled in your project. Do you want to enable version control and add this object type into report?"* will pop up.

If a user will click on ***Yes***, the Version Control will be enabled, and the dynamic text object with the *Version ID* type will be added to the report. If a user clicks ***No***, the Version Control option will remain disabled and no dynamic object will be added to the report.

Then, if a user will enable the option *"Enable user comments"* in the Version Control dialog box, each time the report is saved, the following window will pop up:

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It will be empty, the *Save* button will be disabled. A user will have to enter the version comment, otherwise, he will not be able to continue.

Note: This Version ID description is relevant to the version control of 4.x product generation.

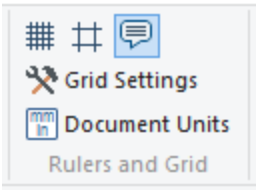
Project Revision

The *Project Revision* option is presenting the current version of entire project as part of generated report, once Version Control is activated.

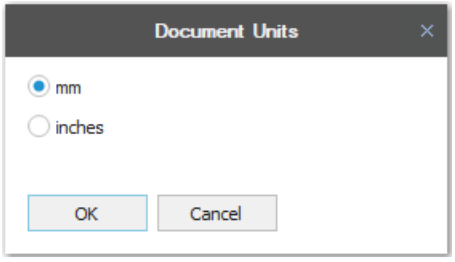
6.9.1 Rulers and Grid

The *Rulers and Grid* dialog box defines settings for rulers and the grid in the report designer workspace.

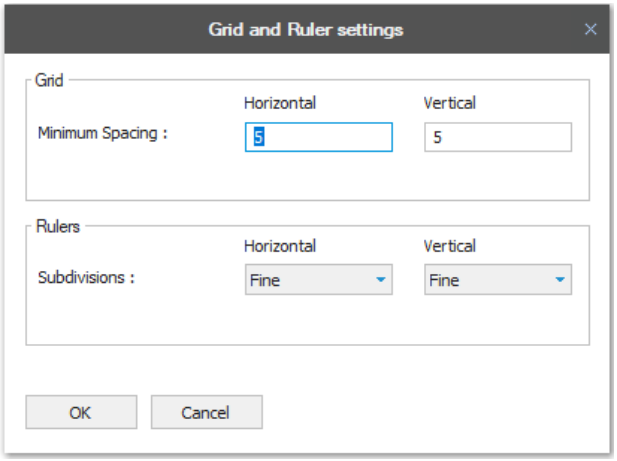
User can open the dialog window with *Grid and Ruler settings* either using the menu in the Designer studio or the toolbar button:



To learn more about how to create header and footer, please, refer to the Page template section.



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Rulers

Rulers are the vertical bar on the left side of the page and the horizontal bar on the top side of the page, which show the exact position of the object on the output report page.

Subdivisions (horizontal and vertical) define the space between ticks in the ruler. The upper combo box has 3 preset positions.

If the unit selection is *mm*, then the ruler definition will have the following spacing:

- *Fine* (1mm tick),
- *Normal* (5mm tick) and
- *Coarse* (1cm tick).

If the unit selection is *inches*, then the ruler definition will have the following spacing:

- *Fine* (1/32" tick),
- *Normal* (1/8" tick) and
- *Coarse* (1" tick).

Ruler Zero defines the offset between 0 ruler mark and the top left corner of the page.

Grid

The grid is a set of dots, drawn in vertical and horizontal lines over the workspace, which makes it easy to align objects on the page and align objects with each other.

Grid spacing defines the distance between dots in ticks.

Minimum spacing

This value sets a minimum grid spacing, which is a low limit of grid spacing while zooming a workspace in low zoom. If low zoom factors are used, the grid spacing will change according to a new zoom factor, but cannot be lower than a value, specified in the *Minimum Spacing* edit boxes.

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If the unit selection is *mm,* then 1unit of the grid minimum spacing definition will correspond to 1mm.

If the unit selection is *inch*, then 1unit of the grid minimum spacing definition will correspond to 1 tick (of rulers) in fine definition, i.e. 1/32".

EXAMPLE: Grid minimum spacing of 5 units in inches will correspond to 5/32".

6.10 Page Number Object

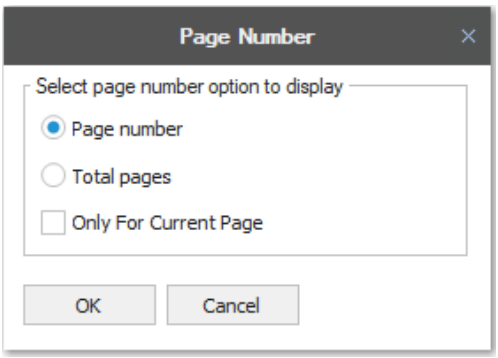
Page Number object allows a user to display the number of the current page or the total number of pages in a report.



To add this object to a report, click on the *Page number* button on the Report Designer Studio *Elements* toolbar:

Draw a rectangle in the workspace where the page number will be displayed.

Then the *Page Number* dialog window will be opened (please, see pic. below):



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Select the desired option: *Page number* or *Total pages* and click *OK*.

The *"Page number"* option will add the number of the current page.

The *"Total pages"* option will add the total number of pages in the report.

The *Total pages* object will be calculated dynamically during report generation based on the number of dynamically generated number of pages.

If the check box *Only for current page* will be checked, then the page number will be displayed only on the page, where the object definition is added. If this check box will not be checked, then the page number will be automatically added to every page of that report.

By default, the *Only for current page* check box is not checked.

The text properties of the object can be changed using the studio font toolbar, e.g. font size, color, style.

When copying/pasting this object on another page, it will automatically display the number of the new page.

When adding *Page Number* to a page template and then applying that page template to another multi-page report, the *"Page Number"* object will automatically update the page number in each place in the report.

6.11 Date & Time Object

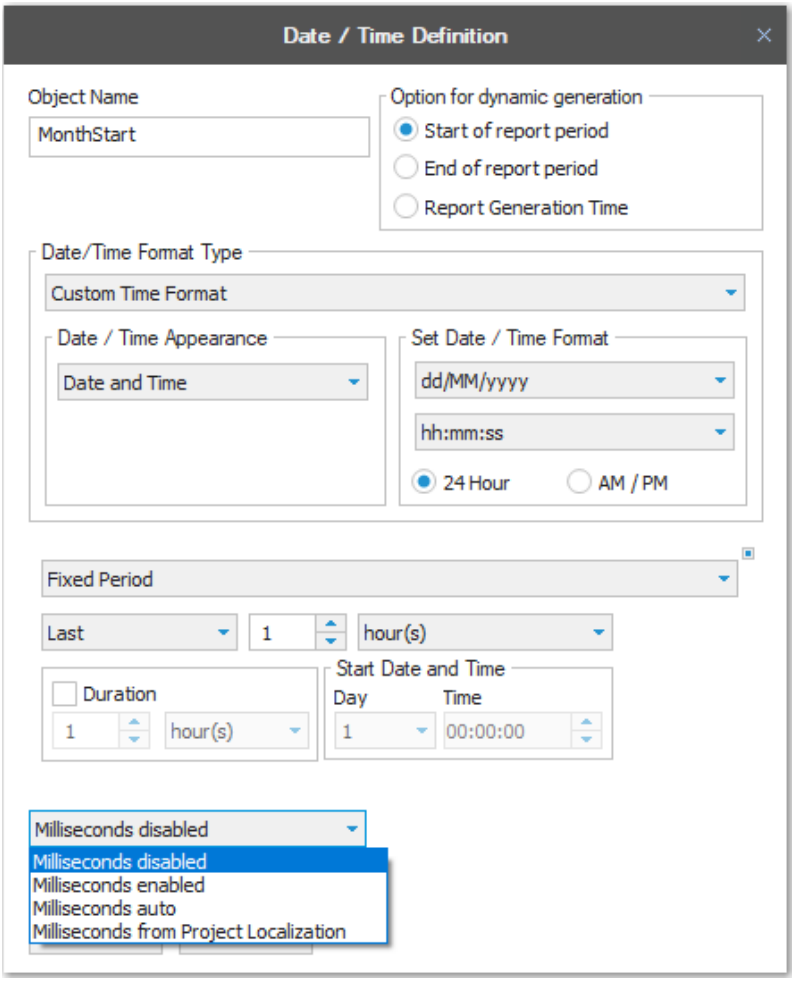
Date and Time object displays dynamic date and/or time in the desired format. To add this object, click on the *Date/Time* button on the Report Designer Studio *Elements* toolbar:



Draw a rectangle in the workspace where the data will be displayed.

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Then the following dialog box will be displayed:



In the *Object Name* section a user will define the name for the selected object.

The *Option for Dynamic Generation* section defines the behavior of date/ time if a report is generated by the Dynamic Report Generator with dynamic period replacement. When the period is replaced dynamically, the Date/Time object can display either start or end time of the report period or timestamp of report generation according to the selected radio button. Then the *"Time Definition"* section of this dialogue will be ignored and only dynamic report generation settings will be considered.

If there is no dynamic time replacement, this object will present time defined in the *"Time Definition"* section of this dialog window.

The *Time Definition* combo box has 4 options: *Absolute or relative period definition, Fixed period, Batch-based* and *Calculated time period*.

The time period configuration is described in details in the Time Period Definition section of this manual.

If a user enables *OS Time Format,* then the computer operational system time settings will be automatically applied to the Date/ Time object settings.

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If a user selects *Custom Time Format,* then *Date/Time Appearance* and *Set Date/Time Format* combo boxes will appear (please, see the pic. above).

The *Date/Time Appearance* section defines which data will be displayed:

- *Date* - displays only the specified date
- *Time* - displays only the specified time
- *Date and Time* - displays both the date and time
- *Week Number* - displays only the week number, where Monday is treated as the beginning of the
  week and the week containing January 1 is "Week 1"
- *Day of the week* - displays the name of the day of the week (e.g. "Monday")
- *Day of the week number* - displays the number of the day of the week, where 1=Monday and
  7=Sunday
- *Month* - displays the name of the month, e.g. "January"
- *Month Number* - displays a two-digit number for the month, where January is "01"
- *Year only* - displays the four-digit year
- *Hour only* - displays the two-digit hour, applying the "24 hour" or "AM/PM" selection, but without the
  "PM" designation (e.g. 15:00 will be displayed as "03")
- *Minute only* - displays the two-digit minutes

The *Set Date/Time Format* section defines the format in which the date and time will be displayed, e.g. dd/mm/yyyy or mm/dd/yyyy or dd/mm/yy etc. for the date format, and 24h format or am/pm for the time format.

By clicking on the combo box *Milliseconds* a user can choose whether to display milliseconds for the timestamp field. The following options are available:

- *Milliseconds disabled:* milliseconds will not be displayed.

- *Milliseconds enabled:* milliseconds will be displayed for every timestamp.

- *Milliseconds auto*: Milliseconds will be displayed only in the timestamps with milliseconds resolution.

- *Milliseconds from the Project localization:* the object will use the configuration set in the Project Localization dialog window.

6.12 Search and Replace

The *Search and Replace* function in Designer Studio enables the report designer to easily find object(s) needed, and to automatically replace the following items within the currently opened report:

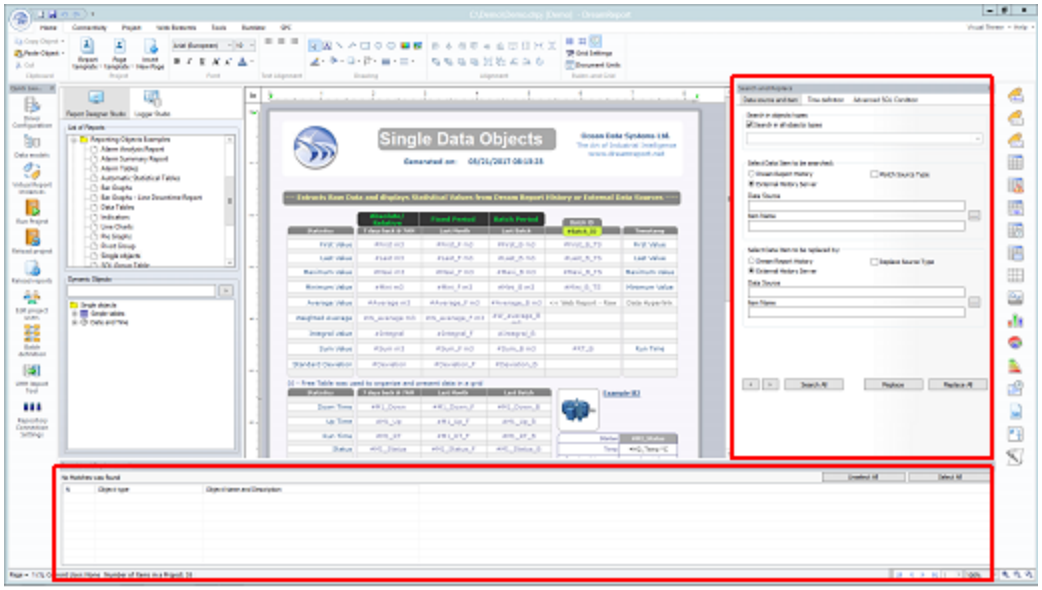
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- Data Sources and Item Names
- Time Definitions
- Advanced SQL Conditions

Search and Replace can apply to all objects on the report, or only on specifically selected items. To open the *Search and Replace* dialog windows:

- Right-click on any "blank space" on the report (for *Search and Replace* on all items on the report)
- First select one or more items to search, and then right-click and select "*Search and Replace*"
- Select an object in the left-side “Dynamic Objects” panel, right click, and select “Search and Replace”
- With a report open in Studio, click “Ctrl + F”

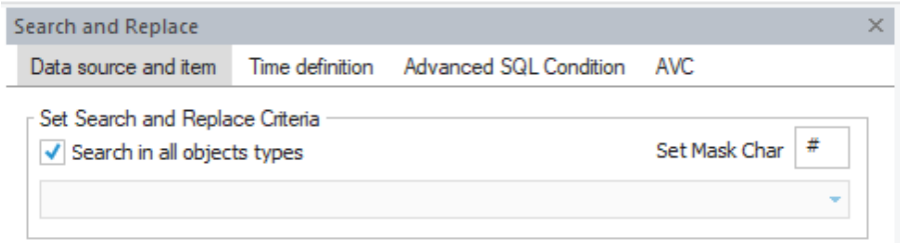
The *Search and Replace* dialog window will be opened on the right side of Studio, with a *Search and Replace Result* window opened across the bottom of Studio:



Using this function, users can automatically either search or replace a specific data item by another data item, or search/replace one specific or all Time definitions by a specified one throughout all the objects within that report.

To search or replace *a specific data item by another one,* select *Data source and item* option in the *Search & Replace* group box, on the top of the window:

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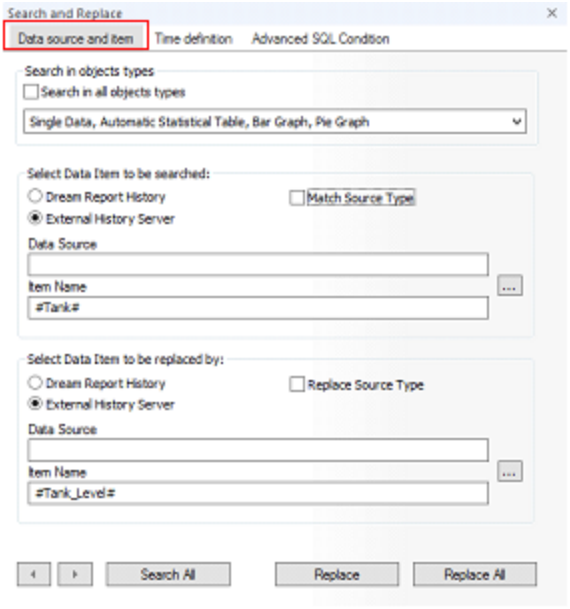
User can select which type of statistical reporting objects will be affected by that data item search/replacements.

If option *Search in all objects* will be selected, then the data item search/replacement will be done in all statistical objects of that report.

If option *Search only in selected object type* will be selected, then the combo box with the list of all available object types will appear just below that radio button. User will be able to select the desired object type and then data item search/replacement will affect only the object type selected:

Search and Replace - Data Source and Item Name

In this section, the user can search all, or specific objects on a report, and replace the *Data Source* and/or *Item Names* that match a user-specified search string:

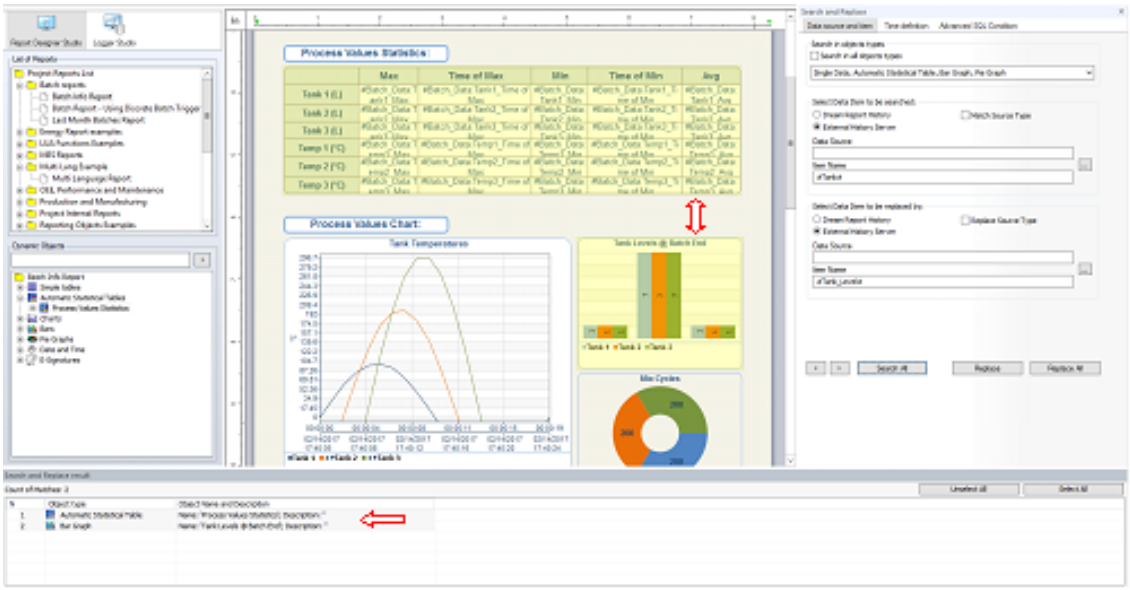


Select *"Search in all Object Types"* to search every object on a report for a match, or for the drop-down, select only the specific report object types to search.

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To search and replace a *Data Source* and *Item*, you can either search for data items or data sources explicitly by typing in the exact data source and/or item name in the *"Select Data Item to be Searched:"* section, or use *"#"* as a wild-card character. Then, in the *"Select Data Item to be Replaced by:"* section, either type in the exact data source and/or item name to be replaced with, or use *"#"* with the replacement string. If searching/replacing on Data Source, check the *"Match Source Type"* option to only search a specific "*Dream Report History*" or "*External History Server*" type, and then check *"Replace Source Type"* if you want to replace the data source type with the one specified, if a match is found.

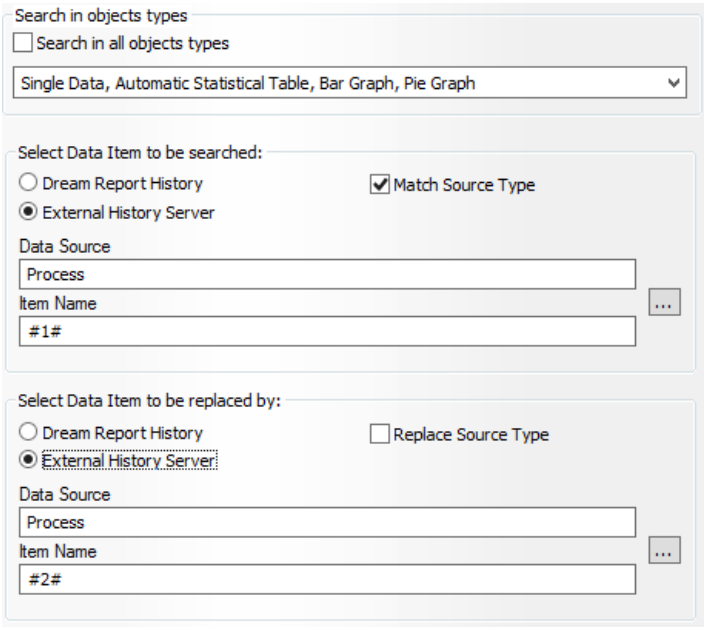
Click the *"Left"* (search previous) or *"Right"* (search next) arrow buttons to highlight each object where a match is found, or click the *"Search All"* button to search and highlight (in yellow) all objects in which a match is found. In the *"Search and Replace Result"* window below, you will see all corresponding objects that match the search item(s):



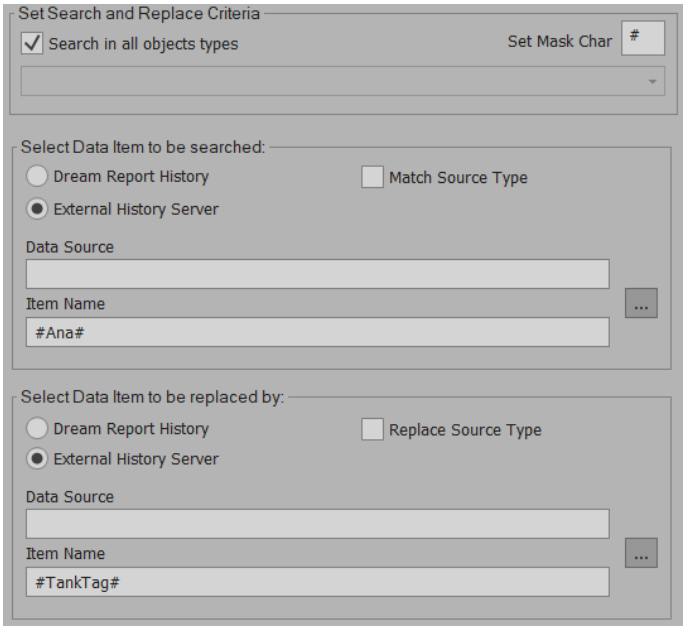
If *"Search All"* was selected, and multiple object matches were found, click *"Replace All"* to replace the items in all selected objects, or select specific items in the *"Search and Replace Result*" window below, and then click *"Replace"* to only perform the replacement in that specific object.

EXAMPLE 1: If you wish to replace all data items with suffix "1" from the *ODBC_Batch* (External History Server) data source to suffix "2", you would enter the following into the "Search and Replace" window:

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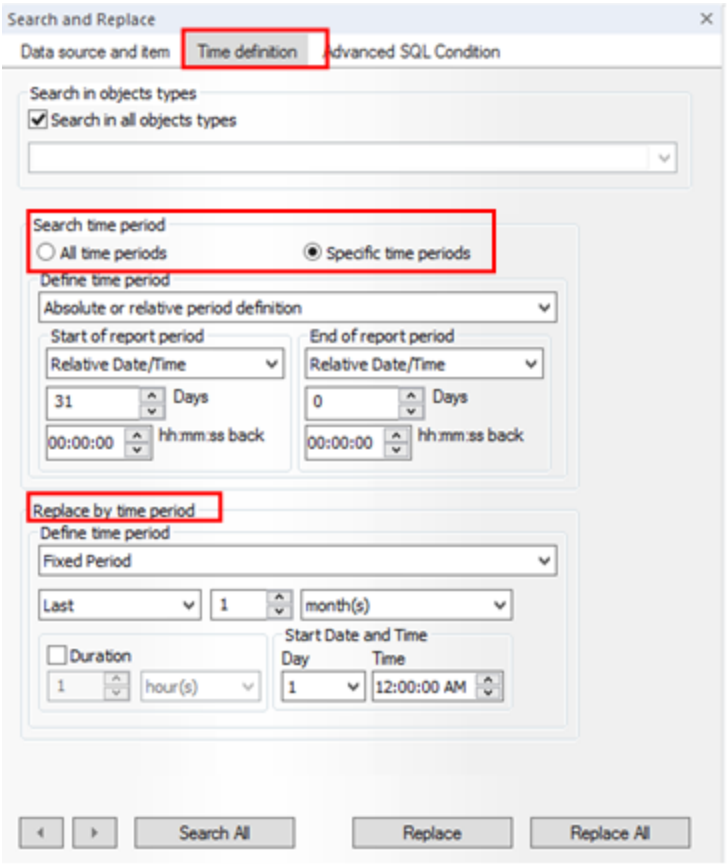
EXAMPLE 2: Replace all tag names from any (Dream Report History) data source containing the text "*Ana*" with the text "*TankTag*". For example, data item "*Ana_10*" would be replaced with "*TankTag_10*":



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Search and Replace - Time Definition

In this section, the user can search all, or specific objects on a report, and replace the objects(s)' *Time Period* - either *"All Time Periods"* in the searched objects, or only *"Specific Time Periods"*. Select *"Search in all Object Types"* to search every object on a report for a match, or for the drop-down, select only the specific report object types to search.

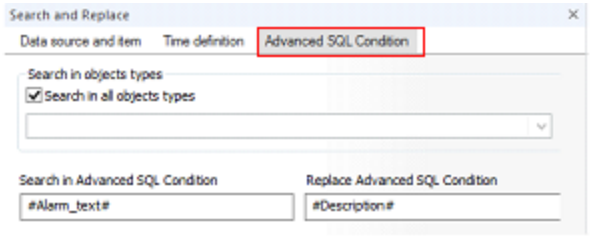


If one or more matches are found, the user can perform the replacement of *Time Definitions* in the same manner as described with the *Data Source and Items,* above - either individually, or on all matches.

Search and Replace - Advanced SQL Condition

Any text can be searched for and replaced in the *Advanced SQL Condition* (SQC) of any object. The "#" wild-card characters should be used for finding string matches:

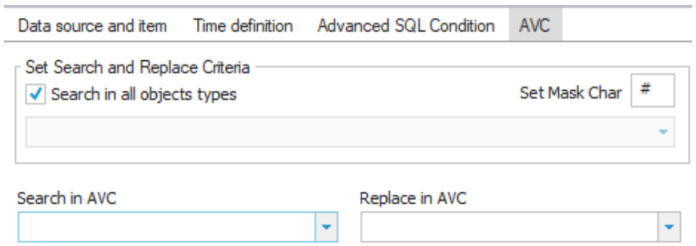
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If one or more matches are found, the user can perform the replacement of *the Advanced SQL Condition* text in the same manner as described with the *Data Source and Items*, above - either individually, or on all matches.

Search and Replace - Advanced Visualization Condition

Any text can be searched for and replaced in the *Advanced Visualization Condition* (AVC) of any object. The "#" wild-card characters should be used for finding string matches:



Tag Dictionary and Virtual Report Instances

Two functionalities - *Tag Dictionary* and *Virtual Report Instances* - provide users with an advanced *Search and Replace* mechanism by using complete data source/data item and complete source type matching.

For details, please, go to the Search and Replace parts of the *Tag Dictionary/ Virtual Report Instances* sections.

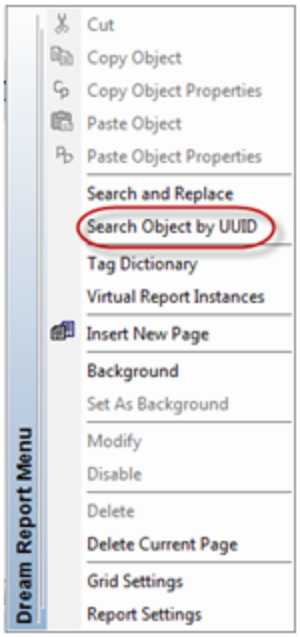
Search Object by UUID

If there is any problem with an object, which is used in WEB reports in Dream Report Web portal, then, in order to find this object, user should search for this object in the DR studio/report by this object's *UUID* (Universal Unique Identifier). This UUID is located in the *"dmlc.log"* log file, which is stored in the folder with the unique name, being generated by Dream Report at the moment of WEB Report generation

To search an object in the report by its UUID, right-click on the report page and select *"Search Object by UUID"* from the popup menu:

For details on WEB reports, please go to the Web Portal section of this manual.

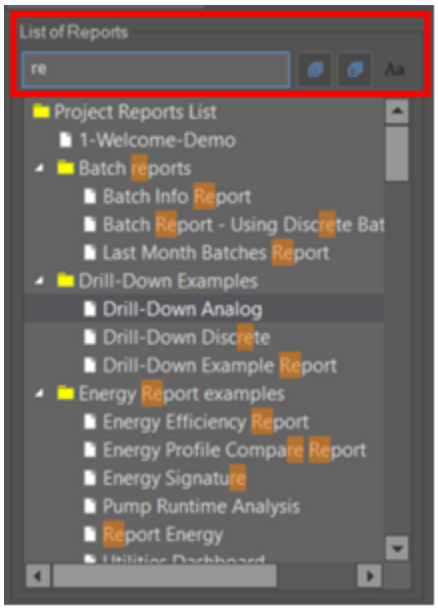
© 2024 Ocean Data Systems Ltd.



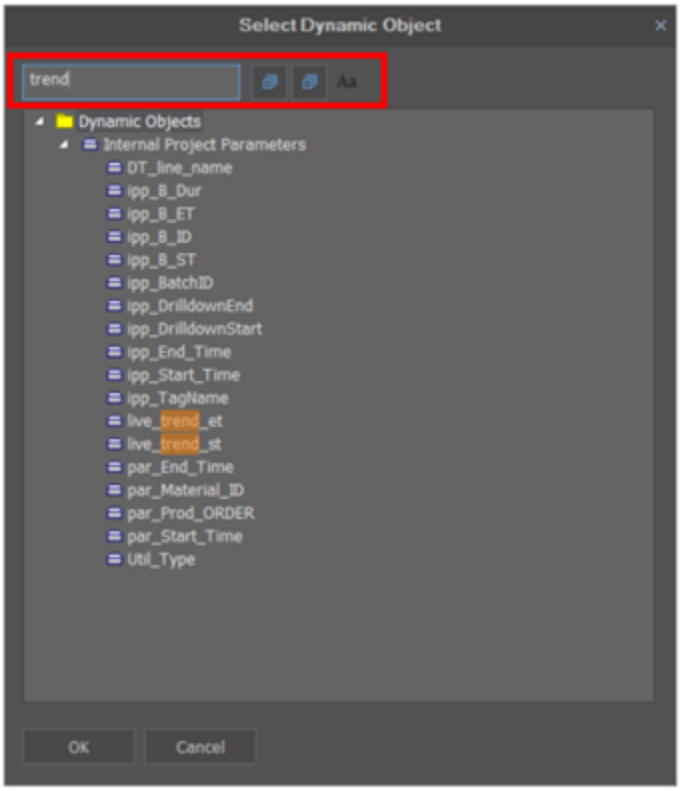
Reports and Objects Search:

In Dream Report 5.1, new search options have been added in *Designer Studio* to the *List of Reports* tree, and to the *"Add Dynamic Token"* screen. Enter text in the search box and the list will be highlighted where ever a match is found:

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Reports Tree:

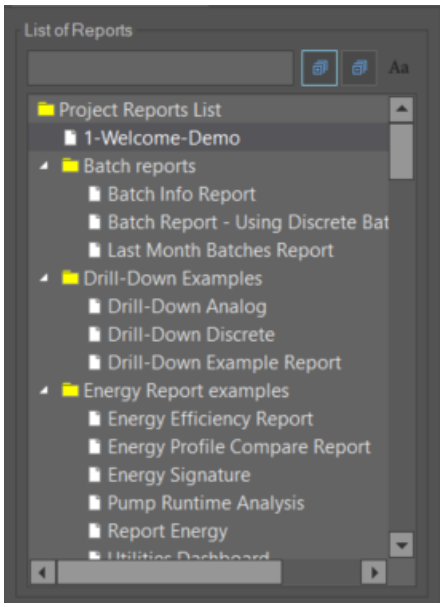


Select Dynamic Token window:

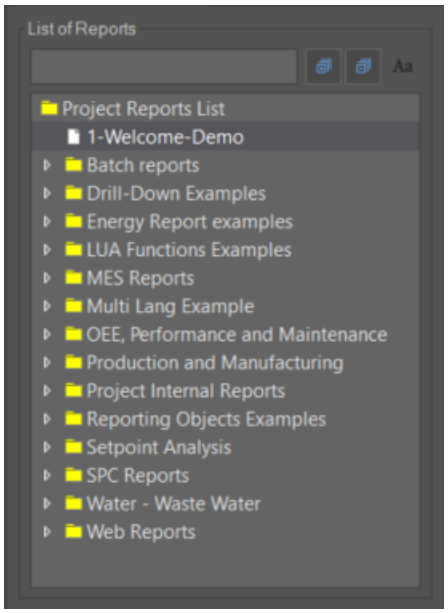
The 3 buttons to the right of the search field perform the following functions:

 *Expand Tree* - the item tree and all subfolders will be expanded:

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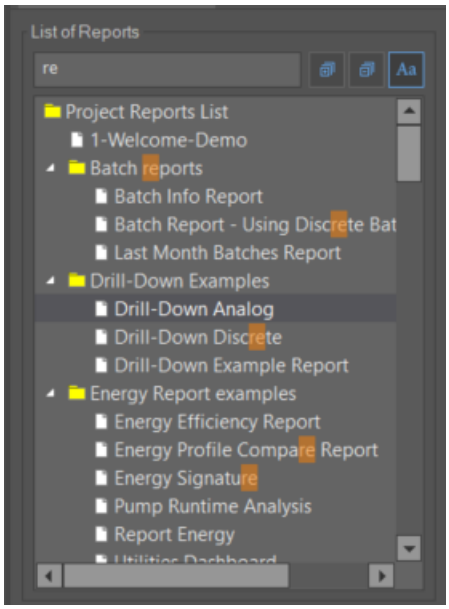


 *Collapse Tree* - the item tree and all subfolders will collapse:



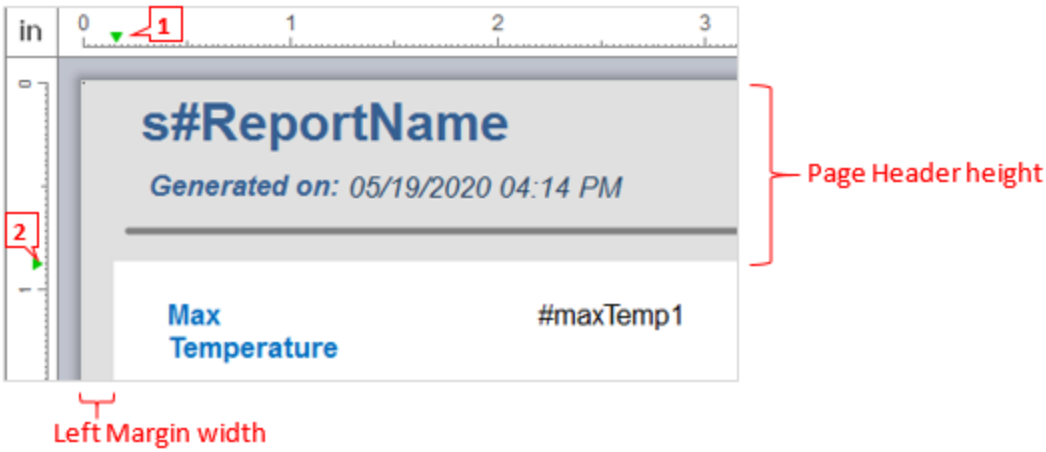
 *Match Case* - when enabled, a case-sensitive search will be performed:

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6.13 Page Headers, Footers and Margins

Using the page margin “arrows”, a user can set the height of the page header and footer, and the width of the page left and right margins. Depending on the *Designer Studio Visual Theme* chosen, the four header/footer/margin arrows will either be shown as green or dark gray arrows:

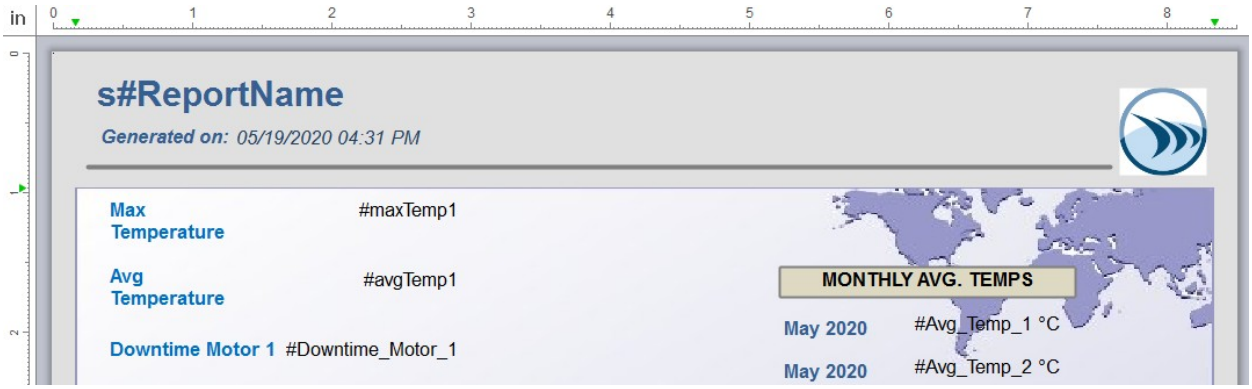


To increase (or reduce) the width of the page margins, click arrow “1”, and slide it left or right until the desired margin width is reached.

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To increase (or reduce) the height of the page header, click arrow “2”, and slide it up or down until the desired height is reached. Repeat for the page footer height. The gray area will be the header (or footer) area. No tabular data from the “main” part of the page will ever be shown in this area. For example, if a table returns many rows of data that need to span more than one page when the report is generated, the rows will be shown down to the top of the page footer, and then will continue on the next page, starting below the page header.

NOTE: If a page background 131 (color or image) is applied, it will only be shown in the “body” of the page, and not in the page header/footer or margins. FOR EXAMPLE:

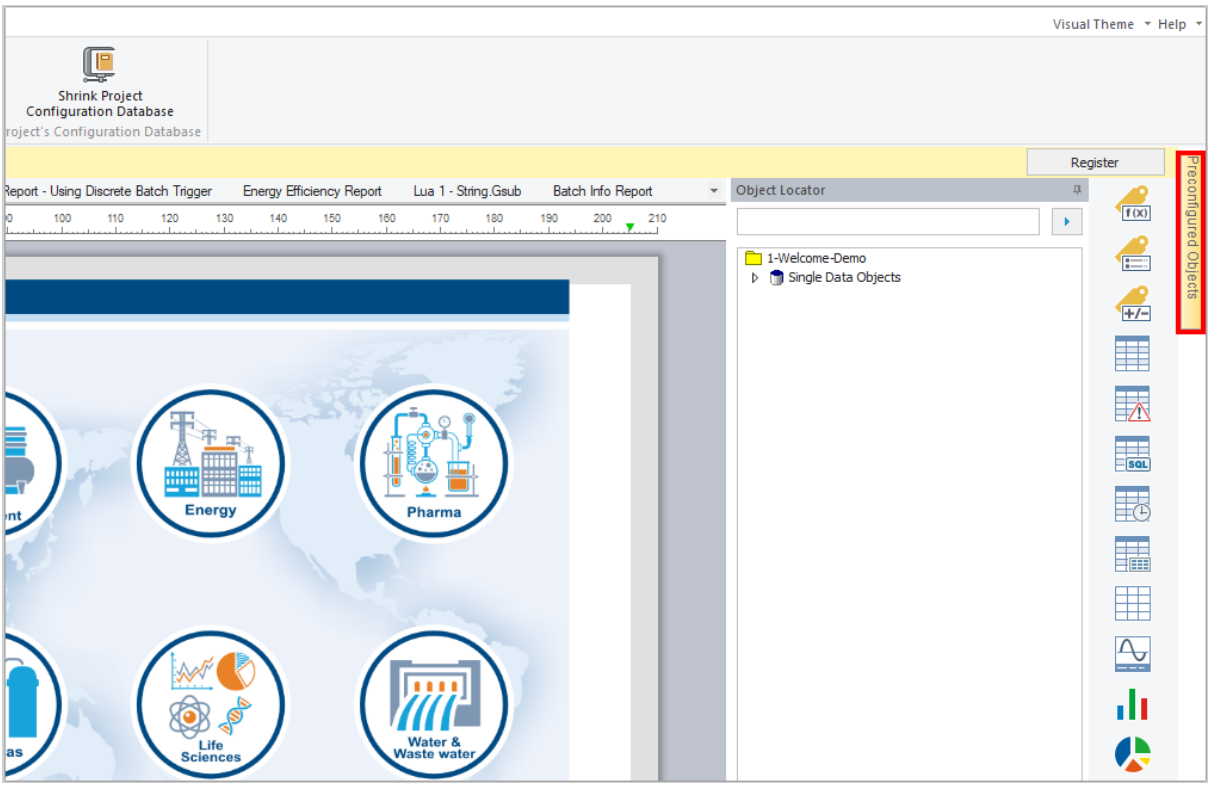


6.14 Object sample panel

In order to simplify selection and configuration of required objects, Dream Report designer studio suggests the new pane - *Object sample panel.*

On the right edge of Designer Studio, there is a new panel button *"Object sample panel"*:

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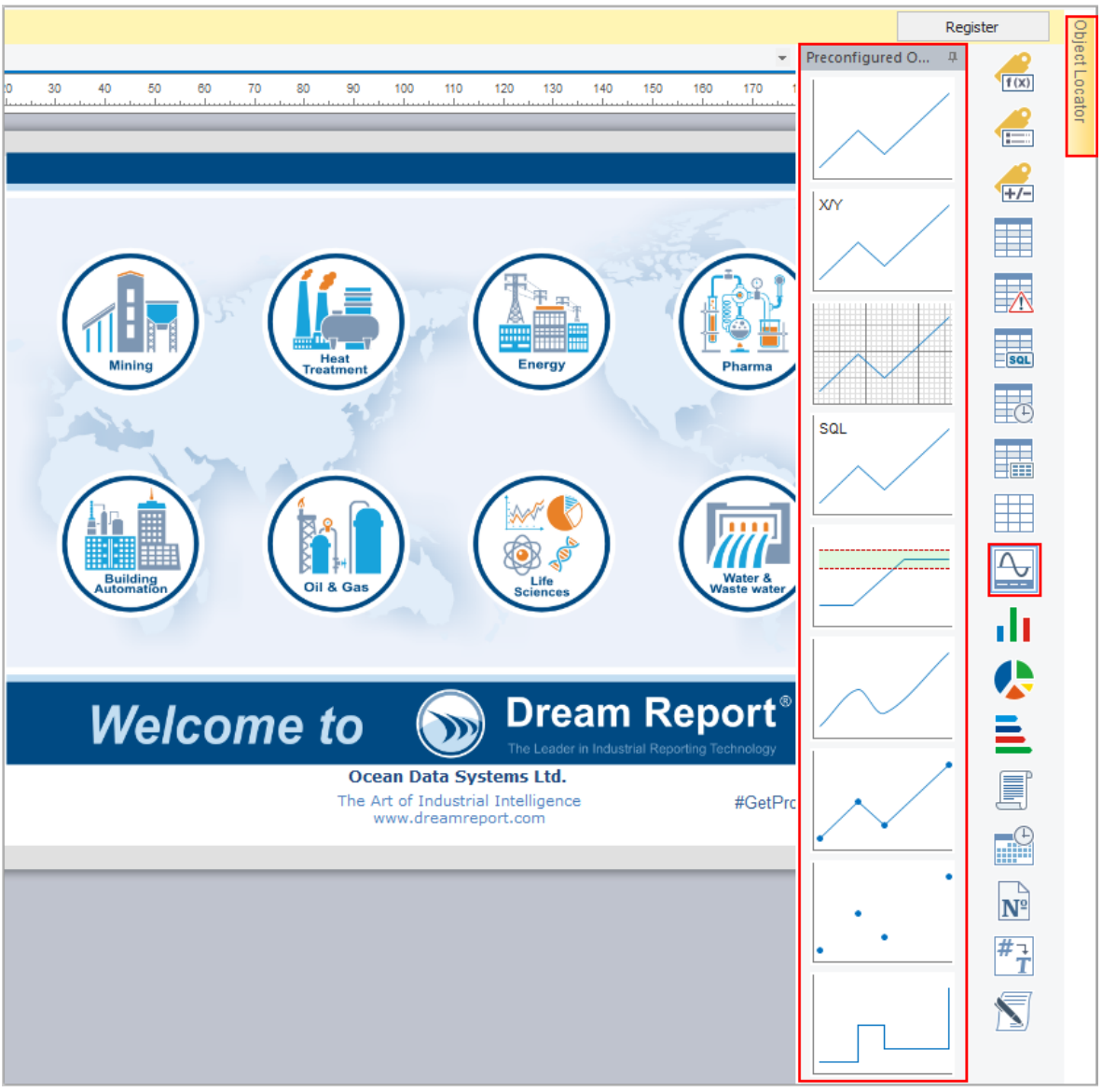


If user will open it - an empty pane will open. User can pin it to the studio frame.

Then, if user will click on specific types of graphical objects (pie graphs, bar graphs, charts, step tables and custom graphical objects), that panel will include pre-defined configurations of the selected object type.

- If user will click, e.g. on charts 420, Sample object panel will suggest different pre-defined types of charts 420:

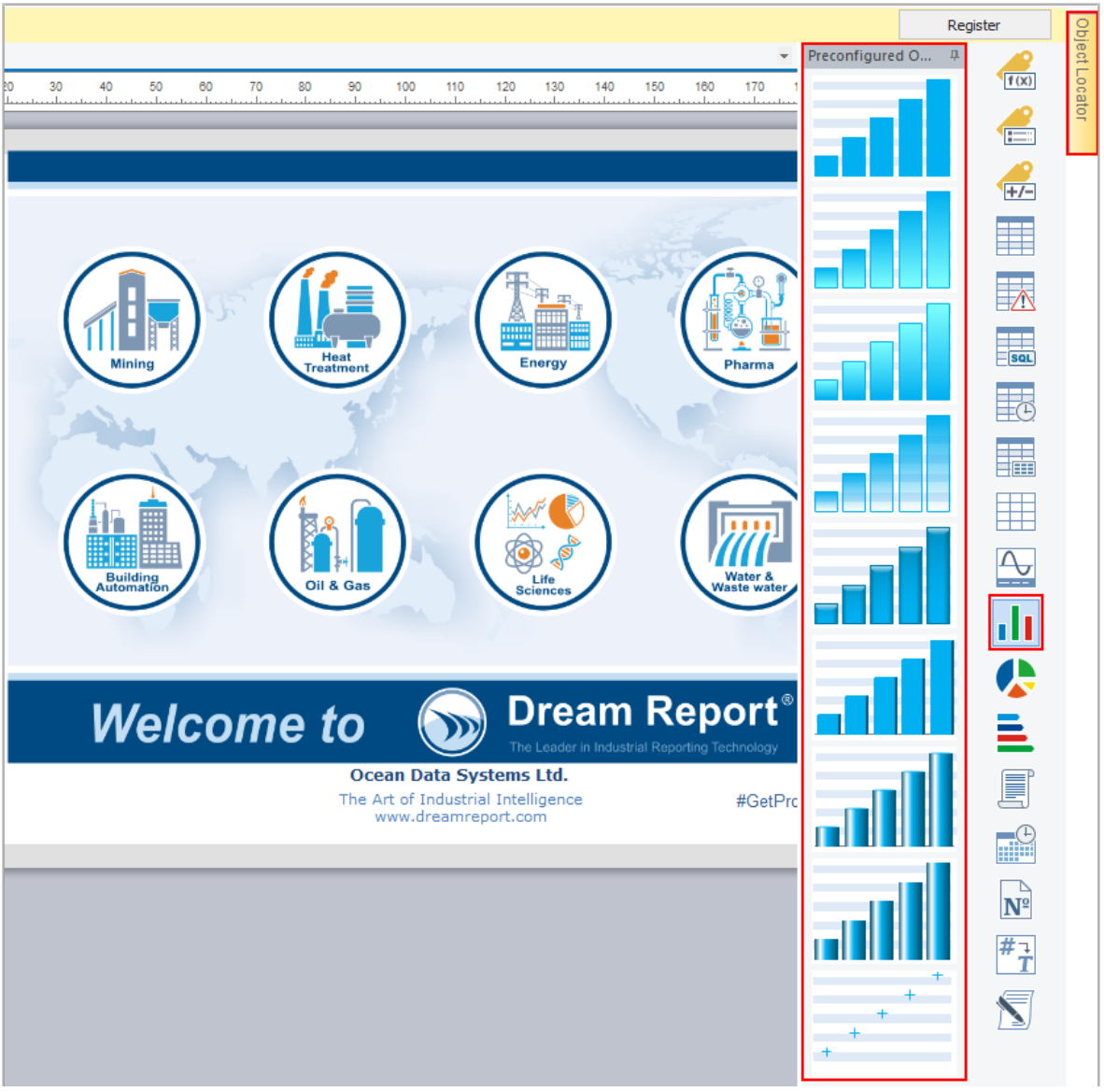
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If user would want to add specific type of chart to the report - he will need to click on specific chart type on the panel and draw a rectangle on report workspace, where that type of chart will be placed - exactly the same way, as user would do, using regular objects tool bar.

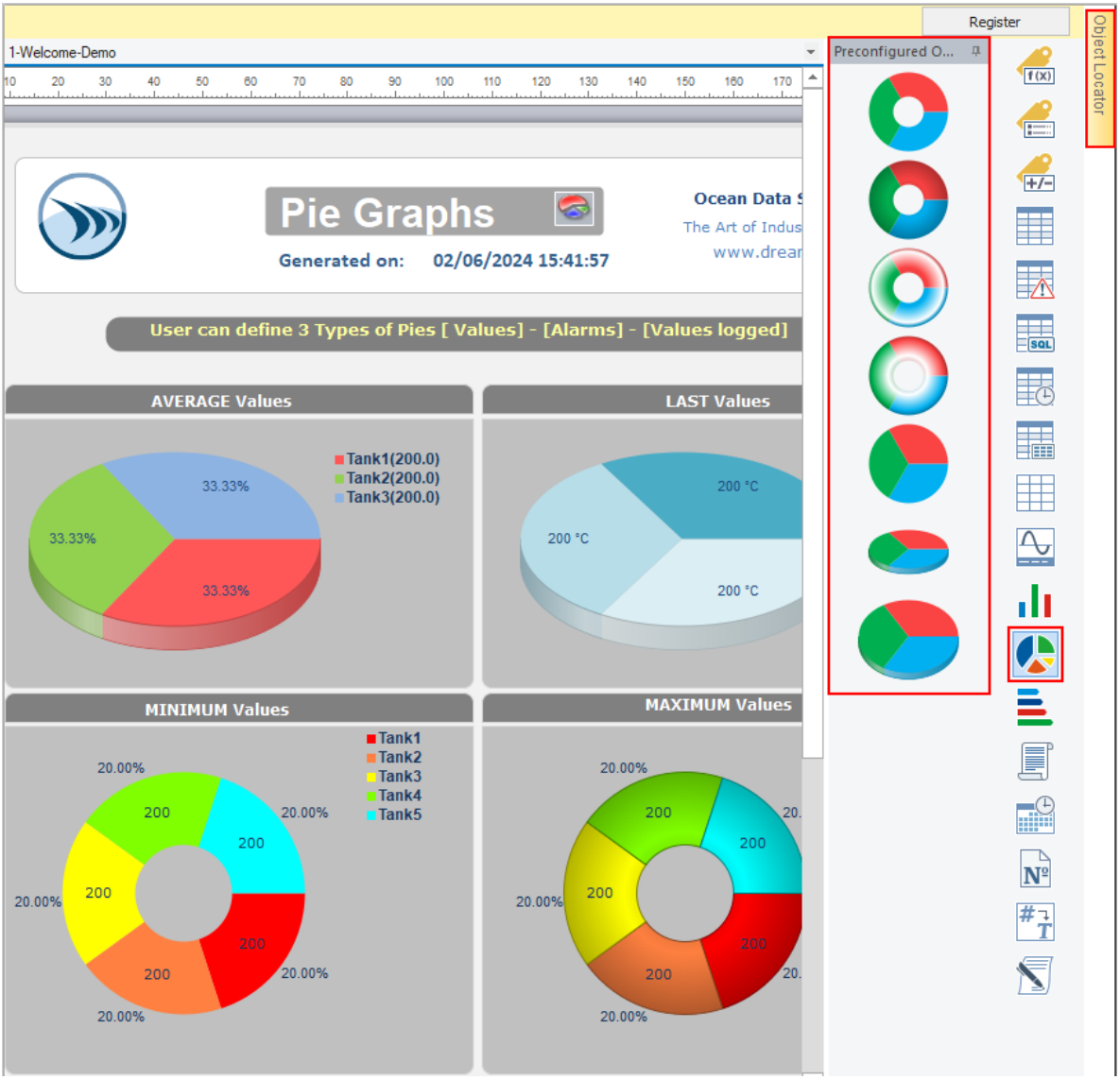
- The same way, user can view and select pre-defined types of Bar graphs 427:

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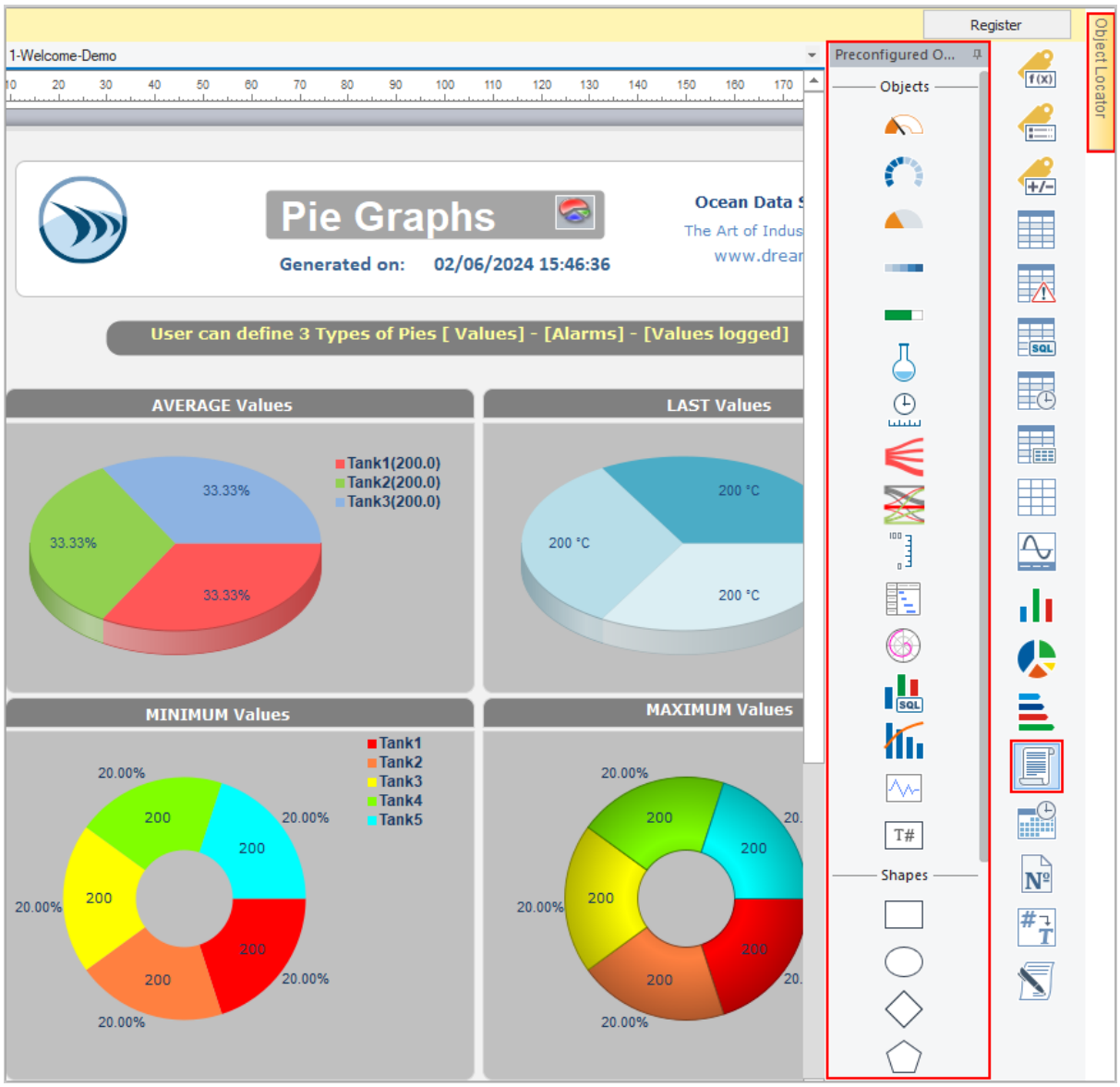
- Also, same way, user can select pre-defined types of Pie graphs 420.

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- If user will select a step table, then a sample object panel will be filled with pre-defined templates of step tables: e.g. a daily table per hour, a weekly table per day, a monthly table per day, etc.
- If user will click on a custom objects library, then Object sample panel will display all available types of custom objects:

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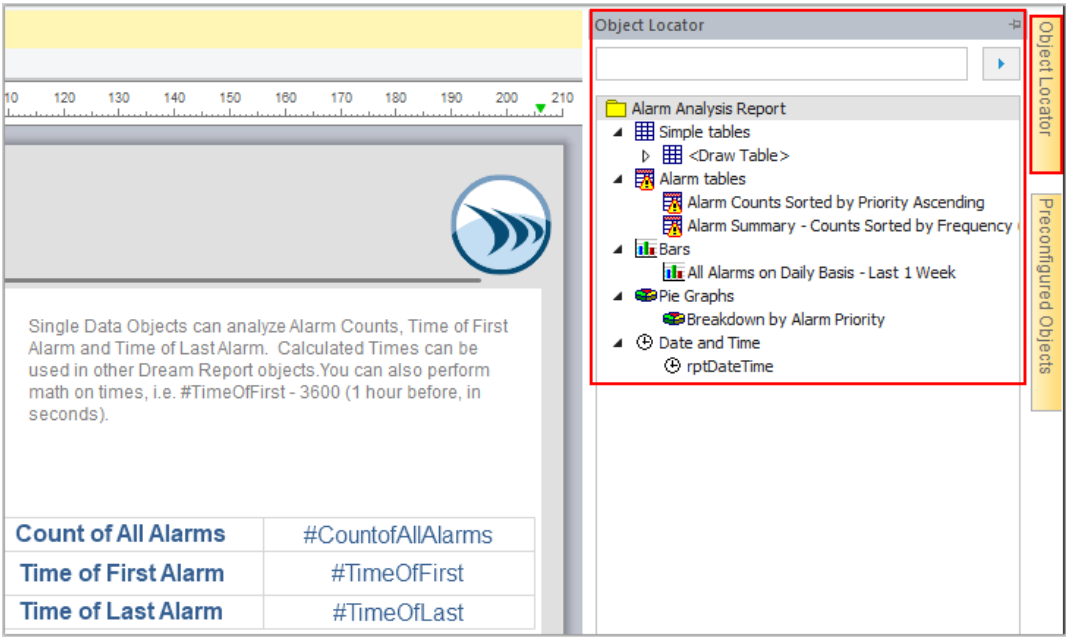


6.15 Object Locator

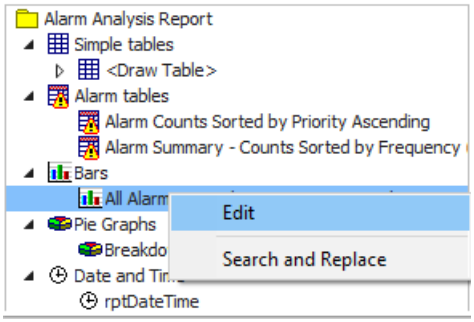
Object Locator

In Designer Studio, an *Object Locator* can be displayed on the right-side of the screen:

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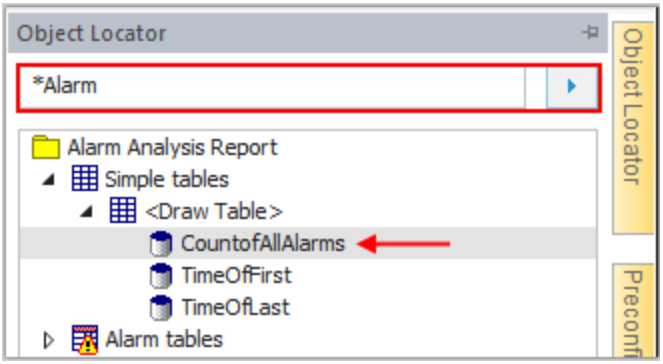
The *Object Locator* lists all dynamic objects (tables, charts, single data objects, etc.) that are contained on the selected report. This provides an organized listing of all objects, by type. If you wish to edit a reporting object, you can either double-click on the object on the report itself; or, in the *Object Locator*, select the object, and right-click and select *Edit*- that will then open the configuration of the selected object:



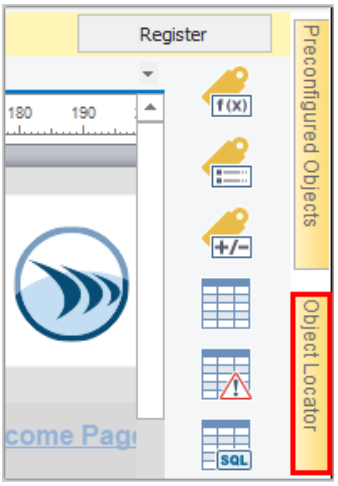
Another benefit of the *Object Locator* is that it helps you quickly select a reporting object, simply by double-clicking on the object name in the Locator – this will take you to the object on the report, and highlight it. This is especially useful in large (multi-page) or complex report with many objects.

If a report that contains many objects, or has multiple pages, you can search for objects by name, and they will be highlighted on the *Object Locator* if a match is found. Enter the string to search on (* is the wildcard) and click the arrow repeatedly to find each match in the list. If a match is found, it will be highlighted in the list:

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You can "dock" the *Object Locator* in position by clicking the "pin" icon in the top right, or by unchecking the "pin", the *Object Locator* will be hidden, which will give you more space for the report design. You can always open/expand the *Object Locator* by clicking the *Object Locator table on the right side:*



NOTE: In Dream Report version 2020 R2 and earlier, the Object Locator was shown below the left-side *List of Reports.*

6.16 Tag Dictionary

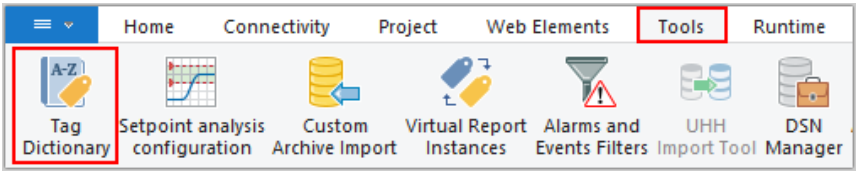
The *Tag Dictionary* module enables users to create tag dictionary for multiple reports.

With the right button of the mouse, click on the report context menu. The report list will have a new entry: Tag dictionary.

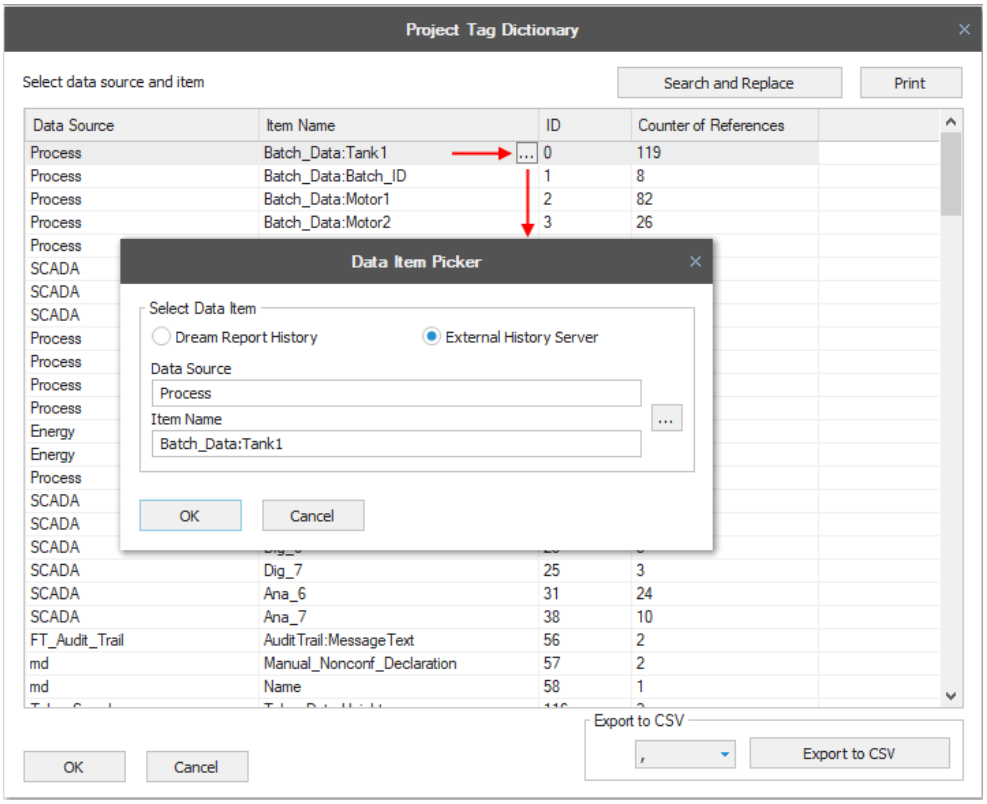
You can also click on *"Configure Tags List"* button in the "Appy report template" dialog window (see Report Templates 210 section).

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Or you can click on the command button *Tag Dictionary* on the *Tools* and *Project* ribbon icons on the horizontal toolbar in the Dream Report Designer studio menu (see pic. below):



The following *"Project Tag Dictionary"* dialog window will open:

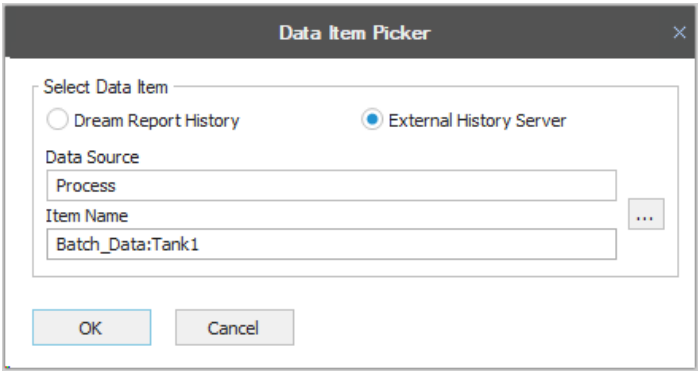


Tag Dictionary will be filled with all tags, which are used in this report in various objects. Columns *"Data Source"* and *"Item Name"* will be filled with the relevant tag information. The column *"Description"* will be empty. A user can click or double-click into the *"Description"* column, and the field will be opened for inserting or editing a text with the logical description of this tag. All the list of source/tag names and their descriptions will be saved inside the report template file together with the reference information on the objects and the names defined.

Tag Dictionary Configuration

If this dialog is opened from the existing report template, which has tag dictionary defined, it will be filled with tag descriptions from the template. "**Data Source**" and "**Item Name**" columns will contain a small button "**...**" (browse). When a user clicks on it, the following *Data Item Picker* dialog window will appear:

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If a user will click *OK* in this item selection dialog window, the source name and the item name will be set into the list control. The source type (Dream Report history or External History Server) will be saved for each entry separately as well.

If a source name or/and item name is defined in the list control and a user calls the item selection dialog window, then the *Select Data Item* window will be opened with the existing selection filled in.

If a user will double-click either into the *"Data Source"* column or into the *"Item Name"* column, the cell will be opened for manual text editing.

In the top-right corner of the tag dictionary dialog window, there is a button *"Print".* If a user will click on it, it will open Windows print dialog box.

Select printer (or the file) and print the list of Source/item names and their descriptions.

Report Tag Dictionary

If this report has been created from the report template, using tag dictionary, then it will be saved for this report as well. When a user will open *Tag dictionary* from the context menu, it will be filled with the relevant information.

If this report doesn't have tag dictionary information yet, then this window will have the list of all tags, used in the project. User can enter the best fit description for every such a tag.

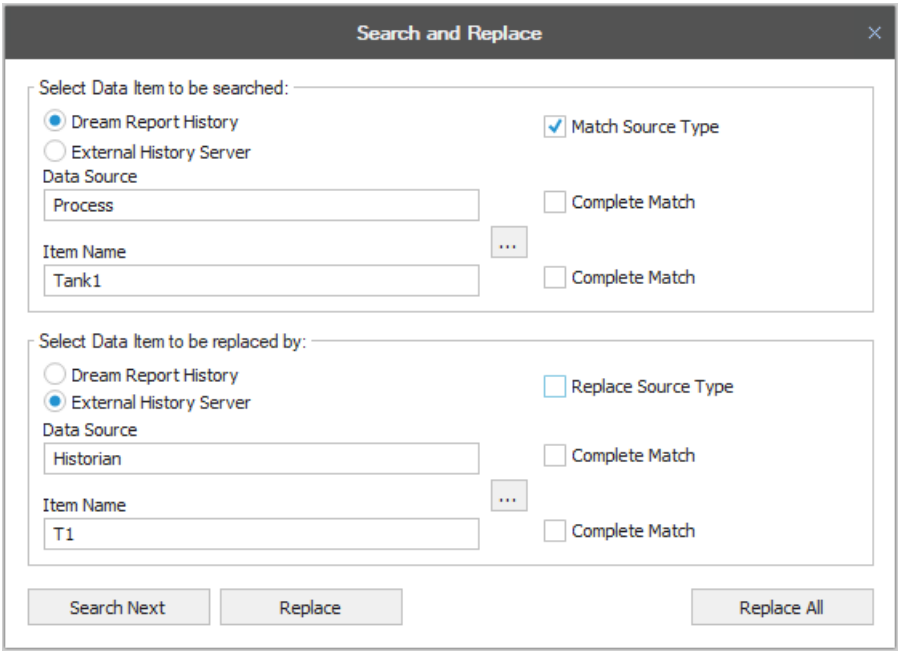
Tag dictionary will be saved into the encrypted *XML file* with the name of report and extension **.tdi.* This file will contain the list of source name; item name; description, and, for every such an entry – the list of references of objects, where this tag is used.

If you apply report template to the report and tag dictionary is not empty, then this file will be automatically created.

Search and Replace

Users can change tag items in the tag dictionary clicking *Search and Replace* button in the top right-hand part of the *Tag dictionary* window. The following *Search and Replace* box will pop up:

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To search for the specific tag item, a user will have to type that tag name in the *Item Name* box of the *Select Data Item* to be searched section. If the project tag dictionary contains a large number of tag items, and a user defines only part of the whole name, then, when he clicks on the *Search Next* button, the search and replace mechanism will find all tag items that have this part of the item name in their names.

Example: If you want to search for tag items with the name *Tank* (Tank 1, Tank 2, Tank 3 etc.), type in the *Item Name* box the word *Tank*, click *Search Next,* and all tag items that have the word *Tank* in their names will be shown.

If you need to find the specific tag with the *complete* name, please, check the corresponding *Complete Match* check box. Then, while searching for the selected item, the search and replace mechanism will show only the tag items that have this complete name.

Example: If you want to find tag items, that have the name *Tank 2*, then, if you type only the word *Tank* for the item name, and click *Search Next,* the message box *"No Data Address was found"* will pop up. You will then have to type the complete tag name *Tank 2* to be searched.

If you search for the specific tag item from the specific data source, you can type part of the name of the data source you need in the *Data Source* edit box, and, when you click *Search Next,* the search and replace mechanism will show all tag items and all the data sources where these items have been found (both external and Dream Report).

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Example: If you have tag item *Tank 1* recorded both into the Dream Report and external historian simulation drivers, then, if you type *Sim* into the *Data Source* edit box, and click *Search Next,* the search and replace mechanism will show all tag items with the name *Tank 1* in all drivers, that have the part of the name *Sim* in their driver logical name (both from Dream Report and External History).

If you need to find the specific tag item from the specific data source, check the *Matching Source Type* check box. Then, while searching for the selected item from the selected database, the search and replace mechanism will show only the data sources that have the same complete data source name as defined in the *Data Source* edit box.

Example: If you want to find tag items, that have the name *Tank 2,* and are recorded into the Dream Report simulation driver for real-time values (and this driver has *Simulation 1* as its driver logical name), then, if you type only part of the name *Sim* in the *Data Source* edit box and check *Matching Source Type* check box, then, when you click *Search Next*, the message box *"No Data Address was found"* will pop up. You will then have to type the complete driver name *Simulation 1* to be searched.

The same mechanism should be applied when a user needs to replace tag items in the Project Tag Dictionary (*Select Data Item to be replaced by* section).

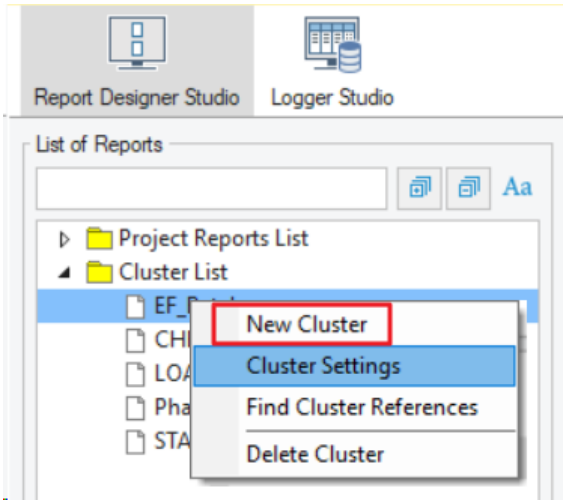
6.17 Clusters

The Cluster is a container which can host a set of reporting objects to represent information related to a certain batch level (entire batch, procedure, operation, phase, etc.).

6.17.1 Create New Cluster

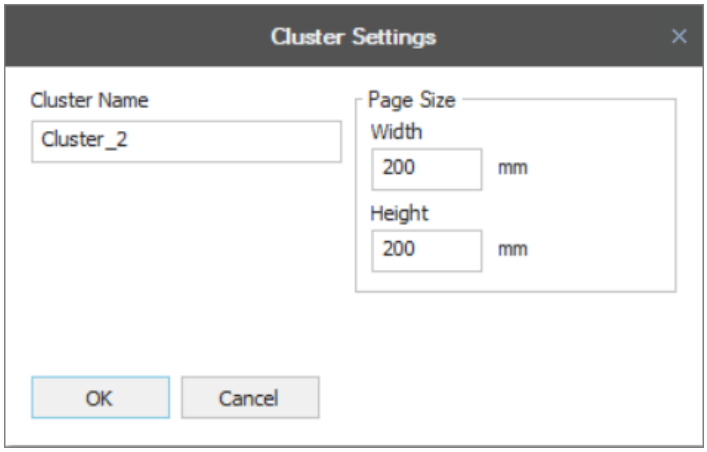
Create, Edit, and Delete Clusters

To create a new cluster, right-click on the cluster tree in the Dream Report Designer Studio and select New Cluster from the context menu.

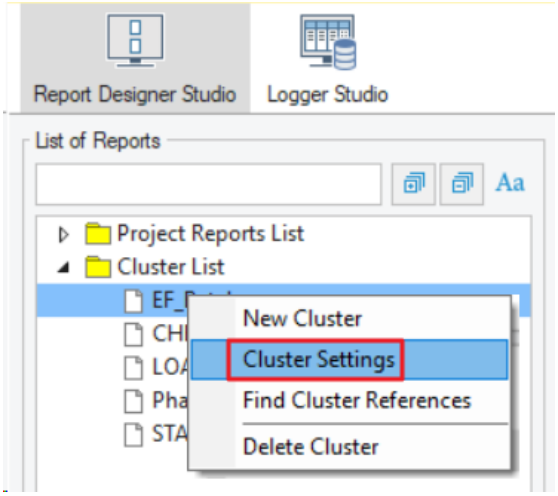


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The *Cluster Settings* dialog window will open. You can specify a name for the cluster and define its dimensions in millimeters. Click OK to save the settings.



For an existing cluster, you can edit its settings or delete it – right-click on the cluster name and select the corresponding option from the context menu.

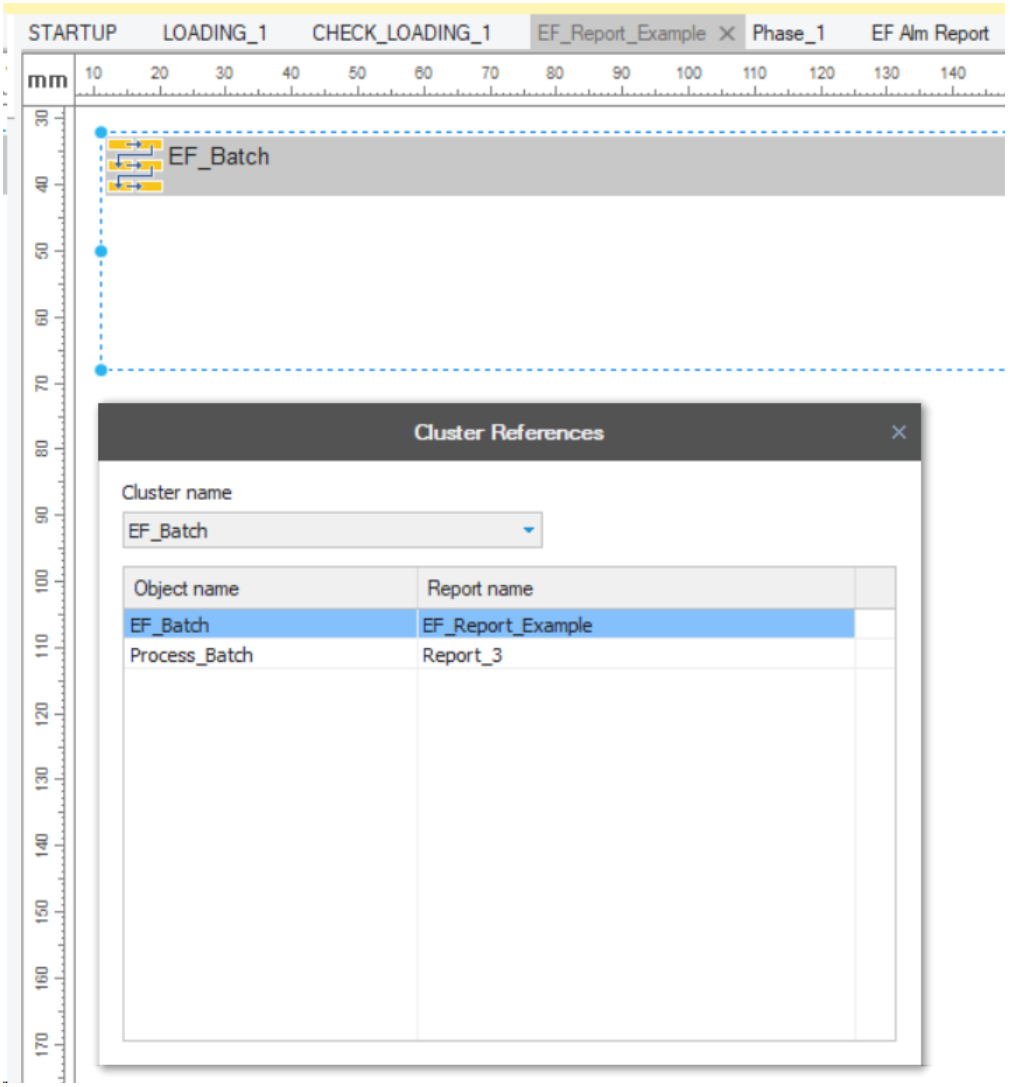


Once a new cluster is created, you can place reporting objects on it and design its layout, and then, map it to one or more batch/phase. Refer to the *Batch Object* section for more information.

When configuring objects inside a cluster, the time definition parameters are not important. You can use any time period or keep the default one. At runtime, all time definitions will be replaced with timestamps/intervals of the batch/phase to which the cluster is assigned.

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By selecting the *Find Cluster References* user will be able to get the reference list of the reports where cluster is used and then by double click on the report in the Cluster Preference dialog user will be redirected to Batch object inside the selected report:



Cluster Dynamic Tokens

In addition to dynamic tokens described in Common Configuration Features/List of Dynamic Tokens section, in clusters, the following tokens can be used.

[ctx#$BatchClusterName$]	Cluster name
[ctx#$BatchInstPath$]	Batch/phase hierarchical name

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[ctx#$BatchPhaseInstName$]	Batch/phase name
[ctx#$BatchStartTime$]	Batch/phase start time
[ctx#$BatchEndTime$]	Batch/phase end time
[ctx#$BatchPhaseDefName$]	Batch/phase definition name
[ctx#$BatchDefPath$]	Batch/phase hierarchical name in its batch definition

If user would be willing to get the context for one of the batch properties, then it has to be defined as part of the cluster in expression object as [ctx#<PropertyName>]

EXAMPLE: Assuming the property name is "*Recipe*" then the expression object in the cluster has to be defined as **[ctx#Recipe]**

Refer to the Simple Statistic Objects/Expression Data Object 312 for more information on using dynamic tokens.

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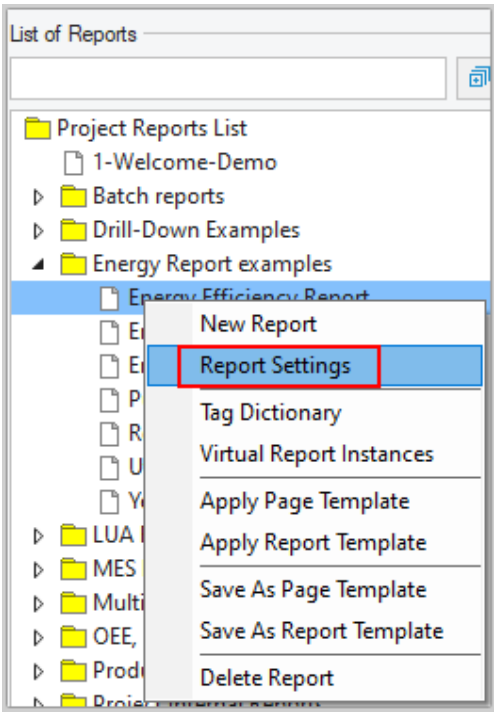
Report Settings

7 Report Settings

7.1 General

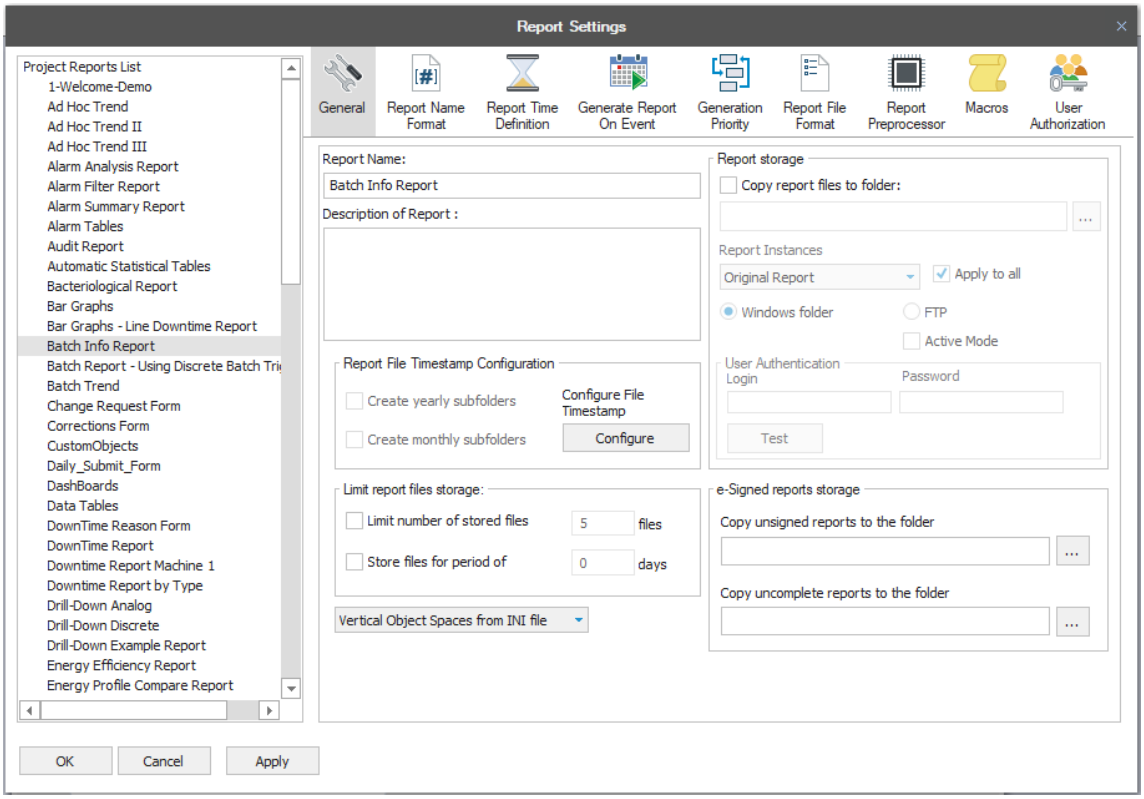
Report Settings

The *Report Settings* window allows the user to configure output settings, report generation schedules/triggers, user access, and general settings relating to the report.



To configure report settings, right-click on the report tree in the Report Designer Studio and select *Report Settings* from the context menu or, simply double-click on the report name – the *Report Settings* window will open:

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The left tree contains a list of reports defined in the project. Panels on the right display settings for the selected report in the tree. If the report selection is changed on the left-side report list, the panel will be updated with data from the selected report.

The configuration of all reports in the project can be changed in one window without closing and reopening it again. Clicking on another report in the tree in the left part of the dialog window will automatically update a dialog window with settings of the selected report.

The *Report Name* can be any unique logical name. Only alphanumeric characters and spaces should be used, otherwise unexpected problems can be expected. The maximum length of a report name is 64 characters.

The Description of Report text box can include a short description for the report. The description can be up to 256 characters. This description will be displayed next to the report name in the Web Portal.

The *Report storage* section allows you to organize and manage report output files. This option enables a secondary storage location for the report files – either to a Windows directory, or to an FTP Server.

The *Copy report files to report folder* option enables a user to automatically copy generated report files (of this report) to a secondary location (Windows or FTP). Select the *Windows folder* option to specify a path – the folder path can be absolute or relative to the report path (defined in the *Project Settings* path definition), or any folder on a local, network or mapped drive. This option is defined separately for each report.

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Uncheck the "*Apply to all*" option to specify the report instances (if being used) and copy them to a different folder.

If the *FTP* option is checked, the "*Active Mode*" option can be selected if the FTP Server requires FTP "Active mode" to be used.

NOTE: If the "Web" report format is enabled, then all (PDF and Excel) report files will be copied to an alternative directory, defined in this section of the report settings. PDF files will also be copied to the main report files folder, defined in the Project Settings, and will be used for the web portal.

FTP Upload for Generated Reports

The **Report storage** section also allows to configure uploading generated reports in *PDF*, *Excel, CSV* and *XML* format to a pre-defined FTP server.

If the "*FTP Server*" option is enabled, Dream Report will upload all reports files generated by that report template, to the specified FTP server.

By clicking the "*Test*" button, the user will be able to test connection to the selected Windows folder or FTP server.

"*Limit report files storage*" section (described below) will perform its function of limiting archived report files by time period or by number of files, both for the Windows folder and for FTP server.

Report File Timestamp Configuration

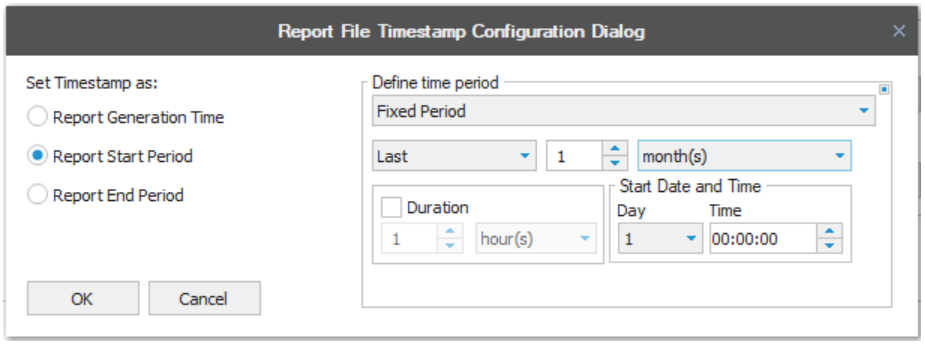
The option *Create yearly subfolders* will automatically create a subfolder for the current calendar year in the format YYYY (e.g., "2020"). The folder will be created in the report directory specified above in the *Copy report files to report folder* section. This option is defined separately for each report.

The option *Create monthly subfolders* will automatically create a subfolder for the current calendar month (e.g., "October"). The folder will be created in the report directory specified above in the *Copy report files to report folder* section. This option is defined separately for each report.

NOTE: Monthly/yearly subfolders will be created in the report directory only as soon as the first report will be generated and stored in the Reports folder. This means that if you have enabled any of these two options, but have not generated any report yet, there will be no subfolder created in the report directory.

The *Configure File Timestamp* button opens a configuration window where the use has the ability to set the report file timestamp to be the "*Report Generation Time*" (default); "*Report Start Time*"; or "*Report End Time*":

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This setting is useful when you want to control what timestamp is used for the report file. For example, if you have a Monthly report that is scheduled to generate on the first of every month, you probably want that report timestamped with the name of the previous month – e.g., today is June 1st, where we generate the May monthly report. As shown in the image above, you would *Set Timestamp as:* the *Report Start Period*, and then *Define time period* as the Last 1 month(s).

The *Limit report files storage* section allows you to control the number of report files saved by Dream Report. This option will be applied to PDF, Excel, CSV and XML report file formats.

Limit number of stored files defines how many files of this report should be stored in the report files directory. If this option is enabled, then each time a new report is generated, Dream Report will check the number of existing report files. If this limit is exceeded, the oldest file(s) will be deleted.

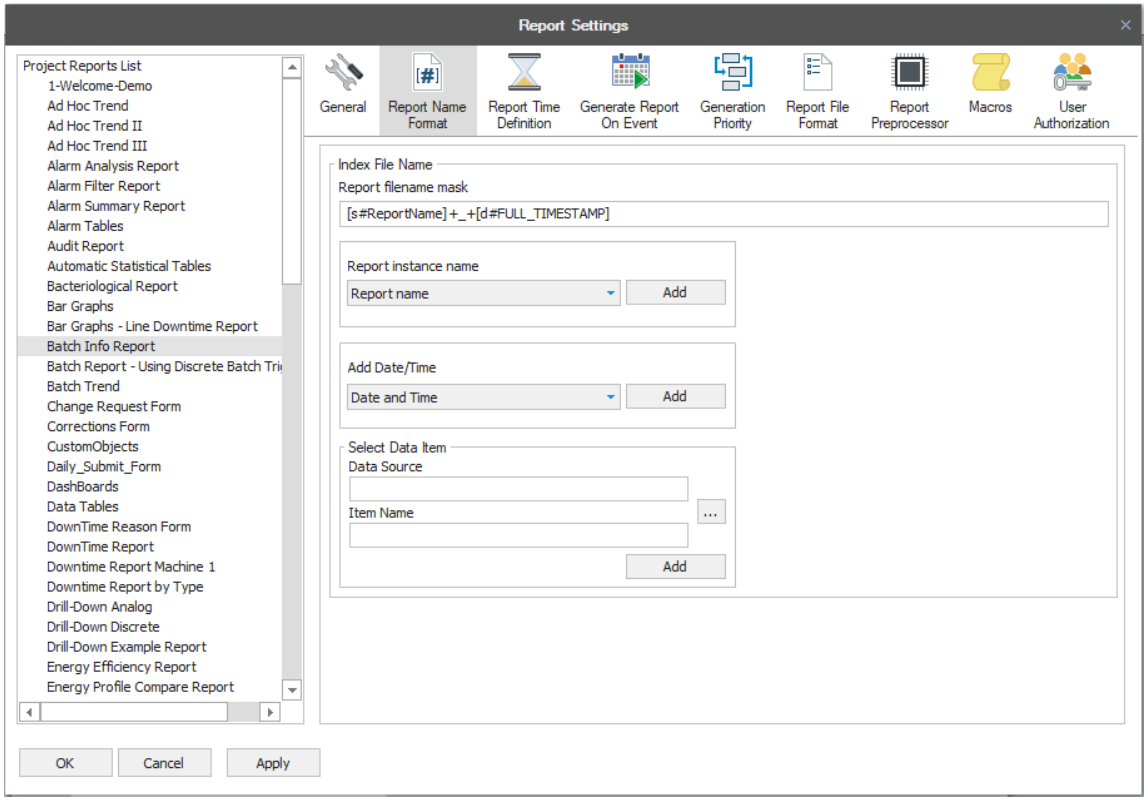
Store files for period of specifies the period (duration back) that files of this report should be kept in the report directory. If this option is enabled, then each time a new report is generated, Dream Report will check the creation date of existing report files and will delete any report created before the defined period.

7.2 Report Name Format

The *Report Name Format* dialog box defines how file names for an output file are generated.

The report file naming rule will be applied both to PDF and Excel report files.

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The *Report filename mask* can be any combination of 4 types of components.

All components defined in a filename mask should be separated by "+".

The maximum number of characters for filename mask is 256 characters.

The available file name component types are:

- *Static text*. You can enter any text strings in any part of a mask. Each string should be included in "" (e.g. "text"+"my report name")
- *Report/Instance Name*. In this section a user has two options: *"Report name"* and *"Instance name"*. If the *"Report name"* menu is selected, then, the following string will be added to the filename mask: *[s#ReportName]* and, during report generation, it will be replaced by report name. In the *"Instance name"* menu the following string will be added to the filename mask: *[s#InstanceName]* and, during report generation, it will be replaced by the report instance name for which this report file was generated.

If the file was generated for the generic report template, the string *"Default"* will be used.

Click *Add* and the component will be added in an appropriate format and the *"+"* separator will be added automatically.

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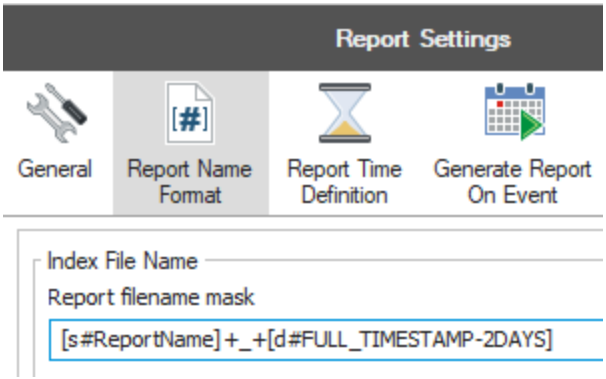
- *Date/time of file generation in various formats*. Select any format of date/time from the "Add Date/Time" combo box and click on the button "Add". .The current value of any tag during report generation can be added as Select Data Item Add the "+" separator will be added automatically. During report generation this component will be replaced by the current value of the selected item.

- The *current value of any tag during report generation* can be added as well. Select the data source and tag in the section "Select Data Item" and click on the "Add" button. The appropriate component will be added to the mask. The "+" separator will be added automatically. During report generation this component will be replaced by the current value of the selected item

You can mix any number of any components in your report filename mask as long as the mask length does not exceed 256 characters. When the length of a filename mask reaches 256 characters, the edit box will automatically stop accepting additional characters.

NOTE: If a user wants to add the date to the report name, using not the timestamp of the report generation, but applying some offset (i.e. some days back), then the additional tokens: *–XDAYS* or *+XDAYS* can be used (please, see the sample below), where:

- *"-" or "+"* is an operator (whether the number of days offset should be added or deducted from the report generation date)
- *X* is the number of days to add or deduct from the report generation date
- *DAYS* is the conventional token word, which will be recognized by the report name mask parser.



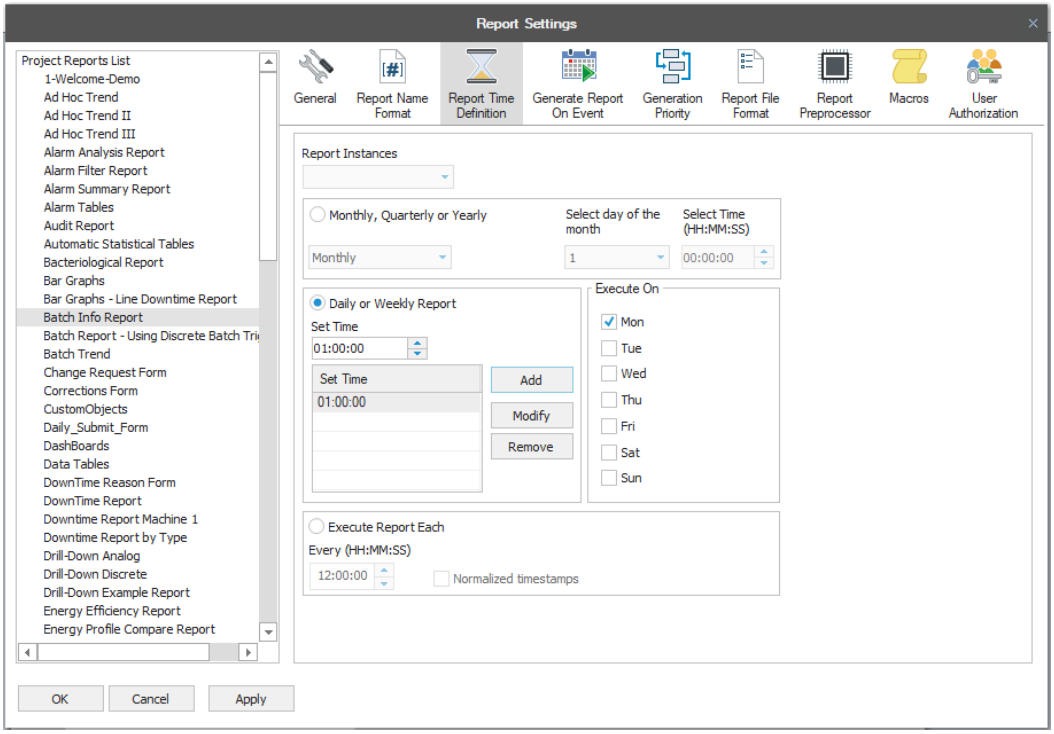
On the picture above the example shows how the additional tokens: *–XDAYS* or *+XDAYS* can be used.

NOTE: *Please, always check that these tokens should be added to the timestamp format inside the brackets as shown in this example.*

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7.3 Generation Time Definition

The *Report Time Definition* dialog box allows a user to define an automatic report generation schedule.



The *Report Instances* combo box contains the list of all available virtual instances for this report. It will enable a user to apply and save different generation schedules to different report instances.

You can only enable this box if report instances for this project have already been created. Otherwise this box will be disabled.

For more details on how to create virtual report instances, please, see *Virtual Report Instances* section.

If a user selects the *Report Instances* option, which is set as an original report template, then, the specified time schedule will be applied only to original report template and will not be applied to any of the report instances.

If a user selects any of the report instances created, then *"Use Schedule"* and *"Apply to All"* boxes will appear.

If *Apply to All* option is selected, then, the specified schedule will be applied to all instances of this report in the project.

To configure the schedule, enable the *"Use Schedule"* box.

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If there is time schedule, defined for *"Apply to All"*, and there is another time schedule, defined for any other template, then that template will be generated twice: at its own schedule and for *"Apply to All"* schedule.

All time schedules for every template will be saved inside the report settings structure of that selected report.

If the report generation schedule is defined and a new instance is added, then it will have no generation schedule by default.

There are 2 options available to configure automatic report generation: *generation on schedule* or *cyclic generation.*

Generation on Schedule

The *Monthly or Yearly Report* option enables users to define a specific time and day of the month or day of the year, when the selected report will be automatically generated.

The left combo box contains two entries: *Monthly* and *Yearly.* Please, select which type of schedule you would like to use.

If *Monthly* option will be selected, then the combo box on the right will be filled with the possible days of the month (1-31). Select which date of every month that selected report will be automatically generated. To the right of date selection, specify the time at which the report will be generated.

NOTE: In Monthly option user has two additional parameters: *"Every Day"* and *"Last Day"* of the Month.

If *Yearly* option will be selected, then the combo box on the right will display a calendar to select a day of the year for the given report to be generated. Though the calendar will contain the current year, report generation will not be limited to the selected year. Every year the report will be generated at your selected date. To the right of date selection, specify a time at which the report will be generated.

The *Daily or Weekly Report* option enables a user to define a very flexible schedule of report generation one or more times during one specific day or several days of the week.

For this, create a list of schedule records, defining when each report will be generated. The schedule record includes the time *(hh:mm:ss)* and the days of the week. Each scheduler record may contain its own set of days of the week. The report will be generated every day at each defined time, which is enabled in the schedule.

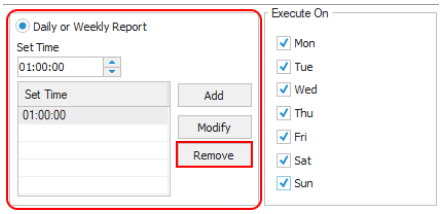
To add a record, enter the desired time in the *Set Time* edit box in the format *hh:mm:ss*, select the desired days of the week and click the *Add* button. The new scheduler record will be added to the scheduler list.

To delete a scheduler record, select a record to be deleted and click the *Remove* button. The selected record will be deleted.

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To modify an existing scheduler record, select the record to be modified - the day of the week. The *Set Time* edit box will display the current definition of that scheduler record. Enter the new time in the *Set Time* edit box and selected desired days of the week in the *Execute On* (group of days of the week) check boxes. After editing scheduler record settings is finished, click the *Modify* button. The selected record will be modified with the new settings.

TIP: If user wants to disable report generation on schedule, he can remove the *Daily/Weekly* settings by clicking on the *Remove* button (please see the picture below):



Cyclic Report Generation

If the *Execute Report Each* option will be selected, then, reports will be generated automatically in a periodical cycle using the period defined in the combo box. The period is entered in the format *hh:mm:ss* .

When defining cyclic generation, it's also influenced by the days of the week. You can define on which days reports will be created.

You can enter any period from 00:00:01 up to 23:59:59.

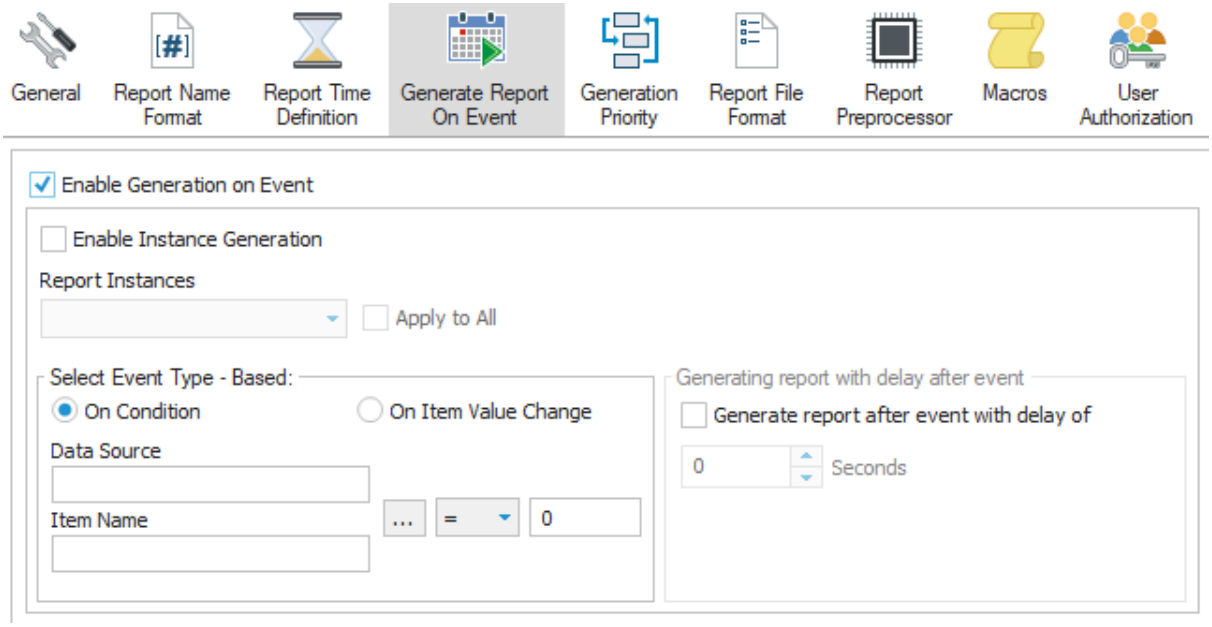
! We recommend not scheduling reports more frequently than every 10 minutes.

NOTE**:** A report cannot be set to have both generation options. A report can be configured to be generated only according to a schedule or in the periodical cycle.

7.4 Generate Report on Event

The *Generate Report on Event* dialog box configures an event-based report generation.

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The "*Enable Generation On Event"* check box enables/disables event-based report generation.

If a user enables *"Instance Generation"* check box, he can configure report generation, and, define different generation rules on event for different report instances.

This box can be enabled only if report instances for this project have already been created. Otherwise this box will be disabled.

For more details on how to create virtual report instances, please, see Virtual Report Instances section.

When the *"Instance Generation"* check box is enabled, select data source, data item, event condition and enter a condition value.

The *Select data source* combo box will be filled with a list of all available sources. After selecting a data source, the combo box *Select Data Item* will be filled with a list of all available items from the selected data source.

The *Condition value* can be any float number in the range from *-65535.00* to *65535.00*.

The symbol "**.**" must be used as the decimal separator.

If the *"Enable Generation on Event"* option is checked and no condition value is specified, or the data source or data item is not specified, the user will get an error message and the report definition will not be complete.

If *On Item Value Change* option was selected, then the window will change configuration controls.

If this option is selected, then every time, when selected data item will change its value, report will be generated. String type data items are supported by that option as well.

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User has also a possibility to set a delay to generate report after event has occurred.

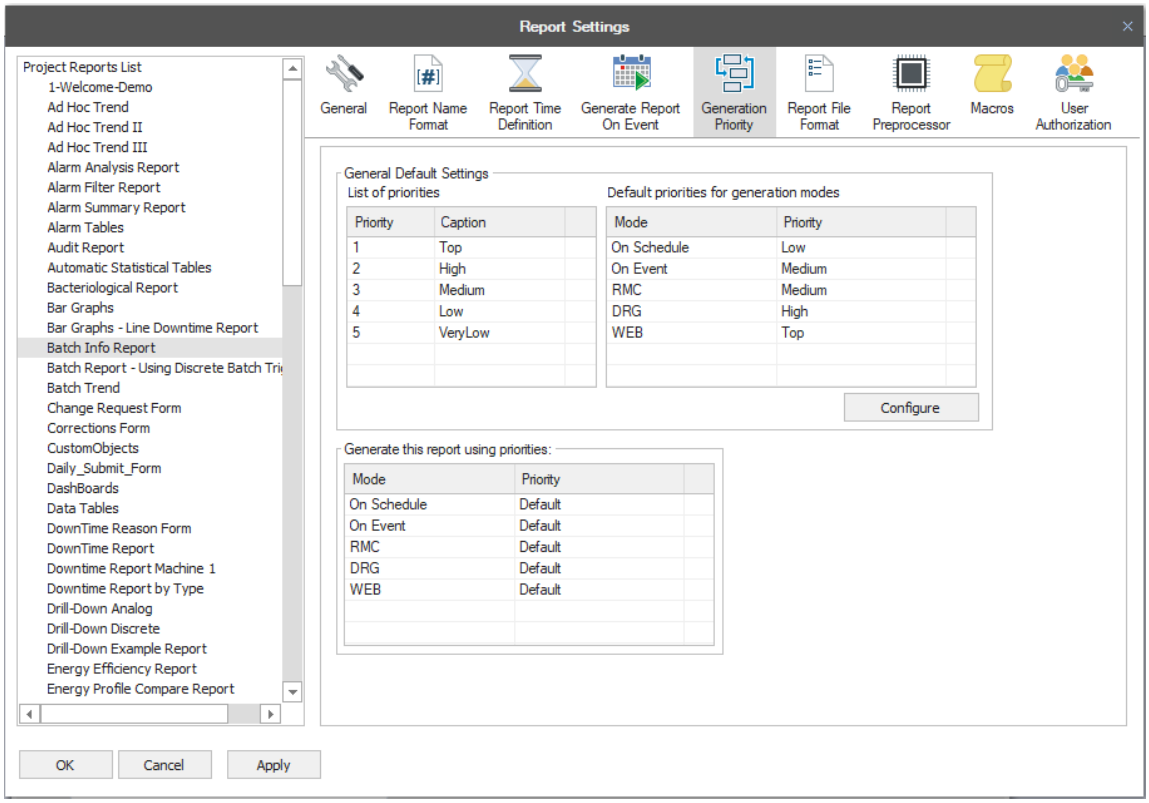
If a user checks the *"Generate report with delay after event"* check box, then, he must set a valid number (from 0 to 86400) of seconds, which runtime will sleep after report generation event has taken place. After the specified period of seconds, the report will be generated.

7.5 Generation Priority

This functionality gives Dream Report the capability to manage priorities when generating reports in different modes and when generating different reports in the same mode.

The user Interface:

In the *"Report Settings"* window in DR studio, the new tab "*Generation Priority"* added:



This dialog window has 2 main sections: *General default settings* and settings for the *current report.*

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The top left list “List of priorities” defines captions for available priorities. Dream Report enables 5 levels of priorities. Each level of priority has a default text caption. User can’t change the numeric ID of priority level, but he can set his own captions to his own terminology. Each priority has the numeric ID and all internal operations are implemented using an ID only, so text caption has meaning in UI configuration only.

The top right list defines default priorities for different modes of generation.

The bottom list defines priorities for that specific report. By default, all reports will have “Default” in each entry. If user will select any non-default entry for a mode – that selection will override the setting for that specific mode for that report.

Implementation:

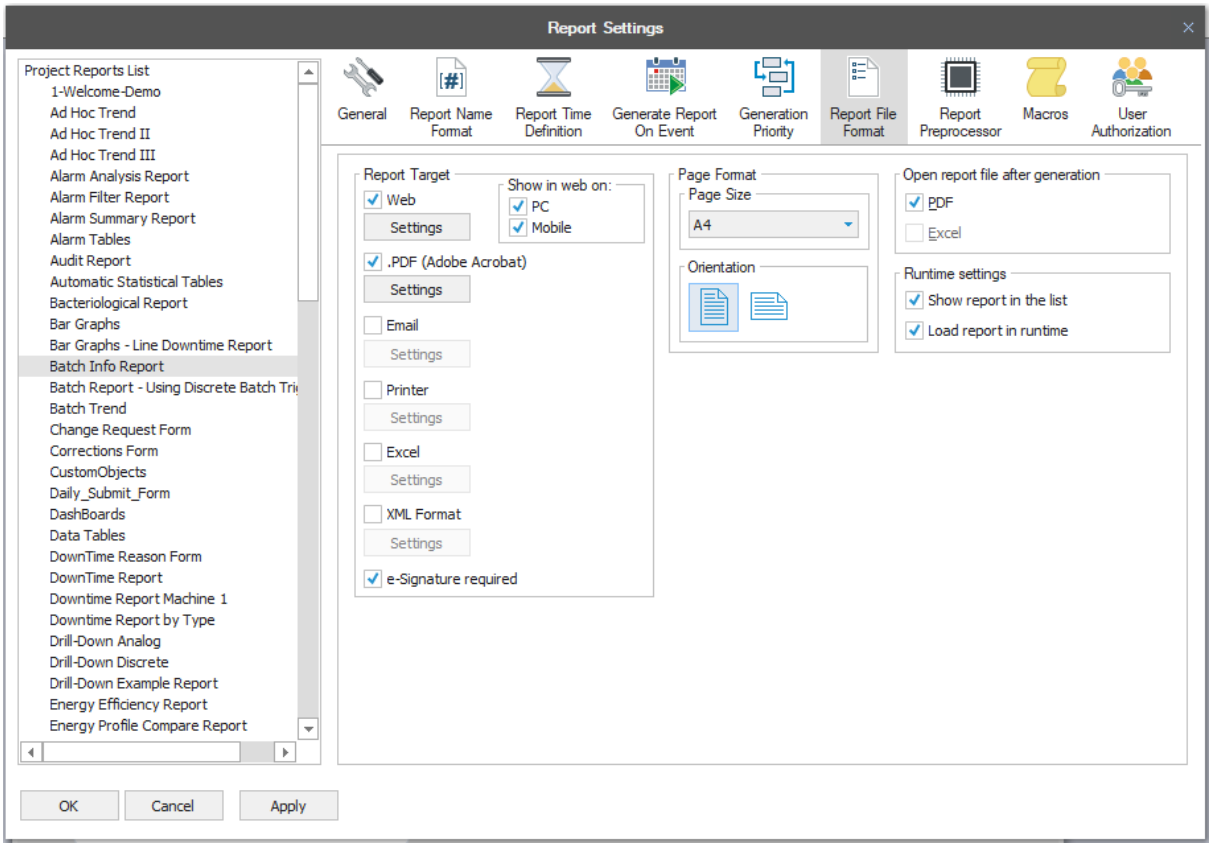
This mechanism of priorities only manages the queue of reports. Any report, which generation is currently in progress, will be completed and its generation will not be paused if a new report with higher priority has been inserted into the generation queue.

When a new report is about to be added to the queue – until this version - it’s always added to the end of the queue. With this new functionality, the report will be added to the place, which corresponds to its priority. If one or multiple reports with that priority already exist and are waiting for the execution in the queue – the new report will be added to the end of the group with its priority.

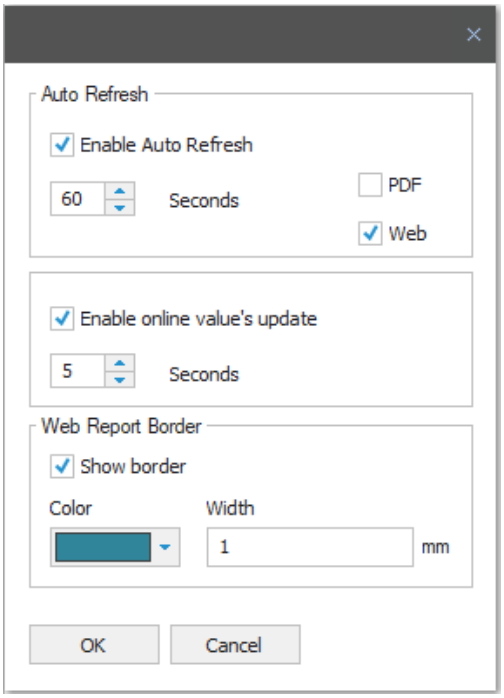
7.6 Report Output Format

This window enables users to configure report output settings - i.e., what format(s) the report will be generated in, page size and orientation, and how and to whom it will be distributed.

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Web Format



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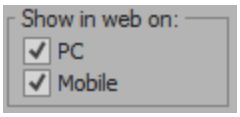
If *Web* report target format is enabled (output as an HTML5 page on the web portal), then the user can optionally click the *Settings* button to configure how this report will be displayed and auto-refreshed in the web portal:

Auto Refresh option enables user to set the auto-refresh rate for the report (auto-generation interval) when it's open in the web portal. The user can also select which report formats will be affected by auto-refresh. For example, a user can set auto-refresh for web reports and can switch it off when that report is displayed in PDF format. If auto-refresh is set to -1, it means that auto-refresh is disabled.

The *Enable Online Value's Update* option allows real-time values (using the *Current Value* statistical function from a real-time data source, in a Single Data Object) and those objects can dynamically update their values in real-time with the defined resolution. Note that only numeric values will be updated – no additional formatting or Advanced Visualization Conditions (if configured on the object) will be applied.
Check this option to enable real-time values update and set the value update rate (resolution). By default, real-time values update is disabled, and if enabled, then the default update rate is 1 second. User can change it with the Seconds setting (minimum update rate is 1 second).

Web Report Border option enables border frame in the Web Report. This option, once enabled, will identify the visibility of the web report frame/border once report is presented in the web portal and when it is multi-page report.

Display Options for Mobile Devices



The *Show in web on* setting allows a report to be shown or hidden on the web portal, depending if the portal is accessed from a desktop ("PC") browser or mobile browser.

You might design and lay out a report specifically for access on the mobile portal, that you don't want visible as a selection on a desktop browser, and vice versa.

PDF Format

If the *PDF (Adobe Acrobat)* option is checked, then the report will be generated in a file in PDF format, which can be opened and viewed with Adobe Acrobat Reader or any other PDF reader software. We recommend using Adobe Acrobat Reader version 11 or higher for the best performance. Report file names will be set based on the **Report Name Format** section.

The *Settings* button just below the *PDF* check box opens the Advanced PDF Security settings window. Click Advanced PDF security for more details about this functionality.

When the *PDF* option is checked, the Email check box will be enabled and can be checked as well. This option enables users to send each generated report file (PDF) to a list of predefined email recipients.

Email

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When the *Email* option is checked, click on the *Settings* button to configure the list of email recipients. Configuration of email manager is described in the Email Configuration section.

Printer

If the generated report has to be printed, enable the *Printer* option. To select one or more printers, click the *Settings* button. Printer configuration is described in details in the Printer section.

Excel

If you need to export data to Excel, enable the *Excel* option and click the *Settings* button. The the *MS Excel report layout wizard*. In this wizard you can configure the report layout, i.e. what data will be exported to Excel and where. Configuration of exporting report content to Excel or CSV format is described in Excel section.

XML Format

If report is needed to be generated in XML format – check the *XML Format* option. To configure which data and in which format will be exported into an XML report file, please click on the *Settings* button and configure XML export. Configuration of XML reports is described XML format section - please, refer to it for more details.

e-Signature option

If an e-Signature (Electronic Signature) is required for the report to be generated, select the *e-Signature* option. For additional requirements on configuring electronic signatures, please refer to the Electronic Signatures section.

Page Format

Page Format will set up page size and orientation of the report.

The *Page Size* list contains most of the popular standards of page sizes (e.g. A4, US Letter, Legal, A5, B5 and others) - select the desired page size for the selected report.

Orientation

If the *Portrait* option is selected, the page will be oriented vertically.

If the *Landscape* option will be selected, the page will be oriented horizontally.

Open Report File After Generation

The *Open report file after generation* will ensure that the generated report format(s) will always open automatically after generation. This means that each time that report is generated, it will be opened on the local computer. Two options: *PDF* and/or *Excel* allow users to specify which report format will be opened automatically.

Note that the appropriate software to open PDF and/or Excel files must be installed on the client PC.

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NOTES: This option will only work when Dream Report runtime is configured to run in “Application” mode, or if user has logged in to. If Dream Report runtime is running in a “Service” mode and the Windows user has not logged in - reports will not automatically open after generation. Also, this option works only on the local PC where the Dream Report runtime engine is running. If Dream Report runtime engine runs on one PC, user can't automatically open reports after generation, on another PC.

If the report is generated from the web portal or from Dynamic Report Generator, it will not be opened automatically.

Runtime Settings

The *Runtime settings* section provides two options for loading, and displaying in the reports list, of that report in runtime:

- The option *Show report in the list* specified if that report will appear in the list of reports in the runtime management console (RMC) and in a web portal, or if it will be hidden from the list. If this option is enabled - the report will be loaded in the runtime engine and will be displayed in the list of all reports both in RMC and in the Web Portal. If this option is disabled, then the report will still be loaded in the runtime engine, will be processed and executed (scheduled, event-triggered, or called by another report), but it will be not displayed in the list of reports neither in the *Runtime Management Console* (RMC), nor in the *Dynamic Report Generator* (DRG), nor in the web portal. However, that report will generate as specified and will perform what is has to do - it will be just hidden and excluded from runtime reports display list.

  This option can be useful for so-called "dummy” reports, where a report is created for some internal calculations, but is not intended to be generated and viewed as the final result report – therefore, end users don't have to see it in the list. Or, for a “sub report”, where it is intended to be triggered from a selection or hyperlink in another report.

  By default, the option Show report in the list is enabled for all new reports.

- The option *Load report in runtime* specifies if that report will be loaded in the runtime engine and will be running in the runtime with all the other reports, or it will be skipped and not loaded at the project start. If this option is enabled - the report will be loaded in the runtime engine and will generate or be triggered as usual.

  If this option is unchecked, then that report will be skipped and not loaded in the runtime engine at the project start. In Designer Studio it will still be present, but it will be ignored in the runtime.

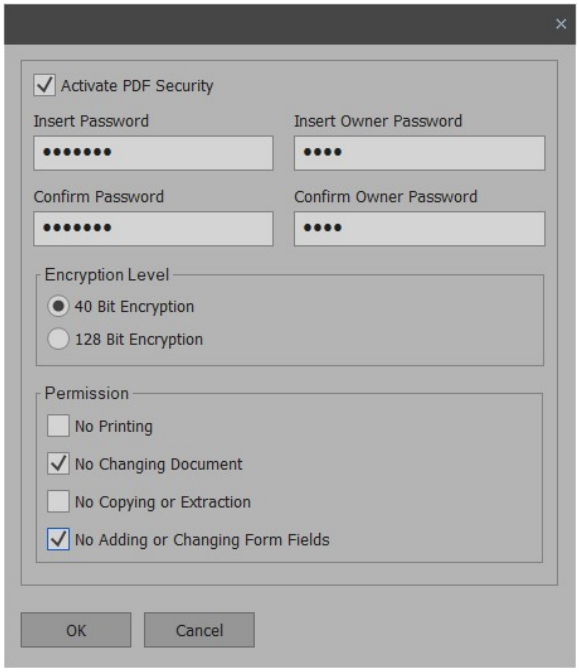
  This option can be useful for reports which are still in development or which are not currently required. A user doesn't need to delete them from the project - the report can be still included in the project, but it will be not loaded by the runtime engine and users

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can switch it on back, when needed. Also, any items used in that report will not be counted towards the license at runtime, if not loaded.

7.6.1 Advanced PDF Security

Users have a possibility to increase security of PDF reports, created by Dream Report by activating and configuring *Advanced PDF Security*. Click on the button *Settings* just below the *PDF* check box in *Report Settings -->Report File Format -->Report Target* window. The following dialog window will be opened:



When a user checks the *Activate PDF Security* check box, all dialog window controls will become enabled.

PDF security configuration dialog provides two passwords: *User Password* to open/read the PDF document and *Owner Password*. This will allow users to change the preset permissions to allow printing, editing and copying pdf document content.

Users must also select the encryption mode in the *Encryption Level* section. There are 2 encryption modes available: *40 bit* and *128 bit*. When this mode option is selected, all generated PDF reports will be generated using the selected encryption mode.

Permissions determine which kind of access the user will get while opening the PDF document. There are 4 options available: *No Printing, No Changing Document, No Copying or Extraction* and *No Adding or Changing Form Fields*. Using these permissions you can prohibit users from printing and using cut and paste operations.

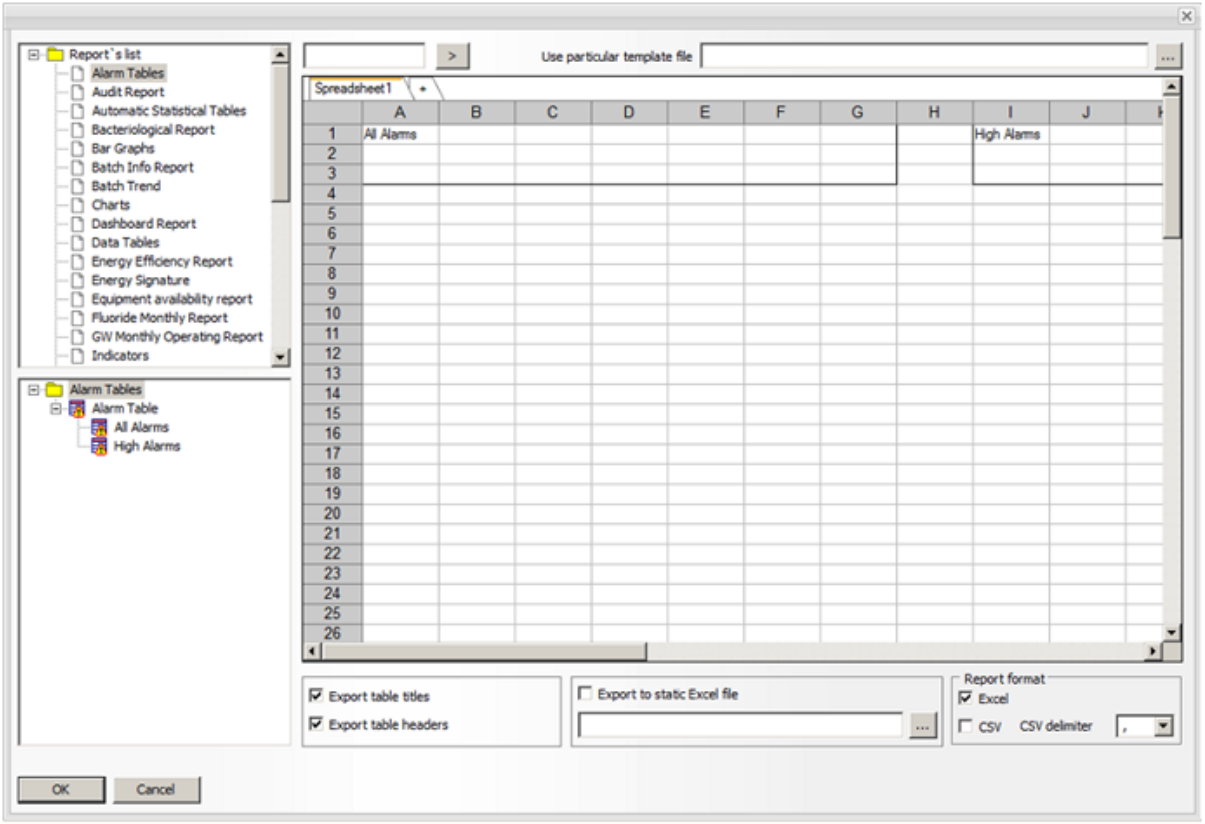
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To disable encryption, permission and password protection, uncheck the *"Activate PDF Security"* check box.

7.6.2 Excel Reports

Dream Report allows users to generate report files in *PDF* and *MS Excel* formats. If a user enables the *"Excel"* option, then the Excel format for that report will be enabled. The layout, which will be exported to Excel, has to be defined separately from the layout for PDF.

NOTE: Dream Report Excel export module will also allow exporting report data to CSV format (for details, please see the CSV Report Format section below).



In order to define Excel format, click on the *"Excel Settings"* button in the *"Report File Format"* section of Report Settings. The *Excel Wizard* will be opened (please see the picture below):

All static text, background color, imported bitmap images, graphic images, cannot be exported to the Excel file.

Dream Report enables export of only non-graphic data objects:

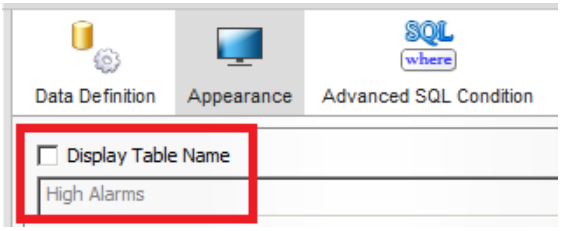
- *Single data objects*
- *Compound objects*

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- *Expression objects*
- *Item tables*
- *Alarm tables*
- *Step tables*
- *SQL tables.*

To add an object to an Excel spreadsheet, first, select the desired report from the report list on the top-left part of the wizard. Then select the desired object from the left-bottom part with a mouse left-click and place the selected object in the desired cell in the Excel Wizard with a mouse right-click.

NOTE: A table object in a report must have a *Table Name* specified if it will be used in an Excel-format report output. If not, the table will not be available to select in the Excel configuration. However, the table name does not necessarily need to be displayed in the object:



To delete an object from an Excel wizard cell, select an object in the wizard cell and press the *Delete* button.

To move an object within the Excel Wizard to another cell, select an object in a cell with a mouse left-click and then right-click on a new place, where the selected object is to be placed. The object will be automatically placed there.
The *"Export Table Titles"* and *"Export Table Headers"* options define the export mode of the table objects.

CSV Report Format

The *Report Format* section allows to export report data to *.xls or *.xlsx and/or CSV format. It has 2 check boxes: *"Excel"* and *"CSV"*.

By default *"Excel"* check box is checked and *"CSV"* check box is unchecked.

If *"Excel"* option is checked, then the report will be generated in Excel format.

If *"CSV"* option is checked, the report will be generated using the same name as in Excel format, but will have "*.csv" extension.

Both report file formats - *"Excel"* and *"CSV"* - will be available for report generation.

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All values will be recorded in a regular text file instead of Excel format with a separator taken from the operating system. The default separator (*"CSV delimiter"*) will be ";".

Search a cell

The number of cells displayed in the Excel Wizard dialog windows is limited to 100,000 cells in either direction. To select any cell you may type the cell address (e.g. A100) in the edit box in the top left part of the dialog window (next to the report list) and click on the button with the arrow (>). Then the required cell will be selected.

The *Export Table Titles* option controls if the title of the exported table will be exported into Excel or not. If this option will be enabled, the title will be exported as a plain text - the font size, style, title background color will not be exported.

The *Export Table Headers* option defines if a table header will be exported into Excel or not. If this option is enabled, the table header will be exported as a plain text. Header font size, style, header background color will not be exported.

The option *"Export to static Excel file"* enables users to export one or more reports to an existing Excel file rather than creating a new file each time the report is executed. This gives users the option to export several reports into the same Excel spreadsheet and create consolidated reports in the same Excel file.

Template selection. Dream Report enables selection of a specific pre-formatted Excel file template for specific reports. If you wish to use an Excel file template for the specific report, select your report in the list and then select your Excel file template in the edit box "*Use particular template file*" in the top right part of the Excel Configuration Wizard dialog window.

Users who are planning to create excel reports based on .xlsm files used as Excel report templates must ensure that MS Excel is installed on the same computer as *Dream Report*'s project, otherwise the .xlsm report file will be created with an error.

USEFUL TIPS:

- When exporting data into an Excel file and creating new Excel report files, Dream Report will copy a template Excel file from a folder "Untitled" in the Project folder of Dream Report installation - *template.xls* file. If you wish to generate custom Excel reports in pre-formatted Excel files, you can format the template.xls file and Dream Report will always use it each time to generate Excel reports.

- When adding objects to an Excel spreadsheet, objects are listed in the object tree by their logical names. To see tables in that object tree, one must specify table names by definition, even if the table name is hidden in an object itself.

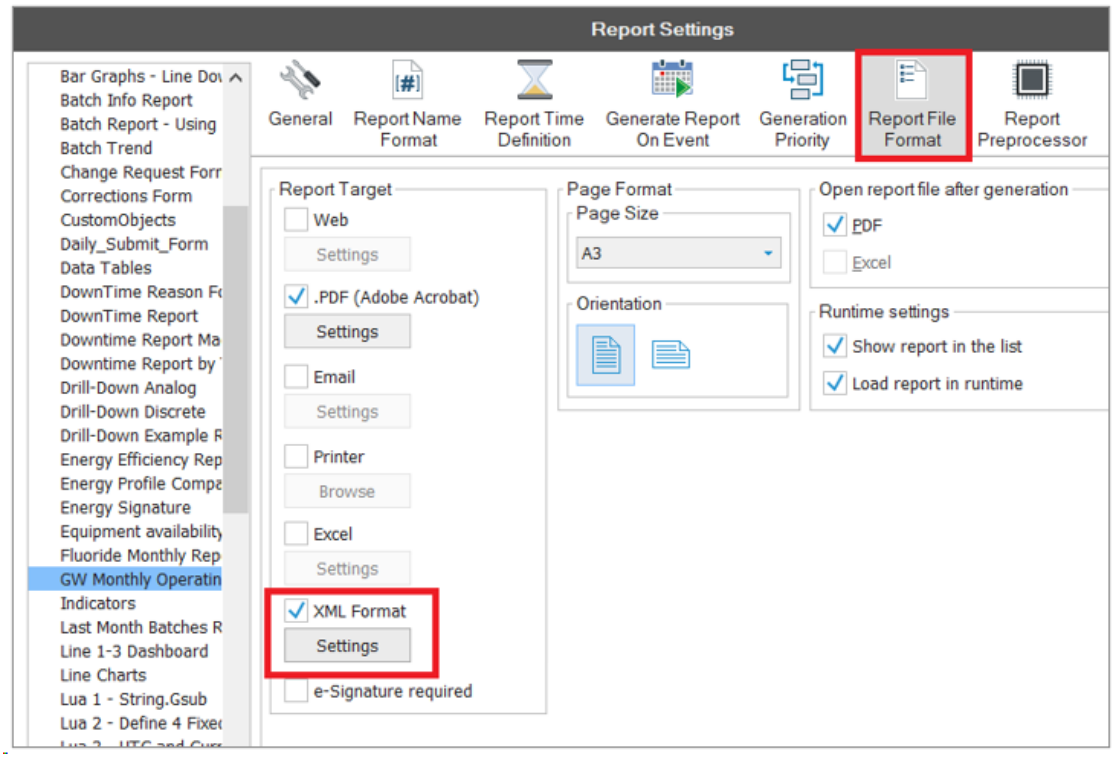
- Users, that plan to work based on the Excel template which includes some logical operations or macros, have to ensure that MS Excel is installed on the PC where the project is running.

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7.6.3 XML reports

XML is a possible report output, along with PDF, XML, CSV and Web (HTML5). With the XML output format, the user first configures a report with all the typical reporting objects – single data objects, expressions, tables, date/time objects, etc. Report formatting is not critical (colors, alignment, fonts, etc.) as the format does not transfer to the XML output. Once the content is on the report and the report data output is verified by generating a PDF report, for example, the XML output can be configured:

1. In Dream Report Studio, double-click on the report name to open the report settings, and select the *Report File Format* tab:

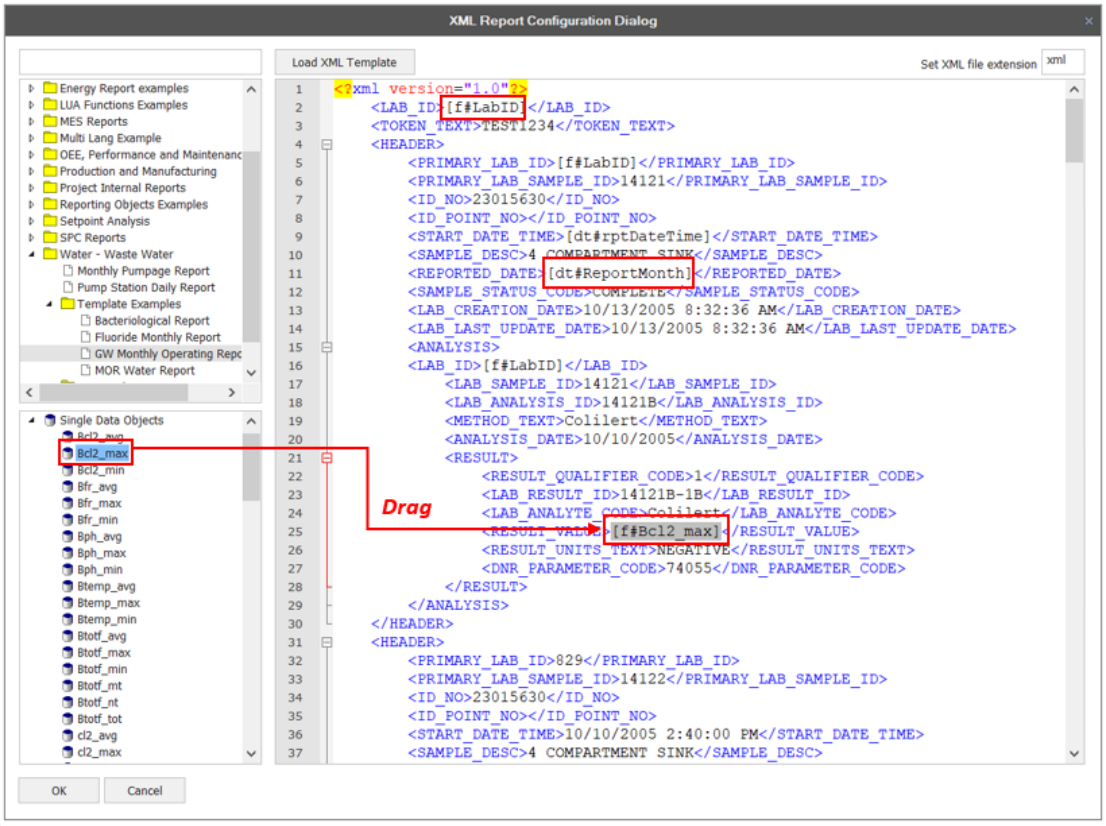


2. Check the *"XML Format"* report target, and then click the associated *"Settings"* button
3. The *"XML Report Configuration"* dialog window will open with a blank XML document
4. At this point, you can either:
   - Create the XML document from scratch by typing in the relevant XML code, and drag available objects from the report into the XML document. This requires basic knowledge of XML formatting; or
   - Import an XML template (by clicking the *"Load XML Template"* button) to which to add dynamic report content, by dragging available objects from the report

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5. In the following example, we have loaded a sample XML template into the "GW Monthly Operating Report". The template already has result data included – for example, *<LAB_RESULT_ID>14121B-1B</LAB_RESULT_ID>* - so we need to replace the data with dynamic objects from the report

6. Simply replace specific text by dragging-and-dropping the appropriate report object from the list of available objects on the left side to the correct location on the XML document:



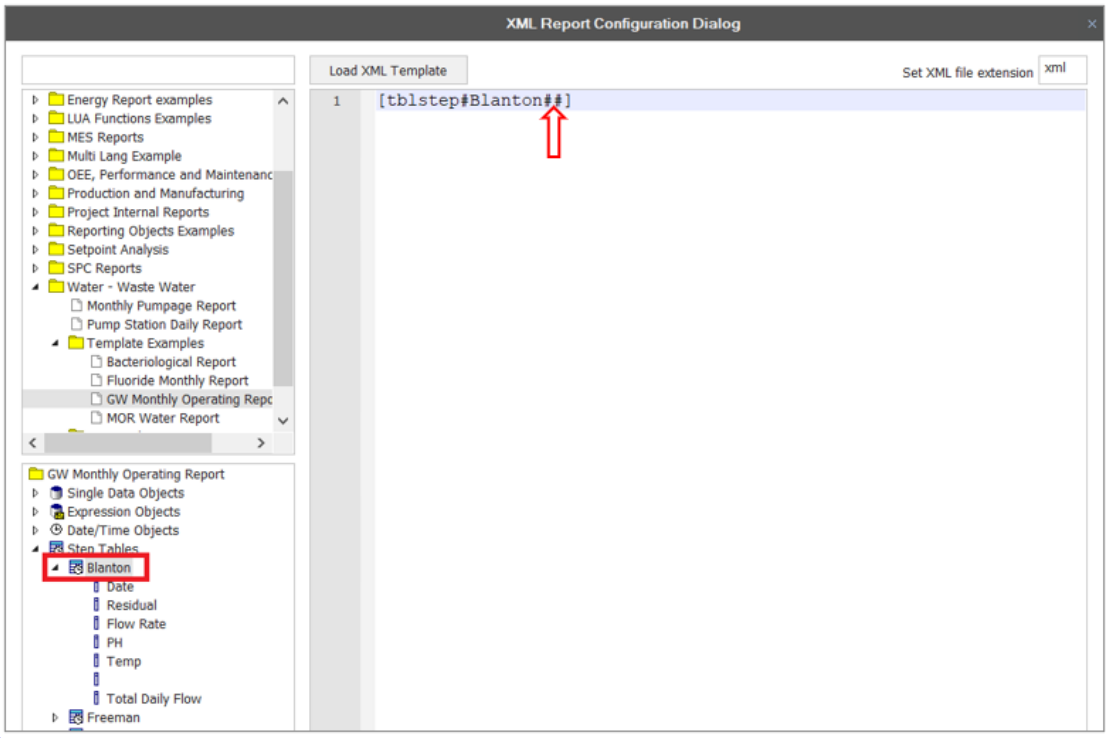
Tabular Data

Inserting the results of tables into the XML document requires additional steps. Again, using the above report as an example:

1. Make sure that a *Table Name* is specified in a table's configuration (in the table's *"Appearance"* settings). If a table is not named, it will not be available to select from the list of report objects on the left side (the same holds true when configuring an Excel output format)

2. Drag and drop the table into the XML wizard - it will be displayed in the wizard, formatted as *[tblstep#Blanton##]* :

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3. Next, drag-and-drop the listed table column(s) between the symbols ## (as shown above the red arrow). In the wizard, it will be displayed as:

[tblstep#Blanton#Date="[col#1:Date]" Residual="[col#2:Residual]" Flow_Rate="[col#3:Flow_Rate]"#]

4. For the XML output to be readable by an XML reader, use following (bolded) syntax to properly define the table – the first line is always needed in the XML output:

<?xml version="1.0" encoding="UTF-8"?>

<Table name="Blanton">

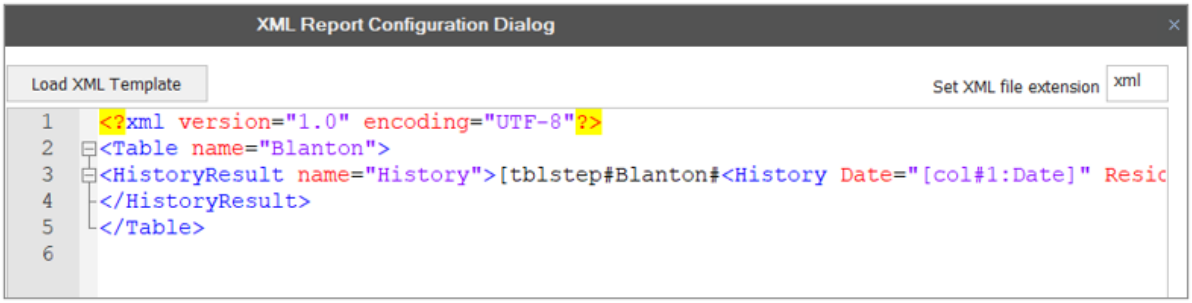
<HistoryResult name="History">[tblstep#Blanton#<History Date="[col#1:Date]" Residual="[col#2:Residual]" Flow_Rate="[col#3:Flow_Rate]" />#]

</HistoryResult>

</Table>

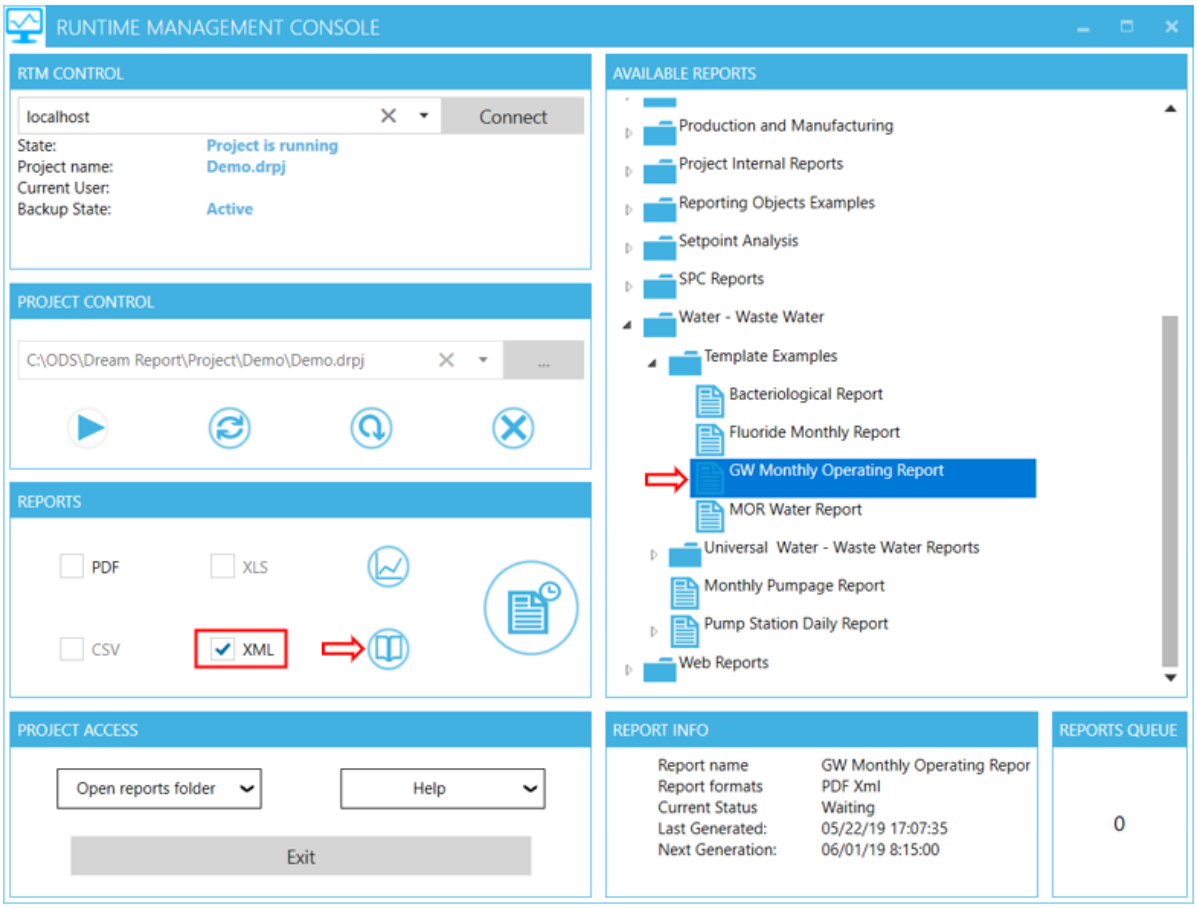
5. Additional XML code can be added to the XML output wizard, with additional object from the report.

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Testing the XML Report Output

Using the Dream Report Runtime Management Console (RMC 600) or the Dynamic Report Generator (DRG 608), select the report, check the "XML" target, and then generate the report:



In the XML output of the above example, notice that the resulting tabular data is inserted into the XML document:

```
<?xml version="1.0" encoding="UTF-8"?>
<Table name="Blanton">
<HistoryResult name="History">
<History Date="04/01/19 12:00:00 AM" Residual="32.63" Flow_Rate="314" />
```

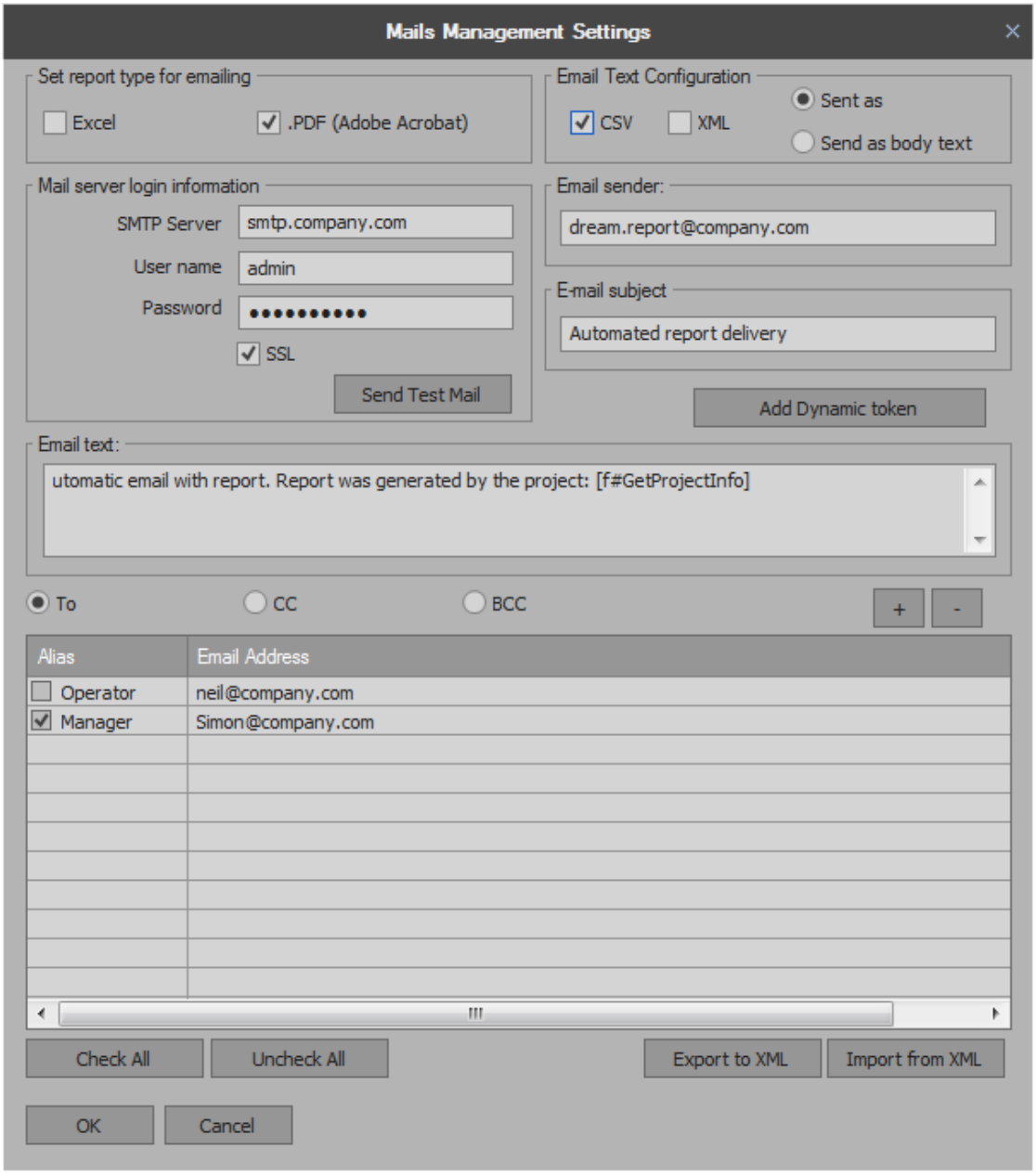

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```
<History Date="04/02/19 12:00:00 AM" Residual="40.67" Flow_Rate="277" />
<History Date="04/03/19 12:00:00 AM" Residual="46.04" Flow_Rate="324" />
<History Date="04/04/19 12:00:00 AM" Residual="46.00" Flow_Rate="360" />
...
<History Date="04/27/19 12:00:00 AM" Residual="39.38" Flow_Rate="277" />
<History Date="04/28/19 12:00:00 AM" Residual="33.75" Flow_Rate="365" />
<History Date="04/29/19 12:00:00 AM" Residual="39.42" Flow_Rate="277" />
<History Date="04/30/19 12:00:00 AM" Residual="33.75" Flow_Rate="365" />
</HistoryResult>
</Table>
```

7.6.4 Email Configuration

The *"Email"* dialog box allows configuring all settings, related to the email server, and to setup a list of email recipients, who will receive emails with generated report files.

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The CSV format checkbox allows you to send CSV report when it's generated.

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When sending by email reports in plain text format (CSV or XML format), you can choose, whether to send a report as attachment or as a body.

The selected option (attachment or email body) will be applied both to CSV and XML report formats.

If *Send as email body* option is selected and email body has text defined, then report content will replace defined email body and report will be sent in the email body, instead of defined email body text.

The Email server login information and the mail recipient list will be saved globally for your project, but the list of the selected mail recipients will be saved for each report separately.

The Dream Report email engine can send emails via any SMTP (Simple Mail Transfer Protocol) server.

To send automatic emails, you need to have only a network connection and properly set SMTP attributes. No additional email software (e.g. MS Outlook) is needed.

In the *Mail server login information* section, you need to specify your SMTP server login information:

SMTP Server: specify the address of your SMTP server. If you use Internet email service, that information is usually specified at the email provider web site.

User name: specify user name to your email account

Password: specify password to your email account

SSL check box will enable/disable sending emails using SSL (Security Socket Layer) protocol, which is required by some Internet email services (e.g. Gmail).

Also, if you need to send emails from a specific TCP/IP port, you can specify your port as addition to the SMTP server address string after symbol (e.g. *smtp.gmail.com:5* - will mean that emails will be sent over TCP/IP port 5).

"Send Test Mail" button - can be used to test that the mail server settings and recipient email address entered is correct. Clicking the "*Send Test Mail*" button will attempt to send a test email to the specified address, and display a success or failure result message.

Email sender: Specify the name of your email account. It should be specified exactly as defined in your account. Some email servers may reject sending emails, if this is specified differently.

In the *Email subject* specify which subject will be applied for every email. This option is set for every report separately.

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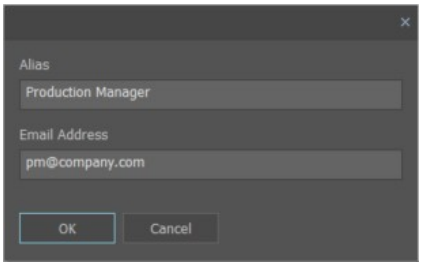
The list below contains a list of mail recipients, who can be selected to send generated report files to.

The check box, on the left from every contact, indicates if that contact is selected to be recipient of this particular report or not.

Double-clicking on any contact in the list will open a dialog box where that contact information can be edited.

The contact list can be imported from an ASCII file to simplify configuring distribution lists. To do that, manually create an ASCII file with the list of contacts, containing the contact alias and email address and click the *Import* button. After that user can browse for an ASCII file, select it and the email recipient list will be imported.

To add an email contact manually, click on the *Add* button and the *Add Email Contact* dialog box will be opened:



In the *Alias* field, fill in the recipient alias (name or title).

In the *Email Address* field, enter the recipient email address.

NOTE: Emails will be generated and delivered only during automatic report generation (according to the generation schedule - on time or on event - as defined in the "Report Time Definition"/ "Generate report on event" sections of the Report Settings).

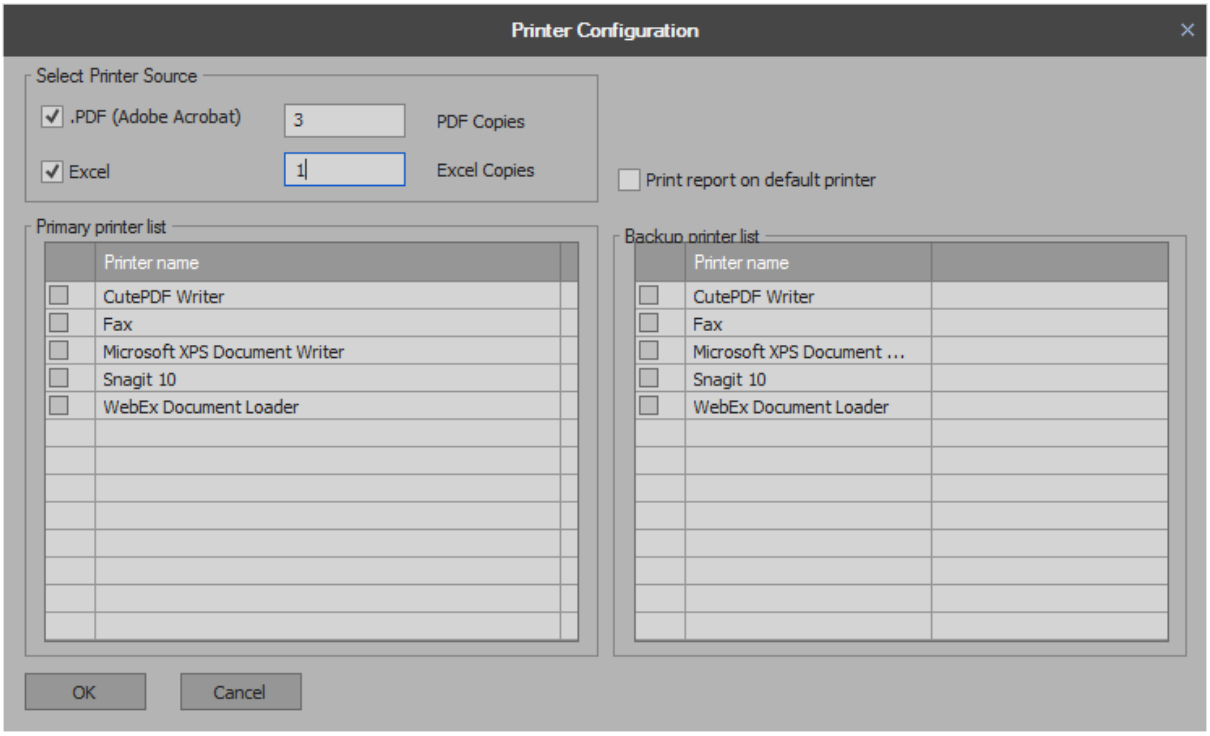
If you need to send/deliver emails with generated reports where the data has been entered manually/on demand, please enable the Email check box in the User Reports Targets section of the Dynamic Report Generator in runtime.

7.6.5 Printer Selection

Each separate report can be printed on a separate list of printers, which enables the most efficient report distribution.

If a user clicks on the *Browse* button below the *Printer* check box in the *Report File Format* dialog box, the *Printer Configuration* window will be opened:

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User can select one or several printers, where each report will be printed each time it is generated.

The *Paper size and orientation* (portrait or landscape) will be taken from the Report File Format section of the *Report Settings* window.

The options *"Excel"* and *"PDF"* enable you to specify which formats of result report you wish to print: the report in PDF format or/and the report in Excel format.

The number of *PDF copies* field allows user to set the number of copies to print for PDF report.
The number of *Excel copies*" field allows user to set the number of copies to print for reports in MS Excel format.

The number of copies for both formats can be set from 1 to 100.

There is no limitation regarding printer type or manufacturer.

The *Primary printer list* defines the main list of printers, on which report will be printed. One or multiple printers can be selected. Active printer for the report printing will be the one, which check box is checked.

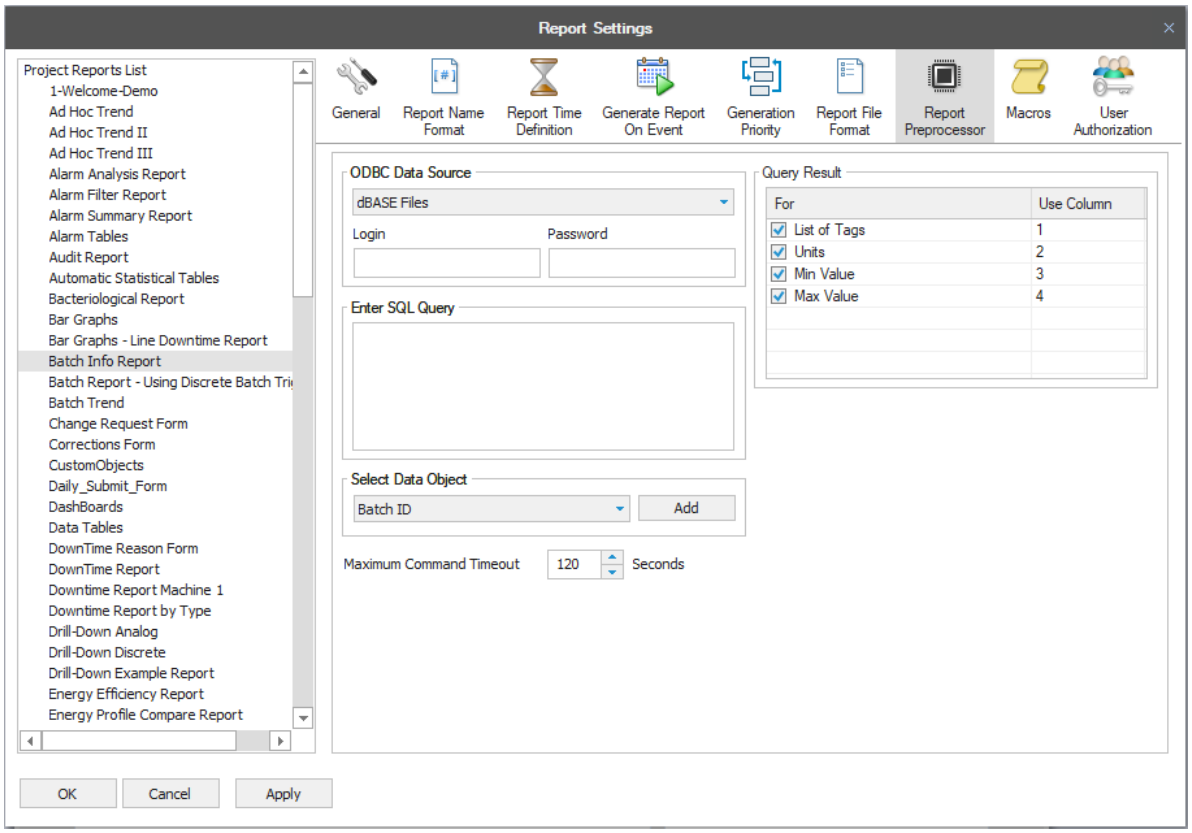
Each main printer may have one backup printer. To define the backup printer, you have to select a printer in the *Primary printer list* (not to select the check box, but to select the printer, to make it highlight), and then select one printer in the *Backup printer list* (selecting its check box).

Both printer lists are populated with all printer definitions, available in Windows (both local and remote ones).

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The option *Print report on default printer* enables printing report on the printer, which is currently defined as default on that computer. If this option is enabled, then, copying that project to another computer will make it work (able to print reports) without re-configuring printer definitions.

7.7 Report Preprocessor

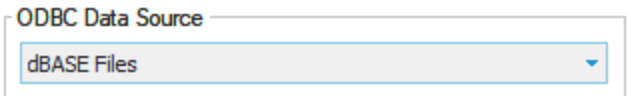


The *Report Preprocessor* dialog box enables users to perform an action (SQL query or stored procedure) before report generation using input parameters, and use the result as an input for report, e.g. as a list of tags.

Report Preprocessor is a database command (SQL query or stored procedure), which will be performed before report generation. The result of that command can be used for further report generation.

First, in the *ODBC Data Source* section define the external server for getting data from (please, see the picture below):

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NOTE: All DSNs defined in the project are saved and can be managed from one place (for details, please see the DSN Manager section of this manual).

Then *enter the SQL Query data* (for more details, please, see Single Data Object or SQL Table section).

In the *"Select Data Object"* combo box you can only select data objects from the preset list of the following 4 objects available: *"Batch ID"*, *"Report start time"*, *"Report end time"* and *"Input parameter from file"*. If a user adds any of those objects to the SQL query (or stored procedure) statement, by clicking *Add* button, then, when launching before report generation, it will replace those dynamic objects by the corresponding real value.

All values for *"Batch ID"*, *"Report start time"* or *"Report end time"* will be accepted only via Dynamic Report Generator. If a report is generated by schedule or event and not by DRG, then, those input parameters will be empty.

If you select the *"Input parameter from file"* option, please, see the corresponding section below.

NOTE: The following dynamic tokens can be used in Report Preprocessor:

[gen#BatchId] - This dynamic token will be replaced by ID of the batch (Batch ID) for which the report is generated.

[gen#ReportStartTime] - This dynamic token will be replaced by *Report Start Time* as configured in the dynamic generation settings.

[gen#ReportEndTime] - This dynamic token will be replaced by *Report End Time* as configured in the dynamic generation settings.

[file#<file_name>#<param_name>] - This dynamic token will be replaced by the parameter value that will be found in the specified *<file_name>*. The file has to have a special format in order to be used in Report Preprocessor. The special file format is:

```
<ods_rpp_document ver = "1.00">

 <ods_rpp_param_list>

  <ods_rpp_param name = "param1" value = "value1"/>

  <ods_rpp_param name = "param2" value = "value2"/>

  <ods_rpp_param name = "param3" value = "value3"/>

 </ods_rpp_param_list>

</ods_rpp_document>
```


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NOTE: For details on the dynamic tokens, used in Dream Report, please see the List of Dynamic Tokens.

The *Query Result* section defines how the result of the SQL command will influence report generation.

There are 4 possible options here:

Option 1. List of tags. If this option is checked, then, the content of the specified column of the SQL query result will be considered as a tag list for report objects. If this option is unchecked, then all other three options below will be unchecked automatically. Three options below make sense only in connection with the tag list.

Option 2. Units. If this option is checked, then, the content of the specified column of the SQL query result will be considered as a unit for the corresponding tag from received tag list.

Option 3. Minimum value. If this option is checked, then, the content of the specified column of the SQL query result will be considered as a minimum value for the corresponding tag from the received tag list. This minimum value will be used for a chart Y scale setting for that tag.

Option 4. Maximum value. If this option is checked, then, the content of the specified column of the SQL query result will be considered as a maximum value for the corresponding tag from the received tag list. This maximum value will be used for a chart Y scale setting for that tag.

If all check boxes in *"Query result"* are unchecked, then, the SQL command will be executed and its result will be ignored. This case can be used to prepare data before report generation.

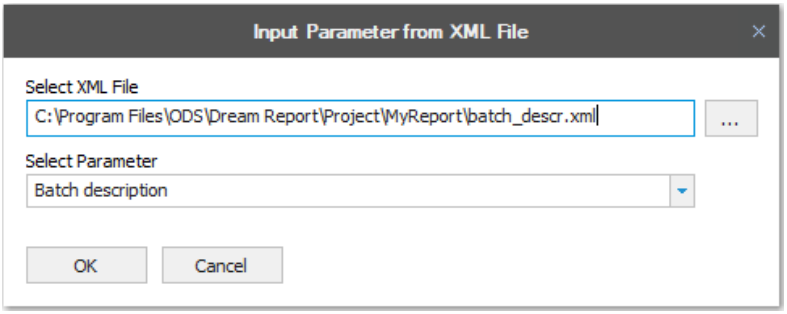
NOTE. SQL Command will be executed in synchronous mode with report generation. Report will start generation only after execution of the SQL command. In the *Maximum Command Timeout* edit box define the maximum waiting timeout. If this timeout is expired, the report will start generation without waiting for the preprocessor results and they will be ignored, i.e., the report will be generated, using its original configuration.

If report has any macros, define it before report generation. Anyway, the *"Report preprocessor"* command will be generated before macros.

Input Parameter from File

If a user selects the *"Input parameter from file"* option and clicks on *"Add"* button, then, *Input parameter from XML file* dialog window will be opened (see pic. below):

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Enter parameter name and select an *XML file* or enter an *XML file name.*
Report Preprocessor will try to open the specified XML file, read it and look for the specified parameter.
If the file has been found, Report Preprocessor will read its value and use as an input parameter for report generation.
When custom input parameter is added to the SQL command edit box, it will be added in the format:
[file#<filename>#<parameter name>]

e.g. [file#C:\Batch\Report_gen.xml#Dataset name]

REPORT PREPROCESSOR APPLICATION

Items can be replaced in the following objects: *Charts, Automatic Statistical Tables, Item Tables.*

Charts

- When replacing items, each line will be added in the order of its retrieval from the database.

- Data source will *NOT* be replaced. New dynamic items will have the same data source as originally defined in a chart. If a chart has several data sources for different lines, then, the first one (defined for the first line) will be considered as the correct data source.

- When replacing the existing lines, each new line will take the corresponding color of a replacing line. E.g. If chart definition has three lines defined with item A (red), item B (blue) and item C (green), and, if two lines come from a database by preprocessor, then, those two lines will take colors red and blue (in the order of their retrieval from a database). If new lines are more than ones in the existing chart definition, then all lines, exceeding the original number, will take default colors.

- Each such an item name will be automatically added to the legend, so a user will automatically see which item corresponds to which color.

- If original chart definition has separate line settings (e.g. time, scale settings) for different lines, then, the line setting of the first line in a chart will be taken as a default one for all dynamic lines.

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- If there is any line, defined on *"Absolute"* or *"Golden batch"*, it will *NOT* be replaced and will stay in addition to all dynamic lines.

- Time definitions and all other settings will have no change – *ONLY* data items will be dynamically replaced.

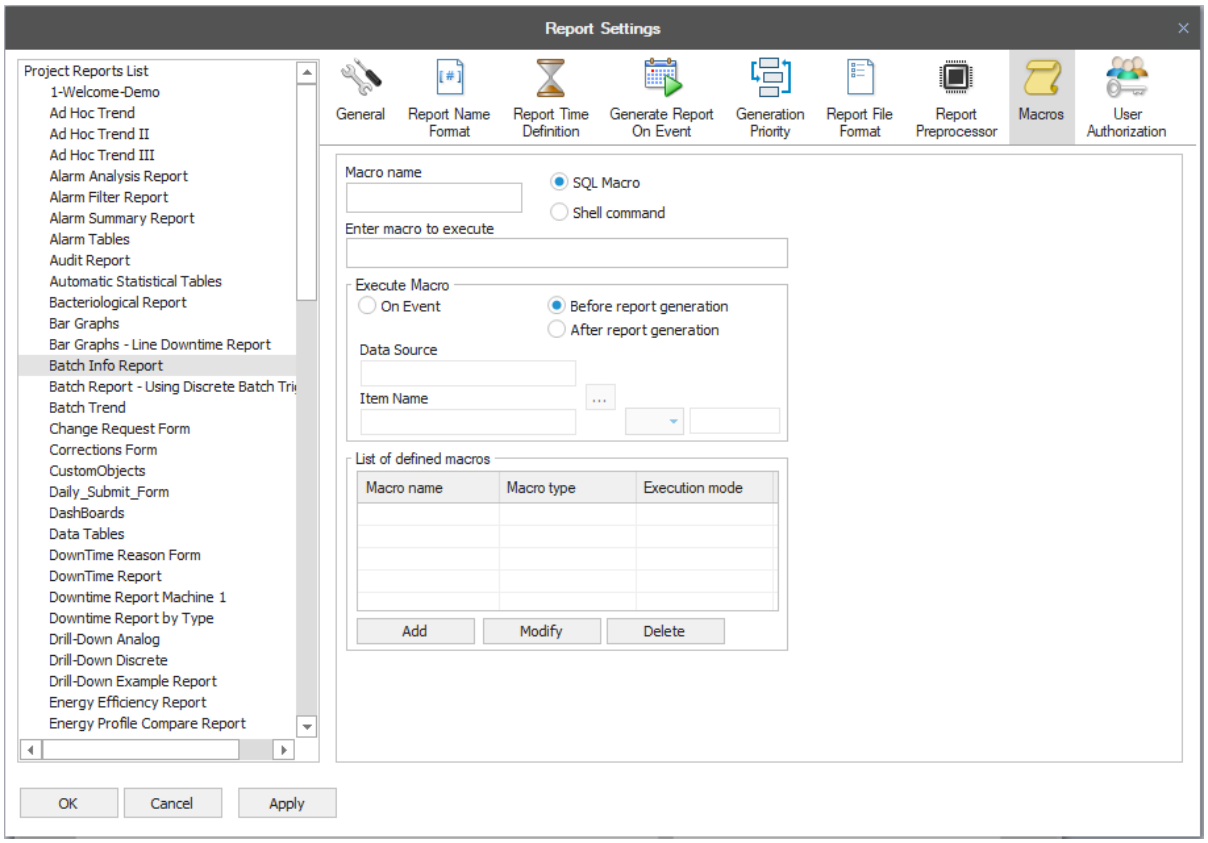
Automatic Statistical Table

Automatic Statistical Table will take all statistical functions, defined in the table and apply it for all items, supplied by preprocessor. All settings (SQC, AVC) from the first item in the table will be used. Also, the data source from the first item will be used as the right one.

Item Tables

In Item tables all originally defined items will be replaced by the new ones. The data source will remain the same. If an Item table contains several data sources, then, the one from the first data item will be considered as the correct one.

7.8 Macros



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This option enables users to define and attach a list of *macros* to each report separately and run it when the report is generated or on event.

A macro can be one of two types: *an SQL macro* or *a shell command (command line).*

To add a macro to a list:

- Specify a unique logical *Macro name* to associate with the macro.
- Select macro type: *SQL Macro* or *Shell command*
- Enter Macro itself.

If the macro type is a *Shell command* enter the command line.
If the macro type is *SQL macro*, enter the name of SQL stored procedure defined in a database associated with the Dream Report project. The format for the SQL stored procedure is:
DSN=DSN_Name:Macro_Name

If the DSN is password protected, then the syntax of a macro will be:

DSN=DSN_Name;UID=login;PWD=password:Macro_Name

If the macro type is *Microsoft Access Macro*, please, enable radio button *SQL Macro*, enter the name and the format: *MACC:"D\Folder_Path\DB_Name.mdb":Macro_Name*

EXAMPLE: *MACC:"C\Program files\ODS\Dream Report\Project\Energy report\Database\Energy report.mdb":Restore*

As soon as you have specified a macro, choose the execution mode. The execution mode is applied to each macro separately and not globally to the entire macro list.

If the execute *before report generation* option will be selected, the macro will be executed before each report is processed. However, the report generation will not wait until the macro execution is completed. The macro will be executed asynchronously.

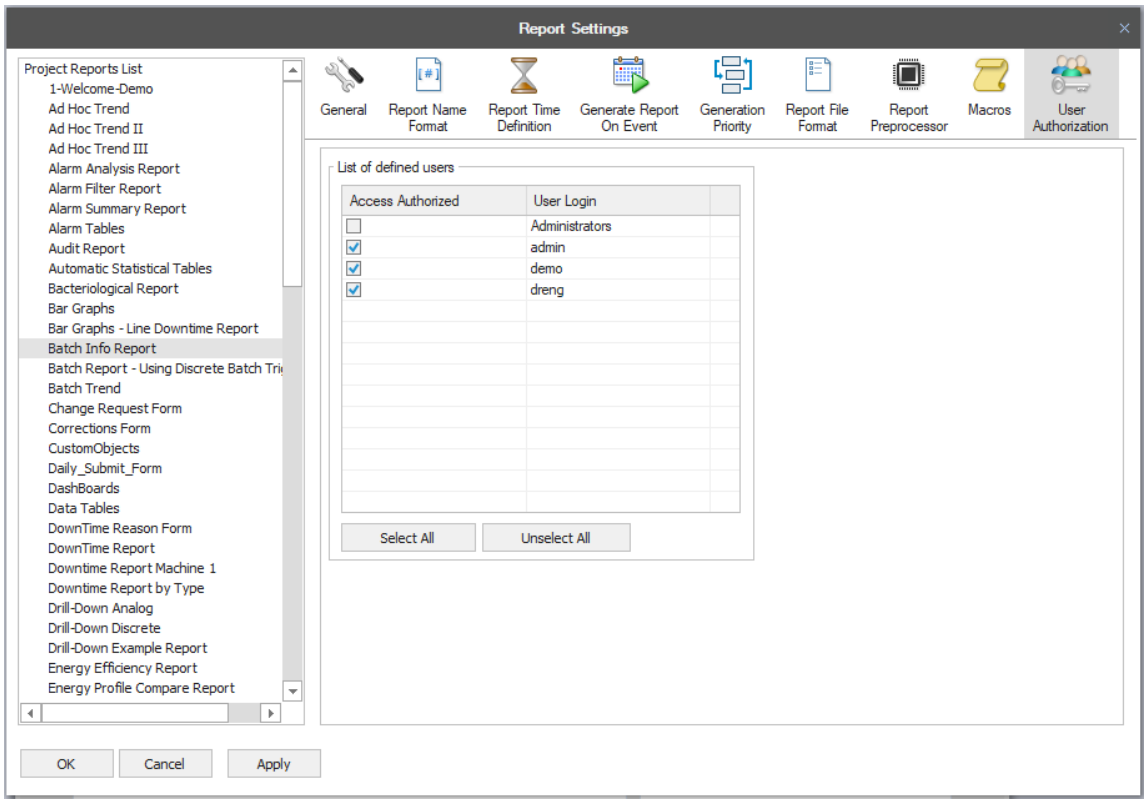
If the execute *after report generation* option will be selected, the macro will be executed each time after the report is processed.

If the execute *On Event* option is selected, specify a macro event condition: source item and the condition itself. The condition value must be a numeric value.

Each time the item value meets the defined condition, the macro will be executed. This option is independent of report generation.

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7.9 User Authorization



This window enables you to define access rights to each specific report for specific users/groups.

This option is also applied for the Runtime Manager and in the Web Portal.

If user management is defined in the project, then you have to specify which users are authorized to have access to each report.

Authorized access to a report means that this user will see that report in the list of reports in the Runtime Management Console window, will be able to select and generate that report, open the PDF file for this report and enable/disable automatic report generation.

If a user is not authorized to have access to a report (i.e. in the "User Authorization" section of this report settings, a check box of that user is unchecked), then after making login to the Runtime manager or to the Web Portal, that unauthorized report will not be displayed in the list of reports. It will be hidden from unauthorized users.

The *List of defined users*, displayed in this section, is a global project list, defined in the *Authorization* dialog window, and is described in details in the User Management section.

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If you delete any user from the project *List of Users and Groups* in the *Authorization* dialog window of the User Management dialog box, then, it will be automatically removed from the *List of defined users* in the *User Authorization* section described here.

If you add a new user to the global project *List of Users and Groups*, it will be automatically added to the *List of defined users* in the *User Authorization* section, described here, and will be unselected. All users are unselected (unauthorized) by default for all reports, unless you select (authorize) them.

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Report and Page Templates

8 Report and Page Templates

8.1 Page Templates

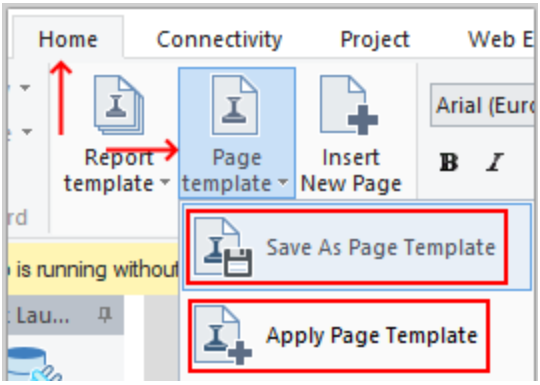
Page template allows users to create page templates that can be easily reused within reports. A page template is similar to the headers and footers of a page in other software. It allows a user to create a template with a common visual layout for every report page.

A page template will save all static objects, including images, pictures, backgrounds, static drawings, static text, and some dynamic objects, such as page number, dynamic text and date/time.

If a user will save any existing report page as a template, all static objects will be saved, and all dynamic statistic and analytic objects will be ignored.

In order to *save the current page as a template*, click the right mouse button on the context menu on report in the report list.

You can also click on the command button *Page Template* on the *Home* ribbon icon on the horizontal toolbar in the Report Designer Studio (see pic. below):



Select *Save as Page Template* option. Page template file will be created with ***.ptdr** extension.

NOTE**:** Users can also save the current report page as a template by clicking on the ODS button in the upper left part of the Dream Report Designer Studio.

By default page template files are saved in the *Templates* folder within the Dream Report installation directory.

To *apply a page template* to a report, click the right mouse button on the context menu on a report in the report list.

You can also click on the command button *Page Template* on the *Home* ribbon icon on the horizontal toolbar. Select *Apply Page Template* option. The standard Windows *File Open* dialog box will be opened, and a user can select any page template to apply to the current page.

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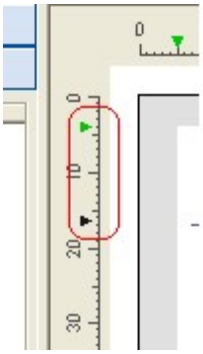
Once the template is added to a report, each template element (pictures, background, graphic objects etc.) will be available for editing as independent objects

If a user applies a page template to an existing report, it will add all template elements to the report page and will not damage the existing report content.

Creating a Footer and a Header

When you save your page as a template, it will be replicated for every new created page of that report. When making reports with long tables, which create and jump to the new pages, user may need to keep some upper area of every page free of any objects. Then, when objects start to jump to a new page, they will start it only from some area, keeping the certain upper section free. For this, users have to define header.

To create a header, you have to place all your header objects to their places, drag down a small green triangle on a vertical ruler (on the top left side of the workspace) and place it below your header objects, as displayed on the picture below:



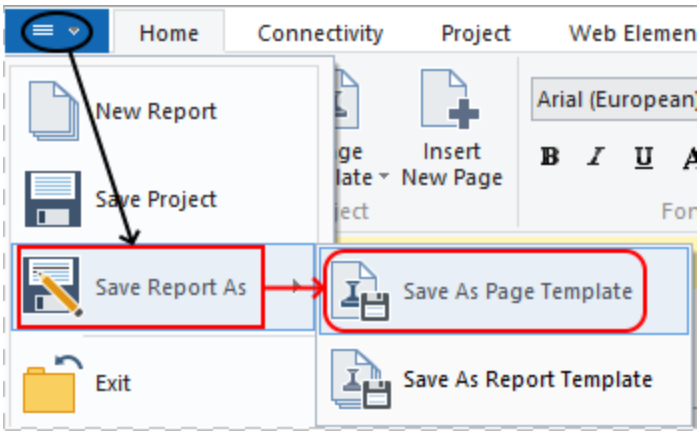
Then, all the area above that triangle will be greyed, and all objects, located in that grey area will be kept clean from any overlaying tables or other objects.

Please, note that, when you drag down the green triangle, it will create the header area not only on the page, where you drag it, but also on every page of that report, including all new pages, which will be dynamically created while generating that report.

Creating a footer should be done using exactly the same procedure, but just dragging up the green triangle on the left bottom part of the vertical ruler.

NOTE: Report pages can be also saved as templates by clicking on the DR Main Button in the upper left part of the Dream Report Designer Studio (please see the picture below):

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8.2 Report Templates

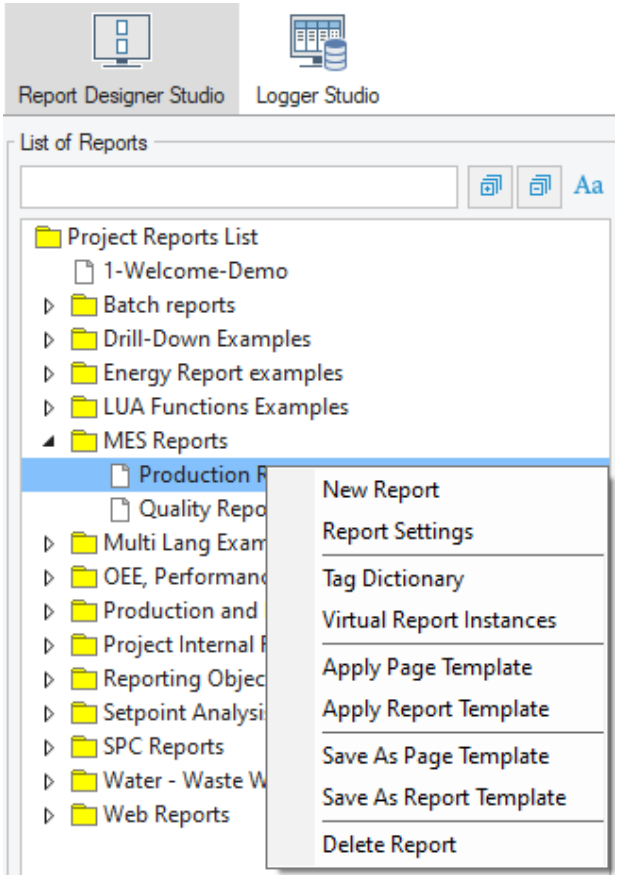
The *Report Template* mechanism allows users to create templates of entire reports to be used for creating other reports. It can be reused to build similar reports.

A report template will save all static, dynamic statistic and analytic objects within the report, but also will include report settings and Excel report configuration.

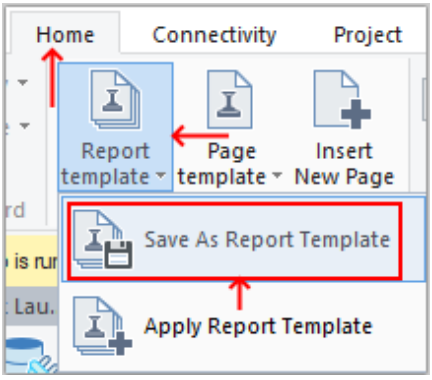
If users will save an existing report as a template, the overall report content will be saved as a template.

To save the current report as a template, right-click on the report in the report list and select menu *Save as Report Template* (see pic. below):

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You can also click on the command button *Report Template* on the *Home* ribbon icon on the horizontal toolbar in the Report Designer Studio (see pic. below):



The report template file will be created with a **.tdr* extension.

NOTE: Users can also save the current report as a template by clicking on the ODS button in the upper left part of the Dream Report Designer Studio.

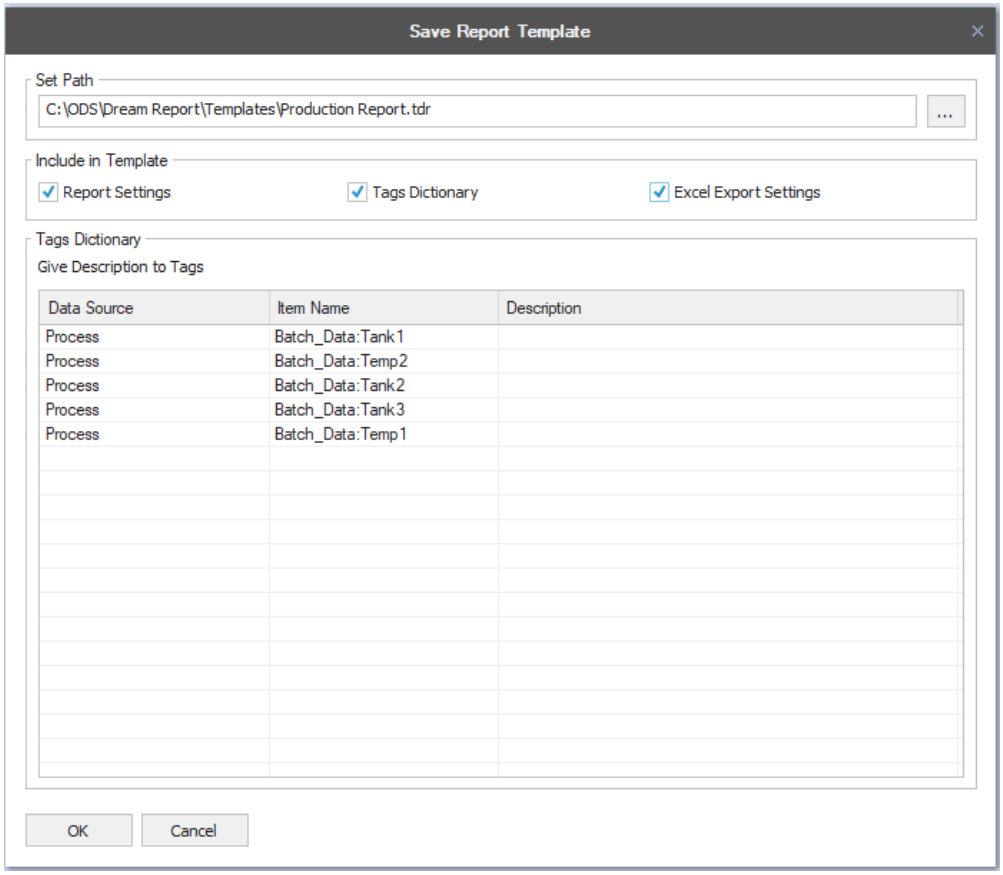
By default report template files are saved in the *Templates* folder within the Dream Report installation directory.

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When a user *saves a report as report template*, the following *Save Report Template* window will be opened:

In the *Set Path* edit box user will have to select the desired report template (**.tdr* files) by browsing for such a template using "**...**" (browse) button on the right from the combo box.

Include in Template section contains 3 check boxes (*Report Settings, Tags Dictionary, Excel Export Settings*), which will define which report information will be saved with the template. If any of those check boxes are unchecked, then this part of the report information will not be saved.

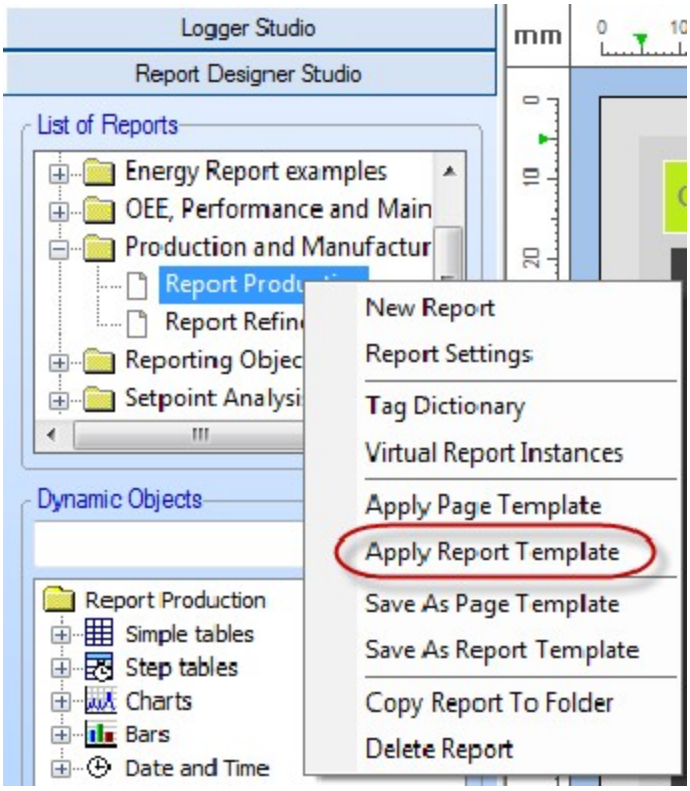


Tag dictionary

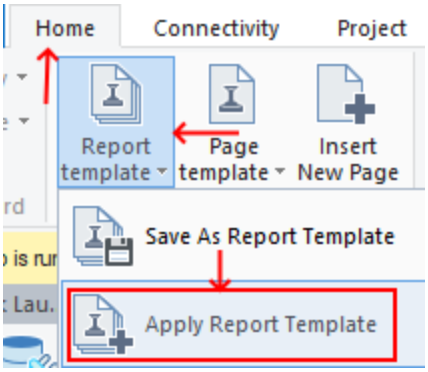
The control list *"Tags dictionary"* will be filled with all tags, which are used in this report in various objects. Columns *"Data Source"* and *"Item Name"* will be filled with relevant tag information. The column *"Description"* will be empty. User can click or double-click into the *"Description"* column and the field will be opened for inserting or editing a text with the logical description of this tag. All the list of source/tag names and their descriptions will be saved inside the report template file. When saving the report template, the tag dictionary will save *ONLY* tag descriptions and their reference associations with statistical objects in the template. Data sources and tag names will not be saved in the template.

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To apply report template to an existing report, right-click on the report in the report list and select menu *Apply Report template:*

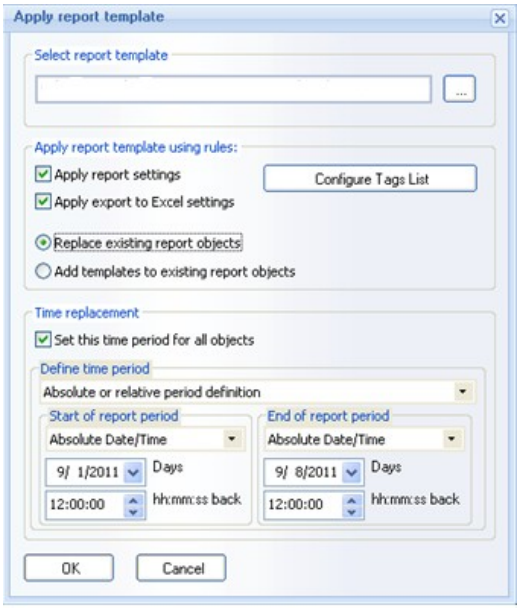


You can also click on the command button *Report Template* on the *Home* ribbon icon on the horizontal toolbar in the Report Designer Studio (see pic. below):



Then *Apply report template* dialog window will be opened:

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User can choose the desired report template and also configure applying settings as follows:

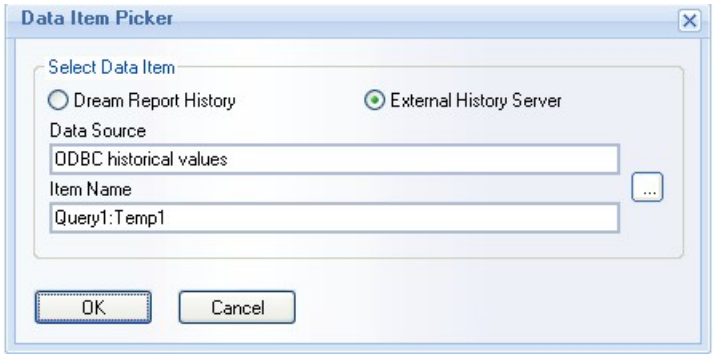
In *Select report template* edit box, the report template has to be selected (**.tdr* files). One can browse for such a template using "..." (browse) button on the right from the combo box.

If the current loaded template has any entry(ies) in the tag dictionary, then the *Configure Tags List* button will become enabled.

If the current template has no tag dictionary defined, or it's originated from older versions, then the *Configure Tags List* button will be disabled.

When user clicks on the *"Configure Tags List"* button the *"Project Tag Dictionary"* window will be opened (please, see Tag Dictionary section).

If this dialog is opened from the existing report template, which has tag dictionary defined, then it will be filled with tag descriptions from the template. *"Source"* and *"Item name"* columns will contain a small button *"…"* (browse). When user clicks on it, the following *Data Item Picker* dialog window will appear:



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If a user will click *OK* in this item selection dialog window, source name and item name will be set into the list control. The source type (*Dream Report History* or *External History Server*) will be saved for each entry separately as well.

If source name or/and item name is defined in the list control and user calls the item selection dialog window, then *Select Data Item* window will be opened with existing selection filled in.

If a user will double-click either into the *"Source name"* column or into the *"Item name"* column, the cell will be opened for manual text editing.

In the top-right corner of the tag dictionary dialog window, there is a button *"Print"*. If a user will click on it, it will open Windows print dialog box and user can select printer (or the file) and print the list of Source/item names and their descriptions.

For details on how to configure tag dictionary, please, go to the Tag Dictionary section.

Apply report template rules:

Apply report settings check box defines report settings, such as report naming rule, generation schedule, report target configuration etc. If this check box is checked, then report settings from the report template will overwrite actual reports settings. If this check box will be unchecked, then the report will remain with the original report settings.

Apply export to Excel settings check box defines if Excel report configuration will be applied from report template to your report. If this check box is enabled, then Excel report configuration will be applied to your report and overwrite existing Excel configuration (if it exists). If this check box is unchecked, then Excel report configuration will not be applied to your report from the report template.

If the option *Replace existing report objects* will be selected, then all the entire content of the applied report template will replace all existing objects in the report and will make that report the exact copy of the applied template.

If the option *Add templates to existing report objects* will be selected, then the report objects will be added to your report in addition to the existing ones. If position of any existing object will be the same as from any new object from the template, such objects will be overlayed one on top of the other.

Time replacement option enables users to apply report template, applying desired time period to all template objects.

If *Set this time period for all objects* check box is checked, then user can specify time period definition, which will be set for all objects, which will be added to the report from the template.

For details on time period definition, please, see Time Period Definition section.

If this check box will be unchecked, then time period replacement will be disabled and all template objects will be added to the report with their original time definitions.

Once the selected template is added to the report, each template element will be available for editing as an independent object.

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Further report modifications will not affect its report template design and also further template modifications will not affect design of that report.

Moving reports from one project to another

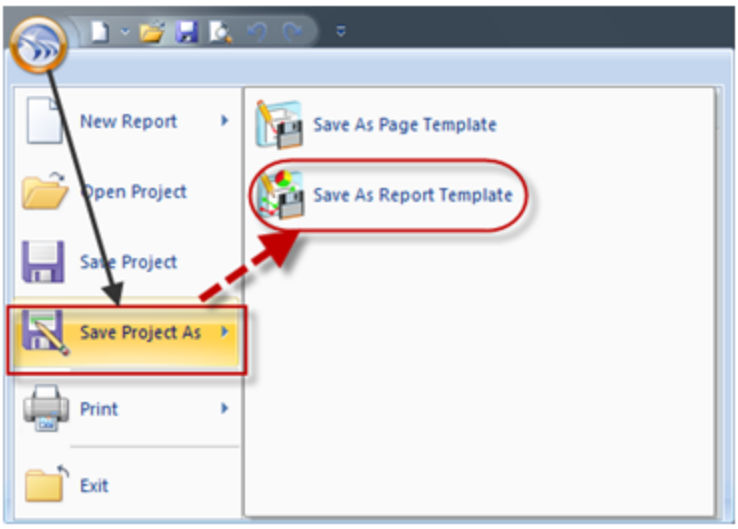
If you need to move the report from one project to another, please, do the following:

1. Save the report, that you want to move, as a report template.

2. Load the project, where you want to move this report.

3. Define a new report, and apply to it that saved report template.

NOTE: Reports can be also saved as templates by clicking on the DR Main Button in the upper left part of the Dream Report Designer Studio (please see the picture below):



Private Code Protected Templates

Reports templates developers are able to save report template and lock it by any private code.

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Common Configuration Features

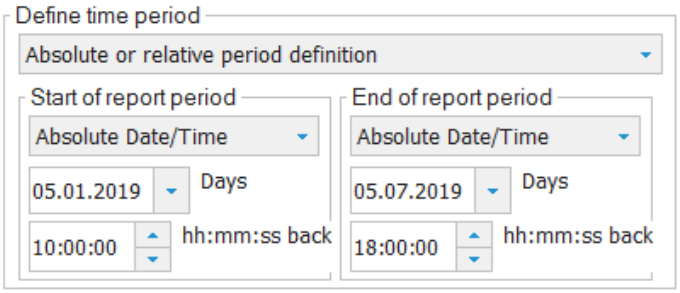
9 Common Configuration Features

9.1 Time Period Definition

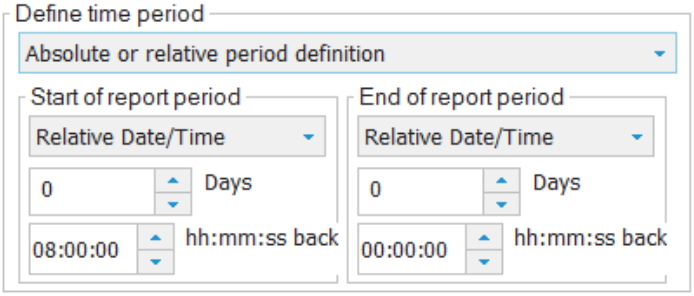
Dream Report has several ways to define time periods, to be used in calculations, tables, charts, etc. The various methods to specify time periods can accommodate the varying time ranges to report over in industrial automation systems. The ***Time Definition Manager*** is a tool for creating and storing "common" time definitions for quicker use in creating reports. The benefit of this is to be able to create and manage time definitions in a single location; reference the pre-configured time definitions in reporting objects (without needing to specify the time period each time); and allow you to change a time definition in one place, and have it automatically applied to all objects referencing that time definition.

Absolute of Relative Time Period Definition

These options are used when you need to use specific dates/times, or dates and time that are relative to (offset from) the moment of report generation – e.g., a "sliding" time period like "last 8 hours back from now"; or since "7AM today until now":

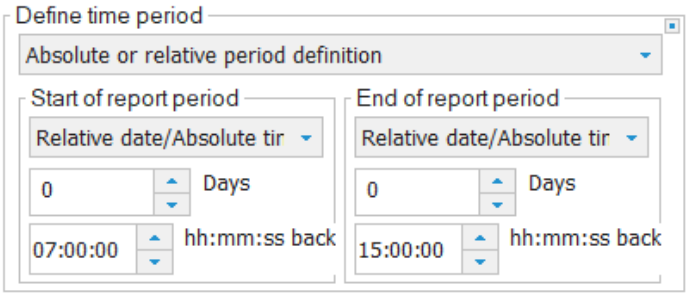
- 

- **Absolute time period** – you can specify the calendar date and time for both the Start and the End of the report period:

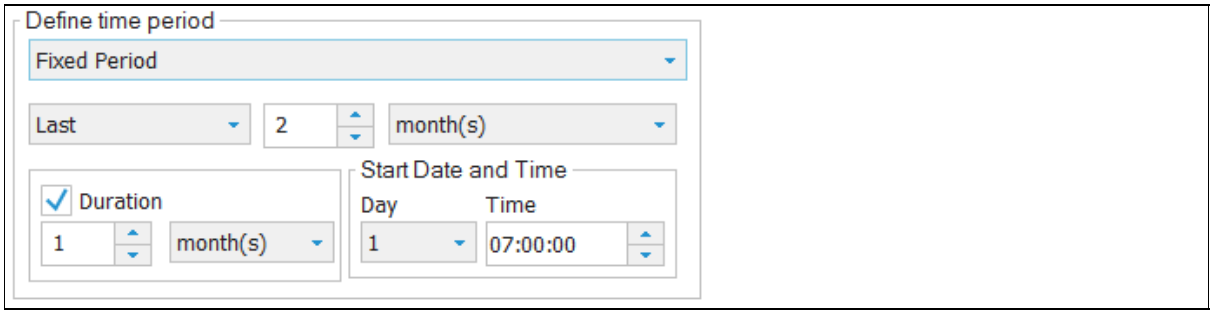


- **Relative time period** – you can specify the time offset, i.e., the number of days or hours, minutes and seconds back from the time of the report definition (as seen below):
  If the time period is defined in the relative mode, then, during report generation, the current time will be taken as the end time and the time offset will be deducted from it as the start time.

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- **Relative date/Absolute time** – this is useful when you want the clock time to be fixed every time the report runs, but the date changes.
  For example, a first shift report covers 07:00 to 15:00 every day – the time range is always the same, but the date changes, so the date is relative to when the report is run.



Fixed Time Period – Fixed time period relates to past (last) or current clock/calendar units (not necessarily "now back".) you can define fixed time period by selecting the following time parameters to measure (as seen below):

- **A** – ***"Last/Current" time*** – where ***"Last"*** means "*previous complete*" time unit (for example, if current time is 14:32, then the *"Last 1 hour"* will be 13:00 - 14:00), and ***"Current"*** means *"incomplete"* period (for example, if the current time is 14:32, then the *"Current hour"* would be 14:00 - 14:32).
- **B** - ***"Duration"*** - the duration of the fixed period (for example, if today is April 29 and you specify fixed period as "*Last 2 months*" and "*Duration 1 month*", then the time period will start on February 1 and will end on March 1)
- **C** – "***Start Date and Time"*** - the start date and time for the specified fixed period. For example, you might want your daily reports to be from 7AM-7AM. In that case, you would set the time period to be *Fixed – Last 1 day*, *Start Time 07:00:00*

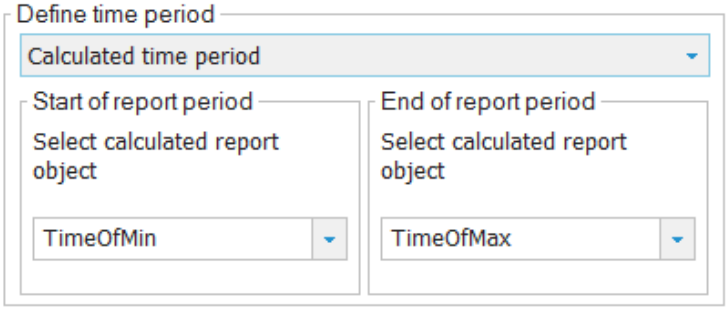
Batch based – if the time period to be used is calculated based in a *Batch Definition* (see next module)

Calculated Time Period – you can define start and end of time period using the result of a calculation of any statistical objects in the report, if those objects have a statistical function which returns the following timestamp(s):

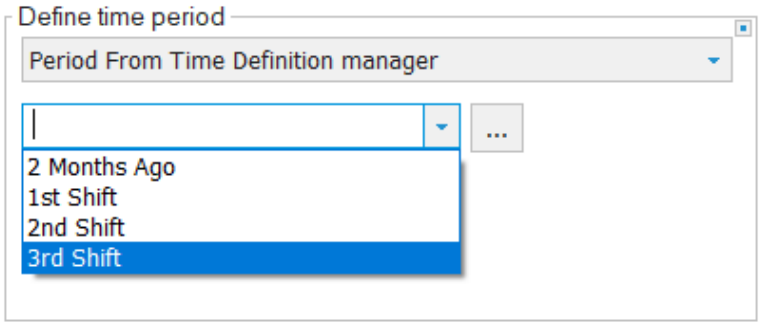
- "Timestamp of first value"
- "Timestamp of last value"

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- "Timestamp of min value"
- "Timestamp of max value"
- "Batch start time"
- "Batch end time"
- If an expression object which was performing operations with the timestamp and had Timestamp as a result



- Or, references a *Timestamp Picker* web element



Period From Time Definition Manager – if any named time definitions were created in the *Time Definition Manager,* select the appropriate definition from the list:

Manual Input – used when entering a timestamp to be associated with a manual data entry value (refer to the *Web Manual Driver* module)

9.2 Apply Correction Factor

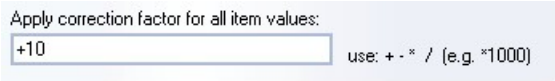
Correction Factor is a simple expression, which can be added to any statistical object with the selected data item. If a statistical object contains several data items, then, the correction factor can be set for every data item separately.

If the correction factor is set for a data item in a statistical object, then, when retrieving value of that data item for that object, first of all, each retrieved value from a database will be re-calculated, applying the correction factor . Then the statistical functions will be performed on re-calculated values.

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If a chart is displayed on item with the correction factor, then, first, all values will be re-calculated, applying correction factor and then, the chart will display re-calculated data.

Correction factor must have a clear syntax: *<operator><value>*, where operator can be: + or - or * or / and value can be any numeric value. EXAMPLE: **1000* or *+10* (see pic. below)



Value for the correction factor can be also dynamic, i.e. taken from a real-time item value or another statistical object.

If you double-click on the edit box with the correction factor, an item browse window will be opened, where you can select a real-time data source and data item. Then, during report generation, the real-time value of the selected item will be read and used as a value for the correction factor.

If the correction factor contains invalid syntax or invalid value or invalid operator, it will be ignored and all values will be taken for consideration as they are.

9.3 Advanced Visualization

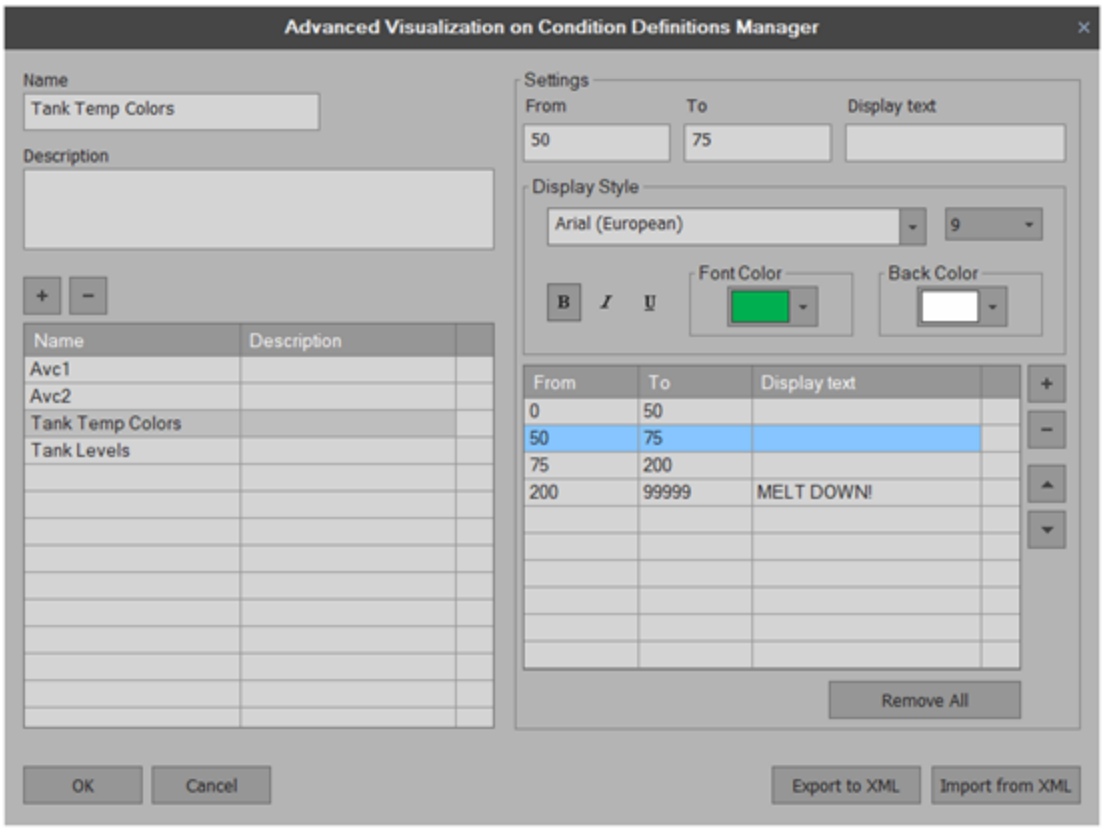


Advanced Visualization option allows you to enhance visualization of the results of the statistical calculations in your report.

Refer to the *Advanced Visualization Condition (AVC) Manager* topic in the *Tools* section of this manual for a detailed explanation of advanced visualization configuration.

EXAMPLE:

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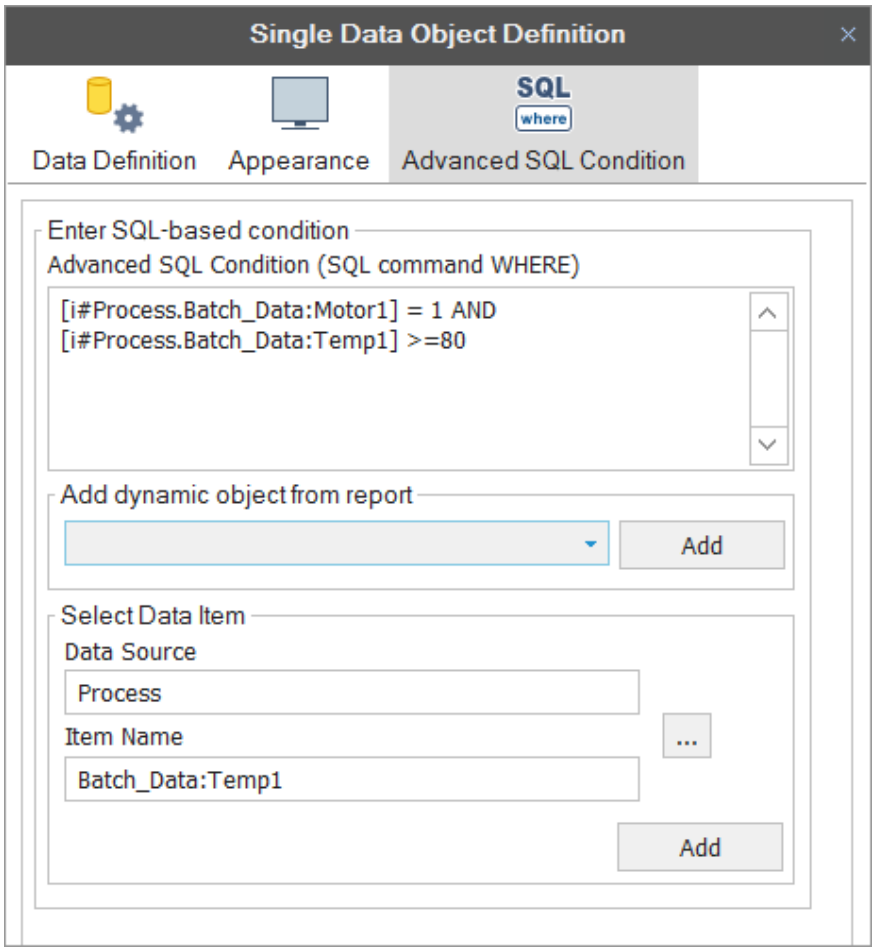


9.4 Advanced SQL Condition

The *Advanced SQL condition (SQC)* enables you to apply additional filtering to the data.

Advanced SQL condition is configured as the *"WHERE clause"* of an SQL command, and will be added to the main conditions, defined in the data object, such as the time period, source, item name etc.

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User can enter any valid SQL condition using any field or column from a table, which is included in the main definition of the data object.

NOTE: SQC cannot contain conditions, which are related to data tables other than the one associated with the data object.

Data item and item(s) from SQL condition should be located in the same table row.
To simplify entering a condition, pick the condition from the *Select Data Item* group of controls. Just select the data source, item name and click on the *Add* button. The item name will be inserted in the format: *[i#<Item Name>]*. Afterwards, it will automatically be converted into a valid SQL expression.
For details, please see List of Dynamic Tokens section.
You can set conditions, which refer to the value of a statistical field rather than the constant value. Select an existing data object in the same report from the combo box, just below the SQL condition edit box, and click on the *Add* button. The selected field will be added to the SQL condition in the format of *[f#<Field Name>]*.
If the SQC contains a field name, then the object value will be calculated as follows: first Dream Report will calculate the values of all objects included in the SQC string, then it will compile the SQC string using the actual object values. Finally, it will calculate value of the entire object.
For details, please see List of Dynamic Tokens section.

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NOTE: Using the name of the entire object in its own SQC may cause deadlock and therefore is not supported.
Creating two objects, where each of them contains an SQC with the name of the other, may also cause deadlock and therefore is not supported.

9.5 List of Dynamic Tokens

Dream Report provides a list of dynamic tokens to display in a specific context.

Below you can find the list of dynamic token, used in Dream Report, with the definition of their functions.

List of Basic Dream Report Dynamic Tokens:

[c#...] - This dynamic token is used in Step tables to give possibility to calculate data between columns and to present this data as an additional column.

[i#...] - This dynamic token has the following format *[i#<Item Name>]* and can be used in 2 possible ways:

a. To provide item name to the Advanced SQL condition;
b. To give currently calculated value to any part of Dream Report, which requests this value, via Analytical driver (i.e. Batch ID to the Report's file name).
EXAMPLE: [i#Analytics.Report1:energy1]

[f#...] - This dynamic token has the following format *[f#Field Name>]* and is used as a parameter that will be replaced dynamically by the value of the item specified in it. It can be used as a part of:

a. Advanced SQL condition;
b. In Expression Objects;
c. In SQL Single Data Objects or in SQL tables.

EXAMPLE: [f#energy1]
NOTE (TIP): value of *f#* token can be used only as part of the current report. If user wants to get this value in another report, he can use *i#* token via analytical driver.

[s#...] - This dynamic token returns to the project different system information and can be used in Dynamic Text Objects.
EXAMPLE: s#ReportName.

[dt#...] - This is the *DateTime* token, which has the following format *[dt#<object_name>]*, and can be used in Expression Objects, in order to perform time-based calculation operations.
EXAMPLE: [dt#energy5].

[cb#...] - This dynamic token has the following format *[cb#<object_name>]* and can be used in 2 possible ways:

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a. For referencing Combo Box objects (where *<object_name>* - is a name of the Combo Box object);
b. In Expression Objects. If the value of the combo box has to be used in the project, it is necessary to define an Expression object, that will contain *[cb#<object_name>]* format. After that it will be possible to use this expression in other places where dynamic tokens can be used.
EXAMPLE: [cb#maintenance1].

[tp#...] - This dynamic token has the following format *[tp#<object_name>]* and can be used in 3 possible ways:
a. For referencing Timestamp Picker objects (where *<object_name>* is a name of the Timestamp Picker object);
b. For time definition in Calculated Time Period and Manual Input modes;
c. In Expression Objects. As soon as it's referenced in Expression objects, it can be used in Advanced SQL condition and other places where dynamic tokens are used.
EXAMPLE: [tp#Energy_production].

[#correction] - This dynamic token is used for a special item name that has to be set in the *Manual Input* statistical function (Single Data Objects), if the Manual Input function will be used for correction operations.
EXAMPLE: [#correction].

[ipp#<parameter>] - This dynamic token is used for accessing Internal Project Parameters defined in the project.
EXAMPLE: [ipp#<Cycle 3>].

List of Web Manual (Entry) Driver Dynamic Tokens (used in Advanced SQL Condition):

[k#ONLY_VALIDATED] - This dynamic token is used when only validated values will be received from Web Manual (Entry) Driver.
[k#NOT_VALIDATED] - This dynamic token is used when only NOT validated values will be received from Web Manual (Entry) Driver.
[k#ORIGINAL] - This dynamic token is used when only original submitted values will be received from Web Manual (Entry) Driver.
EXAMPLE: Tag_Name=[f#exp_tag_name] AND *[k#NOT_VALIDATED]*.

List of Preprocessor Dynamic Tokens

[gen#BatchId] - This dynamic token will be replaced by ID of the batch (Batch ID) for which the report is generated.
[gen#ReportStartTime] - This dynamic token will be replaced by *Report Start Time* as configured in the dynamic generation settings.
[gen#ReportEndTime] - This dynamic token will be replaced by *Report End Time* as configured in the dynamic generation settings.
[file#<file_name>#<param_name>] - This dynamic token will be replaced by the parameter value that will be found in the specified *<file_name>*. The file has to have a special format in order to be used in Report Preprocessor. The special file format is:

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```
<ods_rpp_document ver = "1.00">


  <ods_rpp_param_list>

    <ods_rpp_param name = "param1" value = "value1"/>
    <ods_rpp_param name = "param2" value = "value2"/>
    <ods_rpp_param name = "param3" value = "value3"/>

  </ods_rpp_param_list>

</ods_rpp_document>
```

List of Item Properties Dynamic Tokens

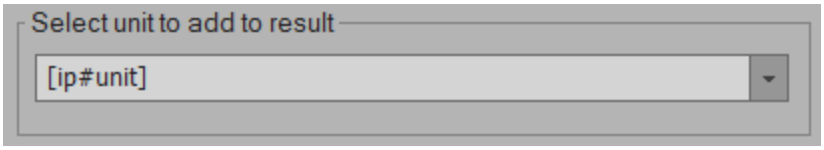
The following Item Property (**[#ip...]**) dynamic tokens apply only to the following Communication Drivers (as of ver. 2020 R2) – *Data Models, Advanced ODBC Historical Values, AVEVA Historian Historical Values, GE Proficy Historian Historical Values:*

[ip#unit] – returns the engineering **unit** defined in the data item/tag
[ip#descr] – returns the **description** configured with the data item/tag
[ip#addr] – returns the **address** associated with the data item/tag

The required syntax is as follows: '[ip#<Data Source>.<Item Name>.unit]'

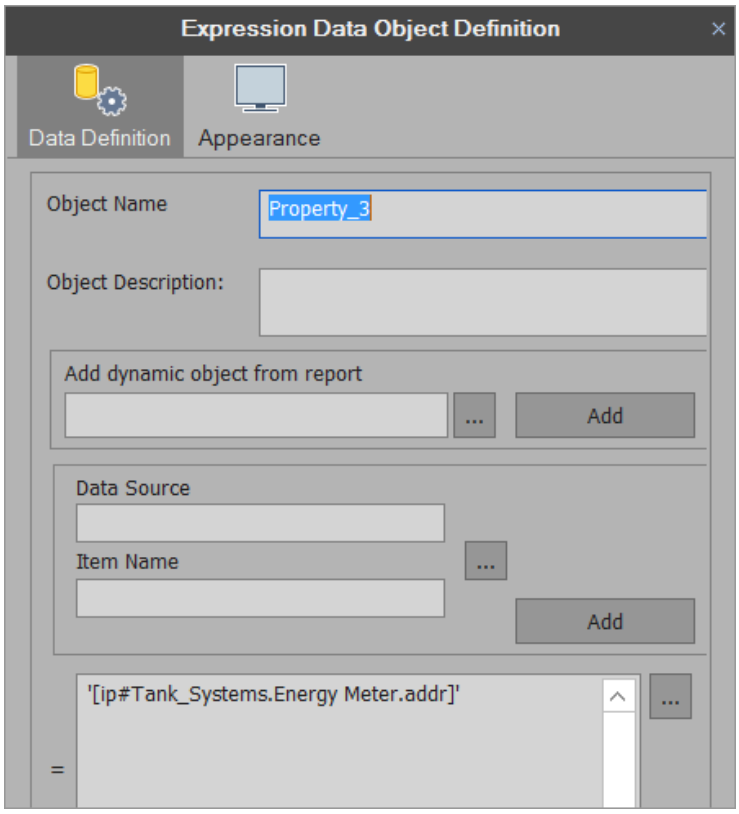
EXAMPLES:

1. Use the *[ip#unit]* dynamic token directly in a Single Data Object to return that data item's units:



2. Use any of the **Item Property** dynamic tokens in an Expression object:
   '[ip#Tank_Systems.Energy Meter.unit]'
   or
   '[ip#Tank_Systems.Energy Meter.descr]'

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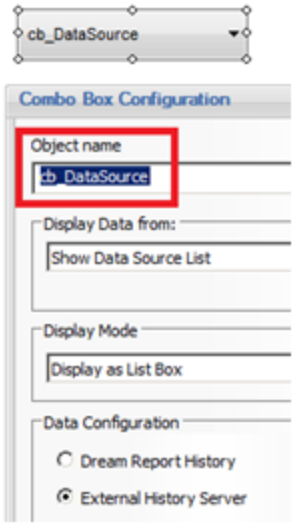
9.6 Using Dynamic Tokens in a Data Source Definition

Dream Report allows the use of dynamic tokens when specifying a Data Source or Item Name in a reporting object (e.g., Single Data Object, Line Chart, Item Table, etc.) This is useful if multiple data sources (e.g., redundant historians) have the same set of tagnames), as you have the ability to dynamically switch data source, simply by referencing a *dynamic token* that contains the Data Source name. The data source might be user-selected from a *Combo box*, or assigned in a logical *Expression object*.

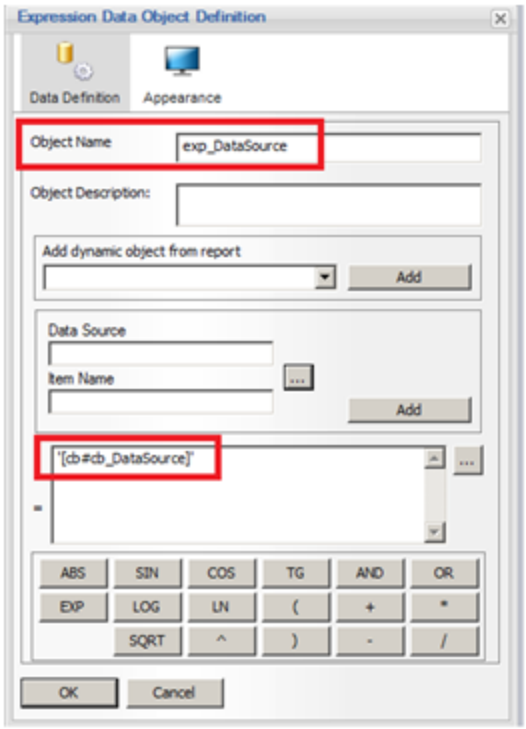
For example, a combo box with the list of data sources can be used on a Web report. Then, in the reporting objects, set a dynamic token (*[f#..]*) instead of a an actual Data Source, which will use dynamic data source from the combo box selection during report generation on the web portal.

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1. Add a *Combo box* to Display Data from a Data Source List:

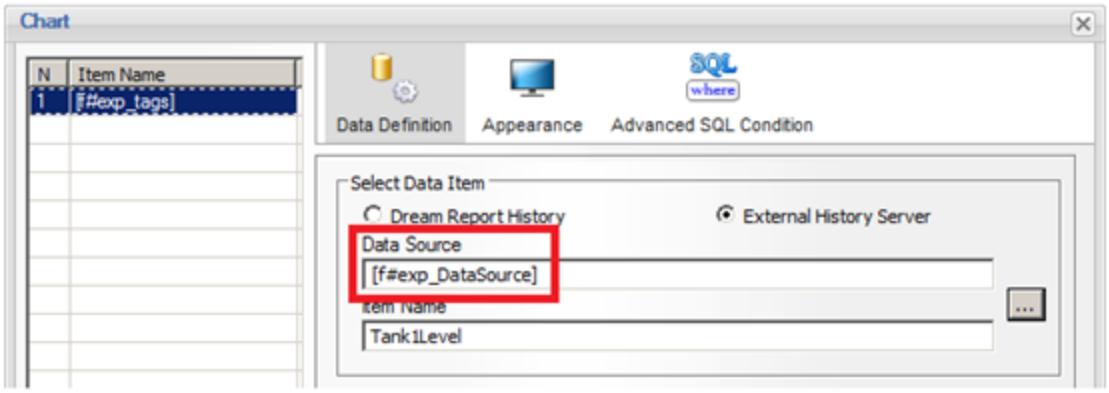


2. Add an *Expression* object to the report, which simply references the Combo box by name (note the single-quotes around the object name):

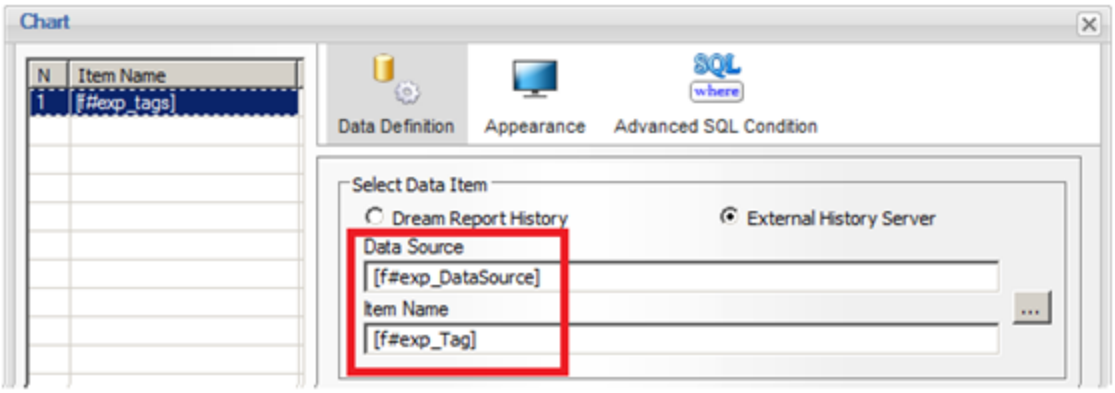


3. In a reporting object (e.g., a *Line Chart*) select an Item (tagname) from a Data Source, and then replace the actual Data Source name with a dynamic token reference to the *Expression object name* containing the dynamic Data Source name:

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NOTE: The same approach can be used for selecting/assigning a *dynamic item/tag name*, based on a user selection or other logic expression that assigns a tag name. In the following Chart example, both a dynamic Data Source and Item Name are used:



The following matrix shows which reporting objects support dynamic data sources and items.

Object	Data Source	Item
Item Table	Yes	Yes
Step Table *	Yes	Yes
AST Table	No	Yes
Chart	Yes	Yes
Bar	Yes	Yes
Pie	Yes	Yes
Single Data Object	Yes	Yes

* Note that for the *Step Table*, the dynamic replacements supported inside the column defined as a *Single Data Object*, but not if tag is defined for the Step Table step.

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Tools

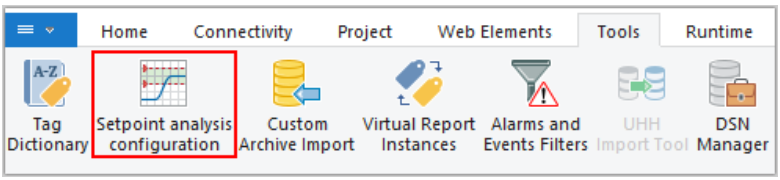
10 Tools

10.1 Setpoint Stability Analysis

Setpoint analysis is a special module, which allows smart analysing of thermal and other processes, where the process is based on a setpoint stability analysis. It allows automatic detection of the stability periods, entry and exit points of those stability periods.

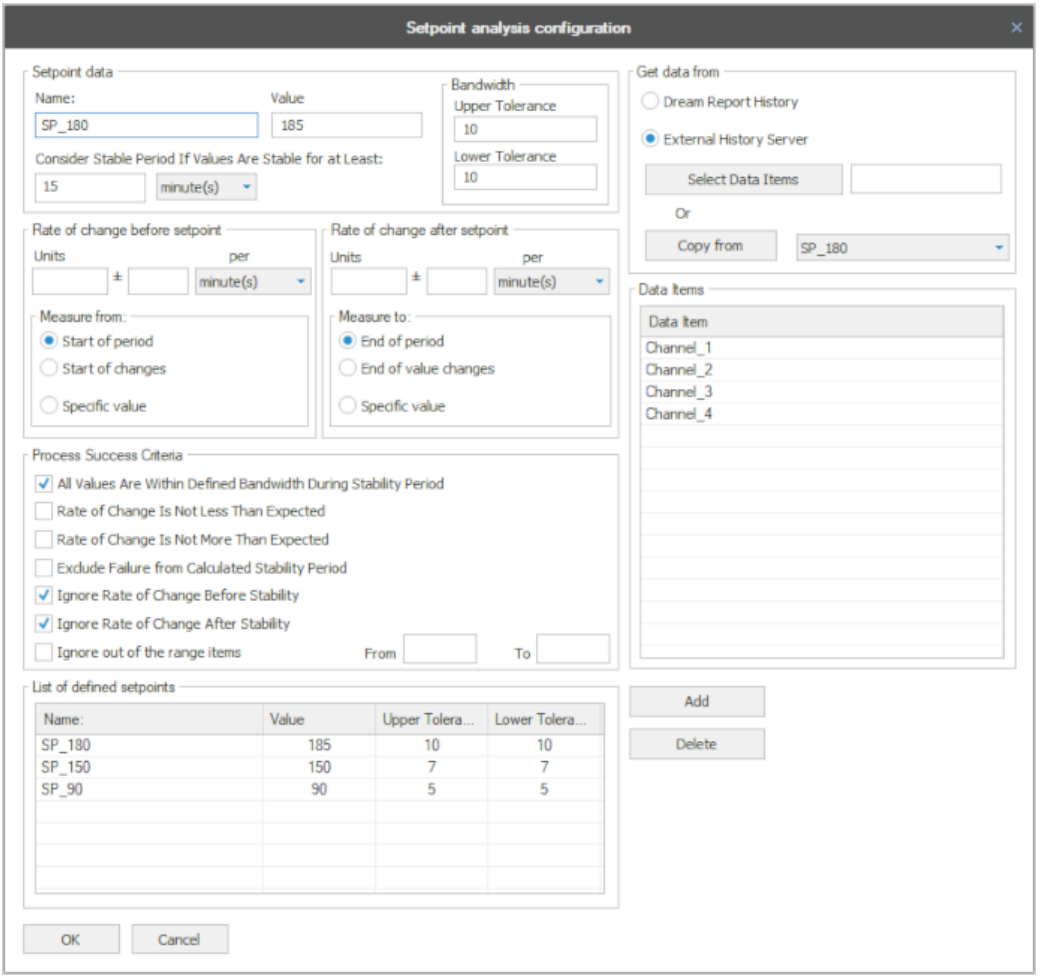
To use *Setpoint Analysis*, user has to create setpoint definitions. Then the analysis result can be used in a chart and in statistical functions.

You can create setpoint definitions in the *Setpoint analysis configuration* window. To open it, click on the command button *Setpoint analysis configuration* on the *Tools* ribbon icon on the horizontal toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu (see pic. below):



The following dialog window will open:

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To define a setpoint, enter a logical *Name* (logical name is unique and can't be the same for different setpoints).

Then, enter *Setpoint Value* and its *Bandwidth*. *Bandwidth* defines high (*Upper Tolerance*) and low (*Lower Tolerance*) levels for the stability. This enables to resolve the task, when high and low tolerance values are different. Both *Upper Tolerance* and *Lower Tolerance* values can be defined as a tag – then real-time tag value at the moment of report generation will be used for the corresponding parameter. Double-click on *Upper Tolerance* or *Lower Tolerance*, and the *Select Data Item* dialog will be opened.

Select any available real-time driver and select a tag, which real-time value will be taken during report generation for the corresponding tolerance.

In the right-hand part of the dialog window select one of the sources to obtain data from: *Dream Report History* or *External History Server.* Select data source and data items, which will be used as a source for the data for setpoint analysis.

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If setpoint configuration has already got some setpoint definition with required data source and tags, select such a setpoint from the combo box next to the button *"Copy from"* and click on that button. This new setpoint definition will copy all defined items from the selected setpoint.

Then click on the button *"Select Data Items"*. The *Select Data Items* dialog window will be opened.

Select items/tags, which will be used for this setpoint analysis.

If "*Dream Report History*" radio button will be enabled, then, the combo box "*Select Data Source*" will contain a list of data access drivers defined in the project. If "*External History Server*" will be selected, the "*Select Data Source*" combo box will contain a list of history access drivers defined in the project.

In *Select Data Source* and *Available Data Items*, select the source and item from which Dream Report will calculate values.

Click on the button "*Add*" in the *List of defined setpoints* section and a new setpoint definition will be added to the project. Its name, value and tolerance will appear in the table in this section.

Consider Stable Period if Values are Stable for at least enables users to define the stability period by setting the time period when the values will remain stable.

Rate of Change (ROC)

If you are interested in measuring the rate of change of your values before entering the stability zone and after exiting it - you can set the criteria for the rate of change measurement.

There are 2 sections:

Rate of change before setpoint - contains the criteria for the rate of change measurement before entering the stability zone.

Rate of change after setpoint - contains the criteria after exiting the stability zone.

Both sections have the same configuration parameters and controls.

Rate Of Change (ROC) has 2 sections to be defined:

- *Value* - you have to specify the expected rate of change (units (e.g. degrees C) per time unit (e.g. per hour, per minute)).
- *Criteria* - to start/stop the rate of change measurement. For the measurement criteria there are 3 options available:

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1. *Start/End of period*. This means that the start time (for ROC before setpoint), or the end time (for ROC after setpoint), will be start/end of the calculation period, defined in the statistical object (e.g. start or end of the batch).

2. *Start/End of changes* - means that the rate of change measurement will be not calculated from the start or until the end of an object calculation period, but only from the point of time when values started to change (or until values are changing). If this option is selected, the edit box will appear, where a user can enter the ***minimum change of value***, from/until which ROC will be calculated.

3. *Specific value*. This option sets a specific value, so that the rate of change will start/stop its calculation only when the item value will reach this value. If this option is selected, the edit box will appear, where a user can enter the *control value* for start/stop of ROC calculation.

Example: If a user sets this option with a specific value of 30, then, the rate of change before setpoint will start its calculation only when the item value (for setpoint) has reached value 30, and will calculate it until the start of the setpoint stability zone.

Setpoint stability zone is a time period, where all values of all items, defined for that setpoint are within the corridor of a setpoint value +- tolerance.

Dynamic values

Almost all the parameters, such as: *Setpoint value, Upper Tolerance, Rate of change value, Lower Tolerance, Specific value, Min rate of change* - can be set as a static number (e.g. 10), or can be set as a real-time tag value. For this, a user can double-click on the needed edit box and the item browse window will be opened. Select the required item and then, in the runtime, when the report is generated, the setpoint module will read the current real-time value of the defined tag, and use its value as a value for that parameter for this specific report generation.

NOTE: If you need to enter manual data (from the "Manual Data Entry real-time values" driver), you will have to do the following:

1. Create Single Data Object 307 in the report.

2. In this *Single Data Object* select the manual data item from the *Manual Data Entry real-time values* driver, which you need for your setpoint module.

3. Select the *Last Value* statistical function for this *Single Data Object.*

4. When double-clicking on the needed edit box in the setpoint module configuration, select from *Analytical* driver this *Single Data Object*. The setpoint module will then read the last value for the manual tag entered.

Process Success Criteria

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This section contains the set of options, which will be used to define automatic process validation.

All values are within defined bandwidth during stability period option controls the situation when one or multiple values will fall out of stability bandwidth. If this option is enabled, the process result will be *Failed*. If this option is disabled, then the process result will be *Succeed*.

Rate of change is not less than expected/Rate of change is not more than expected option controls how rate of change influences the result.

- If rate of change is less than expected and the option *"Rate of change is not less than expected"* is enabled – the process will fail, and if this option is unchecked – the process will succeed.

- If rate of change is more (faster) than expected and the option *"Rate of change is not more than expected"* is enabled – the process will fail, and if this option is unchecked – the process will succeed.

Exclude failure from calculated stability period option influences only calculation of duration of stability period and no other influence.

This option controls the situation when, during the stability period, one or multiple points will exit from the stability bandwidth and then return back into the stability corridor. If this option is enabled, then the time period, when one or multiple values will be out of range, will be excluded from the calculated duration of stability. If this option is not checked, the full stability period will be taken for duration calculation.

Example: The stability period started at 10:00 and finished at 11:00. During this period one data item exited from the stability bandwidth at 10:10 and then returned back into the stability corridor at 10:30. If this option is enabled, the duration will be 40 min, and if it will be unchecked, the duration will be 1 hour.

Ignore rate of change before stability/Ignore rate of change after stability options define if rate of change should be considered for the process validation ("Stability result" function).

If any of those check boxes will be checked, the rate of change will be ignored during calculation of the "Stability result" function.

Ignore out of the range item(s) option enables to discard from the setpoint calculation the items with the values, which are either higher or lower than the ones defined in the setpoint.

When this option is selected, a user will be able to set Low (*From)* and High (*To*) limits for the setpoint definition.

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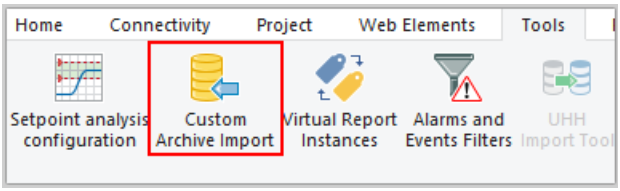
Any calculated statistical function or a chart, where the setpoint with such definition is used, will check if the entry value of every item, defined in the setpoint for the specified/selected time period, is in the range. If the item is out of the range, it will be excluded from the calculation. If the item, which is used in the setpoint, has no value available for the specified period, it will also be considered as an item, which is out of the range.

By default, this option will be unchecked. If this option is checked, but no working range has been set, a user will get the warning message asking to define the range.

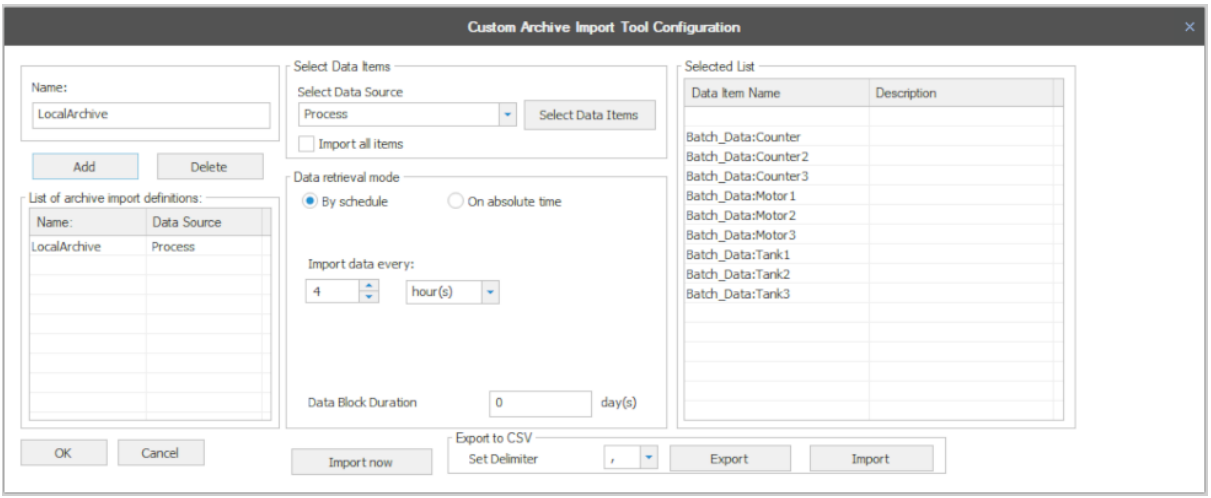
10.2 Custom Archive Import Tool

This *Custom Archive Import Tool* (also referred to as *CAIT*) enables users to access any available external archive (using any defined HDA driver) and periodically import its data (values) into the Dream Report internal database, which makes this data available for reporting from the standard Dream Report database.

To configure custom archive import, click on the command button *Custom Archive Import* on the *Tools* ribbon icon on the horizontal toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu (see pic. below):



The *Custom Archive Import Tool Configuration* dialog window will be opened:



User can create one or multiple archive import definitions.

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To *create a definition*:

1. Put a logical name of that import definition into the *Name* edit box. Import definition name is unique and can't be the same for multiple import definitions.

2. In the *"Select Data Source"* combo box, select required *History access data source*, which will point to the needed external archive.

3. Select data items, which values you need to import. To do it, click on *"Select Data Items"* button and the item selection window, where you can select all needed items, will be opened.

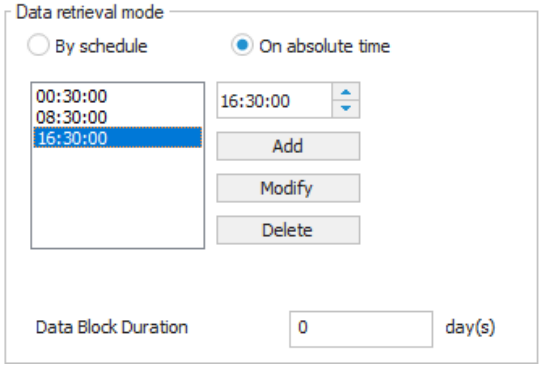
All the selected items will appear in the *Selected List* of Data item names.

If you want to import data from all data items, available at the data source, you don't need to open the item selection window. Just check the check box *"Import all items"* and Archive Import will import all values from all found items.

4. Set *Data retrieval mode*. It has 2 options: *by schedule* and *on absolute time.*

If *by schedule* radio button will be enabled, then, each defined period the archive import tool will connect to the external archive and import all new values (see the pic. above).

If *on absolute time* option is enabled, then, the archive import tool will connect to the external archive and import all new item values at an exact time specified in the combo box (see example below):



5. Click on the button "*Add*".

Now the archive import definition is ready.

6. If user needs to import item values as soon as the archive import definition has been created, he can click *Import Now* directly in the Dream Report Studio and data archiving will be started.

7. You can also *Export* and *Import* the archive configuration(s) to a CSV file and edit the file in notepad (or Excel) and then import the configuration back into your project, or import the configurations into a new project.

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NOTE: In order to launch data archiving immediately, the archive import definition must be first saved (by clicking "*OK*" button). Only then user can open *Custom Archive Import Tool Configuration* dialog window again and start data item import directly in the DR Studio.

Functionality

When starting the runtime manager, it will detect that there are Archive Import definitions available and it will launch the Custom Archive Import Tool engine (*DR_cait.exe*) This will launch a timer and at each scheduled archive event, the following operations will be performed:

CAIT will check in the Dream Report database the last value and timestamp available with the data imported from that Archive import definition. If no data is available, CAIT will know that it's the first import and all data available at external server will be imported into the Dream Report database. If CAIT detects that some data is available, then it will import all data, available in the external server, starting from the timestamp of the last value, available in the Dream Report database and until the current (import) time. So, this way, if during any importing session the connection to the external server was not available, the data will not be lost. They will be automatically imported during the next session.

Using Archive Imported data in reports

When user has added one or several archive import definitions, then, when selecting a list or real-time data source in every statistical objects the list of available data sources will contain both - the real-time data source and the list of archive import names. When a user selects an Archive Import definition as a data source, then browse of data items will display the list of all data items, selected for that archive import. Or, if Archive Import definition has "*Import all items*" enabled, then the list of all items, available at the external data source will be displayed in the item browse window.

NOTE: Runtime configuration control options 595 (*"Run as service"* or *"Run as application"*) can influence the performance of Custom Archive Import Tool (CAIT). If CAIT is launched via Runtime Manager and import is performed to/from SQL Server, please make sure that Runtime Manager is running under user who has an authorized access to SQL Server.

10.3 Virtual Report Instances

Virtual Report Instances is a module, which enables to create multiple pre-defined instances of the same report template, where each instance will use the same template with different pre-defined tags. This will allow users to reduce the design time for cases where the same template should be used with different tags.

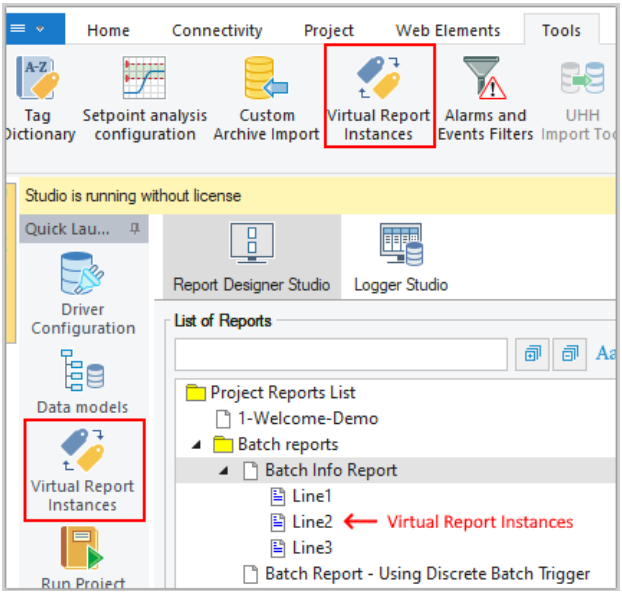
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Configuration

User can create a *Virtual Instance*. It is one or multiple instance definitions, which includes the list of tags, used for that report instance, and the logical name for that definition.

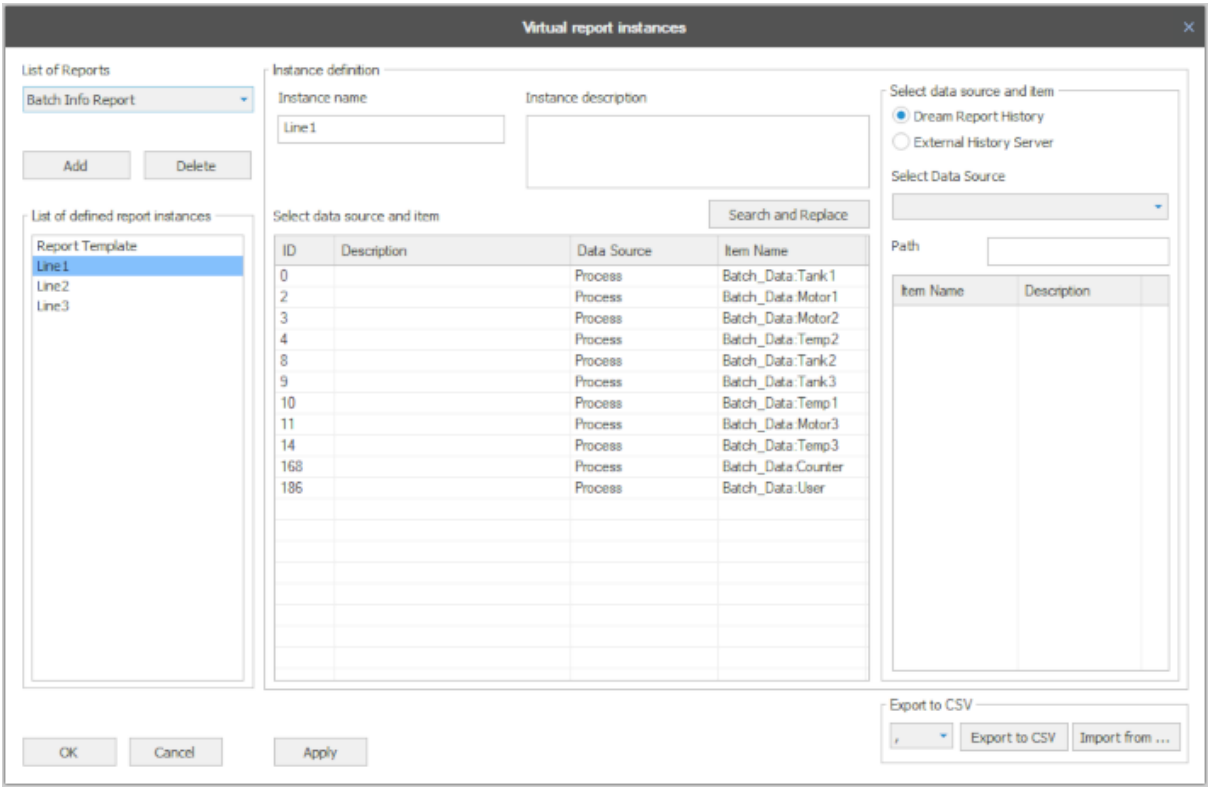
To create *Virtual Instance*, click the right mouse button either on the context menu on report in the report list, or on the context menu on the report page in the *Report Designer* studio.

You can also click on the command button "*Virtual Report Instances*" on the *Tools* ribbon icon of the horizontal toolbar, or on the *Virtual Report Instances* command button on the vertical (*Quick Launch*) toolbar in the Dream Report Designer Studio menu:



The *Virtual report instances* dialog window will be opened:

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If a user opens this *Virtual report instances* window for report with no instances defined, then, this window will show the default instance entry with all originally defined tags. Any time, when user clicks on it, he will see the tag dictionary or just the list of tags, defined in that report.

If a user modifies tag descriptions or any tag in the default instance, and clicks *OK*, then, the pop-up message box will appear, asking *"You are about to change tag dictionary or replace one or several tags, used in that report. Do you want to continue? Yes/No"*. If a user clicks on "No", all changes will be discarded. If *"Yes"*, then the tag dictionary of that report will be modified accordingly.

For details on how to define/ configure Tag Dictionary, please, see Tag Dictionary 161 of this manual.

To *create a new instance*, in the *Instance definition* combo box:

1. Enter *Instance name*, which has to be unique for that report.

2. Enter *Instance description* into the corresponding edit box (optional, not required).

3. Select required *data sources* and *items*/tags for each dictionary entry.

4. Click on *Add* button.

To *delete the instance:*

1. Select any defined instance in the list.

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2. Click on the button "*Delete*". Then a message box will appear, asking: *"Do you want to delete the virtual instance "…"? (Yes/No)"*. If user clicks on *Yes*, the instance will be deleted.

To *modify existing instance:*

1. Select any defined instance in the list

2. Make required modification.

If you change selection to another instance or click *OK,* changes will be automatically applied to the selected report.

The *"List of Reports"* combo box in the upper left corner of the window contains the list of all reports, available in the current project. The current selection will always show the report, that this window has been opened for.

If a user changes selection to another report, then the tag dictionary and instances configuration of another report will be opened here. However, all modifications, done for the previous report, will be not canceled. They will be stored in the memory. Only when the user clicks on *Apply*, all current changes (to all reports) during this working session (since this window was opened), will be saved into the configuration file. By clicking *OK* all changes will be saved and the window will be closed. If a user clicks on *Cancel*, then all changes will be ignored and the window will be closed.

All virtual instances configuration will be saved in the XML file *"rvi.xml"*. This file will be saved in the project folder and will contain all virtual instance definitions for all reports in the project.

Dynamic Token object

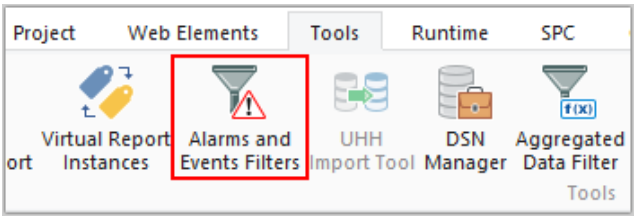
The *Dynamic token object* will have a new entry in its combo box: "*Instance name"*. If it's selected and the report is generated, its displayed value will be the name of a virtual instance, which was currently generated. If report is generated for generic template, then the string "Default" will be displayed.

Exporting and Importing VRI Configurations

You also *Export* and *Import* the VRI configuration(s) to a CSV file and edit the file in notepad (or Excel) and then import the configuration back into your project or import the configurations into a new project. This is also the recommended method if you need to rename items or make mass changes to items/tagnames used in the virtual report instances.

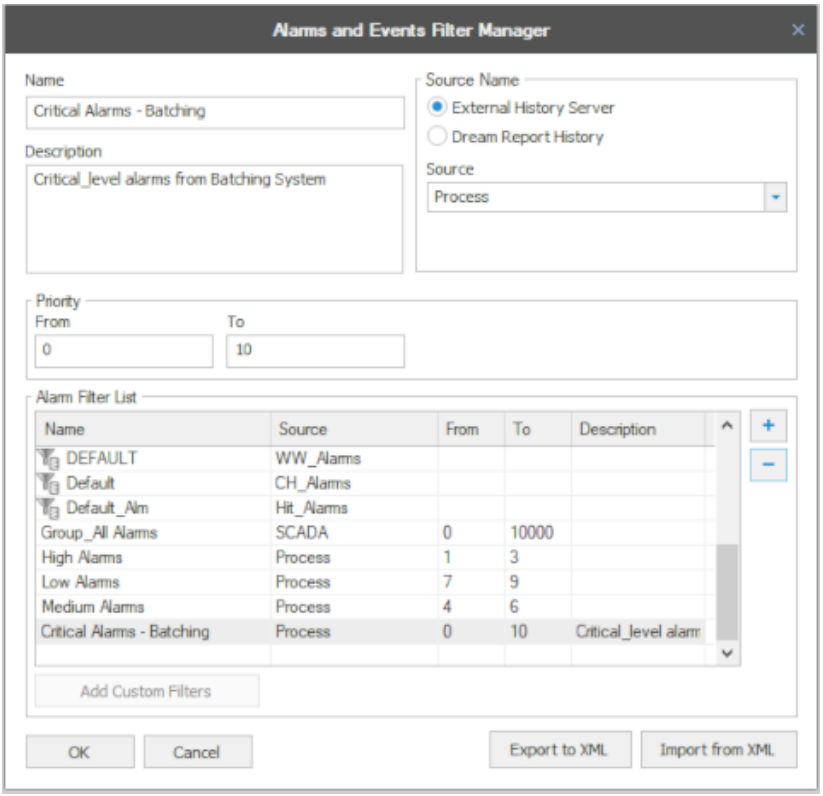
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10.4 Alarms and Events Filter Manager



The *Alarm and Events Filters* manager is used to limit the alarms included in calculations for a specific object within the user-defined properties. A Dream Report project has one global per-project list of alarm filters, which is accessible from the Alarm Table, or any object that supports alarm data sources within any report in the project, or from *Tools > Alarms and Events Filters* icon in Studio.

The purpose of this window is to define and manage priority-based alarm filters, and to select custom filters (defined in specific Alarm Data Sources). The *Alarm Table* object, or any object that supports alarm data sources within any report in the project, can then reference the filters from *Alarms and Events Filters* manager:



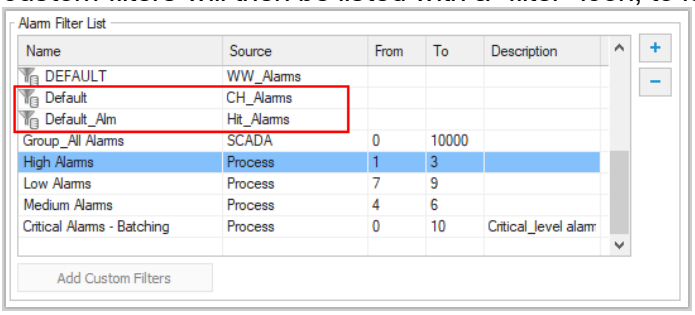
To add a priority-based alarm filter for a specific Alarm data source (previous defined in the *Driver Configuration* Wizard):

1. Select the *External History Server* or *Dream Report History* *Source Name* from the list;

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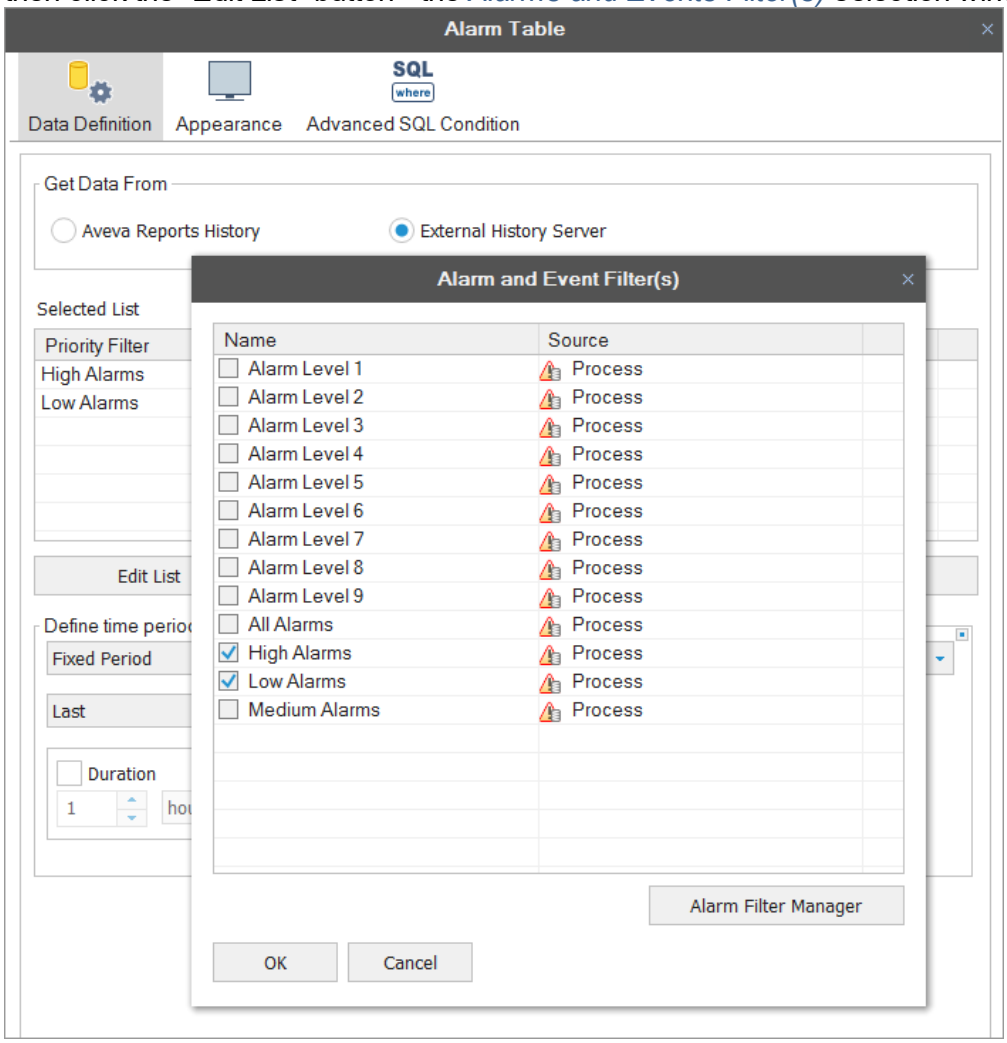
2. Enter a unique filter *Name,* and optional *Description;*
3. Enter the desired *Priority* range for this filter;
4. Click the "+" button to add the filter to the Alarm Filter List or select a filter from the list and click "-" to delete it.

If you wish to add any custom filters defined in specific Alarm Driver configurations (e.g., filters based on alarm group, alarm types, acknowledge state, etc.), select the specific *External History Server* or *Dream Report History Source Name* from the list, and then click the "*Add Custom Filters*" button. Any custom filter(s) associated with that Alarm Source will be listed - select the filter(s) to add to the *Alarms and Events Filters* manager. Those custom filters will then be listed with a "filter" icon, to identify them as being custom filters:



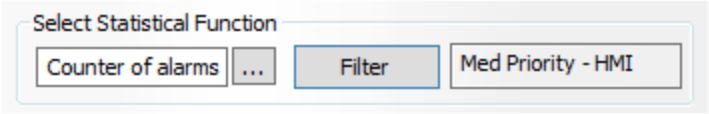
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To reference one or more filters from the *Alarms and Events Filters* manager in the *Alarm Table* object, *Get Data From* either *Dream Report History* or *External History Server*, and then click the "Edit List" button - the *Alarms and Events Filter(s)* selection window will appear:



Select the alarm filter(s) you want to reference in the Alarm Table, or click the "*Alarms Filter Manager"* button to launch the *Alarms and Events Filters* manager to add additional filters.

In a *Single Data Object* or *Automatic Statistical Table*, if any of the *Alarm Analysis Functions* are selected, click the "***Filter***" button, and then select the appropriate alarm filter from the *Alarms and Events Filter(s)* pop-up window, or click the "*Alarms Filter Manager"* button to launch the *Alarms and Events Filters* manager to add additional filters.

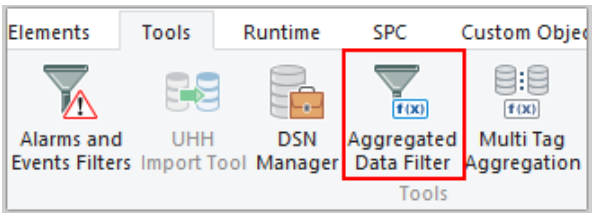


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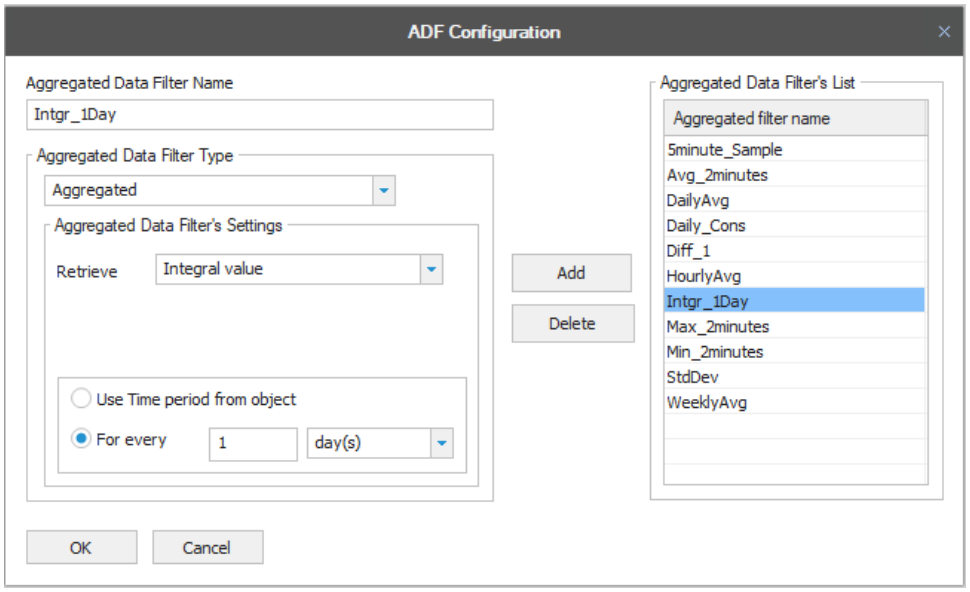
10.5 Aggregated Data Filter

Aggregated Data Filter enables Dream Report to connect to any external history (HDA) data source, and not only to retrieve all values as an array of raw values, but to do smart data retrieval (i.e. extract key values, aggregated values etc.).This mechanism allows smart aggregation extraction from any custom proprietary data source (e.g. binary files etc.).

To configure an aggregated data filter, click on the command button *Aggregated Data Filter* on the *Tools* ribbon icon on the horizontal toolbar either in the Dream Report Studio menu (see pic. below):



The "*ADF Configuration*" dialog window will be opened (please see the picture below):



"*Aggregated filter name*" edit box of the "*Aggregated Data Filters List*" section will contain the list of all aggregated data filters (ADFs) defined in the project.

To configure ADF user will have to:

1. Enter ADF Name ("*Aggregated Data Filter Name*");

2. Select ADF type (in the "*Aggregated Data Filter Type*" combo box). There are 2 options available: "*Sample based*" and "*Aggregated*".

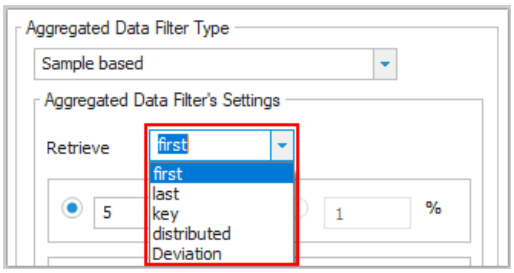
- If *"Sample based"* mode is selected, then, please:

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a) in the *"Retrieve"* combo box select among the available options (*"First", "Last", "Key"* and *"Distributed"*) which values should be retrieved;

b) in the *"Samples"* edit box enter a number of samples (whole non-zero numeric value);

c) in the *"For every"* combo boxes select step period for data retrieval (please see the picture below):

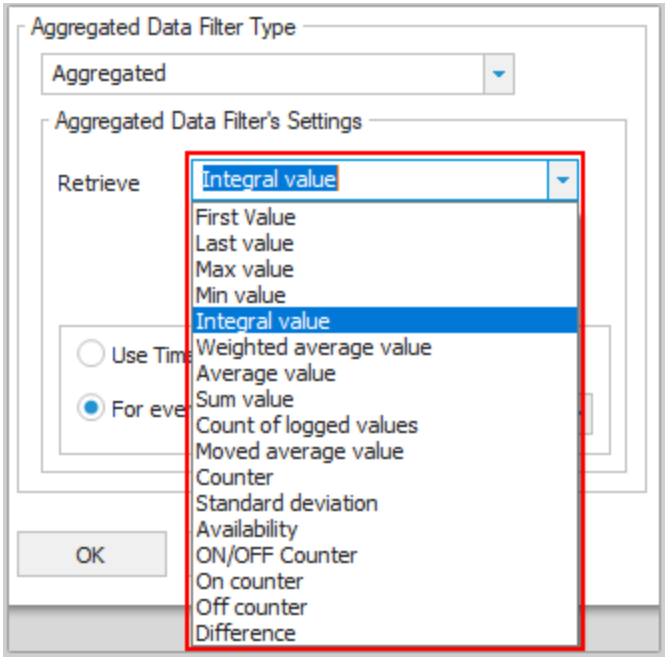


Step period for data retrieval can have the following options: *"second(s)", "minute(s)", "hour(s)", "day(s)", "week(s)", "month(s)", "year(s).*

- If *"Aggregated"* mode is selected, then, please:

a) in the *"Retrieve"* combo box select statistical function which will be calculated for every defined period. Statistical function selection has the following statistical functions available: *"First Value", "Last Value", "Maximum Value", "Minimum Value", "Integral Value", "Weighted Average Value", "Average Value", "Sum Value"* and *"Moved Average Value"* (for details on the definition of each of these statistical functions, please go to the Single Data Object 307 section of this manual);

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b) in the *"For every"* combo boxes define time period. Time period unit has the same options as the step period data retrieval option described above, i.e.: *"second(s)", "minute(s)", "hour(s)", "day(s)", "week(s)", "month(s)", "year(s)*

3. Click on the button *"Add"* and the new filter will be added to the Aggregated Data Filters List.

All project ADF filters list will be saved in the project database.

ADF Functionality Performance Overview

ADF functionality works as follows:

1. Any HDA driver should be configured for the project.

2. "Aggregated data filter" should be defined for that project (in the ADF configuration the data retrieval mode is selected).

3. When designing reports, any tag in any object can be selected and ADF can be applied to this tag (*"ADF to be used"* option in the Designer Studio data objects).

4. During report generation, ADF will be used to get aggregated data and will perform statistical calculation on that aggregated data (and not on raw values).

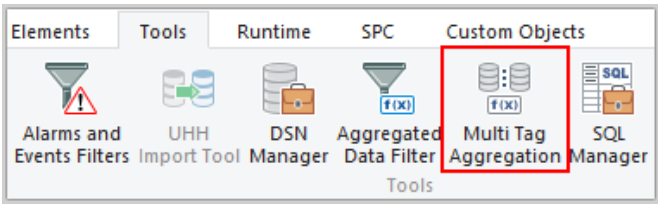
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10.6 Multi-Tag Aggregation

Multi-Tag Aggregation allows Dream Report statistical objects to perform operations not only with one tag, but to perform operations with arrays of values from different tags. Once a Multi-tag Expression (MTE) has been created, it can be used in any chart, table or item field. For example, there might be a requirement to plot a "total quantity on hand" of four storage tanks over the course of a week. You could create an MTE named "*QtyOnHand*", with the expression *(T1_Level + T2_Level + T3_Level + T4_Level)*, and then reference this expression for a pen on a Line Chart. Additionally, you can apply an Aggregated Data Filter (ADF) when configuring the Multi-tag expression. In the above example, if the requirement was to plot the daily average quantity on hand for the four storage tanks, you would create the above MTE, and include an ADF of "1 Day Average" applied to the expression.

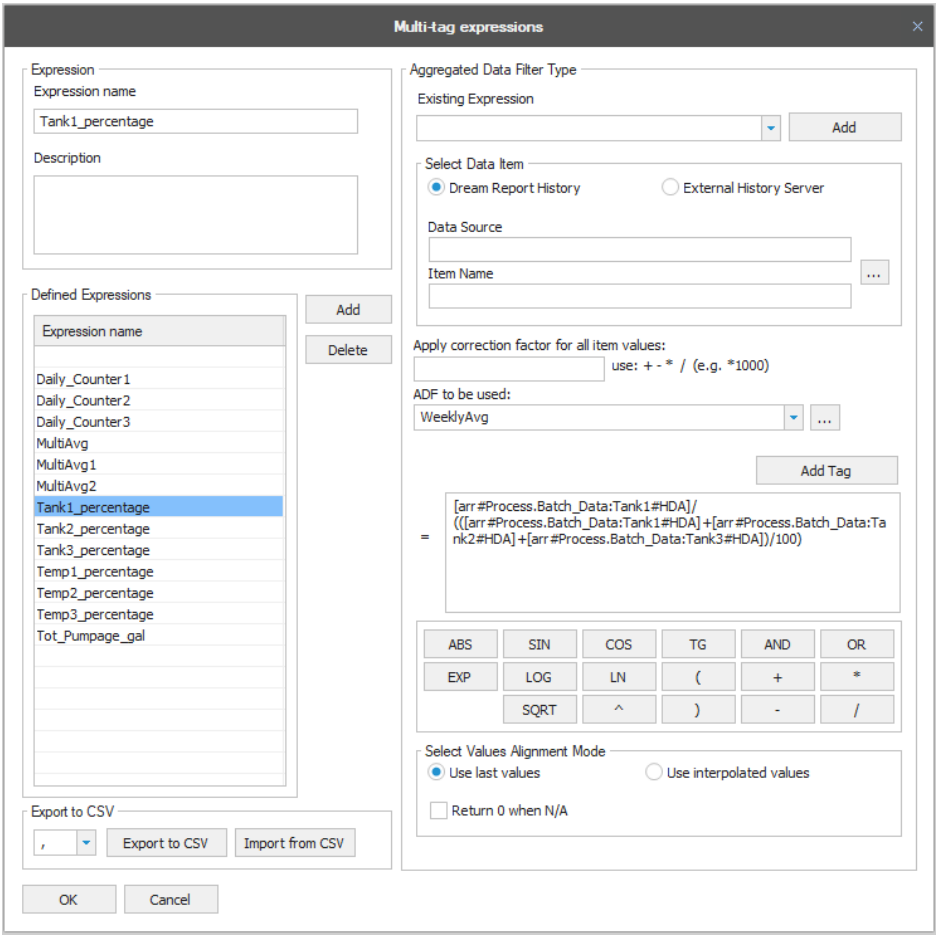
Multi Tag Aggregation Configuration

To configure Multi-tag expressions, click on the *"Multi Tag Aggregation"* command button on the *"Tools"* ribbon icon on the horizontal toolbar in the Dream Report Studio menu (see picture below):



The *"Muti-tag Expressions"* dialog will open:

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Enter an *Expression Name*, which must be a unique name which describes the expression.

The *Existing Expression* option allows users to select an existing expression from any report, or an existing MTE to the new Multi-tag expression. To use this, choose an object from the list-box and click, the *Add* button. The object name will be added to the expression edit box. The selected dynamic object will be added in the format of [f#<Field Name>] or [arr#MultiTagAggregation.<MTEName>#HDA].

The *Select Data Item* section allows the user to select and add any data item from any available data source to the expression. Click the *Add Tag* button to add the selected item to the expression in the format [arr#<item name>]. When calculating the result for the expression, Dream Report will get the value of the data item and replace [arr#<item name>] with that value. To add mathematical or logical operators, click on the appropriate button and it will be added to the expression. The calculation expression can be edited manually as well, directly in the expression edit box.

Apply correction factor for all item values enables adding a simple expression to all tag values, before they are used in the calculation expression. For more details, please, refer to the **Correction Factor** section.

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ADF to be used enables the user to select an aggregated data filter to be applied to the expression. *"ADF to be used"* combo box will contain all ADF definitions configured in the project. The default string will be "Not Used", i.e. no filter (ADF) is applied.

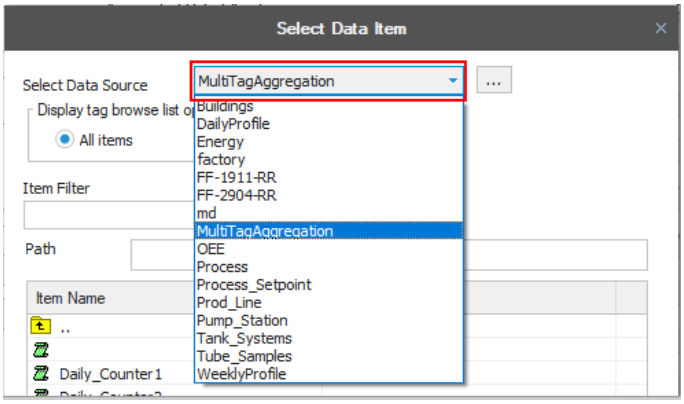
For details on ADF definition/configuration, please go to the **Aggregated Data Filter** section of this manual. Once an ADF has been applied to the Multi-value expression, the expression will be calculated over the time interval defined in the ADF, with the sampling/aggregation rule applied.

Select Values Alignment Mode enables the user to select whether the MTE should *Use Last Value* for the MTE calculation period (e.g., if a daily aggregate, and the last value was logged at 23:30, use that value) or *Use Interpolated values.*

Once the Multi-tag expression has been created, click the *Add* button to add it to the list of Defined Expressions. You can define as many expressions as are needed in the project. Click the *OK* button to close the Multi-tag Expressions dialog.

To use a Multi-tag Expression in a Reporting Object

Once a Multi-tag Expression (MVE) object has been defined, it can be used in an Item field, Step table, Chart, Bar, Pie, or Automatic Statistical Table. In the *Select Data Item* section of the reporting object, select the *External History Server* option, and then select *MultiTagAggregation* in the list of available data sources. Select the desired MTE from the list of defined expression:



Once selected, the MTE will be used as if it were a single data item in the report object - e.g., plotted in a Line Chart, aggregated in an Automatic Statistical Table, etc.

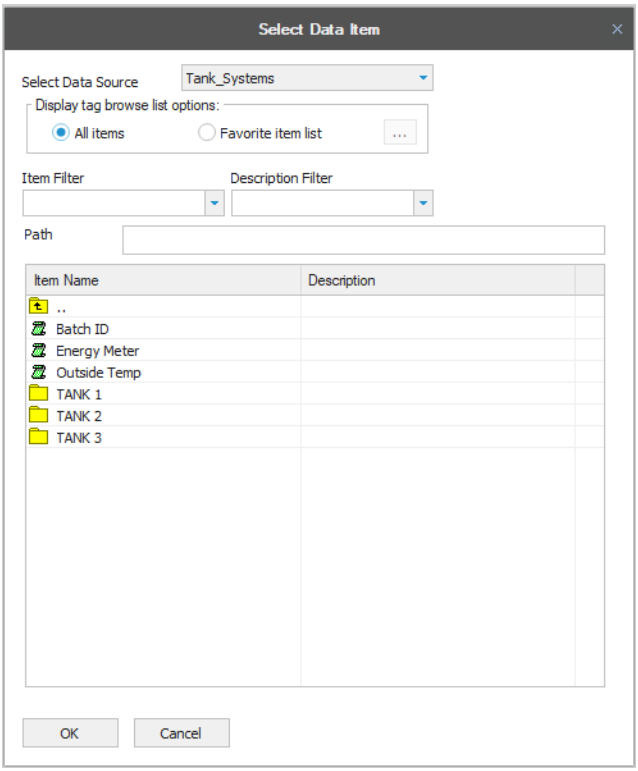
Tag Helper (Tag Selection)

Tag Helper is a new module that allows users to pre-select tags, which will be very often used in a reporting project, and then to select tags for reporting objects from this pre-selected list. This function will help users to avoid selecting tags from thousands of tags from the server and save a lot of engineering time.

NOTE**:** This option works only with historical drivers and is not relevant to DA drivers as DA items browse already shows the list of tags used only for logging.

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If user has selected an HDA *(External History Server)* driver in any object, the following *"Select Data Item"* (tag selection) window will be opened:

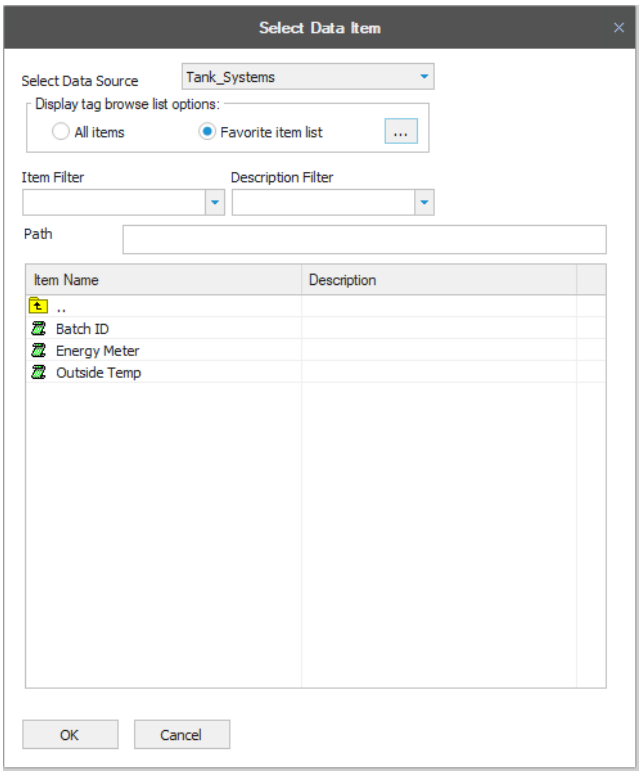


It has two radio-buttons: *"All tags"* and *"Favorite tag list"*. The default selection is: *"All tags"*. When this radio-button is selected, then the items browse will work as in the standard *"Select Data Item"* window.

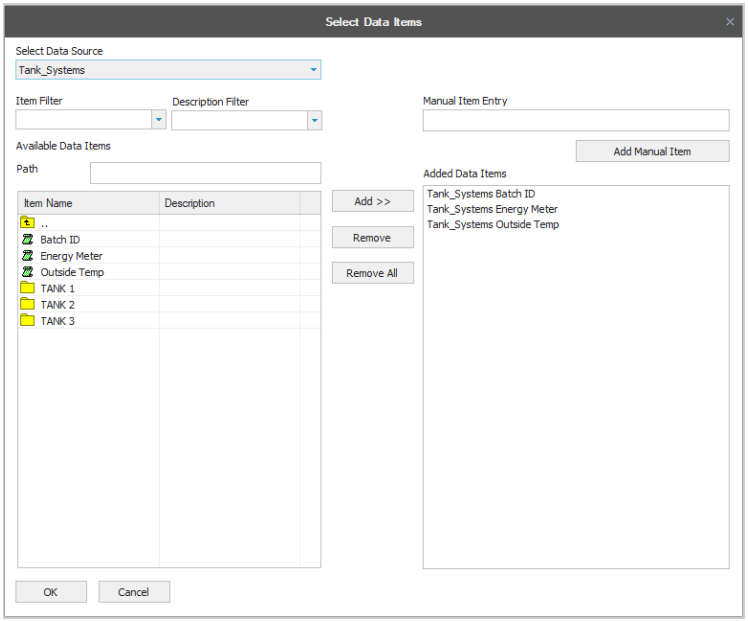
If the *"Favorite tag list"* radio-button is selected, then:

- first, the small button "**...**", next to the radio-button, will become enabled. When the *"Favorite tags list"* option is selected, the item (*Item Name*) browse will display only the list of pre-selected tags for the selected data source (please, see the pic. below):

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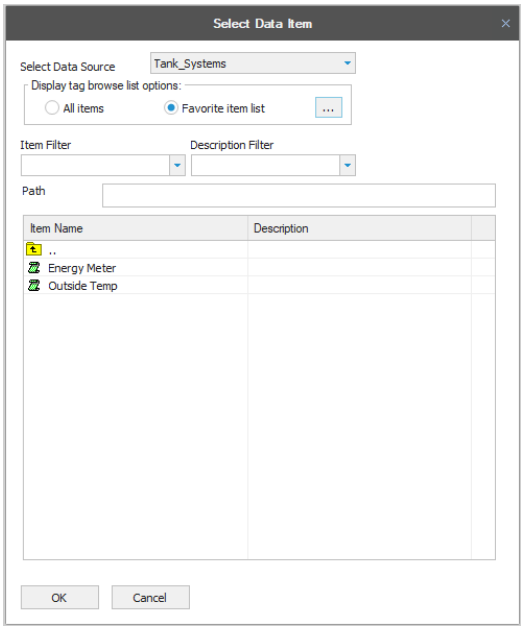
- to pre-select *favorite tags*, user will click on the "**...**" button and the standard Dream Report multi-tag selection (*Select Data Items*) window will be opened (please, see the pic. below):



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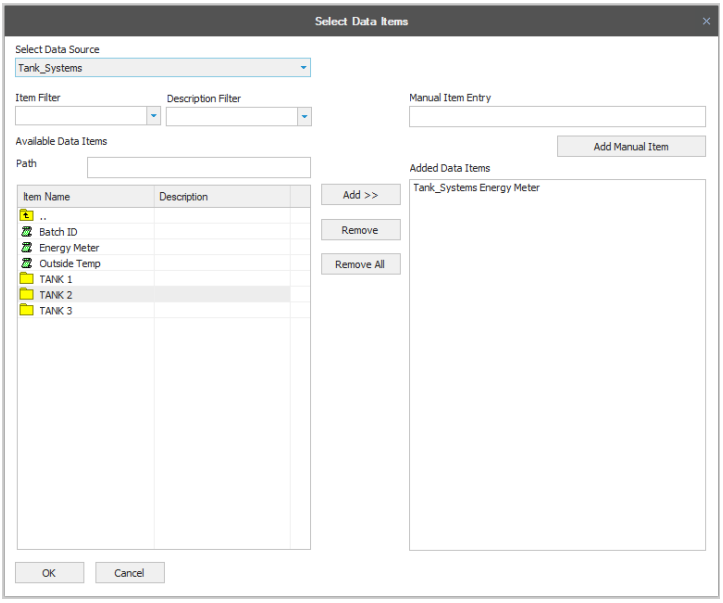
This window will automatically select the driver, which has been selected in the *"Select Data Item"* (tag selection) window. User will be able to select any other HDA driver, defined in the project, and pre-define the list of favorite tags for all defined/required data sources in the same window, without closing and re-opening it. (If the *"Select Data Item"* (tag selection) window has no driver selected yet, then the *"Select Data Items"* (multi-tag selection) window will have no driver selected as well).

- When user will close the *"Select Data Items"* (multi-tag selection) window and select *"Favorite tags list"* in the *"Select Data Item"* (tag selection) window, the tag browser (*"Item Name"*) will not display all the entire list of tags from the data source, but will display only the list of pre-defined tags (please, see the pic. below):



NOTE: This option will also be available in the *"Select Data Items"* (multi-tag selection) window (please, see the pic. below):

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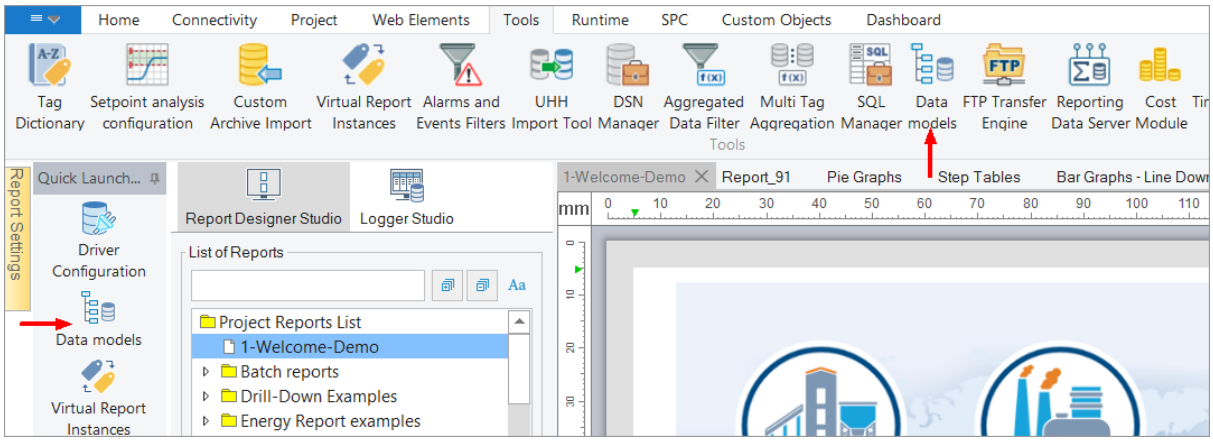


10.7 Data Model

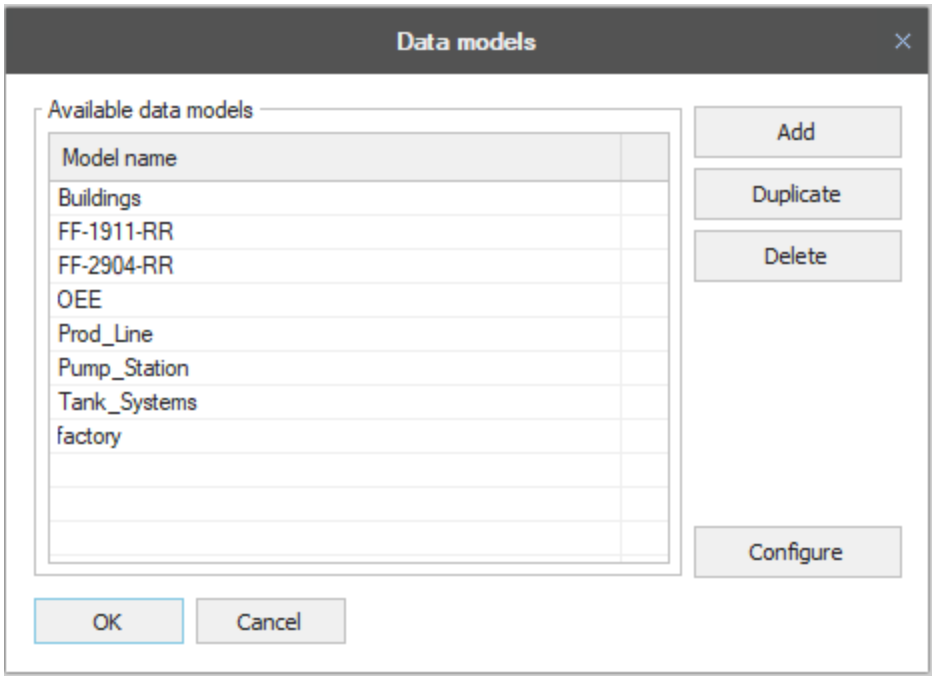
The Dream Report *Data Model* feature provides the ability to organize and structure tags (data items) from one or more data sources in a required structure, as well as dynamically substitute tags for report generation. Tags can be organized in a meaningful hierarchical (folder-based) structure (e.g., by equipment, processing unit, tag types, etc.) which adds context to tags, regardless of the capabilities of the data source. The data sources might be simple "flat" structures such as real-time data, CSV files, or traditional HMI log files; or complex, folder-based tag structures that do not necessarily reflect a practical tag organization. Using the *Data Model*, tag “sources” are hidden from users, and tags can be renamed with meaningful "aliases." Additionally, tags in the data source(s) that are not needed for reporting can be hidden from the user.

The *Data Modeler* configuration can be accessed from the *Data Model* icon on the horizontal *Tools* toolbar, or from the *Data Model* icon on the left side *Quick Launch Bar* in the *Dream Report Designer Studio* (see images below):

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The *Data Models* icon opens a user interface which allows for creating and editing one or more data models:



To Create, Copy or Delete a Data Model

From the *Data Models* user interface:

1. Click the *"Add"* button to *add* a new blank data model. The *Model Name* will be automatically generated as *"DataModel_x".*
2. Double-click on the newly-created *Model Name* to rename it to something meaningful. The model name must not contain any spaces.

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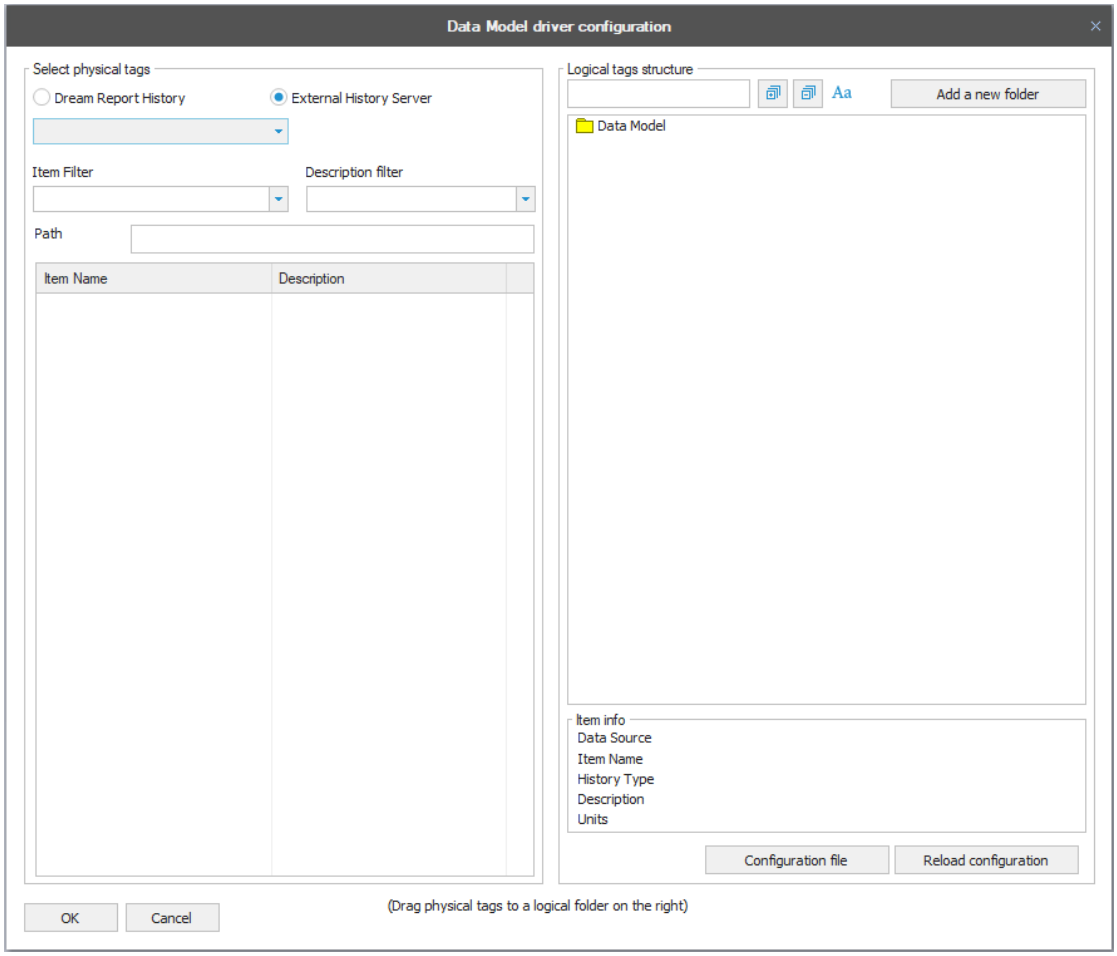
3. If you wish to use an existing Data Model as the basis for a new Data Model, highlight the desired model, and click the *"Duplicate"* button. A *copy* of the model will be created with a new name, at which time it should be renamed with a unique data model name.

4. To *delete* a Data Model, highlight that model and click the *"Delete"* button, and then click *"Yes"* to confirm

To Configure a Data Model - using the Data Model Driver Configuration

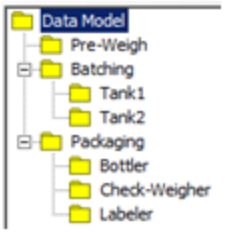
Before creating a Data Model, it is a good idea to have a "sketch" of the needed folder structure. From the *Data Models* user interface:

5. Select (or *Add*, as detailed in the section above) a *Model Name*, and click the *"Configure"* button. The *Data Model Driver Configuration* user interface will open:



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6. On the *Logical Tags Structure* panel on the right side, right-click on the top-level *"Data Model"* folder, and click the *"Insert a new folder"* option. A new (numbered) sub-folder will be created.



7. Double-click the folder number, and enter a *logical name* for the folder.

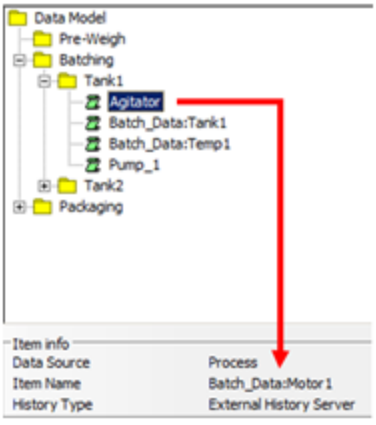
8. At this point, you can either start adding physical tags to the newly-created folder, or repeat steps 6. and 7. until the desired folder is created. Remember that folders can be multiple levels deep

To *Add* tags to a data model folder, in the *Select Physical Tags* left-side panel, select either the *Dream Report History* or *External History Server* option, and then select the appropriate Data Source from the list

9. When a Data Source is selected, a list of physical tags (data items) will be displayed. Select the tag or multiple tags (using the *Shift* or *Control* keys), and then drag-and-drop the tag(s) into the appropriate *Logical Folder* in the data model. The same tag(s) can be dragged into multiple folders.

10. Repeat steps 9. and 10. with tags from different data sources, until the data model is populated with tags, as needed. At this point, logical folders might contain tags from different data sources, and of different types (Dream Report history and External History servers.)

11. Tags in the data model can be *renamed* by double-clicking on the tagname, or selecting the tagname and pressing the *"F2"* button. Type in the new *Logical Name* for the physical tag. Note that the original Data Source name, Item name, and Data Source type for each Logical Tagname can be referenced in the *Item Info* section below the Data Model



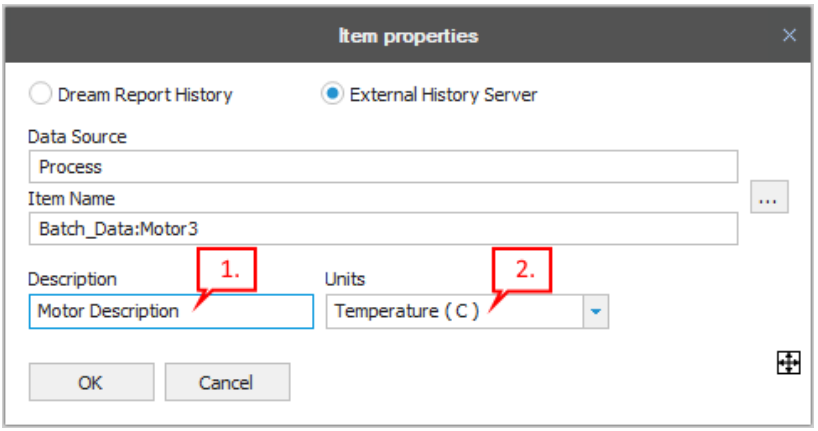
12. Tags can be moved (dragged) from one logical folder to another, and logical folders (already containing tags) can be moved (dragged) to other folders.

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13. To *Save* the configured *Data Model,* click the *"OK"* button, or select *"Cancel"* to discard changes to the model.

14. Click the *"OK"* button to save and close the Data Models window.

Items in a data model can also have user-specified descriptions and engineering units. In the Data Model Driver configuration, right-click on an item, and select "Item properties" - those properties are available: Description and Units:

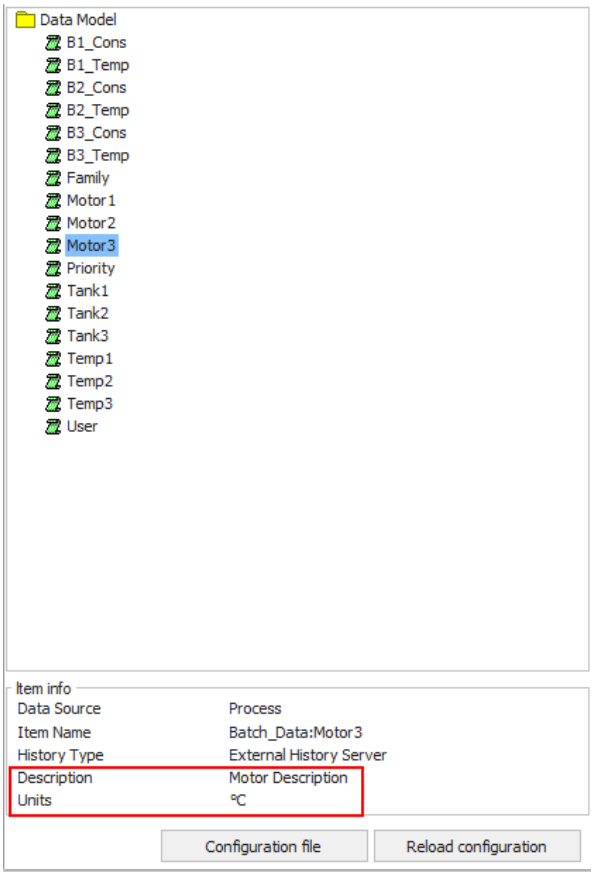


Description – an item description. This can be used in table field captions or chart legends

Units – select an existing unit, or type in your own units

Those options will be displayed in the Item summary view, and also exported to the configuration XML file, where they can be edited:

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To Configure or Edit a Data Model from an XML File

The structure of each Data Model is contained in an *XML file* stored in the specific Dream Report project folder. This file can be edited (using Notepad, for example), which provides an alternate method of configuring the folder structure. The file name for each data model is named according to the following format: *Logic_drv_[DataModelName].xml*, where [*DataModelName*] is the actual data model name. In the example at the start of this model, data model name is "TankSystem_1", so the corresponding file name would be *Logic_drv_TankSystem_1.xml*. The following XML file correlates to the above data model:

```
<?xml version="1.0" encoding="utf-8" ?>
<DataModel>
  <Structure Name="Pre-Weigh" />
  </Structure>
  <Structure Name="Batching">
    <Structure Name="Tank1">
      <Attribute Name="Agitator" Address="Batch_Data:Motor1" DataSource="Process" History="External" />
                  <Attribute Name="Batch_Data:Tank1" Address="Batch_Data:Tank1" DataSource="Process"
History="External" />
                <Attribute Name="Batch_Data:Temp1" Address="Batch_Data:Temp1" DataSource="Process"
History="External" />
      <Attribute Name="Pump_1" Address="Pump_1" DataSource="PLC_Data" History="Internal" />
    </Structure>
    <Structure Name="Tank2">
              <Attribute Name="Batch_Data:Motor2" Address="Batch_Data:Motor2" DataSource="Process"
History="External" />
```


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```
                <Attribute Name="Batch_Data:Tank2" Address="Batch_Data:Tank2" DataSource="Process"
History="External" />
                <Attribute Name="Batch_Data:Temp2" Address="Batch_Data:Temp2" DataSource="Process"
History="External" />
      <Attribute Name="Pump_2" Address="Pump_2" DataSource="PLC_Data" History="Internal" />
    </Structure>
  </Structure>
  <Structure Name="Packaging">
    <Structure Name="Bottler" />
    <Structure Name="Check-Weigher" />
    <Structure Name="Labeler" />
  </Structure>
</DataModel>
```

To edit the XML file:

1. In the *Data Model Driver Configuration* user interface, click the *"Configuration File".*
2. The data model's XML file will open in the *Notebook* editor
3. In Notebook, you can edit sections, rename folders, add new folder sections, rename logical tags, etc. You can also copy and paste sections (indicated by <Structure Name=…> in the file, and rename copied sections (folders) as needed.
4. After saving and closing the XML file, return to the *Data Model Driver Configuration* user interface, and click the *"Reload Configuration"* button - any changes made to the XML file will be loaded and reflected in the logical data model.

NOTE: It is advisable that you do not manually add/type tags (data items) in the XML file, as tags are referenced in a specific format and are case-sensitive.

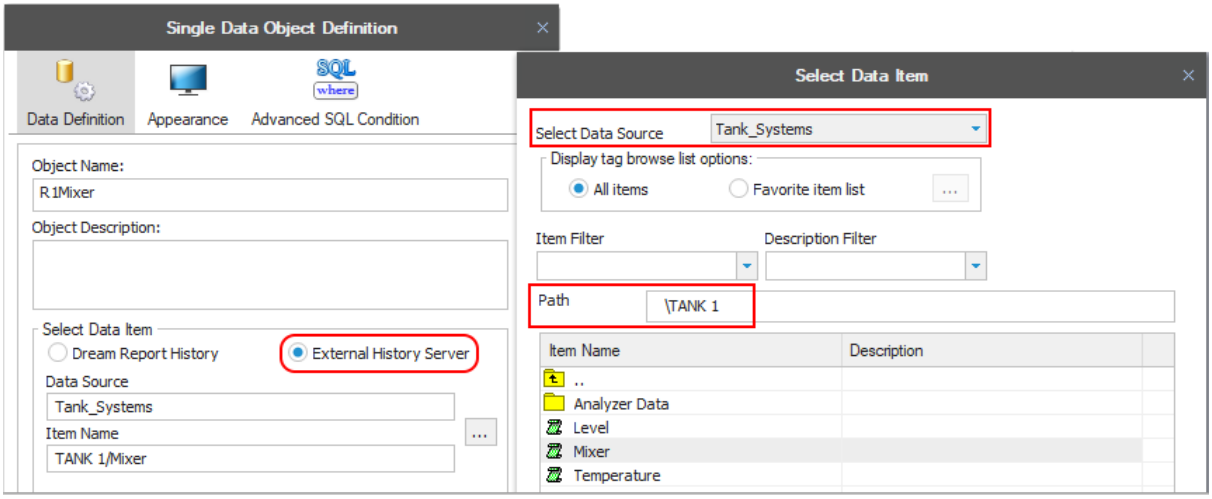
Dynamic Tag Substitution

Instead of configuring a report to reference physical drivers and physical tags, it can be configured to rather reference only a logical driver and logical tags. Then, before report generation, the appropriate XML file containing the actual (physical) tags to be reported on, can be copied into the project folder. The file can be manually copied into the folder, or, using the report's "Macro" configuration, a batch file can be called which copies the XML file. The report will be generated using the dynamic tags substitution map.

Using Logical Tags in a Report

When configuring a report object such as Single Data Object or a Table, a Data Model is referenced as an "External History Server" (regardless if the Data Model contains "*Dream Report History*" source tags), and logical tags are selected in the same way as with physical tags:

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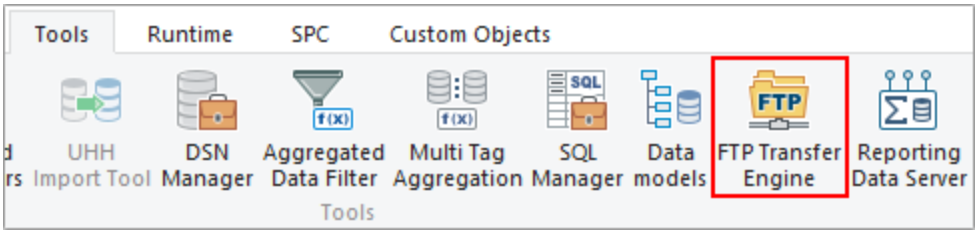


IMPORTANT NOTE: Data model cannot be used as part of another data model!

10.8 FTP Transfer Engine

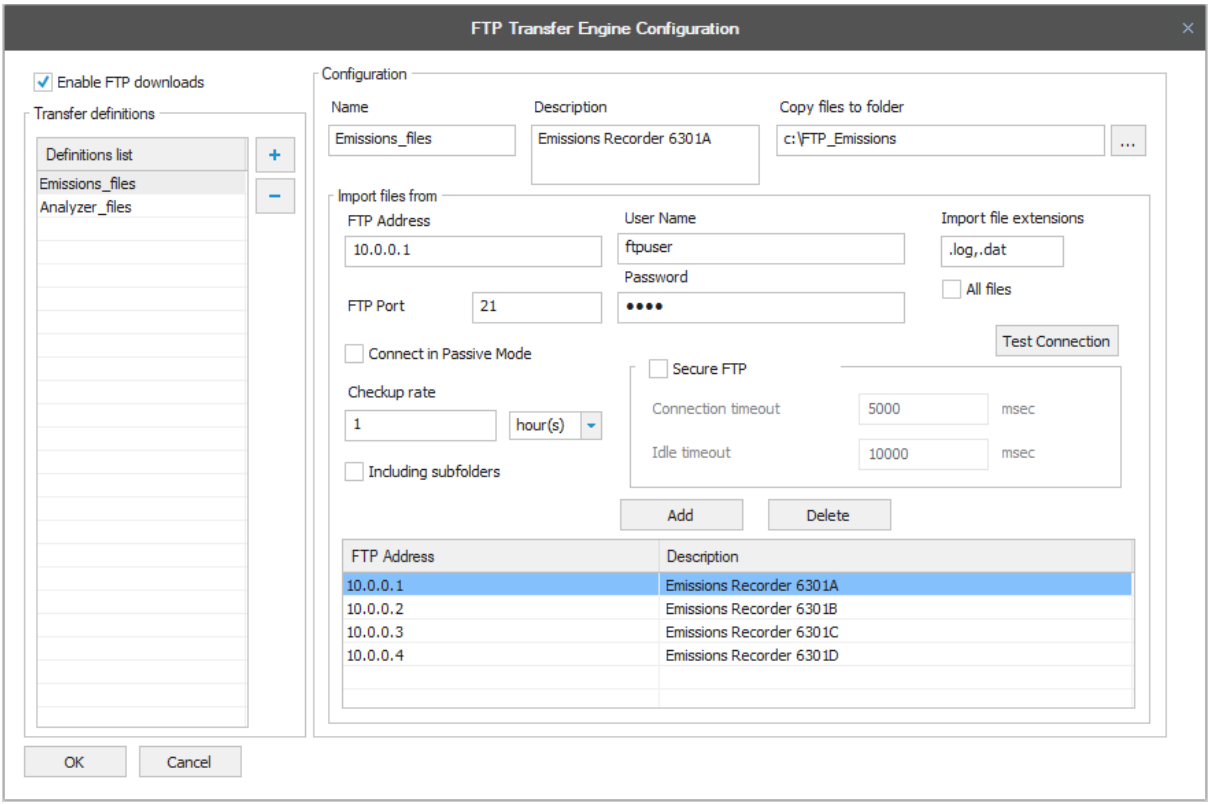
The *FTP Transfer Engine* is a utility which enables Dream Report to periodically download data files from FTP server(s) for reporting in Dream Report.

To define an FTP transfer, click on the command button *FTP Transfer Engine* on the *Tools* ribbon icon on the ribbon toolbar either in Dream Report Studio menu:



The *FTP Transfer Engine Configuration* dialog window will open:

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The *"Enable FTP Transfers"* option must be checked for the FTP Transfer Engine to work. When the project is loaded (at runtime), the FTP engine will be started, and start downloading files at the defined frequency (as described below).

The user can create one or more FTP Transfer definitions from this *Configuration* screen. Typically, an FTP definition is a collection of one or more FTP sites containing the same type of files to be transferred - for instance, if there are number of distributed recorders all logging the same type of data (e.g., CSV files from emissions recorders, DAT files from temperature recorders, etc.)

To create a definition:

1. *Name:* Enter a logical Name of that FTP definition into the "Name" edit box. The Transfer definition name must be unique.

2. *Copy files to Folder:* Enter or browse to a valid path on the Dream Report computer to where all the downloaded files (in this FTP Transfer definition) will be copied. If the same folder is defined for several FTP Definitions, a warning message will appear.

3. *Import File Extensions:* Enter a file extension type, or multiple file types (separated by commas) that can be downloaded as part of this Transfer definition. Dream Report will recognize the file extensions formatted, with a wildcard, a "dot" prefix, or only the file type - e.g., *.CSV, .CSV or CSV. If you wish to import all file types stored in the FTP location, simply check the "All Files" option. This will be common to all FTP transfers in this Transfer Definition.

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4. The *Import Files From section* allows the user to define one or more FTP sites and schedule a transfer that will be associated with that Transfer Definition.
5. *FTP Address:* the address of the FTP site.
6. *FTP Port:* the port number of the FTP site. The default port is "21".
7. *Connect in Passive Mode*: Depending on how the FTP server has been configured, you may need to use a *Passive* connection. In the Active mode, the client (Dream Report) initially specifies which client-side port it has opened up for the data channel, and the FTP server initiates the connection. In Passive mode, the FTP server specifies which server-side port the client should connect to and the client (Dream Report) initiates the connection.
8. *Description:* enter a description for this specific FTP connection.
9. *User Name:* enter a valid User Name for the FTP connection.
10. *Password:* enter a valid Password for the FTP connection.
11. *Secure FTP*: for secured FTP connections, you may need to provide Connection and Idle timeout values to handle FTP connection time out issue.
12. *Checkup Rate:* enter the frequency (in hours, minutes or seconds) at which the Dream Report FTP Transfer Engine will connect to the FTP server and download files.
13. *Including Subfolders*: if checked, any appropriate files contained in any subdirectories on the FTP location will be transferred.

Click *"Add"* to add the FTP definition to this Transfer Definition. Repeat steps 4-13 to add additional FTP definitions. You can modify a definition by selecting that definition in the list below, and make the needed changes. To delete a definition, select it from the list, and click *"Delete"*.

Finally, click the "+" button to add this Transfer Definition to the Definitions List.

At runtime, after each download, the FTP transfer engine will maintain a transfer log (including the timestamp of the last successful transfer and transferred files list). At the next transfer event, only files with a creation date or modification date later than retained data, or a new file name, which did not exist during the last transfer, will be downloaded. If downloading a file to a destination folder where a file with the same name already exists, the new file will overwrite the existing one.

The *FTP Transfer Engine* will log messages into the standard Dream Report log file – start, end and the result (succeeded or failed) of each transfer will be logged. If the transfer failed, the error details will be logged as well.

NOTE: If you receive an FTP connection "timed out" error while testing the connection ("Test Connection" button in the FTP Transfer Configuration screen), or a similar message reported at Runtime in the Dream Report log file, there may be several reasons of that, including:

- Your Internet Service Provider might be blocking the port you're trying to use to connect via FTP - Port 21;

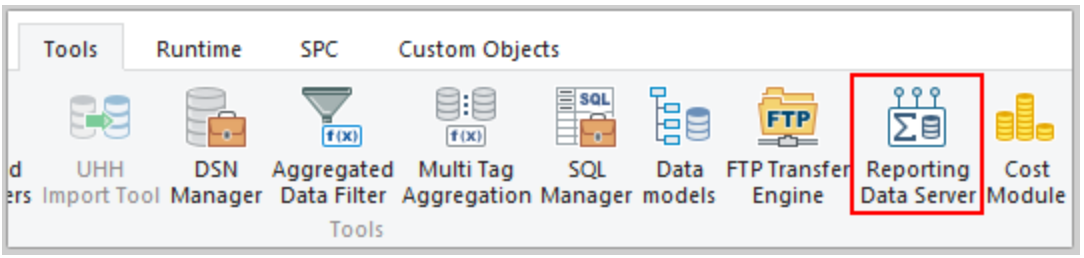
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- The FTP client is not set to work in “Passive” mode - uncheck the “Connect in Passive Mode” option;
- The FTP domain name is expired or is resolving incorrectly. Best practice is to access the FTP server directly via its IP address (e.g., 10.0.0.1, instead of ftp.mysite.com).

10.9 Reporting Data Server (RDS)

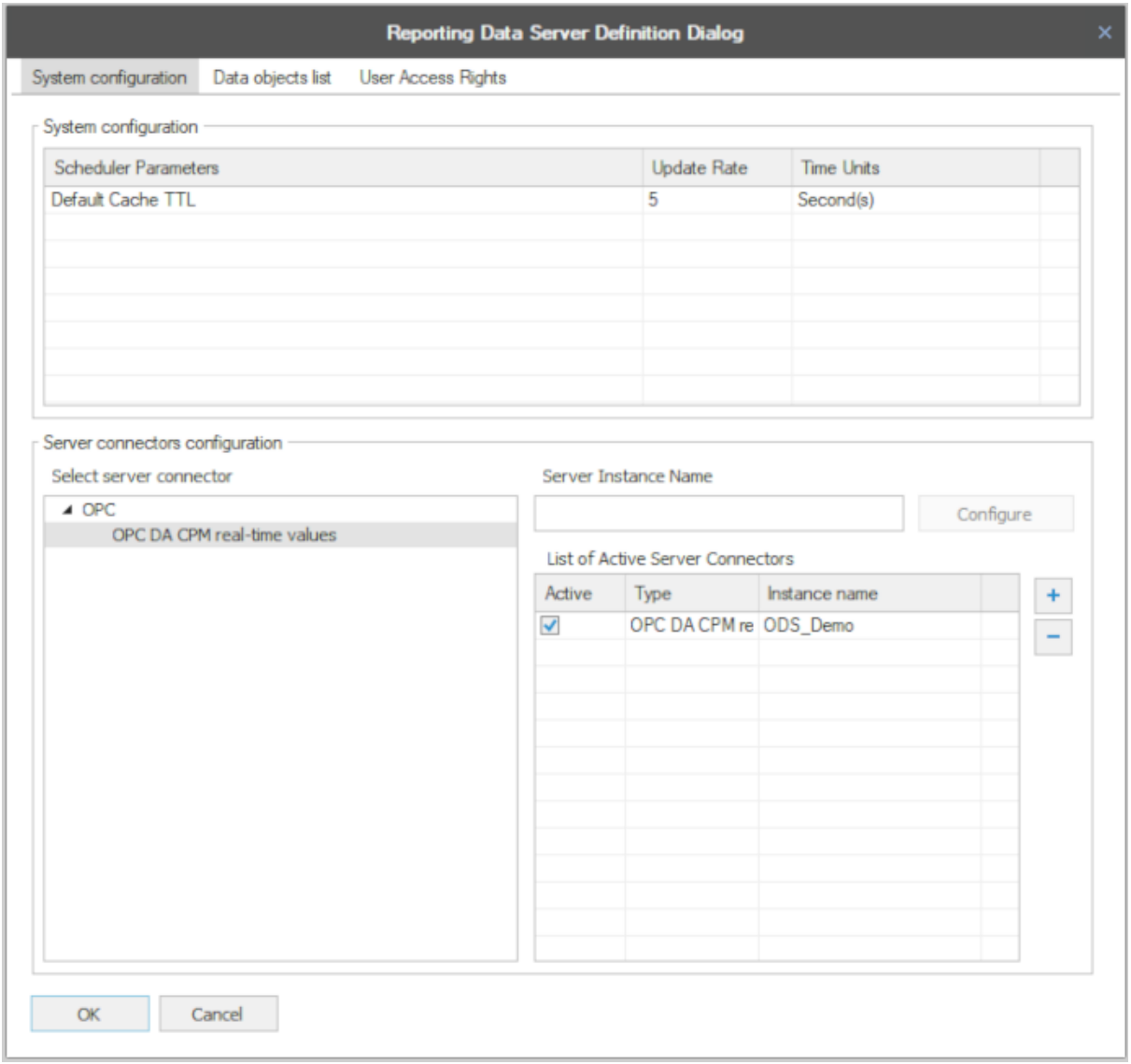
The *Reporting Data Server* is a Dream Report service that exposes data from the internal **System real-time values driver** 785 to external/third-party applications.

Configuring the RDS:



In the “Tools” tab, click on *“Reporting Data Server”* to open RDS Definition dialog. The RDS is configured as follows:

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The *System Configuration* tab is where the server and the parameters to be exposed, are defined.

Scheduler Parameters – specify how frequently values exposed through the RDS will be updated. The default is 5 seconds.

The *Server Connection Configuration* is where instances of the RDS server are defined.

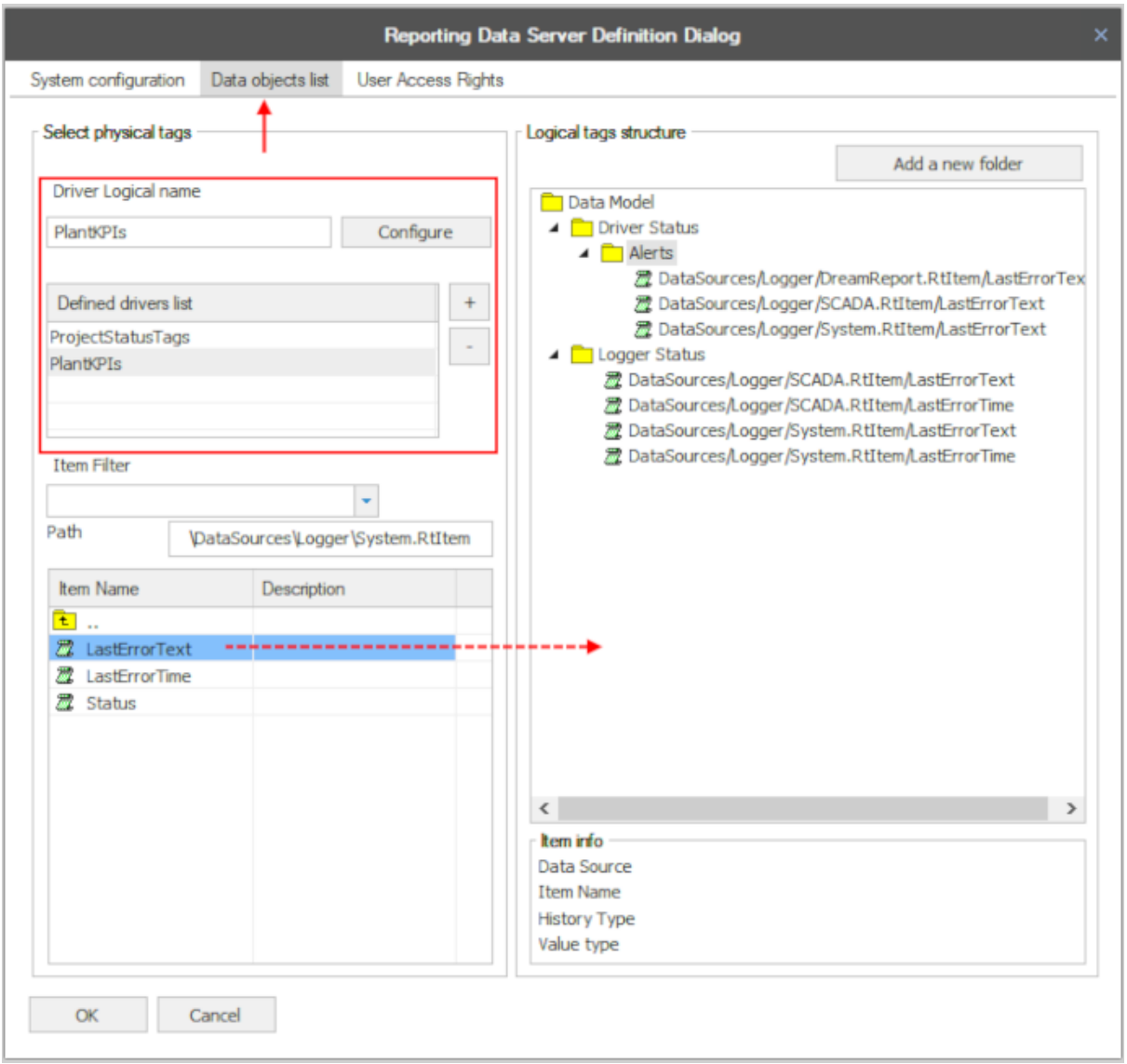
1. *Select Server Connector* – select the OPC DA CPM real-time values driver (as of the Dream Report 5.0 release, the only available driver).
2. *Server Instance Name* - enter a logical name for the server instance, and click the *"[+]*" button to add the server connector to the list. (Clicking on *"[-]"* will remove it from the list). Note that only one OPC DA server can be defined.

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3. Make sure to check the checkbox in the "*List of Active Servers"* before moving to the next tab.

In the *Data objects list* tab, in the "Select Physical tags" section, enter a logical name for the set of tags that will be exposed system driver and configure it as shown earlier. After configuring, click on the *"[+]"* button to add the driver to the list.

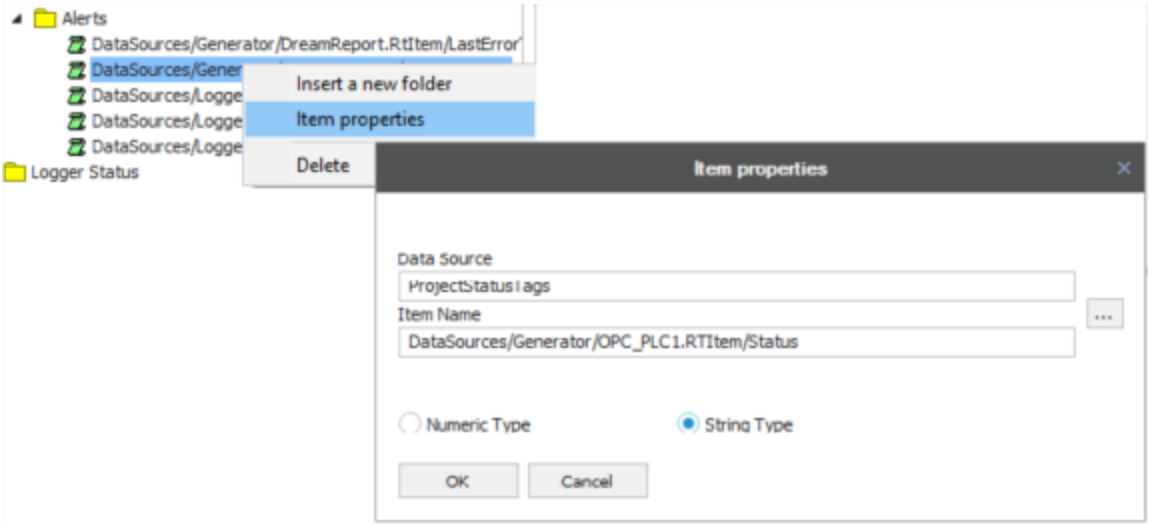
The Tags selection will be shown as below:



Drag and drop tags from the list to the right side panel. By default, the tags will be placed under the "Data Model" folder. You can click on the "***Add a new folder***" button, or right-click in the Data Model panel and "*Insert a new folder*" to add folders and organize a folder tree structure. The items name will be shown as the full path. You can double-click on the item name in the Data Model to rename/alias the tags if needed.

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NOTE: by default, the data type of all items is treated as “number”. If you wish to show an item as a string, right-click on the item from the list and select “Item properties”, the window below will be opened:



Change the radio button to *“String Type”* and click *“[OK]”*.

In the *User Access Rights* tab, you can specify which user(s) or user group(s) can access specific parameters. This assumes that *User Management* is being used in the project.

1. Check the “*Activate User Management*” option to enable access control on the items/parameters;
2. Select a user or group from the left list, and check the folders/items you want to grant access to.

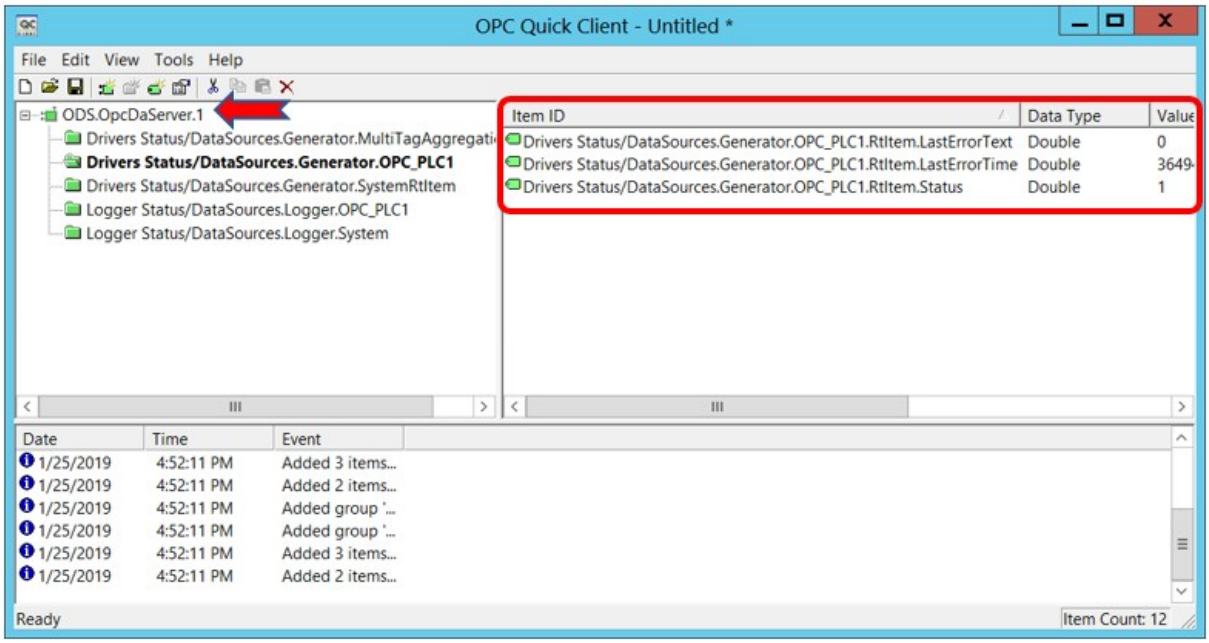
After completing the configuration, click *“[OK]”* to save and close the *RDS Definition Dialog* window.

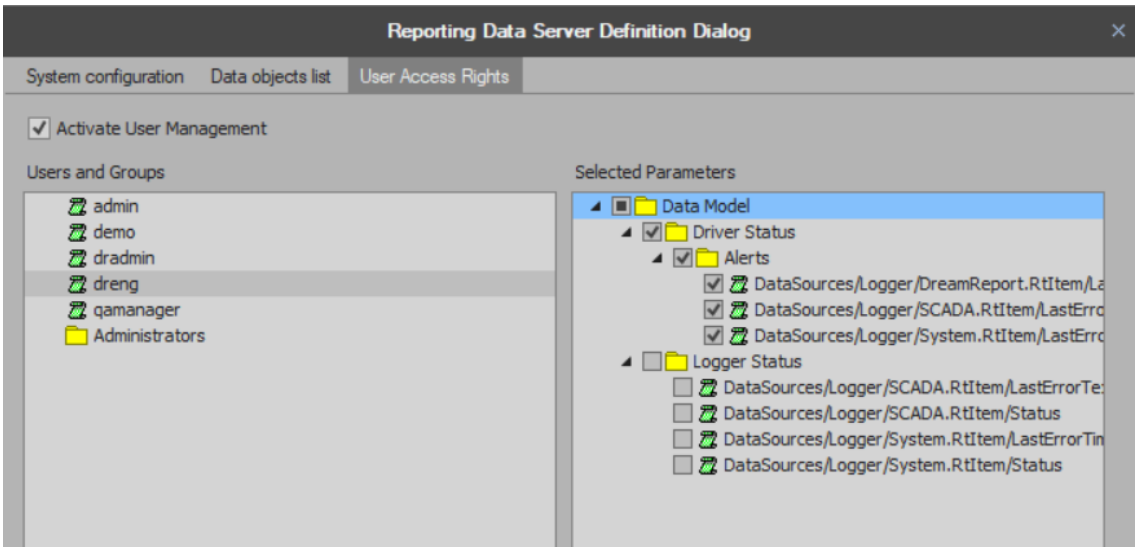
Using the Reporting Data Server

Once configured, any items specified in the *Reporting Data Server* will be available to external applications through the Dream Report OPC DA Server – it will be listed as *ODS.OpcDaServer.1*

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For example, using an OPC client tool, select and connect to the *ODS.OpcDaServer.1* server, and observe the data items that were defined in the RDS are exposed as OPC tags:





NOTE: If *User Management* was enabled, the user will be required to enter valid username and password.

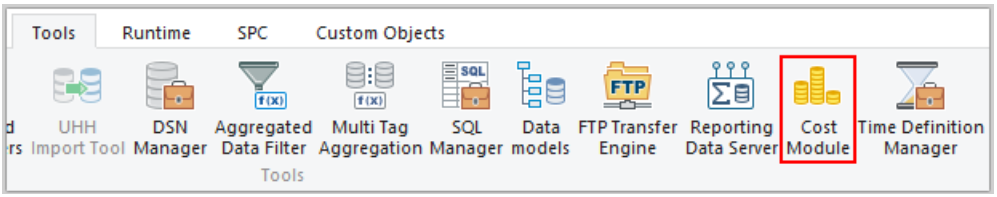
10.10 Cost Module

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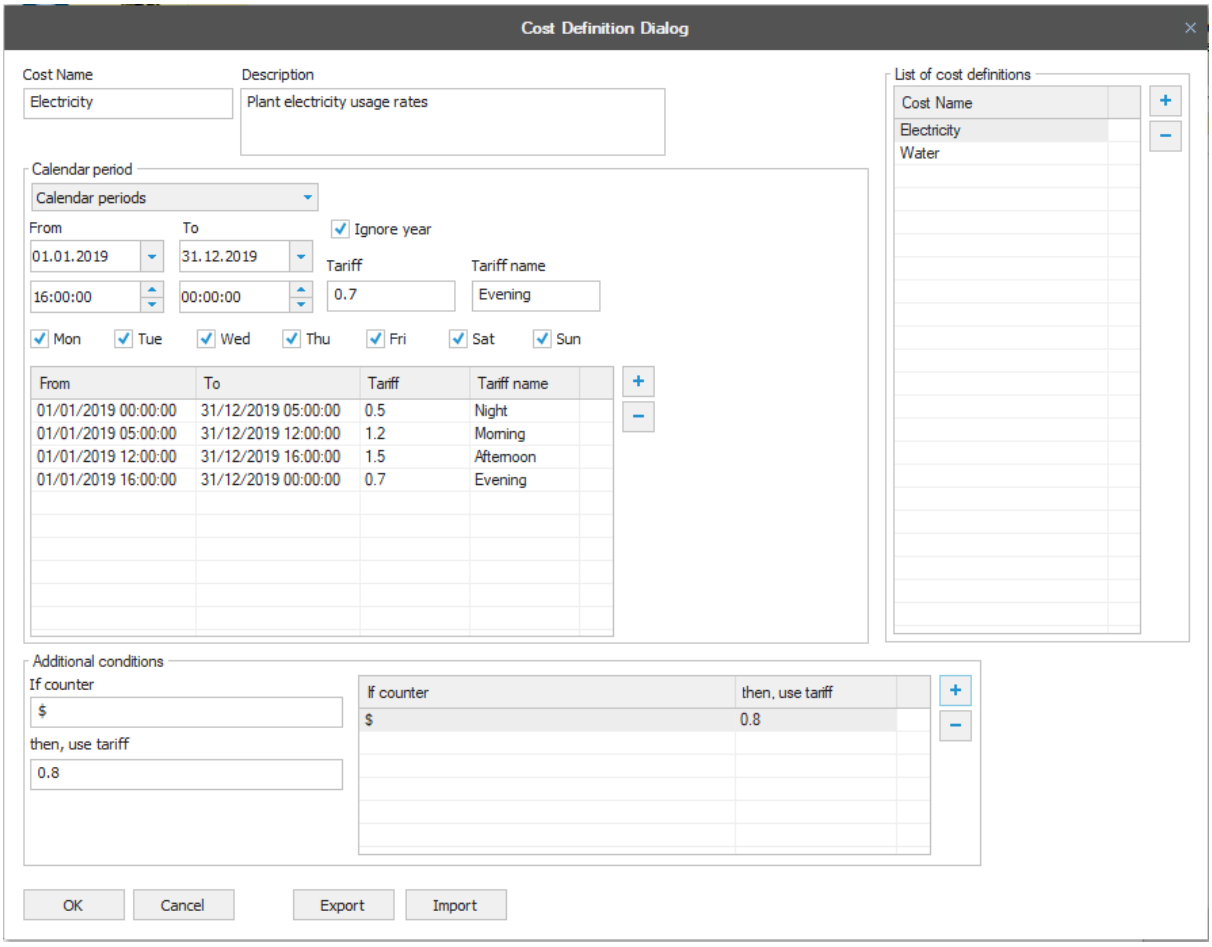
The Cost module allows users to define rates and tariffs (i.e., methods and definitions for calculation of Cost), and use the results of those calculations in reports. The Cost definitions can then be used in billing reports (e.g., calculating billable utilities costs based on meter readings), for energy accounting and even production costs.

Configuration:

In the *"Tools"* tab, click on *"Cost Module"* to open the *Cost Definition dialog*.



A *Cost Definition* is the specification of one or more calendar or time periods, with specific rates or tariffs associated with each period. For example, an energy billing rate might be higher at certain times of the day (or year) than at other times – these can all be accounted for in a Cost definition. Costs are configured as follows:

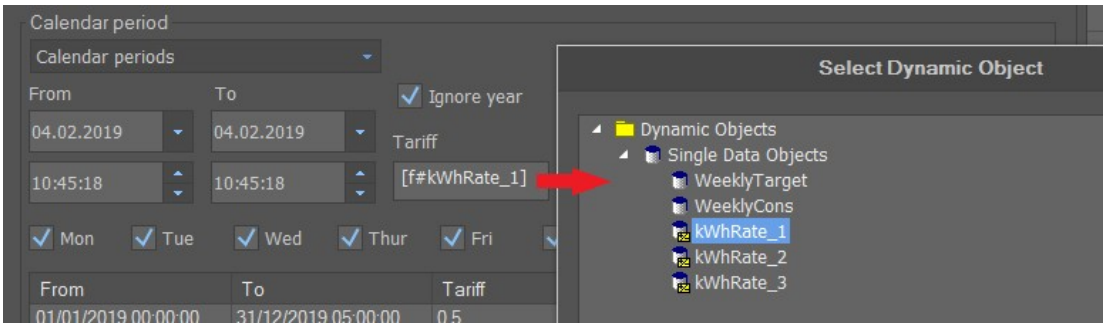


1. Enter a (unique) *Name* and optionally, a *Description*, for the cost definition.

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2. In the *"Calendar period"* section, the first combo box has two options:

   a. *Calendar periods* – these define the start and end period of a specific cost calculation. If the tariff/rate changes during the day, declare hours and *Tariff* multiplier (e.g., the energy rate might be $0.12/kWh at a certain time of the day) and logical *Tariff name* – press *"+"* to add it to the list. Rates may be static (hard-coded), or dynamic, by referencing *Dynamic Tokens* on a report. To reference a dynamic token, double-click in the *Tariff* field – a *Select Dynamic Object* window will open, from which you can select a single data object that contains the tariff value to use:



There are two ways in which the tariff(s) can be used, and how they are applied to calculate total cost:

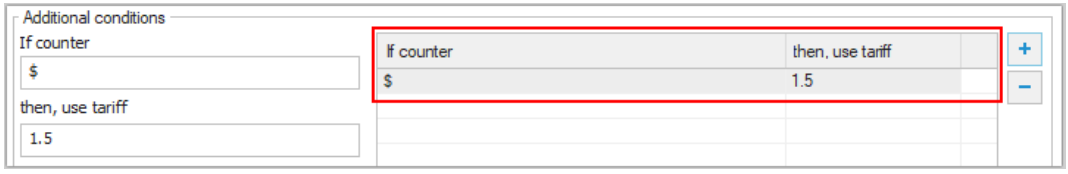
- Fixed rates for various time ranges; or
- A *"base"* rate, and then multipliers of that base rate, determined by use (*Counter* calculation)

1. When defining the tariffs/rates in the *Calendar periods*, each Tariff entered will be an absolute (typically, monetary) value that will be used when calculating cost. For example, if a tariff is set to 1.5 (e.g., 1.5 cents/kWh) for AM hours and 1.75 for PM hours, the energy cost for the day would be calculated as follows (using example Counter values):

   AM: Calculated *Counter* value = 250 kWh
   Energy Cost = 1.5 * 250 = 375 cents ($3.75)
   PM: Calculated *Counter* value = 400 kWh
   Energy Cost = 1.75 * 400 = 700 cents ($7.00)
   Total Energy Cost for the day: 375 + 700 = 1075 cents ($10.75)

2. For each *Calendar Period*, set a "base" rate in the *Additional Conditions* section (base rate must be indicated by a *"$"* symbol) and then the tariffs specified during that calendar period will be multiplied by that base rate:

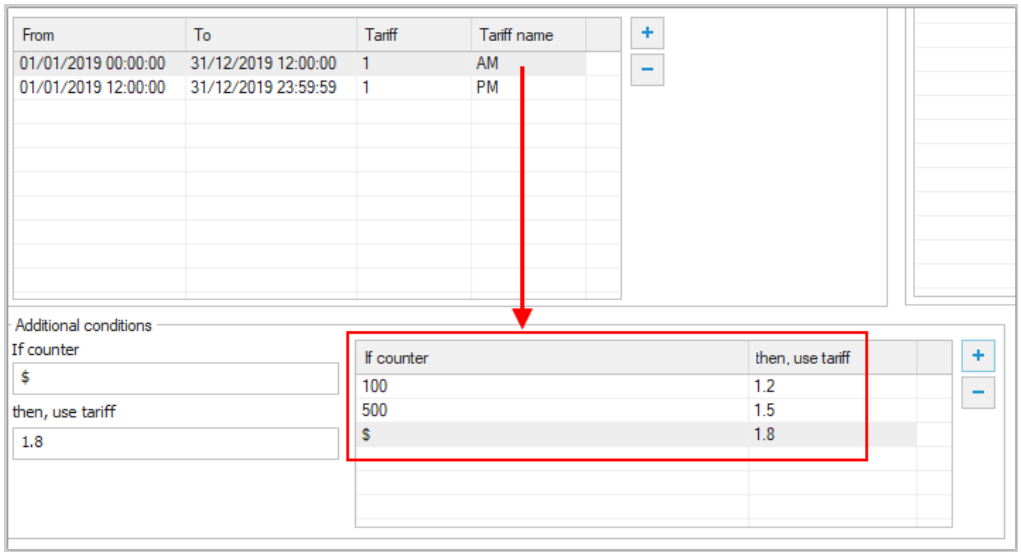
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You can set the same base tariff in the *Additional Conditions* section for each calendar period, and then set a specific tariff (multiplier) for each period. For example, if the base tariff set to 1.5 (as shown above for all time periods), but from 00:00 until 05:00 the tariff is specified as 0.75, then the cost will be calculated as *0.75 * 1.5 * [Counter Value]* for that time period.

You can also specify multiple *Additional Conditions* for each calendar period, which are based on the calculated *Counter* value(s). For instance, the energy tariff/rate in a time period for usage up to 100 kWh might be 1.2c/kWh; between 100 and 500 kWh the rate is 1.5c/kWh; above 500, the rate is 1.8c/kWh. You would then configure the *Additional Conditions* as follows:

Again, you can either hard-code a base tariff, or double-click in the "*then, use tariff*" box to open a list of dynamic tokens on the report to reference a variable containing the base tariff.



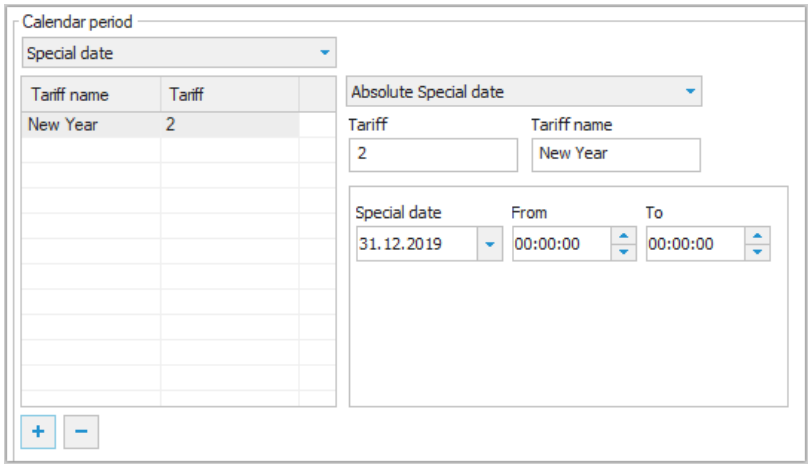
Notes:

- The checkbox *"Ignore year"* (checked by default) ignores the year in the calendar period, as the time period definitions typically repeat for each year. Uncheck this option to define the cost module only for a specific year (or few years).
- The checkboxes of the week days all are checked by default. If a tariff is different for specific days of the week (e.g., a weekend rate and a weekday rate) then check only the relevant days when defining each time period.

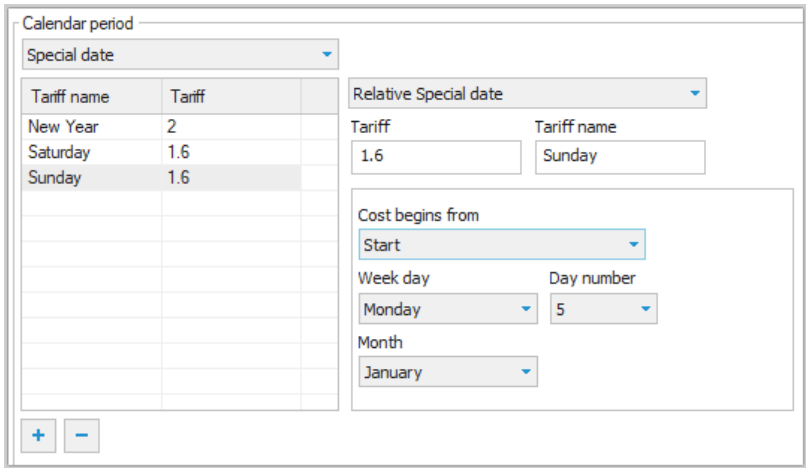
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b. *Special date* – lets you define special dates in which the tariff will be different, such as holidays. In this section there is a combo box with two options: *"Absolute Special date"* and *"Relative Special date"*

- *Absolute Special date* - select one day in the year and specify its hours. On this day, the cost will be calculated by this specified tariff factor.



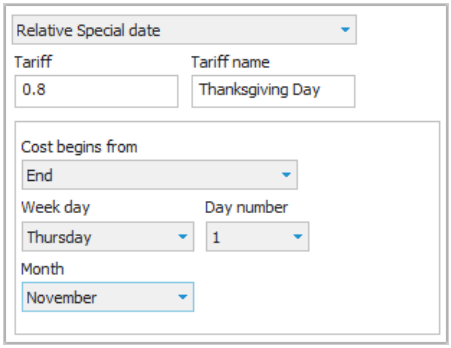
- *Relative Special date*: select one whole day in each week on a specific month, in which the cost will be calculated by this tariff factor:



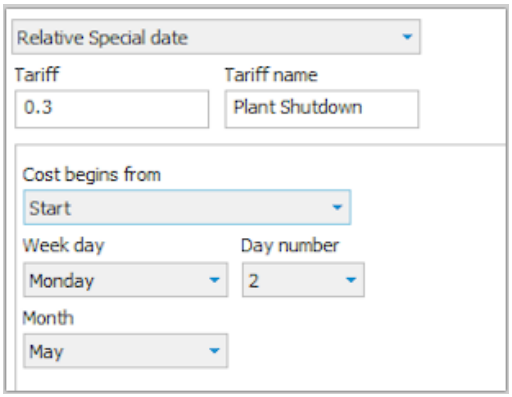
The special dates can be set as the *first*, *last* or n^{th} weekday of a month. For example:

- If the "*last Thursday of every November"* is a holiday, it would be defined as follows:

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- If the *"second Monday of May"* is a plant shutdown, it would be defined as follows:



Notes:

- When picking *"Special date"* in the Calendar period section, you will need to define the base tariff again (or differently) as explained above.
- Usually, the special date defined is covered by (included in) the *"Calendar periods"* as well. If this is the case, then this date will be ignored in the *"Calendar periods"* calculation, and calculated separately using the *Special date* definition – i.e., the *Special date tariff takes precedence*.

3. Finally, click *"+"* to add the cost definition to the list. You can then define additional cost definitions (e.g., one for water usage, one for gas usage, etc.) as needed

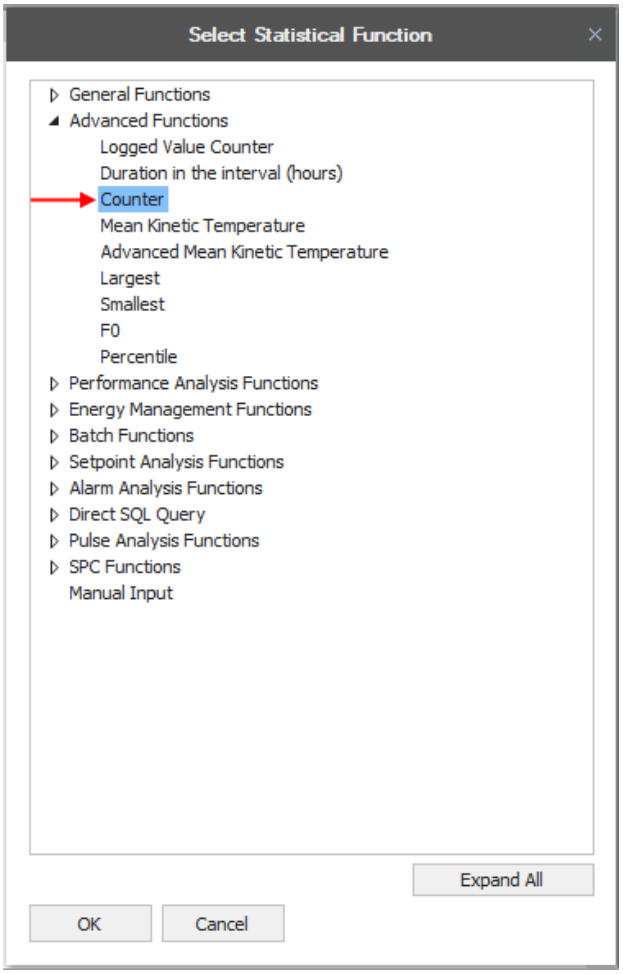
4. *Export* and *Import* – the Cost Module configurations can be exported as an XML file but clicking the *"Export"* button. This is useful if you want to perform mass copy/paste/modify of cost definitions (in Notepad, or any other XML editor). This Export function is also useful when transferring cost definitions from one Dream Report project to another. To import the cost definitions from an appropriately-formatted XML file, click the *"Import"* button and select the XML file.

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Using the Cost Definitions in a Report

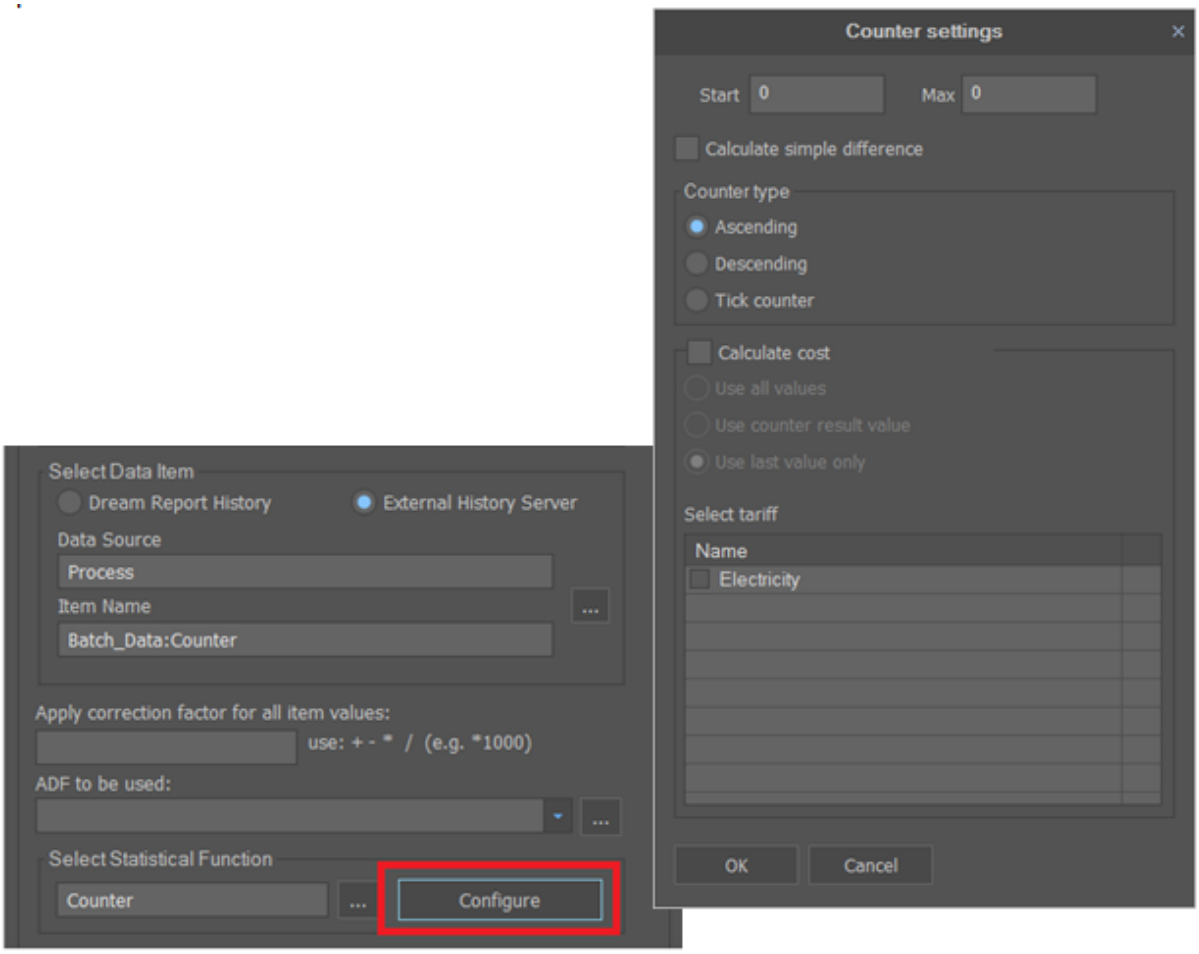
The cost definitions defined in the Cost Module can be used by the *"Counter"* function.

In any object that supports the *"Counter"* statistical function (e.g., the *Single Data Object, Automatic Statistical Table*, etc.), select the *"Counter"* option in the *"Select Statistical Function"* section. In the *Single Data Object:*



After selecting the *"Counter"* function, click the *"Configure"* button, and the following *"Counter Settings"* window will open:

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Start and *Max* value settings are covered in the general Statistical Functions section for the *Counter* function – i.e., if the counter has a roll-over, *Start* is the value it resets to (typically *"0"*) and *Max* is the known roll-over value.

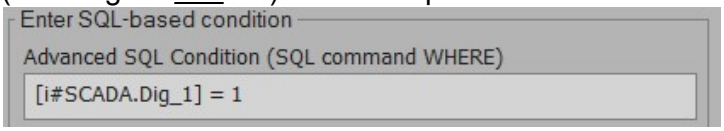
If *"Calculate simple difference"* is checked, then the "*Start*" and "*Max*" fields will be disabled, and the function will just use the statistical function "*Difference*" for the calculation – i.e., a simple mathematical difference of the first and last values over the specified time period, with no consideration of a possible meter "roll-over". The "*Tick counter*" option (covered next) will be also disabled. And if the "*Tick counter*" option is selected, then the "*Difference"* option will be disabled.

"Counter Type" options:

- *Ascending* – default option. This assumes that the counter/meter value always increments (except in the case of a counter rollover).
- *Descending* – Selecting this option assumes that the counter value decrements and the result will be displayed as an *absolute value*. For example, if the first value is 40 and the last value is 25, then the *Counter* result will be 15.
- *Tick counter* - If this option is selected, then *Start* and *Max* values will be disabled. This option *counts the number of recorded values* in the period to calculate the counter value. If referencing a discrete/Boolean counter/trigger tag to count "pulses", it will be necessary to include an *Advanced SQL Condition* in the object's definition to

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filter out the "0" values, otherwise you will get a counter result twice what you expect (counting 0's and 1's) – for example:



Check the *"Calculate cost"* option to enable a cost calculation using the calculated Counter value. By default, this check box is unchecked. When checking the box, the following options will be available, which will specify which counter values will be used to calculate the cost:

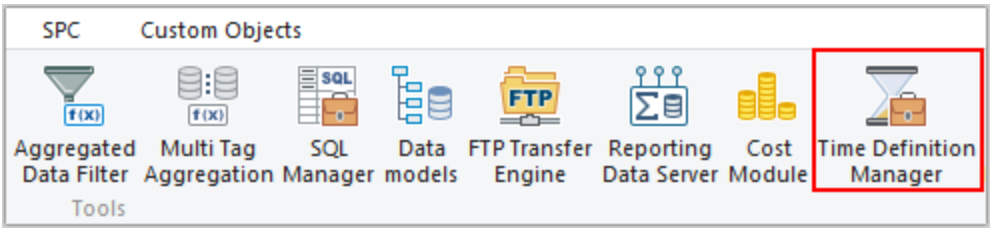
- *Use all values* – all raw time series values (over the defined time period) will be used.
- *Use counter result value* – the counter result will be calculated as defined above, and the cost (tariff) will be applied on that one value.
- *Use last value only* - the last value over the period will be retrieved and its result will be used for the cost calculation. This might be useful if referencing a totalizer tag, where the last value is already the totalized value.
- *Select tariff* – select which tariff definition(s) (as defined in the *Cost Module*) should be applied to calculate the cost. If more than one tariff is selected, then the cost for each tariff will be calculated and then the result will be *the sum value of calculated cost results for each selected tariff.*

NOTE: If the cost is calculated using *"All values"* and the tariff configuration has both *Calendar* conditions and *"Additional conditions"*, then tariff from *"Additional conditions"* has priority, and the *Calendar* will be used to get active-inactive tariff periods only.

10.11 Time Definition Manager (TDM)

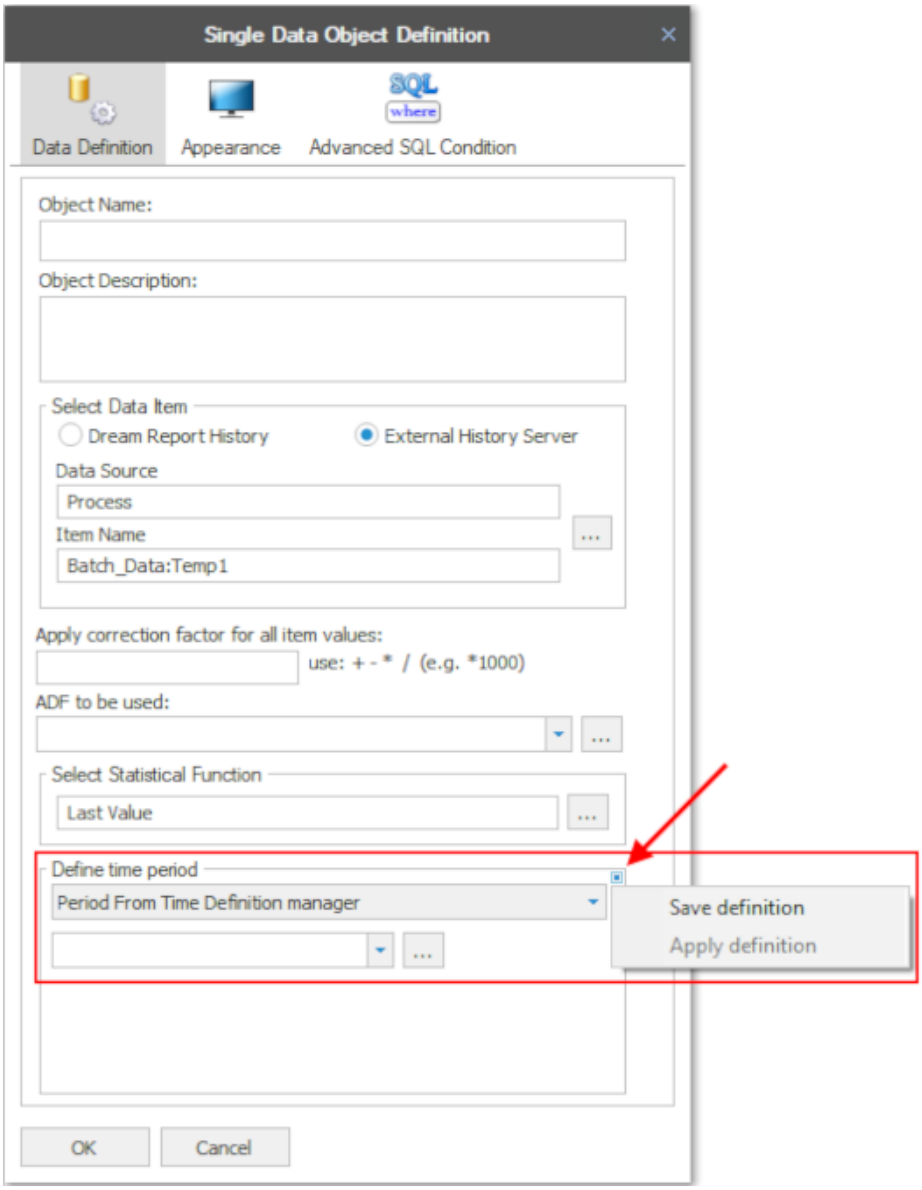
The *Time Definition Manager* is a tool for creating and storing "common" time definitions for quicker use in creating reports. The benefit of this is to be able to create and manage time definitions in a single location; reference the preconfigured time definitions in reporting objects (without needing to specify the time period each time); allow you to change a time definition in one place and automatically apply it to all objects referencing that time definition.

The TDM can be accessed from the *Tools* tab – *"Time Definition Manager"*.



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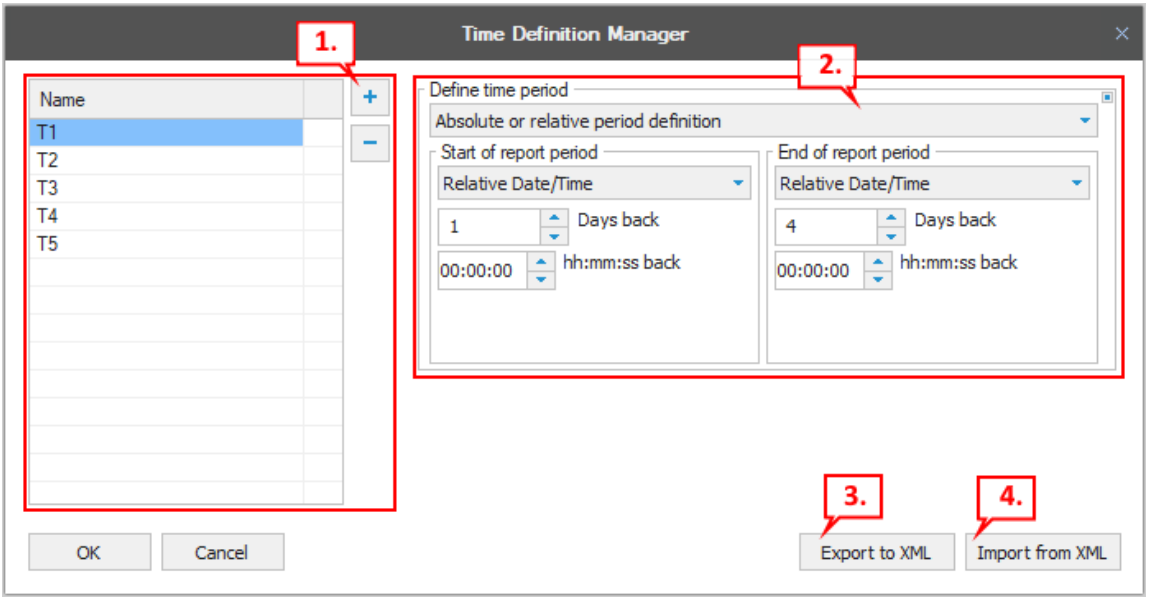
At the *"Define Time Period"* section of a report object, select the *"Period from Time Definition Manager"* option, and all preconfigured time definitions will be shown. Or, click "**[...]**" to access the *Time Definition Manager* to add new definitions - this opens the same interface that can be opened from the *Tools menu* (as shown above):



*Click on the small round button in the top right corner of the section to copy the time definition to the Clipboard. You can apply it later in other objects:

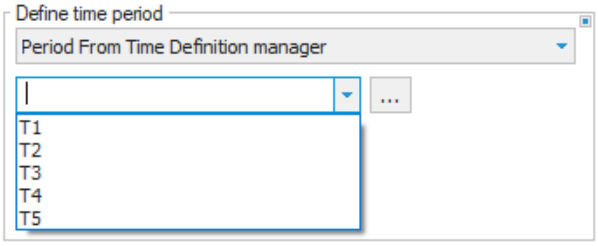
To configure Time Definitions:

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1. Click on the *"[+]"* button to create a new time definition, and double-click on it to give it a meaningful name.
2. Specify the time desired time period definition. Repeat steps 1 and 2 to create additional time definitions.
3. Press the *"Export"* button if you wish to generate an XML file with all created Time Definitions in this project. Then you can use Notepad (or other text editor) to edit or create additional Time definitions, or for export to be used in another Dream Report project. By default, the file will be stored at the project folder.
4. Press the *"Import"* button to select an XML file (edited, or created in another project), and import all the time definitions into the current definitions. Note that any existing time definitions will be overwritten with an XML import.

Once all time definitions have been created, they will be available to select from the list in a reporting object:

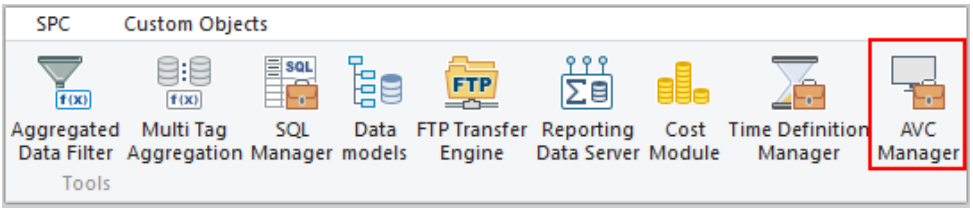


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10.12 Advanced Visualization Condition (AVC) Manager

The *Advanced Visualization Condition Manager* is a tool for creating and storing advanced visualization condition definitions, that can be later used in single data item, Automatic statistical table, Step table and SQL table. The benefit of this is to be able to create and manage advanced visualization conditions in a single location; reference the preconfigured visualization conditions in reporting objects (without needing to specify the conditions each time); allow you to change a visualization condition in one place, and have it automatically apply to all objects referencing that condition.

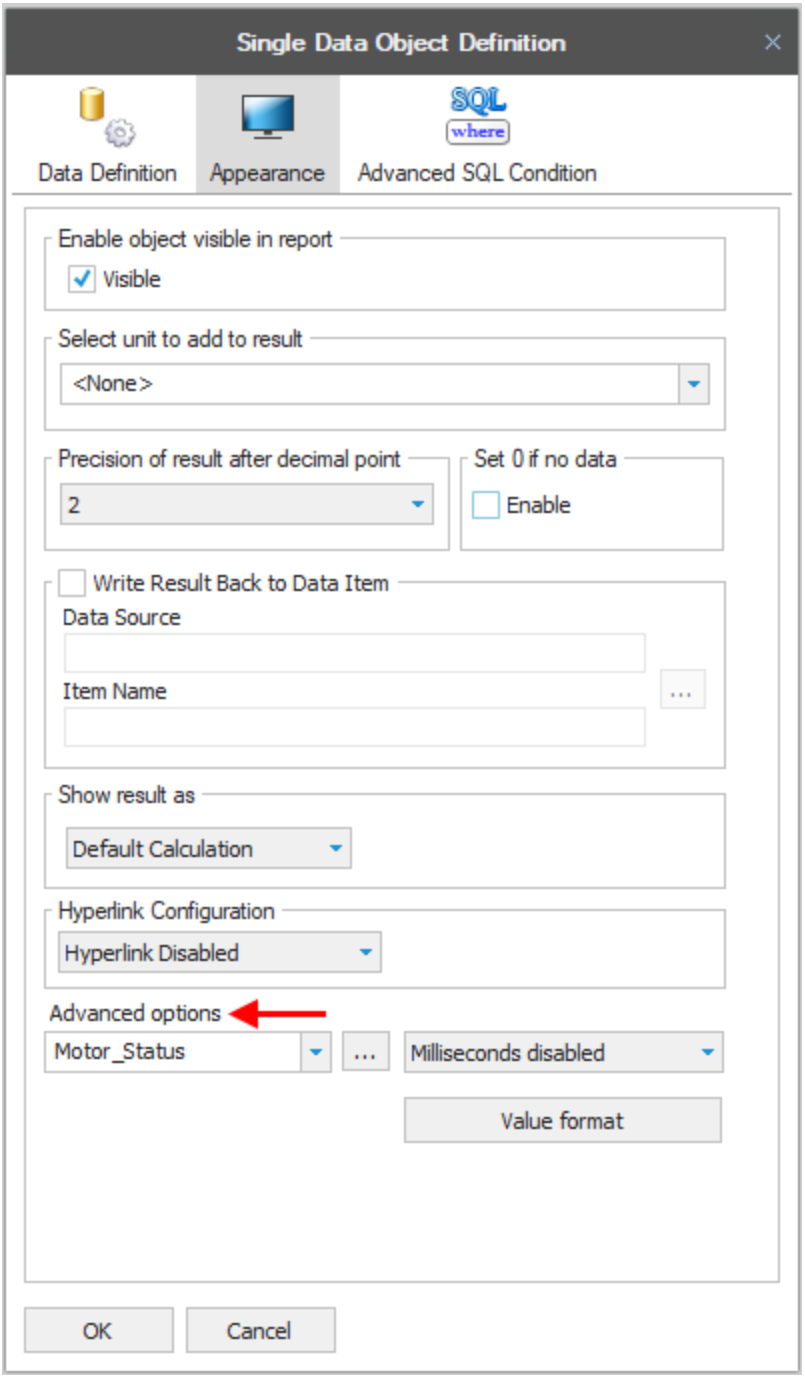
The AVC manager can be accessed from *Tools* tab – *"AVC Manager"*:



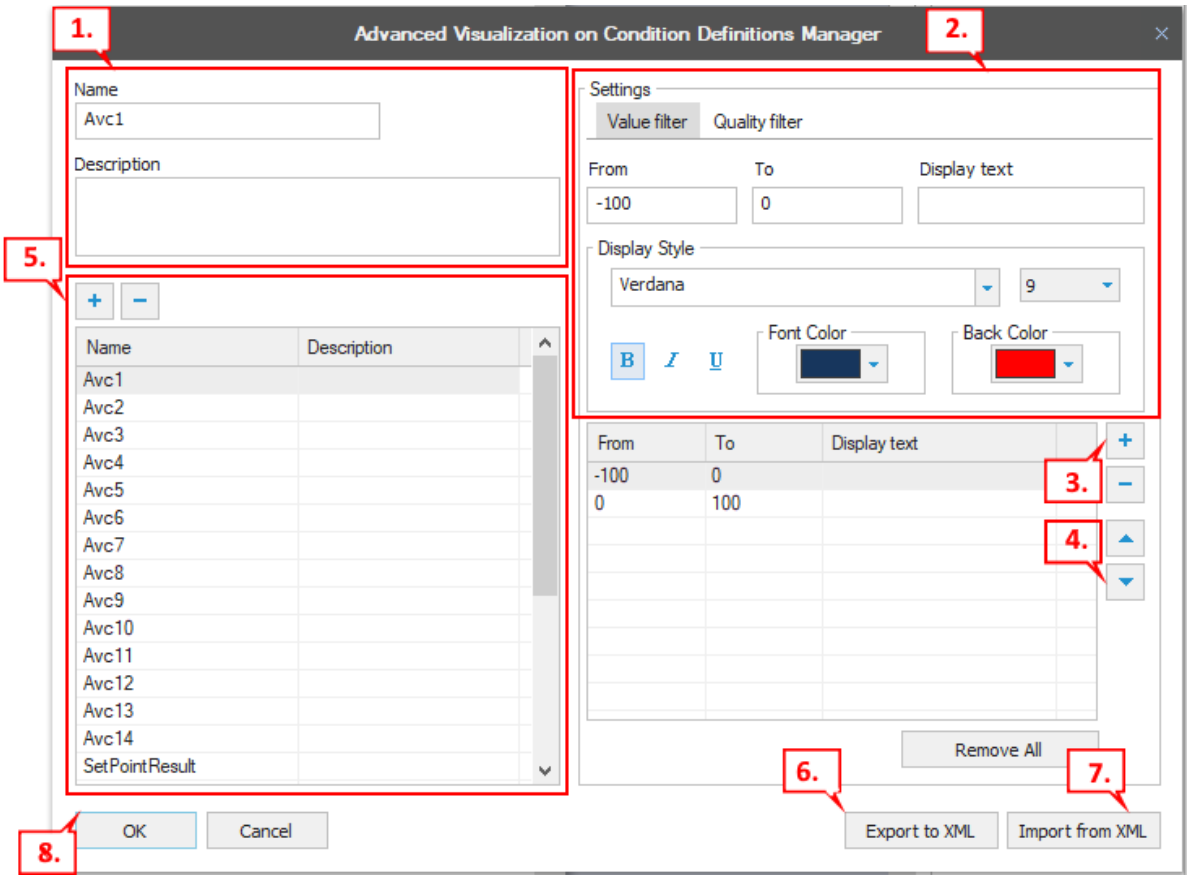
In the Appearance tab or a report object, any pre-configured Advanced Conditions may be selected from the *"Advanced Options"* combo box.

Click the *"[…]"* button to access the AVC Manager to add new conditions (if needed) – this opens the same *Advanced Visualization Condition Manager* interface that can be opened from the Tools menu (as shown above).

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To configure an *Advanced Visualization Condition* definition:

1. Add a *Name* and optionally, a *Description* for the *AVC* definition
2. Add a numeric condition (range) to evaluate, color and font settings, and/or text substitutions. If you wish to reference *dynamic values* for the *From* and *To* conditions, double-click in the appropriate *From* or *To* cell, and you will have the option to select a dynamic object from your report which can then be used to evaluate the visualization condition.
3. Press the *[+]* button to add the condition for this AVC definition. Repeat steps 2 and 3 for any additional conditions to evaluate.
4. If needed, select a condition, and then the *Up* or *Down* buttons to reorder the conditions. Conditions will be evaluated in the order in which they are listed (top down.)
5. Once all conditions are added, click the *[+]* button to add this definition to the list of defined *AVC* definitions.
6. Press the *"Export"* button to generate an XML file with all created conditions in this project. By default, the file will be stored at the project folder. You can then use Notepad (or other text editor) to edit or create additional *AVC* definitions, or use this file for export to be used in another Dream Report project.

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7. Press the *"Import"* button to select an XML file (edited, or created in another project), and import all the conditions to the current definitions. Note that any existing *AVC* definitions will be overwritten with an XML import.
8. Click *"OK"* to close *the Advanced Visualization Condition Definition Manager*.

The *AVC* definitions can then be selected for use in the *Advanced Condition* section of a reporting object.

Report items with *AVC*'s applied to them will have a small yellow screen Icon on them:



10.13 Pivot Groups

The *Pivot Group* feature provides the user with the ability to repeat one or several objects (group) for pre-defined steps (time sub-periods or other conditions) in a report. This functionality is similar to a *Step Table*, however, while a Step Table can repeat lines (*"steps"*) with predefined calculations for each time-sub-period, (Step) *Pivot Groups* will repeat complete a group of objects for each predefined step.

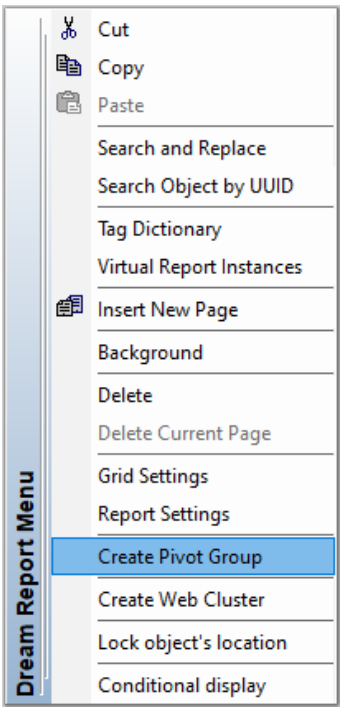
Examples

One example of using a Pivot Group is if you need to repeat an entire chart or table for each day of a week, with each chart or table only showing data/calculations for each day (the "step") over the report period. Another example might be to display detailed batch report data for every batch over the past month - in this case, the group's time period would be the last 1 month, and the step period will be by batch.

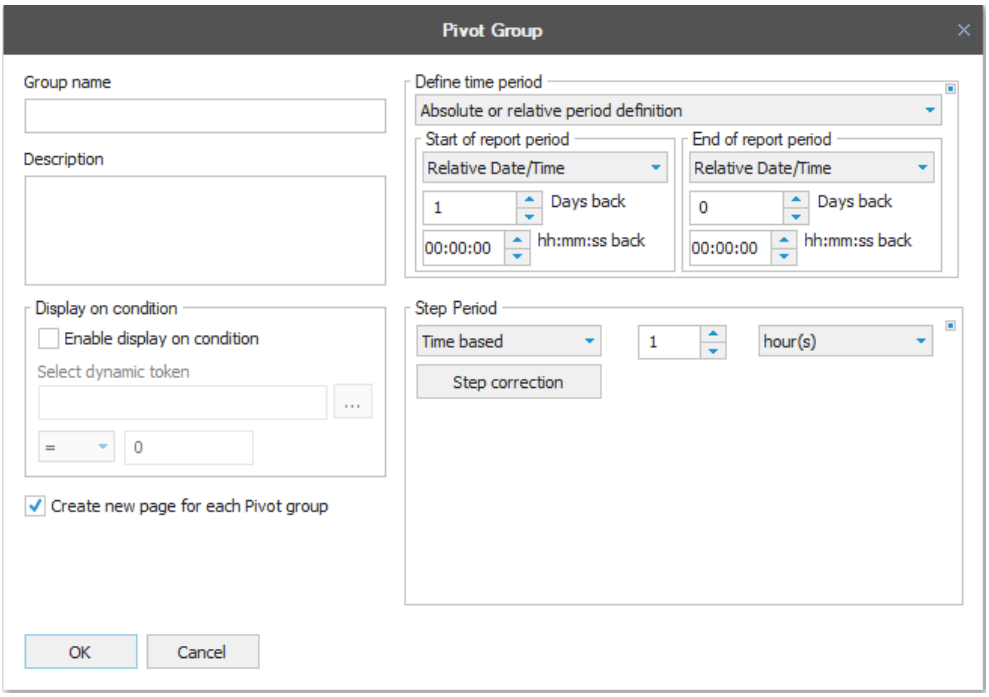
Configuring a Pivot Group

To configure a *Pivot Group*, in Designer Studio, select one or more objects in the report, and right-click to open the *Context Menu.* Select the option *"Create Pivot Group":*

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The following *Pivot Group* configuration window will open:



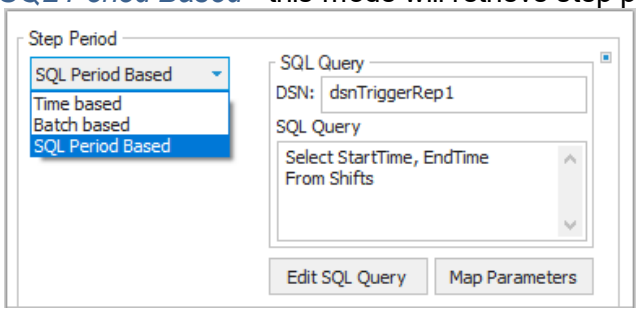
Enter the *Group Name* (must be unique to that report) and an optional *Description*.

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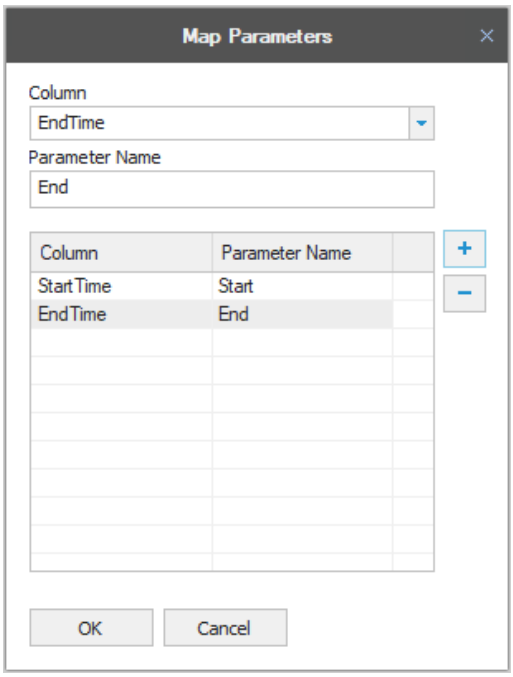
The *Time Period* and *Step Period* work in a similar manner to the way in which they work in a *Step Table*. The *Time Period* parameter defines the overall time period over which the *Pivot Group* will operate. In the Batch example above (analysis by batch over the past month), the Time Period might be defined as a *"Fixed Period"* for the *"Last 1 month(s)"*.

The *Step Period* can be based on one of the following options:
• *Time Based* - behaves the same as in a Step Table
• *Batch Based* - behaves the same as in a Step Table

• *SQL Period Based* - this mode will retrieve step periods from the results of a SQL query:



- Click the *Edit SQL Query* button to open the *SQL Query Definition* window.
- Create a SQL query in which each row returned by the query will contain a start and end period (according to the SQL mapping - see below). For the time period returned in each row of the SQL query, a new step group will be created at report generation.
- Click the *SQL Map Parameters* button to map fields from the SQL query to be used to define the step period:

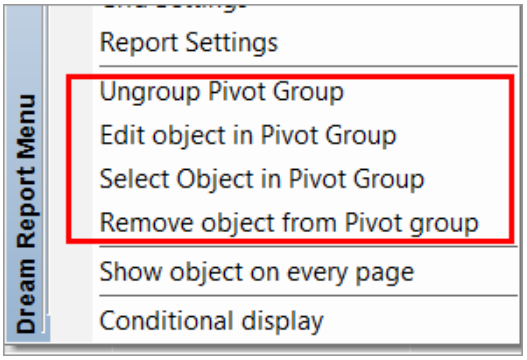


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The *"Enable display on condition"* option will be unchecked by default for a new *Pivot Group*. This means that, by default, the *Pivot Group* will be visible on the report at generation time. Check the *"Enable display on condition"* if you wish to set the conditional display for the group. Click the *Select Dynamic Token "..."* button to select any Single Data object on the report, the evaluation type (=, >, <, !=, >= or <=) and then set the value to be evaluated against. If you require a Pivot Group's visibility to be set by *multiple conditions*, you would use an Expression or Compound data object to evaluate/calculate the conditions, and then reference that object in the conditional display.

Create New Page for Each Pivot Group - checking this option will force each iteration for the Pivot Group (containing all relevant objects) on a new page. If left unchecked, the Pivot Group iterations will be placed immediately after each other.

NOTES:



1. If you wish to remove (ungroup) a Pivot Group, select the group, and *right-click* to open the Context Menu. Select the option *"Ungroup Pivot Group"*. Please note that when you ungroup a Pivot Group, all group settings will be removed.

2. If you need to edit a specific object contained in a Pivot Group, you do not need to un-group the objects first. Simply select the pivot group, hover over the object, right-click, and then select *"Edit Object in Pivot Group"* – that object's configuration options will open, and can be edited, while the object is part of the group.

3. Individual objects can be removed from a Pivot group by selecting that object in the Pivot Group (from the "Dynamic Objects" left side panel), and then right-clicking to select the *"Remove object from Pivot group"* option.

4. You can add individual object(s) to an existing Pivot Group by selecting the Pivot Group and those object(s) you wish to add to the group. Then, right-click to select the *"Add Object(s) to Pivot group"* option.

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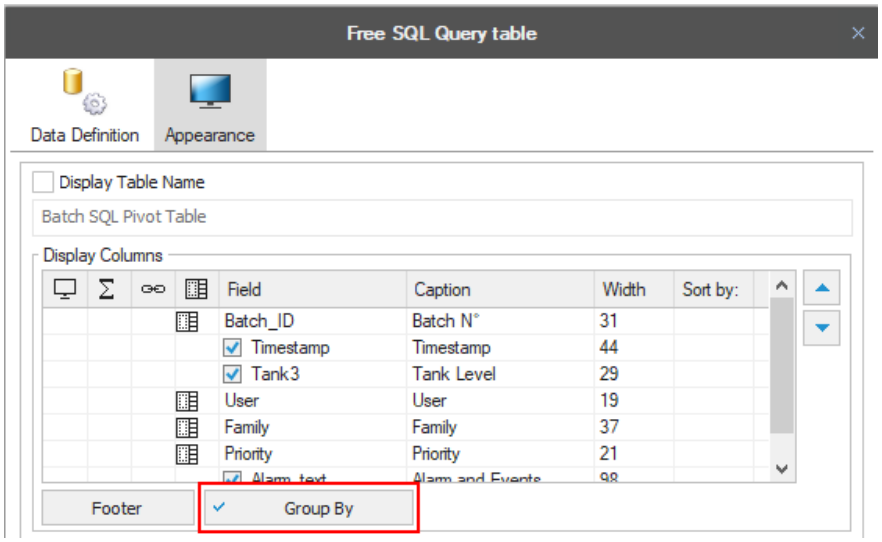
10.14 Pivot Tables (SQL Table Row Grouping)

The *Pivot Table* function provides the user the ability to perform *Group By* operations in the *SQL Table* object, displaying "data blocks" for each grouped data sub-set, as well as intermediate aggregations (on sub-groups) for such groups. For example:

Batch N°	User	Family	Priority	Timestamp	Tank Level	Alarm and Events
Batch_1054	Jim	Tank1	5	01/23/2024 13:17:05	1038.00	Tank Filled 60%
				01/31/2024 12:00:00	733.00	Pumps Runs
			3	01/24/2024 09:00:00	1125.00	Tank High
			9	01/24/2024 12:00:00	1243.00	Pumps Stopped
				01/24/2024 16:00:00	1194.00	Batch in Progress
			6	01/24/2024 13:00:00	1225.00	Temp Grow
				01/25/2024 15:00:00	1205.00	Tank Low
				01/28/2024 16:00:00	733.00	Motor Stopped
				01/30/2024 07:00:00	1194.00	Motor Runs
			8	01/25/2024 13:00:00	1038.00	Production Ends
				01/26/2024 10:00:00	1007.00	Enter Settings Value
				01/26/2024 18:00:00	1194.00	Production In Progress
				01/29/2024 12:00:00	920.00	Pumping Starts
			7	01/27/2024 07:00:00	1219.00	Valve Closed
				02/02/2024 10:00:00	1007.00	Valves Open
				02/02/2024 18:00:00	733.00	Valve Closed
			1	01/29/2024 16:00:00	1125.00	Mixer runs
				02/01/2024 07:00:00	1007.00	Tank Filled 60%
		Max Tank Level			**1243.00**	
		Min Tank Level			**733.00**	
		Avg Tank Level			**1052.22**	
		Tank2	3	01/23/2024 16:00:00	1234.00	Tank High
				01/30/2024 18:00:00	1243.00	Tank High
			8	01/25/2024 10:00:00	920.00	Production In Progress

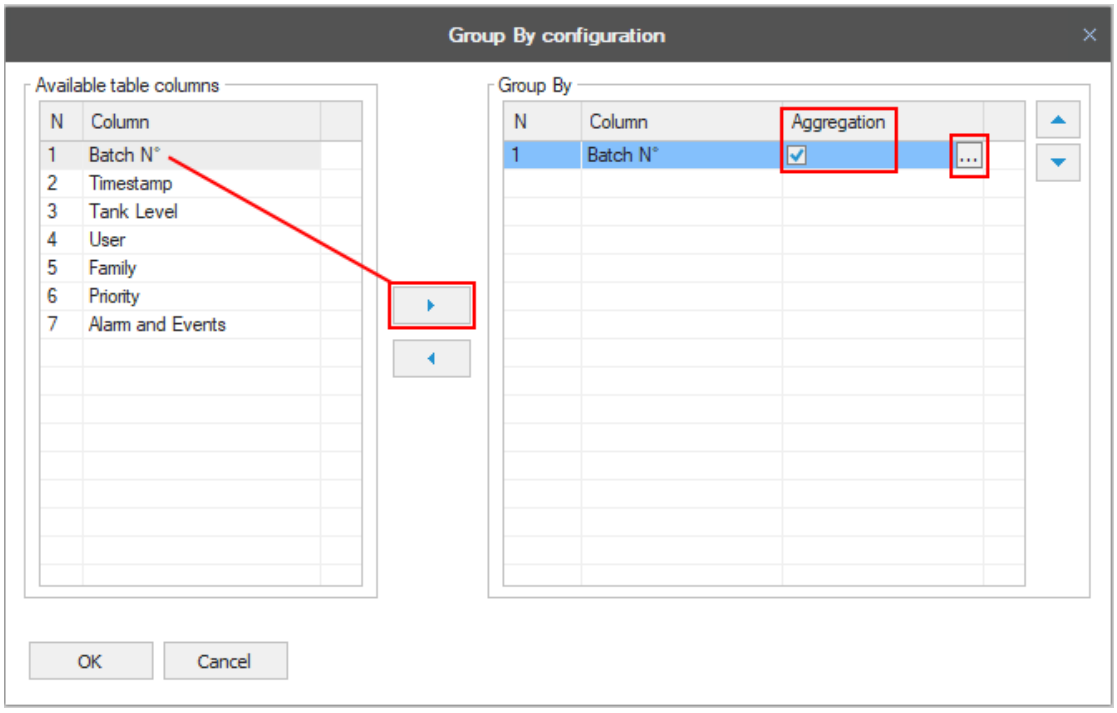
To Configure Data Grouping:

1. Add and configure the *SQL Query Table* object with a SQL query. When you click on the *"Appearance"* tab, you will have the option to configure data grouping:



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2. Click the *"Group By"* button to open *the Group By Configuration* dialog box:

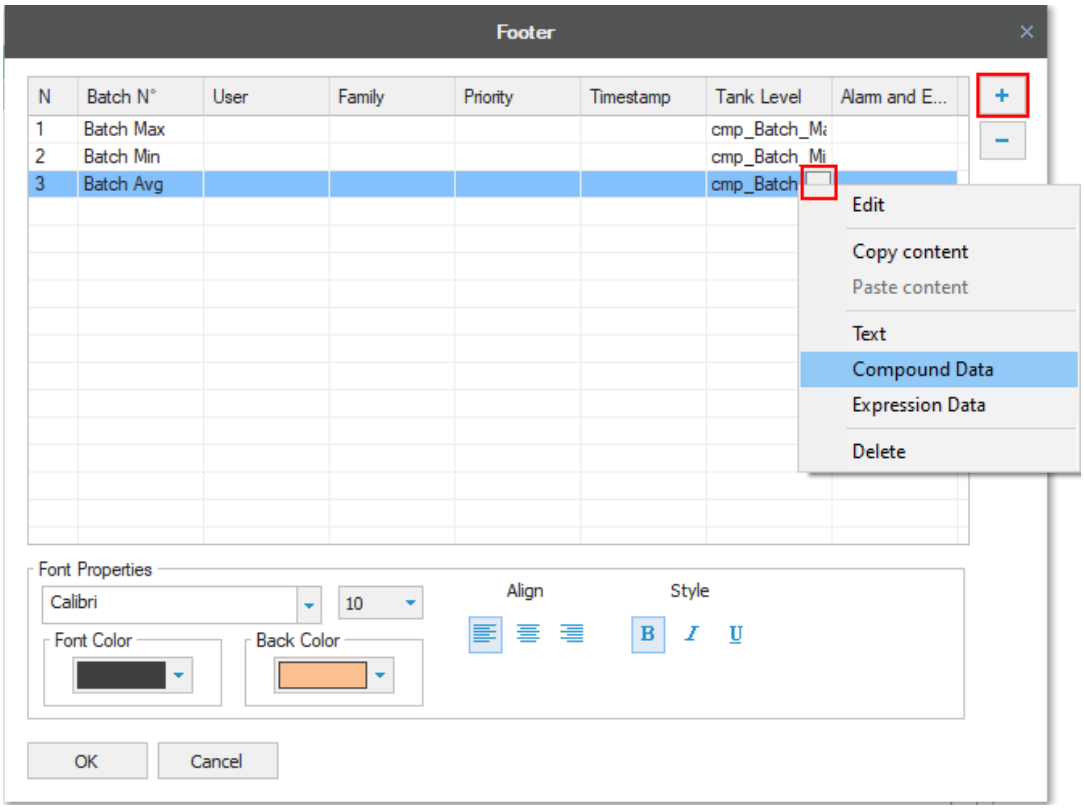


3. In the *Available Table Columns* list, select the field (column) to group on, and then click the *">"* button to add that column to the *Group By* list.

4. Check the *Aggregation* option to configure group aggregates (e.g., Min, Max, Avg over the group). If *Aggregation* is left unchecked, the resulting data in the table will simply be grouped by the selected column.

5. If *Aggregation* is checked, click the *[...]* button to configure the aggregates in the group's footer. The *Footer* configuration dialog box will open:

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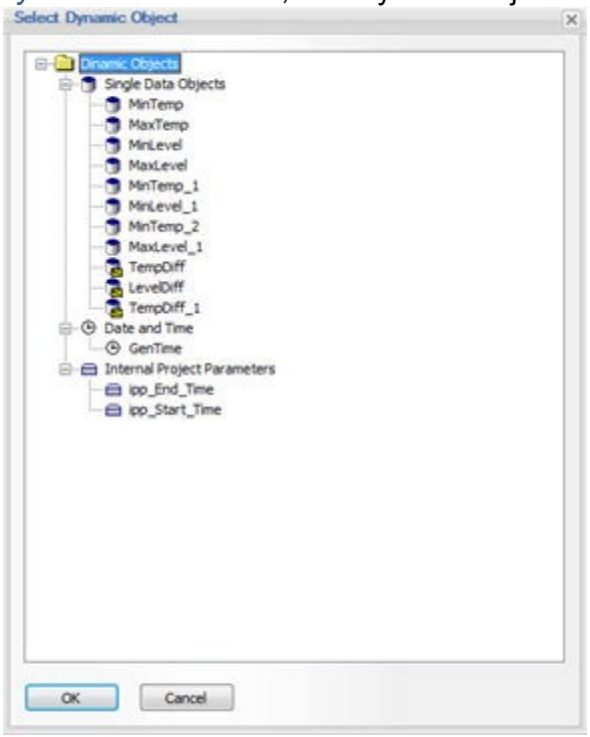


6. Click the *"+"* button to add one or more *Footer* lines.
7. Configure each footer line as needed, adding *Text* (labels), *Compound Data* or *Expression Data* objects, just as you would when configuring a footer in other table objects like the *Step Table* or *Automatic Statistic Table.*
8. To add *additional grouping levels* (sub-groups), repeat steps 3 - 7. You can use the up and down arrows shown in the image on step 2 to *set the grouping order,* where the primary grouping is first, with subsequent sub-group(s) below.
9. Click *"OK"* to close the *Group By* configuration, and then close the *SQL Query Table* object.

10.15 Dynamic Objects Selection

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The text of SQL query can be either static or contain dynamic objects. If user will click on *Add dynamic token* button, then dynamic object selection window will be opened:



This window will contain the list of all dynamic objects, such as:

- *Single Data Objects;*
- *Compound Objects;*
- *Expression Objects;*
- *Combo boxes (selection boxes);*
- *"Date and time" objects;*
- *Timestamp pickers;*
- *Internal project parameters.*

The list of dynamic objects will be populated with objects from currently opened report (report, opened in *Dream Report studio*).

If defined *SQL query* contains dynamic objects, then during report generation value of each such an object will be calculated and placed into the query before its execution.

IMPORTANT NOTE: If you use such an *SQL query* in multiple reports and the query contains dynamic objects - you need to make sure that all those corresponding objects with the same appropriate names have to be defined in each such report, where the SQL query is used.

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Export to file option can export all defined *SQL queries* to a text file, where users can manually edit all SQL queries in a fast way. The format of the text file is the following:

[BatchInfo]

Description=retrieve batch information

Query=SELECT batchID, Username, Lot, Phase ID FROM Batch_Data

[Users]

Description=retrieve user information

Query=SELECT Username, address, Phone ID FROM Users_Data

Were [...] - is query name, then the next line contains description and then there is the query body. Like that user can manually edit *SQL queries* and then import it back.

Import from file button will allow user to select a text file with *SQL queries* and then read it and import into *SQL query* manager. If any query section will fail to be read and parsed, such a query will be skipped.

10.16 Notifier

Notifications is the module, which provides back communication from Dream Report system to users or "*user to user*" notifications. Notifications can be sent by email or to a web portal user inbox.

Three types of notifications are available:

System notifications – Automatic notification on System events, e.g. if report A has been generated or not generated (if an error), if email has been sent or failed, if report has been printed or its printing failed, if there's communication error, etc.

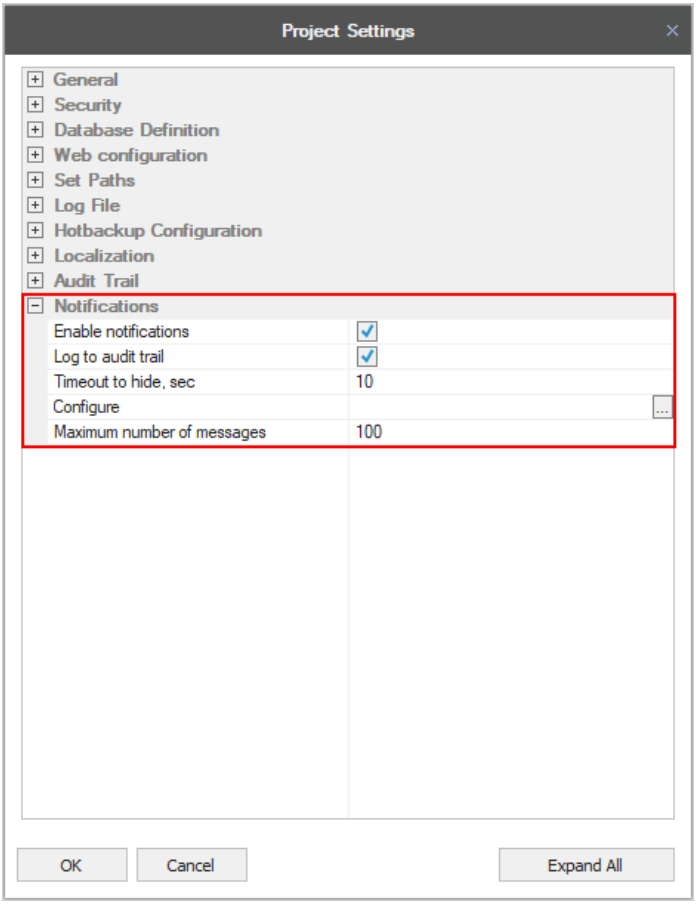
Conditional notification – Automatic notification on value change event. User will be able to set value conditions ("alarms") and dynamic text for such notification. If condition becomes true – the corresponding notification will be generated and sent to a pre-defined list of users.

User notifications – if user A would like to send a message to user B (e.g. with some comments on report information or other) – inter-user communication is available. Also, if user A would like to send a report profile with all filtering criteria, with comments, to user B for review – user notification will allow that. Such notifications can be sent only from one web portal inbox to another one. User notifications are not available by emails.

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Configuration

Project settings section has the section *Notifications*. Also, there is a *Notifications* button in the *Project Setting* ribbon menu. If user will click it, then the "*Notifications*" section of the Project Settings configuration, will be open:



If user is willing to use notification module, then, the user has to open this *Notifications* section of *Project Settings* and check *Enable notifications* check box. That will enable this module in *Dream Report* project.

The option *Log to audit trail* will enable logging of all notifications to the project audit-trail database. If this option is disabled, then all notifications will be not logged.

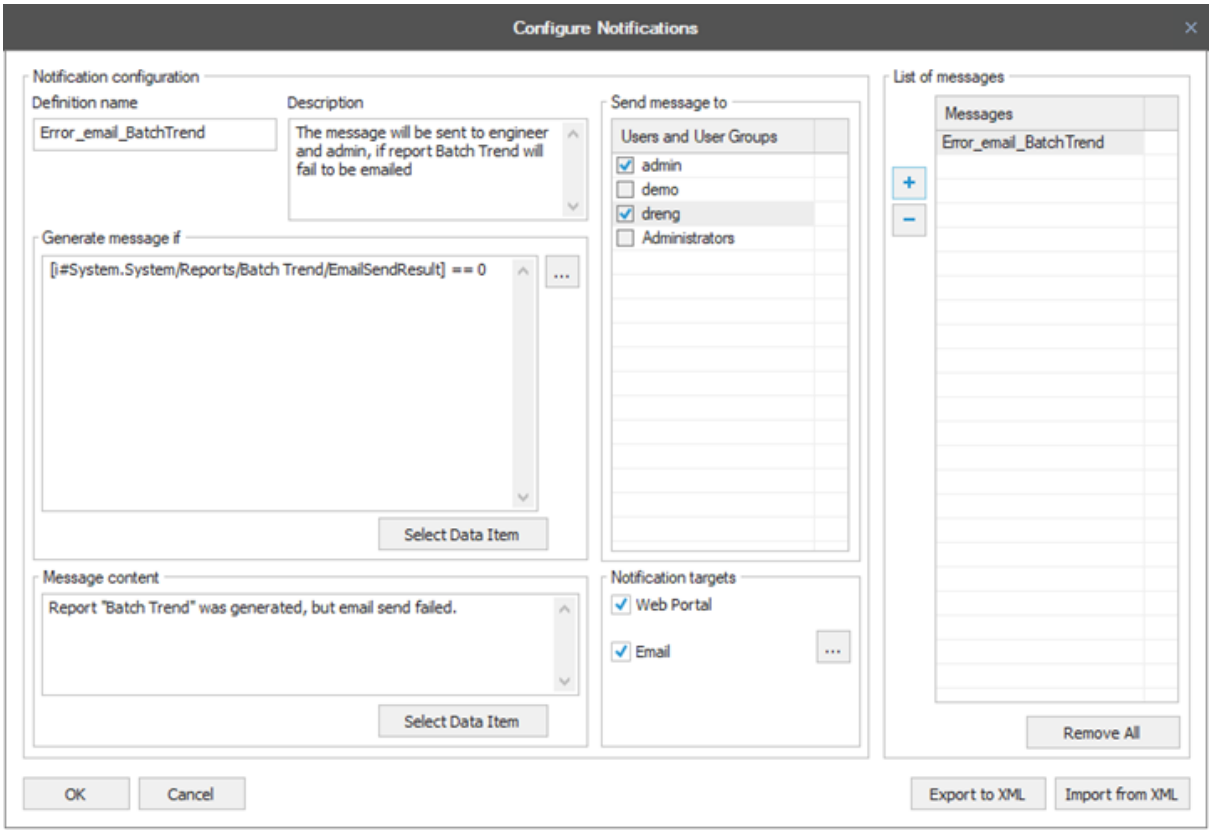
NOTE: The *Log to audit trail* option will be available only, when audit-trail functionality is globally enabled in the project and when the audit-trail option is available in the license.

Parameter *Timeout to hide* defines, how much time, notification popup window will remain open in a web portal, if user does not close it. The default value is 10 seconds.

The *Maximum number of messages* parameter defines the maximum length of the list of messages, which will be displayed in a user inbox in a web portal. The default value is 100 messages.

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If user will click the Configure button ("…"), then Notifications configuration window will open:



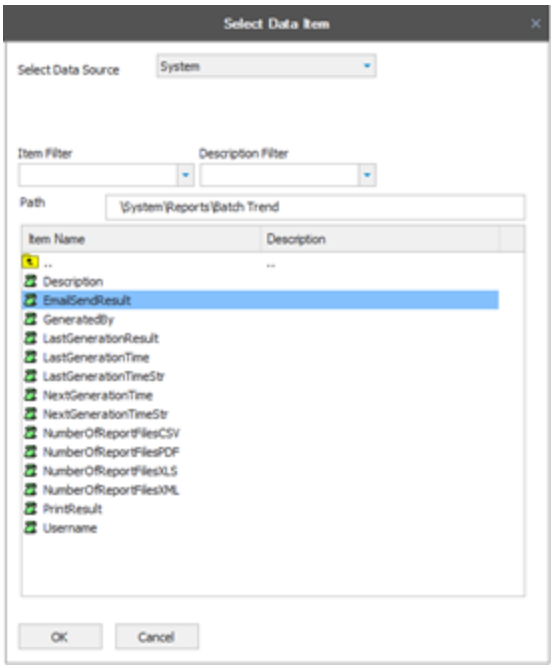
In this configuration window, user can pre-define messages, which will be generated automatically.

To add a new message definition, user has to enter any logical name into the *Definition name* field. That name should give you a hint about that message definition and will be used to distinct that message definition from the other ones. Also, you can enter a message *Description*. It's optional.

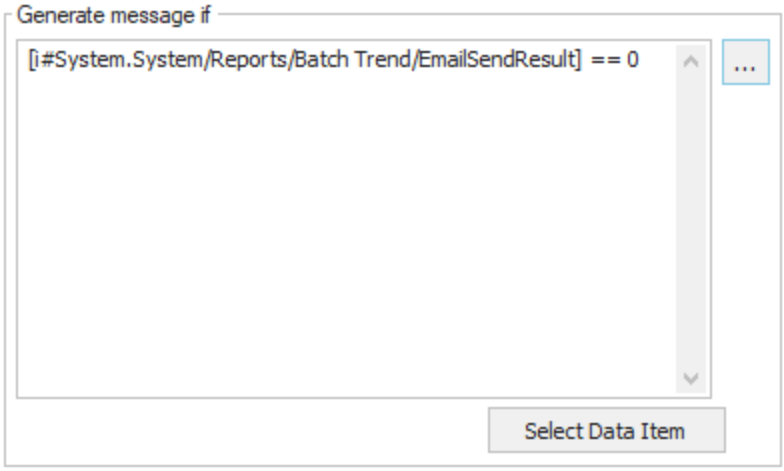
The section *Generate message if* – shall contain the condition, which should be TRUE to generate and send out a message. That condition can contain dynamic tokens – real-time tags values. As soon as the value of any real-time tag, which is included in the condition, is changed – the whole condition will be re-calculated.

When user will click *Select Data Item* button – the standard real-time data item browse window will open:

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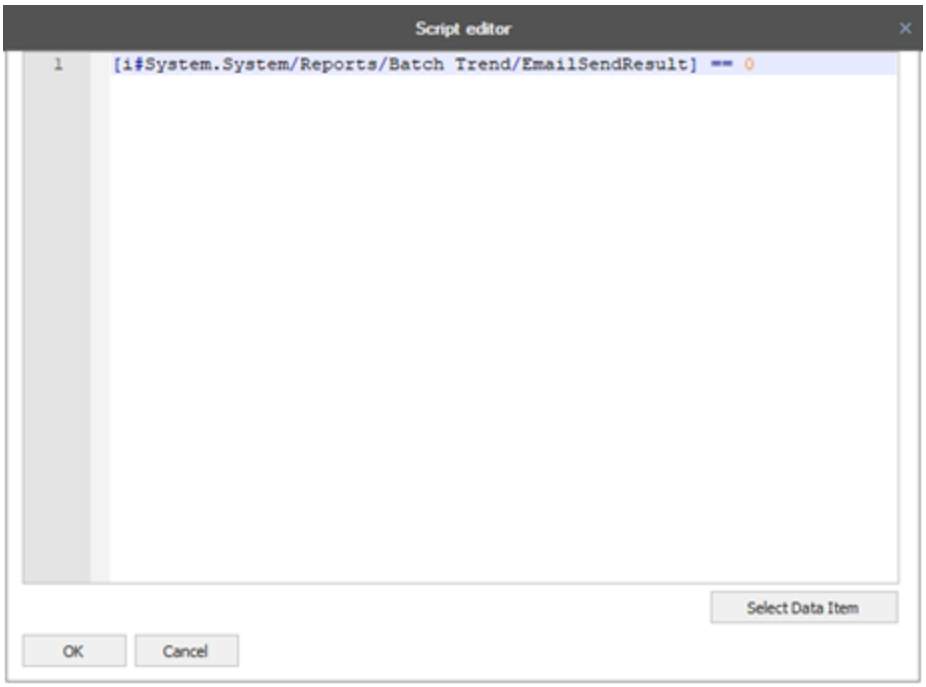
There, you can select a real-time data item and add it to the condition:



A condition represents a script. So, you can enter a simple condition, like *[i#source1.tag1] > 10* or you can write any required functions and scripts, using LUA scripting language.

If you would like to open a condition editor in a separate window, you can click on "…" button (at the right side), and the condition editor will be open:

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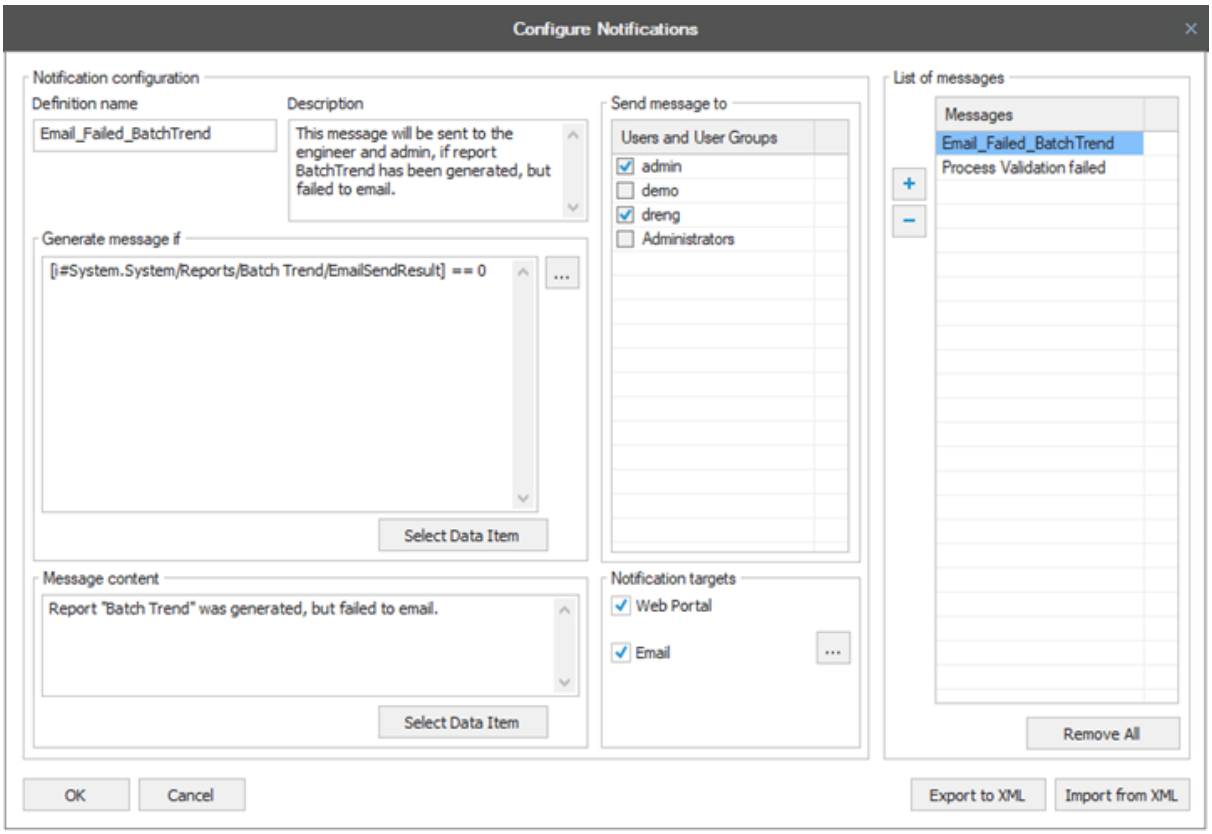
Select Data Item button will open a real-time tag selector, which can be used to select and add real-time tag values to the condition.

When the project is running in the runtime, *Notifications* module will receive all values updates for all data items, used in that condition. If a value of any such a data item would change, the whole condition will be re-calculated and, as soon as the result of the condition has non-zero value – the message will be generated and sent out.

If user would like to create condition on system sanity events (e.g. report generation failure, or report emailing or printing failure, …) – a real-time system driver can be used with the appropriate report property.

On the image below, you can see a notification, configured to send a message, if report "*Batch Trend*" has been generated, but failed to email:

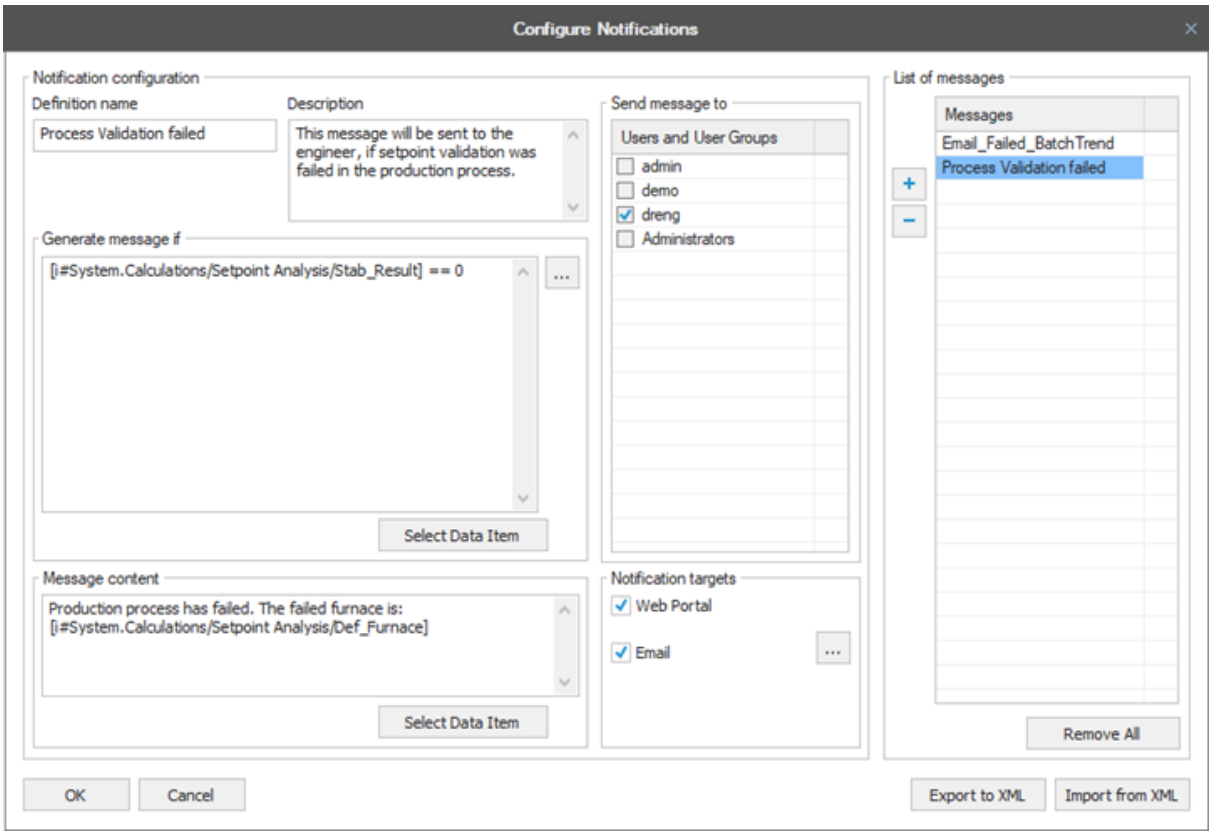
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Also, user can include report statistical objects and real-time tag values into a message text. Such dynamic objects will be replaced by the actual value, at the moment of generation.

At the picture below, you can see a notification, which will be sent, if the heat treatment process setpoint validation failed. The message itself contains the serial ID of the furnace, which setpoint process had failed:

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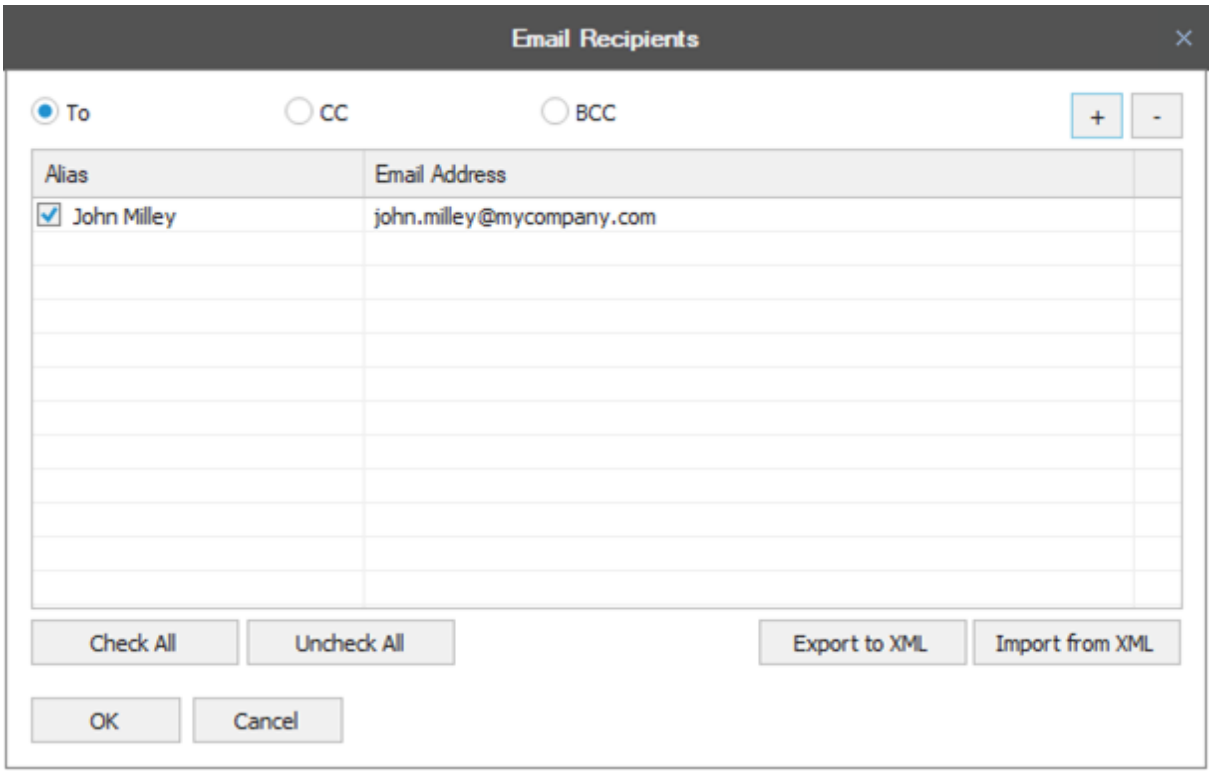
The section *Send message to* allows users to select recipients in the web portal for that message. The list will contain users and user groups, defined in that project. All users or members of that user group, will receive a message in the web portal inbox, when it will be generated.

The section *Notification targets* defines, by which means, the message will be delivered to each recipient. There are two options available: *Web Portal* and *Email*.

IMPORTANT NOTE: When user selects users and user groups – those recipients are selected for a web portal notifications only. Emails recipients list is defined separately.

To define the list of emails recipients, user has to check *Email* check box and click the "…" button, next to the check box, and email list definition window will open:

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To add a new email recipient to the list, click the "+" button. To delete an email address from the list, click the "-" button.

NOTE: The message will be not sent to all list members – it will be sent only to those recipients, which check box is checked!

Among users, you can select, which of them will receive email as "To or as "Cc" or as "Bcc" recipient types – you have to select the required recipient type (e.g. To or Cc) and check (enable) recipients for that recipient type. The list of recipients is saved for each recipient type separately.

The functions "*Export to XML*" and "*Import from XML*" allow users doing quick edit of recipients list, without operating via dialog windows, but by simple editing of an XML file and importing it.

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SQL Development Tools

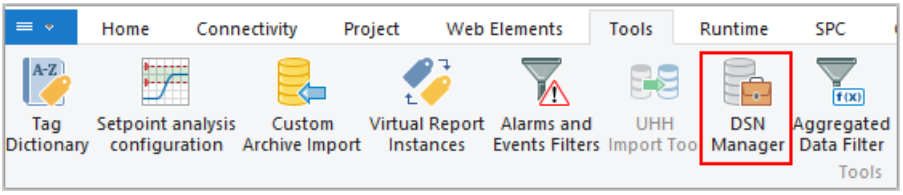
11 SQL Development Tools

11.1 DSN Manager

DSN Manager enables users to manage configuration of all Data Source Names (DSN's) used in the project from a single interface. Dream Report supports ODBC, OLE-DB and "DSN-less" connections.

DSN Manager includes a user interface (*DSN Manager* window) for configuring DSNs, and a Combo Box control, which enables the selection of pre-defined DSNs in SQL tables, Combo Box objects (SQL Query data display), and Single Data Objects (SQL Query statistical function).

You can create DSN definitions in the *DSN Manager* window. To open it, click on the command button *DSN Manager* on the *Tools* ribbon icon on the horizontal toolbar either in the Dream Report Logger Studio or Dream Report Designer Studio menu (see pic. below):

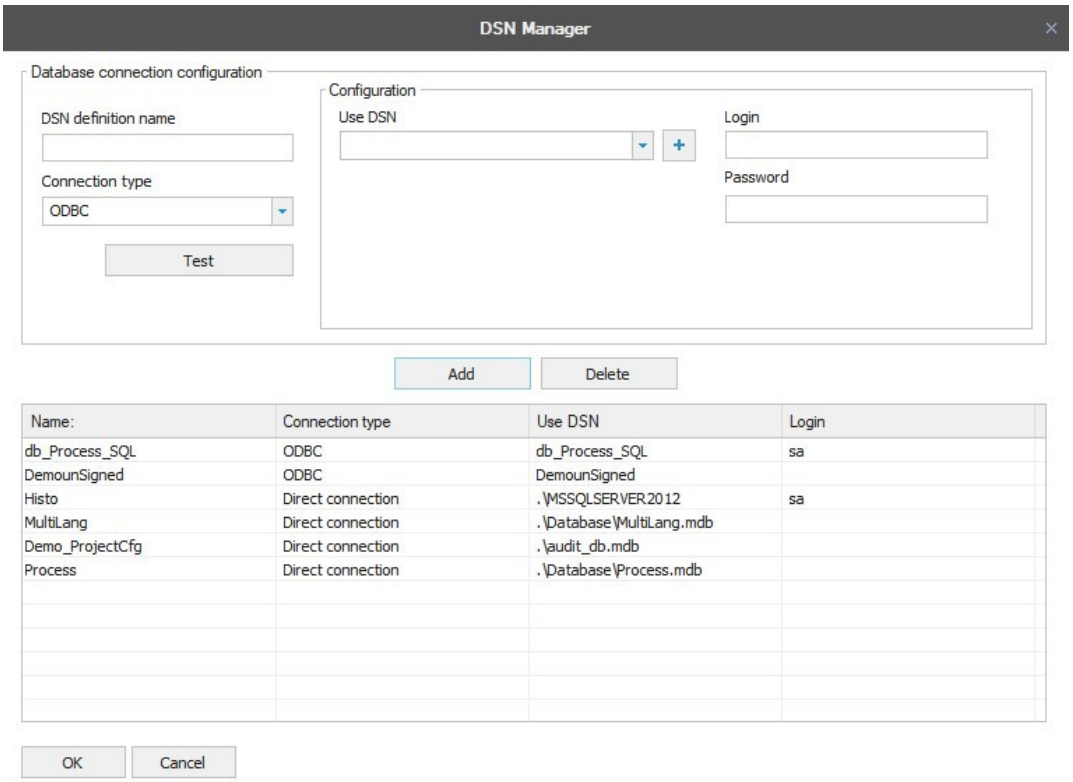


Additionally, when any of the configuration windows of either SQL table or SQL Query data display option in Combo box objects, or *SQL Query* statistical function in *Single Data* objects is opened, then the DSN selection combo box will be replaced by the following standard control.



By default, this control will be empty. Combo box will ***not*** have the list of all DSNs available in the system (i.e., defined in the Windows ODBC Manager). It will only display the list of project DSNs configured in the Dream Report *DSN Manager*, specific to this project. To open the *DSN Manager*, click on the "*[…]*" (browse) button. The *DSN Manager* dialog window will open:

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To Configure a Database Connection

In the *DSN definition name* section, enter a unique logical name for the database connection (DSN), which will be used in further work with that DSN within the project.

In the *Connection Type* section, the user has the option of using an *ODBC, OLE-DB* or *Direct Connection* to connect to each database:

- *ODBC:* The *Use DSN* combo box will be filled with all DSN's (Data Source Names) defined in Windows. If using *ODBC*, select the appropriate DSN, and specify *Login* and *Password* (if needed). Click the *"Add"* button to add the database connection to the list of configured DSN's below.

- *OLE DB:* In the Use *OLE DB Provider* section, click the *"[…]"* (browse) button. The Microsoft *Data Link Properties* window will open, allowing the user to configure the connection to the specific database using *OLE DB.* Note - other non-SQL databases, such as process historians, can also be used, if the appropriate OLE DB driver is installed on the Dream Report machine). Once configured, click *"OK*" to close the *Data Link Properties* window, and then click the *"Add"* button to add this data source definition to the list of configured DSN's. The DSN definition (*DSN definition name, Use DSN* and, optionally, its *Login*) will be added to the list of project DSNs.

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- *Direct Connection:* Using this option, Dream Report can use an ODBC driver to connect directly to a SQL database, without the need for first creating an ODBC DSN in the Windows ODBM Manager. This significantly simplifies project deployment to a production environment, as there is no need to re-create DSNs outside of Dream Report. Select the *Database type (MS SQL Server, MS Access, Oracle* and *MySQL* databases are natively supported, and other ODBC connections can be created using the *ODBC Manual Connection string* option). Depending on which *Database type* is selected, enter or select the required connection parameters. Or, if *ODBC Manual Connection string* is selected in the *Database type* list, manually enter the Connection String (you will need to know the correct syntax for the connection string - reference http://www.connectionstrings.com/ for details on connection to most databases.) Click the *"Add"* button to add the database connection to the list of configured DSN's below.

To delete a *DSN* from a Dream Report project, select a *DSN definition* in the list and click on *"Delete"* button. A confirmation message box *"Do you want to delete selected DSN definition?*" will appear, and if *"Yes"* is clicked, the selected *DSN* will be deleted.

Clicking on the *"Test"* button will check if the connection to the selected DSN succeeded or failed. If DSN connection has failed, a message box with error will be opened. User will have to check the reasons for the DSN connection failure.

If user wants to add a new *DSN* in Widows to use in the project, click the *"+"* (add DSN) button. The standard Windows wizard *"Create New Data Source"* window will be opened and user will be able to create a new DSN definition, and then use it in the Dream Report *DSN Manager*.

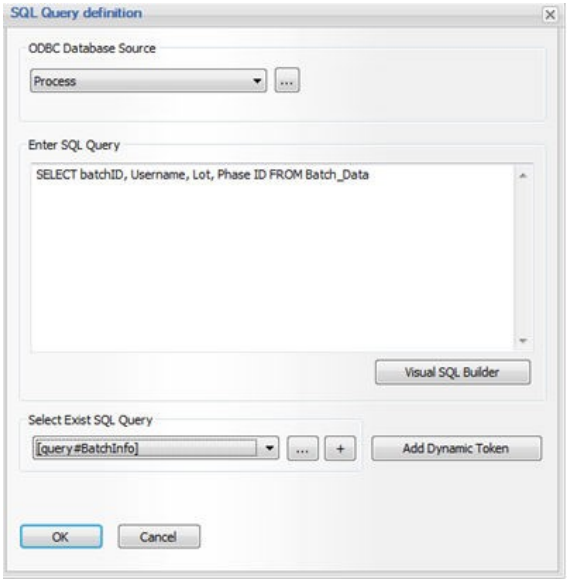
NOTES:

- All DSN configurations will be stored in the project database in the table *"Project_DSNs"*. Login and password for each DSN will be saved in *BASE64* encoding.
- Dream Report uses the Windows *32-Bit ODBC drivers*. On 64-Bit operating systems, the 32-Bit ODBC Data Source Administrator should be used to create new data sources, which can be opened from *C:\Windows\SysWOW64\odbcad32.exe.*

11.2 Edit SQL Query

If user clicks on *Define SQL Query,* the dialog window, where SQL query can be defined will be opened:

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On the top of this window user has to select a DSN. If required DSN is not in the list, user can click on a button "..." and DSN manager window will be opened, where user can define required SQL query. Functionality of DSN manager is described in details in its dedicated section DSN Manager.

If user want to write an SQL query by hand - he do so - just write required SQL query directly in the text box "Enter SQL query".

If user would like to build his SQL query using visual query builder tool, he has to click on the button Visual Query Builder and then visual query builder window will be opened where one can edit SQL query in a user-friendly manner.

Detailed description of visual SQL query builder can be found in its dedicated section Visual SQL Query Designer.
NOTE: Before calling visual query builder, user has to select the DSN first, otherwise, visual query builder will be opened without any database connection.

When user selects an existing data object in the same report from the combo box, just below the *Enter SQL Query* edit box, and clicks on the *Add* button, the selected field will be added to the SQL condition in the format of *[f#<Field Name>]*.

For details, please see List of Dynamic Tokens section.

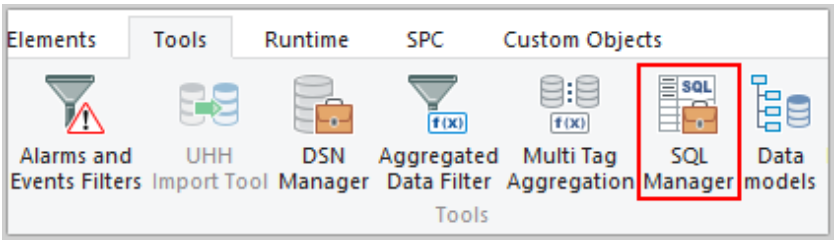
User can also select any statistical object, available in the current report, and add it to the SQL query as dynamic token. TO do so, one has to click on the button "Add Dynamic Token" and then the window with the tree with all available statistical elements will be displayed, where user can select what he needs and add that selection to his SQL query.

More detailed description of selecting dynamic tokens can be found in its dedicated section Dynamic objects selection.

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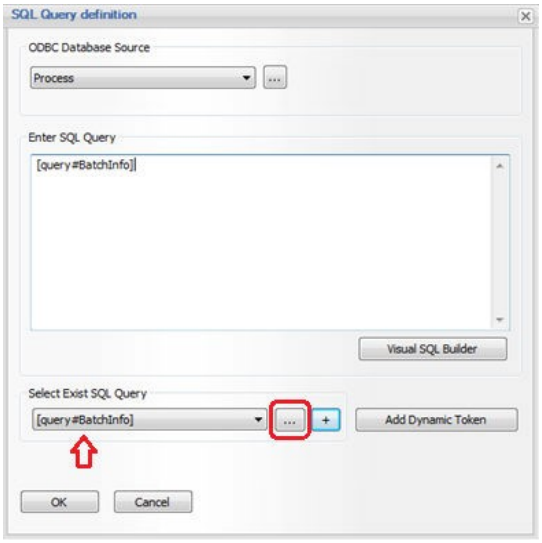
11.3 SQL Query Manager

SQL Query Manager enables Dream Report users to create the list of complete SQL queries or any parts of SQL queries and then dynamically select ore-defined queries or their parts in reporting objects. This mechanism allows users to pre-define SQL query one time and then use it multiple times. The *SQL Manager* is opened from the *Tools* menu bar:



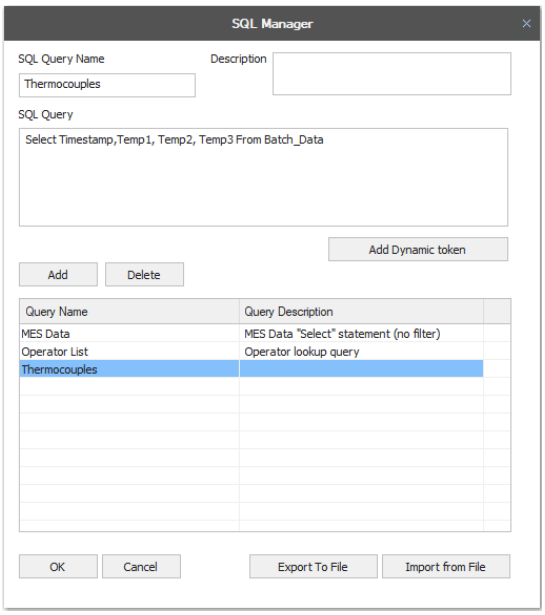
How it works:

When defining SQL query in a statistical object, there the new section "Select existing SQL query". This section has a drop-down list with the selection of existing queries, where user can select pre-defined ready query or any sub-part of query and add it to the list. In order to edit the list of pre-defined SQL queries, user has to click a button "..." (browse):



and SQL Query manager window will be opened:

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In SQL manager window user can create a list of pre-defined strings, which will be then added as they are, to the result SQL query in statistical object, where that query is used.

Each entry in this list has a unique logical name, which has to be entered in *SQL query name* edit box; *Description*, which can briefly describe the purpose of that query or sub-query.

The text of *SQL query* can include any content (SQL query or any of its part or call SQL stored procedure or any other string).

The text of SQL query can be either static or it may contain dynamic objects. If user will click on *Add dynamic token* button, then dynamic object selection window will be opened, where user can select dynamic statistical reporting objects and add them to the SQL as dynamic objects. Dynamic object selection is described in details in its dedicated section Dynamic Objects Selection.

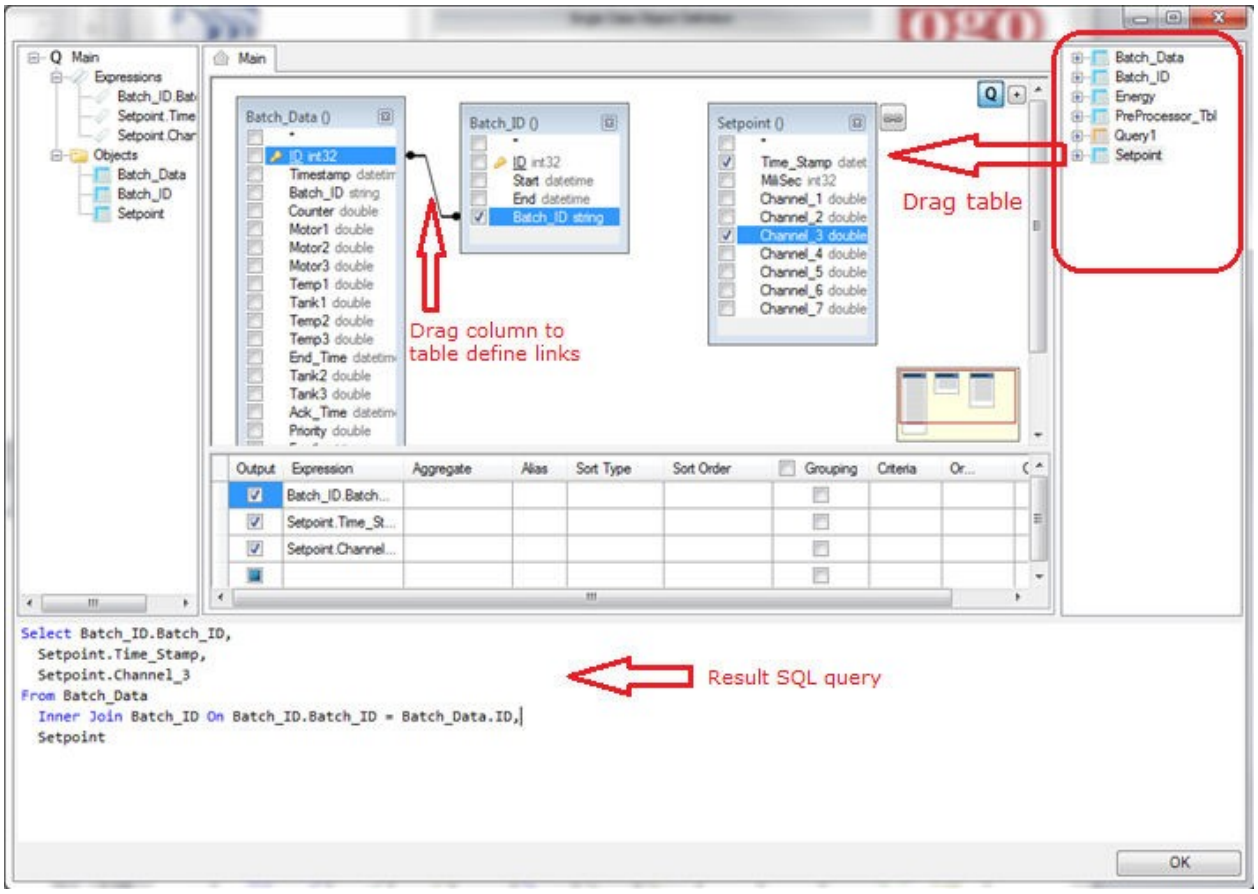
11.4 Visual SQL Query Designer

Visual SQL query designer enables Dream Report users to create and edit SQL queries using visual tools. Visual SQL query designer visually presents selected database schema and allows using mouse to set links between database tables and select which columns user wishes to select in his SQL query.

This visual query designer can be opened in any window, where SQL query has to be defined (SQL table, single data object with SQL query function, as well as pie, bar graph, button, combo box and chart).

The visual query designer window has the following design:

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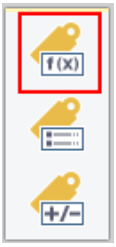
Simple Statistic Objects

12 Simple Statistic Objects

12.1 Single Data Object

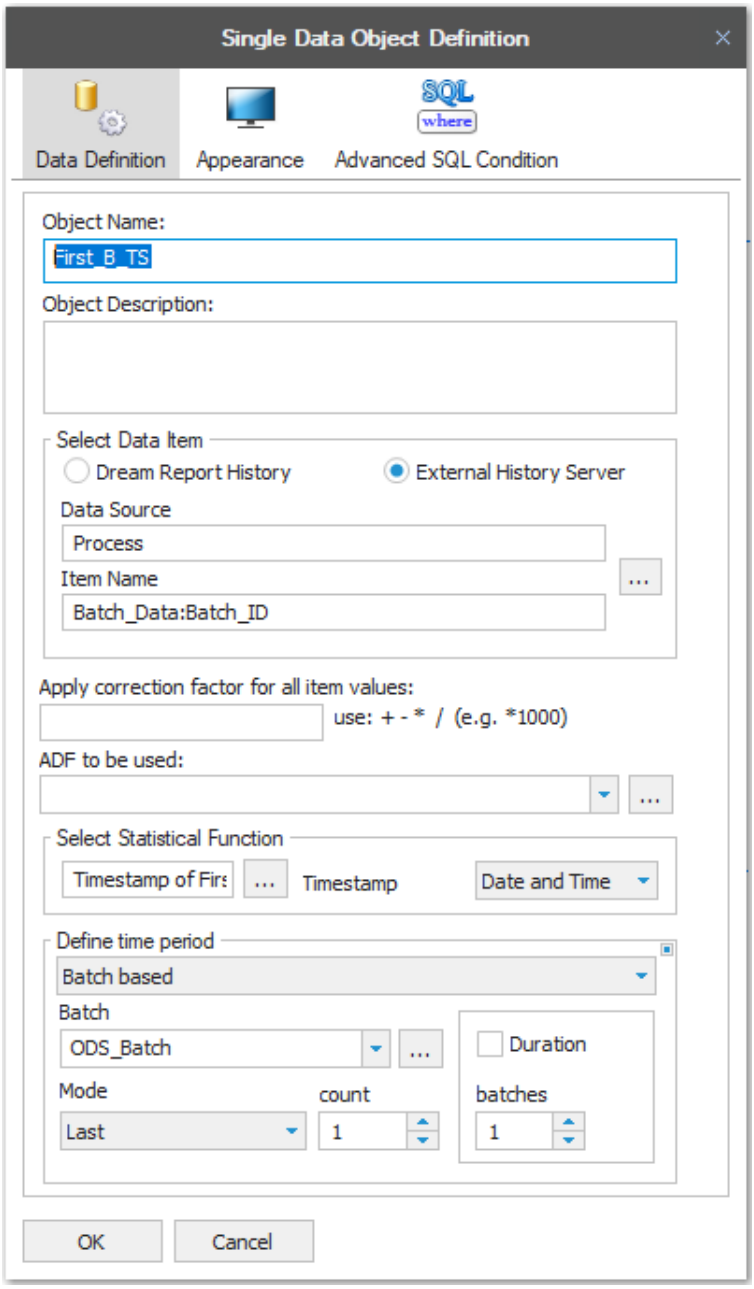
Single Data Object is a dynamic object, which performs statistical calculations with the textual output of the result.

To add this object, click on the *Single Data Object* button on the Report Designer Studio *Elements* toolbar:



Draw a rectangle in the workspace where the output data will be displayed. The following dialog box will be opened:

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Object Name must be a unique logical name, which will be used in further work with that object within the project. The object name can be up to 64 characters long. Only alphanumeric characters and "_" are allowed. The first character cannot be a number.

Object Description allows users to quickly understand the use of the object. The description can be up to 256 characters long. Any characters are allowed.

In the *Select Data Item* section, select the data to display. The radio buttons *"Dream Report History"* and *"External History Server"* define whether historical data will be taken from Dream Report history or directly from the history of an external server using the history driver for that server.

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If *"Dream Report History"* will be selected, the combo box *"Select Data Source"* will contain a list of data access drivers defined in the project. If *"External History Server"* will be selected, the *"Select Data Source"* combo box will contain a list of history access drivers defined in the project.

For *Data Source* and *Item Name*, select the source and item from which Dream Report will calculate values.

NOTE: If you will select *"Dream Report History"*, then you will be prompted to select a data item only from the list of data items defined in one or more logging groups within the Dream Report logger.
However, if the selected statistical function will be *"Current Value"*, you will be prompted to select a data item from the list of all available data items within the selected source.

If you will select *"External History Server"*, then you will be prompted to select a data item from the list of all available items within the selected history source.

Apply correction factor for all item values enables adding simple expression to a single data object. If the correction factor is set for a data item in a single data object, then, when retrieving value of that data item for that object, first of all, each retrieved value from a database will be re-calculated, applying the correction factor. Then the statistical functions will be performed on re-calculated values.

For more details, please refer to the Correction factor section.

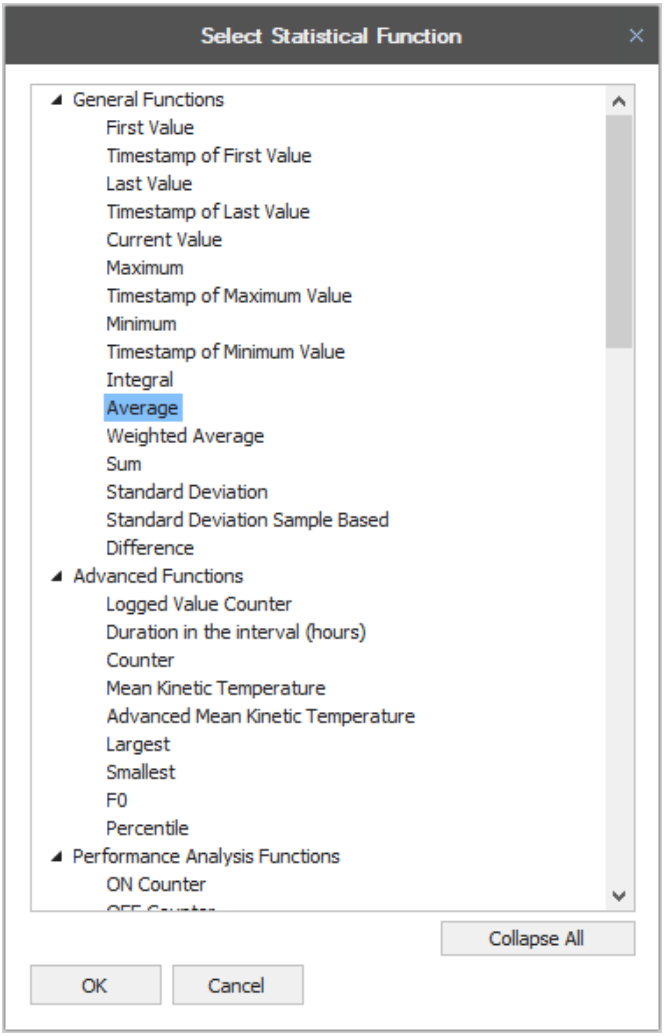
ADF to be used: enables to select an aggregated data filter. *"ADF to be used"* combo box will contain all ADF definitions configured in the project. The default string will be *"Not Used"*, i.e. no filter (ADF) is applied.

For details on ADF definition/configuration, please go to the Aggregated Data Filter section of this manual.

The *Select Statistical Function* combo box contains a list of statistical functions available for calculations.

In the *Select Statistical Function* dialog box all the statistical functions will be grouped according to their common performance characteristics, and will be displayed as a tree (please, see the pic. below):

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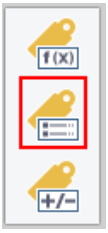
To expand/collapse one of the groups in the Statistical Functions tree, click on the corresponding group branch. To see the whole tree displayed or collapsed, clicking the *"Expand All" / "Collapse All"* button in the bottom right corner of the *Select Statistical Function* dialog box. If the dialog box is opened with the expanded tree of the groups of statistical functions.

By default, when the *Select Statistical Function* dialog box is opened, the tree will appear partially expanded - only the group branch, from which this statistical function has been selected, will be expanded. All other groups will be collapsed.

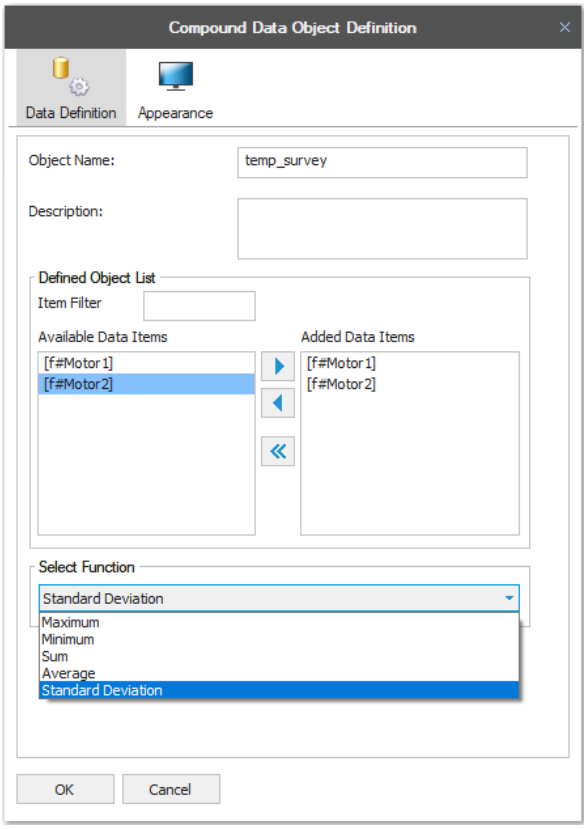
Please follow to the Statistical Functions list 349

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12.2 Compound Data Object



Compound Data Object is a statistical field, which performs analytical calculations between the results of two or more other statistical or analytical fields in the given report.



To add this object, please, click on the *Compound Object* button (second from the left) on the Report Designer Studio *Elements* toolbar. Mark in the workspace the rectangle where desired data will be displayed.

Object Name must be a unique logical name, which will be used in further work with that object within the project. The object name can be up to 64 characters long. Only alphanumeric characters and "_" are allowed. The first character cannot be a number.

Object Description is a label to help users quickly understand purpose of the object. The description can be up to 256 characters long. All characters are allowed.

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Defined Object List contains a list of all statistical objects in the report.

Item Filter is used to limit the items/tags for a specific object within the user-defined properties. If a user has many items/tags stored, and will need only some of them for this particular compound object display, he will only have to define in the *Item Filter* edit box the name for the items/tags he may need. They will be filtered according to the Item Filter name, and will appear in the *Available Data Items* box.

User can select two or more objects in the *Defined Object List* using the *CTRL* button. The object will perform the selected calculation between the selected objects.

Select Function contains a list of available statistical functions as follows:

- *Minimum* - calculates the minimum between the results of the selected data objects
- *Maximum* - calculates the maximum between the results of the selected data objects
- *Average* - calculates the average of values from the selected data objects
- *Sum* - calculates the sum of all values from the selected data objects.
- *Standard Deviation* – calculates standard deviation from the result values of all selected data objects.

The format of the result (decimal precision, added unit etc.) is described in details in the Result Representation section.

12.3 Expression Data Object

Expression Data Object is an object, which accepts a manually entered expression involving one or more statistical objects, mathematical operators and constants. Dream Report supports the use of the *Lua* scripting language for conditional calculations and functions in the *Expression Data Object. Lua* is a powerful scripting language that greatly extends the capabilities of Dream Report.

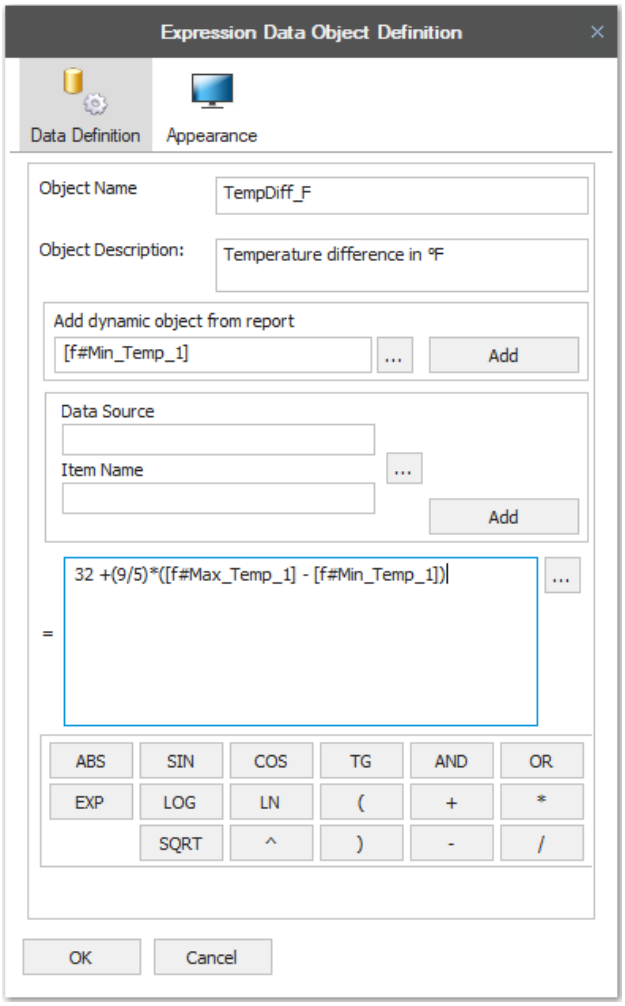
To add this object, click on the *Expression Data* button on the Report Designer Studio *Elements* toolbar:



Then, draw a rectangle in the report page, where the object will be placed. The *Expression Data Object* definition dialog window will be opened:

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Object Name must be a unique logical name, which will be used in further work with that object within the project. The object name can be up to 64 characters long. Only alphanumeric characters and "_" are allowed. The first character cannot be a number.



Object Description allows users to quickly understand the use of the object. The description can be up to 256 characters long. All characters are allowed.

The *Add dynamic object from report* option allows users to select a data object to add to the expression. To use this, choose an object from the combo box and click the *Add* button. The object name will be added to the expression edit box. To remove the last object inserted from expression, click *Delete*. The selected dynamic object will be added in the format of *[f#<Field Name>]*.

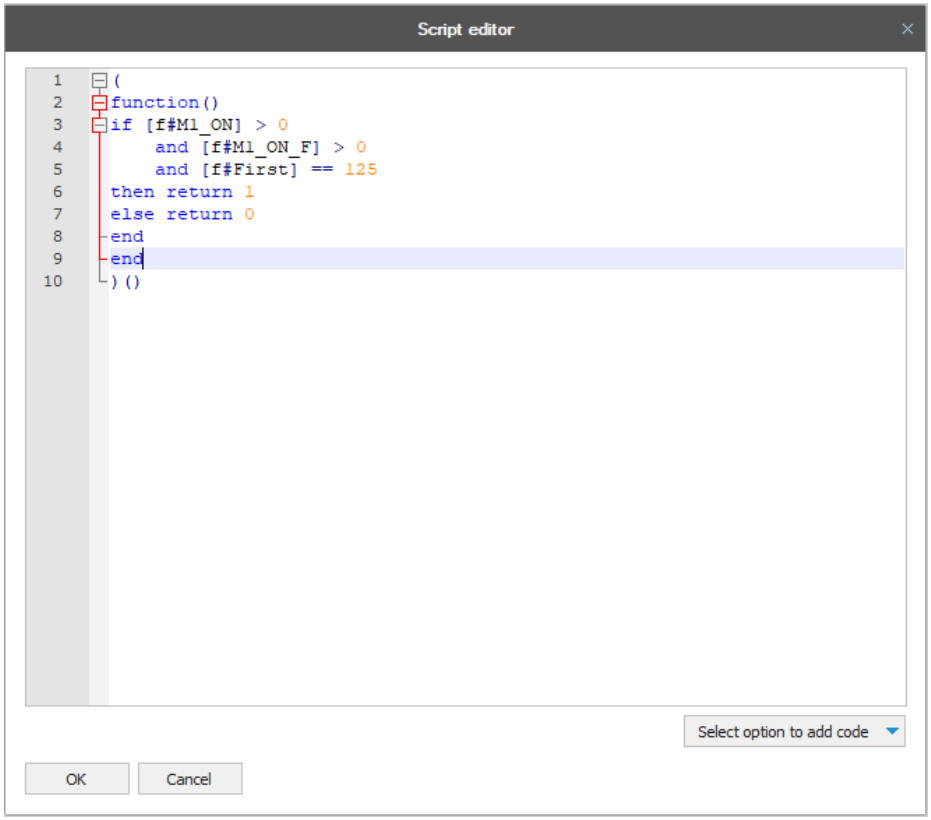
Note that if any of the dynamic objects in an Expression Object shows N/A, then all values in this Expression Object will be shown as N/A.

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NOTE: The *Expression Object* can perform calculations with the data from the footer of a *Step Table* in the report. If Step Table has the footer defined, objects from this footer will be added to the list of dynamic objects of the report (*Add dynamic object from report* section) in the format of *[footer#<Table Name>:<Object name>]* and they (objects) will be available for calculations in Expression Object. The footer will be added to the list of dynamic objects in the report only if Step Table has its name defined.

For details on footer definition, please go to the Step Table 382 section of this manual.

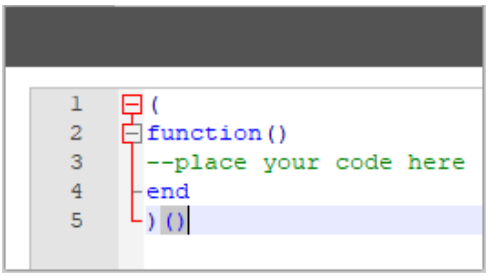
If you wish to use the *Multi-Line Editor* in the *Expression* object, click the *[…]* button at the right of the expression. This will open an edit box with extended height and input text, and with multi-line editing capabilities, and *IntelliSense* to assist with code development. This edit box will display the inserted text in multiple lines, for improved readability and report layout:



By clicking the *"Select option to add code"* drop-down:

- Select the *"Add Dynamic Token"* to open a window to select objects ("Dynamic Tokens") from the report to include in the expression.
- Select the *"Add script function template"* - this is useful when starting to build an expression function from scratch. The following code will be added to the Script Editor:

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NOTES:

- If you add the Date and Time 141 dynamic object, it will be added in the format of *[dt#<object name>]*
- If you add the Combo Box 571 dynamic object, it will be added in the format of *[cb#<object name>]*
- If you add the Timestamp Picker 567 dynamic object, it will be added in the format of *[tp#<object name>]*

For details, please see List of Dynamic Tokens 224 section.

The *Select Data Item* section allows user to select and add any data item from any available data source to the expression. Click the *Add* button to add the selected item to the expression in the format *[i#<item name>]*, where "i" means "item name". When calculating the result for the expression, Dream Report will get the current value of the data item and replace *[i#<item name>]* with the current value.

For details, please see List of Dynamic Tokens section.

To add mathematical or logical operators, click on the appropriate button and it will be added to your calculation expression.

The calculation expression can be edited manually as well, directly in the expression edit box.

The functions Sin, Cos, Tg, SQRT, Ln, Log and Abs must be in the format: *Fn(x)*.

Where *Fn* - is one of those functions and (x) is a function argument, which can be either a constant or a data item value or a statistic object.

The *Log* function calculates a base 10 logarithm and *Ln* calculates a natural logarithm (with base *e*).

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Calculations with Times and Time value types:

An expression object supports calculations using Single Data Objects created with a statistical function "Timestamp of first value", "Timestamp of last value", "Timestamp of minimum value", "Timestamp of maximum value" or "Duration in the interval". In these cases, a user can make mathematical calculations with those objects and constants. During calculation, any such value of a date/time type will be converted into a long integer type representing the number of seconds since 1 January 1970 expressed in UTC, and then the calculations will be performed and the result converted back to a time format, again in UTC.

EXAMPLE 1: A Single Data Object "On_Duration" is defined to calculate "Duration in the interval" when the ventilator was running and then an expression object is defined to calculate an average running time of the ventilator per day, i.e. ("On_Duration"/24). If result of calculation of "On_Duration" is 06:00:00 (6 hours), then the result of expression object will be 00:15:00 (i.e. 06:00:00/24).

EXAMPLE 2: If a user has to calculate the interval between the first value and the last value, define 2 Single Data Objects "TimeOfFirstVal" and "TimeOfLastVal", then the calculation can be done in an expression object, which will have the following definition: (TimeOfLastVal - TimeOfFirstVal).

If TimeOfLastVal = 12:30:00 and TimeOfFirstVal = 12:05:00, then the result value will be 00:25:00.

The format of the output (decimal precision, unit, advanced visualization etc.) is described in details in the Result Representation section.

Operations with Strings:

Expression object allows few operations with strings, such as: concatenation string to a string, concatenation numeric result with a string, having result as a string, extraction left or right or mid part of a string, converting numeric value into a string. This can be done as follows:

- Concatenation. Strings concatenation is done using the operator.
  EXAMPLE 1: If you need to concatenate a string tag "BatchName" value with another string "MyString", then the syntax will be: *"[i#OPC.BatchName]" .. "MyString"*
  EXAMPLE 2: If you need to concatenate a numeric tag to a string, the syntax will be: *[i#OPC.Ana_01] .. "_MyString"* - the result will be: *10.00_MyString*

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- Extracting left or right part of a string is done using functions: *left(<argument>, <num of chars>* or *right(...).* The result will be extracted string.
  EXAMPLE 1: Extract 3 left chars from a string *"3.1415"*. The syntax will be: *left("3.1415", 3).* Result will be: *"3.1"*
  EXAMPLE 2: Extract 3 right chars from a string *"3.1415"*. The syntax will be: *right("3.1415", 3)*. Result will be: *"415"*
  NOTE: if you need to extract a part of value of statistical object or item value - then item name or statistical object name must be taken in quotation marks.
  Example: *left("[f#_sdo1]",3)*

- Converting numeric value into a string can be done using a function: *tostring(<numeric expression>)* - it will calculate a numeric expression and convert the end result into a string.
  Example: *tostring([f#_sdo1] + [f#_sdo2])* - it will calculate a sum of two numeric objects (*_sdo1* and *_sdo2*) and then return the result as a string.

ToNumber() Function in Expression Objects

"ToNumber()" is a ToString() function, which converts its argument to a number. This function works as follows:

- "**+**" or "**-**" sign in front of a string are correctly handled

EXAMPLE: ToNumber("+123") or ToNumber("-123") will give a result of 123 and -123

- Spaces are accepted if they are at the start or end of the text or both

EXAMPLE: ToNumber(" +123") or ToNumber(" -123") as well as ToNumber("+123 ") or ToNumber("-123 "), or ToNumber(" +123 ") and ToNumber(" -123 ") will give a result of 123 and -123

- All non-numerical characters inside the string result in a "N/A"

EXAMPLE: ToNumber("+12 3") will give N/A, ToNumber("-12A5") will give N/A

- The decimal sign must be '.' to be converted, N/A otherwise

EXAMPLE: ToNumber("12.5") will give 12.5 or 12,5 depending on Report Localization Settings, ToNumber("12,5") will give N/A even if user's PC regional settings are set to use the ',' as the decimal separator.

Conditional calculations

Expression object also allows doing conditional calculation, i.e. set a condition, and if condition is true, use one calculation expression. If condition is false, use another calculation expression. The format for such an expression is the following:
(function() if <condition> then return <calculation expression 1> else return <calculation expression 2> end end)()

EXAMPLE 1: *(function() if [f#_sdo1] < [f#_sdo2] then return "abc" else return "xyz" end end)()*
EXAMPLE 2: *(function() if [f#_sdo1] == [f#_sdo2] then return "abc" else return "xyz" end end)()*

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NOTE: For complete list of the conditional calculations and functions available in *Expression Data Object*, please see the reference manual at *http://www.lua.org/manual/5.2/*

Please find below examples of how LUA script can be used in a Dream Report Expression object:

Object Name	Expression Text	Result
expS	"string"	string
exp2	(function () local s, e = string.find("[f#expS]", "t") return s end)()	2.00
exp2_1	(function () local s, e = string.find("[f#expS]", "a") return s end)()	N/A
exp2_2	(function () local s, e = string.find("[f#expS]", "tri") return s end)()	2.00
exp2_3	(function () local s, e = string.find("[f#expS]", "tri") return e end)()	4.00
exp3	(function() return os.time({ year = 2012, month = 8, day = 30, hour = 6, min = 32, sec = 1, dst = true }) end)()	1 346 301 121.00
exp4	(function() return os.date("%Y-%m-%d %H:%M:%S", [f#exp3]) end)()	2012-08-30 06:32:01

Using a LUA Expression to Execute a SQL Statement

Dream Report includes a function that enables users to execute a SQL statement (SQL query or stored procedure) from inside a Lua script, and return the results as a comma-separated list. Any variables or reporting objects can be used as parameters in the SQL statement, making the SQL statement dynamic. Also, the results of SQL query can be received back to the Expression object, and processed by the script as required.

The *UserFuncSqlExecuteQuery()* function is included in the *User Lua Library*, located in the current Dream Report project folder - e.g., C:\ODS\Dream Report\Project\MyDR_Project\UserLuaLib.lua, and is used in an Expression object as follows:

UserFuncSqlExecuteQuery('<DSN>', '<SQL statement>')

where <*DSN*> should be replaced with the name of a DSN defined in the Dream Report *DSN Manager*, and <*SQL statement*> should be replaced with a valid SQL statement. The SQL statement can be dynamic, by referencing dynamic tokens on the report.

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The following function call in an *Expression* object, which references a project DSN named "*process*":

Capsule Filling #1,Capsule Filling #2,Powder Fluid Mixing #1,Powder Fluid Mixing #3,Powder Fluid Mixing #5

UserFuncSqlExecuteQuery('process', 'SELECT DISTINCT Material_Desc FROM MES_Data Order by Material_Desc ')

Returns the following when the report generates:

NOTE: The use of square brackets to designate field names in a SQL query (e.g., - *Select* [*Material_Desc*] *From...*) is not supported in the LUA expression script. This is because Dream Report dynamic tokens are specified with square brackets (e.g., *[f#_MaxTemp])*, and the script parser would consider the SQL field as a dynamic token delimiter.

Dynamic Control for Reporting Objects Position by LUA Script

Dream Report scripting functionality enables controlling the position of reporting objects from LUA script. Using LUA script in an Expression object, a user can dynamically set the position of every object (which can be calculated) so the position of any object (e.g. picture, chart, etc.) on a report page will be defined at the moment of generation, depending on report values/calculations. The following functions can be used in LUA scripts to get and set object positions and properties on a report:

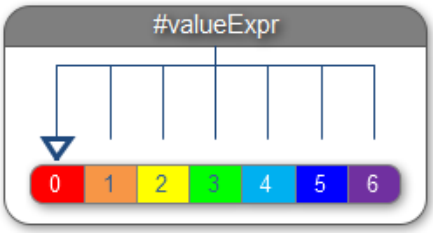
OdsLuaObjGetPropertyValue()

OdsLuaObjSetPropertyValue()

EXAMPLE

In the following example, the LUA script (below) in the *Expression* object (*"#expr"*) will get the integer value of the *#valueExpr*, and based on that value, will show/hide line segments, and locate the triangle accordingly:
Report configuration in Dream Report Studio:

#expr




```
(
function()
```


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```
item = [f#valueExpr]

id = '[uuid#fb86c3c8-2574-469c-8837-c53ff707c97f]'

-- Identify report objects by UUID
lineid1 = '[uuid#2574c726-1cfb-4f9d-8760-c339bf4db561]'
lineid2 = '[uuid#511652f0-1183-4e50-a8a5-2a52c3b60d93]'
lineid3 = '[uuid#9cb53028-df27-4b2a-8910-9469dd07b135]'
lineid4 = '[uuid#3e0140da-480b-4738-abf7-fa32eddb8f05]'
lineid5 = '[uuid#a098d7ed-150b-4ed0-b25a-32156e747631]'
lineid6 = '[uuid#39d1a72c-3bc2-495a-bfe9-89ed76e74db4]'
lineid7 = '[uuid#6f72eea7-ea6e-4d29-a89e-efd3d44de02a]'

lineids = {lineid1, lineid2, lineid3, lineid4, lineid5, lineid6, lineid7}

if item > 0 then
       val = math.floor(item + 0.5)
else
       val = math.ceil(item - 0.5)
       val = -val
end

pos = OdsLuaObjGetPropertyValue('', id, 'Position')
xpos = OdsGetAt(pos, 1)
delta = 8

lineid = -1

if val == 0 then
xpos = xpos + 0
lineid = lineid1
elseif val == 1 then
xpos = xpos + delta
lineid = lineid2
elseif val == 2 then
xpos = xpos + delta*2
lineid = lineid3
elseif val == 3 then
xpos = xpos + delta*3
lineid = lineid4
elseif val == 4 then
xpos = xpos + delta*4
lineid = lineid5
elseif val == 5 then
xpos = xpos + delta*5
lineid = lineid6
elseif val == 6 then
xpos = xpos + delta*6
lineid = lineid7
end

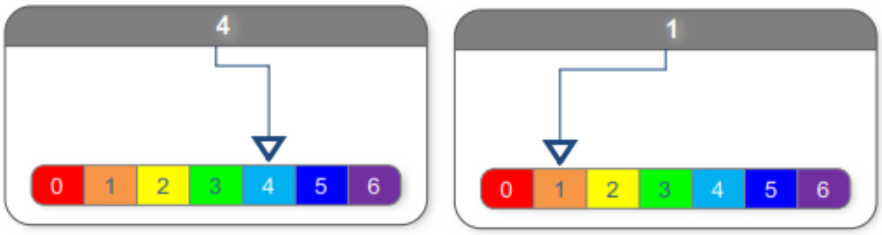
for i = 1, 7, 1
do
       OdsLuaObjSetPropertyValue('', OdsGetAt(lineids,i), 'Visible', 0)
end

OdsLuaObjSetPropertyValue('', lineid, 'Visible', 1)
```


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```
OdsLuaObjSetPropertyValue('', id, 'Position.x', xpos)

end
)()
```



The results on the report, depending on the integer value of *#expr*:

TIP: New way to write script for expressions. Starting from version 2023 P1 it's possible to write script with entry point function that must have predefined name. New function **OdsGetDataFromToken**() has been introduced to be used to get token value and the value can be checked for nil in order to handle situations when token has no value (N/A).

```
function OdsCalculateExpression()
--place your code here
--to get token value use OdsGetDataFromToken('Token')
end
```

EXAMPLE

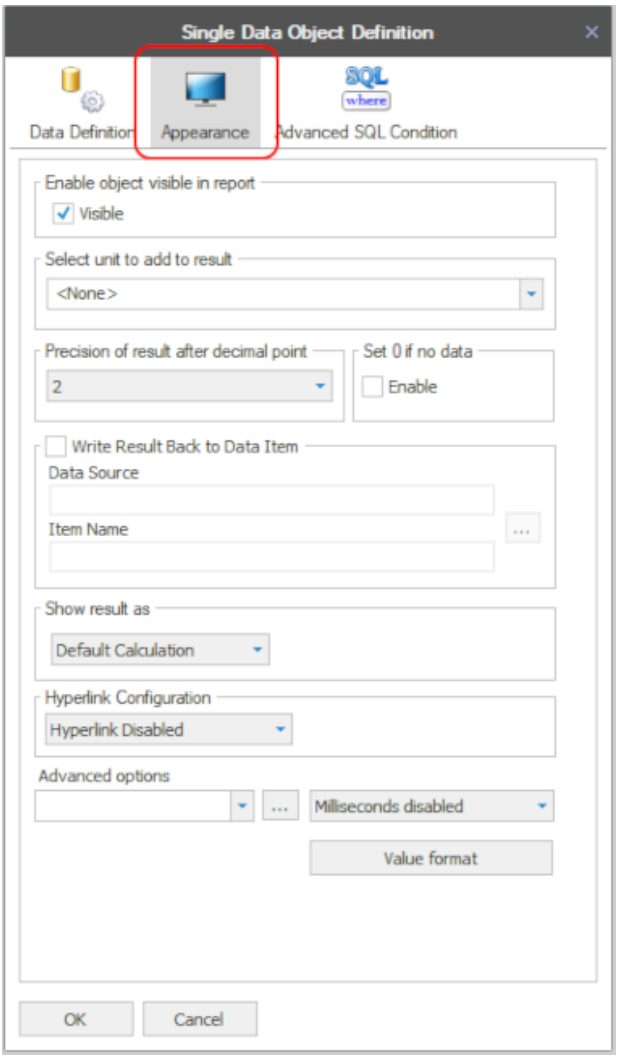
Assuming that user would like to get data from single data object with name "tank_monthly_avg", the call for the `OdsGetDataFromToken()in` expression object has to be defined as: `OdsGetDataFromToken('[f#tank_monthly_avg]')`

For more information on the use of these script functions, and reporting examples, please contact *ODS Support* at support@dreamreport.net.

12.4 Appearance - Result Representation

The format of results (decimal precision, added unit etc.) of statistical and analytical objects can be defined in the *Appearance* dialog box (in earlier Dream Report versions, this was known as the *Result Representation* configuration).

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The ***Visible*** check box defines whether the result of the entire object will be published in the report or will remain invisible in the output report. This can be useful if object is created for internal calculations and is not intended directly for the report.

The ***Select unit to add to result*** combo box allows a user to select or enter a string, which will be added to the end result in the output report. The user can select or manually type any string. This can be used to display engineering units for better report readability.
If user will manually type a unit, which is not the part of the standard units list, that unit will be saved locally, in the list of custom units. When the customer will open "Units" combo box next time, that new custom unit will appear in the list. If user will want to edit the list of custom units - it can be done in a text editor. That list of custom units is located in the file *DreamReport.ini* in the System folder in Dream Report installation (e.g. C:\ODS\Dream Report\System).

Note - Applies to Advanced ODBC Historical Values, Data Models, AVEVA Historian and GE Proficy Historian Historical Values only: In a Single Data Object, if you select "*Get Unit from Item*", the dynamic token 224 **[ip#unit]** will be automatically added. At report generation, the units in the data source associated with that tag will be used (if defined.)

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The *Precision of result after decimal point* combo box defines the number of digits to the right of the decimal point. User can select a number between 0 - 6 from a combo box. Other values can't be entered manually.

The *Display 0, when N/A* option defines, what will be displayed and used for further calculations, if the result of that statistical object is Not Available (N/A). If that option is not checked, then object will display, what is defined in Project Settings --> Localization -> Display, when there's no value. If "Display 0, when N/A" option is checked - this option will override the setting in Project Settings and that object will display 0. Also, in all places, where that object is used for calculations, zero will be used for such calculations.
By default, that option is disabled.

The *Write Result Back to Data Item* group box enables users to define the output action of the result, i.e. which real-time data source and item the calculation result should be written back to when the report generates.

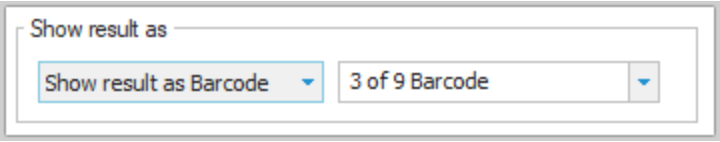
If the *Write Result Back to Data Item* check box is enabled, then, select the data source and item where calculated statistic result will be written to. The item selection will contain all available data items from all available real-time data sources.

The result will be written to the selected data item each time the statistical object is calculated during report generation.

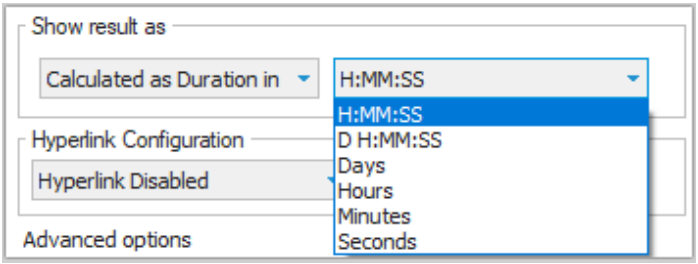
The *Show Result As* section controls the display format for the value. In the left combo box select a type of result output.

By default, the selection is *Default Calculation*. If this output type is selected, the result of statistical calculation will be displayed in its native format.

If *Show result as Barcode* option is selected, select a barcode type in the right combo box, as displayed on a picture above. Dream Report installs several types of barcodes, so a user doesn't have to install anything in addition to the Dream Report.



If *Calculated as Duration* in option is selected, the result of the calculation will be displayed as a time period in seconds. User can select preferred output format, as shown below. The result can be re-used in other numeric calculations.



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If *Timestamp* option is selected, then the result will be displayed as a timestamp of the report object event logged.

> NOTE: a timestamp is the time at which an event is recorded by a computer, not the time of the event itself. The difference may be inconsequential: the time at which an event is recorded by a timestamp (e.g., entered into a log file) should be very, very close to the time of the occurrence of the event recorded.

If *Scientific notation* option is selected, then the result will be displayed as scientific format, e.g. if the result is 290472.00, then displayed result in scientific notation will be 2,9e5.

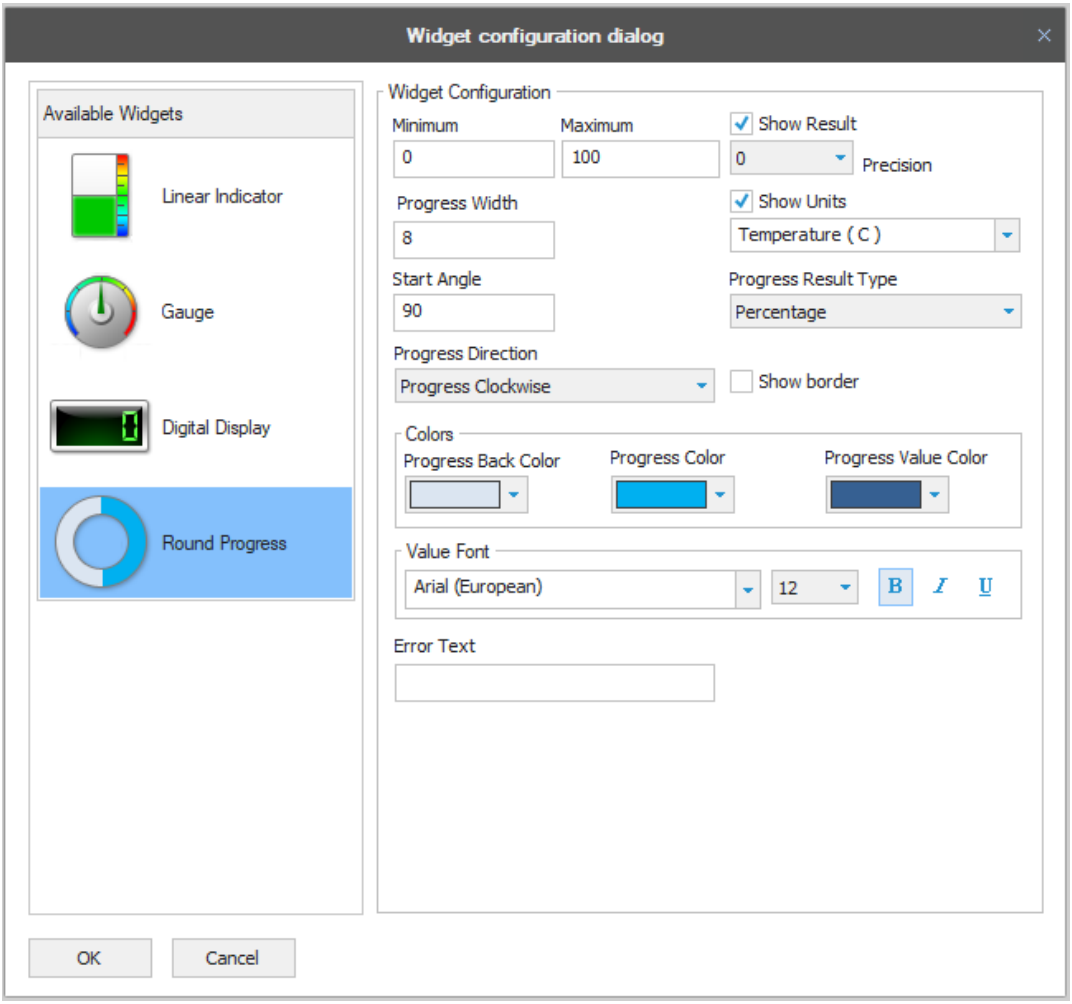
The number of digits after the decimal point will depend on the value, defined in the *"Decimal precision"* combo box, which is in the same window, above.

If *Engineering notation* option is selected, then the result will be displayed in the engineering representation format. The engineering representation format is very similar to the scientific format with the difference that the power value is always multiple of three, e.g. if the result is 290472.00, then the displayed result in the engineering notation will be 290e3, and the same result in scientific representation will be 2.9e5. The number of displayed values after the decimal point depends on the decimal precision, defined in this object.

If *Display as Widget* option is selected, to the right of this combo box a new button *"Configure"* will appear.

When a user clicks on this button, the following configuration dialog box will open:

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In the *Available Widgets* left-hand section, select a graphical display type: *Gauge, Linear Indicator, Digital Display* or *Round Progress.*

Widget Configuration

Gauge and Linear Indicator

In the *Scale* settings section, define the minimum and the maximum values for the limits of the displayed scale on a widget object. This parameter may have any integer or float number. No string values are accepted.

Edit boxes for *Minimum* and *Maximum* value may have either manual static entry or get values from a tag in a standard format: [i#<source>.<tag>]. In this case, when generating report, the object will read values of specified real-time data source and use it for scale limits. For example, user can calculate min and max temperature and use it for scale limits by analytical driver.

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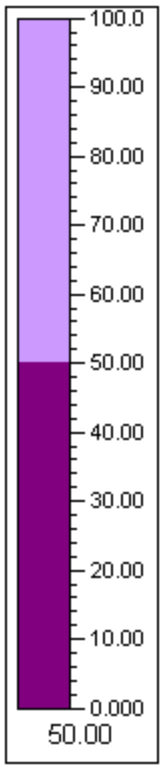
From Version 5.0 R2 limit values can now be provided as Dynamic Tokens, in addition to using static values. To use a Dynamic Token reference, double-click on the Minimum or Maximum text boxes, and the *Select Dynamic Object* window will open, from which to select a Dynamic Token for the limit.

By default minimum will be set to 0 and maximum to 100.

The *Main Division* section defines the range between 2 neighbor valued ticks on a scale (major ticks, next to which scale numbers are drawn). This parameter may contain only positive number (integer or float). By default it will be set to 10, e.g. scale will be display 0, 10, 20,… 100 scale ticks.

The *Subdivisions* section defines how many small horizontal lines (scale divisions) will be drawn between 2 neighbor ticks. This parameter may contain only positive number (integer or float). By default this will be set to 10, e.g. 10 tick divisions between 2 scale marks.

The *Linear Indicator* display type will have the following graphical representation (see image on the right):

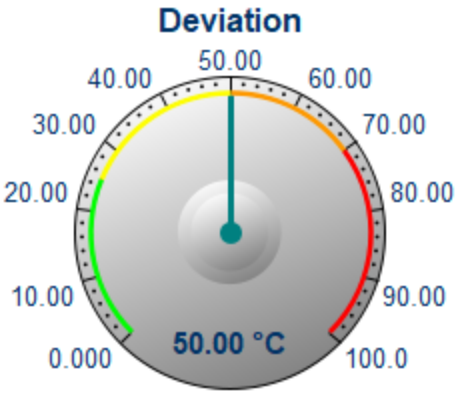


The *Main Division* here is defined as 10, i.e., the scale displays 0, 10, 20,....100 scale ticks.

Subdivision is defined as 5, i.e., there are only 5 small horizontal lines between each of the two neighbor ticks (eg. between 10 and 20, 20 and 30, etc.)

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The *Gauge* display type will have the following graphical representation:



The *Main Division* here is defined as 10, i.e., the scale displays 0.000, 10.00,...50.00 scale ticks.

Subdivision is also defined as 10, i.e., there are 10 small horizontal lines between each of the two neighbor ticks (eg. between 0 and 10.00, 10.00 and 20.00, etc.).

In the *Appearance* section, set visual settings for a gauge or linear indicator object display.

The *"Show Units"* parameter will enable/disable display of a measurement unit on a gauge or a linear indicator object shown. Units can be selected from a standard unit selection combo box or typed in (as it's normally configured in other Dream Report objects). If this option is enabled, then the unit selection combo box will be enabled as well. If this option is disabled, then, the unit selection combo box will be disabled. By default this option is disabled.

The *"Show Title"* parameter will enable/disable display of the object title. If this option is enabled, then, the widget title will be displayed on top of the object. Object title can be specified in the edit box right below the *"Show Title"* check box. If that check box is checked, then, the object title edit box will be enabled. If that check box is unchecked, then, the object title edit box will be disabled.

The *"Show Result"* option will enable/disable digital display (as a digit) of the calculated displayed value in the center of the object. For example, if the displayed value is 60, then, gauge or linear indicator will display 60 units, but also in the middle of the object the number 60 will be displayed as well. By default this option is enabled.

The *"Precision"* combo box will be always enabled and a user can select the required decimal precision. This decimal precision from this combo box will be used both for scale tick marks decimal precision and also for displayed result decimal precision.

If the calculated object (Single Data Object/Compound/Expression object), which includes this widget, already has decimal precision defined in the *Result Representation* section, that decimal precision will be inherited and set in the widget dialog. If a user changes it here, then it will be changed in the *Result Representation* dialog as well.

In the *Properties* section, specify font and background settings for different display parts of that widget objects exactly the same way as it works in other objects.

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In the *Color Grades* section, if a user wishes to color some value segments on a scale, he can specify some value ranges and set color for those value ranges. If this is done, then this color will be used as a scale background for this value range on top of the main scale background.

From Version 5.0 R2 color values can now be provided as percentage values and *Dynamic Tokens*, in addition to using static values. To use a Dynamic Token reference, double-click on the "From" or "To" text boxes, and the *Select Dynamic Object* window will open, from which to select a Dynamic Token for the color value lower or upper limit. To use percentage values, add the % symbol to the static value – for example: from 0% to 10%.

If the *Smooth color transition* option is checked, then on the border between different colored segments, there will be no sharp borders, but color will smoothly transit from one color to another.

Digital Display

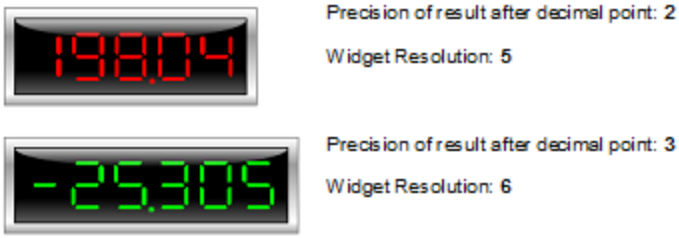
The *Digital Display* widget displays integer or decimal analog values in a digital display format. The *Resolution* option controls the maximum number of digits to display on the widget - this number includes both integer and decimal parts of the number. The number of decimal places to show is set in the object's *Appearance* setting for *Precision of result after decimal point*. For example, if you knew that an analog real tag had a range of 0-250, and you wanted to show a 2 decimal point precision, you'd set the widget's Resolution to "5" - the resulting displayed format would be ###.## (up to 3 digits for the integer part, and 2 digits for the decimal part.) NOTE that if there is a possibility that a signed number (e.g., -97.461) will be displayed, the *Resolution* setting should be increased by 1 digit to account for the "-" sign.

The *Background* color for the digital display is black by default, but can be changed by selecting the *Indicator color*.

The *Digit Height, Width* and *Interspaces* can be set in the *Digital Display Sizes* section, and the digital display's border thickness can be set in the *Borders* section.

Finally, the *Digit Color* can be set in the *Digit* section.

TWO EXAMPLES:



The *Resolution* option controls the maximum number of digits to display on the widget - this number includes both integer and decimal parts of the number. The number of decimal places to show is set in the object's *Appearance* setting for *Precision of result after decimal point.* For example, if you knew that an analog real tag had a range of 0-250, and you wanted

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Round Progress

The *Round Progress* widget displays a circular progress bar of an analog value. The display can be either a "percent of total", or absolute value. The Round Progress widget is configured as follows:

Minimum and *Maximum* allow you to enter the engineering unit value range. For instance, if you had a 150 liter tank, and wanted to show the current lever (either in liters or percentage of full), you would enter "0" and "150" for the Minimum and Maximum, respectively.

Show Result should be checked if you want to show the numeric value or percentage in the center of the widget. If this option is checked, you can then set the decimal *Precision* of the result, and optionally *Show Units* for the result.

Progress Result Type can be set to *"Percentage"* or *"Absolute Value"*. If "Percentage", the circle will represent 100%, and percentage plotted will represent the object's value relative to the Minimum/Maximum range (defined above) as a percentage. If "Absolute Value", the circle will represent the full engineering unit Minimum/Maximum range (defined above), with the value plotted being the object's value, relative to the full range.

Progress Width is the "thickness" of the round progress bar, and the *Start Angle* sets the starting point of the progress indicator color (defaulted to 90°/top mid-point). The *Progress Direction* can be set to "grow" clockwise or counterclockwise

Set the *Colors* and *Value Font* (if enabled) of the widget - *Progress Back Color, Progress Color*, and *Progress Value Color* (if enabled.) *Show Border* will put a fine border line around the circle colors.

If you wish to display specific text in the case of a calculation error, enter the *Error Text.*

In the following examples, both widgets are based on a temperature value of 41.5°C, with a value range of 0° - 150°C. The first widget shows this temperature value as a percentage of total range, and the second widget shows the absolute value, relative to a full scale of 0 - 150. The second widget also has the "Show Border" option checked:



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Hyperlink Configuration

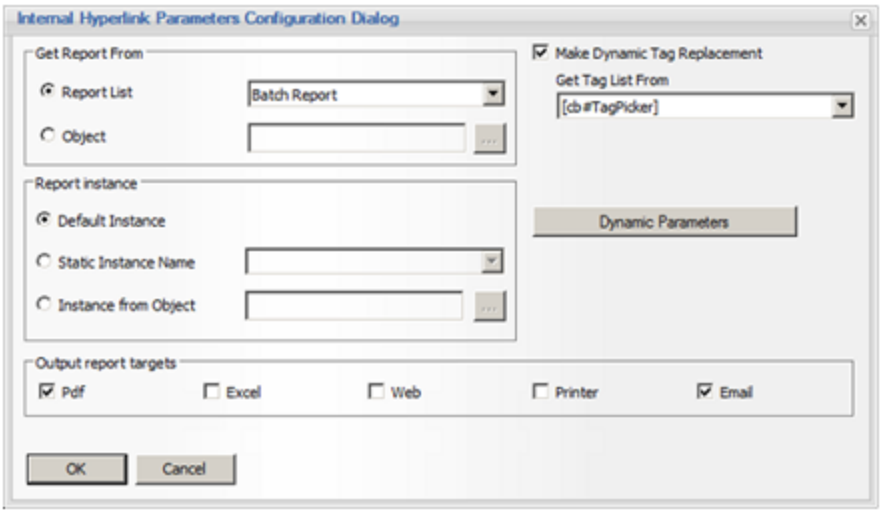
The *Hyperlink Configuration* section allows the resulting value on the report to be configured as hyperlink on Web reports. The *Hyperlink Disabled* is the default setting, with *Internal Hyperlink* and *Raw Data Hyperlink* as the additional options.

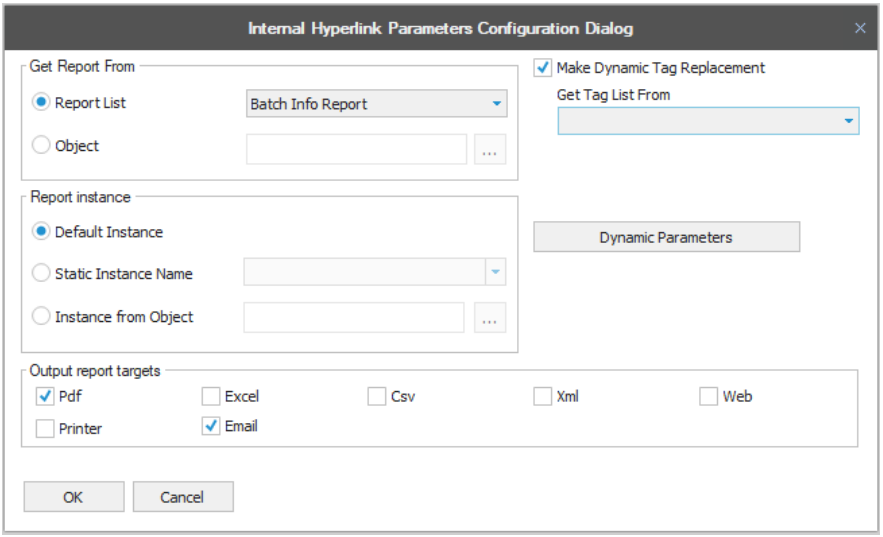
Internal Hyperlink Provides the option to open/generate a report when clicked

Raw Data Hyperlink Provides a "raw data" view (in tabular or chart format) of the raw data for that object

Internal Hyperlink

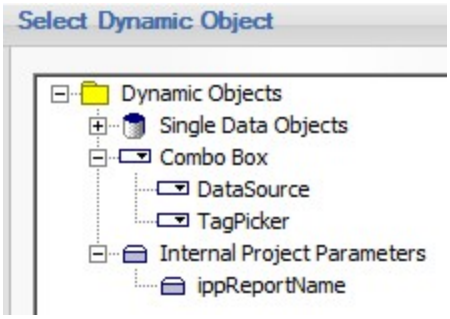
If *Internal Hyperlink* is selected, the *"Internal Hyperlink"* button will be activated. When clicked, the *Internal Hyperlink Parameters Configuration Dialog* window will open, as shown in the following image:

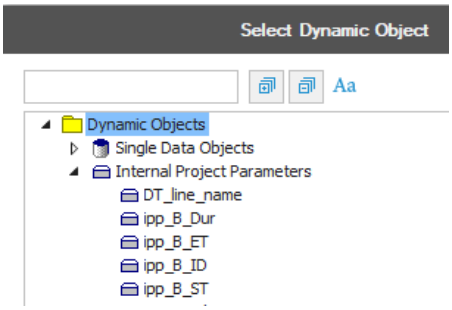




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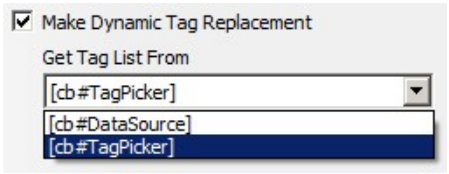
In the *"Get Report From"* section, select the report to open, when the hyperlink is clicked. A specific report name can be selected from the *Report List* option; or, if the *Object* option is selected, a list of dynamic tokens from the current report (combo box, expression object, etc.) or *IPP's* (internal project parameters) displayed. Select the dynamic object that will contain a valid report name when the report is generated.





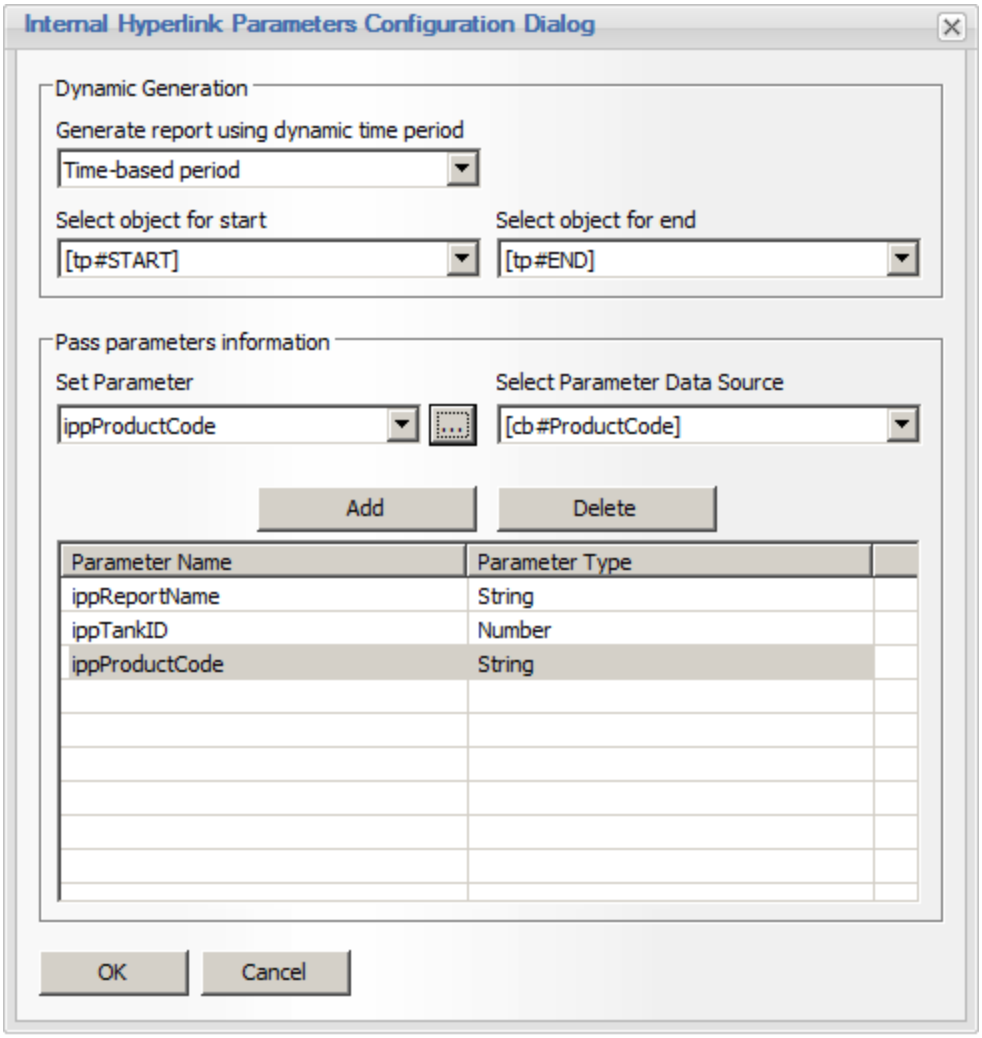
If a report contains Virtual *Report Instances* (VRI's), select either the *Default Instance*, a *Static Instance Name* from the list of available instances, or select the *Instance from Object*, where a list of dynamic tokens from the current report (combo box, expression object, etc.) or *IPP's* (internal project parameters) displayed. Select the dynamic object that will contain a valid report instance name when the report is generated.

By default, when the hyperlinked-report runs, it will generate with data from the tags defined on the report. By checking the *Make Dynamic Tag Replacement* option, the *Get Tag List From* option will be enabled. Select a *Combo box* object from the main report that contains a list of tags that a user can select from.



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Dynamic Parameters



The *"Dynamic Parameters"* button opens the *Internal Hyperlink Parameters Configuration Dialog* window, from which various dynamic parameters can be specified to pass into the target (hyperlinked) report - Time Period, BatchID, and any other Parameter(s) needed on the target report:

In the *Dynamic Generation* section, select either *Time-based period or Batch-based period*. If *Time-based period* is selected, select dynamic objects from the report for the *Start* and *End* times. These dynamic objects can be *Timestamp Picker* web elements, or object that contain valid date/time values (e.g., a Single Data object the gets the "Timestamp of First Value" for some tag.) *If Batch-based period* is selected, select a dynamic object from the report which will contain a valid batch ID or list of batch ID's (e.g., a *Combo Box*).

If other project parameters (IPP's) need to be passed into the target report (e.g., *Product Code*, *Tank ID*, etc.), these parameters can be specified in the *Pass Parameters Information* section. This sets up a "mapping" IPP's to specific objects on the source report, so that when the target report opens, all parameters will be set.

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The combo box *Set Parameter* will contain the list of all available defined internal project parameters (IPPs). The combo box *Select Parameter Data Source* will contain the list of all relevant objects defined in the (source) report (i.e. with the following object types: Single Data Objects, Compound Data Objects, Expression Data Objects, Combo boxes, Date/Time pickers).

When the *"Add"* button is clicked, the selected parameter with the selected corresponding object will be added to the list.

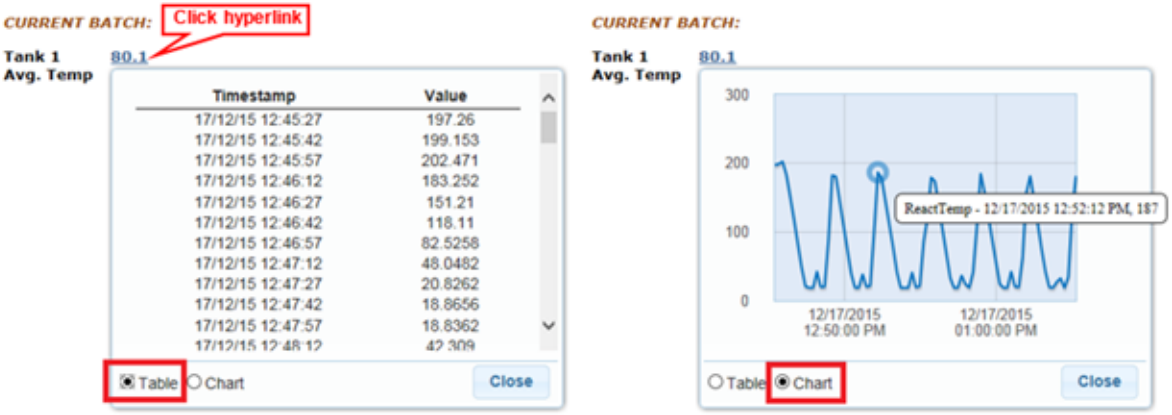
NOTES:

- The list of parameters can't have the same parameter defined twice. However, it may have the same report object defined several times for multiple parameters.
- Report parameters using hyperlinks will work only for web report formats in Dream Report Web Portal. Only WEB report formats (Report Output File) will be generated using hyperlinks. PDF and Excel report formats will not be generated using hyperlinks.

For details on internal project parameters (IPP) configuration, please refer to the *Project Parameters* section of this manual.

Raw Data Hyperlink

If *Raw Data Hyperlink* is selected in the *Hyperlink Configuration* section, then when Web report is generated, the resulting *Single Data* object value will be shown with a hyperlink that, when clicked, will display the raw data for the time period of the object. The raw data can be shown in a *Table* format or a dynamic *Chart* format, by clicking the appropriate radio button. No additional configuration is required for the Table and Chart pop-ups:



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Milliseconds

In the *Milliseconds* combo box, a user can choose whether to display milliseconds for the timestamp field. The following options are available:

- *Milliseconds disabled:* milliseconds will not be displayed.

- *Milliseconds enabled*: milliseconds will be displayed for every timestamp.

- *Milliseconds auto:* Milliseconds will be displayed only in the timestamps with milliseconds resolution.

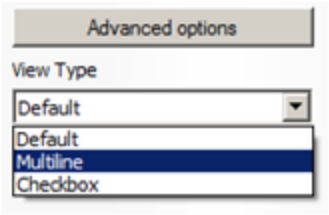
- Milliseconds from the Project localization: the object will use the configuration set in the *Project Localization* dialog window.

Advanced Options

The *"Advanced options"* button will open the *Advanced Visualization settings* window, which is described in detail in the Advanced Visualization 221 section.

View Type (enabled with "Manual Input")

If *"Manual Input"* is selected in the *Select Statistical Function* section of the *Single Data Object's "Data Definition"* tab, an additional setting is available on the *Appearance* configuration - the *View Type*. The three View Type options for Manual Input are *Default, Multiline* and *Checkbox*:



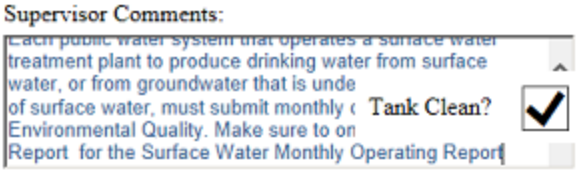
- *Default* On the web report, a simple, a single-line data entry will field will be available for data entry:



- *Multiline* When configuring the report, size the *Single Data Object* to an appropriately-sized textbox. Then, on the web report, the textbox will accommodate multiple lines of text, and will automatically provide a slider if the text exceeds the a space available in the textbox:

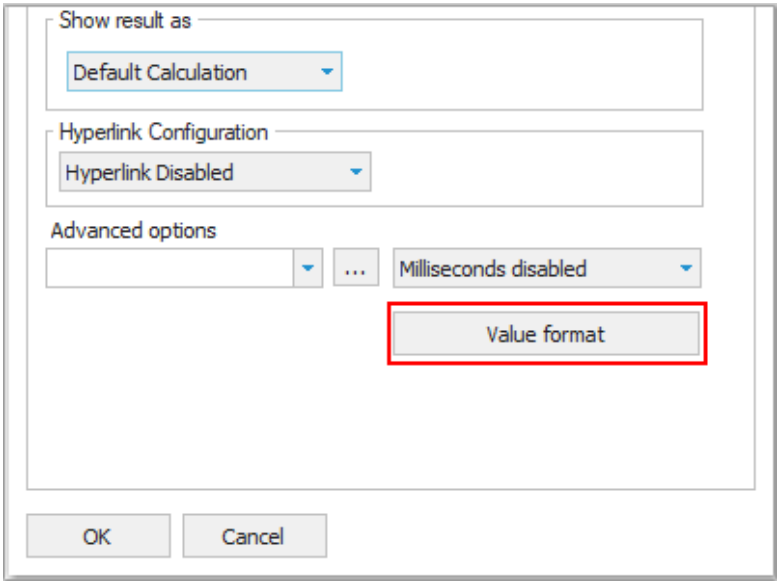
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- *Checkbox* If the Manual Data entry item is defined as “Boolean” data type, a Checkbox is useful for data entry. Simply size the *Single Data Object* as a square, and then the user will be able to use that as a checkbox when entering data on the web report:



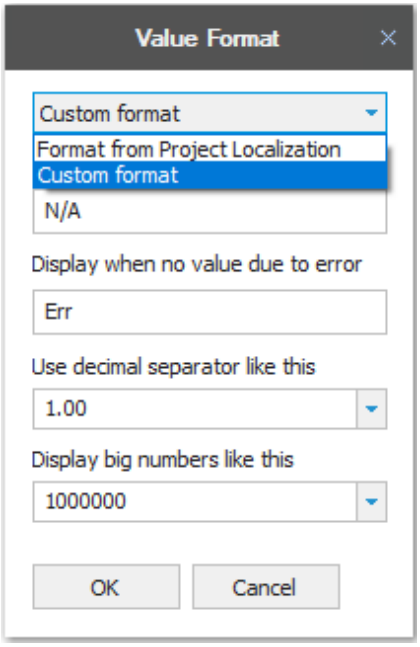
Value Format

If user will click on the button ***Value Format***, in the right bottom part of the dialog window:



The dialog window Value Format will open:

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This window enables user to override formatting of an object's result value in a report. The upper combo box has two entries:

Format from Project localization - if this option is selected, then the result value of the object will be formatted according to the global project format settings, which are defined in Project Settings -> Localization 57. If this option is selected, then all value format controls in this window will be disabled.

Custom format - if this option is selected, user can configure custom settings for the object's result value representation. This option will enable value formatting controls. This configuration will override value format settings in the Project Settings. All configuration in this window will be valid for this specific object only. It will have no effect on any other object in this project.

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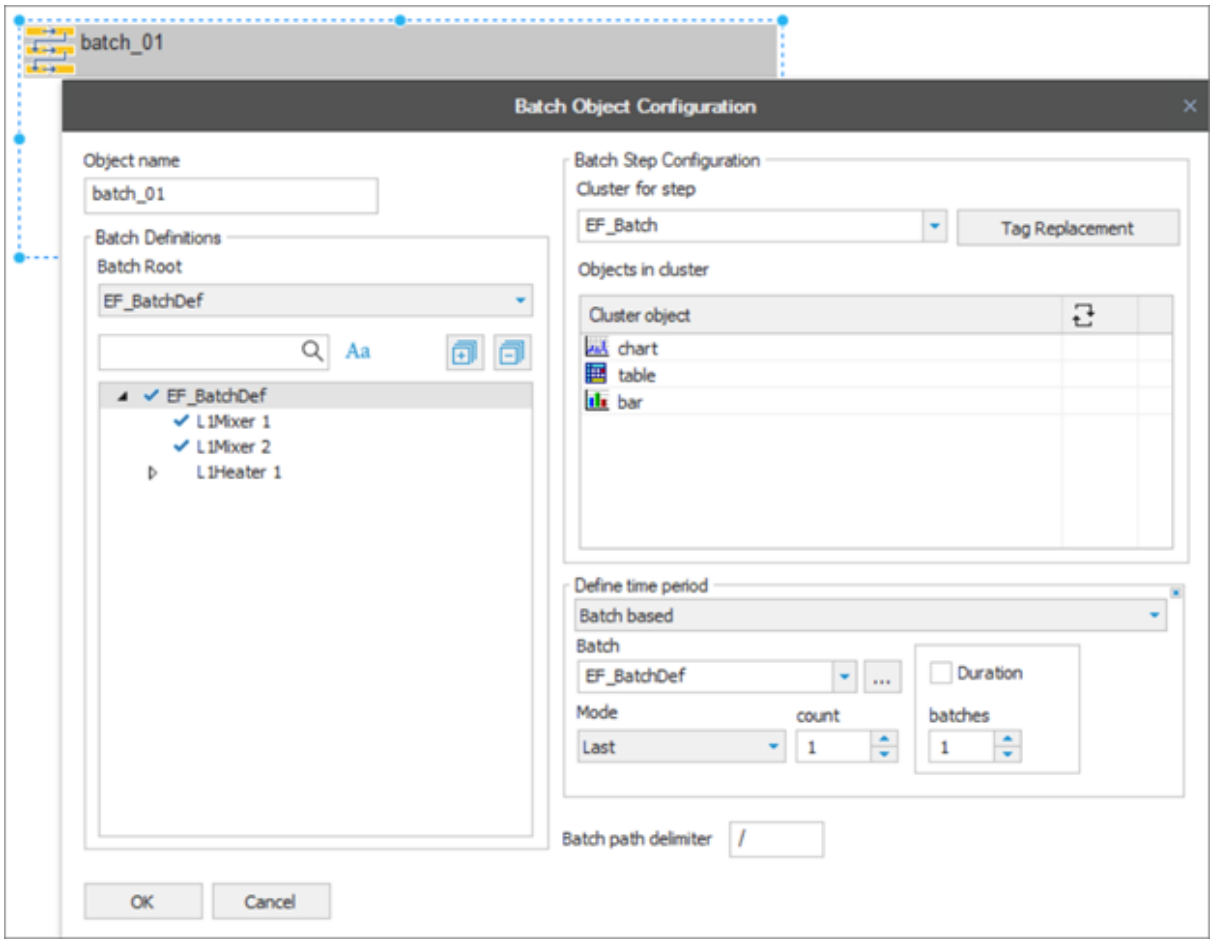
Batch Object

13 Batch Object

Batch object
Clusters 165 can be embedded into reports by using the *Batch Object*, which is available under Batches ribbon.



Click on the *Batch Object* icon and draw a rectangle to place an instance of the object on your report. The *Batch Object Configuration* dialog window will open, where you can assign clusters to existing in the project batch/phase definitions, define the time period for the object, and perform tag replacement.



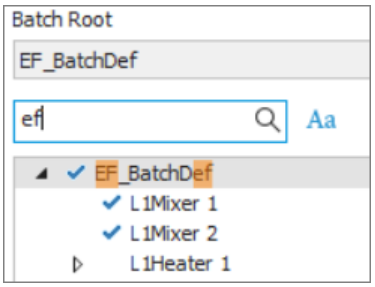
From this window, you can configure the following parameters:

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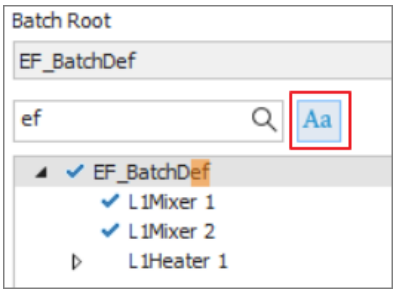
Object name – enter a unique logical name for the object.

Batch Root – select the definition name from the list of batch definitions existing in the project.

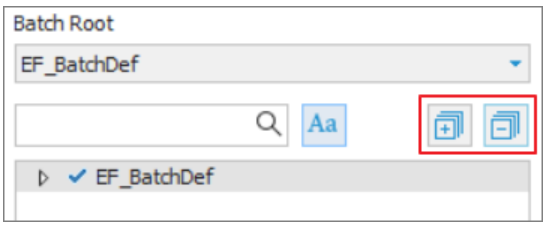
User can search for a specific batch definition(s) – type any string in the search criteria box, and all entries of the string will be highlighted in the list.



Click the *Match case* icon if the case is significant in the search.



User can expand items in the list with the *Expand All* button, and you can collapse all items with the *Collapse All* button.



Cluster for step – from the drop-down list, select the cluster which will be assigned to the currently selected batch or phase definition in the *Batch Definitions* section.

Objects in cluster – list of reporting objects in the cluster selected in the *Cluster for step* list.

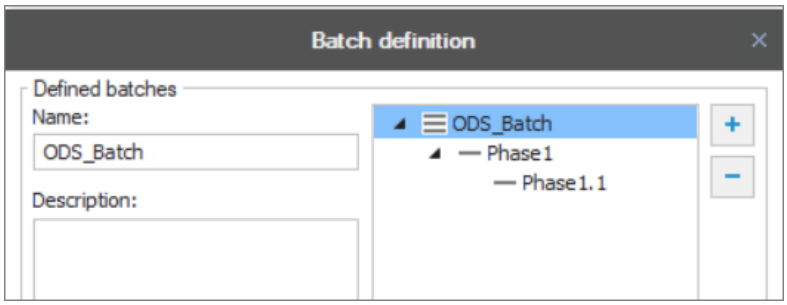
Define time period - time period for the entire batch object. This time period will be applied to the batch selected in the *Batch Root* list.

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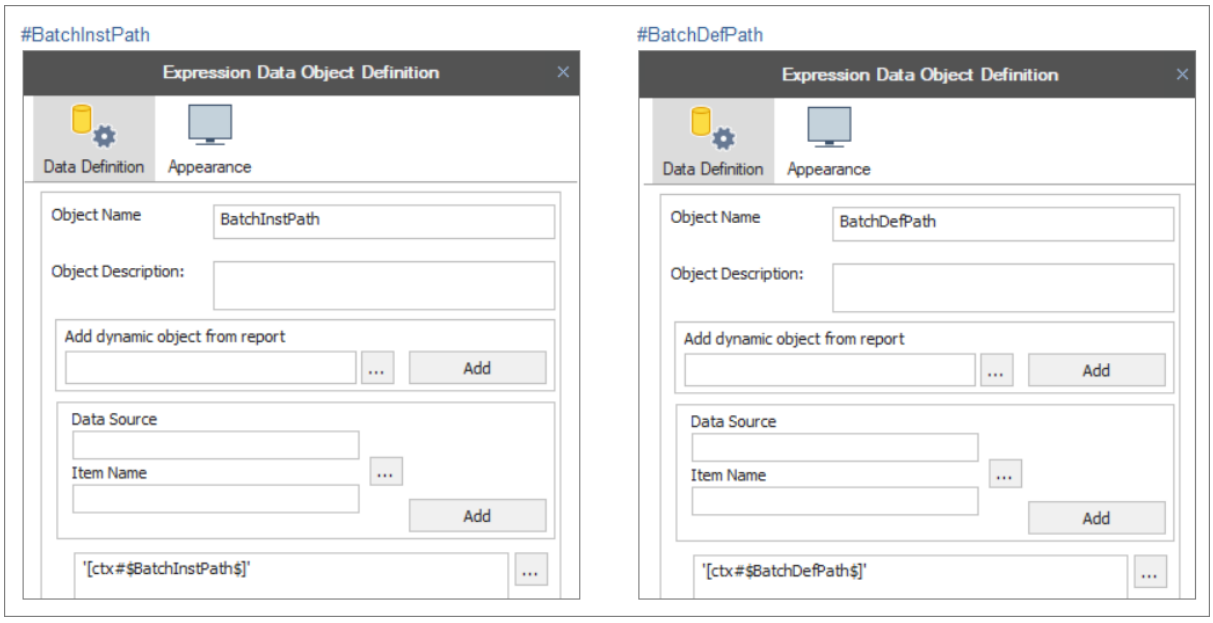
Batch path delimiter – one or more symbols to be used as a separator in hierarchical names of batch phases. This parameter is used by the *[ctx#$BatchInstPath$]* and *[ctx#$BatchDefPath$]* dynamic tokens.

At runtime, upon generating a report hosting a batch object(s), the object will be replaced with a set of reporting objects defined in the clusters. Clusters will be placed in the same order as the corresponding phases defined in the batch hierarchy in the *Batch Definitions* section.

For example, if there is a project with a *Batch definition* configured as follows:

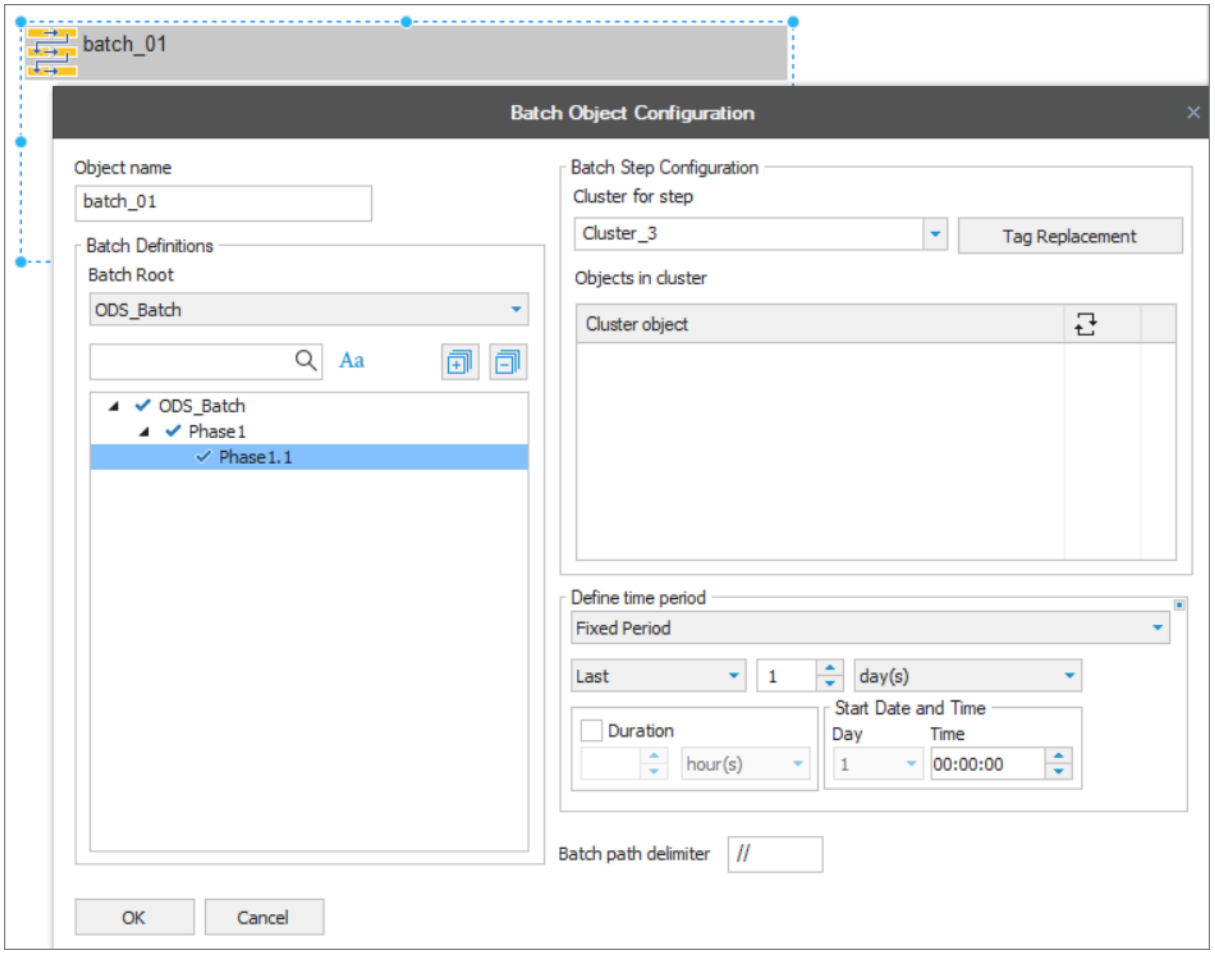


And the project contains a cluster named *Cluster_3* with *Expressions* objects using the *[ctx#$BatchInstPath$]* and *[ctx#$BatchDefPath$] tokens:*



In a Batch Object, *ODS_Batch* and its phases (*Phase 1*, and *Phase1.1)* are mapped to *Cluser_3,* and the *Batch path delimiter* is "***//".***

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The report containing the batch object will display batch/phase paths as follows:

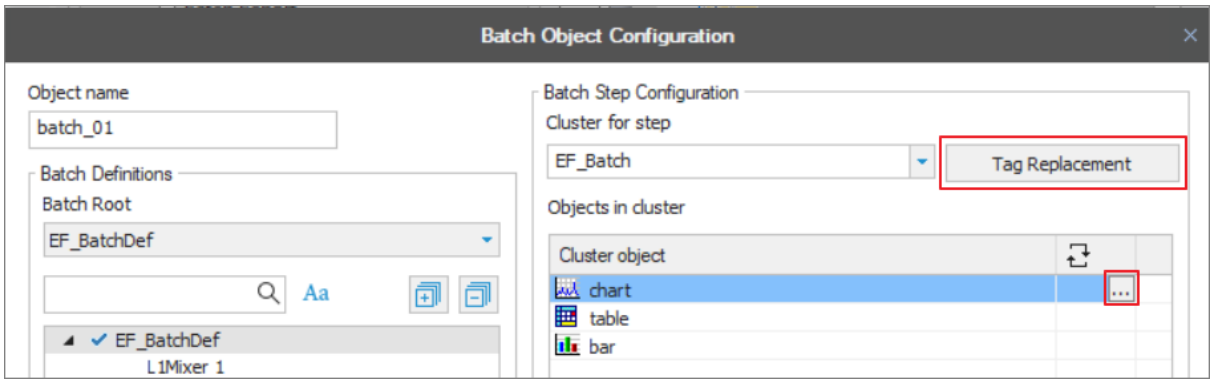
Batch_1052	ODS_Batch
Batch_1052//1	ODS_Batch//Phase1
Batch_1052//1//83339	ODS_Batch//Phase1//Phase1.1

Tag Replacement

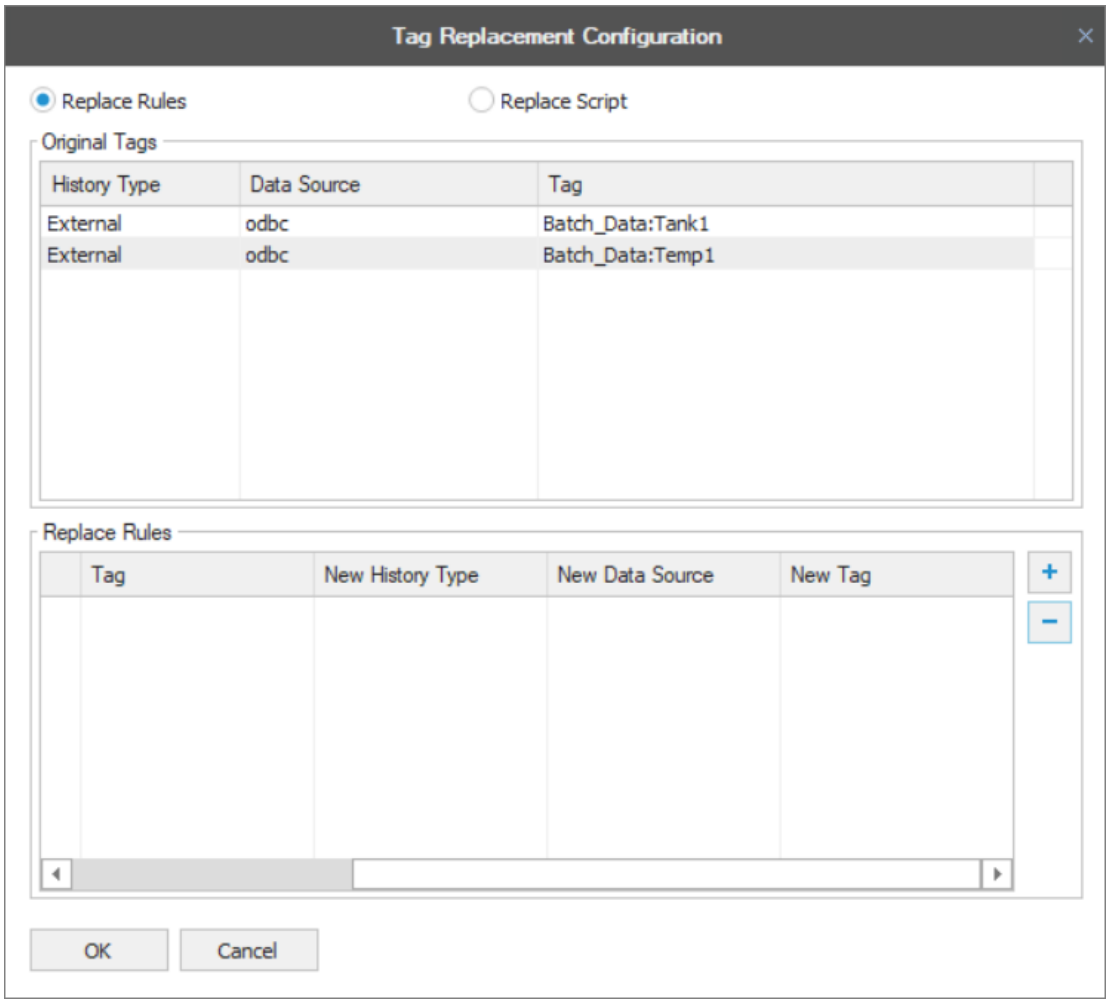
In a batch object, when mapping batches/phases to clusters, one cluster can be assigned to several phases. To re-use a cluster across different processes and equipment units, you can replace originally defined tags.

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Click on the *Tag Replacement* button to replace tags in all objects of the cluster. For tag replacement in a specific object, select the object in the *Cluster object* list and click on the *[…]* button next its name.



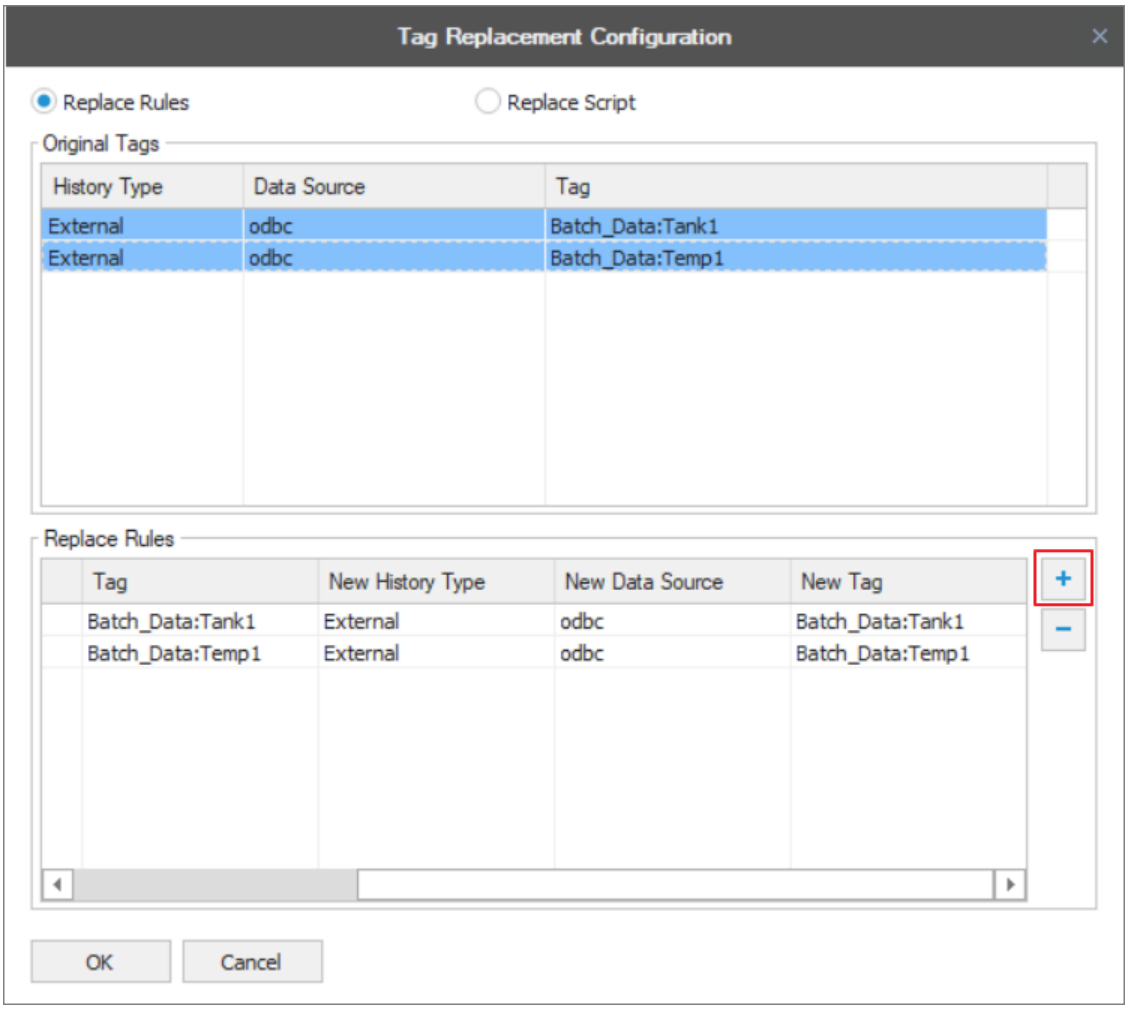
The *Tag Replacement Configuration* window will open, where you can set replacement rules or write a LUA script for advanced tag replacement.



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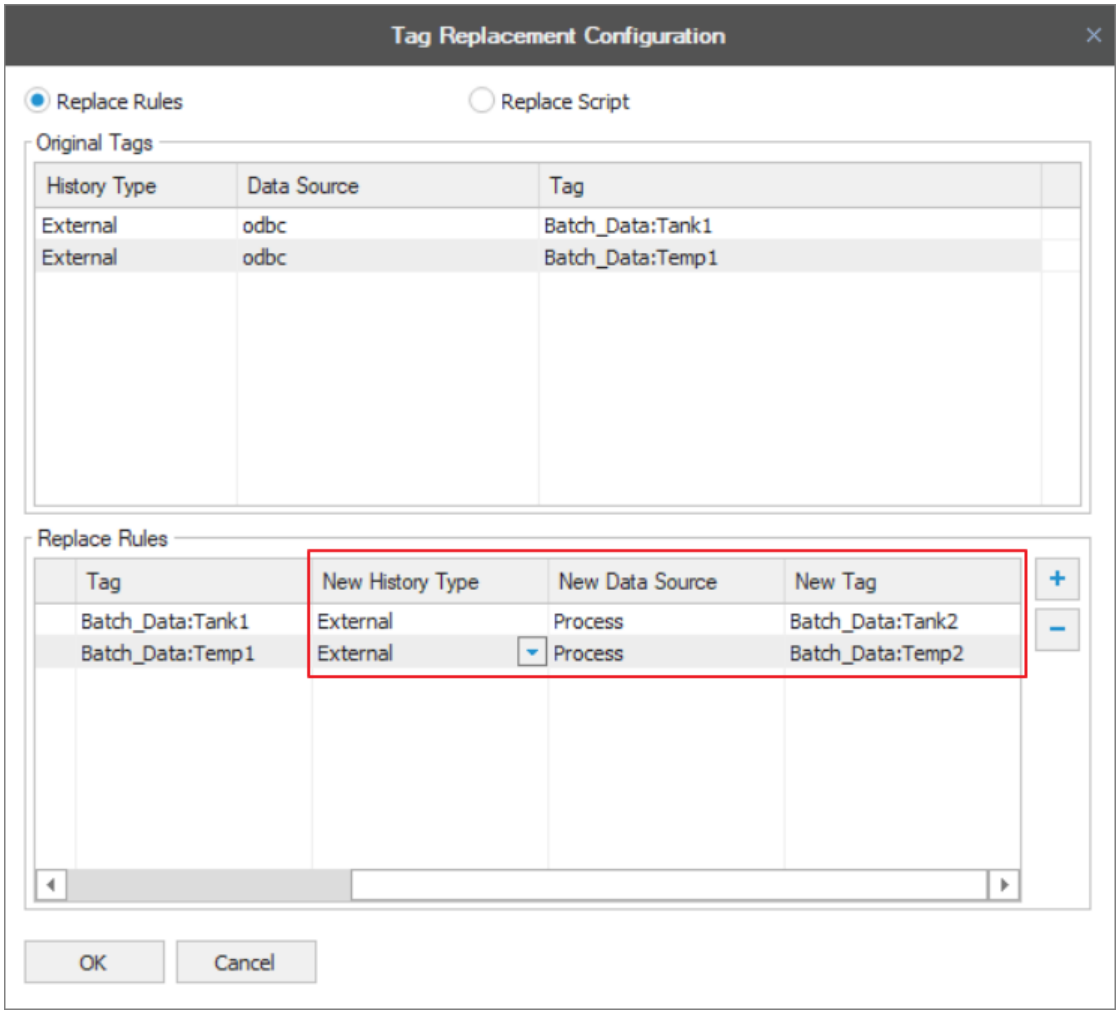
Replacement Rules

In the *Original Tags* list, select the tags to be replaced and click the *[+]* button to add them to the *Replace Rules* area.

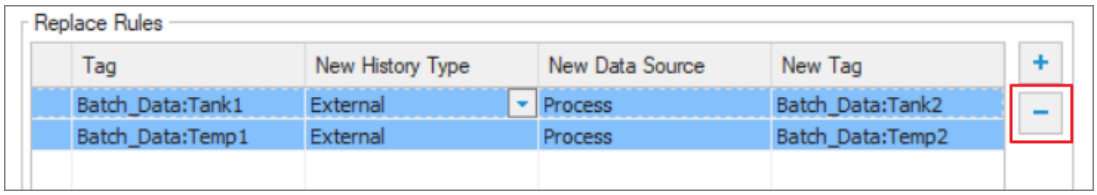


The first three columns in the table display the current configuration of the tags. To change it, provide the new tag data in columns 4-6. You can change either or all tag parameters: *History Type*, *Data Source*, *Tag*.

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To delete a replacement rule(s), select it in the *Replace Rules* table and click the [-] button.

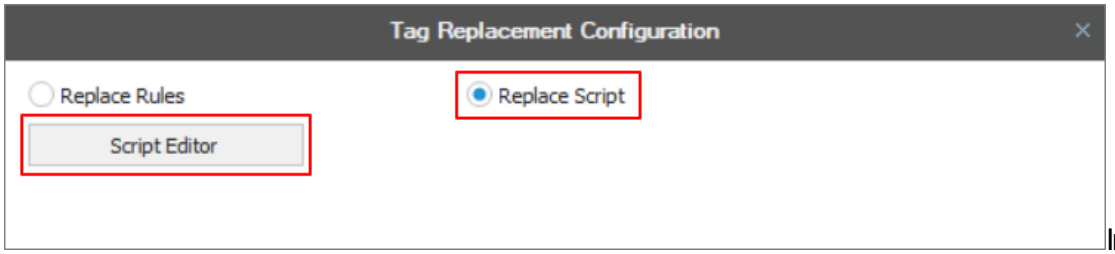


Scripts

Another way to replace tags in a cluster is to write a script.

Select the *Replace Script* option and click the *Script Editor* button.

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In the *Script Editor*, you can assign a new *History Type*/*Data Source*/*Tag* using the scripts similar to the examples below.

Example 1:

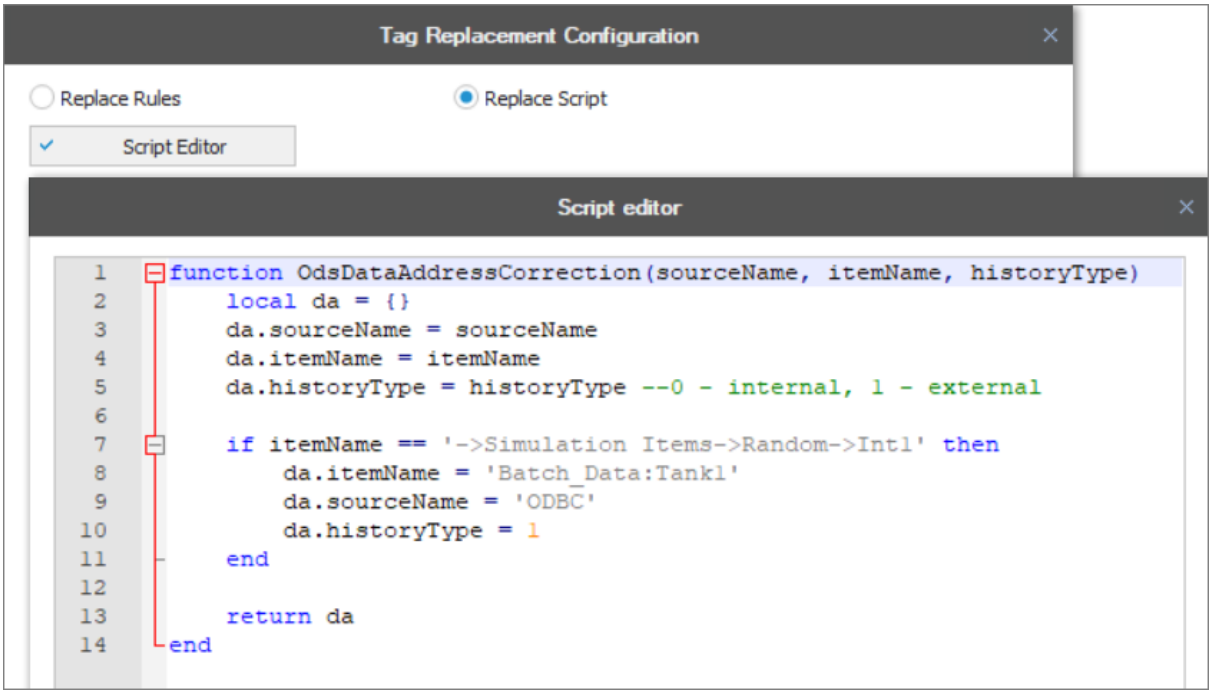
In this example the new tag parameters are assigned directly.

```
function OdsDataAddressCorrection(sourceName, itemName, historyType)
	local da = {}
	da.sourceName = sourceName
	da.itemName = itemName
	da.historyType = historyType --0 - internal, 1 - external

	if itemName == '->Simulation Items->Random->Int1' then
		da.itemName = 'Batch_Data:Tank1'
		da.sourceName = 'ODBC'
		da.historyType = 1
	end

	return da
end
```

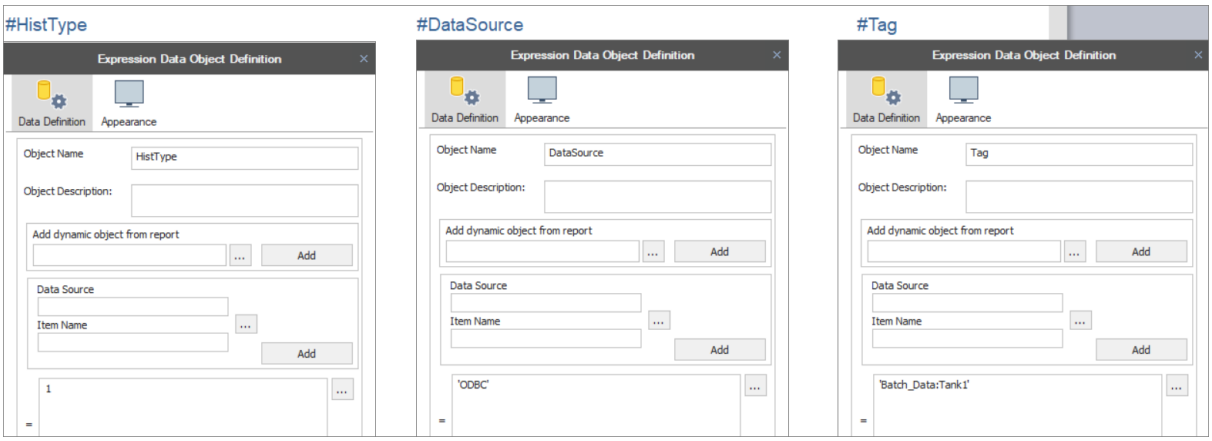

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For the *History Type*, set it to **0**, if internal; **1**, if external.

Example 2

In this example, the data for tag replacement are read from dynamic tokens: *[f#HistType]*, *[f#DataSours]*, and *[f#Tag],* which are defined in *Expression* objects.




```
function OdsDataAddressCorrection(sourceName, itemName, historyType)
        local da = {}
        da.sourceName = sourceName
        da.itemName = itemName
        da.historyType = historyType --0 - internal, 1 - external

        local ht = Ods.GetDataFromToken ('[f#HistType]')
```

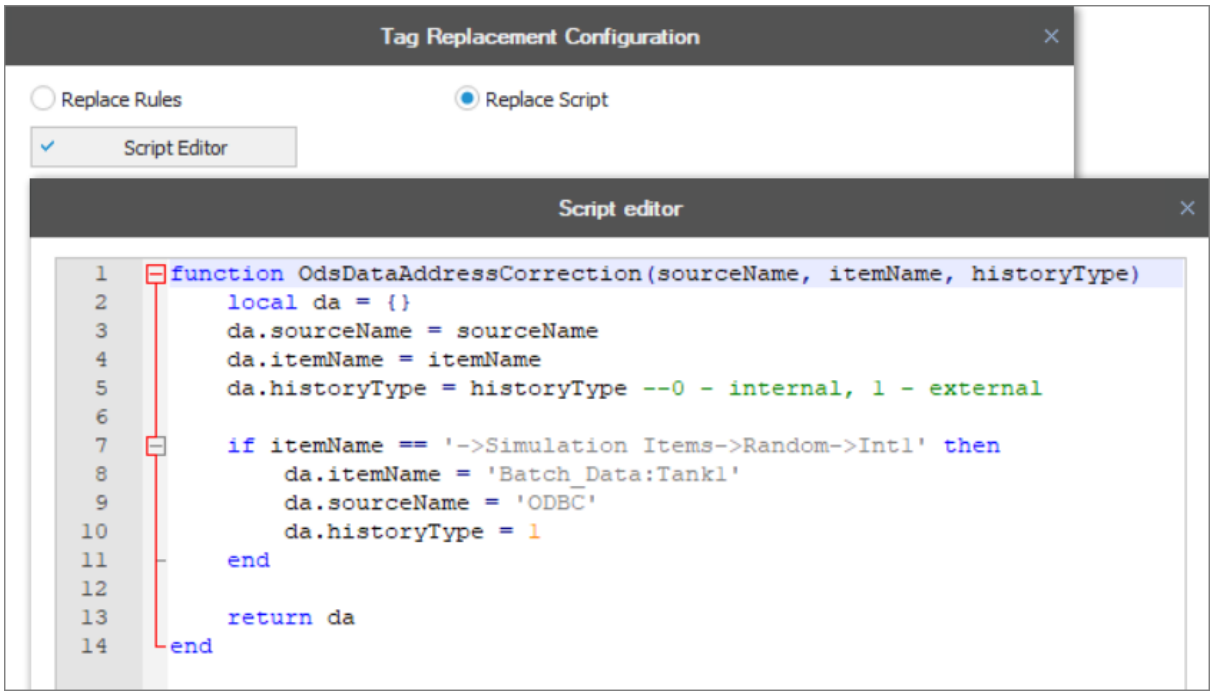

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```
        local ds = Ods.GetDataFromToken ('[f#DataSours]')
        local t = Ods.GetDataFromToken ('[f#Tag]')

        if itemName == '->Simulation Items->Random->Int1' then
                da.itemName = t
                da.sourceName = ds
                da.historyType = ht
        end

        return da

end
```



For the *History Type*, set it to **0**, if internal; **1**, if external.

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Statistical Functions

14 Statistical Functions

14.1 General Functions

- First value - selects the first found value for the selected item from a database within the specified time period
- Timestamp of first value - displays the timestamp of the first value found during the specified time period. The timestamp has a configurable format of three options: *Date/time* or *Date* only or *Time* only.
- Last value - selects the last found value for the selected item from a database, which is within the specified time period
- Timestamp of last value - displays the timestamp of the last found value during the specified time period. The timestamp has a configurable format of three options: *Date/time* or *Date* only or *Time* only.
- Current value - selects current value for the selected item from a database.
  NOTE: If user will display current value in a web portal, there is a way to display real-time value changes. To enable that, user has to open a dialog window Report Settings -> File Format and then click on the button *Settings* and enable real-time value update in web. Also, real-time values update rate can be configured (in seconds). This functionality is described more in details in report settings section Report File Format
- Maximum - retrieves the maximum value of the selected item within the specified time period
- Timestamp of maximum value - displays the timestamp of the maximum value during the specified time period. The timestamp has a configurable format of three options: *Date/time* or *Date* only or *Time* only.
- Minimum - retrieves the minimum value of the selected item within the specified time period
- Timestamp of minimum value - displays the timestamp of the minimum value during the specified time period. The timestamp has a configurable format of three options: *Date/time* or *Date* only or *Time* only.
- Integral - calculates the integral of all values during the specified time period
- Average - calculates the average value of the selected item during the specified time period

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- Weighted average - calculates a time-weighted average of the value during the specified time period. *Weighted average* uses a different calculation than *average,* so do not use the two functions interchangeably. The weighted average function considers the values as well as the duration of each value
- Sum - calculates the sum of all values during the specified time period
- Standard deviation - calculates the standard deviation of all values during the specified time period
- Standard deviation sample based - calculates the standard deviation (sigma) not based on all values over the period, but by specific number of samples (e.g. on first 10 or 20 or 30 samples).
- Difference - calculates a simple mathematical difference of the first and last values in a time period. Unlike the *Counter* function (described below), *Difference* does not take into consideration roll-over values, nor does it matter if values increase/decrease throughout the time period.

14.2 Advanced Functions

- Logged Value Counter - calculates how many times a value in the specified range was logged in the database within the specified period of time. If the Logged Value C*ounter* function is selected, enter a range of values (filter) for the calculation. The values entered are inclusive, i.e. will both be included in the calculation. Negative and floating-point values are accepted, however, only numeric values can be entered. This filter doesn't work with the text or symbolic values.

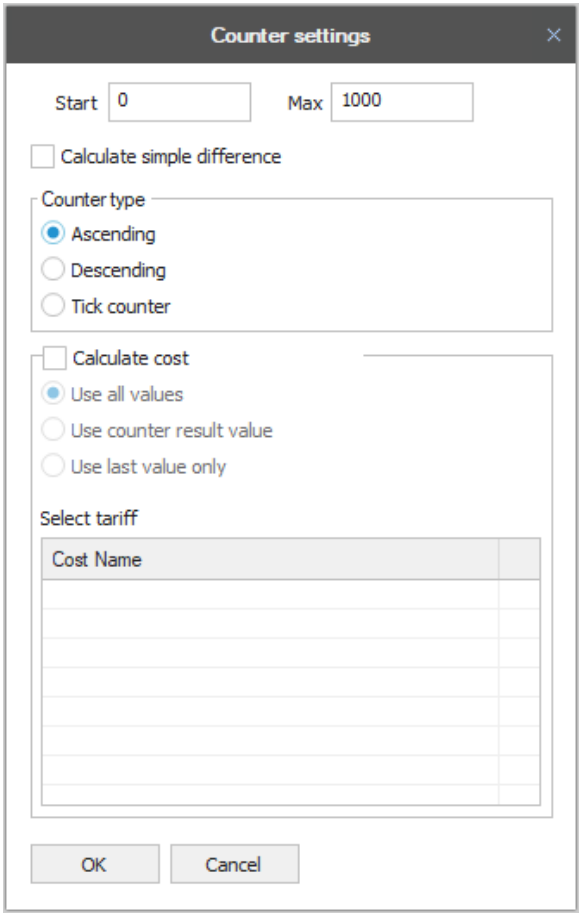


If the value filter is empty and doesn't contain any value range, the full value range (i.e. all values) will be counted.

- Duration in the interval (hours) - calculates the total time period when the values were within the specified value range, and returns the result in the format HH:MM:SS. When this statistical function is selected, a user will have to enter a value filter for the range of values. The values entered are inclusive, i.e. will both be included in the calculation. Negative and floating-point values are accepted, however only numeric values can be entered. This filter doesn't work with text or symbolic values.
  EXAMPLE: If we calculate the "Duration in interval" between 12:00 and 14:00 with a value range of 10-20, where between 12:00 and 13:00 the value was "12" and between 13:00 and 14:00 the value was "22", then the value was only within the specified value range 1 hour (12:00-13:00), and the result will be *01:00:00*

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- Counter - a statistical function mainly used to count consumption (water, electricity consumption etc.). In its simplest form, this function displays the difference between the last and the first value of a data item during the specified time period.



EXAMPLE: If the counter function is applied to an item which had values: 30,40,50,60,70,80,90 - then this statistical function will return *60*, which is (90-30).

If the value counter has a maximum value, after which the counter resets, the maximum ("roll-over") value must be specified. Specify the *Max* value which the counter will reach before resetting, and specify the *Start* value, i.e. the value, from which the counter starts to count after reset (e.g. from 0 or from 1).
EXAMPLE: If you define a counter with a maximum of 1000 and a start value of 1 and your data has values 800, 900, 100, 200, then the result will be **399,** which is (1000-800) + (200-1)

NOTES:

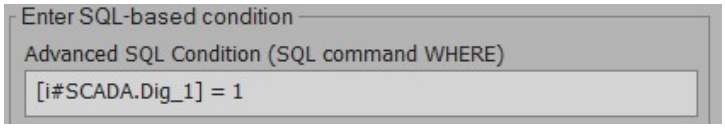
1. The *Counter* function expects that (meter) values are continually increasing (or decreasing) over the specified time period. If the values decrease (or increase), the *Counter* function will assume a roll-over, resulting in unexpected results. If there is the possibility of this scenario, it is advised to use the *Difference* function instead.
2. In order to avoid any mix up due to 0's at the start of Control Maestro (legacy Wizcon) application, a user should write "-1" in *"Start"* and *"Max"* combo boxes.

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If *"Calculate simple difference"* is checked, then the *"Start"* and *"Max"* fields will be disabled, and the function will just use the statistical function *"Difference"* for the calculation – i.e., a simple mathematical difference of the first and last values over the specified time period, with no consideration of a possible meter "roll-over". The "*Tick counter*" option (covered next) will be also disabled. And if the *"Tick counter"* option is selected, then the "*Difference"* option will be disabled.

"Counter Type" options:

- *Ascending* – default option. This assumes that the counter/meter value always increments (except in the case of a counter rollover).
- *Descending* – Selecting this option assumes that the counter value decrements and the result will be displayed as an *absolute value*. For example, if the first value is 40 and the last value is 25, then the *Counter* result will be 15.
- *Tick counter* - If this option is selected, then *Start* and *Max* values will be disabled. This option *counts the number of recorded values* in the period to calculate the counter value. If referencing a discrete/Boolean counter/trigger tag to count "pulses", it will be necessary to include an *Advanced SQL Condition* in the object's definition to filter out the "0" values, otherwise you will get a counter result twice what you expect (counting 0's and 1's):



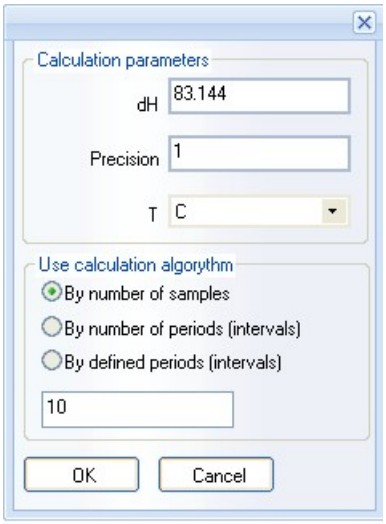
- Check the *"Calculate cost"* option to enable a cost calculation using the calculated Counter value (covered in more detail in the *Cost Module* section).

- Mean Kinetic Temperature (MKT) - this function performs a complex calculation with an array of temperature measurements, calculating the time interval for each temperature, and brings the array to the equivalent of one single temperature value during the period.
  EXAMPLE: If the diary factory has produced milk, which was stored 1 hour at a temperature of +5C, then it was in a truck 1 hour at a temperature of +15C, and then it was in a shop for 10 hours at a temperature +3C, the MKT calculation will calculate the equivalent of storing the milk as at +6.7C for the entire period (12 hours).
  (This example is theoretical and is provided only as an example - the result is not properly calculated using the complete set of input parameters)

- Advanced Mean Kinetic Temperature calculation enhances precision of the calculated result and provides the calculation methodology, which is adopted by Eurotherm as a standard.

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When the *"Advanced Mean Kinetic Temperature"* function is selected, a use has to click on *"Configure"* button and the following dialog window will be opened:



In the *"Calculation parameters"* section a user has to enter constant parameters for the calculation and select the input temperature unit.

In the *"Use calculation algorithm"* section a user has to specify which data will be selected for the calculation and analysis:

1. If the "**By number of samples**" option is selected, then, a user will have to enter the number of samples to take for calculation into the edit box below. The number of samples may be only non-zero and positive.

2. If the "**By number of periods**" option is selected, then, a user will have to enter the number of equal periods into the edit box below. Then, all the entire period, defined in the object, will be divided into that entered number of equal parts, and the calculation will be done accordingly. The number of periods has to be only non-zero and positive.

3. If the "**By defined periods**" option is selected, then the edit box below will be replaced by the time picker control, and a user will have to enter the number of **hours:minutes:seconds**, which will be considered as a time period unit. Then the entire time period of the object will be divided into equal parts, where the length of each will be equal to the entered one. The defined period length has to be only non-zero and positive.

Calculation. The calculation will be done according the formula below:

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$$T_k = \frac{\frac{-\Delta H}{R}}{\ln\left(\frac{e^{\frac{-\Delta H}{RT_{1H}}} + e^{\frac{-\Delta H}{RT_{1L}}} + \cdots + e^{\frac{-\Delta H}{RT_{nH}}} + e^{\frac{-\Delta H}{RT_{nL}}}}{2n}\right)}$$

Where:

T_k = the mean kinetic temperature in K
ΔH = the heat of activation, 83.144kJ.mole^{-1}
R = the universal gas constant, 8.3144x10-3kJ.mole^{-1}.K^{-1}
T_{1H} = the high temperature in K in interval 1
T_{1L} = the low temperature in K in interval 1
T_{nH} = the high temperature in K in interval n
T_{nL} = the low temperature in K in interval n
n = the total number of samples in the calculation.

NOTE: 83.144 kJoules/mol is an average value based upon many common organic reactions.

Calculation methodology.

A) If the option "**By number of samples**" has been selected, Dream Report will assume that one period is taken into account. Start of that period will correspond to the start time of that object definition. Timestamp of the last considered value point will be taken as the end of the period. The minimum, the maximum values and all the Mean Kinetic Temperature calculation will be taken for that period, described above, regardless of the end of the period in object definition.

If the number of received values (from the database) for the Mean Kinetic Temperature calculation is less than the defined maximum of samples, then all the entire object period will be considered for calculation and all received available values will be used for calculation.

B) If the option "**By number of periods**" is selected, then Dream Report will consider the entire time period, defined in the object as the base period for the end calculation. Then it will split that entire time period into the number (defined in the Mean Kinetic Temperature configuration) of equal parts, calculate the minimum and the maximum values for each of those smaller parts (periods) and use that for the entire calculation.

C) If the option "**By defined periods**" is selected, then Dream Report will split the entire object time period into the number of equal parts, where the length of each part will be equal to the one, defined in the Mean Kinetic Temperature configuration (similar to the bar graph period split). Then the minimum and the maximum values will be calculated for every such a period part and they all will be considered for the entire result calculation.

NOTES:

- When either option "**By number of periods**" or "**By defined periods**" will be selected, Query with the previous point must be used, i.e. start of each sub-period should have the actual value for that point of time. **Min** and **Max** values will be calculated for each sub-period and then will be used within the main calculated formula.

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- When option "**By defined periods**" is used, then only the whole complete sub-periods will be considered for calculation

Example: if the period is "18:00 – 21:30" and the sub-period is 1 hour, then only 3 sub-periods (18:00 - 19:00; 19:00 - 20:00; 20:00 - 21:00) will be used.

- Percentile (or a centile) is a measure used in statistics indicating the value below which a given percentage of observations in a group of observations fall. For example, the 20th percentile is the value (or score) below which 20 percent of the observations may be found.

In Dream Report 3 methods of calculation are implemented:

- **The Nearest Rank method:**

One definition of percentile, often given in texts, is that the P-th percentile ($0 < P \leq 100$) of a list of N ordered values (sorted from least to greatest) is the smallest value in the list such that percent of the data is less than or equal to that value. This is obtained by first calculating the ordinal rank and then taking the value from the ordered list that corresponds to that rank. The ordinal rank n is calculated using this formula:

$$n = \left\lceil \frac{P}{100} \times N \right\rceil$$

Note the following:

• Using the Nearest Rank method on lists with fewer than 100 distinct values can result in the same value being used for more than one percentile.

• A percentile calculated using the Nearest Rank method will always be a member of the original ordered list.

• The 100th percentile is defined to be the largest value in the ordered list.

• For $0 \leq p < \frac{1}{2N}$, the closest approximating rank is 0, which is undefined.

- **Inclusive method**

Inclusive method is calculated as follows:

$$x = f(p, N) = p(N - 1) + 1,\ p \in [0, 1]$$

Where x is the rank of the percentile.

Example:

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Consider the ordered list {15, 20, 35, 40, 50}, which contains five data values. What is the 40th percentile of this list using this variant method?

First we calculate the rank of the 40th percentile:

$$x = \frac{40}{100}(5-1)+1 = 2.6$$

So, x=2.6, which gives us $\lfloor x \rfloor = 2$ and $x\%1 = 0.6$. So, the value of the 40th percentile is $v(2.6) = v_2 + 0.6(v_3 - v_2) = 20 + 0.6(35-20) = 29.$

- **Exclusive method**

Exclusive method is calculated as follows:

$$x = f(p,N) = \begin{cases} 1, p \in \left[0, \frac{1}{N+1}\right] \\ p(N+1), p \in \left(\frac{1}{N+1}, \frac{N}{N+1}\right) \\ N, p \in \left[\frac{N}{N+1}, 1\right] \end{cases} .$$

Where x is the rank of the percentile.

The inverse is restricted to a narrower region:

$$p = \frac{x}{N+1}, x \in (0, N).$$

Example:

Consider the ordered list {15, 20, 35, 40, 50}, which contains five data values. What is the 40th percentile of this list using this method?

First, we calculate the rank of the 40th percentile as follows:

$$x = \frac{40}{100}(5+1) = 2.4$$

So x=2.4, which gives us $\lfloor x \rfloor = 2$ and $x\%1 = 0.4$. So the value of the 40th percentile is calculated as:

$$v(2.4) = v_2 + 0.4(v_3 - v_2) = 20 + 0.4(35-20) = 26$$

So, the value of the 40th percentile of the ordered list {15, 20, 35, 40, 50} using this variant method is 26.

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14.3 Performance Analysis Functions

- ON Counter - calculates how many times, during the specified time period, the value changed from zero to a non-zero value.
  Example: If, during the specified period, the following values were found: 1, 0, 0, 1, 0 ,1, 0 - then *ON Counter* will return 2, because the value changed from 0 to 1 only twice.

- OFF Counter - calculates how many times, during the specified time period, the value changed from a non-zero value to zero.
  Example: If, during the specified period, the following values were found: 1, 0, 0, 1, 0 ,1, 0 - then *OFF Counter* will return 3, because the value changed from 1 to 0 three times.

- ON/OFF Counter - calculates how many times, during the specified time period, the value changed from zero to a non-zero value and then changed back to zero.
  Example: If, during the specified period, the following values were found: 1, 0, 0, 1, 0 ,1, 0 - then *ON/OFF Counter* will return 2, because the value changed from 0 to 1 and back to zero twice.

***NOTE**: "*Found Values*" means those values that are in the Dream Report database or the External History server with the correct timestamp and a "good" quality.

- Running Time - calculates the time period when the value was recorded into the database as 1 ("non-zero").

Example: if the motor was turned on during the period between 12:00 and 14:00, then the item value of the motor performance was recorded as "1" (non-zero) during this time period. So, the period of 2 hours will be considered as the running time (up time) of the motor performance.

- Down Time - calculates the time period when the value was recorded into the database as 0.

Example: if the motor was turned off during the period between 14.00 and 17.00, then, the item value of the motor performance was recorded as zero during this time period, So, the period of 3 hours will be considered as the down time of the motor performance.

- System availability - calculates and displays which part of the total defined period the system was available. The calculation is done as follows: first, calculate the duration when the selected item had a non-zero value. Afterwards this time period is divided by overall time period associated with that of the object and is multiplied by 100%. The result is the percentage (%) of the overall period the item had a non-zero value.
  Example: If we calculate the system availability between 12:00 and 14:00, where between 12:00 and 13:00 the item value was "1" and between 13:00 and 14:00 item value was zero, then the time period, where this item was non-zero, is 1 hour (12:00-13:00) out of 2 hours in total (12:00-14:00), so (2/4)*100% = 50%. So, the result of this example will be **50%.**
  When the *System Availability* statistical function is used, **"%"** is automatically added as a unit if no other unit is specified. To remove % as a unit, please, define a space as the unit " ".

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14.4 Batch Functions

- **Batch ID** - displays the ID of the batch, used as the time period for the calculation. If the range of batch IDs is used, then the ID of the first batch from the range will be displayed. And the total period will be taken for report generation.
  This function can be used only with batch-based time period and is not relevant for time-based periods.
- **Batch start time** - displays the start time of the batch, used as the time period for the calculation. If the range of batches is used, then the start time of the first batch from the range will be displayed.
  This function can be used only with batch-based time period and is not relevant for time-based periods.
- **Batch end time** - displays the end time of the batch, used as the time period for the calculation. If the range of batches is used, then the end time of the last batch from the range will be displayed.
  This function can be used only with batch-based time period and is not relevant for time-based periods.
- **Batch duration** - displays the duration of the batch, used as the time period for the calculation. If the range of batches is used, then the duration between the start time of the first batch and the end time of the last batch from the range will be displayed.
  This function can be used only with batch-based time period and is not relevant for time-based periods.

14.5 Set Point Analysis Functions

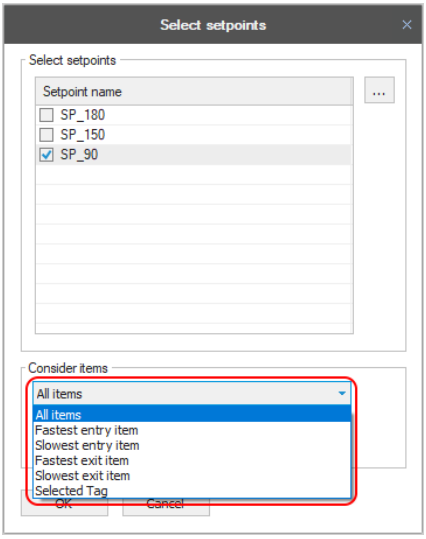
There is a group of statistical functions with a different configuration:
- Start time of stable period
- End time of stable period
- Duration of stable period
- Setpoint stability result
- Counter of stable periods
- Rate of change before entering stability zone
- Rate of change after exiting stability zone

If any of these statistical functions is selected, then, the button "*Select setpoints*" will appear next to the statistical function combo box:



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If a user clicks on the button "*Select setpoints*", the dialog box with setpoint selection will be opened, where a user will be able to select one or several setpoints:



User can select one or more setpoints. Then the check box next to each setpoint will become checked.

If no setpoints have been selected, user can click on ... (browse) button on the right. Then the Setpoint Analysis Configuration dialog window will be opened.

(For details on how to create setpoint definitions, please, go to the section **Setpoint Stability Analysis**.)

Group box "**Consider items**" will have a combo box with 6 entries: "**All items**", "**Fastest entry item**", "**Slowest entry item**", "**Fastest exit item**", "**Slowest exit item**" and "**Selected Tag**". The default selection is "**All items**".

If the "**All items**" option will be selected, then the function will calculate all items/ tags, which have entered and left the stability period. Then the function will do its main calculation for all the items from that setpoint.

If the "**Fastest entry item**" option will be selected, then the function will calculate the item/ tag, which has first reached the stability period (the one, which has the earliest timestamp of the first value within the stability period). Then the function will do its main calculation only for that item and not for all items from that setpoint.

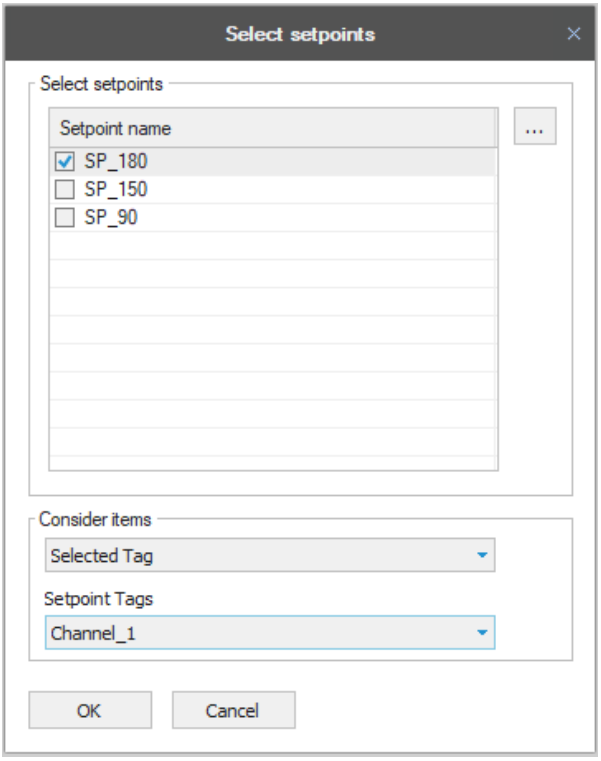
If the "**Slowest entry item**" option will be selected, then the function will calculate the item/tag, which has last reached the stability period (the one, which has the latest timestamp of the first value within the stability period). Then the function will do its main calculation only for that item and not for all items from that setpoint.

If the "**Fastest exit item**" option will be selected, then the function will calculate the item/ tag, which has first left the stability period (the one, which has the earliest timestamp of the first value out of the stability range after stability period end time). Then the function will do its main calculation only for that item and not for all items from that setpoint.

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If the "**Slowest exit item**" option will be selected, then the function will calculate the item/ tag, which has last left the stability period (the one, which has the latest timestamp of the first value out of the stability range after stability period end time). Then the function will do its main calculation only for that item and not for all items from that setpoint.

If the "**Selected Tag**" option will be selected, the "**Setpoint Tags**" selection box will appear:



The dropdown menu will include all the items/tags for the setpoint selected.

When a user will select the item/tag he may need for the calculations, the function will calculate that item/tag, which has entered and left the stability period. Then the function will do its main calculation only for this item from that setpoint.

If a user will select one of the functions from the ***Setpoint stability*** group (please, see the list above), then, it will perform one of the statistical functions described below:

- Start time of stable period calculates the start time of stability period of the selected setpoint. It takes the selected setpoint and gets values of all items/tags defined for that setpoint for the calculation period, defined in that object. This function detects the time, when values of all tags have entered the "stability zone", e.g. are within setpoint value +/- tolerance. If more than one setpoint is selected, the function calculates start time for every defined setpoint and then displays the first one between all of them. If during the object calculation period all tag values have never entered together into the stability zone, the object result will be N/A.

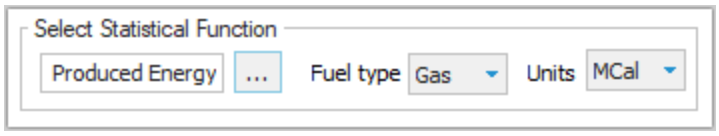
- End time of stable period calculates the end time of stability period of the selected setpoint. End time of stability zone means the timestamp, when last item/tag value has left the stability zone. If it calculates the result for multiple selected setpoints, then it will calculate the result (end time) for each setpoint and then display the last one.

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- Duration of stable period calculates start and end time for one or several setpoints, and then displays the period (duration) between start and end time.
- Setpoint stability result calculates the result, which is true or false. The function gets all values of each item/tag of the setpoint for the interval between start and end time of every setpoint, and checks if all values of all tags are within a setpoint value +/- tolerance. If multiple setpoints have been selected, this analysis will be executed separately for every setpoint. The result of this function will be TRUE if all values of all tags during a stable period of each zone are within the setpoint value +/ tolerance, and will be FALSE if any value is out of range during stability periods.
- Counter of stable periods calculates and then displays the number of the stable periods for one or several setpoints selected.
- Rate of change before entering stability zone calculates rate of change of item/tag values of the setpoint before entering stability zone (for details on how to configure the criteria for this statistical function calculations, please, see section Setpoint Stability Analysis).
- Rate of change after exiting stability zone calculates rate of change of item/tag values of the setpoint after exiting stability zone (for details on how to configure the criteria for this statistical function calculations, please, see section **Setpoint Stability Analysis**).

14.6 Energy Management Functions

- **Produced Energy** - calculates the amount of energy released during the period of some production process. If a user will select this statistical function for the report, then, he will have to select from the corresponding drop-down boxes the type of fuel (gas, coal, mazout/fuel oil) and the type of units (MCal, GCal, Mj, Gj), which will measure the energy produced (see pic. below):



- **Produced Emission** - calculates the amount of gases emitted during the period of some production process. If a user will select this statistical function for the report, then, he will have to select from the corresponding drop down boxes the type of fuel (gas, coal, mazout) and the type of gases, which will measure the emission produced. This section will have the same boxes as the **Produced Energy** option.

14.7 Alarm Analysis Functions

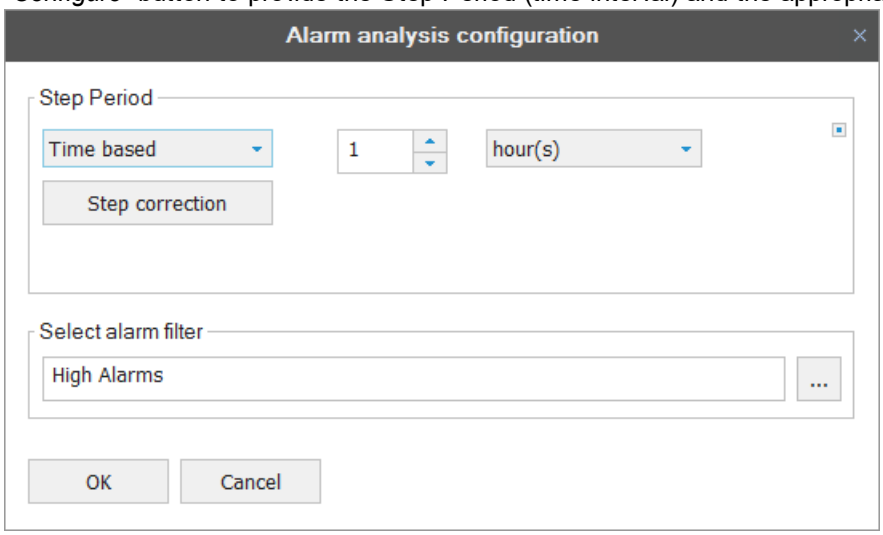
The Alarms statistical functions allow users to filter and analyze alarm counts, and also analyze alarms by their behavior (and operator responses to the alarms) – e.g., rates of alarms to identify alarm "floods", identify "chattering" or nuisance alarms, etc. All alarm statistical functions require an Alarm Filter 242 to be provided as part of the function's configuration.

- ***Counter of alarms*** – for selected period and alarm filter, how many alarms occurred

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- ***Timestamp of First alarm*** – for selected period and alarm filter, when the first alarm started
- ***Timestamp of Last alarm*** – for selected period and alarm filter, when the last alarm started
- ***Alarm Maximum Duration*** – for selected period and alarm filter, the longest time that an alarm lasted (Duration is time between start and end of an alarm)
- ***Alarm Minimum Duration*** – for selected period and alarm filter, the shortest time that an alarm lasted (Duration is time between start and end of an alarm).
- ***Alarm Maximum Response Time*** – for selected period and alarm filter, what is the longest response time (i.e., the difference between time of start and user acknowledgment of an alarm)
- ***Alarm Minimum Response Time*** – for selected period and alarm filter, what is the shortest response time.

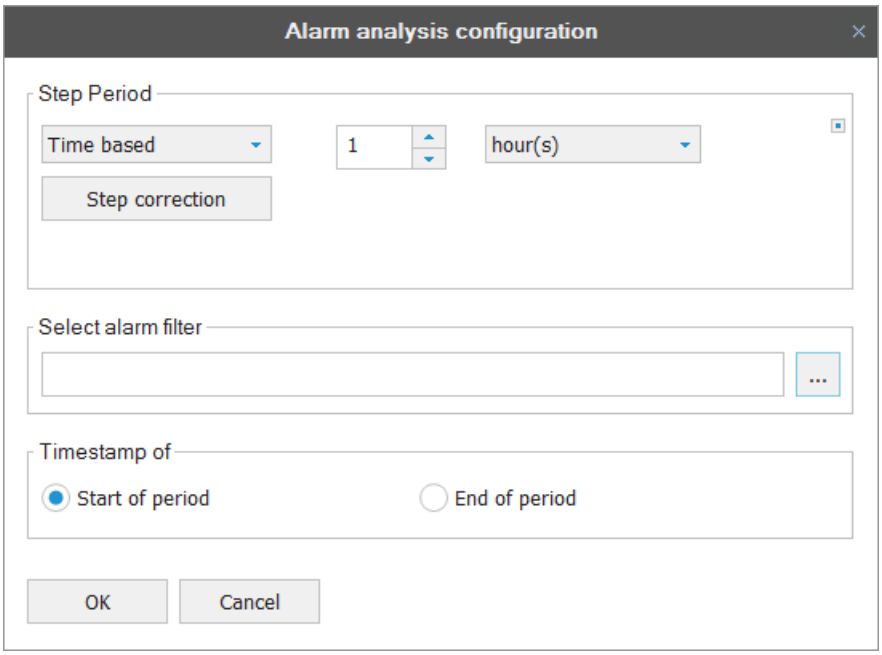
The following statistical functions will divide the report object's time period by a defined **Step Period** (sub-periods), calculate the number of alarms that occurred (started) during each step, and then will find the relevant statistic of all those counts per each step. After selecting the statistical function, click the "*Configure*" button to provide the Step Period (time interval) and the appropriate alarm filter - for example:



- ***Average Alarm Rate*** - calculates the average number of alarms for a specific alarm Filter, that occurred in user defined intervals (e.g. every 10-minute *Step Period*), over the time period defined in the report object
- ***Minimum Alarm Rate*** - calculates the lowest number of alarms for a specific alarm Filter, that occurred in user defined intervals, over the time period defined in the report object
- ***Maximum Alarm Rate*** - calculates the maximum number of alarms for a specific alarm Filter, that occurred in user defined intervals, over the time period defined in the report object

- ***Peak Alarm Timestamp*** - calculates the number of alarms for a specific alarm Filter, that occurred in user defined intervals, over the time period defined in the report object. It will then return the timestamp of the specific period (start or end, user-specified) with the max number of alarms:

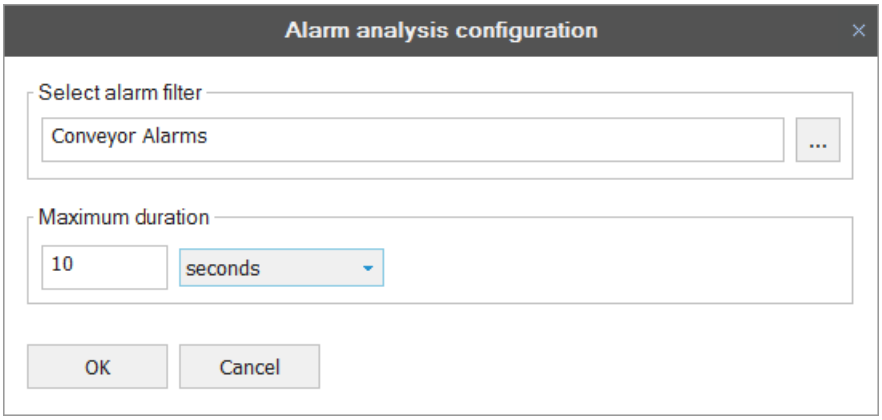
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If the maximum alarm count occurs in multiple step periods, the timestamp of the first identified will be returned.

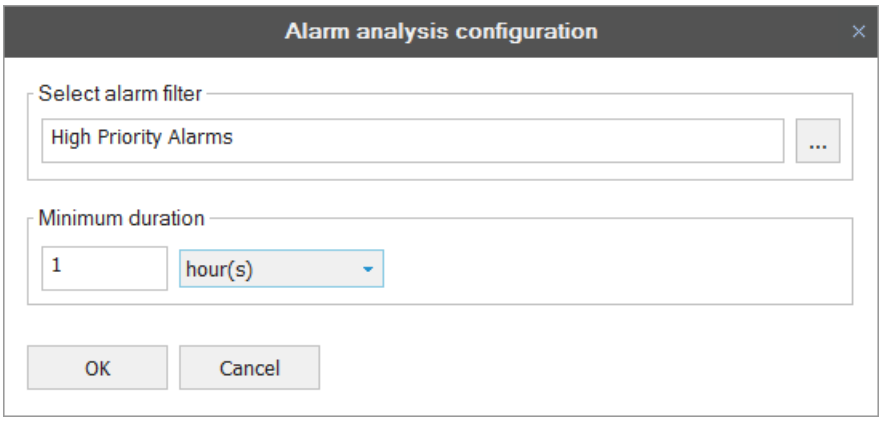
- ***Lowest alarm rate timestamp*** - calculates the number of alarms for a specific alarm Filter, that occurred in user defined intervals, over the time period defined in the report object. It will then return the timestamp of the specific period (start or end, user-specified) with the lowest number of alarms. If the minimum alarm count occurs in multiple step periods, the timestamp of the first identified will be returned.

- ***Count of short-duration alarms*** - calculates the number of alarms for a specific alarm Filter, that have their duration (i.e., the difference between alarm end time and start time) less than or equal to the user-specified maximum duration:

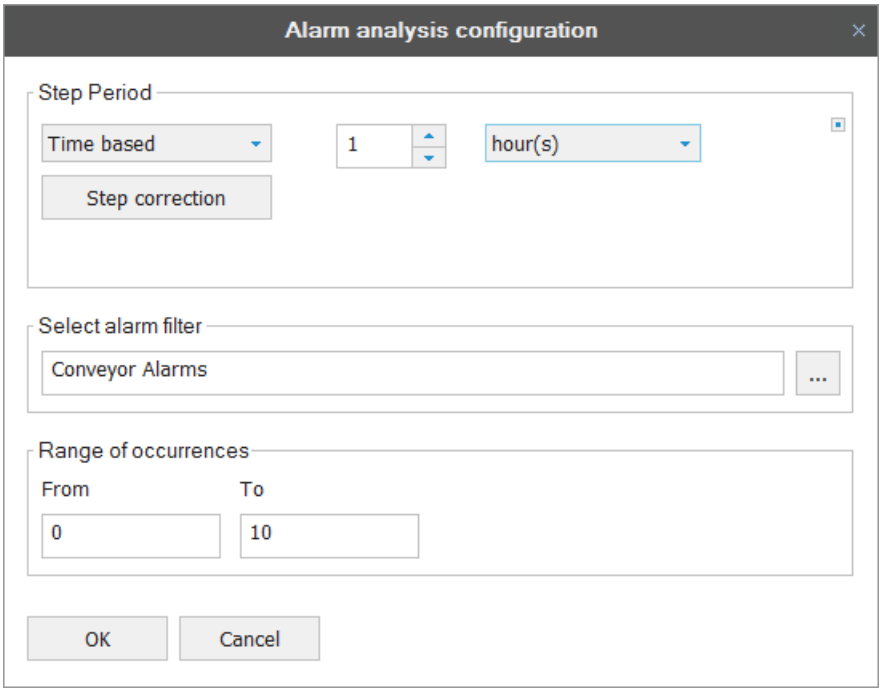


- ***Count of long-duration alarms*** - calculates the number of alarms for a specific alarm Filter, that have their duration (i.e., the difference between alarm end time and start time) greater than or equal to the user-specified minimum duration.

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- ***Count of periods per alarm rate*** – calculates the number of user-defined time periods when the alarm occurrence rate (i.e., number of alarms in that interval) was in a specified range. This can then be used to calculate the percentage of time periods containing short-time and long-period alarms during the object's overall time period. Enter the *From* and *To* values for the **Range of Occurrences**:



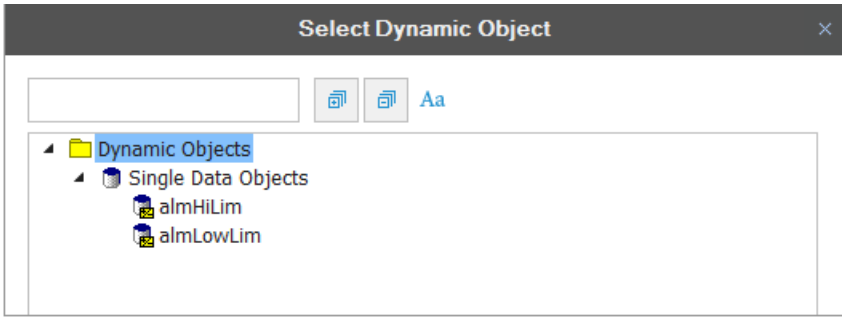
Note that you may use dynamic tokens in place of hard-coded values for the specified ranges:



This allows, for example, *ad hoc* alarm analysis, where the user can enter lower and upper limits on a DRWeb 548 page, and then generate the alarm KPI's based on the ranges they enter. To select a dynamic token to use in an alarm function parameter, double-click in a parameter field (instead of

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typing a hard-coded value) and the "*Select Dynamic Object*" window will open, from which to select an object on the report to use:



14.8 Direct SQL Query

- SQL Query performs a predefined SQL query in the selected database

If SQL Query is selected, click on "*Define SQL Query*". In this case the result will be the result of the query - i.e. the history type, source, item and time period will not be applied.

Functionality of SQL query editor window is described in details in its dedicated section **Edit SQL Query**.

Any standard SQL query can be specified, but only the first row in the result set will be displayed. The value can be of any type. If received value type is not numeric, it will be displayed as a string.

IMPORTANT NOTES:

- When using statistical function "SQL Query" in a Single Data Object and recording its values using analytical driver, the analytical item group in the data logger should be configured with a periodical record rate "**Each**" and not "On Change" or On Update - this is a limitation within the logger.
- When using an MS Access database and column names or table names starting with "_" or other non alphanumeric character, enclose the name with square brackets (e.g. [_MyTable] or [_MyColumn]). This is not required for SQL Server databases.

14.9 Pulse Analysis Functions

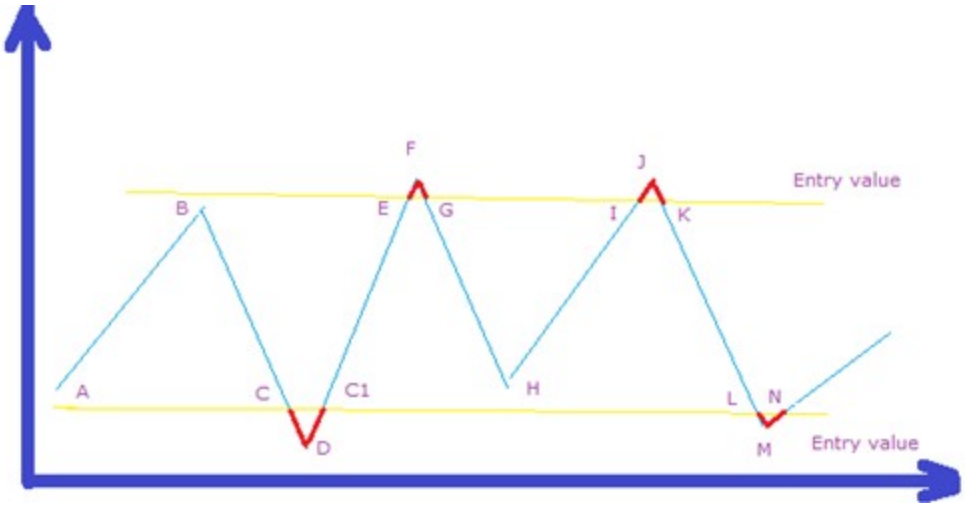
- Number of Pulses calculates and returns the counter of pulses during a specified period of time.

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If a user selects this statistical function for the report, then, he will have to select from the "**Pulse type**" combo box one of the options for the type of pulse wave to be considered: "**+**" ("**positive**", i.e. the upper pulse wave) or "**-**" ("**negative**", i.e. the lower pulse wave), and the value for this pulse wave from the "**Value**" ("**Entry Value**") edit box (this edit box can accept double values ("+", "-", whole and decimal)):



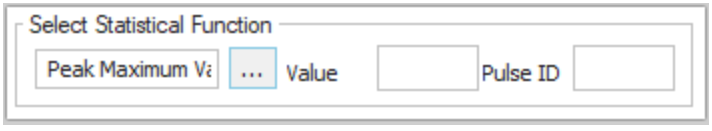
For pulse explanation and its detection display, please see the picture below:



A pulse is counted only when the value crosses the "**Entry Value**" line.
A **positive pulse** is counted only when this pulse is in the top part (e.g. **E-F-G** and **I-J-K**)
A **negative pulse** is counted only when this pulse is in the bottom part (e.g. **C-D-C1** and **L-M-N**)
Points **A**, **B** and **H** are not counted as pulses as they haven't reached the "**Entry Value**".

- Peak Maximum Value calculates maximum value for **positive pulses** only.

If a user selects this statistical function for the report, then, he will have to define the value for the pulse wave from the "**Value**" edit box (this edit box can accept double values ("+", "-", whole and decimal)) and the pulse sequence during the process in the **Pulse ID** edit box (please see the pic. below):



Example: on the picture above **E-F-G** is the ***positive pulse #1*** and **I-J-K** is the ***positive pulse #2***.

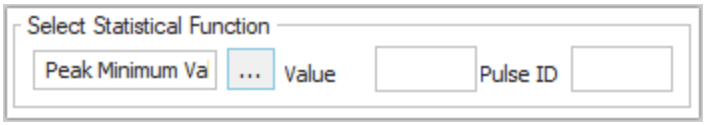
If this parameter is empty, the statistical function will calculate maximum for all pulses for the entire period, i.e. just a simple maximum value over the object period.

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NOTE: Value and **Pulse ID** edit boxes can accept dynamic parameters (f#).

- Peak Minimum Value calculates minimum values for **negative pulses** only.

If a user selects this statistical function for the report, then, he will have to define the value for the pulse wave from the "**Value**" edit box (this edit box can accept double values ("+", "-", whole and decimal)) and the pulse sequence during the process in the **Pulse ID** edit box (please see the pic. below):



Example:. on the picture above **C-D-C1** is the ***negative pulse #1*** and **L-M-N** is the ***negative pulse #2***.

If this parameter is empty, the statistical function will calculate minimum for all pulses for the entire period, i.e. just a simple minimum value over the object period.

NOTE: Value and **Pulse ID** edit boxes can accept dynamic parameters (f#).

14.10 Manual Input

- If Manual Input is selected, then the "**Default Value**" parameter combo box will be displayed next to the **Select Statistical Function** combo box:



It will be filled with the list of all simple statistic objects (Single Data objects, Compound objects, Expression objects), defined in that report.

If a user will want to set a static value as default for **Manual Input**, then he can create an expression object, assign it a static value, and then select it as default for manual input.

When user will select a data item (**Select Data Item**), this data item will be used as a target to write input value into. Also the data validation will be done: if user will try to input a value and its target tag will be a manual parameter, the data validation parameters will be applied. If input value will be incorrect, the value will be displayed in the edit box as red, and if user will click on the push button with "**Refresh report**" function, an error message will be displayed and operation won't be undertaken.

Result Representation

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Such an object will be displayed in the report only as an edit box. User will be able to select it in the DR Designer Studio and change its size and font properties. When displayed in a report in the DR studio, it will contain a value of its statistical objects.

Example: If an object is displayed in the studio as **#object**, then edit box will contain the text "**#object**".

This edit box result representation will be available only in web reports. If report is opened in the DR Web Portal in the web format, the calculated/default value will be written in the edit box control. That value can be changed manually.

If an action button with "**Refresh report**" function is defined, then user will be able to enter different manual values and re-calculate report using those manual values.

If user enters manual value into the edit box, this object won't be re-calculated and manual value will be used instead of "**Refresh report**" action. If edit box is empty, then during "**Refresh report**" operation, the object value will be re-calculated according to its definition.

If report is generated by schedule in PDF, the object value will be displayed in PDF (as default result representation) without any edit box.

For details on "**Refresh report**" action, please see **Action Button** section of this manual.

NOTES:

- Single data objects with the "**Manual input**" statistical function will be displayed ONLY in a web report. When generating a regular PDF or Excel report those objects will be invisible.
- If **Manual Input** function is used in a Step table, then all input values will use a date for each value, which will correspond to the row, where that value was entered into.

After selecting the statistical function and data, select the **time period**.

NOTE: For Single Data Objects the "**Manual Input**" time definition option is available.

The time period for a statistical calculation is described in details in the **Time Definition** section of this manual.

The period defined for the object can also be **Batch-based**. This is also described in details in the sections **Batch Definition** and **Time Definition.**

The Result Representation section describes how to format the results (decimal precision, added unit etc.).

The **Advanced SQL Condition** section describes how to configure advanced filters for the processed values.

Examples of the Single Data objects:

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	Absolute/Relative	Fixe Period	Batch Period	Batch ID: Batch_56	
Statistics	From Jan 1st at Today	Last Month	Last Batch		Timestamp
First Value	150 m3	1350 m3	1125 m3	31/05/2007 08:00:13	First Value
Last Value	975 m3	1350 m3	1485 m3	04/06/2007 15:13:00	Last Value
Maximum Value	1485 m3	1485 m3	1485 m3	02/06/2007 10:00:00	Maximum Value
Minimum Value	150 m3	150 m3	150 m3	02/06/2007 11:00:00	Minimum Value
Average Value	1139.81 m3	1136 m3	1248 m3		
Weighted Average	1133.46 m3	1149 m3	1264 m3		
Integral Value	53682482385	2923296990	469635975		
Sum Value	7502235 m3	409095 m3	69885 m3	103:12:47	Run Time
Standard Deviation	366	372	283		

(i) - Free table was used to present data

NOTE: This example of the single data objects in the generated report demonstrates different single data objects with different statistical functions selected like First Value, Last Value, Maximum Value, Minimum Value, etc. with different time periods defined. The results are represented in the format of the free table.

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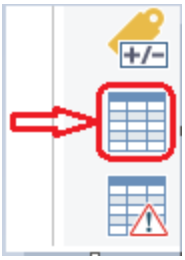
Tables

15 Tables

15.1 Item Table (Raw Values)

Item table is an object that displays an array of values from one or more data items within a specified value range that were logged during the specified time period.

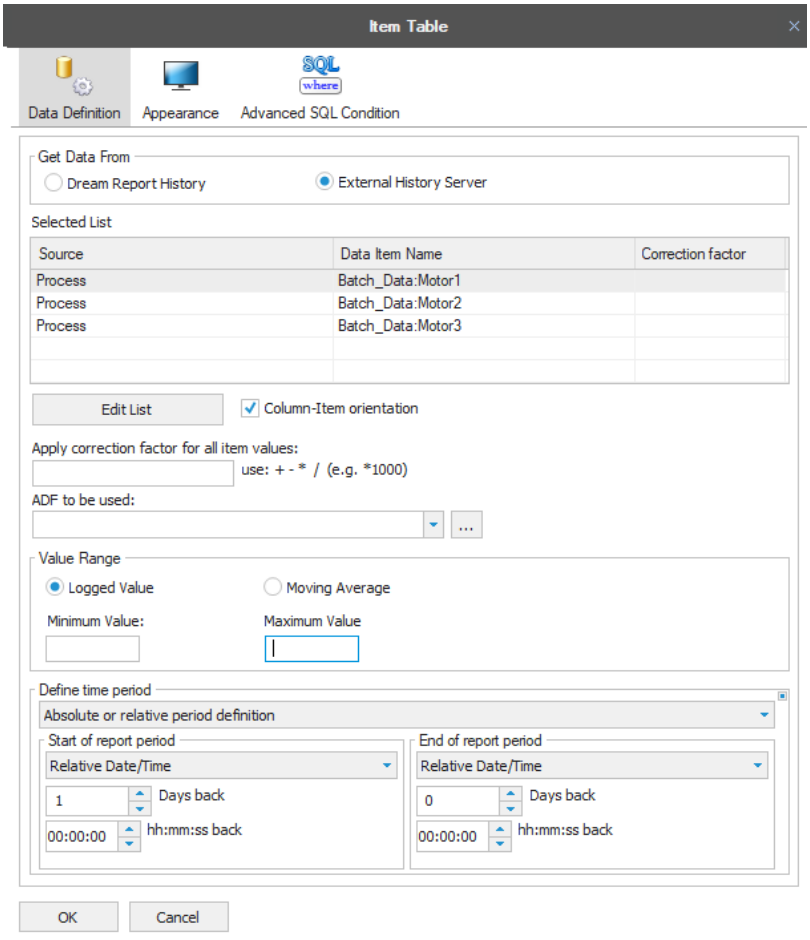
To add this object, please click the *Item Table* button on the Report Designer Studio **Elements** toolbar:



Mark in the workspace the rectangle, where desired data will be displayed.

The **Item Table** definition dialog window will be opened (see pic. on the right):

Item Table Data Definition



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In the **Get Data From** dialog box, select which history type will be used to extract data from: ***Dream Report History*** or ***External History Server***.

To add data items to the **Selected List** table, click the *Edit List* button, and the **Select Data Items** dialog window will be opened.

If "***Dream Report History***" radio button will be enabled, then, the combo box "Select Data Source" will contain a list of data access drivers defined in the project. If "***External History Server***" will be selected, the "Select Data Source" combo box will contain a list of history access drivers defined in the project.

In Select Data Source and Available Data Items, select the source and item from which Dream Report will calculate values, and add them to the list. Data source name and data item name of the selected tags will appear in the **Selected List** table.

If a user will enable **Column-Item orientation** check box, then the table columns will display item values from the selected list.

Apply correction factor for all item values enables adding simple expression to an item table.

If a user needs to display item table on item(s) with the correction factor, then, first, all values of the selected item(s) will be re-calculated, applying correction factor, and then, the item table will display re-calculated data.

For more details, please, refer to the **Correction Factor** section.

ADF to be used: enables to select an aggregated data filter. "**ADF to be used**" combo box will contain all ADF definitions, configured in the project. The default string will be "**Not Used**", i.e. no filter (ADF) is applied.

For details on ADF definition/configuration, please go to the Aggregated Data Filter section of this manual.

In the **Value Range** filter section, specify the range of values you wish to include in your table. For example, you can create a table only for a critical value range and see only those values.

The value filter accepts negative and floating-point values, but it only supports numeric values and not strings.

If you use an Item Table to display string item values, the value filter will be ignored.

The Item table is able to display 2 kinds of data: **Logged Value** (raw data) or **Moving Average**.

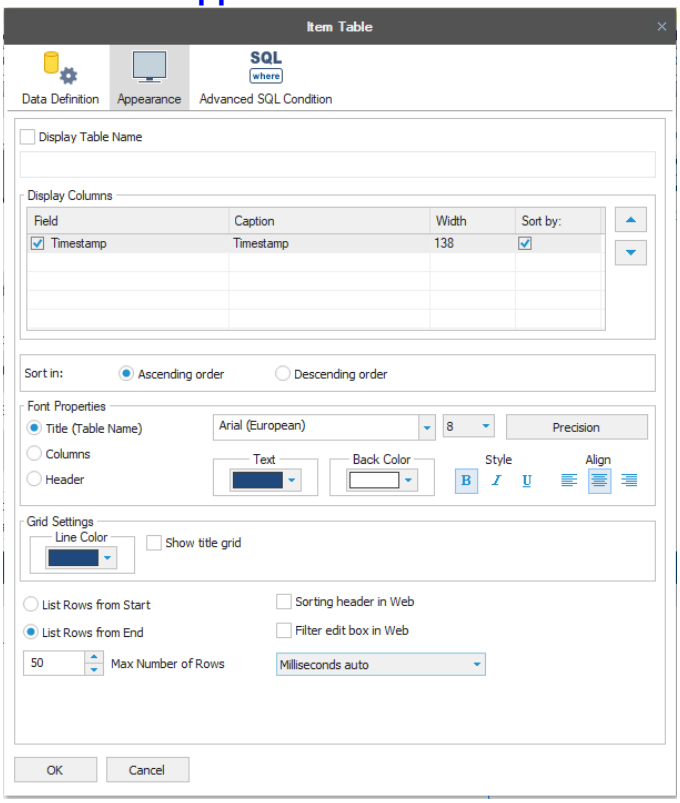
If **Logged Value** will be selected, data will be extracted from history and displayed exactly as it is according to the definition.

If **Moving Average** will be selected, then each raw data array will be automatically recalculated into a moving average array, when each array element is an average of all previous array members, including itself.
In case of **Moving Average**, the value filter will be ignored.

Time Definition, which defines the period for statistical calculations for this object, is described in the Time Definition section of this manual.

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Item Table Appearance



To adjust the formatting of the table, click on the ***Appearance*** floating splitter and the **Table Appearance** dialog window will be opened (see picture in the right corner):

The **Table Name** field will contain a name, which will be displayed.

The **Display Table Name** check box will enable or disable table title display.

The **Display Columns** list defines which columns will be displayed as well as their order, size, width and caption.

The left row of check boxes enables and disables the appropriate column display in the table.

The **Caption** column defines the caption of each column of the table. If you wish to change the caption of any column, double-click on the appropriate caption inside the column and it will be available for editing.

Selecting any column and clicking *Move Up* or *Move Down* buttons will change the order of the selected column.

The right set of check boxes - **Sort By** - will define by which column the data will be sorted. Only one column can be selected.

Radio buttons below (**Sort In**) will define the sorting direction, ***ascending*** or ***descending***.

The **Font Properties** controls enable you to set different font properties for the table title, table header and displayed data (in columns).

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When you define a table, you never know how many rows will actually be displayed. It may be few, but may also result in dozens of pages in a report. Therefore, the **Max Number of Rows** edit box allows you to specify the maximum number of rows to display in the table. This enables the user to protect the report from an overflow.

When defining the maximum number of rows, you can set which "cut" of all the data set you would like to display: the first or the last block of data. This can be defined by selecting an appropriate radio button: **List rows from Start** or **List rows from End**.

Enabling the checkbox **Sorting header in Web** allows users to sort data in Web Portal. By clicking on the caption of the table, a user defines the sort direction, ascending or descending.

By enabling the checkbox **Filter edit box in Web** a user will be able to set a filter in the Web Portal and only the data corresponding to this filter will be displayed.

In the **Milliseconds** combo box, a user can choose whether to display milliseconds for the timestamp field. The following options are available:

- Milliseconds disabled: milliseconds will not be displayed.

- Milliseconds enabled: milliseconds will be displayed for every timestamp.

- Milliseconds auto: milliseconds will be displayed only in the timestamps with milliseconds resolution.

- Milliseconds from the Project localization: the object will use the configuration set in the Project Localization dialog window.

Examples of Item tables:

Column based - When logging is the same for each Tag

Timestamp	Tank1	Tank2	Tank3
02/07/07 18:00:00	150.00	30.00	1500.00
02/07/07 17:00:00	1485.00	750.00	1170.00
02/07/07 16:00:00	1470.00	900.00	1395.00
02/07/07 15:00:00	1455.00	1050.00	1500.00
02/07/07 14:00:00	1440.00	1200.00	1485.00
02/07/07 13:00:00	1425.00	1350.00	1425.00
02/07/07 12:00:00	1410.00	1500.00	1200.00
02/07/07 11:00:00	1395.00	1200.00	900.00
02/07/07 10:00:00	1380.00	900.00	450.00
02/07/07 09:00:00	1365.00	525.00	225.00
02/07/07 08:00:00	1350.00	825.00	75.00
02/07/07 07:00:00	1320.00	975.00	225.00

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All Tanks Together

Timestamp	Tank Name	Values
02/07/07 18:00:00	Tank3	1500.00
02/07/07 18:00:00	Tank2	30.00
02/07/07 18:00:00	Tank1	150.00
02/07/07 17:00:00	Tank3	1170.00
02/07/07 17:00:00	Tank2	750.00
02/07/07 17:00:00	Tank1	1485.00
02/07/07 16:00:00	Tank1	1470.00
02/07/07 16:00:00	Tank2	900.00
02/07/07 16:00:00	Tank3	1395.00
02/07/07 15:00:00	Tank2	1050.00
02/07/07 15:00:00	Tank1	1455.00
02/07/07 15:00:00	Tank3	1500.00
02/07/07 14:00:00	Tank2	1200.00
02/07/07 14:00:00	Tank1	1440.00
02/07/07 14:00:00	Tank3	1485.00
02/07/07 13:00:00	Tank3	1425.00

15.2 Free Table

Free Table is an object that combines different static and dynamic statistical objects into a table.

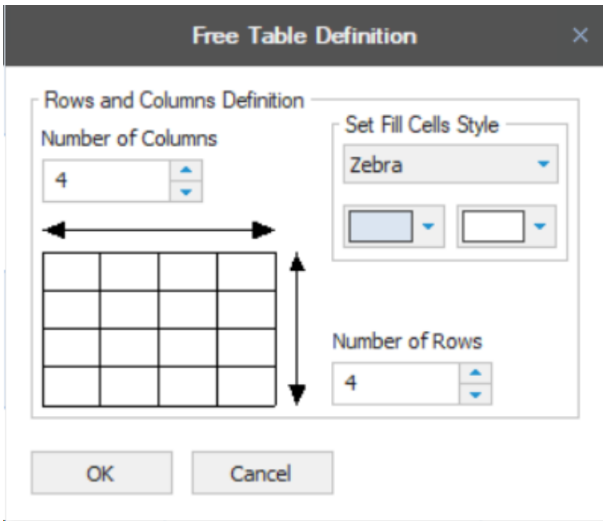
To add a free table to the project, click on the *Free Table* button on the Report Designer Studio **Elements** toolbar:



Mark in the workspace the rectangle, where desired data will be displayed.

The following dialog box will be opened:

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Enter the number of rows and columns for the table as well as select the cells style. Please note that the maximum size is 50 rows and 50 columns.

Set Fill Cells style section:

Select the table style – *Solid color* or *Zebra fill*, and the fill colors.

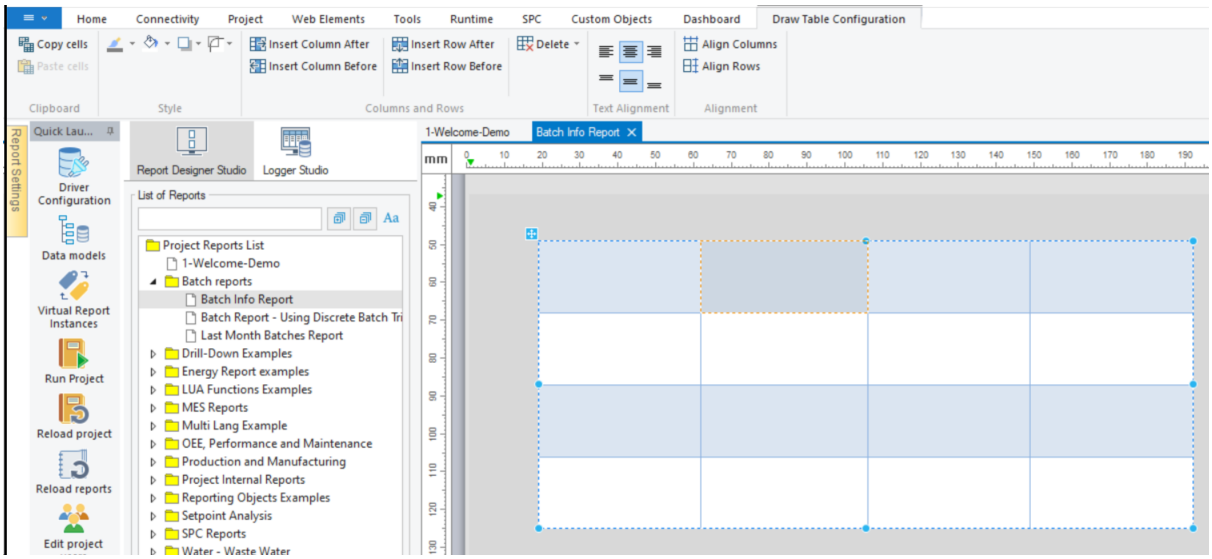
When a free table is added to the project, it can be filled with the following types of data:
To add a statistical object, user has to right-click on a cell and select required object type from a context menu (see pic. below), which can be:

- Static text
- Date/Time Object
- **Single Data** Object
- **Compound Data** Object
- **Expression Data** Object

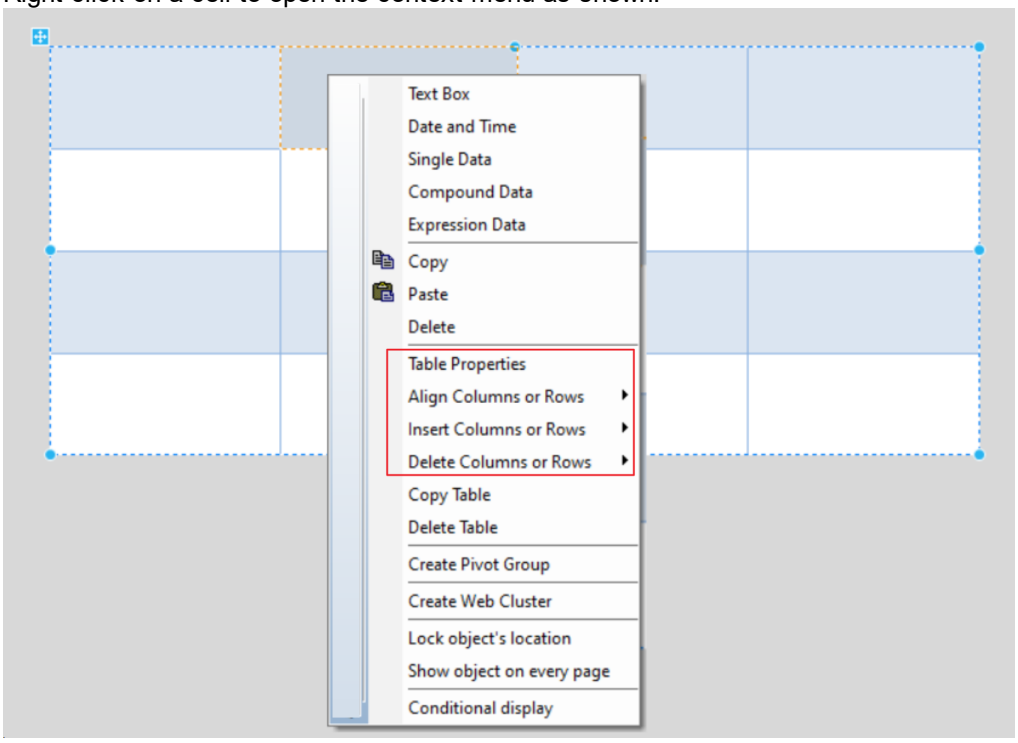
To open text input for a cell, double-click the cell.

The data in the cell can be aligned from *Home - Text Alignment insert/delete column or row and also copy the cell content into another cell*.

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Right-click on a cell to open the context menu as shown:



Use the Single Data or Compound Data or Expression Data menu item to open the corresponding dialog box to configure an object and attach it to the selected cell.
To delete a free table, right-click on any cell in the table and select ***Delete Table***. Or select a table, clicking on the table border and press the ***Delete*** key.

Example of Free table:

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	Absolute/Relative	Fixe Period	Batch Period	Batch ID	
Statistics	From Jan 1st at Today	Last Month	Last Batch	#Batch_ID	Timestamp
First Value	#First m3	#First_F m3	#First_B m3	#First_B_TS	First Value
Last Value	#Last m3	#Last_F m3	#Last_B m3	#Last_B_TS	Last Value
Maximum Value	#Maxi m3	#Maxi_F m3	#Maxi_B m3	#Maxi_B_TS	Maximum Value
Minimum Value	#Mini m3	#Mini_F m3	#Mini_B m3	#Mini_B_TS	Minimum Value
Average Value	#Average m3	#Average_F m3	#Average_B m3		
Weighted Average	#W_average m3	#W_average_F m3	#W_average_B m3		
Integral Value	#Integral	#Integral_F	#Integral_B		
Sum Value	#Sum m3	#Sum_F m3	#Sum_B m3	#RT_B	Run Time
Standard Deviation	#Deviation	#Deviation_F	#Deviation_B		

15.3 Automatic Statistical Table

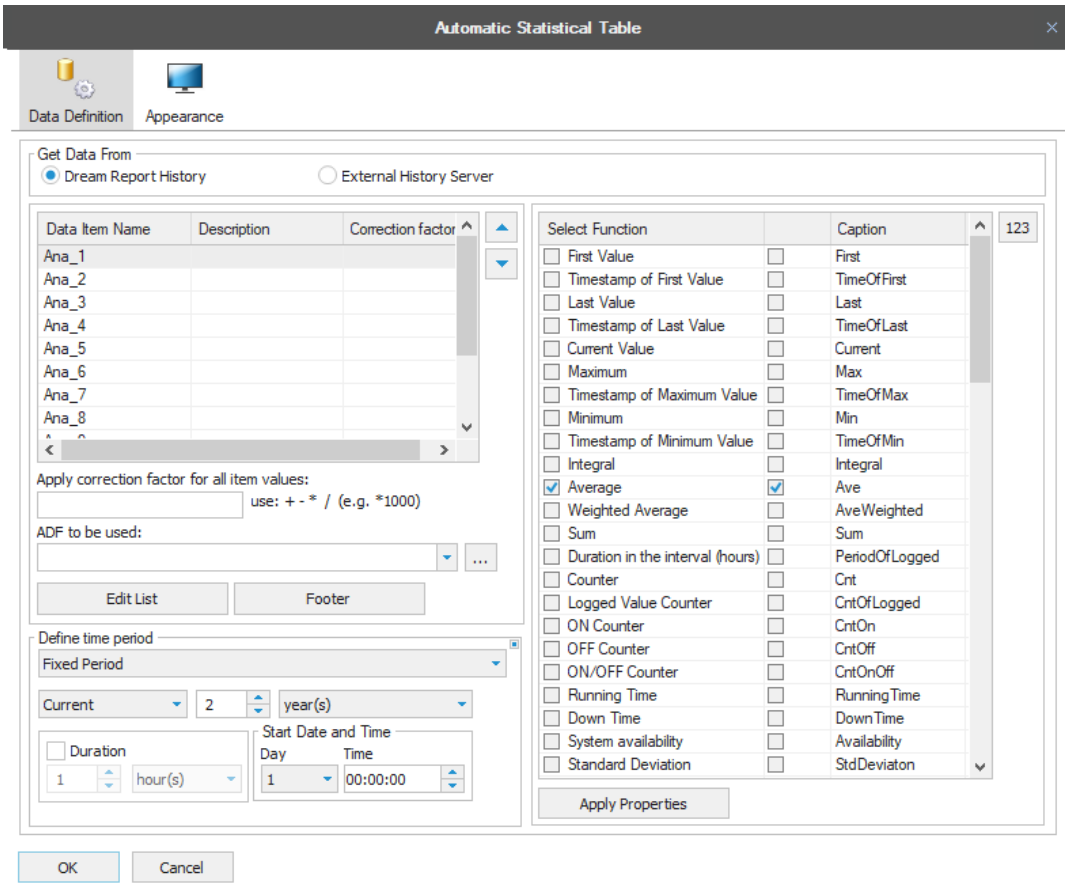
Automatic Statistical Table (AST) is a table object, which allows you to quickly create and modify a table in a few clicks. Select a list of tags, select a list of statistical functions for each of them, and define a common time period.

Click on the *Automatic Statistical Table* button on the statistical object toolbar in the Dream Report Designer Studio:



Draw an area for your table in the report workspace. The **AST Data Definition** dialog window will be opened:

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Automatic Statistical Table Data Definition

In the **Get Data From** dialog box select which history type will be used to extract data from: ***Dream Report History*** or ***External History Server***.

To add data items/tags to the **Selected List** table, click on the *Edit List* button, and the **Select Data Items** dialog window will be opened.

If "***Dream Report History***" radio button will be enabled, then, the combo box "Select Data Source" will contain a list of data access drivers defined in the project.
If "***External History Server***" will be selected, the "Select Data Source" combo box will contain a list of history access drivers defined in the project.
In the Select Data Source and Available Data Items combo boxes, select the source and item from which Dream Report will calculate values, and add them to the list. Data source name and data item name of the selected tags will appear in the **Selected List** table.

When you have selected a data item/tag, choose the statistical functions you will need to perform for the textual output of the report result. The list of all available statistical functions for the AST calculations is the same as for the Single Data Object calculations:

- **Last value**
- **Maximum value**
- **Minimum value**
- **Sum value**

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- **Integral value**
- **Average value**
- **Weighted Average**
- **Duration**
- **Counters**

For detailed information about these statistical functions, please, go to the Single Data Object section.

Apply correction factor for all item values enables adding simple expression to an automatic statistical table. If a user needs to display automatic statistical table on item(s) with the correction factor, then, first, all values of the selected item(s) will be re-calculated, applying correction factor, and then, the automatic statistical table will display re-calculated data.

For more details, please refer to the **Correction Factor** section.

ADF to be used: enables to select an aggregated data filter. "**ADF to be used**" combo box will contain all ADF definitions configured in the project. The default string will be "**Not Used**", i.e. no filter (ADF) is applied.

For details on ADF definition/configuration, please go to the Aggregated Data Filter section of this manual.

For each selected function you can define the format by clicking on the selected statistical function and double-clicking the "**...**" button for the following advanced settings:

- **Column Caption**
- **Settings**
- **Units** (For details, please, see the **Result Representation** section)
- **Precision of result after decimal point** (For details, please, see the **Result Representation** section).
- **Show result as** (For details, please, see the **Result Representation** section).
- **Advanced options** (For details, please, see the **Advanced Visualization Settings** section).
- **Advanced SQL Conditions** (For details, please, see **Advanced SQL Condition** section).

The *Automatic Statistical Table* enables you to add a **Footer**. This footer can have multiple lines, which can include static text, Expression or Compound data objects.

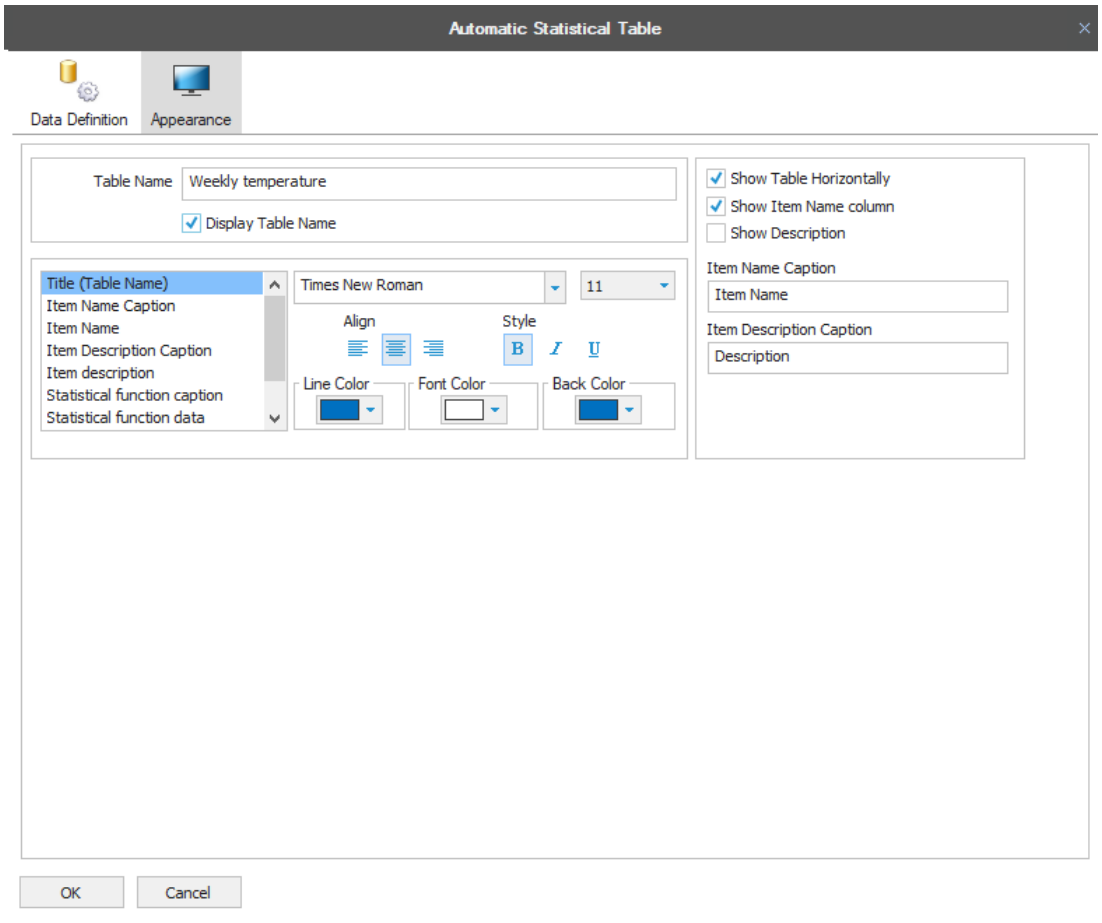
Data from all table cells (objects) can be stored in the Dream Report database for further use using the analytical driver.

Time Definition, which defines the period for statistical calculations for this object, is described in the Time Definition section of this manual.

Automatic Statistical Table Appearance

The **Appearance** section contains column definitions as well as formatting options (font properties, colors, background etc).

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Here you can format the properties of an AST object. The orientation of a table can be specified by the "Show Table Horizontally" check box.

By default, 2 options **Show Item Name** column and Show **Description** are enabled.

User can hide the item name column and the description column by disabling the corresponding edit boxes.

Both columns can be defined accordingly in the **Data Definition Tab**.

The user can set the table name and then decide to display it or not by selecting "Display Table Name".

Example of Automatic Statistical table:

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Weekly Temperature Statistics Sensores 1-3						
	Temp1	Sensor 1	Temp2	Sensor 2	Temp3	Sensor 3
First	86.00		45.00		25.00	
TimeOfFirst	18/02/2008 07:00:00		18/02/2008 07:00:00		18/02/2008 07:00:00	
Last	50.00		25.00		10.00	
TimeOfLast	24/02/2008 18:00:00		24/02/2008 18:00:00		24/02/2008 18:00:00	
Max	99.00		100.00		100.00	
TimeOfMax	19/02/2008 12:00:00		19/02/2008 07:00:00		19/02/2008 10:00:00	
Min	11.00		2.00		5.00	
TimeOfMin	19/02/2008 13:00:00		19/02/2008 13:00:00		18/02/2008 09:00:00	
Ave	74.74		45.45		49.73	
Sum	6278.00		3818.00		4177.00	
PeriodOfLogged	155:00:00		155:00:00		155:00:00	
LoggedValCount	84.00		84.00		84.00	
Deviation	25.47		23.66		35.14	

15.4 Step Table

Step Table is an object, which creates a table automatically with a predefined time for each row in the table.

Example: Create a table for 1 day making 1 row for each hour.



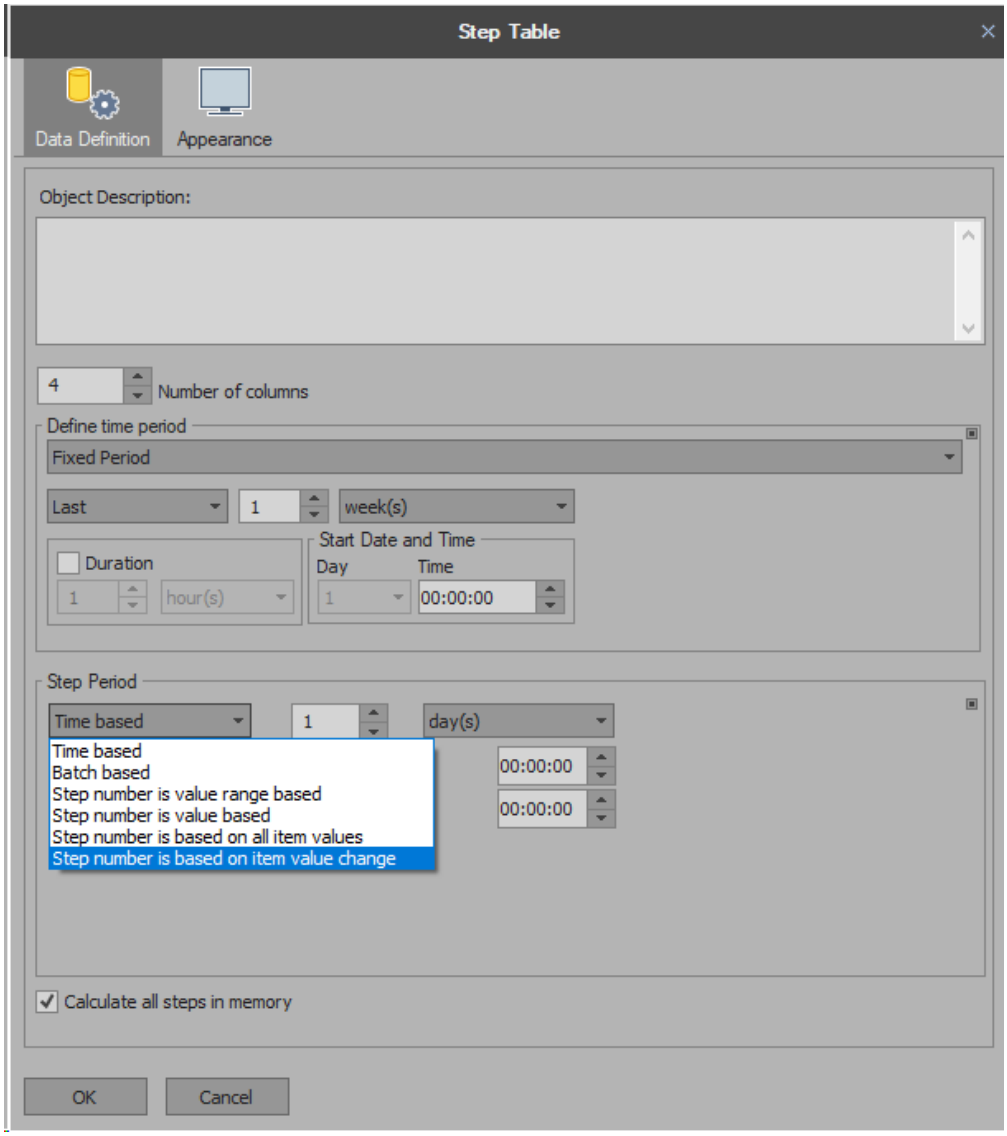
Click on the *"Step Table"* button on the Report Designer Studio **Elements** toolbar (pic. above). Draw a rectangle where you want to place the table in the report workspace.

Step Table Data Definition dialog window will be opened (see pic. on the right):

Step Table Data Definition

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In the **Object Description** section you can specify general information related to an object.



To create a step table, define how many columns that table will contain, what the content of each column will be, and also the general table time period and the period for each row (1 step).

In the **Number of columns** edit box enter a number of columns the table will contain.

The data definition of each column is defined in the **Appearance** section of the **Step Table** definition window.

The **Define time period** group box defines a time period for the entire table. Time period definition is described in detail in the Time Period Definition section.

The **Step Period** section defines a period for each row of the table. It has 6 options: **Time-based**, **Batch-based, Step number is value range based**, **Step number is value based**, **Step number is based on all item values**, and **Step number is based on item value change**.

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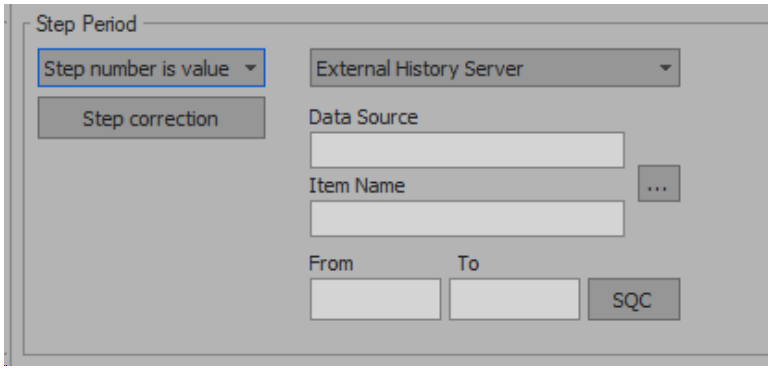
If **Time-based** option is selected, you can enter any integer number from 1 to 86400, and time (**second(s)**, **min(s)**, **hour(s)**, **day(s)**, **week(s)**, **month(s)**, **quarter(s)**, **year(s)**) in the time unit combo box.

Example: If you define a time period of 1 day and a step period of 1 hour, you will have a table for the last 24 hours with 24 rows, where each row will correspond to 1 hour and will contain statistical calculations of data for that corresponding 1 hour.

Batch-based option configuration is described in details in the Batch Definition section.

NOTE: When batch is defined in the external database (see **Batch definition** section) - then, if in the Step table the time period is defined as **Absolute**/**Relative**/**Fixed** or **Calculated**, and the Step period is defined as **batch-based**, the first step of the table will be the beginning of the first batch, which started within the time period defined for the step table. The last step of the table will end with the end of the time period defined.

If **Step number is value range based** option is selected, then user will be able to select a tag (from a real-time or historical data source) and specify **full** or **half empty** value range:



- **Full value range** means that "**From**" and "**To**" value range parameters will have the entered values. In this case Step table will read values of a ranged tag ("ODBC:Batch_Data:Motor 1" as in the picture above), and find time periods when the value of this ranged tag complies with the specified range. Every such a time period found (Start and End time) will be used as a step.

Example: Let's suppose that the tag "Batch_Data:Motor 1" has the following values in the duration of 1 hour:

Timestamp	Value
11:00	10
11:10	12
11:20	20
11:30	21
11:40	11
11:50	12
11:59	30

If **Full range** option is defined with the range of "From" 9 "To" 19, then the step table will have 2 steps for that period: *11:00 – 11:20* and *11:40 – 11:59.*

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- **Half empty value range** means that one of the value range parameters ("**From**" or "**To**") is empty. If "**From**" is empty and "**To**" has value, this will mean the following condition: **ranged tag < To**. If "**To**" is empty and "**From**" has a value, this will mean the following condition: **raged tag > "From"**. In this case Step table will read values of a ranged tag ("ODBC:Batch_Data:Motor 1"), and find time periods when the value of this ranged tag complies with the specified range condition. Every such a time period found will be used as a step.

Example: Let's suppose that the tag "Batch_Data:Motor 1" has the following values in the duration of 1 hour:

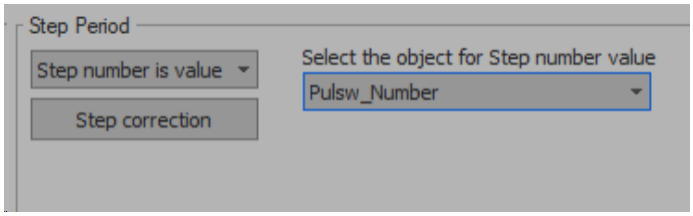
Timestamp	Value
11:00	10
11:10	12
11:20	20
11:30	21
11:40	11
11:50	12
11:59	30

- If **Half empty value range** option is defined with the range of "From " "To" 20, then the step table will have 2 steps for that period: *11:00 – 11:20* and *11:40 – 11:59*.

- If **Half empty value range** option is defined with the range of "From " "To" 40, then the step table will have 1 step for the entire period of *11:00 - 11:59*: The whole table period will be one step only.

- If **Half empty value range** option is defined with the range of "From "20" "To " , then the step table will have 2 steps for that period: *11:20 – 11:40* and *11:59 – <end of the period>*.

If **Step number is value based** option is selected, then the **Select the object for step number value** combo box will be filled with the list of reporting simple objects (Single Data objects, Compound objects, Expression objects,...etc.):



After an object has been selected, later, when report is generated, the object calculation result will be taken as a number of steps.

Example: If the object "Pulse_Number" has a value "4", then, the Step table will have 4 rows. Each row will have the same time period and the difference will be only the **Step ID**, which can be used as an argument for statistical calculations inside the table (please see **Column Type Settings** section below).

NOTE: This option enables to create steps (rows) by calculated number, where time period for each step is the same and the difference between steps is not time, but the number of rows.

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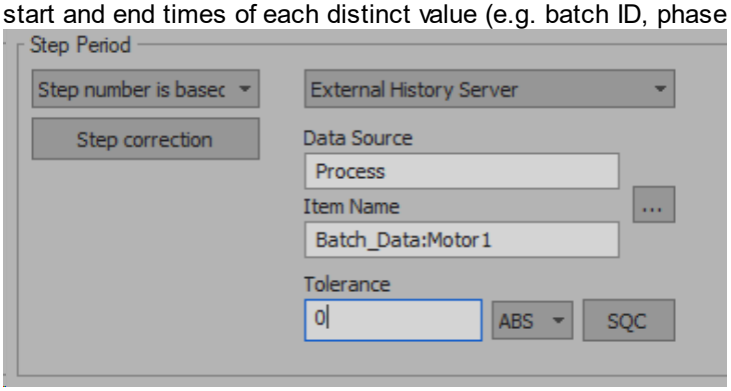
If **Step number is based on all item values** option is selected, then all tag values will be considered. In this mode the Step table will work exactly as an Item table. It will ignore statistical functions, read all values of tag(s), selected in a column. Then it will consider every value as a momentary step where Start and End of a step is the timestamp of that value, and will just list all found tag values over the table period. It will use the function "**Last Value**" for every timestamp period and get all tag values, i.e. for each column definition it will get only the tag name, and the function will be always ignored with the "**Last Value**" used instead.

Example: Let's suppose that the tag "Batch_Data:Motor 1" has the following values in the duration of 1 hour:

Timestamp	Value
11:00	10
11:10	12
11:20	20
11:30	21
11:40	11
11:50	12
11:59	30

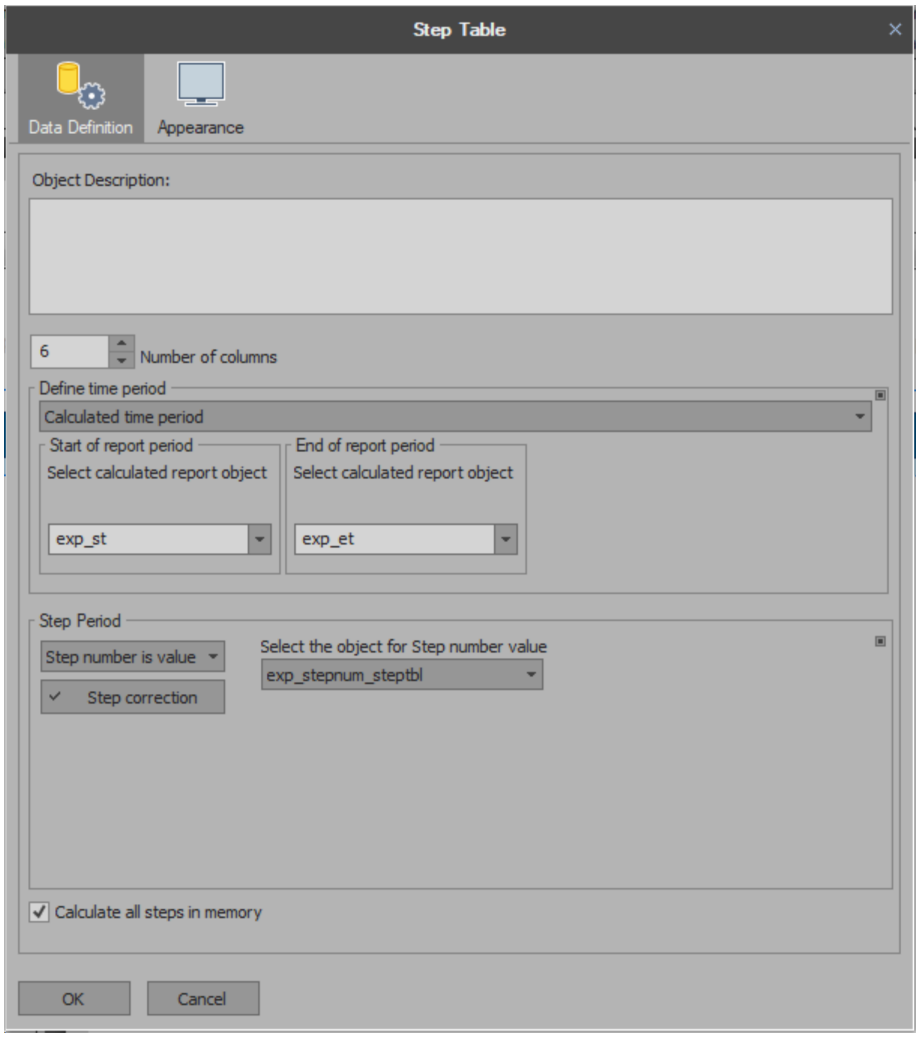
In this case the step table will display 7 steps with every timestamp, i.e. it will work just as a usual item table for tags, selected in the columns. If tags in the columns have different timestamps, they will be all put together and make one common value array, and if another column doesn't have a value at that time, it will display N/A (according to "No value" definition") (exactly as it works in the item table). If step table has, for example, 3 columns with Min, Max and Avg of the tag "Batch_Data:Motor 1", then all 3 columns will just list all values of the same tag.

If the **Step number is based on item value change** option is selected, the Step table will read all values of a specified tag, and each time a tag value was changed (with or without a tolerance, as specified) a new step will be created in the resulting table. The tolerance can be set as in absolute units, or a percentage change. Additionally, an SQC (SQL Query Condition) can be applied to the "step tag" to filter the data based on an SQL condition. Start and End time for each such a step will be the start and end times of each distinct value (e.g. batch ID, phase change, etc.)



Step Correction option provides possibility to make steps starts and ends adjustments:

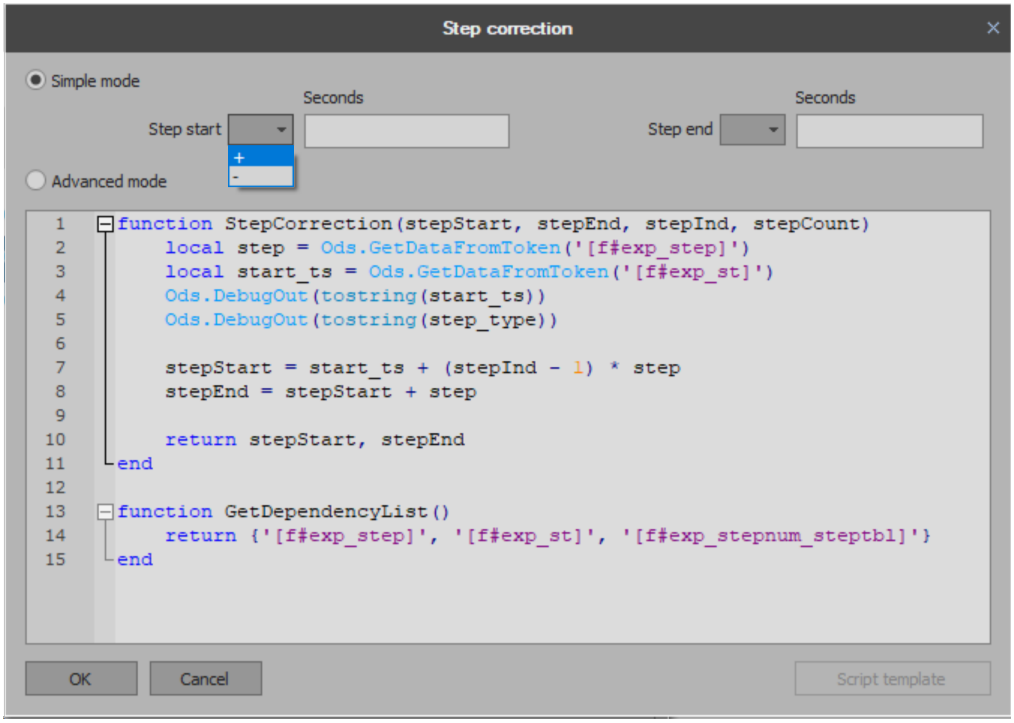
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User can select easier simple step correction with adding or deducting value from the original calculated time of the step or advanced step correction where LUA script can be used to make smart and conditional step correction for every single step. Also two possible ways in advance mode for step correction calculations are possible:

- For every step based on its index using *StepCorrection(stepStart, stepEnd, stepInd, stepCount)* function:

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- By Step List using the *TransformStepList(stepList)* function.

Example: LUA code below returns a Step Table odd rows only:

```
function TransformStepList(stepList)
	local stepCnt = #stepList
	Ods.DebugOut('Step count: '..stepCnt)

	local resStepList = {}

	for i = 1, stepCnt do
		local step = stepList[i]
		local str = step[1]..','..step[2]
		--Ods.DebugOut(str)

		if i%2 == 0 then
			Ods.DebugOut(i)
			resStepList[#resStepList + 1] = {step[1], step[2]}
		end
	end

	return resStepList
end

function GetDependencyList()
	return {}
end
```

Step Table Appearance

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The **Appearance** section contains the definition of the table columns as well as the formatting options (font properties, colours, background etc.).

The **Table Name** field will contain a name, which will be displayed.

The **Display Table Name** check box will enable or disable table title display.

The **Display Columns** list defines which columns will be displayed as well as their order, size, width and caption.

The check box in the **Field** column enables and disables the appropriate column display in the table.

The **Caption** column defines the caption of each column of the table. If you wish to change the caption of any column, double-click on the appropriate caption inside the column and it will be available for editing.

The set of check boxes - **Sort By** - will define by which column the data will be sorted. Only one column can be selected.

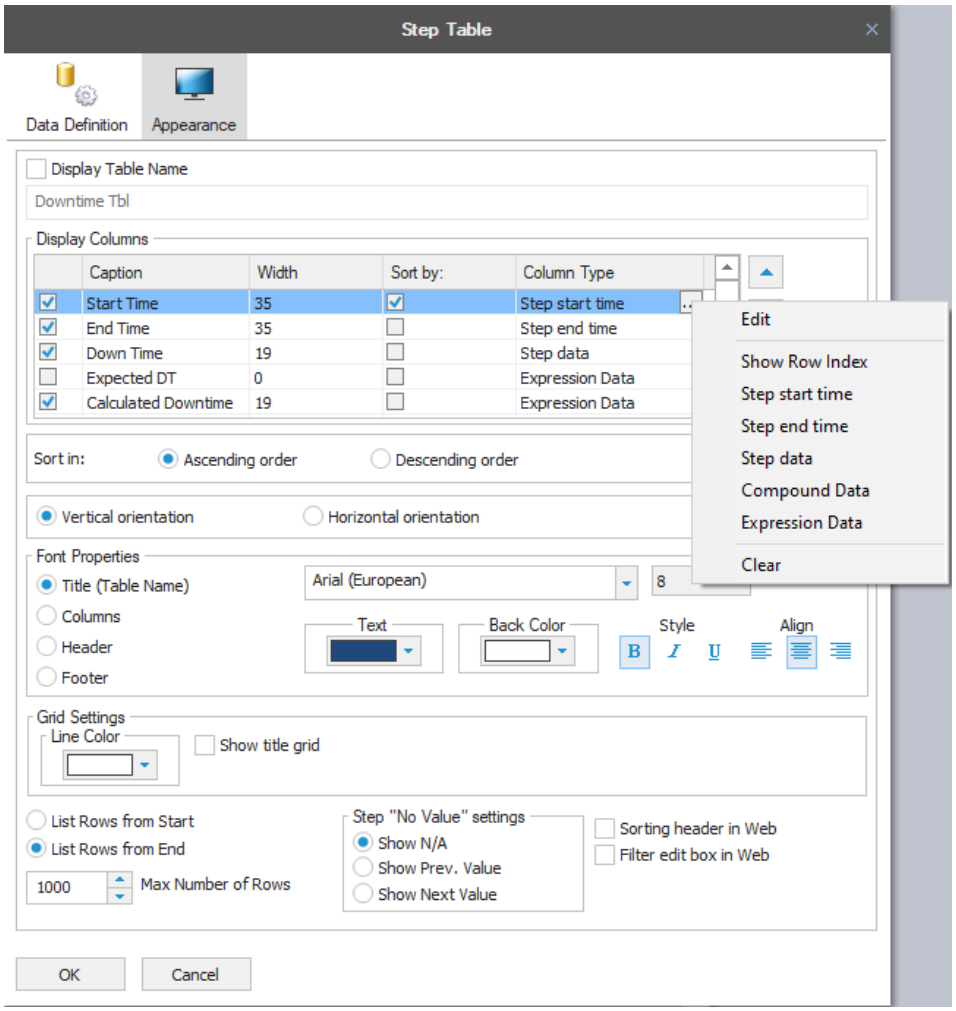
Radio buttons below (**Sort In**) will define the sorting direction, ***ascending*** or ***descending***.

Radio buttons **Vertical orientation** and **Horizontal orientation** below the **Sort In** section will define the graphical layout of the table columns.

Column Type Settings

Use the **Column Type** settings to define the statistical data for each column. If you will click in the list in that column, you will see a small "**...**" button. Click on that button and you will see a pop-up menu:

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Show Row Index

Select this menu to display a row incrementing number (from 1, 2 …) in the column.

Step start time

Select this menu to insert the start time of each step period for each row of the table.
Example: if you define a table from 12:00 until 15:00 with 1 hour for each step (row), then ***Step start time*** will display **12:00, 13:00, 14:00** for 3 rows of the output table.

Step end time

Select this menu insert the start time of each step period for each row of the table.
Example: if you define a table from 12:00 until 15:00 with 1 hour for each step (row) then ***Step end time*** will display **13:00, 14:00, 15:00** for 3 rows of the output table.

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Step data
Select this menu to define the statistical calculation for the selected column. When you select this menu, the Data Definition dialog window will be opened. It is totally identical to the **Single Data Object Definition** window and is described in details in the Single Data Object section.
The only difference between the Single Data Object Definition and the Step Table Data Definition window is that in the Step Table Data Definition there is no time period to be configured. The selected statistical function will be calculated for the selected data item separately for each row of the table.
Example: if you define a table from 12:00 until 15:00 with 1 hour for each step (row), then your defined statistical object will be calculated 3 times for time periods: **12:00-13:00, 13:00-14:00, and 14:00-15:00** for 3 rows of the output table.

Also, in the **Appearance** section of the Step Table such options, for the data definition, as **"Visible"** and **"Write back"** are not available, because they cannot be applied to a step table.

NOTE: When using the following **Pulse Analysis** statistical functions: **Peak Minimum Value** or **Peak Maximum Value**, it's important to note that column value (e.g. column ID) will be available as dynamic token parameter for the statistical function input parameter "**Pulse ID**" in the format [**c#<column name>**].

- **Compound Data**
  Select this menu to define the statistical calculation for the selected column. When you select this menu, the Data Definition dialog window will be opened.
  It is totally identical to the **Compound Data Object Definition** window, and is described in details in the **Compound Data Object** section.

In the **Appearance** section of the step table such options, for the data definition, as **"Visible"** and **"Write back"** are not available, because they cannot be applied to a step table.

- **Expression Data**
  Select this menu to define calculations for the selected column. When you select this menu, the Data Definition dialog window will be opened. It is totally identical to the **Expression Data Object Definition** window, and is described in details in the **Expression Data Object** section.

In the **Appearance** section of the step table such options, for the data definition, as **"Visible"** and **"Write back"** are not available, because they cannot be applied to a step table.

- **Clear** will erase data definition of the column.
- **Edit** will edit the statistical data that has already been entered in that column type.

Step Table enables you to add a **Footer**. This footer can have multiple lines, which can include static text, table start time, table end time, Expression or Compound data objects. Click on the "**Footer**" button to open the Footer configuration window. Refer to the **Footer** section of this document for detailed configuration details.

NOTE: The data from the footer can be used in Expression Object calculations. If Step Table has the footer defined, this footer will be added to the list of dynamic objects of the report in the Expression Object (**Add dynamic object from report** section) in the format of **[f#<Step Table Object Description>]** and its data will be available for calculations.

The footer will be added to the list of dynamic objects in the report only if the Step Table has object description defined.

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For details on Expression Object calculations, please go to the **Expression Object** section of this manual.

The **Font Properties** controls enable you to set different font properties for the table title, table header and the displayed data (in columns).

The **Max Number of Rows** edit box allows you to specify the maximum number of rows to display in the table. This enables a user to protect the report from an overflow. When defining the maximum number of rows, you can set which "cut" of all data set you would like to display: the first or the last block of data. This can be defined by selecting an appropriate radio button: **List rows from Start** or **List rows from End.**

Enabling the checkbox **Sorting header in Web** allows users to sort data in Web Portal. By clicking on the caption of the table, a user defines the sort direction, ascending or descending.

By enabling the checkbox **Filter edit box in Web** a user will be able to set a filter in the Web Portal and only the data corresponding to this filter will be displayed.

Enhanced Display Options

If any specific step cell in the step table has no value, the desired behavior of a step table in this case can be configured by using the "**Step "No value" settings**" option. It has 3 radio-buttons: **Show N/A, Show Previous value** and **Show Next Value.**

Show N/A option is selected by default. In this case, if any specific cell in the step table has no value, the step table will display N/A value. Please see an example below:

Day	Min	Max	Avg
Monday	1	2	1.5
Tuesday	2	3	2.5
Wednesday	NA	NA	NA
Thursday	NA	NA	NA
Friday	NA	NA	NA
Saturday	3	4	3.5
Sunday	4	5	4.5
TOTAL:	1	5	3

If **Show Previous value** option is selected, then the last valid step value will be displayed instead of N/A value. In this sample step table the N/A value is replaced by “2” – the last available value before N/A. Please see an example below:

Day	Min	Max	Avg
Monday	1	2	1.5
Tuesday	2	3	2.5
Wednesday	2	3	2.5
Thursday	2	3	2.5
Friday	2	3	2.5
Saturday	3	4	3.5
Sunday	4	5	4.5
TOTAL:	1	5	2.785714

NOTE: The last valid step value, which will be displayed instead of N/A value, must be available in the range of the
existing values of this Step table, i.e. it should be present among the values existing inside the table. Otherwise it will

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display N/A.
If **Show Next Value** option is selected, then the next valid step value will be displayed instead of N/A value. Please see an example below:

Day	Min	Max	Avg
Monday	1	2	1.5
Tuesday	2	3	2.5
Wednesday	3	4	3.5
Thursday	3	4	3.5
Friday	3	4	3.5
Saturday	3	4	3.5
Sunday	4	5	4.5
TOTAL:	1	5	3.214286

In this sample step table the N/A value is replaced by “3” – the next available value after N/A.

Special mark. If the step value is not real (original), but is last or next available, then, such a cell will have a small red mark in the cell corner, like on the picture below:

Day	Min	Max	Avg
Monday	1	2	1.5
Tuesday	2	3	2.5
Wednesday	3	4	3.5
Thursday	3	4	3.5
Friday	3	4	3.5
Saturday	3	4	3.5
Sunday	4	5	4.5
TOTAL:	1	5	3.214286

NOTE: For footer and inter-column calculation, if cells have values, which are not real values (but last or next available), all the calculation is done using those values, regardless to their nature and origin.

Example of a step table

Step Table Settings	
Time Period:	Last Week
Spilted:	By day

Option

Step Table enables to add "Footer".

This footer can have multiple lines to insert, Text , Expression or Compound data.

Weekly Oil Production			
Day	Oil Well 1	Oil Well 2	Oil Well 3
25/06/2007	1290.0 Brls	902.5 Brls	868.8 Brls
26/06/2007	892.5 Brls	483.8 Brls	826.3 Brls
27/06/2007	1172.5 Brls	650.0 Brls	506.3 Brls
28/06/2007	1290.0 Brls	750.0 Brls	562.5 Brls
29/06/2007	1143.8 Brls	802.5 Brls	1031.3 Brls
30/06/2007	1087.5 Brls	606.3 Brls	593.8 Brls
01/07/2007	1367.5 Brls	937.5 Brls	617.5 Brls
Weekly Production	8244 Barrels	5133 Barrels	5006 Barrels
	44.85 %	27.92 %	27.23 %
Total Production	18382.5 Barrels		

Batch Production				
Batch ID	Start	End	Run Time (hh:mm:ss)	Production
Batch_51	08/04/2007 13:00:13	13/04/2007 16:08:00	121:59:47	1350.00
Batch_52	13/04/2007 17:11:03	29/04/2007 07:09:09	360:48:57	225.00
Batch_53	29/04/2007 08:00:12	15/05/2007 13:09:59	387:59:48	150.00
Batch_54	15/05/2007 14:00:11	23/05/2007 10:10:59	186:59:49	450.00
Batch_55	23/05/2007 11:00:12	31/05/2007 07:11:59	174:59:48	375.00
Batch_56	31/05/2007 08:00:13	04/06/2007 15:12:59	101:59:47	1395.00
Batch_57	04/06/2007 16:00:14	30/06/2007 23:59:59	625:59:46	75.00
			Total	4020

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LUA Script support added in the expression defined as part of the footer in the Step Table object, where user can create a script that will get an access to the value of cell from the Step table.

`OdsGetCellValue(a,b)`, where **a** is column id in the table, **b** is row id. Id starts from 1.
`OdsGetColumnCount()` – returns value of the total number of columns in the table
`OdsGetRowCount()`– returns value of the total number of rows in the table

Example: Script example below is counting cells with specific value

```
(
function()
	local colCnt = OdsGetColumnCount()
	local rowCnt = OdsGetRowCount()
	local matchCnt = 0

	for i = 1, rowCnt do
		local name = OdsGetCellValue(colCnt, i)

		if name ~= nil and name == 'Fred' then matchCnt = matchCnt + 1
		end
	end
return '"Fred" count: '.. matchCnt
end
)()
```

It is also possible to access values of already calculated cells and calculate required results based on cell values.

Example: Script example below provides the running total calculation

```
(
function()
	local curRow = [f#$RowInd$] -- get current Row ID
	local cellVal = OdsGetCellValue(3, curRow)

	if cellVal == nil then cellVal = 0
	end

	if curRow == 1 then return cellVal
	end

	local prevVal = OdsGetCellValue(5, curRow - 1)

	if prevVal ~= nil then return cellVal + prevVal
	end
```


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```
        return cellVal
end
)()
```

StepStart	StepEnd	Data	Row Index	RunningTotal
14/05/2022 00:00:00	14/05/2022 04:00:00	N/A	1	0.00
14/05/2022 04:00:00	14/05/2022 08:00:00	797.00	2	797.00
14/05/2022 08:00:00	14/05/2022 12:00:00	801.00	3	1598.00
14/05/2022 12:00:00	14/05/2022 16:00:00	805.00	4	2403.00
14/05/2022 16:00:00	14/05/2022 20:00:00	808.00	5	3211.00
14/05/2022 20:00:00	15/05/2022 00:00:00	N/A	6	3211.00

Example: Script example below provides the running average

```
(
function()
        local fTotal = function(col, rowCount)
        local sum = 0

        for index = 1, rowCount do
                local cellVal = OdsGetCellValue(col, index)

                if cellVal ~= nil then sum = sum + cellVal
                end
        end
        return sum
end

        local curRow = [f#$RowInd$]
        local cellVal = OdsGetCellValue(3, curRow)

        if cellVal == nil then cellVal = 0
        end

        if curRow == 1 then return cellVal
        end

        return (fTotal(3, curRow - 1) + cellVal) / curRow
end
)()
```

StepStart	StepEnd	Data	Row Index	RunningAverage
14/05/2022 00:00:00	14/05/2022 04:00:00	N/A	1	0.00
14/05/2022 04:00:00	14/05/2022 08:00:00	797.00	2	398.50
14/05/2022 08:00:00	14/05/2022 12:00:00	801.00	3	532.67
14/05/2022 12:00:00	14/05/2022 16:00:00	805.00	4	600.75
14/05/2022 16:00:00	14/05/2022 20:00:00	808.00	5	642.20
14/05/2022 20:00:00	15/05/2022 00:00:00	N/A	6	535.17

NOTE: To make scripts run properly, please ensure to define "Row Index" column in the Step Table.

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15.5 SQL Query Table

SQL Query Table is an object that allows you to connect to any ODBC compatible database and display data from it in a report.

To add this object, click on the *SQL Query Table* button on the Report Designer Studio **Elements** toolbar:



Using the Free SQL Table, you can specify any query and visualize the result as a table with predefined parameters.

To define a Free SQL Table, select the DSN for the database and write an SQL query.

The SQL Table also supports the command "**SELECT * ...**". In this case, draw a table in the Designer Studio as one single column and then, during report generation, it will automatically expand to the right, where the number of columns will correspond to the number of the columns in the database table. The width of each column will be equal to the width of the table you have drawn in the Designer Studio. If the width of the SQL Table at report generation time is too wide, it will be truncated.

Any valid SQL commands can be specified in the **SQL Query** edit box. If you need to use dynamic values in your SQL condition, based on your statistical calculations, you can add any valid object name in the format **[f#<field name>]**, which can be either a Single data object, a Compound object or an Expression object. In this case, during report generation, the value of the specified object will be calculated and the result will replace the **[f#<field name>]** in the query.

For details, please see **List of Dynamic Tokens** section.

Such dynamic objects can be selected from the list and will be automatically added to the SQL query in required format. If user will click on ***Select Dynamic Token*** button, then window with the list of available dynamic objects will be opened and user can select required object and add it to the query as dynamic token. Detailed information on dynamic objects selection can be found in the dedicated section Dynamic objects selection.

Visual Query Builder

Now, if a user doesn't have deep knowledge of SQL language or would like to use visual tool to design SQL query, a user can click on *Visual Query Builder* button and then visual SQL query builder window will be opened, where a user can create and edit his SQL query in a user-friendly manner. More in details Visual query builder is described in its section **Visual Query Builder**

Using pre-defined SQL queries

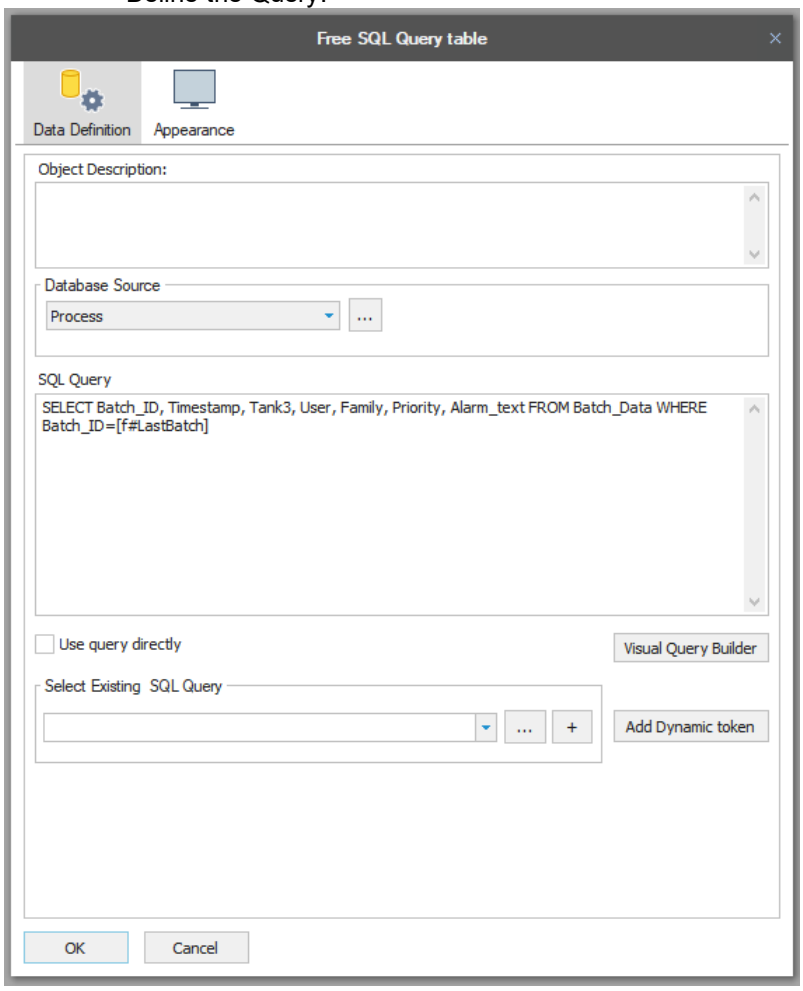
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User has also the ability to use predefined complete SQL queries or used pre-defined queries as any integral part of the entire query. The SQL Query manager module allows users to The *Select existing SQL query* drop down list contains the list of all already defined SQL queries. Detailed description of SQL Query Manager can be found in its dedicated section

SQL Table Data Definition

The **SQL Query Table** must configure the SQL table settings as follows:

- Select the DSN (for details please see the **DSN Manager** section of this manual)
- Define the Query:



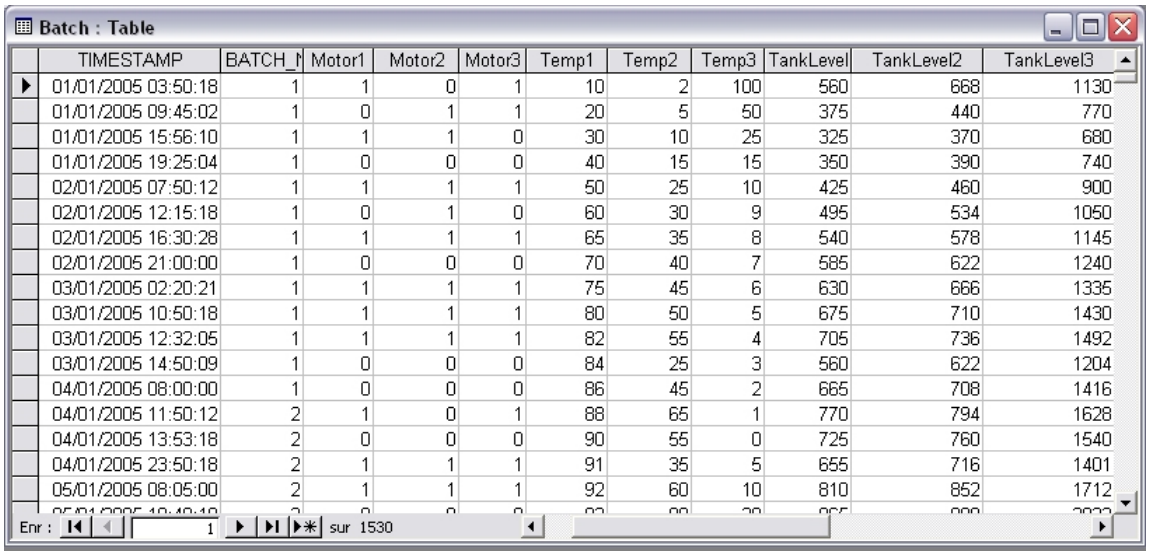
SQL Query table can automatically recognize the list of SQL columns, which will be retrieved from the database and the internal SQL query parser has certain limitations, described below. If you mark the check box **Use query directly** (below the SQL query edit box), then the SQL query will be executed exactly as it is, without trying to parse it.

Case Example:

You need to extract from the Batch Database Tank Level values for the batch number 4 under condition, when Motor 1 is On (1)

You must define the DSN for the database and select it in the **ODBC Database Source** combo box (see **DSN Manager**).

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TIMESTAMP	BATCH_N	Motor1	Motor2	Motor3	Temp1	Temp2	Temp3	TankLevel	TankLevel2	TankLevel3
01/01/2005 03:50:18	1	1	0	1	10	2	100	560	668	1130
01/01/2005 09:45:02	1	0	1	1	20	5	50	375	440	770
01/01/2005 15:56:10	1	1	1	0	30	10	25	325	370	680
01/01/2005 19:25:04	1	0	0	0	40	15	15	350	390	740
02/01/2005 07:50:12	1	1	1	1	50	25	10	425	460	900
02/01/2005 12:15:18	1	0	1	0	60	30	9	495	534	1050
02/01/2005 16:30:28	1	1	1	1	65	35	8	540	578	1145
02/01/2005 21:00:00	1	0	0	0	70	40	7	585	622	1240
03/01/2005 02:20:21	1	1	1	1	75	45	6	630	666	1335
03/01/2005 10:50:18	1	1	1	1	80	50	5	675	710	1430
03/01/2005 12:32:05	1	1	1	1	82	55	4	705	736	1492
03/01/2005 14:50:09	1	0	0	0	84	25	3	560	622	1204
04/01/2005 08:00:00	1	0	0	0	86	45	2	665	708	1416
04/01/2005 11:50:12	2	1	0	1	88	65	1	770	794	1628
04/01/2005 13:53:18	2	0	0	0	90	55	0	725	760	1540
04/01/2005 23:50:18	2	1	1	1	91	35	5	655	716	1401
05/01/2005 08:05:00	2	1	1	1	92	60	10	810	852	1712

Enter the right SQL query: **SELECT TIMESTAMP, BATCH_NUM, Motor1, TankLevel1 FROM Batch WHERE BATCH_NUM=4 AND Motor1=1**

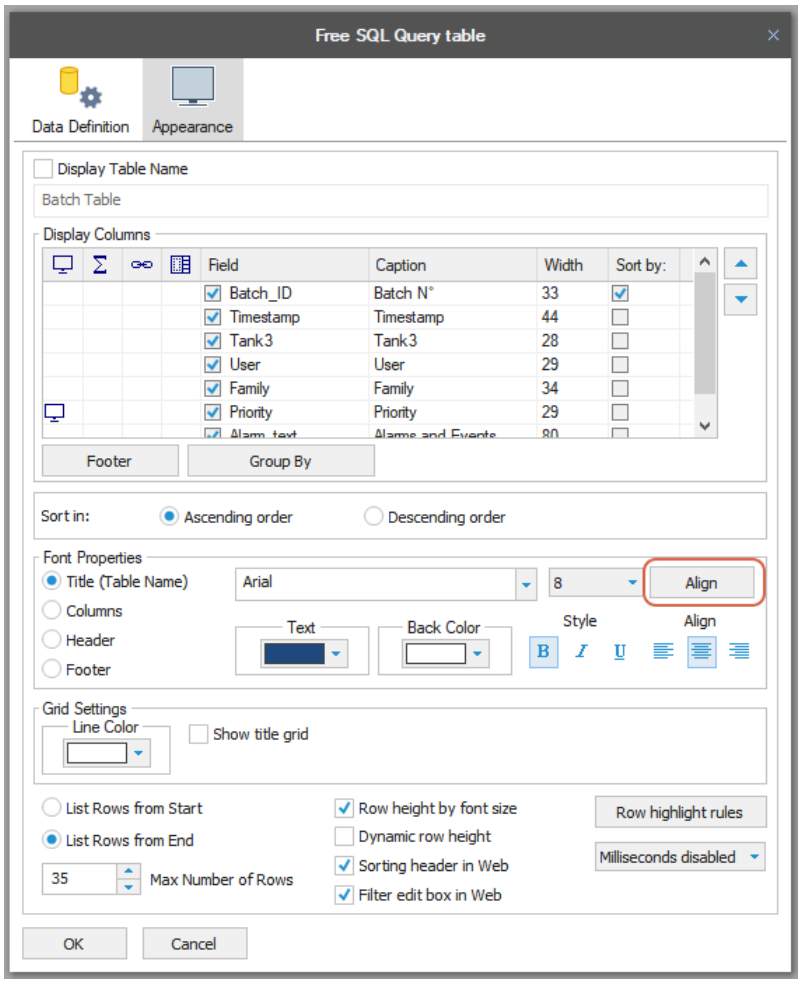
Then you will get the following result in your report:

TIMESTAMP	BATCH_NUM	MOTOR1	TANKLEVEL1
2005-01-18 08:00:00	4.00	1.00	1201.04
2005-01-17 15:50:18	4.00	1.00	1134.32
2005-01-17 09:50:18	4.00	1.00	916.84
2005-01-16 16:50:18	4.00	1.00	628.39
2005-01-16 12:50:18	4.00	1.00	535.32
2005-01-15 15:39:18	4.00	1.00	626.28
2005-01-15 09:21:18	4.00	1.00	678.21
2005-01-14 18:50:18	4.00	1.00	394.62
2005-01-14 16:23:33	4.00	1.00	688.57

SQL Table Appearance

SQL Automatic Column Recognition

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When you enter the SQL query, by default the columns will be automatically recognized. When you open the **Appearance** section, you will see the list of columns to be selected, where you can edit column captions in an easy way, as displayed on the picture below:

However, SQL automatic column recognition has some limitations. If the columns are not recognized automatically, please refer to the following section below:

Disabling Automatic Column Recognition

If you want to enter the SQL query, which contains functions, unsupported by the automatic column recognition, please, check the check box **Use query directly**, and the automatic column recognition will be disabled and the query will be launched as it is. In this case, columns can be added and named manually in the “appearance” tab.

Calling a stored procedure from Free SQL Query Table

It's possible to call a stored procedure using Free SQL Query table. To do that:

- Create SQL Table, select required DSN and specify user name and password for that DSN (if required).
- Inside the SQL query edit box write the following command:

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{CALL ProcedureName (Parameter)}

Example:

{CALL sp_GetNameById (1)}

Where:

sp_GetNameById - name of the stored procedure

1 - the parameter for the stored procedure

It's very important not to put space between the first curly brace and the CALL keyword.

It's not that important for the last curly brace.

The result of the stored procedure will be displayed in that SQL table.

IMPORTANT NOTES:

- When using an MS Access database and column names or table names starting with "_" or other non-alphanumeric symbols, enclose the column or table names in square brackets (e.g. [_MyTable] or [_MyColumn]). This is not required for SQL Server or other database types.
- Statement SELECT * can be used also. Then in the Designer Studio, you will see the table with a single column and, when generating the report, the table will be created according to the number of the retrieved columns.
- Statement AS is not supported by the query parser, so SQL queries such as: SELECT abs **AS** 'Param1' ... shouldn't be used.

The **Display Columns** list defines which columns will be displayed as well as their order, width and caption.

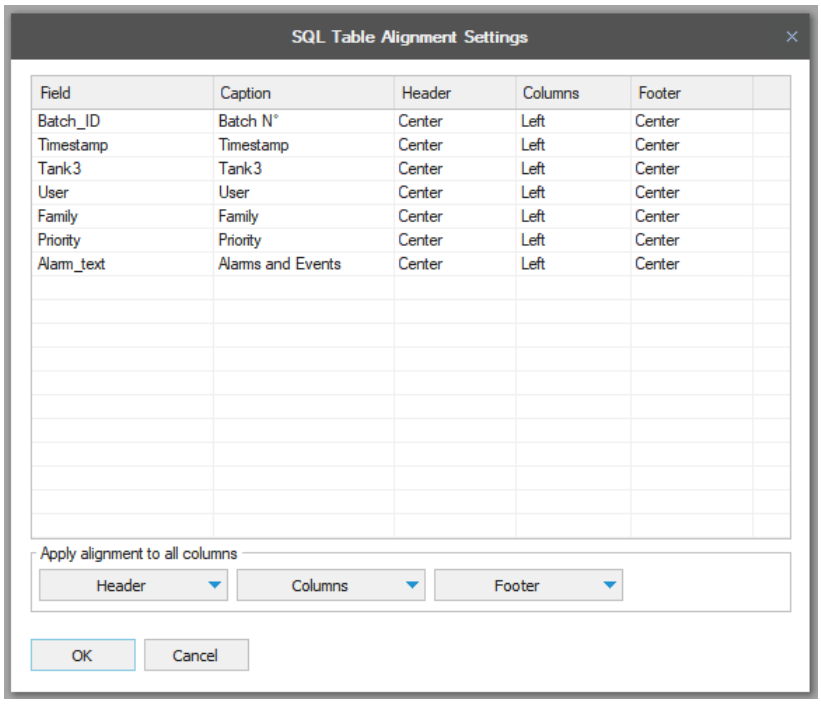
The left row of check boxes enables and disables the appropriate column display in the table.

The **Caption** column defines the caption of each column of the table. If you wish to change the caption of any column, double-click on the appropriate caption inside the column and it will be available for editing.

The right set of check boxes - **Sort By** - will define by which column the data will be sorted. Only one column can be selected. Radio buttons below (**Sort In**) will define the sort direction, ***ascending*** or ***descending***.

Align - Click on the "*Align*" button to open the "*SQL Table Alignment Settings*" window:

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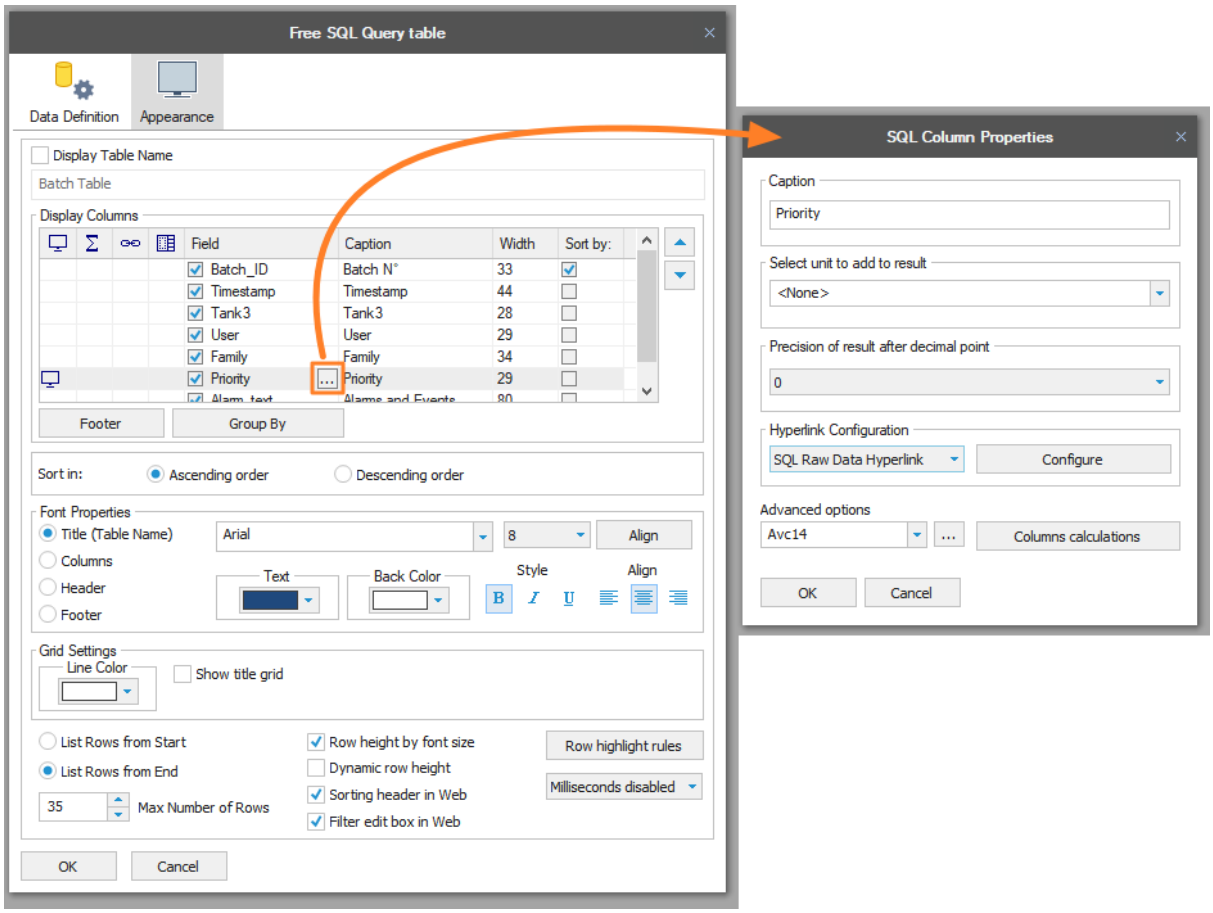


Choose an alignment (left, center, right) for each field separately by clicking on the box under the specific section (*Header*, *Columns*, *Footer*) and selecting the alignment (*To Left*, *Center* or *Right*). Or, in the "*Apply to all*" section, select the alignment for a section that will be applied to all fields.

SQL Column Properties Dialog

By clicking on one of the rows in **Display Columns** list, a user will see the configuration button. This button will open the **SQL Column Properties** dialog (see the pic. below):

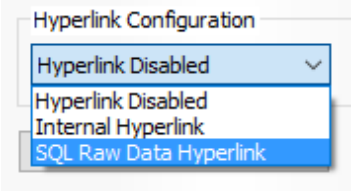
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Here a user can set the Caption text, select the unit that will be added to the result (e.g., °C). A user can also set decimal point precision to the result.

Hyperlink

A user can set and configure cells of the table as an Internal **Hyperlink** or as a **SQL Raw Data Hyperlink**



In the **SQL Data hyperlink** configuration dialog, a SQL query can be defined, the results of which will be displayed in Raw Data window in the Web Portal.

NOTE: A user can also open the Hyperlink configuration dialog by double-clicking on the cell under the icon " " in one of the rows in Display Columns list.

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In **SQL Column Properties** a user can also set the Advanced visualization settings by clicking on the button **Advanced options**. For the detailed information about Advanced visualization settings, please, refer to the section **Advanced visualization** of this manual.
A user can also open Advanced visualization settings dialog, by double-clicking on the cell under the icon " " in one of the rows in Display Columns list.

Columns Calculations Settings

If a user wants to perform calculations between column values, first, enable the checkbox "Use Query Directly" in the Data Definition tab.

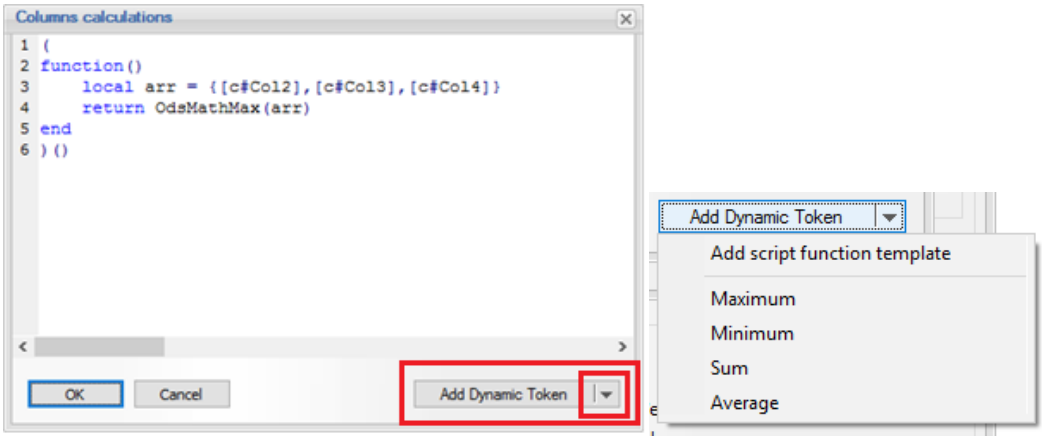
After that, a user will be able to set calculation configurations manually in SQL Column Properties.

By clicking on Columns Calculations button, the configuration dialog window will be opened.

Once this dialog opened a user will have three options:

1. Create a "free-form" script function, with using any predefined functions

2. Use one of the predefined functions (Maximum, Minimum, Average or Sum)



3 Or, add columns of the table through the Dynamic Token dialog window and perform calculations between the columns.
For more information about Dynamic Token, please, refer to the **Dynamic Objects Selection** of this manual.

NOTE: A user can also open the Columns calculations configuration dialog by double-clicking on the cell under the icon " Σ " in one of the rows in Display Columns section.

The **Font Properties** controls enable you to set different font properties for the table title, table header and the displayed data (in columns).

The **Max Number of Rows** edit box allows you to specify the maximum number of rows to display in the table. This enables a user to protect the report from an overflow.

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When defining the maximum number of rows, you can set, which "cut" of all data set you would like to display: the first or the last block of data. This can be defined by selecting an appropriate radio button: **List rows from Start** or **List rows from End**.

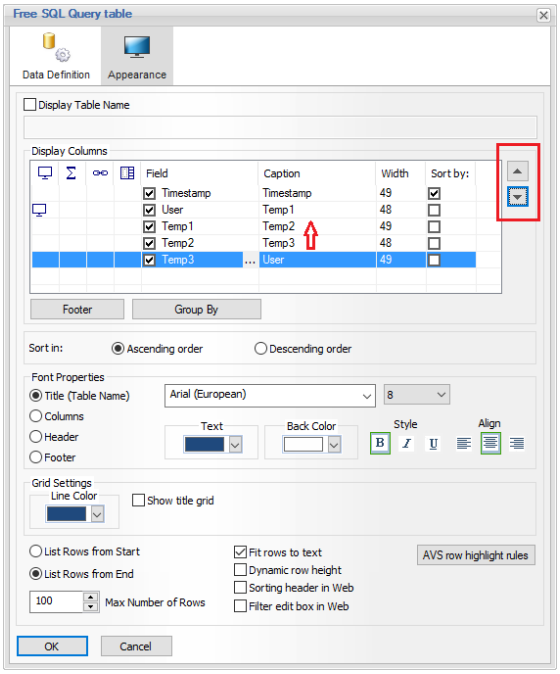
The checkbox **Fit rows to text** is an option which will automatically choose the size of the row according to its text font type and size. If this option is disabled a user can set the row height manually directly in the table, by using a pointer and dragging the row grid.

The checkbox **Dynamic row height** automatically sets the height of the row according to the number of characters in the row.

By enabling the checkbox **Sorting header in Web** allows users to sort data in Web Portal. By clicking on the caption of the table, a user defines the sort direction, ascending or descending.

By enabling the checkbox **Filter edit box in Web** a user will be able to set a filter in the Web Portal and only the data corresponding to this filter will be displayed.

By clicking on **AVS row highlight rules** button (Advanced Visualization Settings), the configuration window will be opened. Here, a user can set the visualization rules, which will be applied to the entire row of the table. Please note that you should set the visualization settings for specific table columns first.



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By clicking on the combo box **Milliseconds**, a user can choose whether to display milliseconds for the timestamp field. The following options are available:

- Milliseconds disabled: milliseconds will not be displayed.

- Milliseconds enabled: milliseconds will be displayed for every timestamp.

- Milliseconds auto: milliseconds will be displayed only in the timestamps with milliseconds resolution.

- Milliseconds from the Project localization: the object will use the configuration set in the Project Localization dialog window.

NOTE: If one or more columns are to the original SQL query/table, then use the Up/Down arrows in Display Columns section (see the pic. below) in order specify the column order in the displayed table. For example, select and move the last added column to the corresponding position.

LUA Script support added in the expression defined as part of the footer in the Step Table object, where user can create a script that will get an access to the value of cell from the Step table.

`OdsGetCellValue(a,b), where a is column id in the table, b is row id. Id starts from 1.`
`OdsGetColumnCount() - returns value of the total number of columns in the table`
`OdsGetRowCount()- returns value of the total number of rows in the table`

Example: Script example below is counting cells with specific value

```
(
function()
	local colCnt = OdsGetColumnCount()
	local rowCnt = OdsGetRowCount()
	local matchCnt = 0

	for i = 1, rowCnt do
		local name = OdsGetCellValue(colCnt, i)

		if name ~= nil and name == 'Fred' then matchCnt = matchCnt + 1
		end
	end
return '"Fred" count: '.. matchCnt
end
)()
```


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Tank1	Tank2	User
993.00	686.00	Jim
993.00	942.00	Paul
1020.00	832.00	Paul
1020.00	971.00	Jim
1032.00	995.00	Fred
1043.00	942.00	Jim
1043.00	1017.00	Fred
1053.00	1035.00	Jim
1063.00	1006.00	Paul
1063.00	1052.00	Jim
Total Columns	ColCnt: 3	Last: Jim
Total Row s	Row Cnt: 10	Cell(col:2, row :1): 686
	Cond. Cell Count	"Fred" count: 2

15.6 Alarm Table

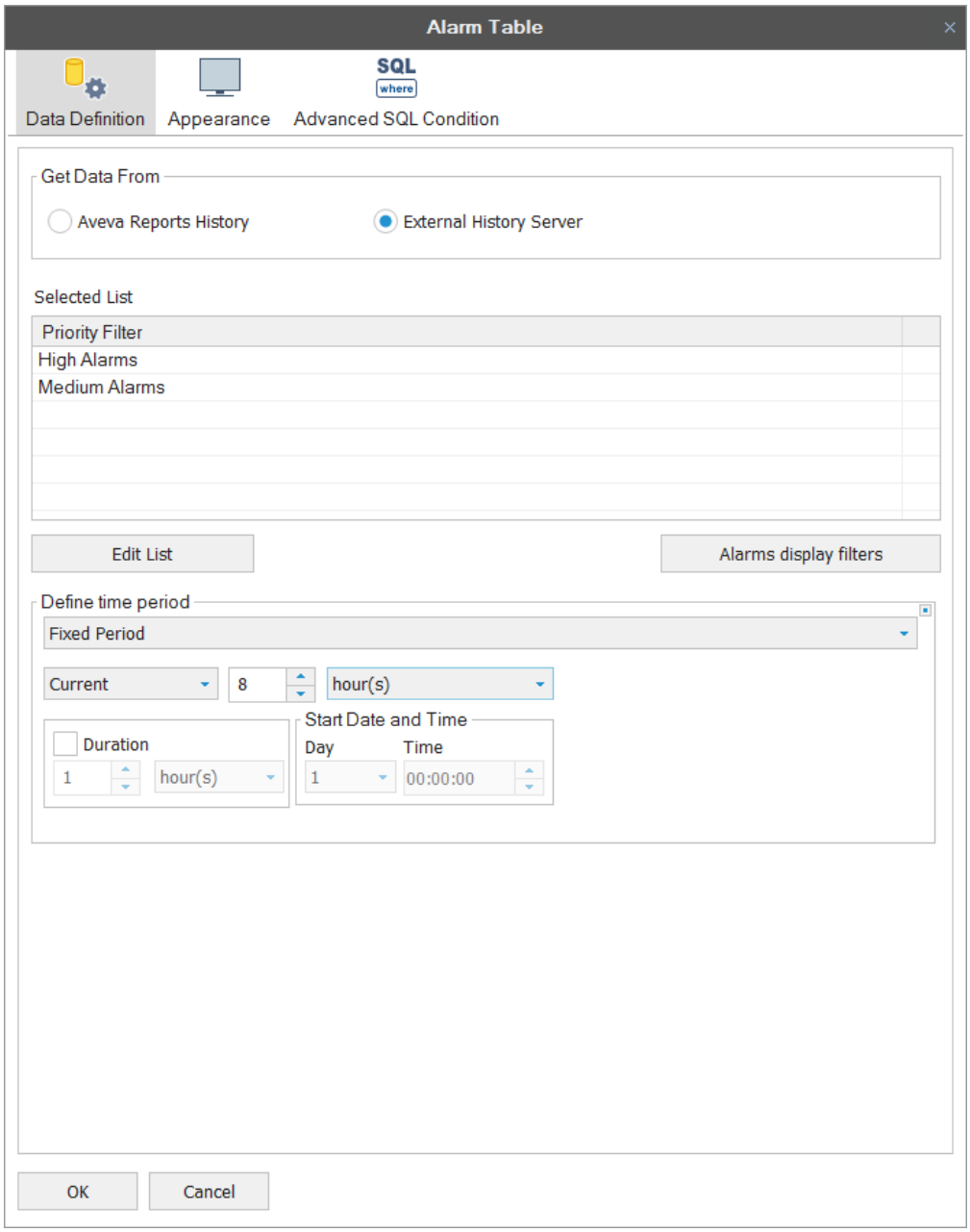
Alarm Table is a dynamic object, which displays, in a selected format, a list of alarms according to the specified time period and the selected alarm filters.

Click on the *"Alarm Table"* button on the Report Designer Studio **Elements** toolbar:



Then draw a rectangle where you want to place the table in the report workspace. The Alarm Table **Data Definition** dialog window will be opened:

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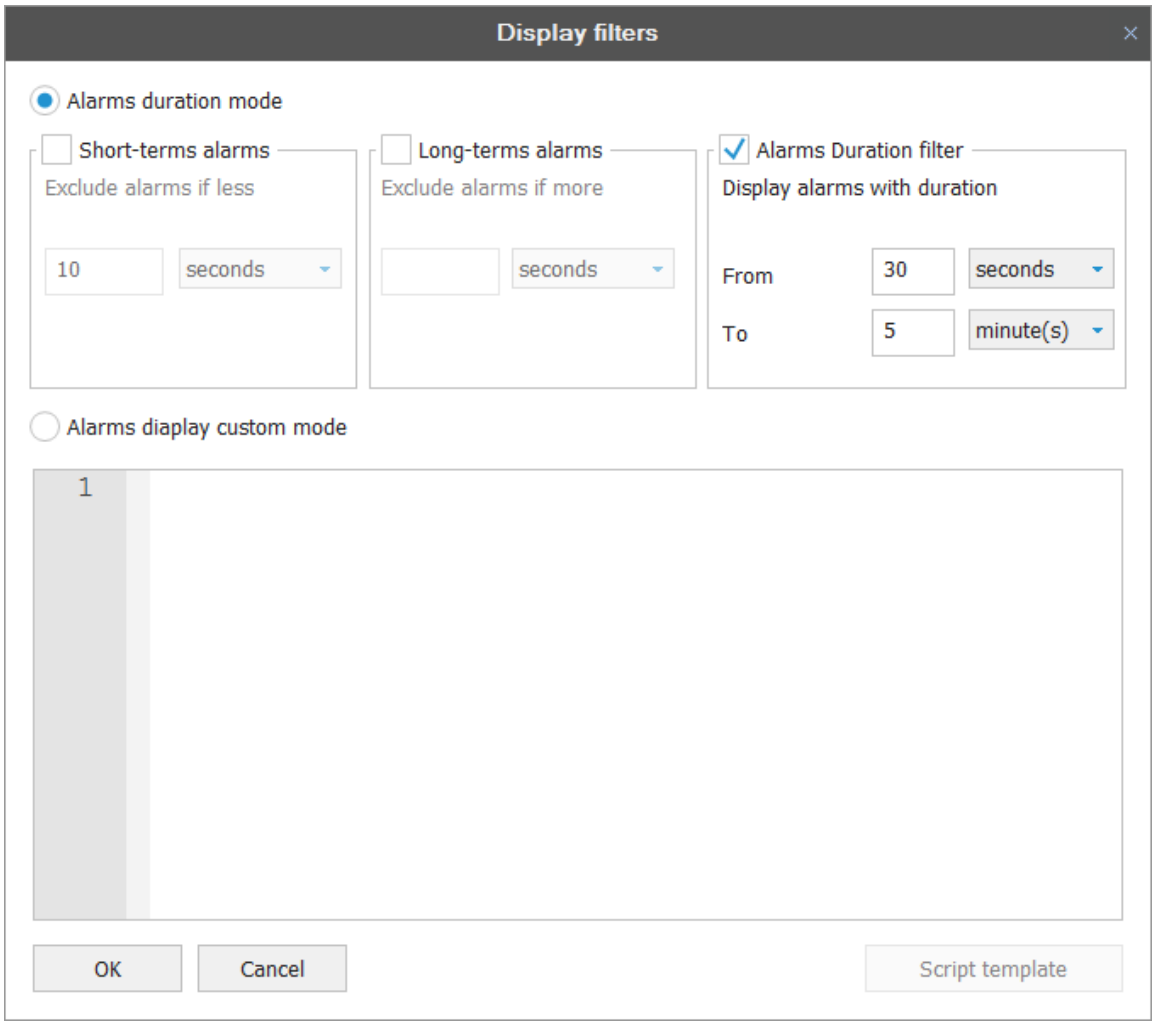
Alarm Table Data Definition

In the **Get Data From** section you can select which history type you will use to extract alarms from: ***Dream Report History*** or ***External History Server***. "***Dream Report History"*** are alarms stored directly by the built-in logger - for legacy applications only.

Click the ***Edit List*** button to select one or more predefined alarm filters from the **Alarm Filter Manager** window. For details on how to configure alarm filters, please, see the Alarm Filter Manager 242 section.

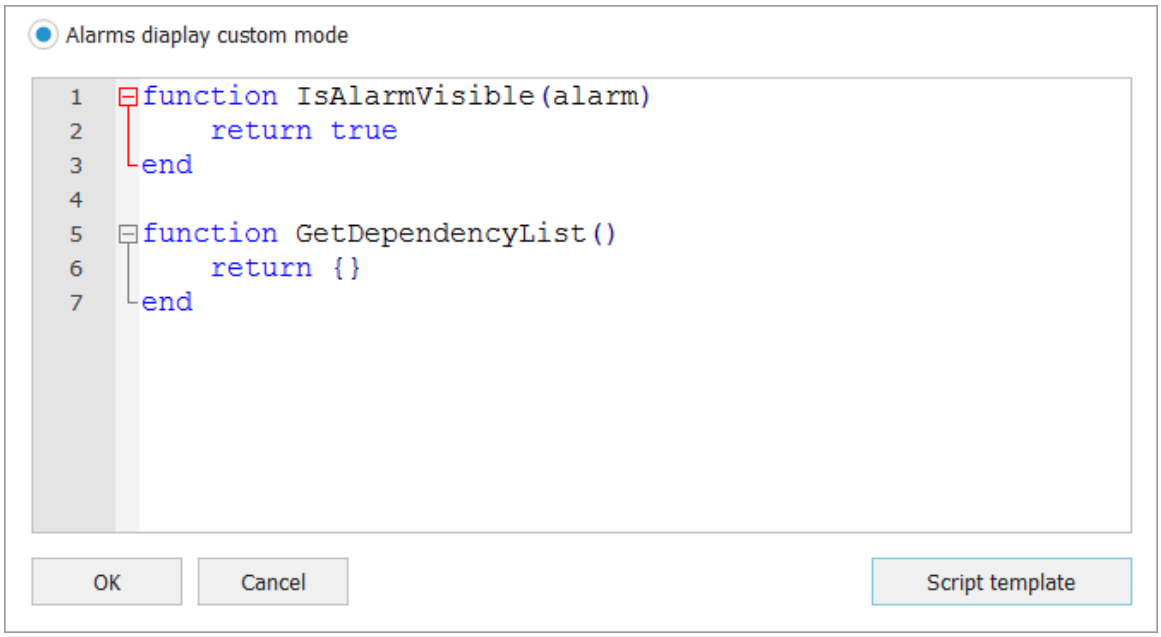
To apply additional filtering based on alarm durations - e.g., to filter out short-duration or "chattering" alarms - click the "**Alarms display filters**" button. The following "Display Filters" window will open:

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- ***Alarms duration mode*** - for alarms that have started within the Alarm Table's *Time Period*, this option allows additional filtering based on the following conditions (multiple options allowed):
  - **Short-term alarms** - any alarms whose duration is less than the specified duration will be excluded from the result
  - **Long-term alarms** - any alarms whose duration is greater than the specified duration will be excluded from the result
  - **Alarms Duration filter** - any alarms whose duration falls within the specified duration will be included in the result
- ***Alarms display custom mode*** - this custom filter mode is defined by using a Lua script that can be created in the script editor window:

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The concept of the Custom Filter is as follows: a function with name *IsAlarmVisible()* will be called for each alarm record received from driver. If the function returns "true" the record will be displayed in the table. This function receives the alarm object name as its input parameter. The function can check alarm properties, and determines if the alarm should be displayed in the table. Alarm object will contain 5 "standard" (always presented) properties: "Text", "StartTime", "AckTime", "EndTime", and "Priority". Additionally, if a driver returns other properties for alarm record they will be contained in the "CustomPropList" member. The script can also use dynamic tokens for its logic.

Example 1: Example of script that can be used to output all alarm properties into debug viewer.

```
function IsAlarmVisible(alarm)

    local info = 'Text: "'..alarm.text..'" '

    if alarm.startTime ~= nil then
        info = info..'ST: '..tostring(alarm.startTime)..' '
    end

    if alarm.ackTime ~= nil then
        info = info..'AC: '..tostring(alarm.ackTime)..' '
    end

    if alarm.endTime ~= nil then
        info = info..'ET: '..tostring(alarm.endTime)..' '
    end

    if alarm.startTime ~= nil and alarm.endTime ~= nil then
        local duration = alarm.endTime - alarm.startTime
        info = info..'Duration: '..tostring(duration)..' '
```


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```
    end

    info = info..'Prior: '..tostring(alarm.priority)

    if alarm.customPropList ~= nil then
           info = info..'\n'
           for key, val in pairs(alarm.customPropList) do
              info = info..'CustomProp: '..key..' = '..val..'\n'
           end
    end

    Ods.DebugOut(info)

    return true
end

function GetDependencyList()

    return {}
end
```

Example 2: Example of script that uses a combo box to display priorities selected in the combo. Note that the *GetDependencyList()* function has to return a list of objects that the script is dependent on. The Lua script that is executed for filtering can use following Lua functions: *"Ods.DebugOut*", "*Ods.GetPathProject*", "*Ods.GetPathSystem*", "*Ods.GetDataFromToken*".

```
function IsAlarmVisible(alarm)

    local token = Ods.GetDataFromToken('[cb#ComboPriority]')
    if token ~= nil then
           local priorCnt = #token
           for i = 1, priorCnt do
                  local prior = tonumber(token[i])

                  if prior == 0 then
                         return true
                  end

                  if alarm.priority == prior then
                         return true
                  end
           end

           return false
```


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```
    end
    return true
end

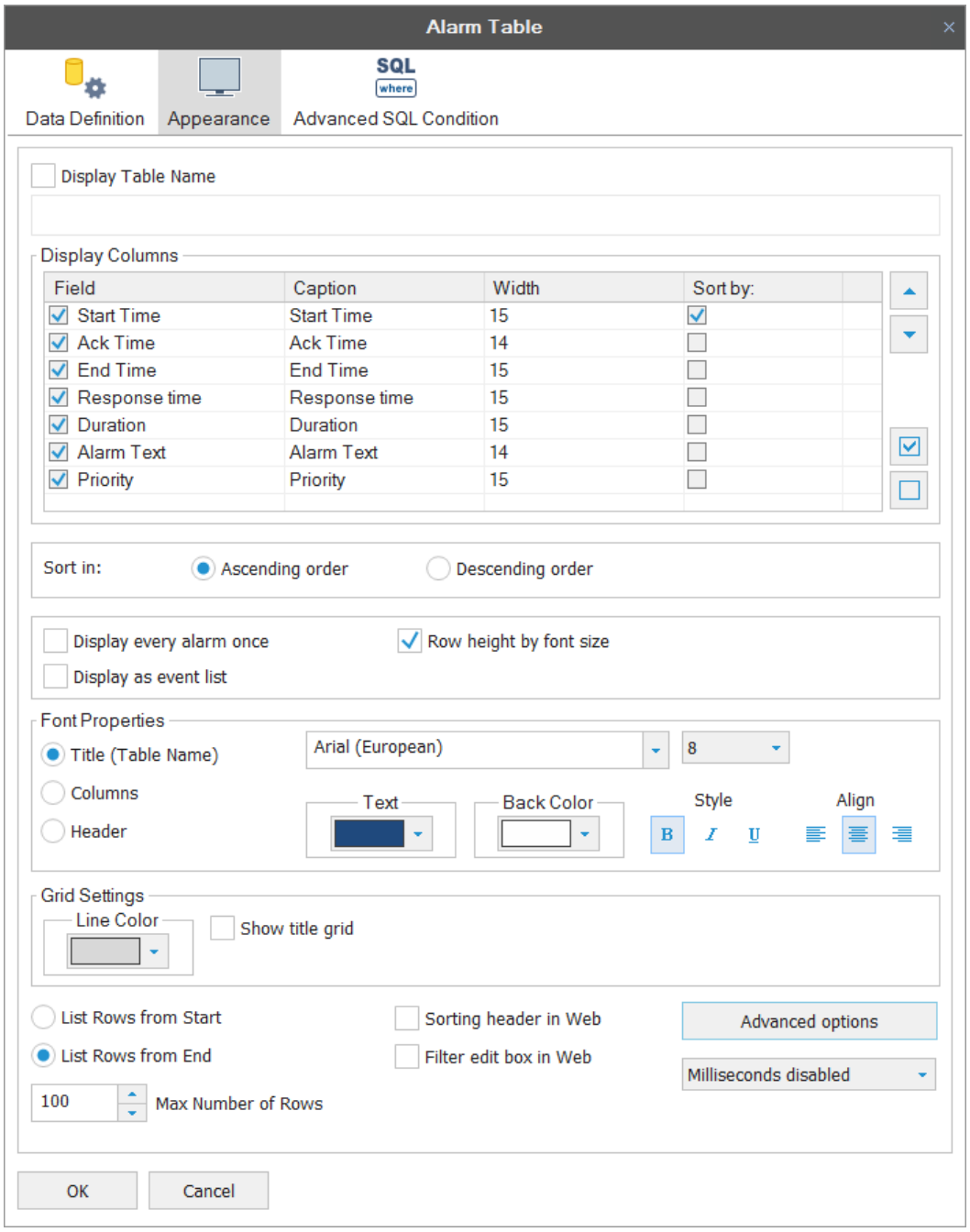
function GetDependencyList()
    return {'[cb#ComboPriority]'}
end
```

Time Period Definition - once you've selected one or more alarm filters for the table, specify the time period for the table. **Time Definition** is described in details in the Time Definition 218 section of this manual.

Alarm Table Appearance

To adjust the format of the table, click on the ***Appearance*** tab:

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The **Table Name** field will contain a name, which will be displayed.

The **Display Table Name** check box will enable or disable table title display.

The **Display Columns** list defines which columns will be displayed as well as their order, size, width and caption.

The left row of check boxes enables and disables the appropriate column display in the table.

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The **Caption** column defines the caption of each column of the table. If you wish to change the caption of any column, double-click on the appropriate caption inside the column and it will be available for editing.

Selecting any column and clicking *Move Up* or *Move Down* buttons will change the order of the selected column.

The right set of check boxes - **Sort By** - will define by which column the data will be sorted. Only one column can be selected.

Radio buttons below (**Sort In**) will define the sorting direction, ***ascending*** or ***descending***.

The **Font Properties** controls enable you to set different font properties for the table title, table header and displayed data (in columns).

When you define a table, you never know how many rows will actually be displayed. It may be few, but may also result in dozens of pages in a report. Therefore the **Max Number of Rows** edit box allows you to specify the maximum number of rows to display in the table. This enables the user to protect the report from an overflow.

When defining the maximum number of rows, you can set which "cut" of all the data set you would like to display: the first or the last block of data. This can be defined by selecting an appropriate radio button: **List rows from Start** or **List rows from End**.

Enabling the checkbox **Sorting header in Web** allows users to sort data in Web Portal. By clicking on the caption of the table, a user defines the sort direction, ascending or descending.

By enabling the checkbox **Filter edit box in Web** a user will be able to set a filter in the Web Portal and only the data corresponding to this filter will be displayed.

In the **Milliseconds** combo box, a user can choose whether to display milliseconds for the timestamp field. The following options are available:

- Milliseconds disabled: milliseconds will not be displayed.

- Milliseconds enabled: milliseconds will be displayed for every timestamp.

- Milliseconds auto: milliseconds will be displayed only in the timestamps with milliseconds resolution.

- Milliseconds from the Project localization: the object will use the configuration set in the Project Localization dialog window.

Note: Please, always keep in mind that an Alarm table will display a number of alarms, not more than the defined as maximum, therefore make sure to define the **Max Number of Rows** as high as needed.

At the same time, if your report contains alarm tables with several dozen thousands of lines, which will result in several hundred pages report, generation of such report may take very long generation time or fail.

User will be able to select the way the report alarm data will be displayed in the alarm table. There are 3 options that can be selected by checking: "**Display every alarm once**", "**Fit rows to text**", "**Display as event list**".

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Display every alarm once. If this check box will be checked, then, if the same alarm will occur multiple times over the period, it will be presented in the list by one (first) occurrence line only. The criteria to compare alarms to identify the same alarms will be the combination of ***Alarm text*** and alarm ***Priority***. If an alarm will have the same text and the same priority, it will be considered as the same alarm. If priority is not available, then the alarm text will only be used for analysis. Timestamp of the last occurred alarm will be shown. If for the last started alarm there is no acknowledged time or/and end time, the corresponding columns will be empty.

The ***Duration*** column will show accumulated duration time for all alarm occurrences. If there is no end time for the last occurrence, the ***Duration*** column will show duration for previous occurrences. If there is only one alarm without end time, the ***Duration*** column will be empty. The ***Response Time*** column will show response time for the last occurrence only. If the last occurrence doesn't have an acknowledged time, the ***Response Time*** column will be empty.

Number of occurrences. The list of available alarm table columns will have a new column: ***Number of occurrences***. This will be the calculated column (like ***Duration*** or ***Response time***), and it will display how many times the same alarm occurred during the alarm table period. The criteria to compare alarms to identify the same ones will be – by ***Alarm text*** and ***Priority***. If ***Priority*** is not available, then the alarm text only will be used for analysis.

NOTE: This column is available only in mode "**Display every alarm once**".

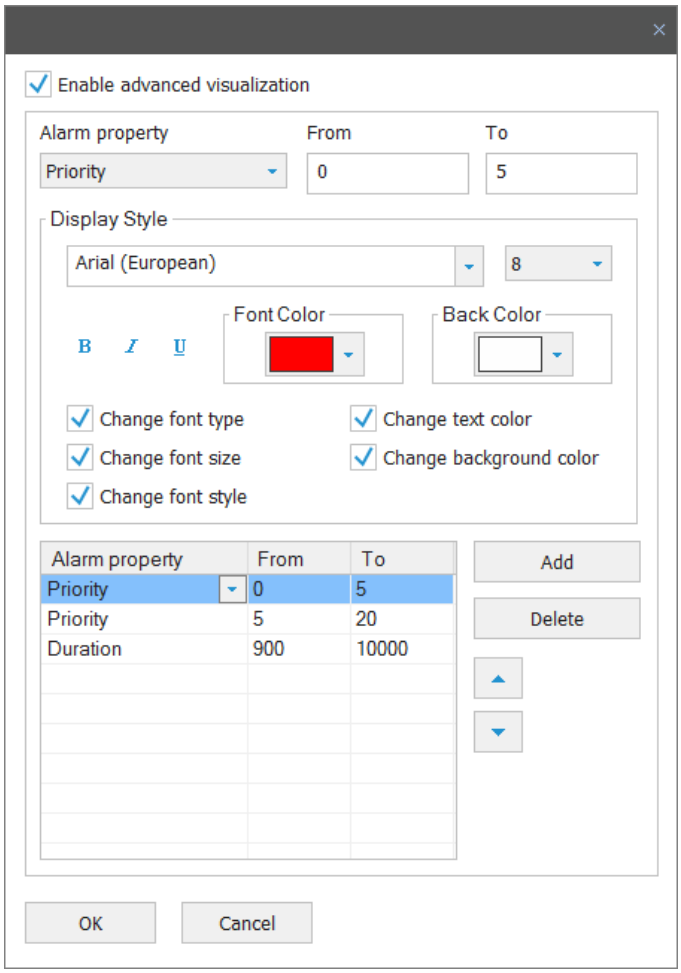
Fit rows to text. By default this display option will be enabled. If it is enabled, the height of the header cells will increase and the data cells part of the table will have less size to fit the text. If this option is disabled, the height of the data cells part of the table will increase, thus giving more size to the text so that maximum fits.

Display as event list. If this check box will be selected, then, the alarm table will automatically unselect display of the following table columns: ***Ack time***, ***End time***, ***Duration***, ***Response time***. The message list table style will have only the following table columns available: ***Start time***, ***Alarm text***, ***Priority***. This mode can be possibly selected in the combination with the "**Display every alarm once**" mode. In this combination single line for alarm will be shown, and the criteria to compare will be the same. In this case the column ***Number of occurrences*** will also be available.

Advanced Visualization

Click the ***Advanced Options*** button to open the **Advanced visualization** dialog window :

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The check box ***Enable advanced visualization*** defines if the advanced visualization mode is enabled or disabled. If you have created all the logic of advanced visualization and then disabled that mode – the entire definition won't be deleted. It will be automatically saved and will just not be used for reporting. You can enable that definition again if you need, without its re-definition.

The **Alarm property** combo box has the following options in its list: **Priority**, **Duration**, **Number of alarm occurrences**.

The **Duration** column will be available only in normal mode.

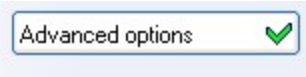
The **Number of Occurrences** column will be available only if **"Display single alarm"** mode will be selected. The Property filter will define the property value range. The font style will define the text and the background color and style for all alarms, which will apply to that property range.

NOTE: If the same alarm is applied to the multiple defined filters, which exclude each other, then the first one will be taken.

If the same alarm is applied to different filters, which do not exclude each other, then both visual properties will be applied.

If a user will enable advanced visualization, then the "***Advanced Options***" button will have additional **OK** icon on it, indicating, that **Advanced visualization** is enabled in this object:

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Example of Alarm table:

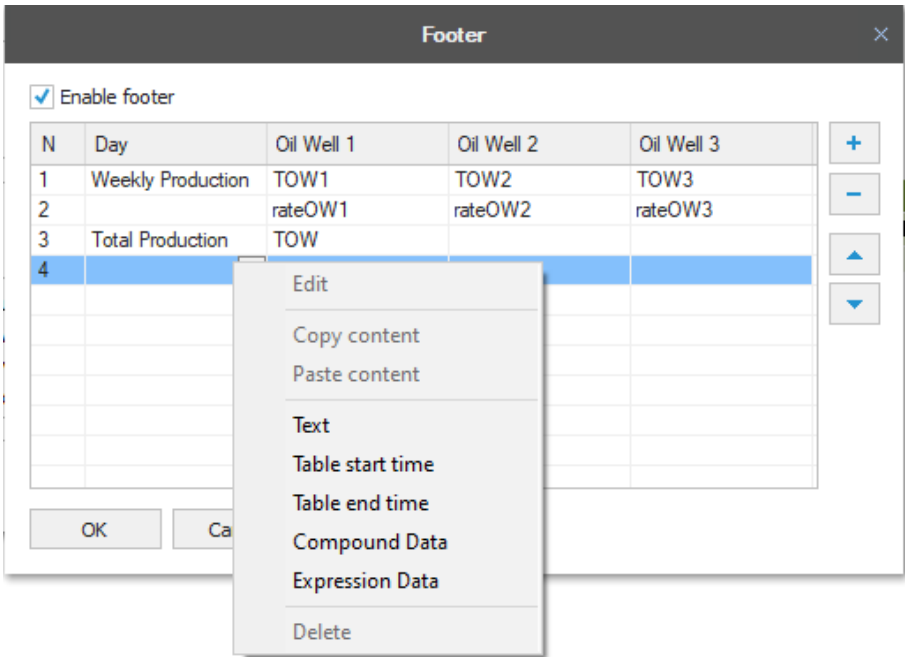
All Alarms

Start Time	Ack Time	End Time	Resp. time	Duration	Alarm Priority	D
02/24/2019 15:00:00	02/24/2019 15:30:00	02/24/2019 16:00:00	4:00:00	8:00:00	7	Valve Cl
02/24/2019 11:00:00	02/24/2019 11:30:00	02/24/2019 12:00:00	3:00:00	6:00:00	8	Producti
02/22/2019 16:00:00	02/22/2019 16:30:00	02/22/2019 17:00:00	2:00:00	4:00:00	9	Pumps S
02/22/2019 07:00:00	02/22/2019 07:30:00	02/22/2019 08:00:00	2:00:00	4:00:00	5	Pumps R
02/24/2019 14:00:00	02/24/2019 14:30:00	02/24/2019 15:00:00	2:00:00	4:00:00	8	Producti
02/23/2019 09:00:00	02/23/2019 09:30:00	02/23/2019 10:00:00	2:00:00	4:00:00	8	Producti
02/23/2019 11:00:00	02/23/2019 11:30:00	02/23/2019 12:00:00	1:00:00	2:00:00	5	Tank Lo
02/21/2019 17:00:00	02/21/2019 17:30:00	02/21/2019 18:00:00	1:00:00	2:00:00	3	Tank Hi
02/21/2019 14:00:00	02/21/2019 14:30:00	02/21/2019 15:00:00	1:00:00	2:00:00	2	Temp Hi
02/22/2019 09:00:00	02/22/2019 09:30:00	02/22/2019 10:00:00	1:00:00	2:00:00	6	Temp Gr
02/22/2019 10:00:00	02/22/2019 10:30:00	02/22/2019 11:00:00	1:00:00	2:00:00	8	Temp Fi
02/23/2019 16:00:00	02/23/2019 16:30:00	02/23/2019 17:00:00	1:00:00	2:00:00	9	Valves
02/22/2019 15:00:00	02/22/2019 15:30:00	02/22/2019 16:00:00	1:00:00	2:00:00	9	Producti
02/23/2019 13:00:00	02/23/2019 13:30:00	02/23/2019 14:00:00	1:00:00	2:00:00	8	Pumping
02/23/2019 18:00:00	02/23/2019 18:30:00	02/23/2019 19:00:00	1:00:00	2:00:00	8	Enter Se
02/24/2019 13:00:00	02/24/2019 13:30:00	02/24/2019 14:00:00	1:00:00	2:00:00	5	Pumps 1

15.7 Table Footer

The Step, SQL and Automatic Statistical tables all include a **Footer** option. This footer can have multiple lines, which can include static text, table start time, table end time, Expression or Compound data objects. Click on the "**Footer**" button in the Appearance settings of the specific table object to open the **Footer** configuration window:

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To configure a table Footer, check the **Enable Footer** option to include the footer in the table.

Click the **"+"** or **"-"** buttons to add or remove footer lines - for instance, if you needed a footer to include a Min, Max and Avg value under each column, click the "+" three times to have a three-line footer.

After adding blank footer lines, you can choose what content to include in each footer "cell". Click the "**[...]**" button in each cell to add one of the following items: Text (e.g., a "label"), Table Start Time, Table End Time, Compound Data, or Expression Data.

Text: Type in a static text label (e.g., "Minimum")

Table Start Time: This will open the Date/Time Definition window, where you can specify the date/time format to display in the footer

Table End Time: This will open the Date/Time Definition window, where you can specify the date/time format to display in the footer

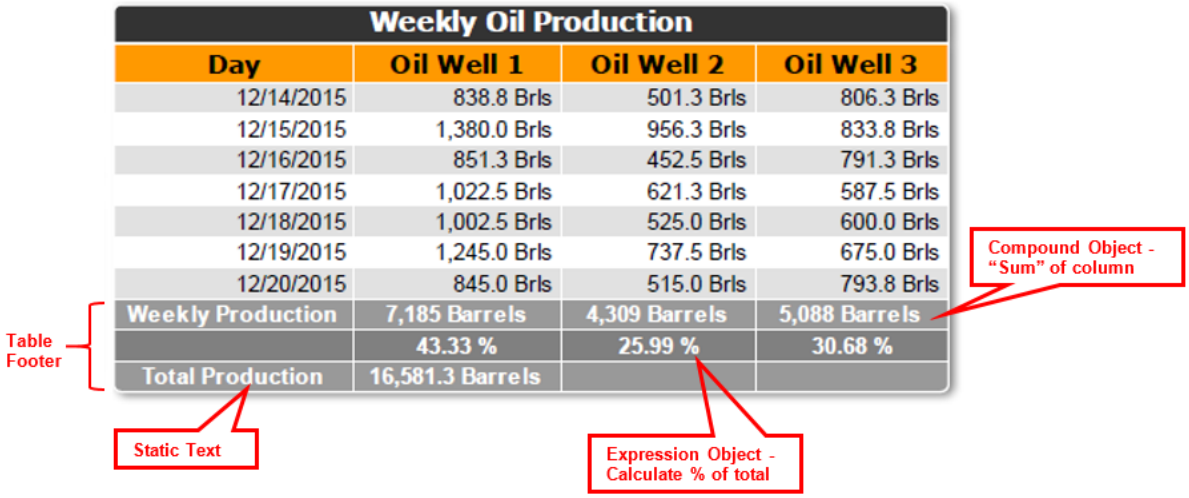
Compound Data: This opens the Compound Data Object Definition window, which is configured as described in the Compound Object section. Enter a unique name for that footer item, and optionally, a description. Note that the names of all the table fields, and all the table footer cells are available for the Compound object calculation. For example, if you wanted to display the maximum value of all values in a column (field), select that field name from the list (e.g., [f#Temp1]) and then in the Select Function section below, select "Maximum." Click the Appearance tab to configure the result representation and Advanced display options for that specific footer value.

Expression Data: This opens the Expression Data Object Definition window, which is configured as described in the Expression Object section. Enter a unique name for that footer item, and optionally, a description. Build the mathematical or logical (using Lua script) expression. Click the Appearance tab to configure the result representation and Advanced display options for that specific footer value.

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If you wish to copy the content of one footer cell to another footer cell, right-click on the appropriate cell, and select either "Copy Content" or "Paste Content". You can edit the pasted content by right-clicking on the appropriate cell and selecting "**Edit**".

Finally, to change the order in which the footer lines are displayed, select the appropriate footer line, and click the **Up** or **Down** arrow to move that line. Repeat for any other footer lines you wish to re-order.



The ***Footer*** configuration shown at the start of this section results in the following table output - note the mix of Text, Compound and Expression objects in the footer.

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Charts and Graphs

16 Charts and Graphs

16.1 Pie Graph

Pie Graph is an object that displays data in a pie chart. The data can be either a data value, a counter of logged values or a counter of logged alarms.

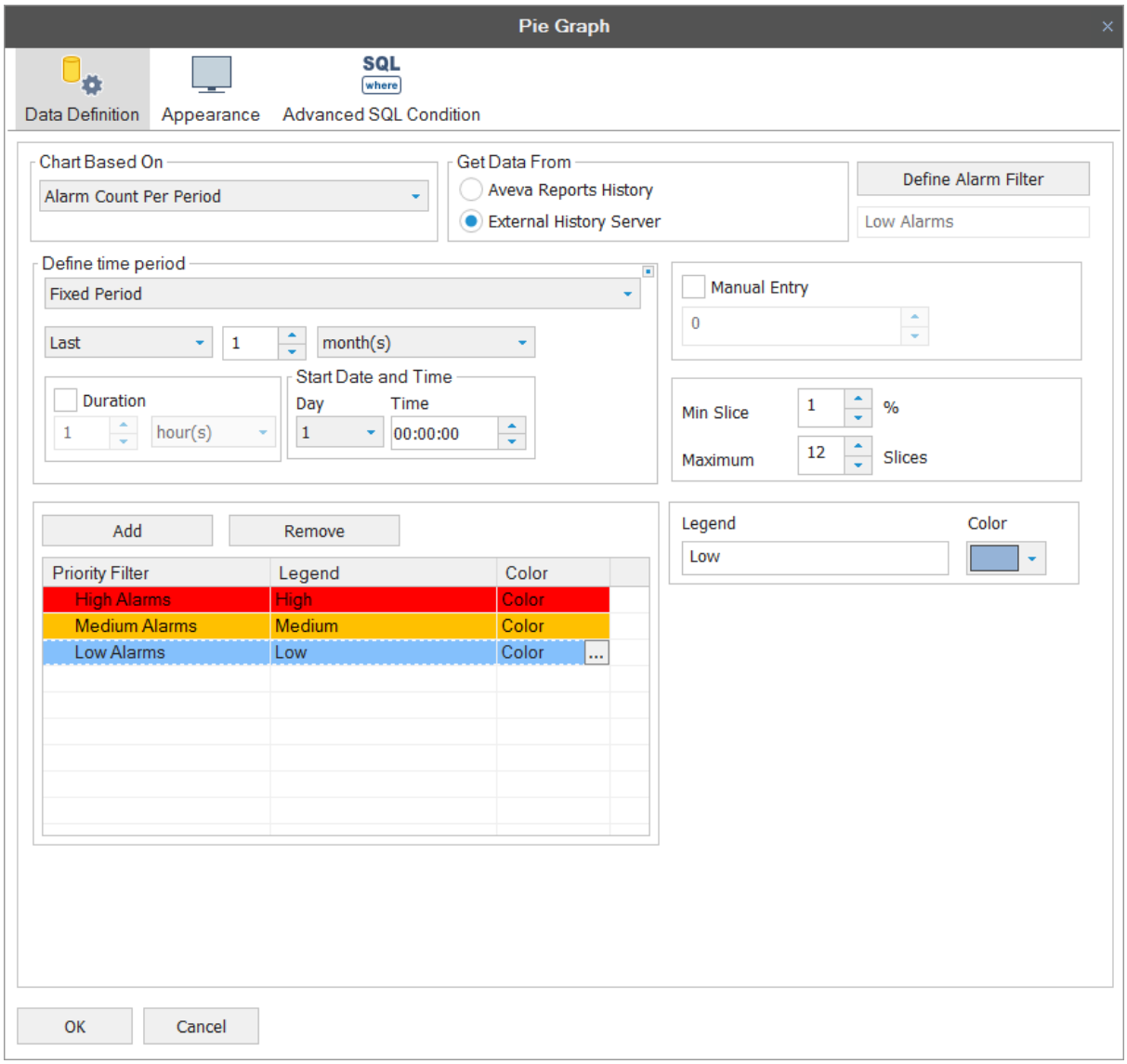
To add a pie chart to a report, click the ***Pie Graph*** button on the Report Designer Studio **Elements** toolbar:



16.1.1 Pie Graph Definition

Draw a rectangle where you would like to place the chart in the report workspace, and the **Pie Graph Definition** dialog window will be opened:

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The upper combo box "**Chart Based On**" defines the kind of data that will be displayed in the chart. You can select:

"**Value**" - to display a raw data item or a statistical value for a defined period

"**Counter of Logged Values**" - to display the number of times the selected data item was logged into the database and its value matched a specified value range.

"**Alarm Count per Period**" - to display the number of alarms during a specified period of time, which matched the selected alarm filters.

"**Alarm Mode**" – to display Pie segments based on advanced alarm analytics for specified alarm filter(s), such as:

- Average Alarm Rate
- Minimum Alarm Rate
- Maximum Alarm Rate
- Count of short-duration alarms

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- Count of long-duration alarms
- Count of periods per alarm rate

The **Get Data From** radio buttons specify the kind of data source for the chart: ***Dream Report History*** (internal data logs) or ***External History Server***.

To create a new chart, select a list of data items and a slice color for the data item in the chart, enter a label for the legend (if needed), and click the *Add* button.

The data source and data item can be selected from the relevant combo boxes in the **Select Data Item** group.

Apply correction factor for all item values enables adding simple expression to a pie graph. If a user needs to display pie graph on item(s) with the correction factor, then, first, all values of the selected item(s) will be re-calculated, applying correction factor, and then, the pie graph will display re-calculated data.

For more details, please refer to the Correction Factor section.

ADF to be used: enables to select an aggregated data filter. "**ADF to be used**" combo box will contain all ADF definitions configured in the project. The default string will be "**Not Used**", i.e. no filter (ADF) is applied.

For details on ADF definition/configuration, please go to the Aggregated Data Filter section of this manual.

When displaying data item values for a specified period, in the **Process Value** combo box you can select one of the options to display. It can be either:

- **Last value** - the last raw value from the database
- **Current value** - the current value for the specified data item from the real-time data driver
- **Average** - the average value for this data item, calculated for the specified time period
- **Minimum** - the minimum value for this data item, calculated for the specified time period
- **Maximum** - the maximum value for this data item, calculated for the specified time period

The **Define time period** section defines the time period for statistical calculations for this object and is described in detail in the Time Definition 218 section of this manual.

The **Manual Data Entry** check box supports entering a static numeric value that will be constant during report generation. This allows users to create a pie graph combining statistical data and static reference data.

In order to add manual data, check the **Manual Data Entry** check box, enter the constant in the edit box below, select the desired color for the corresponding slice, enter a label for the legend, if needed, and click the *Add* button.

Please, note that when the **Manual Data Entry** check box is checked, all data definition controls, like data item selection, time definition etc., will be disabled. To enable those controls again, uncheck the check box.

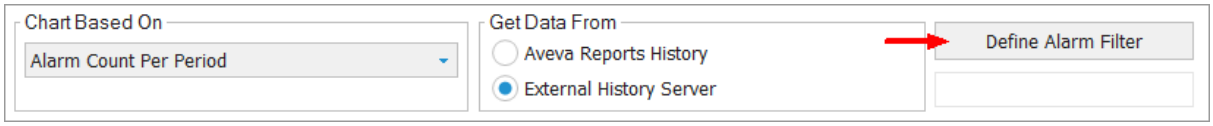
Counter of Recorded Values

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If you select a chart type of **Counter of recorded values**, enter a range of values **FROM** and **TO** on which to filter the data in the edit boxes. *Dream Report* will go to the history and count how many times the selected data item's values matched the value filter, and display the result in the chart.

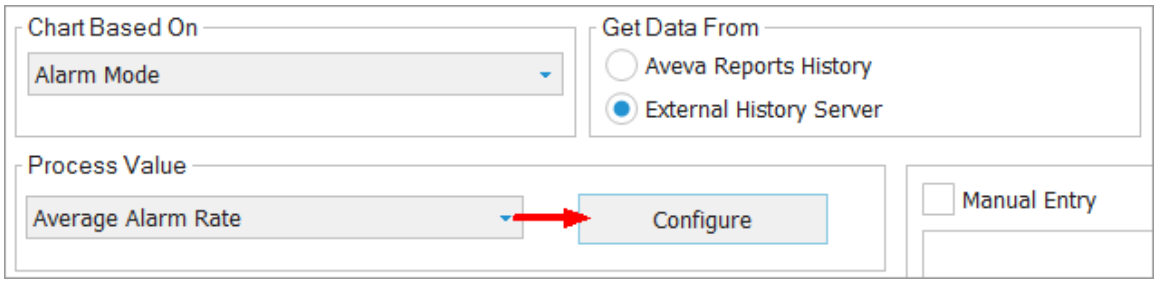
Alarm Count per Period

If you select a chart type of **Alarm Count per Period**, the ***Define Alarm Filter*** button will appear:

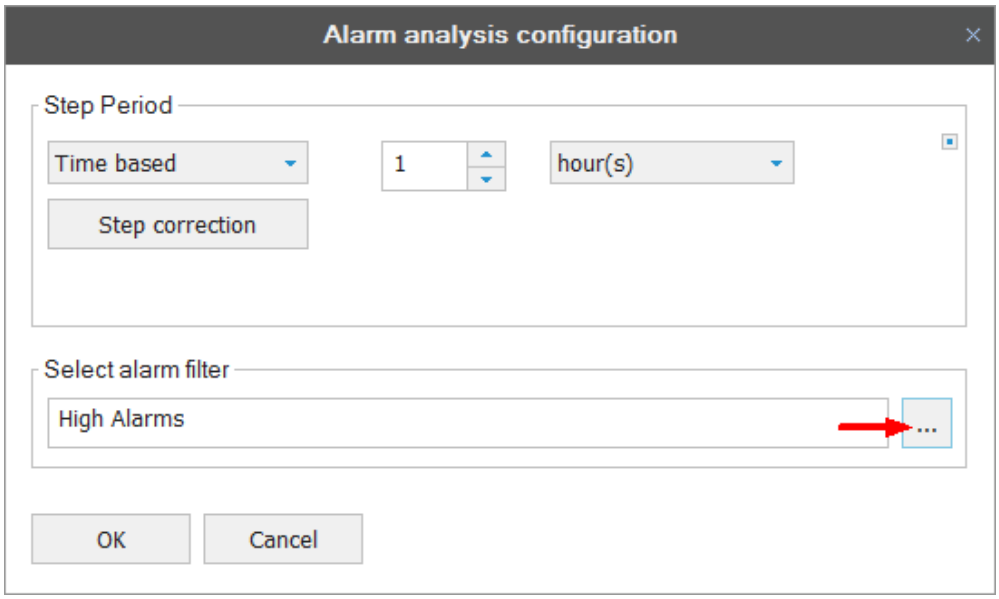


Click on the ***Define Alarm Filter*** button and the Alarm Filter Manager 242 dialog window will be opened. You can select one alarm filter, pick a desired color, enter the label for the legend (if desired), and press the *Add* button. If this pie function is selected, *Dream Report* will go to the alarm history and count how many alarms matched the selected alarm filter, and will display the result in the chart.

Alarm Mode – to display Pie segments based on advanced alarm analytics 361 for a specific alarm filter:



Select the alarm analysis (*Process Value*) to use, and then click on the ***Configure*** button - the *Alarm Analysis Configuration* window will open:



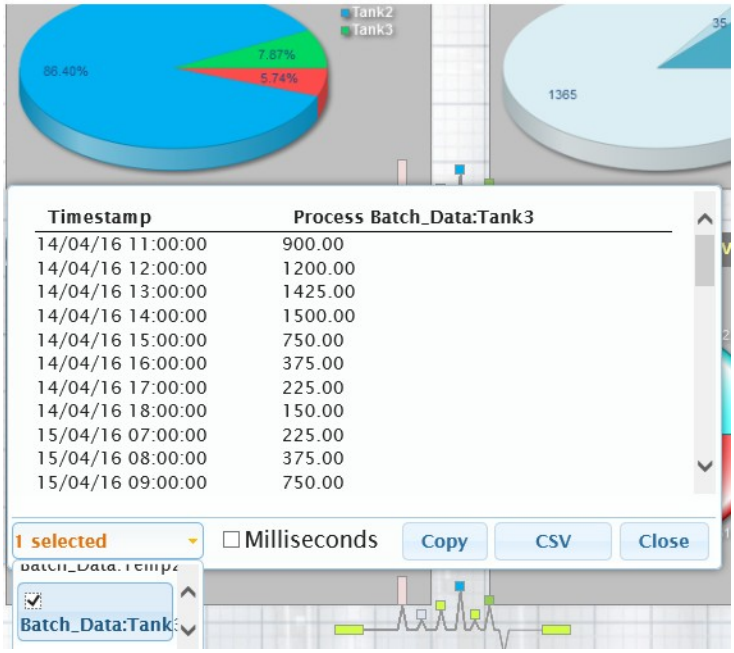
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Set the specific parameter(s) for this alarm function, and then select one alarm filter from the Alarm and Event Filter(s) List 242. Click "OK" to close the window, and then pick a desired color for the pie segment, enter the label for the legend (if desired), and then click "Add" to add this segment to the Pie Graph.

NOTES:

- Pie configuration cannot include different pie functions - one pie graph can only include slices with the same pie function.
- Pie configuration doesn't include slices with different time periods - one time period applies to the entire pie chart for all slices.

The **Show Raw Data in Web** checkbox allows users to display the raw data values which were used in the Pie Chart calculations. In the Web Portal, if a user clicks on the Pie Chart, the Raw Data dialog window will appear. In the Select Tags combo box, selecting one or more tags will then show the associated raw values.

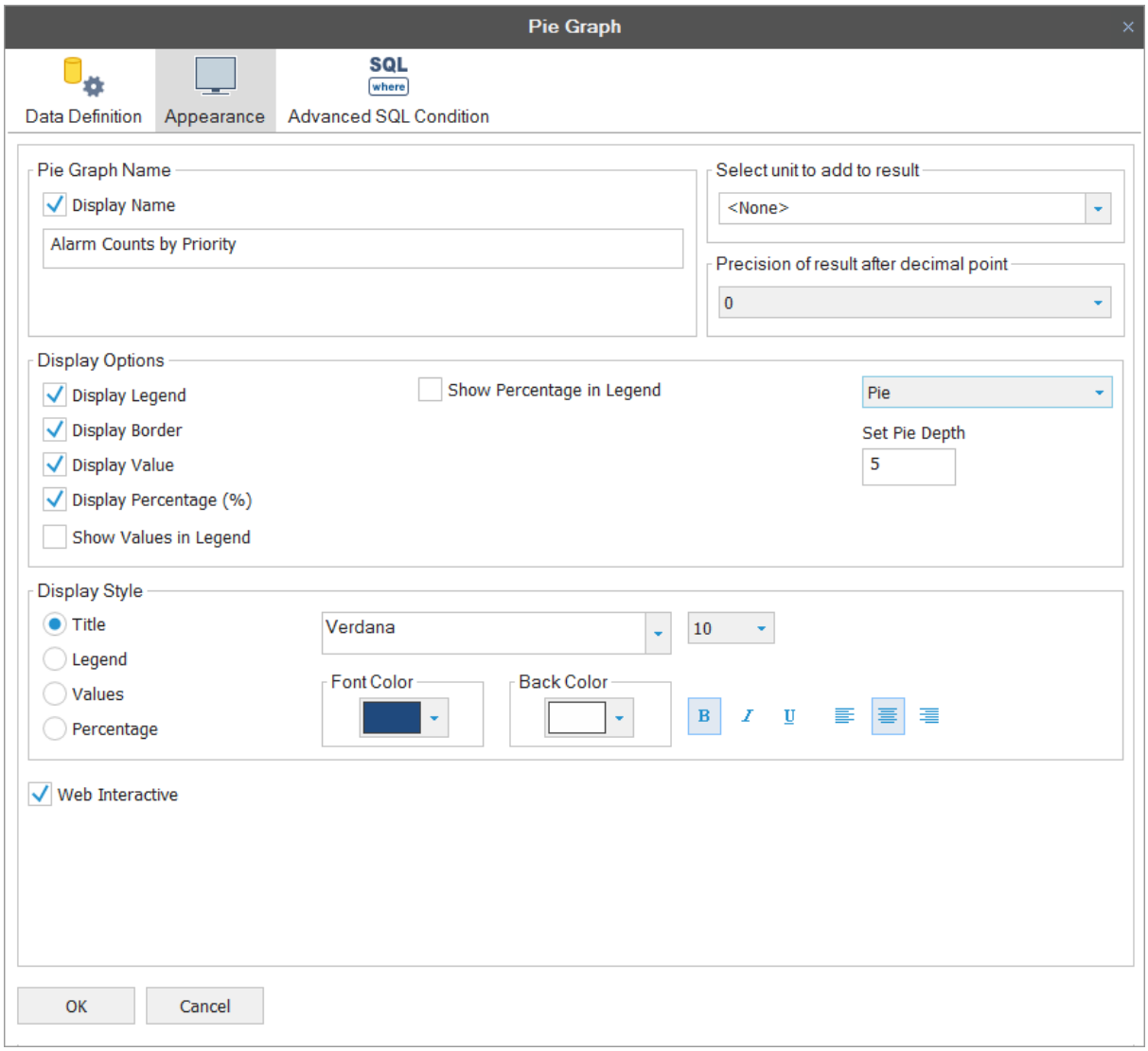


A user can copy the table to clipboard or export it to a .csv file.

16.1.2 Pie Graph Appearance

The **Appearance** section of the **Pie Graph** definition window contains formatting options for the chart:

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The optional **Pie Graph Name** edit box will contain the title, which will be displayed above the chart.

The "**Display Name**" check box will enable or disable the title display (make it visible or invisible).

The **Display Options** section defines which pie object properties will be displayed in a report:

- **Display Legend** - displays a legend box. It can be displayed on the right side or on the bottom of the pie.
- **Display Border** - displays a line between pie slices and on its edges. The line color for the border can be adjusted.
- **Display Value** - displays numeric value for each slice. The value is placed inside each slice and the font properties, decimal precision and measure units are adjustable.
- **Display Percentage (%)** - displays percentage of each slice within 100% for all slices. The percentage is displayed next to each slice.

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- **Show Values in Legend** - displays numeric value for each slice in the graph Legend. Font properties are adjustable in the **Display Style** (described below).

- **Show Percentage in Legend** - displays percentage of each slice within 100% for all slices in the graph Legend. Font properties are adjustable in the **Display Style** (described below).

- **Pie Graph Style** - select the style of the Pie Graph to be displayed. Options are "**Pie**", "**3D Pie**" and "**Doughnut**". Settings for each option are as follows:
  - *Pie*: "**Pie Depth**" in mm

  - *3D Pie*: "**Pie Depth**" in mm; "**Pie Angle**" in degrees

  - *Doughnut* Style: "**Flat Doughnut**"; "**In Gradient Doughnut**"; "**Out Gradient Doughnut**"; "**Rounded Doughnut**"

Display Style defines text display options for different parts of the chart:

- **Title** - when this radio button is selected, you can specify the font type and size for the chart title. Also you can select text alignment, font style, font color and background color for the title text.
  To use a transparent background color for the title, open the background color palette and select "No color". This option is only applicable when "*Display Name*" check box is enabled.

- **Legend** - when this radio button is selected, you can specify the font type and size for the legend. Also you can select the position of the legend - either on the bottom or on the right side of the chart. Also you can specify the font style, font color and background color for the legend.
  To use a transparent background for the legend, open the background color palette and select "No color". This option only applies when the "*Display Legend*" check box is enabled.

- **Values** - when this radio button is selected, you can specify the font type and size for slice values. You can also select text alignment, font style, font color and background color for the value text.
  This option only applies when the "*Display Value*" check box is enabled.

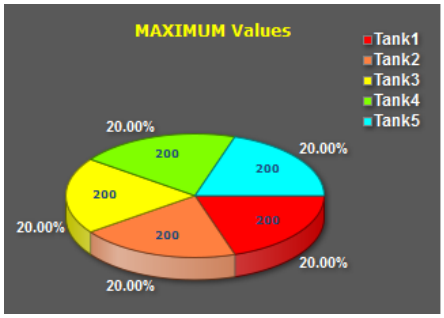
- **Percentage** - when this radio button is selected, you can specify the font type and size for slice percentages. You can also select the text alignment, font style, font color and background color for percentage text. This option only applies when the "*Display Percentage (%)*" check box is enabled.

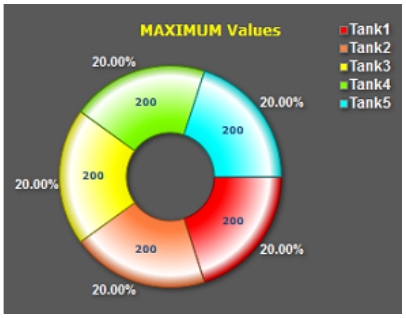
The **Select unit to add to result** defines which engineering unit to display after the decimal point in slice values. This option makes sense only when the *Display Value* check box is selected.
If user will manually type a unit, which is not the part of the standard units list, that unit will be saved locally, in the list of custom units. When the customer will open "Units" combo box next time, that new custom unit will appear in the list. If user will want to edit the list of custom units - it can be done in a text editor. That list of custom units is located in the file *DreamReport.ini* in the System folder in Dream Report installation (e.g. C:\ODS\Dream Report\System).

Precision of result after decimal point defines how many digits after the decimal point will be displayed. This option can only be applied when the *Display Value* check box is selected.
The **Advanced SQL Condition** section is described in details in the Advanced SQL Condition 222 section.

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Examples of "3D Pie" and "Doughnut" Graphs:





- **Web interactive** check box will switch Pie graph from static representation to an interactive visualization in the web. Static Pie graph visualization will be represented exactly, as it's presented in designer studio or in PDF report. Interactive representation may differ from static one, but it will enable certain animation and will provide user certain dynamic interaction. This option is relevant only in web portal.

16.2 Bar Graph

Bar graph displays data in a bar chart. The data can be either a data value, a counter of logged values or a counter of logged alarms.

To add a bar chart to a report, click the ***Bar Graph*** button on the Report Designer Studio **Elements** toolbar:

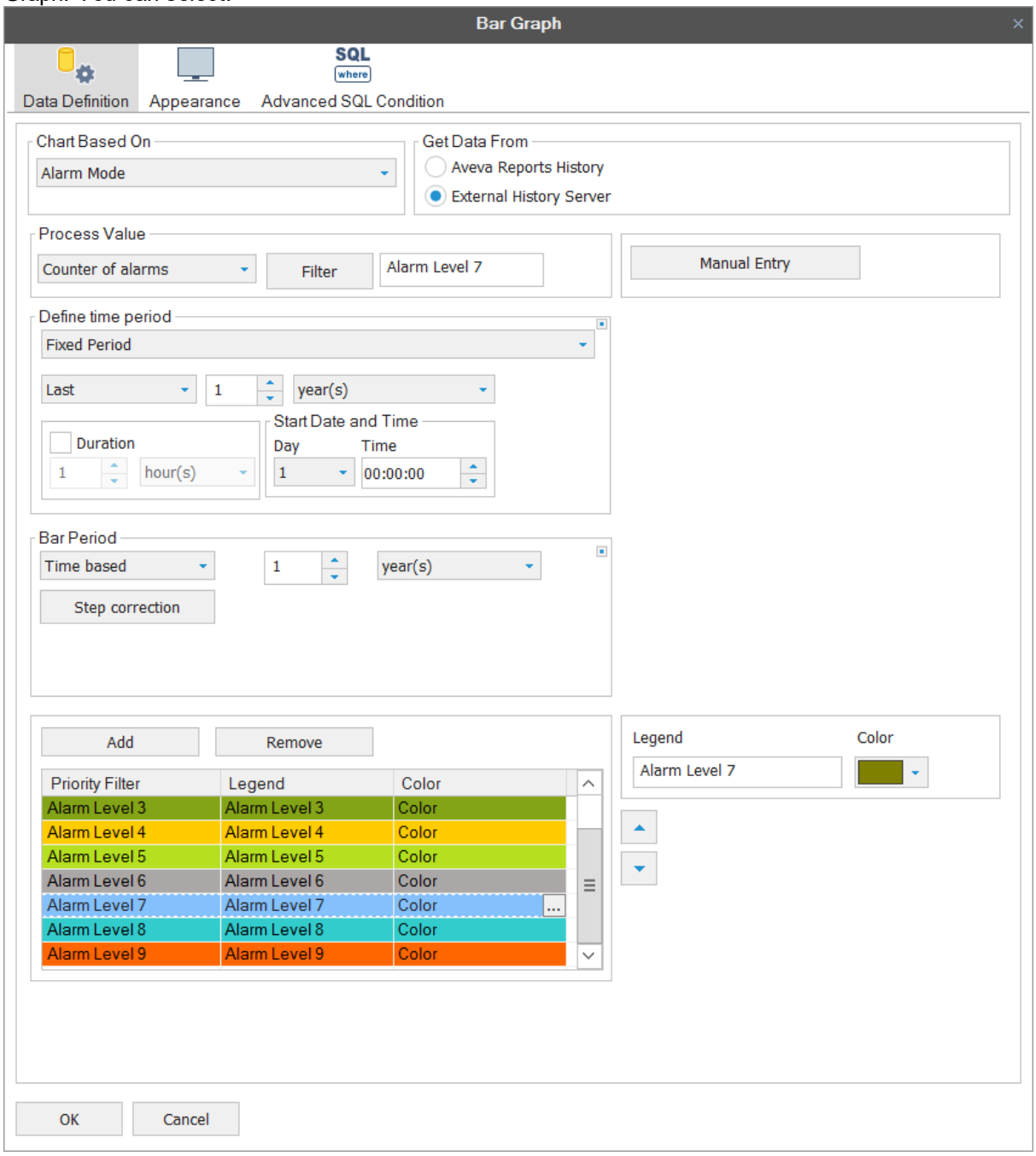


Draw a rectangle where you would like to place the chart in the report workspace, and the **Bar Graph** definition dialog box will be opened.

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16.2.1 Bar Graph Definition

The upper combo box "**Chart Based On**" defines the kind of data that will be displayed in the Bar Graph. You can select:



"**Value**" - to display a raw data item or a statistical value for a defined period

"**Counter of Recorded Values**" - to display the number of times the selected data item was logged into the database and its value matched a specified value range.

"**Alarm Mode**" – to display bars based on advanced alarm analytics 361 for specified alarm filter(s)

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"**SQL Query**" - to use the results of an SQL Query to display values for a defined time period.

The **Get Data From** radio buttons specify the kind of data source for the chart: ***Dream Report History*** or ***External History Server***.

To create a new bar, select from the list a data item and a bar color for the data item in the chart, enter a label for the legend (if needed), and click the *Add* button.

The data source and data item can be selected from the relevant combo boxes in the **Select Data Item** group.

Apply correction factor for all item values enables adding simple expression to a bar graph. If a user needs to display bar graph on item(s) with the correction factor, then, first, all values of the selected item(s) will be re-calculated, applying correction factor, and then, the bar graph will display re-calculated data.

For more details, please refer to the **Correction Factor** section.

ADF to be used: enables to select an aggregated data filter. "**ADF to be used**" combo box will contain all ADF definitions, configured in the project. The default string will be "**Not Used**", i.e. no filter (ADF) is applied.

For details on ADF definition/configuration, please refer to the Aggregated Data Filter 245 section of this manual.

When displaying data item values for a specified period, in the **Process Value** combo box you can select one of the options to display. It can be either:

- **First value** - the first found value for the selected item from a database within the specified time period;
- **Last value** - the last raw value from the database;
- **Current value** - will read and display the current value from the specified data item from real-time data driver;
- **Average** - the average value for this data item, calculated for the specified time period;
- **Maximum** - the maximum value for this data item, calculated for the specified time period;
- **Minimum** - the minimum value for this data item, calculated for the specified time period;
- **Sum** - calculates the sum of all values of this data item during the specified time period;
- **Integral** - calculates the integral of all values of this data item during the specified time period;
- **Standard deviation** - calculates the standard deviation of all values of this data item during the specified time period;
- **Weighted average** - the weighted average value for this data item, calculated for the specified time period;
- **Duration in the interval (hours)** - calculates the duration (in hh:mm:ss) when values of this data item were in the specified value range during the specified time period;
- **Counter** - calculates the counter value from values of this data item during the specified time period;
- **ON Counter** - calculates the ON Counter from all values of this data item during the specified time period;
- **OFF Counter** - calculates the OFF Counter from all values of this data item during the specified time period;
- **ON/OFF Counter** - calculates the ON/OFF Counter from all values of this data item during the specified time period;

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- **System availability** - calculates the system availability (in %) using all values of this data item during the specified time period;
- **SQL Query** - performs a predefined SQL query in the selected database.

NOTE: For more details on each of the statistical functions, listed above, please, go to the Single Data Object section.

The **Define time period** section defines the time period for statistical calculations for this object and is described in detail in the Time Definition section of this manual.

The period can be time-based or Batch-based. This is described in detail in the Batch Definition section .

The **Bar Period** section will allow you to define the period of time per bar group. The bar graph will draw a graph window for a time period, defined in the ***Time Definition*** section. This window will be split into sections with the length of each section based on the ***Bar Period*** definition. All bar slices will be calculated and displayed separately for each period.

The **Manual Entry** check box supports entering a static numeric value that will be constant during report generation. This allows users to create pie graph combining statistical data and static reference data.

In order to add manual data, check the **Manual Entry** check box, enter the constant in the edit box below, select the desired color for the corresponding bar, enter a label for the legend, if needed, and click the *Add* button.

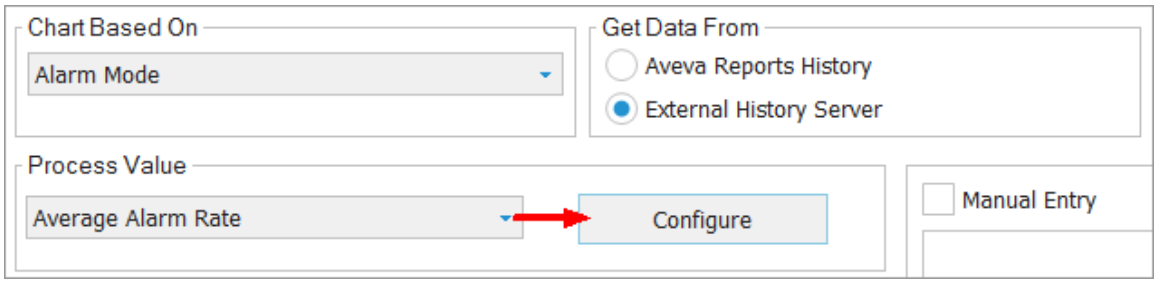
Please, note that when the **Manual Entry** check box is checked, all data definition controls, like data item selection, time definition etc., will be disabled. To enable those controls again, uncheck the check box.

Counter of Recorded Values

If you select a chart type of **Counter of Recorded Values**, then in the edit boxes enter the range of values which will be used for data filtering. Dream Report will go to the history and count how many times the selected data item's values matched the value filter and display the result in the chart.

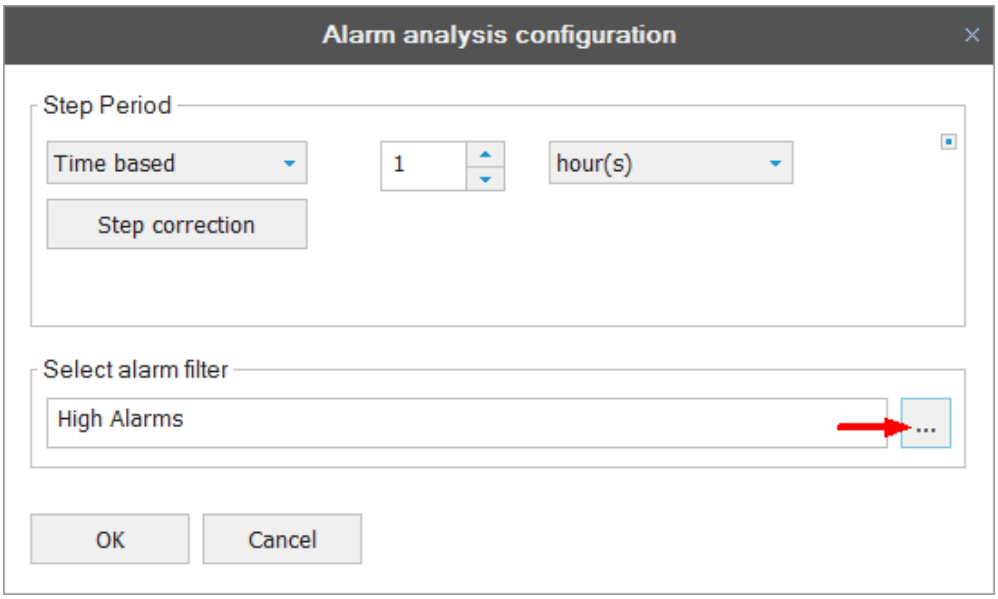
Alarm Mode

Select a chart type of **Alarm Mode to** display bars based on advanced alarm analytics for a specific alarm filter:



Select the alarm analysis (*Process Value*) to use, and then click on the ***Configure*** button - the *Alarm Analysis Configuration* window will open:

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Set the specific parameter(s) for the selected alarm function - available alarm analysis functions are:

- Counter of Alarms Alarm Maximum Duration
- Alarm Minimum Duration
- Alarm Maximum Response Time
- Alarm Minimum Response Time
- Average Alarm Rate
- Minimum Alarm Rate
- Maximum Alarm Rate
- Count of short-duration alarms
- Count of long-duration alarms
- Count of periods per alarm rate

Finally, select an alarm filter from the Alarm and Event Filter(s) List 242. Click "OK" to close the window, and then pick a desired color for the bar, enter the label for the legend (if desired), and then click "*Add*" to add this segment to the Pie Graph.

NOTES:

Bar configuration cannot include different bar functions - one bar graph can only include bars with the same function.

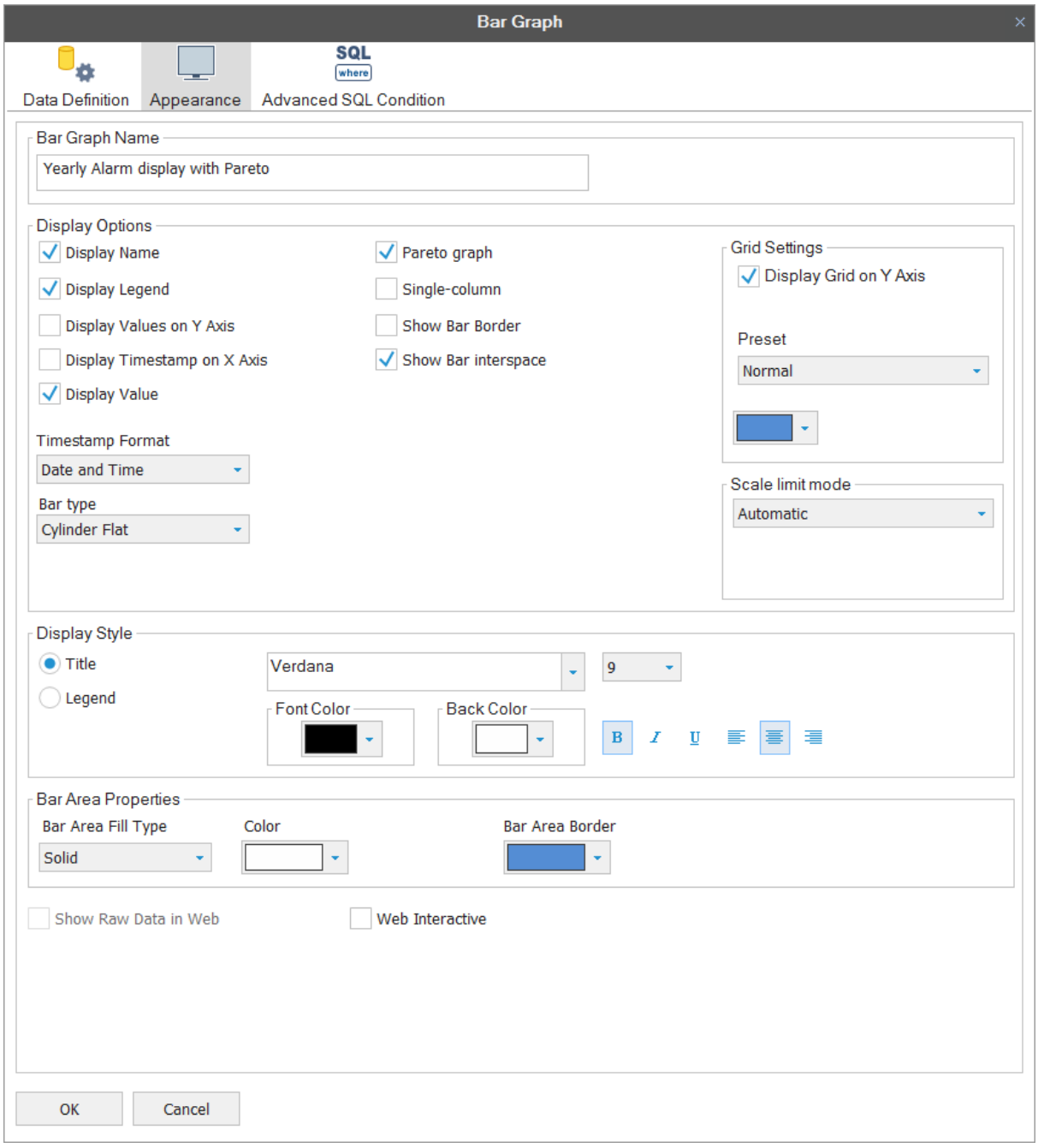
Bar configuration doesn't include bars with different time periods - one time period applies to the entire chart for all bars

16.2.2 Bar Graph Appearance

The **Appearance** section of the **Bar Graph** definition window contains formatting options for the bar graph object.

The **Bar Graph Name** edit box can contain an object title.

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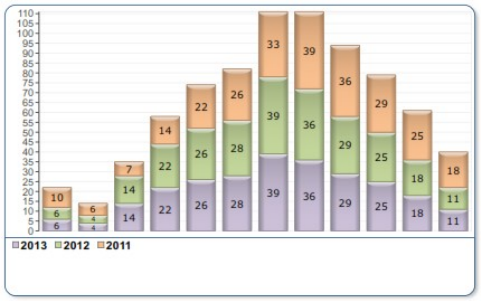


The **Display Options** define which bar graph object properties will be displayed in the report:

- **Display Name** - displays a title for the chart (make it visible or invisible).
- **Display Legend** - displays a chart legend. It can be displayed on the right side or on the bottom of the chart.
- **Display Values on Y Axis** - displays values labels on the Y-axis. Axis lines and values will have the same color as the bar color.

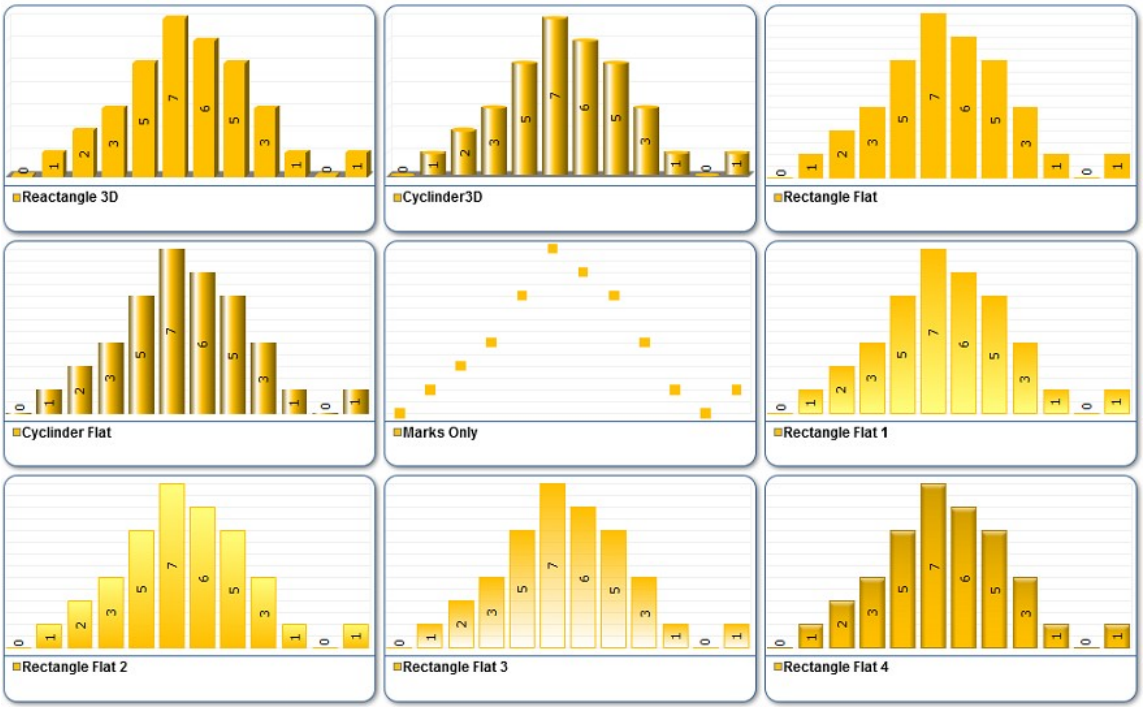
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- **Display Timestamp on X axis** - displays the timestamp on the X-axis of the chart. The timestamp may have a different format, defined in the **Timestamp Format** combo box below the check boxes.
- **Display Value** - displays numeric value for each bar. The value is placed inside each bar.
- **Single-column** option will change visual representation of data. When this option will be selected, all defined bars, which have to be displayed next to each other, will be displayed in one bar column, one above another, so that each bar group will be represented by one single column bar for each bar, as displayed in the image below:

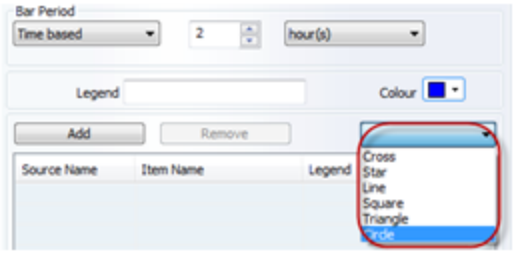


- **Pareto graph option enables bar graph to display all bar graphs in one group, sorted by its value, as** displayed in the image below
- **Show Bar Border** option, when checked, will draw a solid black border around each plotted bar.
- **Show Bar Interspace** option, when checked, will separate each "Bar Period" with a space. If left unchecked, all bars will be plotted next to each other without any spacing between bars.
- The **Bar Type** combo box enables selection of one of the following options for the visual bar representation:

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NOTE: If **Marks Only** bar representation type is selected, then in the **Bar Graph Definition** dialog window (below the "Color" section) a new combo box will appear (please see the picture below):



User will be able to select an option for the type of marks which will visualize the bar defined. There are 6 mark options available: **Cross**, **Star**, **Line**, **Square**, **Triangle** or **Circle**.

In the **Timestamp Format** combo box a user can configure the timestamp format to be displayed on the bar graph.

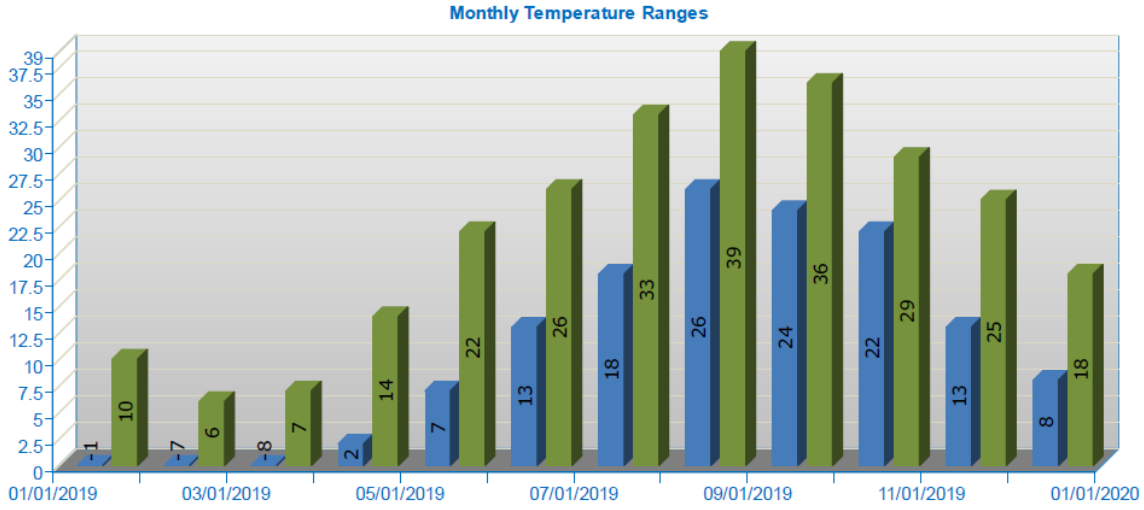
Grid settings

By enabling the **Display Grid on Y Axis** edit box, a user can define if the grid will be shown on the Y Axis of the bar graph object.

Then, a user can define any of three available grid setting options for the bar graph:

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- **Fine**: If this option will be selected, the grid will subdivide the bar graph object into small cells via fine-grid parameters. Values offered by default have been preset in such manner, that for most usual cases none of them needs to be adjusted.
- **Normal**: If this option will be selected, the grid will subdivide the bar graph object into small cells via normal-grid parameters. Values offered by default have been preset in such manner, that for most usual cases none of them needs to be adjusted.
- **Manual**: If this option will be selected, the grid will subdivide the bar graph object into small cells, which will have the Y-Axis value parameter (in mm) entered manually by the user.



Scale limit mode

User can define any of 3 available scale limit modes:

- **Automatic**: If this mode will be selected, the bar graph object will automatically detect minimum and maximum of all values, which have to be displayed in the bar line, and then set scale limits automatically according to that.

- **Automatic zero-based**: If this mode will be selected, the bar graph object will automatically detect maximum of all values, which have to be displayed in the bar line, and then set maximum scale limits automatically according to that. Minimum scale limit will be always zero.

- **Manual or item based**: If this mode will be selected, a user can manually enter a value for minimum and maximum limit for a scale. If you wish to use real-time tag values to set scale limits dynamically during report generation, you can double-click directly on a ***From*** or/and ***To*** edit box, and tag selection dialog window will be opened, where you will be able to select any available real-time data source and select any tag. Then, at the moment of report generation, the bar graph object will read the actual real-time value of that defined tag and use it to define limits of that scale.

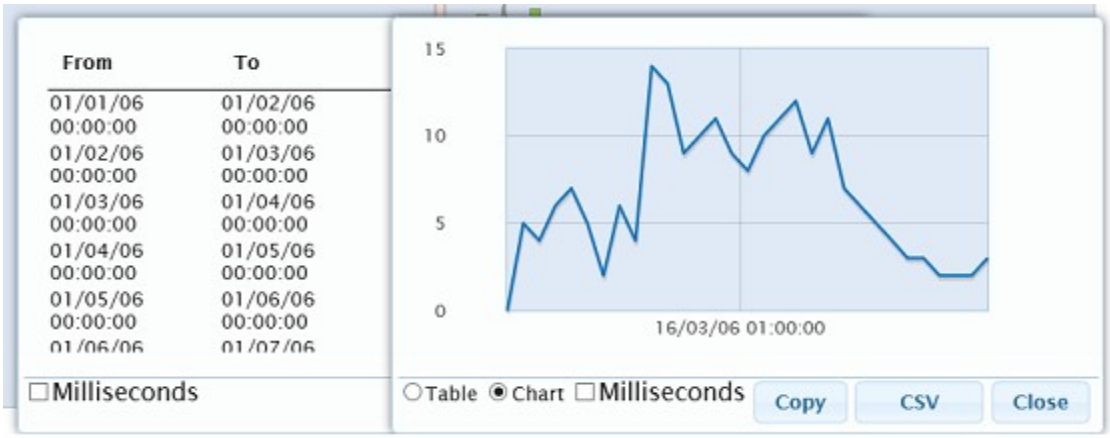
The **Display Style** options define formatting for different bar properties:

- **Title** - when this radio button is selected, you can specify the font type and size for the chart title. Also you can select text alignment, font style, font color and background color for the title text.
  To use a transparent background color for the title, open the background color palette and select "No color". This option is only applicable when "*Display Name*" check box is enabled.

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- **Legend** - when this radio button is selected, you can specify the font type and size for the legend. Also you can select the position of the legend - either on the bottom or on the right side of the chart. Also you can specify the font style, font color and background color for the legend.
  To use a transparent background for the legend, open the background color palette and select "No color". This option can only be applied when the "*Display Legend*" check box is enabled.

- **Show Raw Data in Web** check box allows users to display a bar as a data table in the Web Portal. In addition, by clicking on one of the values in the table, a user can display the raw values which were used for the calculation of that value. A user can also display raw values as a chart (see the example below):



- **Web interactive** check box will switch bar graph from static representation to an interactive visualization in the web. Static bar graph visualization will be represented exactly, as it's presented in designer studio or in PDF report. Interactive representation may differ from static one, but it will enable certain animation and will provide user certain dynamic interaction. This option is relevant only in web portal.

A user can copy the table or chart to clipboard or export it to a .csv file.

The **Advanced SQL Condition** section is described in details in the Advanced SQL Condition section. 222

16.3 Line Chart

Line Chart is an object that displays data in a chart.

To add a chart to a report, click the ***Chart*** button on the Report Designer Studio **Elements** toolbar:

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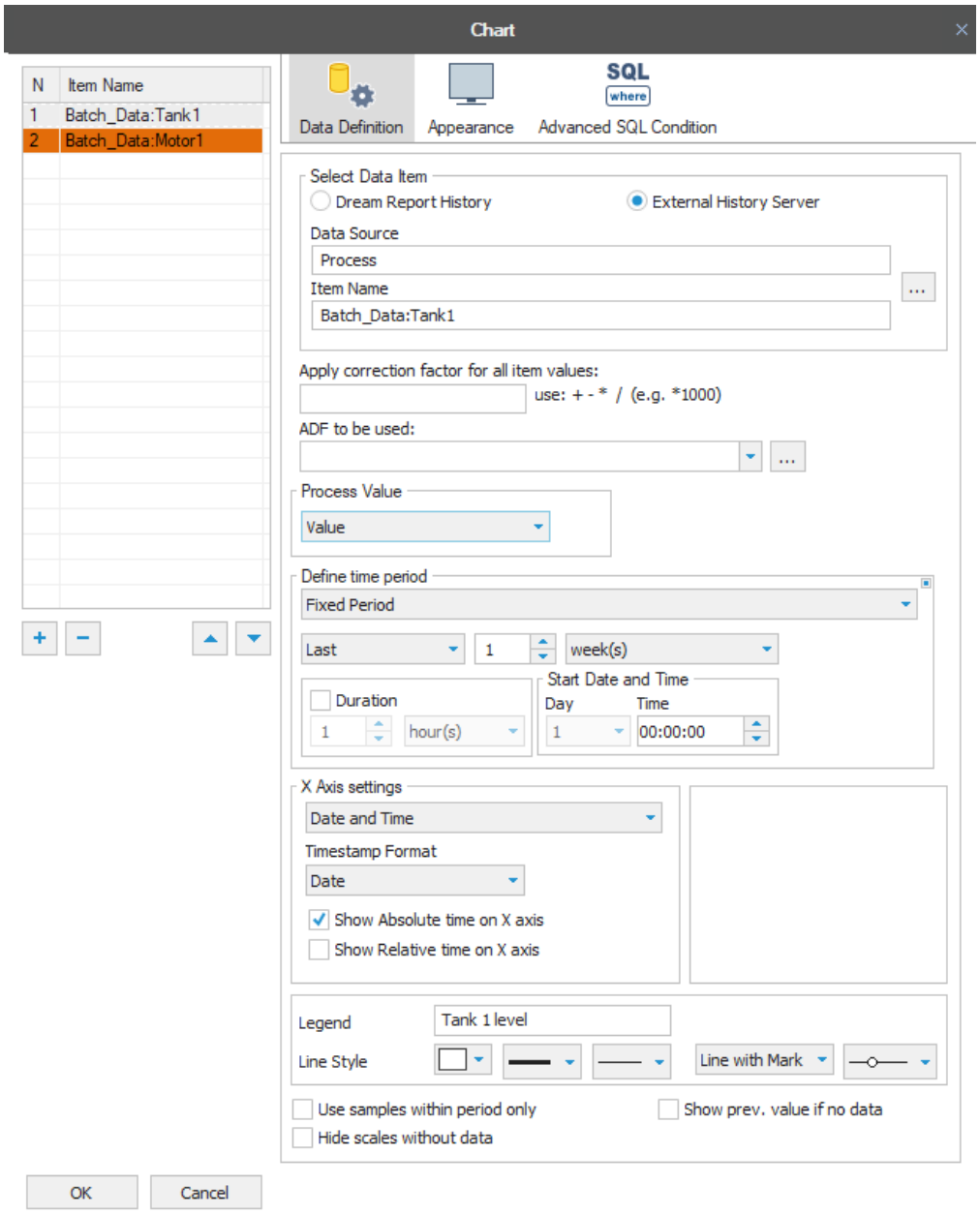
Draw a rectangle where you would like to place the chart in the report workspace, and the **Chart definition** dialog box will be opened.

16.3.1 Chart Definition

Chart Definition

The **Get Data From** radio buttons specify the kind of data source for the chart.

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The data source and data item can be selected from the relevant combo boxes in the **Select Data Item** group.

Select the desired data source and item, select the line color, line width and style, specify the line legend, if desired, and then click on the ***Add Line*** button. The line will be added to the chart.

The two *Up* and *Down* buttons under the configured lines on the left allow you to reorder the items/tags on the chart.

Apply correction factor for all item values enables adding simple expression to a chart. If a user needs to display a chart on item(s) with the correction factor, then, first, all values of the selected item(s) will be re-calculated, applying correction factor, and then, the chart will display re-calculated data.

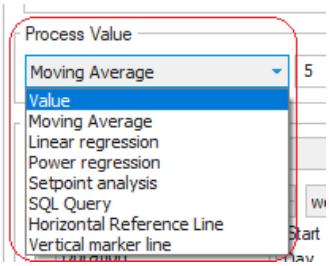
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For more details, please refer to the Correction Factor section.

ADF to be used: enables to select an aggregated data filter. "**ADF to be used**" combo box will contain all ADF definitions, configured in the project. The default string will be "**Not Used**", i.e. no filter (ADF) is applied.

For details on ADF definition/configuration, please go to the Aggregated Data Filter section of this manual.

Process Value section enables to select a statistical function for the chart object and has 6 available options:



Value will display a chart object according to the report item values selected.

Moving Average will display a chart object as an analyzed set of data items having created a series of averages of different values of a defined data value set. When you select Moving Average function in the **Process Value** section, an additional data box will appear:



You can enter a predefined number of values previous to the current one in this box. They will be taken for the calculation of the series of averages of the predefined data value set including the current one.

NOTE: If you leave the mentioned data box blank, the calculation will take the full data set in the defined period of time.

Linear Regression will display a chart object as a linear model, where data items are modeled using linear functions, and their model parameters are estimated from the data values set.

Power Regression will display in curved lines in a chart object the data sets, which compare measurements that change at a specific rate. The mathematical algorithm will analyze entered values in order to define "a" and "b" coefficients, so that when the curved line (matching the appropriate power regression function **y = a*x^b**) will be added, this line will display item values with the highest level of data approximation.

If a user selects the statistical function **Setpoint Analysis**, then the button "..." will appear next to the combo box with the statistical function, which a user has to click and select setpoints that he would like to analyze and display on the chart. Then, in the same window of the setpoint selection, user has to select which data items should be displayed on a chart. There are the following options available:

All items. The chart will display all items, defined for the selected setpoint.

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Fastest entry item. The chart will display only one item of those, defined in the selected setpoint, which was the first to enter the stability zone of the setpoint.

Slowest entry item. The chart will display only one item of those, defined in the selected setpoint, which was the last to enter the stability zone of the setpoint.

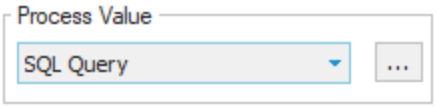
Fastest exit item. The chart will display only one item of those, defined in the selected setpoint, which was the first to exit from the stability zone of the setpoint

Slowest exit item. The chart will display only one item of those, defined in the selected setpoint, which was the first to exit from the stability zone of the setpoint.

Selected Tag. The chart will display the result of the calculations of the selected item/tag, which has entered and left the stability period.

When displaying the setpoint analysis, the chart will display a dash line to display a setpoint value and two horizontal dash lines to display min and max of tolerance. Stability zones will be marked with two small triangles and also put two vertical dash lines, which will help to detect start and stop of the stability zone.

SQL Query will enable users to execute SQL query or stored procedure and display the result of that query in a chart. To define the SQL query, user will have to click on the "**...**" (browse) button next to the SQL Query option (please see the picture below):



The standard "SQL Query Definition" window will be opened. Its configuration will be the same as the standard SQL Query definition in Single Data Objects (for details, please refer to the "Direct SQL Query" section of the Single Data Object Definition configuration window).

NOTE: SQL query in charts can return one of 2 types of data sets:
1. Timestamp and Values (one or multiple columns);
2. Values only (one or multiple columns)

The **Manual Data Entry** section supports entering a static numeric value that will be constant during report generation. This allows users to create a chart combining statistical data and static reference data.

In order to add manual data, click on ***Add*** button, enter the ***value/timestamp*** data for the selected item in the **Manual Data Entry** browse window that will be opened. If a user wants to change the data that have been entered manually, he will only have to click on ***Edit*** button, and make any changes in the data item selected.

Then, select the desired color for the corresponding line, enter a label for the legend, if needed, and click the ***Add*** button.

A line may have 3 possible **styles**, which can be selected from the combo box:

- **Line with mark** (default)
- **Line**
- **Marks only**

Styles are specified globally for all lines of a chart and cannot be assigned to individual lines.

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Time Definition defines the time period for statistical calculations for this object and is described in detail in the Time Definition section of this manual.

Time period definition can be defined for each line separately, i.e. each line may have its own time period, which may be different from periods of other lines.

The period can be time-based or Batch-based. This is described in detail in the Batch Definition section

X Axis settings section allows you to configure settings for X scale.

Upper combo box in this section offers two modes for X scale display: **Date and Time** and **Data Item** modes.

- If **Data Item** mode is selected, then this section will display data item selection control, which enables you to select a data item, which will be assigned to X scale. In this case, Dream Report will display X/Y chart, and display a line, based on the correlated points between values of an item, defined for X scale, and values of an item, defined for Y scale. You can also assign string type data to X scale. In this case, Dream Report will display X/Y chart with a line, based on the correlated points between string values of an item, defined for X scale, and values of an item, defined for Y scale.
- If **Date and Time** option is selected, then X scale will display a timestamp. User will be able to select a timestamp format from a combo box.

Check box **Show absolute time on X axis** enables displaying timestamp in absolute format (e.g. 'April 29, 2008 07:28:00')

Check box **Show relative time on Y axis** enables displaying timestamp in relative format (e.g. 00:00 ; 00:10 ; 00:20 etc.) - it will display amount of hours, minutes, seconds from the starting point of the time of that line. Time format will be automatically set, depending on the time value, which has to be displayed (e.g if timestamp doesn't contain hours, then only minutes and seconds will be displayed).

If both check boxes are checked, then two X-scales will be displayed, showing both absolute and relative time.

Enable scale X/ Enable scale Y check boxes allow to display on the X/Y axis of the chart data items configured.

User can select items to be displayed on the X/Y axis in the **Attach X axis to/ Attach Y axis to** combo boxes.

Use Samples within the Period option once enabled enforces the chart to show only values within the selected time period

Hide scales without data option once selected hides X/Y scales for tags that at the moment of report generation won't get any data out of its data source

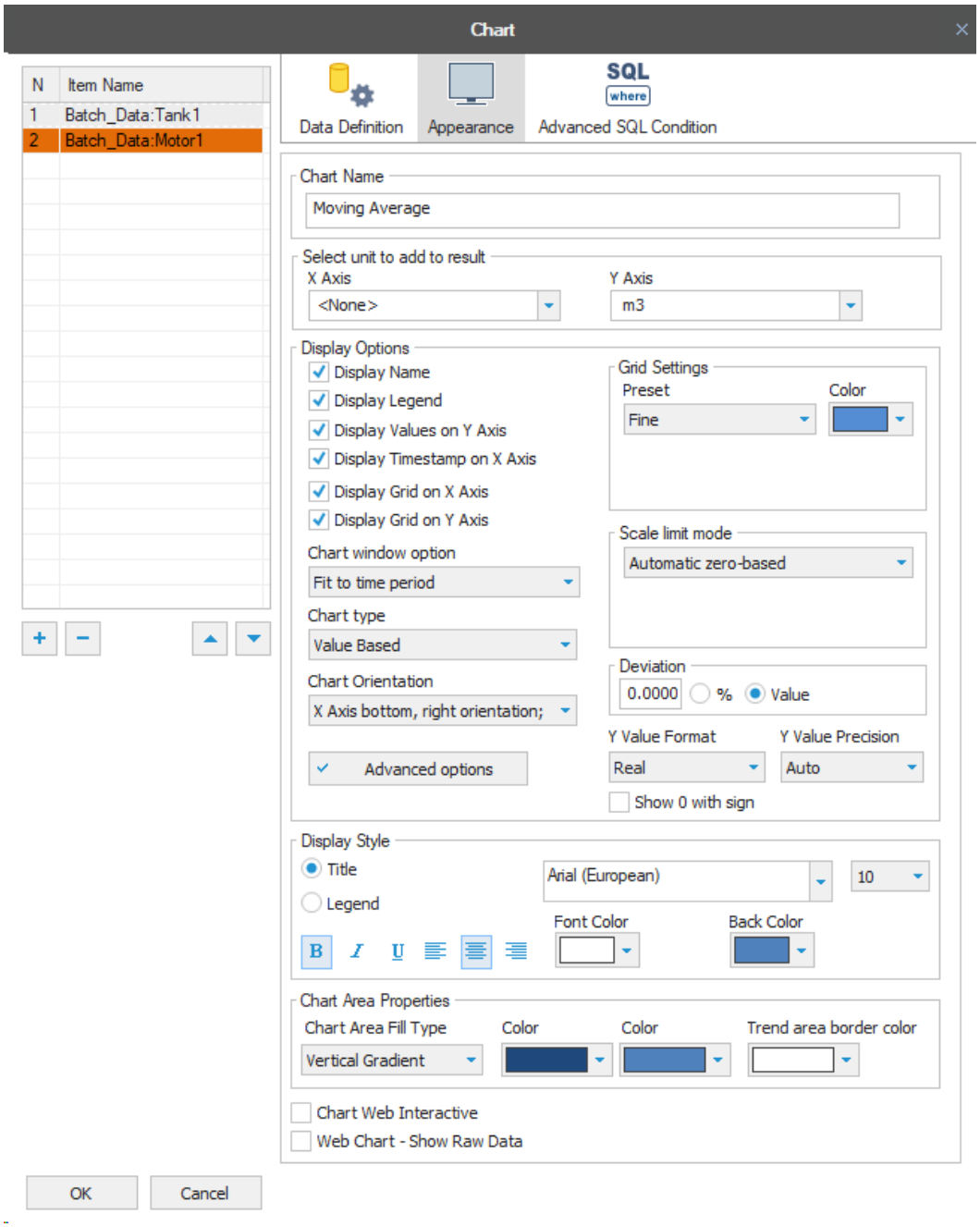
Show prev. value if no data option will allow presentation on the chart the available value for the tags from the previous time period

16.3.2 Line Chart Appearance

Line Chart Appearance

If a user clicks on the **Appearance** bar, the **Chart Appearance** configuration tab will be opened:

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The **Display Options** section contains the list of check boxes, which display/hide chart appearance elements.

The **Chart window option** combo box offers 2 user modes of drawing a chart window during run-time:

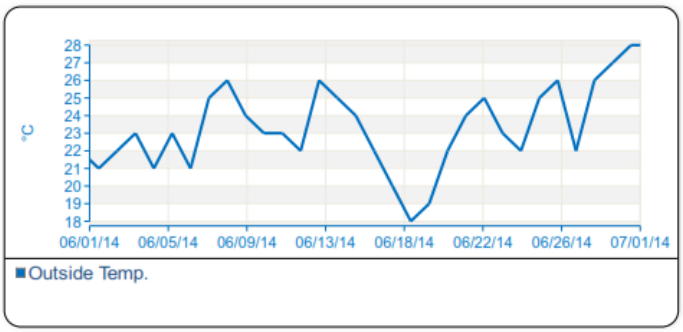
- **Fit to time period** option will force a chart to display full time period, which is defined for that line. If the chart is defined for a long time period and data for its data item exists only for a smaller period, then, the full time period will be displayed anyway.

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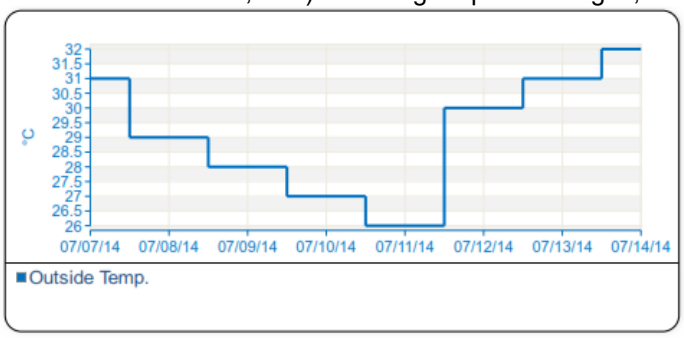
- **Fit to data** option will draw a chart window only for a period of time, when values for its data item exist. If the chart window is configured for 1 week and during report generation, its data item has values only during 1 day, then, the chart window will automatically be drawn for 1 day only. This option is very useful to display charts on batches.

The **Chart type** combo box offers 3 modes of drawing a chart line:

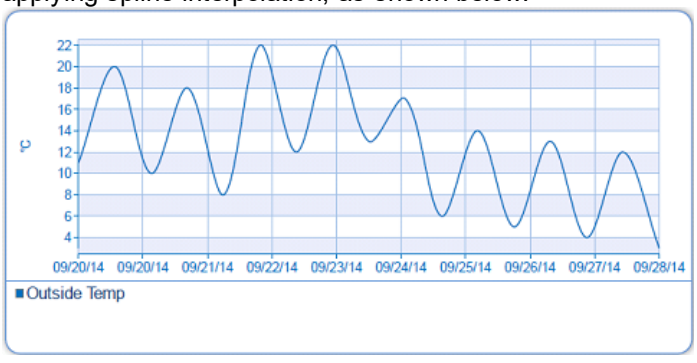
- **Value based** mode will draw a regular chart line, which connects all value points, as shown below:



- **Time based** mode will draw a horizontal line of a value until the time point, when the value is changed. This line type is usually used to display line chart for binary values (chart of run time of a motor or valve state, etc.) or analog setpoint changes, as shown below:



- **Spline value based** mode will draw a spline chart line, which connects all value points applying spline interpolation, as shown below:



The **Deviation section** enables a user to filter all item values and draw a line only on key values, optimizing a chart line and avoiding numerous minor value changes.

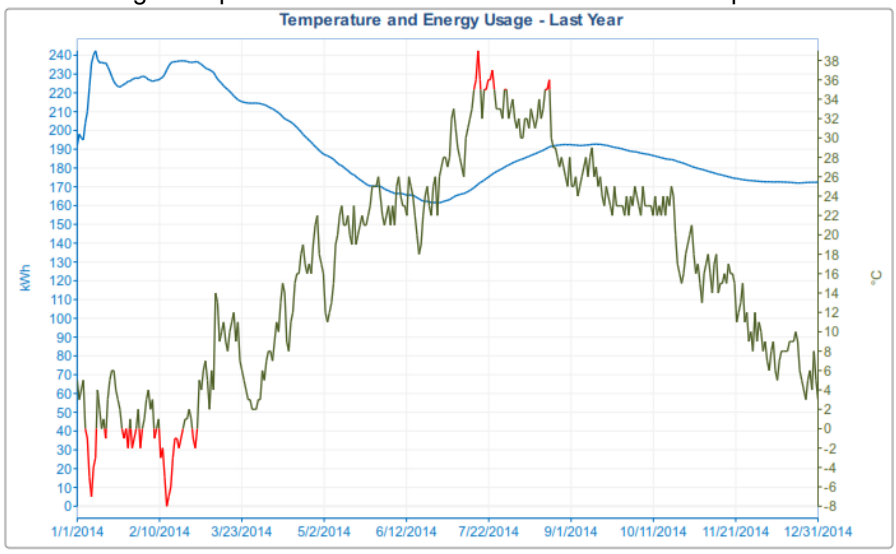
Deviation in % will analyze array of item values and each next value will be ignored if its difference is less % from value of previous valid point, than defined % of deviation.

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Chart Orientation

Dream Report 4.7 introduced a **Chart Orientation** option, which allows for the X-axis to be shown on the left or right side of the chart (instead of along the bottom). This is useful when you need to configure a "long chart" (possibly even spanning multiple pages) and orient the X-axis vertically.

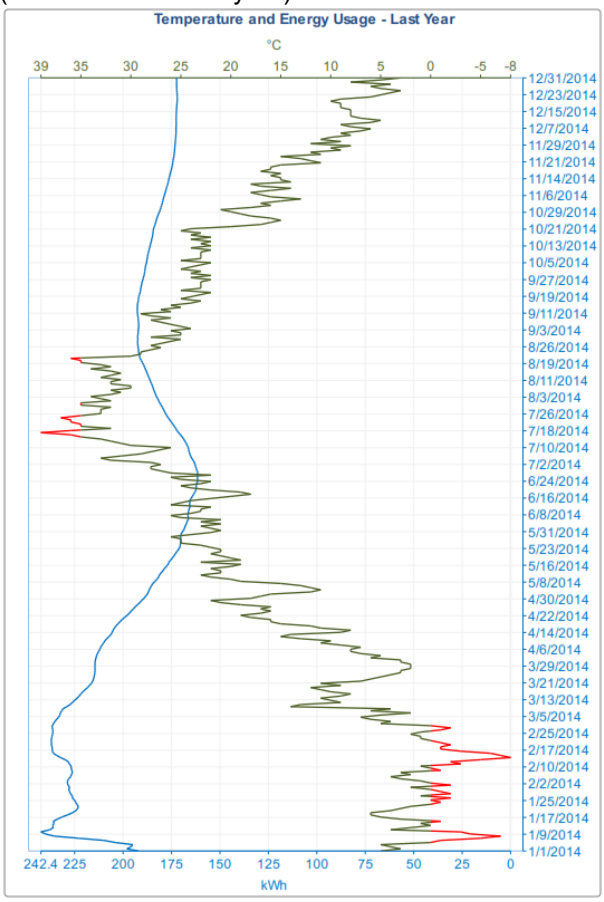
The following examples illustrate the various Chart Orientation options:



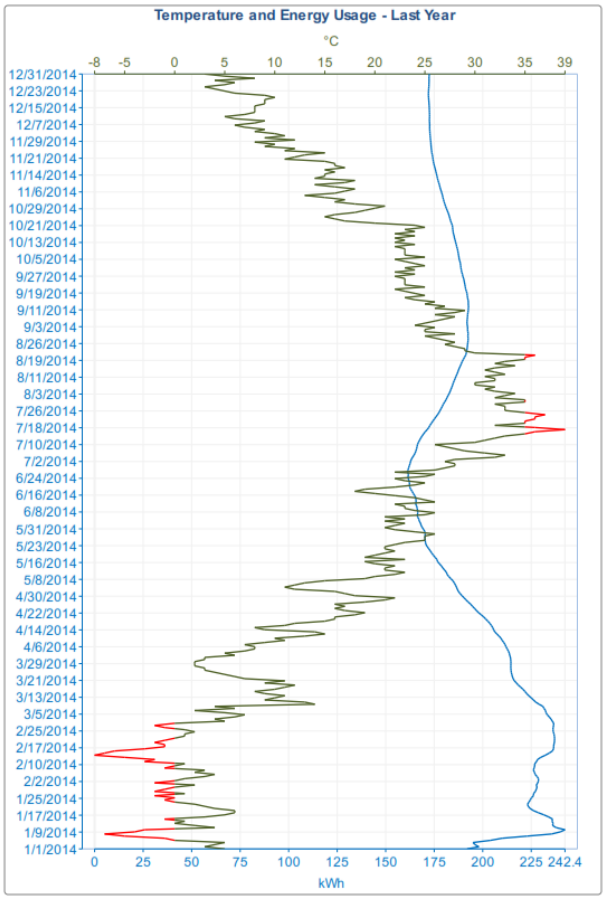
X Axis bottom, right orientation;
Y Axis left, up orientation

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(this is the default layout)



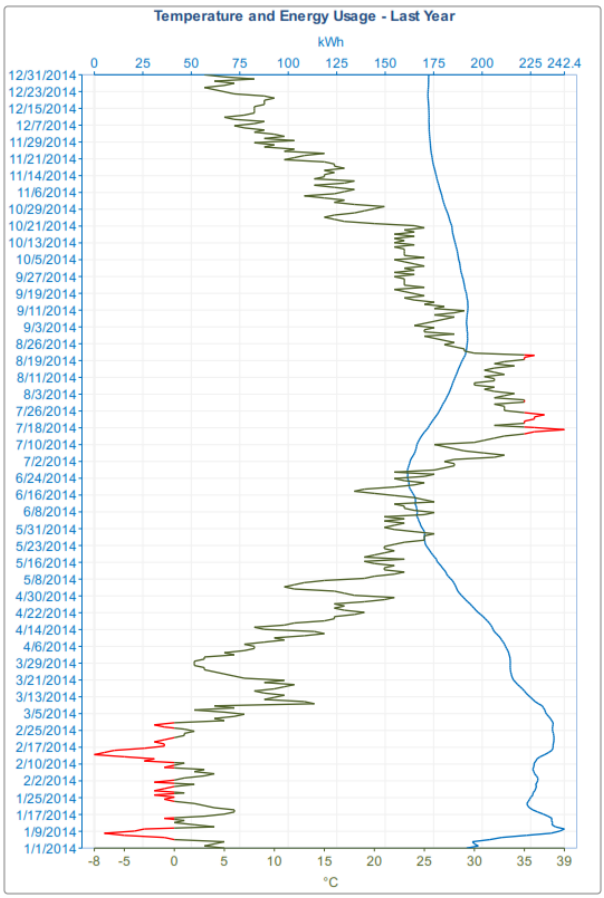
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X Axis right, up orientation;
Y Axis bottom, left orientation

X Axis left, up orientation;
Y Axis bottom, right orientation

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X Axis left, up orientation;
Y Axis top, right orientation

It is possible to have the “long” chart span multiple pages by creating a Pivot Group on the chart object - e.g., show the chart for the last 1 month, with each page showing 1 week’s data.

Grid settings

User can define any of 4 available grid setting options for the chart object:

- **Fine**: If this option is selected, the grid will subdivide the chart object into small cells via fine-grid parameters. Values offered by default have been preset in such manner, that for most usual cases none of them needs to be adjusted.
- **Normal**: If this option is selected, the grid will subdivide the chart object into small cells via normal-grid parameters. Values offered by default have been preset in such manner, that for most usual cases none of them needs to be adjusted.
- **Manual**: If this option is selected, the grid will subdivide the chart object into small cells, which will have the X/Y Axis value parameters entered manually by the user.
- **Aligned to value**: If this option is selected, the grid will subdivide the chart object into small cells, which will have the X/Y Axis value parameters entered manually by the user and adjusted according to the values set.

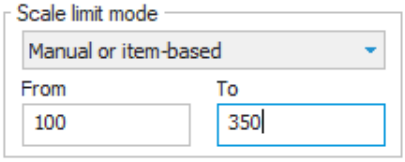
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- **Plotting paper**- the chart grid will be shown as a millimeter paper grid.
- **Equal spaced X –** used when the X values are not time values (for example – Batch ID), then the values will be evenly spaced on the X scale.
- **Logarithm (10) Grid** – In this mode, the Y scale will be replaced by logarithm (10) of the original values.

Scale limit mode

User can define any of 4 available scale limit modes:

- **Automatic**: If this mode is selected, chart object will automatically detect minimum and maximum of all values, which have to be displayed in the chart line and then set scale limits automatically according to that.
- **Automatic zero-based**: If this mode is selected, chart object will automatically detect maximum of all values, which have to be displayed in the chart line and then set maximum scale limits automatically according to that. Minimum scale limit will be always zero.
- **Auto-centered**: If this mode is selected, chart object will automatically detect minimum and maximum of all values, which have to be displayed in the chart line, and then will automatically center scale limits.
- **Manual or item based**: If this mode is selected, user can manually enter a value for minimum and maximum limit for a scale. If you wish to use real-time tag values to set scale limits dynamically during report generation, you can double-click directly on a From or/and To edit box and tag selection dialog window will be opened, where you can select any available real-time data source and select any tag. Then, at the moment of report generation, chart object will read the actual real-time value of that defined tag and use it to define limits of that scale.



All scale limits are set separately for each line, so, in order to change a scale limit for any specific line, a user has to select that line in the list and then edit its scale definition.



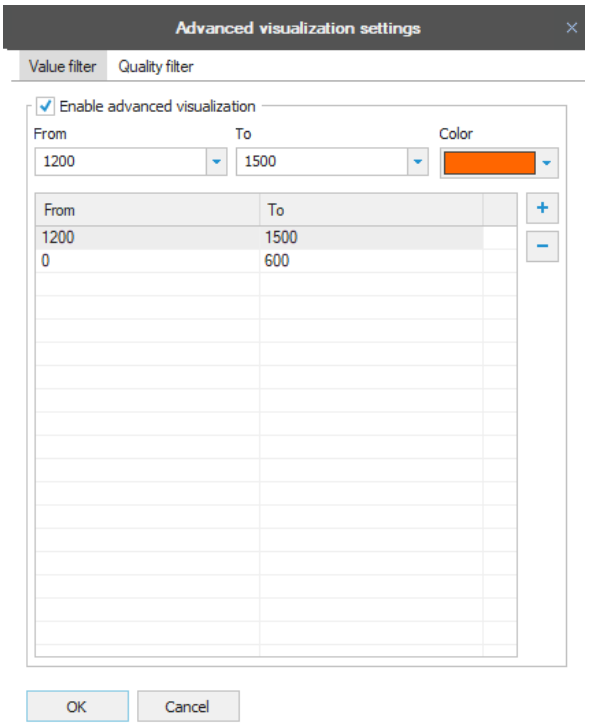
Format: specify the data value format – Real (example: 1500) or Scientific (example: 1.5E3)

Precision: set the decimal precision of Y-axis numbers (example: 1 = 1.5, 2 = 1.49, …)

Advanced Visualization

If a user clicks on the ***Advanced options*** button, the **Advanced visualization** dialog box will be opened:

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Here a user can enter one or several value ranges and corresponding colors. Then, when displaying a line in a chart, if a line value will be in a range, defined in the advanced visualization, then, the line will change a color to the one, defined for that value range in the **Advanced Visualization** section. As soon as the line value exits from that range, it will change its color back to the original one.

User can define one or multiple value range definitions.

Using tags to define limit range for Advanced Visualization

Values for advanced visualization can be taken dynamically from the real-time tag values. To do so, select tag names, instead of values, for **From** or/and **To** edit boxes. If you double-click on **From** or **To** edit box, the tag selection dialog box will be opened, enabling selection of a tag from any real-time data source.

When generating report, the chart object will read the real-time value of the selected tag and then use this value to define limit range for advanced visualization.

The **Display Style** section enables formatting of the chart's **Title** and **Legend**. Formatting options include font styles, text alignments, text and background colors and Legend placement (below or to the right of the chart area.)

The **Chart Area Properties** section enables formatting of the chart's plot area "background" - the **Chart Area Fill Type**. Fill Type options include:

- **Solid**
- **Zebra**
- **Vertical Gradient**
- **Horizontal Gradient**
- **Diagonal Gradient LT to RB** (Left Top to Right Bottom)
- **Diagonal Gradient LB to RT** (Left Bottom to Right Top)

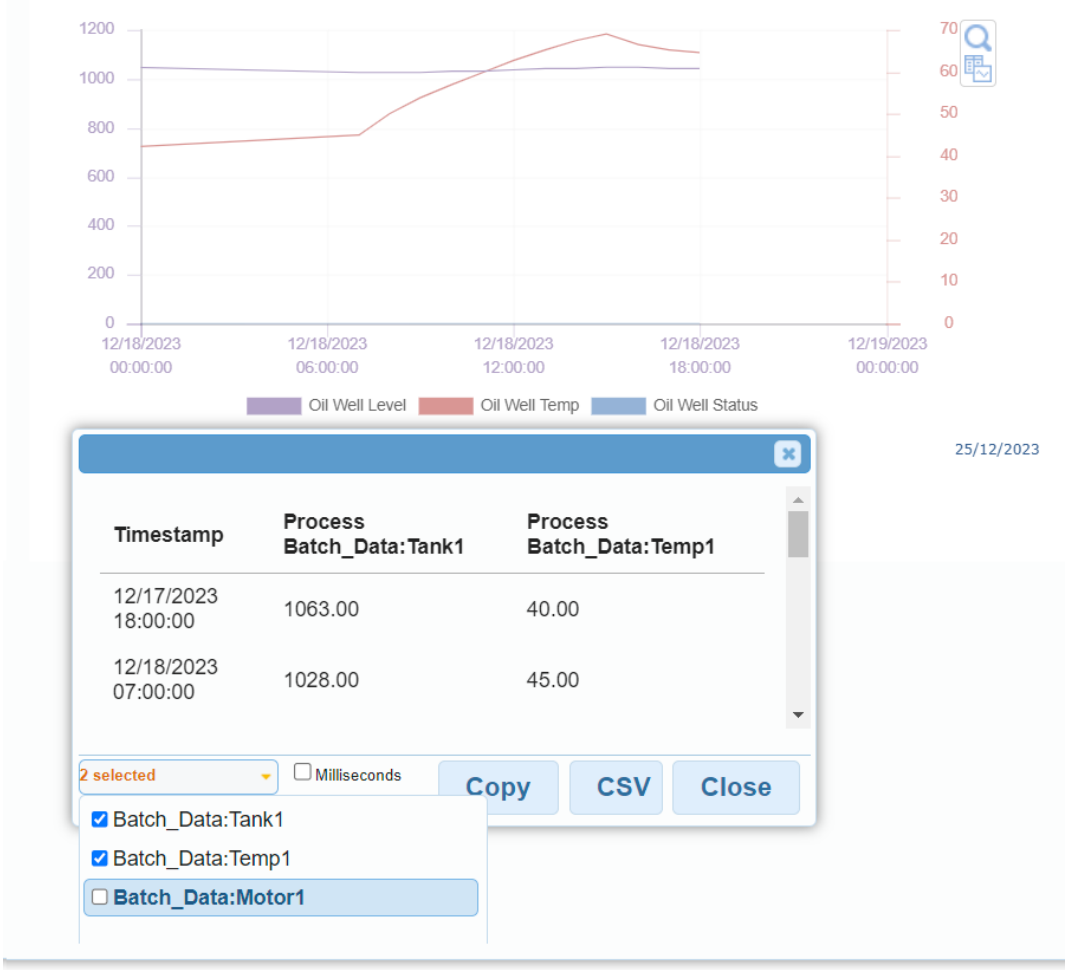
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Once a Chart Area Fill Type has been selected, make the appropriate color selection(s) to be associated with the fill type.

Web Report Options

If the report's format is set to "Web Report", additional interactive options are available on the Line Chart at runtime:

- **Chart Web Interactive** If checked, at runtime (on the web report) a user can dynamically show or hide pens (tags), use the mouse-wheel to zoom in/out on the chart, and hover over a point on the chart to display the tagname, timestamp, and the value at that point
- **Web Chart - Show Raw Data** If checked, the user can click on the "Raw Data" icon on the web interactive chart (highlighted in the red block above) and a pop-up window will appear over the chart. The user can select which of the tags' raw data they want to review, by selecting the tag(s) from the drop-down list, and then closing the drop-down list - the raw data will be displayed. The raw data can also be saved to a CSV file for further off-line analysis by clicking the "CSV" button:



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Web interactive check box will switch Pie graph from static representation to an interactive visualization in the web. Static Pie graph visualization will be represented exactly, as it's presented in designer studio or in PDF report. Interactive representation may differ from static one, but it will enable certain animation and will provide user certain dynamic interaction. This option is relevant only in web portal.

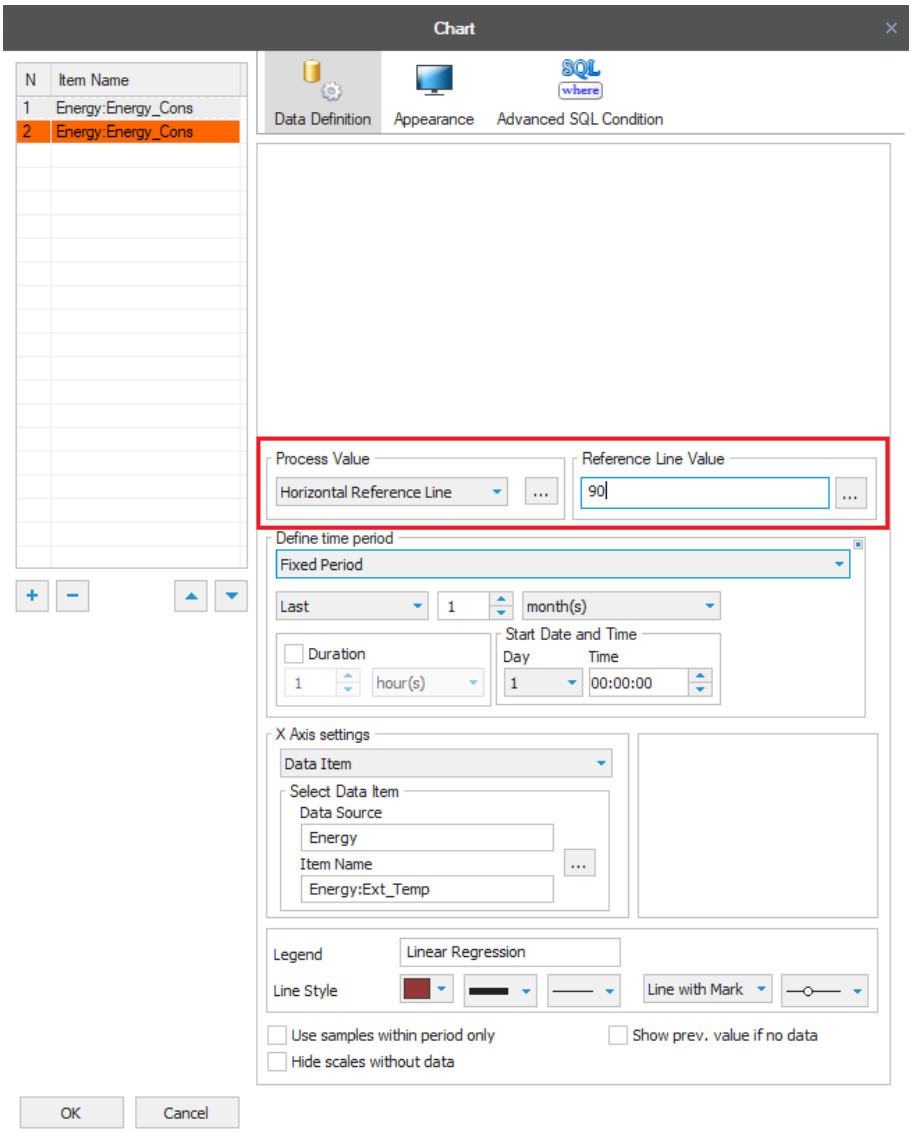
The **Advanced SQL Condition** section is described in details in the Advanced SQL Condition section. Please note that if an Advanced SQL Condition is defined, the filter condition will apply to all the lines on the chart.

16.3.3 Horizontal Reference Line

Horizontal Reference Line

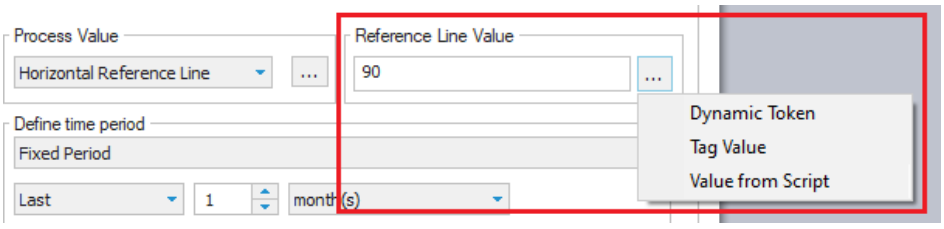
The **Horizontal Reference Line** is an option in the line chart that allows to specify a fixed line on the chart. This line could represent a target or setpoint value, a limit line, etc. To add a **Horizontal Reference Line** to the chart, select the "**Horizontal reference line**" option from the "*Process Value*" section on the Line Chart's *Data Definition* tab. When this option is selected, the "*Reference Line Value*" configuration will be displayed:

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Enter a static value (indicating the value of at which to plot the line) or click on the "**[...]**" button next to the edit box - a context menu will be displayed with 3 options:

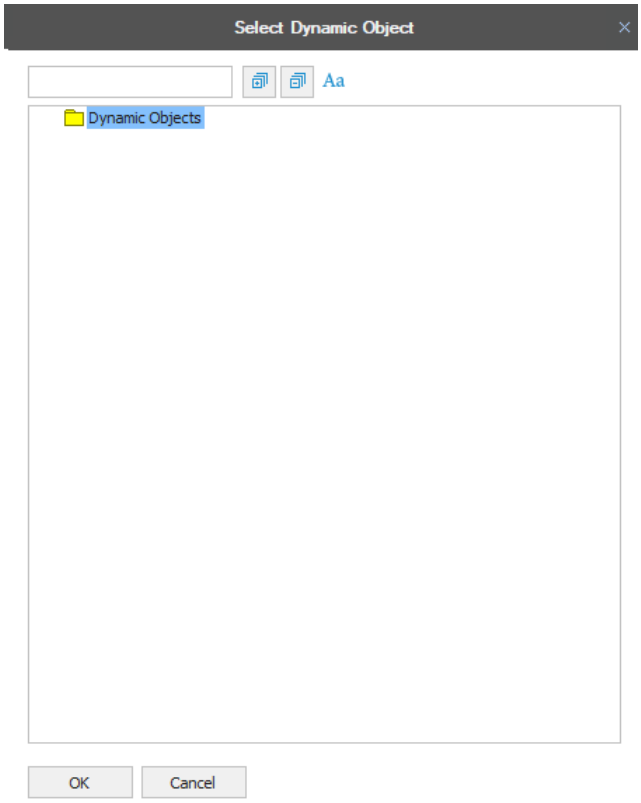
- Dynamic Token
- Tag Value
- Value from Script



- *Dynamic object* - if selected, a "*Select Dynamic Object*" will open, from which the user can select a Single Data, Compound, Expression or Combo box object from that specific report.

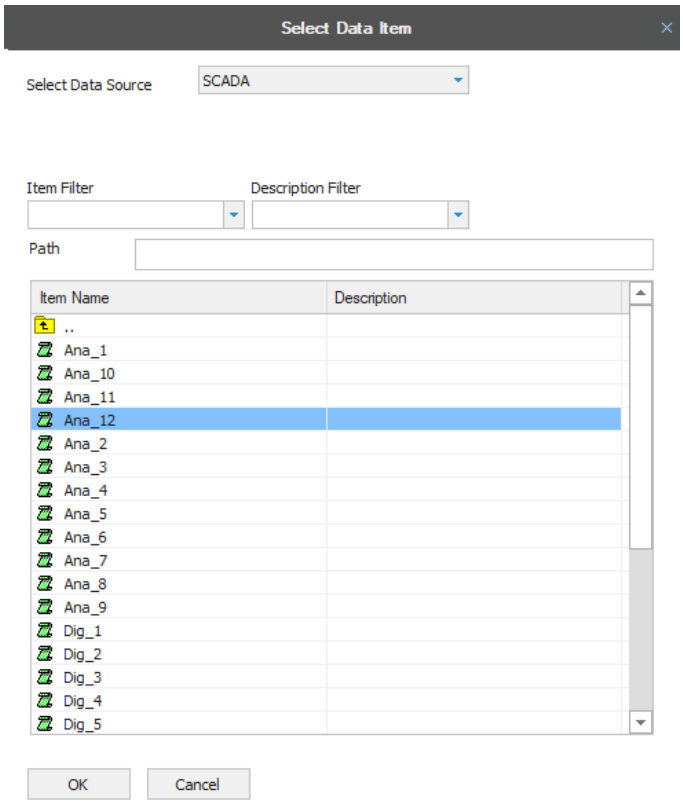
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When report is generated, then a static line with the value of the selected object will be drawn on the line chart.

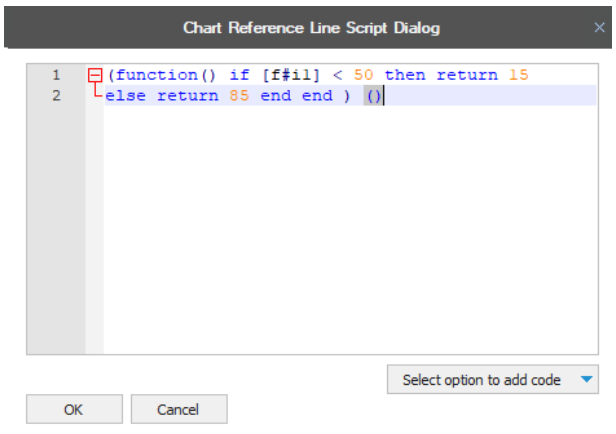


- *Tag value* - if selected, a standard "*Select Data Item*" window will be opened, from which the user can select a real-time tag. With this option selected, at the time of report generation, the chart will read current value of selected tag, and then will display a static horizontal line based on that value:

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- *Value from Script* - if selected, a script editor will open, allowing the user to enter a static value, write a mathematical expression, or a logical (Lua) script to calculate/determine the value to be used for the reference line. For example:



If the expression returns multiple values, then multiple values will be displayed on that line (with equal spacing between them). Only numeric values will be accepted. Any non-numeric values will be ignored.

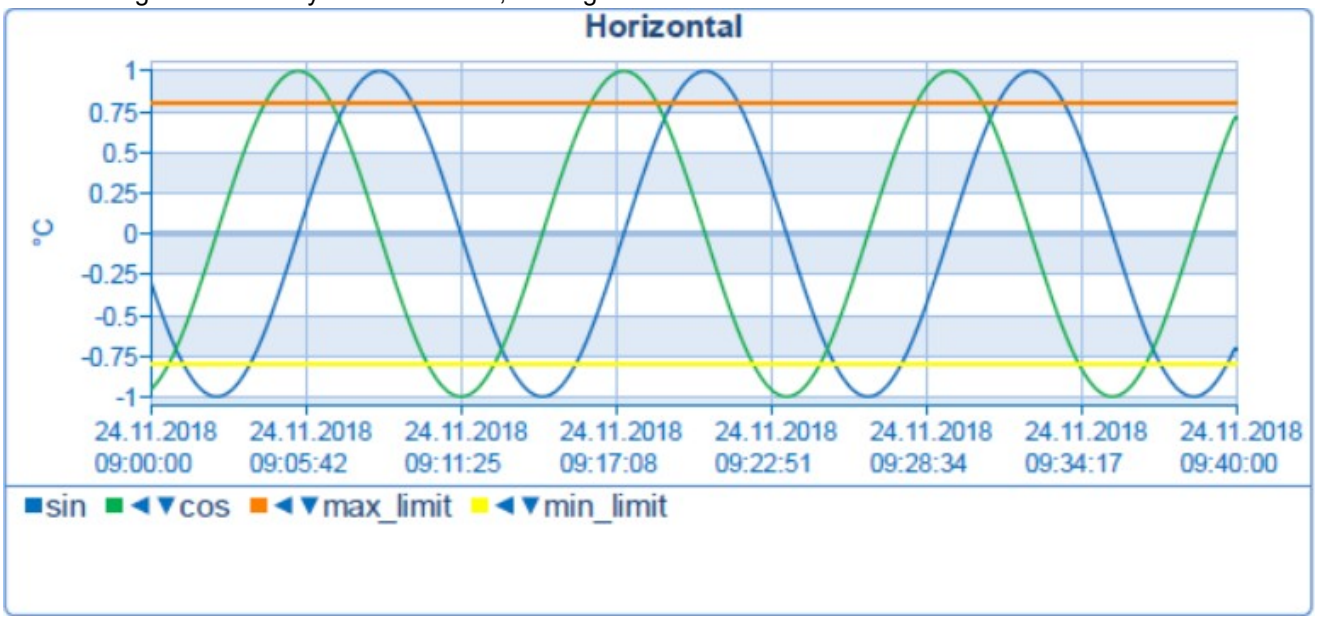
Note that when this option is selected, the “Select Data Item” section will be blank (the area where you’d typically select a tag from either a *Dream Report History* or *External History Server* data source).

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Once the *Horizontal Reference Line* has been configured, click "***Add Line***" to add the horizontal line to the chart.

NOTE: If dynamically replacing tags in a web report, the horizontal reference lines will be NOT replaced and will always be displayed as defined in the original line chart configuration.

The resulting line chart may look as follows, when generated:

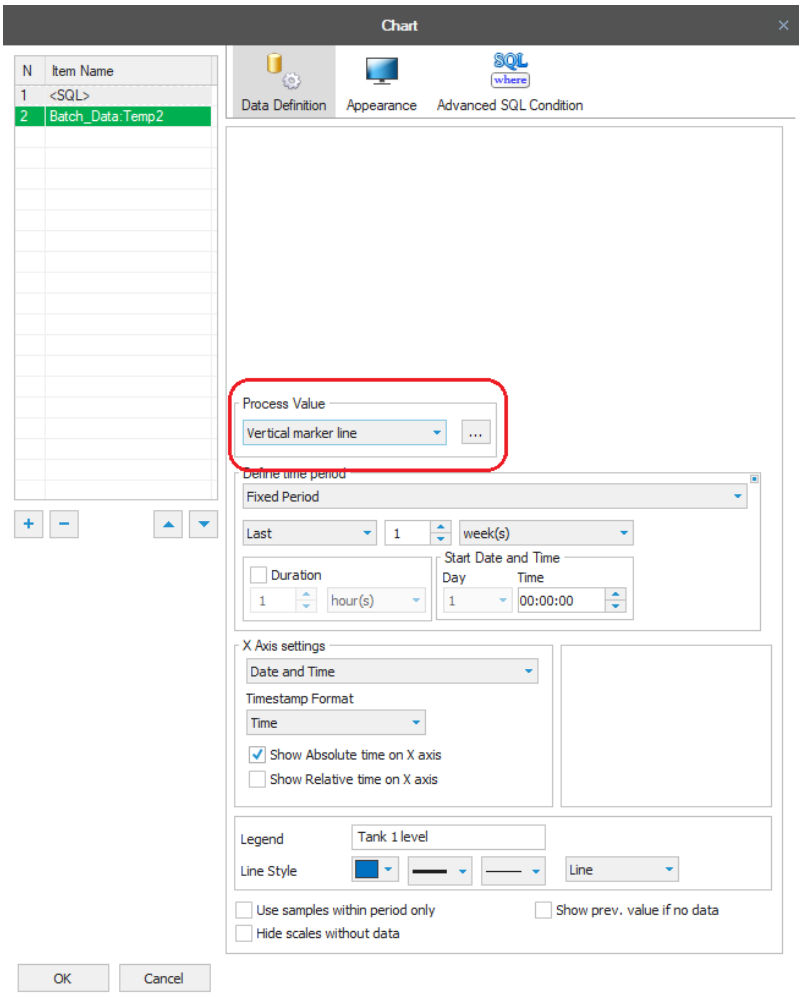


16.3.4 Vertical Marker Line

Vertical Marker Line

To add a vertical marker line to the chart, select the "**Vertical marker line**" option from the "*Process Value*" section on the Line Chart's *Data Definition* tab. When this option is selected, a "**[...]**" button will be displayed:

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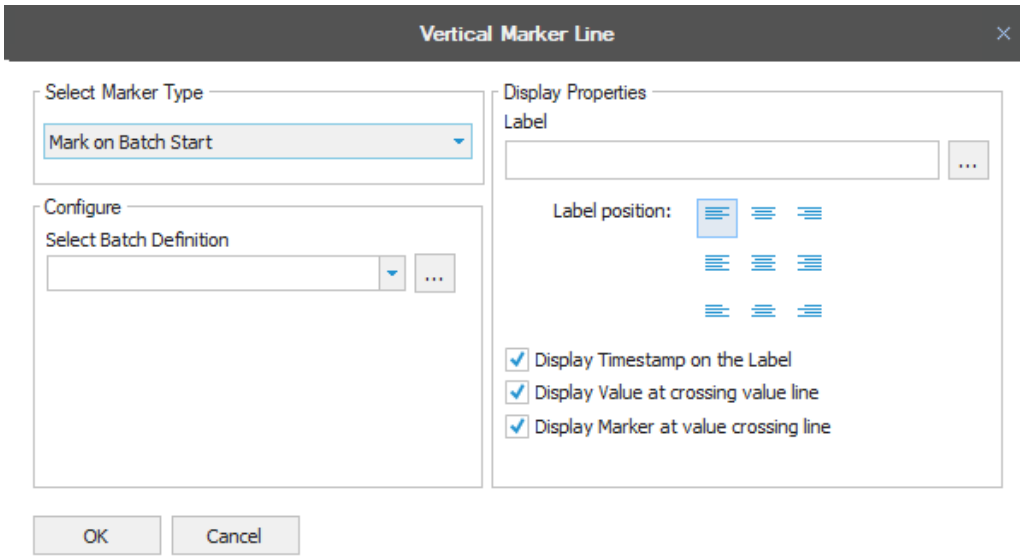


Click the "**[...]**" button to open the **Vertical Marker Line** configuration window. The *Marker Type* can be based on:

- Mark on Batch Start
- Mark on Batch End
- Mark on Object Value
- Mark on Timestamp

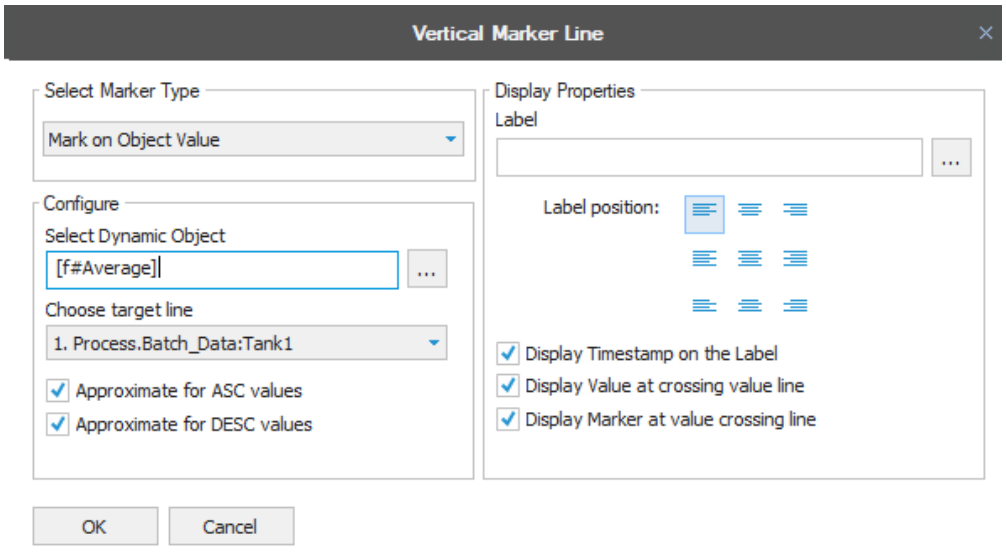
If "***Mark on Batch Start***" or "***Mark on Batch End***" types are selected, select the associated *Batch Definition* – for example:

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At report generation, the chart will check for all Batch IDs of this batch definition during the chart time period, get the start/end time for each found batch ID and for each batch start/end time, will draw a vertical reference line. For the vertical line **Label** (under the *Display Properties*), you can enter a static text label, browse for a dynamic object on the report that will contain the label you wish to use, or enter **$BatchId$**, which will result in the relevant batch ID being displayed as the label for each vertical line.

If the "***Mark on Object Value***" type is selected, select an object from the report that will be used as a comparison "reference" point – i.e., during report generation, the line chart will get the selected object's value, check the set of values of the selected target line and for each found match the chart, will draw a reference line. For example:



Approximation: If there is no exact value match of a logged value, but the target value was passed by the line – the chart will do approximation and draw a reference line at the corresponding timestamp.

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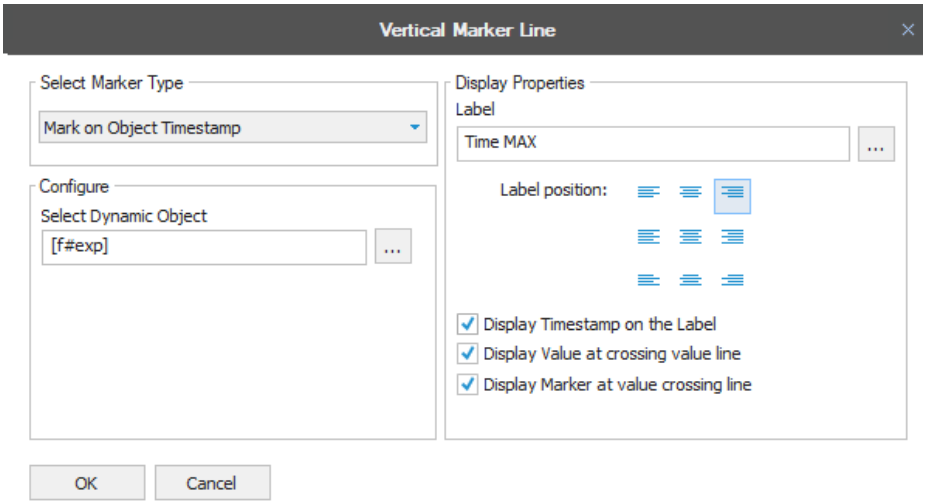
Example: the object values is 10. The target line has values: at 11:00 – 5, at 12:00 – 15. Then, using the linear approximation, the chart will calculate that at 11:30 the value can be considered as 10 and the reference line will be displayed.

If "*Calculate on ascending values*" is checked – value approximation will be used on ascending values in the trend.

If "*Calculate on descending values*" is checked – value approximation will be also used on descending values in the trend.

If neither check box is selected, no approximation will be used - only exact values will be searched for.

If "***Mark on Timestamp***" is selected, click "**[…]**" to select a statistical object on the report that will contain a timestamp value.



During report generation, the line chart will get the timestamp from the selected object and will draw a reference line at the specified timestamp.

16.3.5 Display Properties

Display Properties

When selecting a reference line, then the line style in the chart configuration window will be automatically set to a dashed line. This option can be changed.

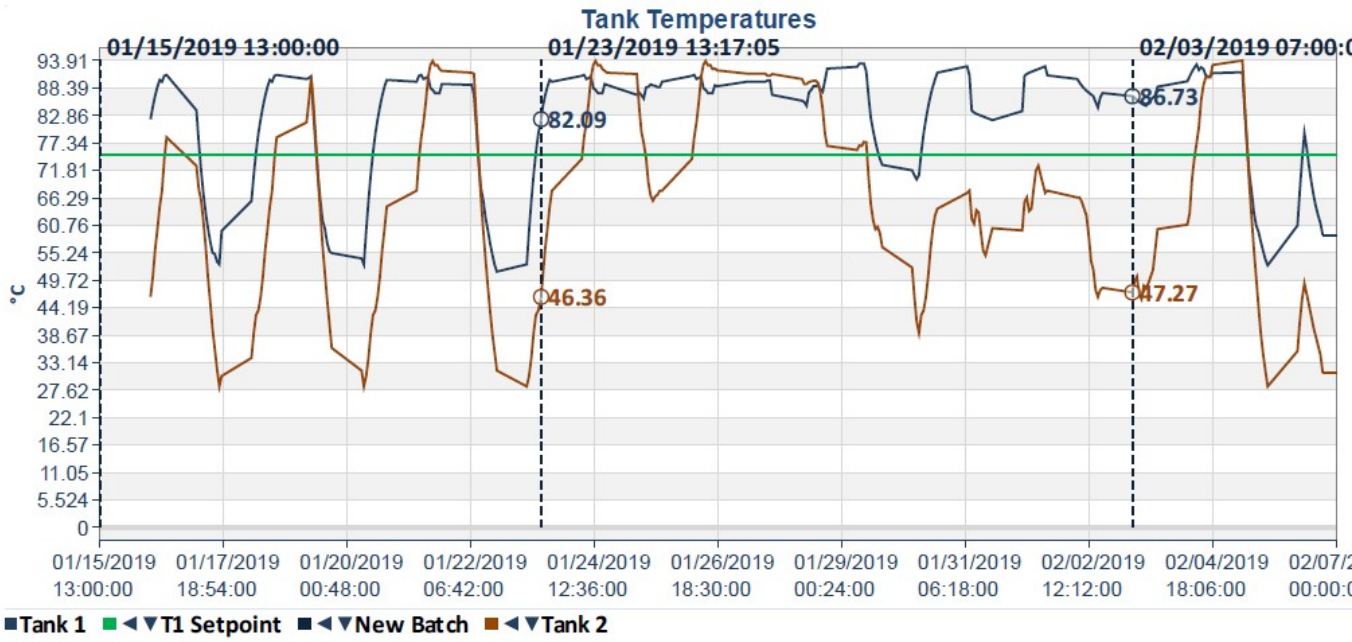
The *Vertical marker line* window has visualization display properties configuration. The user can specify a label, which can either be static text, or by clicking the "**[…]**" button, select a report object as a dynamic reference. Additionally, if the *Mark on Batch Start/End* options are used for the vertical line, the user can enter **$BatchId$** in the *Label* field, which will result in the relevant batch ID being displayed as the label for each vertical line.

The "*Label position*" selector allows users to select position for a marker label it can be above (left) the line or below (right) the line or on the line. Label text can be aligned left, center or to the right relative to the line.

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If "*Display Timestamp on the Label*" checkbox is checked, then the label will display a timestamp (in the project's Localization setting format) and then the label text will follow.

If "*Display Value at crossing value line*" is checked, then at each point of the crossing value line by that marker line, a value will be displayed. Note that in the following example, since the vertical marker line crosses two trend pends, both of those values are displayed at each vertical line:



If "*Display Marker at value crossing line*" is checked, then at each point of the crossing value line by that marker line, a round marker will be displayed.

*Please note, that the system may automatically change label positions to prevent colliding

16.4 Advanced SQL Condition

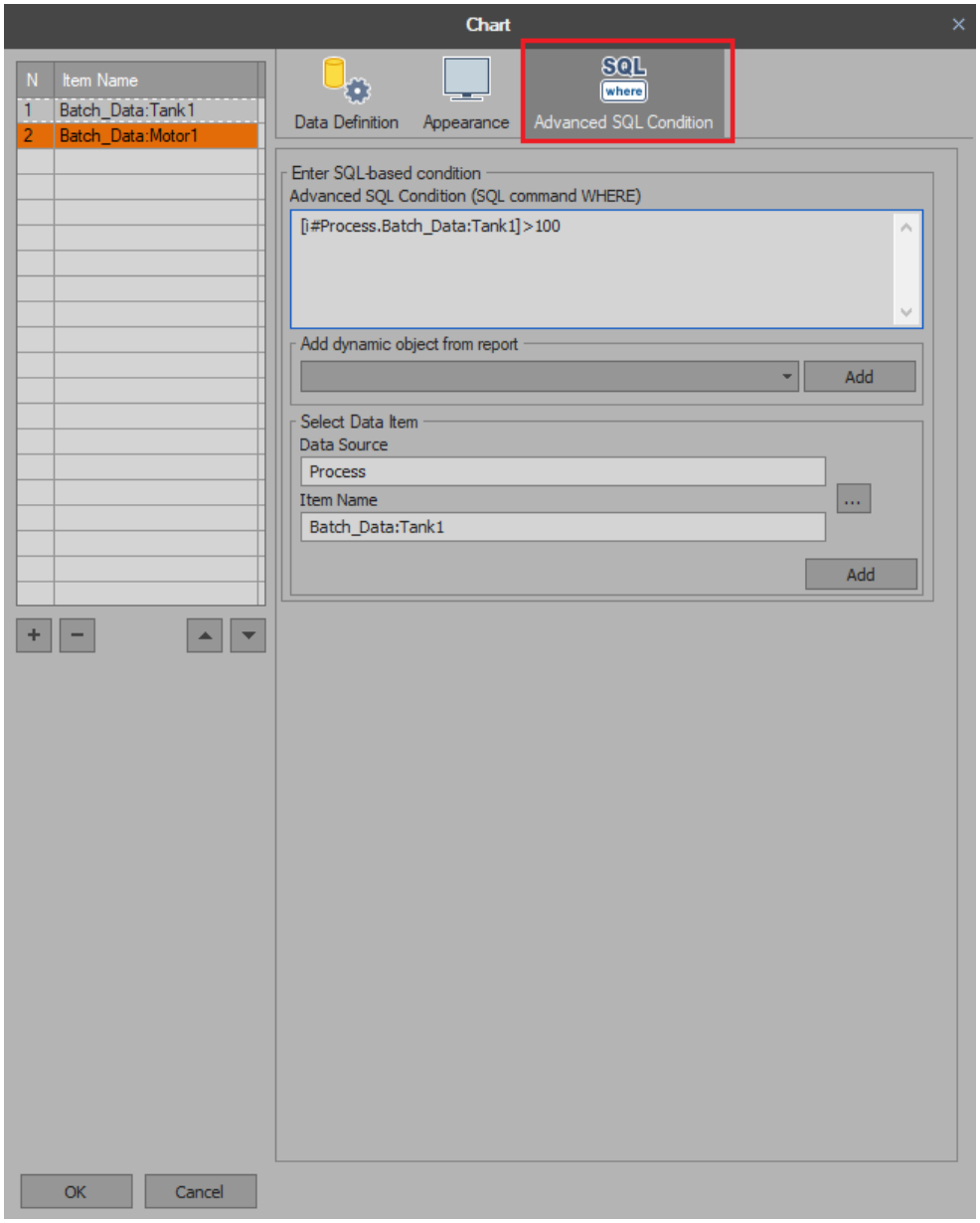
Advanced SQL Condition section in graph configuration allows user to add additional condition to retrieve values, required for that graph object.

Advanced SQL condition has the same configuration and the same functionality for a chart, a bar and a pie graphs.

If a chart has multiple data item segments defined (a chart with multiple lines, a pie with multiple segments, a bar with multiple bars) - defined advanced SQL condition will be applied to all data item segments. Advanced SQL condition is defined per object and not per data item segment.

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If user will click on Advanced SQL Condition button in the chart configuration dialog window, the following window will be displayed:



Advanced SQL condition field can contain any text in any format. When Dream Report will retrieve data for that graph - all text from *advanced SQL condition* edit box will be just added to WHERE statement of the data retrieval query (after AND operator). So, user has to be sure that text/string, defined in advanced SQL condition, will be correctly parsed and supported by the target data source.

If filtering has to be done using data items, then user can select a data item in *Select Data Item* section and click on the button *Add*. Then, when generating report and compiling the advanced SQL condition string, that data item name will converted in the right format (if communication driver, which is used, supports such a conversion).

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Dynamic tokens from report can be added to advanced SQL condition as well. If so, when compiling advanced SQL condition string, Dream Report will first calculate an object, used in advanced SQL condition and then will put its value at the place of its respective dynamic token.

Advanced SQL condition will be applied and used only, if the communication driver supports advanced SQL condition - that is the subject to specific driver's functionality. Most of drivers for SQL (ODBC) data sources do support advanced SQL condition. All drivers, which are based on SDK API or reading data from binary files - do not support advanced SQL condition.

Advanced SQL condition can be used, e.g. - get me values of a data item A, when data item B was ZERO, etc., i.e. it's additional filtering of data while retrieving it from the data source..

16.5 Indicator

Indicator object is an object that displays calculated data in the new standard representation way according to the latest energy reporting standards (eg. Energy Performance Charts (EPCs)).

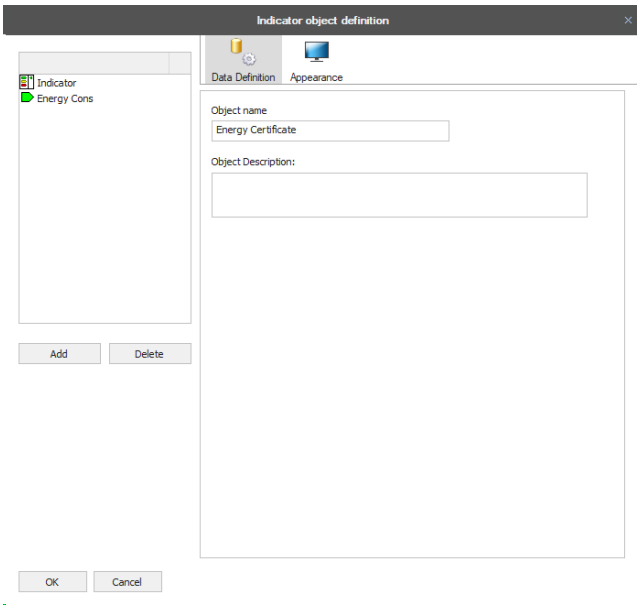
An indicator object will calculate the value according to the defined function or calculation, grade the result according to the preset grade of value ranges, and display the result with the grade mark.

To add an indicator object to a report, click on the ***Indicator*** button on the Report Designer studio Elements toolbar:



As soon as user clicks on the button and marks the area on the report workspace, the **Indicator Object Definition** dialog window will be opened:

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The **Indicator Object Definition** dialog window consists of 2 parts: **Data Definition** and **Appearance**.

Data Definition

The **Data Definition** dialog enables users to create one or several indicator definitions and display results accordingly.

Every indicator object can have (but not necessary) a name. If a user wants, he can type a name in the **Object name** edit box, and this name can be then displayed on top of the object.

To the left of the **Object name** edit box, there is a list with defined indicators. As soon as a user creates a new indicator definition, he will click on ***Add*** button, and the definition will be added.

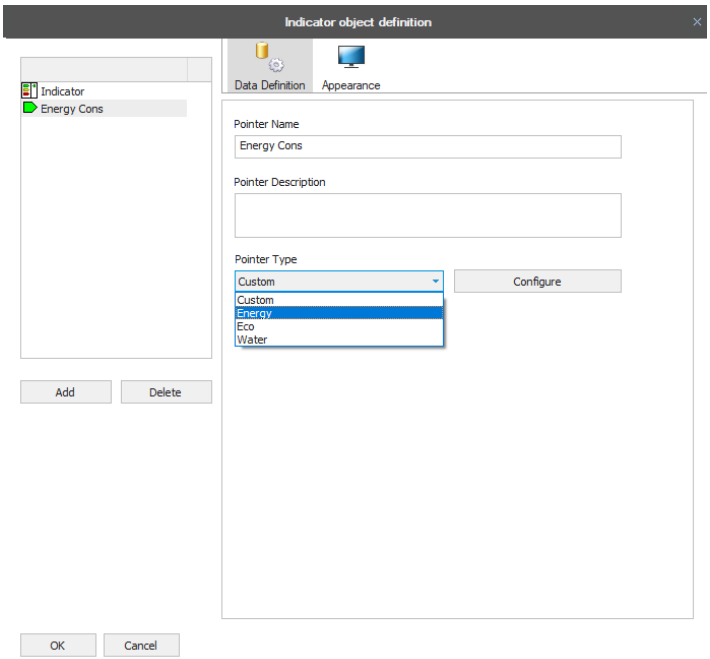
Every indicator definition has a logical name and will be added to the list by its name.

Any indicator definition can be deleted by clicking on ***Delete*** button.

Create a new indicator

To create a new indicator, a user has to enter a logical name for this indicator, and then to select its type from the list of the defined indicators. The following dialog window will be opened:

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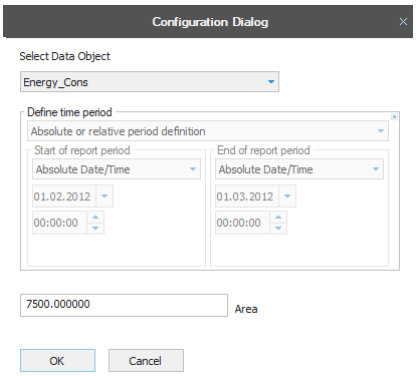
The **Pointer Type** combo box will have 4 values: 3 pre-configured types and the custom one. This combo box will have the following selection: **Energy indicator**, **Eco (CO2) indicator**, **Water indicator**, **Custom indicator**.

When a user has selected the required indicator type, he can then configure it. The preset indicator types and the custom one will have different configuration dialog boxes (***please see the corresponding sections below***).

Energy/Eco/Water indicators configuration

Energy Indicator will display how much energy was spent per m2 per year. Therefore, to calculate this indice, select an existing statistical object for energy consumption, select a time period, which is referenced to that object and has a possibility to enter the area (in m2 or /ft2). The selected statistical object value will be divided by area and then interpolated for 1 year according to the associated period (e.g. if the associated period is 1 year, the result will be multiplied by 12).
Eco Indicator. This indicator will display how much CO2 was emitted per m2 per year. Therefore, to calculate this indice, select an existing statistical object, which calculates CO2 emission, select a time period, which is referenced to that object and has a possibility to enter the area (in m2 or /ft2). The selected statistical object value will be divided by area and then interpolated for 1 year according to the associated period (e.g. if the associated period is 1 year, the result will be multiplied by 12).
Water Indicator. This indicator will display how much water was spent per m2 for per 1 year. Therefore, to calculate this indice, select an existing statistical object for water consumption, select a time period, which is referenced to that object and has a possibility to enter the area (in m2 or /ft2). The selected statistical object value will be divided by area and then interpolated for 1 year according to the associated period (e.g. if the associated period is 1 year, the result will be multiplied by 12).
User can configure any of those preset types (**Energy Indicator**/ **Eco Indicator**/ **Water Indicator**) in the ***Configuration*** dialog window, which will appear after clicking on *Configure* button, next to the **Pointer Type** combo box:

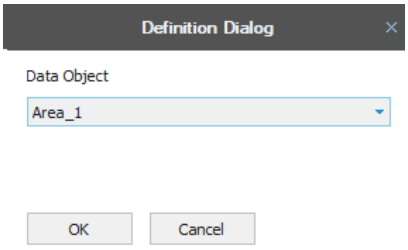
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The **Select Data Object** combo box in this dialog box will contain the list of Single Data Objects, Compound and Expression objects, already existing in that report. As soon as any one of the existing objects has been selected, the **Time Period Definition** combo box will appear, showing the original time period settings of the data object selected. This time definition will be taken for the indicator. Then, define the area, which the selected object may enter during the defined time period, click *OK*, and the configuration of this type of indicator (**Eco/Water/Energy**) will be finished.

Custom Indicator Configuration

Custom Indicator. This indicator will display how much energy was spent to heat/cool 1 m2 for 1C degree. Therefore, to calculate this indice, select a tag for energy consumption, select a tag for a temperature, that has a possibility to enter an area (m2). As soon as a user selects this type, the following dialog window will appear:

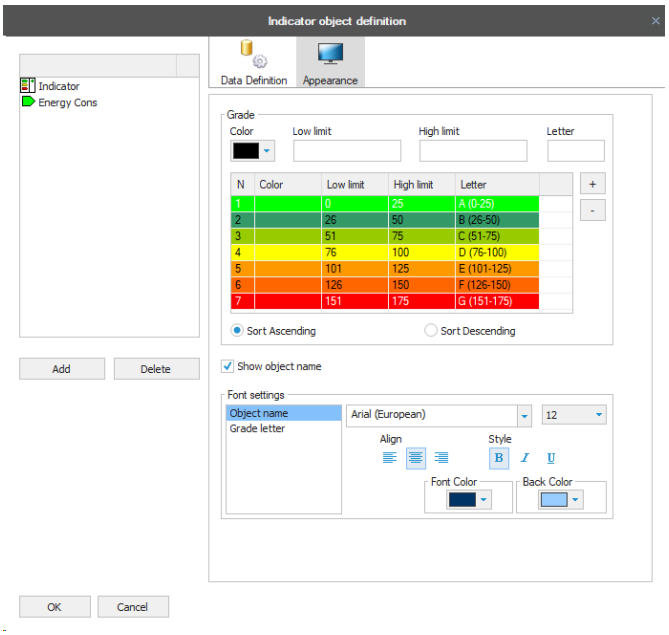


The combo box in this dialog box will contain the list of Single Data Objects, Compound and Expression objects, already existing in that report. Select one of the existing objects and its result will be taken for the indicator.

Appearance

If a user will click on the ***Appearance*** float bar, the following **Appearance** dialog window will be opened:

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All **Appearance** configuration is saved separately per each indicator definition.

Grade definition is done in the "**Grade definition**" section.

User will add limits (**High** – **Low**), define grade color and add segment to the list. By default all added grades will get alphabetic enumerated Grade letter: A, B, C, D, …

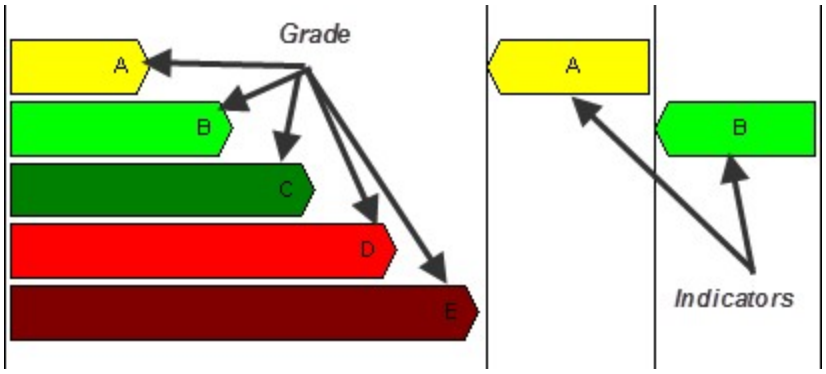
If a user wishes to replace letter label by another one, he can double-click in the list control and edit the grade label (e.g. like it works in item or alarm table for table column caption).

If a user wants the name of the indicator to appear on the picture, he will have to enable the **Show object name** box.

User can also define typeface for the defined objects in the *Font settings* part of the **Grade definition** dialog window.

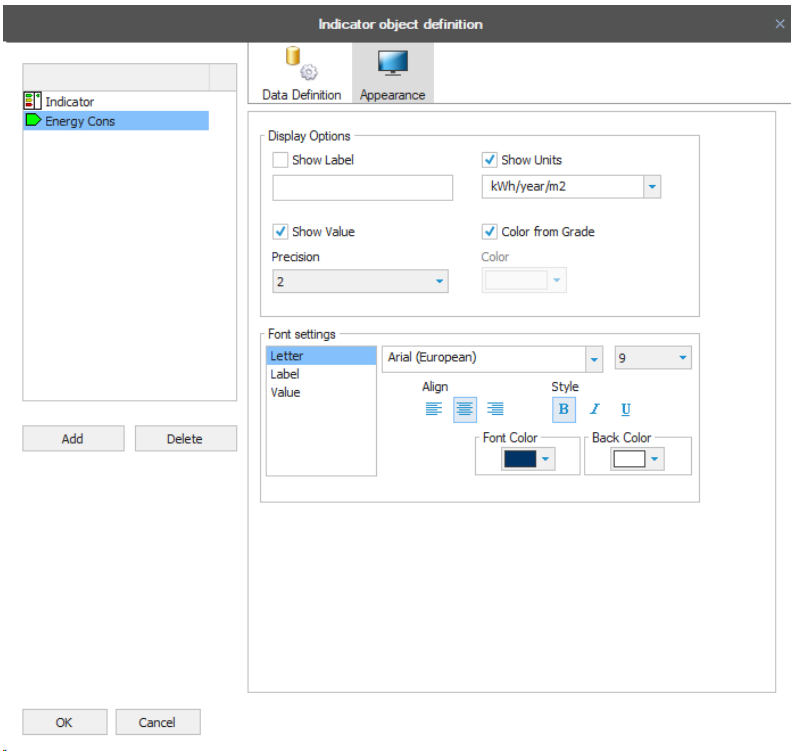
NOTE: **Grade definition** dialog window will appear if Indicator object on the defined indicators tree is selected.

The grades and the indicators defined will be displayed as on the picture below:

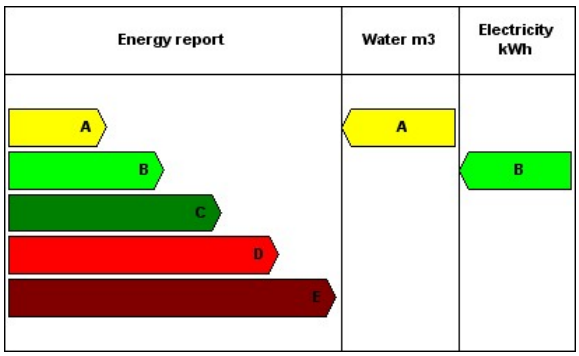


If a user will select one of the indicators from the list, then, the following dialog window will be opened:

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In the **Display Options** section a user can enable displaying labels, units, values and the color for each indicator selected from the list.
The typeface for each indicator object selected can be defined in the *Font Settings* section of the **Appearance** dialog window.
Click ***OK***, and the picture of the result indicator object will appear as displayed on the picture below:



This picture is an example of the ***Indicator Object***, where **Energy report** is the **object name**; **Water**, **Electricity** are **pointer names**; **m3**, **kWh** are **pointer units** (with enabled display); **A**, **B indicators** on the right correspond to each of the **pointers** defined in the ***Appearance*** dialog box; **A**,**B**,**C**,**D**,**E grades** on the left correspond to the indicator appearance

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Electronic-Signature

17 Electronic-Signature

Electronic signature (e-Signature) functionality provides users the ability to electronically sign generated PDF reports. The e-Signature function is enabled with the Dream Report *Life Sciences* license option.

One or more e-Signature objects can be added to a report page. Only PDF reports can be e-signed. If the report has multiple output formats and is to be electronically signed - only the PDF report file will be updated with the completed signature object(s).

When a PDF report with one or more e-Signature objects is initially generated, the unsigned PDF report file will be copied to the user-specified *"Unsigned Reports"* folder – this is specified in the "General" section of the Report Settings. All meta data with the internal content of that PDF report will be recorded into a dedicated meta-file. If Dream Report will need to re-generate that PDF report with its original content, it's available at any time using its meta data.

Once the authorized user signs the report, one of two things will happen:

- If only one e-Signature object exists on the report, the report is considered fully signed. The "unsigned" version of the report is removed from the *"Unsigned Reports"* folder, and the final, signed copy will then copied to the permanent report location folder;
- If the report is signed and it has still at least one unsigned signature object
- - that PDF report file will be re-generated exactly as is, using its meta data, but will be placed in the "*Uncomplete Reports*" folder. Only once the last e-Signature object is signed and the report file is signed completely will it be re-generated with all e-Signature objects filled in, and then copied to the permanent report location folder, defined in report settings - general section.

Electronically Signed Report States

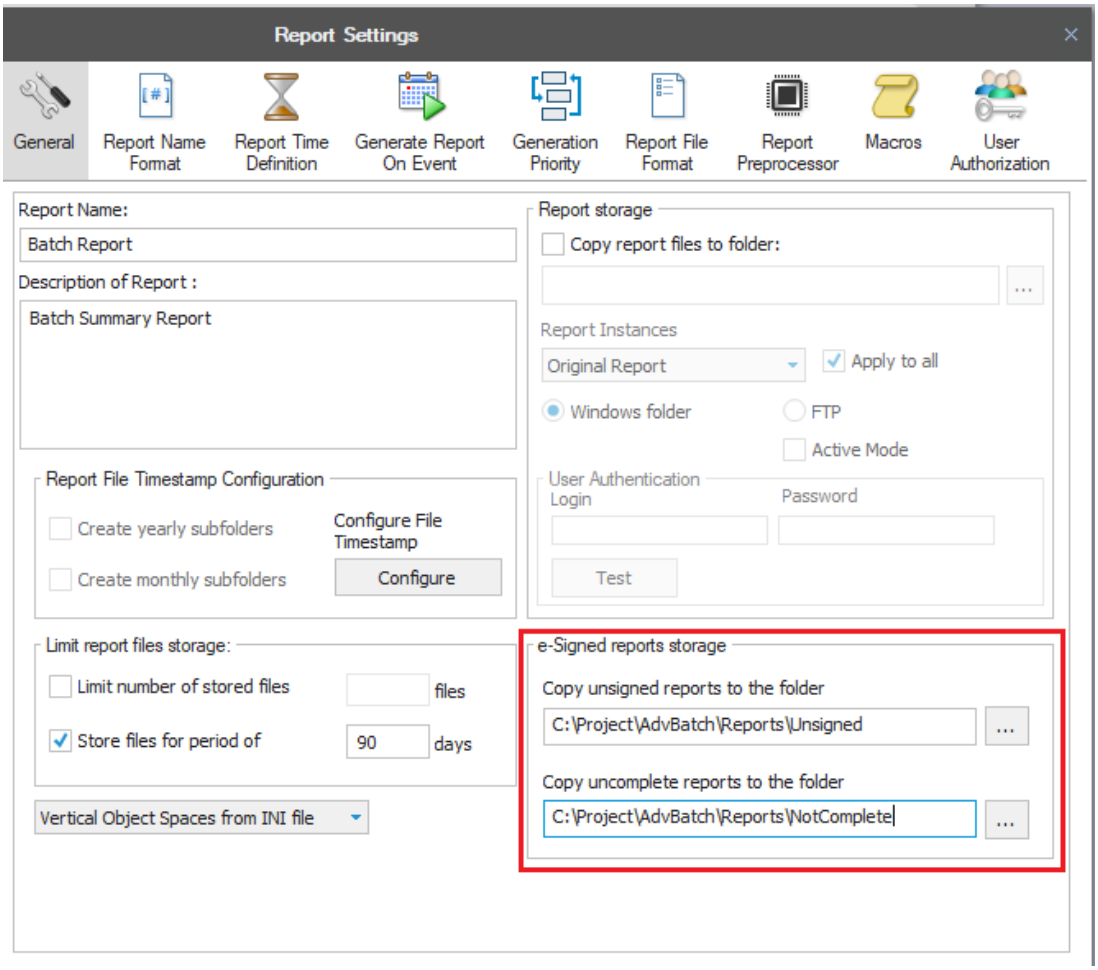
If a report requires a signature, there are 3 possible states of the generated report:

- **Not signed** – a report which has at least one electronic signature object, and none of them are yet signed.
- **Signing in progress** – a report which has more than one electronic signature object, and at least one of them is signed, and at least one of them is not signed. This is a report whose signature process has been started, but is not finished yet and is still in progress (i.e., not yet completed).
- **Signed** – a report that contains at least one e-Signature, where all of its signatures are signed and completed.

Signed Reports Folders

In the *General* tab of a report's *Report Settings*, a user can specify folder locations to which to save not signed ("unsigned") reports, and not completed ("uncomplete") reports:

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Completed (fully signed) reports will be copied to the permanent folder, defined in

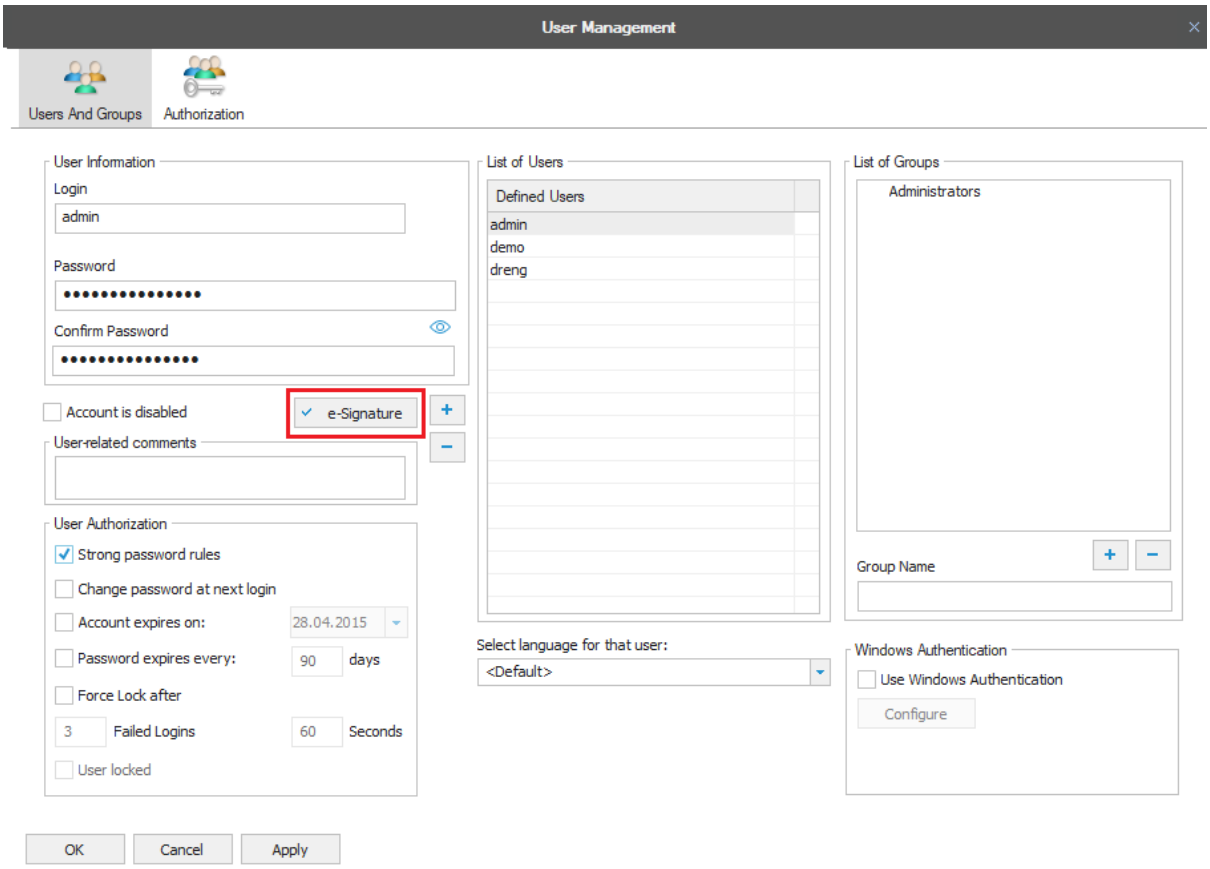
Project Settings ➔ *Path,* and

Report Settings ➔ *General* ➔ *Copy reports to folder* (if defined)

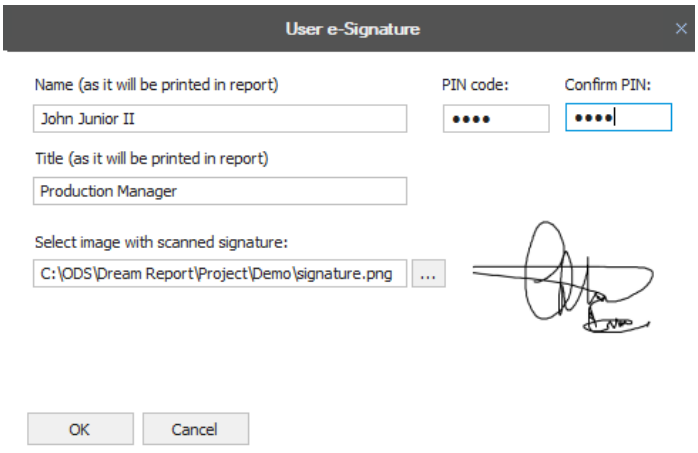
Defining a User's E-Signature

Individual user accounts can be assigned electronic signatures under the *Users And Groups* definition section in the User Management Configuration:

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Select a user, and then click the "*e-Signature*" button. The *User e-Signature* configuration window will open, which will allow you to configure electronic signature properties for that specific user:



The *Name* field should contain user's full name, as it will be printed in report - this does not need to match the Dream Report/Windows login/username.

The *Title* field has to contain the user's official Title, as it will/can be printed in the report.

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Select image with scanned signature allows you to select and add a scanned signature image (which will be printed in reports as the electronic signature) - select the image file with the scanned signature - *.bmp, *.png, *.gif and *.jpeg formats are supported. This image file will be loaded and saved with the user information and will not be linked to an external image thereafter.

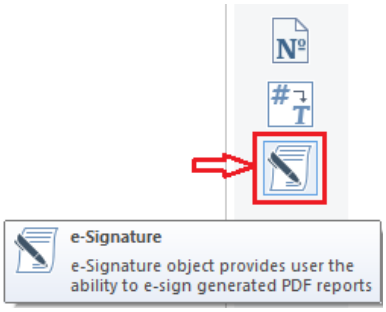
If user private e-Signature certificate was previously created, you can browse for that certificate file and include it in the e-Signature configuration for that user.

An additional *PIN code* is available for a user's electronic signature. This is not a mandatory field. A PIN code is an additional user validation criterion. It can be any numeric combination with up to 32 digits, and can only accept only digits. If you want to maintain 3-credentials login to comply with FDA 21 CFR Part11 e-Signature rules, you have to set a PIN code. If you wish to have and maintain a regular security level of e-Signature, then PIN code may remain empty.

Click *OK* to close the *User e-Signature window*. Repeat the above procedure for any other users, which you wish to create an electronic signature for. If a user account has an e-Signature defined, a check [✓] will appear on the "*e-Signature*" button.

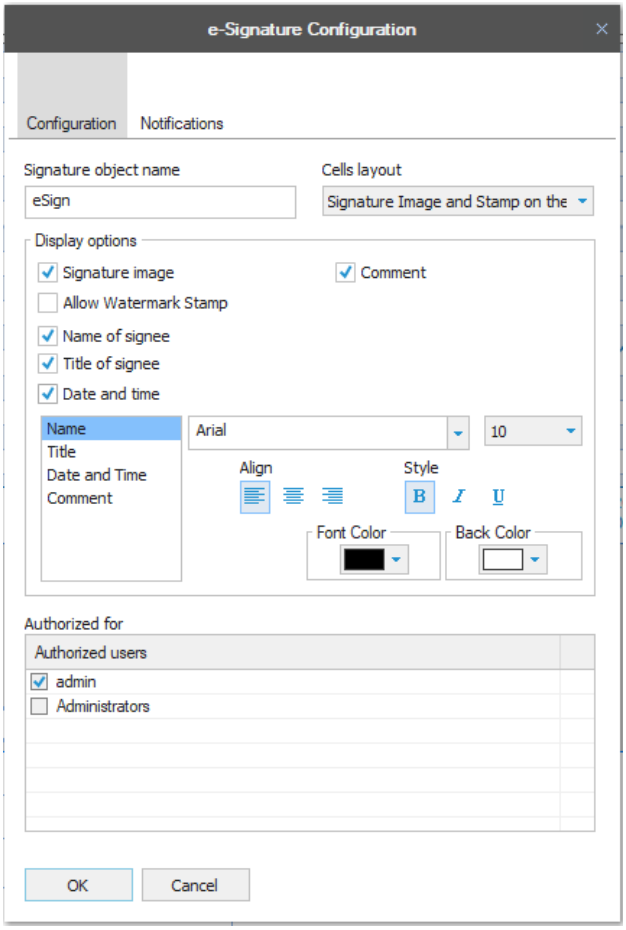
Adding an e-Signature Object to a Report

To add one or more e-Signature objects to a report, click on the *e-Signature* button on the Report Designer Studio right-side toolbar, and then draw a "rectangle" in the location on the report for the e-Signature block:



Once the e-Signature object is added, the *e-Signature Configuration* window will open to the Configuration tab:

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Signature object name must be a unique logical name which will be used in further work with that object within the project. The object name can be up to 64 characters long. Only alphanumeric characters and "_" are allowed.

The *Cells Layout* option allows the user to select one of two predefined e-Signature grid layout formats. The first option is the layout with *Image and Stamp at the bottom*:

Name Of Signee
Title Of Signee
Date And Time
Comment
Signature Image

The second option is the layout with *Signature Image and Stamp cells on the right*:

Name Of Signee	Signature Image	Stamp Image
Title Of Signee		
Date And Time		
Comment		

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If a user's e-Signature configuration has a signature image assigned, select the *Signature image option* to include that image in the e-Signature object on the report.

Select the *Allow Watermark Stamp* option to include an image for a watermark stamp like "*Passed", "Failed", "Approved", "Rejected"* or *"Confirmed"* in the e-Signature object. A subfolder named *\ESignStamps* must be created under the current project's folder, which contains the available watermark images.

Select the *Name of signee* option to include the user's full name defined in the e-Signature configuration, into the e-Signature object in the report.

Select the *Title of signee* option to include the user's title, as defined in e-Signature configuration, into the e-Signature object in the report.

Select the *Date and time* option to include the Date and Timestamp when the that e-Signature instance was signed, into the e-Signature object in the report.

Use the formatting options to specify how sections of the e-Signature grid will be displayed, including font and background colors, font styles, and text alignment.

Select from the list, defined Dream Report users, who will be authorized to electronically sign that e-Signature object in this report.

Click *OK* to close and save the e-Signature object configuration.

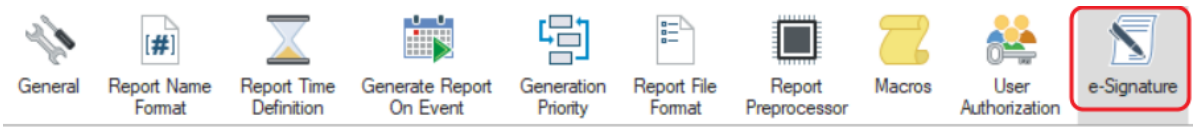
Finally, if an e-Signature is required for the report to be generated, open the *Report Settings* for the report and select the *Report File Format* tab. Select the *e-Signature required* option.

You may add multiple e-Signature objects to the same report and then, after report generation, each of such e-Signature objects will have to be signed in order for the report to be considered fully signed.

e-Signature Workflow

e-Signature workflow allows the project designer to add multiple e-signature objects to a report and define a signing workflow – which signature must be signed first, then, which signature must be next, and so on.

When multiple e-Signature placeholders were defined in the report, user can open Report Setting and go to "e-Signature" tab:



During configuration of the e-Sign workflow user will be able to define the strict order of responsible persons. Enabling the check box "Enable e-sign in the specific order" will provide the project's developer option to define who will have to sign report first and then second etc.:

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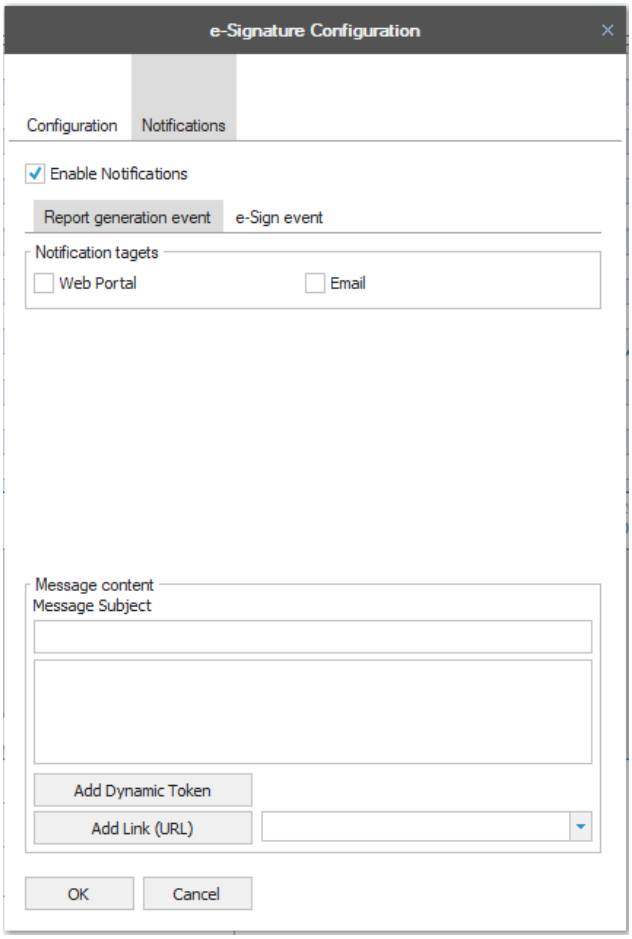


Note: Project may include more e-Signature placeholders. In such case if some are not selected the workflow won't be applicable to the users that are assigned to sign that e-Signature placeholder.

Using Notifications with e-Signatures

An e-Signature object can trigger *Notifications* when the report is generated, and/or when an electronic signature event occurs. In the *e-Signature Configuration* window, click on the *Notifications* icon to open the *Notifications* configuration. Check the *Enable Notifications* options to enable the notifications configuration options:

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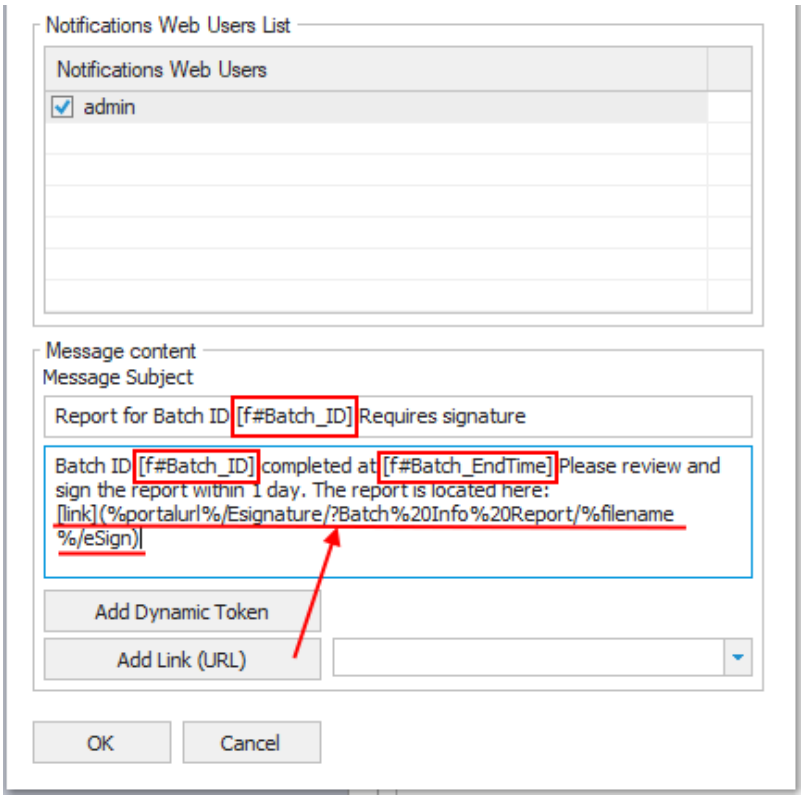
Select either the *Report generation event* or *e-Sign event* tabs to specify the trigger event for the notification. The *Notification Targets* can either be the *Web Portal*, to recipient(s) who are users defined in the Dream Report project; or any specified Email recipients.

Check the *Web Portal* option to notify selected web users. For a User to be listed, all of the following requirements must be met: user must have e-Signature enabled and configured; user has access rights to the web portal; and must have rights to generate reports in the web portal. Select the user(s) to receive the web notification.

Check the *Email* option to send the notification by email. Once checked, the configure button […] will appear. Click this button to select any named email recipient(s) defined in the Email settings of the project.

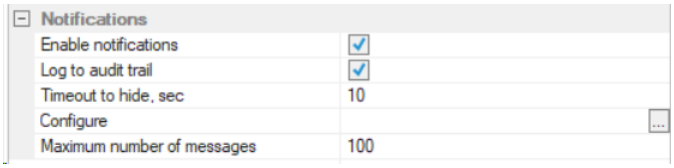
Enter a *Message Subject* (line), and the message body. These can be static text, or a combination of static text and values from dynamic tokens (dynamic objects on the report). Additionally, you can add a direct link to the report's signature page on the web portal by selecting the e-Signature object name from the drop-down list, and clicking the "*Add Link (URL)*" button. For example:

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If you wish to send notification(s) on an electronic signing event, select *e-Sign event* tab, and configure the Notification settings as with the *Report generation event*. The only difference here is that the "*Add Dynamic Token*" option is disabled – this is because on a signing event, the report is not being dynamically generated, so the dynamic tokens are not available at this point.

Note: In order to be able to send notifications for eSign, user has to ensure that *Notification* option is activated in the Project Settings:



Signing PDF reports electronically

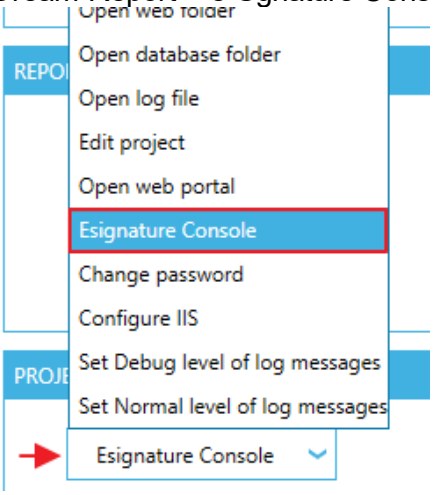
When a report which requires an e-Signature is generated, the report (PDF) output will be saved to a directory under the defined folder named *\UnsignedReports\[ReportName].* The PDF report will be "unsigned" - i.e., it will contain the empty e-Signature object.

To sign report electronically, the authorized user can do it either using a web browser on a PC or on a mobile device from the eSignature feature in Dream Report Web Portal, or using the *eSignature Console* Windows application.

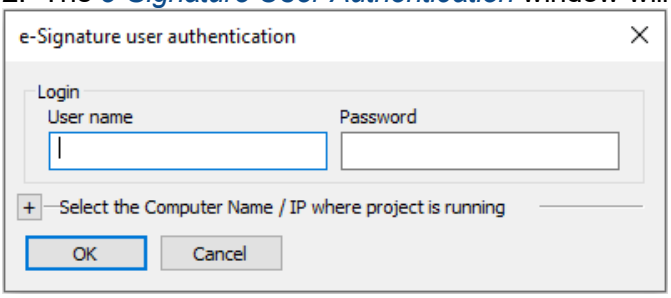
eSignature Console (Windows app)

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1. Open the *e-Signature Console*, launched from either the *Runtime Management Console* (RMC), or from Windows start menu: Start > All Programs > ODS > Dream Report > e-Sgnature Console:



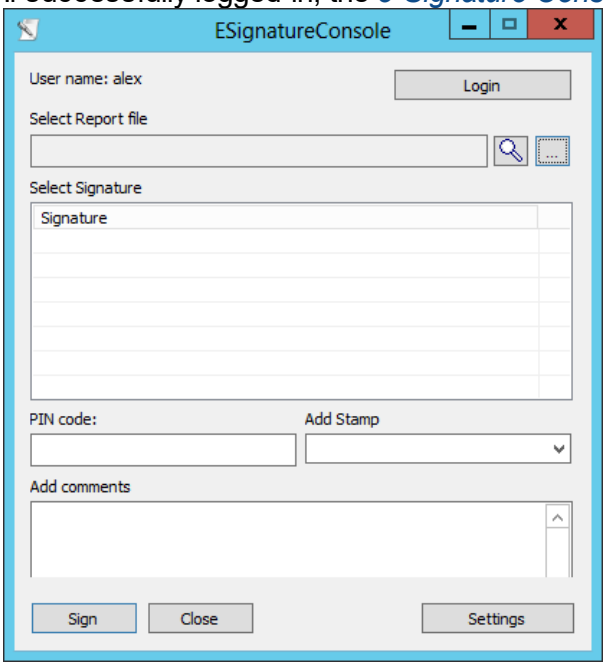
2. The *e-Signature User Authentication* window will open:



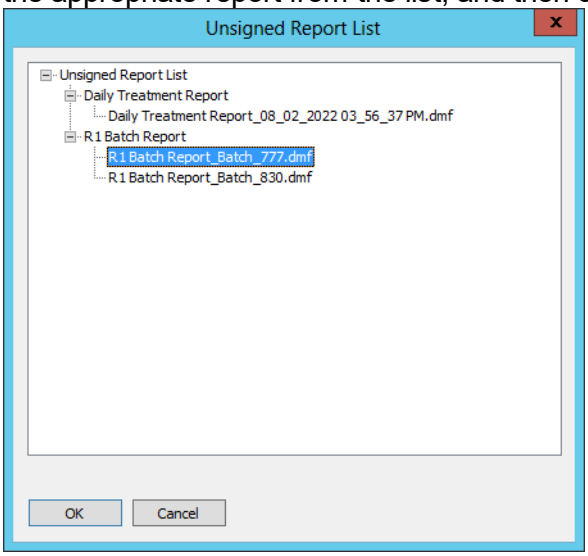
3. Log in with the user name and password of the signee. If the Dream Report project is running on a remote machine, select the computer name / IP of the PC where the project is running. Click *OK* to log in.

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4. If successfully logged-in, the *e-Signature Console* window will open:



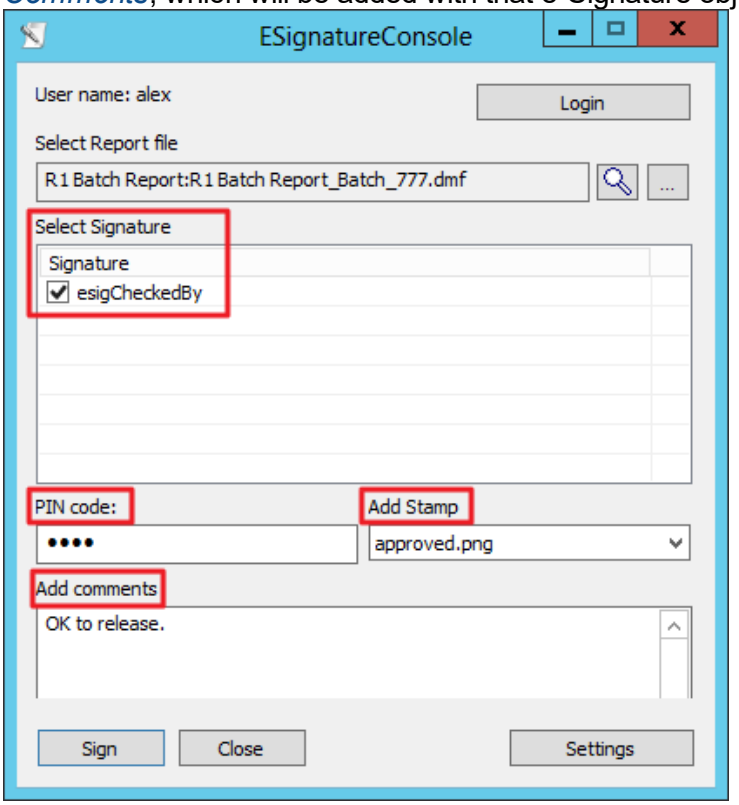
5. Click the **[...]** (browse) button to select report file you wish to sign. Only unsigned, or partially signed reports that this user is authorized to sign, will be listed. Select the appropriate report from the list, and then click *OK*:



6. Names of available e-Signature objects will be listed in the *Select Signature* section. The e-Signatures list will contain only those which are authorized to be signed by the logged in user. Select the required signature object and optionally add a *PIN code* (if defined for that user). User may *Add a Stamp* and *Add*

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Comments, which will be added with that e-Signature object on the PDF report.



7. Click the *Sign* button, and if all credentials are valid, the report will be electronically signed and a message will pop up that the "*PDF report was successfully signed*". If the report has only one e-Signature object and it was successfully signed, then that specific report will be removed from the "Unsigned Reports" folder. If the report has multiple e-Signatures and after e-signing it still has unsigned e-Signature objects, that report file will be moved to the "uncomplete" folder until the last signature object is signed and no unsigned signature objects remain in the report.

8. After signing that signature object, the user can continue signing other reports or signing other signature objects on that report, and then click *Close* button, when the operation is completed and user wants to close the signature window.

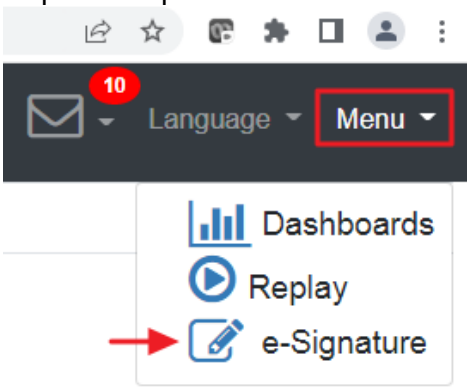
9. If you open a signed PDF report after being (fully) signed, the e-Signature object will be displayed with the electronic signature completed:



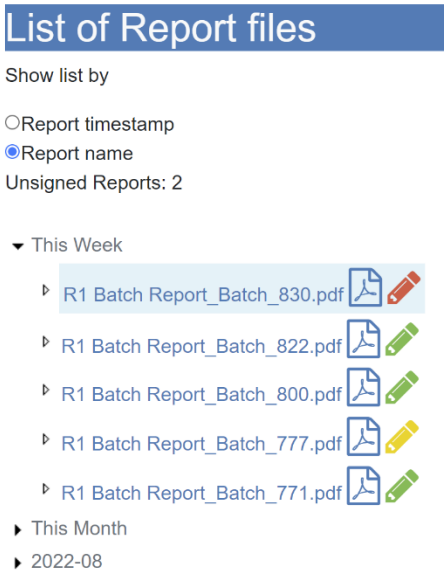
e-Signatures in the Dream Report Web Portal

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1. Click the *e-Signature* option from *Menu*, in the top-right corner of the Dream Report web portal frame:



2. Or, open the specific PDF report to preview it. The right panel will display the library of all existing report files for that report. If the report requires an electronic signature by the logged-in user, then the list will display a "pencil" icon:



- If the report file is completely signed, then the icon will be **green**.
- If the report is unsigned (i.e., no e-Signature objects yet signed), and if the logged-in user has e-signature rights for that report, the icon will be **red**. The red icon is a link that can be clicked, and will take the user to the e-Signature page where the user can review and sign the report.
- If the report is partially signed (at least one e-Signature object not yet signed), and if the logged-in user has e-signature rights on that report, the icon will be shown in **yellow**. The yellow icon is a link that can be clicked, and will take the user to the e-Signature page where the user can review and sign the report.

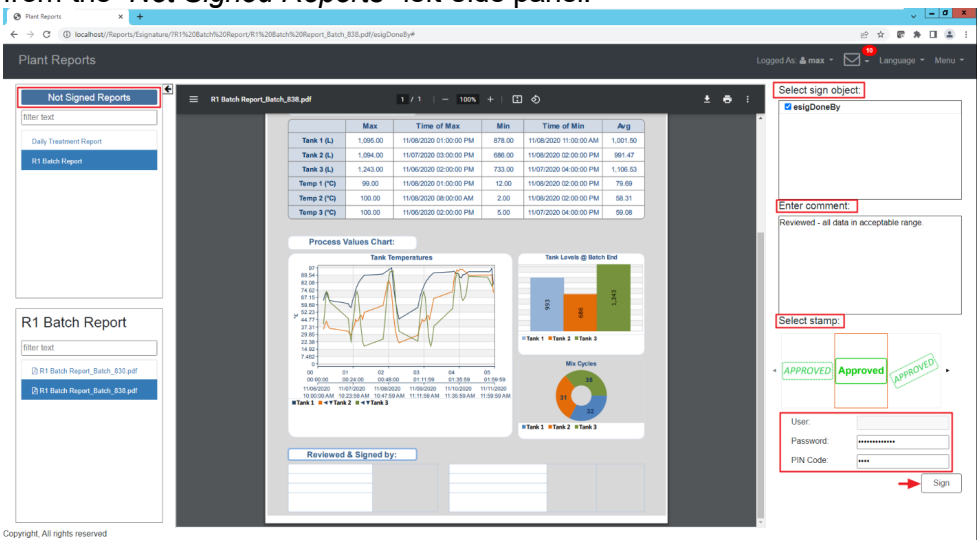
- If the user who is logged into the web portal does not have e-signature rights for that report, the only icon they will see is a green pencil, which indicates that the report is completely signed. If no icon is shown next to the file name, it indicates that either there is no e-Signature object on the report, or that the

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report is not yet fully signed. For example:



3. The e-Signature page will be displayed with the selected report, and any other unsigned reports that the logged in user can sign, will also be available to select from the "*Not Signed Reports*" left-side panel.



4. The top left panel (*Not Signed Reports*), will list all reports with unsigned report files. If there is a large number of reports listed, you can search for the required report name by prefix filter. If you wish to review and sign a report other than what is currently displayed, first select the report in the upper left side panel, and then select the specific report file from the list in the lower left panel.

5. Any named e-Signature objects that the user is authorized to sign will be listed on the right side, under the "*Select sign object*" section. Select the specific e-Signature object to sign.

6. Enter a comment in the "*Enter Comment*" section. The comment is not required, but can be useful to add context or additional information to the signature.

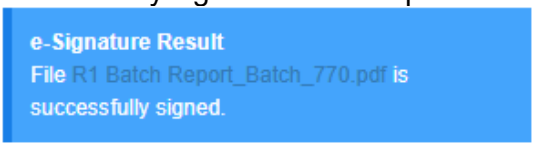
7. Select a watermark/stamp image from the "*Select stamp*" section – e.g., "*Passed", "Failed", "Approved", "Rejected", "Confirmed",* etc. to add to the e-Signature object (if it was configured to display the watermark stamp.) Note: a subfolder named

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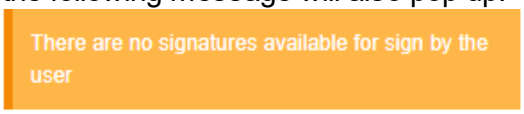
\ESignStamps must be created under the current project's folder, which contains the available watermark images.

8. Enter the user's *Password*, and (if defined in the user's e-Signature configuration) the *PIN Code*.

9. Finally, click the "*Sign*" button to electronically sign the report file. If successful, a message will pop up, indicating that the e-Signature object on that report file was successfully signed. For example:



Additionally, if there are no other e-Signature objects on that report for the user to sign, the following message will also pop up:



10. Repeat the above steps to review and sign any other available report files.

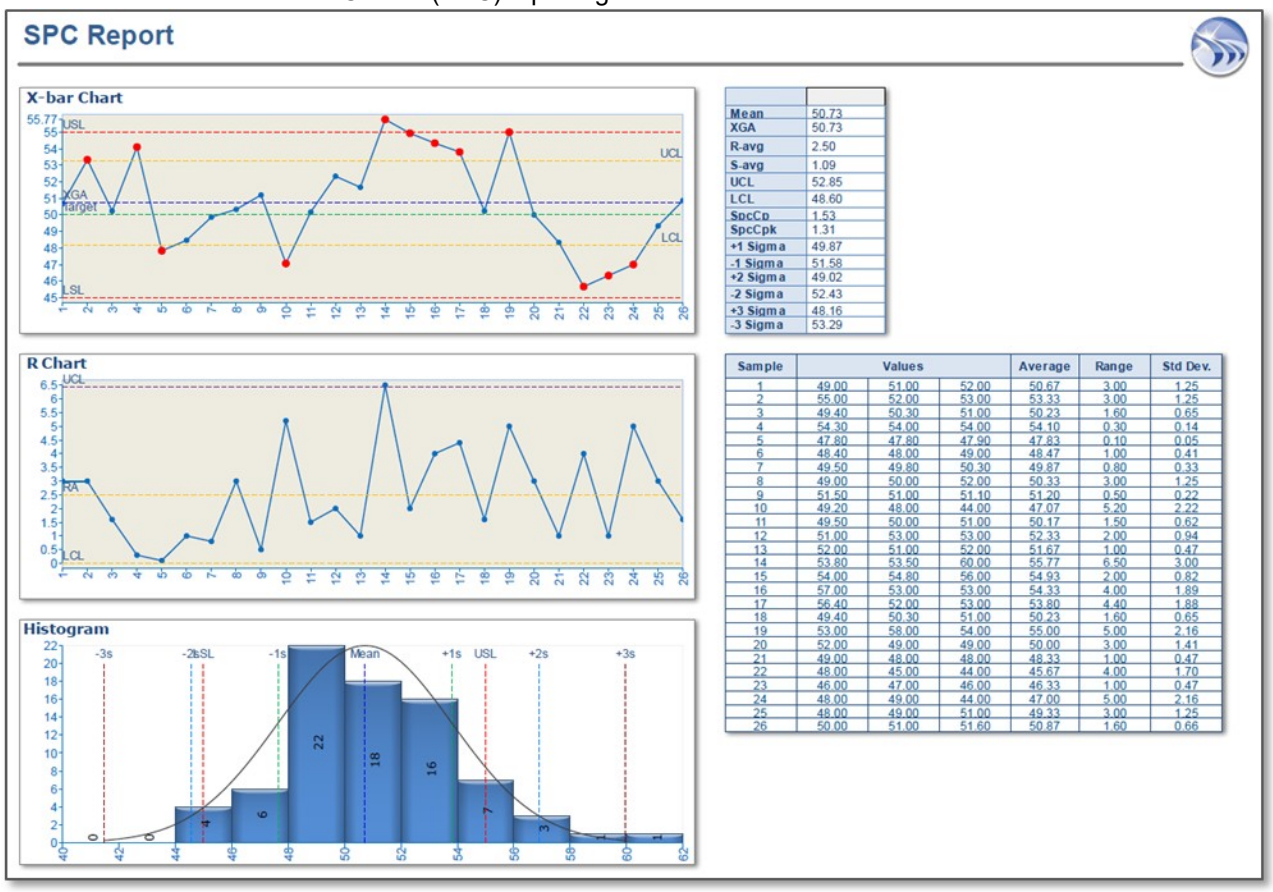
The reports' e-Signature status icons will be updated when you return to viewing the report details on the web portal.

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SPC Module

18 SPC Module

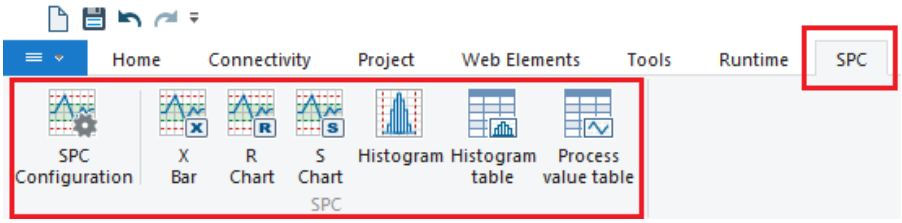
The **SPC** module is a license-enabled add-on option which provides a set of functions, charts and tables for Statistical Process Control (SPC) reporting:



Mean	50.73
XGA	50.73
R-avg	2.50
S-avg	1.09
UCL	52.85
LCL	48.60
SpcCp	1.53
SpcCpk	1.31
+1 Sigma	49.87
-1 Sigma	51.58
+2 Sigma	49.02
-2 Sigma	52.43
+3 Sigma	48.16
-3 Sigma	53.29

Sample	Values			Average	Range	Std Dev.
1	49.00	51.00	52.00	50.67	3.00	1.25
2	55.00	52.00	53.00	53.33	3.00	1.25
3	49.40	50.30	51.00	50.23	1.60	0.65
4	54.30	54.00	54.00	54.10	0.30	0.14
5	47.80	47.80	47.90	47.83	0.10	0.05
6	48.40	48.00	49.00	48.47	1.00	0.41
7	49.50	49.80	50.30	49.87	0.80	0.33
8	49.00	50.00	52.00	50.33	3.00	1.25
9	51.50	51.00	51.10	51.20	0.50	0.22
10	49.20	48.00	44.00	47.07	5.20	2.22
11	49.50	50.00	51.00	50.17	1.50	0.62
12	51.00	53.00	53.00	52.33	2.00	0.94
13	52.00	51.00	52.00	51.67	1.00	0.47
14	53.80	53.50	60.00	55.77	6.50	3.00
15	54.00	54.80	56.00	54.93	2.00	0.82
16	57.00	53.00	53.00	54.33	4.00	1.89
17	56.40	52.00	53.00	53.80	4.40	1.88
18	49.40	50.30	51.00	50.23	1.60	0.65
19	53.00	58.00	54.00	55.00	5.00	2.16
20	52.00	49.00	49.00	50.00	3.00	1.41
21	49.00	48.00	48.00	48.33	1.00	0.47
22	48.00	45.00	44.00	45.67	4.00	1.70
23	46.00	47.00	46.00	46.33	1.00	0.47
24	48.00	49.00	44.00	47.00	5.00	2.16
25	48.00	49.00	51.00	49.33	3.00	1.25
26	50.00	51.00	51.60	50.87	1.60	0.66

The SPC features are accessed from the ***SPC*** ribbon icon on the horizontal toolbar in the *Dream Report Designer Studio* menu (see pic. below):



The **SPC Configuration** icon opens a user interface which allows for the definition of SPC data collection parameters for variable data items. All other SPC objects and functions reference the SPC definitions configured in the **SPC Configuration** interface.

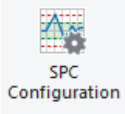
The **X-Bar, R-Chart, S-Chart** and **Histogram** icons allow a user to configure and place the appropriate SPC charts on a report.

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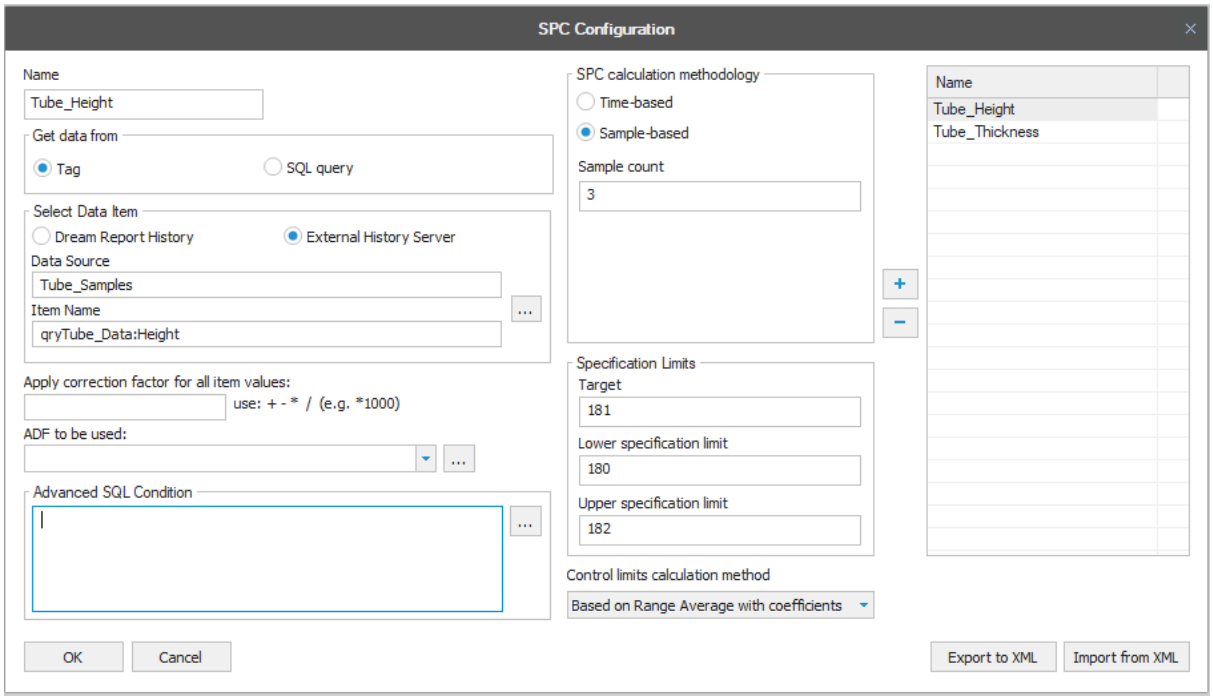
The **Histogram Table** and **Process Value Table** icons allow a user to configure and place the appropriate SPC data tables on a report.

Additionally, the **Single Data object**, the **Automatic Statistical Table (AST)** and the **Step Table** can be configured to calculate and display any of the twenty included SPC statistical functions (X-bar, LCL, UCL, Cp, Cpk, etc.)

18.1 SPC Configuration



Before using any SPC objects or statistical functions in Dream Report Studio, one or more SPC definitions should be created in the **SPC Configuration** interface. Click the **SPC Configuration** icon on the **SPC** ribbon bar. The following interface will open:



To Create an SPC Configuration/definition:

1. Enter a unique **Name** for the SPC configuration
2. An SPC configuration ("Name") can be based on a data item from any configured Dream Report data source, or from the results of a SQL query. In the **Get Data From** section, select either "Tag", or "SQL Query"

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- If "Tag" is selected, the standard Dream Report "Select Data Item" options will be displayed. Select either "Dream Report History" or "External History Server" to select the appropriate data source and data item (tag) that contains the data you wish to perform the SPC analysis on. Additionally, a Correction Factor, Aggregated Data Filter (ADF) and Advanced SQL Condition can be applied to the raw data before the SPC analysis is performed.

- If "SQL Query" is selected, the standard Dream Report SQL Query interface will be displayed. Select an ODBC Database Source, and create a SQL query that will return data in two columns - one containing a date/timestamp, and one containing the data to be analyzed. All the SQL functionality described in the "SQL Development Tools" section are available here.

3. Dream Report can use either a "Time-based" or "Sample-Based" **SPC calculation methodology**:

   - **Sample-Based** (the default) will group the raw data in "X measurements per sample" (i.e., the "Sample count") as the SPC sample in all SQL objects and functions.

   - For **Time-based** sampling, enter the "Step Interval" (e.g., every 15 minutes) and the Sample count, which will be the first "X" values (measurements) in the defined "Step Interval", to be used as the SPC "sample" in all SQL objects and functions. If a different sampling interval is needed - e.g., for each 1 hour period, take the first 4 measurements at 5 minute intervals - an Aggregated Data Filter (ADF) can be used to generate desired data set (also, use last values, averages, or others).

4. **Specification Limits** - i.e., the Target, Lower Specification Limit (LSL) and Upper Specification Limit (USL) - can be hard-coded by entering the values in the appropriate fields, or, if you double-click in a field, you have the ability to reference a Dynamic Object (Single Data, Compound or Expression object) from a specific report for any of the limits. This is useful if you want to use the same SPC definition (e.g., "*Inside_Diameter*") but have the target and spec limits be dynamic, depending on a specific product being run at that time.

5. The **Control Limits Calculation Method** option allows you to specify which industry-accepted calculation method will be used when calculating the Upper and Lower Control Limits for this specific SPC configuration:

   - Based on Standard Deviation
   - Based on Range Average with coefficients (*default*)
   - Based on Standard Deviation Average with coefficients
   - Based on Specification Limits

6. Click the "**+**" to Add the SPC configuration to the list of defined SPC configuration Names

7. To Delete an SPC configuration Name, select the Name in the list, and click the "**-**" button

8. Press the **"Export to XML"** button if you wish to generate an XML file with all created SPC configurations in this project. You can then use Notepad (or other text editor) to edit or create additional SPC definitions, or for export to be used in another Dream Report project. By default, the file will be stored at the project folder.

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9. Press the **"Import from XML"** button to select an XML file (edited, or created in another project), and import all the SPC definitions into the current configuration. Note that any existing SPC configurations will be overwritten with an XML import.

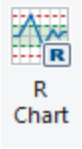
18.2 SPC Control Charts - X-bar, R and S

SPC Control Charts are used to graphically display how a process changes over time, and monitors the stability of a process - i.e., whether the process is in or out of control. The most commonly used control charts are "X-bar" charts, along with a corresponding Range (R) chart and/or Standard Deviation (S) Chart, can be selected from the SPC menu bar in Dream Report Studio.

X-bar Chart Plots the process mean ("X Bar") over time for subgroups of variable data



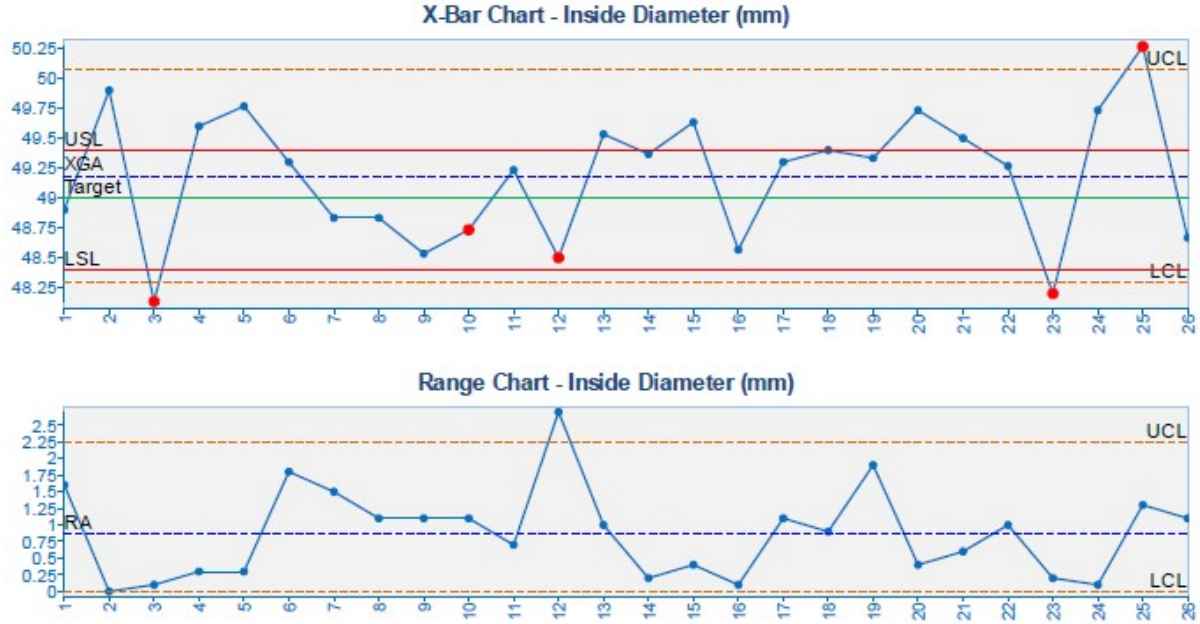
R (Range) Plots the range (R) of variation among the individual measurements of SPC samples.



S (Std. Dev) Plots the standard deviation (S) over time of multiple subgroups of variable data

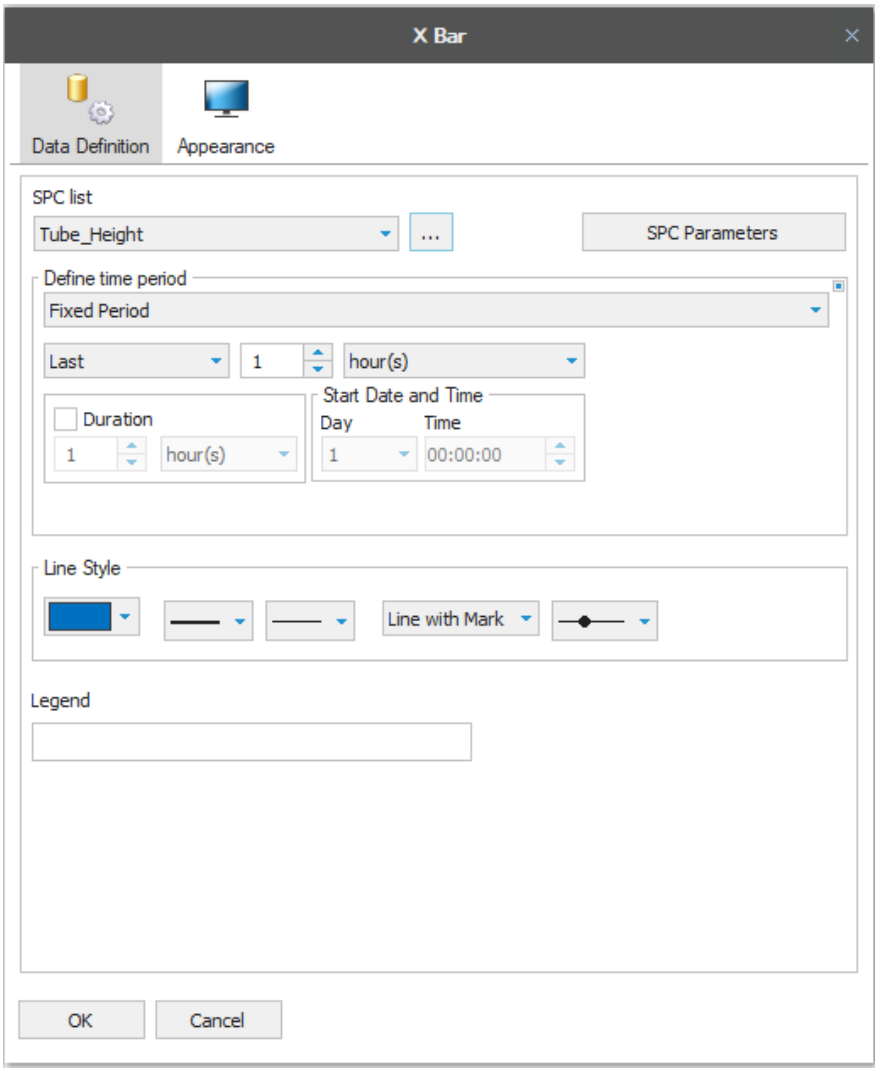


The following is an example of an X-bar and R Chart in Dream Report:



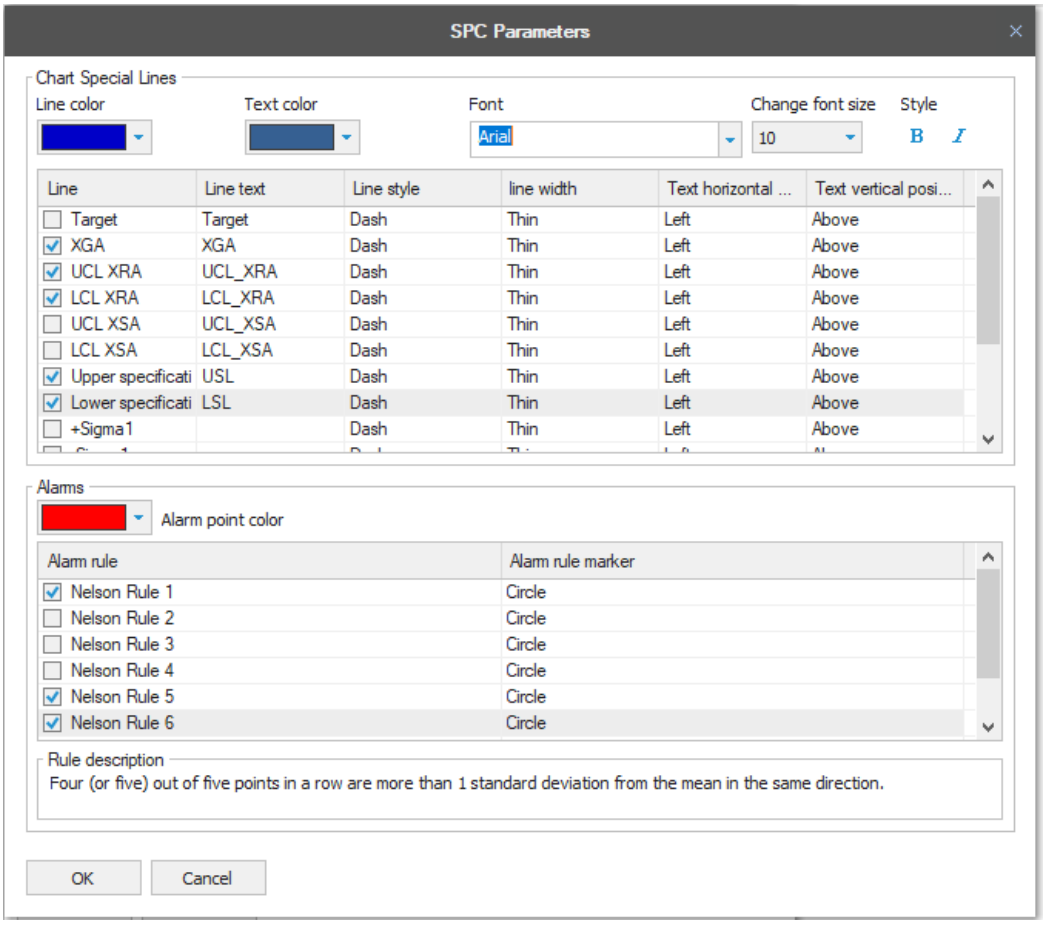
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After creating one or more SPC configurations, an SPC Control Chart can be added to a report by selecting one of the **X-bar**, **R Chart** or **S Chart** icons from the **SPC** tab in Dream Report Studio, and selecting an area on the report on which to place the chart. While the X-bar, R and S control charts are configured independently of each other, they share a common interface, and as such, are configured similarly:



Before using any SPC objects or statistical functions in Dream Report Studio, one or more SPC definitions should be created in the **SPC Configuration**, or, the SPC Configuration interface can be launched from within the SPC chart object. To select (or configure) an SPC configuration for the Control Chart, select the "**SPC Parameters**" button on the "Data Definition" tab of the chart object. The following **SPC Parameters** window will open:

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Select an existing SPC configuration from the SPC List, or click the **[...]** button to open the SPC Configuration window to create a new configuration. After selecting an SPC configuration to show on the control chart, select which of the **Chart Special Lines** to show on the chart, along with configuring the line color, style, caption and font for each line. The following Chart Special Lines are available for each specific control chart:

X-bar Chart

Target	The Target Specification Limit, as defined in the SPC configuration
XGA	The Grand Average (mean) of all samples shown on the control chart
UCL RA	Upper Control Limit line, calculated based on the RA (Range Average)
LCL RA	Lower Control Limit line, calculated based on the RA (Range Average)
UCL SA	Upper Control Limit line, calculated based on the SA (Std. Dev Average)
LCL SA	Lower Control Limit line, calculated based on the SA (Std. Dev Average)
USL	Upper Specification Limit, as defined in the SPC configuration
USL	Upper Specification Limit, as defined in the SPC configuration
+Sigma1	+1 Standard Deviation (Sigma) from the Grand Average (mean)
-Sigma1	-1 Standard Deviation (Sigma) from the Grand Average (mean)
+Sigma2	+2 Standard Deviation (Sigma) from the Grand Average (mean)

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-Sigma2	-2 Standard Deviation (Sigma) from the Grand Average (mean)
+Sigma3	+3 Standard Deviation (Sigma) from the Grand Average (mean)
-Sigma3	-3 Standard Deviation (Sigma) from the Grand Average (mean

R (Range) Chart

RA	The Average of the sample ranges of all samples shown on the control chart
UCL RA	Upper Control Limit line, calculated based on the RA (Range Average)
LCL RA	Lower Control Limit line, calculated based on the RA (Range Average)

S (Standard Deviation) Chart

SA	The Average of the sample standard deviations of all samples shown on the control chart
UCL SA	Upper Control Limit line of Standard Deviations, calculated based on the SA (Std. Dev Average)
LCL SA	Upper Control Limit line of Standard Deviations, calculated based on the SA (Std. Dev Average)

Additionally, the X-bar chart allows for the evaluation and **SPC Alarm** of a sample against any of the eight "Nelson" SPC rules. The Nelson SPC rules are almost identical to the combination of the four basic/core and four supplemental "Western Electric Company" (WECO) SPC rules. If an SPC sample violates any of the selected SPC rules, that sample will be highlighted (alarmed) with the specified Alarm Point color and marker.

Nelson Rules

Rule 1	1 point is more than 3 standard deviations from the mean.
Rule 2	9 (or more) points in a row are on the same side of the mean.
Rule 3	6 (or more) points in a row are continually increasing (or decreasing).
Rule 4	14 (or more) points in a row alternate in direction, increasing then decreasing.
Rule 5	2 (or 3) out of 3 points in a row are more than 2 standard deviations from the mean in the same direction.
Rule 6	4 (or 5) out of 5 points in a row are more than 1 standard deviation from the mean in the same direction.
Rule 7	15 points in a row are all within 1 standard deviation of the mean on either side of the mean.
Rule 8	8 points in a row exist with none within 1 std. dev. of the mean and the points are in both directions of the mean.

Click "**OK**" to close the SPC Parameters window.

Configure the **Define Time Period** option to set the time period over which to chart the SPC samples. The Time Period is defined in the same way as all other Dream Report objects, and can be *Relative*, *Absolute*, *Fixed*, *Calculated* or *Batch-based*.

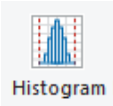
The **Line Style** settings allow you to specify how the SPC samples will be plotted on the Control chart - line color, thickness, style (solid or dashed), with or without a line marker, and marker shape.

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If needed, a static text **Legend** can be entered as well, on the Data Definition screen.

Click the **Appearance** tab to set the general appearance settings of the Control chart, including background color, chart title and font, axis fonts, chart grid lines, axis units, etc.

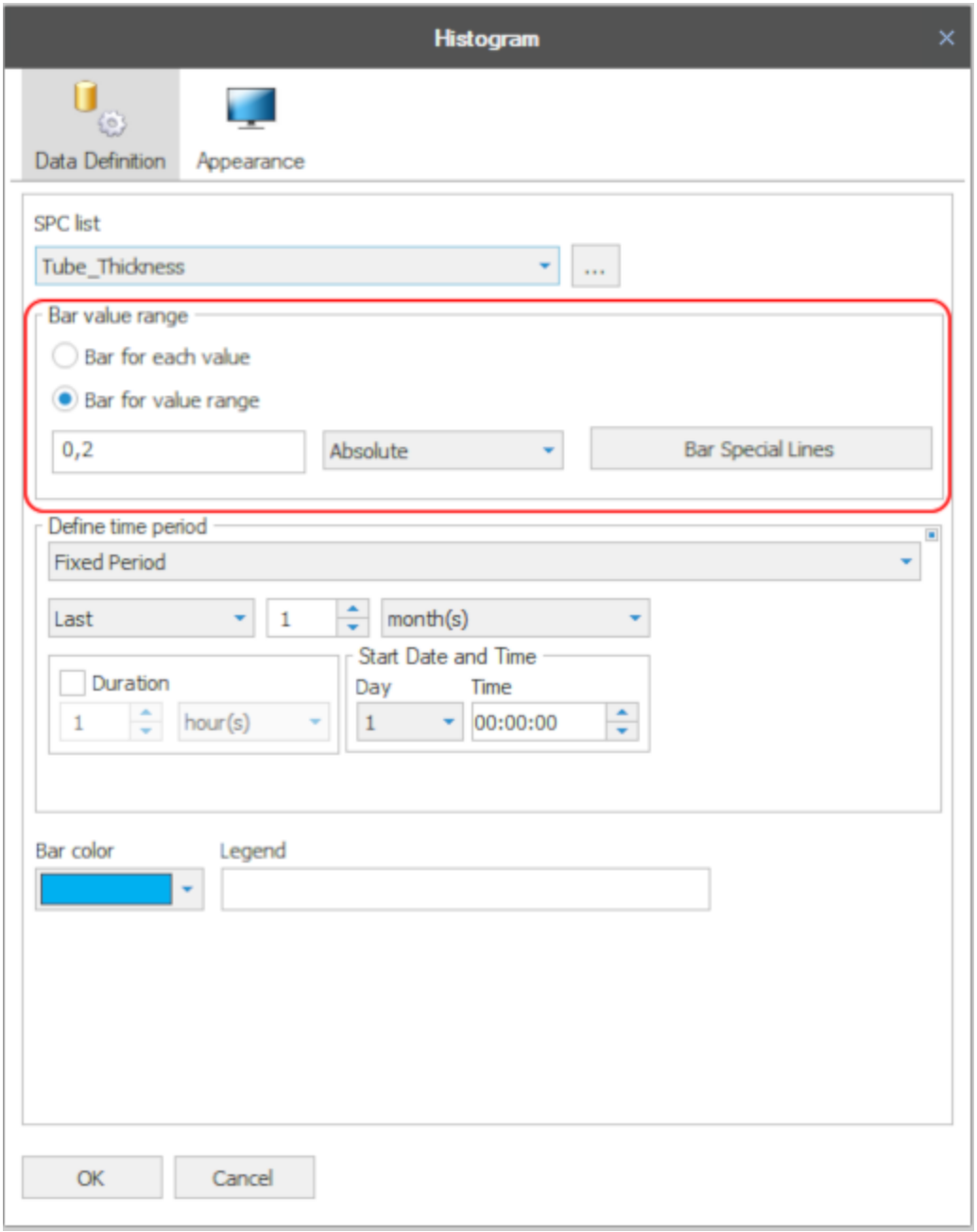
18.3 Histogram Chart



A **Histogram** shows the distribution of the data provided from the samples over a given time period. To add a Histogram chart to a report, select the Histogram icon from the SPC menu bar, and select an area on the report on which to place the chart.

After placing the Histogram object on the report, the following Histogram configuration window will open:

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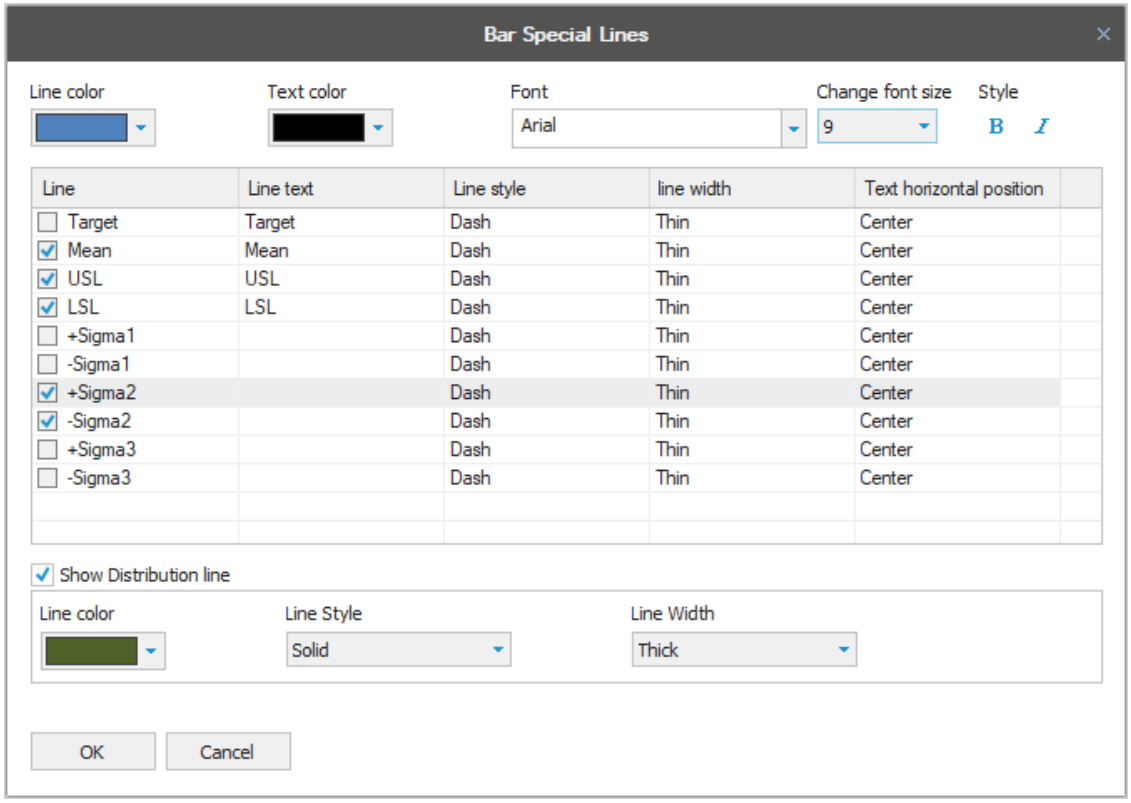
Before using any SPC objects or statistical functions in Dream Report Studio, one or more SPC definitions should be created in the **SPC Configuration**; or, the SPC Configuration interface can be launched from within the SPC Histogram object. To select (or configure) an SPC configuration for the Histogram, select an existing SPC configuration name from the **SPC List**, or click the **[...]** button to open the SPC Configuration window to create a new configuration.

Using the **Bar Value Range** option, the bars on a Histogram can be configured to represent either the frequency (number of occurrences) of individual values in the data set, or the frequency of value ranges in the data set.

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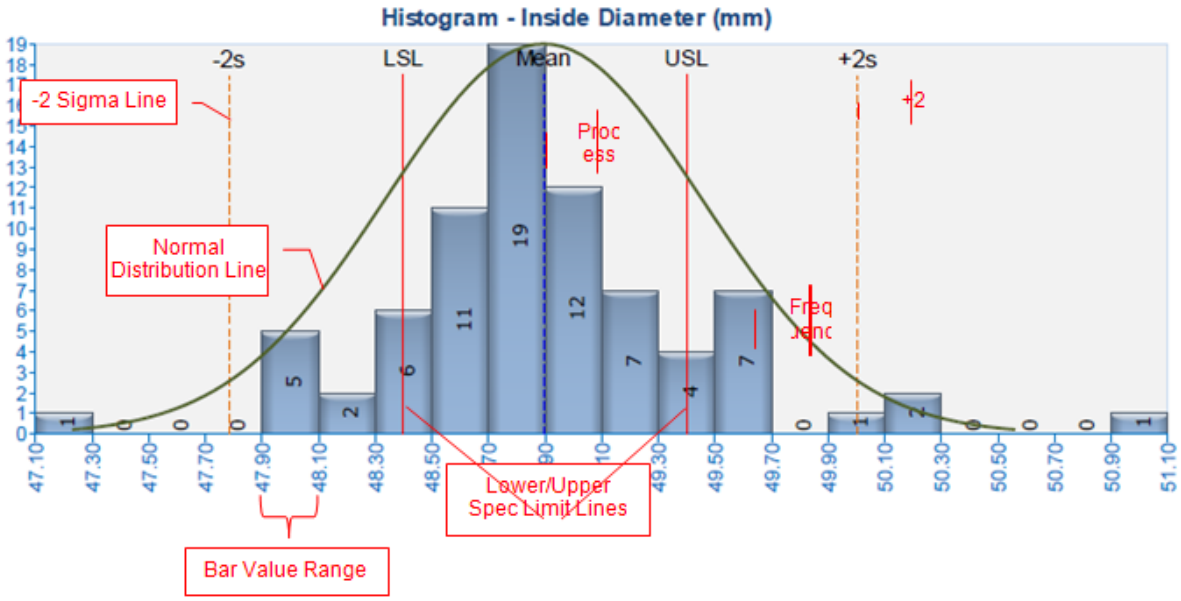
- **Bar for Each Value** Each bar in the Histogram will represent the frequency of occurrence of individual values in the data set selected, with values analyzed at the **Value Precision** selected. For example, if a Value Precision of "1" were selected, and the following raw data values were included in the data set (42.123, 42.033, 42.098, 42.144, 43.09, etc.) the number "42.1" would have a frequency of "3" on the Histogram, due to the rounding to 1 decimal place.
- **Bar for Value Range** Each bar in the Histogram will represent the frequency of occurrence of a range of values (either in Absolute units or a Percentage range) for the data set selected

Click the "**Bar Specification Lines**" button to select which "special" SPC vertical lines should be included on the Histogram (e.g., Target, Mean, USL, LSL, -2Sigma, +2 Sigma, etc.), line and font formatting options, as well as whether to include the Normal **Distribution Line** on the Histogram:



The following image shows several of the bar special lines and Histogram formatting options:

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After selecting the SPC Configuration and specifying the Histogram bar lines, configure the **Define Time Period** option to set the time period over which to chart the SPC samples. The Time Period is defined in the same way as all other Dream Report objects, and can be *Relative*, *Absolute*, *Fixed*, *Calculated* or *Batch-based*.

Finally, click the **Appearance** tab to set the general appearance settings of the Histogram, including bar type and color, background color, chart title and font, axis fonts, chart grid lines, axis units, etc.

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18.4 Histogram Table

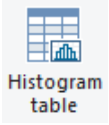
A **Histogram Table** shows the distribution of the data provided from the samples over a given time period:

Histogram Table - Inside Diameter (mm)

Data Range	Frequency
47.10 - 47.30	1
47.30 - 47.50	0
47.50 - 47.70	0
47.70 - 47.90	0
47.90 - 48.10	5
48.10 - 48.30	2
48.30 - 48.50	6
48.50 - 48.70	11
48.70 - 48.90	19
48.90 - 49.10	12
49.10 - 49.30	7
49.30 - 49.50	4
49.50 - 49.70	7
49.70 - 49.90	0
49.90 - 50.10	1
50.10 - 50.30	2
50.30 - 50.50	0
50.50 - 50.70	0
50.70 - 50.90	0
50.90 - 51.10	1

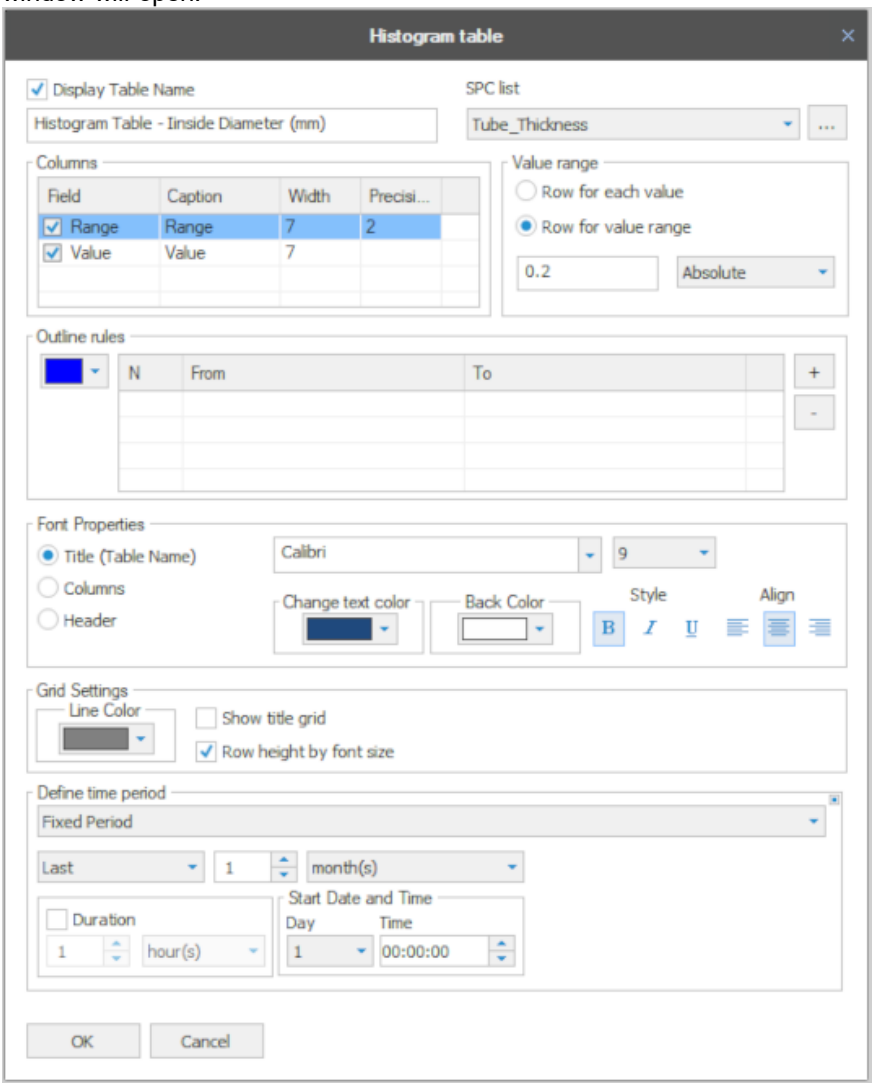
Before using any SPC objects or statistical functions in Dream Report Studio, one or more SPC definitions should be created in the **SPC Configuration**; or, the SPC Configuration interface can be launched from within the **SPC Histogram Table** object.

To add a Histogram Table to a report, select the **Histogram Table** icon from the SPC menu bar, and select an area on the report on which to place the table.



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After placing the Histogram Table object on the report, the following **Histogram Table** configuration window will open:



To select (or configure) an SPC configuration for the Histogram Table, select an SPC configuration name from the **SPC List**, or click the **[...]** button to open the SPC Configuration window to create a new configuration.

After a specific SPC configuration has been selected for the table, using the **Value Range** option, the rows on a Histogram Table can be configured to represent either the frequency (number of occurrences) of individual values in the data set, or the frequency of value ranges in the data set.

- **Row for Each Value** Each row in the Histogram Table will represent the frequency of occurrence of individual values in the data set selected, with values analyzed at the **Value Precision** selected. For example, if a Value Precision of "1" were selected, and the following raw data values were included in the data set (42.123, 42.033, 42.098, 42.144, 43.09, etc.) the number "42.1" would have a frequency of "3" on the Histogram
- **Row for Value Range** Each row in the Histogram Table will represent the frequency of occurrence of a range of values (either in Absolute units or a Percentage range) for the data set selected

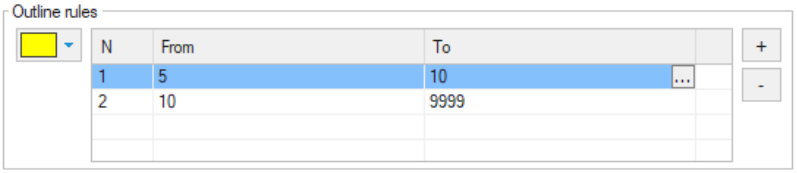
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In the **Columns** section, choose which of the fields (columns) you want to include in the table. The two available fields are:

- **Range** Depending on the option selected in t Value Range section (described above) the individual data value, or value range, will be displayed under this column in each row of the table
- **Value** The frequency (number of occurrences) for each data value/value range will be displayed.

Each row in the Histogram Table will represent the frequency of occurrence of individual values in the data set selected, with values analyzed at the **Value Precision** selected. For example, the column titles (Caption), and for the Range field, the data Precision. For example, if Precision is set to "2" (decimal places), the ranges in each row might show something like "*48.10 - 48.30", "48.30 - 48.50*", etc…

In the **Outline Rules** section, you have the ability to set the background color of a table row, based on the value (range) frequency. For instance, if less than between 5 and 10 occurrences of a data value or value-range is reported, set the background color to yellow; and if greater than 10 and 15, set the background color to green. Click the "+" (or "-") to add or (remove) conditions. Value ranges (lower and upper values) can be explicitly specified, or by double-clicking in the *From* or *To* cells, you can browse for dynamic objects on the report to reference:



And the report output:

Histogram Table - Inside Diameter (mm)

Data Range	Frequency
47.10 - 47.30	1
47.30 - 47.50	0
47.50 - 47.70	0
47.70 - 47.90	0
47.90 - 48.10	5
48.10 - 48.30	2
48.30 - 48.50	6
48.50 - 48.70	11
48.70 - 48.90	19
48.90 - 49.10	12
49.10 - 49.30	7
49.30 - 49.50	4
49.50 - 49.70	7
49.70 - 49.90	0
49.90 - 50.10	1
50.10 - 50.30	2
50.30 - 50.50	0
50.50 - 50.70	0
50.70 - 50.90	0
50.90 - 51.10	1

Configure the **Define Time Period** option to set the time period over which to report the SPC samples. The Time Period is defined in the same way as all other Dream Report objects, and can be *Relative*, *Absolute*, *Fixed*, *Calculated* or *Batch-based*.

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Finally, set the general appearance settings of the Histogram Table, including table grid and background color, fonts, table name, etc.

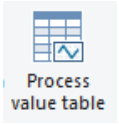
18.5 Process Value Table

A **Process Value Table** shows a matrix of the values (measurements) taken for the SPC analysis, along with the calculated Average (X-bar), Range and Standard Deviation over a given time period:

SPC Samples - Inside Diameter (mm)

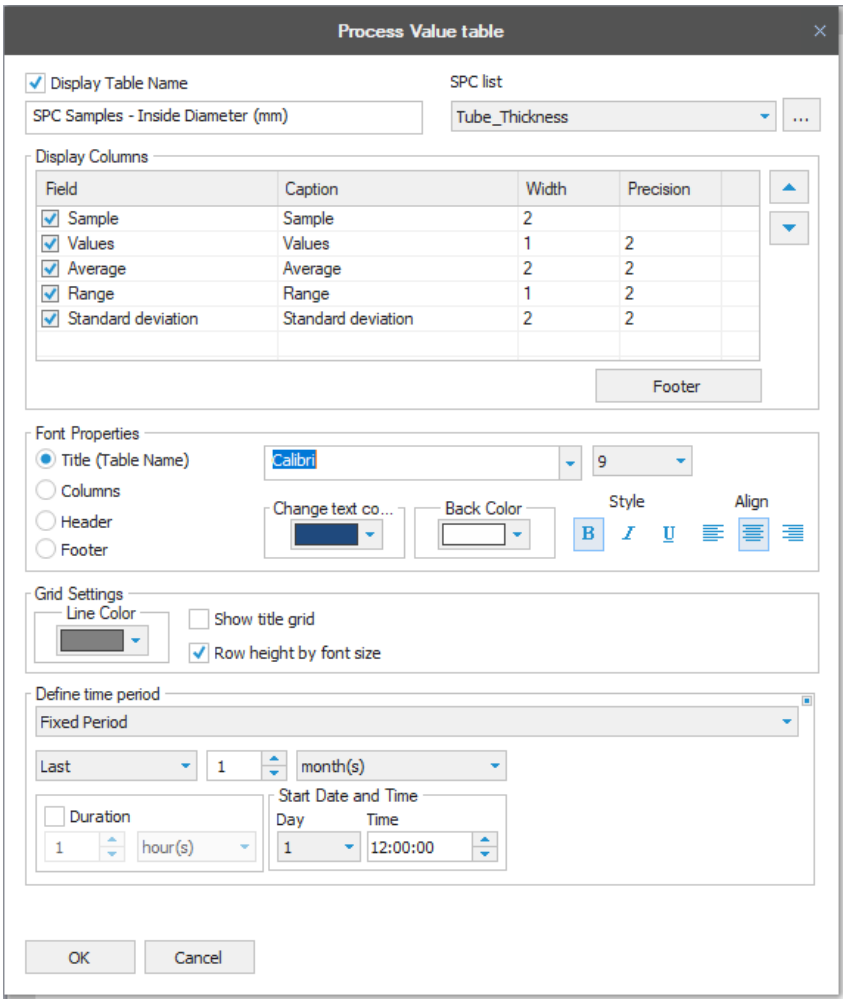
Sample	Values			Average	Range	Std. Dev
1	49.00	48.30	48.50	48.60	0.70	0.29
2	49.00	49.00	49.00	49.00	0.00	0.00
3	48.20	48.80	48.10	48.37	0.70	0.31
4	48.90	49.50	49.50	49.30	0.60	0.28
5	48.70	49.00	48.90	48.87	0.30	0.12
6	49.00	49.00	48.60	48.87	0.40	0.19
7	48.70	48.10	48.80	48.53	0.70	0.31
8	48.70	49.20	49.20	49.03	0.50	0.24
9	48.10	48.30	49.20	48.53	1.10	0.48
10	49.20	48.10	48.90	48.73	1.10	0.46
11	48.70	49.20	48.90	48.93	0.50	0.21
12	48.90	47.10	48.60	48.20	1.80	0.79
13	49.20	50.20	49.20	49.53	1.00	0.47
14	49.30	49.50	49.30	49.37	0.20	0.09
15	49.50	49.00	49.50	49.33	0.50	0.24
16	48.50	48.60	48.60	48.57	0.10	0.05
17	48.70	48.60	48.80	48.70	0.20	0.08
18	48.80	48.80	48.80	48.80	0.00	0.00
19	48.30	49.50	50.20	49.33	1.90	0.78
20	49.50	49.00	48.90	49.13	0.60	0.26
21	48.80	48.80	49.10	48.90	0.30	0.14
22	49.40	48.80	48.70	48.97	0.70	0.31
23	48.20	48.30	48.10	48.20	0.20	0.08
24	48.80	48.90	48.80	48.83	0.10	0.05
25	48.80	51.00	50.10	49.97	2.20	0.90
26	49.40	48.30	48.30	48.67	1.10	0.52

To add a Process Value Table to a report, select the **Process Value Table** icon from the SPC menu bar, and select an area on the report on which to place the table.



After placing the Process Value Table object on the report, the following **Process Value Table** configuration window will open:

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To select (or configure) an SPC configuration for the Process Value Table, select an SPC configuration name from the **SPC List**, or click the **[...]** button to open the SPC Configuration window to create a new configuration.

After a specific SPC configuration has been selected for the table, select which columns to display; the column name captions; and the data precision for each data column, in the **Display Columns** section.

Depending on the number of measurements defined per SPC sample (in the SPC Configuration), the number of "Values" columns needed will be automatically be set when the report generated. In the example shown at the start of this section, 3 columns are shown under the "Values" heading, as the SPC Configuration was defined with 3 measurements per sample.

A table Footer can be included in the Process Value Table by clicking the "**Footer**" button, and adding the required number of footer lines by clicking the "**+**" button. The footer is configured in the same way as is done in the Step Table and SQL Table objects.

Configure the **Define Time Period** option to set the time period over which to report the SPC samples. The Time Period is defined in the same way as all other Dream Report objects, and can be *Relative*, *Absolute*, *Fixed*, *Calculated* or *Batch-based*.

Finally, set the general appearance settings of the Process Value Table, including table grid and background color, fonts, table name, etc.

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18.6 SPC Statistical Functions

The Dream Report SPC module includes a set of twenty SPC statistical functions that can be used in Single Data, Automatic Statistical Table (AST) and Step Table objects.

XGA	The Grand Average (mean) of all samples of the selected data set, over the defined time period
RA	The Standard Deviation of the sample Standard Deviations of the selected data set, over the defined time period
SA	The Average of the sampled Ranges of the selected data set, over the defined time period
UCL_XRA	Upper Control Limit value in the X-bar Chart, calculated based on the RA (Range Average)
LCL_XRA	Lower Control Limit value in the X-bar Chart, calculated based on the RA (Range Average)
UCL_XSA	Upper Specification Limit value in the X-bar Chart, calculated based on the SA (Std. Dev Average)
LCL_XSA	Upper Specification Limit value in the X-bar Chart, calculated based on the SA (Std. Dev Average)
UCL_RA	Upper Control Limit value in the Range (R) Chart, calculated based on the RA (Range Average)
LCL_RA	Lower Control Limit value in the Range (R) Chart, calculated based on the RA (Range Average)
UCL_SA	Upper Control Limit value in the Standard Deviation (S) Chart, calculated based on the SA (Std. Dev Average)
LCL_SA	Lower Control Limit value in the Standard Deviation (S) Chart, calculated based on the SA (Std. Dev Average)
CP	Process Capability calculation of the selected data set, over the defined time period
CPK	Process Capability Index of the selected data set, over the defined time period. Adjustment of Cp for the effect of non-centered distribution.
+Sigma1	+1 Standard Deviation (Sigma) from the Grand Average (mean) of the selected data set, over the defined time period
-Sigma1	-1 Standard Deviation (Sigma) from the Grand Average (mean) of the selected data set, over the defined time period
+Sigma2	+2 Standard Deviations (Sigma) from the Grand Average (mean) of the selected data set, over the defined time period
-Sigma2	-2 Standard Deviations (Sigma) from the Grand Average (mean) of the selected data set, over the defined time period
+Sigma3	+3 Standard Deviations (Sigma) from the Grand Average (mean) of the selected data set, over the defined time period

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-Sigma3	-3 Standard Deviations (Sigma) from the Grand Average (mean of the selected data set, over the defined time period

When using any of the SPC statistical functions in a Single Data object, Automatic Statistic Table or Step Table, first select the item in question, the specific SPC Configuration name, and the time period over which to perform the statistical calculation.

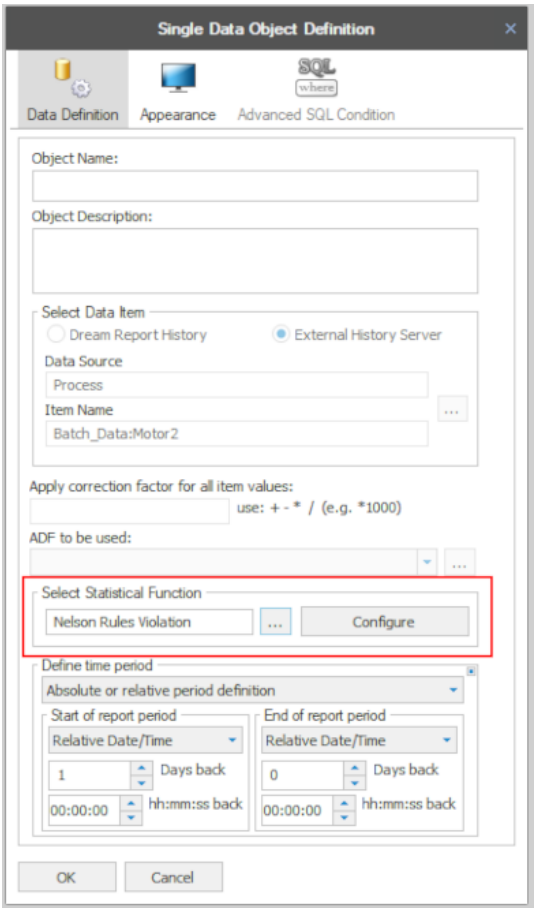
Nelson Rules Usage

The Nelson rules are a method in statistical process control (SPC) of determining whether some measured variable is out of control (unpredictable, versus consistent). The *Nelson Rules* statistical function can be used in the following objects:

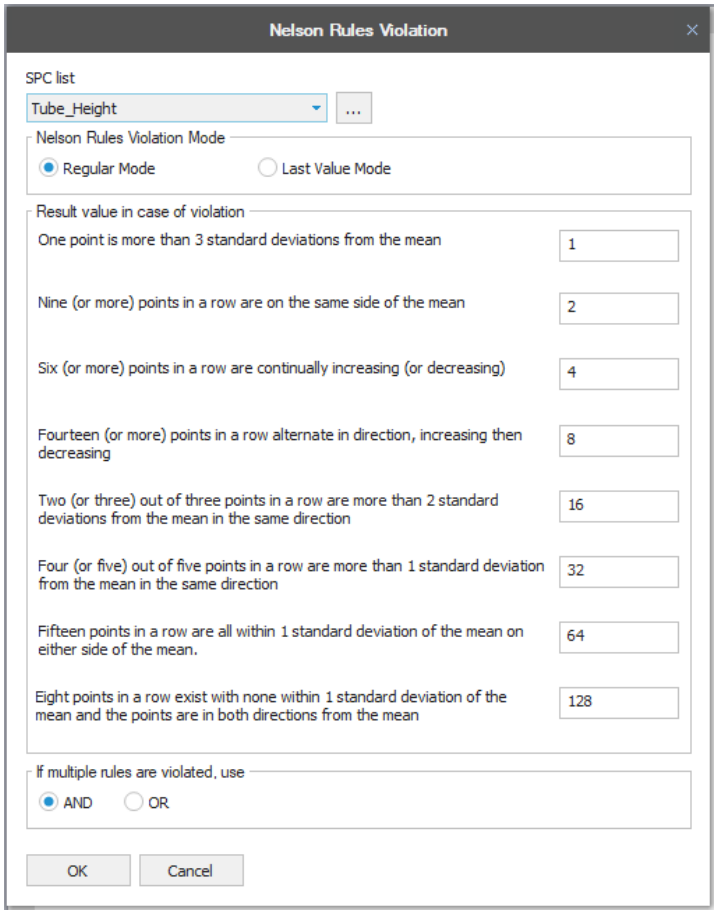
- Single Data Objects,
- Step Table,
- Automatic Statistical Table (AST),
- SPC X-Bar Chart

The *Nelson Rules Violation* statistical function returns an integer value indicating which rule(s) were violated. The configurations in Single Data Object, Step Table and AST are identical. After selecting the *Nelson Rules Violation* statistical function under the list of SPC functions, click the "*Configure*" button to open the *Nelson Rules Violation* dialog:

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SPC List: Select the specific SPC definition for which you wish to display the Nelson rule violation. If needed, click the "[…]" button to open the *SPC Definitions* configuration window, from where you can view existing SPC definitions, or can create a new one.

Nelson Rules Violation mode: Two modes are available *Regular Mode* or *Last Value Mode.*

In *Regular Mode* the calculation will be done based on all values over the specified time period, so the result reflects all violation rules that occurred in that time period. If *Last Value Mode* is selected the calculation will be done only based on the last value of the Array (the SPC sample, made up of multiple measurements), checking if the last value caused the violation for one or several Nelson Rules.

Result Value in Case of Violation: Either use the default values, or set any unique value for the event of violation of each of the Nelson rules. Please note that the values are set in decimal mode, but in calculations these values will be converted to binary mode, and all the operations (AND/OR) will be done as bitwise operations.

If multiple rules are violated, use: To apply right bitwise operation, choose "AND" or "OR". If *AND* is selected, the result will represent the bitwise AND operation of all values of the different Nelson Rules that were violated, using the values specified in the *Result Value in case of violation.* If *OR* is selected the result will represent the bitwise OR operation of all values of the different Nelson Rules that were violated, using the values specified in the *Result Value in case of violation.*
Example 1:

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- *Nelson Rules Violation mode:* Regular Mode
- *Result Value in case of violation:* values defined by default

	Decimal Value	Binary Value
Nelson Rule 1	1	1
Nelson Rule 2	2	10
Nelson Rule 3	4	100
Nelson Rule 4	8	1000
Nelson Rule 5	16	10000
Nelson Rule 6	32	100000
Nelson Rule 7	64	1000000
Nelson Rule 8	128	10000000

- *If multiple rules are violated, use* set to *OR*, then:

  With this configuration, if Nelson Rules 1, 5 and 8 occurred than the result will be the bitwise OR operation of Nelson Rules 1,5 and 8 where 1 OR 10000 OR 10000000. The result in binary format will be 100010001, which is 145 in decimal representation. The value 145 will be the result in the object.

  Note: with default values used in the example the bitwise operation is equivalent of the sum of decimal values: 1+16+128.

Example 2:

- *Nelson Rules Violation mode:* Regular Mode
- *Result Value in case of violation:* values defined by default

	Decimal Value	Binary Value
Nelson Rule 1	1	1
Nelson Rule 2	2	10
Nelson Rule 3	4	100
Nelson Rule 4	8	1000
Nelson Rule 5	16	10000
Nelson Rule 6	32	100000
Nelson Rule 7	64	1000000
Nelson Rule 8	128	10000000

- *If multiple rules are violated, use* set to *AND*, then:

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With this configuration, if Nelson Rules 1, 5 and 8 occurred than the result will be bitwise AND operation of Nelson Rules 1,5 and 8 where 1 AND 10000 AND 10000000. The result in binary format will be 0, which is 0 in decimal representation as well. The value 0 will be the result in the object.

Example 3:

If a user would like to have a separate value for each Nelson rule, add 8 separate Single Data Objects and configure each to reflect the result of one specific Nelson rule. For example, if for each object all the values for each rule result are set to 0 except one of the rules which is set to 1, then each object will return as result 1 or 0 and user can show separately which rules have been detected by the calculation.

Example 4:

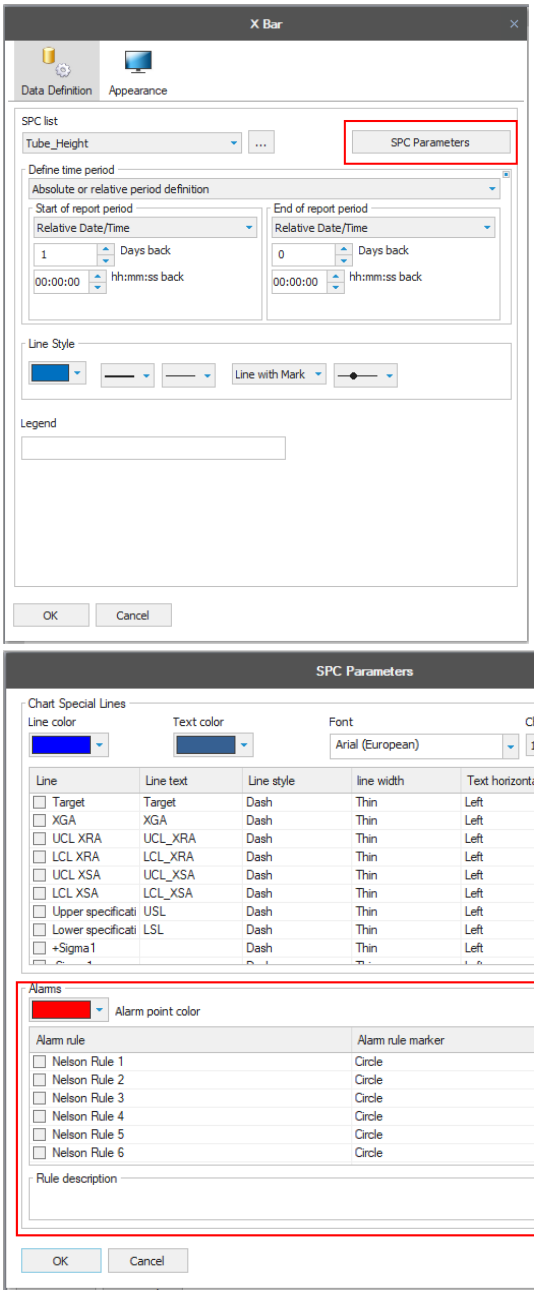
If *Nelson Rules Violation mode* is set to *Last Value Mode,* only the rules detected on the last point of array are calculated. In addition, if the operation AND is used then the result is calculated using bitwise AND operation of all detected Nelson Rules and a binary value 2^{64} (1111 1111 1111 1111 1111 1111 1111 1111). If the operation OR is used the result is calculated as bitwise OR operation of all detected Nelson Rules.

NOTE: In all the above examples, the resulting integer values can be displayed as a meaningful Nelson Rule violation description, using the *Advanced Visualization Condition* feature to substitute the text (and/or colors). Or, the resulting value could be written back to a real-time value in an HMI, which could then trigger an SPC alarm.

X Bar Chart

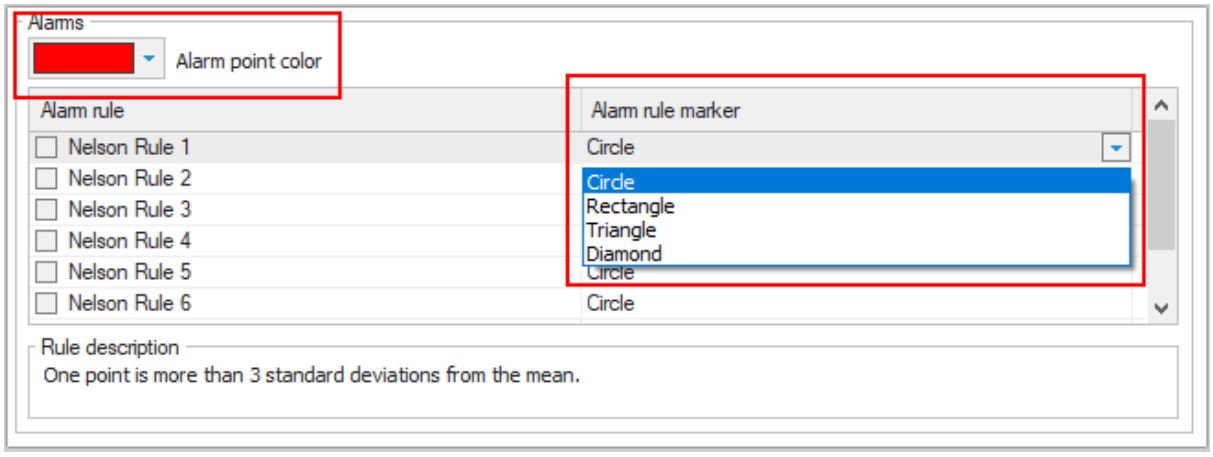
One or more Nelson Rules can be specified in an *X Bar Chart*, to indicate an SPC rule violation:

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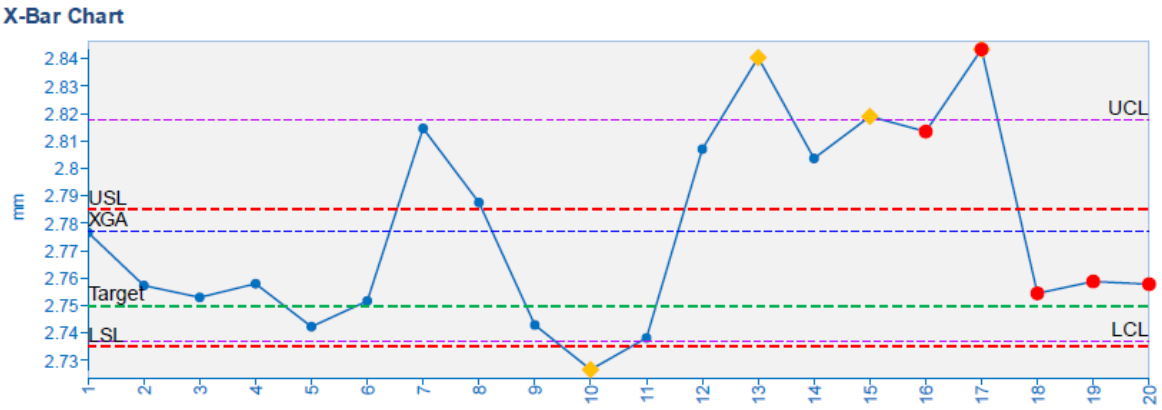
The configuration should be done in the *SPC Parameters* configuration dialog – select an color and marker style for each selected Nelson Rule you wish to use:

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Note: If more than one rule is detected for the same point, the color of the "highest" rule will overlay the lowest one.

As an example, the resulting X-Bar chart, with Nelson rules 1 (orange), 3 (pink) and 8 (red) specified, might be displayed as follows – here we see that rules 1 and 8 were violated:

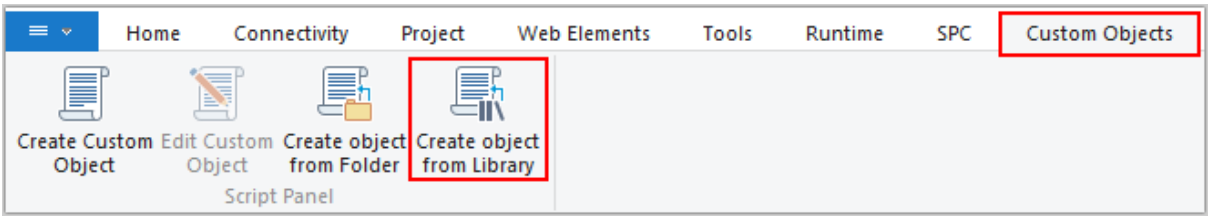


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Custom Objects

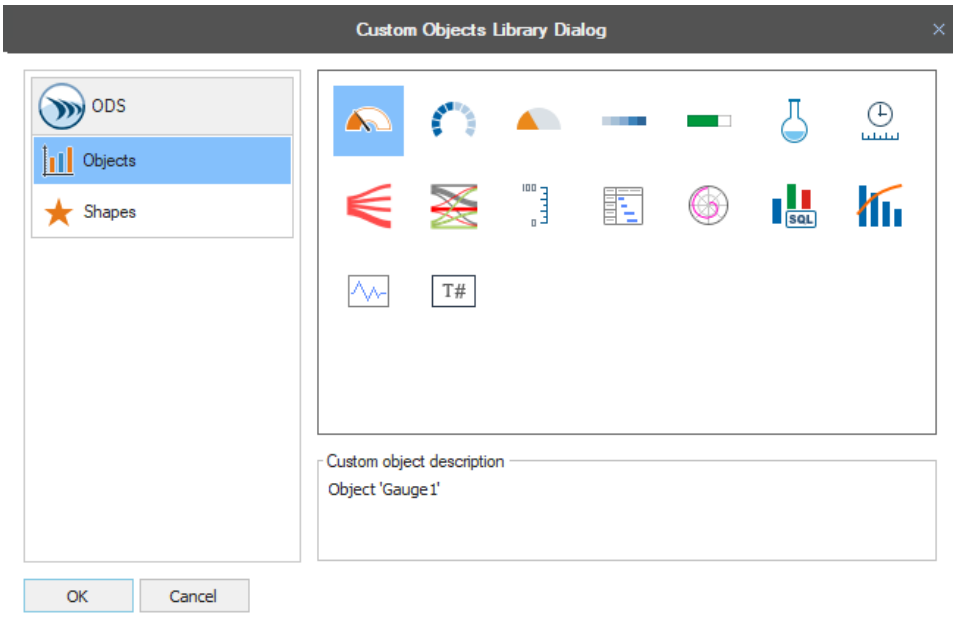
19 Custom Objects

19.1 Custom Object Library



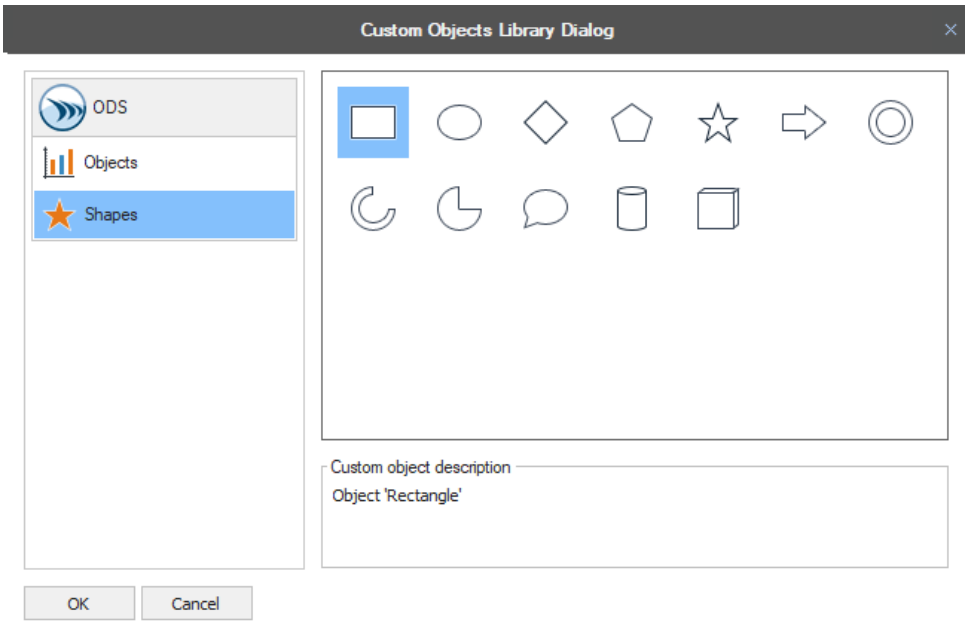
Custom object library can be accessed from the "***Custom Objects***" tab in Dream Report Studio.

Click on the "*Create object from library*" icon, and the following "*Custom Objects Library Dialog*" will open:



Click on "*Shapes*" or "*Objects*" on the left side of the screen to switch between the object types:

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Custom objects:

 **Gauge 1 -** This gauge will display a selected value (static or dynamic token) within a selected range.

 **Gauge 2 -** This gauge will color segments before and after a selected value (static or dynamic) within a selected range.

 **Trend –** Displays a line graph of the values of a selected tag within a selected time period with configured colors.

 **Pie Sector -** The Pie Sector will color parts in a pie graph before and after a selected value (static or dynamic) within a selected range.

 **Value Range Indicator –** Displays value ranges of a selected tag within a selected time period with configured colors.

 **Horizontal Progress Bar -** The Bar will color parts in a Progress bar before and after a selected value (static or dynamic) within a selected range.

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 **Retort -** The Retort will color parts in a Retort before and after a selected value (static or dynamic) within a selected range in a flask shape.

 **Time Scale –** Displays a scale with selected time period.

 **Value Scale –** Displays a scale with selected Value range.

 **Gant Batch Chart –** Displays all batches in selected period by “start time” order.

 **Radial Chart –** Displays tag(s) values in polar coordinate system within selected time period. Also known as a Circular chart.

 **SQL Bar-** Display data received from selected SQL query as a bar graph.

Geometric shapes – Advanced visual shapes.

After selecting a graphical object from the list and pressing *“OK”*, it will appear in the upper left corner of the report. Drag the object to move it, and resize it by dragging the corner points. Double-click the object to open the object’s configuration, and configure as needed.

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User Management

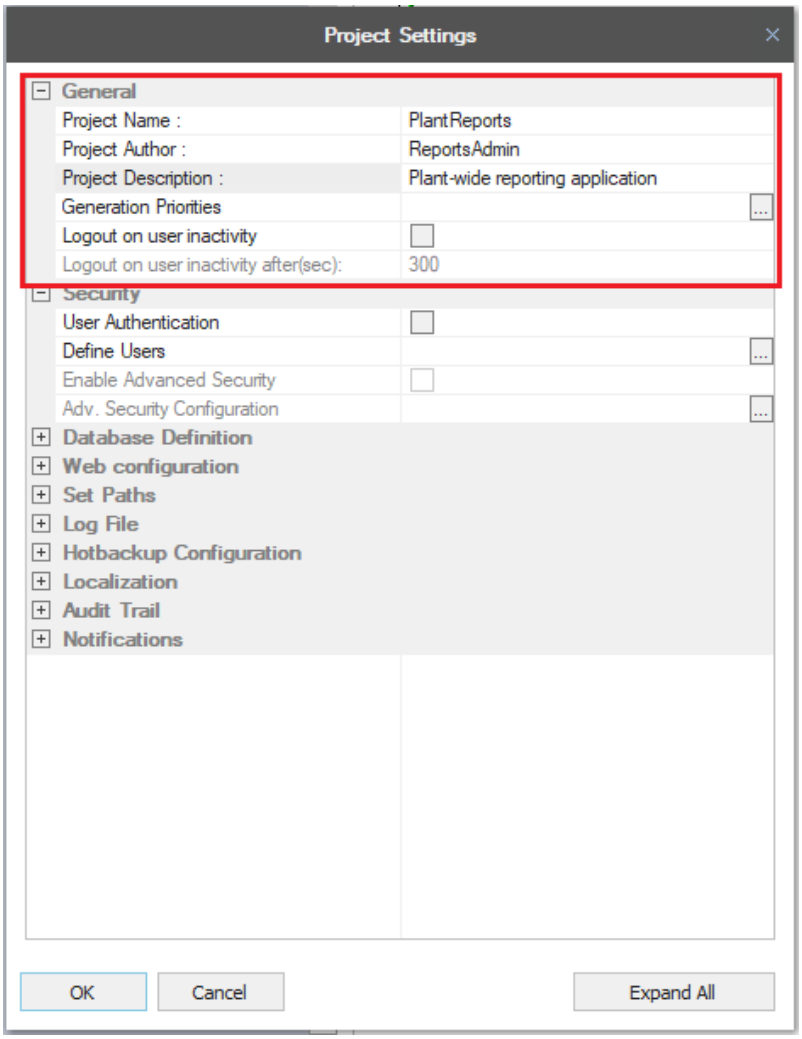
20 User Management

20.1 User Management Configuration

This functionality allows users to define users/user groups and their respective authorization and authentication to access different project modules and different reports.

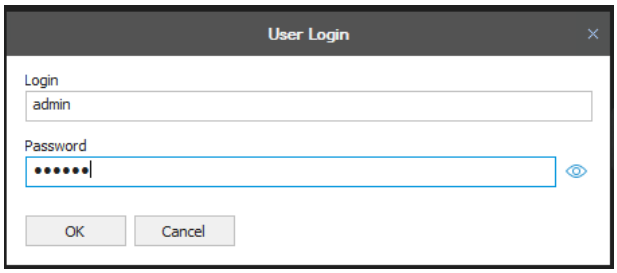
User Management dialog box provides an interface to define users and their access rights.The number of users and user groups, defined in a project is not unlimited.

If you want to enable user authorization to access to Dream Report project, first, check the *Enable User Authorization* check box in the *General section of the Project Settings* 35 dialog box:

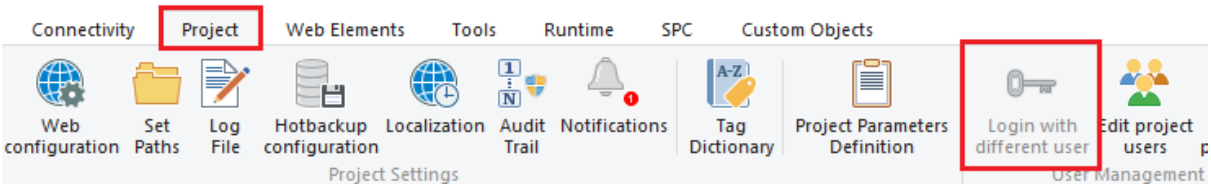


If user authentication-enabled project is launched either in the studio or in the runtime, a login window will be prompted:

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The login window will also appear if a user will click on the *Login with different user* command button in the *User Management* section of the *Project* toolbar ribbon (see pic. below).



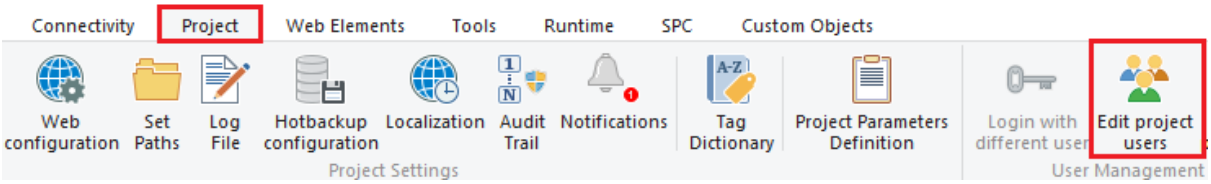
NOTE: Please, remember that Login with different user option will become enabled only if *Enable User Authorization* check box in Project Settings - General 35 section is checked.

If user will try to log in to a Dream Report studio and has no right to access designer studio neither logger studio, then studio will be closed automatically as `the user has no sufficient rights to use part of designer studio.

If a project is running in the runtime engine, then, each time, when Runtime Management Console 600 (RMC) window is loaded, then login window will be open. If user login fails, the project will continue to run, but the Runtime Management Console window will be immediately closed, so that the current user will have no access to any project control operation.

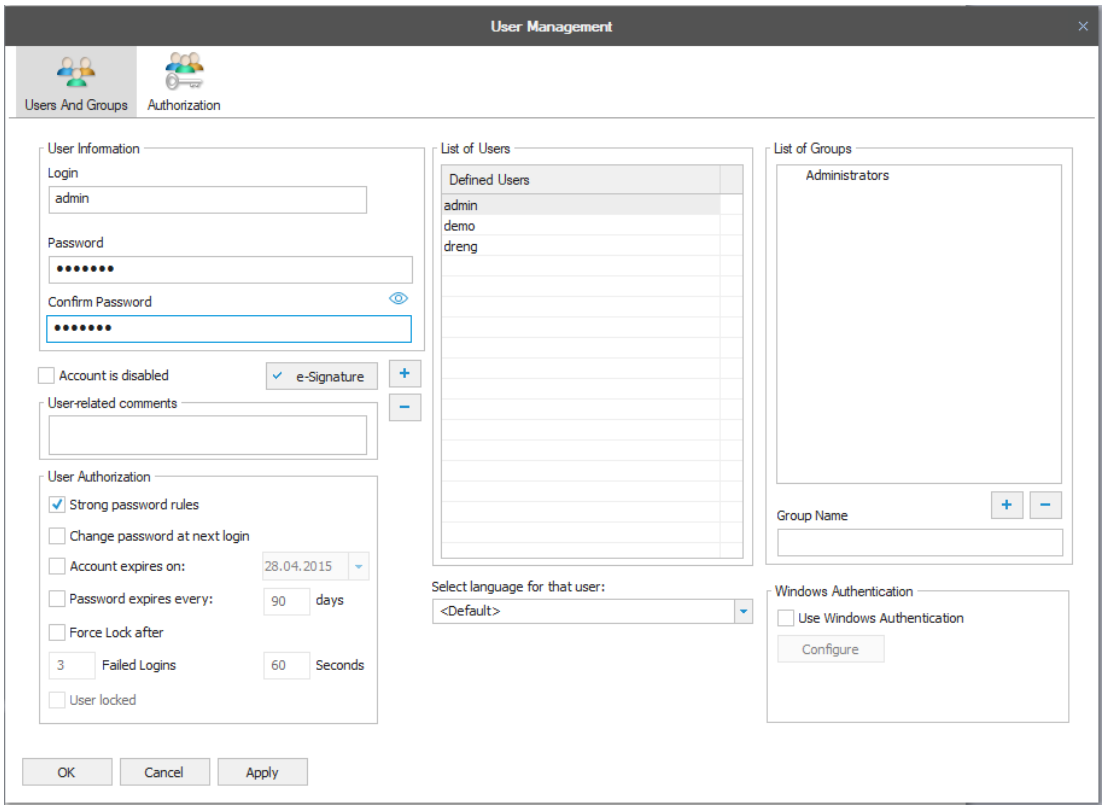
If a user hasn't entered the login information for the runtime within 1 minute, the login window will be closed automatically, and RMC window will be closed.

To open User Management dialog window user has to click on the *Edit project users* command button in the *User Management* section of the Project ribbon toolbar (see pic. below):



or click on *Define Users* button in Project settings - General window. The following user configuration dialog window will be opened:

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NOTE: *Edit project users* option will be enabled only if the user has *Full Administrator Rights*, i.e. the right to modify existing users and their properties, as well as to create new users. This access is usually given to project administrators (please, see *Full Administrator Rights* option in the User/Group Authorization 523 section).

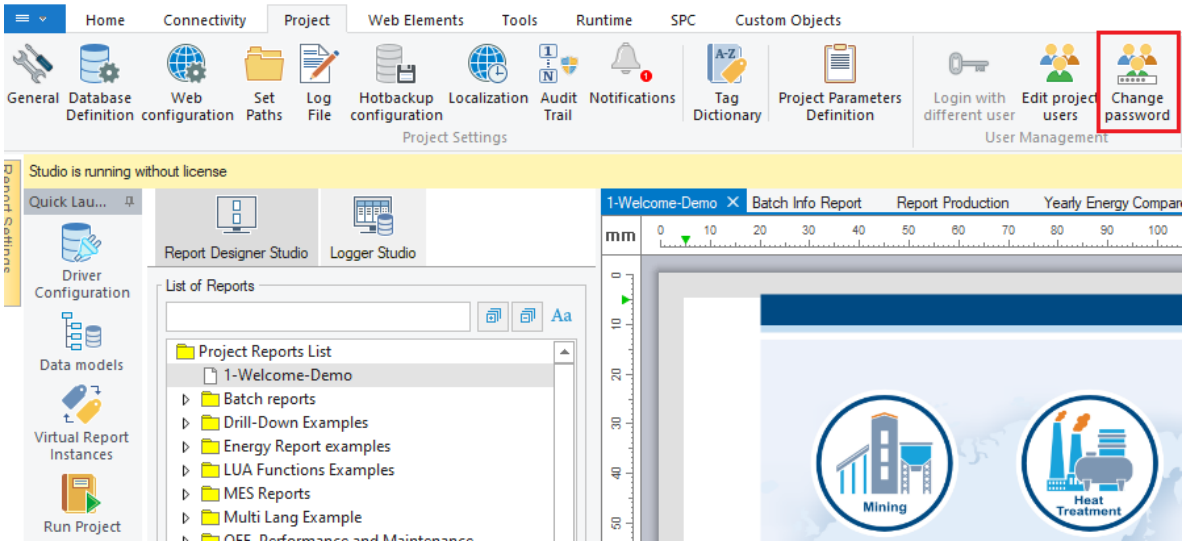
IMPORTANT: If no user will have full administration rights - then no user will have access to user management configuration window anymore. Therefore, at least one user has to have full administration rights, before enabling/activating user management in your Dream Report project.

Edit project users section is available at any stage of Dream Report project development and editing and there is no specific requirement to define and edit project users in the beginning or at the end of the reporting project development. However, we would recommend to make all users definitions at the end of project development, when all reports and forms are created.

User can also access and edit project users without enabling/activating user management in the project. In that case, user definitions will be defined and saved in the project, however, Dream Report will not require user login. That can be useful when designing and editing the project, while it's not completed yet.

If the user has no full administrative rights and cannot access user management window to modify his settings, there is the button *Change password* in Project toolbar, User management section:

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Any logged user, with and without administrative rights, can click that button and *Change password* window will open, where user can change his password.

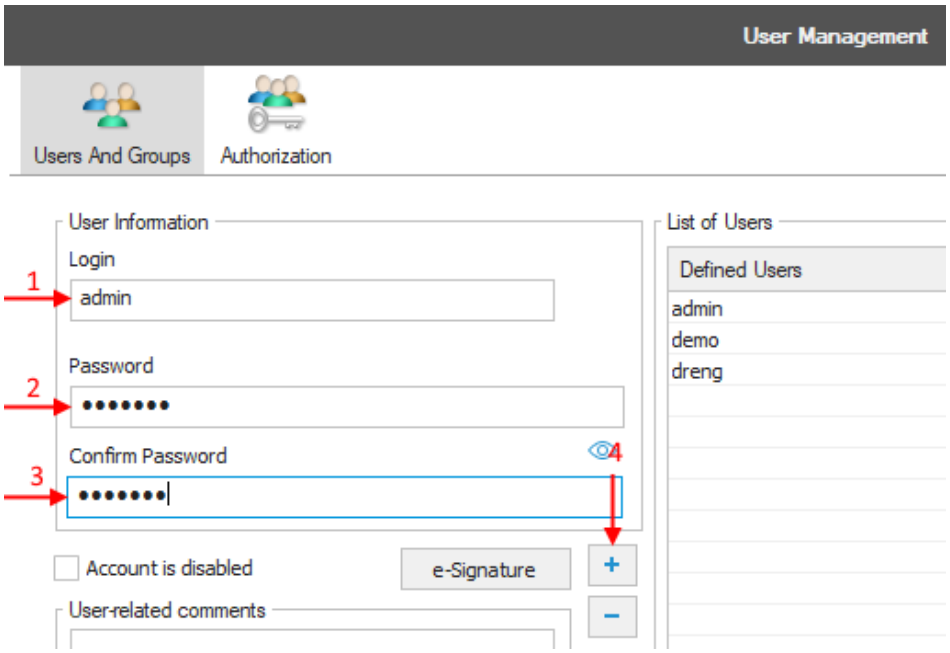
Users and Groups

In *Users and Groups* section, you can create users and user groups. The left part of the dialog box contains the list of users and their settings and the right part contains the list of users' groups definitions.

List of Users

To add a new user, you have to fill a new user information: *login* (user name), a *password* and password confirmation - those are the minimum requirements to add a new user and then click on the button + and the new user will be added to the project.

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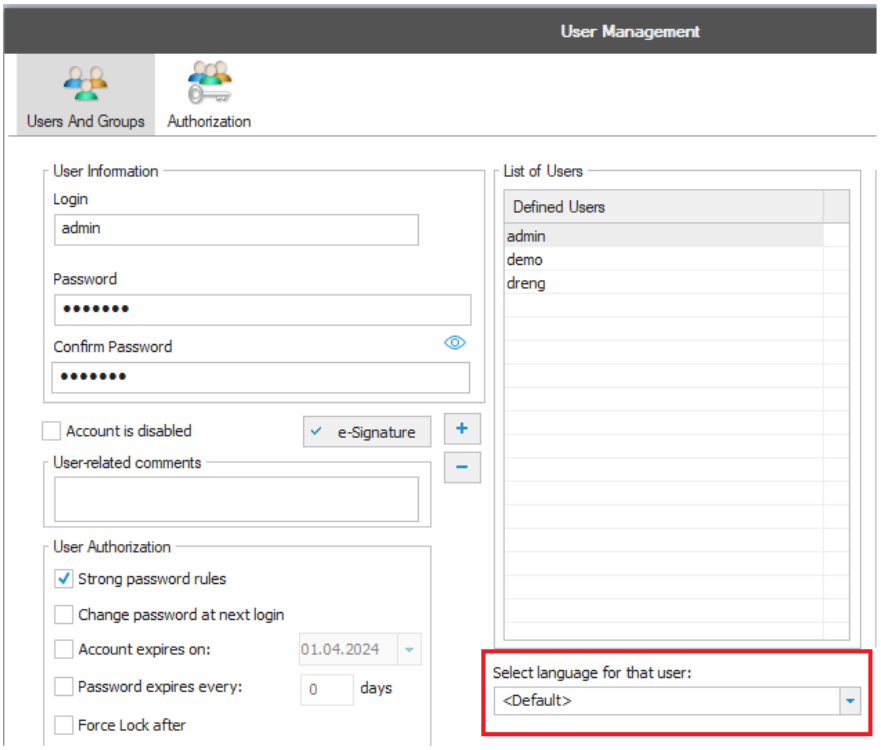


Multiple other options are available for a user definition:

Account is disabled option will disable user definition, while keeping user definition available. That means, that if one will try to login with that user name - that user login will be rejected. However, to enable back that user just *Account is disabled* checkbox will have to be unchecked and that user will be enabled again.

Select language for that user combo box can define, which language will be loaded for user interface, when that user will log in:

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Dream Report may change the language of user interface (menu items, user control captions, etc) depending on user preferences.

NOTE: Language selection will not affect the language of the content of reports, but will affect the language of the environment, user interface only.

If user will click on *e-Signature* button, it will open the dialog window to configure e-signature settings for that specific user. E-Signature configuration and functionality is described more in details in the Electronic Signature 468 section.

User Authorization

User authorization section contains additional user definitions:

Strong password rules - if this option is enabled, then strong password validation rules will be enabled. Strong password rules mean:

- Minimum password length should be at least 6 characters
- Password should contain at least one element from each of the 4 following categories: 1. Upper case letters (A, B…, Z), 2. Lower case letters (a, b, c, …, z), numbers (0 – 9) , special characters ({ } [ ],. <> ; : ? / \ ! @ # $ % ^ * ( ) - _ = +)

If *Strong password rules* option is disabled, then both strong password rules will be not checked and user can define any password of any complexity.

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Change password at next logon - if this option is selected, then next time, when that user will try to log in, he will be prompted to change the password. That is valid for the first user logon into either Dream Report studio or into a web portal. IN that case, user has to change his password, or he will not be granted access into the system.

If this option is disabled, user will not be forced to change his password and he may change it at any point of time in the future at his consideration.

Account expires on - this option allows to set an expiration date for user account. If this option is enabled, the expiration date had to be selected. When such a date has been reached, that user account will become disabled, however, user account definition will be still there. So, the project administrator can always enable back that account and recover that user.

Password expires - this option allows to set an expiration date for a password. If this option is enabled and the expiration date has been reached, at next logon, that user will be asked to change his password.

Force lock - this option defines the rule of user account lock in case of unsuccessful login attempts. If this option is enabled, then user has to enter two parameters: the *number of failed logins* and the *timeout in seconds*. In case this option is enabled, then if user login fails (due to the wrong password), a timer will switch on and if during defined timeout, another logins will fail, then when the number of login failures will reach the define number, then the account will be locked out. If the account is locked out, then only project administrator can open this window and unlock it. There is no other way, how an account can be unlocked.

As soon as user properties are configured, click on + (add) button and the new user will be added to the list of Dream Report users.

When you click on existing user in the list and click on - (delete) button, then the selected user will be deleted. If you select several users in the list, then user name, password and password confirmation edit boxes will be disabled. If you click on - button, all selected users will be deleted.

If you press on *Delete* button on the keyboard, then selected users will be deleted as well.

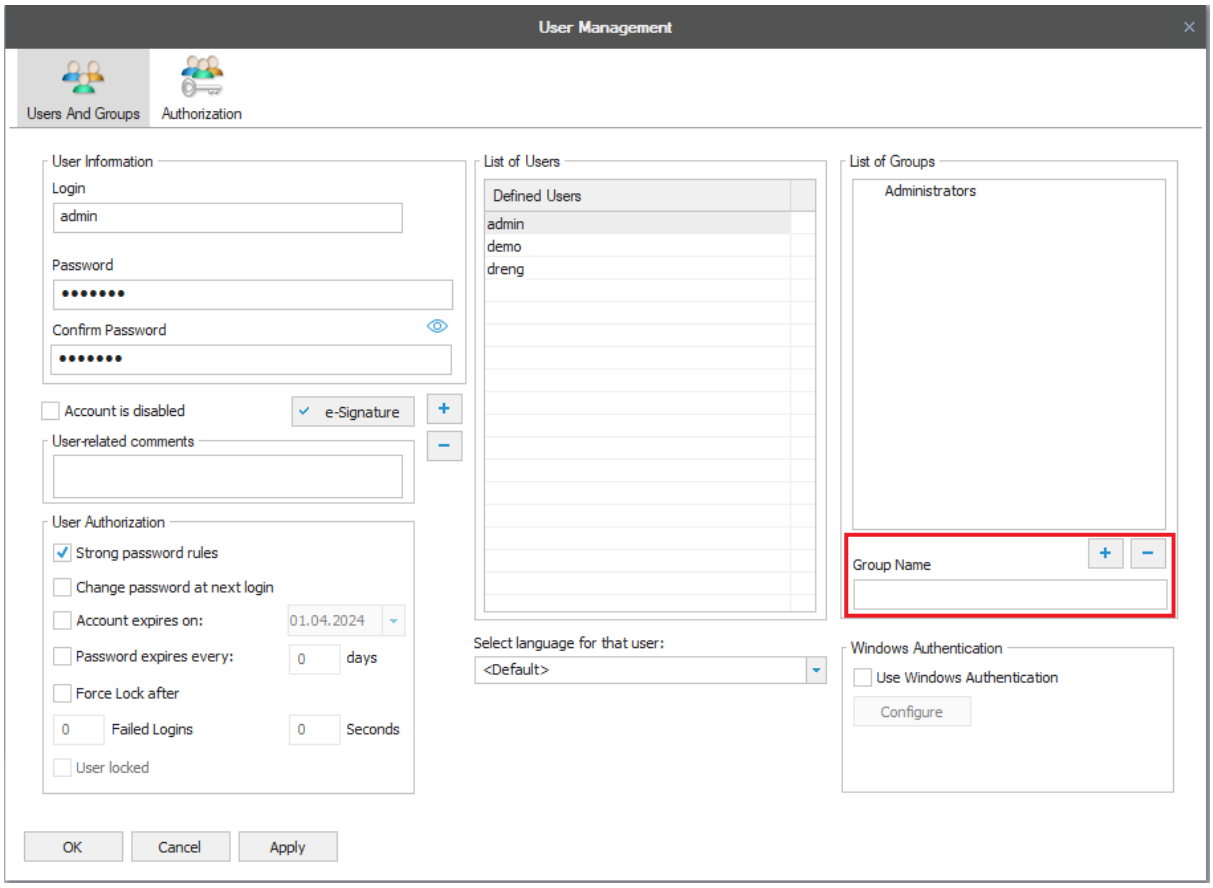
Change of password

If user has no administration rights and has no access to user definition window and such a user has to change his password, then he can click on *Change Password* button in the Project ribbon, User management section and *Change password* dialog window will be open.

List of Groups

To add a new user group, one has to type a new group name in the edit box below the list control, click on + (add) button, and new user group will be added to the list:

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When you select one or several users in the list, you can drag and drop selected users to the required group.

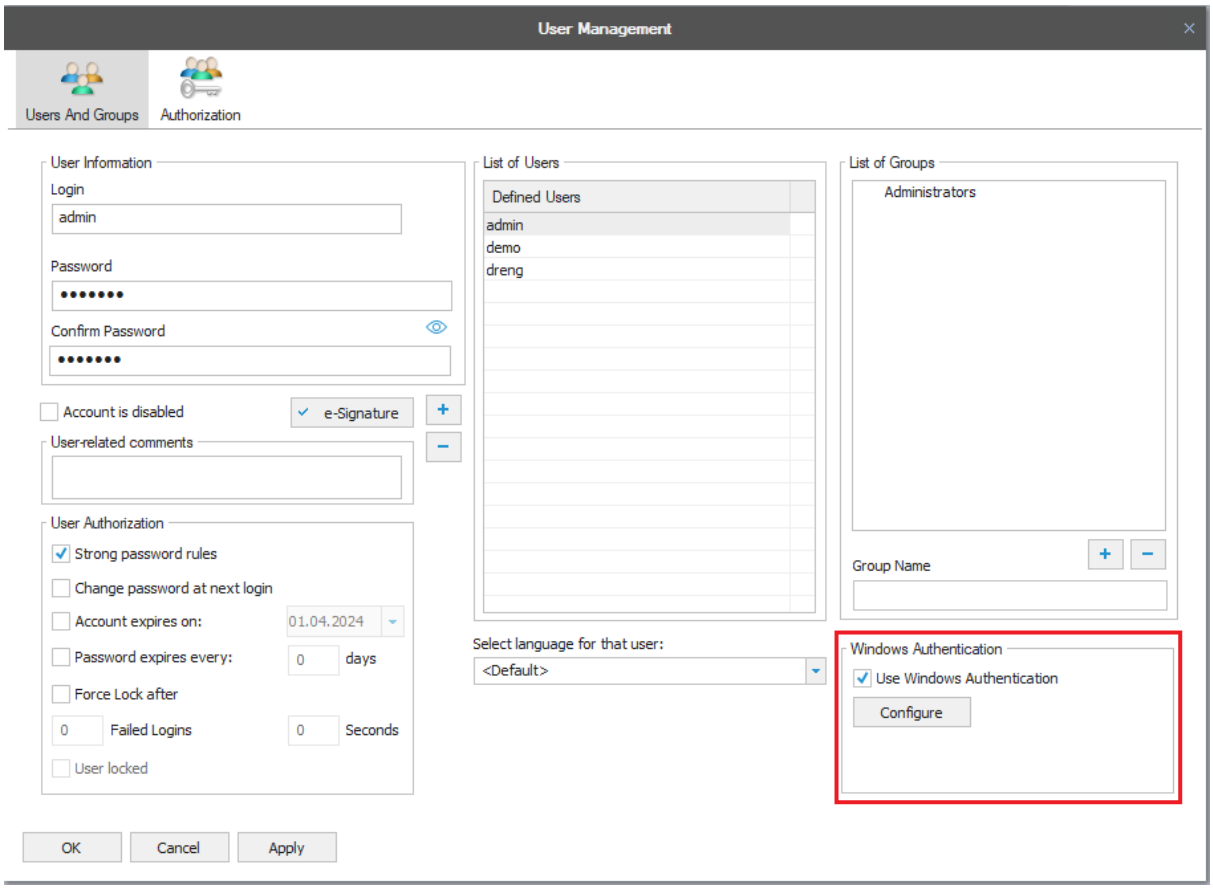
When you select any group in the list, it will immediately set selected all the users, defined and belonging to that group, in the users list. You can click on any user entry to select/unselect user for the selected group.

Windows Authentication

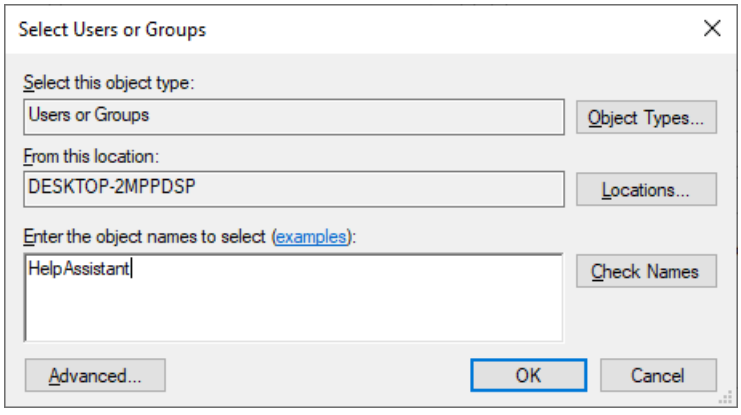
This section allows to get users/groups list(s) from Windows and to include those users and user groups into a Dream Report user management.

There is a *Windows Authentication* group box, which has the check box *Use windows authentication*. If this check box is not checked, then the button “Configure” will be disabled. As soon as that check box is enabled, then *Configure* button will become enabled:

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If user will click that *Configure* button, then the standard Windows dialog box *Select User or Group* will open:

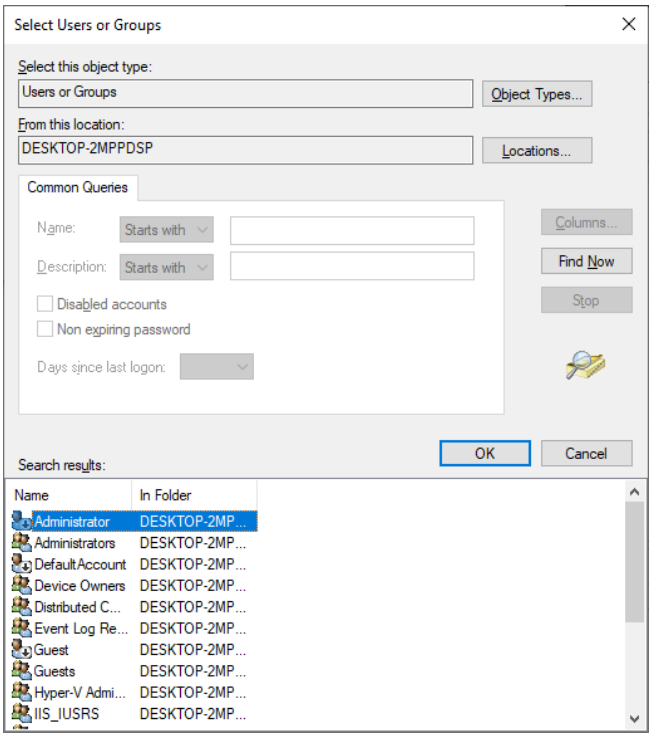


User will have to select Windows users/ groups, their location, and the name.

If the selected name can't be found, or is not typed correctly, then the error message box will pop up, saying that an object with the selected name cannot be found.

In this case user can click on the *Advanced* button to start advanced Windows user/group selection. The following dialog box will be opened:

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If a user clicks on the *Find Now* button, the drop-down list will appear. User will be able to select the relative -distinguished name (RDN) to be added to the list of Users /Groups, and then click *OK*. This name will immediately appear in the object name edit box of the Select User or Group dialog box.

Click *OK*, and the selected Windows user or group will be added to the corresponding list in the User Management Users and Groups dialog window.

All selected information will be saved in Dream Report User Management database.

Audit-Trail Record

When permissions of the user are changed the corresponding event is going to be logged into audit trail if this option is activated in a project.The message contains a field with name "EventDetails" where the following information is recorded:

Changed user: <UserName> , original permissions: d = 1, rt = 1, rtg = 1, rts = 1, l = 1, w = 1, wg = 1 dshb = 1 admin = 1, off = 0, win = 0, new : d = 1, rt = 1, rtg = 1, rts = 1, l = 1, w = 1, wg = 1 dshb = 1 admin = 1, off = 1, win = 0

In this string "UserName" is a user name of the user whose permissions were changed.Then the original/current permissions of the user and newly set permissions of the user.
The codes in the permissions string are following:

d - Access to Designer Studio
rt - Access to Runtime Engine
rtg - Generate Reports in Runtime
rts - Stop Or Shutdown Runtime Engine

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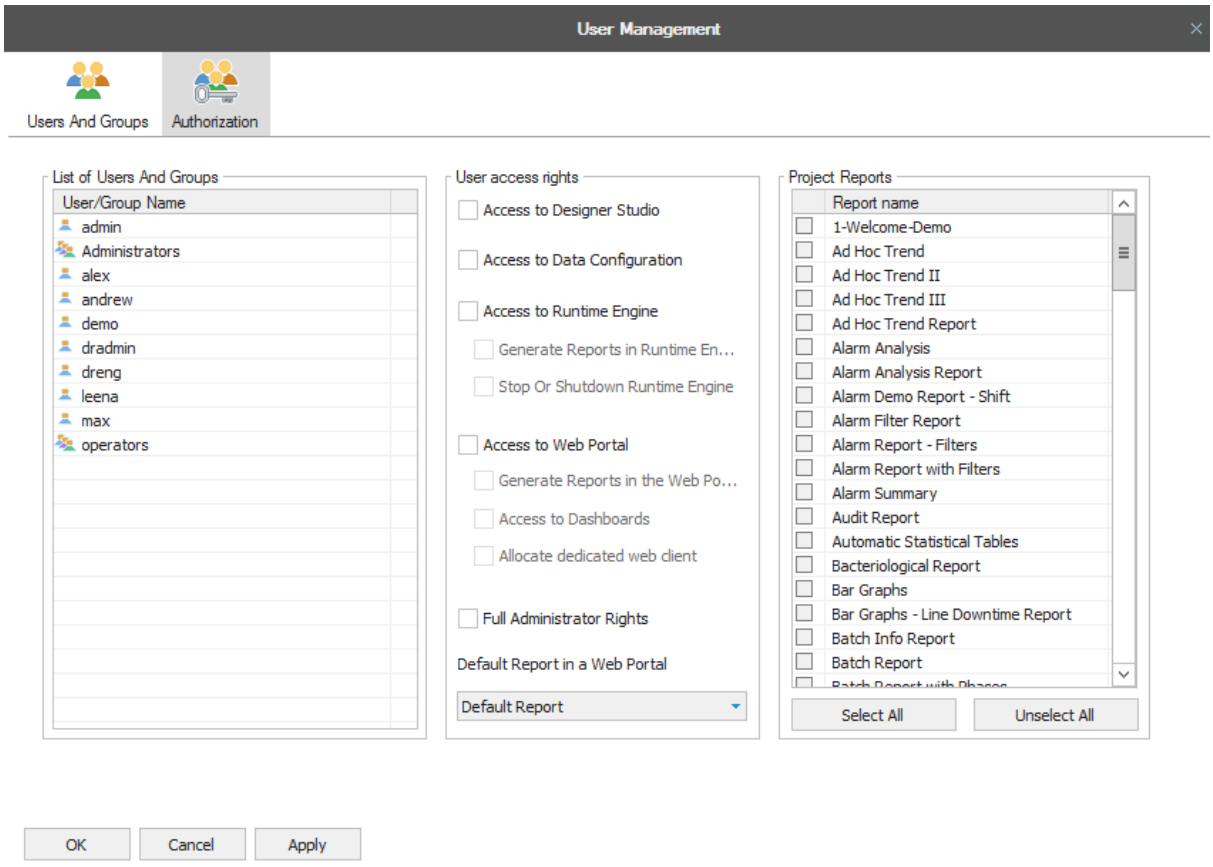
l - Access to Data Configuration for logging
w - Access to Web Portal
wg - Generate Reports in Web Portal
dshb - Access to Dashboards
admin - Full Administrator Rights
off - Account is Disabled
win - Windows User

Example: d = 1 means that user has permission to access designer studio, d = 0 means that user does not have access to designer studio.

20.2 User/Group Authorization

This functionality enables you to assign project report access rights to the user or user groups selected.

From the User Management window, click the *Authorization* tab:



The *List of Users and Groups* will display all users and groups, defined in the Users and Groups section.

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You can select any user/group and assign its access rights by checking the corresponding check boxes with allowed access rights in the User access rights section of this window.

User Access Rights

Access to Designer Studio specifies if the user has the rights to access and design reports. If this option is switched off, the Designer Studio floating splitter and the same menu option in View menu will be disabled.

Access to data configuration specifies if the user has rights to access the Communication Drivers, and the data logging definition ("Logger Studio") sections in Studio. If this option is unchecked, the Logger studio floating splitter and menu option in View menu, as well as driver definition dialog box access, will be disabled, and user will not be able to add/edit data communication driver settings.

Access to runtime engine defines if the user has rights to control runtime manager operations. If this option is disabled, the Runtime Management Console (RMC) dialog box will be unavailable for that user. If this option is enabled, there are two additional settings available:

- *Generate Reports in Runtime Engine* – if checked, the logged in user will be able to select and generate reports from the Runtime Management Console or Dynamic Report Generator. If unchecked, the user will not be able to generate reports, but will have access to other functionality in the RMC (e.g., open log file, open the reports, folder, etc.)
- *Stop or Shutdown Runtime Engine* – if checked, the logged in user will be able to shut down the running project.

NOTE: If RMC is password-protected and is minimized (and hidden in the system tray), then whenever a user tries to maximize it by double-clicking on the RMC icon in the system tray, RMC will ask for user authorization.

Access to Web Portal defines if the user has rights to open and connect to the project's reporting web portal to view reports. Additionally:

- *Generate Reports in the Web Portal*, if checked, will allow that user/group to generate dynamic reports, with user-specified time ranges, Ad-Hoc reports, etc.
- *Access to Dashboards*, if checked, will enable the option for the user/group to open the Dashboards section of the portal, to view and interact with dashboards (if configured).
- *Allocate dedicated web client* – this option allows you to to assign a licensed web client for a specific user. This means that will be always available for that user, regardless of how many web clients are currently allocated or available

Full Administrator Rights

Full Administrator Rights defines if a user has all access rights, as well as the rights to access the user definition window ("Edit Project Users") to modify existing users and their properties, and create new users. Usually this access is given to project administrators only.

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If this option is enabled, then all other check boxes with allowed access rights will automatically become checked, but not allowed for manual enable/disable. If individual access rights or properties need to be set, uncheck *Full Administrator Rights*, and then check/uncheck options as needed.

If this option is enabled for a user, then every time this user logs in the Dream Report Studio, the ***Edit project users*** command button in the **User Management** section of the **Project** toolbar will be enabled. And this user will have an access to editing project users in the Dream Report Studio.

Otherwise, this command button will be always disabled.

NOTE: Always select at least one user to have **Full Administrator Rights**. If no user or group has been given the right to have access to the *User Management* window in the project, then, on exiting the *User Management* section, the following message box will appear: "***No user with the right to administrate project was defined. Please, define at least one user with an access to User Definition window***". Then, you will have to go back to the *Authorization* section in *User Management,* and select at least one user, who will have access to the User Definition window.

You can assign different user rights by selecting one or several users and/or groups from the *List of Users and Groups*, and by checking appropriate check boxes with the corresponding access rights.

Check boxes in the **List of Users and Groups** are not related to user rights, but only to access to reports.

If no report is selected in the **Report name** list of the **Project Reports** section (on the right), then, all check boxes in the **User access rights** list will be disabled.

At runtime, when a user attempts a login, the Dream Report *User Management* will check if it is a Windows user. If yes, then it will verify with Windows Active Directory or Domain which groups this user belongs to, and then will apply the access rights.

If a user belongs to different groups which are defined in Dream Report *User Management*, then user rights will be set using maximum ("additive") access mode.

Example: if a user belongs to the *Guest* group with access to the Designer studio, and also belongs to the *Engineers* group, which has an access to the Runtime manager, then, that user will get access both to the Designer studio and the Runtime manager.

The *Default Report in a Web Portal* option allows you to specify a default report to be opened in the web portal, when that user logs in to the portal (instead of opening the default "Welcome" page). If no default report is selected for the user, then when that user logs in to the web portal, default Welcome web page will be opened (as defined under the *Project* > *Web Configuration* > *Portal Display Options* > *Set Default Web Page As* option.)

By default, no default report will be assigned to all users.

The *Project Reports* list will list all reports defined in the Dream Report project. After selecting a user or group, check one or more reports, which the selected user or group will have access to at runtime, in the *Report Name* list control (on the right).

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NOTE: If there are any virtual instances of the reports in the project, then, if a user gets some/ all access rights to any report in this project, they will automatically get the same defined access rights to all the instances of that report.

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Web Portal

21 Web Portal

21.1 Manual Configuration of IIS

Before installing Dream Report with the Web Portal option, **Internet Information Services (IIS)** needs to be enabled/configured with specific options, as described below. Those actions are required prior to Dream Report installation, and don't have to be performed again when creating/running a new project.

Steps to follow:

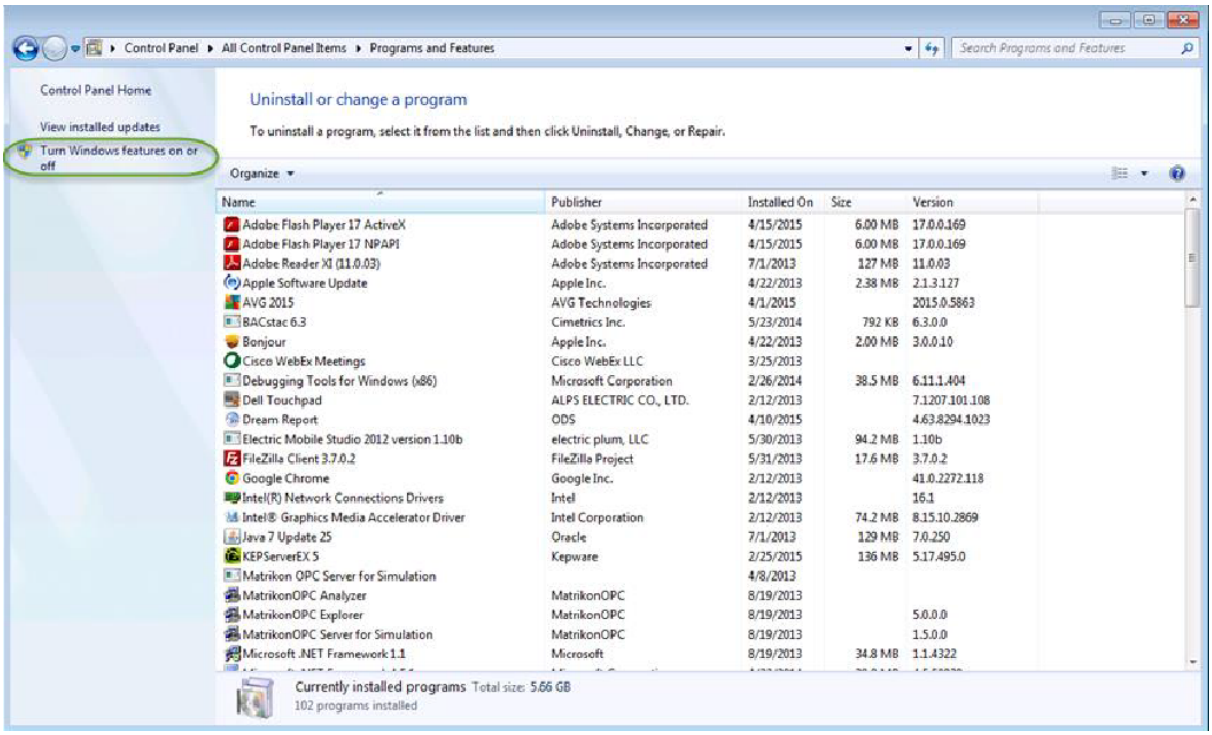
1. Log in to Windows as a System Administrator.

2. Ensure that the computer on which you are installing Dream Report has Microsoft **.Net Framework version 4.7.1 or newer** installed

3. Configure Internet Information Services, specific to the Windows operating system being used:

Configuring IIS on Windows 8:

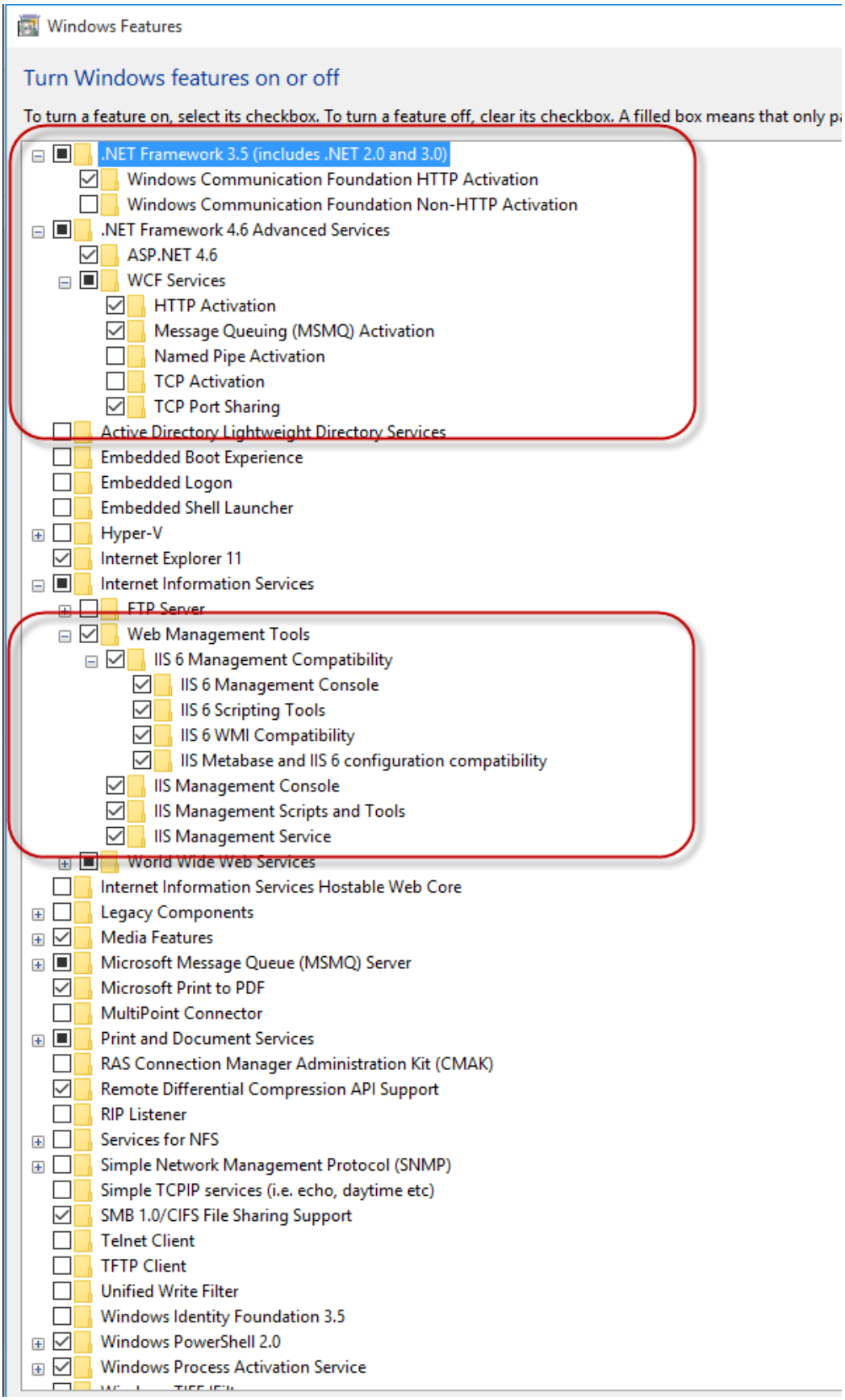
- Open the Windows **Control Panel**
- Open the **Programs and Features** window from the *Control Panel -> Programs and Features* on your PC and click the *Turn Windows features on or off* option, as shown below:



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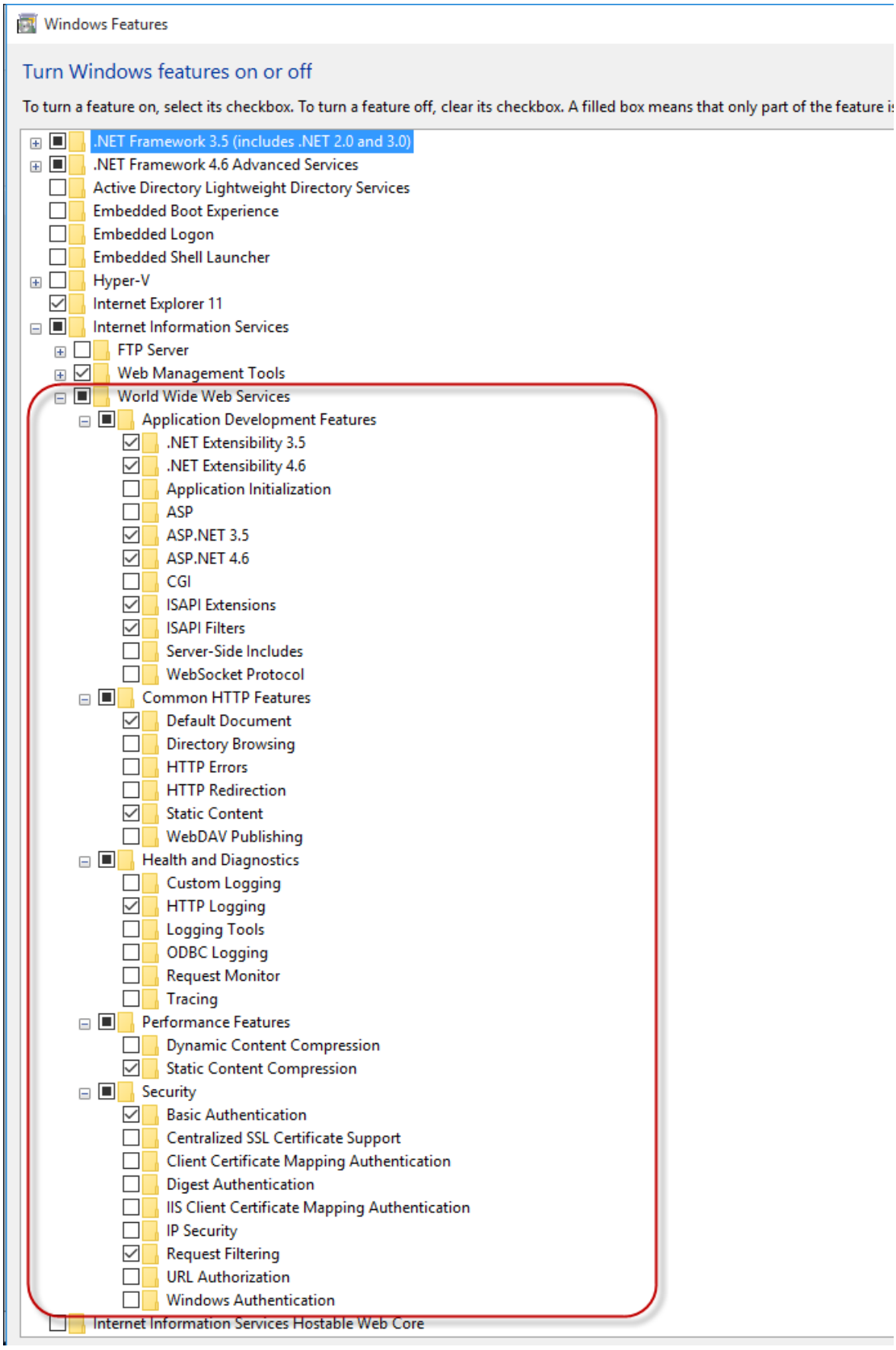
- Please make sure that the following components are enabled (the checked items in the following images):

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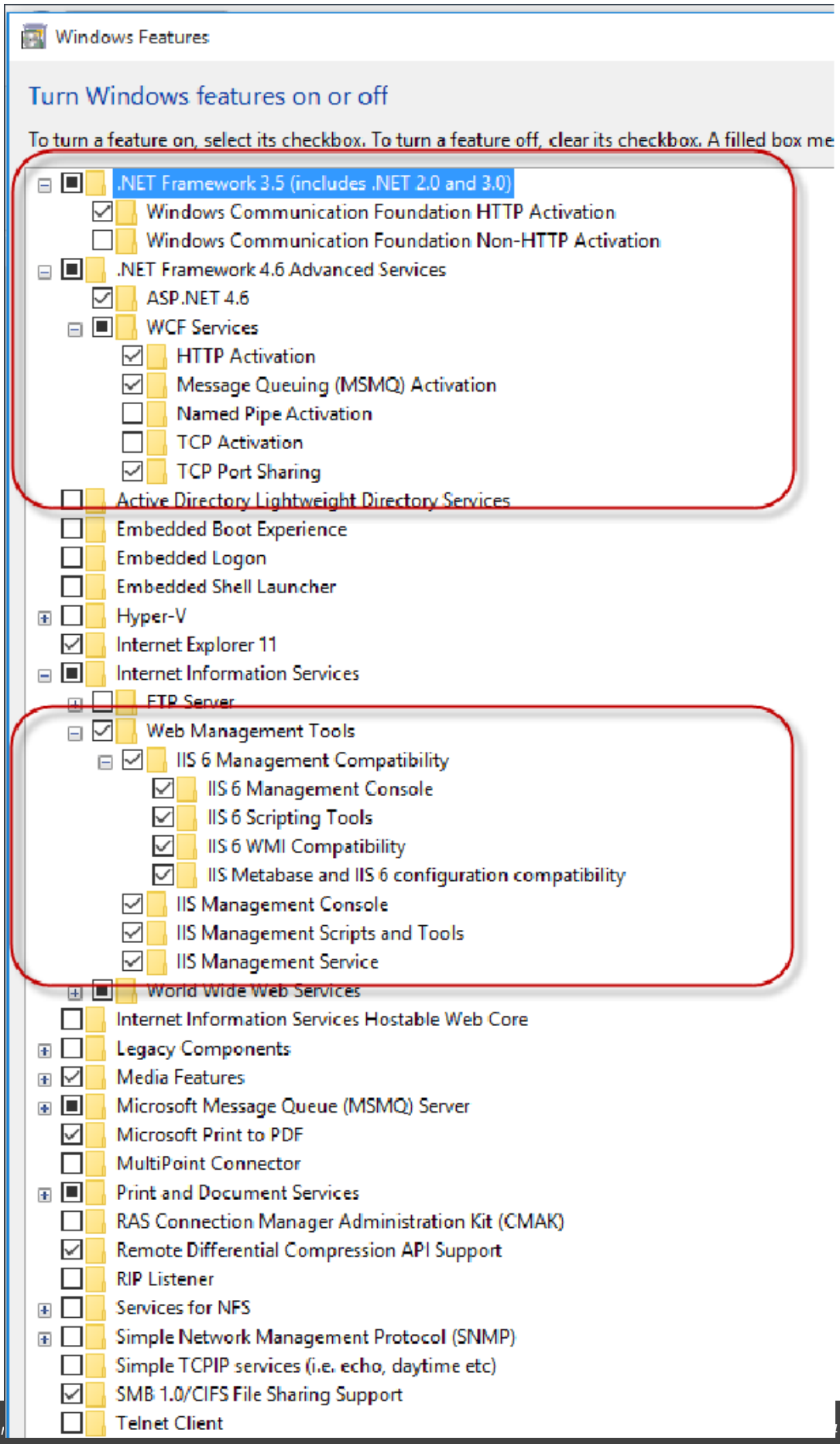


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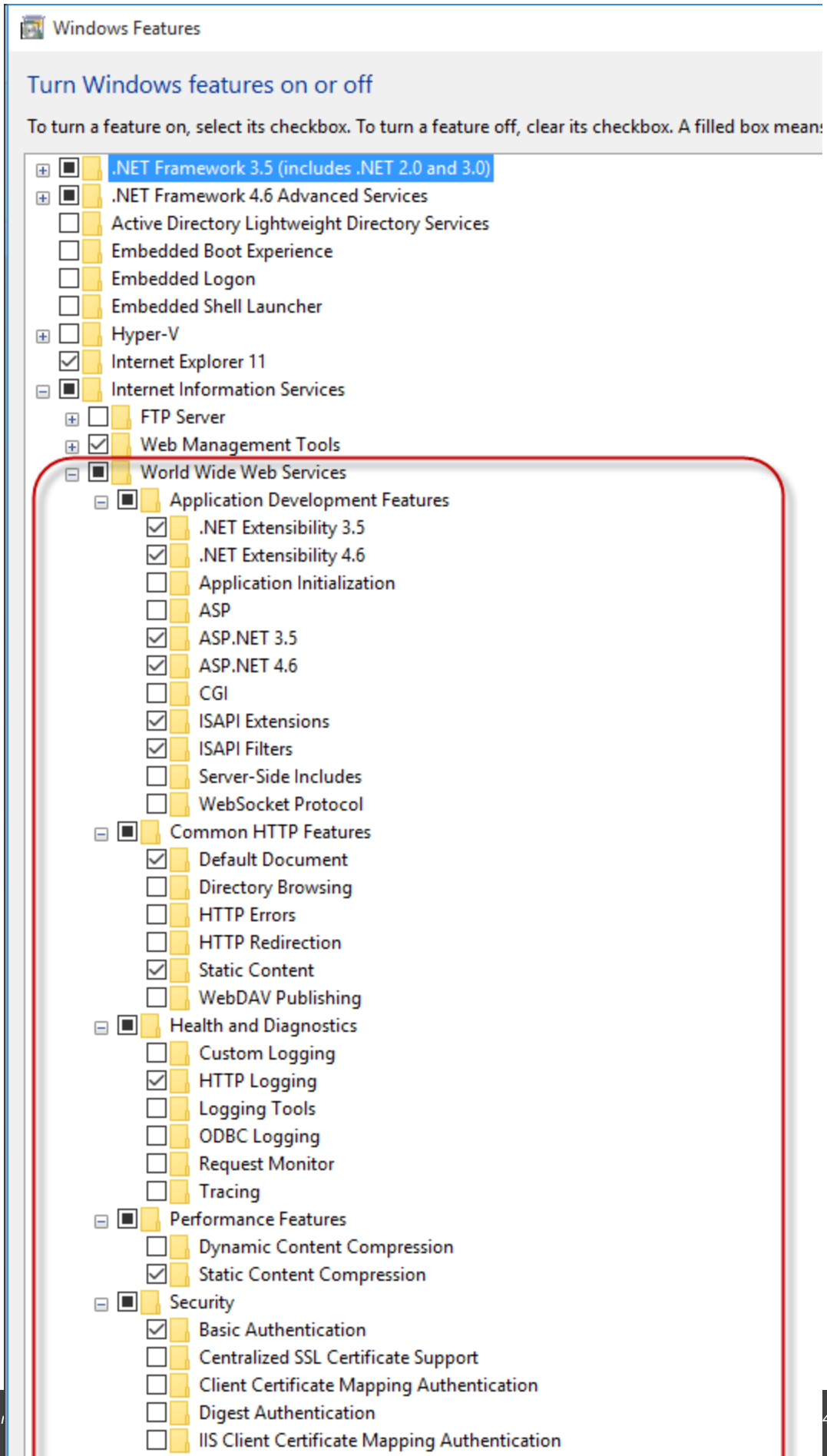
Configuring IIS on Windows 10:

- Click on the Windows icon in the lower-left corner of the screen, and then click *Settings*.
- Click *Search* at the center of the window, and enter **Turn Windows features on or off** in the search box - select this option.
- Make sure that the following components are enabled (the checked items in the images below):

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Windows Features
Turn Windows features on or off
To turn a feature on, select its checkbox. To turn a feature off, clear its checkbox. A filled box me
.NET Framework 3.5 (includes .NET 2.0 and 3.0)
Windows Communication Foundation HTTP Activation
Windows Communication Foundation Non-HTTP Activation
.NET Framework 4.6 Advanced Services
ASP.NET 4.6
WCF Services
HTTP Activation
Message Queuing (MSMQ) Activation
Named Pipe Activation
TCP Activation
TCP Port Sharing
Active Directory Lightweight Directory Services
Embedded Boot Experience
Embedded Logon
Embedded Shell Launcher
Hyper-V
Internet Explorer 11
Internet Information Services
FTP Server
Web Management Tools
IIS 6 Management Compatibility
IIS 6 Management Console
IIS 6 Scripting Tools
IIS 6 WMI Compatibility
IIS Metabase and IIS 6 configuration compatibility
IIS Management Console
IIS Management Scripts and Tools
IIS Management Service
World Wide Web Services
Internet Information Services Hostable Web Core
Legacy Components
Media Features
Microsoft Message Queue (MSMQ) Server
Microsoft Print to PDF
MultiPoint Connector
Print and Document Services
RAS Connection Manager Administration Kit (CMAK)
Remote Differential Compression API Support
RIP Listener
Services for NFS
Simple Network Management Protocol (SNMP)
Simple TCPIP services (i.e. echo, daytime etc)
SMB 1.0/CIFS File Sharing Support
Telnet Client

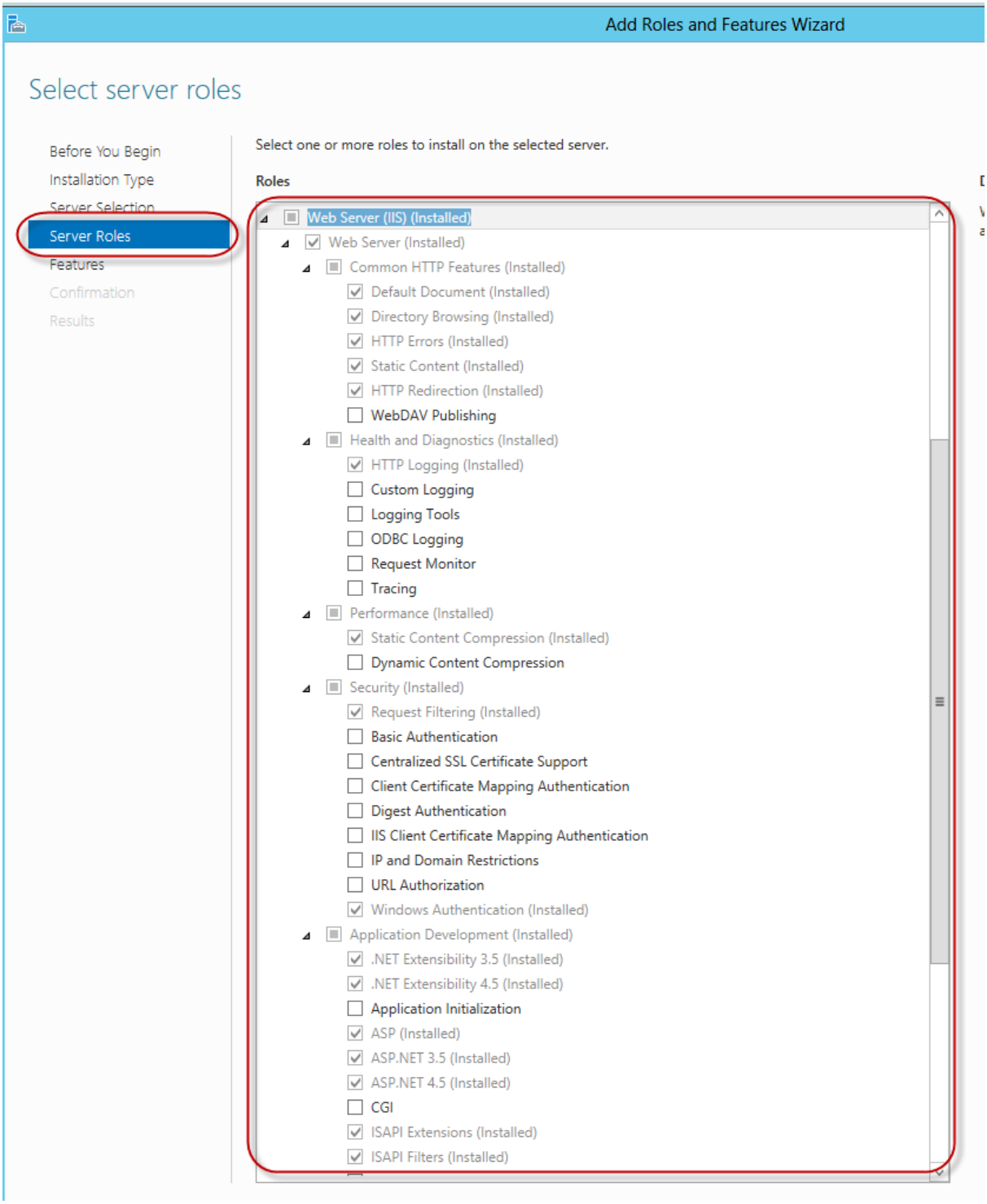
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Windows Features
Turn Windows features on or off
To turn a feature on, select its checkbox. To turn a feature off, clear its checkbox. A filled box means
.NET Framework 3.5 (includes .NET 2.0 and 3.0)
.NET Framework 4.6 Advanced Services
Active Directory Lightweight Directory Services
Embedded Boot Experience
Embedded Logon
Embedded Shell Launcher
Hyper-V
Internet Explorer 11
Internet Information Services
FTP Server
Web Management Tools
World Wide Web Services
Application Development Features
.NET Extensibility 3.5
.NET Extensibility 4.6
Application Initialization
ASP
ASP.NET 3.5
ASP.NET 4.6
CGI
ISAPI Extensions
ISAPI Filters
Server-Side Includes
WebSocket Protocol
Common HTTP Features
Default Document
Directory Browsing
HTTP Errors
HTTP Redirection
Static Content
WebDAV Publishing
Health and Diagnostics
Custom Logging
HTTP Logging
Logging Tools
ODBC Logging
Request Monitor
Tracing
Performance Features
Dynamic Content Compression
Static Content Compression
Security
Basic Authentication
Centralized SSL Certificate Support
Client Certificate Mapping Authentication
Digest Authentication
IIS Client Certificate Mapping Authentication

Configuring IIS on Windows Server 2012:

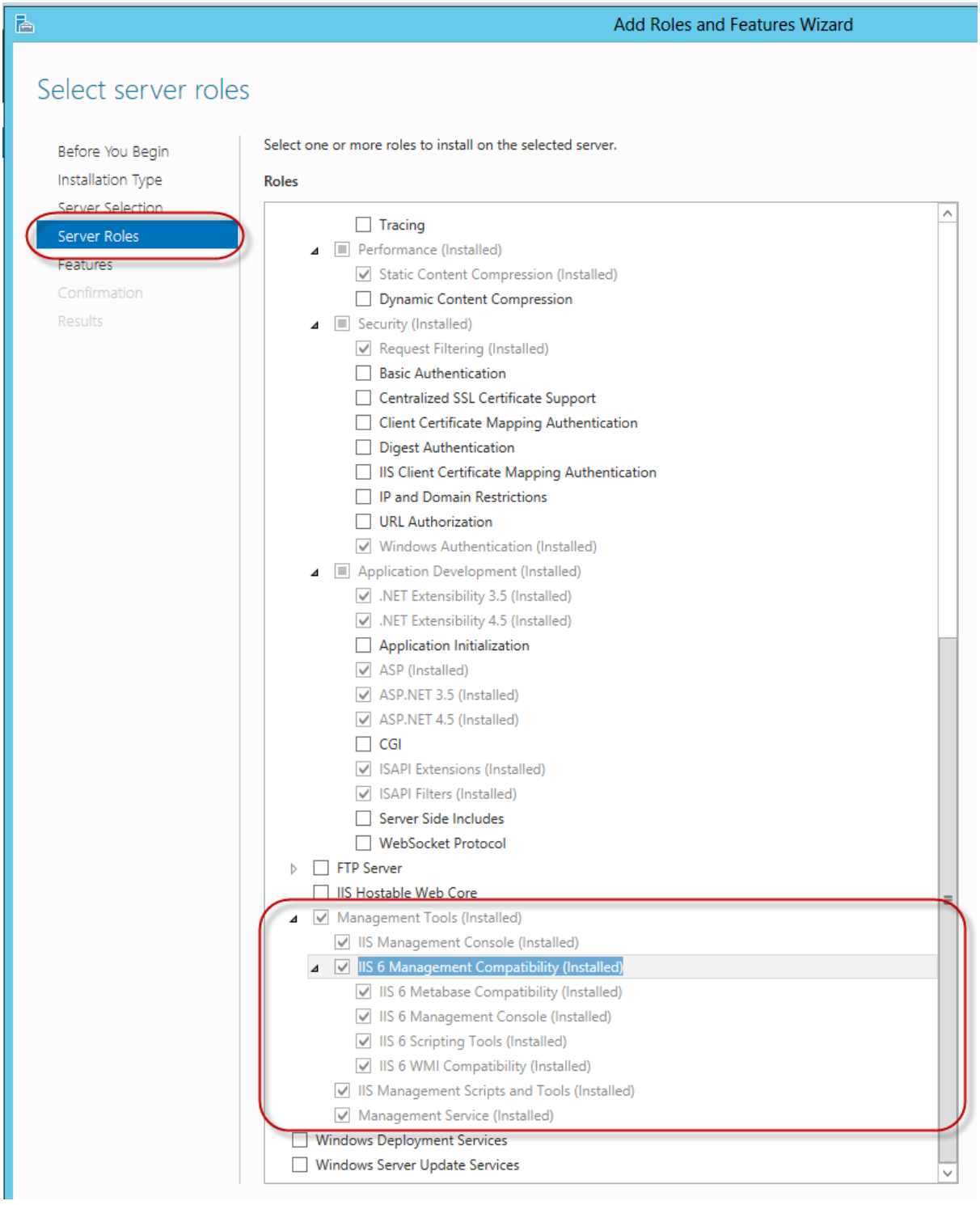
- Click *Server Manager* from the *Start* menu and configure ***Server Roles*** as shown in the images below:

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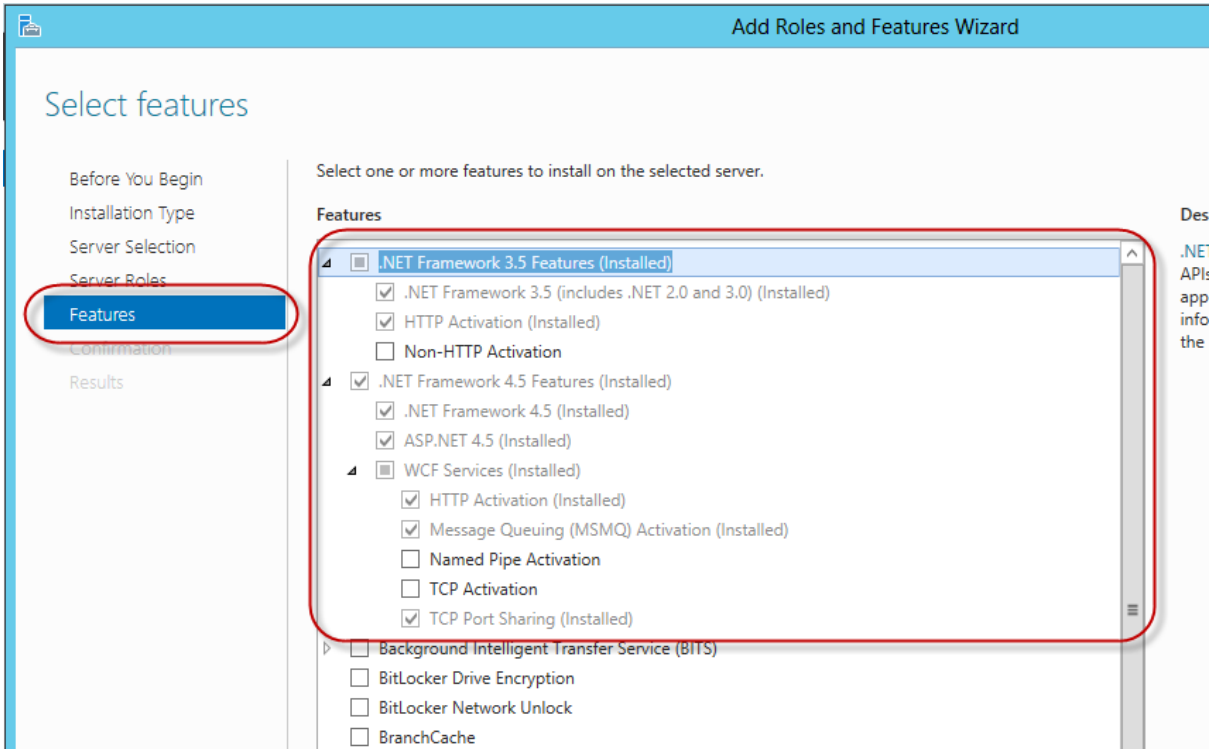
Server Roles configuration, continued…

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- After configuring *Server Roles*, please go to the ***Features*** section and configure it as shown below:

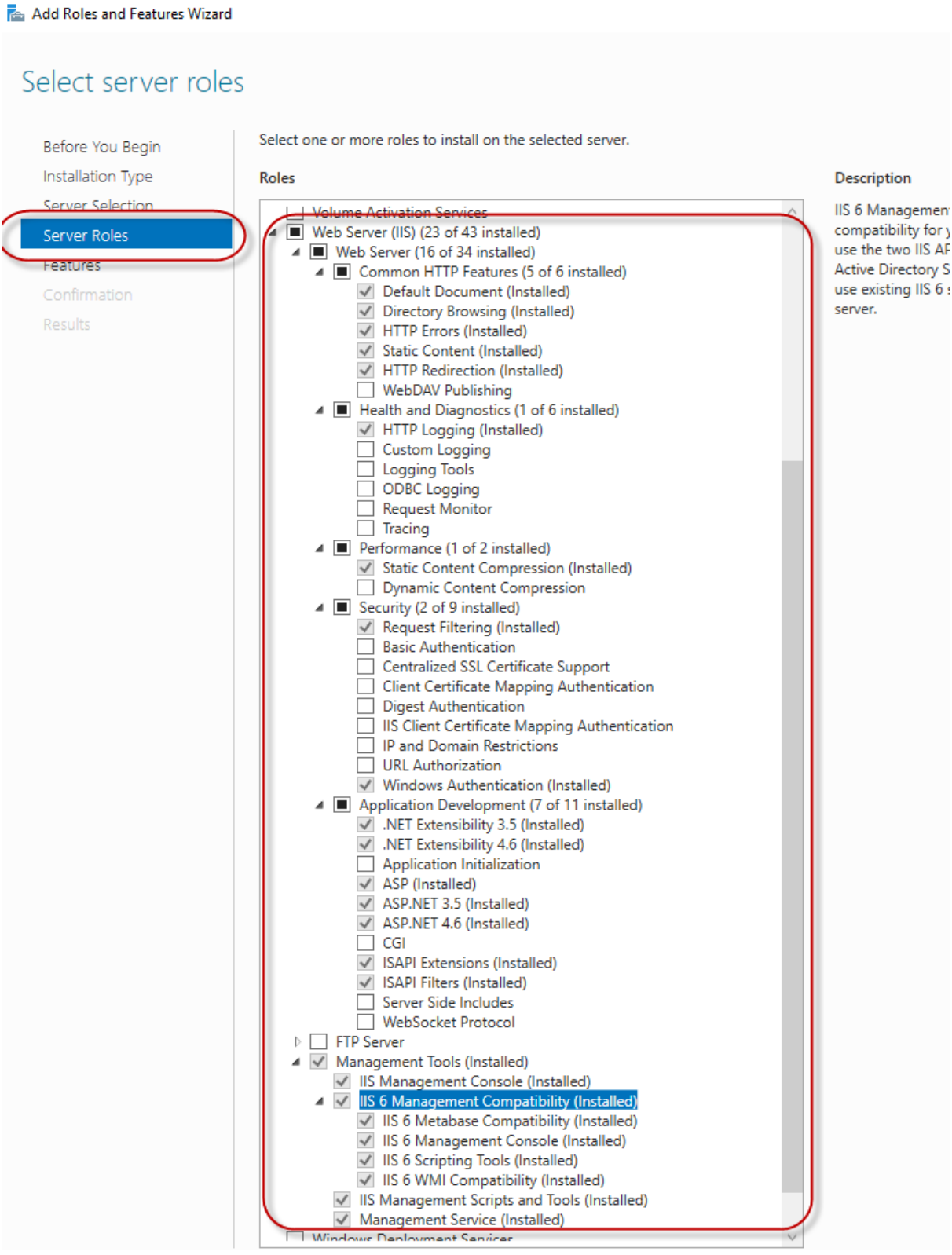
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Configuring the IIS on Windows Server 2016 and Windows Server 2019:

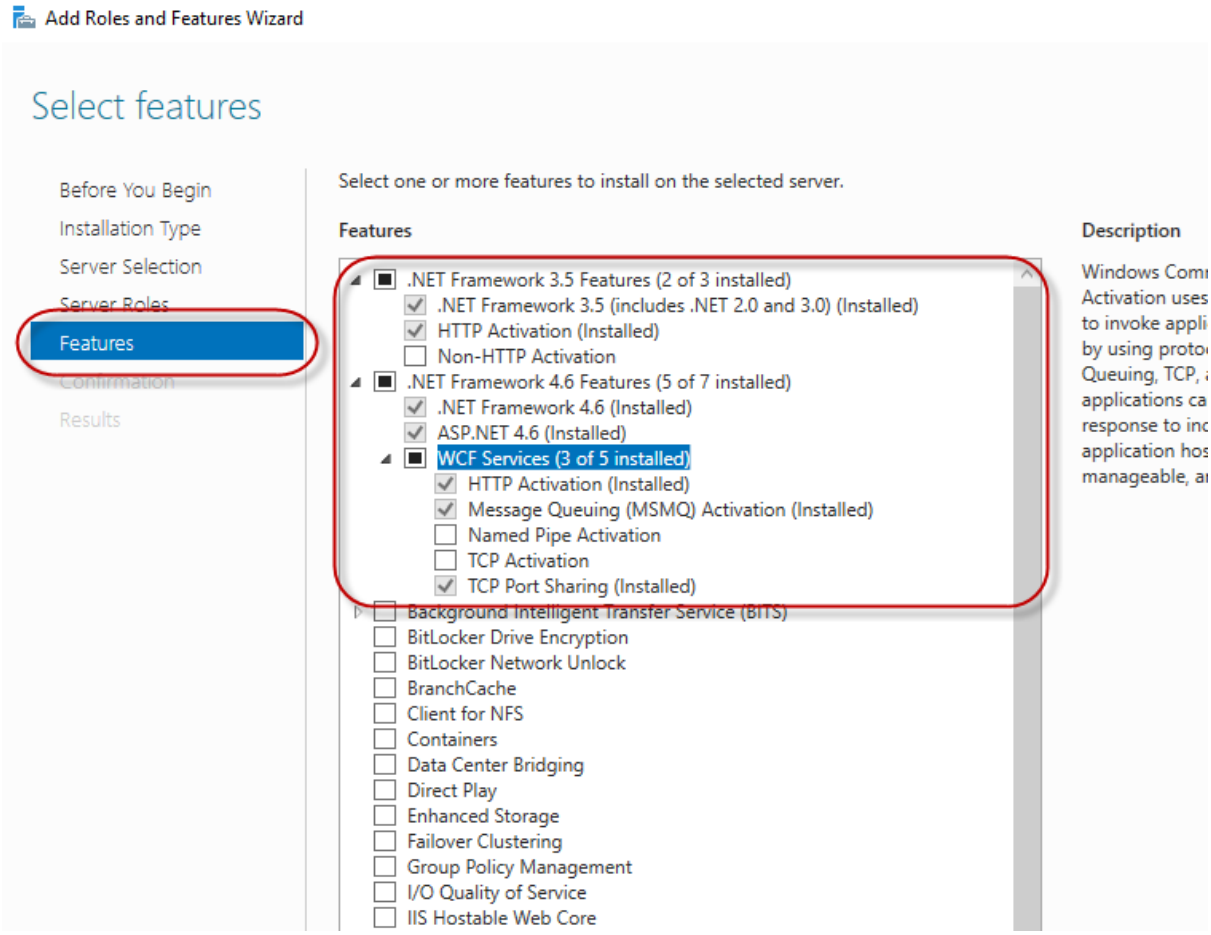
- Click *Server Manager* from the *Start menu* and configure ***Server Roles*** as shown below:

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- After configuring *Server Roles*, please go to the ***Features*** section and configure it as shown below:

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4. After installing/configuring IIS, you may be prompted to restart the computer.

5. Install Dream Report.

Notes:

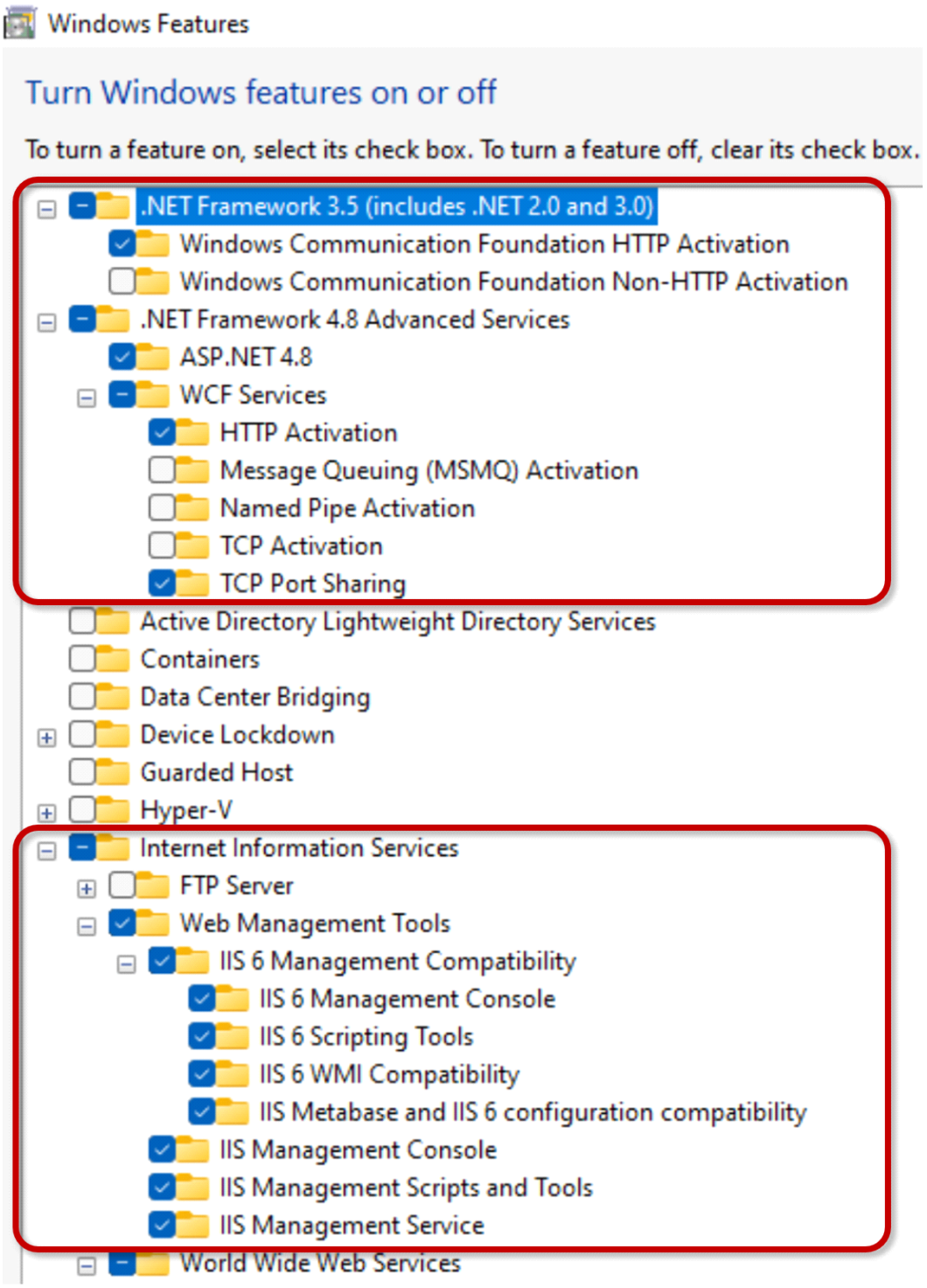
1. If IIS is not installed and configured correctly prior to installing Dream Report, the product can still be installed, but user will receive a warning message stating that the Product Web Portal won't be installed as part of the current installation. IIS can be configured later, at which point, you can run the Dream Report software installation again, where you will have the opportunity to modify the installation, and install the Product Web Portal.

2. Please note that for Dream Report 4.8 and newer, ***HTTP Activation*** *must be enabled, as shown in the various IIS configuration images above.*

Configuring IIS on Windows 11:

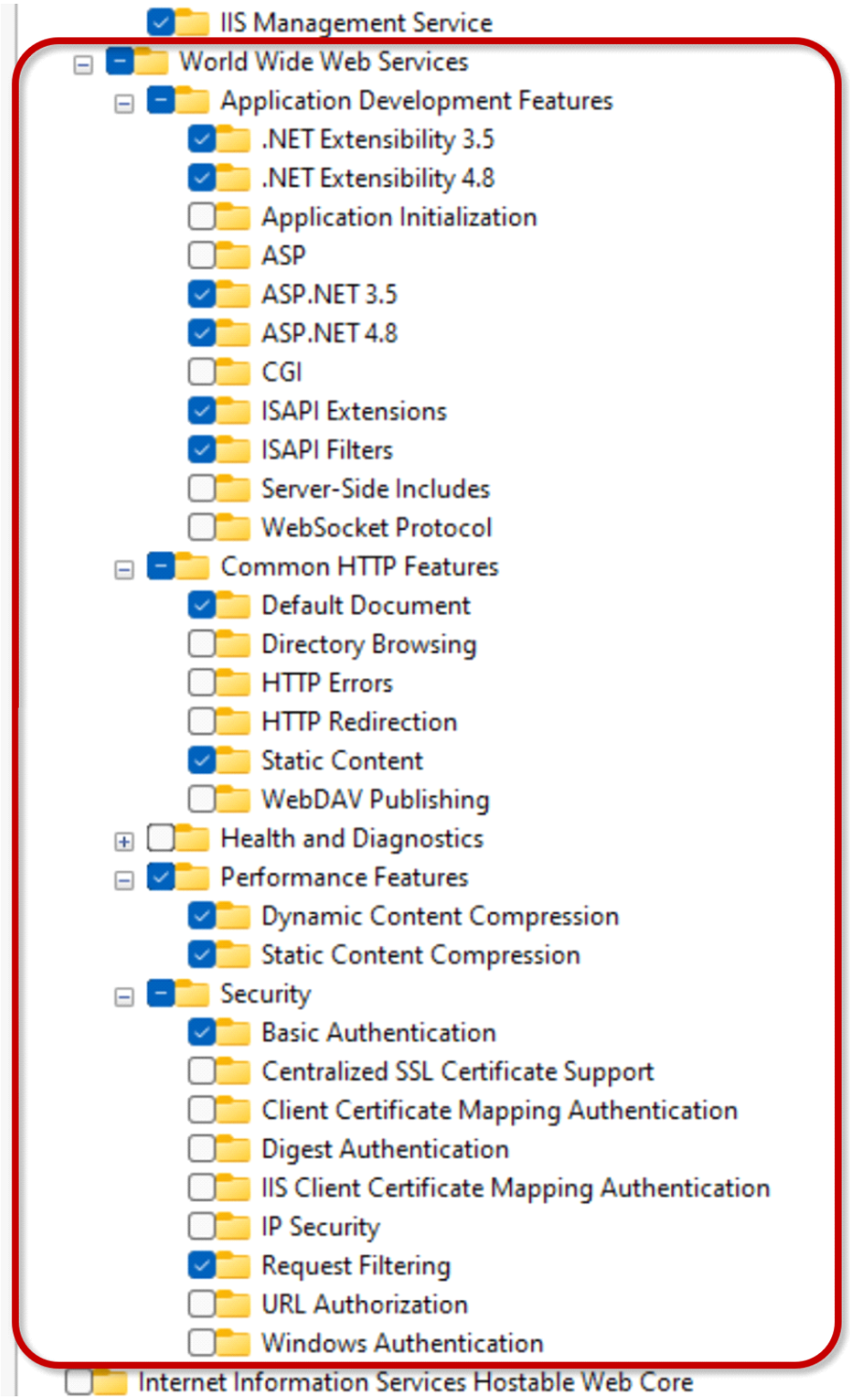
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- Click on the Windows icon in the lower-left corner of the screen, and then click *Settings*.
- Click *Search* at the center of the window, and enter **Turn Windows features on or off** in the search box - select this option.



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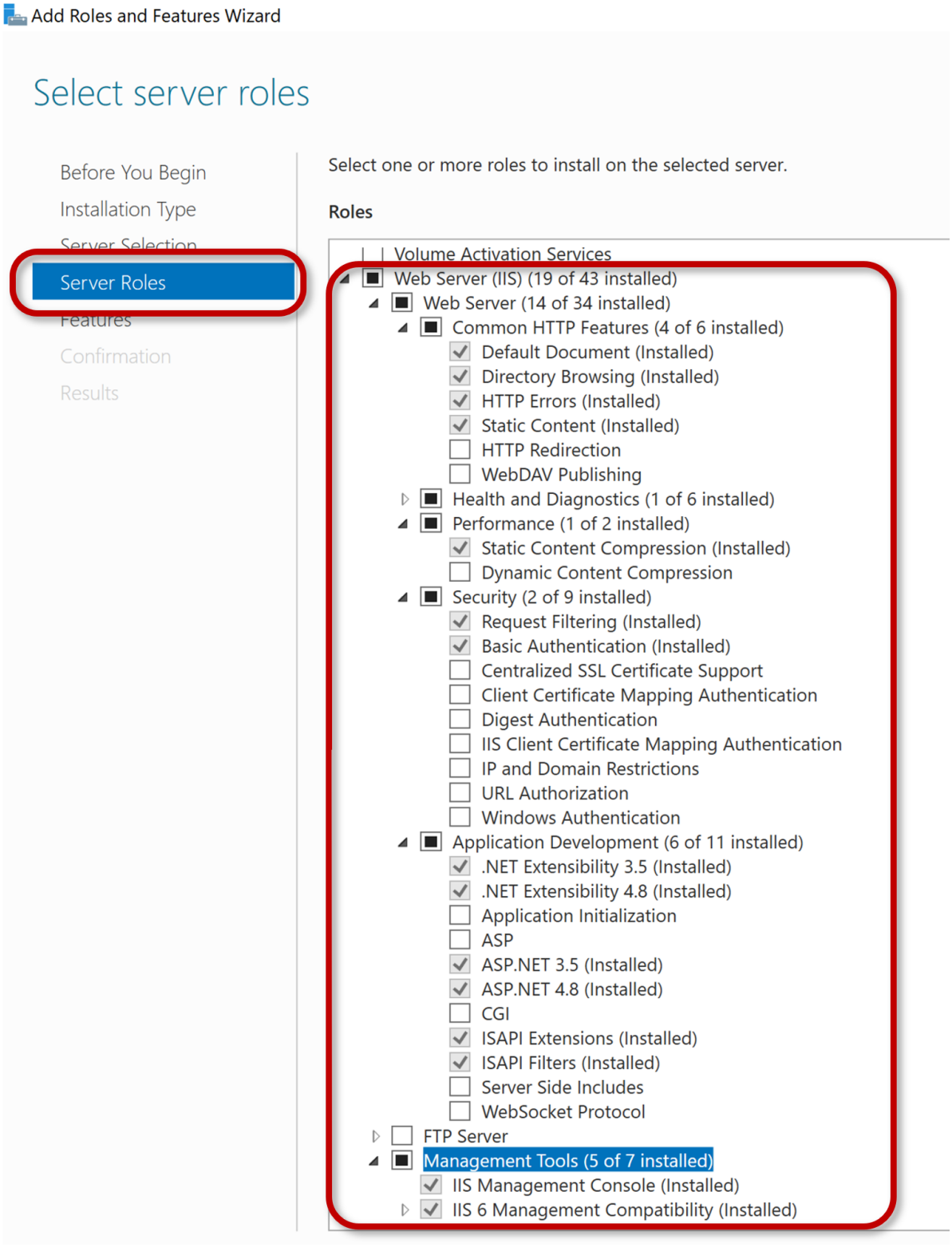
- Make sure that the following components are enabled (the checked items in the images below):



Configuring the IIS on Windows Server 2022:

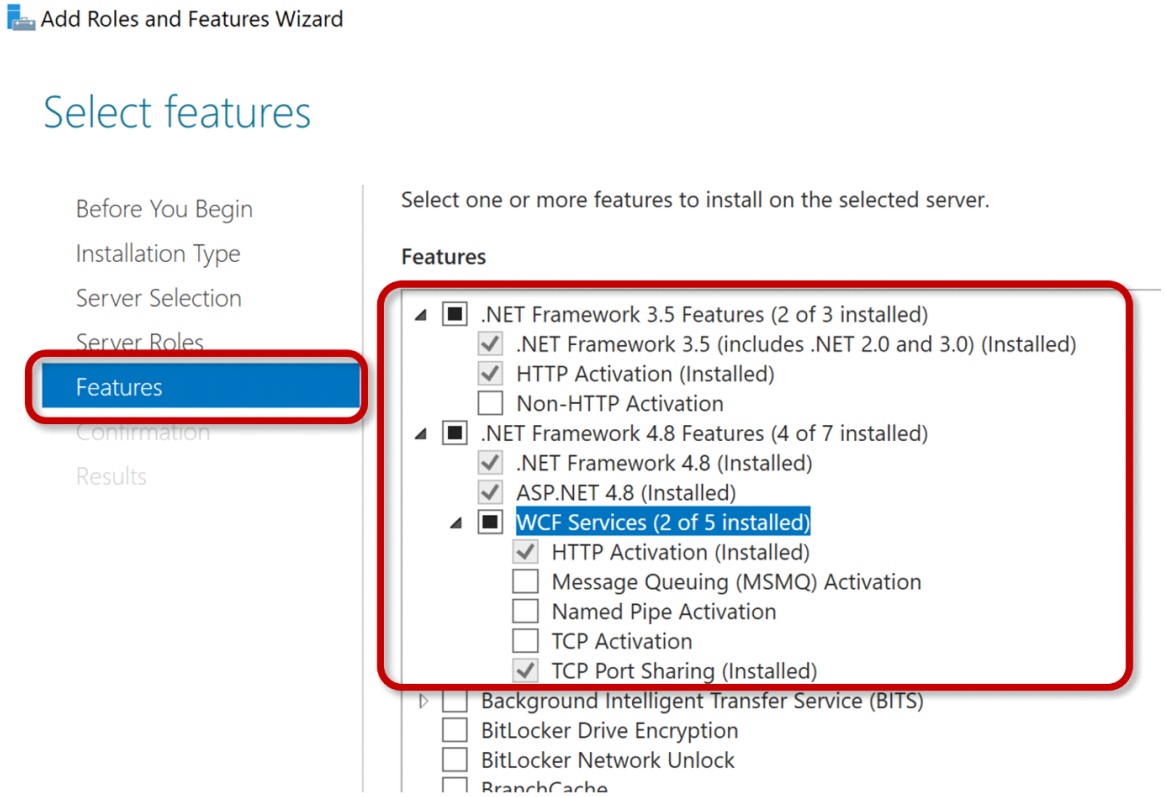
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- Click *Server Manager* from the *Start menu* and configure ***Server Roles*** as shown below:



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- After configuring *Server Roles*, please go to the ***Features*** section and configure it as shown below:



21.2 Configure IIS from Dream Report

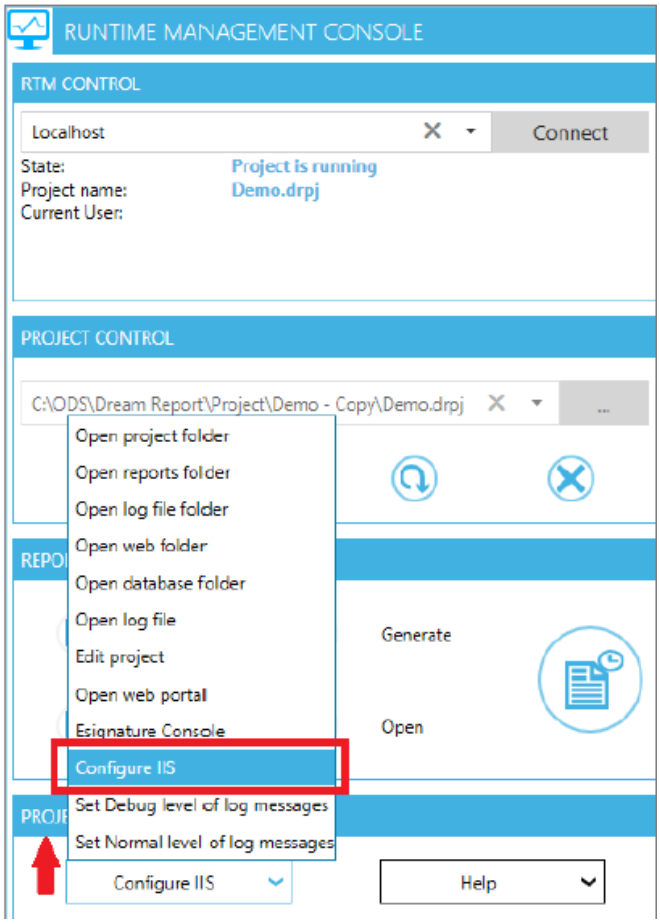
Web Portal Activation

To activate the web portal, Dream Report must be installed on a PC with a web server (IIS) installed. Then, during installation, the Dream Report installer will install all necessary files to use the web functionality. Otherwise, if the IIS web server is installed later, in order to be able to use the web functionality, Dream Report has to be re-installed to add the web portal components. The ASP engine will be installed by Dream Report installer automatically as well.

NOTE: To have access to a project in the Dream Report Web Portal, each time a new project is started, user will have to configure IIS (Internet Information Services) for that project manually, by clicking on the ***Configure IIS*** button from one of two locations:

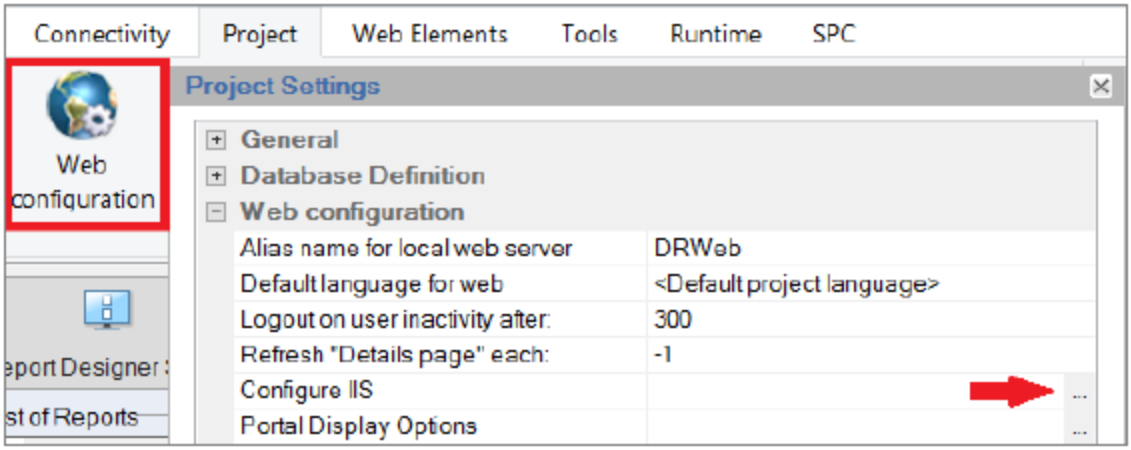
- From the Project Access section of the Runtime Management Console, select "**Configure IIS**":

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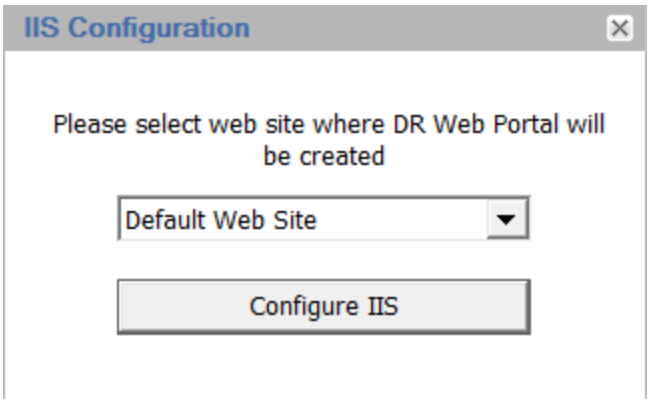
OR

- From the Project menu in **Dream Report Studio**, select Web Configuration, and then click the **[...]** button to "Configure IIS":



Starting the IIS configuration process from either location will pop up the following window:

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Click the "**Configure IIS**" button, and if the IIS configuration process is successful, the following message will be displayed: "***IIS configuration has been successfully completed***". The most common reason for failure of the IIS configuration is one or more required IIS features being missing. Refer to the **Manual Configuration of IIS** later in this section.

If Internet Information Services (IIS) is not installed (or installed, but not all the required features enabled) in the user's operating system, the following message will be displayed: ***"Can't configure IIS. Web portal is not enabled".*** IIS will then have to be installed, and then configured (for details, please, see Manual Configuration of IIS).

NOTE: For IIS versions 7, 7.5 and 8, if user clicks on "*Configure IIS*" button, the Application Pool "OdsDrAppPool" will be automatically created. Thus, for 64-Bit OS this will allow automatic configuration of Dream Report Web portal.
To load the web portal on the local computer, open Internet Explorer and type the default URL: http://localhost/drweb (or http://<IP address>/drweb).

This will automatically open the welcome page of the Dream Report web portal. DRWeb is the default alias name for the Dream Report web portal, which is automatically created in web server. If you want to change that alias, you can setup a custom alias name in the **Web Configuration** dialog box in the **Project Settings**.

If User Management is enabled for the current running Dream Report project, the DRWeb portal will be password protected, and the user will be prompted to enter valid login information. Only users authorized to access the web site under **User Management** in the **Project Settings** will be allowed to access the portal. If **User Management** is not enabled in the Dream Report project, the web portal will not ask for user authorization. Only reports allowed for the current user will be displayed.

21.3 Web Portal

General Overview

Dream Report has its own proprietary web portal, which enables users to browse a list of reports from the currently running project, to visualize any existing report from the entire project, to generate any report on demand in real-time, to enter manual values (data) into the Dream Report database or use them for calculations or filtering for regular reporting.

Dream Report web portal uses **ASP.net** web technology and has communication with the runtime manager, using Microsoft .NET Framework version 4.5 or higher.

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No ActiveX components are used, neither specific technologies, like Silverlight. Dream Report is based on pure clean web technology and therefore is supported by most of common web browsers (e.g. Internet Explorer, Edge, Chrome, Mozilla Firefox, Opera, etc.).

Mobile platforms support. Also, Dream Report web portal has specific support of web browsers on mobile platforms (Android OS, iOS). When web client is connecting to Dream Report web server, then the type of web client OS is checked and the corresponding version of web portal will be loaded.

To open web portal, user has to open a web browser and type a URL and Dream Report web alias, configured in Project Settings Web configuration (by default, it's drweb, i.e. the URL would look like: http://localhost/drweb).

If user would like to use secure web connection, using HTTPS protocol, then the URL would be, e.g. https://localhost/drweb. IIS configurator will automatically both HTTP and HTTPS configurations, where HTTPS is configured with self-signed certificate.

Report files publishing

Web portal automatically publishes all generated reports in PDF, Excel and XML format. If report is generated in multiple formats – user will see that report with up to three icons, corresponding to available formats of that report.

When opening Dream Report web portal, it will access the history of all PDF, Excel and XML files of each report and show that library. User will see the tree with reports, their available format icons and report generation button, which allows user to generate that report directly from there.

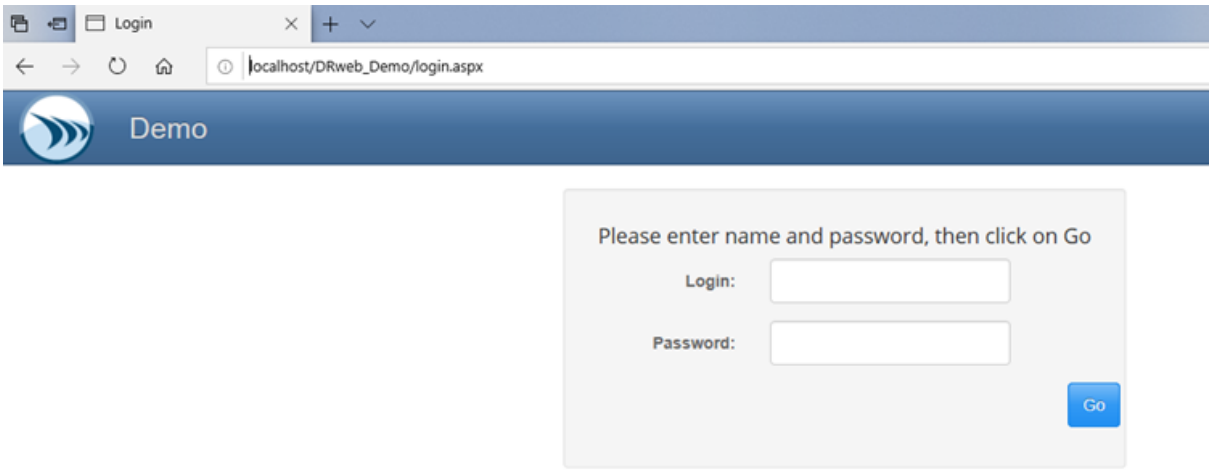
Web reports

If report has Web format defined, then report formats will also display a WEB icon. Web reports are presented not as a file, but as a dynamic and interactive web page. No history of such reports is available.

User login

If the project has user management enabled, then login web page will be open, where user will need to enter his login and password and then, Dream Report web portal will be open, if that user has sufficient user rights to access it. When web portal will be open, user will see the list of only those reports, which are allowed and enabled for that logged user. After user login, Welcome page will be open:

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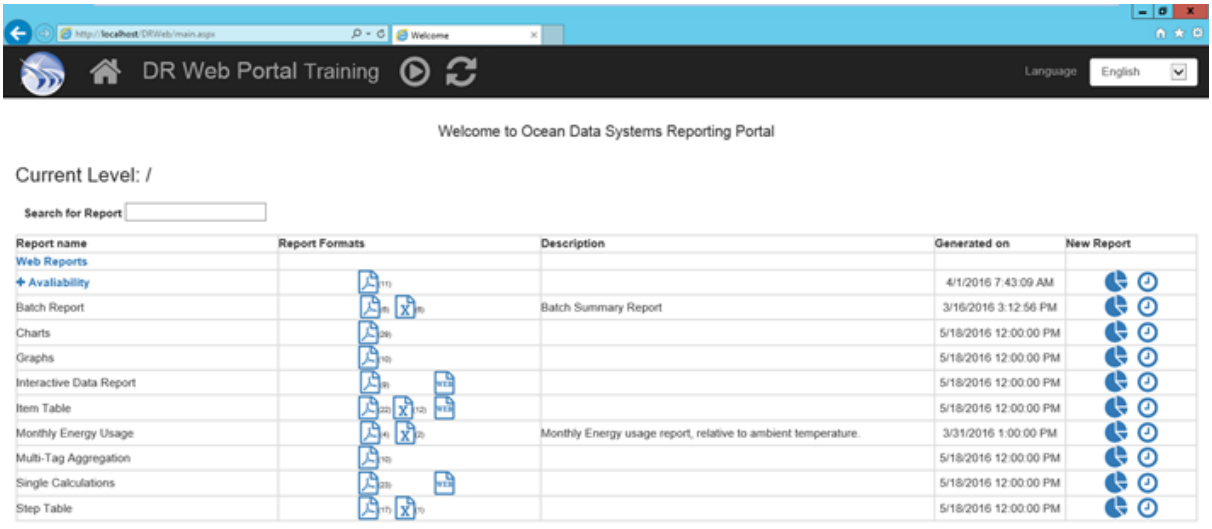


If user management is not enabled in that project, Welcome page will be open directly, without login page.

User settings allow configuring specific report to open first, when specific user logs in. As such, each user can, potentially, have his own report – such report will be open in the welcome page. If no custom first report is defined for a user – then first report, defined in the project, will be open by default in the *Welcome Page*.

Web Portal Welcome Page

Welcome Page of Dream Report Web Portal enables users to view and browse a list of reports from the current running project, to open any existing report (if it's allowed and enabled to that specific user), and also to generate any report on user demand in real-time.



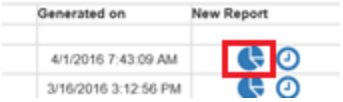
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By default, the **Web Portal Welcome Page** displays the following data:

- *Report name* - name of the report, as defined in the Report Settings 170 in the Designer Studio;
- *Report Formats* - report format types (PDF/Excel/XML/Web)
- *Description* - description of the report (as defined in report settings)
- *Generated on* - date and time of the last report generation;
- *New Report* - standard generation ("*New Report*") and dynamic report generation ("New Dynamic Report" - generate report with dynamic time period) buttons.

When user selects a report, the report view frame will display “Please, wait, while retrieving report information…” and, meanwhile, it will generate the report and then display it in the report view frame. Then, user can work with this report according to its design.

If user will click on “New report” icon in the right column:

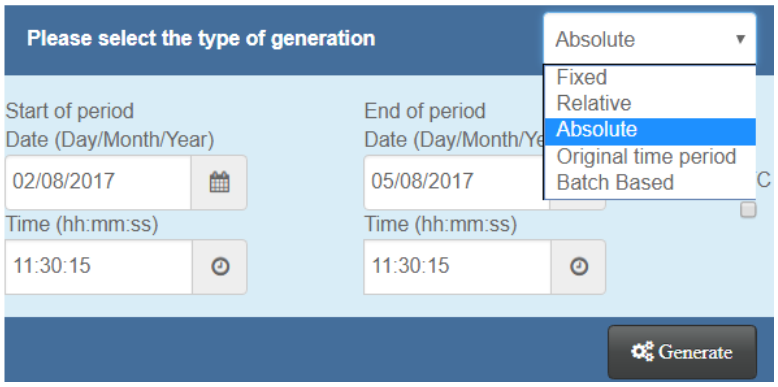


– new report will be generated. If report format is configured with multiple out formats (e.g. PDF, CSV and XML) – when generating a new report, it will be generated in all defined formats. If report is defined only in web output format, the corresponding web page with that report will be open, without any file being generated.

If user will click on “New dynamic report” icon in the right column:



- dynamic report generation web page will be open:



User will be able to define one of the 5 options for dynamic report generation:

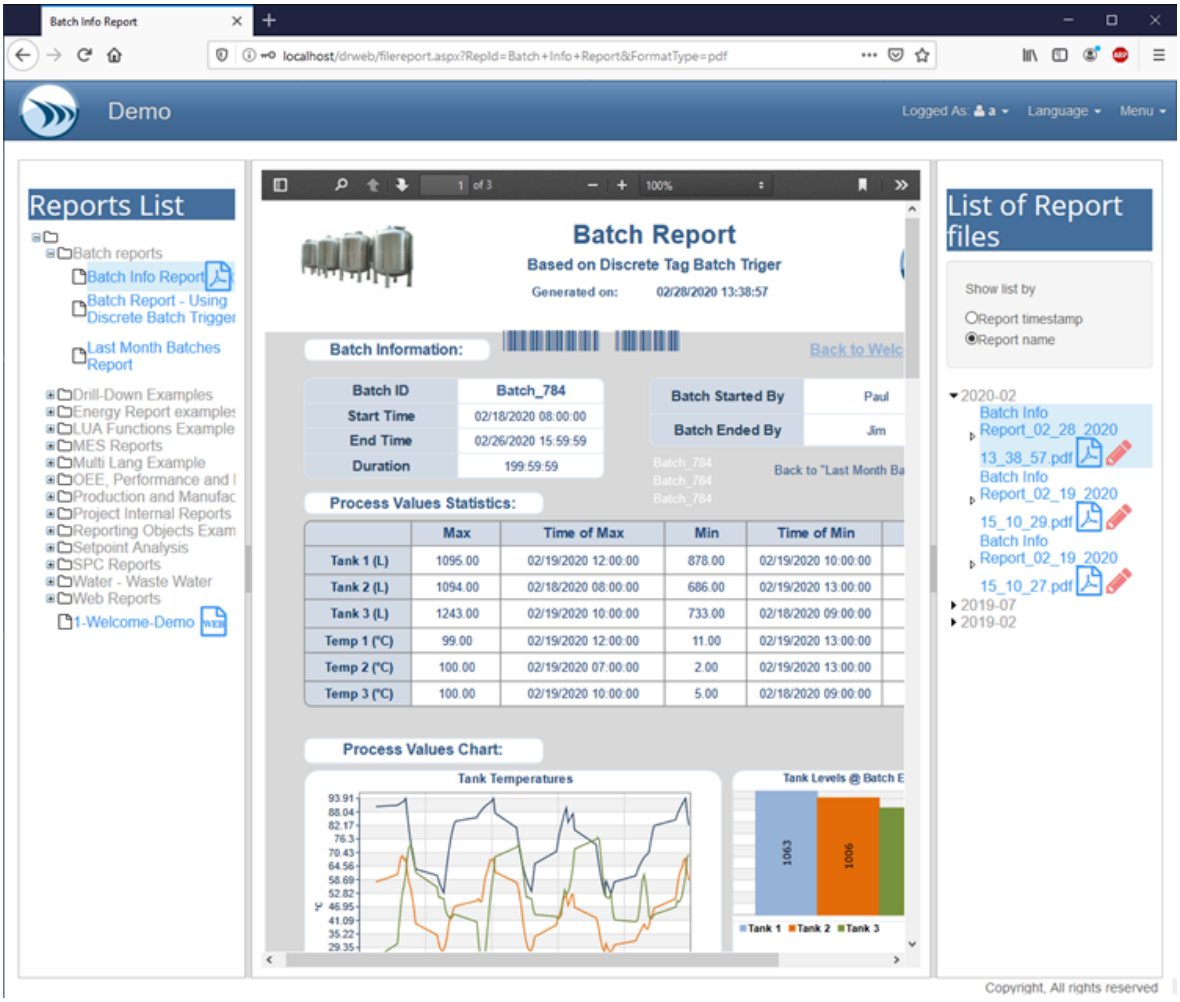
- Original time period,
- Batch-based,
- Absolute,
- Relative and
- Fixed.

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If user will click on a file icon:



and open report in a file format (e.g. PDF or Excel or XML format), the library with all generated report files of that report will be displayed in the right pane and user can click on any file in that right pane and that selected file from report history will be open:



This is a “Detail Page”.

Web Portal Detail Page displays the following data:

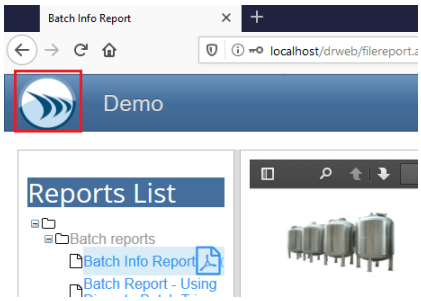
Reports List - the left part of the detail page presents all reports with their instances and report format types defined in the project. User can view any generated report without any need to go back to the Welcome Page;

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The middle frame will display the selected report in the selected format.

List of Report files - the right part of the detail page presents the list of all generated report files arranged weekly/monthly/yearly in separate folders. The list of report files can be displayed either as a list with report timestamps (*Show list by: Report timestamp*) or as a list with report names (*Show list by: Report name*).

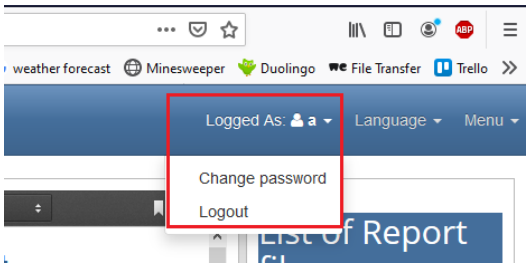
If user will click on round ODS logo in the top left corner:



- it's the *Back* button – it will take you back to the Web Portal Welcome Page.

Top right corner will suggest users three menus:

User menu:

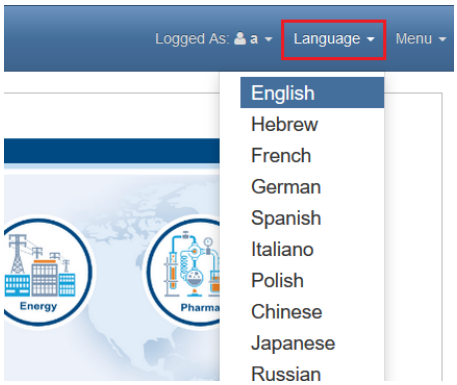


This menu will display current logged user. If user will click on the arrow button, then a pop down menu will suggest two menu options:
Change password – if user will click on that button, it will open a web page, which will allow user to change his password.
Logout – this menu item will log out current user and will bring user back to user login page.

NOTE: if user management is disabled in Dream Report project, then this user menu will be hidden and will be not displayed.

Language menu:

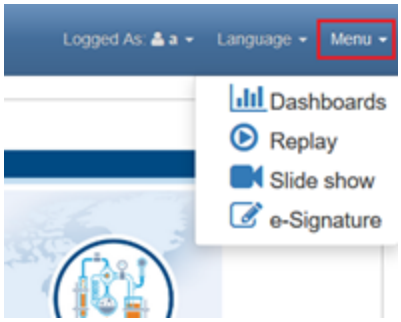
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This menu allows user to switch the language of web portal user interface – menus, tooltips, etc.
By default, web portal will use the language, defined in Dream Report project settings. However, if user would like to change the language – another language can be selected and then, all strings in web portal user interface will be replaced by new selected language.

NOTE: Please, note, that this menu will not affect the language of reports! It will change the UI language only.

Functional menu:



This menu enables user to access specific modules within web portal:

- Dashboards: this menu item will open Dream Report dashboards page within web portal
- Replay: This menu will open a web page, where “Report replay” function can be used. This function allows user to select specific date and time in the past and select a time offset. Then, Dream Report will generate report, as if it would be generated at selected date and time. And then, report will be re-generated with time offset – allowing user to watch specific moment of time and then, the same data with time offset. Such analysis enables users to analyze the situation, e.g. at the moment of a critical alarm and then watch the situation after such an alarm.
  This module will be described more in details below.

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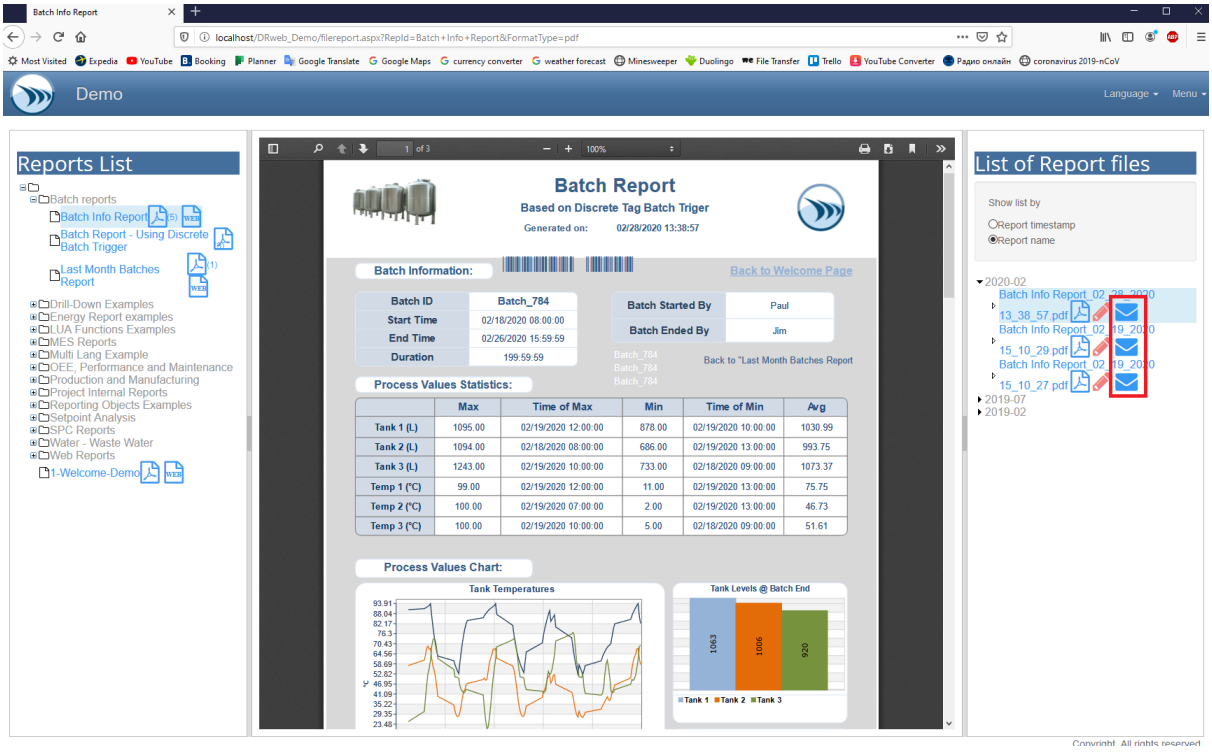
- Slideshow: This menu will start slideshow, which user can configure in project settings. Slide show enables user to define multiple reports in a sequence and specify a timeout. Then, those selected reports will be generated and displayed during that timeout, one after another, in a loop.
  If a user will use PDF reports in a slide show, then only the most recently generated report will be displayed. New PDF report generation is not triggered during a slide show.
  If Web reports are used, then Dream Report will automatically generate a new report and will always display actual reports during the slide show. Therefore, it's recommended to use

  For more information on how to configure a Slide Show in Design Studio, please, refer to the section Web Configuration in the Project Settings section.

- eSignature: this menu will open eSignature panel on the right side. That panel will allow user to e-sign reports.

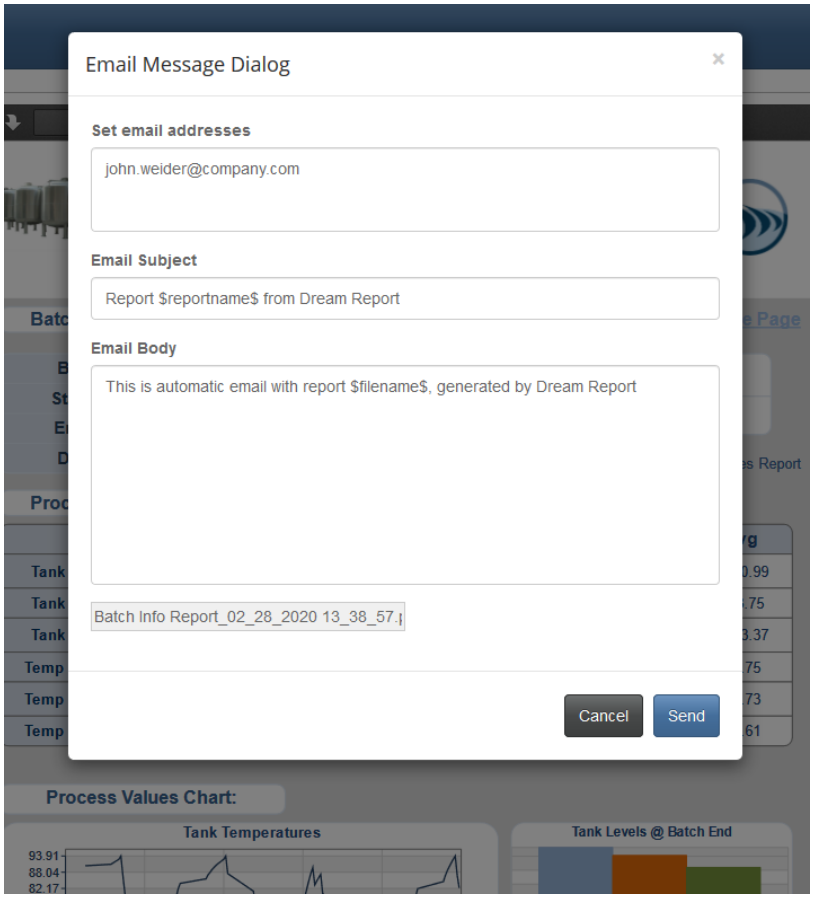
Emailing Reports

If SMTP email server is defined 194 in Dream Report project, then, when user will open Report detailed page, the right panel with report files library, will have an email icon next to each file:



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If user will want to send a report file by email directly from the web browser, please,click on *Email* icon, then "Send email" popup window will be open in a web browser:



In *Set email addresses* edit box, user can manually enter email addresses of email recipients, who will receive that email with report file. If multiple email addresses have to be added, they should be separated by "," symbol. Maximum, up to 10 email recipients can be added.

Email subject can contain free text for the email subject and *Email body* can contain free text for the email body. Report file will be always sent as an email attachment.

Besides free text, email body and email subject can contain also dynamic tokens, which will be dynamically replaced by their actual values.

Both email subject and email Message will be able to process the following dynamic tokens:

- *$reportname$* – name of report
- *$filename$* – name of report file
- *$username$* – the name of current logged user.
- *$currenttimestamp$* – current timestamp, formatted according to the project settings.

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- *$currentdate$* – current date, formatted according to the project settings.

Default email subject is "*Report $reportname$ from Dream Report*"

Default email body is "This is an automatic email with report $filename$, generated by Dream Report".

User can send email, leaving Email subject or/and email body fields empty – it's allowed.

Recipients list edit box can't be empty and must have at least one valid email address.

When user is ready to send report by email – he can click the *Send* button and the selected report file will be sent to entered email addresses as the attachment.

NOTE 1: If user would like to send report file in Excel or XML format and not in PDF format - each report file is listed in the reports library panel separately, so user will just have to click an Email icon next to the appropriate file format.

NOTE 2: All emails will be sent from Dream Report runtime engine PC and not from the PC, where web browser is used for emailing. Therefore, SMTP settings on Dream Report server PC will matter and no SMTP settings on web client side PC are required.

NOTE 3: If SMTP settings in Dream Report project, defined in Report Settings > Report format > Email configuration 194 are empty - all emailing functionality in a web portal will be hidden, as its use is irrelevant.

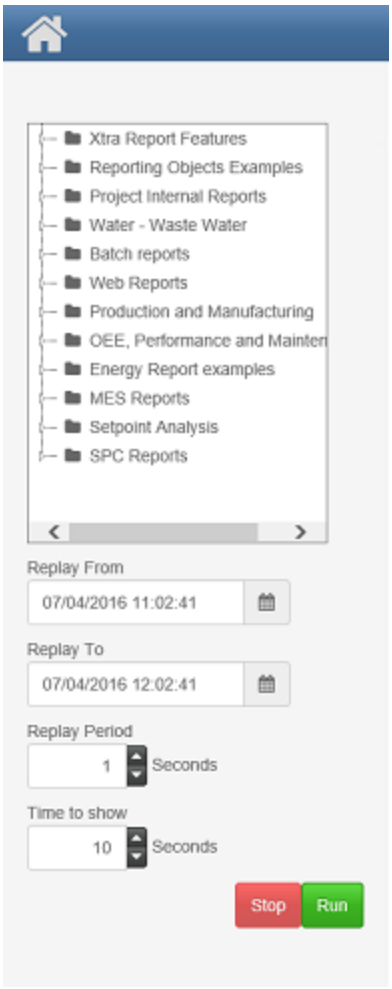
NOTE 4: When using the Web Portal as an embedded part of an external website, inside an iFrame, or used in an ActiveX control, due to security reasons and for proper management of the concurrent web client licensing, the URL for the project's web portal must be accessed through HTTPS only! For example: https://<machine_name>/drweb

21.4 Replay

When user will open replay section, this module allows user to select specific date and time in the past and select a step time offset. Then, Dream Report will generate report, as if it would be generated at selected date and time. And then, report will be re-generated with step time offset – allowing user to watch specific moment of time and then, the same data with time offset. Such analysis enables users to analyze the situation, e.g. at the moment of a critical alarm and then watch the situation after such an alarm.

This module has the following configuration parameters:

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Replay From – the start of replay period.
Replay To – the end of replay period.
Replay Step – the duration of a replay step.
Run – the button which runs the replay.
Stop – the button which stops the replay.

When user will click on Start button, Replay will take the start period from *Replay From* section, generate report for that start point of time.

The end period of the reports will be calculated as Replay From + Replay Step*N, where N = the number of displayed reports (the number of steps).

The reports will be replayed until the following condition has been met: Replay From + Replay Step*N ≥ Replay To.

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21.5 Manual Data Entry

Manual Data Entry Functions enable users to enter manual values in the standard Dream Report reporting template. Those manual values are used to enter manual data into the Dream Report database and use them for calculations or filtering for regular reporting. This functionality is enabled **ONLY** in Dream Report Web Portal (for details about the Dream Report Web Portal, please see **Web portal** section).

Manual Data Entry Functions also enable to select and transfer a file (**CSV** or **Excel** file) from a web client PC to the location, defined in the Dream Report project, thus allowing to import data from Excel or CSV files (data importer automatically picks up such a file, reads values and their corresponding timestamps and logs them all into a database).

System Requirements

Please refer to the *Dream Report Windows and Database Support Matrix* tech note on in the **Tech Support >Tech Notes** section of the Dream Report Website (www.dreamreport.com) for supported operating system and database for **Manual Data Entry.**

Manual Data Entry Report Configuration

To configure Manual Data Entry Reports operation, user will have to:

1. Create a Dream Report project where Manual Data Entry report(s) will be set (please refer to the **Project Settings** section of this manual).

2. Add and configure one or several instances of the Web Manual Driver and enter the list of manual parameters, which will be available in reports (please refer to the **Web Manual Driver** section).

3. Define Dream Report project users, which will have access to that project (please refer to the **User Management** section).

4. Design reports with Manual Data Entry and configure them correspondingly to the manual data parameters defined (please refer to the **Report Settings** and **Designer Studio** sections).

5. Define user access to every report, i.e. select which users will be able to access that report (please refer to the **User Authorization** section).

As soon as this configuration has been done, Dream Report web portal will automatically contain all designed reports. When user logs into the web portal, only the allowed list of reports will be displayed and user can open any of them.

Web Elements

Manual Data Entry Functions enable users to add **web elements**, i.e. **dynamic interactive objects** which will be available ONLY in web report formats and will enable users to interact with different report data (enter values, select values from combo boxes, push a button with pre-defined operation, etc).

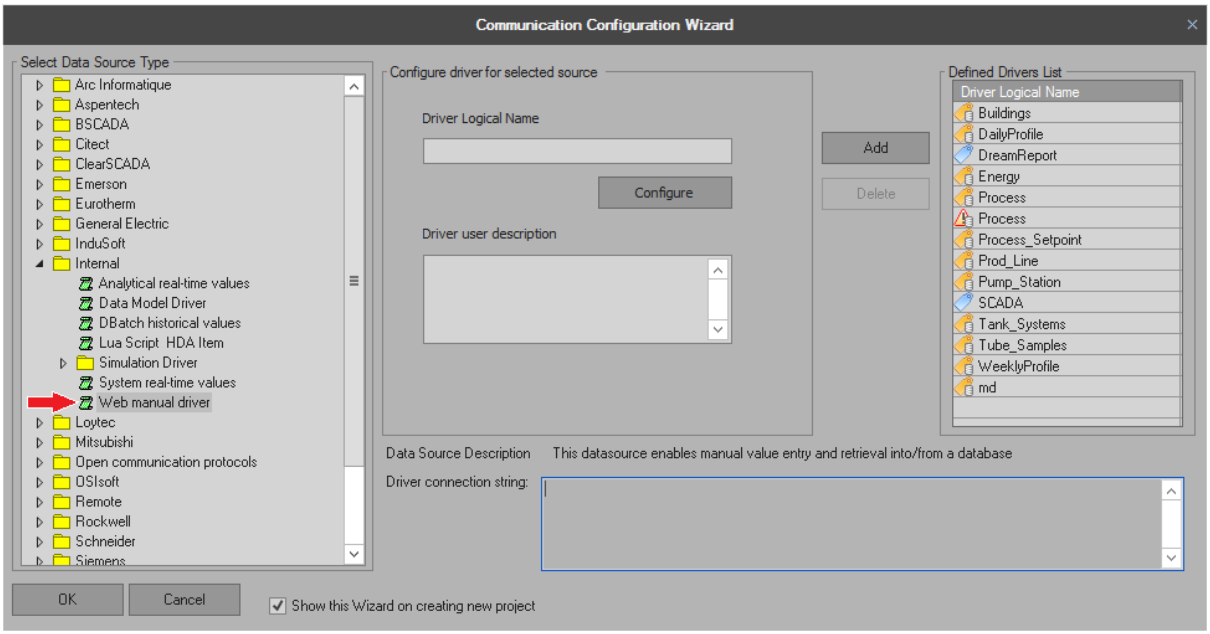
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Web elements will be available only when "**Web**" option is enabled for the current report (for details, please see the Report Output Format 181 section of this manual).

Configuration and functionality of **web elements** for WEB reports is described in details in the following sections: Timestamp Picker 567, Hyperlink 568, Combo Box 571, Action Button 582 and **Tree Object** 587.

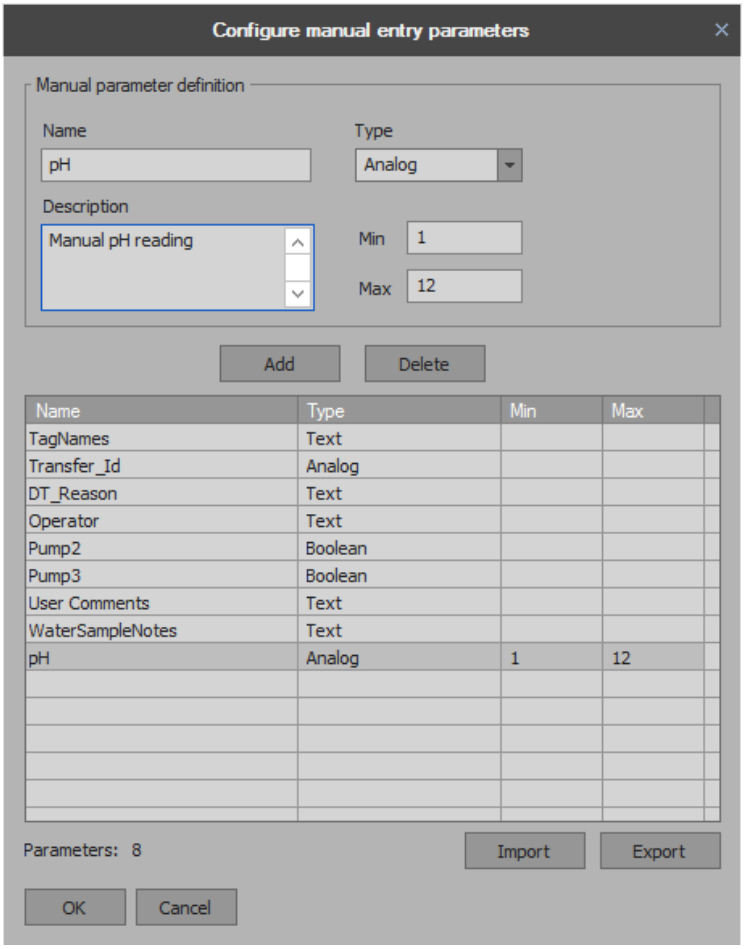
21.6 Web Manual Driver

Dream Report includes a **Web Manual** driver, which is used for operator data entry (manual data entry) through the Dream Report Web Portal to the Dream Report project database, and then can be used for reporting on the manually-entered data.
To configure **Web Manual driver**, first, open the **Internal** folder of the **Communication Configuration Wizard** 77 dialog window:



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Click on ***Configure*** button and the following dialog window will open:



Define tags for the selected data source. Every manual tag must have its **Name** and **Type**. Optional information can be also added in the **Description** box (any free text) or for the data validation criteria (**Min** and **Max** values).

The defined manual tag can be one of three types available: **Analog** (default selection), **Boolean** and **Text**.

NOTE: The data validation criteria input is available only for the **Analog** type tags. If other type is selected, validation criteria input controls will be hidden.

Values for both **Min** and **Max** for the validation criteria are expected as integer or float numbers. They will be saved and displayed as a double format number. If **Min** or **Max** value edit boxes remain empty, the corresponding **Min** or **Max** double value will be considered.

The amount of manual tags defined in the **Manual Entry Parameters** configuration window will be displayed in the **Parameters:** section below the manual tags list.

If you click "**Export**" button, the standard Windows "**Save As**" window will be opened, where you can select location and name for the list export file. A list export file format is **csv** with semi-column used as

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a separator. A list export file will have a header, as the first row, and data starting from the second row. It will have 5 columns: **Name**, **Type**, **Min**, **Max**, **Description**. **Name** and **Type** fields are obligatory and others are optional.

If you click "**Import**" button, the standard Windows "**Open file**" window will be opened, where you can select location and name for the list import file. "**Open file**" will be filtered by "***.csv**" extension.
The format of the import file list will be exactly the same as described in the "**Export**" section. Only 2 columns - **Name** and **Type** are obligatory. If a list file with only these 2 columns has been created, such an import file should be imported as well.

When a file will be imported, the message box will pop up, asking: "*Do you want to replace existing tags by the importing list?*" The corresponding operation will be done according to a user's choice.

NOTE: If you try to import tags, appending the list to the existing one, and the imported tag will have the same name as an already existing one, a message box will pop up saying that the duplicated tag name has been found, specifying the name of that tag and proposing a user to choose either to "use an existing tag definition", or "delete an existing one and use an imported tag definition. The corresponding action will be done according to the user's choice.

There is no limit in term of the number of tags, defined in the **Web manual driver** configuration dialog window.

NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "**Select Data Source Type**" field on any other driver and then go back to the driver that you need to configure.

21.7 Web Clusters

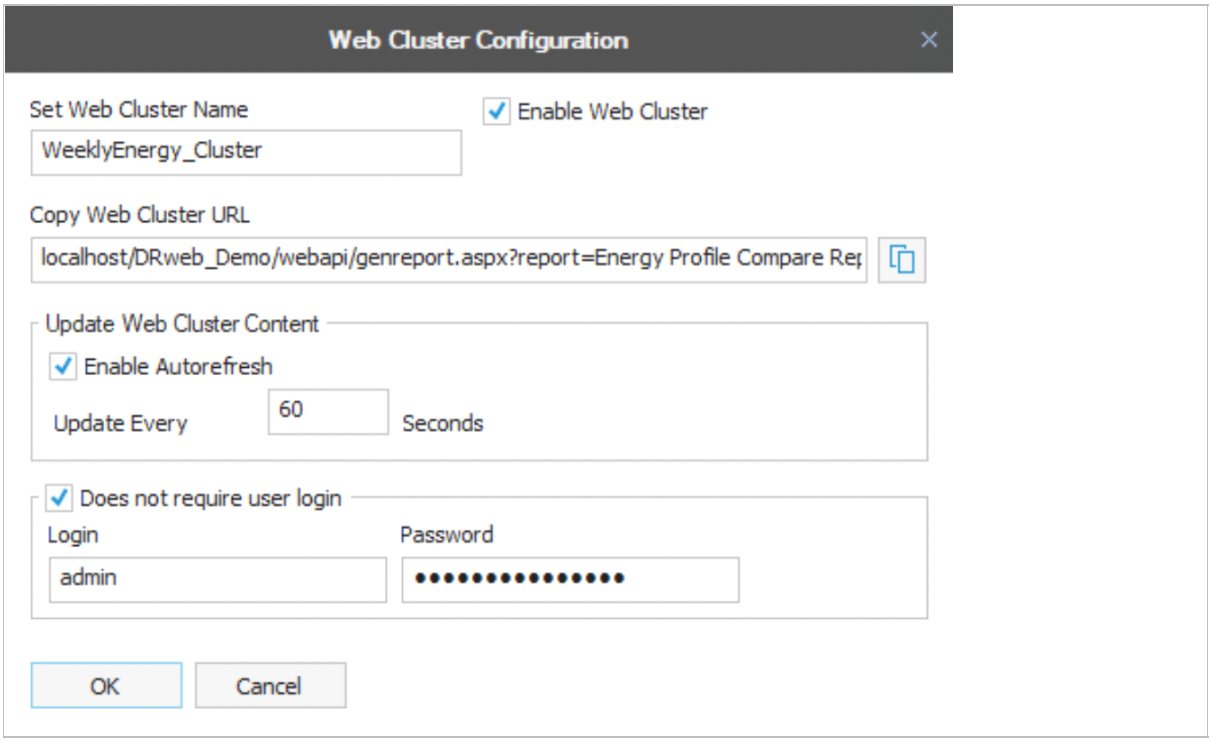
Web Clusters

The *Web Clusters* feature allows users to define a report area (report "cluster") with one or more objects, and provide a URL to that specific cluster, so that it can be published in any external web content container. This enables users to publish any Dream Report reporting content in their web applications.

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To create a *Web Cluster*, select one or more objects on a report, right-click, and select "*Create Web Cluster*":



The *Web Custer Configuration* window will open:

Set Web Cluster Name – specify the name for the Web Cluster. This name has to be unique to the report on which it is it is defined.

Enable Web Cluster – enables or disables Web Cluster at runtime.

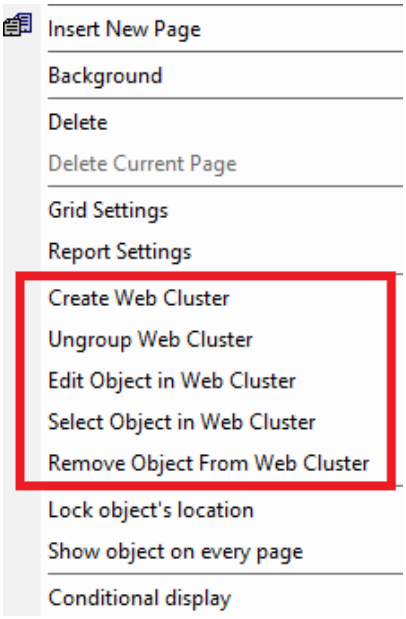
Copy Web Cluster URL – Once cluster is defined, a unique URL will be created for it. Copy the automatically generated URL and use it in third-party applications, or as part of an iFrame definition when embedding into an external web site.

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Enable Autorefresh – checking this option enables the Web Cluster (objects) to update/refresh automatically at a specified frequency, once loaded into a web page. By default, auto refresh is set to 30 seconds. This can be set to any suitable (and reasonable) refresh rate (in seconds), considering the complexity of the objects contained in the Web Cluster – i.e., how long it would typically take to query and calculate data for objects in the cluster.

If *User Management* is enabled in the Dream Report project, when accessing the Web Cluster, a user will have to provide the user name and password of the user that has rights to access the report from which the web cluster was originally defined. This manual login can be bypassed, if needed, by checking the option "*Does not require user login*". If checked, enter the appropriate user credentials, which will then be used to authenticate at runtime.

From the (right-click) context menu, you can create a new web cluster, add new object(s) to it, modify or select an object which is already part of the Web Cluster, or remove the object from the Web cluster:



Another option to edit the Web Cluster configuration is to simply double-click on the cluster, and the *Web Cluster Configuration* window will open.

Example of the URL usage inside report objects: As an external link the Web cluster link should be defined as follow:

http://localhost:443/<DRWeb>/webapi/genreport.aspx?report=Energy Profile Compare Report_WeeklyEnergy_Cluster&format=web&token=7nOmH1U1szxfGLDZaG4lyNaccLYFybw08mPCnwMoEr9o4n6zKrXr%2FHBSGJPK4Rop

Then the " http(s)://localhost:443/<WebAlias>" has to be manually replaced with **%portalurl%,** where **%portalurl%** will be dynamically replaced with appropriate client's IP, port and project Web Alias in the runtime once accessed.

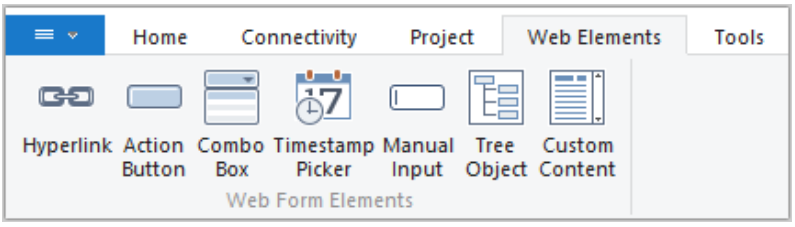
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Dynamic Interactive Objects (Web Elements)

22 Dynamic Interactive Objects (Web Elements)

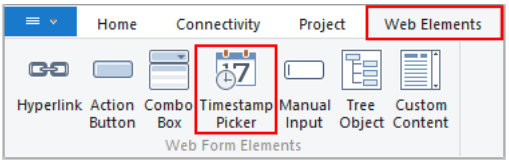
Dream Report **Web Elements** allow for interactive reporting through the Dream Report web portal (DRWeb 548). Web Elements can be selected from the "**Web Elements**" toolbar:



22.1 Timestamp Picker

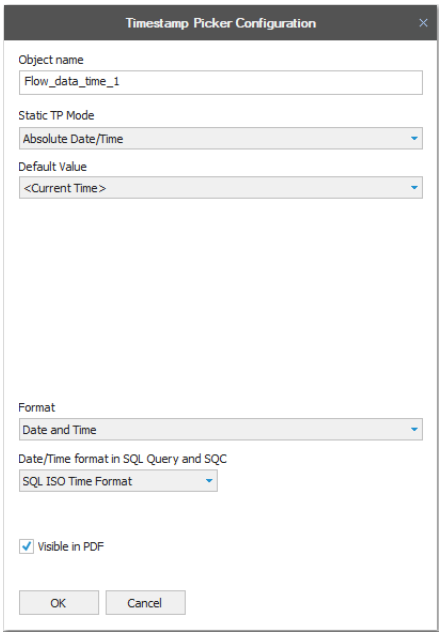
Timestamp Picker is a dynamic interactive object, which enables users to select timestamp for association with the entered values, and is available ONLY in WEB reports (please also see **Manual Data Entry** section).

To add this object, click on the command button *Timestamp Picker* on the ***Web Elements*** ribbon icon on the horizontal toolbar in the Dream Report Designer Studio menu (see pic. below):



Draw a rectangle in the workspace where the output data will be displayed.

The following **Timestamp Picker Configuration** dialog box will be opened:



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Object Name must be a unique logical name, which will be used for each Timestamp Picker object in order to be able to reference any of those specific date/time objects in the data entry objects.

Default Value allows users to configure which timestamp value this object will display as a default. The **Default Value** combo box has the list of all Timestamp Picker objects and simple statistical objects (Single Data Objects, Compound and Expression Objects), already defined in that report, so that the user can select one object to control default values in others. Also the **Default value** combo box has an entry "**Current time**", so every Timestamp Picker object will always display current time by default. This entry will be displayed by default when a user will add a new object to the report.

Format enables users to select specific format of date and time for each Timestamp Picker. This combo box has 3 options available: "**Date and time**", "**Date**" and "**Time**".

The "**Visible in PDF**" option controls whether this Timestamp Picker object will be displayed in the generated PDF report or not. If this object is defined as invisible, then it will be initialized with its default value and then all data input objects that will be based on that object, will get its default value.

The "**The Date/Time format in SQL Query and SQC**" option allows the user to set the date/time format that may be required by a SQL query or SQC condition. At report generation time, the user-selected date/time value in the Timestamp Picker will be converted to the format specified in this option. Options available are:

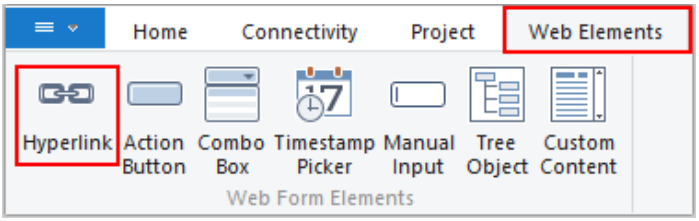
- "**SQL ISO Time Format**" (default)
- "**Seconds from 01/01/1970**"
- "**Custom Time Format**" (user specified format)

Example of the Timestamp Picker object in the runtime mode: 

22.2 Hyperlink

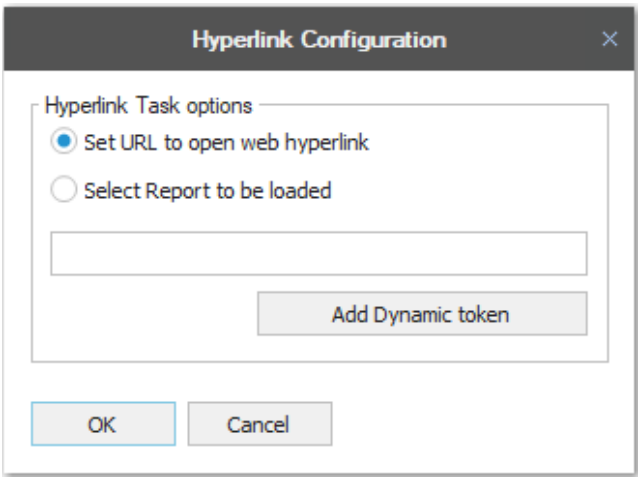
Hyperlink is a dynamic interactive object, which enables users to add a text and turn it into a hyperlink, and is available ONLY in WEB reports (please also see **Manual Data Entry** section)

To add this object, click on the command button *Hyperlink* on the ***Web Elements*** ribbon icon on the horizontal toolbar in the Dream Report Designer Studio menu (see pic. below):



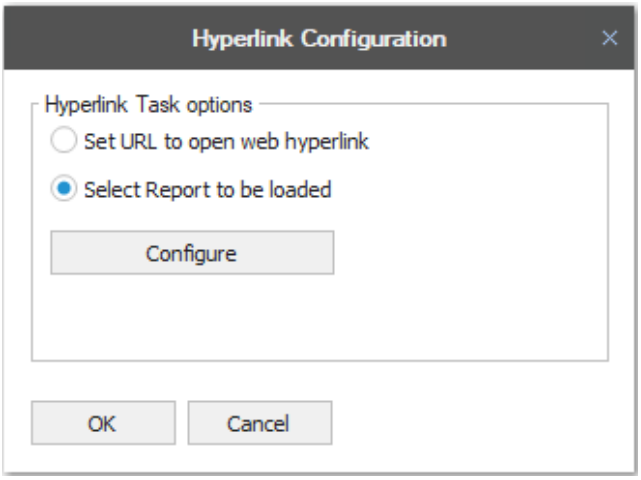
The following **Hyperlink Configuration** dialog box will be opened:

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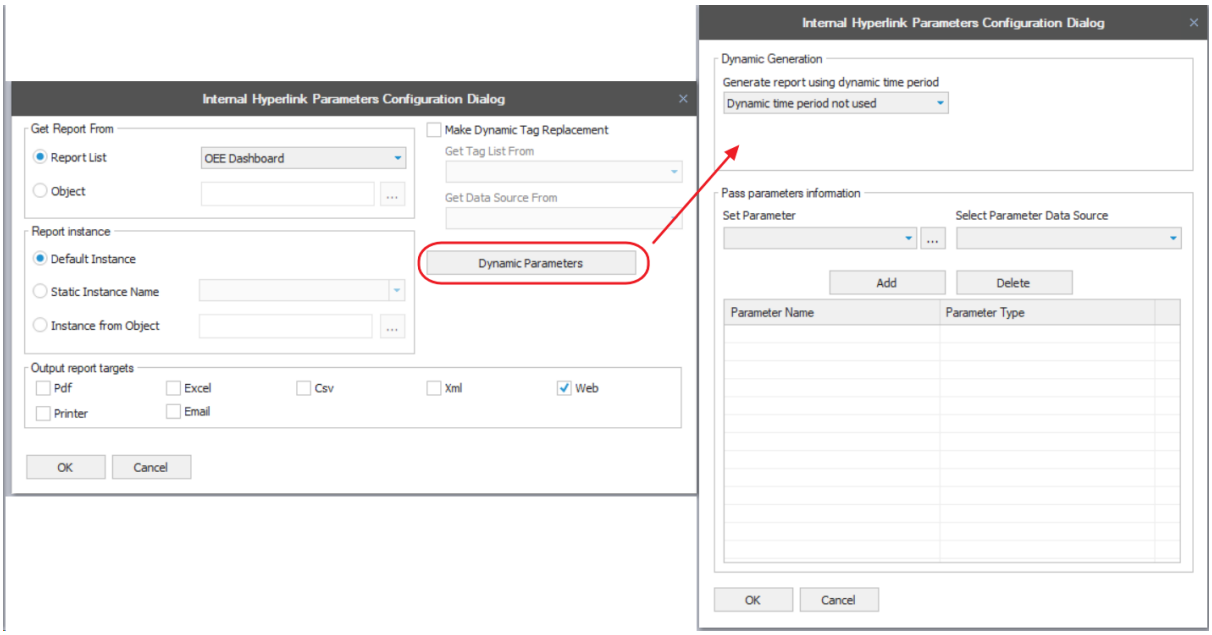


If "**Set URL to open web hyperlink**" option is selected, user **MUST ENTER A WEB PAGE ADDRESS (starting with http(s)://),** and then, after clicking on that hyperlink, a new web page will be opened, navigated to a specified hyperlink (please see the pic. above).

If "**Select Report to be loaded**" option is selected, by pressing the "Configure" button additional configuration dialog will be opened where user will be able to select report from a combo box with the list of all reports, available for that user, and also will be able to select which report will be opened upon clicking on that hyperlink (please see the pic. below):



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By default this option will be disabled.

In the "**Enable Hyperlink**" check box user can enable/disable object as internal hyperlink

Combo box "**Select Report to generate**" will be filled with the list of all project reports including current report.

Combo box "**Set Parameter**" will be filled with the list of all available defined internal project parameters (IPPs).

Combo box "**Select Parameter Data Source**" will be filled with the list of all relevant objects defined in that report (i.e. with the following object types: Single Data Objects, Compound Data Objects, Expression Data Objects, Combo boxes, Date/Time pickers).

When user will click on "*Add*" button, the selected parameter with the selected corresponding object will be added to the list.

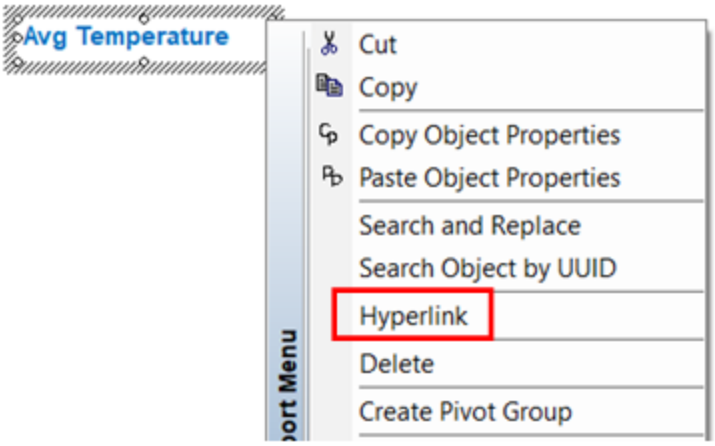
NOTES:

- The list of parameters can't have the same parameter defined twice. However, it may have the same report object defined several times for multiple parameters.
- Report parameters using hyperlinks will work only for web report formats in Dream Report Web Portal. Only WEB report formats (Report Output File) will be generated using hyperlinks. PDF and Excel report formats will not be generated using hyperlinks.

For details on internal project parameters (IPP) configuration, please refer to the Project Parameters section of this manual.

Text Object Hyperlink Definition

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If a text object is defined as a hyperlink, its caption is not linked to the object's hyperlink configuration. So, if a user will change the text, it will have no influence on a hyperlink definition. To edit hyperlink, user will have to select that text object and click on the ***Hyperlink*** button or select **Hyperlink** from the right-click context menu (please see the pic. below):

To remove hyperlink from the text object, select *Delete* from the right-click Dream Report context menu.

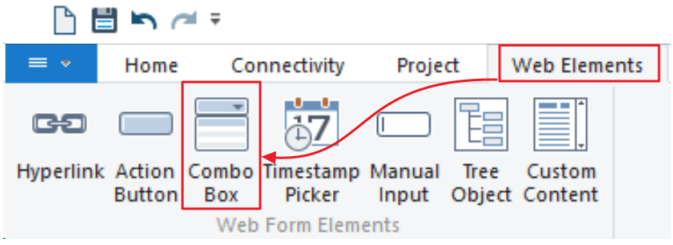
Dream Report Context (right-click) Menu for the text object has 6 entries: **Cut**, **Copy Object**, **Copy Object Properties**, **Paste Object Properties**, **Hyperlink**, **Delete**.

22.3 Combo Box

The **Combo Box** is a dynamic interactive Web object, which enables users to select values from a predefined list, and is available ONLY in Web reports (please also see **Manual Data Entry** section)

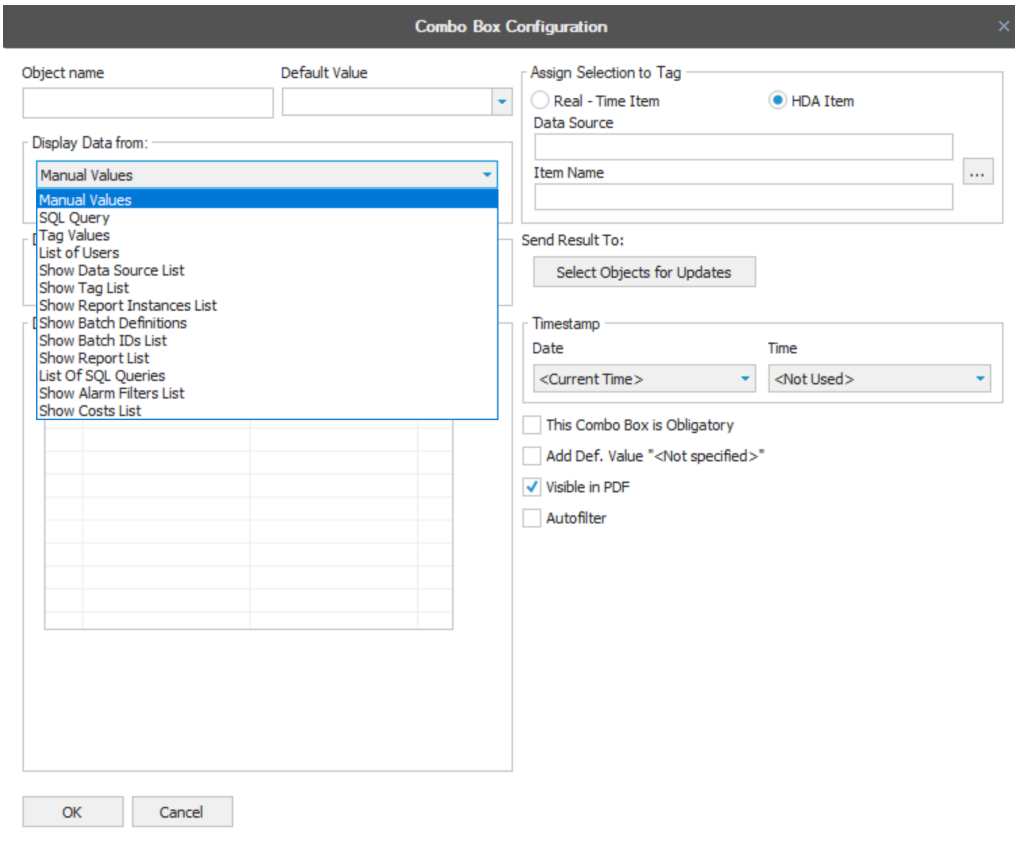
The **Combo box** object will be visible only in Web reports and will not be displayed in PDF/Excel reports.

To add this object, click on the command button *Combo Box* on the ***Web Elements*** ribbon icon on the top toolbar in the Dream Report Designer Studio menu (see image below):



Draw a rectangle in the workspace where the output data will be displayed. The following **Combo Box Configuration** dialog box will be opened:

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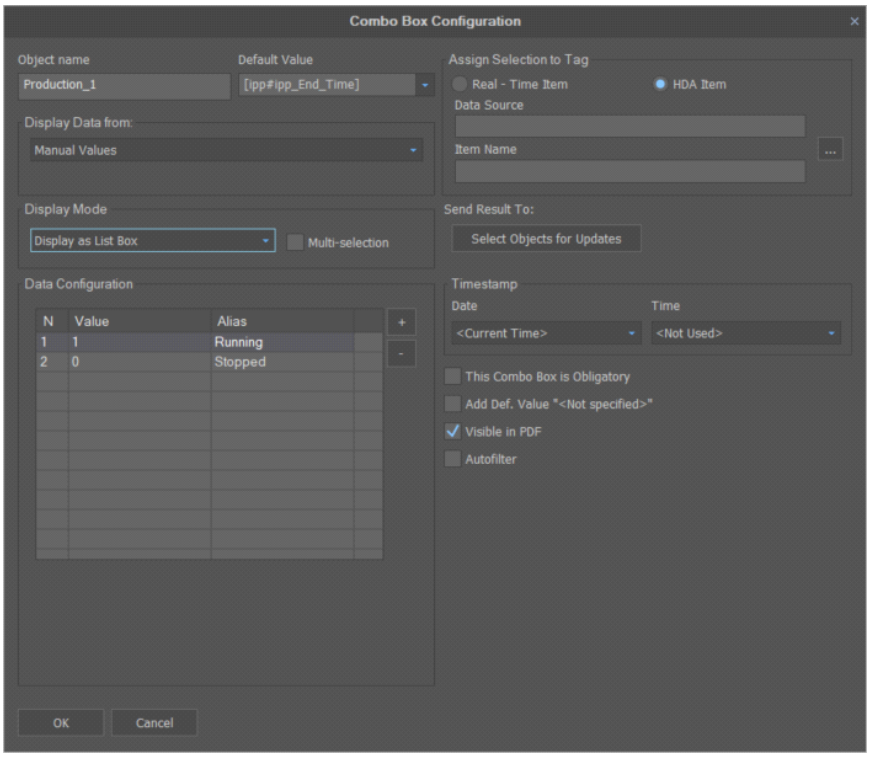
Object Name must be a unique logical name (to that report), which will be used to reference that object within the project.

Default Value enables the user to select an object whose value will be used as the default value in the Combo Box object in Web reports in the Dream Report Web Portal.

Data Display Configuration

Display Data from: the combo box can display data from multiple data sources: “**Manual values**”, “**SQL query**”, “**Tag values**”, “**List of users**”, "**Show Data Source List**", "**Show Tag List**", "**Show Report Instances List**", "**Show Batch Definitions**", "**Show Batch IDs List**", “**Show Report list**”, “**List of SQL Queries**”, “**Show Alarm Filters List**” and “**Show Costs List**”.

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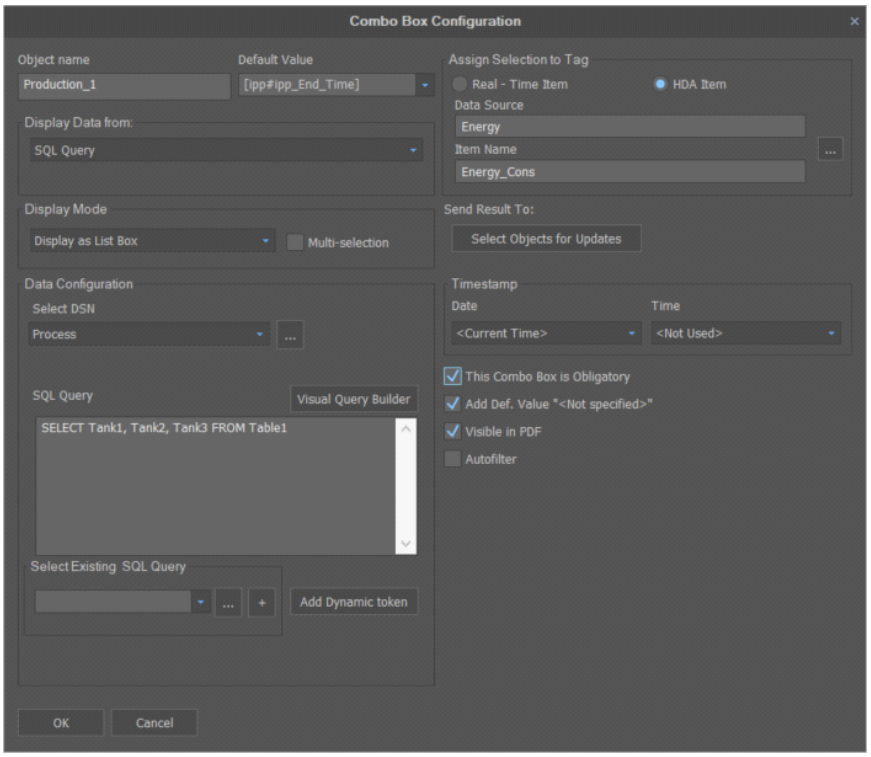


- **Manual values** - in the **Data Configuration** section press the "+" (multiple times) to add rows to the table, and the manually enter a set of values (text or numeric), to be displayed in the combo box. Optionally, you can assign each entry an Alias – the "Alias" will be displayed in the list, but the "Value" will be what Dream Report uses once the user-selection is made (please see the image below):

The **Combo Box Object** will display the list in the same order as they entered in the **Combo Box Configuration** dialog box, without any sorting.

- **SQL Query** - in the **Data Configuration** section, **Select the DSN** (see explanations below), and specify the **SQL Query** or select an **Existing SQL Query** (from queries defined in the *SQL Manager*). On opening or refresh of the web report, SQL query will be executed, and the results will be displayed in the combo box (please see the image below):

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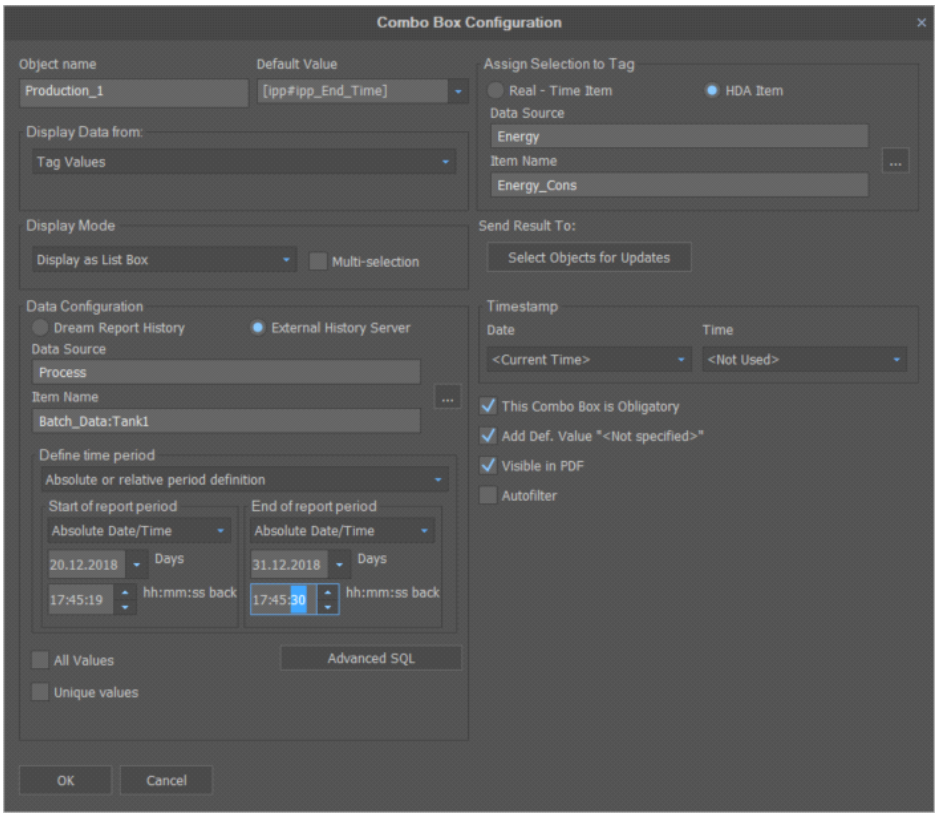


By default, the **Select DSN** combo box will be empty. If any DSNs have already been configured in the Project *DSN Manager*, then user will be able to select one of the DSNs from that list. If no DSNs have been configured yet, or, if user needs to configure a specific DSN, click on the "**[...]**" (browse) button in the **Select DSN** combo box and the **Project DSNs Configuration** dialog window will be opened. Note that the SQL query should return a single column of data.

For details on configuring DSNs, please refer to the **DSN Manager** section of this manual.

- **Tag values** – this option allows the combo box to be populated with a list of values from a specific tag/data item over a defined time period. For example, you might want to show a list of manually recorded values, recipes, setpoint changes, etc. in the past 24 hours.

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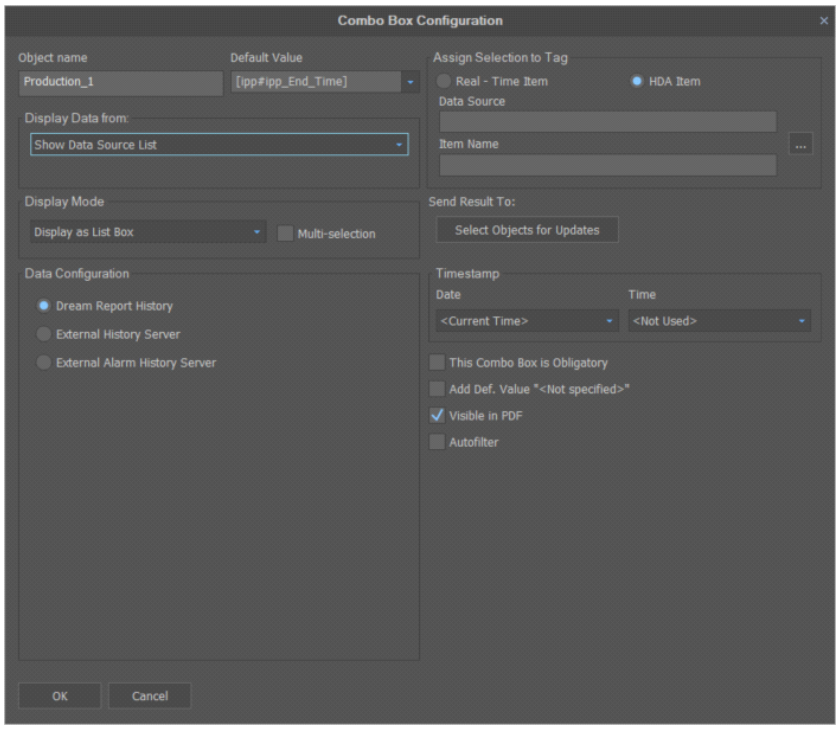
In the **Data Configuration** section, select a tag (**Data Source/Item name**) and time period (**Define time period**), and then the combo box will be filled with all values extracted for the specified tag for the specified time period.

If user wants to display all existing values, check the **All values** check box, and then the time period definition control will become disabled and all tag values will be extracted. If more than one same value exists in the database, only one will be displayed in the combo box (it will operate similar to the "**SELECT DISTINCT …**" SQL query). *Be very careful when using this option, as it could result in a huge number of values being returned to the combo box!*

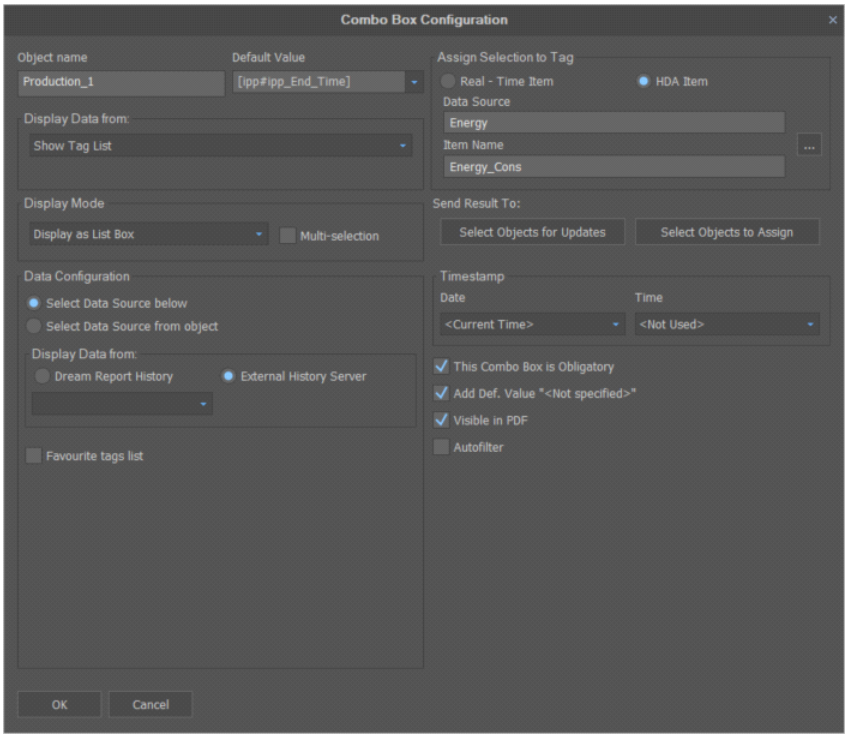
To apply additional filtering to the data, click on the **Advanced SQL** button. The **Advanced SQL Condition** dialog window will be opened (for details, please see **Advanced SQL Condition** section of tis manual).

- **List of Users** - this option is will populate the combo box with a list of all users defined in the project. If Windows user management system is used (Active directory or local windows users list), then Dream Report will retrieve the list of all users from Windows and fill the combo box with that list (for details, please see **User Management** section of this manual).
- **Show Data Source List** – this option will populate the combo box with a list of data sources, or a list of alarm sources, defined in the project. The user can select from one of three options "**Dream Report History**", "**External History Server**" , and "**External Alarm History Server**" (please see the image below):

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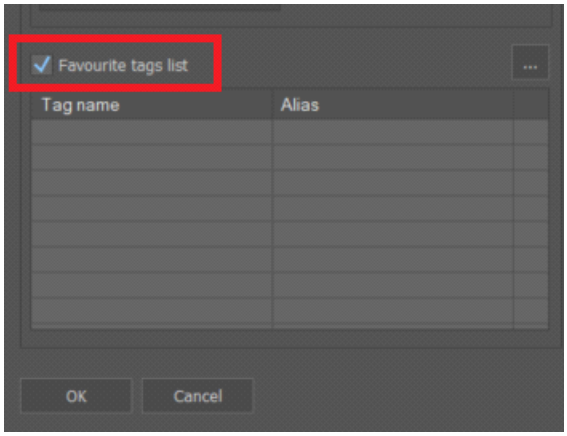


- **Show Tag List** – this option will populate the combo box with a list of all tags/data items from a specified data source, or could be dynamically populated with tags based on a user selection of a data source from another combo box on the web report:

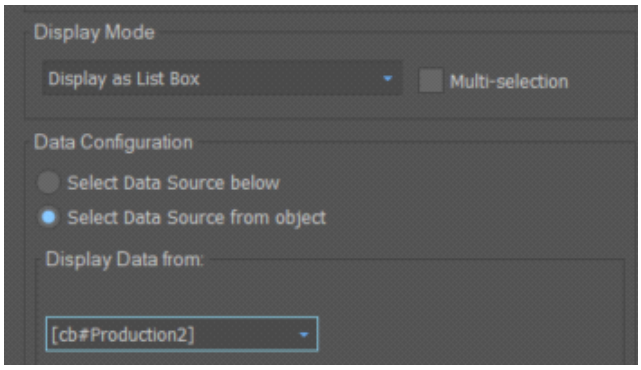


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The "**Data Configuration**" section has 2 radio-buttons: "**Select Data Source below**" and "**Select Data Source from object**". If **Select Data Source below** option is selected, then the "**Display Data from**" combo box will contain the list of data sources by the selected type: **Dream Report History** or **External History Server** (please, see the image above).



If the "Favorite tags list" option will be checked, a list of Tags and Alias will be shown:



If **Select Data Source from object** option is selected, then the "**Display data from**" combo box will contain the list of Web combo box objects, defined in that report – specify a combo box which is populated with a list of Data Sources (as described in the previous option):

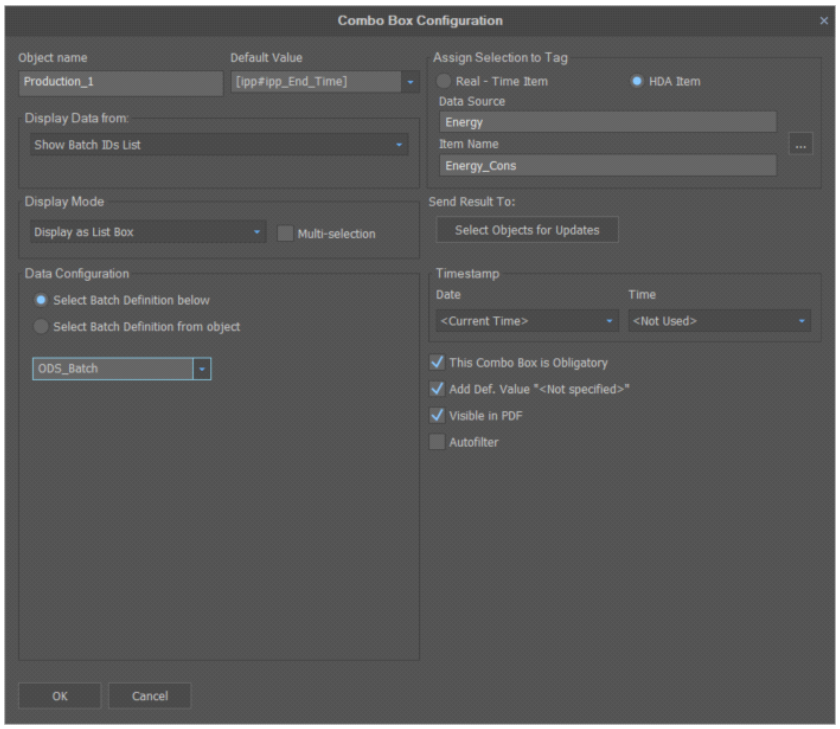
Check the **Multi-selection** option to allow the user to check multiple tagnames from the combo box in the web portal.

If a report is generated from Web and this report has the "**Show Tag List**" combo box with no selection, then all reports will be generated by default using the tag(s) originally defined in all report objects. If the user first selects one or more tags from the combo box, the report will be generated for the selected tags using the tag replacement mechanism (used in a "Refresh Report" or "Generate Report" **Action Button**, or in the **Report Pre-processor**).

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- **Show Report Instances List** – this option will show all Report Instances for a specified report. The options in this configuration allow the user to display the report instances for the **Default** report; a specific report selected in the **Report List**; or from **Another Object** (usually, another combo box) containing valid report names.

- **Show Batch Definitions** - the combo box in a Web report will list all Batch Definition names defined in the project. A web report may have multiple combo boxes with this function defined.



- **Show Batch IDs List** – this option enables the combo box to be populated with a list of batch ID values associated

- with a specific Batch Definition:

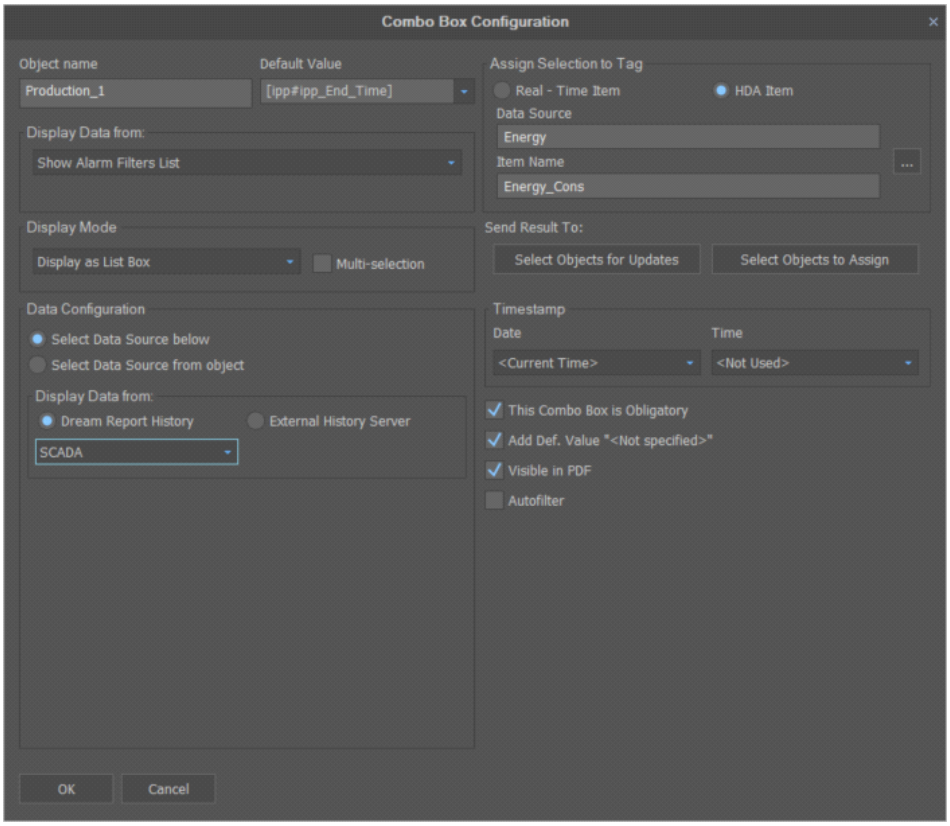
  In the "**Data Configuration**" section, if "**Select Batch Definition below**" option is selected, the user can specify which Batch Definition from the project will be used with which to populate the combo box with batch ID's.

  If "**Select Batch Definition from object**" option is selected, then the list below that radio-button will be filled with all other combo box objects on that web report. Select a Web combo box object which will have the "**Batch Definition**" function (described above in the "**Show Batch Definitions**" section), and then the batch ID list for that given Web combo box will be filled with batch IDs taken from the batch definition, as selected in the corresponding "**Show Batch Definitions**" web combo box.

  If report is generated from Web and report has the "**Show Batch IDs List**" combo box, then, if it has no selection, the report will be generated using the default time period, defined in its objects. If the "**Show Batch IDs List**" combo box has any selection, the report will be generated for the selected batch ID.

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- **Show Report list** - this option is will populate the combo box with all reports in the project.
- **List of SQL Queries** - the combo box will be filled with a list of SQL query names defined in the SQL Manager.



User can get the selected query into expression object and and get its content by using lua function `OdsGetDataFromToken()`.

EXAMPLE

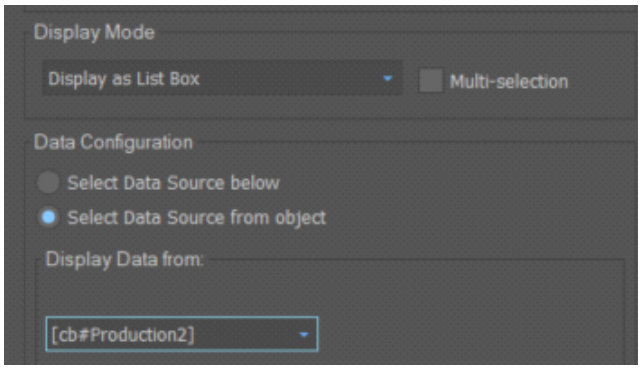
Assuming that user would like to get content data from combo box object with name "Production_1", the call for the `OdsGetDataFromToken()` in expression object has to be defined as: `OdsGetDataFromToken('[cb#Production_1]')` and then that expression object can be used in the SQL Table, Single Data Object SQL based etc.

- **Show Alarm Filters List** – this option will display a list Alarm Filters associated with a specified Alarm data source:

  In the "**Data Configuration**" section, if **Select Data Source below** option is selected, then the "**Display Data from**" combo box will contain the list of data sources by the selected type: **Dream Report History** or **External History Server** (please, see the image above). Select the appropriate alarm source

  If **Select Data Source from object** option is selected, then the "**Display data from**" combo box will contain the list of Web combo box objects defined in that report (see the image below):

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Make sure to select an object that will contain a valid list of Alarm sources.

- **Show Costs List** - this option will populate the combo box with a list of cost definitions, as defined in the Cost Module.

General

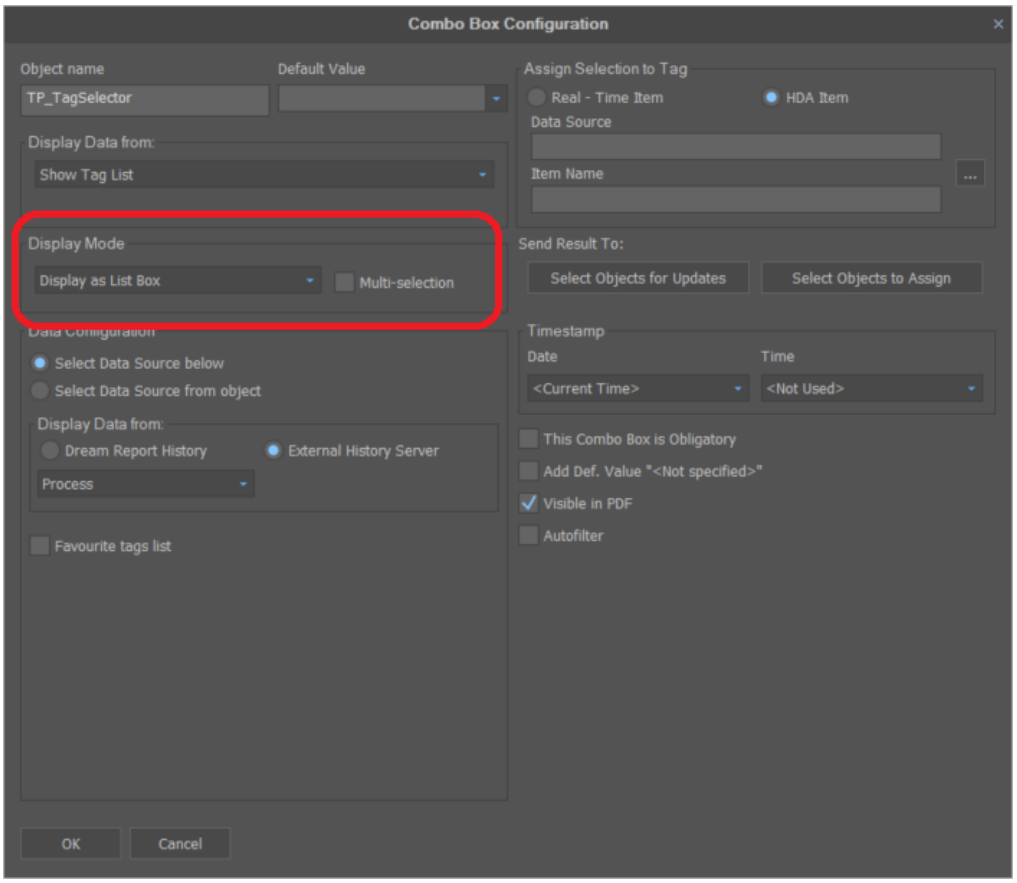
The "**Multi-selection**" option will allow the user to select multiple items in the list from the web report, by holding down the "Ctrl" button while selecting multiple items in the list. By default, this option is unchecked, allowing the user to select only a single item in the list.

Display mode

The "**Display as a Selection Box**" will populate the combo box as a list of "radio button" items, and if the "**Multi-selection**" option (described above) is checked, then the list will show check-boxes next to each item.

User is able to display a list box on a Web report either as a standard list box or as a selection list. This can be configured by "Display mode" control:

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If "Display as List box" option is selected, then a standard list box will be displayed.

The **Assign Selection to Tag** section is used to associate/map the value selected in the combo box, with either a real-time (**Real-time Item**) or history data (**HDA Item**) value parameter. For example, when creating a "data entry form", the user might select an item from a list (e.g., a *Test Type*) and then associate that with the appropriate data item defined in the Web Manual Driver, so that when the data is submitted, the selection from the combo box is saved to that item.

The option to "**Send Result To:**" specifies an action for any selected entry of this combo box. This combo box will be filled with the list of other combo boxes, defined in this report, and user can select any of them. On the web report, ss soon as a selection is made in this combo box, the selected "child" combo box data will be refreshed, based on the association.

In the **Timestamp** section user can define timestamp (**Date** and **Time**) for the defined entered values. This relates to the **Assign Selection to Tag** section.

If "**This combo box is obligatory**" is checked, then selecting a value from this combo box is required for successful report validation. If a user does not select any value, they will not be able to complete the report. If this check box is checked, then a red "*****" mark will be displayed to the left from the combo box and, as soon as a user selects any value from the combo box, the "*" will change its color to green.

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If check box "**Add Default Value "<Not specified>**" is checked, then the combo box will be filled with all values according to its data configuration and one more entry- **<Not specified>** - will be entered in addition.

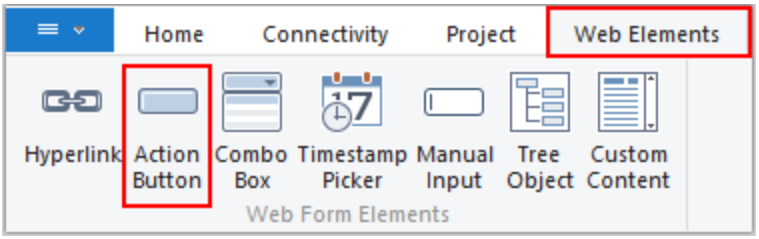
The "**Visible in PDF**" option controls whether this Combo Box object will be displayed in the corresponding PDF format for this report.

If check box "**Autofilter**" is checked, then values in the combo box will be filtered automatically.

22.4 Action Button

Action Button is a dynamic interactive object, which enables users to perform a pre-defined action, and is available ONLY in WEB reports (please also see **Manual Data Entry** section)

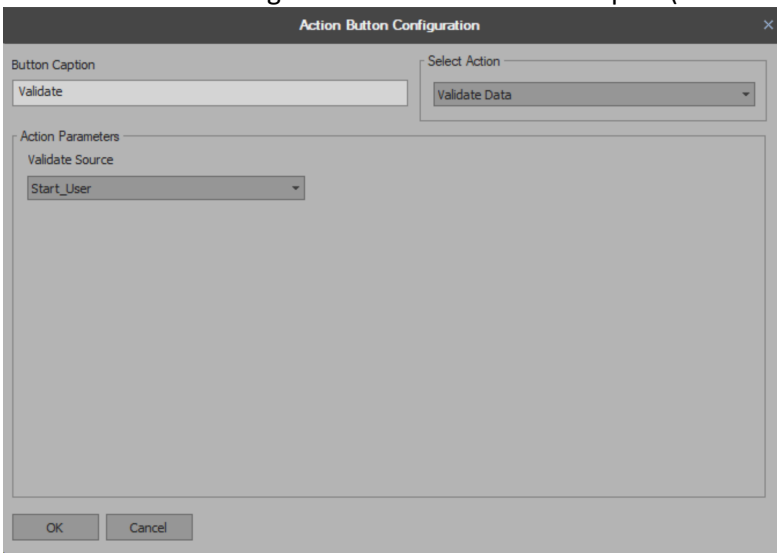
To add this object, click on the command button *Action Button* on the ***Web Elements*** ribbon icon on the horizontal toolbar in the Dream Report Designer Studio menu (see pic. below):



To configure an **Action Button**, please configure the following parameters:

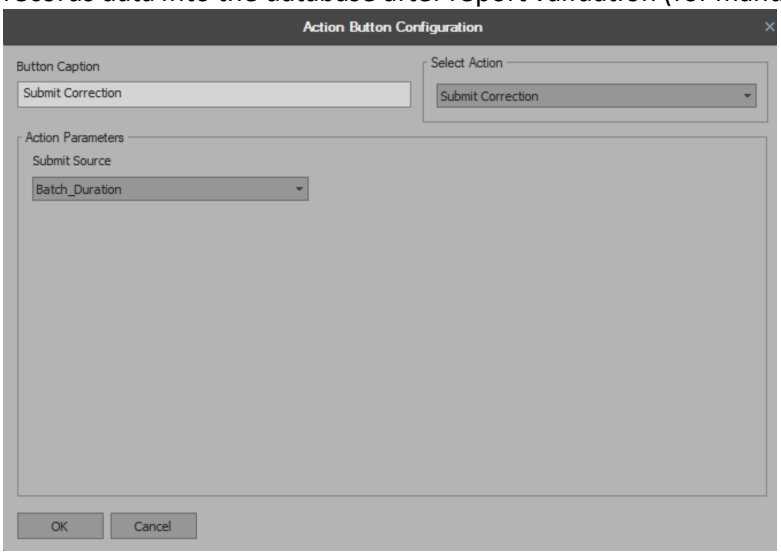
1. **Action button label/text**("Button Caption")

2. **Action to be done when this button is clicked** ("Select Action"). The following actions are available:
   - ***Validate data*** – manages data validation of the report (for manual data entry):

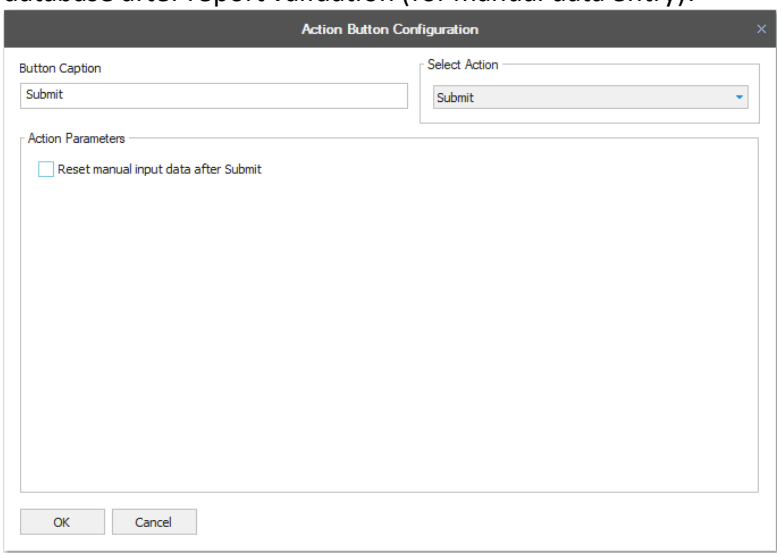


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- ***Submit Correction*** - checks for correct data in the defined data source and records data into the database after report validation (for manual data entry):



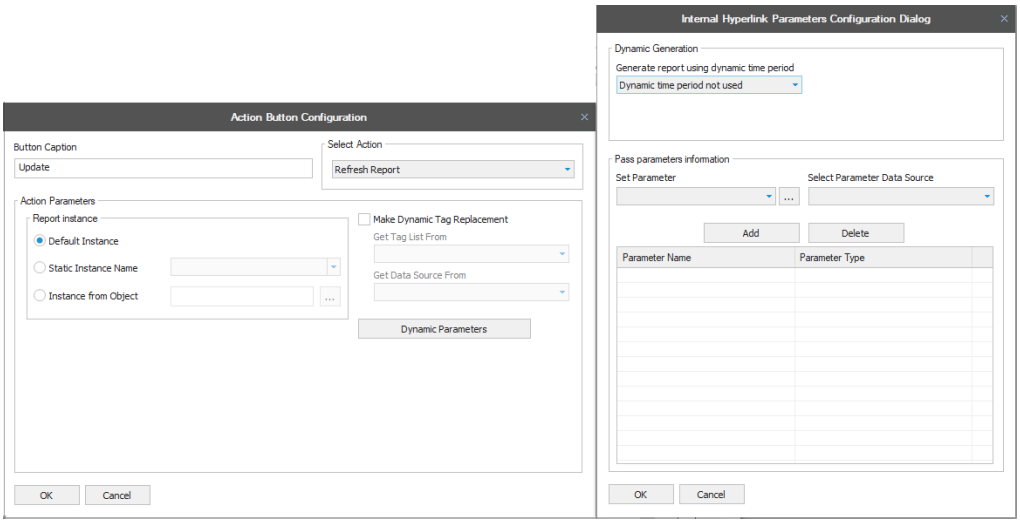
- ***Submit*** – checks report fields for correct data and records data into the database after report validation (for manual data entry):



After data submit action, if "Reset manual input data after Submit" is checked, then all manual input field will be set as empty fields

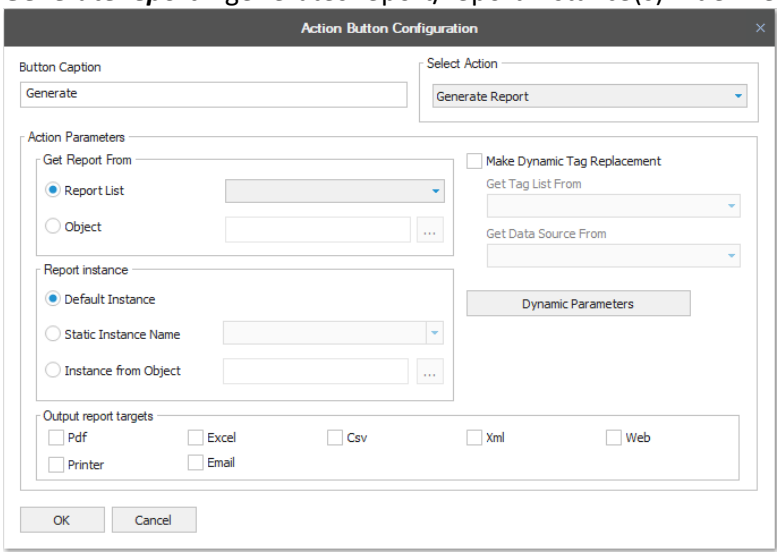
- ***Refresh report*** - refreshes data of all objects in the currently displayed web report:

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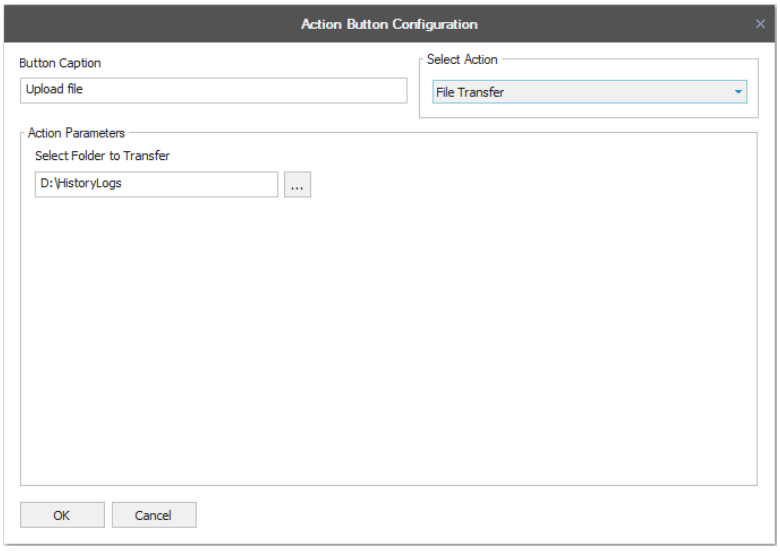
Report can be refreshed as is, however report has report instances defined then user can also specify the static instance he is willing to refresh or set it is dynamic instance set through object in the report.

- ***Generate report*** – generates report/report instance(s) if defined:



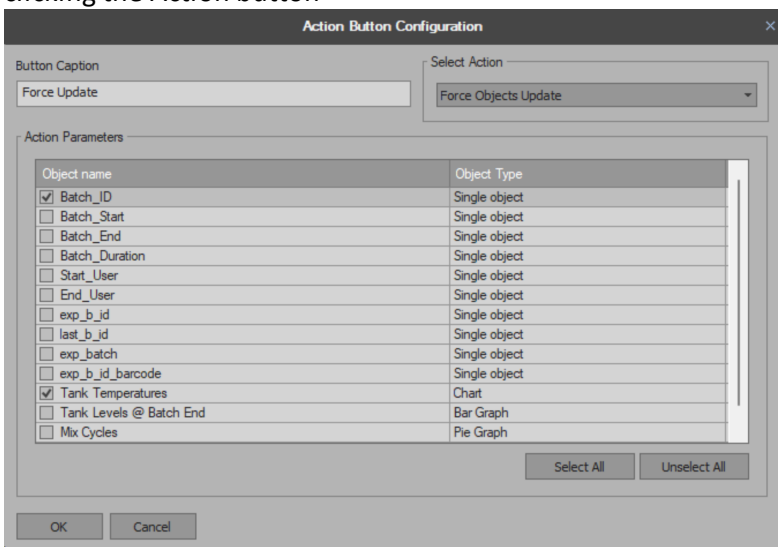
- *Login with different user* – opens Web Portal Welcome page where user has to enter login credentials:
- *Logout* – logs current user out and opens Web Portal Welcome Page where user has to enter login credentials
- *File transfer* - selects a folder where all client's selected files will be transferred to

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NOTE: When user will click on the "..." (browse) button on a web report, the "**Select file**" window will be opened, where user can select any single file (no filter by extension), and as soon as the file has been selected, it will be transferred to the server. A window with a progress bar and the "*Cancel*" button will be displayed until the operation is completed. **The maximum size of an uploaded file is 51200kB.**

- *Generate PDF* - will send the report as PDF to the printer, user will be able to chose whether to print the report to any available in the OS printer or save the file as PDF.
- *Reset web report data* - updates/changes data of all objects in the currently displayed web report to default
- *Submit and Validate* – both the "Submit" and "Validate" actions in one (for manual data entry)
- *Execute SQL Query* – use this option to create (or select from the *SQL Manager*) a SQL statement, and execute that SQL query when that button is clicked on the web report
- *Force Objects Update* – select specific object(s) on the report to update by clicking the Action button



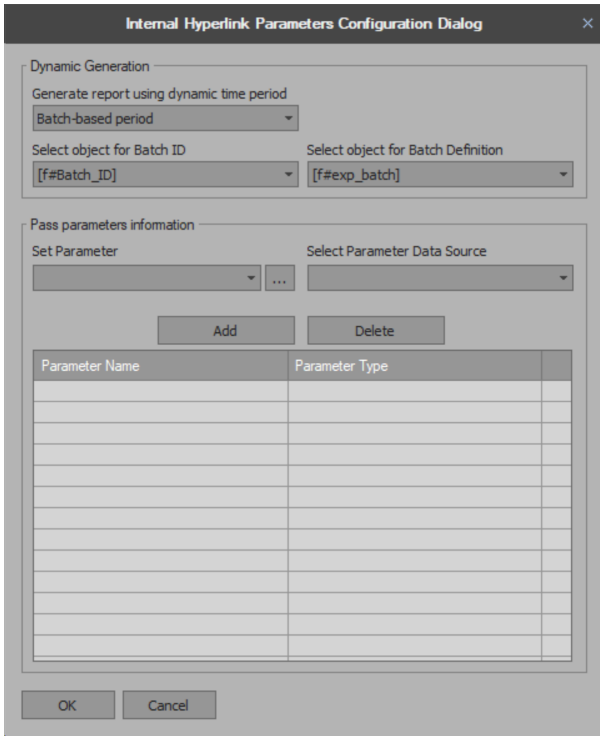
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Some options have **Make Dynamic Tag Replacement**. If this option is enabled, then the "**Get Tag List From**" combo box will be filled with the list of all web combo box objects, which have the "***Tags List***" and "***Report Instances***" functions.

If in real-time (in a web report), the selected web combo box object has no selected value, the report will be generated without any dynamic replacement.

If, during report generation, the selected combo box has the value(s) selected, the report will be generated with original tags replaced by the web combo box selection: either by other tags (tag set), selected in a web combo box object, or by virtual report instance(s).

If user will click on **Dynamic Parameters** button, then the following window will be opened:



This window allows user to set dynamic time period parameters (either batch based or report start and time, coming from dynamic/calculation objects) as well as pass values to Internal Project Parameters for report generation.

The upper list box "Generate report using dynamic time period" has three available values:

- Dynamic period is not used - this option disable dynamic parameters for report generation.
- Batch-based period. This option enables users to specify object, which value will hold a batch ID. This list box will automatically contain the list of all *Single Data Object*, *Expression Object* and *List Box* object types, existing in that report. Content of any such an object can be used as a source for batch ID for report generation.

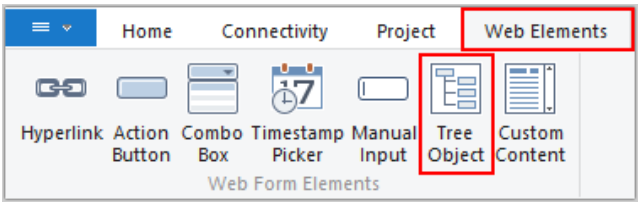
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- Time-based period. This option enables to generate report using dynamic time period. If this option is selected, then user will be able to select the object for report start time and the object for report end time. *Single Data Object*, *Expression Object, Date/Time picker* and *List Box* object types are available for selection.

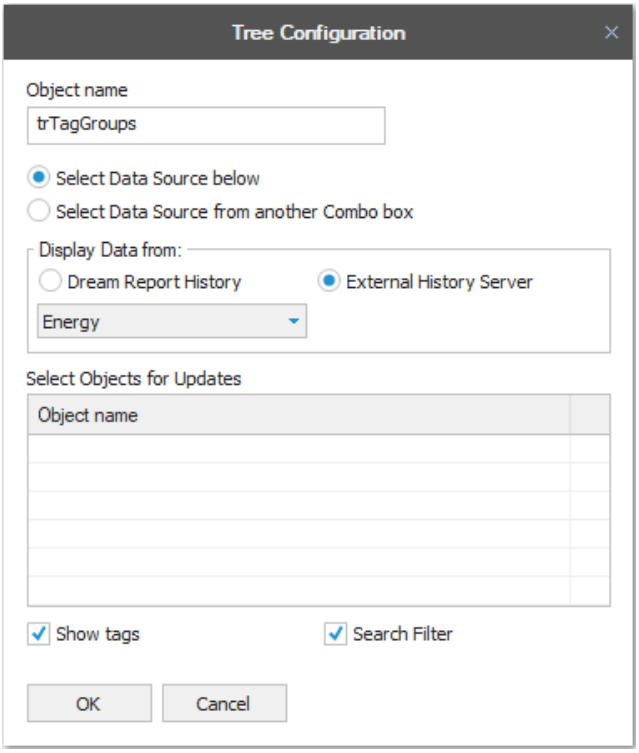
22.5 Tree Object

The **Tree Object** is a dynamic interactive web object, which enables users to display the folder structure of a hierarchical tag source. The selected group, or sub-group, can then be used to filter an associated Combo Box which has been configured to display a tag/item list. The **Tree Object** is available ONLY in WEB reports. The **Tree Object** will be visible only in Web reports and will not be displayed in PDF/Excel reports.

To *add* this object, click on the *"***Tree Object***"* command button on the *Web Elements* ribbon icon in the horizontal toolbar of Dream Report Designer Studio:



Draw a rectangle in the report workspace where the **Tree Object** will be displayed. The following **Tree Configuration** dialog box will be opened:



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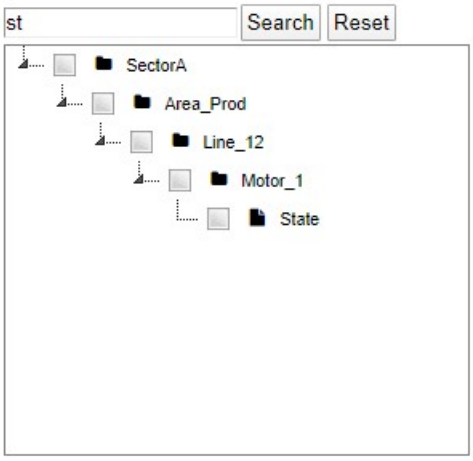
Object Name must be a unique logical name, which can be referenced by other objects within the project.

The **Tree Object** can either access a specific data source, by selecting "**Select Data Source below**" option, or by selecting a data source dynamically at runtime, by selecting the "**Select Data Source from another Combo box**" option. Depending on which option is selected for the Data Source, select the appropriate Data Source (External History Server) or Combo Box from the "**Display Data from:**" section.

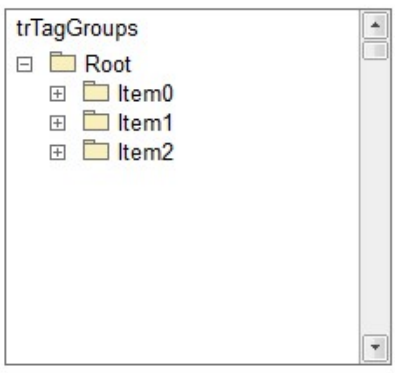
Finally, if you wish to dynamically update any associated objects (e.g., a list of tags in a Combo Box on the web report), make sure to **Select Objects for Updates**.

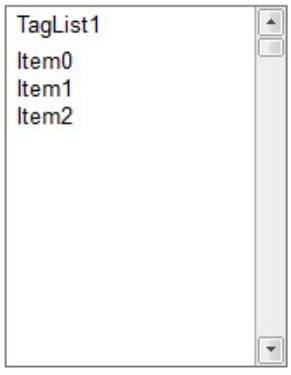
Show tags option – when checked, the *Tree* object will show the tags under the hierarchical nodes (folders). When unchecked, the *Tree* object should be used together with a *Combo box*. In this case, select the folder in the *Tree* object, and then select the tags in linked *Combo box*.

Search filter option – if this box is checked, the search option will appear in the *Tree* object in the DRWeb portal:



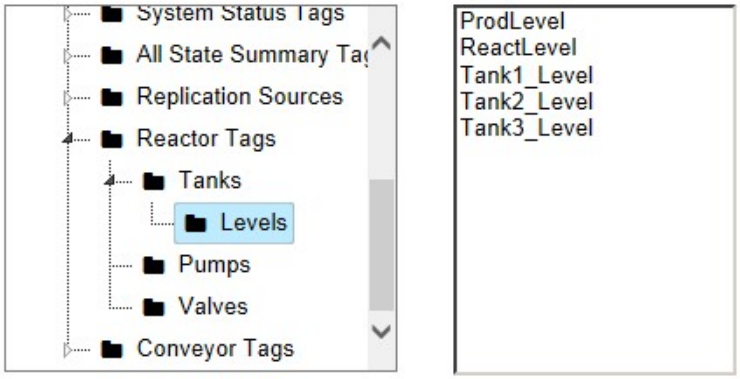
Click "**OK**" to close the **Tree Configuration** window. The **Tree Object** will display on the report, as shown in the left image below ("*trTagGroups*"). The *"TagList1*" Combo Box object shown on the right of this image is associated with the "*trTagGroups*" Tree object.





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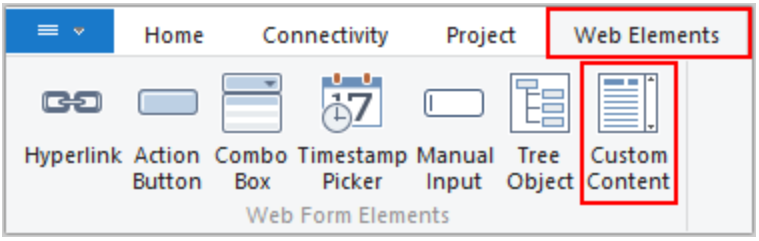
At runtime, on a Web report, the **Tree Object** will be populated according to the hierarchical structure of the data source. Double-clicking on a folder will either expand the folder to the next level, or display any tags/items contained in that group in any associated object(s), as shown below:



22.6 External Web Content

The external web "Custom Content" feature enables you to insert and use a web page or external documents in reports (PDF, Image or plain text).

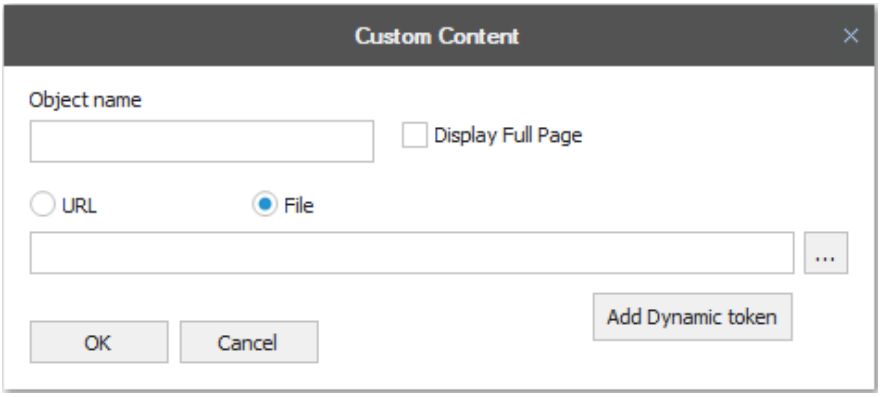
Note: file types that are not supported (to be inserted/embedded) will be downloaded from the browser.



To add a new web object to a report, where external content will be displayed, click on the *"***Custom Content***"* button on the *Web Elements* ribbon icon in the horizontal toolbar of Dream Report Designer Studio, and draw the object in the needed size on the report page:

The following window will open:

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1. Enter a meaningful object name
2. Check the "*Display Full Page*" option for the inserted object to be displayed on the whole page regardless the size of the drawn object.
3. Select the object type - "*URL*" or "*File*", and browse or manually insert the location of the file or URL. Dynamic tokens can be used to reference *Expression* object(s) on the report that contain the desired URL or file path.

   Important Note: When using dynamic tokens, any backslashes (\) in the expression object that contains the file path should be replaced with forward slashes (/).

   For example: instead of '*D:\ODS\Dream Report*', use '*D:/ODS/Dream Report*'
4. Click the [OK] button to save the changes and close the *Custom Content* configuration window.

Note: Dynamic replacement of Hostname in URL when client accessing Dream Report web portal.

The %hostname% place holder in URL will be automatically replaced inside the hyperlink to the name of the host from were Dream Report project's web portal is running. So for the end client it will be transparent where Dream Report server is located. User will be able to access Dream Report project web portal from intranet as well as from internet without doing any modifications in the hyperlink.

Example:

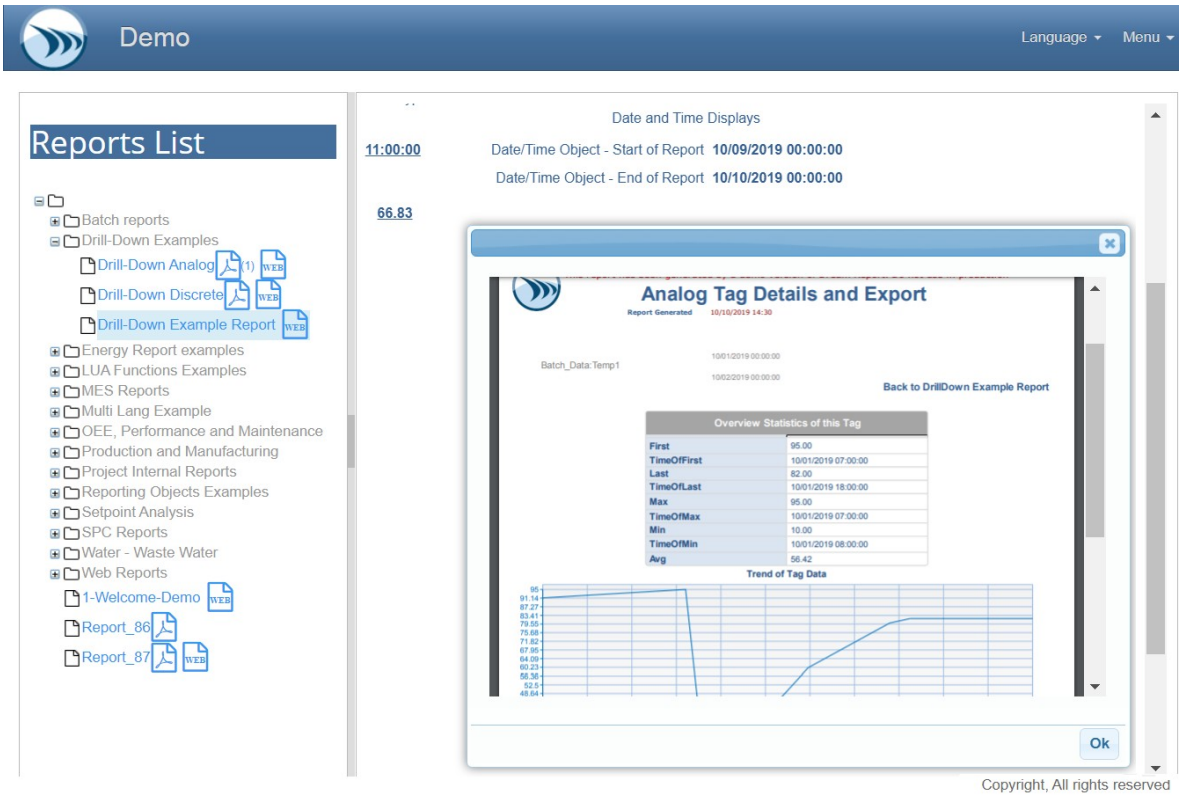
The following defined URL : http://%hostname%/DRWeb_Demo/WebApi/GenReport.aspx?report=ReportInfo&format=web&Rep_Name=[cb#ReportList]

When accessed from the host like www.dreamreport.net will be replaced on Dream Report server side to:

http://www.dreamreport.net/DRWeb_Demo/WebApi/GenReport.aspx?report=ReportInfo&format=web&Rep_Name=[cb#ReportList]

The following illustrates how the Custom Content might look in a web report:

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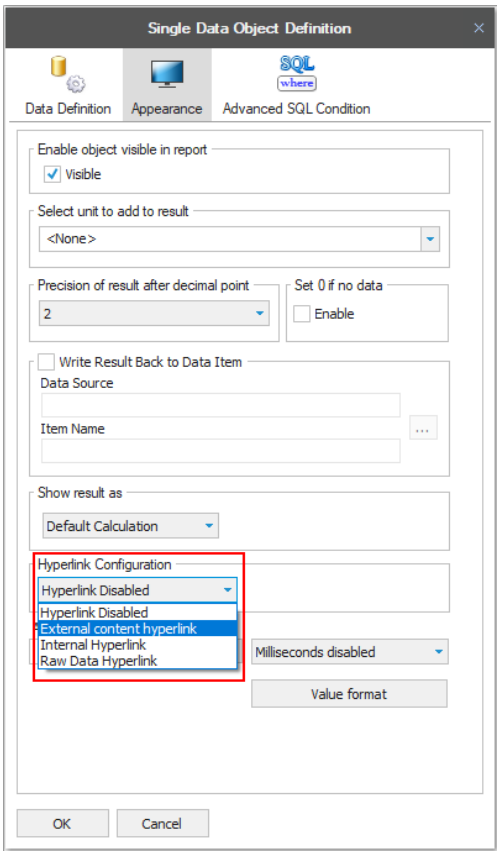


Different Custom Content Based on Conditions:

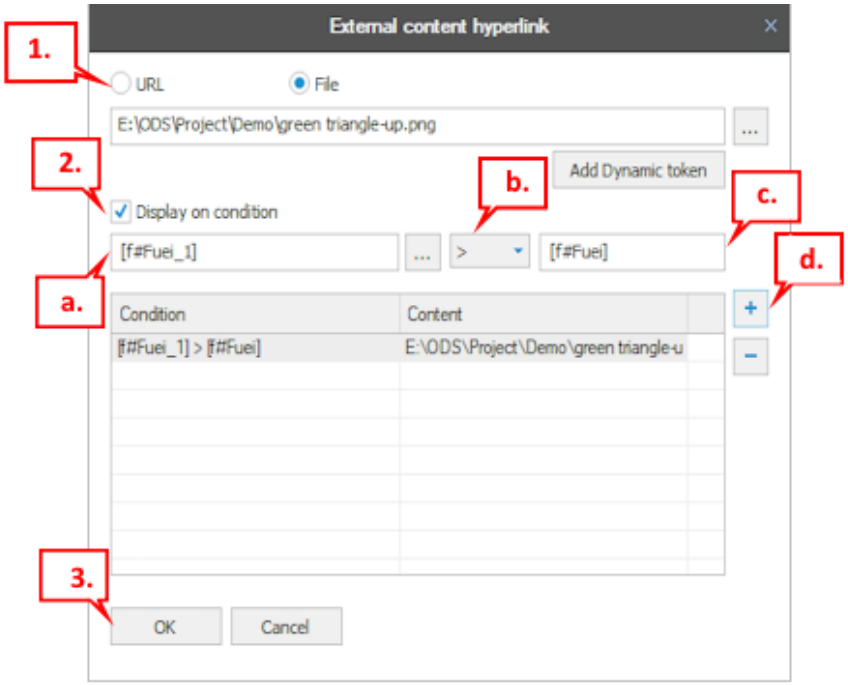
Different external content can be shown in the report, based on pre-defined conditions evaluated in a *Single Data Object*.

In a *Single Data Object* definition, on the “Appearance” tab, an option is added to the dropdown list under the “*Hyperlink Configuration*” section – “*External content hyperlink*”:

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When selected, click on the "*Configure*" button that appears near the selection, and the following configuration window will be opened:



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1. Select the object type: *URL*, *File,* or *Add Dynamic token* to reference an Expression object that contains desired URL or file path.

2. Check the "*Display on condition*" box in order to specify a condition for the external content:
   a. Insert manually or click on the "…" button to browse the tags.
   b. Select the sign for the condition.
   c. Insert manually or click twice on the box to add the tags.

   Important Note: As described in the previous section, when using dynamic tokens, any backslashes (\) in the expression object that contains the file path should be replaced with forward slashes (/).

   d. Click on the [+] button to add the condition to the list.

3. Click [OK] to save and close the window.

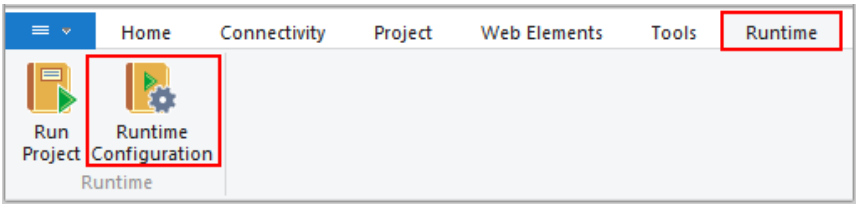
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Runtime Manager

23 Runtime Manager

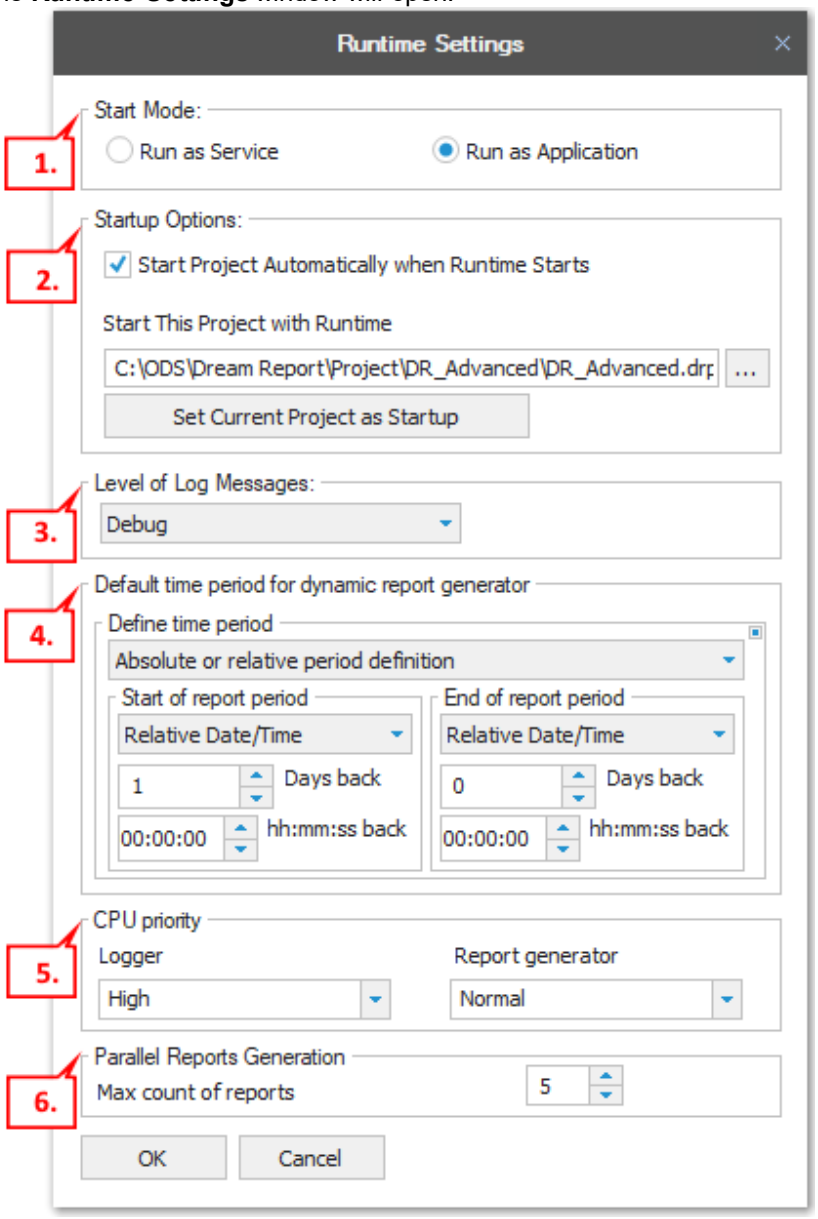
23.1 Runtime Configuration

The **Runtime Configuration** enables the administrator to configure the startup and runtime behavior of a specific Dream Report project. From the **Runtime** tab in Studio, click on the **Runtime Configuration** icon:



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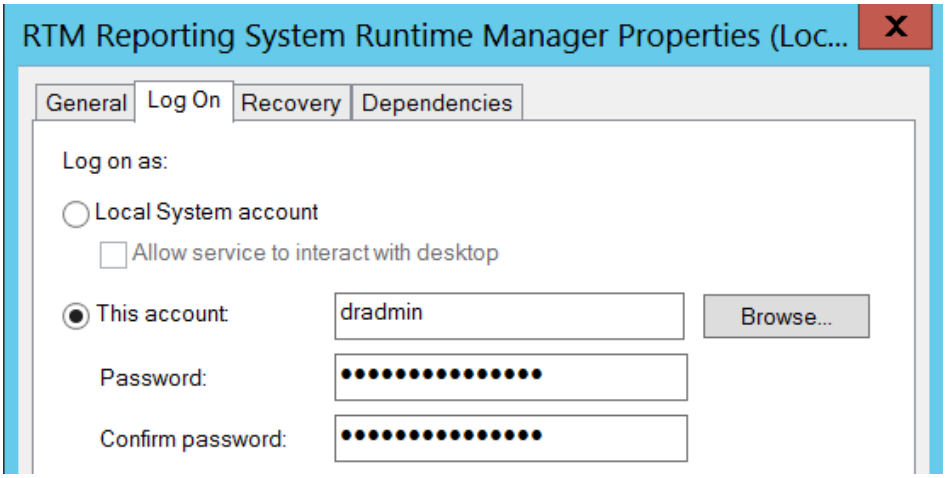
The **Runtime Settings** window will open:



1. **Start mode** – specifies how the runtime control service/runtime manager (RTM.exe) will start up:
    - **Run as Application** – the Dream Report RTM will run as an application when the user logs in to Windows. This is the default.
    - **Run as Service** - the RTM will be set to start automatically as a Windows service (appears as *RTM Reporting System Runtime Manager* in Windows Services)

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IMPORTANT NOTE: By default, Windows services are set to run under the "Local System Account". This account has limited privileges on a PC, and as such, can impact the operation of the Dream Report application. If Windows accounts are used for any SQL connectivity; if reports are set to copy to network drives; or if network printers are specified on a report, they will require a specific user account (with appropriate privileges) to be associated with the RTM service. This can be set in the "Log On" tab of *RTM Reporting System Runtime Manager,* under Windows Services:



2. **Startup Options** – specifies what happens when the RTM service starts automatically:
   - **Start Project Automatically when Runtime Starts** – check if the PC starts up unattended, and you want the project to launch automatically
   - **Start this Project with Runtime** – either select a specific project by clicking the **[...]** button and browsing for a project file. Or, click the "**Set Current Project as Startup**" to use the current project
3. **Level of Log Messages** – specifies whether the launched project will write basic messages/error information to the Dream Report log file ("Normal" mode) or a detailed-level of log messages ("Debug.")
4. **Default Time Period for Dynamic Report Generator** section enables to define time period which will be displayed as default when the Dynamic Report Generator is opened.
5. **CPU Priority -** the *CPU priority* for different Dream Report runtime tasks can be adjusted, if necessary, to balance resources on a machine running other processes. This can be specified for both the "**Logger**" process (important if Dream Report Logger Studio is configured to log a lot of data points) and "**Report Generator**", which is responsible for the scheduling and generation of reports. The default priority for all processes is "Normal". There are 5 levels of CPU settings:

   - Critical high
   - High
   - Normal
   - Low
   - Very low

   If the CPU priority is to a specific level, then the process may gain more performance/CPU priority or lose performance comparing to other running processes. If you modify CPU priority, the change will take affect only after PC restart.

6. **Parallel Reports Generation**

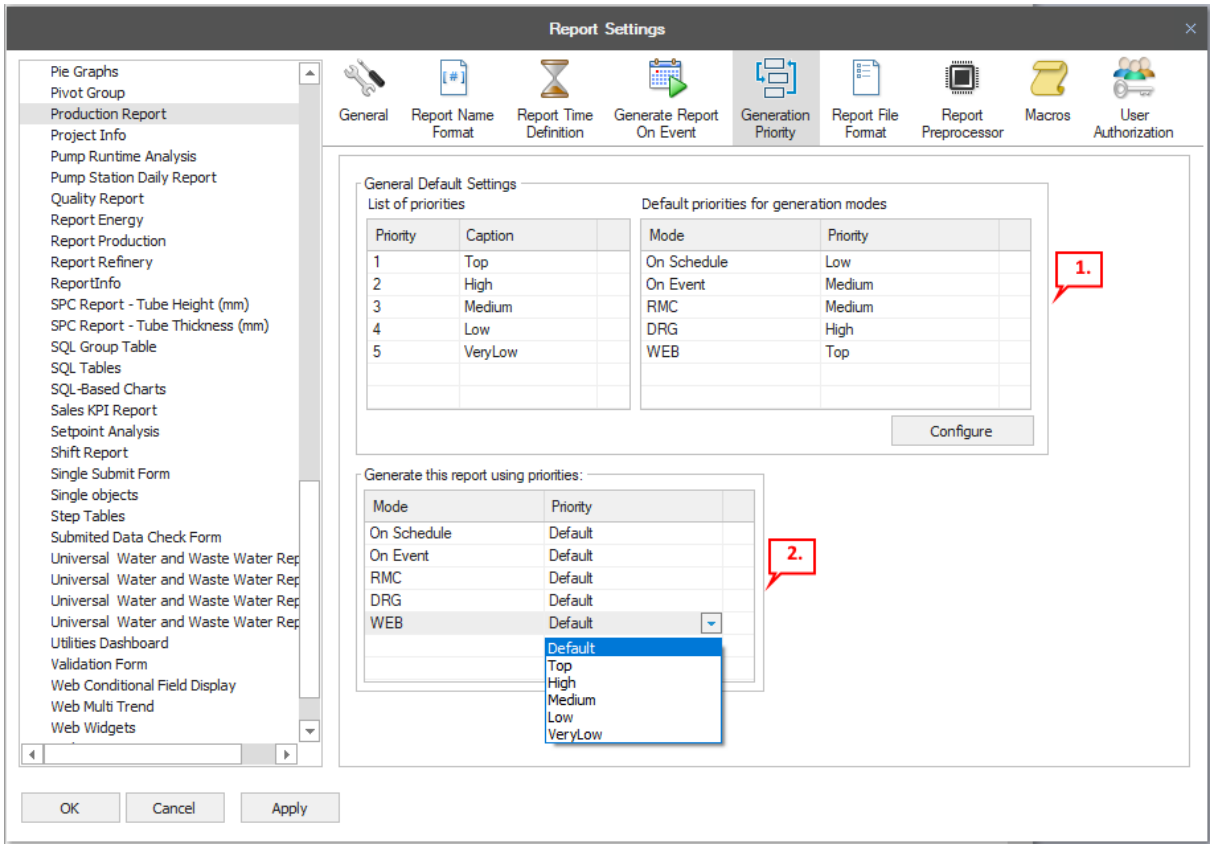
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The *Parallel Reports Generation* option allows the user to specify how many reports can run (generate) simultaneously. The default is 5 reports. If more than the specified number of reports are triggered at the same time (e.g., multiple reports scheduled to run at midnight) then the additional reports will be queued to run upon completion of one of the reports running in parallel.

In larger reporting applications - i.e., applications either with a large number of reports scheduled to run at the same time, or a large number of active DRWeb users - it is advisable to increase the **Max count of Reports** option to allow for faster report generation. Please note that the higher number of simultaneously generated reports will impact CPU usage, so make sure that there is sufficient CPU bandwidth available. Max is 10.

Report Generation Prioritization

The **Report Generation Priority** feature allows the user to specify how Dream Report manages priorities when generating reports in different modes (scheduled, event-generated, web on-demand, etc.) and when generating different reports in the same mode. This setting is specified at the report-level in the "*Generation Priority*" tab of the **Report Settings**:



This dialog window has 2 main sections: *General Default Settings* and settings for the current report.

1. **General Default Settings** (defaults that apply to the current project)
   - **List of Priorities** – this list defines descriptions (captions) for the 5 available generation priority level. Each level of priority has a default text caption. A user can't change the numeric ID of the priority level, but you can specify your own caption for each priority level. The text caption has meaning in UI only. To edit a priority caption, either double-click on

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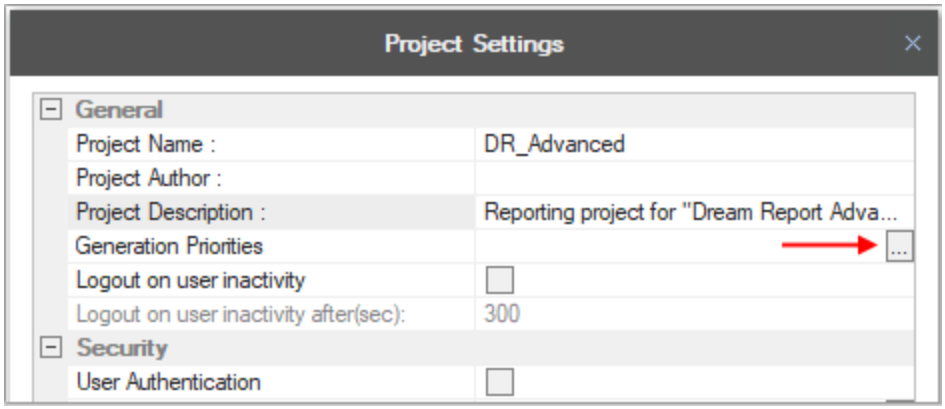
the caption or click the "*Configure*" button. When the *"General Default Settings*" window opens, you can type in your own captions if desired.

- **Default Priorities for Generation Modes** – the default report generation priorities, by generation mode, are as follows:

Generation Mode	Priority
On Schedule	Low
On Event	Medium
RMC	Medium
DRG	High
Web	Top

To edit the default generation priorities for a project, either double-click on a priority, or click the "*Configure*" button. When the "**General Default Settings**" window opens, you can type in your own captions if desired.

NOTE: The *"General Default Settings*" configuration window can also be opened and set from the **Generation Priorities** setting in the "*General*" section of the project Settings window:



2. **Generate this Report using Priorities** - the bottom list defines priorities for that specific report. By default, all reports will have "Default" in each entry. If you select a specific priority level for a mode, that selection will override the default setting for that specific mode for that report.

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Implementation:

This priority mechanism only manages the reports queue. Any report which is currently being generated will be completed, and its generation will not be paused if a new report with higher priority has been inserted into the generation queue. Any report added to queue will be placed in the queue corresponding to its priority. If one or multiple reports with that same priority are already queued for generation, the new report will be added to the end of the group having the same priority.

23.2 Runtime Management Console

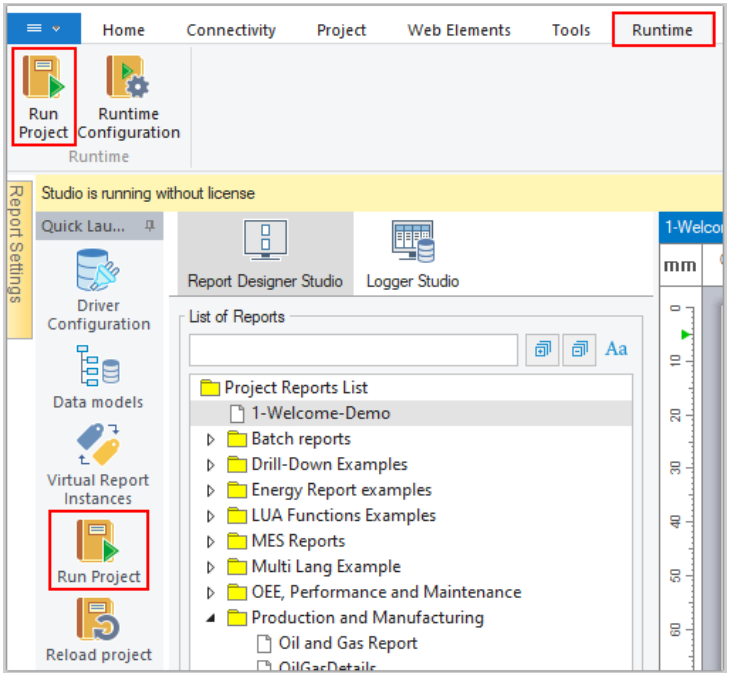
Any Dream Report project can run by means of a special module - Runtime Manager (Runtime control service). This module can run either as a service (launched on the PC start) or as an application (launched on a user Windows login). To control all operations, related to the Runtime Manager (runtime service) and report generation, the Runtime Management Console (RMC) is used.

Runtime Management Console enables managing the project in Runtime, i.e. reloading the project/reports, shutting the project, providing access to different project options (project folders, Web portal, IIS configuration), Dream Report license info, help documentation, report generation on demand, while the project is running.

Runtime Management Console (RMC) can be launched in 3 ways:

- Double-click on the ***Runtime Management Console*** icon on the desktop;
- From the ***Runtime Management Console*** shortcut in the Startup menu;
- Click on the *Run Project* command button either on the **Runtime** ribbon icon on the horizontal toolbar, or on the vertical toolbar both in the Dream Report Logger Studio and Dream Report Designer Studios (see pic. below):

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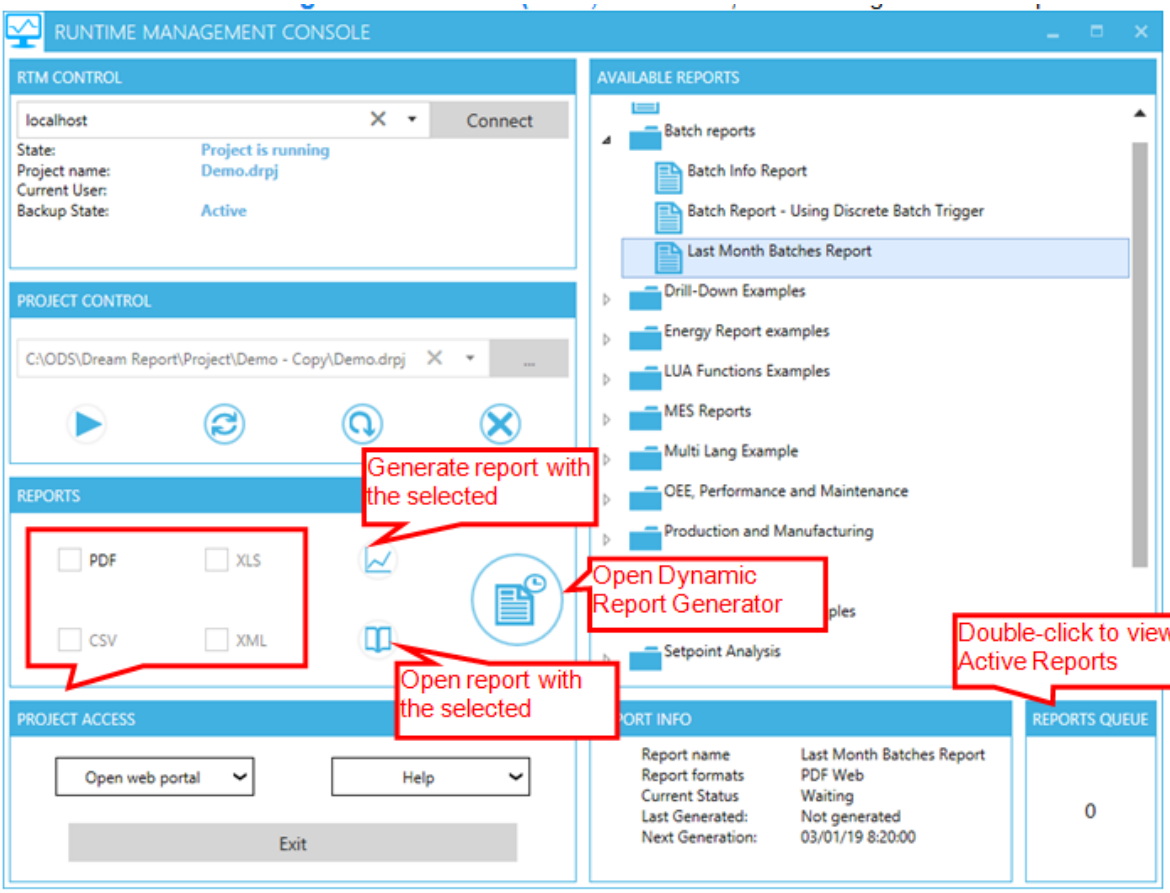


NOTE: If RMC is closed, then it will hide in the system tray. If a user wants to maximize it, double-click on the RMC icon in the system tray or right-click it in the system tray (then the "Open RMC" context menu will be started).

If the currently running project was modified, press the *Reload Project* button to reload the project and start using the updated project. Reloading a project has the same effect as restarting the runtime manager - the previous project will be completely closed and opened again.

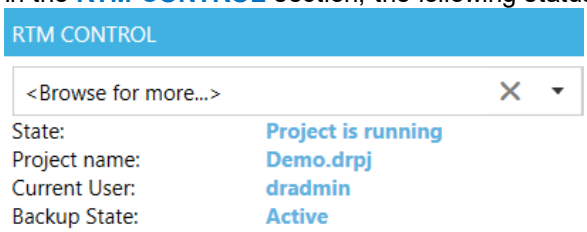
When the **Runtime Management Console (RMC)** is launched, the following window will open:

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When starting the RMC, it will check if a project is currently running. If yes, then it will connect to it and automatically display the currently running project path in the local computer section. Or, a user can select a project to start from the RMC.

In the **RTM CONTROL** section, the following statuses will be displayed:



- **State** - the status of the project - *Running* (or other informational messages)
- **Project Name** - the name of the project currently running. If a concurrent/remote development project is loaded, it will appear in red text, and the node name/IP address will be shown above, indicating *where* the project is running
- **Current User** – if User Management is enables, the current user logged into the RMC
- **Backup State** - the mode for the project, which is running, - ***Active*** (as master, i.e. connected to the main station) or ***Passive*** (in the backup mode, if the hotbackup node is configured).

The **PROJECT CONTROL** section allows the following user actions:

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1. **Run Project** – if a new project is selected from the […] button, this button will then start up the selected project
2. **Reload Project** – completely restarts the currently selected project and its associated modules (logger, generator, etc.)
3. **Reload Reports** – reloads the latest, saved copies of the reports only
4. **Shutdown the Project** – completely shuts down the currently running project

Switching between projects

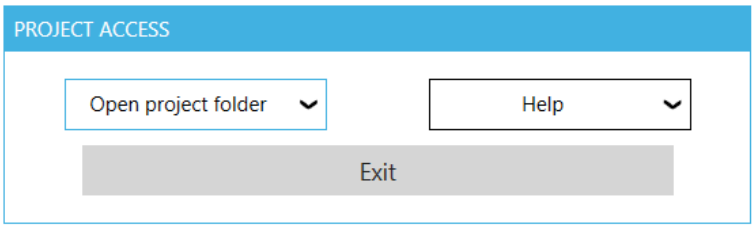
If a project is running and a user needs to stop it and switch to another project, stop the currently running project (4.), browse for another project and click on "*Start*" (1.), as shown in the above image.

The **REPORTS** section allows the user to generate and/or open the select report (from the right-side AVAILABLE REPORTS panel). The selections will enable the PDF, Excel/CSV, and/or XML formats.



The large circular button launches the *Dynamic Report Generator* utility (described below.)

The **PROJECT ACCESS** section provides access to several runtime administration tasks:



When clicking the *Open Project Folder* drop-down, the following options will be available:

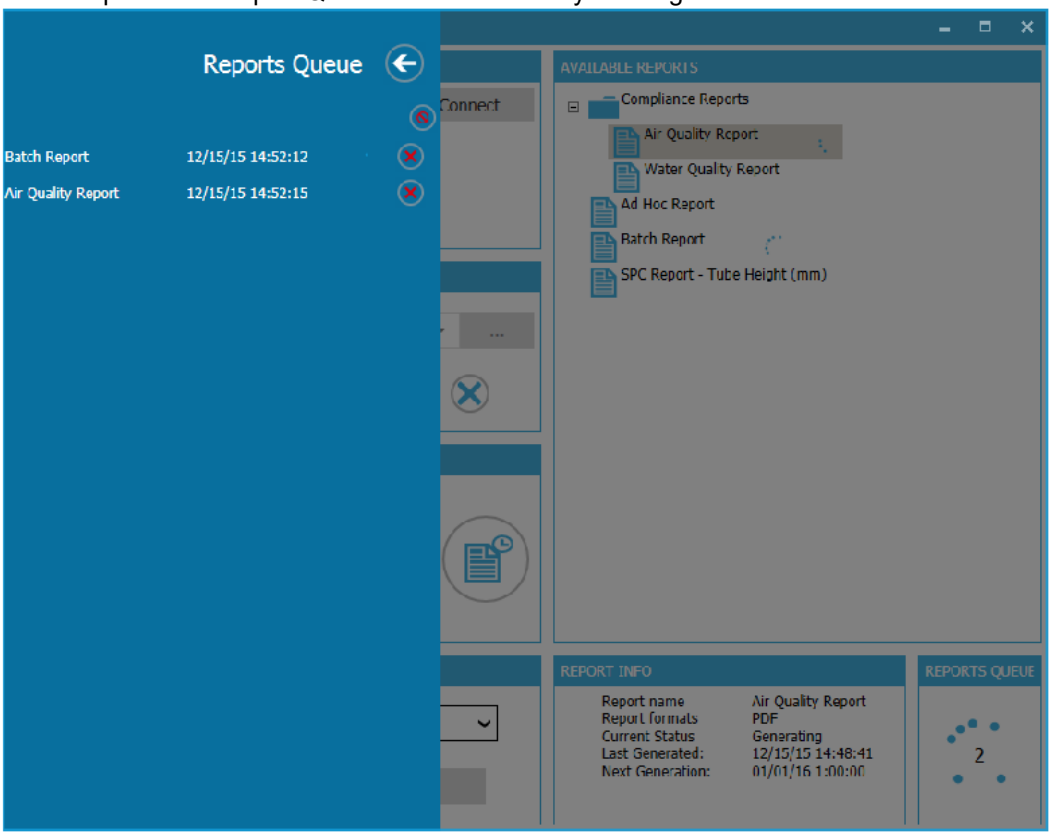
- **Open Project folder** – opens Windows Explorer to the folder containing the running project
- **Open Reports folder** - opens Windows Explorer to the folder containing the main reports directory
- **Open Log File folder -** opens Windows Explorer to the folder containing the main Dream Report log file
- **Open Web folder** - opens Windows Explorer to the folder web portal files
- **Open Database folder** - opens Windows Explorer to the folder containing project database file(s)
- **Open Log File** - opens the current project's log file in Notepad
- **Edit Project** – open Dream Report Studio with the currently running project
- **Open Web Portal** – opens the DRWeb portal with the default browser
- **Esignature Console** – Opens the Electronic Signature console to review and sign reports

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- **Configure IIS** – opens a dialog to configure the DRWeb portal (with all defaults) for the currently running project
- **Set Debug level of Log Messages –** temporarily sets the project's logger into a detailed, debug mode
- **Set Normal level of Log Messages** - temporarily sets the project's logger into a "normal" logging mode

If a user selects any report or its instance, the section "**Report info**" will display its related information, including last generation date, next scheduled date, etc..

If you wish to view the list of active reports in the reports queue, double-click the **REPORTS QUEUE** text in the lower right of the RMC. The Reports Queue will then be shown on the left side of the RMC. Queued reports can be deleted, if needed, by selecting the specific report, and clicking the red "**X**" next to that report. The Report Queue can be closed by clicking the ← button:



User Management

If a project, which RMC is trying to connect to (either on a local or remote PC) has *User Management* enabled, then user will be prompted to enter a username and password. If login failed, the connection will be denied.

If a user tries to launch a new project and user login failed, then the project will be started anyway (in the runtime control service), but the RMC will not be connected to it.

NOTE: If User Management is activated and the RMC is minimized, then, if a user wants to maximize it, he will have to enter the login and password again.

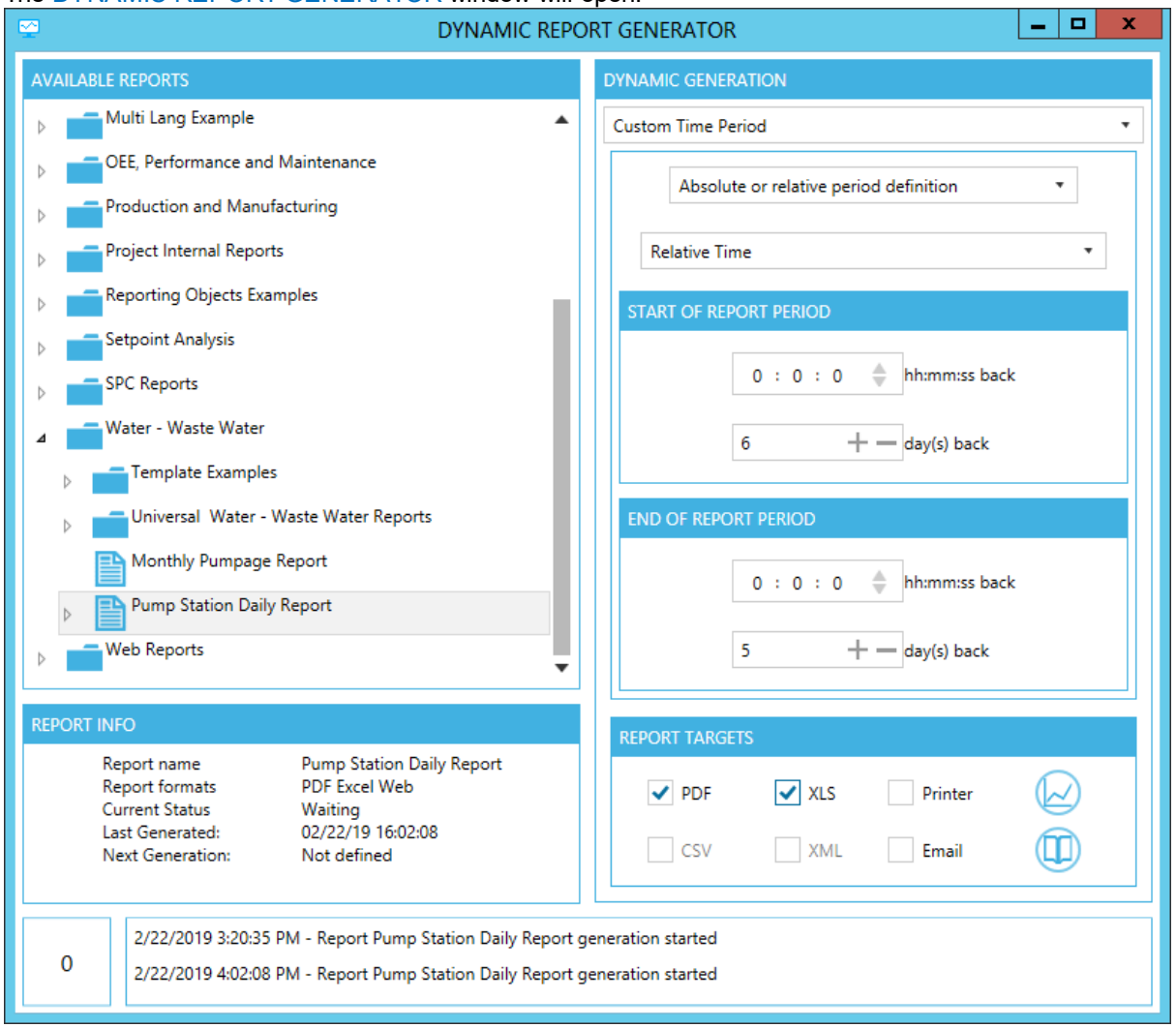
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Dynamic Report Generator

The **Dynamic Report Generator (DRG)** is a module that allows a user to generate reports on demand, where the user can select a specific time period for the report generation. The DRG is implemented as a standard Windows application (**generate.exe**) as well as an ActiveX control that can be embedded in an HMI. To open the new **Dynamic Runtime Generator**, either select the *Dynamic Report Generator* program from the Windows Start menu, or click the fllowing button in the **REPORTS** section of the **Runtime Management Console**:



The DYNAMIC REPORT GENERATOR window will open:



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The DRG can generate predefined reports for the currently running project, specifying report time definition properties and output formats at runtime. All dynamic modifications of the report properties will be done only for that specific report execution and will not be saved in the report layout. If you have a running project containing a daily report, and you generate this report using DRG, applying a new period of 1 hour, it will generate an hourly report file from it. The original report will continue to run and generate daily reports as before.

Note that reports can also be dynamically generated from a **command line**, with several options available to be included in the execution command, such as report name, start time, end time, batch id, output target format, etc. For example:

rtm.exe -generate -name Downtime_Report -instance Inst1 -target pdf excel email printer

This will be described in more detail in the **Command Lines in Runtime Manager** section.

Command Lines in Runtime Manager

Dream Report Runtime Manager can execute a number of command lines. The **Command line** has the following available formats for generation requests:
-generate This argument will say that generation request will be performed. The following parameters are possible:
-name Report name
-instance Report instance name
-fixPeriod This argument will indicate that the fixed time period is used
-absPeriod This argument will indicate that the absolute time period is used
-relPeriod This argument will indicate that the relative time period is used
-batchRelPeriod This argument will indicate that the batch-based relative time period is used
-batchAbsPeriod This argument will indicate that the batch-based absolute time period is used
-timeStart Time that defines start of period
-timeEnd Time that defines end of period
-batchDef Name of the batch definition to be uses
-batchRel Mode for the relative batch ID (it can be “last” or “current”)
-batchCount Number of batches to count
-batchIdStart ID of the batch for the report start
-batchIdEnd ID of the batch for the report end
-currentTime This argument will set the current time for the report.
Target for the report can be **“pdf”**, **“email”**, **“printer”**, **“excel”** (see examples below)
-fileParam File to be used as a file with the parameters for preprocessor

NOTE: If **-fixPeriod** is used, then **-timeStart** has to provide one of the following arguments: **“last day”**, **“last n days”**, **“last hour”**, **“last n hours”**, **“last week”**, **“last n weeks”**, **“last month”** and **“last n months”**, **“Current day”**, **“Current hour”**, **“Current week”**, **“Current month”**, **“Current quarter”,** where **n** is a number from 1 to 500.

Examples:

- **rtm.exe -generate -name Report_1 -instance Instance_1 -fixPeriod “last 10 hours”**
- **rtm.exe -generate -name Report_1 -instance Instance_1 -absPeriod -timeStart “31/12/2010 00:00:00” -timeEnd “01/01/2011 00:00:00”**
- **rtm.exe -generate -name Report_1 -instance Instance_1 -relPeriod -timeStart 10-2:30:30 -timeEnd 5-2:30:30**

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• rtm.exe -generate -name Report_1 -instance Instance_1 -batchRelPeriod -batchDef MyBatch -batchRel last -batchCount 2
• rtm.exe -generate -name Rep1 -instance Inst1 -batchAbsPeriod -batchDef MyBatch -batchIdStart 120 -batchIdEnd 130
• rtm.exe -generate -name Rep1 -instance Inst1 -currentTime "31-12-2010 18:00:20"
• rtm.exe -generate -name Rep1 -instance Inst1 -target pdf excel email printer
• rtm.exe -generate -name Rep1 -instance Inst1 -fileParam "C:\Data\params.xml"

Examples of targets for the report:

-t pdf
-t pdf excel
-t pdf excel email
-t pdf excel email printer

NOTES:

- Report target "**printer**" will send output files for printing according to the printer settings of the report file format of the Dream Report Studio. It means that no matter which targets have been defined in the cmd command, printer will receive only those files which have been defined in the Dream Report Studio Report Settings.
- If the generated report needs to be delivered to the email, user must always add the generated report output format (PDFor/and Excel) to the "**-t email**" command line.

Example: "**-t pdf email**" - report will be sent to the defined email with the report generated in PDF format;

"**- t excel email**" - report will be sent to the defined email with the report generated in Excel format;

"**- t pdf excel email**" - report will be sent to the defined email with the report generated in PDF and Excel format.

"Starting the Project" command line:

In order to be able to start project from the command line the following command has to be run:
"<path to RTM>\rtm.exe" -control -startproject "full project path"
Example:"C:\ODS\Dream Report\System\RTM.exe" -control - startproject "C:\ODS\Dream Report\Project\Demo\Demo.drpj"

Backward Compatibility Command Formats

For backward compatibility Runtime Manager also accepts old command formats:
generate.exe <report name> -f <period>;
generate.exe <report name> [-a, -r] <start of period> <end of period>

List of accepted parameters:

<report> - is the name of report to be generated
-f : is a fixed period for report generation.

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<period> : is a period for report generation. It can have the following values: *"last day"*, *"last n days"*, *"last hour"*, *"last n hours"*, *"last week"*, *"last n weeks"*, *"last month" and "last n months"*, *"Current day"*, *"Current hour"*, *"Current week"*, *"Current month"*, *"current quarter"* where **n** is a number from 1 to 500.
-a : is absolute date and time mode
<start of period> : defines the start date and time. Its format is : *dd.mm.yy-hh:mm:ss, or dd/mm/yy-hh:mm:ss.*
<end of period> : defines the end date and time. Its format is : *dd.mm.yy-hh:mm:ss, or dd/mm/yy-hh:mm:ss.*
-r is relative date and time mode
<start of period> : defines the start date and time. Its format is : *dd-hh:mm:ss.*
Where *dd-hh:mm:ss* is a number of days-hours:minutes:seconds back from the current time.
<end of period> : defines the end date and time. Its format is : *dd-hh:mm:ss.*
Where *dd-hh:mm:ss* is a number of days-hours:minutes:seconds back from the current time.

Batch-based command-line parameters:

generate.exe <report name> -br <"Batch Name"> <mode> <count> - batch-based report generation.
<"Batch Name"> - specifies name of batch definition, which will be used to get batch IDs for report generation
<mode> - specifies batch mode. It can have 2 possible values: Last or Current
<count> - specifies how many batch IDs to include into the range. It may have only positive whole values, e.g. 1, 2, 3...
Example: generate.exe "Energy Report" -br "Prod_Batch" Last 1 - will generate report for 1 last batch, using "Prod_Batch" batch definition.

generate.exe <report name> -ba <"Batch Name"> <"StartBatchID"> <"EndBatchID"> - absolute batch-based report generation.
<"Batch Name"> - specifies name of batch definition, which will be used to get batch IDs for report generation
<"StartBatchID"> - specifies start batch ID
<"EndBatchID"> - specifies end batch ID

This option will generate report for the range of batches between <"StartBatchID"> and <"EndBatchID">. DRG will identify the start time of the <"StartBatchID"> and the end time of the <"EndBatchID"> and generate report for that time period.

User can also specify the same batch ID both for <"StartBatchID"> and <"EndBatchID">, then the report will be generated for that 1 specified batch ID.

Example: generate.exe "Energy Report" -ba "Prod_Batch" "10-9937" "10-9937" - will generate the report for batch ID "10-9937" using "Prod_Batch" batch definition.

23.3 Dynamic Report Generator

Dynamic Report Generator (DRG) is a module that allows a user to generate reports on demand, where the time period for the report is selected by a user at runtime, or where the list of tags (or other parameters), which will be used for specific report generation, is specified manually at runtime. The DRG is a useful tool when testing report generation with different parameters (e.g., different time periods) than were specified in the report design. All dynamic modifications of the report properties will be done only for that specific report

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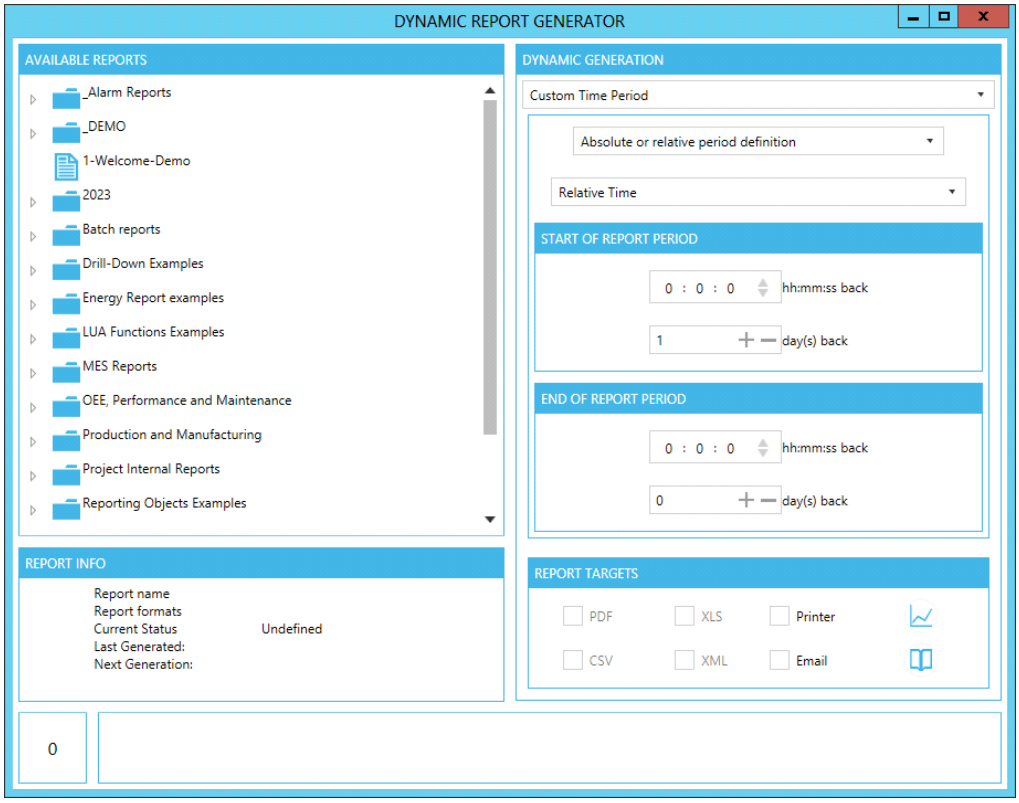
execution, and will not be saved in the report layout. If you have a running project containing a daily report, and you generate this report using the DRG, applying a new period of *Last 1 hour*, it will generate an hourly report file from it. The original report will continue to run and generate as defined in the report's settings.

Dynamic Report Generator is implemented as a standard Windows application (**generate.exe**).

NOTE: When installing Dream Report, the DRG will be also installed as an ActiveX control, which can be integrated into an HMI application on the local Dream Report machine.



The **Dynamic Report Generator** window can be opened either from the Windows Start menu "*Dynamic Report Generator*", or from the Runtime Management Console (RMC). To open Dynamic Report Generator from the RMC, click the "*Dynamic Generation*" button:



The following DYNAMIC REPORT GENERTOR configuration window will open:

DRG has 2 working modes: **Silent** and with the **User interface**.

Silent Mode

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If a user runs a report generation command (with or without additional command line parameters), the DRG will not open any user interface, and will execute the command in a "silent" mode - i.e., pass command to the runtime manager to generate the selected report for the specified period. This is useful when you want to generate a report from a command line from some external application – e.g., a batch file, HMI, custom application, etc.

The Command line has the following available options (arguments) for generation requests:

-generate This argument indicates that the report will be generated. The following additional parameters are available:
-name Report name
-instance Report instance name
-fixPeriod Indicates that a Fixed time period is used
-absPeriod Indicates that an Absolute time period is used
-relPeriod Indicates that a Relative time period is used
-batchRelPeriod Indicates that a Batch-based Relative time period is used
-batchAbsPeriod Indicates that the Batch-based Absolute time period is used
-timeStart Time that defines start of period
-timeEnd Time that defines end of period
-batchDef Name of the Batch Definition to be used
-batchRel Mode for the relative batch ID (it can be "last" or "current")
-batchCount Number of batches to count
-batchIdStart ID of the batch for the report start
-batchIdEnd ID of the batch for the report end
-currentTime Sets the current time for the report.
-target Target for the report can be "pdf", "email", "printer", "excel" (see examples below)
-fileParam File to be used as a file with the parameters for the report preprocessor

Note: If **-fixPeriod** is used, then **-timeStart** has to provide one of the following arguments: **"last day"**, **"last n days"**, **"last hour"**, **"last n hours"**, **"last week"**, **"last n weeks"**, **"last month"** and **"last n months"**, **"Current day"**, **"Current hour"**, **"Current week"**, **"Current month"**, **"Current quarter"**, where **n** is a number from 1 to 500.

Examples:

- **rtm.exe -generate -name Report_1 -instance Instance_1 -fixPeriod "last 10 hours"**
- **rtm.exe -generate -name Report_1 -instance Instance_1 -absPeriod -timeStart "31/12/2021 00:00:00" -timeEnd "01/01/2022 00:00:00"**
- **rtm.exe -generate -name Report_1 -instance Instance_1 -relPeriod -timeStart 10-2:30:30 -timeEnd 5-2:30:30**
- **rtm.exe -generate -name Report_1 -instance Instance_1 -batchRelPeriod -batchDef MyBatch -batchRel last -batchCount 2**
- **rtm.exe -generate -name Rep1 -instance Inst1 -batchAbsPeriod -batchDef MyBatch -batchIdStart 120 -batchIdEnd 130**
- **rtm.exe -generate -name Rep1 -instance Inst1 -currentTime "2021-12-02 18:00:20"**
- **rtm.exe -generate -name Rep1 -instance Inst1 -target pdf excel email printer**
- **rtm.exe -generate -name Rep1 -instance Inst1 -fileParam "C:\Data\params.xml"**

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Examples of targets for the report:
-target pdf
-target pdf excel
-target pdf excel email
-target pdf excel email printer

NOTES:

- Report target "**printer**" will send output files for printing according to the printer settings of the report file format specified in the Designer Studio. This means that no matter which target(s) have been defined in the command line, the printer will receive only those files which have been defined in the Report Settings.
- If the generated report needs emailed, always add the generated report output format (PDF, Excel, CSV and/or XML) to the "**-target email**" command line.
  Examples:
  "**-target pdf email**" - report will be sent to the defined email address(es) with the report generated in PDF format;
  "**- target excel email**" - report will be sent to the defined email address(es) with the report generated in Excel format;
  "**- target pdf excel email**" - report will be sent to the defined email address(es) with the report generated in PDF and Excel format.

Starting the Project Command Line

If you wish to start (run) the project from the command line, run the following command:
"<path to RTM>\rtm.exe" -control -startproject "full project path"
Example:
"C:\ODS\Dream Report\System\RTM.exe" -control - startproject "C:\ODS\Dream Report\Project\Demo\Demo.drpj"

Backward Compatibility Command Formats

For backward compatibility, the DRG also accepts legacy command formats:
generate.exe <report name> -f <period>;
generate.exe <report name> [-a, -r] <start of period> <end of period>

List of accepted parameters:

<report>	The name of report to be generated
-f	A fixed period for report generation.
<period>	A period for report generation. It can have the following values: **"last day"**, **"last n days"**, **"last hour"**, **"last n hours"**, **"last week"**, **"last n weeks"**, **"last month"** and **"last n months"**, **"Current day"**, **"Current hour"**, **"Current week"**, **"Current month"**, **"Current quarter"** where **n** is a number from **1** to **500**.
-a	Absolute date and time mode
<start of period>	Specifies the start date and time. Its format is: "**dd.mm.yy-hh:mm:ss**", or "**dd/mm/yy-hh:mm:ss**".
<end of period>	Specifies the end date and time. Its format is: "**dd.mm.yy-hh:mm:ss**", or "**dd/mm/yy-hh:mm:ss**".

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-r Relative date and time mode
<start of period> Specifies the start date and time. Its format is: "**dd-hh:mm:ss**",where **dd-hh:mm:ss** is a number of days-hours:minutes:seconds back from the current time.
<end of period> Specifies the end date and time. Its format is : "**dd-hh:mm:ss**", where **dd-hh:mm:ss** is a number of days-hours:minutes:seconds back from the current time.

Batch-based command-line parameters:

generate.exe <report name> -br <"Batch Name"> <mode> <count> - batch-based report generation.
<"Batch Name"> Specifies batch definition name, which will be used to get batch IDs for report generation
<mode> Specifies batch mode. It can have 2 possible values: **Last** or **Current**
<count> Specifies how many batch IDs to include into the range. It may have only positive integers, e.g. 1, 2, 3...

Example:
generate.exe "Energy Report" -br "Prod_Batch" Last 1 - will generate report for the last 1 batch, using "*Prod_Batch*" batch definition.

generate.exe <report name> -ba <"Batch Name"> <"StartBatchID"> <"EndBatchID"> - absolute batch-based report generation, where
<"Batch Name"> Specifies batch definition name, which will be used to get batch IDs for report generation
<"StartBatchID"> Specifies start batch ID
<"EndBatchID"> Specifies end batch ID

This option will generate a report for the range of batches between <"StartBatchID"> and <"EndBatchID">. DRG will identify the start time of the <"StartBatchID"> and the end time of the <"EndBatchID"> and generate the report for that time period.

You can also specify the same batch ID both for <"StartBatchID"> and <"EndBatchID"> - in this case, the report will be generated for that 1 specified batch ID.

Example:
generate.exe "Energy Report" -ba "Prod_Batch" "10-9937" "10-9937" - will generate the report for batch ID "10-9937" using "*Prod_Batch*" batch definition.

User Interface Mode

In the *Dynamic Report Generator* user interface window, as shown at the start of this section, the user can specify the time period, and type of report generation.

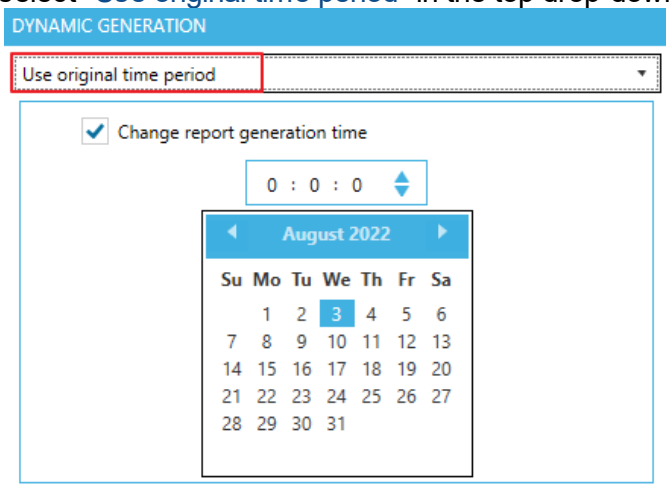
First, select the report from the **AVAILABLE REPORTS** list that you want to generate.

If you wish to dynamically modify the time (or batch) period for the report for the entire report generation (i.e., for all objects on the report), specify a new report period in the **DYNAMIC**

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GENERATION section. For a complete description of the time period definitions, refer to the *Time Period Definition* section of this manual.

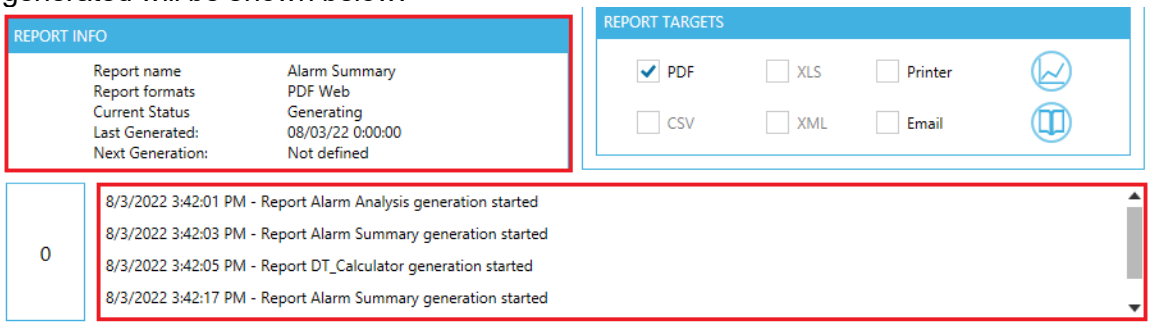
If you wish to generate report with its original settings (as defined in the Designer Studio), select "Use original time period" in the top drop-down list:



If you wish to "replay previous reports", i.e., to generate a report with the original period definition but using an earlier generation time (generate the report as if it was another date or another time), select "Use original time period" (as described above) and enable the option "Change report generation time". Then set the date and time for which you would like to generate the report.

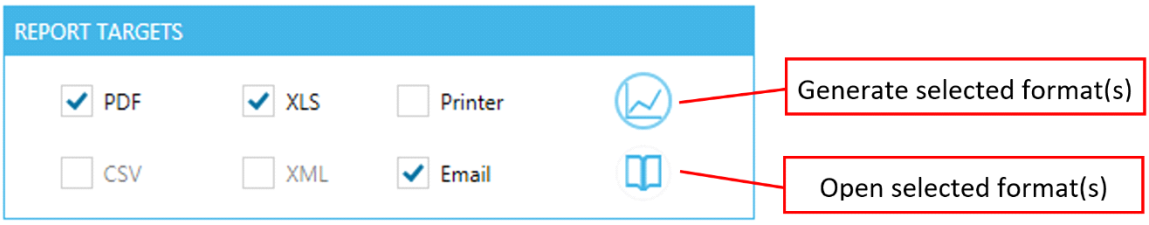
Example: If you have a weekly report, and you are generating the report on 27 January, and originally your report would display data from January 20-27, then, if you set Change report generation option to 17 January, it will report on data from January 10-17.

The **REPORT INFO** section will display the status of the current report defined for generation, and the history status of the queue of reports that are being (or have been) generated will be shown below:



In the **REPORT TARGETS** section, you can select the format for the report generation: PDF, XLS (Excel), CSV, and XML, as well as sending to the Printer and/or Email (if specified in the report's settings):

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After selecting the report, the desired time option, time period and format for report generation, click the "Generate" button, and the report will be generated forcing all objects from the selected report, using the time period specified by the user in the DRG.

NOTES:

- You can select one or more of these options (if they were specified in the report's settings): PDF, XLS, CSV and XML, and when clicking the Generate button, the report will be generated in the format(s) you have chosen;
- If you want to use the Email and/or Print report target for dynamic report generation, they must be enabled and configured in the *Report File Format* section of Report Settings in the Designer Studio.

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Remote/Concurrent Project Development

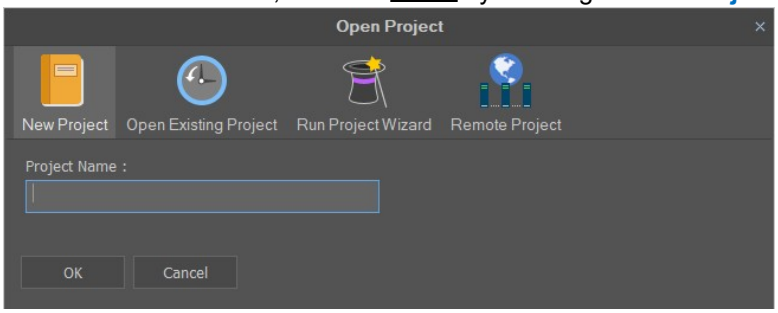
24 Remote/Concurrent Project Development

Dream Report 4.8 introduced the concept of a **Repository-based project configuration**. Prior to version 4.8, all Dream Report project development was performed "locally" on the Dream Report PC/server, with all project configuration files being contained under the main project directory. Starting in Dream Report 4.8, project development can be performed in two ways:

1. "**Traditional**" (local) project development, but now with the project's configuration completely contained in a single *SQLite* configuration database (which requires no installation or configuration on the user's part). The project configuration file will be named with the project name, and a ***.DRPJ*** file extension.

2. **Repository-based** project development, where a common project "repository" (also a *SQLite* configuration database file) is maintained on a Dream Report "server", allowing for local or remote Dream Report developers to work with local copies of the project (based off the main project repository), lock objects for remote development (and hence prevent conflicts with other remote users), and maintain a complete configuration audit trail as reports and other project configuration tools are checked in/out of the main project repository. The project repository file will be named with the project name, and a ***.DRREPO*** file extension.

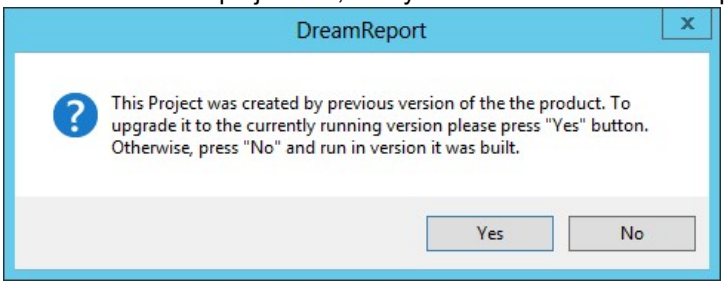
In both scenarios above, the user starts by creating a **New Project** in Dream Report Studio:



Once Dream Report Studio opens and the new project is created, the user can start creating the project and reports. No additional/special configuration is needed at this point for "traditional" project development.

24.1 Upgrading a Dream Report Project to a Configuration Database

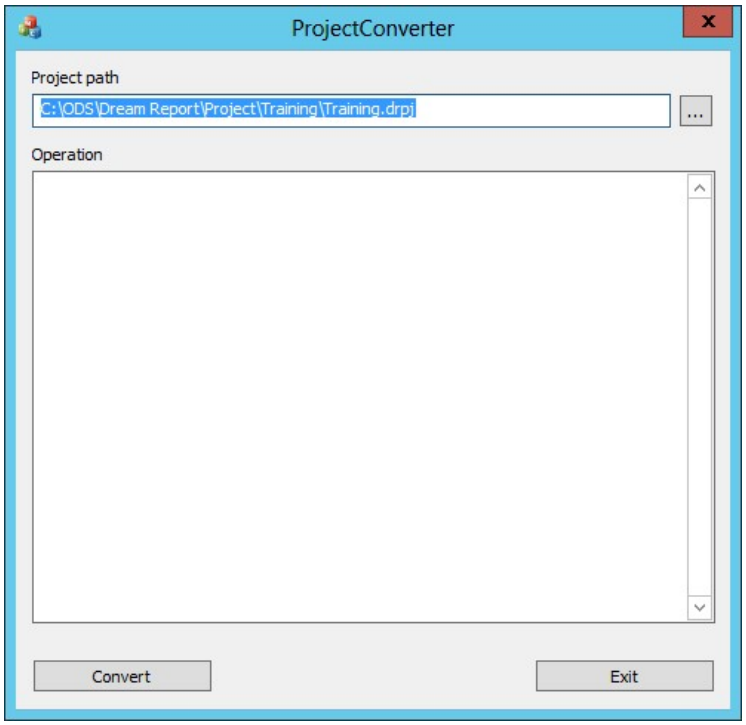
If you wish to upgrade a project created in an earlier version of Dream Report (prior to ver. 4.8), you can upgrade the project to the latest version to a repository-based project. From the **Open Project** window shown above), select *Open Existing Project*, and browse to the directory containing the old project. Click "OK" to select the project file, and you will be notified that the project will be upgraded.



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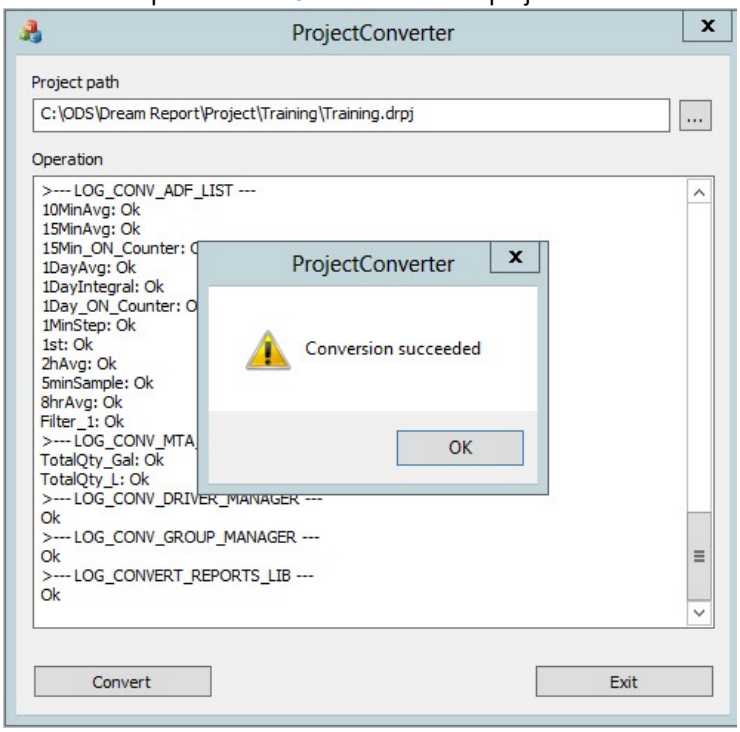
If you have not yet **made a backup copy of your project** folder, this is the time to do it!

Click "Yes" to start the upgrade process - when the **Project Converter** window opens, click the "Convert" button:



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All reports and modules will be converted and added to a new project configuration file - the conversion statuses will be displayed, and then upon successful completion of the project conversion, the following window will open - click "OK" to close the project converter:



The upgraded project is now completely contained in a single configuration database file, named with the project name, and a *.DRPJ* file extension.

24.2 Repository-Based Project Development

As discussed above, the two main reasons to use a Dream Report project repository are:

- **Version Control** - even if remote/concurrent report development is not being used, a repository-based project allows for project version control
- **Remote or Concurrent** (multi-developer) project development

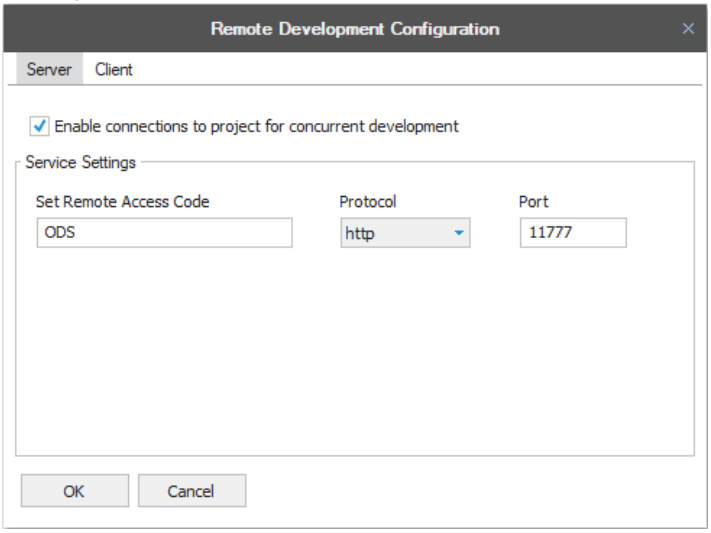
After creating a new project (as described above), **to enable and implement a repository-based Dream Report project**:

1. On the left-side Quick Launch toolbar, click the "**Remote Development Configuration**" icon. The following "*Remote Development Configuration*" window will open:



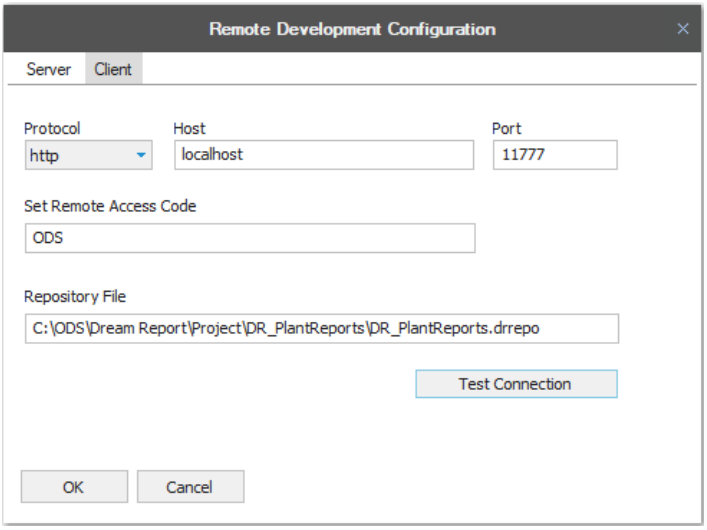
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2. On the "**Server**" tab, check the option to "*Enable Connections to this project for concurrent development*."



3. For the *Service Settings* (i.e., the settings that remote development nodes will need to use to connect to this repository node), enter a *Remote Access Code*, the communication *Protocol* to use (http or https), and the *Port* number, through which to communicate with the Dream Report repository. The *Remote Access Code* should be a unique code (known to all remote Dream Report developers) that they will enter when connecting to the remote repository.

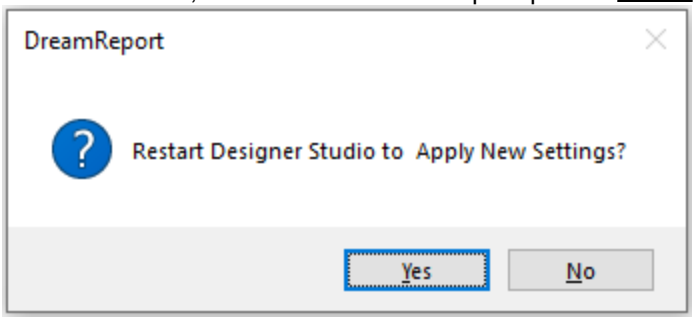
4. If this node is a Dream Report development client, the settings on the "**Client**" tab allow the user to modify how the local working copy of the project will connect to the repository node:



5. Changes here are only needed if *Remote Development Configuration* settings are changed on the repository node/server.

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After the "*Enable Connections to this project for concurrent development*" option has been checked on the "**Server**" tab, click "OK". You will be prompted to restart Studio with the new settings:



After clicking "**Yes**", Studio will automatically close, and then reopen. If **User Management** was enabled (see the following section), the user will be prompted to log in before Studio opens.

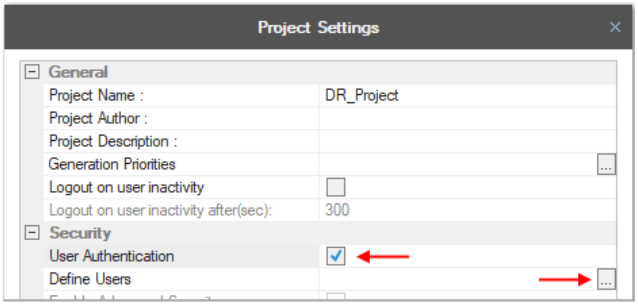
24.3 User Management with Repository-Based Project Development

It is *highly recommended* to use **User Management** (project security) with a repository-based Dream Report project. Even if remote/concurrent project development is not being performed, User Management in a repository-based project will facilitate **Version Control** in that all changes will be tracked and attributed to the user logged into Dream Report Studio.

For remote/concurrent project development, User Management ensures that reports and project modules can be locked/unlocked by specific users.

If using remote development in a **Terminal Services** environment, **User Management** *must* be used, and each report developer must log into Studio with a different user account.

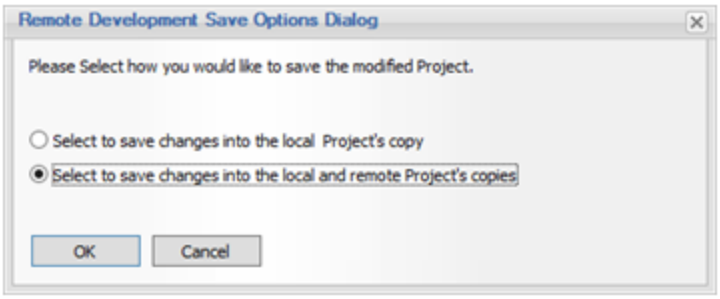
To enable User Management, check the *User Authentication* option under *the Project > General* section:



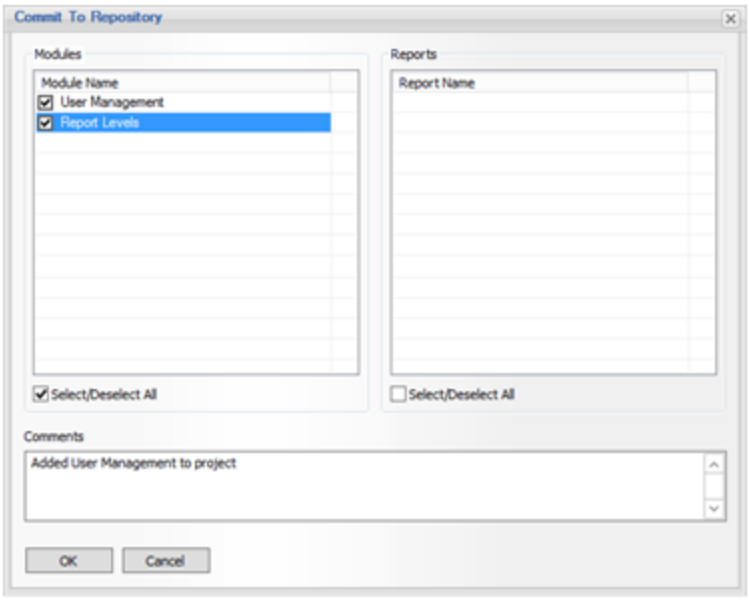
Next, click the *Define Users* **[...]** button to add users, and then give all users with project development authorization "*Access to Designer Studio*", "*Access to Data Configuration*", or simply give them "*Full Administrator Rights*". Refer to the **User Management** section of the Help documentation for more details on setting up users and granting authorization.

Make sure to **Save** the project by clicking the Dream Report icon in the top left of Studio and clicking "*Save Project*", or the Save Project (💾) icon. You will be prompted to either save only the Local working copy of the project, or both the Local copy and the Remote (repository) file as well:

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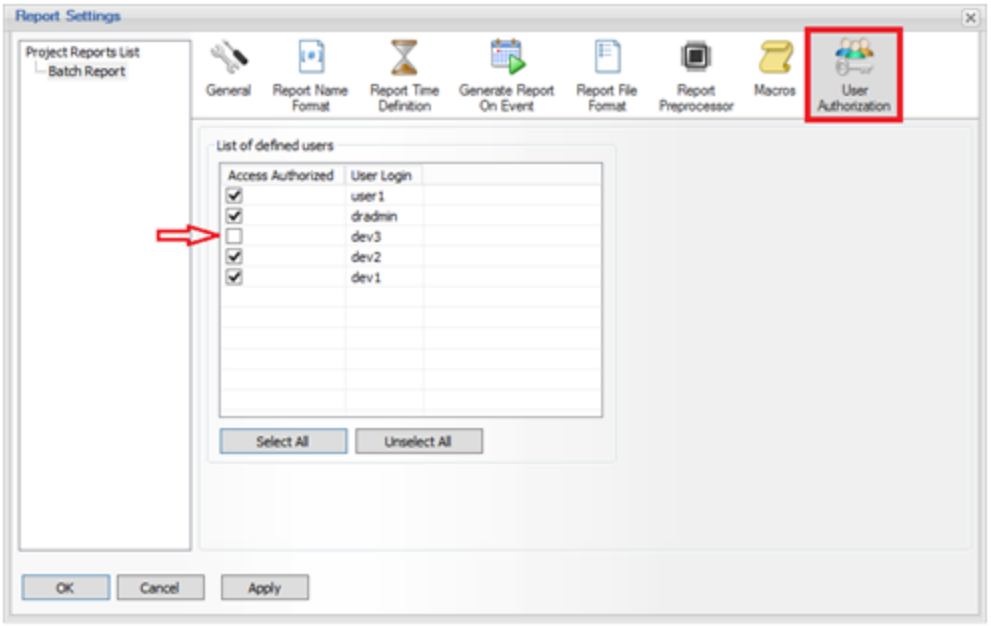
Note: Make sure to select the second option, to ensure that all remote users will have access to the latest changes in the project. The **Commit to Repository** window will open - select all reports/modules to commit, add a user comment describing the "commit", and then click "OK":



Important Note:

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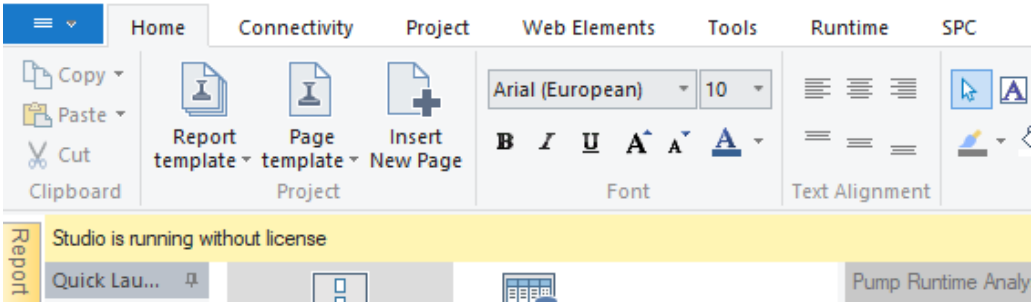
If User Management is enabled on the project, do not forget to give all/specific users access to each report as reports are created in the project. If this step is missed, reports will not appear in the Runtime Management Console (RMC) or in the Web Portal for users to open or generate:



24.4 Remote/Concurrent Project Development - Connecting to a Project Repository

NOTE: Licensing

If you are opening Dream Report Studio on a remote development station, you likely will not have (or need) a Dream Report license on that machine. All Dream Report licenses (tag-based runtime license, and optional remote development licenses) are installed on the Dream Report "server". If running Studio on a machine without a valid Dream Report license, you will see a yellow band indicating this - you can still open Studio, connect to a repository node, and perform remote development (assuming a remote development license is available.)

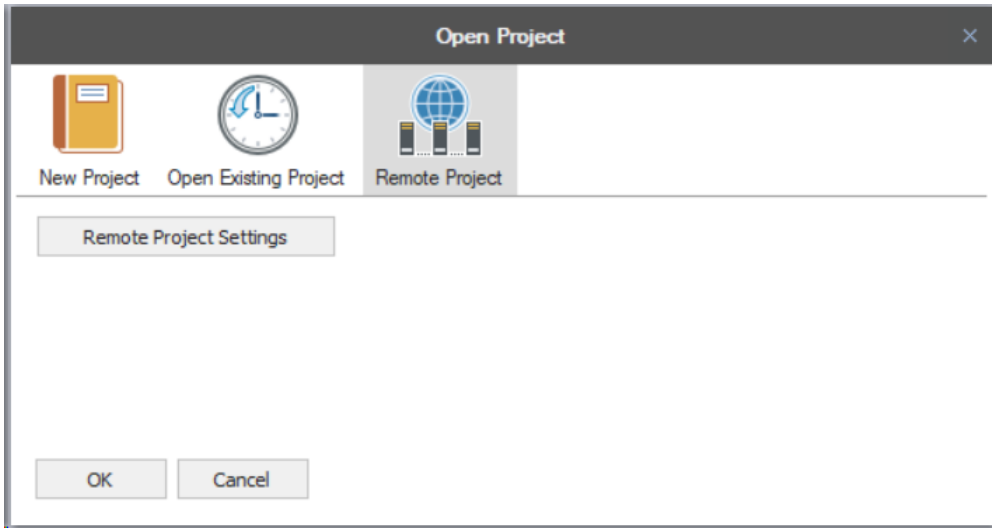


The only limitation is that you will not be able to run and test the project locally, as no runtime license is present.

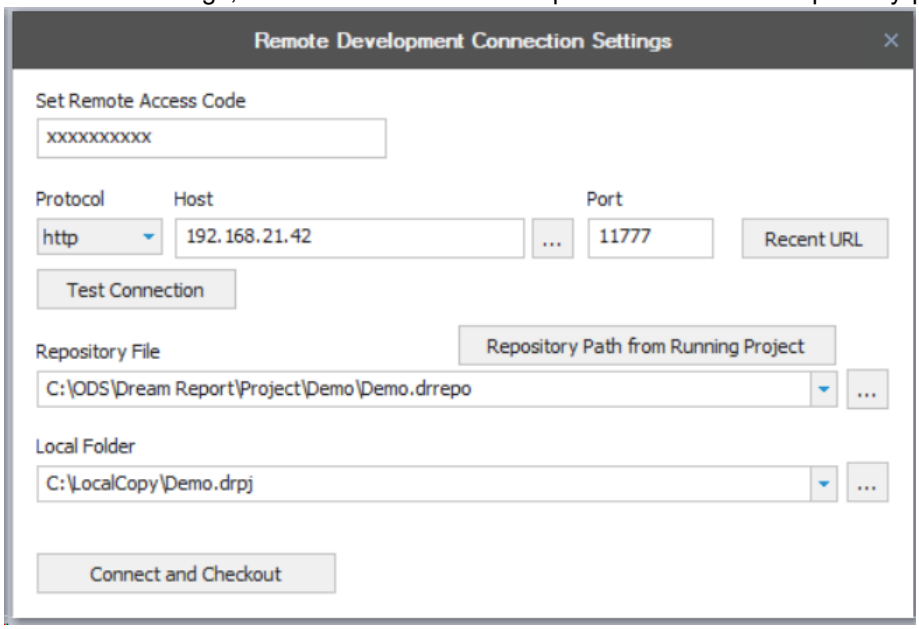
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To use Dream Report Studio on a computer "remote" from the Dream Report repository/runtime machine, start **Studio** by clicking either the *Dream Report Studio* on the desktop, or from *Programs > ODS > Dream Report > Dream Report Studio*. After Studio opens, if this is the first time connecting to a remote repository-based project, follow these steps:

1. On the **Open Project** window, click the **Remote Project** icon, and then click the *"Remote Project Settings"*:



2. When the **Remote Development Connection Settings** window opens, enter the following connection settings, which were defined and required on the remote repository project:



- *Set Remote Access Code* - enter the specific code that Dream Report clients will need when connecting to the Dream Report repository node
- *Protocol* - select either **http** or **https**
- *Host* - enter (or browse for) the computer name or IP address of the repository node

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- *Port* - port through which Dream Report will communicate with the repository node

Note: if this is a Dream Report engineering workstation, that's used for development of multiple remote repositories, click the "Recent URL" button - this will display a list of previous configured repository connections.

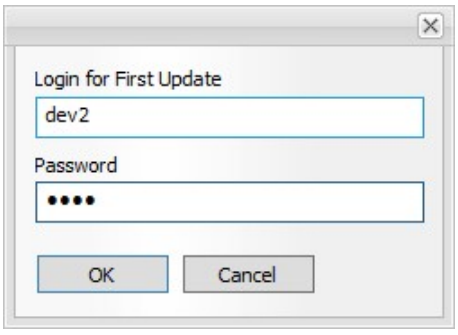
3. Click the "*Test Connection*" button. If successful, the message "*Test Connection succeeded*" will be displayed. If not successful, the warning message "*Test connection failed. Please verify that all parameters set properly.*" If that is the case, the first thing to check is that you can ping the repository node, and that the Firewall (if being used) has the specified port open.

4. Next, select the Dream Report **Repository File** on the remote Dream Report repository node, by performing one of the following:

   - As a quick start, you can click the "*Repository Path from Running Project*" button - this will check if a project is actively running on the repository node, and if so, will automatically point to that repository file
   - Click the drop-down list to select a previously used remote repository file
   - Click the **[...]** button to browse for the repository file on the remote repository node (this will *not* browse the local computer). The repository file will typically be located in *\ODS\Dream Report\Project\<My_DR_Project>*.drrepo*

5. The **Local Folder** will be the directory on the local (development) node where the working copy of the project will reside. By default, Dream Report will create a "\Remote\" folder under the local "\Project" directory, under which all local working copies of projects will be located - e.g., *\ODS\Dream Report\Project**Remote***\<My_DR_Project>*

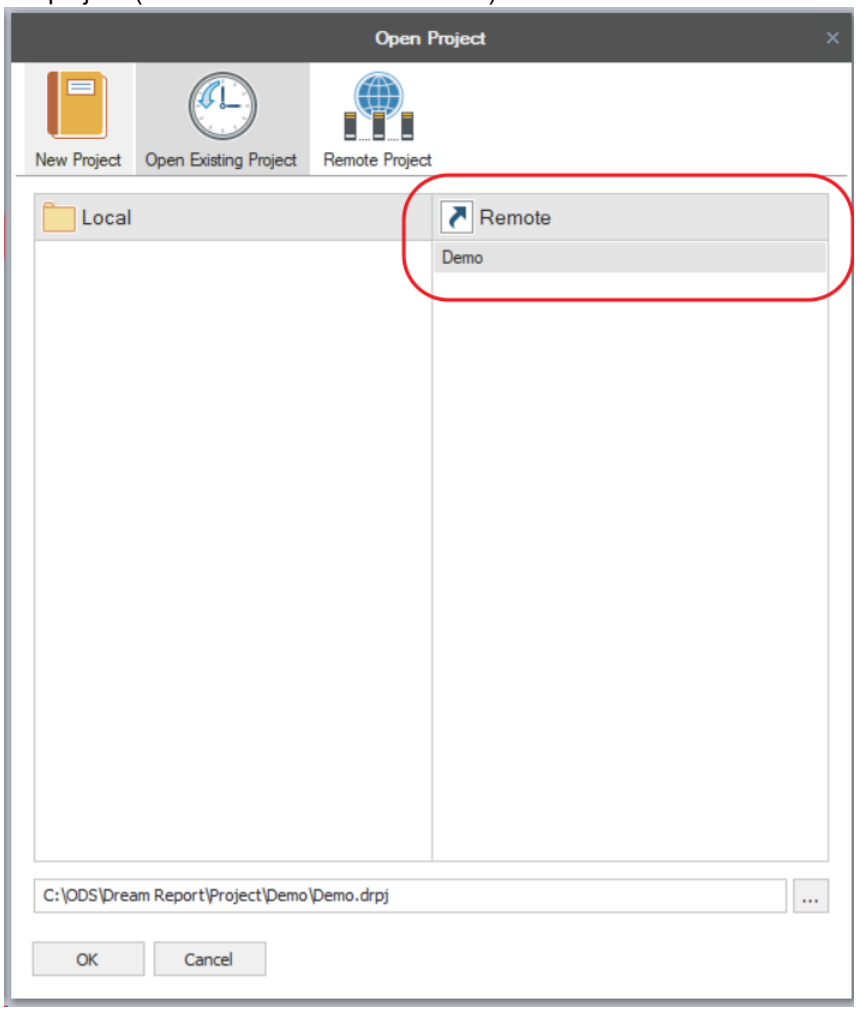
6. Click the "*Connect and Checkout*" button, to create a local copy of the project. If a local copy of that project was previously created, the message "*The project file already exists. Please set another location*". If successful (and if User Management/Security was not enabled on the repository node) then Studio will restart automatically with the local working copy of the project. If User Management was enabled, you will be prompted twice to log in - once to first accept the changes to connect to the remote repository, and then again when Dream Report Studio automatically restarts with the local working copy of the project



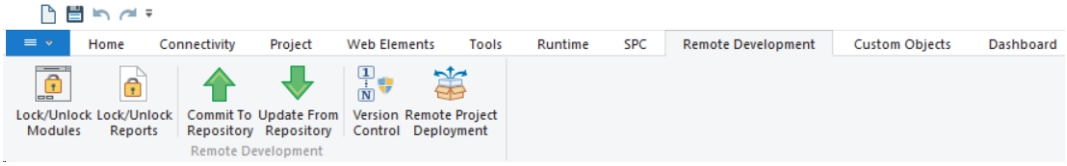
7. Now that a local working copy of the project has been created, each time you open Dream Report Studio, you do not need to go through the above procedure to configure the connection to the remote project. Rather, on the **Open Project** window, simply click on the "*Open Existing Project*" icon, and select the "*Remote*" project option, and then select the local working copy of

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the project (most recent will be the default):



8. You will notice in Studio that a new "Remote Development" tab will appear in the menu bar:



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24.5 Remote/Concurrent Project Development - Locking/Unlocking and Committing/Updating

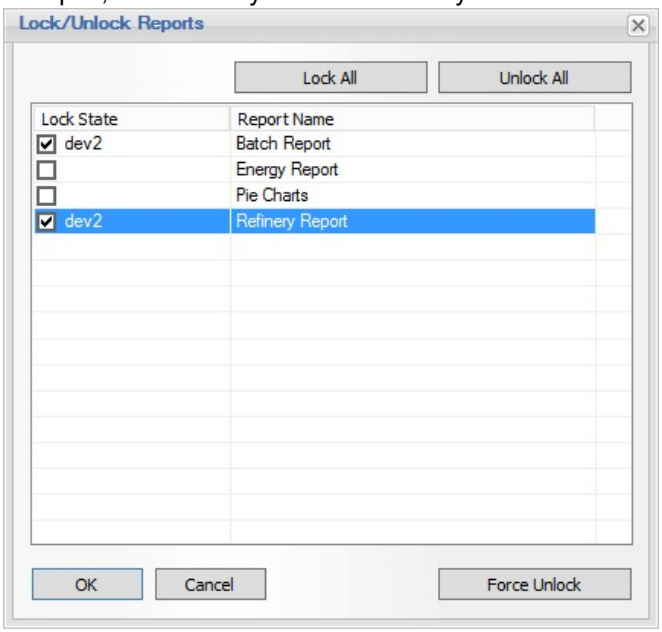
There are two important concepts to understand and follow with remote or concurrent development:

- **Locking** and **Unlocking** Reports and Project Modules
- **Committing To** and **Updating From** the project Repository

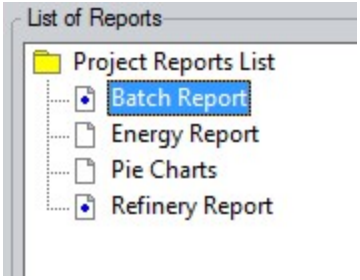
Locking and Unlocking Reports and Project Modules

Before editing any report, or editing any configuration module in Studio, it is important to lock that report/module, thereby preventing any other user(s) editing the same report/module, and hence preventing potential configuration conflicts or overwrites.

To lock a report, either **right-click** on the report and select "*Lock Report*". Or, from the **Remote Development** menu, click the "*Lock/Unlock Reports*" icon - the following **Lock/Unlock Reports** window will open, from which you can selectively lock individual reports or all reports:



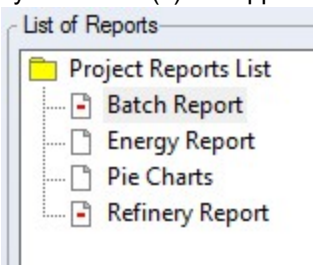
Note that if project User Management is being used, the user who locked the report(s) will appear under the Lock State column. Click "*OK*" to close the **Lock/Unlock Reports** window. Notice in the List of Reports, those reports locked by the current user will appear with a blue dot in the report icon:



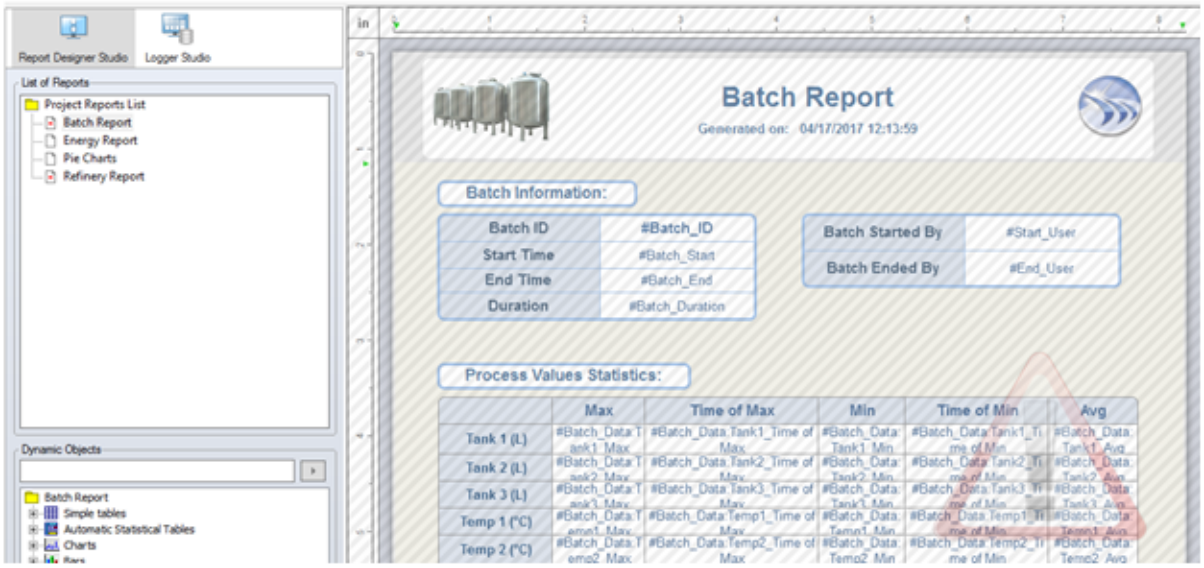
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Edit the report as needed. If you wish to reload reports for testing purposes, you do not yet need to unlock the report. You may wish to leave it locked until all changes are finalized.

If a user opens the project Studio from another remote development station, any reports currently locked by other user(s) will appear with a red dot in the report icon:



Additionally, if any externally locked report is selected, the report will appear with a "Warning!" watermark, and will be shown with diagonal cross-hatched lines. The content of the report will not be able to be edited:

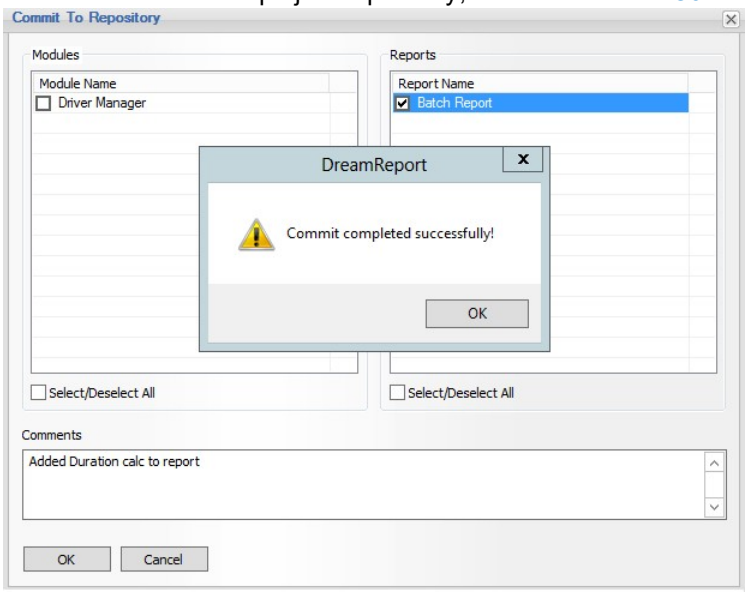


On the development Studio where the report is locked, once all configuration changes are completed on the locked report(s), the following steps must be performed to update the central repository and unlock the report(s):

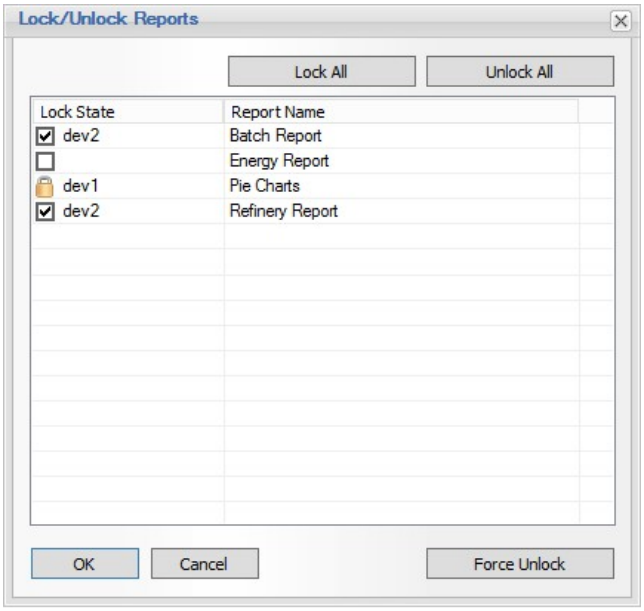
1. Save the report(s) - click the Save Project (💾) icon. You will be prompted to save to only the local (working) copy of the project, or both the local copy *and* commit to the repository. Select the second option to Save *and* Commit.

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2. If the reports were only saved locally (and not committed), right-click on a report name and select "*Commit to Repository*". Or, from the **Remote Development** menu icon, click "*Commit to Repository*". The following **Commit to Repository** window will open - select the report(s) you wish to commit to the project repository, and enter a user *Comment* before clicking "*OK*":



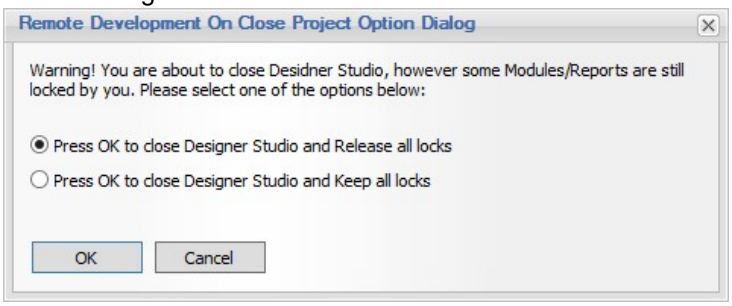
3. Finally, if you are ready to unlock the report(s) so that other developers can work on them, either right- click on the report and select "Unlock Report". Or, from the **Remote Development** menu, click the "*Lock/Unlock Reports*" icon - the following **Lock/Unlock Reports** window will open, from which you can selectively unlock (uncheck) individual reports or all reports:



Note: the user only can unlock reports that they specifically have locked. The "lock" icon next to other report names indicates that the report(s) has been locked by another user.

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If you attempt to close Studio with one or more reports or project modules left locked, the following pop-up will be displayed, where you can either leave the report(s)/module(s) locked, or unlock them before exiting:

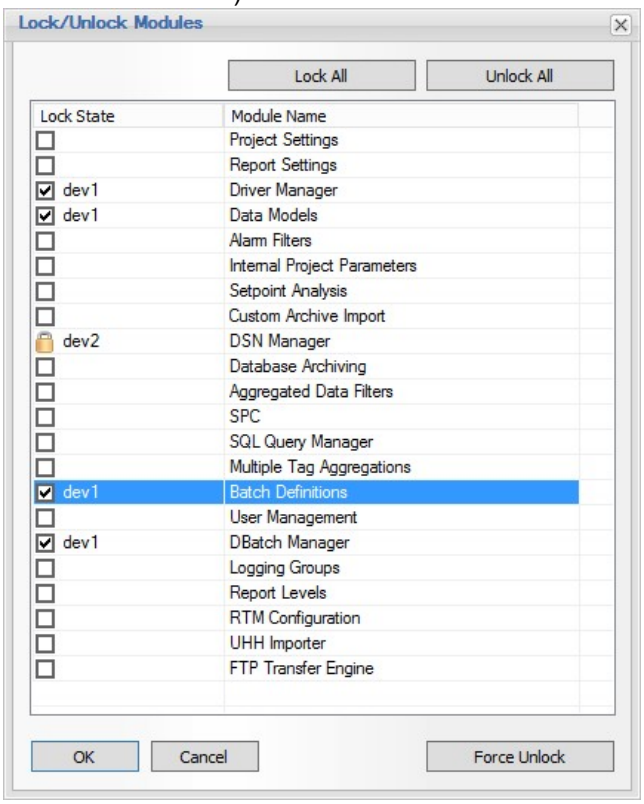


Modules in Dream Report Studio (objects other than reports) can, and *should*, be locked during configuration. These modules include

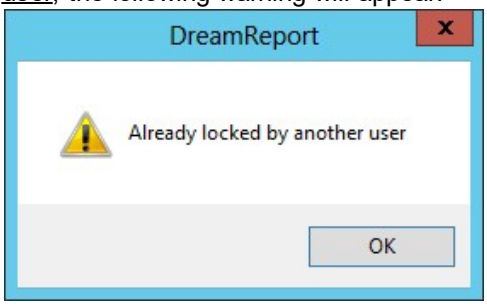
- Communication Driver Manager
- Batch Definitions
- DSN Manager
- Data Models
- Aggregated Data Filters (ADF)
- …

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Modules are locked in much the same way that reports are locked - from the **Remote Development** menu, click the "*Lock/Unlock Module*" icon - the following **Lock/Unlock Modules** window will open, from which you can selectively lock individual modules (locking certain modules will automatically lock associated modules):



If a user on one development node attempts to open/edit a module that is already locked by another user, the following warning will appear:



IMPORTANT RULES FOR REMOTE/CONCURRENT DEVELOPMENT:

Whenever opening Dream Report Studio, make sure to first Update from Repository

With Concurrent Development, you must implement User Management (project security) to avoid any potential development conflicts

Avoid using the same user (login credentials) on different development nodes

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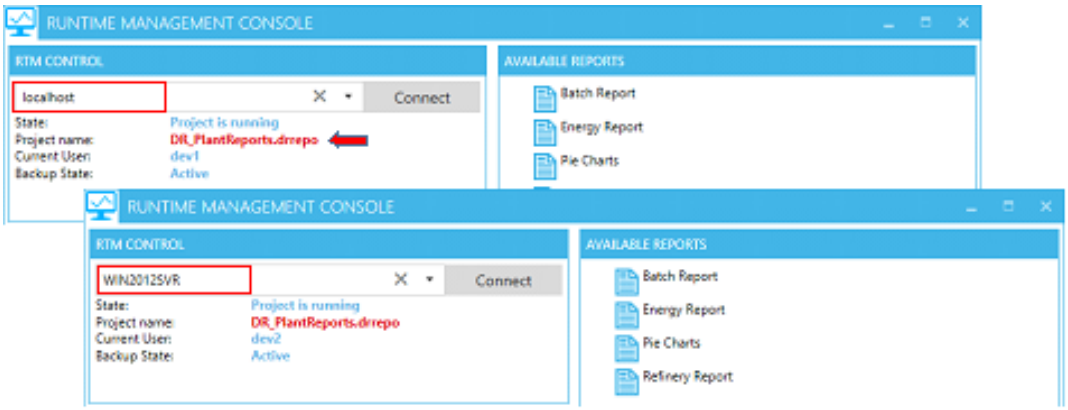
24.6 Running a Repository-Based Dream Report Project

To run or reload a repository-based project, simply use the "*Run Project*", "*Reload Project*" or "*Reload Reports*" icons from the Quick Launch toolbar, just as you would with a "traditional" (single-node) Dream Report installation.

Regardless if the "run" action is taken from Dream Report Studio running on the repository node, or from a remote development station, the repository will be started on the repository node. When the Runtime Management Console starts (you will need to log in if User Management is enabled) notice that:



- The repository file is loaded into runtime (.*drrepo* project file)
- The node name/IP address (or "localhost") will be displayed, indicating where the project is running:

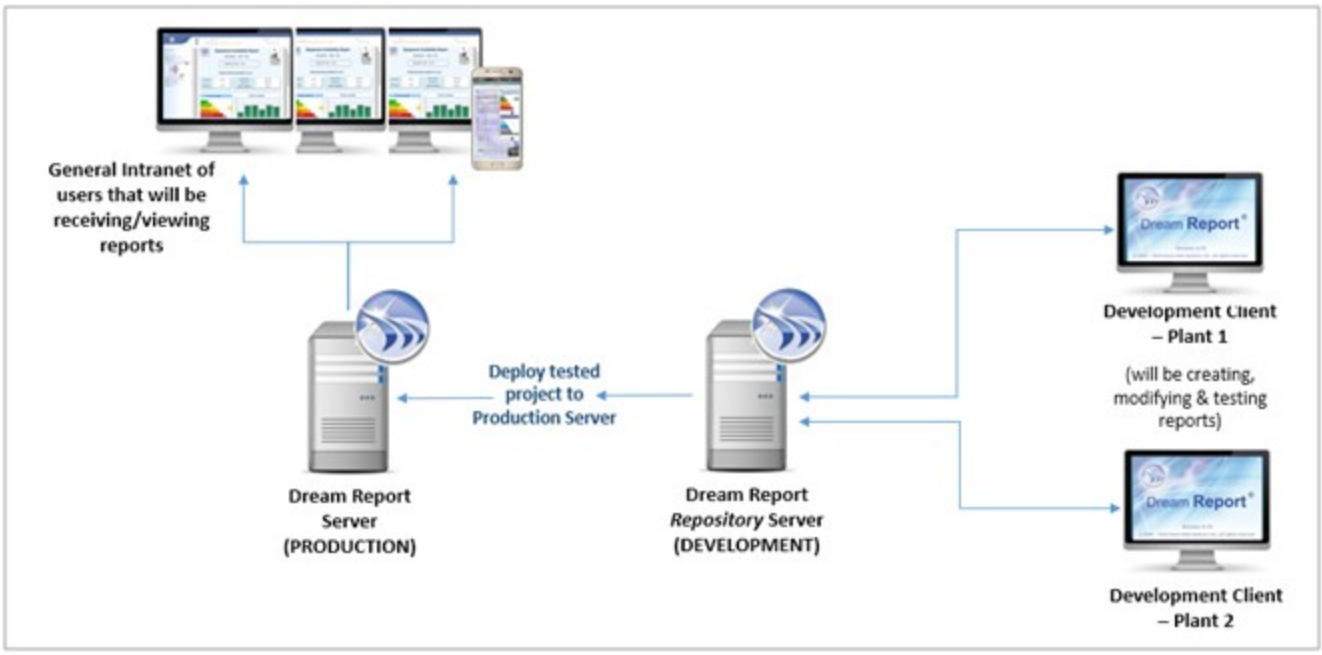


Using the Runtime Management Console, the user can generate and test reports.

24.7 Remote Project Deployment

In certain scenarios, you might wish to deploy and run the Dream Report project on a dedicated "production" server. The sole purpose of this server could be to run the Dream Report project, and not for report/project development. The system architecture might look as follows:

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In the above scenario, Dream Report developers at *Plant 1* and *Plant 2* work locally to develop reports, based on a Dream Report project maintained on a repository server ("*DEVELOPMENT*"). When all reports have been tested on the repository server, the project can be deployed to a runtime ("*PRODUCTION*") server using the **Remote Project Deployment** feature, found on the Remote Development toolbar.

There are two parts to configuring remote deployment:



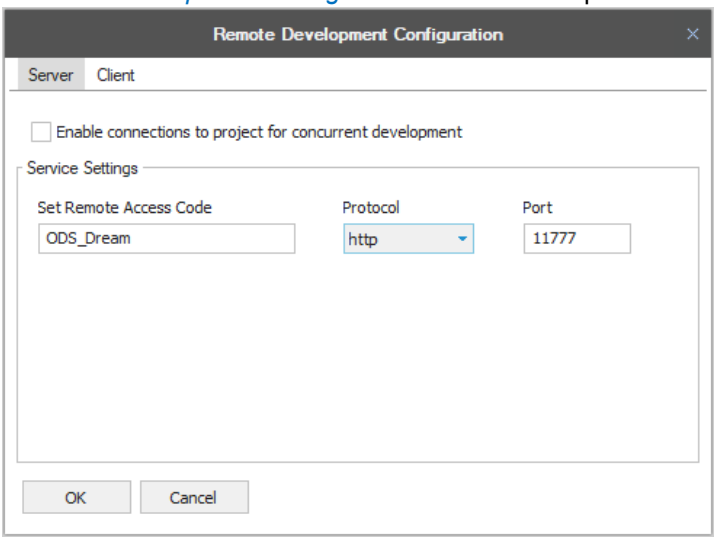
- On the runtime/production station; and
- On the development/repository station

1. **On the Dream Report runtime/production node**, the following tasks must be performed to allow for a runtime project to be deployed to the node, and to allow for running of, and auto-update of, the running project.

   a. Immediately after installing Dream Report on the production node (and prior to any project being deployed to the node), start Dream Report Studio, and create a new (local) project. The Project Name is unimportant - we just need to get into Studio

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b. When Studio opens, click the "**Remote Development Configuration**" icon. The following "*Remote Development Configuration*" window will open:

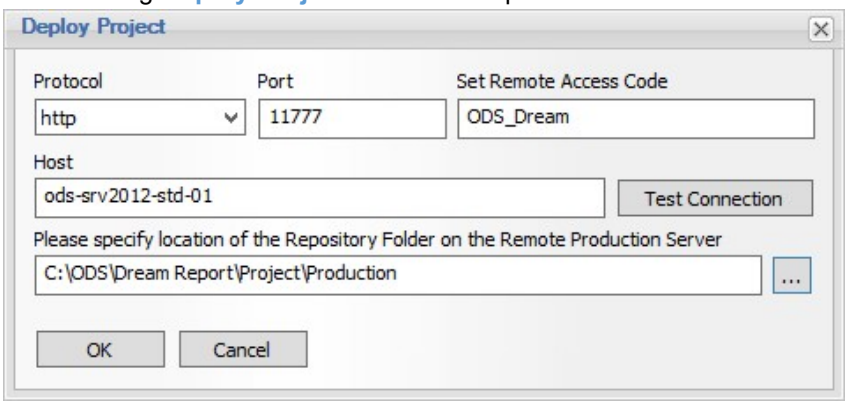


c. On the "**Server**" tab, do not check the option to "*Enable Connections to this project for concurrent development*."

d. For the *Service Settings* (i.e., the settings that development/deployment node will need to use to connect to this runtime/production node), enter a *Remote Access Code*, the communication *Protocol* to use (**http** or **https**), and the *Port* number, through which to communicate with this Dream Report runtime node. The *Remote Access Code* should be a unique code th/*at is entered by the administrator when configuring **Remote Project Deployment** (as described below in this step 2.)

e. Save and close Studio.

2. **In Dream Report Studio on the *DEVELOPMENT* node**, click the **Remote Project Deployment** icon, and the following **Deploy Project** window will open:



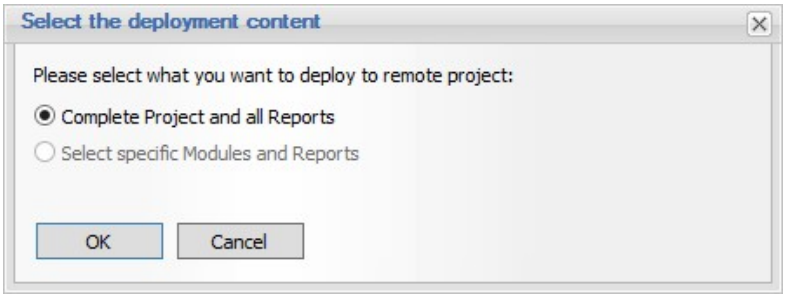
a. These settings determine how the development/repository station will connect to the Dream Report runtime/production node:

- *Protocol* - select either **http** or **https**
- *Port* - port through which Dream Report will communicate with the runtime node

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- *Set Remote Access Code* - enter the specific code that Dream Report repository node will need when connecting to the Dream Report production node
- *Host* - enter the computer name or IP address of the repository node
- *Location of Repository Folder -* after clicking the "*Test Connection*" button, browse for the directory on the Dream Report runtime/production node to which the runtime repository file will be copied

b. After successfully configuring the **Deploy Project** window, click "OK", and the following pop-up window will appear:

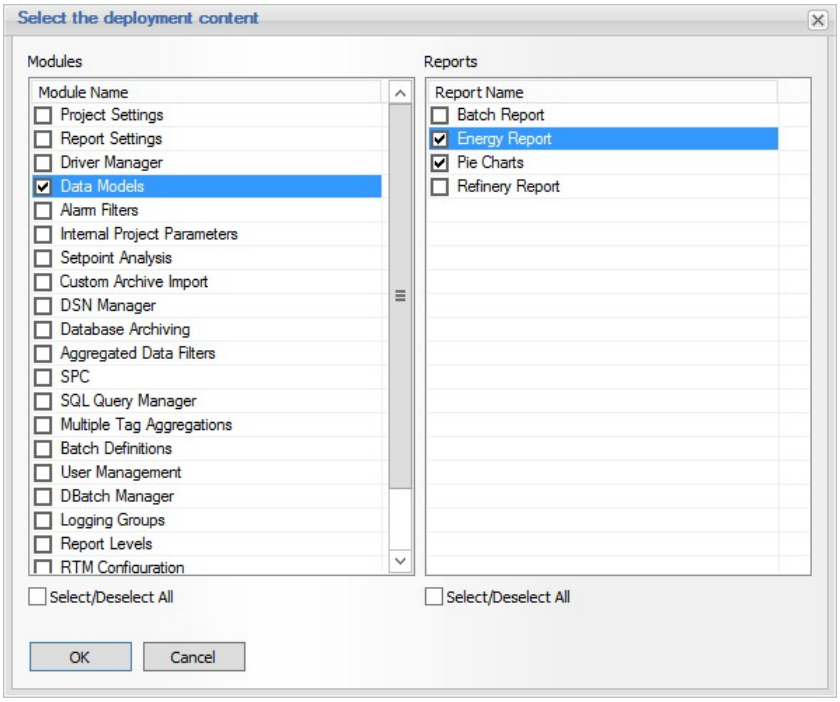


c. If this is the first time the project is being deployed to a remote runtime server, the only selection available will be to deploy the *Complete Project and all Reports*, and the project will be deployed (copied) to the specified folder on the runtime node. If changes have been made to the repository project and you wish to selectively update the production project (with specific reports and/or modules), *Select specific Modules and Reports* - the following window will open, from which you can choose which item(s) to deploy:

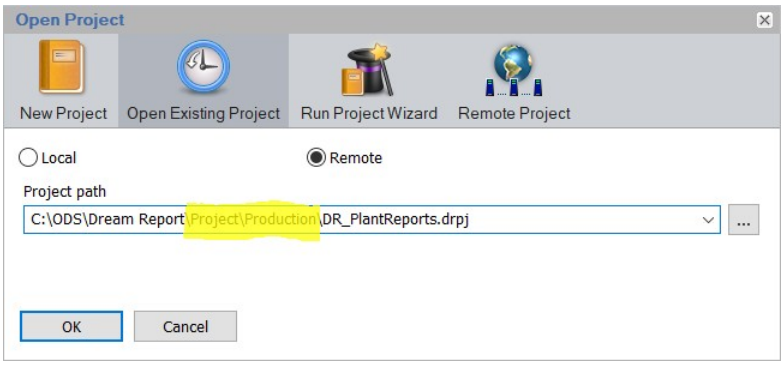
d. If the project ***is*** currently running on the runtime/production node, the changes will be applied, and the project will reload automatically.

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e. If the project is ***not*** currently running on the runtime/production node, the following one-time procedure must be followed:



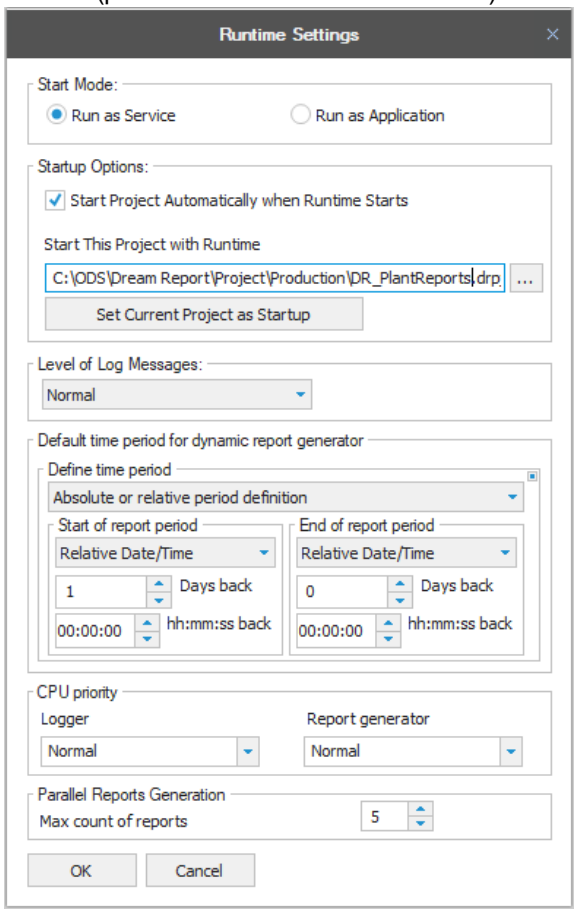
f. Start Dream Report Studio on the runtime/production node, and click the **Open Existing Project** option, to open the (just-deployed) project file *<ProjectName>.drpj* from the deployment directory (notice that when you select this project file, "*Remote*" is automatically selected":



g. After the project opens, select the **Runtime** tab from the menu bar. Click the **Runtime Configuration** icon to set the Runtime options. Make sure to start the current (deployed) project Automatically when Runtime Starts, setting runtime to Run as a

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Service (preferred for an unattended server) or Run as Application:



h. Finally, click the **Run Project** icon to start running the project.

i. Close Studio on the runtime/production node.

***NOTE**: Steps e. through i. need only be performed initially and once on the runtime/production node*

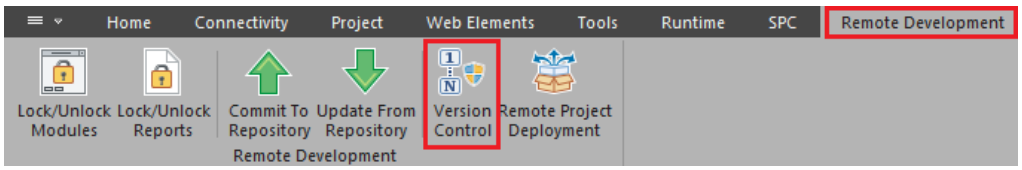
24.8 Version Control

The *Version Control* feature enables users to log and track all changes between versions of reports, or even the entire project. Additionally, you can roll back (revert) to a specific, validated version, if needed. With the Version Control option enabled, any time a report is modified and saved, the history of all the versions of that report will be automatically logged into the project database. When the entire project is saved, each report will be saved only if there have been any changes in this report.

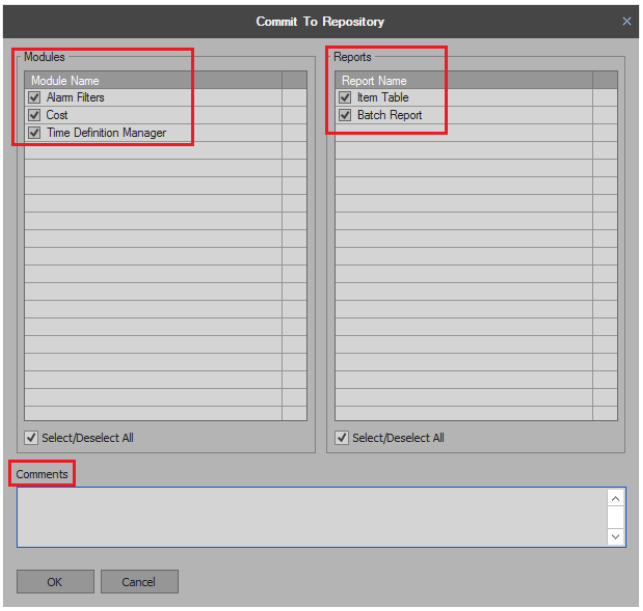
Version Control on a project is automatically activated when enabling the *Remote Development* feature. The *Remote Development* feature enables both remote or local project development, and by default, the *Version Control* feature will be activated as well. Setting up *Remote Development* is covered in the *Repository-Based Project Development* section.

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After enabling Remote Development, the project will be reloaded and a new menu "*Remote Development*" will be available, with a "*Version Control*" button. Click the "*Version Control*" button to open the *Version Control Management* window.



NOTE: The User Comments option ("*Require Comments on Commit*") must be enabled in the Version Control management system. Then, whenever the report is saved, a window will open ("*Commit to Repository*") requesting (requiring) a relevant comment. A comment must be entered in order to continue. The comment text must meet a minimum length and format - more than 5 characters, and may not start with multiple spaces. The comments entered will be logged into the secure audit trail database and will be attached to the new report version number.



Version Control by Project

The *Version Control* module in Dream Report will manage the version on two levels: the global Project version, and individual Report versions.

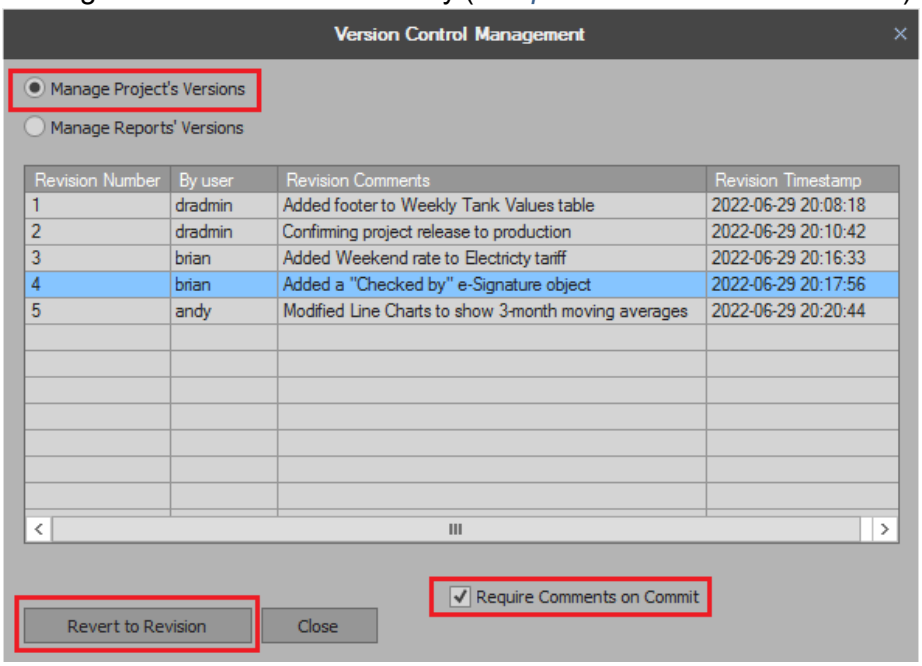
All the modifications in the current project will be tracked and stored in the Dream Report secured configuration database:

- Communication Drivers
- Project Settings

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- SPC Definitions
- SQL Management
- etc…

The *Version Control Management* allows a user to display current project version information and list all project-level changes, roll back to a specified version ("*Revert to Revision*"), and making user comments mandatory ("*Require Comments on Commit*"):



The *Revision Number* is auto-incremented by the system, whenever changes are committed. This *Revision Number* can be displayed on a report (see below).

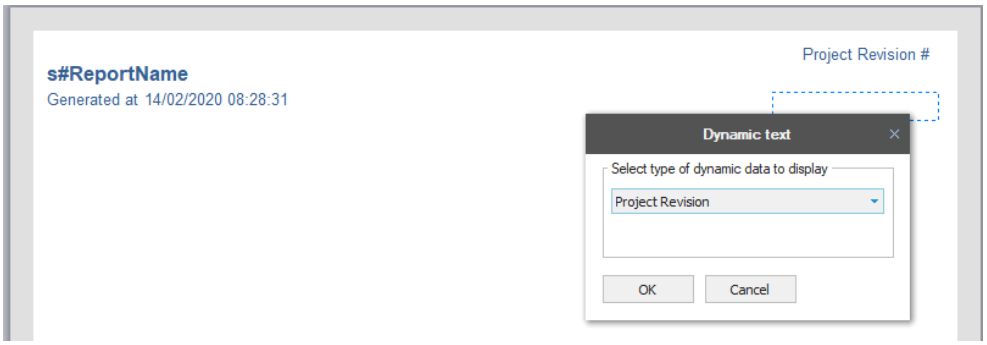
The user who was logged in to Studio and committed the changes will appear under the *By User* column.

The *Revision Comments* show the specific comments entered (if required) when the changes were committed.

The timestamp when each change/revision was committed will appear under the *Revision Timestamp* field.

The project revision number (*Project Revision*) can be added to a report using the *Dynamic Text Object*. This value is not user changeable – when a report generates, it will always display the current revision number of the project:

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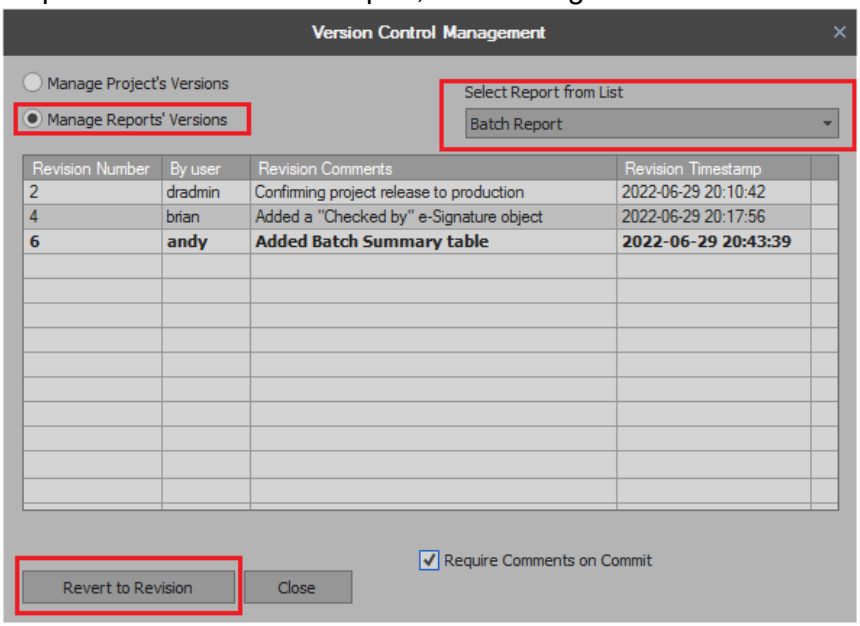


Version Control by Report

The following operations (report layout changes) will be considered as a change to a report:

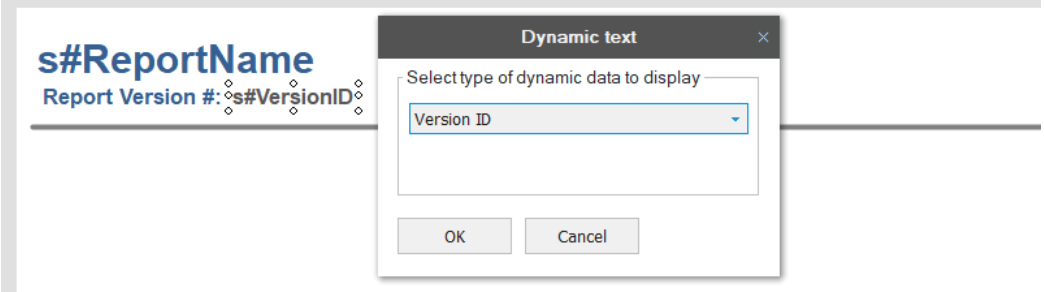
- Change of an object configuration (items, time, appearance, etc.);
- Deleting an object;
- Adding a new object;
- Moving object location;
- Changes to the Report Settings (schedule, name, storage path, etc.)

By selecting the *Manage Reports' Version* option, the *Version Control Management* window allows a user to select specific reports, the report versions, display version information, and when the change was committed (*Revision Timestamp*). It is possible to roll back (revert) to a specified version of that report, and clicking the "*Revert to Revision*" button:



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A report version ID can be added to a report header or footer by adding a *Dynamic Text* object, and selecting *Version ID* from the list. This value is not user changeable – when a report generates, it will always display the current version number of the report:



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Communication Drivers

25 Communication Drivers

Dream Report enables you to connect to the various heterogeneous data sources and acquire real-time data and access external proprietary history servers.

Dream Report supports three types of drivers:

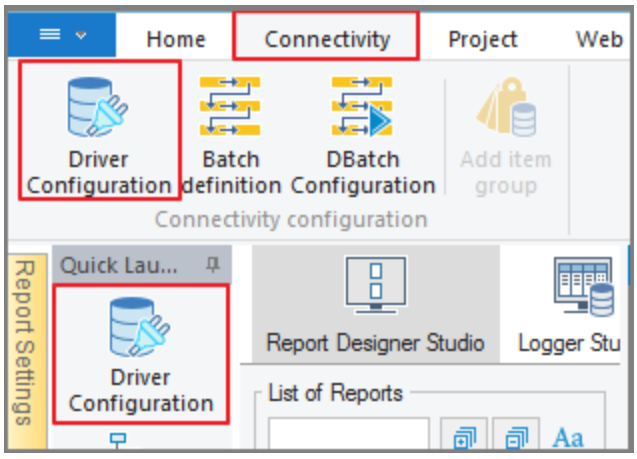
- *Real-Time Data Access Drivers*
- *External Historical Values Drivers*
- *External Historical Alarms Drivers*

Starting from version 5.0, Dream Report does not provide real-time alarm logging, so real-time alarms drivers are no longer supported in the newly created projects. The real-time alarms drivers which present in some folders of the Communication Configuration Wizard, are kept in Dream Report for backward compatibility only and cannot be used in newly created reporting projects.

25.1 Data Source Definition

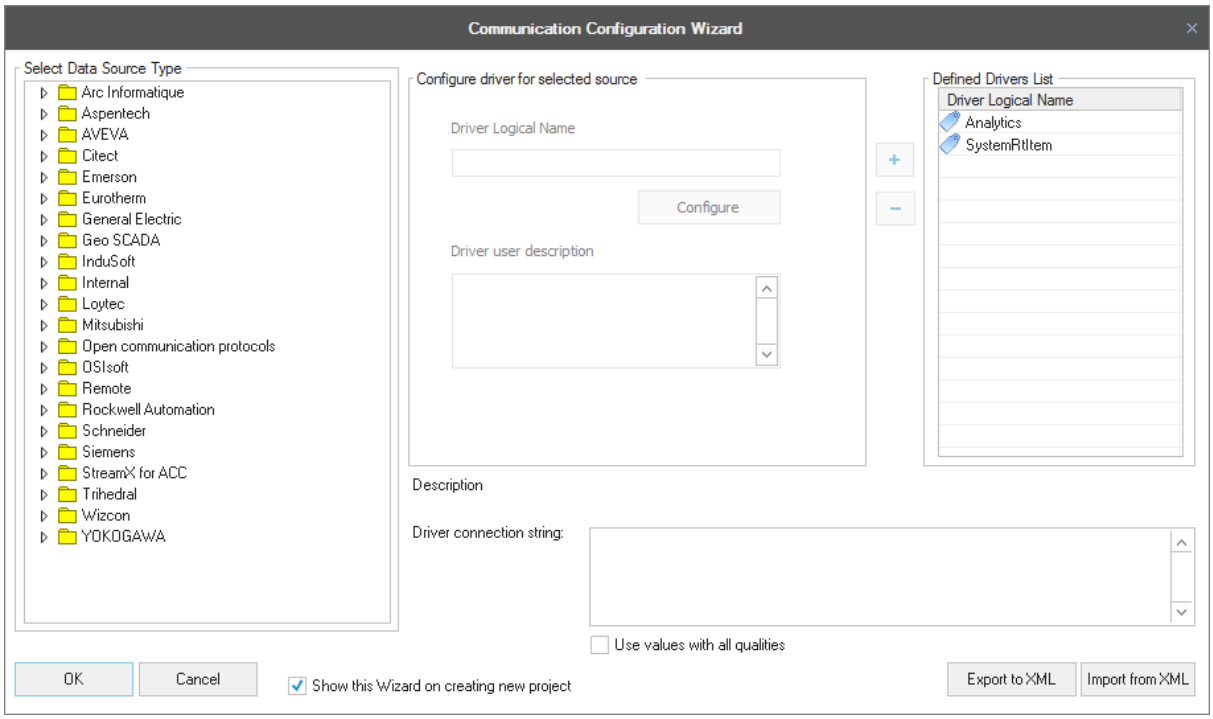
Data source (Driver) Definitions

Data source (driver) definition can be done in the *Communication Configuration Wizard* dialog box, which can be opened from either *Logger Studio* or *Report Designer Studio*. Click on the *Driver Configuration* command button either on the *Connectivity* ribbon, or the *Driver Configuration* button is also located on the left vertical toolbar:



Data source selection will be displayed as a tree:

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The first browse level will be the list of data source vendors. All first level browse will be displayed as folders.

Each folder has separate drivers for different automation software products and type of data to access (real-time values, historical values, historical alarms), which should be configured separately.

When the type of a driver is selected from the *Select Data Source Type* tree, enter the *Driver Logical Name* box for configuration. To configure driver communication parameters, button *Configure* will open driver configuration dialog box. If driver does not have any configuration interface, that button will be disabled.

After a new driver definition has been created, it must be added to a general list of data sources defined in a project, by clicking on the *Add* button. The data source configured will appear in the *Defined Drivers List*. The *Delete* button will delete the selected data source from the list.

NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you will just need to click in the *Select Data Source Type* field on any other driver and then go back to the driver that you need to configure.

When all the communication settings for the project are done, click *OK*, and the driver configuration will be finished.

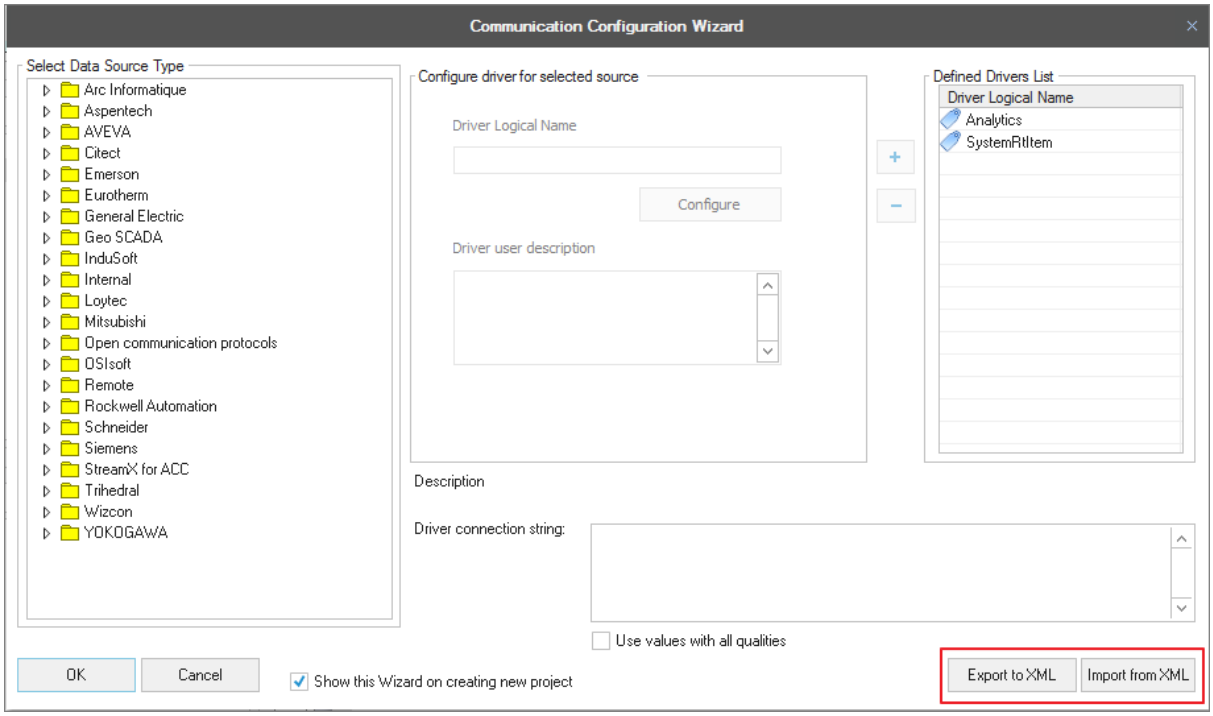
For detailed information on how to configure different types of drivers, please, see related parts of the *Communication Drivers* section.

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Import/Export of Communication Drivers Configuration to/from XML File

In order to easier and faster edit list of defined communication drivers, as well as to move drivers configuration from one PC to another, *Communication Drivers Configuration* wizard enables users to export the list of defined communication drivers configurations into an XML file, as well as to import communication drivers configurations from external XML file.

If user will click on *Export to XML* button, in the bottom right corner of the window:



Then, the standard *Save as* window will open, where user can enter the output XML file name and select the folder, where the output XML file will be copied.

Each communication driver has its own XML structure, which depends on its configuration options and settings. User can easily modify driver configuration parameters within XML file, copy/clone driver configurations, etc.

In order to import driver configurations from existing file, user has to click on the *Import from XML* button and standard *Open File* windows dialog box will open, where user can select an XML file, which will be imported.

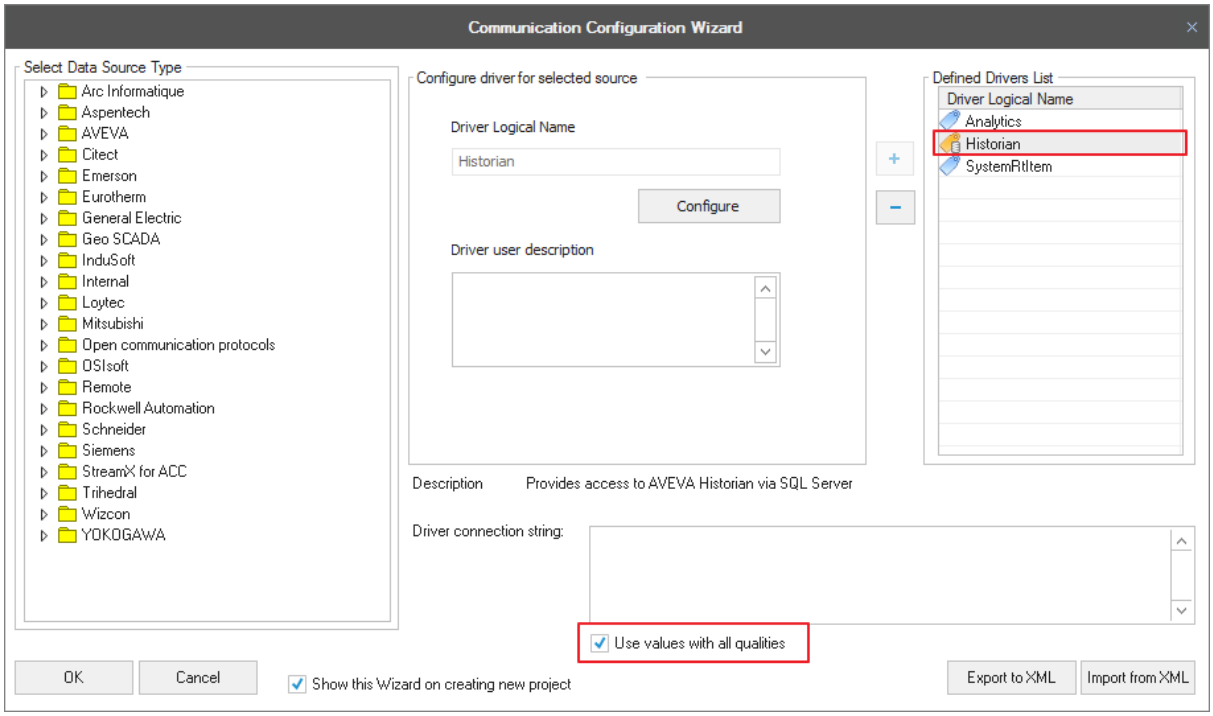
When importing drivers configurations, Dream Report will check all logical names of driver instances and will import and add only drivers instances names, which do not exist yet in this project. Any duplicated drivers instances names will be ignored and skipped.

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Using All Qualities for a Data Source

By default, Dream Report retrieves values from a data source with Good quality only. The *Use Values with All Qualities* parameter provides a possibility to get and report data with different values of quality.

The parameter is set up individually for each driver definition. To retrieve values with all values of quality from a data source, select that data source in the *Defined Drivers List* and check the *Use Values with All Qualities* checkbox:



For a real-time driver, if logging groups are defined, values with all qualities will be stored in the project database. In the Dream Report Logger Studio, the Quality column will contain the real quality read from a datasource.When a tag value is written to the project database, the Quality column in the database will contain 0 for all values obtained with Good quality and 1 - for all values with Not Good quality.

For a historical values driver, all statistical functions will be calculated only on the values obtained with Good quality. All Advanced SQL Conditions and Aggregated Data Filters will use the values with good quality only. However, In Multi-tag Aggregation, if calculation are made over the arrays that includes values with both Good and Not Good qualities, the quality of the result value in Dream Report will be Good.

The *Use Values with All Qualities* option is currently available for the following drivers:

- Rockwell Automation / Rockwell PLC real-time values
- AVEVA / AVEVA Historian (historical values)

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- AVEVA / AVEVA Historian InSight (historical values in Cloud Historian)
- AVEVA / AVEVA SuiteLink Protocol (real-time values from AVEVA InTouch and SuiteLink sources)
- AVEVA / Application Server (real-time values)
- Emerson / OPC DeltaV real-time values
- Emerson / OPC DeltaV historical values
- General Electric / Proficy Historian historical values
- General Electric / iFix Native real-time values, iFix6+ Native real-time values
- General Electric / iFix Native historical values drivers, iFix6+ Native historical values drivers
- Open Communication protocols / Modbus (TCP/IP, RS232,ASCII)
- Open Communication protocols / OPC / OPC DA (real-time values)
- Open Communication protocols / OPC / OPC UA real-time values
- Open Communication protocols / OPC / OPC HDA (historical data access)
- Open Communication protocols / OPC / OPC UA historical values
- OSIsoft / OSIsoft PI Asset Framework historical values

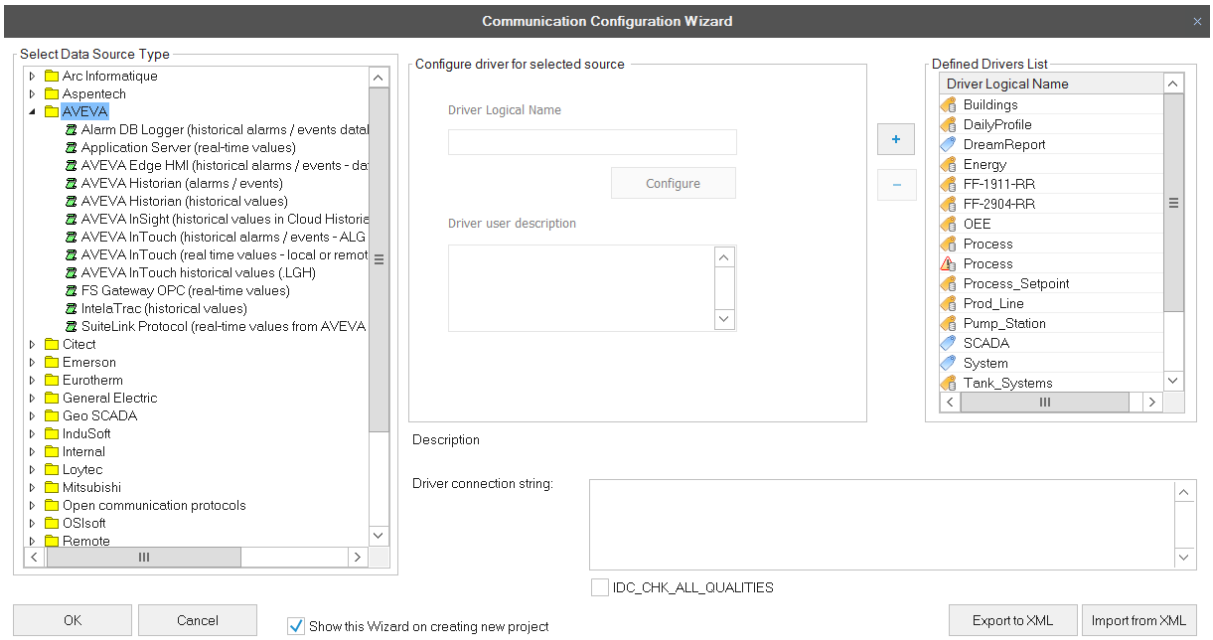
NOTE: Additionally, quality filters can be implemented inside some drivers, but it is set up on the level of every specific driver in its configuration window.

25.2 AVEVA

The Dream Report *AVEVA* communication drivers provide data connectivity between Dream Report and the AVEVA software.

To configure the AVEVA drivers, first, open the *Communication Configuration Wizard* dialog window in Dream Report Studio - all drivers are listed under the *AVEVA* folder:

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Select the driver you need for your project, give it a logical name and click on the *Configure* button.

After finishing the configuration click on the *Add* button to add it to the list and then *OK* to save and close the wizard.

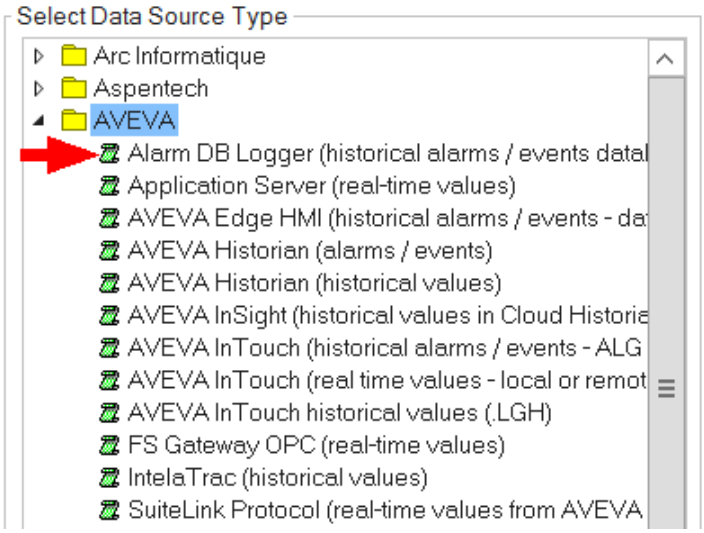
25.2.1 Alarm DB Logger (Historical Alarms/Events Database)

The *Dream Report Alarm DB logger (historical alarm/event – database)* driver allows connecting to a local or remote SQL Server database (WWALMDB, or user-specified database name) with AVEVA alarms, extract alarms, and provide them for reporting.

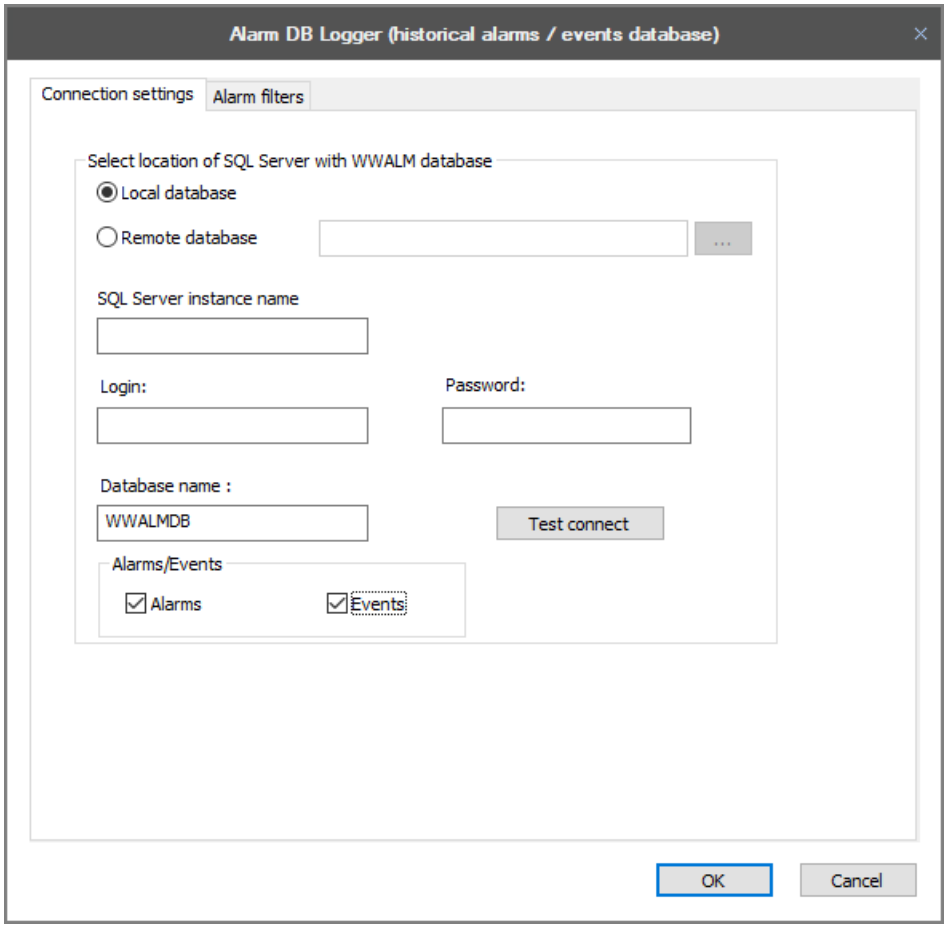
NOTE: Configuration for the *Application Server (historical alarm/event – database A2ALMDB)* is identical to this driver. The only difference being that the default database name provided is A2ALMDB.

To add this driver to the project, please select *Alarm DB (historical alarm/event – database)* driver from the list of drivers in the *AVEVA* folder of the *Select Data Source Type* section (please see the picture below):

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If InTouch (historical alarm/event – database WWALM) communication driver is selected, click on *Configure* button, and the following *InTouch (historical alarm/event – database WWALM)* driver configuration dialog window will open:



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Connection Settings

In this window user can define connection to the WWALMDB (AVEVA Alarms Database) database. The connection to the WWALMDB database can be configured either by using the SQL Server database locally (*Local database*) or remotely (*Remote database*). If a named instance of SQL Server or SQL Express is being used, make sure to enter the *SQL Server Instance Name*.

If the SQL server, which is running the WWALMDB database, is configured with user authentication, then enter *Login* and *Password* for the SQL Server into the corresponding edit boxes.

If your SQL Server is configured with Windows Authentication mode, leave the user name and password edit boxes empty.

The default *Database Name* is *WWALMDB* (or *A2ALMDB*) – if your AVEVA Alarm Logger database is named differently, then change the name here.

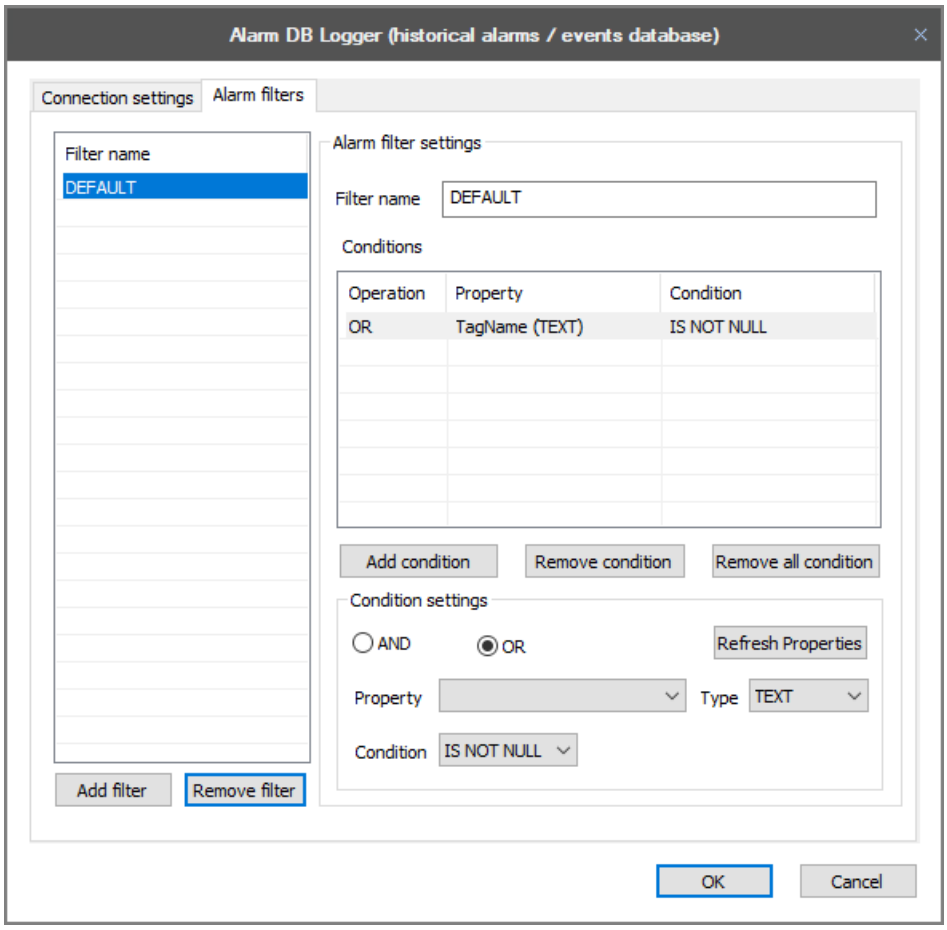
The *Test Connect* button will try to establish communication to the alarm database based on SQL Server.

The *Alarms*/*Events* section allows you to specify whether the driver will query AVEVA Alarms, Events, or both. If Events are not needed, uncheck this option, as it will reduce query times.

Alarm Filters

In this window user can define alarm filters and alarm filtering conditions (please see the following image):

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In the *Filter Name* section user can define the name of the alarm filter (which should be unique).

NOTE: By default, when the *Alarm filters* window is opened, the WWALMDB filter will be configured with the name *DEFAULT* and with the following filtering conditions as: *OR* (*Operation*), *TagName (TEXT)* (*Property*) and *IS NOT NULL* (*Condition*).

This default alarm filter will display all alarms without filtering them.

Condition Settings

The *Property* combo box will include the list of all properties which exist in the alarm table.

The *Type* combo box will include 3 options: *Numeric*, *Text* and *Boolean*.

If the *Numeric* type is selected, the *Condition* combo box will have the following options: *!=, = , > , >= , < , <=, BETWEEN*.

If the *Text* type is selected, the *Condition* combo box will include the following options: *!=, =, IS NOT NULL, IS NULL, LIKE*.

If the *Boolean* type is selected, the *Condition* combo box will include only one option: *=, !=*.

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After having defined the *Condition*, user will select *AND* or *OR* and click on *Add* condition button.

When all conditions have been added, user will click *Add filter* button and the defined filter will be added to the list of filters (in the *Filter Name* table).

NOTE: If user selects filter from the list, the *Conditions* list will be filled with the filter settings.

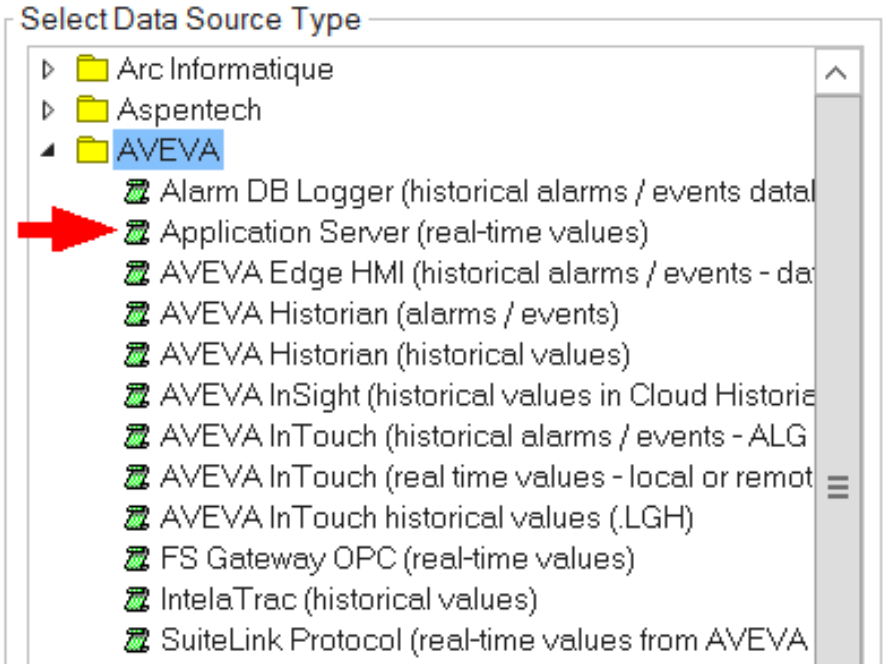
If user selects condition from the list of conditions, all dialog controls will be filled according to the defined condition.

If user has defined the alarm filter without clicking on *Add filter* button and clicks *OK* button, the filter, which has not been added before, will be automatically added to the list of alarm filters.

25.2.2 Application Server (Real-Time Values)

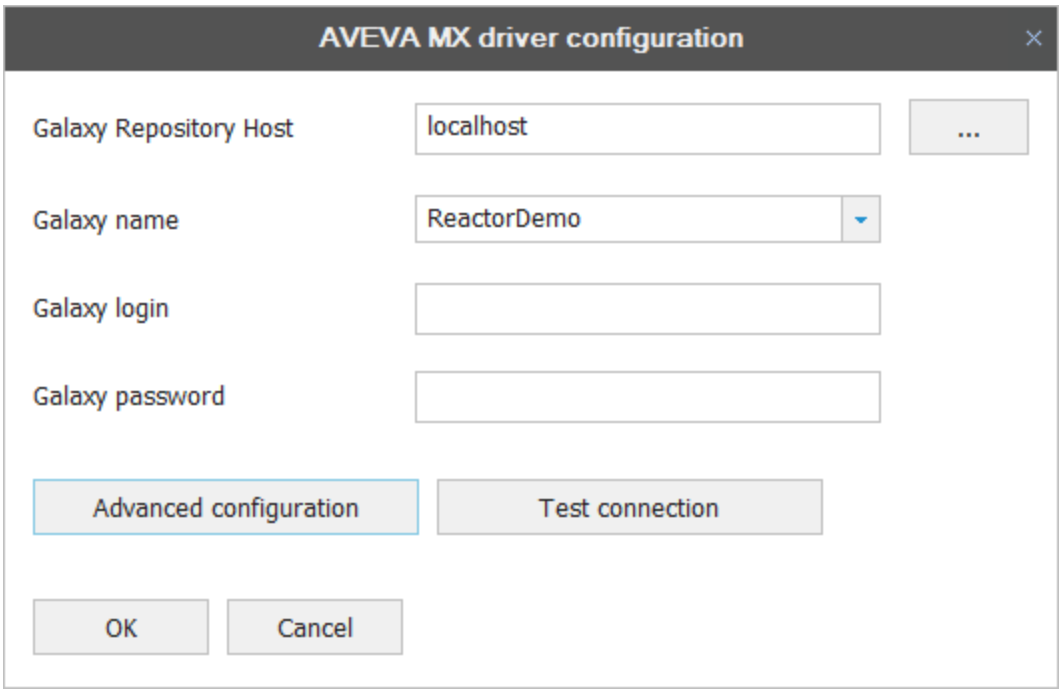
The *Application Server* driver enables connecting to and reading real-time values from a local or remote Galaxy Repository.

To configure the *Application Server* driver, open the *Communication Configuration Wizard* dialog window, select the *Application Server (real-time values)* driver under the *AVEVA* folder:



Click the *Configure* button, and the following AVEVA MX driver configuration dialog window will open:

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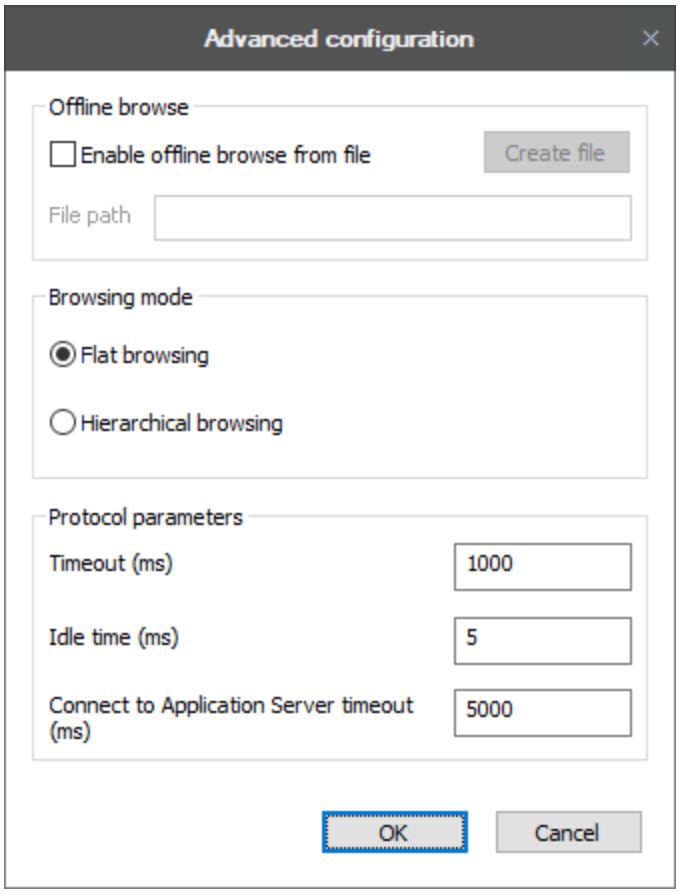
Galaxy Repository Host: Enter the IP or computer name which contains the Galaxy Repository (GR), or click the "[…]" button to browse the network for the GR node.

Galaxy name: after selecting the Galaxy host, Galaxy names will be listed – select the specific Galaxy name.

Galaxy login and *password*: If the GR is secured, enter the valid credentials and click the *Test connection* button to test your connection to the repository.

Click the *Advanced Configuration* button, and the following window will open:

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Offline browse

Check the *Enable offline browse from file* box in order to create a local tag list file in a specified location – this makes browsing the Galaxy objects a lot faster, as a cached copy of the items will be saved in the Dream Report machine. A default path – under the current Dream Report project directory - will be listed when checking the box (change the path if needed) and click the *Create file* button to create the offline file in that location.

Browsing mode

Select the tags' browsing mode – *Flat* will list all the tags under one folder, and *Hierarchical* will list the tags' and folders' hierarchy as they organized in the repository.

Protocol Parameters

The retrieval *Timeout*, *Idle time* and *Connection to Application Server timeout* have default values (in ms) that can be changed from this *Advanced Configuration* window, if needed.

Click *OK* to close the *Advanced Configuration* window.

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Click the *OK* button to close the driver configuration window, and return to the *Communication Configuration Wizard*. Then enter a unique *Driver Logical Name* for this configured data source.

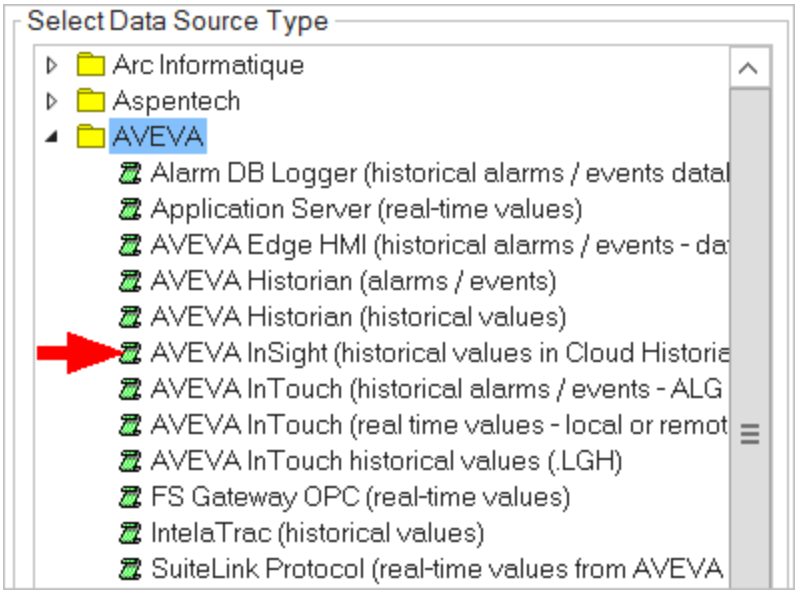
Finally, click the *Add* button to add this configured instance of the driver to the project's list of data sources, and will appear in the *Defined Drivers* list.

NOTE: There are several AVEVA licensing requirements when using the *AVEVA Application Server (real-time values)* driver. Please refer to the "Using Dream Report with AVEVA Application Server" Tech Note on the *Dream Report Knowledge Base* (www.dreamreport.net/techsupport)

25.2.3 AVEVA InSight (Historical Values in Cloud Historian)

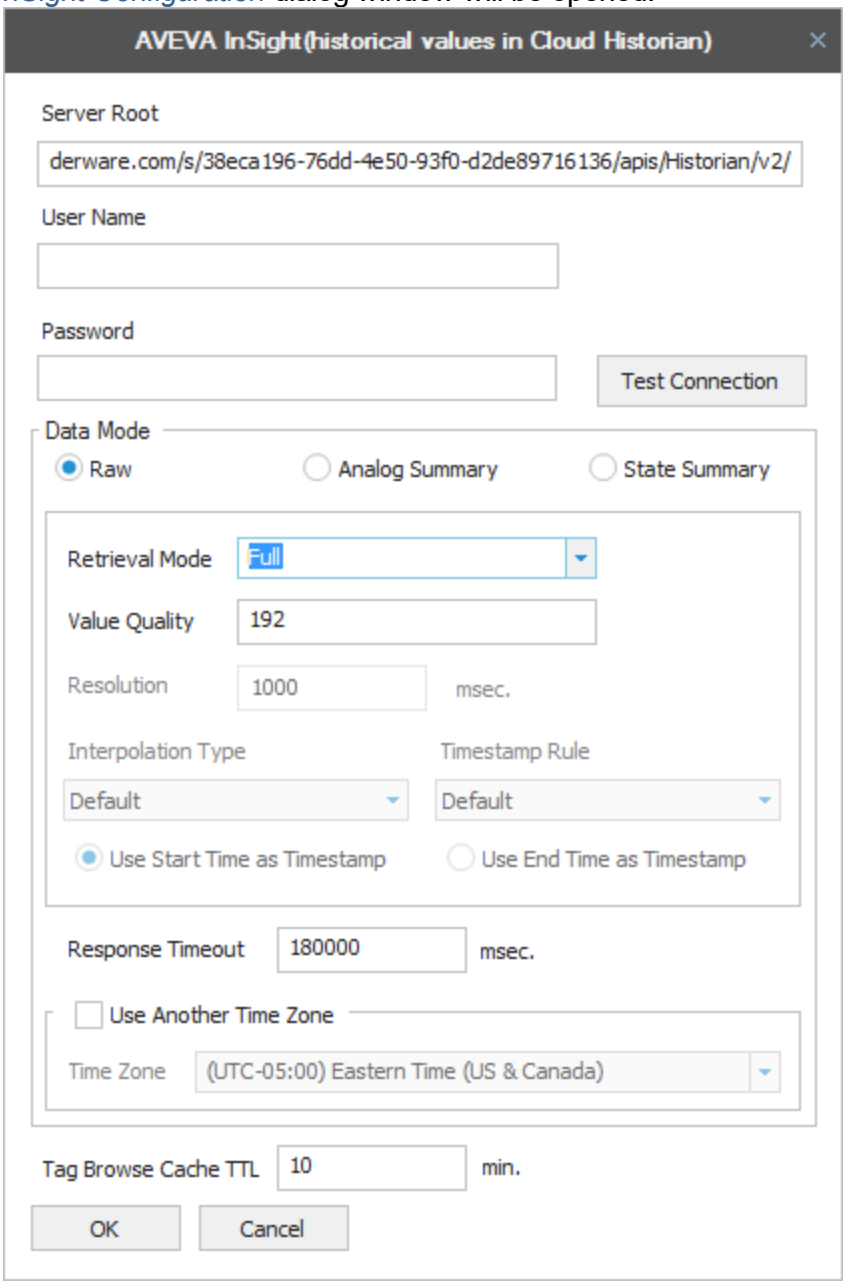
The *AVEVA InSight (historical values in Historian in the Cloud)* driver enables users to directly access raw, Analog Summary and State Summary data from an AVEVA AVEVA "InSight" online Historian.

In the *Communication Configuration Wizard*, select AVEVA InSight driver from the *AVEVA* folder of the *Select Data Source Type* section (please see the image below):



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The *Configure* button will be enabled. Click on it to setup the driver configuration, and the *InSight Configuration* dialog window will be opened:



Server Root: https://online.wonderware.com/s/jh9hdx/apis/Historian/v2/ << for example >>

The *Server Root* (i.e., the *URL* for your specific InSight Historian) is dependent on the Online Historian "Solution" you are connecting to. The Solution is identified by a unique string in the URL, specific to your InSight Historian. In the above example, *Solution* is identified by the string *jh9hdx* - the steps to determine the URL for your specific InSight Historian are detailed at the end of this section.

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User Name: typically, the email address (or user name) associated with the InSight Historian

Password: associated password (it is recommended that the User Name and Password used for the InSight website are used)

Data Mode:

- *Raw* will access the raw analog, discrete and string data.

- *Analog Summary* exposes the analog summary data, where an analog tag "aggregate" data can be retrieved - average, count, first, integral, last, maximum, minimum, stdDev

- *State Summary* exposes the state summary data aggregates (typically used for discrete and integer tags) - average, count, maximum, minimum, text and value

Options include *Retrieval modes* (*Full, Delta, Cyclic, Average*, etc.); *Resolution* (in msec) if applicable to the resolution mode selected; *Interpolation Type*, if applicable to the resolution mode selected; Value Quality (by default, good quality 192 is used); *Timestamp Rule* (where the timestamp returned will be the start or end of the resolution period specified.

Response Timeout: Duration that Dream Report will wait for a response from InSight when querying

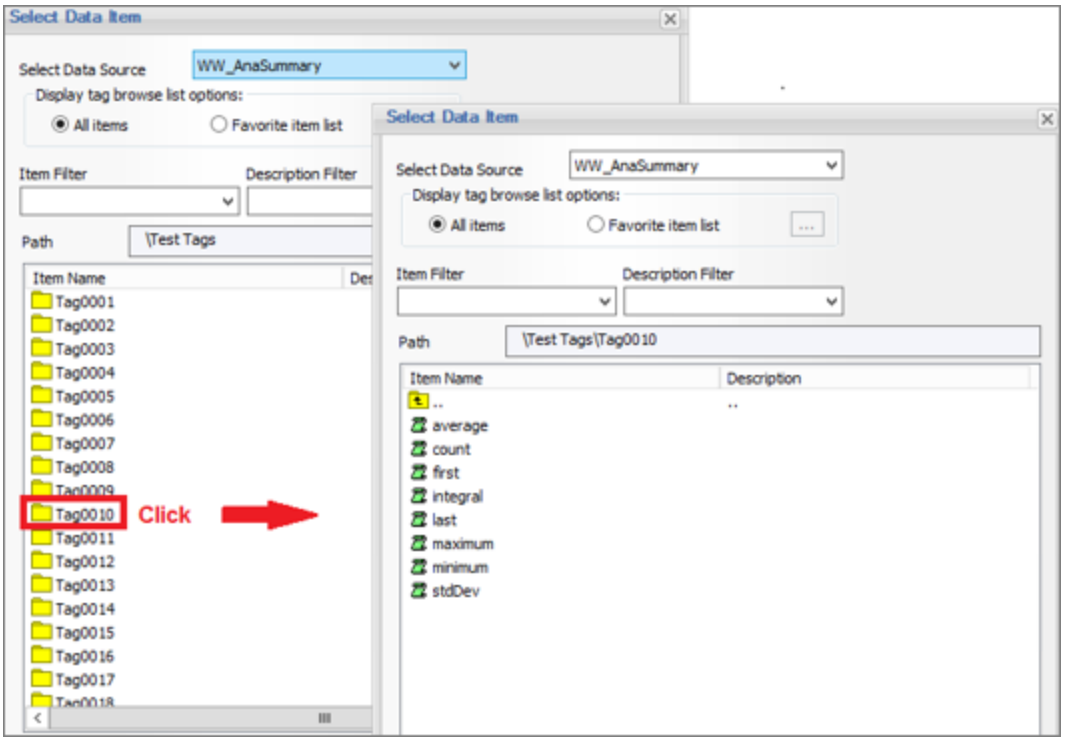
Use Another Time zone: By default, Dream Report will query the data relative to the local time zone. If querying data that was logged relative to a different time zone, select the appropriate time zone here

Tag Browse Cache TTL (Time To Live):

Specify the time interval for Dream Report to check for the latest tag list from InSight Historian. Dream Report will then cache the latest list of tags, making for fast browsing of tags from reporting objects. If your Historian is relatively "static" (i.e., its configuration does not change frequently) then you can set the "Cache time to live" to a longer interval - e.g., every 12 hours

If the InSight driver is configured for Analog Summary retrieval, when browsing for tags in a reporting object, first select the specific tagname, and then select the desired aggregate value(s) to use:

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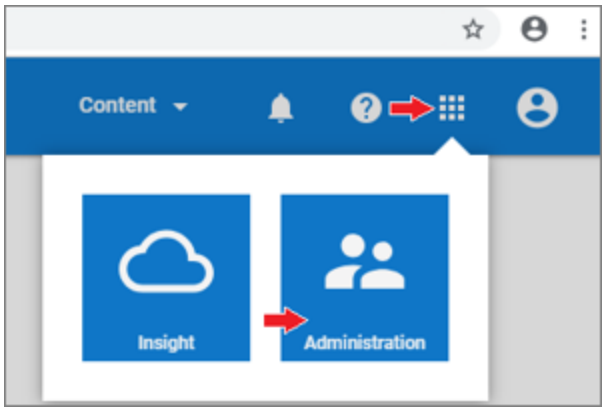
Determining the AVEVA Online InSight Historian URL to use in Dream Report

As mentioned above, every user's online Historian will require a specific *URL*, based on the *Solution* being referenced in the Online Historian. A *Solution* is a configuration in AVEVA Online InSight that specifies a set of tags, from one or more data sources, that can be accessed by one or more defined users. A customer might define multiple Solutions in their Online Historian, based on plant locations, processes, user groups, etc. As such, when configuring instances of the AVEVA InSight historical values driver in Dream Report, each instance will need the specific *URL* of the AVEVA Solution to which you wish to connect.

To determine the URL to use, follow these steps on the AVEVA Historian Online website:

- Open a browser and go to the following website: online.AVEVA.com
- Log in with your AVEVA Online credentials
- At the welcome page, select which *Solution* you want to connect to with the Dream Report InSight communication driver.
- In the top-right of the *Online InSight* web page, select the *Online Suite* icon, and then click *Administration*:

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- On the *Administration* page, click the *REST API* link on the *Integration Settings* icon
- At the bottom of the *Historian Data REST API* screen, expand the *Basic Authentication* section - you will then see the *URL* (Endpoint). This is the URL to use for your AVEVA *Solution* in the specific instance of Dream Report AVEVA InSight driver configuration - copy it, and paste it into the InSight driver configuration in Dream Report

25.2.4 FS Gateway OPC (Real-Time Values)

AVEVA OPC driver of Dream Report is a **legacy driver** that has to be used to connect Dream Report to FactorySuite Gateway (FSGateway) OPC Server.

The AVEVA OPC driver is based on the OPC technology, and is specially designed to work with FS Gateway OPC server with a limited number of concurrent OPC clients.

It's impossible to communicate with FS Gateway OPC server using regular OPC driver due to the following reason: FS Gateway allows only 1 simultaneous OPC client connection and Dream Report can establish up to 3 client connections (Designer studio: 1 connection for tag browser and 1 connection for data access client; Logger studio: 1 connection for OPC Client to get value updates). FS Gateway doesn't support simultaneous connection of 2-3 and more OPC Clients.

In order to adapt the OPC client of Dream Report to work normally with such OPC server, this AVEVA OPC driver has been designed. It's based on the regular OPC client with a modified mechanism of tag browsing and establishing connections to server.

As soon as you add the AVEVA OPC driver to your project - the Studio will establish only 1 client connection (for tag browsing only), and the OPC client will not be loaded into the Studio. During the first connection to FS Gateway, tag browser will request and save the entire list of items from the OPC server into a text file in the System folder of the Dream Report installation. The name of that file will be **<address of your OPC server>.DATA**. Then, each time, when you open the Designer studio, Dream Report will not establish a new connection to the OPC server, but will provide a browse from an existing text file. This will enable you to edit your project, while Runtime Manager is running, without damaging its client connection.

The order of using this driver is the following:

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1. Add AVEVA OPC driver to your project.

2. Design your project.

3. Save your project and close the Designer studio.

4. Start runtime.

Now you can also open the Designer studio while runtime is running - the client connection will not be damaged.

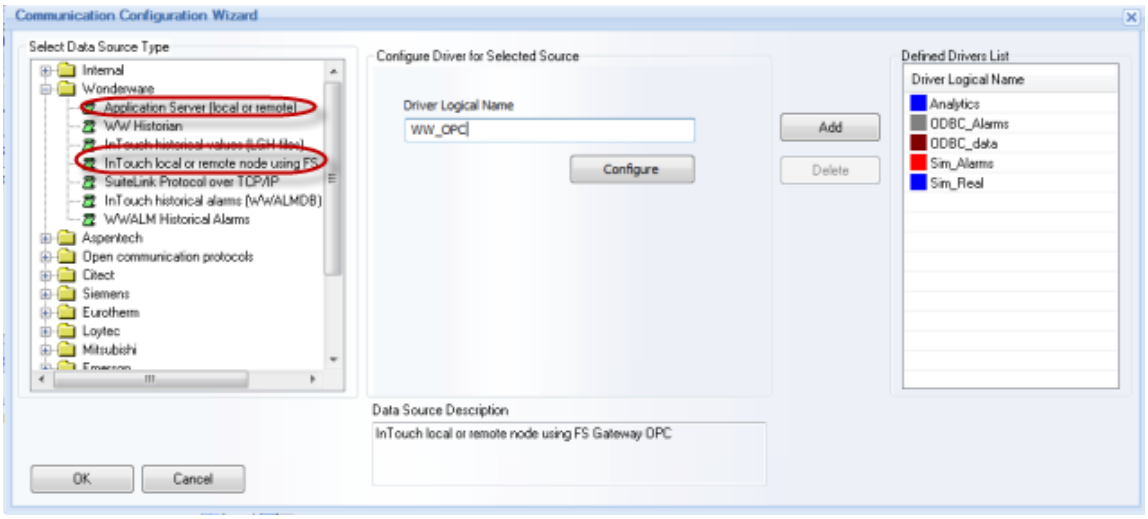
In order to refresh the list of browsed items from the OPC server, you have to delete manually or rename the existing browse text file, close Runtime Manager, and then load the Designer studio again. Then, the Studio will get a new browse list of items from the OPC server, and create a new browse text file.

All the communication with the data server is done using the regular standard OPC communication protocol.

AVEVA OPC driver supports OPC 1.0 and OPC 2.0 standards. The driver can be configured to any local or remote OPC server, having flat or hierarchical architecture.

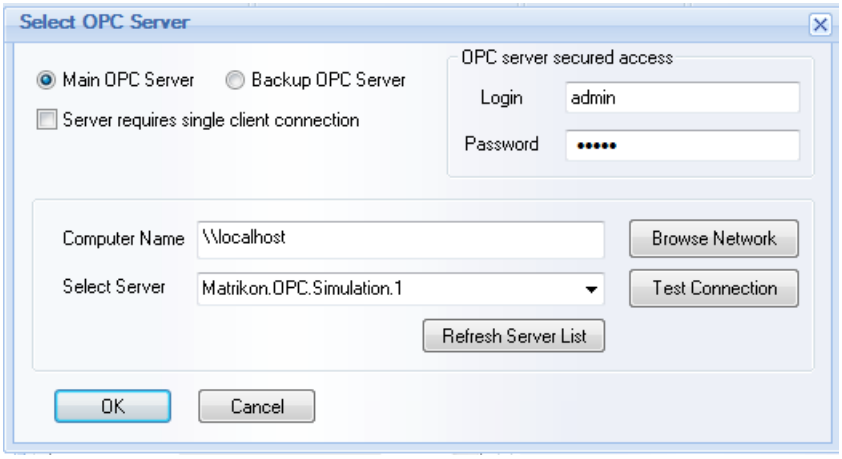
Driver Configuration

1. In order to configure the AVEVA OPC driver, please, open the **Communication Configuration Wizard dialog window**, select AVEVA OPC driver (**InTouch local or remote node using FS Gateway OPC** or **Application Server (local or remote)**) from the AVEVA folder of the **Data Source Selection** tree (please see the picture below):



Click on *Configure* button. The OPC driver configuration window will be opened:

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This dialog window has 2 options (radio buttons: **Main OPC Server** and **Backup OPC Server**), that allow OPC driver to work in a hot-backup mode and automatically switch from one OPC server to another in case of communication error, being able to connect to the secured OPC servers.

If the "**Main OPC Server**" radio button is enabled, you can select the computer name and the OPC server.

If the "**Backup OPC Server**" radio button is enabled, the **Computer Name** edit box and the **Select Server** combo box will be empty. You will be able to make another selection for the backup OPC server.

If the OPC server has secured (password protected) connection, it will be possible to specify, in the **OPC server secured access** section, login and password for the connection for the selected OPC server. Login and password will be set and saved separately for the main and backup servers.

NOTE: If OPC server definition contains login and password, the OPC browser and client will use it every time, when connecting to the OPC server.

If no login and password is defined, then the OPC browser and the client will be connecting to the server as usual, in anonymous mode.

In the **Select Server** combo box, please, select the required OPC server, to which you would like to connect (FS Gateway) from the selected PC.

In the **Computer Name** field, specify the name of the PC, where OPC server is running. By default it is ***"\\localhost"***, which means a local PC. If another PC in a network has to be specified, click on *Browse Network* button, and then select the needed computer name from a network.

You can refresh server list from the specified PC by clicking on the button "*Refresh Server List*". It will get a list of OPC servers, installed on the specified PC, and update the list of servers in the combo box.

When the OPC server is selected, click the button "*Test Connection*" to test communication between Dream Report OPC client and your OPC server.

NOTES:

- During installation of Dream Report, additional OPC component will be installed - OPC Core Component Redistributable 2.20 from OPC Foundation. It's supposed to repair all possible problems in the OPC servers registrations and repair the Windows OPC component installation.

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- If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "**Select Data Source Type**" field on any other driver and then go back to the driver that you need to configure.

AVEVA OPC Driver Configuration in AVEVA License Migration

If a customer upgrades AVEVA Quick Reports (either production or consignment) license to a AVEVA Dream Report license, this upgraded AVEVA Dream Report license doesn't allow using OPC drivers from **Open Communication Protocols** any more. Customer has limited access only to OPC drivers allowed by AVEVA and located in the **AVEVA** folder in Dream Report driver configuration section ("**Application Server (local or remote)**" or "**InTouch local or remote using FS Gateway**").

If a customer has an OPC driver configured in the **Open Communication Protocols** in the AVEVA Quick Reports license and he wants/needs to use it in the upgraded AVEVA Dream Report license, he can use one of the following options described below:

A. Delete an OPC driver, which has been configured in the **Open Communication Protocols** in AVEVA Quick Reports license, and configure a new OPC driver in the **AVEVA** folder in Dream Report driver configuration section ("**Application Server (local or remote)**" or "**InTouch local or remote using FS Gateway**"). In this case all existing log groups (data) for this driver will be lost.

B. Perform the following actions for changing driver configuration (in this case all log groups (data) won't be lost):

1. Configure AVEVA OPC driver in the **AVEVA** folder in Dream Report driver configuration section ("**Application Server (local or remote)**" or "**InTouch local or remote using FS Gateway**");
2. Close Dream Report studio;
3. In the Project folder open **ProjectCfg.mdb** file and select the table "**Data Sources**" where all data about the drivers, which have been configured in the project, are stored;
4. In the "**Data Sources**" table select this newly configured AVEVA OPC driver and copy data from all sections (except for the "***Driver Definition***" section, it must remain unchanged) into the corresponding sections of the configured OPC driver which you want/need to keep for your project;
5. Delete the configured AVEVA OPC driver from the "**Data Sources**" table.
6. Now, the OPC driver, which has been defined in the project with the AVEVA Quick Reports license, will have the configuration of a AVEVA OPC driver allowed by AVEVA in the AVEVA Dream Report license and all the existing data (log groups) won't be lost.

Example: if you have "**OPC DA real-time values**" driver with the name "**OPC_DA**" configured in the project in AVEVA Quick Reports and you upgrade your license to AVEVA Dream Report and you don't want to lose your data (log groups) from the driver "**OPC_DA**", please do the following:

1. Configure a new AVEVA OPC driver (for example, with the name "**WW_OPC**") in the **AVEVA** folder in Dream Report driver configuration section ("**Application Server (local or remote)**" or "**InTouch local or remote using FS Gateway**");
2. Close Dream Report studio;
3. In the Project folder open **ProjectCfg.mdb** file and select the table "**Data Sources**";

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4. In the "**Data Sources**" table select "**WW_OPC**" driver and copy data from all sections (except for the "**Driver Definition**" section) into the corresponding sections of the "**OPC_DA**" driver.

5. Delete the "**WW_OPC**" driver from the "**Data Sources**" table.

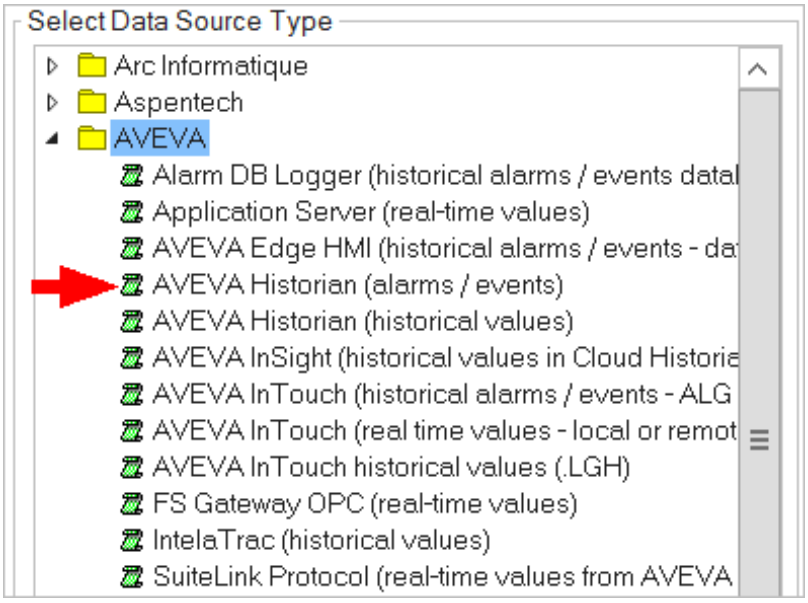
6. Now the "**OPC_DA**" driver will have the configuration of the "**WW_OPC**" driver (allowed by AVEVA) but the existing log groups (data) from the "**OPC_DA**" driver won't be lost.

7.

25.2.5 HIstorian (Alarms / Events)

The Dream Report **Historian (alarm/event)** driver allows for connecting to and reporting on high-speed alarms and events that have been logged to history blocks in AVEVA Historian from Application Server (available in *AVEVA System Platform 2014 R2* and later.) The Historian containing these alarm logs can be either local (on-premise), remote, or even Cloud-based. Access to on-premise Historian alarms is done natively using the AVEVA *SDK* and communication to a cloud-based Historian is implemented using the *oData* protocol.

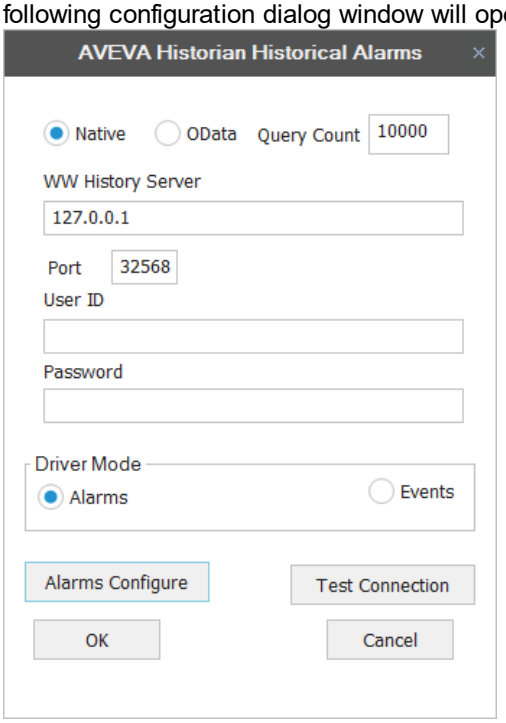
To add this driver to the project, please select the **Historian (alarm/event)** driver from the list of drivers in the AVEVA folder of the **Communication Configuration Wizard** (please see below):



Historian Alarms Driver Configuration

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Select the **Historian (alarm/event)** communication driver and click on the "*Configure*" button. The following configuration dialog window will open:



Connection Settings

There are two ways in which this communication driver can connect to the AVEVA Historian alarm files - either using the "**Native**" option (using the AVEVA Historian SDK) or using "**OData**" calls (Open Data Protocol.)

The **Query Count** option can be set to limit the number of rows returned from an alarm query in this connection - the default is 10,000 rows.

Enter the **AVEVA History Server** (AVEVA Historian) name or IP address. IP address is preferable for remote Historian connections.

The default **Port** number used for this connection is **32568**. For remote connections, make sure that this port is opened. This port number can be changed if necessary, to match the appropriate firewall port. For *OData*, port **32569** is more commonly used.

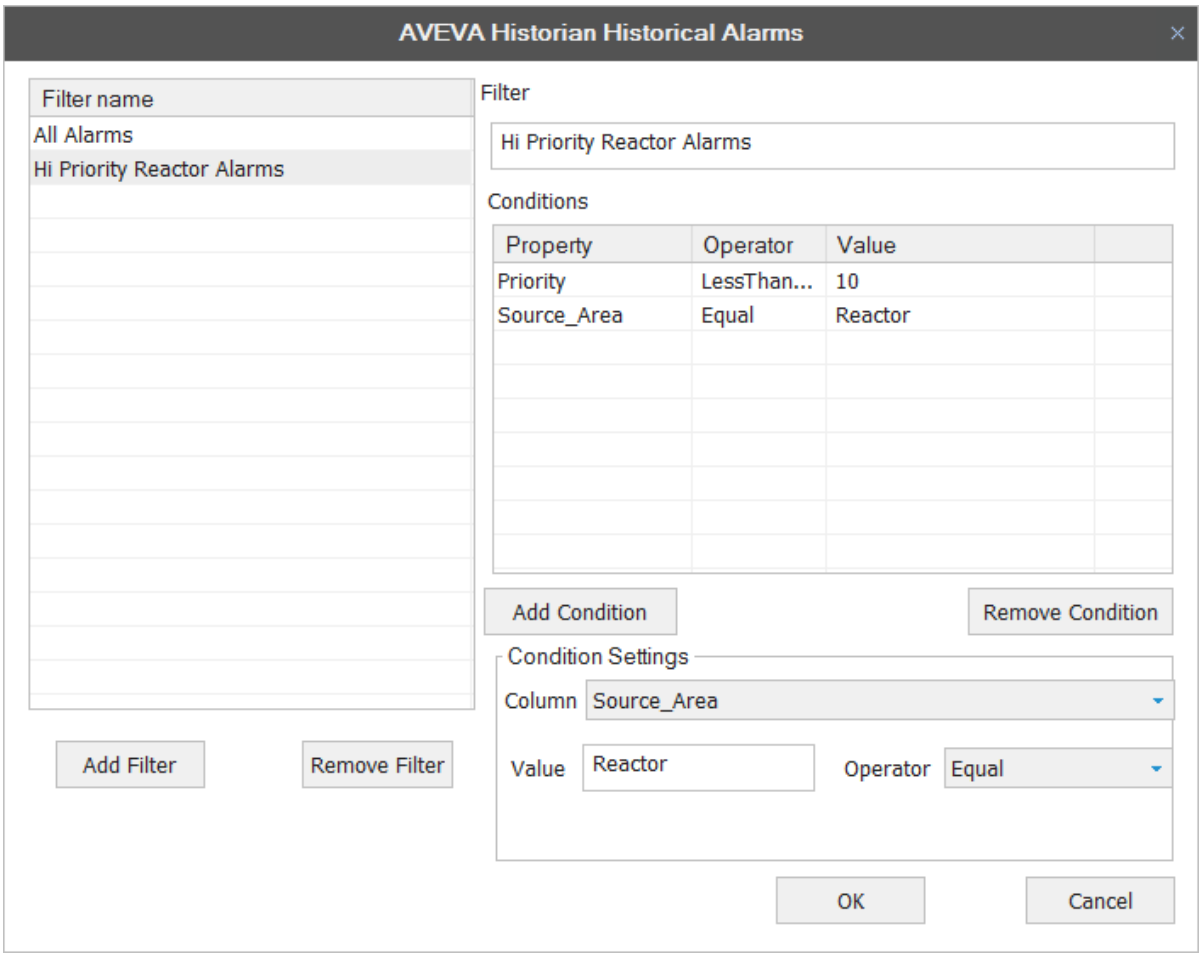
Enter a **User ID** and **Password** for the Historian server. Note that these credentials are *Windows* credentials, and not SQL Server credentials.

Click the "**Test Connection**" button to verify connection to the Historian. If the test is not successful, the most common things to check are the user credentials entered; the port number being used is being blocked by a firewall; or try using the "other" connection protocol (Native vs. OData).

Configuring Alarm Filters

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Click the "**Alarms Configure**" button to open the configuration window, where a user can define alarm filters and alarm filtering conditions, as shown below:



Enter a **Filter Name** that describes this specific alarm filter. Next, you will need to specify what **Conditions** (alarm properties) to filter on for this alarm filter.

The **Property** section lists all properties for this specific alarm filter. The list will initially be blank, so you can define and add conditions in the section below. Please refer to *AVEVA* documentation for a detailed description of all available alarm properties.

Choose an alarm table **Column** (property) to filter on. Once selected, enter a numeric value or string to evaluate from the **Condition** list. For instance, if you were defining a "High Priority Tank" filter, you might set the filter conditions as follows:

Column: *Priority*
Value: *100*
Condition: *LessThan*

Click the "**Add Condition**" button to add this condition to the filter. Then, define the next condition:

Column: *Source_Area*
Value: *Tank*
Condition: *Contains*

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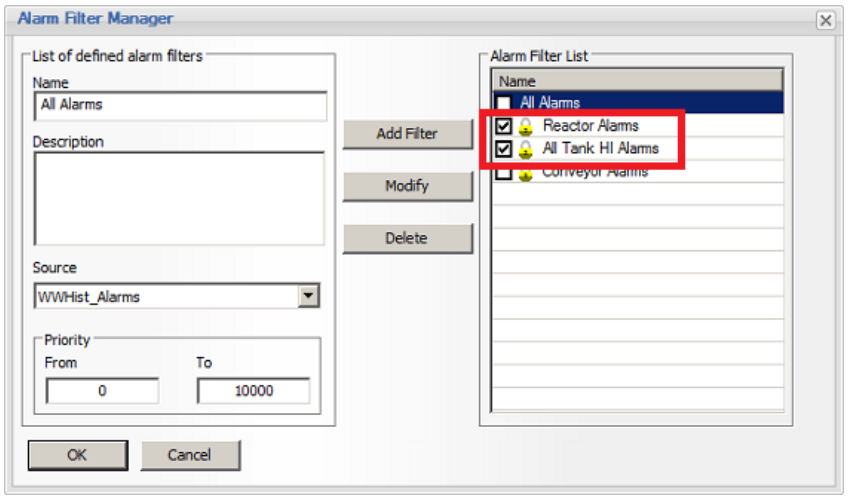
Click the "**Add Condition**" button to add this condition to the same filter, and then click "**Add Filter**" to add this filter to the list of defined **Filter Names**.

Many different Alarm Filter names (and associated conditions) can be created, that can then be used in an Alarm Table object, where the filter(s) can be selected to filter the alarm report as needed.

Click the "**OK**" buttons to close the Alarm Filter Configuration window, and the WW Historian Alarms configuration window.

NOTE:

1. If more than one condition is defined in a specific **Alarm Filter**, all conditions defined will be "AND'ed" when evaluated - i.e., all defined conditions must be met for the alarm rows to be returned. In the above example, only alarm records with the *Source_Area* column containing the text "*Tank*" *and* the associated alarm *Priority* < *100* will be returned.
2. If, in the **Alarm Table**, more than one Filter Name is selected, the all alarm records associated with each Filter Name will be returned in the report - i.e., Filter Names will be "OR'ed" with each other. In the Alarm Table configuration below, all "*Reactor Alarms*" as well as all "*Tank HI Alarms*" will be returned at runtime:

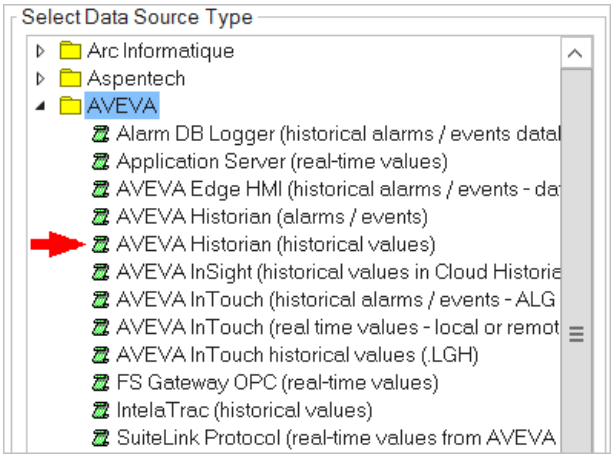


25.2.6 Historian (Historical Values)

The **Historian (historical values)** driver enables users to directly access AVEVA Historian and extract data using WW Historian's native retrieval modes. The driver exposes historical data from both the History/WideHistory tables, and the AnalogSummary/StateSummary (aggregation) tables.

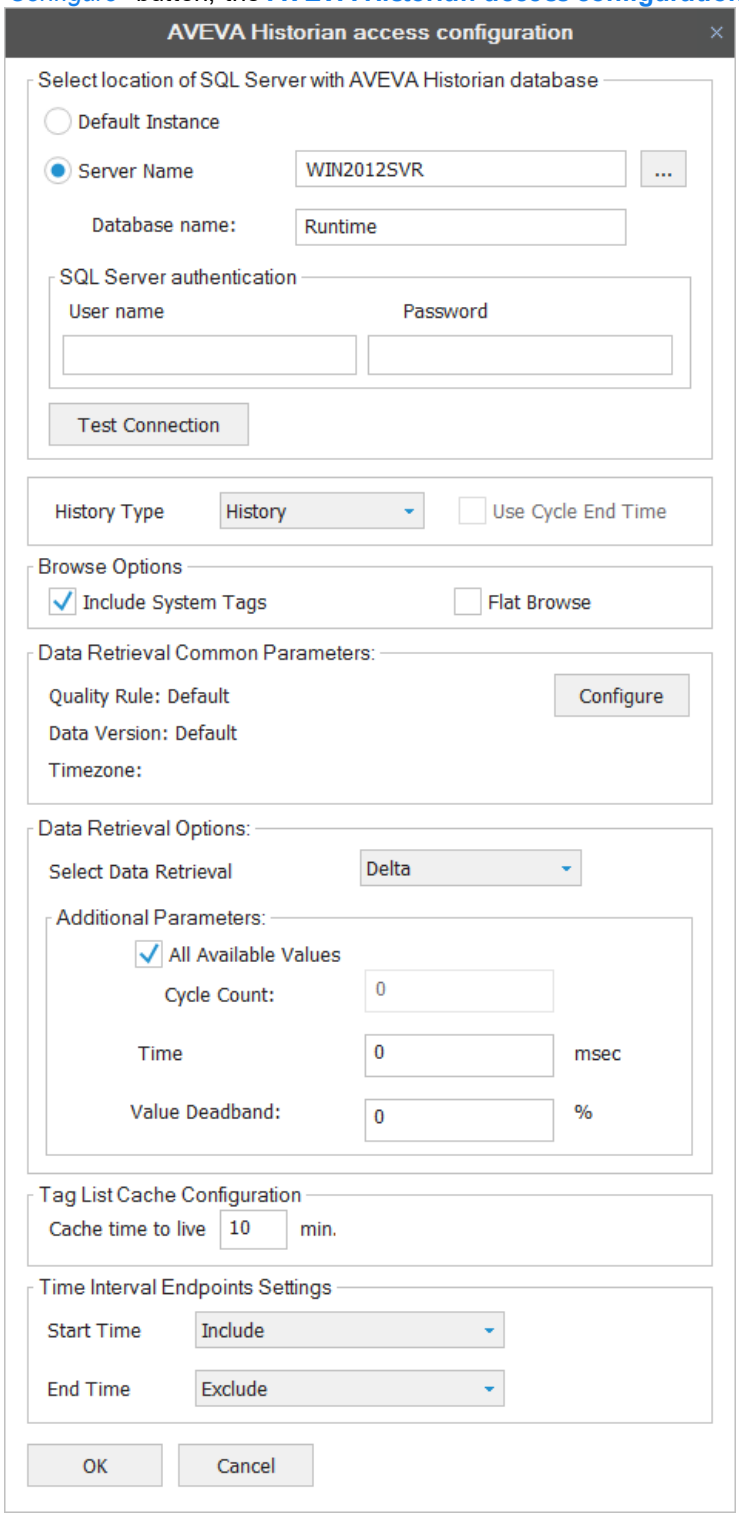
The driver does not require creating an ODBC DSN connection. Select **Historian (historical values)** driver from the list of AVEVA history access drivers in the **AVEVA** folder of the Select Data Source Type section:

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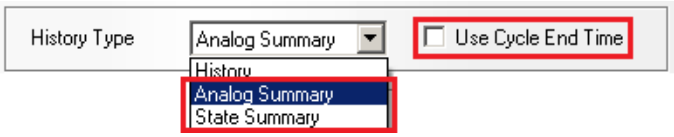
The "*Configure*" button will be enabled. Click on it to setup the driver configuration. If you click on "*Configure*" button, the **AVEVA Historian access configuration** dialog window will be opened:



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First, in the **Select location of SQL Server with WW Historian Database** section, specify the AVEVA Historian to connect to. This can be either a local computer or remote. If it's a local PC, keep the option "**This computer**" selected. If you need to connect to a remote AVEVA Historian server, you have select the "**Remote computer**" option. Then click on "**...**" (browse) button and select a remote PC, where your WW Historian server is running. Or, simply enter the server name or IP address of the appropriate WW Historian.

Once you have selected the location of your WW Historian server, enter a valid User name and Password to the SQL Server with WW Historian. If your SQL Server has Windows Authentication mode and if your Windows account has access to the "Runtime" database, then you can leave the "User name" and "Password" edit boxes empty (Windows authentication of the current user will be used.)



In the **History Type** section, select either *History*, *Analog Summary* or *State Summary:*

History - the instance of the WW Historian driver will query and extract data from the "raw" history tables or views such as "*History*" and "*WideHistory*"

Analog Summary - the instance of the WW Historian driver will query and extract data from the "AnalogSummary" aggregate table, which contains a set of summary data (min, max, avg, integral, etc.) for analog tags defined in Historian for analog summary replication

State Summary - the instance of the WW Historian driver will query and extract data from the "StateSummary" aggregate table which contains a set data aggregates (time in state, number of occurrences, etc.) for discrete and integer tags defined in Historian for state summary replication

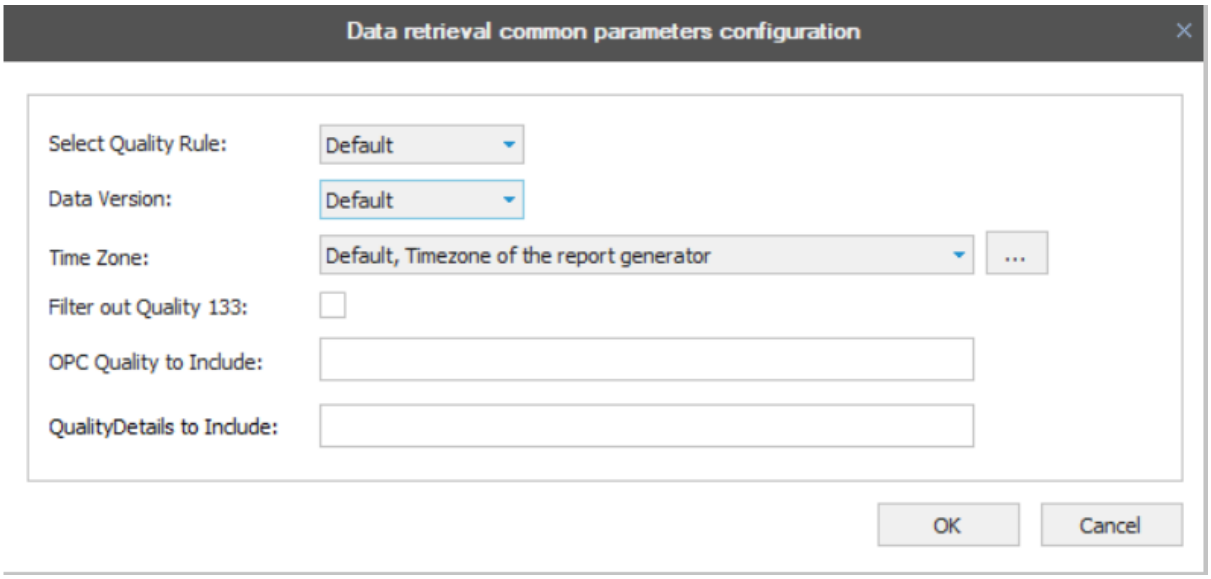
If either Analog Summary or State Summary are chosen, then the option "**Use Cycle End Time**" will be enabled. The Historian "Summary" tables include a "*StartDateTime*" and "*EndDateTime*" for each row of data, indication the time period over which the summary/aggregates are calculated. This check box will allow the user to specify which datestamp field Dream Report should use when querying the database.

The **Browse Options** allows the user to specify if Dream Report should **Include System Tags** when browsing the Historian's tags. The **Flat Browse** option enables tag browsing in a simple or "flat" structure, or expose the tags as organized in Historian's tag grouping structure contained under the main ("Public") tag group/folder.

If you wish to test connection to your selected WW Historian server, click on "***Test Connection***" button, and the message box with the appropriate result of test connection will be displayed.

In the "**Data Retrieval Common Parameters**" section, define the rules for specifying the *Quality*, *Data Version* and *Time Zone* for retrieving data from the WW Historian.

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Select Quality Rule - used to specify whether values with certain characteristics are explicitly excluded from consideration by data retrieval:

- *Default* – uses the setting of the *QualityRule* system parameter in AVEVA Historian
- *Good* - data values with uncertain (64) OPC quality are not used in the retrieval calculations and are ignored.
- *Extended* - data values with both good and uncertain OPC quality are used in the retrieval calculations.
- *Optimistic* - calculations that include some good and some NULL values do not cause the overall calculations to return NULL.

Data Version - specify whether to retrieve the originally stored version or the latest version that is available:

- *Default* – uses "Latest". If data has not been updated in the Historian, *Original* and *Latest* are the same
- *Latest* – retrieve the latest available version of a data point
- *Original* – retrieve the originally stored data point

Time Zone – by default the local time of the Dream Report generator will be used. If the Historian is located in another time zone, and you wish to retrieve data relative to that time zone, select the appropriate time zone from the list.

Filter out Quality 133 – from the AVEVA Historian documentation*: If the start date is specified using* >= *(*the default in Dream Report*), then a row is always returned for the specified start date. If the start date/time coincides exactly with a valid value change, then the Quality is normal (0). Otherwise, the (*last known*) value at the start date is returned, and the Quality value is 133.*

It can be useful to filter out Quality 133 so as to avoid retrieving an initial (false) Batch ID tag.

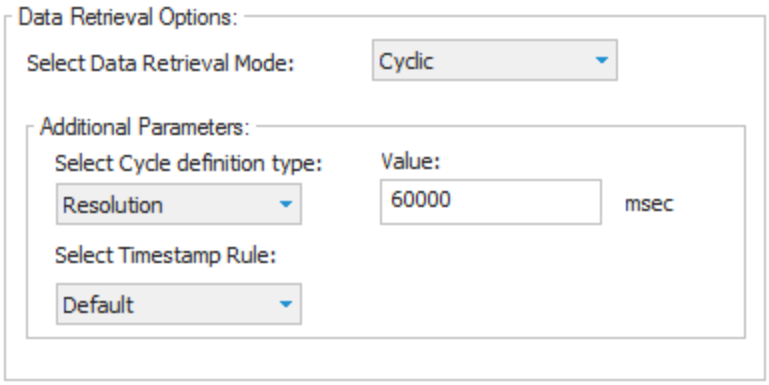
OPC Quality to Include – the Historian OPCQuality parameter is the data quality as reported by the source of that data (e.g., from an OPC Server communication with a PLC). The quality can be *Good*, *Bad*, *Uncertain*, or *Initial Value*. Within *Good*, *Bad* and *Uncertain,* there are several "sub-quality" values. Refer to the [OPCQualityMap] table in the Historian Runtime database. Enter the OPC Quality (numeric) values to include, separated by commas – e.g.: 192,193

QualityDetails to Include – the QualityDetail indicates what happened with data while it was processed by various AVEVA Historian subsystems. Refer to the [QualityMap] table in the Historian Runtime

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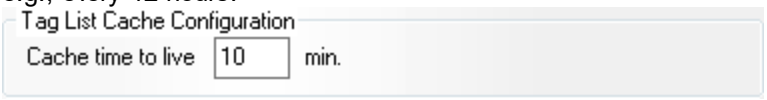
database for available QualityDetails to filter on. A quality detail of 192 is good quality, but there are several others you may want to include – e.g., 192,252,448

In the "**Data Retrieval Options**" section, select an available data "retrieval mode" (i.e., the way the data should be retrieved by this driver from the WW Historian.) These retrieval modes are specific to WW Historian. For example, you can configure the driver to extract the data from Historian in 1 minute "*Cyclic*" intervals, by specifying the following parameters:

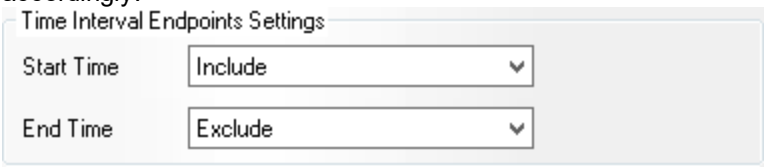


For more information about the data retrieval quality rules and the data retrieval modes, refer to the *"Retrieval Modes*" section of the AVEVA Historian user manual.

In the **Tag List Cache Configuration** section, specify the time interval for Dream Report to check for the latest tag list from AVEVA Historian. Dream Report will then cache the latest list of tags, making for fast browsing of Historian tags from reporting objects. If your Historian is relatively "static" (i.e., its configuration does not change frequently) then you can set the "*Cache time to live*" to a longer interval - e.g., every 12 hours:



In the **Time Interval Endpoints Settings** section, specify how Dream Report will handle start and end times in a query on AVEVA Historian. The defaults are "**Start Time: Include**" and "**End Time: Exclude**" - this implies that the following will be used in the SQL "Where…" expression: .. *DateTime* **>=** *'…' AND DateTime* **<** *'…'* If you wish to include/exclude start or end times, change these settings accordingly:



NOTES:

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Dream Report allows for multiple instances of the AVEVA Historian driver to be configured to the same Historian. This is useful if you need to use Historian's different retrieval modes in a reporting project. **For example**, you might name one instance *Hist_Delta*, defined with "Delta" retrieval mode; one instance *WW_Hist_1minCyc*, defined with "Cyclic - 1 minute" retrieval mode; and one instance *Hist_1dayMax*, defined with "Maximum - 1 day" retrieval mode. All instances will point to the same Historian and will browse the same tag configuration, but at report generation time, the data will be retrieved from the WW Historian using the specified retrieval mode.

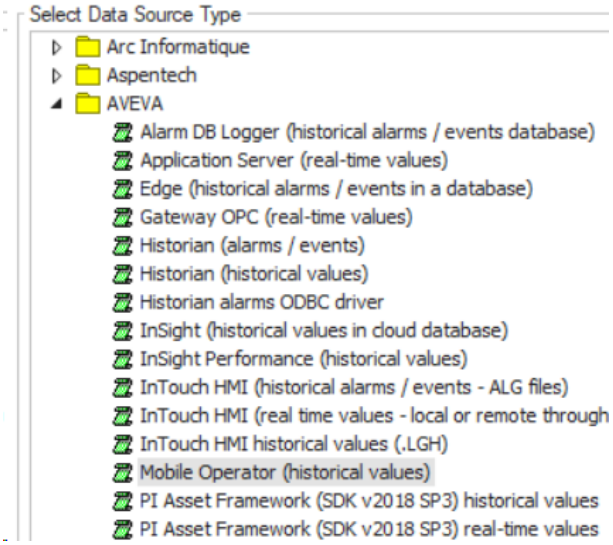
In many cases, it is highly recommended that you take advantage of Historian's retrieval modes to "pre-process" the data, allowing for much faster report generation in Dream Report. For instance, a daily "totalization" report over a month would need to integrate a flow-meter tag on a daily basis for a month. Using a "full" or "cyclic" retrieval mode to extract the data would result in millions of rows of data being returned and needing to be totalized in Dream Report (using the Dream Report "Integral" statistical function.) However, if you configure the Historian driver in Dream Report to use Historian's "Integral" retrieval mode, at 1 Day resolution (86,400,000 msec), Historian will calculate the integrals, and simply return one value per day (i.e., the integral) to Dream Report to report on.

If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "**Select Data Source Type**" field on any other driver and then go back to the driver that you need to configure.

25.2.7 Mobile Operator (Historical Values)

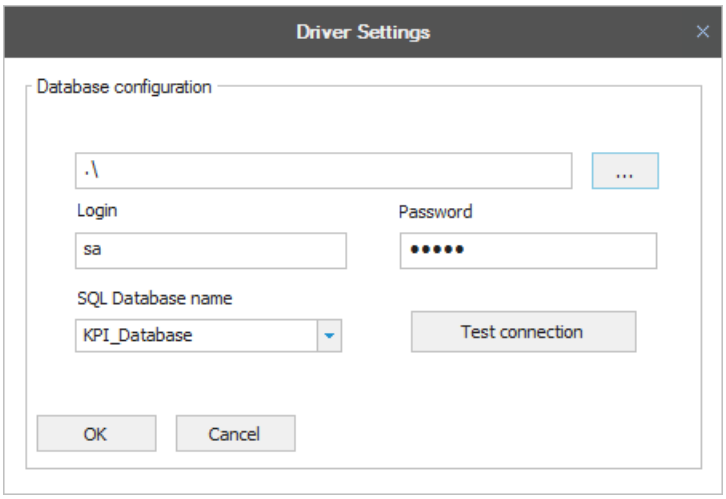
The Mobile Operator (IntelaTrac) driver allows to connect and read the historical values from a local or remote Mobile Operator (IntelaTrac) database.

To configure the Mobile Operator (IntelaTrac) driver, first, open the *Communication Configuration Wizard* dialog window, select the **Mobile Operator** (ex **IntelaTrac) (historical values)** driver under the "*AVEVA*" folder:



Click the *Configure* button, and the following *Driver Settings* window will be opened:

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1. Enter the IP or computer name which contains the Mobile Operator (IntelaTrac) SQL Server database, or click the "[…]" button to browse the network for the database server.
2. Enter the **Login** and **Password** used for SQL Server authentication. Leave those fields blank to use the Windows authentication credentials (the Windows account under which Dream Report runtime is running must have SQL permissions to the IntelaTrac database).
3. Select the **SQL database name** of the Mobile Operator (IntelaTrac) database from the list, and click the "*Test connection*" button to check the connection to the database.

Click the ***"OK"*** button to close the driver configuration window, and return to the **"Communication Configuration Wizard"**. Then enter a unique **"Driver Logical Name"** for this configured data source.

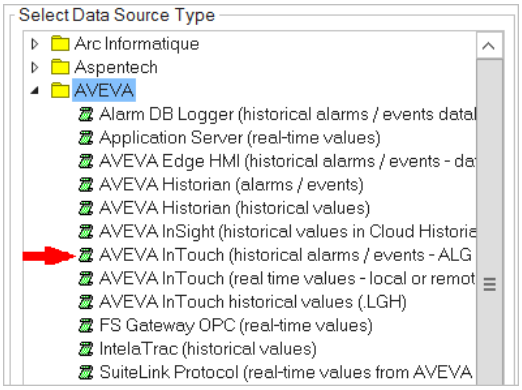
Finally, click the ***"Add"*** button to add this configured instance of the driver to the project's list of data sources, and will appear in the *Defined Drivers* list.

25.2.8 InTouch (Historical Alarms/Events - ALG Files)

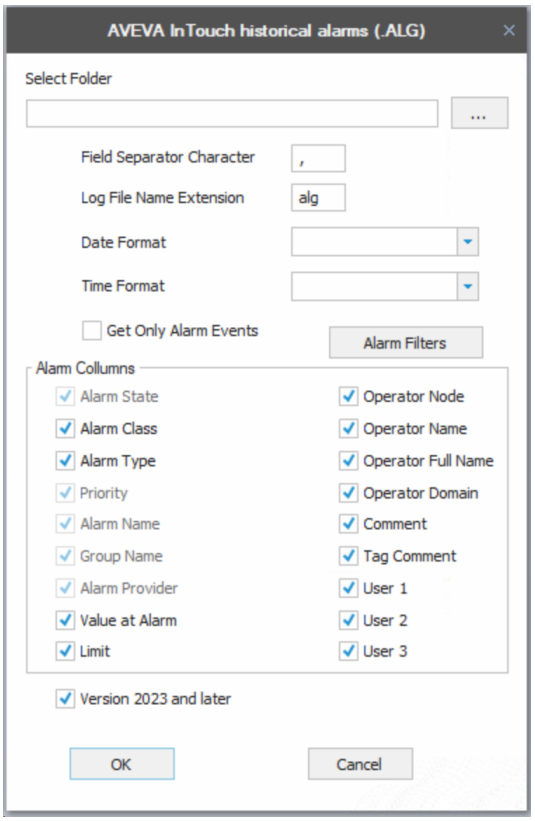
The InTouch ALG driver allows to read the legacy InTouch historical alarms and events from a local ALG files folder.

To configure the InTouch ALG driver, open the *Communication Configuration Wizard* window, and select the **InTouch (historical alarms/events – ALG files** driver under the "AVEVA" folder:

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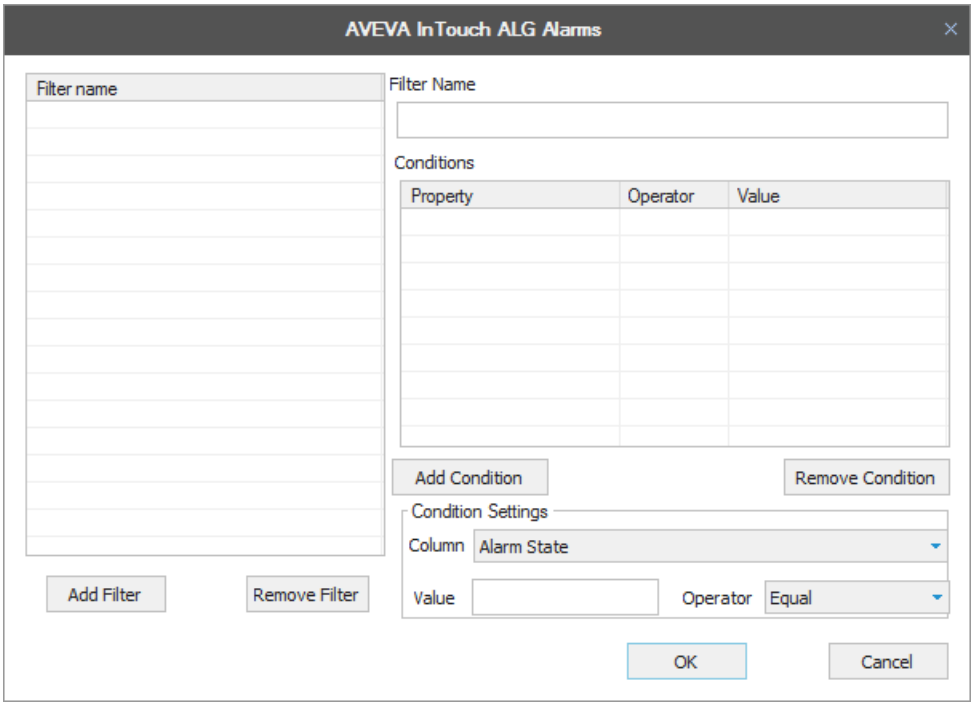
Click the *Configure* button, and the following *AVEVA InTouch historical alarms (ALG)* configuration dialog window will open:



1. **Select Folder**, which contains the ALG alarm log files. Click on the "*[…]*" button to open the browse window.
2. **Field Separator Character** - manually enter the character used for data separation in the ALG files ("**,**" is the default).
3. **Log File Name Extension** - the file name extension defaults to "ALG", and can be changed here if different.
4. Select the **Date Format**, as used in the ALG files.

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5. Select the **Time Format**, as used in the ALG files.
6. **Alarm Columns:** Check the Column titles which exist in the ALG files. Some columns are checked by default, and this configuration can be changed in this window.
7. Please select the option "Version 2023 or later" if you are getting ALG files from AVEVA System Platform 2023 or newer.
8. Click the "**Filters Configure**" button to open the InTouch ALG Filters configuration window, where a user can define alarm *Filters* and alarm filtering *Conditions*, as shown below:



a. Enter a **Filter Name** that describes this specific alarm filter. Next, you will need to specify what **Conditions** (alarm properties) to filter on for this alarm filter.

b. The **Conditions** section lists all properties for this specific alarm filter. The list will initially be blank, so you can define and add conditions in the section below. Please refer to *AVEVA* documentation for a detailed description of all available alarm properties.

c. Choose an alarm table **Column** to filter on. Once selected, enter a numeric value or string to evaluate from the **Condition** list.

d. Click the "***Add Condition***" button to add this condition to the same filter.

e. Click "***Add Filter***" to add this filter to the list of defined **Filter Names**.

Multiple defined *Alarm Filters* (with associated conditions) can be created, that can then be used in an **Alarm Table** object, where the filter(s) can be selected to filter the alarm report as needed.

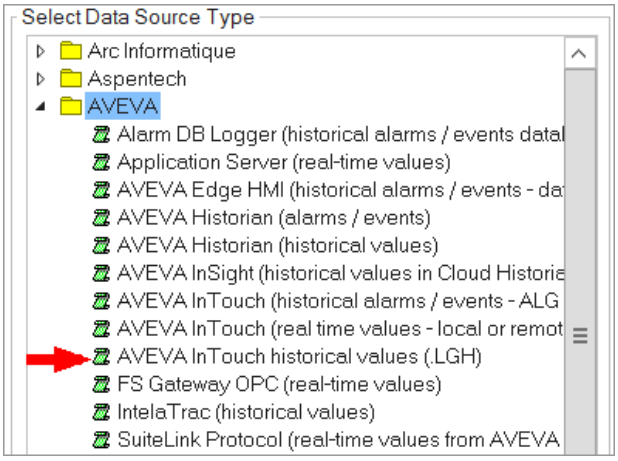
Click the "**OK**" buttons to close the Alarm Filter Configuration window, and the AVEVA InTouch ALG configuration window.

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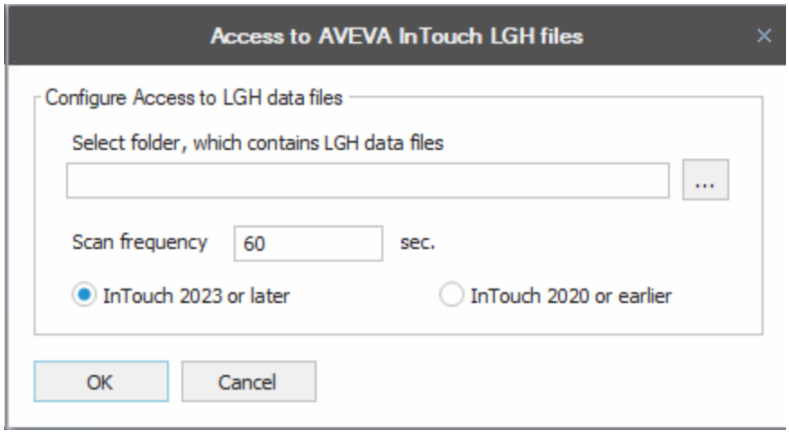
25.2.9 InTouch (Historical Values - LGH Files)

The **InTouch (historical values - LGH files)** driver allows Dream Report to access the InTouch internal proprietary history archive, which is saved in LGH binary files, and report out of that archive, without the necessity of exporting data into an open database. This driver allows connecting to either local or remote LGH historical archives.

To add this driver to the project, select **InTouch (historical values - LGH files)** driver from the list of AVEVA history access drivers in the **AVEVA** folder of the Select Data Source Type section (please see the following image):



Then button "*Configure*" will become enabled. Click on "*Configure*" button, and the following driver configuration window will be opened:



In the **Access to AVEVA LGH files** dialog window, browse or enter the path containing the LGH files. By default the LGH path will be empty. If real-time InTouch driver is enabled and configured in the project, then the default path to LGH files will be taken as follows: "***<InTouch project path>/LGH***".
If a user will click on the "…" button in the "**Configure Access to LGH data files**" section, then the standard "Select folder" dialog window will be opened (it will be the same as the one which is opened when a user clicks on the button to browse for an InTouch project).

Important Note:

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Dream Report will create a sub-directory under the Dream Report project folder named *\LghCfg_<name of configured LGH driver>*. This directory will contain files with an ”sif” extension – these are internal versions of the LGH files that Dream Report creates to facilitate fast access to the data for reporting. These files will typically use an equivalent amount of hard drive space as the LGH files, so consider this when planning storage requirements on the Dream Report machine.

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Tag Browser

When opening the history tag browser for the first time, the driver will get the list of all tags and save it in a static tag array. Then, when another call to get a browse of the list of tags will come, the driver will return immediately the ready content of the tag array. This array will be kept until the driver "Shut()" function is called.

Data extraction

When the request to get the list of values arrives from the History Manager, the driver will open appropriate LGH files, will extract all values of the specified tag for the specific period of time, and will return it.

Following the common design of all Dream Report data access drivers, when extracting all tag values from the LGH archive, the driver will fill the values vector, which is provided by the History Manager, with the maximum of 100 values, and will remove those provided from its internal record set. Then, when the History Manager will call the driver again to receive the next portion (100 values), the driver will just fill the array with the next 100 values and also delete them from its internal record set. This will be called in a loop until the History Manager stops receiving all available values by those 100 values portions. If the amount of extracted values is too big, the driver will extract the maximum of 200,000 values. If this limit is reached, all other remained values will be skipped.

NOTE: Please note that LGH history does not include the string tags.Please also specify the correct version of the LGH files in accordance to AVEVA System Platform version.

25.2.10 InTouch (Real-Time Values - Local or Remote through FS Gateway OPC)

Please refer the *FS Gateway OPC (Real-Time Values)* section of this manual for the information on this driver.

25.2.11 AVEVA Edge Real-Time Values

Prerequisites

After installing Dream Report, only one AVEVA Edge HMI driver - *AVEVA Edge HMI (historical alarms / events - database support)* - will be present in the *Select Data Source Type* list of the *Communication Configuration Wizard*. For AVEVA Edge HMI drivers to be displayed in the list of available drivers, an appropriate AVEVA Edge HMI communications toolkit needs to be copied to the Dream Report *System* folder. Open the *IWS Toolkits* folder in the *System* folder of Dream Report installation (by default *C:\ODS*\Dream Report*System*). Find the toolkit folder that corresponds to your version of AVEVA Edge HMI. Copy all files in that folder and paste them to the *System* folder. After that all drivers to connect to AVEVA Edge HMI will be displayed under *AVEVA* folder of the *Communication Configuration Wizard*.

The *MS SQL Native Client 11* must be installed on the PC where Dream Report resides. If not installed, the install for SQL Native Client 11 is included in the *\ODS*\Dream

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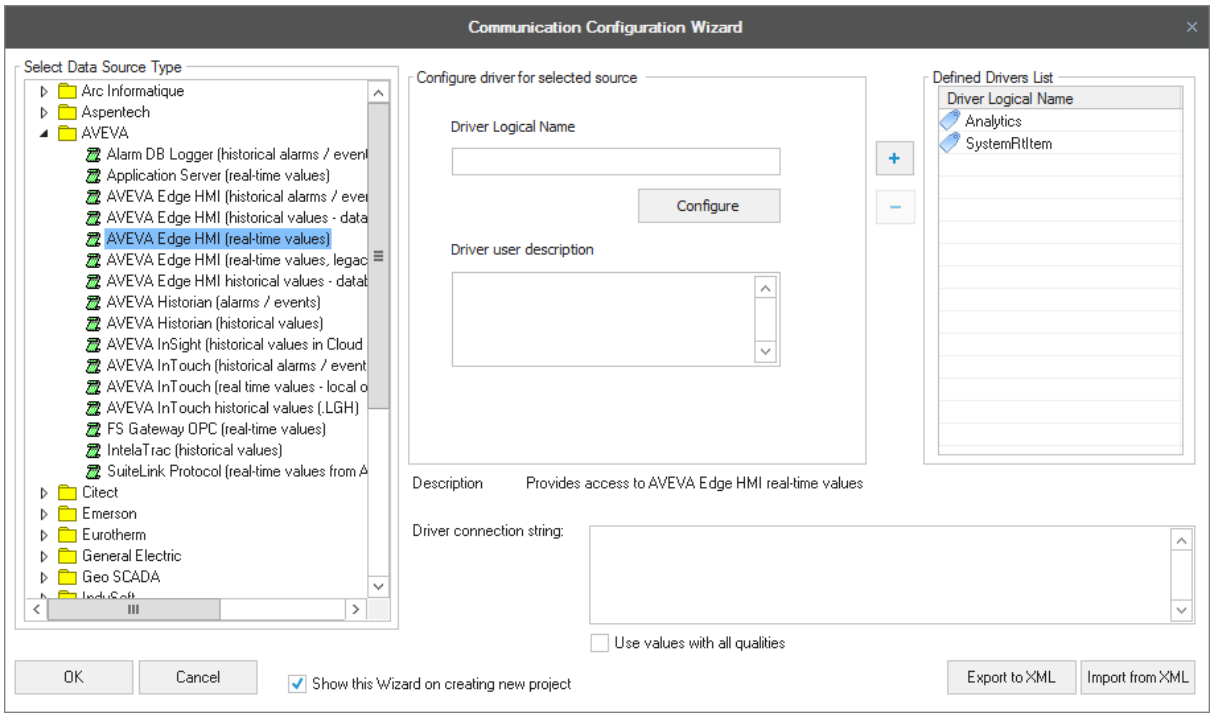
Report*Utilities*\ folder. Please refer to the tech note "SQL Server Requirements for Dream Report – SQL Native Client" for more information.

Additionally, AVEVA Edge HMI needs to be configured properly. Please refer to the tech note "Using Dream Report with AVEVA Edge HMI and InduSoft Web Studio" for more information.

NOTE: The AVEVA Edge HMI legacy drivers are used to communicate with InduSoft versions older than 8.1.2.

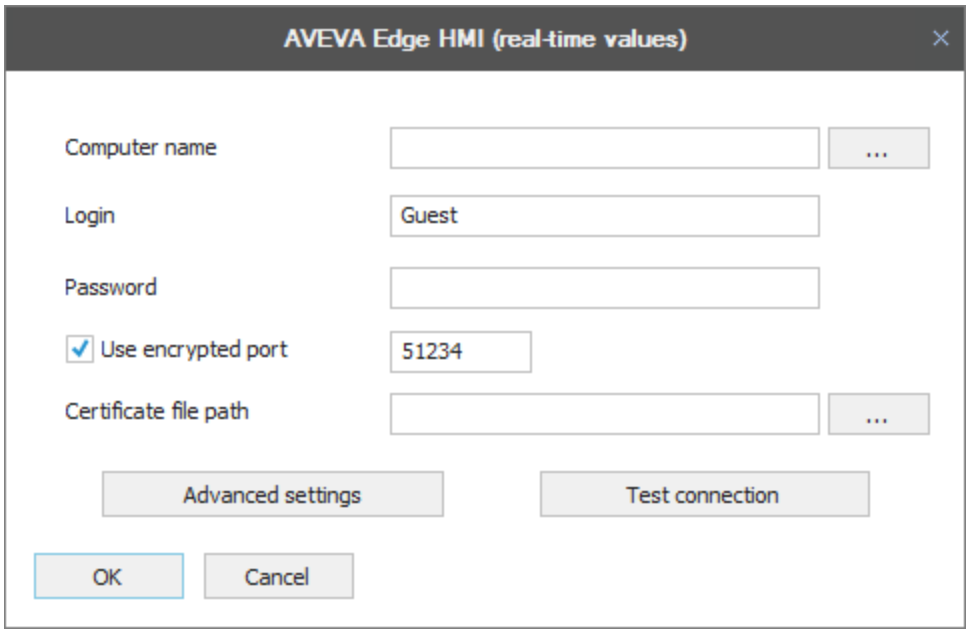
Driver Configuration Settings

Select the *AVEVA Edge HMI (real-time values)* driver, found under the *AVEVA* section of the Dream Report *Communication Configuration Wizard*:



When you click on the *Configure* button of the *Communication Configuration Wizard* , the following configuration window will open:

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Computer name – enter the IP address or the network name of the computer that the AVEVA Edge HMI server is on, click on the […] button to browse computers in the network, or leave empty for local connection.

Login and *Password* - If the server is configured with user authentication – enter the Login and Password that are required for accessing the data.

Use encrypted port – This option is checked by default and set to the default port. Change the port if it defined differently in the AVEVA Edge HMI settings. Uncheck this option if it is unchecked in the AVEVA Edge HMI settings.

Certificate file path – Click on the *[…]* button to pick the certificate file to use for the connection, if needed and defined in the AVEVA Edge HMI settings. By default, the *Auto Trust* option in the AVEVA Edge HMI settings is set to on, and no specific certificate is needed.

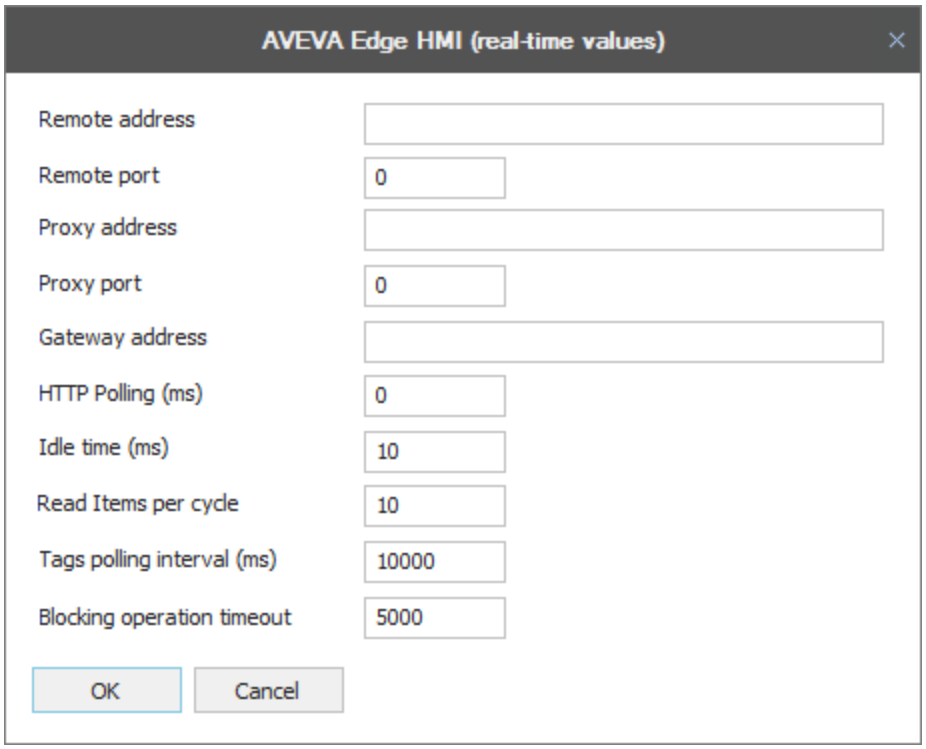
Test connection – Click on this button to test the connection to the server with the current configuration, and display a success or failure result message.

Advanced settings:

There are few additional settings to configure a non-default connection on a remote computer.

Clicking on the *Advanced Settings* button will open the following window:

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Remote address – The IP address or computer name of the server with AVEVA Edge HMI on it.

Remote port – The non-encrypted port for connection.

Proxy address – The IP address or computer name of the proxy server.

Proxy port – The port in which the proxy server is listening.

Gateway address – The IP address or computer name of the gateway.

HTTP Polling – The time in milliseconds for polling.

Data retrieving options:

Idle time – The time in milliseconds

Read Items pet cycle – The number of Items read per cycle.

Tag polling interval – The time between polling requests.

Blocking operation timeout – Timeout period for a blocking operation.

Press *OK* to save the configuration.

IMPORTANT NOTES:

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- AVEVA Edge HMI driver Native Drivers require installation of the Microsoft Visual C++ Redistributable 2012 x86 that can be downloaded from the official Microsoft web site

25.2.12 AVEVA Edge Historical Values

Prerequisites

After installing Dream Report, only one AVEVA Edge HMI driver - *AVEVA Edge HMI (historical alarms / events - database support)* - will be present in the *Select Data Source Type* list of the *Communication Configuration Wizard*. For AVEVA Edge HMI drivers to be displayed in the list of available drivers, an appropriate AVEVA Edge HMI communications toolkit needs to be copied to the Dream Report *System* folder. Open the *IWS Toolkits* folder in the *System* folder of Dream Report installation (by default *C:\ODS*\Dream Report*System*). Find the toolkit folder that corresponds to your version of AVEVA Edge HMI. Copy all files in that folder and paste them to the *System* folder. After that all drivers to connect to AVEVA Edge HMI will be displayed under *AVEVA* folder of the *Communication Configuration Wizard*.

The *MS SQL Native Client 11* must be installed on the PC where Dream Report resides. If not installed, the install for SQL Native Client 11 is included in the *\ODS*\Dream Report*Utilities*\ folder. Please refer to the tech note "SQL Server Requirements for Dream Report – SQL Native Client" for more information.

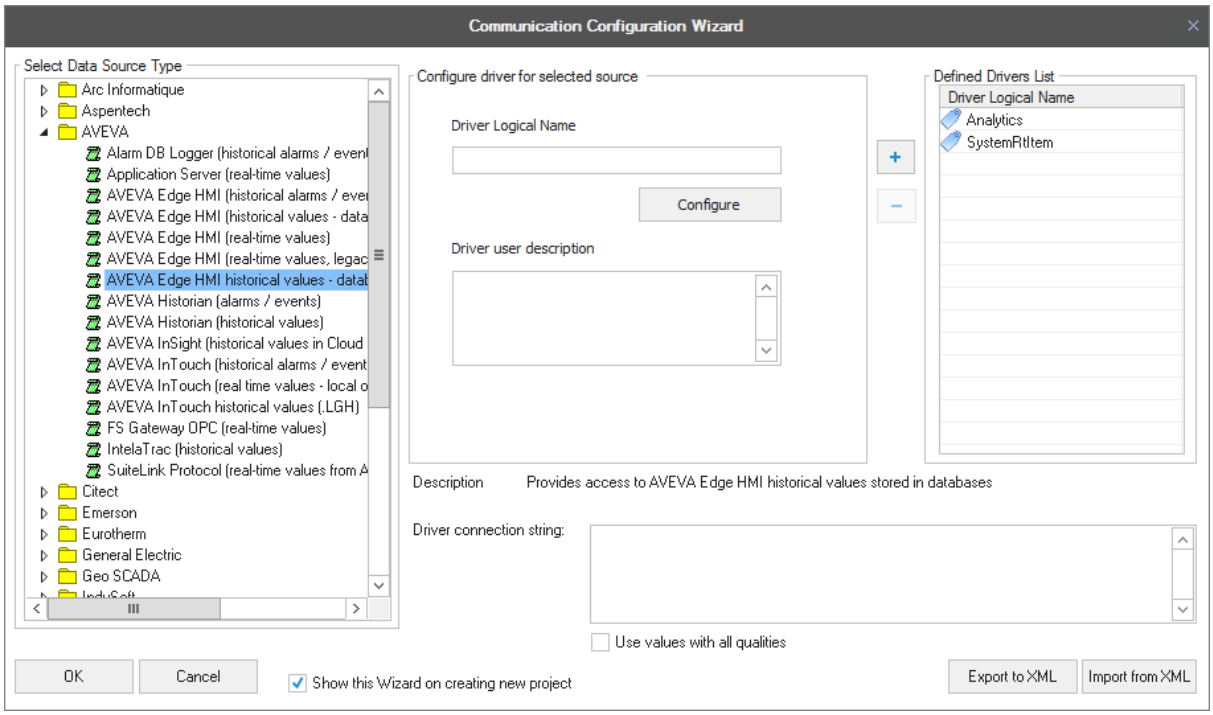
Additionally, AVEVA Edge HMI needs to be configured properly. Please refer to the tech note "Using Dream Report with AVEVA Edge HMI and InduSoft Web Studio" for more information.

NOTE: The AVEVA Edge HMI legacy drivers are used to communicate with InduSoft versions older than 8.1.2.

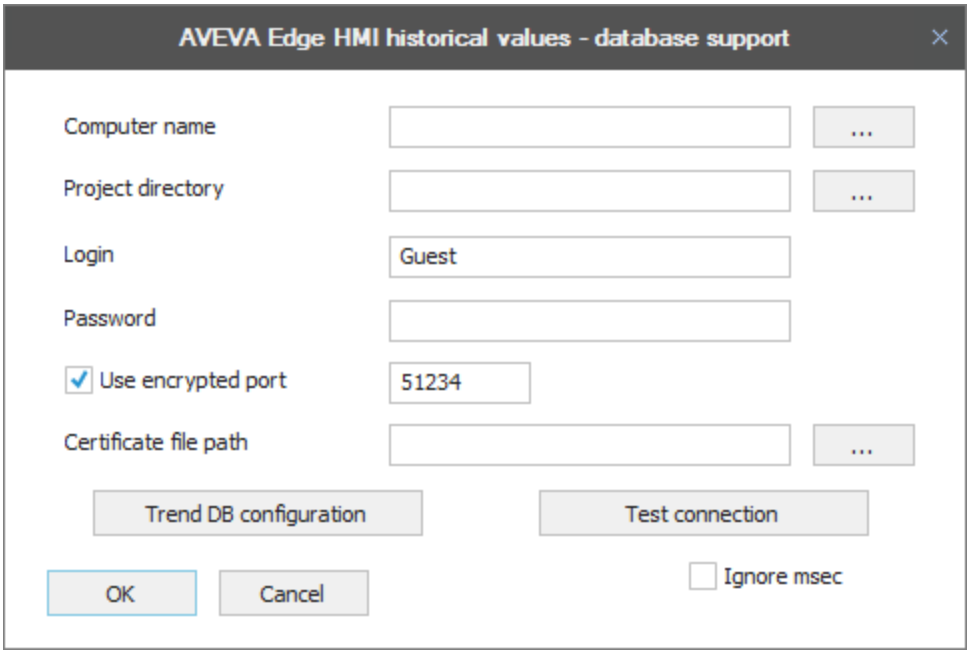
Driver Configuration Settings

Select the *AVEVA Edge HMI (historical values - database support)* driver, found under the *AVEVA* section of the Dream Report *Communication Configuration Wizard*:

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When you click on *Configure* button of the *Communication Configuration Wizard*, the following configuration window will open:



Computer name – enter the IP address or the network name of the computer that the AVEVA Edge HMI server is on, click on the *[…]* button to browse computers in the network, leave empty for local connection.

Project directory – Click *[…]* to browse for the AVEVA Edge HMI project path.

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Login and *Password* - If the server is configured with user authentication – enter the Login and Password that are required for accessing the data.

Use encrypted port – This option is checked by default and set to the default port. Change the port if it defined differently in the AVEVA Edge HMI settings. Uncheck this option if it unchecked in the AVEVA Edge HMI settings.

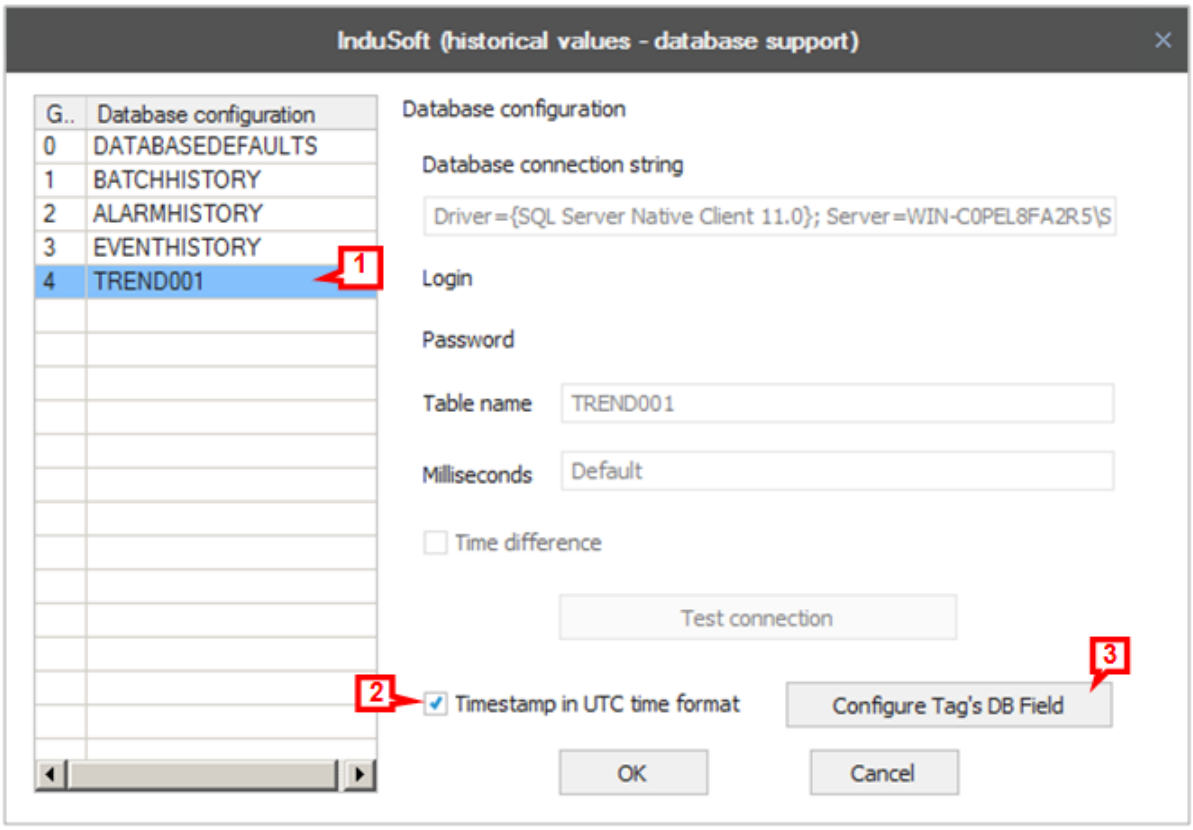
Certificate file path – Click on the *[…]* button to pick the certificate file to use for the connection, if needed and defined in the AVEVA Edge HMI settings. By default, the *Auto Trust* option in the AVEVA Edge HMI settings is on, and no specific certificate is needed.

Test connection – Click on this button to test the connection to the server with the current configuration, and display a success or failure result message.

Trend Database (DB) configuration:

After specifying the Project directory, click on the *Trend DB configuration* button, the following window will be opened:

NOTE: If the project directory path will be incorrect or missing, clicking on the button will present an error message.



In this window presents all the database details as they were configured in the AVEVA Edge HMI server.

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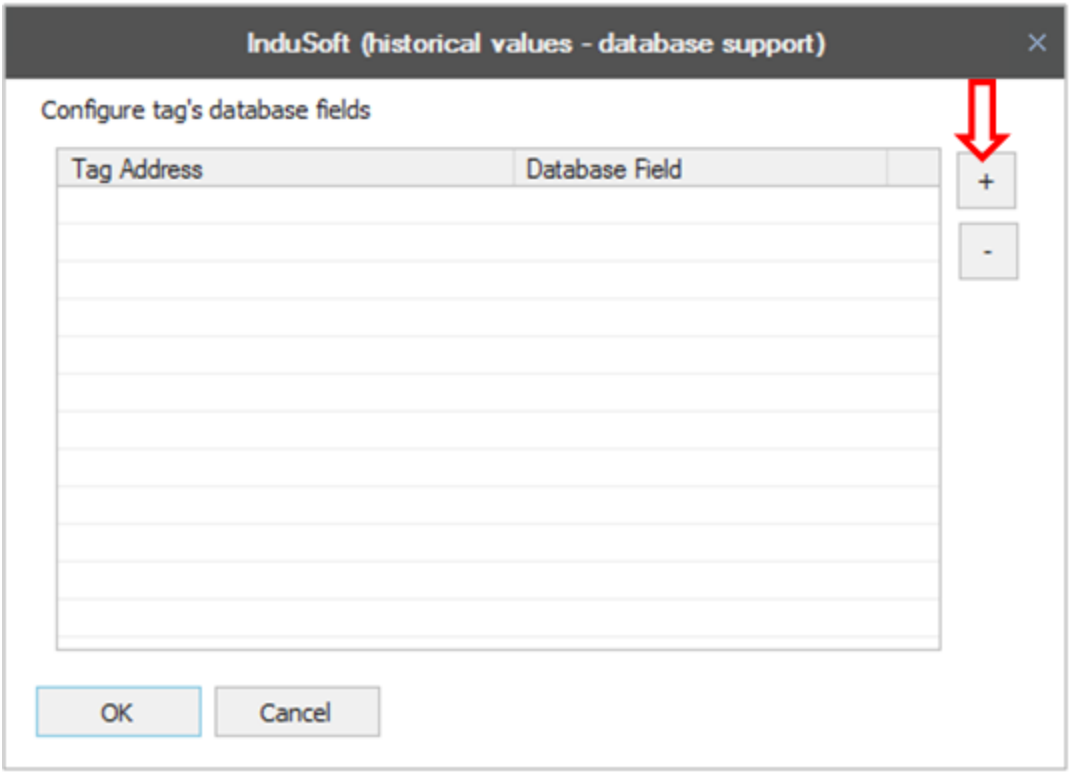
1. Click on the table name from the list on the left to see its details on the right.

NOTE: If the table settings are set to default in the AVEVA Edge HMI server, they cannot be changed from the Dream Report configuration window.

2. *Timestamp in UTC time format* – This option is checked by default. Uncheck this option if it is unchecked at the AVEVA Edge HMI settings.

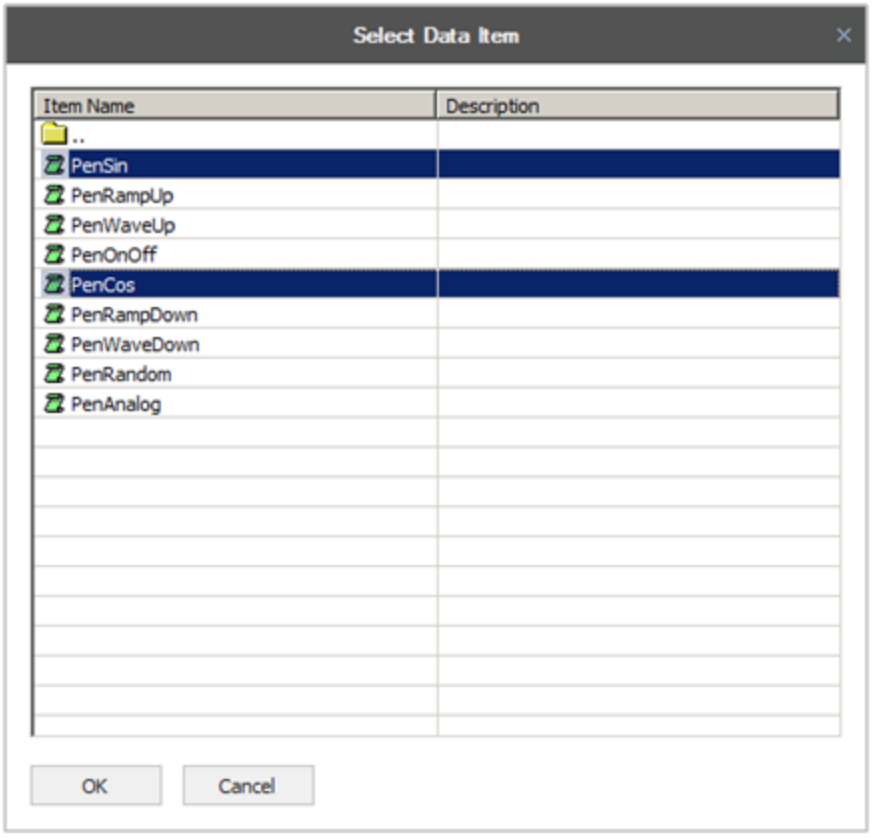
3. *Configure Tag's DB Field*:

When the tags have different names assigned to them in the database table in the AVEVA Edge HMI project, Dream Report can't read them automatically and you will have to enter them manually.



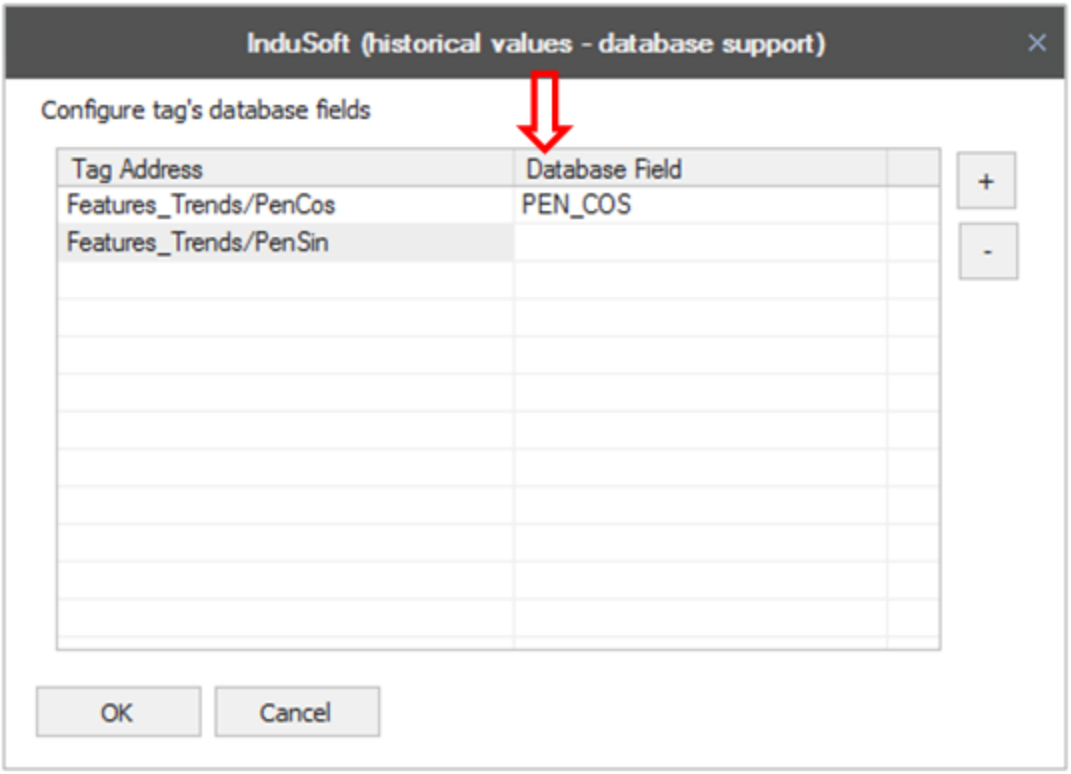
Click on the *[+]* button to browse and pick the tags that has Database Fields assigned to them at the AVEVA Edge HMI server:

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Then, click *OK*. The selected tags will be added to the list. Click on the empty textbox and write the field name as it appears in the AVEVA Edge HMI server:

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Click *OK* to save and exit.

IMPORTANT NOTES:

- AVEVA Edge HMI driver Native Drivers require installation of the Microsoft Visual C++ Redistributable 2012 x86 that can be downloaded from the official Microsoft web site

25.2.13 AVEVA Edge Historical Alarms/Events

Prerequisites

The *MS SQL Native Client 11* must be installed on the PC where Dream Report resides. If not installed, the install for SQL Native Client 11 is included in the *ODS*\Dream Report*Utilities*\ folder. Please refer to the tech note "SQL Server Requirements for Dream Report – SQL Native Client" for more information.

Additionally, AVEVA Edge HMI needs to be configured properly. Please refer to the tech note "Using Dream Report with AVEVA Edge HMI and InduSoft Web Studio" for more information.

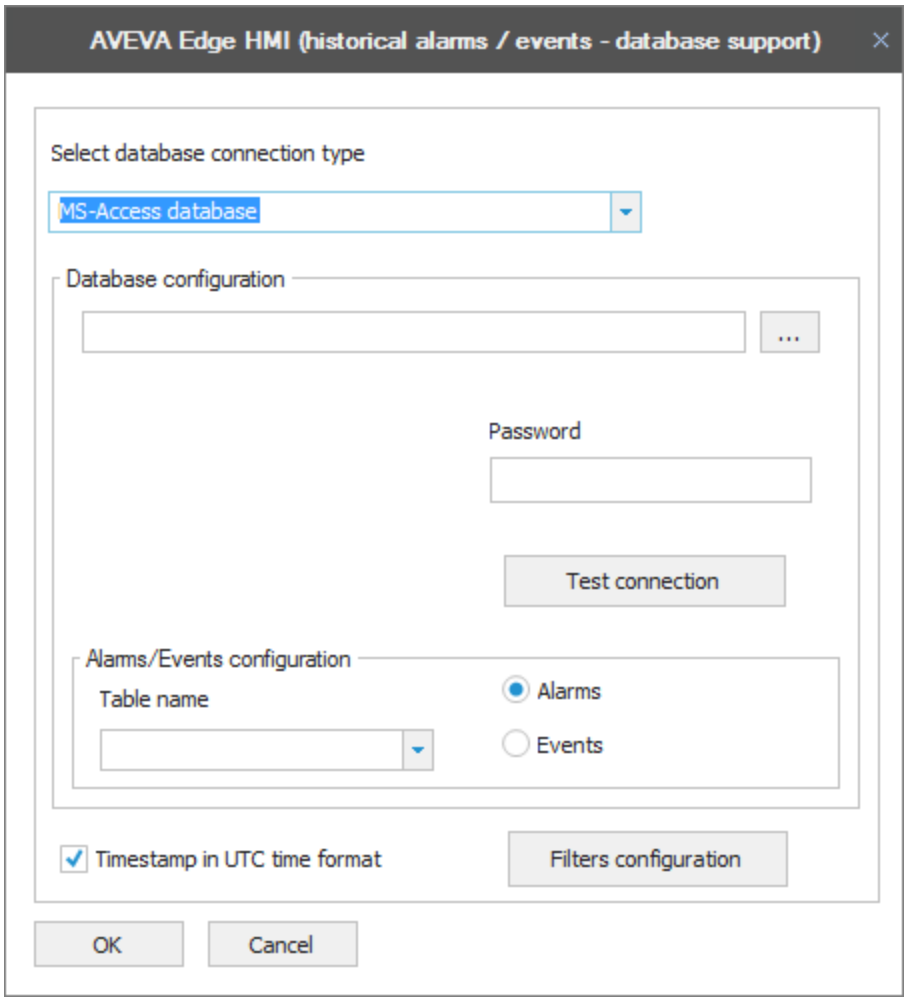
Driver Configuration Settings

Click on the *Configure* button of the *Communication Configuration Wizard* to open the configuration window.

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There are three database connection types, the configuration is slightly different for each:

MS-Access database



Database configuration:

Click on the *[…]* button to browse for the access file in your computer. (with the .mdb extension)

If the file is secured by a password, enter it in the *Password* field.

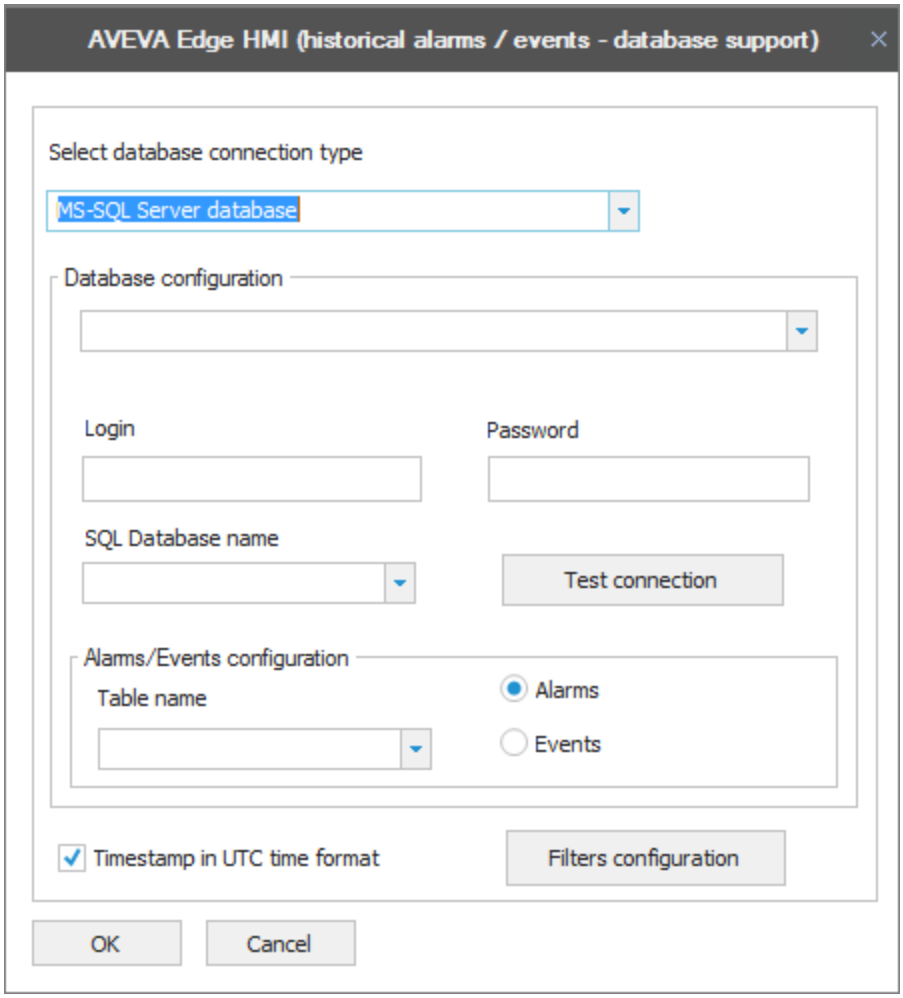
Click the *Test connection* button to let Dream Report to try accessing the file.

Pick the specific table from the *Table Name* list.

Pick if you want the data to be presented as *Alarms* or *Events*.

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MS-SQL Server database



Database configuration:

Click on the down arrow button to select a SQL server from your computer. (or fill in the box manually)

If a *Login* and *Password* needed, enter them in the fields.

Pick the specific database from the list.

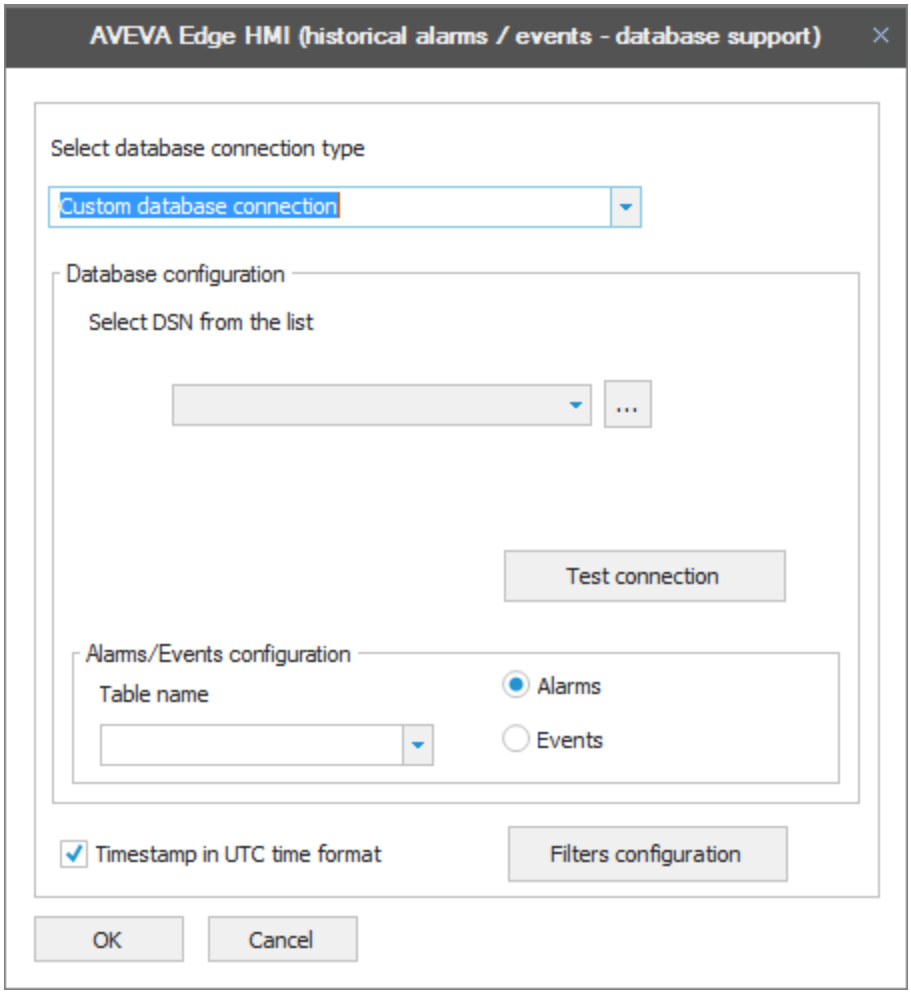
Click the *Test connection* button to let Dream Report to try accessing the file.

Pick the specific table from the *Table Name* list.

Pick if you want the data to be presented as *Alarms* or *Events*.

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Custom database connection



Database configuration:

Click on the down arrow to select a DNS from the predefined list, or click on the *[…]* button to open the DSN manager and add a new configuration.

Click the *Test connection* button to let Dream Report to try accessing the file.

Pick the specific table from the *Table Name* list.

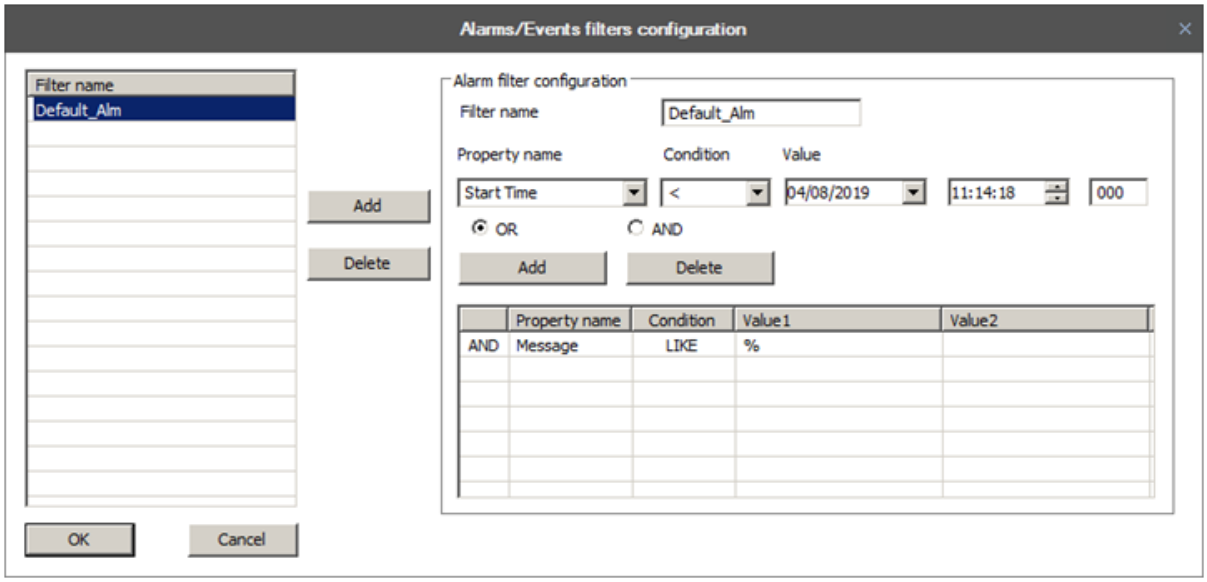
Pick if you want the data to be presented as *Alarms* or *Events*.

Timestamp in UTC time format – This option is checked by default. Uncheck this option if it is unchecked in the AVEVA Edge HMI settings.

Click the *Filters configuration* if you wish to “pre-filter” this instance of the driver with specific alarms or events. The

following configuration window will open:

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Multiple filters can be defined, with each filter definition being comprised of one or more filter conditions. You can add additional filters by doing the following:

Under the *Alarm filter Configuration* section, enter a new *Filter Name*, and then click the *Add* button.

Select the *Filter Name* on the left panel, and then add a filter *Property*, setting any relevant condition(s) for that property

Select *OR* or *AND* depending on the logic to be evaluated for this specific filter.

Click the *Add* button (in the *Filter Configuration*) section to add the condition to this filter.

Repeat steps 1-4 to add additional condition(s) to this filter definition.

When finished, click *OK* to save the Alarm (or Event) filters.

Click *OK* again to save the driver configuration and close the window.

IMPORTANT NOTES:

- AVEVA Edge HMI driver Native Drivers require installation of the Microsoft Visual C++ Redistributable 2012 x86 that can be downloaded from the official Microsoft web site

25.2.14 SuiteLink Protocol Driver

The **SuiteLink protocol over TCP/IP** communication driver enables users to connect to SuiteLink-enabled AVEVA products either locally or remotely and to extract real-time data, using the AVEVA SuiteLink communications protocol. It is the appropriate choice when connecting to **AVEVA InTouch** (traditional applications) and any **AVEVA DA Servers**.

IMPORTANT NOTE: The AVEVA **SuiteLink protocol over TCP/IP** driver requires the following AVEVA components to be installed on the Dream Report machine:

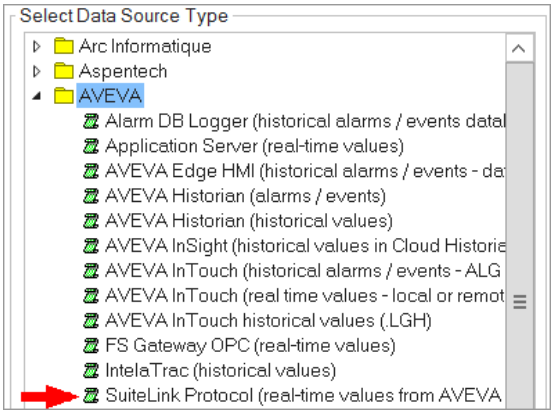
- AVEVA Tag Browser

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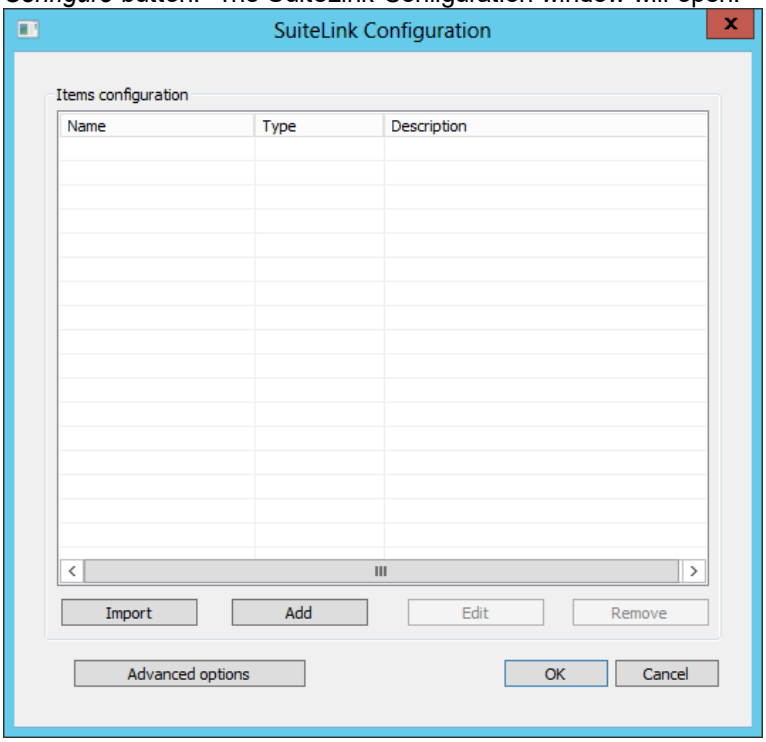
- AVEVA SuiteLink protocol

If Dream Report is installed on a machine without these requisite components, the easiest way to add them is to install AVEVA *FactorySuite Gateway* ("FSGateway"), which can be downloaded from the AVEVA website.

To configure SuiteLink driver, open the "Communication Configuration Wizard" dialog window and select the **SuiteLink Protocol over TCP/IP** driver from the list of AVEVA history access drivers in the *AVEVA* folder of the "Select Data Source Type" section:



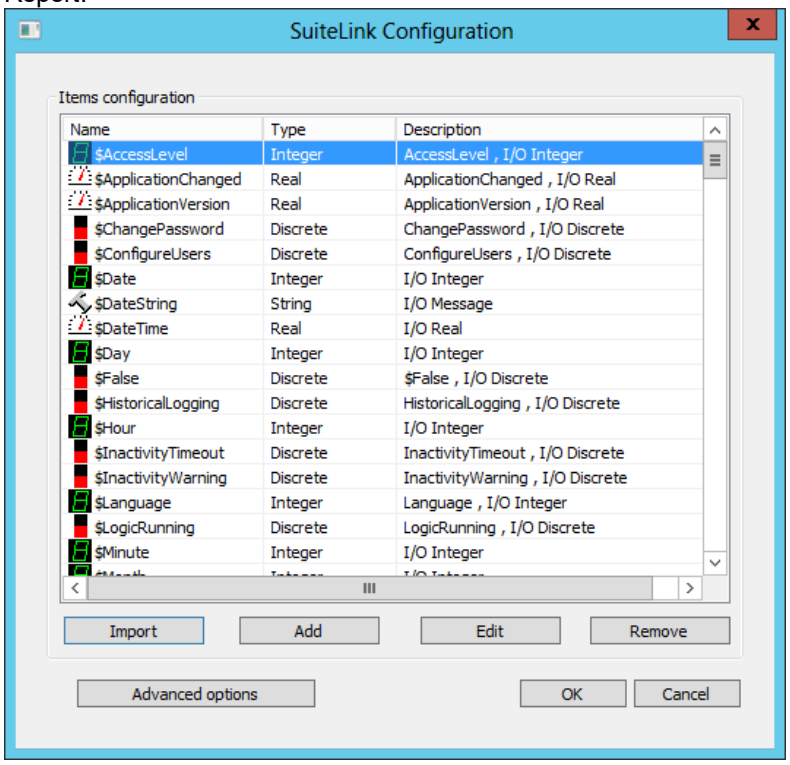
Configure *SuiteLink Protocol over TCP/IP* driver in the **SuiteLink Configuration** dialog box by clicking *Configure* button. The SuiteLink Configuration window will open:



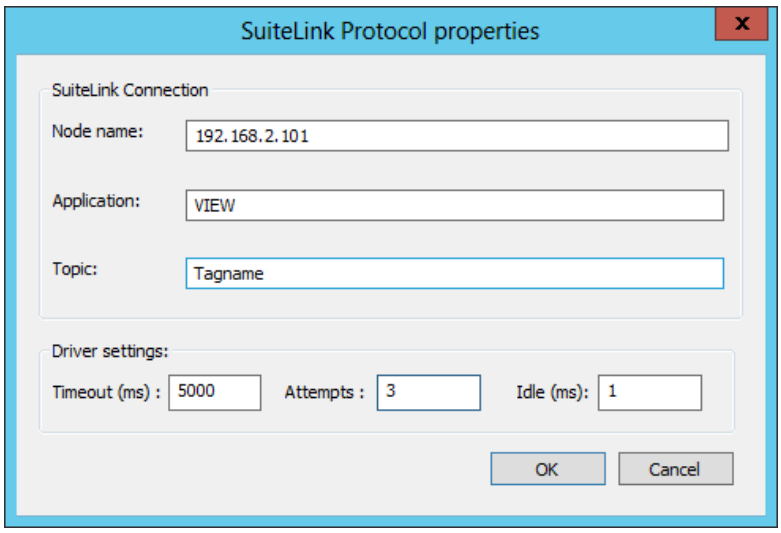
Importing InTouch Tags via a SuiteLink connection

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Click the "*Import*" button (as shown above) and select an appropriate folder (local or remote) with an InTouch project – the list of tags from the InTouch application will be listed and imported into Dream Report:



If the InTouch application is on a remote PC (from the Dream Report machine), click the "*Advanced Options*" button, and specify the **Node name** (or IP address) where InTouch is running:

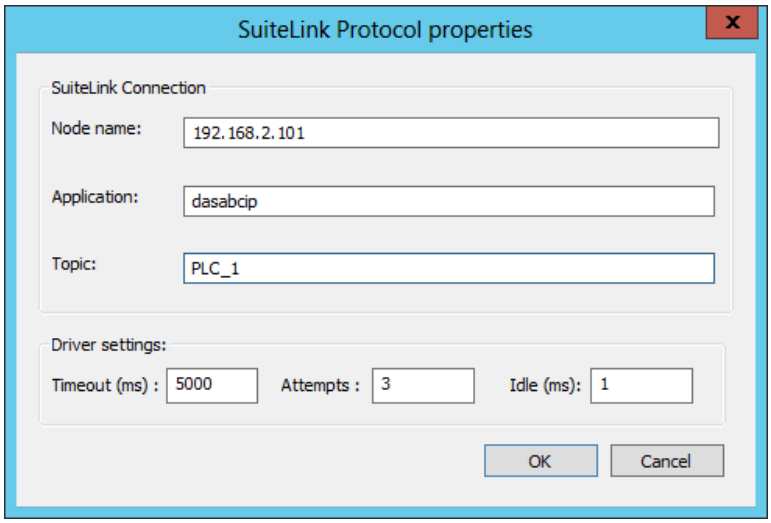


Communicating with Any Other SuiteLink Data Source

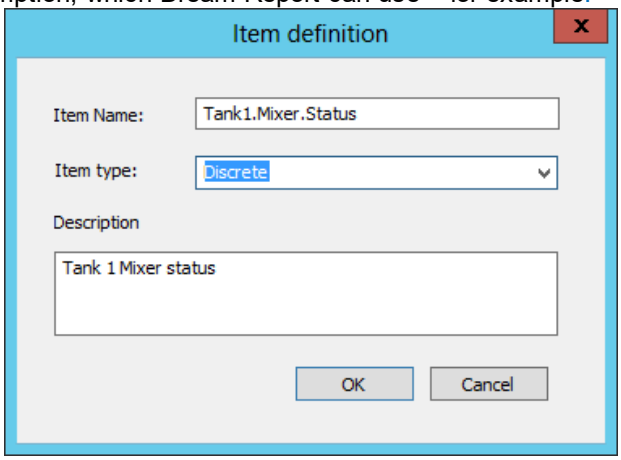
The **SuiteLink Protocol over TCP/IP** driver can be configured to communicate with any other SuiteLink-based product, such as AVEVA DA or OI Servers, the Historian IOServer Service, FSGateway, etc.

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To configure the **SuiteLink Protocol over TCP/IP** driver, click the "*Advanced Options*" button, and enter the *Node Name* (or IP Address), the *Application* name (the name of the application executable, such as *dasabcip*, *aahiosvrsvc*, etc.) and the specific *Topic* name (sometime called "Group Name") configured in the SuiteLink product. For example, enter the location, executable name and topic for a AVEVA DASABCIP DA Server, set any driver communication "tuning" settings (not typically needed), and then click "**OK**":

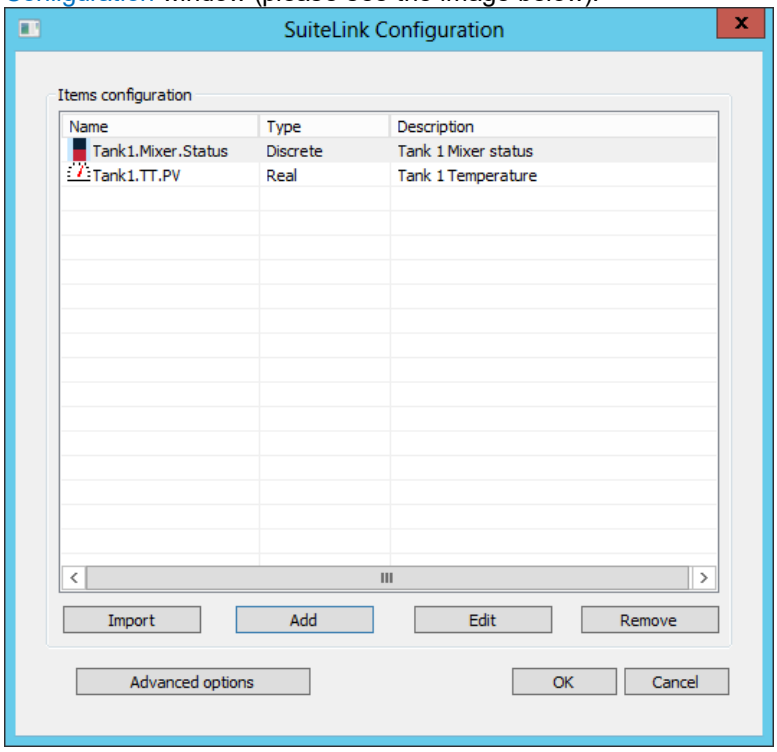


Next, we need to manually configure the data items in the communication driver. Unlike with the InTouch tag import, Dream Report requires the user to manually add items to the driver. To do this, click the "*Add*" button on the main **SuiteLink Configuration** window, and manually enter the item name, exactly as it is configured in the data source (case sensitive!), as well as the data type, and optionally, as description, which Dream Report can use – for example:



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Click "*OK*" to add the defined item/ tag to the "***Items Configuration***" definition of the SuiteLink Configuration window (please see the image below):



Using the "*Add*" button, add as many items as will be needed in the Dream Report application. has been defined. You can also Edit or *Remove* items using the appropriate button.

Click "*OK*" to close the WW SuiteLink Configuration window.

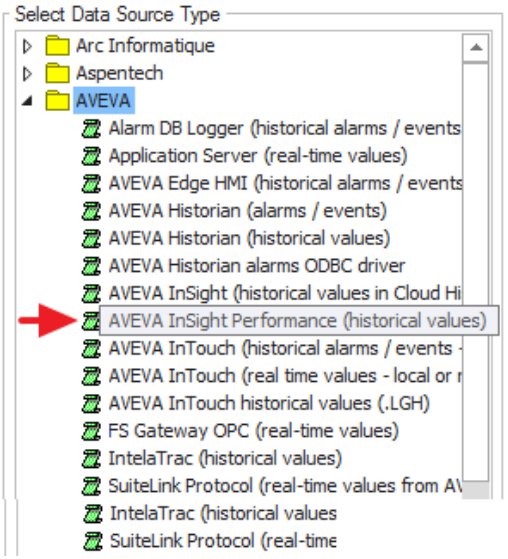
25.2.15 AVEVA InSight Performance

The *AVEVA InSight Performance*

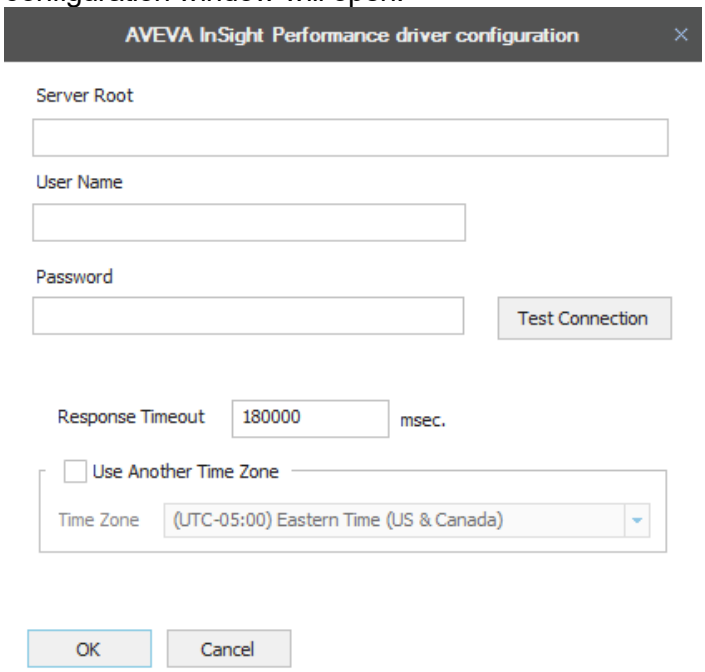
(historical values) driver enables users to directly access AVEVA™ Insight - Performance-based asset utilization and operational performance data.

In the *Communication Configuration Wizard*, select ***AVEVA InSight Performance*** driver from the *AVEVA* folder of the *Select Data Source Type* section:

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Click the *Configure* button to set up the driver configuration, and the *InSight Performance* configuration window will open:



Server Root: https://online.wonderware.com/s/**7a124abf8-f11d-23fe-550b-3f1bc8a25**/apis/mes/odata
<< for example >>

The *Server Root* (i.e., the URL for your specific InSight Performance historian) is dependent on the InSight Historian "Solution" you are connecting to. The Solution is identified by a unique string in the URL, specific to your InSight Performance Historian. In the above example, the specific Solution is identified by the string shown in **bold** text.

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NOTE that this must then be followed by **/apis/mes/odata** The steps to determine the URL for your specific InSight Performance server are detailed at the end of this section.

User Name: typically, the email address (or user name) associated with the InSight Historian

Password: associated password (it is recommended that the User Name and Password used for the InSight website are used)

Response Timeout: Maximum time (in milliseconds) that the driver will wait for a response from InSight when making a connection attempt

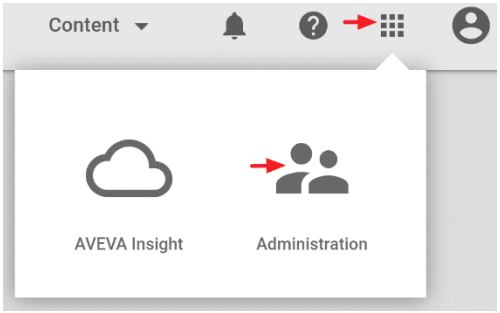
Use Another Time Zone: If the Dream Report server is in a different time zone from that where the InSight data was logged, select the specific time zone, so ensure that the data is time-offset appropriately.

Determining the AVEVA Online InSight Historian URL to Use

As mentioned above, every user's InSight Historian will require a specific URL, based on the *Solution* being referenced in the Online Historian. A Solution is a configuration in AVEVA Online InSight that specifies a set of tags and metrics, from one or more data sources, that can be accessed by one or more defined users. A customer might define multiple Solutions in their InSight system, based on plant locations, processes, user groups, etc. As such, when configuring instances of the AVEVA InSight historical values driver in Dream Report, each instance will need the specific URL of the AVEVA Solution to which you wish to connect.

To determine the URL to use, follow these steps on the AVEVA InSight website:

- Open a browser and go to the following website: online.wonderware.com
- Sign in with your AVEVA Online credentials
- At the welcome page, select which *Solution* you want to connect to with the Dream Report InSight communication driver
-



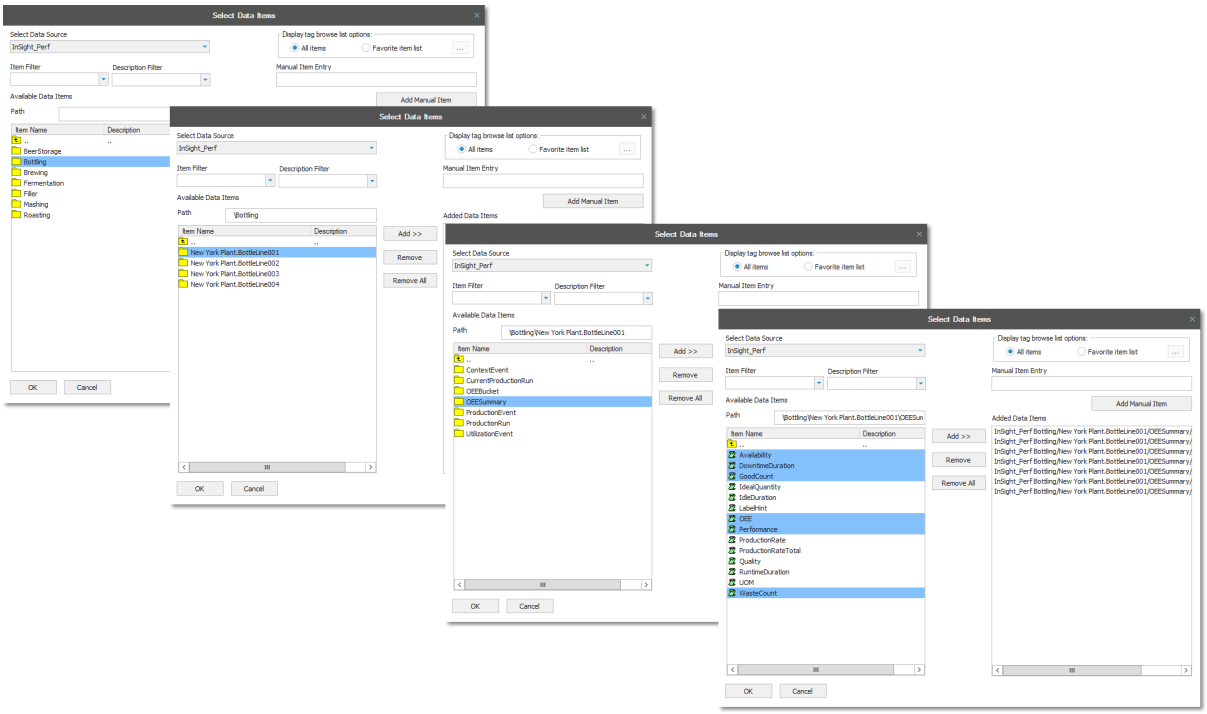
- In the top-right of the AVEVA InSight web page, select the *AVEVA InSight Suite* icon, and then click *Administration*:
- On the *Administration* page, click the *REST API* link on the *Integration Settings* icon

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- At the very bottom of the *Historian Data REST API* screen, expand the *Basic Authentication* section - you will then see the *URL* (Endpoint). Copy this URL to use for your AVEVA Solution and paste it into the *InSight Performance* driver configuration in Dream Report
- Finally, delete the /Historian/v2/ part of the URL, and replace it with **/mes/odata** – this indicates that the solution should provide InSight Performance data (and not the process historian data).

Using the InSight Performance Driver in a Report

The InSight Performance data can be used in any reporting object (single calculations, tables, line charts, bar graphs, etc.) Under the *Data Definition* section of an object, select *External History Server*, then select the configured instance of the InSight Performance Driver, and then click through the folder structure to expose the assets, performance metrics, and then individual calculations:



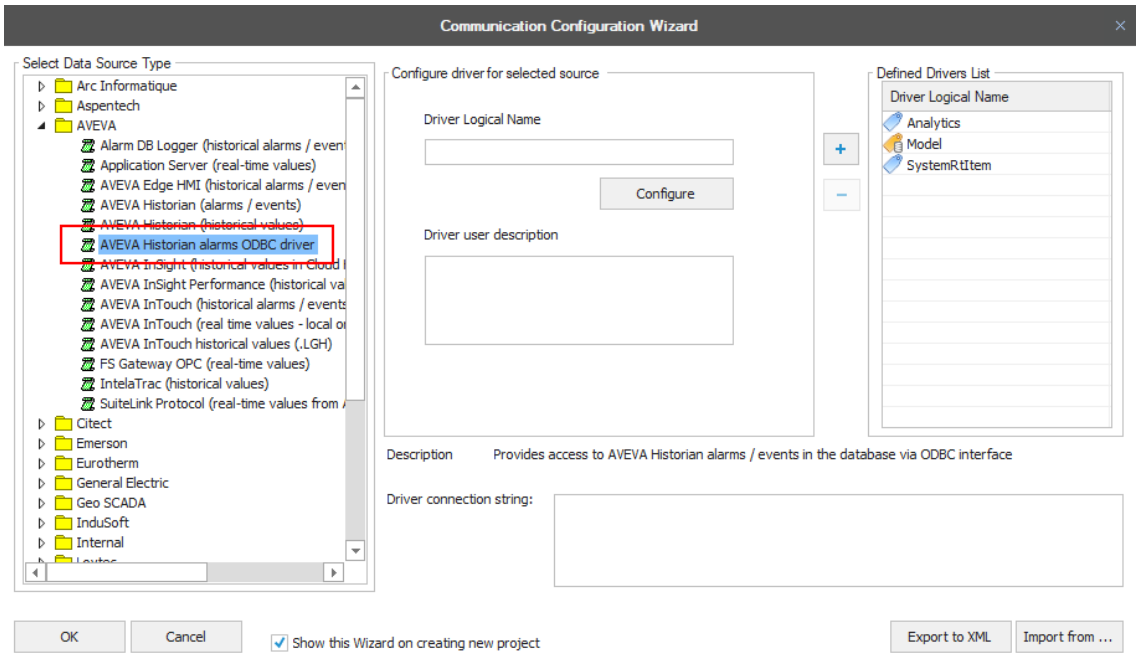
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25.2.16 AVEVA Historian (Historical Alarms ODBC based Driver)

AVEVA Historian Historical Alarms based on ODBC

The *AVEVA Historian Historical Alarms ODBC* driver allows connecting to a local or remote AVEVA Historian (that is configured to store alarms and events in its history blocks) over an ODBC connection. By connecting to the Historian's SQL Server *Runtime* database, you can extract alarms and events, and provide them for reporting. The *Runtime* database is a database interface to alarms and events stored in AVEVA Historian.

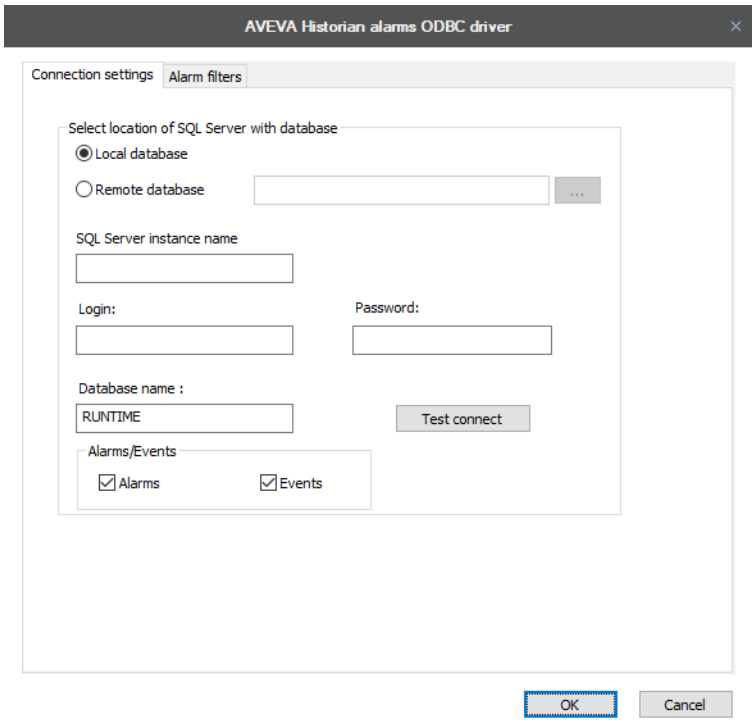
To add this driver to the project, select *AVEVA Historian Alarms ODBC driver* from the list of drivers in the AVEVA folder of the "Select Data Source Type" section:



General Connection Settings

In *Connection Settings* window, you can specify connection details to the *Runtime* database (AVEVA Alarms Database Interface to AVEVA Historian Blocks). The connection to the Runtime database can be configured either by using the SQL Server database locally (Local database) or remotely (Remote database).

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Local or Remote Database – specify if the SQL Server with the *Runtime* database is on the same server/machine as Dream Report, or on a remote server. If a remote server, then specify the name or IP address of remote server where AVEVA Historian is installed.

SQL Server Instance Name – specify the name of the SQL server with Runtime database, only if a named instance of SQL Server or SQL Express is being used.

Login – if the SQL server hosting the Runtime database is configured with SQL-based user authentication, enter the *Login* (user name) for the SQL Server into the corresponding edit box. If your SQL Server is configured with Windows Authentication mode, leave the Login edit boxes empty – it will then use the Windows account under which Dream Report is running. Note: that Windows account must have the appropriate access rights to the SQL Server and the *Runtime* database.

Password – if the SQL server hosting the Runtime database is configured with SQL-based user authentication, enter the *Password* for the SQL Server into the corresponding edit box. If your SQL Server is configured with Windows Authentication mode, leave the Password edit box empty.

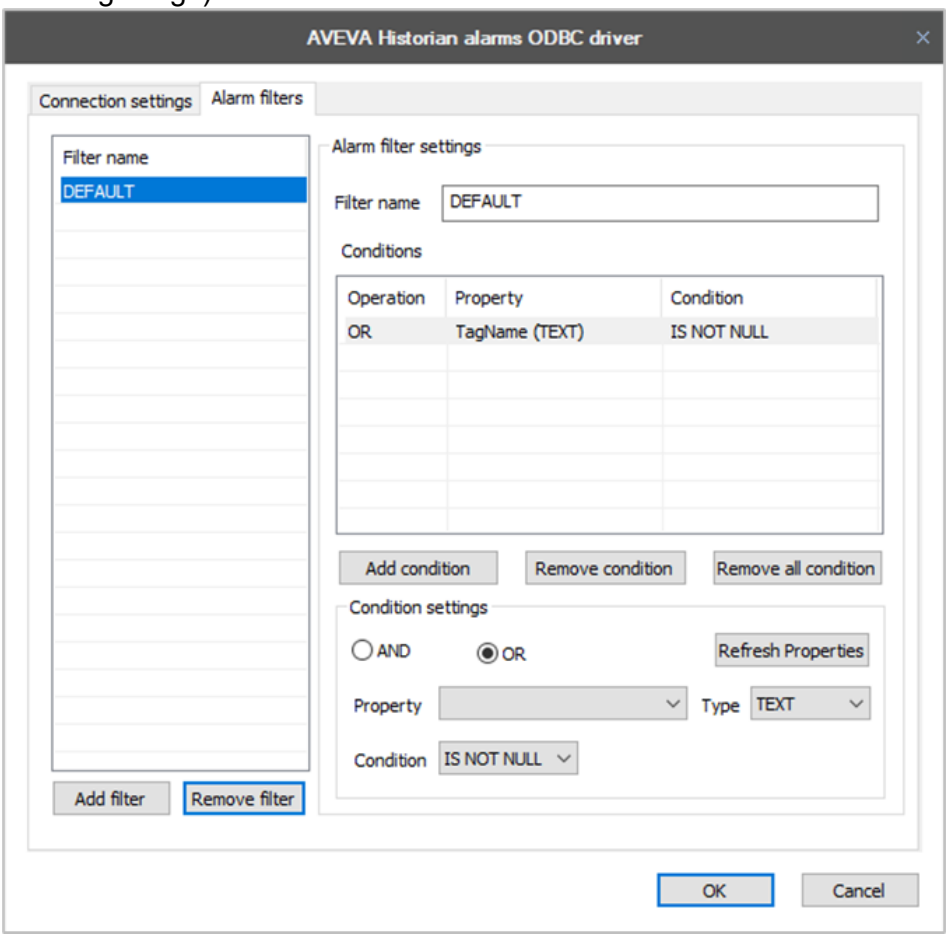
Database Name – The Database Name is always ***Runtime***. However, this field is possible to modify if a future version of AVEVA Historian Alarms and Events the database name changes.

Alarms/Events – The Alarms/Events section allows you to specify whether the driver will query AVEVA Alarms, Events, or both. If Events are not needed, uncheck this option, as it will reduce query times.

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Alarm Filters

In this window the user can define alarm *Filters* and alarm filtering conditions (please see the following image):



In the *Filter Name* section, the user can specify the name of the alarm filter (which should be unique). An alarm Filter is made up of one or more specific Conditions, which are defined in the *Conditions* section.

NOTE: By default, when the Alarm filters window is opened, the filter will be configured with the name DEFAULT and with the following filtering conditions as: OR (Operation), TagName (TEXT) (Property) and IS NOT NULL (Condition). This default alarm filter will display all alarms without filtering them.

Condition Settings

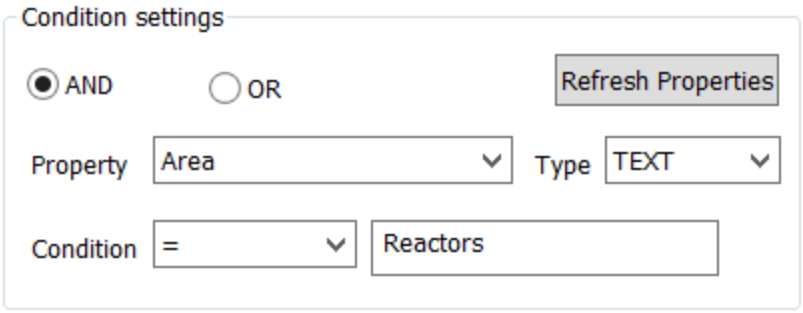
The **Property** combo box will include the list of all properties which exposed from the alarm table. Click the "*Refresh Properties*" button to retrieve the list of available properties to filter on, and then select the property you wish to filter on.

The **Type** combo box will include 3 options: *Numeric*, *Text* and *Boolean*:

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- If the *Numeric* type is selected, the *Condition* combo box will have the following options: !=, = , > , >= , < , <=, BETWEEN
- If the *Text* type is selected, the Condition combo box will include the following options: !=, =, IS NOT NULL, IS NULL, LIKE
- If the *Boolean* type is selected, the Condition combo box will include only one option: =, !=.

After selecting the Property, the Type, and the Condition, enter the numeric value or string to filter on. For example:



Select AND or OR and click on Add condition button. This allows you to AND or OR multiple conditions in a single filter – e.g., *Area = 'Reactors' AND Priority < 10*

When all conditions have been added, click the "*Add filter*" button to add the defined filter to the list of filters (in the *Filter Name* list).

Notes:

- If user selects a filter from the list, the Conditions list will be filled with the filter settings.
- If user selects condition from the list of conditions, all dialog controls will be filled according to the defined condition.
- If user has defined the alarm filter without clicking the "*Add filter*" button, and clicks OK, the filter, which has not yet been added, will be automatically added to the list of alarm filters.

Please reference the Help section *Tools > Alarms and Events Filter Manager* for more information on configuring alarm filters for use in reporting objects.

25.2.17 PI Asset Framework Drivers

Dream Report has a set of drivers to connect to PI Asset Framework software, which includes:

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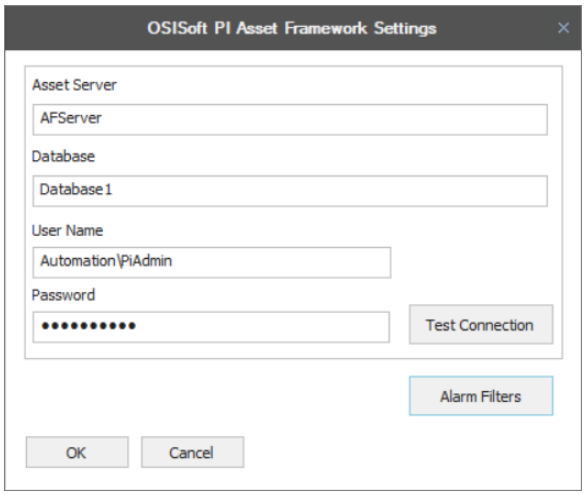
- PI Asset Framework historical values
- PI Asset Framework real-time values
- PI Asset Framework (SDK v2018 SP3) historical values
- PI Asset Framework (SDK v2018 SP3) real-time values
- PI Asset Framework Event Frame data
- PI Asset Framework Historical Alarms

All drivers require the PI Asset Framework Client and the PI SDK to be installed on both Asset Framework and Dream Report servers.

With PI AF Client is 2017 SP2, use the *PI Asset Framework historical values* and *PI Asset Framework real-time* values drivers to connect to historical and real-time data in PI AF. With PI AF Client is 2018 SP3 – the *PI Asset Framework (SDK v2018 SP3) historical values* and *PI Asset Framework (SDK v2018 SP3) real-time* values drivers.

The *PI Asset Framework Event Frame data* and *PI Asset Framework Historical Alarms* drivers connect to process events and their related data stored in PI AF Event Frames. The *PI Asset Framework Event Frame data* driver allows for building a multi-level batch structure based on Event Frames batch templates, which then can be used in Dream Report batch definitions. The *PI Asset Framework Historical Alarms* driver provides possibility to retrieve PI AF Event Frames alarm and event data.

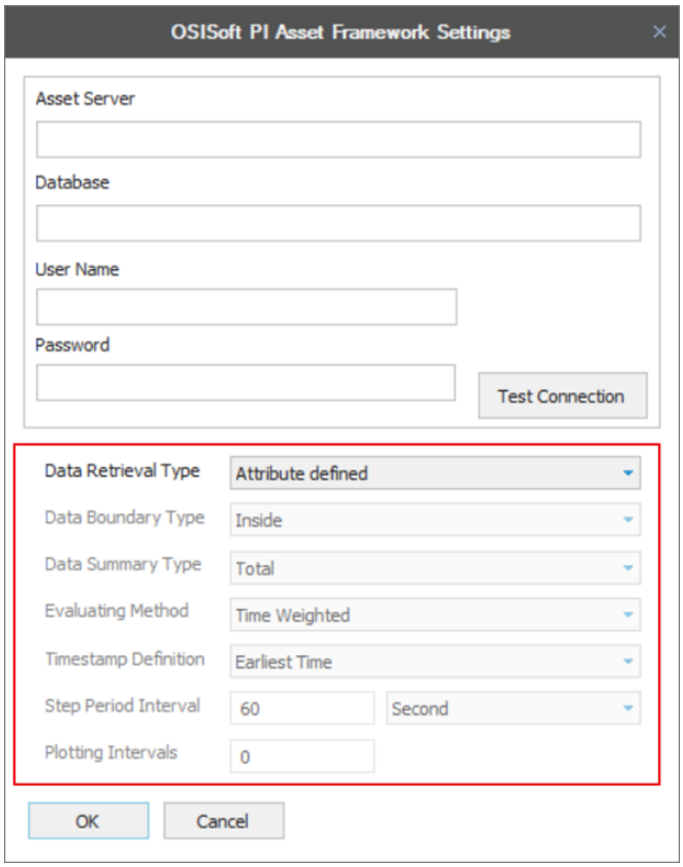
All drivers have a common set of parameters to connect to an AF database:



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Historical Values Driver

If the *PI Asset Framework Historical Values* driver was selected, the following *PI Asset Framework Setting* dialog will be opened:



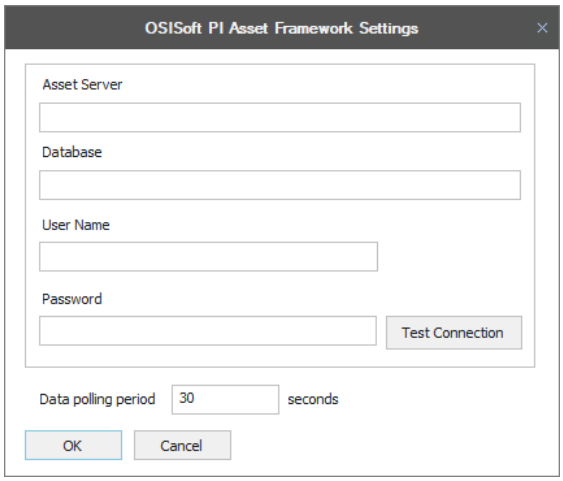
1. *Asset Server* – the name/address of the PI server. Please note that name is key sensitive.
2. *Database name* – the name of the database on the server.
3. *Username* and *Password* – The PI server is configured with user authentication – as such, a Username and Password are required for accessing the data.
4. The *Test Connection* button will try to establish communication to the selected database on the PI historian.
5. *Data Retrieval Type* – configuration of different options for data aggregation and extraction.

For more detailed information about retrieval modes please see Asset Framework documentation.

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Real-Time Values Driver

The settings for the Real-Time values driver are the same as the Historical Values driver, plus one additional detail – the *Data polling period*.



Data polling period is used when tag values are received by subscription (for example, if tag values are logged ***On Change***). In this case, *Data polling period* will define how often the driver will check for a new value to recognize a tag value change.

After clicking on *OK* button you will return to the *Communication Configuration Wizard*. Then you need to assign a unique *Driver Logical Name* for the selected data source.

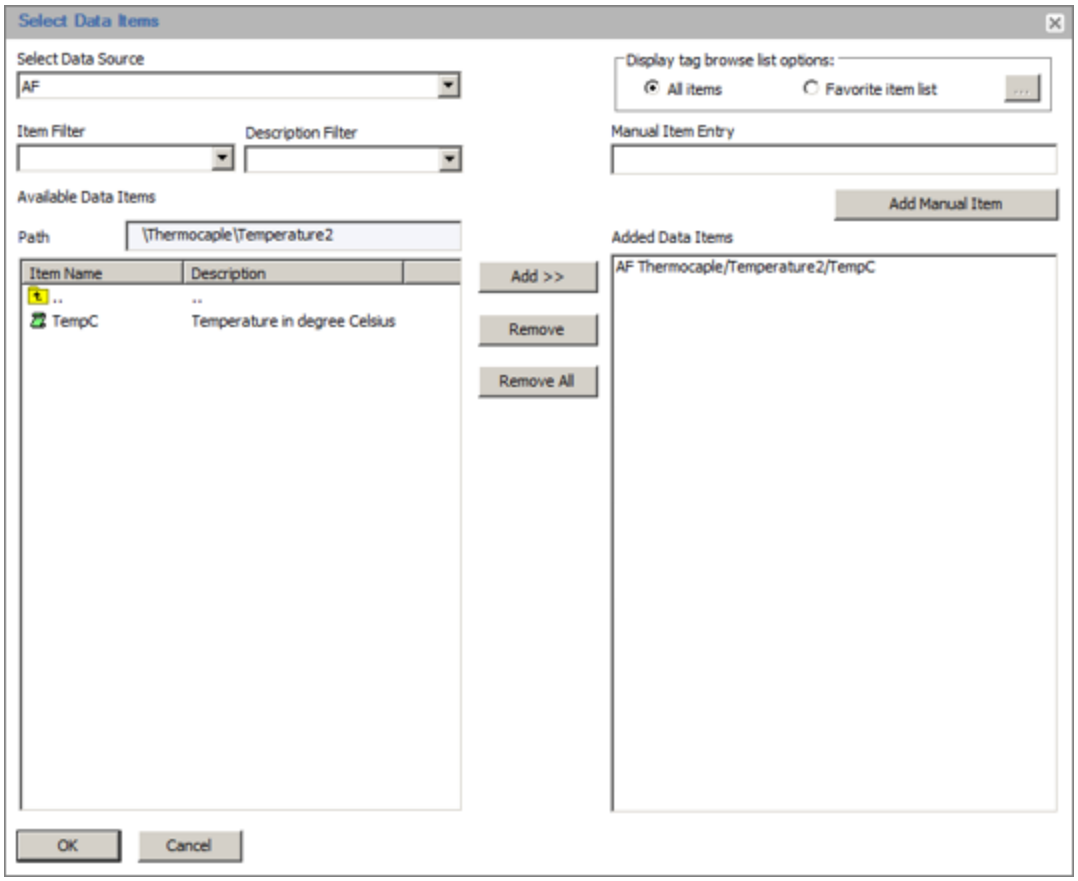
When the source is configured, it should be added to a general list of data sources, defined in a project, by clicking the *Add* button. The configured source will appear in the *Defined drivers list*.

When all the communication settings for the project are done, click *OK*, and the data source configuration will be finished.

Using the PI Asset Framework Driver in a Report

After adding the driver to the project it is possible to use it in report objects. The first screen shot shows the browse of PI Asset Frameworks tags from Real Time items driver in logger studio. The second screen shot shows a browse of PI Asset Frameworks tags from HDA Items driver in the table configuration.

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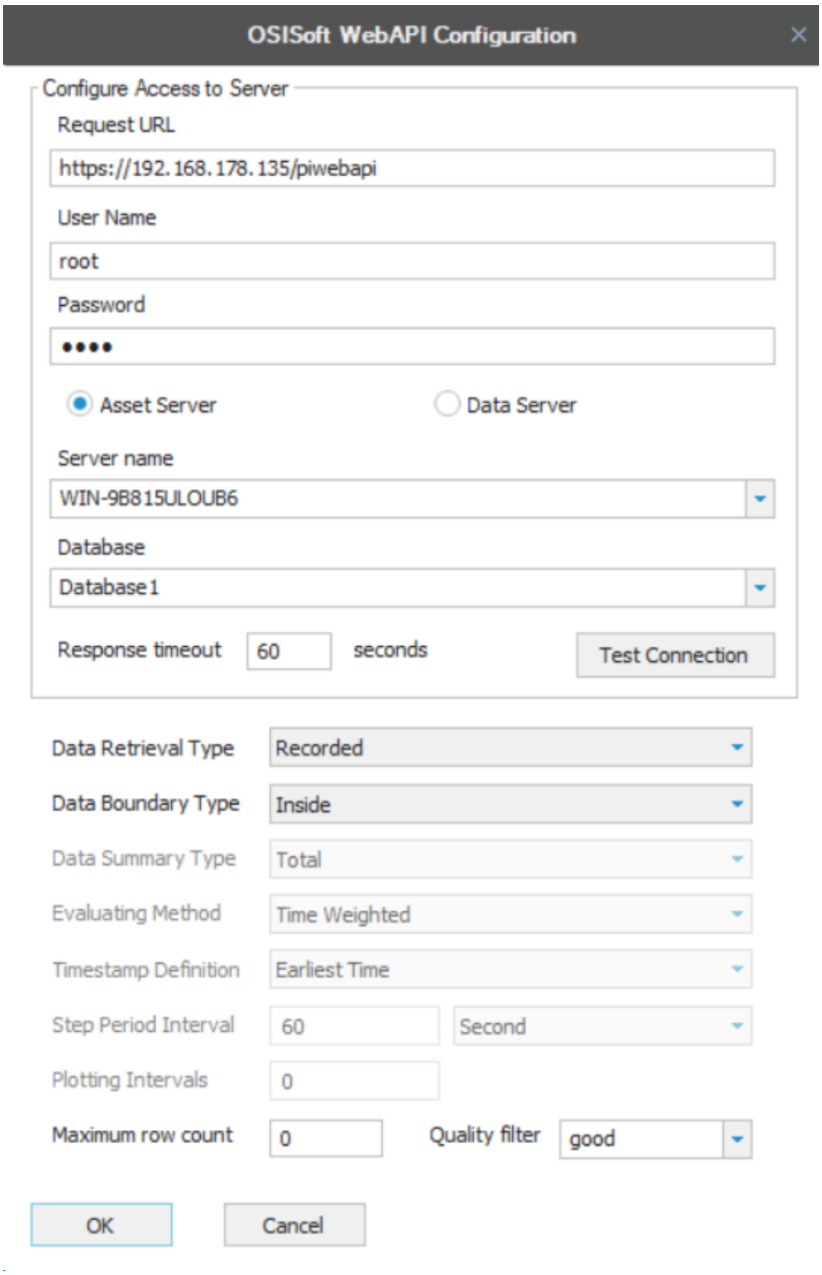


IMPORTANT NOTE: In order to be able to communicate with different PI Databases, User has to ensure that appropriate instance of the PI driver is created as part of the Reporting Project.

25.2.18 PI WebAPI Historical Values

The Dream Report PI Web API Historical Values communication driver provides data connectivity between Dream Report and the data sources over Web API interface:

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To get connection to the PI Asset Framework over the Web Rest API please provide location of the AF Server by specifying the *Request URL* of the server. It has to computer name or the IP address: https://<IP address>/piwebapi or https://<Computer Name>/piwebapi
URL's Example: https://192.168.178.135/piwebapi

And then provide the *User Name* and *Password* of the authorized person.

Response timeout by default set to 60 seconds. Please note that if user is planning get large time periods in the reports it's recommended to increase that timeout. However in case of communication errors between Dream Report and PI Asset Framework server big timeout may affect the general responsiveness of the project.

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An *Asset Server* represents a single logical data store. The server includes references to individual Asset Databases contained within it, as well as supported units of measure.

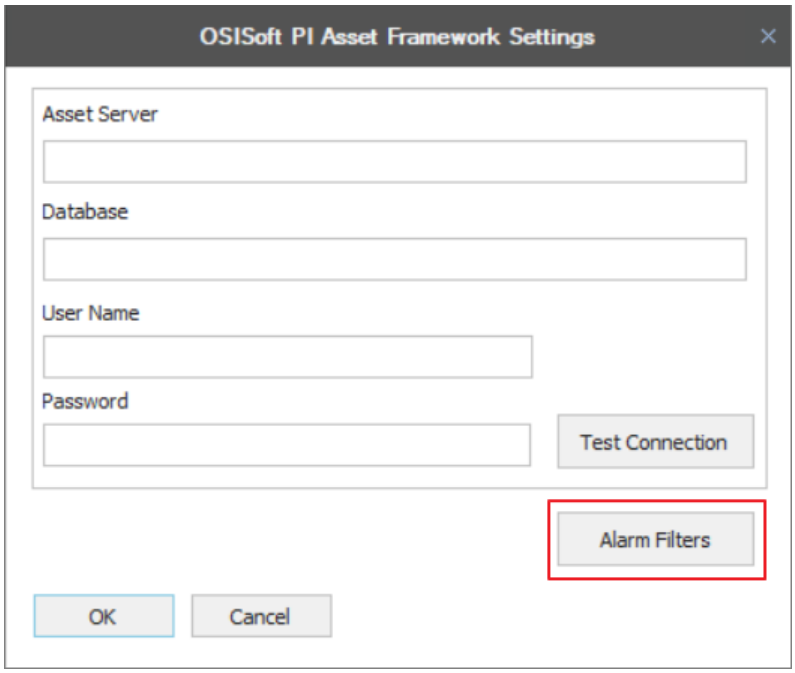
A *Data Server* is used to track the data recorded from PI points for a specific process or entity.

Once the above information is provided user will have to specify *Server name* from dropdown list and the select the *Database* from the “Database” dropdown list.

Data Retrieval Type – configuration of different options for data aggregation and data extraction. For more detailed information about retrieval modes please see Asset Framework documentation.

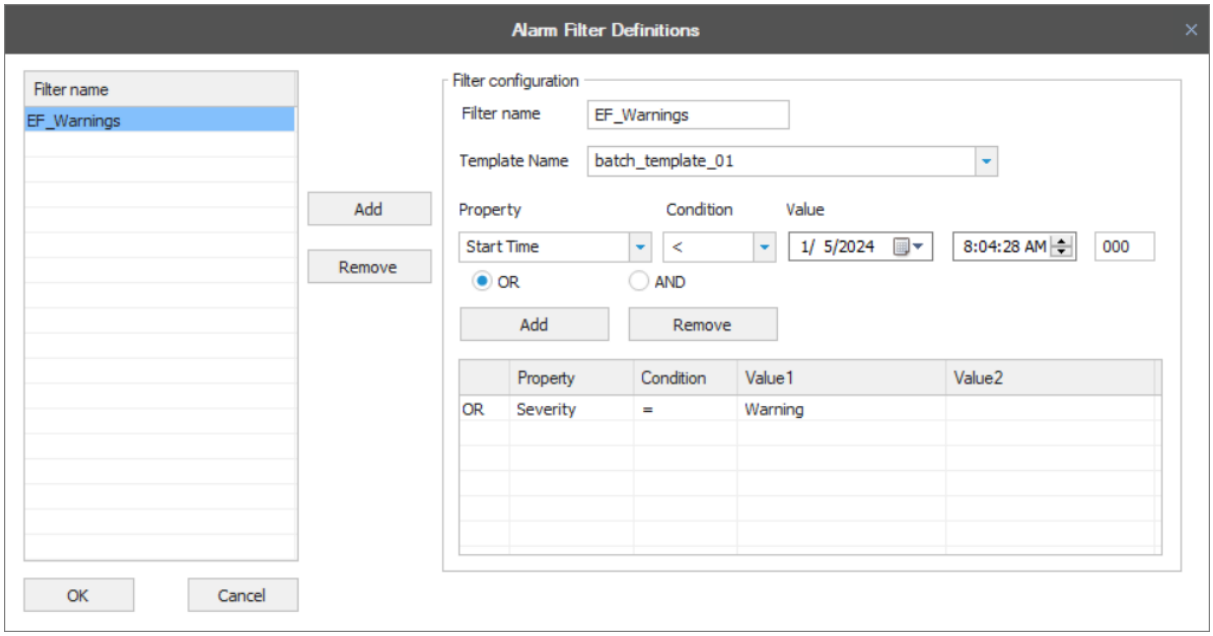
25.2.19 PI Asset Framework Historical Alarms

PI Asset Framework Historical Alarms Driver Specific Settings



The *Alarm Filters* button opens the *Alarm Filter Definitions* window, where you can create alarm and event filters. The filters are used by *Dream Report Alarms and Events Filters Manager*, and then they will be available in alarm-related reporting objects and functions. Refer to sections *Tools/Alarms and Events Filter Manager* 242 for more information.

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Multiple filters can be defined, with each filter definition being comprised of one or more filter conditions. You can add additional filters by doing the following:

Under the *Filter Configuration* section, enter a new *Filter Name*, and then click the Add button.

In the *Template Name*, select the template for alarm/event reporting. The drop-down list will display the existing in PI AF Library templates with the ***Severity*** other than *None*.

Select the *Filter Name* on the left panel, and then add a filter *Property*, setting any relevant condition(s) for that property.

Select *OR* or *AND* depending on the logic to be evaluated for this specific filter.

Click the *Add* button (in the *Filter Configuration*) section to add the condition to this filter.

Repeat steps 1-4 to add additional condition(s) to this filter definition.

When finished, click *OK* to save the Alarm (or Event) filters.

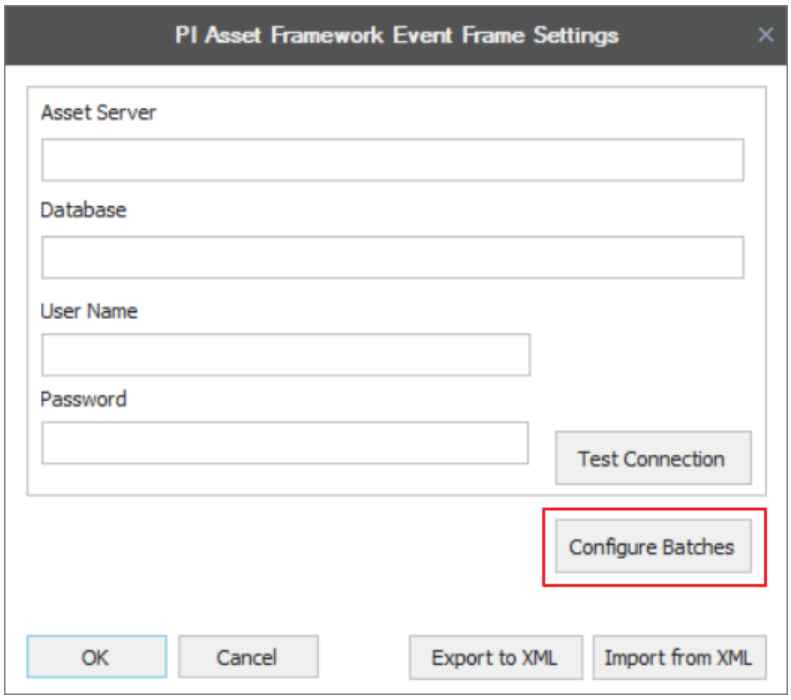
Click *OK* again to save the driver configuration and close the window.

Additionally, AVEVA PI Asset Framework needs to be configured properly. Please refer to the tech note *"How to Configure PI Drivers in Dream Report"* for more information.

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25.2.20 PI Asset Framework Event Frame Data

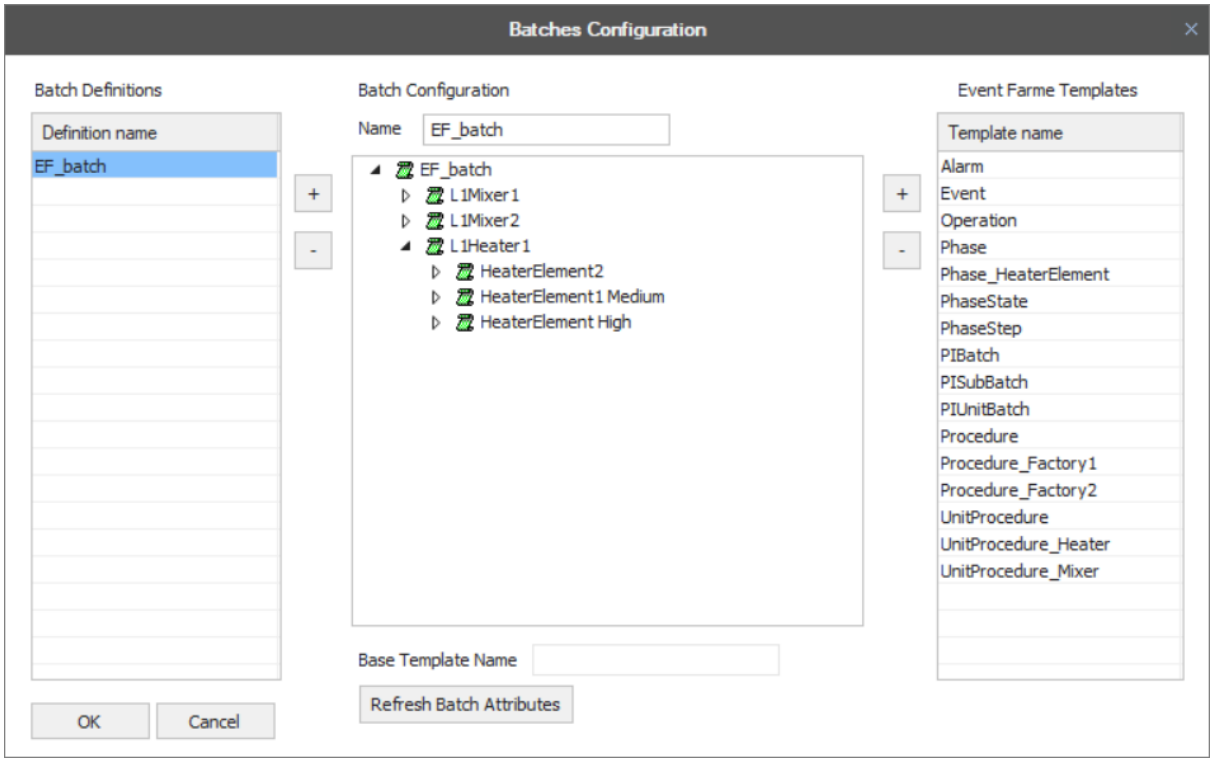
PI Asset Framework Event Frame Data Driver Specific Settings



The *Configure Batches* button opens the *Batch Configuration* window, where you can reproduce an AF Event Frame batch structure so that it can be used in Dream Report Batches module for creating batch definitions or configuring batch objects. Refer to sections *Batch Definition and Batch Object* 358 for more information.

In the *Batch Configuration* window, the following parameters can be configured.

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Event Frame Templates - displays Event Frame Templates defined in *Asset Framework Library*.

IMPORTANT NOTE! In the Batch Configuration area, build/replicate a batch definition(s) following/mirroring the structure defined in *Event Frames Structure of PI Event Frames Interface Manager*.

To add a new element to the definition, select the needed template in the Event Framework Templates list and click the *[+]* button. To remove an element, select it and click on *[-]*.

You can rename any element in *Batch Configuration* – click on its name and type a new one.

Base Template Name displays the name of the template from which the selected element was instanced (as it is specified in Event Frame Library).

Name – the name of the top-level element in the *Batch Configuration* box. With this name the definition will be saved in the *Batch Definitions* list.

Click the *[+]* button to save the created batch definition in the *Batch Definitions* list.

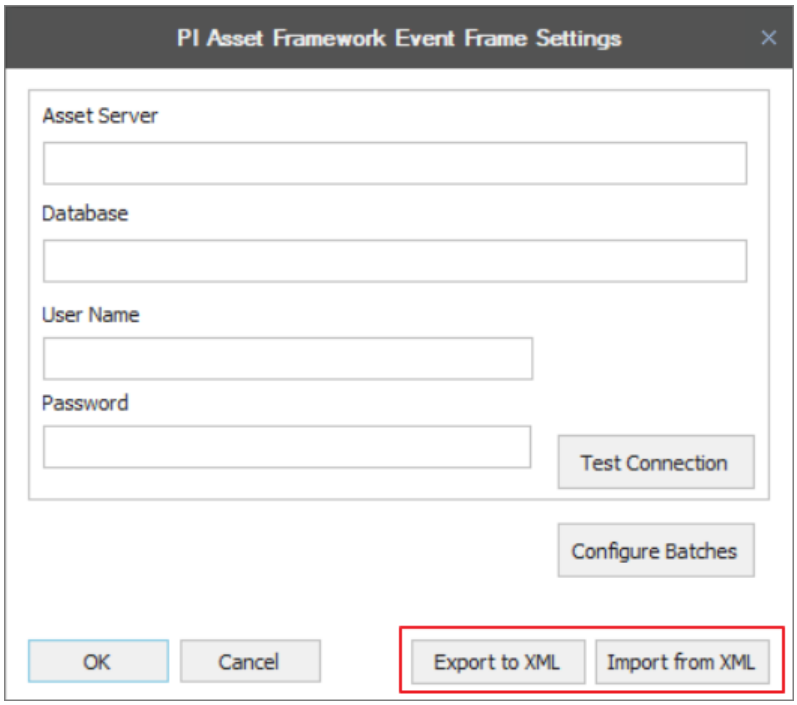
Click *OK* to complete configuration and close the window.

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Refresh Attributes – update attributes associated with the templates used in the batch definition being edited.

To delete an existing definition from the *Batch Definitions* list, select the definition and click *[-]*.

Click *OK* to complete configuration and close the window.



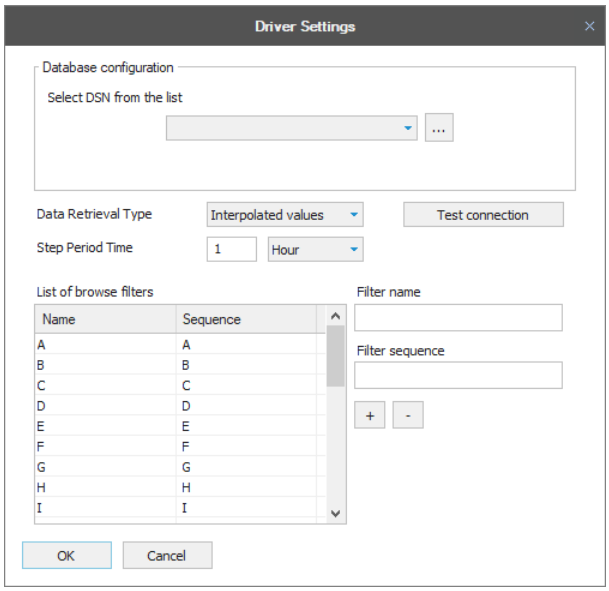
Press the *Export to XML* button if you wish to generate an XML file with connection settings and all batch definitions created in the driver. You can then use Notepad (or other text editor) to edit created batch definitions or for export to be used in another Dream Report project.

Press the *Export to XML* button to select an XML file (edited, or created in another project), and import settings and batch definitions into the current configuration. Note that any existing configurations parameters and definitions will be overwritten with an XML import.

25.2.21 PI Historical Values

The Dream Report Historical Values communication driver provides data connectivity between Dream Report and the data sources over ODBC interface. It also provides user flexible way of tags browse filtering:

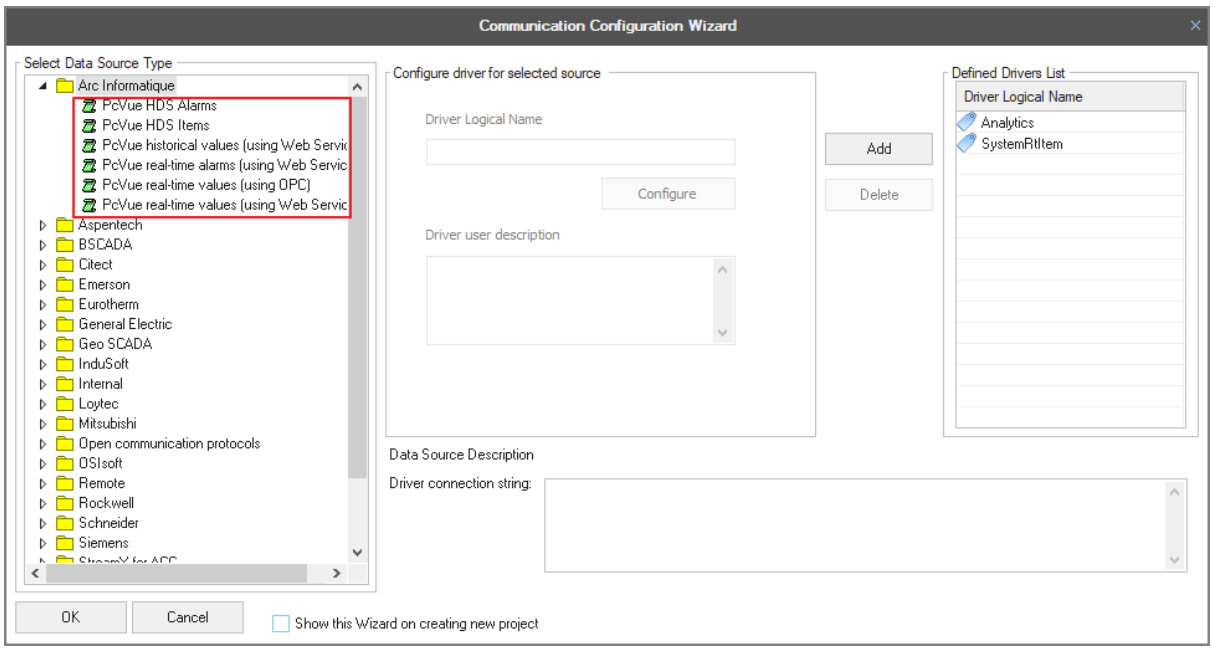
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25.3 Arc Informatique

PcVue drivers of Dream Report enable you to connect to PcVue SCADA using web services or OPC communication, and get access to real-time data, real-time alarms and historical data of PcVue running project.

To configure PcVue drivers, first, open the *Communication Configuration Wizard* dialog window. In the *Arc Informatique* folder, please select the PcVue driver you need from the *Select data Source Type* section, and click on *Configure* button:



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NOTE: In Dream Report version 3.43 the PcVue Web Services driver had one driver instance for real-time data, historical data and alarms configuration.

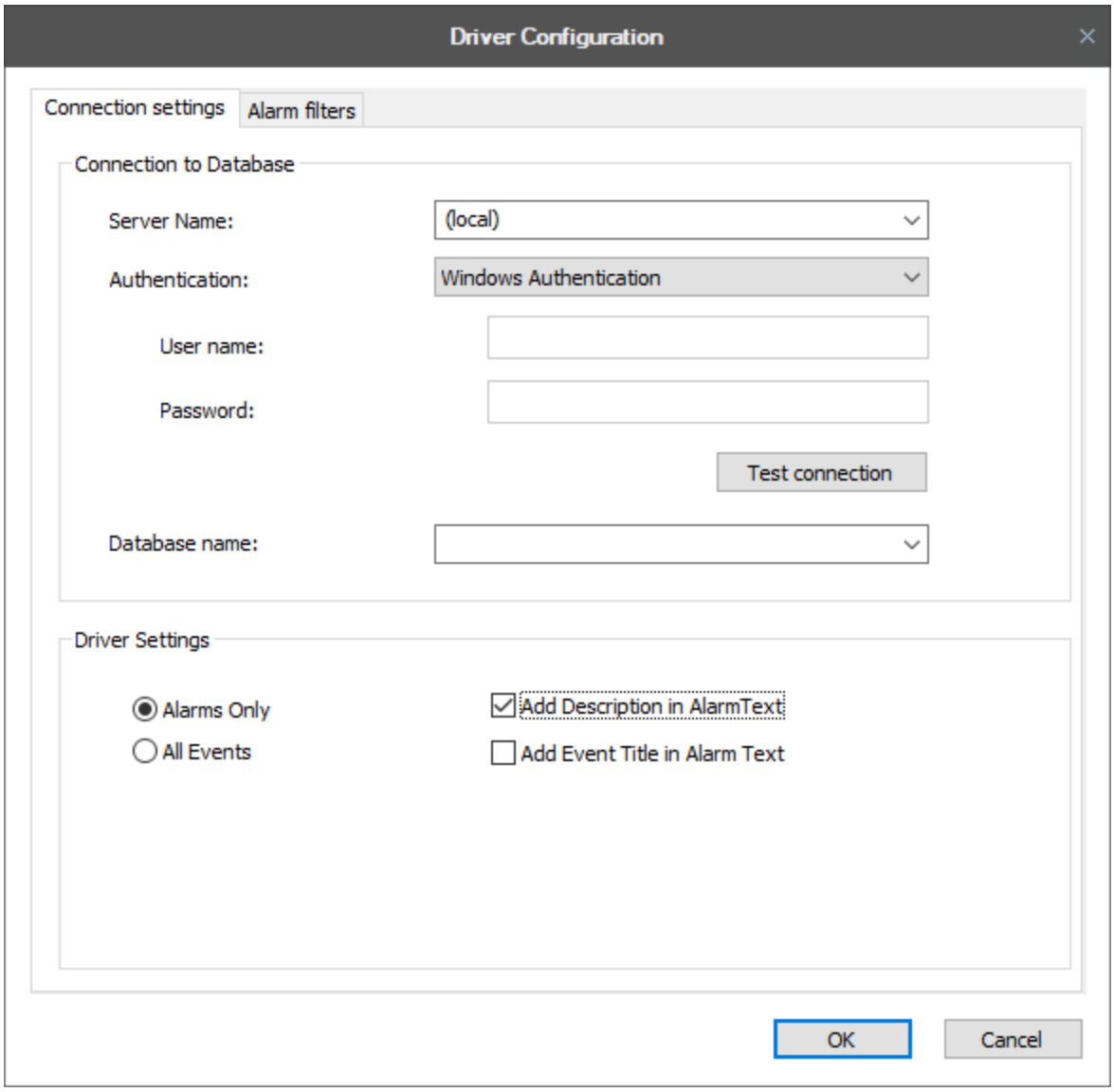
Now, in this new version of Dream Report, the PcVue Web Services driver has three driver instances and should be configured separately as *PcVue real-time values (using Web Services)*, *PcVue real-time alarms (using Web Services)*, and *PcVue historical values (using Web Services)*.

25.3.1 PcVue HDS Alarms

The PcVue HDS Alarms communication driver allows you to connect to PcVue alarm database, running on a local or remote node.

In the driver configuration window, provide the following information:

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Connection Settings

Connection to Database

In this window user can define connection to the PcVue alarms database which needs to be accessed. The connection to the PcVueAlm database, based on SQL Server, can be configured either by using the SQL Server database locally (Local database) or remotely (Remote database).

If the SQL server, which is running the PcVueAlm database, is configured with user authentication, then enter login and password for the SQL Server into the corresponding edit boxes. If your SQL Server is configured with Windows Authentication mode, leave the user name and password edit boxes empty.

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In the *Database name* combo box, select the database in which alarms and events records are stored.

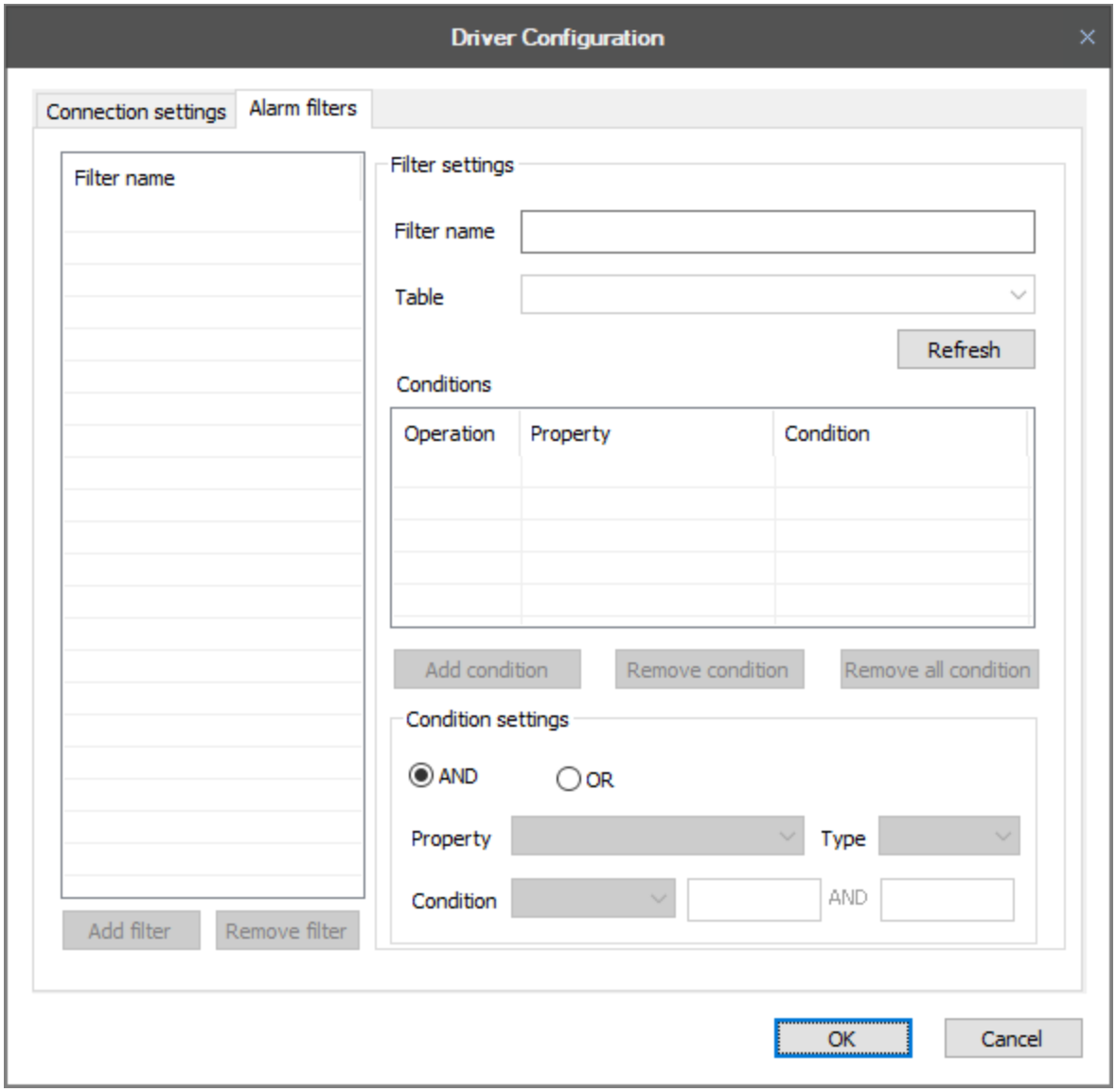
The *Test Connection* button will try to establish communication to the PcVueAlm database based on SQL Server.

Driver Settings

The *Alarm Only* or *All Events* modes are available to indicate what records are to be reported.

The *Add Description in Alarm Text* and *Add Event Title in Alarm Text* parameters allow to add corresponding fields to Alarm Text.

Alarm Filters



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When the dialog window will be opened, it will connect to the alarm database and get the list of tables in the database. This list will be available in the *Table* combo box for selection. If user clicks *Refresh* button, the combo box will be filled with the updated list of tables.

In the *Filter Name* section user will have to define the name of the alarm filter (which should be unique). To add or remove a filter from the list, use *Add filter* or *Remove filter* buttons.

Condition Settings

The *Property* combo box will include the list of all fields which exist in the alarm table selected from the *Table* combo box.

NOTE: *Property* is a list of all columns from the Alarm Log table without the timestamp (Alarm log is a table where the list of its columns includes the column "LogList").

If any table has been selected in the *Table* combo box, then the *Property* combo box will be filled with the list of alarm properties of the selected table.

If, before clicking the *Refresh* button, any alarm property has been selected, this selection will remain unchanged.

The *Type* combo box will include 3 options: *Numeric, Text and Boolean*.

If the *Numeric* type is selected, the *Condition* combo box will have the following options: = , > , >= , < , <=, *BETWEEN*.

If the *Text* type is selected, the *Condition* combo box will include the following options: *IS, IS NOT, LIKE*.

If the *Boolean* type is selected, the Condition combo box will include only one option: =.

After having defined the Condition, user will select *AND* or *OR* and click on *Add condition* button.

When all conditions have been added, user will click *Add* filter button and the defined filter will be added to the list of filters.

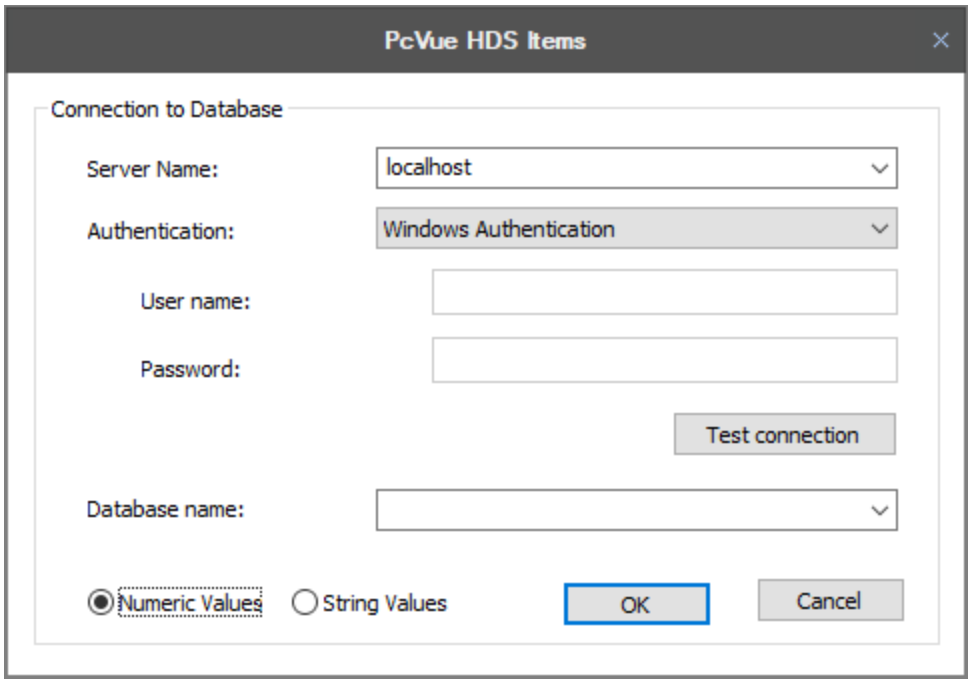
NOTE: If user selects filter from the list, the *Conditions* list will be filled with the filter settings. If user selects condition from the list of conditions, all dialog controls will be filled according to the defined condition.

If user has defined the alarm filter without clicking on *Add filter* button and clicks *OK* button, the filter, which has not been added before, will be automatically added to the list of alarm filters.

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25.3.2 PcVue HDS Items

If *PcVue HDS Items* communication driver is selected, then, as soon as you click on *Configure* button, the following *PcVue HDS Items* configuration dialog window will be opened:



Server name: select the local or a remote machine containing the PCVue database.

Authentication: select Windows or SQL-based authentication.

If the SQL server, which is running the PcVue HDS database, is configured with user authentication, then enter user name and password for the SQL Server into the corresponding edit boxes in the section SQL Server authentication. If your SQL Server is configured with Windows Authentication mode, leave the user name and password edit boxes empty.

The *Test Connection* button will try to establish communication to the selected PcVue HDS database based on SQL Server.

Select the the name of the database from the *Database name* list.

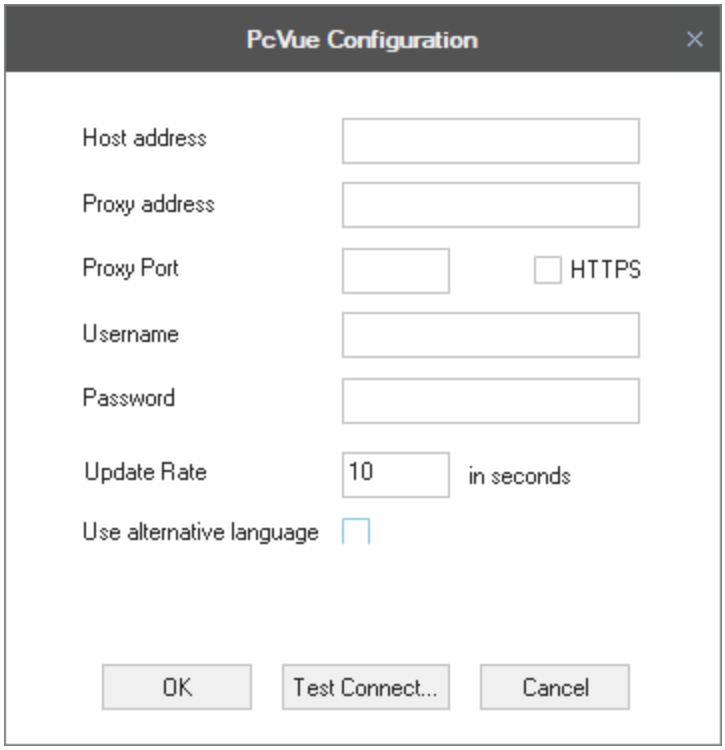
Select *Numeric value* or *String Values* to select the type of values to be retrieved. If you need to retrieve both types of data, configure two instances of the PCVue HDS Items driver – one with *Numeric Value* selected, and one with *String Values* selected.

Click *OK* button to save the driver configuration or *Cancel* to exit the window without saving.

25.3.3 PcVue Real-Time Values (Using Web Services)

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If *PcVue real-time values (using web services)* communication driver is selected, then, as soon as you click on *Configure* button, the following *PcVue Configuration* dialog window will be opened:



In this window, please, specify:

Host address: The IP address of PcVue server, to which the driver will be connected.

Proxy address: The address of a proxy server (if exists).

Proxy port: Proxy port.

HTTPS: This option defines if HTTP or Secure HTTP (HTTPS) will be used for data transfer.

Username: Username for login to PcVue server.

Password: Password for PcVue server connection.

Update Rate: This option specifies time period for cyclical check of values updates. Though PcVue web services driver doesn't support unsolicited mode of data acquisition, all data updates are not received automatically, but are checked periodically with rate, defined in this parameter.

Use alternative language option defines whether primary or secondary language will be used for tag description and other text data properties.

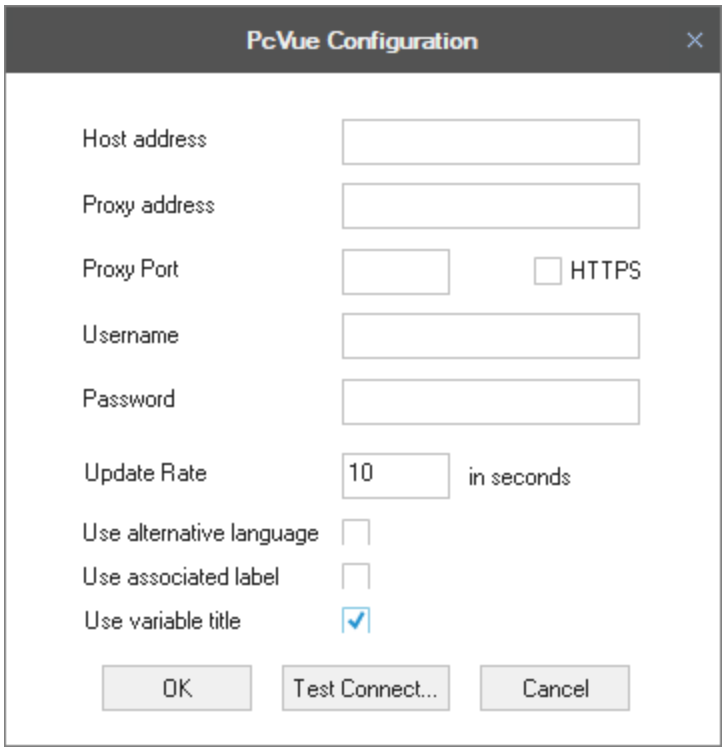
When all configuration is properly set, a user can test connection with a server by clicking on *Test Connection* button in the bottom part of the driver configuration window.

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Click *OK* button to save the driver configuration or *Cancel* to exit the window without saving.

25.3.4 PcVue Real-Time Alarms (Using Web Services)

If *PcVue real-time alarms (using Web services)* communication driver is selected, then, as soon as you click on *Configure* button, the following *PcVue driver configuration* dialog window will be opened:



In this window, please, specify:

Host address: The IP address of PcVue server, to which the driver will be connected.

Proxy address: The address of a proxy server (if exists).

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Proxy port: Proxy port.

HTTPS: This option defines if HTTP or Secure HTTP (HTTPS) will be used for data transfer.

Username: Username for login to PcVue server.

Password: Password for PcVue server connection.

Update Rate: This option specifies time period for cyclical check of values and alarm updates. Though PcVue web services driver doesn't support unsolicited mode of data acquisition, all data updates are not received automatically, but are checked periodically with rate, defined in this option.

Use alternative language option defines whether primary or secondary language will be used for tag description and other text data properties.

Use associated label:

Use variable title: This option enables/disables the use of the name for the alarm updates.

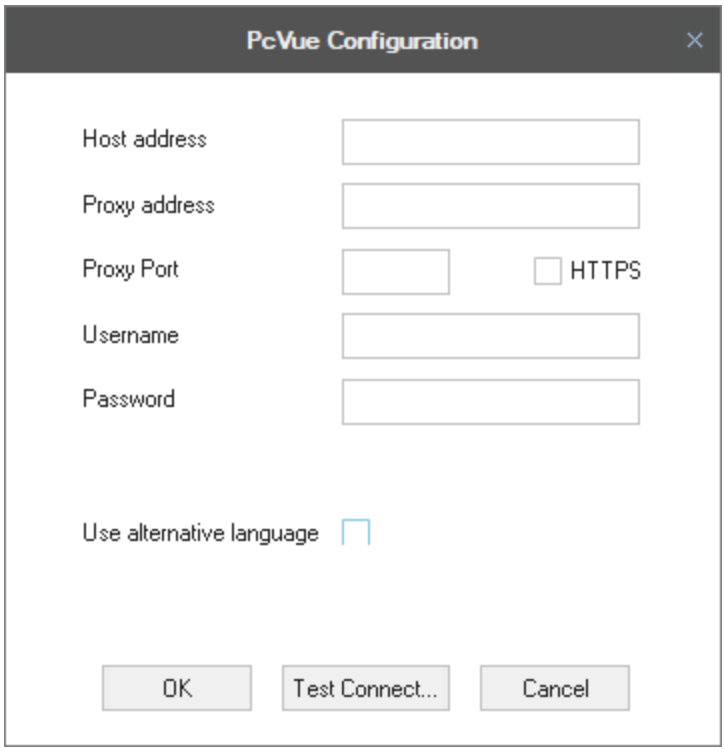
When all configuration is properly set, a user can test connection with a server by clicking on *Test Connection* button in the bottom part of the driver configuration window.

Click *OK* button to save the driver configuration or *Cancel* to exit the window without saving.

25.3.5 PcVue Historical Values (Using Web Services)

If the *PcVue historical values (using Web services)* communication driver is selected, then, as soon as you click on *Configure* button, the following *PcVue Configuration* dialog window will be opened:

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In this window, please, specify:

Host address: The IP address of PcVue server, to which the driver will be connected.

Proxy address: The address of a proxy server (if exists).

Proxy port: Proxy port.

*HTTP*S: This option defines if HTTP or Secure HTTP (HT TPS) will be used for data transfer.

Username: Username for login to PcVue server.

Password: Password for PcVue server connection.

Use alternative language option defines whether primary or secondary language will be used for tag description and other text data properties.

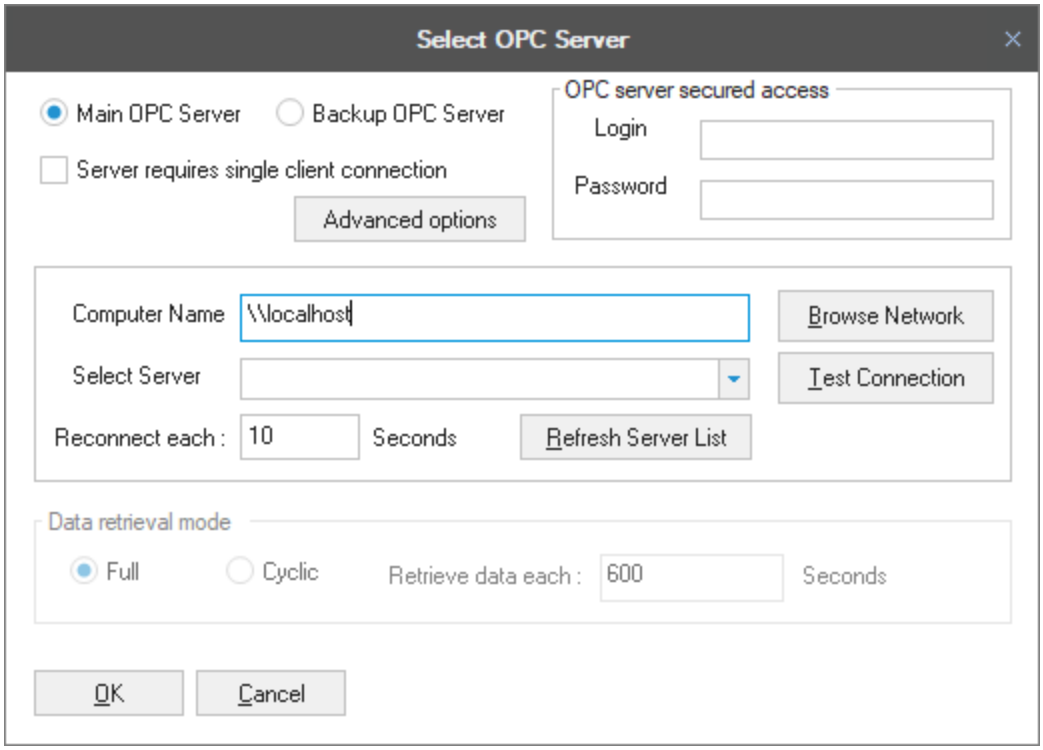
When all configuration is properly set, a user can test connection with a server by clicking on *Test Connection* button in the bottom part of the driver configuration window.

Click *OK* button to save the driver configuration or *Cancel* to exit the window without saving.

25.3.6 PcVue Real-Time Values (Using OPC)

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If *PcVue real-time values (using OPC)* driver is selected, then, as soon as you click on *Configure* button, the *Select OPC Server* dialog box will be opened.



For details please refer to the OPC Drivers 837 section.

Redundancy

PcVue real-time values (using OPC) driver enables users to use the driver in redundant mode.

On the top of the configuration window, there are radio-buttons *Main server* and *Backup server*. If user will select *Main server* and configure the driver - that configuration will be saved for a main server only. Then, if user will selects a *Backup server* option, he/she can configure in the same window all configuration for a backup server.

When the project is running and driver will fail to connect to the main server or will fail to read a value from it, driver will try to re-establish secure connection and to read a value again. If re-establishing connection had failed as well, the driver will immediately try to connect to a backup server and to repeat the operation with backup server.

The next value read operation, driver will start doing with the main server again.

Handling of Communication errors and re-connections

PcVue driver has an embedded function to re-establish connection in case of communication error. While requesting data from the remote PcVue server, when an error is received, the

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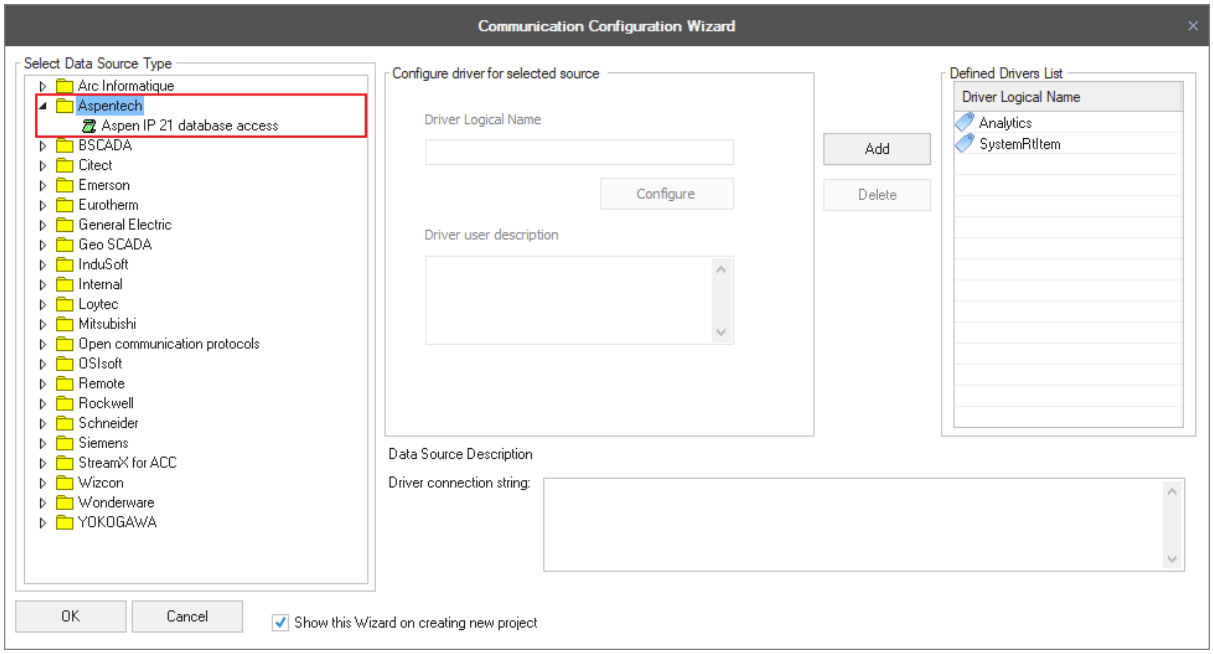
driver will try first to re-initiate the communication session again and, if succeeded, will request the needed data again. Only after the failure again, it will return the communication error. Each next reading, the driver will retry to initiate the connection again.

NOTES:

- When selecting PcVue driver during Dream Report installation, it's recommended to select also installation of Visual C++ 2005 redistributable component in the *Components* section of the same window of Dream Report installation.
- If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the *Select Data Source Type* field on any other driver and then go back to the driver that you need to configure.

25.4 AspenTech

Open the *AspenTech* folder to connect to the data of *AspenTech* running project.

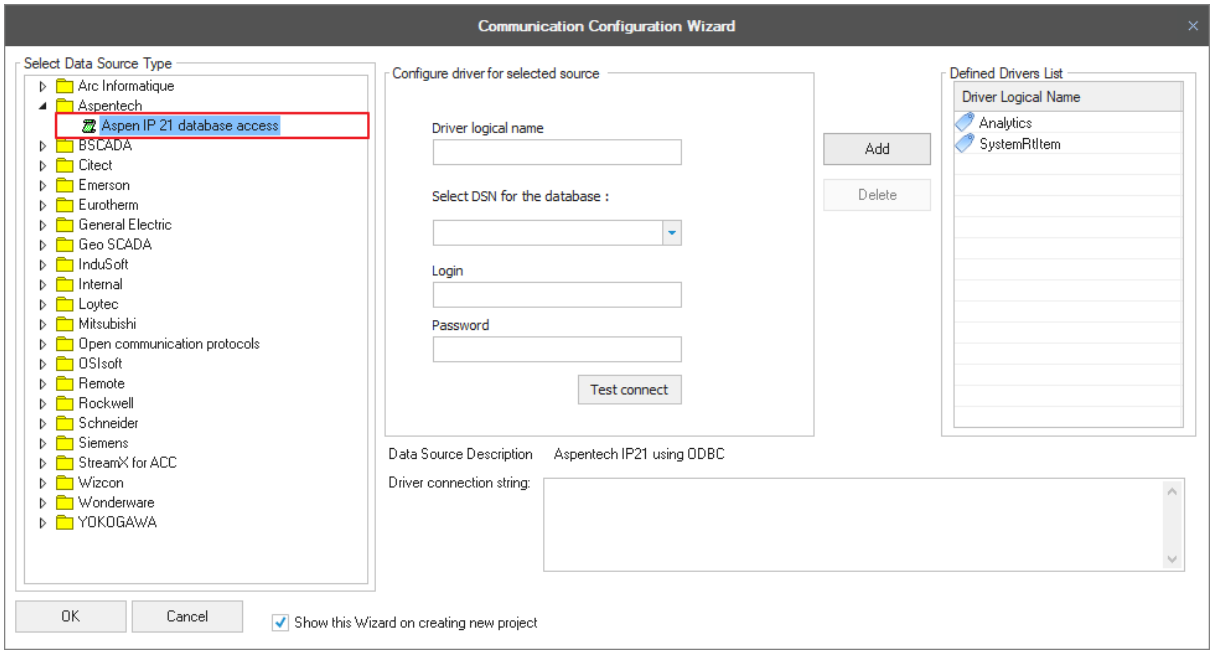


25.4.1 The Aspen IP21 Database Access

The *Aspen IP21 Database Access* driver of Dream Report allows for connecting to a local or remote AspenTech IP21 historian, browse the IP21 tags, and generate reports for data stored in the IP21 historian.

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Select the driver in the *Select Data Source Type* section and enter the necessary information in the *Configure Driver for Selected Source* area.



Type any name in the *Driver logical name* field.

Select the DSN defined for the AspenTech IP21 historian database from the *Select DSN for the database* combo box.

Provide credentials for access to the Historian database in the *Login* and *Password* fields.

Click on the *Test Connection* button to check if the connection has been established successfully.

After the successful connection test, click the *Add* button to the new driver definition to the *Defined Drivers List*.

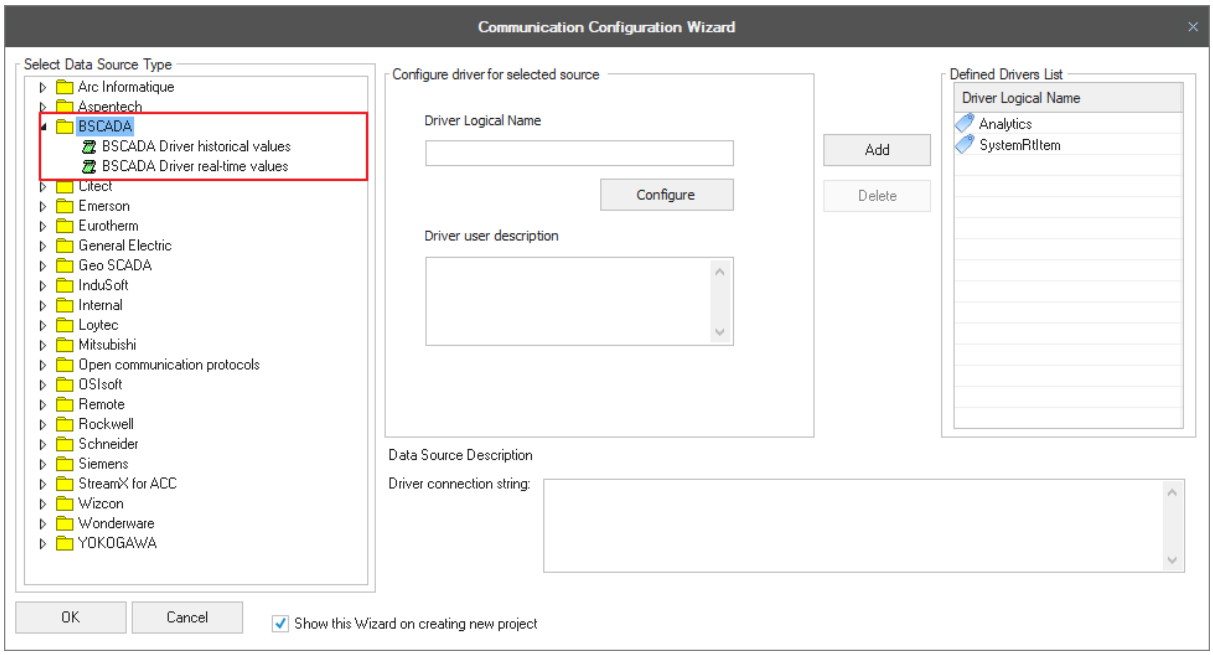
Click *OK* to close the driver configuration window.

25.5 BSCADA

BSCADA drivers of Dream Report enable you to connect to real-time data and historical data of BSCADA running project.

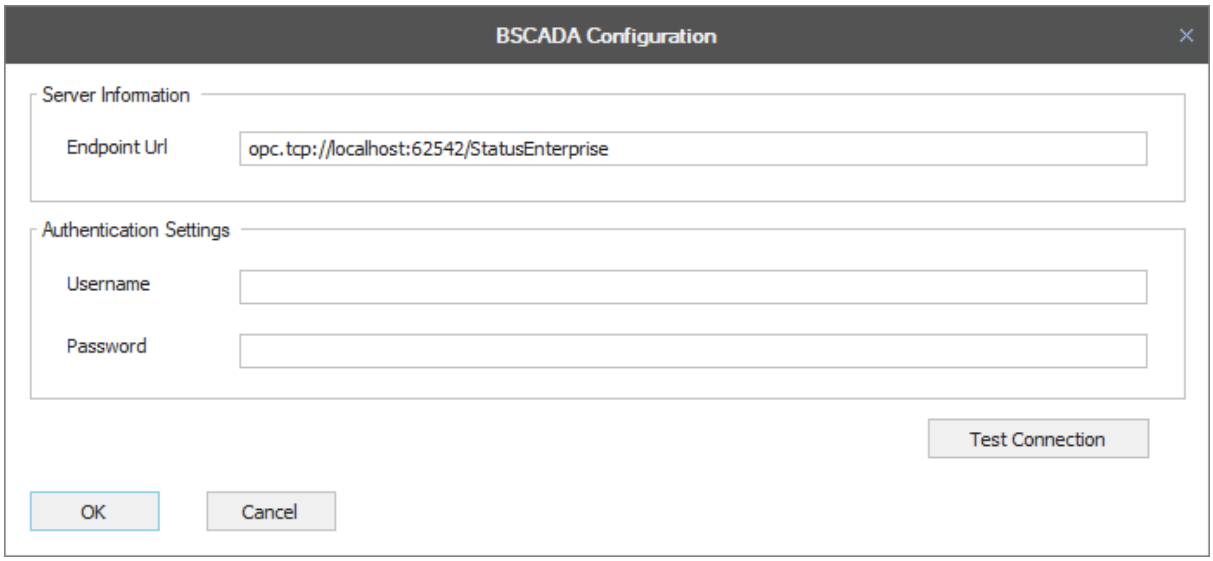
To configure BSCADA drivers, open the *Communication Configuration Wizard* dialog window. In the *BCADA* folder, select the driver you need in the *Select data Source Type* section, and click on the *Configure* button.

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25.5.1 BSCADA Driver Historical Values

If the *BSCADA Driver Historical Values* communication driver is selected, then, as soon as you click on the *Configure* button, the following *BSCADA Configuration* dialog window will be opened:



Provide the following information in the driver configuration window:

Endpoint Url: URL pointing to the location of BSCADA.

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Username: Username for connection to BSCADA.

Password: Password for connection to BSCADA.

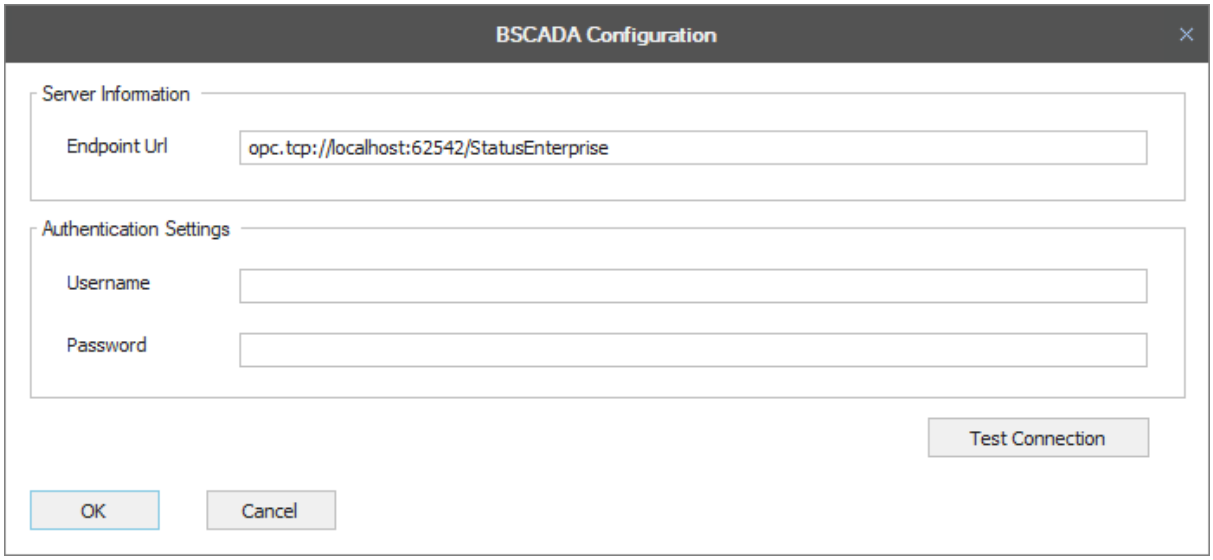
NOTE: All the parameters have to be provided by the BSCADA administrator.

Click on the *Test Connection* button to check if the connection has been established successfully.

Click *OK* to close the driver configuration window.

25.5.2 BSCADA Driver Real-Time Values

If the *BSCADA Driver Real-Time Values* communication driver is selected, then, as soon as you click on the *Configure* button, the following *BSCADA Configuration* dialog window will be opened:



Provide the following information in the driver configuration window:

Endpoint Url: URL pointing to the location of BSCADA.

Username: Username for connection to BSCADA.

Password: Password for connection to BSCADA.

NOTE: All the parameters have to be provided by the BSCADA administrator.

Click on the *Test Connection* button to check if the connection has been established successfully.

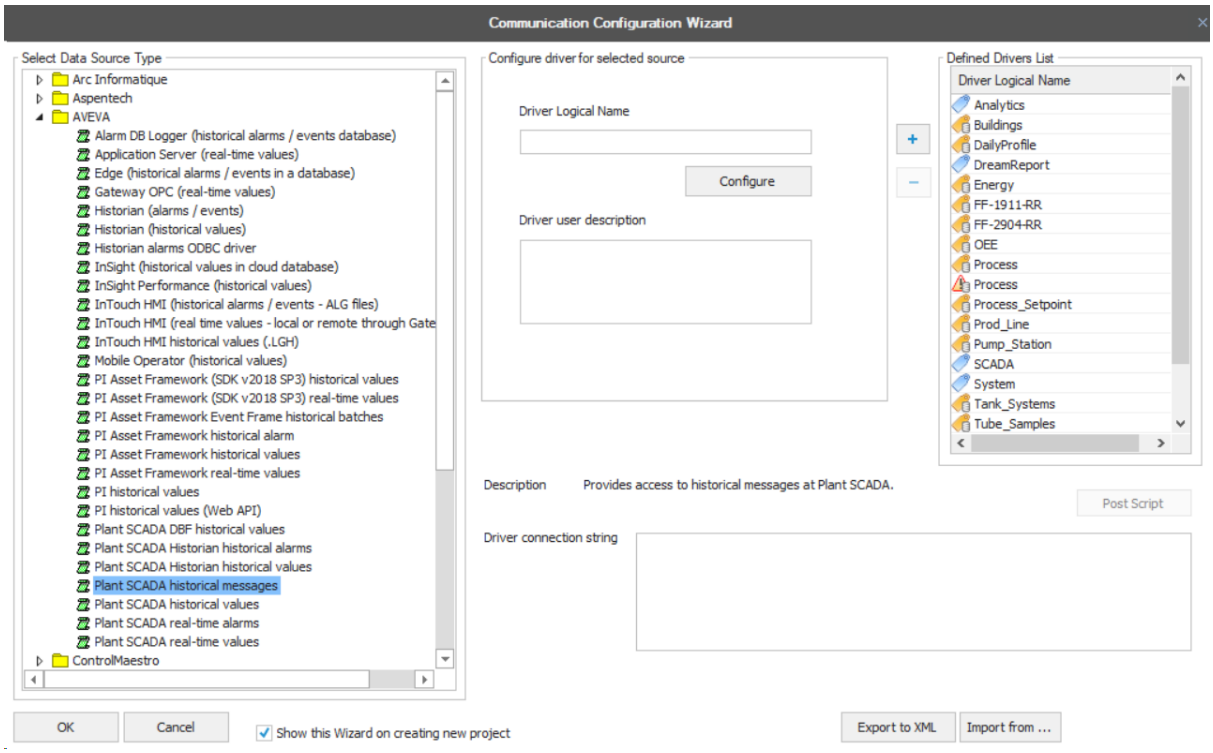
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Click *OK* to close the driver configuration window.

25.6 Plant SCADA

Plant SCADA drivers of Dream Report enable you to connect to Plant SCADA real-time and historical values, Plant SCADA historical messages, Plant SCADA Historian historical values and alarms data, as well as historical values from DBF files.

To configure Plant SCADA drivers, open the *Communication Configuration Wizard* dialog window. In the *AVEVA* folder, select the driver you need in the *Select data Source Type* section, and click on the *Configure* button.

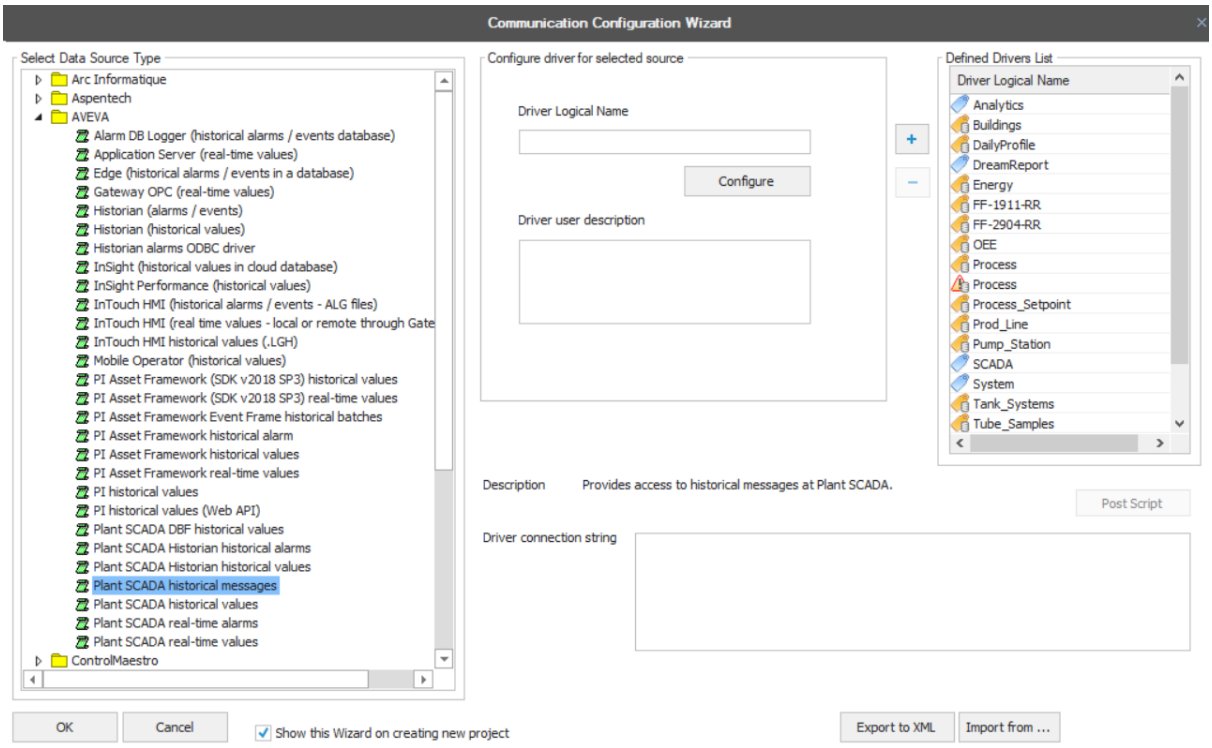


25.6.1 Plant SCADA Historian Drivers

Plant SCADA Historian drivers allows you to connect to *Plant SCADA* Historian SQL Server database, running on a local or remote node, and generate direct tags browse, using a data model from CH database and then will automatically generate SQL queries to retrieve statistical information from CH database.

To configure the *Plant SCADA Historian* driver, first, open the *Communication Configuration Wizard* dialog window in Dream Report Studio - all drivers are listed under the *AVEVA* folder:

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Select the driver you need for your project and click on *Configure* button.

25.6.1.1 Citect Historian Historical Alarms

Enter topic text here.

25.6.1.2 Citect Historian Historical Values

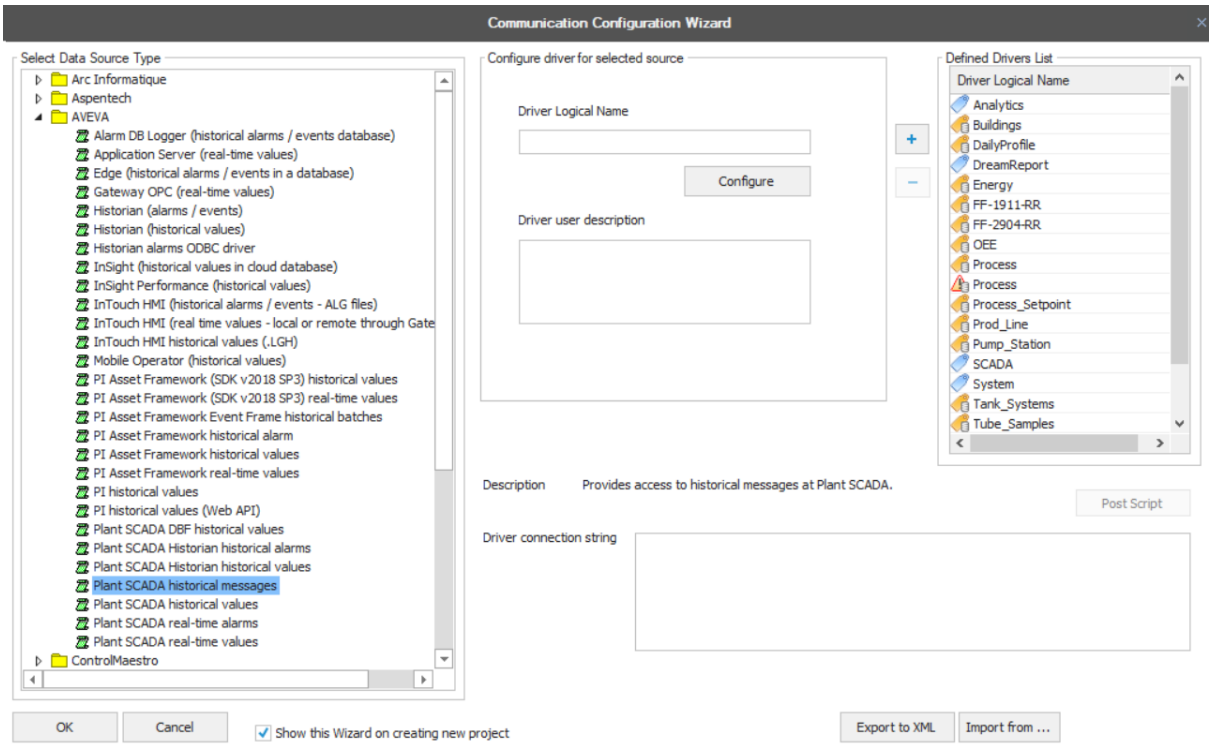
Enter topic text here.

25.6.2 Plant SCADA Drivers

The Dream Report *Plant SCADA* communication drivers provide data connectivity between Dream Report and a *Plant SCADA* server.

To configure the Plant SCADA driver, first, open the **"Communication Configuration Wizard"** dialog window in Dream Report Studio - all drivers are listed under the ***AVEVA*** folder:

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Select the driver you need for your project and click on *"Configure"* button.

25.6.2.1 Plant SCADA Real-Time Values

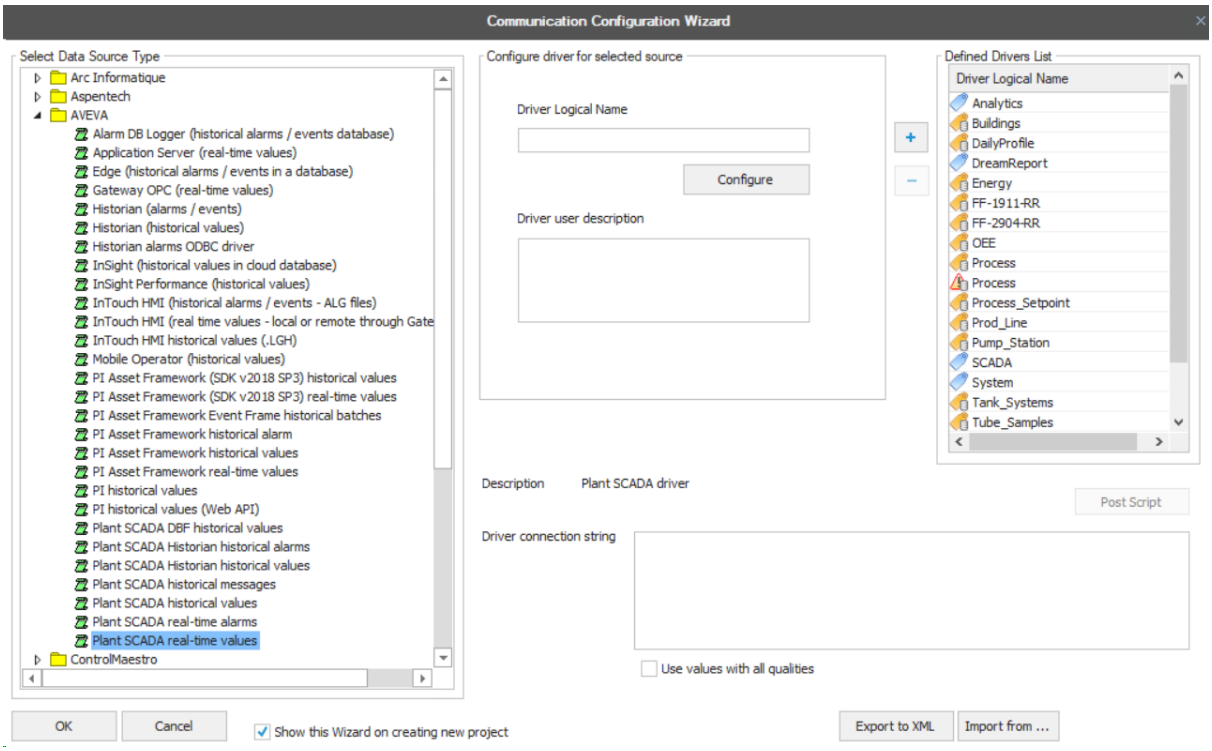
Plant SCADA real-time values drivers allows you to connect to Plant SCADA, running on a local or remote node, get browse of Plant SCADA tags and access real-time values.

The driver uses native Plant SCADA ctAPI to communicate with it. That driver was tested and supports Plant SCADA versions starting from 6.10 and up to the version 7.5.

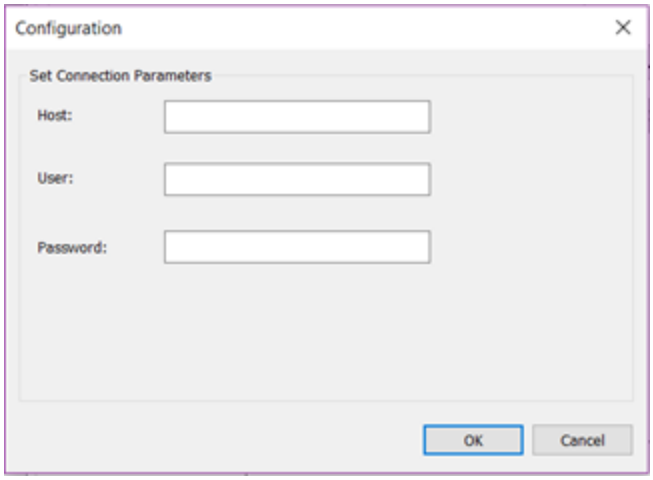
Driver configuration

When user selects "Plant SCADA real-time values" driver from the available drivers list:

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A driver instance logical name has to be defined and the driver instance has to be configured. When user clicks on he button "*Configure*", the following driver configuration window will be open:



The field **"Host"** should contain the host name (IP address) in case of connectivity to remote Plant SCADA node. If you want to connect to a local Plant SCADA node - please, keep this field empty. It should be filled only for remote connectivity.

Fields **"User"** and **"Password"** have to be empty in case of connectivity to a local Plant SCADA node. If you are connecting to a remote Plant SCADA node, and the connection is secured, then please, enter user login criteria (user name and password) in the respective fields.

IMPORTANT NOTES:

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- Connectivity to Plant SCADA remote node is possible, only if the Plant SCADA license on remote node side, where you are connecting to, must have the special license option, enabling remote connectivity.
- Plant SCADA Native Drivers require installation of the Microsoft Visual C++ Redistributable 2012 x86 that can be downloaded from the official Microsoft web site

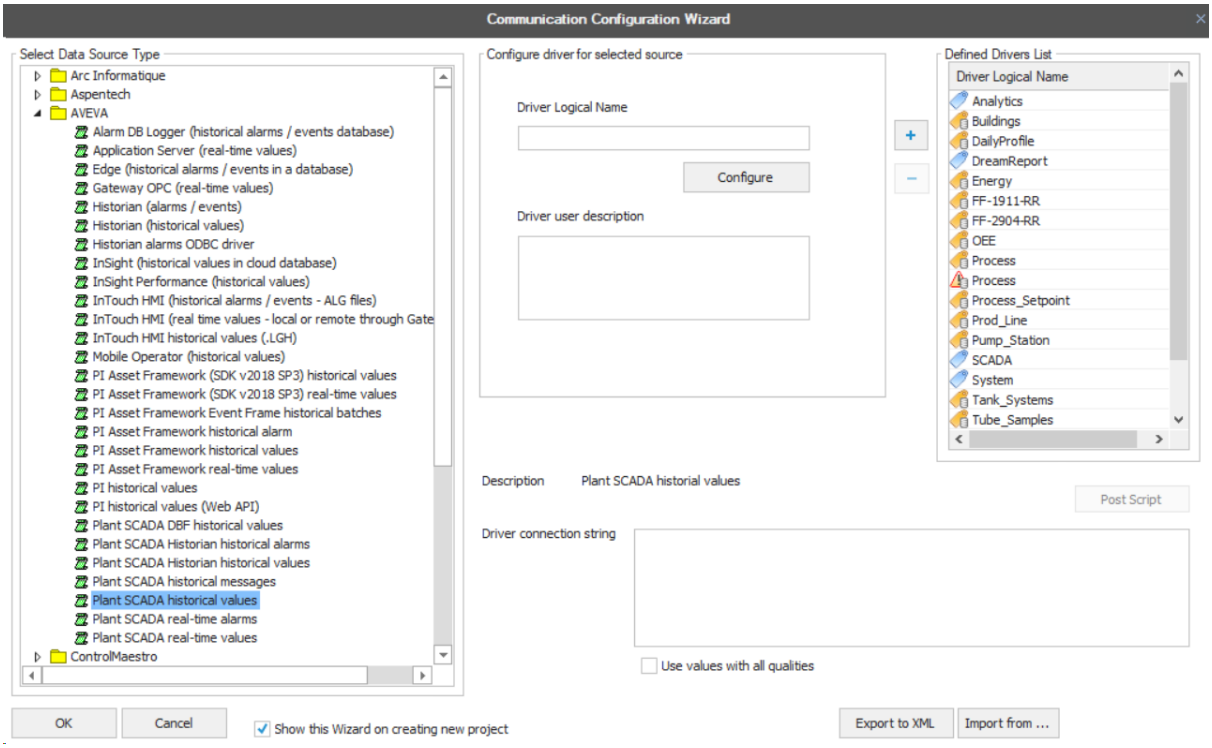
25.6.2.2 Plant SCADA Historical Values

Plant SCADA Historical values drivers allows you to connect to Plant SCADA, running on a local or remote node, get browse of Plant SCADA tags and access native Plant historical values.

The driver uses native ctAPI to communicate with Plant SCADA. That driver was tested and supports Plant SCADA versions starting from 6.10 and up to the version 7.5.

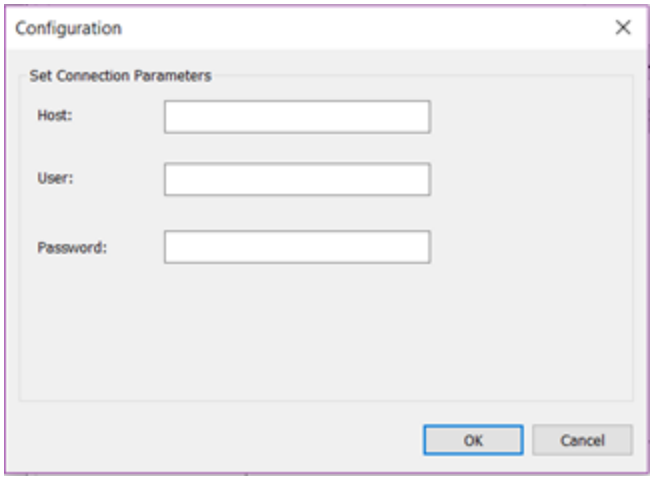
Driver configuration

When user selects "Citect historical values" driver from the available drivers list:



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A driver instance logical name has to be defined and the driver instance has to be configured. When user clicks on he button "*Configure*", the following driver configuration window will be open:



The field **"Host"** should contain the host name (IP address) in case of connectivity to remote Plant SCADA node. If you want to connect to a local Plant SCADA node - please, keep this field empty. It should be filled only for remote connectivity.

Fields **"User"** and **"Password"** have to be empty in case of connectivity to a local Plant SCADA node. If you are connecting to a remote Plant SCADA node, and the connection is secured, then please, enter user login criteria (user name and password) in the respective fields.

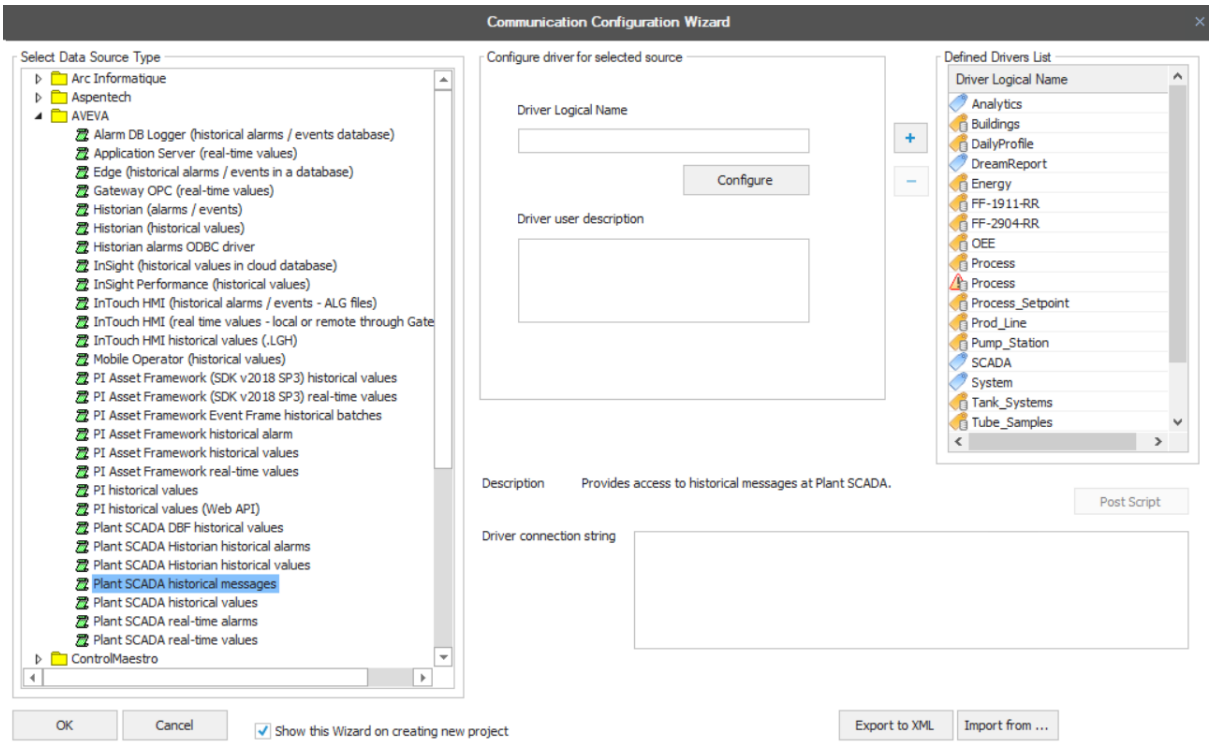
IMPORTANT NOTES:

- Connectivity to Plant SCADA remote node is possible, only if the Plant SCADA license on remote node side, where you are connecting to, must have the special license option, enabling remote connectivity.
- Citect Native Drivers require installation of the Microsoft Visual C++ Redistributable 2012 x86 that can be downloaded from the official Microsoft web site

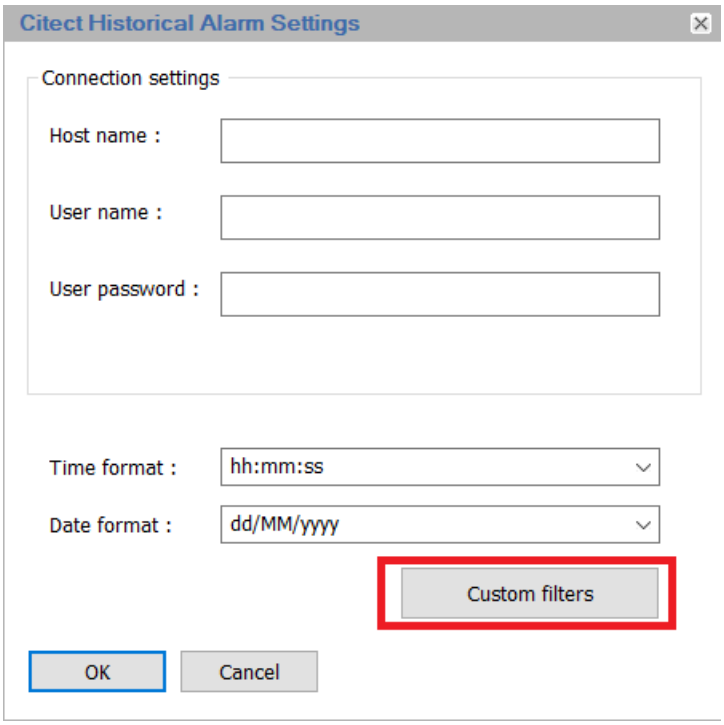
25.6.2.3 Plant SCADA Historical Messages

Plant SCADA Historical messages driver allows you to connect to Plant SCADA, running on a local or remote node. The driver uses native Plant SCADA ctAPI to communicate. it was tested with Plant and supports Plant versions between 7.5 and 6.10.

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When you click on *"configure"* button, the following configuration window will open:



Host name: If user is trying the connect to remote computer the computer name or IP address of remote machine has to be specified.

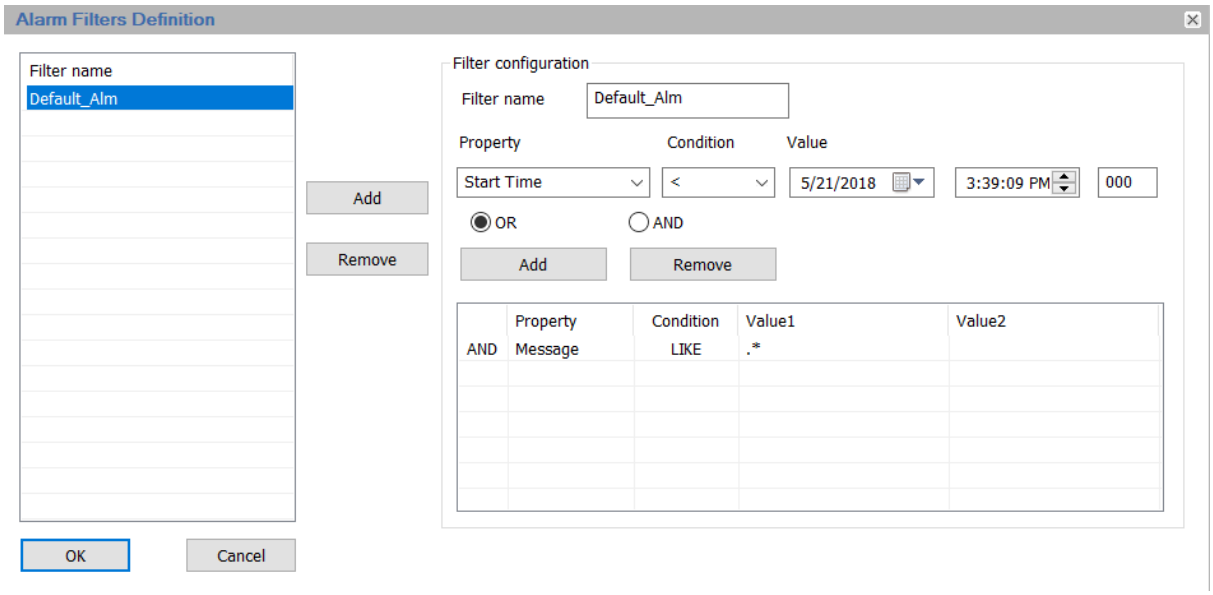
User name and **password:** please provide credentials of the user defined in the SCADA.

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IMPORTANT NOTE: DATE AND TIME must identical to the Plant SCADA settings

The settings for the *Historical messages* driver are the same as the *Real-Time alarms* driver, plus additional button for the "*Custom filters"*.

Click the *"Custom filters"* if you wish to "pre-filter" this instance of the driver with specific alarms or events. The
following configuration window will open:



Multiple filters can be defined, with each filter definition being comprised of one or more filter conditions. You can add additional filters by doing the following:

1. Under the **Filter Configuration** section, enter a new **Filter Name**, and then click the *"Add"* button.
2. Select the **Filter Name** on the left panel, and then add a filter **Property**, setting any relevant condition(s) for that property
3. Select *"***OR***"* or *"***AND***"* depending on the logic to be evaluated for this specific filter.
4. Click the *"Add"* button (in the *Filter Configuration*) section to add the condition to this filter.
5. Repeat steps 1-4 to add additional condition(s) to this filter definition.

When finished, click *"OK"* to save the Alarm (or Event) filters.

25.7 Emerson

DeltaV drivers of Dream Report enable you to connect to real-time and historical values, as well as historical alarms from DeltaV running project.

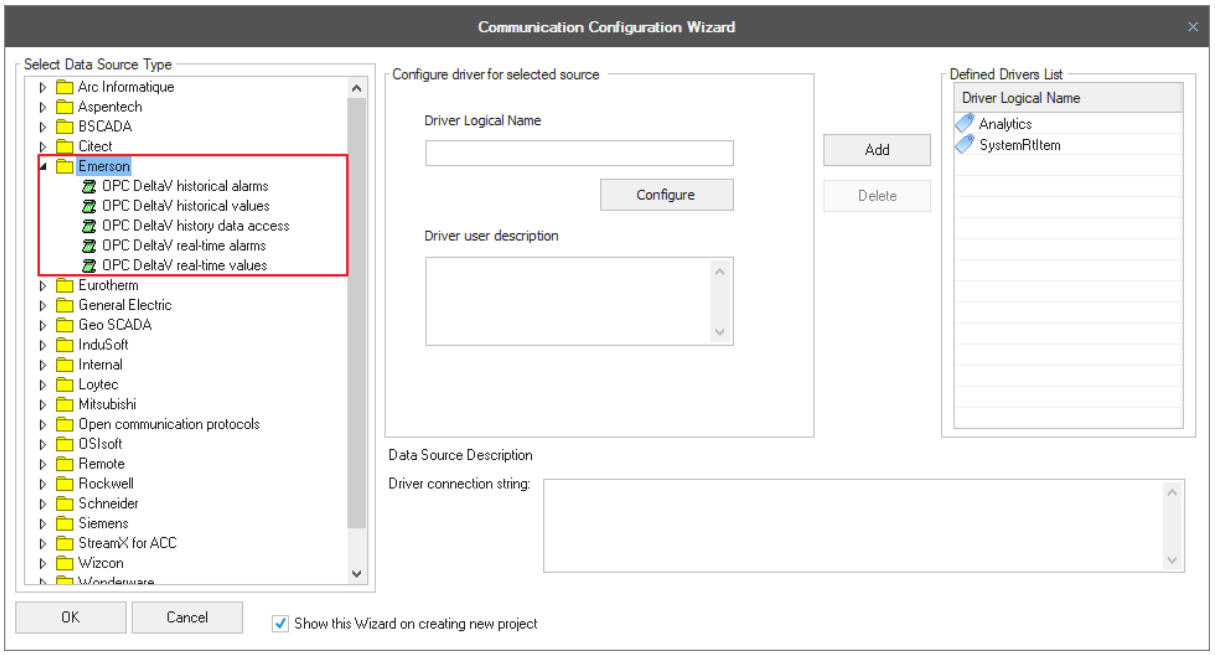
The *Emerson* folder will display the following list of drivers:

- OPC DeltaV historical alarms
- OPC DeltaV historical values

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- OPC DeltaV history data access
- OPC DeltaV real-time alarms
- OPC DeltaV real-time values

NOTE: As real-time alarm logging in Dream Report is no longer supported, the OPC DeltaV real-time alarms driver should not be used. It is present for backward compatibility only.



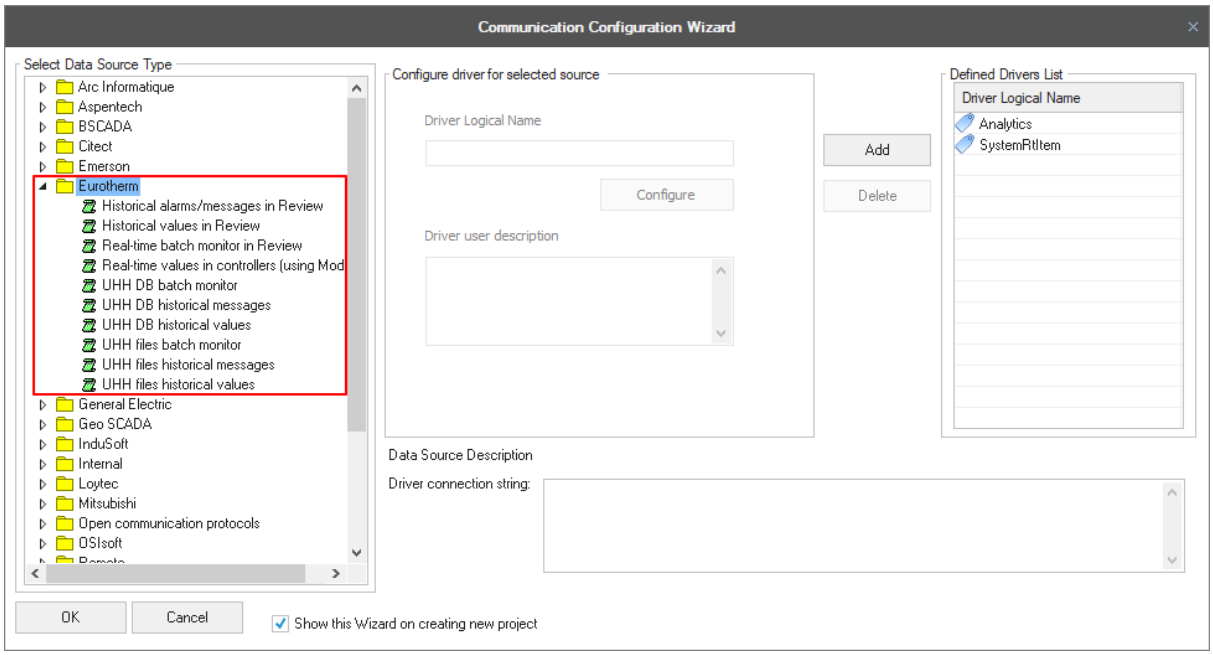
To configure DeltaV drivers, open the *Communication Configuration Wizard* dialog window. In the *Emerson* folder, select the driver you need in the *Select data Source Type* section, and click on the *Configure* button.

25.8 Eurotherm

The Dream Report *Eurotherm* communication drivers provide data connectivity between Dream Report and the Eurotherm data sources.

To configure the Eurotherm drivers, first, open the *Communication Configuration Wizard* dialog window in Dream Report Studio - all drivers are listed under the *Eurotherm* folder:

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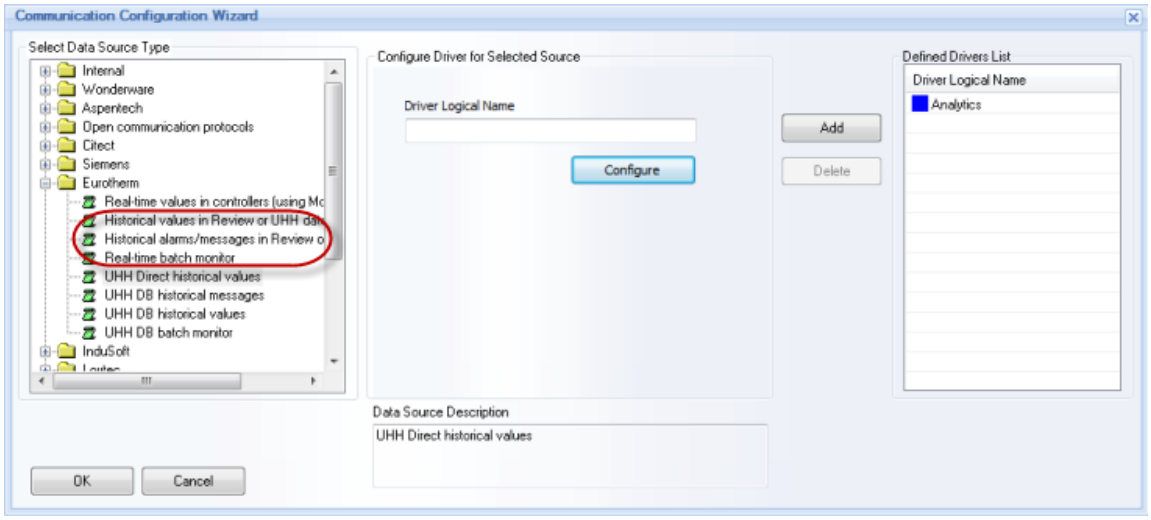
Select the driver you need for your project, give it a logical name and click on the *Configure* button.

After finishing the configuration click on the *Add* button to add it to the list and then *OK* to save and close the wizard.

25.8.1 Eurotherm Review drivers

Eurotherm Review communication driver enables connecting to one or several Review databases.

This driver is available in the **Eurotherm** folder of the Select Data Source Type section of the **Communication Configuration Wizard** (please see the (picture below):



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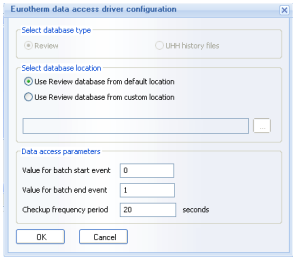
NOTE: In Dream Report version 3.43 the Eurotherm (Review) driver had one driver instance for both real-time and historical data access configuration.

Now, in this new version of Dream Report, the Eurotherm (Review) driver has three instances and should be configured separately as "**Historical values in Review database**", "**Historical alarms/messages in Review database**" or "**Real-time batch monitor**".

Real-time batch monitor driver

This driver can periodically query Review database, detect start of a new batch or end of currently running batch, and assign a corresponding pre-defined value to the logical data point according to the event type (e.g. value '0' if a new batch is started, and value '1' if the actual batch is ended).

If a user has selected the **Real-time batch monitor** driver from the **Eurotherm** folder in the Select Data Source Type section of the **Communication Configuration Wizard**, and clicks on the button "*Configure*", then, the **Eurotherm data access driver configuration** window will be opened:



In the **Select database location** section user will have to select whether the default **Review** database (e.g. *C:\Program files\Eurotherm\Review\Review.erv)* or any other **Review** (custom) database will be used for connection. If a user selects option "Use Review database from custom location", then the "..." (browse) button will become enabled, and a user can browse and select the required **Review database** file (with ***.erv** extension).

Data access parameters section defines which value will be assigned to a selected data point when a new batch will be started, and which value will be assigned to that data point, when the actual running batch will be ended.

Checkup frequency rate parameter defines how often the driver will check Review database for batch events. Default value is 20 seconds, i.e. by default every 20 seconds this driver will open connection to the Review database and check for start/stop batch events.

In order to make automatic batch report generation from Review database, user has to:

1. Add Eurotherm Review data access driver to the project

2. Create a batch definition, based on that driver (item-based, external data source, select any data item from required area and dataset)

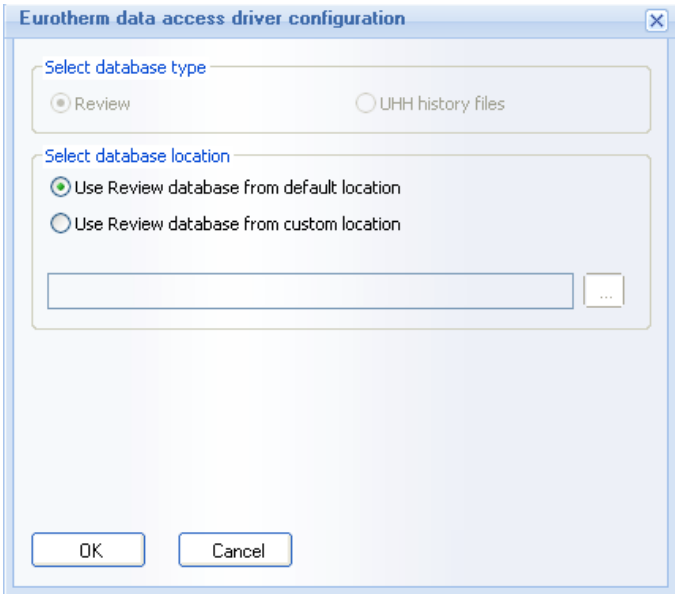
3. Go to report settings ==> Generate on event section and select any data item from the same area and dataset, which was used for the batch definition, and assign the required value according to the required event type (end of a batch or start of a new batch).

History Data/Alarms Access Eurotherm Review driver

This driver enables having direct and automatic access to the Review archives, and making reports out of that.

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If a user has selected either the **Eurotherm Historical values in Review database** driver, or **Eurotherm Historical alarms/messages in Review database** driver in the the **Eurotherm** folder of the Select Data Source Type section of the **Communication Configuration Wizard**, and clicks on the button "*Configure*", then the following **Eurotherm data access driver configuration** dialog window will be opened:



In this window user can select the type of the archives, which need to be accessed, and the location of those archives. User doesn't need to create and configure a DSN or do any configuration other than just pick up the archive selection.

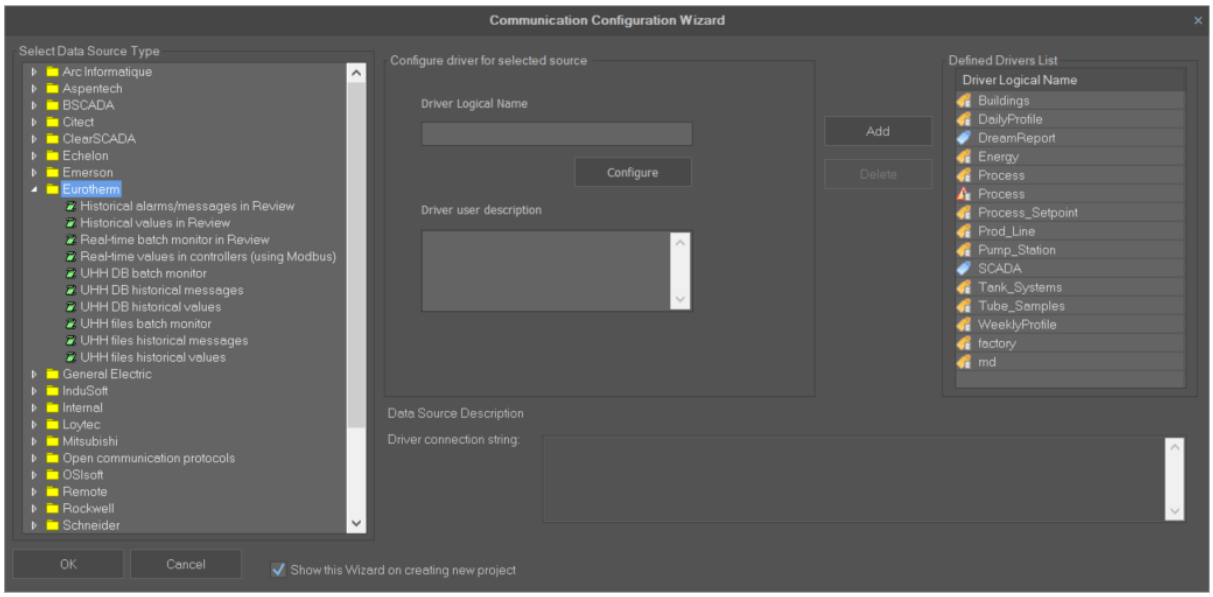
NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "**Select Data Source Type**" field on any other driver and then go back to the driver that you need to configure.

25.8.2 Eurotherm UHH Files Drivers

The “UHH Files” drivers allows for data retrieval from multiple UHH files using the UHH Navigator API.

To configure a UHH Files driver, first, open the *Communication Configuration Wizard* dialog window:

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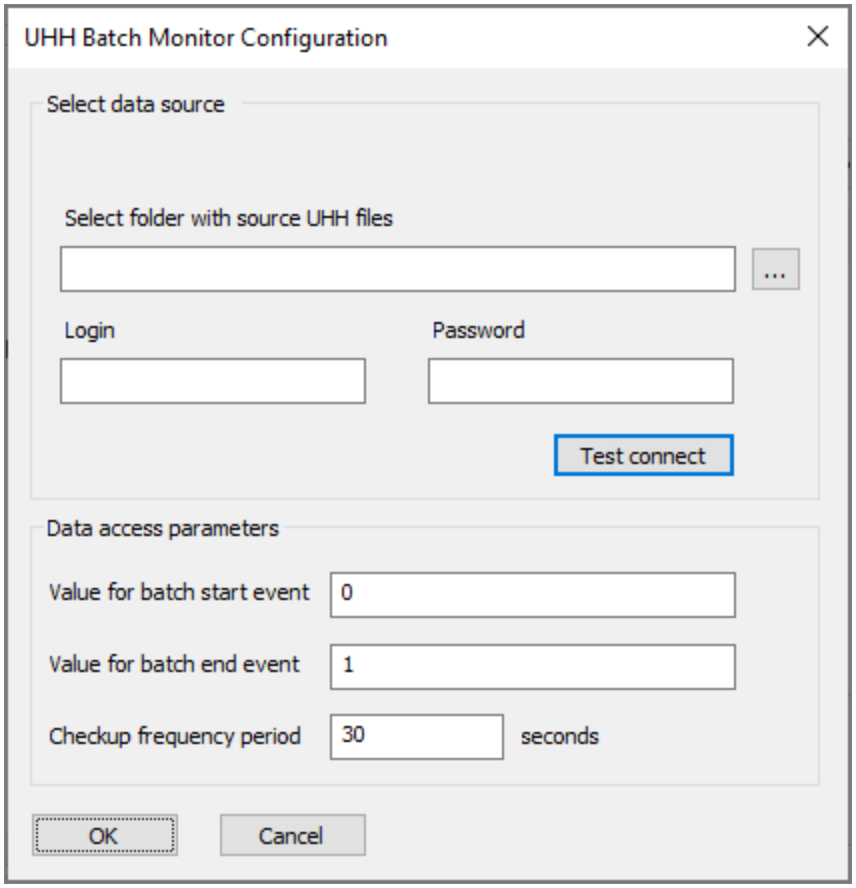
Select one of the three UHH files drivers (**UHH files batch monitor, UHH files historical messages, UHH files historical values**) from the **Eurotherm** folder in the **Select data source type** section. Click on *Configure* button, and the UHH files driver configuration dialog box will be opened.

UHH files batch monitor:

This driver can periodically receive data from UHH files, detect the start of a new batch or end of currently running batch, and assign a corresponding pre-defined value to the logical data point according to the event type (e.g. value '0' if a new batch is started, and value '1' if the actual batch is ended).

To add this driver to the project, select the "**UHH files batch monitor**" driver from the list of drivers in the *Eurotherm* folder of the *Communication Configuration Wizard*, click on the *Configure* button, and the following driver configuration window will open:

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Select data source section:

1. Click on the "[…]" button to open the browse window and select a folder with the UHH files for use.
2. Enter the Windows *Login* and *Password* for the selected folder. Leave those fields empty if there are none.
3. Click the "*Test connect*" button to verify your information.

Data access parameters section defines which value will be assigned to a selected data point when a new batch will be started, and which value will be assigned to that data point, when the actual running batch ends.

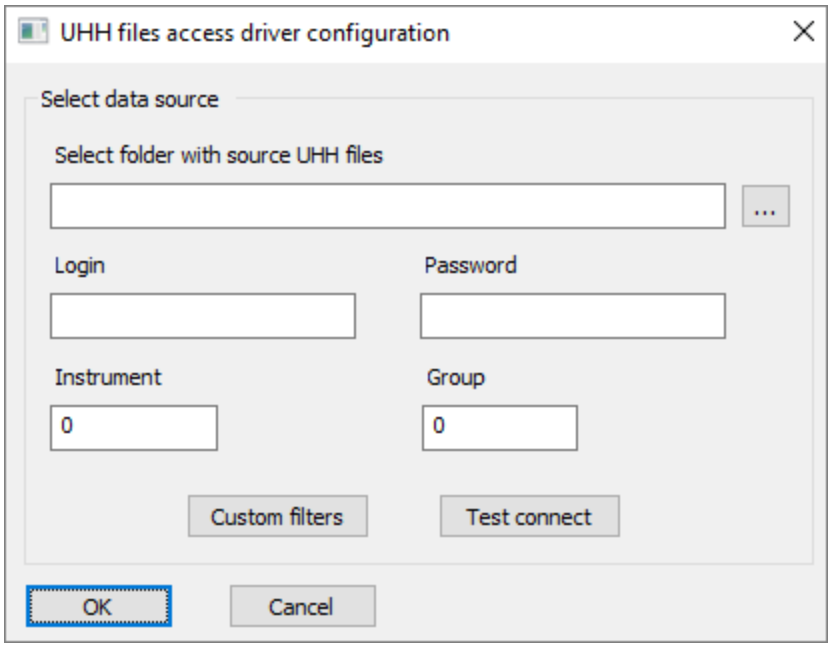
Checkup frequency period parameter defines how often (in seconds) the driver will check the *Review* database for batch events. Default value is 30 seconds, i.e. by default every 30 seconds, this driver will open a connection to the *Review* database and check for batch start/stop events.

UHH files historical messages:

This driver allows retrieval of historical messages from a set of *UHH* files on local or remote machine.

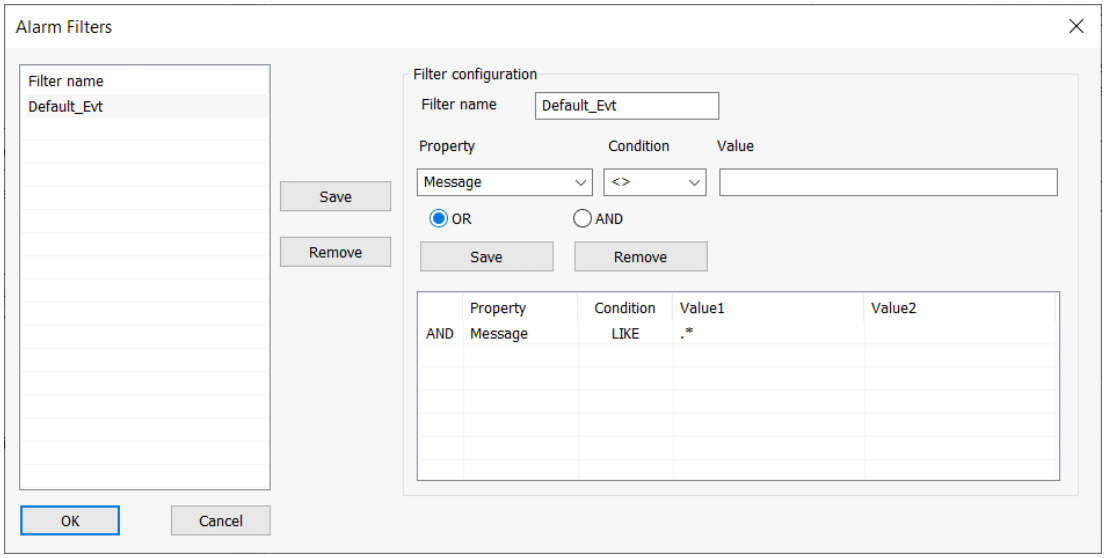
To add this driver to the project, select the "**UHH files historical messages**" driver from the list of drivers in the **Eurotherm** folder of the *Communication Configuration Wizard*, click on the *Configure* button, and the following driver configuration window will open:

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Select data source section:

1. Click on the "[…]" button to open the browse window and select a folder with the UHH files for use.
2. Enter the Windows *Login* and *Password* for the selected folder. Leave those fields empty if there are none.
3. Enter the *Instrument* and *Group* numbers
4. Click the "*Test connect*" button to verify your information.
5. Click the "*Custom filters*" to open the following *Alarm Filters* configuration window:



6. Click the "*Custom filters*" to open the following *Alarm Filters* configuration window:

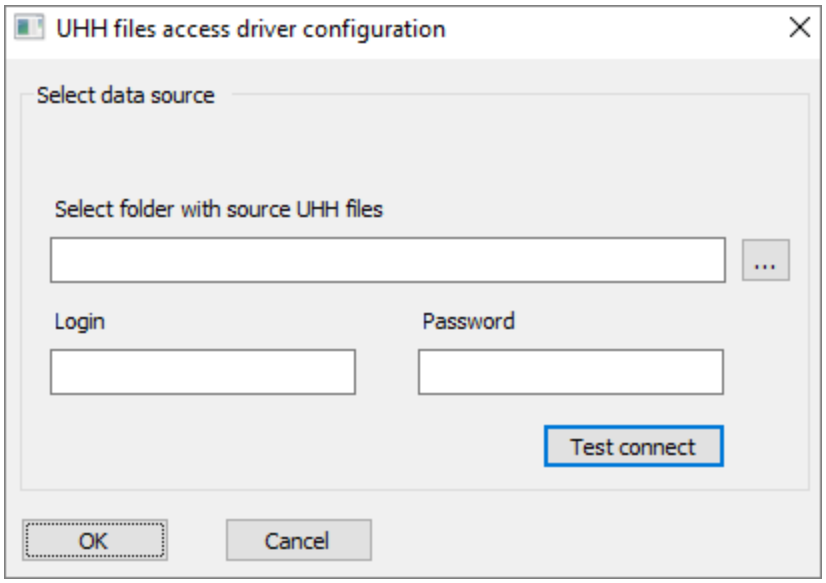
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An *Alarm Filter* is a set of predefined conditions (query filters) on the alarm data, that can be used in Dream Report objects to filter alarm displays or in alarm-related calculations. An Alarm Filter is made up of one or more filter Conditions.

To create a filter:

- Filter Name – enter a descriptive name for the filter – e.g., "Reactor Alarms", "High Priority", etc.
- Condition – select a Property (from the *Custom Properties* list described above) and then set the evaluation criteria:
  - AND or OR – specify whether this filter condition will be *AND*ed or *OR*ed with the other condition(s)
  - Property – specify whether the value being evaluated is *Boolean*, *Numeric* or *Text* data
  - Condition – specify the operator type for the filter being evaluated: >, =, *IS NOT NULL*, etc.
  - Value – enter the actual value (numeric or text) to be evaluated.
    ***Note: In this filter configuration window use wild characters instead of the regular SQL (%) rules.**
- Once all fields in the *Condition* section are specified, click the "**Save**" button (below the "*OR* and *AND*" fields) to *add this condition* to the list of conditions that make up this *Filter*
- Add additional conditions, if needed, for this *Filter*
- Once all conditions are entered for this *Filter*, click the "**Save**" button (to the left of the "*OR* and *AND*" fields) to add this filter to the list of filters for this Alarm driver configuration. The new Alarm Filter will be added to the list of Filter Names on the left-side panel.
- Repeat the above steps to create additional filters, and then click "*OK*" to close the *Alarm Filters* window.

UHH files historical values:
This driver allows retrieval of historical values from a set of UHH files on local or remote machine.



To add this driver to the project, select the "**UHH files historical values**" driver from the list of drivers in the *Eurotherm* folder of the *Communication Configuration Wizard*, click on the *Configure* button, and the following driver configuration window will open:

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1. Click on the "[…]" button to open the browse window and select a folder with the UHH files for use.
2. Enter the Windows *Login* and *Password* for the selected folder. Leave those fields empty if there are none.
3. Enter the *Instrument* and *Group* numbers
4. Click the "*Test connect*" button to verify your connection.

Click the ***"OK"*** button to close the UHH files configuration window, and return to the **"Communication Configuration Wizard"**. Then you need to enter a unique **"Driver Logical Name"** for this configured data source.

Finally, click the ***"Add"*** button to add this configured instance of the UHH files driver to the project's list of data sources, and will appear in the *Defined Drivers* list.

25.8.3 Real-time Values in Controllers (Using Modbus)

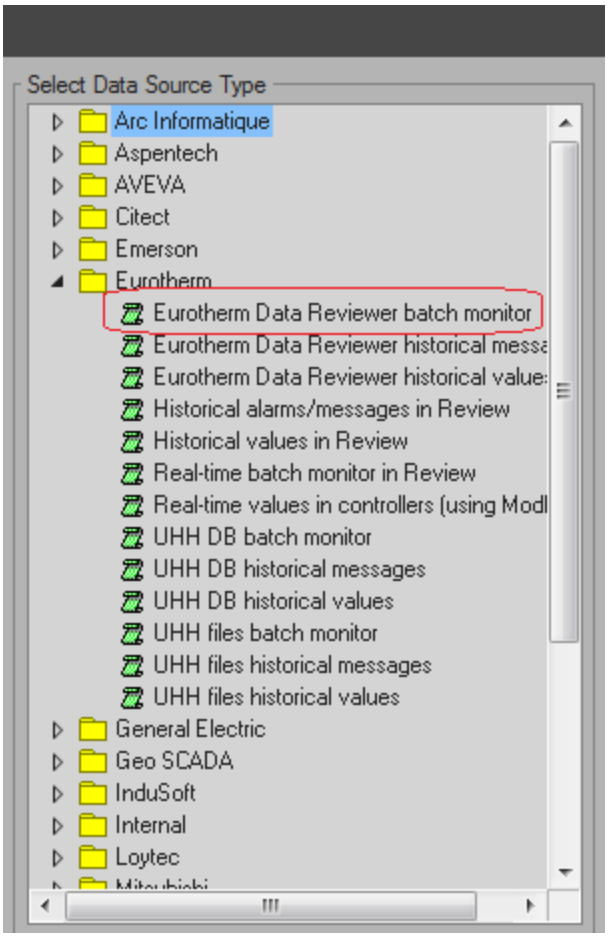
Product allows communicating with Eurotherm recorders and controllers over Modbus. User can load profile of specific Eurotherm device from the list of available profiles. For more details about Modbus driver configuration please refer to Modbus driver 812 description.

25.8.4 Eurotherm Data Reviewer batch monitor driver

Eurotherm Data Reviewer batch monitor driver allows users to connect to Eurotherm Data Reviewer system and to monitor batch start and batch end events and generate reports automatically upon batch end or batch start.

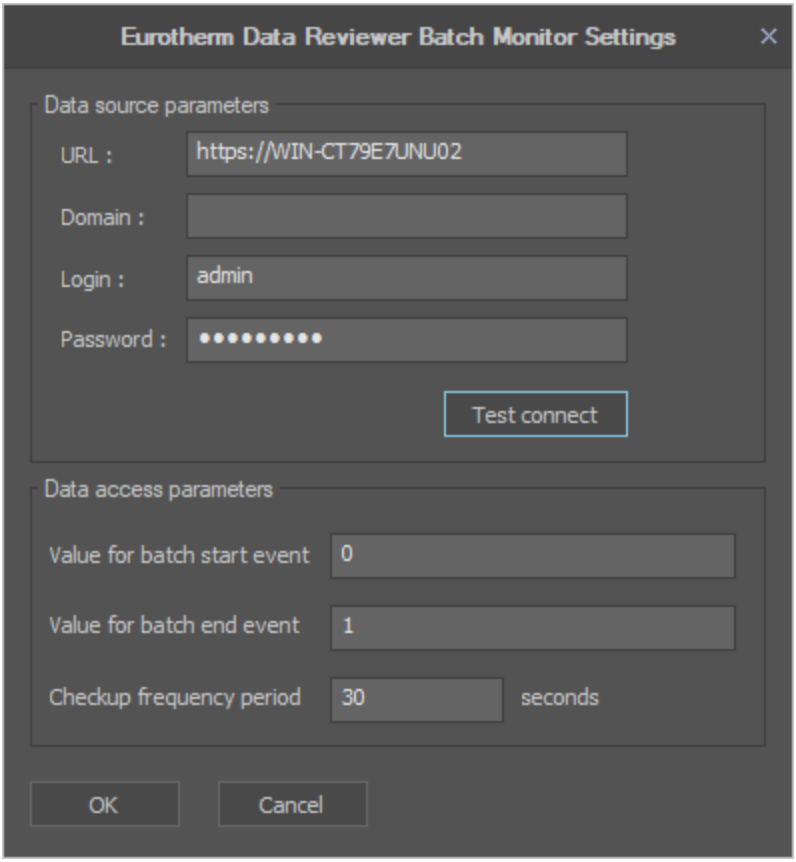
In order to use that driver in the project, user has to select it from the list:

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Then, set the logical name for that new driver instance and click “Configure” button and driver configuration window will be open:

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Enter the URL to your Reviewer system in the *URL* edit box.

If the system is under domain – please, enter the domain name in the *Domain* edit box.

Then, you have to specify *login* and *password* to connect to Data Reviewer and click the *Test connection* button. The driver will try to connect to Reviewer and then, it will open a result message box – either test connection had succeeded or failed.

Then, user can configure data access and batch event parameters:

Value for batch start event and *Value for batch end event* parameters mean – which value the driver will send to Dream Report, when the corresponding event will happen.

While using default parameters, , the driver will send 0 value, when batch start event will happen and the value 1, when batch end event will happen. So, when you configure automatic report generation on batch start or batch end - please, make sure to use the right values to trigger report generation.

Checkup frequency period will define, how often, the driver will connect to Reviewer and check batch statuses for specific instruments and groups. The default value is 30 seconds, i.e. each 30 seconds, the driver will connect to reviewer, check batch status for each instrument/group and disconnect.

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After driver configuration is completed, user has to click *OK* in the driver configuration window, then click the button + (add) and add the driver instance to the Dream Report project.

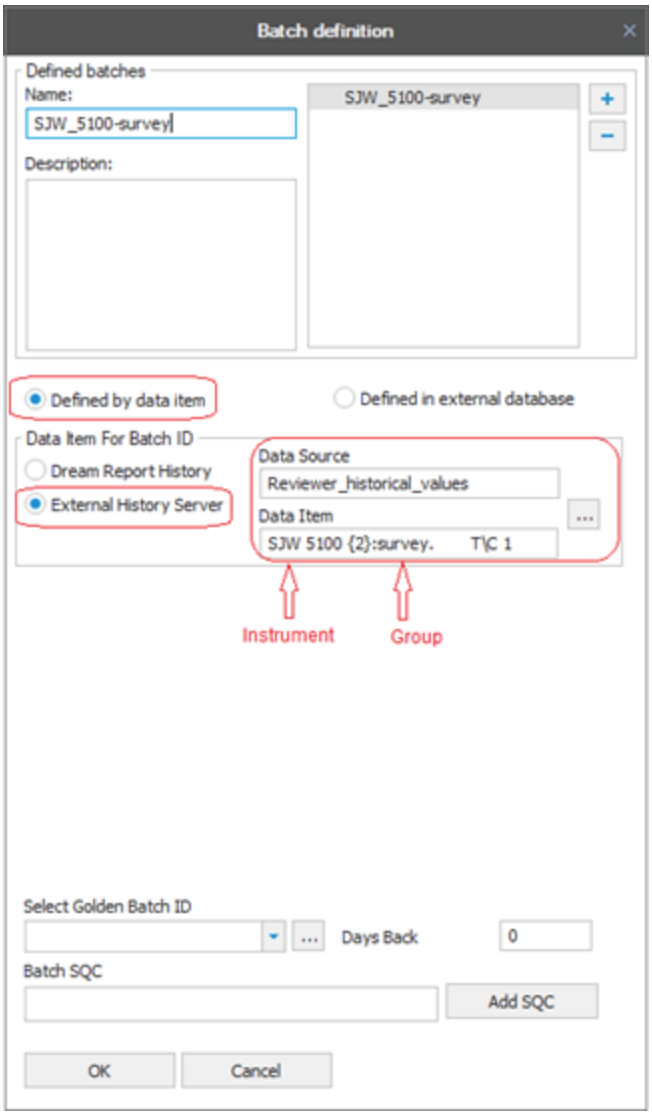
Browsing Reviewer channels

When user will browse channels from Reviewer for Dream Report statistical objects, then channel browse will display the list of instruments. Then, when user will select the instrument – the browse list will open the second level – the list of groups, available for that instrument. Then, when user has selected a group, then channels browser will display the list of channels, available for that selected group. Each statistical object will save Reviewer channel as: *Instrument : Group : Channel name*.

Batch configuration

In order to add and configure a batch definition, based on Reviewer, you have to open batch definition window, add a new batch, based on data item, external history server. Then, click on a "…" button (tag browse) and select any tag, from the required instrument and group:

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That's all configuration. In the runtime, Dream Report batch definition will extract the instrument name and the group name from the selected channel name, in the batch definition and batch monitor will watch the status of batches for that instrument and group.

Configuring automatic report generation on batch end

To configure automatic report generation on batch end, please, do the following:

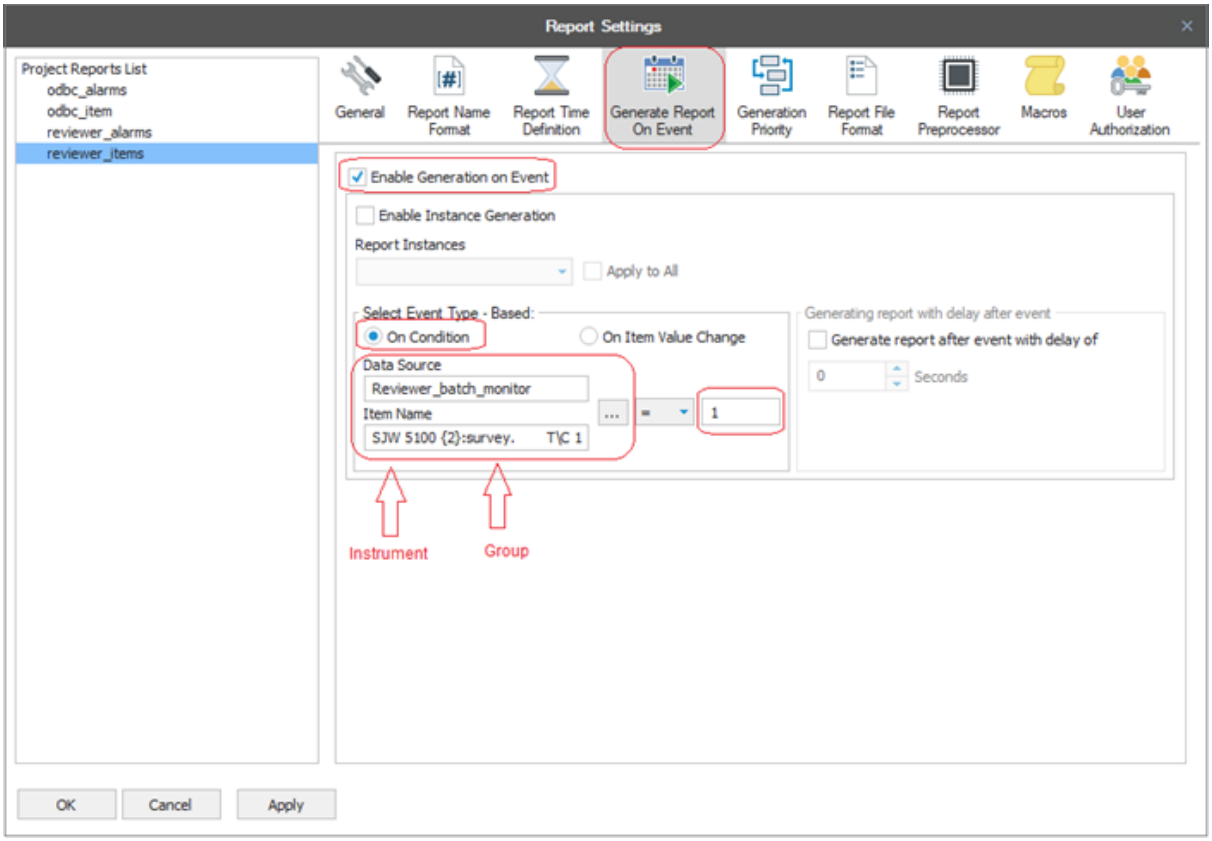
- Open *Report Settings* -> *Generate Report on Event* window,
- Enable check box *Enable generation on event*,
- Select event type option *On condition*,

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- Click "…" (tag browser) window, select the data source, corresponding to your Eurotherm Data Reviewer batch monitor, select the required instrument, required group, corresponding to the batch, which you want to monitor and select any channel, of that group.

- If you want to generate report on batch end, you have to set the generation condition "= *1*" (or another value, which you have set in "batch end event", in batch monitor driver configuration. The default value is 1).

(see pic)



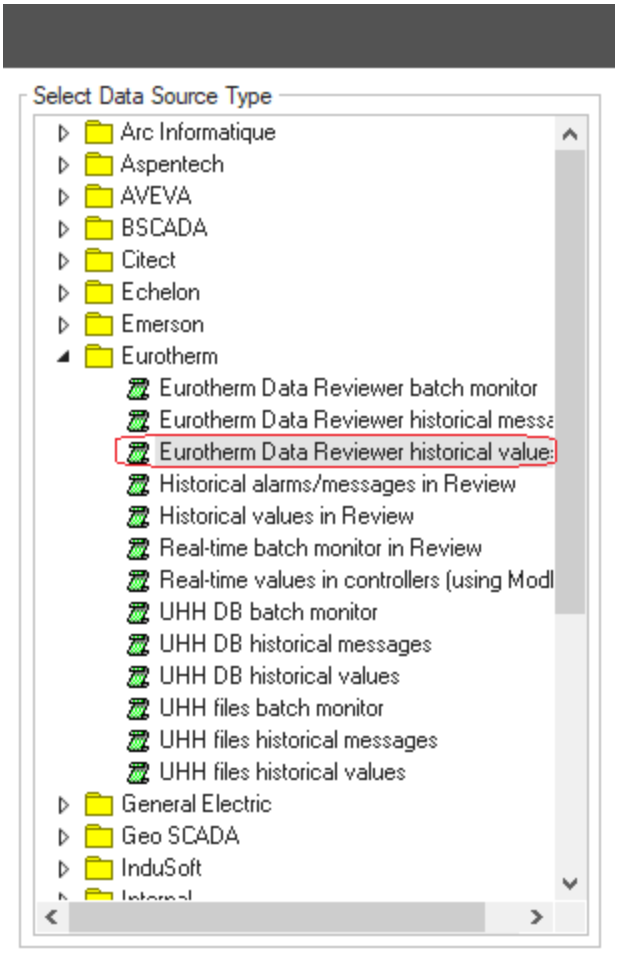
When you have configured report as displayed on the picture, every time, when batch, corresponding to that instrument and group, will be ended, that report will be automatically generated.

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25.8.5 Eurotherm Data Reviewer historical values access driver

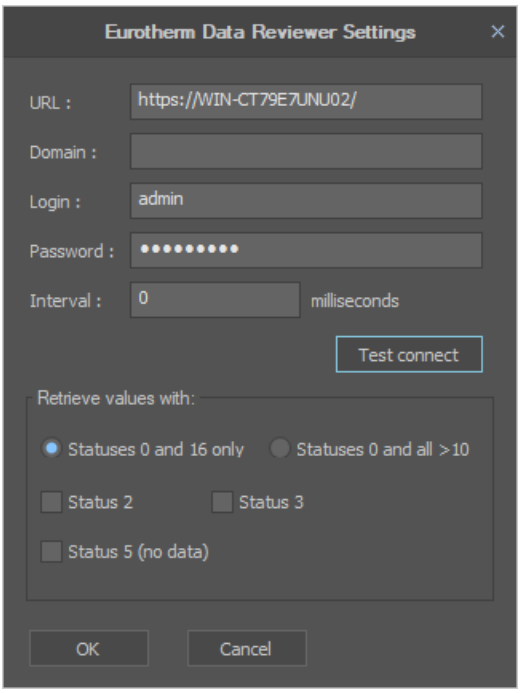
Eurotherm Data Reviewer historical values driver allows users to connect to Eurotherm Data Reviewer system, access and retrieve historical values and use that retrieved data in reports.

In order to use that driver in the project, user has to select it from the list:



Then, set the logical name for that new driver instance and click *Configure* button and driver configuration window will be open:

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Enter the URL to your Reviewer system in the *URL* edit box.

If the system is under domain – please, enter the domain name in the *Domain* edit box.

Then, you have to specify *login* and *password* to connect to Data Reviewer and click the *Test connection* button. The driver will try to connect to Reviewer and then, it will open a result message box – either test connection had succeeded or failed.

After connection to Reviewer is configured and tested, you have to define, which status of values will be accepted for retrieved values.

The default option is: *Statuses 0 and 16*. That means, that when retrieving historical values from Reviewer, the driver instance will request only values with status 0 or status 16 only. All values, which have any other statuses, will be ignored.

User can also select another option: *Statuses 0 and all >1*". If this option is selected, then when retrieving historical values from Reviewer, the driver instance will request only values with status 0 or any status, greater, than 10, only. All values, which have any statuses between 1 to 10, will be ignored.

Besides those option, user can also add additional option – to include status 2, and/or status 3, and/or status 5 (no data) to the list of acceptable statuses.

If user will want to have different acceptable statuses settings for different calculations, one can add multiple driver instances, looking at the same Reviewer to the project, and each driver instance would have its specific statuses configuration and will be used for the required calculations.

After the driver configuration is completed, user has to click *OK* in the driver configuration window, then click "+" button and add the driver instance to the Dream Report project.

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NOTE: Starting from the version 2023 Eurotherm Data Reviewer HDA driver started to support Advance SQL Conditions in the reporting statistical objects.

Below are examples of the SQC definitions

[i#EDR_HisVal.6100A_2021/BulbControl/Loop1OP]>0 and
[i#EDR_HisVal.6100A_2021/BulbControl/Loop1WSP] <30

operands "and", "or", LIKE can be used as part of Advanced SQL condition in statistical objects

Browsing Reviewer channels

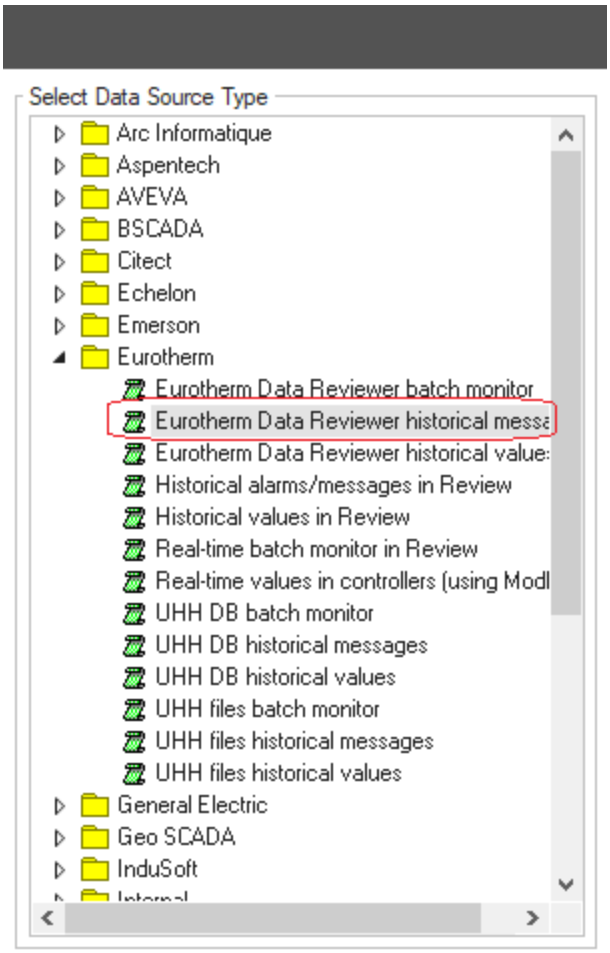
When user will browse channels from Reviewer for Dream Report statistical objects, then channel browse will display the list of instruments. Then, when user will select the instrument – the browse list will open the second level – the list of groups, available for that instrument. Then, when user has selected a group, then channels browser will display the list of channels, available for that selected group. Each statistical object will save Reviewer channel as: *Instrument : Group : Channel name*.

25.8.6 Eurotherm Data Reviewer historical messages access driver

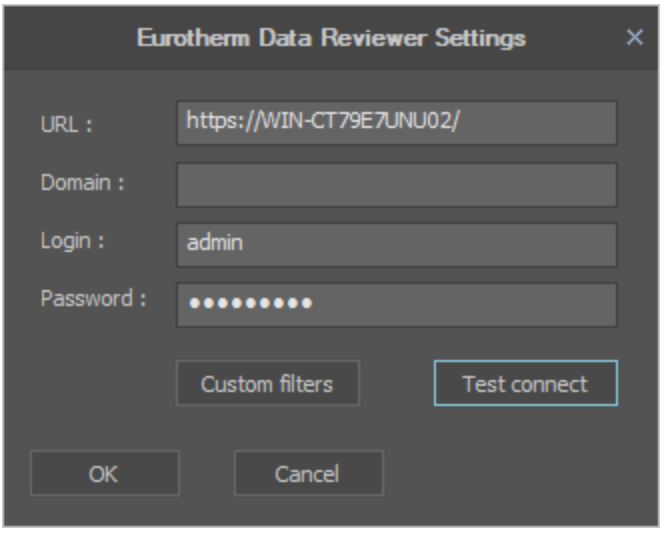
Eurotherm Data Reviewer messages driver allows users to connect to Eurotherm Data Reviewer system, access and retrieve messages, according to pre-defined filters.

In order to use that driver in the project, user has to select it from the list:

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Then, set the logical name for that new driver instance and click *Configure* button and driver configuration window will be open:



Enter the URL to your Reviewer system in the *URL* edit box.

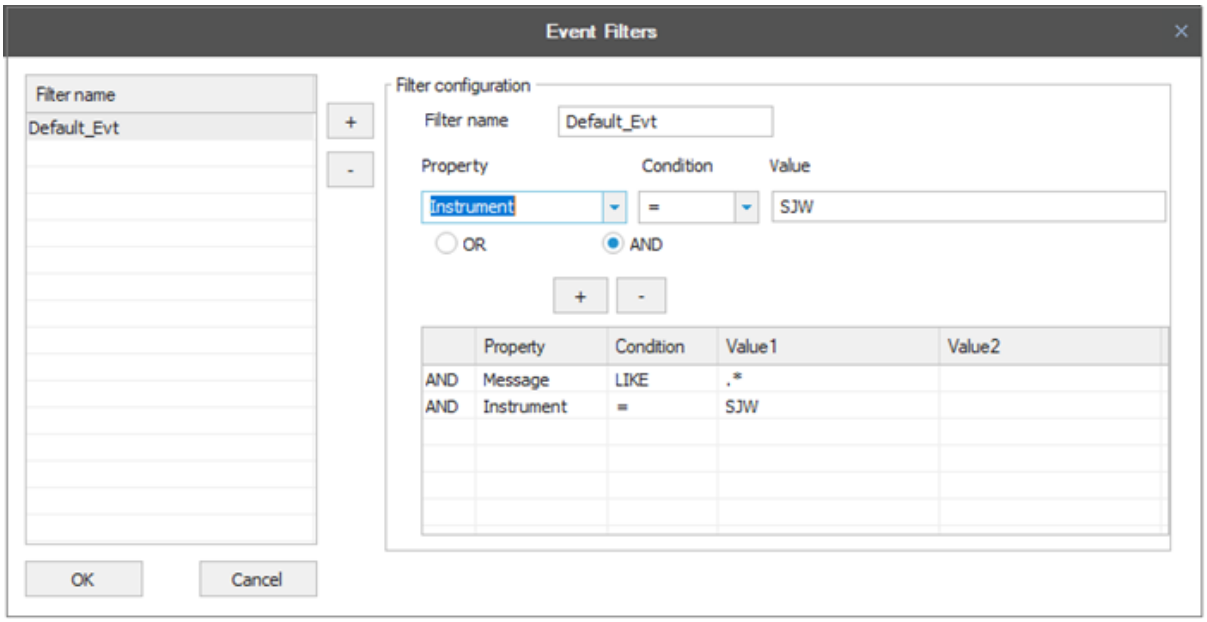
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If the system is under domain – please, enter the domain name in the *Domain* edit box.

Then, you have to specify *login* and *password* to connect to Data Reviewer and click the *Test connection* button to test the connection to Reviewer server. The driver will try to connect to Reviewer and then, it will open a result message box – either test connection had succeeded or failed.

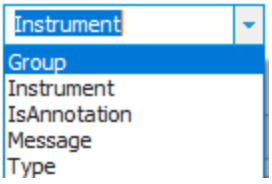
After connection to Reviewer is configured and tested, you have to define filters for messages retrieval.

Click on the button *Custom filters* and the filters definition window will be open:



To add a new filter, you have to:

- Enter a filter logical name in the *Filter name* edit box.
- Create a filter condition: Select a message property from the *Property* drop-down list. The following properties are available for selection:



- Then select a condition operator from *Condition* drop-down list, set condition value and click on "*…*" (add) to add a new condition to the list.

The list of condition operators will be displayed according to the selected property: numeric and string properties will have the list of relevant conditions for the property type.

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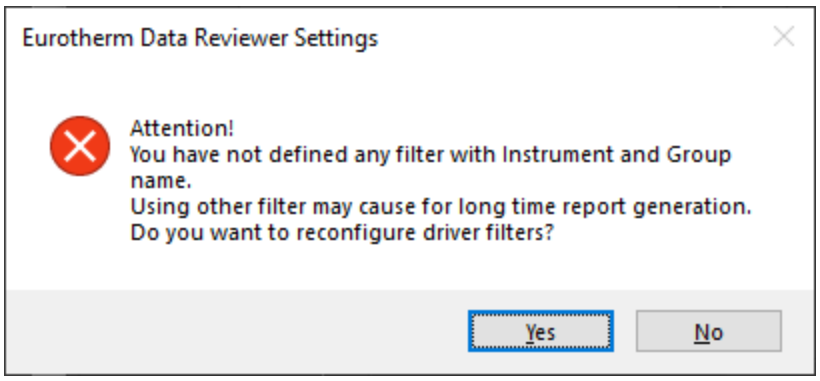
One filter can include several conditions. When adding a new condition, user has to select the logical operator of that condition (*AND* / *OR*).

When all conditions are defined – you have to click on "+" (add) button (to the left from *Filter name* label) and the new filter will be added to the list.

User can add as many filters, as needed. There is no pre-defined limit of the number of defined message filters.

IMPORTANT NOTE: As Reviewer batch is defined by an instrument and a group – if you want to get messages per specific batch, you have to specify instrument and group conditions, corresponding to desired batch type, in a message filter.

If there is no message filter defined, with an instrument and a group, then, when clicking *OK* and closing filter configuration window, the following warning message box will be open:



NOTE: Once defining the instance of the driver, it is strongly recommended to set the instrument and group as part of the filter as such definition will significantly improve report time generation.

If you would like to reconfigure filters and add a filter with an instrument and a group conditions, you have to click *Yes* button. If you do not want to reconfigure message filters now – please, click the button *No*.

After driver configuration is completed, user has to click *OK* in the driver configuration window, then click "+" button and add the driver instance to the Dream Report project.

NOTE: Starting from the version 2023 Eurotherm Data Reviewer HDA driver started to support Advance SQL Conditions in the reporting statistical objects.

Below are examples of the SQC definitions

"message" LIKE '%Connetion%' OR "annotationType"=1

"messageTypeId"=15 AND "annotationType"=0

"instrumentName" = 'nano2021' and "groupName" = 'BulbControl_2021' and "catList" = 2

("catList" = 4 or "catList" = 16) and "instrumentName" = 'nano2021' and "groupName" = 'BulbControl_2021' and "message" LIKE '%Config%'

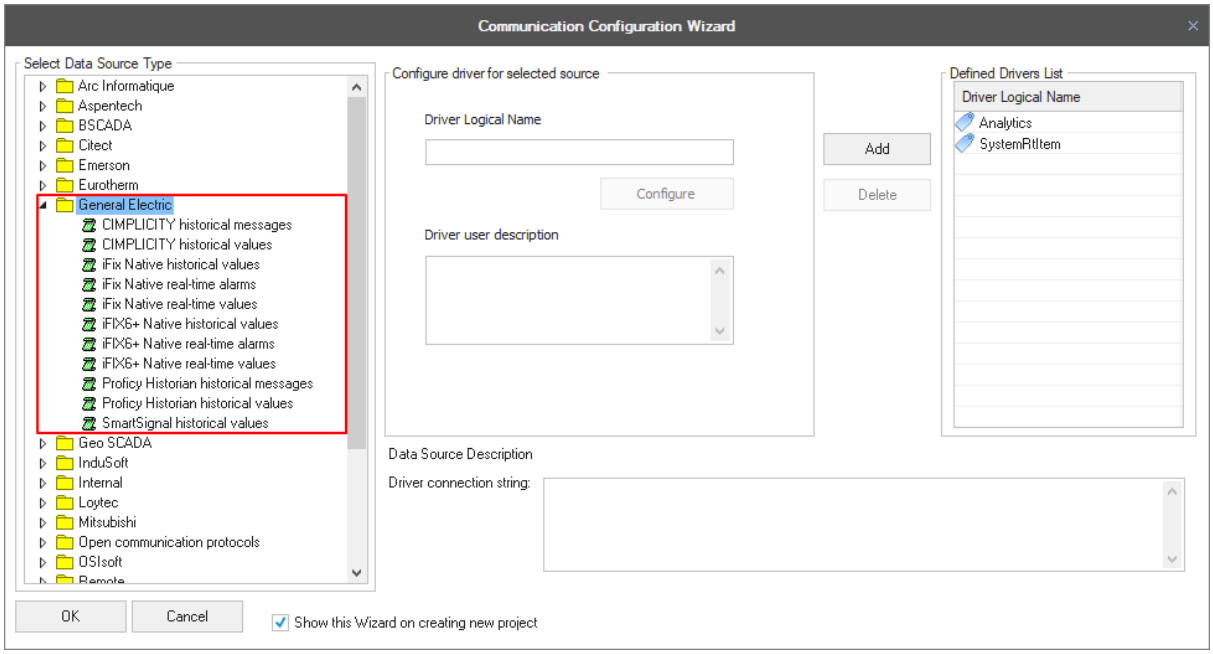
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operands "and", "or", LIKE can be used as part of Advanced SQL condition in statistical objects

25.9 General Electric

The Dream Report *General Electric* communication drivers provide data connectivity between Dream Report and the General Electric software.

To configure the General Electric drivers, first, open the *Communication Configuration Wizard* dialog window in Dream Report Studio - all drivers are listed under the *General Electric* folder:



Select the driver you need for your project, give it a logical name and click on the *Configure* button.

After finishing the configuration click on the *Add* button to add it to the list and then *OK* to save and close the wizard.

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Supported GE Intelligent Platforms Software

The following versions of GE Intelligent Platforms software are supported in Dream Report:

Proficy Historian

Versions 3.5, 4.5, 5.0, 6.0, 6.1, 7.0, 7.1

Proficy iFix

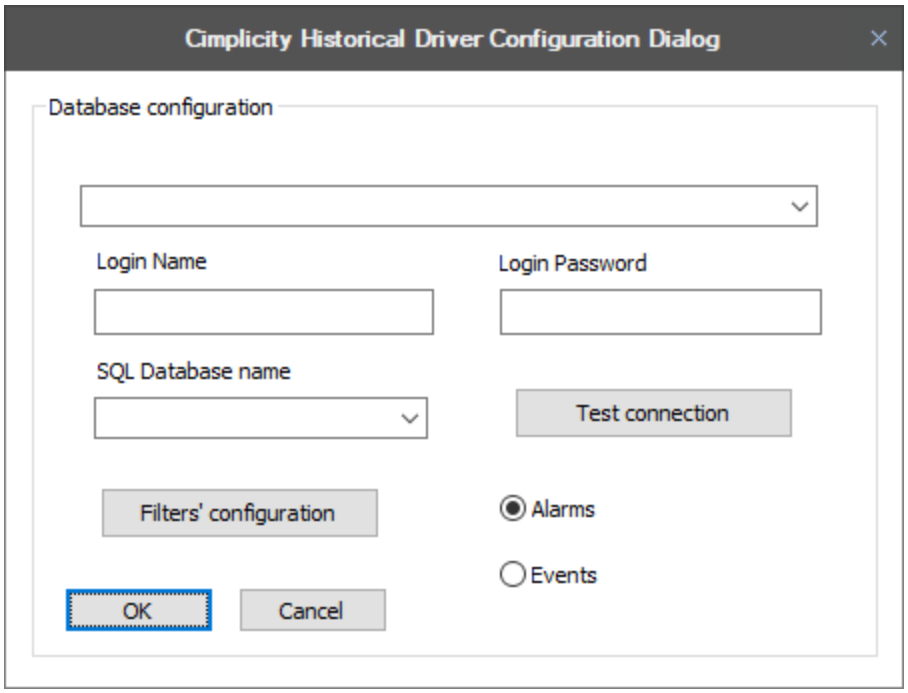
Version 3.5 up to 6.1

Proficy Cimplicity

Version 6.1 and later, up to and including 9

25.9.1 CIMPLICITY Historical Messages

This window allows you to define database configuration for getting access by *Cimplicity historical messages* driver.



Database Configuration

The upper popup box gives you the opportunity to determine either local or remote SQL server instance. Please click on the *Down arrow* at the right side of the popup box and you will see the list of available SQL server instances, both local and network.

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If the SQL server is configured with user authentication, then enter *Login Name* and *Login Password* for the SQL Server into the corresponding edit boxes.

If your SQL Server is configured with Windows Authentication mode, leave the *Login Name* and *Login Password* edit boxes blank.

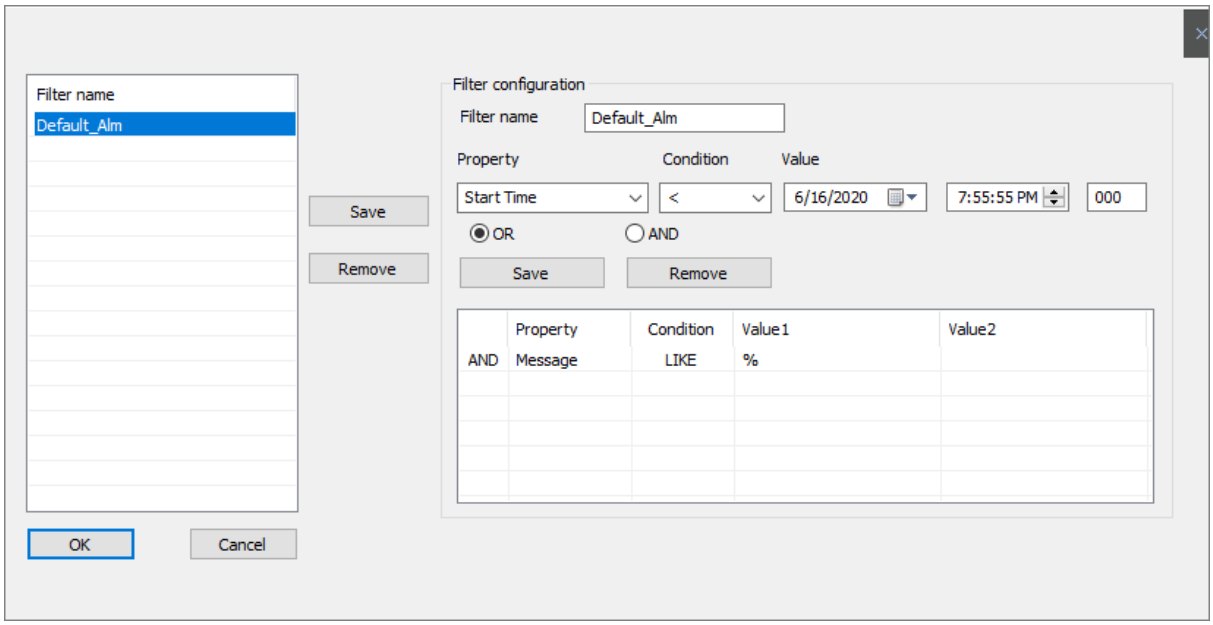
Then you need to select proper *SQL Database name* from the popup box list by clicking on the *Down arrow* at the right side of the popup box.

The *Test Connection* button will try to establish communication to the selected database based on SQL Server.

The *Alarms* and *Events* modes are available to indicate what records are to be reported.

Click on the *Filters' configuration* button to define the filters for the driver.

Filters Configuration



Enter a *Filter Name* that describes this specific alarm filter. Next, you will need to specify what *Conditions* (alarm properties) to filter on for this alarm filter.

The *Property* lists all properties for this specific alarm filter. Choose an alarm table Column to filter on. Select *Condition* and enter a numeric value, datetime or string to evaluate from the selected property. Click the *Save* (right button) to add this condition to the same filter.Click *Save* (left button) to add this filter to the list of defined Filter Names.

Multiple defined Alarm Filters (with associated conditions) can be created, that can then be used in an Alarm Table object, where the filter(s) can be selected to filter the alarm report as needed.

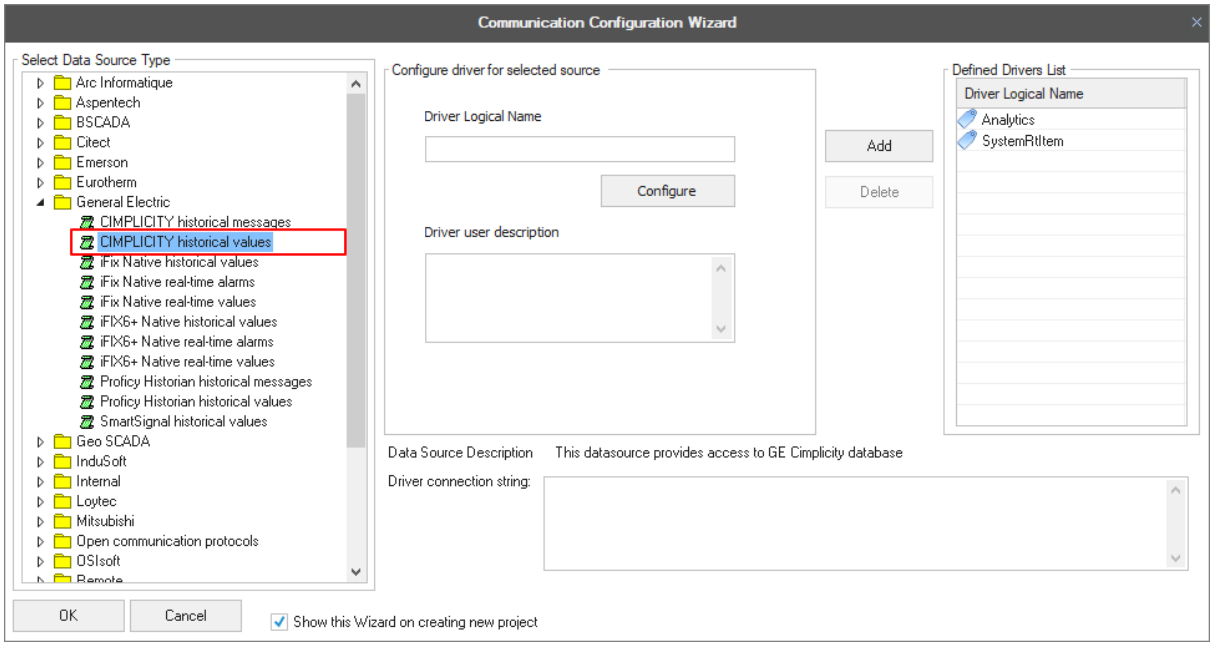
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Click the *OK* buttons to close the Alarm Filter Configuration window, and the driver configuration window.

25.9.2 CIMPLICITY Historical Values

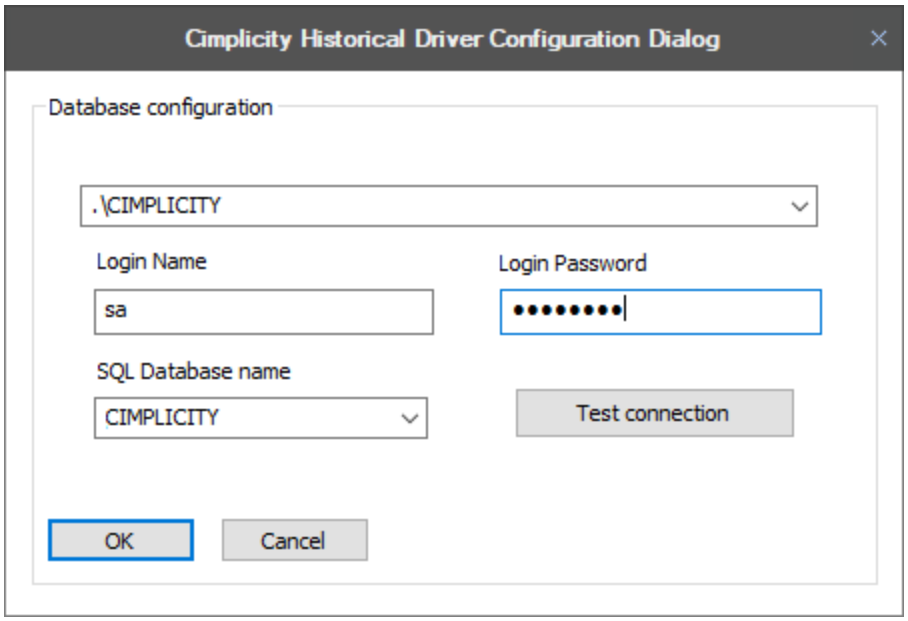
This driver provides automated values browse and extraction from local or remote SQL server.

To configure *Cimplicity historical values* driver, first, open the *Communication Configuration Wizard* dialog window. In the *General Electric* folder, please, select the *Cimplicity historical values* driver from the *Select data source type* section, and click on *Configure* button:



If Cimplicity historical values communication driver is selected, then, as soon as you click on *Configure* button, the following *Cimplicity Historical Driver Configuration Dialog* window will be opened:

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This window allows you to define database configuration for getting access by *Cimplicity historical values* driver.

The upper popup box gives you the opportunity to determine either local or remote SQL server instance. Please click on the *Down arrow* at the right side of the popup box and you will see the list of available SQL server instances, both local and network.

If the SQL server is configured with user authentication, then enter *Login Name* and *Login Password* for the SQL Server into the corresponding edit boxes.

If your SQL Server is configured with Windows Authentication mode, leave the *Login Name* and *Login Password* edit boxes blank.

Then you need to select proper *SQL Database name* from the popup box list by clicking on the *Down arrow* at the right side of the popup box.

The *Test Connection* button will try to establish communication to the selected database based on SQL Server.

After clicking on *OK* button you will return to the *Communication Configuration Wizard*. Then you need to assign *Driver Logical Name* for the selected data source. When the source is configured, it should be added to a general list of data sources, defined in a project, by clicking on *Add* button. The configured source will appear in the *Defined drivers list*.

When all the communication settings for the project are done, click *OK*, and the data source configuration will be finished.

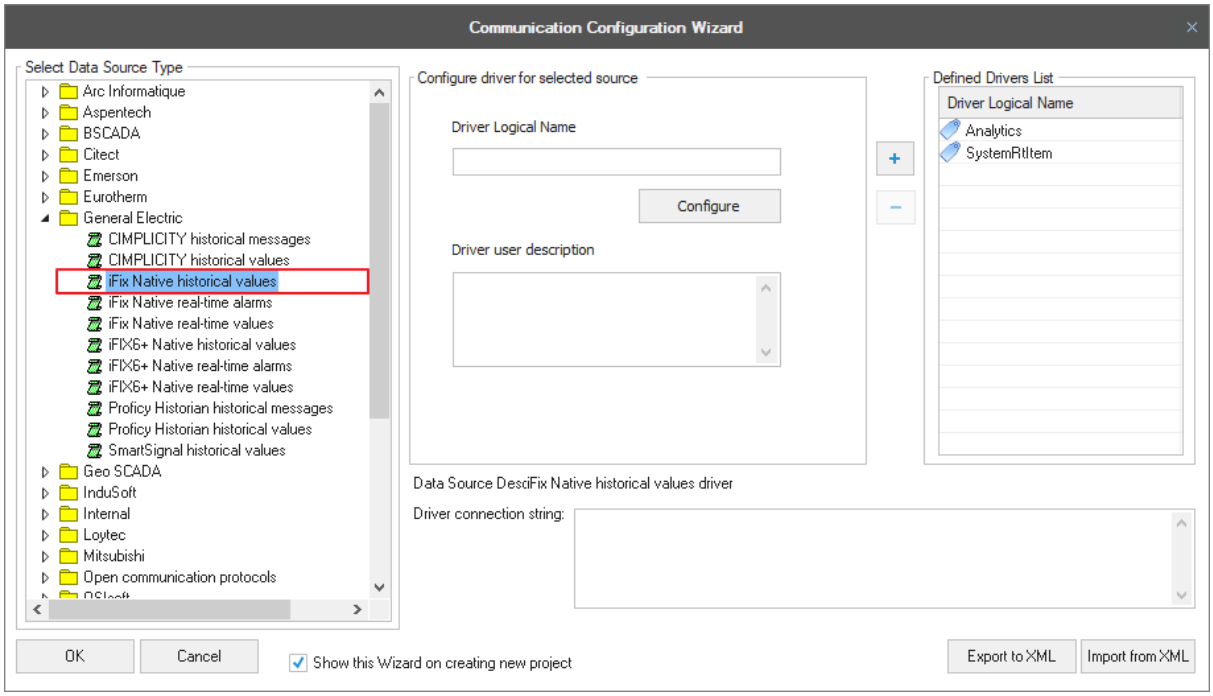
25.9.3 iFix Native Historical Values

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The *iFix Native historical values* communication driver provides automated values browse and extraction from local iFix database.

NOTE: iFix Native drivers can provide connection only to local data sources, i.e. on the same specific PC where iFix SCADA and Dream Report are running.

To configure iFix Native historical values driver, first, open the *Communication Configuration Wizard* dialog window. In the *General Electric* folder, please, select the iFix historical values driver from the *Select Data Source Type* section, and click on *Configure* button:



No configuration is required for this driver, you just need to assign *Driver Logical Name* for it. When the source is configured, it should be added to a general list of data sources, defined in a project, by clicking on *Add* button. The configured source will appear in the *Defined Drivers List*. Button *Delete* will delete selected source from the list.

When all the communication settings for the project are done, click *OK*, and the data source configuration will be finished.

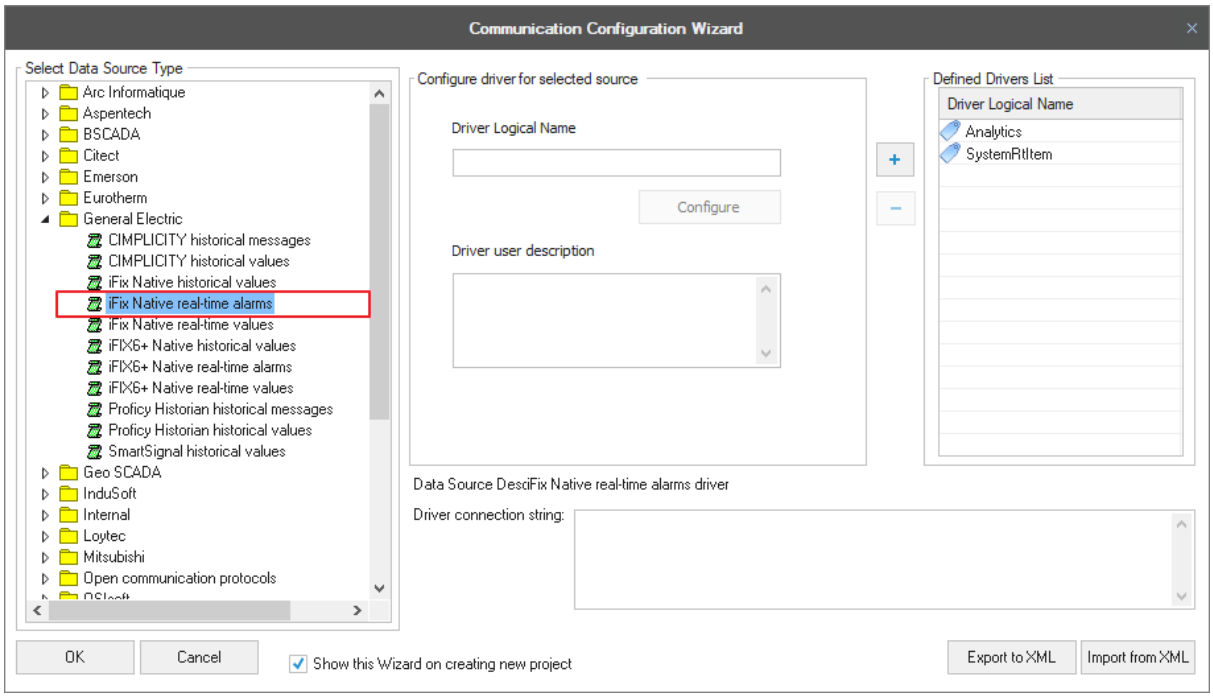
25.9.4 iFix Native Real-Time Values

The *iFix Native real-time values* communication driver enables users to connect directly to iFix SCADA, browse tags, extract values and log them in real time into the Dream Report internal history.

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NOTE: iFix Native drivers can provide connection only to a local data sources, i.e. on the same specific PC where iFix SCADA and Dream Report are running.

To configure iFix Native real-time values driver, first, open the *Communication Configuration Wizard* dialog window. In the *General Electric* folder, please, select the iFix Native real-time values driver from the *Select Data Source Type* section.



No configuration is required for this driver, you just need to assign *Driver Logical Name* for it. When the source is configured, it should be added to a general list of data sources, defined in a project, by clicking on *Add* button. The configured source will appear in the *Defined Drivers List*. Button *Delete* will delete selected source from the list.

When all the communication settings for the project are done, click *OK*, and the data source configuration will be finished.

25.9.5 GE Proficy Historian Historical Values

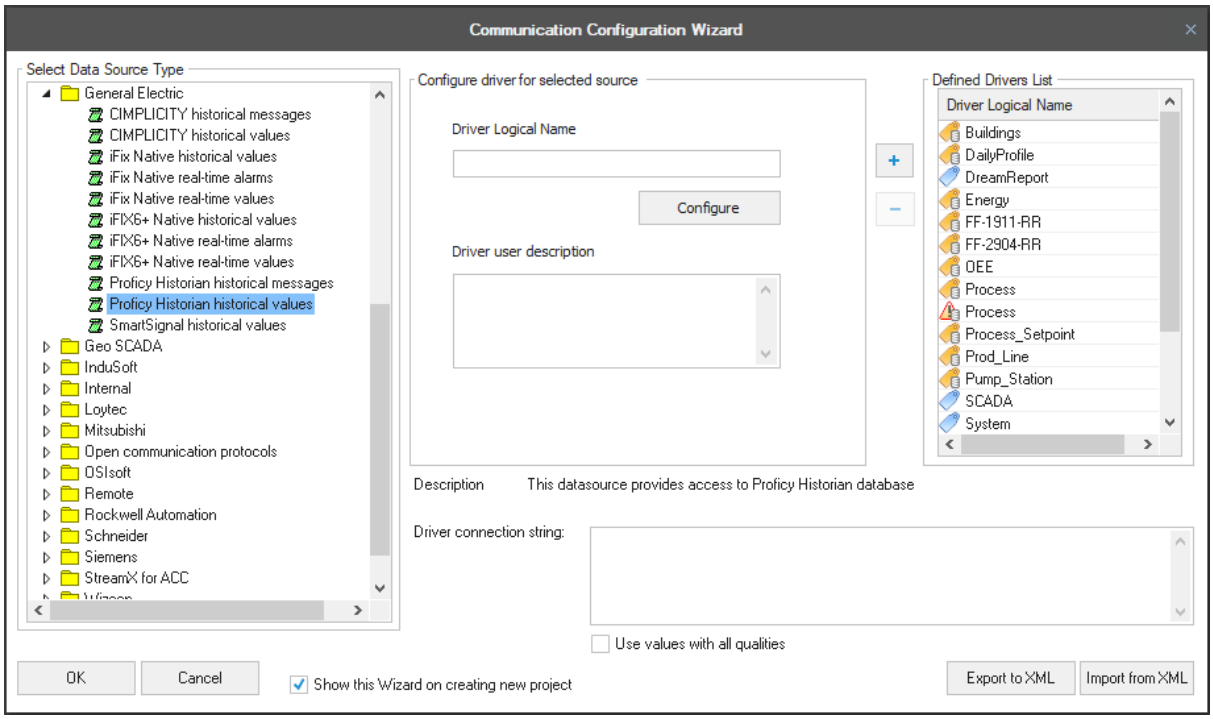
The *Proficy Historian Historical Values* driver enables users to directly access GE Proficy Historian and extract data using native retrieval and sampling modes of Proficy Historian. The driver utilizes the GE iHistorian OLE-DB Provider. The historian may be local (on node) or remote. If remote, make sure to install the *Historian Client Tools*, found on the GE Historian delivery media. By installing the *Historian Client Tools* on the Dream Report computer, the tools will enable communications to the remote GE Historian.

NOTE: If you have already been using the *iHistorian Connectivity historical values* driver in your project with an older version of Dream Report you will need to reconfigure your *Defined*

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Drivers List in your project after the Dream Report version upgrade to *Proficy Historian historical values* driver (i.e. remove *iHistorian Connectivity historical values* driver from the list and add a properly configured *Proficy Historian historical values* driver to it). Please make sure that the *Driver Logical Name* for the new driver is the same as the *Driver Logical Name* as the old one, in order to avoid internal project logical inconsistency.

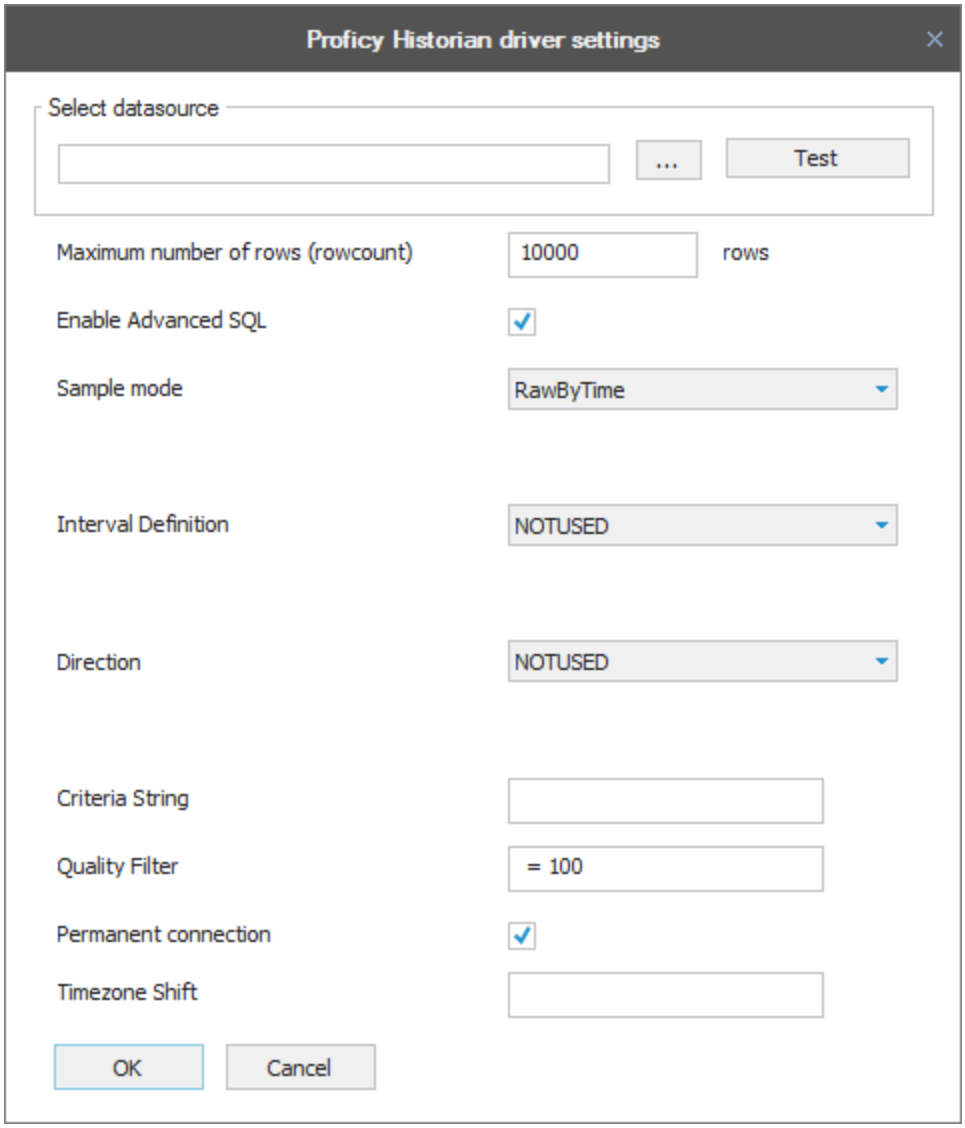
The driver can be configured to expose historical numeric values, or historical message/string values, found under the *General Electric* section of the Dream Report *Communication Configuration Wizard*:



Select the *Proficy Historian historical values* driver from the *General Electric* drivers folder of the *Select Data Source Type* section (as shown in the image above).

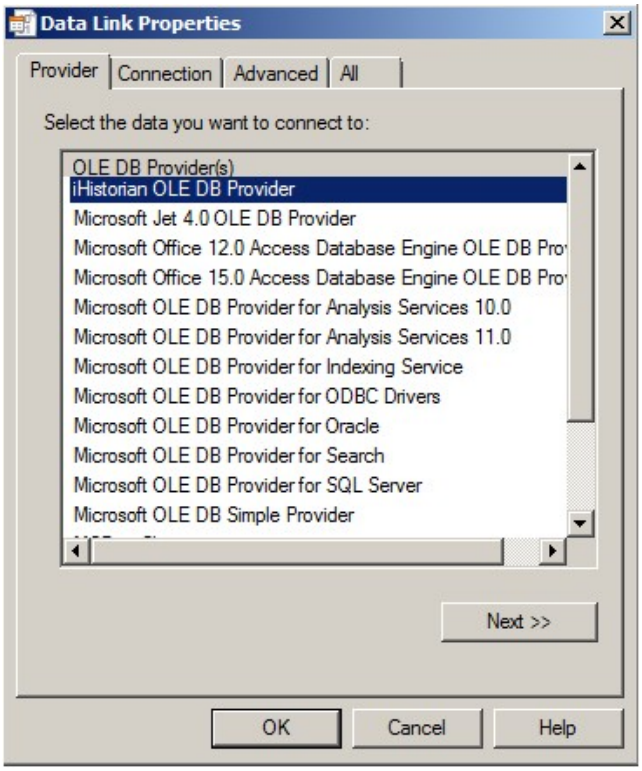
The *Configure* button will be enabled, which, when clicked, will open the *Proficy Historian driver settings* dialog window:

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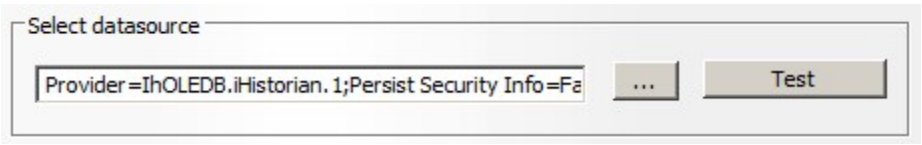


In the *Select Datasource* section, click the browse button *[…]* to select the iHistorian OLE DB Provider:

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Click the *Next >>* button to specify the connection details. If Proficy Historian is on the same computer as Dream Report, then no additional configuration is needed for the OLE DB provider. If Proficy Historian is on a remote computer, please enter the computer name or IP address for the Data Source: and then click *Test Connection* to verify the connection. Click *OK* to close the OLE DB configuration window. The connection string will then be added to the Proficy Historian Driver Settings:



Finally, click the *Test* button to verify the connection.

Enter the *Maximum Number of Rows (rowcount)*. This parameter will limit the number of rows returned from the Historian to the first "x" number of values (as determined by the retrieval/sampling mode defined below). The default is 10,000 rows, and can be modified here.

The *Enable Advanced SQL* option allows the user to provide additional SQL-type filtering capabilities to the Proficy Historian connection.

Sample Mode - when retrieving data from Historian, you specify either a "raw" or "non-raw" sampling mode. Non-raw retrieval can include a calculation mode, so that calculations are performed at the Historian side prior to data being returned to Dream Report. The available sample modes are as follows:

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- CurrentValue
- Interpolated
- RawByTime
- RawByNumber
- Calculated
- Lab
- Trend

Current Value sampling mode retrieves the data sample value with newest timestamp of any quality that was received by the Historian. This is not the same as retrieving the newest raw sample stored in the archive, since archive compression sometimes discards raw samples sent by the collector during the compression process. Current Value Sampling retrieves a single sample containing the current value of the tag, not a series of historical samples.

Using *Interpolated mode*, on retrieval, interpolation is performed to produce an evenly spaced list of the most likely real-world values. Even if you are not using compression at the Historian side, you can use interpolation if you want samples spaced on intervals other than the "true" collection rate. An *Interval Definition* can be specified either in Milliseconds, or in an equal (time-) spaced *NumberOfSample*s, with the value being specified in the *Interval Value* field.

RawByTime retrieval mode returns all raw samples of all qualities with a timestamp greater than the start time and less than or equal to the end time. It will not return a raw sample with same time stamp as the start time. The *NumberOfSamples* is ignored and all raw samples will be returned (up to the number of rows specified in the *Maximum Number of Rows (rowcount)* option.

RawByNumber retrieval returns “x” number of raw samples (*Interval Definition*, set to *NumberOfSamples*, with a value specified in *Interval Value*) of all qualities, starting from a time stamp of the indicated start time, moving in the specified *Direction* - *Forward* or *Backward*. It will return a raw sample with the same timestamp as the start time. If there is no sample at the specified start time, the retrieval count begins at the next sample.

Calculated modes can be separated into 3 main categories:

- *Raw* calculation modes, where only raw points are used to determine calculated value. These include:
  - Count
  - RawTotal
  - RawAverage
  - RawStandardDeviation
- *Interpolated* calculation modes use both raw and interpolated data points to determine a value. These include:
  - Minimum

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  - MinimumTime
  - Maximum
  - MaximumTime
  - TimeGood

- *Time-Weighted* calculation modes use both time-weighting and interpolated points to determine a value. These include:

  - Average
  - Total
  - StandardDeviation

- *Other* calculation modes include:

  - StateCount
  - StateTime

Lab sampling mode only returns actual collected values. Each collected value is repeated until the next collected value, resulting in a jagged step plot instead of a smooth curve.

Trend sampling mode will identify the significant points and return them to Dream Report. These will be raw samples. The way the significant points are established is by finding the raw minimum and raw maximum of each interval (specified either by time interval in milliseconds, or number of equally-spaced samples.)

For all of these Calculated modes, you have the option of providing an *Interval Value* can be specified either in Milliseconds, or in an equal (time-) spaced *NumberOfSamples*, with the value being specified in the *Interval Value* field. Additionally, you can provide a *State Value* and/or *Criteria String*, where applicable, for any of these modes.

The *Quality Filter* is the addition of a search filter on the data. When dealing with historian based data retrieval, a variable quality will be returned. This designation enables the user to set an acceptable level of quality for Dream Report to accept the results. Results below this quality will be ignored by Dream Report.

If the *Permanent Connection check box* is selected, Dream Report keeps connection to the Proficy Historian until generation is completed. If the connection to the Historian server is lost while a query is being executed during a report generation, the generation cannot be completed, and a crash of the Dream Report runtime engine may occur. To prevent potential connectivity-related issues, uncheck the *Permanent Connection* parameter. With the parameter unchecked, Dream Report opens a separate connection for each query. Note, that this may increase the speed of report generation. In general, it is recommended to keep the parameter checked if the Historian and Dream Report are located on the same server and to disable the *Permanent Connection* for remote Proficy Historian.

The *Timezone Shift* parameter allows to set up a time shift from server local time for the timestamps displayed in a report. The parameter is defined in minutes and can be positive and negative, e.g. 60 or -120.

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Click *OK* to close the GE Proficy Historian driver configuration.

Enter a unique *Driver Logical Name* for this configured instance of the driver

Click *Add* to add it to the *Defined Drivers List*.

NOTE: Please refer to the GE Proficy Historian “Advanced Topics” documentation for more details on the various Proficy Historian sampling and calculation modes

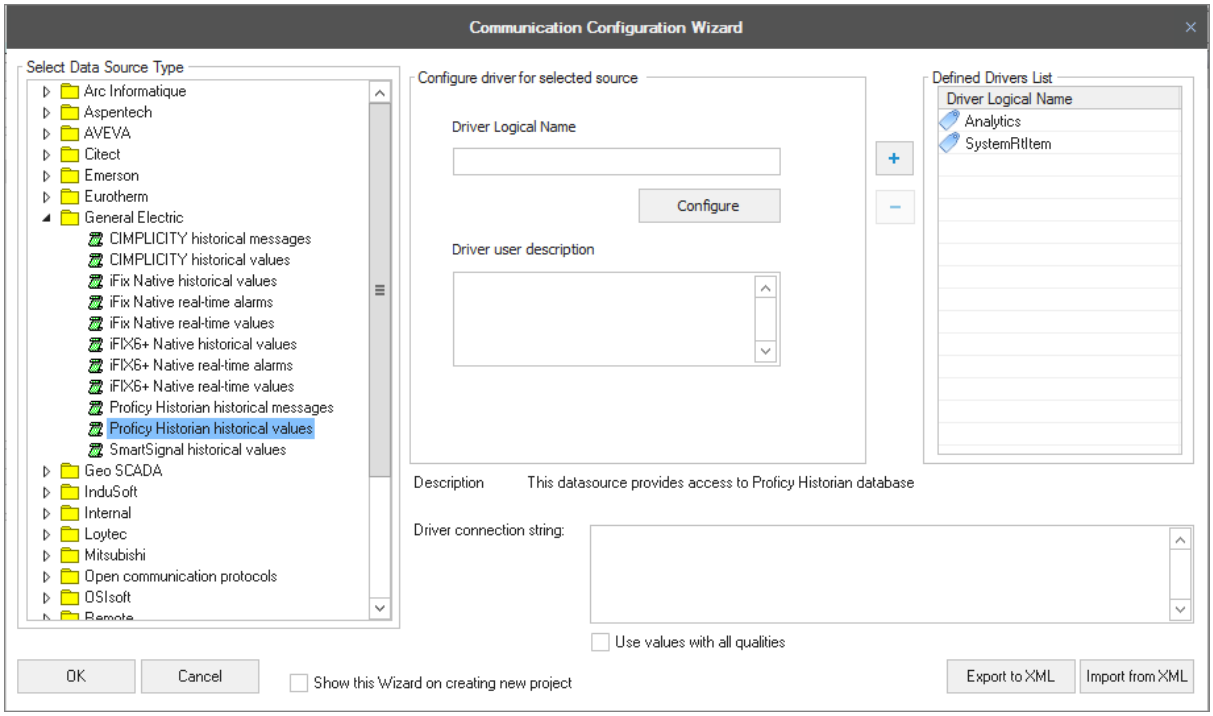
25.9.6 GE Proficy Historian Historical Messages

The *Proficy Historian Historical Messages* driver provides automated history alarms and events extraction from a local or remote Proficy Historian server. The historian may be local (on node) or remote. If remote, make sure to install the *Historian Client Tools*, found on the GE Historian delivery media. By installing the *Historian Client Tools* on the Dream Report computer, the tools will enable communications to the remote GE Historian.

NOTE: If you have already been using the *iHistorian Connectivity historical messages* driver in your project with an older version of Dream Report you will need to reconfigure your *Defined Drivers List* in your project after the Dream Report version upgrade to *Proficy Historian historical messages* driver (i.e. remove *iHistorian Connectivity messages values* driver from the list and add a properly configured *Proficy Historian historical messages* driver to it). Please make sure that the *Driver Logical Name* for the new driver is the same as the *Driver Logical Name* as the old one, in order to avoid internal project logical inconsistency.

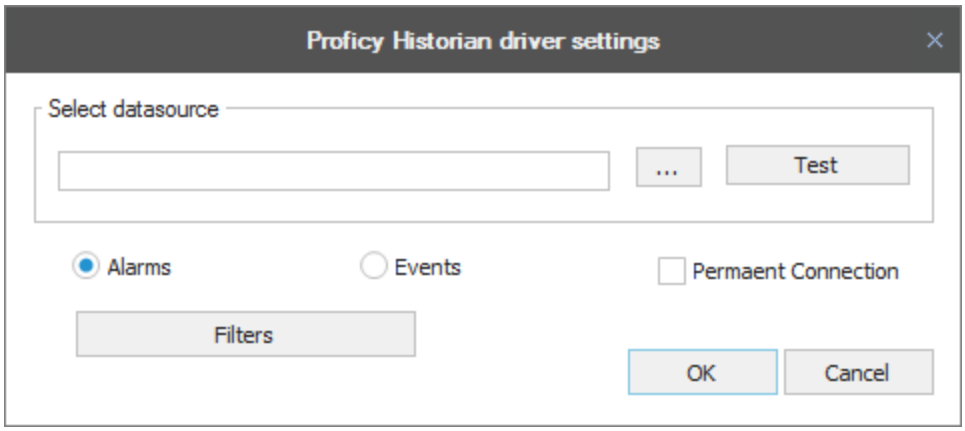
The driver can be configured to expose historical messages (Alarm or Event), found under the *General Electric* section of the Dream Report *Communication Configuration Wizard*:

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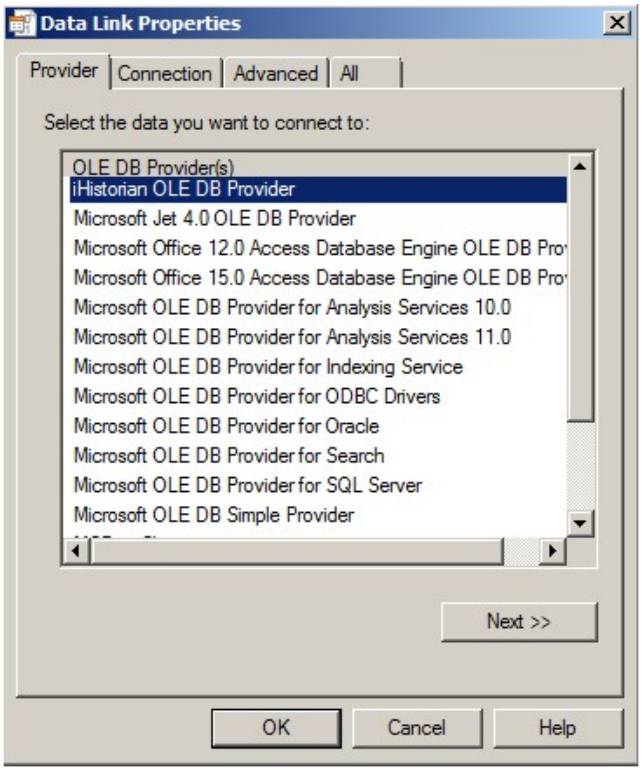
Select the *Proficy Historian historical messages* driver from the *General Electric* drivers folder of the *Select Data Source Type* section (as shown in the image above).

The *Configure* button will be enabled, which, when clicked, will open the *Proficy Historian driver settings* dialog window:

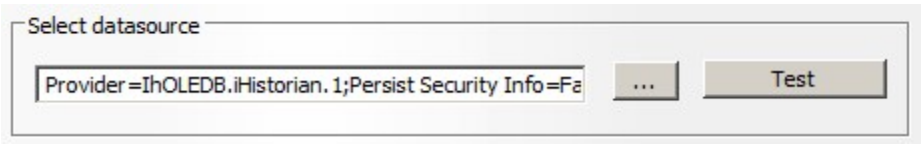


In the *Select Datasource* section, click the browse button *[…]* to select the iHistorian OLE DB Provider:

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Click the *Next >>* button to specify the connection details. If Proficy Historian is on the same computer as Dream Report, then no additional configuration is needed for the OLE DB provider. If Proficy Historian is on a remote computer, please enter the computer name or IP address for the Data Source: and then click *Test Connection* to verify the connection. Click *OK* to close the OLE DB configuration window. The connection string will then be added to the Proficy Historian Driver Settings:



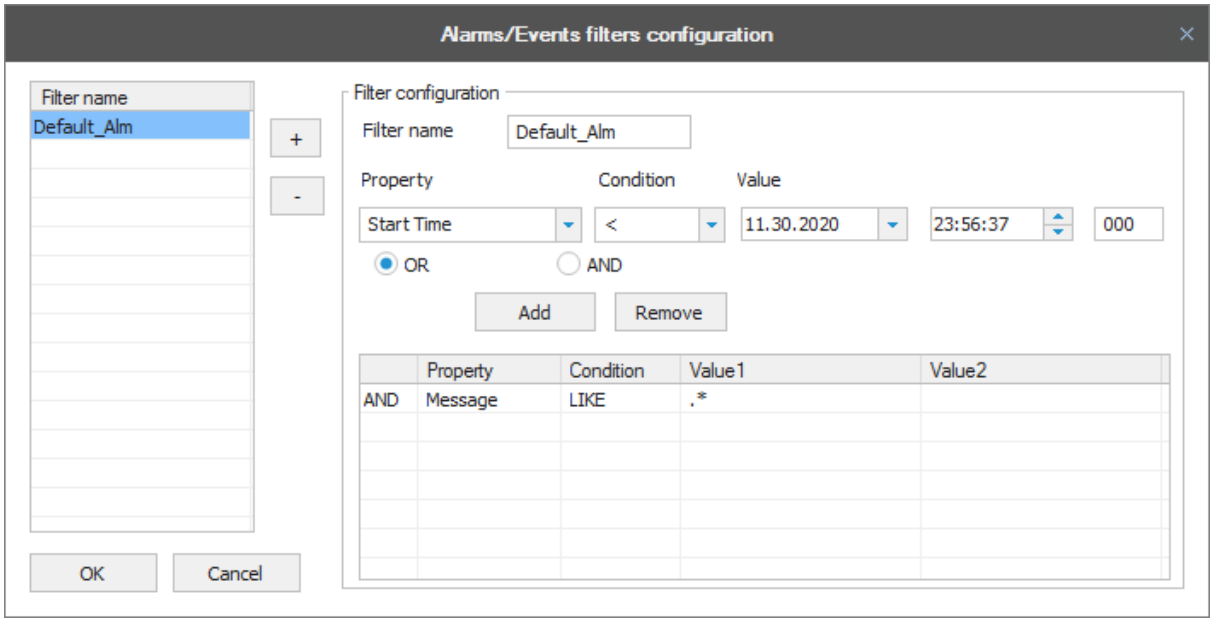
Finally, click the *Test* button to verify the connection.

Select either *Alarms* or *Events* for this driver's configuration to define the type of messages to be retrieved by the driver.

If the *Permanent Connection checkbox* is selected, Dream Report keeps connection to the Proficy Historian until generation is completed. If the connection to the Historian server is lost while a query is being executed during a report generation, the generation cannot be completed, and a crash of the Dream Report runtime engine may occur. To prevent potential connectivity-related issues, uncheck the *Permanent Connection* parameter. With the parameter unchecked, Dream Report opens a separate connection for each query. Note, that this may increase the speed of report generation. In general, it is recommended to keep the parameter checked if the Historian and Dream Report are located on the same server and to disable the *Permanent Connection* for remote Proficy Historian.

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Click the *Filter* button if you wish to "pre-filter" this instance of the driver with specific alarms or events. The following configuration window will open:



The default Alarm (or Event) filter will be displayed, indicating that all alarms (or events) will be returned when used in an Alarm Table object. Multiple filters can be defined, with each filter definition being comprised of one or more filter conditions.

You can add additional filters by doing the following:

Under the *Filter Configuration* section, enter a new *Filter Name*, and then click the *"+"* button.

Select the filter you want to configure in the *Filter Name* list on the left panel, and then add a filter *Property* (e.g., by Level, Tagname, Event Category, etc.), setting any relevant condition(s) for that property.

Select *OR* or *AND* depending on the logic to be evaluated for this specific field.

Click the *Add* button (in the *Filter Configuration* section) to add the condition to this filter.

Click *OK* to save the Alarm (or Event) filters.

Click *OK* to close the Proficy Historian driver configuration.

In the *Communication Configuration Wizard* window, enter a unique *Driver Logical Name* for this configured instance of the driver. Then click *Add* to add it to the Defined Drivers List.

25.9.7 iFix6+ Native Historical Values

The *iFix6+ Native Historical Values* driver and *iFix6+ Native Real-Time Values* driver is a new set of drivers to be used with iFix version 6.0 and higher.

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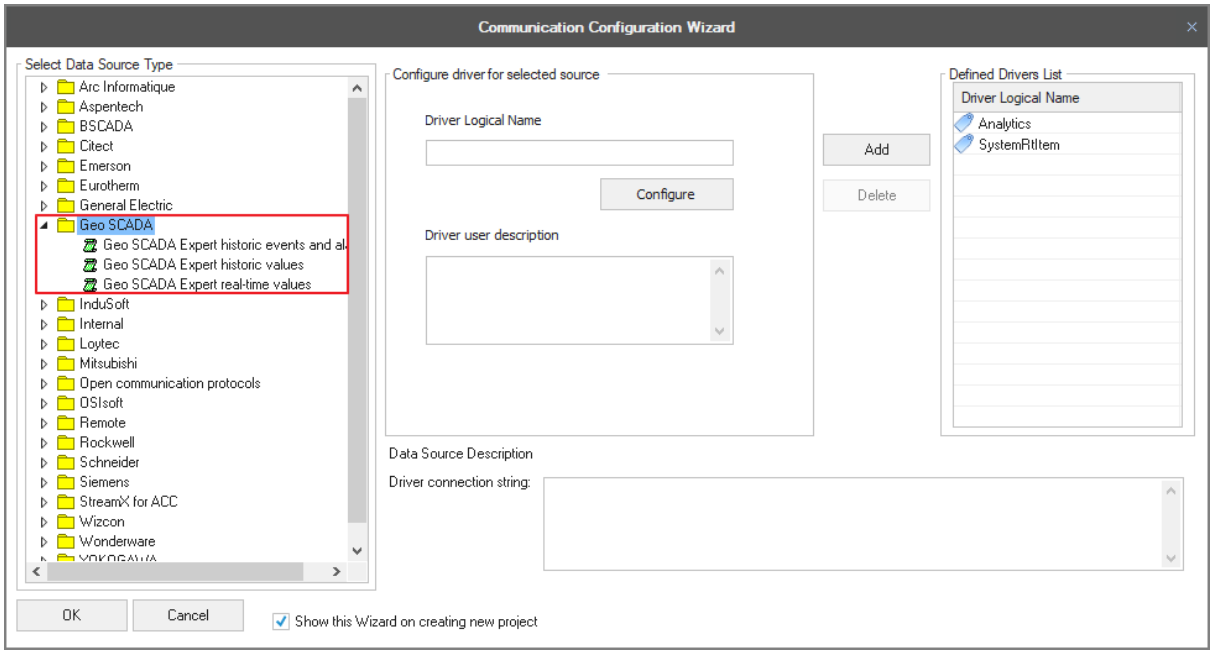
The configuration of the drivers is similar to the *iFix Native Historical Values* and *iFix Native Real-Time Values* drivers.

Please refer the *iFix Native Historical Values* and the *iFix Native Real-Time Values* sections of this manual for the information on these drivers.

25.10 Geo SCADA

The Dream Report Geo *SCADA* communication drivers provide data connectivity between Dream Report and a ClearSCADA server.

To configure the Geo *SCADA* driver, first, open the **"Communication Configuration Wizard"** dialog window in Dream Report Studio - all drivers are listed under the ***"Geo SCADA"*** folder:

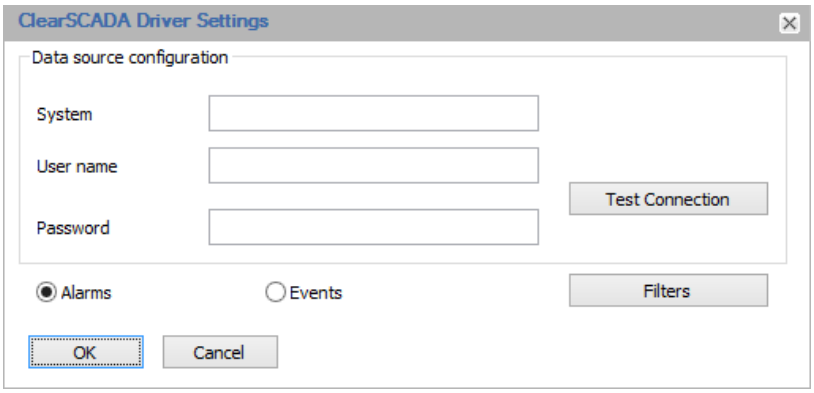


Select the driver you need for your project and click on *"Configure"* button.

25.10.1 Geo SCADA Expert Historic Events and Alarms

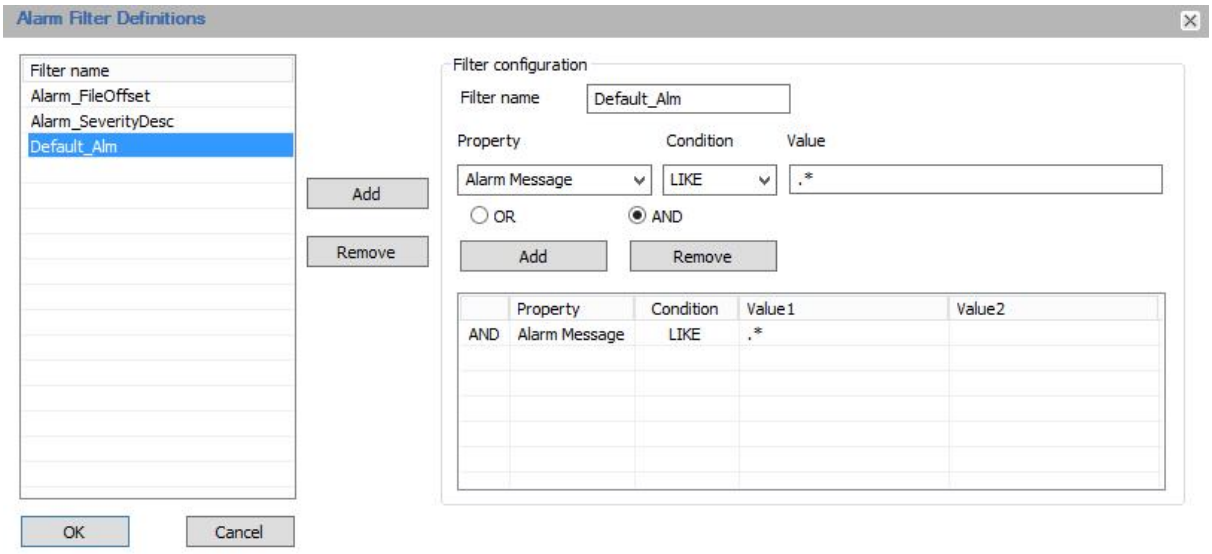
The Geo SCADA Expert Historic Events and Alarms driver provides connectivity to the Geo SCADA historical alarm and event logs. The settings for the *Historical Messages* driver are the same as the *Historical Values* driver, plus additional section for the Message type, and additional alarm Filters:

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You can select either *"Alarms"* or *"Events"* for this driver's configuration.

Click the *"Filter"* if you wish to "pre-filter" this instance of the driver with specific alarms or events. The following configuration window will open:



Multiple filters can be defined, with each filter definition being comprised of one or more filter conditions. You can add additional filters by doing the following:

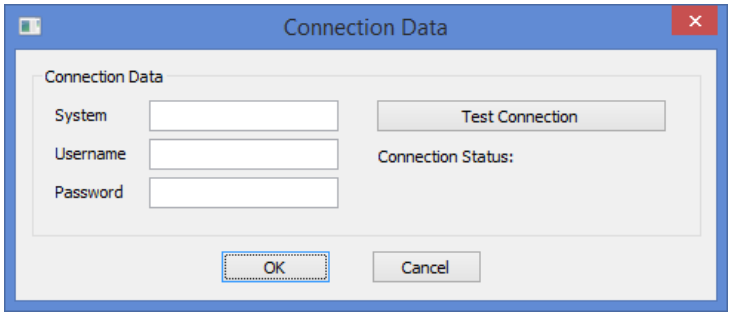
1. Under the **Filter Configuration** section, enter a new **Filter Name**, and then click the *"Add"* button.
2. Select the **Filter Name** on the left panel, and then add a filter **Property**, setting any relevant condition(s) for that property
3. Select *"***OR***"* or *"***AND***"* depending on the logic to be evaluated for this specific filter.
4. Click the *"Add"* button (in the *Filter Configuration*) section to add the condition to this filter.
5. Repeat steps 1-4 to add additional condition(s) to this filter definition.

When finished, click *"OK"* to save the Alarm (or Event) filters.

25.10.2 Geo SCADA Expert Historic Values

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The Geo SCADA Expert Historic Values driver provides connectivity to the Geo SCADA historical data log files. When the *Historical Values* driver is selected, the following **"Connection Data"** dialog will be opened:

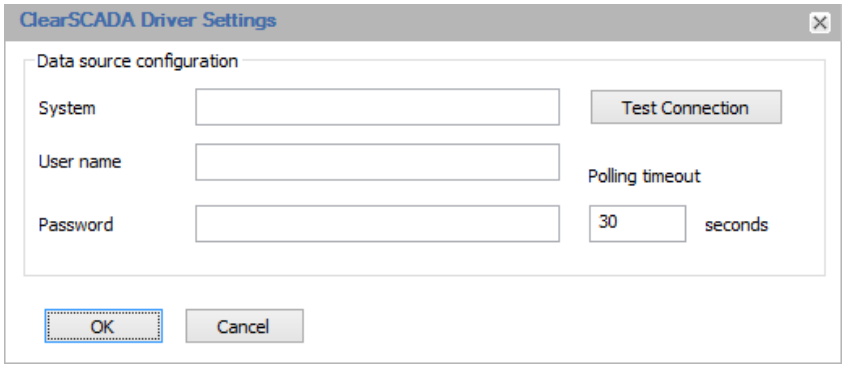


1. *System* – the System name of the Geo SCADA server.
2. *Username* and *Password* – If the server is configured with user authentication – a Username and Password are required for accessing the data.

The "*Test Connection*" button will try to establish communication to the host.

25.10.3 Geo SCADA Expert Real-Time Values

The Geo SCADA Expert Real-Time Values driver provides connectivity to realtime tag values in the Geo SCADA HMI. The settings for the *Real-time Values* driver are the same as the Historical Values driver, plus one additional detail – the **"Polling timeout" ***.



After clicking on *"OK"* button you will return to the **"Communication Configuration Wizard"**. Then you need to enter a unique **"Driver Logical Name"** for the selected data source.

When the source is configured, it should be added to a general list of data sources, defined in a project, by clicking the *"Add"* button. The configured source will appear in the **Defined drivers list**.

When all the communication settings for the project are done, click *"OK"*, and the data source configuration will be finished.

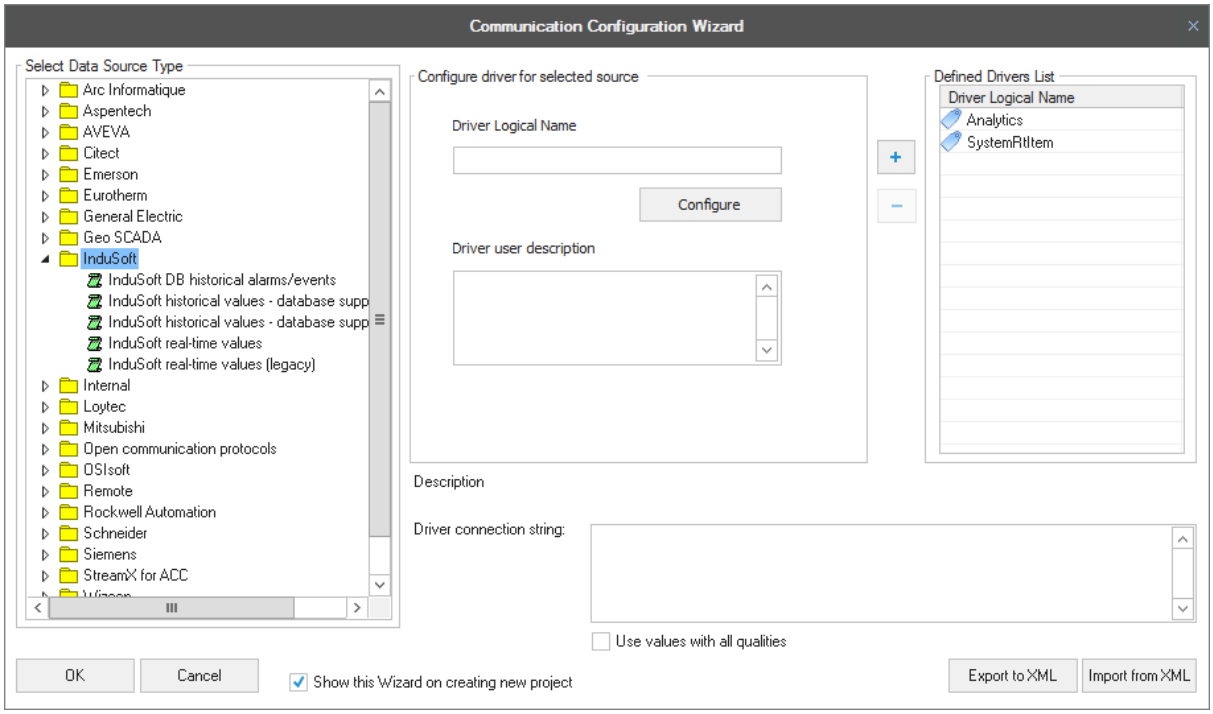
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25.11 InduSoft

The Dream Report *InduSoft* communication drivers provide data connectivity between Dream Report and the InduSoft server.

After installing Dream Report, only one InduSoft driver - InduSoft *HMI (historical alarms / events - database support)* - will present in the *Select Data Source Type* list of the *Communication Configuration Wizard*. For InduSoft Drivers to be displayed in the list of available drivers, an appropriate AVEVA Edge HMI communications toolkit needs to be copied to the Dream Report *System* folder. Open the *IWS Toolkits* folder in the *System* folder of Dream Report installation (by default *C:\ODS\AVEVA Reports\System*). Find the toolkit folder that corresponds to your version of InduSoft. Copy all files in that folder and paste them to the *System* folder. After that all drivers to connect to AVEVA Edge HMI will be displayed under *InduSoft* folder of the *Communication Configuration Wizard*.

To configure the InduSoft driver, first, open the *Communication Configuration Wizard* dialog window in Dream Report Studio - all drivers are listed under the *InduSoft* folder:



Select the driver you need for your project, give it a logical name and click on the *Configure* button.

After finishing the configuration click on the *Add* button to add it to the list and then *OK* to save and close the wizard.

NOTE: The legacy drivers are used to communicate with InduSoft versions older than 8.1.2.

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25.11.1 InduSoft DB Historical Alarms/Events Driver

Please refer the *AVEVA Edge Historical Alarms/Events* 686 section of this manual for the information on this drivers.

25.11.2 InduSoft Historical Values – Database Support Driver

Please refer the *AVEVA Edge Historical Values* 681 section of this manual for the information on this drivers.

25.11.3 InduSoft Real-Time Values Driver

Please refer the *AVEVA Edge Real-Time Values* 677 section of this manual for the information on this drivers.

25.12 Internal

When you open the *Internal* folder, the following list when expanded will be displayed:

- Analytical real-time values
- Data Model driver
- DBatch historical values
- Lua Script HAD item driver
- Simulation Driver (displayed as a folder):
  - Simulation Driver real-time values
  - Simulation Driver real-time alarms
  - Simulation Driver historical values
  - Simulation Driver historical alarms
- System historical driver
- System real time driver
- Web manual driver

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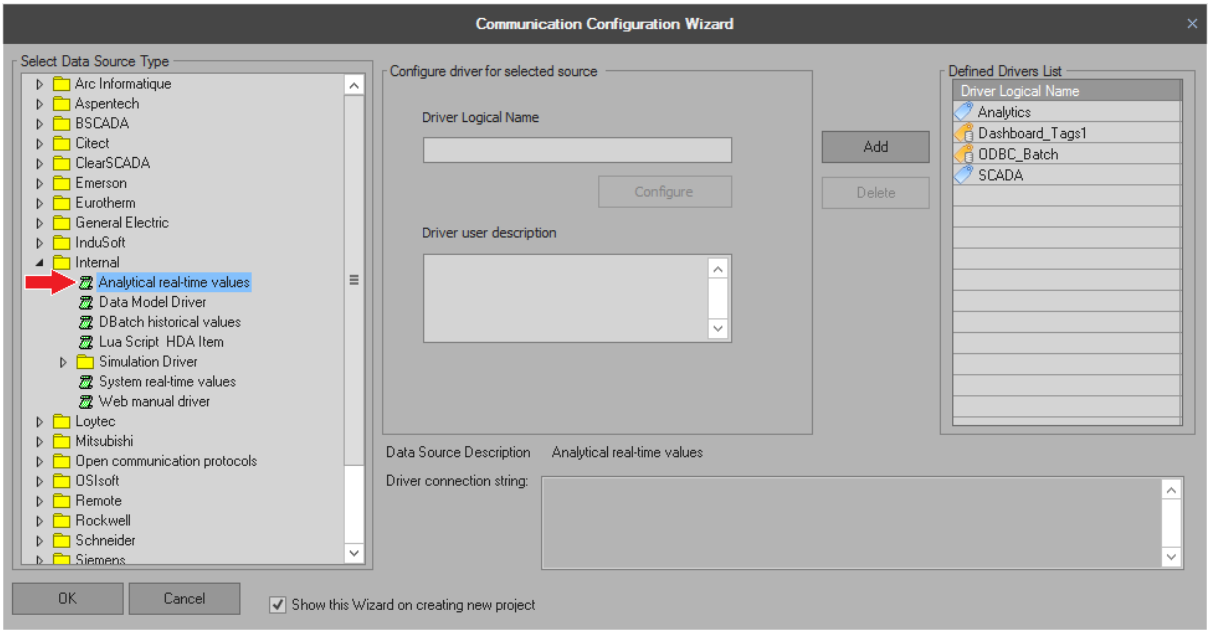
25.12.1 Analytical Real-Time Values

Analytical driver of Dream Report is an internal module, which is responsible for recording statistical data, calculated by Dream Report to the database.

Each textual statistical object, defined in the report, such as **Single** data object, **Compound** data object and **Expression object** can be considered by Dream Report as internal variables, and their values can be recorded to the Dream Report database as values of any other data source.

To use this module:

1. Open the **Communication Configuration Wizard** dialog window:



When the driver configuration window is opened in the **Driver Logical Name** section, the Dream Report analytical driver (**Analytics**) will be automatically configured, and you will not need to do its configuration again.

2. Create new data logging group

- When you want to add items to your group, you will see that the list of available items is the actual list of data objects, defined in your project. You can select any items and add to that new item group.
- If group record mode is "***On Update***" or "***On Change***", Dream Report will calculate values of the statistical objects and record them into the database during each report generation. If group record mode is "***Every***", then Dream Report will re-calculate values of the statistical objects each defined period and record those values into the database, independently of report generation.

At this stage, your analytical module is defined and ready to use.

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NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "**Select Data Source Type**" field on any other driver and then go back to the driver that you need to configure. A project may contain as many item logging groups with the analytical driver, as needed.

NOTES:

- If you change a **report name** after items groups are created (that reference Analytics items), you will need to reconfigure the item group(s), as the original report name will still be referenced in the analytics items – i.e., the **Analytical driver** uses report name and item name in its item names.
- When using **Analytical driver**, analytical items and analytical data can be used in any item-related Dream Report object, i.e. Single Data, Item Table, Pie Graph, Bar Graph, Line Chart.
- We recommend defining analytical groups and objects with analytical data only after regular objects are completely defined. This part should be the last stage of report/project development.
-

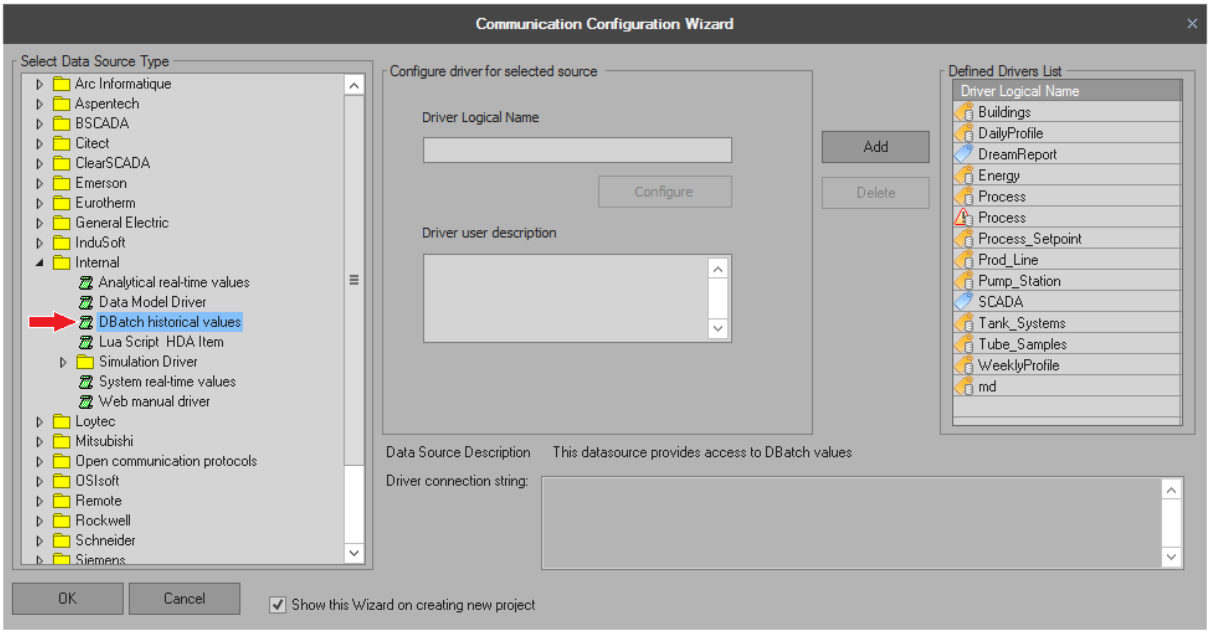
25.12.2 Data Model Driver

Data Model Driver is a virtual HDA driver. Per every defined in the project data model the virtual instance of the Data Model Driver will be created, it will inherit the name of the data model. For more details please refer to the *Data Modeler* section of this manual for the information on this driver.

25.12.3 DBatch Historical Values

DBatch historical values driver enables users to connect directly to a special project batch database and use its data for reporting within Dream Report or in external applications. The project batch database is created when the DBatch mechanism (described in this section above) is configured. Then the DBatch historical values driver will be configured automatically and you will not need any additional configuration in the Communication Configuration Wizard:

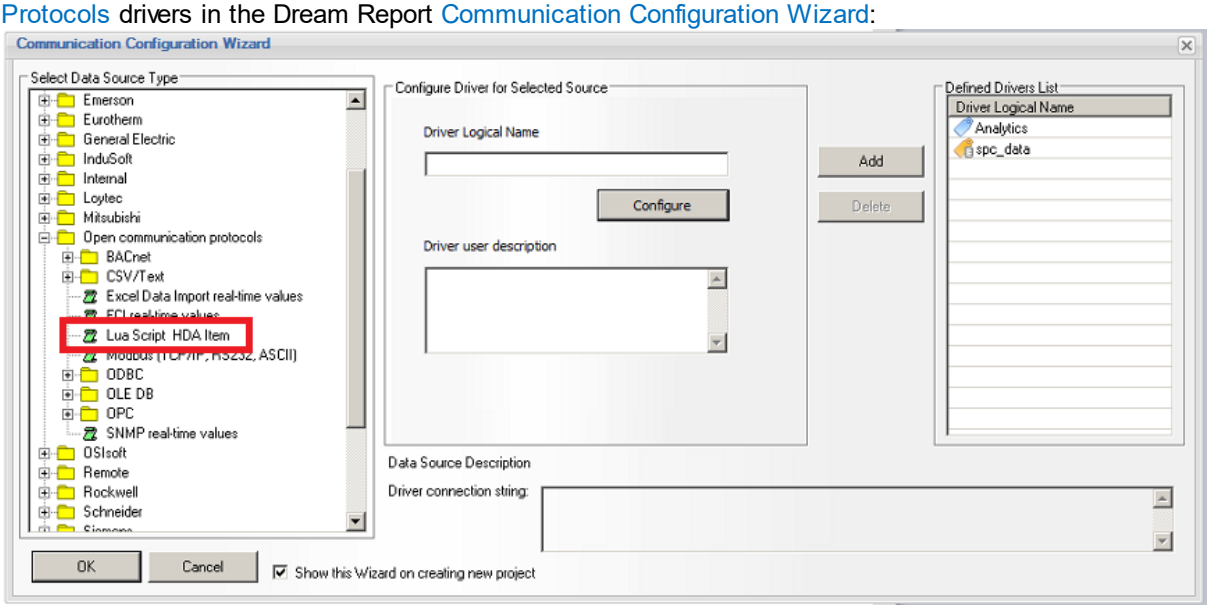
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25.12.4 Lua Script HDA Items

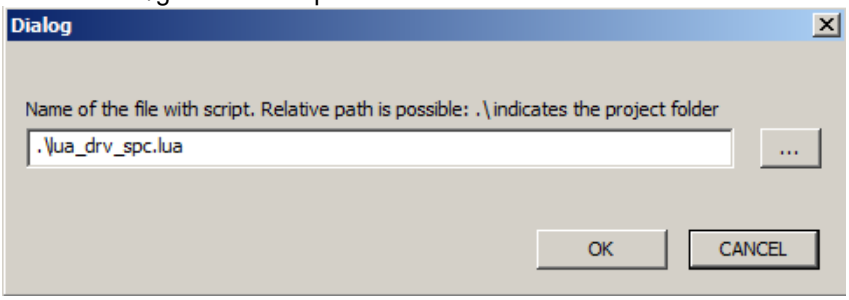
The **LUA Script Historical Data Access (HDA) Item** driver is an internal driver which can generate a simple or complex set of calculated data. This driver can be used for simulation, to build "ideal profiles" for comparison or other tasks, which require generating specific datasets with certain rules. A user can write any script which can generate and manipulate data using simple or complex rules, using all the power of the "open" LUA scripting language.

To configure the LUA Script HDA Item driver, first select it from the list of Open Communication Protocols drivers in the Dream Report Communication Configuration Wizard:



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Enter a unique **Driver Logical Name** for the instance of the LUA Script driver, and then click the "**Configure**" button. When the following dialog box opens, enter the path and name to a valid LUA script that extracts/generate sample data:



Note that you can include the explicit file path with the file name, or, if the Lua script is located in the current project directory, simply preface the file name with "**\.**"

The following is an example of a Lua script that extracts sets of non-timestamped data from a set of text files, adds timestamps to the data when called, making the data usable in Dream Report reports objects:

```
-- Always existing object:
--OdsDrvEnv = {}
--OdsDrvEnv.PathProject = ''

rulesTestItems = {}
rulesTestItems["SPC/Test_01"] = { path="SPC/Test_01", desc="Test set for SPC
#1", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_1.txt"}
rulesTestItems["SPC/Test_02"] = { path="SPC/Test_02", desc="Test set for SPC
#2", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_2.txt"}
rulesTestItems["SPC/Test_03"] = { path="SPC/Test_03", desc="Test set for SPC
#3", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_3.txt"}
rulesTestItems["SPC/Test_04"] = { path="SPC/Test_04", desc="Test set for SPC
#4", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_4.txt"}
rulesTestItems["SPC/Test_05"] = { path="SPC/Test_05", desc="Test set for SPC
#5", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_5.txt"}
rulesTestItems["SPC/Test_06"] = { path="SPC/Test_06", desc="Test set for SPC
#6", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_6.txt"}
rulesTestItems["SPC/Test_07"] = { path="SPC/Test_07", desc="Test set for SPC
#7", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_7.txt"}
rulesTestItems["SPC/Test_08"] = { path="SPC/Test_08", desc="Test set for SPC
#8", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_8.txt"}
rulesTestItems["SPC/Test_09"] = { path="SPC/Test_09", desc="Test set for SPC
#9", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_9.txt"}
rulesTestItems["SPC/Test_10"] = { path="SPC/Test_10", desc="Test set for SPC
#10", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\
\TEST_10.txt"}
rulesTestItems["SPC/Test_11"] = { path="SPC/Test_11", desc="Test set for SPC
#11", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_11.txt
"}
rulesTestItems["SPC/Test_12"] = { path="SPC/Test_12", desc="Test set for SPC
#12", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\\TEST_12.txt
"}
rulesTestItems["SPC/Test_13"] = { path="SPC/Test_13", desc="Test set for SPC
#13", values = {}, filename = OdsDrvEnv.PathProject .. "\\SPC_DATA\
\TEST_13.txt"}

function BrowseItems()
```


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```
        local  res={}
        local i=1
        for key,value in pairs(rulesTestItems) do
                res[i]=value
                i=i+1
        end
        return res
end

function ReadData(itemAddress, from, to)
        local tvqlist = {}    -- new array
        local starttime = os.date("*t", from/1000);
        local I = 1
        local item = rulesTestItems[itemAddress]

        lines = {}
        for line in io.lines(item.filename) do
                item.values[#(item.values) + 1] = line
        end

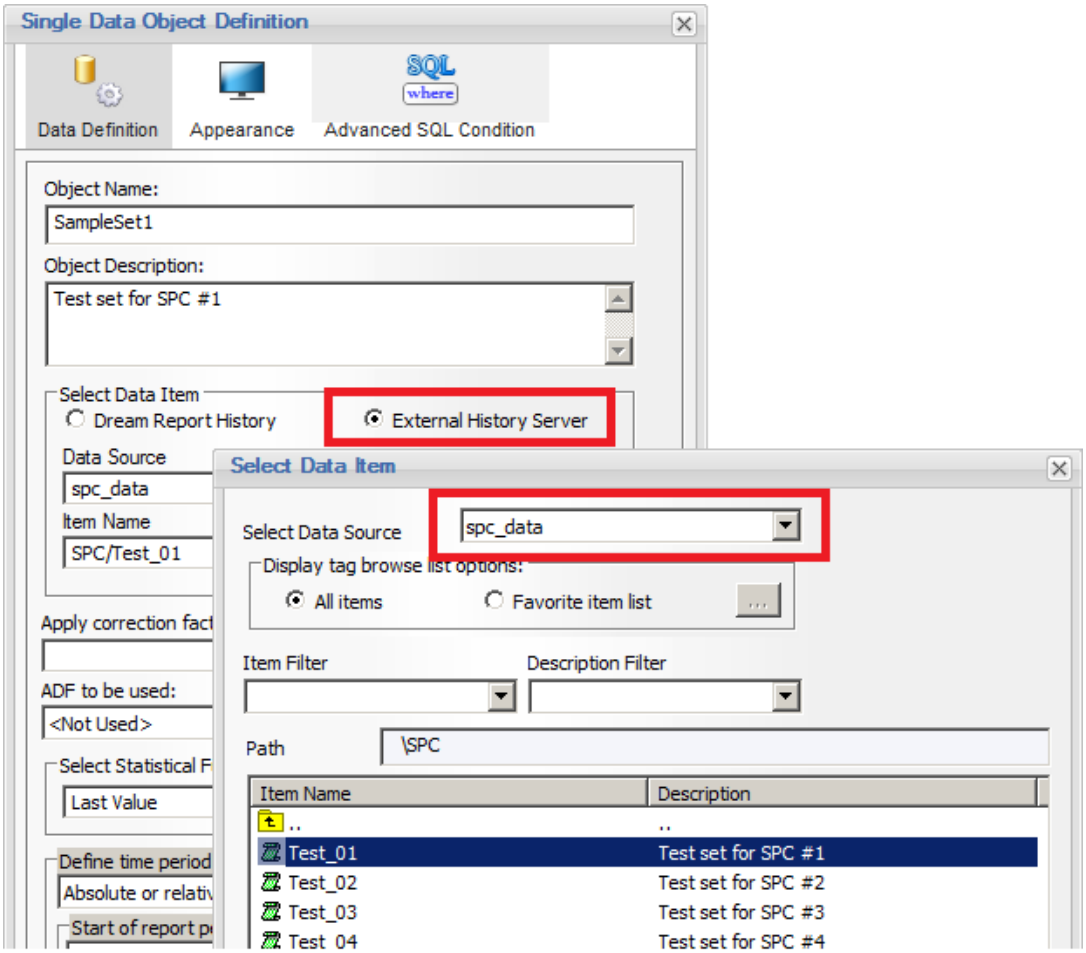
        for key, value in pairs(item.values) do
                tvqlist[i] = {timestamp = os.time{ year = starttime.year, month =
starttime.month,   day   =   starttime.day,   hour   =   starttime.hour,   min   =
starttime.min+i} , value = tonumber(value), quality = 0}
                i = i + 1
        end
        return tvqlist
end

function ReadDataWithPrevPoint(itemAddress, from, to)
        return ReadData(itemAddress, from, to)
end
```

Using LUA Script HDA Item Driver Tags in a Report

When configuring a report object such as Single Data Object or a Table, LUA Script HDA Item driver tags are referenced as an "External History Server" and tags are selected in the same way as with any other Dream Report Data Source:

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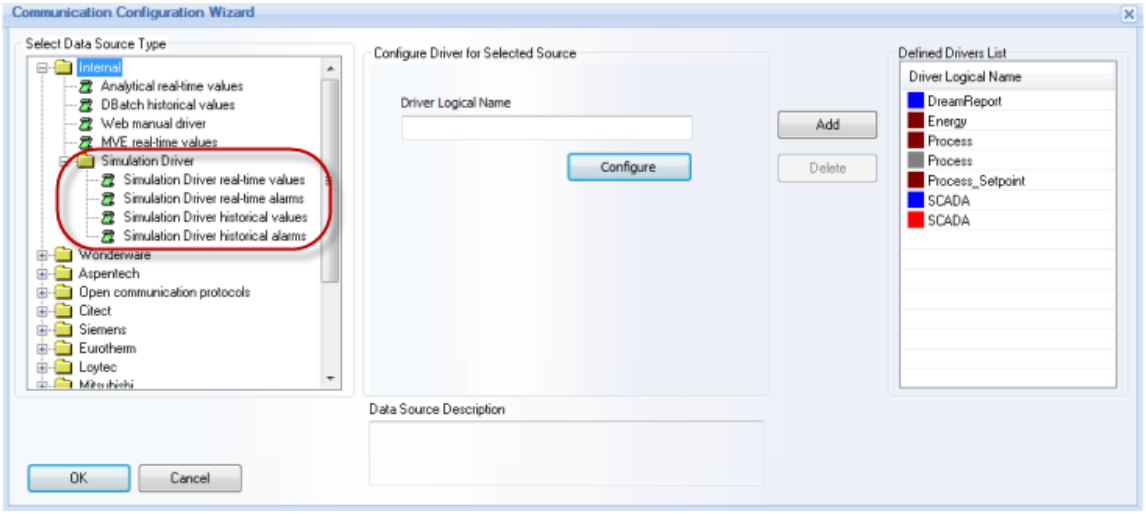
25.12.5 Simulation Drivers

Simulation Driver enables to design report templates without connection to the real data servers. Users can define different virtual data sources and variables according to their needs. This allows for testing of Dream Report projects without connecting to "real" data sources.

The **Simulation Driver** set includes **Simulation Data Driver** (Simulation Driver real-time/historical values) and **Simulation Alarm Driver** (Simulation Driver real-time/historical alarms).

To configure **Simulation Driver**, first, open the Communication Configuration Wizard dialog window:

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Select **Simulation Data Driver** (Simulation Driver real-time/historical values) or **Simulation Alarm Driver** (Simulation Driver real-time/historical alarms) from the **Simulation Driver** subfolder of the **Internal** folder in the **Select data source type** section.

NOTE: In Dream Report version 3.43 the Simulation driver had one driver instance for real-time data, historical data and alarms configuration.

Now, in this new version of Dream Report, the Simulation driver has four driver instances and should be configured separately as **Simulation Driver real-time values**, **Simulation Driver real-time alarms**, **Simulation Driver historical values** or **Simulation Driver historical alarms**.

Simulation Data Driver Configuration

All configuration of the **Simulation Data Driver** is stored in the text file **dummy.cfg**, which is located in the System folder of Dream Report installation.

The configuration file of the **Simulation Data Driver** has the following format:

```
[DataSource_A]
Dig1,int,rand,200,0,2
Tag_50_1,float,rand,500,0,35
Tag100_1,int,rand,500,30,95

[DataSource_B]
Dig1,int,rand,200,0,2
Tag_50_1,float,rand,500,0,35
Tag100_1,int,rand,500,30,95
```

[SOURCE NAME] is a definition of a virtual data server. One configuration file can contain multiple source definitions. They will be just listed one below the other, like shown on example above.

List of items is added one below another right below the source name. Each source can have a list of its own items.

Item definition has the following format:

<Item name>,<format>,<method>,<change rate>,<minimum value>,<max value>

Example:

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Dig1,int,rand,200,0,2

<format> can be **int**, **float**, **bool**, **string**

<method> can be **rand**, **const**

When clicking on ***Configure*** button, the configuration dialog, i.e. the dialog with virtual source selection will be prompted. This list will be compiled from a list of sources, mentioned in the driver configuration file.

(In the example, mentioned above, the list of sources will have two sources: **DataSource_A** and **DataSource_B**).

Click on *Add* button and add this driver to your project.

Simulation Alarm Driver Configuration

The configuration file of the **Simulation Alarm Driver** has the name **dummyalarm.cfg**, and it has the following format:

```
[Alarms_A]
"FireDetection_Adminsitration ", 10, 11
"FireDetection_Gymnasium ", 10, 16
"Intrusion_East_Gate ", 20, 15
"Pool_water_temp_22°C ", 10, 19
"Outside_temp_17°C ", 60, 19

[Alarms_B]
"Pipeline1_Speed_Low ", 2, 10
"Valve1_Open ", 10, 11
"Valve2_Open ", 11, 12
"Valve2_Closed ", 11, 13
"Valve3_Closed ", 12, 13
"Lack_of_pressure_Oilwell1 ", 1, 10
"Lack_of_pressure_Oilwell3 ", 1, 12
```

[SOURCE NAME] is a definition of a virtual alarm server. One configuration file can contain multiple source definitions. They will be just listed one below the other, like shown on example above.

List of alarm definitions is added one below another right below source name. Each source can have a list of its own items.

Alarm definition is recorded in a format:

"<alarm text>",<priority>, <generating period in sec.>

When clicking on ***Configure*** button, the configuration dialog, i.e. the dialog with virtual source selection will be prompted. This list will be compiled from a list of sources, mentioned in the driver configuration file.

(In the example, mentioned above, the list of sources will have two sources: **Alarms_ A** and **Alarms_ B**).

Click on *Add* button and add this driver to your project.

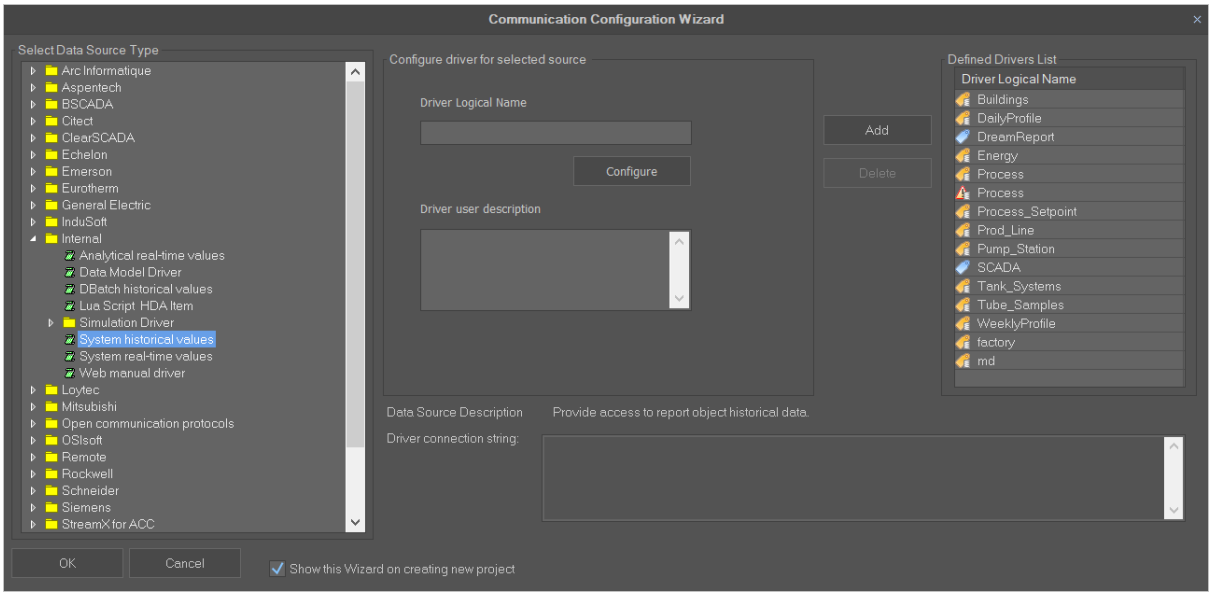
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NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "**Select Data Source Type**" field on any other driver and then go back to the driver that you need to configure.

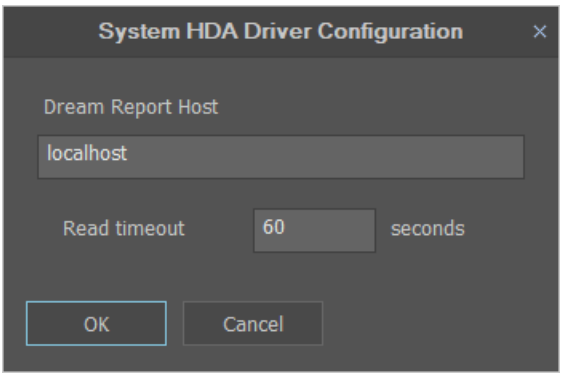
25.12.6 System Historical Values

This driver provides access to historical values of tags defined in data models.

To configure the **"System historical values"** driver, first select it from the list of **Internal** drivers in the **Dream Report *Communication Configuration Wizard***:



After selecting the ***System historical values*** driver click the ***"Configure"*** button to open the **"System HDA Driver Configuration"** window:



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1. **Dream Report Host** – enter the host name or IP address of the server (typically, the local Dream Report machine).

2. **Read timeout**– the time in seconds in which the driver will try to connect to the server.

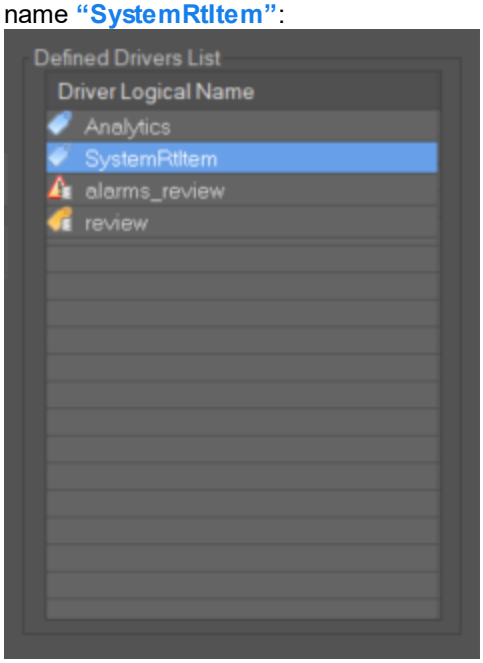
Click the ***"OK"*** button to close the System Driver settings window, and return to the **"Communication Configuration Wizard"**. Then you need to enter a unique **"Driver Logical Name"** for this configured data source.

Finally, click the ***"Add"*** button to add this configured instance of the *System driver* to the project's list of data sources, and will appear in the *Defined Drivers* list.

25.12.7 System Real-Time Values

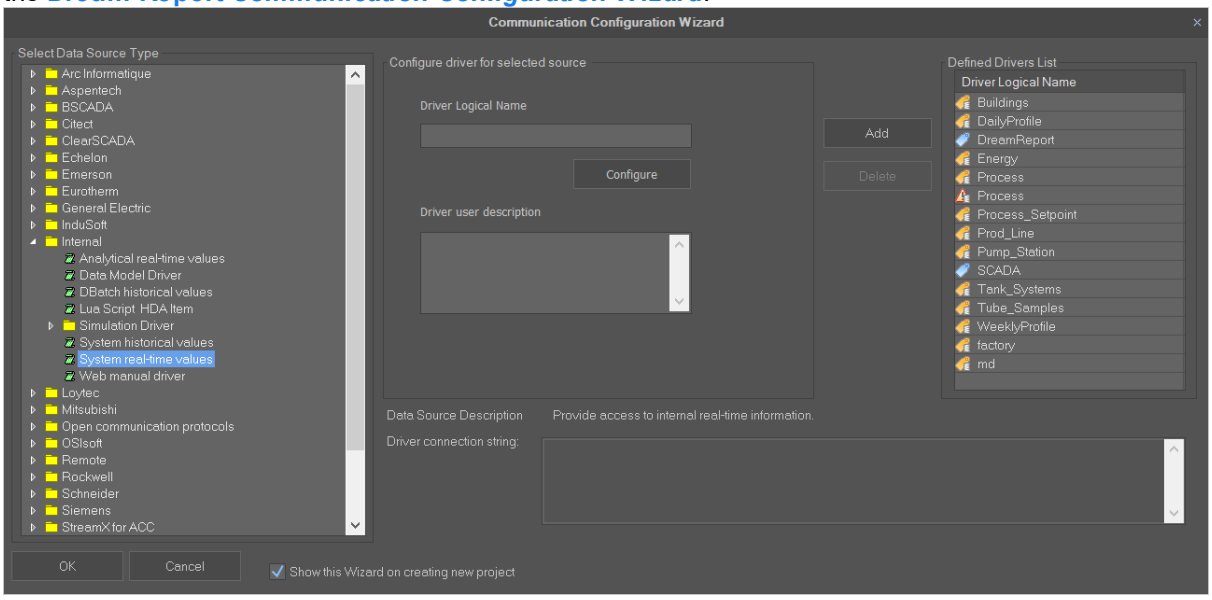
This driver provides access to internal real-time information (e.g. report generation status, email sending result, print result, etc.) as well as access to reports' calculation objects (in both polling mode and subscription mode). This access can be user protected, and is exposed through the **Analytic Data Server** (ADS.).

When creating a new project, one instance of the System Driver will be automatically created with the name **"SystemRtItem"**:

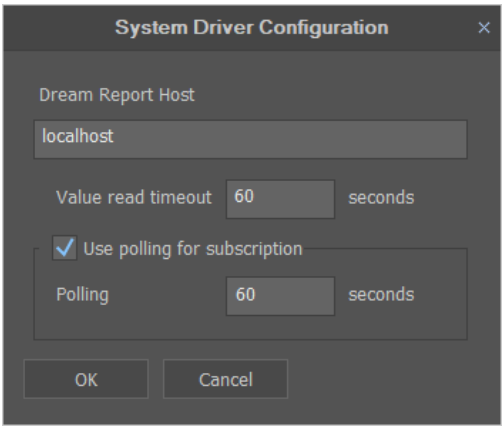


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To configure another **"System real-time values"** driver, first select it from the list of **Internal** drivers in the **Dream Report *Communication Configuration Wizard***:



After selecting the ***System real-time values*** driver click on the ***"Configure"*** button, the following **"System Driver Configuration"** dialog will open:



1. Dream Report Host – The host name or IP address of the server (typically, the local Dream Report machine).
2. Value read timeout – the time in seconds in which the driver will try to connect to the server.
3. Use polling for subscription – the time in seconds in which the driver will ask the server for data.

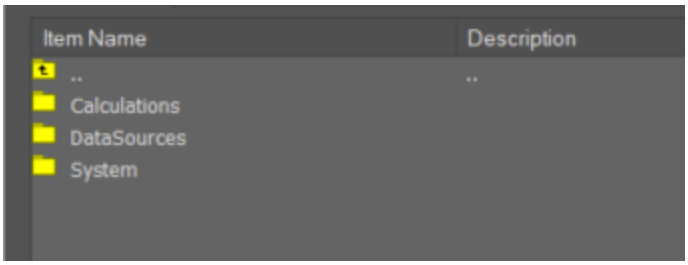
Click the ***"OK"*** button to close the System Driver settings window, and return to the **"Communication Configuration Wizard"**. Then you need to enter a unique **"Driver Logical Name"** for this configured data source.

Finally, click the ***"Add"*** button to add this configured instance of the System driver to the project's list of data sources, and will appear in the *Defined Drivers* list.

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Functionality:

When opening the tag browse, from the logger or data object definition, the following browse will be displayed:

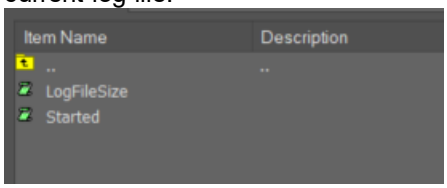


Note: Unless the system tags have been added to a logging group(s), you will only have access to the "**Current Value**" for each tag. If this is the case, you must first select "*Current Value*" Statistical Function before the tags can be browsed.

The browse contains several folders:

System folder - By default, this folder is created with two subfolders:

1. **Project folder** - This folder contains predefined data items with global values per project:
   - *Started* – string value. Contains the timestamp (in ISO format), when the project was last started.
   - *Log file size* - Contains a numeric value in bytes, which is the actual size of the project's current log file.



2. **Report folder** – This folder contains a list of reports folders, with the following set of parameters for each report listed:
   - *EmailSendResult*
   - *GeneratedBy* - which module generated the report. For example, if generated on event, then "EVENT"; if generated by schedule then "SCHEDULE"
   - *LastGenerationResult*
   - *LastGenerationTime*
   - *LastGenerationTimeStr*
   - *NumberOfReportFilesPDF*
   - *NumberOfReportFilesXLS*
   - *PrintResult*
   - *Username* - the name of the user who generated the report. If generated automatically, then the value is "AUTO".

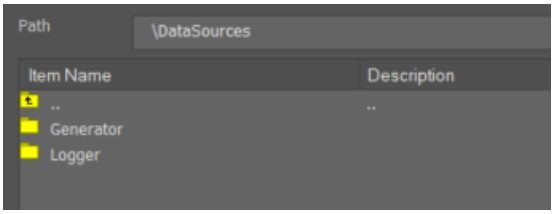
Data Sources folder - by default, this folder is created with two subfolders that contains a list of reports folders:

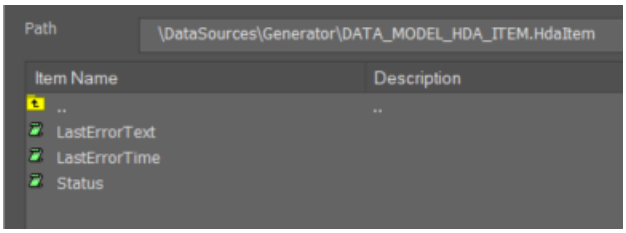
1. **Generator** – contains report generation information and errors for each configured instance of a **Communication Driver**
2. **Logger**- contains information/errors relating to data logging by real-time sources.

The parameters available for each are:

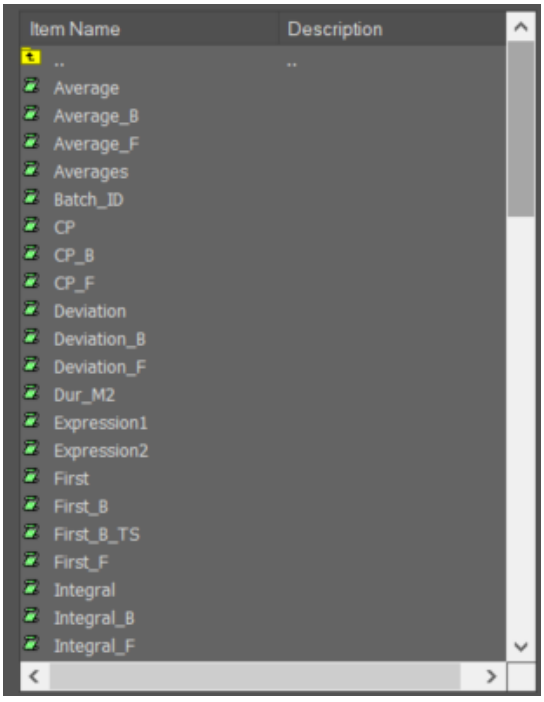
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- *LastErrorText*
- *LastErrorTime*
- *Status*





Calculations folder – this folder contains a list of reports folders, with all defined single result objects in each report: *Single Data Items*, *Compound* objects and *Expression* objects. Footer objects from tables are visible and accessible as well:

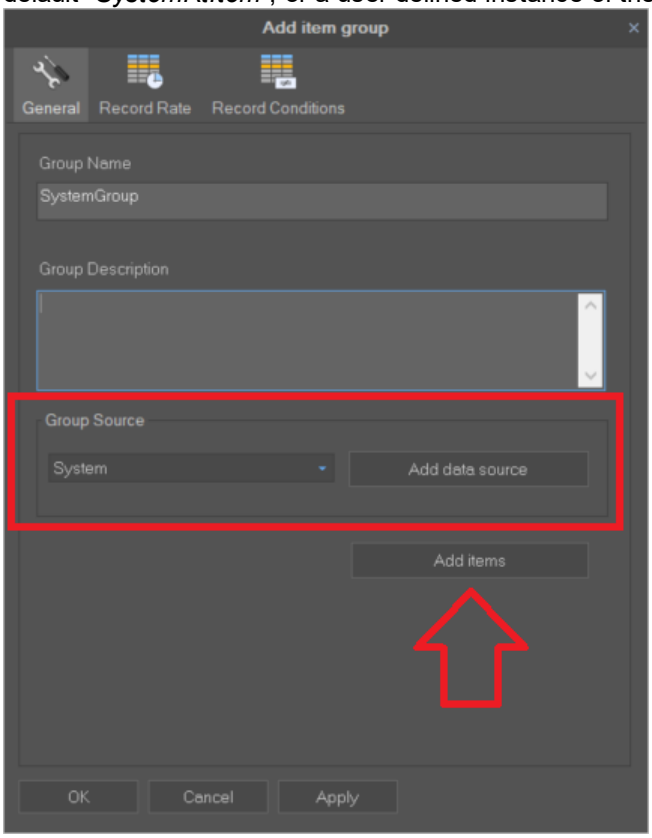


Usage

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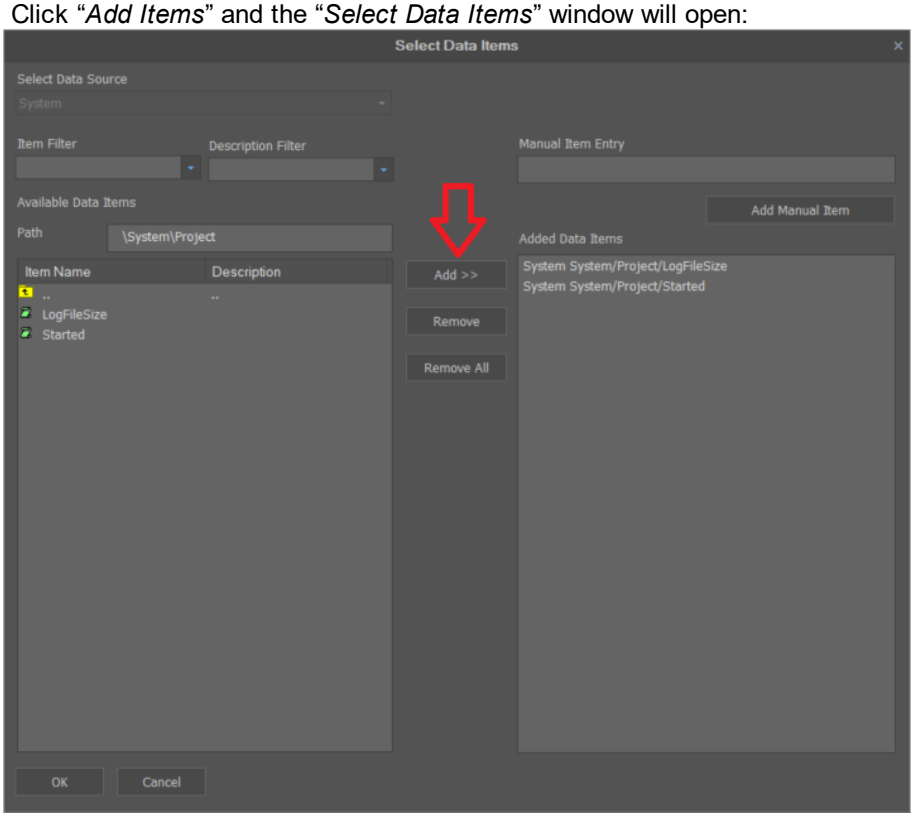
As with any real-time data source, any tag/parameter exposed through the System Driver can be logged to the Dream Report database (configured in the Dream Report Logger Studio) and the historical data reported on, or the current value can be accessed directly, without the need to log the tag. The System parameters can also be exposed through the Analytic Data Server (ADS) to external applications.

Logging Groups - in the **Logger Studio** tab in Dream Report Studio, right-click to "*Add Item Group*" to create a new item group, and set the *Group Source* field to the System driver (either the default "*SystemRtItem*", or a user-defined instance of the System driver):



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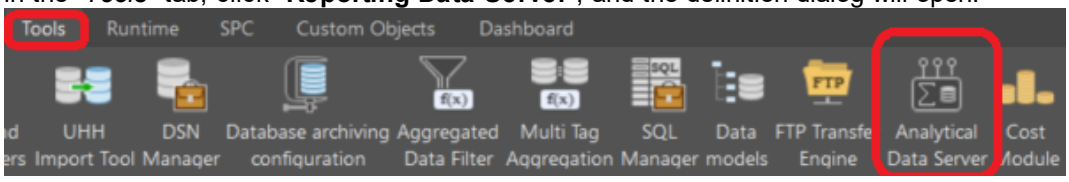
Click "*Add Items*" and the "*Select Data Items*" window will open:



To add items to the active parameters list, select one or more items from the appropriate folder(s), and drag them to the tab in the right, or click the "*Add >>"* button. In the "*Record Rate*" tab, set the storage mechanism and storage rate for this logging group, and under the "*Record Conditions*" tab, set the conditions (if needed) under which the tags will be logged. Then click "**OK**" to close the Item Group configuration. The logged system tags can then be browsed from reporting objects as "*Dream Report History"* data items, and reported on.

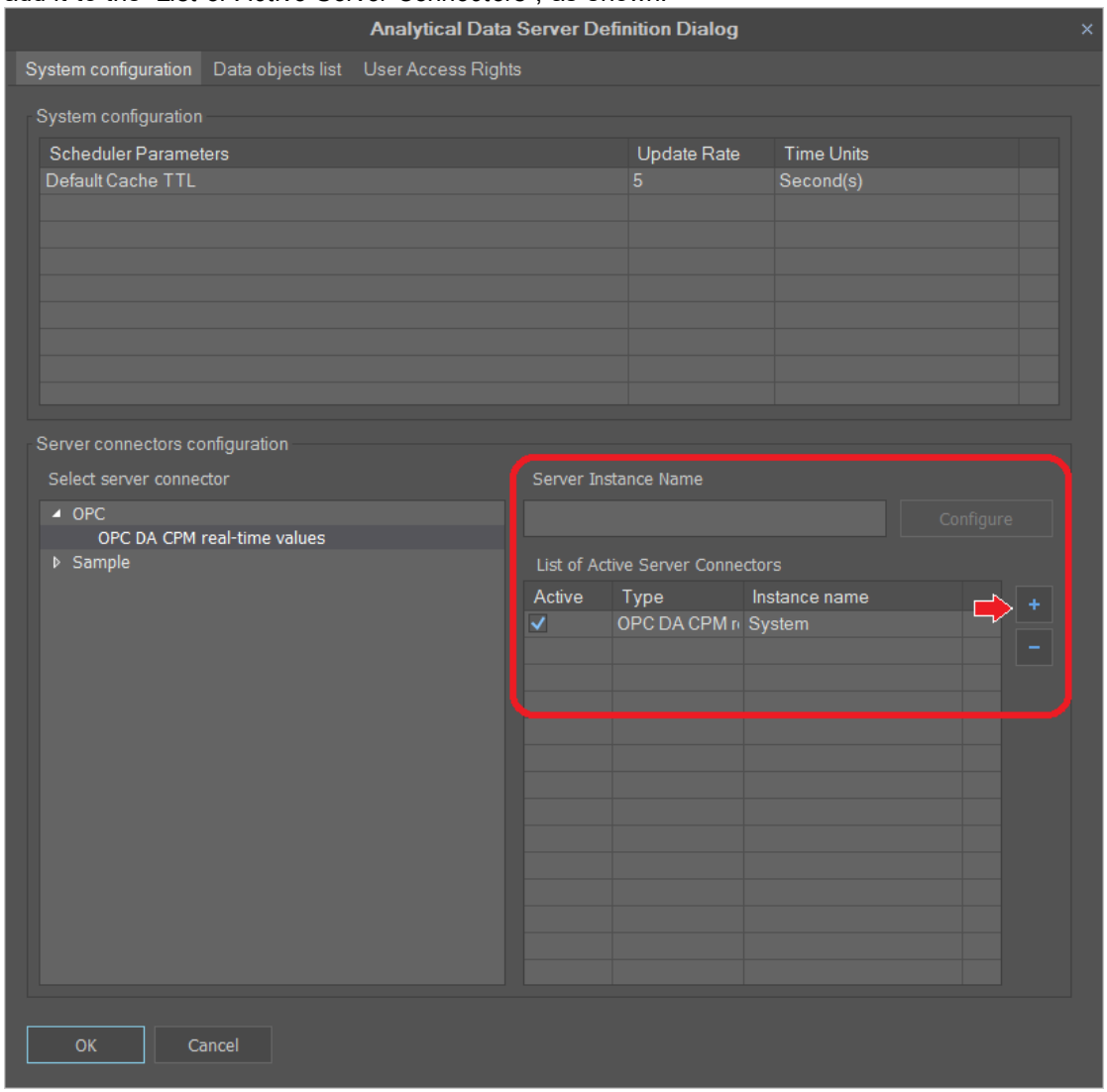
2. **Current Values** – certain reporting objects (such at the *Single Data Object* and the *Bar* and *Pie* graphs) allow reporting of the "Current Value". In this case, the System driver tags do not need to logged. Simply select the "Current Value" statistical function first from the list, and then browse "Dream Report History" data items (all items will be exposed, not just those that were logged) and select the tag to report on.

3. **Reporting Data Server** -the Analytic Data Server will allow you to configure selected (or all) items from the System Driver to external applications over OPC. In the *Report Designer Studio*, in the "*Tools*" tab, click "**Reporting Data Server**", and the definition dialog will open:



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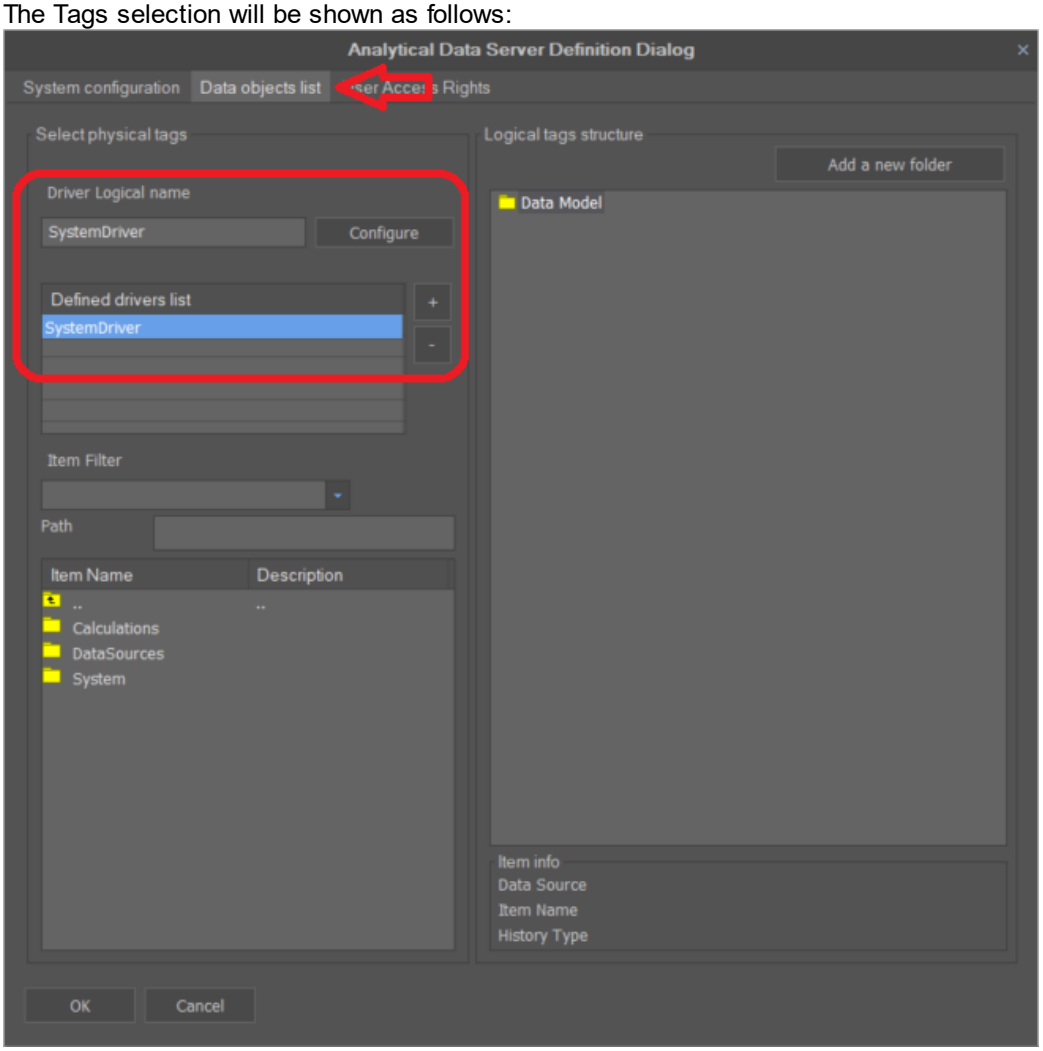
In the "*Server connectors configuration*" section, select the server and click the "**[+]**" button to add it to the "*List of Active Server Connectors*", as shown:



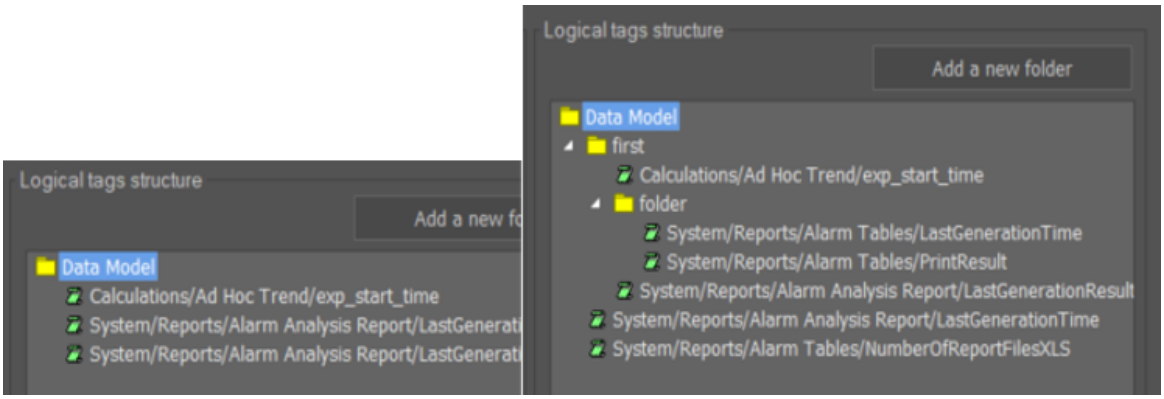
Then, in the "*Data objects list*" tab, in the "Select Physical tags" section, enter a logical name for the system driver and configure it as shown earlier. After configuring, click on the "**[+]**" button to add the driver to the list.

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The Tags selection will be shown as follows:



Drag and drop tags from the list to the right. By default, the tags will be placed under the "Data Model" folder. You can click on the "*Add a new folder*" button, or right-click in the Data Model panel and "*Insert a new folder*" to add folders and organize a folder tree structure.



You can double-click on the tagname in the Data Model to rename/alias the tags if needed.

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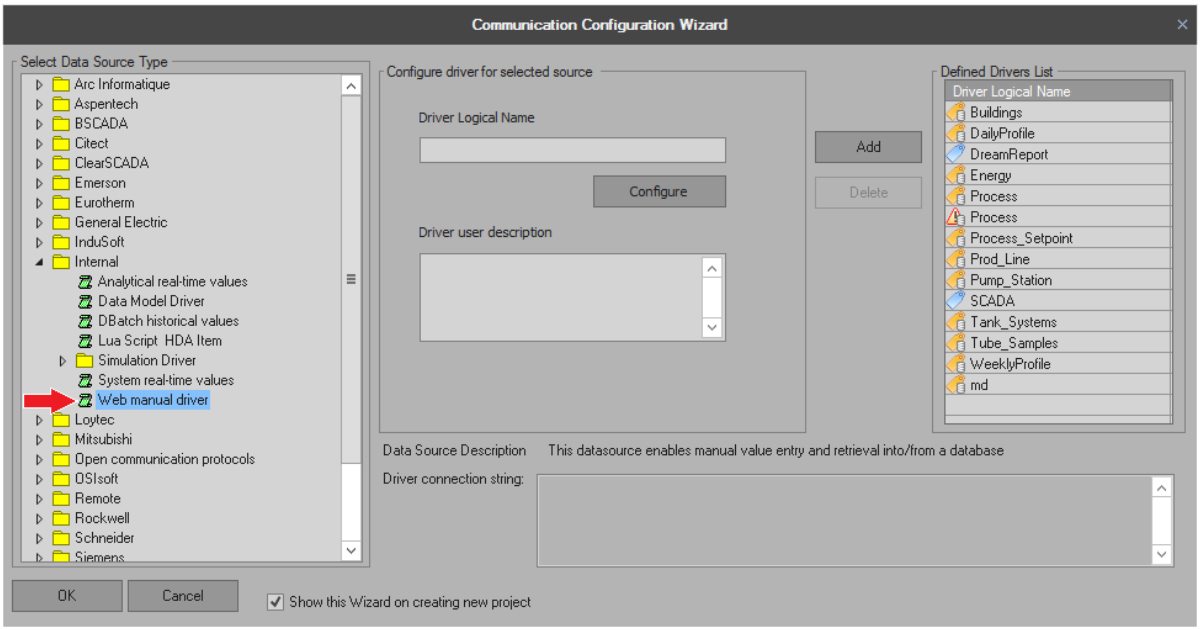
Once configured, any items spcified in the Analytics Data Server will be available to external applications through the Dream Report OPC DA Server.

A detailed explanation of the **Analytic Data Server** are covered in a separate Help topic.

25.12.8 Web Manual Driver

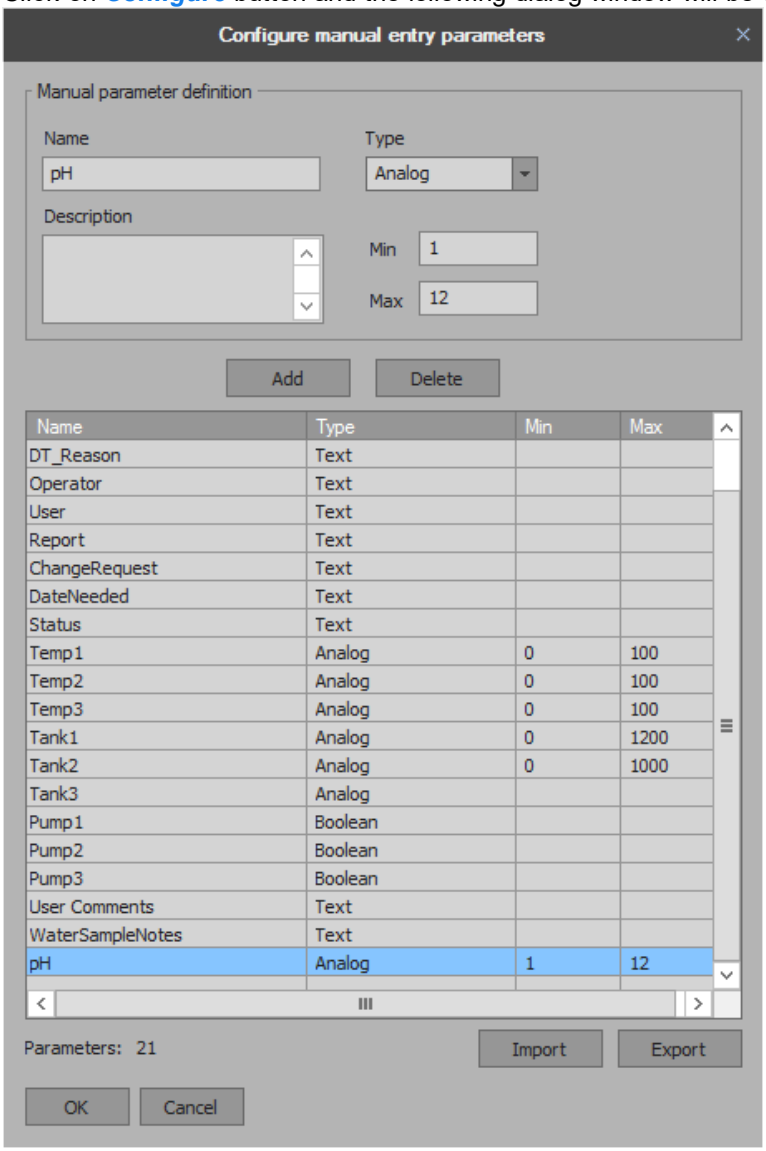
Dream Report includes **Web Manual** driver, which enables connectivity to any external databases, which support ODBC connectivity and have supported data structure.

To configure **Web Manual driver**, first, open the **Internal** folder of the **Communication Configuration Wizard** dialog window:



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Click on ***Configure*** button and the following dialog window will be opened:



Define tags for the selected data source. Every manual tag must have its **Name** and **Type**. Optional information can be also added in the **Description** box (any free text) or for the data validation criteria (**Min** and **Max** values).

The defined manual tag can be one of three types available: **Analog** (default selection), **Boolean** and **Text**.

NOTE: The data validation criteria input is available only for the **Analog** type tags. If other type is selected, validation criteria input controls will be hidden.

Values for both **Min** and **Max** for the validation criteria are expected as integer or float numbers. They will be saved and displayed as a double format number. If **Min** or **Max** value edit boxes remain empty, the corresponding **Min** or **Max** double value will be considered.

The amount of manual tags defined in the **Manual Entry Parameters** configuration window will be displayed in the **Parameters:** section below the manual tags list.

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If you click "**Export**" button, the standard Windows "**Save As**" window will be opened, where you can select location and name for the list export file. A list export file format is **csv** with semi-column used as a separator. A list export file will have a header, as the first row, and data starting from the second row. It will have 5 columns: **Name**, **Type**, **Min**, **Max**, **Description**. **Name** and **Type** fields are obligatory and others are optional.

If you click "**Import**" button, the standard Windows "**Open file**" window will be opened, where you can select location and name for the list import file. "**Open file**" will be filtered by "***.csv**" extension.

The format of the import file list will be exactly the same as described in the "**Export**" section. Only 2 columns - **Name** and **Type** are obligatory. If a list file with only these 2 columns has been created, such an import file should be imported as well.

When a file will be imported, the message box will pop up, asking: "*Do you want to replace existing tags by the importing list?*" The corresponding operation will be done according to a user's choice.

NOTE: If you try to import tags, appending the list to the existing one, and the imported tag will have the same name as an already existing one, a message box will pop up saying that the duplicated tag name has been found, specifying the name of that tag and proposing a user to choose either to "use an existing tag definition", or "delete an existing one and use an imported tag definition. The corresponding action will be done according to the user's choice.

There is no limit in term of the number of tags, defined in the **Web manual driver** configuration dialog window.

NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "**Select Data Source Type**" field on any other driver and then go back to the driver that you need to configure.

25.13 Open Communication Protocol

The **Open communication protocols** folder will display the following list of open communication protocols:

• **CSV** (displayed as a folder). List when expanded:
- Tag values in CSV files

• **Excel** Data Import real-time values

• **Modbus** (TCP/IP, RS232, ASCII) (displayed as a leaf node)

• **MQTT** real-time values

• **ODBC** folder will display two entries:
- ODBC historical values
- ODBC historical alarms
- Advanced ODBC historical alarms
- Advanced ODBC historical values

• **OLE DB** folder will display:
- OLE DB historical values

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- OLE DB historical alarms

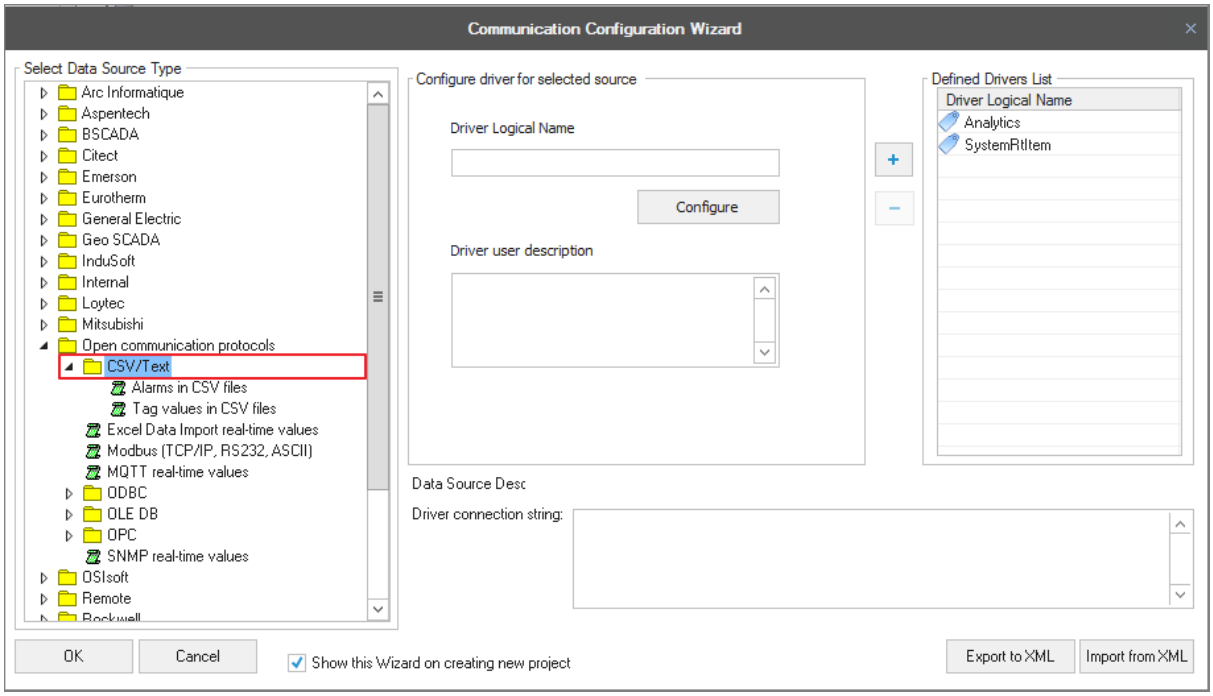
• **OPC driver** (displayed as a folder). List when expanded:
- OPC DA (real-time values)
- OPC AE (real-time alarms)
- OPC HDA (history data access)
- OPC UA Historical values
- OPC UA real-time values

• **SNMP** real-time values

25.13.1 CSV/Text Drivers

The *CSV/Text* drivers are Dream Report communication online drivers that permit to transfer data from Data CSV/ASCI files that were generated by industrial equipment one like PLCs, RTUs etc. into Dream Report database. CSV Driver provides automated browse of data items and automated periodical data extraction from any types of CSV/Text files. Driver periodically check for data updates in specified data file(s) and convert this data into a Dream Report database. Then that data is available for fast and efficient reports generation and creation. It can be accessed also as open database by any 3-d party applications.

To configure the CSV/Text drivers, first, open the *Communication Configuration Wizard* dialog window in Dream Report Studio - all drivers are listed under the *Open communication protocols* - *CSV/Text* folder:



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User interface common definition

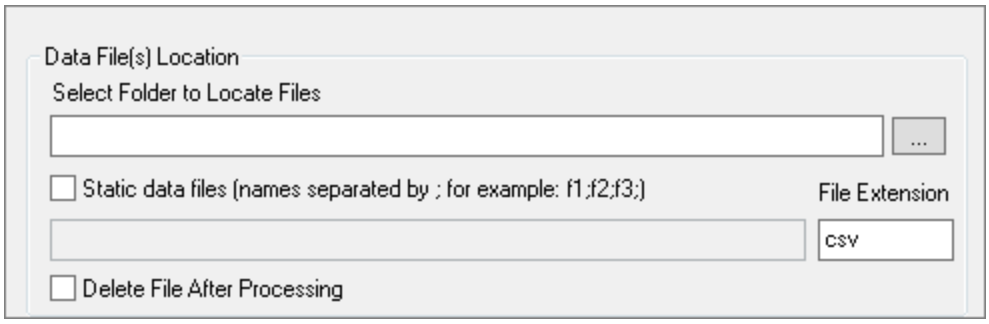
User interface configuration dialog designed so it will require minimum user actions to be tuned up.

In *Data File(s) Location* part user has to provide full path to CSV/Text files location from where data will be converted into Dream Report Database: *Select folder to locate files* option is used to provide location of file from where data is going to be exported into Dream Report db, it is “dynamically” scanned folder. Data from all files located in it will be exported.

Static data file option has to be use in case and user has only specific files to be scanned for data export. In dialog user can specify only one file, however by editing xml configuration file it is possible to add several files.

User has to provide extension of files. By default, it configured for CSV file types, but can be manually edited.

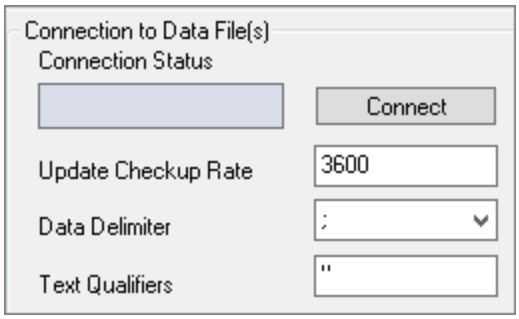
Processed CSV/Text file(s) can be removed by selecting *Delete File After Processing* option.



Update Checkup Rate indicates how often Dream Report run time is checking for new updates in specified above directory or if static Data flies are renewed.

Data delimiter provides indication of text to column separation.

Text qualifier is a symbol that indicates where text begins and ends.



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Description of Time Stamp Settings

Preset Formats:

Dream Report CSV driver preset timestamp formats that user can specify in case and CSV files based on one of those formats:

1. 'Seconds since 1970' – This format corresponds to seconds since 01 January 1970.

2. ‘Seconds and Milli’ – This format corresponds to Seconds and milliseconds separated by delimiter. For example: “1196858560,968”

3. ‘Milliseconds’ – Similar format as above one without delimiter: “1196858560968”

4. 'mm/dd/YYYY'

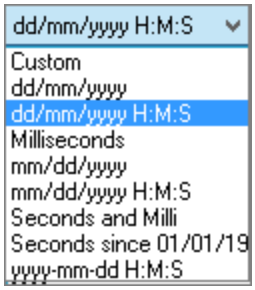
5. 'mm/dd/YYYY H:M:S'

6. 'dd/mm/yyyy'

7. 'dd/mm/yyyy H:M:S'

8. 'yyyy-mm-dd H:M:S'

See screen shot below:



Custom Date and Time Format

In case and timestamp format that used in CSV files is not exist in predefined list user can select “Custom” option and build his own format which will correspond to defined in CSV files. It even does not need to be in a human-recognizable format; e.g. a date passed as "02:1999:9" is acceptable, even though it is ambiguous without context. As long as the format string format matches the input string the function will succeed. The user has to make sure, though, that the input can be parsed in an unambiguous way. The string "1999112" can be parsed using the format "%Y%m%d" as 1999-1-12, 1999-11-2, or even 19991-1-2. It is necessary to add appropriate separators to reliably get results.

The formats are:

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%a or %A The weekday name in English, in abbreviated form or the full name.
%b or %B or %h The month name in English, in abbreviated form or the full name.
%C The century of the year. It makes sense to use this format only if the format string also contains the %y format.
%d or %e The day of the month as a decimal number (range 1 through 31). Leading zeroes are permitted but not required.
%D Equivalent to %m/%d/%y.
%F Equivalent to %Y-%m-%d, which is the ISO 8601 date format.
%H or %k the hour as a decimal number, using a 24-hour clock (00 through 23).
%I the hour as a decimal number, using a 12-hour clock (01 through 12).
%j The day of the year as a decimal number (range 1 through 366). Leading zeroes are permitted but not required.
%m The month as a decimal number (range 1 through 12). Leading zeroes are permitted but not required.
%M The minute as a decimal number (range 0 through 59). Leading zeroes are permitted but not required.
%n or %t Matches any white space.
%p The `AM' or `PM'. This format is not useful unless %I or %l is also used.
%r The complete time using the AM/PM format of the current locale. The same as %I:%M:%S %p
%R The hour and minute in decimal numbers using the format %H:%M.
%S The seconds as a decimal number (range 0 through 60). Leading zeroes are permitted but not required.
%T or %X Equivalent to the use of %H:%M:%S in this place.
%u The day of the week as a decimal number (range 1 through 7). Monday being 1. Leading zeroes are permitted but not required.
%U The week number of the current year as a decimal number (0 through 53). Leading zeroes are permitted but not required.
%V The ISO 8601:1988 week number as a decimal number (1 through 53). Leading zeroes are permitted but not required.
%w The day of the week as a decimal number (0 - 6), Sunday being 0. Leading zeroes are permitted but not required.
%W The week number of the current year as a decimal number (0 - 53). Leading zeroes are permitted but not required.
%x The same as %Y:%m:%d.
%y The year without a century as a decimal number (range 0 - 99). Leading zeroes are permitted but not required. It is best to avoid %y completely and use %Y instead.
%Y The year as a decimal number, using the Gregorian calendar.
%% A literal `%' character.

All other characters in the format string must have a matching character in the input string. Exceptions are white spaces in the input string which can match zero or more whitespace characters in the format string.

Examples of Custom formats and its usage mask in CSV driver definition:

b. “%d/%m/%Y %H:%M:%S” correspond to “12/09/2007 10:11:29”
c. “%Y-%m-%d %H:%M:%S” correspond to 2007-09-13 23:12:30”
d. “%d-%m-%y %H:%M:%S” correspond to “12-09-07 10:11:29”
e. %Y-%m-%d %I:%M:%S %p correspond to “2007-09-13 11:59:01 PM.

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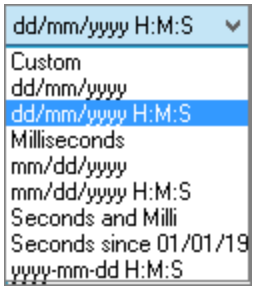
f. %H:%M:%S %d/%b/%Y where %b correspond to 3 first letters of the month – “11:59:01 11/SEP/2007”.

Dream Report CSV driver handle 4 possible options with milliseconds available in CSV file:

1. Milliseconds since 01 January 1970.
2. Seconds and milliseconds separated by delimiter: 1196858560,968
3. Standard Date & Time format with milliseconds: “12/09/2007 10:11:29.493”
4. Milliseconds in separate column.

For two last cases user have to select “Custom” Time format and adjust time format manually. See examples how to configure CSV configuration when milliseconds are existing in CSV files:

- %d/%m/%Y %H:%M:%S:%Z correspond to “12/09/2007 10:11:29:493”
- %d/%m/%Y %H:%M:%S.%Z correspond to “12/09/2007 10:11:29” and “493”, here user have to specify also the column name where milliseconds are located. See the image below:



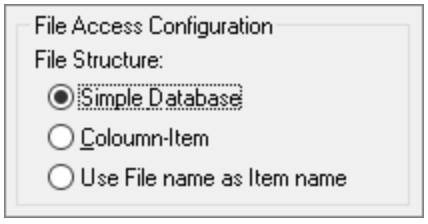
UTC time:

In case and timestamps in CSV files defined as UTC, user will have to select “UTC time in use” check box.

Data Items CSV/Text columns mapping

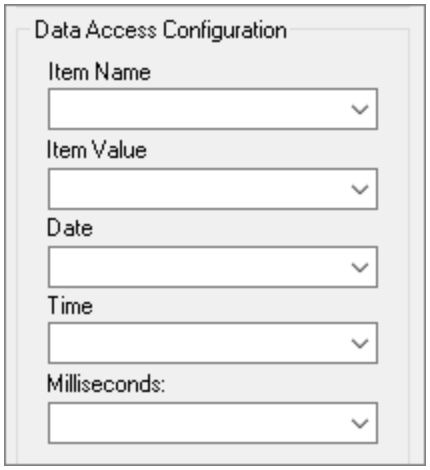
In “File Access Configuration” user has to specify file structure. Currently Dream Report supports 3 files structures:

i. “Column – Item” If this option is selected user will have to specify column name correspond to Timestamp
ii. “Simple Database” If this option is selected user will have to specify column correspond to Item Name, Item Value and Timestamp.
iii. “File Name is Item Name” If this option is selected user will have to specify column correspond to Timestamp and to Item Value.



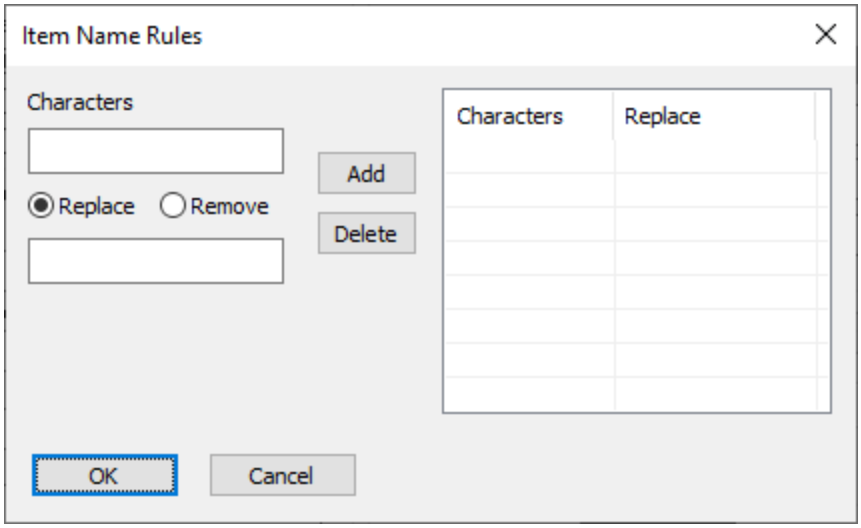
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User have to press connect button in order to read structure and retrieve appropriate information from CSV/Text files, then to specify which field in CSV/Text driver “Data Access Configuration” corresponds to which column in CSV/Text files:



NOTE: Some CSV/Text files include 2 or 3 separate columns for Date, Time and Milliseconds. If mentioned columns are not used please keep those columns empty.

Item Name Rules



Item Name Rules button - When clicking on this button the following window will open:

Enter the character you would like to remove or replace in the *Character* box.

Select the action – *Replace* or *Remove*. If *Replace* was selected, specify the replace character.

Click *Add* to add the rule to the list.

To delete a rule, select the rule in the list, and then click the *Delete* button.

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For example: changing the “[“ and “]” symbols in tagname to avoid possible errors.

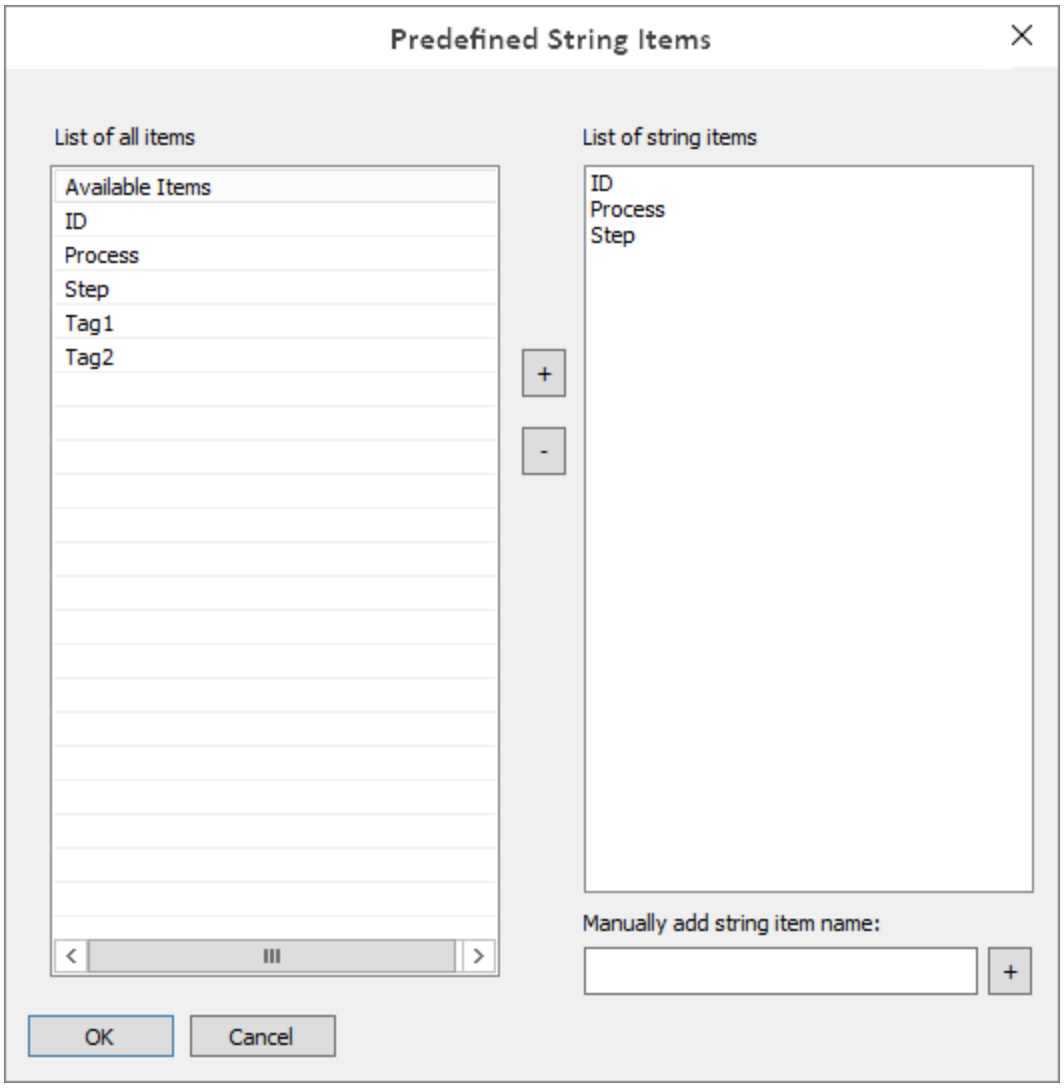
String Items

When Dream Report imports string fields from a CSV/Text file, and some values in those fields are numeric, the values will be converted and stored in the project database as numbers. As numeric and string data is stored in different table, that will result the numeric values are missing in reports. To prevent this, configure the *Predefined String Items* list using the *String Items* button in the driver configuration window.

Click on the *String Items* to open the *Predefined String Items* window.

NOTE: For the fields to shown up in the window, the driver must be initialized, so when you configure the driver for the first time and click on the *String Items* button, the *List of all items* section will be empty. Save the driver definition and click the *Add* button in the *Communication Configuration Wizard* window to add the driver definition to the *Defined Driver List*. Then click on the *Configure* button to reopen driver configuration . Now, when you click on the *String Items* button, the value fields from a CSV/Text file will be displayed in the *List of all items* section.

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Use the "+" button to add a selected field to the *List of string items*, or "-" button to delete a field from the list.

You can define a string item field to the *List of string items* by typing the name of a field in the *Manually add string item name* textbox and clicking "+" button next to it.

Transfer of CSV/Text based project to another computer

Transfer of the Dream Report project which is based on CSV/Text converter has to be done in 3 simple steps:

1. Copy Dream Report project to destination computer.

2. Copy from <Program Files>\ODS\Dream Report\System directory subfolder “CSVCFG”. This directory includes configuration XML files that were defined in project.

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3. Ensure that location of CSV/Text files is the same as it was defined on computer where project had been developed.

Restrictions and components that have to be included in CSV/Text files

1. Header has to be included.

2. Column delimiter must be different then ":", for example ";", it is also recommended to avoid "," delimiter due to the fact that in some locales it corresponds to decimal point separator.

3. Strings that don't include Time Stamp aren't allowed.

For example:

Original files can't include the following lines:

"Coolant Temp 20 - 40 Deg C: 0:00:38".It has to be replaced by "00:00:58 1 Sep 2007; Coolant Temp 20 - 40 Deg C: 0:00:38".

4. While defining instance of Dream Report CSV/Text driver, all CSV files correspond to this instance have to be located in same folder.

25.13.2 Excel Data Import Driver

Dream Report includes *Excel Data Import (EDI)* driver, which enables to periodically access specific Excel file(s) or check for specific folder(s) (optionally including subfolders) and import all new data.

EDI driver will permanently run with Dream Report and look after specific Excel file or all files in a specific folder (optionally including subfolders). As soon as the file modify time has changed or new files have appeared in the folder, EDI driver will access that file or the newly created files, read data according to its configuration and log that data into the standard Dream Report database.

In order to import data from Excel you need to define logging group from EDI source with record rate *On Update*.

EDI Driver Compatibility

EDI driver is compliant with the following MS Excel versions:

• MS Excel 2000

• MS Excel 2003

• MS Excel 2007

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• MS Excel 2010

• MS Excel 2013

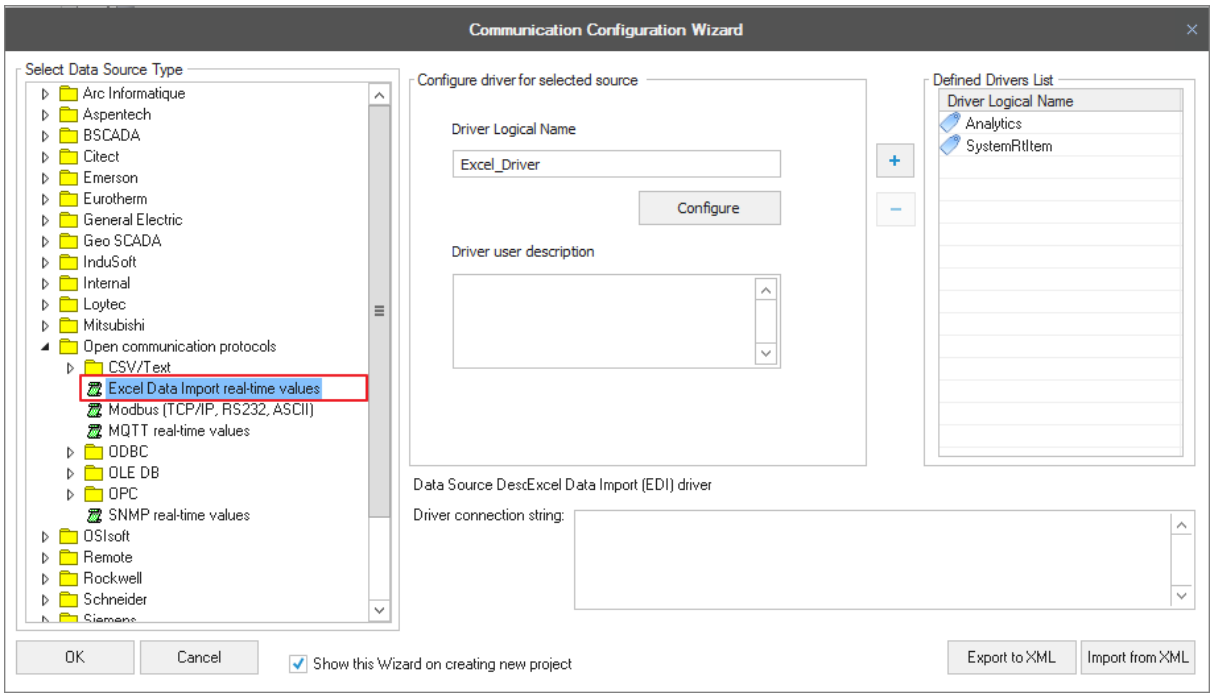
• MS Excel 2016

• MS Excel 2019

MS Excel is not required to be installed on the PC, where EDI driver will work. EDI driver includes a special integrated library to access MS Excel files without MS Excel software itself.

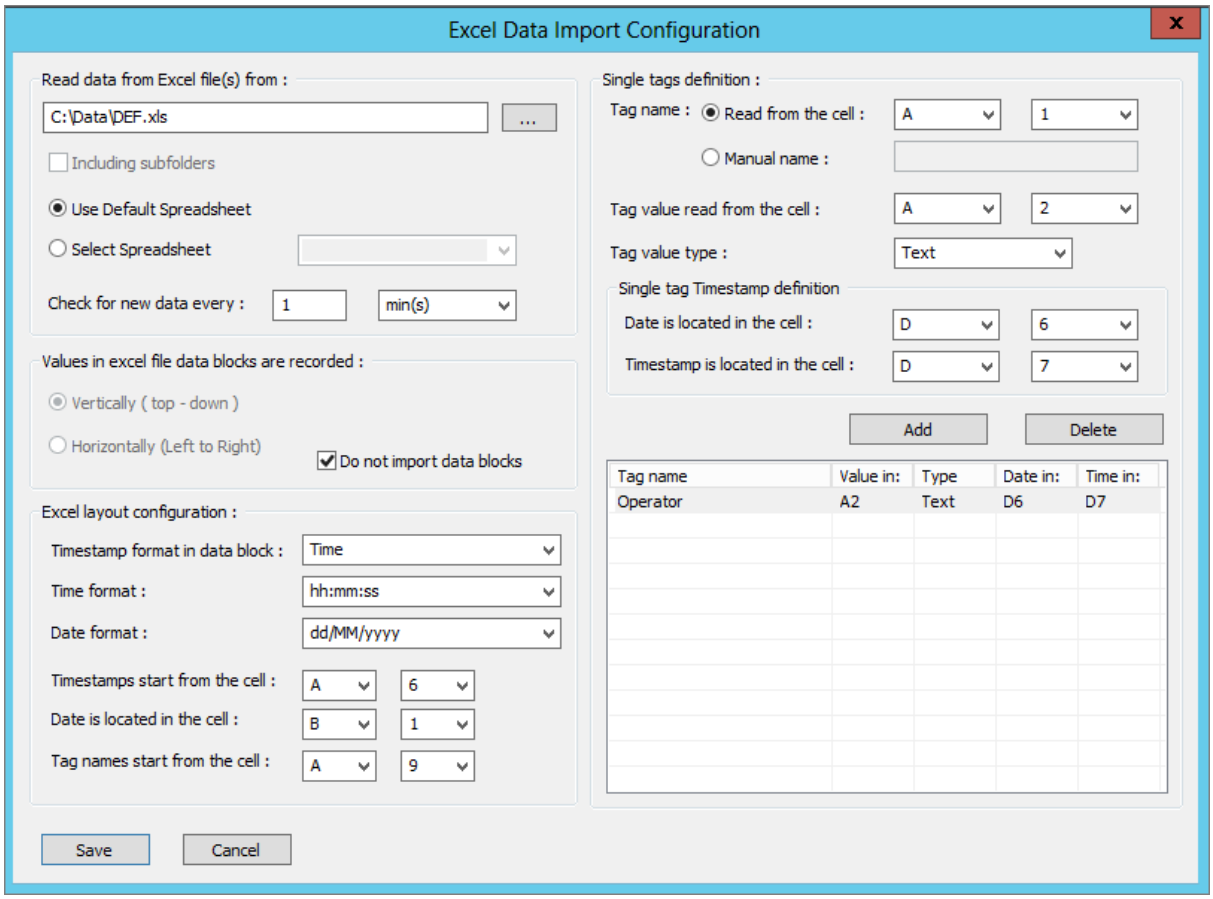
EDI Driver Configuration

To configure EDI driver, first, open the *Open communication protocols* section of the *Communication Configuration Wizard* dialog window:



Click on *Configure* button and the following dialog window will be opened:

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In the Read data from Excel file(s) from: section, please select a specific file with the extension *.xls or *.xlsx. Then the EDI driver will periodically check the timestamp of the modification of that selected file with the period defined below. As soon as the file modification timestamp has been changed, the driver will read file data and all new values will be archived into the database.

If you have entered the folder name (but not the file name), the driver will periodically scan for the entire folder and keep the list of the last processed files and their modification timestamp. As soon as a new file has been found or the modification timestamp of any existing file has been changed to a newer one, the driver will process all these files and all new data will be archived into the standard Dream Report database.

Check box "**Including subfolders**" will be enabled only if the edit box with the file/folder name contains a folder name. If you have entered only a file name, this check box will be disabled.

If this check box is enabled, then EDI driver will check not only all files in the selected folder, but also in all subfolders located under that selected folder.

You can specify the spreadsheet from where all the data will be transferred into Dream Report. There are 2 options available: Use Default Spreadsheet and Select Spreadsheet.

- **Use Default Spreadsheet** radio button is enabled by default when the Excel Data Import Configuration dialog window will be opened the first time. When the configuration of all the rest of the EDI driver's parameters continues, it will always refer to this default Excel spreadsheet.

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• If **Select Spreadsheet** radio button is enabled, then you will be able to select a specific spreadsheet.

In the **Check for new data every** section, specify the period for a new data check. You can enter any integer number from 1 to 86400, and time (second(s), min(s), hour(s), day(s), month(s)) in the time unit combo box. The timer will start when the project is started, and then each defined number of time units, EDI driver will check for the new data.

In the **Values in Excel file data blocks are recorded:** section you can configure how to import data in blocks. First, select the type of data layout – Vertically (top-down) or Horizontally (letf to right). The data layout type defines the direction of values, which are listed after their corresponding tag name cell. In the horizontal orientation values are listed to the right from their tag name. In vertical orientation values are listed down from their tag name.

If there is no need to import data from data blocks, please check the Do not import data blocks check box. Then both radio-buttons will be disabled.

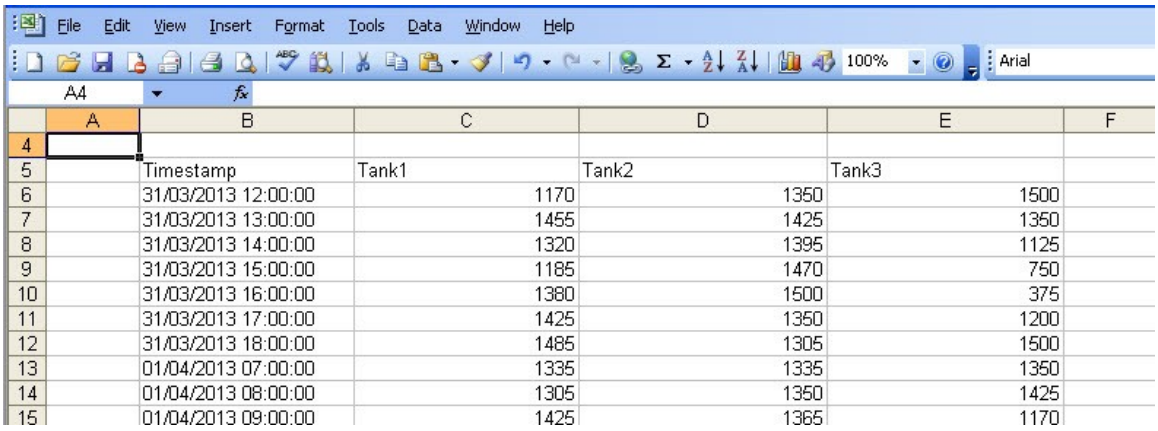
In the **Excel layout configuration** section, first select timestamp format in a data block in the Timestamp format in data block: combo box. This combo box has 3 entries: "**Time**", "**Date**" and "**Date and Time**". Each of them sets the timestamp format, which will be used next to each value in data blocks. The default timestamp format value is Time.

Time format combo box enables to select time format and has 9 entries: "hh", "hh am/pm", "mm", "hh:mm", "hh:mm am/pm", "hh:mm:ss", "hh:mm:ss am/pm", "hh:mm:ss.msec", "hh:mm:ss.msec am/pm". The default time format value is hh:mm:ss.

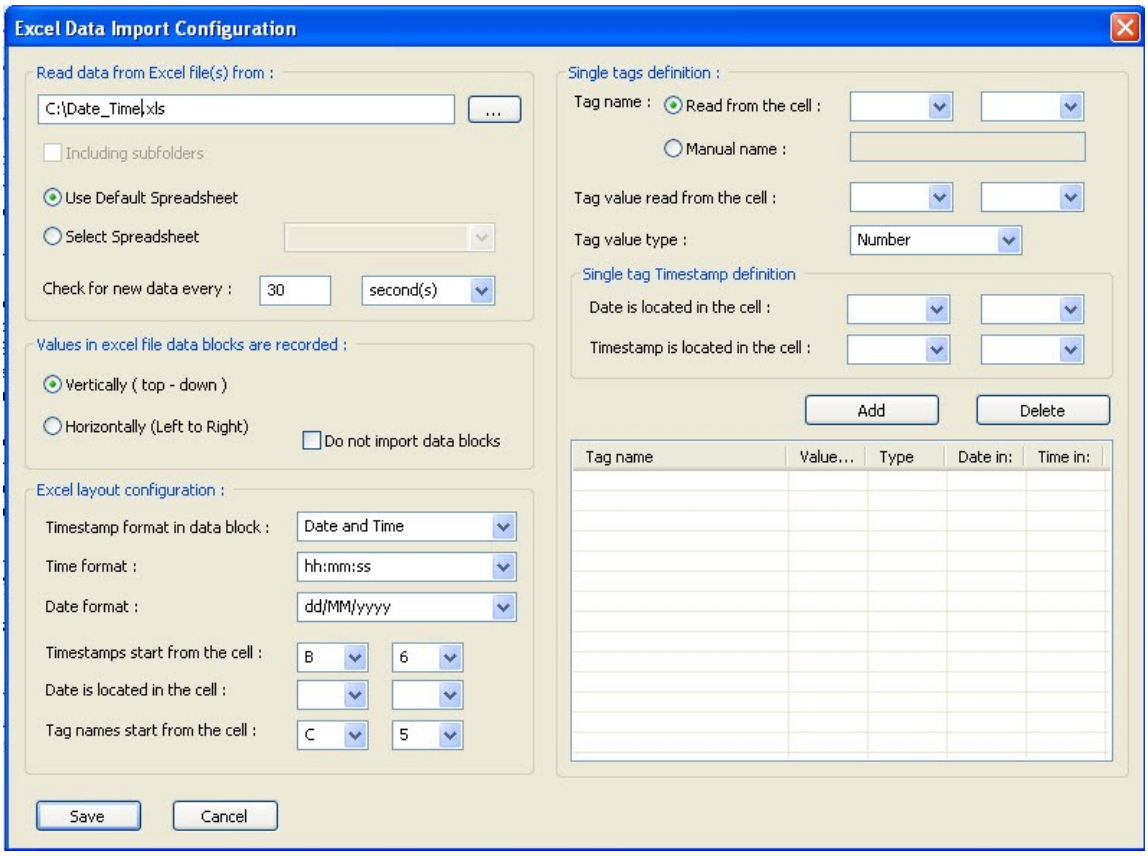
Date format combo box enables to select date format for the values timestamp. This combo box has exactly the same entries and functions as the date format combo box (Set Date Format) in the Project Settings Localization section in the Dream Report studio.

In the combo boxes Timestamps start from the cell, please select a cell where timestamps values start. If an Excel file has the vertical layout type, please select the first cell from the top, containing Timestamp. If an Excel file has horizontal orientation, please select first cell from the left, containing Timestamp.

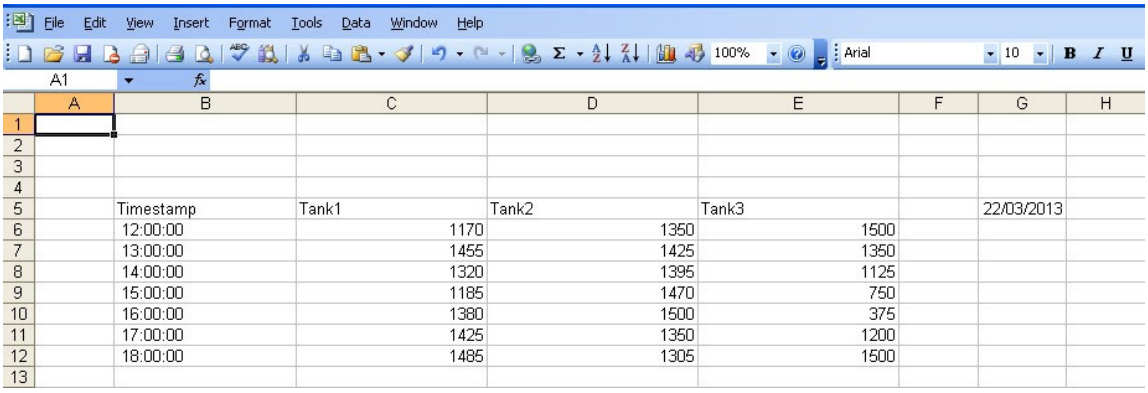
If the timestamp format in the **Timestamp format in data block** combo box is "Date and time", then please ignore section "Date is located in cell".



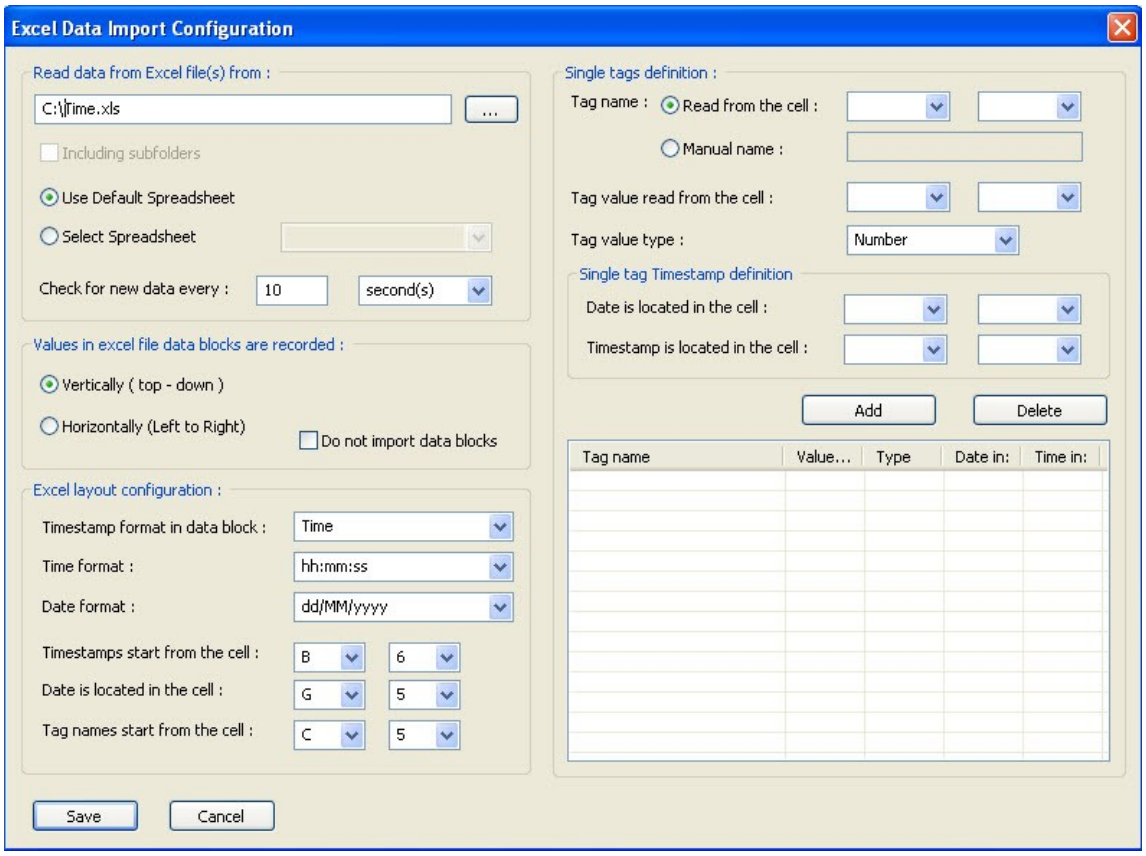
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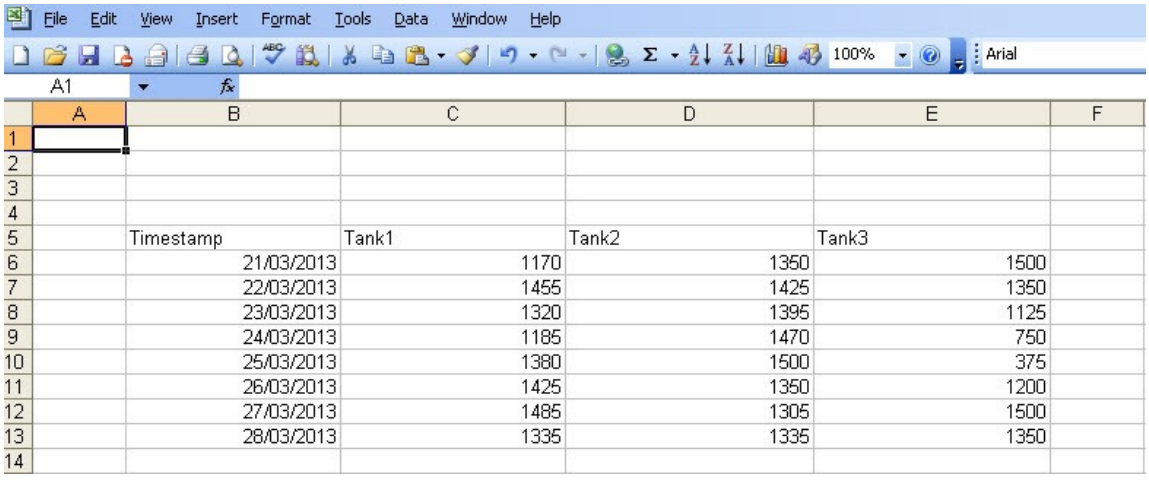
If the **Timestamp format in data block** combo box has the Time value defined, select a cell, which contains the date that will be taken for every value and added to its time. Row and Column of the cell will be selected from the combo boxes in the "Date is located in the cell" section.



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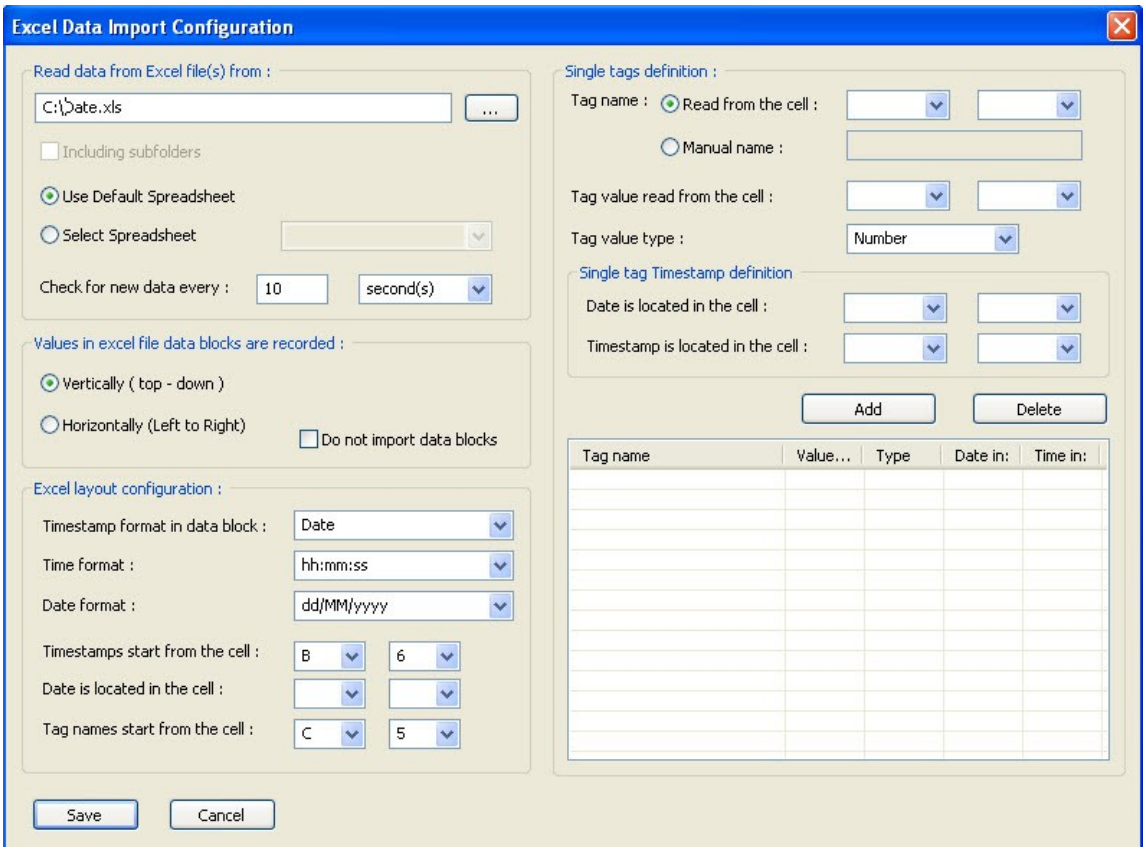


If the **Timestamp format in data block** combo box has the Date value defined, the midnight time will be added to each items date.



	A	B	C	D	E	F
1						
2						
3						
4						
5		Timestamp	Tank1	Tank2	Tank3	
6		21/03/2013	1170	1350	1500	
7		22/03/2013	1455	1425	1350	
8		23/03/2013	1320	1395	1125	
9		24/03/2013	1185	1470	750	
10		25/03/2013	1380	1500	375	
11		26/03/2013	1425	1350	1200	
12		27/03/2013	1485	1305	1500	
13		28/03/2013	1335	1335	1350	
14						

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In the **Tag names start from the cell** combo box select the start place to read tag names and their values - i.e. specify a cell, which is the start for tag names.

- If the table is vertical, select the first left cell of the row, which has tag names. Then EDI driver will know that all other tag names are located to the right of that cell.
- If the table is horizontal, select the first top cell of the column, which has tag names. Then EDI driver will know that all other tag names are located below that cell.

The EDI engine will assume that all values are started just next to the corresponding tag name. If any tag name cell is empty, its data block will be ignored

Single Tags Definition

Data can be also taken from particular cells. For this purpose, please select cells one by one and define a name for a value from that cell (Tag name) and a type for that value (Tag value type).

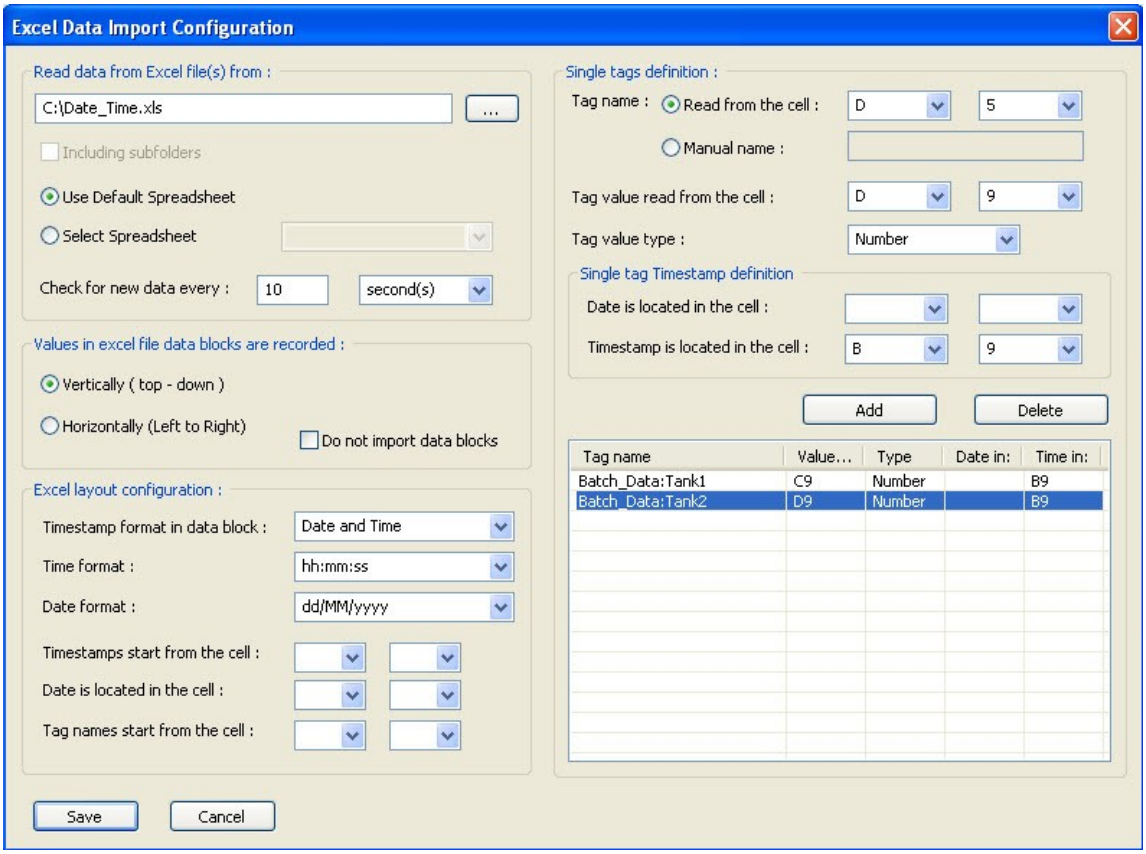
Tag name can be also taken as a value of another cell. Enable the radio-button Read from the cell and select the address of the cell, which will contain the name of the desired tag. Or enable the radio-button Manual name and enter the name of the tag manually into the edit box next to it.

Having defined a single tag name (Tag name), select the address of the cell, which will contain value (Tag value read from the cell), and then select its type from the corresponding combo box (Tag value type). The Tag value type combo box has 3 entries: Number, Boolean and Text.

As soon as a new single tag has been defined, add it to the tags list by clicking the Add button. You can always remove the single tags definition by clicking the Delete button.

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When single tags' definitions will be added to the Database, timestamps for the value(s) of those tags will be taken from the Single Tag Timestamp Definition section:



NOTE: There are 2 possible configuration options available here:

- Option 1. If the Excel file includes both "Date" and "Time", and it is split in two different cells, then, in order to get the Timestamp of the single data values, you should specify 2 different locations for "Date" and "Time".
- Option 2. If in the Excel file only one cell represents both "Date" and "Time", then you will have to select only the "Timestamp" cell and keep the "Date" cell blank.

EDI Tags Browse

If you want to use any of EDI tags in reports and try to select a tag from the report, the EDI browser will access the selected Excel file or group of files in the selected folder, read all tag names and display them in the list. If, during report design, you will modify Excel file and add some tags, EDI will have to close and open studio again, and the tag browse will be renewed.

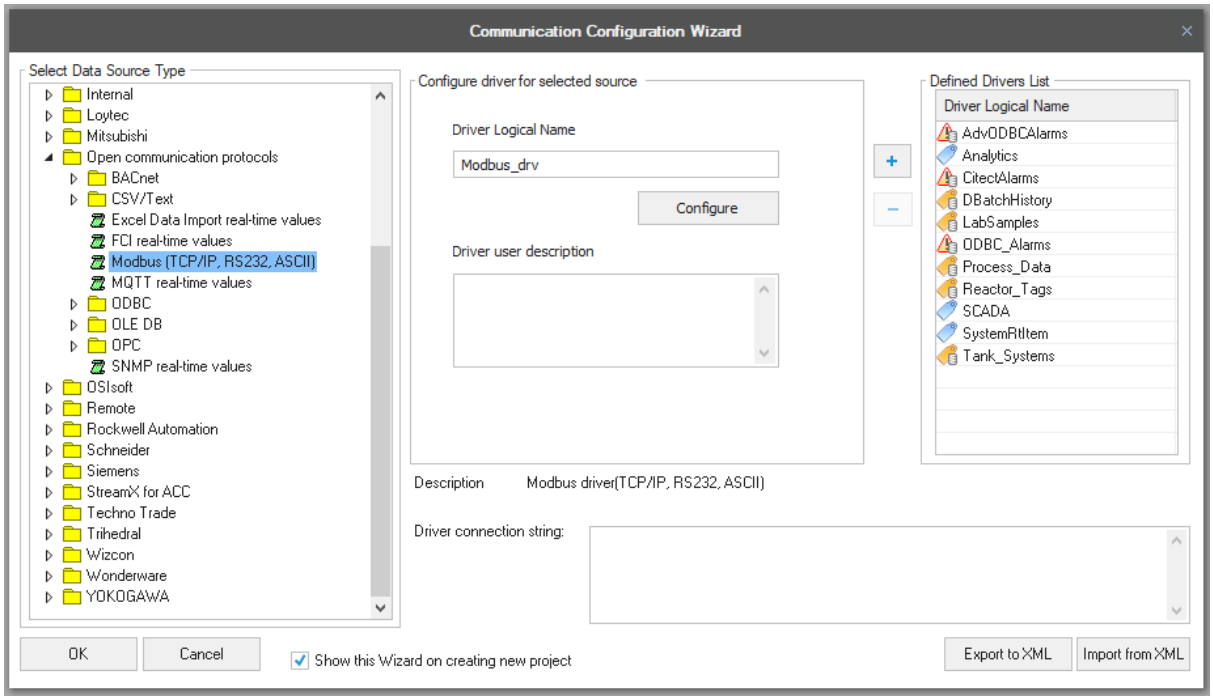
NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "Select Data Source Type" field on any other driver and then go back to the driver that you need to configure.

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25.13.3 Modbus (TCP/IP, RS232, ASCII)

Modbus driver enables connecting to one or several devices, which are able to communicate using Modbus protocol, receive real-time values and write values back to a Modbus compliant device.

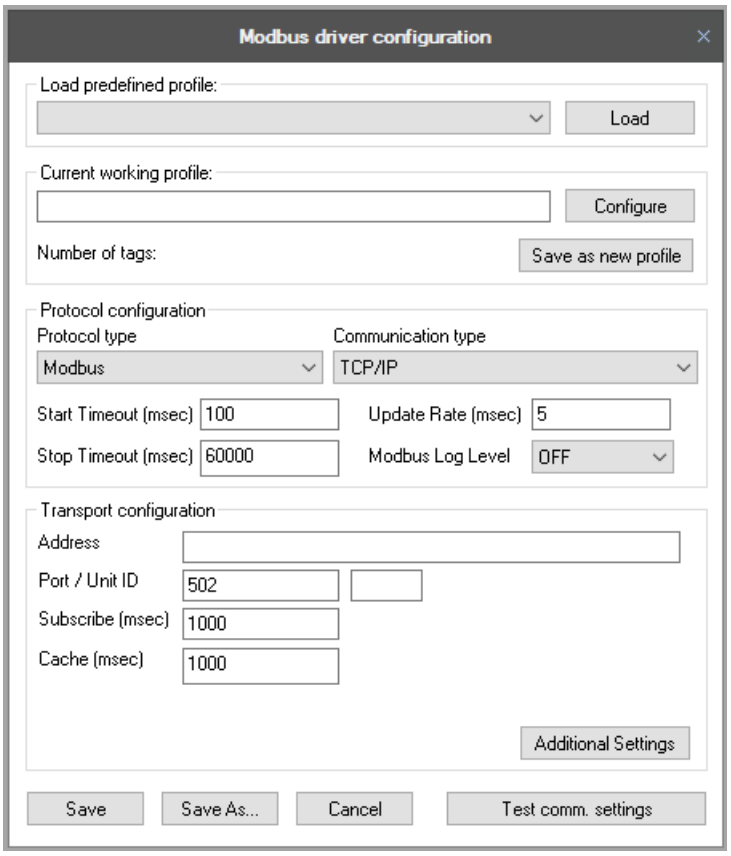
Modbus driver can be selected from the *Open communication protocols* folder in the Select Data Source Type section in the *Communication Configuration Wizard* dialog window:



User interface common definition

Once *Modbus driver* is selected, click on "*Configure*" button, the Modbus driver configuration window will be opened:

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This window provides users with the possibility to configure communication parameters to a Modbus device and also data points in that device for communication.

Modbus Profiles

User can configure Modbus driver instance based on the device definition or just use profile if such device is already exist in the list of pre-configured profiles.

There are pre-configured profiles in the product installation, supplied with the product. When installing the product, there is a folder "Modbus" in the System folder in the product installation (e.g. *C:\Program Files\ODS\Dream Report\System\Modbus*). All profile files are located there, where the name of a profile file is the displayed name of a profile in the profile list.

Profile is a ready set of data points: their name, Modbus address, data type etc.

Load existing profile

The combo box "*Load predefined profile*" contains the full exhaustive list of all available predefined Modbus profiles. If there is any profile, which you want to load, please, select this profile in the combo box and then click on the "*Load*" button. The driver configuration engine will load the selected profile and the section "*Current working profile*" will display the loaded Modbus profile data, such as: Profile description will be written in the edit box, and the "*Number of tags*" string will display the number of tags, defined in the selected profile. Now all list of predefined tags will be loaded.

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Create and save new profile

If you are not using any predefined profile and you have already configured once your list of Modbus data points, and you will use the same profile in the future, you can type a description for the new profile, click on the button "*Save as a new profile*" and then you can type the profile name in the "*Save file*" dialog window. The profile file has to be saved in the *Modbus* folder in the "System" directory (then it will become available in the profile selection list with its list of data points and their addresses).

If you are using an existing predefined Modbus profile and you have edited/modified it and wish to save it under a new profile name, you also need to enter a profile description, click on a button "*Save as a new profile*", and then the new predefined Modbus profile will be created.

Configuring Modbus (Protocol Configuration)

If you have selected a predefined Modbus profile or defined tags manually, please, configure the communication to your Modbus device.

Protocol type combo box contains available protocols: *Modbus* and *JBus*. Please, select which communication protocol will be used.

Communication type combo box enables users to specify the way how to connect to a Modbus device. There are two options available: *TCP/IP* and *Serial*.

Default selection is *TCP/IP*. If this option is selected, enter your Modbus device IP address into the *Address* edit box.

Start Timeout (msec) - parameter will set delay before driver will start monitoring of the values from Modbus device its communicating to.

Stop Timeout (msec) - parameter that identify maximal timeout that communication driver will wait before cutting the connection to Modbus device. Such timeout is used on the project shut or reload event.

Update Rate (msec) - this parameter sets how often cyclic monitoring to the device will be done.

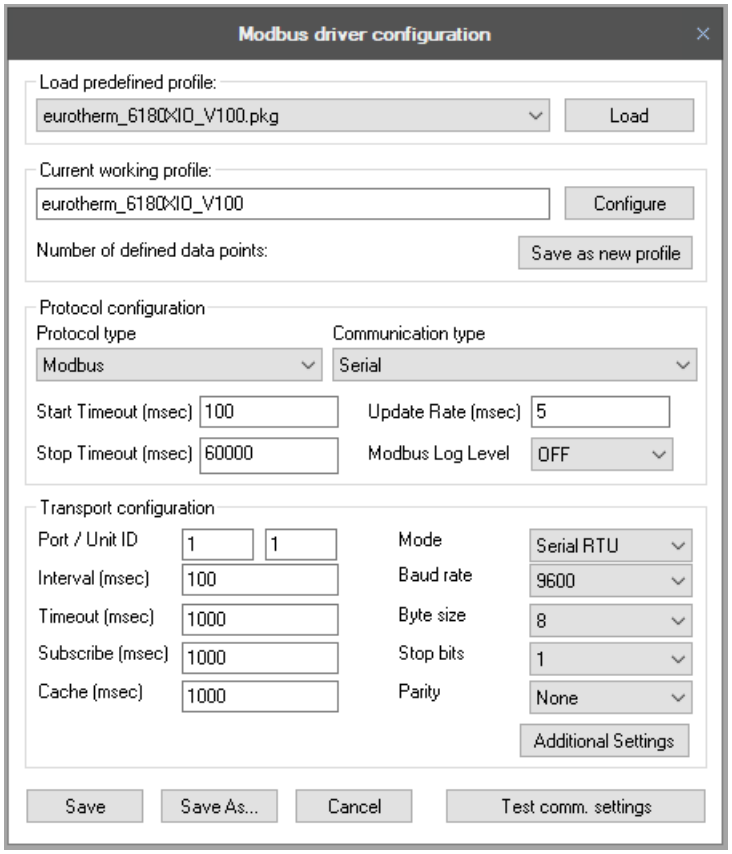
Modbus Log Level - by setting the level user will be able to get more details about communication between project where driver is defined and the Modbus device. It will create separate file inside project's sub-folder "Logs".

The *TCP/IP* port number and the Modbus unit ID (address), which can be 1 to 255, have to be specified in the "Port/Unit ID" edit box.

The *Subscribe* parameter determines how often the driver will sample Modbus device for new values. If any data points are defined to be sampled in unsolicited mode (which is not supported by Modbus protocol), then, this driver will periodically scan Modbus device with the period, defined in the "*Subscribe*" edit box and in this way it will emulate unsolicited way of communication to a Modbus device (please, see the picture above).

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If a user selects the "*Serial*" communication type, then the driver configuration window will have the following display:



In this case, please, enter parameters for serial communication. Port value has the COM number (e.g. "1" will mean COM1), Unit ID is the Modbus unit ID (address), which can be 1-255.

NOTE: Connection to devices on serial ports does not support multi-drop (multiple instruments on the same port). Serial Modbus communication supports one device per serial port.

Interval (msec) - parameter sets minimal resolution between two values coming from the same address available only for serial communication.

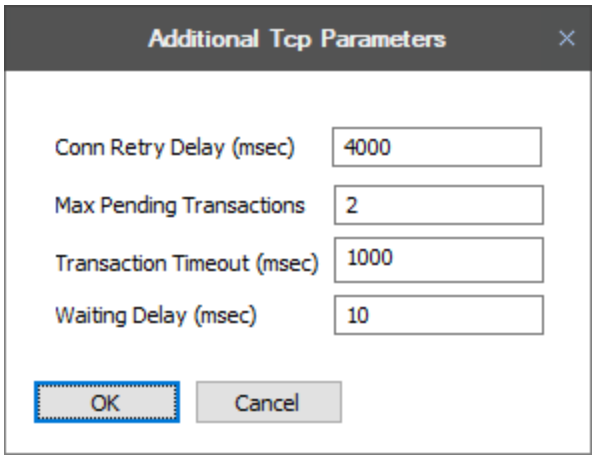
Timeout (msec) - parameter sets the timeout that communication driver will wait for response on the value read operation available only for serial communication.

Subscribe - parameter will have the same meaning and will work the same way as it was described in the TCP/IP communication type section.

Cache (msec) - parameter that determine how long value will be kept in the cache before newly value can be taken into account / used in project.

Additional Settings for TCP/IP connection:

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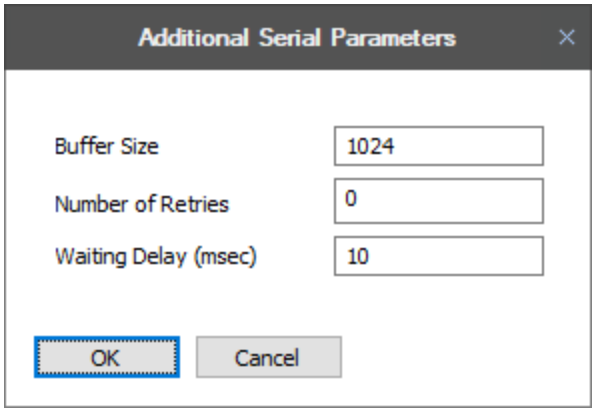
Conn. Retry Delay (msec) - parameter sets timeout for retries to establish connection with Modbus device.

Max. Pending Transactions - parameter sets the maximum number of transactions are waiting in the queue.

Transaction Timeout (msec) - parameter sets timeout for the transaction operation.

Waiting Delay (msec) - parameter determines the time that must elapse before TCP can release a closed connection and reuse its resources..

Additional Settings for Serial connection:



Buffer Size - parameter sets the maximum size of the buffer that driver will use in a serial communication data exchange.

Number of Retries - parameter sets the maximum number of retries the communication driver will have for each reading in case of failure.

Waiting Delay (msec) - parameter sets response waiting delay timeout from Modbus device on a serial port.

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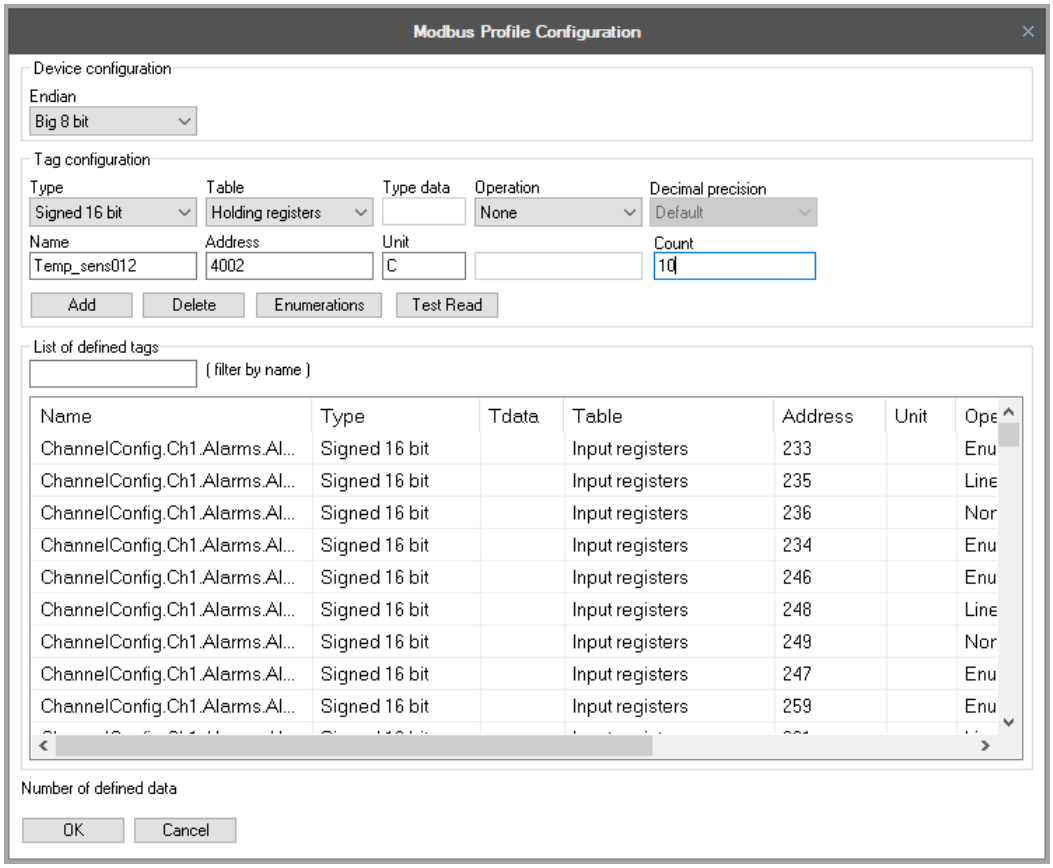
Testing Connection

If the "TCP/IP" communication type is selected, then, the "Test Connect" button will try to establish communication to the selected Modbus device and then will display the appropriate message box according to the result: either *Test connection succeeded* or *Test connection failed.*

If the "*Serial*" communication type is selected, then, the "*Test Connect*" button will check connection to the COM port.

Configure Data points

To configure Modbus data points, click on "Configure" button, and the Modbus Profile Configuration window will be opened:



In this window a user has to define his data points one by one, specifying a data point logical name (in the "*Name*" edit box), its logical Modbus address (in the "*Address*" edit box) using standard Modbus conventional addressing, user can add units of measure (in the "*Unit*" edit box), and then click on "*Add*" button. The new data point will be added to the list. If there is a block of consequence addresses available on the device, that user can specify the first address in the "*Address*" edit box and then the number of consequence addresses in the "*Count*" edit box.

Once address is specified and all configuration was done properly, user can press "*Test Read*" to get the value from the specified address.

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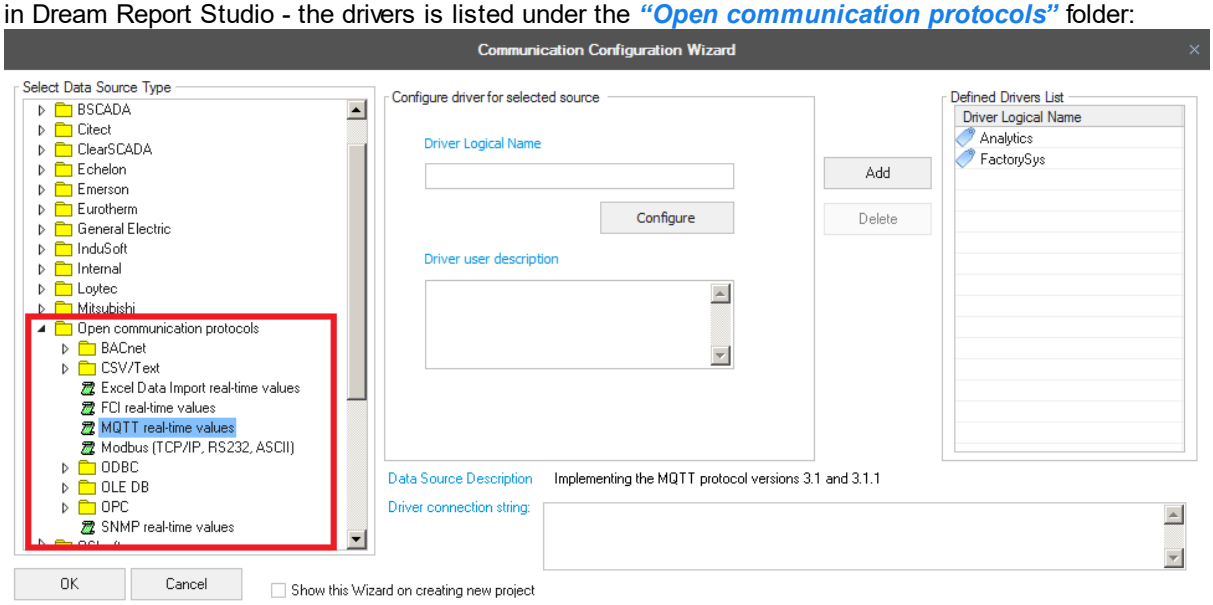
If a list of data points is too long, a user can filter the items list by name, using a name mask with wild characters.

NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "*Select Data Source Type*" field on any other driver and then go back to the driver that you need to configure.

25.13.4 MQTT Real-Time Values

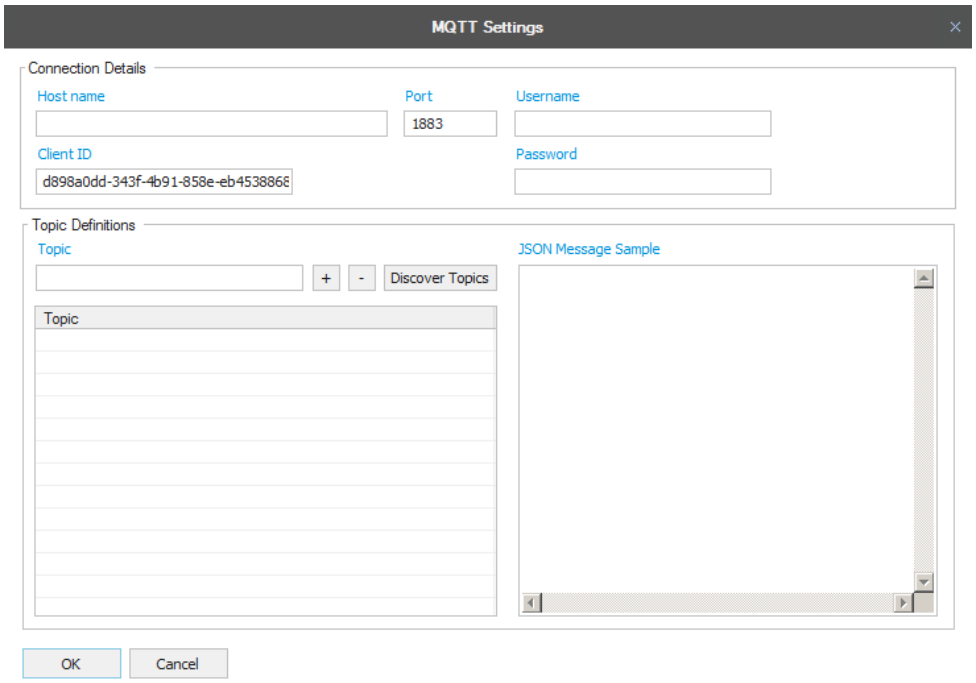
The Dream Report MQTT communication driver provides real-time data connectivity using the MQTT protocol for reading JSON strings.

To configure the MQTT driver, first, open the **"Communication Configuration Wizard"** dialog window in Dream Report Studio - the drivers is listed under the ***"Open communication protocols"*** folder:



After selecting the *MQTT real-time values* driver click on the ***"Configure"*** button, the following **"MQTT settings"** dialog will open:

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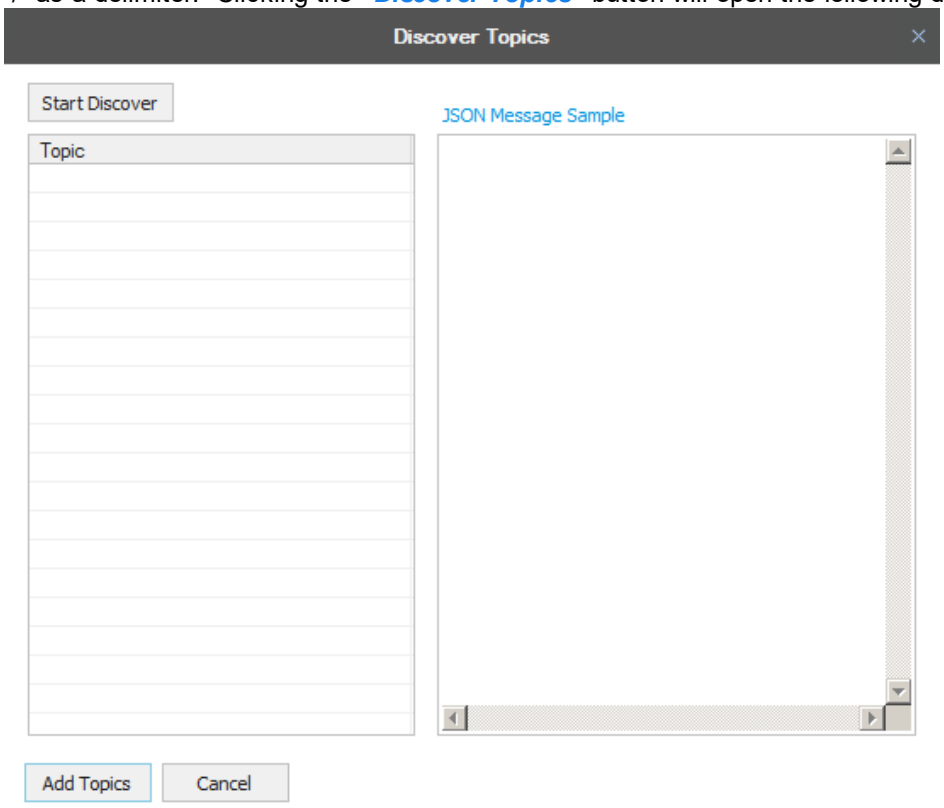
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Connection Details:

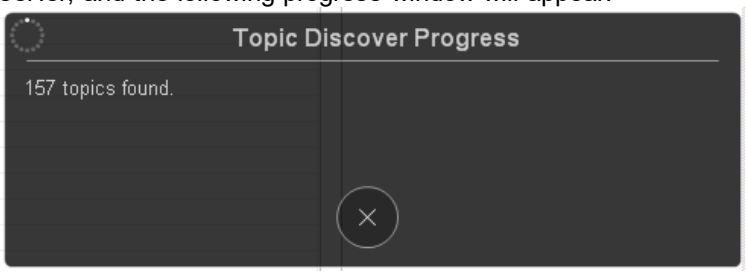
1. Host name – The Host name or IP address of the server, which is the MQTT broker.
2. Client ID – The unique ID with which you will connect with. The ID is auto-generated when the Configuration is opened for the first time, but can be changed.
3. Port – The port on which the MQTT broker is working.
4. Username and Password – If the MQTT server/broker is configured with user authentication – a *Username* and *Password* are required for accessing the data.

Topic Definitions

In the *Topic Definitions* section, the user can add the MQTT Topic(s) to be used in the project. MQTT Topics are structured in a hierarchy (similar to folders and files in a file system) using the forward slash "/" as a delimiter. Clicking the ***"Discover Topics"*** button will open the following dialog:



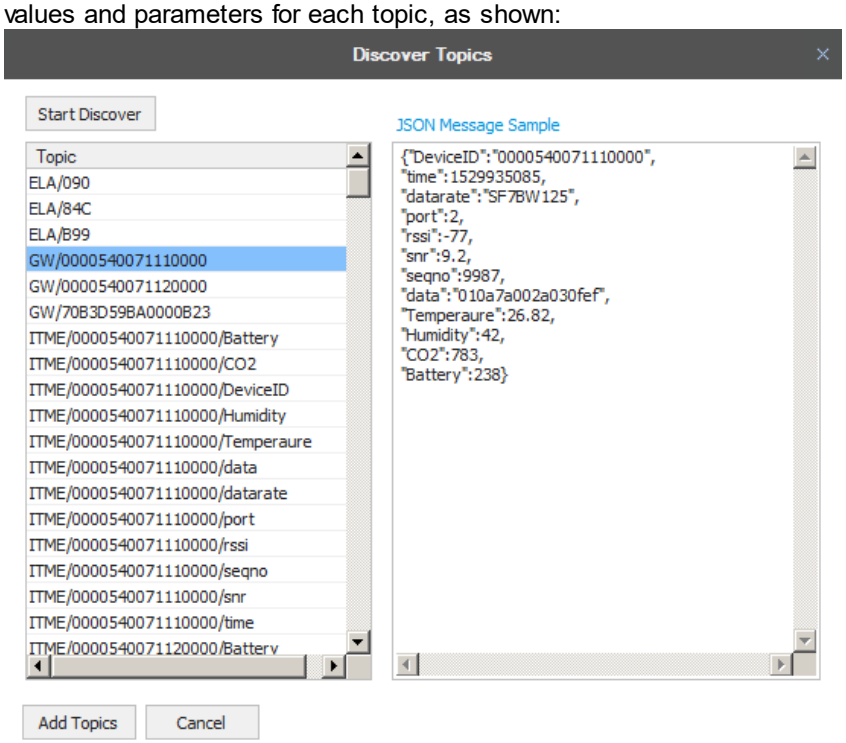
By clicking the ***"Start Discover"*** button, the driver automatically searches for topics on the MQTT server, and the following progress window will appear:



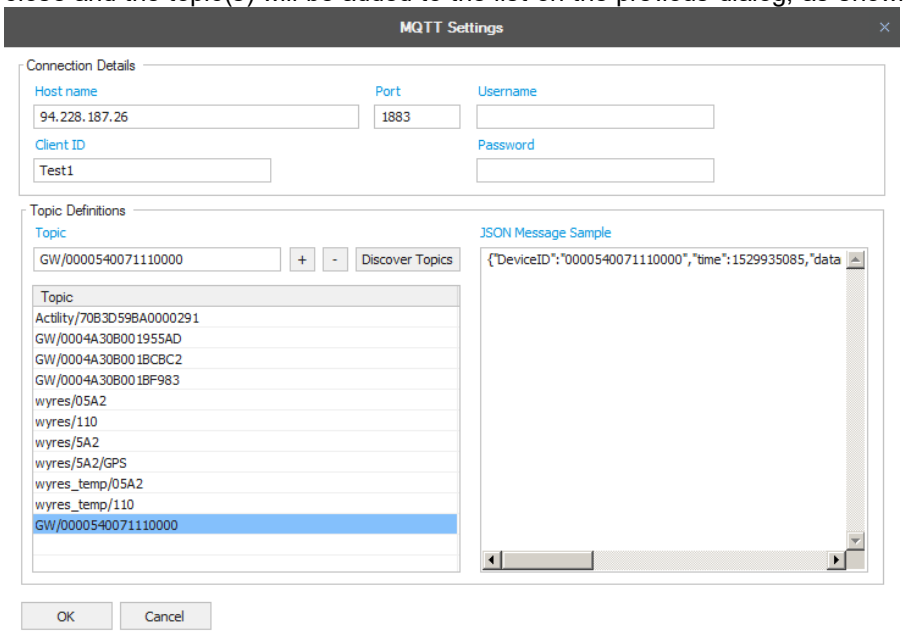
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When the number of Topics found stops increasing, click on the "**X**" to close the Progress window, and the previous window ("Topic Definitions") will be filled with the list of discovered topics.

When selecting a topic from the list, the "JSON Message Sample" section in the right will show the values and parameters for each topic, as shown:



Choose the Topic(s) you need for the project and click on the ***"Add Topics"*** button. This dialog will close and the topic(s) will be added to the list on the previous dialog, as shown:



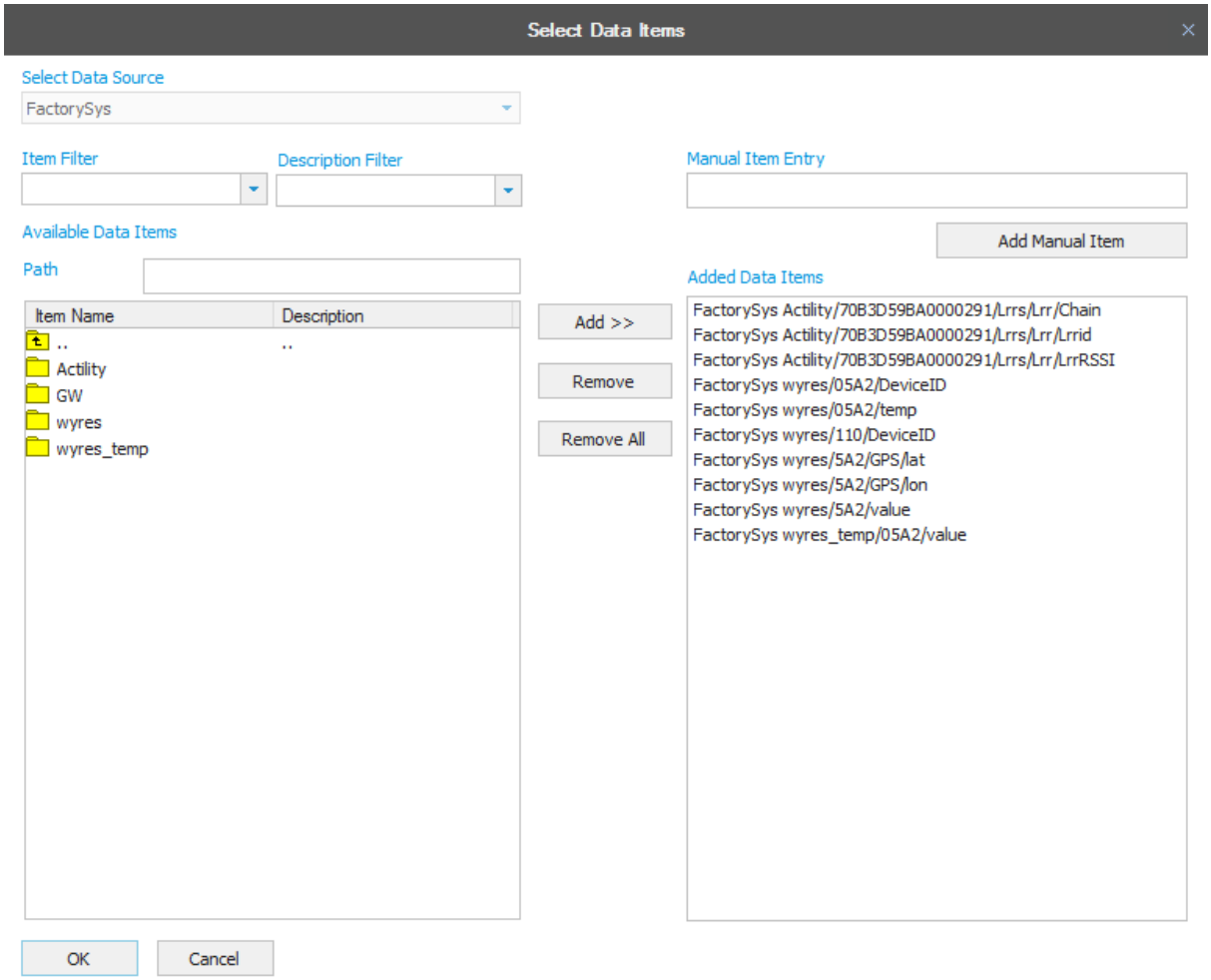
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Click the ***"OK"*** button to close the MQTT Driver settings window, and return to the **"Communication Configuration Wizard"**. Then you need to enter a unique **"Driver Logical Name"** for this configured data source.

Finally, click the ***"Add"*** button to add this configured instance of the MQTT driver to the project's list of data sources, and will appear in the *Defined Drivers* list.

Using the MQTT Driver in a Report

After configuring and adding the MQTT driver to the project, the real-time data items can used in report objects, and additionally, using the Dream Report Logger Studio, can be logged to the Dream Report project database. The following screenshot shows the browse of MQTT tags from Real Time items driver in logger studio.



IMPORTANT NOTE:

- MQTT Native Driver requires installation of the Microsoft Visual C++ Redistributable 2013 x86 that can be downloaded from the official Microsoft web site
- Current value stat function during the report generation is not supported with MQTT driver.

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25.13.5 ODBC Driver

Dream Report includes **ODBC driver**, which enables connectivity to any external databases which support ODBC connectivity and have supported data structure.

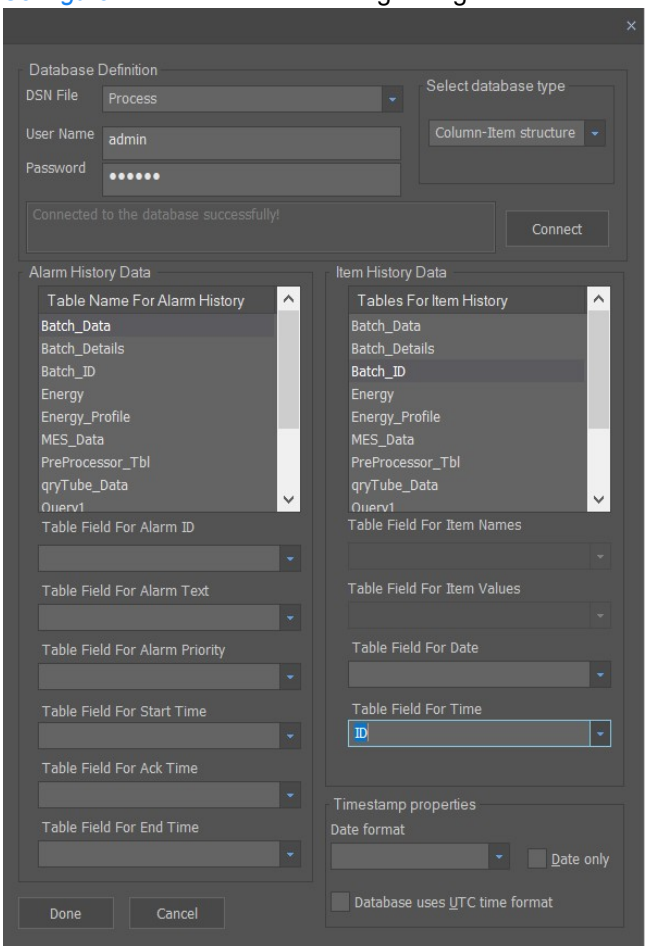
ODBC driver of Dream Report provides automatic tag browsing, tag and alarm data extraction.

To configure **ODBC driver**, first, open the **Communication Configuration Wizard** dialog window:



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Select either **ODBC historical values** driver or **ODBC historical alarms** driver from the **ODBC** subfolder of the **Open communication protocols** folder in the **Select data source type** section. Click on *Configure* button and the following configuration window will be opened:



NOTE: In Dream Report version 3.43 the ODBC History Access driver had one instance both for historical data and historical alarms configuration.

Now, in this new version of Dream Report, the ODBC driver has two instances and should be configured separately as "**ODBC historical values**" (for historical data) or/and "**ODBC historical alarms**" (for historical alarms).

Configuration Steps:

1. Open **DSN File** combo box and select a DSN, which is configured to your database.

If DSN requires login and password, enter user name and password in appropriate edit boxes below DSN combo box.

NOTE: All DSNs defined in the project are saved and can be managed from one place (for details, please see the **DSN Manager** section of this manual).

2. Click *Connect* button. The driver will connect to a database, read a list of its tables and fill table lists for tag values data extraction and alarms data extraction.

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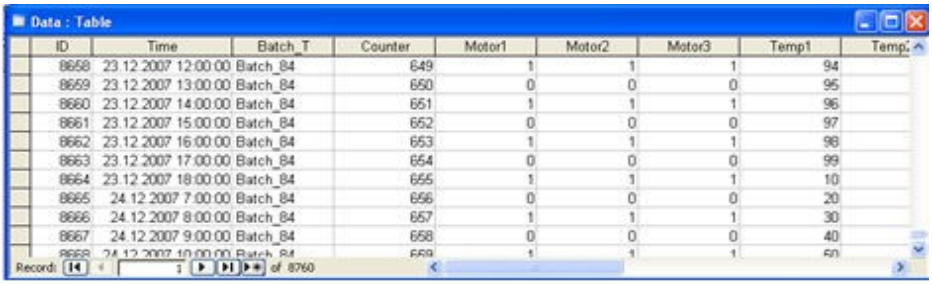
NOTE: When displaying a list of available tables in the selected database, the ODBC driver will display all tables (user and system tables) and all views, available in that database.

3. Select database type. The ODBC driver proposes the following types of database:

- **Internal database**
- **Column-Item structure**
- **Any database (AnyDB structure)**
- **InSQL database**
- **PcVue HDS database**
- **Aspen InfoPlus.21**

Internal database enables connectivity to the internal Dream Report database, created by Dream Report.

Column-Item database enables connectivity to the database tables with the structure, where data is recorded in a table, where there is a column for a timestamp (optional - 2 columns for timestamp and milliseconds), and value for each tag is recorded in a separate column, where the name of the column is considered as a tag name. Below you can see an example of a data table with the **Column-item** architecture:



Any database enables connectivity to the database tables with the structure, where data is recorded in 3 or 4 columns: **Tag name**, **Tag value**, **Timestamp** (optional - 2 columns for timestamp - time and milliseconds). Below you can see an example of a data table with the **Any database** architecture:



InSQL option enables automatic connection to InSQL database. This option provides automatic tag browse and data extraction from InSQL database.

PcVue HDS database enables connectivity to the PcVue historical database server.

Aspen InfoPlus.21 enables connectivity to the Aspen IP21 historical database server.

4. Data mapping for tag values

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From the right table list (**Item History Data**), select a table, which contains your tags values. As soon as you have selected a table, combo boxes below this list will be automatically filled with names of all the columns from the selected table.

Select appropriate column names from the combo boxes with column names as follows:

- If you have selected **Internal database** - no column mapping is required. Dream Report will know by itself how to get tag names and data.
- If you have selected **Column-Item structure** type, please, select only a column with Timestamp from the combo box **Table field for date**.
- If you have selected **Any database** - please, select:
  - **column name**, containing tag names in the combo box **Table field for item names**
  - **column name**, containing tag values in the combo box **Table field for item values**
  - **column name**, containing timestamps in the combo box **Table field for date**
- If you have selected **InSQL database** - no column mapping is required. Dream Report will know by itself how to get tag names and data.
- If you have selected **PcVue HDS database** - no column mapping is required. Dream Report will know by itself how to get tag names and data.
- If you have selected **Aspen InfoPlus.21** - no column mapping is required. Dream Report will know by itself how to get tag names and data.

5. Timestamp management

In order to comply with different timestamp formats of different databases, ODBC driver has a powerful mechanism to configure timestamp format, which will be received from a database. ODBC driver can process timestamps in SQL Date/Time format or as a string.

If timestamp is stored in one column, then, if you use **Column-Item** or **Any database** type, select only a column with Timestamp from the **Table field for date** combo box.

If timestamp is stored in two columns, then, if you use **Column-Item** or **Any database** type, select only a column with date from the **Table field for time** combo box.

Timestamp properties

If timestamp is used in local time zone, timestamp will be accepted as it has been retrieved from the database. If timestamp is used in GMT format, check the **Database uses UTC time format** check box. Then all timestamps, received from a database, will be automatically converted into a local time zone.

If date format has a special (non-standard SQL) format, a user can select a format from the date format selection combo box (**Date format**). If timestamp with that date contains only date (no time), then, check the "Date only" check box, next to the **Date format** combo box.

6. Browsing from a text file

If you connect ODBC driver to a big database, where getting browse of tags takes a lot of time, in order to avoid losing time for each browse, ODBC driver offers a function to save list of all found tags into a text file during the first connection. Then it will not connect to a database each time when tag browse is requested. It will take it from that text file. In order to switch on this option, please, check the **Use text file to save item list** check box.

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In order to reset a browse from the text and refresh it, delete a text file (it's created in the System directory), and then, during next database connection, the driver will establish database connection, create a new tag browse file and save list of tags in it again.

7. Data mapping for alarms

If you connect ODBC driver to an alarm database, please, select a table with alarm archive from the left table list (**Alarm History Data**). Then select appropriate column names from the combo boxes below as follows:
- **Table Field for Alarm ID** - column, which contains alarm IDs (optional) (has to be numeric).
- **Table Field for Alarm Text** - column, which contains alarm text.
- **Table Field for Alarm Priority** - column, which contains alarm priority (has to be numeric).
- **Table Field for Start Time** - column, which contains alarm start time.
- **Table Field for Ack Time** - column, which contains alarm acknowledge time (optional.)
- **Table Field for End Time** - column, which contains alarm end time (optional).

NOTE: timestamp format for alarm timestamps (**star**/**ack**/**end** time) will be used in the same way as configured in the **Date timestamp format** configuration section (please, refer to the **Timestamp management** paragraph (paragraph 5) above).

NOTE: Data mapping for **InTouch alarms** database:
To pick up alarms from the InTouch alarm SQL Server database, please:
1. Select DSN for InTouch alarm SQL Server database.
2. Click *Connect* button
3. Select ***AlarmEventHistory*** as alarm table in the left list of the tables map fields to retrieve alarm data as follows:
    - As InTouch alarms don't have ID, select Priority field for alarm ID
    - For alarm text select Description field
    - For alarm priority select Priority field
    - For alarm start, ack and end time select EventStamp field
4. In your alarm table in Dream Report, please, uncheck (disable) Ack time, End time, Duration and Response time columns for proper display.

DSN/ODBC when using 64bit OS

If Dream Report is installed on 64 bit Operating System (i.e. Windows 7 or Windows 2008 Server), DSN/ODBC may not work with 64bit ODBC. In this case, please use **ODBCAD32.exe**, which is located in ***C:\Windows\SysWOW64*** directory, to create a 32bit DSN to work with Dream Report.

For details please see **Using Dream Report in 64-Bit OS** section.

DSN settings (SQL Server connection) in Version 4+

If, before upgrading from a version older than 4.x, the Dream Report project DSN was defined in order to connect to SQL Server databases, then, in version 4+, the driver in the DSN definition should be changed for the SQL Native Client 11.0 driver.

For details, please see the **Project Upgrade Procedure** section of this manual.

Application tips:

- ODBC driver has been qualified and used with MS SQL Server, MySQL, MS Access, Oracle, InSQL.

- In order to retrieve data from Oracle database, the following timestamp format has to be configured: YYYY-MM-DD HH:MM:SS.

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- ODBC driver can extract and process numeric and string values.

- Null values are always ignored.

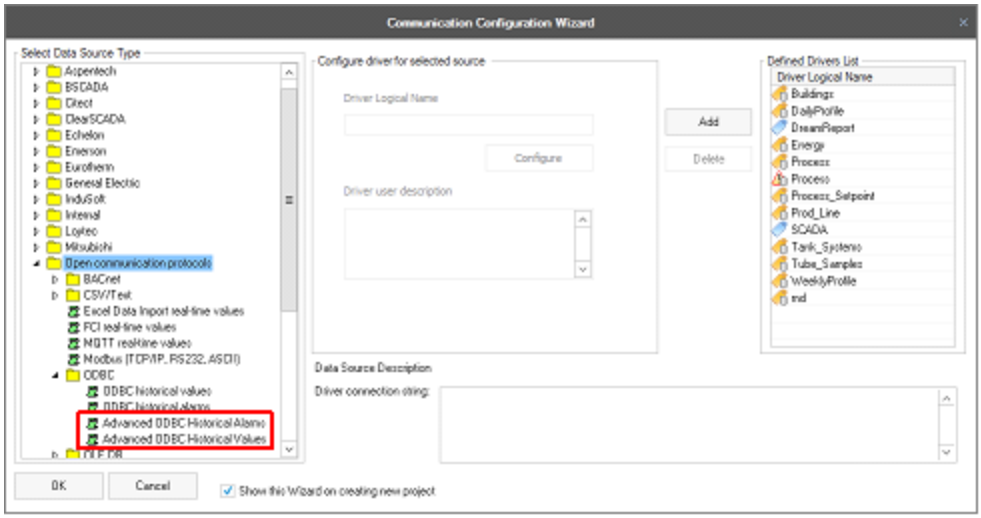
NOTE: If you need to configure the same driver more than once, then, after having configured it the first time, you'll just need to click in the "**Select Data Source Type**" field on any other driver and then go back to the driver that you need to configure.

25.13.6 Advanced ODBC Drivers

The ***Advanced ODBC Historical Values*** driver provides the ability to access relational databases and automatically retrieve historical, timestamped data from single SQL tables and views, as well as from multiple SQL tables and views as queries or complex data structures.

The ***Advanced ODBC Historical Alarms*** driver enables you to retrieve alarm and event data from external database tables, views or custom queries, using a custom number of fields, and being able to define custom alarm filters using all available alarm property fields of that given alarms structure.

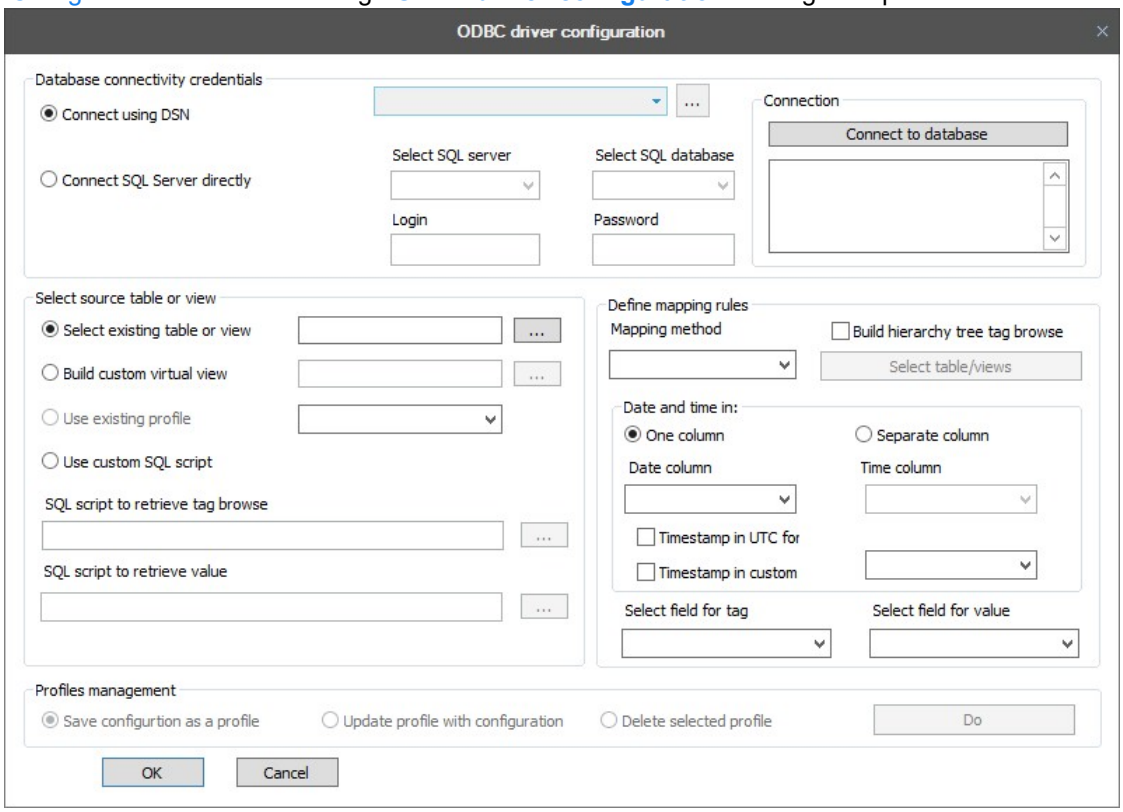
To configure the *Advanced ODBC* drivers, open the **"Communication Configuration Wizard"** dialog window in Dream Report Studio – both drivers are listed under the ***"ODBC"*** folder in the ***"Open communication protocols"*** section:



I. Advanced ODBC Historical Values driver

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Select the ***Advanced ODBC Historical Values*** driver from the Communication Drivers Wizard, enter a Driver Logical Name (descriptive name for this instance of the driver configuration) and click the "Configure" button - the following **"ODBC driver configuration"** dialog will open:



1. Database Connectivity Credentials:
The connection to a database is either by:

- **Connect using DSN** - select a DSN (Data Source Name) from the list of DSN's configured in this Dream Report project (this is not the list of available ODBC DSN's configured on the PC), or add a new DSN using the *"[...]"* button, and configure it in the **"DSN manager"** window.
- **Connect SQL Server Directly** – This option allows you to connect directly to a SQL Server (local or remote, default or named instance), enter the *Login* and *Password* for that SQL Server, and then select the specific database to use for this connection.

Notes:

- If you leave the login credentials blank, Dream Report will attempt to use the Windows credentials of the currently logged-in user.
- If running Dream Report as a Windows service, make sure the account under which the service runs has permissions to the SQL database referenced here
- The login account used must have rights to the specific database and tables/views that will be refenced in this instance of the driver

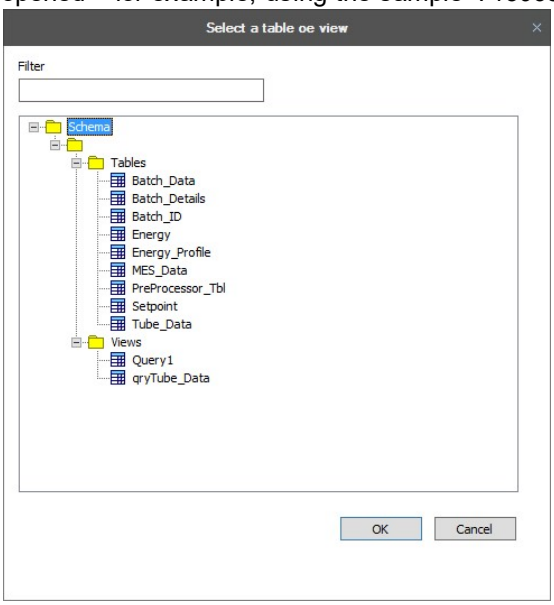
When finished, click on *"Connect to database"* button. The connection result will either show "Connected *successfully*" or a detailed ODBC error message.

2. **Select Source Table or View**

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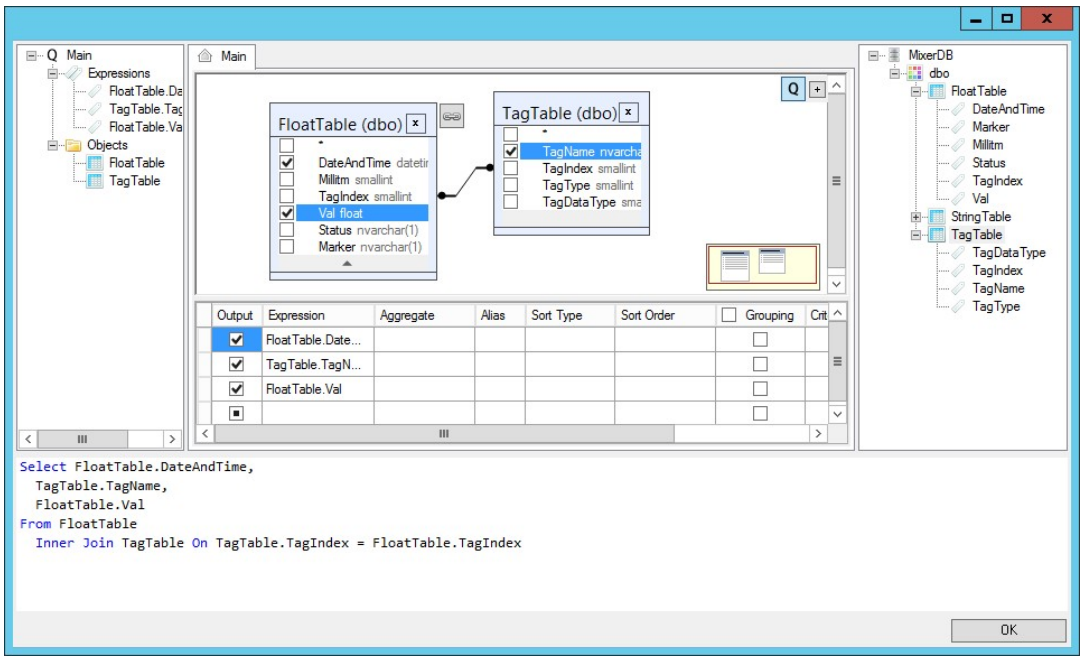
In this section there are 4 options to select table or SQL view for the data source:

a. **Select existing table or view** (default option) – allows you to select a single Table or View from the database. Click on the "**[...]**" button, and the following window will be opened – for example, using the sample "*Process*" database:



You can search for the specific Tables and Views in the list by entering search text into the *Filter* edit box. Then double-click the desired table or view to select it.

b. **Build Custom Virtual View** – click the "**[...]**" button to open the use ***Visual SQL Query Builder***, select multiple tables or views and their columns, which will be used for data extraction, and select/define links between them:

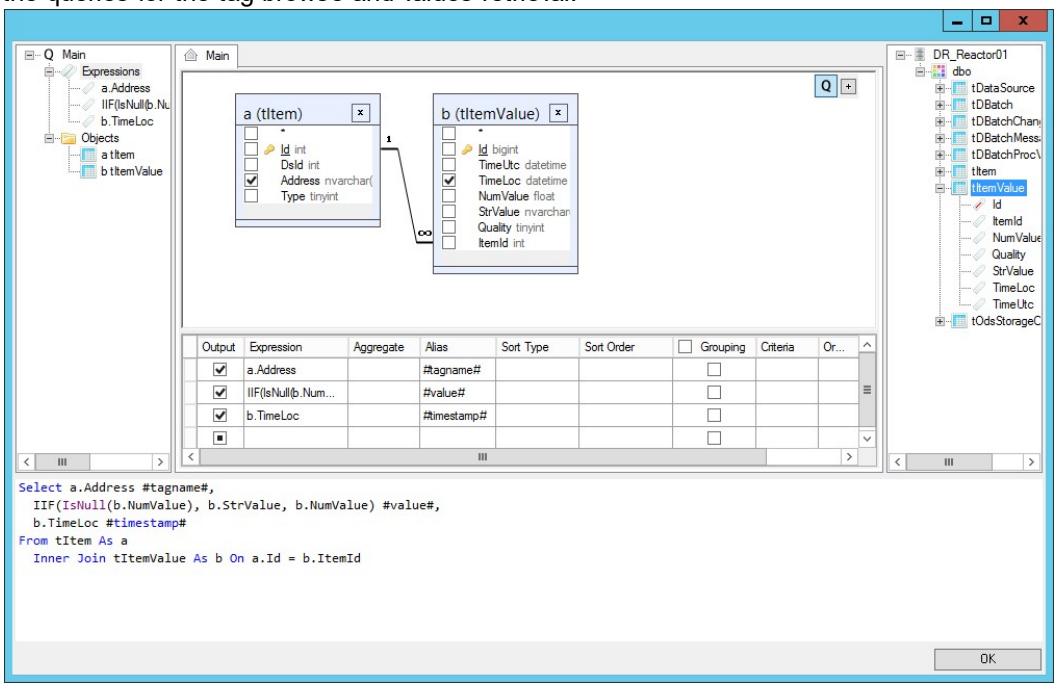


Once the query has been built, click "*OK*" to return to the ODBC driver configuration.

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c. **Use Existing Profile** – enables the user to select an existing query profile from the list. A pre-defined list of profiles is included with the Dream Report installation (saved in the \ODS\Dream Report\ODBC Profiles\ directory) and users can create and add their own profiles to that directory. The selected profile data is also copied into the project database, so that if the project is developed on one machine and then copied to an end user PC, the selected profile configuration will be saved with the project as well, without any need for additional manual manipulation. All profiles concept will be described further in more in detail.

d. **Use Custom SQL Script** - allows the user to create a custom SQL query that Dream Report will use to retrieve a tag listing, and associated historical values. click on the *"..."* button, and then standard *Visual SQL Query Builder* will be opened, from which to build the queries for the tag browse and values retrieval:



After building the queries, the user can replace specific objects using internal keywords:

- **#tagname#** - the retrieved value for this field will be a tagname.
- **#value#** - gets a logged value result from its associated column.
- **#date#** - gets a date (if date and time are in separate columns) from its associated column.
- **#time#** - gets time (if date and time are in separate columns) from its associated column.
- **#timestamp#** - gets the complete timestamp as one value from its attached column (instead of using separate data and time columns)
- **#starttime#** - this dynamic token is an input parameter; i.e., it will not be associated with a specific column in the query. This parameter will be replaced in the resulting query by the start time defined in the report object.
- **#endtime#** - this dynamic token is an input parameter; i.e., it will not be associated with a specific column in the query. This parameter will be replaced in the resulting query by the end time defined in the report object.

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If custom SQL script is used to retrieve the tag list and values, the "Mapping rule" section (covered next) will be disabled, except the timestamp format controls ("*Timestamp in UTC format*" and "*Timestamp in custom format*").

Example:

Retrieve tag:

SELECT DISTINCT [Address] #tagname# FROM [tItem] – this query will use the column "Address" for the tag names.

Retrieve value:

SELECT a.[Address] #tagname#, IIF(ISNULL(b.[NumValue]),b.[StrValue],b.[NumValue]) #value#, b.[TimeLoc] #timestamp# FROM [tItem] AS [a] INNER JOIN [tItemValue] AS [b] ON a.[Id] = b.[ItemId] - this query will use the column *Address* as a tag name, *NumValue* or *StrValue* for the data values and *TimeLoc* as the timestamp.

3. **Define Mapping Rules**

The section allows you to specify how the table/view is structured, how to map to the appropriate fields, and how to automatically retrieve the tag list and values from a target source.

a. **Mapping Method** specifies how your table/view is structured:

- Wide – The table/view returns timestamped data with each data item (tagname) having its own column with data. For example:

Timestamp	Tag1	Tag2	Tag3	Tag4
3/4/2018 13:45:00	44.2	34.5	109.1	17.2
3/4/2018 13:50:00	…	…	…	…

With this option selected, you only need to specify which column(s) contain the date and time.

- Narrow – The table/view returns timestamped data with one column that contains the logged item/tagname, and another column that contains the logged data for that item/tagname. For example:

Timestamp	Tagname	Value
3/4/2018 13:45:00	Tag1	44.2
3/4/2018 13:45:00	Tag2	34.5
3/4/2018 13:45:00	Tag3	109.1
3/4/2018 13:45:00	Tag4	17.2
3/4/2018 13:50:00	Tag1	…

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With this option selected, you then need to specify which column (field) contains the tag names, and which column contains the data values. These are selected in the "Select field for tag" and "Select field for value" section at the bottom of the driver configuration window.

b. **Build Hierarchy Tree Tag Browse** - defines how to build a "tree" (folders and sub-folders) browsing structure of your tagnames (unchecked by default), and can be used with the "*Select existing table or view*" or "*Use custom SQL script*" for the Table or View Source options (covered in section 2 above). The tree tag browse can be built in 2 levels:
   - the first level is a table or view, and then when it expands, it returns a list of tags from opened item. If this option is checked, then the button *"Select tables/views"* will be enabled. Click on that button, a window to select a table or view will be opened, this window enables multi-selection.
     Note: This option assumes that each selected table or view has the same architecture and the same column name for timestamp (or date and time).

c. **Date and Time in** – specifies how the date and time are recorded in the table/view, and in what format.
   - Specify whether the timestamp for the logged data is in *One Column* containing the date and time; or in *Separate Column*, and then select the appropriate Date Column and Time Column from the available columns (fields)
   - Timestamp in UTC format - if UTC timestamping is used for the logged data, check this option. This will ensure that Dream Report offsets the returned timestamps to the appropriate local time zone
   - Timestamp in custom format – check this option only if the timestamp column in the database has a type that different from "date/time" (e.g., a formatted string type, seconds from 1/1/1970, etc.), and select from the combo-box the appropriate format being used.

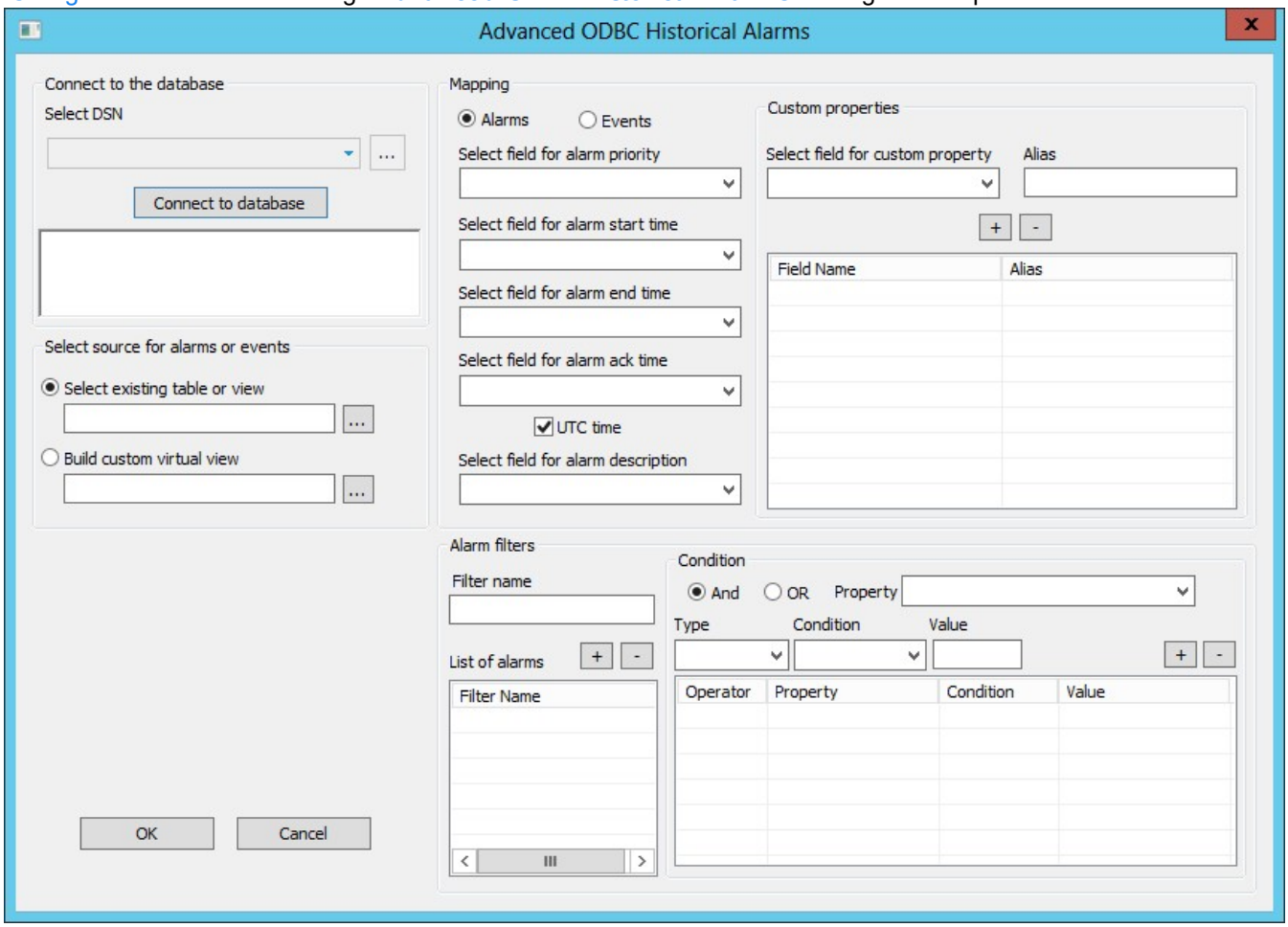
d. **Select fields for tags and values** – required if the Mapping Method selected is "Narrow table" (see section 3.a above).

Profiles management
Profiles mechanism allows users to save current definition, use it when connection to the same database structure is required, and complete the entire configuration in one click. All profiles are saved globally in a subfolder "ODBC profiles" under the Dream Report project folder, if used by that Dream Report project - it will be saved in the project.

I. Advanced ODBC Historical Alarms

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If the ***Advanced ODBC Historical Alarms*** driver was selected from the Communication Drivers Wizard, enter a Driver Logical Name (descriptive name for this instance of the driver configuration) and click the "Configure" button - the following **"Advanced ODBC Historical Alarms"** dialog will be opened:



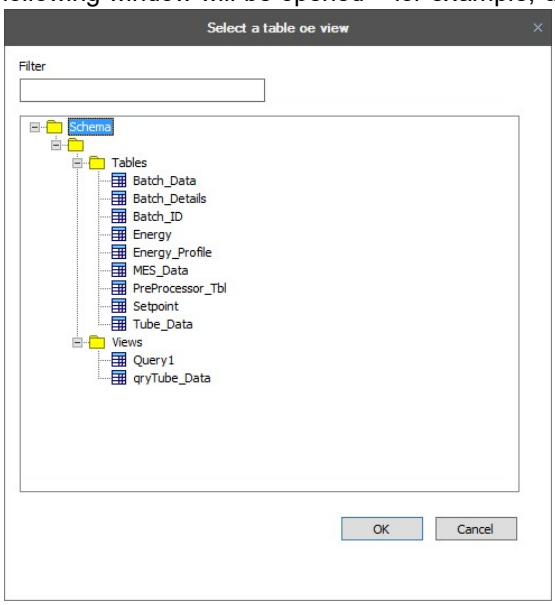
1. Connect to the Database:
Connect to a database either by selecting an existing project DSN from the list, or by adding a new DSN using the **"[...]"** button to launch the **"DSN Manager"** configuration window.

2. Select Source for Alarms or Events
In this section there are 2 options to select source table or SQL view for the Alarm data source:

a. **Select existing table or view** (default option) – allows you to select a single Table or View from the database containing the alarms. Click on the **"[...]"** button, and the

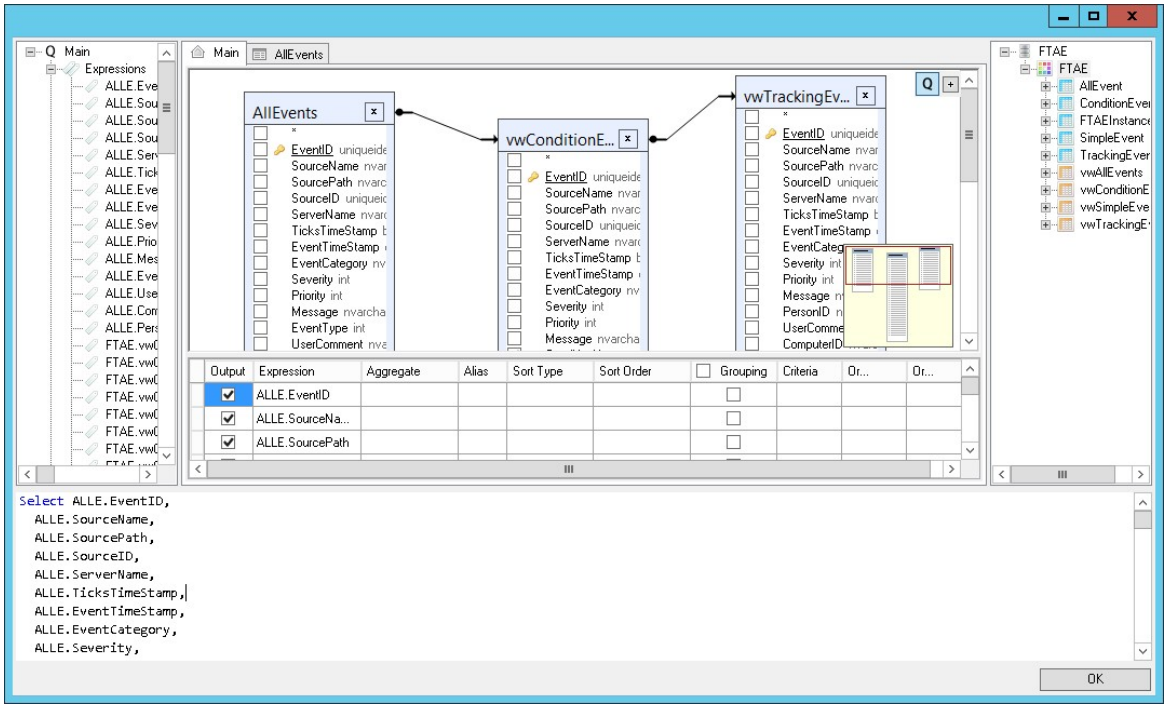
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following window will be opened – for example, using the sample "*Process*" database:



You can search for the specific Tables and Views in the list by entering search text into the *Filter* edit box. Then double-click the desired table or view to select it.

b. **Build Custom Virtual View** – click the "**[...]**" button to open the use ***Visual SQL Query Builder***, select multiple tables or views and their columns, which will be used for data extraction, and select/define links between them:



Once the query has been built, click "*OK*" to return to the driver configuration.

3. Mapping Rules

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a. **Mapping** - In the mapping section, specify whether the mapping is for an Alarms or an Events data source:

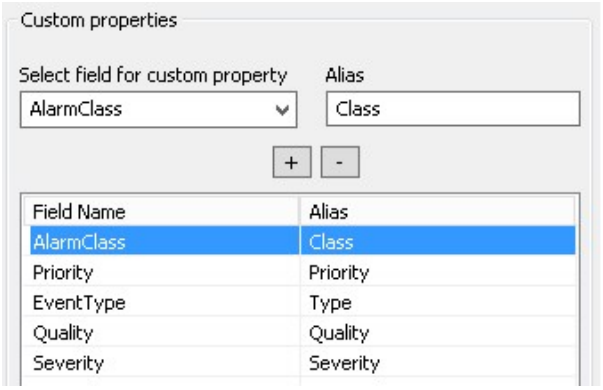
Alarms – the following fields are required to be mapped to columns in the alarm table/view: *Alarm Start, Acknowledge* and *End* times, *Alarm Priority*, and *Alarm Description* (alarm comment). Select the appropriate field from each list box

Events – the *Event Start time* (which is the event timestamp), *Event Priority*, and *Event Text* (description) are required. Select the appropriate field from each list box

UTC Time - if UTC timestamping is used for the alarm logs, check this option. This will ensure that Dream Report offsets the returned timestamps to the appropriate local time zone

4. Custom Properties

In "Custom Properties" select one or more fields from the alarm table/view, which will be used when creating Alarm Filters (covered below.) You can add an "Alias" (name as shown in the Alarm Filters) for each selected field, or leave the Alias as-is (in that case Dream Report will display the actual field name). Finally, click the **"+"** button to add the field to the custom property list. For example:



5. Alarm Filters

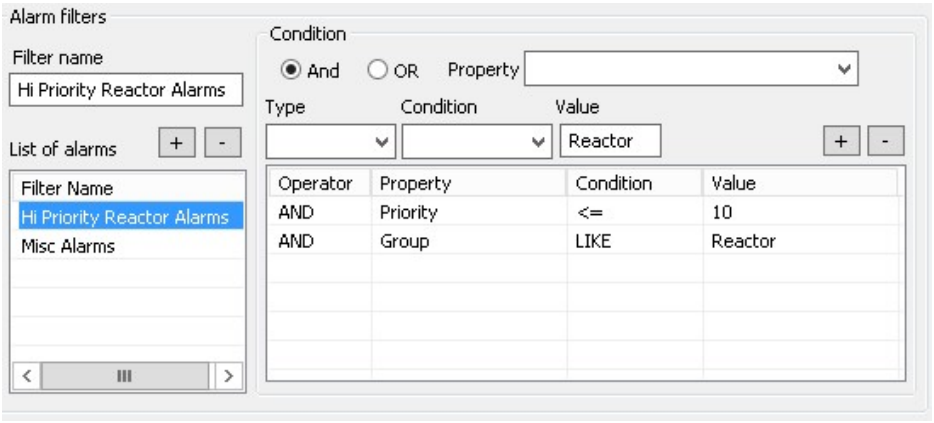
An Alarm Filter is a set of predefined conditions (query filters) on the alarm data, that can be used in Dream Report objects to filter alarm displays or in alarm-related calculations.

To create a filter:

- Filter Name – enter a descriptive name for the filter – e.g., "Reactor Alarms", "High Priority", etc.
- Condition – select a Property (from the Custom Properties list described above) and then set the evaluation criteria:
  - AND or OR – specify whether this filter condition will be *AND*ed or *OR*ed with the other condition(s)
  - Type – specify whether the value being evaluated is *Boolean*, *Numeric* or *Text* data
  - Condition – specify the operator type for the filter being evaluated: >, =, *IS NOT NULL*, etc.
  - Value – enter the actual value (numeric or text) to be evaluated
- Once all fields in the Condition section are specified, click the "+" button (top-right of Condition list) to add this condition to the list of conditions that make up this Filter
- Add additional conditions, if needed, for this Filter
- Once all conditions are entered for this Filter, click the "+" button (below the "Filter Name" field) to add this filter to the list of filters for this Alarm driver configuration.
- Repeat the above steps to create additional filters.

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For example:



At this point, the driver configuration is complete. Click *"OK"* to return to the "Communication Configuration Wizard".

When the source is configured, add it to the list of data sources defined in the current project by clicking the *"Add"* button. The configured source will appear on the right-side **Defined drivers list**.

Add and configure any additional drivers (if needed) and then click *"OK"* to close the "Communication Configuration Wizard".

25.13.7 OPC Drivers

Dream Report has the OPC drivers set, which includes the following drivers:

- OPC DA (Data Access)
- OPC AE (Alarm and Event)
- OPC HDA (History Data Access)
- OPC UA real time values
- OPC UA historical values

OPC DA driver supports OPC 1.0 and OPC 2.0 standards.

OPC HDA driver supports OPC 1.20 standard.

OPC driver can be configured to any local or remote OPC server, having flat or hierarchical architecture.

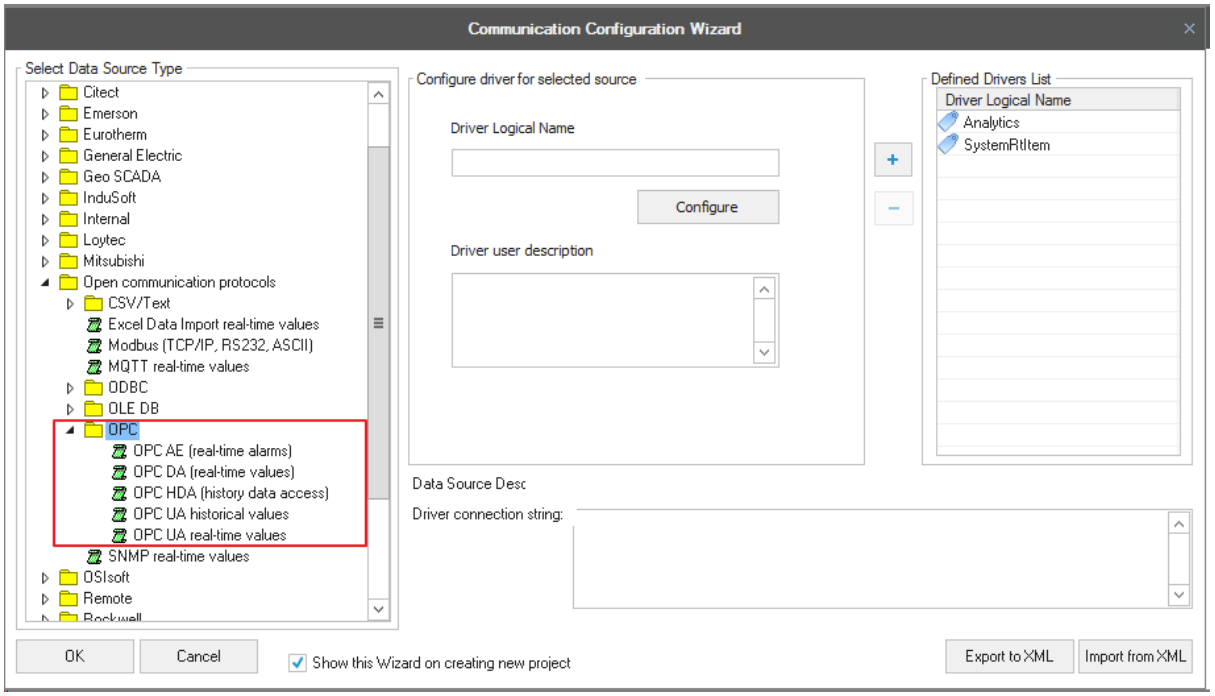
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OPC Client Configuration

OPC driver can be configured to any local or remote OPC server, having flat or hierarchical architecture.

OPC Client Configuration

To configure OPC driver, first, open the *Communication Configuration Wizard* dialog window:



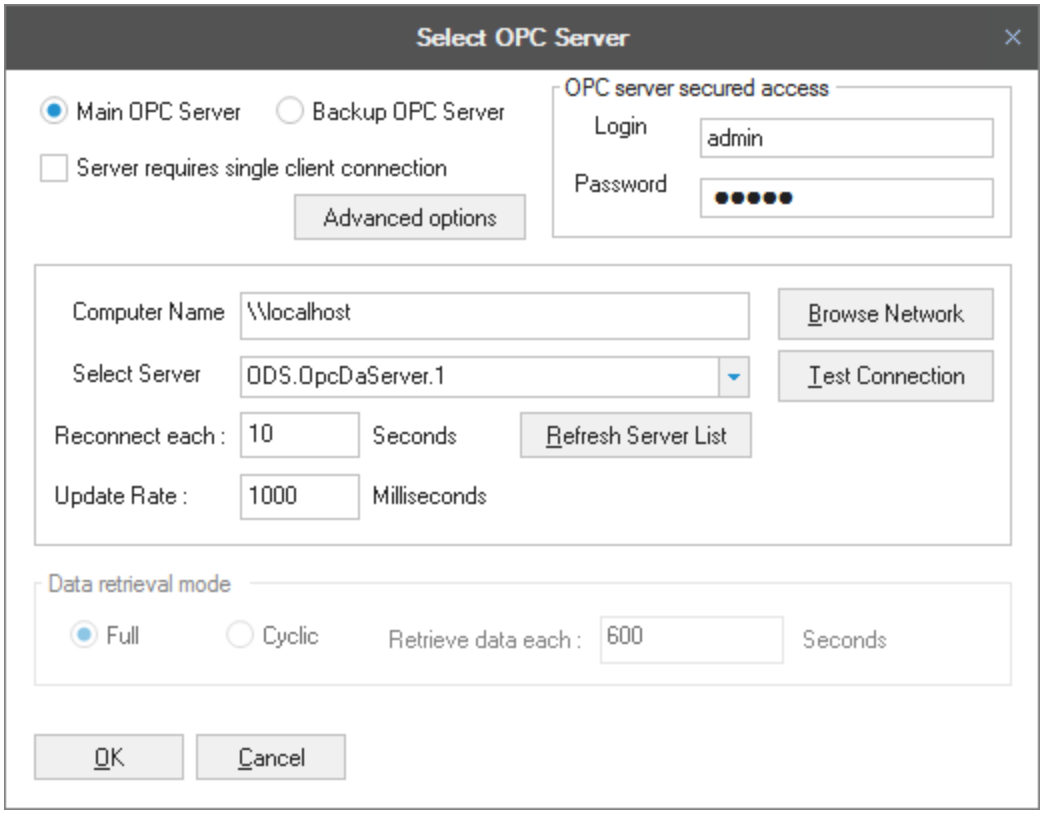
Select one of the OPC drivers (OPC DA (real-time values), OPC AE (real-time alarms), OPC HDA (history data access), OPC UA real time values, or OPC UA historical values) from the *OPC* subfolder of the *Open communication protocols* folder in the *Select data source type* section, click on *Configure* button, and the OPC driver configuration dialog box will be opened.

NOTE: In Dream Report version 3.43 the OPC driver had one driver instance for real-time data, historical data and alarms configuration.

In later versions of Dream Report, the OPC driver has several driver instances and should be configured separately as OPC DA (real-time values), OPC AE (real-time alarms), OPC HDA (history data access), OPC UA real time values, or OPC UA historical values.

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OPC DA (real-time values) configuration:



This dialog window has 2 options (radio buttons: *Main OPC Server* and *Backup OPC Server*), that allow OPC driver to work in a hot-backup mode and automatically switch from one OPC server to another in case of communication error, being able to connect to the secured OPC servers.

If the *Main OPC Server* radio button is enabled, you can select the computer name and the OPC server.

If the *Backup OPC Server* radio button is enabled, the *Computer Name* edit box and the *Select Server* combo box will be empty. You will be able to make another selection for the backup OPC server.

If the OPC server has secured (password protected) connection, it will be possible to specify, in the *OPC server secured access* section, *login* and *password* for the connection for the selected OPC server. Login and password will be set and saved separately for the main and backup servers.

NOTE: If OPC server definition contains login and password, the OPC browser and client will use it every time, when connecting to the OPC server.

If no login and password is defined, then the OPC browser and the client will be connecting to the server as usual, in anonymous mode.

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In the *Select Server* section, select an OPC server, to which you would like to connect.

In the *Computer Name* field, specify the name of the PC, where OPC server is running. By default it is "*localhost*", which means a local PC. If another PC in a network has to be specified, click on *Browse Network* button, and then select the needed computer name from a network.

You can refresh server list from the specified PC by clicking on the button *Refresh Server List*. It will get a list of OPC servers, installed on the specified PC, and update the list of servers in the combo box.

When the OPC server is selected, click the button *Test Connection* to test communication between Dream Report OPC client and your OPC server.

The *Reconnect each* parameter sets up a time interval in seconds to automatically reconnect to the OPC server each time the connection is lost.

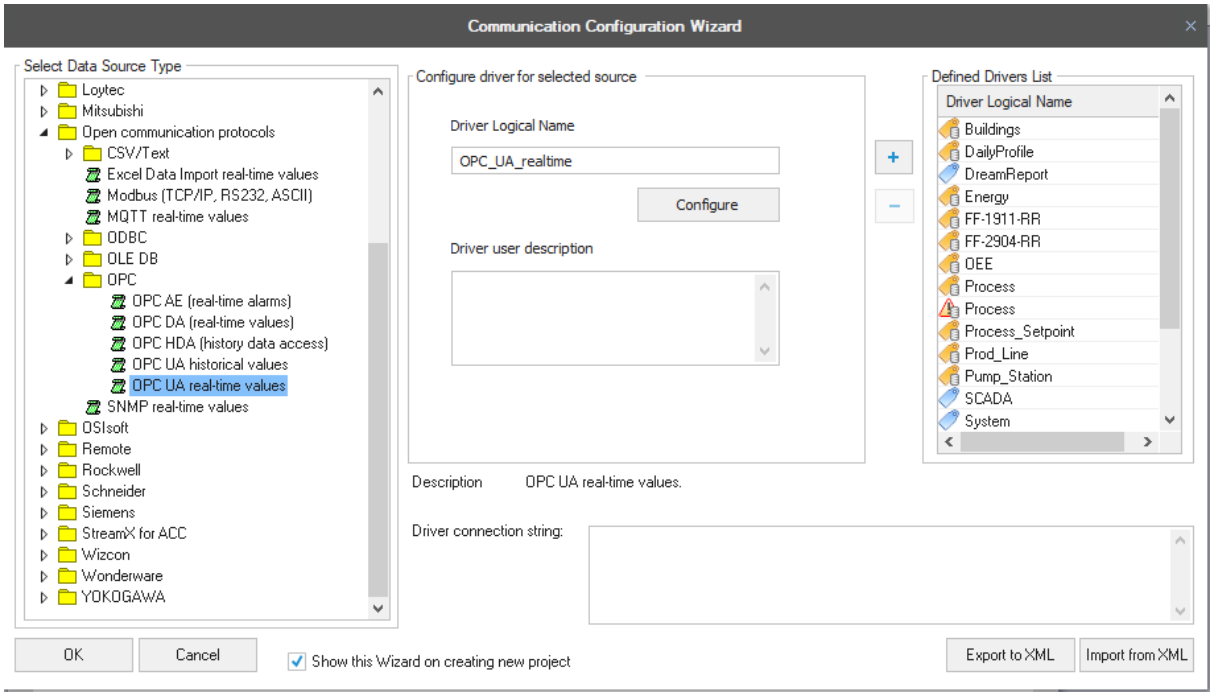
The *Update Rate* is a time interval in milliseconds that defines an update rate for a virtual group created on the OPC server when Dream Report connects to the server to subscribe for values updates.

OPC HDA (history data access) driver configuration

NOTE: In Dream Report 4.x versions prior to 4.6 R4 (4.64), the OPC DA and OPC HDA drivers are configured identically. In DR 4.64, the OPC HDA driver has been updated to include integrated data aggregation and data retrieval modes. So, users can select whether to retrieve all raw values or use data aggregation retrieval modes.

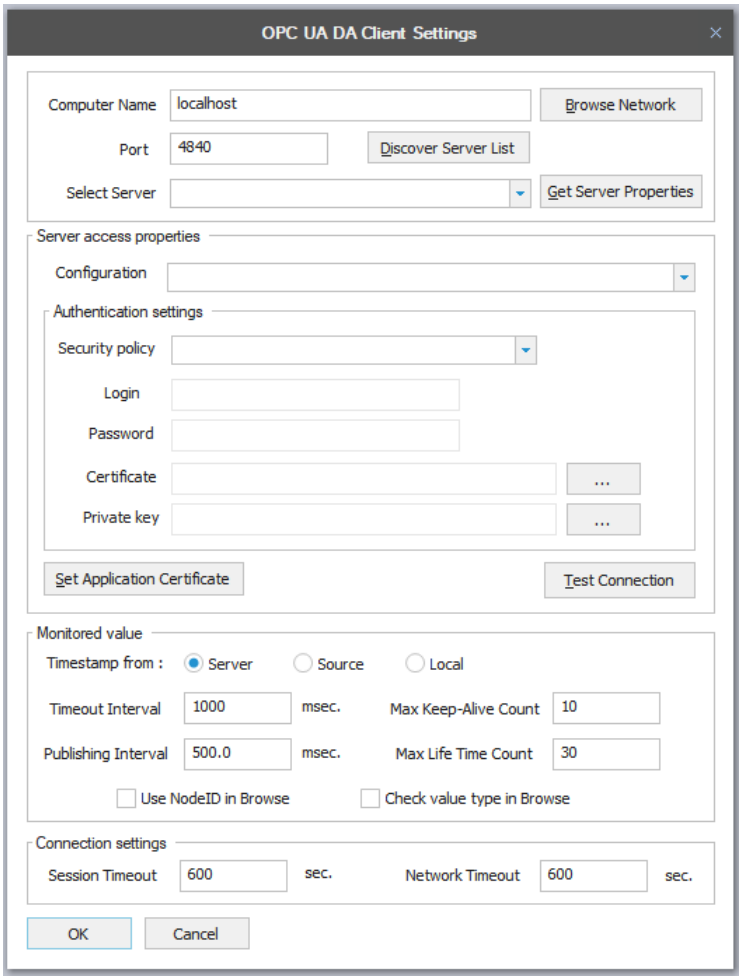
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OPC UA (real-time)



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General Connection Settings



Computer Name – Specify the computer name or IP address of the OPC UA Server machine.

Port – specify the port number so the OPC UA server can be discovered.

Discover Server List – click to list the available OPC-UA servers available on the specified computer

Select Server – After specifying the port number and pressing the "*Discover Server List*" button, select the OPC UA Server from the dropdown list to connect to.

Once a Server is selected, the "*Server access properties*" section will be filled automatically with default options. If, however, the properties are not shown, click the "**Get Server Properties**" button to get properties of selected server.

Server access properties

Configuration – from the dropdown list, select the *end point connection* option that corresponds to the OPC UA Server definition.

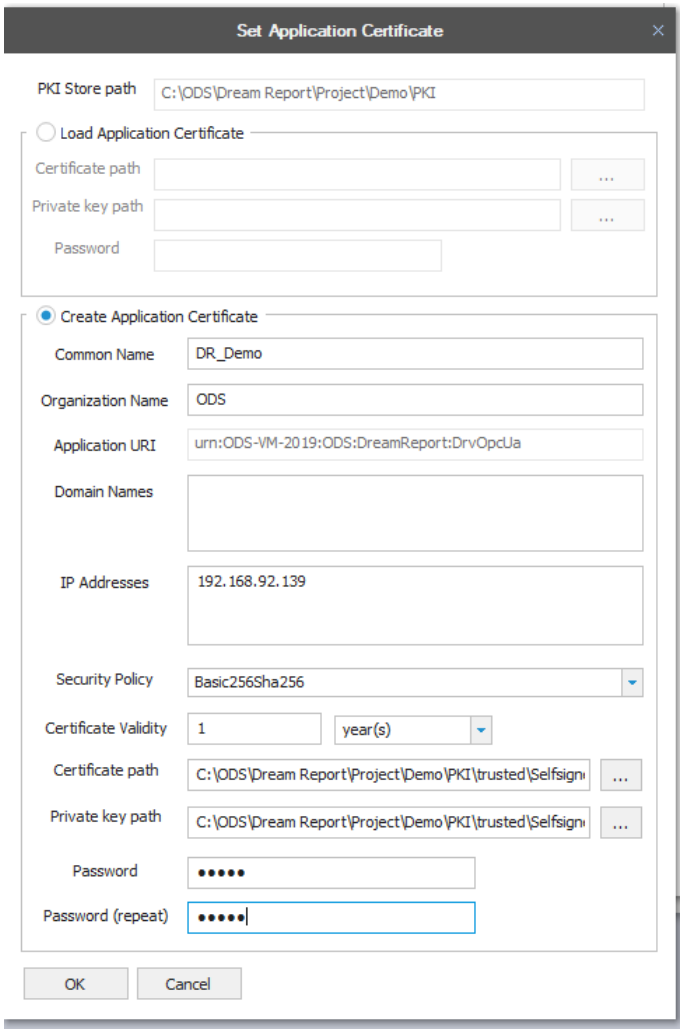
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Security Policy – select one of the security options from dropdown list that will allow connection to the OPC UA Server (this must match what is enabled on the OPC UA server side).

Login / Password – if the OPC UA server is secured with a user name and password, then specify those in the appropriate fields.

Certificate – if OPC UA server requires a certificate to allow a client connection, then specify/select an appropriate certificate and a **Private Key**.

Set Application Certificate - if the OPC UA server requires a client certificate, then user can create a "Self-signed Client Certificate". Click this button to create a certificate and supply it to the OPC Server:



Important Notes:

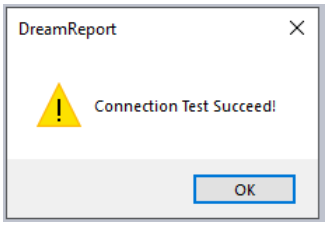
The Self-signed Client Certificate must comply with Security Policy of the OPC UA Server, as well as recognized as a "Trusted" certificate on the OPC UA Server side.

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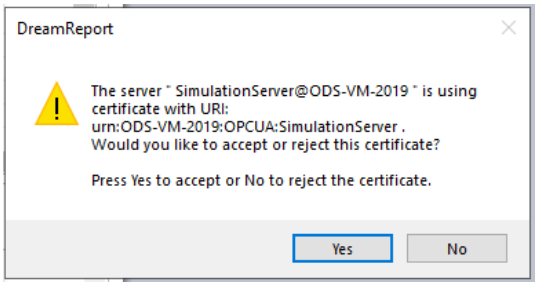
Please also ensure that the Certificate from OPC UA Server is located under the Dream Report project folder as follows: *<Project folder path>\PKI\trusted*

It is also very important to ensure that when OPC UA set to work over HTTPS protocol, the Dream Report OPC UA client Certificate is recognized as a "Trusted" certificate on the OPC UA Server side. In some cases the certificate has to be copied manually to the appropriate location on a OPC UA Server side.

After the initial configuration of the OPC UA driver, click the "**Test Connection**" button to verify the status of the connection:



After a successful connection, you be prompted to store server's certificate into a trusted location:



Click "*Yes*" if the OPC UA Server can be trusted.

Monitored value

Timestamp from option:

> "**Server**" will retrieve the timestamp of value from the OPC UA server machine (default selection).
>
> "**Source**" will retrieve the original timestamp from the PLC/Controller, if supported by the equipment.
>
> "**Local**" will assign the local Dream Report computer's timestamp to the value at the moment the value received from OPC UA server

Update Rate – this is the time interval (in milliseconds) for monitoring for connection timeout with server. If during specified timeout the connection has been lost, the driver will force a reconnect and re-subscribe for all tags used in the driver's instance. By default, it's set to 1000 msec.

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Publishing Interval – the publishing interval (in milliseconds) defines the cycle time in which the server sends notifications (data changes, events or status changes) periodically to the client (Dream Report). By default, this is set to 500 msec.

Max. Keep-Alive Count – sets the threshold for the Subscription's "keep-alive" counter. Whenever the keep-alive counter reaches the provided threshold, the server publishes a keep-alive notification message for the subscription from driver side. By default, this is set to 10.

Max. Life Time Count – Sets the threshold for the Subscription's "life timer" counter. Whenever the life time counter reaches the provided threshold, the server deletes the subscription in the driver. By default, this is set to 30.

Use NodeID in Browse – when browsing for tags, the tagnames will have the NodeID added as part of the tag. This increases the performance of the project loading into runtime.

Check Value Type in Browse – with this option, during the browse the driver will identify the type of tag and if the type is "array", it will be represented as branch in the tree. Please note that activation of this option will slow the browse.

Connection Settings

Session Timeout – specifies the maximum number of seconds that a session should remain open without activity.

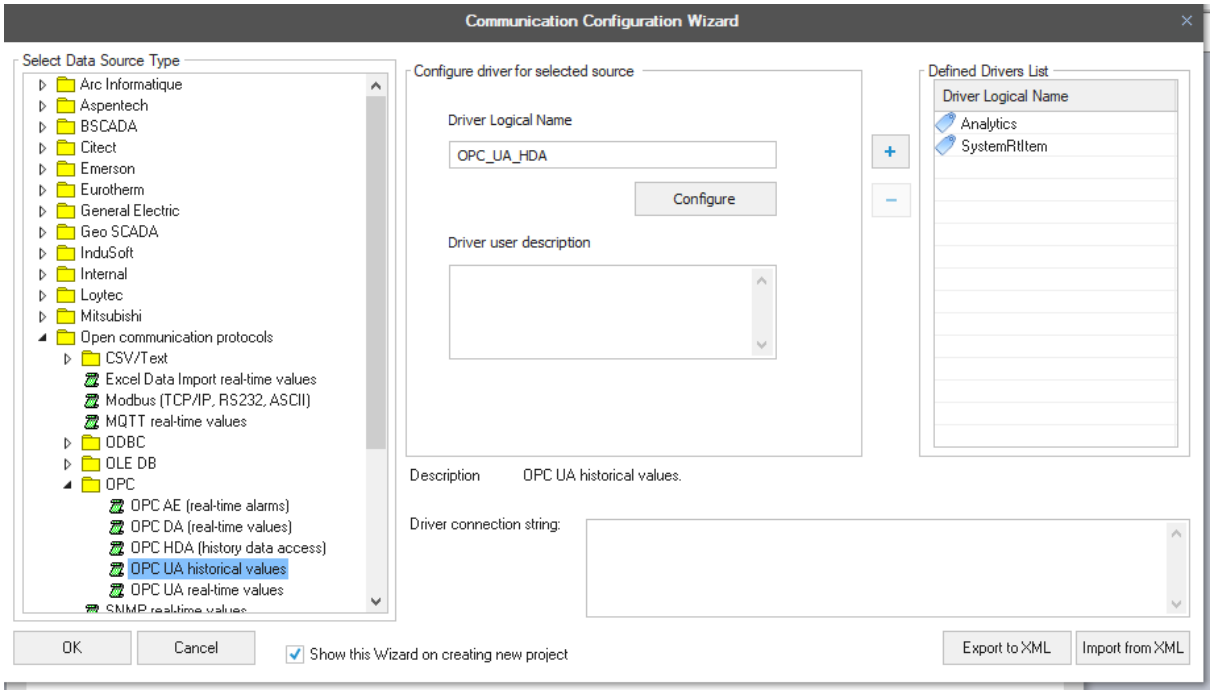
Network Timeout – specifies the timeout, in seconds, to use when trying to establish a network connection to the UPC UA server.

Note:

The **Session Timeout** is used to remove the session from the server due to inactivity, while **Update Rate** (timeout interval) is used to bring connection back after communication error, for example. But, it will also force a re-initialization for the tags that are used in the project.

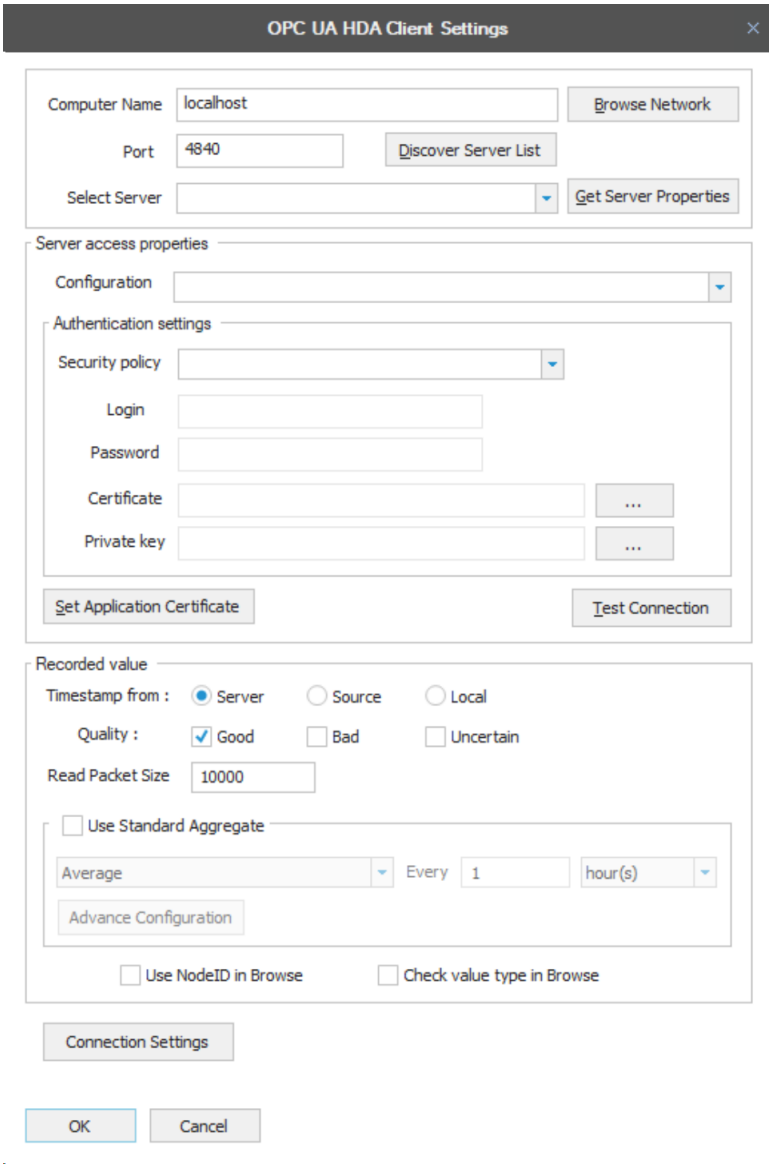
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OPC UA historical values (HDA)



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General Connection Settings



Computer Name – Specify the computer name or IP address of the OPC UA Server machine.

Port – specify the port number so the OPC UA server can be discovered. There is no default port number, therefore this parameter has to be taken from OPC UA Server definition.

Discover Server List – click to list the available OPC-UA servers available on the specified computer

Select Server – After specifying the port number and pressing the "*Discover Server List*" button, select the OPC UA Server from the drop-down list to connect to.

Once a Server is selected, the "*Server access properties*" section will be filled automatically with default options. If, however, the properties are not shown, click the "**Get Server Properties**" button to get properties of selected server.

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Server access properties

Configuration – from the drop-down list, select the *end point connection* option that corresponds to the OPC UA Server definition.

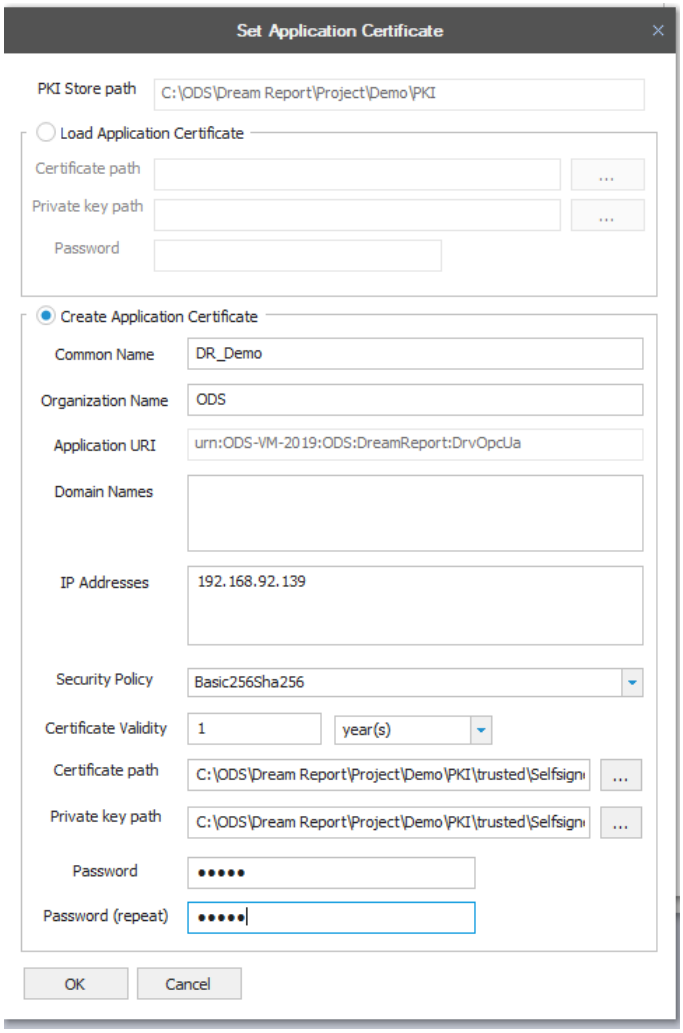
Security Policy – select one of the security options from drop-down list that will allow connection to the OPC UA Server (this must match what is enabled on the OPC UA server side).

Login / Password – if the OPC UA server is secured with a user name and password, then specify those in the appropriate fields.

Certificate – if OPC UA server requires a certificate to allow a client connection, then specify/select an appropriate certificate and a **Private Key**.

Set Application Certificate - if the OPC UA server requires a client certificate, then user can create a "Self-signed Client Certificate". Click this button to create a certificate and supply it to the OPC Server:

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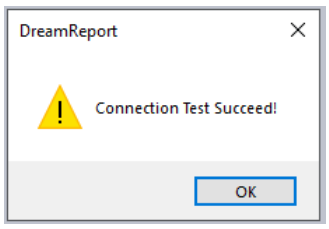


Important Note:

The Self-signed Client Certificate must comply with Security Policy of the OPC UA Server, as well as recognized as a "Trusted" certificate on the OPC UA Server side.

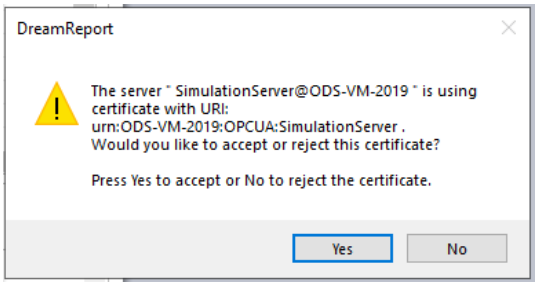
Please also ensure that the Certificate from OPC UA Server is located under the Dream Report project folder as follows: *<Project folder path>\PKI\trusted*

After the initial configuration of the OPC UA driver, click the "**Test Connection**" button to verify the status of the connection:



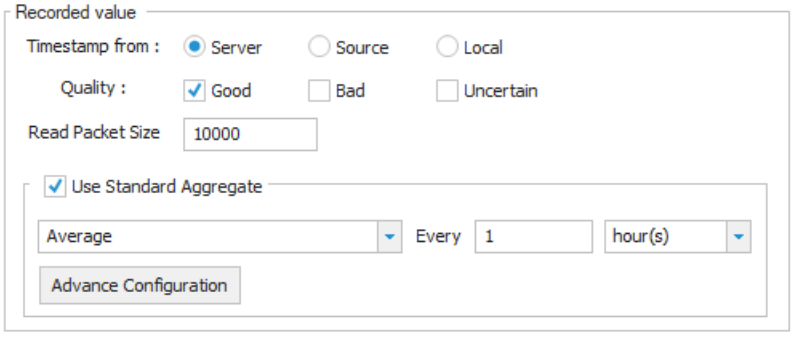
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After a successful connection, you be prompted to store server's certificate into a trusted location:



Click "*Yes*" if the OPC UA Server can be trusted.

Recorded Value



Timestamp from option:

"**Server**" will retrieve the timestamp of value from the OPC UA server machine (default selection).
"**Source**" will retrieve the original timestamp from the PLC/Controller, if supported by the equipment.
"**Local**" will assign the local Dream Report computer's timestamp to the value at the moment the value received from OPC UA server

Quality option:

"**Good**" – driver will consider values with "*good*" quality to be used for calculations.
"**Bad**" – driver will consider values with "*bad*" quality to be used for calculations.
"**Uncertain**" –driver will consider values with "*uncertain*" quality to be taken for calculations.

Note: Multiple data quality options may be selected.

Read Packet Size Parameter – sets the maximum number of events/values returned for any tag over the time range. If only one time is specified, the time range must extend to return this number of values.
The default value of 1000, however if 0 is set it will indicate that there is no limit of events/values that the server can return in the specified time period.

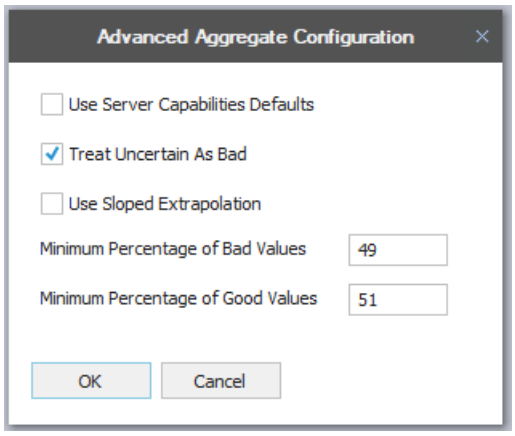
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Use Standard Aggregates Option – select one of the Standards Aggregates for data retrieval. OPC UA HDA driver supports the standard list of aggregates defined by OPC Foundation OPC UA Specifications ver. 1.04:

Average	Retrieve the average value of the data over the interval.
Delta	Retrieve the difference between the Start and End value in the interval.
Count	Retrieve the number of raw values over the interval.
AnnotationCount	Retrieve the number of Annotations in the interval (applies to Historical Aggregates only).
DurationGood	Retrieve the total duration of time in the interval during which the data is Good.
DurationBad	Retrieve the total duration of time in the interval during which the data is Bad.
Delta	Retrieve the difference between the Start and End value in the interval.
End	Retrieve the value at the end of the interval.
Maximum	Retrieve the maximum raw value in the interval with the timestamp of the start of the interval.
Minimum	Retrieve the minimum raw value in the interval with the timestamp of the start of the interval.
MaximumActualTime	Retrieve the maximum value in the interval and the timestamp of the maximum value.
MinimumActualTime	Retrieve the minimum value in the interval and the timestamp of the minimum value.
NumberOfTransitions	Retrieve the number of changes between zero and non-zero that a Boolean or numeric value experienced in the interval.
PercentGood	Retrieve the percentage of data (0 to 100) in the interval which has Good Status Code.
PercentBad	Retrieve the percentage of data (0 to 100) in the interval which has Bad Status Code.
Range	Retrieve the difference between the minimum and maximum value over the interval.
Start	Retrieve the value at the beginning of the interval.
TimeAverage	Retrieve the time weighted average data over the interval using Interpolated Bounding Values.
Total	Retrieve the total (time integral) of the data over the interval using Interpolated Bounding Values.
WorstQuality	Retrieve the worst Status Code of data in the interval.

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Click the "**Advance Configuration**" button to set additional options for fine tuning for the selected aggregate function:



Use Server Capabilities Defaults - sets whether the server will use default values to calculate aggregate values. If value is 'false' (unchecked), the server uses the configuration provided by this object to calculate aggregate values.

Treat 'Uncertain' As 'Bad' – if selected, the driver will consider all values followed by "Uncertain" quality as values with "Bad" quality.

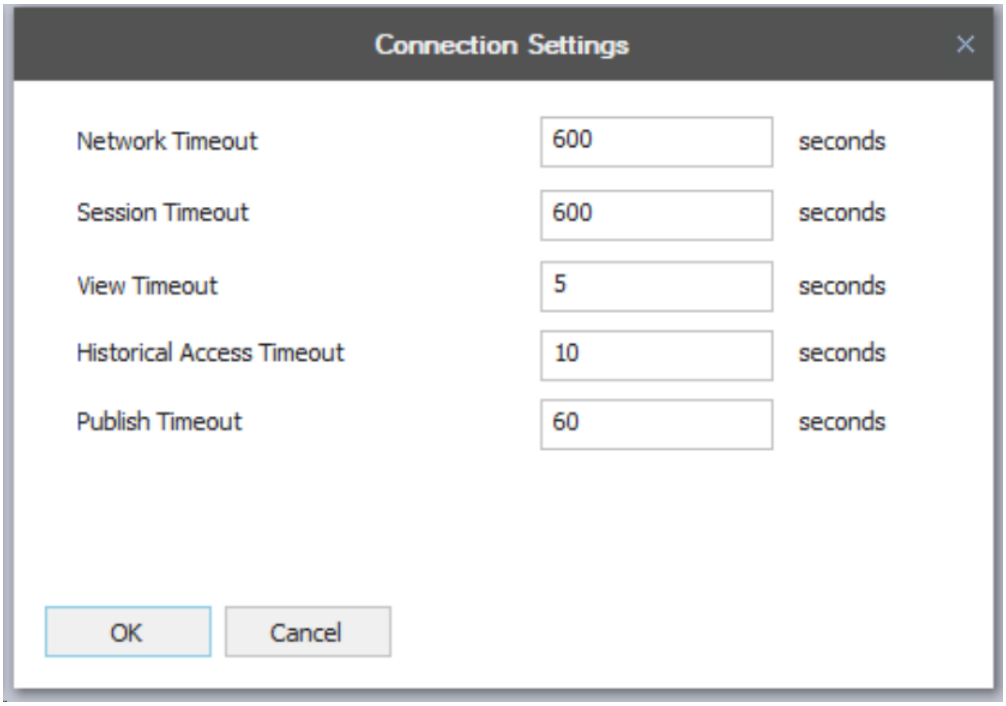
Use Sloped Extrapolation – defines whether the server uses linear extrapolation (sloped extrapolation) or extrapolation based on horizontal line fit (stepped extrapolation) for projecting values that are farther in the future than available in the historian.

Minimum Percentage of Bad Values – the minimum percentage of 'Bad' values required for the status code of the processing interval to become 'Bad'. Sets the minimum percentage of 'Bad' values in a processing interval required for status code of the interval to be set to 'Bad'. Please note that the following relationship must hold true for PercentDataGood and PercentDataBad: *PercentDataGood >= (100 - PercentDataBad).* If both sides of the inequation are equal, the result of the *PercentDataGood* calculation is used.

Minimum Percentage of Good Values – the minimum percentage of 'Good' values required for the status code of the processing interval to become 'Good'. Sets the minimum percentage of 'Good' values in a processing interval required for status code of the interval to be set to 'Good'. Please note that the following relationship must hold true for PercentDataGood and PercentDataBad: *PercentDataGood >= (100 - PercentDataBad).* If both sides of the inequation are equal, the result of the *PercentDataGood* calculation is used.

Click the "**Connection Settings**" button to set additional options for fine tuning for the selected aggregate function:

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Connection Settings

Session Timeout – specifies the maximum number of seconds that a session should remain open without activity.

Network Timeout – specifies the timeout, in seconds, to use when trying to establish a network connection to the UPC UA server.

View Timeout – specifies the timeout, in seconds, to increase waiting time for tag list browse.

Historical Access Timeout – specifies the timeout, in seconds, to increase waiting time for big amount of data requested from OPC UA server

Publish Timeout – specifies the timeout, in seconds, for publish requests. Since publish requests are enqueued at server until new notifications are sent it is recommended to set a long timeout. Especially do not set this timeout smaller than the maximal used publish interval of a subscription.

25.13.8 IEC 61850 real-time driver

IEC 61850 is an international standard defining communication protocols for intelligent electronic devices at electrical substations. It is a part of the International Electrotechnical

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Commission's (IEC) Technical Committee 57 reference architecture for electric power systems.

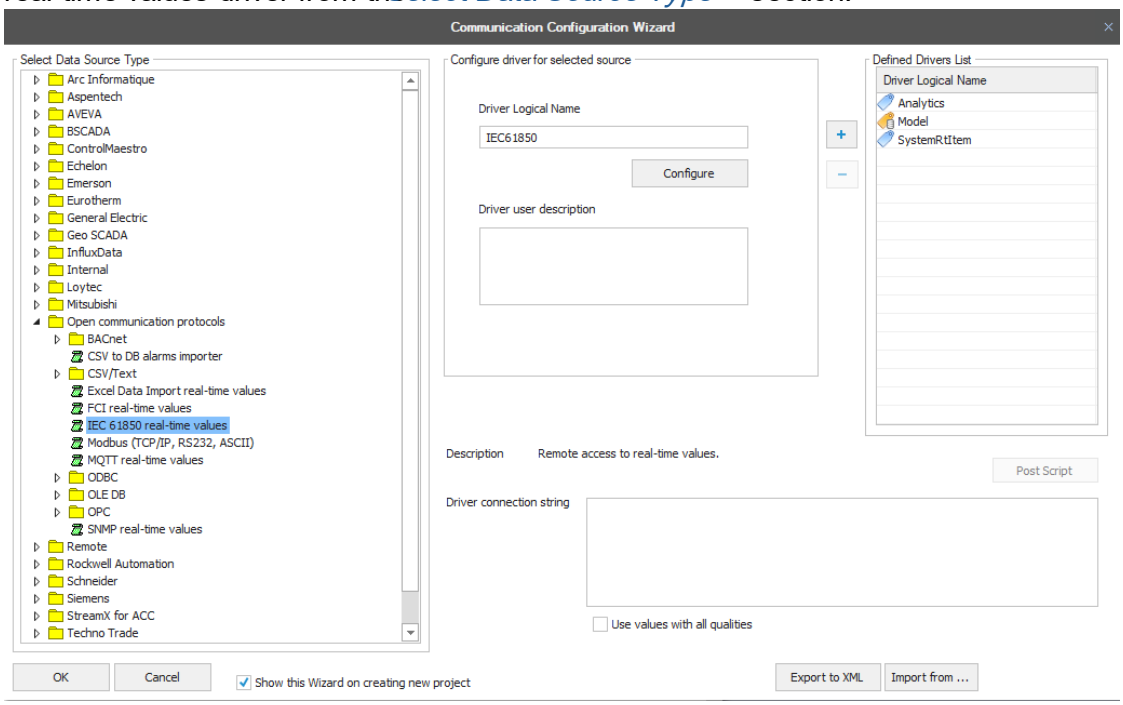
IEC 61850 real-time communication driver enables users to connect with intelligent electronic devices (IED) at electrical substations and read data from IED and store that data into the Dream Report internal history.

IEC 61850 real time communication driver supports following object types:

- MX - Measurements (analog values)
- ST - Status information
- CF - Configuration
- DC - Description
- EX - Extended definition

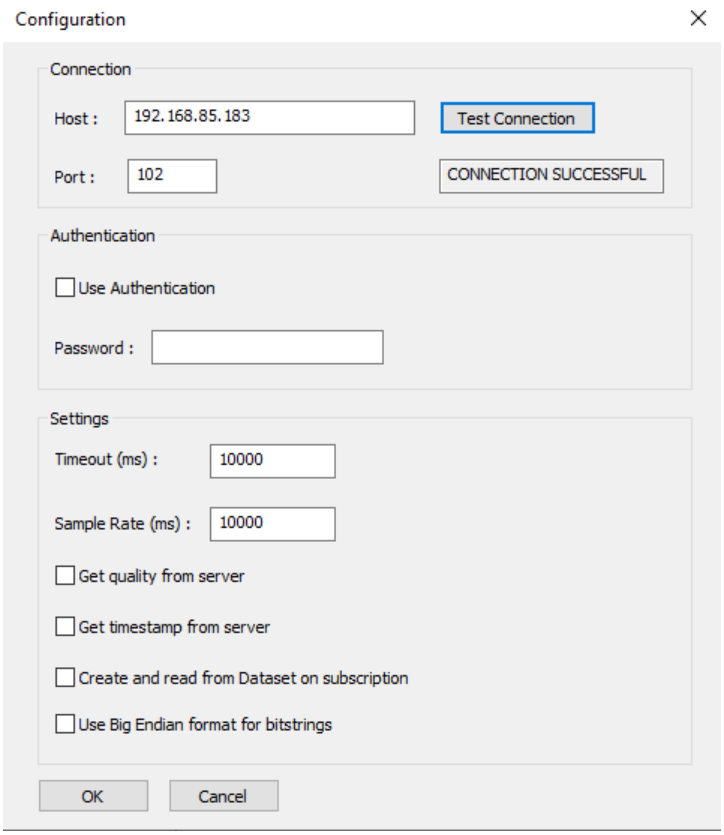
that have following supported data types: Floating Point, BitString, UTCTime, Integer, VisibleString.

To configure IEC 61850 real time driver, first, open the *Communication Configuration Wizard* dialog window. In the "Open Communication protocols" folder, please, select the IEC 61850 real-time values driver from the *Select Data Source Type* section.



When user clicks on the *Configure* button of the *Communication Configuration Wizard*, the following configuration window will open:

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Host: Enter IP address of the server.

Port: Provide the port number (default is 102)

Authentication: If the IED to which user would like to get connection is password protected then user must check "Use Authentication" box and enter password to order to be able to establish the proper connection to the server.

Test Connection button: User can verify the status of the connection after the initial configuration of the IEC 61850 driver.

Settings:

Timeout (ms): the time in milliseconds in which the driver waits for response from the server.

Sample Rate (ms): time in milliseconds between requests to the server when subscribing.

Get quality from server: when checked the IEC driver will consider the quality of the received value from server, otherwise Dream Report IEC driver will use values with good quality only.

Note: *If user is willing to use all available qualities in the reports, then the appropriate option has to be activated in the main "Communication Configuration Wizard" dialog: "Use values with all qualities".*

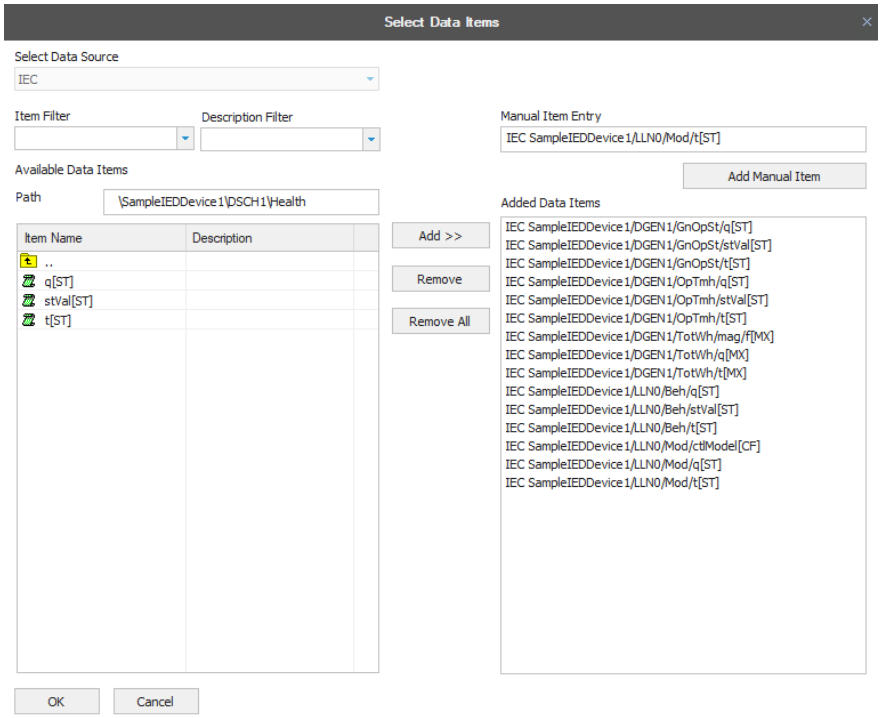
Get timestamp from server: when checked gets timestamp from server, otherwise using local machine time.

Create and read from Dataset on subscription: when checked creates dataset on server when subscribed to receive array of values with each transaction, otherwise sending one request per tag.

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Use Big Endian format for bitstrings: Reverse bit string reading. Check this box when getting wrong values.
Click OK to close the driver configuration window.

Tag browsing example:



NOTE: By default, the IEC 61850 real-time driver is not part of the Dream Report of the installation package. It can be provided to the end user upon request by contacting company's representative.

25.14 Remote

The Dream Report **Remote Connectivity Server** (RCS) facilitates the communication between Dream Report communication drivers running on remote PC's with **Remote Drivers** configured on the Dream Report runtime engine. Since several communication drivers do not natively allow for remote connections to real-time values or historical archives, the **Remote Connector**, when installed and configured on the remote node, will allow a Dream Report node to generate reports with data from those nodes. The **Remote Connector** also allows for reporting of data sources from remote locations, using web services to establish the connection.

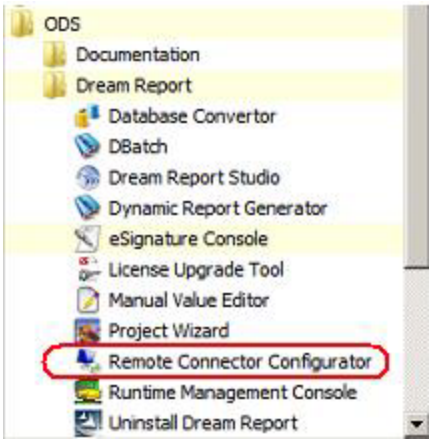
25.14.1 Remote Connector Server

The Dream Report Remote Connector Server must be installed (a separate **install** from the main Dream Report software) on each remote PC/server where Dream Report

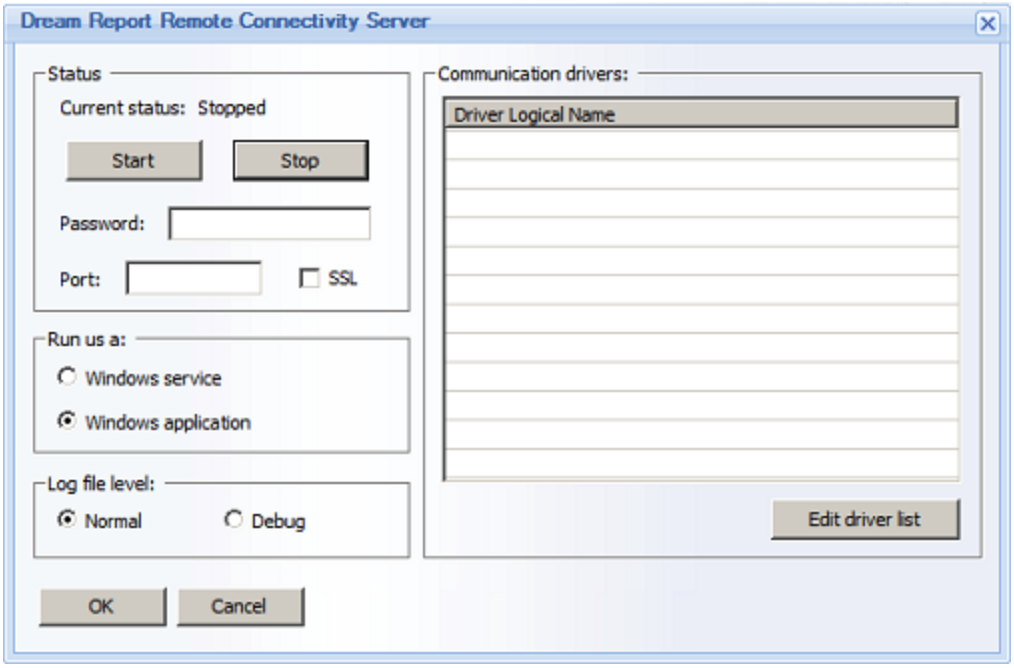
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communication drivers are to be configured. The RCS does not require a separate license - the license is applied on the client side (Dream Report).

The Remote Connector Configurator (on the remote node from Dream Report) is launched from **Start > All Programs > ODS > Dream Report > Remote Connector Configurator**:

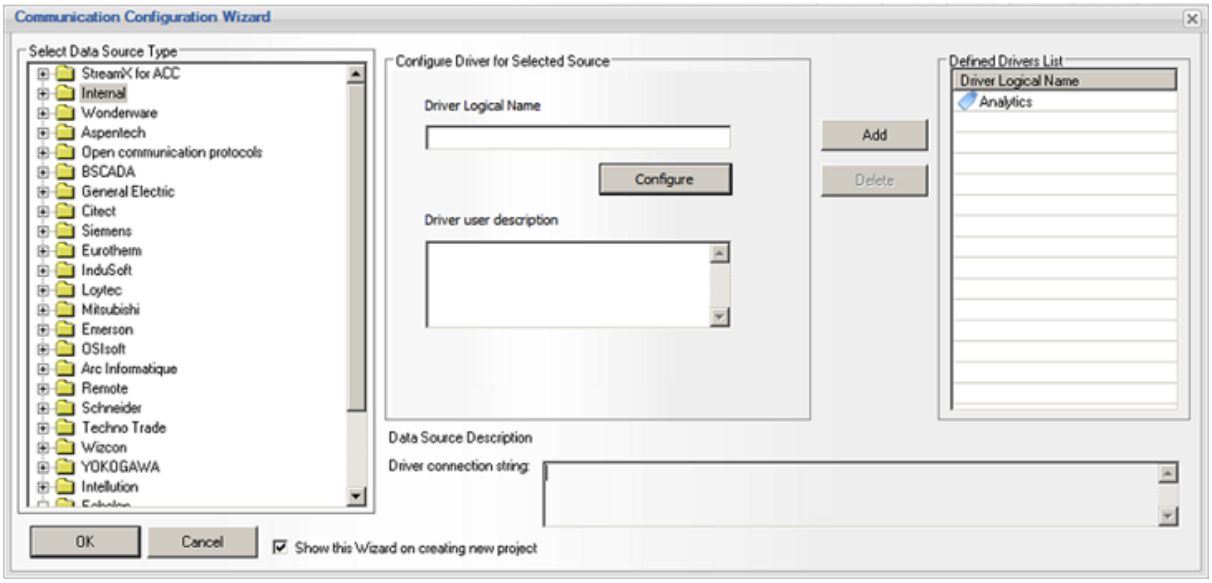


The Dream Report **Remote Connectivity Server** utility will open, and should be configured as follows:



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1. Start and **Stop** Buttons: These buttons will Start and Stop the Remote Connector runtime engine. The “Current status” label will indicate the current status of the engine. The engine status will be retained in the event of a PC is restart or if a Windows session is restarted - the engine status will be the same as the "last known status."
2. **Password**: The user can set connectivity password, which will be used as a password for **Remote Drivers** to connect to this RCS engine. If a **Password** is defined, the Remote Connectivity Server will allow connection only if a matching password is supplied by the **Remote driver**. If the password is changed, then when closing the Configuration window on "OK", the engine will be reloaded. If exiting on Cancel, nothing will happen and old password will remain valid.
3. **Port** and **SSL**: All communications between Remote Drivers and Remote Servers will be done based on **Web Services** communication. The Default port will be 80. If the port is occupied, then 8080 can be used as alternative. Check **SSL** if Secure Sockets Layer protocol security is required. The matching setting will need to be configured on the **Remote Driver(s)**.
4. **Run as a** (Running Mode): The RCS can run as a Windows Service or as an Application. The default mode is Application. If the mode is changed, then when exiting the window on *"OK",* the engine will be reloaded in the new selected mode. If exiting on *"Cancel"*, no changes will be made.
5. **Communication Drivers**: Click the *"Edit drivers list"* to open the standard Dream Report **Driver Configuration** window. The user can then configure one or more communication drivers to local data sources, as described in the **Communication Drivers** section:



Once the driver(s) are configured and added, click "OK", and the configured drivers will appear in the Driver Logical Name list in the Dream Report **Remote Connectivity Server** window.
NOTE: the Remote Connectivity Server only supports Real-time values and HDA (Historical Data Access) History values.
6. **Log file level**: The Remote Connectivity Server will use an activity log file. Log file will be created in a standard installation folder. The format of the Log File will be a standard CSV file, named *rcs_log.csv*. The log file can be configured to log in "Normal" mode (start/stop/change

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of running mode, change of a driver list, and standard log messages from the Dream Report drivers); or a "Debug" mode, which will log all activity with a much higher level of detail.

Remote Connectivity Server Operation

When the Remote Connectivity Server runtime is started, RCS will load configured drivers and communicate with **remote connectivity drivers** (RCD). RCDs will open a connection session with RCS, and all incoming function calls, received from Dream Report Runtime driver will transmit to its server. Server will receive the command, send it to the appropriate driver and will send the response back to the remote driver (RCD). All communication will be executed using SSL and Web Services. When transmitting large arrays of data for historical values, RCS will pack the data using a compression utility and transmit the archived buffer. At the Dream Report side, the **Remote Driver** will be able to detect that received dataset is archived and will unpack it before processing.

25.14.2 Remote Driver Connector

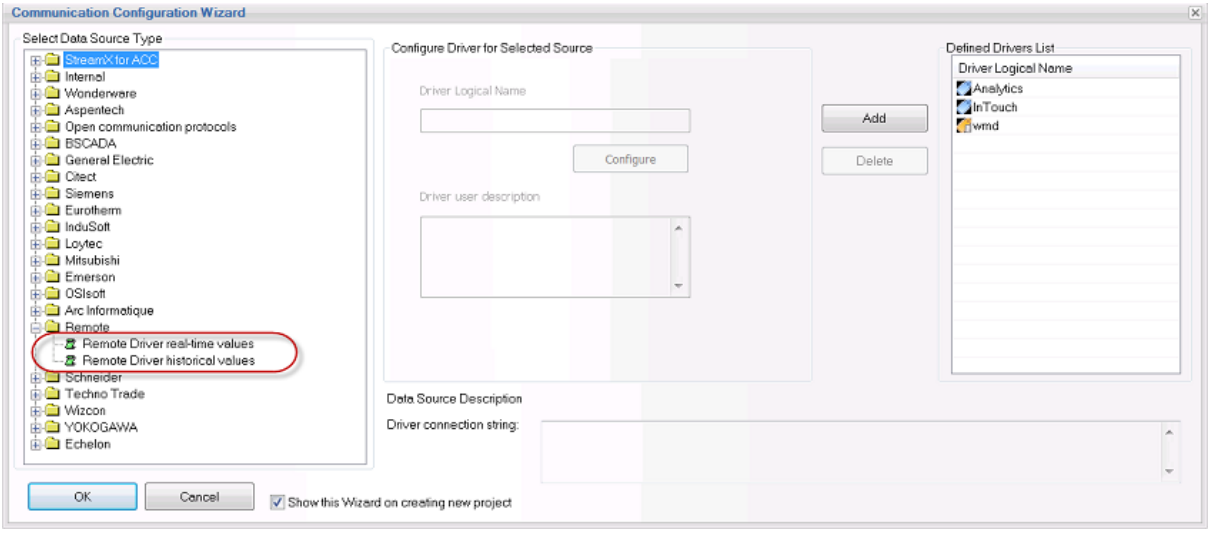
The Dream Report **Remote Driver Connectors** allow for Dream Report communication drivers to run on remote PC's and establish remote web-enabled communication between communication drivers and Dream Report runtime engine.
The following **Remote Connector** driver types are supported:

- **Remote Driver real-time values**
- **Remote Driver historical values**

Remote Driver Configuration

The **Remote Driver** configuration is performed on the **client side** (Dream Report Studio). To configure a **Remote Driver**, open the **Communication Configuration Wizard** dialog window, and expand the **Remote** folder:

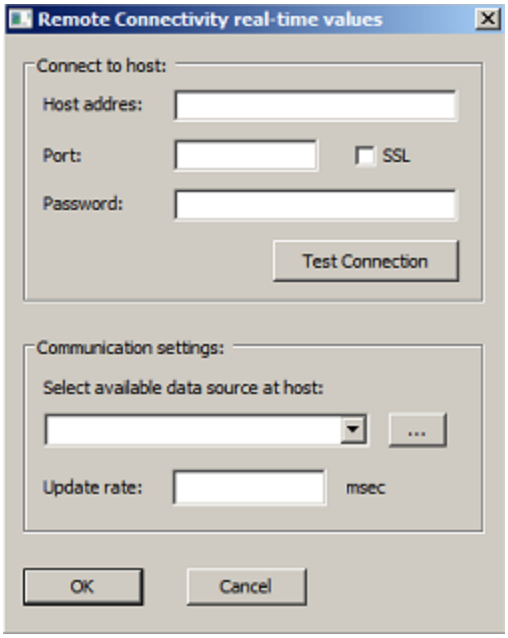
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Select one of the 2 types of **Remote** drivers (**Remote Driver real-time values** or **Remote Driver historical values**). Enter a Driver Logical Name, and the click on *"Configure"* button to open the specific driver's configuration window.

Remote Driver Real-time values

The following configuration window will open for **Remote Driver real-time values**:

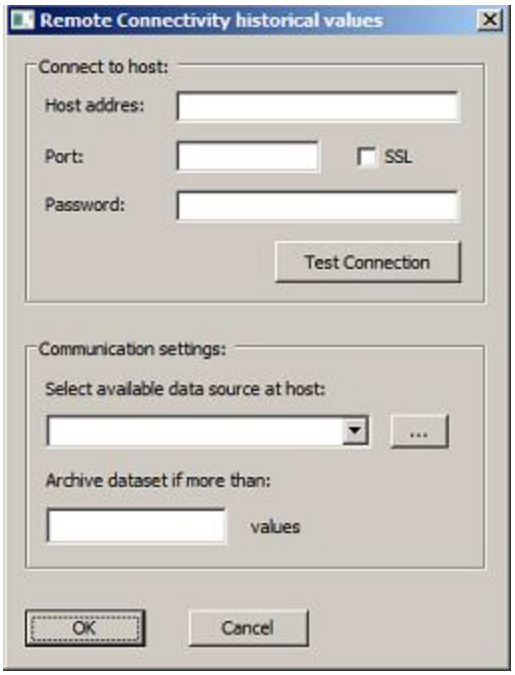


Connect to host (running the remote Dream Report communication driver), by entering the Host Address (IP), Port number, check SSL option if required), and the Password required to authenticate with the remote host.

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Click the *"Test Connection"* button, and if successful, the Remote driver configuration will automatically receive a list of all available drivers of that type (real-time) configured on the remote Host. In the **Communication settings** section: Select available data source at host from the list for the required data source. Finally, enter an Update rate (in msec) at which the **Remote Driver** will poll for real-time data on the Host.

Remote Driver Historical values
The following configuration window will open for **Remote Driver Historical values**, and will allow for retrieval from historical data archives on a remote data source:



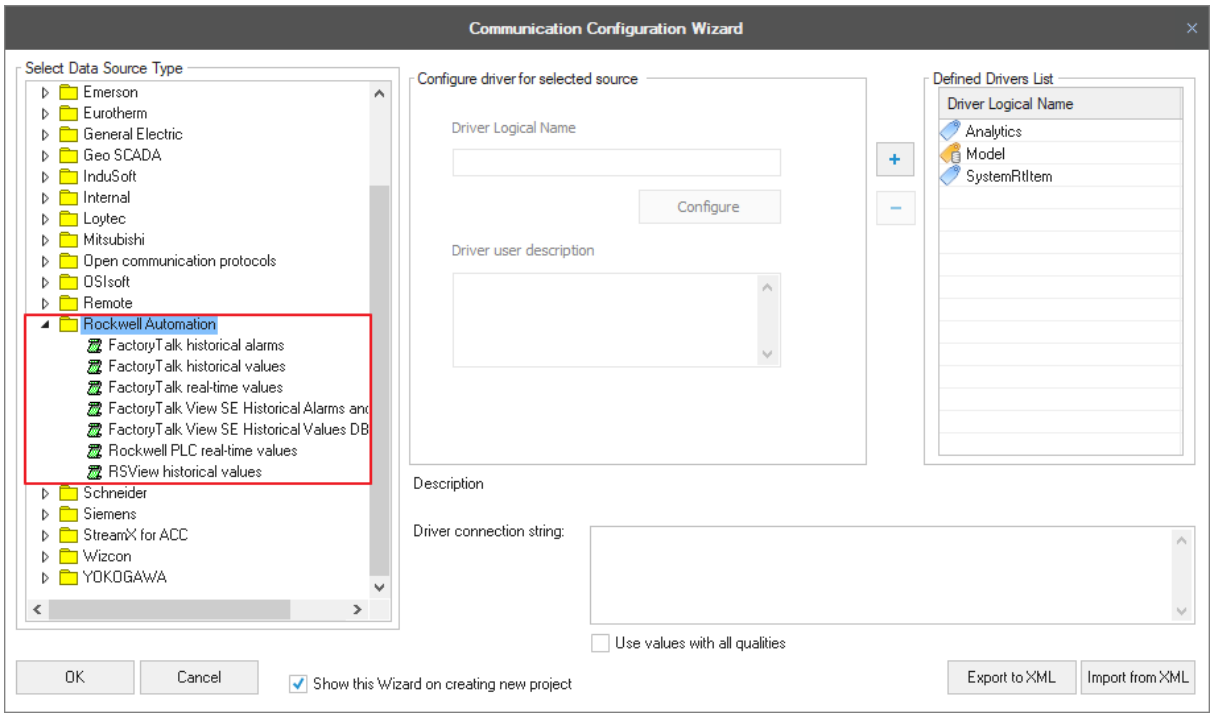
Connect to host (running the remote Dream Report communication driver), by entering the Host Address (IP), Port number, check SSL option if required), and the Password required to authenticate with the remote host.
Click the *"Test Connection"* button, and if successful, the Remote driver configuration will automatically receive a list of all available drivers of that type (historical) configured on the remote Host. In the **Communication settings** section: Select available data source at host from the list for the required data source. Finally, configure the driver to Archive dataset if more than "x" number of values. This setting allows the Remote connector to create a "compression" packages of "x" number of data points (values) from the historical archive at the Host side, and send that compressed package of data to the Remote Driver on Dream Report, where it is uncompressed and reported on.

IMPORTANT NOTE: If Advanced SQL Condition (SQC) is going to be used in the the objects that are based on remote driver, please make sure that the data source names are identical on both sides in Remote Server configuration as well as in the Dream Report project.Please also note that this will work only with data sources that support SQC feature.

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25.15 Rockwell

To configure the Rockwell Automation drivers, first, open the *Communication Configuration Wizard* dialog window in Dream Report Studio - all drivers are listed under the *Rockwell Automation* folder:



Select the driver you need for your project, give it a logical name and click on the *Configure* button.

After finishing the configuration click on the *Add* button to add it to the list and then *OK* to save and close the wizard.

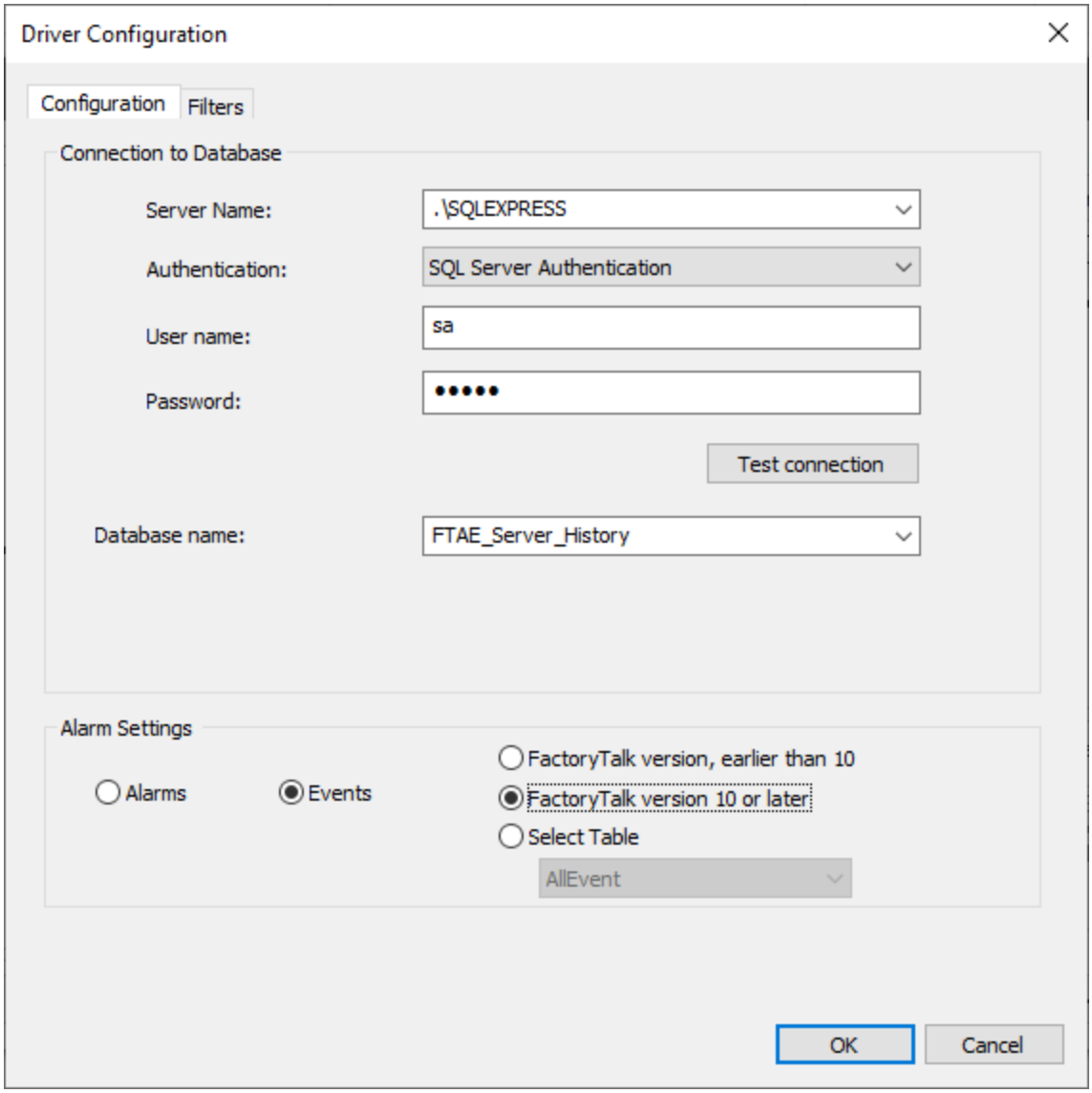
NOTE: For Rockwell Automation OSI PI -based Historian with Asset Framework, the *OSISoft PI Asset Framework historical values* and the *OSISoft PI Asset Framework real-time* values drivers can be used. These drivers are located in the *OSIsoft* folder.

25.15.1 FactoryTalk View SE Historical Alarms and Events DB

The *FactoryTalk View SE Historical Alarms and Events DB* driver exposes alarms and events logged to the FactoryTalk SQL database.

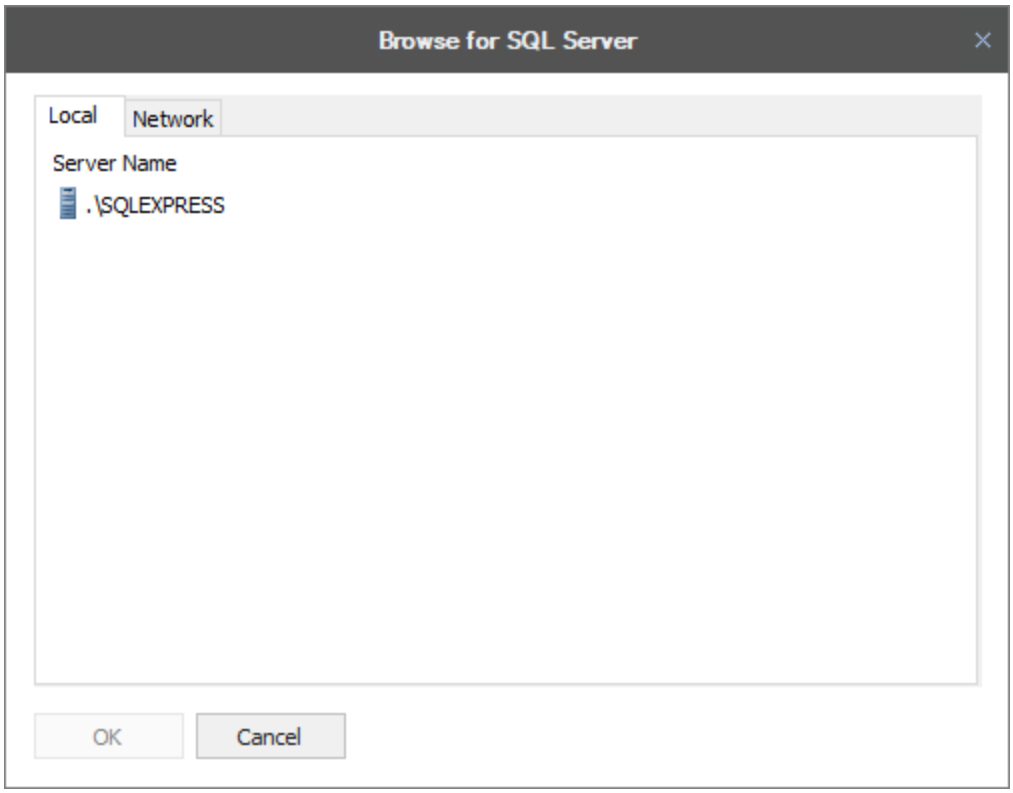
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Select this driver from the list, and click the *Configure* button - the following dialog window will open:



From the *Server Name* selection, the following selection screen will open:

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Select the SQL server (containing the FactoryTalk alarm and event database) click *OK*.

Select the *Authentication* - *SQL Server* or *Windows* authentication, depending on what is enabled on the SQL Server side.

Enter the *User name* and *Password* corresponding to the authentication type.

Click on the *Test Connection* button to test and establish the connection to the SQL server.

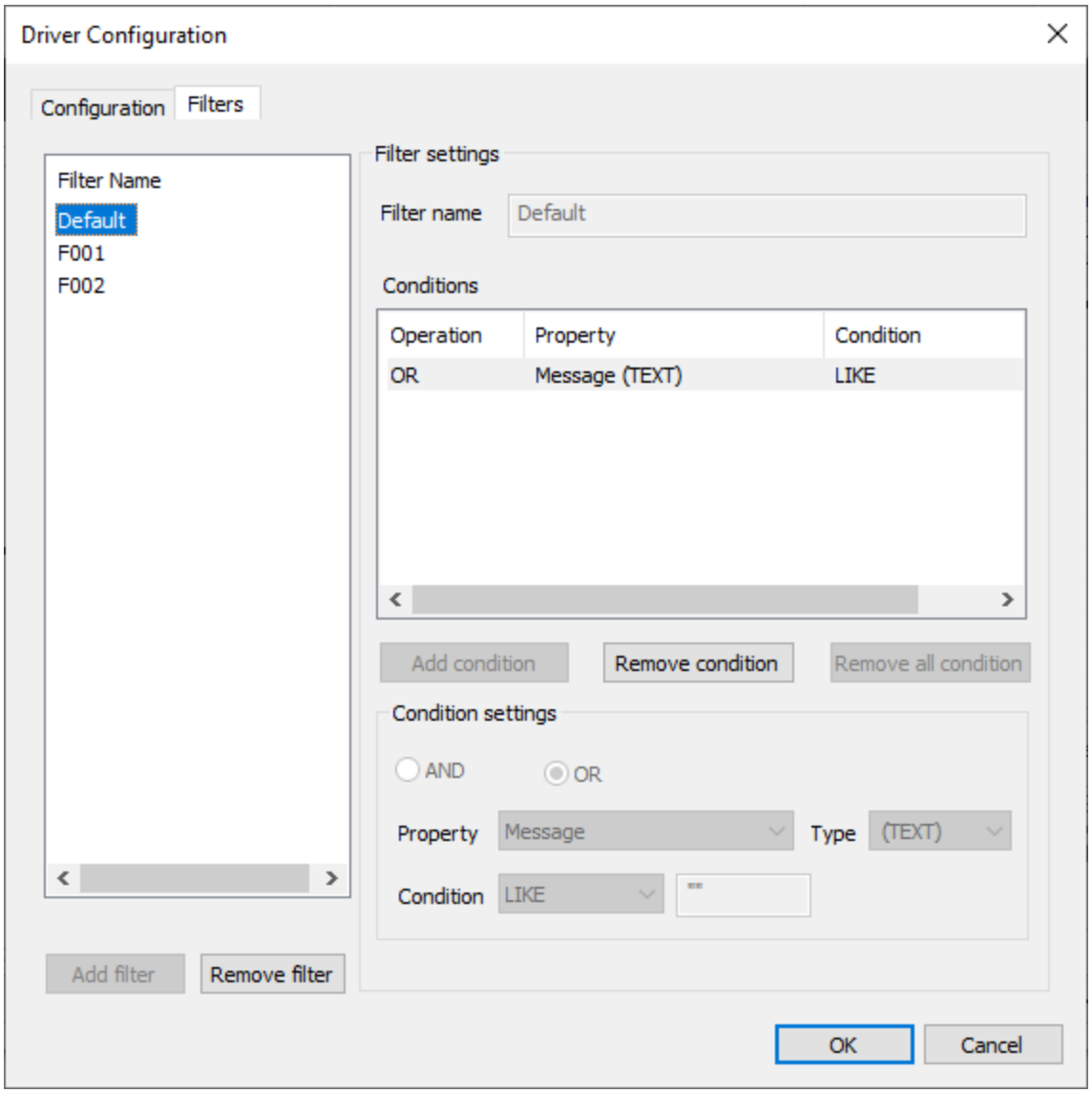
After establishing the connection, select from the drop-down list the *Database name*.

Select what data to extract – *Alarms* or *Events*. Note that you can configure two different instances of this driver – one to extract Alarms, and one to extract Events.

Select *FactoryTalk version earlier than 10* or *FactoryTalk version10 or later* to connect to default tables for corresponding version of FactoryTalk software. If the default table name has been changed, select the table name from the *Select Table* drop-down list.

Click the *Filters* tab to open the configuration window where the alarm filters and alarm filtering conditions can be defined:

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An alarm Filter is made up of one or more alarm Conditions. Enter a descriptive *Filter Name*, click the *Add Filter* button, then select/specify the required *Property*/*Condition*, and click *Add Condition*. Repeat for any other conditions for this specific Filter.

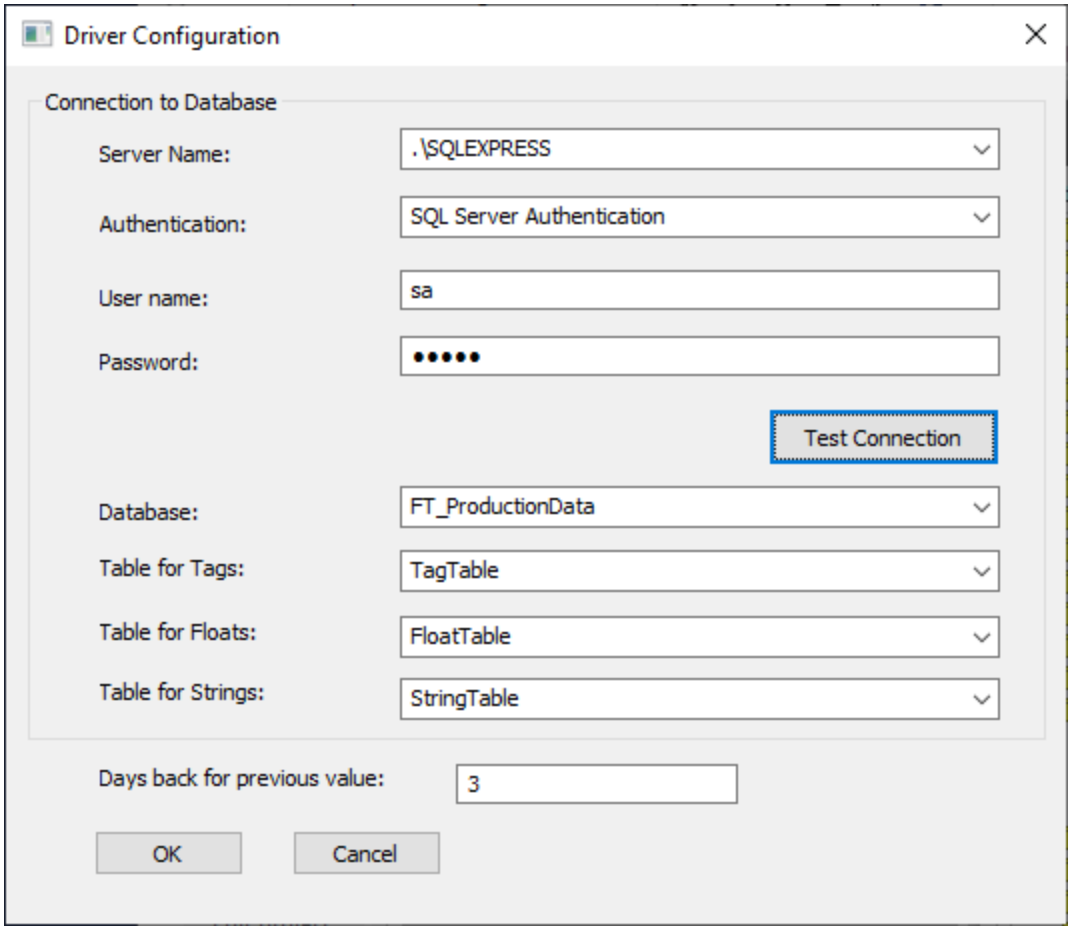
Click *OK* to close the *Driver Configuration* window, and then make sure to click *Add* on the *Communication Configuration Wizard* screen, to ensure that this configured driver instance is added to the project.

25.15.2 FactoryTalk View SE Historical Values DB

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The *FactoryTalk View SE Historical Values DB* driver of Dream Report enable you to connect to Rockwell Automation's Historian SE SQL database.

Select this driver from the *Select Data Source Type* list in the *Communication Configuration Wizard*, and click the *Configure* button. The following dialog window will open:



Server name – Select the name of the Historian server.

Select *Authentication* (*Windows* or *SQL Server Authentication*).

User name and *Password* – Enter the User name and Password that are required for accessing the data.

Test connection – Click on this button to test the connection to the server with the current configuration, and display a success or failure result message.

Database - Select the Historian SE database from the drop down list, and provide the Table names for the *TagTable*, *FloatTable* and *StringTable*.

Days back for previous value - How many days back the driver goes to look for values.

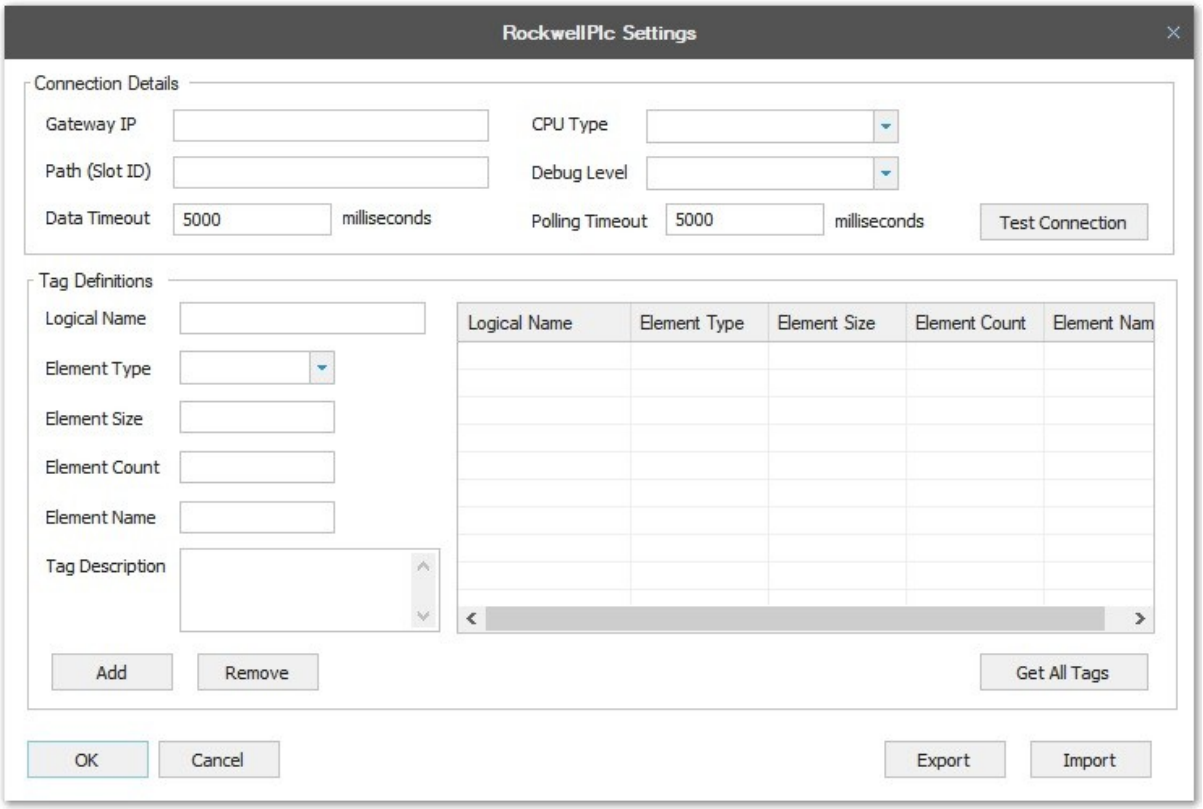
Click on the *OK* button to save configuration and close the window.

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25.15.3 Rockwell PLC real-time values

The *Rockwell PLC real-time values* driver provides connectivity directly to Rockwell Automation Allen-Bradley controllers.

Select this driver from the list, and click the *Configure* button. The following dialog window will open:



Connection Details

Gateway IP: IP-address of the PLC

Path (Slot ID): Communication type and Physical Slot ID where the CPU is located on the bus. Example: 1,2 where '1' is Ethernet network communication type and '2' is slot ID where CPU is placed on the rack.

NOTE: For *SLC 500 PLC* controller/CPU type user has to specify only the "*Gateway IP*" address of the controller and "0" as single value parameter in the "*Path (Slot ID)*"

CPU Type: Select the type of the controller to which you are connecting from the drop-down list.

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Debug Level: When the project starts, Dream Report creates a log file in which details of the connection and data pooling will be written. The parameter defines which messages will be logged. Select the log level from the drop-down list.

Data Timeout: a time interval in milliseconds to get response from the PLC for requested tag's value. If timeout is over such request will be skipped and next will be sent to the PLC.

Polling Timeout: a frequency in milliseconds with which Dream Report requests data updates from the controller. This parameter is used for *On Change* and *On Update* record modes when the data is logged by Dream Report logger.

Test Connection: Click this button to check if the connection to the controller has been established successfully.

NOTE: For *SLC 500 PLC and Logix-class PLC* controller/CPU types, when clicking *Test Connection*, an error message may be displayed since the connectivity test is not supported by some controllers. Please ignore this message and continue configuration.

Tag Definitions

The driver has a functionality allowing to configure a list of tags which will be acquired from the controller for reporting.

In the *Tag Definition* section, you can upload a list of all tags defined in the controller by clicking on the *Get All Tags* button (if supported by specified PLC type), or you can add or remove tags individually using the *Add* and *Remove* buttons.

To add a tag manually, provide the following information:

Logical Name: The logical name of an element which is used in Dream Report for tags browse.

Element Type: Data type of an element. Select the type from the drop-down list.

Element Size: The size of an element in bytes. Example DINT is 4 Bytes, therefore the value in that field has to be set to '4'

Element Count: The address of an element in the PLC. Default value is 1.

Element Name: The real name for an element as it is defined in PLC.

Tag Description: The description of an element. This option is not supported by controllers, however user can manually add description for every tag/elemt

If an array of items is retrieved from a controller after clicking on the *Get All Tags* button, the Element Type for the array will be UNKNOWN. To address a particular element of the array, use the following syntax: <ArrayName>.<Element Index>, e.g. TempSP[2].0, TempSP[2].1 etc. Element numbering starts from 0.

For any tag added to the driver (manually or using the *Get All Tags* button), its configuration can be modified. Select the tag you wish to modify, and then enter or change its parameters.

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Export and Import

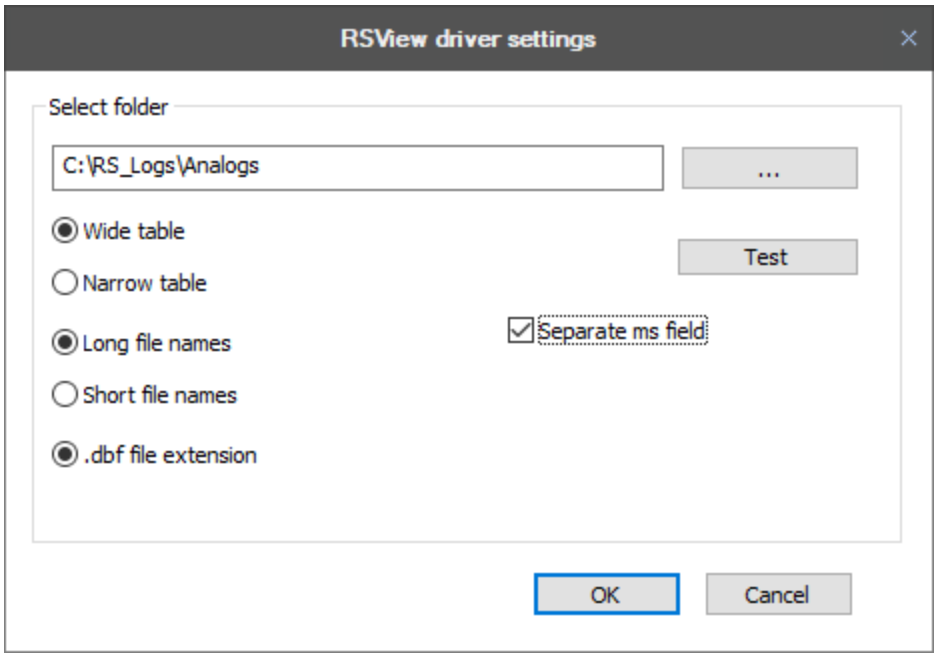
The configuration of tags defined in the driver can be exported to an .XML file. When you click on the *Export* button, the Windows Explorer open. Provide the path and the name for the configuration file. Then you can edit the tag information in any text editor. To import tag configuration from an .XML file, use the *Import* button.

25.15.4 RSView Historical Values

The *Rockwell RSView Historical values* driver allows Dream Report to access RSView32 internal proprietary history archives (.DBF files), and generate reports directly from those archives, without the necessity of first exporting data into an open database or other format.

This driver allows connecting to either local or remote .DBF historical archives.

Select this driver from the *Select Data Source Type* list in the *Communication Configuration Wizard*, and click the *Configure* button. The following dialog window will open:



By default the folder path will be blank in the *Select Folder* section. Click the [...] button in to browse for a path containing RSView .DBF log files. Click the *Test* button to verify that valid files exist in the selected directory.

Select .DBF file format (*Wide Table* or *Narrow Table*). Data logged in the .DBF format can be stored in narrow or wide. The narrow .DBF format stores one date, one time, and one tag value per line. The wide .dbf format stores one date, one time, and multiple tag values per line.

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Select .DBF file name format (*Long file names* or *Short file names*). The Long file names format is *YYYY MM DD NNNN <Log File Identifier String> <(type)>.dbf*, the Short file names format 8-character file names: *YYMMDDnz.dbf*.

NOTE: Make sure that in the log files directory there are files containing tag names and files containing data. The tag names files firmats are: *YYYY MM DD NNNN <Log File Identifier String> Tagname.dbf* for long file names or *YYMMDDnt.dbf* for short file names.

Check the *Separate ms field* if there is a separate field for milliseconds in the log files.

Click *OK* to close the driver configuration. Make sure to click *Add* to add the configured driver to the *Defined Drivers List*.

Tag Browsing

RSView32 historical log file data can be accessed from any reporting object when creating a report, by selecting *External History Server* and then clicking *Edit List* button to select the configured data source - all tagnames contained in the log files will be available to select for reporting. When opening the history tag browser for the first time, the driver will get the list of all tags and save it in a static tag array. On subsequent tag browsing, a cached list of tagnames will be immediately available.

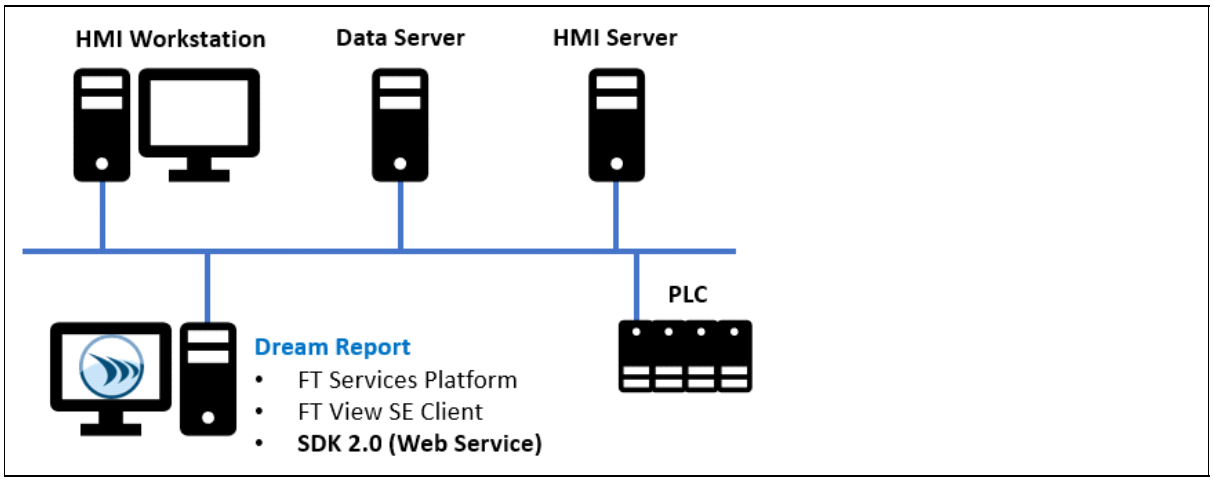
25.15.5 FactoryTalk Communication Requirements

The Dream Report FactoryTalk® drivers uses the Rockwell Automation SDK, and as such, has the same system requirements as other Rockwell Automation software products. Please refer to Rockwell Automation's Product Compatibility for the current support requirements.

As the SDK works in the FactoryTalk View Client environment only, ensure that Site Edition is installed, and that the HMI Server is running. The operating system requirements will be same with Site Edition Client, and of course, must meet the operating system requirements for Dream Report.

This example network architecture shows Dream Report, with the FactoryTalk SDK. *HMI Workstation* is the engineering workstation. The FactoryTalk *HMI Server*, *Directory Server*, and *Data Server* might be hosted on different machines. Note that the Dream Report/SDK server can be hosted on the same computer with FactoryTalk View SE Client as presented in the picture below or it can be stand alone PC within the same intranet:

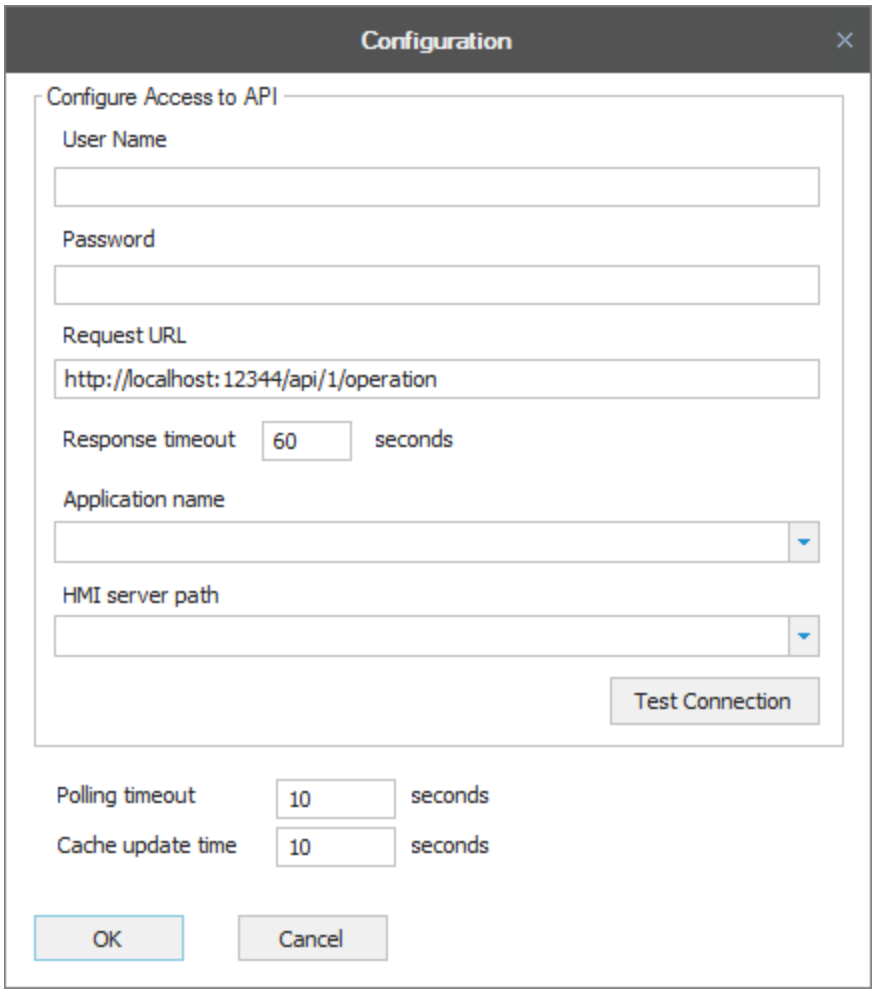
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25.15.6 FactoryTalk Real-Time Values

In the *Communication Configuration Wizard*, select the *FactoryTalk Real-Time Values* driver from the list, and click the *Configure* button - the following configuration window will open:

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User Name and *Password* - user name and password of the user defined in the FTView application, with necessary rights to connect to and extract data from the FTView application.

Request URL - enter the URL of the server where the FTView application is running - *http://localhost:port/api/1/operation* - change *localhost* to the IP-address of the server, and *port* to the port on which the application is running (as shown in the Image above).

Example: http://localhost:12344/api/1/operation where 12344 is the port number for http type of communication between Dream Report hosted computer and the server where Rockwell Data Agent Service is installed.

Response Timeout - the timeout (in seconds) used for each send and receive operation on the instance of the communication driver for retrieving data from the server. *Response Timeout* is a maximum time the driver will wait to get a response from the connected application. By default, this timeout set to 60 sec. Please note increasing this parameter may affect report generation time; however, decreasing this timeout may affect getting values from the server.

Next, select the *Application Name* from the drop-down list. It will populate all the available FTView applications on that node - please make sure to pick the currently running application.

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Select the intern *HMI Server Path* from the list of available HMI Server Names.

Click the *Test Connection* button to verify the connection to the FTView server.

Polling Timeout - used when tag values are received by subscription (for example, if the tag value is logged *On Change* or *On Update* mode). In this case the *Polling Timeout* parameter defines how often the driver will poll the tag values in order to recognize a tags' values changes, emulating subscription mode.

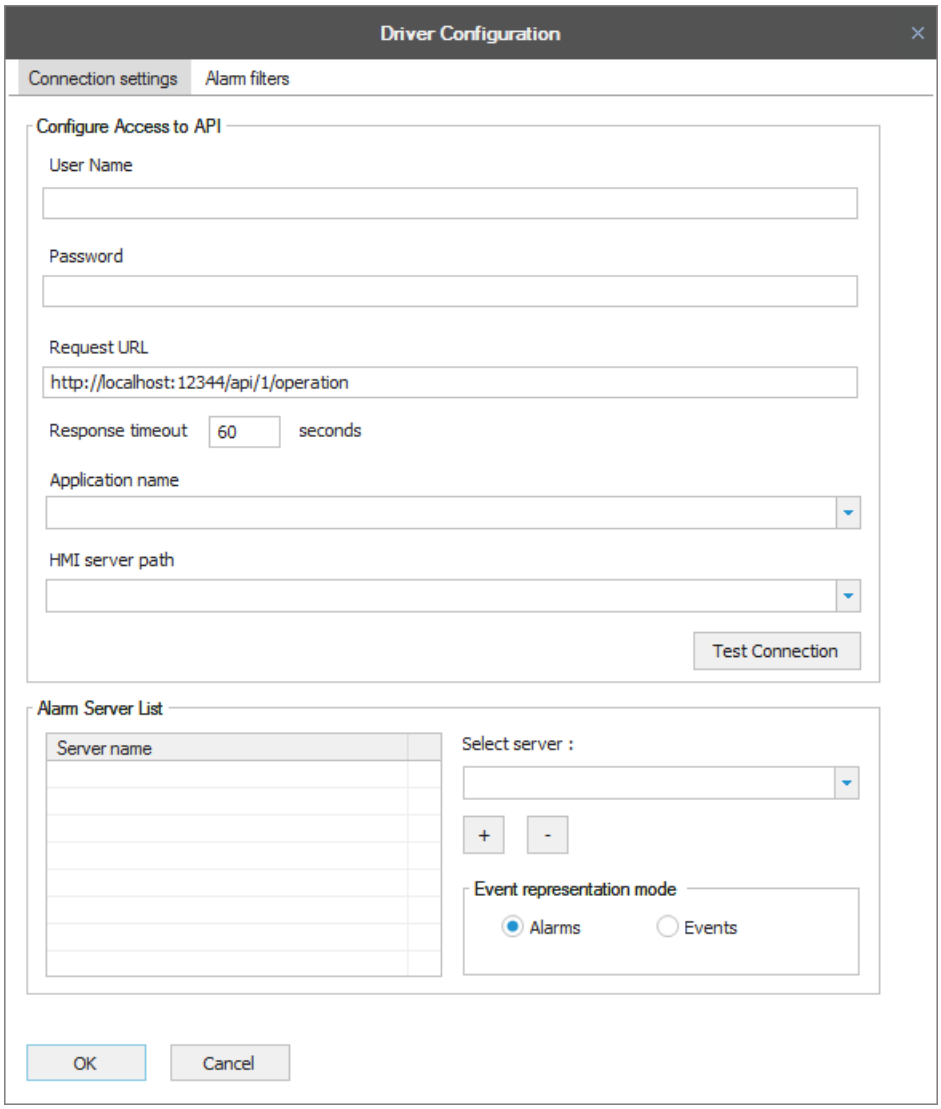
Cache update time - used to determine how long the value will be kept in cache for reading from the driver. After a value is read from the server, and the timeout is due, the value will be updated in the cache.

Note: It is recommended to keep both parameters - *Polling Timeout* and *Cache update time* identical. If the Cache Update Time parameter is greater, then the driver will read values from the cache, but values might not be up to date. To set those parameters appropriately, the user should consider the the network performance as well as the number of tags sampled.

25.15.7 FactoryTalk Historical Alarms

In the *Communication Configuration Wizard*, select the *FactoryTalk Historical Alarms* driver from the list, and click the *Configure* button - the following configuration window will open:

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Connection Settings

User Name and *Password* - user name and password of the user defined in the FTView application, with necessary rights to connect to and extract data from the FTView application.

Request URL - enter the URL of the server where the FTView application is running - *http://localhost:port/api/1/operation* - change *localhost* to the IP-address of the server, and *port* to the port on which the application is running (as shown in the Image above).

Example: http://localhost:12344/api/1/operation where 12344 is the port number for http type of communication between Dream Report hosted computer and the server where Rockwell Data Agent Service is installed.

Response Timeout - the timeout (in seconds) used for each send and receive operation on the instance of the communication driver for retrieving data from the server. *Response Timeout* is a maximum time the driver will wait to get a response from the connected application. By default, this timeout set to 60 sec. Please note increasing this parameter may

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affect report generation time; however, decreasing this timeout may affect getting values from the server.

Next, select the *Application Name* from the drop-down list. It will populate all the available FTView applications on that node - make sure to pick the currently running application.

Select the intern *HMI Server Path* from the list of available HMI Server Names.

Click the *Test Connection* button to verify the connection to the FTView server.

Alarm Server List

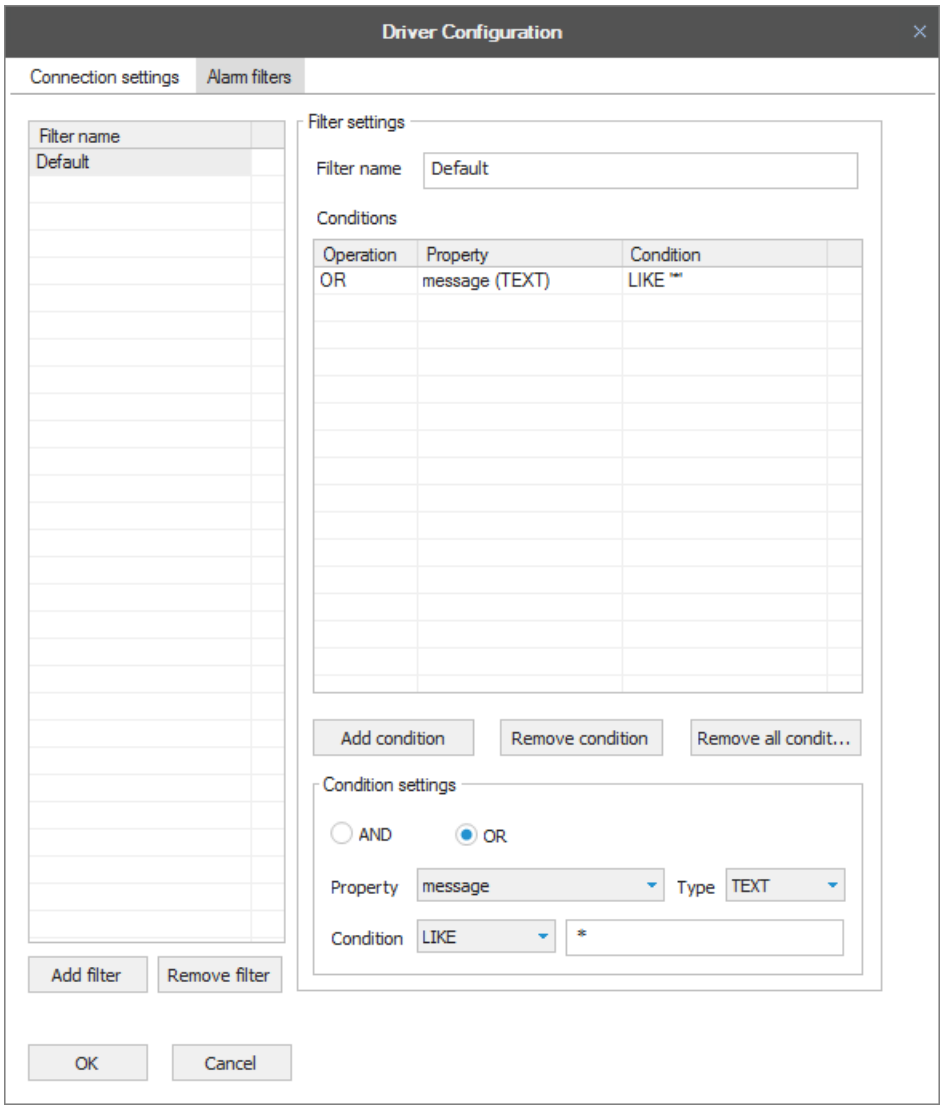
Once connection had been established, select the *Server* from the drop-down list, and click [+] to add it to the *Alarm Server List*. You can add several Alarm servers into the single driver instance definition.

Select the representation mode – as *Alarms* or *Events*. When the *Alarms* mode is selected, Dream Report automatically combines events corresponding to the same alarm instance and represent them in a single row. Such a row contains the Start time, the End time, and the Acknowledgment time of an alarm. In the *Event* mode, each change of an alarm even related to the same alarm instance will be displayed in a separate row – one record for the start, one record for the end, etc.

Alarm Filters

Click on the *Alarm Filters* tab to configure the alarm filters and alarm filtering conditions.

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An Alarm *Filter* is made up of one or more alarm *Conditions*. Enter a descriptive *Filter Name*, then select/specify the required property/condition, and click *Add Condition*. Repeat for any other conditions for this specific Filter.

Click the *Add Filter* button on the bottom left of the configuration window.

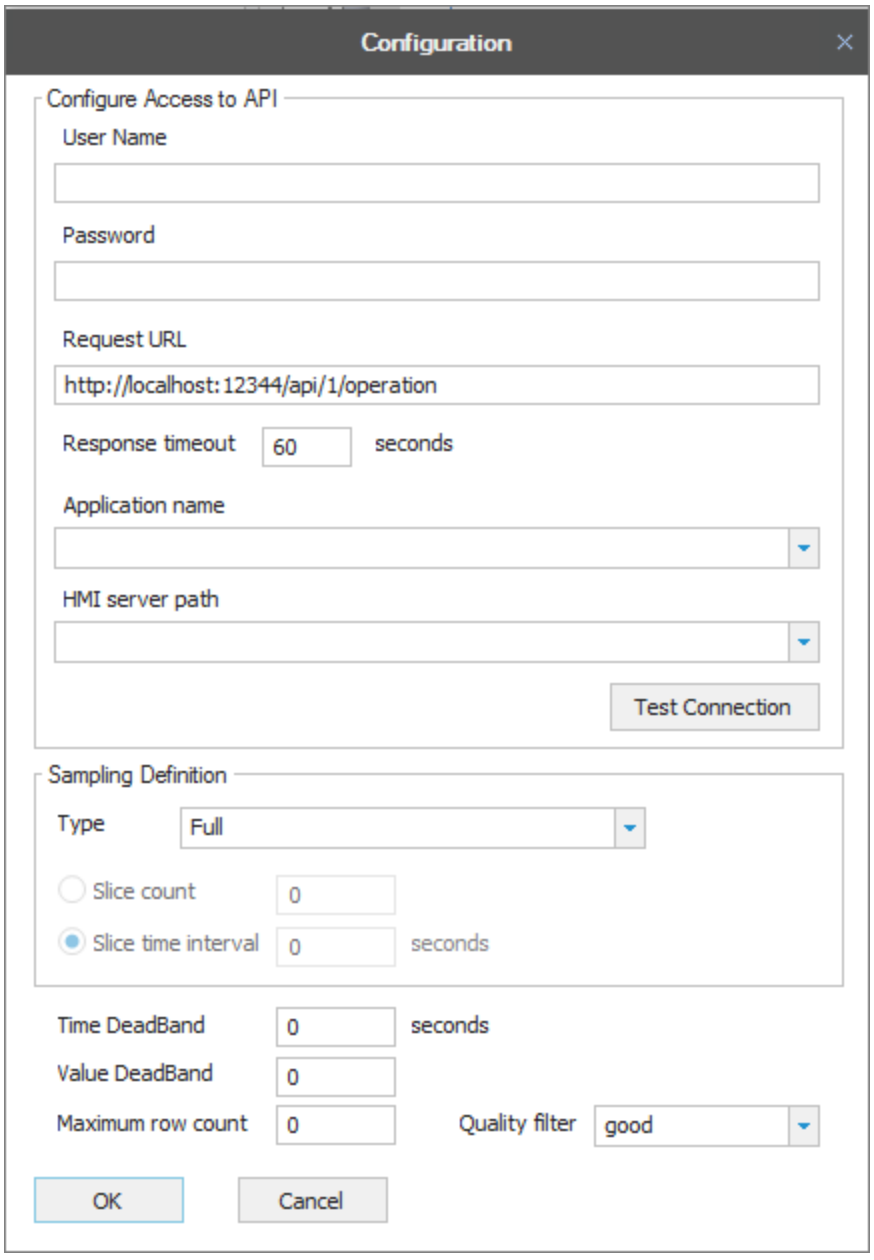
Click *OK* to close the *Driver Configuration* window, and then make sure to click *Add* on the *Communication Configuration Wizard* screen, to ensure that this configured driver instance is added to the project.

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25.15.8 FactoryTalk Historical Values

The *FactoryTalk Historical Values* driver enables connectivity to Rockwell FactoryTalk View (FTView) software, and exposes the historically-logged data by FactoryTalk View applications.

In the *Communication Configuration Wizard*, select the *FactoryTalk Historical Values* driver from the list, and click the *Configure* button - the following configuration window will open:



User Name and *Password* - user name and password of the user defined in the FTView application, with necessary rights to connect to and extract data from the FTView application.

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Request URL - enter the URL of the server where the FTView application is running - *http://localhost:port/api/1/operation* - change *localhost* to the IP-address of the server, and *port* to the port on which the application is running (as shown in the Image above).

Example: http://localhost:12344/api/1/operation where 12344 is the port number for http type of communication between Dream Report hosted computer and the server where Rockwell Data Agent Service is installed.

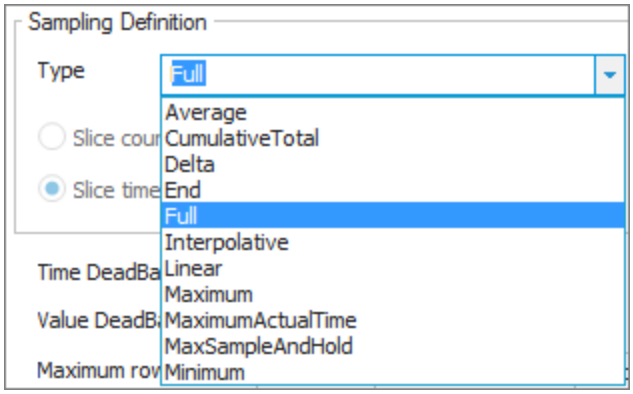
Response Timeout - the timeout (in seconds) used for each send and receive operation on the instance of the communication driver for retrieving data from the server. *Response Timeout* is a maximum time the driver will wait to get a response from the connected application. By default, this timeout set to 60 sec. Please note increasing this parameter may affect report generation time; however, decreasing this timeout may affect getting values from the server.

Next, select the *Application Name* from the drop-down list. It will populate all the available FTView applications on that node - please make sure to pick the currently running application.

Select the intern *HMI Server Path* from the list of available HMI Server Names.

Click the *Test Connection* button to verify the connection to the FTView server.

For the *Sampling Definition*, select the data sampling *Type* for this instance of the driver configuration from the list:



Depending on the sampling type selected, specify the *Slice method* (time interval) for the data:

Slice count - the number of slices (i.e., number of equal time-spaced values returned), or *Slice time interval* that specifying the time interval (in seconds) for the returned data.

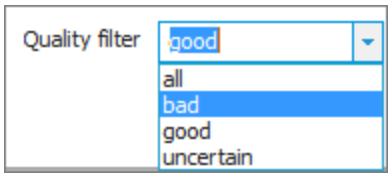
The following settings determine “how much” data is returned:

- *Time DeadBand* - rows will not be returned more frequently than every [X] seconds
- *Value DeadBand* - any data values that change less than the specified dead band will not be returned. The value is a percentage of full scale, expressed as a value between 0 and 100. A value of zero means that no dead band will be applied, and all values will be returned

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- *Maximum Row Count* - The maximum number of values in a time series to return. It overwrites any other parameters. (i.e., if a sampling definition would result in 10000 values, but the max row count is set to 500, then only 500 values will be returned). This limits the data to the first [X] number data points.

Use the *Quality Filter* option to limit the data returned based on the quality detail associated with each data point:

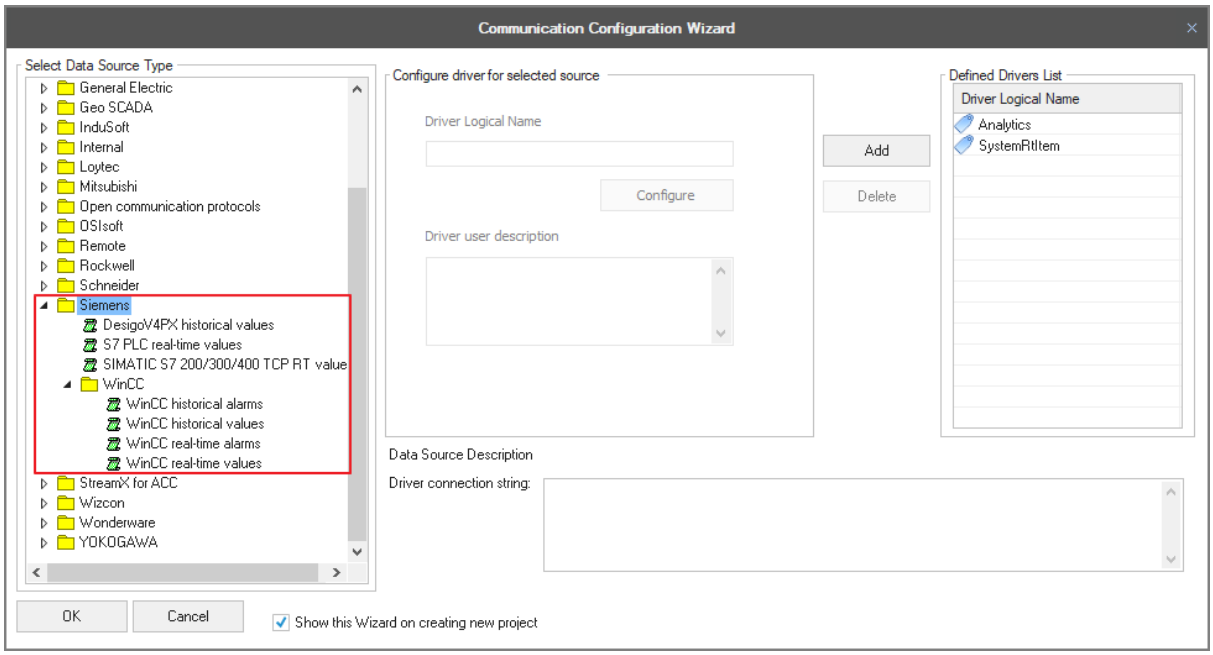


25.16 Siemens

The *Siemens* folder will display the following list of drivers:

- DesigoV4PX historical values
- S7 PLC real-time values
- SIMATIC S7 200, 300, 400 TCP RT values
- WinnCC historical alarms
- WinnCC historical values
- WinnCC real-time alarms
- WinnCC real-time values

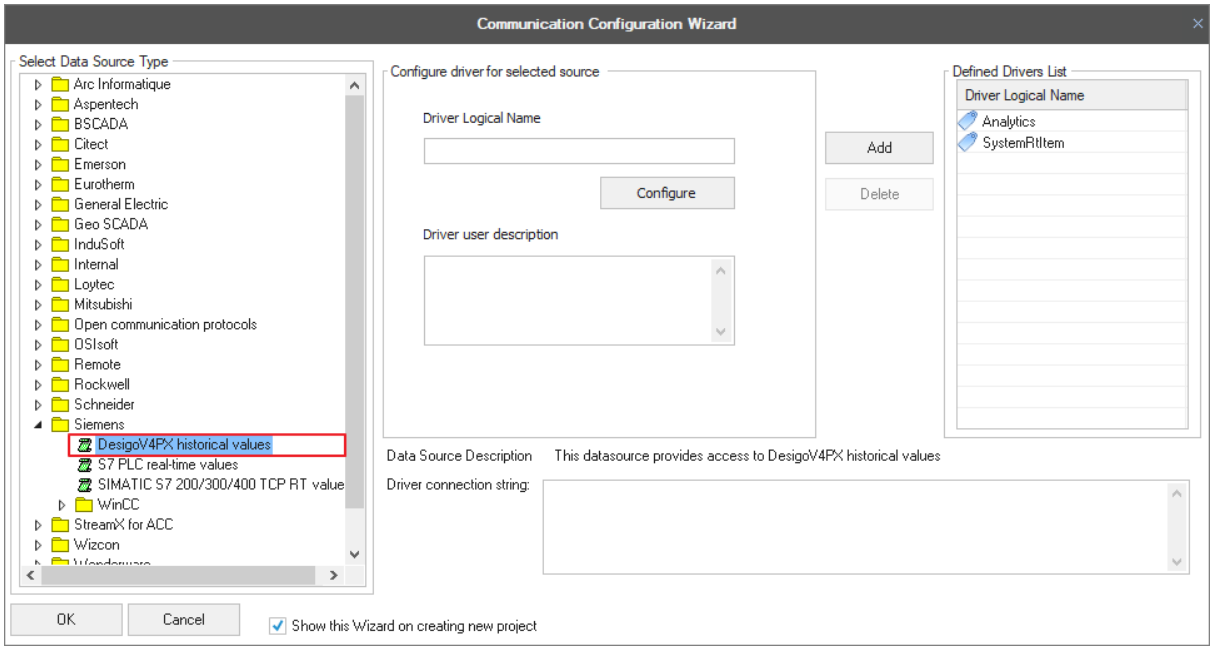
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25.16.1 DesigoV4PX Historical Values

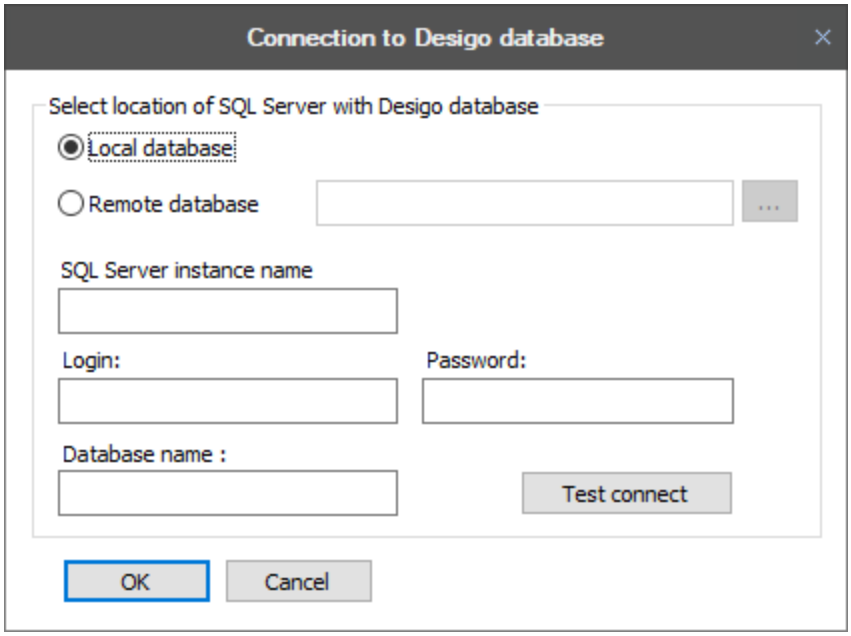
The *DesigoV4PX Historical Values* driver enables connectivity to Desigo SQL database.

To configure the*DesigoV4PX Historical Values* driver, open the *Siemens* folder in the *Communication Configuration Wizard* window, and select the driver:



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The *Configure* button will be enabled. Click on it to setup the driver configuration. If you click on *Configure* button, the *Connection to Desigo database* configuration dialog window will be opened:



The connection to the database can be configured either by using the SQL Server database locally (*Local database*) or remotely (*Remote database*). If a named instance of SQL Server or SQL Express is being used, make sure to enter the *SQL Server Instance Name*.

If the SQL server, which is running the database, is configured with user authentication, then enter *Login* and *Password* for the SQL Server into the corresponding edit boxes.

If your SQL Server is configured with Windows Authentication mode, leave the user name and password edit boxes empty.

Enter the name of the database in the *Database Name* field.

The *Test Connect* button will try to establish communication to the database.

Click on the *OK* button to save configuration and close the window.

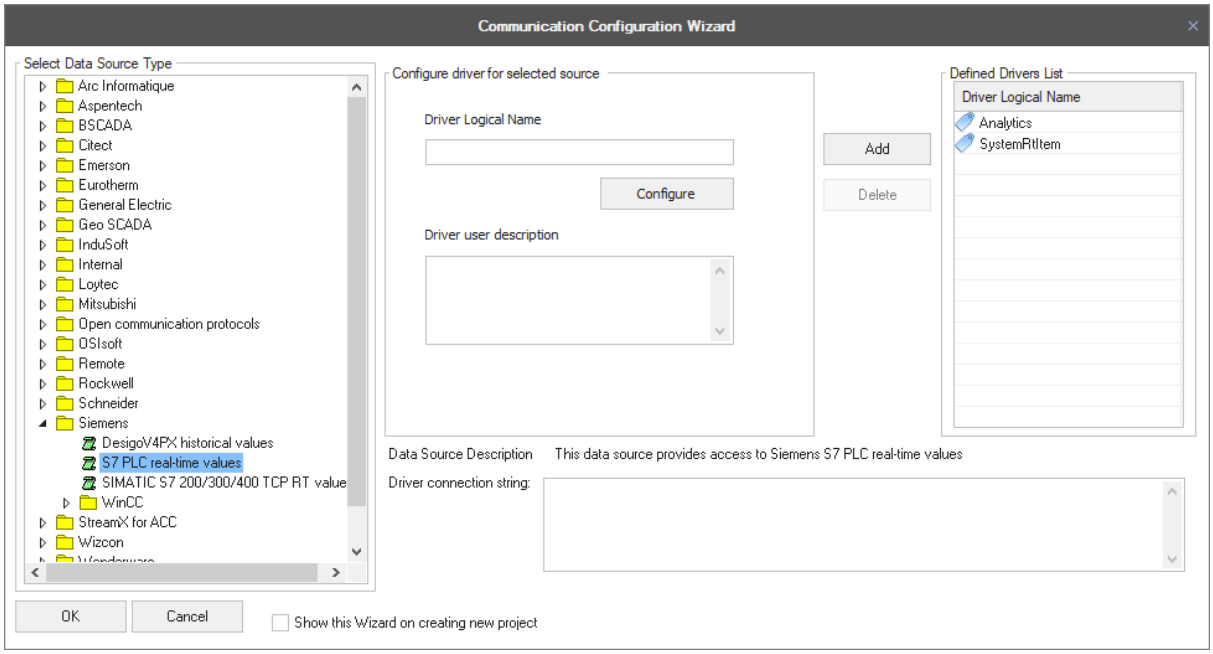
25.16.2 S7 PLC Real-Time Values

The **SIMATIC S7 PLC Real-Time Values** driver enables connectivity to the Siemens SIMATIC PLC product.

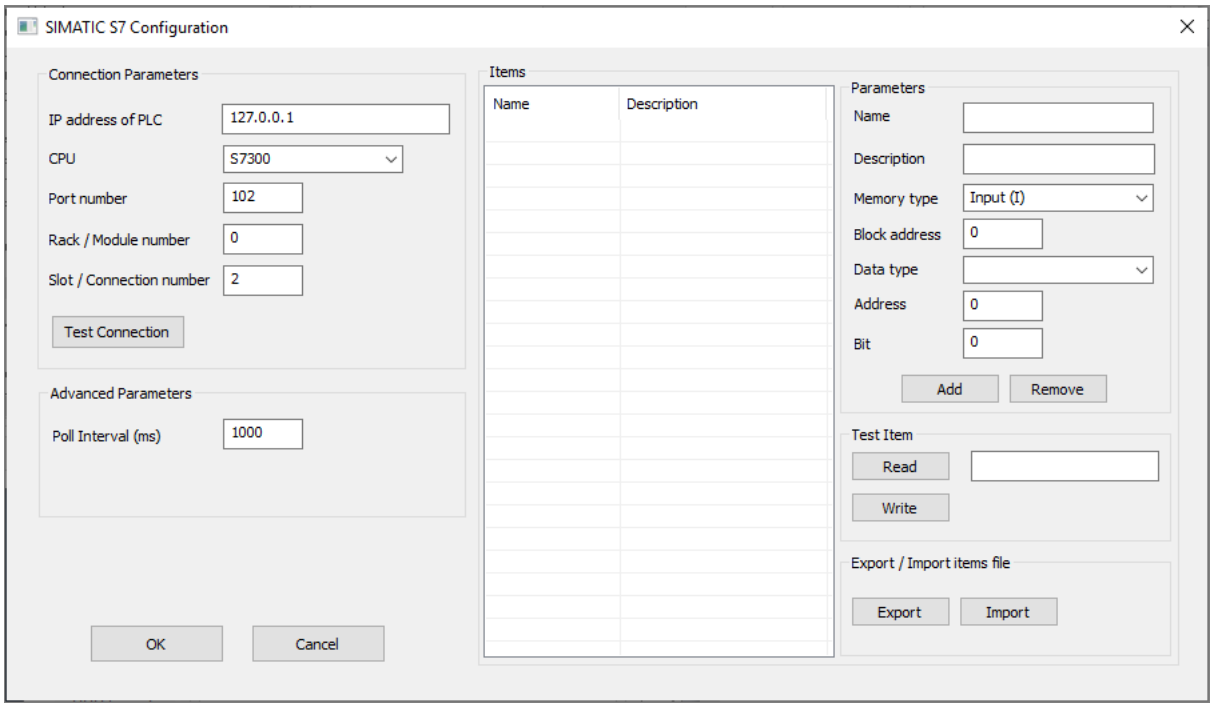
Note: The driver is compatible with the following CPU versions of S7 PLC: S7-200, S7-300, S7-400, S7-1200 and S7-1500.

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To configure the SIMATIC S7 PLC driver, open the Siemens folder in the *Communication Configuration Wizard* window, and select the driver:



Click the Configure button - the following SIMATIC S7 Configuration window will open:



Connection Parameters

Enter the PLC parameters to establish the connection:

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IP adderess of PLC: Enter the IP address of the PLC.

CPU: Select the matching CPU type from the list.

Port number: Enter the port number.

Rack / Module number: Enter the Rack and Slot numbers.

Click on *Test Connection* to test and establish the connection to the PLC.

Advanced Parameters

Poll Interval (ms) - defines how often the driver will check the value of the tag to recognize a tag value change.

Parameters

Create the tags by the following parameters:

Name: Enter a meaningful name.

Description: Enter the tag description.

Memory type: Select the Memory type – “Data Block” – is the most common type to use.

Block address: Enter the “Block address” – in which the data is stored.

Data Type: Select the Data Type from the list in alignment with the information from the PLC.

Bit: Enter the Address (offset) of the data inside the block.

Click *Add* to add the tag to the list at the center, or *Remove* to remove the tag from the list.

Test Item

Check your tag configuration by reading the data from the tag or writing to it. Use the *Read* or the *Write* buttons.

Export/Import Items file

Click on the *Export* button to open the browse for files window, enter a name for the file and click *Save* to create a special SVC file with the extension “.s7i”. now the tags configuration can be duplicated into other projects or machines. Click on the *Import* button to import the tag configuration from an existing file.

Click *OK* to save and close the configuration window.

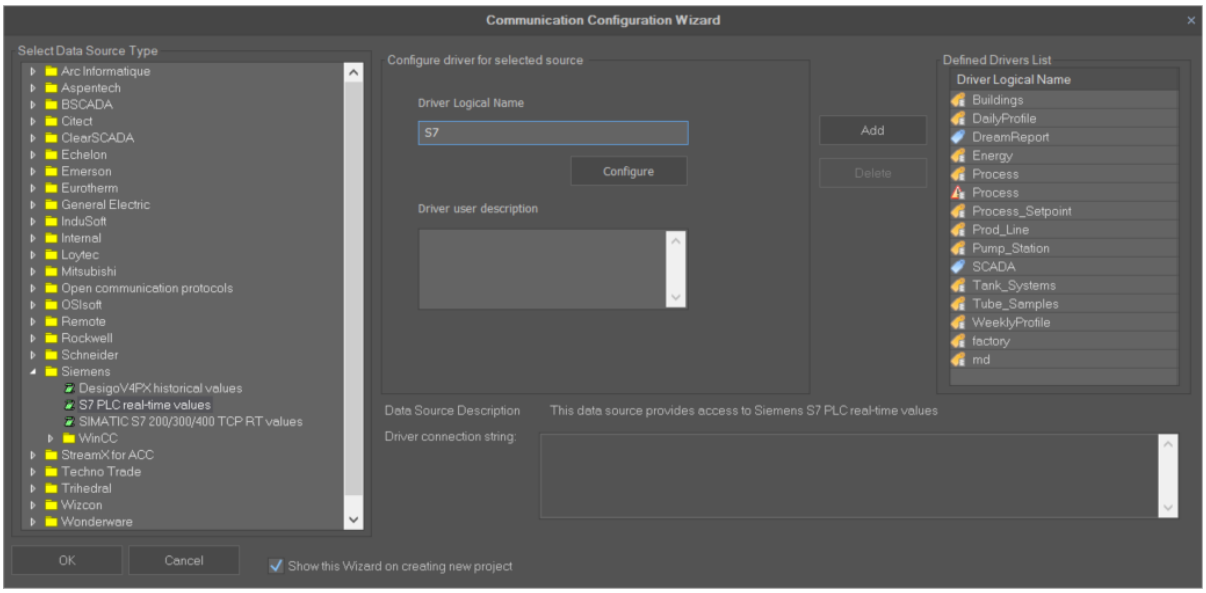
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25.16.3 SIMATIC S7 200/300/400 Real-Time Values Driver

The *SIMATIC S7 PLC Real-Time Values* driver enables connectivity to the Siemens SIMATIC PLC product.

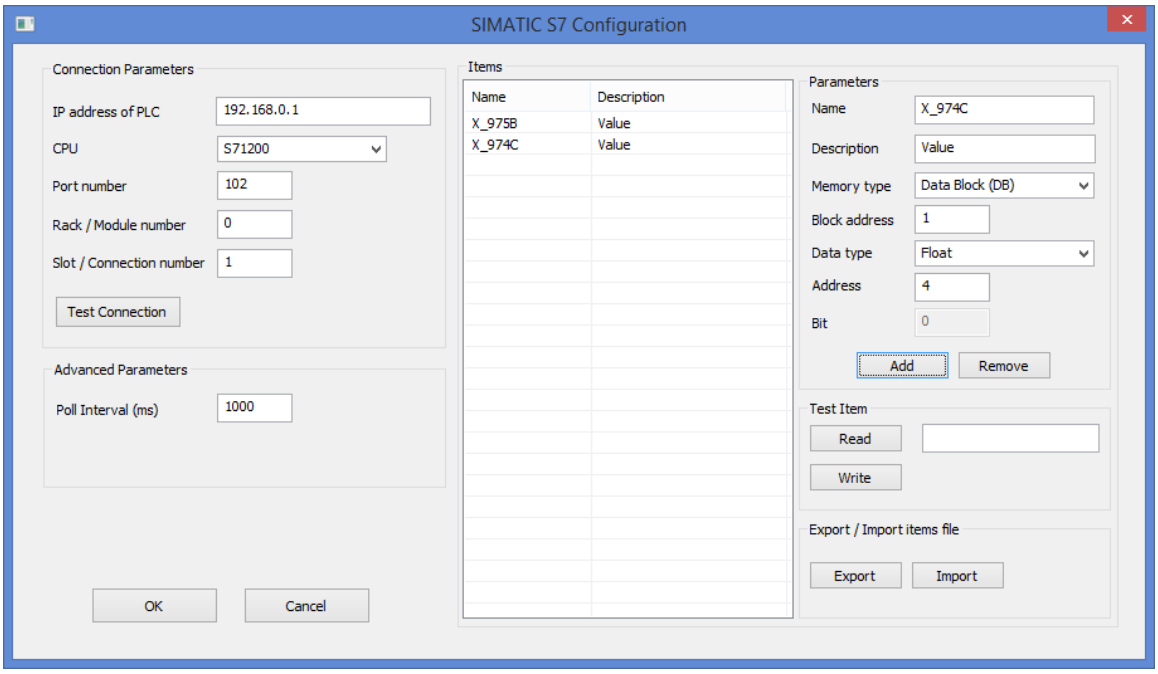
Note: The driver is compatible with the following CPU versions of S7 PLC: S7-200, S7-300, S7-400, S7-1200 and S7-1500.

To configure the SIMATIC S7 PLC driver, open the Siemens folder in the *Communication Configuration Wizard* window, and select the driver:



Click the *"Configure"* button - the following *SIMATIC S7 Configuration* window will open:

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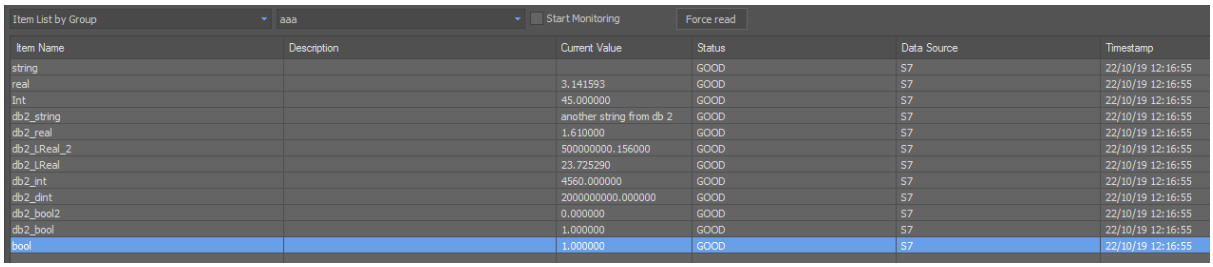
1. Connection Parameters – Enter the PLC parameters to establish the connection:
   a. Enter the IP address of the PLC.
   b. Select the matching CPU type from the list.
   c. Enter the port number.
   d. Enter the Rack and Slot numbers.
2. Click on “Test Connection to test and establish the connection to the PLC.
3. Advanced Parameters: Poll Interval - defines how often the driver will check the value of the tag to recognize a tag value change.
4. Parameters – Create the tags by the following parameters:
   a. Enter a meaningful name.
   b. Enter the tag description.
   c. Select the Memory type – “Data Block” – is the most common type to use.
   d. Enter the “Block address” – in which the data is stored.
   e. Select the Data Type from the list in alignment with the information from the PLC.
   f. Enter the Address (offset) of the data inside the block.
5. Click “Add” to add the tag to the list at the center.
6. Test Item – Check your tag configuration by reading the data from the tag or writing to it.
7. Export/Import Items file – Click on the “Export” button to open the browse for files window, enter a name for the file and click “save” to create a special SVC file with the extension “.s7i”. now the

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tags configuration can be duplicated into other projects or machines. Click on the “Import” button to import the tag configuration from an existing file.

Click “OK” to save and close the configuration window.

Using the SIMATIC S7 Real Time valued in a project:



After establishing the connection and adding the tags, they can be monitored in the “logger studio” tab by adding them to a new or existing logging group.

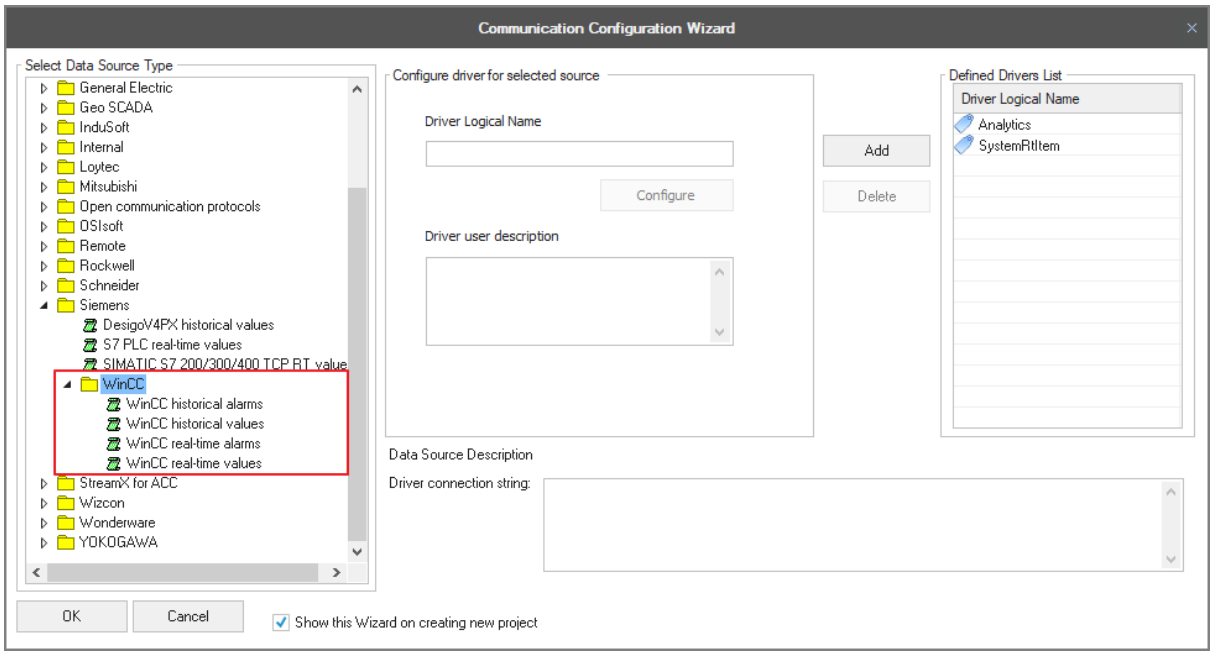
25.16.4 WinCC

The WinCC folder will display the following list of drivers:

- WinnCC historical alarms
- WinnCC historical values
- WinnCC real-time alarms
- WinnCC real-time values

NOTE: As real-time alarm logging in Dream Report is no longer supported, the WinnCC real-time alarms driver should not be used. It is present for backward compatibility only.

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WinCC drivers do not require any configuration. They connect to the running project in local WinCC SCADA. Select the desired driver from the list, type the name of the driver in the *Diver Logical Name* field, and click the *Add* button.

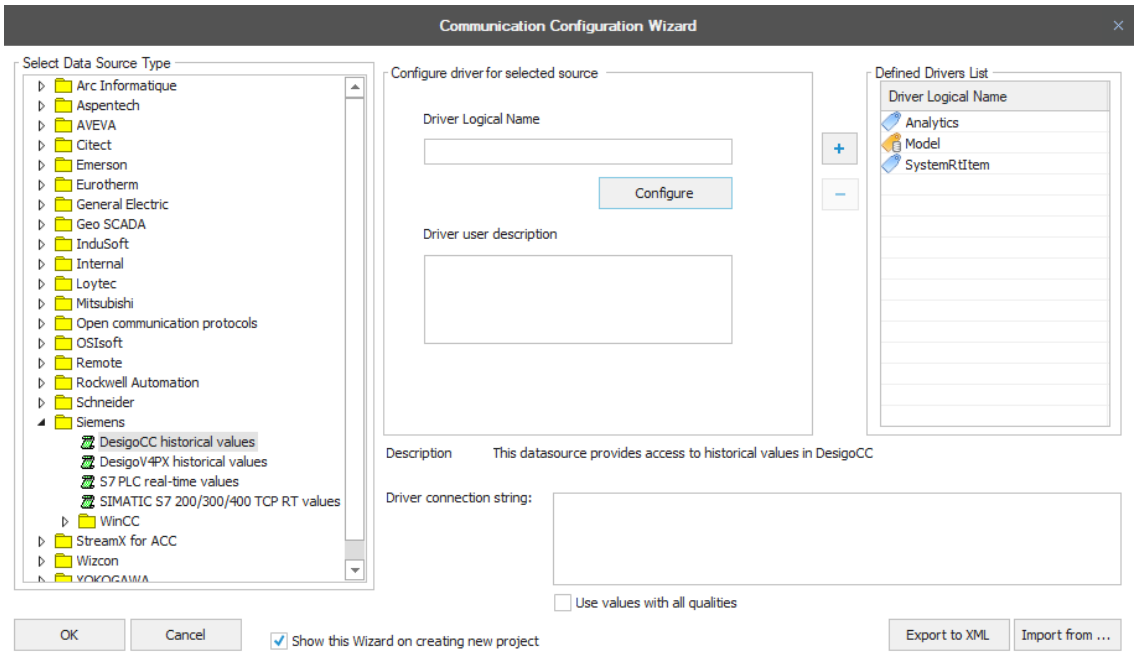
If you need to connect to a remote WinCC, then you should use a Remote Connector.

25.16.5 Siemens Desigo CC Historical Values

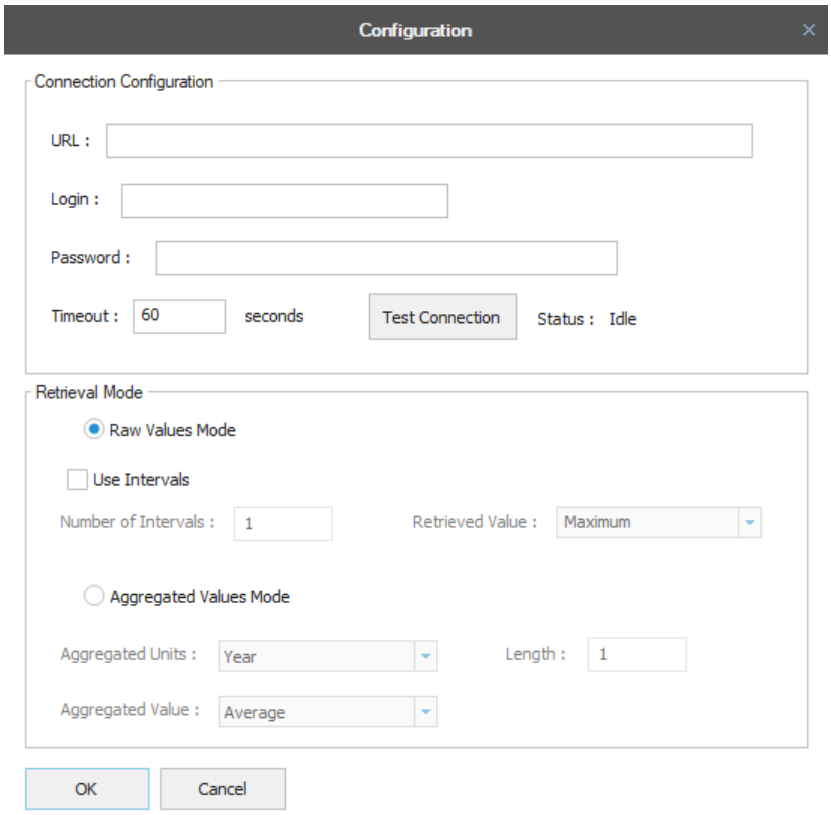
Siemens Desigo CC Historical Values Driver (REST API based)

Dream Report provides the connectivity to the *Desigo CC* historical data through its new *Desigo CC historical values communication driver.* This communication driver is based on the REST API.

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General Connection Settings



URL – specify the URL to connect to Desigo CC Platform*.

Login – specify the login to connect to Desigo CC Platform*.

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Password – specify the password to connect to Desigo CC Platform*.

* this information should be provided by Siemens Desigo CC Team in charge of the Desigo CC project development.

Timeout – specify the timeout for connection test. The value is in seconds

Test Connection – use this button to test the connection to Desigo CC platform.

Status – this information will be updated after the connection test.
Possible status values: Idle, Connected, Connection Failed.

Retrieval Mode – in this section it's possible to choose the retrieval mode for Desigo CC data source. Possible modes: "Raw Values" or "Aggregated Values.

Raw Values – if "Raw Values" retrieval mode is specified, it is possible to retrieve all data in raw mode or use intervals to make calculations.

Use Intervals – if "Use Intervals" is selected, it's possible to define the following parameters:

Number of intervals – specify the number of intervals to be used, so the specified in the object period will be split by set number.

Aggregated Values – if "Aggregated Values" is specified, it's possible to retrieve aggregated data from Desigo CC data source. The following parameters are available for this retrieval mode:

Aggregated Units – specify the aggregation period. Possible options: Year, Quarter, Month, Week, Day, Hour, Minute, Second.

Length, by default this value set to 1.

Aggregated Value – specify the aggregation function to be used. Possible options: Average, Count, First Value, Last Value, Standard Deviation, Sum, Sum Squared, Variance (do we need to explain some of the functions like Sum Squared and/or Variance). For detailed description of those options please refer to Desigo CC help.

25.17 Control Maestro (Wizcon)

Control Maestro (Wizcon) drivers of Dream Report enable you to connect to Control Maestro (Wizcon) SCADA using native connection and get access to the real-time data, real-time alarms and historical data and alarms of the Wizcon running project.

When user selects any Control Maestro (Wizcon) driver form the Wizcon folder in the Select Data Source Type section of the Communication Configuration Wizard dialog window (see the picture below), there is no need to make any special configuration, unless you want to configure collection of real-time network alarms from Wizcon network.

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Accessing historical values stored in MS SQL database

Data is stored in MS SQL database called “VfiTag”. There are two tables storing numerical (“VfiTagNumHistory”) and string values (“VfiTagStrHistory”). Timestamps are stored as Unix Timestamps with milliseconds. In newer versions of ControlMaestro there is also a third table with tag references called “VfiTagRef”.

Driver to use in Dream Report: Wizcon Native historical values driver OR Advanced ODBC historical values driver

Important information about Wizcon Native historical values driver:

- This driver does not require any configuration
- Dream Report has to be running on the same PC as ControlMaestro to use this driver OR you can use Dream Report Remote connector to access ControlMaestro running on another PC.
- This driver will work only when ControlMaestro is running.

Important information about Advanced ODBC historical values driver:

- Depending on configuration of ControlMaestro databases in MS SQL Server may be attached to server only when ControlMaestro is running.
- Depending on configuration of ControlMaestro databases may be split when size of database exceeds limit set in ControlMaestro. In such case there will be VfiTag database containing most recent data and there will also be other databases named VfiTag_XXX_YYY where XXX and YYY will be Unix timestamps (with milliseconds) indicating time period included in this database. Accessing data split this way with Advanced ODBC driver is not recommended, use the Wizcon Native historical values driver which will retrieve the data seamlessly.
- If older version of ControlMaestro is used where reference table is not available, only tag ids will be available, in this case the reference table either needs to be created manually or you should use Wizcon Native historical values driver to get tag names in browse explorer.

Accessing historical values stored in file formats (DBX/proprietary)

Data is stored in files either in DBX format or proprietary format. There are separate files for each day created and stored locally on the same PC as ControlMaestro.

Driver to use in Dream Report: Wizcon Native historical values driver

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Important information about Wizcon Native historical values driver:

- This driver does not require any configuration.
- Dream Report has to be running on the same PC as ControlMaestro to use this driver OR you can use Dream Report Remote connector to access ControlMaestro running on another PC.
- This driver will work only when ControlMaestro is running.

Accessing real-time values

Driver to use in Dream Report: Wizcon Native real time values

Important information about Wizcon Native real time values driver:

- This driver does not require any configuration.
- Dream Report has to be running on the same PC as ControlMaestro to use this driver OR you can use Dream Report Remote connector to access ControlMaestro running on another PC.
- This driver will work only when ControlMaestro is running.

Note: When browse of the list of Wizcon tags is opened and Wizcon network is enabled, you will see automatically a tree of Wizcon network stations and expanding a tree, you will get a list of Wizcon tags from the selected station.

If a network station has more than a thousand tags, it can take several seconds (up to a minute) to get a list of tags from the selected station. (Note: Receiving a list of 65000 tags from remote station can take up to 7-10 minutes, depending on the PC resources and network load).

Accessing historical alarms stored in MS SQL database

Alarms are stored in MS SQL database called “VfiAlarm” in table called “VfiAlarmHistory”. All timestamps are stored as Unix timestamp with milliseconds.

Driver to use in Dream Report: Wizcon Native historical alarms OR Advanced ODBC historical alarms driver

Important information about Wizcon Native historical alarms driver:

- This driver does not require any configuration.

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- Dream Report has to be running on the same PC as ControlMaestro to use this driver OR you can use Dream Report Remote connector to access ControlMaestro running on another PC.
- This driver will work only when ControlMaestro is running.

Important information about Advanced ODBC historical alarms driver:

- Depending on configuration of ControlMaestro databases in MS SQL Server may be only attached to server only when ControlMaestro is running.
- Depending on configuration of ControlMaestro databases may be split when size of database exceeds limit set in ControlMaestro. In such case there will be VfiAlarm database containing most recent alarms and there will also be other databases named VfiAlarm_XXX_YYY where XXX and YYY will be Unix timestamps (with milliseconds) indicating time period included in this database. Accessing data split this way with Advanced ODBC driver is not recommended, use the Wizcon Native historical alarms driver which will retrieve data seamlessly.

Accessing historical alarms stored in file format (DBX)

Alarms are stored in DBX files. There are separate files for each day. Files are stored locally on the same PC as ControlMaestro.

***Driver to use in Dream Report**: Wizcon Native historical alarms driver*

Important information about Wizcon Native historical alarms driver:

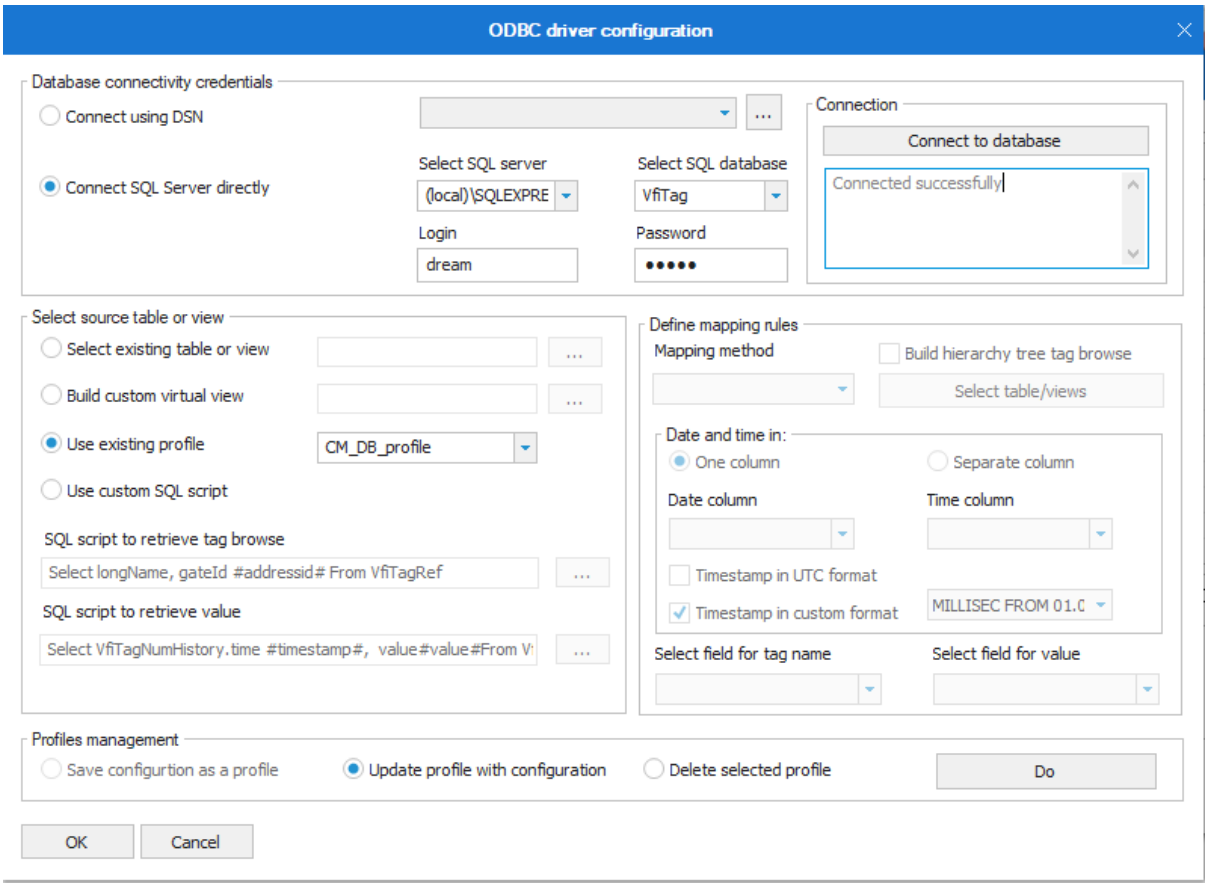
- This driver does not require any configuration.
- Dream Report has to be running on the same PC as ControlMaestro to use this driver OR you can use Dream Report Remote connector to access ControlMaestro running on another PC.
- This driver will work only when ControlMaestro is running.

Advanced ODBC historical values driver configuration for ControlMaestro

To configure this driver for use with ControlMaestro SQL database, select “Connect SQL Server directly”, enter SQL server name, login and password; and then select SQL database.

If newer version of ControlMaestro is used that has tag reference table (“VfiTagRef”), Dream Report has a predefined profile for it. Just select “Use existing profile” and select “CM_DB_profile”. Configuration should look like this:

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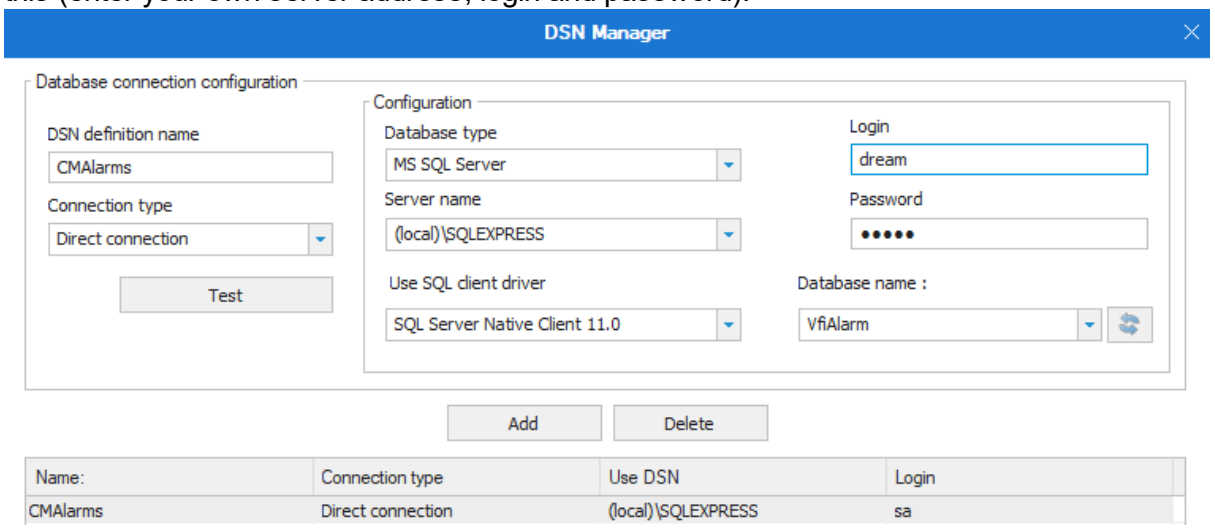


This profile contains predefined script to map tag names to historical values.

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Advanced ODBC historical alarms driver configuration for ControlMaestro

To use this driver, first add a new DSN by clicking "…" button and then configuring DSN like this (enter your own server address, login and password):



Select Database name (should normally be "VfiAlarm") and input your own DSN definition name. You can test here if the connection is correct by clicking "Test". Add the DSN definition and close this window to go back to driver definition.

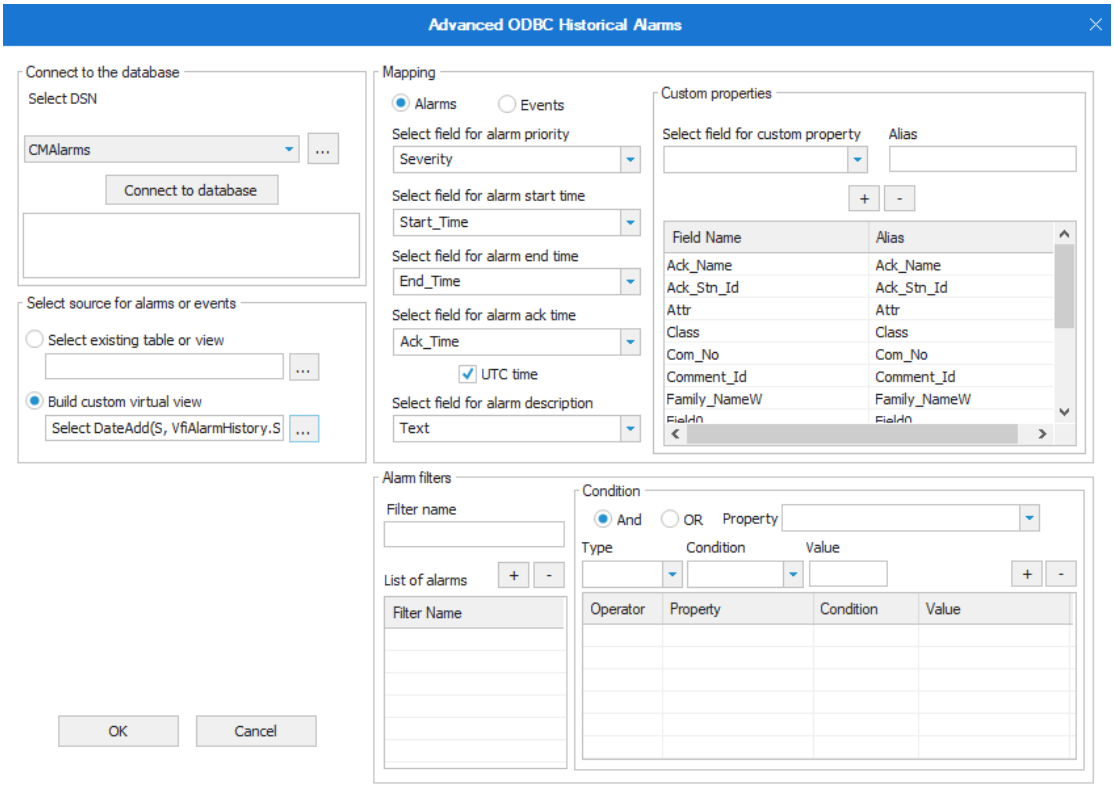
Because timestamps in this table are stored as Unix timestamp with milliseconds, they need to be adjusted. In the Driver configuration window select DSN that was created, choose "Build custom virtual view" and use visual query builder and text editor to create this view:

```
Select DateAdd(S, VfiAlarmHistory.Start_Time / 1000, '1970-01-01') As
  Start_Time,
  VfiAlarmHistory.Id,
  DateAdd(S, VfiAlarmHistory.End_Time / 1000, '1970-01-01') As End_Time,
  DateAdd(S, VfiAlarmHistory.Ack_Time / 1000, '1970-01-01') As Ack_Time,
  VfiAlarmHistory.Ack_Name,
  VfiAlarmHistory.Severity,
  VfiAlarmHistory.Class,
  VfiAlarmHistory.Zone,
  VfiAlarmHistory.Attr,
  VfiAlarmHistory.Ident,
  VfiAlarmHistory.Name,
  VfiAlarmHistory.Text,
  VfiAlarmHistory.Station_Id,
  VfiAlarmHistory.Comment_Id,
  VfiAlarmHistory.Path,
  VfiAlarmHistory.Stat0_Time,
  VfiAlarmHistory.Stat0_User,
  VfiAlarmHistory.Stat1_Time,
```


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```
  VfiAlarmHistory.Stat1_User,
  VfiAlarmHistory.Field0,
  VfiAlarmHistory.Field1,
  VfiAlarmHistory.Field2,
  VfiAlarmHistory.Field3,
  VfiAlarmHistory.Field4,
  VfiAlarmHistory.Com_No,
  VfiAlarmHistory.Ack_Stn_Id,
  VfiAlarmHistory.Handler,
  VfiAlarmHistory.Family_NameW
From VfiAlarmHistory
```

In next step define mapping. Dream Report needs to know which fields hold priority, alarm description and alarm start, end and ack times. You can also add all the custom properties that are available so you can display them in the Alarm table:



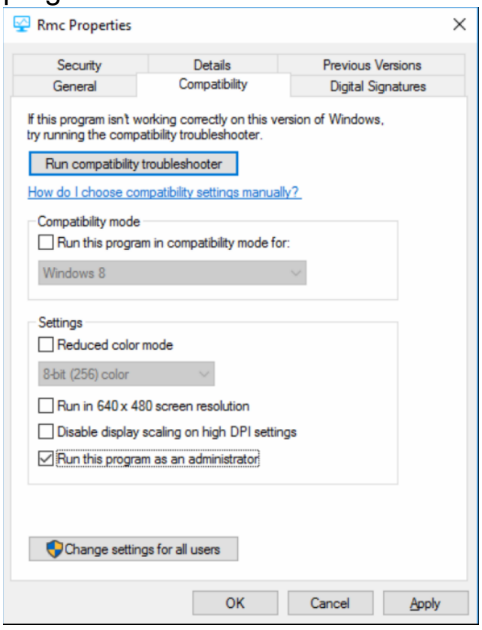
At this point it is also possible to pre-filter alarms by any condition you write in the bottom right of the window.

Possible problems and troubleshooting

One of known issues is when both Dream Report and ControlMaestro are running using user account without admin rights. Sometimes in such cases communication does not work. If this happens, solution is to edit properties of products' processes and enable option “Run this

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program as an administrator”:



This has to be done for all the processes of Dream Report:

- DreamReport.exe
- Generator.exe
- RTM.exe
- RMC.exe
- LoggerRT.exe
- etc. (if also other modules are used)

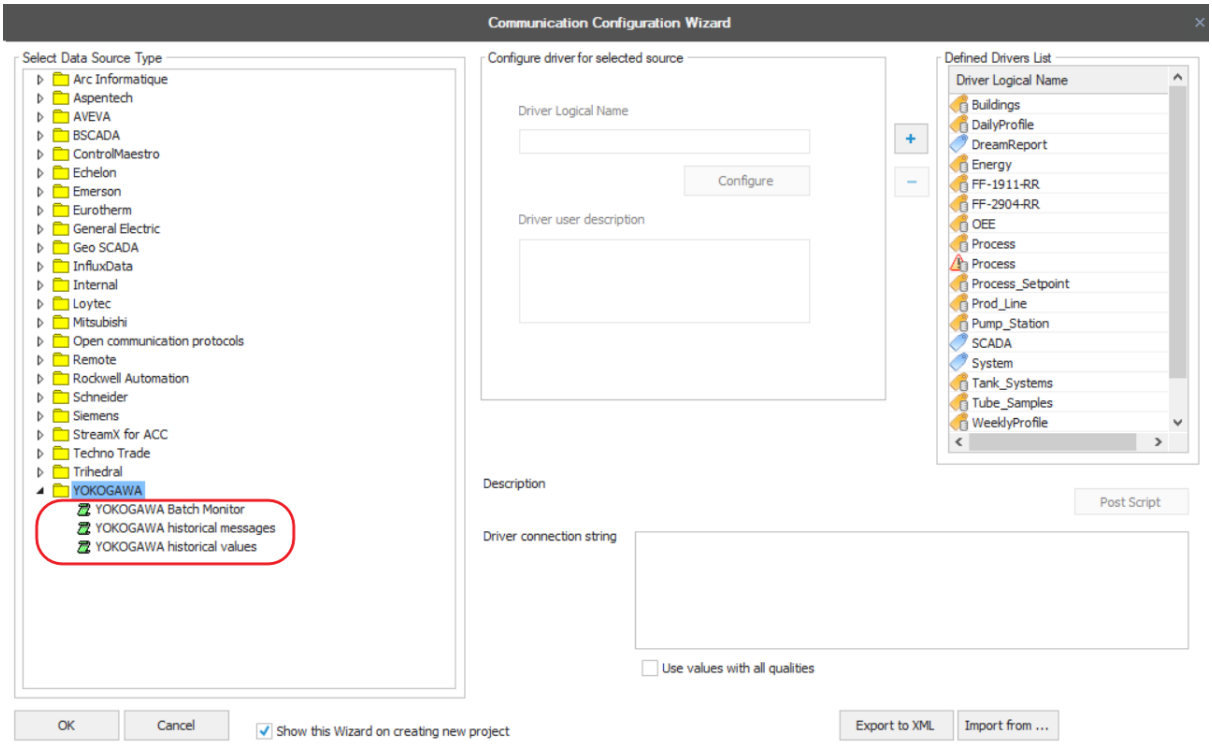
25.18 YOKOGAWA

The Dream Report *Yokogawa* communication drivers provide data connectivity between Dream Report and the Yokogawa data sources (recorders).These drivers directly access the native/binary Yokogawa recorder file formats.

Note: There are certain scenarios (e.g., query performance with large data files, advanced data filtering on the Yokogawa data) where you might want to first extract the proprietary files into an “open” MS SQL Server database, and then report on the data from the SQL tables. The optional Yokogawa Data Importer Tool allows Dream Report to periodically import data from the Yokogawa binary files from the specified folders to a database to a SQL Server. The Yokogawa Data Importer is implemented with Dream Report version 2023 Patch1 or newer, and is license enabled. Please contact Tech Support for more information on this utility, if needed.

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To configure the *Yokogawa* drivers, first, open the *Communication Configuration Wizard* dialog window in Dream Report Studio - all drivers are listed under the *Yokogawa* folder:



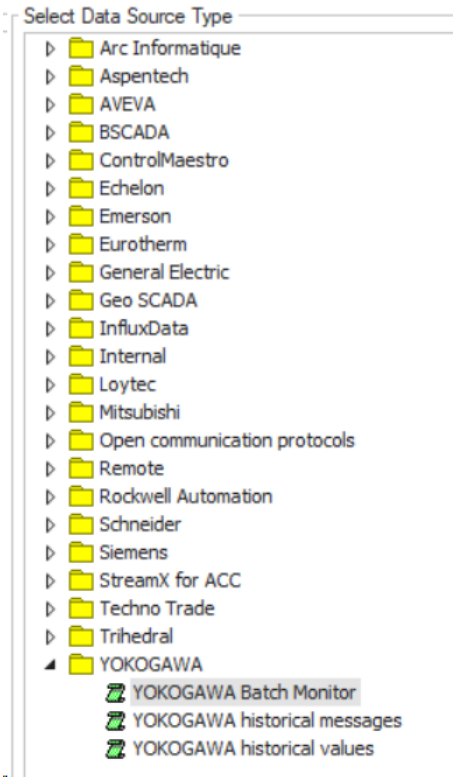
Select the driver you need for your project, give it a logical name and click on the *Configure* button.

After finishing the configuration click on the *Add* button to add it to the list and then *OK* to save and close the wizard.

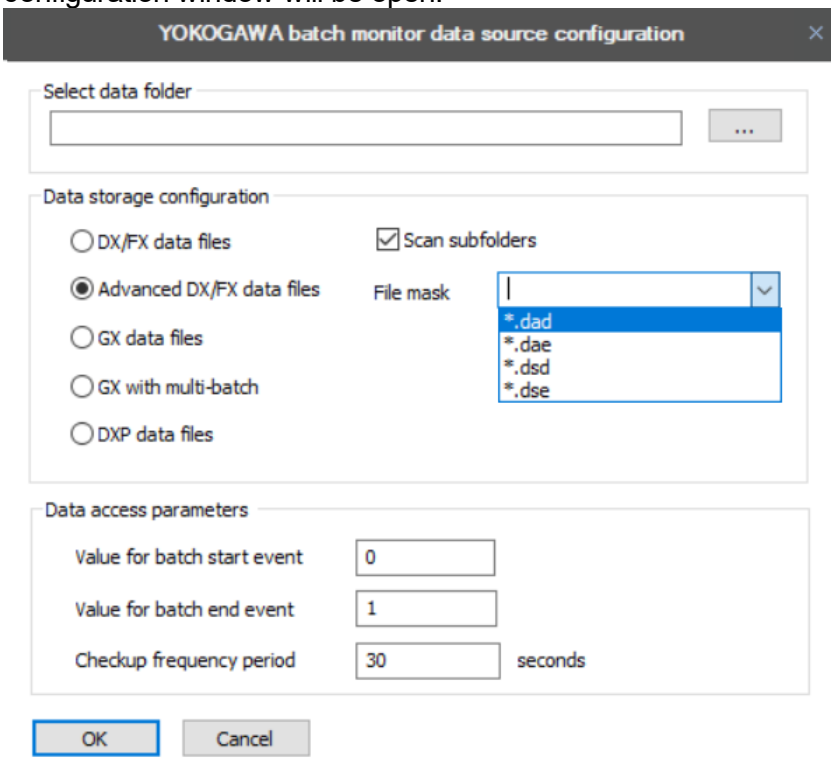
25.18.1 YOKOGAWA Batch Monitor

The *Yokogawa Batch Monitor* driver allows users to connect to Yokogawa files to monitor batch start and batch end events, and generate reports automatically upon batch end or batch start.
To configure an instance of this driver, select it from the list:

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Then, set the logical name for that new driver instance and click *Configure* button and driver configuration window will be open:



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Select the data folder where the Yokogawa recorder files are stored. In the *Data Storage Configuration* section, select the appropriate Yokogawa file type this driver instance will work with, including the file extension type.

Next, specify *Data Access Parameters*, which are used for detecting batch start and end events:
Value for batch start event and *Value for batch end event* parameters – what value the driver will send to Dream Report when the corresponding event occurs.

With the default parameters, the driver will send a 0 value on the batch start event, and a 1 value on the batch end event. These values will be used when configuring automatic report generation on batch start or batch end - make sure to use the appropriate value to trigger report generation.

Checkup frequency period defines how often the driver will connect to the Yokogawa Files folder to check batch statuses for specific instruments and groups. The default value is 30 seconds - i.e., every 30 seconds, the driver will connect, check batch status for each instrument/group, and then disconnect.

Once configuration is completed, press "OK", and add [+] the driver instance to the project.

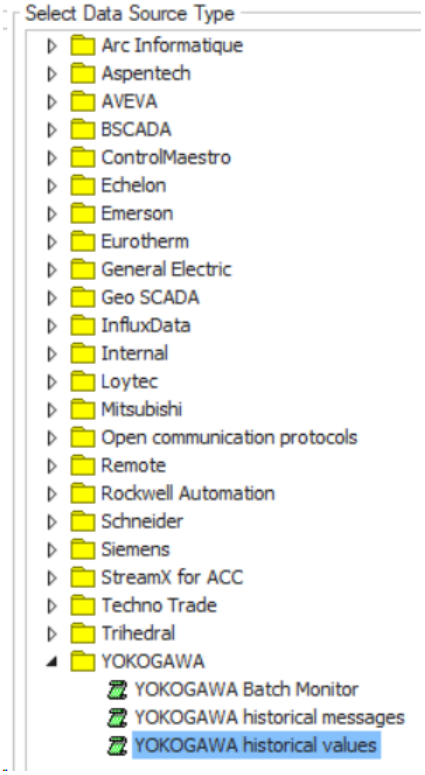
To configure automatic batch report generation from Yokogawa files:
1. Configure and add the Batch Monitoring driver, as well as the Yokogawa Historical values driver to the project
2. Create a Batch Definition, based on the Yokogawa historical values driver (Item-based, External Data Source, and select any channel from the desired recorder)
3. On the batch report's Report Settings, enable "Generate Report on Event", select the same recorder which was used for the batch definition, and assign the required value according to the required event type (end of a batch or start of a new batch).

25.18.2 YOKOGAWA Historical Values

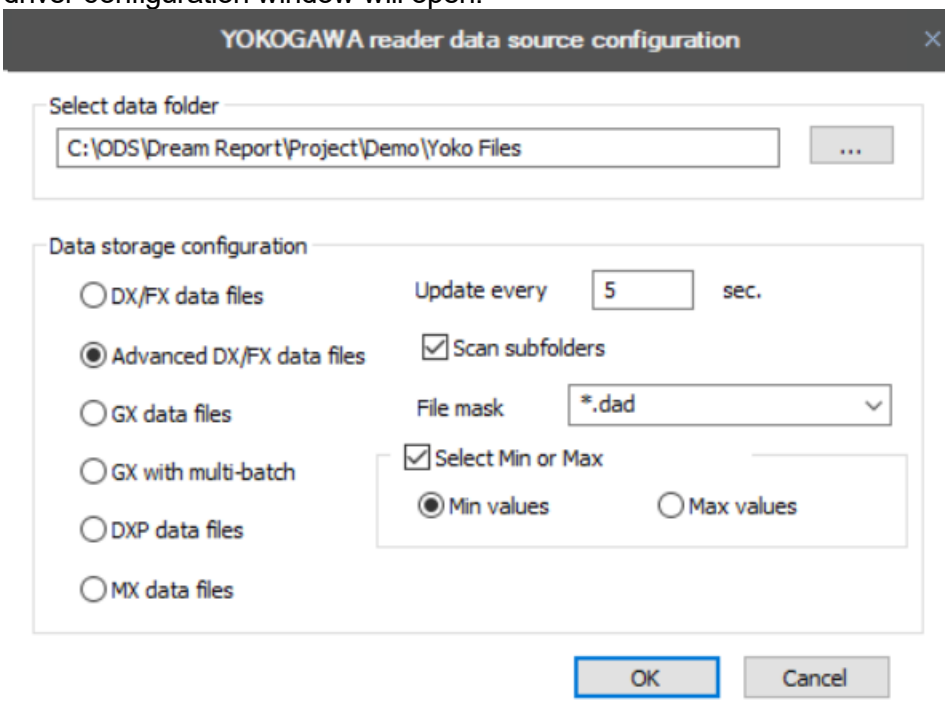
Yokogawa historical values driver allows users to connect to Yokogawa files, access and retrieve historical values and use that data in reports.

To configure an instance of this driver, select it from the list:

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Then, set the logical name for that new driver instance, click the *Configure* button, and the driver configuration window will open:



Select the data folder where the Yokogawa recorder files are stored. In the *Data Storage Configuration* section, select the appropriate Yokogawa file type this driver instance will work with, including the file extension type.

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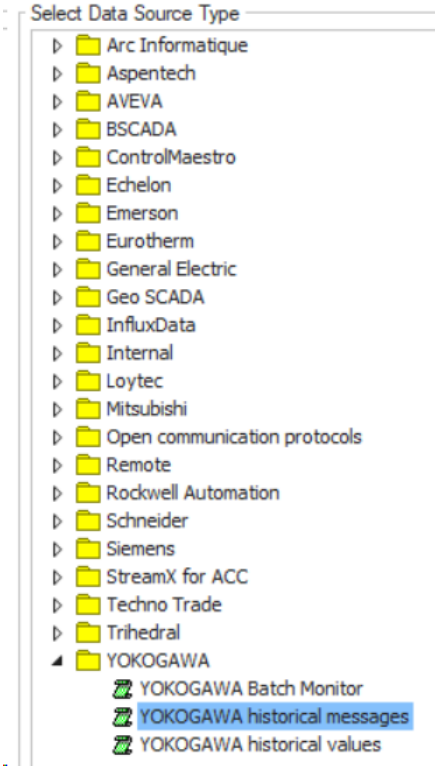
Use the *Update every:__sec.* setting to specify how often runtime will scan the specified folder for newly received data.
Note: Please ensure to use a reasonable update rate, as fast updates may cause performance issues.

Once configuration is completed, press "OK", and add [+] the driver instance to the project.

25.18.3 YOKOGAWA Historical Messages

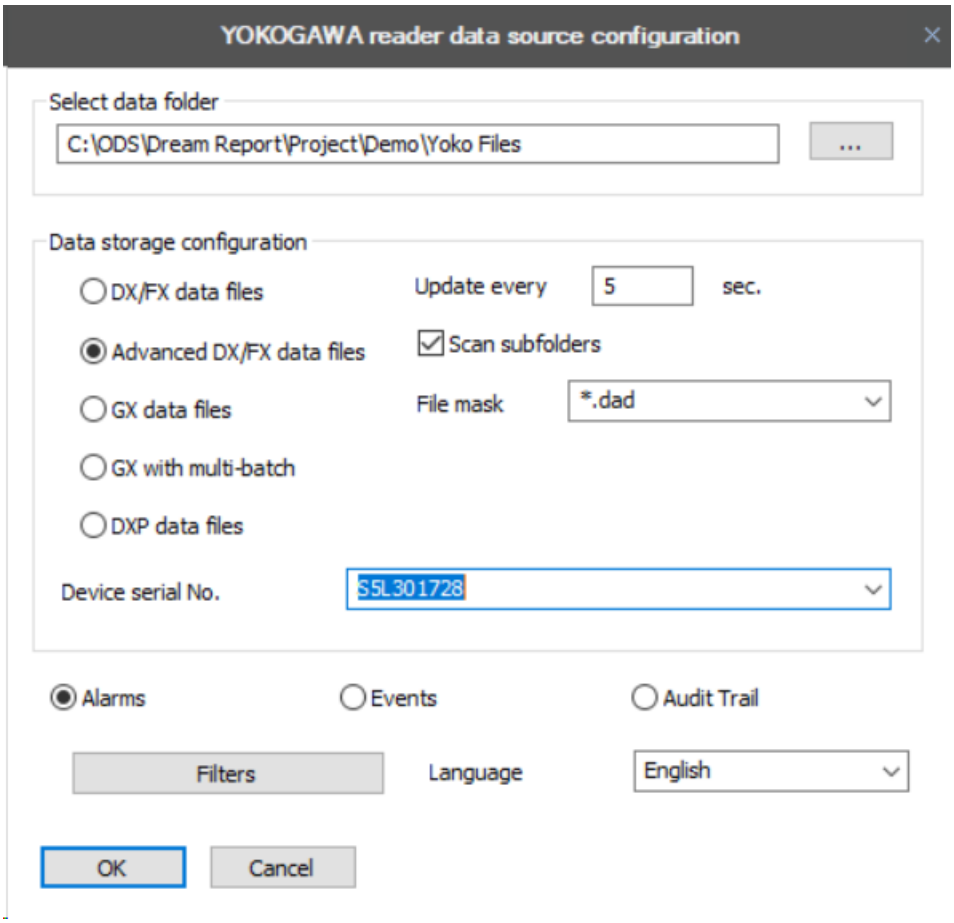
The *Yokogawa Historical Messages* driver allows users to connect to Yokogawa recorder files, access and retrieve alarm, event and audit trail messages, using pre-defined filters.

To configure an instance of this driver, select it from the list:



Then, set the logical name for that new driver instance,click the *Configure* button, and driver configuration window will open:

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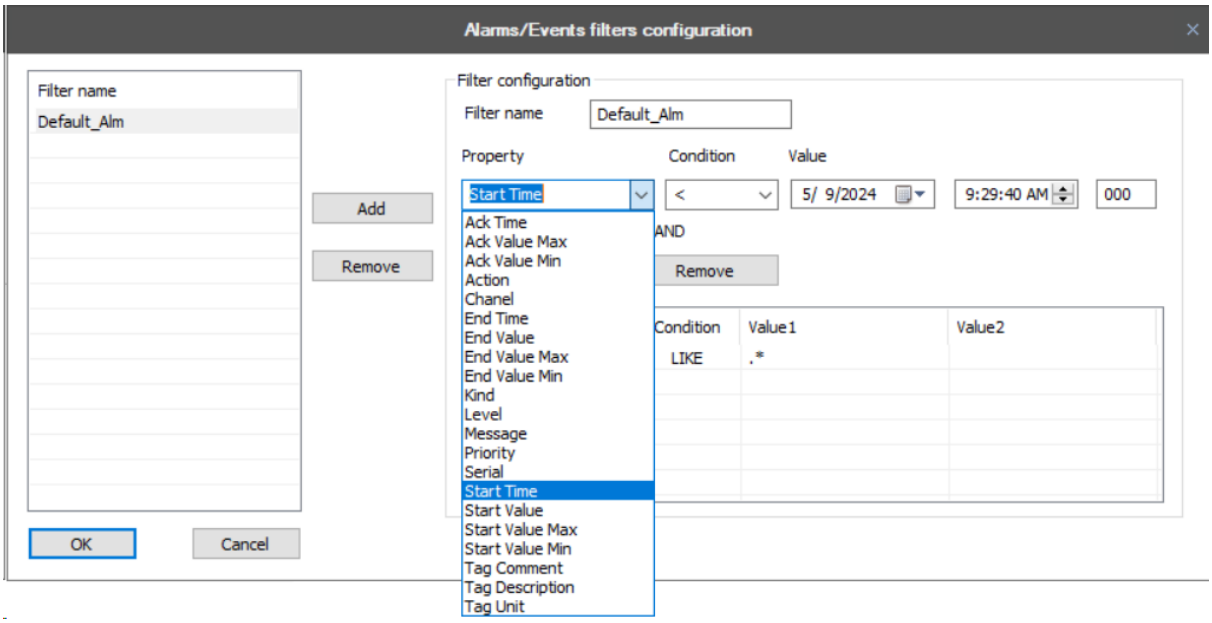
Select the data folder where the Yokogawa recorder files are stored. In the *Data Storage Configuration* section, select the appropriate Yokogawa file type this driver instance will work with, including the file extension type.

Use the *Update every:__sec.* setting to specify how often runtime will scan the specified folder for newly received messages.
Note: Please ensure to use a reasonable update rate, as fast updates may cause performance issues.

Specify the type of messages: *Alarms*, *Events* or *Audit Trail*. Note that you can configure multiple instances of this driver, with each one exposing a different category of messages – e.g., one for alarms, and one for audit trail messages.

Select the *Language* for message text from available languages in the combo box. Open *Filters* to specify message filters to the driver instance definition:

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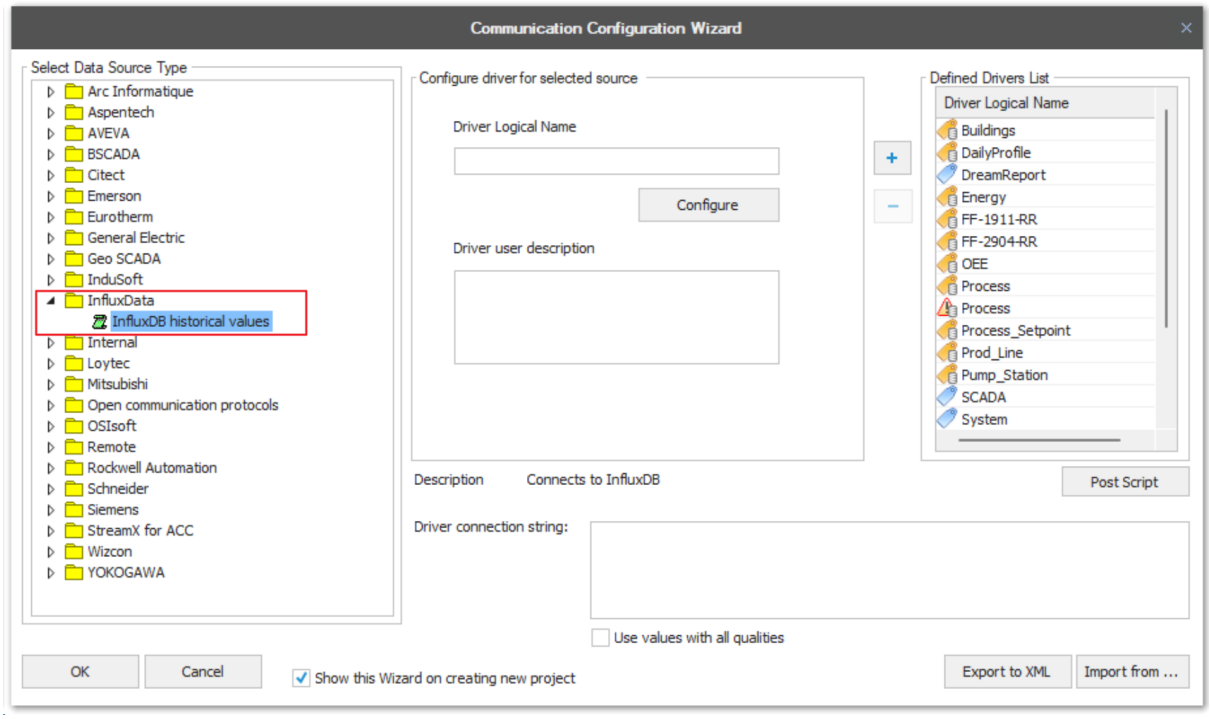
Note: The default filter "Default_Alm" will populate all Alarms available in the specified time period when the report is generated. User can add additional filters with different criteria (e.g., by Priority, specific Channel, etc.) and then reference those filter definitions in report(s) where alarm tables and alarm-based metrics/calculations are used. Please refer to the *Alarms and Events Filter Manager* topic in the "Tools" section of the user manual for additional information.

Once configuration is completed, press "OK", and add [+] the driver instance to the project.

25.19 InfluxData

The ***InfluxDB Historical Values*** driver provides the ability to access Influx databases and retrieve historical, timestamped data from local or cloud based InfluxDB server.

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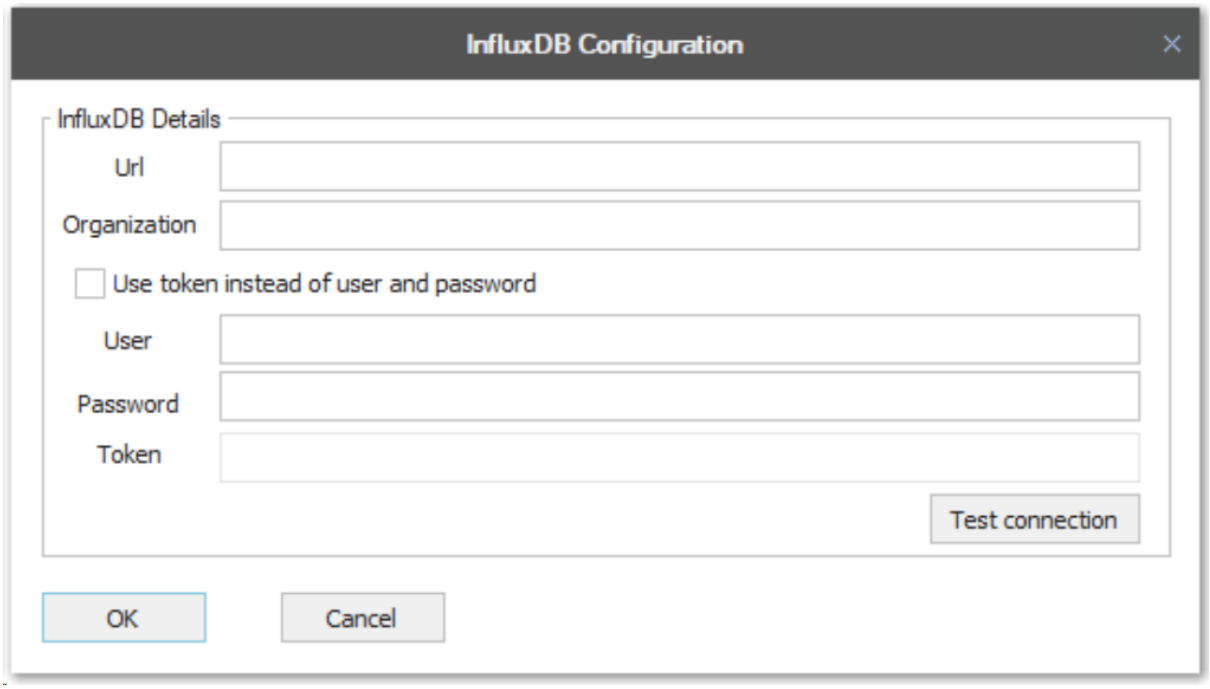
25.19.1 InfluxDB Historical Values

Dream Report includes **InfluxDB driver**, which enables connectivity to any external cloud-based databases which support InfluxData connectivity and have supported time driven data structure.

InfluxDB driver of Dream Report provides automatic tag browsing, tags data extraction.

Once user provides logical name for the InfluxDB instance definition and presses "Configure" button, the following dialog will be opened:

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Url - please provide

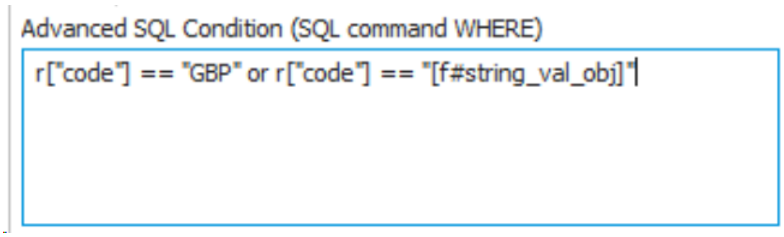
Organization - provide the name of your organization. This name has to be taken from the InfluxDB server. Please contact InfluxDB administrator to get the details.

Use token instead of user and password - User has two possible ways to get connected to the Influx Database, by providing the user name and password or by providing the connection token.

As soon as all the connection details were provided, user can check the connection to the InfluxDB server by pressing "Test connection" button.

Once user selected to configure the connection with token authentication then Organization name can be empty.

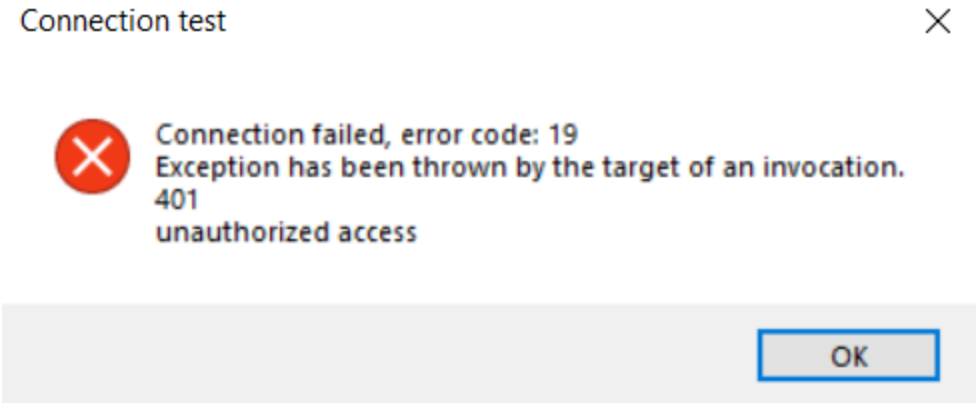
InfluxDB driver supports "Advanced SQL Condition" in the following syntax:



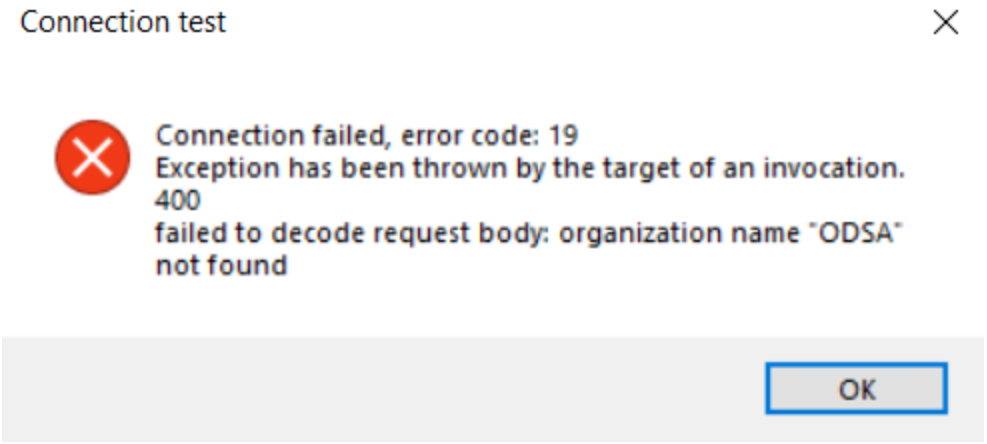
Note: AddAutoQuote tune parameter has to be set to "no" in Dream Report.ini

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Potential Errors on the "Test connection":

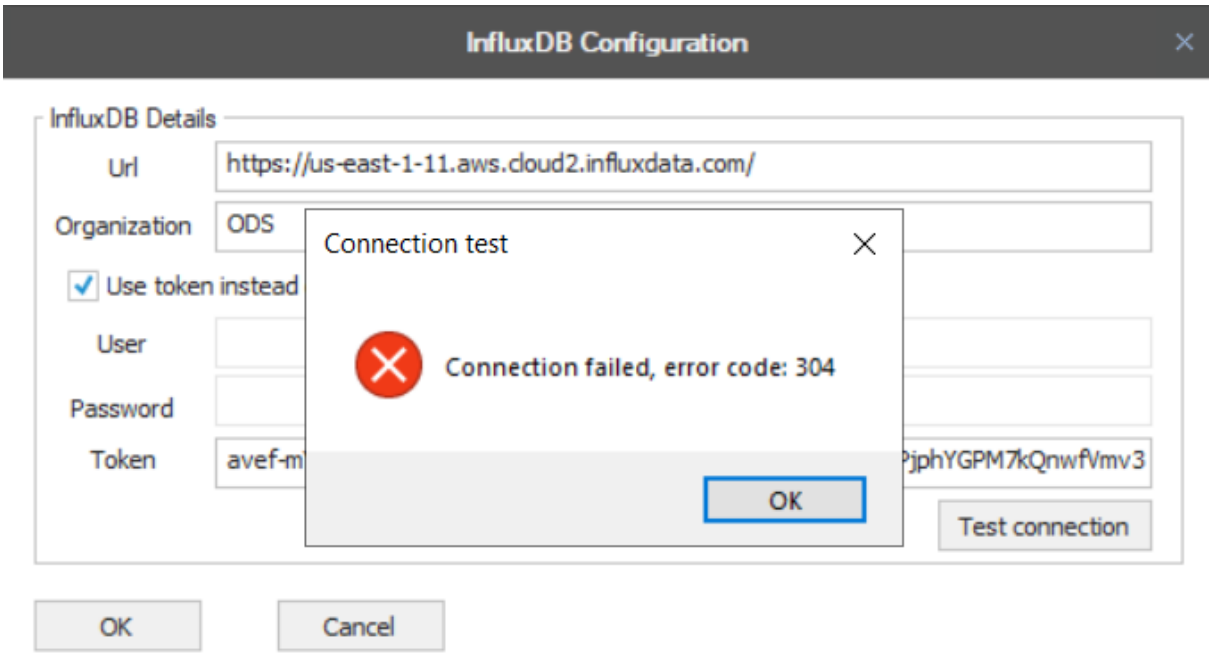


- User name or password is not correct, please ensure that the inserted information is correct, otherwise please contact administrator

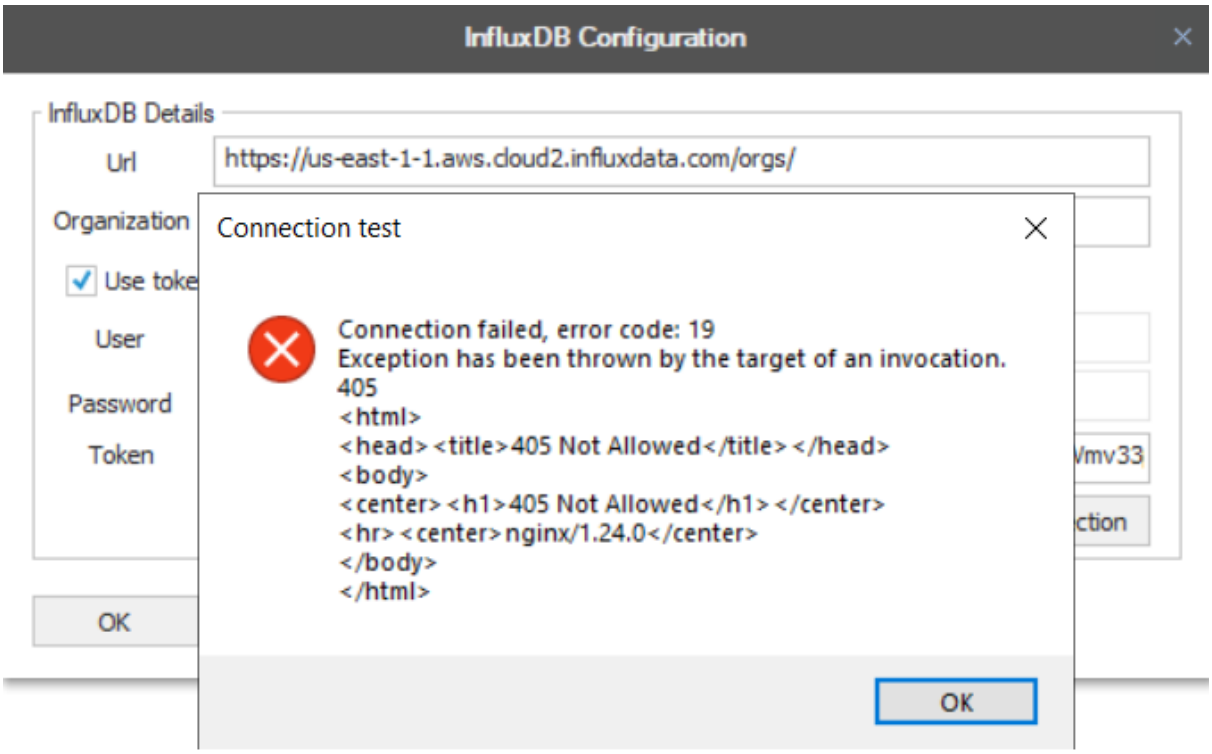


- Wrong or incorrect Organization name.

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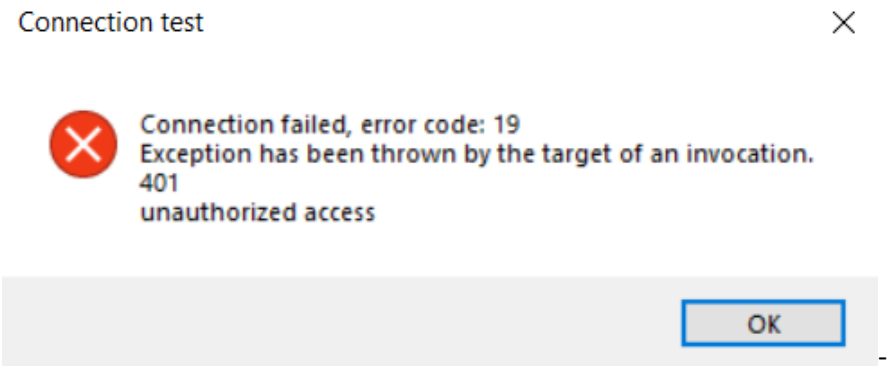


- incorrect URL



- incorrect URL

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- incorrect Token

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Dashboards

26 Dashboards

The **Dashboard Platform** is an end-to-end solution for creating, managing and sharing interactive dashboards. It includes a powerful dashboard designer application for easily composing dashboards as well as a web interface for managing and viewing dashboards.

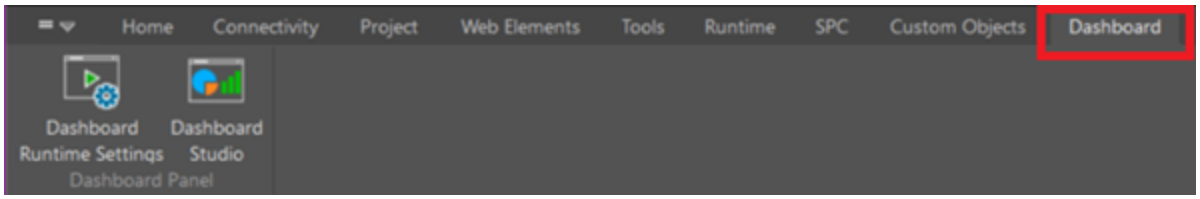
Usage

In order to use the Dashboards feature in a Dream Report project, that the following requirements must be met:

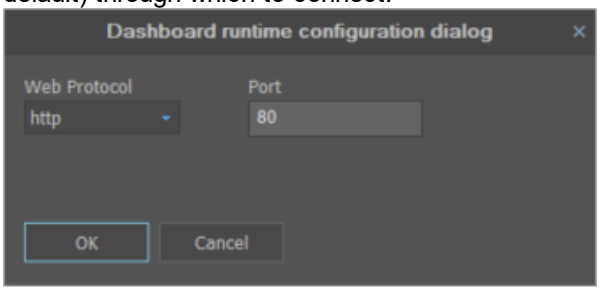
1. Dream Report Full version (not an OEM) license
2. 250-tag or larger license is required
3. At least one Data Model must be configured in Dream Report

Note: The Data Model names will be used in the Dashboard's data source configuration, so make sure to use intuitive and logical names.

After configuring one or more data models in your project, go to the ***Dashboard*** tab and click the "***Dashboard Runtime Settings***" option to set the basic connection settings for the dash-boarding:



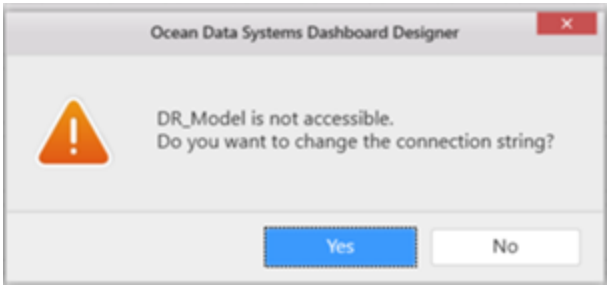
When the "*Dashboard Runtime Configuration Dialog*" opens, select the Web protocol and the port (80 is default) through which to connect:



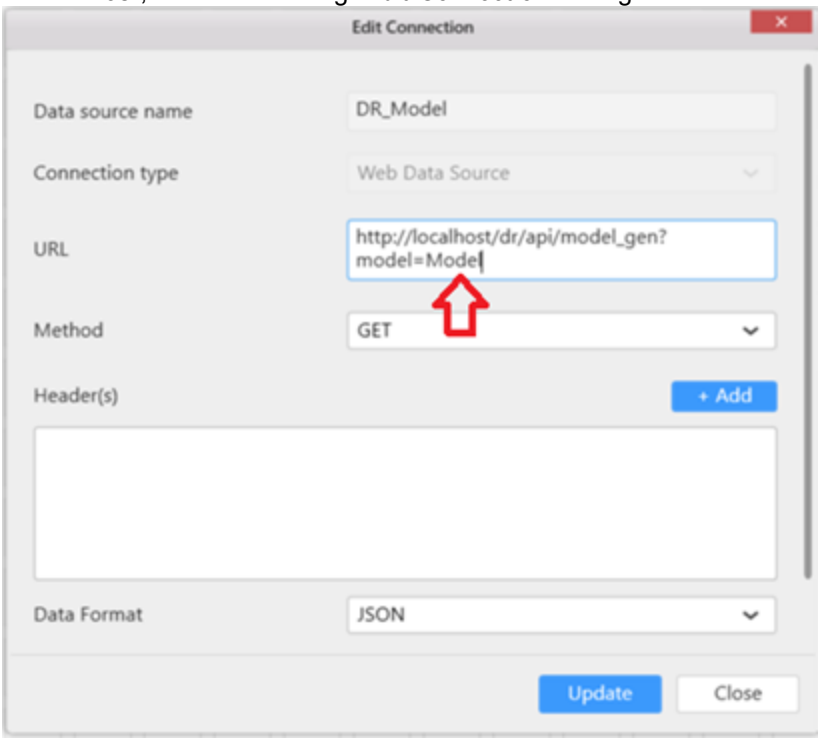
Click "**OK**" to save the settings and close the window. Depending on the Windows security settings, a UAC *User Access Control) pop-up window might pop up - click"*Yes*" to allow the connection.

After connecting, click on the "***Dashboard studio***" icon on the *Dashboard* tab. The project will run (if not already running), and the "*Dashboards Designer*" window will open. If the first time opening the designer, the following pop-up window will open:

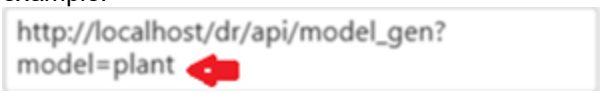
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Press "*Yes*", and the following "*Edit Connection*" configuration window will open:

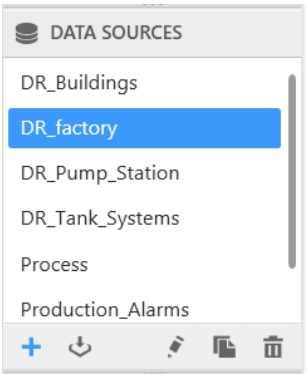


In the URL field, change the "Model" (as shown above) to the name of your actual data model – for example:

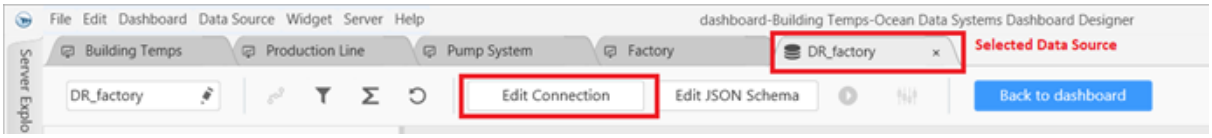


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You can edit the connection settings of any data source, by first double-clinking the specific data source name on the right-side panel, or by selecting the data source name, and clicking the pencil icon below "Edit data source":



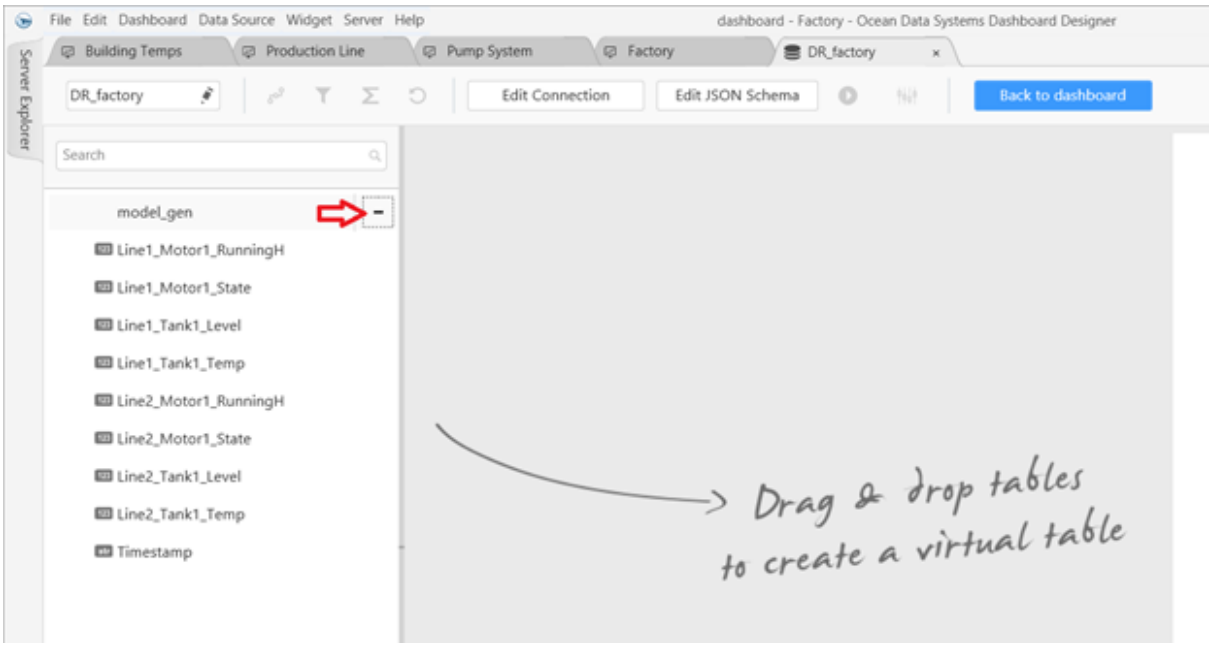
Once the Data Source tab opens, clicking on the "*Edit connection*" button to open the configuration window shown previously:



Notes:

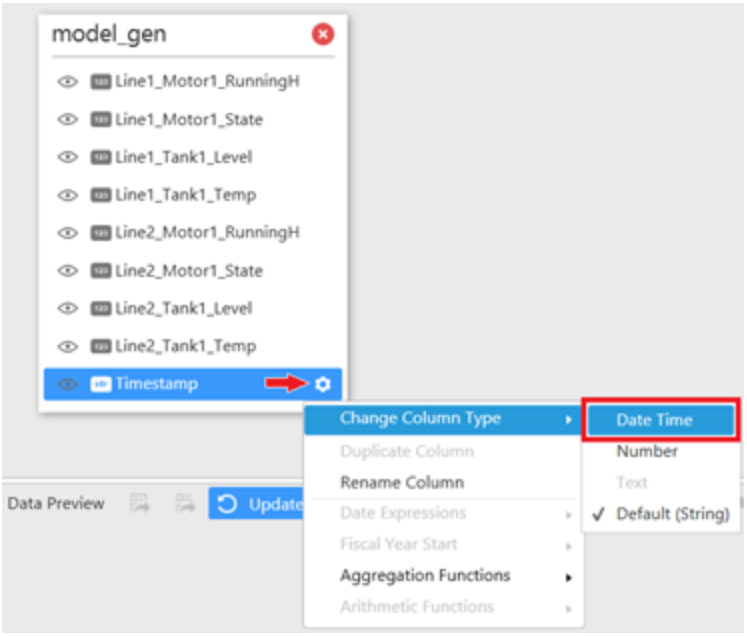
- The name of the Data source should be: **DR_<*Name of the Data model*>**
- The URL should be: **http://localhost/dr/api/model_gen?model= <*Name of the Data model*>**

Once the Data Source panel is open, click the + to display the list of items in the data model. Drag the items into the data source panel:



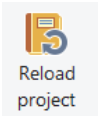
Click "*Connect*" to open the window with the list of tags exposed through the data source:

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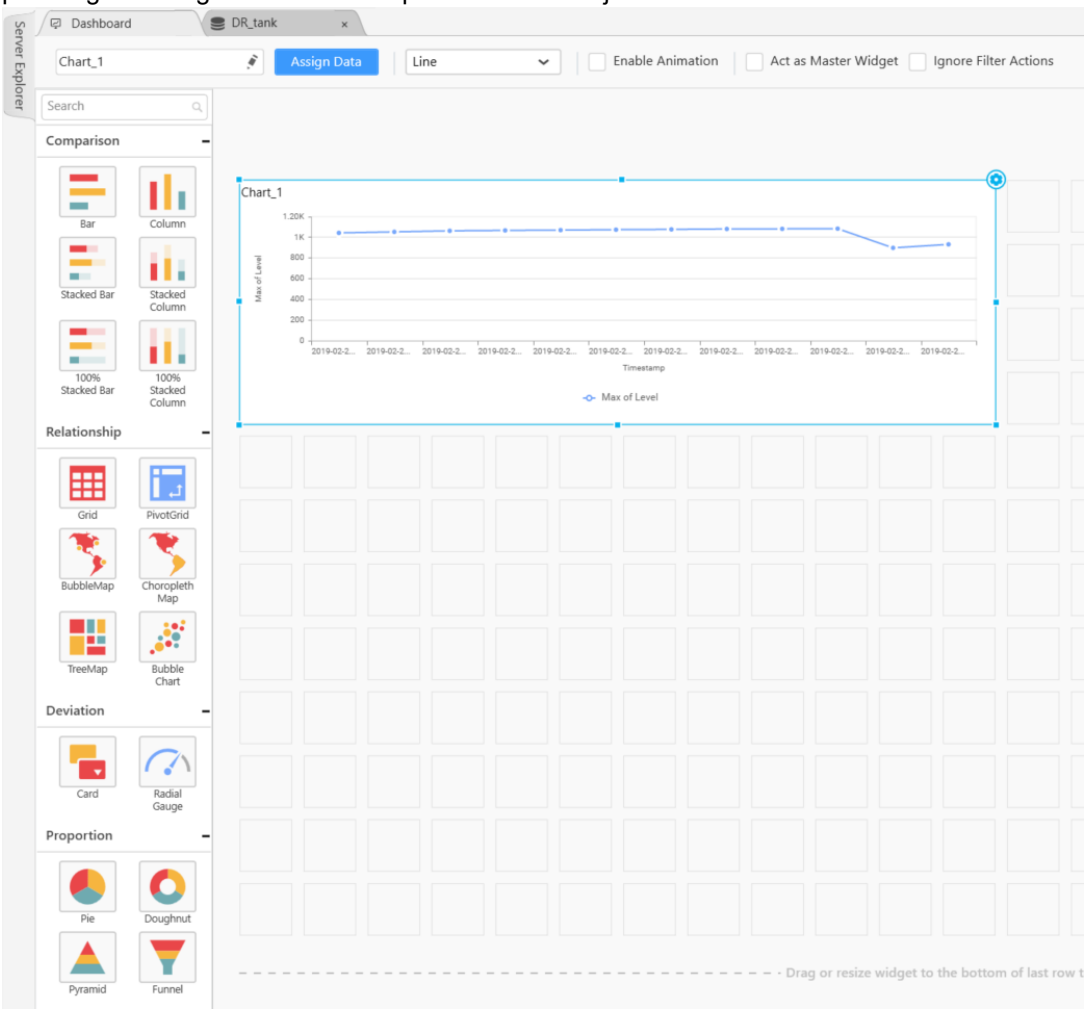
Notes:

- The Timestamp column type should be changed to "*Date Time*" (it will be set to *String* by default) for proper operation
- Whenever a new "Data model" is added to the Dream Report project in Dream Report Studio, make sure to "Reload Project" in Studio to enable the Dashboard Studio to connect to that data model.



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After configuring the Data sources, drag and drop the widgets from the left, resize, and configure by pressing on the “gear icon” in left up corner of the object:



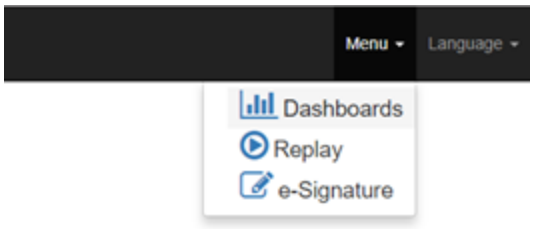
For more information about dashboard designing, please refer to:

https://help.syncfusion.com/dashboard-platform/dashboard-designer/getting-started

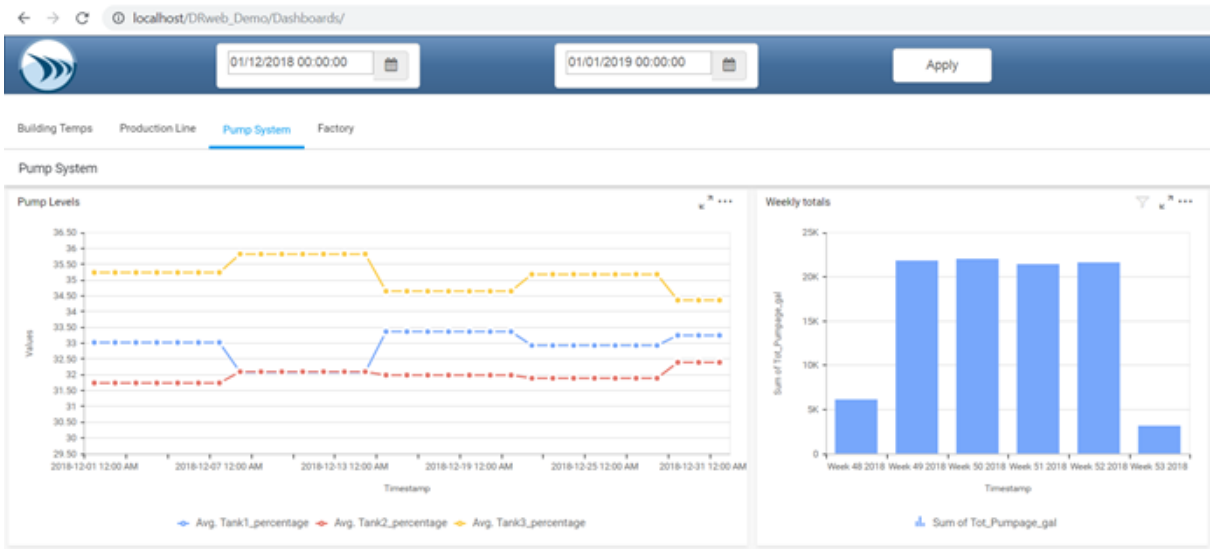
Accessing Dashboards from Dream Report Web Portal

In the Dream Report Web Portal, click on “Dashboards” from the top-right “Menu” selection in the browser, to view and interact with the dashboards.

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Specify dates in the timestamp pickers, and click “Apply” to show the dashboard results on selected period:



Click on the “Dream Report” logo to go back to project’s main web portal.

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