GUIDE

OPC Router Quick Start

HANDS-ON APPLICATION GUIDE

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Software toolbox®

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Introduction

The OPC Router provides a flexible way to move data from point A to point B, while transforming, analyzing, and acting on said data. This guide is intended to serve as an introduction to using the OPC Router and how to quickly get up and running. It assumes no prior knowledge or experience using the product but is meant to be introductory, and not a replacement of the OPC Router help file or feature specific documentation. For additional details on any feature mentioned in this document please refer to the help file.

This guide will look at:

1. Installing the OPC Router
2. Applying a license
3. What components make up the OPC Router Configuration
4. How to configure a basic connection
5. How to deploy the configuration to the runtime service
6. How to validate the configuration is running successfully

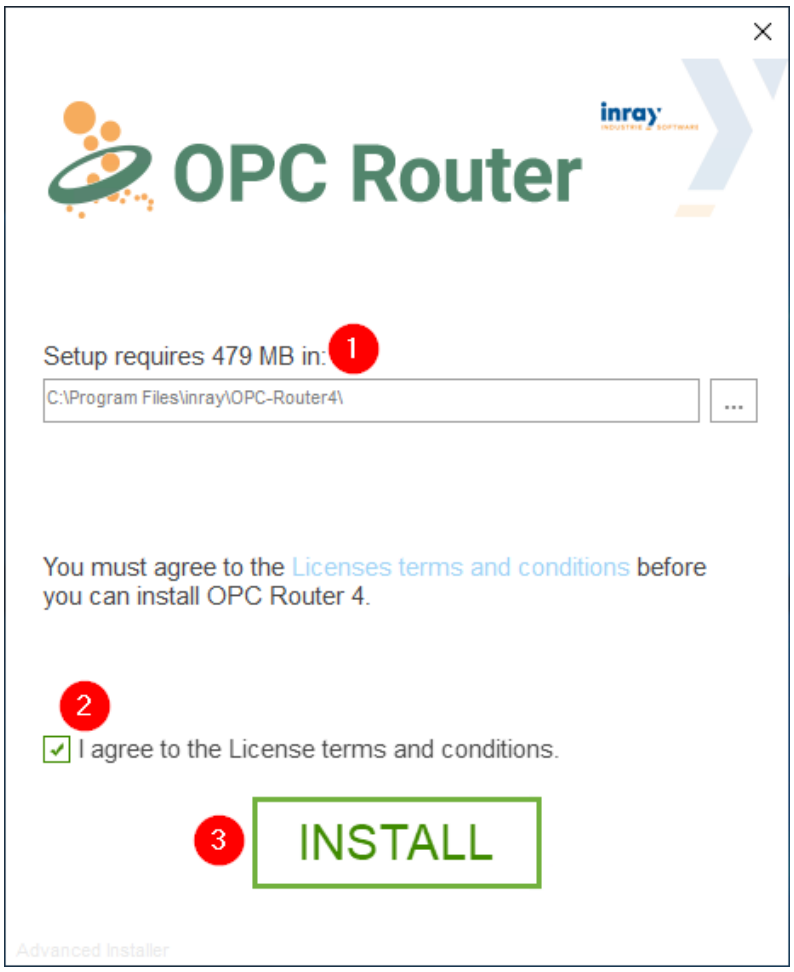
Installing the OPC Router

Installing the OPC Router was designed to be quick and easy – with minimal user interaction required.

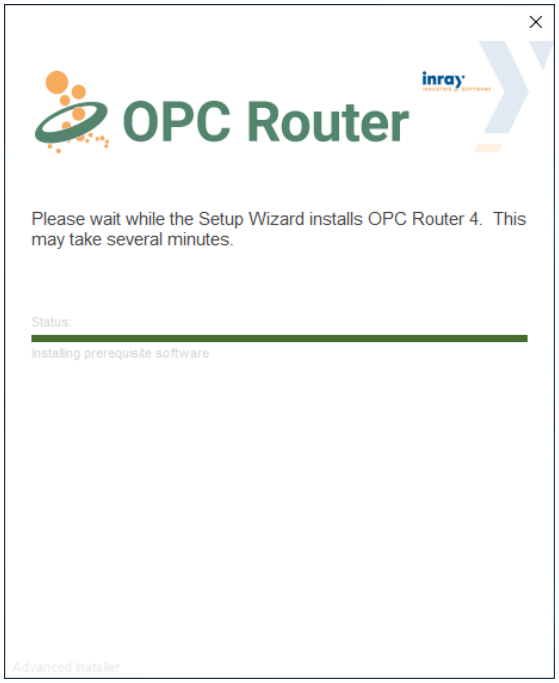
1. The OPC Router Installer can be downloaded here if needed.

2. Launch the OPC Router installer by double clicking the installer executable. It might be necessary (depending on system configuration and user permissions) to right click the installer and select the "Run as administrator" option – it is recommended to do this to ensure the installer has adequate permissions.

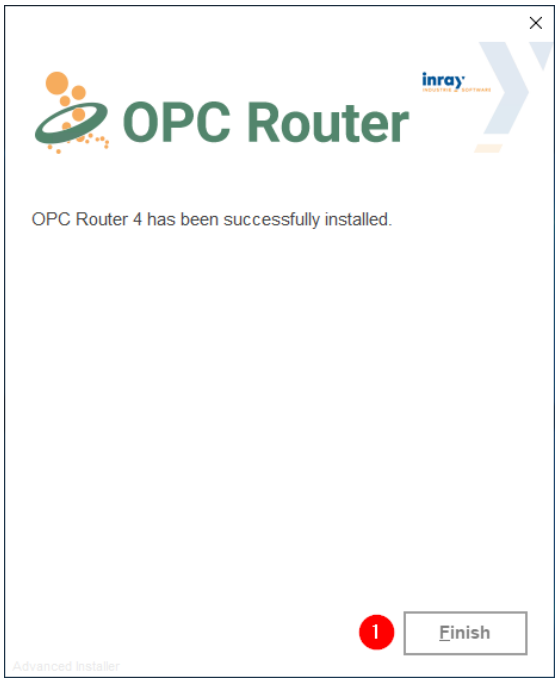
3. Once the installer initializes; confirm the install directory (1) and either click to read through the License terms and conditions and then press *Install* (or check the "I accept" checkbox (2) and press *Install* (3) to begin the installation.



4. The installer will handle installing all pre-requisites and components of the OPC Router



5. Once the installation is complete press *Finish* (1) to close the installer.

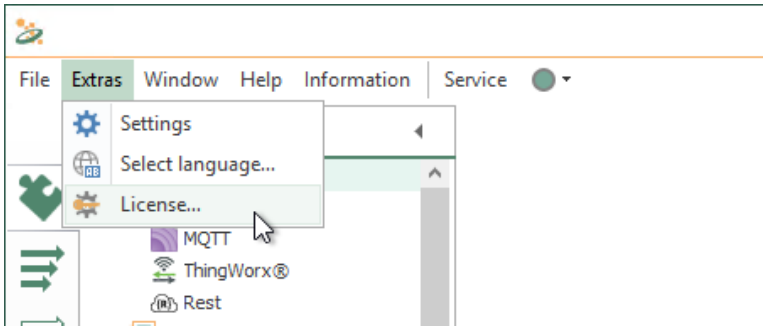


Licensing the OPC Router

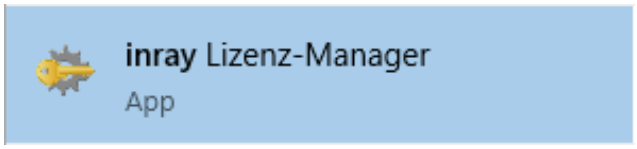
The OPC Router is fully functional in demo mode (i.e. without a license applied) but will run for only two hours at a time, before it must be restarted. Applying a license to an unlicensed/demo system simply removes the 2-hour demo timer for features covered by the license. This section can be skipped if the OPC Router is being evaluated (i.e. being run in Demo mode) and/or if no license has been purchased.

In order to license the OPC Router:

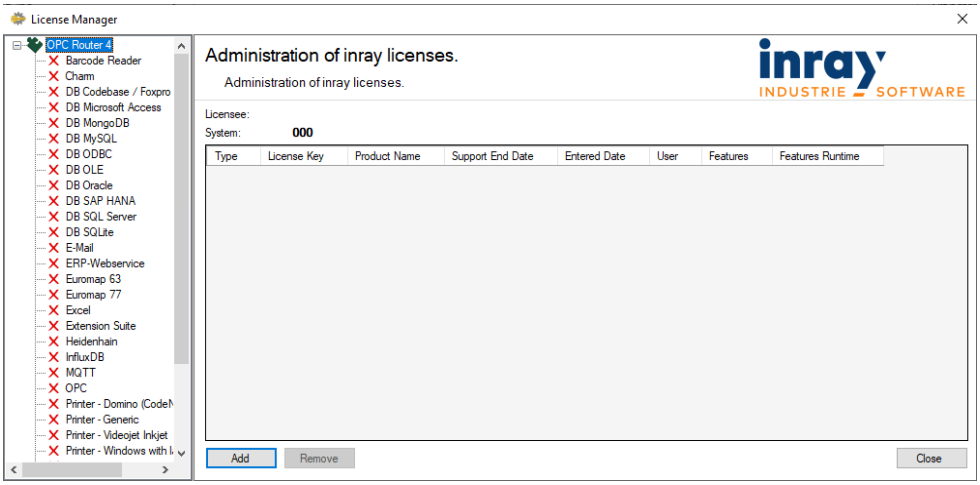
1. Launch the OPC Router License manager by either launching it from within the OPC Router Configuration window (Extras > License)



Or by launching the OPC Router Lizenz-Manager from the start menu – also found at C:\ProgramData\inray\inray.License.Admin.exe



2. The basic UI of the License Manager shows all licensed (green checkmark) and unlicensed (red X) components of the OPC Router on the left, and any active licenses currently applied to the system on the right. In this image no licenses have been applied to the system.

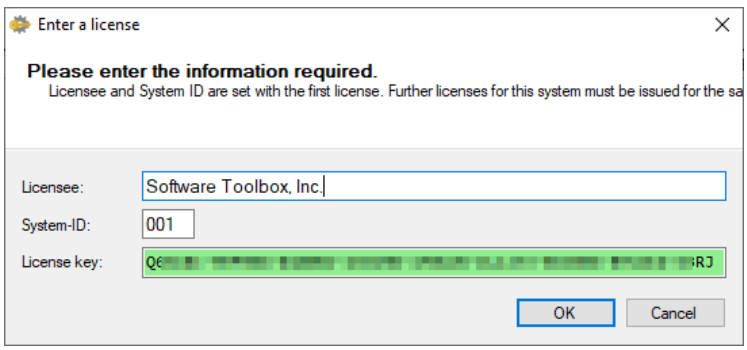


3. Press the *Add* button to add a new license to the system. All three fields (Licensee, System-ID, and License Key) should be copied from the Software Toolbox provided email *exactly* as they are shown. Press OK to add the license.

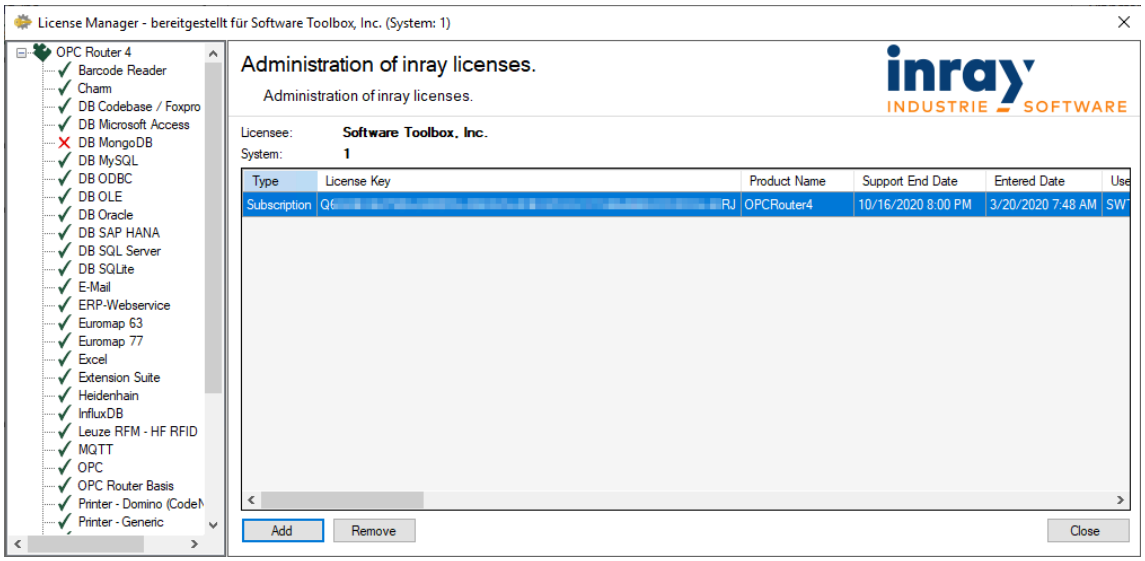
   a. Licensee – Identifies the company or user to which the license is registered

   b. System-ID – Identifies the system on which the license is running. Future licenses that are added to the same machine (e.g. if an additional feature license is added after the original licesne purchase) must reflect the same system ID.

   c. License Key – Acts as the serial/license number, and is used by the OPC Router to determine what features will be unlocked after the license is added.



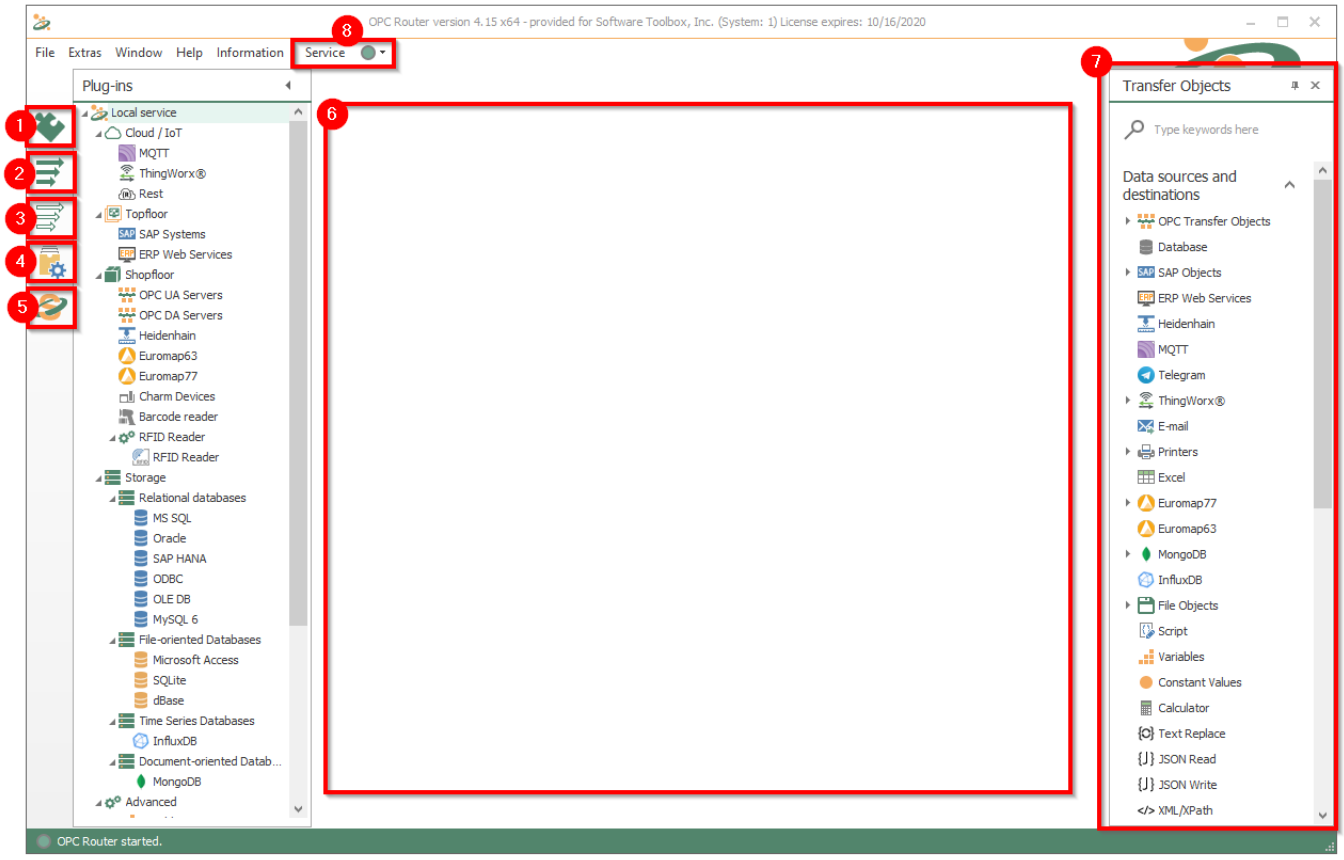
4. Confirm (on the left side) that the expected features are licensed, and that the license shown in the right pane matches what was purchased and expected. Press *Close* to exit out of the license manager.



The OPC Router User Interface

Launching the OPC Router Configuration application (Start > inray > OPC Router Configuration) brings up the configuration User Interface – where all project changes and additions can be done, the current status of any existing connection can be verified, and where practically all OPC Router configuration takes place.

The User interface is made up of the following components:



1. **Plug-Ins** – In this section all Plug-ins are created and managed. Plug-Ins define how the OPC Router interacts with the outside world, and they provide a means to not only get data into the OPC Router, but also a means of getting the data back out.

2. **Connections** – This section contains a list of all connections that have been configured in the product. This will be where new connections are added, and existing connections can be modified or deleted.

3. **Templates** – In this section templates can be configured. While template creation is beyond the scope of this document, templates provide a quick and easy way to rapidly create connections – where the general layout is the same, and the only differences are minor text or plug-in differences.

4. **Go Productive** – In this section, the connection(s) that have been configured in the Connections section can be sent to the runtime service and activated. Once set productive – the connection will begin executing based on the dataflow, plug-ins, and triggers defined in the connection itself.

5. **State** – This section allows any connections that are currently deployed to the runtime service to be monitored. This acts as a window into the runtime engine to verify that connections are healthy and moving data.

6. **Workspace** – This is the primary workspace, any components opened in the OPC Router (Plug-ins, transfer objects, connections, templates, etc.) will be opened here for editing.

7. **Transfer Objects** – This section contains all transfer objects that are available to build connections. This includes any configured Plug-Ins, Objects that can move the data from Point A to Point B, objects that can analyze and transform the data, as well as objects that can trigger the connection to execute and/or take some action. This is the toolbox from which connections are built.

8. **Service Status** – The color indicator shows the current state of the runtime service (Green – Running, and Red – Stopped). This allows the Runtime service to the stopped, started, or restarted.

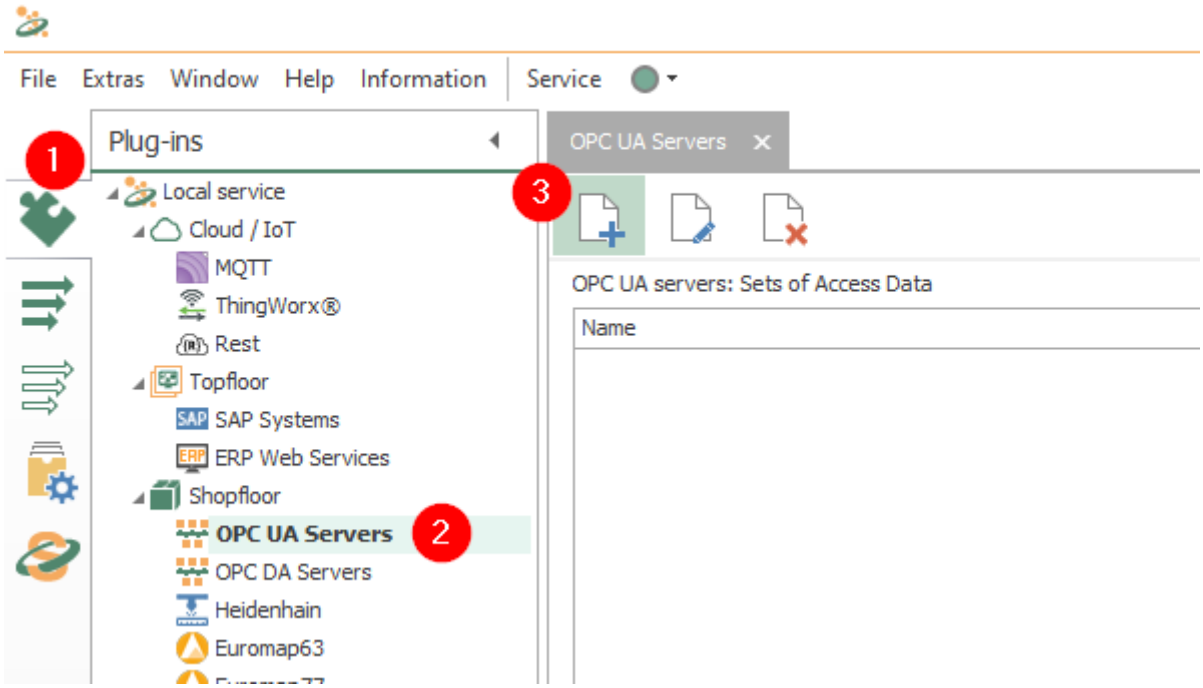
Configuring a Basic Connection

For this example, the OPC Router will be configured as a simple data logger. The OPC Router will – on a 10 second interval – log the current value of 4 tags read from an OPC UA Server to a SQL Database.

Configuring the source Plug-In

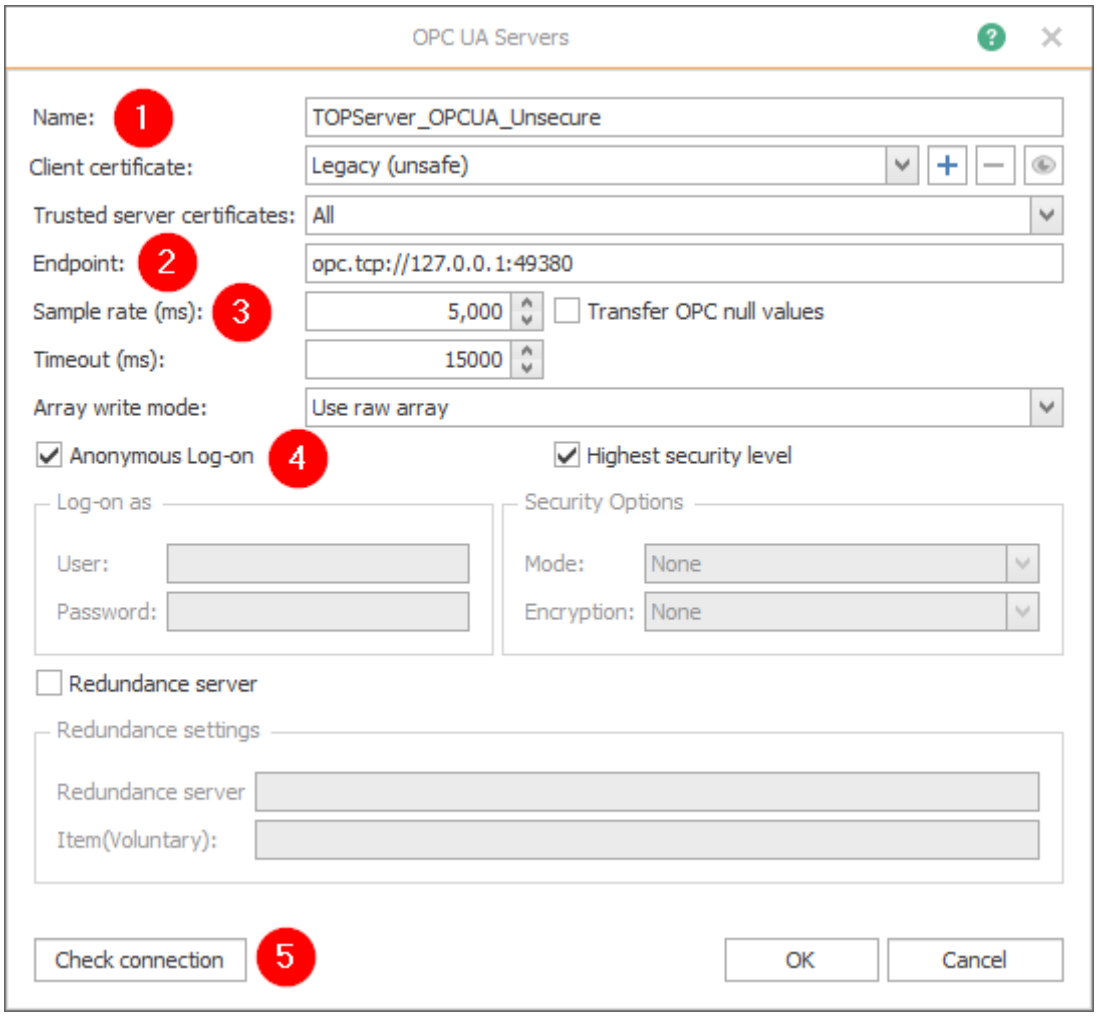
First, the source plugin must be created. This plug-in will define the connection to the OPC UA Server where the datapoints will be read from.

1. Open the Plug-Ins section (1), double-click the *OPC UA Servers* plug-in (2) under the Shopfloor section, and use the *Create new Plug-in Instance* button (3) to configure a new OPC UA Server Connection:



2. Give the plug-in a user-friendly name (1); this will be how the plug-in is referenced everywhere else in the OPC Router. The same plugin can be used across several connections, so this name should be descriptive of the data source it represents. In this case the OPC UA Server in question is the Software Toolbox TOP Server, so the server endpoint (2) reflects an OPC UA Endpoint that has been configured there. (please note that the TOP Server OPC UA Endpoint configuration is outside the scope of this document. If using the TOP

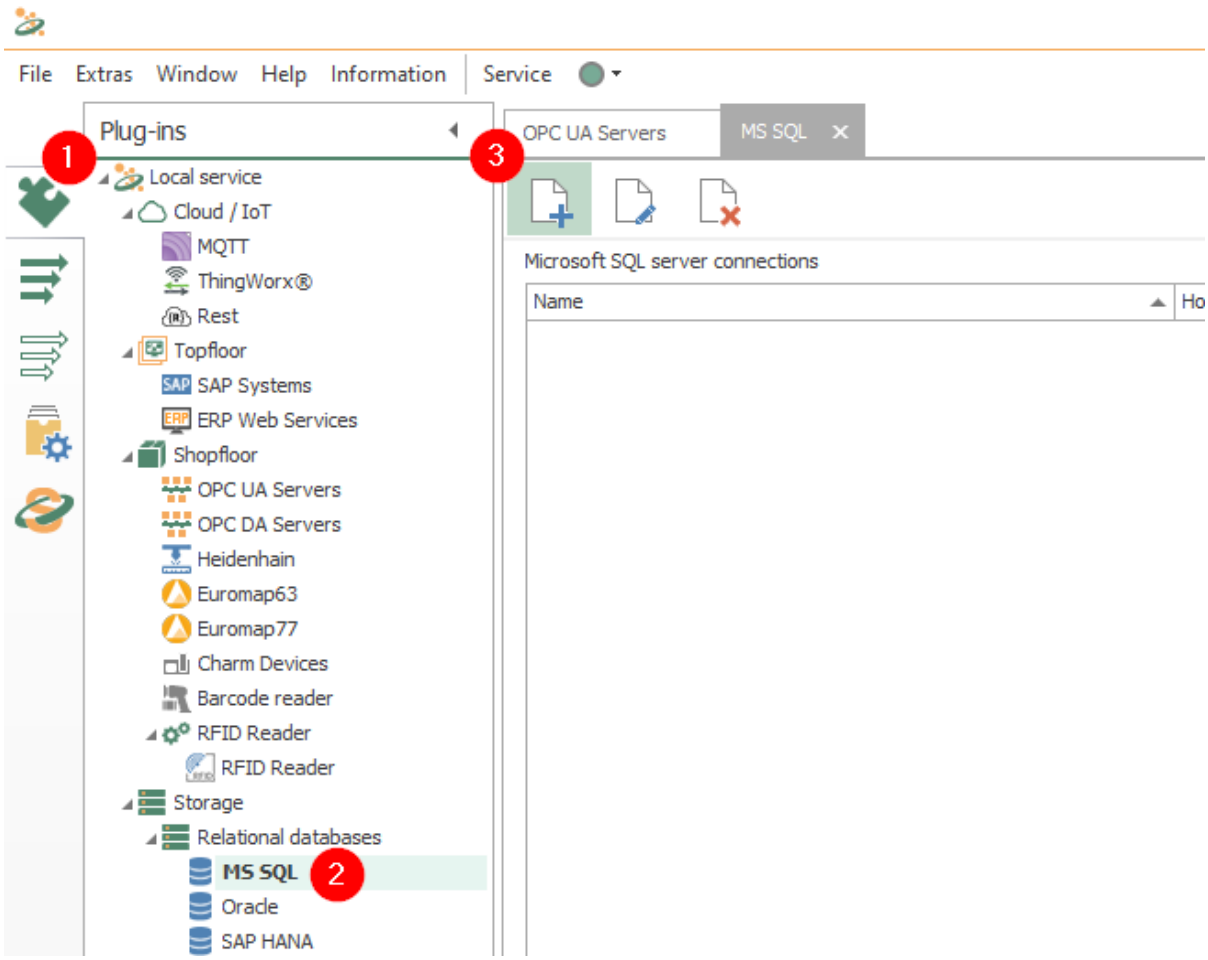
Server; refer to the following how-to guide for a UA Endpoint configuration quick start tutorial. It is vital that the security configuration in the OPC Router UA Plug-In match the UA Endpoint Security settings configured in the OPC UA Server; regardless of what particular OPC UA Server is being used) Since data is only going to be logged every 10 seconds the default 50ms sample time can be increased to not overburden the PLC from which the data will be read (3); this sample rate should be appropriately fast to capture any desired data changes, but not excessively so to create undue load on the OPC Server and/or PLC from which the data is read. For the sake of this example the connection is going to be un-encrypted and no user authentication is required by the OPC UA Server; the Log-on mode is set to anonymous (4). Finally, the plug-in configuration can be tested against the OPC UA Server (5). Use the *OK* button to finalize the plugin-creation.



Configuring the destination Plug-In

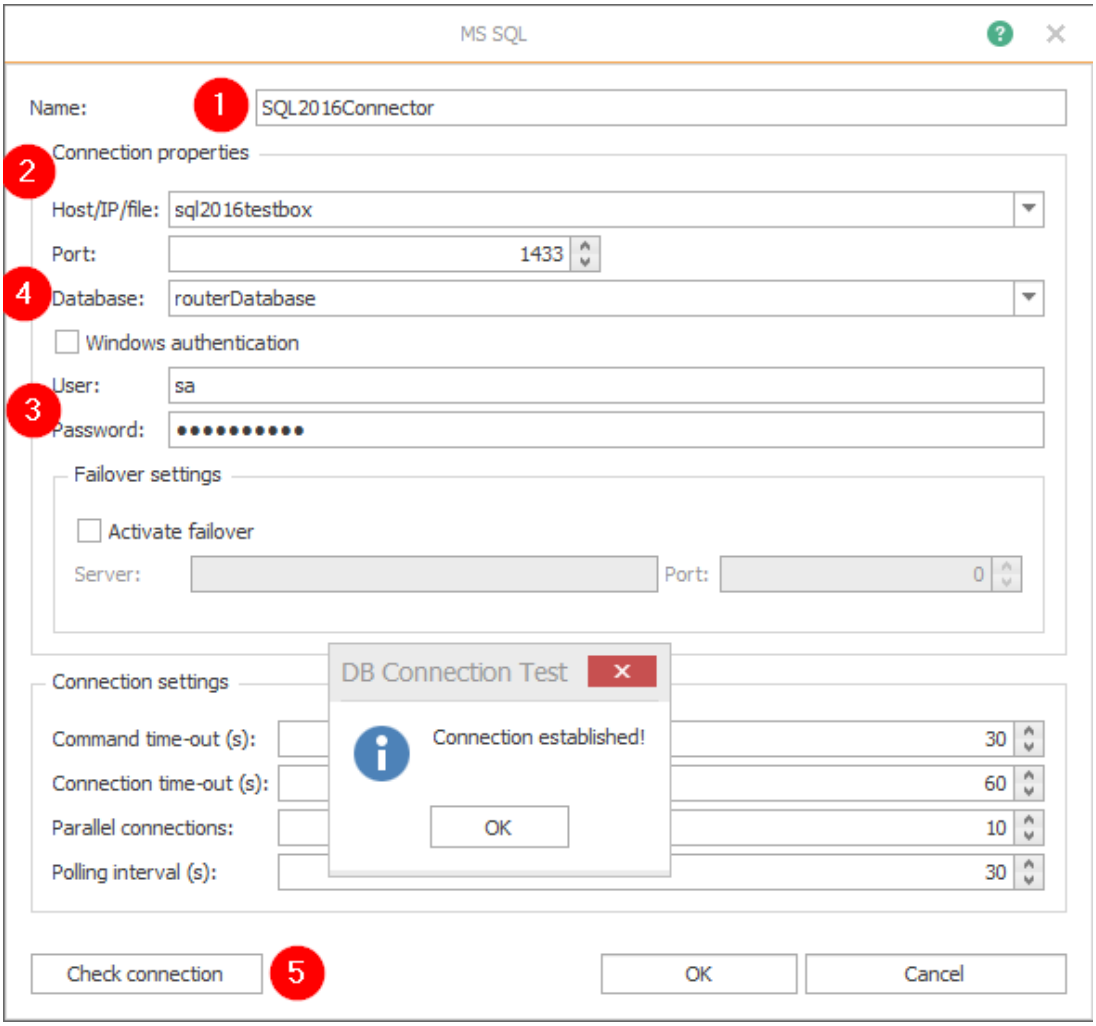
With the source plug-in created, the destination plug-in is next. This plug-in will define the SQL Server connection where the table exists that the OPC UA datapoints will be logged to.

1. Open the Plug-Ins section (1), double-click the *MS SQL* plug-in (2) under the Relational Database section, and use the *Create new Plug-in Instance* button (3) to configure a new Microsoft SQL Server Connection:



2. Give the plug-in a user-friendly name (1); this will be how the plug-in is referenced everywhere else in the OPC Router. The same plugin can be used across several connections, so this name should be descriptive of the data source it represents. Enter the hostname/IP address (2) where the SQL Server instance is hosted and change the port if it is known to not be the default port – skip the database selection drop down (4) for now. Specify the username and password with which the OPC Router can authenticate with the SQL server

(3). Now use the Database selection drop down (4) to now select the database to which data should be logged. This step is done after the user credentials are provided – so that the OPC Router has the necessary permission to query the available databases from the Microsoft SQL Server instance. Use the *Check Connection* button to validate that the connection to the SQL Server instance can be successfully established (5), then use the OK button to finish the plug-in creation.

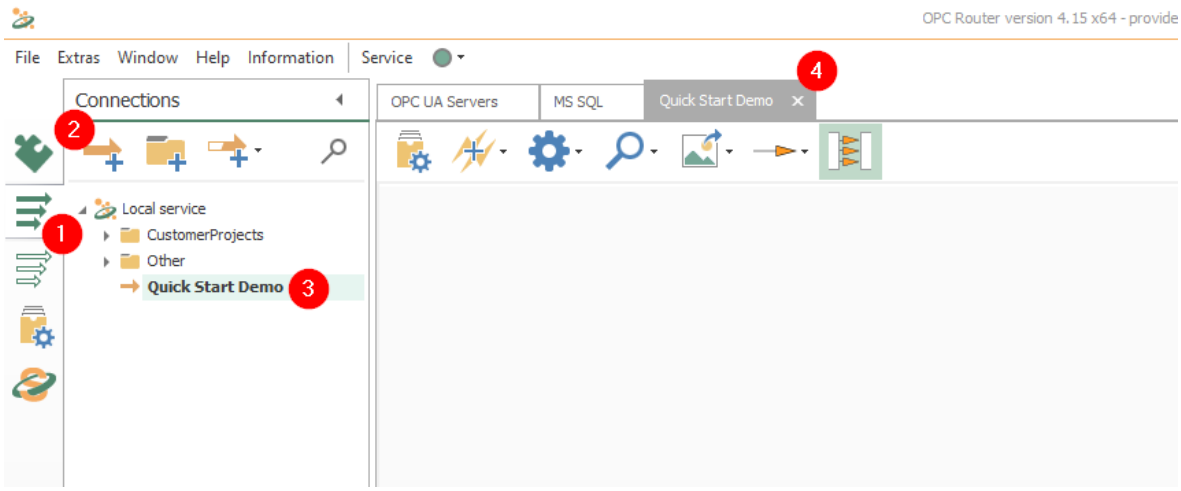


NOTE: If using Windows Authentication with your database you MUST set the OPC Router Service to run as the Windows User you are authenticating as, otherwise it will attempt to authenticate as the System account. This can be done in the Windows Services by finding the OPCRouter4Service and setting the user in the Log On tab.

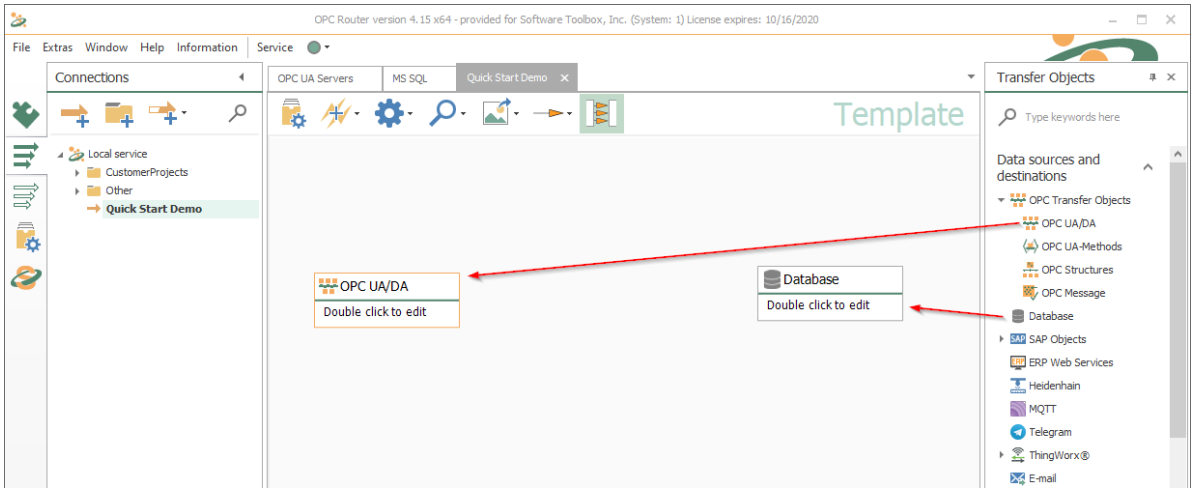
Creating the Connection

With both the source and destination plug-ins now defined the connection/dataflow can be configured.

1. Open the Connections section (1) and use the *New Connection* button (2) to create a new connection. Give the connection a descriptive name (3), and double click the connection to open it for configuration – if this does not automatically happen (4).

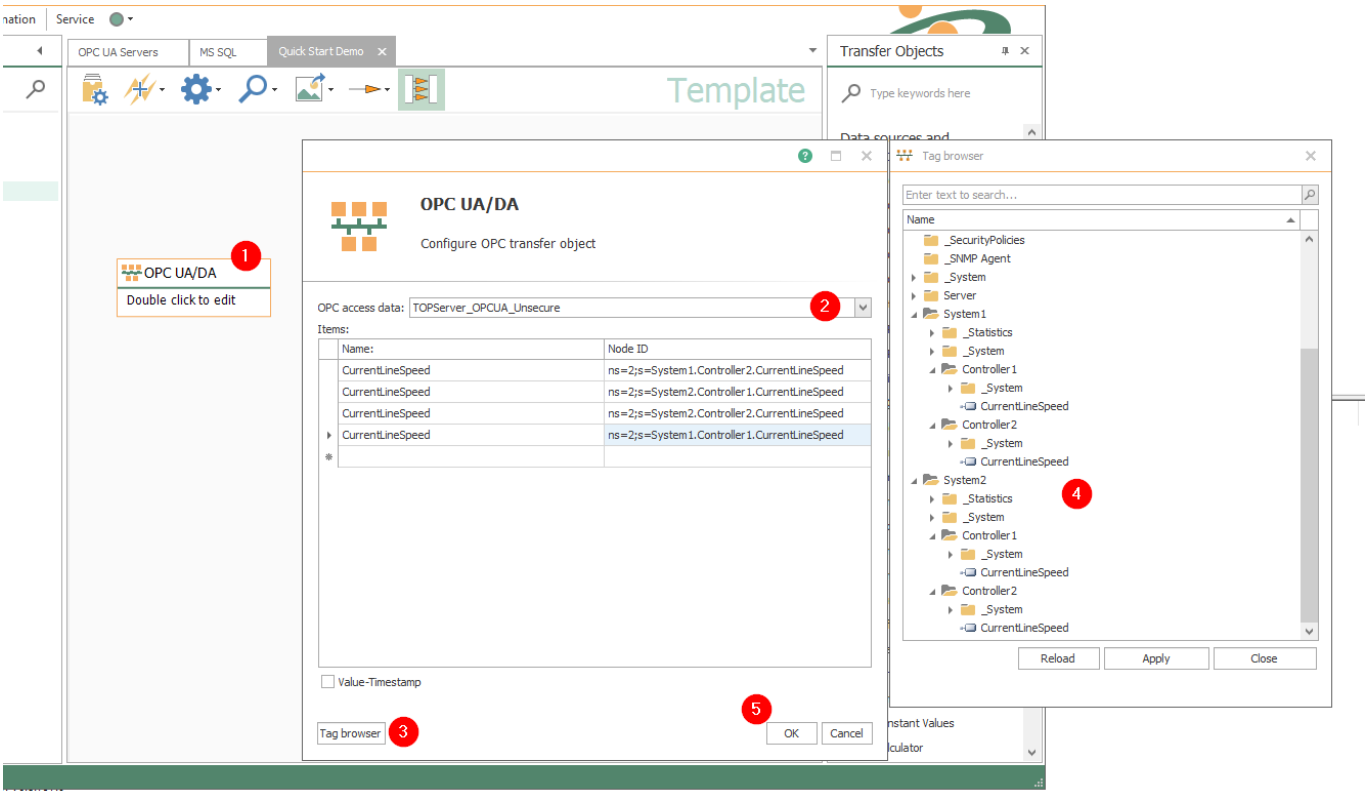


2. Click and drag the source and destination plug-in types from the Transfer Object list to the Connection workspace. For now, these are just generic objects that have not been associated with any specific plug-in.

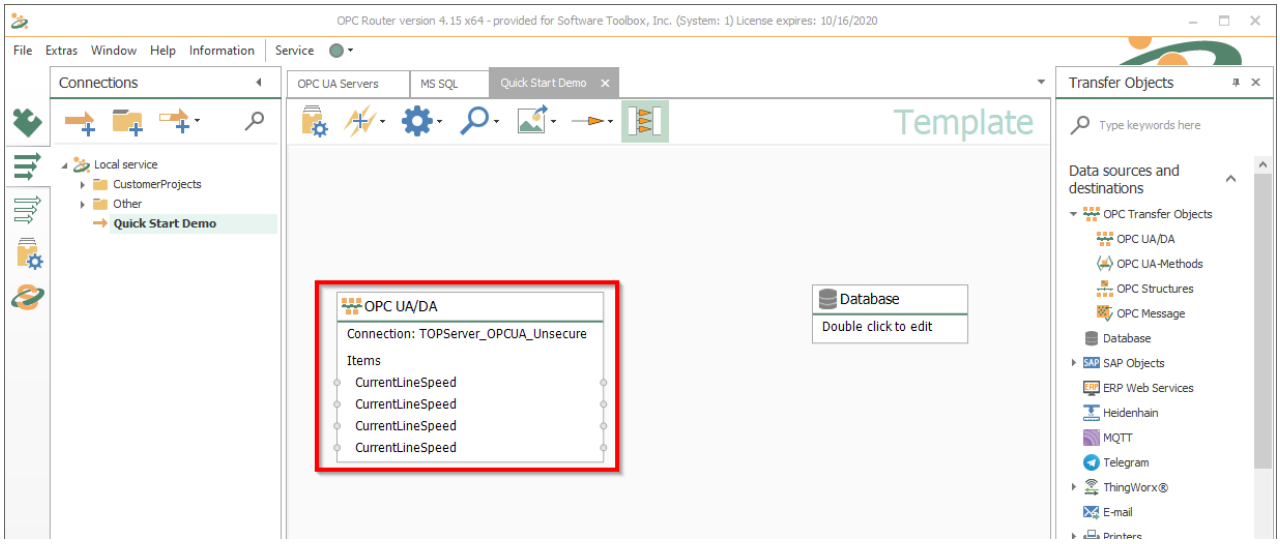


3. Double click the OPC UA/DA Connector (1) and use the *OPC access data* dropdown to select the OPC UA Server plug-in that was previously configured. Press the *Tag browser* button (3) or manually enter all OPC

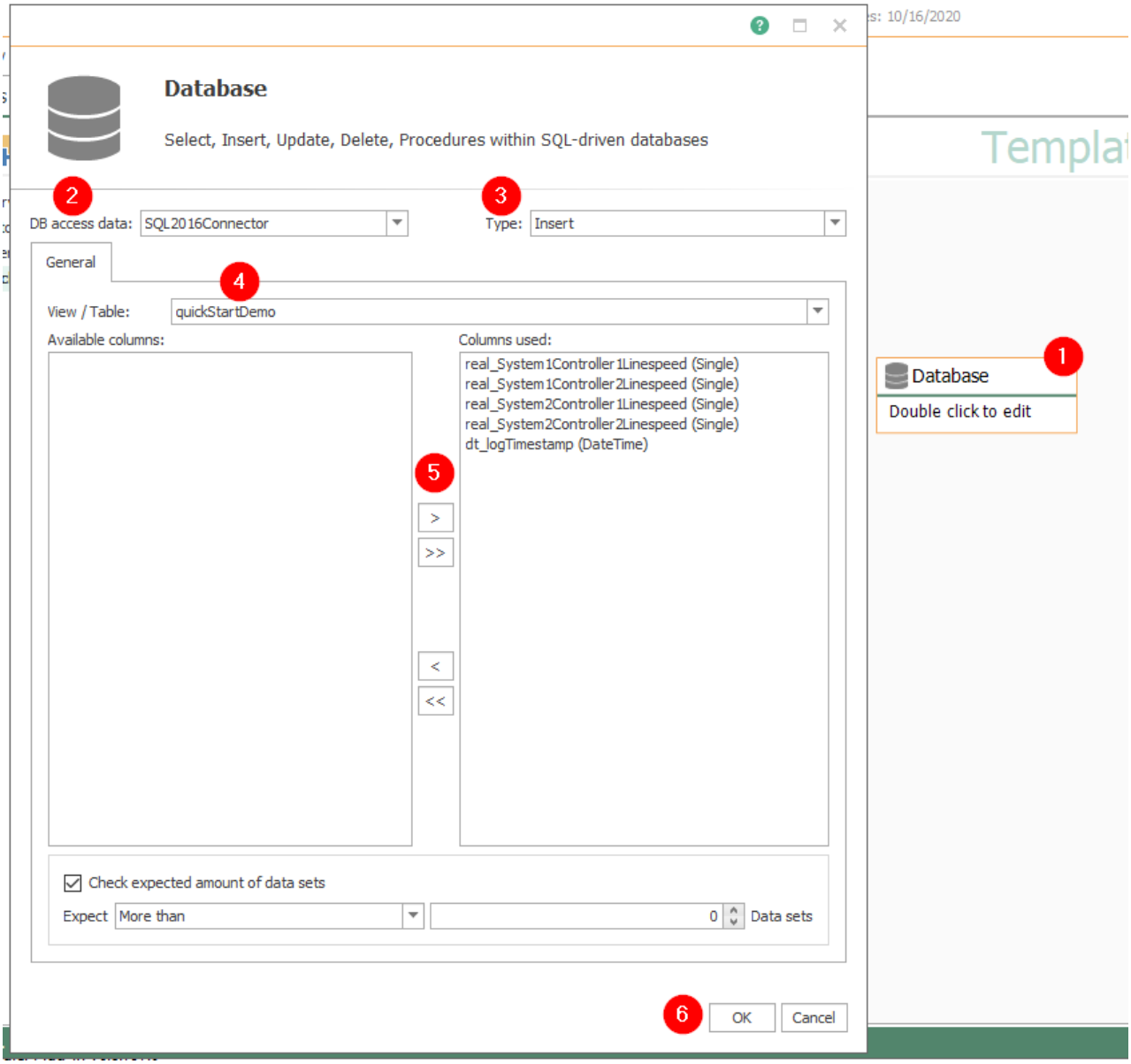
UA node IDs. Browse to the points that should be read from the OPC UA Server, double clicking them to add them to the list of monitored tags (4).



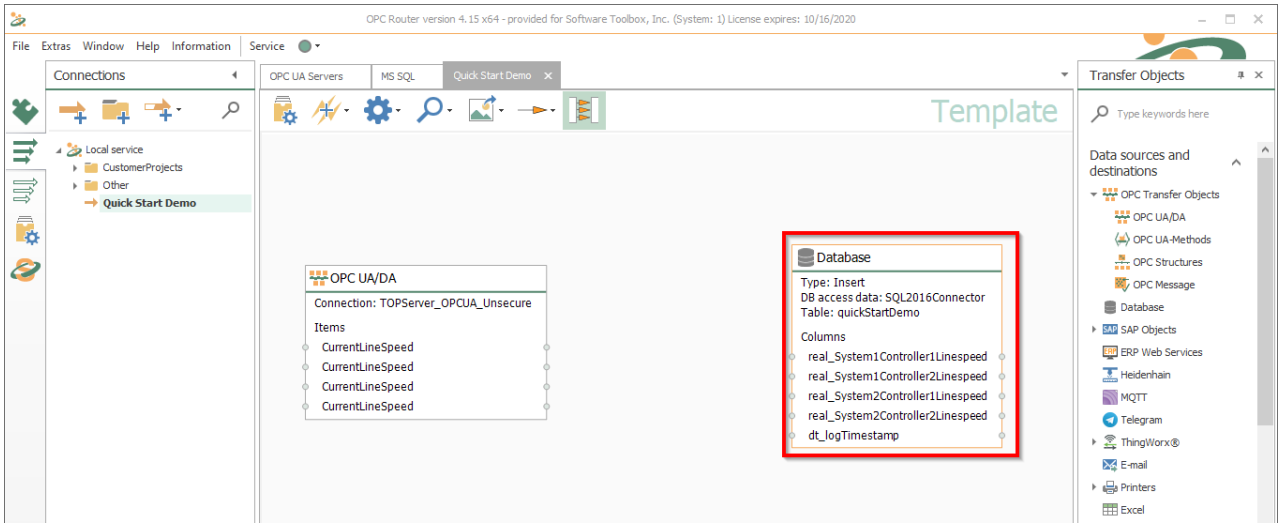
Use the *OK* Button (5) to finish the OPC UA Server configuration. The OPC UA Object in the connection configuration should now reflect the changes made above:



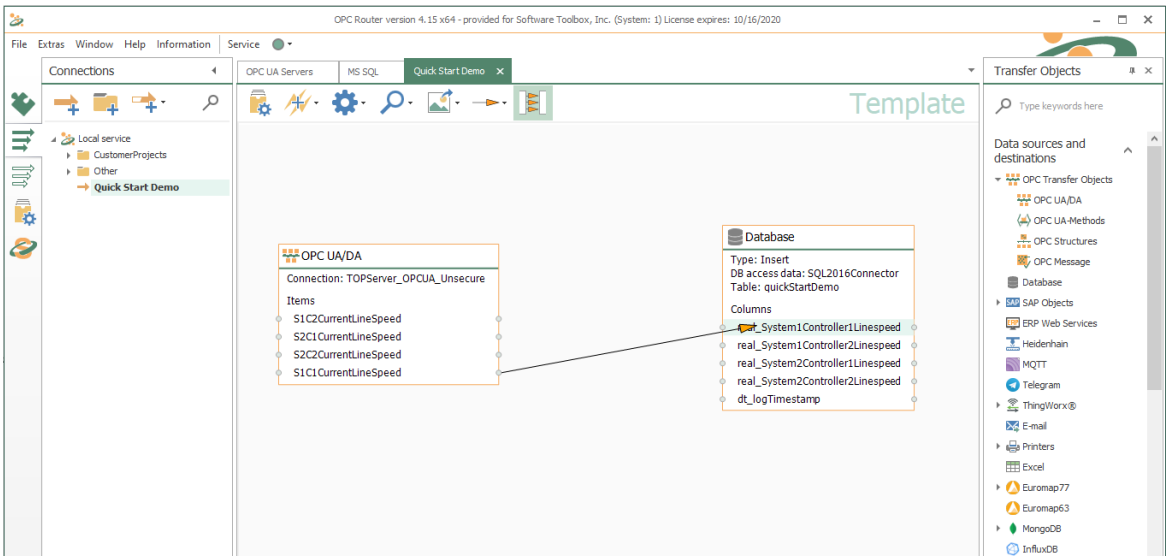
4. Double click the Database Connector (1) and use the *DB access data* dropdown to select the Microsoft SQL Server plug-in that was previously configured. Use the *Type* dropdown (3) to specify that data should be inserted to the table, and use the *View/Table* dropdown (4) to select the table or view to which the data should be logged. Select any columns that are available in the table from the left pane, and use the center buttons (5) to transfer them to the columns that will be used in the conifguration, shown in the right pane.



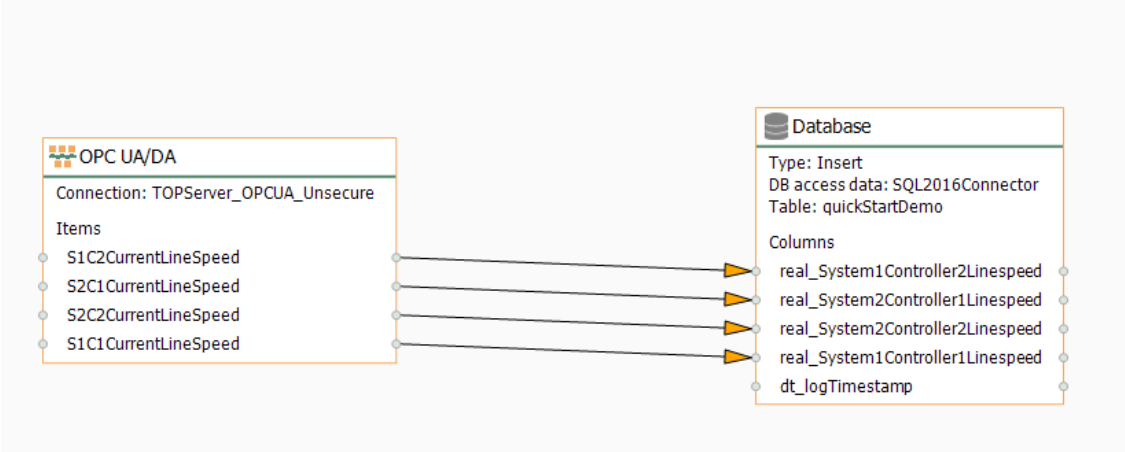
Use the *OK* Button (6) to finish the SQL Database configuration. The Database Object in the connection configuration should now reflect the changes made above:



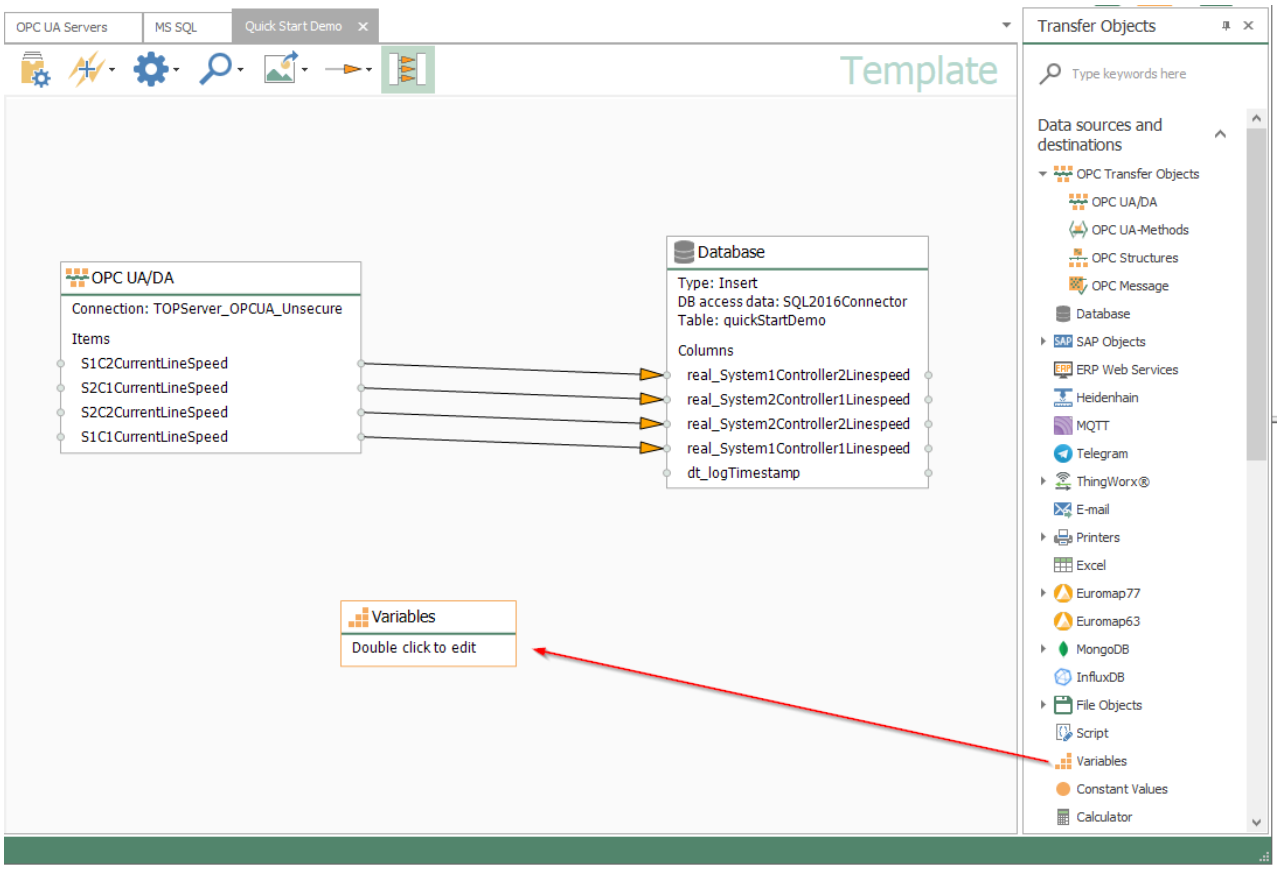
5. Associate the items that are read from the OPC UA Server with columns available in the SQL Server Table by clicking-and-dragging the OPC UA Object over to the appropriate column.



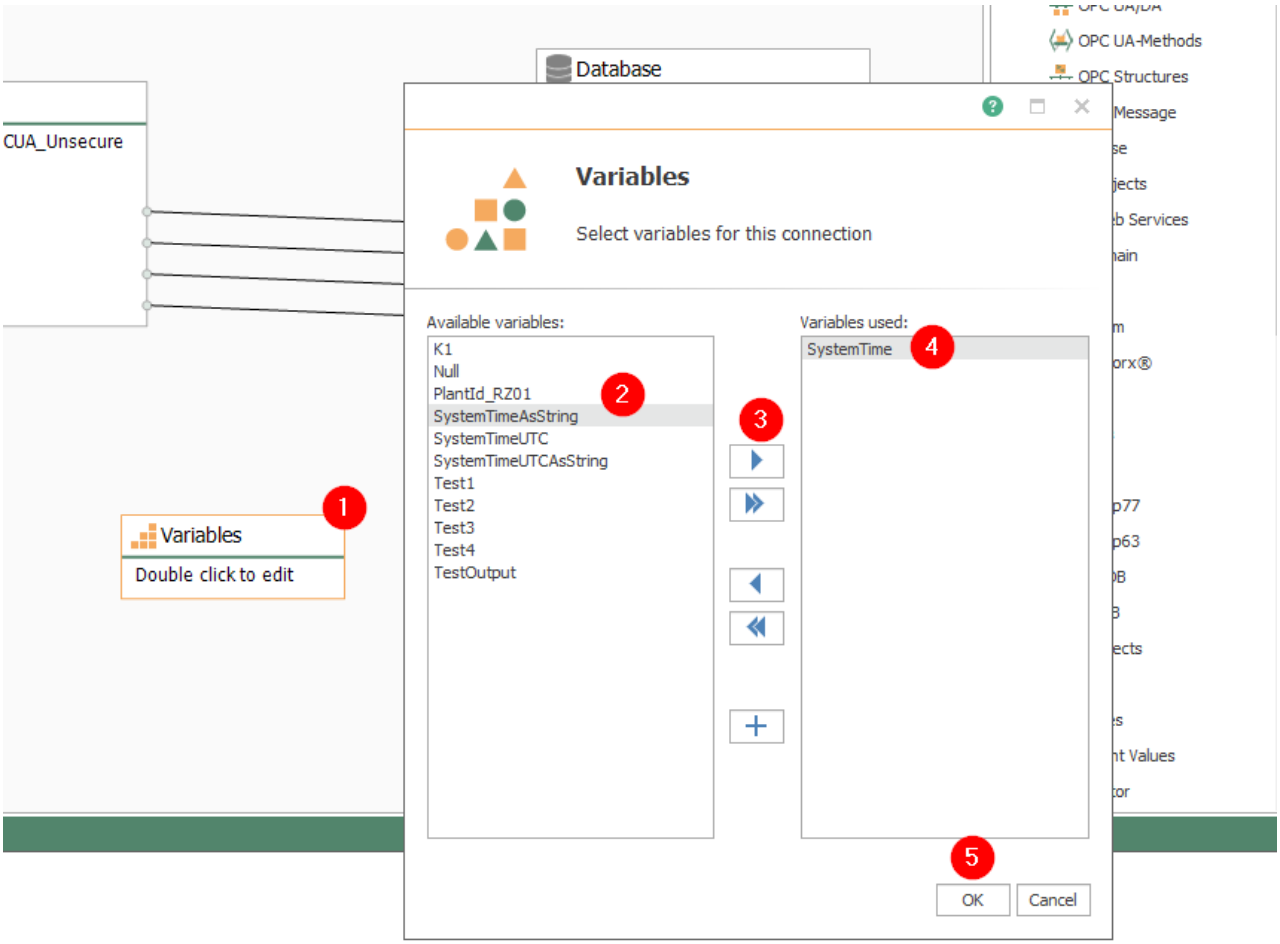
Until all OPC UA items have been associated with a SQL Server column – the OPC Router will automatically re-order items as appropriate to keep the configuration neat.



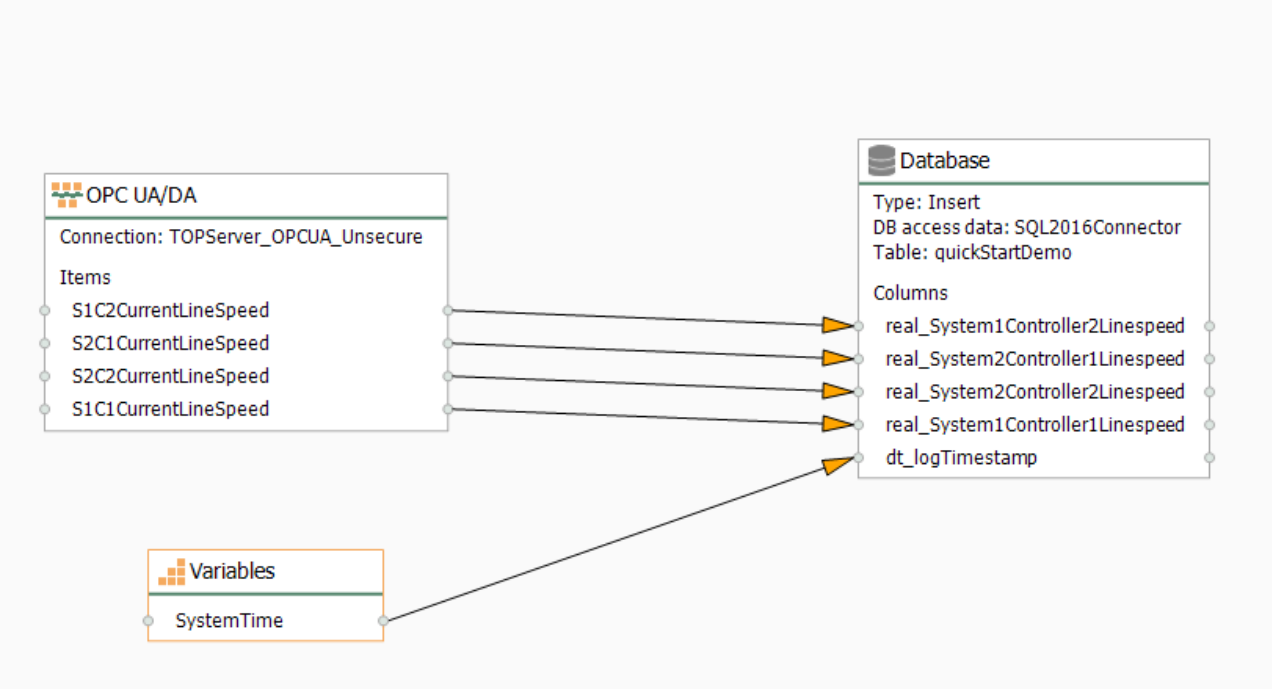
6. The dt_logTimestamp column has not yet been assigned a value. For this column the current system timestamp of the OPC Router should be logged – in this example project. Click and drag a *Variables* transfer object to the connection.



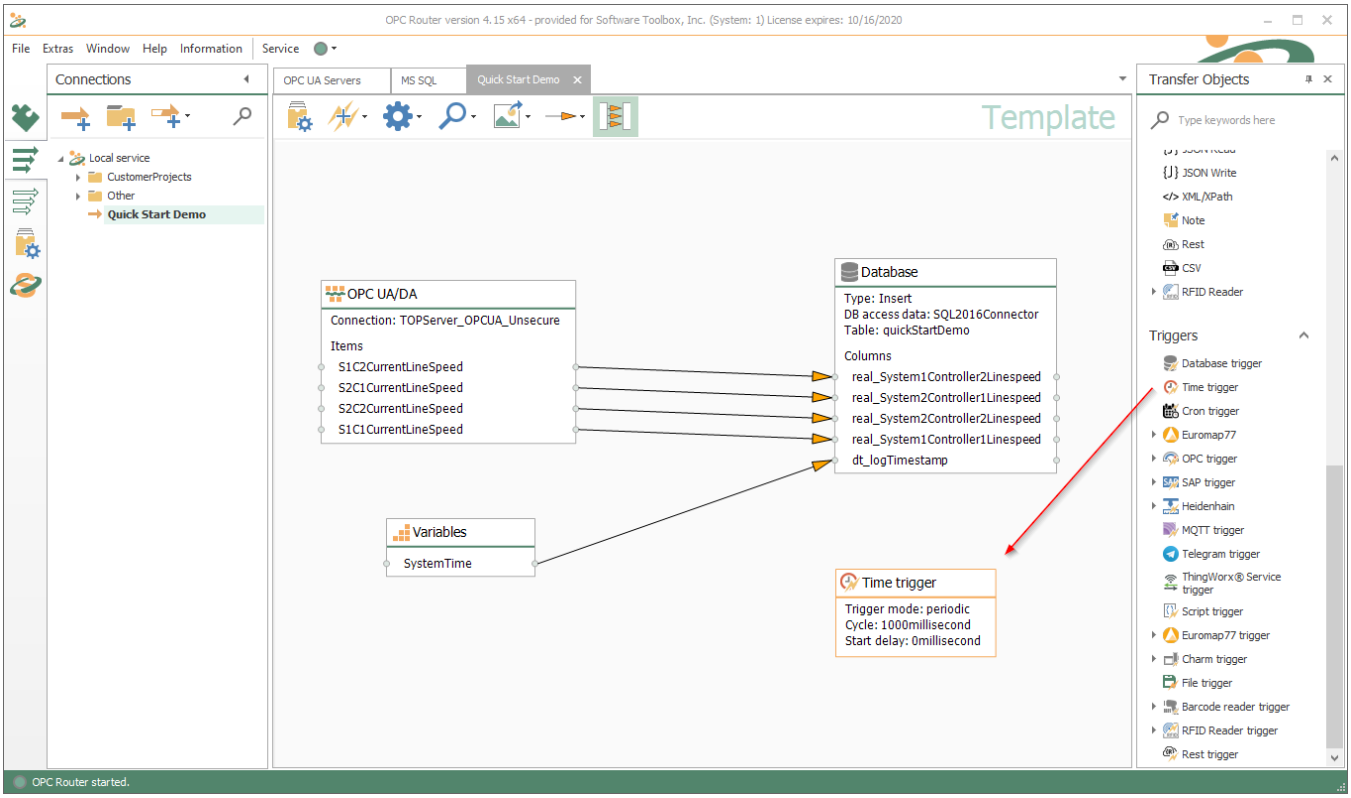
7. Double click the *Variables* object instance (1), select the *SystemTime* variable in the left pane (2), and use the central buttons (3) to move it to the *Used Variables* Section on the right (4). Press the *OK* button (5) to close the dialog.



8. As with the OPC UA items, the SystemTime variable must be linked to the dt_logTimestamp column in the SQL Database object instance. Click and drag the variable to the associate column.



9. Finally a trigger must be added to the configuration to execute the configured data flow. Click and drag a Time Trigger to the Connection configuration. The list of triggers can be found at the very bottom of the Transfer Objects list. The location where the trigger is placed does not matter, and does not impact the triggers function.

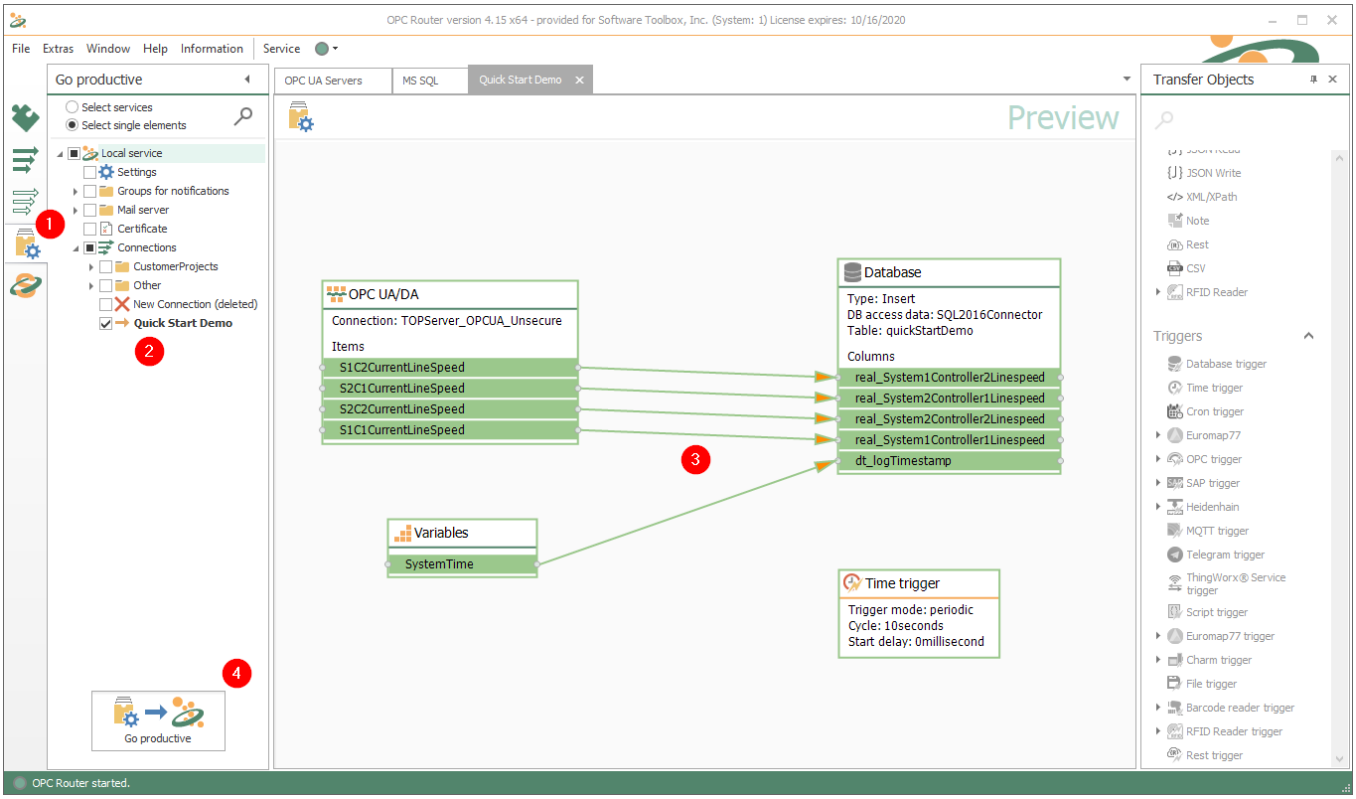


10. Double click the Time trigger object instance (1) to configure it. Specify the type of time trigger (2), and in the case of a Periodic trigger, the interval at which data should be transferred (3). Press OK (4) to complete the configuration.

Deploying the Configuration to the Runtime Service

With the connection now created, the final step is to deploy the connection to the runtime service to set it active.

1. Open the *Go Productive* section of the configuration (1), and review which Connections will be deployed (2) – this panel also shows any connections that will be deleted upon deployment. Review the Connection components that will be deployed once set productive (3) and use the *Go Productive* button (4) to push the configuration to the runtime service.



2. Read and acknowledge any dialogs that are shown. This includes possible prompts about having to start or restart the runtime service (which is required after plug-in changes). Once the pop-up dialogs disappear the configuration has been set productive.

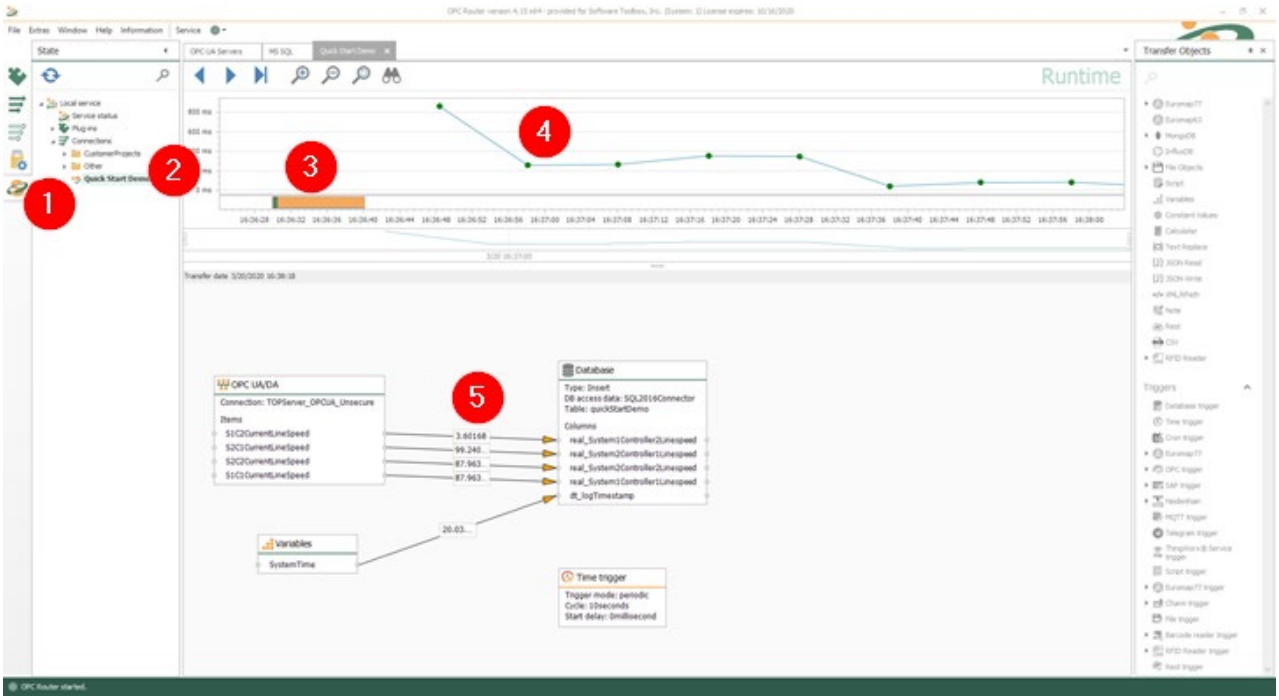
Monitoring the deployed connections

The State section can be used to monitor the state of any currently deployed/active connection.

1. Open the State tab where connections can be monitored (1) and select the Quick Start Demo connection to monitor (2).

2. The colored bar (3) shows when the connection was started, was initialized, and when it sat idle. Hovering the mouse over any part of this bar shows the state in which the connection was at that moment in time. This graph also shows individual data transfers (4) with each dot representing a new triggered transfer of data between the OPC UA Server and the SQL Database table.

3. The Connection view itself (5) shows the values being transferred over each arrow/data link and can be used to monitor data flow between items in the connection.



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Conclusion

For any further questions regarding the OPC Router or its configuration refer to the OPC Router help documentation, and the Software Toolbox support team is ready to help. Submit your questions by visiting the support website at https://support.softwaretoolbox.com and using the *Ask a Question* button, or at the following contact information:

Technical Support Line (Available Monday through Friday, 08:00 – 17:00 US EST)

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Email: support@softwaretoolbox.com

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