

## Quick Startup Guide

### TSXCUSBMBP USB Adapter Connectivity Guide

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## Introduction

### 1.1 Purpose

The purpose of this document is to show you how to use the [TOP Server Modbus Suite](#) with the TSXCUSBMBP adapter.

Schneider Electric has developed hardware in response to the increased usage of USB. The TSXCUSBMBP adapter replaces the SA85 without the requirement of having an available ISA, PCI or PCMCIA slot.

### 1.2 Functionality

The TSXCUSBMBP provides a bridge between a high speed Modbus Plus network and a PC's USB port with two areas of functionality.

#### 1.2.1 Communication

The adapter provides a means of programming and exchanging data with applications supporting Modbus RTU. A Virtual Serial Port is granted by the software driver to simulate actual serial hardware but at a faster speed since no serial communications are actually taking place.

#### 1.2.2 Diagnostics

The adapter is also used as a diagnostic and network monitoring tool for Modbus Plus networks. Included is a full and local network scan, an active stations table, and detailed node information.

### 1.3 Abbreviated Terms

The following terms may have been used in this document as a generalization. An expanded explanation of the terms is provided.

- **Adapter** refers to the TSXCUSBMBP hardware.
- **Software Application** or **application** is used to reference the third party software that will be communication to the TSXCUSBMBP driver with Modbus RTU requests.



- **Driver Software** or **driver** is used to reference the TSXCUSBMBP software that is installed during setup to create a bridge between the Modbus Plus network (along with the TSXCUSBMBP hardware) and computer USB port.
- **Server** refers to the TOP Server application.



## 2. Setup

### 2.1 Requirements

The requirements are as follows:

- Microsoft Windows XP with SP 2 or greater installed
- 150 MB free disk space
- 1 GB RAM
- An available USB port or a USB hub supporting USB 1.1 or greater

### 2.2 Software

There are two pieces of software you will need.

#### *TOP Server*

You will need to download and install the TOP Server.

1. Download the [free trial of TOP Server](#)
2. Run the installer and be sure to select the Modbus Suite of drivers.

#### *TSXCUSBMBP Driver*

The software driver must be installed before connecting the USB cable to the TSXCUSBMBP.

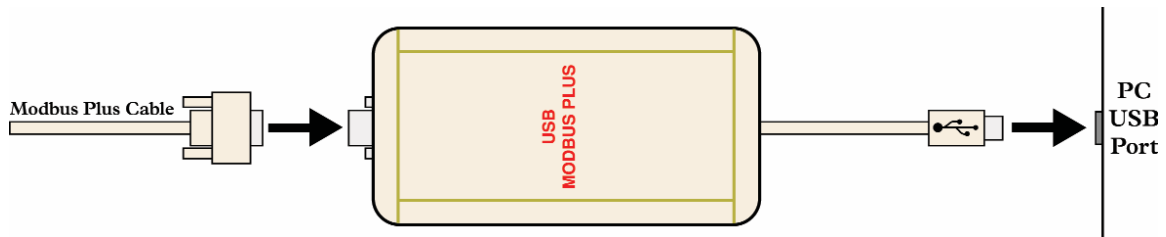
1. Insert the CD-ROM labeled TSXCUSBMBP Driver into your CD-ROM drive.
2. The installation should begin automatically. If not, manually start the installation by running the Setup.exe application.
3. Follow the on-screen instructions to complete the software installation.
4. The final step of the software installation will display a message window containing instructions. Please read the instructions carefully.



## 2.3 Hardware

Connect the UBS cable to any available USB port on the PC or USB hub. Power for the TSXCUSBMBP is supplied through the USB port so no other power connection is required. A green LED on the cover will illuminate indicating power is present.

❑ DO NOT CONNECT THE MODBUS PLUS CABLE TO THE NETWORK UNTIL THE TSXCUSBMBP HAS BEEN CONFIGURED WITH A UNIQUE NODE ADDRESS WITH THE DRIVER SOFTWARE.



The New Hardware Wizard will start up if this is the first time that this hardware is connected to the computer. Follow the wizard to complete the hardware installation and restart the computer.



## 3. TSXCUSBMBP Configuration

### 3.1 Access from the System Tray

During the installation of the software, the TSXCUSBMBP driver is added to the Startup group. Upon power up of the computer, the driver will start and scan for attached devices. An icon will appear in the system tray indicating the status of the driver.



- Indicates that a TSXCUSBMBP is found and initialized.



- Indicates that a TSXCUSBMBP is in the process of being initialized.



- Indicates that no TSXCUSBMBP is found.

#### 3.1.1 Exit Driver

Right clicking on the TSXCUSBMBP icon and selecting Exit Driver will close the driver and break the connection to the TSXCUSBMBP. The driver will need to be restarted manually by running the MbSvr.exe application. By default, the application is installed in the following location:

C:\Program Files\Schneider Electric\TSXCUSBMBP\

Or the application can be started from the Start menu:

Start, All Programs, Schneider Electric, TSXCUSBMBP

#### 3.1.2 Rescan Adapters

Right clicking on the TSXCUSBMBP icon and selecting Rescan Adapters will initiate a scan to identify a connected TSXCUSBMBP. A rescan is necessary if the computer is powered up without the TSXCUSBMBP being connected. This state will be indicated by a red icon. If a rescan is completed and





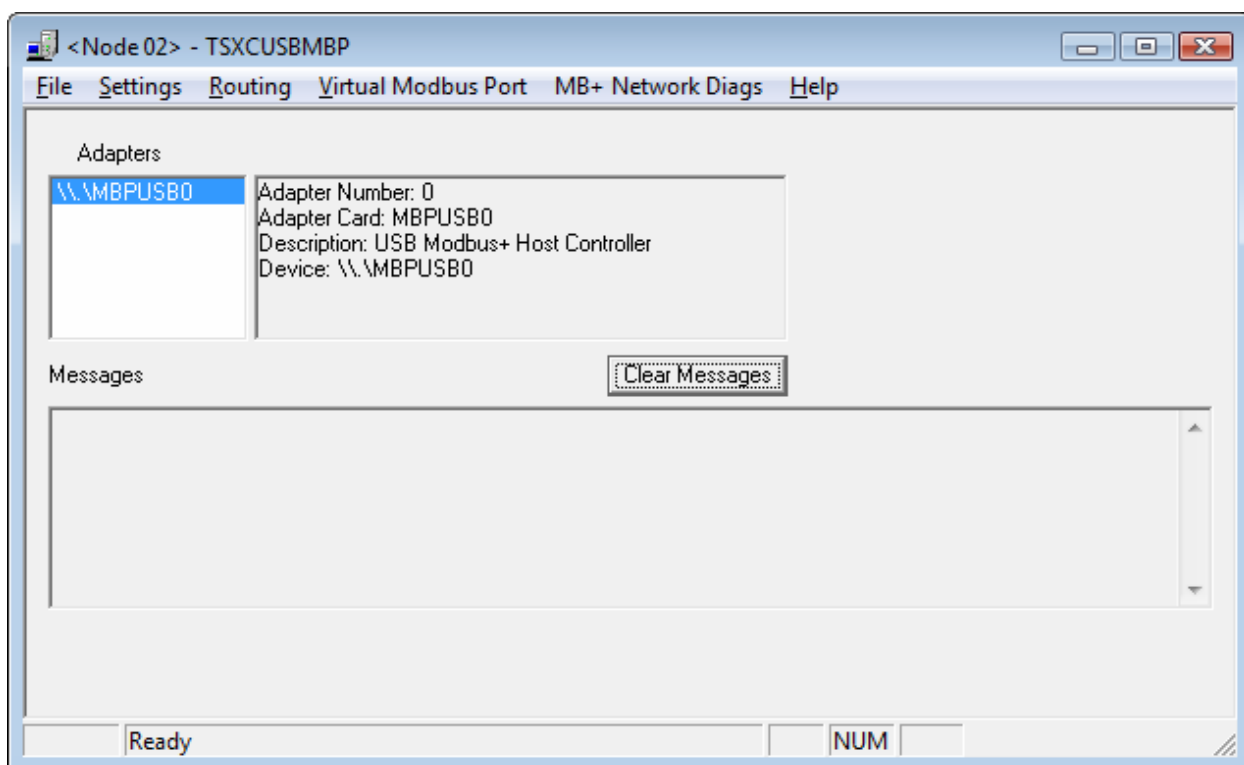
no adapter is found, check the USB cable and confirm that power is applied on the adapter using the LEDs on the housing. Then confirm that the correct drivers are installed and enabled.

### 3.1.3 Show Interface

Double clicking or right clicking on the TSXCUSBMBP icon and selecting Show Interface will display the Interface Window

## 3.2 Configure the Driver

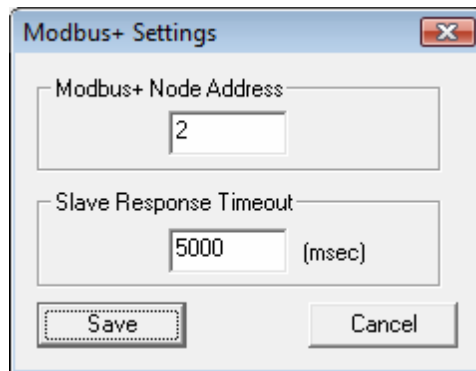
The Interface Window is used to configure the TSXCUSBMBP adapter. The title bar of the window displays the current node that is already selected for the adapter. Information on initialized adapters is displayed as well as a window for status and error information.



### 3.2.1 Settings

Since the TSXCUSBMBP is a node on the Modbus Plus network, a unique node address must be assigned. This must be done prior to connecting the adapter to the network.

From the top level menu, select Settings. The following window is displayed:

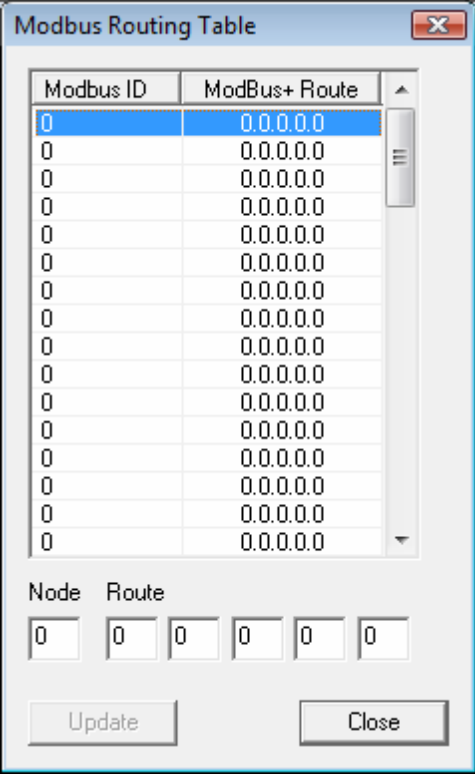


- **Modbus+ Node Address** is the address that will be assigned to the TSXCUSBMBP.
- **Slave Response Timeout** is the amount of time that is allowed for the slave device to respond to the TSXCUSBMBP before it can accept another request from the application.

### 3.2.2 Routing

For the TSXCUSBMBP to be able to communicate on a Modbus Plus network, the driver must convert a Modbus RTU ID into a 5-byte Modbus Plus routing path. The driver supports multiple addressing methods which are detailed in the help manual. Some addresses do not require an entry in the routing table. For instance, a Modbus ID which is in the range of 1-64 will be used directly as the first byte of the routing path while the remaining bytes will be set to 0. In this example, the Modbus ID must be unique to the Modbus Plus network. From the top level menu, select Routing. The following window is displayed: (See next page)





The dialog box titled "Modbus Routing Table" contains a table with two columns: "Modbus ID" and "ModBus+ Route". The first row is highlighted in blue, showing "0" in the Modbus ID column and "0.0.0.0" in the ModBus+ Route column. Below the table, there are two sections: "Node" and "Route". The "Node" section has a single input field containing "0". The "Route" section has four input fields, each containing "0". At the bottom of the dialog are two buttons: "Update" and "Close".

Modbus ID	ModBus+ Route
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0
0	0.0.0.0

Node: 0      Route: 0 0 0 0

Update      Close

Select the Modbus ID by clicking the entry on the table. The entry will become highlighted and the current values will be populated in the fields below.

- **Node** is the slave address used by the application.
- **Route** is the Modbus Plus routing that is created by the structure of the network.

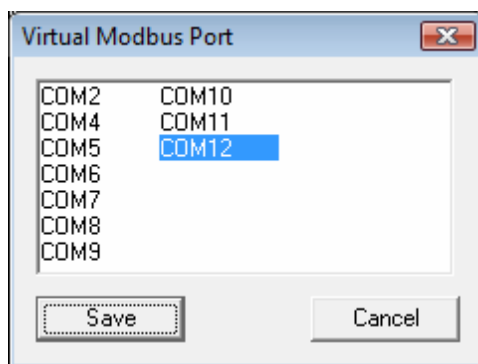
Press Update to apply the changes to the table.



### 3.2.3 Virtual Modbus Port

The Virtual Modbus Port is used by the application to send Modbus RTU requests to the TSXCUSBMBP driver. The COM port must be free and have no other device installed on it.

From the top level menu, select Virtual Modbus Port. The following window is displayed



- The **COM#** which is highlighted is the current COM port being used. To change select a different COM port.

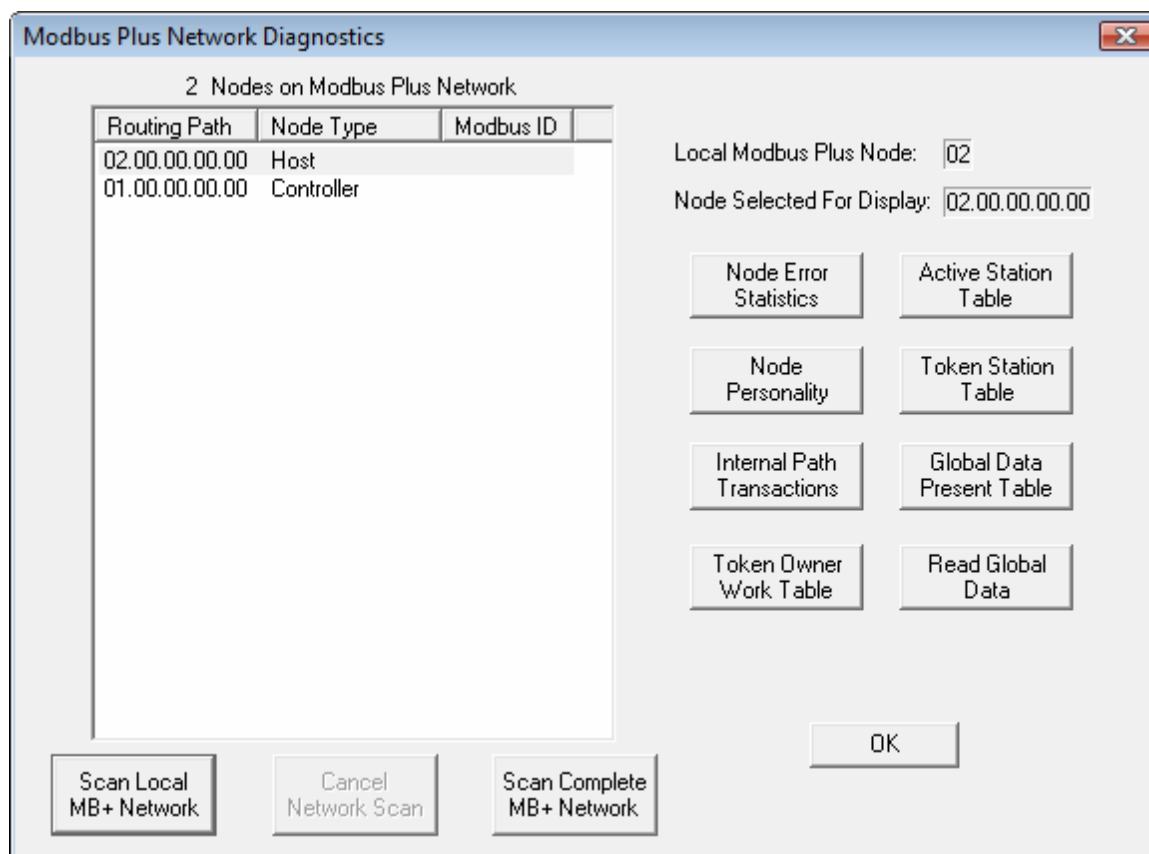
Press Save to activate the changes.



### 3.2.4 MB+ Network Diagnostics

The TSXCUSBMBP driver also provides useful diagnostics functions such as a complete and local network scan. Refer to the TSXCUSBMBP driver help manual for complete details on the diagnostic tools.

From the top level menu, select MB+ Network Diagnostics. The following window is displayed:



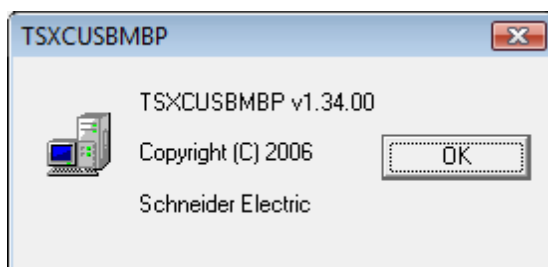
When the diagnostic window is first opened, only the TSXCUSBMBP adapter will be displayed. A scan must be performed to see other devices on the network.



### 3.2.5 Help

From the top level menu, select Help|Manual to display the TSXCUSBMBP USB Modbus Plus Communications Adapter User Manual.

From the top level menu, select Help|About... to display the TSXCUSBMBP driver version and copyright information.



## 4.TOP Server Configuration

### 4.1 Prerequisites

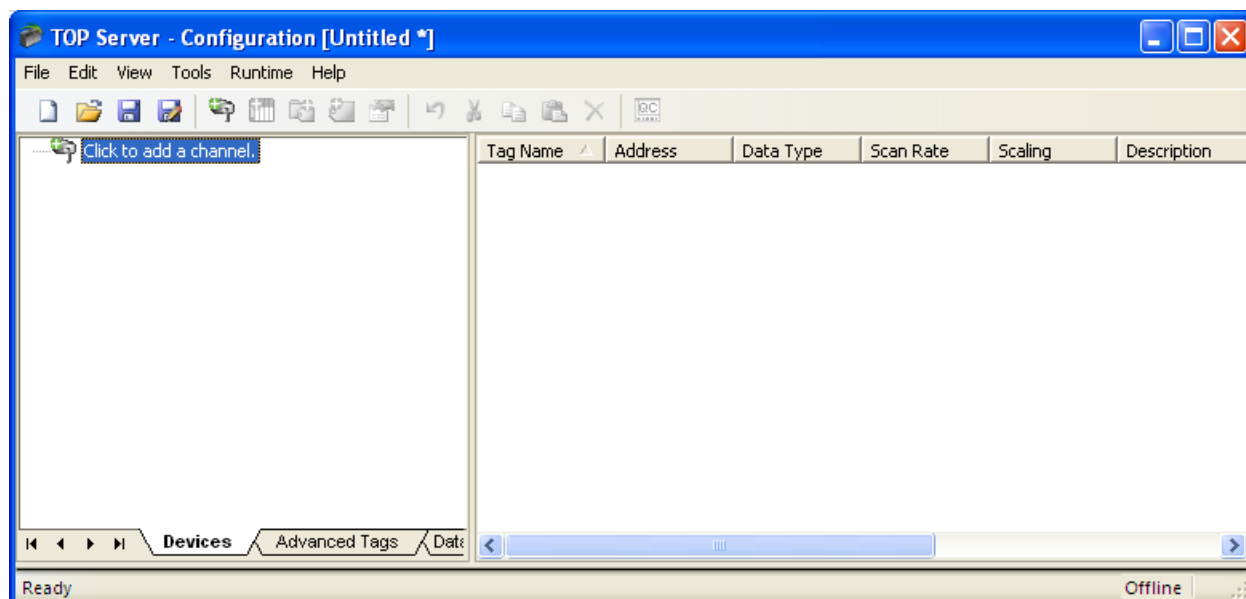
- The TSXCUSBMBP software and hardware must be installed and configured using the above guidelines.
- TOP Server must be installed on a computer that meets the hardware requirements.
- A new or existing server project must be opened.

### 4.2 Set up the Server

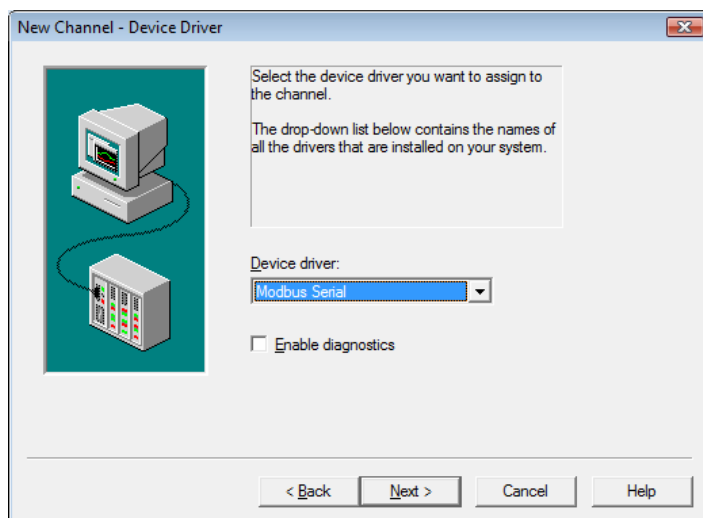
Use the following procedure to create a new channel, device and tag for use with the TSXCUSBMBP adapter.

#### 4.2.1 Create a New Channel

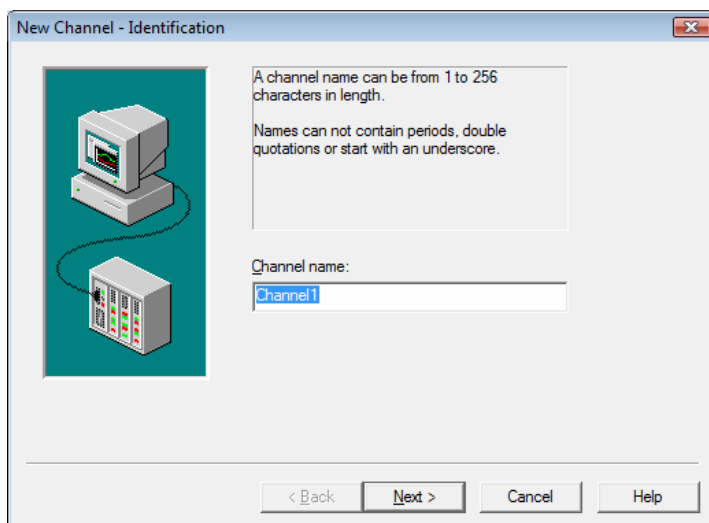
1. Using the top level menu, select “Click to add a channel.”



2. Enter a channel name. Press Next when complete.

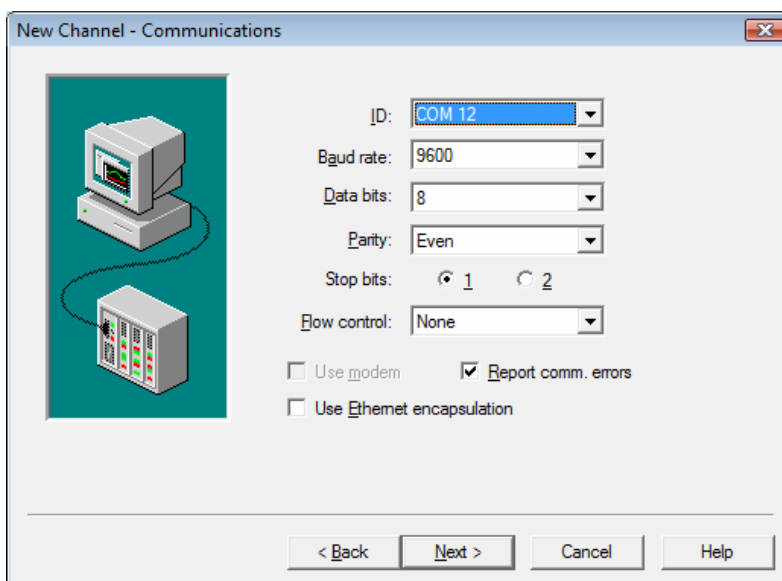


3. Use the Device Driver: drop down menu to select the Modbus Serial driver. Press Next when complete.





4. Use the ID: drop down menu to select the Virtual Modbus Port that was configured when setting up the TSXCUSBMBP driver. All other parameters are ignored when using a Virtual Modbus Port. Press Next when complete.

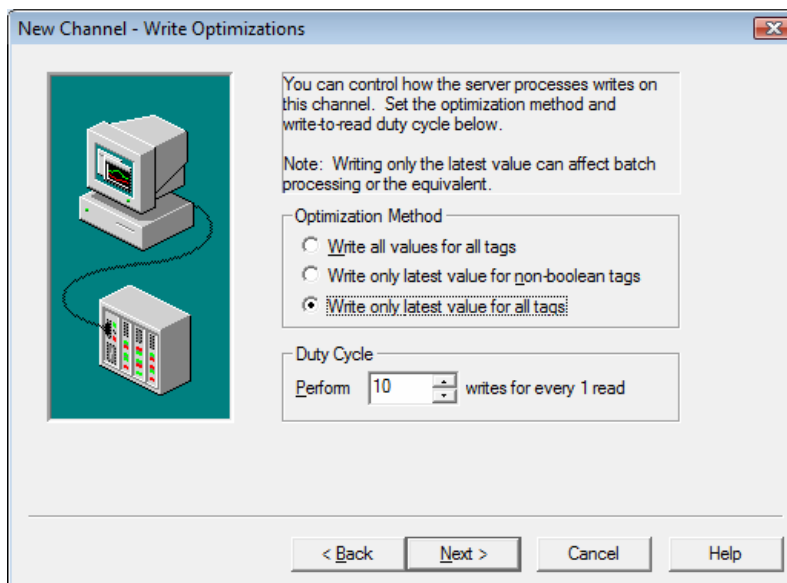


The 'New Channel - Communications' dialog box is shown. It features a graphic of a computer and a rack of modules on the left. The right side contains the following settings:

- ID: COM 12 (selected in a dropdown menu)
- Baud rate: 9600 (selected in a dropdown menu)
- Data bits: 8 (selected in a dropdown menu)
- Parity: Even (selected in a dropdown menu)
- Stop bits: 1 (selected with a radio button, 2 is unselected)
- Flow control: None (selected in a dropdown menu)
- ☐ Use modem
- ☒ Report comm. errors
- ☐ Use Ethernet encapsulation

At the bottom are buttons for '< Back', 'Next >', 'Cancel', and 'Help'.

5. Make any optimizations that are necessary. For most cases, the default values will work correctly. Press Next when complete.



The 'New Channel - Write Optimizations' dialog box is shown. It features a graphic of a computer and a rack of modules on the left. The right side contains the following settings:

You can control how the server processes writes on this channel. Set the optimization method and write-to-read duty cycle below.

Note: Writing only the latest value can affect batch processing or the equivalent.

Optimization Method

- ☐ Write all values for all tags
- ☐ Write only latest value for non-boolean tags
- ☒ Write only latest value for all tags

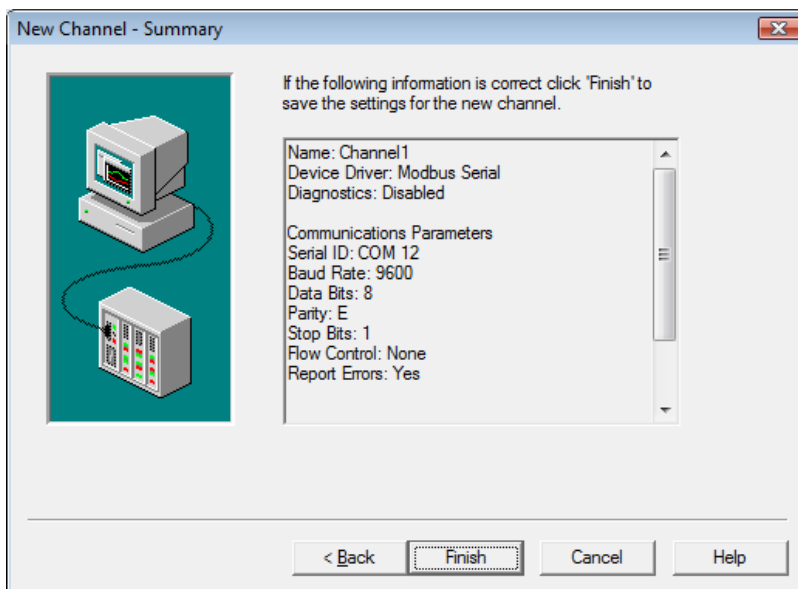
Duty Cycle

Perform 10 writes for every 1 read

At the bottom are buttons for '< Back', 'Next >', 'Cancel', and 'Help'.

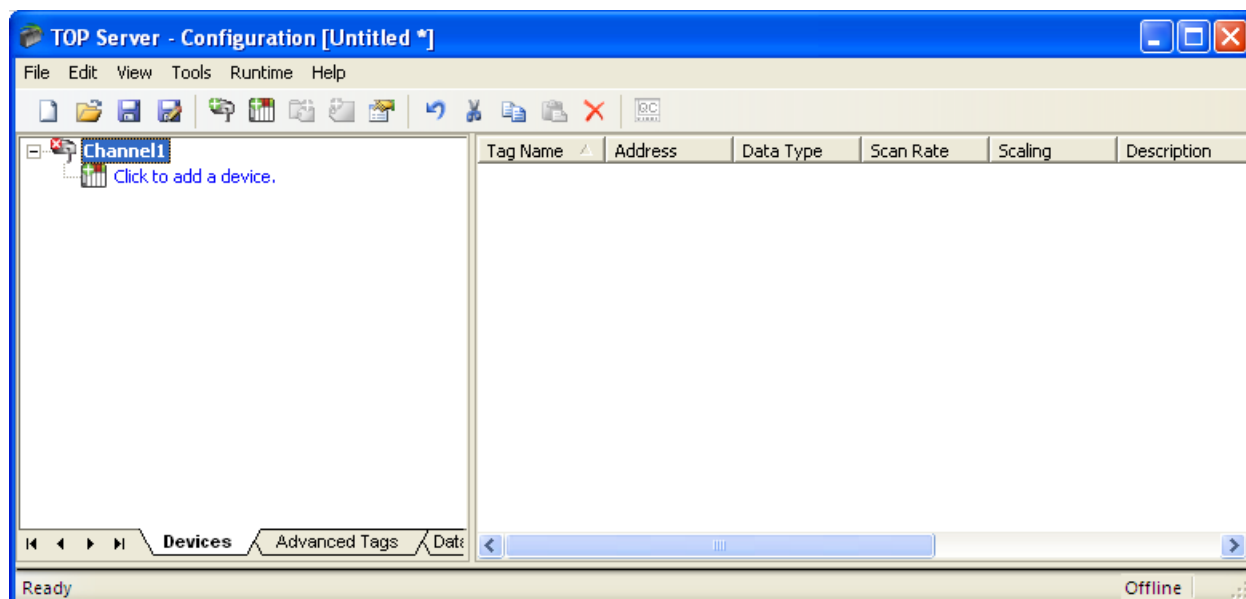


6. Review the summary and press Finish when complete.

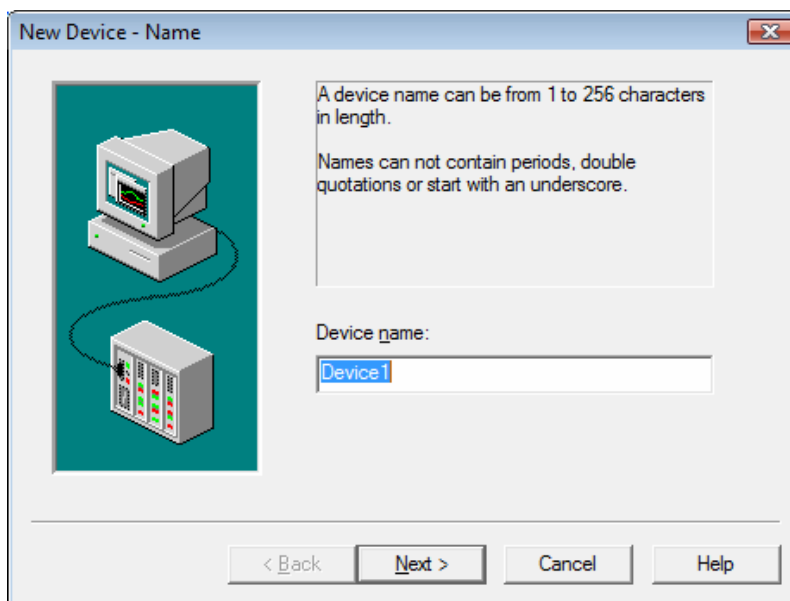


## 4.2.2 Create a New Device

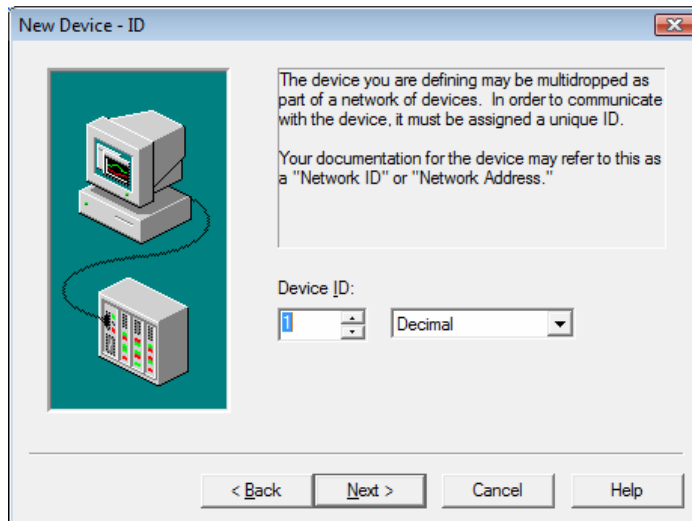
1. Using the top level menu, select "Click to add a device."



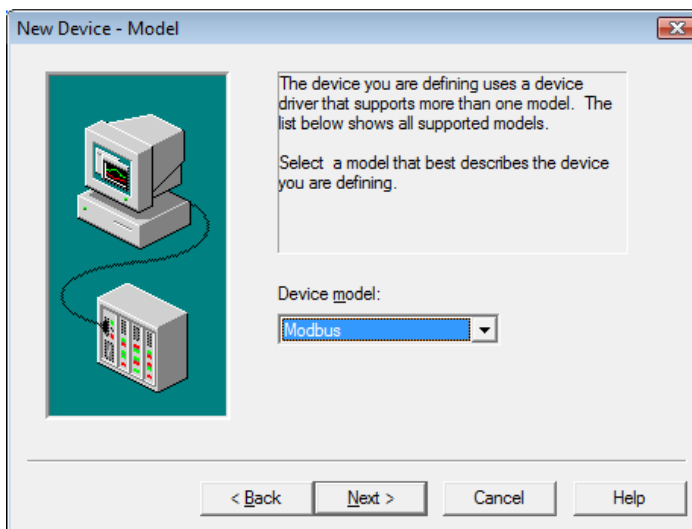
2. Enter a device name. Press Next when complete.



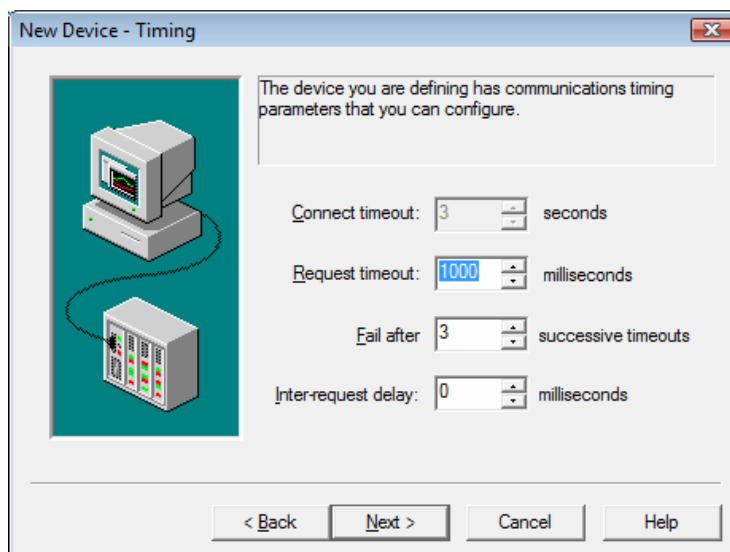
3. Use the Device model: drop down menu to select Modbus. Press Next when complete.



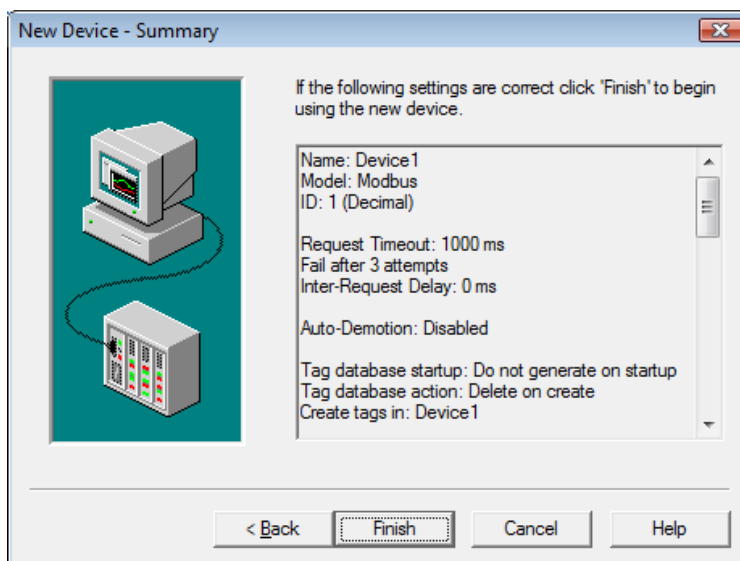
4. Use the Device ID: drop down menu to select the slave ID that was configured in the Modbus Routing Table when setting up the TSXCUSMBBP driver. If no entry was made in the Modbus Routing Table, select the Modbus Plus node address of the device. Press Next when complete.



5. Continue with the New Device wizard using the default values for the remaining pages. The values can be modified at the device level at a later time.

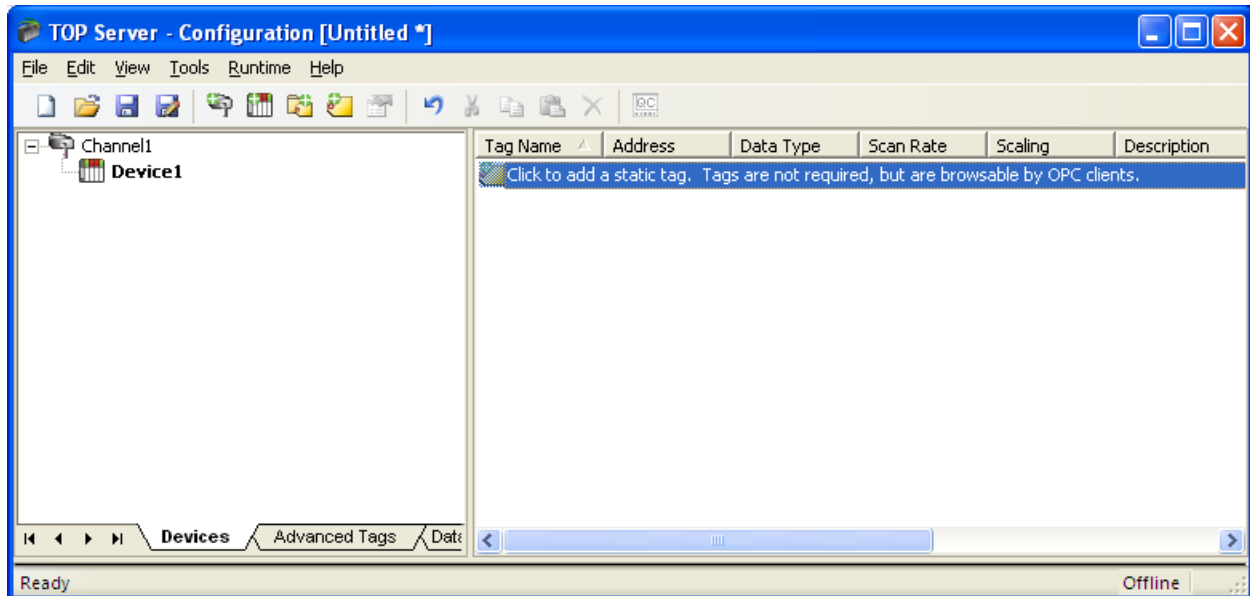


6. Review the summary and press Finish when complete.

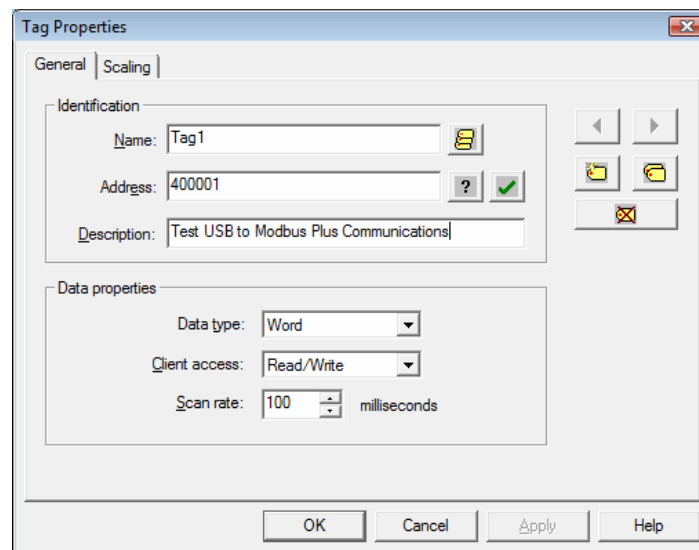


### 4.2.3 Create a New Tag

1. Using the top level menu, select "Click to add a static tag"

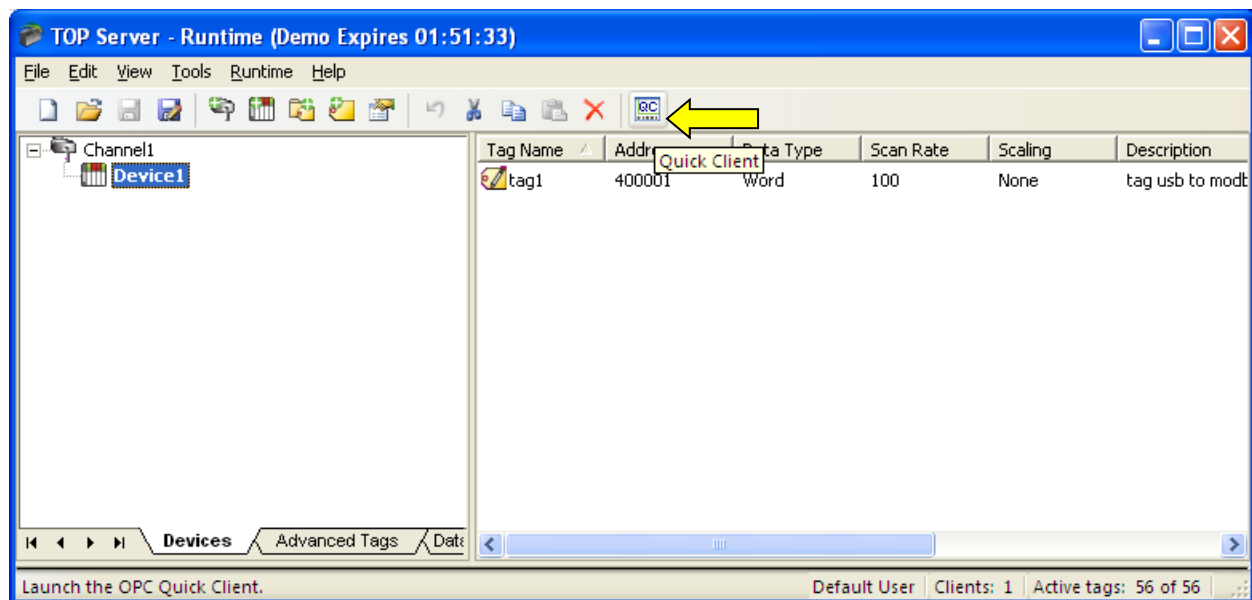


2. Under the General tab, assign a name for the new tag. In this example, Modbus address 400001 is used in the address field. A description may also be entered. Press OK when complete.

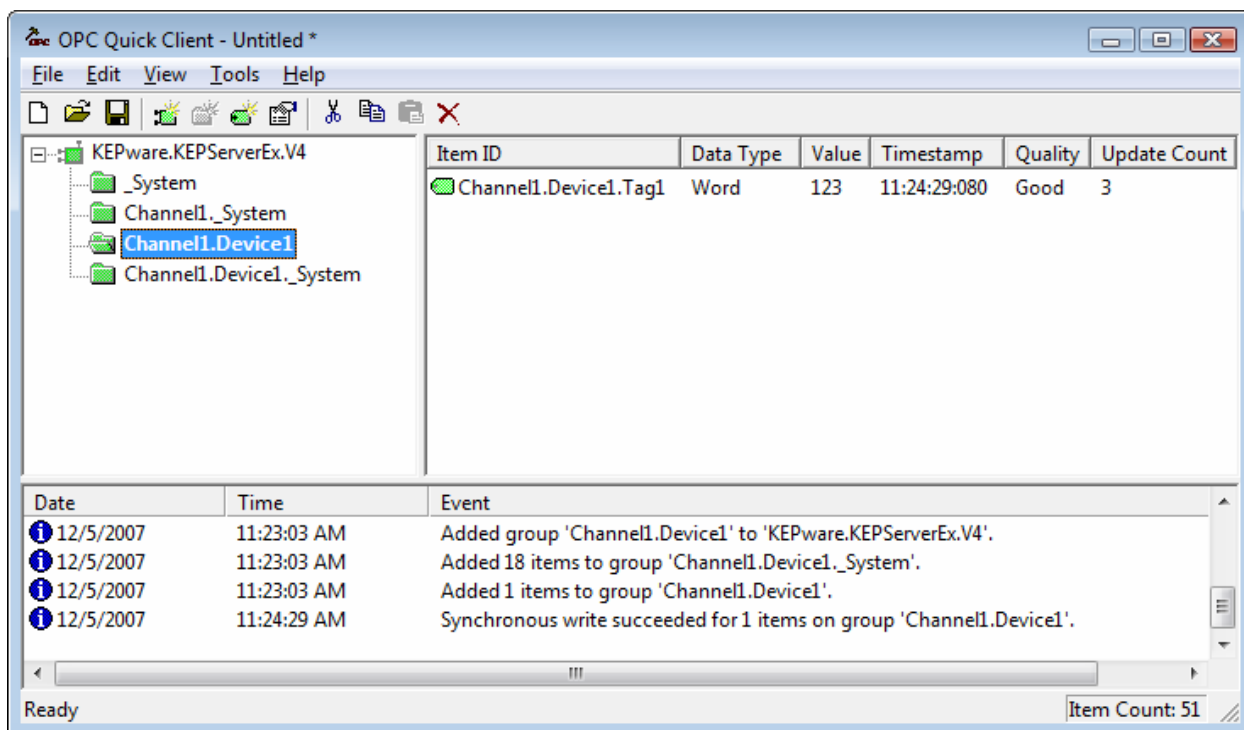


### 4.3 Check the Connection

1. Using the top level menu, select OPC Quick Client button (the yellow arrow is designating the Quick Client button on the screen below)



2. Click on the folder that has the channel and device name that you specified above. This example used the default values of Channel 1 and Device 1. The window on the right displays information regarding the created tags. The connection is working correctly as Tag1 shows a Quality of Good.



The connection is now ready for the transferring of data with OPC. Refer to the TSXCUSBMBP driver help manual for complete details on how to use the TSXCUSBMBP to connect to applications such as Concept, Unity, and ProWorx32.

