



OPC Servers

Modbus OPC Server Quick Start



APPLICATION NOTE

October 2015

Description: Guide to configuring and running the Modbus OPC Server.

Introduction to Modbus OPC Server

The ICONICS Modbus OPC Server is an OPC-compliant OPC Data Access (DA) and Alarm & Events (A & E) Server that serves data to OPC clients.

The ICONICS Modbus OPC Server is based on the popular Modbus protocol and can be connected to real world Modbus compatible I/O hardware.

Key Features of Modbus OPC Server 3.6

- Advanced OPC data quality and data conversion to client's request.
- Modbus OPC Server utilizes advanced threading capability of the Modbus Server.
- Supports multiple multi-drop I/O devices.
- Supports multiple groups for easy configuration and manageability.
- Supports all popular PLC and RTU data types.
- Internal simulated for configuration and testing.
- OPC client for rapid testing of your OPC data connections.
- Tag multiplier allows you to create hundreds of tags in seconds.
- User interface for viewing tags, groups, and real-time signals.
- Supports OPC Data Access (DA) and Alarm and Events (AE) specifications.
- Flexible engineering units and signal ranges.
- TraceWorX32 diagnostics support (logging data into XML file)
- Sample OPC Client

This document will guide you through the steps of configuring your Modbus server and explains the advance features available including, advanced server settings.

Configuring the Modbus Server

Start the Modbus Configurator by going to Start → Programs → ICONICS Modbus OPC Server 3.6 → Modbus OPC Configurator

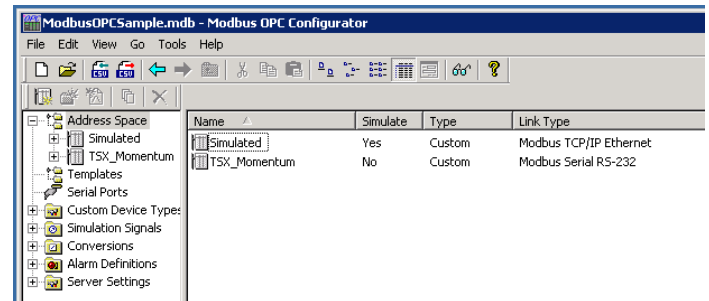


Figure 1 - Modbus Configurator

NOTE: You will notice a default configuration, which can be used to add a new Device or create new configuration file to start. If you chose to create a new configuration, make sure it is made active.

Defining Devices:

OPC Modbus Server v 3.6 let user add Modbus Serial or Modbus Ethernet Device in the same configuration. Follow the steps below to define your device.

1. Right-click on Address Space and select New → Device.

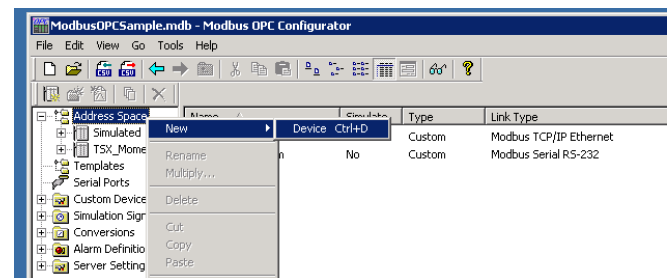


Figure 2 - New Device

2. Give the Device a name and specify "Link Type" as Modbus TCP/IP Ethernet or *Modbus Serial RS-323.

NOTE: A COM/Serial port should have been defined if selecting Modbus Serial RS-323.



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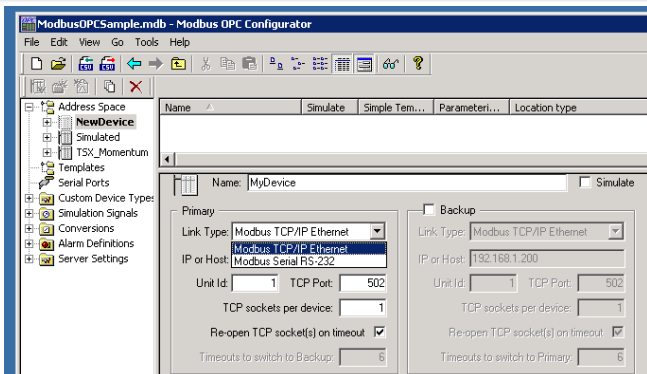


Figure 3 - Device Link Type Settings

NOTE: These settings must match the settings of your Modbus device

3. Select IP or HOST for Modbus TCP/IP Ethernet or COM Port if defining a Modbus Serial RS-232 device.

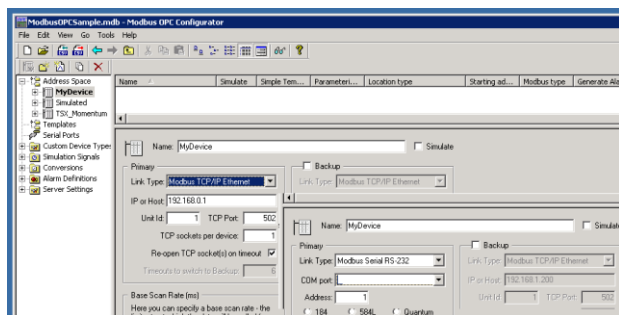


Figure 4 - Device Link Type Settings/ IP or Port setting

4. If selecting Modbus Serial RS-232 then define a Serial port with properties matching to Serial device as shown in Figure 5.

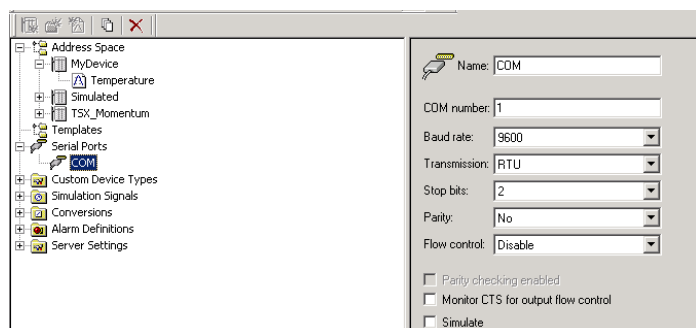


Figure 5 - Serial COM port setting

5. Then select the Device (Radio Button) Type if it is listed under "Type", otherwise select "Custom" and press the "Apply" button when you are done.

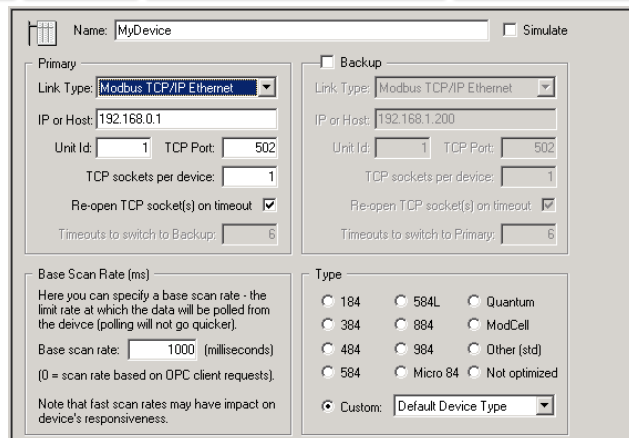


Figure 6 - Device type

Defining Data Items

6. Right-click on the device that you have just created and select New → Data Item

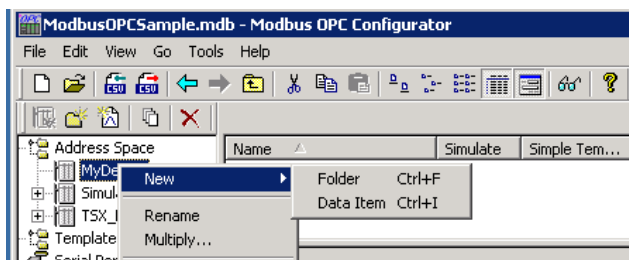


Figure 7 - Data Item

NOTE: You can use "Folder" option to arrange data items more efficiently.

7. Give the data item a name and set its properties. Like Modbus Data Type, Device Address then click on "Apply" when you are done

You can create a Temperature tag as shown in Figure 8 if you wish.



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Figure 8 - Temperature tag settings

Similarly you can create additional data items, then click on **"Apply"** when you are done

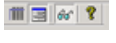
Defining Alarms for Data Items

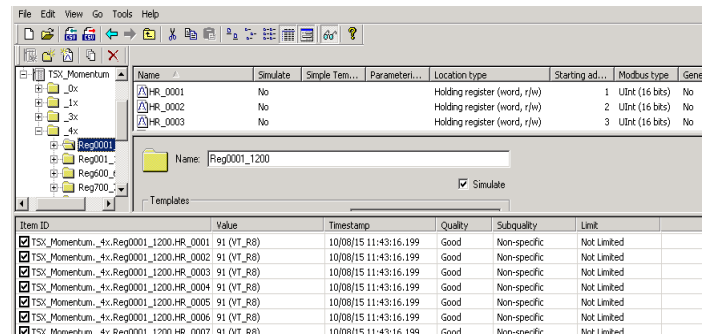
If you want your data items to generate OPC Alarms, check **"Generate Alarms"** and Select **"Limit"** or **"Digital"** based upon your **Modbus Data Type** along with any desired additional properties.

You may have to define additional "Limit" and "Digital" alarms under  **Alarm Definitions** in Server configuration for multiple OPC Data Items.

Figure 9 - Generate Alarms

NOTE: You can connect any industry standard OPC Alarm & Event client such as "ICONICS AlarmWorX32 viewer" to view alarms from Modbus A & E server.

Your configuration is ready and now you can monitor OPC data items by clicking on the Monitor View button  and selecting a folder or data item on the right hand side panel of your configuration.



Item ID	Value	Timestamp	Quality	Subquality	Limit
TSX_Momentum_4x.Reg0001_1200.HR_0001 91 (VT_P8)	10/08/15 11:43:16.199	Good	Non-specific	Not Limited	
TSX_Momentum_4x.Reg0001_1200.HR_0002 91 (VT_P8)	10/08/15 11:43:16.199	Good	Non-specific	Not Limited	
TSX_Momentum_4x.Reg0001_1200.HR_0003 91 (VT_P8)	10/08/15 11:43:16.199	Good	Non-specific	Not Limited	
TSX_Momentum_4x.Reg0001_1200.HR_0004 91 (VT_P8)	10/08/15 11:43:16.199	Good	Non-specific	Not Limited	
TSX_Momentum_4x.Reg0001_1200.HR_0005 91 (VT_P8)	10/08/15 11:43:16.199	Good	Non-specific	Not Limited	
TSX_Momentum_4x.Reg0001_1200.HR_0006 91 (VT_P8)	10/08/15 11:43:16.199	Good	Non-specific	Not Limited	
TSX_Momentum_4x.Reg0001_1200.HR_0007 91 (VT_P8)	10/08/15 11:43:16.199	Good	Non-specific	Not Limited	

Figure 10 - Monitor View

You can exit the configurator and use an OPC client can to browse the Modbus OPC Server and OPC tags.

Advance Features

The Server Settings tree in the Modbus OPC Server 3.6 Configurator allows you to make changes to the server itself, specifically:

- **Threading**
- **Trace**
- **Statistics**
- **Online Changes**

Threading

The threading configuration allows you to specify the initial and maximum number of threads created by the OPC server.



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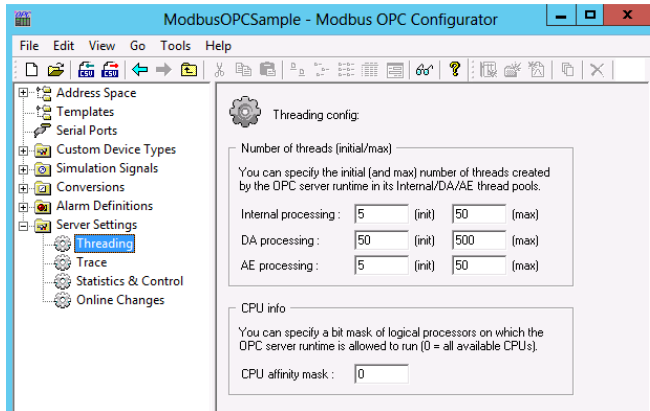


Figure 11 - Threading options

Trace

In Modbus version 3.6 or later you can enable XML Tracing to diagnose communication issues with your configuration. To do so, check the “Enable XML tracing” box and change the other trace settings as desired.

Statistics & Control

Under the Statistics & Control page you can enable runtime statistics and control items to achieve the following.

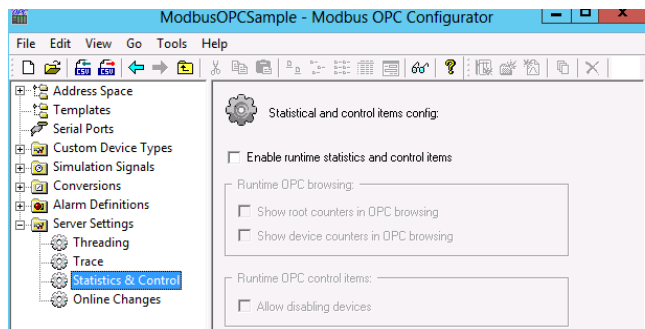


Figure 12 - Statistics & Control options

Online Changes

The Online Changes dialog allows you to define the rate at which the Modbus runtime checks for configuration changes made to the active database.

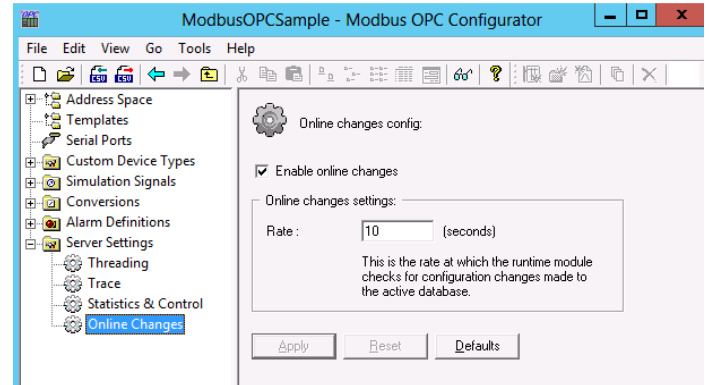


Figure 13 - Online Changes options

Scaling

Scaling is an advanced capability of the Modbus OPC Server. It is used to convert raw device data into meaningful engineering data. In the following example, we will demonstrate how a temperature sensor with a value from 0 to 65535 to have engineering values from -10 to 300 Degrees Celsius.

1. Start the Modbus OPC Configurator
2. In the left-hand pane, right-click on the Conversions folder and select New → Conversion
3. Set the High Instrument Range IR to 65535
4. Set the Low Engineering Units EU to -10 and the High Engineering Units EU to 300.

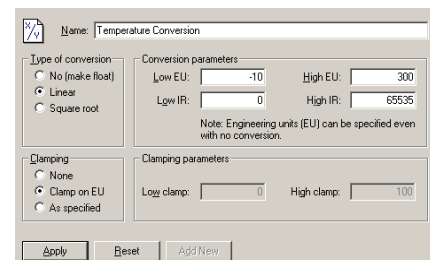


Figure 14 - Temperature Conversion Properties

5. Click “Apply” when you are done.
6. If you have followed the example and created a Temperature tag in the previous section, select the tag.
7. In the tag configuration, check Use Conversion and select the Temperature Conversion we have just created.



Figure 15 - Set Conversion on Temperature Tag

8. Click on “Apply” when you are done.