
ION over Modbus communications

New features and improvements were made on firmware version v1.4.1 for the PM8000 and ION7400 meters. This document addresses issues related to replacing legacy products on a Modbus serial (RS-485) bus connected to PME systems.

ION over Modbus is a communications method that allows an ION master such as EcoStruxure™ Power Monitoring Expert or PowerLogic™ ION Setup software full access to all the ION modules inside the ION meter, while communicating using Modbus RTU protocol on the serial daisy chain

The primary use of ION over Modbus is specifically for retrofit applications, where a Modbus meter such as the PowerLogic PM800 series meter is being replaced by an ION meter such as the PowerLogic PM8000 series meter on the RS-485 serial bus.

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Additional information

- ◆ *ION Reference*, available from www.schneider-electric.com
- ◆ Your ION meter's user manual
- ◆ Your ION meter's Modbus register information (map)
- ◆ Power Monitoring Expert online help
- ◆ ION Setup online help

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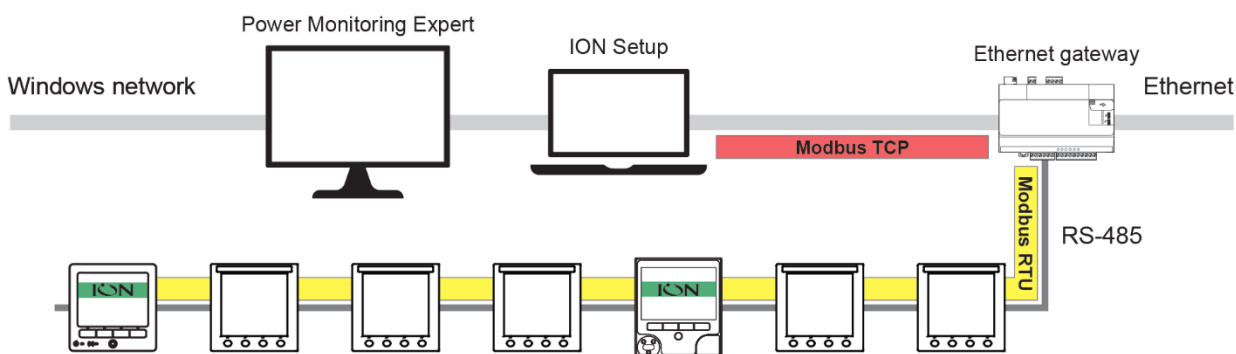


ION over Modbus overview

All ION meters support the Modbus RTU protocol. Newer ION meter firmware adds ION over Modbus functionality. This enables an ION master such as Power Monitoring Expert or ION Setup to access all configuration and historical data in the meter while it is connected to a serial communications bus and configured as a Modbus RTU device.

Supported networks

Updates are available for Power Monitoring Expert and ION Setup to support ION over Modbus for communication networks utilizing an Ethernet to serial gateway device to connect to the serial daisy chain.



Power Monitoring Expert and ION Setup currently **do not** support ION over Modbus communications for:

- Direct Ethernet or direct serial communications connections.
- Serial communications sites that use serial-to-serial communications converters such as an RS-232 to RS-485 converter or USB to RS-485 adapter.
- Modem sites (telephone, radio or fiber optic).

Serial communications considerations

ION meters can generate larger volumes of historical data, events or waveforms, which might cause communications performance issues. It is recommended not to exceed 10-15 devices wired on the same RS-485 daisy chain.

Prerequisites

To use ION over Modbus, both your ION meter and ION software must meet the minimum requirements.

ION meter

- PM8000 firmware v1.4.1 or later
- ION7400 firmware v1.4.1 or later

ION software

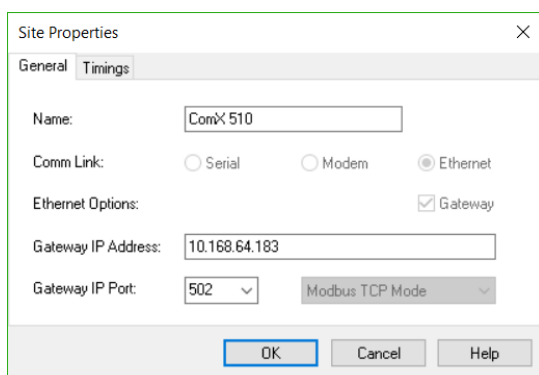
- Power Monitoring Expert 8.2 CU1 (cumulative update #1) or later
- The latest version of ION Setup (available from [Box at Schneider Electric](#))

Device settings for ION over Modbus

The Ethernet gateway device and all the meters on its RS-485 port must be properly configured to enable ION over Modbus communications with the ION meter.

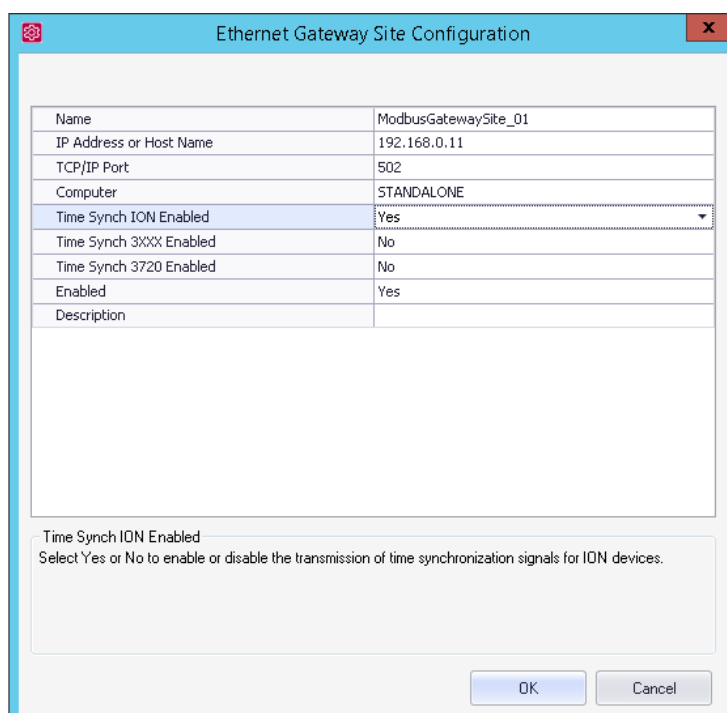
Modbus Ethernet gateway device setup

The gateway device's Ethernet port must be set to Modbus TCP (Port 502).



The Site Properties dialog box, Timings tab, shows the following configuration:

Property	Value
Name	ComX 510
Comm Link	☐ Serial ☐ Modem ☒ Ethernet
Ethernet Options	☒ Gateway
Gateway IP Address	10.168.64.183
Gateway IP Port	502
Modbus TCP Mode	Modbus TCP Mode



The Ethernet Gateway Site Configuration dialog box shows the following configuration:

Property	Value
Name	ModbusGatewaySite_01
IP Address or Host Name	192.168.0.11
TCP/IP Port	502
Computer	STANDALONE
Time Synch ION Enabled	Yes
Time Synch 3XXX Enabled	No
Time Synch 3720 Enabled	No
Enabled	Yes
Description	

Time Synch ION Enabled
Select Yes or No to enable or disable the transmission of time synchronization signals for ION devices.

ION meter configuration

The usual rules apply to the ION meter when adding it to the Modbus serial daisy chain:

- The communications protocol must be set to Modbus RTU, same setting as all the other Modbus devices on the daisy chain.
- The ION meter's Modbus address must be unique from all other devices on the same RS-485 daisy chain.
- The baud rate and parity must be set to the same value for the gateway device and all the Modbus devices on the RS-485 daisy chain. The other serial port settings must also match the Modbus default values (i.e., 8 data bits and 1 stop bit).

Time synchronization settings

To time sync the ION meter using PME or ION Setup, you must set *Time Sync Source* to **Ethernet** or **Ethernet-ION**.

Setting the meter's time synchronization source

Use ION Setup to configure the source for ION time synchronization.

1. Open the Setup Assistant for the meter and select **Clock**.
2. Select **Time Sync Source** and click **Edit**.
3. Set the time synchronization source to **ETHERNET** or **ETHERNET-ION**, then click **OK**.

Enabling ION time synchronization

Use the same settings in Power Monitoring Expert as you would for a serial ION meter communicating using ION protocol. To enable Power Monitoring Expert time synchronization:

1. Log in to Management Console, then select **Sites**.
2. Right-click your Modbus Ethernet gateway site, then select **Configure Site**.
3. Set Time Synch ION Enabled to **Yes**.
4. Click **OK**.

Multi-master support

You can use multiple masters (i.e., a Modbus master, Power Monitoring Expert, or ION Setup) to communicate with the ION meter. However, it is recommended that you do not use more than 2 masters because of the slower speeds and bandwidth limitations associated with RS-485 networks.

NOTE: A Modbus master can access only the mapped Modbus registers on an ION meter. Refer to the ION meter's Modbus register list, available from Schneider Electric.

Events

For ION over Modbus, events involving communications will be recorded by the ION meter as Ethernet events.

Additional information

If you have questions or comments about this technical bulletin, please contact Schneider Electric Technical support.

<https://www.schneider-electric.com/b2b/en/support/contacts.jsp>