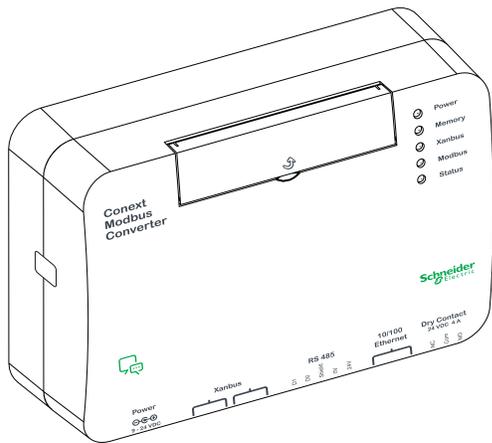


Conext™ Modbus Converter

Owner's Guide



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Contact Information www.schneider-electric.com

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<http://www.schneider-electric.com/sites/corporate/en/support/operations/local-operations/local-operations.page>

Information About Your System

As soon as you open your product, record the following information and be sure to keep your proof of purchase.

Serial Number _____

Product Number _____

Purchased From _____

Purchase Date _____

About This Guide

Purpose

The purpose of this Owner's Guide is to provide explanations and procedures for installing, operating, configuring, maintaining, and troubleshooting the Conext Modbus Converter.

Scope

The Guide provides safety guidelines, planning, and setup information, procedures for installing the Modbus Converter, as well as information about configuring, monitoring, and troubleshooting the unit. It does include information on how to use other Schneider Electric products.

Firmware Revision

Some Modbus Converter features and functions described in this guide may be incorporated with later firmware versions. This manual is valid for Modbus Converter version 01.00. To view the firmware version on your product, see the Modbus Converter Status Information in the Web user interface.

Audience

The Guide is intended for use by anyone who plans to construct, install, or operate a system involving the Modbus Converter. The information in this manual is intended for qualified personnel. Qualified personnel have training, knowledge, and experience in:

- Installing electrical equipment
- Applying all applicable installation codes
- Analyzing and reducing the hazards involved in performing electrical work
- Changing any TCP/IP-related settings

Organization

This Guide is organized into five chapters and two appendices.

Chapter 1, "Overview", describes physical features of the Modbus Converter and introduces the user interface.

Chapter 2, "Installation", describes how to install, wire, and connect the Modbus Converter to your network.

Chapter 3, "Configuration", describes how to configure and change device settings, and upgrade firmware.

Chapter 4, "Monitoring", describes how to monitor LED indicator lights (LEDs).

Chapter 5, "Troubleshooting", describes how to interpret events and alerts.

Appendix A, "Specifications", contains the electrical, mechanical and environmental specifications for the Modbus Converter.

Conventions Used

The following conventions are used in this guide.

DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, can result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation, which, if not avoided, can result in moderate or minor injury.

NOTICE

NOTICE indicates important information that you need to read carefully.

Abbreviations and Acronyms

DHCP - Dynamic Host Configuration Protocol

LED - Light Emitting Diode (used for indicator lights)

SELV - Safety Extra Low Voltage

TCP/IP - Transmission Control Protocol/Internet Protocol

Related Information

Modbus Maps

Modbus maps are not included in this guide. They are available at www.schneider-electric.com/solar. The following Modbus maps are used with the Modbus Converter:

- Conext SW Modbus Map (503-0244-01-01)
- XW Modbus Map (503-0246-01-01)
- XW Automatic Generator Start Modbus Map (503-0247-01-01)
- XW MPPT 60 150 Modbus Map (503-0248-01-01)
- Grid-Tie/TX Modbus Map (503-0250-01-01)
- XW System Control Panel Modbus Map (503-0251-01-01)
- XW MPPT 80 600 Modbus Map (503-0252-01-01)
- Conext Modbus Converter/ComBox Modbus Map (503-0253-01-01)

Related Products

For more information about related products, refer to:

XW Hybrid Inverter/Charger Operation Guide

Xantrex XW Series Solar Charge Controller Owner's Manual

Xantrex XW Automatic Generator Start Owner's Guide

XW System Control Panel Owner's Guide

Conext SW Inverter/Charger Owner's Guide

XW MPPT 80 600 Solar Charge Controller Operation Guide

XW MPPT 60 150 Solar Charge Controller Operation Guide

Grid-Tie-AUS Solar Inverter Owner's Manual

Conext TX Solar Inverter Owner's Manual

You can find more information about Schneider Electric as well as its products and services at www.schneider-electric.com.

For specific information on Solar products go to www.schneider-electric.com/solar.

Important Safety Instructions

READ AND SAVE THESE INSTRUCTIONS - DO NOT DISCARD

This guide contains important safety instructions for the Conext Modbus Converter that must be followed during installation and configuration procedures.

DANGER

HAZARD OF ELECTRIC SHOCK

- Read all instructions, cautionary markings, and all other appropriate sections of this manual before installing, operating, troubleshooting or performing maintenance on the Conext Modbus Converter.
- Exercise extreme caution at all times to prevent accidents.
- These instructions are for use by qualified installers only.

Failure to follow these instructions will result in death or serious injury.

DANGER

HAZARD OF ELECTRIC SHOCK AND FIRE

- Connect only to Safety Extra Low Voltage (SELV) circuits and power sources.
- All wiring must be done by qualified personnel to ensure compliance with all applicable installation codes and regulations.
- For Indoor Use Only.
- Do not disassemble. No user serviceable parts inside.

Failure to follow these instructions will result in death or serious injury.

NOTICE

EQUIPMENT DAMAGE

- All cables connected to the Modbus Converter must run indoors and not be susceptible to lightning strikes.
- Turn OFF all devices before connecting cables. The Conext Modbus Converter does not have an ON/OFF switch.
- Do not connect an Ethernet cable from the Modbus Converter to the WAN/MODEM port on the network router.
- Do not connect an Ethernet cable plug into a Xanbus port on the Conext Modbus Converter.
- Do not connect a Xanbus RJ-45 cable plug into the 10/100 Ethernet port of the Conext Modbus Converter.
- Do not connect any port on the Modbus Converter to an outside line or to a public telecommunication network.
- Ensure that the device connected on the Xanbus network is in standby mode before changing settings. Do not change any settings unless you are familiar with the device.
- Changes to any TCP/IP-related settings should only be performed by a qualified IT professional.

Failure to follow these instructions can damage equipment or affect network performance.

NOTICE

EQUIPMENT DAMAGE

- Do not disassemble the Conext Modbus Converter.
- See warranty for instructions on obtaining service.
- The Conext Modbus Converter contains no user-serviceable parts. Attempting to service the Conext Modbus Converter yourself will void your warranty.

Failure to follow these instructions can damage equipment.

Important: This device can be configured to connect to the Internet using port-forwarding in your network router's settings. There is a security risk in port-forwarding unencrypted network traffic over a public network (Internet). Use of a VPN or a secure tunnel to route Modbus Converter communication via the Internet is recommended.

Contents

Important Safety Instructions

1 Overview

Compatible Xanbus™ Components	1-2
Physical Features	1-3
Data Port and Reset	1-3
LED Indicator Lights (LEDs)	1-4
Communication and Power Ports	1-5
Types of Modbus Converter Networks	1-6
Modbus Converter as a Modbus Slave (RS 485)	1-6
Modbus Converter on a Local Area Network (LAN)	1-7
Power Sources for the Modbus Converter	1-8
User Interface	1-9
Home Screen	1-9
Menu Bar	1-10
Side Menu	1-10

2 Installation

Choosing a Location	2-2
Materials and Tools Required	2-3
Materials List	2-3
Additional Material and Tools	2-3
Mounting the Modbus Converter	2-4
Wall Mount	2-4
DIN Rail Mount	2-6
Wiring the RS 485 Modbus Connector for Data Communication to the Modbus Converter	2-7
Wiring the Dry Contact Connector	2-9
Connecting the Modbus Converter to an Ethernet Network	2-10
Turning On the Modbus Converter	2-12
Connecting the AC/DC Power Adapter	2-13
Wiring the RS 485 Modbus Connector for Power to the Modbus Converter	2-14
Finding the Modbus Converter on the Network	2-16
Logging in to the Modbus Converter Web User Interface Using a USB Thumb Drive	2-18

3 Configuration

- Configuration Steps ----- 3-2
- Logging In----- 3-3
- Changing the Password ----- 3-4
- Changing the Time----- 3-6
- Changing E-Mail Settings ----- 3-8
- Connecting the Modbus Converter to the Xanbus Network ----- 3-10
- Changing Other Settings ----- 3-12
 - General Settings ----- 3-13
 - TCP/IP Settings ----- 3-14
 - Web ----- 3-15
 - Dry Contact Relay ----- 3-16
 - Xanbus Communications ----- 3-16
 - Modbus Communications ----- 3-17
 - Modbus Byte Order ----- 3-17
 - Modbus Address List ----- 3-19
 - Modbus Address Enumeration ----- 3-20
- Resetting the Modbus Converter to Factory Settings----- 3-22
- Upgrading Firmware ----- 3-23
 - Clearing Modbus Converter Internal Firmware Memory ----- 3-23
 - Installing Modbus Converter Upgrades from a Thumb Drive ----- 3-24
 - Installing Modbus Converter Upgrades Remotely ----- 3-26
 - Installing Xanbus Device Upgrades ----- 3-30

4 Monitoring

- Monitoring LEDs ----- 4-2
 - Startup ----- 4-2
 - Operating Mode ----- 4-3
- Monitoring Communication Settings----- 4-4
- Monitoring System Aggregation and Energy Parameters----- 4-6

5 Troubleshooting

Alerts----- 5-2
 Events----- 5-3
 Troubleshooting----- 5-4

A Specifications

Electrical Specifications----- A-2
 Communication Interfaces----- A-2
 Data Interfaces----- A-2
 User Interfaces----- A-2
 Power Supply (SELV on all sources)----- A-2
 Memory----- A-2
 General Specifications----- A-3
 Features----- A-3
 Regulatory Approvals----- A-4
 Schneider Electric Products that work with the Modbus Converter----- A-4
 Views and Dimensions----- A-5
 Front View----- A-5
 Bottom View----- A-5
 Side View----- A-6
 Back View----- A-6

1

Overview

Chapter 1 describes the features of the Conext Modbus Converter and provides an overview of its physical features and Web interface. It includes:

- Compatible Xanbus™ Components
- Physical Features
- Types of Modbus Converter Networks
- Power Sources for the Modbus Converter
- User Interface

The Conext Modbus Converter is a multi-function communication device that delivers a unified view of system performance for residential power monitoring systems. It provides a communications gateway between a network of Xanbus-enabled devices and Modbus devices. Operators can configure the Modbus Converter system and monitor performance with third party software packages and building management systems.

Other features of the Modbus Converter include:

- Compatibility—connect Xanbus-enabled devices without requiring device-specific control panels
- Real time clock—keeps time for the entire system
- Non-volatile memory—preserves the latest Modbus Converter settings if power is interrupted or network communication is disrupted.
- Firmware storage and upgrade capability—use the Modbus Converter to upgrade or downgrade firmware for Xanbus-enabled devices on the network.

Compatible Xanbus™ Components

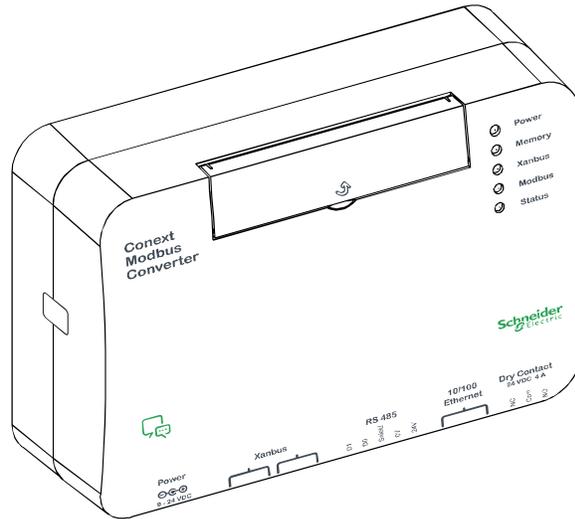
The Modbus Converter works with several Schneider Electric products including:

- XW Inverter/Chargers
- XW System Control Panel (SCP)
- XW Automatic Generator Start (AGS)
- Conext SW Inverter/Chargers
- MPPT 60 150 Solar Charge Controllers
- MPPT 80 600 Solar Charge Controllers
- Conext TX Grid-Tie Solar Inverters
- Grid-Tie-AUS Series Grid-Tie Solar Inverters

Note: For details on specific models supported, see the “Specifications” in Appendix A. The Modbus Converter supports up to a maximum of 20 devices on a Xanbus network depending on the device types.

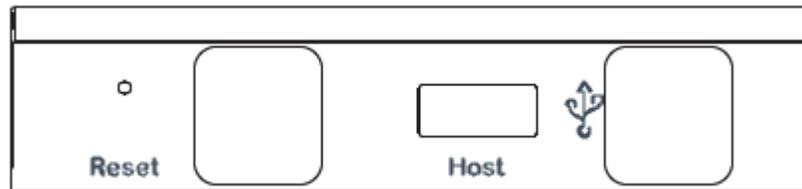
Physical Features

The following illustration shows the Modbus Converter. The tables in the following sections contain descriptions of the connectors, indicators, and data ports on the Modbus Converter.



Data Port and Reset

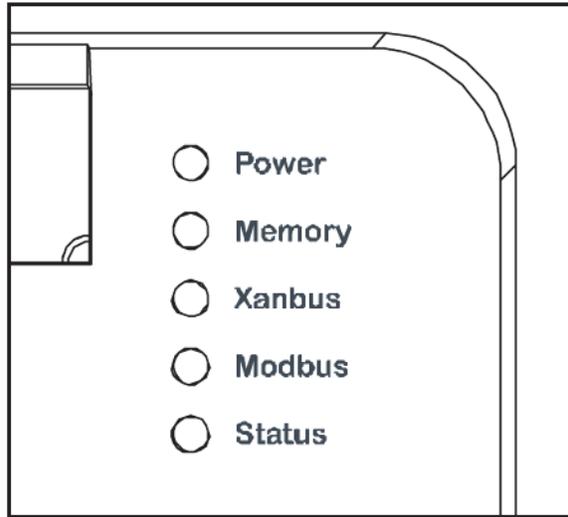
The data port and reset button are located at the top, front of the Modbus Converter. Their functions are listed in the following table.



Item	Description
Reset	Reset pinhole is used to restore factory settings or clear internal firmware memory. See “Resetting the Modbus Converter to Factory Settings” and “Clearing Modbus Converter Internal Firmware Memory”.
Host	USB Host data port for uploading firmware upgrades into the device - a thumb drive or equivalent mass storage device can be used. See “Installing Modbus Converter Upgrades from a Thumb Drive”.

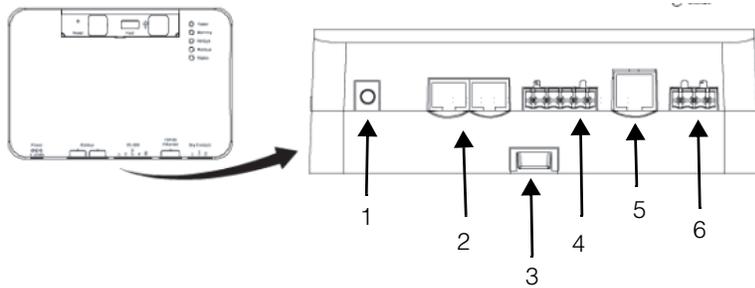
LED Indicator Lights (LEDs)

The Power LED flashes slowly during the Modbus Converter application loading and flashes quickly during application initialization. The other LEDs go on as the startup progresses. Once the Modbus Converter is ready, the Power LED is on and the other LEDs behave as described below. See “Monitoring LEDs” for more information.



Item	Description
Power	Green LED. The Modbus Converter is powered and ready to communicate when on.
Memory	Green LED. Device is logging data to internal memory when flashing.
Xanbus	Green LED. Device is actively communicating or transferring data with the Xanbus network when on.
Modbus	Green LED. Each flash indicates that the Modbus Converter received a message from the Modbus.
Status	Amber LED. Devices on the Modbus Converter system have events or alerts when on.

Communication and Power Ports



Item	Description
1	Power port. Use an AC/DC power adapter connected to a wall outlet to provide power to the Modbus Converter.
2	Xanbus ports. Plug in a CAT5 cable from Xanbus-enabled devices for communications and/or power to the Modbus Converter.
3	DIN rail sliding catch. Slides up/down to lock/release the Modbus Converter to a DIN rail.
4	RS 485 Modbus port. Use the RS 485 Modbus connector from a Modbus device for communications and 24V power terminals to the Modbus Converter.
5	10/100 Ethernet port for CAT5 cable only. Use to connect to a DHCP-enabled network router.
6	Dry Contact port. Use to switch power for extra-low voltage (ELV) devices. It does not provide power to the Modbus Converter.

See the “Installation” section for more detail on these ports.

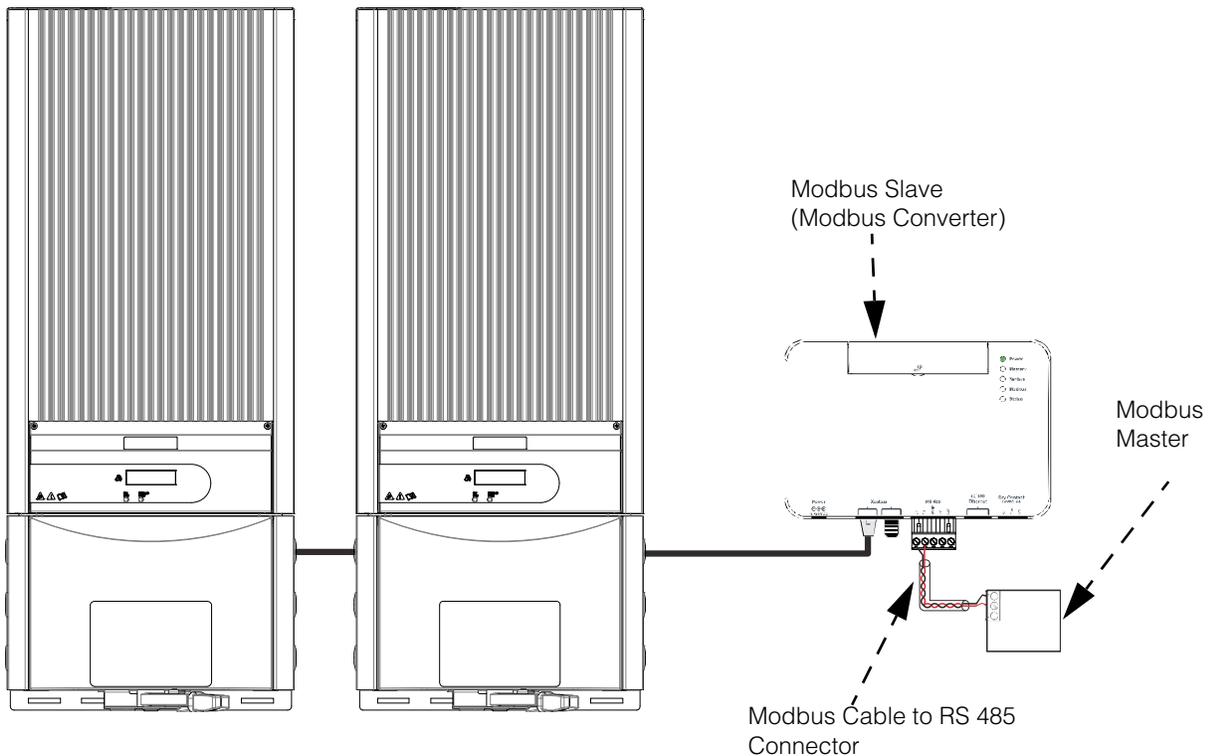
Types of Modbus Converter Networks

The Modbus Converter can interface with different devices with wired or wireless connections to provide options for configuring your devices and monitoring your power system performance. There are two communication network options:

- Modbus Converter as a Modbus Slave (RS 485)
- Modbus Converter on a Local Area Network (LAN) for Modbus TCP/IP

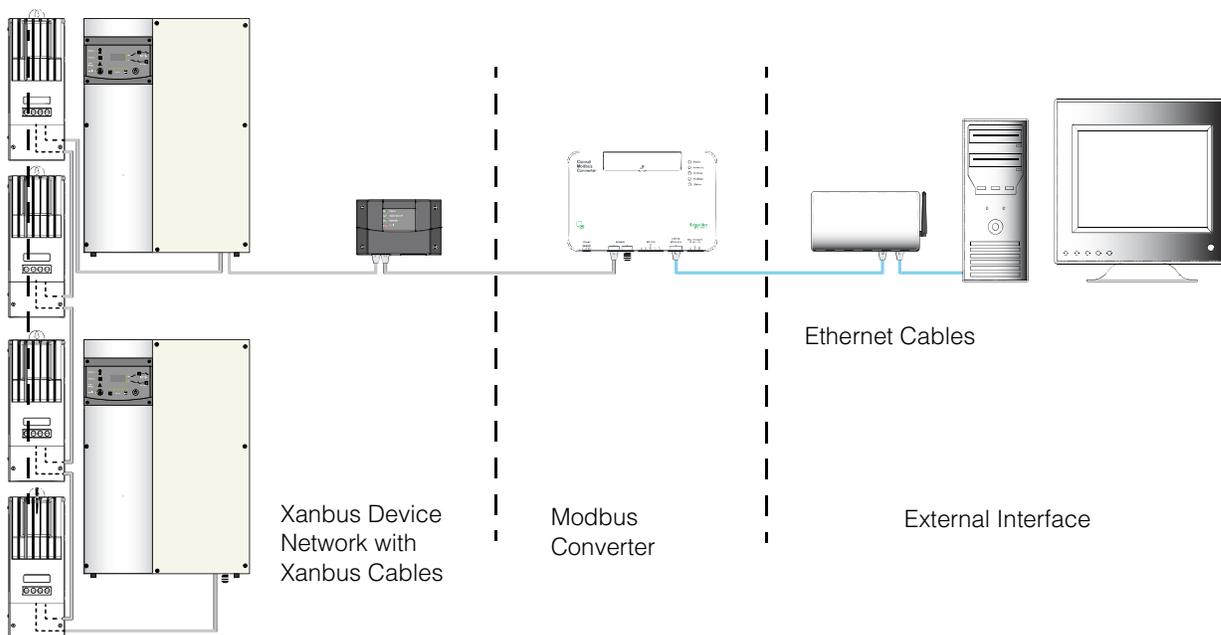
Modbus Converter as a Modbus Slave (RS 485)

You can use the Modbus Converter as a Modbus slave where performance data can be sent to a master device such as a Programmable Logic Controller (PLC) or Supervisory Control and Data Acquisition (SCADA) system through an RS 485 connection. You can also configure the system devices from the master device.



Modbus Converter on a Local Area Network (LAN)

When the Modbus Converter is part of a LAN, you can access the Modbus Converter Web interface from a computer on the same LAN, or through a wireless connection with LAN access. An Ethernet connection is required between the Modbus Converter and a router and computer for configuring the Modbus Converter.



Note: There is a security risk in port-forwarding unencrypted network traffic over a public network (Internet). Use of a VPN or a secure tunnel to route Modbus Converter communication via the Internet is recommended.

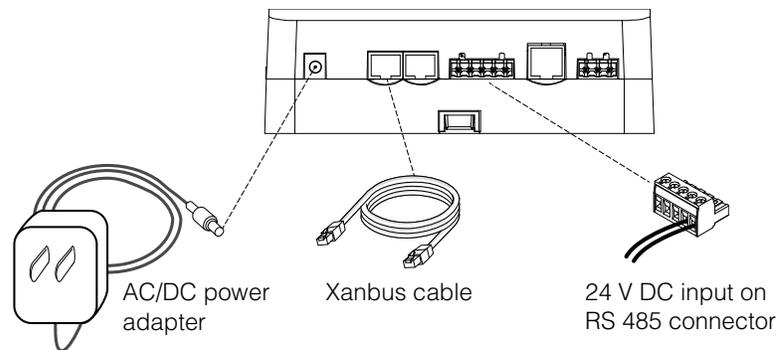
Power Sources for the Modbus Converter

The Modbus Converter consumes an average of 2 W (10 W peak) under most operating conditions. The power sources connected to the Modbus Converter must be capable of providing this power requirement.

There are three power sources for the Modbus Converter:

- AC/DC power adapter (supplied)
- Xanbus-enabled device via CAT5 or CAT5e cable (Xanbus cable)
- 24 V DC power input connections on RS 485 Modbus connector

All three sources can be used alone or simultaneously, but typically the AC/DC power adapter (supplied) is used as a primary source with either a Xanbus or RS 485 Modbus connection as secondary sources. See the following diagram for connection locations.



⚠ DANGER

HAZARD OF ELECTRIC SHOCK AND FIRE

Connect only to Safety Extra Low Voltage (SELV) circuits and power sources.

Failure to follow these instructions will result in death or serious injury.

Safety Extra Low Voltage (SELV) is a common designation that refers to a circuit in which the voltages within the circuit and from the circuit to ground have values that are not a shock hazard, under both normal and single fault conditions. In the Modbus Converter, the SELV circuits and their intended connections are:

- the supplied AC/DC power adapter connected to the power port of the Modbus Converter.
- Xanbus communications and power which come from SELV circuits on Xanbus-enabled Schneider products.
- 24 V DC power input connections which must be SELV and are connected to the Modbus Converter via the RS 485 Modbus connector.
- SELV Ethernet circuits.
- an external SELV circuit connected via the Dry Contact connector (see “Wiring the Dry Contact Connector” on page 2–9).

User Interface

This section describes the elements of the Web-based user interface for the Modbus Converter. This interface is used to check the status of the Modbus Converter, configure the communications options for your network and perform upgrades. The menu bar contains icons for going to the home screen, linking to the Schneider Electric Web site, and closing or logging out of the Web interface.

To access the Web interface, log in with a user name and password.

Web browsers

Correct operation of the Web-interface has been verified with the following browsers:

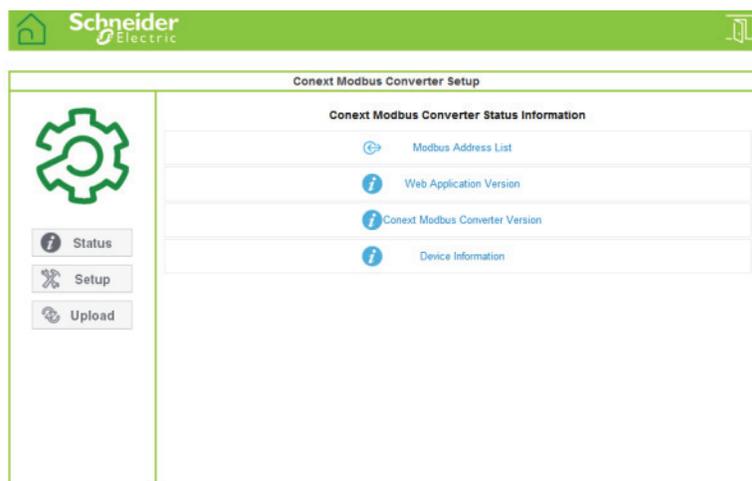
- Mozilla Firefox 12.x and later
- Microsoft Windows Internet Explorer 8.x and later
- Google Chrome 18.x and later
- Safari 5.x and later

Other browsers have not been tested and may have varying degrees of compatibility with the Modbus Converter. For example, when using Internet Explorer 8.0, you may experience some screens that do not display correctly.

Note: JavaScript and cookies must be enabled in your Web browser for the interface to function.

Home Screen

Note: Although the Modbus Converter interface is displayed within a Web browser, it does not use Web browser functions such as the Back button. All navigation through the interface is done within the main (Home) screen.



Menu Bar



Item	Description
	Returns to the Home menu
	Links to the Schneider Electric Solar web site
	Closes the Modbus Converter Web interface and logs out

Side Menu

Item	Description
	Status information on the Modbus Converter such as version information, Modbus addresses, and other device identification
	Setup functions for settings such as passwords, time, Web, TCP/IP, E-Mail, and Modbus
	Upload function for firmware upgrades to the Modbus Converter and Xanbus-enabled devices

2

Installation

Chapter 2 describes how to install, wire, and connect the Conext Modbus Converter to your network. It includes:

- Choosing a Location
- Materials and Tools Required
- Mounting the Modbus Converter
- Wiring the RS 485 Modbus Connector for Data Communication to the Modbus Converter
- Wiring the Dry Contact Connector
- Connecting the Modbus Converter to an Ethernet Network
- Turning On the Modbus Converter
- Finding the Modbus Converter on the Network
- Logging in to the Modbus Converter Web User Interface Using a USB Thumb Drive

Choosing a Location

Choose a clean, dry, easily accessible location indoors.

If you mount the Modbus Converter on a wall, the recommended height is at eye-level so that you can clearly see the LEDs and have easy access to the data ports.

All of the communication ports on the Modbus Converter are accessible from the bottom of the device when mounted on a wall or DIN rail. Clearance of at least 2 inches (50 mm) below the device is needed to allow for the bending radius of cables that connect to the Modbus Converter.

No cables should be run through conduits that could be exposed to lightning strikes. The following are recommended maximum cable lengths in a Modbus Converter system:

131 feet (40 m)	Total Xanbus network
328 feet (100 m)	Router to Modbus Converter
164 feet (50 m)	Modbus Master (RS 485) to Modbus Converter

DANGER

HAZARD OF ELECTRIC SHOCK AND FIRE

- Connect only to Safety Extra Low Voltage (SELV) circuits and power sources.
- All wiring must be done by qualified personnel to ensure compliance with all applicable installation codes and regulations.
- For Indoor Use Only.
- Do not disassemble. No user serviceable parts inside.

Failure to follow these instructions will result in death or serious injury.

Materials and Tools Required

Materials List

The following materials are supplied in the Conext Modbus Converter package:

- Modbus Converter unit
- Modbus Converter Quickstart Guide
- Modbus Converter CD includes:
 - Device Discovery Tool
 - Modbus Converter Owner's Guide
- AC/DC power adapter (PN: 0J-921-0023-Z) with replaceable multi-plug for North America, Europe, Asia, UK
 - 5.5 mm diameter (outer, negative), 2.1 mm diameter (inner, positive) connector
 - 12 VDC (output), 1.5 ADC
- Dry contact connector
- RS 485 Modbus connector
- Ethernet cable (2 m)
- Xanbus network terminator
- two #6 wood screws with anchors

Additional Material and Tools

The following materials and tools are not supplied but are required to complete the installation:

- Xanbus or CAT5 or CAT5e network cable(s) - 6.5 feet (2 m) or longer
- Modbus network cable(s)
- wire stripper
- ferrules

For wall mount:

- two #6 (or equivalent) mounting screws for non-drywall mounting
- screwdriver set

For DIN rail mount:

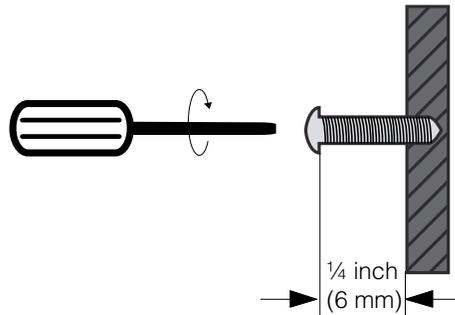
- 35-mm "top hat" DIN rail (EN50022)
- pliers
- diagonal cutter or heavy duty scissors

Mounting the Modbus Converter

Wall Mount

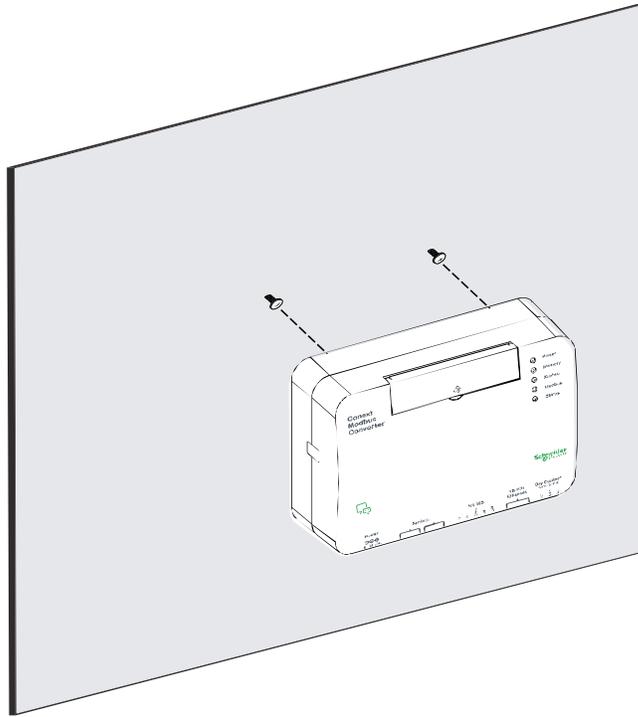
To mount the Modbus Converter on a wall:

1. Choose the location for mounting the device.
2. Using the template in the Modbus Converter Quickstart Guide, mark the mounting holes on the wall with a pencil.
The holes must be at the same height and 4 7/16 inches (112 mm) apart.
3. Insert the two anchors and mounting screws supplied in the marked locations on the wall, leaving a space of about 1/4 inch (6 mm) between the wall and screw head.



If you are mounting the Modbus Converter on concrete, the anchors and mounting screws supplied are not suitable. Use two mounting screws that are equivalent to #6 screws.

4. Place the Modbus Converter on the mounting screws and confirm a snug fit before going to the next step.



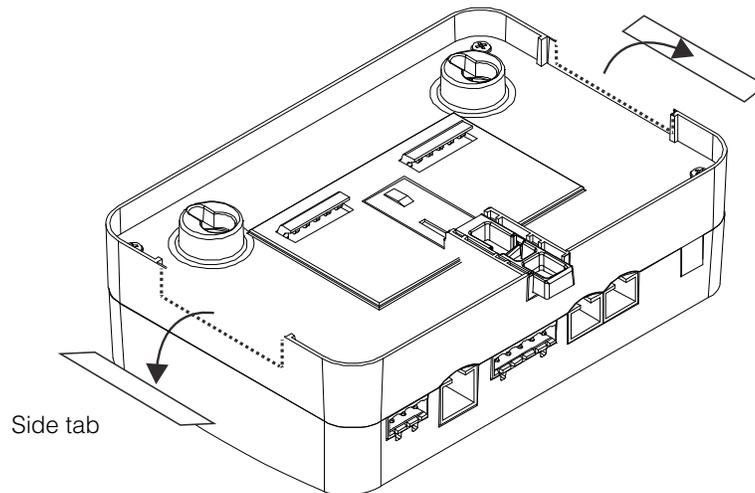
5. Connect the wiring and cables. Go to “Wiring the RS 485 Modbus Connector for Data Communication to the Modbus Converter” on page 2-7.

DIN Rail Mount

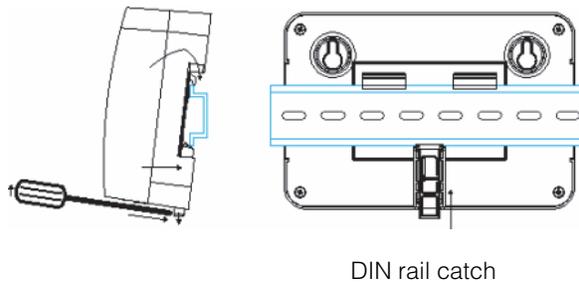
A standard 35-mm “top hat” DIN rail (EN50022) must be used for mounting.

To mount the Modbus Converter on the DIN Rail:

1. Choose the location for mounting the device.
2. Using heavy duty scissors or a diagonal cutter, cut both ends of the side tab on one end of the Modbus Converter.



3. Break off the side tab. You may need to use pliers for this.
4. Repeat steps 2 and 3 for the tab at the other end of the Modbus Converter.
5. Use a suitable tool, such as a screwdriver, to pull down the catch on the bottom of the Modbus Converter.
6. Mount the Modbus Converter on the DIN rail and release the catch. See the following illustration.



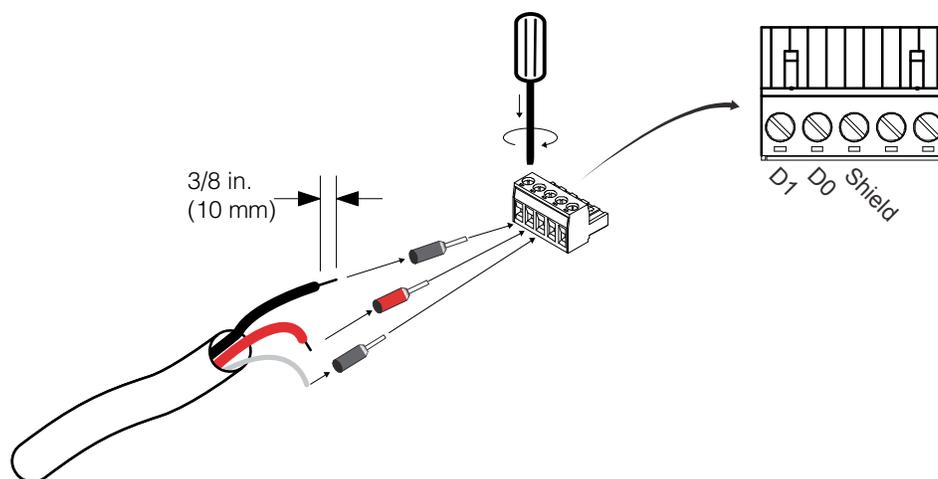
7. Connect the wiring and cables.

Wiring the RS 485 Modbus Connector for Data Communication to the Modbus Converter

The RS 485 Modbus connector provides three terminals to wire communication cables to the Modbus Converter. The five-terminal RS 485 connector uses the first three terminals for a data cable. The cable has a size of 16–24 AWG with 1.5 mm^2 – 0.25 mm^2 wires. The cable can be shielded or non-shielded.

To wire the RS 485 Modbus connector for data communication:

1. Select a two-wire, twisted pair, shielded cable not longer than 164 feet (50 m). Refer to the local electrical code and application to select the insulation and temperature class of the cable to be used.
2. Strip $3/8$ in. (10 mm) from the end of the wires to be connected and attach ferrules to the two signal wires (red and black in the following diagram).
3. Insert the ferrules and the shield wire into the connector terminals as shown in the following diagram.



4. Secure the wires by tightening the screw on the terminal.
The middle terminal is not connected internally but is provided for the shield connection of the cable.
5. If you intend to use the Dry Contact, go to “Wiring the Dry Contact Connector”. Otherwise, go to “Connecting the Modbus Converter to an Ethernet Network”.

Modbus versus Xanbus

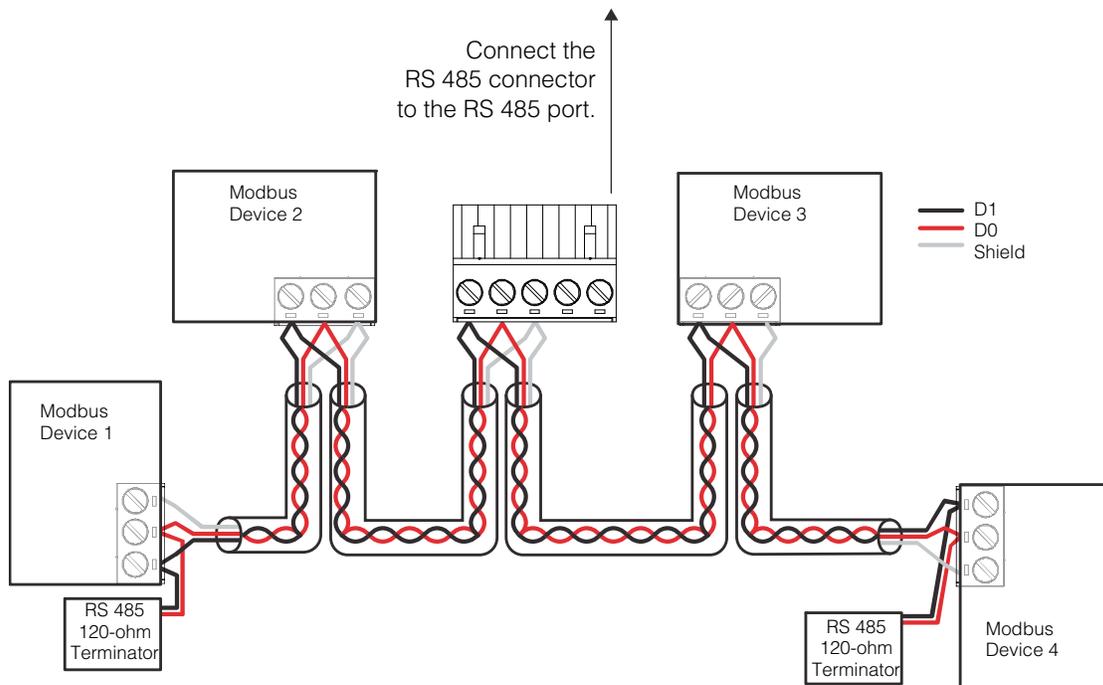
The RS 485 Modbus connection and the Xanbus cable connection both provide data communication from the network and devices to the Modbus Converter. Communication with Modbus devices is handled through the RS 485 or 10/100 Ethernet connection on the Modbus Converter while communication with Xanbus components occurs through the Xanbus ports of Xanbus-enabled devices.

Connecting the Modbus Converter with other Modbus Devices

In the Modbus implementation, the Modbus Converter acts as a slave to an RS 485 master device. The RS 485 connection to the Modbus Converter allows communication between the Xanbus network and the master device. This enables Conext devices to link to third party software and building management systems.

If any Modbus device, including the Modbus Converter, is installed as the last device in a daisy chain, a 120 ohm terminator must be used because they do not have an internal terminator for the RS 485 network. When inserting two wires in one terminal, as in the case of daisy-chained RS 485 Modbus devices, use smaller gauge wires. See the following example.

Note: Turn off all Modbus and other devices prior to wiring the connectors.



Wiring the Dry Contact Connector

Wiring instructions for dry contact wiring for SELV devices is included in this section. The dry contact connector is intended to control the trigger of SELV devices such as small DC fans or external AC or DC relays. It does not provide power to the Modbus Converter.

To wire the dry contact connector:

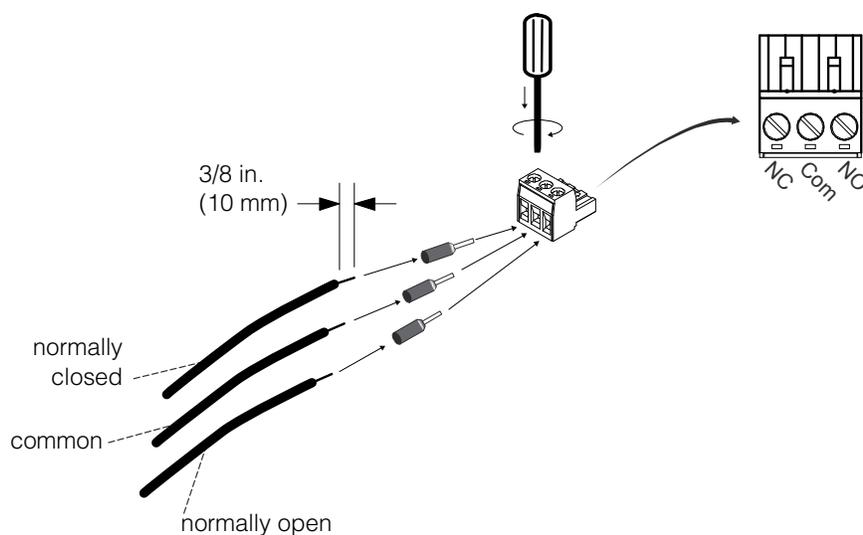
⚠ DANGER

ELECTRIC SHOCK AND FIRE HAZARD

- Turn off all other devices prior to wiring the connectors.
- The Dry contact port must only be connected to a circuit rated 24V DC max, 4A max, and supplied from an SELV source.

Failure to follow these instructions will result in death or serious injury.

1. Strip 3/8 in. (10 mm) from the end of the wire to be connected and attach ferrules to the bare wires.
2. Insert the ferrule into the Dry Contact connector's wire terminal.
3. Secure the wire by tightening the screw on the terminal.



4. Repeat steps 2 and 3 for the remaining wires.

Note: The Dry Contact Connector should not be used for any safety-critical applications.

5. Once all the Dry Contact wires are secured, push the Dry Contact connector into the Dry Contact port until it locks into place.
6. Go to "Connecting the Modbus Converter to an Ethernet Network".

Connecting the Modbus Converter to an Ethernet Network

Note: The computer and network router may remain powered at this stage in the process. If not already powered, make sure these two devices are on before proceeding.

Before connecting a computer and router to the Conext Modbus Converter, ensure that it meets the following prerequisites.

Router

The network router must be able to supply DHCP addresses automatically to connected devices. If your network router does not support automatic DHCP, refer to your network router's user guide or contact your system administrator.

Operating System

- Microsoft Windows 7 (recommended) or later
- Microsoft Windows XP (SP2, SP3)
- Vista X86
- Mac OS X 10.4.8. or later
- Linux

Web Browsers

- Mozilla Firefox 12.x or later
- Microsoft Windows Internet Explorer 8.x or later
- Google Chrome 18.x or later
- Safari 5.x or later

Note: JavaScript and cookies must be enabled in your Web browser.

To connect the Modbus Converter to a Computer on an Ethernet Network:

1. Make sure that the computer and network router are turned on and that the Modbus Converter is not turned on. Ensure that the network router selected has DHCP enabled.
2. Connect one end of an Ethernet cable to the computer's network port.

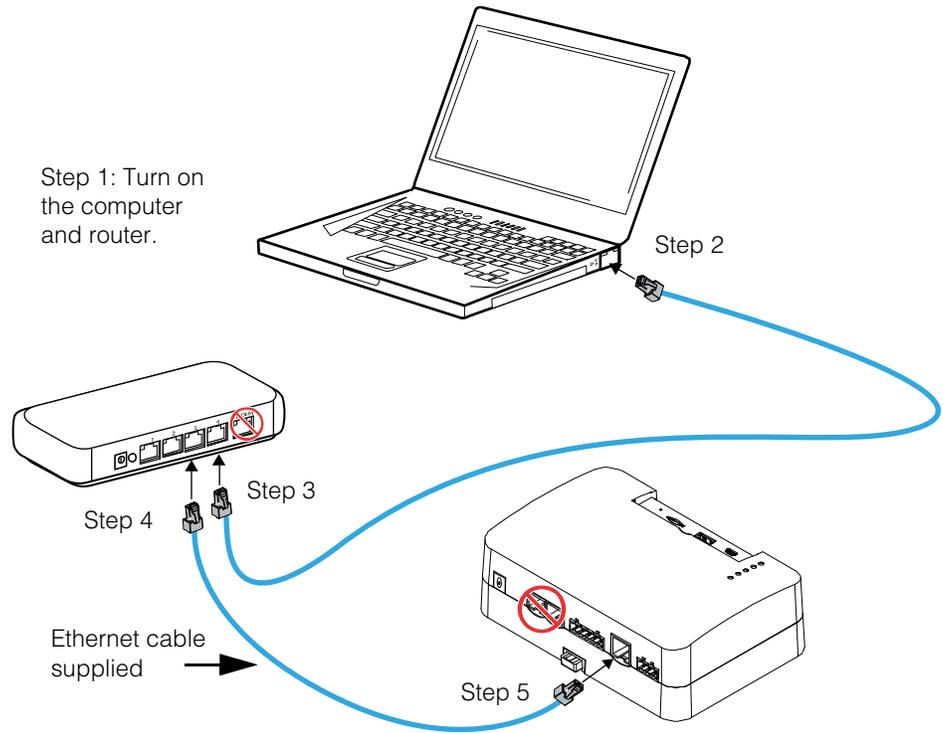
<i>NOTICE</i>

EQUIPMENT DAMAGE

- Do not connect an Ethernet cable from the Modbus Converter to the WAN/MODEM port on the network router.
- Do not connect an Ethernet cable plug into a Xanbus port on the Modbus Converter.

Failure to follow these instructions can damage equipment.

3. Connect the other end of the Ethernet cable to a vacant Ethernet/LAN port on the network router.



4. Connect one end of the Ethernet cable (supplied) to the LAN port on the network router.
At this stage the network router should be on but the LED showing port-activity on the router will not show any indication.
5. Connect the other end of the Ethernet cable to the Modbus Converter.
At this stage the Ethernet cable should be the only cable (except for the Dry Contact if used) plugged into the Modbus Converter.

Turning On the Modbus Converter

It is important that you follow the sequence of steps in “Connecting the Modbus Converter to an Ethernet Network” before turning on the Modbus Converter.

To turn on the Modbus Converter:

1. Connect a power source to the Modbus Converter:
 - Plug the AC/DC power adapter into the AC wall outlet (see “Connecting the AC/DC Power Adapter”), or
 - Plug the RS 485 connector, which has been wired with a 24 V DC power supply, to the RS 485 port on the Modbus Converter until it locks into place. See “Wiring the RS 485 Modbus Connector for Power to the Modbus Converter” for the wiring procedure.

Note: Xanbus is a valid power source for the Modbus Converter. However, for first-time setup, using Xanbus as a power source is not recommended. The Modbus Converter clock will override the other Xanbus devices' clocks and could trigger unintentional time-based events. Therefore, DO NOT connect the Modbus Converter to the Xanbus network prior to setting up the internal clock of the Modbus Converter. See “Changing the Time” on page 3–6.

2. When power is applied to the Modbus Converter, all the LEDs will flash once and then the Power LED will flash intermittently for approximately two minutes during the application loading and initialization sequence.
Wait until the Power LED lights up steadily before proceeding to the next step.
3. When the Modbus Converter is ready, proceed to either “Finding the Modbus Converter on the Network” on page 2–16 or “Logging in to the Modbus Converter Web User Interface Using a USB Thumb Drive” on page 2–18.

Connecting the AC/DC Power Adapter

⚠ DANGER

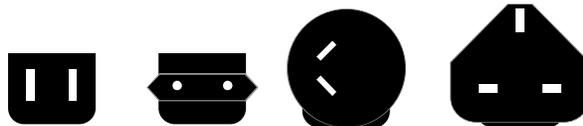
ELECTRIC SHOCK AND FIRE HAZARD

Use only the AC/DC Power Adapter supplied with this Modbus Converter unit. When ordering a replacement, reference PN: 0J-921-0023-Z.

Failure to follow these instructions will result in death or serious injury.

To use the AC/DC power adapter supplied with the Modbus Converter as a power source:

1. Select the correct power plug supplied with the AC/DC power adapter that matches the AC outlet type.



2. Connect the power plug to the AC outlet.
3. Connect the other plug of AC/DC power adapter to the Power port on the Modbus Converter.
4. Go back to step 2 of "Turning On the Modbus Converter".

Wiring the RS 485 Modbus Connector for Power to the Modbus Converter

To use the Modbus RS 485 connector to provide power to the Modbus Converter, use the following procedure. When powering the Modbus Converter through the 24 V DC terminals on the RS 485 connector, use a power supply (AC/DC or DC/DC) that provides galvanic isolation to meet the required SELV connections.

⚠ DANGER

ELECTRIC SHOCK AND FIRE HAZARD

If the power terminals on the Modbus RS 485 connector are used, the RS 485 connector must only be connected to a circuit rated 24V DC max, 1A max (fused on the positive wire), and supplied from an SELV source.

Failure to follow these instructions will result in death or serious injury.

NOTICE

EQUIPMENT DAMAGE

Turn OFF all devices before connecting cables. The Modbus Converter does not have an ON/OFF switch. See “Power Cycle” below.

Failure to follow these instructions can damage equipment or affect performance.

Power Cycle

To power cycle the Modbus Converter, also called a hard reboot:

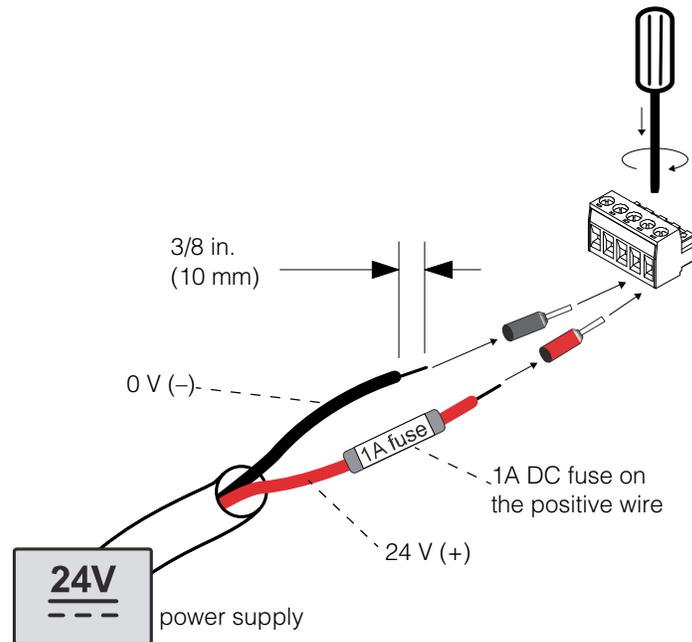
1. Turn the Modbus Converter OFF – unplug and disconnect it from all power sources.
2. Wait ten seconds before the next step.
Ensure that there is no USB thumb drive inserted in the USB Host port.
3. Turn the Modbus Converter ON – plug and connect it to a power source.

Wiring Steps

To wire the RS 485 Modbus connector for power to the Modbus Converter:

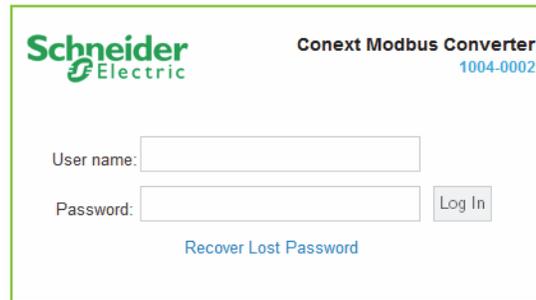
1. Turn off the 24 V DC power supply, if not already.
2. Unplug the RS 485 connector from the RS 485 port on the Modbus Converter.
3. Strip 3/8 in. (10 mm) from the end of the 0 V (–) wire of the power cable.
4. Terminate the wire with a ferrule.
5. Install a 1A DC fuse on the 24 V (+) wire of the power cable and strip 3/8 in. (10 mm) from the end of the wire.
6. Terminate the wire with a ferrule.

7. Insert the ferrules into the Modbus connector's wire terminals as shown.



Note: The polarity of the wires is shown above and on the unit.

8. Secure the wires by tightening the screws on the terminal.
9. Plug the Modbus connector into the RS 485 port of the Modbus Converter.
10. Turn on the 24 V DC power supply.
11. Go back to step 2 of "Turning On the Modbus Converter".



The image shows a login page for a Schneider Electric Conext Modbus Converter. The page features the Schneider Electric logo in the top left corner. In the top right corner, the text "Conext Modbus Converter" is displayed in bold, with the model number "1004-0002" below it. The main content area contains a "User name:" label followed by a text input field, a "Password:" label followed by another text input field, and a "Log In" button to the right of the password field. Below the password field, there is a blue link that says "Recover Lost Password".

6. Enable all antivirus software including firewall protection software.
7. To complete configuration of your Modbus Converter, go to the "Configuration" section.

Logging in to the Modbus Converter Web User Interface Using a USB Thumb Drive

In cases where it is not practical to discover the Modbus Converter's IP address using the Device Discovery tool (or using the Windows network browser), it is possible to discover the Modbus Converter's IP address using a USB thumb drive.

1. Plug a USB thumb drive into the Modbus Converter's USB Host data port while the Modbus Converter unit is powered on (the Power LED is steadily on and not flashing).
2. Watch the Memory LED and wait for it to flash quickly five times.
3. Remove the USB thumb drive from the USB Host data port.
4. Plug the USB thumb drive into your computer's USB port.
5. Navigate to the root directory of the thumb drive using the file system browser on your computer.
6. Look for a file named *serial number.html*, where *serial number* is the Serial Number of the Modbus Converter.
7. Double-click on the *serial number.html* file. Your default web browser will launch and display the System Information below.

Conext Modbus Converter by Schneider Electric

System Information

Model Number:	865-1059
Serial Number:	B12761896
Hardware Revision:	Rev-C
Device Name:	ComBox-B12761896

MAC Address:	00-00-54-FE-01-17
IP Address:	10.167.76.192
Hostname:	cb-B12761896

Software ID:	150-0279
Kernel Version:	1.17
Application Version:	Ver01.01BN0310
Application Build Date:	2013-04-25_00-01-52
Boot Loader Version:	Ver01.00BN0015
Boot Loader Build Date:	2012-10-31_09-28-09

Date and Time:	2013/04/26 02:06:23
Time Zone:	(-08:00)Pacific-Time_US_Canada_Tijuana
Uptime:	207

[Connect](#)

8. Click on the Connect button shown within System Information. The web browser opens up and the Modbus Converter user interface **Login** window appears.

Note that this will only work if your computer is on the same Local Area Network as the Modbus Converter.

3

Configuration

Chapter 3 describes how to configure settings for the Conext Modbus Converter. It also includes how to connect devices to the Xanbus network. The topics are:

- Configuration Steps
- Logging In
- Changing the Password
- Changing the Time
- Changing E-Mail Settings
- Connecting the Modbus Converter to the Xanbus Network
- Changing Modbus Converter Settings
- Resetting the Modbus Converter to Factory Settings
- Upgrading Firmware

Configuration Steps

To complete setup of your Modbus Converter, the procedures in the “Installation” section must be successfully completed. Make sure that the Modbus Converter is connected and the **Power** LED is steadily on. Your Xanbus devices should still be in standby mode.

When you log in to the Web interface, most of the setup information will appear automatically and has default values. Some of the information will have to be changed, such as passwords, some information can be modified if desired, and some information should only be modified by a qualified IT professional.

The following items are part of the Modbus Converter configuration process:

Primary

- Log in - see “Logging In”
- Change the password - see “Changing the Password”
- Set the time - see “Changing the Time”
- Enter e-mail information see “Changing E-Mail Settings”
- Connect the Modbus Converter to the Xanbus network - see “Connecting the Modbus Converter to the Xanbus Network”

Secondary

- Change TCP/IP settings if you want to use static IP addresses - see “TCP/IP Settings”
- Take your Xanbus devices out of standby mode.

Optional/ Occasional

- Configure general device settings
- Clear the device memory
- Upgrade the device firmware

Logging In

The first time you log in to the Modbus Converter Web interface, use the default **User name:** *admin* and **Password:** *password*.

The login form is titled "Schneider Electric Conext Modbus Converter 1004-0002". It contains two input fields: "User name:" and "Password:". To the right of the "Password:" field is a "Log In" button. Below the input fields is a blue link that says "Recover Lost Password".

Once you have logged in, click



in the left side menu to change the password.

The screenshot shows the "Conext Modbus Converter Setup" web interface. At the top left is the Schneider Electric logo. Below it is a navigation sidebar with three buttons: "Status" (with an information icon), "Setup" (with a wrench icon), and "Upload" (with a document icon). The main content area is titled "Conext Modbus Converter Status Information" and contains four links, each with an information icon: "Modbus Address List", "Web Application Version", "Conext Modbus Converter Version", and "Device Information".

Changing the Password

You should change the password from the default “password” as soon as possible.

Changing

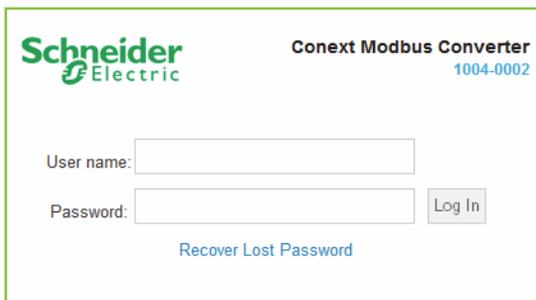
To change the Modbus Converter password:

1. Click  in the left side menu.
2. Under **Conext Modbus Converter settings**, click **User Password**.
3. Enter the **Old Password**.
4. Enter your **New Password**.
The password should contain at least eight alphanumeric (0-9, a-z, A-Z) characters with no special characters and spaces. Passwords are case-sensitive and the maximum length is 32 characters.
5. Enter the **New Password (confirm)** again.
6. Click **Submit**.
A message indicates that the password change was successful.

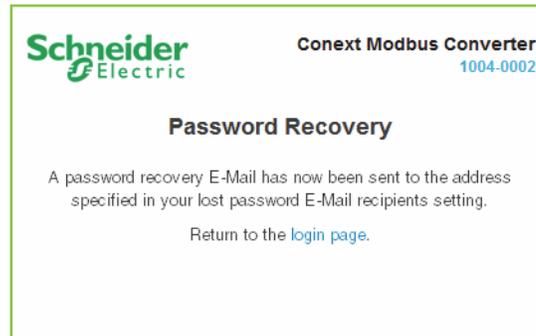
Recovering

To recover a Password:

If you forget the password, click **Recover Lost Password** in the **Login** window.



An e-mail will be sent to the designated e-mail address(es) containing the current or a random temporary password for your Modbus Converter.



Note: You must have the Modbus Converter **E-mail Settings** configured for this feature to work. See “Changing E-Mail Settings” on page 3–8’.

Changing the Time

⚠ WARNING

PHYSICAL INJURY HAZARD

Be careful when changing the Modbus Converter time setting. It will override any time settings on individual Xanbus-enabled devices in the network. The time represents the entire system. Any appliance or equipment that is time-controlled by a Xanbus device, such as a generator connected to an AGS, can inadvertently turn on at the wrong time.

Failure to follow these instructions can result in death or serious injury.

You can also choose to use the network time for your system. If enabled, network time (SNTP) will override the Time setting at the next SNTP polling update. See “Using Network Time”.

The default setting has SNTP network time enabled (SNTP state is On).

To change the Modbus Converter time and/or date:

1. Click  in the left side menu.
2. Under **Modbus Converter settings**, click **Time and Zone**.



3. Click  to display the current time.
4. To change the Date/Time, enter it in the same format as shown (YYYY/MM/DD HH:MM:SS) and click **Set Time**.
5. To set the Time Zone, select from the drop-down list and click **Set Time Zone**.

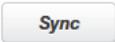
Note: This date/time setting overrides settings on other devices in the system.

Using Network Time

You can choose to use the network time for your Modbus Converter system.

Note: If you enable this option it will replace any manual settings that you set under Time and Zone at the next update according to the SNTP poll setting.

To use the network time and date:

1. Click  in the left side menu.
2. Under **Modbus Converter settings**, click **Network Time (SNTP)**.
3. In **SNTP Server Name**, enter the IP address or URL of the network time server, (**pool.ntp.org** is recommended) and then click .
4. In **SNTP Poll Interval**, enter (in hours) how often you want to update the Modbus Converter system time to the network time and then click .
5. To enable the automatic network time setting, select **SNTP State On** and then click .
To disable the automatic network time setting, select **SNTP State Off** and then click .
6. To perform a manual network time synchronization especially when automatic network time setting is disabled, click  under **Perform SNTP Synchronization**.

Changing E-Mail Settings

E-Mail Settings

Parameter	Value	
Mailer Status	<input type="text" value="Enabled"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
E-Mail Server Address	<input type="text" value="mailserver.yourdomain.com"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
E-Mail Server Port	<input type="text" value="25"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
E-Mail Recipients	<input type="text"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
E-Mail Authentication	<input type="text" value="Disabled"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
E-Mail User ID	<input type="text" value="user@yourdomain.com"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
E-Mail Password	<input type="text" value=""/> (New) <input type="text" value=""/> (Confirm)	<input type="button" value="↺"/> <input type="button" value="💾"/>
Lost Password E-Mail Recipients	<input type="text"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
Lost Password E-Mail From Address	<input type="text" value="no-reply@schneider-electric.com"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
Reset Lost Passwords	<input type="text" value="No"/>	<input type="button" value="↺"/> <input type="button" value="💾"/>
Send Test E-mail	<input type="button" value="Send"/>	

Mailer Status

Activates or deactivates e-mailing features. When enabled, a user who forgets a password when trying to log in can have the Modbus Converter send the current password or a randomly generated temporary password by e-mail.

E-mail Server Address

This is the mail server address provided by the internet service provider. It has the format *mailserver.yourdomain.com*. Contact your internet service provider for the correct information.

E-mail Server Port	This is the port number used by a computer to transmit electronic data through the internet. The number 25 is typically reserved for e-mail.
E-mail Recipients	This parameter can be filled with multiple e-mail addresses separated by a comma. Any address listed here will receive e-mail messages generated by the Modbus Converter.
E-mail Authentication	Use this parameter to enable or disable an external e-mail's authentication settings. When enabled, you have to supply the E-mail User ID and E-mail Password below.
E-mail User ID	Enter the external e-mail account's user ID which is usually the full e-mail address that includes the domain name.
E-mail Password	Enter the external e-mail account's password.
Lost Password E-Mail Recipients	<p>Enter a valid e-mail address where the current password or a random temporary password can be sent.</p> <p>For multiple e-mail recipients, separate the addresses with a comma.</p>
Lost Password E-Mail From Address	Enter a valid e-mail address that can be used as an identifier of the sender. Generally, the sender is also the user of the Modbus Converter.
Reset Lost Passwords	<p>Select No to send the current password by e-mail.</p> <p>Select Yes to generate a random temporary password to be sent by e-mail.</p>
Send Test E-Mail	<p>Use this parameter's button to test that the e-mail settings above have been configured correctly.</p> <p>Press the  button to send a sample e-mail message to the addresses listed in the E-mail Recipients parameter.</p>

Connecting the Modbus Converter to the Xanbus Network

Once the Modbus Converter has been installed and configured, Xanbus devices can be added at any time. New devices are automatically discovered by the Modbus Converter application and Modbus addresses are assigned according to the starting address configuration settings. Log out of the Web interface and then Log in again to check the Modbus address for the new device.

The Xanbus network cable (a CAT5 cable) can provide both data communication and power from Xanbus-enabled devices.

When applying power to the Modbus Converter by connecting it to the Xanbus network, ensure that the Xanbus network itself has power. The inverter/charger or controller supplying power to the Xanbus network must be operating.

The following Xanbus-enabled devices can provide power to the Xanbus network:

- XW Inverter/Chargers
- Conext SW Inverter/Chargers
- MPPT 80 600 Solar Charge Controllers

The MPPT 60 150 Solar Charge Controller, XW System Control Panel, and the XW Automatic Generator Start cannot provide power the Modbus Converter. However, two or more Conext TX Grid-tie Inverters in the same Xanbus network can supply enough power to the Modbus Converter.

Note:

- Use Xanbus network cables that are at least 6.5 feet (2 m) long such as:
 - 25-foot (7.6-m) network cable (809-0940)
 - 75-foot (22.9-m) network cable (809-0942)
- Use of Xanbus network cables shorter than 6.5 feet (2 m) will result in degraded Xanbus network performance

Note:

- Xanbus components can be arranged in any order.
- Use a network terminator at both ends of the Xanbus network.

Note: Xanbus is a valid power source for the Modbus Converter. However, for first-time setup, using Xanbus as a power source is not recommended. The Modbus Converter clock will override the other Xanbus devices' clocks and could trigger unintentional time-based events. Therefore, DO NOT connect the Modbus Converter to the Xanbus network prior to setting up the internal clock of the Modbus Converter. See "Changing the Time" on page 3–6.

To connect the Modbus Converter to a Xanbus network:

The assumption at this point is that there is an existing Xanbus network and all Xanbus-enabled devices in that network have all been previously interconnected with each other.

1. Put the Xanbus-enabled inverters and inverter/chargers into standby mode before connecting the Modbus Converter to avoid triggering any unintentional time-based events.

You may put the Xanbus-enabled inverters and inverter/chargers out of standby mode later when you have completed configuration of the Modbus Converter.

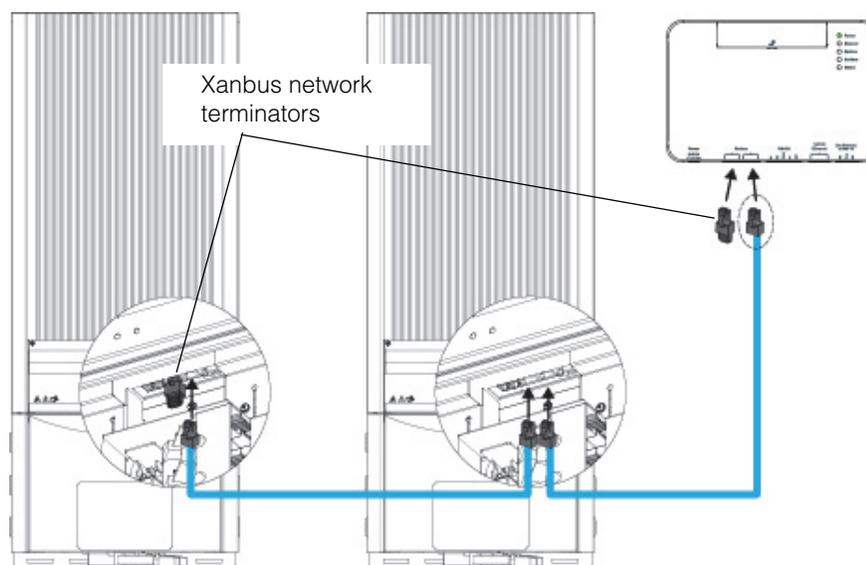
2. Using the sample illustration below, connect the Modbus Converter to the Xanbus network.

NOTICE

EQUIPMENT DAMAGE

Do not connect a Xanbus RJ-45 cable plug into the 10/100 Ethernet port of the Modbus Converter.

Failure to follow these instructions can damage equipment or affect network performance.



Be sure to terminate the Xanbus network with Xanbus network terminators at both ends.

When the Modbus Converter starts communicating with other Xanbus-enabled devices on the network, the Xanbus LED will go on.

The Modbus Converter is now ready to configure, control and monitor the devices connected on the Xanbus network.

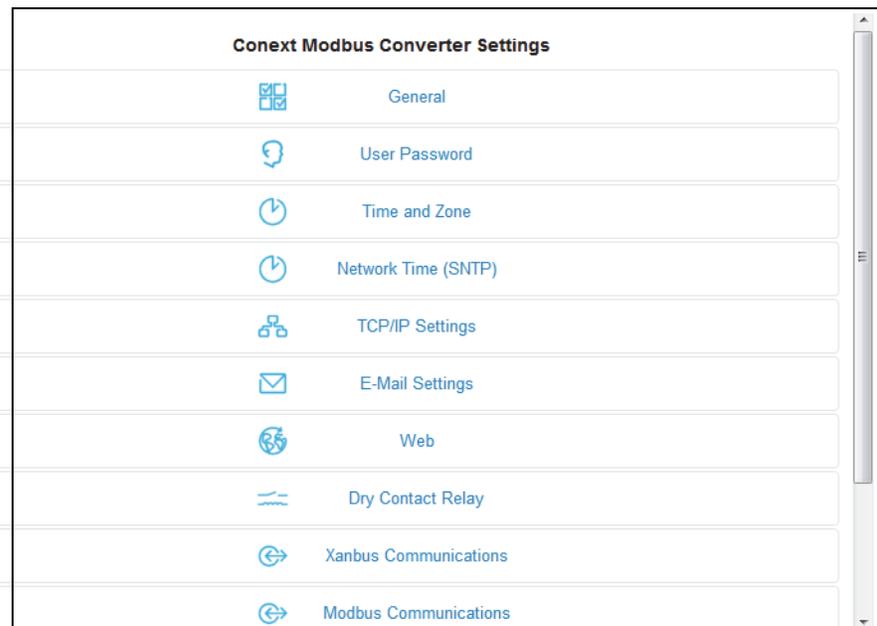
Changing Modbus Converter Settings

The procedures for configuring the other Modbus Converter Settings are described in the following sections.

To change Modbus Converter settings:

1. Click  on the left side menu.

You will see a screen similar to the one shown below.



2. Click on the setting type that you want to change.
That portion of the window will expand to display the change options for that setting. The size and content of the expanded window varies depending on the type of setting.
3. In the expanded window, click  to see the current setting. This may be different from the value shown if the change was made in another way.
4. Modify the value(s) as necessary.
5. Click  to save the change(s).

General Settings

General	
Parameter	Value
Device Friendly Name	<input type="text" value="B12345678"/>  
Reboot Conext Modbus Converter	<input type="button" value="Reboot"/>
Shutdown Conext Modbus Converter	<input type="button" value="Shutdown"/>

Changing the device name

The default **Device Friendly Name** is the serial number of the unit that is assigned at the factory. It is good practice to change this default to a user friendly name.

To change the device name:

1. Replace the default value using alpha-numeric characters.
2. Click  to save the setting.
3. To recall the previous value, click .

Rebooting the Modbus Converter

It is possible to reboot the Modbus Converter unit from within the web user interface without doing a power cycle. This type of “soft” rebooting is oftentimes necessary when certain settings are changed, like changing the Xanbus Bit Rate parameter.

To reboot the Modbus Converter:

1. Click the button. A Warning dialog box appears.
2. Click the Ok button on the Warning dialog box.
3. To discontinue rebooting, click the Cancel button.

Shutting down the Modbus Converter

The Modbus Converter unit can be shutdown from within the web user interface. Shutting down is equivalent to turning off the unit usually for preparing to store the unit away or to re-install the unit at a different location.

To shutdown the Modbus Converter:

1. Click the button. A Warning dialog box appears.
2. Click the Ok button on the Warning dialog box.
3. To discontinue shutting down, click the Cancel button.

TCP/IP Settings

 TCP/IP Settings	
Parameter	Value
TCP/IP Address	<input type="text" value="10.167.76.67"/>  
TCP/IP Net Mask	<input type="text" value="255.255.255.0"/>  
Gateway Address	<input type="text" value="10.167.76.1"/>  
DNS Server Address	<input type="text" value="10.167.77.80"/>  
Device Name	<input type="text" value="cb-1004-0035"/>  
Use DHCP	<input type="text" value="Yes"/>  

These settings should be suitable unless you want to use a static IP address.

Note: Changes to any TCP/IP-related settings should only be performed by a qualified IT professional.

Web

Web	
Parameter	Value
Web Server Access	<input type="text" value="HTTP"/>   
Web Server Port	<input type="text" value="80"/>  

If you want Web access to the Modbus Converter:

- In **Web Server Access**, select **HTTP** and then click .

If you do not want Web access to the Modbus Converter:

- In **Web Server Access**, select **Disabled** and then click .

The default value of 80 for the **Web Server Port** should only be changed if necessary.

Note: If the Web server is disabled (for example, for security reasons), the Web server will not be available on the next reboot of the Modbus Converter. To regain access to the Web server, a “Resetting the Modbus Converter to Factory Settings” is necessary to make configuration changes.

Dry Contact Relay

Dry Contact Relay	
Parameter	Value
Relay Mode Of Operation	Automatic 

You can set the **Relay Mode of Operation** to **Automatic** so that the relay will automatically go on if there is an alert in the system. To manually control the mode of operation so that the relay is always on or off, select **On** or **Off**.

Xanbus Communications

Xanbus Communications	
Parameter	Value
Xanbus Bit Rate	250 Kbps 

The Xanbus bit rate setting for the Modbus Converter has two possible values – 125 and 250 Kbps. The default value for the **Xanbus Bit Rate** is 250 Kbps.

When this setting is changed, the Modbus Converter must be rebooted before the new setting can take effect. See “Rebooting the Modbus Converter” on page 3–13.

Modbus Communications

Modbus Communications	
Parameter	Value
RS-485 Baud Rate	19200
RS-485 Parity	E
RS-485 Stop Bits	1
Modbus TCP Enabled	Listening
Modbus TCP Port	502
Modbus Address	201
Modbus Byte Order	LSB First

All of the RS 485 and Modbus settings for the Modbus Converter can be changed as necessary. The default value for the **Modbus TCP Port** is 502 and the **Server Modbus Address** is 201.

Select **Listening** in **Modbus TCP Enabled** to enable Modbus communication.

Note:

When writing a character string using function code 0x10 (Write Multiple Registers), the NUL terminator **MUST** be written or the string will not be stored.

When writing 32-bit modbus registers, both 16-bit registers which make up the 32-bit value must be written in order to store the data.

Modbus Byte Order

The Modbus Converter may be configured to change the Modbus byte and word ordering for packed ASCII strings, and 32-bit values. There are two settings for **Modbus Byte Order**:

1. Least Significant byte/word first (**LSB First**)
2. Most Significant byte/word first (**MSB First**)

Select the appropriate setting for your Modbus network.

The following are examples of how the settings operate.

Packed String Example:

When sending the text string "CONEXT" over Modbus:

1. Least Significant byte/word:



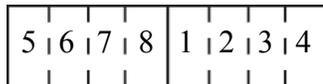
2. Most Significant byte/word:



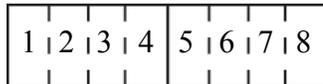
32-bit Word Example:

When sending the value 0x12345678 over modbus:

1. Least Significant byte/word:



2. Most Significant byte/word:



Modbus Address List

Use this function to change the Modbus address of a device. The Modbus Converter automatically assigns addresses when it is installed but the individual values can be changed as necessary. The default addresses are assigned per device type.

Note: To change the initial starting address settings, see “Modbus Address Enumeration”.

To change a device Modbus address:

1. In **Setup**, click **Modbus Address List**.

The expanded window displays a table of addresses that are already reserved along with the associated device, its ID and **On Line** status.

Note: Valid Modbus addresses are listed from 1 to 247. The rest are assigned special meanings.

2. To change a device Modbus address:

- Select the **Device** from the drop-down list. Its address is displayed in the address box.

If you want to make sure you have selected the correct device:



and a physical indicator on the device will flash or light up depending on the device.

- Click  to ensure that you view the latest information.
- Enter the new address for the device in the address box. Do not use an address that is already reserved.
- Click **Submit** to save the address change.

To reset all of the device Modbus addresses to their default values:

1. In **Modbus Address List**, click **Reset Addresses**.
2. Reboot the Modbus Converter. See “Rebooting the Modbus Converter” on page 3–13.

Modbus Address Enumeration

↻ Modbus Address Enumeration		
Parameter	Value	
XW Modbus Start Address	<input type="text" value="10"/>	<input type="button" value="↻"/> <input type="button" value="💾"/>
MPPT-60 Modbus Start Address	<input type="text" value="30"/>	<input type="button" value="↻"/> <input type="button" value="💾"/>
AGS Modbus Start Address	<input type="text" value="50"/>	<input type="button" value="↻"/> <input type="button" value="💾"/>
SCP Modbus Start Address	<input type="text" value="70"/>	<input type="button" value="↻"/> <input type="button" value="💾"/>
CSW Modbus Start Address	<input type="text" value="90"/>	<input type="button" value="↻"/> <input type="button" value="💾"/>
Grid-Tie Modbus Start Address	<input type="text" value="110"/>	<input type="button" value="↻"/> <input type="button" value="💾"/>
MPPT-80 Modbus Start Address	<input type="text" value="170"/>	<input type="button" value="↻"/> <input type="button" value="💾"/>

Use this function to change the initial starting Modbus addresses for device types. The Modbus Converter automatically assigns starting addresses when it is installed but the starting values can be changed as you wish.

These changes should be made before connecting new devices to the Modbus Converter system. When the Modbus Converter detects a new device, it will assign the address based on the current start address setting for that device type. For example, for a XW Modbus start address of 10:

- The first XW discovered on the network will be assigned the address 10.
- The second XW discovered on the network will be assigned the address 11, and so on.

The starting addresses for each device type on installation of the Modbus Converter are listed above.

To change device type starting addresses:

1. In **Modbus Device Address Enumeration**, click  for the device type to ensure you have the current information.
2. Enter the new starting value for the device type and click .

Note: Valid Modbus addresses can be from 1 to 247. The rest of the numbers are assigned special meanings.

3. Once you have saved all device type starting addresses, there are two options:
 - You can keep the existing device addresses and the new start address will be applied only to newly discovered devices.

When a new device is detected, the Modbus Converter will first determine the starting address of that device type, find the first unused address for that device type, and assign this address to the new device

- The Modbus Converter can perform a device rediscovery to reassign addresses based on the changed starting addresses.

To reassign new addresses to all devices:

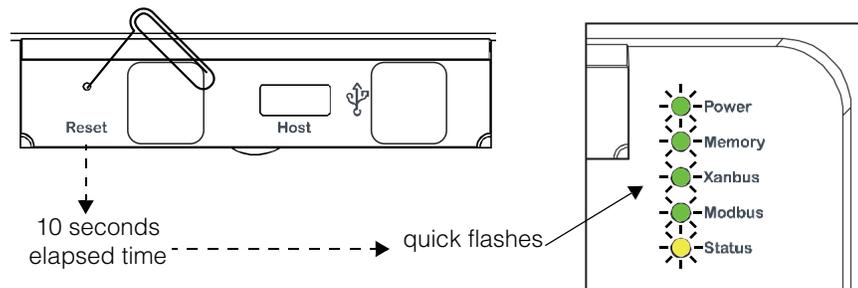
In **Modbus Address List**, click **Reset Addresses**.

Resetting the Modbus Converter to Factory Settings

If you need to return the Modbus Converter to all of the original factory settings, you can perform a reset.

To reset the Modbus Converter to original factory settings:

1. Turn off the Modbus Converter by disconnecting all its power sources and ensure that the Power LED is off. Wait ten seconds before the next step.
2. Insert a pointed object such as a paper clip into the Reset pinhole and press the button while turning on the Modbus Converter by reconnecting to its power source.



3. Continue pressing (holding) the Reset pinhole button until all indicator LEDs flash quickly five times (approximately 10 seconds) and then quickly release the button.

Important: Do not hold the reset button too long after observing the quick flashes. When you observe that the indicator LEDs have begun flashing slowly, the internal firmware memory will have already been cleared. There is no way to undo this except to do an upgrade. See “Upgrading Firmware” on page 3–23.

Note: The Power LED flashes slowly during the Modbus Converter application loading and flashes quickly during application initialization. The other LEDs go on as the startup progresses. This process takes about two minutes.

4. When the reset is complete, the Power indicator is on to indicate that the Modbus Converter is ready.

Upgrading Firmware

From time to time firmware upgrades will be available for your Modbus Converter and Xanbus-enabled devices. You can perform these upgrades by downloading them from the Schneider Electric Solar web site at www.schneider-electric.com/solar to a mass storage device, such as a thumb drive, or to a computer that you then connect to the Modbus Converter.

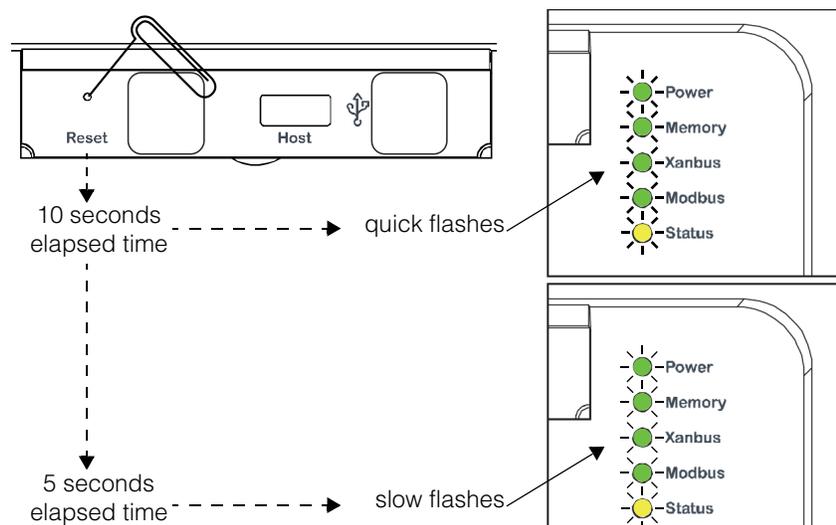
Note: It is recommended that you clear the internal firmware memory of the Modbus Converter before installing Modbus Converter firmware upgrades.

Clearing Modbus Converter Internal Firmware Memory

Note: Clearing internal firmware memory should be done for Modbus Converter upgrades only. It is not necessary for upgrades to other devices on the network.

To clear the Modbus Converter internal firmware memory:

1. Turn off the Modbus Converter by disconnecting all its power sources. Wait ten seconds before the next step.
2. Insert a pointed object such as a paper clip into the Reset pinhole and press the button while turning on the Modbus Converter by reconnecting to its power source.



3. Continue pressing (holding) the Reset pinhole button until all indicator LEDs flash quickly five times (approximately 10 seconds) and then continue to hold the button until the LEDs flash slowly (approximately 5 seconds).
4. When the memory has been cleared, the Status LED is on and a firmware upgrade must be done.

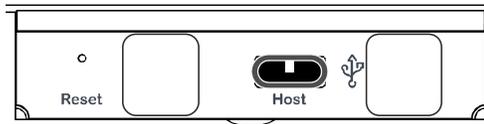
Installing Modbus Converter Upgrades from a Thumb Drive

To install an upgrade for the Modbus Converter using a thumb drive:

1. Connect the thumb drive to a computer with Internet access.
There must be only one **.bdl** file on the thumb drive. If there are two or more **.bdl** files, there is no guarantee which **.bdl** file will be chosen.
2. In a Web browser, go to **www.schneider-electric.com/solar** to select the upgrade that you need.
3. Once you have found the upgrade, save the **.bdl** file to the root directory of the thumb drive.

Note: The **.bdl** file must be saved to the root directory of the thumb drive for the upgrade to install properly.

4. Clear the Modbus Converter internal memory. See “Clearing Modbus Converter Internal Firmware Memory”.
5. Connect the thumb drive to the USB port labeled Host on the top front of the Modbus Converter.



The firmware upgrade will begin automatically.

6. Watch the indicator LEDs on the Modbus Converter. When the Xanbus LED goes on, it is now okay to remove the thumb drive.
As the upgrade progresses the Power LED flashes. The other LEDs go on to indicate the upgrade process. This can take several minutes depending on the size of the upgrade.
7. When the upgrade is complete, the Power LED is on to indicate that the Modbus Converter is ready.
8. Clear your computer's web browser cache after this upgrade prior to logging back in to the Modbus Converter's web user interface.

Clearing a web browser's cache

To clear the web browser's cache:

1. In PC-based web browsers, press the keyboard shortcut **CTRL** - **SHIFT** - **DEL**.
2. In the dialog box that appears (it varies for each web browser), select an option to clear temporary internet files or "cache". See examples in Figure 3-1 and Figure 3-2 on page 3-25.
3. For Mac's Safari web browser, you have to go to Preferences and go under Security.

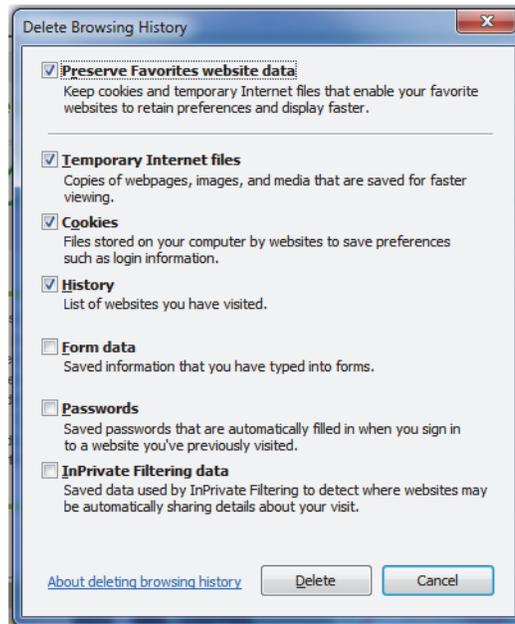


Figure 3-1 Internet Explorer Delete Browsing History

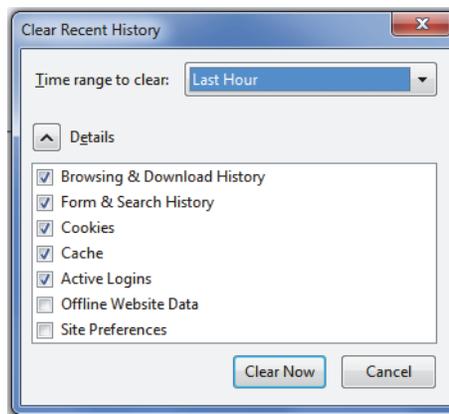


Figure 3-2 Firefox Clear Recent History

Installing Modbus Converter Upgrades Remotely

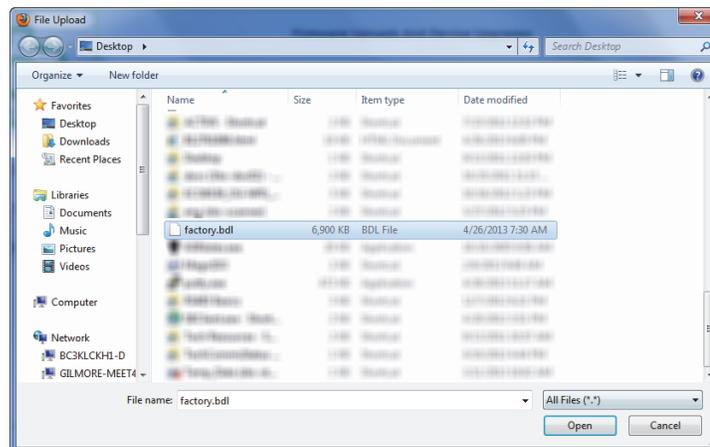
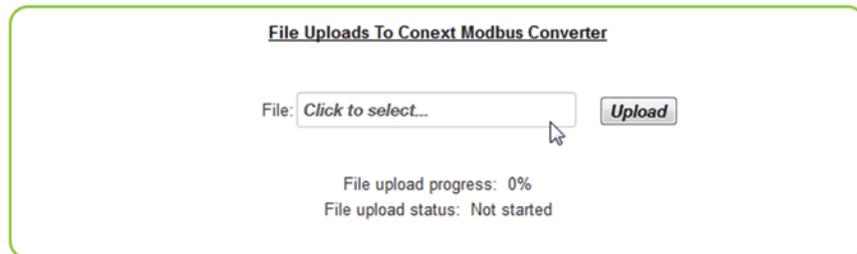
Note: Your Web browser may not support the upgrade function. Use Chrome 18.x or later, IE 10.x or later, Firefox 12 or later, or Safari 5.x or later for Modbus Converter upgrades.

To install a Modbus Converter upgrade remotely:

1. In a Web browser, go to **www.schneider-electric.com/solar** to select the Modbus Converter upgrade that you need.
2. Once you have found the upgrade, save the **.bdl** file in a local directory. In the example below, *factory.bdl* is used.
3. In your Web browser, connect to your Modbus Converter.
4. Log in to the Modbus Converter Web interface with your user name and password.

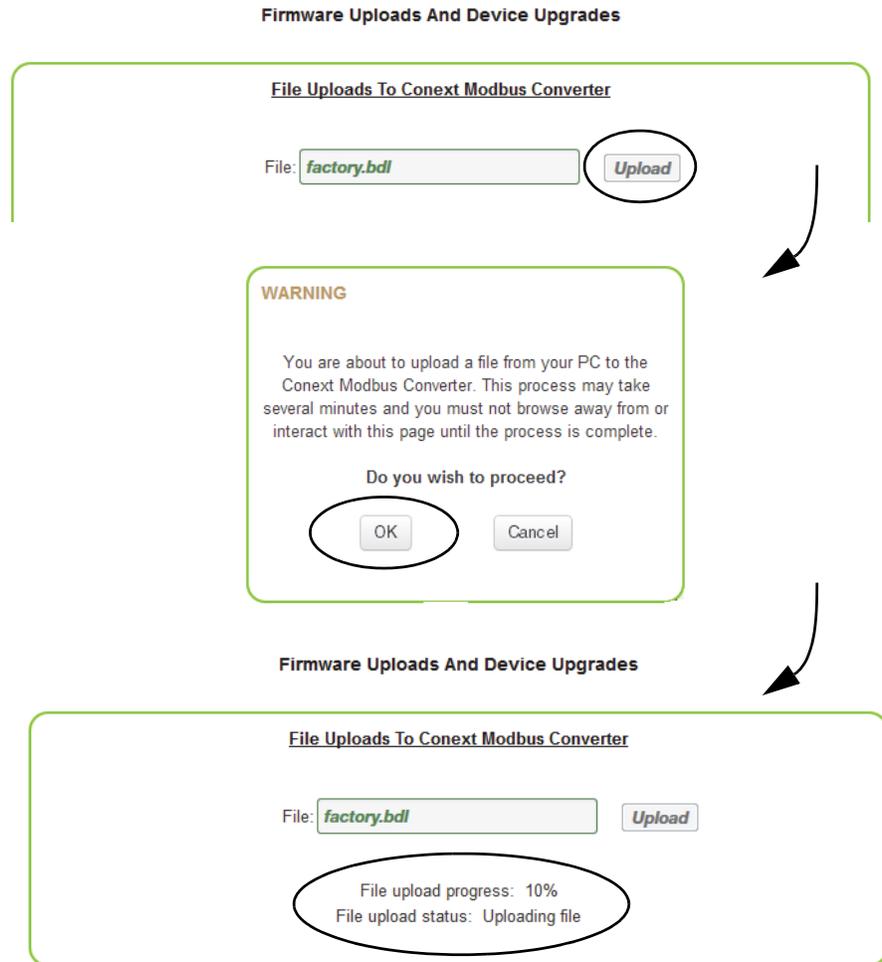
5. Click  in the left side menu.
6. In File under File Uploads To Conext Modbus Converter, click the field box to select the **.bdl** file (*factory.bdl*) that you saved in a local directory from the Schneider Electric web site.

Firmware Uploads And Device Upgrades



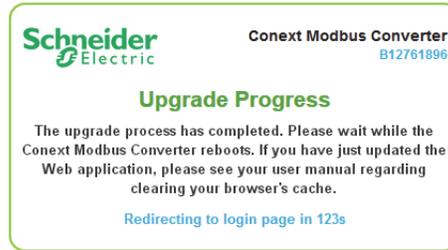
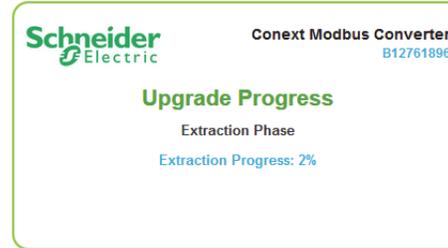
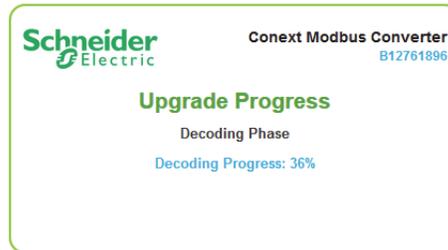
7. Click **Upload**.

You will be automatically prompted with a warning dialog box. Click OK.
 As the bundle is transferred to the Modbus Converter, progress is indicated in percentage and a message screen indicates when the file transfer has been completed successfully.

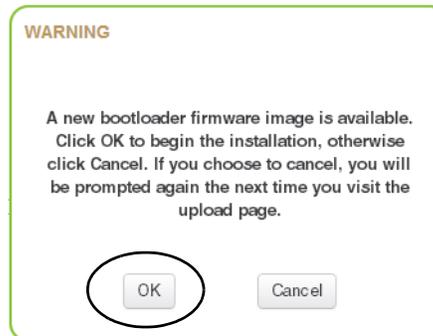


When the bundle file has transferred to the Modbus Converter, the files in the bundle are automatically extracted and reprogramming of the Modbus Converter begins.

The Modbus Converter update will show a series of update progress screens similar to what is shown in the next page.



If the bundle file also contains a bootloader upgrade file, you will be automatically prompted to update the Modbus Converter bootloader.



When you click OK, you will see a series of bootloader upgrade progress screens similar to what is shown in the next page.



After the bootloader upgrade is complete, the Modbus Converter restarts automatically.

8. Clear your computer's web browser cache after this upgrade prior to logging back in to the Modbus Converter's web user interface. See "Clearing a web browser's cache" on page 3-24.

Installing Xanbus Device Upgrades

You can upgrade firmware for specific Xanbus-enabled devices remotely.

Note: Your Web browser may not support the upgrade function. Use Chrome 18.x or later, IE 10.x or later, Firefox 12 or later, or Safari 5.x or later for Modbus Converter upgrades.

To install upgrades for Xanbus devices connected to the Modbus Converter:

1. In a Web browser, go to www.schneider-electric.com/solar to select the device upgrade that you need.
2. Once you have found the upgrade, save the **.xf0** file in a local directory.

Note: Do not change the **.xf0** file name unless it is for a Grid-Tie inverter.

For a Grid-Tie **.xf0** file you must prefix the file name with 867.0001, for example, 867.0001.filename.xf0

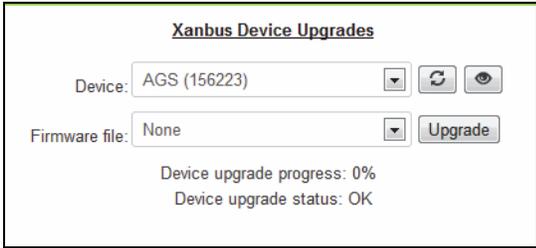
3. In your Web browser, connect to the Modbus Converter.
4. Log in to the Modbus Converter Web interface with your user name and password.

5. Click  in the left side menu.

6. In **File** under **File Uploads To Conext Modbus Converter**, click to select the **.xf0** file that you saved in a local directory from the Schneider Electric web site.

As the **.xf0** file is transferred to the Modbus Converter, progress is indicated in percent until completion.

7. Once the file has successfully been transferred to the Modbus Converter, go to the **Xanbus Device Upgrades** section.



8. In **Device**, click  to load the latest list of devices.

9. Select the **Device** that you want to upgrade from the drop-down list.

You can click  to confirm that you have selected the device you want. When you click the icon, some type of visual indicator on the selected device will flash or light up.

10. In **Firmware file**, select the **.xf0** file for the device upgrade.
11. Click **Upgrade**.

Device upgrade progress is indicated in percent and **Device upgrade status** is **OK** when the upgrade has completed successfully.

If the device upgrade is not successful, click **Upgrade** again to retry.

If retrying does not work:

- Do a power cycle of the Xanbus device that is being upgraded.
- Then, click Upgrade on the web interface.

4

Monitoring

Chapter 4 describes the many ways the Modbus Converter can monitor system components. Topics include:

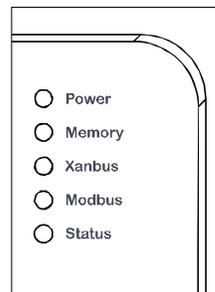
- Monitoring LEDs
- Monitoring Communication Settings
- Monitoring System Aggregation and Energy Parameters

Monitoring LEDs

The behavior of the LEDs allows you to monitor the functioning of the Modbus Converter. There are five LEDs in the upper right corner of the Modbus Converter:

- Power
- Memory
- Xanbus
- Modbus
- Status

All indicator LEDs are green except for the yellow Status indicator.



Startup

The Power LED flashes slowly during the Modbus Converter application loading and flashes quickly during application initialization. The other LEDs go on as the startup progresses. Once the Modbus Converter is ready, the Power LED is on solidly. This process takes about two minutes.

Operating Mode

States of the LEDs and what they mean are listed in the following table.

Indicator	State	Meaning
Power	On	powered and ready to communicate
Memory	Flashing	logging data to internal memory
Xanbus	On	actively communicating or transferring data with the Xanbus network
Modbus	Flashing	receiving messages from a Modbus component - one flash per message
Status	On	problem on a Xanbus device or the Modbus Converter itself - check the Modbus map for device faults or warnings

Monitoring Communication Settings

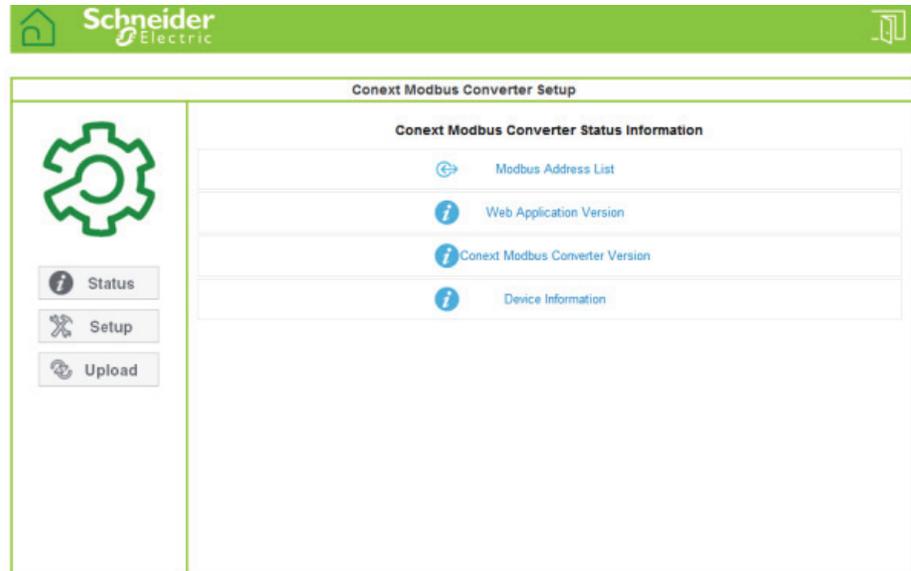
You can view the current setting for the Modbus Converter without making changes.

You may need the Modbus maps for interpreting monitoring information. They are not included in this guide. See “Modbus Maps” for more information.

To view Modbus Converter communication settings:

1. Click  in the left side menu.

You will see the screen shown below.



2. Click on the setting type that you want to view.

That portion of the window will expand to display the options for that setting as shown in the following screen. The size and content of the expanded window varies depending on the type of setting.

Conext Modbus Converter Status Information

 [Modbus Address List](#)

Address	Model	Instance	ID
10	XW4024-120/240-60	1	41942
30	XW-MPPT60-150	1	1232603
31	XW-MPPT60-150	3	169820
51	AGS	0	144629
70	SCP2	0	185997
90	CSW4024-120/240	0	1252897
110	Grid Tie Inverter	0	823706
170	MPPT 80 600	0	1205422

 [Web Application Version](#)

 [Conext Modbus Converter Version](#)

 [Device Information](#)

Monitoring System Aggregation and Energy Parameters

The Conext Modbus Converter collects the following data that is sent through the Modbus RS 485 connection to a building management system or other third party software:

- Device level energy aggregation
- System level energy aggregation
- Energy Parameters:
 - grid input and output energy
 - energy from battery (inverting)
 - energy to battery (charging)
 - energy to loads
 - energy from generator
 - PV energy input

Note: If the Modbus Converter is rebooted under any circumstances (for example, firmware upgrade or power outage), all hourly energy records will be set to zero.

For example:

Grid Input Hourly Energy records the energy input from the grid to the system every hour. The value of this variable is reset to 0 at the beginning of every hour for recording the energy from grid during the new hour.

Scenario 1: Modbus Converter under normal operation

at 10:45 am, Grid Input Hourly Energy = 0.61 KWh
at 10:59 am, Grid Input Hourly Energy = 0.72 KWh
at 11:00 am, Grid Input Hourly Energy = 0.0 KWh
at 11:59 am, Grid input Hourly Energy = 0.70 KWh
at 12:00 pm, Grid input Hourly Energy = 0.0 KWh

Scenario 2: Modbus Converter reboot for firmware upgrade

at 10:45 am, Grid Input Hourly Energy = 0.61 KWh
at 10:45 am, Modbus Converter is rebooted for firmware upgrade
at 10:47 am, Modbus Converter is booted up, Grid Input Hourly Energy = 0.0 KWh
at 10:59 am, Grid Input Hourly Energy = 0.11 KWh
at 11:00 am, Grid Input Hourly Energy = 0.0 KWh
at 11:59 am, Grid input Hourly Energy = 0.70 KWh
at 12:00 pm, Grid input Hourly Energy = 0.0 KWh

5

Troubleshooting

Chapter 5 describes event and alert indicators and resolutions to issues that might be encountered when installing or operating the Modbus Converter. It includes:

- Alerts
- Events
- Troubleshooting

Alerts

You will need the Modbus maps for interpreting alerts. They are not included in this guide. See “Modbus Maps” for more information.

When an alert occurs for a device:

- The yellow Status indicator on the Modbus Converter is on.

Check the warning bit map in the Modbus map for the device to identify the alert. The following is an example of an alert in a Conext XW Modbus map.

Modbus Address	Name	Type	R/W	Units	Scale	Offset	Notes
0x0046	Warning Bitmap 0	uint16	r		1.0	0.0	bit0=W44 Battery Over Temperature bit1=W45 Capacitor Over Temperature bit2=W48 DC Under Voltage bit3=W49 DC Over Voltage bit4=W57 FET1 Over Temperature bit5=W58 FET2 Over Temperature bit6=W63 AC Overload bit7=W64 AC Overload bit8=W68 Transformer Over Temperature bit9=W70 Check Phase Configuration bit10=W94 Remote Power Off bit11=W95 Equalize Abort bit12=W96 Cannot Equalize bit13=W97 Battery Temperature Sensor Failure bit14=W500 Lost Network Connection bit15=W501 Non Volatile Memory Warning

Events

You will need the Modbus maps for interpreting events. They are not included in this guide. See “Modbus Maps” for more information.

When there is an event in the system or a device:

- The yellow Status indicator on the Modbus Converter is on.

Check the fault bit map in the Modbus map for the device to identify the event. The following is an example of an event in a Conext XW Modbus map.

Modbus Address	Name	Type	R/W	Units	Scale	Offset	Notes
0x0044	Fault Bitmap 2	uint16	r		1.0	0.0	bit0=DC Under-Voltage Shutdown bit1=DC Over-Voltage Shutdown bit2=EEPROM Error bit3=EEPROM Error (Cal Fail) bit4=EEPROM Error (Config Fail) bit5=EEPROM Error (Default Fail) bit6=EEPROM Error (Log Fail) bit7=EEPROM Error (Strings Fail) bit8=FET1 Over-Temperature Shutdown bit9=FET2 Over-Temperature Shutdown bit10=Configuration Copy Error bit11=Invalid Fault bit12=Invalid Warning bit13=Invalid Interrupt bit14=AC Overload (Primary) bit15=AC Overload (Secondary 1s)

Troubleshooting

Problem	Symptom	Solution
Device Discovery Tool cannot find the Modbus Converter.	The Modbus Converter is not listed in the results list from the search.	<p>Check to see if the Power indicator is on.</p> <p>Check all Modbus Converter connections to make sure that they are secure.</p> <p>Check to make sure that there is a server on the Ethernet network to recognize the Modbus Converter or there are no other network issues.</p> <p>Check the configuration settings. See “Changing Modbus Converter Settings” on page 3–12.</p> <p>Check to make sure there are no faults with the Ethernet cables.</p>
Unexpected behavior in the Web interface.	For example, the Loading in progress message continues for an extended period.	<p>An upgrade may have been applied to the Modbus Converter.</p> <p>Clear your Web browser cache. See “Clearing a web browser’s cache” on page 3–24.</p>
Firmware upgrade not successful.	Status light is on and there is a message in the Upload screen.	<p>There may have been a communication event. Restart the upgrade process.</p> <p>Clear the Modbus Converter internal memory. See “Clearing Modbus Converter Internal Firmware Memory” on page 3–23.</p>
Status light is flashing.		<p>If a firmware upgrade is in progress, wait for it to finish. The Status light will go off on completion.</p>
Xanbus overload	<p>All devices on the network do not appear in the Web interface.</p> <p>Logged data is random.</p>	<p>The network may exceed traffic limits for the Modbus Converter. The maximum number of devices for the Modbus Converter network, as stated in the specifications, is up to 20 depending on the type of device.</p>
Modbus Converter does not boot up.	Modbus Converter startup process does not complete.	<p>Reset the Modbus Converter. See “Resetting the Modbus Converter to Factory Settings” on page 3–22.</p> <p>If resetting does not work, update the firmware. See “Upgrading Firmware” on page 3–23.</p>

A

Specifications

Appendix A contains the electrical, mechanical, and environmental specifications for the Conext Modbus Converter.

Note: All specifications are subject to change without notice.

Electrical Specifications

Communication Interfaces

Xanbus	Connector: 2 x RJ45 Products Supported: Conext XW, SW, TX, MPPT 60, HV MPPT 80, AGS, SCP - for details on specific Schneider Electric products supported see "Schneider Electric Products that work with the Modbus Converter"
Ethernet	Connector: 1 x RJ45, 10/100 MBPS Server: FTP, Web, Modbus TCP/IP Client: SMTP, SNTIP Auto discovery: DPWS
RS 485	Modbus (1 x Connector: Screw 5-terminal, 16-24AWG, 2-wire serial, 19200 bps)

Data Interfaces

USB 2.0-Host	Connector: USB-A Protocols: MSD
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User Interfaces

User Interfaces	Status indicator LEDs on Modbus Converter Web-server pages for Configuration and Monitoring functions
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Power Supply (SELV on all sources)

Power Consumption	2 W average / 10 W peak
AC/DC adapter (supplied) ^a	Input: 100-240V AC, 50-60Hz, 0.6A, Output: 12V DC, 1.5A, 5.5mm outer, 2.1mm center-positive jack
Xanbus	When connected to Conext XW / SW or HV MPPT 80 providing 15V DC, 200mA min
24V on RS 485 Modbus connector	24V DC, 1A max input only through pins 4 and 5

a. When ordering a replacement, reference PN: 0J-921-0023-Z.

Memory

Internal	96 MB Flash
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General Specifications

Weight (device only)	250 g (0.6 lb)
Dimensions (device only) (W × H × D)	6.7 × 4.5 × 2.1 inches (169 × 114 × 54 mm)
Shipping package dimensions (includes device, CD, cables, adapters, connectors, screws, Quickstart Guide)	12.6 × 9.6 × 3.1 inches (320 × 245 × 80 mm)
Shipping package weight	2 kg (4.5 lb)
Housing/Mounting system	ABS Plastic DIN rail: 35 mm top hat Wall mount: 2 screws
IP rating / Mounting Location	IP 20, NEMA 1, Indoor only
Status Display	5 x LEDs
Temperature	Operating: -4 to 122 °F (-20 to 50 °C) Storage: -40 to 185 °F (-40 to 85 °C) Maximum case temperature: 140 °F (60 °C)
Humidity	Operating: < 95%, non-condensing Storage: < 95%

Features

Programmable dry contact relay	Screw 3-terminal, 16-24 AWG, NC-Com-NO, Class 2, 24 V DC, 4 A max SELV input only
Graphical user interface	Integrated Web Server for Modbus Converter settings only (Internet Browser)
Remote firmware upgrades	Yes
Datalogger	Yes
Max. number of Xanbus devices	up to 20 Actual number depends on device types

Regulatory Approvals

EMC immunity	EN61000-6-1
EMC emissions	EN61000-6-3, FCC Part 15 Class B, Ind. Canada ICES-003 Class B
Substances / environmental	RoHS

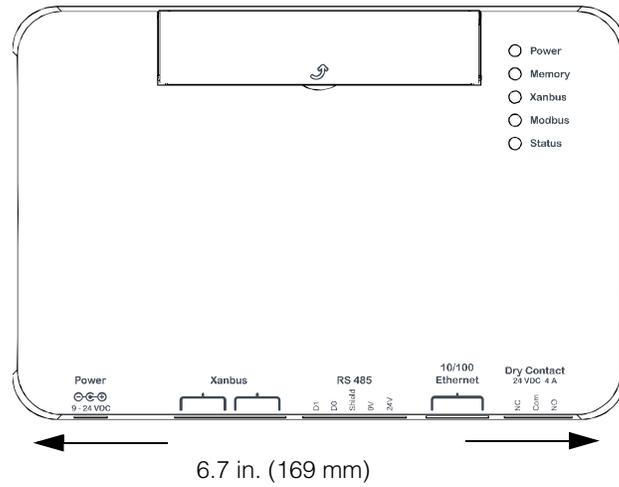


Schneider Electric Products that work with the Modbus Converter

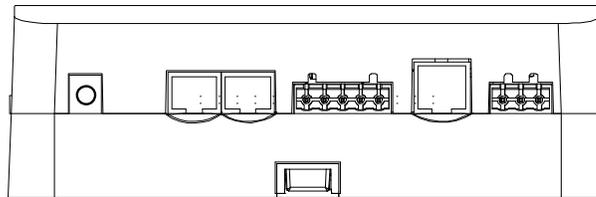
- Conext XW Inverter / Chargers:
 - 230 V/50 Hz
 - XW 4024 Product No. 865-1045
 - XW 4548 Product No. 865-1040
 - XW 6048 Product No. 865-1035
 - 120/240 V/60 Hz
 - XW 4024 Product No. 865-1010
 - XW 4548 Product No. 865-1005
 - XW 6048 Product No. 865-1000-01
- Conext SW Inverter / Chargers:
 - SW 2524 120 Product No. 865-2524
 - SW 4024 120 Product No. 865-4024
 - SW 2524 230 Product No. 865-2524-61
 - SW 4024 230 Product No. 865-4024-61
- Conext TX Grid-Tie Solar Inverter (N. America):
 - TX 2800 Product No. 878-2801
 - TX 3300 Product No. 878-3301
 - TX 3800 Product No. 878-3801
 - TX 5000 Product No. 878-5001
- Grid-Tie Series AUS Solar Inverter:
 - Grid-Tie 2.8 Product No. 864-1030
 - Grid-Tie 5.0 Product No. 864-1039-01
- MPPT 60 150 Solar Charge Controller: Product No. 865-1030-1
- MPPT 80 600 Solar Charge Controller: Product No. 865-1032
- XW System Control Panel (SCP): Product No. 865-1050
- XW Automatic Generator Start (AGS): Product No. 865-1060

Views and Dimensions

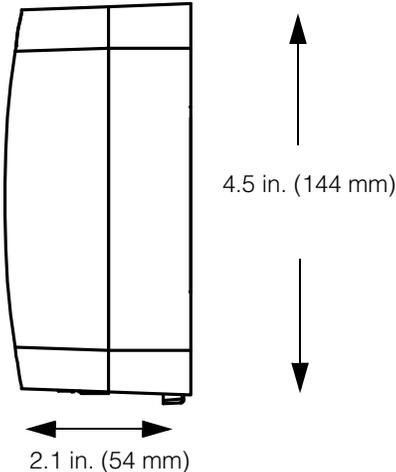
Front View



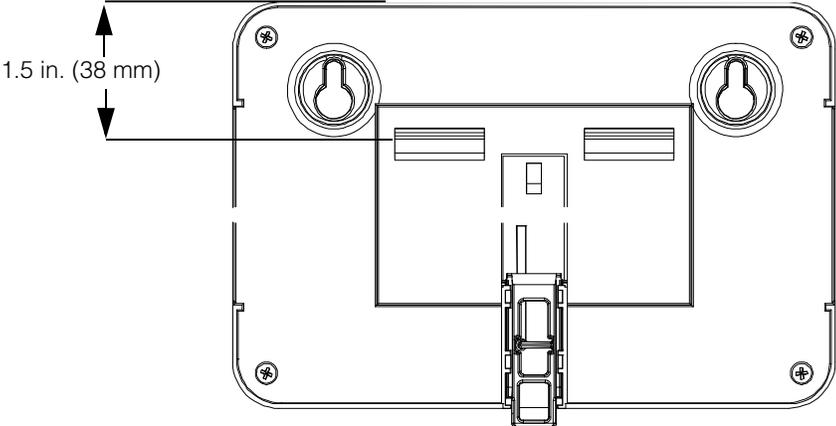
Bottom View



Side View



Back View



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<http://www.schneider-electric.com/sites/corporate/en/support/operations/local-operations/local-operations.page>