

499TWD01 100

Ethernet/Modbus Gateway for M238 Hardware Guide

06/2011

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

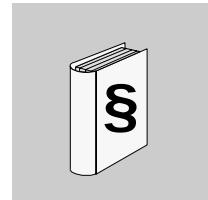
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Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

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** minor or moderate injury.

CAUTION

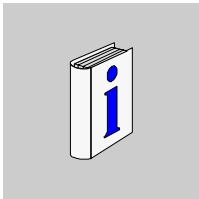
CAUTION, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** equipment damage.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book



At a Glance

Document Scope

This manual describes how to configure the 499TWD01100 Module to be used with the M238 Controller.

Validity Note

This document has been updated with the release of SoMachine V3.0.

Related Documents

Title of Documentation	Reference Number
Modicon TM2 Expansion Modules Configuration Programming Guide	EIO0000000396 (ENG); EIO0000000397 (FRE); EIO0000000398 (GER); EIO0000000399 (SPA); EIO0000000400 (ITA); EIO0000000401 (CHS)
M238 Controller Hardware Guide	EIO0000000016 (ENG); EIO0000000017 (FRE); EIO0000000018 (GER); EIO0000000019 (SPA); EIO0000000020 (ITA); EIO0000000021 (CS)
Ethernet Gateway Quick Reference Guide	31005879 (Multilingual)

You can download these technical publications and other technical information from our website at www.schneider-electric.com.

Product Related Information

DANGER

EXPLOSIVE POTENTIAL

- Only use this equipment in non-hazardous locations, or in locations that comply with Class I, Division 2, Groups A, B, C and D.
- Do not substitute components which would impair compliance to Class I Division 2.
- Do not connect or disconnect equipment unless power has been removed or the location is known to be non-hazardous.

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

WARNING

LOSS OF CONTROL

- The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure. Examples of critical control functions are emergency stop and overtravel stop, power outage and restart.
- Separate or redundant control paths must be provided for critical control functions.
- System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
- Observe all accident prevention regulations and local safety guidelines.¹
- Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.

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

¹ For additional information, refer to NEMA ICS 1.1 (latest edition), "Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control" and to NEMA ICS 7.1 (latest edition), "Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems" or their equivalent governing your particular location.

User Comments

We welcome your comments about this document. You can reach us by e-mail at techcomm@schneider-electric.com.

499TWD01100 Ethernet/Modbus Gateway



Overview

This manual describes the 499TWD01100 Ethernet/Modbus Gateway to be used with the Modicon M238 Logic Controller.

What’s in this Chapter?

This chapter contains the following topics:

Topic	Page
Gateway Overview	10
Gateway External Features	11
Gateway LED-Panel Description	13
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Gateway Overview

Overview

This manual describes the 499TWD01100 Ethernet/Modbus Gateway to be used with the Modicon M238 Logic Controller (*see M238 Logic Controller, Hardware Guide*).

The Gateway is used to connect a single controller Modbus/RTU (RS485) device and the physical layer of Modbus/TCP networks. The Gateway module supports slave mode only.

The Gateway adds Ethernet connectivity to the Schneider Electric controller product line. The Gateway is supplied through the serial port of the controller and does not require a separate supply.

The 499TWD01100 Ethernet/Modbus Gateway will be referred to as **Gateway** in the remainder of this document.

Package Contents

The Gateway package contains:

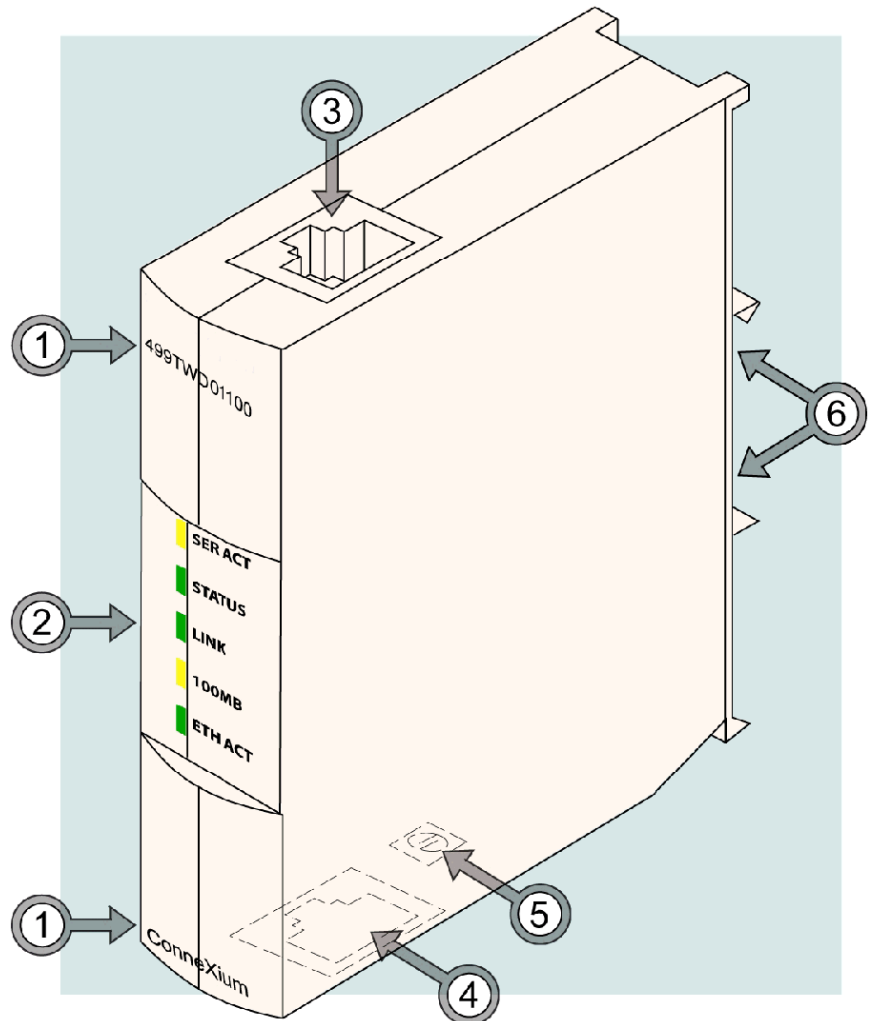
- One module
- One Quick Reference Guide
- One adapter cable (mini-din, RJ45 male, 50 cm length (20 in.))

NOTE: The adapter cable included in this package will not be used with M238 controllers. Use an XBTZ9980 cable to connect the Gateway to the M238 controller. This part must be ordered separately.

Gateway External Features

External Features

The following figure shows the parts of the Gateway:



Legend

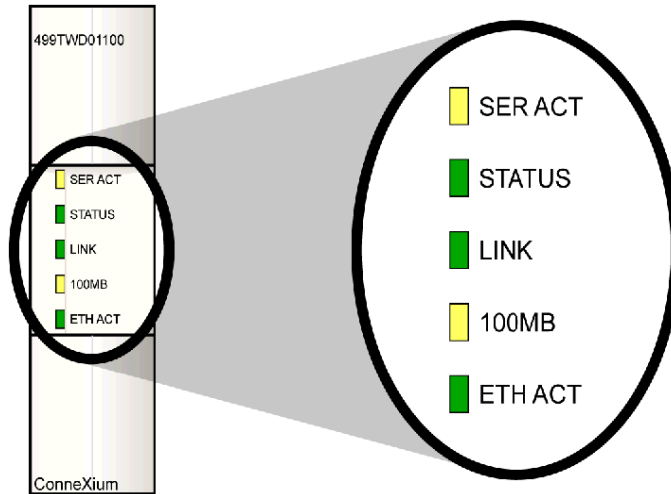
The following table describes the external features of the Gateway:

Feature		Function
1	Model number Model name	499TWD01100 ConneXium
2	LED display	Visual indications of the Gateway operating status
3	RJ45 connector	Power and communications connection to the controller RS485 port (over the XBTZ9980 cable)
4	RJ45 connector	Connection to TCP/IP over Ethernet cable (not supplied)
5	PE ground	Protective ground (PE) (M3 screw terminal)
6	DIN rail connector	For DIN rail mounting

Gateway LED-Panel Description

LED-Panel

The five LEDs implemented in Gateway are visual indications of the operating status of the module:



Description of the Communication LEDs

This table describes the condition(s), colors, and flash patterns that indicate the operating status of the module:

Label	Meaning	Pattern	Indication(s)
SER ACT (yellow)	serial line activity	on	serial activity
		off	no serial activity
STATUS (green)	module status	on	normal condition
		off	abnormal condition
		flash: 2	invalid MAC address
		flash: 3	link not connected
		flash: 4	duplicate IP connection
		flash: 5	attempting to get IP connection through BootP
		flash: 6	default IP address
		flash: 7	kernel mode
LINK (green)	Ethernet link	on	link is active
		off	link is not active

Label	Meaning	Pattern	Indication(s)
100MB (yellow)	speed	on	100 MB/sec (half duplex only, no full duplex support)
		off	10 MB/sec (full/half duplex)
ETH ACT (green)	Ethernet activity	on	Ethernet is active
		off	Ethernet is not active

NOTE: During the autobaud process, the serial activity LED flashes at a 50Hz rate and appears to be on solid. When the serial activity LED goes off, the autobaud process is complete.

Using the LED Table

Individual flashes are approximately 200 ms. There is a one-second interval between flash sequences. For example:

- flashing—flashes steadily, alternating between 200 ms on and 200 ms off
- flash 1—flashes once (200 ms), then 1 second off
- flash 2—flashes twice (200 ms on, 200 ms off, 200 ms on), then one second off, etc.

Gateway Installation

Introduction

This section shows how to install the Gateway and connect it to a controller.

Foreword

The equipment is delivered in ready-to-operate condition. The following procedure is appropriate for installation.

Proper Grounding

DANGER

HAZARD OF ELECTRIC SHOCK

- The grounding terminal connection (PE) must be used to provide a protective ground at all times.
- Make sure that an appropriate, braided ground cable is attached to the PE/PG ground terminal before connecting or disconnecting the network cable to the equipment.

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

Ground Cable

The recommended protective ground (PE) wire size is 0.75 ...4 mm² (AWG 18 ... 12). The maximum allowable length of the 0.75 mm² (AWG 18) wire is less than 2 m (6.56 ft).

The XBTZ9980 Cable

Use the required 2 RJ45 connectors / 2.5 m (8.19 ft) cable XBTZ9980 to connect the Gateway to the M238 controller. This part must be ordered separately. The one adapter cable included in this package will not be used with M238 controller range.

Mounting Instructions

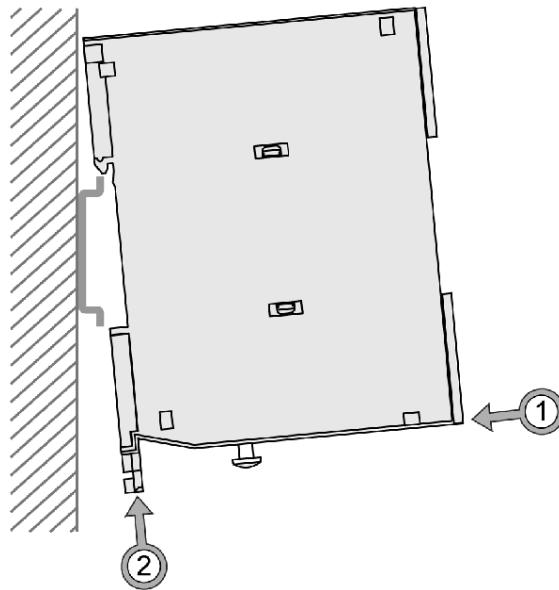
Usually, the Gateway is mounted on a DIN rail or a panel with the Controller panel mounting kit (TWDXMT5).

NOTE: Before installing a Gateway module, read the Safety Information at the beginning of this guide as well as the instructions for Proper Grounding (see page 15) in this section.

To connect the Gateway to the DIN rail, take the following steps (as shown in the diagram below):

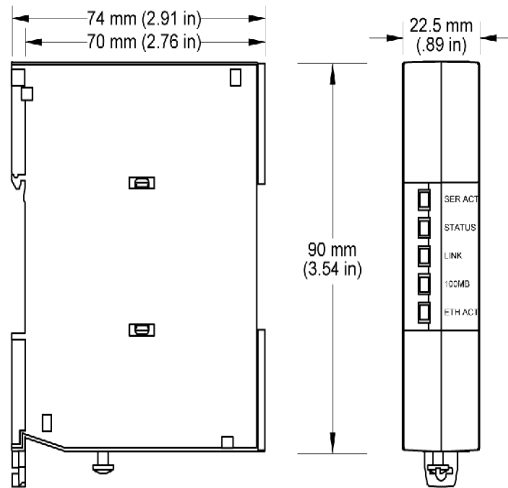
Step	Action	Comment
1	Attach the hinges on the back of the Gateway to the DIN rail, then press down to align the Gateway vertically with the rail.	Make sure the DIN rail latch is pulled down to the open position.
2	Lock the Gateway to the DIN rail.	Push up the plastic DIN rail clip on the bottom.

The following figure shows the Gateway being mounted on a DIN rail:



Gateway Dimensions

The following diagram shows the dimensions of the Gateway:



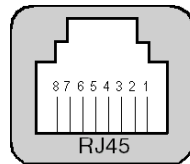
Gateway Wiring

Ethernet Wiring

The Gateway contains an RJ45 10/100 Mbps port. The port negotiates speed to the fastest condition that the end device can support.

Ethernet Connector Pin Assignment

The following figure illustrates the pin assignments for the Gateway Ethernet port:



The following table illustrates the pin assignments for the Gateway Ethernet port:

Pin	Ethernet	Description
1	TXD+	transmitted data
2	TXD-	transmitted data
3	RXD+	received data
4	—	N.C.
5	—	N.C.
6	RXD-	received data
7	—	N.C.
8	—	N.C.

WARNING

UNINTENDED EQUIPMENT OPERATION

Do not connect wires to unused terminals or terminals marked “Not Connected (N.C.)”.

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

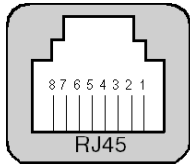
Serial Wiring

The Gateway has one 8-pin RJ45 connector:

- 1 marked SL1 (Serial Line 1) for the RS 232/485 serial line
- 1 marked SL2 (Serial Line 2) for the RS 485 serial line

Serial Line Connector Pin Assignments

The following figure illustrates the pin assignments for the Gateway Serial port:



The following table illustrates the pin assignments for the Gateway Serial port:

Pin	RS232	RS485	Description
1	RXD	N.C.	received data
2	TXD	N.C.	transmitted data
3	RTS	N.C.	request to send
4	–	D1 (A+)	differential pair
5	–	D0 (B-)	
6	CTS	N.C.	clear to send
7	+ 5 Vdc / 200 mA		power supply
8	0 V		Signal Common

General Characteristics

Environmental Characteristics

Operating Temperature	0 ... 55 °C (32 °F ... 131 °F)
Storage Temperature	-40 °C ... +70 °C (-40 °F ... 158 °F)
Relative Humidity	10 ... 95% (non-condensing)
Pollution Degree	2
Degree of Protection	IP20
Corrosion Immunity	free from corrosive gases
Altitude	operation: 2000 m (6560 ft) max. storage: 3040 m (10000 ft) max.
Vibration Resistance	When mounted on a DIN rail: 10 ... 57 Hz: 0.075 mm double amplitude (peak-to-peak) displacement. 57 ... 100 Hz: 9.8 m/s² (1g) constant acceleration. - duration: 10 sweeps at 1 octave/min on each of three mutually perpendicular axes.
Shock Resistance	147 m/s ² (15 g), 11 ms duration, 3 shocks per axis, on three mutually perpendicular axes (IEC 61131-2)
(IEC 61000-4-2) Electrostatic Discharge (ESD)	4 kV contact
	4 kV air
(IEC 61000-4-3) RFI Immunity (RS)	80 MHz to 2.0 GHz 10 V/m, 1 kHz 80% AM
(IEC 61000-4-4) Fast Transients (EFT)	communications ports/cables +/- 1 kV
(IEC 61000-4-5) Surge withstand capability (transients)	1.2 x 50 µs
	shielded communications cable 1 kV/cm 2 Ω
EN61000-4-6 Conducted disturbances immunity	3 Vrms 150 kHz to 80 MHz, 1 kHz 80% AM
Flammability	connector: UL 94 V-0
	enclosure: UL 94 V-0
Weight	< 200 g (7 oz)

Electrical Characteristics

Max. current draw	180 mA @ 5 Vdc
Supply Voltage	5 +/- 0.5 Vdc

Certifications and Standards

UL 508, UL 1604 hazardous class 1, Div. 2, groups A, B, C, D	
CSA C22.2 No. 142	
CSA C22.2 No. 213 hazardous class 1, Div. 2, groups A, B, C, D	
CE	EN 61131-2
	EN 55011 (class A)

NOTE: Equipment must not be connected or disconnected in any hazardous locations including any Class I Division 2 location.

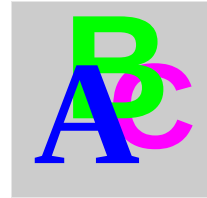
DANGER

EXPLOSIVE POTENTIAL

- Only use this equipment in non-hazardous locations, or in locations that comply with Class I, Division 2, Groups A, B, C and D.
- Do not substitute components which would impair compliance to Class I Division 2.
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Failure to follow these instructions will result in death or serious injury.

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