SIEMENS

RUGGEDCOM RMC30

Installation Guide

01/2017
RC1008-EN-05

Disclaimer Of Liability

Siemens has verified the contents of this document against the hardware and/or software described. However, deviations between the product and the documentation may exist.

Siemens shall not be liable for any errors or omissions contained herein or for consequential damages in connection with the furnishing, performance, or use of this material.

The information given in this document is reviewed regularly and any necessary corrections will be included in subsequent editions. We appreciate any suggested improvements. We reserve the right to make technical improvements without notice.

Registered Trademarks

RUGGEDCOM™ and ROS™ are trademarks of Siemens Canada Ltd.

Other designations in this manual might be trademarks whose use by third parties for their own purposes would infringe the rights of the owner.

Third Party Copyrights

Siemens recognizes the following third party copyrights:

- Copyright © 2004 GoAhead Software, Inc. All Rights Reserved.

Security Information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. For more information about industrial security, visit http://www.siemens.com/industrialsecurity .

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit http://support.automation.siemens.com .

Warranty

Siemens warrants this product for a period of five (5) years from the date of purchase, conditional upon the return to factory for maintenance during the warranty term. This product contains no user-serviceable parts. Attempted service by unauthorized personnel shall render all warranties null and void. The warranties set forth in this article are exclusive and are in lieu of all other warranties, performance guarantees and conditions whether written or oral, statutory, express or implied (including all warranties and conditions of merchantability and fitness for a particular purpose, and all warranties and conditions arising from course of dealing or usage or trade). Correction of nonconformities in the manner and for the period of time provided above shall constitute the Seller's sole liability and the Customer's exclusive remedy for defective or nonconforming goods or services whether claims of the Customer are based in contract (including fundamental breach), in tort (including negligence and strict liability) or otherwise.

For warranty details, visit www.siemens.com/ruggedcom or contact a Siemens customer service representative.

Contacting Siemens

Address
Siemens Canada Ltd
Industry Sector
300 Applewood Crescent
Concord, Ontario
Canada, L4K 5C7

Telephone
Toll-free: 1 888 264 0006
Tel: +1 905 856 5288
Fax: +1 905 856 1995

E-mail
ruggedcom.info.i-ia@siemens.com

Web
www.siemens.com/ruggedcom

Table of Contents

Preface

This guide describes the RUGGEDCOM RMC30. It describes the major features of the device, installation, commissioning and important technical specifications.

It is intended for use by network technical support personnel who are responsible for the installation, commissioning and maintenance of the device. It is also recommended for use by network and system planners, system programmers, and line technicians.

CONTENTS

Alerts

The following types of alerts are used when necessary to highlight important information.

DANGER!
DANGER alerts describe imminently hazardous situations that, if not avoided, will result in death or serious injury.

WARNING!
WARNING alerts describe hazardous situations that, if not avoided, may result in serious injury and/or equipment damage.

CAUTION!
CAUTION alerts describe hazardous situations that, if not avoided, may result in equipment damage.

IMPORTANT!
IMPORTANT alerts provide important information that should be known before performing a procedure or step, or using a feature.

NOTE
NOTE alerts provide additional information, such as facts, tips and details.

Related Documents

Other documents that may be of interest include:

- *ROS User Guide for the RUGGEDCOM RMC30*

Accessing Documentation

The latest user documentation for RUGGEDCOM RMC30 is available online at www.siemens.com/ruggedcom. To request or inquire about a user document, contact Siemens Customer Support.

Training

Siemens offers a wide range of educational services ranging from in-house training of standard courses on networking, Ethernet switches and routers, to on-site customized courses tailored to the customer's needs, experience and application.

Siemens' Educational Services team thrives on providing our customers with the essential practical skills to make sure users have the right knowledge and expertise to understand the various technologies associated with critical communications network infrastructure technologies.

Siemens' unique mix of IT/Telecommunications expertise combined with domain knowledge in the utility, transportation and industrial markets, allows Siemens to provide training specific to the customer's application.

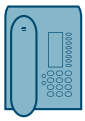
For more information about training services and course availability, visit www.siemens.com/ruggedcom or contact a Siemens Sales representative.

Customer Support

Customer support is available 24 hours, 7 days a week for all Siemens customers. For technical support or general information, contact Siemens Customer Support through any of the following methods:

Online

Visit http://www.siemens.com/automation/support-request to submit a Support Request (SR) or check on the status of an existing SR.



Telephone

Call a local hotline center to submit a Support Request (SR). To locate a local hotline center, visit http://www.automation.siemens.com/mcms/aspa-db/en/automation-technology/Pages/default.aspx .

Mobile App

Install the Industry Online Support app by Siemens AG on any Android, Apple iOS or Windows mobile device and be able to:

- Access Siemens' extensive library of support documentation, including FAQs and manuals
- Submit SRs or check on the status of an existing SR
- Contact a local Siemens representative from Sales, Technical Support, Training, etc.
- Ask questions or share knowledge with fellow Siemens customers and the support community

1 Introduction

The RUGGEDCOM RMC30 is an industrially hardened, 2-port Serial-to-Ethernet server that has been specifically designed to operate in electrically harsh and climatically demanding environments. The RUGGEDCOM RMC30 allows communication with virtually any serial device via Ethernet, providing simple and reliable network connectivity.

The RUGGEDCOM RMC30 is packaged in a compact, galvanized steel enclosure that allows either DIN or panel mounting for efficient use of cabinet space. It has an integrated power supply with a wide range of voltages for worldwide operability. An operating temperature range of -40 to 85°C (-40 to 185°F) without the use of internal cooling fans allows it to be placed in almost any location. The RUGGEDCOM RMC30 is compliant with EMI and environmental standards for utility substations, industrial manufacturing, process and control and intelligent transportation systems applications.

The RUGGEDCOM RMC30 offers both an RS232 port and a RS485/422 port simultaneously via a solid screw down terminal block. The 10Base-T Ethernet port supports both auto-negotiation and auto-crossover detection and simplifies cabling. Simple and intuitive network based configuration using either the built in Web or Telnet server makes setup a breeze. The RUGGEDCOM RMC30's superior ruggedized design coupled with the Rugged Operating System™ (ROS®) provides improved system reliability making it ideally suited for creating Ethernet networks for mission critical, real-time, control applications.

CONTENTS

Section 1.1

Feature Highlights

Connectivity

- 1 x RS232 and 1 x RS422/485 port
- 1 x 10Base-TX port
- Fully compliant EIA/TIA RS485 and RS232 ports
- Built-In optional RS485 Termination

Serial Encapsulation

- Transmit serial data over an IP network
- Support for Modbus TCP, DNP 3, TIN serial protocols
- Baud rates up to 230 kbps
- Point to point and multi-point modes
- Convert Modbus RTU to Modbus TCP

- Support multiple Modbus masters
- Use *Serial IP* port redirection software to support PC applications statistics and built-in *sniffer* for troubleshooting

Designed for Harsh Environments

- Operates over a temperature range of -40 to 85 °C (-40 to 185 °F) without the use of fans for improved reliability
- 21 AWG galvanized steel enclosure suitable for DIN or panel mounting provide secure mechanical reliability

Section 1.2
Description

The RUGGEDCOM RMC30 features various ports, controls and indicator LEDs on the display panel for connecting, configuring and troubleshooting the device. The display panel can be located on the rear, front or top of the device, depending on the mounting configuration.

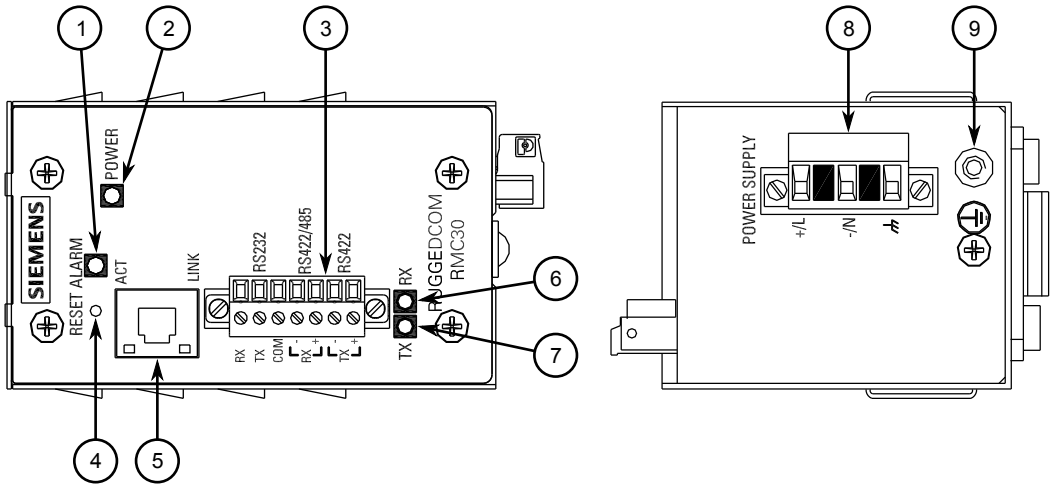


Figure 1: RUGGEDCOM RMC30

1. ALARM LED **2.** POWER LED **3.** Serial Terminal **4.** Reset Button **5.** Copper Ethernet Port with LEDs **6.** TX LED **7.** RX LED **8.** Power Terminal Block **9.** Chassis Ground Terminal

ALARM LED	Illuminates when an alarm condition exists.
POWER LED	Illuminates when power is being supplied to the device.

State	Description
Green	Power is on
Off	Power is off

RESET Button	Shuts down and restarts the device. For more information, refer to Section 2.4, "Resetting the Device" .
TX/RX LEDs	Indicate the connection status of the serial terminal.

LED	State	Description
TX	Green (Blinking)	Transmitting serial data
RX	Green (Blinking)	Receiving serial data

Serial Terminal	The RS232/RS422/RS485 serial terminal serves a dual purpose: • The RS232 terminals allow for a direct interface with the device and access to initial management functions. For information about connecting to the device via the serial terminal, refer to Section 2.3, "Connecting to the Device" . • The RS422/RS485 terminals allow for half or full duplex serial connections respectively. For more information, refer to Chapter 3, *Communication Ports* .
Power Supply Terminal	A pluggable terminal. For more information, refer to: • Section 2.2, "Connecting Power" • Section 4.1, "Power Supply Specifications"
Communication Ports	Receive and transmit data. For more information about the various ports available for the RUGGEDCOM RMC30, refer to Chapter 3, *Communication Ports* .

2 Installing the Device

The following sections describe how to install the device, including mounting the device, installing/removing modules, connecting power, and connecting the device to the network.

DANGER!
Electrocution hazard – risk of serious personal injury and/or damage to equipment. Before performing any maintenance tasks, make sure all power to the device has been disconnected and wait approximately two minutes for any remaining energy to dissipate.

WARNING!
*Radiation hazard – risk of serious personal injury. This product contains a laser system and is classified as a **CLASS 1 LASER PRODUCT**. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.*

IMPORTANT!
This product contains no user-serviceable parts. Attempted service by unauthorized personnel shall render all warranties null and void.

Changes or modifications not expressly approved by Siemens Canada Ltd could invalidate specifications, test results, and agency approvals, and void the user's authority to operate the equipment.

IMPORTANT!
*This product should be installed in a **restricted access location** where access can only be gained by authorized personnel who have been informed of the restrictions and any precautions that must be taken. Access must only be possible through the use of a tool, lock and key, or other means of security, and controlled by the authority responsible for the location.*

CONTENTS

Section 2.1
Mounting the Device

The RUGGEDCOM RMC30 is designed for maximum mounting and display flexibility. It can be equipped with connectors that allow it to be installed in a 35 mm (1.4 in) DIN rail or directly on a panel.

IMPORTANT!
Heat generated by the device is channeled outwards to the enclosure. As such, it is recommended that 2.5 cm (1 in) of space be maintained on all open sides of the device to allow for some convectional airflow.

Forced airflow is not required. However, any increase in airflow will result in a reduction of ambient temperature and improve the long-term reliability of all equipment mounted in the rack space.

NOTE
For detailed dimensions of the device with either DIN rail or panel hardware installed, refer to *Chapter 5, Dimension Drawings* .

CONTENTS

Section 2.1.1

Mounting the Device on a DIN Rail

For DIN rail installations, the RMC30 can be equipped with a DIN rail bracket pre-installed on the back of the chassis. The bracket allows the device to be slid onto a standard 35 mm (1.4 in) DIN rail.

To mount the device to a DIN rail, do the following:

1. Align the slot in the bracket with the DIN rail.

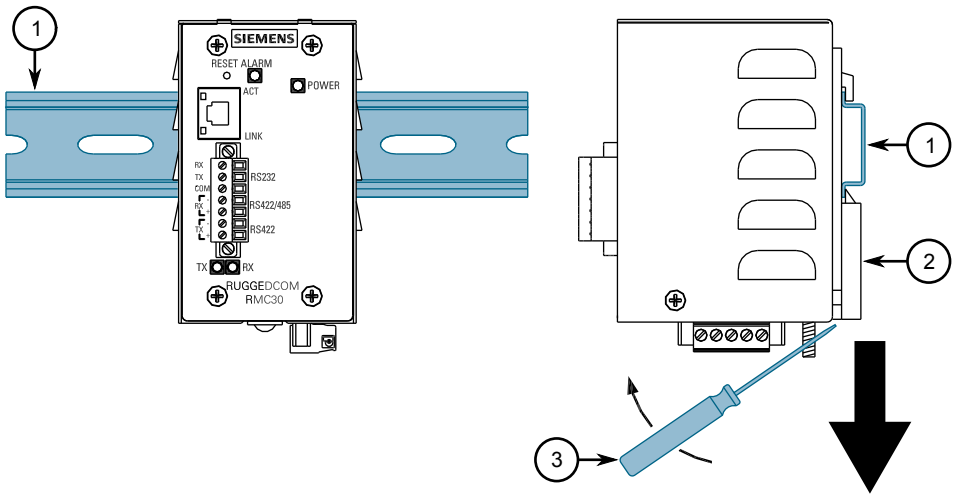


Figure 2: DIN Rail Mounting

1. DIN Rail **2.** DIN Rail Bracket **3.** Screw Driver

2. Pull the release on the bracket down and slide the device onto the DIN rail. If necessary, use a screw driver to unlock the release. Let go of the release to lock the device in position.

Section 2.1.2
Mounting the Device to a Panel

To mount the device to a panel, do the following:

1. Place the panel adapter against the panel and secure it with screws.

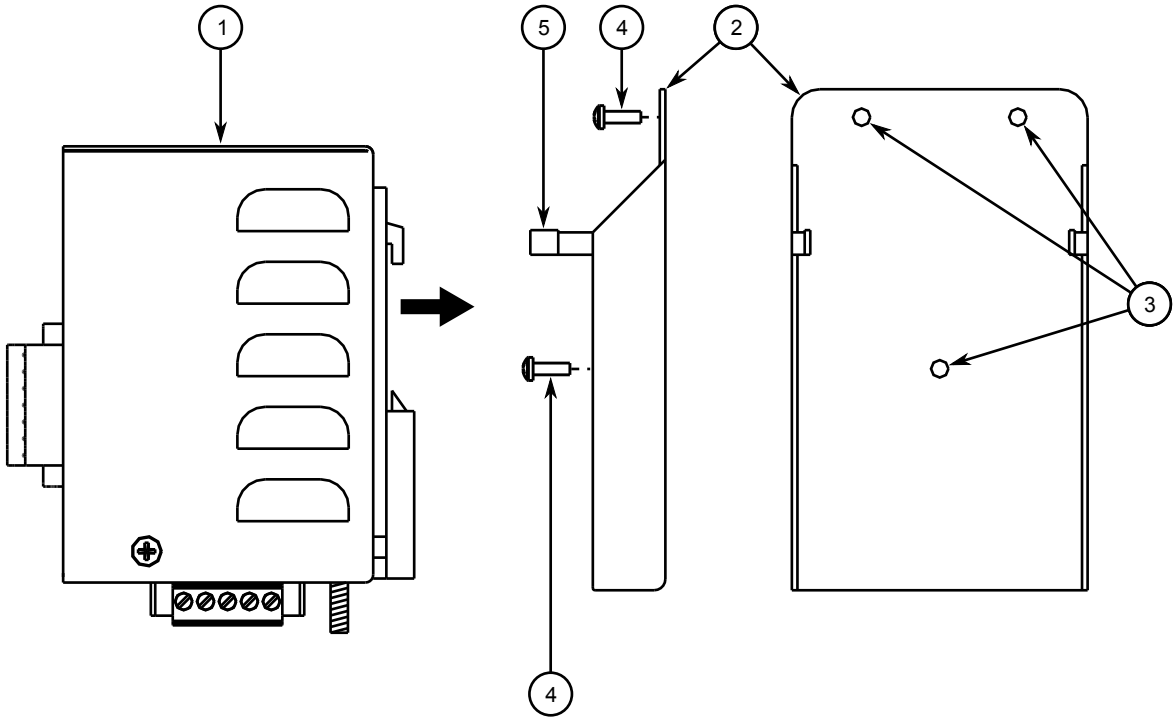


Figure 3: Panel Mounting

1. RUGGEDCOM RMC30 **2.** Panel Adapter **3.** Mounting Holes **4.** Screw **5.** Metal Clips

2. Insert the device into the adapter. Make sure the device is secured between the two metal clips.

Section 2.2
Connecting Power

The RUGGEDCOM RMC30 supports a single integrated high AC/DC or low DC power supply

NOTE

- *For 110/230 VAC rated equipment, an appropriately rated AC circuit breaker must be installed.*
- *For 125/250 VDC rated equipment, an appropriately rated DC circuit breaker must be installed.*
- *Use only #16 gage copper wiring when connecting terminal blocks.*
- *Equipment must be installed according to applicable local wiring codes and standards.*

- *All line-to-ground transient energy is shunted to the Surge Ground terminal. In cases where users require the inputs to be isolated from ground, remove the ground braid between Surge and Chassis Ground. Note that all line-to-ground transient protection circuitry will be disabled.*

IMPORTANT!
Siemens requires the use of external surge protection in VDSL applications where the line may be subject to surges greater than that for which the device is rated. Use the following specifications as a guide for VDSL external surge protection:

- *Clamping Voltage: 50 V to 200 V*
- *Insertion Loss: < 0.1 dB at 10 MHz*
- *Peak Surge Current: 10 kA, 8x20µs waveform*

CONTENTS

Section 2.2.1

Connecting AC Power

To connect a high AC power supply to the device, do the following:

CAUTION!
Electrical hazard – risk of damage to equipment. Before testing the dielectric strength (HIPOT) in the field, remove the braided ground cable connected to the surge ground terminal and chassis ground. This cable connects transient suppression circuitry to chassis ground and must be removed in order to avoid damage to transient suppression circuitry during testing.

1. Connect the positive wire from the power source to the positive/live (+/L) terminal on the terminal block.

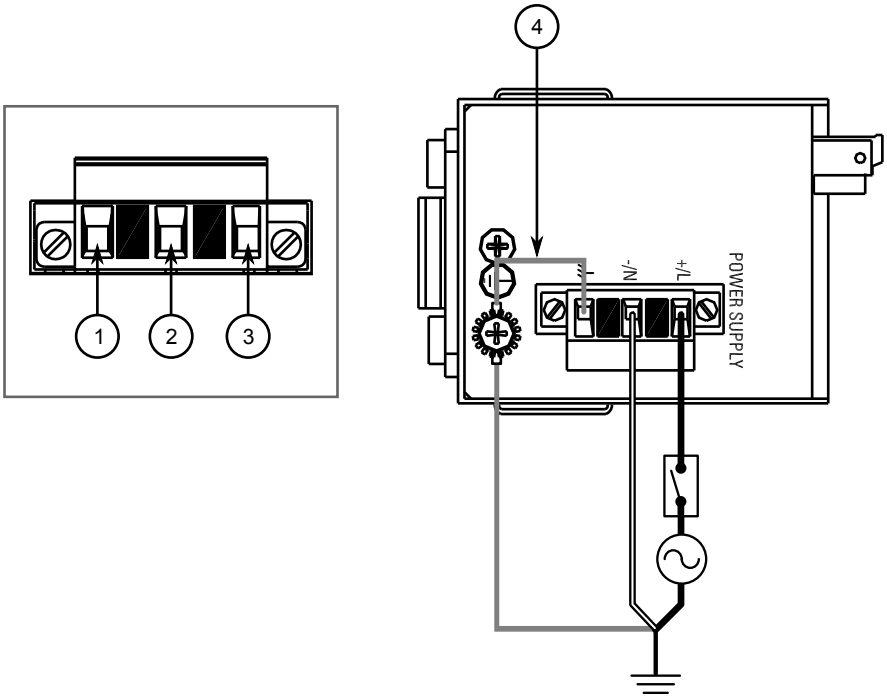


Figure 4: Terminal Block Wiring

1. Positive/Live (+/L) Terminal **2.** Negative/Neutral (-/N) Terminal **3.** Surge Ground Terminal **4.** Braided Ground Cable

2. Connect the negative wire from the power source to the negative/neutral (-/N) terminal on the terminal block.
3. Using a braided wire or other appropriate grounding wire, connect the surge ground terminal to the chassis ground connection. The surge ground terminal is used as the ground conductor for all surge and transient suppression circuitry internal to the unit.
4. Connect the ground terminal on the power source to the chassis ground terminal on the device.

Section 2.2.2

Connecting DC Power

To connect a high or low DC power supply to the device, do the following:

CAUTION!
Electrical hazard – risk of damage to equipment. Before testing the dielectric strength (HIPOT) in the field, remove the braided ground cable connected to the surge ground terminal and chassis ground. This cable connects transient suppression circuitry to chassis ground and must be removed in order to avoid damage to transient suppression circuitry during testing.

1. Connect the positive wire from the power source to the positive/live (+/L) terminal on the terminal block.

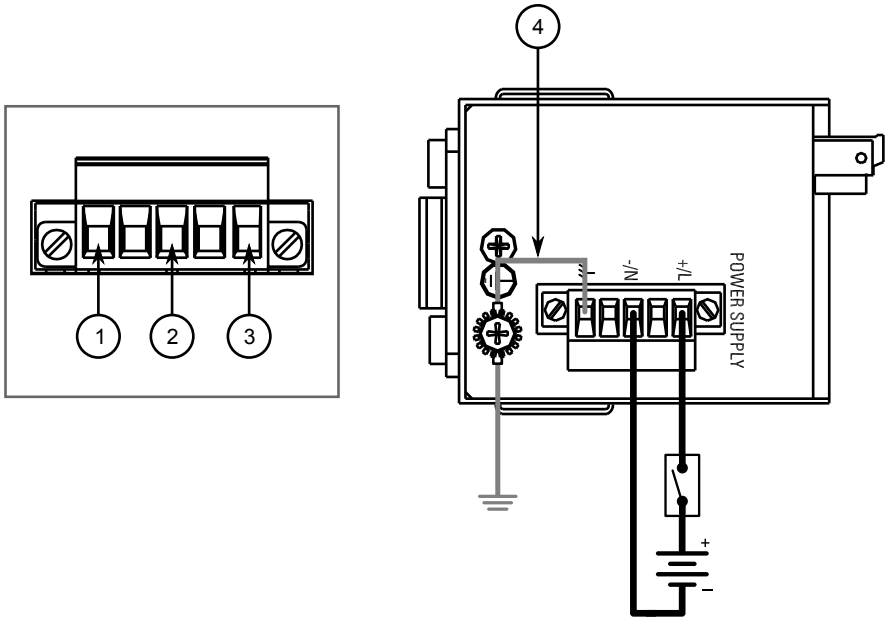


Figure 5: Terminal Block Wiring

1. Positive/Live (+/L) Terminal **2.** Negative/Neutral (-/N) Terminal **3.** Surge Ground Terminal **4.** Braided Ground Cable

2. Connect the negative wire from the power source to the negative/neutral (-/N) terminal on the terminal block.
3. Using a braided wire or other appropriate grounding wire, connect the surge ground terminal to the chassis ground connection. The surge ground terminal is used as the ground conductor for all surge and transient suppression circuitry internal to the unit.
4. Connect the ground terminal on the power source to the chassis ground terminal on the device.

Section 2.3

Connecting to the Device

The following describes the various methods for accessing the RUGGEDCOM ROS console and Web interfaces on the device. For more detailed instructions, refer to the *RUGGEDCOM ROS User Guide* for the RUGGEDCOM RMC30.

» RS232/RS422/RS485 Serial Console Terminal

Connect a PC or terminal directly to the RS232 serial terminals to access the boot-time control and RUGGEDCOM ROS console interface.

IMPORTANT!
The console interface is intended to be used only as a temporary connection during initial configuration or troubleshooting.

The serial terminal implements RS232 DCE (Data Communication Equipment) on a Phoenix-style compression connector. For more information, refer to Section 3.2, “Serial Terminal” .

Communication Ports

Connect the copper Ethernet port to a management switch and access the RUGGEDCOM ROS console and Web interfaces via the device's IP address. The factory default IP address for the RUGGEDCOM RMC30 is https://192.168.0.1 .

For more information about available ports, refer to Chapter 3, *Communication Ports* .

Section 2.4

Resetting the Device

The RUGGEDCOM RMC30 can be reset (rebooted) using the **RESET** button. The **RESET** button is recessed and can only be reached using a pin or small screwdriver.

To reset the device, quickly press and release the *RESET* button with a pin.

3 Communication Ports

The RUGGEDCOM RMC30 can be equipped with various types of communication ports to enhance its abilities and performance.

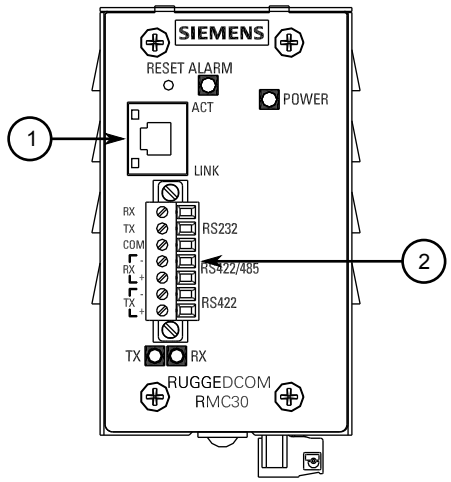


Figure 6: Port Assignment

1. Port 1 **2.** Port 2

Port	Type
1	Copper Ethernet Port
2	RS232/RS485/RS422 Serial Terminal

CONTENTS

Section 3.1

Copper Ethernet Ports

The RUGGEDCOM RMC30 supports a single 10/100Base-TX Ethernet port that allows connection to a standard Category 5 (CAT-5) unshielded twisted-pair (UTP) cable with an RJ45 male connector. The RJ45 receptacles are directly connected to the chassis ground on the device and can accept CAT-5 shielded twisted-pair (STP) cables.

WARNING!
Electric shock hazard – risk of serious personal injury and/or equipment interference. If shielded cables are used, make sure the shielded cables do not form a ground loop via the shield wire and the RJ45 receptacles at either end. Ground loops can cause excessive noise and interference, but more importantly, create a potential shock hazard that can result in serious injury.

IMPORTANT!
For substation applications, do not use the copper Ethernet port to interface with field devices across distances that could produce high levels of ground potential rise (i.e. greater than 2500 V) during line-to-ground fault conditions.

LEDs

Each port features a **Speed** and **Link** LED that indicates the state of the port.

LED	State	Description
Speed	Yellow	The port is operating at 100 Mbps
	Off	The port is operating at 10 Mbps
Link	Yellow (Solid)	Link established
	Yellow (Blinking)	Link activity
	Off	No link detected

Pin-Out

The following is the pin-out for the RJ45 male connectors:

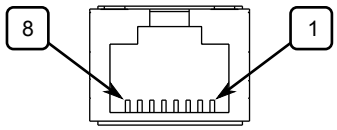


Figure 7: RJ45 Ethernet Port Pin Configuration

Pin	Name	Description
1	RX+	Receive Data+
2	RX-	Receive Data-
3	TX+	Transmit Data+
4	Reserved (Do Not Connect)	
5	Reserved (Do Not Connect)	
6	TX-	Transmit Data-
7	Reserved (Do Not Connect)	
8	Reserved (Do Not Connect)	

Specifications

For specifications on the available copper Ethernet ports, refer to Section 4.2, “Copper Ethernet Port Specifications” .

Section 3.2
Serial Terminal

The RUGGEDCOM RMC30 is equipped with a seven-terminal Phoenix-style connector. This connector can accommodate one RS232 connection, and one RS485/422 connection. The following is the pin-out for the serial terminal:

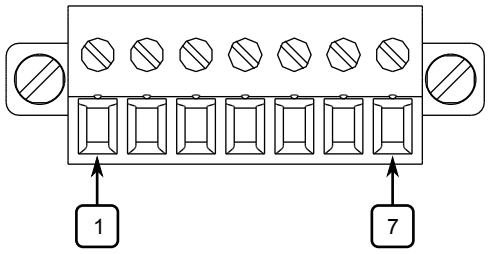


Figure 8: Serial Terminal Pin Configuration

Pin	Name	Mode	Description
1	Rx	RS232	Receive data
2	Tx	RS232	Transmit data
3	COM	Shared common	
4	-Rx	RS422/485	Receive data-
5	+Rx	RS422/485	Receive data+
6	-Tx	RS485	Transmit data-
7	+Tx	RS485	Transmit data+

CONTENTS

Section 3.2.1
RS232 Data Ports

The serial terminal includes a single EIA/TIA RS232 compliant port, consisting of three terminals: Transmit (Tx), Receive (Rx) and Common (COM).

IMPORTANT!
The RS232 port is intended for point-to-point applications only.

In adherence to the EIA/TIA guidelines for RS232 communications, the following is recommended by Siemens:

- Always use shielded cabling to minimize the effects of ambient electrical noise
- Although greater distances are possible, limit the cable length to 15 m (49 ft) or less for more reliable communications
- Use a baud rate of 120 kbps

The RS232 port uses a Phoenix-style DB9 compression connector. The following is the pin-out for the connector:

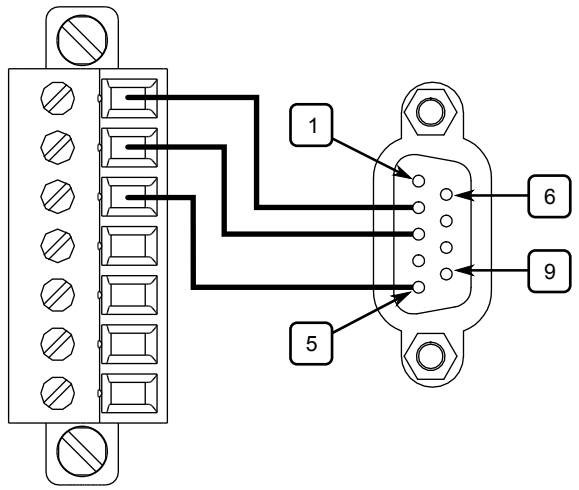


Figure 9: Phoenix-Style DB9 Connector Pin Configuration

Pin	Name	Description
1	Reserved (Do Not Connect)	
2	RD	Receive Data
3	TD	Transmit Data
4	Reserved (Do Not Connect)	
5	SGND	Signal Ground
6	Reserved (Do Not Connect)	
7	Reserved (Do Not Connect)	
8	Reserved (Do Not Connect)	
9	Reserved (Do Not Connect)	

The RS232 data port has two modes of operations, but only one mode is active at any given time:

- Communications with IEDs (intelligent electronic devices such as PLC, RTU, etc.)
- Console configuration of the device.

To activate console configuration mode, press and hold **Ctrl+Z** for approximately 10 seconds during power up. To deactivate console mode, reset the device.

Section 3.2.2

RS485/422 Data Ports

The serial terminal includes a single RS485/RS422 data port. In half duplex mode, the RS485 connections (Rx+, Rx-, COM) should be connected. In full-duplex mode, the RS422 connections (Rx+, Rx-, Tx+, Tx-, COM) should be connected. Both RS485 and RS422 can accommodate multi-drop networks, for master-slave serial network communications. For both RS485/RS422 connections, the following general guidelines should be followed:

- To minimize the effects of ambient electrical noise, use shielded cabling.
- The correct polarity must be observed throughout a single sequence or ring.
- The number of devices wired should not exceed 32, and total distance should be less than 1219 m (4000 ft) at 100 kbps.
- The Common terminals should be connected to the common wire inside the shield.
- The shield should be connected to earth ground at a single point to avoid loop currents.
- The twisted pair should be terminated at each end of the chain (typically with a 120 Ohm resistor and a 10nF capacitor in series across the twisted pair).

NOTE
The RUGGEDCOM RMC30 features built-in pull-up and pull-down resistors. As such, external bias resistors are only recommended when connecting the RUGGEDCOM RMC30 to third-party serial devices that do not have built-in pull-up and pull-down resistors.

NOTE
Transient protection is provided on all terminals. Lightning strikes and ground surge currents can cause large momentary voltage differences between ends of communication links. For maximum reliability of the entire link, all equipment should have similar transient protection installed.

The following shows the recommended RS485 wiring.

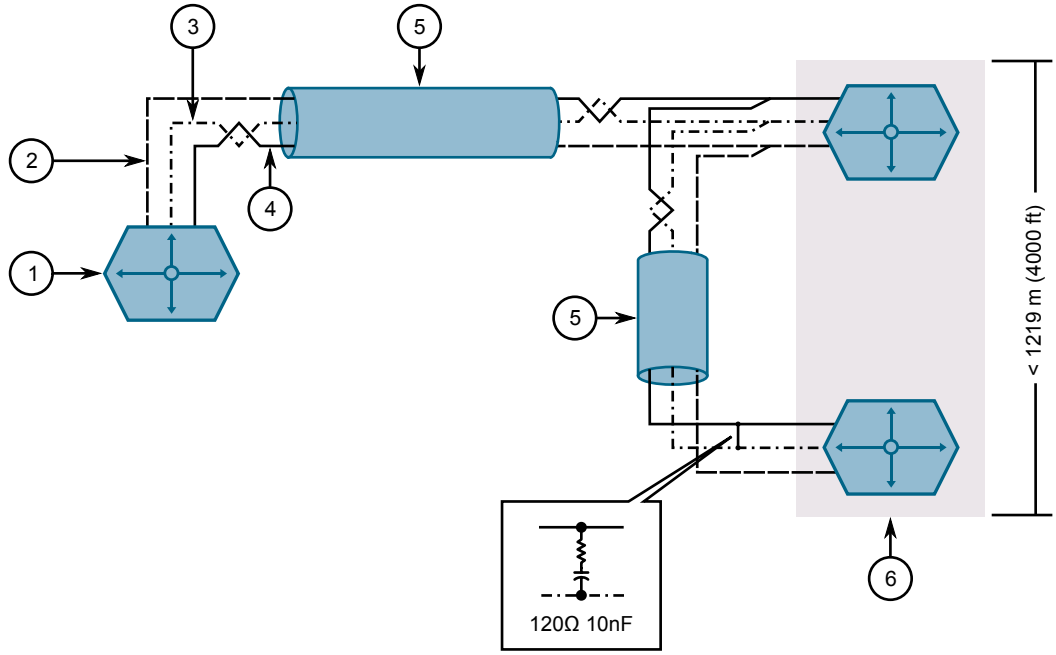


Figure 10: Recommended RS485 Wiring

1. RUGGEDCOM RMC30 Device With Built-In Termination **2.** Common (Isolated Ground) **3.** Negative **4.** Positive **5.** Shield to Earth (Connected At a Single Point) **6.** RS485 Devices (32 Total)

4 Technical Specifications

This section provides important technical specifications related to the device and available modules.

CONTENTS

Section 4.1

Power Supply Specifications

Power Supply Type	Minimum Input	Maximum Input	Internal Fuse Rating[a]	Max. Power Consumption
24 VDC	18 VDC	36 VDC	3.15A (T)	3 W
48 VDC	36 VDC	59 VDC		
HI[b]	88 VDC	300 VDC		
	85 VAC	264 VAC		

[a] *(T) denotes time-delay fuse.*

[b] *This is the same power supply for both AC and DC.*

Section 4.2

Copper Ethernet Port Specifications

The following details the specifications for copper Ethernet ports that can be ordered with the RUGGEDCOM RMC30.

Speed[c]	Connector	Duplex[c]	Cable Type[d]	Wiring Standard[e]	Maximum Distance[f]	Isolation[g]
10Base-TX	RJ45	FDX/HDX	> CAT-5	TIA/EIA T568A/B	100 m (328 ft)	1.5 kV

[c] *Auto-negotiating.*

[d] *Shielded or unshielded.*

[e] *Auto-crossover and auto-polarity.*

[f] *Typical distance. Dependent on the number of connectors and splices.*

[g] *RMS 1 minute.*

Section 4.3
Supported Networking Standards

Parameter	10Base-FL	100Base-FX	Notes
IEEE 802.3	Yes No		10Base-T
IEEE 802.3x	Yes No	Yes No	Full Duplex, Flow Control

Section 4.4
Operating Environment

Parameter	Range	Comments
Ambient Operating Temperature	-40 to 85 °C (-40 to 185 °F)	Measured from a 30 cm (12 in) radius surrounding the center of the enclosure.
Ambient Relative Humidity	5% to 95%	Non-condensing
Ambient Storage Temperature	-40 to 85 °C (-40 to 185 °F)	

Section 4.5
Mechanical Specifications

Dimensions	Refer to Chapter 5, *Dimension Drawings*
Weight	0.68 kg (1.5 lbs)
Ingress Protection	IP40 (1 mm or 0.04 in objects)
Enclosure	21 AWG Galvanized Steel

5 Dimension Drawings

NOTE
All dimensions are in millimeters, unless otherwise stated.

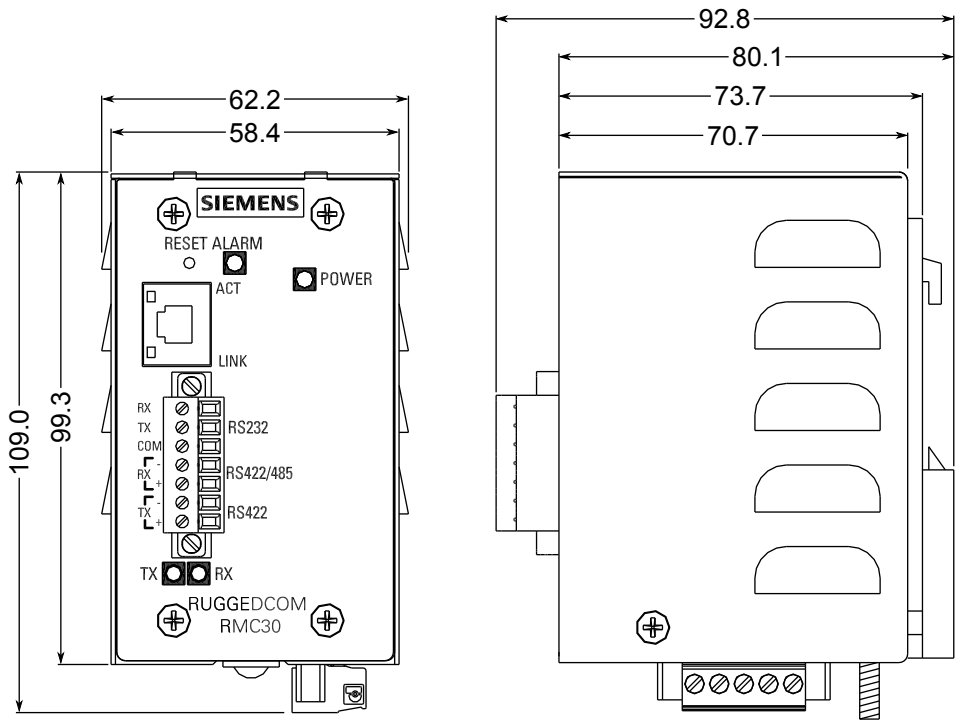


Figure 11: Overall Dimensions

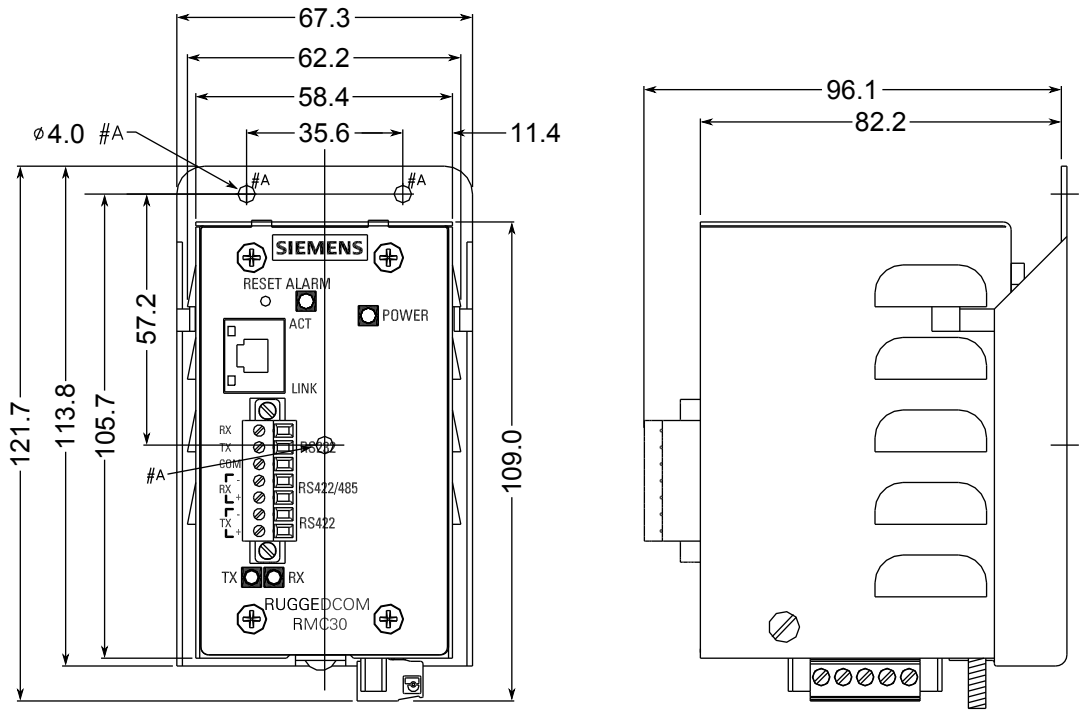


Figure 12: Panel Mount Dimensions

6 Certification

The RUGGEDCOM RMC30 device has been thoroughly tested to guarantee its conformance with recognized standards and has received approval from recognized regulatory agencies.

CONTENTS

Section 6.1

Approvals

This section details the approvals issued for the RUGGEDCOM RMC30.

CONTENTS

Section 6.1.1

CSA

This device is certified by the CSA Group to meet the requirements of the following standards:

- **CSA-C22.2 NO. 60950-1**
  Information Technology Equipment – Safety – Part 1: General Requirements (Bi-National standard, with UL 60950-1)
- **UL 60950-1**
  Information Technology Equipment – Safety – Part 1: General Requirements)

Section 6.1.2
European Union (EU)

This device is declared by Siemens Canada Ltd to comply with essential requirements and other relevant provisions of the following EU directives:

- **EN 60950-1**
  Information Technology Equipment – Safety – Part 1: General Requirements
- **EN 61000-6-2**
  Electromagnetic Compatibility (EMC) – Part 6-2: Generic Standards – Immunity for Industrial Environments
- **EN 60825-1**
  Safety of Laser Products – Equipment Classification and Requirements
- **EN 55022**
  Information Technology Equipment – Radio disturbance characteristics – Limits and methods of measurement

The device is marked with a CE marking and can be used throughout the European community.

CE

A copy of the CE Declaration of Conformity is available from Siemens Canada Ltd. For contact information, refer to "Contacting Siemens " .

Section 6.1.3
FCC

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference on his own expense.

Section 6.1.4
FDA/CDRH

This device meets the requirements of the following U.S. Food and Drug Administration (FDA) standard:

- Title 21 Code of Federal Regulations (CFR) – Chapter I – Sub-chapter J – Radiological Health

Section 6.1.5
Industry Canada

This device is declared by Siemens Canada Ltd to meet the requirements of the following Industry Canada standard:

- CAN ICES-3 (A)/NMB-3 (A)

Section 6.1.6
Other Approvals

This device meets the requirements of the following additional standards:

- **IEEE 1613**
  IEEE Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations
- **IEC 61850-3**
  Communications Networks and Systems for Power Utility Automation – Part 3: General Requirements

Section 6.2
EMC and Environmental Type Tests

The RUGGEDCOM RMC30 has passed the following EMC and environmental tests.

IEC 61850-3 Type Tests

Test	Description		Test Levels	Severity Levels
IEC 61000-4-2	ESD	Enclosure Contact	± 8 kV	4
		Enclosure Air	± 15 kV	4
IEC 61000-4-3	Radiated RFI	Enclosure Ports	20 V/m	Note[a]
IEC 61000-4-4	Burst (Fast Transient)	Signal Ports	± 4 kV @ 2.5 kHz	Note[a]
		DC Power Ports	± 4 kV	4
		AC Power Ports	± 4 kV	4
		Earth Ground Ports	± 4 kV	4
IEC 61000-4-5	Surge	Signal Ports	± 4 kV Line-to-Earth, ± 2 kV Line-to-Line	4
		DC Power Ports	± 2 kV Line-to-Earth, ± 1 kV Line-to-Line	3
		AC Power Ports	± 4 kV Line-to-Earth, ± 2 kV Line-to-Line	4
IEC 61000-4-6	Induced (Conducted) RFI	Signal Ports	10 V	3
		DC Power Ports	10 V	3
		AC Power Ports	10 V	3
		Earth Ground Ports	10 V	3
IEC 61000-4-8	Magnetic Field	Enclosure Ports	40 A/m continuous, 1000 A/m for 1 s	Note[a]

Test	Description		Test Levels	Severity Levels
			1000 A/m for 1 s	5
IEC 61000-4-29	Voltage Dips and Interrupts	DC Power Ports	30% for 0.1 s, 60% for 0.1 s, 100% for 0.05 s	
		AC Power Ports	30% for 1 period, 60% for 50 periods	
IEC 61000-4-11			100% for 5 periods, 100% for 50 periods	
IEC 60255-5	Dielectric Strength	Signal Ports	2 kV (Fail-Safe Relay output)	
		DC Power Ports	1.5 kV	
		AC Power Ports	2 kV	
	HV Impulse	Signal Ports	5 kV (Fail-Safe Relay Output)	
		DC Power Ports	5 kV	
		AC Power Ports	5 kV	

[a] *Siemens specified severity level.*

IEEE 1613 EMC Immunity Type Tests

NOTE
The RUGGEDCOM RMC30 meets Class 2 requirements for an all-fiber configuration and Class 1 requirements for copper ports.

Description		Test Levels
ESD	Enclosure Contact	± 8 kV
	Enclosure Air	± 15 kV
Radiated RFI	Enclosure Ports	35 V/m
Fast Transient	Signal Ports	± 4 kV @ 2.5 kHz
	DC Power Ports	± 4 kV
	AC Power Ports	± 4 kV
	Earth Ground Ports	± 4 kV
Oscillatory	Signal Ports	2.5 kV common mode @ 1MHz
	DC Power Ports	2.5 kV common, 1 kV differential mode @ 1MHz
	AC Power Ports	2.5 kV common, 1 kV differential mode @ 1MHz
HV Impulse	Signal Ports	5 kV (Failsafe Relay)
	DC Power Ports	5 kV
	AC Power Ports	5 kV
Dielectric Strength	Signal Ports	2 kV
	DC Power Ports	1.5 kV
	AC Power Ports	2 kV

Environmental Type Tests

Test	Description		Test Levels	Severity Levels
IEC 60068-2-1	Cold Temperature	Test Ad	-40 °C (-40 °F), 16 Hours	
IEC 60068-2-2	Dry Heat	Test Bd	85 °C (185 °F), 16 Hours	
IEC 60068-2-30	Humidity (Damp Heat, Cyclic)	Test Db	95% (non-condensing), 55 °C (131 °F), 6 cycles	
IEC 60255-21-1	Vibration		2 g @ 10-150 Hz	Class 2
IEC 60255-21-2	Shock		30 g @ 11 ms	Class 2