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Edition 11/2022

Installation Manual

SIMATIC NET

Rugged Ethernet Switches

RUGGEDCOM RS8000

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Rugged Ethernet Switches RUGGEDCOM RS8000

Installation Manual

11/2022
C79000-G8976-1020-07

Legal Information

Warning Notice System

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury will result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury may result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

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indicates that property damage can result if proper precautions are not taken.

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The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Canada

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Table of Contents

Preface

This guide describes the RUGGEDCOM RS8000. 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.

Related Documents

Other documents that may be of interest include:

Document Title	Link
RUGGEDCOM ROS Configuration Manual	https://support.industry.siemens.com/cs/ww/en/view/109737246

SIMATIC NET Glossary

The SIMATIC NET Glossary describes special terms that may be used in this document.

The glossary is available online via Siemens Industry Online Support (SIOS) at:

https://support.industry.siemens.com/cs/ww/en/view/50305045

Accessing Documentation

The latest user documentation for RUGGEDCOM RS8000 is available online at https://support.industry.siemens.com. To request or inquire about a user document, contact Siemens Customer Support.

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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.

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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 https://www.siemens.com or contact a Siemens Sales representative.

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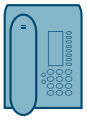
Customer support is available 24 hours, 7 days a week for all Siemens customers. For technical support or general information, contact Siemens Customer Support through any of the following methods:

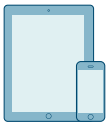
Online

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 https://w3.siemens.com/aspa_app/?lang=en.



Mobile App

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- 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

Contacting Siemens

Address	Siemens Canada Ltd. Digital Industries Process Automation 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	info.ruggedcom@siemens.com
Web	https://www.siemens.com

1 Introduction

The RUGGEDCOM RS8000 provides substation hardened, fully managed, Ethernet switches specifically designed to operate reliably in electrically and environmentally harsh environments.

The RUGGEDCOM RS8000's Zero-Packet-Loss technology provides a high level of immunity to electromagnetic interference (EMI) and heavy electrical surges typical of environments found in electric utility substations, industrial plant floors or in curb side traffic control cabinets. The RUGGEDCOM RS8000 model provides IEEE 1613 Class 2 error-free communications performance under EMI stress. An operating temperature range of -40 to 85 °C (-40 to 185 °F) allows the RUGGEDCOM RS8000 to be placed in almost any location.

The RUGGEDCOM RS8000 provides a wide range of power supply options suitable for multiple industries and for worldwide operability. Options include 24 VDC, 48 VDC, and HI (88-300 VDC or 85-264 VAC)

The RUGGEDCOM RS8000 offers advanced Layer 2 and 3 networking features and network management via the Rugged Operating System (ROS). A unique feature of ROS is the performance of its IEEE 802.1w Rapid Spanning Tree Protocol (RSTP) used for implementing fault tolerant ring and mesh network architectures. The protocol has been optimized to support ring sizes of up to 160 switches and fault recovery times in the order of less than 5 ms per switch.

The RUGGEDCOM RS8000's superior ruggedized design coupled with the Rugged Operating System (ROS) provides improved system reliability and advanced networking features making it ideally suited for creating Ethernet networks for mission-critical, real-time control applications.

1.1 Feature Highlights

Ethernet Ports

- Eight 100Base-FX
- Multi-mode and single-mode optical transceivers
- Industry standard fiber optical connectors: MTRJ, LC

Rated for Reliability in Harsh Environments

- Immunity to EMI and heavy electrical surges
  - Zero-Packet-Loss™ Technology

- Meets IEEE 1613 Class 2 (electric utility substations)
- Exceeds IEC 61850-3 (electric utility substations)
- Exceeds IEC 61800-3 (variable speed drive systems)
- Exceeds IEC 61000-6-2 (generic industrial)
- Exceeds NEMA TS-2 (traffic control equipment)

- -40 to 85 °C (-40 to 185 °F) operating temperature (no fans)
- Failsafe Output Relay: For critical failure or error alarming
- Conformal coated printed circuit boards (optional)

Cyber Security Features

- Multi-level user passwords
- SSH/SSL (128-bit encryption)
- Enable/disable ports, MAC based port security
- Port based network access control (802.1x)
- VLAN (802.1Q) to segregate and secure network traffic
- RADIUS centralized password management
- SNMPv3 authentication and 56-bit encryption

Management Tools

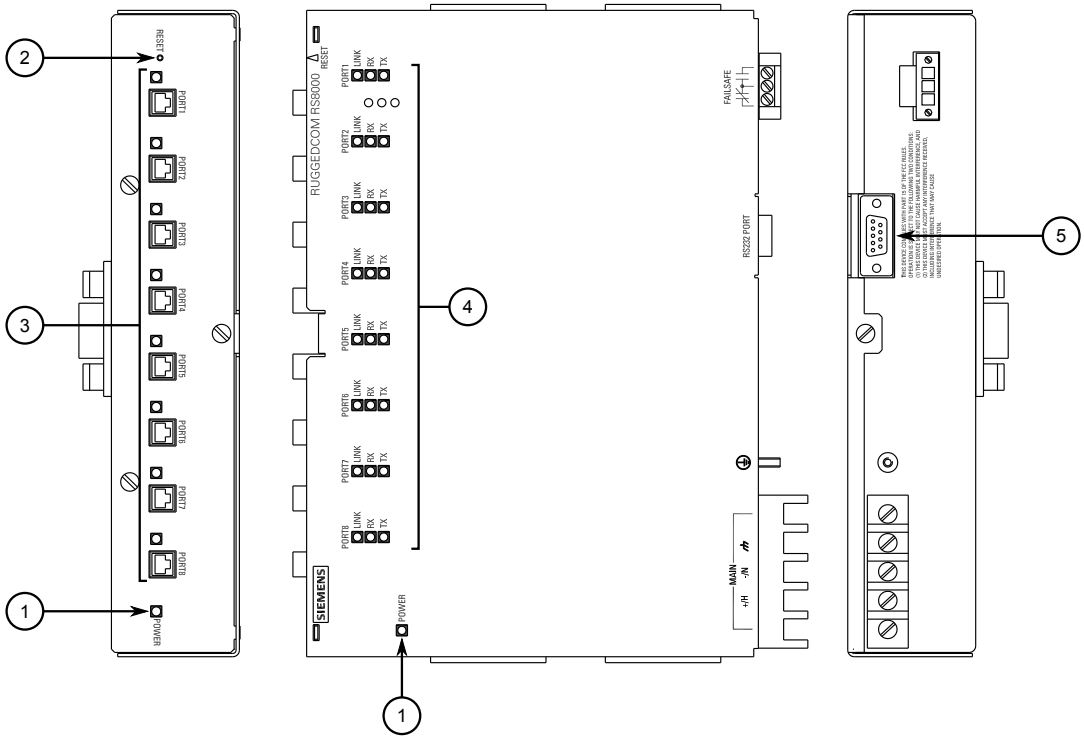
- Web-based, Telnet, CLI management interfaces
- SNMP v1/v2/v3 (56-bit encryption)
- Remote Monitoring (RMON)
- Rich set of diagnostics with logging and alarms

Universal Power Supply Options

- Universal high-voltage range: 88-300 VDC or 85-264 VAC
- Popular low voltage ranges: 24 VDC (10-36 VDC), 48 VDC (36-59 VDC)
- Terminal blocks for reliable maintenance free connections
- CSA/UL 60950 safety approved to 85 °C (185 °F)

1.2 Description

The RUGGEDCOM RS8000 features various ports, controls and indicator LEDs on the front and rear panels for configuring and troubleshooting the device.



① POWER LED
② RESET Button
③ Communication Ports
④ Port Status Indicator LEDS
⑤ RS232 Serial Console Port (DB9)

Figure 1.1 Front and Rear Panels

POWER LED

Illuminates when power is being supplied to the device.

Color	Description
Green	Device ready
Off	No power

RESET Button

Shuts down and restarts the device. For more information, refer to "Resetting the Device" (Page 18).

Port Status Indicator LEDs

These LEDs indicate when serial ports are active.

LED	State	Meaning
Link	Solid	Link detected
	Off	No link detected
RX	Blinking	Link activity (receiving)
	Off	No link activity
TX	Blinking	Link activity (transmitting)
	Off	No link activity

RS232 Serial Console Port	The serial console port is for interfacing directly with the device and accessing initial management functions. For information about connecting to the device via the serial console port, refer to "Connecting to the Device" (Page 17).
Communication Ports	Receive and transmit data. For more information about the various ports available for the RUGGEDCOM RS8000, refer to "Communication Ports" (Page 19).

1.3 Required Tools and Materials

The following tools and materials are required to install the RUGGEDCOM RS8000:

Tools/Materials	Purpose
AC or DC power cord (16 AWG)	For connecting power to the device.
CAT-5 Ethernet cables	For connecting the device to the network.
Flathead screwdriver	For mounting the device to a DIN rail.
Phillips screwdriver	For mounting the device to a panel.
4 x #8-32 screws	For mounting the device to a panel.

1.4 Decommissioning and Disposal

Proper decommissioning and disposal of this device is important to prevent malicious users from obtaining proprietary information and to protect the environment.

Decommissioning

This device may include sensitive, proprietary data. Before taking the device out of service, either permanently or for maintenance by a third-party, make sure it has been fully decommissioned.

For more information, refer to the associated "Configuration Manual".

Recycling and Disposal

For environmentally friendly recycling and disposal of this device and related accessories, contact a facility certified to dispose of waste electrical and electronic equipment. Recycling and disposal must be done in accordance with local regulations.

1.5 Cabling Recommendations

All copper Ethernet ports on RUGGEDCOM products include transient suppression circuitry to protect against damage from electrical transients and conform with IEC 61850-3 and IEEE 1613 Class 1 standards. This means that during a transient

electrical event, communications errors or interruptions may occur, but recovery is automatic.

Siemens also does not recommend using copper Ethernet ports to interface with devices in the field across distances that could produce high levels of ground potential rise (i.e. greater than 2500 V), during line-to-ground fault conditions.

1.5.1 Supported Fiber Optic Cables

The following fiber optic cable types are supported under the stated conditions.

Cable Type	Wavelength (nm)	Modal Bandwidth (MHz·km)	Distance (m)		
			100Base-FX	1000Base-SX	10GBase-SR
OM1 (62.5/125)	850	200	—	275	33
	1300	500	2000	—	—
OM2 (50/125)	850	500	—	550	82
	1300	500	2000	—	—
OM3 (50/125)[a]	850	1500	—	550	300
	1300	500	2000	—	—
OM4 (50/125)[a]	850	3500	—	550	400
	1300	500	2000	—	—

[a] *Laser optimized.*

2 Installing the Device

This chapter describes how to install the device, including mounting the device, 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

Fire/electrical/burn hazard – risk of serious personal injury and/or damage to the device

Do not use any parts that show evidence of damage. If damaged parts are used, the device may not function according to the specification. Damaged parts can lead to:

- Injury to personnel
- Loss of certification/approvals
- Violation of EMC regulations
- Damage to the device or other components

⚠ CAUTION

Burn hazard – risk of personal injury

The surface of the device may be hot during operation, or as a result of the ambient air temperature.

Wear appropriate personal protective equipment and use caution when working with or around the device.

⚠ NOTICE

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.

⚠ NOTICE

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.

2.1 General Procedure

The general procedure for installing the device is as follows:

⚠ NOTICE

The user is responsible for the operating environment of the device, including maintaining the integrity of all protective conductor connections and checking equipment ratings. Make sure to review all operating and installation instructions before commissioning or performing maintenance on the device.

1. Review the relevant certification information for any regulatory requirements. For more information, refer to "Approvals" (Page 25).
2. Mount the device.
3. Connect the failsafe alarm relay.
4. Connect power to the device and ground the device to safety Earth.
5. Connect the device to the network.
6. Configure the device.

2.2 Mounting the Device

The RUGGEDCOM RS8000 is designed for maximum mounting and display flexibility. It can be equipped with connectors that allow it to be installed in a 48 cm (19 in) rack, 35 mm (1.4 in) DIN rail, or directly on a panel.

⚠ NOTICE

Heat generated by the device is channeled outwards from 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 rack, DIN rail or panel hardware installed, refer to "Dimension Drawings" (Page 22).

2.2.1 Mounting the Device on a DIN Rail

The RUGGEDCOM RS8000 can be ordered with a panel/DIN rail adapter preinstalled on the back of the chassis. Use the adapter to mount the device to a standard 35 mm (1.4 in)IEC/EN 60715 or TS35 DIN rail.

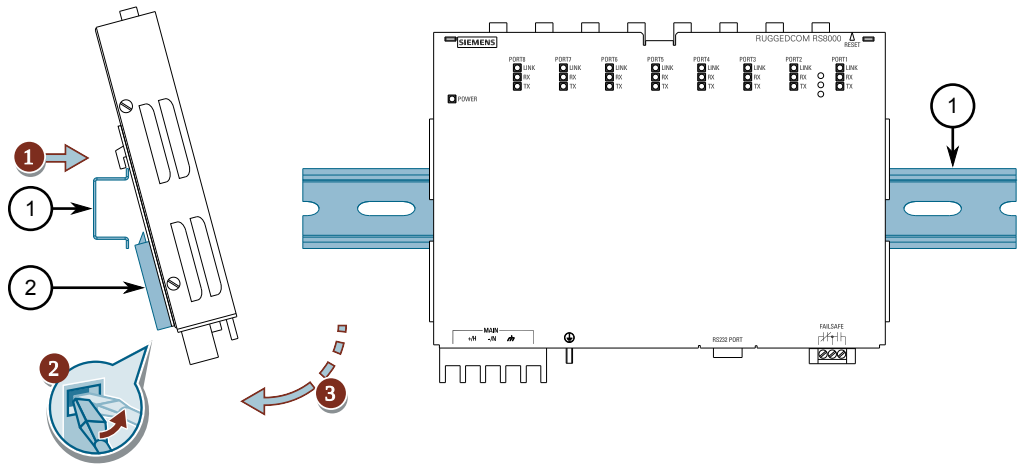
Mounting the Device

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

1. Hook the top teeth of the adapter onto the DIN rail.

   Note

   The adapter features a sliding release with a slot at the bottom for a flathead screwdriver.



① DIN Rail
② Panel/DIN Rail Adaptor

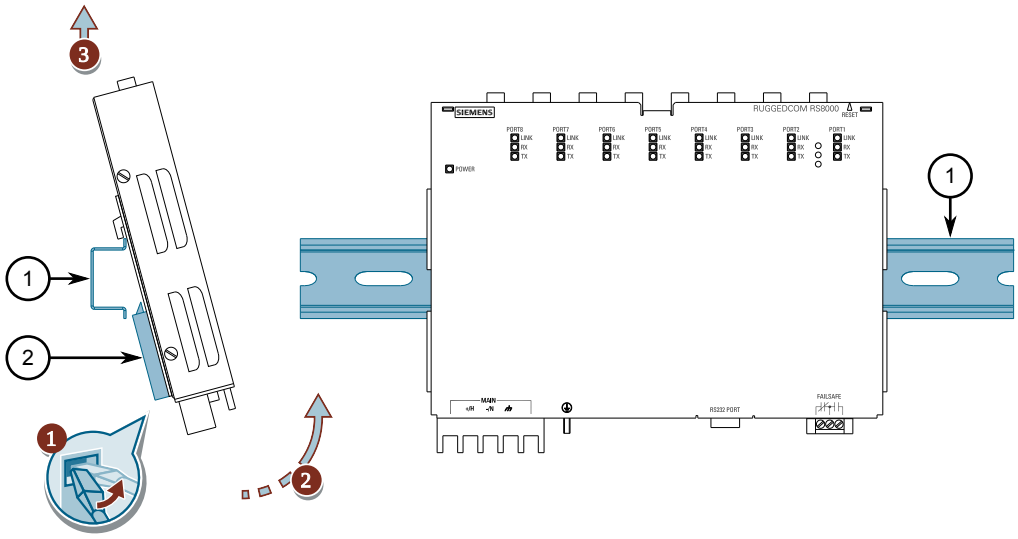
Figure 2.1 Mounting the Device to a DIN Rail

2. Insert a flathead screwdriver into the slot of the sliding release and move it down.
3. Push the device against the bottom of the DIN rail, then let go of the sliding release to latch the device.

Removing the Device

To remove the device from a DIN rail, do the following:

1. Insert a flathead screwdriver into the slot of the sliding release and move it down.



① DIN Rail
② DIN Rail Adapter

Figure 2.2 Removing the Device from a DIN Rail

2. Swing the bottom of the device away from the DIN rail.
3. Lift the device off the DIN rail.

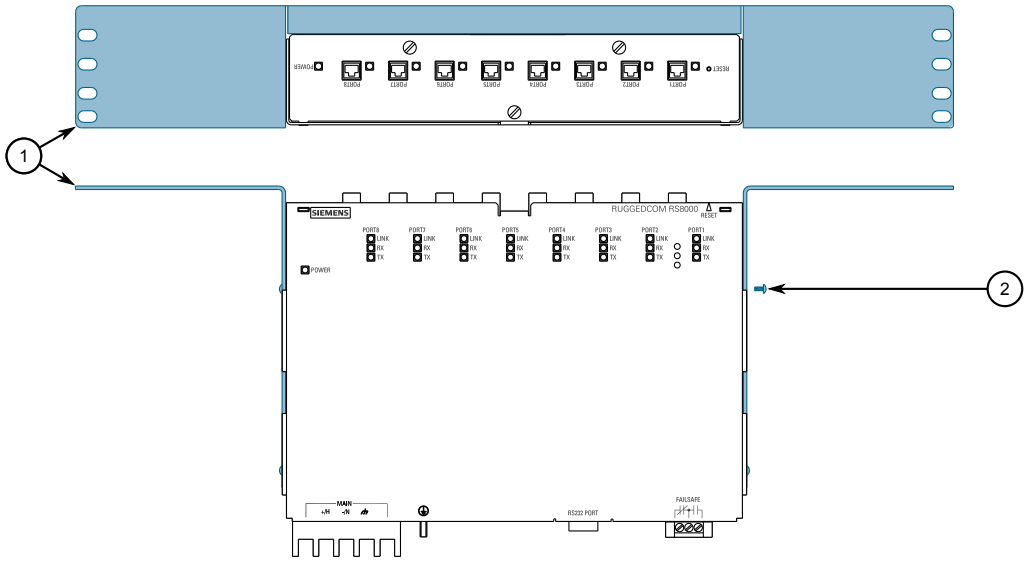
2.2.2 Mounting the Device to a Rack

To secure the device to a standard 48 cm (19 in) rack, do the following:

1. Remove the four screws from the side of the device.
2. Insert the device into rack mount adapter and use the screws to secure it.

Note

The device can be installed with the communication ports facing the front or rear of the rack, depending on the desired orientation.



① Rack Mount Adapter
② Screw

Figure 2.3 Rack Mounting

3. Insert the rack mount adapter and device assembly into the rack.

Note

Since heat within the device is channelled to the enclosure, it is recommended that 1 rack-unit of space, or 44 mm (1.75 in), be kept empty above the device. This allows a small amount of convectional airflow.

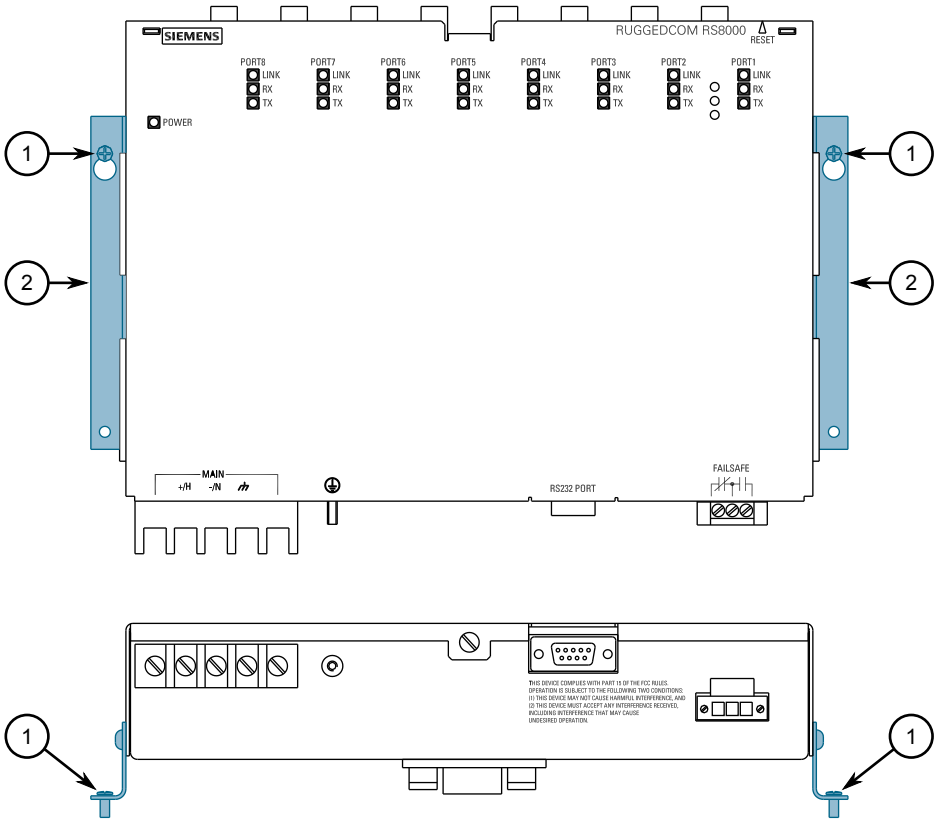
Forced airflow is not required. However, any increase in airflow will result in a reduction of ambient temperature and improve the long-term reliability of all equipment mounted in the rack space.

4. Secure the adapter to the rack using the supplied hardware.

2.2.3 Mounting the Device to a Panel

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

1. Place the device against the panel and align the adapters with the mounting holes.



① Screw
② Panel/DIN Rail Adaptor

Figure 2.4 Panel Mounting

2. Install the supplied screws to secure the adapters to the panel.

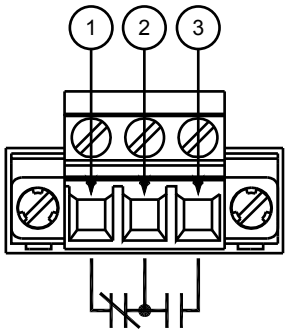
2.3 Connecting the Failsafe Alarm Relay

The failsafe relay can be configured to latch based on alarm conditions. The NO (Normally Open) contact is closed when the unit is powered and there are no active alarms. If the device is not powered or if an active alarm is configured, the relay opens the NO contact and closes the NC (Normally Closed) contact.

Note

Control of the failsafe relay output is configurable through RUGGEDCOM ROS. One common application for this relay is to signal an alarm if a power failure occurs. For more information, refer to the "RUGGEDCOM RS8000 Configuration Manual" for the RUGGEDCOM RS8000.

The following shows the proper relay connections.



① Normally Closed
② Common
③ Normally Open

Figure 2.5 Failsafe Alarm Relay Wiring

2.4 Connecting Power

The RUGGEDCOM RS8000 supports a single integrated high AC/DC or low DC power supply

⚠ NOTICE

- For 88-300 VDC rated equipment, an appropriately rated circuit breaker must be installed.
- For 100-240 VAC rated equipment, an appropriately rated circuit breaker must be installed.
- Use minimum #16 gage wiring when connecting terminal blocks.
- A circuit breaker is not required for 12, 24 or 48 VDC rated equipment.
- Power input terminals have reverse polarity protection for 12, 24 and 48 VDC rated equipment.
- Equipment must be installed according to applicable local wiring codes and standards.

2.4.1 Connecting AC Power

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

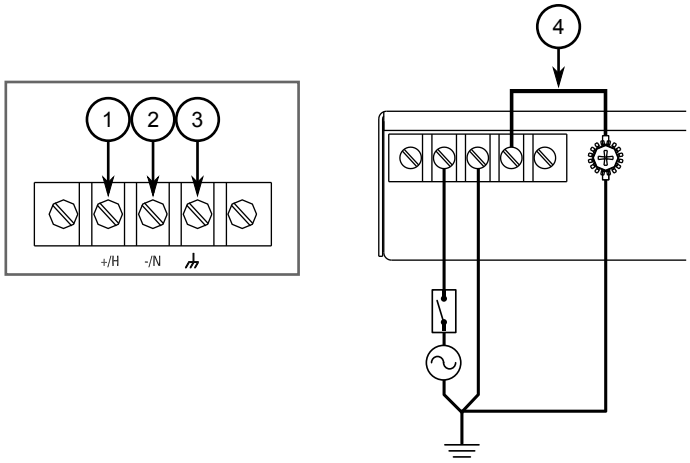
⚠ NOTICE

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.

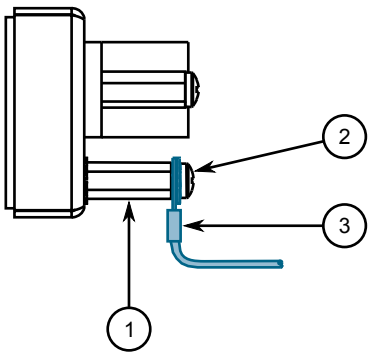
1. Connect the positive wire from the power source to the positive/hot (+/H) terminal on the terminal block.



① Positive/Hot (+/H) Terminal
② Negative/Neutral (-/N) Terminal
③ Surge Ground Terminal
④ Braided Ground Cable

Figure 2.6 Terminal Block Wiring

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. Using a #6 ring tongue and #6-32 screw, secure the ground terminal on the power source to the chassis ground terminal on the device. Make sure the lug is tightened to 1.7 N·m (15 lbf·in).



① Stainless Steel Stud
② #6-32 Screw
③ #6 Ring Tongue

Figure 2.7 Chassis Ground Connection

2.4.2 Connecting DC Power

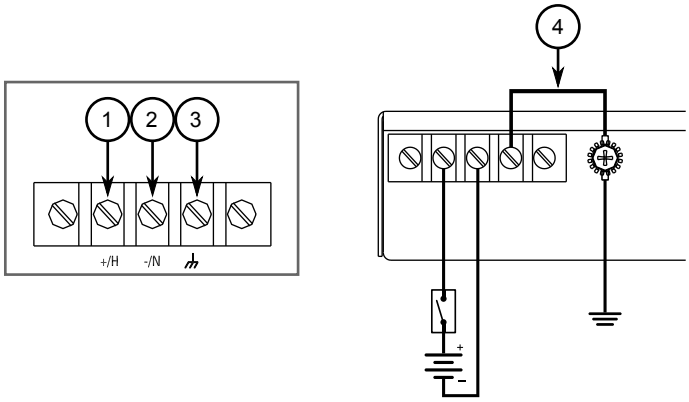
To connect a high or low DC power supply to the device, do the following:

⚠ NOTICE

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/hot (+/L) terminal on the terminal block.

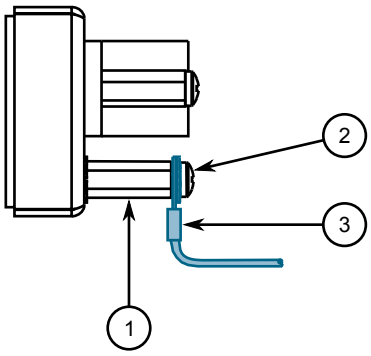


① Positive/Hot (+/L) Terminal
② Negative/Neutral (-/N) Terminal
③ Surge Ground Terminal
④ Braided Ground Cable

Figure 2.8 Terminal Block Wiring

2. Connect the negative wire from the power source to the negative/neutral (-/N) 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. Using a #6 ring tongue and #6-32 screw, secure the ground terminal on the power source to the chassis ground terminal on the device. Make sure the lug is tightened to 1.7 N·m (15 lbf·in).



① Stainless Steel Stud
② #6-32 Screw
③ #6 Ring Tongue

Figure 2.9 Chassis Ground Connection

3 Device Management

This section describes how to connect to and manage the device.

3.1 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 RS8000 Configuration Manual" for the RUGGEDCOM RS8000.

Serial Console Port

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

⚠ NOTICE
The serial console port is intended to be used only as temporary connections during initial configuration or troubleshooting.

The serial console port implements RS232 DCE (Data Communication Equipment) on a DB9 connector. The following is the pin-out for the port:

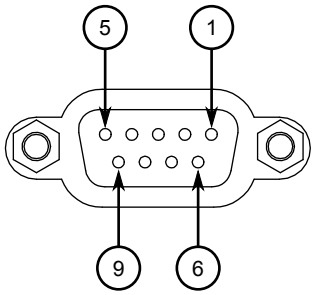


Figure 3.1 Serial DB9 Console Port

Pin	Name	Description
1	NC	No Connection
2	TX	Transmit Data
3	RX	Receive Data
4	NC	No Connection
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

Communication Ports

Connect any of the available Ethernet ports on the device to a management switch and access the RUGGEDCOM RS8000 console and Web interfaces via the device's IP address. For more information about available ports, refer to "Communication Ports" (Page 19).

3.2 Configuring the Device

Once the device is installed and connected to the network, it must be configured. All configuration management is done via the RUGGEDCOM ROS interface. For more information about configuring the device, refer to the "RUGGEDCOM RS8000 Configuration Manual" associated with the installed software release.

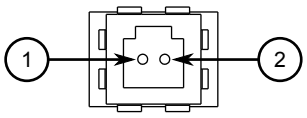
3.3 Resetting the Device

The RUGGEDCOM RS8000 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.

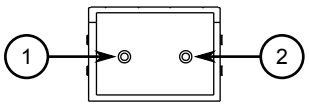
4 Communication Ports

Fiber optic Ethernet ports are available with either MTRJ (Mechanical Transfer Registered Jack) or LC (Lucent Connector) connectors. Make sure the Transmit (Tx) and Receive (Rx) connections of each port are properly connected and matched to establish a proper link.



① Tx Connector
② Rx Connector

Figure 4.1 MTRJ Port



① Tx Connector
② Rx Connector

Figure 4.2 LC Port

For specifications on the available fiber optic Ethernet ports, refer to "Fiber Optic Ethernet Port Specifications" (Page 21).

5 Technical Specifications

This chapter provides important technical specifications related to the device.

5.1 Power Supply Specifications

Note

When determining cable lengths, make sure the nominal input voltage for the power supply is provided at the power source.

Power Supply Type	Input Range		Internal Fuse Rating[ab]	Maximum Power Consumption[c]
	Minimum	Maximum		
12-24 VDC	10 VDC	36 VDC	6.3 A(F)	15 W
24 VDC	18 VDC	36 VDC	5 A(F)	
48 VDC	36 VDC	59 VDC	3.15 A(T)	
HI (125/250 VDC)[d]	88 VDC	300 VDC	3.15 A(T)	
HI (110/230 VAC)[d]	85 VAC	265 VAC	3.15 A(T)	

[a] *(F) denotes fast-acting fuse*

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

[c] *Power consumption varies based on configuration. 10/100Base-TX ports consume roughly 1 W less than fiber optic ports.*

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

5.2 Failsafe Relay Specifications

Voltage	Current
30 VAC	0.3 A
30 VDC	1 A
80 VDC	0.3 A

5.3 Fiber Optic Ethernet Port Specifications

The following details the specifications for fiber optic Ethernet ports that can be ordered with the RUGGEDCOM RS8000.

5.4 Operating Environment

The RUGGEDCOM RS8000 is rated to operate under the following environmental conditions.

Ambient Operating Temperature[a]	-40 to 85°C (-40 to 185 °F)
Ambient Storage Temperature	-40 to 85°C (-40 to 185 °F)
Ambient Relative Humidity[b]	5% to 95%
Maximum Altitude	2000 m (6562 ft)

[a] *Ambient Temperature as measured from a 30 cm radius surrounding the center of the enclosure.*

[b] *Non-condensing*

5.5 Mechanical Specifications

Weight	2.25 kg (5 lbs)
Ingress Protection	IP30
Enclosure	18 AWG Galvanized Steel

5.6 Dimension Drawings

Note

All dimensions are in millimeters, unless otherwise stated.

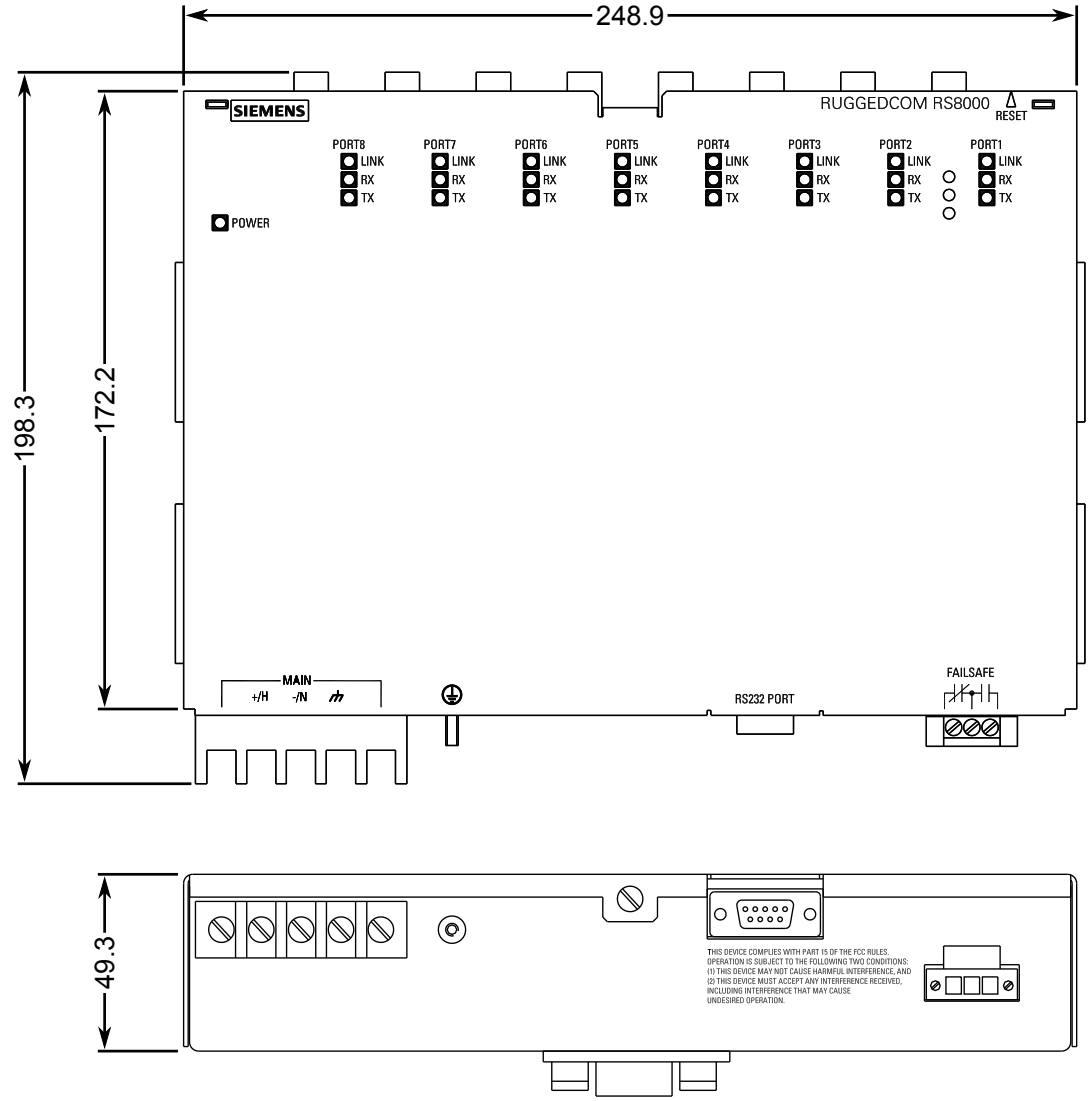


Figure 5.1 Overall Dimensions

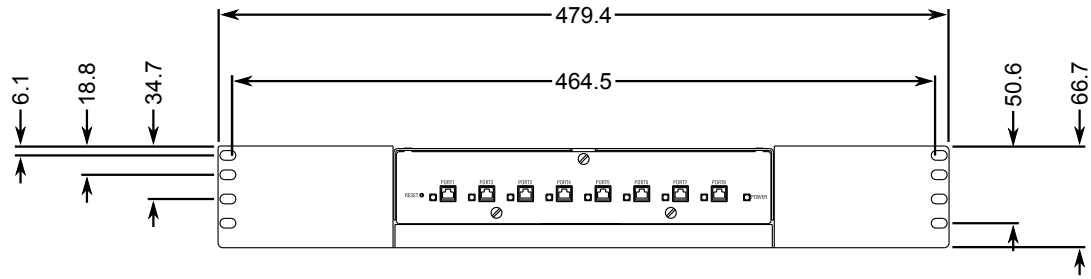


Figure 5.2 Rack Mount Dimensions

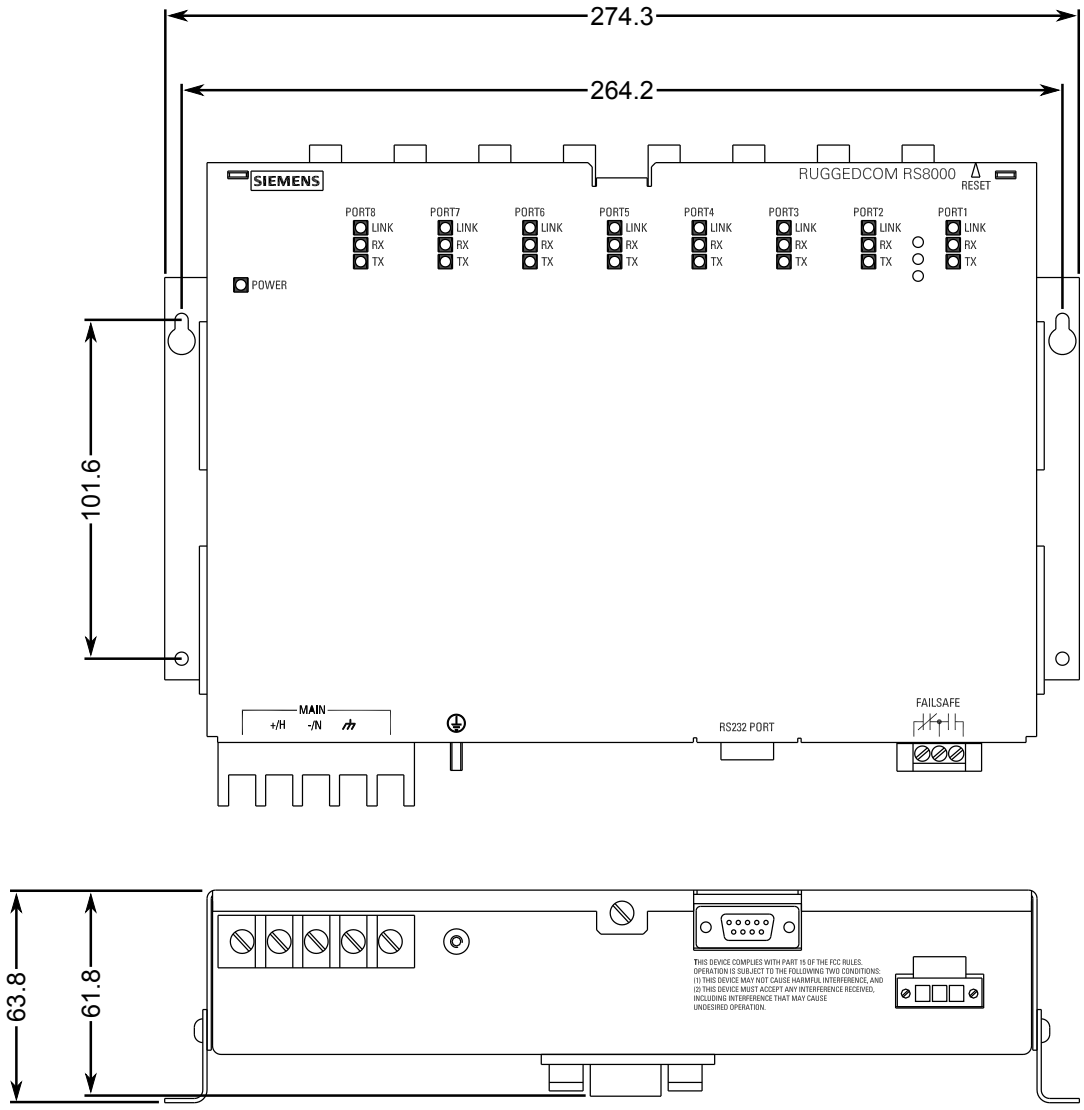


Figure 5.3 Panel and Din Rail Mount Dimensions

6 Certification

The RUGGEDCOM RS8000 device has been thoroughly tested to guarantee its conformance with recognized standards and has received approval from recognized regulatory agencies.

6.1 Approvals

This section details the standards to which the RUGGEDCOM RS8000 complies.

Note

All relevant certificates and test reports are available on Siemens Industry Online Support [https://support.industry.siemens.com].

6.1.1 UKCA

This device is certified for use in Great Britain and bears the United Kingdom Certified Assessed (UKCA) marking. The marking is printed on the body of the device, along with the identification number of the notified body.

6.1.2 CSA

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

- **CSA-C22.2 NO. 62368-1**
  Information Technology Equipment – Safety – Part 1: General Requirements (Bi-National standard, with UL 62368-1)
- **UL 62368-1**
  Information Technology Equipment – Safety – Part 1: General Requirements)

The Certificate Body (CB) test certificate is available on SIOS at https://support.industry.siemens.com/cs/ww/en/view/109794219.

6.1.3 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 62368-1**
  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 63000**
  Technical Documentation for the Assessment of Electrical and Electronic Products with Respect to the Restriction of Hazardous Substances
- **CISPR 32/EN 55032**
  Electromagnetic Compatibility of Multimedia Equipment – Emission Requirements

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

CE

6.1.4 FCC

This device 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 device 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 users will be required to correct the interference at their own expense.

⚠ **NOTICE**
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

6.1.5 ISO

This device was designed and manufactured using a certified ISO (International Organization for Standardization) quality program that adheres to the following standard:

- **ISO 9001:2015**
  Quality management systems – Requirements

6.1.6 ACMA

This device meets the requirements of the following Australian Communications and Media Authority (ACMA) standards under certificate ABN 98 004 347 880:

- Radiocommunications (Compliance Labelling – Devices) Notice 2014 made under Section 182 of the Radiocommunications Act 1992
- Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2008 made under Section 182 of the Radiocommunications Act 1992
- Radiocommunications (Compliance Labelling – Electromagnetic Radiation) Notice 2003 made under Section 182 of the Radiocommunications Act 1992
- Telecommunications Labelling (Customer Equipment and Customer Cabling) Notice 2001 made under Section 407 of the Telecommunication Act 1997

The device is marked with an RCM symbol to indicate compliance when sold in the Australian region.

A copy of the Declaration of Conformity is available via Siemens Industry Online Support at https://support.industry.siemens.com/cs/ww/en/view/89855782.

6.1.7 RoHS

This device is declared by Siemens Canada Ltd. to meet the requirements of the following RoHS (Restriction of Hazardous Substances) directives for the restricted use of certain hazardous substances in electrical and electronic equipment:

- **China RoHS 2**

  Administrative Measure on the Control of Pollution Caused by Electronic Information Products

A copy of the Material Declaration is available online at https://support.industry.siemens.com/cs/ww/en/view/109738831.

6.2 EMC and Environmental Type Tests

The RUGGEDCOM RS8000 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	x
IEC 61000-4-4	Burst (Fast Transient)	Signal ports	±4 kV @ 2.5 kHz	x
		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	
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 61000-4-12	Damped Oscillatory	Signal ports	2.5 kV common, 1 kV differential mode @ 1 MHz	3
		DC Power ports	2.5 kV common, 1 kV differential mode @ 1 MHz	3
		AC Power ports	2.5 kV common, 1 kV differential mode @ 1 MHz	3
IEC 61000-4-16	Mains Frequency Voltage	Signal ports	30 V Continuous, 300 V for 1 s	4

Test	Description		Test Levels	Severity Levels
		DC Power ports	30 V Continuous, 300 V for 1 s	4
IEC 61000-4-17	Ripple on DC Power Supply	DC Power ports	10%	3
EC 60255-5	Dielectric Strength	Signal ports	2 kVAC (Fail-Safe Relay output)	
		DC Power ports	1.5 kVDC	
		AC Power ports	2 kVDC	
	HV Impulse	Signal ports	5 kV (Fail-Safe Relay Output)	
		DC Power ports	5 kV	
		AC Power ports	5 kV	

IEEE 1613 (C37.90.x) EMC Immunity Type Tests

Note

RUGGEDCOM products meet Class 1 requirements for copper Ethernet configurations and Class 2 for fiber Ethernet configurations. Class 1 allows for temporary communication loss, while Class 2 requires error-free and interrupted communications.

IEEE Test	IEEE 1613 Clause	Description		Test Levels
C37.90.3	9	ESD	Enclosure Contact	±8 kV
			Enclosure Air	±15 kV
C37.90.2	8	Radiated RFI	Enclosure ports	35 V/m
C37.90.1	7	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 and differential mode @ 1MHz
			AC Power ports	2.5 kV common and differential mode @ 1MHz
C37.90	6	HV Impulse	Signal ports	5 kV (Failsafe Relay)
			DC Power ports	5 kV
			AC Power ports	5 kV
		Dielectric Strength	Signal ports	2 kVAC (Failsafe Relay)
			DC Power ports	1.5 kVDC

IEEE Test	IEEE 1613 Clause	Description		Test Levels
			AC Power ports	2 kVAC

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

For more information

Siemens RUGGEDCOM
https://www.siemens.com/ruggedcom

Industry Online Support (service and support)
https://support.industry.siemens.com

Industry Mall
https://mall.industry.siemens.com

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