

Edition

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Installation Manual

SIMATIC NET

Rugged Ethernet Switches

RUGGEDCOM RSG2488

<https://www.siemens.com/ruggedcom>

SIEMENS

SIMATIC NET

Rugged Ethernet Switches RUGGEDCOM RSG2488

Installation Manual

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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.
--

 NOTICE

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

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

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.

Proper Use of Siemens Products

Note the following:

 WARNING
--

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.
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Trademarks

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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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Preface

This guide describes the RUGGEDCOM RSG2488. 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/109737237
RUGGEDCOM Modules Catalog for RSG2488	https://support.industry.siemens.com/cs/ww/en/view/109757282
RUGGEDCOM SFP Transceivers Catalog	https://support.industry.siemens.com/cs/ww/en/view/109482309

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 RSG2488 is available online at <https://support.industry.siemens.com>. To request or inquire about a user document, contact Siemens Customer Support.

Registered Trademarks

RUGGEDCOM®, ROS®, RCDP®, and RUGGEDCOM Discovery Protocol® are registered 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.

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 <https://www.siemens.com> or contact a Siemens customer service representative.

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

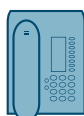
Customer Support

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



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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

Contacting Siemens

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E-Mail	info.ruggedcom@siemens.com
Web	https://www.siemens.com

Introduction

The RUGGEDCOM RSG2488 is a utility grade, fully managed, industrial Ethernet switch designed to operate reliably in harsh environments. With a rugged metal enclosure and an optional conformal coating, the RUGGEDCOM RSG2488 provides a high level of immunity to electromagnetic interference and heavy electrical surges, and can withstand temperatures between -40 and 85 °C (-40 and 185 °F).

Highly modular, the RUGGEDCOM RSG2488 switch supports up to 28 electrical and/or optical interfaces with data transfer rates of 10/100/1000 Mbit/s. This makes it the ideal industry-standard switch for constructing electrical and/or optical line, ring and star topologies.

1.1 Feature Highlights

Extreme Flexibility

- Support for up to a total of 28 non-blocking ports (six 4-port modules and two 2-port modules)
- Mixture of fiber optic or copper Gigabit ports with up to 28 Gig Ethernet ports
- All-aluminum construction

Compact 1U Form Factor

- Space-saving design

Vertical Loading Modular Design

- Allows for simple, cost effective in-field servicing and upgrading

Dual Redundant Smart Power Supplies

- Hot-swappable, cable-free
- HI voltage AC/DC: 98-300 V DC or 88-264 V AC
- Smart power supplies able to detect loss of input voltage

Fast Network Fault Recovery

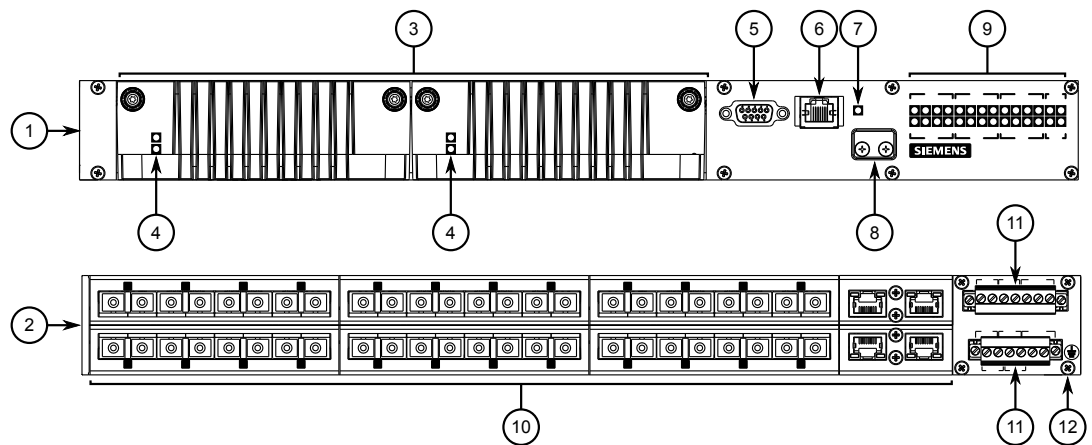
- Less than 5 ms per hop (typical)

Reliability in Harsh Environments

- Immunity to EMI and heavy electrical surges
- Zero-Packet-Loss Technology
- Supports Siemens FastConnect RJ-45 Cabling System
- -40 to 85 °C (-40 to 185 °F) operating temperature (fan-less)
- Conformal coated printed circuit boards (optional)

1.2 Description

The RUGGEDCOM RSG2488 features various ports, controls and indicator LEDs on the front panel for connecting, configuring and troubleshooting the device.



- ① Front
- ② Rear
- ③ Power Modules
- ④ Power Status LEDs
- ⑤ RS-232 Serial Console Port (DB9)
- ⑥ Management Port
- ⑦ Alarm Indicator LED
- ⑧ Access Plate
- ⑨ Port Status LEDs
- ⑩ Line Modules
- ⑪ Power Supply Terminal Block
- ⑫ Chassis Ground Terminal

Figure 1.1 RUGGEDCOM RSG2488

Power Status LEDs	Indicates the status of the power modules.
LED	Description
I	The power module is receiving power
O	The power module is supplying power

RS-232 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 21) .								
Management Port	The 10/100Base-T Ethernet management port is for system management that is out-of-band from the switch fabric. For information about connecting to the device via the 10/100Base-T Ethernet management port, refer to "Connecting to the Device" (Page 21) .								
Alarm Indicator LED	The alarm indicator LED illuminates when an alarm condition exists.								
Access Plate	The removable access plate provides access to the microSD slot. Use a microSD card to load/store the firmware and configuration for the device. For information about using a microSD card, refer to "Inserting/Removing the MicroSD Card" (Page 23) .								
Port Status LEDs	Port status indicator LEDs indicate the operational status of each port. <table border="1" data-bbox="718 772 1436 940"> <thead> <tr> <th>State</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Solid</td> <td>Link detected</td> </tr> <tr> <td>Blinking</td> <td>Link activity</td> </tr> <tr> <td>Off</td> <td>No link detected</td> </tr> </tbody> </table>	State	Description	Solid	Link detected	Blinking	Link activity	Off	No link detected
State	Description								
Solid	Link detected								
Blinking	Link activity								
Off	No link detected								
Line Modules	The device features slots for up to eight line modules. For more information, refer to "Modules" (Page 25) .								
Failsafe Alarm Relay	Latches to default state when a power disruption or other alarm condition occurs. For more information, refer to: <ul style="list-style-type: none"> • "Connecting the Failsafe Alarm Relay" (Page 12) • "Failsafe Alarm Relay Specifications" (Page 31) 								
Power Supply Terminal Block	A pluggable terminal block. For more information, refer to: <ul style="list-style-type: none"> • "Connecting Power" (Page 13) • "Power Supply Specifications" (Page 31) 								
Chassis Ground Terminal	Protects the device from power surges and accumulated static electricity. For information about grounding the device, refer to "Grounding the Device" (Page 16) .								

1.3 Required Tools and Materials

The following tools and materials are required to install the RUGGEDCOM RSG2488:

Tools/Materials	Purpose
AC/DC power cord (16 AWG)	For connecting power to the device.
Lightning protector	For protecting the device from harmful electrical strikes.
Shielded coaxial cables	For connecting the device to antennas and an Ethernet network.
Flathead screwdriver	For mounting the device to a DIN rail.
Phillips screwdriver	For mounting the device to a panel.
4 x #6-32 screws	For mounting the device to a panel.
Braided or equivalent ground wire	For grounding the device to safety Earth.

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

Siemens recommends using SIMATIC NET industrial Ethernet shielded cables for all Ethernet ports.

1.5.1 Protection On Twisted-Pair Data Ports

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.

1.5.2 Gigabit Ethernet 1000Base-TX Cabling Recommendations

The IEEE 802.3ab Gigabit Ethernet standard defines 1000 Mbit/s Ethernet communications over distances of up to 100 m (328 ft) using all 4 pairs in category 5 (or higher) balanced, unshielded twisted-pair cabling. For wiring guidelines, system designers and integrators should refer to the Telecommunications Industry Association (TIA) TIA/EIA-568-A wiring standard that characterizes minimum cabling performance specifications required for proper Gigabit Ethernet operation. For

reliable, error-free data communication, new and pre-existing communication paths should be verified for TIA/EIA-568-A compliance.

The following table summarizes the relevant cabling standards:

Cabling Category	1000Base-TX Compliant	Required Action
< 5	No	New wiring infrastructure required.
5	Yes	Verify TIA/EIA-568-A compliance.
5e	Yes	No action required. New installations should be designed with Category 5e or higher.
6	Yes	No action required.
> 6	Yes	Connector and wiring standards to be determined.

Follow these recommendations for copper data cabling in high electrical noise environments:

- Data cable lengths should be as short as possible, preferably 3 m (10 ft) in length. Copper data cables should not be used for inter-building communications.
- Power and data cables should not be run in parallel for long distances, and should be installed in separate conduits. Power and data cables should intersect at 90° angles when necessary to reduce inductive coupling.
- Shielded/screened cabling can be used when required. Care should be taken to avoid the creation of ground loops with shielded cabling.

1.5.3 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.

Installing the Device

This chapter describes 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 may contain 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



⚠ 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" \(Page 37\)](#).
2. Review the "RUGGEDCOM RSG2488 Modules Catalog" for special installation or regulatory requirements related to the modules installed in the device. In the case of Precision Time Protocol (PTP) line modules, this includes antenna installation and regulatory requirements.
3. Mount the device.
4. Connect the failsafe alarm relay.
5. Connect power to the device and ground the device to safety Earth.
6. Connect the device to the network.
7. Configure the device.

2.2 Unpacking the Device

When unpacking the device, do the following:

1. Inspect the package for damage before opening it.
2. Visually inspect each item in the package for any physical damage.
3. Verify all items are included.

Note

If any item is missing or damaged, contact Siemens for assistance.

2.3 Mounting the Device

The RUGGEDCOM RSG2488 is designed for maximum mounting and display flexibility. It can be equipped with adapters that allow it to be installed to a rack, DIN rail, or 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 convectational 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 32).

2.3.1 Mounting the Device to a Rack

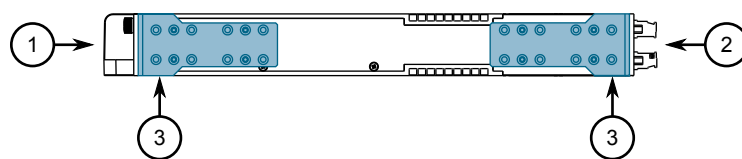
For rack mount installations, the RUGGEDCOM RSG2488 can be ordered with rack mount adapters pre-installed at the front and rear of the chassis. Additional adapters are provided to further secure the device in high-vibration or seismically active locations.

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

1. Make sure the front and rear rack mount adapters are installed on the both sides of the chassis.

Note

The chassis features multiple mounting holes, allowing the rack mount adapters to be installed up to 25 mm (1 in) from the face of the device.



- ① Rear
- ② Front
- ③ Rack Mount Adapter

Figure 2.1 Rack Mount Adapters

2. Insert the device into the rack. To make the modules and ports accessible from the front, insert the power supply side of the device first. Reverse the orientation to have the power supplies, management ports and LEDs accessible from the front.
3. Secure the adapters to the rack using the supplied hardware.

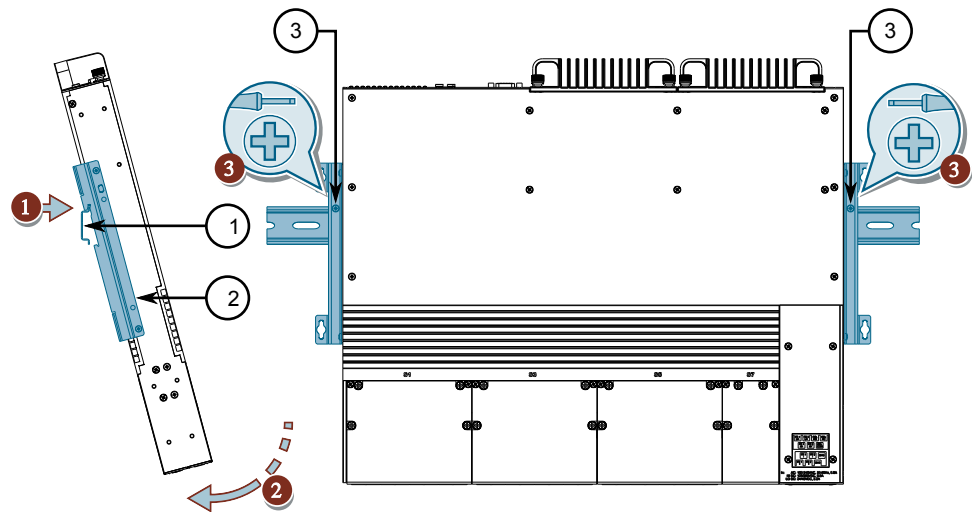
2.3.2 Mounting the Device on a DIN Rail

The RUGGEDCOM RSG2488 can be ordered with DIN rail adapters preinstalled on each side of the chassis. Use the adapters to mount the device to a standard 35 mm (0.6 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 adapters onto the DIN rail.



- ① DIN Rail
- ② DIN Rail Adapter
- ③ Screw

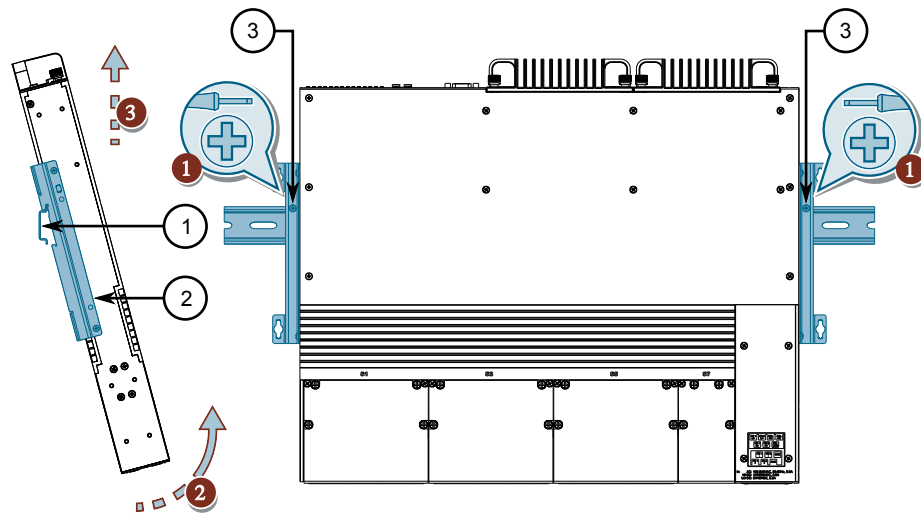
Figure 2.2 Mounting the Device to a DIN Rail

2. Rest the device against the bottom of the DIN rail.
3. Secure the device to the DIN rail with at least one screw (supplied). Apply screws to the adapters on either side of the device.

Removing the Device

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

1. Remove screws from the DIN rail adapters on both sides of the device.



- ① DIN Rail
- ② DIN Rail Adapter
- ③ Screw

Figure 2.3 Removing the Device from a DIN Rail

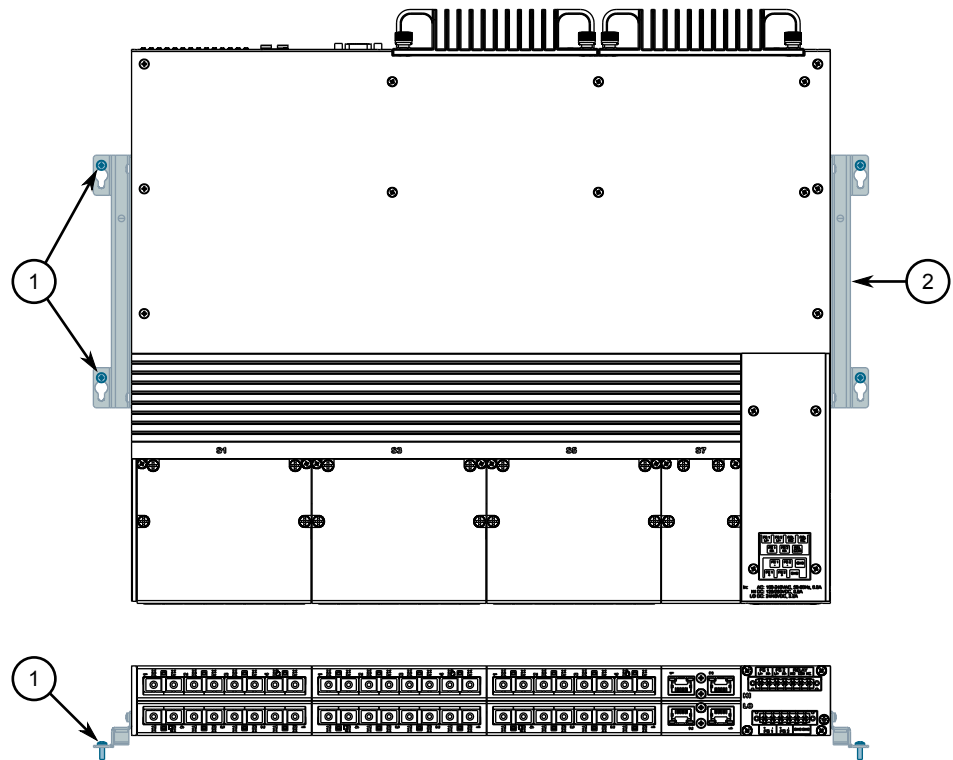
2. Swing the bottom of the device away from the DIN rail.
3. Lift the device off the DIN rail.

2.3.3 Mounting the Device to a Panel

For panel installations, the RUGGEDCOM RSG2488 can be ordered with panel/DIN rail adapters pre-installed on each side of the chassis. The adapters allow the device to be attached to a panel using screws.

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.

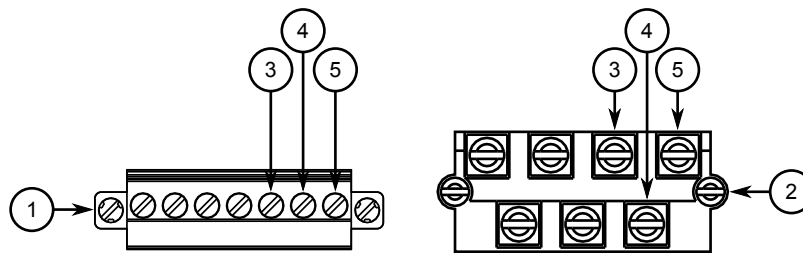
2.4 Connecting the Failsafe Alarm Relay

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 RSG2488. One common application for this relay is to signal an alarm if a power failure occurs. For more information, refer to the "RUGGEDCOM ROS Configuration Manual" for the RUGGEDCOM RSG2488.

The following shows the proper relay connections.



- ① Pluggable Terminal Block for HI Power Supplies
- ② Screw-Type Terminal Block for HIP Power Supplies
- ③ Normally Open Terminal
- ④ Common Terminal
- ⑤ Normally Closed Terminal

Figure 2.5 Failsafe Alarm Relay Wiring

2.5 Connecting Power

The RUGGEDCOM RSG2488 supports dual redundant AC and/or DC power supplies that can be installed in any combination.

The RUGGEDCOM RSG2488 can be equipped with either a screw-type or pluggable terminal block, which provides power to both power supplies. The screw-type terminal block is installed using Phillips screws and compression plates, allowing either bare wire connections or crimped terminal lugs. Use #6 size ring lugs for secure, reliable connections under severe shock or vibration.

⚠ DANGER

Electrocution hazard – risk of serious personal injury or death

The device may have two power supplies equipped, which may be connected to separate power sources. Make sure all power sources are off before servicing the power supply terminals.

⚠ NOTICE

Electrical hazard – risk of damage to equipment

Do not connect wiring to unused power supply input terminals. For instance, if a Low DC power supply is installed in the PS1 slot, do not connect the PS1 High AC/DC terminals to a power source.

⚠ NOTICE


- In a high AC/DC and low DC (24/48 V) power supply arrangement, the placement of the AC and DC power supplies is not slot-dependent. However, if a high AC/DC power supply is installed in slot PS1, the high AC/DC wiring must be connected to the high terminal block PS1 terminals. If a low DC power supply is installed in slot PS1, the low DC wiring must be made to the low terminal block


2.5.1 Connecting High AC/DC Power

- PS1 terminals. High voltage wiring is always made to the upper *Hi* terminal block and low voltage (24/48 V) wiring is always made to the lower *Lo* terminal block.
- Use minimum #16 gage wiring when connecting terminal blocks.
 - The maximum wire length between the terminal block and power source must not exceed 6 m (20 ft) for 24 V power supplies or 18 m (60 ft) for 48 V power supplies.
 - A circuit breaker rated no higher than 20 A must be installed between the device and the supply mains.
 - Whenever possible, use a separate circuit breaker for each power supply.
 - For maximum redundancy in a dual power supply configuration, use two independent power sources.
 - A socket outlet/disconnect device must be installed near the device and be easily accessible.
 - Equipment must be installed according to applicable local wiring codes and standards.

2.5.1 Connecting High AC/DC Power

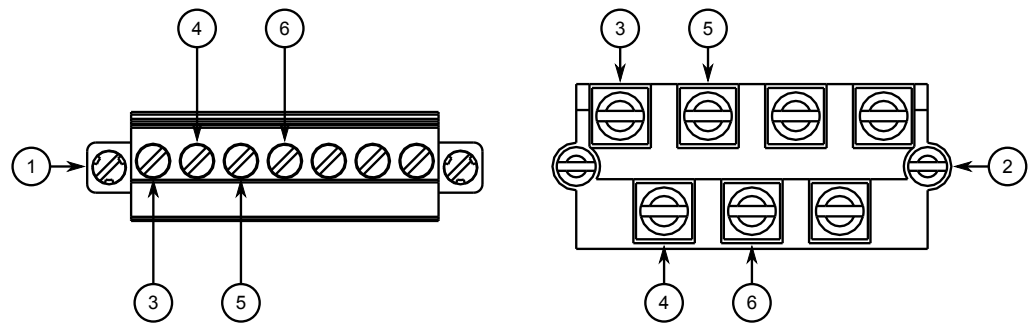
To connect a high AC/DC power supply to the device, do the following:

 DANGER
Electrocution hazard – risk of death, serious personal injury and/or damage to the device
Make sure the supplied cover is always installed over high voltage screw-type terminal blocks.

 NOTICE
Electrical hazard – risk of damage to equipment
Do not connect AC power cables to a DC power supply terminal block. Damage to the power supply may occur.

Note
The screw-type terminal block is installed using Phillips screws and compression plates, allowing either bare wire connections or crimped terminal lugs. Use #6 size ring lugs for secure, reliable screws, which must be removed to make connections.

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



- ① Screw-Type Terminal Block for HIP Power Supplies
- ② Pluggable Terminal Block for HI Power Supplies
- ③ Positive/Live (+/L) Terminal for PS1
- ④ Neutral/Negative (-/N) Terminal for PS1
- ⑤ Positive/Live (+/L) Terminal for PS2
- ⑥ Neutral/Negative (-/N) Terminal for PS2

Figure 2.6 AC Terminal Block Wiring

2. Connect the negative wire from the power source to the neutral/negative (-/N) terminal on the terminal block.
3. Connect the ground terminal on the power source to the ground terminal on the device. For more information, refer to ["Grounding the Device" \(Page 16\)](#).

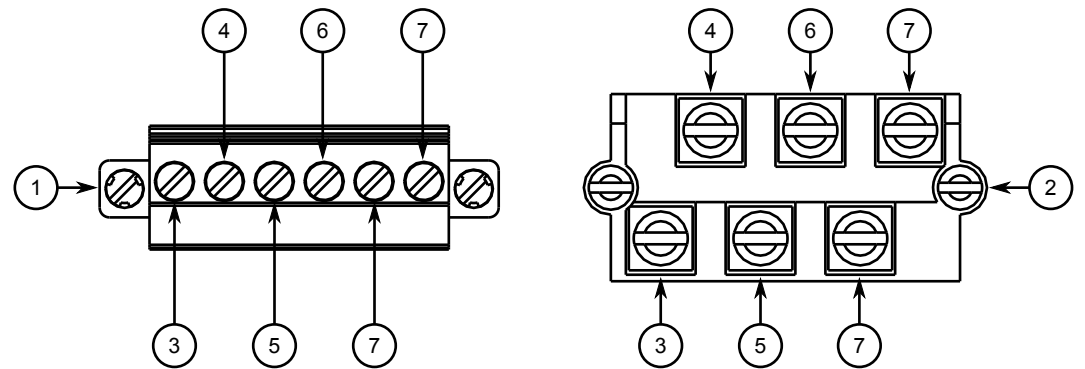
2.5.2 Connecting Low DC Power

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

Note

The screw-type terminal block is installed using Phillips screws and compression plates, allowing either bare wire connections or crimped terminal lugs. Use #6 size ring lugs for secure, reliable screws, which must be removed to make connections.

1. Connect the positive wire from the power source to the positive terminal on the terminal block.



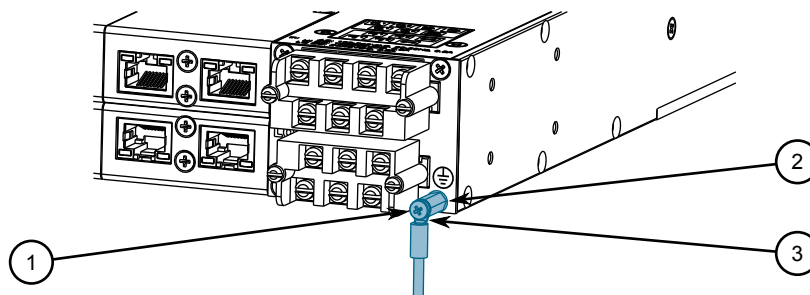
- ① Screw-Type Terminal Block for 24 and 48 Power Supply
- ② Pluggable Terminal Block for 24P and 48P Power Supply
- ③ Positive Terminal for PS1
- ④ Negative Terminal for PS1
- ⑤ Positive Terminal for PS2
- ⑥ Negative Terminal for PS2
- ⑦ Chassis Ground

Figure 2.7 DC Terminal Block Wiring

2. Connect the negative wire from the power source to the negative terminal on the terminal block.
3. Connect the ground terminal on the power source to the ground terminal on the device. For more information, refer to "[Grounding the Device](#)" (Page 16).

2.5.3 Grounding the Device

The RUGGEDCOM RSG2488 chassis ground terminal uses an M3 screw. It is recommended to terminate the ground connection with an M3 ring or spade lug and torque it to 1.7 N·m (15 lbf-in).



- ① M3 Screw
- ② Standoff
- ③ M3 Ring Lug

Figure 2.8 Chassis Ground Connection

2.5.4 Wiring Examples

The following illustrate how to connect power to single and dual power supplies.

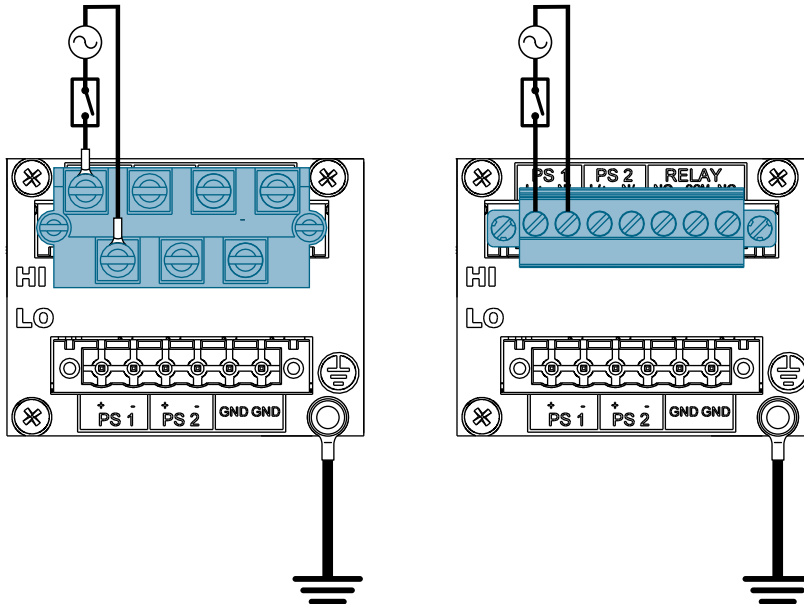


Figure 2.9 Single High AC/DC Power Supply

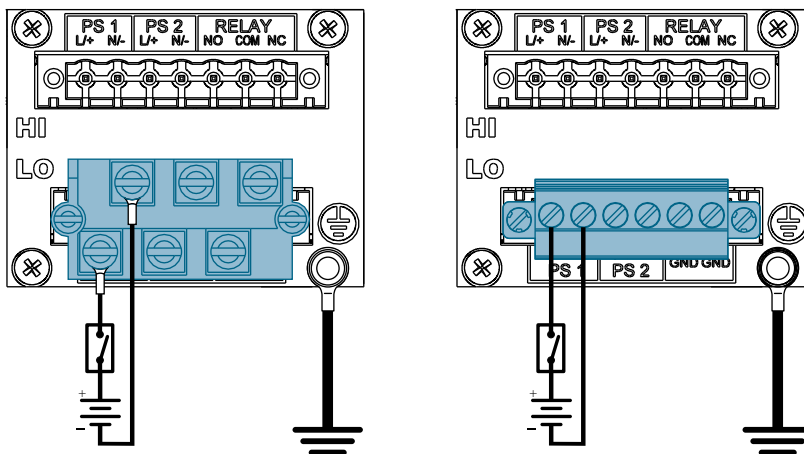


Figure 2.10 Single Low DC Power Supply

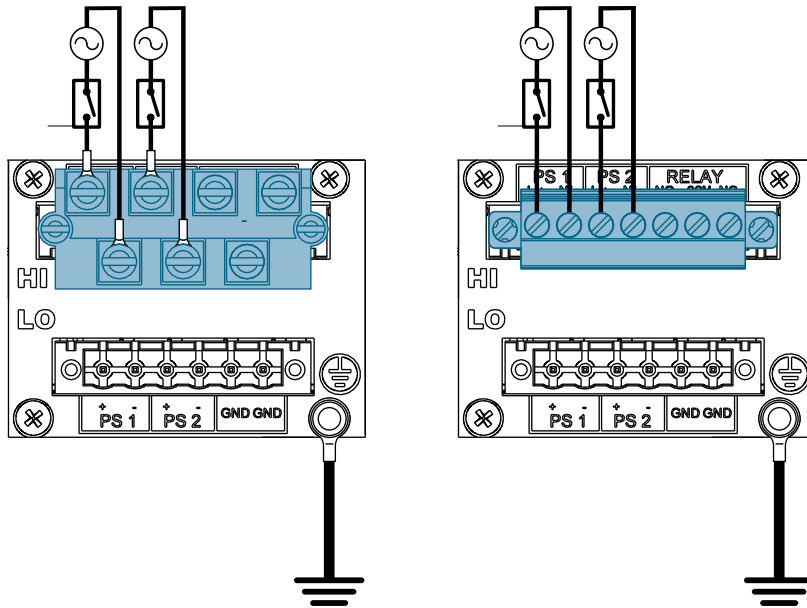


Figure 2.11 Dual High AC/DC Power Supply

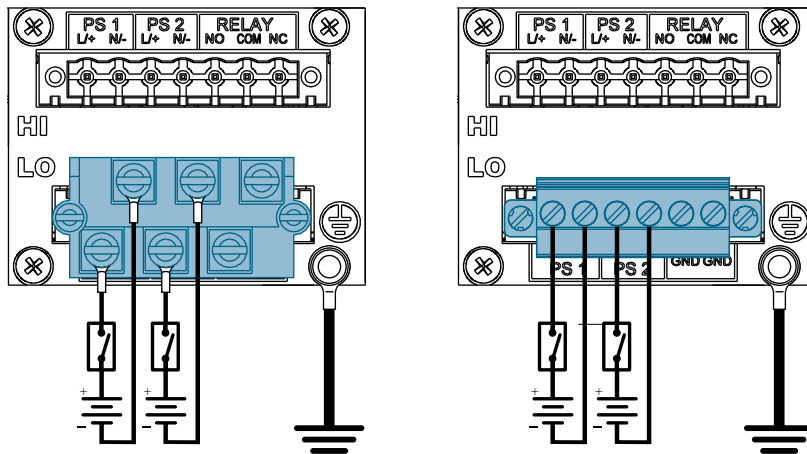


Figure 2.12 Dual Low DC Power Supply

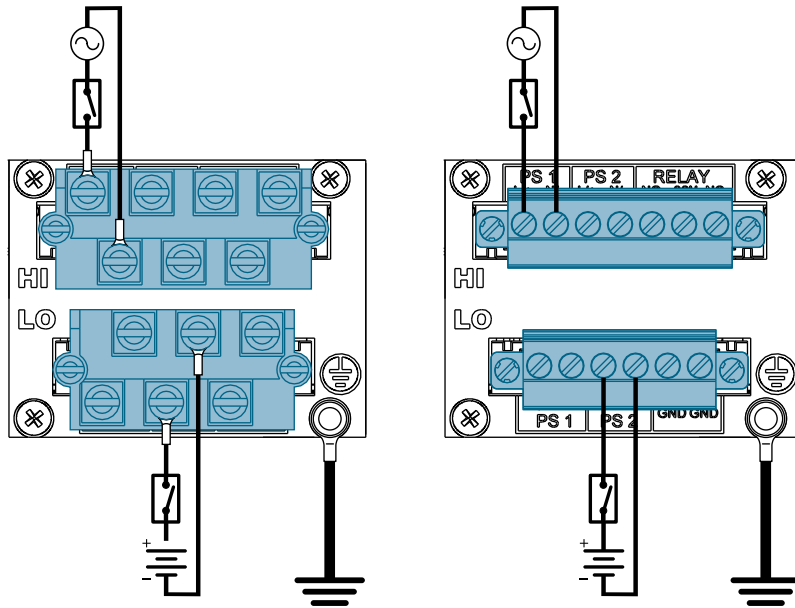


Figure 2.13 High AC/DC Power Supply and Low DC Power Supply

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 RSG2488 console and Web interfaces on the device. For more detailed instructions, refer to the "RUGGEDCOM ROS Configuration Manual" for the RUGGEDCOM RSG2488.

Serial Console and Management Ports

Connect a workstation directly to the serial console or management ports to access the boot-time control and RUGGEDCOM RSG2488 interfaces. The serial console port provides access to RUGGEDCOM RSG2488's console interface, while the management port provides access to RUGGEDCOM RSG2488's console and Web interfaces.

The serial console port implements RS-232 DCE (Data Communication Equipment) on a DB9 connector. The following is the pin-out for the port:

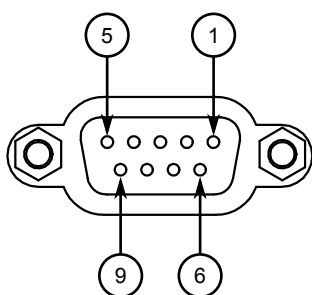


Figure 3.1 Serial DB9 Console Port

Pin	Name	Description
1	DCD	Data Carrier Detect
2	RX	Receive Data
3	TX	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request to Send

Pin	Name	Description
8	CTS	Clear To Send
9	Reserved (Do Not Connect)	

The management port is a 10/100Base-TX copper Ethernet port with an RJ45 connector. The following is the pin-out for the management port:

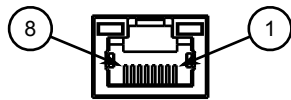


Figure 3.2 RJ45 Management Port

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

Communication Ports

Connect any of the available Ethernet ports on the device to a management switch and access the RUGGEDCOM RSG2488 console and Web interfaces via the device's IP address. The factory default IP address for the RUGGEDCOM RSG2488 is <https://192.168.0.1>.

If connecting to the management port, use the address <https://10.0.0.1>.

For more information about available ports, refer to "Modules" (Page 25).

Note

Single-mode fiber ports only support Ultra Physical Contact (UPC) cable connectors.

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 RSG2488 interface. For more information about configuring the device, refer to the "RUGGEDCOM ROS Configuration Manual" associated with the installed software release.

3.3 Inserting/Removing the microSD Card

The RUGGEDCOM RSG2488 accepts a microSD card for storing configuration files and/or software updates.

⚠ NOTICE

Configuration hazard – risk of data loss

The microSD card must not be removed or replaced during normal operation of the device. Make sure the device is powered down before removing or inserting the card.

⚠ NOTICE

Mechanical/electrical hazard – risk of damage to the microSD card

- Do not expose the microSD card to extreme temperatures or humidity
- Do not expose the microSD card to large magnetic or static electric fields
- Do not bend or drop the microSD card

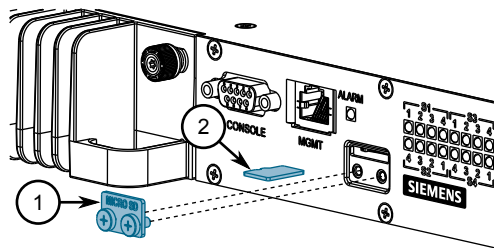
⚠ NOTICE

Security hazard – risk of unauthorized access and/or exploitation

Make sure to remove the microSD card before decommissioning the device or sending the device to a third-party.

To insert or remove a microSD card, do the following:

1. Power down the device.
2. Unscrew the retention screws and remove the access plate.



- ① Access Plate
- ② MicroSD Card

Figure 3.3 Inserting/Removing a MicroSD Card

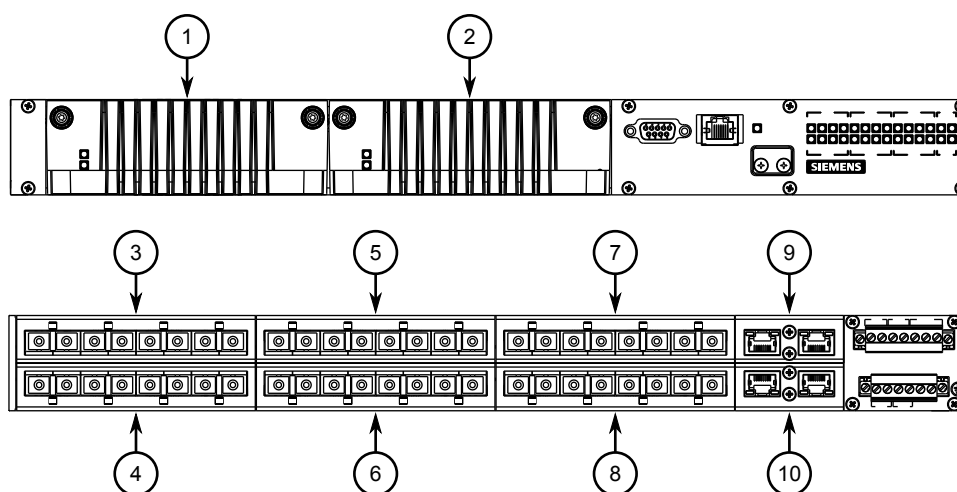
3. Without touching the contacts on the card, insert or remove the microSD card.
4. Install the access plate and finger-tighten the retention screws.
5. Power up the device.

Modules

The RUGGEDCOM RSG2488 features slots for up to eight field-replaceable line modules, which can be used to expand and customize the capabilities of the device to suit specific applications. A variety of modules are available, each featuring a specific type of communication port: copper Ethernet, fiber optic Ethernet and Small Form-factor Pluggable (SFP). A Precision Time Protocol (PTP) module for accurate clock synchronization is also available.

Modules can be installed in any one of the available slots in the device chassis.

Use the RUGGEDCOM RSG2488 software to determine which ports are equipped on the device. For more information, refer to the "RUGGEDCOM ROS Configuration Manual" for the device.



- ① Power Module Slot (PS1)
- ② Power Module Slot (PS2)
- ③ Line Module Slot (Slot 1)
- ④ Line Module Slot (Slot 2)
- ⑤ Line Module Slot (Slot 3)
- ⑥ Line Module Slot (Slot 4)
- ⑦ Line Module Slot (Slot 5)
- ⑧ Line Module Slot (Slot 6)
- ⑨ Line Module Slot (Slot 7)
- ⑩ Line Module Slot (Slot 8)

Figure 4.1 Available Chassis Slots

Note

The PTP module can only be installed in slot 1.

Slot	Module Type
PS1 and PS2	Power Supply Module
1	4-Port Copper Ethernet, Fiber Optic Ethernet, SFP Transceiver or PTP Module
2 to 6	4-Port Copper Ethernet, Fiber Optic Ethernet or SFP Transceiver
7 to 8	2-Port Copper Ethernet, Fiber Optic Ethernet or SFP Transceiver

4.1 Available Modules

A variety of modules are available for use with the RUGGEDCOM RSG2488.

For more information, refer to the "RUGGEDCOM Modules Catalog [<https://support.industry.siemens.com/cs/us/en/view/109757282>]" for the RUGGEDCOM RSG2488.

4.2 Installing/Removing Line Modules

Upon installing a new line module in the device, all features associated with the module are available in RUGGEDCOM RSG2488. For more information, refer to the "RUGGEDCOM ROS Configuration Manual" for the RUGGEDCOM RSG2488.

Once a line module is removed, all the features associated with the module are hidden or disabled in RUGGEDCOM RSG2488.

 **NOTICE**

Only one Precision Time Protocol (PTP) line module is supported per chassis.

 **NOTICE**

Contamination hazard – risk of equipment damage

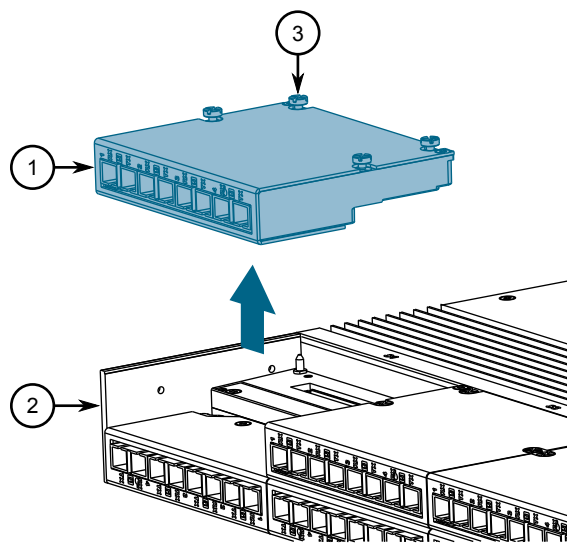
Prevent the ingress of water, dirt and other debris that may lead to premature equipment failure. Always make sure slots are not left empty and open ports are protected with plugs or covers.

Removing a Module

To remove a line module, do the following:

1. Make sure power to the device has been disconnected and wait approximately two minutes for any remaining energy to dissipate.
2. [Optional] If the device is installed in a rack, remove it from the rack.
3. Loosen the screws that secure the module.

4. Pull the module from the chassis to disconnect it.



- ① Module
- ② Chassis
- ③ Screw

Figure 4.2 Removing a Module

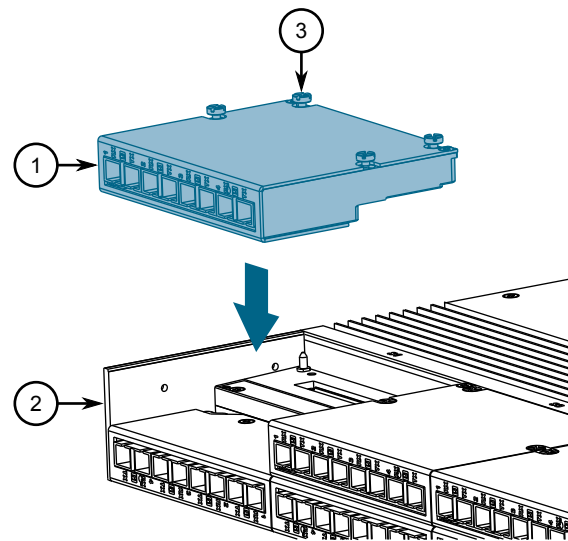
5. Install a new module or a blank module (to prevent the ingress of dust and dirt).
6. [Optional] If necessary, install the device in the rack.
7. Connect power to the device.

Installing a Module

To install a line module, do the following:

1. Make sure power to the device has been disconnected and wait approximately two minutes for any remaining energy to dissipate.
2. [Optional] If the device is installed in a rack, remove it from the rack.
3. Remove the current module from the slot.
4. Insert the new module into the slot.

4.3 Installing/Removing Power Modules



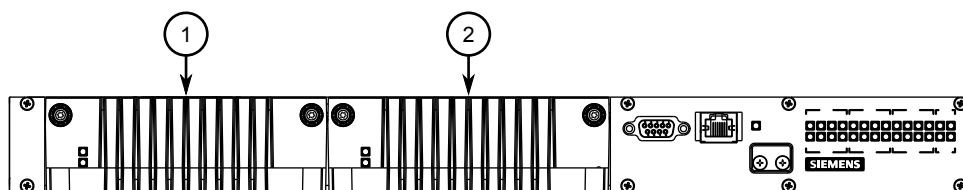
- ① Module
- ② Chassis
- ③ Screw

Figure 4.3 Installing a Module

5. Tighten the screws to secure the module.
6. [Optional] If necessary, install the device in the rack.
7. Connect power to the device.

4.3 Installing/Removing Power Modules

The RUGGEDCOM RSG2488 supports dual redundant power supply modules.



- ① Power Supply Module (PS1)
- ② Power Supply Module (PS2)

Figure 4.4 Power Supply Modules

⚠ NOTICE**Contamination hazard – risk of equipment damage**

Prevent the ingress of water, dirt and other debris that may lead to premature equipment failure. Always make sure slots are not left empty.

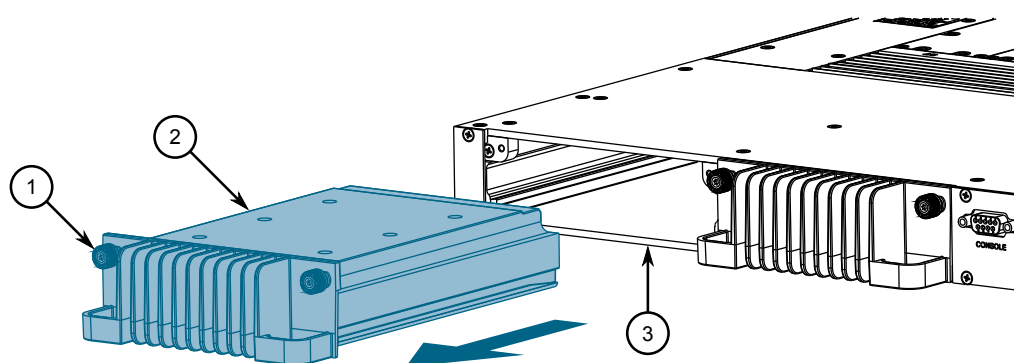
Note

Power modules are hot swappable. When installing/removing a power module, it is not necessary to turn off power to the device.

Removing a Power Module

To remove a power module, do the following:

1. Loosen the screws that secure the module to the chassis until the module can be removed.



- ① Screws
- ② Power Supply
- ③ Chassis

Figure 4.5 Removing a Power Supply

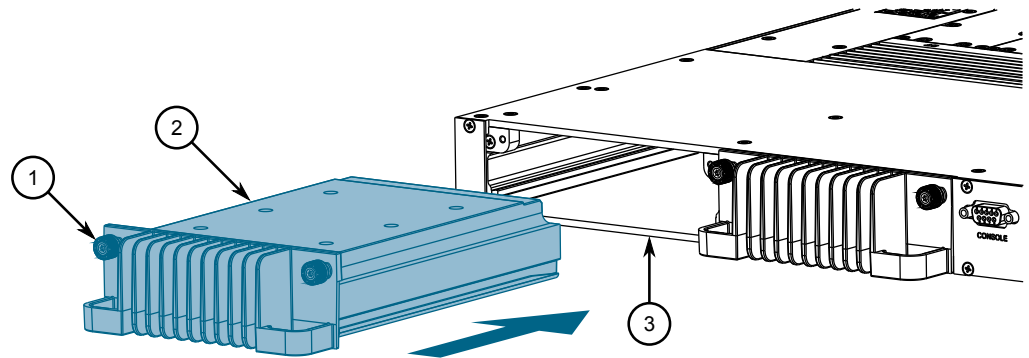
2. Slide the module out of the chassis.
3. Install a new or blank module to prevent the ingress of dust and dirt.

Installing a Power Module

To install a power module, do the following:

1. If equipped, remove the existing module.
2. Insert the module into the empty slot.

4.3 Installing/Removing Power Modules



- ① Screws
- ② Power Supply
- ③ Chassis

Figure 4.6 Installing a Power Module

3. Hand-tighten the screws to secure the power module to the chassis.
4. Turn on power to the device and confirm the module is receiving and supplying power. This is indicated by the LEDs on the module.

LED	State	Description
O	Green	The module is supplying power
I	Green	The module is receiving power

Technical Specifications

This section provides important technical specifications related to the device.

5.1 Power Supply Specifications

Note

Use the internal fuse rating to determine the size of the external circuit breaker/fuse.

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	Maximum Power Consumption
	Min	Max		
24 VDC (Single)	13 VDC	36 VDC	10 A	62 W
48 VDC (Single)	38 VDC	72 VDC	5 A	59 W
High Voltage AC/DC	98 VDC	300 VDC	3.15 A	66 W
	88 VAC ^a	264 VAC ^a		

^a Rated at frequency range 47Hz - 63Hz.

5.2 Failsafe Alarm Relay Specifications

NOTICE

The alarm switching voltage must be greater than the Safety Extra Low-Voltage (SELV) to meet safety requirements.

Parameter	Value (Resistive Load)
Maximum Switching Voltage	250 VAC
	30 VDC
Rated Switching Current	2 A @ 250 VAC
	2 A @ 30 VDC
	0.15 A @ 125 VDC
Maximum Switching Capacity	150 W
	500 VA

5.3 Supported Networking Standards

Standard	10 Mbps	100 Mbps	1000 Mbps	Notes
IEEE 802.1AB	Yes	Yes	Yes	Link Layer Discovery Protocol (LLDP)
IEEE 802.1D	Yes	Yes	Yes	MAC bridges
IEEE 802.1Q	Yes	Yes	Yes	VLAN (Virtual LAN)
IEEE 802.1p	Yes	Yes	Yes	Priority levels
IEEE 802.1x	Yes	Yes	Yes	Port-based network access control
IEEE 802.3	Yes	No	No	10Base-T
IEEE 802.3u	No	Yes	No	100Base-TX/100Base-FX
IEEE 802.3z	No	No	Yes	1000Base-SX/LX
IEEE 802.3ab	No	No	Yes	1000Base-TX
IEEE 802.3x	Yes	Yes	Yes	Full duplex operation

5.4 Operating Environment

Ambient Operating Temperature ^{ab}	-40 to 85 °C (-40 to 185 °F)
Ambient Storage Temperature	-40 to 85 °C (-40 to 185 °F)
Ambient Relative Humidity ^c	5% to 95%
Maximum Altitude	2000 m (6562 ft)

^a Measured from a 30 cm (11.8 in) radius surrounding the center of the enclosure.

^b Operating temperature may vary based on the limitations of installed SFPs. Refer to the "RUGGEDCOM SFP Transceivers Catalog" for SFP temperature ratings.

^c Non-condensing.

5.5 Mechanical Specifications

Weight	8.6 kg (19 lbs)
Ingress Protection	IP30
Enclosure	Aluminum

5.6 Dimension Drawings

Note

All dimensions are in millimeters, unless otherwise stated.

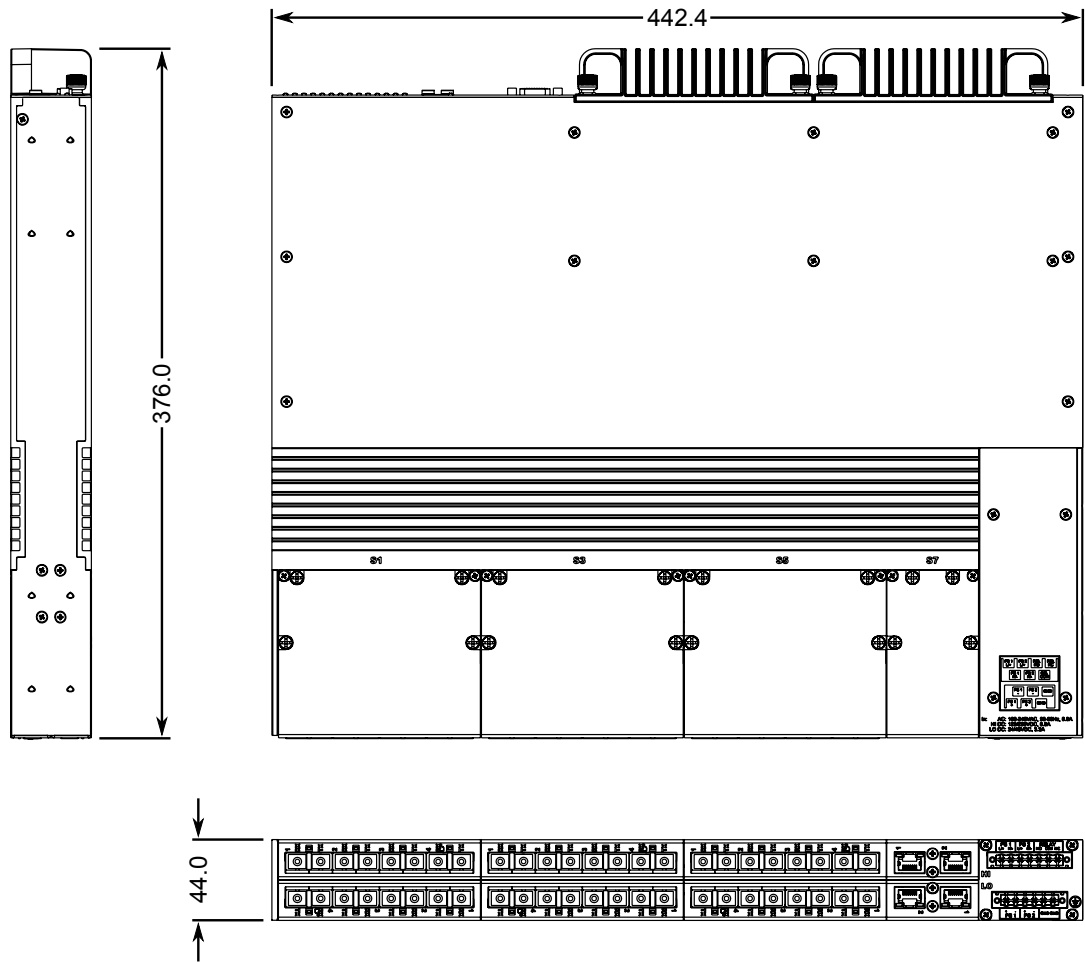


Figure 5.1 Overall Dimensions

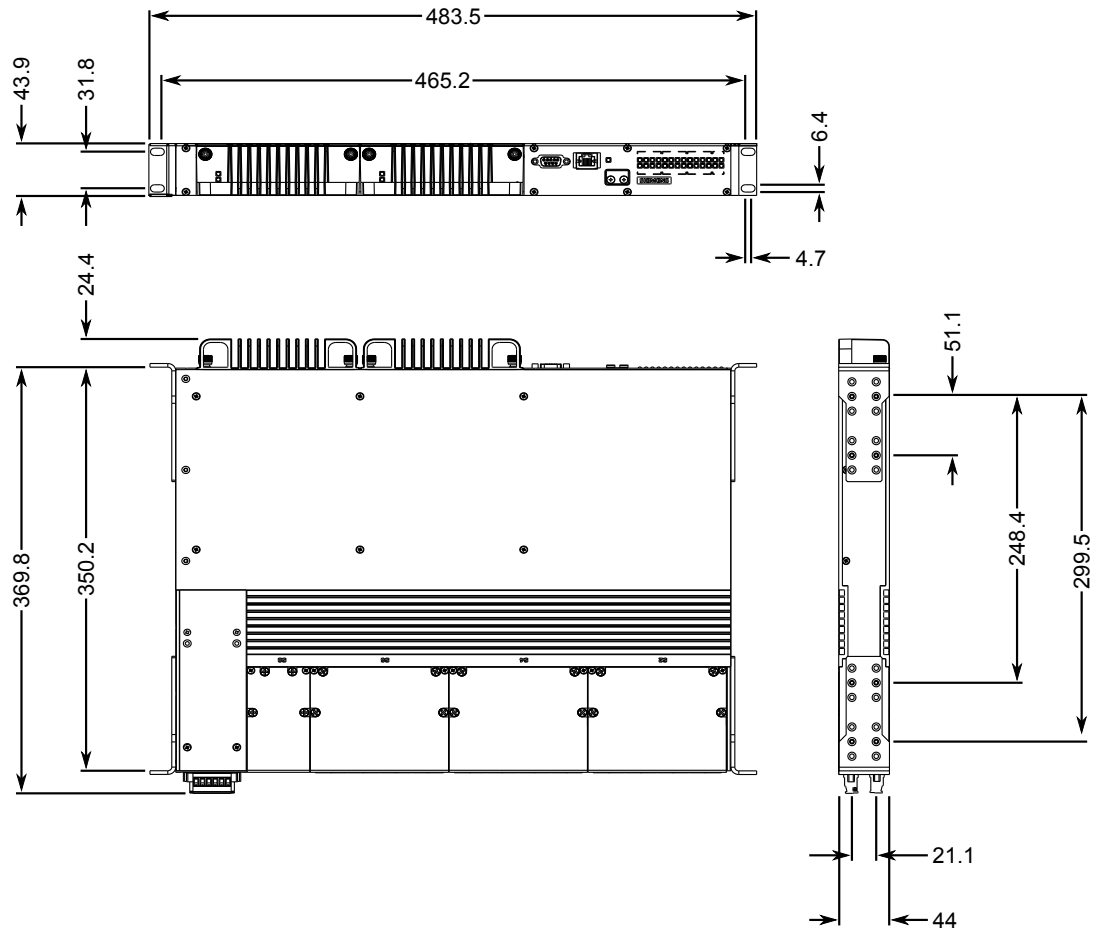
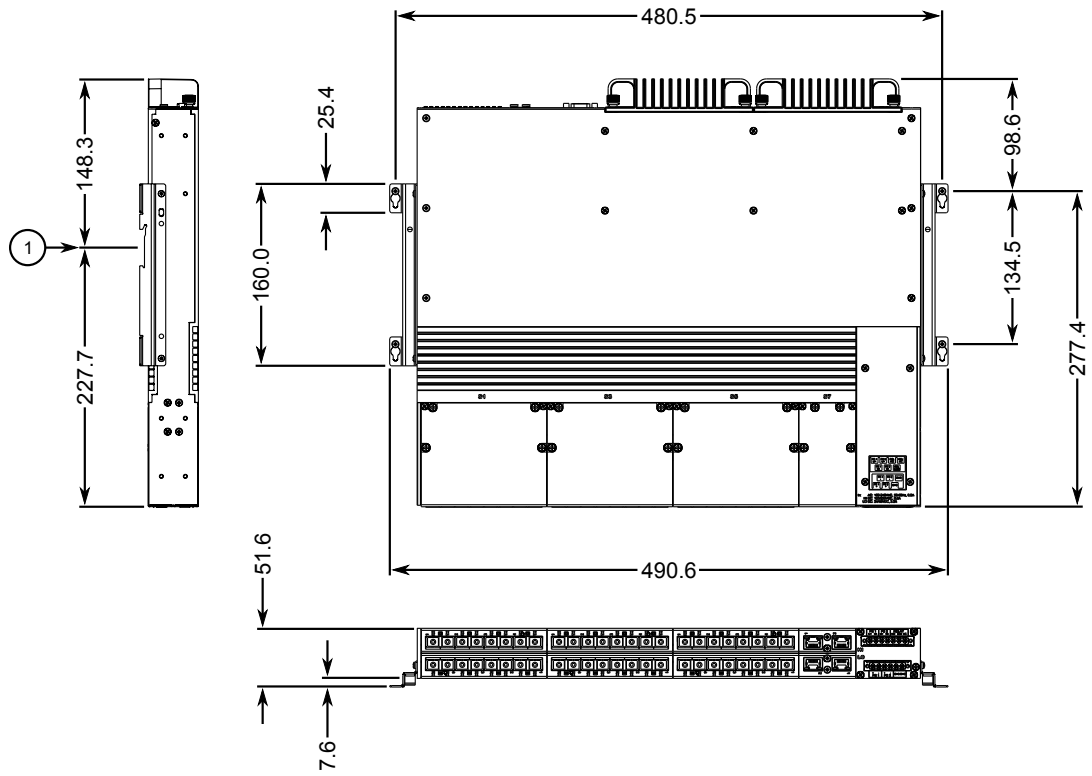


Figure 5.2 Rack Mount Dimensions



① DIN Rail Centerline

Figure 5.3 Panel and Din Rail Mount Dimensions

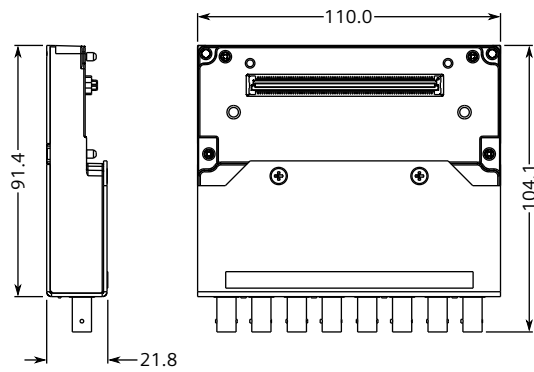


Figure 5.4 4-Port Line Module Dimensions

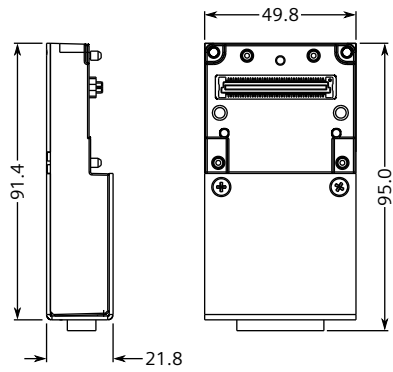


Figure 5.5 2-Port Line Module Dimensions

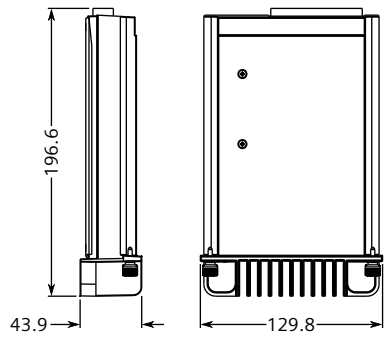


Figure 5.6 Power Module Dimensions

Certification

The RUGGEDCOM RSG2488 device has been thoroughly tested to guarantee its conformance with recognized standards and has received approval from recognized regulatory agencies.

Note

Certifications related to individual modules are detailed in the "RUGGEDCOM Modules Catalog" for the device available online.

6.1 Approvals

This section details the standards to which the RUGGEDCOM RSG2488 complies.

Note

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

This device is certified by TÜV SÜD to meet the requirements of the following standards:

- **CSA/EN/IEC/UL 62368-1**
Information Technology Equipment – Safety – Part 1: General Requirements)

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.



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 ISED

This device is declared by Siemens Canada Ltd. to meet the requirements of the following ISED (Innovation Science and Economic Development Canada) standard:

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

6.1.6 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

6.1.7 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>.

6.1.8 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**

6.1.9 Other Approvals

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>.

6.1.9 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**
General Requirements
- **IEC 61000-6-2**
Electromagnetic Compatibility (EMC) – Part 6-2: Generic Standards – Immunity for Industrial Environments

6.2 EMC and Environmental Type Tests

The RUGGEDCOM RSG2488 has passed the following EMC and environmental tests.

EMC Type Test for IEC 61850-3

Note

- In the case of an all fiber port configuration, this product meets all Class 2 requirements. Otherwise, all Class 1 requirements are met for copper ports.
- If the unit contains copper ports, the IEC 1613 conformance is Class 1, during which disturbance errors may occur but recovery is automatic.
- If the unit contains all fiber ports, the IEC1613 conformance is Class 2, during which no disturbance errors will occur.

Test	Description		Test Levels	Severity Levels
IEC 61000-4-2	ESD	Enclosure Contact	± 8 kV	4
		Enclosure Air	± 15 kV	
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 and 5 kHz	4
		DC Power Ports	± 4 kV @ 2.5 and 5 kHz	
		AC Power Ports	± 4 kV @ 2.5 and 5 kHz	
		Earth Ground Ports	± 4 kV @ 5 kHz	

6.2 EMC and Environmental Type Tests

Test	Description	Test Levels	Severity Levels	
IEC 61000-4-5	Surge	Signal Ports	± 4 kV Line-to-Earth ± 2 kV Line-to-Line	
		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		
		AC Power Ports		
		Earth Ground Ports		
IEC 61000-4-8	Magnetic Field	Enclosure Ports	100 A/m for 3 min 1000 A/m for 3 s	5
IEC 61000-4-10	Damped Oscillating Magnetic Field	Enclosure Ports	100 A/m for 1 s (100 kHz and 1 MHz)	5
IEC 61000-4-11	Voltage Dips and Interrupts	AC Power Ports	30% for 1 period 60% for 50 periods 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		
		AC Power Ports		
IEC 61000-4-16	Mains Frequency Voltage	Signal Ports	30 V for 60 s 300 V for 1 s	4
		DC Power Ports		
		AC Power Ports		
IEC 61000-4-17	Ripple on DC Power Supply	DC Power Ports	10%	3
IEC 61000-4-18	Damped Oscillatory Wave	Signal Ports	2.5 kV Common Mode 1.0 kV Differential Mode	3
		DC Power Ports		
		AC Power Ports	2.5 kV Common Mode	
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	
EC 60225-27	Dielectric Strength	Signal Ports	2 kVAC (Fail-Safe Relay Output)	
		DC Power Ports	1.5 kVDC	
		AC Power Ports	2 kV	

6.2 EMC and Environmental Type Tests

Test	Description		Test Levels	Severity Levels
	HV Impulse	Signal Ports	5 kV (Fail-Safe Relay Output)	
		DC Power Ports	5 kV	
		AC Power Ports		

^a Siemens-specified severity levels

EMC Immunity Type Tests per IEEE 1613

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.

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

Environmental Type Tests

Test	Description		Test 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 60068-2-14	Change of Temperature	Test Nb	5 Cycles, -40 to 85° C (40 to 185° F)

6.2 EMC and Environmental Type Tests

Test	Description		Test Levels
IEC 60068-2-30	Humidity (Damp Heat, Cyclic)	Test Db	95% (non-condensing) 55 °C (131 °F), 6 Cycles
IEC 60068-2-31	Free Fall		Procedure 1, 2 falls from a height of 250 mm (9.8 in)
IEC 60068-2-78	Humidity (Damp Heat, Steady State)	Test Cab	10 days @ 55 °C (131 °F) and 93% Relative Humidity
IEC 60255-21-1	Vibration		Level 2 (2 g @ 10 to 150 Hz)
IEC 60255-21-2	Shock		Level 2 (30 g @ 11 mS)
	Bump		Level 1 (10 g @ 16 mS)
IEC 60529	Ingress Protection		IP3x

For more information

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