SIEMENS

Edition 11/2022

Installation Manual

SIMATIC NET

Rugged Ethernet Switches

RUGGEDCOM RS416

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SIMATIC NET

Rugged Ethernet Switches RUGGEDCOM RS416

Installation Manual

11/2022
C79000-G8976-1018-11

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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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Process Automation
300 Applewood Crescent
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Canada

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Preface

This guide describes the RUGGEDCOM RS416. 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/109737245

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 RS416 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' 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.

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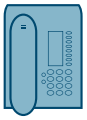
Customer support is available 24 hours, 7 days a week for all Siemens customers. For technical support or general information, contact Siemens Customer Support through any of the following methods:

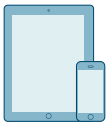
Online

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.



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- 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 RS416 is an industrially hardened serial device server with an integrated, fully managed, Ethernet switch, designed to operate reliably in electrically harsh and climatically demanding environments. Featuring a modular design that can support IEEE 1588 and IRIG-B time synchronization, up to 16 serial ports and up to four Ethernet ports, the RUGGEDCOM RS416 is able to interconnect and synchronize multiple types of intelligent electronic devices (IEDs).

The time source is provided via IEEE 1588 v2 and converted to IRIG-B for distribution to the IEDs via the serial ports or dedicated IRIG-B cabling. Each serial port supports standard data communications plus an IRIG-B time-synchronization output. Using the RUGGEDCOM RS416 results in fewer connectivity devices reducing overall system costs and extends the useful life of existing legacy IEDs minimizing capital expenditure for new equipment.

The RUGGEDCOM RS416 provides a high level of immunity to electromagnetic interference and heavy electrical surges typical of environments found in electric utility substations, factory floors or in curb side traffic control cabinets. The RUGGEDCOM RS416 also features a wide operating temperature range of -40 to 85 °C (-40 to 185 °F) allowing it to be installed in virtually any location.

The embedded Rugged Operating System (ROS®) within the RUGGEDCOM RS416 provides advanced layer 2 and layer 3 networking functions, advanced cyber security features, and a full array of intelligent functionality for high network availability and manageability. Coupled with the ruggedized hardware design, the RUGGEDCOM RS416 is ideal for creating mission-critical, real-time, control applications in any harsh environment.

1.1 Feature Highlights

Serial Device Server

- Modular design allows for 4, 8, 12, or 16 serial ports
- Fully compliant EIA RS422/TIA RS485, RS422, RS232 serial ports (software selectable) with IRIG-B outputs
- Serial fiber interface (ST)
- Transmit serial data over an IP network
- Support for Modbus TCP, DNP 3, TIN serial protocols
- Baud rates up to 230 kbps
- Raw socket mode allows conversion of any serial protocol

- Point-to-point and multi-point modes
- Converts Modbus RTU to Modbus
- Supports multiple Modbus masters
- Converts DNP3.0 to DNP over UDP/TCP

Ethernet Ports

- Integrated Ethernet switch
- Copper or fiber options
- Supports IEEE 1588 v2
- Non-blocking, store and forward switching

IRIG-B Option

- Conversion from IEEE 1588 v2
- One IRIG-B PWM/PPS Output
- One IRIG-B PWM Input
- Supports TTL levels
- BNC Connectors

IEEE 1588

- Internal clock is synchronized with IEEE 1588 version 2
- 100µs time accuracy

Rated for Reliability in Harsh Environments

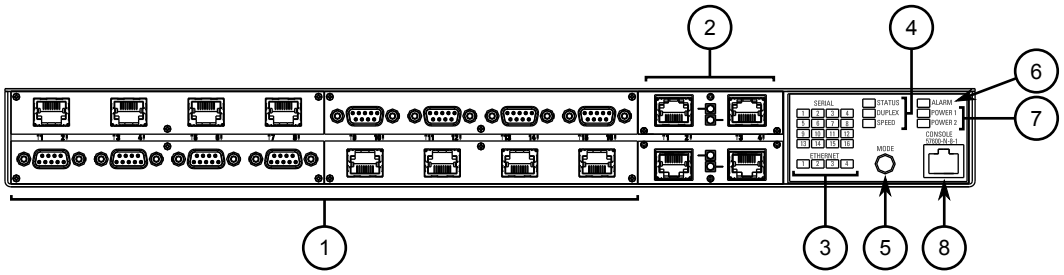
- Immunity to EMI and heavy electrical surges
- Fully independent 2 kV (RMS) isolated serial ports
- -40 to 85 °C (-40 to 185 °F) operating temperature (no fans)
- 18 AWG galvanized steel enclosure

Universal Power Supply Options

- Fully integrated, dual-redundant (optional) power supplies
- Universal high-voltage range: 88-300 VDC or 85-264 VAC
- Popular low voltage ranges: 24 VDC (10-36 VDC), 48 VDC (36-59VDC)
- Terminal blocks for reliable maintenance free connections
- CSA/UL 62368-1 safety approved to 85 °C (185 °F)

1.2 Description

The RUGGEDCOM RS416 features various ports, controls and indicator LEDs on the display panel for connecting, configuring and troubleshooting the device. The display panel can be located on the rear, front or top of the device, depending on the mounting configuration.



① Serial Ports
② Fiber Optic Ethernet and/or BNC (Optional) Ports
③ Port Status Indicator LEDs
④ Display Mode Indicator LEDs
⑤ Mode Button
⑥ Alarm Indicator LED
⑦ Power Module Indicator LEDs
⑧ RS-232 Serial Console Port (RJ45)

Figure 1.1 RUGGEDCOM RS416

Communication Ports

Ports for communicating with other devices or accessing the RUGGEDCOM RS416 operating system are described in "Communication Ports" (Page 23).

Port Status Indicator LEDs

Port status indicator LEDs indicate the operational status of each port, dependent on the currently selected mode.

Mode	Color/State	Description	
		Ethernet Ports	Serial Ports
Status	Green (Solid)	Link detected	—
	Green (Blinking)	Link activity	Traffic detected
	Off	No link detected	No traffic
Duplex	Green (Solid)	Full duplex mode	
	Orange (Blinking)	Half duplex mode	
	Off	No link detected	
Speed	Green (Solid)	100 Mb/s	>19200 to <57600 bps
	Green (Blinking)	—	57600 bps or higher
	Orange (Solid)	10 Mb/s	<19200 bps
	Off	No link detected	

Display Mode Indicator LEDs	The display mode indicator LEDs indicate the current display mode for the port status indicator LEDs (i.e. Status, Duplex or Speed).
Mode button	The **Mode** button sets the display mode for the port status indicator LEDs (i.e. Status, Duplex or Speed). It can also be used to reset the device if held for 5 seconds.
Alarm Indicator LED	The alarm indicator LED illuminates when an alarm condition exists.
Power Module Indicator LEDs	The power module indicator LEDs indicate the status of the power modules.

Color	Description
Green	The power supply is supplying power
Red	Power supply failure
Off	No power supply is installed

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).

1.3 Required Tools and Materials

The following tools and materials are required to install the RUGGEDCOM RS416:

Tools/Materials	Purpose
AC 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 #6-32 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.*

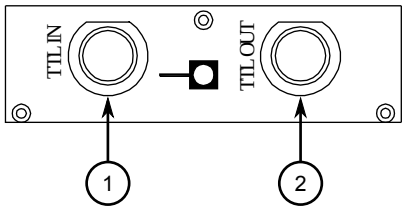
1.6 Precision Time Protocol (PTP) Support

The Precision Time Protocol (PTP) module adds the ability to provide time synchronization via Ethernet using the Precision Time Protocol (PTP) and Network Time Protocol (NTP), and to synchronize with an external IRIG-B source.

The PTP module features BNC ports for TTL IN and TTL OUT. It also includes an LED to indicate when synchronization has been achieved.

Note

The PTP module can only be installed in slot 5. For more information, refer to "Communication Ports" (Page 23).



① TTL OUT Port
② TTL IN Port

Figure 1.2 PTP Module

For more information about the BNC ports, refer to "BNC Ports" (Page 28).

1.6.1 Supported Time Synchronization Sources

The following time synchronization sources are supported by the RUGGEDCOM RS416, with or without the PTP card:

Synchronization Source	Without PTP Card	With PTP Card
NTP	✓	✓
IEEE 1588 v2	✓	✓
IRIG-B PWM	×	✓

NTP

NTP (Network Time Protocol) is the standard for synchronizing the clocks of computer systems throughout the Internet and is suitable for systems that require accuracies in the order of 1 ms.

IRIG-B PWM

IRIG-B time synchronization is an even older, established, inter-device time synchronization mechanism providing accuracy in sub-milliseconds.

IEEE 1588

IEEE 1588 is designed to provide networked, packet-based time synchronization between different networking nodes (PTP devices). The RUGGEDCOM RS416 supports PTP v2, which is defined in the IEEE 1588-2008 standard. IEEE 1588 is designed to fill a niche not well served by either of the two older, dominant protocols, NTP and IRIG-B. IEEE 1588 is also designed for applications that cannot bear the cost of a GPS receiver at each node or for which GPS signals are inaccessible.

The RUGGEDCOM RS416 only supports ordinary clock mode. An ordinary clock can be configured as either a Grandmaster Clock (GM) or a Slave Clock (SC) within the master-slave hierarchy.

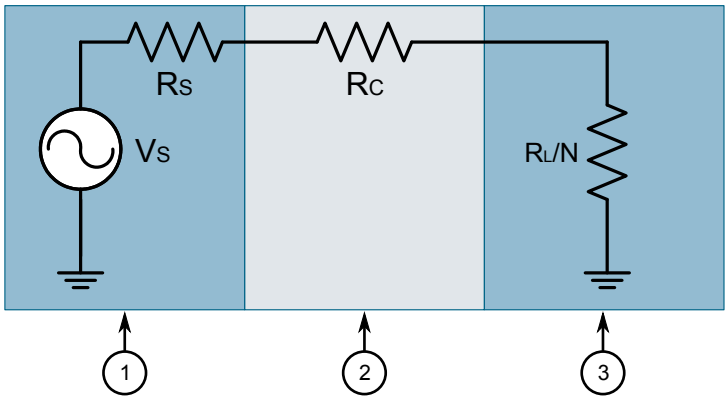
Every Ethernet port on the RUGGEDCOM RS416 supports IEEE 1588. For more information, refer to "IEEE 1588 Support" (Page 7).

1.6.2 TTL Outputs

The PTP card provides a TTL (Transistor-Transistor Logic) output.

The TTL OUT port supports the IRIG-B PWM and PPS signal formats. Enabling/disabling the output port and selecting the signal format is controlled through the RUGGEDCOM RS416 operating system.

The number of devices that can be connected to the TTL Out port is dependent on the cabling type and length, as well as the input impedances of the devices. The following simplified circuit schematic shows the interface between an IRIG-B source and connected devices.



① Source
② Cabling
③ Device

Figure 1.3 IRIG-B Simplified Circuit Schematic

The maximum number of devices (N) that can be connected to the source is determined by checking if the source current (IS) required to drive the connected devices is less than the maximum drive current the source can provide, and verifying that the load voltage (VL) the connected devices see is greater than the minimum required voltage.

1.6.3 IEEE 1588 Support

RUGGEDCOM RS416 supports various IEEE 1588 time synchronization capabilities and provides synchronization in 2-step mode. This mode supports the following clock types:

- End-to-End Slave Clock
- End-to-End Master Clock

- Peer-to-Peer Slave Clock
- Peer-to-Peer Master Clock

2 Installing 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

Radiation hazard – risk of serious personal injury

This product contains a laser system and is classified as a *CLASS 1 LASER PRODUCT*. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

⚠ 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:

1. **Review the relevant certification information for any regulatory requirements.**

   For more information, refer to "Approvals" (Page 37).

2. **Unpack and inspect the device.**

   For more information, refer to "Unpacking the Device" (Page 10).

3. **Mount the device.**

   For more information, refer to "Mounting the Device" (Page 10).

4. **Connect the failsafe alarm relay.**

   For more information, refer to "Connecting the Failsafe Alarm Relay" (Page 13).

5. **Connect power to the device and ground the device to safety Earth.**

   For more information, refer to "Connecting Power" (Page 15).

6. **Connect the device to the network.**

   For more information, refer to "Communication Ports" (Page 23).

7. **Configure the device.**

   For more information, refer to "Configuring the Device" (Page 22).

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 RS416 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 34).

2.3.1 Mounting the Device to a Rack

For rack mount installations, the RUGGEDCOM RS416 can be equipped with rack mount adapters pre-installed at the front or 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:

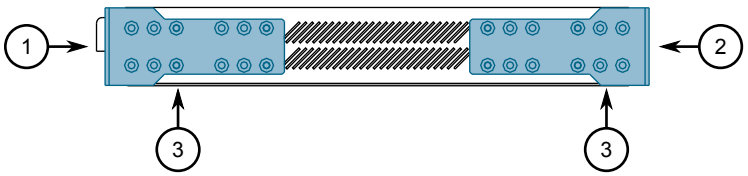
Note

The device can be ordered with the communication ports located at the front or rear of the device. Placing the ports at the rear allows all data and power cabling to be installed and connected at the rear of the rack.

1. Make sure the rack mount adapters are installed on the correct side 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. If required, install adapters on the opposite side of the device to protect from vibrations.
3. Insert the device 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.

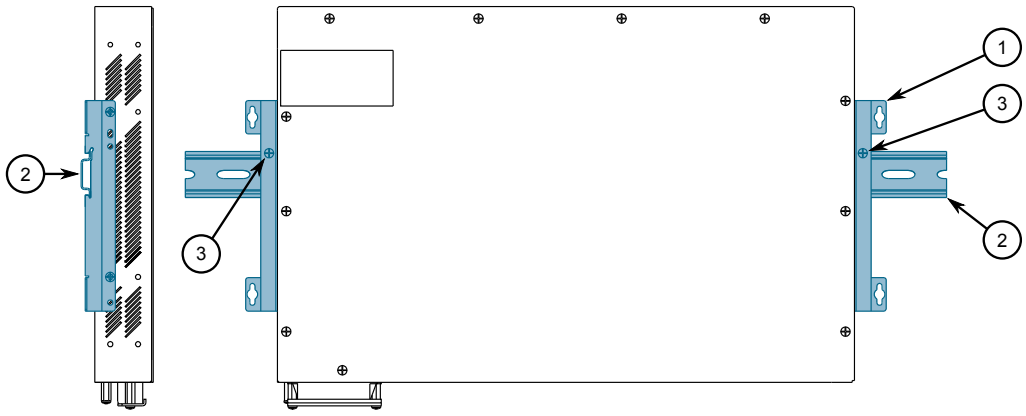
4. Secure the adapters to the rack using the supplied hardware.

2.3.2 Mounting the Device on a DIN Rail

For DIN rail installations, the RUGGEDCOM RS416 can be equipped with panel/DIN rail adapters pre-installed on each side of the chassis. The adapters allow the device to be slid onto a standard 35 mm (1.4 in) DIN rail.

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

1. Align the adapters with the DIN rails and slide the device into place.



① Panel/DIN Rail Adapter
② DIN Rail
③ Screw

Figure 2.2 DIN Rail Mounting

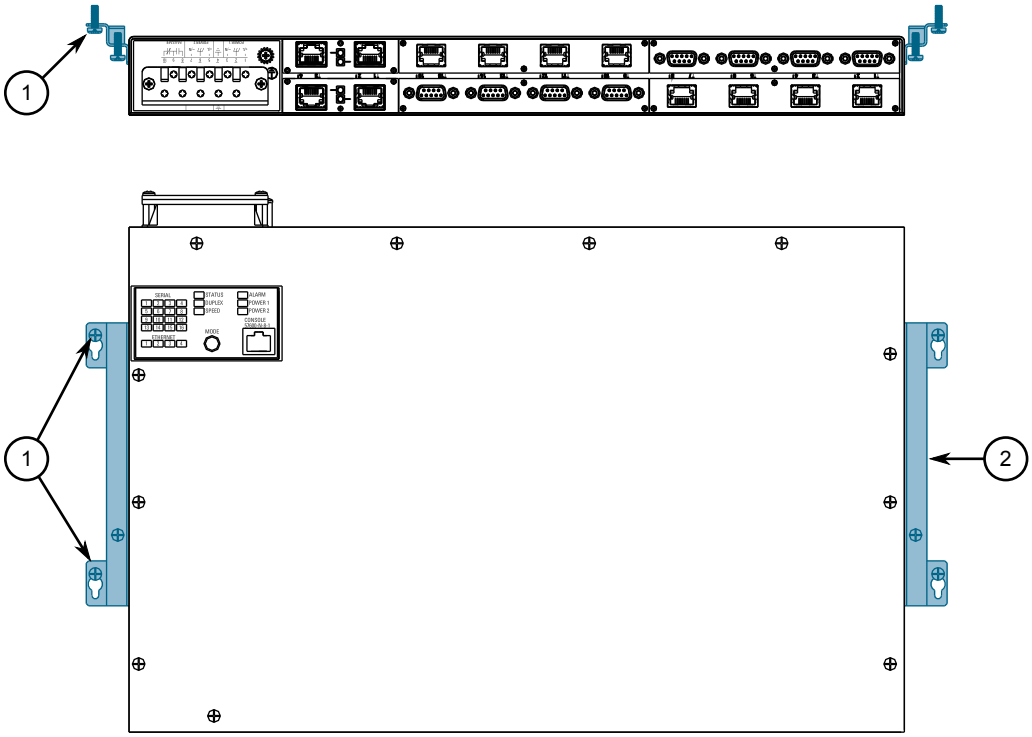
2. Install one of the supplied screws on either side of the device to secure the adapters to the DIN rails.

2.3.3 Mounting the Device to a Panel

For panel installations, the RUGGEDCOM RS416 can be equipped 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 Adapter

Figure 2.3 Panel Mounting

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

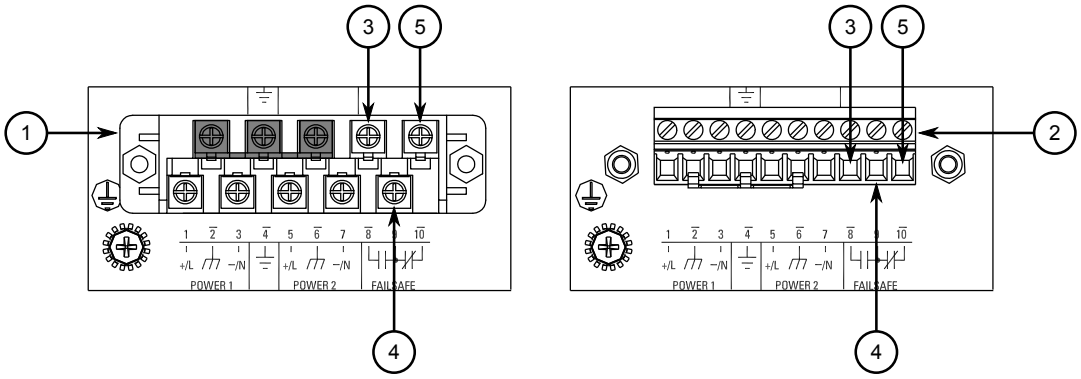
2.4 Connecting the Failsafe Alarm Relay

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 RS416. One common application for this relay is to signal an alarm if a power failure occurs. For more information, refer to the "RUGGEDCOM RS416 User Guide" for the RUGGEDCOM RS416.

The following shows the proper relay connections.

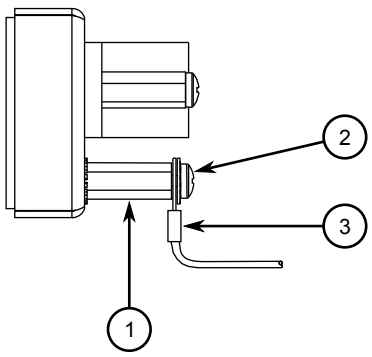


① Screw-Type Terminal Block
② Pluggable Terminal Block
③ Normally Open Terminal
④ Common Terminal
⑤ Normally Closed Terminal

Figure 2.4 Failsafe Alarm Relay Wiring

2.5 Grounding the Device

The RUGGEDCOM RS416 chassis ground terminal uses a #6-32 screw. It is recommended to terminate the ground connection with a #6 ring lug and torque it to 1.7 N·m (15 lbf·in).



① Stainless Steel Stud
② #6-32 Screw

③ #6 Ring Lug

Figure 2.5 Chassis Ground Connection

2.6 Connecting Power

The RUGGEDCOM RS416 supports single or dual redundant high AC and/or low DC power supplies.

The RUGGEDCOM RS416 can be equipped with either a screw-type or pluggable terminal block, which provides power to both internal power modules. 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.

⚠ NOTICE

Each internal power module is labeled POWER 1 or POWER 2. Before connecting power to the device, determine which module POWER 1 and POWER 2 are associated with.

Note

- For maximum redundancy in a dual power supply configuration, use two independent power sources.
- For 100-240 VAC rated equipment, an appropriately rated AC circuit breaker must be installed.
- For 88-300 VDC rated equipment, an appropriately rated DC circuit breaker must be installed.
- Use minimum #16 gage copper wiring when connecting terminal blocks.
- A circuit breaker is not required for 12, 24 or 48 VDC rated power supplies.
- It is recommended to provide a separate circuit breaker for each power supply module.
- Equipment must be installed according to applicable local wiring codes and standards.

2.6.1 Connecting AC or DC Power

To connect a single high AC, high DC 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 metal jumper. This metal jumper connects transient suppression circuitry to chassis ground and must be removed in order to avoid damage to transient suppression circuitry during testing.

⚠ 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.

⚠ NOTICE

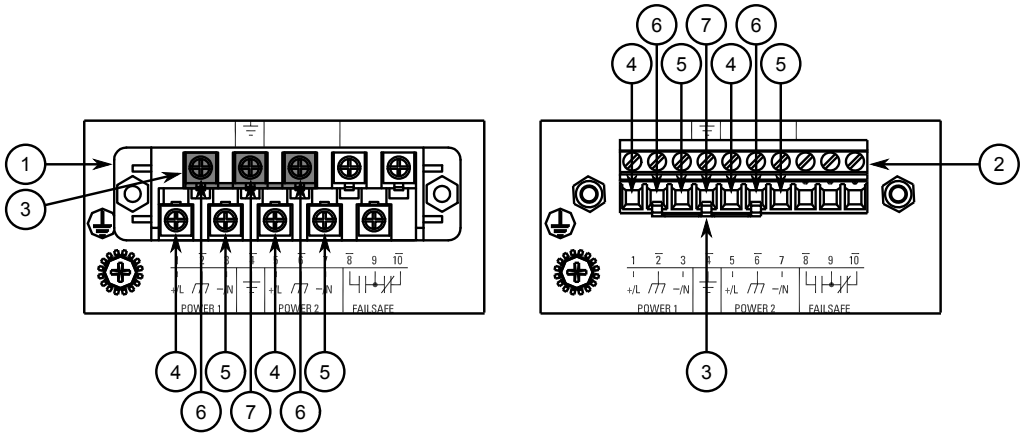
Each internal power module is labeled POWER 1 or POWER 2. Make sure to connect the power supply to the corresponding internal power module.

1. Remove the terminal block cover.
2. Identify the internal power module (POWER 1 or POWER 2) appropriate for the power supply (AC or DC).
3. If a screw-type terminal block is installed, remove the screws from the positive/live (+/L) and negative/neutral (-/N) terminals associated with the selected internal power module (i.e. terminals 1 and 3 for POWER 1 or terminals 5 and 7 for POWER 2). Use these screws along with #6 ring lugs to secure the wires to the terminal block.

   Note

   For wiring options, refer to "Wiring Examples" (Page 17).

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



① Screw-Type Terminal Block
② Pluggable Terminal Block
③ Jumper
④ Positive/Live (+/L) Terminal
⑤ Negative/Neutral (-/N) Terminal (-/N)
⑥ Surge Ground Terminal
⑦ Chassis Ground Terminal

Figure 2.6 Terminal Block Wiring

5. Connect the negative wire from the power source to the negative/neutral (-/N) terminal on the terminal block.
6. Install the supplied metal jumper between terminals 2, 4 and 6 to connect the surge ground terminals to the chassis ground terminal. The surge ground terminals are used as the ground conductor for all surge and transient suppression circuitry internal to the unit.
7. Connect the ground terminal on the power source to the chassis ground terminal on the device. For more information, refer to "Grounding the Device" (Page 14).

⚠ **DANGER**
Electrocution hazard – risk of death, serious personal injury and/or damage to the device Make sure the supplied terminal block cover is always installed before the device is powered.

8. Install the terminal block cover.

2.6.2 Wiring Examples

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

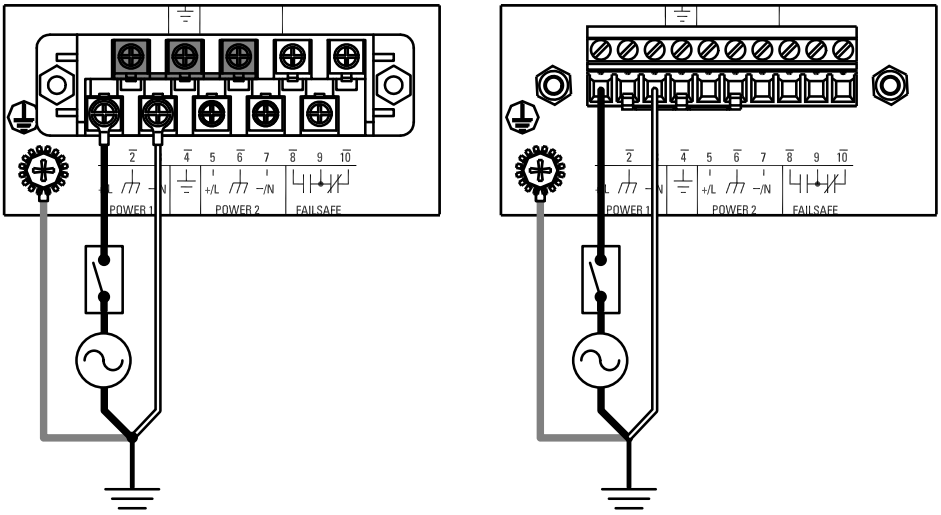


Figure 2.7 Single AC Power Supply

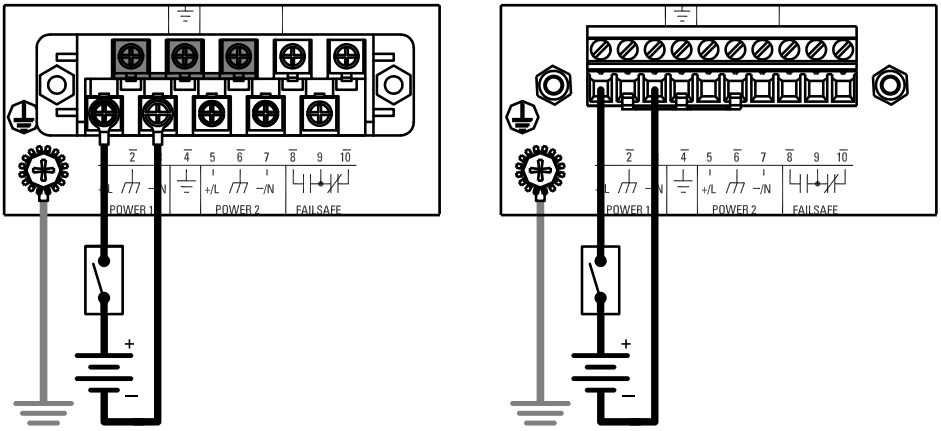


Figure 2.8 Single DC Power Supply

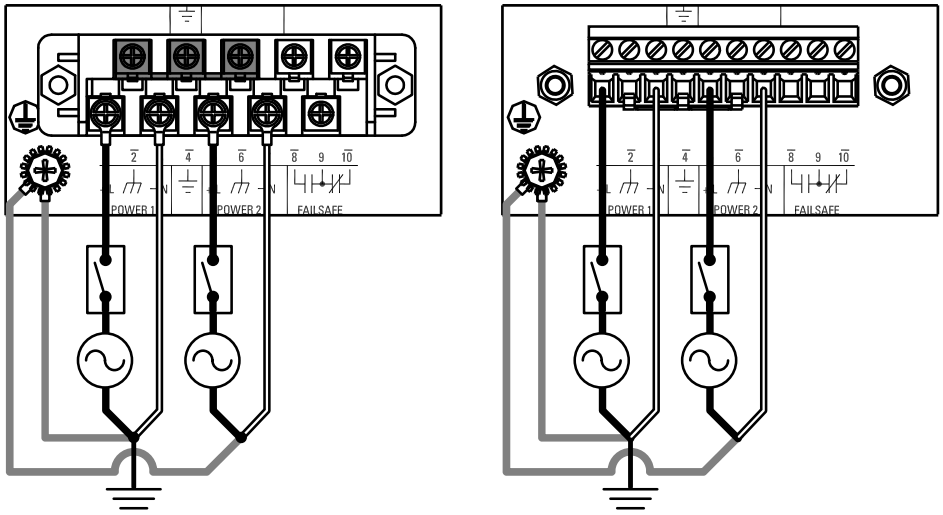


Figure 2.9 Dual AC Power Supply

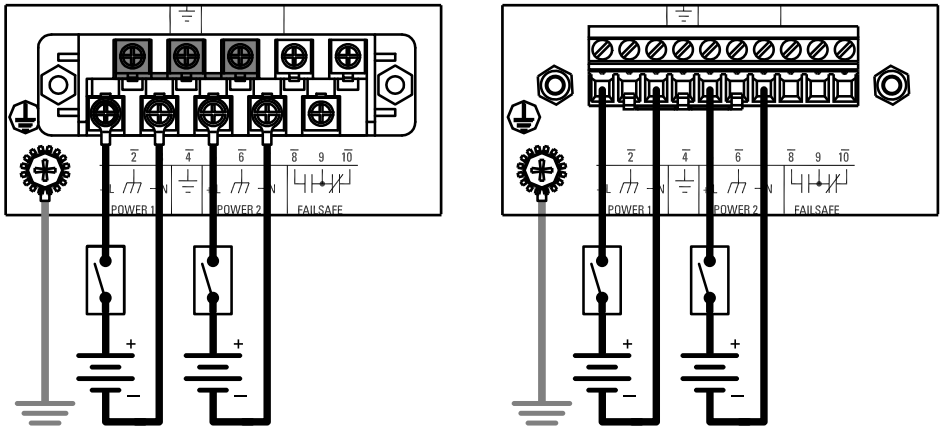


Figure 2.10 Dual DC Power Supply

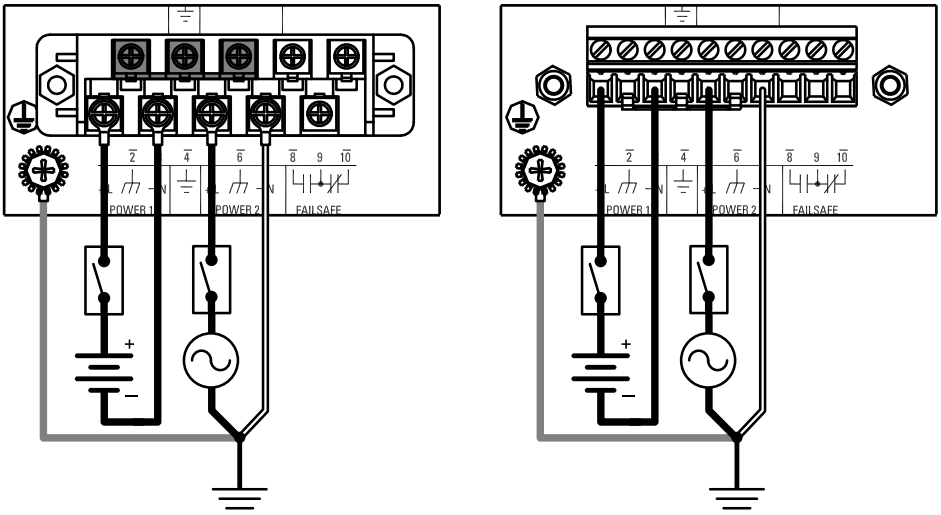


Figure 2.11 Dual AC/DC Power Supply

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 RS416 console and Web interfaces on the device. For more detailed instructions, refer to the "RUGGEDCOM RS416 User Guide" for the RUGGEDCOM RS416.

RS232 Console Port

Connect a PC or terminal directly to the RS232 console port to access the boot-time control and RUGGEDCOM RS416 interfaces. The console port provides access to RUGGEDCOM RS416's console and Web interfaces.

⚠ NOTICE

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

Connection to the console port is made using an RJ45-to-DB9 console cable. The following is the pin-out for the console port:

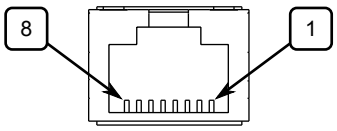


Figure 3.1 RJ45 Console Port Pin Configuration

Pin		Name	Description
RJ45 Male	DB9 Female		
1	6	DSR[a]	Data Set Ready
2	1	Reserved (Do Not Connect)	
3	4	DTR[a]	Data Terminal Ready
4	5	GND	Signal Ground
5	2	RxD	Receive Data (to DTE)
6	3	TxD	Transmit Data (from DTE)
7	8	CTS[b]	Clear to Send
8	7	RTS[b]	Read to Send
1	9	RI[c]	Ring Indicator

[a] *The DSR, DCD and DTR pins are connected together internally.*

[b] *The CTS and RTS pins are connected together internally.*

[c] *RI is not connected.*

Communication Ports

Connect any of the available Ethernet ports on the device to a management switch and access the RUGGEDCOM RS416 console and Web interfaces via the device's IP address. For more information about available ports, refer to "Communication Ports" (Page 23).

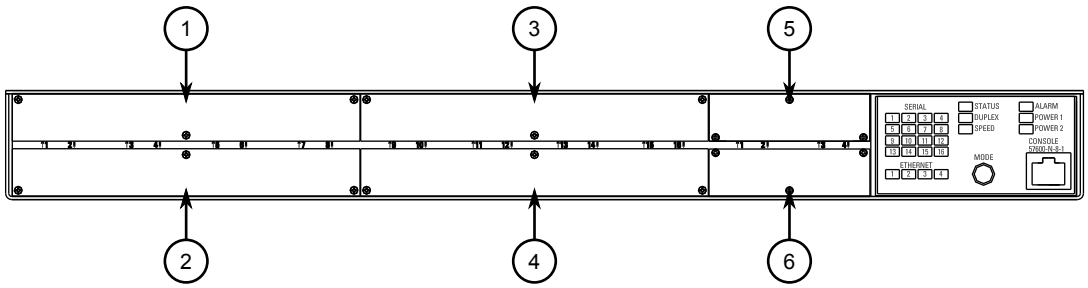
3.2 Configuring the Device

Once the device is installed and connected to the network, it must be configured. All configuration management is done via the RUGGEDCOM RS416 interface. For more information about configuring the device, refer to the "RUGGEDCOM RS416 User Guide" associated with the installed software release.

4 Communication Ports

The RUGGEDCOM RS416 can be equipped with various types of communication ports to enhance its abilities and performance.

Each communication port type has a specific place in the RUGGEDCOM RS416 chassis.



① Slot 1
② Slot 2
③ Slot 3
④ Slot 4
⑤ Slot 5
⑥ Slot 6

Figure 4.1 Port Assignment

Slot	Type
1 to 4	Serial Ports
5	Fast Ethernet (10/100Base-TX, 10Base-FL or 10/100Base-FX) or IRIG-B BNC Ports
6	Fast Ethernet (10/100Base-TX, 10Base-FL or 10/100Base-FX)

4.1 Copper Ethernet Ports

The RUGGEDCOM RS416 supports several 10/100Base-TX Ethernet ports that allow connection to standard Category 5 (CAT-5) unshielded twisted-pair (UTP) cables with RJ45 male connectors. The RJ45 connectors are directly connected to the chassis ground on the device and can accept CAT-5 shielded twisted-pair (STP) cables.

⚠ WARNING

Electric shock hazard – risk of serious personal injury and/or equipment interference

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

LEDs

Each port features a dedicated LED that indicates the state of the port.

State	Description
Yellow (Solid)	Link established
Yellow (Blinking)	Transmitting/receiving
Off	No link detected

Pin-Out

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

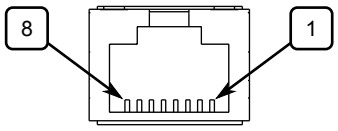


Figure 4.2 RJ45 Ethernet Port Pin Configuration

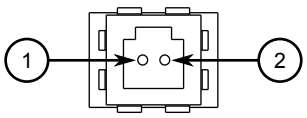
Pin	Name	Description
1	RX+	Receive Data+
2	RX-	Receive Data-
3	TX+	Transmit Data+
4	Reserved (Do Not Connect)	
5	Reserved (Do Not Connect)	
6	TX-	Transmit Data-
7	Reserved (Do Not Connect)	
8	Reserved (Do Not Connect)	

Specifications

For specifications on the available copper Ethernet ports, refer to "Copper Ethernet Port Specifications" (Page 31).

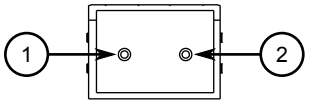
4.2 Fiber Optic Ethernet Ports

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



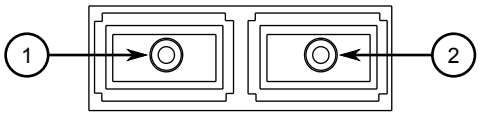
① Tx Connector
② Rx Connector

Figure 4.3 MTRJ Port



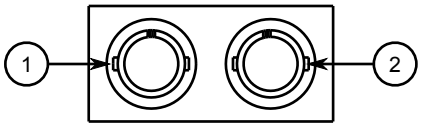
① Tx Connector
② Rx Connector

Figure 4.4 LC Port



① Tx Connector
② Rx Connector

Figure 4.5 SC Port



① Tx Connector
② Rx Connector

Figure 4.6 ST Port

For specifications on the available fiber optic Ethernet ports, refer to "Fiber Optic Ethernet Port Specifications" (Page 32).

4.3 Serial Ports

The RUGGEDCOM RS416 supports serial cards with fiber serial ST (Straight Tip) connectors, RS232/RS485/RS422 DB9 serial ports or RS232/RS485/RS422 RJ45 serial ports.

Serial DB9 and RJ45 ports can be run in RS232, RS485 or RS422 mode. They can also be ordered with IRIG-B time code support.

Note

On power-up, all serial RJ45 ports default to RS485 mode. Each port can be individually set to RS232, RS485 or RS422 mode through RUGGEDCOM RS416. For more information, refer to the "RUGGEDCOM RS416 User Guide" for the RUGGEDCOM RS416.

Note

For information about how to connect devices configured to run in RS485 mode, refer to "Connecting Multiple RS485 Devices" (Page 29).

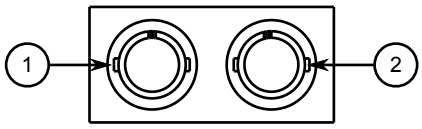
All serial ports feature an LED that indicates the current state of the port.

State	Description
Green	Link activity detected
Off	No link detected

For specifications on serial ports, refer to "Serial Port Specifications" (Page 33).

The following is the pin-out description for ST, DB9 and RJ45 serial ports:

Fiber Serial Port



① Tx Connector
② Rx Connector

Figure 4.7 ST Port

Serial DB9 Port

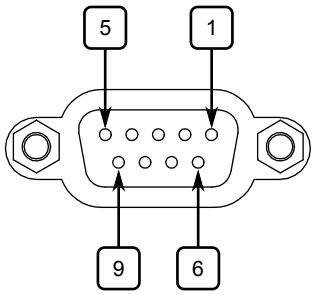


Figure 4.8 Serial DB9 Port Pin Configuration

Pin	Mode		
	RS232 DCE	**RS485**	**RS422**
1	DCD[a]		
2	TX[b]	TX/RX+	TX+
3	RX[b]		RX+
4	DTR[a]		
5	Common (Isolated) Ground		
6	DSR[a]		RX-
7	RTS	TX/RX-	TX-
8	CTS		
9	RI[c]		
Shield	Chassis Ground		

[a] *The DSR, DCD and DTR pins are connected together internally.*

[b] *In RS232 DCE mode, ports transmit to DTE devices on pin 2 and receive from DTE on pin 3.*

[c] *RI is not connected.*

Note

Pins 1, 4 and 6 and pins 7 and 8 are connected internally. In RS232 mode, these pins enter a high impedance state. A DTE that asserts RTS will see CTS asserted. However, the device will not perform hardware flow control.

Serial DB9 Port with IRIG-B Support

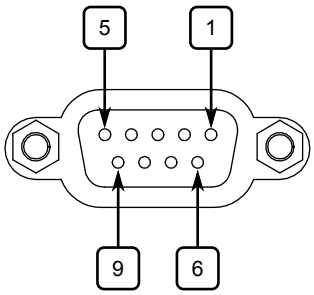


Figure 4.9 Serial DB9 Port Pin Configuration

Pin	Mode		
	RS232 DTE	**RS485**	**RS422**
1			RX-
2	RX[a]	TX/RX+	TX+
3	TX[a]		RX+
4	IRIG-B+		
5	Common (Isolated) Ground		
6	Common (Isolated) Ground		
7	RTS	TX/RX-	TX-
8	CTS		
9	Common (Isolated) Ground		
Shield	Chassis Ground		

[a] *In RS232 DTE mode, ports transmit to DTE devices on pin 2 and receive from DTE on pin 3.*

Note

Pins 7 and 8 are connected internally. In RS232 mode, these pins enter a high impedance state. A DTE that asserts RTS will see CTS asserted. However, the device will not perform hardware flow control.

Serial RJ45 Port

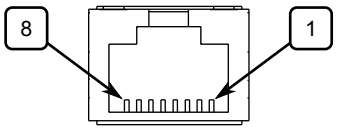


Figure 4.10 Serial RJ45 Port Pin Configuration

Pin	RS232 Mode	RS485 Mode	RS422 Mode
1	DSR[a]		RX-
2	DCD[a]		
3	DTR[a]		
4	Common (Isolated) Ground		
5	RXD[b]		RX+
6	TXD[b]	TX/RX+	TX+
7	CTS		
8	RTS	TX/RX-	TX-
Shield	Chassis Ground		

[a] *The DSR, DCD and DTR pins are connected together internally.*

[b] *In RS232 mode, the RJ45 ports conform to EIA-561 DTE, which transmit on TXD and receive on RXD.*

Note

Pins 1, 2 and 3 and pins 7 and 8 are connected internally. In RS232 mode, these pins enter a high impedance state. A DTE that asserts RTS will see CTS asserted. However, the device will not perform hardware flow control.

Serial RJ45 Port with IRIG-B Support

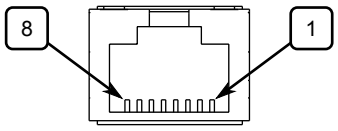


Figure 4.11 Serial RJ45 Port Pin Configuration

Pin	RS232 Mode	RS485 Mode	RS422 Mode
1			RX-
2	+IRIG-B		
3	Common (Isolated) Ground		
4	Common (Isolated) Ground		
5	RXD[a]		RX+
6	TXD[a]	TX/RX+	TX+
7	CTS		
8	RTS	TX/RX-	TX-
Shield	Chassis Ground		

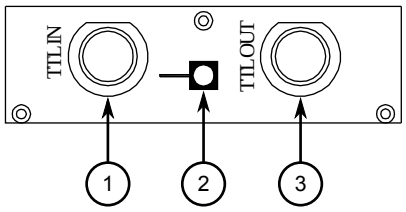
[a] *In RS232 mode, the RJ45 ports conform to EIA-561 DTE, which transmit on TXD and receive on RXD.*

Note

Pins 7 and 8 are connected internally. In RS232 mode, these pins enter a high impedance state. A DTE that asserts RTS will see CTS asserted. However, the device will not perform hardware flow control.

4.4 BNC Ports

The following BNC ports are available on the PTP module:



Port	Function
TTL OUT	IRIG-B PWM or 1 PPS signal output, software selectable
TTL IN	TTL-level IRIG-B PWM signal input

① TTL OUT Port
② Sync LED
③ TTL IN Port

Figure 4.12 PTP Module

Inputs are controlled by RUGGEDCOM RS416 and only one can be active at any time. For information about activating an input, refer to the "RUGGEDCOM RS416 User Guide" for the RUGGEDCOM RS416.

The color of the **Sync** LED on the front panel of the PTP module indicates the status of the incoming timing signal:

- **Green** – Signal locked
- **Amber/Yellow** – Holdover (GPS lock has been achieved, but the receiver no longer sees the minimum number of required satellites)

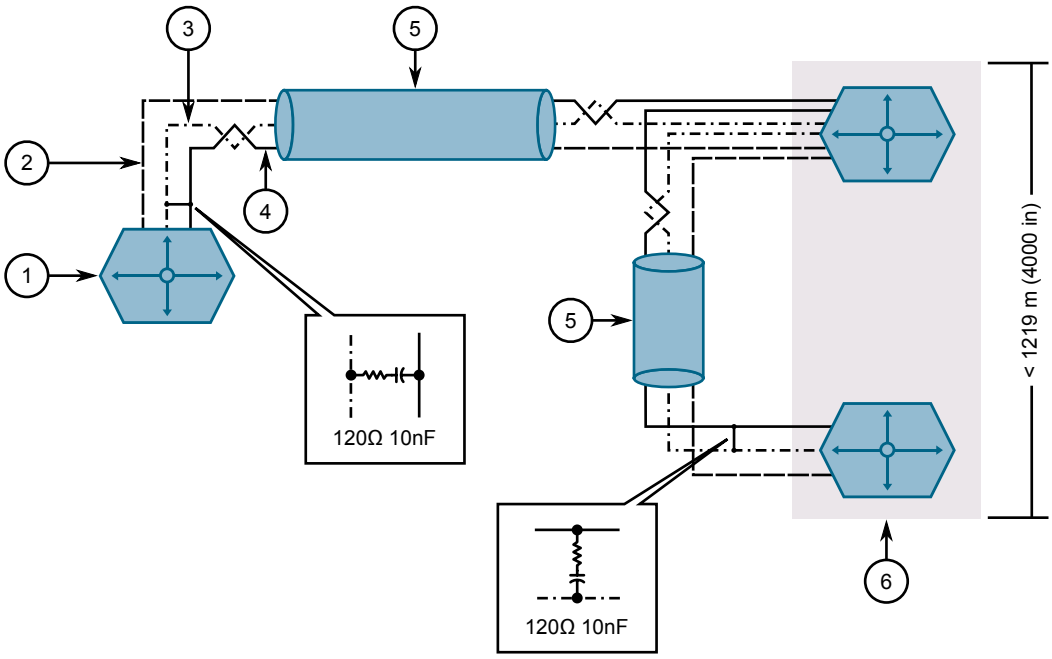
- **Red** – Error
- **Off** – No signal detected

4.5 Connecting Multiple RS485 Devices

Each RS485 port can communicate with multiple RS485 devices by wiring devices together in sequence over a single twisted pair with transmit and receive signals on the same two wires (half duplex). For reliable, continuous communication, adhere to the following guidelines:

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

The following shows the recommended RS485 wiring.



① RUGGEDCOM RS416
② Common (Isolated Ground)
③ Negative
④ Positive
⑤ Shield to Earth (Connected At a Single Point)

⑥ RS485 Devices (32 Total)

Figure 4.13 Recommended RS485 Wiring

5 Technical Specifications

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

5.1 Power Supply Specifications

Power Supply Type	Input Range		Internal Fuse Rating[ab]	Isolation	Maximum Power Consumption[c]
	Minimum	Maximum			
12 VDC	10 VDC	36 VDC	6.3 A(F)	1.5 kVDC	25 W
24 VDC					
48 VDC	36 VDC	59 VDC	3.15 A(T)		
HI (125/250 VDC)[d]	88 VDC	300 VDC	2 A(T)	4 kVAC, 5.5 kVDC	
HI (110/230 VAC)[d]	85 VAC	264 VAC			

[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] *The HI power supply is the same power supply for both AC and DC.*

5.2 Failsafe Relay Specifications

Maximum Switching Voltage	Rated Switching Current
30 VAC	0.3 A, 1.0 A
80 VDC	0.3

5.3 Copper Ethernet Port Specifications

The following details the specifications for copper Ethernet ports that can be ordered with the RUGGEDCOM RS416.

Speed[a]	10/100Base-TX
Connector	RJ45
Duplex[a]	FDX/HDX
Cable Type[b]	> CAT-5
Wiring Standard[c]	TIA/EIA T568A/B

Maximum Distance[d]	100 m (328 ft)
Isolation[e]	1.5 kV

[a] *Auto-negotiating.*

[b] *Shielded or unshielded.*

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

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

[e] *RMS 1 minute.*

5.4 Fiber Optic Ethernet Port Specifications

The following details specifications for the fiber optic Ethernet ports that can be equipped on the RUGGEDCOM RS416.

10Base-FL Ethernet Optical Ports

Mode	Connector Type	Cable Type (µm)	Tx λ (nm)[a]	Tx Min. (dBm)	Tx Max. (dBm)	Rx Sensitivity (dBm)	Rx Saturation (dBm)	Distance (km)[a]	Power Budget (dB)
MM	ST	62.5/125	850	-16	-9	-34	-11.2	2	18
		50/125		-19.8	-12.8				14.2

[a] *Typical.*

Fast Ethernet (100 Mbps) Optical Ports

Mode	Connector Type	Cable Type (µm)	Tx λ (nm)[a]	Tx Min. (dBm)	Tx Max. (dBm)	Rx Sensitivity (dBm)	Rx Saturation (dBm)	Distance (km)[a]	Power Budget (dB)
MM	ST	62.5/125	1300	-19	-14	-31	-14	2	12
		50/125		-22.5					8.5
MM	SC	62.5/125	1300	-19	-14	-31	-14	2	12
		50/125		-22.5					8.5
MM	MTRJ	62.5/125	1300	-19	-14	-31	-14	2	12
		50/125		-22.5					8.5
SM	ST	9/125	1300	-15	-8	-32	-3	20	17
SM	SC	9/125	1300	-15	-8	-31	-7	20	16
SM	LC	9/125	1300	-15	-8	-34	-7	20	19
SM	LC	9/125	1300	-15	-8	-34	-7	20	19
SM	SC	9/125	1300	-5	0	-34	-3	50	29
SM	LC	9/125	1300	-5	0	-35	3	50	30
SM	SC	9/125	1300	0	5	-37	0	90	37
SM	LC	9/125	1300	0	5	-37	0	90	37

[a] *Typical.*

5.5 Serial Port Specifications

This section details specifications for ports that can be equipped on the RUGGEDCOM RS416.

Copper Serial Ports

Baud Rate	Connector	Isolation
1200 to 230400 kbps	DB9	2.5 kV
1200 to 230400 kbps	RJ45	2.5 kV
1200 to 230400 kbps	DB9	2.5 kV
1200 to 230400 kbps	RJ45	2.5 kV

Fiber Serial Ports

Mode	Connector	Typical Distance (km)	Optical Wavelength (nm)	Cable Size
Multimode	ST	5	850	50/125
				62.5/125

5.6 IRIG-B Port Specifications

IRIG-B PWM Input Specifications

Parameter	Specification
Input Voltage	TTL-Compatible
Input Impedance	> 200 kΩ

IRIG-B PWM Output Specifications

Parameter	Specification
Output Current (I_s)	100 mA
Output Voltage (V_s)	TTL-Compatible
Output Impedance (R_s)	50 Ω

5.7 Operating Environment

The RUGGEDCOM RS416 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] *Measured from a 30 cm (12 in) radius surrounding the center of the enclosure.*

[b] *Non-condensing.*

5.8 Mechanical Specifications

Weight	4.5 kg (10 lbs)
Ingress Protection	IP20
Enclosure	18 AWG Galvanized Steel

5.9 Dimension Drawings

Note

All dimensions are in millimeters, unless otherwise stated.

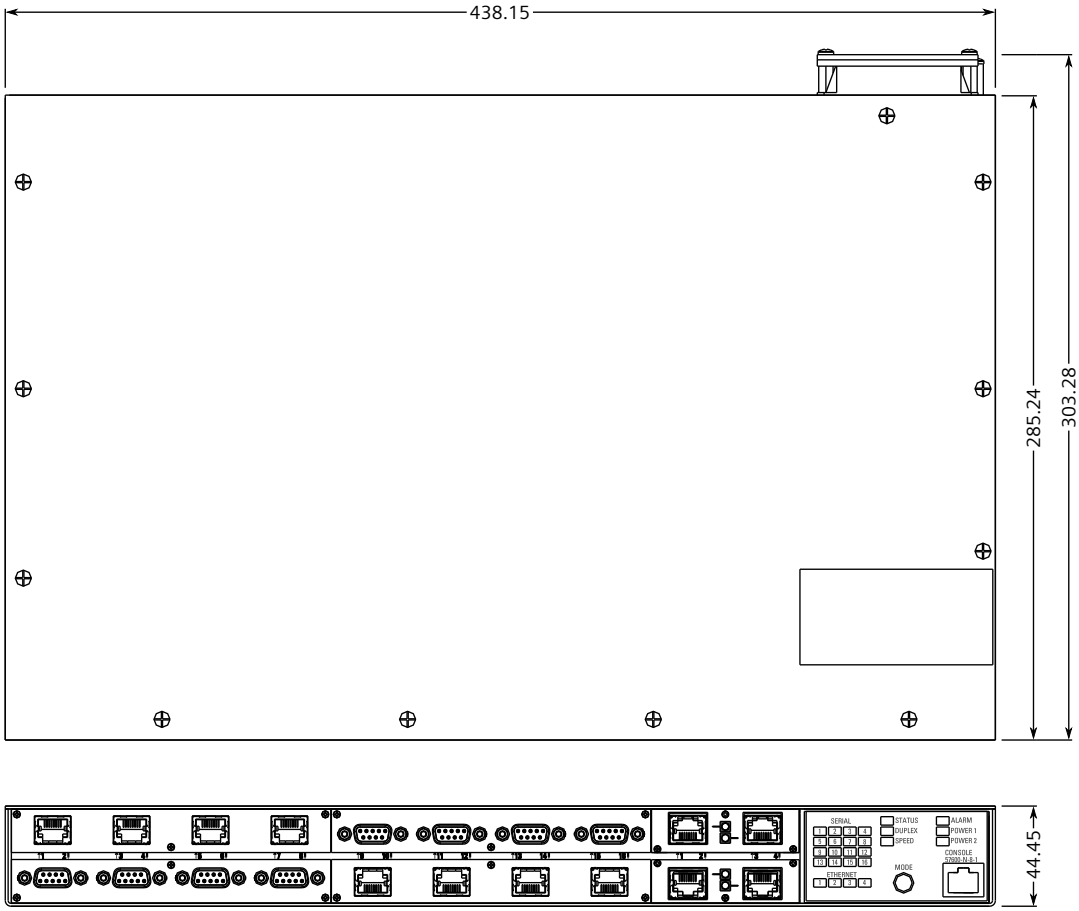


Figure 5.1 Overall Dimensions

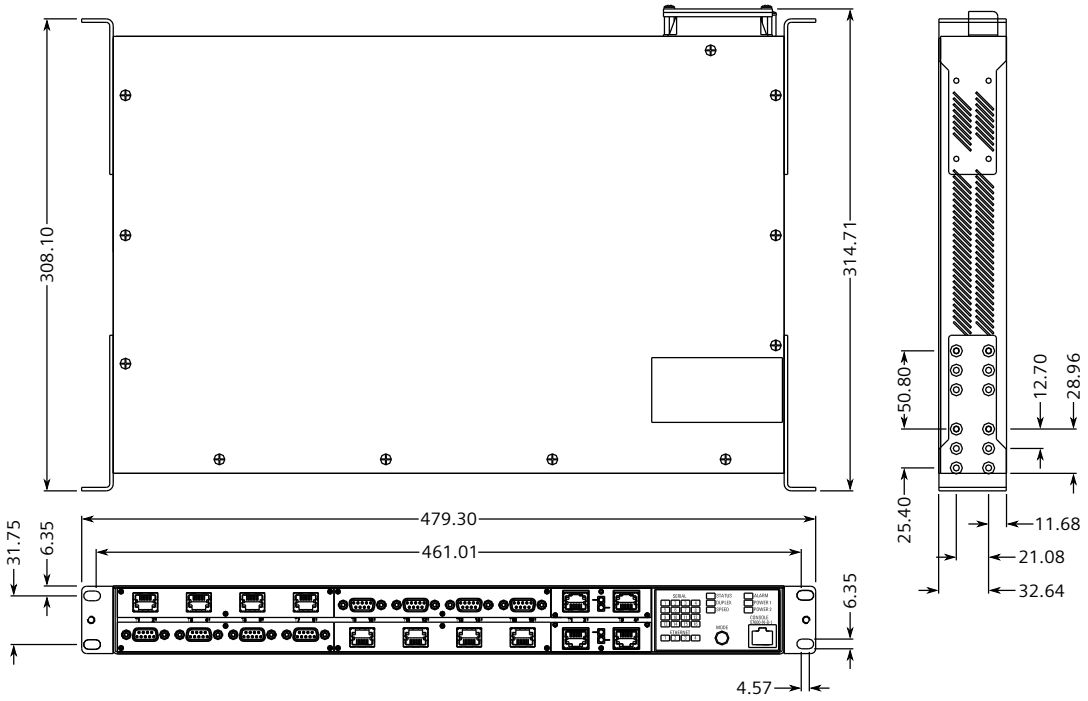


Figure 5.2 Rack Mount Dimensions

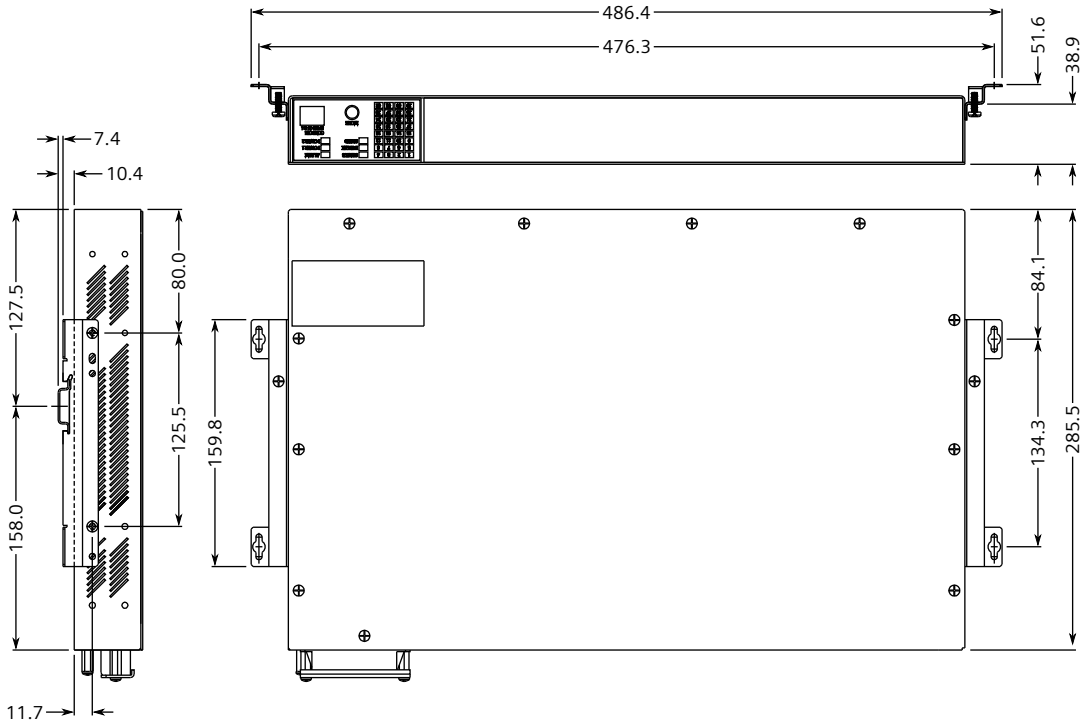


Figure 5.3 Panel and DIN Rail Mount Dimensions

6 Certification

The RUGGEDCOM RS416 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 RS416 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 meets the requirements of the following Canadian Standards Association (CSA) standards under certificate 16.70023156:

- **CAN/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 device is marked with a CSA symbol that indicates compliance with both Canadian and U.S. 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 FDA/CDRH

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

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

6.1.6 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)

6.1.7 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

6.1.8 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.

6.1.9 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.

6.1.10 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**
  Communication Networks and Systems for Power Utility Automation - Part 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 RS416 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

Test	Description		Test Levels	Severity Levels
		Enclosure Air	± 15 kV	4
IEC 61000-4-3	Radiated RFI	Enclosure ports	20 V/m	Note[a]
IEC 61000-4-4	Burst (Fast Transient)	Signal ports	± 4 kV @ 2.5 kHz	Note[a]
		DC Power ports	± 4 kV	4
		AC Power ports	± 4 kV	4
		Earth ground ports	± 4 kV	4
IEC 61000-4-5	Surge	Signal ports	2 kV	3
		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	100 A/m	Note[a]
			1000 A/m for 3 s	5
IEC 61000-4-29	Voltage Dips and Interrupts	DC Power ports	30% for 0.1 s, 100% for 0.05 s	
IEC 61000-4-11		AC Power ports	30% for 1 period, 100% for 5 periods, 100% for 250 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
		DC Power ports	30 V Continuous, 300 V for 1 s	4
IEC 61000-4-17	Ripple on DC Power Supply	DC Power ports	± 15%	4
EC 60225-27	Dielectric Strength	Signal ports	2 kVAC (Fail-Safe Relay output)	
		DC Power ports	1.5 kV	
		AC Power ports	2 kV	

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

[a] *Siemens specified severity level.*

IEEE 1613 EMC Immunity Type Tests

Note

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

Environmental Type Tests

Test	Description		Test Levels	Severity Levels
IEC 60068-2-1	Cold Temperature	Test Ad	-40 °C (-40 °F), 16 Hours	
IEC 60068-2-2	Dry Heat	Test Bd	85 °C (185 °F), 16 Hours	

Test	Description		Test Levels	Severity Levels
IEC 60068-2-30	Humidity (Damp Heat, Cyclic)	Test Db	95% (non-condensing), 55 °C (131 °F), 96 hours	
IEC 60068-2-6	Vibration		2 g @ 10-150 Hz	Class 2
IEC 60068-2-27	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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