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Edition 11/2022

Installation Manual

SIMATIC NET

Rugged Ethernet Switches

RUGGEDCOM RS900

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Rugged Ethernet Switches RUGGEDCOM RS900

Installation Manual

11/2022
C79000-G8976-1024-15

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.

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

⚠ WARNING

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

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

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.

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Trademarks

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.

Digital Industries
Process Automation
300 Applewood Crescent
Concord, Ontario, L4K 4E5
Canada

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Table of Contents

Preface

This guide describes the RUGGEDCOM RS900. 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/109737197

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 RS900 is available online at https://support.industry.siemens.com. To request or inquire about a user document, contact Siemens Customer Support.

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

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

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

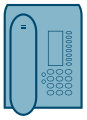
For more information about training services and course availability, visit https://www.siemens.com or contact a Siemens Sales representative.

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:

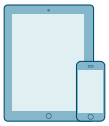
Online

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

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 RS900 is a 9-port utility-grade, fully managed Ethernet switch specifically designed to operate reliably in electrically harsh and climatically demanding environments.

The RUGGEDCOM RS900 provides a high level of immunity to electromagnetic interference and heavy electrical surges typical of environments found on plant floors and curb-side traffic control cabinets. An operating temperature range of -40 to 85 °C (-40 to 185 °F), optional conformal coating, and a galvanized steel enclosure allows the RUGGEDCOM RS900 to be placed in almost any location.

The RUGGEDCOM RS900 can be mounted on a DIN rail or panel for efficient use of cabinet space.

The integrated power supply supports a wide range of voltages (88-300 VDC or 85-264 VAC) for worldwide operability, as well as dual-redundant, reversible polarity, 24 VDC and 48 VDC power supply inputs for high availability applications requiring dual or backup power inputs.

The RUGGEDCOM RS900's superior ruggedized design and embedded RUGGEDCOM Rugged Operating System (ROS) provides superior system reliability and advanced networking features making it ideally suited for creating Ethernet networks for mission-critical, real-time, control applications.

1.1 Feature Highlights

Ethernet Ports

- 6 x 10/100Base-TX copper Ethernet ports
- [Optional] Up to 3 x additional 10/100Base-TX copper or 10/100Base-FX fiber optic Ethernet ports
- Multi-mode and single-mode optical transceivers
- Long haul optics allow distances up to 90 km (56 mi)
- Industry standard fiber optical connectors: LC, SC, ST, MTRJ

Rated for Reliability in Harsh Environments

- Immunity to EMI and heavy electrical surges
- -40 to 85 °C (-40 to 185 °F) ambient operating temperature (no fans)
- 20 AWG Galvanized Steel

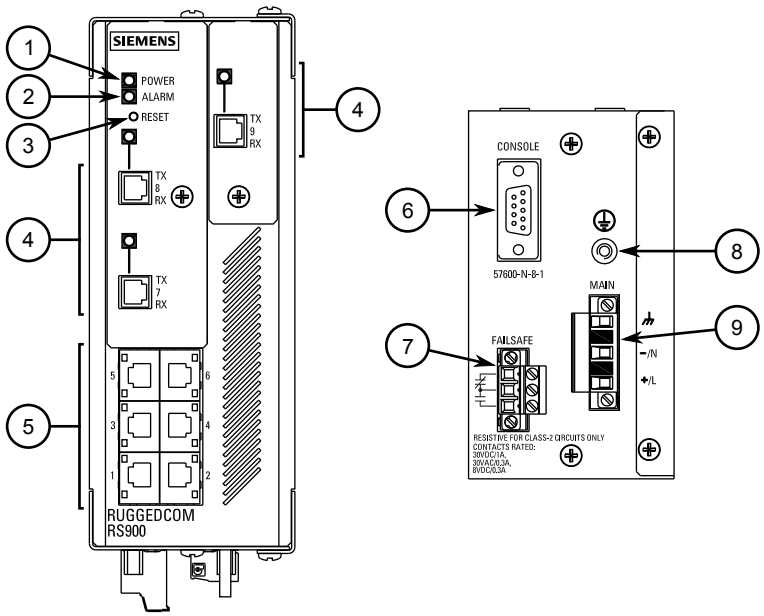
- DIN or panel mounting options provide secure mechanical reliability
- [Optional] Conformal coated printed circuit boards

Power Supply

- Fully integrated power supply
- Universal high-voltage range: 88-300 VDC or 85-264 VAC
- Dual LO DC inputs: 24 or 48 VDC
- Terminal blocks for reliable maintenance free connections
- CSA/UL 62368-1 safety approved to 85 °C (185 °F)

1.2 Description

The RUGGEDCOM RS900 features various ports, controls and indicator LEDs on the front panel for connecting, configuring and troubleshooting the device.



① POWER LED
② ALARM LED
③ RESET Button
④ [Optional] Copper (10/100Base-TX) or Fiber Optic (100Base-FX) Ethernet Ports
⑤ Copper (10/100Base-TX) Ethernet Ports
⑥ RS232 Console Port (Serial)
⑦ Failsafe Alarm Relay
⑧ Chassis Ground Connection
⑨ Power Supply Terminal Block

Figure 1.1 RUGGEDCOM RS900

POWER LED	Illuminates green during boot up and when power is supplied to the device.
ALARM LED	Illuminates red when an alarm condition exists.
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 15).
RESET Button	Shuts down and restarts the device. For more information, refer to "Resetting the Device" (Page 16).
Communication Ports	Communication ports in general receive and transmit data, as well as provide access to the RUGGEDCOM ROS Web interface. For more information about the various ports available, refer to "Communication Ports" (Page 17).
Failsafe Alarm Relay	Latches to default state when a power disruption or other alarm condition occurs. For more information, refer to: • "Connecting the Failsafe Alarm Relay" (Page 9) • "Failsafe Alarm Relay Specifications" (Page 21)
Power Supply Terminal Blocks	Pluggable terminal blocks for connecting one or more power sources. For more information, refer to "Connecting Power" (Page 10) and "Power Supply Specifications" (Page 21).

1.3 Required Tools and Materials

The following tools and materials are required to install the RUGGEDCOM RS900:

Tools/Materials	Purpose
AC power cord (16 AWG)	For connecting power to the device.
Multi-mode and/or single-mode fiber optic cables	For connecting the device to a LAN.
CAT-5 Ethernet cables	For connecting the device to a LAN.
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 I standards. This means that during a transient electrical event, communications errors or interruptions may occur, but recovery is automatic.

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

1.5.1 Supported Fiber Optic Cables

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

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

[a] *Laser optimized.*

2 Installing the Device

This chapter describes how to install the device, including mounting the device, connecting power, and connecting the device to the network.

⚠ DANGER

Electrocution hazard – risk of serious personal injury and/or damage to equipment

Before performing any maintenance tasks, make sure all power to the device has been disconnected and wait approximately two minutes for any remaining energy to dissipate.

⚠ WARNING

Radiation hazard – risk of serious personal injury

This product contains a laser system and is classified as a *Class I 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:

Note

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 27).
2. Mount the device.
3. Connect the failsafe alarm relay.
4. Connect power to the device and ground the device to safety Earth.
5. Connect the device to the network.
6. Configure the device.

2.2 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 RS900 is designed for maximum mounting and display flexibility. It can be equipped with adapters that allow it to be attached to a DIN rail or panel.

Note

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 DIN rail or panel hardware installed, refer to "Dimension Drawings" (Page 23).

2.3.1 Mounting the Device on a DIN Rail

The RUGGEDCOM RS900 can be ordered with a DIN rail adapter preinstalled on the back of the chassis. Use the adapter to mount the device to a standard 35 mm (1.4 in) IEC/EN 60715 or TS35 DIN rail.

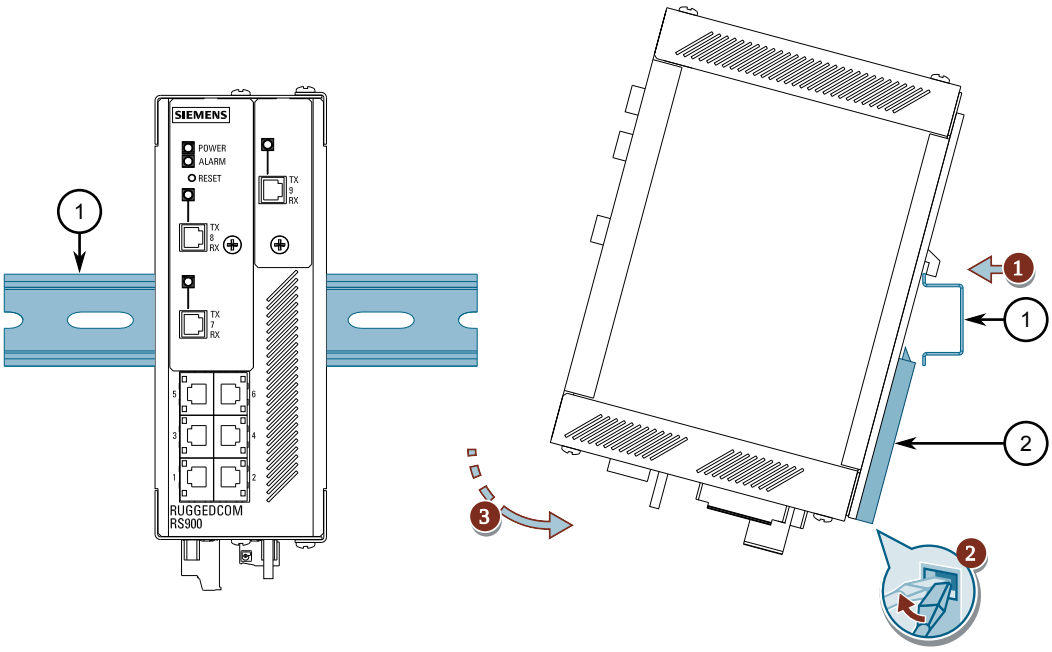
Mounting the Device

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

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

   Note

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



① DIN Rail
② DIN Rail Adapter

Figure 2.1 Mounting the Device to a DIN Rail

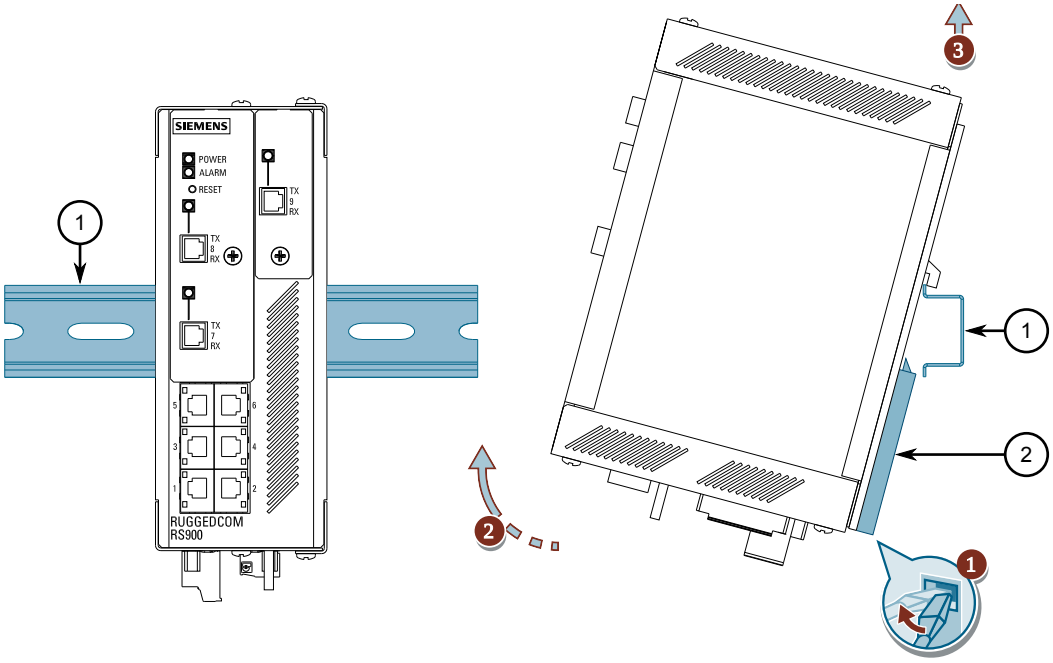
2. Insert a flathead screwdriver into the slot of the sliding release and move it down.

3. Push the device against the bottom of the DIN rail, then let go of the sliding release to latch the device.

Removing the Device

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

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



① DIN Rail
② DIN Rail Adapter

Figure 2.2 Removing the Device from a DIN Rail

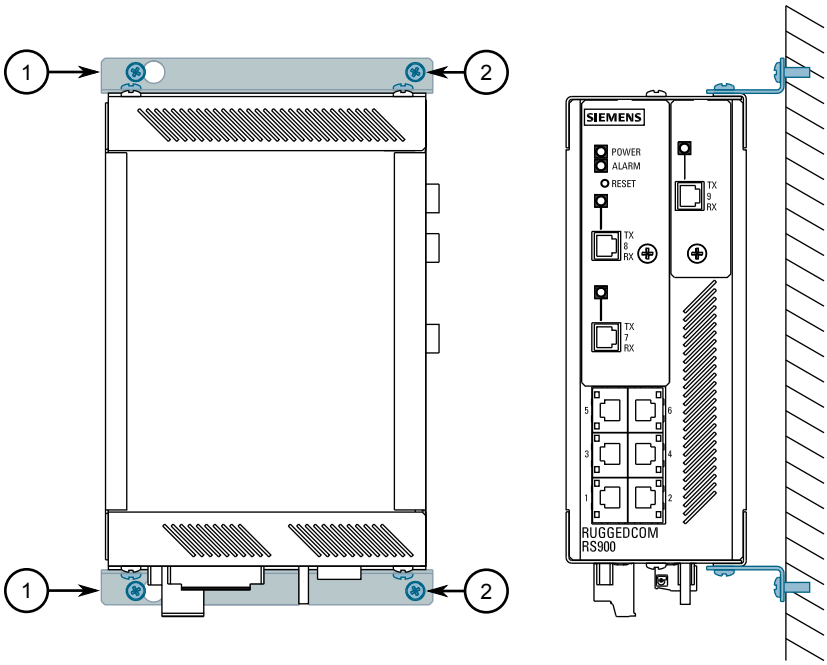
2. Swing the bottom of the device away from the DIN rail.
3. Lift the device off the DIN rail.

2.3.2 Mounting the Device to a Panel

For panel installations, the RUGGEDCOM RS900 can be equipped with panel adapters pre-installed on the top and bottom 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. Prepare mounting holes in the panel where the device is to be installed.
2. Place the device against the panel and align the adapters with the mounting holes.



① Screw (M3.5 or #6-32)
② Panel Mount Adapter

Figure 2.3 Panel Mounting

3. Secure the adapters to the panel with M3.5 or #6-32 screws.

2.4 Connecting the Failsafe Alarm Relay

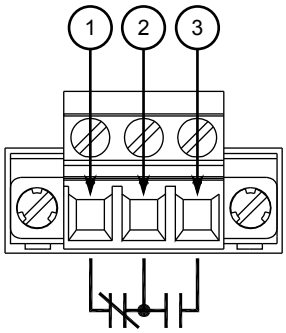
The failsafe relay can be configured to latch based on alarm conditions. The NO (Normally Open) contact is closed when the unit is powered and there are no active alarms. If the device is not powered or if an active alarm is configured, the relay opens the NO contact and closes the NC (Normally Closed)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

Note

Control of the failsafe relay output is configurable through RUGGEDCOM RS900. 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 RS900.

To connect the failsafe alarm relay, do the following:

1. Insert the failsafe alarm relay terminal block into the device and tighten the screws.
2. Connect a failsafe device to the terminal block.



① Normally Closed
② Common
③ Normally Open

Figure 2.4 Failsafe Alarm Relay Wiring

2.5 Connecting Power

The RUGGEDCOM RS900 supports power input from a single high AC/DC or low DC power supply.

Note

- For 110/230 VAC rated equipment, an appropriately rated AC circuit breaker must be installed.
- For 125/250 VDC rated equipment, an appropriately rated DC circuit breaker must be installed.
- Use minimum #16 gage copper wiring when connecting terminal blocks.
- Equipment must be installed according to applicable local wiring codes and standards.
- All line-to-ground transient energy is shunted to the Surge Ground terminal. In cases where users require the inputs to be isolated from ground, remove the ground braid between Surge and Chassis Ground. Note that all line-to-ground transient protection circuitry will be disabled.

2.5.1 Connecting High AC/DC Power

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

⚠ NOTICE

Electrical hazard – risk of damage to equipment

Do not connect AC power cables to terminals for DC power. Damage to the power supply may occur.

⚠ NOTICE

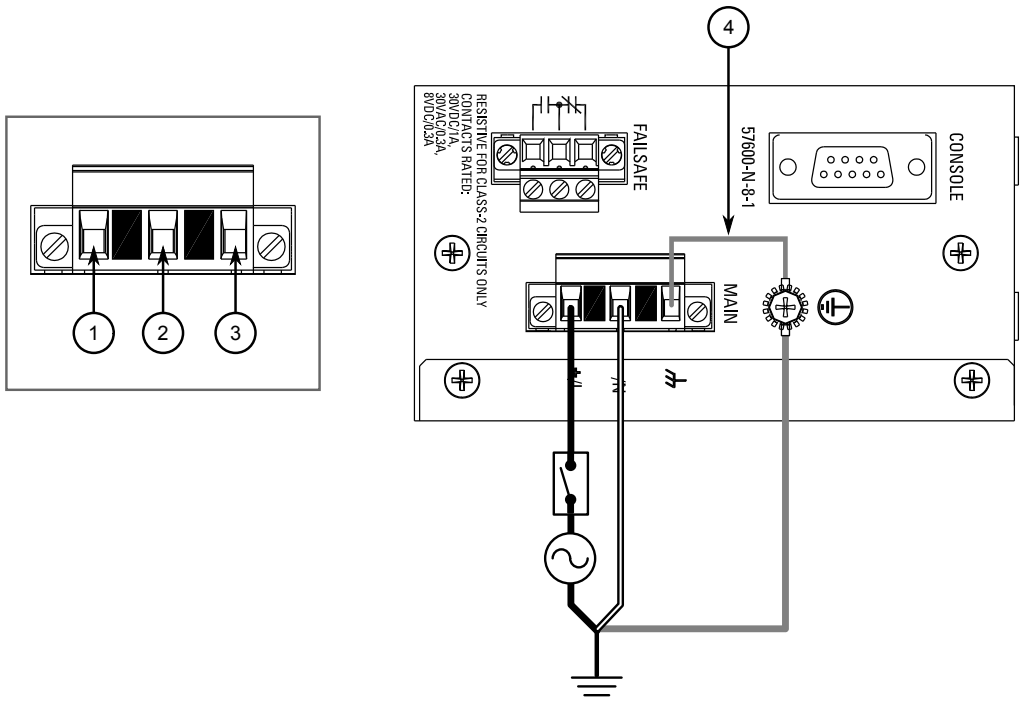
Electrical hazard – risk of damage to equipment

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

Note

Torque all terminal connections to 0.6 N·m (5 lbf-in).

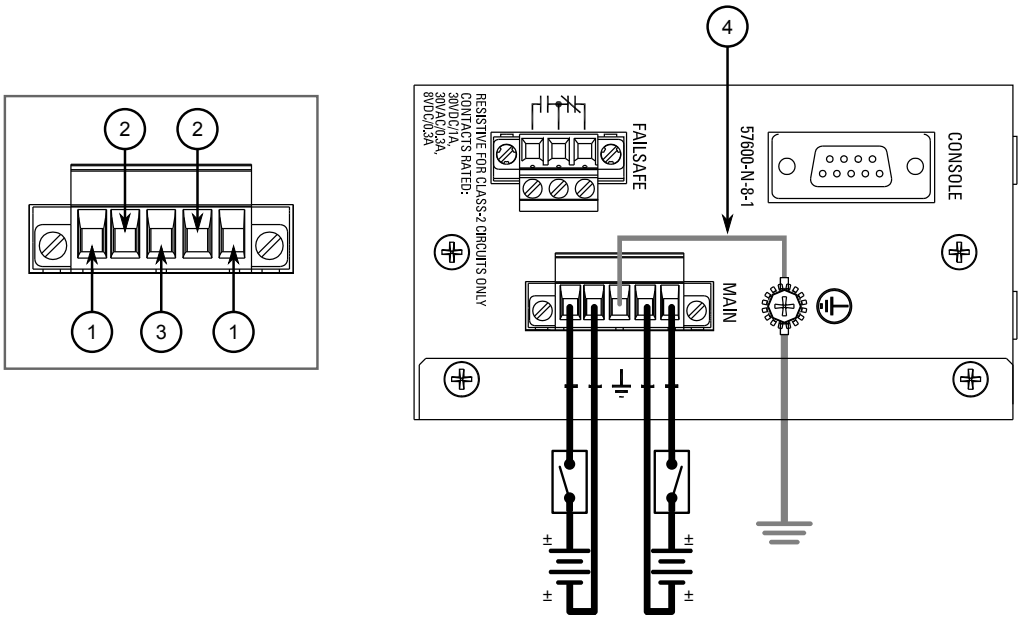
1. Secure the power terminal block to the device.
2. Connect the positive wire from the power source to the positive/live (+/L) terminal on the terminal block.



① Positive/Live (+/L) Terminal
② Negative/Neutral (-/N) Terminal
③ Surge Ground Terminal

④ Braided Ground Cable

Figure 2.5 Terminal Block Wiring



① Positive Terminal
② Negative Terminal
③ Surge Ground Terminal
④ Braided Ground Cable

Figure 2.6 Terminal Block Wiring – Dual DC Power Supply Inputs

3. Connect the negative wire from the power source to the negative/neutral (-/N) terminal on the terminal block.
4. Connect the ground wire from the power source to the chassis groun terminal on the terminal block.

2.5.2 Connecting Low DC Power

RUGGEDCOM RS900's equipped with 24 or 48 V power supply inputs feature reverse polarity protection and dual power supply inputs allowing the device to accept redundant connections to a single DC power supply.

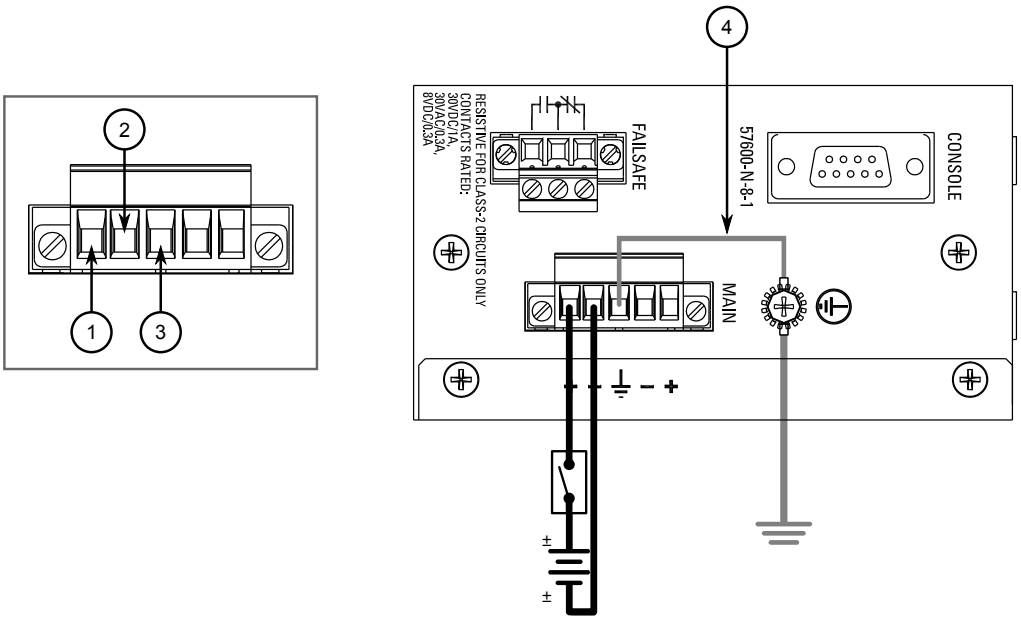
To connect a low DC power supply to the device, do the following:

Note

Torque all terminal connections to 0.6 N·m (5 lbf-in).

1. Secure the power terminal block to the device.

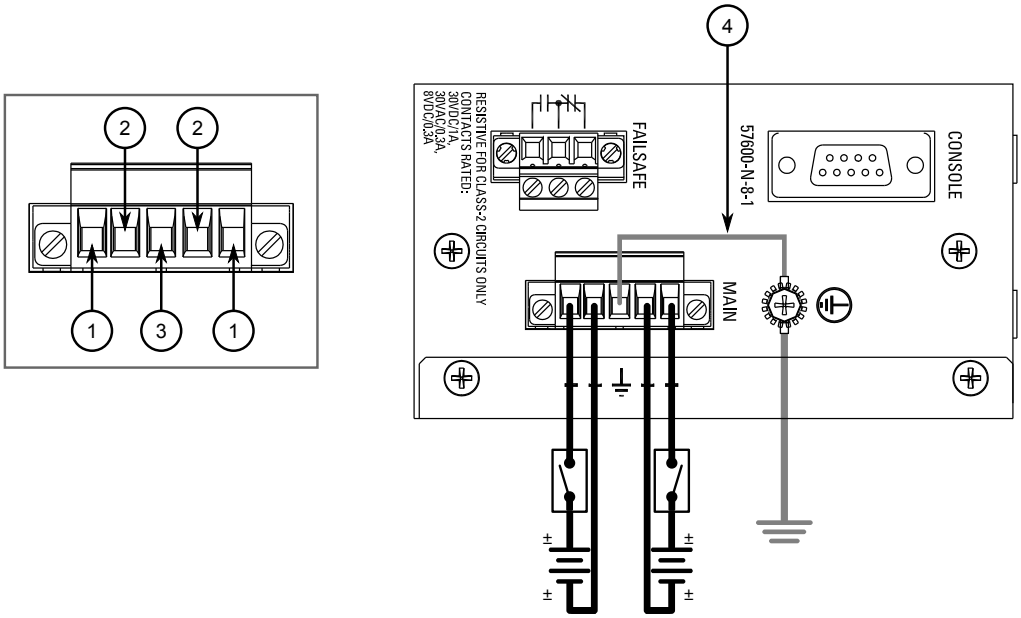
2. Connect the positive wire from the power source to the positive terminal on the terminal block.



① Positive Terminal
② Negative Terminal
③ Surge Ground Terminal
④ Braided Ground Cable

Figure 2.7 Terminal Block Wiring – Single DC Power Supply Inputs

3. Connect the negative wire from the power source to the negative terminal on the terminal block.
4. [Optional] If a redundant connection is required, repeat step 2 (Page 13) and step 3 (Page 13) to connect the secondary power inputs.



① Positive Terminal
② Negative Terminal
③ Surge Ground Terminal
④ Braided Ground Cable

Figure 2.8 Terminal Block Wiring – Dual DC Power Supply Inputs

5. Using a braided wire or other appropriate grounding wire, connect the surge ground terminal to the chassis ground connection. The surge ground terminal is used as the ground conductor for all surge and transient suppression circuitry internal to the unit.
6. Connect the ground wire from the power source to the chassis groun terminal on the terminal block.

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 RS900 console and Web interfaces on the device. For more detailed instructions, refer to the "RUGGEDCOM ROS Configuration Manual" for the RUGGEDCOM RS900.

Console Port

Connect a workstation directly to the RS232 serial console port to access the boot-time control and RUGGEDCOM ROS console interface. The console port provides access to RUGGEDCOM RS900's console interface.

Note

The serial console port is intended to be used only as a temporary connection during initial configuration or troubleshooting, and should only be used in a safe area (as defined by IEC 60079-0, Edition 6.0).

Use the following settings to connect to the port:

Speed	57600 baud
Data Bits	8
Stop Bit	1
Parity	None
Flow Control	Off
Terminal ID	VT100

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

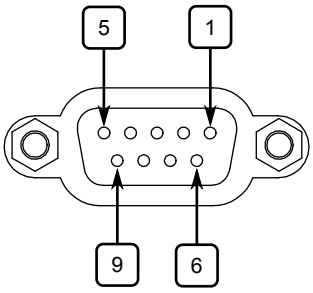


Figure 3.1 Serial DB9 Console Port

Pin	Name	Description
1[a]	Reserved (Do Not Connect)	
2	TX	Transmit Data
3	RX	Receive Data
4[a]	Reserved (Do Not Connect)	
5	GND	Signal Ground
6[a]	Reserved (Do Not Connect)	
7[b]	Reserved (Do Not Connect)	
8[b]	Reserved (Do Not Connect)	
9	Reserved (Do Not Connect)	

[a] *Connected internally.*

[b] *Connected internally.*

Ethernet Ports

Connect any of the available Ethernet ports on the device to a management switch and access the RUGGEDCOM RS900 console and Web interfaces via the device's IP address. The factory default IP address for the RUGGEDCOM RS900 is https://192.168.0.1.

For more information about available ports, refer to "Communication Ports" (Page 17).

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 RS900 interface. For more information about configuring the device, refer to the "RUGGEDCOM ROS Configuration Manual" associated with the installed software release.

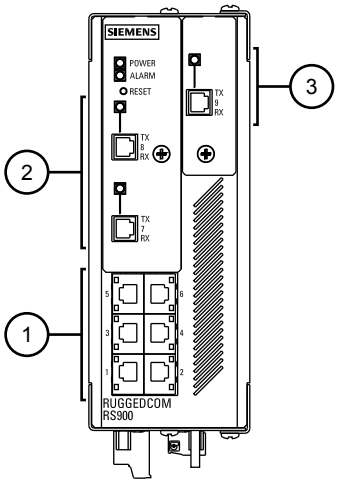
3.3 Resetting the Device

The RUGGEDCOM RS900 can be reset (rebooted) using the **RESET** button. The **RESET** button is recessed and can only be reached using a pin or small screwdriver.

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

4 Communication Ports

The RUGGEDCOM RS900 can be equipped with various types of communication ports to enhance its abilities and performance.



① Ports 1 to 6
② Ports 7 and 8
③ Port 9

Figure 4.1 Port Assignment

Port	Type
1 to 6	Copper Ethernet Ports (10/100Base-TX)
7 and 8	Copper (10/100Base-TX) or Fiber Optic (100Base-FX) Ethernet Ports
9	Fast Ethernet Port (10/100Base-TX or 100Base-FX)

4.1 Copper Ethernet Ports

The RUGGEDCOM RS900 supports multiple 10/100Base-TX Ethernet ports that allow connection to standard Category 5 (CAT-5) shielded or unshielded twisted-pair cables with RJ45 male connectors.

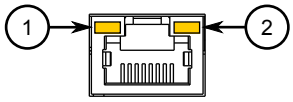
⚠ WARNING

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

When 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 **Speed** and **Link/Activity** LED that indicates the state of the port.



① Speed LED
② Link/Activity LED

Figure 4.2 RJ45 Port LEDs

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

Pin-Out

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

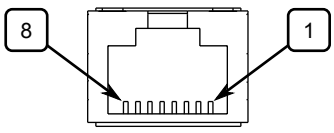


Figure 4.3 RJ45 Ethernet Port Pin Configuration

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

Pin	Name	Description
5	Reserved (Do Not Connect)	
6	TX-	Transmit Data-
7	Reserved (Do Not Connect)	
8	Reserved (Do Not Connect)	

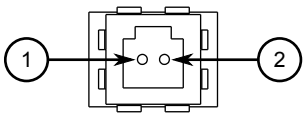
Specifications

For specifications on the available copper Ethernet ports, refer to "Copper Ethernet Port Specifications" (Page 22).

4.2 Fiber Optic Ethernet Ports

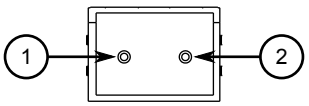
Fiber optic Ethernet ports are available with either MTRJ (Mechanical Transfer Registered Jack), LC (Lucent Connector), SC (Standard or Subscriber Connector) or ST (Straight Tip) connectors. Make sure the Transmit (Tx) and Receive (Rx) connections of each port are properly connected and matched to establish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

Port Types



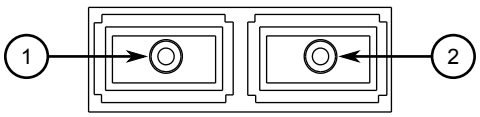
① Tx Connector
② Rx Connector

Figure 4.4 MTRJ Port



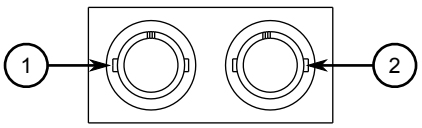
① Tx Connector
② Rx Connector

Figure 4.5 LC Port



① Tx Connector
② Rx Connector

Figure 4.6 SC Port



① Tx Connector
② Rx Connector

Figure 4.7 ST Port

LEDs

Each port features an LED that indicates the link/activity state of the port.

State	Description
Yellow (Solid)	Link established

State	Description
Yellow (Blinking)	Link activity
Off	No link detected

Specifications

For specifications on the available fiber optic Ethernet ports, refer to "Fiber Optic Ethernet Port Specifications" (Page 22).

5 Technical Specifications

This section provides important technical specifications related to the device.

5.1 Power Supply Specifications

Note

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

Power Supply Type	Input Voltage		Internal Fuse Rating[a]	Isolation	Maximum Power Consumption[b]
	Minimum	Maximum			
HI	88 VDC	300 VDC	3.15 A(T)	4 kVAC	10 W
	85 VAC	264 VAC	3.15 A(T)	5.5 kVDC	10 W
24	10 VDC	36 VDC	3.15 A(T)	1.5 kVDC	10 W
48	37 VDC	72 VDC	3.15 A(T)	1.5 kVDC	10 W

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

[b] *Power consumption may vary based on configuration.*

5.2 Failsafe Alarm Relay Specifications

Maximum Switching Voltage	Rated Switching Current	Isolation
30 VDC	2 A, 60 W	1500 V_{rms} for 1 minute
125 VDC	0.24 A, 30 W	
125 VAC	0.5 A, 62.5 W	
220 VDC	0.24 A, 60 W	
250 VAC	0.25 A, 62.5 W	

5.3 Supported Networking Standards

The following networking standards are supported by RUGGEDCOM RS900:

Standard	10 Mbps Ports	100 Mbps Ports	1000 Mbps Ports	Notes
IEEE 802.3x	•	•	•	Full Duplex Operation

Standard	10 Mbps Ports	100 Mbps Ports	1000 Mbps Ports	Notes
IEEE 802.3z			•	1000Base-LX
IEEE 802.3ab			•	1000Base-Tx
IEEE 802.1D	•	•	•	MAC Bridges
IEEE 802.1Q	•	•	•	VLAN (Virtual LAN)
IEEE 802.1p	•	•	•	Priority Levels

5.4 Copper Ethernet Port Specifications

The following details the specifications for copper Ethernet ports that can be ordered with the RUGGEDCOM RS900.

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]	2.5 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.*

5.5 Fiber Optic Ethernet Port Specifications

The following details the specifications for fiber Ethernet ports that can be ordered with the RUGGEDCOM RS900.

Note

- All optical power numbers are listed as dBm averages. To convert from average to peak, add 3 dBm. To convert from peak to average, subtract 3 dBm.
- Maximum segment length is greatly dependent on factors such as fiber quality, and the number of patches and splices. Consult a Siemens sales associate when determining maximum segment distances.

Mode	Connector Type	Tx λ (nm)[a]	Cable Type (µm)	Tx (dBm)		Rx Sensitivity (dBm)	Rx Saturation (dBm)	Distance (km)[a]	Power Budget (dB)
				Minimum	Maximum				
MM	MTRJ	1300	50/125	-22.5	-14	-33.5	-14	2	11
			62.5/125	-19	-14	-33.5	-14	2	14.5

Mode	Connector Type	Tx λ (nm)[a]	Cable Type (µm)	Tx (dBm)		Rx Sensitivity (dBm)	Rx Saturation (dBm)	Distance (km)[a]	Power Budget (dB)
				Minimum	Maximum				
MM	SC	1300	50/125	-22.5	-14	-33.9	-14	2	11.4
			62.5/125	-19	-14	-33.9	-14	2	14.9
MM	ST	1300	50/125	-22.5	-14	-33.9	-14	2	11.4
			62.5/125	-19	-14	-33.9	-14	2	14.9
MM	LC	1310	62.5/125	-19	-14	-32	-14	2	13
SM	ST	1310	9/125	-15	-7	-34	-3	20	19
SM	LC	1300	9/125	-15	-8	-38	-3	20	23
SM	LC	1310	9/125	-5	0	-35	-3	50	30
SM	LC	1310	9/125	0	5	-37	0	90	37
SM	SC	1300	9/125	-15	-8	-31	-7	20	16
SM	SC	1310	9/125	-5	0	-34	-3	50	29
SM	SC	1310	9/125	5	0	-37	0	90	42

[a] *Typical.*

5.6 Operating Environment

The RUGGEDCOM RS900 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.*

5.7 Mechanical Specifications

Weight	1.2 kg (2.7 lbs)
Ingress Protection	IP30
Enclosure	20 AWG Galvanized Steel

5.8 Dimension Drawings

Note

All dimensions are in millimeters, unless otherwise stated.

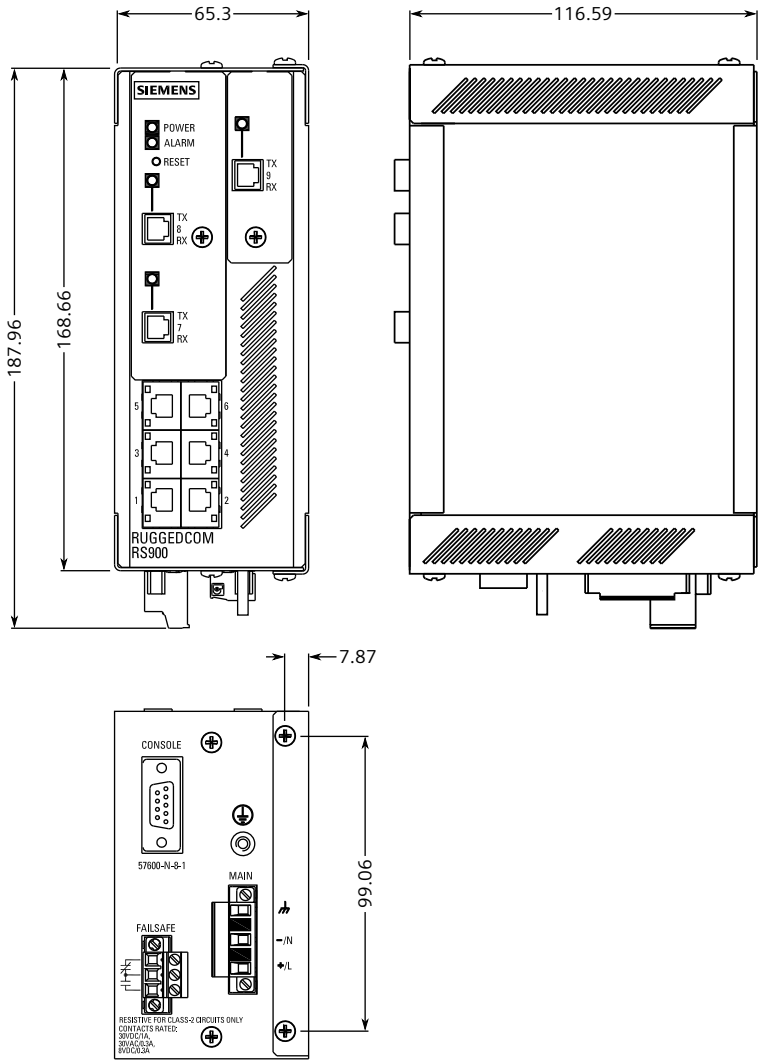


Figure 5.1 Overall Dimensions

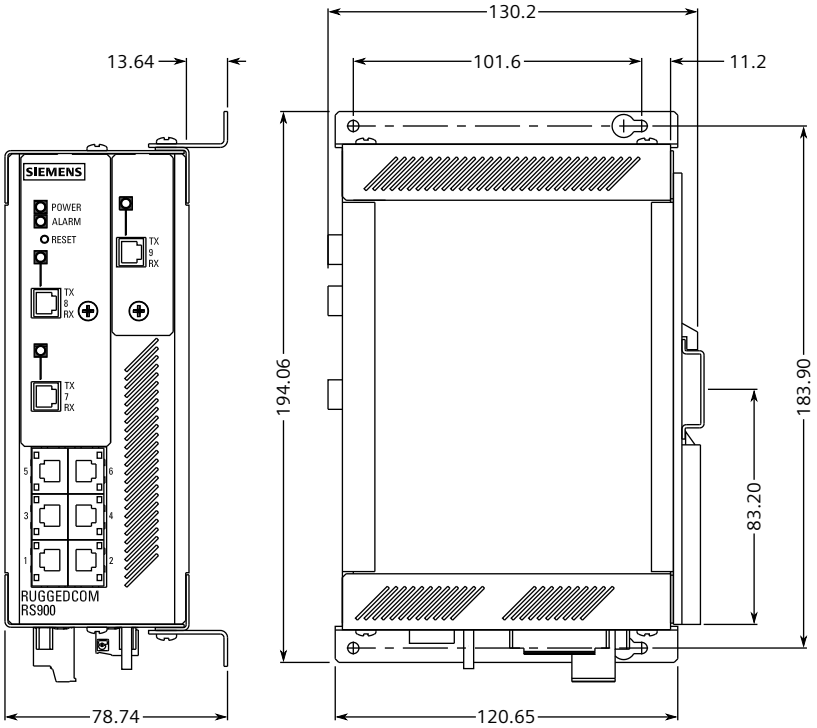


Figure 5.2 Panel and DIN Rail Mount Dimensions

6 Certification

The RUGGEDCOM RS900 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 RS900 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 and U.S. standards under certificate 16.70065161:

- **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.

CE

6.1.4 FCC

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

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

Note

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 TÜV SÜD

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

- **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

6.1.8 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

6.1.9 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.

6.1.10 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.

6.1.11 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 61000-6-2**
  Electromagnetic Compatibility (EMC) – Part 6-2: Generic Standards – Immunity for Industrial Environments

- **IEC 61850-3**
  Communication Networks and Systems in Substations – Part 3: General Requirements
- **NEMA TS-2**
  Traffic Controller Assemblies with NTCIP Requirements

6.2 EMC and Environmental Type Tests

The RUGGEDCOM RS900 has passed the following Electromagnetic Compatibility (EMC) and environmental tests.

EMC Type Tests

Test	Description		Test Levels	Severity Levels
IEC 61000-4-2	ESD	Enclosure Contact	± 8 kV	4
		Enclosure Air	± 15 kV	4
IEC 61000-4-3	Radiated RFI	Enclosure Ports	20 V/m	
IEC 61000-4-4	Burst (Fast Transient)	Signal Ports	± 4 kV @ 2.5 kHz	x
		DC Power Ports	± 4 kV	4
		AC Power Ports	± 4 kV	4
		Earth Ground Ports	± 4 kV	4
IEC 61000-4-5	Surge	Signal Ports	± 4 kV Line-to-Ground ± 2 kV	4
		DC Power Ports	± 2 kV Line-to-Ground ± 1 kV Line-to-Line	3
		AC Power Ports	± 4 kV Line-to-Ground ± 2 kV Line-to-Line	4
IEC 61000-4-6	Induced (Conducted) RFI	Signal Ports	10 V	3
		DC Power Ports	10 V	3
		AC Power Ports	10 V	3
		Earth Ground Ports	10 V	3
IEC 61000-4-8	Magnetic Field	Enclosure Ports	40 A/m Continuous 1000 A/m for 1 s	
IEC 61000-4-11	Voltage Dips and Interrupts	AC Power Ports	100% for 5 Periods 100% for 50 Periods	

Test	Description		Test Levels	Severity Levels
IEC 61000-4-12	Damped Oscillatory	Signal Ports	2.5 kV Common Mode @ 1 MHz 1 kV Differential Mode @ 1 MHz	3
		DC Power Ports	2.5 kV Common Mode @ 1 MHz 1 kV Differential Mode @ 1 MHz	3
		AC Power Ports	2.5 kV Common Mode @ 1 MHz 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	10%	3
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	
IEC 60255-27	Dielectric Strength	Signal Ports	2 kV (Failsafe Relay Output)	
		DC Power Ports	1.5 kV	
		AC Power Ports	2 kV	
	HV Impulse	Signal Ports	5 kV (Failsafe Relay Output)	
		DC Power Ports	5 kV	
		AC Power Ports	5 kV	

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
ESD	Enclosure Contact	± 8 kV
	Enclosure Air	± 15 kV
Radiated RFI	Enclosure Ports	35 V/m

Description		Test Levels
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 @ 1 MHz
	DC Power Ports	2.5 kV Common and Differential Mode @ 1 MHz
	AC Power Ports	2.5 kV Common and Differential Mode @ 1 MHz
HV Impulse	Signal Ports	5 kV (Failsafe Relay)
	DC Power Ports	5 kV
	AC Power Ports	5 kV
Dielectric Strength	Signal Ports	2 kV (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	
IEC 60068-2-30	Humidity (Damp Heat, Cyclic)	Test Db	95% (Non-Condensing), 55 °C (131 °F), 6 Cycles	
IEC 60255-21-1	Vibration		2 g @ 10 to 150 Hz	Class 2
IEC 60255-21-2	Shock		30 g @ 11 ms	Class 2

For more information

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

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

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

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