SIEMENS

RUGGEDCOM RS900GP

Installation Guide

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Table of Contents

Preface

This guide describes the RUGGEDCOM RS900GP. It describes the major features of the device, installation, commissioning and important technical specifications.

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

CONTENTS

- "Alerts"
- "Related Documents"
- "Accessing Documentation"
- "Training"
- "Customer Support"

Alerts

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

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

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

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

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

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

Related Documents

Other documents that may be of interest include:

- RUGGEDCOM ROS User Guide [https://support.industry.siemens.com/cs/ww/en/view/109737198]

Accessing Documentation

The latest user documentation for RUGGEDCOM RS900GP is available online at
https://www.siemens.com/ruggedcom. To request or inquire about a user document, contact Siemens Customer
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Customer support is available 24 hours, 7 days a week for all Siemens customers. For technical support or general
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Telephone

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www.automation.siemens.com/mcms/aspa-db/en/automation-technology/Pages/default.aspx.

Mobile App

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

- Access Siemens' extensive library of support documentation, including FAQs and manuals
- Submit SRs or check on the status of an existing SR

- Contact a local Siemens representative from Sales, Technical Support, Training, etc.
- Ask questions or share knowledge with fellow Siemens customers and the support community

1 Introduction

The RUGGEDCOM RS900GP is an industrially hardened, fully managed Ethernet switch providing dual fiber optical Gigabit Ethernet ports and eight Fast Ethernet copper ports, each capable of supplying high power 802.3at compliant Power over Ethernet (PoE).

Designed to operate reliably in harsh industrial environments, the RUGGEDCOM RS900GP 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. An operating temperature range of -40 to 85 °C (-40 to 185 °F) coupled with optional conformal coating and a powder coated aluminum enclosure allows the RUGGEDCOM RS900GP to be placed in almost any location.

The embedded RUGGEDCOM ROS (Rugged Operating System) provides advanced networking features such as Enhanced Rapid Spanning Tree (eRSTP), Port Rate Limiting and a full array of intelligent functionality for high network availability and manageability.

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Section 1.1
Feature Highlights

Ethernet Ports

- Up to 2 x 100/1000Base-X fiber optic ports or 2 x 10/100/1000Base-TX copper ports
- 8 x 10/100Base-TX RJ45 802.3af/802.3at compliant PoE ports
- Data and power over a single Ethernet cable
- Auto-sensing ports provide power only to PoE end devices
- Compatible with RUGGEDCOM WIN CPE and Pico base stations
- Industry standard fiber optic connectors: LC, SC, ST and SFP pluggable optics
- Bi-directional simplex fiber support
- Long haul optics allow Gigabit distances up to 70 km (43.5 mi)

Rated for Reliability in Harsh Environments

- Immunity to EMI and heavy electrical surges
- -40 to 85°C (-40 to 185 °F) operating temperature (no fans)
- [Optional] Conformal coated printed circuit boards

Power Supply

- Single 54 VDC, 255 W (or greater) external power supply can deliver 30 W x 8 port per IEEE 802.3at

- Second power supply input for a redundant 54 V power supply

- Complies with IEEE 802.3af, 15 W x 8 output when using 48 VDC power supplies

Section 1.2

Description

The RUGGEDCOM RS900GP features various ports, controls and indicator LEDs on the front panel for connecting, configuring and troubleshooting the device.
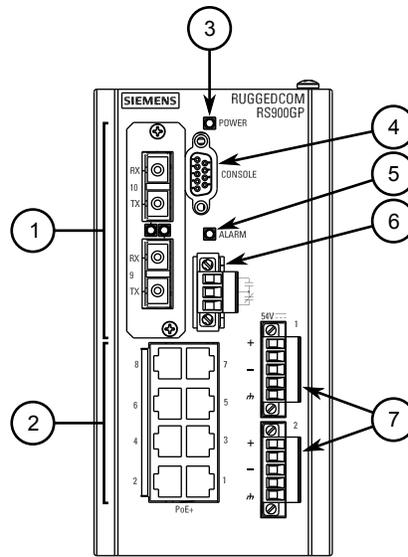
Figure 1: RUGGEDCOM RS900GP

1. Fiber Optic or SFP (Small Form-Factor Pluggable) Ethernet Ports   **2.** Copper PoE Ethernet Ports   **3.** POWER LED   **4.** RS-232 Console Port (DB9)   **5.** ALARM LED   **6.** Failsafe Alarm Relay   **7.** Redundant Power Supply Terminal Blocks

Communication Ports	Receive and transmit network traffic, as well as provide remote Web access to the RUGGEDCOM ROS operating system. For more information, refer to:
	• Section 3.1, "Connecting to the Device"
	• Chapter 4, *Communication Ports*
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 Section 3.1, "Connecting to the Device".
POWER LED	Illuminates when power is being supplied to the device.

Color	Description
Green	Device is receiving power
Off	No power

ALARM LED	Illuminates when an alarm condition exists.
Failsafe Alarm Relay	Latches to default state when a power disruption or other alarm condition occurs. For more information, refer to: • Section 2.6, "Connecting the Failsafe Alarm Relay" • Section 5.3, "Failsafe Alarm Relay Specifications"
Power Supply Terminal Block	A pluggable terminal block. For more information, refer to: • Section 2.7, "Connecting Power" • Section 5.1, "Power Supply Specifications"

Section 1.3

Required Tools and Materials

The following tools and materials are required to install the RUGGEDCOM RS900GP:

Tools/Materials	Purpose
DC power cord (16 AWG)	For connecting power to the device.
CAT-5 Ethernet cables	For connecting the device to the network.
#2 Phillips Flathead screwdriver	For mounting the device to a DIN rail.
Phillips screwdriver	For mounting the device to a panel.
4 x M3.5 (#6-32) screws	For mounting the device to a panel.

Section 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 *User Guide*.

» 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.

2 Installing the Device

This section 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!**
> *Burn hazard – risk of serious personal injury. Avoid contact with the surface of the unit. The metal surface may be hot due to the high allowable ambient temperature per specification.*

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

> ! **IMPORTANT!**
> *This product contains no user-serviceable parts. Attempted service by unauthorized personnel shall render all warranties null and void.*
>
> *Changes or modifications not expressly approved by RuggedCom Inc. could invalidate specifications, test results, and agency approvals, and void the user's authority to operate the equipment.*

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

> **i NOTE**
> *This product contains a Lithium battery that is not replaceable by the operator or by service personnel.*

CONTENTS

- Section 2.6, "Connecting the Failsafe Alarm Relay"
- Section 2.7, "Connecting Power"

Section 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 Section 6.1, "Approvals".

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.

Section 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.

> ⊘ **IMPORTANT!**
> *If any item is missing or damaged, contact Siemens for assistance.*

Section 2.3
Cabling Recommendations

Siemens does not recommend the use of copper cabling of any length for critical, real-time substation automation applications. 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.

Section 2.4

Mounting the Device

The RUGGEDCOM RS900GP is designed for maximum mounting and display flexibility. It can be equipped with connectors that allow it to be installed in a 35 mm (1.4 in) DIN rail or directly on a panel.

> ⚠ **IMPORTANT!**
> *Heat generated by the device is channeled outwards 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.*

> ℹ **NOTE**
> *For detailed dimensions of the device with either DIN rail or panel hardware installed, refer to Section 5.8, "Dimension Drawings".*

CONTENTS

Section 2.4.1

Mounting the Device on a DIN Rail

For DIN rail installations, the RUGGEDCOM RS900GP can be equipped with a DIN rail bracket that allows the device to be slid onto a standard 35 mm (1.4 in) DIN rail.

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

1. Secure the DIN rail bracket to the back of the device chassis.
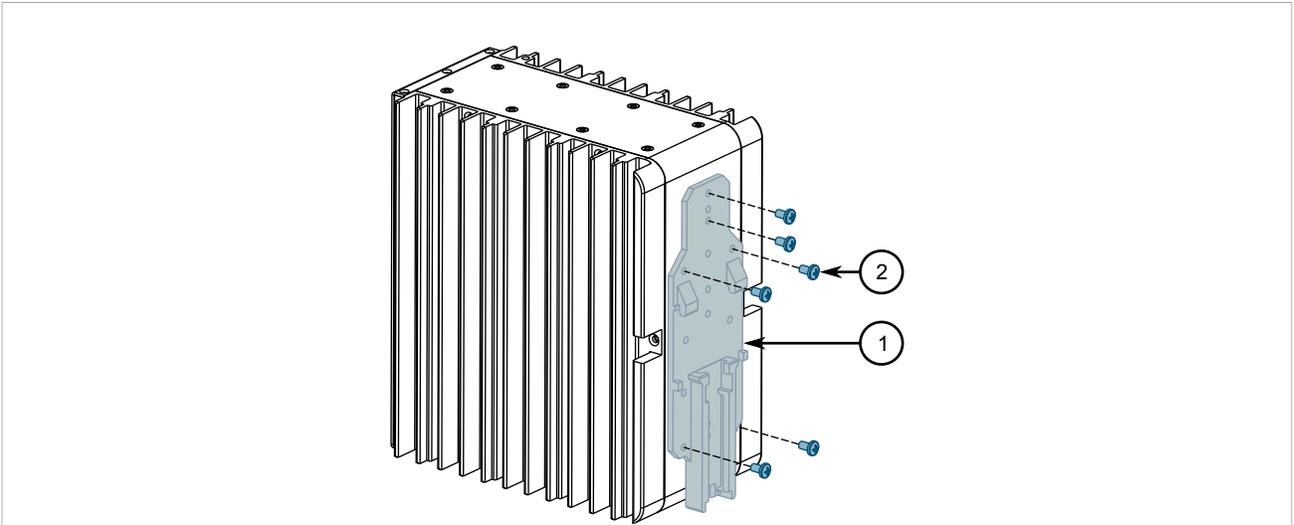
Figure 2: DIN Rail Bracket Assembly

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

2.   Align the slot in the bracket with the DIN rail.
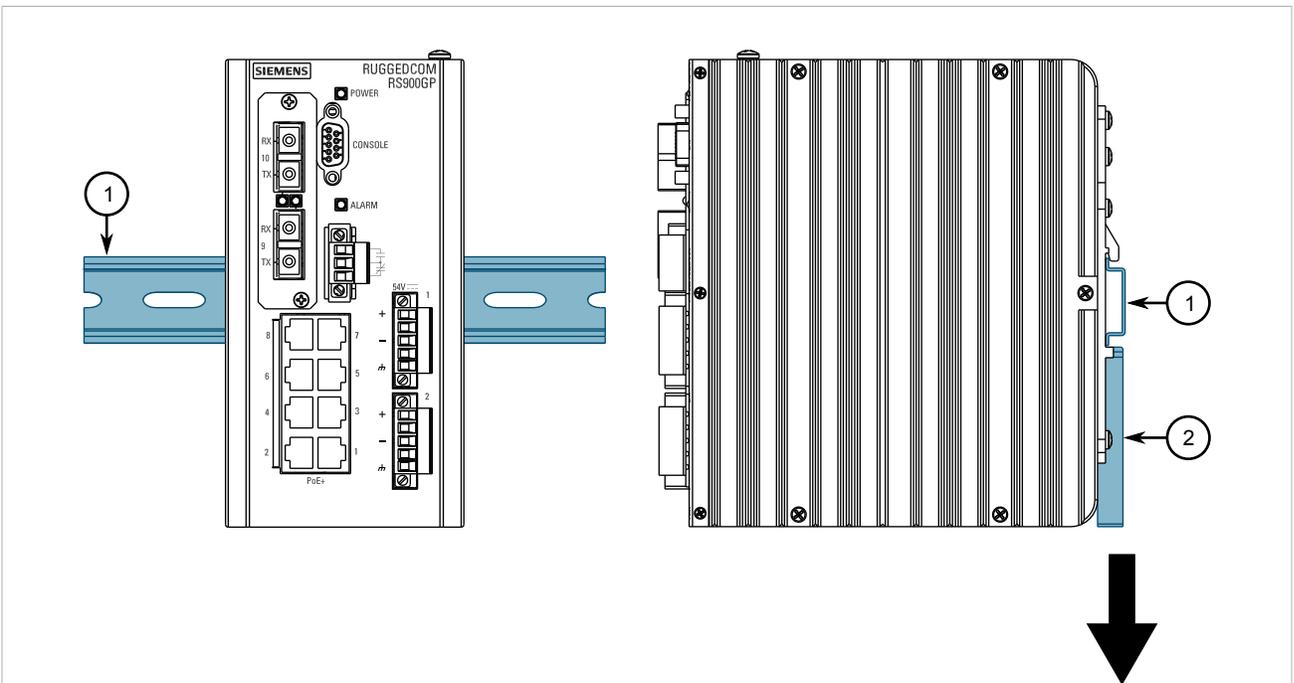
Figure 3: DIN Rail Mounting

1. DIN Rail   **2.** DIN Rail Bracket

3.   Pull the release on the bracket down and slide the device onto the DIN rail. Let go of the release to lock the device in position.

Section 2.4.2
Mounting the Device to a Panel

For panel installations, the RUGGEDCOM RS900GP can be equipped with panel adapters that allow the device to be attached to a panel in multiple orientations.

Figure 4: Panel Mount Options

1. Rear Mount Orientation   **2.** Front Mount Orientation   **3.** Side Mount Orientation
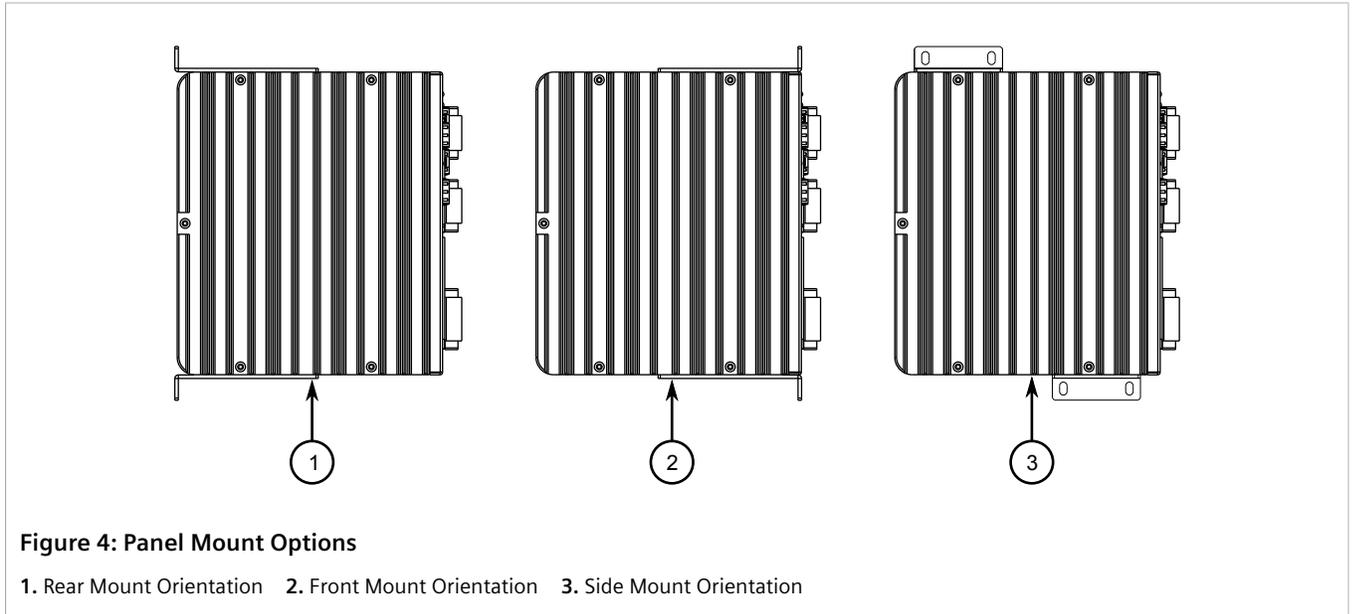
1. Secure the adapters to the device in the desired orientation.

2. Place the device against (side or rear mount orientation) or insert it into (front mount orientation) the panel and align the adapters with the mounting holes.

Figure 5: Panel Mounting (Rear Mount Orientation Shown)

1. Panel Adapter   **2.** Screw
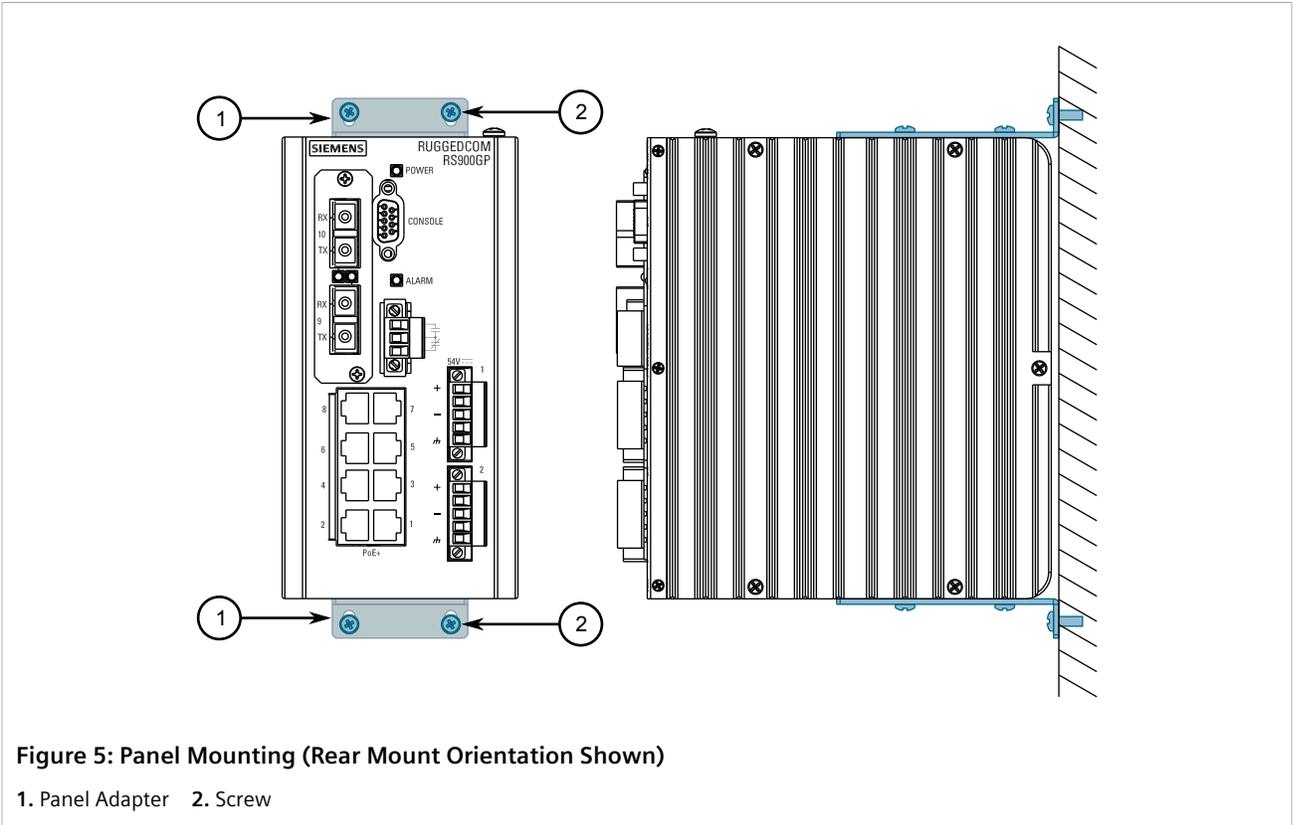
3.   Install #6 screws (not supplied) to secure the adapters to the panel.

Section 2.5
Grounding the Device

The RUGGEDCOM RS900GP chassis features a threaded hole for connecting the device to ground (Earth). It is recommended to terminate the ground connection with an M3 ring or spade lug, and then torque to 1.7 N·m (15 lbf-in).

Figure 6: Chassis Ground Connection

1. Chassis Ground Connection   **2.** M3 Screw   **3.** M3 Ring Lug
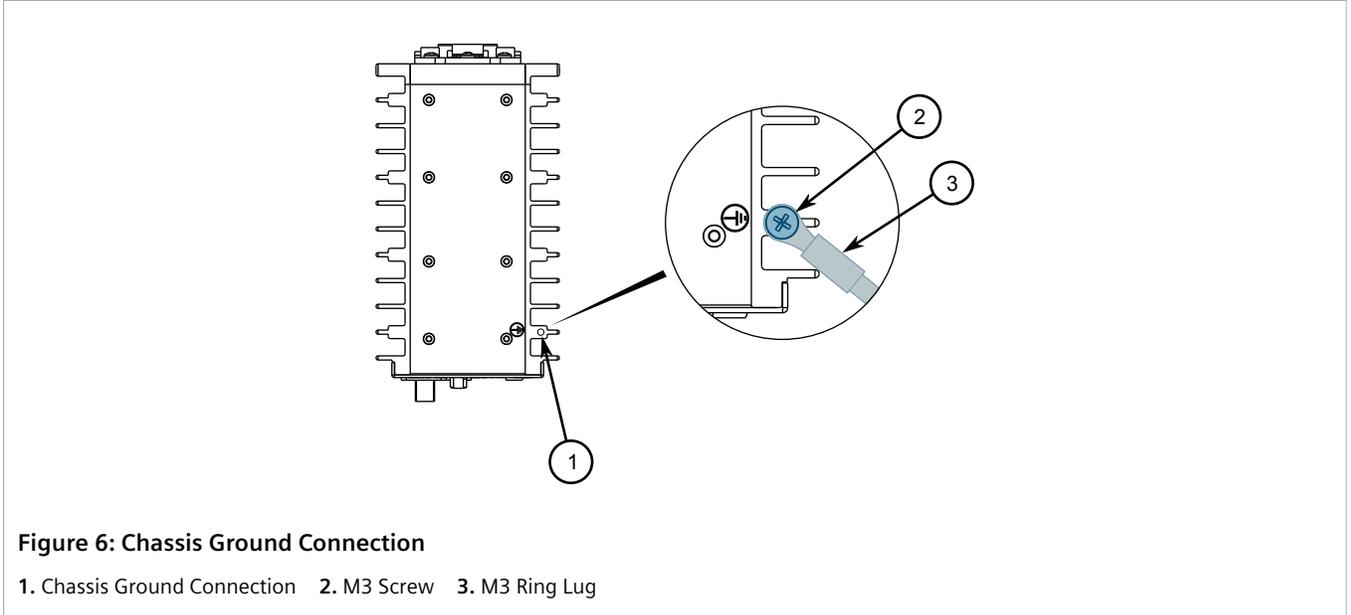
Section 2.6
Connecting the Failsafe Alarm Relay

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.

> **i** **NOTE**
> *Control of the failsafe relay output is configurable through ROS. One common application for this relay is to signal an alarm if a power failure occurs. For more information, refer to the RUGGEDCOM ROS User Guide for the RUGGEDCOM RS900GP.*

The following shows the proper relay connections.

Figure 7: Failsafe Alarm Relay Wiring

1. Normally Open   **2.** Common   **3.** Normally Closed
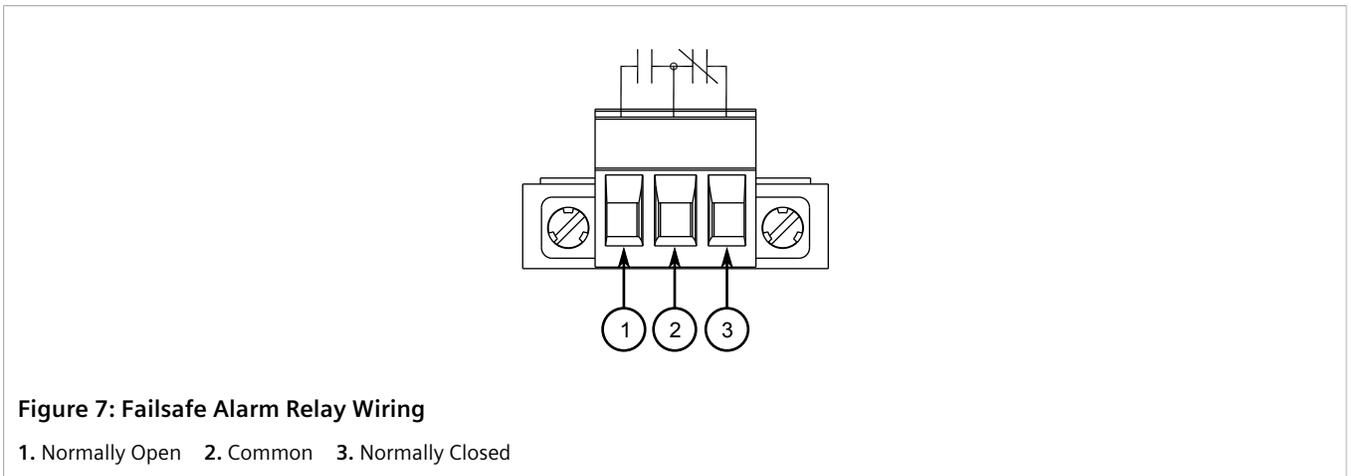
Section 2.7

Connecting Power

The RUGGEDCOM RS900GP features an integrated low DC power supply that accepts input from redudant power sources. Requirements for the power source(s) is dependent on the IEEE 802.3 standard required by the application:

Standard	Watts/ Port Output	Power Supply Type	Input Range		Isolation	Minimum Power Required
			Minimum	Maximum		
IEEE 802.3at	30	DC	51 VDC	57 VDC	1.5 VAC/2.2 kVDC	255 W
IEEE 802.3af	15	DC	45 VDC	57 VDC	1.5 VAC/2.2 kVDC	135 W

> **NOTE**
> *Power sources can be connected to either power supply terminal block on the device.*

> **IMPORTANT!**
> • *Use minimum #16 gage copper wiring when connecting terminal blocks.*
> • *Equipment must be installed according to applicable local wiring codes and standards.*

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

1. Secure a European-style terminal block (or Euroblock) to one of the available terminals.

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

Figure 8: Terminal Block Wiring – Single DC Power Supply Inputs

1. Positive Terminal   **2.** Negative Terminal   **3.** Chassis Ground Terminal
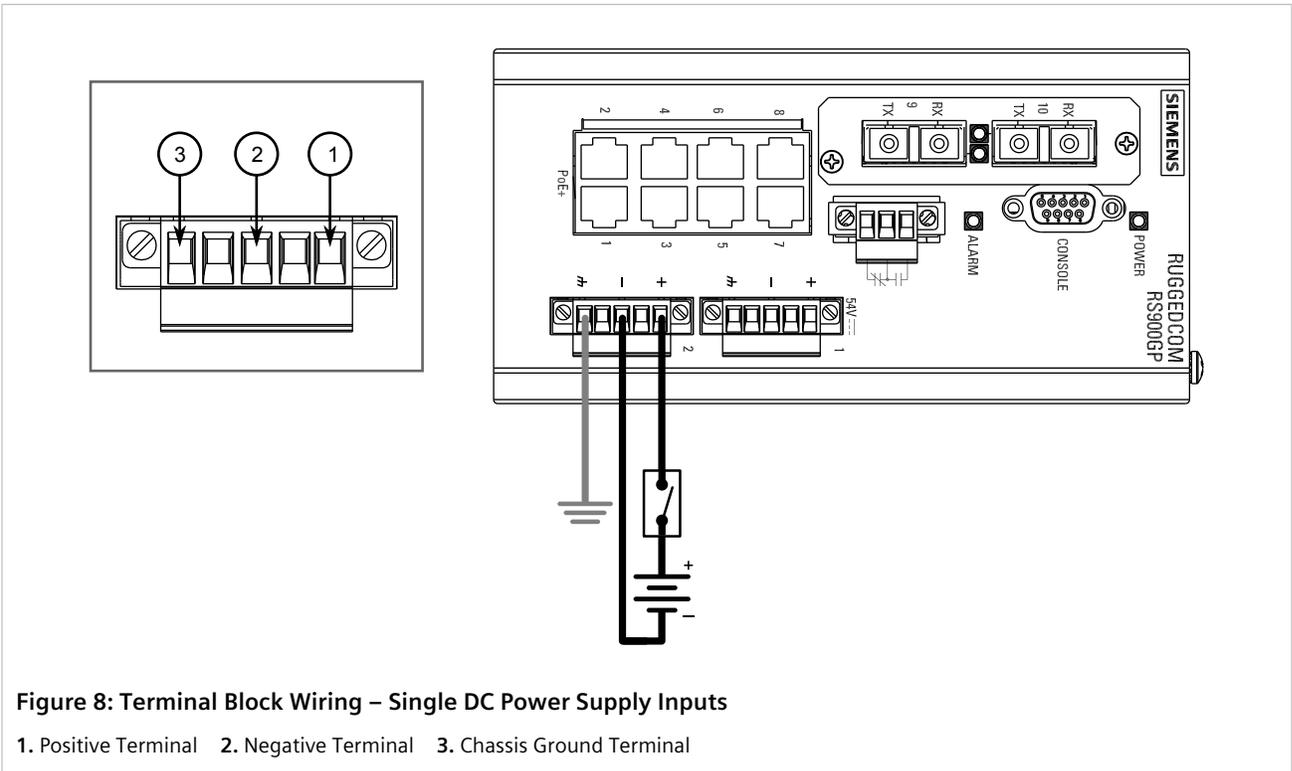
3. Connect the negative wire from the power source to the negative terminal on the terminal block.

⚠ **CAUTION!**
Electrical hazard – risk of damage to the device. For Power-over-Ethernet (PoE) support, make sure the PoE power source is isolated from earth/chassis ground. Do not connect either positive or negative terminals to chassis ground.

4. Connect the ground terminal on the power source to the chassis ground terminal on the device.

5. If a redundant power source is required, repeat Step 1 to Step 4 using the second terminal.

3   Device Management

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

CONTENTS

- Section 3.1, "Connecting to the Device"
- Section 3.2, "Configuring the Device"

Section 3.1

Connecting to the Device

The following describes the various methods for accessing the ROS console and Web interfaces on the device. For more detailed instructions, refer to the *RUGGEDCOM ROS User Guide* for the RUGGEDCOM RS900GP.

» Serial Console Port

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

> **(!) IMPORTANT!**
> *The serial console port is intended to be used only as a temporary connection during initial configuration or troubleshooting.*

The serial console port implements RS-232 DCE (Data Communication Equipment) on a DB9 connector. 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 following is the pin-out for the port:
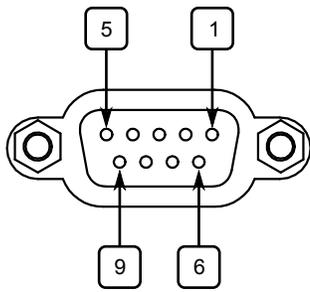
Figure 9: Serial DB9 Console Port

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.*

» Communication Ports

Connect any of the available Ethernet ports on the device to a management switch and access the RUGGEDCOM ROS console and Web interfaces via the device's IP address. The factory default IP address for the RUGGEDCOM RS900GP is https://192.168.0.1.

For more information about available ports, refer to Chapter 4, *Communication Ports*.

Section 3.2

Configuring the Device

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

4 Communication Ports

The RUGGEDCOM RS900GP features eight standard 10/100Base-TX copper RJ45 Ethernet ports capable of Power-over-Ethernet (PoE). It can also be equipped with two additional Gigabit Ethernet capable ports, for which many fiber transceiver and copper options are available.

Each communication port type has a specific place in the RUGGEDCOM RS900GP chassis.
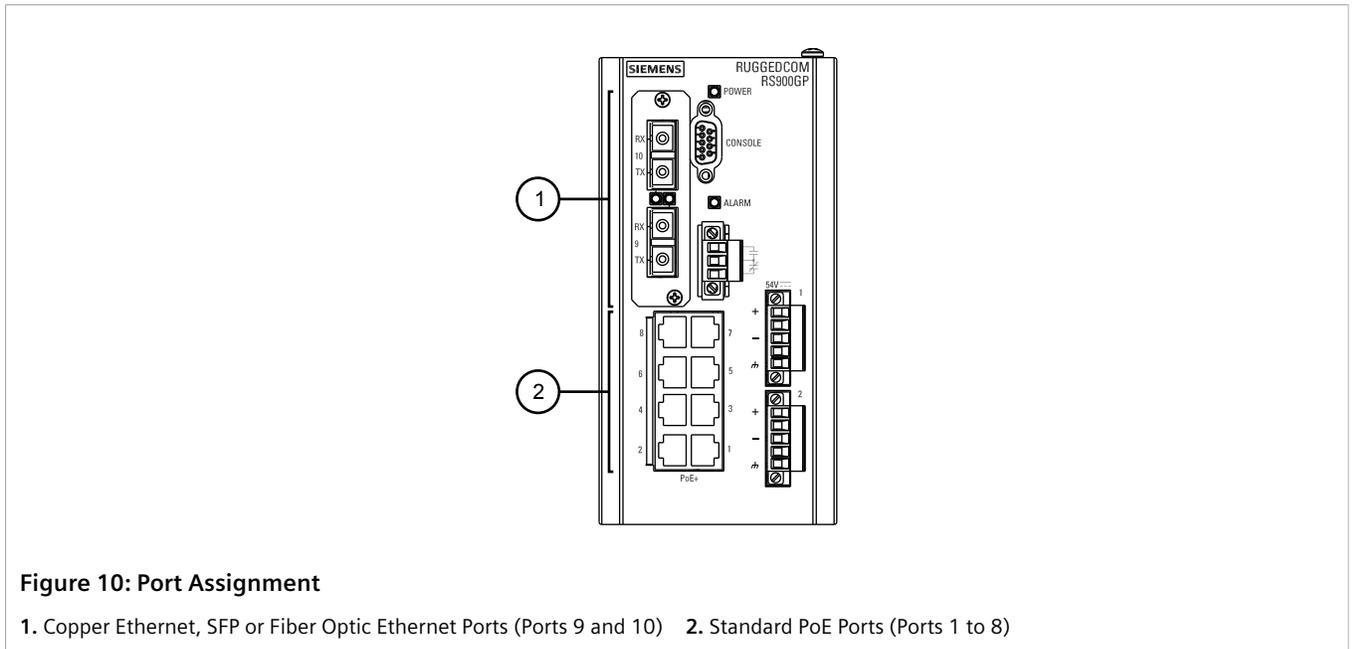
Figure 10: Port Assignment

1. Copper Ethernet, SFP or Fiber Optic Ethernet Ports (Ports 9 and 10) **2.** Standard PoE Ports (Ports 1 to 8)

CONTENTS

Section 4.1

Copper Ethernet Ports

The RUGGEDCOM RS900GP supports an optional set of 10/100/1000Base-TX copper RJ45 or micro-D Ethernet ports that allow connection to standard Category 5 (CAT-5) unshielded twisted-pair (UTP) cables with RJ45 male connectors. Each port is directly connected to chassis ground on the device and can accept CAT-5 Unshielded Twisted-Pair (UTP) or 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 an LED that indicates its link/activity state.

Figure 11: LED for RJ45 Ports (9 to 10)
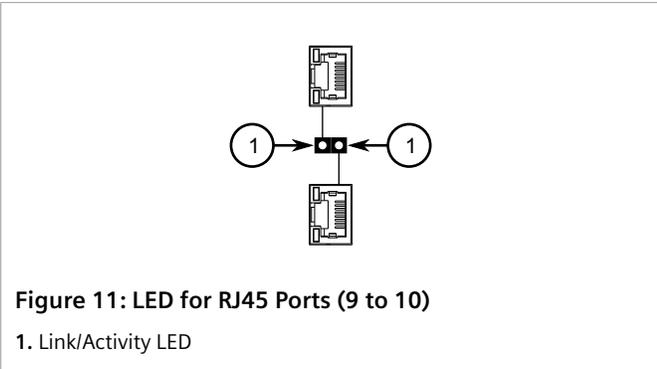
1. Link/Activity LED

LED	State	Description
Link/Activity	Green (Solid)	Link established
	Green (Blinking)	Link activity
	Off	No link detected

Figure 12: LED for Micro-D Ports (9 to 10)

1. Link/Activity LED
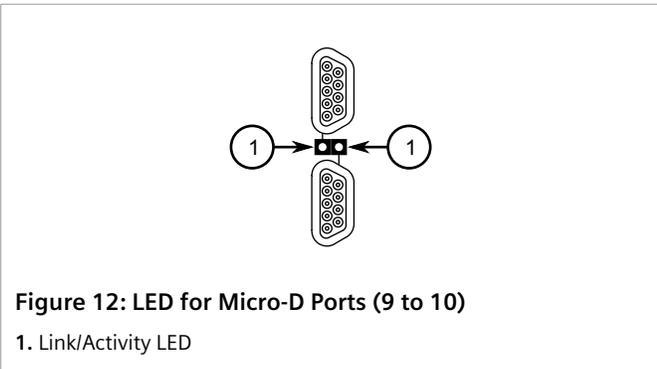
≫ Pin-Out

The following are the pin-out descriptions for the RJ45 and micro-D connectors:

Figure 13: RJ45 Port Pin Configuration
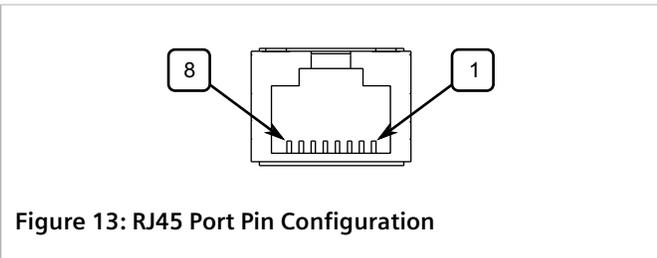
Pin	Name		Description
	10/100Base-TX	1000Base-TX	
1	RX+	BI_DB+	Receive Data+ or Bi-Directional
2	RX-	BI_DB-	Receive Data- or Bi-Directional
3	TX+	BI_DA+	Transmit Data+ or Bi-Directional
4	Reserved (Do Not Connect)	BI_DD+	Bi-Directional

Pin	Name		Description
	10/100Base-TX	**1000Base-TX**	
5	Reserved (Do Not Connect)	BI_DD-	Bi-Directional
6	TX-	BI_DA-	Transmit Data- or Bi-Directional
7	Reserved (Do Not Connect)	BI_DC+	Bi-Directional
8	Reserved (Do Not Connect)	BI_DC-	Bi-Directional
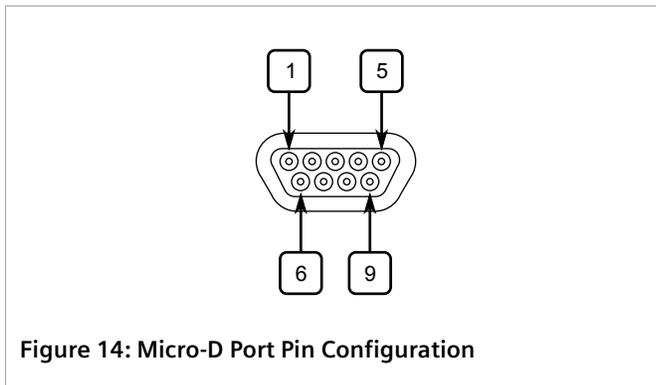
Figure 14: Micro-D Port Pin Configuration

Pin	Name	
	10/100Base-TX	**1000Base-TX**
1	RX+	A+
2	Reserved (Do Not Connect)	C+
3	Reserved (Do Not Connect)	
4	Reserved (Do Not Connect)	D+
5	TX+	B+
6	RX-	A-
7	Reserved (Do Not Connect)	C-
8	Reserved (Do Not Connect)	D-
9	TX-	B-

» Specifications

For further specifications, refer to Section 5.4, "Copper Ethernet Port Specifications".

Section 4.2

PoE Ports

The RUGGEDCOM RS900GP supports eight 10/100Base-TX Power over Ethernet (POE) ports (ports 1 to 8). Each port complies with the IEEE 802.3at and IEEE 802.3af standards, and feature the ability to automatically enable/disable power when PoE-capable devices are connected or removed.

The total allowable power budget for all PoE ports is dependent on the IEEE 802.3 standard required by the application:

Standard	Power Budget
IEEE 802.3at	255 W

Standard	Power Budget
IEEE 802.3af	135 W

If the power input is less than what is required, to prevent exceeding the power budget, port priorities can be set via the RUGGEDCOM ROS operating system to disable low priority ports when demand is too high. Ports can also be enabled/disable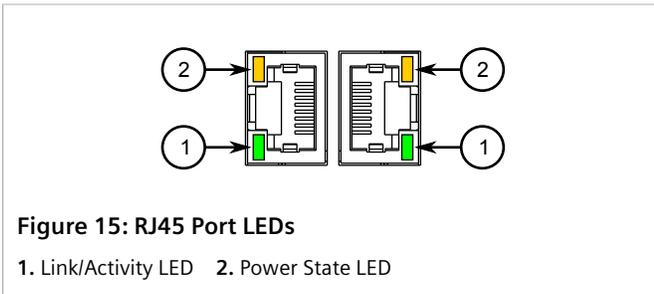d and placed on a power schedule to conserve power. For more information, refer to the *RUGGEDCOM ROS User Guide* for the device.

For information about connecting a power source, refer to Section 2.7, "Connecting Power".

» LEDs

Each PoE port features an LED that indicates the port's power and link/activity state.

Figure 15: RJ45 Port LEDs

1. Link/Activity LED   **2.** Power State LED

LED	State	Description
Link/Activity	Green (Solid)	Link established
	Green (Blinking)	Link activity
	Off	No link detected
Power State	Yellow (Solid)	Power provided
	Yellow (Blinking)	Searching for load
	Off	No power or port disabled

» Pin-Out

The pin-out for the PoE ports is as follows:

Figure 16: RJ45 Ethernet Port Pin Configuration
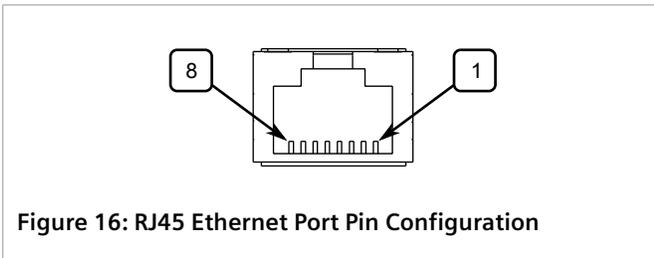
Pin	Name	Description
1	RX+	Receive Data+
2	RX-	Receive Data-
3	TX+	Transmit Data+
4	Reserved (Do Not Connect)	
5	Reserved (Do Not Connect)	
6	TX-	Transmit Data-
7	Reserved (Do Not Connect)	
8	Reserved (Do Not Connect)	

» Specifications

For specifications on the available PoE ports, refer to Section 5.4, "Copper Ethernet Port Specifications".

For PoE power output specifications, refer to Section 5.2, "PoE Output Specifications".

Section 4.3

Fiber Optic Ethernet Ports

Optional 100Base-FX, 1000Base-SX and 1000Base-LX fiber optic Ethernet ports are available for ports 9 and 10 with either LC (Lucent Connector) and SC (Standard or Subscriber Connector) connectors. Make sure the Transmit (Tx) and Receive (Rx) connections of each port are properly connected and matched to establish a proper link.

» Available Ports
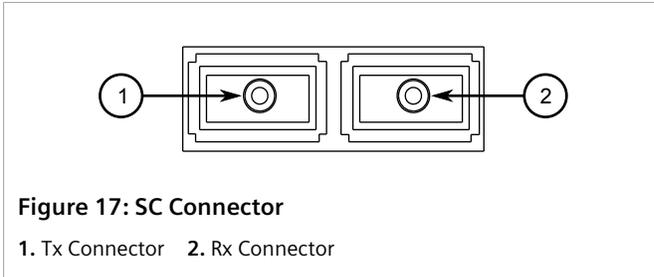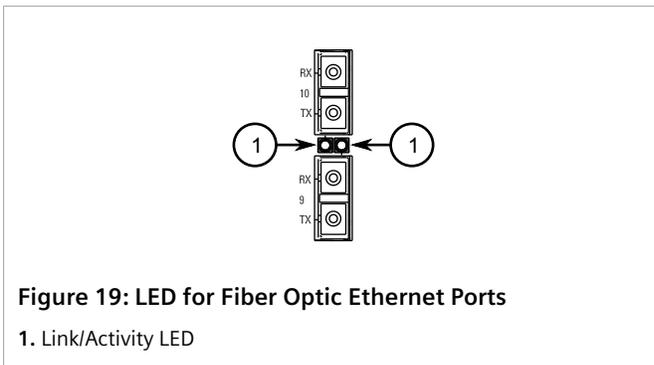
Figure 17: SC Connector

1. Tx Connector   **2.** Rx Connector

Figure 18: LC Connector

1. Tx Connector   **2.** Rx Connector

» LEDs

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

Figure 19: LED for Fiber Optic Ethernet Ports

1. Link/Activity LED

State	Description
Green (Solid)	Link established
Green (Blinking)	Link activity
Off	No link detected

» Specifications

For further specifications, refer to Section 5.5, "Fiber Optic Ethernet Port Specifications".

Section 4.4

SFP Transceivers

The RUGGEDCOM RS900GP supports up to two Small Form-Factor Pluggable (SFP) transceiver sockets, which are compatible with a wide array of SFP transceivers available from Siemens.
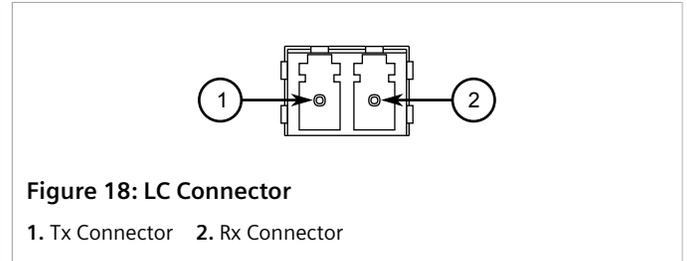
» LEDs

Each socket features an LED that indicates its link state.

State	Description
Green (Solid)	Link established
Green (Blinking)	Activity
Off	No link detected

» Compatible SFP Transceivers

The following SFP transceivers are compatible with the RUGGEDCOM RS900GP. For more information, including installation/removal instructions and ordering information, refer to the *RUGGEDCOM SFP Transceiver Catalog* *[https://support.industry.siemens.com/cs/ca/en/view/109482309]*.

> ⚠ **IMPORTANT!**
> *Only use SFP transceivers approved by Siemens for RUGGEDCOM products. Siemens accepts no liability as a result of performance issues related in whole or in part to third-party components.*

SFP Transceiver	Order Code	Speed (Mbit/s)	Mode[a]	Nominal Distance (km)
RUGGEDCOM SFP1112-1	6GK6000-8CG01-0AA0	10/100/1000	CAT-5e Copper	0.1
RUGGEDCOM SFP1121-1FX2	6GK6000-8FE51-0AA0	100	MM	2
RUGGEDCOM SFP1131-1FX20	6GK6000-8FE52-0AA0	100	SM	20
RUGGEDCOM SFP1131-1FX50	6GK6000-8FE53-0AA0	100	SM	50
RUGGEDCOM SFP1131-1FX90	6GK6000-8FE54-0AA0	100	SM	90
RUGGEDCOM SFP1132-1BX10R	6GK6000-8FB51-0AA0	1000	SM	10
RUGGEDCOM SFP1132-1BX10T	6GK6000-8FB52-0AA0	1000	SM	10
RUGGEDCOM SFP1132-1BX40R	6GK6000-8FB53-0AA0	1000	SM	40
RUGGEDCOM SFP1132-1BX40T	6GK6000-8FB54-0AA0	1000	SM	40
RUGGEDCOM SFP1122-1SX	6GK6000-8FG51-0AA0	1000	MM	0.5
RUGGEDCOM SFP1132-1LX10	6GK6000-8FG52-0AA0	1000	SM	10
RUGGEDCOM SFP1132-1LX25	6GK6000-8FG53-0AA0	1000	SM	25
RUGGEDCOM SFP1132-1LX40	6GK6000-8FG57-0AA0	1000	SM	40
RUGGEDCOM SFP1132-1LX70	6GK6000-8FG54-0AA0	1000	SM	70
RUGGEDCOM SFP1132-1LX100	6GK6000-8FG55-0AA0	1000	SM	100
RUGGEDCOM SFP1132-1LX115	6GK6000-8FE56-0AA0	1000	SM	115

[a] *MM = Multi-Mode, SM = Single-Mode*

5 Technical Specifications

This section provides important technical specifications related to the device.

Section 5.1

Power Supply Specifications

Power Supply Type	Minimum Input	Maximum Input	Fuse Rating	Isolation	Maximum Power Consumption	Maximum Combined Power Output at PoE Ports
54 VDC	45 VDC	57 VDC	6.3A (T) [a]	1.5 kVDC	15 W	273 W

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

Section 5.2

PoE Output Specifications

The RUGGEDCOM RS900GP adheres to the following power output and IEEE 802.3 specifications depending on the input voltage supplied to the device.

Power In	Power Out
51 to 57 VDC	50 to 57 VDC, 30 W per Port Maximum (IEEE 302.at)
45 to 57 VDC	44 to 57 VDC, 15 W per Port Maximum (IEEE 302.af)

Section 5.3
Failsafe Alarm Relay Specifications

> **i** **NOTE**
> *The following specifications are for Class-2 circuits only.*

Maximum Switching Voltage	Rated Switching Current	Isolation
30 VDC	1 A	
80 VDC	0.3 A	1500 V_{rms} for 1 minute
30 VAC		

Section 5.4
Copper Ethernet Port Specifications

The following details specifications for all standard and optional fixed copper Ethernet ports that can be ordered with the RUGGEDCOM RS900GP. For more information about the SFP ports, refer to Section 4.1, "Copper Ethernet Ports".

> **i** **NOTE**
> - *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.*
> - *All optical power numbers are listed as dBm averages.*
> - *F51 transceivers are rated for -40 to 85 ℃ (-40 to 185 ℉).*

Connector	Duplex[b]	Cable Type[c]	Wiring Standard[d]	Maximum Distance[e]	Isolation
RJ45 (PoE and Non-PoE)	FDX/HDX	> CAT-5	TIA/EIA T568A/B	100 m (328 ft)	1.5 kV
micro-D	FDX/HDX	> CAT-5	TIA/EIA T568A/B	100 m (328 ft)	1.5 kV

[b] *Auto-Negotiating.*

[c] *Shielded or unshielded.*

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

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

Section 5.5
Fiber Optic Ethernet Port Specifications

The following details specifications for all optional fixed fiber optic Ethernet ports that can be ordered with the RUGGEDCOM RS900GP. For more information about the SFP ports, refer to Section 4.3, "Fiber Optic Ethernet Ports".

> **NOTE**
> • *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.*
>
> • *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.*

» Fast Ethernet (100 Mbps) Optical Specifications

Mode	Connector Type	Cable Type (µm)	Tx λ (nm)[f]	Tx min. (dBm)	Tx max. (dBm)	Rx Sensitivity (dBm)	Rx Saturation (dBm)	Distance (km)[f]	Power Budget (dB)
MM	SC	62.5/125	1300	-19	-14	-31	-14	2	12
		50/125		-22.5					8.5
SM	SC	9/125	1300	-15	-8	-31	-7	20	16
SM	SC	9/125	1300	-5	0	-34	-3	50	29
SM	SC	9/125	1300	0	5	-37	0	90	37

[f] *Typical.*

» Gigabit Ethernet (1 Gbps) Optical Specifications

Mode	Connector Type	Cable Type (µm)	Tx λ (nm)[g]	Tx min (dBm)	Tx max (dBm)	Rx Sensitivity (dBm)	Rx Saturation (dBm)	Distance (km)[g]	Power Budget (dB)
MM	LC	50/125	850	-9	-2.5	-20	0	0.5	11
SM	SC	9/125	1310	-10	-3	-20	-3	10	10
SM	LC	9/125	1310	-9.5	-3	-21	-3	10	11.5
SM	SC	9/125	1310	-5	0	-20	-3	25	15
SM	LC	9/125	1310	-7	-3	-24	-3	25	17

[g] *Typical.*

Section 5.6

Operating Environment

The RUGGEDCOM RS900GP is rated to operate under the following environmental conditions.

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

[h] *Measured from a 30 cm (12 in) radius surrounding the center of the RUGGEDCOM RS900GP enclosure.*

[i] *Non-condensing*

[j] *Over temperature range of -40 to 85 ℃ (-40 to 185 ℉)*

Section 5.7

Mechanical Specifications

Weight	2.3 kg (5 lbs)
Ingress Protection	IP40 (1 mm objects)
Enclosure	Aluminum

Section 5.8

Dimension Drawings

> **NOTE**
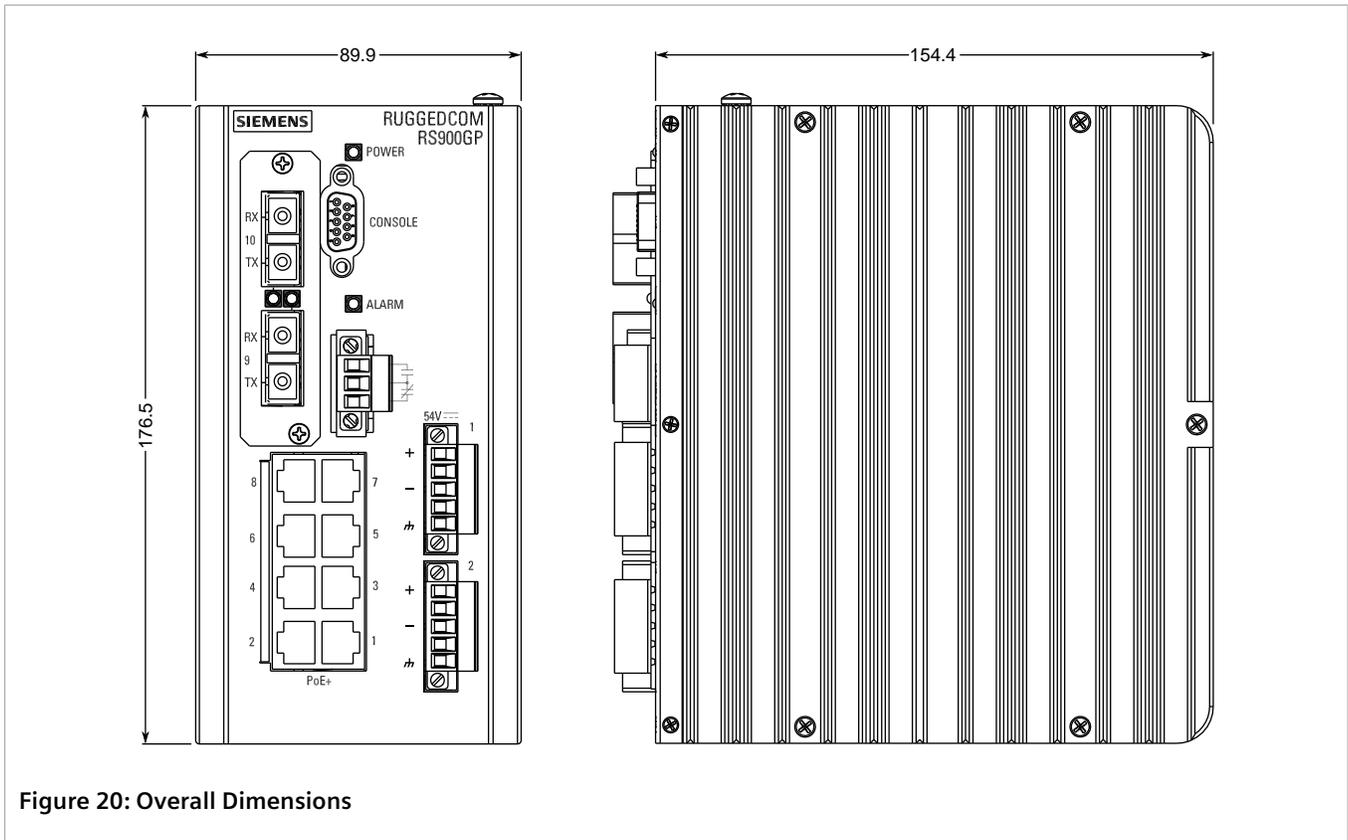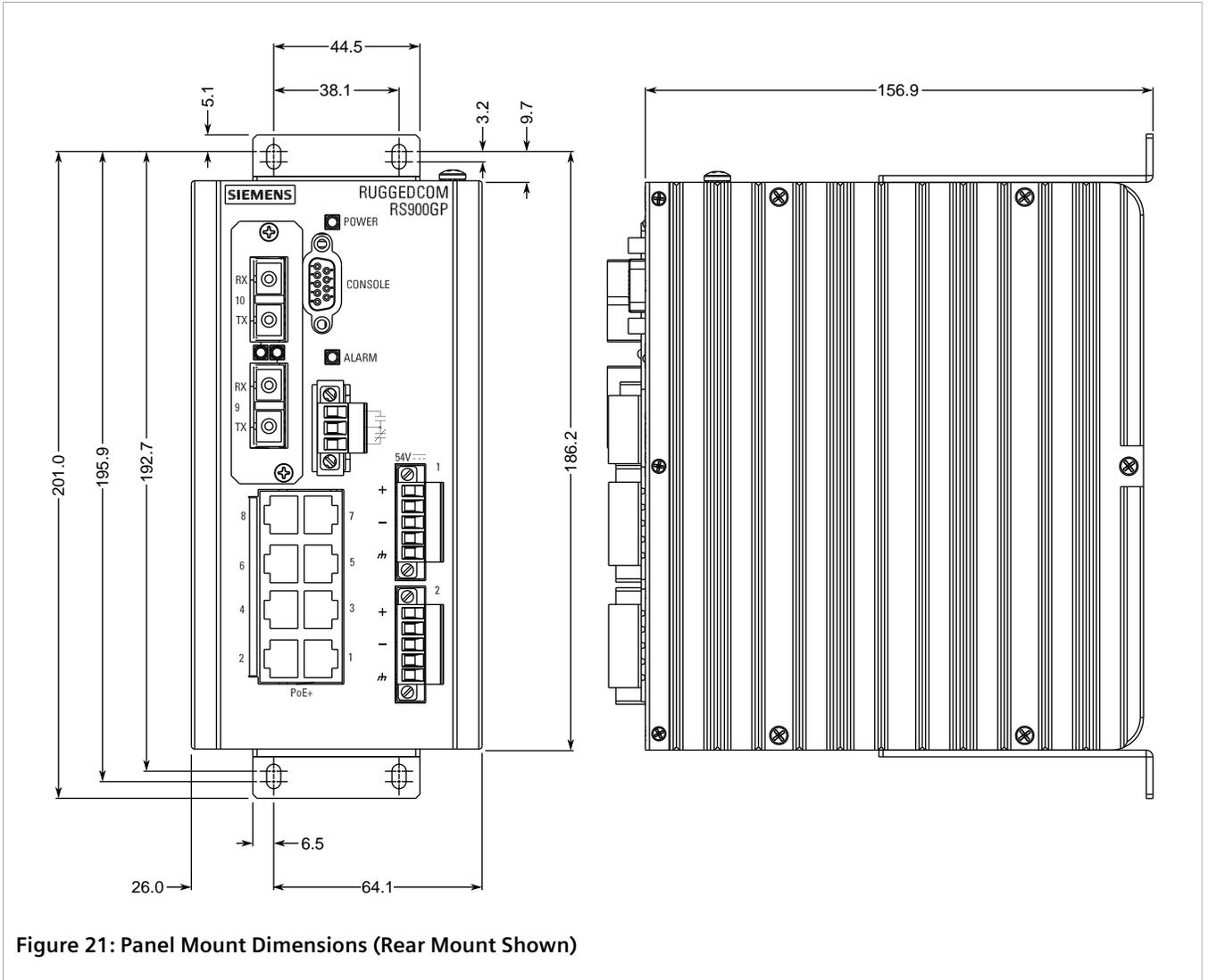> *All dimensions are in millimeters, unless otherwise stated.*

Figure 20: Overall Dimensions

Figure 21: Panel Mount Dimensions (Rear Mount Shown)
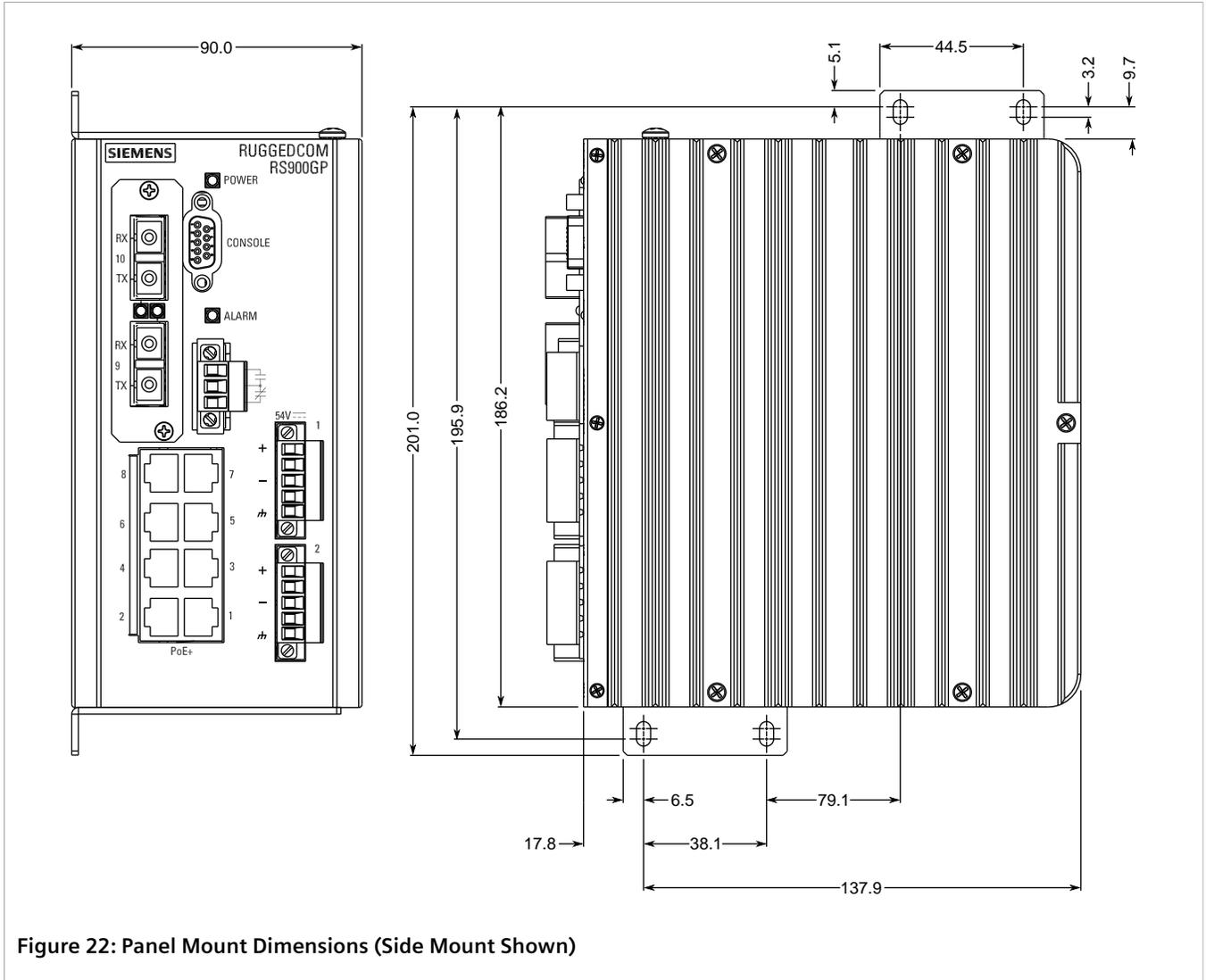
Figure 22: Panel Mount Dimensions (Side Mount Shown)
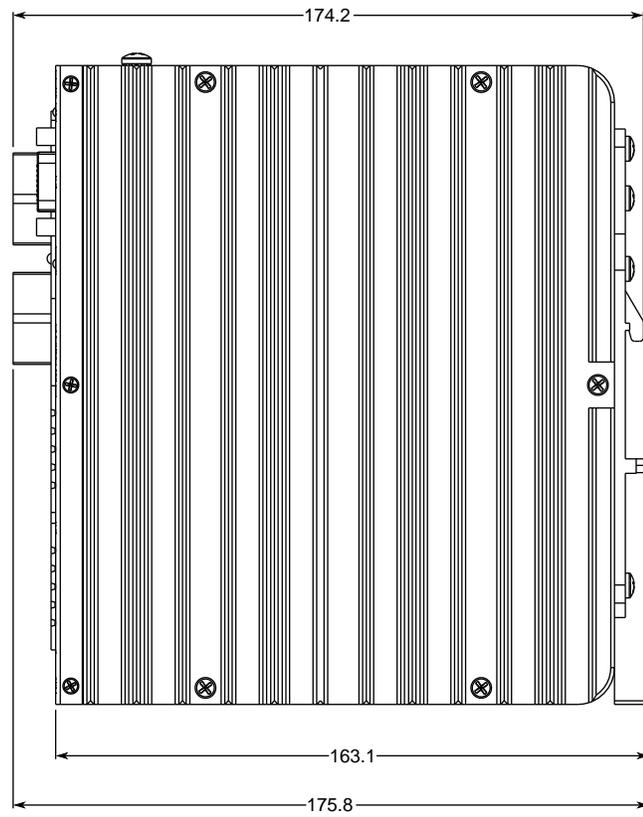
Figure 23: DIN Rail Mount Dimensions

6 Certification

The RUGGEDCOM RS900GP device has been thoroughly tested to guarantee its conformance with recognized standards and has received approval from recognized regulatory agencies.

CONTENTS

Section 6.1
Approvals

This section details the standards to which the RUGGEDCOM RS900GP complies.

CONTENTS

Section 6.1.1
TÜV SÜD

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

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

- **UL 60950-1**
  Information Technology Equipment – Safety – Part 1: General Requirements)

Section 6.1.2
European Union (EU)

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

- **EN 60950-1**
  Information Technology Equipment – Safety – Part 1: General Requirements

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

- **EN 60825-1**
  Safety of Laser Products – Equipment Classification and Requirements

- **EN 50581**
  Technical Documentation for the Assessment of Electrical and Electronic Products with Respect to the Restriction of Hazardous Substances

- **EN 55022**
  Information Technology Equipment – Radio Disturbance Characteristics – Limits and Methods of Measurement

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

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

Section 6.1.3
FCC

This 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.

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

Section 6.1.4
FDA/CDRH

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

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

Section 6.1.5
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)

Section 6.1.6
ACMA

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

- Radiocommunications (Compliance Labelling – Devices) Notice 2014 made under Section 182 of the Radiocommunications Act 1992

- Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2008 made under Section 182 of the Radiocommunications Act 1992

- Radiocommunications (Compliance Labelling – Electromagnetic Radiation) Notice 2003 made under Section 182 of the Radiocommunications Act 1992

- Telecommunications Labelling (Customer Equipment and Customer Cabling) Notice 2001 made under Section 407 of the Telecommunication Act 1997

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

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

Section 6.1.7
RoHS

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

- **China RoHS 2**
  Administrative Measure on the Control of Pollution Caused by Electronic Information Products

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

Section 6.1.8
Other Approvals

This device meets the requirements of the following additional standards:

- **EN50121-4**
Railway applications – Electromagnetic Compatibility – Emission and Immunity of the Signaling and
Telecommunications Apparatus

Section 6.2
EMC and Environmental Type Tests

The RUGGEDCOM RS900GP 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	x
IEC 61000-4-4	Burst (Fast Transient)	Signal Ports		3
		DC Power Ports	± 1.5 kV	x
		Earth Ground Ports	± 2 kV	3
IEC 61000-4-5	Surge	Signal Ports	± 500 V Line-to-Earth ± 500 V Line-to-Line	x
		DC Power Ports	± 500 V Line-to-Earth ± 500 V Line-to-Line	x
IEC 61000-4-6	Induced (Conducted) RFI	Signal Ports	10 V	3
		DC Power Ports	10 V	3
		Earth Ground Ports	10 V	3
IEC 61000-4-8	Magnetic Field	Enclosure Ports	40 A/m Continuous 1000 A/m for 1 s	
IEC 61000-4-29	Voltage Dips and Interrupts	DC Power Ports	30% for 0.1 s 60% for 0.01 s 100% for 0.01 s	
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

Test	Description		Test Levels	Severity Levels
IEC 61000-4-16	Mains Frequency Voltage	Signal Ports	30 V Continuous	4
		DC Power Ports	30 V Continuous, 300 V for 1s	4
IEC 61000-4-17	Ripple on DC Power Supply	DC Power Ports	± 15%	4
IEC 60255-5	Dielectric Strength	Signal Ports	2 kV (Fail-Safe Relay output)	
		DC Power Ports	1.5 kV	
IEC 60255-5	HV Impulse	Signal Ports	5 kV (Fail-Safe Relay output)	
		DC Power Ports	5 kV	

» EMC Immunity Type Tests per IEEE 1613

> **NOTE**
> *The RUGGEDCOM RS900GP meets Class 2 requirements for an all-fiber configuration and Class 1 requirements for copper Ports. 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	± 2 kV @ 2.5 kHz
	DC Power Ports	± 1.5 kV
	Earth Ground Ports	± 2 kV
Oscillatory	Signal Ports	2.2 kV Common Mode @ 1 MHz
	DC Power Ports	2.2 kV Common and Differential Mode @ 1 MHz
HV Impulse	Signal Ports	5 kV (Failsafe Relay)
	DC Power Ports	5 kV
Dielectric Strength	Signal Ports	2 kV (Failsafe Relay)
	DC Power Ports	1.5 kV

» Environmental Type Tests

Test	Description		Test Levels	Severity Levels
IEC 60068-2-1	Cold Temperature	Test Ad	-40 ℃ (-40 ℉), 16 Hours	
IEC 60068-2-2	Dry Heat	Test Bd	85 ℃ (185 ℉), 16 Hours	
IEC 60255-21-1	Vibration		2g @ 10-150 Hz	Class 2
IEC 60255-21-2	Shock		30g @ 11 ms	Class 2