SIEMENS

RUGGEDCOM i801

Installation Guide

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Preface

This guide describes the RUGGEDCOM i801 (i-Series) product line. It describes the major features, 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

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/109737193]

Accessing Documentation

The latest user documentation for RUGGEDCOM i801 is available online at https://www.siemens.com/ruggedcom. To request or inquire about a user document, contact Siemens Customer Support.

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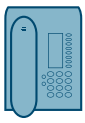
Online

Visit http://www.siemens.com/automation/support-request to submit a Support Request (SR) or check on the status of an existing SR.



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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

1 Introduction

The RUGGEDCOM i801 is a compact, fully managed Ethernet switch designed to operate reliably in harsh industrial environments. The flexibility of the RUGGEDCOM i801 allows the user to choose from managed or unmanaged, regular or extended temperature, fiber optical or copper interfaces, and fast or Gigabit Ethernet. With up to nine Ethernet ports, the RUGGEDCOM i801 is the perfect choice for a wide variety of demanding industrial environments such as those found in process control applications (oil and gas, petro-chemical, metals and mining, wind farms).

The RUGGEDCOM i801 is packaged in a compact, die cast aluminum, DIN mountable enclosure for efficient use of cabinet space. Dual 24 VDC power inputs increase reliability in case of primary power supply faults. The i800 provides a high level of immunity to electromagnetic interference and heavy electrical surges typical of environments found in industrial applications. An operating temperature range of -20 to 60 °C (-4 to 140 °F) or optionally -40 to 85 °C (-40 to 185 °F), coupled with hazardous location certification (Class 1 Division 2) allows the RUGGEDCOM i801 to be placed in almost any location.

The RUGGEDCOM i801 features a full array of intelligent functionality for high network availability and manageability. The embedded Rugged Operating System (ROS) provides advanced Layer 2 and Layer 3 networking functions, and advanced cyber security features. The Enhanced Rapid Spanning Tree Protocol (eRSTP) provides very fast network recovery in case of failures, guaranteeing a high availability network, and allows any topology from ring to mesh. Numerous other features like VLANs and QoS make the RUGGEDCOM i801 an enterprise class switch in an industrial class package.

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Section 1.1

Feature Highlights

Ethernet Ports

- Up to 8 x 10/100Base-TX ports
- 1 x 1000Base-LX or 10/100/1000Base-TX port
- Industry standard LC fiber optical connectors
- Multi-mode and single-mode optical transceivers

Cyber Security Features

- Multi-level user passwords

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

Rated for Reliability in Harsh Environments

- Immunity to EMI and heavy electrical surges
- Hazardous Location Certification: Class I, Division 2
- -20 to +60 °C (-4 to 140 °F) operating temperature (optional -40 to +85°C or -40 to 185 °F)
- Conformal coated printed circuit boards (optional)
- Die cast aluminum enclosure

Memory Options

- Removable microSD/microSDHC card

Power Supply

- Dual low-voltage DC inputs: 24 VDC (9-32 VDC)
- Compression fit connections
- CSA/UL 60950 safety approved to 85 °C (185 °F)

Section 1.2

Description

The RUGGEDCOM i801 features various ports, controls and indicator LEDs on the front panel for connecting, configuring and troubleshooting the device.

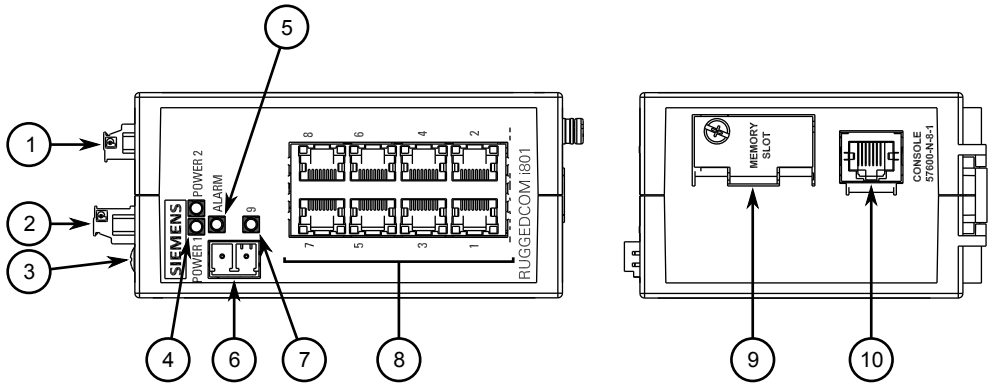

Figure 1: RUGGEDCOM i801

1. Failsafe Alarm Relay **2.** Power Supply Terminal Block **3.** Chassis Ground Terminal **4.** POWER LEDs **5.** ALARM LED **6.** Fiber Optic or Copper Gigabit Ethernet Port **7.** Port Status LED **8.** Copper Ethernet Ports **9.** Access Plate **10.** RS-232 Console Port (RJ-45)

Failsafe Alarm Relay	Latches to default state when a power disruption or other alarm condition occurs. For more information, refer to: • Section 2.4, "Connecting the Failsafe Alarm Relay (If Equipped)" • Section 5.2, "Failsafe Alarm Relay Specifications"
Power Supply Terminal Block	A pluggable terminal block. For more information, refer to: • Section 2.5, "Connecting Power" • Section 5.1, "Power Supply Specifications"
POWER LEDs	Illuminate when power is being supplied to the device by the respective power source.

Color	Description
Green	Device ready
Red	Device booting up
Off	No power

ALARM LED	Illuminates when an alarm condition exists.
Port Status LED	Indicates the status of the associated port.

State	Description
Solid	Link
Blinking	Activity
Off	No link/activity

Communication Ports	Receive and transmit data, as well as provide access to the RUGGEDCOM ROS Web interface. For more information about the various ports available for the RUGGEDCOM i801, refer to Chapter 4, *Communication Ports*.
Access Plate	The removable access plate provides access to the microSD/microSDHC slot. Use a microSD/microSDHC card to load/store the firmware and configuration for the device. For information about using a microSD/microSDHC card, refer to Section 3.3, "Inserting/Removing the MicroSD/MicroSDHC Card".
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".

Section 1.3

Required Tools and Materials

The following tools and materials are required to install the RUGGEDCOM i801:

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

Section 1.4

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.*

Section 1.5

Decommissioning and Disposal

Proper decomissioning 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, installing/removing modules, connecting power, and connecting the device to the network.

DANGER!
Electrocution hazard – risk of serious personal injury and/or damage to equipment. Before performing any maintenance tasks, make sure all power to the device has been disconnected and wait approximately two minutes for any remaining energy to dissipate.

WARNING!
*Radiation hazard – risk of serious personal injury. This product 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 Siemens Canada Ltd 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.*

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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

Mounting the Device

The RUGGEDCOM i801 can be equipped with a DIN rail bracket pre-installed on the back of the chassis. The bracket allows the device to be slid onto a standard 35 mm (1.4 in) DIN rail.

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.

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

1. Align the slot in the bracket with the DIN rail.

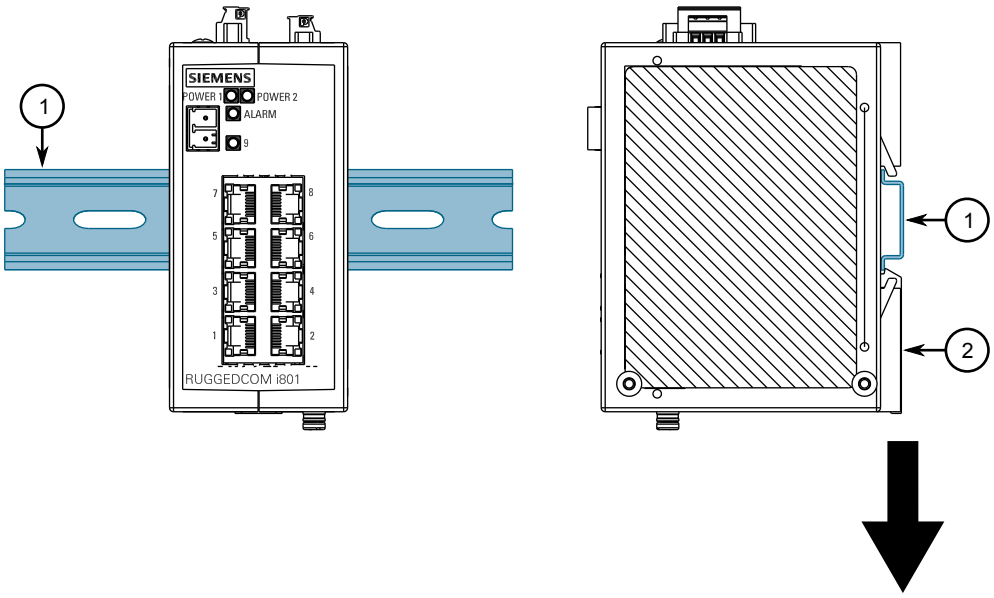

Figure 2: DIN Rail Mounting

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

2. 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

Connecting the Failsafe Alarm Relay (If Equipped)

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

NOTE
Control of the failsafe relay output is configurable through RUGGEDCOM ROS. One common application for this relay is to signal an alarm if a power failure occurs. For more information, refer to the RUGGEDCOM ROS User Guide for the RUGGEDCOM i801.

The following shows the proper relay connections.

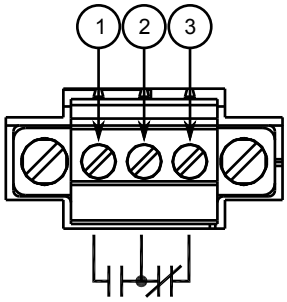

Figure 3: Failsafe Alarm Relay Wiring

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

Section 2.5

Connecting Power

The RUGGEDCOM i801 supports a single low DC power supply with reverse polarity and dual independent inputs. This allows for two redundant DC power sources with the same nominal voltage to be connected.

To connect power to the device, do the following:

IMPORTANT!

- *Terminals P1-, P2- and GND are connected together internally. As such, if redundant power supplies are connected, their negative terminals must be at the same potential.*
- *Do not field wire the DC power supply on the DC mains or Battery mains.*
- *Use minimum #16 gage wiring when connecting terminal blocks.*
- *Equipment must be installed according to applicable local wiring codes and standards.*

1. Connect the positive wire from the power source to the positive terminal (P1+ or P2+) on the terminal block.

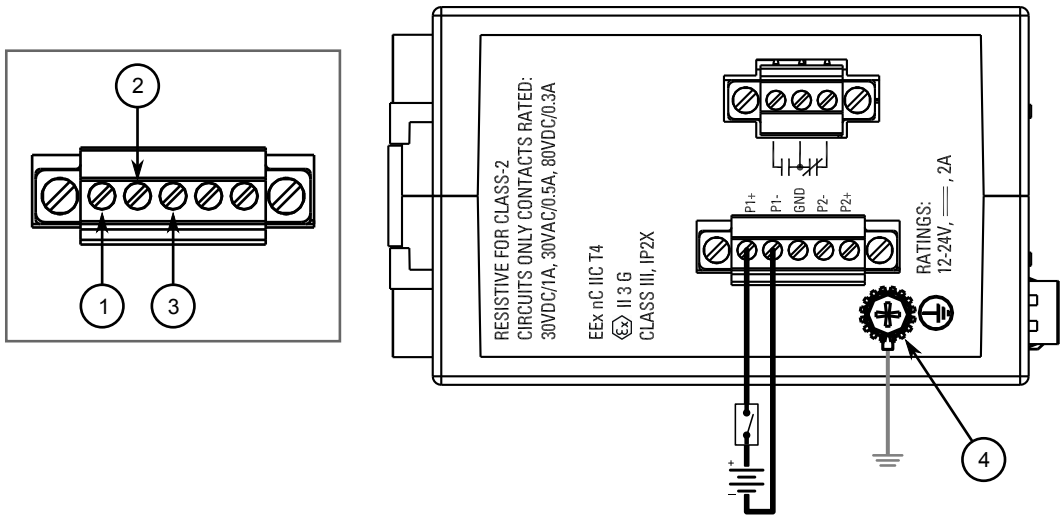

Figure 4: Terminal Block Wiring – Single DC Power Supply Input

1. Positive Terminal **2.** Negative Terminal **3.** GND Terminal **4.** Chassis Ground Terminal

2. Connect the negative wire from the power source to the negative terminal (P1- or P2-) on the terminal block.
3. [Optional] If connecting a second redundant power source, repeat Step 1 and Step 2, making sure to connect the power supply to the P2 ports.

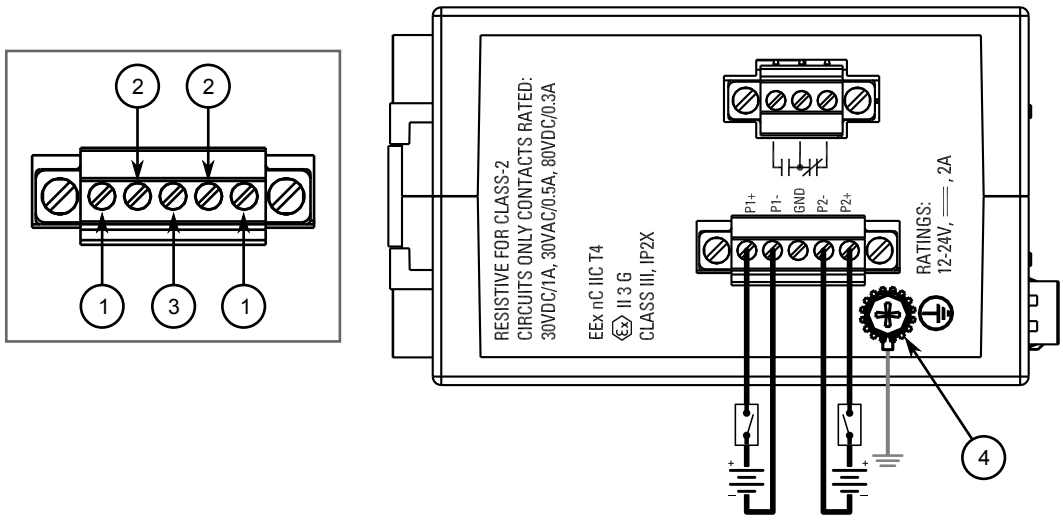

Figure 5: Terminal Block Wiring – Dual DC Power Supply Inputs

1. Positive Terminal **2.** Negative Terminal **3.** GND Terminal **4.** Chassis Ground Terminal

4. Connect the chassis ground terminal to protective Earth.

3 Device Management

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

CONTENTS

Section 3.1

Connecting to the Device

The following describes the various methods for accessing the RUGGEDCOM ROS console and Web interfaces on the device. For more detailed instructions, refer to the *RUGGEDCOM ROS User Guide* for the RUGGEDCOM i801.

» RS232 Console Port

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

IMPORTANT!
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:

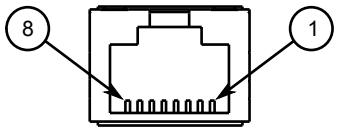

Figure 6: RJ45 Console Port Pin Configuration

Pin		Name	Description	Comment
RJ45 Male	DB9 Female			
1[a]	6	DSR	Data Set Ready	
2	1	DCD	Carrier Detect	Reserved (Do Not Connect)
3[a]	4	DTR	Data Terminal Ready	
4	5	GND	Signal Ground	
5	2	RxD	Receive Data (to DTE)	
6	3	TxD	Transmit Data (from DTE)	

Pin		Name	Description	Comment
RJ45 Male	DB9 Female			
7	8	CTS[b]	Clear to Send	
8	7	RTS[b]	Read to Send	

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

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

Section 3.3

Inserting/Removing the MicroSD/MicroSDHC Card

The RUGGEDCOM i801 accepts a microSD/microSDHC card to support the following features:

- Configuration update and backup
- Redundant firmware image
- Greatly expanded logging capability
- Fault-tolerant firmware update

CAUTION!
Configuration hazard – risk of data loss. The microSD/microSDHC card must not be removed or replaced during normal operation of the device. Make sure the device is powered down before removing or inserting the card.

CAUTION!
Mechanical/electrical hazard – risk of damage to the microSD/microSDHC card.

- *Do not expose the microSD/microSDHC car to extreme temperatures or humidity.*
- *Do not expose the microSD/microSDHC card to large magnetic or static electric fields.*
- *Do not bend or drop the microSD/microSDHC card.*

CAUTION!
Security hazard – risk of unauthorized access and/or exploitation. Make sure to remove the microSD/microSDHC card before decommissioning the device or sending the device to a third-party.

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

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

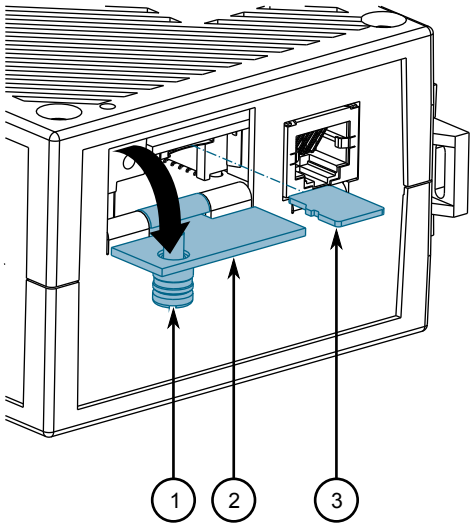

Figure 7: Inserting/Removing a MicroSD/MicroSDHC Card

1. Retention Screw **2.** Access Plate **3.** MicroSD/MicroSDHC Card

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

4 Communication Ports

The RUGGEDCOM i801 can be equipped with various types of communication ports to enhance its abilities and performance. To determine which ports are equipped on the device, refer to the factory data file available through RUGGEDCOM ROS. For more information on how to access the factory data file, refer to the *RUGGEDCOM ROS User Guide* for the RUGGEDCOM i801.

Each communication port type has a specific place in the RUGGEDCOM i801 chassis.

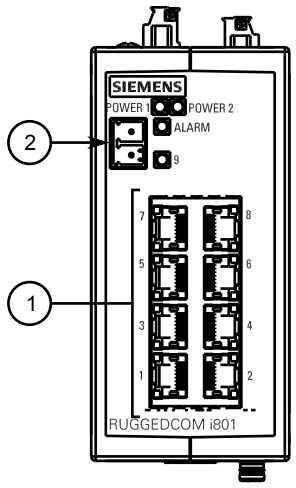

Figure 8: Port Assignment

1. Ports 1 to 8 **2.** Port 9

Port	Type
1 to 8	Copper Ethernet Ports (10/100Base-TX)
9	Copper or Fiber Ethernet Port (10/100/1000Base-TX or 1000Base-SX or 1000Base-LX)

CONTENTS

Section 4.1

Copper Ethernet Ports

The RUGGEDCOM i801 supports several 10/100/1000Base-TX Ethernet ports that allow connection to standard Category 5 (CAT-5) unshielded twisted-pair (UTP) cables with RJ45 male connectors. The RJ45 receptacles 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.

Each port features a **Speed** and **Link** LED that indicates the state of the port.

LED	State	Description
Speed	Yellow	The port is operating at maximum speed
	Off	The port is not operating at maximum speed
Link	Yellow (Solid)	Link established
	Yellow (Blinking)	Link activity
	Off	No link detected

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

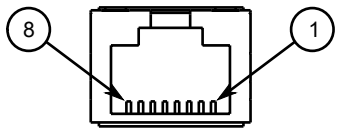

Figure 9: RJ45 Ethernet Port Pin Configuration

Pin	Name		Description
	10/100TX	1000TX/SX/LX	
1	RX+	BI_DA+	Receive Data+ or Bi-Directional Pair A+
2	RX-	BI_DA-	Receive Data- or Bi-Directional Pair A-
3	TX+	BI_DB+	Transmit Data+ or Bi-Directional Pair B+
4	Reserved (Do Not Connect)	BI_DC+	Transmit Data+ or Bi-Directional Pair C+
5	Reserved (Do Not Connect)	BI_DC-	Receive Data- or Bi-Directional Pair C-
6	TX-	BI_DB-	Transmit Data- or Bi-Directional Pair B-
7	Reserved (Do Not Connect)	BI_DD+	Receive Data- or Bi-Directional Pair D+

Pin	Name		Description
	10/100TX	1000TX/SX/LX	
8	Reserved (Do Not Connect)	BI_DD-	Receive Data- or Bi-Directional Pair D-

For specifications on the available copper Ethernet ports, refer to Section 5.3, "Copper Ethernet Port Specifications".

Section 4.2

Fiber Optic Ethernet Ports

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

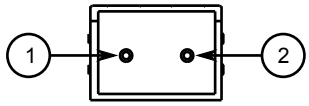

Figure 10: LC Port

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

For specifications on the available fiber optic Ethernet ports, refer to Section 5.4, "Fiber Optic Ethernet Port Specifications".

5 Technical Specifications

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

CONTENTS

Section 5.1

Power Supply Specifications

Power Supply Type	Minimum Input	Maximum Input	Internal Fuse Rating[a]	Maximum Power Consumption
24 VDC	9 VDC	32 VDC	3A (T)	9 W

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

Section 5.2

Failsafe Alarm Relay Specifications

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

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	

Section 5.3
Copper Ethernet Port Specifications

The following details the specifications for copper Ethernet ports that can be ordered with the RUGGEDCOM i801.

Order Code	Speed	Connector	Duplex[b]	Cable Type[c]	Wiring Standard[d]	Maximum Distance[e]	Isolation[f]
1CG01	10/100/1000Base-TX	RJ45	FDX/HDX	> Category 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.*

[f] *RMS 1 minute.*

Section 5.4
Fiber Optic Ethernet Port Specifications

The following details the specifications for fiber Ethernet ports that can be ordered with the RUGGEDCOM i801.

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[g]	Connector Type	Cable Type (µm)	Tx λ (typ.) (nm)	Tx min. (dBm)	Tx max. (dBm)	Rx Sensitivity (dBm)	Rx Saturation (dBm)	Distance (typ.) (km)	Power Budget (dB)
MM	LC	62.5/125	850	-9.5	-4.0	-20	0.0	0.4	10.5
SM	LC	9/125	1310	-9.5	-3.0	-21	-3.0	10	11.5

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

Section 5.5
Operating Environment

The RUGGEDCOM i801 is rated to operate under the following environmental conditions.

Ambient Operating Temperature[h]	-20 to 60 °C (-4 to 140 °F) -40 to 85 °C (-40 to 185 °F) (Optional)
Ambient Storage Temperature	-40 to 85 °C (-40 to 185 °F)
Ambient Relative Humidity[i]	up to 95%

Maximum Altitude	2000 m (6562 ft)
Vibration	1 g @ 10 to 500 Hz
Shock	30 g @ 11 ms

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

[i] *Non-condensing, 55 °C (131 °F), 6 cycles.*

Section 5.6
Mechanical Specifications

Weight	1.0 kg (2.2 lbs)
Ingress Protection	IP40 (1 mm or 0.04 in objects)
Enclosure	Cast Aluminum Enclosure

Section 5.7
Dimension Drawings

NOTE
All dimensions are in millimeters, unless otherwise stated.

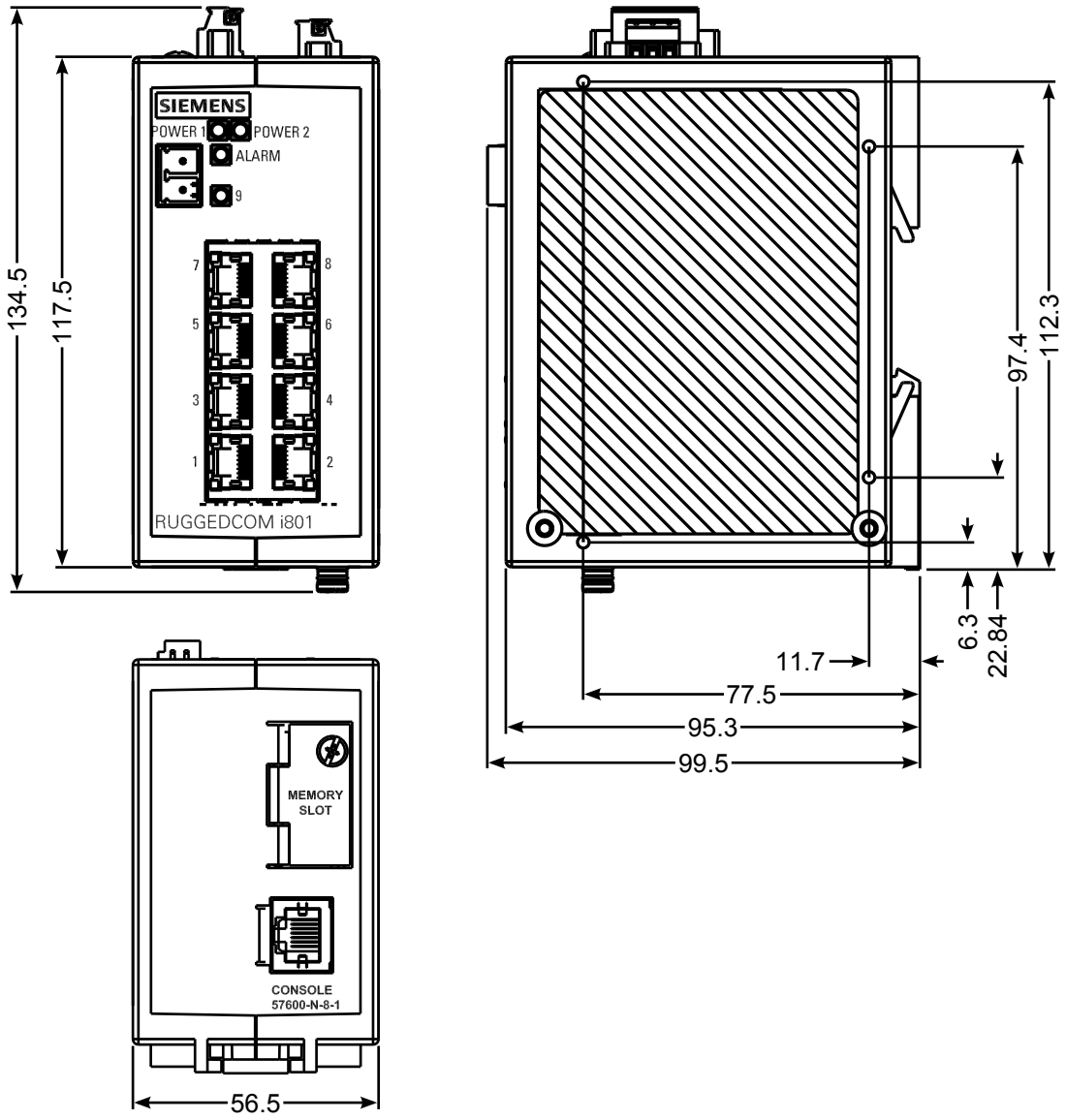

Figure 11: Overall Dimensions

6 Certification

The RUGGEDCOM i801 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 i801 complies.

CONTENTS

Section 6.1.1

CSA

This device meets the requirements of the following Canadian Standards Association (CSA) standards under certificates 2058468 (general safety) and 2068170 (hazardous locations):

- **CAN/CSA-C22.2 No. 60950-1-03**
  Information Technology Equipment – Safety – Part 1: General Requirements
- **CAN/CSA-C22.2 No. 0-M91**
  General Requirements - Canadian Electrical Code, Part II

- **CAN/CSA-C22.2 No. 14-05**
  Industrial Control Equipment
- **CAN/CSA-C22.2 No. 142-M1987**
  Process Control Equipment Industrial Products
- **CAN/CSA-C22.2 No. 213-M1987**
  Non-Incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations
- **UL 60950-1**
  Information Technology Equipment – Safety Part 1: General Requirements
- **ANSI/UL 508**
  Standard for Industrial Control Equipment
- **UL 916 4th Edition 2007**
  Standard for Energy Management Equipment
- **ANSI/ISA-12.12.01-2007**
  Non-incendive Electrical Equipment For Use In Class 1 And 2, Division 2 And Class 3, Divisions 1 And 2 Hazardous (classified) Locations

The device is marked with a CSA symbol that indicates compliance with both Canadian and U.S. requirements.

Copies of the CSA Declarations of Conformity are available via Siemens Industry Online Support:

- https://support.industry.siemens.com/cs/ww/en/view/109476357 (General Safety)
- https://support.industry.siemens.com/cs/ww/en/view/109476358 (Hazardous Locations)

Section 6.1.2

ATEX/IEC Ex

This device meets the requirements of the following ATEX/IEC Ex standards:

- **IEC/EN 60079-15:2005**
  Electrical Apparatus for Explosive Gas Atmospheres - Part 15: Construction, Test and Marking of Type of Protection "N" Electrical Apparatus

It is specifically approved for use in hazardous locations defined as:

- EEx nC IIC T4
- Ex II 3 G
- 12-24 VDC, 2A, Class III

Section 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 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.

CE

A copy of the EU Declaration of Conformity is available via Siemens Industry Online Support at https://support.industry.siemens.com/cs/ww/en/view/109475424.

Section 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.

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

Section 6.1.5
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

Section 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)

Section 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 9001:2008**
  Quality management systems – Requirements

Section 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.

Section 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.

Section 6.1.10
Other Approvals

This device meets the requirements of the following additional standards:

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

Section 6.2
EMC and Environmental Type Tests

The RUGGEDCOM i801 has passed the following EMC and environmental tests.

» IEC 61850-3 Type Tests

Test	Description		Test Levels
IEC 61000-4-2	ESD	Enclosure Contact	± 4 kV ± 8 kV
		Enclosure Air	± 8 kV
IEC 61000-4-3	Radiated RFI	Enclosure ports	20 V/m
IEC 61000-4-4	Burst (Fast Transient)	Signal ports	± 4 kV @ 5 kHz
		DC Power ports	± 4 kV @ 5 kHz
IEC 61000-4-5	Surge	Signal ports	± 1 kV line-to-earth
		DC Power ports	± 0.5 kV line-to-earth/line
IEC 61000-4-6	Induced (Conducted) RFI	Signal ports	10 V
		DC Power ports	
		Earth ground ports	
IEC 61000-4-8	Magnetic Field	Enclosure ports	30 A/m
IEC 61000-4-29	Voltage Dips	DC Power ports	30% reduction for 0.3 seconds 60% reduction for 1 second
IEC 61000-4-12	Damped Oscillatory	Signal ports	2.5 kV common, 1 kV differential mode @ 1 MHz
		DC Power ports	2.5 kV common, 1 kV differential mode @ 1 MHz
IEC 61000-4-16	Mains Frequency Voltage	Signal ports	10 V Continuous, 100 V for 1 s
		DC Power ports	10 V Continuous, 100 V for 1 s
IEC 61000-4-17	Ripple on DC Power Supply	DC Power ports	± 15%

IEEE 1613 EMC Immunity Type Tests

Description		Test Levels
ESD	Enclosure Contact	± 8 kV
	Enclosure Air	± 8 kV
Radiated RFI	Enclosure ports	35 V/m
Fast Transient	Signal ports	± 4 kV @ 5 kHz
	DC Power ports	± 4 kV @ 5 kHz
	Earth ground ports	± 4 kV @ 5 kHz
Oscillatory	Signal ports	2.5 kV common mode @ 1MHz
	DC Power ports	2.5 kV common, 1 kV differential mode @ 1MHz

Environmental Type Tests

Test	Description		Test Levels
IEC 60068-2-1	Cold Temperature	Test Ad	-40 °C (-40 °F), 16 Hours
IEC 60068-2-2	Dry Heat	Test Bd	85 °C (185 °F), 16 Hours
IEC 60068-2-30	Humidity (Damp Heat, Cyclic)	Test Db	95% (non-condensing), 55 °C (131 °F), 6 cycles
IEC 60068-2-6	Vibration		1 g @ 10-500 Hz
IEC 60068-2-27	Shock		30 g @ 11 ms