

Elexant 9200i

CONNECT AND PROTECT

Wireless Communications Interface



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1. OVERVIEW

This section contains an overview of the Elexant 9200i Wireless Communications product. It introduces the main features of the product, variations available, as well as provides directions on accessing manufacturer information that pertains to the equipment there-in.

1.1 Introduction

The nVent RAYCHEM Elexant 9200i is a Wireless Communications Interface that provides an alternative solution to hardwired Remote Monitoring and Configuration of Electric Heat Tracing Systems (EHT) systems.

This product contains equipment from 3rd party manufacturers, is regional in its application, and covers a range of frequencies, all of which need be defined at the time of purchase. Engineering Services typically define the equipment that is needed in order to meet a specific application.

Additional copies of this user manual may be ordered separately through your nVent Heat Tracing Solutions representative or online at RAYCHEM.nVent.com using the document number H60819.

1.1.1 Description

A minimum of two radio transceivers are required to establish a network. This product is intended for integration with nVent RAYCHEM Supervisor software and nVent RAYCHEM Electric Heat Tracing (EHT) Controllers.

The Elexant 9200i product line consists of the following:

- Standalone enclosures
- A wireless communications option within a given Control Panel
- External antenna packages

Standalone enclosures can be configured in many ways, enabling the customer to choose from a range of options: enclosure material, radio frequency, antenna type, and heating option.

1.1.2 Enclosure Variants

(See Notes 1 and 2)

Catalog Number	Part Number	Description
10392-100	9200i-E-PC-868-FW	Elexant 9200i 868 MHz Phoenix Contact module in FG enclosure with window, antenna, and pre-drilled holes for power (M25) and communications (M20)
10392-101	9200i-E-PC-868-FW-EXT	Elexant 9200i 868 MHz Phoenix Contact module in FG enclosure with window, external antenna connection, and pre-drilled holes for power (M25) and communications (M20) - antenna & coax sold separately
10392-102	9200i-E-PC-868-SW	Elexant 9200i 868 MHz Phoenix Contact module in SS enclosure with window, antenna, and pre-drilled holes for power (M25) and communications (M20)
10392-103	9200i-E-PC-868-SW-EXT	Elexant 9200i 868 MHz Phoenix Contact module in SS enclosure with window, external antenna connection, and pre-drilled holes for power (M25) and communications (M20) - antenna & coax sold separately
10392-104	9200i-A-PC-900-FW	Elexant 9200i 900 MHz Phoenix Contact module in FG enclosure with window and antenna
10392-105	9200i-A-PC-900-FW-EXT	Elexant 9200i 900 MHz Phoenix Contact module in FG enclosure with window and external antenna connection - antenna & coax sold separately
10392-106	9200i-A-PC-900-SW	Elexant 9200i 900 MHz Phoenix Contact module in SS enclosure with window and antenna
10392-107	9200i-A-PC-900-SW-EXT	Elexant 9200i 900 MHz Phoenix Contact module in SS enclosure with window and external antenna connection - antenna & coax sold separately
10392-108	9200i-A-PC-024-FW	Elexant 9200i 2.4 GHz Phoenix Contact module in FG enclosure with window and antenna
10392-109	9200i-A-PC-024-FW-EXT	Elexant 9200i 2.4 GHz Phoenix Contact module in FG enclosure with window and external antenna connection - antenna & coax sold separately
10392-110	9200i-A-PC-024-SW	Elexant 9200i 2.4 GHz Phoenix Contact module in SS enclosure with window and antenna
10392-111	9200i-A-PC-024-SW-EXT	Elexant 9200i 2.4 GHz Phoenix Contact module in SS enclosure with window and external antenna connection - antenna & coax sold separately
10392-112	9200i-E-PC-024-FW	Elexant 9200i 2.4 GHz Phoenix Contact module in FG enclosure with window, antenna, and pre-drilled holes for power (M25) and communications (M20)
10392-113	9200i-E-PC-024-FW-EXT	Elexant 9200i 2.4 GHz Phoenix Contact module in FG enclosure with window, external antenna connection, and pre-drilled holes for power (M25) and communications (M20) - antenna & coax sold separately
10392-114	9200i-E-PC-024-SW	Elexant 9200i 2.4 GHz Phoenix Contact module in SS enclosure with window, antenna, and pre-drilled holes for power (M25) and communications (M20)
10392-115	9200i-E-PC-024-SW-EXT	Elexant 9200i 2.4 GHz Phoenix Contact module in SS enclosure with window, external antenna connection, and pre-drilled holes for power (M25) and communications (M20) - antenna & coax sold separately

Table 1 - Elexant 9200i Enclosure Variants

1.1.3 Antenna Package Variants

All Antenna Packages listed are accessories to the Enclosures shown above, and are shown to assist the customer in product selection. However, they are not included in the approvals of the Enclosures. Each component of the antenna packages must have its own suitable certification for each use case. Refer to the section on 'SPECIFIC CONDITIONS OF SAFE USE' for further information.

(See Notes 1 and 2)

Catalog Number	Part Number	Description
10392-151	9200i-E-PC-ANT-868-OM1-3	Elexant 9200i 868 MHz Antenna Package Accessory - OMNI 2 dBi antenna with 3 meter coaxial cable, antenna bracket, and gland
10392-152	9200i-A-PC-ANT-900-OM2-3	Elexant 9200i 868 - 900 MHz Antenna Package Accessory - OMNI 2 dBi antenna with 3 meter coaxial cable, antenna bracket, and gland
10392-153	9200i-C-PC-ANT-024-OM3-3	Elexant 9200i 2.4 GHz Antenna Package Accessory - OMNI 2 dBi antenna with 3 meter coaxial cable, antenna bracket, and gland
10392-154	9200i-C-PC-ANT-900-YA1-3	Elexant 9200i 868 - 900 MHz Antenna Package Accessory - OMNI 5 dBi YAGI antenna with 3 meter coaxial cable, antenna bracket, and gland
9200i-ANT-C	9200i-ANT-C	Customized Antenna Package Accessory

Table 2 - Elexant 9200i Antenna Packages

Notes:

- Many countries restrict the use of specific Radio Frequencies. In general, the following frequencies can be used accordingly:
 - 868 MHz – EMEAI
 - 900 MHz – North America
 - 2.4 GHz – Global
- Further information pertaining to specific regional information can be found within the manufacturer's documentation.

1.1.4 Product Features

- Available in three frequencies for global coverage:**
 - 868 MHz, 900 MHz, 2.4 GHz
- Multiple network topologies & modes**
 - Point to Point / Star, Line / Mesh
 - I/O Data, Serial, PLC / Modbus RTU
- Multiple Radio setup types**
 - Master, Slave, Repeater / Slave
 - 128 bit Advanced Encryption Standard (AES)
- Self-Healing**
 - Radios auto-negotiate alternate pathways in the event of a lost path
- Long distance coverage**

The Elexant 9200i is an encapsulation of a 3rd party transceiver and associated equipment. It provides a transparent communications bridge between a Master and Slave / Repeater transceiver, allowing for communications to span many kilometers. The main interface to a Heat Tracing Controller is a RS-485 Serial interface, supporting the Modbus RTU protocol. A full set of features can be found within the manufacturer's documentation.

1.2 Vital Information

This manual is a guide for the setup and operation of the nVent RAYCHEM Elexant 9200i Wireless Communications product.

IMPORTANT: All information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their particular application.

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1.3 Technical Support

Contact nVent Customer Care at:

North America:

Email: thermal.info@nVent.com
Tel: +1.800.545.6258

Europe, Middle East, Africa:

Email: thermal.info@nVent.com
Tel: +32.16.213.511

Asia Pacific:

Email: cn.thermal.info@nVent.com
Tel: +86.21.2412.1688

Latin America:

Email: thermal.info@nVent.com
Tel: +1.713.868.4800

1.4 Supporting Services

A commissioning program for the Elexant 9200i has been developed in order to simplify and streamline all related activities – Programming, Equipment Tracking, Progress Tracking, QA/QC, etc. Please speak to your nVent representative for assistance with this program.

2. INSTALLATION AND WIRING

2.1 Initial Inspection

Inspect the shipping container for damage. If the shipping container or cushioning material is damaged, it should be kept until the contents of the shipment have been verified for completeness and the equipment has been checked mechanically and electrically. If the shipment is incomplete or shows visible damage, notify the nearest nVent Thermal representative.

2.2 Operator Safety Considerations

The Elexant 9200i Wireless Communications products are suitable for Class 1, Division 2, Groups A, B, C, and D hazardous areas (IECEx / ATEX Zone 2 approvals pending).

Refer to RAYCHEM-IM-H60818-Elexant9200i-EN Installation Manual for more details.

2.3 Elexant 9200i Assembly

The figure below displays the different physical assemblies for the common Variants of the Elexant 9200i.

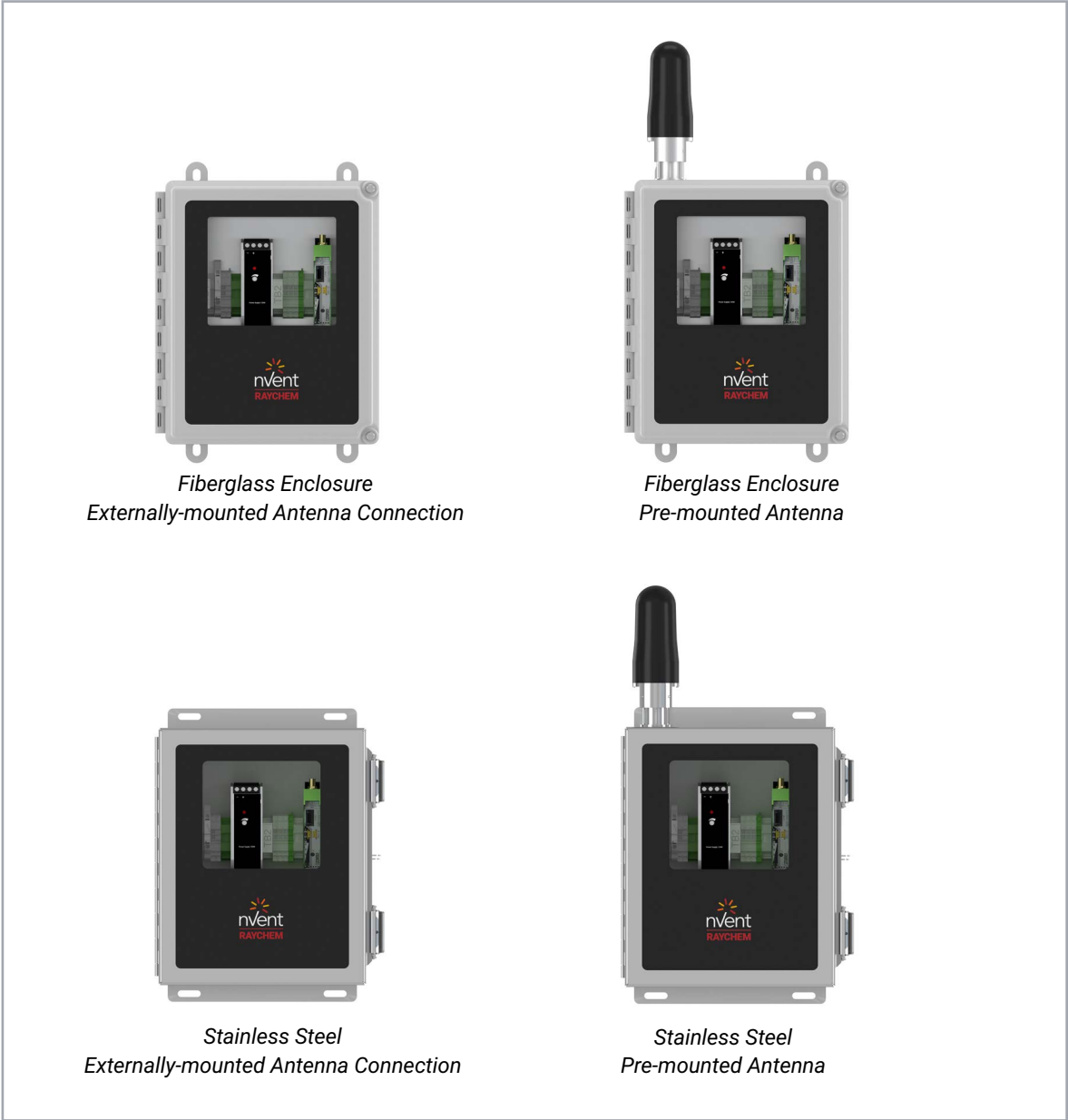


Figure 1 - Elexant 9200i Assembly

2.4 Connections and Indicators

A. TB-1 Wiring

Terminals	Function
1	Earth Ground (G)
2	Power IN (L1)
3	Power IN (N)

B. TB-2 Wiring

Terminals	Function
1	RS-485 +
2	RS-485 –
IE ^{Note1}	RS-485 Shield (SH)
PE	Earth Ground (G)

Note 1: To provide isolated earth for comm shield, remove jumper between IE & PE.

C. Antenna Connections

Note: Internal antenna connections made at factory. An external connection applies if using an external antenna package; such a connection method is provided.

Status LEDs – Radio transceivers

PWR	Green LED indicating status of supply voltage
Off	No supply voltage present
On	Supply voltage OK

DAT	Green LED indicating status of bus communications
Off	No communication
Flashing	Unit in Configuration mode
On	Cyclic data communication

ERR	Red LED indicating error state
Off	No error
Flashing – Slow (1.4 Hz)	When unit configured for I/O data mode
	Double assignment of I/O map address
	Missing input module
	Missing output module
	RAD ID changed
	When unit configured for PLC/Modbus RTU mode
	Double assignment of I/O map address
	RAD ID changed
	No Modbus communication
Flashing – Fast (2.8 Hz)	Wireless connection interrupted
On	Local bus error






RX	Green LED indicating Receive data activity of wireless transmissions, in conjunction with serial interface
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TX	Green LED indicating Transmit data activity of wireless transmissions, in conjunction with serial interface
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LED Bar Graph			
Green and Yellow LEDs indicating receive signal strength			
Graph status	LEDs	Receive signal	RSSI voltage
	All 4 LEDs are lit	Connection with maximum receive signal strength	2.5 to 3.0 V
	1 Yellow LED and 2 Green LEDs are lit	Connection with very good receive signal strength	2.0 to 2.5 V
	1 Yellow LED and 1 Green LED is lit	Connection with good receive signal strength	1.5 to 2.0 V
	1 Yellow LED lit	Connection with weak receive signal strength	1.0 to 1.5 V
	All LEDs off	Not connected Configuration mode Overload	0 VDC

868 MHz Radio Levels						
LED Bar Graph	1.2k	9.6k	19.2k	60k	120k	RSSI voltage
	-90 dBm	-85 dBm	-80 dBm	-75 dBm	-70 dBm	>= 2.5 V
	-100 dBm	-95 dBm	-90 dBm	-85 dBm	-80 dBm	>= 2.0 V
	-110 dBm	-105 dBm	-100 dBm	-95 dBm	-90 dBm	>= 1.5 V
	LINK	LINK	LINK	LINK	LINK	~1.0 V
	Not Connected, Configuration more, or overload					0 V

900 MHz Radio Levels					
LED Bar Graph	16k	125k	250k	500k	RSSI voltage
	-75 dBm	-70 dBm	-65 dBm	-60 dBm	2.5 to 3.0 V
	-85 dBm	-80 dBm	-75 dBm	-70 dBm	2.0 to 2.5 V
	-95 dBm	-90 dBm	-85 dBm	-80 dBm	1.5 to 2.0 V
	LINK	LINK	LINK	LINK	1.0 to 1.5 V
	Not Connected, Configuration more, or overload				0 V

2.4 GHz Radio Levels				
LED Bar Graph	16k	125k	250k	RSSI voltage
	-70 dBm	-65 dBm	-60 dBm	≥ 2.5 V
	-80 dBm	-75 dBm	-70 dBm	≥ 2.0 V
	-90 dBm	-85 dBm	-80 dBm	≥ 1.5 V
	LINK	LINK	LINK	~ 1.0 V
	Not Connected, Configuration more, or overload			0 V

2.5 Mounting and Removal Procedures

The ideal mounting method is to secure the enclosure to channel strut, or other structural components, using the included mounting hardware.

Mounting and removal of the Elexant 9200i should only be attempted by trained personnel. If support is needed, contact nVent Technical Support (refer to section 1.3).

2.6 Wiring and Input Interfaces

2.6.1 Input Power

The input power connection is made at the screw terminals on Terminal Block TB-1.

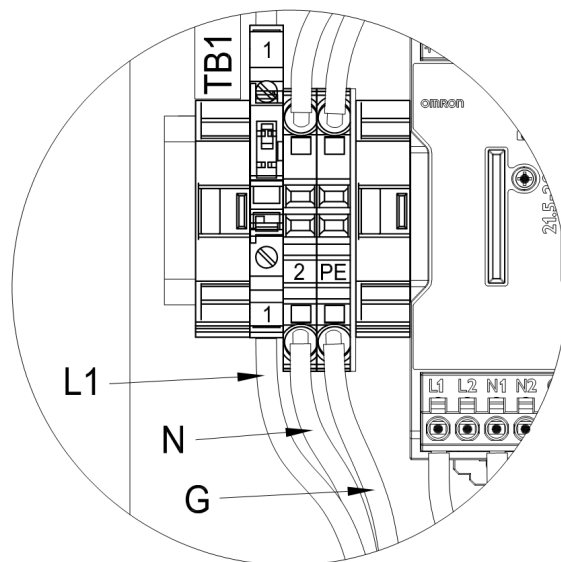


Figure 2 - Input Power

2.6.2 RS-485 Connections

Wiring for RS-485 communications is made at screw terminals on Terminal Block TB-2.

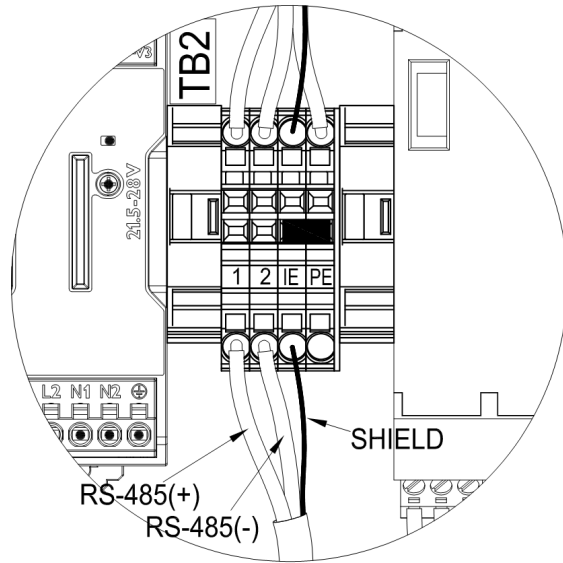


Figure 3 - RS-485 Connections

2.6.3 Antenna Coaxial Connection

Depending on the package purchased, an external antenna may need to be connected.

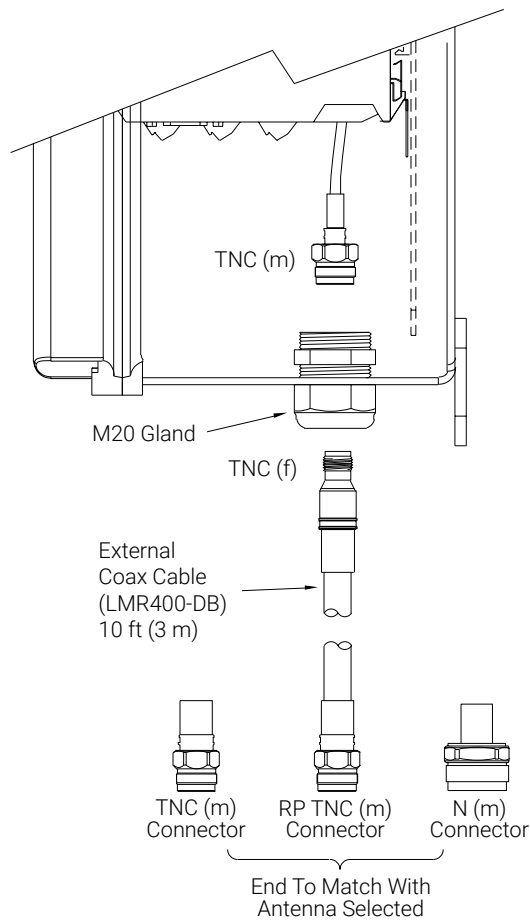


Figure 4 - Antenna Coaxial Connection

3. PRODUCT OPERATIONS

3.1 Programming and Configuration

Please reference Phoenix Contact's User Manual RAD-XXXX-IFS, or equivalent, for the latest information pertaining to this procedure.

4. FIRMWARE UPGRADE

4.1 Firmware Upgrade Procedure

Please reference Phoenix Contact's User Manual RAD-XXXX-IFS, or equivalent, for the latest information pertaining to this procedure.

5. TROUBLESHOOTING

5.1 Troubleshooting Procedure

Please reference Phoenix Contact's User Manual RAD-XXXX-IFS, or equivalent, for the latest information pertaining to this procedure.

Specific Conditions of Safe Use

The enclosure of the device shall be fitted with a locking mechanism such that it is only accessible with the use of a tool.

To maintain an internal pollution degree 2 environment, after opening the enclosure, make sure there is no visible condensation or dust. Power the device and let it heat up for 5 minutes before closing the enclosure door.

Only install in areas with low risk of mechanical impact.

Enclosure openings must be filled by equipment marked for use in ATEX / IECEx Zone 2 areas, and match or exceed the IP rating of the enclosures. General Guide to Cable Entry Positions into Cable Gland or Enclosure Side:

- Maximum hole diameter is major thread diameter of cable gland plus 0.7 mm (.03")
- Minimum material to be maintained between holes: Glands M16 through M32: 15mm (0.59") Glands M35 through M75: 20 mm (0.79") Glands M75 through M100: 35 mm (1.38"). Prior to making holes in the enclosure wall or gland plate, verify that the selected gland will not interfere with the sealing washer and locknut
- Select a gland for the correct application with the proper certifications. Make certain all cable gland accessories are included for through hole installation. Additional accessories may include locknut and sealing washers
- Install the gland in accordance to the manufacturer's instructions
- Holes must be located to prevent sealing washer and locknut from interfering with gasket
- Externally mounted antennas and accessories must be suitable for ATEX / IECEx Zone 2 areas, and match or exceed the IP rating of the enclosures
- The fuse for incoming power shall be considered user replaceable. Refer to Enclosure Drawing Bill of Materials for the correct Current Rating, Model, and Part Number of the fuse. Prior to replacing the fuse, disable or disconnect from power. Upon replacing the fuse, remove the fuse plug / housing, replace the fuse per note above, close and re-seat the fuse plug / housing securely





North America

Tel +1.800.545.6258
Fax +1.800.527.5703
thermal.info@nVent.com

Europe, Middle East, Africa

Tel +32.16.213.511
Fax +32.16.213.604
thermal.info@nVent.com

Asia Pacific

Tel +86.21.2412.1688
Fax +86.21.5426.3167
cn.thermal.info@nVent.com

Latin America

Tel +1.713.868.4800
Fax +1.713.868.2333
thermal.info@nVent.com



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