RADline Ethernet

900 MHz trusted wireless Ethernet radios



Data sheet
2629_en_G

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1 Description

The Product short description incorporates the MOTR-9™ radio board, a 1 watt, frequency-hopping, spread spectrum (FHSS) transceiver. It operates in the license-free 902-928 MHz ISM band. The MOTR-9 provides user-configurable over-the-air data rates up to 500 kbps. Adjustable packet sizes maximize data speed and minimize latency. The radio provides selectable 128/192/256-bit AES encryption to prevent unwanted intrusion and keep data secure.

The module allows users to configure a master, slave or repeater for use in a wireless Ethernet network. It features 128/192/256-bit AES encryption for highly secure data transmission. The Product short description supports TCP/IP, UDP and IP v4 protocols with all programming and radio diagnostics accessible via a simple integrated web server. The radio also features user-upgradable firmware.

Integrated serial ports allow broadcasting RS-232/422/485 protocols to serial clients. It can also be used as a Modbus RTU/TCP gateway.

The integrated bus connector on the RAD-ISM-900-EN-BD-BUS allows the addition of expansion I/O modules. Up to 64 digital or 32 analog signals can be monitored via XML or controlled using Modbus RTU/TCP.

The RAD-ISM-900-EN-BD/B is a dedicated slave radio for networking remote, 10/100 Mbps Ethernet devices.

2 Applications

- SCADA systems
- PLC/RTU extensions
- Pump controls
- Tank level/pressure/temperature monitoring
- Water/wastewater treatment
- Petroleum and chemical processing

3 Features

- MOTR-9™ transceiver
- Selectable 125, 250, 500 kbps over-the-air speeds
- Functions as a master, repeater, or slave
- User selectable 128/192/256-bit AES encryption security features
- RS-232 and RS-422/485 ports allow integration of serial devices onto Ethernet network (built-in device server)
- Programming and network diagnostics are accessed via integrated, IT-friendly web server; no additional software needed
- Modbus RTU/TCP compatible for process and industrial applications

The products described in this data sheet are exclusively for export outside of the European Economic area.

Make sure you always use the latest documentation.
It can be downloaded at phoenixcontact.com.

This document is valid for all products listed in the “Ordering data” on page 2.

4 Ordering data

Products

Description	Type	Order No.	Pcs./Pkt.
Radio, 900 MHz, wireless Ethernet, with serial ports	RAD-ISM-900-EN-BD	**2900016**	1
Radio, 900 MHz, wireless Ethernet, with I/O bus connection	RAD-ISM-900-EN-BD-BUS	**2900017**	1
Radio, 900 MHz, wireless Ethernet, slave only	RAD-ISM-900-EN-BD/B	**2901205**	1

Accessories

Description	Type	Order No.	Pcs./Pkt.
Antenna, 0 dB gain, omnidirectional, 1.8 m (6 ft.) cable, MCX connector (male)	RAD-ISM-900-ANT-OMNI-0-6	**2867160**	1
Antenna, 3 dB gain, omnidirectional fiberglass, type N connector (female)	RAD-ISM-900-ANT-OMNI-FG-3-N	**2867791**	1
Antenna, 6 dB gain, omnidirectional fiberglass, type N connector (female)	RAD-ISM-900-ANT-OMNI-FG-6-N	**2885579**	1
Enclosure, NEMA 4X pre-wired, includes MINI-UPS, power distribution and surge protection for 900 MHz radio system	RAD-SYS-NEMA4X-900	**2917188**	1
Cable, 7.6 m (25 ft.) RG213 with type N connectors (male)	RAD-CAB-RG213-25	**2867597**	1
Surge protection, bulkhead mount for 900 MHz radio	CN-UB-280DC-BB-ASSY	**5603859**	1
Adapter cable, 1.2 m (4 ft.) RG316 with type N (male) and MCX (male) connectors	RAD-CON-MCX90-N-SS	**2885207**	1
Module, 8-channel digital input	RAD-IN-8D	**2867144**	1
Module, 8-channel digital output with relays	RAD-OUT-8D-REL	**2867157**	1
Module, 4-channel analog input	RAD-IN-4A-I	**2867115**	1
Module, 4-channel analog output	RAD-OUT-4A-I	**2867128**	1
Module, 2-channel digital input, 2-channel digital output, 1-channel analog input, 1-channel analog output	RAD-IN+OUT-2D-1A-I	**2867322**	1
Module, pulse input	RAD-IN-2D-CNT	**2885223**	1
Module, pulse output	RAD-OUT-2D-CNT	**2885236**	1

5 Technical data

General data	
Mounting	NS35 mounting rail (IEC 60715)
Dimensions (W x H x D)	52 x 99 x 115 mm (2.1 x 3.90 x 4.5 in.)
Weight	296 g (0.65 lb.)
Case material	Polyamide PA non-reinforced with aluminum heatsink
Operating temperature	-40 to 65°C (-40 to 149°F)
Storage temperature	-40 to 75°C (-40 to 167°F)
Relative humidity	10 - 95% non-condensing
Degree of protection	IP20
LED indicators	Status: solid indicates normal operation; flashing indicates error RS-485TX: flashing indicates RS-422/485 data transmitting RS-485RX: flashing indicates RS-422/485 data receiving RS-232TX: flashing indicates RS-232 data transmitting RS-232RX: flashing indicates RS-232 data receiving RF LINK: solid when RF link is established; flashes with no radio connection RF DATA: flashes when data is sent/received WAN LINK: flashes when data is detected on Ethernet port WAN SPEED: solid when 100Base-T connection exists

Supply voltage	
Power	11-30 V DC Class 2
Connection	Screw-type terminal, 12-24 AWG
Current consumption, maximum	250 mA @ 24 V DC
RF Link contact	0.5 A, 30 V DC

Transmission data	
Frequency	902-928 MHz
Transmit power	10 mW (10 dBm) … 1 W (30 dBm); adjustable in 1 dBm increments
Typical range[1]	24 km (15 mi.)
Receive sensitivity	500 kbps: –92 dBm 250 kbps: –98 dBm 125 kbps: –102 dBm
RSSI test point	0-3.5 V DC
PER	5%
Packet size (bytes)[2]	Latency mode: 55 Balanced: 110 Throughput: 242
Packet size (bytes)[3]	Latency mode: 110 Balanced: 264 Throughput: 440

1 Based on a fixed-range calculation with a 5 dB gain omnidirectional antenna at each end. TX power is set to 30 dBm with an over-the-air data rate set to 125 kbps. A 10 dB fade margin and clear line-of-sight over average terrain is assumed.

2 Firmware before v2.0

3 Firmware v2.0 and later

Serial ports[1]	
Port connections	RS-232; D-SUB 9 female RS-422/485; 4-pin pluggable screw terminal block
Baud rate (bps)	1200, 2400, 4800, 9600, 19200, 38400, 57600, 93750, 115200, 187500

1 Not applicable to RAD-ISM-900-EN-BD/B

Ethernet	
Port connection	RJ45
Ethernet transmission rate	10/100 Mbps

Approvals	
FCC/IC	Part 15, Section 247
㊊	Class I, Div. 2 Groups A, B, C, D