

# 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.



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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 <sup>1</sup>	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) <sup>2</sup>	Latency mode: 55 Balanced: 110 Throughput: 242
Packet size (bytes) <sup>3</sup>	Latency mode: 110 Balanced: 264 Throughput: 440

<sup>1</sup> 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.

<sup>2</sup> Firmware before v2.0

<sup>3</sup> Firmware v2.0 and later

### Serial ports<sup>1</sup>


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

<sup>1</sup> 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