

## Wireless module - RAD-900-IFS - 2901540

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Radioline - 900 MHz wireless transceiver with RS-232/485 interface, can be extended with I/O modules, RSMA (female) antenna connection, point-to-point, star, and mesh networks up to 250 stations, range of up to 32 km (line of sight), use in North America

### Product Description


Radioline is the new wireless system for large systems. Special features include extremely easy assignment of inputs and outputs by simply turning the thumbwheel - without any programming. Radioline transmits I/O signals (I/O mode) or serial data (serial mode) and is therefore very versatile. Alternatively, I/O signals can now also be connected to controllers directly using the Modbus protocol (PLC/Modbus RTU mode). In addition, you can implement various network structures: from a simple point-to-point connection to complex mesh networks. Thanks to the latest Trusted Wireless technology, Radioline is the ideal choice for industrial use.

### Your advantages

- ✓ Extended temperature range, -40 °C ... +70 °C
- ✓ Range of several kilometers thanks to adjustable data rates for the wireless interface
- ✓ Integrated RS-232/RS-485 interface
- ✓ Quick and easy startup without programming
- ✓ High degree of reliability due to Trusted Wireless 2.0 technology (AES encryption, frequency hopping method, and coexistence management)
- ✓ Mesh networks of up to 250 devices



### Key Commercial Data

Packing unit	1 pc
GTIN	 4 046356 610209
GTIN	4046356610209
Weight per Piece (excluding packing)	350.000 g
Custom tariff number	85176200
Country of origin	United States

# Wireless module - RAD-900-IFS - 2901540

## Technical data

### Note

Trade restriction	The products are offered exclusively for export outside the EU and the European Economic Area.
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### Dimensions

Width	35 mm
Height	116 mm
Depth	114.5 mm

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C -40 °F ... 158 °F
Ambient temperature (storage/transport)	-40 °C ... 85 °C -40 °F ... 185 °F
Permissible humidity (operation)	20 % ... 85 %
Permissible humidity (storage/transport)	20 % ... 85 %
Altitude	2000 m
Vibration (operation)	in accordance with IEC 60068-2-6: 5g, 10 Hz ... 150 Hz
Shock	16g, 11 ms

### General

Operating mode	PLC / Modbus RTU dual mode (Activation and configuration via PSI-CONF software)
Overvoltage category	II
Assembly instructions	on standard DIN rail NS 35 in accordance with EN 60715
Degree of pollution	2
Housing material	PA 6.6-FR
Flammability rating according to UL 94	V0
Wireless licences	USA (FCC, Part 15.247, ID: SGV-SHR-900) Canada (IC, RSS210, ID: 4720C-SHR900) Mexico (IFT, ID: RCPHRA17-1113) Chile Argentina
Export note	The products are offered exclusively for export outside the European Economic Area (EEA).

### Supply

Supply voltage range	10.8 V DC ... 30.5 V DC
Max. current consumption	328 mA (@24 V DC)
Nominal power consumption	1.7 W (30 dBm)

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### Technical data

#### Supply

Power consumption	8.4 W (peak; 30 dBm)
Transient surge protection	Yes

#### Wireless interface

Antenna connection	RSMA (female)
Direction	Bi-directional
Frequency	900 MHz
Frequency range	902 MHz ... 928 MHz
Data rate	16 kbps (adjustable)
	125 kbps (adjustable)
	250 kbps (adjustable)
	500 kbps (adjustable)
Receiver sensitivity	-112 dBm (16 kbps)
	-105 dBm (125 kbps)
	-102 dBm (250 kbps)
	-95 dBm (500 kbps)
Transmission power	max. 1 W (adjustable)
Range	± 32 km (The range may be considerably above or below that stated, and depends on the environment, antenna technology, and the product used)
Security	128-bit data encryption

#### Serial interface

Interface 1	RS-232
Connection method	COMBICON plug-in screw terminal block
	D-SUB-9 female connector
Connection technology	3-wire
Data rate	300 bps / 600 bps / 1.2 kbps / 2.4 kbps / 4.8 kbps / 9.6 kbps / 19.2 kbps / 38.4 kbps / 57.6 kbps / 93.75 kbps / 115.2 kbps
Interface 2	RS-485
Connection method	COMBICON plug-in screw terminal block
Connection technology	2-wire
Termination resistor	390 Ω (switchable via DIP switches)
	150 Ω (switchable via DIP switches)
	390 Ω (switchable via DIP switches)
Data rate	300 bps / 600 bps / 1.2 kbps / 2.4 kbps / 4.8 kbps / 9.6 kbps / 19.2 kbps / 38.4 kbps / 57.6 kbps / 93.75 kbps / 115.2 kbps / 187.5 kbps
Interface 3	Configuration interface
Connection method	S-PORT (socket)

#### RSSI output

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### Technical data

#### RSSI output

Number of outputs	1
Voltage output signal	0 V ... 3 V

#### RF link relay output

Number of outputs	1
Contact type	PDT
Contact material	PdRu, gold-plated
Maximum switching voltage	30 V AC/DC
Max. switching current	500 mA
Electrical service life	5x 10 <sup>5</sup> switching cycles with 0.5 A at 30 V DC

#### Connection data

Connection method	Screw connection
Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	2.5 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	2.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	14
Stripping length	7 mm
Tightening torque	0.6 Nm
Screw thread	M3

#### Status indicator

Status display	Green LED (supply voltage, PWR)
	Green LED (bus communication, DAT)
	Red LED (periphery error, ERR)
	3x green, 1x yellow LED (LED bar graph receive quality, RSSI)
	Green LED (receive data, RX)
	Green LED (transmit data, TX)

#### Standards and Regulations

Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC
Standard designation	NOM
Flammability rating according to UL 94	V0
Interface description	Trusted Wireless
Security	128-bit data encryption
Shock	16g, 11 ms
Vibration (operation)	in accordance with IEC 60068-2-6: 5g, 10 Hz ... 150 Hz

## Wireless module - RAD-900-IFS - 2901540

### Technical data

#### Standards and Regulations

Conformance	FCC Directive, Part 15.247
	ISC Directive RSS 210
UL, USA	Class I, Zone 2, AEx nA nC IIC T4
UL, USA/Canada	Class I, Div. 2, Groups A, B, C, D
UL, Canada	Class I, Zone 2, Ex nA nC nL IIC T4 Gc X
CSA	CSA C22.2

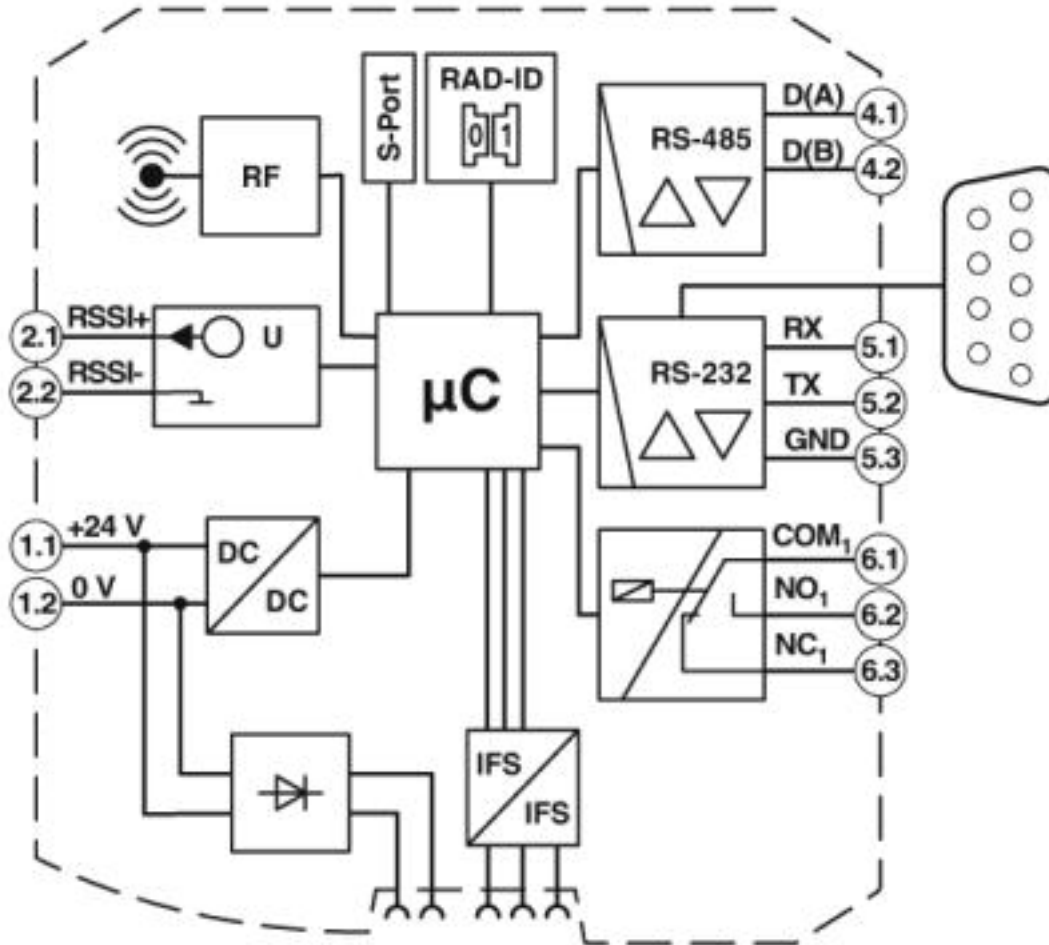
#### Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 50
	For details about hazardous substances go to tab "Downloads", Category "Manufacturer's declaration"

### Drawings

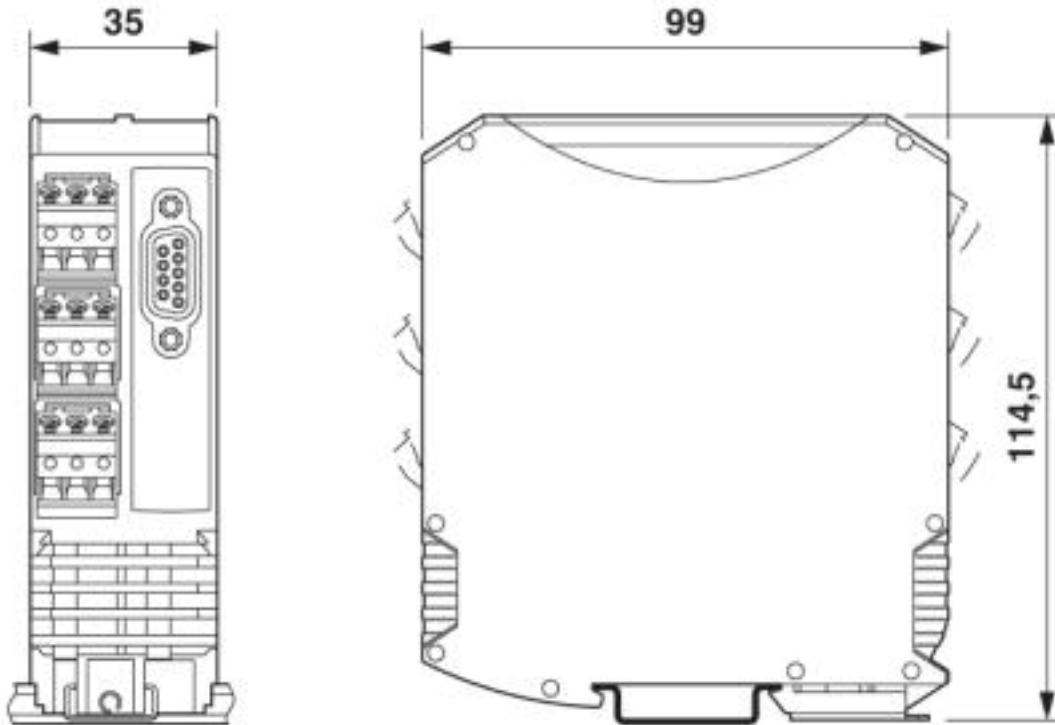
# Wireless module - RAD-900-IFS - 2901540

Block diagram



## Wireless module - RAD-900-IFS - 2901540

Dimensional drawing



### Classifications

#### eCl@ss

eCl@ss 10.0.1	19179290
eCl@ss 4.0	27230200
eCl@ss 4.1	27230200
eCl@ss 5.0	27242200
eCl@ss 5.1	27242200
eCl@ss 6.0	19179200
eCl@ss 7.0	19179290
eCl@ss 8.0	19179290
eCl@ss 9.0	19179290

#### ETIM

ETIM 3.0	EC001423
ETIM 4.0	EC000310
ETIM 5.0	EC000310
ETIM 6.0	EC000310
ETIM 7.0	EC000310

# Wireless module - RAD-900-IFS - 2901540

## Classifications

### UNSPSC

UNSPSC 6.01	30211506
UNSPSC 7.0901	43223108
UNSPSC 11	39121008
UNSPSC 12.01	43223108
UNSPSC 13.2	43222604

## Approvals

### Approvals

#### Approvals

FCC / Industry Canada / UL Listed / cUL Listed / NOM / cULus Listed

#### Ex Approvals

UL Listed / cUL Listed / cULus Listed

### Approval details

FCC	SGV-SHR-900
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Industry Canada	4720C-SHR900
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UL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 238705
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cUL Listed		<a href="http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm">http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/index.htm</a>	FILE E 238705
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NOM	RCPHRA17-1113
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cULus Listed	
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## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### Accessories

#### Antenna

##### Antenna - RAD-ISM-900-ANT-OMNI-FG-3-N - 2867791

Omnidirectional antenna, 900 MHz, gain: 5 dBi, polarization: linear, opening angle: h/v 360°/28°, degree of protection: IP65, connection: N (female), incl. mounting bracket and mast clips



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##### Antenna - RAD-ISM-900-ANT-OMNI-5 - 2867199

Omnidirectional antenna, 900 MHz, gain: 7 dBi, polarization: linear, opening angle: h/v 360°/30°, degree of protection: IP65, connection: N (female), incl. mounting bracket and mast clips



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##### Antenna - RAD-ISM-900-ANT-YAGI-3-N - 2867801

Directional antenna, 868 MHz / 900 MHz, gain: 5 dBi, polarization: linear, opening angle: h/v 168°/78°, degree of protection: IP65, connection: N (female), incl. mounting bracket and mast clips



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##### Antenna - RAD-ISM-900-ANT-OMNI-FG-6-N - 2885579

Omnidirectional antenna, 900 MHz, gain: 8 dBi, polarization: linear, opening angle: h/v 360°/15°, degree of protection: IP65, connection: N (female), incl. mounting bracket and mast clips



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##### Antenna - RAD-ISM-900-ANT-YAGI-6.5-N - 2867814

Directional antenna, 868 MHz / 900 MHz, gain: 8.5 dBi, polarization: linear, opening angle: h/v 100°/62°, degree of protection: IP65, connection: N (female), incl. mounting bracket and mast clips



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### Accessories

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#### Antenna - RAD-ISM-900-ANT-YAGI-10-N - 5606614



Directional antenna 868 MHz / 900 MHz, gain: 12 dBi, polarization: linear, opening angle: h/v 56°/46°, degree of protection: IP65, connection: N (female), incl. mounting bracket and mast clips

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#### Antenna - RAD-900-ANT-OMNI-2-2-RSMA - 2904801



Omnidirectional antenna, 900 MHz, gain: 2 dBi, polarization: linear, degree of protection: IP65, connection: RSMA (male), incl. 1.8 m / 6 ft. connecting cable and mounting bracket for wall mounting

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#### Antenna - RAD-900-ANT-OMNI-2-N - 2904802



Omnidirectional antenna, 868 MHz / 900 MHz, gain: 2 dBi, polarization: linear, opening angle: h/v 360°/50°, degree of protection: IP66, connection: N (female), for control cabinet mounting (optional wall mounting)

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### Coaxial adapter

#### Adapter - RAD-ADP-N/F-N/F - 2867843



Antenna adapter for control cabinet feed-through, frequency range: 0.3 GHz ... 6 GHz, degree of protection: IP65, connection: 2 x N (female)

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#### Adapter - RAD-ADP-RSMA/M-RSMA/F-90 - 2904790



Antenna adapter, frequency range: 0.3 GHz ... 6 GHz, connection: RSMA (male) -> RSMA (female), 90° angled

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## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### Coaxial cable

##### Antenna cable - RAD-PIG-RSMA/N-0.5 - 2903263



Antenna cable, outside diameter: 5 mm (0.2 in.), inner conductor: solid, attenuation: 0.4 / 0.5 / 0.6 dB at 0.9 / 2.4 / 5.8 GHz, connection: N (male) -> RSMA (male), cable length: 0.5 m (1.6 ft.)

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##### Antenna cable - RAD-PIG-RSMA/N-1 - 2903264



Antenna cable, outside diameter: 5 mm (0.2 in.), inner conductor: solid, attenuation: 0.5 / 0.8 / 1.1 dB at 0.9 / 2.4 / 5.8 GHz, connection: N (male) -> RSMA (male), cable length: 1 m (3.3 ft.)

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##### Antenna cable - RAD-PIG-RSMA/N-2 - 2903265



Antenna cable, outside diameter: 5 mm (0.2 in.), inner conductor: solid, attenuation: 0.9 / 1.3 / 2.0 dB at 0.9 / 2.4 / 5.8 GHz, connection: N (male) -> RSMA (male), cable length: 2 m (6.5 ft.)

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##### Antenna cable - RAD-PIG-RSMA/N-3 - 2903266



Antenna cable, outside diameter: 5 mm (0.2 in.), inner conductor: solid, attenuation: 1.2 / 2.0 / 3.0 dB at 0.9 / 2.4 / 5.8 GHz, connection: N (male) -> RSMA (male), cable length: 3 m (10 ft.)

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##### Antenna cable - RAD-CAB-PFP240-10 - 5606124



Antenna cable, outside diameter: 6 mm (0.24 in.), inner conductor: solid, attenuation: 1.0 / 1.5 / 2.1 dB at 0.9 / 2.4 / 5.8 GHz, connection: 2x N (male), cable length: 3 m (10 ft.)

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## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### Antenna cable - RAD-CAB-PFP400-20 - 5606125



Antenna cable, outside diameter: 10 mm (0.4 in.), inner conductor: solid, attenuation: 1.0 / 1.5 / 2.2 dB at 0.9 / 2.4 / 5.8 GHz, connection: 2x N (male), cable length: 6 m (20 ft.)

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#### Antenna cable - RAD-CAB-PFP500-25 - 5606126



Antenna cable, outside diameter: 13 mm (0.51 in.), inner conductor: solid, attenuation: 1.0 / 1.6 / 2.3 dB at 0.9 / 2.4 / 5.8 GHz, connection: 2x N (male), cable length: 7.5 m (25 ft.)

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#### Antenna cable - RAD-CAB-RG213-40 - 2867377



Antenna cable, outside diameter: 10 mm (0.4 in.), inner conductor: solid, attenuation: 2.9 dB at 900 MHz, connection: 2 x N (male), cable length: 12 m (40 ft.)

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#### Antenna cable - RAD-CAB-RG213-50 - 2867225



Antenna cable, outside diameter: 10 mm (0.4 in.), inner conductor: solid, attenuation: 3.5 dB at 900 MHz, connection: 2 x N (male), cable length: 15 m (50 ft.)

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#### Antenna cable - RAD-CAB-PFP400-60 - 2867380



Antenna cable, outside diameter: 10 mm (0.4 in.), inner conductor: solid, attenuation: 2.5 / 4.2 / 6.3 dB at 0.9 / 2.4 / 5.8 GHz, connection: 2x N (male), cable length: 18 m (60 ft.)

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## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### Antenna cable - RAD-CAB-PFP400-80 - 2867393



Antenna cable, outside diameter: 10 mm (0.4 in.), inner conductor: solid, attenuation: 3.3 / 5.6 / 8.4 dB at 0.9 / 2.4 / 5.8 GHz, connection: 2x N (male), cable length: 24 m (80 ft.)

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#### Antenna cable - RAD-CAB-PFP400-100 - 2867238



Antenna cable, outside diameter: 10 mm (0.4 in.), inner conductor: solid, attenuation: 4.1 / 6.9 / 10.4 dB at 0.9 / 2.4 / 5.8 GHz, connection: 2x N (male), cable length: 30 m (100 ft.)

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#### Antenna cable - RAD-CAB-PFP600-150 - 2885184



Antenna cable, outside diameter: 15 mm (0.6 in.), inner conductor: solid, attenuation: 3.9 / 6.8 / 10.4 dB at 0.9 / 2.4 / 5.8 GHz, connection: 2x N (male), cable length: 45 m (150 ft.)

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#### Antenna cable - RAD-CAB-PFP900-200 - 2885197



Antenna extension cable, length: 200 ft

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### Communication module

#### Communication module - RAD-RS485-IFS - 2702184



Radioline - RS-485 multipoint multiplexer, can be extended with I/O modules, can be used as Modbus/RTU bus coupler or can be combined with Radioline wireless system, up to 99 stations, range of up to 1.2 km on in-house copper cables

## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### Configuration memory

Configuration memory - RAD-MEMORY - 2902828



Radioline - memory stick for saving custom configuration data

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Configuration memory - RAD-900-CONF-RF1 - 2702122



Radioline - configuration stick for easy and safe network addressing for the 900 MHz wireless module (RAD-900-...), unique network ID, RF band 1

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#### Control box

Control cabinet - RAD-SYS-NEMA4X-900 - 2917188



NEMA 4X enclosure for wireless systems

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#### DIN rail connector

DIN rail bus connectors - ME 17,5 TBUS 1,5/ 5-ST-3,81 GN - 2709561



DIN rail connector for DIN rail mounting. Universal for TBUS housing. Gold-plated contacts, 5-pos.

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#### Extension module

## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### I/O extension module - RAD-DAIO6-IFS - 2901533



Radioline - I/O extension module, 2 digital inputs and outputs (0 ... 250 V AC/DC) and 1 analog input (0/4 ... 20 mA) and output (0/4 ... 20 mA, 0 ... 10 V)

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#### I/O extension module - RAD-DI4-IFS - 2901535



Radioline - I/O extension module, 4 digital inputs (0 ... 250 V AC/DC)

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#### I/O extension module - RAD-DOR4-IFS - 2901536



Radioline - I/O extension module, 4 digital relay outputs (5 A, 250 V AC/DC)

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#### I/O extension module - RAD-DI8-IFS - 2901539



Radioline - I/O extension module, 8 digital inputs (0 ... 30.5 V DC) or 2 pulse inputs up to 100 Hz

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#### I/O extension module - RAD-DO8-IFS - 2902811



Radioline - I/O extension module, 8 digital transistor outputs (30.5 V DC/200 mA)

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## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### I/O extension module - RAD-AI4-IFS - 2901537



Radioline - I/O extension module, 4 analog current inputs (0/4 mA ... 20 mA)

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#### I/O extension module - RAD-AO4-IFS - 2901538



Radioline - I/O extension module, 4 analog current or voltage outputs (0/4 mA ... 20 mA, 0 V ... 10 V)

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#### I/O extension module - RAD-NAM4-IFS - 2316275



Radioline - I/O extension module, 4 NAMUR digital input module used in Radioline and PROFIBUS PA MUX I/O systems. Fulfills the NAMUR proximity sensor standard EN 60947-5-6, and communication to the head stations for Radioline systems and the FB-MUX/HS...PA via the T-BUS connector installed on the DIN rail. This module has channel-to-channel isolation.

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#### I/O extension module - RAD-AI4-U-IFS - 2702290



Radioline - I/O extension module, 4 analog voltage inputs (0 ... 5 V, 0 ... 10 V)

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### Mounting material

#### Weather protection tape - RAD-TAPE-SV-19-3 - 2903182



Vulcanizing sealing tape for external protection of adapters, cable connections, etc. against the effects of weather, roll length: 3 m

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## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### Programming cable

Cable for programming - RAD-CABLE-USB - 2903447



Radioline - USB data cable for communication between the PC and Radioline devices, energy supply for diagnostics and configuration via the USB port of the PC, cable length: 2 m / 6.5 ft

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#### Surge protection for transceiver systems

Surge protection device - CN-UB-70DC-6-BB - 2803166



Attachment plug with surge protection for coaxial signal interfaces. Connection: N connector, female/female

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Surge protection device - CN-LAMBDA/4-2.2-BB - 2800024



Attachment plug with Lambda/4 technology as surge protection for coaxial signal interfaces. Connection: N connectors socket-socket

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Surge protection device - CN-LAMBDA/4-2.25-BB - 2801057



Attachment plug with Lambda/4 technology as surge protection for coaxial signal interfaces. Connection: N connectors socket-socket

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#### Additional products

## Wireless module - RAD-900-IFS - 2901540

### Accessories

#### I/O extension module - RAD-DAIO6-IFS - 2901533



Radioline - I/O extension module, 2 digital inputs and outputs (0 ... 250 V AC/DC) and 1 analog input (0/4 ... 20 mA) and output (0/4 ... 20 mA, 0 ... 10 V)

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#### I/O extension module - RAD-DI4-IFS - 2901535



Radioline - I/O extension module, 4 digital inputs (0 ... 250 V AC/DC)

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#### I/O extension module - RAD-DOR4-IFS - 2901536



Radioline - I/O extension module, 4 digital relay outputs (5 A, 250 V AC/DC)

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#### I/O extension module - RAD-DI8-IFS - 2901539



Radioline - I/O extension module, 8 digital inputs (0 ... 30.5 V DC) or 2 pulse inputs up to 100 Hz

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#### I/O extension module - RAD-DO8-IFS - 2902811



Radioline - I/O extension module, 8 digital transistor outputs (30.5 V DC/200 mA)

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## Wireless module - RAD-900-IFS - 2901540

### Accessories

I/O extension module - RAD-AI4-IFS - 2901537



Radioline - I/O extension module, 4 analog current inputs (0/4 mA ... 20 mA)

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I/O extension module - RAD-AO4-IFS - 2901538



Radioline - I/O extension module, 4 analog current or voltage outputs (0/4 mA ... 20 mA, 0 V ... 10 V)

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I/O extension module - RAD-PT100-4-IFS - 2904035



Radioline - I/O extension module, 4 Pt 100 inputs (-50°C ... +250°C / -58 °F ... 482 °F)

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