

# RAD-2400-IFS - Wireless module



2901541

<https://www.phoenixcontact.com/us/products/2901541>

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Radioline - 2.4 GHz wireless transceiver with RS-232/RS-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 5 km (with a clear line of sight), for worldwide use

## 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

- License-free 2.4 GHz frequency band
- Range of several kilometers thanks to adjustable data rates for the wireless 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
- Integrated RS-232/RS-485 interface
- Modular extension with up to 32 I/O extension modules supported
- Extended temperature range of -40 °C ... +70 °C
- Approved for use in zone 2
- International approvals

## Commercial data

Item number	2901541
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DN26
Product key	DNC614
GTIN	4046356610193
Weight per piece (including packing)	205.88 g
Weight per piece (excluding packing)	135.82 g
Customs tariff number	85176200
Country of origin	DE

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## Set consists of

ME 17,5 TBUS 1,5/ 5-ST-3,81 KMGY - DIN rail bus connector

2713645

<https://www.phoenixcontact.com/us/products/2713645>



DIN rail bus connector, color: light gray, nominal current: 8 A (parallel contacts), rated voltage (III/2): 125 V, number of positions: 5, product range: TBUS5-17,5..., pitch: 3.81 mm, mounting: DIN rail mounting, locking: without, mounting method: without, type of packaging: packed in cardboard, Item with gold-plated contacts, bus connectors for connecting with electronics housings, 5 parallel contacts

## Technical data

### Notes

#### Note on application

Note on application	Only for industrial use
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### Product properties

Product type	Wireless module
Application	I/O
	RS-232
	RS-485
Operating mode	I/O data (Default setting, configuration via thumbwheel)
	Serial data (Activation and configuration via PSI-CONF software)
	PLC/Modbus RTU mode (Activation and configuration via PSI-CONF software)
	PLC / Modbus RTU dual mode (Activation and configuration via PSI-CONF software)
MTTF	733 Years (SN 29500 standard, temperature 25°C, operating cycle 21%)
	340 Years (SN 29500 standard, temperature 40°C, operating cycle 34.25%)
	135 Years (SN 29500 standard, temperature 40°C, operating cycle 100%)

#### Insulation characteristics

Overvoltage category	II
Degree of pollution	2

### Electrical properties

Rated insulation voltage	60 V (In accordance with EN/IEC 60079-7)
Maximum power dissipation for nominal condition	1.56 W
Transient surge protection	yes

#### System limits

Designation	Wireless module
Number of supported devices	≤ 250 (Addressing via PSI-CONF software)
	≤ 99 (Addressing via thumbwheel)
Number of possible extension modules	≤ 32 (per wireless module)

#### System limits

Designation	Wireless network
Number of supported devices	≤ 99 (I/O extension modules per wireless network, serial interfaces deactivated)
	0 (no I/O extension modules can be used)
	≤ 99 (I/O extension modules per wireless network, access to extension modules via Modbus RTU protocol)

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## Supply

Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30.5 V DC
Max. current consumption	≤ 65 mA (at 24 V DC, at 25 °C, stand-alone) ≤ 6 A (at 24 V DC, with DIN rail connector at full capacity)

## Output data

### Digital

Output name	RF link relay output
Number of outputs	1
Contact switching type	Changeover contact
Contact material	PdRu, gold-plated
Maximum switching voltage	30 V AC/DC 60 V DC
Max. switching current	500 mA (30 V AC/DC) 300 mA (60 V DC)
Electrical service life	5x 10 <sup>5</sup> switching cycles with 0.5 A at 30 V DC

### Analog

Output name	RSSI voltage output
Number of outputs	1
Voltage output signal	0 V ... 3 V

## Connection data

Connection method	Screw connection
Stripping length	7 mm
Conductor cross-section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross-section, rigid 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
Tightening torque	0.5 Nm ... 0.6 Nm 5 lb <sub>f</sub> -in. ... 7 lb <sub>f</sub> -in.

## Interfaces

### Wireless

Range	≤ 5 km (The range may be considerably above or below that stated, and depends on the environment, antenna technology, and the product used)
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### Serial: RS-232

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
Connection method	COMBICON plug-in screw terminal block

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Connection technology	3-conductor
Transmission length	≤ 15 m

## Serial: RS-485

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
Connection method	COMBICON plug-in screw terminal block
Connection technology	2-conductor
Transmission length	≤ 1200 m
Termination resistor	390 Ω (switchable via DIP switches) 150 Ω (switchable via DIP switches) 390 Ω (switchable via DIP switches)

## Serial: Configuration interface

Connection method	S-PORT (socket)
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## Wireless

Interface description	Trusted Wireless
Direction	Bi-directional
Frequency	2400 MHz
Frequency range	2.4002 GHz ... 2.4785 GHz
Channel distance	1.3 MHz
Number of channel groups	8
Number of channels per group	55
Transmit capacity, minimum	0 dBm
Transmit capacity, maximum	≤ 20 dBm (100 mW, outside of Europe, adjustable via software) ≤ 19 dBm (Europe, can be set via software, depends on the data rate) 18 dBm (Default setting, adjustable)
Data rate	16 kbps (adjustable) 125 kbps (Default setting, adjustable) 250 kbps (adjustable)
Minimum receiver sensitivity	-106 dBm (16 kbps) -96 dBm (125 kbps) -93 dBm (250 kbps)
Antenna connection method	RSMA (female)
Security	128-bit data encryption

## Functions

Wireless licenses	Europe, USA, Canada, additional countries in the e-shop
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## Wireless

Frequency band	2.4 GHz
Wireless standard	Trusted Wireless

## Signaling

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

## Dimensions

Dimensional drawing	
Width	17.5 mm
Height	116 mm
Depth	114.5 mm

## Material specifications

Color (Housing)	gray (RAL 7042)
Material (Housing)	PA 6.6-FR
Flammability rating according to UL 94	V0

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C (>55°C derating, see technical documentation) -40 °F ... 158 °F (>131°F derating, see technical documentation)
Ambient temperature (storage/transport)	-40 °C ... 85 °C -40 °F ... 185 °F
Altitude	2000 m
Permissible humidity (operation)	20 % ... 85 %
Permissible humidity (storage/transport)	20 % ... 85 %
Shock	16g, 11 ms
Vibration (operation)	in accordance with IEC 60068-2-6: 5g, 10 Hz ... 150 Hz

## Approvals

### CE

Certificate	CE-compliant
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### ATEX

Identification	Ⓔ II 3 G Ex ec nC IIC T4 Gc
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Certificate	IBExU 15 ATEX B008 X
Note	Please follow the special installation instructions in the documentation!

## IECEX

Identification	Ex ec nC IIC T4 Gc
Certificate	IECEX IBE 13.0019X

## UL, USA/Canada

Identification	508 Listed
	Class I, Div. 2, Groups A, B, C, D T4A
	Class I, Zone 2, IIC T4

## CCC / China-Ex

Identification	Ex ec nC IIC T4 Gc
Certificate	2022122310115624

## Wireless approval, Europe

Note	RED 2014/53/EU
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## Wireless approval USA, FCC

Certificate	YG3RAD2400A
Note	FCC directive, part 15.247

## Wireless approval for Argentina, RAMATEL

Certificate	C-27397
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## Wireless approval Australia, RCM

Certificate	-
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## Wireless approval Brazil, ANATEL

Certificate	06279-19-06497
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## Wireless approval India, WPC

Certificate	NER-ETA/314
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## Wireless approval Canada, IC

Certificate	4720B-RAD2400A
Note	ISC directive RSS 210

## Wireless approval Morocco, ANRT

Certificate	MR 10464 ANRT 2015
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## Wireless approval Mexico, IFT

Certificate	IFT RCPHRA17-1112
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## KC approval for South Korea

Certificate	MSIP-CRI-PCK-2901541
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## KC-s

Certificate	KTL 20-KA4BO-0146X
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## Wireless approval Taiwan, NCC

Certificate	CCAJ18LP1990T7
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## Wireless approval United Arab Emirates, TRA

Certificate	ER0126713
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## Corrosive gas test

Identification	ISA-S71.04-1985 G3 Harsh Group A
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## EMC data

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
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## Electrostatic discharge

Standards/regulations	EN 61000-4-2
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## Electrostatic discharge

Contact discharge	± 6 kV (Test Level 3)
Discharge in air	± 8 kV (Test Level 3)
Indirect discharge	± 6 kV
Comments	Criterion B

## Electromagnetic HF field

Standards/regulations	EN 61000-4-3
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## Electromagnetic HF field

Frequency range	26 MHz ... 3 GHz (Test Level 3)
Field intensity	10 V/m
Comments	Criterion A

## Fast transients (burst)

Standards/regulations	EN 61000-4-4
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## Fast transients (burst)

Input	± 2 kV (Test Level 3)
Signal	± 2 kV
Comments	Criterion B

## Surge current load (surge)

Standards/regulations	EN 61000-4-5
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## Surge current load (surge)

Input	± 0.5 kV (symmetrical)
	± 1 kV (asymmetrical)
Signal	± 1 kV (asymmetrical)
Comments	Criterion B

## Conducted interference

Standards/regulations	EN 61000-4-6
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## Conducted interference

Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V

## Emitted interference

Emitted radio interference in acc. with EN 55011	EN 55016-2-3 Class A industrial applications
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## Criteria

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

## Standards and regulations

Standard designation	Ex Directive (ATEX)
Standards/specifications	EN 60079-0
Standard designation	Ex Directive (ATEX)
Standards/specifications	EN 60079-15
Standards/specifications	EN 300328
	EN 61000-6-4
	EN 61000-6-2
	EN 50371
	EN 60950-1

## Mounting

Mounting type	DIN rail mounting
Assembly note	on standard DIN rail NS 35 in accordance with EN 60715

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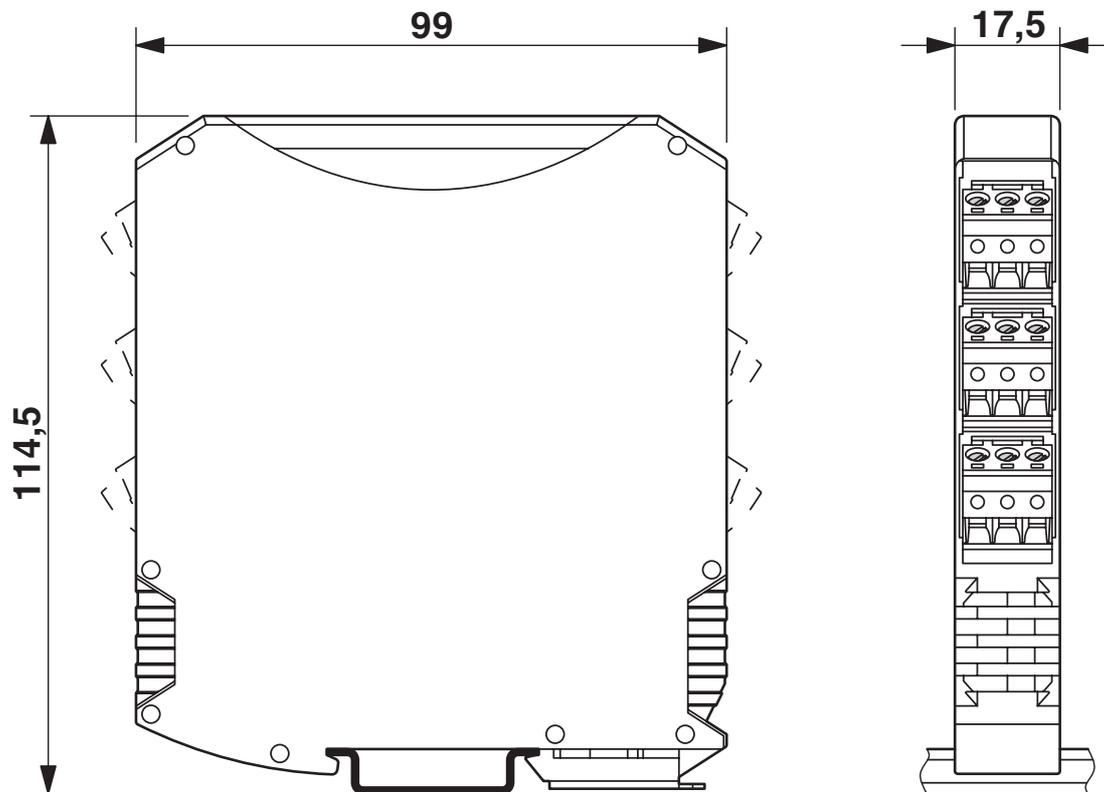
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## Drawings

Dimensional drawing



Slim design

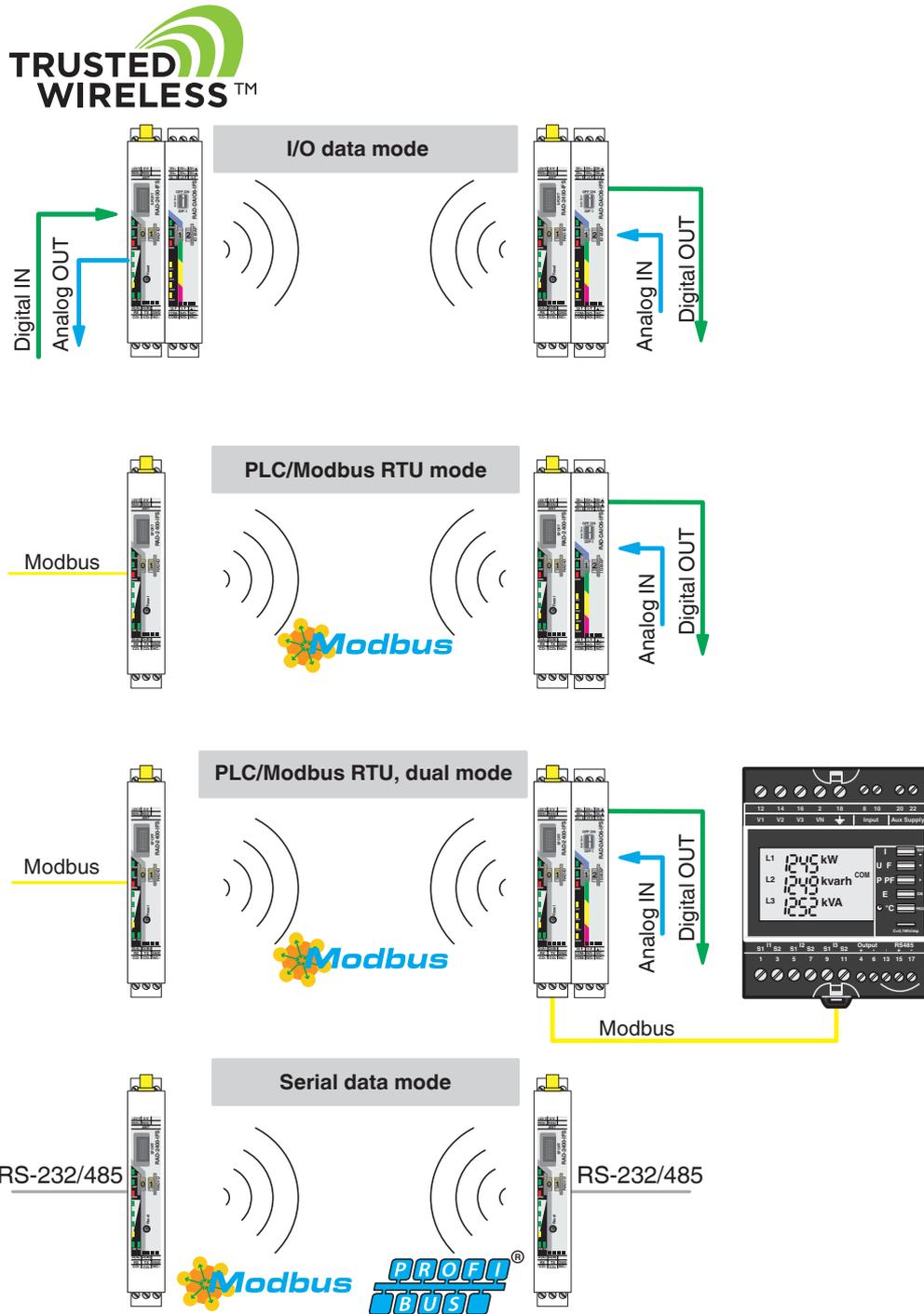
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## Application drawing



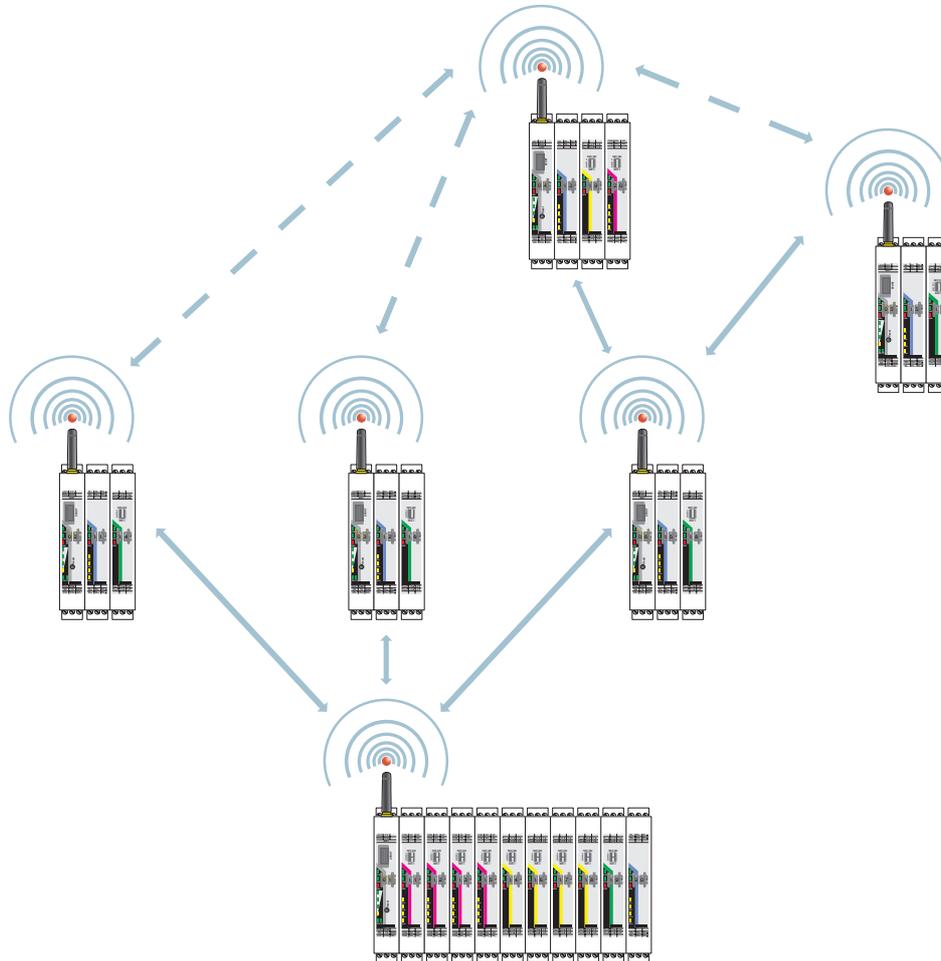
Operating modes

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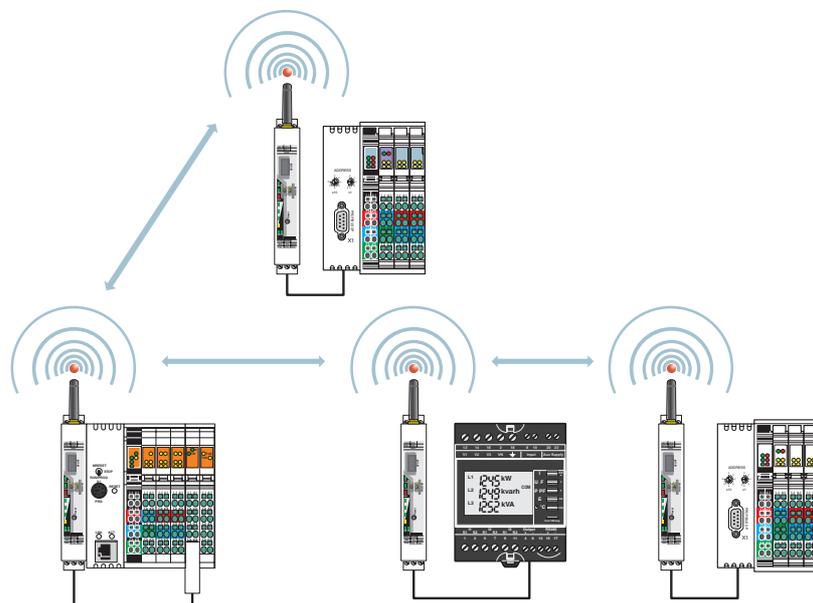
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Application drawing



Wireless module in I/O data mode

Application drawing



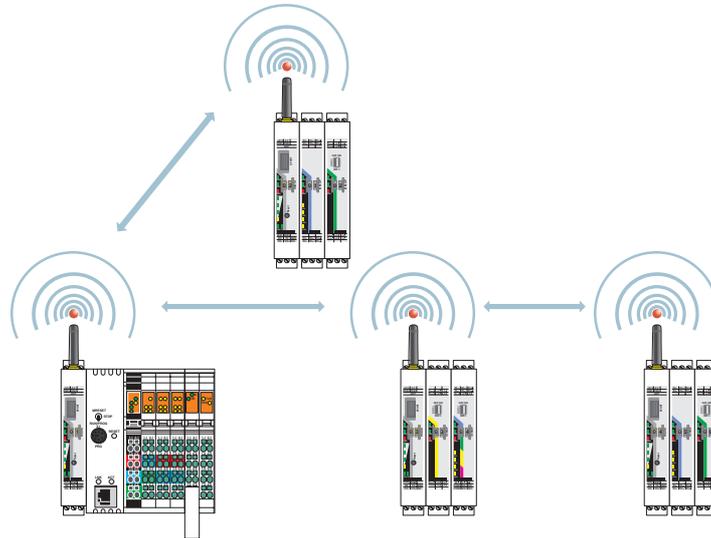
Serial data mode

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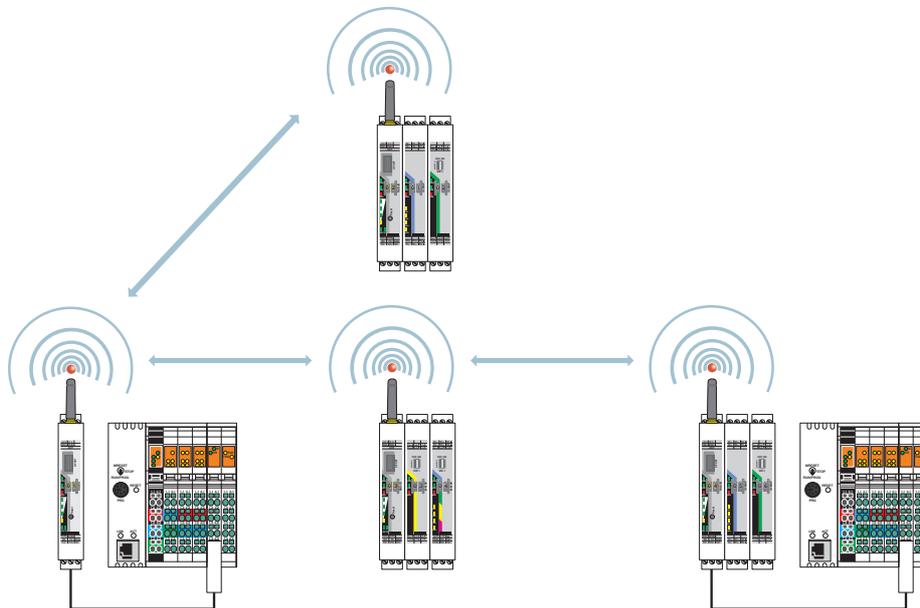
<https://www.phoenixcontact.com/us/products/2901541>

Application drawing



Wireless module in PLC/Modbus RTU mode

Application drawing

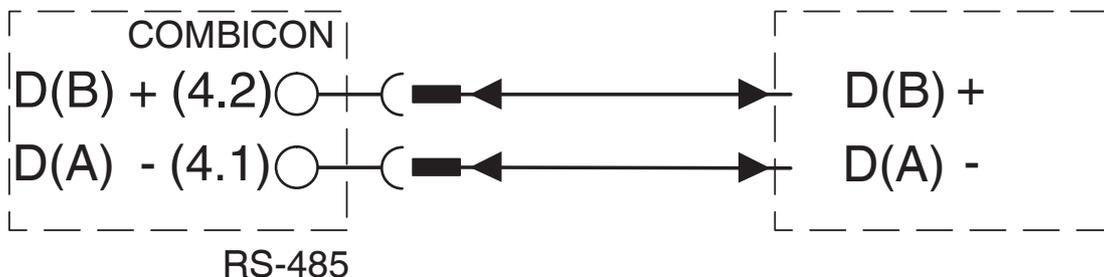


PLC / Modbus/RTU dual mode

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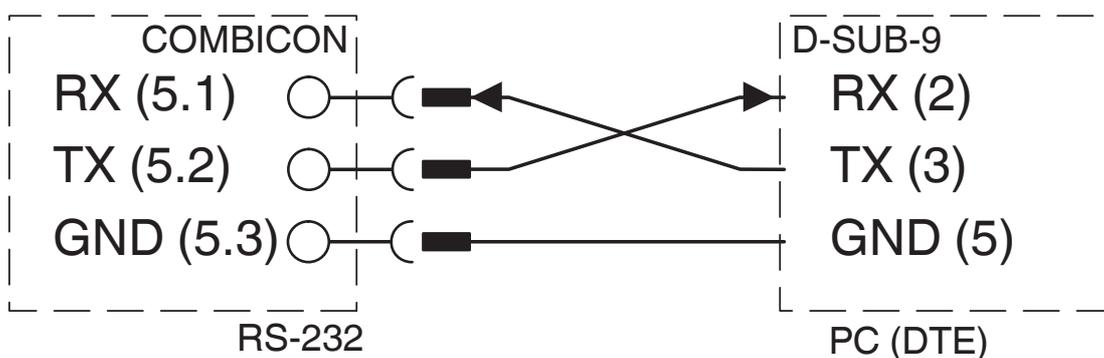
<https://www.phoenixcontact.com/us/products/2901541>

Connection diagram



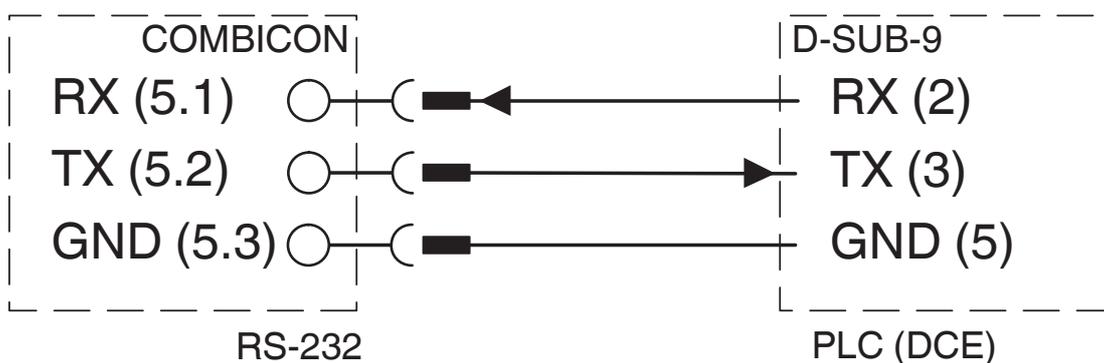
RS-485 connection

Connection diagram



RS-232 connection

Connection diagram



RS-232 connection

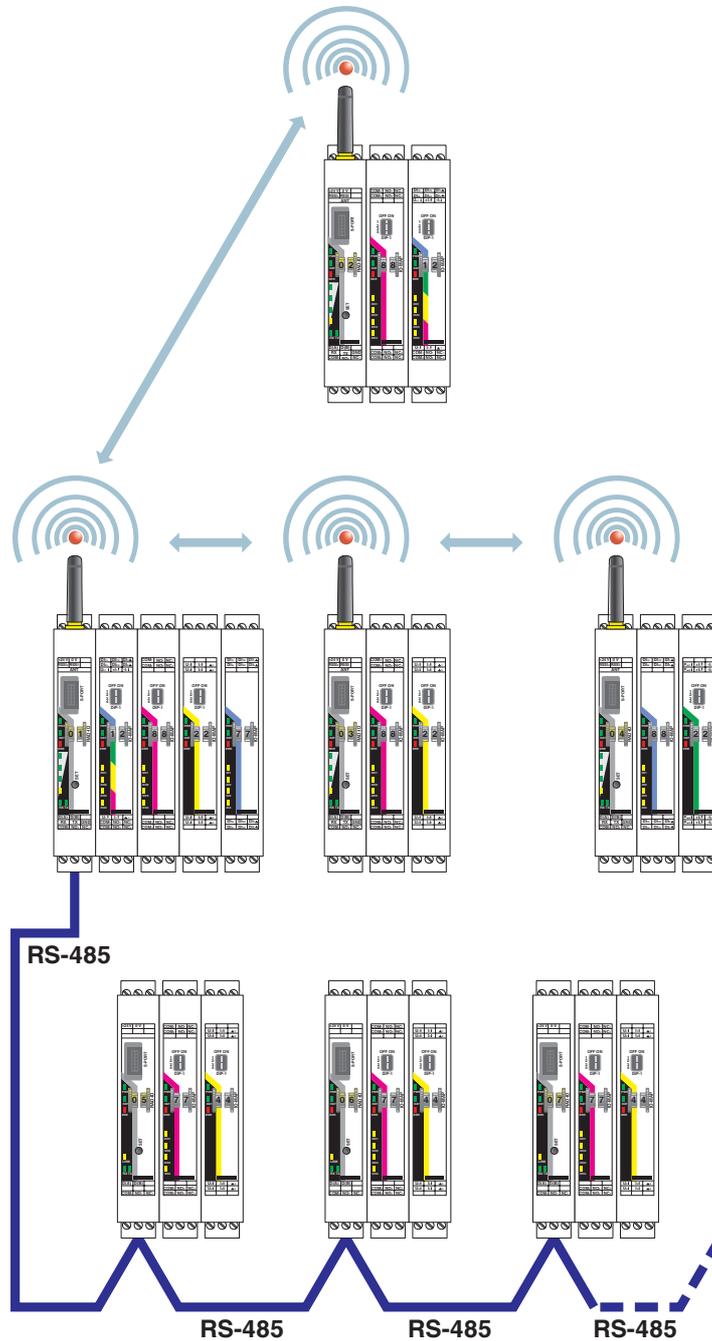
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Functional drawing



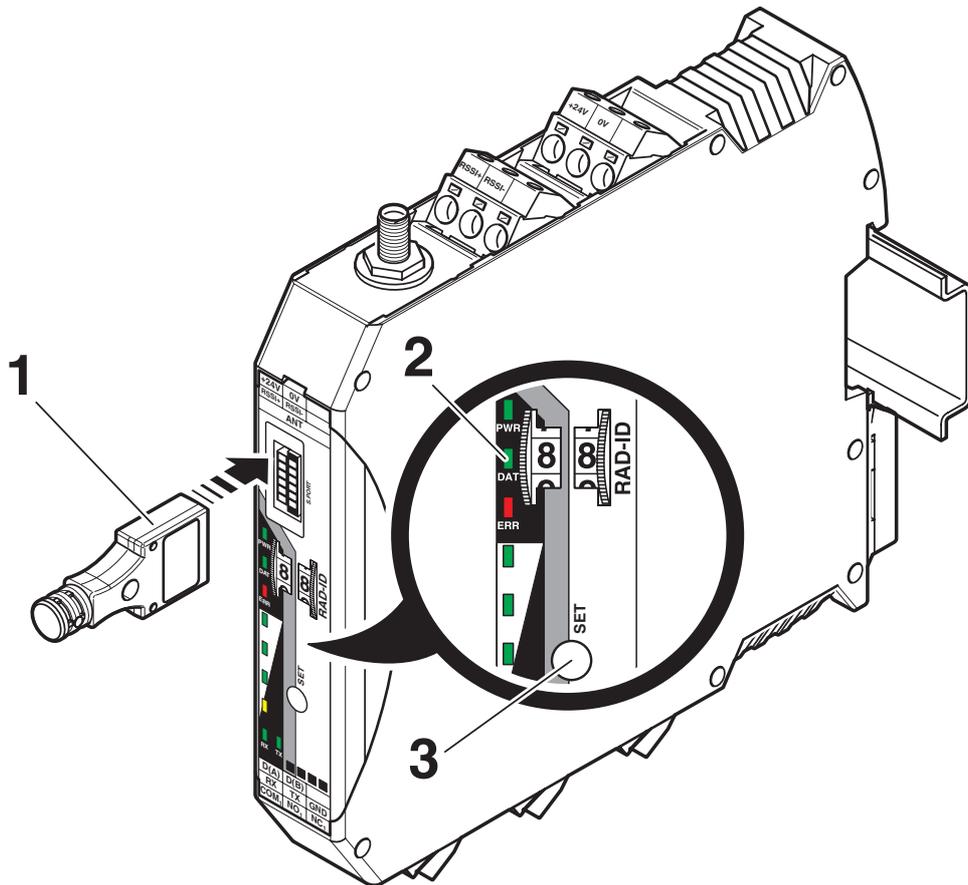
I/O-to-I/O, wireless, and RS-485

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Schematic diagram



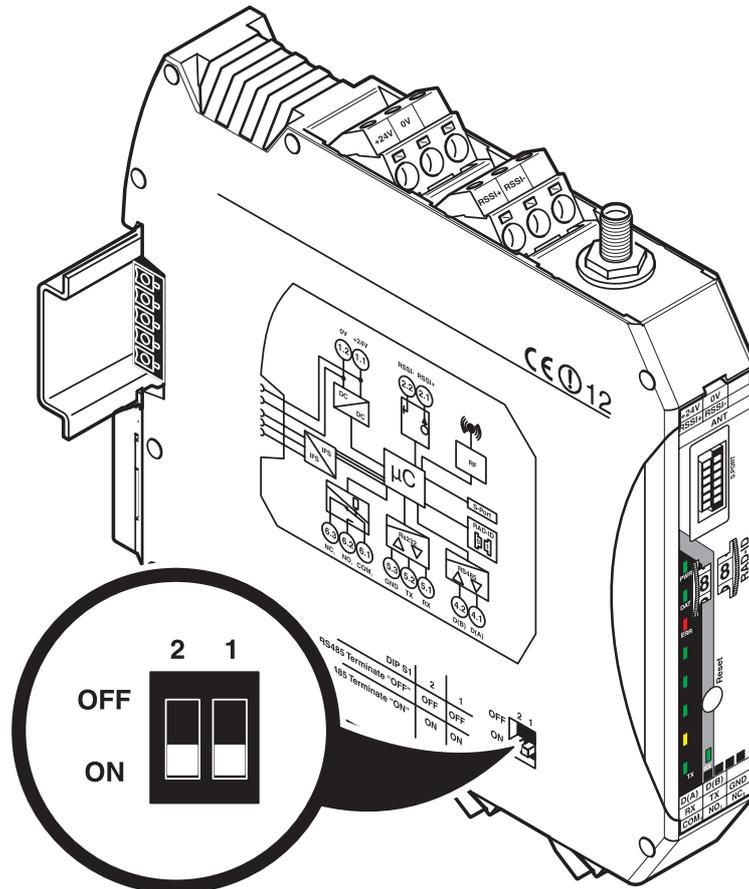
Configuration via CONFSTICK

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Schematic diagram



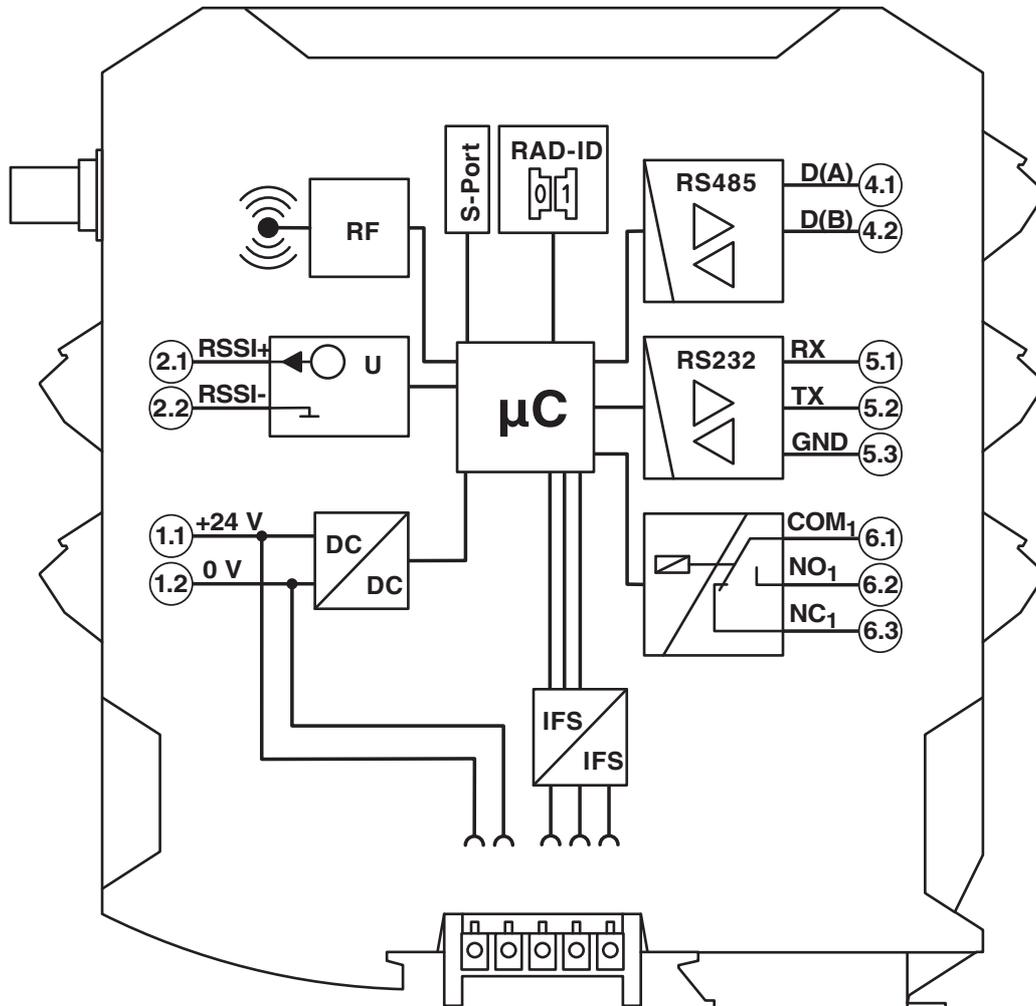
DIP switches

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Circuit diagram



Basic circuit diagram

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## Approvals

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 **UL Listed**  
Approval ID: E238705

 **cUL Listed**  
Approval ID: E238705

 **KC**  
Approval ID: MSIP-CRI-PCK-2901541

 **NOM**  
Approval ID: RCPPHRA17-1112

**ANATEL**  
Approval ID: 06279-19-06497

**NCC**  
Approval ID: CCAJ18LP1990T7

 **IECEX**  
Approval ID: IECEX IBE 13.0019X

 **cUL Listed**  
Approval ID: E196811

 **UL Listed**  
Approval ID: E196811

 **ATEX**  
Approval ID: IBExU15ATEXB008 X

 **KC-s**  
Approval ID: 20-KA4BO-0146X

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CCC

Approval ID: 2022122310115624

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## Classifications

### ECLASS

ECLASS-13.0	19170501
ECLASS-15.0	19170501

### ETIM

ETIM 9.0	EC000816
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### UNSPSC

UNSPSC 21.0	43222604
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	6(c), 7(a), 7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: n/a)
SCIP	7a3fc1fe-77ae-42b1-97a7-36d6ad5e3fd7

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