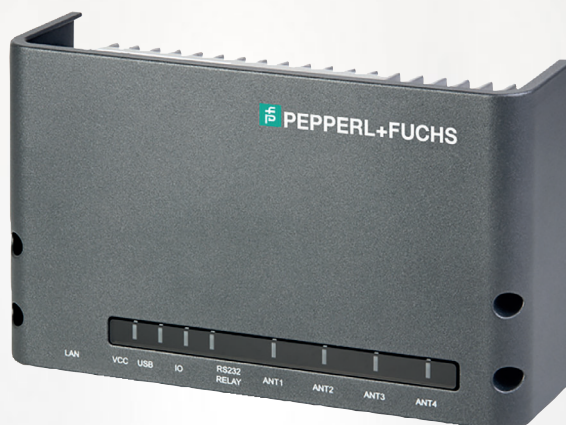


**IUR-F800-V1D-4A-FR\***

**UHF Read Device  
for Connecting  
External Antennas**

**Manual**



---

With regard to the supply of products, the current issue of the following document is applicable:  
The General Terms of Delivery for Products and Services of the Electrical Industry, published  
by the Central Association of the Electrical Industry (Zentralverband Elektrotechnik und Elek-  
troindustrie (ZVEI) e.V.) in its most recent version as well as the supplementary clause:  
"Expanded reservation of proprietorship"

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# 1 Introduction

## 1.1 Content of this Document

This document contains information required to use the product in the relevant phases of the product life cycle. This may include information on the following:

- Product identification
- Delivery, transport, and storage
- Mounting and installation
- Commissioning and operation
- Maintenance and repair
- Troubleshooting
- Dismounting
- Disposal



---

### Note

For full information on the product, refer to the further documentation on the Internet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

---

The documentation comprises the following parts:

- This document
- Datasheet

The documentation may also comprise the following parts, if applicable:

- EU-type examination certificate
- EU declaration of conformity
- Attestation of conformity
- Certificates
- Control drawings
- Instruction manual
- Functional safety handbook
- Other documents

## 1.2 Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismantling lies with the plant operator.

Only appropriately trained and qualified personnel may carry out mounting, installation, commissioning, operation, maintenance, and dismantling of the product. The personnel must have read and understood the instruction manual and the further documentation.

Prior to using the product make yourself familiar with it. Read the document carefully.

## 1.3 Intended Use

Always operate the device as described in these instructions. Only in this way, the safe function of the device and the connected systems is guaranteed.

The protection of operating personnel and plant is only given if the device is used in accordance with its intended use.

## 1.4 Symbols Used

This document contains symbols for the identification of warning messages and of informative messages.

### Warning Messages

You will find warning messages, whenever dangers may arise from your actions. It is mandatory that you observe these warning messages for your personal safety and in order to avoid property damage.

Depending on the risk level, the warning messages are displayed in descending order as follows:



---

#### **Danger!**

This symbol indicates an imminent danger.

Non-observance will result in personal injury or death.

---



---

#### **Warning!**

This symbol indicates a possible fault or danger.

Non-observance may cause personal injury or serious property damage.

---



---

#### **Caution!**

This symbol indicates a possible fault.

Non-observance could interrupt the device and any connected systems and plants, or result in their complete failure.

---

### Informative Symbols



---

#### **Note**

This symbol brings important information to your attention.

---



---

#### **Action**

This symbol indicates a paragraph with instructions. You are prompted to perform an action or a sequence of actions.

## 2 Certificates and Approvals

### 2.1 Declaration of Conformity (RE Directive 2014/53/EU)

This product was developed and manufactured in line with the applicable European standards and directives.



#### Note

A Declaration of Conformity can be requested from the manufacturer or downloaded from [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

The product manufacturer, Pepperl+Fuchs SE, 68307 Mannheim, Germany, has a certified quality assurance system that conforms to ISO 9001.



ISO9001

### 2.2 FCC Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

#### Attention:

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



#### Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

#### FCC Notice

To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

#### FCC Exposure Information

To comply with FCC RF exposure compliance requirements, the antennas used for this transmitter must be installed to provide a separation distance of at least 34 cm from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter.

The following antennas are approved by FCC under FCC Part 15:

- IUA-F830-FR2 (approx. 6 dBi)
- IUA-F860-FR2 (approx. 8–9 dBi)

For operating conditions, see chapter 3.4.

## 2.3

### IC Information

This device complies with Industry Canada licence-exempt RSS standard(s) and with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. this device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### IC Exposure Information

To comply with IC RF exposure compliance requirements, the antennas used for this transmitter must be installed to provide a separation distance of at least 34 cm from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter.

The following antennas are approved by IC Canada according to RS210:

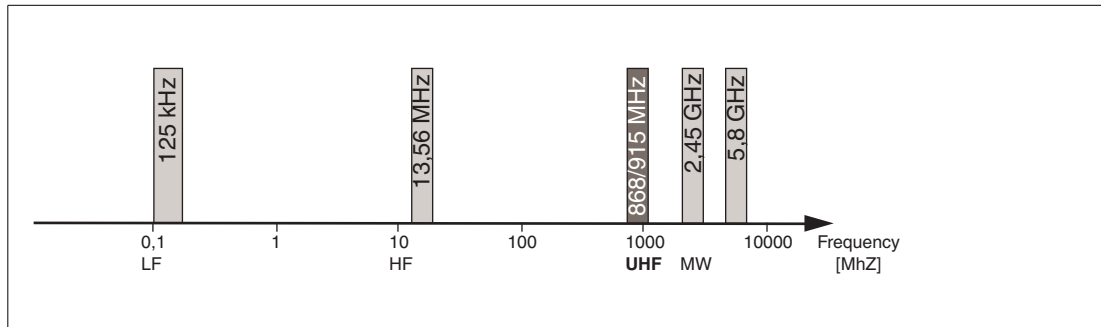
- IUA-F830-FR2 (approx. 6 dBi)
- IUA-F860-FR2 (approx. 8–9 dBi)

For operating conditions, see chapter 3.4.

## 3 Product Description

### 3.1 RFID Frequency Bands

The following diagram shows the different frequency bands used for RFID. The devices described in this manual operate in the frequency range from 865 MHz ... 868 MHz, and from 902 MHz ... 928 MHz, which is highlighted.



- 100 kHz ... 135 kHz: low frequency LF
- 13.56 MHz: high frequency HF
- 865 MHz ... 868 MHz (Europe), 902 MHz ... 928 MHz (USA), 920 MHz ... 925 MHz (China): ultra-high frequency UHF
- 2.45 GHz and 5.8 GHz: microwave MW

### 3.2 UHF general

#### 3.2.1 Advantages of UHF

- Long detection range
- UHF tags are available as cheap and space-saving adhesive labels
- High transfer rates
- Tag is available with a large working memory (user memory)
- Bulk detection

#### 3.2.2 Applications for UHF systems

- Identification in galvanic coating or painting systems used in automotive production,
- Identification feasible over greater distances than with LF and HF systems,
- Identification of automotive superstructures in automotive production,
- Pallet identification and measurement of goods movements in the logistics sector, and
- Access control at unloading stations with HGV identification.

#### 3.2.3 Electronic Product Code EPC

The electronic product code EPC is a unique identifier in the form of a sequence of numbers. The number sequence has a set structure and a length of 64 bits, 80 bits, 96 bits, or longer, depending on the EPC used. This number sequence is saved to the RFID tag, offering worldwide unique identification of the tagged object.

The EPC was defined by GS1 for use in inventory management. Tags with memory banks for EPC codes must be programmed by the user. The memory of new tags must not contain any valid EPC codes. The EPC numbers are managed and assigned by GS1. To obtain EPC numbers, please contact the GS1 branch in your country (<http://www.gs1.com/contact>).

The EPC is defined by GS1 with at present 13 different encoding schemes. SGTIN-96 (serialized global trade item number) is given here as an example of a frequently used encoding scheme. SGTIN-96 has a defined format, and is structured as follows:



1. **Header:** The header specifies the EPC standard used, and denotes the number sequence.
2. **Filter value:** Denotes the unit of the product, for example, end product, additional packaging, pallet.
3. **Partition:** Denotes the point at which the following company prefix ends and the object data begins.
4. **Company Prefix:** Assigned sequence of numbers that identifies the producer.
5. **Object class:** Sequence of numbers that describes the object, e.g., item number. The company prefix and the object class are each of variable length, but together are always 44 bits long.
6. **Serial number:** Sequence of numbers that identifies the item, e.g., the sequential serial number of the item.

	Header	Filter value	Partition	Company Prefix	Objekt class	Serial number
Length [Bit]	8	3	3	20 ... 40	4 ... 24	38
Value	48 <sub>dez</sub>	0 <sub>dez</sub>	5 <sub>dez</sub>	4050143 <sub>dez</sub>	124 <sub>dez</sub>	203886 <sub>dez</sub>

Table 3.1

### 3.2.4 The Impact of Various Materials on the Detection Range

In the UHF frequency band, the properties of the environment, and the quality of the surface on which the tag is mounted strongly affect the system's read/write detection range. The UHF tags must be mounted on the material for which they were designed. For example, glass has a negative impact on the detection range when used as a mounting surface. When a UHF tag is mounted on damp materials, the detection range is worse compared to dry material. The mounting surface material often has a greater influence on the read range than the material between the tag and the read/write device. The graph shows the impact of different materials.

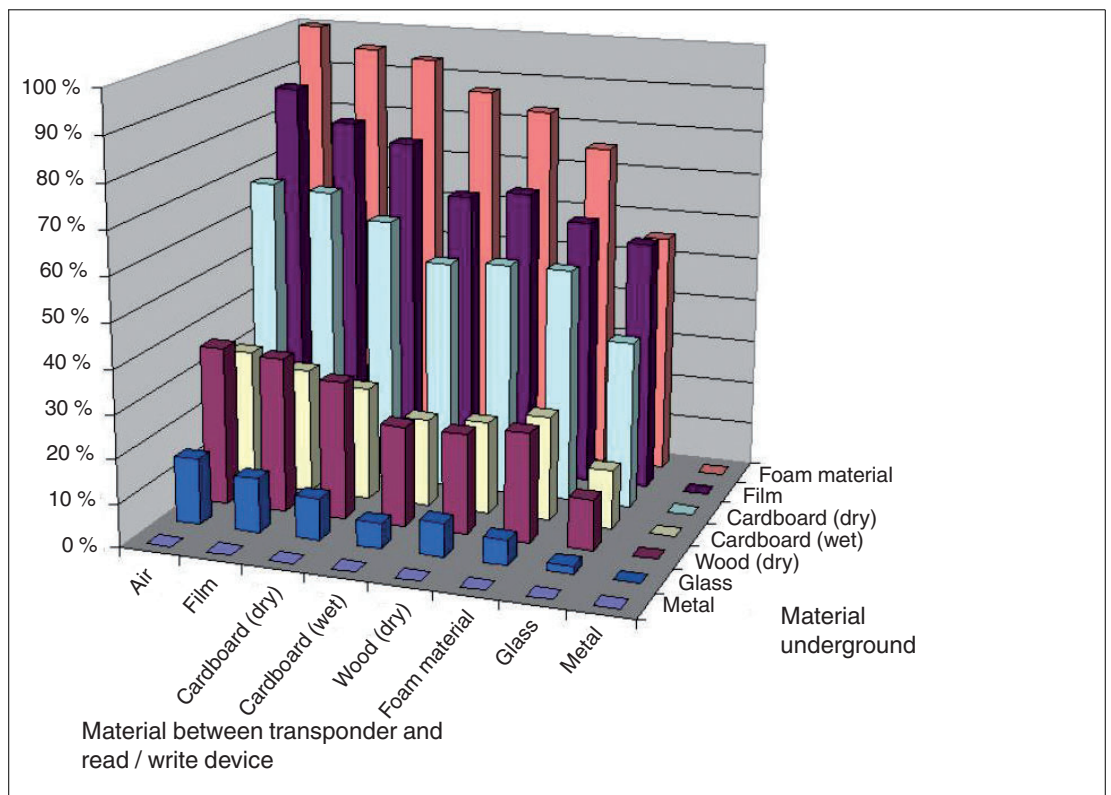


Figure 3.1

There are tags available that are optimized for mounting on metal or on an electrically conductive surface. They can be attached to metal without an additional spacer. These tags contain an "-M-" in the product name (e.g., IUC77-F151-M-GBL). If these tags are mounted on plastic material or non-electrically conductive materials, the achievable sensing range can be reduced compared to mounting on metal.

If the read/write tag is mounted on plastic material or non-electrically conductive materials, the abbreviation "-M-" is not included in the product name (e.g., IUC76-50-FR1). These read/write tags can be mounted on cardboard or similar material.

Generally speaking, the sensing range always depends on the mounting surface material. It is therefore impossible to make a generalization about a tag's detection range. Only a statement with restrictions is possible. The detection range achieved with the currently set parameters must be checked at each installation point of a read/write device. The transmission power can be used to affect the sensing range of the read/write device. The transmission power must be set so that the read/write tag can be read securely at the lowest possible power level. An increase in the transmission power can lead to unintentional identification of nearby read/write tags. This unintentional identification of read/write tags in the vicinity of the read/write device should also be checked.

### 3.2.5 Dense Reader Mode (DRM)

#### Europe

A special operating mode for read/write tags in accordance with the specification EPC Gen 2 (ISO/IEC 18000-63) allows several read/write devices to be operated close to each other simultaneously without interference.

In accordance with EN 302208, the read/write device uses only channels 4, 7, 10, and 13 in this mode for transmission (read/write head → read/write tag communication path). The transmission power is a maximum of  $2 W_{erp}$  in accordance with EN 302208.

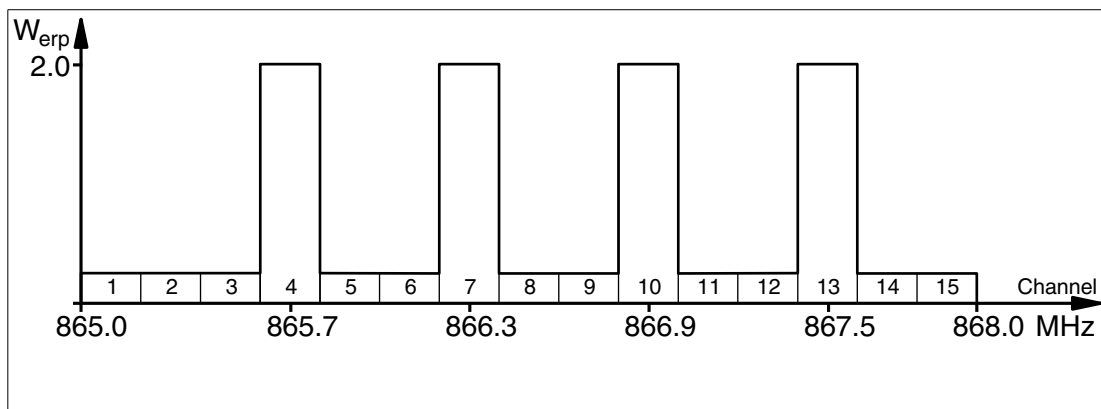


Figure 3.2

The response from the read/write tag appears via the frequency offset, which is achieved by the modulation used in this mode on the two adjacent channels. Due to the high level difference between the transmission channels and the response channels, this technology offers major benefits for reusing frequencies.

### 3.2.6 Frequency Hopping Spread Spectrum

With FHSS (Frequency Hopping Spread Spectrum), the information to be transmitted is distributed successively through multiple channels. Only one frequency channel is used at any one time. This results in a larger bandwidth for the entire signal, in spite of the fact that each channel has a smaller bandwidth. This section shows the channel assignment for China and the USA in graphic form as an example. Different parameters apply for both assignments, such as the number of channels and channel bandwidth. Different parameter sets apply in other countries.

## USA

The ISM band from 902 MHz ... 928 MHz is available in the USA. The band is split into 50 channels, each with a bandwidth of 500 kHz. FHSS with a maximum retention time of 0.4 seconds is used. All channels must be used. Channel restriction is not permitted.

In contrast to the read/write devices for Europe and China, the transmitter radiated power is specified in  $W_{\text{eirp}}$ . A maximum of 4  $W_{\text{eirp}}$  is permitted on all channels.

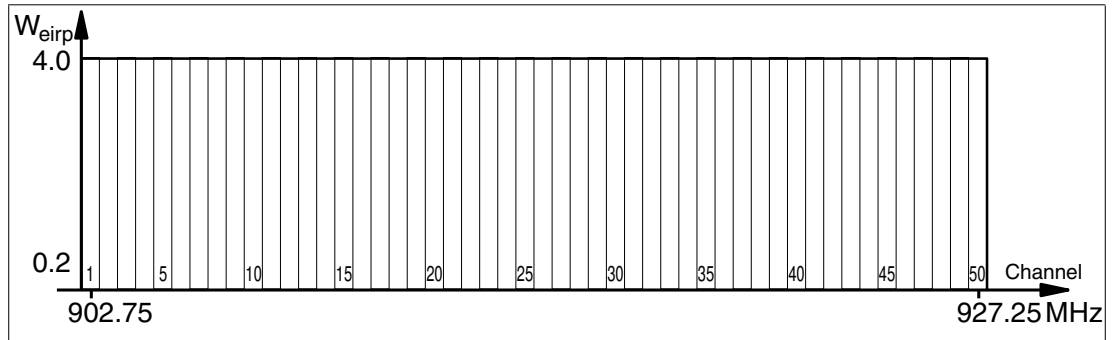


Figure 3.3

### 3.2.7 Relevant Standards for UHF

European radio standards: EN 300220 and EN 302208

Usage recommendations for RFID type labels, information about recycling, installation of readers and antennae: ISO/IEC TR 24729 parts 1-4

Installation and commissioning of UHF-RFID systems: ETSI TR 102436

Description of air interface: EPC Gen 2 (ISO/IEC 18000-63)

## 3.3 Countries of Use



### Note

#### Transmission License

A country-specific transmission license is required to operate this device. In the European Union, the manufacturer's declaration of conformity constitutes an adequate license. All current transmission licenses can be found in the datasheet for the relevant device at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).



### Note

If you wish to use the device in a country not included in this chapter, make sure the relevant values for the device are consistent with the local conditions before use.

The frequency access method used is part of the country-specific settings.

#### Frequency Access Method

- In many countries, including the USA and China, a frequency hopping spread spectrum is used. The number and position of the frequencies is fixed and cannot be changed by the user. All channels are used.
- A parameterizable frequency list is used in other countries, including the European Union, Singapore, Vietnam, and India. You can compile this frequency list from a specified set of channels. Four channels are specified in the European Union as appropriate for dense reader mode in accordance with EN 302208. See chapter 3.2.5. With this setting, you can configure one, multiple, or all four channels.

### 3.4 General Functions and Features



Figure 3.4

#### Functions

The read/write device is designed for reading passive read/write tags in the UHF frequency range. The output power of the read/write device can be configured in the range 100 mW to 2 W. This allows detection ranges of up to 12 m depending on the antenna used.

Tags that comply with EPC Gen 2 (IO/IEC 18000-63) are supported.

#### Determining the Maximum Permissible Output Power of the Read/Write Device

For high reading ranges, the output power of the read/write device must be set to the maximum permissible level. This depends on the type of read/write device used with approval for the EU or North America and the applicable radio regulations at the installation site.

##### EU Read/Write Device in Accordance with EN 302208

A maximum radiated power of 2 W ERP (Effective Radiated Power) is permitted under the European radio regulation EN 302 208. The power  $P_{out}$  depends on the cable attenuation and the antenna gain in dBi. When using a circular polarized antenna, reduce the gain ( $[G] = \text{dBic}$ ) by 3 dB. For a linear antenna, use the maximum linear gain ( $[G] = \text{dBi}$ ).

$$P_{out} = P_{ERP} - \text{Antenna gain} + \text{Cable attenuation} + 2.1 \text{ dB}^1$$

##### FCC Read/Write Device in Accordance with FCC47 Part 15 and IC RSS-247, Issue 2

According to the FCC and IC approvals, a maximum output power of 1 W (30 dBm) is permitted at the SMA socket of the read/write device. The radiated power of the antenna must not exceed 4 W EIRP. Due to these specifications, the IUA-F830-FR2 antenna must be operated with a cable length of at least 2.0 m when using cable type LowLoss-240 (32 dB/100 m). The IUA-F830-FR2 antenna must be operated with a cable length of at least 6.0 m when using cable type LowLoss-240 (32 dB/100 m).

1. Correction factor for converting radiated performance from ERP to EIRP

### 3.5 Indicators and Operating Elements

#### LEDs

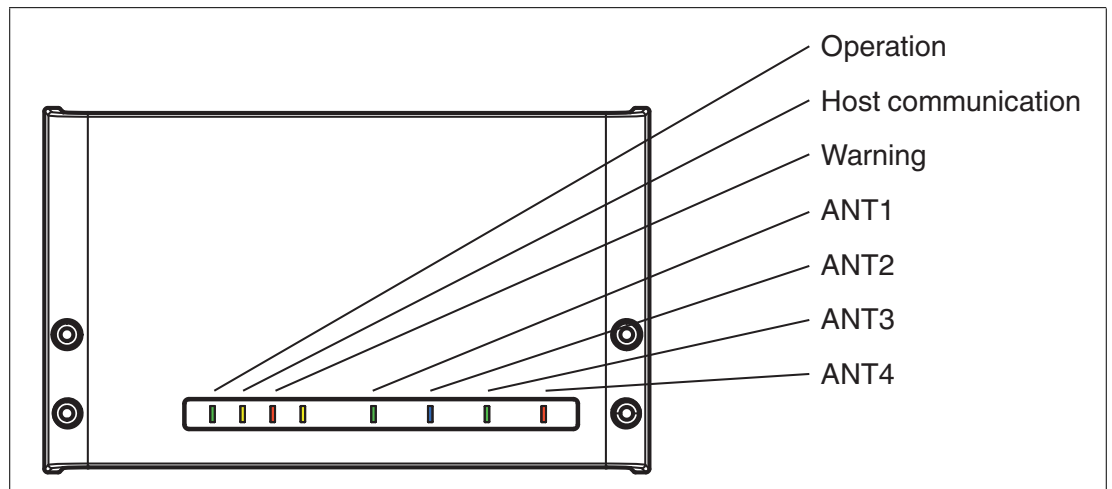


Figure 3.5

#### Operation

Operating LED Green	Host communication LED Yellow	LED warning Red	Description
Flashing	-	Off	Normal operation
-	Flashing	-	Device receives valid protocol from host
Flashing	-	On	RF warning [0x84]
Flashing	-	Flashing	Hardware warning Run reader diagnostic [0x6E] for further error analysis

#### Firmware Updates

Operating LED Green	Host communication LED Yellow	LED warning Red	Description
Flashing	Flashing	Flashing	Firmware transferred from host to read/write device

#### Resetting the Configuration

Operating LED Green	Host communication LED Yellow	LED warning Red	Description
Flashing	Flashing	Flashing	While T1 is pressed for max. 5 seconds
On	On	On	Configuration reset complete

**Antennas 1–4**

Color	Description
Green	Antennas switched on
Blue	Tag detected
Red	Impedance not equal to 50 Ω

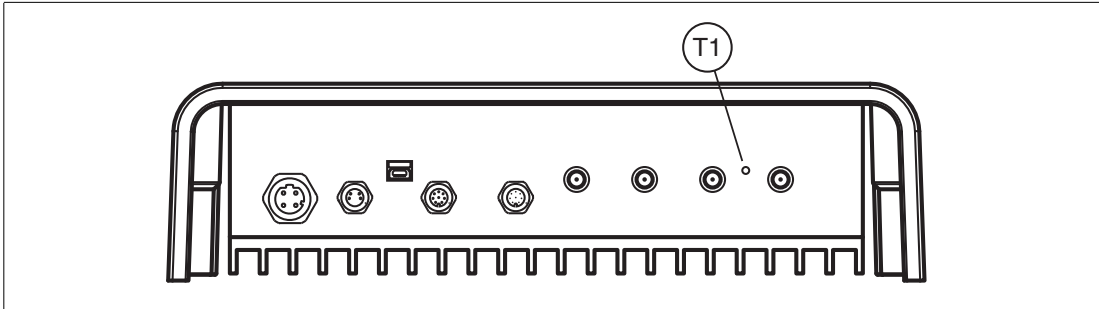
**Button**

Figure 3.6

The configuration can be reset using the T1 button. The T1 button is located centrally between the ANT3 and ANT4 antenna connections.

Use a paper clip, for example, to press the button.

**Resetting the Configuration****Note**

If the configuration is reset, the read/write device will be returned to factory settings. All previous configurations are lost as a result.

1. Press and hold the T1 button for at least 5 seconds.
  - ↳ The three status LEDs light up.
  - ↳ The device restarts.

### 3.6 Connections

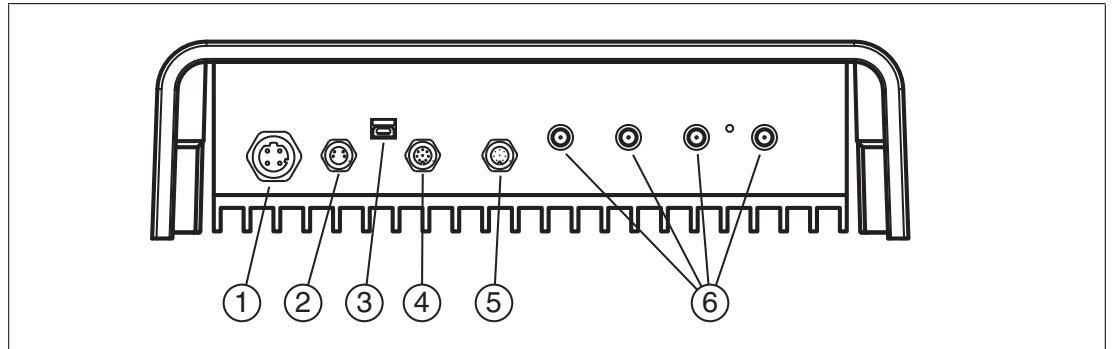


Figure 3.7

No.	Designation	Description
1	LAN	Ethernet interface, M12 See chapter 4.6
2	VCC	Power supply, M8 See chapter 4.5
3	USB	USB mini interface See chapter 4.6
4	IO	Digital inputs/outputs, M8 See chapter 4.7
5	RS232 RELAY	RS232/Relay outputs, M8 See chapter 4.6, see chapter 4.7
6	ANT1 – ANT4	Antenna connections See chapter 4.4

## 4 Installation

### 4.1 Storage and Transportation

Keep the original packaging. Always store and transport the device in the original packaging. Store the device in a clean and dry environment. The permitted ambient conditions must be considered, see datasheet.

### 4.2 Unpacking

Check the product for damage while unpacking. In the event of damage to the product, inform the post office or parcel service and notify the supplier.

Check the package contents against your purchase order and the shipping documents for:

- Delivery quantity
- Device type and version in accordance with the type label
- Any accessories ordered

Retain the original packaging in case you have to store or ship the device again at a later date. Should you have any questions, please contact Pepperl+Fuchs.

### 4.3 Mounting



#### Warning!

Malfunctions with pacemakers

This device does **not** exceed the permissible limits for electromagnetic fields. Maintain a minimum distance of 34 cm between the device and your pacemaker.

Inadequate distance from the read/write device can result in inhibitions, reprogramming, or incorrect stimulation pulses.

The read/write device is designed for indoor and outdoor wall mounting. For outdoor use, the read/write device must be installed with the connections facing down to ensure that the seal is maintained.



#### Note

Do not route the connection cable within the sensing range of the antenna.



#### Caution!

Mounting the read/write device

Make sure that the read/write device is firmly attached to the mounting surface.



#### Note

The installation recommendations made in this document are based on favorable conditions. Pepperl+Fuchs cannot provide any guarantee that the device will function correctly in different environments.

Holes for countersunk screws are provided in the housing for wall mounting. The max. screw head diameter is 8.0 mm; the max. thread diameter is 5.3 mm and is suitable for M5 screws. The screws used should have a minimum length of 45 mm, depending on the mounting situation. It is not necessary to screw on the housing for mounting.



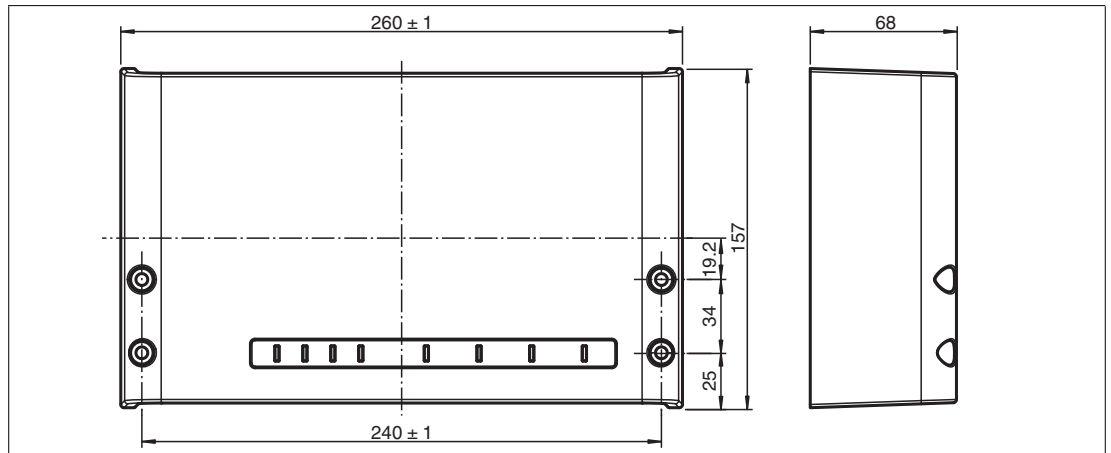


Figure 4.1

## 4.4 Antennas

The SMA sockets for connecting the external antennas are located on the underside of the read/write device.

The maximum tightening torque for the SMA sockets is 0.45 Nm.

It is possible to connect a DC voltage of 24 V DC with a maximum of 500 mA straight to the antenna line to supply power to external components. The antenna outputs must be configured accordingly.



### Caution!

Higher tightening torques will destroy the antenna connections.

If using antennas from other manufacturers, switching on the supply voltage on the antenna line can destroy the antennas.

Use high-impedance antennas. If you have any questions, please contact our technical support team.

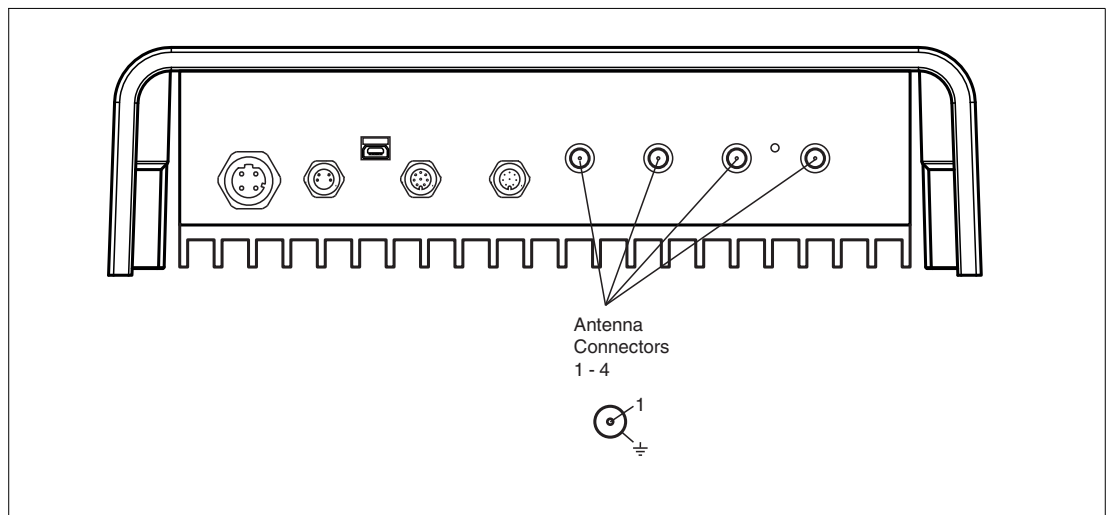


Figure 4.2

Connection	Description
ANT1 – ANT4	Connection of external antennas Input impedance 50 Ω

## 4.5 Supply Voltage

Connect the supply voltage of 24 V DC to the VCC connection.



### Caution!

Checking the power supply

The read/write device may be supplied only by a power supply that complies with EN 62368-1 Chapter Q.1 Limited Power Sources LPS or by a power supply certified under NEC Class 2/LPS.

Each read/write device must always be powered by its own external power supply.

Swapping the two contacts at the VCC terminal can destroy the device. The external wiring for the power supply must comply with the following standards.

### Cable Specifications

Conductor cross section	Standards
$\geq 0.5 \text{ mm}^2$	IEC 60332-1-2 and IEC 60332-1-3
$< 0.5 \text{ mm}^2$	IEC 60332-2-1 and IEC 60332-2-2

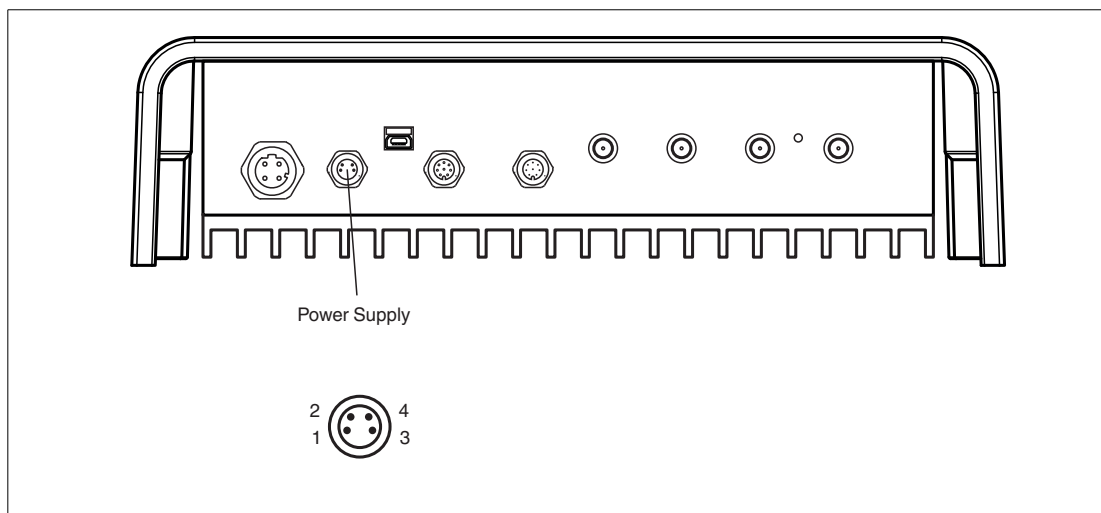


Figure 4.3

### Pinout

Pin	Description
1	VDC: +24 V DC $\pm$ 20 %
2	VDC: +24 V DC $\pm$ 20 %
3	GND: Ground
4	GND: Ground

## 4.6 Interfaces

### Ethernet Interface at LAN Terminal

The read/write device has an integrated network interface for a D-coded M12 connector. The connection is made via the LAN terminal. The interface has automatic "crossover detection," which complies with the 1000BASE-T standard.

Cables with a minimum category of STP CAT5 must be used for structured cabling. This ensures smooth operation at 10 Mbps or 100 Mbps.

The prerequisite for using the TCP/IP protocol is that each device on the network has its own IP address. All read/write devices have a factory default IP address. The transfer parameters can be configured as required.



**Note**

The read/write device has a DHCP-enabled TCP/IP interface.

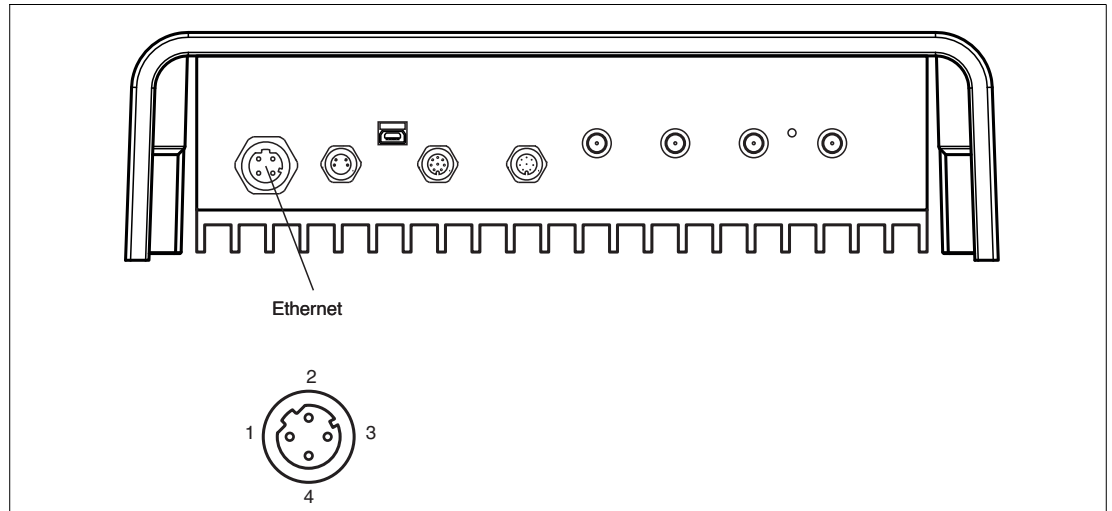


Figure 4.4

**Pinout**

Pin	Description
1	TX+
2	TX-
3	RX+
4	RX-

**Ethernet interface: Factory setting**

Parameter	Factory setting
IP address	192.168.10.10
Subnet mask	255.255.0.0
Port	10001
DHCP	Off

**USB Mini Interface**

The read/write device has a USB interface. This can be used either to connect the read/write device to a host system or to connect a USB memory stick to the device using an "On-The-Go" adapter cable. The connection is made via the mini-USB socket.



**Caution!**

Cable length

The USB cable used can be up to 5 m long. Longer cables must not be used.

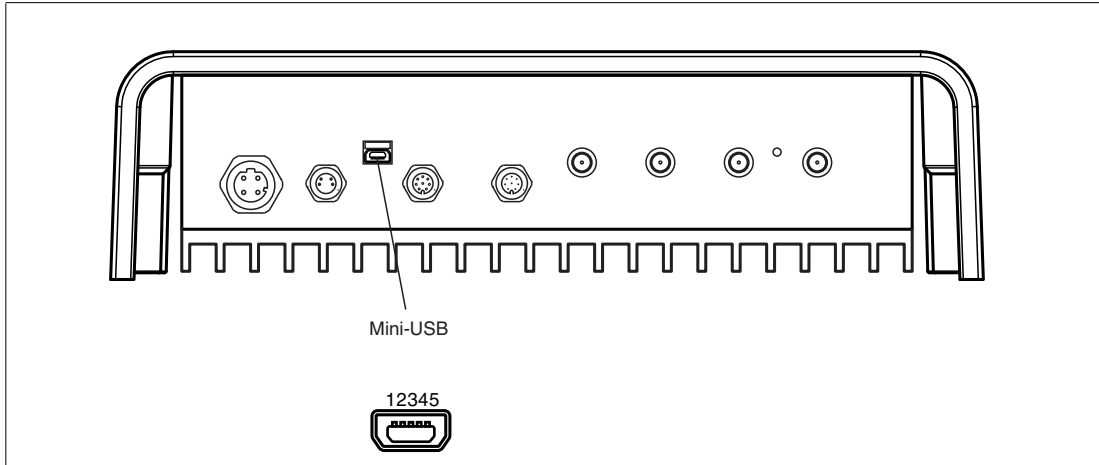


Figure 4.5

Use a standard shielded USB cable to connect the read/write device to a host system. The data rate of the USB interface is limited to 12 Mbit.

### USB Memory Stick

A USB "On-The-Go" adapter enables you to use the interface as a USB host interface. This allows you to connect USB memory sticks to the read/write device. Various service functions can be performed using USB memory sticks, such as reading out log and service data and loading a configuration file.



### Caution!

USB memory stick

After inserting the USB memory stick, observe the LED display on the read/write device.

Do not remove the USB memory stick until a USB action is complete.

Use a USB "On-The-Go" adapter cable only with a USB memory stick. Using a USB "On-The-Go" adapter cable for a PC connection may destroy the read/write device.

### Reading Out Log and Service Data

When the USB memory stick is inserted during operation, the read/write device creates a sub-directory named after the device ID of the device. The device ID is printed on the nameplate. The device stores device information such as firmware version and IP address in this directory in the INFO.LOG file. If a file already exists for this device, the device information is updated with the date and time after the USB memory stick has been inserted.

In addition, the ACTION.LOG and SERVICE.LOG files are also saved to the USB memory stick with additional details for the service and maintenance of the devices.

After inserting the USB memory stick, the green and red status LEDs will be lit continuously. After the successful completion of the USB actions, the red LED goes out and the green status LED starts to flash again. The USB memory stick can be disconnected from the device after the red status LED goes out. In the event of an error, the red LED flashes until the USB memory stick is removed.

### Backing up the Device Configuration to a USB Memory Stick

When the USB memory stick is inserted during operation, the write/read device saves the readable configuration as an editable, readable CSV file named CONFIG.INI on the USB memory stick. This file is stored in the main directory of the USB memory stick to make it easy to copy the configuration. In addition, this file is stored in a subdirectory named after the device ID of the device. The device ID is printed on the nameplate. Configurations of several read/write devices of a plant/installation can be stored on one memory stick.

All non-protected configuration pages (CFG areas) including the interface settings of a device are copied. Password-protected configuration pages are not copied.

After inserting the USB memory stick, the green and red status LEDs will be lit continuously. After the successful completion of the USB actions, the red LED goes out and the green status LED starts to flash again. The USB memory stick can be disconnected from the device after the red status LED goes out.



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**Note**

Any existing CONFIG.INI configuration file in the main directory of the USB memory stick will be overwritten.

Password-protected configuration pages are not written to the USB memory stick. No error message will appear.

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**Copying the Configuration to a Read/Write Device**

Connect the USB memory stick to the powered down device to copy the configurations stored on a USB memory stick to a read/write device. After the power is turned on, the read/write device searches for a USB memory stick during the boot process and copies the configuration to its memory. Make sure that no configuration pages in the read/write device are password-protected. If configuration pages are password-protected, the configuration will not be used. This also applies if individual configuration parameters contain values outside the permitted range.

After the successful completion of the USB actions, the red LED goes out and the green status LED starts to flash again. The USB memory stick can be disconnected from the device after the red status LED goes out. In the event of an error, the red LED flashes until the USB memory stick is removed.



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**Note**

If the USB memory stick is inserted during operation, the configuration stored on the USB memory stick may be overwritten.

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## RS232 Interface

The read/write device has an RS232 interface, which is connected using the RS232/RELAY connection. You can configure the transfer parameters using a software protocol.

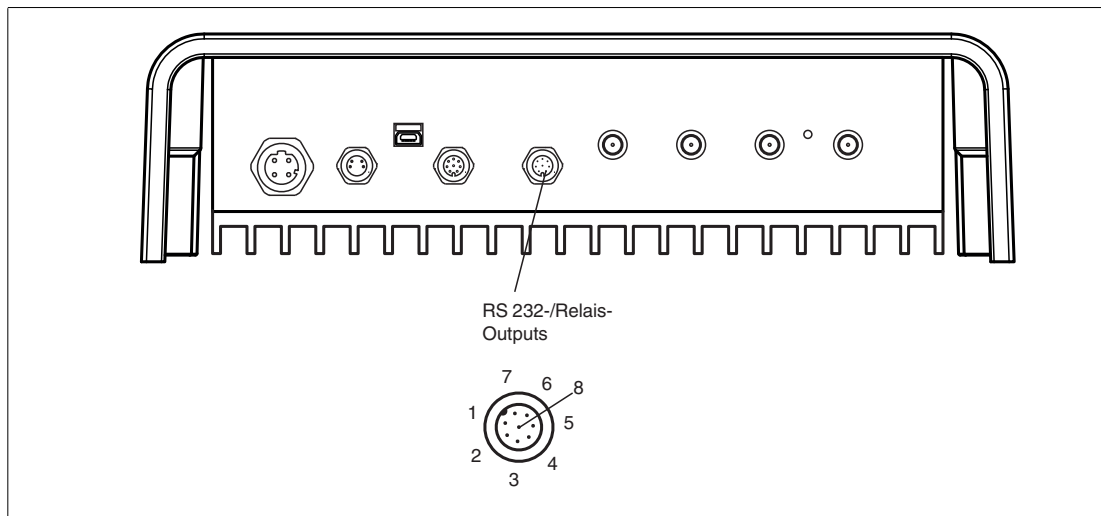


Figure 4.6

### Pinout

Pin	Description
1	RS232 – RxD
2	RS232 – TxD
3	GND
4	+24 V DC, max. 750 mA
5	REL1-NO
6	REL1-COM
7	REL2-NO
8	REL2-COM

## 4.7 Inputs/Outputs

### RS232/RELAY

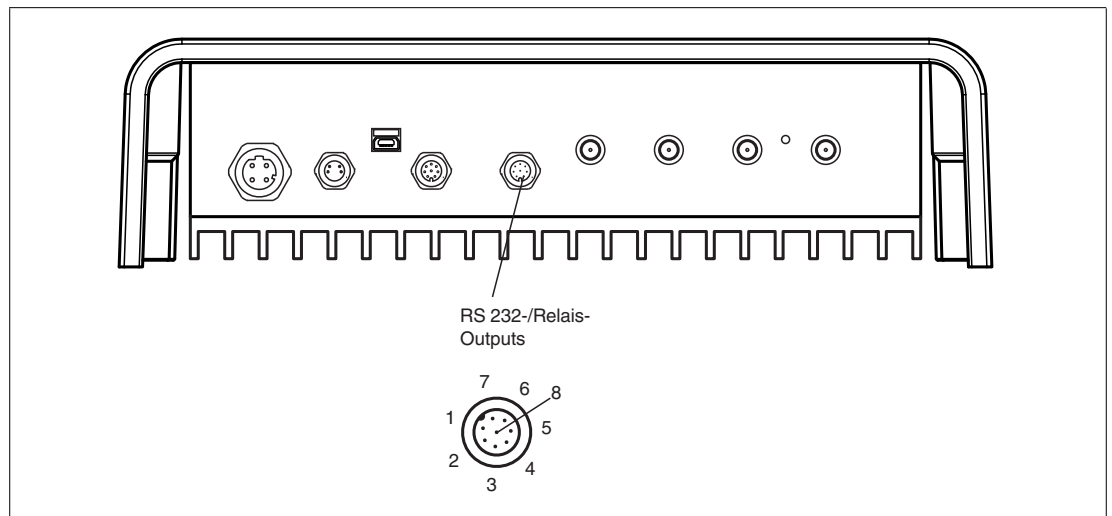


Figure 4.7

#### Pinout

Pin	Description
1	RS232 – RxD
2	RS232 – TxD
3	GND
4	+24 V DC, max. 750 mA
5	REL1-NO
6	REL1-COM
7	REL2-NO
8	REL2-COM

#### 24 V DC Voltage

A voltage of 24 V DC can be tapped at PIN 4 of the RS232/relay terminal. This can be used, for example, to connect the digital inputs and outputs.



#### Warning!

Maximum current

A maximum current of 750 mA can be taken from PIN 4 of the RS232/relay terminal.

#### Relay Outputs

There are two relay outputs (REL1 and REL2) available at the RS232/RELAY terminal as NO contacts.



#### Caution!

Continuous load

The relay output is designed for a maximum of 24 V DC/2 A continuous load.

The maximum switching current must not exceed 1 A.

The relay output is designed only for switching resistive loads. If there is an inductive load, the relay contacts must be protected by an external protective circuit.

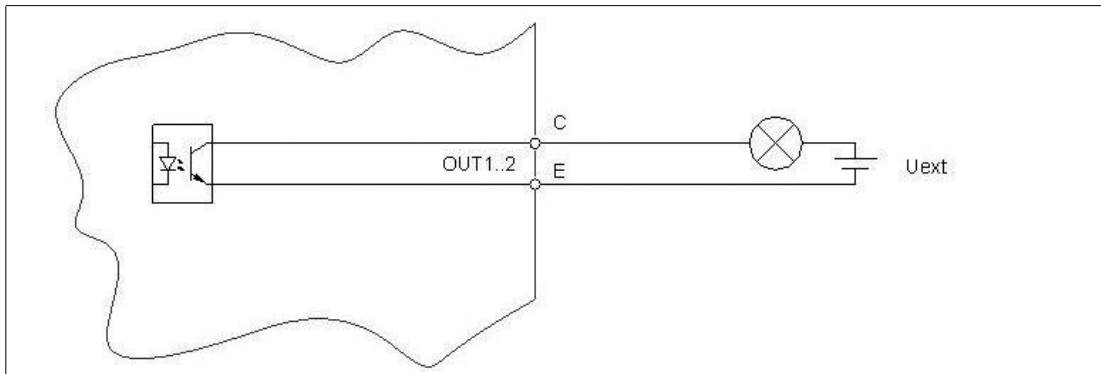


Figure 4.8

### Digital Inputs/Outputs at the IO Terminal

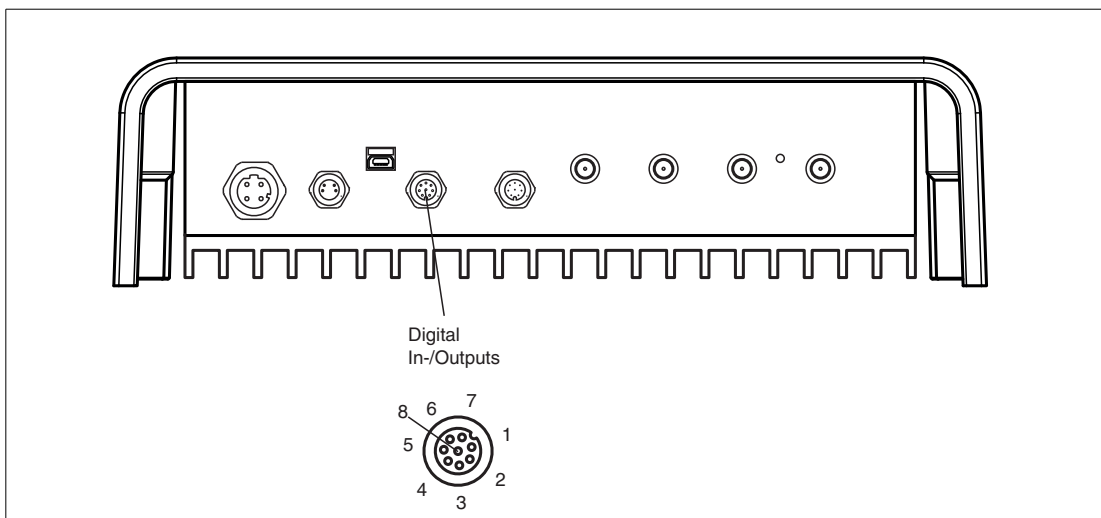


Figure 4.9

#### Pinout

Pin	Description
1	OUT1-E
2	OUT1-C
3	OUT2-E
4	OUT2-C
5	IN1 -
6	IN1 +
7	IN2 -
8	IN2 +



### Inputs

The optocoupler inputs at the IO terminal are galvanically isolated from the electronics of the read/write device and must therefore be supplied with an external voltage.

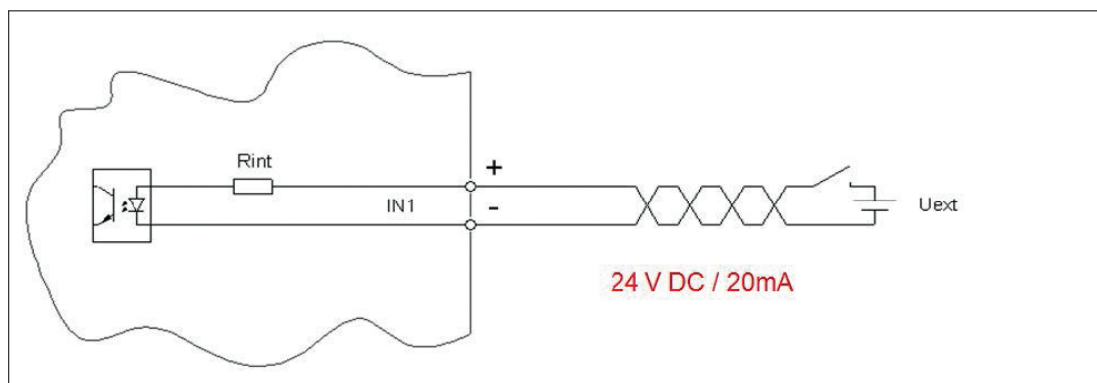


Figure 4.10 Internal and external wiring of the digital inputs



### Caution!

Do not exceed the maximum input current/voltage

The inputs are designed for an input voltage of 12–24 V DC and a maximum input current of 20 mA. Reverse polarity or overload of the input will result in destruction of the input.

### Outputs

The transistor connection and the collector and emitter of the optocoupler output are galvanically isolated from the read/write device and routed to the outside without an additional internal circuit at the IO terminal. The output must therefore be supplied with an external voltage.

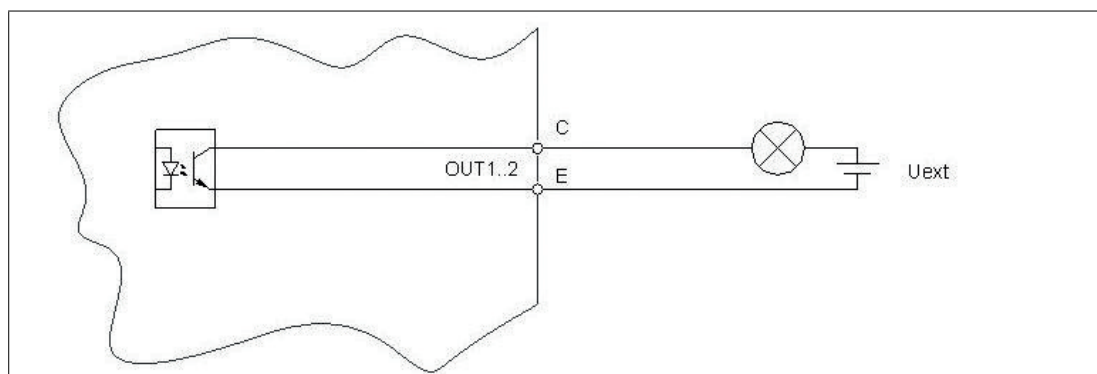


Figure 4.11 Internal and external wiring of the digital outputs



### Caution!

Do not exceed the maximum output current/voltage

The output is designed for a maximum of 24 V DC/20 mA. Reverse polarity or overload of the output will result in destruction of the output. The output is designed only for switching resistive loads.

## 5 Service and Maintenance

The device is designed and constructed to function stable over long periods of time. For this reason, regular cleaning or maintenance is unnecessary.

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## Explosion Protection

- Intrinsic Safety Barriers
- Signal Conditioners
- FieldConnex® Fieldbus
- Remote I/O Systems
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- Mobile Computing and Communications
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement

## Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
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