## 4.6.6    Prevention of interference sources

A high level of immunity to interference can be achieved by avoiding interference sources. All switched inductances are a frequent source of interference in plants.

### Suppression of inductance

Relays, contactors, etc. generate interference voltages and must therefore be suppressed using one of the circuits below.

Even with small relays, interference voltages of up to 800 V occur on 24 V coils, and interference voltages of several kV occur on 230 V coils when the coil is switched. The use of freewheeling diodes or RC circuits prevents interference voltages and thus stray interference on conductors installed parallel to the coil conductor.
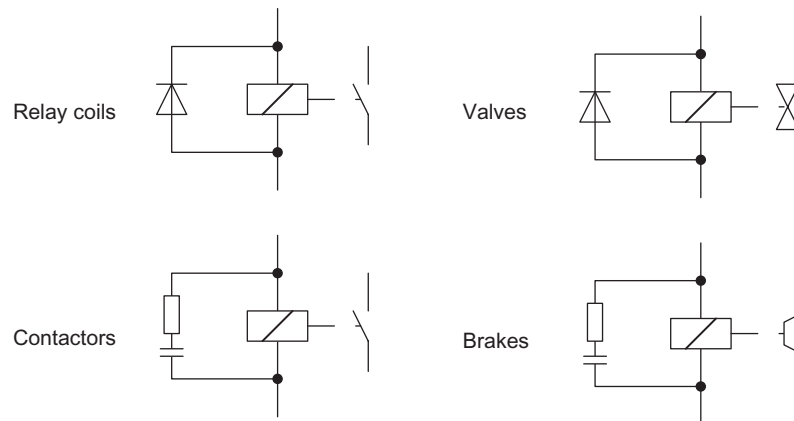


Figure 4-13    Suppression of inductance

---

**Note**

All coils in the cabinet should be suppressed. The valves and motor brakes are frequently forgotten. Fluorescent lamps in the control cabinet should be tested in particular.

---

## 4.6.7 Equipotential bonding

Potential differences between different parts of a plant can arise due to the different design of the plant components and different voltage levels. If the plant components are connected across signal cables, transient currents flow across the signal cables. These transient currents can corrupt the signals.

Proper equipotential bonding is thus essential.

- The equipotential bonding conductor must have a sufficiently large cross section (at least 10 mm$^2$).

- The distance between the signal cable and the associated equipotential bonding conductor must be as small as possible (antenna effect).

- A fine-strand conductor must be used (better high-frequency conductivity).

- When connecting the equipotential bonding conductors to the centralized equipotential bonding strip, the power components and non-power components must be combined.
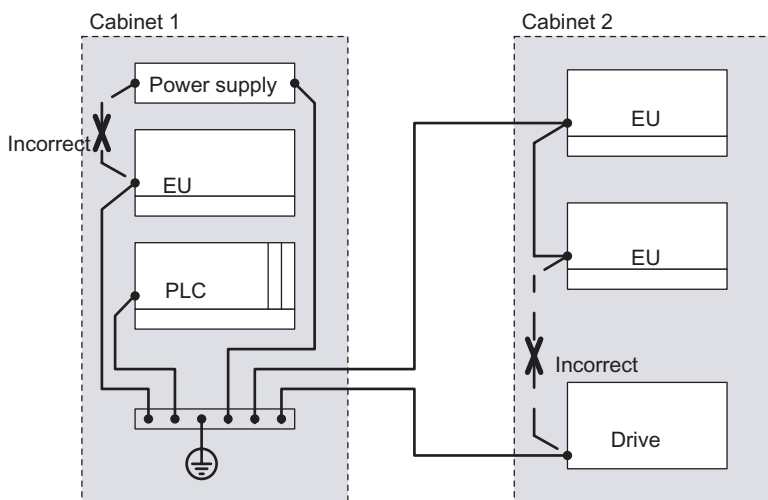


Figure 4-14    Equipotential bonding

The better the equipotential bonding in a plant, the smaller the chance of interference due to fluctuations in potential.

Equipotential bonding should not be confused with protective earthing of a plant. Protective earthing prevents the occurrence of excessive contact voltages in the event of device faults.

## 4.6.8    Cable shielding

Signal cables must be shielded in order to prevent coupling of interference.

The best shielding is achieved by installing the cables in steel tubes. However, this is only necessary if the signal cable is routed through an environment prone to particular interference. It is usually adequate to use cables with braided shields. In either case, however, correct connection is vital for effective shielding.

---

**Note**

An unconnected or incorrectly connected shield has no shielding effect.

---

As a rule:

- For analog signal cables, the shield should be connected at one end on the receiver side

- For digital signals, the shield should be connected to the enclosure at both ends

- Since interference signals are frequently within the HF range (> 10 kHz), a large-area HF-proof shield contact is necessary
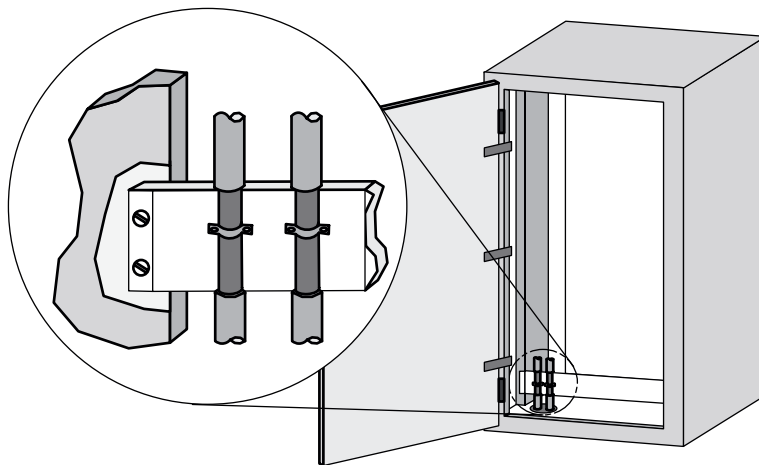


Figure 4-15    Cable shielding

The shielding bus should be connected to the control cabinet enclosure in a manner allowing good conductance (large-area contact) and must be situated as close as possible to the cable inlet. The cable insulation must be removed and the cable clamped to the shielding bus (high-frequency clamp) or secured using cable ties. Care should be taken to ensure that the connection allows good conductance.
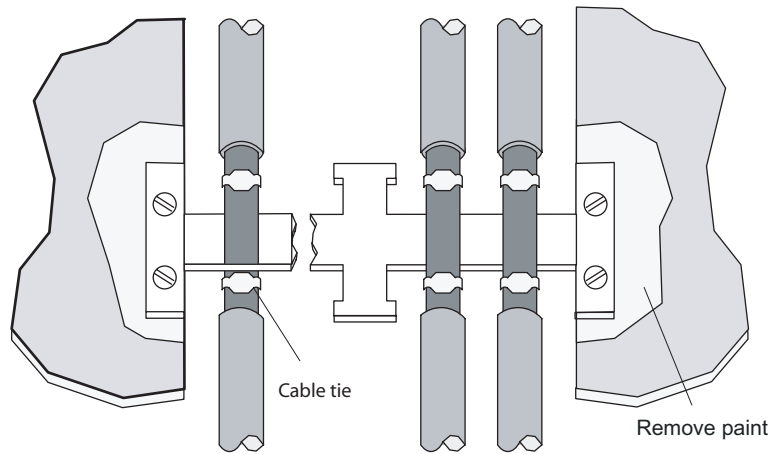
Figure 4-16    Connection of shielding bus

The shielding bus must be connected to the PE busbar.

If shielded cables have to be interrupted, the shield must be continued via the corresponding connector housing. Only suitable connectors may be used for this purpose.
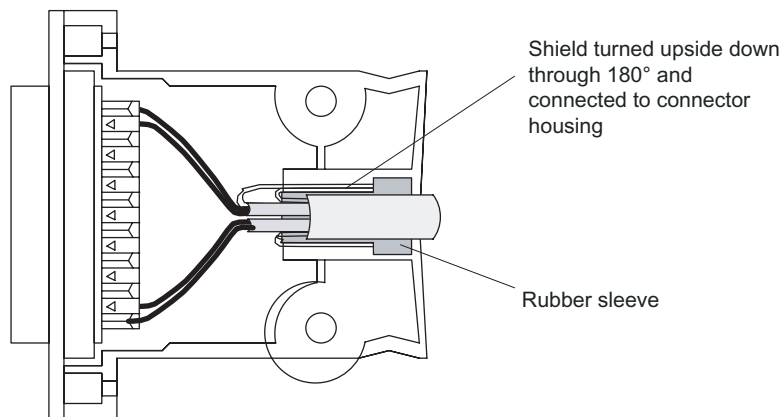


Figure 4-17    Interruption of shielded cables

If intermediate connectors, which do not have a suitable shield connection, are used, the shield must be continued by fixing cable clamps at the point of interruption. This ensures a large-area, HF-conducting contact.

# Readers 5

The reader ensures inductive communication with the transponders, and handles the serial connection to the communication modules/interface modules and 8xIQ-Sense module.

Communication between the transponder and reader takes place over inductive alternating fields.

The transmittable data volume between reader and transponder depends on:

- the speed at which the transponder moves through the transmission window of the reader.
- the length of the transmission window.
- the transponder type (FRAM, EEPROM).

# 5.1 RF 310-R

## 5.1.1 Features

| Reader RF 310-R | Features | |
|---|---|---|
|  | Design | (1) IQ-Sense interface |
| | | (2) Operating indicator |
| | Applications | Identification tasks on small assembly lines in harsh industrial environments |
| | Read/write distance to transponder | 30 mm max. |
| | Data transmission rate | Read: 50 bytes/s |
| | | Write: approx. 40 bytes/s |

## 5.1.2 Indicators

Table 5-1      RF 310-R indicators

| Color | Meaning |
|---|---|
| Green | Operating voltage available |
| Yellow | Transponder present |
| Red | Fault |

### 5.1.3 Transmission window

#### Ensuring reliable data exchange

The "center point" of the transponder must be situated within the transmission window.

### 5.1.4 Metal-free area

The RF 310-R can be flush-mounted in metal. Please allow for a possible reduction in the field data values.
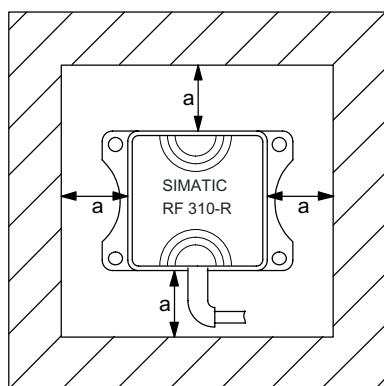


Figure 5-1    Metal-free area for RF 310-R

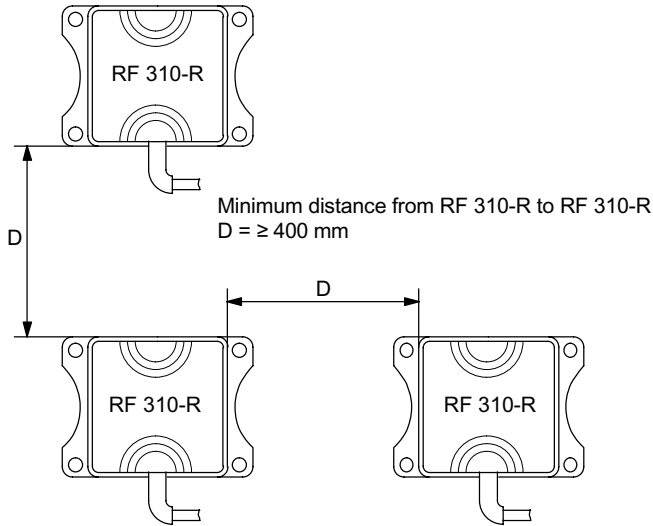## 5.1.5    Minimum distance between several RF 310-R units



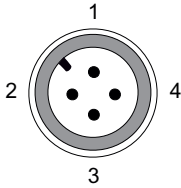Figure 5-2    Minimum distance between several RF 310-R units

## 5.1.6    RF 310-R field data

|  | RF 320-T transponder | RF 340-T transponder |
|---|---|---|
| Working distance (Sa) | 0-12 mm | 0-20 mm |
| Limit distance (Sg) | 18 mm | 30 mm |
| Length of the transmission window (L) | 30 mm | 40 mm |
| Width of the transmission window (W) | 12 mm | 16 mm |

| Reader RF 310-R to reader RF 310-R |  |
|---|---|
| Minimum distance | 400 mm |

## 5.1.7 Pin assignment of the IQ-Sense interface

Table 5-2　　RF 310-R pin assignment

| Pin | Pin, device end, 4-pin M12 | Assignment |
|---|---|---|
| | 1 | IQ-Sense |
| | 2 | Not assigned |
| | 3 | IQ-Sense |
| | 4 | Not assigned |

## 5.1.8 Cable and connector pin assignment

The following figure shows the cable and connector pin assignment of the connecting cable between 8xIQ-Sense and RF 310-R.
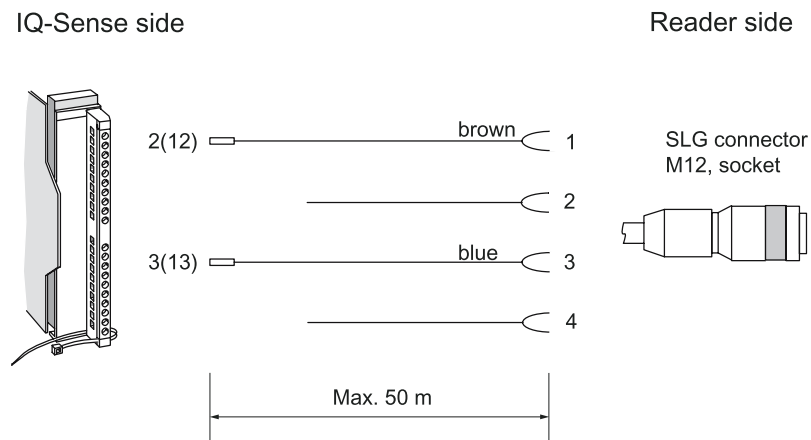
IQ-Sense side　　　　　　　　　　　　　　　　　Reader side

Figure 5-3　　Cable and connector pin assignment

## 5.1.9 Technical data of the RF 310-R

Table 5-3     Technical data of the RF 310-R

| | |
|---|---|
| Inductive interface to the transponder | |
| Transmission frequency for power/data | 13.56 MHz |
| Interface to SIMATIC S7-300 | IQ-Sense, 2-wire polarity independent |
| Required master module | 8-IQ-Sense (6ES7 338-7XF00-0AB0) |
| RFID channels (RF 310-R) | Max. 2 possible per master module |
| Hybrid operation with other profiles | Max. 4 Opto-BERO, 1x SIMATIC RF 310-R |
| Cable length, reader | Max. 50 m (unshielded cable) |
| Read/write distances of reader | See field data RF 310-R |
| Minimum distance between 2 RF 310-R units | $\geq$ 400 mm |
| SLG data transmission rate<br>• Read<br>• Write | <br>Approx. 50 bytes/s<br>Approx. 40 bytes/s |
| Traversal rate<br>• Read<br>• Write | <br>Approx. 0.8 m/s (2 bytes)<br>Approx. 0.2 m/s (2 bytes) |
| Function | Read, write, initialize transponder |
| Multi-tag | no |
| Power supply | via IQ-Sense master module 24 V DC |
| Indicators | 2-color LED (operating voltage, presence, error) |
| Plug connector | M12 (4-pin) |
| Housing<br>• Dimensions (in mm)<br>• Color<br>• Material | <br>55 x 75 x 30 (not including M12 connector)<br>anthracite<br>plastic PA 12 |
| Fixing | 4 x M5 screws |
| Ambient temperature<br>• During operation<br>• Storage and transport | <br>• -25°C to +70°C<br>• -40°C to +85°C |
| Degree of protection per EN 60529 | IP65 |
| Shock to EN 60 721-3-7 Class 7 M2<br>Overall shock response spectrum type II<br>Vibration to EN 60 721-3-7 Class 7M2 | 50 g<br>1 g (9 to 200 Hz)<br>1.5 g (200 to 500 Hz) |
| Weight | Approx. 200 g |
| Approvals | • Radio to R&TTE guidelines EN 300 330, EN 301 489<br>• CE<br>• UL<br>• FCC |

## 5.1.10 FCC information

**Siemens SIMATIC RF 300**

FCC ID: xxxxxxxx

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.

**Caution**

Any changes or modifications not expressly approved by the party responsible for

compliance could void the user's authority to operate the equipment.

## 5.1.11 RF 310-R ordering data

| RF 310-R | Order No. |
|---|---|
| with IQ-Sense interface for SIMATIC S7-300<br>ET 200M<br>IP65<br>-25° to +70°C<br>55 x 75 x 30 mm<br>Max. limit distance: 30 mm<br>with integrated antenna | 6GT2 801-0AA00 |

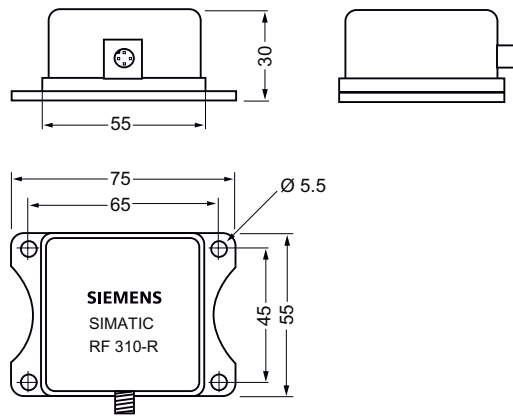## 5.1.12    Dimension drawing



Figure 5-4     RF 310-R dimension drawing

# Transponder/tags

# 6

Transponders consist predominantly of logic, FRAM and/or EEPROM.

If a transponder moves into the transmission field of the reader, the necessary power for all of the circuit components is generated and monitored by the power supply unit. The pulse-coded information is prepared in such a way that it can be processed further as pure digital signals. The handling of data, including check routines, is performed by the control unit, which also manages the various memories.

# 6.1    RF 320-T

## 6.1.1    Features

| RF 320-T transponder | Features | |
|---|---|---|
| | Applications | Identification tasks on small assembly lines in harsh industrial environments |
| | Memory | Read-only area (4 bytes UID) |
| | | User data area (20 bytes) |
| | Read/write range | Max. 18 mm |
| | | (in conjunction with reader RF 310-R) |
| | Mounting on metal | No: distance to metal must be at least 10 mm |

## 6.1.2 Metal-free area

### Direct mounting of the RF 320-T on metal

Direct mounting of the RF 320-T on metal is not allowed.

The following figures show the minimum distance between the RF 320-T and metal:
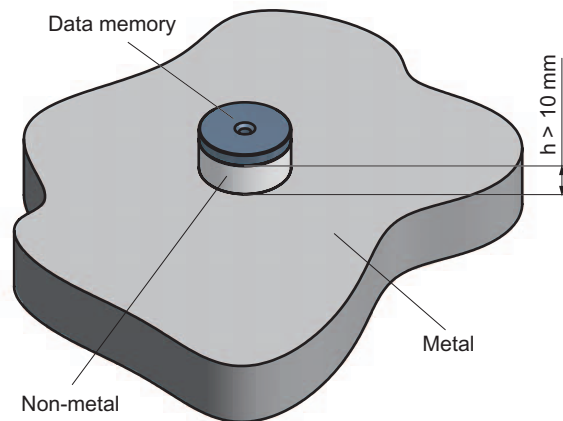


Figure 6-1   Mounting of the RF 320-T on metal with spacer
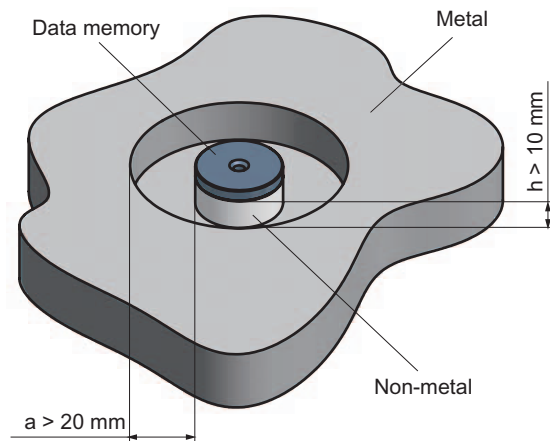
### Flush-mounting of the RF 320-T in metal



Figure 6-2   Flush-mounting of the RF 320-T in metal with spacer

## 6.1.3 Field data

Table 6-1      Field data for transponder RF 320-T to reader RF 310-R

| Transponder RF 320-T to reader RF 310-R | |
|---|---|
| Working distance (Sa) | 0 to 12 mm |
| Limit distance (Sg) | 18 mm |
| Transmission window (L) | 30 mm |

Table 6-2      Field data for transponder RF 320-T to RF 320-T

| Transponder RF 320-T to transponder RF 320-T | |
|---|---|
| Minimum distance | 100 mm |

## 6.1.4    Technical data

Table 6-3     Technical data of the RF 320-T

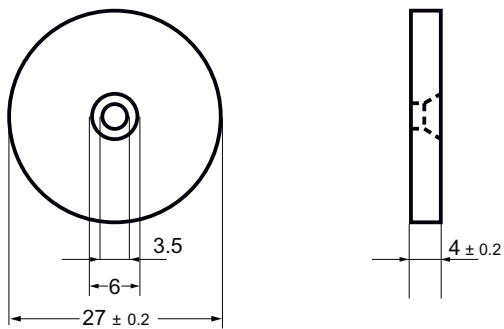| | |
|---|---|
| Memory size | 20 bytes EEPROM (r/w), 4 bytes UID (ro) |
| Memory organization | Byte-oriented access, write protection possible in 4-byte blocks |
| MTBF | $8 \times 10^6$ h |
| Read cycles | Unlimited |
| Write cycles, min. | 50 000 |
| at ≤ 40 °C, typical | > 100 000 |
| Data retention time | > 10 years (at < +40 °C) |
| Read/write distance, max. | 18 mm (see field data) |
| Energy source | Inductive power transmission |
| Shock/vibration-resistant to EN 60721-3-7, Class 7 M3 | 100 g/20 g |
| Torsion and bending load | not permissible |
| Fixing | Adhesive/M3 screws |
| Recommended spacing from metal | > 10 mm |
| Degree of protection per EN 60529 | • IP67/IPX9K |
| Housing<br>• Dimensions<br>• Color/material | Button<br>• Ø 27 mm x 4 mm<br>• Black/epoxy resin |
| Ambient temperature<br>• During operation<br>• Storage and transport | <br>• -25 to +85 °C<br>• -40 to +125 °C |
| Weight | Approx. 5 g |

**Note**

All the technical data listed are typical data and are applicable for an ambient temperature of between 0 C and +50°C and a metal-free environment.

## 6.1.5　Ordering data

| RF 320-T transponder | Order No. |
|---|---|
| Transponder RF 320-T, button, 20-byte EEPROM<br><br>IP 67<br><br>-25 to +85 °C<br><br>d = 27 mm x 4 mm | 6GT2 800-1CA00 |

## 6.1.6　Dimension drawing

### Dimensions of the device



Dimensions in millimeters

## 6.2 RF 340-T

### 6.2.1 Features

| RF 340-T transponder | Features | |
|---|---|---|
|  | Applications | Identification tasks on small assembly lines in harsh industrial environments |
| | Memory | Read-only area (4 bytes UID) |
| | | Read/write memory (8 KB) |
| | Read/write range (in conjunction with reader RF 310-R) | Max. 30 mm |
| | Mounting on metal | Yes: can be directly mounted on metal |

## 6.2.2 Metal-free area

Direct mounting of the RF 340-T on metal is allowed.

### Direct mounting of the RF 340-T on metal
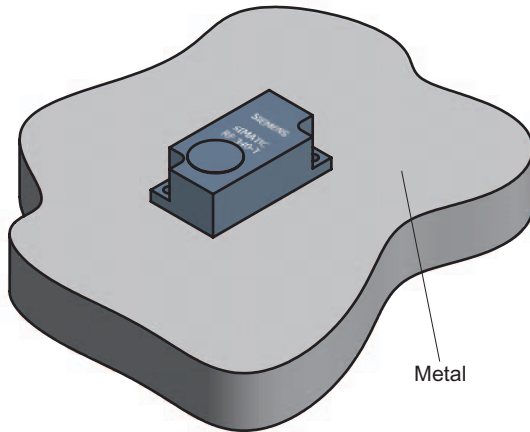


Figure 6-3    Direct mounting of the RF 340-T on metal:

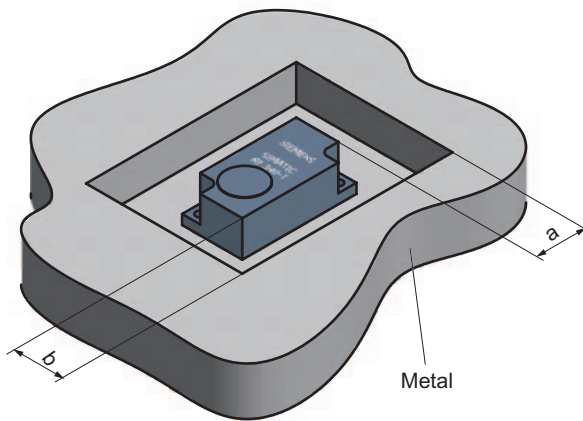### Flush-mounting of the RF 340-T in metal:



Figure 6-4    Flush-mounting of the RF 340-T in metal:

## 6.2.3 Field data

Table 6-4     Field data for transponder RF 340-T to reader RF 310-R

| Transponder RF 340-T to reader RF 310-R | |
| --- | --- |
| Working distance (Sa) | 0 to 20 mm |
| Limit distance (Sg) | 30 mm |
| Transmission window (L) | 40 mm |

Table 6-5     Transponder RF 340-T to transponder RF 340-T

| Transponder RF 340-T to transponder RF 340-T | |
| --- | --- |
| Minimum distance | 100 mm |

## 6.2.4    Technical data

Table 6-6    Technical data of the RF 340-T

| Memory size | 8 KB | |
|---|---|---|
| Memory organization | 8 bit / bytewise | |
| Memory configuration<br>• Serial number (UID)<br>• Application memory | 4 bytes (fixed code)<br>8188 bytes r/w | |
| Storage technology | FRAM | |
| MTBF, at +40 °C | > 1.5 x $10^6$ h | |
| Write cycles, at +40°C | Virtually unlimited (>$10^{10}$) | |
| Read cycles | Unlimited | |
| Transmission rate<br>• Reading<br>• Writing | with RS 422 reader:<br>Approx. 0.3 ms / byte<br>approx. 0.3 ms / byte | with IQ-Sense reader:<br>Approx. 20 ms / byte<br>approx. 25 ms / byte |
| Data retention | > 10 years | |
| Read/write distance | 0 to max. 60 mm (depends on reader used) | |
| Multitag capability | max. 4 transponders | |
| Recommended spacing from metal | can be directly mounted on metal | |
| Power supply | Inductive, without battery | |
| Degree of protection to EN 60529<br>Shock to EN 60721-3-7<br>Vibration to EN 60721-3-7<br>Torsion and bending load | IP68/IPX9K<br>50 g<br>20 g<br>Not permitted permanently | |
| Housing dimensions<br>Color<br>Material<br>Fixing | 48 x 25 x 15 mm (L x W x H)<br>Anthracite<br>PA12<br>2 screws (M3) | |
| Ambient temperature<br>• During operation<br>• Storage and transport | -25°C to +85°C<br>-40°C to +85°C | |
| Weight | Approx. 25 g | |

## 6.2.5　Ordering data

### Ordering data

| RF 340-T | Order No. |
|---|---|
| RF 340-T transponder<br>8 KB FRAM<br>48 x 25 x 15 mm (L x W x H) | 6GT2 800-4BB00 |

## 6.2.6　Dimension drawing

### Dimensions of the device
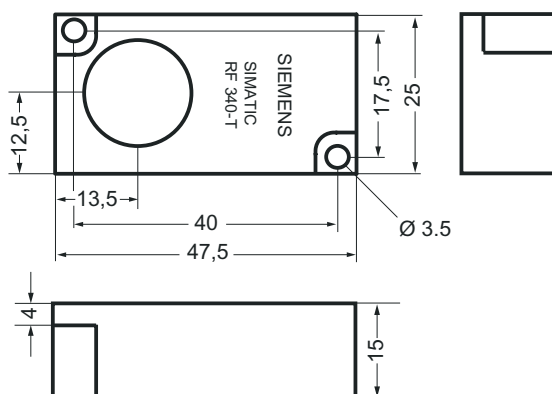


Dimensions in millimeters

# Communication modules

# 7

The communication modules (interface modules) are links between the RFID components (reader and transponder) and the higher-level control systems (e.g. SIMATIC S7) or PC or computers.

# 7.1 8xIQ-Sense

The 8xIQ-Sense module in conjunction with the RF 310-R handles the function of the communication module in SIMATIC RF 300. It can be operated centrally in an S7-300 or decentrally in an ET 200M.
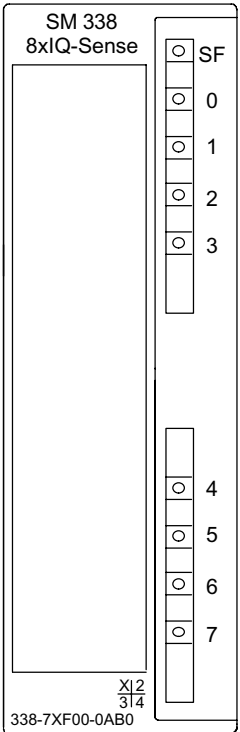
## 7.1.1 Features

| 8xIQ-Sense | Features | |
|---|---|---|
| | Operation | Centralized or distributed |
| | Communication | with up to 8 IQ-Sense devices fitted with IQ-Sense communication interfaces |
| | Status displays | Status LED for each channel (green) (for BERO only) |
| | | Fault LED (red) |

## 7.1.2 Indicators

### Status displays

The 8xIQ-Sense module has the following LEDs:
A green LED, which has no function for RFID devices, and a red SF LED (system fault LED), which indicates the diagnostic state of the module.

| | LEDs | Labeling | LED status | Meaning |
|---|---|---|---|---|
| SM 338<br>8xIQ-Sense<br>SF<br>0<br>1<br>2<br>3<br>4<br>5<br>6<br>7<br>X\|2<br>3\|4<br>338-7XF00-0AB0 | Green LED per channel | 0…7 | Has no function here | |
| | Red | SF | Illuminated | Module fault, sensor fault, active teach-in operation, external auxiliary voltage missing |
| | | | Not illuminated | No fault or no active teach-in operation |

## 7.1.3 Configuration

### Centralized S7-300 configuration
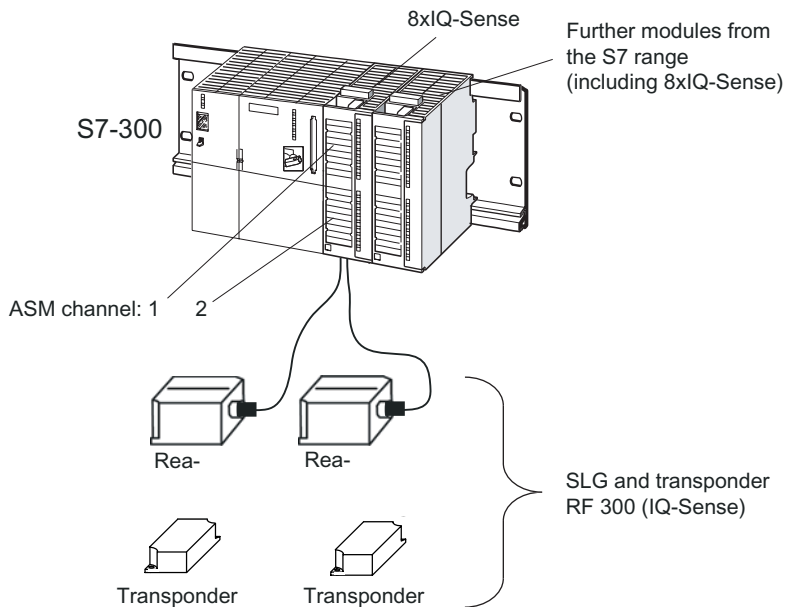


Figure 7-1     Configurator for 8xIQ-Sense with reader RF 310-R (centralized configuration)

### Distributed configuration (ET 200M)
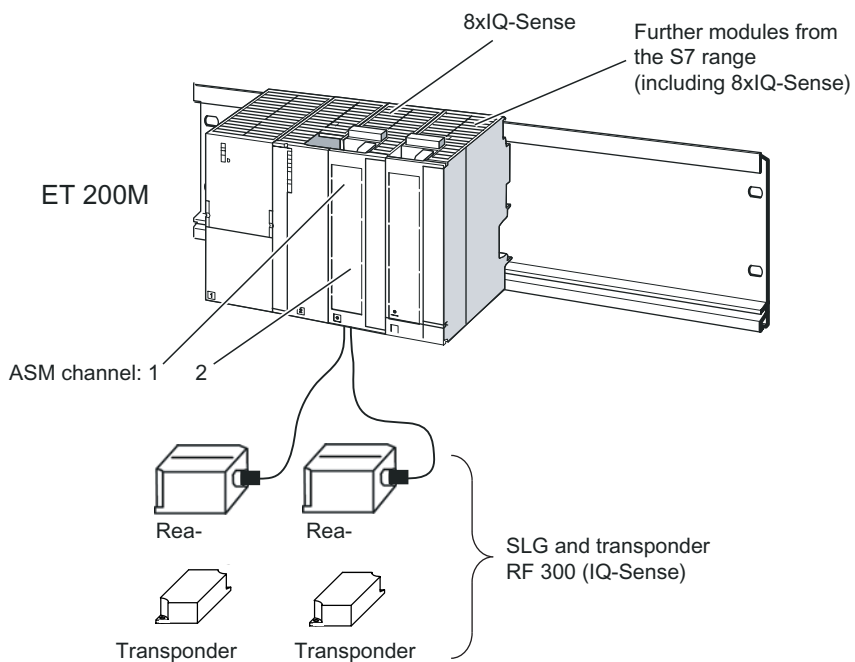


Figure 7-2     Configurator for 8xIQ-Sense with reader RF 310-R (distributed configuration)

## 7.1.4    Addressing

The address range of the 8xIQ-Sense module is 16 bytes I/O.

This is independent of the choice of channel profiles on the connected device

(i.e. the IQ profile IDs in HW Config).

### Access to memory areas

A direct association exists between the number of the channel to which the IQ-Sense device is connected (terminal) and the input and output data area of the module. Based on the address range, the following addresses can be used to access the memory areas:

Address = module initial address + (channel no. x 2)

**Example**

Module initial address = 280

I/O address for channel 3: 286
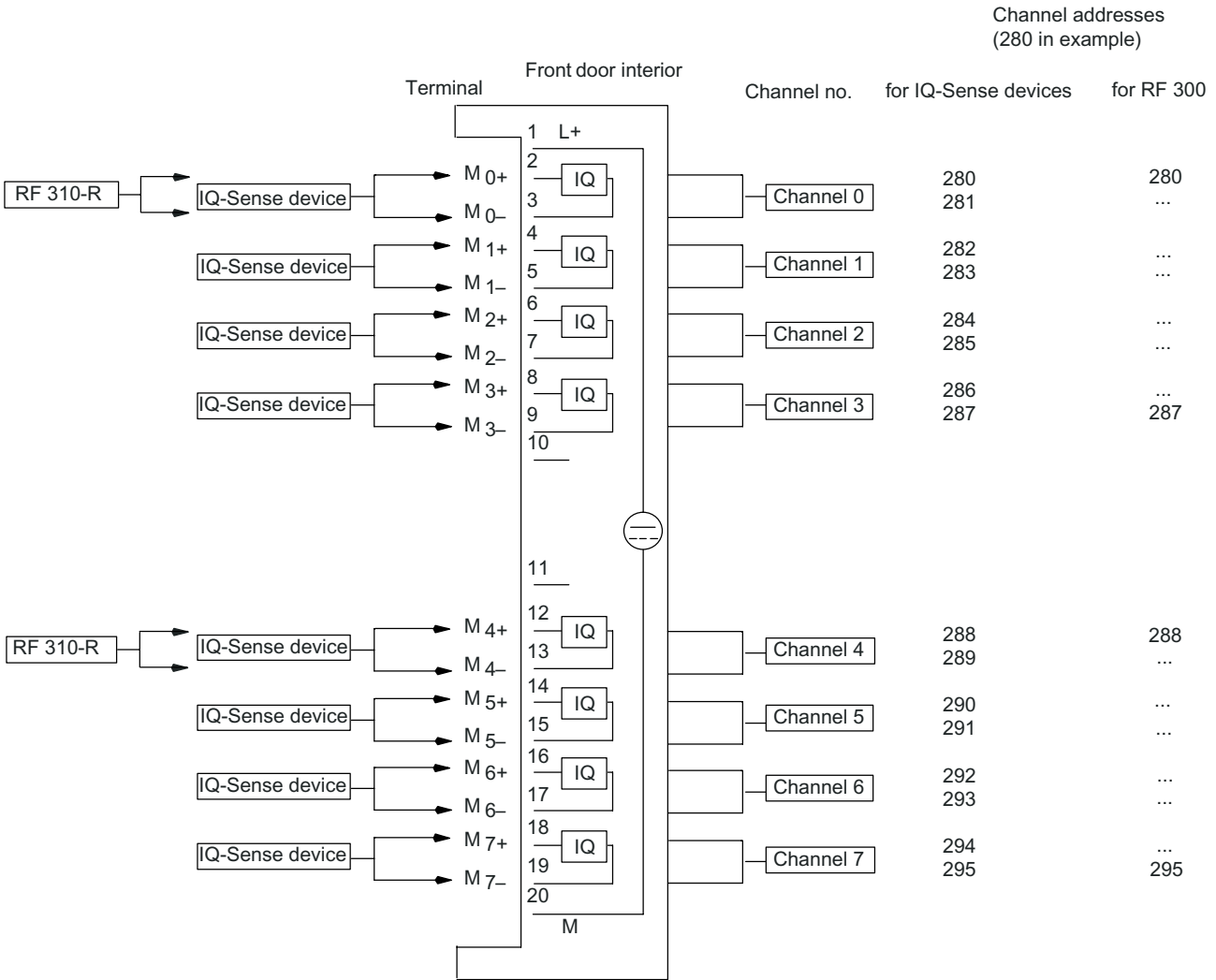


Figure 7-3     8xIQ-Sense module: Assignment of terminal pair to memory area

---

**Note**

A maximum of two read/write devices can be operated!

Each read/write device uses channel numbers 0 to 3 or 4 to 7.

---

## 7.1.5    Technical data

| Voltages and currents | |
|---|---|
| Rated supply voltage | 24 V DC |
| Reverse polarity protection | yes |
| Galvanic isolation | |
| • Between the channels | no |
| • Between channels and backplane bus | yes |
| Permissible potential difference | |
| Between different circuits | 75 V DC / 60 V AC |
| Insulation tested at | 500 V DC |
| Current input | |
| • from the backplane bus | 120 mA typical |
| • from L+ power supply | 500 mA max. |
| Module power loss | 2.5 W typical |
| **Module-specific data** | |
| Number of channels | 8 |
| Channels for RFID systems | 2 |
| Cable length, unshielded | 50 m max. |
| **Dimensions and weight** | |
| Dimensions w x h x d (mm) | 40 x 125 x 120 |
| Weight | Approx. 235 g |

## 7.1.6    Ordering data

| 8xIQ-Sense | Order No. |
|---|---|
| SIMATIC S7-300<br><br>IQ-Sense SM338 for S7-300 and ET200M for the connection of up to 8xIQ-Sense sensors<br><br>Optical sensors, ultrasonic sensors and RF identification systems can be connected. | 6ES7 3387XF000AB0 |

# Accessories

<div style="text-align: right; font-size: 3em;">8</div>

## 8.1 MOBY software

Version 3.0 and higher of the "MOBY Software", product is supplied on CD. The software includes a complete set of function blocks and drivers for MOBY. The programs are explained in brief in the "readme" file in the main directory of the CD:

- FC 35: S7 function for the 8xIQ-Sense module

- FB 240: Function block for ASM 450; MOBY on PROFIBUS-DP via SIMATIC S5 (including device data file for PROFIBUS-DP)

- FB 250: Function block for ASM 400

- FB 41 contains a function block for the ASM 410. The call interface of the FB is virtually identical to FB 250. Please refer to the description of FB 250 for programming instructions.

- FC 44 can be used to operate the ASM 450 in a SIMATIC S7 environment. It is essential to read the instructions in the "read_me" file in the FC 44 directory. The "FC 44 for ASM 450" description is available for operation of the ASM 450.

- FC 45: S7 function for the ASM 754

- Function FC 47 for ASM 470

- FB 47 contains a function block for SIMATIC S5 115U - 155U. It can be used to operate the ASM 470 in a SIMATIC S5 environment via an ET 200M.

- Load program for ES 030 and device data file for connection of the ES 030 to PROFIBUS-DP

- Test and demo programs for demonstrating the "read from MDS" and "write to MDS" functions etc. on a PC (Windows). The ASM 424/724 MOBY modules and SIM are connected to the PC by cable to the serial interface of the PC (COM 1 or COM 2).

- A brief description of the individual directories is provided in English and German ("read_me.txt" and "lies_mich.txt").

- 3964R driver for DOS, Windows 95 and Windows NT

- C library for CCT32 for Windows 95/NT 4.0

- C library for MOBY API for Windows 98/NT 4.0

- Latest edition of MOBY documentation in PDF format

- Tools: you will find utility programs for MOBY configuration here

The "MOBY Software" CD has a user-friendly interface based on HTML. When you run start.exe, a window appears with the following main menu items:

- FC for S7

- FB for S5

- PC Support

- Doc

- Tools

- Demo

- News

## Notes on MOBY software and licensing

When purchasing an interface module or SIM, no software or documentation is supplied. The "MOBY Software" CD-ROM contains all available FBs/FCs for the SIMATIC, C libraries for Windows 98/NT, demo programs, etc. and needs to be ordered separately. In addition, the CD-ROM contains the complete RFID documentation (German, English and French) in PDF format.

The purchase of an interface module or SIM includes a payment for the use of the software, including documentation, on the "MOBY Software" CD-ROM and the purchaser acquires the right to make copies (copy license) insofar as they are required as part of the customer-specific application or

development for the plant.

**The enclosed contract pertaining to the use of software products against a one-off payment shall apply in addition.**

# Appendix

<div style="text-align: right; font-size: 2em;">A</div>

## A.1 Certificates and approvals

### DIN ISO 9001 certificate

The quality assurance system for the entire product process (development, production, and marketing) at Siemens fulfills the requirements of ISO 9001 (corresponds to EN29001: 1987).

This has been certified by DQS (the German society for the certification of quality management systems).

EQ-Net certificate no.: 1323-01

### Certifications for the United States, Canada, and Australia

### Safety

| One of the following markings on a device is indicative of the corresponding approval: | |
| --- | --- |
| (UL) | Underwriters Laboratories (UL) per UL 60950 (I.T.E) or per UL 508 (IND.CONT.EQ) |
| C(UL) | Underwriters Laboratories (UL) according to Canadian standard C22.2 No. 60950 (I.T.E) or C22.2 No. 142 (IND.CONT.EQ) |
| C(UL)US | Underwriters Laboratories (UL) according to standard UL 60950, Report E11 5352 and Canadian standard C22.2 No. 60950 (I.T.E) or UL508 and C22.2 No. 142 (IND.CONT.EQ) |
| (UL) | UL recognition mark |
| (CSA) | Canadian Standard Association (CSA) per Standard C22.2. No. 60950 (LR 81690) or per C22.2 No. 142 (LR 63533) |
| (CSA)NRTL | Canadian Standard Association (CSA) per American Standard UL 60950 (LR 81690) or per UL 508 (LR 63533) |

## EMC

| USA | |
|---|---|
| Federal Communications Commission<br><br>Radio Frequency Interference Statement | 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 his own expense. |
| Shielded Cables | Shielded cables must be used with this equipment to maintain compliance with FCC regulations. |
| Modifications | Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment. |
| Conditions of Operations | 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. |

| CANADA | |
|---|---|
| Canadian Notice | This Class B digital apparatus complies with Canadian ICES-003. |
| Avis Canadien | Cet appareil numérique de la classe b est conforme à la norme NMB-003 du Canada. |

| AUSTRALIA | |
|---|---|
|  | This product meets the requirements of the AS/NZS 3548 Norm. |

## A.2 Service and support

### Technical support

You can reach the technical support team for all A&D projects at

- Telephone: +49 (0) 180 5050 222
- Fax: +49 (0) 180 5050 223

### Internet

- Visit our site on the Internet at:

  http://www.siemens.com/automation/service&support

- You can send a support query to:

  http://www.siemens.de/automation/support-request

- You can find the latest general information about our identification systems on the Internet at:
  http://www.siemens.de/simatic-sensors

- The online catalog and the online ordering system is available at:

  http://mall.automation.siemens.com/

## A.3 Contact partners

If you have any further questions on the use of our products, please contact one of our representatives at your local Siemens office.

The addresses are found on the following pages:

- On the Internet at: http://www.siemens.com/automation/partner
- In catalog CA 01
- In Catalog FS 10 specially for factory automation sensors

## A.4 Application consulting

For questions about special applications, please send an e-mail to the following address: application-consulting.FAS@siemens.com

or call the following phone number: 0911/895-5775

## A.5 Training

### Training center

We offer appropriate courses to get you started. Please contact your regional Training Center, or the central Training Center in D-90327 Nuremberg.

Telephone: +49 (911) 895-3200

http://www.sitrain.com

# List of abbreviations

**ASM**

        Interface module

**CSA**

        Canadian Standard Association

**EMC**

        Electromagnetic compatibility

**FB**

        Function Block

**FC**

        Function

**IEC**

        International Electrotechnical Commission

**L**

        Length of a transmission window

**MDS**

        Mobile data memory

**RFID**

        Radio Frequency Identification Devices

**Sa**

        Operating distance between MDS and SLG

**Sg**

Limit distance

**SLG**

Write/read device

**SP**

Intersection of the axes of symmetry of the MDS

**Tag**

See transponder

**TPDR**

Transponder

**UL**

Underwriter Laboratories, USA

**VDE**

Verband Deutscher Elektrotechniker [Association of German Electrical Engineers]

**XPDR**

Transponder

# Glossary

**Active field**

Area with minimum field strength containing the transmission window, as well as the areas in which the field strength is no longer sufficient for data exchange.

**Active surface**

See active field

**Automation system (AS)**

A programmable logical controller (PLC) of the SIMATIC S7 system, comprising a central controller, a CPU and various I/O modules.

**Battery-free data memory**

Mobile data memories which operate without batteries. Power is supplied to the data memory across an electromagnetic alternating field.

**CE mark**

Communauté Européenne (product mark of the European Union)

**Data transmission rate**

Unit of measurement for the volume of data transmitted within a unit of time, e.g. bytes/s

**Dwell time**

The dwell time is the time in which the transponder dwells within the transmission window of a read/write device. The read/write device can exchange data with the transponder during this time.

**Dynamic mode**

In dynamic mode, the data carrier moves past the read/write device at a traversing rate which depends on the configuration. Various checking mechanisms (listen-in check, CRC, ECC, etc.) ensure error-free data transfer even under extreme environmental conditions. A serial connection (up to 1000 m) is used to connect the read/write device directly to an interface module, PC, or any other system.

## Electromagnetic compatibility

Electromagnetic compatibility is the ability of an electrical or electronic device to operate satisfactorily in an electromagnetic environment without affecting or interfering with the environment over and above certain limits.

## Equipotential bonding

Potential differences between different parts of a plant can arise due to the different design of the plant components and different voltage levels. It is necessary to compensate for these differences by equipotential bonding: this is done by combining the equipotential bonding conductors of power components and non-power components on a centralized equalizing conductor.

## ESD Directive

Directive for handling ESDs.

## Frequency hopping

Automatic search for free channels.

In frequency hopping, data packets are transferred between the communication partners on constantly changing carrier frequencies. This makes it possible to react to interference from devices transmitting signals in the same frequency range. If an attempt to send a data packet is unsuccessful, the packet can be transmitted again on a different carrier frequency.

## IQ-Sense interface

Simple interface on the IQ-Sense module, using a standard design for all types of sensors, enabling integrated data exchange between the sensor and control system.

## Limit distance

The limit distance is the maximum clear distance between the upper surface of the read/write device and the transponder, at which the transmission can still function under normal conditions.

## Metal-free area

Distance/area which must be maintained between the transponder and metal in order to prevent interference during data transfer between the transponder and read/write device.

## Mobile data memory (MDS)

See transponder

## Multi-tag capability

Multi-tag capability means the ability to use several read/write devices which communicate simultaneously with different data carriers.

## Programmable logic controller (PLC)

The programmable logical controllers (PLCs) of the SIMATIC S5 systems consist of a central controller, one or more CPUs, and various other modules (e.g. I/O modules).

## Read/write devices (SLG)

See readers

## Read/write distance

See transmission distance

## Reader/writer

See write/read device

## RFID systems

SIMATIC RF identification systems control and optimize material flow and production sequences. They identify reliably, quickly and economically, use non-contact data communication technology, and store data directly on the product. They are also resistant to contamination.

## Secondary fields

The strength of the secondary fields, which exist in addition to the transmission window, is usually lower than that of the transmission window and depends on the metallic environment. Secondary fields should not be used in configuring.

## Static mode

In static mode, the transponder is positioned at a fixed distance (maximum: limit distance) exactly over the read/write device.

## Telegram cycles

The transfer of a read or write command takes place in three cycles, known as telegram cycles. 1 or 2 bytes of user data can be transferred with each command. The acknowledgement transfer (status or read data) takes place in 3 further cycles.

## Transmission distance

Distance between communication module (read/write device) and transponder (mobile data memory)

## Transmission window

Area in which reliable data exchange between transponder and read/write device is possible due to a particular minimum field strength.

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# U

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