


6.3 SIMATIC RF320T

6.3.1 Features

RF320T	Characteristics	
	Field of application	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	See Section Field data of RF300 transponders (Page 44)
	Mounting on metal	Not possible: Recommended distance from metal ≥ 20 mm

6.3.2 Ordering data

Table 6- 1 Ordering data RF320T

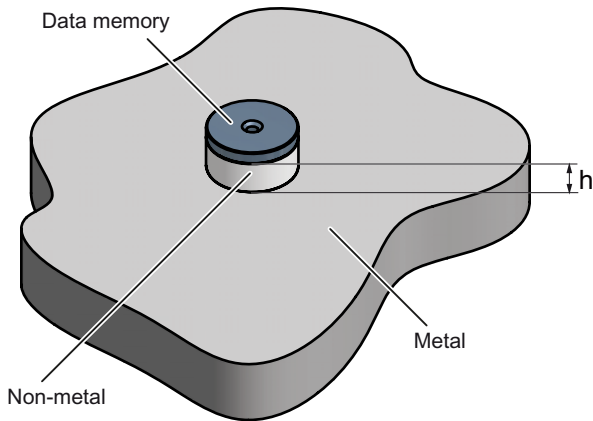
RF320T	Order number
<ul style="list-style-type: none"> • Button • Memory size: 20 byte EEPROM • IP67 • Operating temperature: -25 °C to +85 °C • Dimensions: $\varnothing = 27$ mm x 4 mm 	6GT2800-1CA00

6.3.3 Metal-free area

Mounting of RF320T on metal

Direct mounting of the RF320T on metal is not allowed.

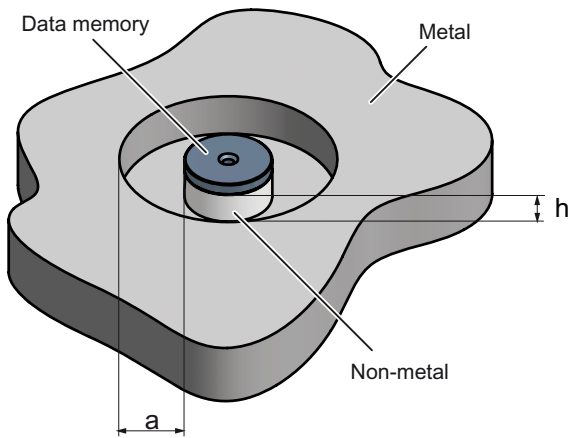
The following figures show the minimum distance between the RF320T and metal:



$h > 20 \text{ mm}$

Figure 6-2 Mounting of an RF320T on metal with spacer

Flush-mounting of RF320T in metal



$h > 20 \text{ mm}$

$a > 20 \text{ mm}$

Figure 6-3 Flush-mounting of RF320T in metal with spacer

At lower values, the field data change significantly, resulting in a reduced range.

6.3.4 Technical data

Table 6- 2 Technical data for RF320T

Memory size	20 bytes EEPROM (r/w), 4 bytes UID (ro)
Memory organization	Byte-oriented access, write protection possible in 4-byte blocks
MTBF (Mean Time Between Failures) in years	1800
Read cycles	Unlimited
Write cycles, min. at ≤ 40 °C, typical	50 000 > 100 000
Data retention time	> 10 years (at < +40 °C)
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 44)]
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	> 20 mm
Degree of protection to EN 60529	• IP67/IPX9K
Housing	Button
• Dimensions	• Ø 27 mm x 4 mm
• Color/material	• Black/epoxy resin
Ambient temperature	
• Operation	• -25 to +85 °C
• Transport and storage	• -40 to +125 °C
Weight	Approx. 5 g

Note

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

6.3.5 Dimension drawing

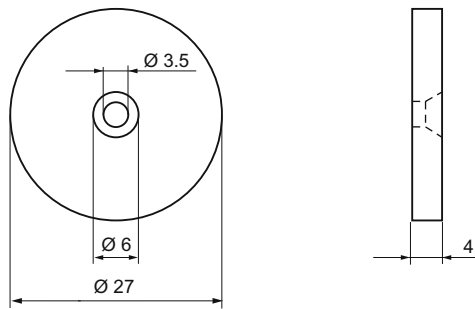



Figure 6-4 RF320T dimension drawing

Dimensions in mm

6.4 SIMATIC RF340T

6.4.1 Features

Table 6- 3

RF340T	Characteristics	
	Field of application	Identification tasks on small assembly lines in harsh industrial environments
	Memory	Read-only area (4 bytes UID) Read/write memory (8 KB) OTP ¹⁾ memory (20 bytes)
	Read/write range	See Section Field data of RF300 transponders (Page 44)
	Mounting on metal	Direct mounting on metal is possible.

¹⁾ OTP: (One Time Programmable)

6.4.2 Ordering data

Table 6- 4 Ordering data RF340T

RF340T	Order number
<ul style="list-style-type: none"> • IP68 • Memory size: 8 KB FRAM • Operating temperature: -25 °C to +85 °C • Dimensions: 48 x 25 x 15 (L x W x H, in mm) 	6GT2800-4BB00

6.4.3 Metal-free area

Direct mounting of the RF340T on metal is permitted.

Mounting of RF340T on metal

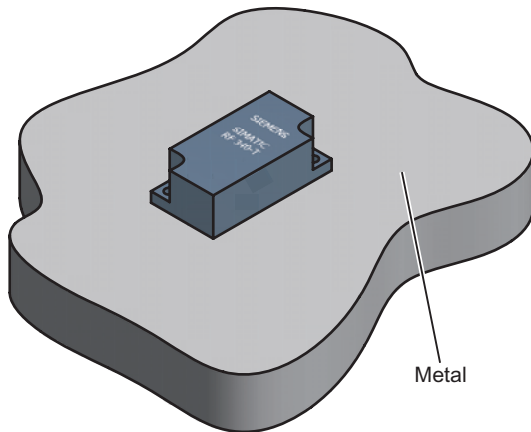


Figure 6-5 Mounting of RF340T on metal

Flush-mounting of RF340T in metal:

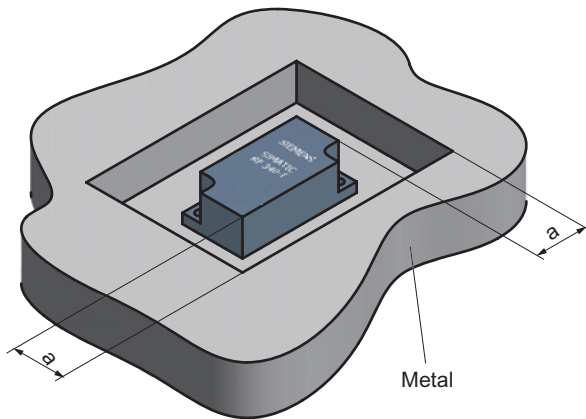


Figure 6-6 Flush-mounting of RF340T in metal

The standard value for a is ≥ 20 mm. At lower values, the field data change significantly, resulting in a reduction in the range.

6.4.4 Technical specifications

Table 6- 5 Technical specifications for RF340T

Memory size	8 KB
Memory organization	Blocks of 8 bits/byte-by-byte
Memory configuration	
<ul style="list-style-type: none"> • Serial number (UID) • Application memory • OPT memory 	<ul style="list-style-type: none"> • 4 bytes (fixed code) • 8189 bytes r/w • 20-byte OTP ¹⁾ memory
Storage technology	FRAM / EEPROM
MTBF (Mean Time Between Failures) in years	1200
Write cycles, at +40 °C	Virtually unlimited (>10 ¹⁰)
Read cycles	Virtually unlimited (>10 ¹⁰)
Data transmission time	With RS422 reader: With IQ-Sense reader:
<ul style="list-style-type: none"> • Read • Write 	Approx. 0.13 ms/byte Approx. 20 ms/byte approx. 0.13 ms/byte approx. 25 ms/byte
Data retention	> 10 years
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 44)]
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	IP68/IPX9K
Shock to EN 60721-3-7	50 g
Vibration to EN 60721-3-7	20 g
Torsion and bending load	Not permitted permanently
Enclosure dimensions	48 x 25 x 15 mm (L x W x H)
Color	Anthracite
Material	PA12
Fixing	2 screws (M3)
Ambient temperature	
<ul style="list-style-type: none"> • Operation • Storage and transport 	-25°C to +85°C -40°C to +85°C
Weight	Approx. 25 g

¹⁾ OTP: One Time Programmable

6.4.5 Dimension drawing

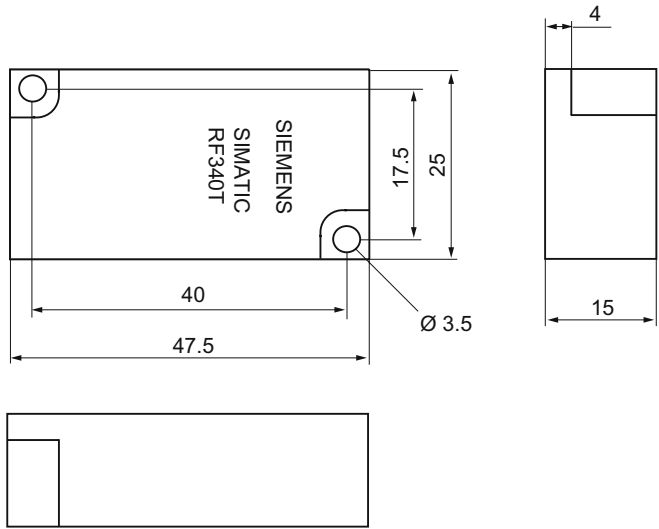



Figure 6-7 RF340T dimension drawing

Dimensions in mm

6.5 SIMATIC RF350T

6.5.1 Features

RF350T	Characteristics	
	Field of application	Identification tasks on small assembly lines in harsh industrial environments
	Memory	Read-only area (4 bytes UID) Read/write memory (32 KB) OTP ¹⁾ memory (20 bytes)
	Read/write range	See Section Field data of RF300 transponders (Page 44)
	Mounting on metal	Direct mounting on metal is possible.

¹⁾ OTP: One Time Programmable

6.5.2 Ordering data

Table 6- 6 Ordering data RF350T

RF350T	Order number
<ul style="list-style-type: none"> • IP68 • Memory size: 32 KB FRAM (read/write) and 4 byte EEPROM (read only) • Operating temperature: -25 °C ... +85 °C • Dimensions: 50 x 50 x 20 (L x W x H, in mm) 	6GT2800-5BD00

6.5.3 Metal-free area

Direct mounting of the RF350T on metal is permitted.

Mounting of RF350T on metal

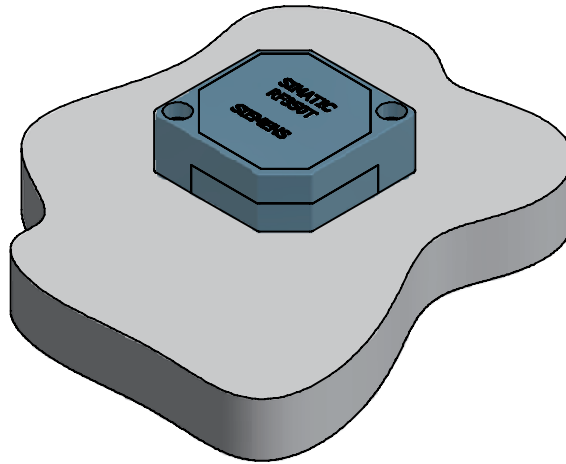


Figure 6-8 Mounting of RF350T on metal

Flush-mounting of RF350T in metal:

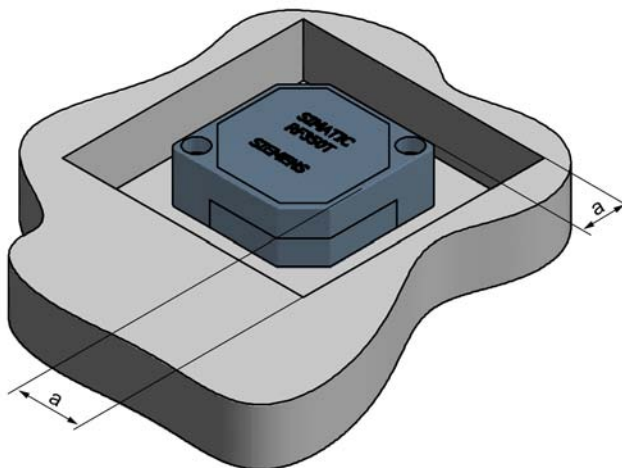


Figure 6-9 RF350T flush-mounted in metal

The standard value for a is ≥ 20 mm. At lower values, the field data change significantly, resulting in a reduction in the range.

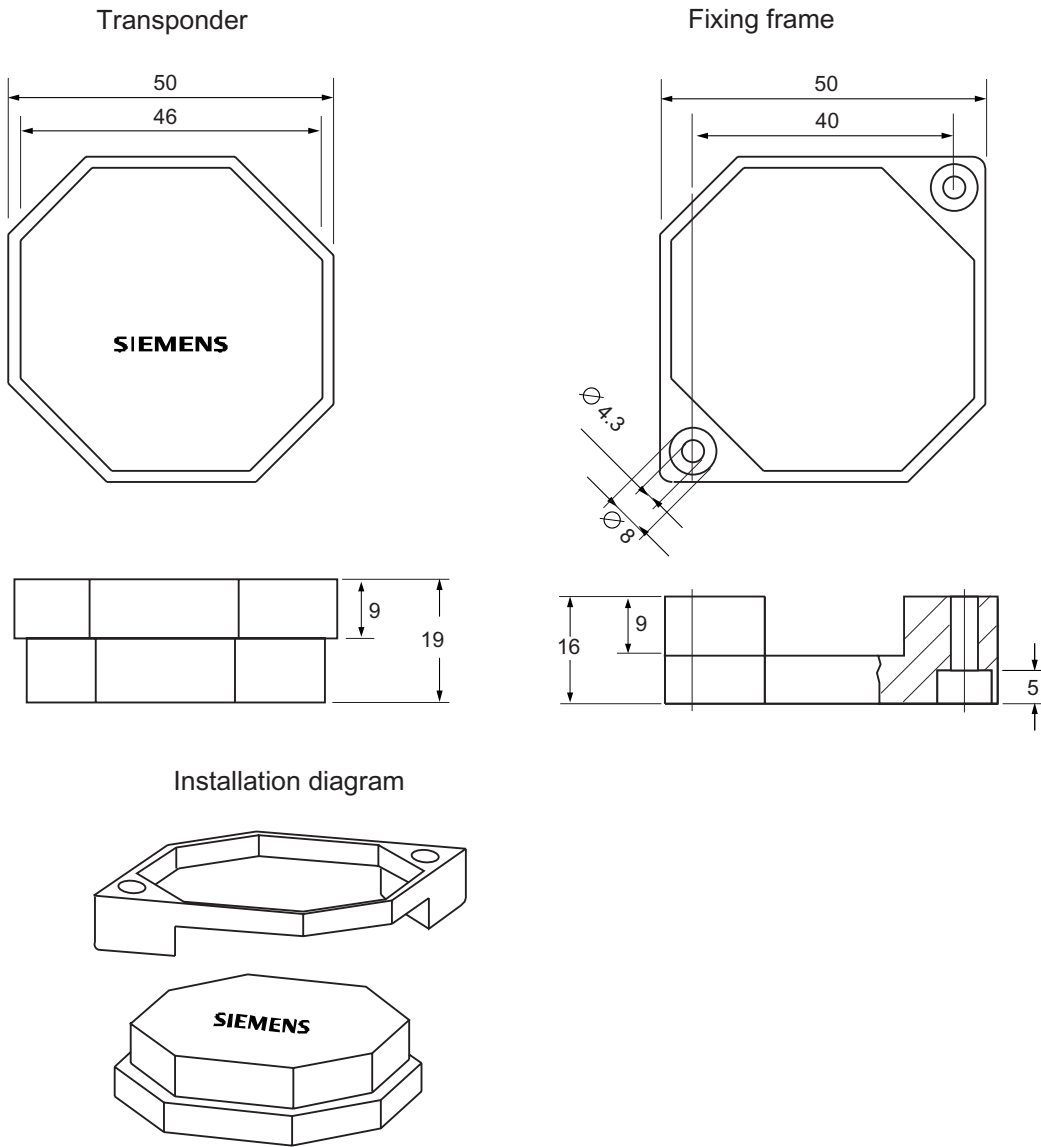
6.5.4 Technical data

Table 6- 7 Technical specifications for RF350T

Memory size	32 KB				
Memory organization	Blocks of 8 bits/byte-by-byte				
Memory configuration					
<ul style="list-style-type: none"> • Serial number (UID) • Application memory • OTP ¹⁾ memory 	<ul style="list-style-type: none"> • 4 bytes (fixed code) • 32765 bytes r/w • 20 bytes 				
Storage technology	FRAM / EEPROM				
MTBF (Mean Time Between Failures) in years	1200				
Write cycles, at +40 °C	Virtually unlimited (>10 ¹⁰)				
Read cycles	Virtually unlimited (>10 ¹⁰)				
Data transmission time	With RS422 reader: With IQ-Sense reader:				
<ul style="list-style-type: none"> • Read • Write 	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Approx. 0.13 ms/byte</td> <td style="width: 50%;">Approx. 20 ms/byte</td> </tr> <tr> <td>approx. 0.13 ms/byte</td> <td>approx. 25 ms/byte</td> </tr> </table>	Approx. 0.13 ms/byte	Approx. 20 ms/byte	approx. 0.13 ms/byte	approx. 25 ms/byte
Approx. 0.13 ms/byte	Approx. 20 ms/byte				
approx. 0.13 ms/byte	approx. 25 ms/byte				
Data retention	> 10 years				
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 44)]				
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	IP68				
Shock to EN 60721-3-7	50 g				
Vibration to EN 60721-3-7	20 g				
Torsion and bending load	Not permitted permanently				
Enclosure dimensions	50 x 50 x 20 mm (L x W x H)				
Color	Anthracite				
Material	PA12				
Fixing	2 screws M4				
Ambient temperature					
<ul style="list-style-type: none"> • Operation • Transport and storage 	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">-25 °C to +85 °C</td> <td style="width: 50%;"></td> </tr> <tr> <td>-40 °C to +85 °C</td> <td></td> </tr> </table>	-25 °C to +85 °C		-40 °C to +85 °C	
-25 °C to +85 °C					
-40 °C to +85 °C					
Weight	Approx. 25 g				

¹⁾ OTP: One Time Programmable

6.5.5 Dimension drawing




The transponder can be mounted as shown with the fixing frame.

Figure 6-10 RF350T dimension drawing

Dimensions in mm

6.6 SIMATIC RF360T

6.6.1 Features

RF360T	Characteristics	
	Field of application	Identification tasks on small assembly lines in harsh industrial environments
	Memory	Read-only area (4 bytes UID) Read/write memory (8 KB) OTP ¹⁾ memory (20 bytes)
	Read/write range	Refer to SectionField data of RF300 transponders (Page 44)
	Mounting on metal	Not possible; recommended distance from metal ≥ 20 mm

¹⁾ OTP. One Time Programmable

6.6.2 Ordering data

Table 6- 8 Ordering data RF360T

RF360T	Order number
<ul style="list-style-type: none"> • IP67 • Memory size: 8 KB FRAM (read/write) and 4 byte EEPROM (read only) • Operating temperature: -25 °C ... +75 °C • Dimensions: 85.8 x 54.8 x 2.5 (L x W x H, in mm) 	6GT2800-4AC00

Table 6- 9 Ordering data for RF360T accessories

RF360T accessories	Order number
Spacers	6GT2190-0AA00
Fixing pocket	6GT2190-0AB00

6.6.3 Metal-free area

Direct mounting of the RF360T on metal is not allowed. A distance ≥ 20 mm is recommended. This can be achieved using the spacer 6GT2190-0AA00 in combination with the fixing pocket 6GT2190-0AB00.

Mounting of RF360T on metal

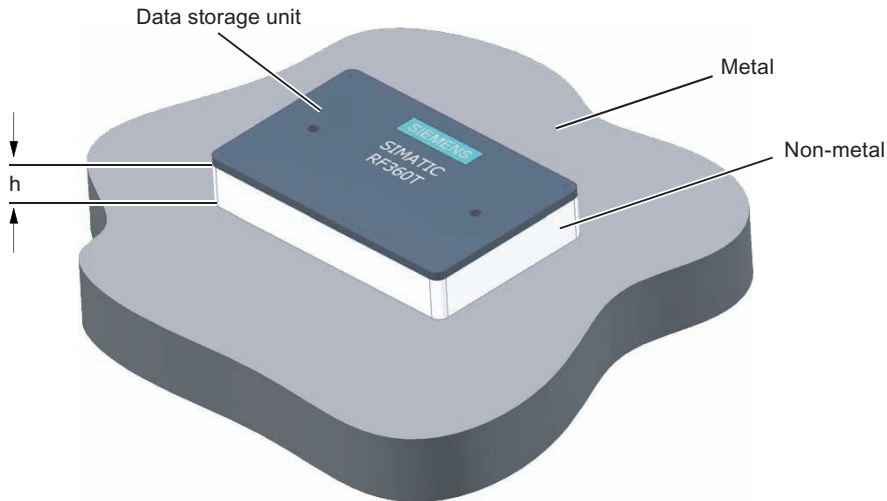


Figure 6-11 Mounting of RF360T with spacer

The standard value for h is ≥ 20 mm.

Flush-mounting of RF360T in metal:

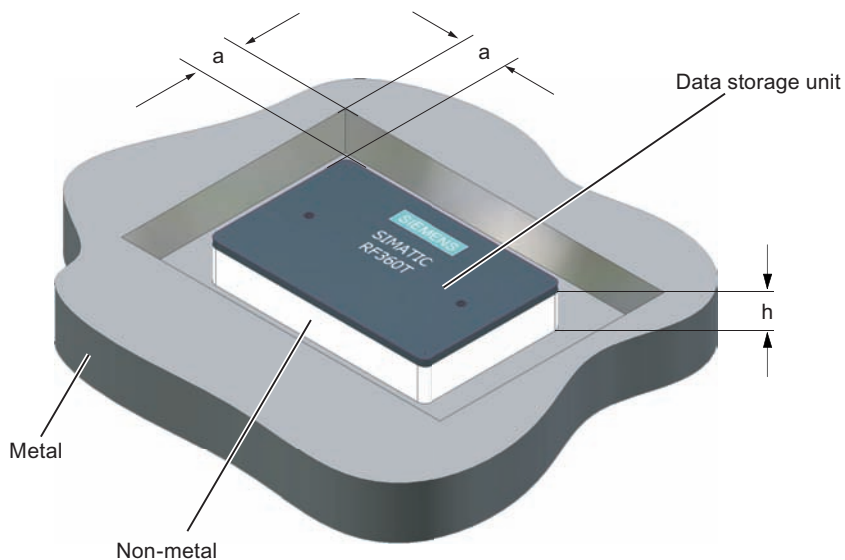


Figure 6-12 Flush-mounting of RF360T with spacer

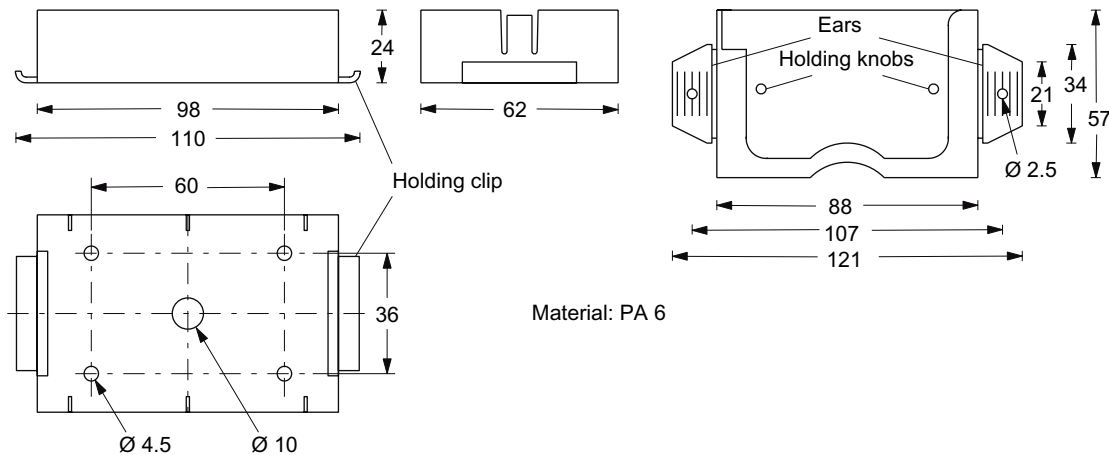
The standard value for a is ≥ 20 mm. At lower values, the field data change significantly, resulting in a reduction in the range.

Dimensions of spacer and fixing pocket for RF360T

Dimension sketch

Spacer: 6GT2190-0AA00

Fixing pocket: 6GT2190-0AB00

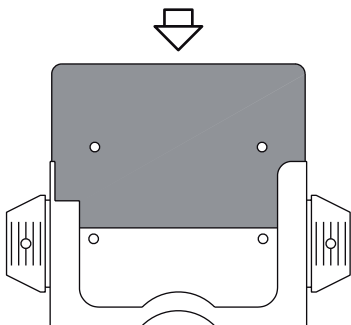


The spacer can be directly mounted on metal. In combination with the fixing pocket, a non-metal distance of 20 mm results between the transponder and metal.

Mounting:

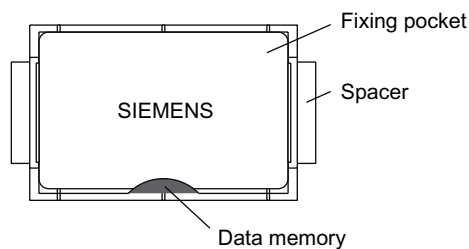
- With 2 or 4 screws (M4)
- With rubbers on the holding clips (e.g. on mesh boxes)
- With cable ties on the holding clips (e.g. on mesh boxes)

Transponder with fixing pocket



The transponder is inserted into the fixing pocket. Locking is via the holding knobs in the fixing pocket.

Transponder with fixing pocket and spacer (connected together)



The fixing pocket is attached to a non-metal base by the ears. This can be achieved with:

- Screws in the holes provided
- Rivets in the holes provided
- Nails through the holes
- Tacks through the plastic of the ears
- Pushing into the spacers

The ears can be moved through up to 90°.

Re-assembly instructions:

The transponder is inserted into the fixing pocket. The ears are moved by 90° and inserted into the spacer. The fixing pocket must be aligned such that it covers the transponder (see Figure). Locking is automatic.

Figure 6-13 Dimensions of spacer and fixing pocket for RF360T

6.6.4 Technical data

Table 6- 10 Technical specifications for RF360T

Memory size	8 KB
Memory organization	Blocks of 8 bits/byte-by-byte
Memory configuration	<ul style="list-style-type: none"> • Serial number (UID) • 4 bytes (fixed code) • Application memory • 8189 bytes r/w • OTP ¹⁾ memory • 20 bytes
Storage technology	FRAM / EEPROM
MTBF (Mean Time Between Failures) in years	1200
Write cycles, at +40 °C	Virtually unlimited (>10 ¹⁰)
Read cycles	Virtually unlimited (>10 ¹⁰)
Data transmission time	With RS422 reader: With IQ-Sense reader:
• Read	Approx. 0.13 ms/byte Approx. 20 ms/byte
• Write	approx. 0.13 ms/byte approx. 25 ms/byte
Data retention	> 10 years
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 44)]
Multitag capability	max. 4 transponders
Recommended spacing from metal	≥ 20 mm; e.g. using spacer 6GT2190-0AA00 in conjunction with fixing pocket 6GT2190-0AB00
Power supply	Inductive, without battery
Degree of protection to EN 60529	IP67
Shock to EN 60721-3-7	50 g
Vibration to EN 60721-3-7	20 g
Torsion and bending load	Not permitted permanently
Enclosure dimensions	85.8 x 54.8 x 2.5 mm (L x W x H)
Color	Anthracite
Material	Epoxy resin
Fixing	2 screws (M3) or with fixing pocket 6GT2190-0AB00
Ambient temperature	
• Operation	-25°C to +75°C
• Transport and storage	-40°C to +85°C
Weight	Approx. 25 g

1) OTP: One Time Programmable

6.6.5 Dimension drawing

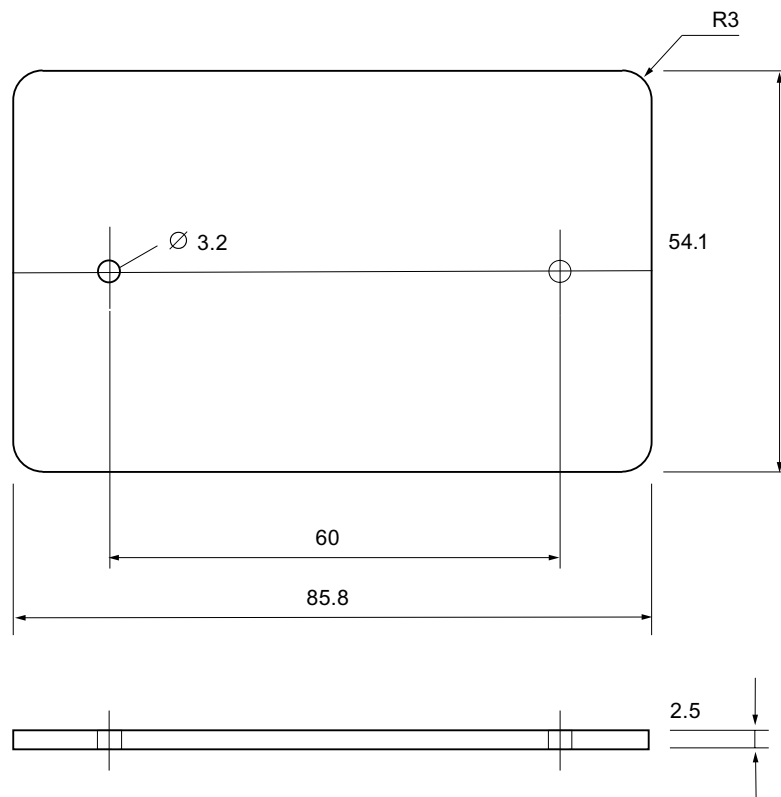



Figure 6-14 RF360T dimension drawing

Dimensions in mm

6.7 SIMATIC RF370T

6.7.1 Features

The SIMATIC RF370T transponder is a passive (i.e. battery-free) data carrier in a square type of construction.

RF370T	Characteristics	
	Field of application	Identification tasks on assembly lines in harsh industrial environments, suitable for larger ranges, e.g. automotive industry
	Memory	Read-only area: 4 byte UID read/write memory: 32/64 KB OTP ¹⁾ memory: 20 bytes
	Read/write range	Refer to SectionField data of RF300 transponders (Page 44)
	Assembly	Direct assembly on metal or flush-mounting is possible (with two M5 screws)
	Degree of protection	IP68 IPx9K
	High resistance	to mineral oils, lubricants and cleaning agents

¹⁾ OTP: One Time Programmable

6.7.2 Ordering data

Table 6- 11 Ordering data RF370T

RF370T	Order number
<ul style="list-style-type: none"> IP68 Memory size: 32 KB FRAM Operating temperature: -25 to +85 °C Dimensions: 75 x 75 x 40 (L x W x H, in mm) 	6GT2800-5BE00
<ul style="list-style-type: none"> IP68 Memory size: 64 KB FRAM Operating temperature: -25 to +85 °C Dimensions: 75 x 75 x 40 (L x W x H, in mm) 	6GT2800-6BE00

6.7.3 Metal-free area

Direct mounting of the RF370T on metal is permitted.

Mounting of RF370T on metal

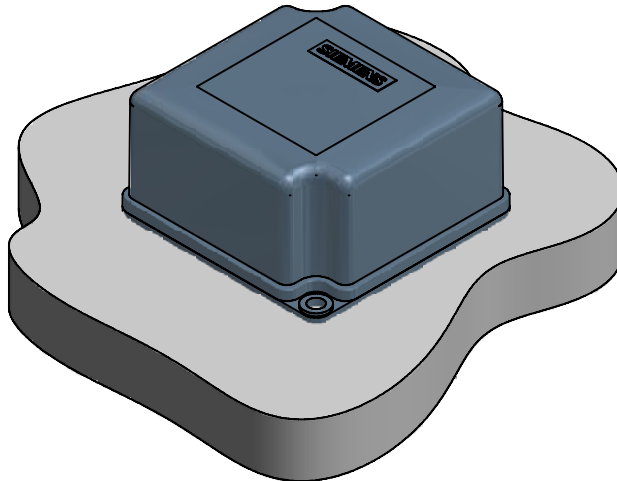


Figure 6-15 Mounting of RF370T on metal

Flush-mounting of RF370T in metal:

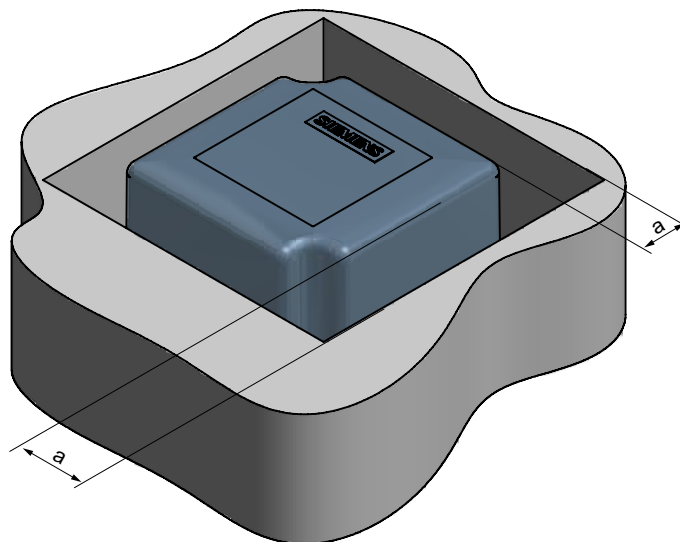


Figure 6-16 RF370T flush-mounted in metal

The standard value for a is ≥ 20 mm. At lower values, the field data change significantly, resulting in a reduction in the range.

6.7.4 Mounting instructions

It is essential that you observe the instructions in the Section Installation guidelines (Page 61).

Properties	Description
Type of installation	Screw fixing (two M5 screws)
Tightening torque	< 1.2 Nm (at room temperature)

6.7.5 Technical data for RF370T with 32 KB FRAM

Table 6- 12 Technical specifications for RF370T with 32 KB FRAM/64 KB FRAM

Memory size	32 KB/64 KB	
Memory organization	Blocks of 8 bits/byte-by-byte	
Memory configuration	Serial number	4 bytes (fixed code)
	Application memory	32765 bytes r/w (32 KB) 65276 bytes r/w (64 KB)
	OTP ¹⁾ memory	20 bytes
Storage technology	FRAM / EEPROM	
MTBF (Mean Time Between Failures) in years	1200	
Write cycles, at +40 °C	Virtually unlimited (>10 ¹⁰)	
Read cycles	Virtually unlimited (>10 ¹⁰)	
Data transmission time	Read	Approx. 0.13 ms/byte
	Write	Approx. 0.13 ms/byte
Data retention in years	> 10	
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 44)]	
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	IPx9K	
Shock resistant to EN 60721-3-7	50 g	
Vibration resistant to EN 60721-3-7	20 g	
Torsion and bending load	Not permissible continuously	
Enclosure dimensions	75 x 75 x 40 mm (L x W x H)	
Color	Anthracite	
Material	PA12	
Fixing	Two M5 screws	
Ambient temperature	Operation	-25 °C to +85 °C
	Transport and storage	-40°C to +85°C
Weight	Approx. 200 g	

¹⁾ OTP: One Time Programmable; single write

6.7.6 Dimensional drawing

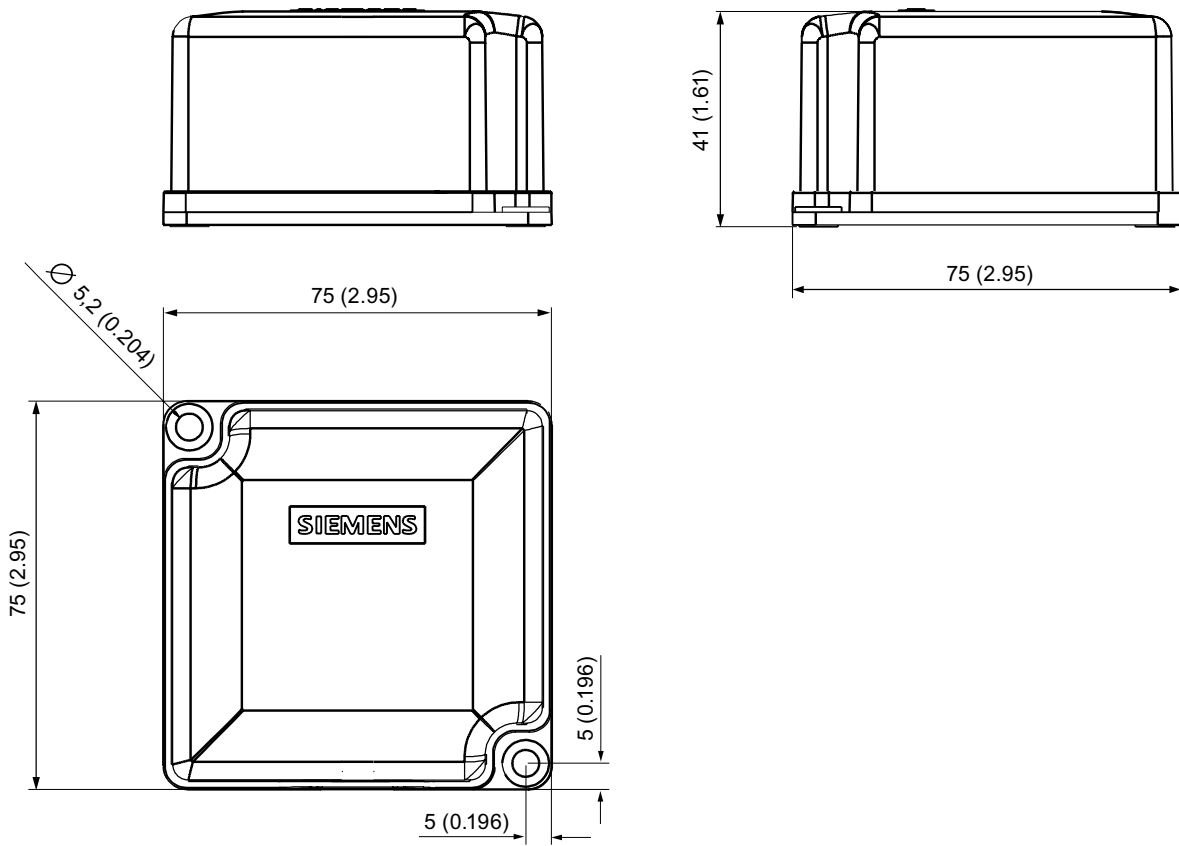



Figure 6-17 RF370T dimension drawing

Dimensions in mm (inches in brackets)

6.8 SIMATIC RF380T

6.8.1 Features

The SIMATIC RF380T transponder is an extremely rugged and heat-resistant round data carrier suitable e.g. for applications in the automotive industry.

SIMATIC RF380T transponder	Characteristics	
	Field of application	Identification tasks in applications (e.g. automotive industry) with cyclic high temperature stress > 85 °C and < 220 °C Typical applications: <ul style="list-style-type: none"> • Primer coat, electrolytic dip area, cataphoresis with the associated drying furnaces • Top coat area with drying furnaces • Washing areas at temperatures > 85°C • Other applications with higher temperatures
	Memory	<ul style="list-style-type: none"> • Read-only area (4 bytes UID) • Read/write memory (32 KB) • OTP¹⁾ memory (20 bytes)
	Read/write range	Refer to SectionField data of RF300 transponders (Page 44)
	Assembly	<ul style="list-style-type: none"> • Direct assembly on metal or flush-mounting is possible. • The transponder can be secured using a special holder (see installation guidelines, section on RF380T). The tag size is designed such that it can be secured on a skid or also directly on a body.
	Degree of protection	IP 68
	High resistance	to mineral oils, lubricants and cleaning agents

¹⁾ OTP: One Time Programmable

6.8.2 Ordering data

RF380T	Order number
<ul style="list-style-type: none"> • IP68 • Memory size 32 KB FRAM (read/write) and 4 byte EEPROM • Operating temperature -25 ... +200 °C (cyclic) • Dimensions: 114 x 83 (ØxH in mm) 	6GT2800-5DA00

Accessories for RF380T	Order number
Holder (short version)	6GT2090-0QA00
Holder (long version)	6GT2090-0QA00-0AX3
Covering hood	6GT2090-0QB00
Universal holder	6GT2590-0QA00

6.8.3 Installation guidelines for RF380T

It is essential that you observe the instructions in the Section Installation guidelines (Page 61).

The following section only deals with features specific to the SIMATIC RF380T.

6.8.3.1 Mounting instructions

<p>NOTICE</p> <p>Only use tag with original holder</p> <p>You are strongly recommended to only use the tag with the original holder specified. Only this holder guarantees that the data memory observes the listed values for shock, vibration and temperature. A protective cover is recommendable for applications in paint shops.</p>

Data memory holder

Short version (6GT2 090-0QA00)	Long version (6GT2090-0QA00-0AX3)
<p>Material: V2A sheet-steel with thickness 2.5 mm BI 2.5 DIN 59382 1.4541</p>	

Assembly of data memory with holder

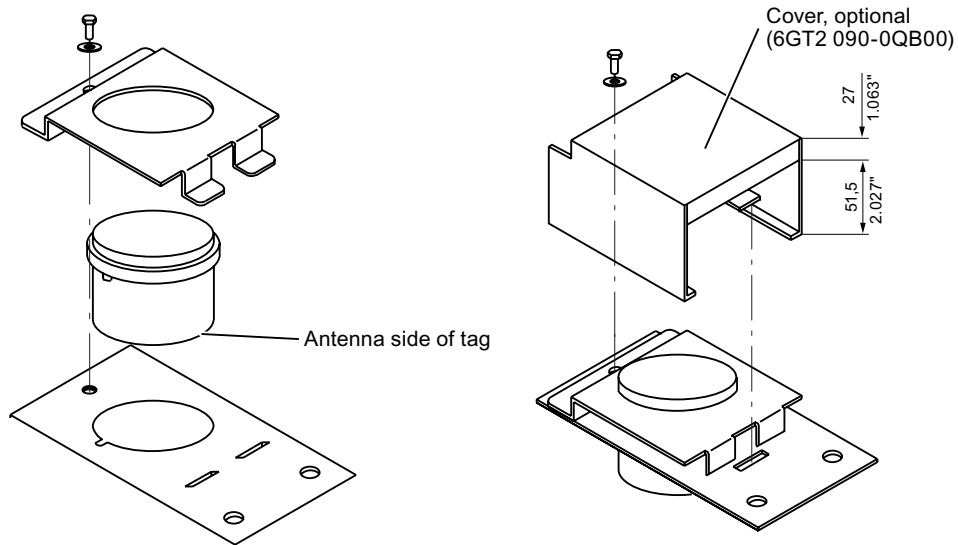


Figure 6-18 Assembly of tag with holder

Scope of supply

The holder is provided with all mounting parts and a mounting diagram. Mounting screws for securing the holder are not included. The mounting screws are of diameter M 10. The minimum length is 25 mm. The optional cover can be used for the long and short versions of the holder.

Universal holder

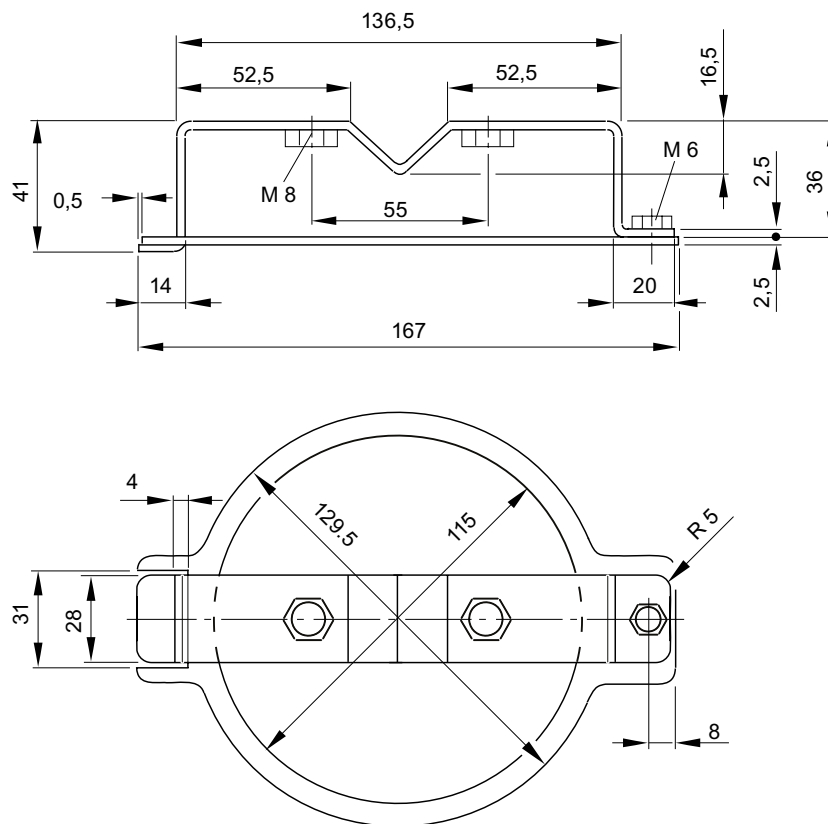


Figure 6-19 Universal holder 6GT2590-0QA00

6.8.3.2 Metal-free area

Direct mounting of the RF380T on metal is permitted.

Mounting of RF380T on metal

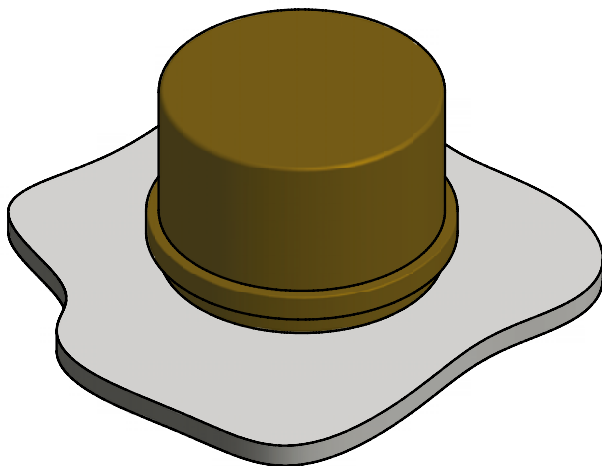


Figure 6-20 Mounting of RF380T on metal

Flush-mounting of RF380T in metal:

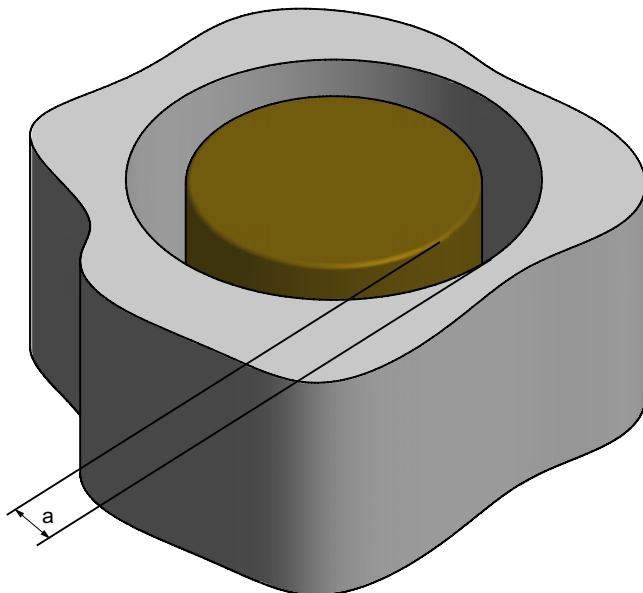


Figure 6-21 RF380T flush-mounted in metal

The standard value for a is ≥ 40 mm. At lower values, the field data change significantly, resulting in a reduction in the range.

6.8.4 Configuring instructions

6.8.4.1 Temperature dependence of the transmission window

The guidelines in Section "Planning the RF300 system" apply to configuration of heat-resistant data memories, with the exception of the limit distance and field length at temperatures above 85 °C.

Calculation of transmission window with heat-resistant data memories

The factor 0.8 is required for calculating the transmission window, and takes into account production tolerances and temperature influences of to 85 °C.

An additional correction factor C must be included in the calculation at temperatures > 85 °C (up to 110 °C):

$t_{v[T < 85\text{ °C}]} = \frac{L \cdot 0,8}{V_{MDS}}$	
$S_{g[T > 85\text{ °C}]} = S_g \cdot C \quad L_{[T > 85\text{ °C}]} = L \cdot C$	
$t_{v[T > 85\text{ °C}]} = \frac{L \cdot C \cdot 0,8 \text{ [m]}}{V_{MDS} \text{ [m/s]}}$	
L	Field length
S _g	Limit distance tag - reader
V _{Tag}	Tag speed
C	Correction factor at temperatures > 85 °C (cf. following picture with correction factor C depending on temperature)
t _v	Tag dwell time

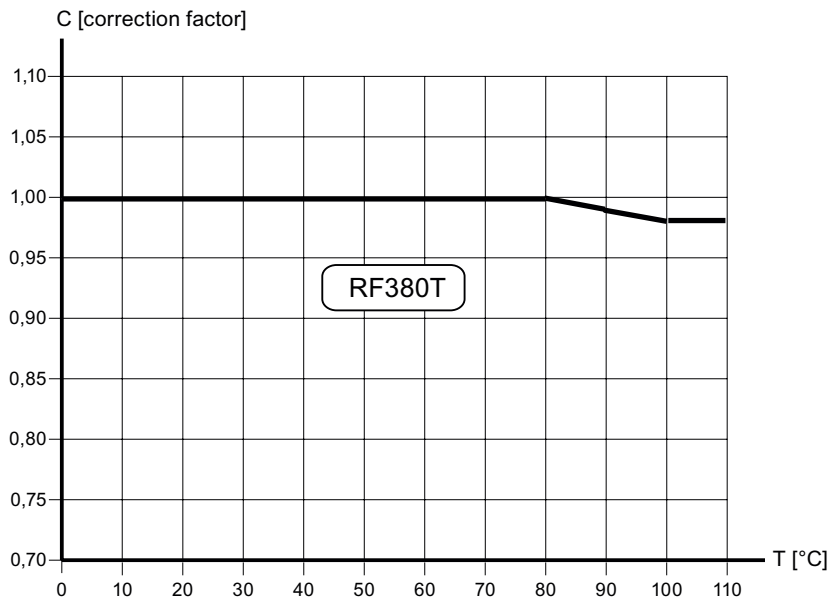


Figure 6-22 Correction factor C depending on temperature

The following diagram shows the reduction in the limit distance and field length at increased processing temperatures (internal temperature of tag):

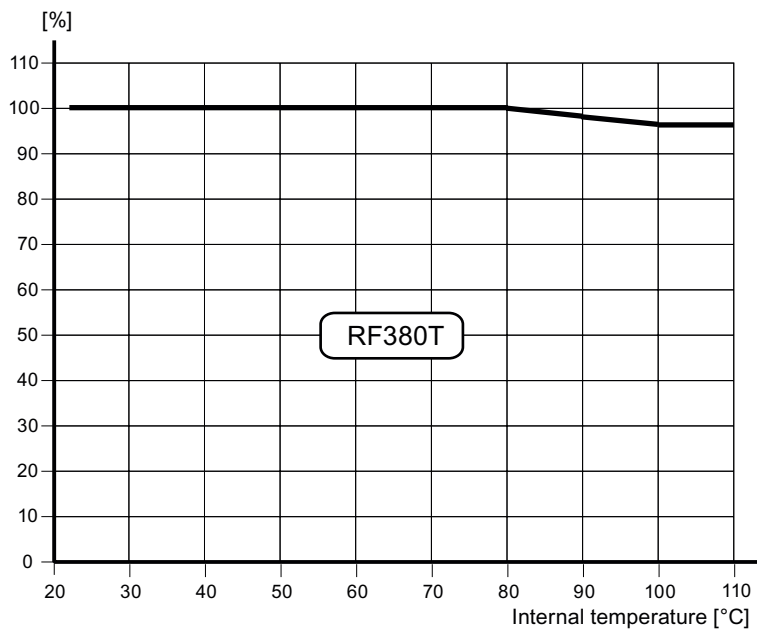


Figure 6-23 Reduction in field length and limit distance

The reduction in the field data at higher temperatures is due to the increased current consumption of the electronics.

6.8.4.2 Temperature response in cyclic operation

At ambient temperatures (T_u) up to 110 °C, cyclic operation is not necessary, i.e. up to this temperature, the transponder can be in constant operation.

Note

Calculation of the temperature curves

Calculation of the temperature curves or of a temperature profile can be carried out on request by Siemens AG. Exact knowledge of the internal temperature facilitates configuration for time-critical applications.

You can also carry out the calculation with the aid of the "SIMATIC RF Temperature Calculator" on the "RFID Systems Software & Documentation" CD [see Accessories (Page 246)].

Ambient temperatures > 110 °C

NOTICE
Cancellation of warranty
The internal temperature of the data memory must not exceed the critical threshold of 110 °C. Each heating phase must be followed by a cooling phase. No warranty claims will otherwise be accepted.

Some limit cycles are listed in the table below:

Table 6- 13 Limit cycles of data memory temperature

T _u (heating up)	Heating up	T _u (cooling down)	Cooling down
220 °C	0.5 h	25 °C	> 2 h
200 °C	1 h	25 °C	> 2 h
190 °C	1 h	25 °C	> 1 h 45 min
180 °C	2 h	25 °C	> 5 h
170 °C	2 h	25 °C	> 4 h

The internal temperature of the tag follows an exponential function with which the internal temperature and the operability of the tag can be calculated in advance. This is particularly relevant to temperature-critical applications or those with a complex temperature profile.

Ambient temperatures > 220°C

NOTICE
Cancellation of warranty
The data memory must not be exposed to ambient temperatures > 220 °C. No warranty claims will otherwise be accepted.
However, the mechanical stability is retained up to 230 °C!

Example of a cyclic sequence

Table 6- 14 Typical temperature profile of an application in the paint shop

Start of tag at initial point	Duration (min)	Ambient temperature (°C)
Electrolytic dip	20	30
Electrolytic dip dryer	60	200
Transport	60	25
PVC dryer	25	170
Transport	60	25
Filler dryer	60	160
Transport	60	25
Top coat dryer	60	120
Transport	60	25
Wax dryer	25	100
Transport	150	25

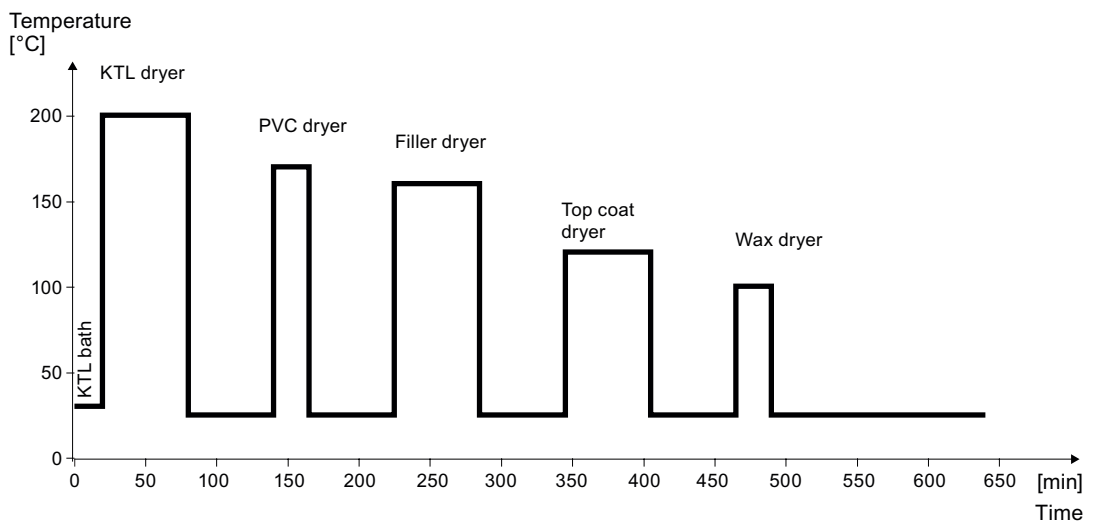


Figure 6-24 Graphic trend of temperature profile from above table

The simulation results in the following:

Following a simulation time of 36.5 hours, a total of 3 cycles were carried out, and an internal temperature of 90 degrees Celsius was reached.

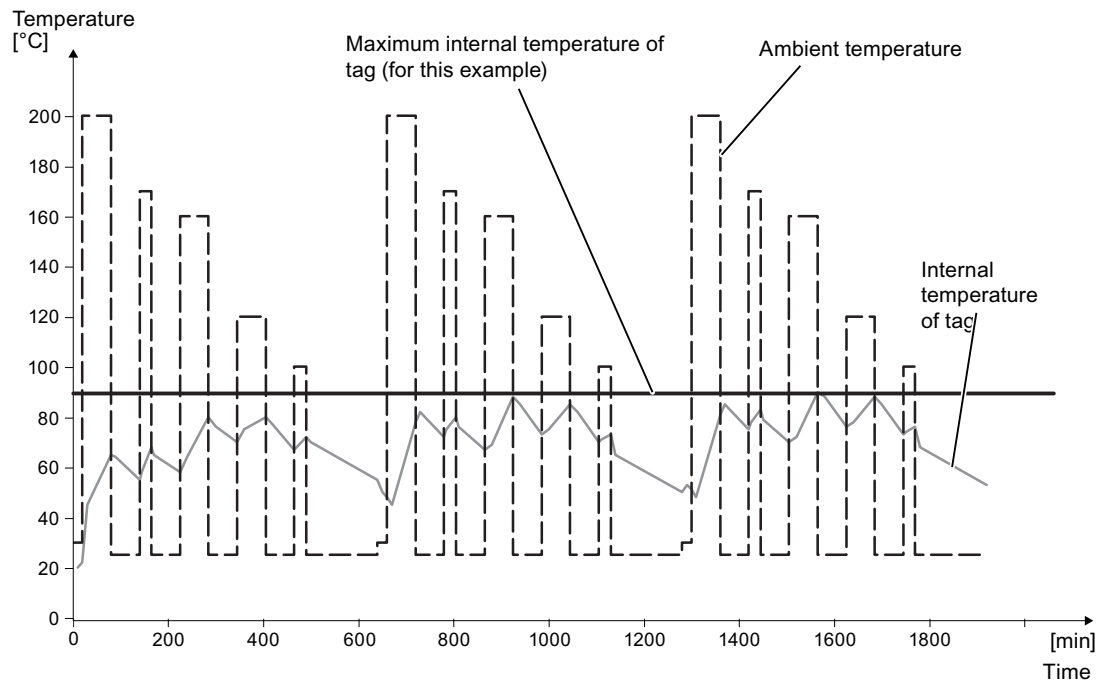


Figure 6-25 Complete temperature response due to simulation

6.8.5 Technical specifications

Table 6- 15 RF380T with 32 KB FRAM

Memory size	32KB	
Memory organization	Blocks of 8 bits/byte-by-byte	
Memory configuration	Serial number	4 bytes (fixed code)
	Application memory	32765 bytes r/w
	OTP ¹⁾ memory	20 bytes
Storage technology	FRAM / EEPROM	
MTBF (Mean Time Between Failures) in years	1177	
Write cycles, at +40 °C	Virtually unlimited (>10 ¹⁰)	
Read cycles	Virtually unlimited (>10 ¹⁰)	
Data transmission time	Read	Approx. 0.13 ms/byte
	Write	Approx. 0.13 ms/byte
Data retention	> 10 years	
Read/write distance	Dependent on the reader used [see Chapter Field data of RF300 transponders (Page 44)]	
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	IP68	
Shock resistant ²⁾ to EN 60721-3-7	50 g	
Vibration ²⁾ to EN 60721-3-7	5 g	
Direction-dependent	No	
Torsion and bending load	Not permissible continuously	
Enclosure dimensions	(diam. x H in mm) 114 x 83	
Color	Brown	
Material	PPS	
Fixing	Holder to be ordered separately	
Ambient temperature	During operation, continuously	-25 °C to +110°C
	During cyclic operation	-25 °C to +220°C
	Transport and storage	-40°C to +110°C
Weight	Approx. 900 g	

1) OTP: One Time Programmable
 2) Applies only in connection with original bracket

6.8.6 Dimensional drawing

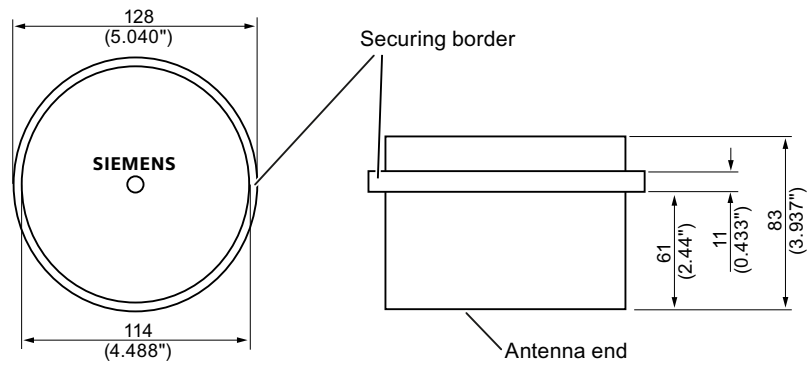


Figure 6-26 Dimension drawing RF380T

Dimensions in mm (inches in brackets)

ISO transponder

ISO 15693-compatible transponders, such as the MDS Dxxx from the MOBY D range of products, represent a cost-effective alternative to RF300 tags. The performance that can be achieved with this (data rate, memory size), however, is considerably less than with RF300 tags (see Chapter Communication between communication module, reader and transponder (Page 40)).

Operating with the following ISO tags from MOBY D is described in this manual:

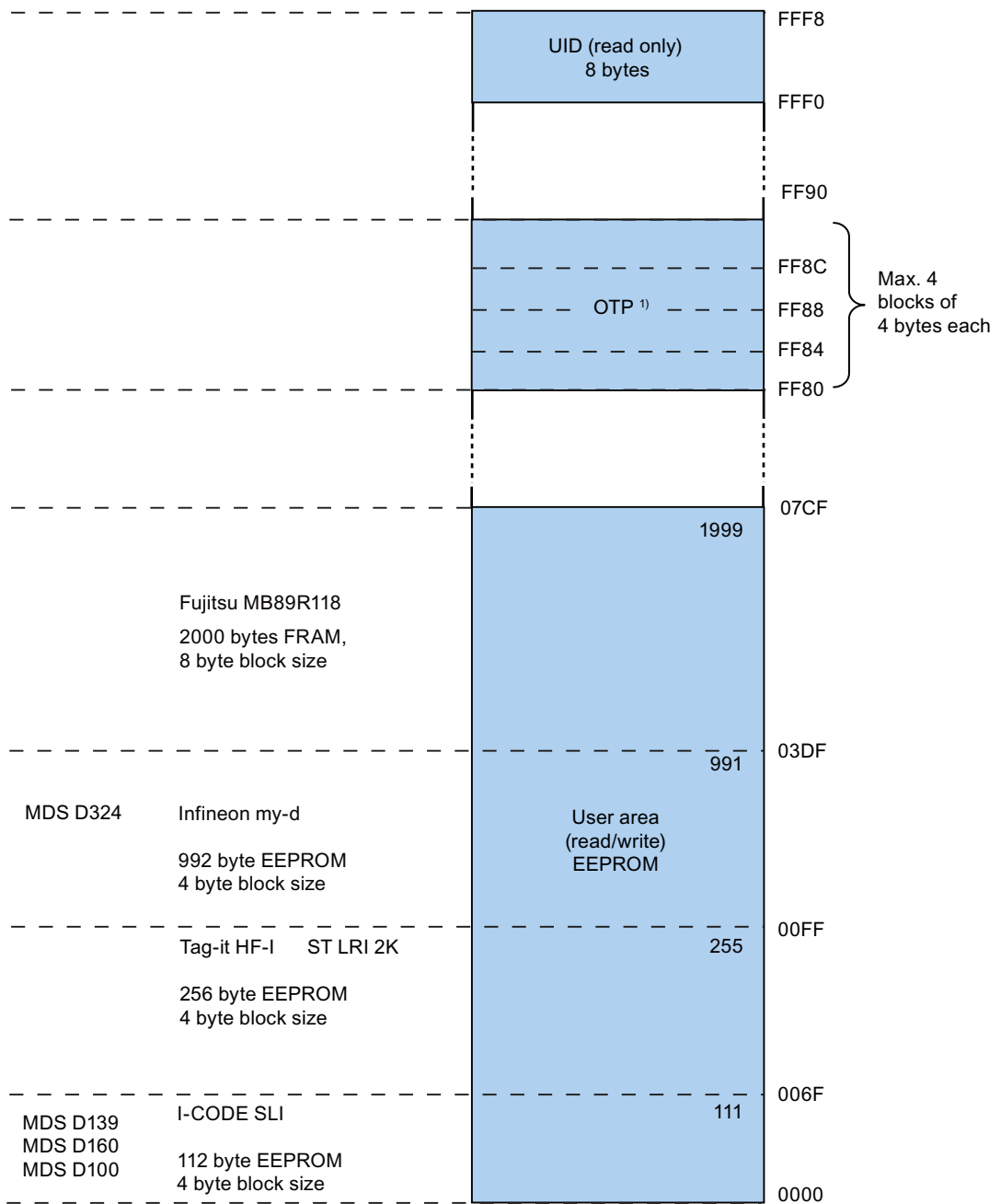
- MDS D100
- MDS D124
- MDS D139
- MDS D160
- MDS D324

Compatible RF300 readers

ISO tags can currently only be read using the following readers

- SIMATIC RF310R (RS422) [6GT2801-1AB10]
- SIMATIC RF380R [6GT2801-3AB10]

7.1 Memory configuration of the ISO tags



1) If the OTP area is used, there will be a correspondingly lower amount of user memory available, because the OTP area always occupies the uppermost 16 bytes of the user memory.

Figure 7-1 Memory configuration of ISO tags

Memory areas

Depending on the manufacturer of the transponder chip, the memory configuration of an ISO tag consists of EEPROM memory of varying sizes. Except for transponders that are equipped with a Fujitsu 2k FRAM, these are equipped with only one FRAM.

The typical sizes are 112 bytes, 256 bytes, 992 bytes or 2000 bytes. Each ISO transponder chip features an 8-byte unique serial number (UID, read only). This UID is transferred as an 8 byte value through a read command to address FFF0 with a length of 8.

OTP area

For the OTP area, a 16-byte address space is always reserved at the end of the memory area. The blocks are divided up depending on the chip (see technical specifications). For the user, this means that the corresponding addresses for the user data are not available to the application when the OTP area is used.

A total of 4 block addresses ("mapped" addresses) are provided:

- FF80
- FF84
- FF88
- FF8C

A write command to this block address with a valid length (4, 8, 12, 16 depending on the block address) protects the written data from subsequent overwriting.

Note

Exception - Fujitsu chip

This chip only has 8-byte blocks, which means that only 2 block addresses have to be addressed: FF80 and FF88 (lengths 8 and 16).

NOTICE

OTP writing/locking should only be used in static operation.
--

NOTICE


Use of the OTP area is not reversible.

If you use the OPT area, you cannot undo it, because the OPT area can only be written to once.
--

7.2 MDS D100

7.2.1 Characteristics

The MDS D100 mobile data memory is a passive, maintenance-free transponder based on the ISO 15693 standard with I-Code technology.

MDS D100	Characteristics	
	Field of application	From simple identification such as electronic barcode replacement/supplementation, through warehouse and distribution logistics, right up to product identification.
	Memory	EEPROM 128 bytes gross 112 bytes net capacity
	Read/write range	See Chapter Field data of ISO transponders (Page 47).
	Mounting on metal	Not possible; recommended distance from metal ≥ 20 mm
	ISO standard	15693 with I-code technology

7.2.2 Ordering data

Table 7- 1 Ordering data for MDS D100

MDS D100	Order number
<ul style="list-style-type: none"> • IP68 • Memory size: 112 byte EEPROM • Operating temperature: -25 ... +80 °C • Dimensions: 85.6 x 54 x 0.9 (L x W x H, in mm) • ISO card 	6GT2600-0AD10

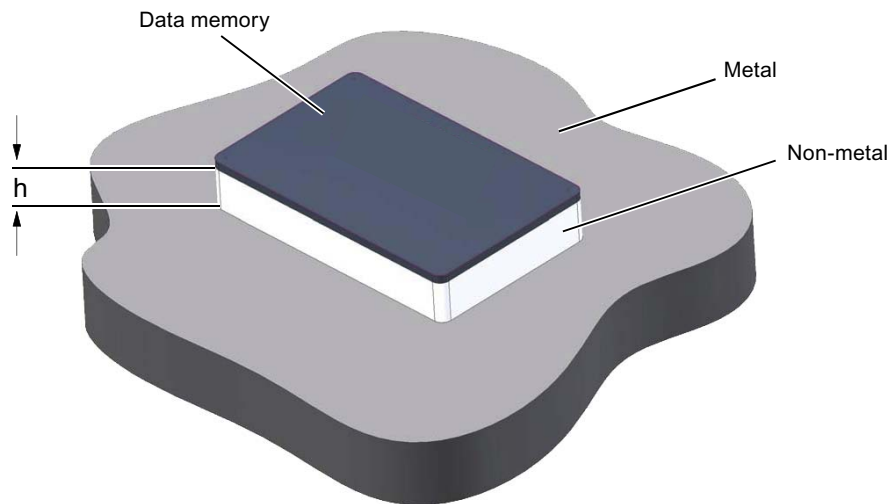
Table 7- 2 Ordering data for MDS D100 accessory

MDS D100 accessory	Order number
Spacers	6GT2190-0AA00
Fixing pocket	6GT2190-0AB00
Fixing pocket (cannot be mounted directly on metal)	6GT2390-0AA00

7.2.3 Metal-free area

Direct mounting of the MDS D100 on metal is not allowed. A distance of ≥ 20 mm is recommended. This can be achieved using the spacer 6GT2190-0AA00 in combination with the fixing pocket 6GT2190-0AB00.

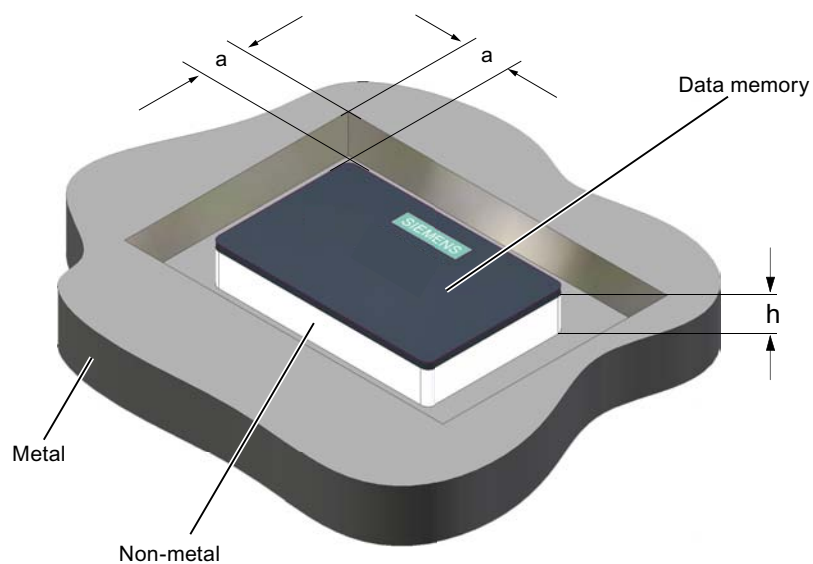
Mounting on metal



$h \geq 20$ mm

Figure 7-2 Mounting of the MDS D100 on metal with spacer

Flush-mounting



$h \geq 20$ mm

$a \geq 20$ mm

Figure 7-3 Flush-mounting of MDS D100 in metal with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results.

Fixing pocket for MDS D100

The fixing pocket is secured on a non-metallic surface with M4 countersunk head screws in the holes provided.

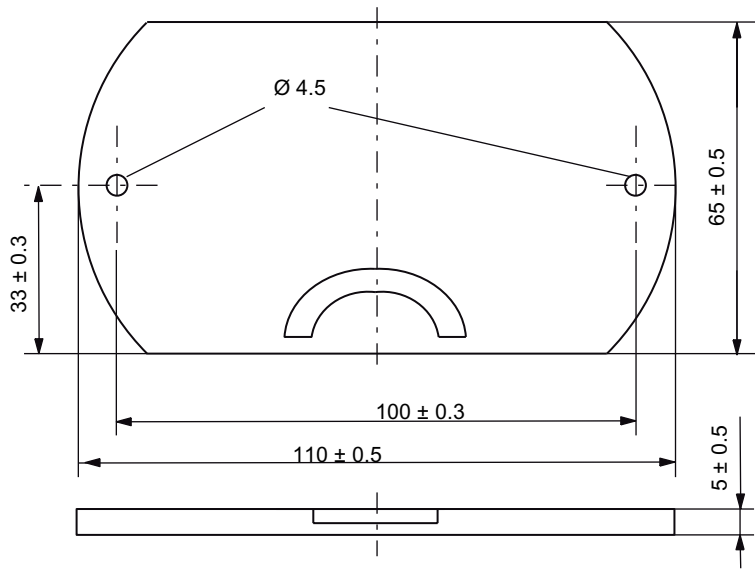


Figure 7-4 Fixing pocket 6GT2390-0AA00 for MDS D100

Note

The fixing pocket shown here with Order No.: 6GT2 390-0AA00 is not suitable for use with the spacer (6GT2 190-0AA00).

Note

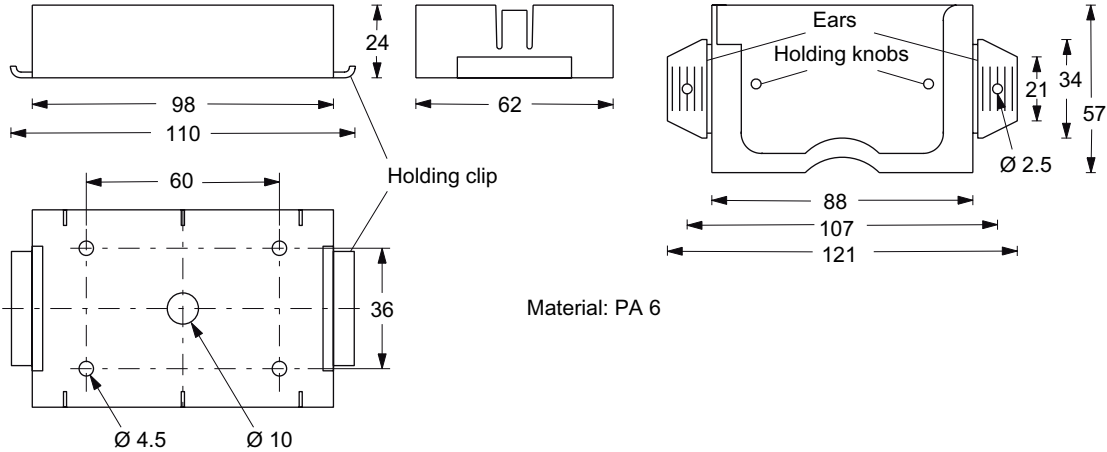
When mounting the MDS D100 on metal, it is also possible to use the 6GT2 190-0AB00 fixing pocket, but only in combination with the 6GT2 190-0AA00 spacer.

Fixing pocket with spacer for MDS D100

Dimension sketch

Spacer: 6GT2190-0AA00

Fixing pocket: 6GT2190-0AB00

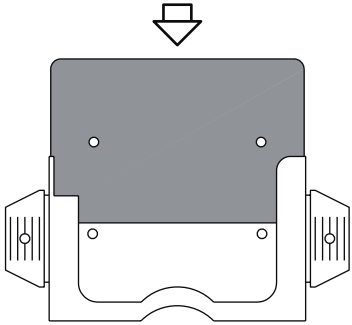


The spacer can be directly mounted on metal. In combination with the fixing pocket, a non-metal distance of 20 mm results between the transponder and metal.

Mounting:

- With 2 or 4 screws (M4)
- With rubbers on the holding clips (e.g. on mesh boxes)
- With cable ties on the holding clips (e.g. on mesh boxes)

Transponder with fixing pocket



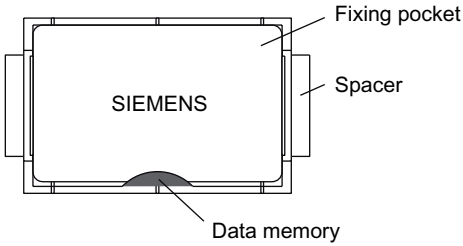
The transponder is inserted into the fixing pocket. Locking is via the holding knobs in the fixing pocket.

The fixing pocket is attached to a non-metal base by the ears. This can be achieved with:

- Screws in the holes provided
- Rivets in the holes provided
- Nails through the holes
- Tacks through the plastic of the ears
- Pushing into the spacers

The ears can be moved through up to 90°.

Transponder with fixing pocket and spacer (connected together)



Re-assembly instructions:

The transponder is inserted into the fixing pocket. The ears are moved by 90° and inserted into the spacer. The fixing pocket must be aligned such that it covers the transponder (see Figure). Locking is automatic.

Figure 7-5 Dimensions of the spacer and fixing pocket 6GT2190-0AB00 for MDS 100

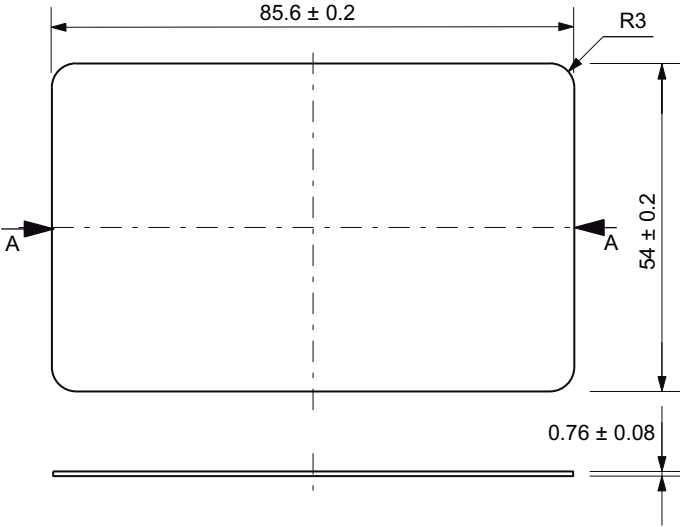
7.2.4 Technical data

Table 7- 3 Technical data for MDS D100

Memory size	128 bytes
Memory configuration	
<ul style="list-style-type: none"> • Serial number • Configuration memory ¹⁾ • AFI/DSFID ¹⁾ • Application memory 	<ul style="list-style-type: none"> • 8 bytes (fixed code) • 6 bytes • 2 bytes • 112 bytes
Storage technology	EEPROM
Memory organization	EEPROM 128 bytes gross 112 bytes net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	according to ISO 15693
Data retention (at +40 °C)	10 years
MTBF (at +40 °C)	2 x 10 ⁶ hours
Read cycles	Unlimited
Write cycles, typical	200 000
Write cycles, min.	100 000
Read/write distance (S _g)	See Chapter Field data of ISO transponders (Page 47).
Distance from metal	min. 20 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP68
Vibration	ISO 10373/ISO 7810
Torsion and bending load	ISO 10373/ISO 7816-1
Mechanical design	Laminated plastic card, printable on both sides
<ul style="list-style-type: none"> • Color • Material • Dimensions (L x W x H) in mm 	<ul style="list-style-type: none"> • White/petrol • PC • 85.6 x 54 x 0.9
Fixing	Adhesive, fixing pocket
Ambient temperature	
<ul style="list-style-type: none"> • Operation • Transport and storage 	<ul style="list-style-type: none"> • -25 °C to +80 °C • -25 °C to +80 °C
Weight, approx.	5 g

¹⁾ Configuration memory and AFI/DSFID are used/not used by RF300.

7.2.5 Dimension drawing




Dimensions in mm
Figure 7-6 MDS D100 dimension drawing

7.3 MDS D124

7.3.1 Characteristics

The MDS D124 is a passive, maintenance-free transponder based on the ISO 15693 standard with I-Code technology.

This mobile data memory can also be easily used in harsh environments under extreme environmental conditions (e.g. with higher temperature load).

MDS D124	Characteristics	
	Field of application	Application areas in production and distribution logistics and product identification
	Memory	EEPROM 128 bytes gross 112 bytes net capacity
	Read/write range	See Chapter Field data of ISO transponders (Page 47).
	Mounting on metal	Not possible: Recommended distance from metal ≥ 25 mm
	ISO standard	15693 with I-code technology

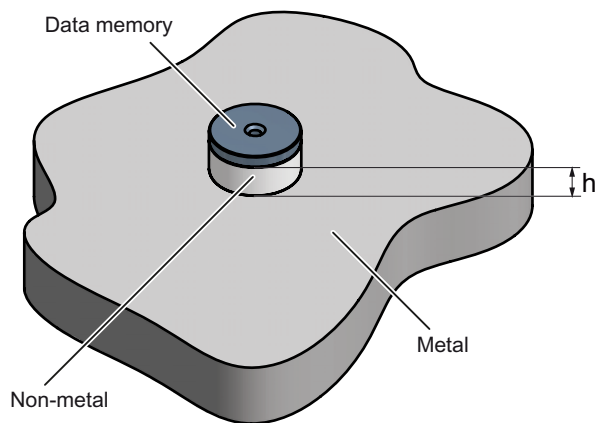
7.3.2 Ordering data

Table 7- 4 Ordering data for MDS D124

MDS D124	Order number
<ul style="list-style-type: none"> • IP67 • Memory size: 112 byte EEPROM user memory • Operating temperature: -25 ... +125 °C • Dimensions: $\varnothing = 27$ mm x 4 mm 	6GT2600-0AC00

7.3.3 Metal-free area

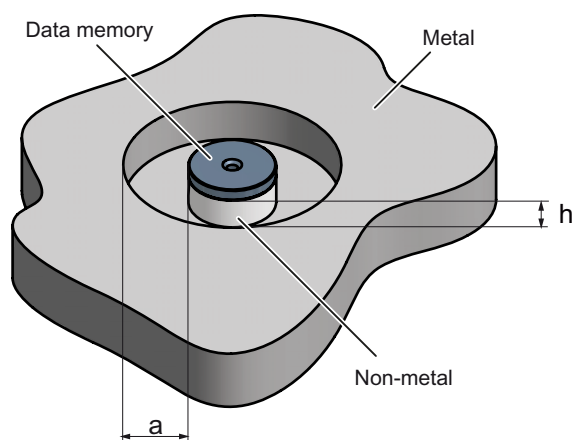
Mounting on metal



$h \geq 25 \text{ mm}$

Figure 7-7 Mounting of the MDS D124 on metal with spacer

Flush-mounting



$h \geq 25 \text{ mm}$

$a \geq 25 \text{ mm}$

Figure 7-8 Flush-mounting of MDS D124 in metal with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results. It is possible to mount the MDS with metal screws (M3 countersunk head screws). This has no tangible impact on the range.

7.3.4 Technical specifications

Table 7- 5 Technical data for MDS D124

Memory size	128 bytes
Memory configuration	
<ul style="list-style-type: none"> • Serial number • Configuration memory ¹⁾ • AFI/DSFID ¹⁾ • Application memory 	<ul style="list-style-type: none"> • 8 bytes (fixed code) • 6 bytes • 2 bytes • 112 bytes
Storage technology	EEPROM
Memory organization	EEPROM 128 bytes gross 112 bytes net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	to ISO 15693
Data retention (at +40 °C)	10 years
MTBF (at +40 °C)	≥ 1.5 x 10 ⁶ hours
Data transmission rate	
<ul style="list-style-type: none"> • Read • Write 	<ul style="list-style-type: none"> • Approx. 3.5 ms/byte • Approx. 9.5 ms/byte
Read cycles	Unlimited
Write cycles, typical	1 000 000
Write cycles, min.	200 000
Read/write distance (S _g)	See Chapter Field data of ISO transponders (Page 47).
Distance from metal	min. 25 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP67
Shock according to EN 60721-3-7, Class 7M3 total shock response spectrum, Type II	100 g
Vibration-resistant to EN 60721-3-7, Class 7M3	20 g
Torsion and bending load	Not permissible
Dimensions (D x H) in mm	27 x 4
Color	Black
Material	Epoxy casting resin
Fixing	Adhesive, M3 screw
Tightening torque at +20 °C	≤ 1 Nm (at high temperatures, the expansion coefficients of the materials used must be taken into account)

Ambient temperature

- Operation • -25 °C to +125 °C
- Transport and storage • -40 °C to +150 °C

Weight, approx. 5 g

1) Configuration memory and AFI/DSFID are used/not used by RF300.

7.3.5 Dimension drawings

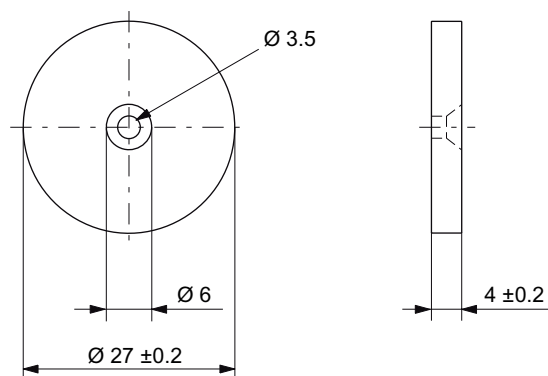



Figure 7-9 Dimensions of MDS D124

7.4 MDS D139

7.4.1 Characteristics

The MDS D139 is a passive, maintenance-free transponder based on the ISO standard 15693.

MDS D139	Characteristics	
	Field of application	Reusable, heat-proof transponders with a limited service life are required for use in production logistics and in assembly lines subject to high temperatures (up to +220 °C).
	Memory	112 byte user memory; considerably less expensive than the heat-proof mobile data storage units available today due to its simple construction (without thermal insulation), but also due to its lack of complexity.
	Read/write range	See Chapter Field data of ISO transponders (Page 47).
	Mounting on metal	Not possible: Recommended distance from metal ≥ 30 mm
	ISO standard	15693

Note

Compatibility with SIMATIC RF300 depending on MLFB number

Only the MDS D139 with MLFB 6GT2600-0AA10 is compatible with SIMATIC RF300.

7.4.2 Ordering data

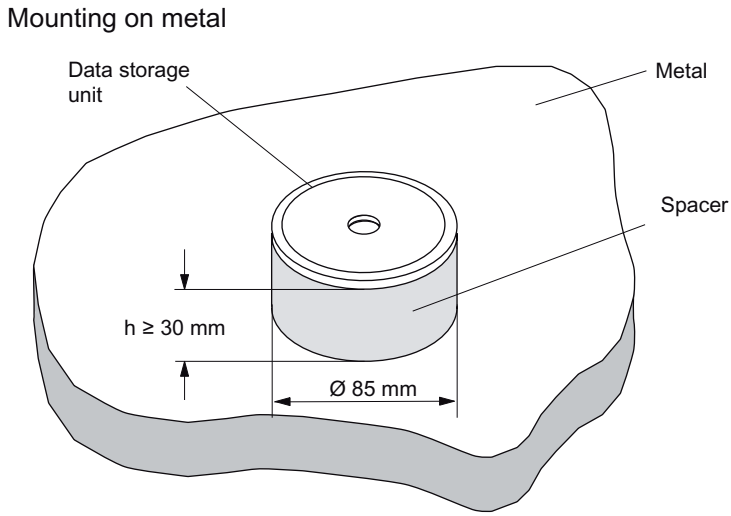
Table 7- 6 Ordering data for MDS D139

MDS D139	Order number
<ul style="list-style-type: none"> • IP68 • Memory size: 112-byte user memory • Operating temperature: up to +200 °C/+220 °C [heat-resistant (r/w)] • Dimensions: 85 x 15 (Ø x H in mm) 	6GT2600-0AA10

Table 7- 7 Ordering data for MDS D139 accessory

MDS D139 accessory	Order number
Spacers Diameter x height: 85 mm x 30 mm	6GT2690-0AA00

7.4.3 Metal-free area



Flush-mounting of the MDS in metal is not permitted!

Figure 7-10 Metal-free area for MDS D139

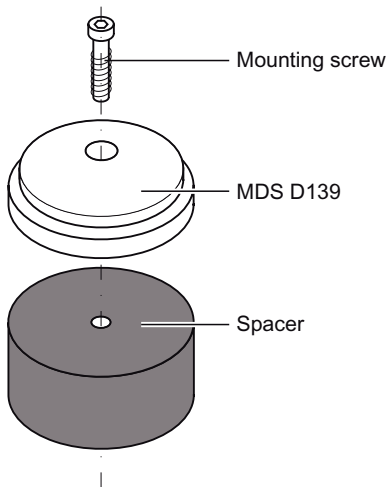


Figure 7-11 MDS D139: Mounting recommended with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results. It is possible to mount the MDS with metal screws (M5). This has no tangible impact on the range. It is recommended that a test is performed in critical applications.

7.4.4 Technical specifications

Table 7- 8 Technical data for MDS D139

Memory size	128 bytes
Memory configuration	
<ul style="list-style-type: none"> • Serial number • Configuration memory ¹⁾ • AFI/DSFID ¹⁾ • Application memory 	<ul style="list-style-type: none"> • 8 bytes (fixed code) • 6 bytes • 2 bytes • 112 bytes
Storage technology	EEPROM
Memory organization	EEPROM 128 bytes gross 112 bytes net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Data retention	10 years
MTBF	2 x 10 ⁶ hours
Read cycles	Unlimited
Write cycles	
<ul style="list-style-type: none"> • at + 40 °C, typical • at + 70 °C, min. 	<ul style="list-style-type: none"> • 500 000 • 10 000
Read/write distance (S _g)	See Chapter Field data of ISO transponders (Page 47).
Distance from metal	min. 30 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP68
Shock resistant to EN 60721-3-7, Class 7M3	50 g
Total shock response spectrum, Type II	
Vibration-resistant to EN 60721-3-7, Class 7M3	20 g
Torsion and bending load	Not permissible
Dimensions (D x H) in mm	85 x 15
Color	Black
Material	Plastic PPS
Fixing	1x M5 screw ²⁾
Tightening torque	1.5 Nm ²⁾

Ambient temperature	• Operation	-25 °C to +100 °C	Permanent
		+140 °C	20% reduction in the limit distance
		+200 °C 3	Tested up to 4000 hours or 1500 cycles
		+220 °C	Tested up to 2000 hours or 500 cycles
	• Transport and storage	-40 °C to +100 °C	
Weight, approx.		50 g	

- 1) Configuration memory and AFI/DSFID are used/not used by RF300.
 - 2) For mounting with the spacer (6GT2690-0AA00), use a stainless steel M5 screw to avoid damaging the MDS in high temperatures (expansion coefficient).
- In higher temperatures (> +80 °C), observe the expansion coefficient of all materials in order to prevent damage to the transponder due to fastening.
- Note that no processing is possible beyond +140 °C.

7.4.5 ATEX

The MDS D139 mobile data memory is classed as a piece of simple, electrical equipment and can be operated in the Category 2G protection zone.

7.4.6 Dimension drawings

Dimensions (in mm)

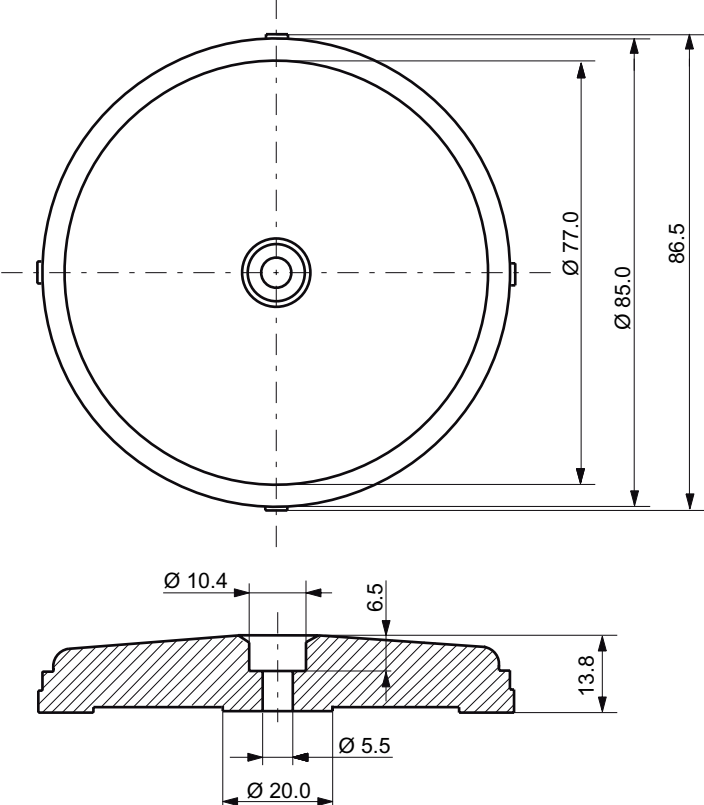



Figure 7-12 Dimensions of MDS D139

7.5 MDS D160

7.5.1 Characteristics

This mobile data memory is a passive, maintenance-free laundry tag based on the ISO 15693 standard with I-Code technology for cyclic applications.

MDS D160	Characteristics	
	Field of application	Typical applications are, for example: <ul style="list-style-type: none"> • Rented work clothing • Hotel laundry • Surgical textiles • Hospital clothing • Dirt collection mats • Clothing for nursing homes/hostels
	Memory	EEPROM 128 bytes gross 112 bytes net capacity
	Read/write range	See Chapter Field data of ISO transponders (Page 47).
	Mounting on metal	Not possible: Recommended distance from metal ≥ 25 mm
	High resistance	Thanks to its rugged packaging, the MDS D160 is a transponder that can be used under extreme environmental conditions. It is washable, heat-resistant and resistant to all chemicals generally used in the laundry process.
	ISO standard	15693 with I-code technology for cyclic applications

Note

Compatibility with SIMATIC RF300 depending on MLFB number

Only the MDS D160 with MLFB 6GT2600-0AB10 is compatible with SIMATIC RF300.

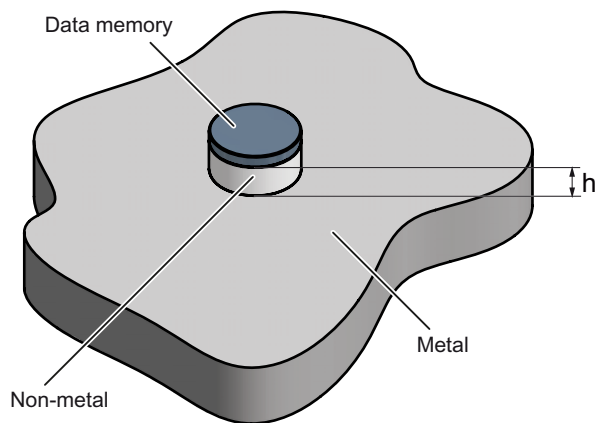
7.5.2 Ordering data

Table 7- 9 Ordering data for MDS D160

MDS D160	Order number
<ul style="list-style-type: none"> • IP68 (24 hours, 2 m, +20 °C) • Memory size: 112 byte user memory • Operating temperature: -25 °C ... +70 °C • Dimensions: 16 x 3 ±0.1 (Ø x H in mm) • Laundry tag for cyclical applications (r/w) 	6GT2600-0AB10

7.5.3 Metal-free area

Mounting on metal



$h \geq 25 \text{ mm}$

Figure 7-13 Mounting of the MDS D160 on metal with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results. In critical applications, it is recommended that a test is performed.

Flush-mounting

Flush-mounting of the MDS D160 in metal is not permitted!

7.5.4 Technical specifications

Memory size	128 bytes
Memory configuration	
<ul style="list-style-type: none"> • Serial number • Configuration memory ¹⁾ • AFI/DSFID ¹⁾ • Application memory 	<ul style="list-style-type: none"> • 8 bytes (fixed code) • 6 bytes • 2 bytes • 112 bytes
Storage technology	EEPROM
Memory organization	EEPROM 128 bytes gross 112 bytes net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	According to ISO 15693
Data retention (at +55 °C)	10 years
MTBF (at +40 °C)	2x 10 ⁶ hours
Data transmission rate	
<ul style="list-style-type: none"> • Read • Write 	<ul style="list-style-type: none"> • Approx. 3.5 ms/byte • Approx. 9.5 ms/byte
Bulk detection/multitag capability	Yes
Data retention	10 years
Read cycles	Unlimited
Write cycles at + 40 °C, typical	1 000 000
Read/write distance (S ₉)	See Chapter Field data of ISO transponders (Page 47)
Distance from metal	min. 25 mm (approx. 30% reduction of the field data)
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP68 (24 hours, 2 m, +20 °C)
Shock, tested in accordance with IEC 68-2-27	40 g (18 ms; 6 axes; 2000 repeats/h)
Vibration, tested in accordance with IEC 68-2-6	10 g (10 to 2000 Hz; 3 axes; 2.5 h)
Torsion and bending load	Not permissible
Mechanical strength	
<ul style="list-style-type: none"> • Isostatic pressure • Axial pressure • Radial pressure 	<ul style="list-style-type: none"> • 300 bar for 5 min. • 1000 N for 10 s • 1000 N for 10 s
Resistance to chemicals	All chemicals normally used in the washing process
MDS lifespan	At least 100 wash cycles

Mechanical design	Pressed, impact-resistant plastic	
<ul style="list-style-type: none"> • Color • Material • Dimensions (D x H) in mm 	<ul style="list-style-type: none"> • Gray • PPA (polyphthalamide) • 16 x 3 ±0.1 	
MDS fixing	Patch, sew, glue	
Ambient temperature		
<ul style="list-style-type: none"> • Operation 	<ul style="list-style-type: none"> • -25 °C to +70 °C • +120 °C 	<ul style="list-style-type: none"> • permanent • for 100 hours (20% reduction in the limit distance) • 100 x for 10 minutes • 1 x for 30 seconds
<ul style="list-style-type: none"> • Transport and storage 	<ul style="list-style-type: none"> • +175 °C • +220 °C • -25 °C to +85 °C 	
Weight, approx.	1 g	

* No processing possible from +140 °C upwards

1) Configuration memory and AFI/DSFID are used/not used by RF300.

Note

- Regeneration time for the MDS D160 between wash cycles must be at least 24 hours
- It is recommended that a test is performed in critical applications.

7.5.5 Dimension drawings

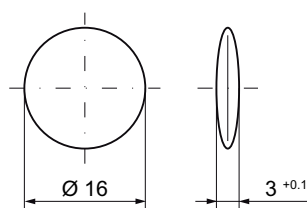



Figure 7-14 Dimensions of MDS D160

7.6 MDS D324

7.6.1 Characteristics

The MDS D324 is a passive, maintenance-free transponder based on the ISO standard 15693 with my-d technology.

MDS D324	Characteristics	
	Field of application	Production and distribution logistics and product identification
	Memory	For the user, the usable application memory amounts to 992 byte.
	Read/write range	See Chapter Field data of ISO transponders (Page 47).
	Mounting on metal	Not possible: Recommended distance from metal ≥ 25 mm
	High resistance	Can also be used in harsh environments under extreme environmental conditions (e.g. with higher temperature load).
	ISO standard	15693 with my-d technology.

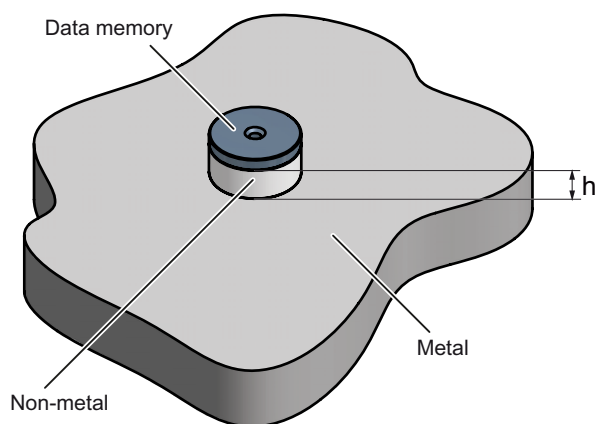
7.6.2 Ordering data

Table 7- 10 Ordering data MDS D324

MDS D324	Order number
<ul style="list-style-type: none"> • IP67 • Memory size: 992 byte EEPROM user memory • Operating temperature: -25 °C...+125 °C • Dimensions: 27 x 4 (Ø x H in mm) 	6GT2600-3AC00

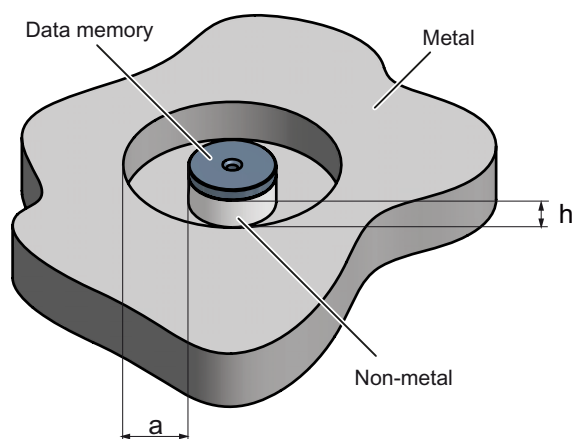
7.6.3 Metal-free area

Mounting on metal



$$h \geq 25 \text{ mm}$$

Figure 7-15 Mounting of the MDS D324 on metal with spacer



$$h \geq 25 \text{ mm}$$

$$a \geq 25 \text{ mm}$$

Figure 7-16 Flush-mounting of MDS D324 in metal with spacer

Note

If the minimum guide values (h) are not observed, a reduction of the field data results. It is possible to mount the MDS with metal screws (M3 countersunk head screws). This has no tangible impact on the range.

7.6.4 Technical specifications

Table 7- 11 Technical data MDS DS324

Memory size	1024 bytes
Memory configuration	<ul style="list-style-type: none"> • Serial number • 8 bytes (fixed code) • Configuration memory ¹⁾ • 16 bytes • Application memory ¹⁾ • 992 bytes • Manufacturer data • 8 bytes
Storage technology	EEPROM
Memory organization	1024 EEPROM/gross 992 net capacity When using the OPT area, 16 bytes of it must be subtracted in 4 byte blocks
Protocol	according to ISO 15693
Data retention (at +40 °C)	10 years
MTBF (at +40 °C)	≥ 1.5 x 10 ⁶ hours
Data transmission rate	<ul style="list-style-type: none"> • Read • Approx. 3.5 ms/byte • Write • Approx. 9.5 ms/byte
Read cycles	Unlimited
Write cycles, typical	1 000 000
Write cycles, min.	200 000
Read/write distance (S _g)	See Chapter Field data of ISO transponders (Page 47)
Distance from metal	min. 25 mm (approx. 30% reduction of the field data)
Multitag capability	Yes
Anti-collision speed	Approx. 20 transponders/s simultaneously identifiable
Power supply	Inductive power transmission (without battery)
Degree of protection to EN 60529	IP67
Shock according to EN 60721-3-7, Class 7M3 total shock response spectrum, Type II	100 g
Vibration-resistant to EN 60721-3-7, Class 7M3	20 g
Torsion and bending load	Not permissible
Dimensions (D x H) in mm	27 x 4
Color	Black
Material	Epoxy casting resin
Fixing	Adhesive, M3 screw
Tightening torque at +20 °C	≤ 1 Nm (at high temperatures, the expansion coefficients of the materials used must be taken into account)

Ambient temperature	
• Operation	• -25 °C to +125 °C
• Transport and storage	• -40 °C to +150 °C
Weight, approx.	5 g

1) Configuration memory and AFI/DSFID are used/not used by RF300.

7.6.5 Dimension drawings

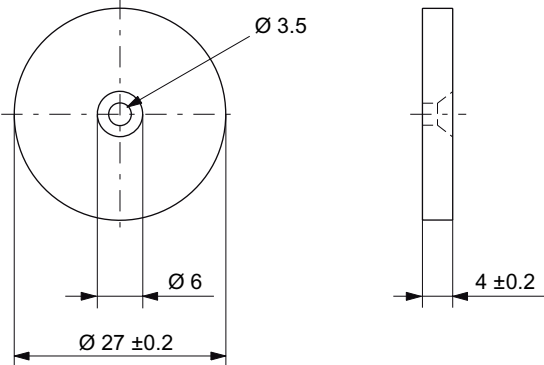


Figure 7-17 Dimensions of MDS D324

System integration

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

8.1 Introduction

RF310R, RF340R, RF350R and RF380R readers are connected to the controller via the following interface/communication modules:

- ASM 452
- ASM 456
- ASM 473
- ASM 475
- RF170C
- RF180C
- 8xIQ-Sense

Function blocks, interface modules/communication modules and readers

Function blocks are used for integration into the SIMATIC. Using these, the input parameters are transferred to the reader using the "init_run"(RESET) command.

You can find more detailed information on the software parameterization in Product Information "FB 45 and FC 45 input parameters for RF300 and ISO transponders" (<http://support.automation.siemens.com/WW/view/en/33315697>) or the Function Manuals FB 45 (<http://support.automation.siemens.com/WW/view/en/21738808>) and FC 45 (<http://support.automation.siemens.com/WW/view/en/21737722>) as of the A3 edition.

Interface modules/communication modules and function blocks

The following table shows the most important features of the interface modules/communication modules, as well as the compatible function blocks.

Table 8- 1 Overview of interface modules/communication modules

ASM/ communication module	Interfaces to the application (PLC)	Interfaces to the reader	Function blocks	Reader connections	Dimensions (W x H x D) in mm	Temperature range	Degree of protection
ASM 452	PROFIBUS DP-V1	2 x 8-pin socket, M12	FC 45	1	134 x 110 x 55	0 °C to +55 °C	IP67
ASM 456	PROFIBUS DP-V1	2 x 8-pin socket, M12	FB 45 FC 55 FC 56	2 (parallel) *	60 x 210 x 54 or 79	0 °C to +55 °C	IP67
ASM 473	PROFIBUS DP-V1	2 x 8-pin socket, M12	FC 45 FB 45 FC 55	1	87 x 110 x 55	0 °C to +55 °C	IP67
ASM 475	S7-300 (central), ET200M (PROFIBUS)	Via screw terminals in front connector	FC 45 FB 45 FC 55	2	40 x 125 x 120	0 °C to +60 °C	IP20
SIMATIC RF170C	PROFIBUS DP-V1 PROFINET I O	2 x 8-pin socket, M12	FB 45 FC 55	2 (parallel) *	90 x 130 x 60	-25 °C to +55° C	IP67
SIMATIC RF180C	PROFINET I O	2 x 8-pin socket, M12	FB 45	2 (parallel) *	60 x 210 54	0 °C to +60° C	IP67
8xIQ-Sense	8xIQ-Sense	Via screw terminals in front connector	FC 35	2 (parallel) *	40 x 125 x 120	0 °C to +60 °C	IP20

*) If 2 readers are used on one ASM, the following restrictions apply:

- The maximum operating temperature is 35 °C
- The input voltage is 24 V ±10%

Current consumption ≤ 425 mA per reader

8.2 ASM 452

8.2.1 Features

Area of application

The ASM 452 interface module is a MOBY module for operating MOBY and RF300 components with RS422 over PROFIBUS DP-V1 on

- Any computers and PCs
- Any PLCs

When operating the interface module on a SIMATIC S7, function blocks are made available to the user.



Figure 8-1 Interface module ASM 452

The ASM 452 is the result of consistent development of the familiar ASM 450/451 interface modules. Optimal data throughput can be achieved even in large-scale PROFIBUS configurations thanks to the use of acyclic data traffic on PROFIBUS DP V1. The minimum cyclic data load of the ASM 452 on the PROFIBUS provides the user with the guarantee that other PROFIBUS nodes (e.g. DI/DO) can still be processed at great speed.

The ASM 452 is an interface module for communication between PROFIBUS and the RF310R with RS422 interface. Through the ASM 452, the data on the RF300 transponder can be physically addressed ("Normal" addressing). In SIMATIC S7, FC 45 is available for this purpose.

8.2.2 Ordering data

Table 8-2 Ordering data for ASM 452 and accessories

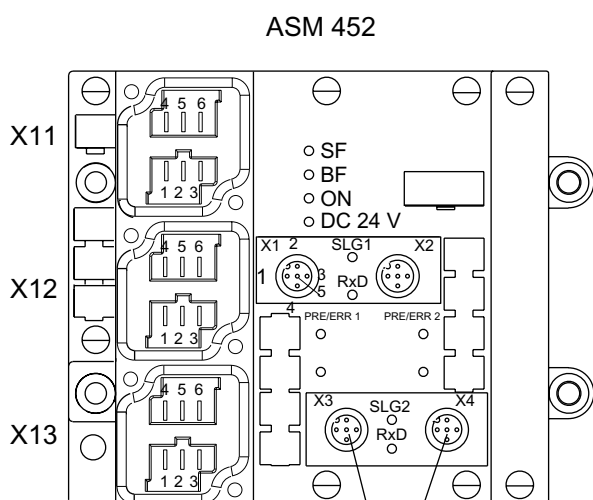
Product description	Order No.
ASM 452 interface module for PROFIBUS DP-V1, 1x RF3xxR with RS422 interface, without connector for 24 V DC and PROFIBUS	6GT2002-0EB20
Accessories:	
Connector for PROFIBUS DP and 24 V supply	6ES7194-1AA00-0XA0
Connecting cable RF3xxR ↔ ASM 452	
Plug-in cable, pre-assembled, length: 2 m (standard length)	6GT2891-1CH20
Plug-in cable, pre-assembled, length: 5 m	6GT2891-1CH50
Opt. Cable connector without read/write device cable (for cable lengths > 20 m) ASM 452 ↔ reader	6GT2090-0BC00
M12 blanking cap for unused RF310R connection (1 pack = 10 pieces)	3RX9802-0AA00
CD "RFID Systems Software & Documentation" with FC 45, GSD file	6GT2080-2AA10
Replacement part:	
Connector plate; T functionality for PROFIBUS connection	6ES7194-1FC00-0XA0
FC 45 Reference Manual German English French	Available in electronic form on the CD "RFID Systems Software & Documentation"

The ASM 456 plug-in cables 6GT2891-0Fxxx can be used as extension cables.

8.2.3 Pin assignment and display elements

Pin assignments

The figure below illustrates the pin assignments of ASM 452.



Not available for RF300

LEDs for PROFIBUS DP

SF: System Fault
BF: Bus Fault

ON: Lights up when there is ASM (is generated by the 24 V supply voltage).
24 V DC: Lights up when the 24 V supply voltage is connected to the ASM.

LEDs for RF300 and ASM 452

RxD: Reader active with
PRE/ERR 1 Transponder present or error display
(PRE/ERR 2) for reader
(The "transponder present" display always takes priority. The error is only indicated when a transponder is not present.)

Transponder present: The LED is permanently ON. If more than one transponder is in the field, the number of transponders is indicated by short interruptions. A fault is not output.

Error display:

The LED is permanently OFF. The last error number is indicated by brief light pulses.

Reader 1: Reader 1 is selected
(Reader 2) (Reader 2 is selected.)

Only reader 1 can be selected.

Socket	Pin assignment
X11 and X12 (PROFIBUS DP)	1 Signal
	2 PE
	3* PE
	4 Signal
	5* L+
	6* M
X13 (Supply voltage)	1 PE
	2 L+
	3 M
	4 PE
	5 L+
	6 M

* Not connected

Socket	Pin assignment (reader)
X1 (X3) (green)	1 +RxD
	2 +TxD
	3 -TxD
	4 -RxD
	5 PE
X2 (X4)	X2 X4
	1 +24 V +24 V
	2 DA1 DE 1
	3 0 V 0 V
	4 DA0 DE 0
5 PE PE	

Figure 8-2 Pin assignment and LEDs of ASM 452

8.2.4 Configuration

Hardware description

The ASM 452 has the same housing as the distributed I/O system ET 200X. General information on ASM 452 (e.g.: assembly, operation and wiring; general technical data) is available in the ET200X manual (Order No. 6ES7 198-8FA00-8AA0). Descriptions of accessories and network components can also be found in this manual.

Configuration

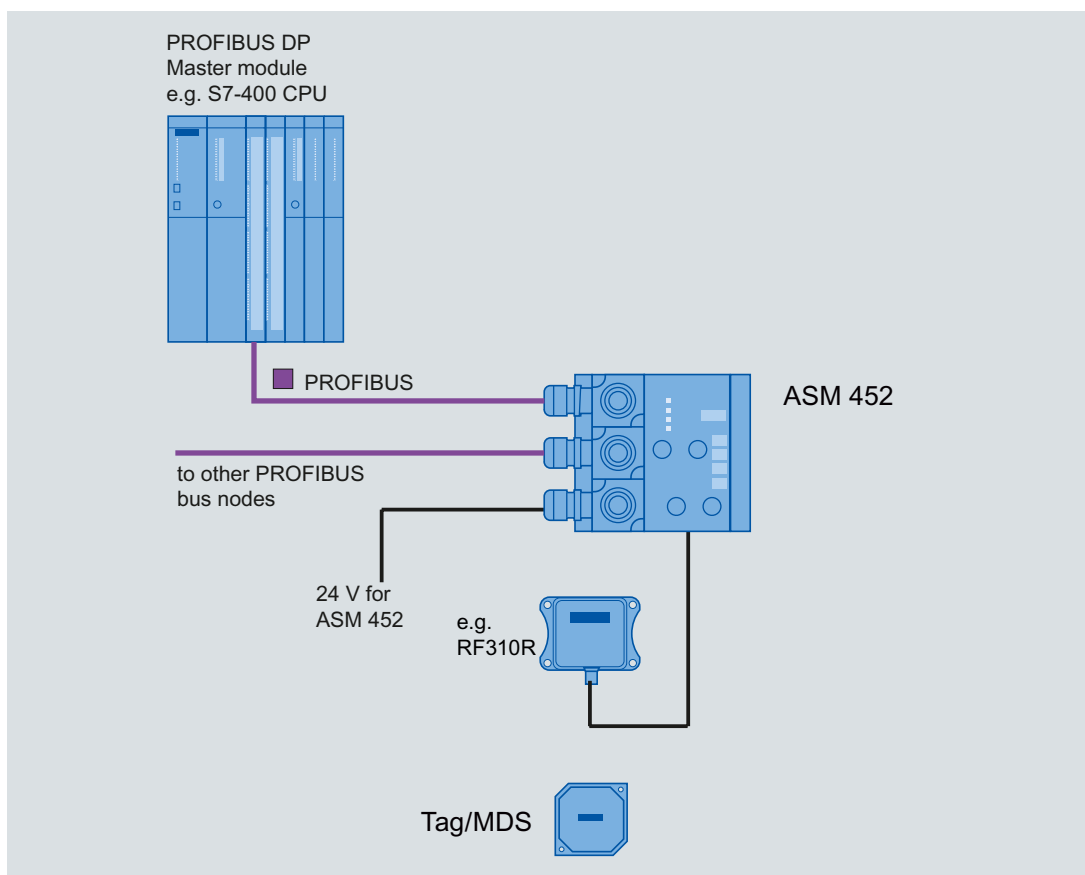


Figure 8-3 Configuration of ASM 452

PROFIBUS configuration

The ASM 452 is integrated into the hardware configuration by means of a GSD file. The ASM can then be configured using the HW Config of SIMATIC Manager or another PROFIBUS tool. A GSD file is provided for ASM 452 on the CD "RFID Systems Software & Documentation".

Operating mode of the ASM 452

The approved operating modes of ASM 452 are described in the GSD file. It is set using the hardware configuration tool (e.g. STEP 7 HW Config).

Reader connection system

A reader always occupies two M12 connector sockets on the ASM 452.

A pre-assembled cable therefore ensures easy connection of the reader (see figure below).

The connecting cable is available in lengths of 2 m (standard) and 5 m. Extensions are possible up to 1000 m using connecting cables 6GT2891-...

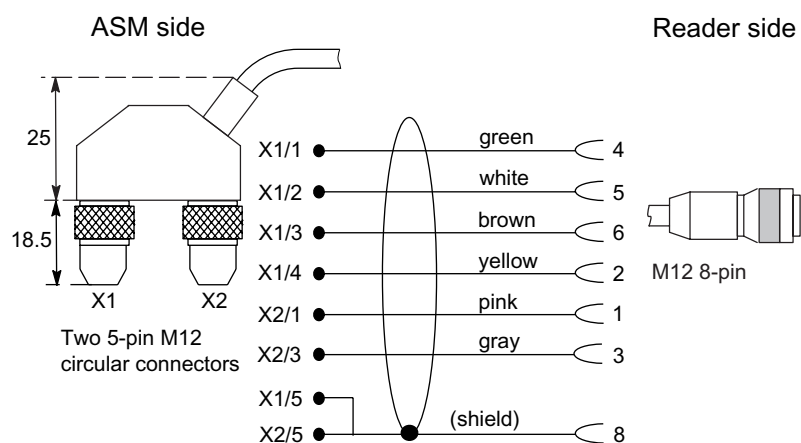


Figure 8-4 Connecting cable (2 m) ASM 452/473 ↔ RF3xxR reader with RS422 (6GT2891-1CH20)

Cable installation

Signal	M12 (reader side)	Cable	X1 / Data	X2
24 V DC	1	Pink	-	1
TX -	2	Yellow	4	-
GND	3	Gray	-	3
TX +	4	Green	1	-
RX +	5	white	2	-
RX -	6	brown	3	-
-			-	-
Shield	8 + terminal piece	Shield	5	5

Cable assignment ASM 452/473 ↔ RF3xxR reader with RS422 (6GT2891-1CH20)

A reader cable connector with screw-type terminals is provided for users who want to individually pre-assemble their own cables (see figure below). Cables and reader cable connectors can be ordered from the MOBY catalog.

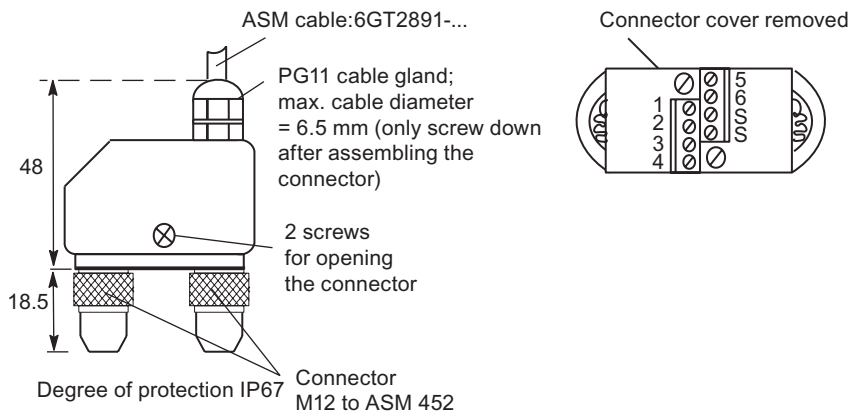


Figure 8-5 Cable connector ASM 452/473 ↔ RF3xx reader with RS422 (6GT2090-0BC00)

Pin assignment for ASM 452/473 cable connector

Connector pin	Connection to pin of the reader	Wire color
1	4	Note data sheet provided by the manufacturer
2	5	
3	6	
4	2	
5	3	
6	1	
S	8 + terminal piece	

Pin 7 must not be connected.

PROFIBUS cable with 24 V supply

The ASM 452 can also be operated with the "green" PROFIBUS cable. It is important to ensure that a 24 V cable is connected from X12 to X13. The 24 V cable can be connected to pins 5 and 6 in plug X12.

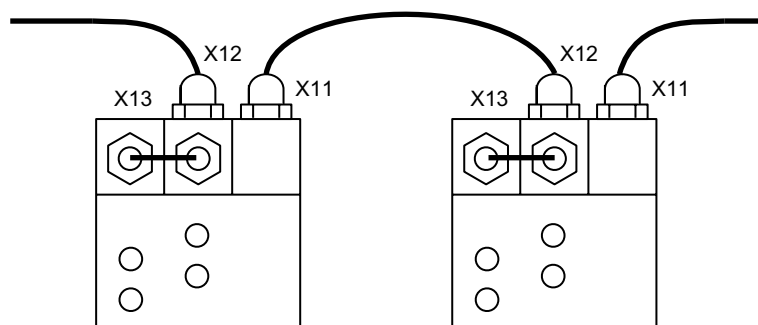


Figure 8-6 PROFIBUS cable with 24 V supply

PROFIBUS address and terminating resistor

You must remove the connector plate from the ASM before you set the PROFIBUS address or connect the terminating resistor. The connector plate covers the DIL switch. The position of the DIL switch in ASM is shown in the figure below with one setting example for each case.

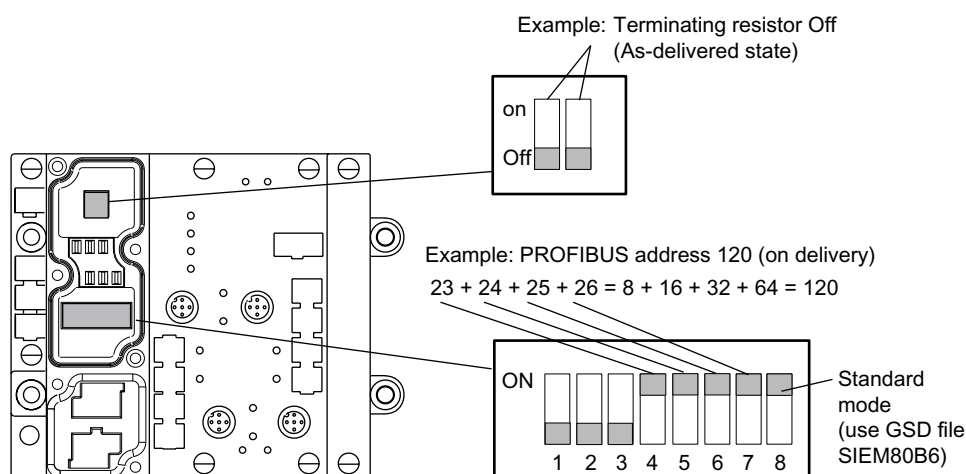


Figure 8-7 Setting the PROFIBUS address/connecting the terminating resistor

Note

- The PROFIBUS address in ASM 452 must always match the PROFIBUS address defined in the configuring software for this ASM.
- To ensure that the terminating resistor functions correctly, you must always switch **both** DIL switches of the terminating resistor to "on" or "off".

8.2.5 Technical data

Table 8-3 Technical data for ASM 452

Serial interface to the user	PROFIBUS DP-V1
Procedure after connection	EN 50170 Vol. 2 PROFIBUS PG 11 cable gland PROFIBUS and power supply connectors are not included in the scope of delivery
Transmission rate	9600 baud to 12 Mbaud (automatic detection)
Max. block length	2 words cyclic/240 bytes acyclic
Serial interface to the RF3xxR	
Connector	2 x M12 coupler plug
Max. cable length	2 m = Standard length, 5 m, 10 m, 20 m and 50 m, (up to 1000 m on request)
Readers that can be connected	1x RF3xxR with RS422 interface
Software functions	
Programming	Depending on the PROFIBUS DP master
Function blocks for SIMATIC S7	FC 45
Transponder addressing	Direct access via addresses
Commands	Initialize transponder, read data from transponder, write data to transponder
Multi-tag capability	No
S7 data structures via UDTs	Yes
Power supply	
Rated value	24 V DC
Permissible range	20 V to 30 V DC
Current consumption	Max. 180 mA; typ. 130 mA (without reader)
Digital inputs	none
Digital outputs	none
Ambient temperature	
Operation	0 °C to +55 °C
Storage and transport	-40 °C to +70 °C
Dimensions (W x H x D) in mm	134 x 110 x 55 (without bus connector)
Fixing	4 M5 screws; for mounting on any plate or wall
Weight, approx.	0,5 kg
Degree of protection	IP67
MTBF (at 40 °C)	30 • 10 ⁴ hours = 34 years

8.2.6 PROFIBUS Diagnosis

The following table lists possible error indications with their meanings and provides remedies.

Table 8- 4 LED indication for PROFIBUS diagnosis

"BF" LED	"SF"LED	Cause of error	Error correction
ON	*	<ul style="list-style-type: none"> • ASM 452 is in start-up mode. 	-
		<ul style="list-style-type: none"> • The connection to the DP master has failed. • ASM 452 not detecting a baud rate. 	<ul style="list-style-type: none"> • Check the PROFIBUS DP connection. • Check the DP master.
		<ul style="list-style-type: none"> • Bus interrupt • DP Master not functioning 	<ul style="list-style-type: none"> • Check all cables on your PROFIBUS DP network. • Check whether the connector plugs for PROFIBUS DP are securely plugged into the ASM 452.
flashes	on	<ul style="list-style-type: none"> • The configuration data sent to the ASM 452 by the DP master do not match the configuration of the ASM 452. 	<ul style="list-style-type: none"> • Check the configuration of the ASM 452 (input/output, PROFIBUS address). • Correct GSD file being used? <ul style="list-style-type: none"> – SIEM80B6.GSD for ASM 452
Flashes	Off	<ul style="list-style-type: none"> • ASM 452 has detected the baud rate, but is not being addressed by the DP Master. • ASM 452 has not been configured. 	<ul style="list-style-type: none"> • Check the PROFIBUS address set on the ASM 452 or in the configuration software. • Check the configuration of the ASM 452 (station type).
on	Flashes	<ul style="list-style-type: none"> • There is a hardware defect in the ASM 452. 	<ul style="list-style-type: none"> • Replace the ASM 452.

8.2.7 Dimension drawing

The following figure shows the dimensional drawing of an ASM 452 with bus connectors. You must add the length of the PG cable gland and the radius of the cable used to the measured overall width and depth.

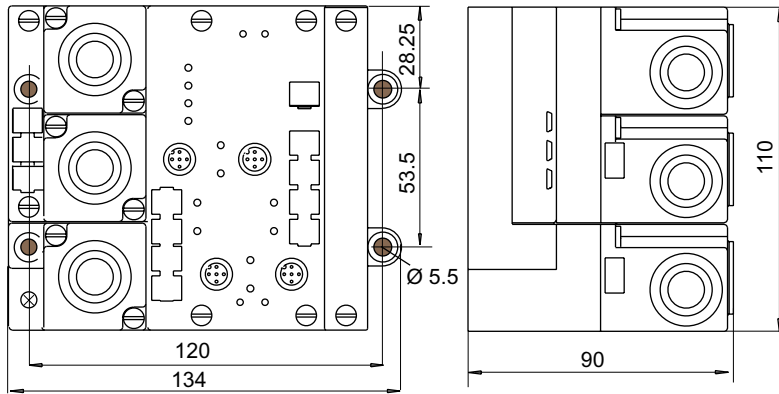


Figure 8-8 Dimensional drawing of ASM 452

Example of stripped lengths

The following diagram shows an example of stripped lengths. The lengths apply to all cables which can be connected to the connector plugs. You must twist any shield braid present, plug into a core end sleeve and cut off any excess.

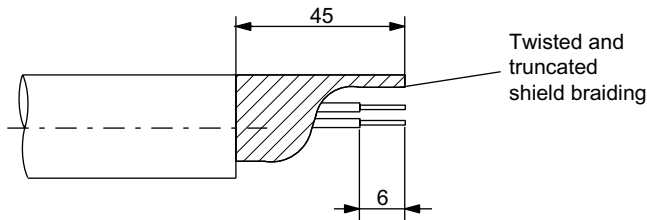


Figure 8-9 Length of stripped insulation for PROFIBUS cables

8.3 ASM 456

Configured with ASM 456

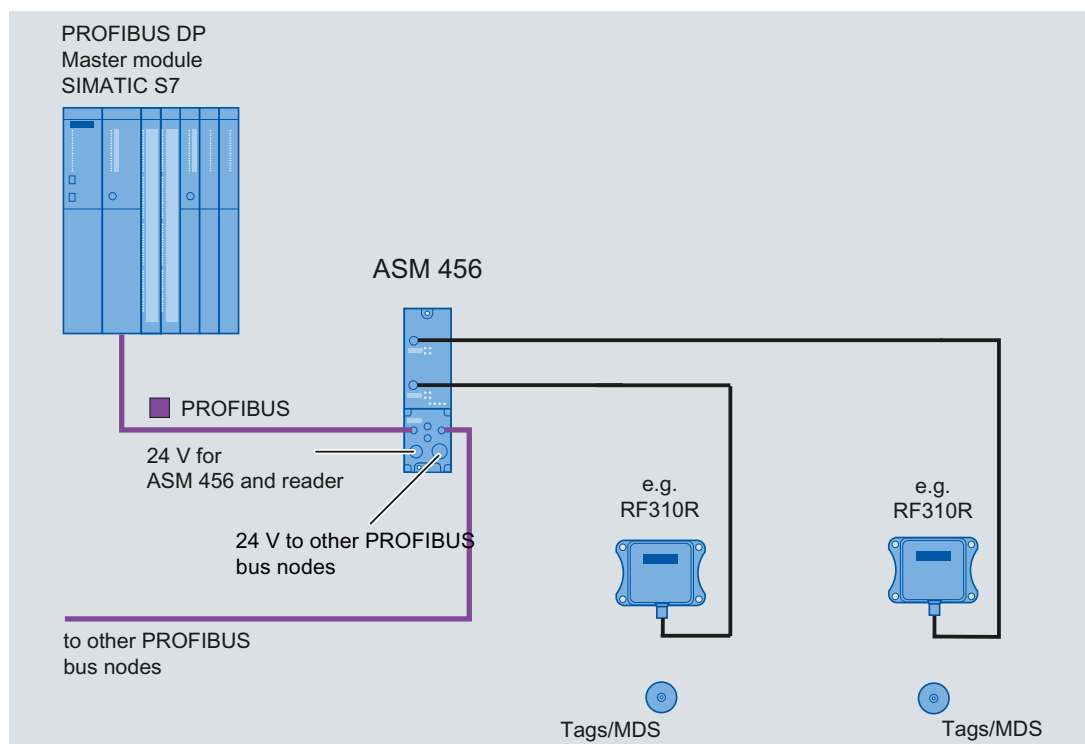


Figure 8-10 Configuration of ASM 456

For more detailed information, please refer to ASM 456 Operating Instructions (<http://support.automation.siemens.com/WW/view/en/32629442>).

8.4 ASM 473

8.4.1 Features

Field of application

The ASM 473 interface module is an RF300 module for SIMATIC S7. It can be plugged into the ET 200X distributed I/O station and DESINA. ET 200X is operated by the user over PROFIBUS DP V1. An S7-300 or S7-400 with integrated PROFIBUS connection can be used as the controller.

ASM 473 supplements the SIMATIC S7 interface module ASM 475. The IP67 degree of protection means that it can be installed and operated in the process without the need for an additional protective housing.

To operate the ASM 473, an ET 200X basic module BM 141/142 with the order number 6ES7141-1BF11-0XB0 or 6ES7142-1BD21-0XB0 or a BM 143 is required.

The transponder data are accessed by means of physical addressing of the transponder.

For operation in a SIMATIC S7, the function FC 45 is available. The hardware of the ASM 473 is configured with an object manager (OM) that is integrated in the SIMATIC Manager.



Figure 8-11 Interface module ASM 473

Other features:

- Up to 7 ASM 473 interface modules can be operated simultaneously in an ET 200X station.
- Any other I/O modules from the ET 200X spectrum can be operated with the ASM 473.

8.4.2 Ordering data

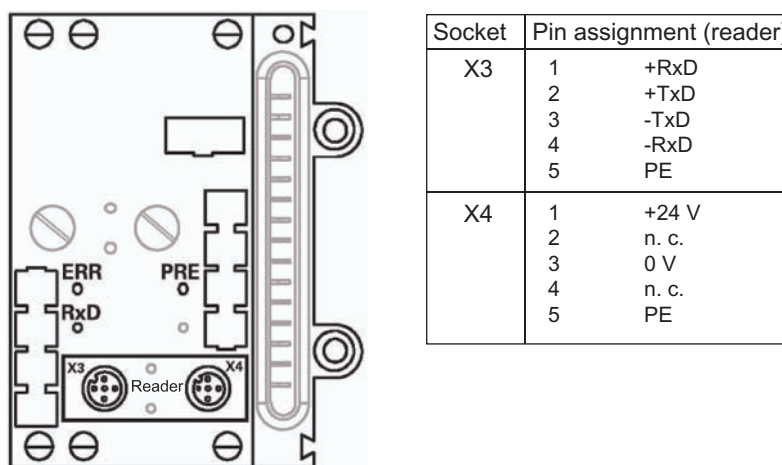
Table 8- 5 Ordering data for ASM 473 and accessories

Product description	Order No.
Interface module ASM 473 1x RF3xxR reader with RS422 interface	6GT2002-0HA10
Accessories:	
Connecting cable ASM 473 ↔ Reader RF3xxR	
Plug-in cable, pre-assembled, length 2 m (standard length)	6GT2891-1CH20
Plug-in cable, pre-assembled, length 5 m	6GT2891-1CH50
Opt. Cable connector without reader cable (for cable lengths > 20 m) ASM 473 ↔ Reader	6GT2090-0BC00
CD "RFID Systems Software & Documentation" with FC 45, GSD file	6GT2080-2AA10
FC 45 Reference Manual German English French	Available in electronic form on the CD "RFID Systems Software & Documentation"

8.4.3 Pin assignment and display elements

Pin assignments

The figure below illustrates the pin assignment for the read/write device and the display elements.



LEDs for PROFIBUS DP

General indicators (SF, BF, ON, 24VDC) are located on the basic module of the ET 200X.

LEDs for MOBY

- RxD: Reader active with command
- PRE: Indicates the presence of a transponder
- ERR: Error indicated by flashing sequence

The following ASM states are also indicated with the LEDs "PRE" and "ERR":

PRE	ERR	Description, Causes, Remedy
OFF/ON	ON (perm.)	Hardware is defective (RAM, flash,...)
ON	OFF	Charger is defective (can only be repaired in the factory).
2 Hz	OFF	Firmware loading is active or no firmware detected → Load firmware → ASM must not be switched off until loaded
2 Hz	2 Hz	Firmware loading terminated with errors → Restart required → Load firmware again → Check update files
5 Hz	5 Hz	Operating system error → Switch ASM or ET 200X base station OFF/ON
OFF	1 x flash every 2 s	ASM has booted and is waiting for a RESET (init_run) from the user

Figure 8-12 Interfaces and indicators of the ASM 473 for RF300

8.4.4 Configuration

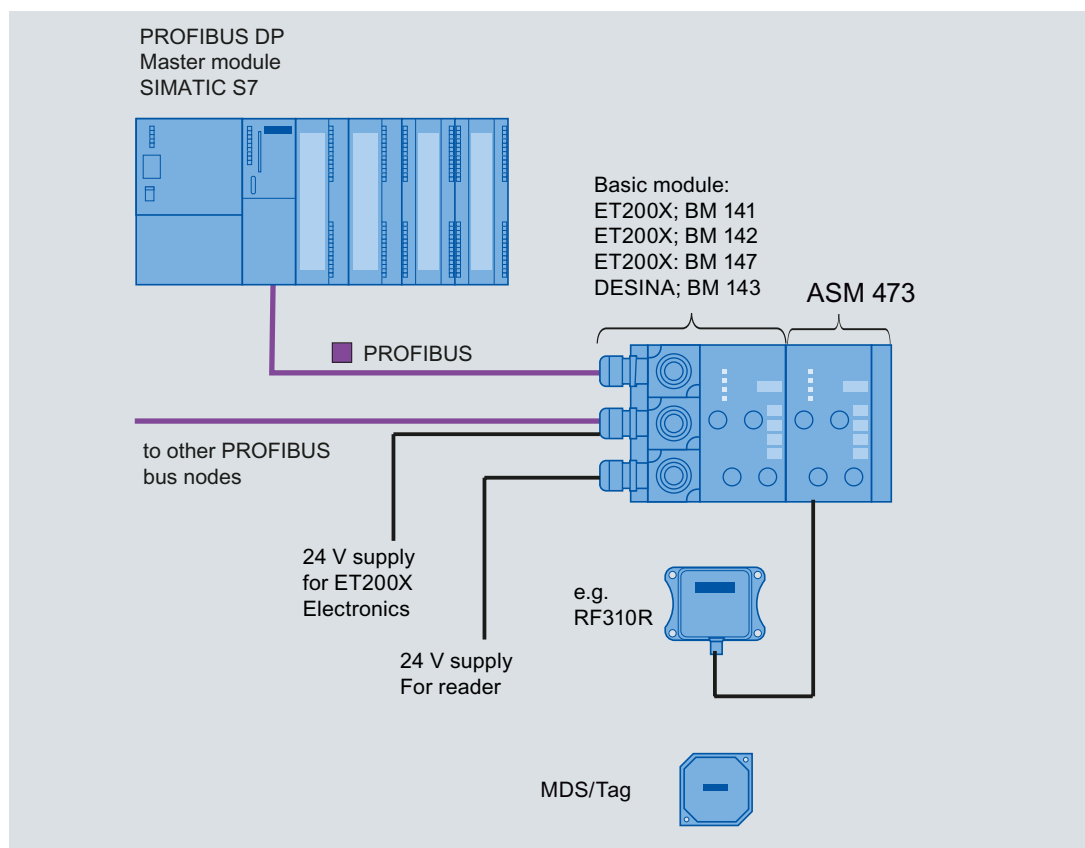


Figure 8-13 Configuration of ASM 473

Note

It differs from ASM 452 in that for ET 200X the 24 V supply must be connected to the PROFIBUS connector **and** on the load voltage connector (see the ET 200X manual).

Basic module - Requirements for operation of ASM 473

The following table indicates the status of the ET 200X basic module of 10/2002. The functionality of new basic modules is stored in HW Config of the SIMATIC Manager.

Table 8- 6 Requirements for operation of ASM 473

Order number of the ET 200X basic module	For operation with ASM 473 (6GT2002-0HA00)*	For operation with ASM 473 PARAM (6GT2002-0HA10)
6ES7141-1BF00-0XB0	No	No
6ES7141-1BF00-0AB0	Yes	Yes
6ES7141-1BF01-0XB0	No	No
6ES7141-1BF10-0XB0	No	No
6ES7141-1BF11-0XB0	Yes	Yes
6ES7141-1BF40-0AB0	Yes	Yes
6ES7142-1BD10-0XB0	No	No
6ES7142-1BD11-0XB0	No	No
6ES7142-1BD20-0XB0	No	No
6ES7142-1BD21-0XB0	Yes	Yes
6ES7142-1BD22-0XB0	No	Yes**
6ES7143-1BF00-0AB0	Yes	Yes
6ES7143-1BF00-0XB0	Yes	Yes
6ES7147-1AA00-0XB0	No	No
6ES7147-1AA01-0XB0	No	Yes
* Discontinued		
** Notes on operation: In HW Config, please parameterize the module 6ES7142-1BD21-0XB0.		

Example for a maximum configuration of ASM 473 on an ET 200X

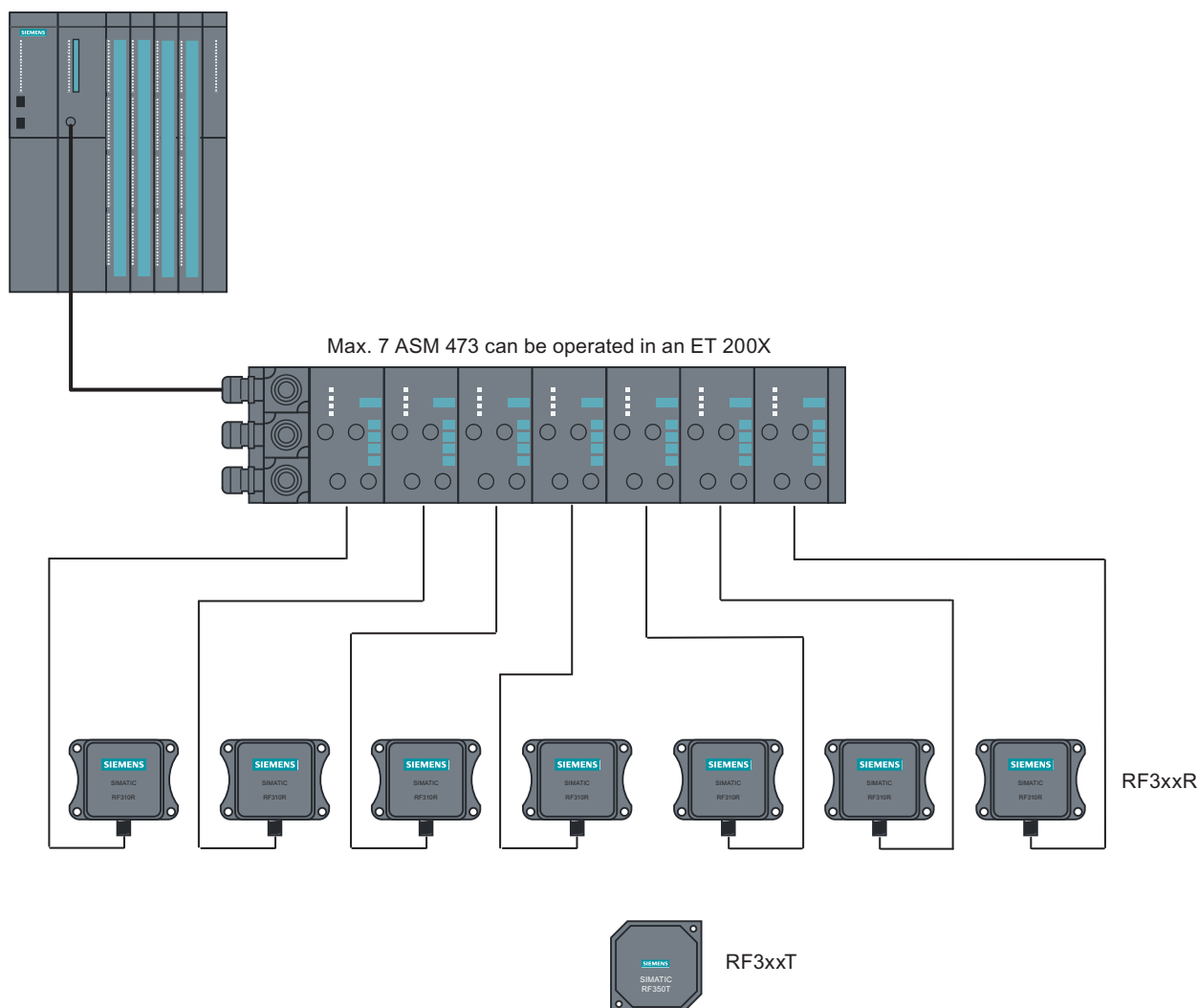


Figure 8-14 Example for a maximum configuration of ASM 473 on an ET 200X

Depending on the PROFIBUS master, up to 123 ET 200X modules can be run on one PROFIBUS branch.

Hardware configuration

The ASM 473 is integrated in the hardware configuration of the SIMATIC Manager by calling Setup.exe in the directory daten\S7_OM on the "RFID Systems Software & Documentation" CD. Currently, the ASM 473 cannot be integrated in masters of other manufacturers.

Reader connection system

A reader always occupies the two M12 connection sockets X3 and X4 on the ASM 473. A prefabricated cable makes it easy to connect the reader. The standard version of the connecting cable is 2 m in length. Other cable lengths are available on request.

For customers who want to assemble their own cables, an ASM cable connector with screw-type terminals is available. Cables and ASM cable connectors can be ordered from the MOBY catalog.

8.4.5 Technical data

Table 8- 7 Technical specifications for ASM 473

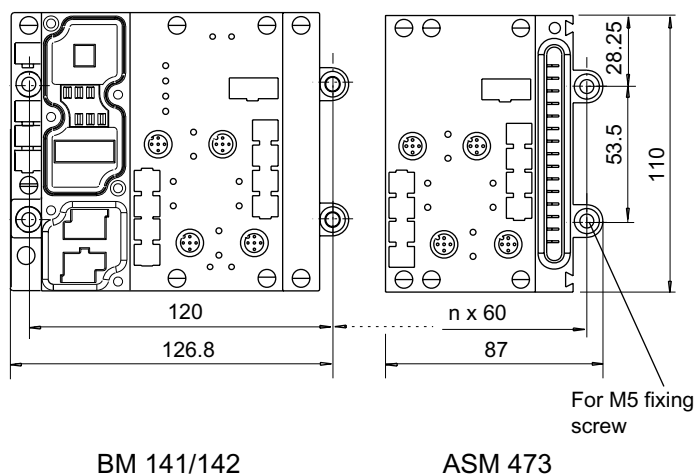
Interface for ET 200X	SIMATIC S7 I/O bus cyclic/acyclic services
Communication	2 words cyclic/238 bytes acyclic
Command buffer in ASM	142 x 238 bytes
Serial interface to the reader	
• Connector	2 x M12 coupler plug
• Max. cable length	2 m = standard length; other pre-assembled cables = 5 m, (up to 1000 m on request)
• Readers that can be connected	1 x RF3xxR reader with RS422
Software functions	
Programming	Depending on the PROFIBUS DP master
Function blocks for SIMATIC S7	FC 45, FB 45, FC 55
MDS addressing	Direct access via addresses
Commands	Initialize transponder, read data from transponder, write data to transponder, etc.
PROFIBUS Diagnosis	Yes; in accordance with ET 200X basic station
S7 diagnostics	Yes, can be called up via S7 OM
Reloadable firmware	Yes, via S7 OEM
Power supply ¹	
• Rated value	24 V DC
• Permissible range	20.4 V to 28.8 V DC
Current consumption	Typ. 75 mA; max. 500 mA (or see Technical specifications of the connected reader)
Power dissipation of the module	Typically 1.6 W
Digital outputs/inputs	Via expansion modules from the ET 200X spectrum
Ambient temperature	
• Operation	0 °C to +55 °C
• Transport and storage	-40 °C to +70 °C
Dimensions (W x H x D) in mm	
• Single unit	87 x 110 x 55
• Width module	60 x 110 x 55
Fixing	2 M5 screws (customer side) 2 M3 screws (product side)
Degree of protection	IP67
Weight, approx.	0.275 kg

For installation instructions and general technical data, see the ET 200X manual.

8.4.6 Dimensional drawings

Dimension drawing for mounting holes

The figure below shows the dimensions for the position of the holes for the fixing screws for a basic module and an ASM 473 expansion module.



n = Number of expansion modules

Figure 8-15 Dimensions for fixing holes for basic modules and expansion modules

Example of stripped lengths

The following diagram shows an example of stripped lengths. The lengths apply to all cables which can be connected to the connector plugs. You must twist any shield braid present, plug into a core end sleeve and cut off any excess.

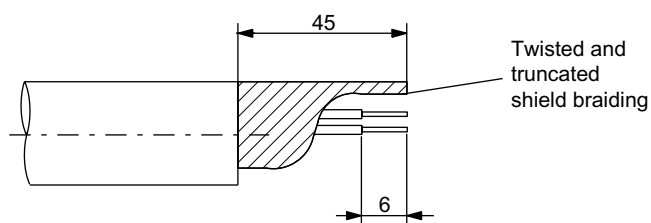


Figure 8-16 Length of stripped insulation for PROFIBUS cables

8.5 ASM 475

8.5.1 Features

Area of application

The ASM 475 interface module acting as the link between all RF300 systems and SIMATIC S7-300 performs the functions of a communication module. It can be operated centrally in the S7-300 or decentrally in an ET200M.

As many as eight ASM 475 interface modules can be plugged into one SIMATIC S7-300 rack and operated. In a configuration with several racks (max. four), the ASM 475 can be plugged into and operated on any rack. This means that as many as 32 ASMs can be operated in the maximum configuration of a SIMATIC S7-300. The ASM can also be operated in the ET 200M distributed I/O on PROFIBUS. Operation in an S7-400 environment is therefore problem-free. Up to 8 ASMs can be operated on each ET200M.

Error messages and operating states are indicated by LEDs.

A configuration that is resistant to interference is possible due to electrical isolation between the read/write device and the SIMATIC S7-300 bus.



Figure 8-17 Interface module ASM 475

The ASM 475 with the order number 6GT2002-0GA10 is a parameterizable module. The basic functions of the module are then already specified when the module is configured in HW Config (e.g. standard addressing).

The data in the MDS is accessed direct by means of physical addresses using the ASM 475. Operation in a SIMATIC S7 is controlled by the function FC 45.

ASM 475 and FC 45 form a unit that is used for reading the data of the MDS easily and at optimal speed.

8.5.2 Ordering data

Table 8- 8 Ordering data for ASM 475 and accessories

Product description	Order No.
ASM 475 interface module for SIMATIC S7 2 x RF3xxR reader with RS422 can be connected in parallel, without front connector	6GT2002-0GA10
Accessories:	
Front connector (1 x per ASM)	6ES7392-1AJ00-0AA0
Connecting cable ASM 475 ↔ RF3xxR	
Plug-in cable, pre-assembled, length: 2 m (standard length)	6GT2891-0EH20
Plug-in cable, pre-assembled, length: 5 m	6GT2891-0EH50
Terminal element (1 x per reader cable)	6ES7390-5BA00-0AA0
Shield connecting element	6ES7390-5AA00-0AA0
CD "RFID Systems Software & Documentation" with FC 45, S7 object manager	6GT2080-2AA10
FC 45 Reference Manual German English French	Available in electronic form on the CD "RFID Systems Software & Documentation"

The ASM 456 plug-in cables 6GT2891-0Fxxx can be used as extension cables.

8.5.3 Indicators

Bezel and indicator elements

The figure below illustrates the bezel of the ASM 475 and the inside of the front door complete with the associated connection diagram. The read/write devices must be connected to the ASM in accordance with the connection diagram.

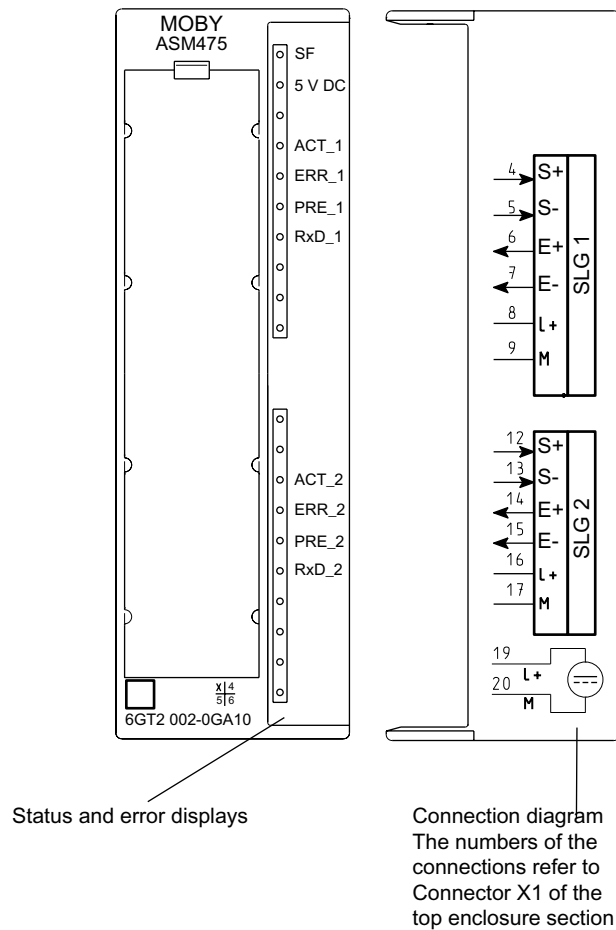


Figure 8-18 Bezel and inside of the front door of the ASM 475

Display elements on the ASM

Table 8- 9 Function of the LEDs on the ASM 475

Light emitting diode	Meaning
SF	System fault (hardware error on ASM)
DC 5V	24 V are connected to ASM and the 5 V voltage on ASM is OK.
ACT_1, ACT_2	The corresponding reader is active in processing a user command.
ERR_1, ERR_2	A flashing pattern indicates the last error to occur. This display can be reset using the parameter Option 1.
PRE_1, PRE_2	Indicates the presence of a transponder.
RxD_1, RxD_2	Indicates live communication with the reader. In the event of a fault on the reader, this display may also be lit.

On the ASM 475, further operating states are indicated with the LEDs PRE, ERR and SF:

Table 8- 10 Operating status display on ASM 475 via LEDs

SF	PRE_1	ERR_1	PRE_2	ERR_2	Meaning
ON	OFF/ON	ON (perm.)	OFF/ON	ON (perm.)	Hardware is defective (RAM, Flash, etc.)
ON	OFF	ON	OFF	OFF	Charger is defective (can only be repaired in the factory).
OFF	2 Hz	OFF	2 Hz	OFF	Firmware loading is active or no firmware detected <ul style="list-style-type: none"> • Firmware download • ASM must not be switched off
OFF	2 Hz	2 Hz	2 Hz	2 Hz	Firmware loading terminated with errors <ul style="list-style-type: none"> • Restart required • Load firmware again • Check update files
Any value	5 Hz	5 Hz	5 Hz	5 Hz	Operating system error <ul style="list-style-type: none"> • Switch ASM off/on
OFF	OFF	1 flash every 2 s	OFF	1 flash every 2 s	ASM has booted and is waiting for a RESET (init_run) from the user.

8.5.4 Configuration

Centralized configuration with SIMATIC S7-300

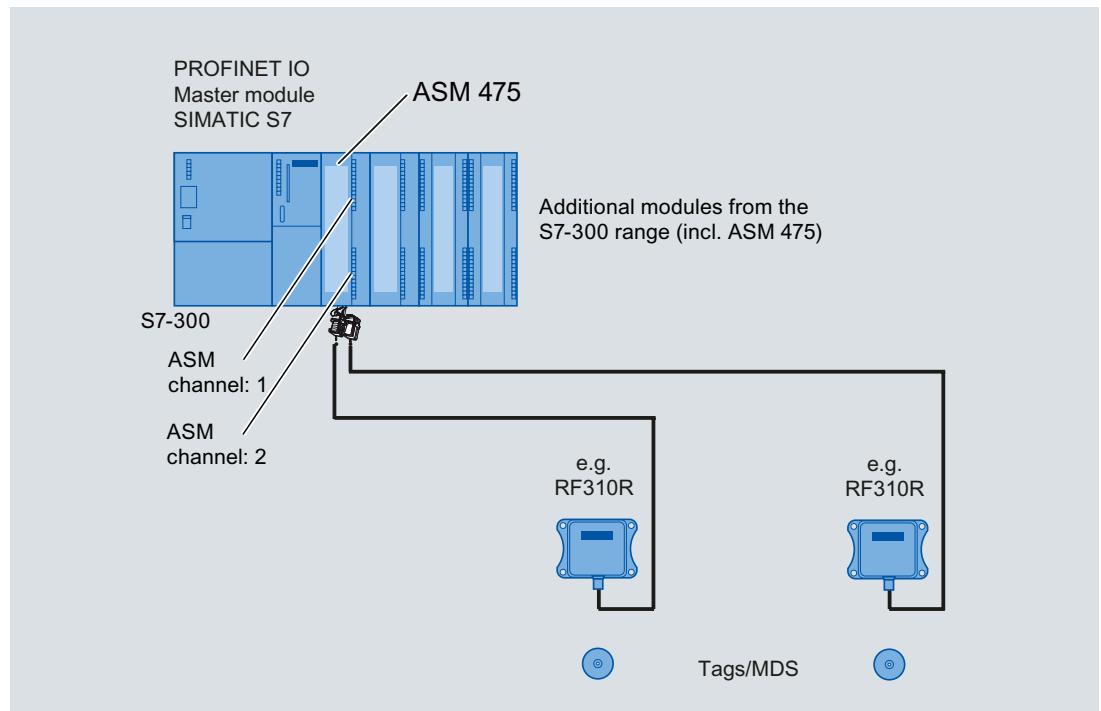


Figure 8-19 Configuration of ASM 475 central

Distributed configuration with ET200M

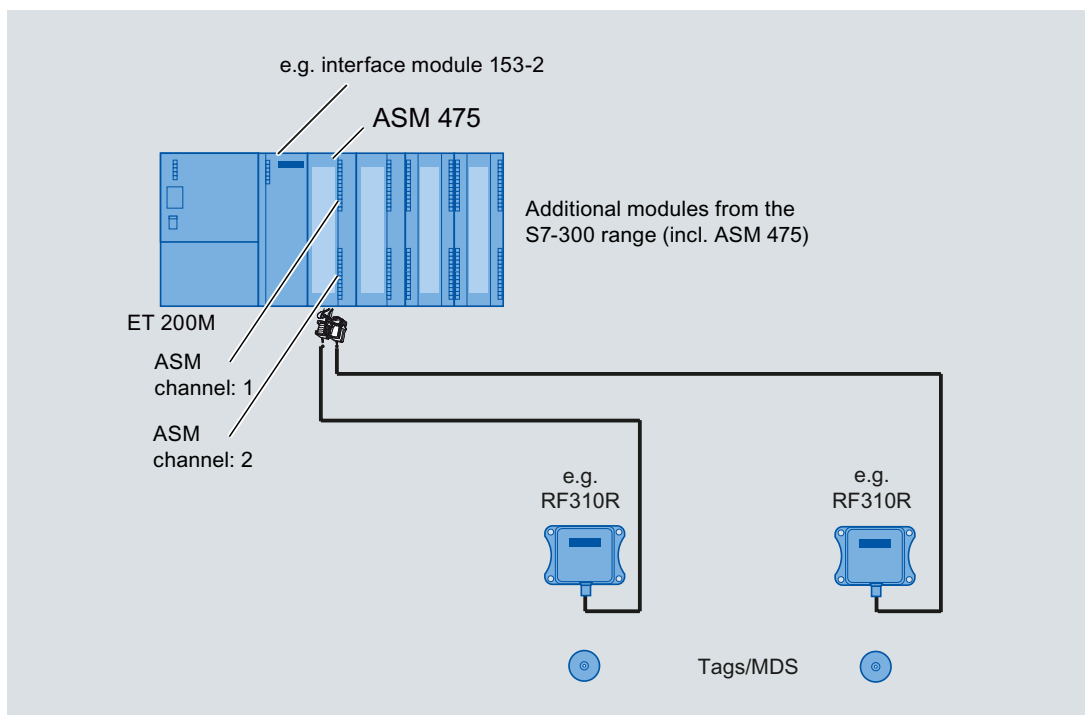
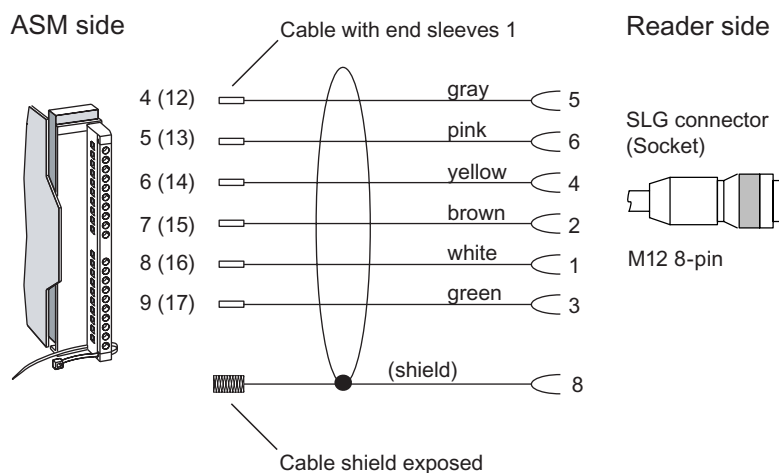


Figure 8-20 Configuration of ASM 475 distributed

Reader connection system

The connecting cable has a length of 2 m (standard) and 5 m. Extensions up to 1000 m are possible with the 6GT2891-0F plug-in cables.



¹ 6GT2891-0E... with straight SLG connector (standard)

Figure 8-21 Installation of connecting cable between ASM 475 and RF300 reader with RS 422

Cable installation

Signal	Pin on M12 connector	Cable	Labeling
24 V DC	1	white	1 Reader 2 8 -16
TX -	2	brown	1 Reader 2 7-15
GND	3	Green	1 Reader 2 9-17
TX +	4	Yellow	1 Reader 2 6-14
RX +	5	Gray	1 Reader 2 4-12
RX -	6	Pink	1 Reader 2 5-13
Shield	8 + terminal piece	-	

Cable assignment for connection of an RF300 reader to ASM 475

8.5.5 Technical data

Table 8- 11 Technical data for ASM 475

Serial interface for SIMATIC S7-300 or ET200M	I/O bus; cyclic and acyclic services
Communication	2 words cyclic/238 bytes acyclic
Command buffer in ASM 475	70 x 238 bytes per RF310R reader
Serial interface to the reader	
Connector	Via screw-type terminal on front connector The front connector is not included in the scope of supply.
Max. cable length	Pre-assembled cables = 2 m, 5 m, (up to 1000 m on request)
Readers that can be connected	2 x RF3xxR reader with RS422 parallel mode
Software functions	
Programming	Depending on the PROFIBUS DP master
Function blocks for SIMATIC S7	FC 45; FB 45; FC 55
Transponder addressing	Direct access via addresses
Commands	Initialize transponder, read data from transponder, write data to transponder
Multitag mode	No
S7 data structures via UDTs	Yes
Power supply	
Rated value	24 V DC
Permissible range	20.4 V to 28.8 V DC
Current consumption	
Without reader for U = 24 V DC, max.	350 mA
With reader connected, max.	500 mA, per connected reader
Power dissipation of the module, typ.	2 Watts
Current consumption from I/O bus, max.	80 mA
Electrical isolation between S7-300 and RF300	Yes
Fuse 24 V for the reader	Yes, electronic
Ambient temperature	
During operation	
Horizontal installation of SIMATIC	0 to +60 °C
Vertical installation of SIMATIC	0 to +40 °C
Transport and storage	-40 to +70 °C
Dimensions (W x H x D) in mm	40 x 125 x 120
Weight, approx.	0.2 kg

8.6 RF170C

Configured with RF170C

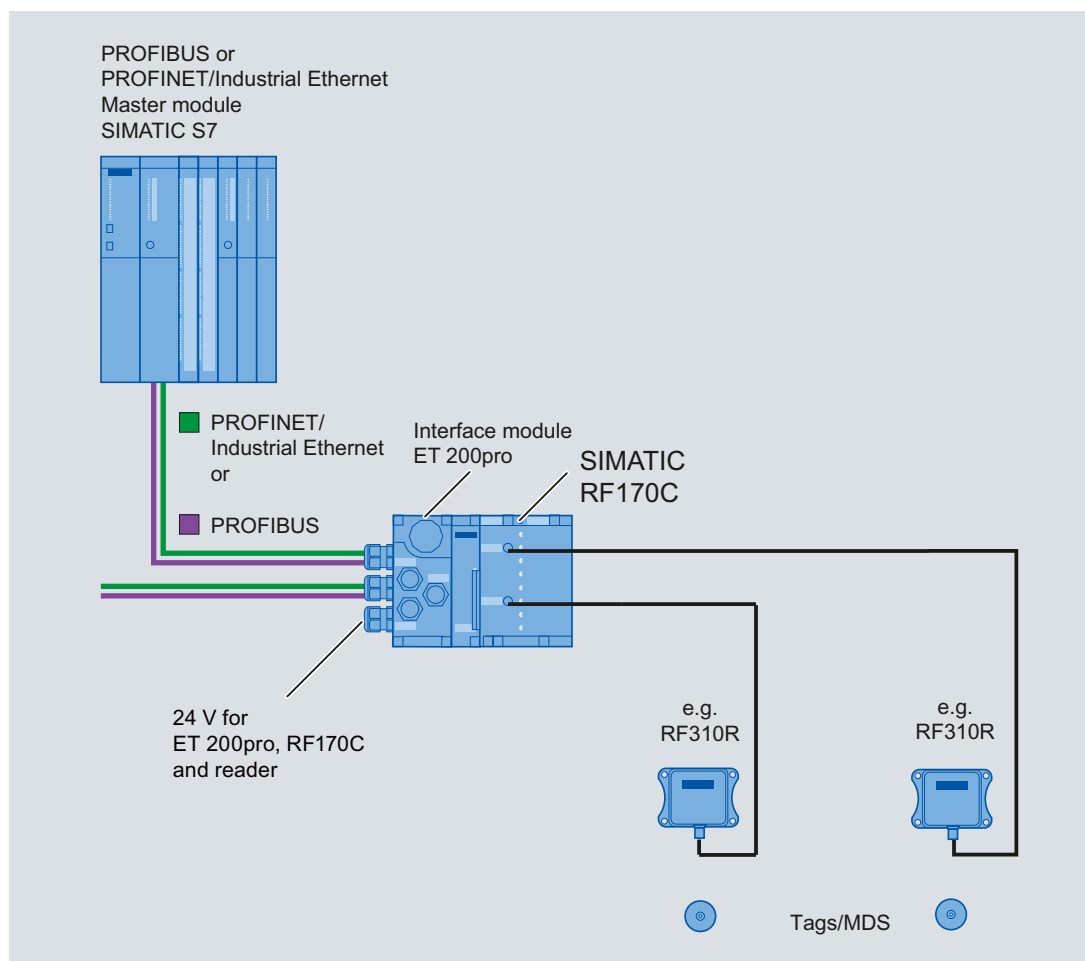


Figure 8-22 Configuration of RF170C

For more detailed information, refer to SIMATIC RF170C Operating Instructions (<http://support.automation.siemens.com/WW/view/en/32622825>).

8.7 RF180C

Configured with RF180C

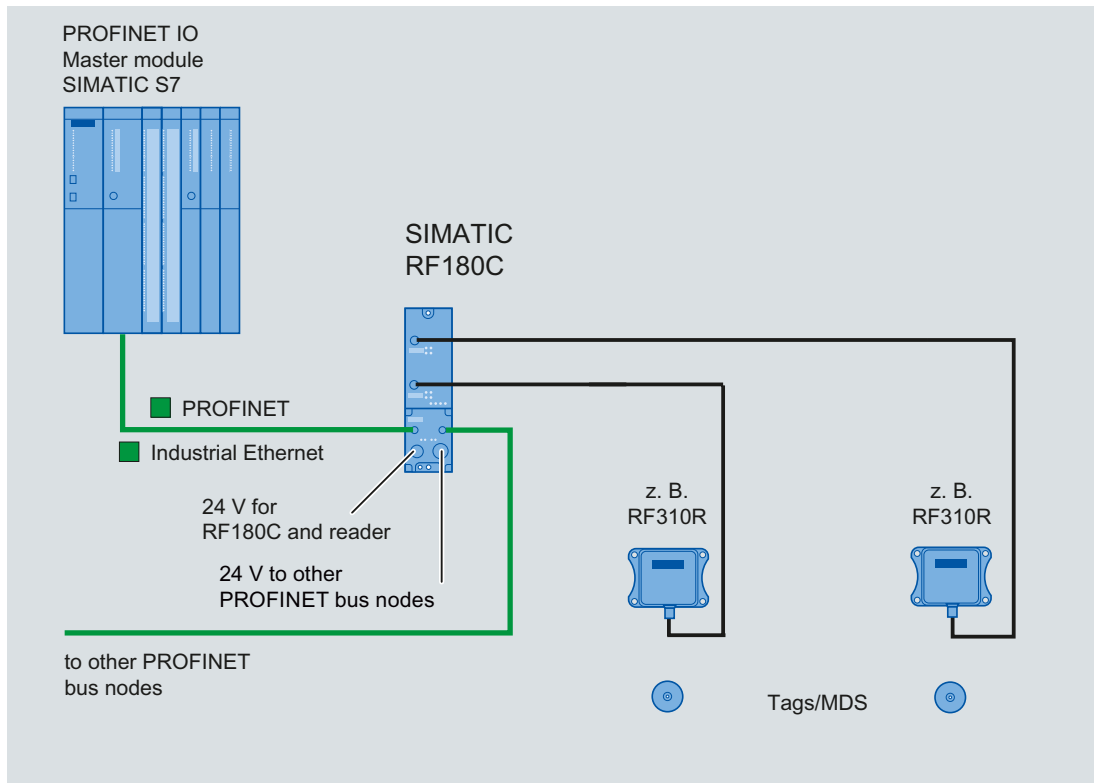


Figure 8-23 Configuration of RF180C

For more detailed information, refer to SIMATIC RF180C Operating Instructions (<http://support.automation.siemens.com/WW/view/en/30012157>).

8.8 8xIQ-Sense

8.8.1 Features

Field of application

The 8xIQ-Sense module is the link between the RF310R with 8xIQ-Sense interface and SIEMENS S7-300 and functions in the same manner as the communication module (interface module). It can be operated centrally in an S7-300 or decentrally in an ET200M.



Figure 8-24 8xIQ-Sense interface module

8.8.2 Ordering data

Table 8- 12 Ordering data for 8xIQ-Sense and accessories

	Order number
<ul style="list-style-type: none"> • IQ-Sense SM338 for S7-300 and ET200M for the connection of up to 8xIQ-Sense sensors • Optical sensors, ultrasonic sensors and RF identification systems can be connected. 	6ES7 3387XF000AB0

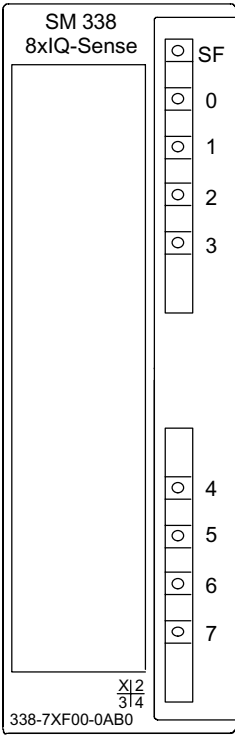
Table 8- 13 Ordering data for 8xIQ-Sense accessories

	Order number
M12 cable plug, 4-pole, with 5 m black PUR cable, 4 x 0.34 mm ²	3RX8000-0CB42-1AF0
M12 cable plug, 4-pole, with 10 m black PUR cable, 4 x 0.34 mm ²	3RX8000-0CB42-1AL0

8.8.3 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
	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	

8.8.4 Configuration

Centralized configuration with SIMATIC S7-300

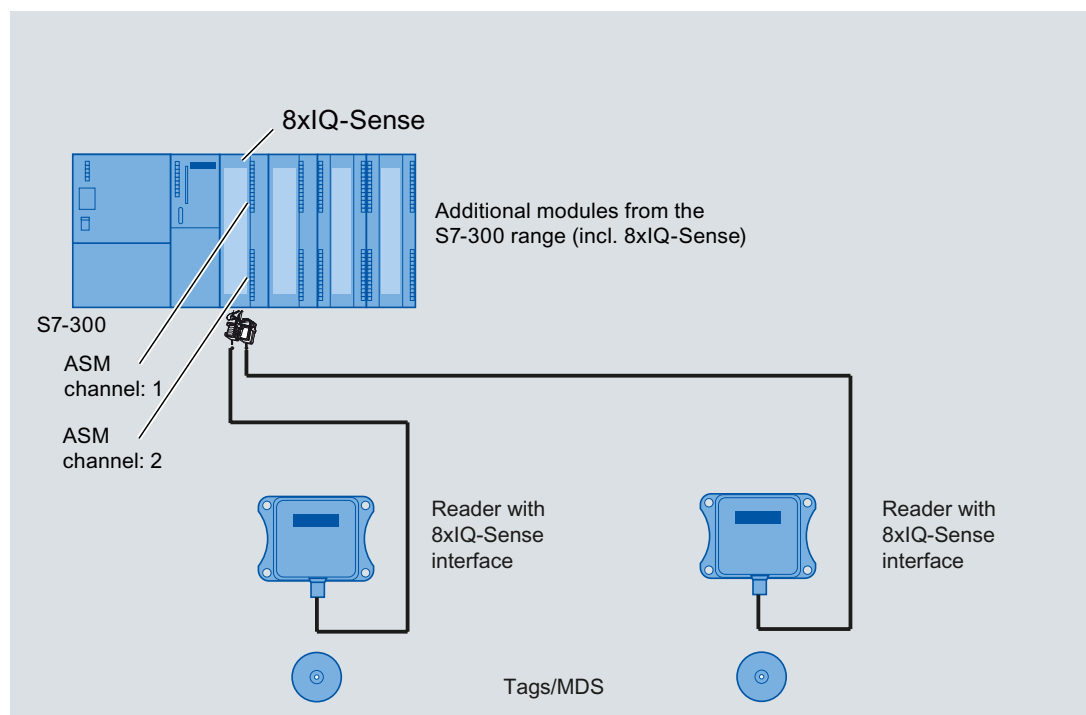


Figure 8-25 Configuration of 8xIQ-Sense central

Distributed configuration with ET 200M

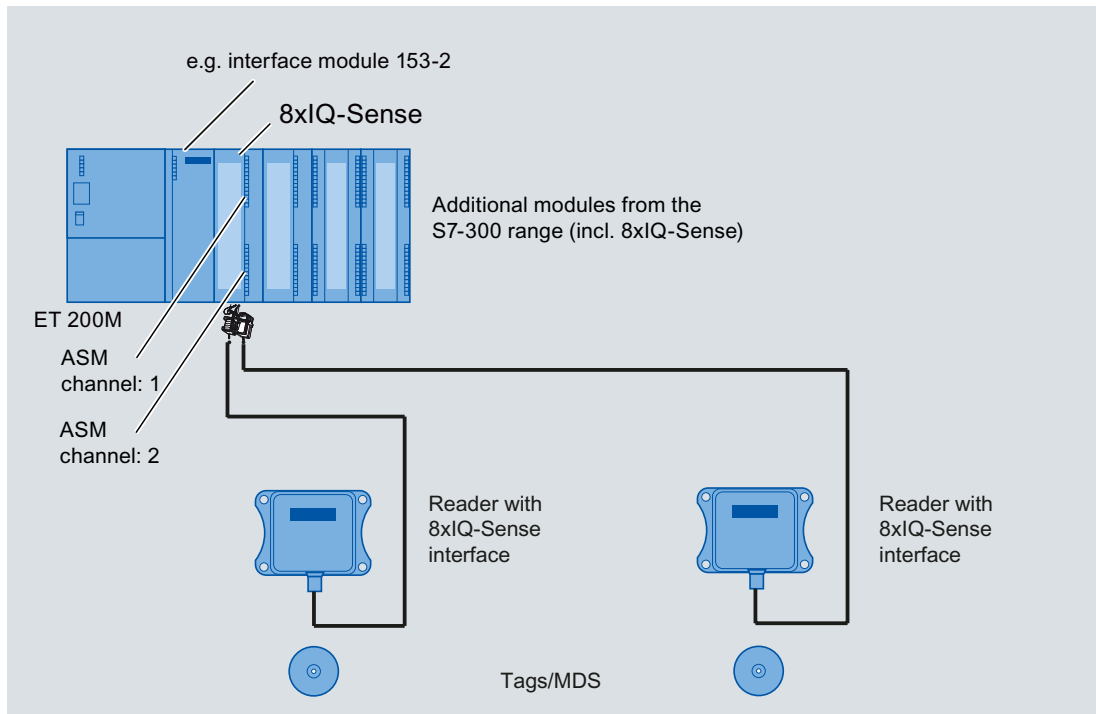


Figure 8-26 Configuration of 8xIQ-Sense distributed

Table 8- 14 Pin assignment of RF310R with IQ-Sense interface

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

Configuration of connecting cable from 8xIQ-Sense to RF310R

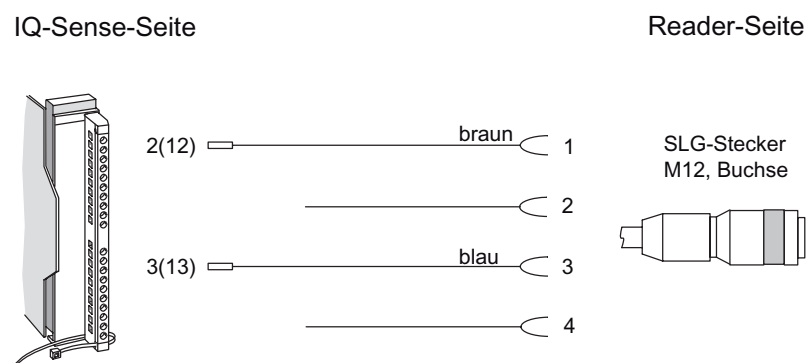


Figure 8-27 Cable and pin assignment of RF300 with IQ-Sense

8.8.5 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

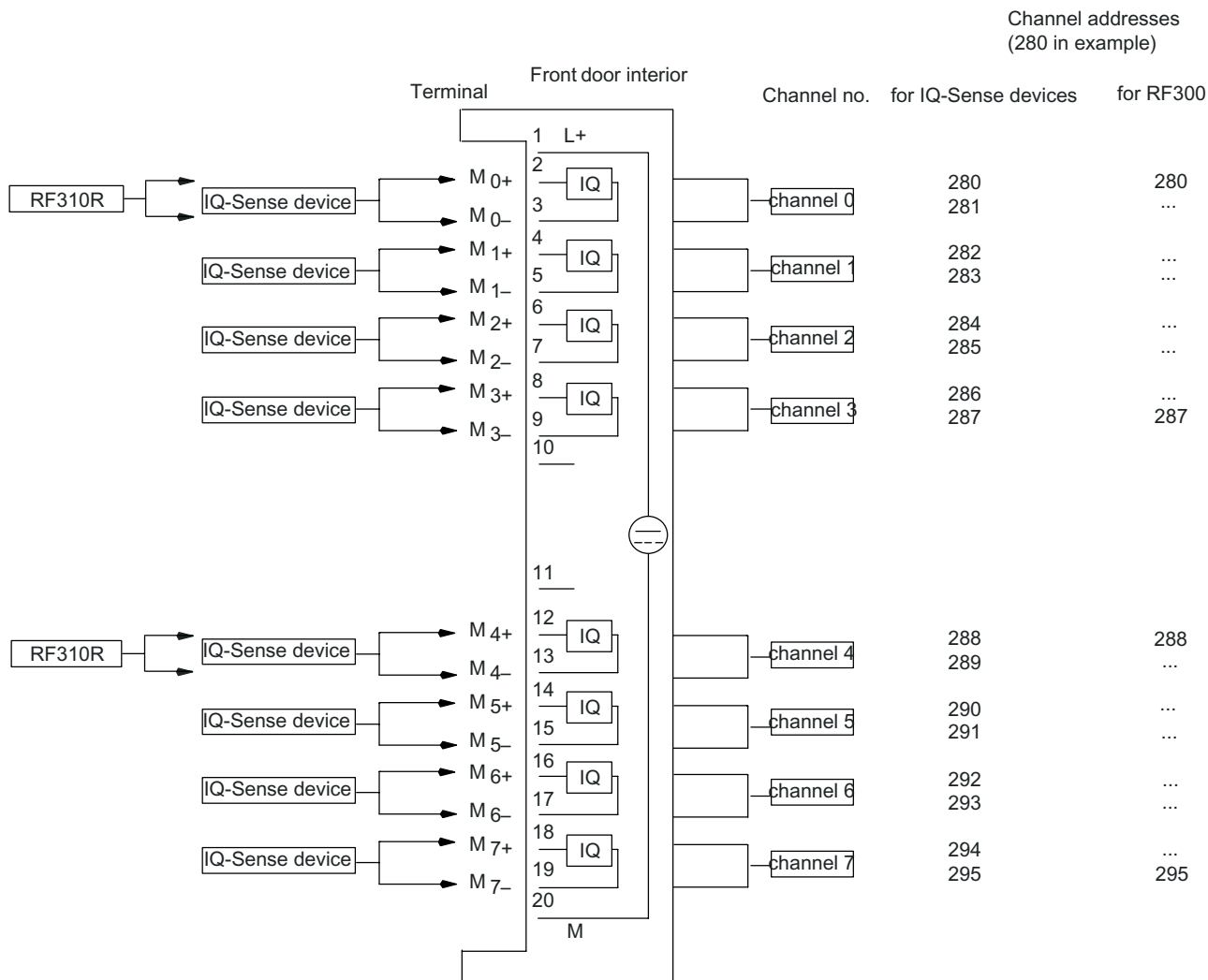


Figure 8-28 8xIQ-Sense module: Assignment of terminal pair to memory area

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.

8.8.6 Technical data

Voltages and currents	
Rated supply voltage	24 V DC
Reverse polarity protection	yes
Galvanic isolation	
<ul style="list-style-type: none"> • Between the channels • Between channels and backplane bus 	no yes
Permissible potential difference	
Between different circuits	75 V DC / 60 V AC
Insulation tested at	500 V DC
Current input	
<ul style="list-style-type: none"> • from the backplane bus • from L+ power supply 	120 mA typical 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

System diagnostics

9.1 Error codes

Error codes of the RF300 readers

Flashing of red LED on reader	Error code (hexadecimal)	Description
00	00	no error
02	01	Presence error, possible causes: <ul style="list-style-type: none"> • The active command was not carried out completely • The tag has left the field while the command is being processed • Communication fault between reader and tag
05	05	Parameterization error, possible causes: <ul style="list-style-type: none"> • Unknown command • Incorrect parameter • Function not allowed
06	06	Air interface faulty
12	0C	The tag memory cannot be written, possible causes: <ul style="list-style-type: none"> • Hardware fault (memory faulty) • Memory write-protected (corresponding OTP area has already been written)
13	0D	Error in the specified memory address (access attempted to non-existent or non-accessible memory areas).
19	13	Buffer overflow: Insufficient buffer available in the reader for saving the command
20	14	Major system fault (hardware fault)
21	15	Parameter assignment error: faulty parameter in RESET command
25	19	Previous command is still active
28	1C	Antenna is already switched off/Antenna is already switched on
30	1E	Incorrect number of characters in frame
31	1F	Running command cancelled by "RESET" command

9.2 Diagnostics functions

9.2.1 Overview

Extended diagnostic functions with SIMATIC RF300

With SIMATIC RF300, extended diagnostic functions are available which simplify commissioning and maintenance.

These diagnostics data are accessed using the SIMATIC function blocks via the SLG STATUS and MDS STATUS commands. These two commands can each be called in various modes (subcommands) for which corresponding data structures (UDTs) are defined.

Table 9- 1 In RF300 mode

Command	Mode (subcommand)	Meaning
SLG status	01	Hardware and firmware configuration, parameterization status
	06	Communication error counter, current command status
MDS status	01	Serial number of the tag (UID), memory configuration EEPROM write-protection status
	02	Serial number of the tag (UID), HF field strength value, communication error counter, presence counter (duration)

Overview of the diagnostic functions

Table 9- 2 In ISO mode

Command	Mode (subcommand)	Meaning
SLG status	01	Hardware and firmware configuration, parameterization status
MDS status	03	Serial number of the tag (UID), recognized tag type in the field (number = tag - type, see reset parameter "ftim"), memory configuration, write protect status (OTP), size and number of blocks in the user memory

9.2.2 Reader diagnostics with SLG STATUS

The SLG STATUS command can be used to scan the status and diagnostics data of the reader.

SLG STATUS (mode 01), UDT110

HW	ASCII	Type of hardware (31 to 38 hex)	
HW-V	Binary value	HW version 0 to FF hex 0 to FF hex	= Version (high byte): Unused = Version (low byte)
Url-V	Binary value	Version of loader 0 to FF hex 0 to FF hex	= Version (high byte) = Version (low byte)
FW	ASCII format	Type of firmware	
FW-V	Binary value	Firmware version 0 to FF hex 0 to FF hex	= Version (high byte) = Version (low byte)
TR	Binary value	Type of driver	"1" = 3964R
TR-V	Binary value	Version of driver 0 to FF hex 0 to FF hex	= Version (high byte) = Version (low byte)
SS	Binary value	RS232 / RS422 01 hex	= RS422
Baud	Binary value	Baud rate 01 hex 03 hex 05 hex	= 19.2 Kbaud = 57.6 Kbaud = 115,2 Kbaud
dili	Binary value	This variable is only provided for the RF380R. This gives the user the capability of checking the actual output power that is set, i.e. an incorrect value in the parameter "dili" of the RESET message frame would lead to the default setting of "05", which would be displayed in the read/write device status.	
		The following values are possible:	Meaning
		02 hex	0.5 W
		03 hex	0.75 W
		04 hex	1,0
		05 hex	1.25 W (default)
		06 hex	1.5 W
		07 hex	1.75 W
08 hex	2.0 W		

mtag	Binary value	Number of MDSes (Multitag/Bulk) that can be processed in the antenna field	= 1 with single-tag mode (param = 0x05, 0x25)
ftim	Binary value	00 hex 01 hex 03 hex 04 hex 05 hex 06 hex 07 hex	RF300 transponder ISO transponder (for ISO mixed operation) ISO my-d (Infineon SRF 55V10P) ISO (Fujitsu MB89R118) ISO I-Code SLI (Philips SL2 ICS20) Tag-it HFI (Texas Instruments) ISO (ST LRI2K)
ANT	Binary value	Status of antenna 01 hex 02 hex	= Antenna On = Antenna Off
ANW	Binary value	Presence mode 0 01 hex	= Operation without presence = Operation with presence (see ANW-MELD signal)

SLG STATUS (mode 06), UDT280

FZP	Binary value	0 ... 255	= Error counter, passive (errors during idle time)
ABZ	Binary value	0 ... 255	= Abort counter
CFZ	Binary value	0 ... 255	= Code error counter
SFZ	Binary value	0 ... 255	= Signature error counter
CRCFZ	Binary value	0 ... 255	= CRC error counter
BSTAT	Binary value	0 ... 255	= Current command status
ASMFZ	Binary value	0 ... 255	= Interface problems to host (ASM/PC) parity, BCC, frame error

Note

All counter values are reset after reading (= SLG STATUS command executed).

Explanations:

- "FZP": Counts interference pulses when communication is not taking place with a transponder. (e.g. EMC interference caused by contactors, motors, etc.). Counter values can also be generated when a tag is located at the edge of the field even when there is no external interference.
- "ABZ", "CFZ", "SFZ" and "CRCFZ" are protocol error counters that can be generated during reader/tag communication. This can be caused by unsuitable reader/tag positioning (e.g. tag on field boundary, several data carriers in the field) or external electromagnetic interference.

To ensure clear diagnosis of the quality of communication, it is recommended that an SLG STATUS command (mode 06) is executed following receipt of the presence command to reset the error counter.

The protocol error counters are not mutually independent. If a code error (CFZ) occurs, this will cause a secondary signature (SFZ) or CRC (CRCFZ) error.

- "BSTAT" is the status for the most recently executed command. A value other than 0 means that the previous command was repeated by the reader due to faults (see above).
- "ASMFZ" signals line-conducted communication interference between the communication module (ASM) and the reader. Faults of this type can be caused by contact problems on the connector or the cable connection.

9.2.3 Transponder diagnostics with MDS STATUS

The MDS STATUS command can be used to scan the status and diagnostics data of the transponder that is located within the antenna field.

MDS STATUS (mode 01), UDT260

UID	Binary value	0 ... $2^{64} - 1$	= b0-31: 4 byte TAG ID, b32-63: 0
MDS type	Binary value	0x01	= Transponder without FRAM
		0x02	= Transponder with FRAM 8 KB
		0x03	= Transponder with FRAM 32 KB
Lock STATUS	Binary value	0 ... 255	= Content of lock-bit register (EEPROM addr. 0xFF18)

MDS STATUS (mode 02), UDT270

LFD	Binary value	0 ... 255	= Value for field strength
FZP	Binary value	0 ... 255	= Error counter (passive) → errors during idle time
FZA	Binary value	0 ... 255	= Error counter (active)
ANWZ	Binary value	0 ... 255	= Presence counter

Note

All counter values are reset when the tag exits the field or when the antenna is switched off.

Notes:

- "LFD" is a value for the field strength that is determined in the transponder. The lower the value, the higher the field strength. A setpoint of **< 28 hex** signals reliable data transfer.
- "FZP" counts fault pulses when communication with a transponder is not taking place (e.g. electromagnetic interference caused by contactors, motors, etc.). Counter values can also be generated when a transponder is located at the edge of the field even when there is no external interference.
- "FZA" counts errors that can occur during reader-to-transponder communication. This can be caused by unsuitable reader/transponder positioning (e.g. transponder on field boundary, several data carriers in the field) or external electromagnetic interference.
- "ANWZ" is the value for the time that the transponder remains in the field before the MDS STATUS command (mode 02) is executed. A time step is 10 ms. The maximum time that can be recorded is therefore 2.5 s.

MDS-STATUS for ISO mode (mode 03) UDT230

Table 9- 3 MDS STATUS for ISO mode


UID	Binary value	0...2 ⁶⁴ -1	8 byte TAG-ID, MSB first
MDS type	Binary value	0...255	Tag type recognized in the field, number like that in reset parameter ftim
IC_version	Binary value	0...255	Chip version (for my-d = 00h)
Size	Binary value	0...65535	Memory size in bytes
lock_state	Binary value	0...255	Lock status, OTP information: per block (4 x 4 bytes or 2 x 8 bytes) one bit (bit = 1: block is locked)
block_size	Binary value	0...255	Block size of the transponder
nr_of_blocks	Binary value	0...255	Number of blocks

Table 9- 4 MDS STATUS for ISO mode - Explanations

MDS type	In this parameter, the tag type that is actually processed is reported to the user, e.g. <ul style="list-style-type: none"> • 03 = ISO my-d (Infineon SRF 55V10P) • 04 = ISO (Fujitsu MB89R118) • 05 = ISO I Code SLI (Philips SL2 ICS20) • 06 = ISO Tag-it HFI (Texas Instruments) • 07 = ISO (ST LRI2K)
Size	Depending on tag type, e.g. my-d: 992 bytes
lock_state	e.g. <ul style="list-style-type: none"> • 01 = Block 1 of address FF80 - FF83 is locked or • 03 = Block 1 and 2 of address FF80 - FF87 are locked, e.g. for the Philips SL2 ICS20 (MDS D124, D160 or D100). This chip provides a usable memory (112 bytes EEPROM) from address 0000 - 006F (total OTP area 0060 - 006F). In this memory, the locked area corresponds to the addresses 0060 - 0063 or 0060 - 0067
block_size	Depending on tag type, e.g. my-d: 4 bytes
nr_of_blocks	Depending on tag type, e.g. my-d: 248

Appendix

A.1 Certificates and approvals

Certificate	Description
	CE Approval to R&TTE

A.1.1 Certificates and Approvals

Notes on CE marking

The following applies to the system described in this documentation:
The CE marking on a device is indicative of the corresponding approval:

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:	
	Underwriters Laboratories (UL) per UL 60950 (I.T.E) or per UL 508 (IND.CONT.EQ)
	Underwriters Laboratories (UL) according to Canadian standard C22.2 No. 60950 (I.T.E) or C22.2 No. 142 (IND.CONT.EQ)
	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 recognition mark
	Canadian Standard Association (CSA) per Standard C22.2. No. 60950 (LR 81690) or per C22.2 No. 142 (LR 63533)
	Canadian Standard Association (CSA) per American Standard UL 60950 (LR 81690) or per UL 508 (LR 63533)

USA	
Federal Communications Commission 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	
Canada Notice	This Class A digital apparatus complies with Canadian ICES-003.
Avis Canadien	Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

A.2 Accessories

CD "RFID Systems Software & Documentation"

The CD contains:

- FB/FC for SIMATIC, 3964R
- Driver for DOS/Windows 95/NT/2000/XP
- C libraries
- PC demonstration program
- RFID documentation in PDF format, especially RFID system manuals, programming instructions and operating instructions

The "RFID Systems Software & Documentation" CD has a user-friendly interface based on HTML. After Start.exe has been called, a window for selecting the RFID system appears:

- RF300
- RF600
- RF-MANAGER
- MOBY
- CM/ASM

After selecting the RFID system, you can navigate to the required information.

Product	Order number
CD "RFID Systems Software & Documentation"	6GT2 080-2AA10

Note

Notes on "RFID system software" and licensing

When purchasing a communication module or an interface module, no software or documentation is supplied. The "RFID Systems Software & Documentation" CD-ROM contains all available FBs/FCs for the SIMATIC, C libraries, 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 a communication module or an interface module includes a payment for the use of the software, including documentation, on the "RFID Systems Software & Documentation" 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.

A.3 Connecting cable

In the following chapter, you will find an overview of the connecting cables between the readers and communication modules or PCs.

A.3.1 Reader RF3xxR (RS422) with ASM 452/ASM 473

A reader always occupies two M12 connection sockets on the ASM 452/ASM 473. A pre-assembled cable therefore ensures easy connection of the reader (see figure below). The connecting cable has a length of 2 m (standard) and 5 m. Extensions up to 1000 m are possible with the 6GT2891-0F plug-in cables.

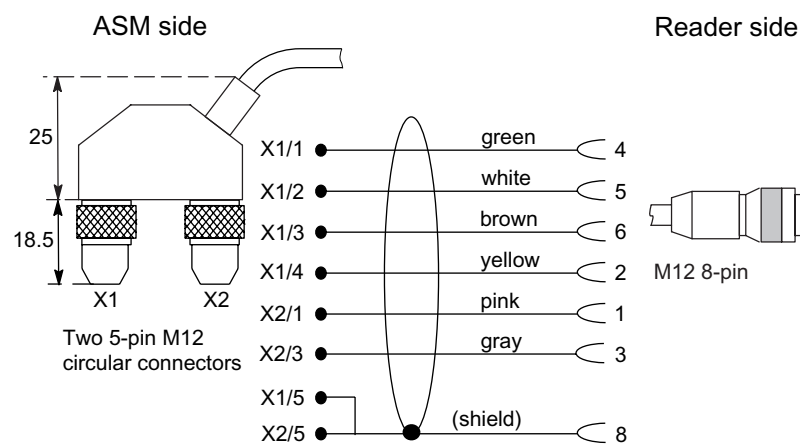


Figure A-1 Connecting cable between ASM 452/473 and RF3xxR reader with RS422 (6GT2891-1CH20)

A.3.2 Reader RF3xxR (RS422) with ASM 456/RF170C/RF180C

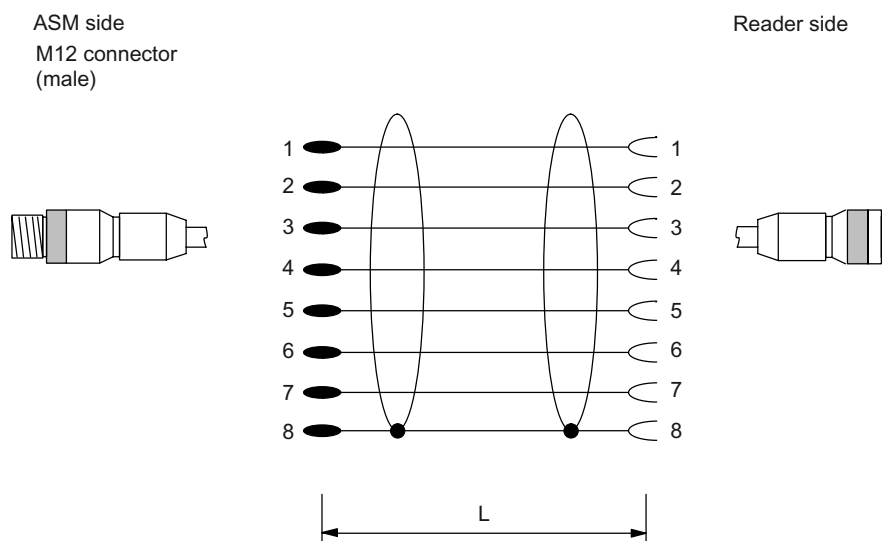


Figure A-2 Connecting cable between ASM 456, RF170C, RF180C and reader RF3xxR (RS422)

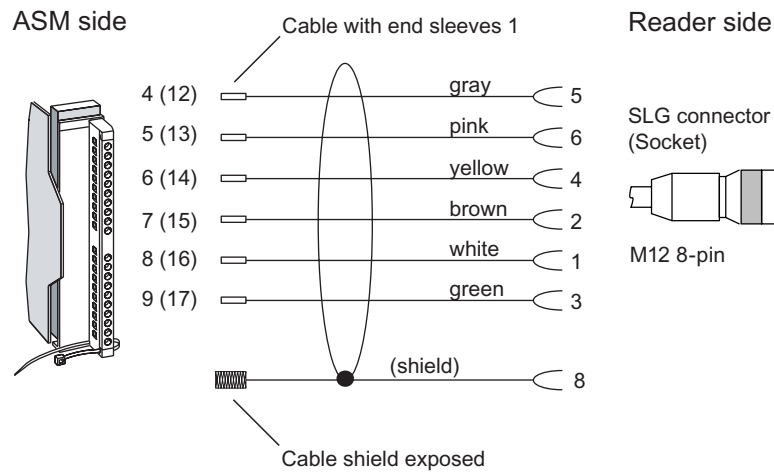
Table A- 1 Ordering data

Length L	Order number
2 m	6GT2891-0FH20
5 m	6GT2891-0FH50
10 m	6GT2891-0FN10
20 m	6GT2891-0FN20
50 m	6GT2891-0FN50

A.3.3 Reader RF3xxR (RS422) with ASM 475

Reader connection system

The connecting cable has a length of 2 m (standard) and 5 m. Extensions up to 1000 m are possible with the 6GT2891-0F plug-in cables.



¹ 6GT2891-0E... with straight SLG connector (standard)

Figure A-3 Installation of connecting cable between ASM 475 and RF300 reader with RS 422

A.3.4 RF310R and IQ-Sense

The connecting cable is available in lengths of 5 m (standard) and 10 m.

IQ-Sense-Seite

Reader-Seite

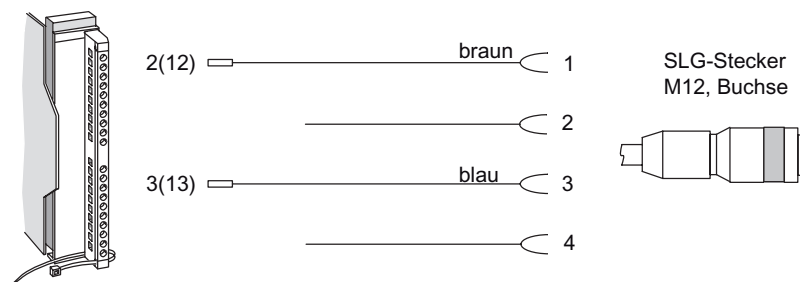


Figure A-4 Configuration of connecting cable from 8xIQ-Sense to RF310R

Length	Order number
5 m	3RX8000-0CB42-1AF0
10 m	3RX8000-0CB42-1AL0

A.3.5 Reader RF380R (RS232) - PC

The connecting cable (6GT2891-OKH50) is 5 m long

Special feature of the cable: additional branch for the power supply.

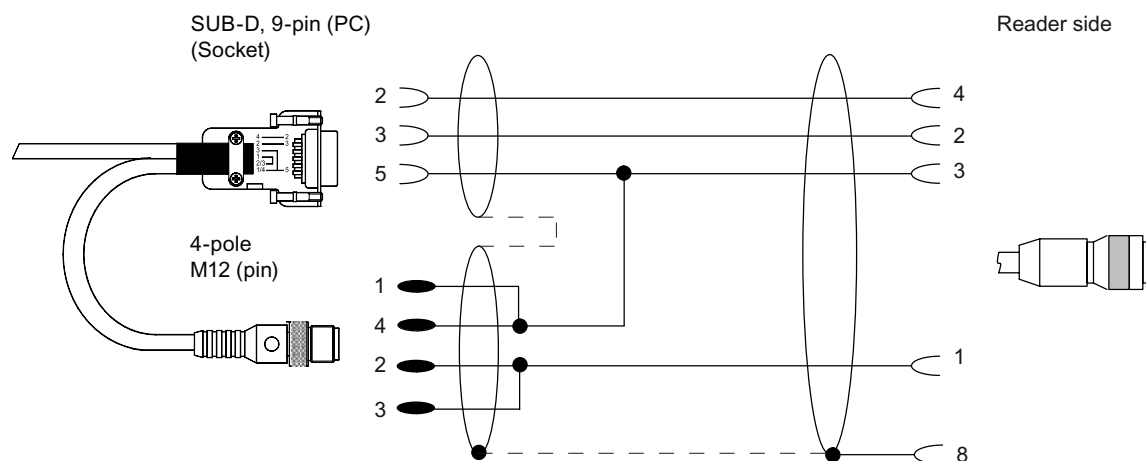


Figure A-5 Connecting cable RF380R (RS232) to the PC

Suitable power supply unit: e.g. wide-range power supply unit

Table A- 2 Ordering data for wide-range power supply unit

Wide-range power supply unit for SIMATIC RF-systems (100 - 240 V AC / 24 V DC / 3 A) with 2 m connecting cable with country-specific plug	EU: 6GT2898-0AA00 UK: 6GT2898-0AA10 US: 6GT2898-0AA20
---	---

A.4 Ordering data

RF300 components

Table A- 3 RF300 reader

Readers	Description	Order number
RF310R (IQ-Sense)	<ul style="list-style-type: none"> • With IQ-Sense interface • IP67 • Operating temperature: -25 °C to +70 °C • Dimensions: 55 x 75 x 30 (L x W x H, in mm) • with integrated antenna 	6GT2801-0AA00
RF310R (RS422)	<ul style="list-style-type: none"> • With RS422 interface (3964R) • IP67 • Operating temperature: -25 °C to +70 °C • Dimensions: 55 x 75 x 30 (L x W x H, in mm) • with integrated antenna • ISO 15693 compatible 	6GT2801-1AB10
RF340R	<ul style="list-style-type: none"> • With RS422 interface (3964R) • IP67 • Operating temperature -25 °C ... +70 °C • Dimensions 75 x 91 x 41 (L x W x H in mm) • with integrated antenna 	6GT2801-2AA10
RF350R	<ul style="list-style-type: none"> • With RS422 interface (3964R) • IP65 • Operating temperature: -25 °C ... +70 °C • Dimensions: 75 x 96 x 41 (L x W x H, in mm) • For pluggable antennas ANT 1, ANT 18, ANT 30 	6GT2801-4AA10
RF380R	<ul style="list-style-type: none"> • With RS422 interface (3964R) • IP67 • Operating temperature: -25 °C ... +70 °C • Dimensions: 160 x 96 x 40 (L x W x H, in mm) • with integrated antenna • ISO 15693 compatible 	6GT2801-3AB10

Table A- 4 Antennae

Antenna	Description	Order number
ANT 1	<ul style="list-style-type: none"> • IP67 • Operating temperature: -25 °C to +70 °C • Dimensions: 75 x 75 x 20 (L x W x H, in mm) 	6GT2398-1CB00
ANT 18	<ul style="list-style-type: none"> • IP67 (front) • Operating temperature -25 °C to +70 °C • Dimensions: M18 x 50 (Ø x L in mm) 	6GT2398-1CA00
ANT 30	<ul style="list-style-type: none"> • IP67 (front) • Operating temperature -25 °C to +70 °C • Dimensions: M30 x 58 (Ø x L in mm) 	6GT2398-1CD00

Table A- 5 RF300 transponder

RF300 transponder	Description	Order number
RF320T	<ul style="list-style-type: none"> • IP67 • Memory size: 20 byte EEPROM • Operating temperature: -25 °C to +85 °C • Dimensions: 27 mm x 4 mm (Ø x H in mm) 	6GT2800-1CA00
RF340T	<ul style="list-style-type: none"> • IP68 • Memory size: 8 KB FRAM • Operating temperature: -25 °C to +85 °C • Dimensions: 48 x 25 x 15 (L x W x H, in mm) 	6GT2800-4BB00
RF350T	<ul style="list-style-type: none"> • IP68 • Memory size: 32 KB FRAM (read/write) and 4 byte EEPROM (read only) • Operating temperature: -25 °C ... +85 °C • Dimensions: 50 x 50 x 20 (L x W x H, in mm) 	6GT2800-5BD00
RF360T	<ul style="list-style-type: none"> • IP67 • Memory size: 8 KB FRAM (read/write) and 4 byte EEPROM (read only) • Operating temperature: -25 °C ... +75 °C • Dimensions: 85.8 x 54.8 x 2.5 (L x W x H, in mm) 	6GT2800-4AC00
RF370T (32 KB FRAM)	<ul style="list-style-type: none"> • IP68 • Memory size: 32 KB FRAM • Operating temperature: -25 to +85 °C • Dimensions: 75 x 75 x 40 (L x W x H, in mm) 	6GT2800-5BE00
RF370T (64 KB FRAM)	<ul style="list-style-type: none"> • IP68 • Memory size: 64 KB FRAM • Operating temperature: -25 °C to +85 °C • Dimensions: 75 x 75 x 40 (L x W x H, in mm) 	6GT2800-6BE00
RF380T	<ul style="list-style-type: none"> • IP68 • Memory size 32 KB FRAM (read/write) and 4 byte EEPROM • Operating temperature -25 ... +200 °C (cyclic) • Dimensions: 114 x 83 (Ø x H in mm) 	6GT2800-5DA00

Table A- 6 ISO transponder

ISO transponder	Description	Order number
MDS D100	<ul style="list-style-type: none"> • IP68 • Memory size: 112 byte EEPROM • Operating temperature: -25 ... +80 °C • Dimensions: 85.6 x 54 x 0.9 (L x W x H, in mm) • ISO card 	6GT2600-0AD10
MDS D124	<ul style="list-style-type: none"> • IP67 • Memory size: 112 byte EEPROM user memory • Operating temperature: -25 ... +125 °C • Dimensions: 27 mm x 4 mm (Ø x H in mm) 	6GT2600-0AC00
MDS D139	<ul style="list-style-type: none"> • IP68 • Memory size: 112-byte user memory • Operating temperature: up to +200 °C/+220 °C [heat-resistant (r/w)] • Dimensions: 85 x 15 (Ø x H in mm) 	6GT2600-0AA10
MDS D160	<ul style="list-style-type: none"> • IP68 (24 hours, 2 m, +20 °C) • Memory size: 112 byte user memory • Operating temperature: -25 °C...+70 °C • Dimensions: 16 x 3 ±0.1 (Ø x H in mm) • Laundry tag for cyclical applications (r/w) 	6GT2600-0AB10
MDS D324	<ul style="list-style-type: none"> • IP67 • Memory size: 992 byte EEPROM user memory • Operating temperature: -25 °C...+125 °C • Dimensions: 27 x 4 (Ø x H in mm) 	6GT2600-3AC00

Table A- 7 Communication modules/interface modules

ASM/ communication module	Description	Order number
ASM 452	<ul style="list-style-type: none"> for PROFIBUS DP-V1, 1x RF3xxR with RS422 interface without connector for 24 V DC and PROFIBUS 	6GT2002-0EB20
ASM 456	<ul style="list-style-type: none"> for PROFIBUS DP-V1 For connecting as many as 2 readers 	6GT2002-0ED00
ASM 473	1x RF3xxR reader with RS422 can be connected	6GT2002-0HA10
ASM 475	<ul style="list-style-type: none"> For SIMATIC S7 2 x readers RF3xxR with RS422 can be connected in parallel without a front connector 	6GT2002-0GA10
RF170C	Communication module, 1 unit	6GT2002-0HD00
	Connection module, 1 unit	6GT2002-1HD00
RF180C	RF180C communication module max. 2 SLGs or readers can be connected	6GT2002-0JD00
	Connection block M12, 7/8" PN	6GT2002-1JD00
	Push-pull connection block, RJ45	6GT2002-2JD00
8xIQ-Sense	<ul style="list-style-type: none"> IQ-Sense SM338 for S7-300 and ET200M for the connection of up to 8xIQ-Sense sensors Optical sensors, ultrasonic sensors and RF identification systems can be connected. 	6ES7 3387XF000AB0

Accessories

Table A- 8 Accessories for RF300 reader

Readers	Accessories	Order number
RF380R	Connecting cable RS232 to PC	6GT2891-0KH50

Table A- 9 Accessories for RF300 tags

Tag	Accessories	Order number
RF360T	Spacers	6GT2190-0AA00
	Fixing pocket	6GT2190-0AB00
RF380T	Holder (short version)	6GT2090-0QA00
	Holder (long version)	6GT2090-0QA00-0AX3
	Covering hood	6GT2090-0QB00
	Universal holder	6GT2590-0QA00

Table A- 10 Accessories for ISO tags

MDS	Accessories	Order number
MDS D100	Spacers	6GT2190-0AA00
	Fixing pocket	6GT2190-0AB00
	Fixing pocket (cannot be mounted directly on metal)	6GT2390-0AA00
MDS D139	Spacer [85 mm x 30 mm (Ø x H in mm)]	6GT2690-0AA00

Table A- 11 Connecting cable accessory - ASM/communication module to reader

ASM - Reader	Description	Order number
ASM 452/ ASM 473 and reader RF3xxR with RS422	Length	
	2 m	6GT2891-1CH20
	5 m	6GT2891-1CH50
ASM 456/RF170C/ RF180C and reader RF3xxR (RS422)	Length	
	2 m	6GT2891-0FH20
	5 m	6GT2891-0FH50
	10 m	6GT2891-0FN10
	20 m	6GT2891-0FN20
	50 m	6GT2891-0FN50
ASM 475 and reader RF3xxR (RS422)	Length	
	2 m	6GT2891-0EH20
	5 m	6GT2891-0EH50
8xIQ-Sense and RF310R	Length	
	5 m	3RX8000-0CB42-1AF0
	10 m	3RX8000-0CB42-1AL0

Table A- 12 RFID accessories, general

RFID accessories, general	Order number
CD "RFID Systems Software & Documentation"	6GT2 080-2AA10
Wide-range power supply unit for SIMATIC RF systems (100 - 240 V AC/24 V DC/3 A) with 2 m plug-in cable with country-specific connector	EU: 6GT2898 0AA00 UK: 6GT2898 0AA10 US: 6GT2898 0AA20

A.5 Service & Support

Contact partner

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 (www.siemens.com/automation/partner)
- In Catalog CA 01
- In Catalog FS 10 specially for factory automation sensors

Technical Support

You can access technical support for all IA/DT projects via the following:

- Phone: + 49 (0) 180 5050 222
(€ 0.14 /min. from the German landline network, deviating mobile communications prices are possible)
- E-mail (support.automation@siemens.com)
- Internet: Online support request form: (www.siemens.com/automation/support-request)

Service & support for industrial automation and drive technologies

You can find various services on the Support homepage (www.siemens.com/automation/service&support) of IA/DT on the Internet.

There you will find the following information, for example:

- Our newsletter containing up-to-date information on your products.
- Relevant documentation for your application, which you can access via the search function in "Product Support".
- A forum for global information exchange by users and specialists.
- Your local contact for IA/DT on site.
- Information about on-site service, repairs, and spare parts. Much more can be found under "Our service product range".

RFID homepage

For general information about our identification systems, visit RFID homepage (www.siemens.com/simatic-sensors/rf).

Technical documentation on the Internet

A guide to the technical documentation for the various products and systems is available on the Internet:

SIMATIC Guide manuals (www.siemens.com/simatic-tech-doku-portal)

Online catalog and ordering system

The online catalog and the online ordering system can also be found on the A&D Mall homepage. (www.siemens.com/automation/mall)

Training center

We offer appropriate courses to get you started. Please contact your local training center or the central training center in

D-90327 Nuremberg.

Phone: +49 (0) 180 523 56 11

(€ 0.14 /min. from the German landline network, deviating mobile communications prices are possible)

For information about courses, see the SITRAIN homepage (www.sitrain.com).

Glossary

Active surface

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.

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 storage unit

Mobile data storage units which operate without batteries. Power is supplied to the data storage unit across an electromagnetic alternating field.

Byte

A group of eight bits forms a byte

CE marking

Communauté Européenne (product mark of the European Union)

Communication modules

Communication modules are used to integrate the MOBY identification systems in SIMATIC or SINUMERIK systems, or to connect them to PROFIBUS, PCs or any other system. Once supplied with the corresponding parameters and data, they handle data communication. They then make the corresponding results and data available. Suitable software blocks (FB/FC for SIMATIC; C libraries for PCs with Windows) ensure easy and fast integration in the application.

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.

EMC Directive

Guidelines for electromagnetic compatibility This guideline relates to any electrical or electronic equipment, plant or system containing electric or electronic components.

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

Frequency hopping technique 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.

Interface modules (ASM)

See communication modules

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.

L_x

Length of a transmission window in the x direction

L_y

Length of a transmission window in the y direction

M

Centerpoint of a field of a transmission window

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 storage units (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 logic controllers (PLC) of the SIMATIC S5 system 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

Readers

Readers ensure fast, secure data transfer between mobile data storage units and higher-level systems (PLCs, PCs, etc.). The data, energy included, are transmitted inductively across an electromagnetic alternating field or by radio. This principle enables contact-free data transmission, ensures high industrial compatibility and works reliably in the presence of contamination or through non-metallic materials.

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 above the read/write device.

Tag

See transponder

Telegram cycles

The transfer of a read or write command takes place in three cycles, known as message frame 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 storage unit)

Transmission window

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

Transponder

An invented word from transmitter and responder. Transponders are used on the product, the product carrier, the object, or its transport or packaging unit, and contain production and manufacturing data, i.e. all application-specific data. They follow the product through assembly lines, transfer and production lines and are used to control material flow.

Because of their wireless design, transponders can be used, if necessary, at individual work locations or manufacturing stations, where their data can be read and updated.

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

If a transponder moves into the transmission window 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 logic, which also manages the various memories.

Index

8

- 8xIQ-Sense module
 - Addressing, 231
 - Indicators, 228
 - Ordering data, 228

A

- Antennae
 - Minimum clearances, 117
- Application Planning
 - SIMATIC RF300, 29
- Approvals, 243
- ASM 452
 - Configuration, 200
 - Indicators, 199
 - Operating mode, 201
 - Ordering data, 198
 - Pin assignments, 199
 - PROFIBUS address and terminating resistor, 203
 - PROFIBUS configuration, 200
 - Reader connection system, 201
- ASM 473
 - Design and function, 208
 - Dimensions, 216
 - Features, 208
 - Hardware configuration, 213
 - Maximum configuration of an ET 200X, 213
 - Notes on operation, 212
 - Ordering data, 209
 - Pin assignments, 210
 - Reader connection system, 214
 - Technical specifications, 215
- ASM 475
 - Assignment for connecting cable, 222, 249
 - Cable installation, 223
 - Design and function, 217
 - Function of the LEDs, 220
 - Indicators, 220
 - Ordering data, 218
 - Pin assignment, 222, 249
 - Status display with LEDs, 220

C

- Cabinet configuration, 85
- Cable, 247
 - Reader - ASM, 247
 - Shielding, 90
- Calculation example, 42
- Certificates, 243
- Combinations
 - Reader-tag, 20
- Communication modules, 19, 195
- Communication time
 - Calculating, 40
- Connecting cable
 - Reader-communication module/ASM/PC, 247
- Contact partner, 259
- Conventions, 12, 22
- Coupling paths, 84
- Courses, 260
- Customer benefits, 22

D

- Data transmission rate
 - MDS D100, 56
 - MDS D124, 57
 - MDS D139, 58
 - MDS D160, 59
 - MDS D324, 60
 - RF320T, 50
 - RF340T, 51
 - RF350T, 52
 - RF360T, 53
 - RF370T, 54
 - RF380T, 55
- Design
 - System Manual, 11
- Detection area, 37
- Diagnostic functions
 - SIMATIC RF300, 236
 - Transponder, 240
- Direction of motion
 - Transponder, 37
- Display elements
 - RF310R reader with IQ-Sense interface, 95

- RF310R reader with RS422 interface, 100, 105, 110, 122
- RF340R reader, 105
- RF350R reader, 110, 122
- Dwell time
 - Transponder, 39
- Dynamic mode, 38
 - Dwell time of the transponder, 39

E

- Electromagnetic compatibility
 - Coupling paths, 84
- Electromagnetic interference, 82
- EMC Directives
 - Propagation of electromagnetic interference, 82
- EMC Guidelines, 245
 - Avoiding interference, 88
 - Basic Rules, 81
 - Cabinet configuration, 85
 - Cable shielding, 90
 - Definition, 80
 - Equipotential bonding, 89
 - Overview, 79
- Equipotential bonding, 89
- Error codes
 - Readers, 235

F

- FC 45, 236
- Features of ASM 452 interface module
 - Area of application, 197
- Field data
 - RF310R reader, 47
 - RF340R reader, 45
 - RF350R reader / ANT18, 45
 - RF350R reader / ANT30, 46
 - RF380R reader, 46, 47
- Fields of application, 22
- Fixing pocket
 - for MDS D100, 172
- Flush-mounting
 - of transponders and readers, 62

I

- Inductive alternating field, 29
- Input parameter, 195
- Installation
 - Several readers, 63

- Installation guidelines, 61
- Interface modules, 195
- Interference sources
 - Electromagnetic, 83
- IQ-Sense interface
 - Pin assignment, 95, 230
- ISO functionality, 93

L

- LEDs
 - For MOBY, 210
 - for PROFIBUS DP, 210

M

- Main applications, 22
- MDS D139
 - Dimensions, 185
- MDS STATUS, 236
- Memory configuration of the RF300 tags, 128
- Metal
 - Influence on the transmission window, 64
- Metal-free area
 - Reader RF310R, 96, 100
 - Reader RF340R, 106, 123
 - Transponder RF320T, 132
 - Transponder RF340T, 136
 - Transponder RF350T, 140
 - Transponder RF360T, 144
 - Transponder RF370T, 149
 - Transponder RF380T, 158
- Minimum clearances
 - Antenna to antenna, 117
- Minimum distance
 - Antenna to antenna, 49
 - Reader to reader, 48
 - Transponder to transponder, 48

O

- Ordering data, 252
 - 8xIQ-Sense module, 228
 - Antennae, 253
 - Interface modules/communication Modules, 256
 - Overview, 252
 - Readers, 252
 - RF300 transponder, 254
 - RF310R reader, 94
 - RF310R with IQ-Sense, 94

P

- Parameterization
 - Function blocks, 195
- PROFIBUS cable
 - Stripped lengths, 216

R

- Reader RF310R
 - Display elements, 95
 - Metal-free area, 96, 100
 - Pin assignment of IQ-Sense interface, 95
- Reader RF340R
 - Metal-free area, 106, 123
- Readers, 93
 - Mounting, 63
- Reducing interference due to metal, 61
- Reduction of field data by metal
 - RF340R, 66
 - RF350R with ANT 1, 67
 - RF350R with ANT 18, 68
 - RF350R with ANT 30, 69
 - RF380R, 65, 70, 71
- Resistance to chemicals
 - Transponder, 72
- RF300
 - SLG STATUS, 238
- RF300 system diagnostics
 - SLG-STATUS reader diagnostic functions XE *
 - MERGEFORMAT, 237
- RF310R reader, 94, 99, 109, 121
 - Characteristics, 94, 99, 109, 121
 - Minimum distance, 96, 101
 - Ordering data, 94
 - Pin assignment of IQ-Sense interface, 230
- RF340R reader, 104
 - Characteristics, 104
- RF340T
 - Characteristics, 135
- RF370T transponder/32 KB FRAM
 - Technical specifications, 151
- RFID systems
 - Overview, 17

S

- Selection criteria
 - SIMATIC RF300 components, 29
- Shielding, 90
- SIMATIC RF300
 - Diagnostic functions, 236

- Technical specifications, 27
- SLG STATUS, 236
- Spacers, 173
- Static mode, 37
 - Dwell time of the transponder, 39
- System diagnostics
 - MDS status, 240
 - Overview, 236
- System overview
 - RFID systems, 17

T

- Technical documentation
 - On the Internet, 260
- Technical specifications
 - RF370T transponder/32 KB FRAM, 151
 - SIMATIC RF300, 27
 - Transponder RF320T, 133
 - Transponder RF340T, 137
 - Transponder RF350T, 141, 146
 - Transponder RF360T, 146
- Technical Support, 259
- Time constants, 41
- Tolerance of pallet side transport, 43
- Tolerance of pallet transport height, 42
- Tracking
 - Tolerance, 34
- Tracking tolerances, 34
- Training, 260
- Transmission gaps, 44
- Transmission window
 - ANT18 and ANT30 (RF350R), 32
 - Impact of metal, 64
 - Reader RF340R, 31
 - RF310R reader and ANT1 (RF350R), 30
 - RF380R reader, 33
 - Width, 34
- Transponder
 - Detection area, 37
 - Directions of motion, 37
 - Dwell time, 39
 - Mounting on metal, 64
 - Resistance to chemicals, 72
- Transponder RF320T
 - Characteristics, 131
 - Metal-free area, 132
 - Technical specifications, 133
- Transponder RF340T
 - Characteristics, 135
 - Metal-free area, 136
 - Technical specifications, 137

- Transponder RF350T
 - Characteristics, 139
 - Metal-free area, 140
 - Technical specifications, 141
- Transponder RF360T
 - Characteristics, 143
 - Metal-free area, 144
 - Technical specifications, 146
- Transponder RF370T
 - Characteristics, 148
 - Metal-free area, 149
- Transponder RF380T
 - Metal-free area, 158

U

- User data
 - Calculate maximum number, 40
 - Calculating, 40

W

- Write/read distance, 29

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