


5.2 SIMATIC RF310R with IQ-Sense interface

5.2.1 Features

RF310R with IQ-Sense	Characteristics	
	Design	<ul style="list-style-type: none"> ① IQ-Sense interface ② Status display
	Field of application	Identification tasks on small assembly lines in harsh industrial environments
	Read/write distance to transponder	Max. 35 mm
	Data transmission rate	<ul style="list-style-type: none"> • Read: approx. 50 bytes/s • Write: approx. 40 bytes/s

Note

SIMATIC RF310R with IQ-Sense interface is not suitable for combining with ISO tags.

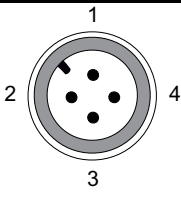
5.2.2 Ordering data of RF310R with IQ-Sense interface

RF310R	Order number
<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 • Max. limit distance: 35 mm (depending on transponder) 	6GT2801-0AA00

5.2.3 Pin assignment of RF310R IQ-Sense interface

Table 5- 1 Pin assignment of RF310R with IQ-Sense interface

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

Pin	Pin, device end, 4-pin M12	Assignment
	4	Not connected

5.2.4 Display elements of the RF310R reader with IQ-Sense interface

Color	Meaning
Green	Operating voltage available
yellow	Transponder present
Red	Error occurred (see FC35 documentation, Section "Error messages and troubleshooting", Subsection "Error messages, error_MOBY")

5.2.5 Ensuring reliable data exchange

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

5.2.6 Metal-free area

The RF310R can be flush-mounted in metal. Please allow for a possible reduction in the field data values.

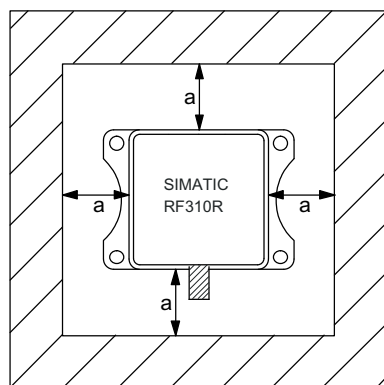


Figure 5-1 Metal-free area for RF310R

To avoid any impact on the field data, the distance a should be ≥ 20 mm.

5.2.7 Minimum distance between RF310R readers

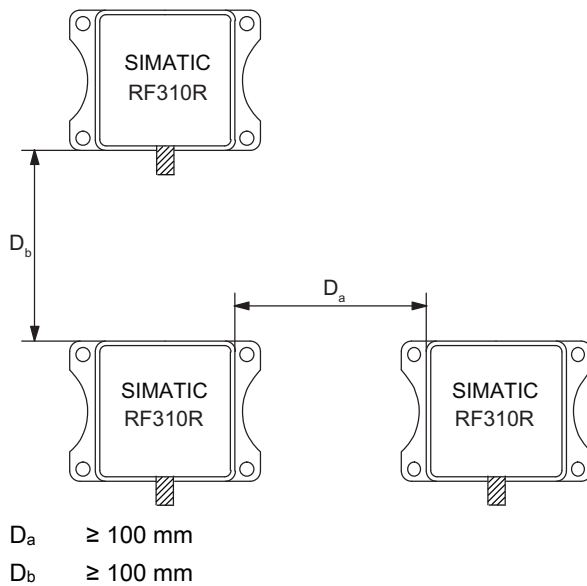


Figure 5-2 Minimum distance between RF310R readers

5.2.8 Technical data for RF310R reader with IQ-Sense interface

Table 5- 2 Technical specifications for RF310R reader with IQ-Sense interface

Inductive interface to the transponder	
Transmission frequency for power/data	13.56 MHz
Interface to SIMATIC S7-300	
Required master module	8-IQ-Sense (6ES7 338-7XF00-0AB0)
RFID channels (RF310R)	max. 2 per master module,
Mixed operation with other profiles	max. 4 Opto-BEROs, 1x SIMATIC RF310R
Cable length reader - communication module	Max. 50 m (unshielded cable)
Read/write distances of reader	See Chapter Field data of RF300 transponders (Page 41)
Minimum distance between two RF310R readers	$\geq 100 \text{ mm}$
Data transfer rate for read/write device	
Reading	Approx. 50 byte/s
Writing	Approx. 40 byte/s
Passing speed	
Reading	Approx. 0.8 m/s (2 bytes)
Writing	Approx. 0.8 m/s (2 bytes)
Function	Read, write, initialize transponder
Multi-tag	No
Power supply	via IQ-Sense master module 24 V DC

Display elements	2-color LED (operating voltage, presence, error)
Plug-in connector	M12 (4-pin)
Enclosure	
Dimensions (in mm)	55 x 75 x 30 (without M12 enclosure connector)
Color	Anthracite
Material	Plastic PA 12
Fixing	4 x M5 screws
Ambient temperature during operation	-25°C to +70°C
during transport and storage	-40°C to +85°C
Degree of protection to EN 60529	IP67
Shock to EN 60721-3-7 Class 7 M2	50 g
Vibration to EN 60721-3-7 Class 7 M2	20 g
Weight	Approx. 150 g
MTBF (Mean Time Between Failures) in years	153.5
Approvals	Radio to R&TTE guidelines EN 300 330, EN 301 489, CE, FCC, UL/CSA
Current consumption	Typ. 40 mA

5.2.9 FCC information

Siemens SIMATIC RF300 with IQ-Sense interface

FCC ID: NXW-RF310R-IQ

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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution

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

5.2.10 Dimension drawing

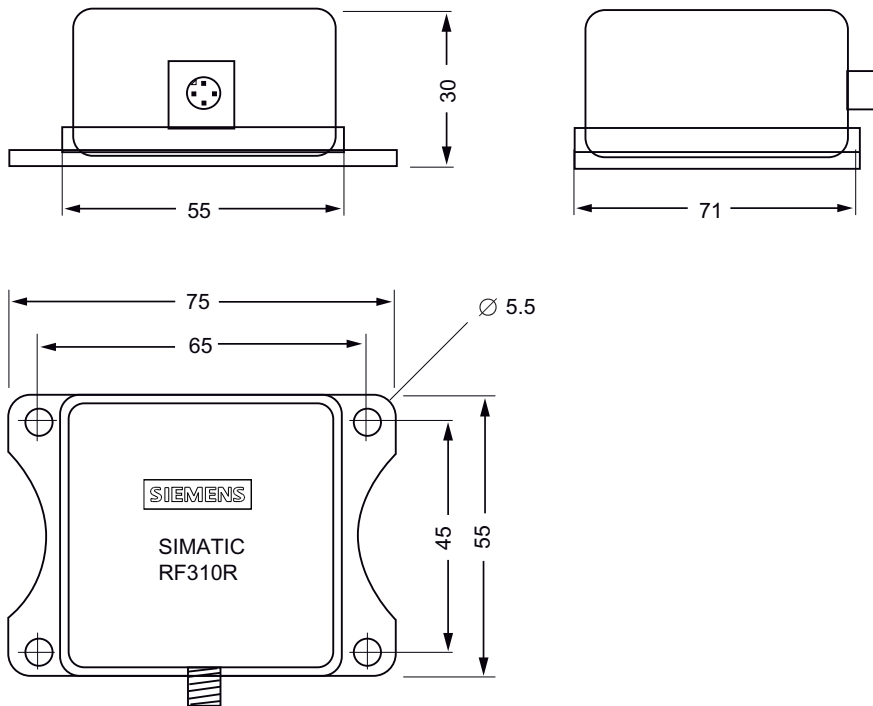



Figure 5-3 Dimension drawing for RF310R

Dimensions in mm

5.3 SIMATIC RF310R with RS422 interface

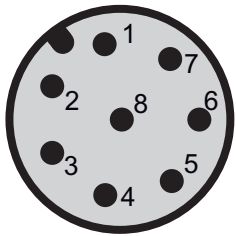
5.3.1 Features

RF310R with RS422	Characteristics						
	Design	① RS422 interface ② Status display					
	Field of application	Identification tasks on small assembly lines in harsh industrial environments					
	Read/write distance to transponder	Max. 90 mm					
	Data transmission rate	<table border="1" data-bbox="1031 1780 1444 1953"> <thead> <tr> <th data-bbox="1031 1780 1238 1818">RF300 tags</th> <th data-bbox="1238 1780 1444 1818">ISO tags</th> </tr> </thead> <tbody> <tr> <td data-bbox="1031 1818 1238 1879">Approx. 8000 byte/s</td> <td data-bbox="1238 1818 1444 1879">Approx. 600 byte/s</td> </tr> <tr> <td data-bbox="1031 1879 1238 1939">Approx. 8000 byte/s</td> <td data-bbox="1238 1879 1444 1939">Approx. 400 byte/s</td> </tr> </tbody> </table>	RF300 tags	ISO tags	Approx. 8000 byte/s	Approx. 600 byte/s	Approx. 8000 byte/s
RF300 tags	ISO tags						
Approx. 8000 byte/s	Approx. 600 byte/s						
Approx. 8000 byte/s	Approx. 400 byte/s						

5.3.2 Ordering data for RF310R with RS422 interface

RF310R	Order number
<ul style="list-style-type: none"> • With RS422 interface (3964R) • IP 67 • Operating temperature: -25 °C to +70 °C • Dimensions: 55 x 75 x 30 (L x W x H, in mm) • with integrated antenna • Max. limit distance: 35 mm (depending on transponder) 	6GT2801-1AB10

5.3.3 Pin assignment of RF310R RS422 interface

Pin	Pin Device end 8-pin M12	Assignment
	1	+ 24 V
	2	- Transmit
	3	0 V
	4	+ Transmit
	5	+ Receive
	6	- Receive
	7	Free
	8	Earth (shield)

5.3.4 Display elements of the RF310R reader with RS422 interface

Color	Meaning	
Green	Flashing	Operating voltage present, reader not initialized or antenna switched off
	Permanently on	Operating voltage present, reader initialized and antenna switched on
Yellow ¹⁾	Transponder present	
Flashing red	Error has occurred, the type of flashing corresponds to the error code in the table in Section "Error codes". The optical error display is only reset if the corresponding reset parameter ("option_1", see FC45 / FB45 documentation, Section "Input parameters") is set.	

¹⁾ Only in the "with presence" mode.

5.3.5 Ensuring reliable data exchange

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

5.3.6 Metal-free area

The RF310R can be flush-mounted in metal. Please allow for a possible reduction in the field data values.

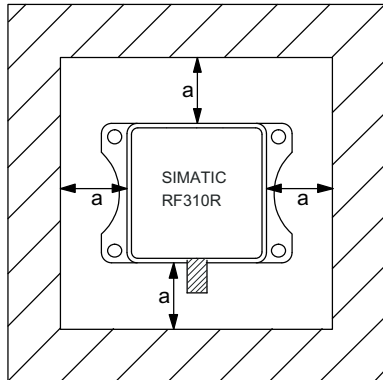
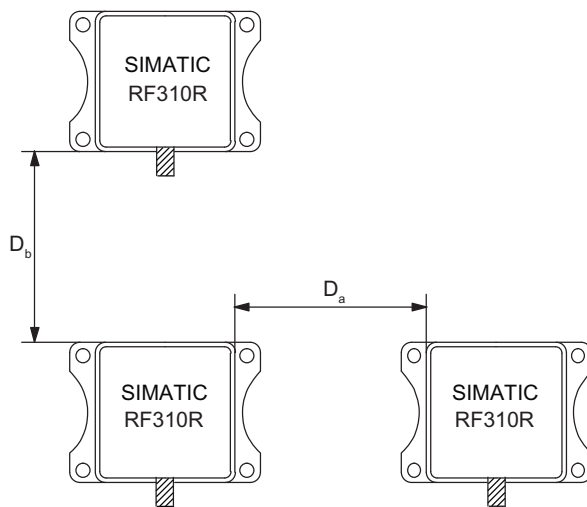


Figure 5-4 Metal-free area for RF310R

To avoid any impact on the field data, the distance a should be ≥ 20 mm.

5.3.7 Minimum distance between RF310R readers



$D_a \geq 100$ mm

$D_b \geq 200$ mm

Figure 5-5 Minimum distance between RF310R readers

5.3.8 Technical specifications of the RF310R reader with RS422 interface

Table 5- 3 Technical specifications of the RF310R reader with RS422 interface

Inductive interface to the transponder		
Transmission frequency for power/data	13.56 MHz	
Antenna	integrated	
Interface to the communication module	RS422 (3964R protocol)	
Baud rate	19200 baud, 57600 baud, 115200 baud	
Cable length reader - communication module	Data cable length max. 1000 m (shielded cable)	
Read/write distances of reader	See Chapter Field data of RF300 transponders (Page 41)	
Minimum distance between two RF310R readers	≥ 100 mm or ≥ 200 mm	
Maximum data transmission range, reader - transponder (tag)	RF300 tags	ISO tags
Read	Approx. 8000 bytes/s	Approx. 600 bytes/s
write	Approx. 8000 bytes/s	Approx. 400 bytes/s
Functions	Initialize/read/write transponder Scan status and diagnostics information Switch antenna on/off Repeat command Scan transponder serial numbers	
Power supply	24 V DC	
Display elements	2-color LED (operating voltage, presence, error)	
Plug-in connector	M12 (8-pin)	
Enclosure		
Dimensions (in mm)	55 x 75 x 30 (without M12 plug connector)	
Color	Anthracite	
Material	Plastic PA 12	
Fixing	4 x M5 screws	
Ambient temperature		
during operation	-25 °C to +70 °C	
during transport and storage	-40 °C to +85 °C	
Degree of protection to EN 60529	IP67	
Shock to EN 60721-3-7 Class 7 M2	50 g	
Vibration to EN 60721-3-7 Class 7	20g	
Weight	Approx. 170 g	
MTBF (Mean Time Between Failures) in years	169.9	
Approvals	Radio to R&TTE guidelines EN 300 330, EN 301 489, CE, FCC, UL/CSA	
Current consumption	Typ. 50 mA	

5.3.9 FCC information

Siemens SIMATIC RF310R with RS422 interface

FCC ID: NXW-RF310R

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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution

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

5.3.10 Dimension drawing

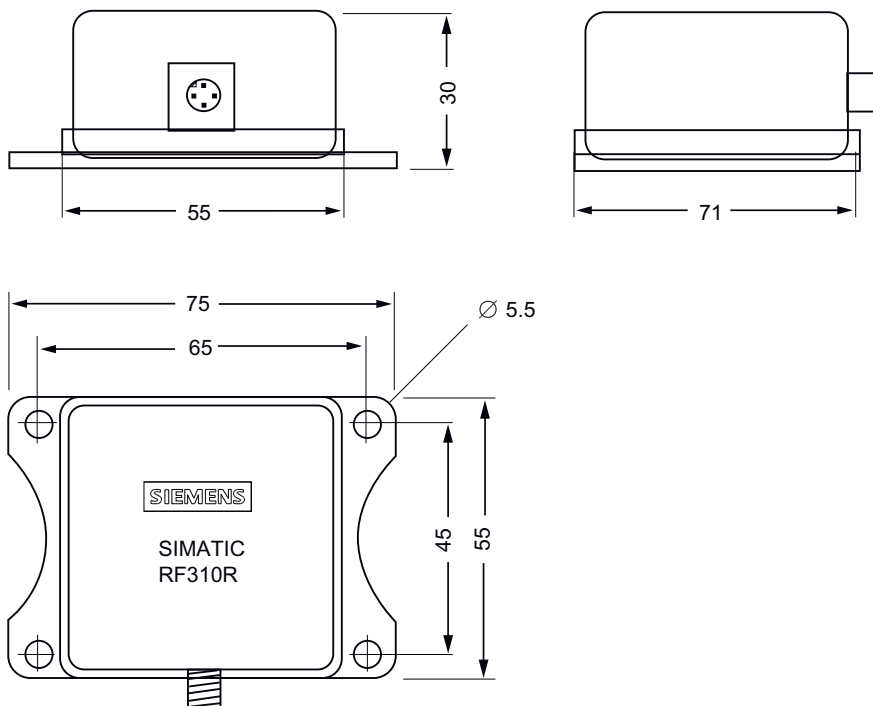



Figure 5-6 Dimension drawing for RF310R

Dimensions in mm

5.4 SIMATIC RF340R

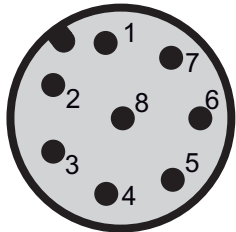
5.4.1 Features

RF340R	Characteristics				
	Design	① RS422 interface ② Status display			
	Field of application	Identification tasks on assembly lines in harsh industrial environments			
	Read/write distance to transponder	Max. 65 mm			
	Data transmission rate	<table border="1"> <thead> <tr> <th>RF300 tags</th> <th>ISO tags</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> approx. 8000 byte/s approx. 8000 byte/s </td> <td></td> </tr> </tbody> </table>	RF300 tags	ISO tags	<ul style="list-style-type: none"> approx. 8000 byte/s approx. 8000 byte/s
RF300 tags	ISO tags				
<ul style="list-style-type: none"> approx. 8000 byte/s approx. 8000 byte/s 					
Read Write					

5.4.2 Ordering data for RF340R

RF340R	Order number
<ul style="list-style-type: none"> With RS422 interface (3964R) IP 67 Operating temperature -25 °C ... +70 °C Dimensions 75 x 91 x 41 (L x W x H in mm) with integrated antenna Max. limit distance: 65 mm (depending on transponder) 	6GT2801-2AB10

5.4.3 Pin assignment of RF340R RS422 interface

Pin	Pin Device end 8-pin M12	Assignment
	1	+ 24 V
	2	- Transmit
	3	0 V
	4	+ Transmit
	5	+ Receive
	6	- Receive
	7	Free

Pin	Pin Device end 8-pin M12	Assignment
	8	Earth (shield)

5.4.4 Display elements of the RF340R reader

Color		Meaning
Green	Flashing	Operating voltage present, reader not initialized or antenna switched off
	Permanentl y on	Operating voltage present, reader initialized and antenna switched on
Yellow ¹⁾		Transponder present
Flashing red		Error has occurred, the type of flashing corresponds to the error code in the table in Section "Error codes". The optical error display is only reset if the corresponding reset parameter ("option_1", see FC45 / FB45 documentation, Section "Input parameters") is set.

1) Only in the "with presence" mode.

5.4.5 Ensuring reliable data exchange

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

5.4.6 Metal-free area

The RF340R can be flush-mounted in metal. Please allow for a possible reduction in the field data values.

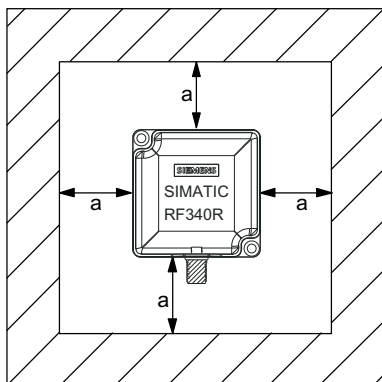
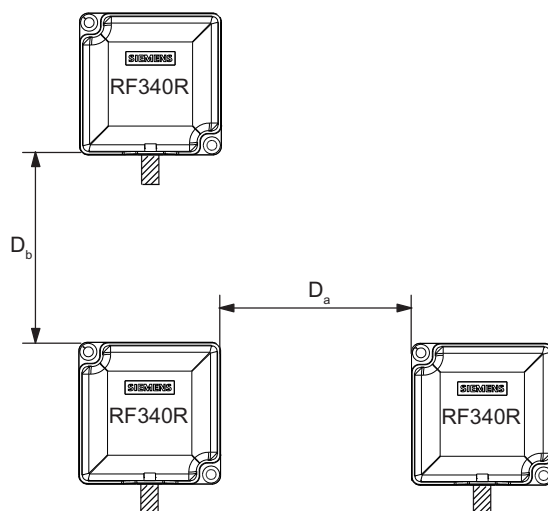


Figure 5-7 Metal-free area for RF340R

To avoid any impact on the field data, the distance a should be ≥ 20 mm.

5.4.7 Minimum distance between RF340R readers



$D_a \geq 100 \text{ mm}$

$D_b \geq 250 \text{ mm}$

Figure 5-8 Minimum distance between RF340R readers

5.4.8 Technical data of the RF340R reader

Table 5- 4 Technical specifications of the RF340R reader

Inductive interface to the transponder		
Transmission frequency for power/data	13.56 MHz	
Antenna	integrated	
Interface to the communication module	RS422 (3964R protocol)	
Baud rate	19200 baud, 57600 baud, 115200 baud	
Cable length reader - communication module	Data cable length max. 1000 m (shielded cable)	
Read/write distances of reader	See Chapter Field data of RF300 transponders (Page 41)	
Minimum distance between two RF340R readers	$\geq 100 \text{ mm}$ or $\geq 250 \text{ mm}$	
Maximum data transfer rate reader - transponder (tag)	RF300 tags	ISO tags
Reading	Approx. 8000 byte/s	
Writing	Approx. 8000 byte/s	
Functions	Initialize/read/write transponder Scan status and diagnostics information Switch antenna on/off Repeat command Scan transponder serial numbers	
Power supply	24 V DC	

Display elements	2-color LED (operating voltage, presence, error)
Plug connector	M12 (8-pin)
Enclosure	
Dimensions (in mm)	75 x 75 x 40 (without M12 device connector)
Color	Anthracite
Material	Plastic PA 12
Fixing	2 x M5 screws
Ambient temperature	
during operation	-25 °C to +70 °C
during transport and storage	-40 °C to +85 °C
Degree of protection to EN 60529	IP67
Shock to EN 60721-3-7 Class 7 M2	50 g
Vibration to EN 60721-3-7 Class 7 M2	20 g
Weight	Approx. 250 g
MTBF (Mean Time Between Failures) in years	140
Approvals	Radio to R&TTE guidelines EN 300 330, EN 301 489, CE, FCC, UL/CSA
Current consumption	Typ. 100 mA

5.4.9 FCC information

Siemens SIMATIC RF340R (MLFB 6GT2801-2AA10) FCC ID: NXW-RF340R

Siemens SIMATIC RF340R (MLFB 6GT2801-2AB10) FCC ID: NXW-RF340R01

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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution

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

5.4.10 Dimension drawing

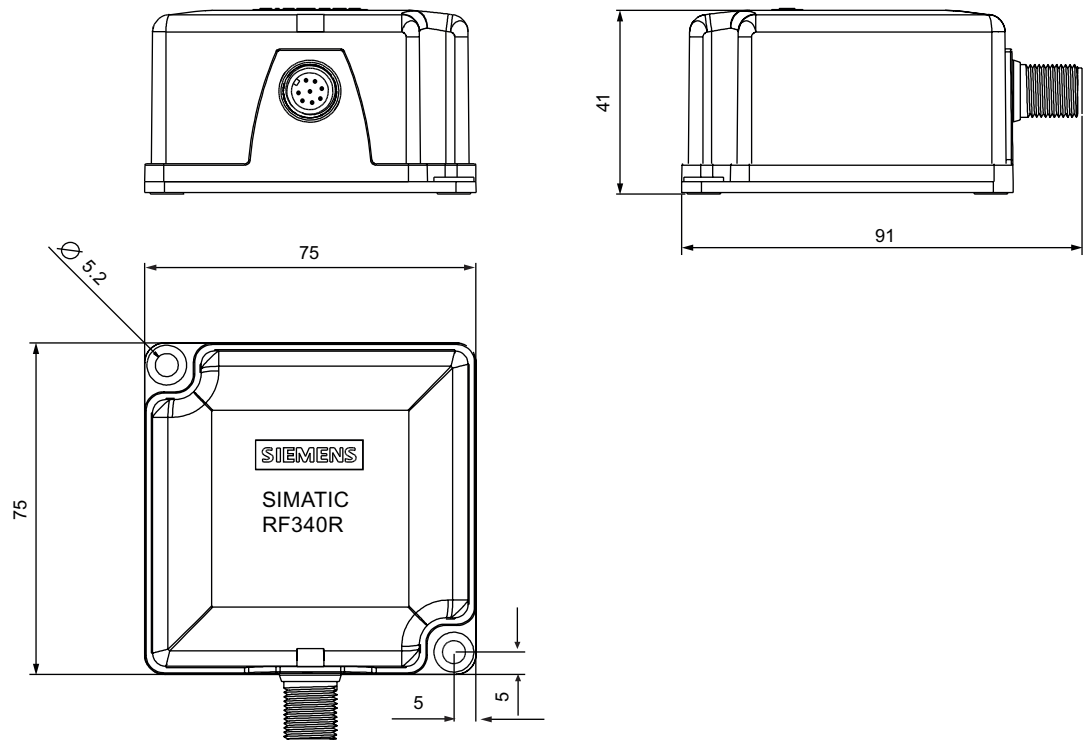


Figure 5-9 Dimension drawing for RF340R


Dimensions in mm

5.5 SIMATIC RF350R

5.5.1 Features

RF350R	Characteristics	
	Design	① Antenna connection ② RS422 interface ③ Status display
	Field of application	Identification tasks in assembly lines in harsh industrial environments; for external antennas (ANT 1, ANT 18, ANT 30)
	Read/write distance to transponder	Max. 60 mm
	Data transmission rate	RF300 tags ISO tags

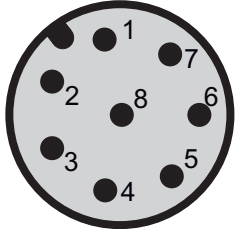
5.5 SIMATIC RF350R

RF350R	Characteristics		
	Read Write	<ul style="list-style-type: none"> • Read: approx. 8000 byte/s • Write: approx. 8000 byte/s 	

5.5.2 Ordering data for RF350R

RF350R	Order number
<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 12, ANT 18, ANT 30 	6GT2801-4AB10

5.5.3 Pin assignment of RF350R RS422 interface

Pin	Pin Device end 8-pin M12	Assignment
	1	+ 24 V
	2	- Transmit
	3	0 V
	4	+ Transmit
	5	+ Receive
	6	- Receive
	7	Free
	8	Earth (shield)

5.5.4 Display elements of the RF350R reader

Color		Meaning
Green	Flashing	Operating voltage present, reader not initialized or antenna switched off
	Permanently on	Operating voltage present, reader initialized and antenna switched on
Yellow ¹⁾		Transponder present
Flashing red		Error has occurred, the type of flashing corresponds to the error code in the table in Section "Error codes". The optical error display is only reset if the corresponding reset parameter ("option_1", see FC45 / FB45 documentation, Section "Input parameters") is set.

¹⁾ Only in the "with presence" mode.

5.5.5 Ensuring reliable data exchange

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

5.5.6 Metal-free area

The RF350R reader does not have an internal antenna. Operation is not affected by mounting on metal or flush-mounting in metal. For information about the metal-free area required by the external antennas, refer to the corresponding section of the chapter Antennas (Page 118).

5.5.7 Technical data of the RF350R reader

Table 5- 5 Technical specifications of the RF350R reader

Inductive interface to the transponder		
Transmission frequency for power/data	13.56 MHz	
Antenna	External, antennas ANT 1, ANT 12, ANT 18 or ANT 30	
Interface to the communication module	RS422 (3964R protocol)	
Baud rate	19200 baud, 57600 baud, 115200 baud	
Cable length reader - communication module	Data cable length max. 1000 m (shielded cable)	
Read/write distances of reader	See Chapter Field data of RF300 transponders (Page 41)	
Minimum distance between two antennas	See Chapter Minimum clearances (Page 47)	
Maximum data transfer rate reader - transponder (tag)	RF300 tags	ISO tags
Reading	Approx. 8000 byte/s	@ Werte
Writing	Approx. 8000 byte/s	

Functions	Initialize/read/write transponder Scan status and diagnostics information Switch antenna on/off Repeat command Scan transponder serial numbers
Power supply	24 V DC
Display elements	2-color LED (operating voltage, presence, error)
Plug connector	M12 (8-pin); M8 (4-pin) for antenna
Enclosure	
<ul style="list-style-type: none"> • Dimensions (in mm) • Color • Material 	<ul style="list-style-type: none"> • 75 x 75 x 40 (without M12 device connector) • Anthracite • Plastic PA 12
Fixing	2 x M5 screws
Ambient temperature	
<ul style="list-style-type: none"> • During operation • Transport and storage 	<ul style="list-style-type: none"> • -25 °C to +70 °C • -40 °C to +85 °C
Degree of protection to EN 60529	IP65
Shock to EN 60721-3-7 Class 7 M2	50 g
Vibration to EN 60721-3-7 Class 7 M2	20 g
Weight	250 g
MTBF (Mean Time Between Failures) in years	140
Approvals	Radio to R&TTE guidelines EN 300 330, EN 301 489, CE, FCC, UL/CSA
Current consumption	Typ. 100 mA

5.5.8 FCC information

Siemens SIMATIC RF350R (MLFB 6GT2801-2AA10) FCC ID: NXW-RF350R

Siemens SIMATIC RF350R (MLFB 6GT2801-2AB10) FCC ID: NXW-RF350R01

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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution

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

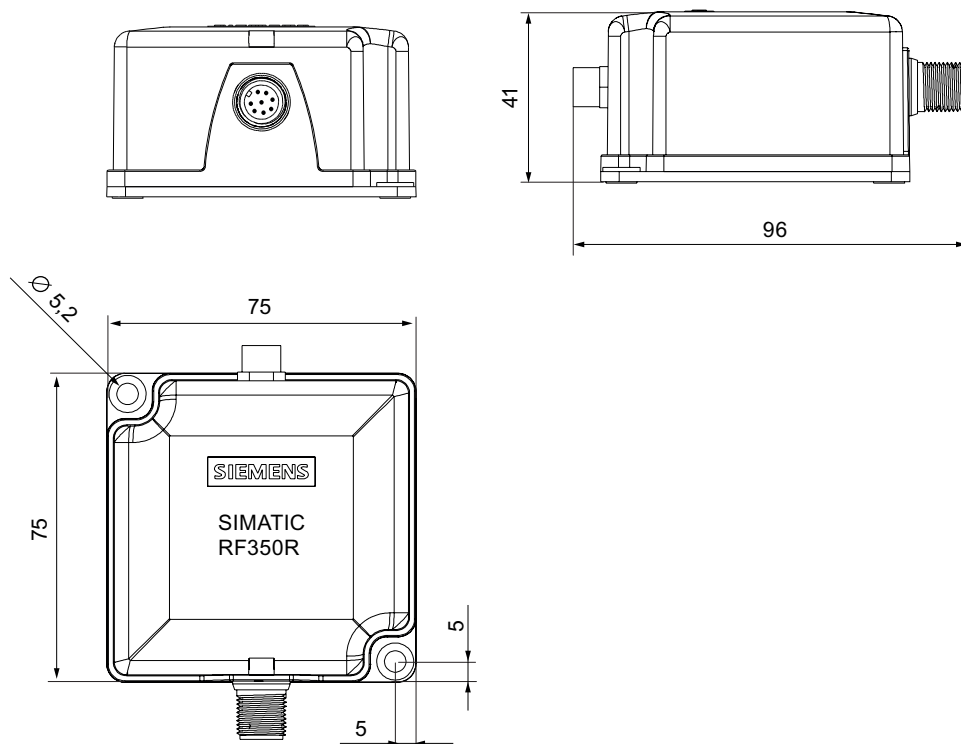






Figure 5-10 RF350R dimension drawing

Dimensions in mm

5.5.10 Antennas

5.5.10.1 Features

For the RF350R reader, you can use the following pluggable antennas:

Antenna	Product photo	Limit distance S_g in mm ¹⁾	Dimensions (L x B x H) in mm	Suitable for dynamic operation
ANT 1		to 60	75 x 75 x 20	Yes
ANT 12			M12 x 1.0 x 40 (\varnothing x thread x L) @ <--> Schreibweise wie bei den anderen Antennen? Klammer?	
ANT 18		to 13	\varnothing M18 x 50	No
ANT 30		to 22	\varnothing M30 x 58	No

¹⁾ Depending on the transponder used

ANT 1

The ANT 1 is an antenna in the mid performance range and can be used to the customer's advantage in production and assembly lines due to its manageable housing shape. The antenna dimensions make it possible to read/write large quantities of data dynamically from/to the tag during operation. The antenna cable can be connected at the reader end.

ANT 12

The ANT 12 is primarily envisaged for tool identification applications. The very small size of the antenna means that highly exact positioning is possible using the plastic nuts included in the scope of delivery. The antenna cable can be connected at the SLG end. Communication with the data storage unit is only possible with the MDS D421 in static mode.

ANT 18

The ANT 18 is designed for use in small assembly lines. Due to its small, compact construction, the antenna can be easily positioned for any application using two plastic nuts (included in the package). The antenna cable can be connected at the reader end. Data communication is only possible with the RF320T and RF340T tags in static mode.

ANT 30

The ANT 30 is designed for use in small assembly lines. In comparison to ANT 18, the maximum write/read distance is approximately 60 % larger. Due to its compact construction, the antenna can be easily positioned for any application using two plastic nuts (included in the package). The antenna cable can be connected at the reader end. With the RF320T, RF340T and RF350T tags, communication with the data storage unit is only possible in static mode.

5.5.10.2 Ordering data for antennas

Antenna	Order number
ANT 1	6GT2398-1CB00
ANT 12	6GT2 398-1CC00
ANT 18	6GT2398-1CA00
ANT 30	6GT2398-1CD00

5.5.10.3 Ensuring reliable data exchange

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

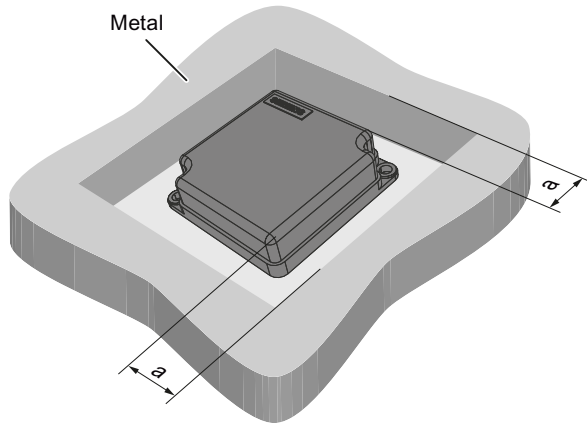
5.5.10.4 Metal-free area

The antennas ANT 1, ANT 12, ANT 18 and ANT 30 can be flush-mounted on metal. Please allow for a possible reduction in the field data values. During installation, maintain the minimum distances (a and b) on/flush with the metal.

NOTICE**Reduction of range if the metal-free space is not maintained**

At values lower than a and b, the field data changes significantly, resulting in a reduction in the limit distance and operating distance. Therefore, during installation, maintain the minimum distances (a and b) on/flush with the metal.

Metal-free space for flush-mounted installation of ANT 1



a = 40 mm

Figure 5-11 Metal-free area for ANT 1

Flush-mounting of ANT 12

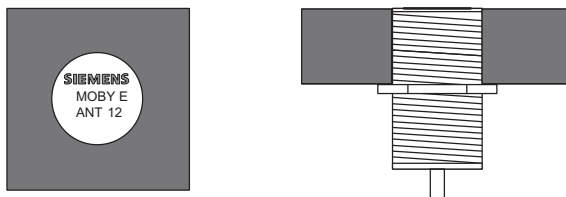
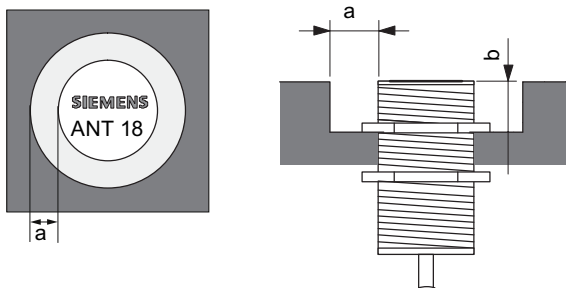


Figure 5-12 Metal-free area for ANT 12

The ANT 12 can be flush-mounted in metal.

Metal-free space for flush-mounted installation of ANT 18

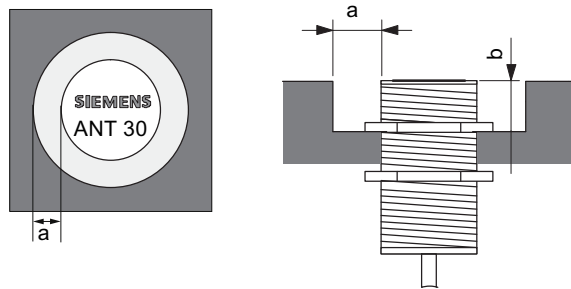


a = 10 mm

b = 10 mm

Figure 5-13 Metal-free area for ANT 18

Metal-free space for flush-mounted installation of ANT 30

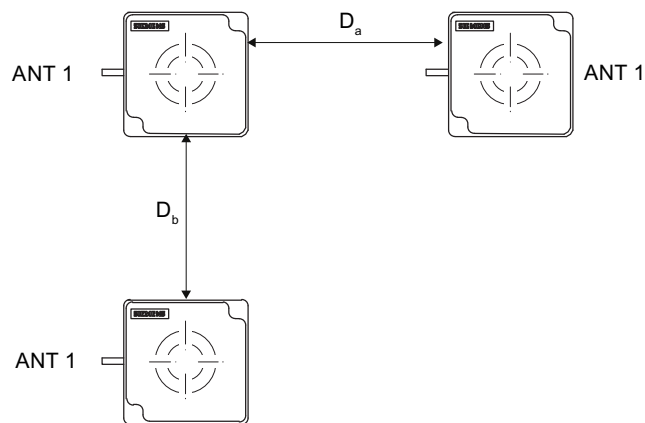


a = 20 mm
b = 20 mm

Figure 5-14 Metal-free area for ANT 30

5.5.10.5 Minimum distance between antennas

Minimum distance for ANT 1

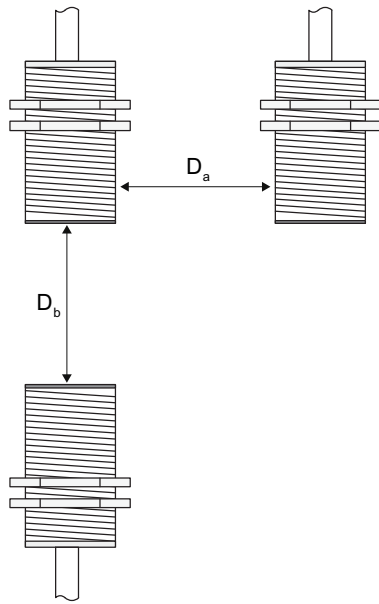


$D_a \geq 100 \text{ mm}$
 $D_b \geq 250 \text{ mm}$

Figure 5-15 Minimum distance for ANT 1

The reader electronics can be mounted directly alongside each other.

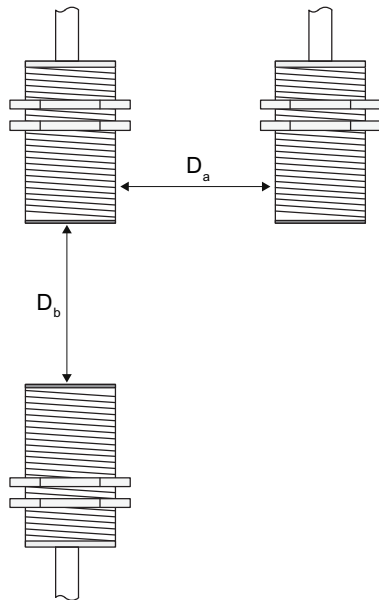
Minimum distance for ANT 12



$D_a > 80 \text{ mm}$
 $D_b > 80 \text{ mm}$

Figure 5-16 Minimum distance for ANT 12

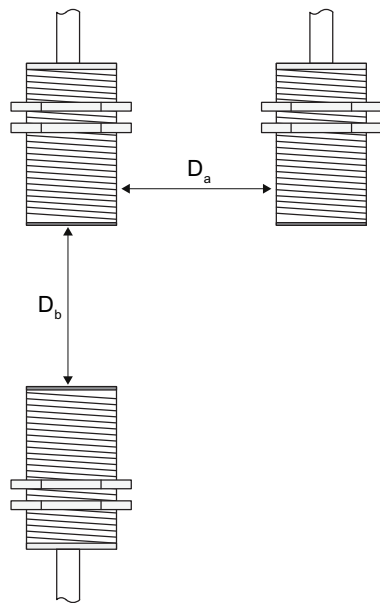
Minimum distance for ANT 18



$D_a \geq 100 \text{ mm}$
 $D_b \geq 200 \text{ mm}$

Figure 5-17 Minimum distance for ANT 18

Minimum distance for ANT 30



$D_a \geq 100 \text{ mm}$

$D_b \geq 250 \text{ mm}$

Figure 5-18 Minimum distance for ANT 30

5.5.10.6 Technical data for antennas

Table 5- 6 Technical data for antennas ANT 1, ANT 12, ANT 18 and ANT 30

	ANT 1	ANT 12	ANT 18	ANT 30
Read/write distance antenna to transponder (Sg) max	100 mm	5 mm	15 mm	22 mm
Enclosure dimensions in mm	75 x 75 x 20 (L x W x H)	M18 x 1.0 x 55 (\varnothing x thread x L)	M18 x 1.0 x 55 (\varnothing x thread x L)	M30 x 1.5 x 58 (\varnothing x thread x L)
Color	Anthracite	Pale turquoise		
Material	Plastic PA 12	Plastic Crastin		
Plug connection	4-pin (pins on antenna side)			
Antenna cable lengths	3 m			
Degree of protection to EN 60529	IP67	IP67 (front)		
Shock-resistant acc. to EN 60721-3-7, Class 7M2	50 g ¹⁾			
Vibration-resistant to EN 60721-3-7, Class 7M2	20 g (3 to 500 Hz) ¹⁾			
Attachment of the antenna	2 x M5 screws	2 plastic nuts M12 x 1.0	2 plastic nuts M18 x 1.0	2 plastic nuts M30 x 1.5

	ANT 1	ANT 12	ANT 18	ANT 30
Ambient temperature				
• During operation	-25 °C to +70 °C			
• Transport and storage	-40 °C to +85 °C			
MTBF (at +40 °C)	2.5 x 10 ⁵ hours			
Approx. weight	80 g	45 g	120 g	150 g

1) Warning: The values for shock and vibration are maximum values and must not be applied continuously.

5.5.10.7 Dimension drawings for antennas

All dimensions in mm

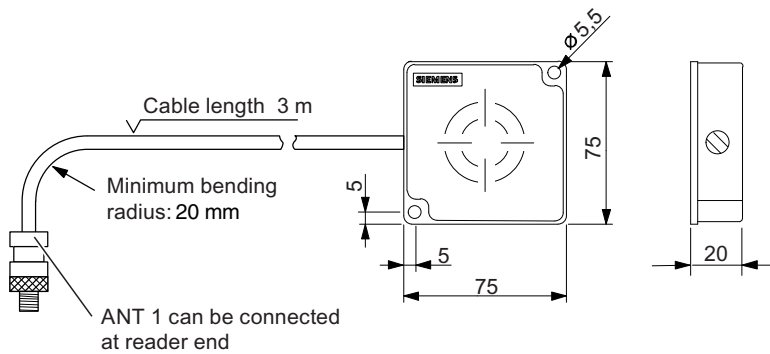


Figure 5-19 Dimension drawing for ANT 1

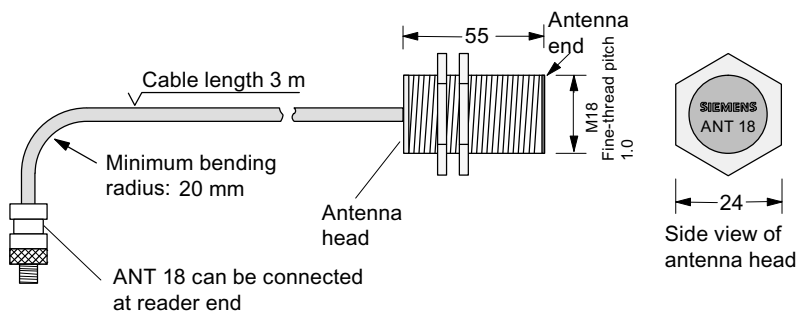


Figure 5-20 Dimension drawing for ANT 12

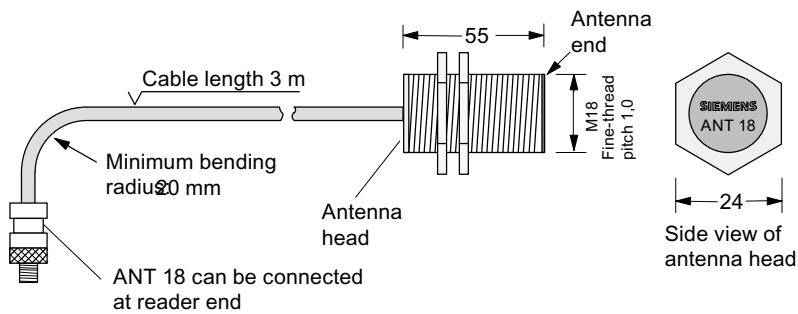


Figure 5-21 Dimension drawing for ANT 18

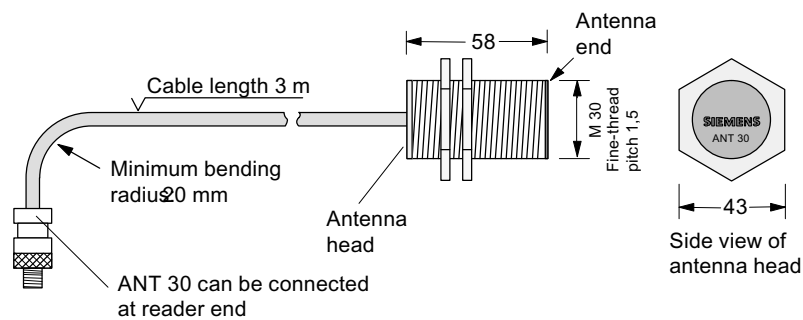


Figure 5-22 Dimension drawing for ANT 30

5.6 SIMATIC RF380R

5.6.1 Features

RF380R	Characteristics		
	Design	① RS232 or RS422 interface ② Status display	
	Field of application	Identification tasks on assembly lines in harsh industrial environments	
	Read/write distance to transponder	Max. 210 mm	
	Data transmission rate	RF300 tags Approx. 8000 byte/s Approx. 8000 byte/s	ISO tags Approx. 600 byte/s Approx. 400 byte/s
	Read write		

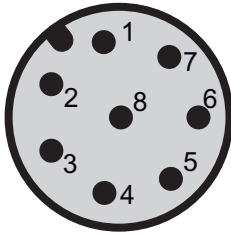
5.6.2 RF380R ordering data

RF380R	Order number
<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 max. limit distance 150 mm (dependent on transponder) 	6GT2801-3AB10

5.6.3 Pin assignment of RF380R RS232/RS422 interface

You can connect the RF380R reader to a higher-level system via the internal RS422 interface or via the RS232 interface. After connection, the interface module automatically detects which interface has been used.

Note correct assignment of the pins here:

Pin	Pin Device end 8-pin M12	Assignment	
		RS232	RS422
	1	+ 24 V	+ 24 V
	2	RXD	- Transmit
	3	0 V	0 V
	4	TXD	+ Transmit
	5	NC	+ Receive
	6	NC	- Receive
	7	not used	not used
	8	Earth (shield)	Earth (shield)

5.6.4 Display elements of the RF380R reader

Color		Meaning
Green	Flashing	Operating voltage present, reader not initialized or antenna switched off
	Permanently on	Operating voltage present, reader initialized and antenna switched on
Yellow ¹⁾		Transponder present
Flashing red		Error has occurred, the type of flashing corresponds to the error code in the table in Section "Error codes". The optical error display is only reset if the corresponding reset parameter ("option_1", see FC45 / FB45 documentation, Section "Input parameters") is set.

¹⁾ Only in the "with presence" mode.

5.6.5 Ensuring reliable data exchange

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

5.6.6 Metal-free area

The RF380R can be flush-mounted in metal. Please allow for a possible reduction in the field data values.

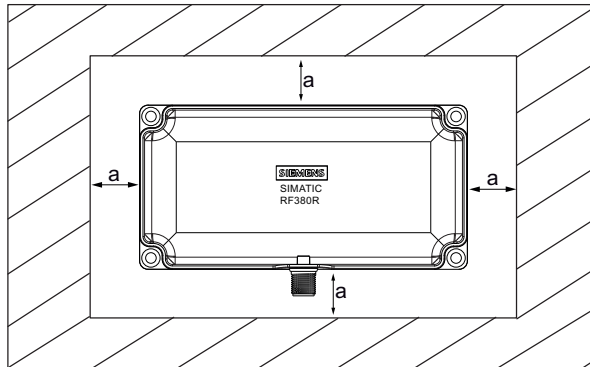


Figure 5-23 Metal-free area for RF380R

To avoid any impact on the field data, the distance a should be ≥ 20 mm.

5.6.7 Minimum distance between RF380R readers

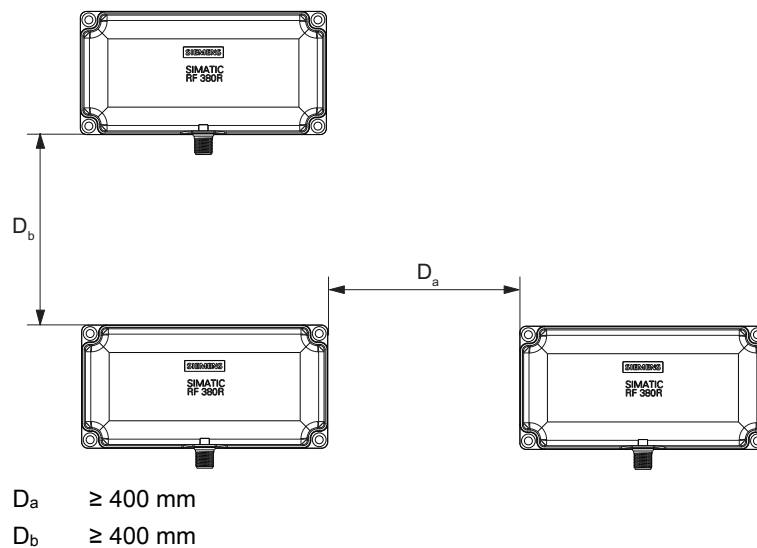


Figure 5-24 Minimum distance between RF380R readers

5.6.8 Technical specifications of the RF380R reader

Table 5- 7 Technical specifications of the RF380R reader

Inductive interface to the transponder		
Transmission frequency for power/data	13.56 MHz	
Antenna	integrated	
Interface to the communication module	RS232 or RS422 (3964R protocol)	
Baud rate	19200 baud, 57600 baud, 115200 baud	
Cable length reader - communication module	RS422 data cable length: max. 1000 m RS232 data cable length: Max. 30 m	
Read/write distances of reader	See Chapter Field data of RF300 transponders (Page 41)	
Minimum distance between two RF380R readers	≥ 500 mm	
Maximum data transmission range reader - transponder (tag)	RF300 tags	ISO tags
Read	Approx. 8000 byte/s	Approx. 600 byte/s
write	Approx. 8000 byte/s	Approx. 400 byte/s
Functions	Initialize/read/write transponder Scan status and diagnostics information Switch antenna on/off Repeat command Scan transponder serial numbers	
Power supply	24 V DC	
Display elements	2-color LED (operating voltage, presence, error)	
Plug connector	M12 (8-pin)	
Enclosure		
Dimensions (in mm)	160 x 80 x 40 (without M12 plug connector)	
Color	Anthracite	
Material	Plastic PA 12	
Fixing	4 x M5 screws	
Ambient temperature		
• During operation	• -25 °C to +70 °C	
• Transport and storage	• -40 °C to +85 °C	
Degree of protection to EN 60529	IP67	
Shock to EN 60 721-3-7 Class 7 M2	50 g	
Vibration to EN 60 721-3-7 Class 7 M2	20 g	
Weight	Approx. 600 g	
MTBF (Mean Time Between Failures) in years	109 years	
Approvals	Radio to R&TTE guidelines EN 300 330, EN 301 489, CE, FCC, UL/CSA	
Current consumption	Typ. 160 mA	

5.6.9 FCC information

Siemens SIMATIC RF380R (MLFB 6GT2801-3AA10) FCC ID: NXW-RF380R

Siemens SIMATIC RF380R (MLFB 6GT2801-3AB10) FCC ID: NXW-RF380R01

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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Caution

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

5.6.10 Use of the reader in hazardous areas

The TÜV SÜD Automotive GmbH as approved test center as well as the TÜV SÜD Product Service GmbH as certification center, identification number 0123, as per Article 9 of the Directive of the European Council of 23 March 1994 (94/9/EC), has confirmed the compliance with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in hazardous areas as per Annex II of the Directive. The essential health and safety requirements are satisfied in accordance with the following standards:

Document	Title
EN 60079-0: 2006	Electrical equipment for hazardous gas atmospheres - Part 0: General requirements
EN 60079-15: 2005	Electrical equipment for hazardous gas atmospheres - Part 15: Design, testing and identification of electrical equipment with type of protection "n"
DIN VDE 0848-5: 2001 (in parts)	Safety in electrical, magnetic and electromagnetic fields - Part 5: Explosion protection
ZLS SK 107.1	Central office of the states for safety; test components

Identification

The identification of the electrical equipment as an enclosed unit is:



II 3G Ex nC IIB T5

-25 °C to +70 °C

U_m = 30 V DC

The equipment is assigned the following references:

XXXXXXXXXX [= serial number, is assigned during production]

TPS 09 ATEX 1 459 X [= certificate number]


"No use of the equipment in the vicinity of processes generating high charges"
 "Do not disconnect plug on load"

5.6.11 Use of the reader in hazardous areas for gases

Temperature class delineation for gases

The temperature class of the reader for hazardous areas depends on the ambient temperature range:

Ambient temperature range	Temperature class
-25 °C to +70 °C	T5

<p> WARNING</p> <p>Ignitions of gas-air mixtures</p> <p>When using the RF380R reader, check to ensure that the temperature class is observed in respect of the requirements of the area of application</p> <p>Non-compliance with the permitted temperature ranges while using the reader can lead to ignitions of gas-air mixtures.</p>
--

5.6.12 Installation and operating conditions for the hazardous area

- a) The connector on the RF380R must be grounded via its supply line.
- b) Use of the equipment in the vicinity of processes generating high charges is not allowed.
- c) The plug of the RF380R must not be disconnected in a hazardous atmosphere or under load.
- d) The supply line for the RF380R is not part of this certificate. The supply line must exhibit a sufficient temperature resistance.
- e) The equipment must be mechanically protected when installed.

5.6.13 Dimension drawing

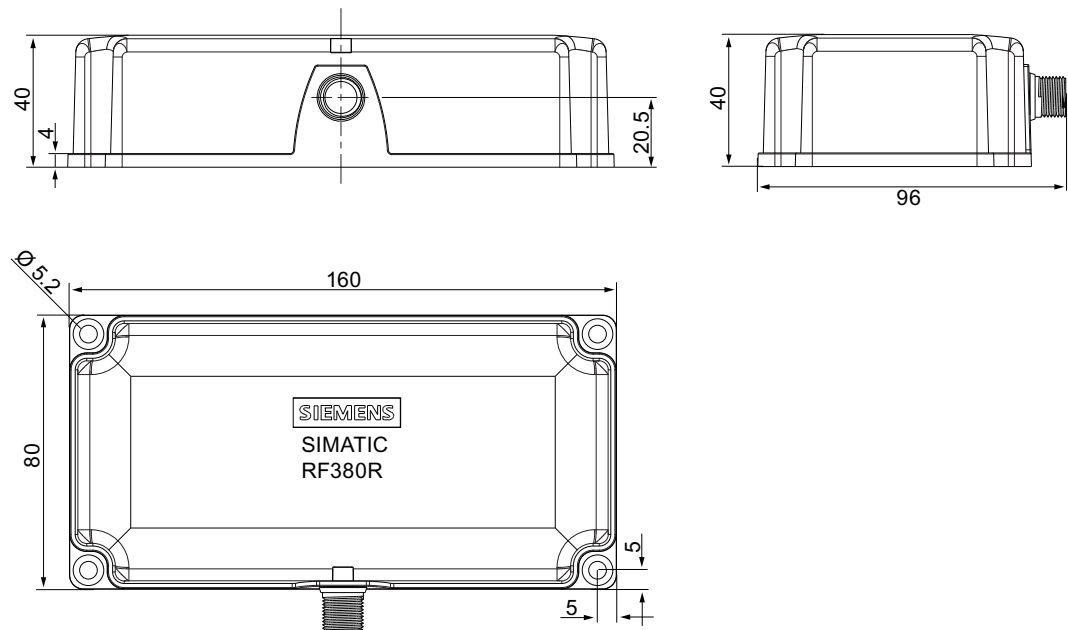


Figure 5-25 Dimension drawing RF380R

Dimensions in mm

RF300 transponder

6.1 Overview of RF300 tags

Characteristics of the RF300 tags

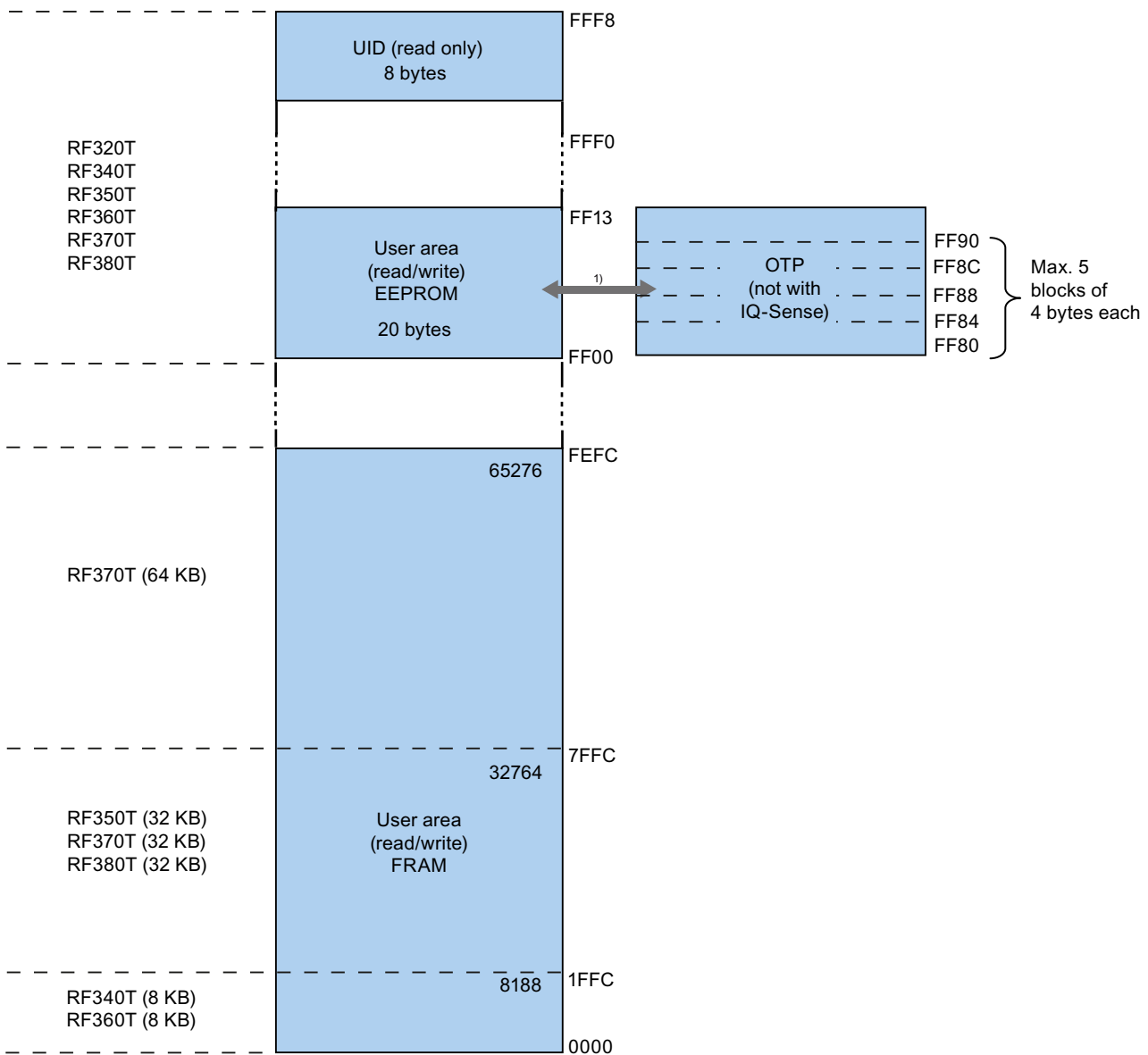
The RF300 tags (RF3xxT) stand out particularly for their extremely fast data exchange with the RF300 readers (RF3xxR). With the exception of the RF320T transponder, all of the RF300 tags have 8 to 64 KB of FRAM memory, which has an almost unlimited capacity for read/write actions.

RF300 tags

The following RF300 tags can be used at any time with RF300:

- RF320T
- RF340T
- RF350T
- RF360T
- RF370T
- RF380T

6.2 Memory configuration of the RF300 tags



1) Physically identical memory When the OTP area is used, the corresponding user area (FF00-FF13) can no longer be modified (read only).

Figure 6-1 Memory configuration of the RF300 tags

EEPROM area

The memory configuration of an RF300 tag always comprises an EEPROM memory that has 20 bytes for user data (read/write) and a 4 byte unique serial number (UID, read only). For reasons of standardization, the UID is transferred as an 8 byte value through a read command to address FFF0 with a length of 8. The unused 4 high bytes are filled with zeros.

Note

The EEPROM user memory (address FF00-FF13, or FF80-FF90) requires significantly more time for writing (approx. 11 ms/byte) than the high-speed FRAM memory. For time-critical applications with a write function, it is therefore recommended that FRAM tags are used (e.g. RF340T, RF350T, RF360T, RF370T, RF380T).

FRAM area

Depending on the tag type, high-speed FRAM memory is available. (8 KB, 32 KB, 64 KB). This area does not exist for the RF320T.

In the case of RF3xxT tags with FRAM memory, the data carrier initialization command (INIT) is only effective on this memory area but not on the EEPROM area (FF00-FF13).

OTP area

The EEPROM memory area (address FF00-FF13) can also be used as a so-called "OTP" memory (One Time Programmable). The 5 block addresses FF80, FF84, FF88, FF8C and FF90 are used for this purpose. A write command to this block address with a valid length (4, 8, 12, 16, 20 depending on the block address) protects the written data from subsequent overwriting.

Note

The OTP area cannot be used for the IQ-Sense reader variant.

Note

Seamless use of the OTP area

When the OTP area is used, it must be ensured that the blocks are used starting from Block 0 consecutively.

Examples:

3 blocks (with write command), Block 0, 1, 2 (FF80, length = 12): valid

2 blocks (consecutive), Block 0 (FF80, length =4), Block 1 (FF84, length = 4): valid


2 blocks (consecutive), Block 0 (FF80, length =4), Block 2 (FF88, length = 4): Invalid

1 Block, Block 4 (FF90, length = 4): Invalid

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.

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 41)
	Mounting on metal	Not possible: Recommended distance from metal ≥ 20 mm

6.3.2 Ordering data

Table 6- 1 Ordering data RF320T

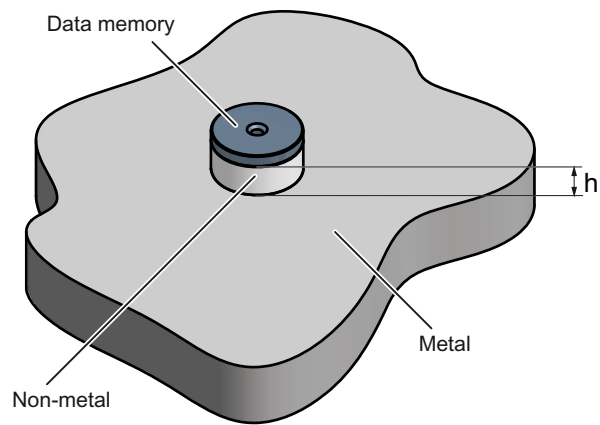
RF320T	Order number
<ul style="list-style-type: none"> • Button • Memory size: 20 byte EEPROM • IP67 • Operating temperature: -25 °C to +85 °C • Dimensions: $\varnothing = 27$ mm x 4 mm 	6GT2800-1CA00

6.3.3 Mounting on metal

Mounting of RF320T on metal

Direct mounting of the RF320T on metal is not allowed.

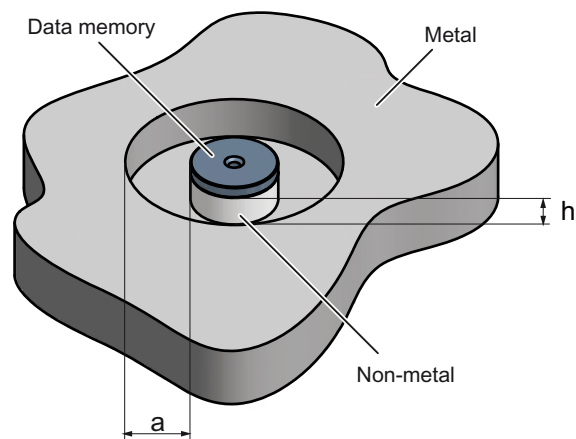
The following figures show the minimum distance between the RF320T and metal:



$h > 20 \text{ mm}$

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 41)]
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

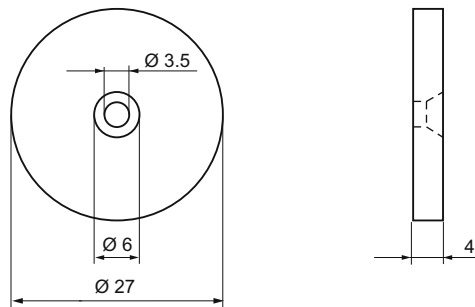



Figure 6-4 RF320T dimension drawing

Dimensions in mm

6.4 SIMATIC RF340T

6.4.1 Features

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 41)
	Mounting on metal	Direct mounting on metal is possible.

¹⁾ OTP: (One Time Programmable)

6.4.2 Ordering data

Table 6- 3 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 Mounting on metal

Direct mounting of the RF340T on metal is permitted.

Mounting of RF340T on metal

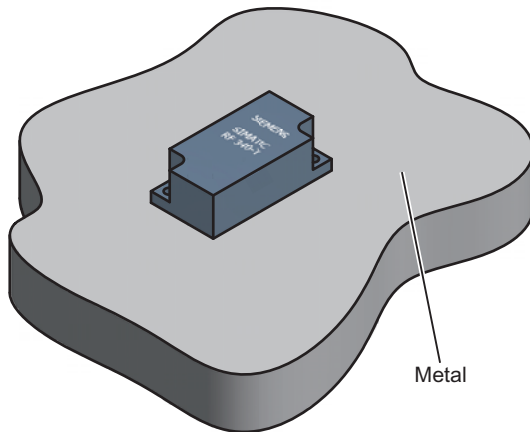


Figure 6-5 Mounting of RF340T on metal

Flush-mounting of RF340T in metal:

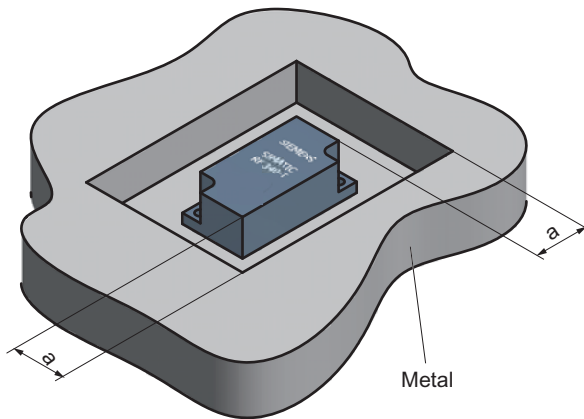


Figure 6-6 Flush-mounting of RF340T in metal

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- 4 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) • 4 bytes (fixed code) • Application memory • 8189 bytes r/w • OPT memory • 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:
• 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 41)]	
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 -25°C to +85°C • Storage and transport -40°C to +85°C 	
Weight	Approx. 25 g	

¹⁾ OTP: One Time Programmable

6.4.5 Dimension drawing

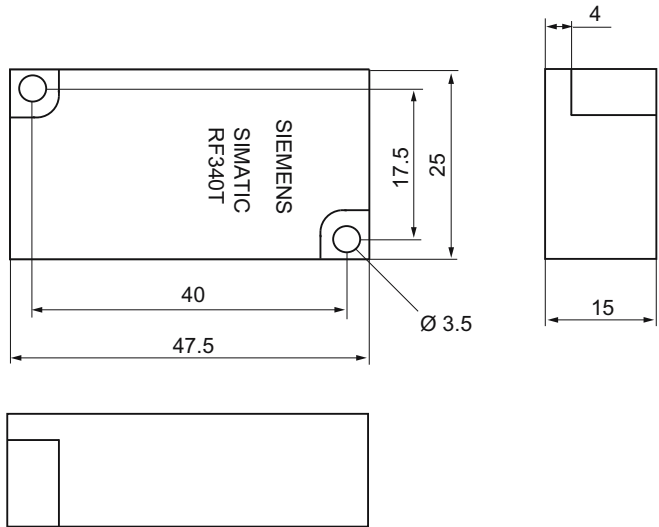



Figure 6-7 RF340T dimension drawing
 Dimensions in mm

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 41)
	Mounting on metal	Direct mounting on metal is possible.

¹⁾ OTP: One Time Programmable

6.5.2 Ordering data

Table 6- 5 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 Mounting on metal

Direct mounting of the RF350T on metal is permitted.

Mounting of RF350T on metal

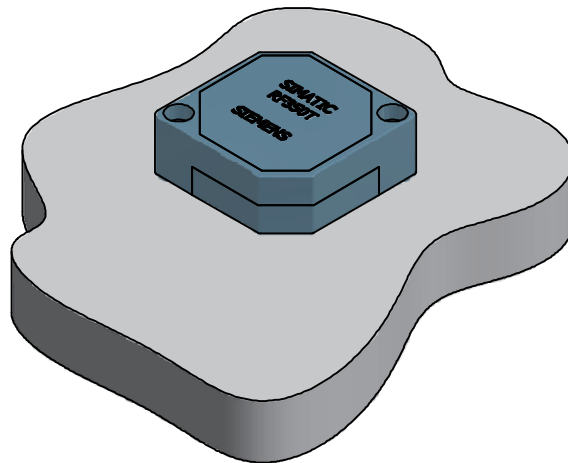


Figure 6-8 Mounting of RF350T on metal

Flush-mounting of RF350T in metal:

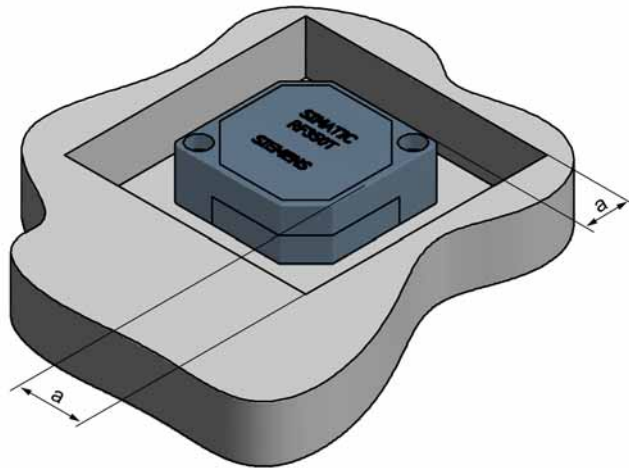


Figure 6-9 RF350T flush-mounted in metal

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

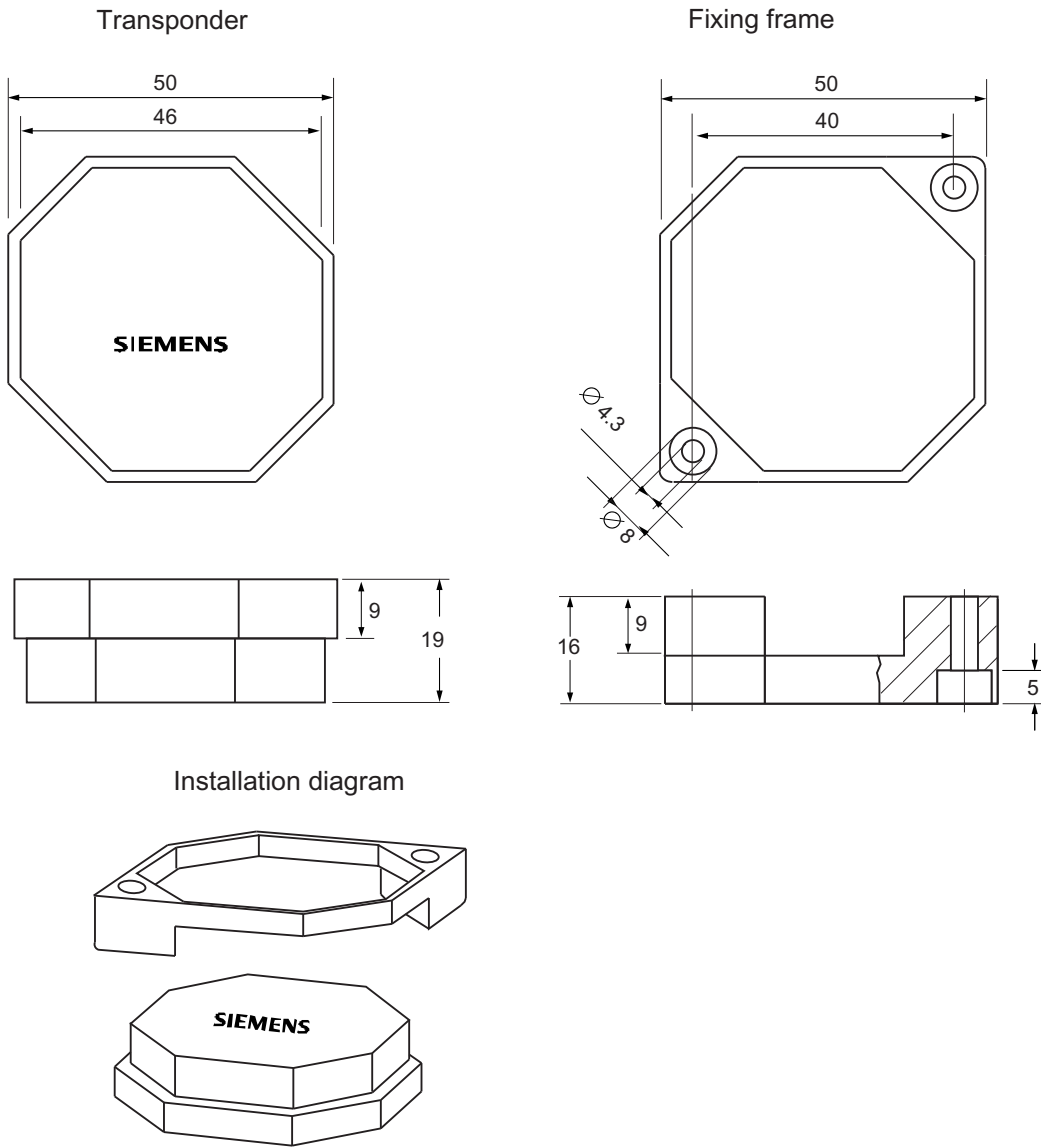
Table 6- 6 Technical specifications for RF350T

Memory size	32 KB	
Memory organization	Blocks of 8 bits/byte-by-byte	
Memory configuration	<ul style="list-style-type: none"> • Serial number (UID) • 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	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 41)]
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	
• Operation	-25 °C to +85 °C
• Transport and storage	-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 41)
	Mounting on metal	Not possible; recommended distance from metal ≥ 20 mm

¹⁾ OTP. One Time Programmable

6.6.2 Ordering data

Table 6- 7 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- 8 Ordering data for RF360T accessories

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

6.6.3 Mounting on metal

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

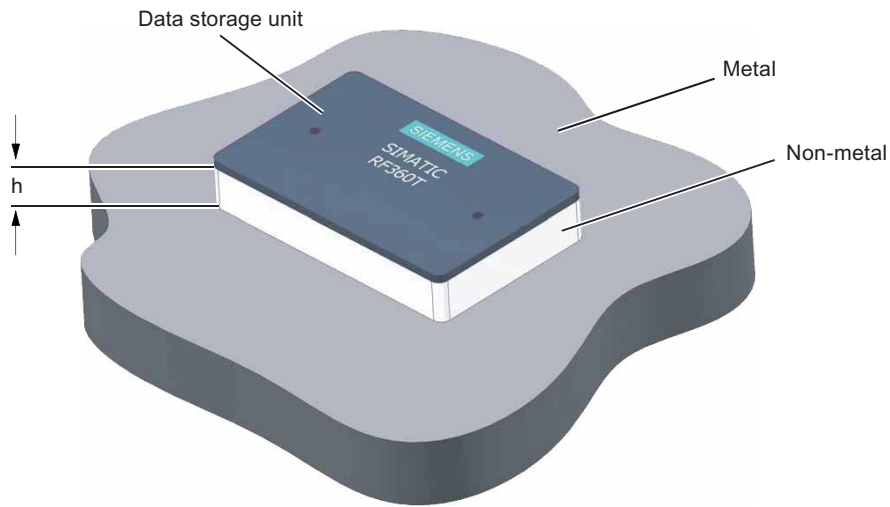


Figure 6-11 Mounting of RF360T with spacer

The standard value for h is ≥ 20 mm.

Flush-mounting of RF360T in metal:

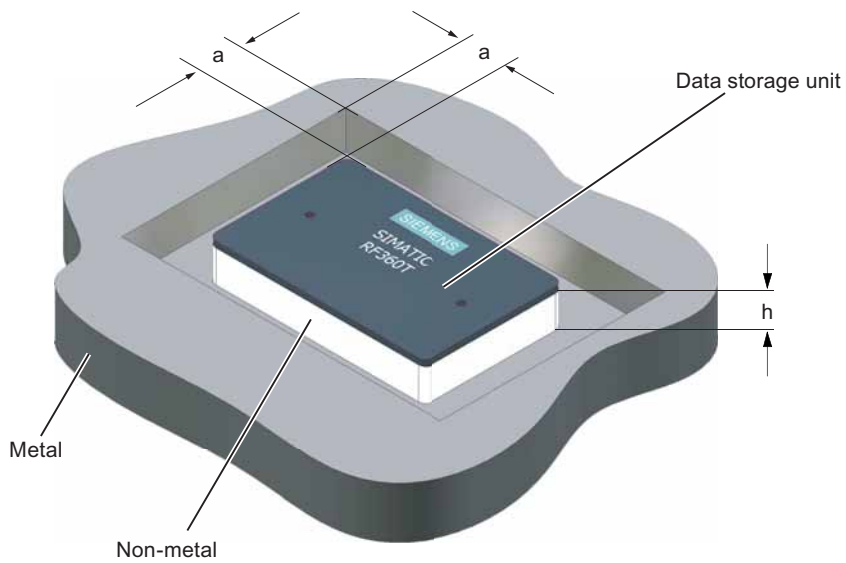


Figure 6-12 Flush-mounting of RF360T with spacer

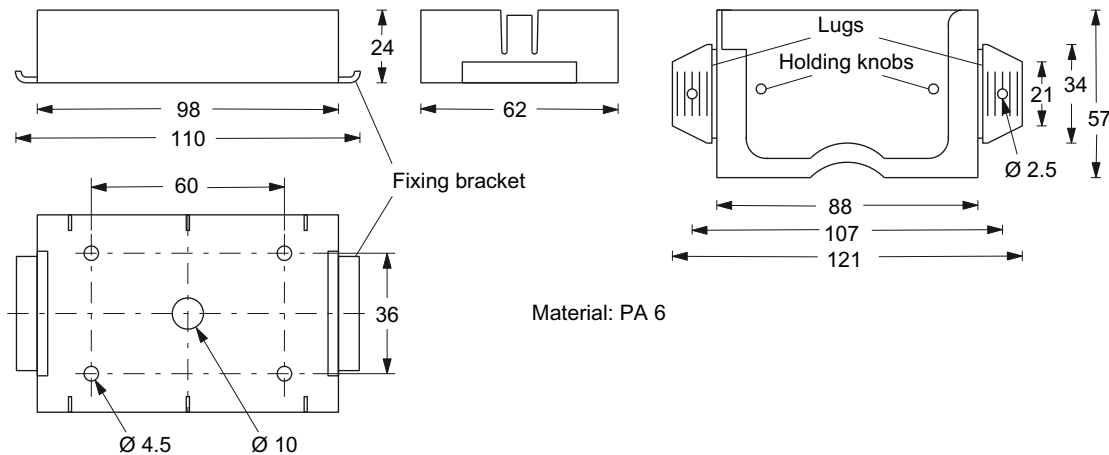
The standard value for a is ≥ 20 mm. At lower values, the field data change significantly, resulting in a reduction in the range.

Dimensions of spacer and fixing pocket for RF360T

Dimension sketch

Spacers: 6GT2190-0AA00

Fixing pocket: 6GT2190-0AB00

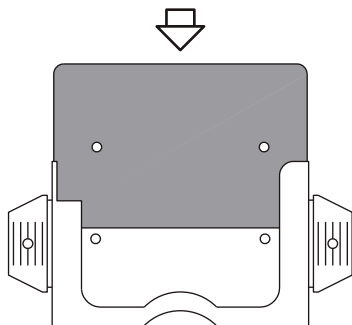


The spacer can be directly mounted on metal. In combination with the fixing pocket, a non-metal distance of 20 mm results between the transponder and metal.

Mounting:

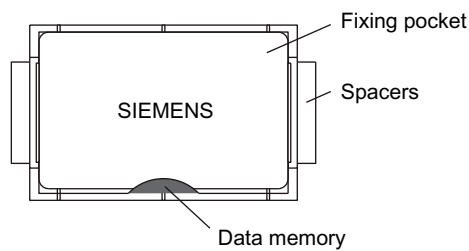
- With 2 or 4 screws (M4)
- With rubbers on the holding clips (e.g. on mesh boxes)
- With cable ties on the holding clips (e.g. on mesh boxes)

Transponder with fixing pocket



The transponder is inserted into the fixing pocket.
Locking is carried out using the holding knobs in the fixing pocket.

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.

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°.

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