

SIEMENS


SIMATIC Sensors

RFID systems

SIMATIC RF382R Scanmode

Operating Instructions (Compact)

Characteristics

RF382R Scanmode	Characteristics	
	Operating range	Suitable for high speeds, e.g. in <ul style="list-style-type: none"> • Suspension conveyor systems • Assembly lines • Production • Order picking
	Antenna field	Designed for transponders that are directed sideways past the long side of the antenna. See Chapter Transmission window (Page 3)
	Read distance	Depending on transponder; see Field data for MDS and SLG (Page 6)
	Degree of protection	IP67

Ordering data

Table 1 RF382R Scanmode ordering data

Product	Order No.
RF382R Scanmode	6GT2801-3AB20-0AX0

Table 2 RF382R Scanmode ordering data for accessories

Accessories	Order No.
Simatic Sensors connecting cable, length: 5 m	6GT2891-0FH50
Simatic Sensors RF380R connecting cable RS232	6GT2891-0KH50
Wide-range power supply 24 V, 4 A, with Euro plug	6GT2898-0AA00
Wide-range power supply 24 V, 4 A, with UK plug	6GT2898-0AA10
Wide-range power supply 24 V, 4 A, with US plug	6GT2898-0AA20

Safety instructions for the device/system

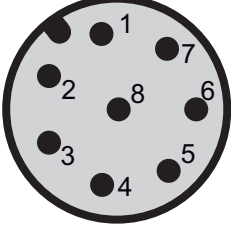
NOTICE
This device/system may only be used for the application instances that have been described in the catalog and the technical documentation "SIMATIC RF300 System Manual (http://support.automation.siemens.com/WW/view/en/21738946)" and only in combination with third-party devices and components recommended and/or approved by Siemens.

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

Pin assignment RF382R Scanmode RS232 interface

You can connect the RF382R Scanmode reader via the internal RS232 interface or via a higher-level system. Pay attention to the correct assignment of the pins.

Table 3 Connector and reader pin assignment

Pin	Pin Device end 8-pin M12	Assignment
	1	+ 24 V
	2	RXD
	3	0 V
	4	TXD
	5	must not be connected
	6	must not be connected
	7	must not be connected
	8	Ground (shield)

Display elements of the RF382R Scanmode reader

Table 4 LED display elements on the reader

Color	Meaning
Green	Operating voltage present, reader ready for operation
Yellow	Transponder present
Red	Red LED for error display is activated permanently if correct operation of the reader cannot be guaranteed (e. g. faulty start, checksum error during operation).

Transmission window

Orientation of magnetic fields of the SIMATIC RF382R Scanmode

For many applications it may be best to operate the reader so that the tags move from left to right (or from right to left) at a certain distance in front of the narrow edge of the reader. This direction of movement uses the horizontal magnetic field of the reader, see figure below.

You also have the option of moving the tags up and down (or down and up) past the narrow edge of the reader. This direction of movement uses the vertical magnetic field of the reader.

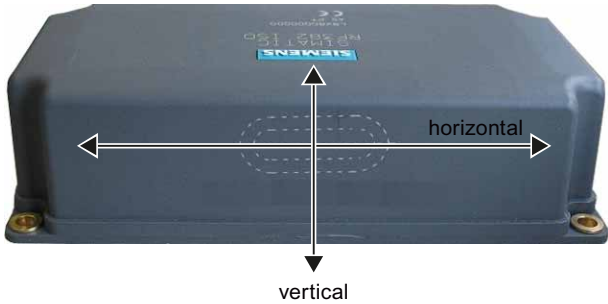


Figure 1 Definition of horizontal and vertical magnetic reader field

Maximum magnetic field strength

The reader creates the maximum magnetic field about 13 mm below the upper reader edge. For the largest possible reading range the tags you want to read should move in this range. This applies whether you use the horizontal or the vertical magnetic field.

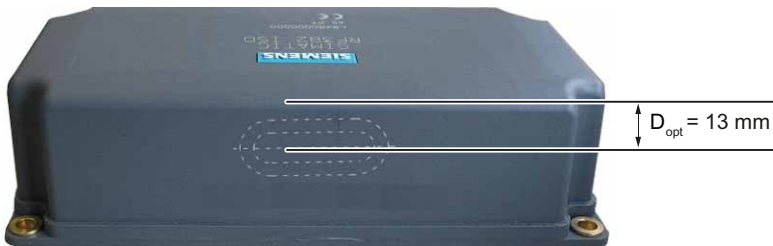


Figure 2 Line of maximum magnetic field strength

The area of the maximum field strength and, therefore, the maximum range is identified by a laser icon:



Figure 3 Laser icon marking

Transmission window for horizontal magnetic field

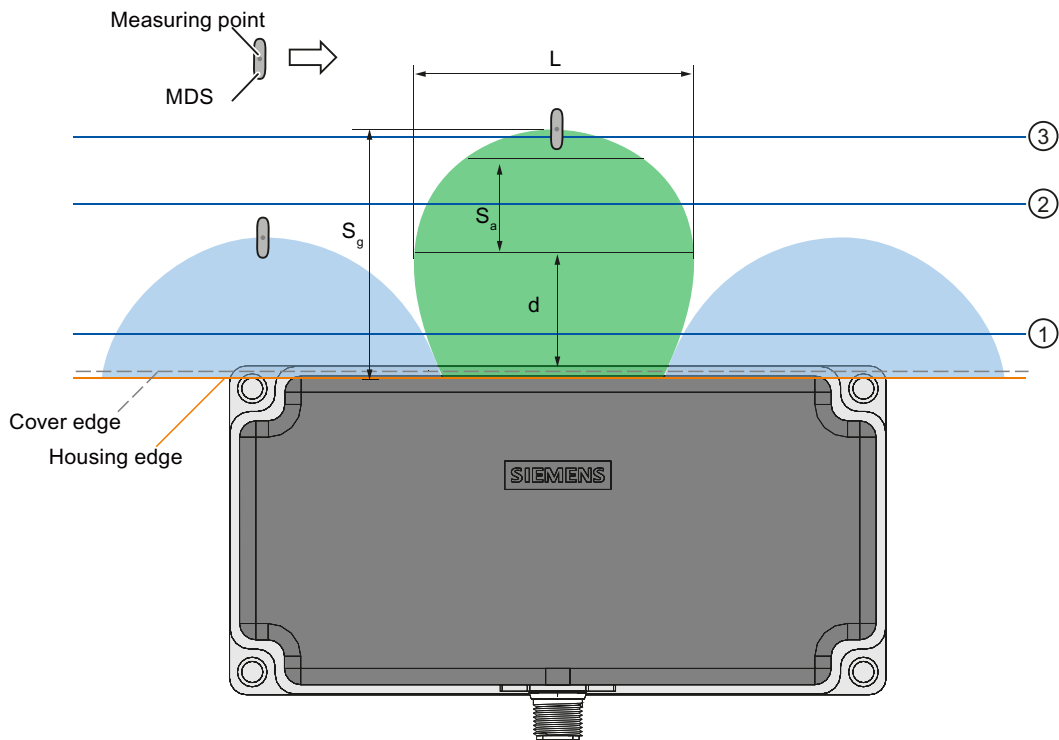


Figure 4 Distance definition for horizontal magnetic field

Green	Main field (processing field)
Blue	Secondary fields, horizontal magnetic field
L	Maximum length of the main field, horizontal magnetic field
d	Distance from the reader edge at which maximum horizontal main field length L exists
S_a	Operating range in the main field
S_g	Limit distance
①	Level 1
②	Level 2
③	Level 3
⇒	Direction of motion of the transponder

Operating range (S_a)

The operating range lies between Level ① and Level ③.

The operating range between Levels ① and ② includes secondary fields.

The recommended operating range therefore lies in the green main field between Level 2 and Level 3.

Limit distance (S_{lim})

The limit distance lies on Level ③.

Transmission window for vertical magnetic field

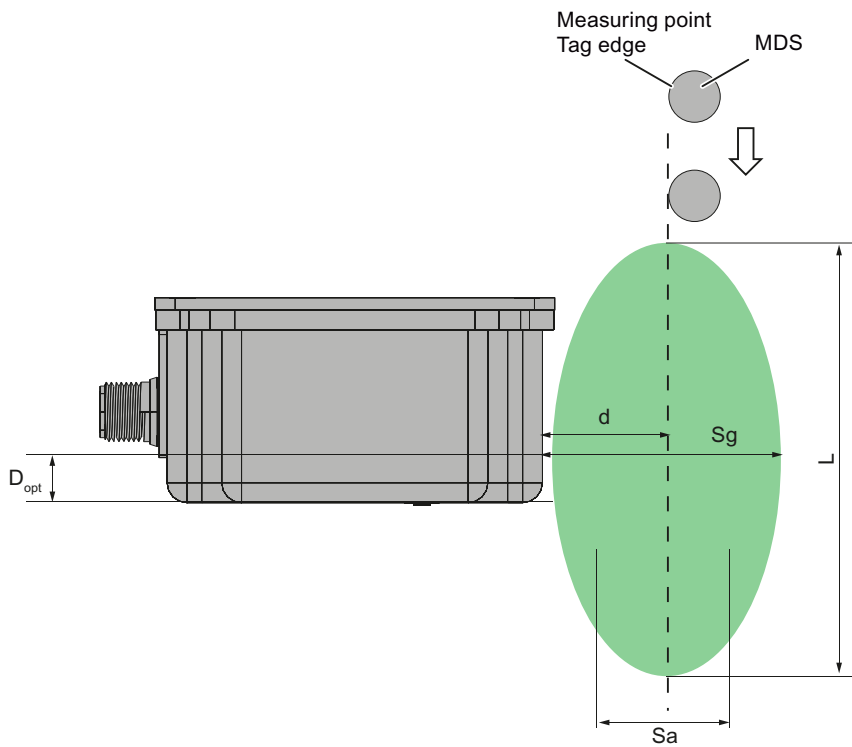


Figure 5 Distance definition vertical magnetic field

Green	Main field (processing field)
L	Maximum length of the main field, horizontal magnetic field
d	Distance from the reader edge at which maximum horizontal main field length L exists
S_a	Operating range in the main field
S_g	Limit distance
D_{opt}	= 13 mm
\Downarrow	Direction of motion of the transponder

Field data for MDS and SLG

The following tables show the field data of transponders with SIMATIC RF382R Scanmode. The technical specifications listed below are typical data and apply at an ambient temperature of +22 °C.

Tolerances of $\pm 20\%$ are admissible due to production and temperature conditions.

Field data horizontal field

Table 5 Length of the transmission window L

MDS D124	MDS D160	MDS D324	MDS D424	MDS D460
60	50	60	65	50

All dimensions in mm

Table 6 Usable field width with dynamic operation (median deviation) in mm

MDS D124	MDS D160	MDS D324	MDS D424	MDS D460
20	20	20	20	20

All dimensions in mm

Table 7 Operating range

MDS D124	MDS D160	MDS D324	MDS D424	MDS D460
40...65	35...50	40...65	40...65	30...50

All dimensions in mm

Table 8 Limit distance

MDS D124	MDS D160	MDS D324	MDS D424	MDS D460
75	65	75	75	60

All dimensions in mm

Field data vertical field

Table 9 Length of the transmission window at different distances d (reader tag edge)

d (mm)	MDS D124	MDS D160	MDS D324	MDS D424	MDS D460
2	155	130	155	150	120
10	150	125	150	145	115
20	140	110	140	135	105
30	130	100	130	120	90

All dimensions in mm

Table 10 Usable field width with dynamic operation (median deviation)

MDS D124	MDS D160	MDS D324	MDS D424	MDS D460
25	25	25	25	25

All dimensions in mm

Table 11 Operating range in mm (S_a)

MDS D124	MDS D160	MDS D324	MDS D424	MDS D460
10...25	10...25	10...25	10...25	10...25

All dimensions in mm

Table 12 Limit distance in mm (S_g)

MDS D124	MDS D160	MDS D324	MDS D424	MDS D460
75	65	75	75	60

All dimensions in mm

Note

Tips if the range is too short

If the range of the antenna is too short, you must check

- the power supply/switched-mode power supply (interference)
- whether there are monitors or other sources of interference nearby
- whether there is metal in the environment

Minimum distance from transponder to transponder (without multitag mode), in mm

The values are valid at a distance of 20 mm (reader-tag).

Table 13 Minimum distance transponder

	MDS D124 to MDS D124	MDS D160 to MDS D160	MDS D324 to MDS D324	MDS D424 to MDS D424	MDS D460 to MDS D460
Horizontal main field	100	100	100	100	100
Vertical main field	150	120	150	180	120

The minimum distance can be undershot in multitag mode.

NOTICE
<p>Extension of the data transmission time if distance values are undershot</p> <p>If the distance values specified in the tables are undershot, it is possible that the inductive fields will be affected. The time required for data transmission can increase unpredictably.</p> <p>For this reason, please observe the values in the tables.</p>

Traversing speed with RF382R Scanmode

The following table shows the traversing speed of a transponder through the main field. The direction of motion of the transponder is horizontal.

Table 14 Traversing speed of different transponders

	MDS D124	MDS D160 MDS D460	MDS D324 MDS D424
UID number (8 bytes)	1.5 m/s	1.5 m/s	1.5 m/s

Mounting on metal

The RF382R can be mounted directly on metal. Flush mounting on metal is not permitted.

Minimum distance between several RF382R Scanmode readers

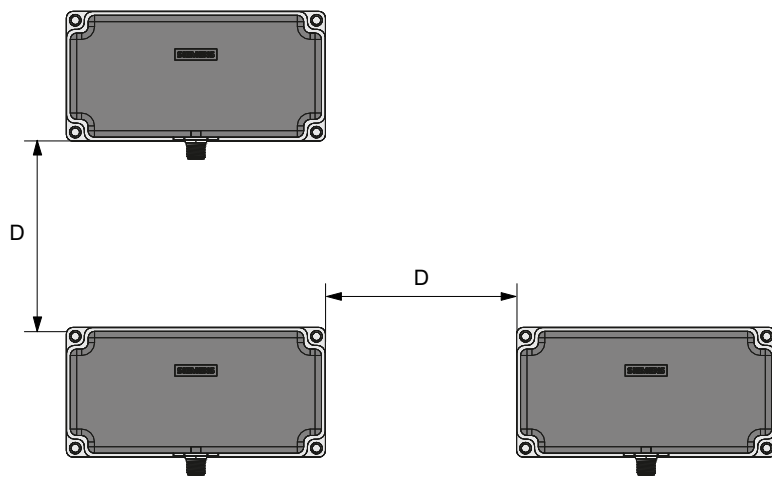


Figure 6 Minimum distance between several RF382R Scanmode readers

Minimum distance D from RF382R to RF382R	$D \geq 200 \text{ mm}$
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Setting the parameters of the RF382R

Certain parameters of the scan mode can be changed during operation. These parameters are transferred from the host to the reader via the serial interface for this purpose.

You can change the following parameters this way:

- ScanMode: Single Read (single reading of a tag) or Continuous Read (continuous reading of a tag)
- LockTime: Lock time for the setting "Continuous Read"
- Retentive: The parameters are stored in the non-volatile Flash memory of the reader.

The interface parameters for transfer are set permanently to 38400, 8, n, 1. This data sequence can be easily integrated into an existing application because the parameter assignment frame is open.

Structure of the parameter assignment frame to the reader

You can transfer a new parameter set to the reader at any time during operation. When a parameter set is received, scan mode will be interrupted, and the new parameters are checked and adopted if they are found to be "good". Scan mode will start up immediately once the parameters have been accepted.

Note

Data will be lost during parameter setting (which means from receipt of a parameter frame until acknowledgment) if operation continues.

The parameters are either saved in RAM (status = 00) only or retentively (status = 01). The command for transmission of parameters ("Para") is 01.

Data backup takes place with a simple EXOR operation (BCC) of all data bytes to be transferred.

The parameters will be transferred as a data sequence (message frame). The following parameters can be modified:

- "LockTime" parameter; you can set values of 0..65535 (time base 100 ms)
- "ScanMode" parameter; you can set ContinuousRead (00) and SingleRead (01)

All the other parameter bytes are reserved for future use and have to be assigned with 0.

Sending parameters to the reader

Command byte "Para"	Status	1st byte (res.)	...	6th byte "ScanMode"	7th byte "LockTime" (HighByte)	8th byte "LockTime" (LowByte)	...	21st byte (res.)	BCC
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The command message frame consists of 24 bytes that you always have to transfer completely.

Acknowledgment of the reader

Acknowledgment byte "Para"	Error code	BCC	
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The acknowledgment message frame consists of three bytes. The acknowledgment byte is identical to the command byte. The error code is zero if the parameters are accepted without errors. An error code other than zero means that the parameters have not been accepted. The following error codes are defined:

01	The command byte is incorrect (only "Para" is permitted)
02	The status byte is incorrect (RAM or retentive only)
03	The Scanmode parameter is incorrect (ContinuousRead and SingleRead permitted only)
04	The BCC value in the parameter message frame is incorrect.
05	Data could not be saved retentively (error with Flash type request)
06	Data could not be saved retentively (error with Flash delete)
07	Data could not be saved retentively (error with Flash writing)

Technical specifications

Table 15RF382R technical specifications

Inductive interface to the MDS	
Transmission frequency	13.56 MHz
Transmit power	Approx. 0.7 W
Supported transponders (reader air interface)	Transponder to ISO 15693
Antenna	Integrated, horseshoe shape
HOST interface	RS232
Baud rate	38400 baud
Read distances of the reader	See Chapter Field data for MDS and SLG (Page 6)
Minimum distance between two RF382R Scanmode readers	200 mm
Cable length reader - HOST	max. 30 m
Maximum data transmission rate transponder (tag) - reader (reading)	600 byte/s
Functions	Read transponder serial number
Power supply	24 V DC
Display elements	2-color LED (operating voltage, presence, error)
Plug connector	M12 (8-pin)
Housing	
<ul style="list-style-type: none"> • Dimensions (in mm) • Color • Material 	<ul style="list-style-type: none"> • 160 x 80 x 41 (without M12 device connector) • Anthracite • Plastic PA 12
Mounting	4 x M5 screws
Ambient temperature	
<ul style="list-style-type: none"> • 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	IP67
Shock to EN 60721-3-7 Class 7 M2	50g
Vibration to EN 60721-3-7 Class 7 M2	20g
Weight	approx. 550 g
MTBF (Mean Time Between Failures)	1 x 10 ⁶ h
Approvals	Radio to R&TTE guidelines EN 300 330, EN 301489, CE
Current consumption	typ. 140 mA
Max. power consumption (DC input)	3.5 W

Dimension drawing

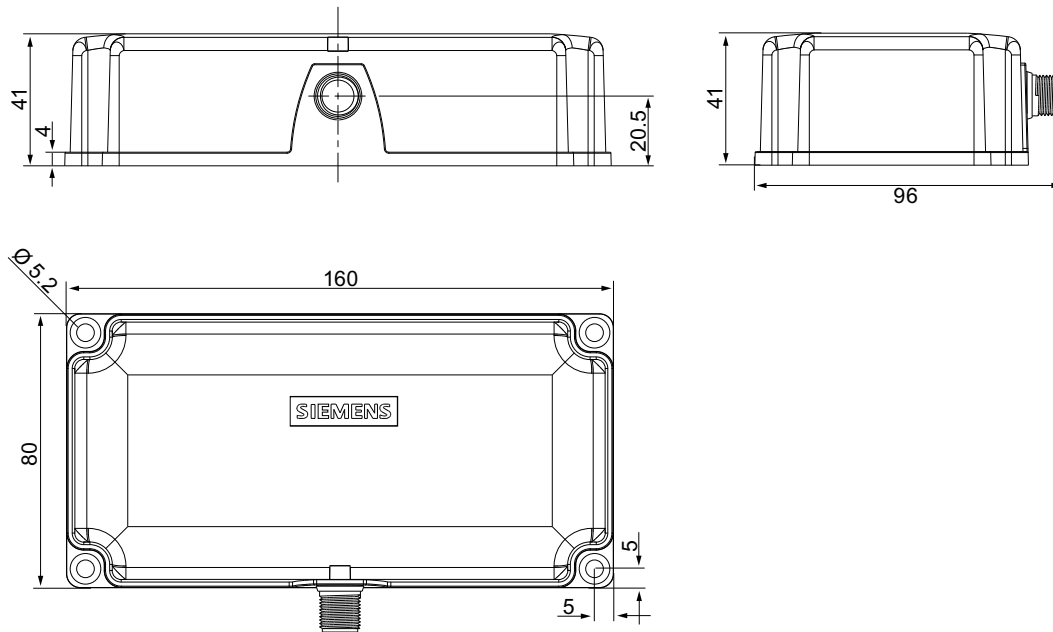


Figure 7 Dimension drawing

Service & Support

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 (<mailto:support.automation@siemens.com>)
- Internet: Online support request form: (www.siemens.com/automation/support-request)

Service & support at IA/DT

Support homepage (www.siemens.com/automation/service&support)

RFID homepage

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

FCC Information to the user:

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.

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