

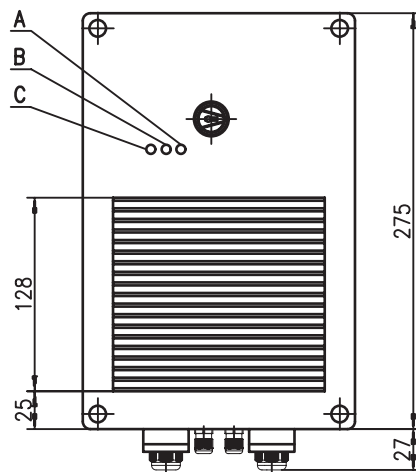
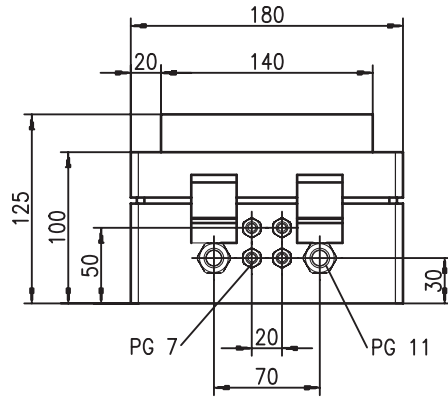


Ident system RFM 82

Transponder reader with separate antenna



Dimensioned drawing



- A Power LED
- B Read LED
- C Status LED



ISO 9001 ISO 15693

- Powerful writing and reading unit for operating ranges up to 700mm (depends on antenna and transponder)
- For separate antennas
- Suitable for industrial usage
- Bulk detection of up to 35 transponders possible
- Configurable functions
- RS 232 interface

Accessories:

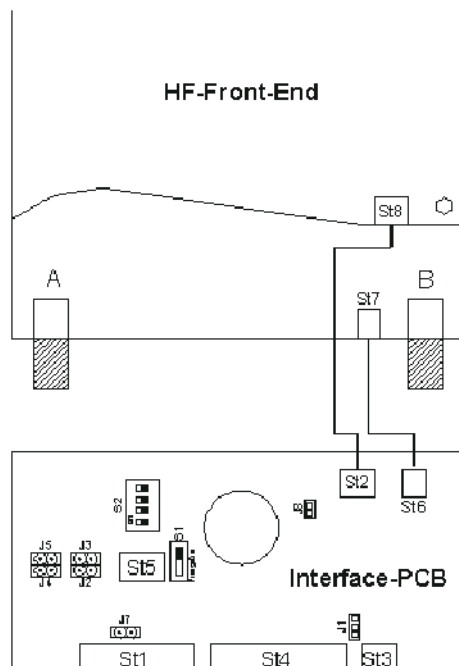
(available separately)

- **Transponder** - see Order guide and separate transponder data sheet



The operation without AFM... antenna may damage the RFM 82 SL 200!

Electrical connection



Connections

- A Main antenna
- B Secondary antenna (gate)
- ST1 Trigger input and switching output
- ST3 RS 232 interface
- ST4 Voltage supply and RS 485 interface
- ST6/ST7 Internal connection
- ST2/ST8 Internal connection
- S1 Release of the key-operated switch
- S2 Network address, binary
- J7 Internal acoustic signaller

For details see page 3.

We reserve the right to make changes • RFM_04e.fm



Specifications

Characteristic values

Working frequency	13.56MHz
Operating range ¹⁾	max. 700mm (AFM500x600)
Output power ²⁾	0.5 ... 4W (AFM500x600)
Data carrier speed ¹⁾	max. 3.0m/s
Memory access	write/read - approx. 50ms/block typical
Data protocols	I-Code (1+2) Tag-It /Tag-It HFI ISO 15693

Electrical data

Operating voltage U _B	12 ... 30VDC
Power consumption	max. 40.0W, typ. 1.65A at 24VDC
Data interface	RS 232
Baud rate	9600
Protocol	8 data bits, 1 stop bit, 1 start bit, no parity
Data frame	STX DATA CRLF
Prefix 1	02h = STX
Postfix 1	0Dh = CR
Postfix 1	0Ah = LF
Connection	antenna cable 3.6m/50Ω with SMA connector on RFM 82

Mechanical data

Housing	aluminium diecast, grey
Weight	approx. 3500g
Dimensions	280 x 180 x 130mm (RFM 82 SL 200) 500 x 600 x 55mm (AFM 500x600)

Environmental data

Ambient temp. (operation/storage)	-25°C ... +60°C/-40°C ... +70°C
Relative air humidity	5 ... 90% (non-condensing)
Standards and directives	R&TTE 1999/5/EG, EN 60950-1, EN 300330-2, EN 301489-1/3
Protection class	IP 65 acc. to EN 60529

1) Dependent on the transponder and antenna used



2) Observe performance data of the antenna and national regulations!

Order guide

	Designation	Part No.
Read-write unit		
Protocols acc. to ISO 15693 and I-Code	RFM 82 SL 200	500 39707
Separate antennas		
Operating range up to 700mm	AFM500x600	500 39706
Connector units		
Installation box for standalone operation	MA 2	500 31256
Network, multinet slave	MA 21 100.2	501 03125
Profibus connection	MA 42 DP-K	500 35298
Interbus connection	MA 42 IS	500 32853
Ethernet connection	IM 58631	501 01845
Disc transponder		
Ø 22mm, 256 byte memory	TFM 02 1125.220	501 02915
Ø 30mm, 44 byte memory	TFM 03 1105.210	500 40508
Ø 30mm, 112 byte memory	TFM 03 1110.210	501 02917
Ø 50mm, 44 byte memory	TFM 05 1105.210	500 40507
Ø 50mm, 112 byte memory	TFM 05 1110.210	501 02916
Self-adhesive transponder		
55x55mm, 44 byte memory	TFM 05 2205.210	500 40506
55x55mm, 256 byte memory	TFM 05 2225.220	501 02913
86x54mm, 44 byte memory	TFM 08 2205.210	500 40505
86x54mm, 256 byte memory	TFM 08 2225.220	501 02914
100x70mm, 112 byte memory	TFM 09 2210.210	501 02910
High temperature transponder		
51x51x5.3mm, 44 byte memory	TFM 05 2605.210	500 40504
Keyring transponder		
50x28x2mm, 256 byte memory	TFM 03 5125.220	501 02956
Spacer for disc transponder		
Ø 30mm for TFM 03 11...	Spacer 30	500 32404
Ø 50mm for TFM 05 11...	Spacer 50	500 32405

Function

Especially powerful unit for reading from and writing to suitable transponders in an industrial environment, with large operating ranges.

Device can be accessed directly by commands via a terminal program. It can also be configured via the Leuze RF-Config software. For commands see section "commands and messages".

Diagrams

see
transponder data sheet

Remarks

Ident system RFM 82
Transponder reader with separate antenna
Working range

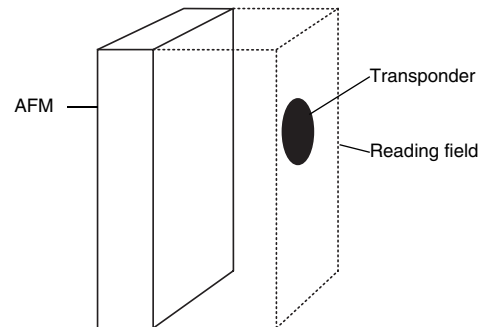
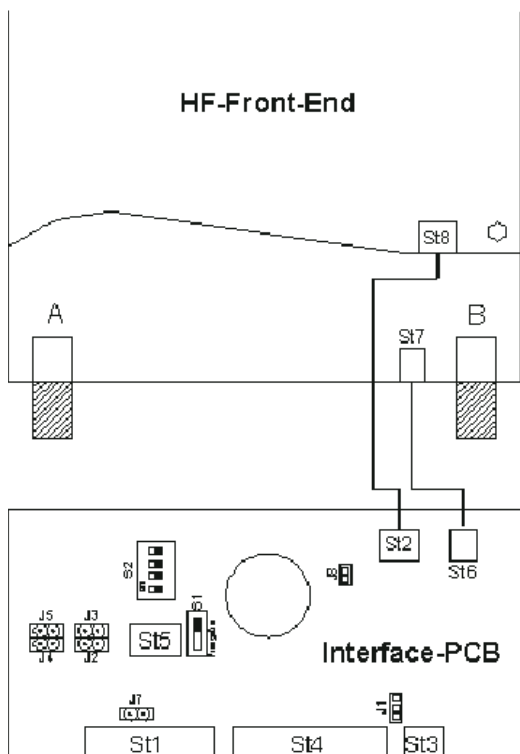
The read-write device RFM 82 SL 200 with connected antenna AFM... supports several data protocols according to ISO 15693, e.g. I-Code SLI. Leuze electronic offers a selection of transponders for applications in an industrial environment which support this technology.

This powerful device is intended in particular for large operating ranges and for field applications that use many transponders simultaneously. The device can be configured for this purpose. For long operating ranges, the antenna must be adjusted during commissioning. This can be achieved with SWR meters used in radio and RF technology, or can be done by Leuze maintenance (for a fee).

The detection range (reading field) of the reader is similar to a cuboid positioned above the antenna. Particularly good values for operating range and speed are obtained in the geometric centre of the reading field's upper margin and if transponder and antenna are positioned parallel to each other. Usually, there is hardly any reduction in the operating range up to an angle of $\pm 10^\circ$ to the parallel surface. At higher angles, the range is considerably reduced - although there is no fixed rule. One must take into consideration that metal surfaces in the immediate environment may further influence the properties of the device.

The entire front side of the antenna (black) is active and must not be in close range of metal (metal-free area: min. 700mm in front of antenna).

The voltage supply, antenna, interface, trigger sensor, etc. are connected directly to the RFM 82 SL 200. They can also be coupled via connector units MA...


Installation and connection

Connections

- A** Main antenna
- B** Secondary antenna (gate)
- ST1** Trigger input and switching output
- ST3** RS 232 interface
- ST4** Voltage supply and RS 485 interface
- ST6/ST7** Internal connection
- ST2/ST8** Internal connection
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Assignment ST1, ST3, ST4

Connector	Pin	Signal
ST1	1	Trigger+
	2	Trigger-
	3	VDC output 1
	4	Switching output 1
	5	GND output 1
ST3	1	RS 232 GND
	2	RS 232 RXD
	3	RS 232 TXD
ST4	2	VDC GND
	3	24VDC
	9	RS 485 A
	10	RS 485 B

2 jumpers can be used for the output configuration (for output 1)

J2 if plugged, VDC for output 1 is provided internally

J3 if plugged, GND for output 1 is provided internally

If jumpers J2 and J3 are plugged, no connection to ST1 is required for this purpose.



Commands and Messages

The factory setting permits immediate operation once the supply voltage is present. The following settings are activated by the factory settings:

- **Single shot:** This function reads a the data / serial number of a transponder once while it is in the field. The information that has been read is output via the interface
- **Data:** The read activation (trigger) outputs the serial number of the transponder.
- **Trigger:** The device reads after a trigger signal has been supplied, or after a software trigger ('+')
- **Switching output:** If the read is successful, the device supplies a 300ms high pulse at the output
- **Anti-collision off:** This function permits the simultaneous handling of several transponders within the field. In case of active trigger, only a single transponder is expected, hence anti-collision=off.

The following commands can be used to carry out direct actions:

- **Command '+'** activates a read process

Command syntax	STX '+'CRLF
Response	STX '@'0''Tagtype'SNRCRLF

 Tagtype stands for transponder type: 01 = I-Code, SNR = serial number
- **Command '-'** terminates the read process without a response
If no transponder was read, a NO READ (18h) is output
- **Command 'V'** returns the software version of the reader

Command syntax	STX 'V'CRLF
Response	STX 'Version''Name'CRLF
- **Command 'R'** carries out a restart and resets the device to factory settings

Command syntax	STX 'R'CRLF
Response	STX 'Q2'CRLF
	STX 'S'CRLF
- **Command 'I'** returns the serial number of the transponder(s) located in the reading field. The command can be used for identifying transponders located in the reading field.

Command syntax	STX 'I'CRLF
Response	STX '0'0''@''Tagtype'SNRCRLF

 Tagtype stands for transponder type: 01 = I-Code, SNR = serial number
- **Command 'W'** writes the desired data into the specified memory block

Command syntax	STX 'W'0'5'0''1'1'dataCRLF
Response	STX 'Q'4'CRLF (Q4 = write command received)

 After a trigger pulse or '+', the data are transferred into the tag, the response is STX 'Q'5'CRLF (Q5=write succeeded)
 The character sequence 011 after the block number stands for write 1 data block (1) [range 1-9] to I-Code transponder (01);

Notice: For the following command 'N' with direct transponder access, the transponder must have been previously identified following a trigger.

- **Command 'N'** returns the data of the desired block (block number, tag type, number in ASCII)

Command syntax	STX 'N'0'6'01''1'CRLF
Response	STX '0'0'6'01''Data'CRLF

 (where '0'6' = block number, '01' = tag type, '1' = number of blocks)

Note: Data is always coded in ASCII hexadecimal. Four ASCII characters fit into one block. Since only complete blocks are transmitted, the block data must always be filled up (8 characters/block)

**RF-Config configuration software**

With the help of the Leuze configuration software RF-Config, further options may be used and set. A complete description of the command structure and configuration can be requested separately, may be downloaded from the Internet under www.leuze.de or accessed under menu item "Help" of the RF-Config software.

The following messages inform you about the state of the device:

- 'S' After the voltage has been switched on, the device reports that is ready for operation.
- 'Q0' Command could not be carried out.
- 'Q1' Configuration changed.
- 'Q2' Action carried out.
- 'Q4' Write command understood.
- 'Q5' Write succeeded.
- '^' No transponder in the field or not readable.
- 'E01' Invalid command.
- 'E02' Invalid parameter.
- 'E10' Contradictory configuration selected (e.g., trigger and permanent reading).



Safety notices and conformity

Safety notices

The read-write systems RFM 82 with separate antenna AFM... for radio frequency identification (RFID) and the optional connector units MA... have been developed, manufactured and tested according to the applicable European safety standards. They correspond to the state of the art. Access and changes to the device, except where expressly described in this operating manual, are not authorised.

Intended use and operation

Attention! The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not corresponding to its intended use.

Read-write systems of type RFM 82 with separate antenna AFM... based on radio frequency identification are electronic devices for inductive data transmission that are intended to be used for automatic object recognition and material flow control in association with suitable code and data carriers known as transponders. The aforementioned MA... connector units simplify the connection of the read-write systems of type RFM and permit the adaptation to various interfaces.

In particular, unauthorised uses include:

- rooms with explosive atmospheres
- operation for medical purposes

Typical areas of application

The read-write systems RFM 82 with separate antenna AFM... and the optional MA... connector units are designed in particular for the following areas of application:

- object recognition in handling and warehousing systems
- commissioning systems in dispatch centres
- flexible material flow control in assembly lines and daisy-chained manufacturing cells
- acquisition of operational data

Declaration of conformity

The devices have been developed in accordance with the CE directive 1999/5/EC (R&TTE) and comply with the radio frequency permits acc. to EN 300 330-2, as well as with the EMC criteria of EN 301 489-3 and the safety standard of EN 60950-1.

The read-write system RFM 82, the separate antenna AFM... and the connector units MA... are developed and manufactured under observation of the applicable European standards and directives.

A respective Declaration of Conformity may be downloaded via the Internet at www.leuze.de. The manufacturer of the product, Leuze electronic GmbH + Co. KG in D-73277 Owen/Teck, possesses a certified quality assurance system in accordance with ISO 9001.