

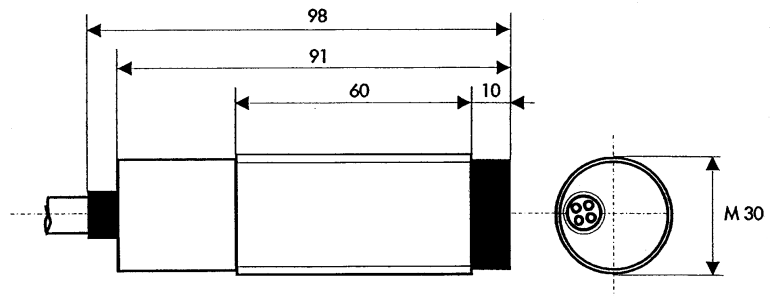


Ident system RFM 12

Transponder reader



Dimensioned drawing



ISO 9001 ISO 15693

- Writing and reading unit in M30 case for operating ranges up to 45mm (depends on transponder)
• Standardised protocols
• Suitable for industrial usage
• High data transfer rate
• Configurable functions
• RS 232 interface
• Prepared for connection to MA 2 / MA 21 100.2 / MA 42

Electrical connection

Accessories:

(available separately)

- Transponder - see Order guide and separate transponder data sheet

Connector configuration

Cable with connectors, approx. 1 m long

Table with 2 columns: Colour and Connection. Rows include: grey (+8 ... 30VDC supply), white (0VDC GND, supply), green (RS 232 Tx), yellow (RS 232 Rx), brown (RS 232 GND), violet (trigger +8 ... 30VDC), white-black (switching output).

We reserve the right to make changes • RFM\_01.e.fm



Ident system RFM 12

Specifications

Characteristic values

Working frequency	13.56MHz
Reading range <sup>1)</sup>	max. 45mm, 35mm recommended (transponder Ø 50mm)
Writing range <sup>1)</sup>	max. 40mm, 30mm recommended (transponder Ø 50mm)
Data carrier speed <sup>1)</sup>	max. 2.0m/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 <sub>B</sub>	12 ... 30VDC
Power consumption	approx. 0.9W, 35mA typ. 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

Indicators

LED green	switching output
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Mechanical data

Housing	M30 metal bushing with ABS front, black
Weight	210g
Dimensions	Ø 30mm, 98mm long

Environmental data

Ambient temp. (operation/storage)	-25°C ... +65°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 67 acc. to EN 60529

1) Depends on transponder, reading type and reading distance used

Function

Unit for the reading and writing of suitable transponders in an industrial environment. Device can be accessed directly by commands via the Leuze RF-Config terminal program (for commands see Section "commands and messages").

Diagrams

see  
transponder data sheet

Order guide

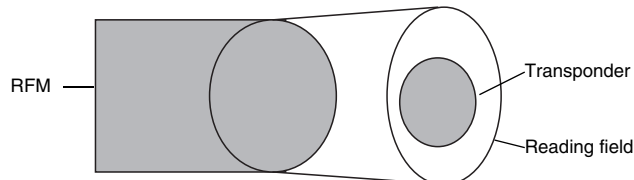
	Designation	Part No.
<b>Read-write unit</b>		
Protocols acc. to ISO 15693 and I-Code	RFM 12 SL 200	500 40497
<b>Connector units</b>		
Installation box for standalone operation	MA 2	500 31256
Network, multinet slave	MA 21 100.2	501 03125
Profibus connection	MA 42 DP-K	500 35298
Interbus connection	MA 42 IS	500 32853
Ethernet connection	IM 58631	501 01845
<b>Disc transponder</b>		
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
<b>Self-adhesive transponder</b>		
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
<b>High temperature transponder</b>		
51x51x5.3mm, 44 byte memory	TFM 05 2605.210	500 40504
<b>Keyring transponder</b>		
50x28x2mm, 256 byte memory	TFM 03 5125.220	501 02956
<b>Spacer for disc transponder</b>		
Ø 30mm for TFM 03 11...	Spacer 30	500 32404
Ø 50mm for TFM 05 11...	Spacer 50	500 32405

Remarks

## Working range

The read-write device RFM 12 SL 200 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.

The detection range (reading field) of the reader is similar to a cylinder positioned above the reader. 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 reading device 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 device (black) is active and must not be in close range of metal (metal-free area: min. 50mm in front of device).



To simplify the installation, the RFM's cable is fitted with connectors that match the connector units MA .... Apart from a simplified connection, the MA ... connector units also offer an additional service interface for the configuration of the reader via a null modem cable.

## 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.
- **Precharge:** A write command can be sent before the transponder enters the field.
- **Transponder type:** I-Code transponder type is activated.

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 'H'** stops all actions and performs a software new-start (settings are retained)  
Command syntax      STX 'H'CRLF  
Response              STX 'Q2'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)

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](http://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 12 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 12 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 12 with 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 12 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 under [www.leuze.de](http://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.