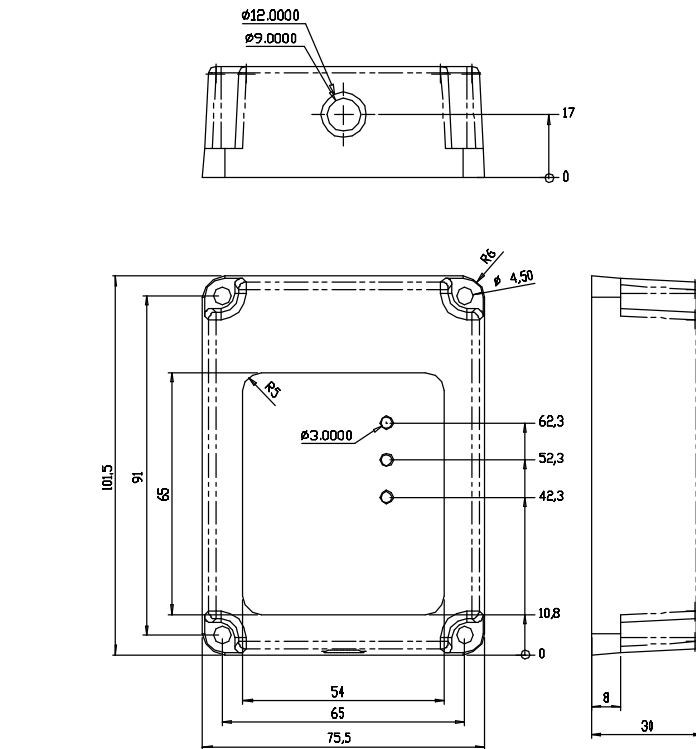


Ident system RFM 32

Transponder reader

Dimensioned drawing

en 01-2015/03 50128697



- Compact writing and reading unit for operating ranges up to 110mm (depends on transponder)
- Standardised protocols
- Suitable for industrial usage
- High data transfer rate
- Configurable functions
- RS 232 interface
- Connection to MA 2 / MA 21 100.2 / MA 2xxi
- **Optional:** Ex model for Ex zone 2, gas (Ex) II 3G nA IIB T4 Gc X and Ex zone 22, dust (Ex) II 3D Ex tc IIIC T80°C Dc IP67 X

Electrical connection

Connector configuration
Cable with connectors:

approx. 1 m long (standard model)
approx. 10m long (Ex model)

Colour	Connection
grey	+12 ... 30VDC (supply)
white	0VDC (GND, supply)
green	RS 232 TxD
yellow	RS 232 RxD
brown	RS 232 GND
violet	trigger +12 ... 30VDC
white-black	switching output

Accessories:

(available separately)

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



We reserve the right to make changes • DS_RF32_RF32Ex_en_50128697.fm

Specifications

Characteristic values

Working frequency	13.56MHz
Reading range ¹⁾	max. 110mm, 85mm recommended (transponder Ø 50mm)
Writing range ¹⁾	max. 95mm, 70mm recommended (transponder Ø 50mm)
Data carrier speed ¹⁾	max. 6.0m/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	approx. 1.2W, 40mA 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 <CR><LF>

Indicators

LED green	read process (not online!)
LED yellow	voltage supply
LED red	activation (trigger)

Mechanical data

Housing	RFM 32 SL 200	RFM 32 SL 200 Ex n
Weight	Black ABS, molded	Black ABS, molded
Dimensions	approx. 280g	approx. 500g
	101.5 x 75.5 x 30mm	

Environmental data

Ambient temperature	operation -25°C ... +65°C	-25°C ... +60°C
	storage -40°C ... +70°C	-40°C ... +70°C
Relative air humidity	5 ... 90% (non-condensing)	
Standards and directives	R&TTE 1999/5/EG, 94/9/EWG EN 50021, EN 301489-3, EN 300330-2, EN 60950	
Protection class	IP 67 acc. to EN 60529	

Explosion protection

Certification (CENELEC)	 II 3G Ex nA IIB T4 Gc X
	 II 3D Ex tc IIIC T80°C Dc IP67 X

1) Depends on transponder, reading type and reading distance used, and the temperature. Above an ambient temperature of 50°C, the operating range decreases by up to 20%.

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.
Read-write unit		
Protocols acc. to ISO 15693, e.g. NXP I-Code and Tag-IT	RFM 32 SL 200 ¹⁾	50040498
Explosion protected, protocols acc. to ISO 15693, e.g. NXP I-Code and Tag-IT	RFM 32 SL 200 Ex n	50103087
Connector units		
Installation box for standalone operation	MA 2 ¹⁾	50031256
Network, multinet slave	MA 21 100.2 ¹⁾	50103125
Modular interfacing unit for all common field bus systems	MA2xxi ¹⁾	
Disc transponder		
Ø 22mm, 256 byte memory, IP 68	TFM 02 1125.220	50102915
Ø 30mm, 112 byte memory, IP 66	TFM 03 1110.210	50102917
Ø 30mm, 112 byte memory, IP 68	TFM 03 1510.210	50106412
Ø 50mm, 112 byte memory, IP 66	TFM 05 1110.210	50102916
Ø 50mm, 112 byte memory, IP 68	TFM 05 1510.210	50106413
Disc transponder with Ex approval ²⁾		
Ø 54x15mm, 112 bytes of memory, black, up to 90°	TFM 05 1110.Ex	50108070
Self-adhesive transponder		
55x55mm, 44 byte memory	TFM 05 2205.210	50040506
55x55mm, 256 byte memory	TFM 05 2225.220	50102913
86x54mm, 44 byte memory	TFM 08 2205.210	50040505
86x54mm, 256 byte memory	TFM 08 2225.220	50102914
High temperature transponder		
51x51x5.3mm, 44 byte memory, IP 68	TFM 05 2605.210	50040504
Ø 85mm, 44 byte memory, IP 68	TFM 08 1605.210	50106414
Keyring transponder		
50x28x2mm, 256 byte memory	TFM 03 5125.220	50102956
Spacer for disc transponder		
Ø 36mm for TFM 03 1...	Spacer 30 HT	50107102
Ø 56mm for TFM 05 1...	Spacer 50 HT	50107103
Ø 85mm for TFM 08 16...	Spacer 85 HT	50106411

1) Devices are not suitable for potentially explosive areas

2) See data sheet Transponder TFM...EX

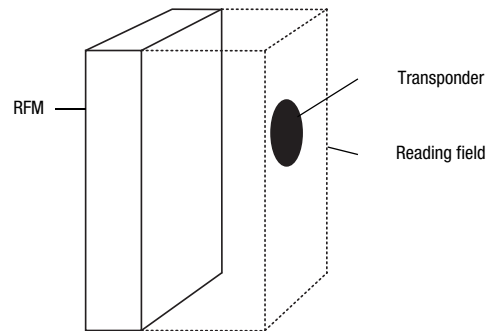
Remarks

Working range

The read-write device RFM 32... 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 cuboid 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. 100mm 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
- **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.
- **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 are 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 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.
- 'A' 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 – standard device RFM 32 SL 200

Safety notices

The read-write systems RFM 32 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 32 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 32 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 European directive 1999/5/EC (R&TTE) and comply with the radio frequency permits acc. to EN 300330-2, as well as with the EMC criteria of EN 301489-3 and the safety standard of EN 60950-1.

The read-write system RFM 32 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.com. The manufacturer of the product, Leuze electronic GmbH + Co. KG in D-73277 Owen, possesses a certified quality assurance system in accordance with ISO 9001.

Notices for the safe use of sensors in potentially explosive areas – Ex device RFM 32 SL 200 Ex n

This document is valid for devices with the following classifications:

Device group	Device category	Equipment protection level	Zone
II	3G	Gc	Zone 2
II	3D	Dc	Zone 22



Attention!

- Check whether the equipment classification corresponds to the requirements of the application.
- The devices are not suited for the protection of persons and may not be used for emergency shutdown purposes.
- A safe operation is only possible if the equipment is used properly and for its intended purpose.
- Electrical equipment may endanger humans and (where applicable) animal health, and may threaten the safety of goods if used incorrectly or under unfavorable conditions in potentially explosive areas.
- The applicable national regulations (e.g. EN 60079-14) for the configuration and installation of explosion-proof systems must be observed without fail.

Intended use and operation

Read-write systems of type RFM 32 SL 200 Exn 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:

- operation for medical purposes

Installation and Commissioning

- The devices must only be installed and commissioned by trained electricians. They must be aware of the regulations and operation of explosion-proof equipment.
- Connection outside the potentially explosive area: disconnect only in safe environment.
- Connection cables and connectors must be protected from excessive or unintended pulling or pushing strain.
- Prevent dust deposits from forming on the devices.
- Metallic parts (e.g. housing, mounting devices) are to be integrated into the potential equalization to prevent electrostatic charge.

Service and Maintenance

- No changes may be made to explosion-proof devices.
- Repairs may only be performed by a person trained for such work or by the manufacturer.
- Defective devices must be replaced immediately.
- Cyclical maintenance is generally not necessary.
- Depending on the environmental conditions, it may occasionally be necessary to clean the surfaces of the sensors. This cleaning must only be performed by persons trained for this task. We recommend using a soft, damp cloth. Cleaning agents that contain solvents must not be used.

Chemical resistance

Resistance to chemicals must be examined on a case by case basis.

Certifications

The devices have been developed in accordance with the European directives 94/9/EC (ATEX) and 1999/5/EC (R&TTE) and comply with the radio frequency permits according to EN 300330-2, as well as with the EMC criteria of EN 301489-3. Safety and health are guaranteed in accordance with EN 60950-1. The required certifications are requested at the time of writing this documentation.

Declaration of conformity

The read-write system RFM 32 SL 200 Ex n and the connector units MA... are developed and manufactured under observation of the applicable European standards and directives.

The manufacturer of the product, Leuze electronic GmbH + Co. KG in D-73277 Owen, possesses a certified quality assurance system in accordance with ISO 9001.



the **sensor** people

EG-KONFORMITÄTS- ERKLÄRUNG

EC DECLARATION OF CONFORMITY

DECLARATION CE DE CONFORMITE

Der Hersteller

The Manufacturer

Le constructeur

Leuze electronic GmbH + Co. KG
In der Braike 1, PO Box 1111
73277 Owen, Germany

erklärt, dass die nachfolgend
aufgeführten Produkte den
einschlägigen Anforderungen
der genannten EG-Richtlinien
und Normen entsprechen.

declares that the following
listed products fulfil the
relevant provisions of the
mentioned EC Directives and
standards.

déclare que les produits
identifiés suivants sont
conformes aux directives CE
et normes mentionnées.

Produktbeschreibung:

Description of product:

Description de produit:

RFID Schreib-/Lesegerät
RFM 32 SL 200 Ex-n


RFID read/write device
RFM 32 SL 200 Ex-n

Appareil de lecture/écriture
RFID
RFM 32 SL 200 Ex-n

Kennzeichnung Gas / Staub:

Marking for gas / dust:

Marquage gaz / poussière:

 II 3G Ex nA IIB T4 Gc X

/

 II 3D Ex tc IIIC T80°C Dc IP67 X

Angewandte EG-Richtlinie(n):

Applied EC Directive(s):

Directive(s) CE appliquées:

1999/5/EG
94/9/EG

1999/5/EC
94/9/EC

1999/5/CE
94/9/CE

Angewandte Normen:

Applied standards:

Normes appliquées:

EN 60950-1: 2006+A12:2011
EN 300 330-2 V1.5.1: 2010
EN 60079-15: 2010

EN 301 489-1 V1.9.2: 2011
EN 60079-0: 2009
EN 60079-31: 2009

13.03.15

Datum / Date / Date

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