



Ident system RFM 32Ex

Transponder reader for Ex zone 2



Part No. 501 08199



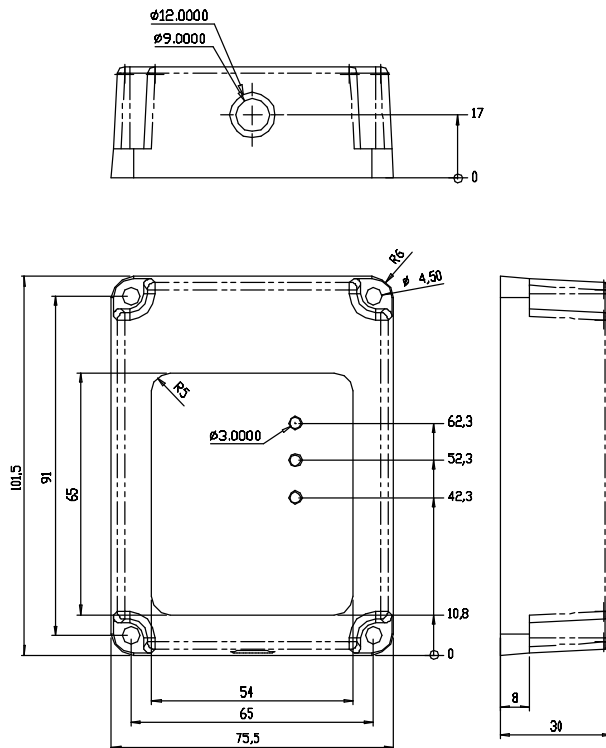
- Compact writing and reading unit for operating ranges up to 110mm (depends on transponder)
- Standardised protocols
- For Ex zone 2, suitable for gas (II 3G EExnA II T4), -25 °C < Ta < +60 °C
- RS 232 interface
- Prepared for connection to MA 2 / MA 21 100.2 / MA 42

Accessories:

(available separately)

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

Dimensioned drawing



Electrical connection

Connector configuration
Cable with connectors, approx. 10m long

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

We reserve the right to make changes • R1FMEx_01gb.fm



Ident system RFM 32Ex

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. 5.0m/s
Data protocols	ISO 15693 e. g. I-Code (1+2) Tag-It /Tag-It HFI Infineon

Electrical data

Operating voltage U _B	12 ... 30VDC
Power consumption	max. 1.2W
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 2	0Ah = LF

Mechanical data

Housing	Black ABS, moulded
Weight	approx. 500g
Dimensions	101 x 75 x 30mm
Cable length	10m

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/EC, 94/9/EWG EN 50021 EN 301489-3 EN 300330-2 EN 60950

Protection class	IP 67 acc. to IEC 529 Ex approval for zone 2, protection type nA, temperature range T4
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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%.

Order guide

	Designation	Part No.
Read-write unit		
Protocols acc. to ISO15693, I-Code, Tag IT, 10m cable	RFM 32 SL 200 Exn	501 03087
Connector units		
Installation box for standalone operation	MA 2 ¹⁾	500 31256
Network, multinet slave	MA 21 100.2 ¹⁾	501 03125
Profibus connection	MA 42 DP-K ¹⁾	500 35298
Interbus connection	MA 42 IS ¹⁾	500 32853
Ethernet connection	IM 58631 ¹⁾	501 01845
Disc transponder with ATEX approval ²⁾		
Ø 34x8mm, 112 byte memory, black	TFM 03 1110.Ex	501 08071
Ø 54x15mm, 112 byte memory, black	TFM 05 1110.Ex	501 08070

1) Devices are not suitable for potentially explosive areas

2) Approval area for ATEX zone 2, temperature range T4: -25...+60°C (tested operation), protection type nA, non-sparking devices

Function

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

Diagrams

see
transponder data sheet

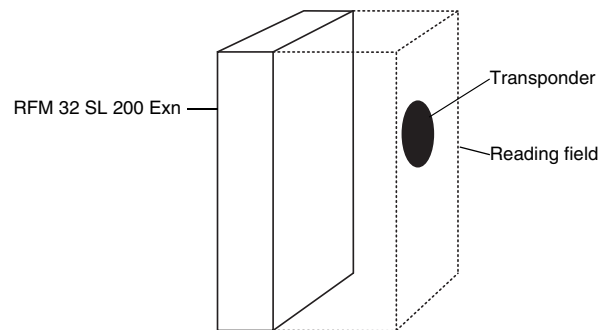
Remarks

Ident system RFM 32Ex**Transponder reader for Ex zone 2****Working range**

The read-write device RFM 32 SL 200 Exn supports several data protocols according to ISO 15693, e.g. I-Code SLI.

Leuze offers a selection of transponders for this technology.

The detection range (reading field) of the reader is similar to a cuboid positioned above the antenna surface. Particularly good values for operating range and speed are obtained in the geometric centre of the reading field's upper margin. The best results are always achieved when the transponder and the 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 device is active and must not be in close range of metal (metal-free area: min. 100mm in front of device).



The voltage supply, interface, trigger sensor etc. are connected via an MA 2 / MA 21 100.2 or MA 42 connector unit for the RFM 32 SL 200 Exn.

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 command outputs the serial number of the transponder.
- **Trigger:** The device reads after a trigger signal has been supplied, or after a software trigger ('+').
- **Good Read:** 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.

Short commands without data

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

- **Command '+'** activates a read process
Command syntax STX '+'CRLF
Response STX '0''@''0''Tag type'SNRCRLF
Tag type 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 'y1''y0''m1''m0''d1''d0''t3''t2''t1''t0''Name'CRLF
y stands for year (2), m for month (2), d for day, t for tag number (4) and name for type of device
- **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'** (Inventory)
displays the serial numbers of all transponders located in the 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



Further commands

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

- **Command 'N'** Read block
returns the data of the desired block(s) (block number, tag type, number in ASCII)
Command syntax STX 'N'05'01'1'SNR'CRLF
Response STX '0'05'01'Data'CRLF
(where 05 = block number, 02 = tag type I-Code, 1 = number of blocks to be read)
when using multiple transponders (anti-collision), the SNR **must** also be specified here

- **Command 'W'** Write block
writes the desired data to the specified memory block
Command syntax STX 'W'05'01'1'SNR'xxxxxxx'CRLF
(where 05 = block number, 01 = tag type I-Code, 1 = number of blocks to be written,
xxxxxxx = data)
Response STX 'Q4'CRLF (Q4 = command understood)
STX 'Q5'CRLF (Q5 = write operation successful - after trigger)

Configuration commands (see Leuze RFID configuration document)

The RFID devices have a configuration register with a total of 66 addresses (00 to 66h). Depending on the function, a setting may require multiple addresses (see configuration document)

- **Command 'G'** Read configuration
Response 'GFF00' (complete)
'G00xxxxxxx'

- **Command 'C'** Configure
Response 'C0199'
where 01=register address (start), 99=configuration data
'Q1' (see also Acknowledgements)

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.
- '^' No transponder in the field or not readable.
- 'E01' Invalid command.
- 'E04' Frame error.
- 'E10' Contradictory configuration selected (e.g., trigger and permanent reading).



Safety notices, approvals and conformity

Safety notices

The read-write systems RFM 32 SL 200 Exn 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 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.

The RFM 32SL 200 Exn version is specially designed for use in potentially explosive atmospheres in accordance with zone 2 (II 3G EEx nA T4). Approved temperature range -25°C to +60°C.

In particular, unauthorised uses include:

- Operation for medical purposes

Typical areas of application

The read-write systems RFM 32 SL 200 Exn with the optional MA... connector units are designed in particular for the following areas of application:

- Object detection in conveyor and storage technology in potentially explosive atmospheres in accordance with zone 2, temperature range T4
- Flexible material flow control in painting systems, assembly lines and daisy-chained manufacturing cells.
- Acquisition of operational data

Approvals

The devices have been developed in accordance with the explosion protection directive 94/9/EWG (EN 50021), CE directive 1999/5/EC (R&TTE) and comply with the radio frequency permits acc. to EN 300 330-2 as well as with EMC criteria EN 301 489-3. Protection of safety and health are ensured acc. to EN 60950-1. At the time of creation of this documentation, the required permits have been applied for.

Declaration of conformity

The read-write system RFM 32 SL 200 Exn 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/Teck, possesses a certified quality assurance system in accordance with ISO 9001.



EG-Konformitätserklärung

EC-Declaration of conformity

Hersteller:

Manufacturer:

Leuze electronic GmbH + Co KG
In der Braike 1
73277 Owen / Teck
Deutschland

erklärt unter alleiniger Verantwortung, dass das Produkt:
declares under sole responsibility that the product:

Gerätebeschreibung:

Description of Product:

RFM 32 SL 200 Ex-n
(CE II 3G EEx nA II T4)
-25°C ≤ Ta ≤ +60°C

folgenden Richtlinien und Normen für die Gerätegruppe II, Gerätekategorie 3 entsprechen
und bei bestimmungsgemäßer Verwendung und Beachtung der Betriebsanleitung die
grundlegenden Sicherheits- und Gesundheitsanforderungen erfüllen.
conform to the following directives and standards for equipment group II, equipment category 3. They fulfill the basic health
and safety requirements if used as intended and in accordance with the operating manual.

Angewandte EG-Richtlinien:

Applied EC-Directive:

EG-Richtlinie

1999/5/EG (R&TTE) Gesetz über
Funkanlagen und Telekommunikation
94/9/EG Explosionsschutzrichtlinie

Angewandte harmonisierte Normen:

Applied harmonized standards:

EN 300 330-1 V1.3.1 (2001-06)

Luftschnittstelle bei Funkanlagen
§3(2) (Artikel 3(2>>))

EN 301 489-1 V1.2.1 (2000-08)

EN 301 489-3 V1.2.1 (2000-08)

Schutzanforderungen in Bezug auf die
elektromagnetische Verträglichkeit
§3(1)2, Artikel 3 (1)b)

EN 60950-1:2001

Gesundheit und Sicherheit
§3(1)1. (Artikel 3 (1) a))

EN 50021:1999

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Die Gesellschaft ist eine Kommanditgesellschaft
mit Sitz in Owen. Registergericht Kirchheim-Teck, HRA 712
Persönlich haftende Gesellschafterin ist die
Leuze-electronic Geschäftsführungs-GmbH mit Sitz in Owen
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Vorsitzender des Verwaltungsrats: Meinert Hahnemann

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