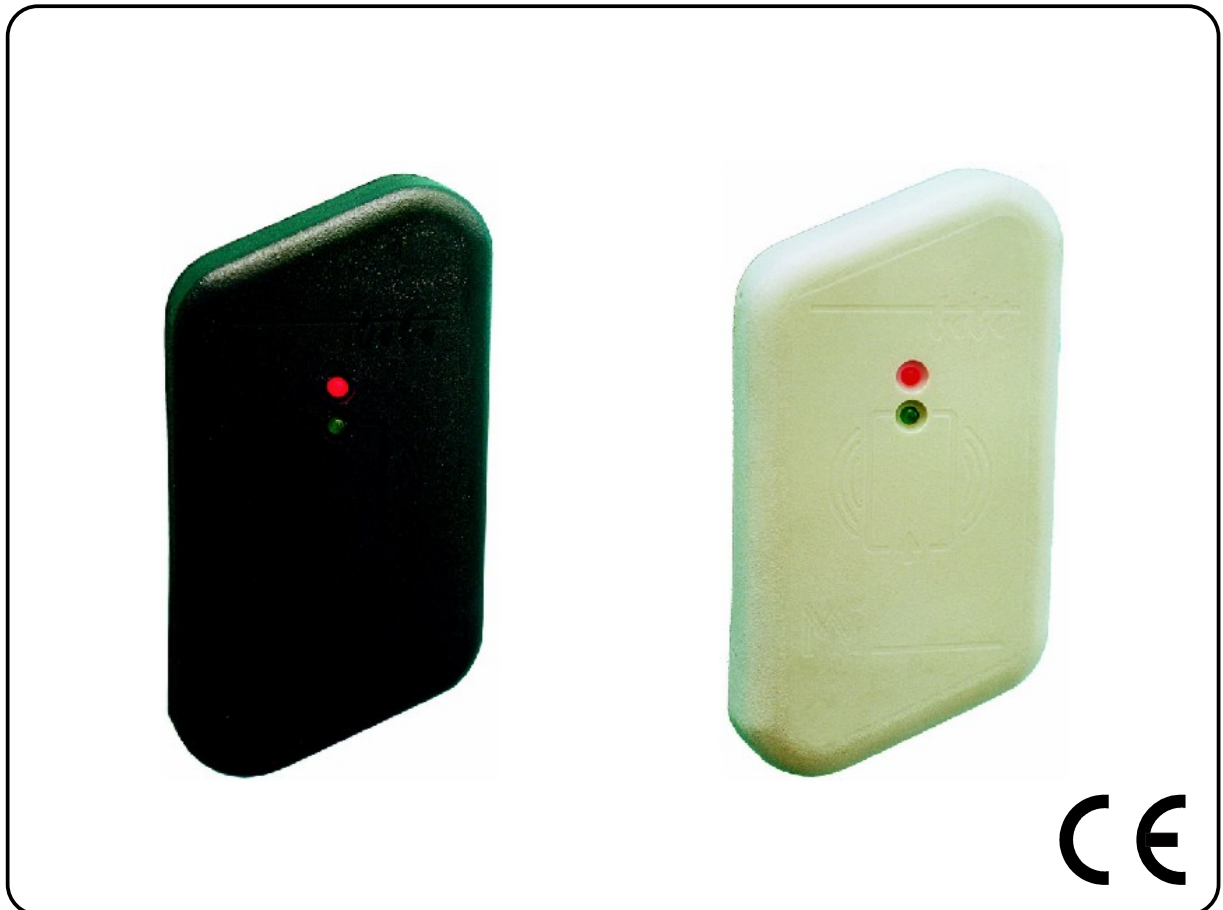




## MM-R32

Proximity card reader with RS232 interface



### Technical data:

- reader type: R32
- frame format: ASCII
- identifiers: Unique transponders
- readout system: 125 kHz, ASK, Manchester
- range of card readout: at least 5 cm
- data transmission: RS232
- transmission format: 9600 Baud, 8 N 1
- power supply: +12V DC
- current consumption: 100 mA
- dimensions: 95 x 48 x 13 mm
- operating temperature: -30°C...+70°C

### Casing

The reader has a durable and aesthetic casing made of a shock-proof polyamide. All electronic components are protected by vepuran which makes the reader resistant to atmospheric conditions. That is why it can be used both in and outdoors. Its small dimensions allow installing it virtually anywhere.

The cable used for connecting the reader is placed in the middle of the back side of the casing. The order of wires:

Signal	Wire	Description
+12V	red	+12V power supply
GND	blue	ground (supply -)
E	screen	to controller's ground
TxD	green	sending line of the RS232
RxD	white	receiving line of the RS232



### General device characteristics

The Mm-R32 reader is destined for readout of Unique type transponders (proximity identifiers). Identifiers have various shapes and sizes, they can be plastic cards, key-fobs, cylinders, etc. Each transponder sends its unique 64-bit code in a 125 kHz field using amplitude modulation with Manchester encoding.

A transponder sends its code many times when placed in the reader's field. The reader sends the code to the computer only once using the serial port. The reader sends the card number in the form of ASCII codes.

### Configuring the reader

The Mm-R32 reader can be configured according to the user's demands. Configuration includes the reader's work mode and transmission format. Configuration can be set along with the order or using the bibiCom programme (Windows® 98/200/XP).

Configuration can also be set using one's own programme by sending the following command:

'K', CFG, - CFG

CFG is a configuration byte. Its bits set the following functions:

bit 0 - 1 = hexadecimal data format (0 = decimal)

bit 1 - 1 = adding \* at the beginning of transmission

bit 2 - 1 = adding reader number before card number

bit 3 - 1 = adding CR LF at the end of transmission

bit 4 - 1 = OnLine work mode (0 = OffLine)

bit 5 - 1 = signalling card absence [^]

bit 6 - 1 = special mode with CRC security

bit 7 - always set to 1

„-CFG” is the CFG byte with every bit negated, sent as transmission protection.

### Reader work modes

#### OnLine

In OnLine mode every time a card appears in the reader's field this event is signalled (green LED, buzzer) and the card's code is sent once to the computer.

If the "signalling card absence" option is enabled the reader will additionally send a special code when the card disappears from its field. The sending of that code is not signalled by the reader (LED nor buzzer).

#### OffLine

In the OffLine mode the reader will not react to a card when it appears in its field. The reader will activate only after receiving a command from the computer.

If there is a card in the reader's field and its code has not been sent yet the code will be sent immediately. If there is no card in the field, the reader will turn on the green LED and wait for a card to appear. If a card is brought close to the reader it will cause the same reaction as in the OnLine mode.

After sending the card's code the reader becomes inactive again. Readout of another card is possible after receiving another command from the computer.

### Data transmission

Transponders send 64-bit codes to the reader, but the code has only 40 bits. The remaining bits are used for synchronization and controlling if readout is correct. The received number is stored on 5 bytes which are then sent to the computer.

In the special CRC mode (higher resistance to interference) the card number is stored on 6 bytes (first byte = 0) plus a 7th byte = CRC8.

Transmission format is set in the reader's configuration. A single transmission frame consists of 4 fields:

1. Transmission start character [\*] - option
2. Reader number [8 hex digits between < > brackets] - option
3. Card number in one of the following formats:
  - a) 10 hex characters (0..9,A..F) or 15 digits (0..9)
  - b) 14 hex characters or 21 digits (CRC mode)
  - c) [^] character - card removed from field
  - d) empty field - no card in the reader's field
4. Transmission end [CR LF code] - option.

Example of a full code:

**\*<00E8003A>1CB47F38A9(CR)(LF)**

### Controlling the reader

Commands are transmitted to the reader using the serial port. Another command can be sent after receiving a response to the previous command or after 150 ms has elapsed. If using the reader in OnLine mode no commands have to be sent.

Using the OffLine mode requires sending corresponding commands to the reader:

XON [0x11] - read a card (wait for a card)

XOFF [0x13] - abort waiting for a card

'T' - check card presence

'M' - check reader presence

The last two commands work in both modes. The 'T' command results in sending a single transmission frame - if there is no card number included it means that there is no card in the reader's field. This allows to control the presence of a card during the programmes runtime.

The 'M' command results in sending the reader's number in the following format:

'<' 8 hex characters '>' [CR] [LF]