



Proximity Reader **IR-03.1**

CERTIFICATE
ASSEMBLY AND
OPERATION MANUAL

CE EAC



Proximity Reader

IR-03.1

**Certificate,
Assembly and Operation Manual**



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1 GENERAL INFORMATION

Proximity reader IR-03.1 (hereinafter – the *reader*) is designed for reading and decoding the code logged into the proximity identifier and its transfer to the controller of PERCo system operating device.

Colour of the reader housing is marked by the end letter:

IR-03.1B – light beige;

IR-03.1D – dark grey.

The reader with regard to resistance to environmental exposure complies with GOST 15150-69, category NF1 (outdoor operation).

Operation of the reader is allowed at ambient air temperature from -40°C to +40°C and at relative air humidity of up to 93% at +40°C.

Storage of the reader is allowed in dry indoor facilities at the ambient air temperature from -40°C to +45°C and at relative air humidity 98% at +25°C.

The reader in the original package should be transported in closed freight containers or other closed type cargo transport units.

After the transportation or storage at temperatures below zero or at high air humidity the reader must be kept unpacked for not less than 24 hours indoors within normal climate conditions prior to putting it in operation.

Marking of the reader is made in form of a label located on the rear panel of the reader housing. The label contains the following reader data: trademark and manufacturer's contact details; model name and number; serial number; year and month of manufacture; input voltage; power consumption.

Reader is packed in a carton package preventing its damage during transportation and storage.

Due to continuous improvement of products the Manufacturer reserves the right to modify, without notice, the product design not aggravating its technical specifications.

2 TECHNICAL SPECIFICATIONS

Rated operating voltage ¹	12±1.2 VDC
Consumption current	max. 80 mA
Power consumption	max.1 W
Card reading distance at the rated operating voltage for different card (trinket) types:	
<i>HID</i> cards	min. 7 cm
<i>EM-Marin</i> cards	min. 9 cm
Trinkets	min. 4 cm
Card reading distance at reader mounting on metal base-plate:	
<i>HID</i> cards	min. 5 cm
<i>EM-Marin</i> cards	min. 7 cm
Trinkets	min. 4 cm
Controller connection interface	<i>RS-485</i>

¹ As a power supply it is recommended to use dc source with linear voltage stabilization and output pulsation amplitude max. 50 mV.

Cable length.....	0.8 m
Distance between the reader and external controller for cable type <i>F/UTP2-Cat5e 2x2x0,52</i>	max. 50 m
maximal	200 m ²
Mean lifetime	8 years
Ingress Protection Rating	IP67 (EN 60529)
Electric shock protection class	III (IEC 61140)
Reader dimensions (without cable).....	145x50x20 mm
Reader weight.....	max. 230 g

3 DELIVERY SET

Reader <i>IR-03</i>	1
Metal base-plate	1
Assembly set:	
Plastic dowels	4
Screws	4
Package	1
Assembly and operation manual	1

4 PRODUCT DESCRIPTION

4.1 Design

Reader consists of a unit in plastic housing with three-color LED indicator on the front panel: green (upper), yellow (central) and red (lower). Reader comes with a sound indication.

The card code reading is confirmed by the short-time sound signal and alteration of the yellow (central) light indicator's state (switches off if the light was on and switches on if the light was off).

Reader protection from environmental exposures is ensured by covering its board with compound. Shield cable for reader connection is output on its rear side.

Also the reader back side features two jumpers:

- closer to reader centre – three jumpers "reader number" (see Table 1);
- closer to reader lower edge – jumper "switch off end-of-line resistor" (jumper uncut – end-of-line resistor is present, after cutting the jumper – end-of-line resistor is switched off).



Note:

Up to 8 readers can be connected to one controller. In this case, each reader using the jumper "reader number" must set an individual number (see Table 1). All readers with even numbers will be tied to one direction of the pass, and all readers with odd numbers to the other. Reference of the reader number to a passage direction is programmed by the software.

² Maximum distance between the reader and external controller depends on the cable cross-section. For selecting the cable type please contact PERCo specialists.

For reader mounting a metal base-plate is included in delivery set.

The metal base-plate has 4 holes to fix it with screws to mounting surface. Reader is fixed to metal base-plate with a screw in lower part of reader housing.

4.2 Operation principle

Readers provide code reading from Proximity identifiers with operation frequency 125 kHz (hereinafter – the identifier) produced by HID Corporation type ProxCard II, ISOProx II, trinkets ProxKey II (standard formats HID: 26 bit (H10301), 37 bit (H10302, H10304)), and the production of EM-Microelectronic-Marin SA.

Code reading is provided by presenting identifier to the reader, while identifier can be placed inside pocket, wallet or any other magneto transparent container (cover). Maximum distance possible for identifier sensing by the reader depends on the type of identifier.

When switched on the reader radiates close low frequency (125 kHz) electromagnetic field. Caught in this field the identifier activates and starts transmitting individual encoded signal received by the reader.

Reader transforms the input signal in accordance with an external device interface and sends it to controller of external device via *RS-485* interface.

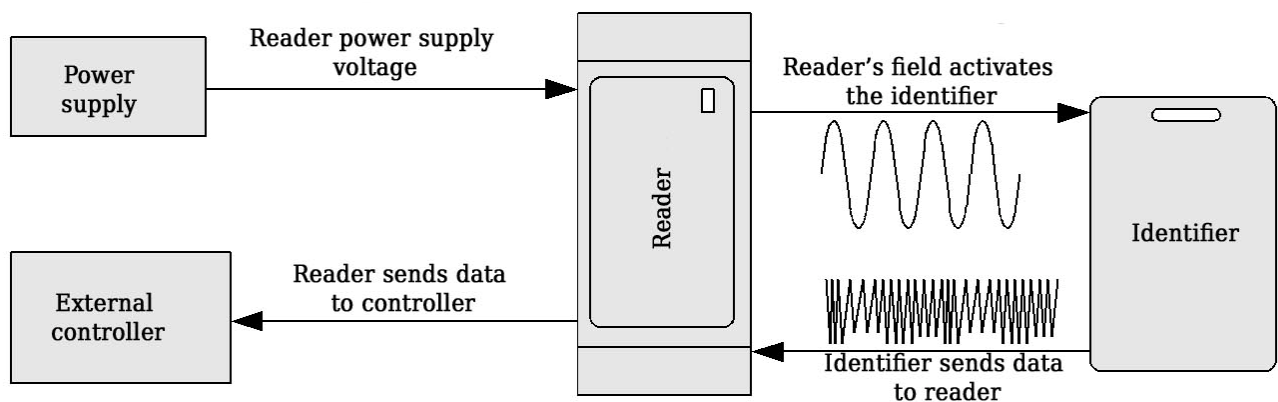


Figure 1. Reader operation

5 SAFETY REQUIREMENTS



Attention!

- Before mounting and first switch-on carefully study this manual.
- Reader installation must be carried out by circuit installer.
- Use only serviceable tools at reader installation.
- Joining of all connectors is made only upon power supply off.
- Cable laying should be produced subject to electrical devices operation rules.

6 INSTALLATION INSTRUCTIONS

6.1 Installation details

It is recommended to install the reader near to operating device. The mounting height of the reader is determined by convenience of card presentation (normally 90 – 150 cm from the floor).

The following factors must be considered:

- Close electric interference sources shorten card reading distance, therefore reader must be installed at min. 1 m whilst its cable laid at min. 30 cm distance from computer monitors, electric generators and motors, ac relays, thyristor light regulators, ac lines, computer and telephone signals.
- When reader mounted on metal surface the code reading distance from card reduces to 15–25 %.
- If the reader is mounted behind metal surface it is necessary to cut out the window in it and install the reader opposite and equidistant to window edges (Ref. Fig. 2) provided that window measures are min. 225×130 mm. The window can be covered with non-metal panel (for ex. plastic) whilst reader can be recessed inside the window at max. 20 mm distance from metal surface front side – at this mounting variant the code reading distance reduces to 30 – 50%.
- Distance between two readers should be min. 50 cm.

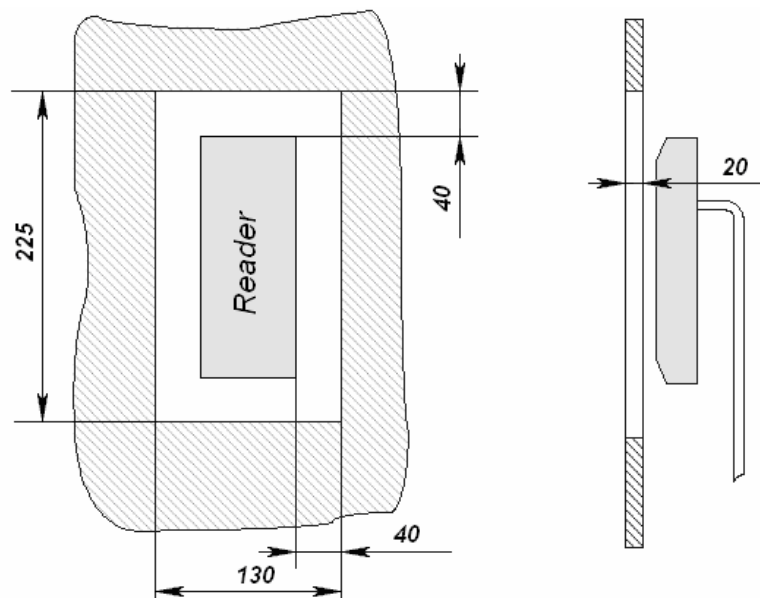


Figure 2. Reader installation behind the metal surface

6.2 Cables parameters

Recommended cable type for connection reader to external controller - F/UTP2-Cat5e 2x2x0.52 (max. distance – 50 m). At a greater distance, a cable with a large cross-section of cores should be used.



Note:

Maximum distance between the reader and external controller is 200 m and depends on the cable cross-section. For selecting the cable type please contact PERCo specialists.

6.3 Installation tools

- 1.2÷1.5 kW hammer drill;
- Ø16 mm hard-alloyed drill bits;
- Ø5 mm hard-alloyed drill bits;
- Flat slot screwdriver No2;
- Mounting knife;
- Level;
- Measuring tape (2 m).

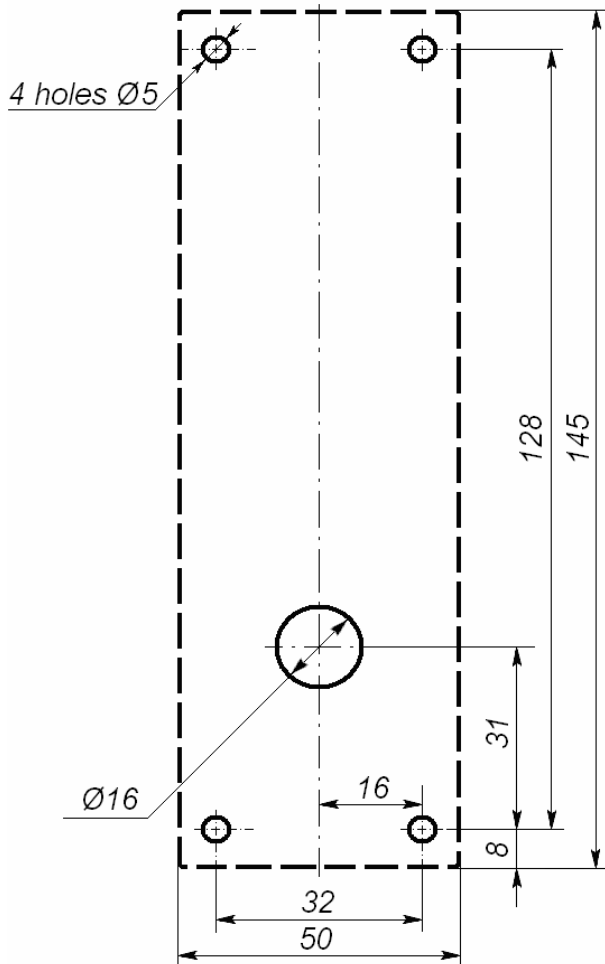


Figure 3. *IR-03.1* reader installation layout (reader housing is dotted)

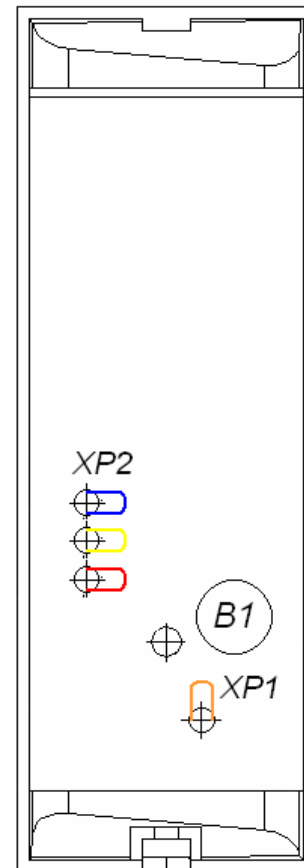


Figure 4. Piezoelectric element (*B1*), jumpers «reader number» (*XP2*), jumper «switch off end-of-line resistor» (*XP1*)

6.4 Installation procedure

Assembly order:

1. Select the reader mounting place. Factors to be considered are given in clause 6.1.
2. Make the marking and holes in mounting surface for fixing the base-plate and cable laying from the reader (Ref. Fig. 3).
3. Release the screw at reader bottom fixing it to metal base-plate. Take off the metal base-plate and fasten it with 4 screws from delivery set.

- Using the three jumpers **XP2** (see Fig. 4 and Table 1) set the reader number, for which you need to snap the necessary jumpers with a pliers. Cut bridges should not contact other bridges and with a metal base.

Table 1. How to set the reader number

Cut bridges (by wire color)	Reader number
not one is cut	1
red	2
yellow	3
red and yellow	4
blue	5
red and blue	6
yellow and blue	7
red, yellow and blue	8

- At connection of several readers to PERCo system controllers via *RS-485* interface, all units are series-connected. If the reader is not the end device of *RS-485* communication line, please cut by nippers the jumper «switch off end-of-line resistor». It is necessary to install end-of-line resistors at *RS-485* line ends in this case.
- Lay the reader cable through specified hole in mounting surface. Install the reader on metal base-plate and fasten it with a screw in the bottom.
- Lay the cable, fix it and connect to PERCo system controller (connection layout is shown in Fig. 5 and in controller manual). For extension of a reader cable the twisted pair cable must be used provided that A and B signal lines are in one pair.



Attention!

When mounting the reader please provide the cable bending radius of min. 10 mm at reader basis.

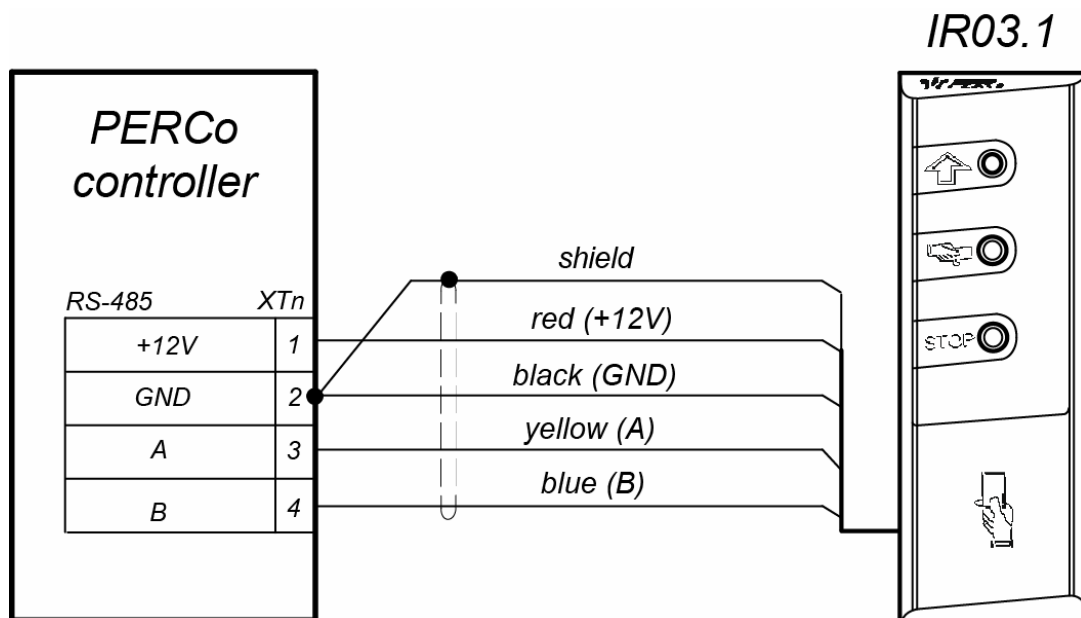


Figure 5. Connection layout of the reader to PERCo system controller via *RS-485*

7 POSSIBLE FAULTS AND REMEDY

Possible faults that can be resolved by the Customer and their remedy are given in the table below:

FAULT	POSSIBLE CAUSE	REMEDY
At the power-up reader does not react on card presentation	No supply voltage to the reader	Check the accuracy of reader connection to power supply
Reader reacts on card presentation but there are no output data events for it and LED indication does not light	No contact with external controller via <i>RS-485</i>	Check the accuracy of <i>RS-485</i> connection.

If the fault is not cleared please contact the Manufacturer.

8 PERCO WARRANTY

PERCo (the Manufacturer) warrants that the **IR-03.1 proximity reader** complies with applicable statutory safety requirements, electromagnetic compatibility provided that the instructions on storage, installation and operation, given in the Assembly & Operation Manual are observed.

The warranty period is **5 (five) years** commencing from the date of sale.

Should there be no date of sale on the warranty card, the warranty period shall commence from the date of manufacture specified in the Certificate and on the Product label.

In the post-warranty period the replacement parts/components are warranted to be free from defects in material or workmanship for a period of 3 (three) months from the date of shipment of the repaired/replaced Product to the Customer.

All claims with regard to quantity, completeness and defects to appearance of the Product delivered are accepted by the Manufacturer in writing within no more than 5 (five) working days after the products are received by the Customer. In case of failure to meet the abovementioned deadline no claims are accepted.

The Warranty does not cover:

- products, parts and components with:
 - external mechanical damages resulting in the Product's fault;
 - defects resulting from Customer's improper testing, operation, installation, maintenance, modification, alteration, or adjustment;
 - damages due to force majeure circumstances (natural disasters, vandalism etc.) or defects as a result of external circumstances (power surges, electric discharge, etc);
- fuses, accumulators, galvanic elements and other components, replacement of which is performed by the Customer in accordance with the Product's in-line documentation.

To the maximum extent permitted by the acting law, the Manufacturer does not incur a liability for any direct or indirect losses of the Customer, including but not limited to loss of profit or data, losses caused by idle period, missed profit, and etc related to use or impossibility to use products and software, including possible software errors and failures.

Within the warranty period the products are repaired free of charge at the Manufacturer's site. The Manufacturer reserves the right to repair failed product or replace it with an operational one. Time of repair is specified at the moment the Product is accepted for

repair. Transportation cost to and back from the place of repair shall be borne by the Customer.

In order to shorten the repair time the Customer must inform the Manufacturer's Technical Support Department (the TSD) of the problem with the Product's operation and/or about the origin of the fault by submitting a filled-in Technical Support Form by e-mail, fax or via the Manufacturer's website or communicate directly a specialist of the TSD.

The Manufacturer reserves the right not to accept the Product for repair from the Customer who failed to submit the Technical Support Form.

The Manufacturer's warranty obligations don't cover attendance by the experts of a Customer and maintenance of any Product on site

If in the course of the examination taken by the Manufacturer of the Product or its parts/components believed to be faulty, no faults have been detected, the Customer is responsible for compensation of the Manufacturer's expenses related to the examination.

Apart from the warranties mentioned above the Manufacturer does not provide any other warranties with regard to compatibility of a Product purchased with software or products produced by other manufacturers as well as any warranties that this Product will fit for the purposes not stipulated in the Product's in-line documentation.

The warranty does not provide for any claims with regard to the technical specifications of the Product in case they are in compliance with those stated by the Manufacturer. The Manufacturer does not guarantee that the Product purchased will meet Customer's requirements and expectations.

PLEASE NOTE THAT PERCo PRODUCES TECHNICALLY SOPHISTICATED PRODUCTS THAT, IF NOT FAULTY, CANNOT BE RETURNED BACK IF BY SOME REASON THE CUSTOMER DEEMS THEM UNSATISFACTORY



The PERCo *IR-03.1* proximity reader is in conformity with the essential requirements of the EU's Machinery, Low-Voltage and EMC Directives and carries the CE marking accordingly.

WARRANTY CARD



IR-03.1 Proximity reader

Serial number	5	4	7				
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Date of manufacture _____ 20__

Quality Control Seal

Date of sale « » _____ 20__

(signature, seal)



Cutting line

Warranty Repair Coupon



IR-03.1 Proximity reader

Serial number	5	4	7				
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Date of manufacture _____ 20__

Quality Control Seal

Date of sale « » _____ 20__

(signature, seal)

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