Matrix 2k
Proximity card reader (with lock controller)

iron iL Logic

GENERAL INFORMATION

"MATRIX – IIK" reader is a reader of EM-Marine standard combined with Touch Memory controller.

Variants of stand-alone system creation for one door:

A. Input and output – using cards/keyfobs of EM-Marine standard:
- input – reader "MATRIX-II" (or CP-Z reader in case of buried mounting)
- output – reader/controller MATRIX-II"K + supply unit + electromagnetic lock or electromechanical lock/latch

B. Input – using cards/keyfobs of EM-Marine standard, output – using door release pushbutton:
- input – reader/controller MATRIX-II"K
- output – door opening pushbutton + supply unit + electromagnetic lock or electromechanical lock/latch

Plugs

LED

CHARACTERISTICS

Identifiers - cards/keyfobs of EM-Marine standard
Input protocol – Dallas Touch Memory
Card reading distance – not less, than 80 mm (for cards)
Card reading confirmation – buzzer, three-color LED
Type of connected lock – electromagnetic/electromechanical
Maximum number of cards: - up to 680
standard – for passage
master – for programming
blocking – for passage blocking (+ can be uses as a standard one)

Additional operating modes:

- "Blocking" mode – the passage is allowed for blocking cards, not allowed for standard ones;
- "Accept" mode – simultaneous opening and recoding of all brought EM-Marine cards/keyfobs;
- "Trigger" mode – for device switching on/of (add-on device with power supply not greater than 17 V).

Light and sound indication of operating modes and programming (possibility to mute the buzzer)
Setting of lock opening duration:from 0 up to 220 sec (default – 3 seconds)
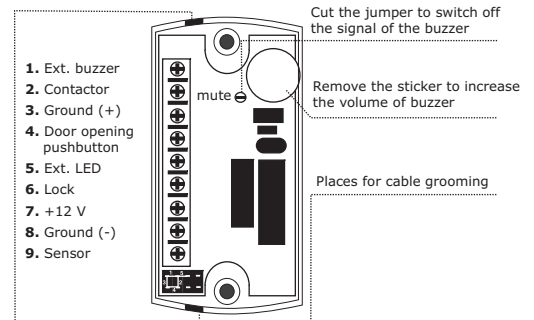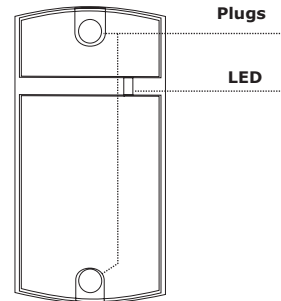Output:MIS transistor
Operating voltage:- 12 VDC
Current consumption in card waiting mode – not more than 45 mA
Switching current – up to 5 A
Overall dimensions – 85x44x18 mm
Operating temperature – from -40°C up to +50°C

Cut the jumper to switch off the signal of the buzzer

1. Ext. buzzer
2. Contactor
3. Ground (+)
4. Door opening pushbutton
5. Ext. LED
6. Lock
7. +12 V
8. Ground (-)
9. Sensor

mute

Remove the sticker to increase the volume of buzzer

Places for cable grooming

ADD-ON DEVICES

Electromagnetic/electromechanical lock;
lock opening pushbutton (normally open);
external buzzer, external LED;
open door sensor (NC or NO, automatic identification of sensor type)
additional reader, having output DS 1990A (readers "Matrix-II, III", "CP-Z", contactor Touch Memory).

STRUCTURE AND OPERATING PROCEDURE

In working condition red LED is on, indicating the presence of power supply.

Operating modes:

1. The card is present in reader's database.
Green LED is blinking, buzzer is sound, the lock is open for the set time (or by door sensor triggering).
2. The card in missing in reader's database.
LED is blinking for three-four times (red and green), buzzer is sound.
Reader programming with master card is describes in section 3 "Programming".

Reader programming

First switching on of reader (no cards in the database)
Short signals are sound for 16 seconds. It indicates that the memory is erased and the mode of master cards addition is set.
At the moment of signal sounding touch the reader with a card. It would lead to recording it into the memory as a master card.
Stoppage of short signal generation confirms the successful record of the first master card.
In order to add new master cards touch the reader with them in turn with a pause between touches not more than 16 seconds. For each touch with a card reader generates a short confirmation signal. Output from the master keys addition mode is done automatically in 16 seconds after the last touch. Reader indicates the output from this mode by the series of 5 short signals.
Later on master cards are used for programming.
If none of cards were recorded repeat switching on.
The mode of master card recording is set during power supply only if the database is empty.
(the is no standard, master, or blocking card)

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Programming modes

Modes	Programming mode entrance	Notations
Programming with master cards		**1…5** - number of touches
1. Standard card addition	1 l M	
2. Blocking card addition	1 l M	**l** – long touch (card is hold for about 6 seconds near the reader)
3. Master card addition	1 s M, 1 l M	
4. Single card deletion	2 s M, 1 l M	
5. All cards deletion (controller memory cleared)	3 s M, 1 l M	**s** – short touch (card is brought to the reader for less than 1 second)
6. Setting of door opening time	4 s M	
7. Activation of "Blocking" mode	1 l B	
8. Activation of "Accept" mode	5 s M	**M** – master card
9. Recording of reader memory into DS 1996 key	1 s M, 1 l M	**S** – standard card
10. Recording from DS 1996L key to reader memory	In the first switching on mode with the empty database	**B** – blocking card
Programming with jumpers		
1. Works related to electromechanical lock	Position 1	
2. Memory clearing	Position 2	
3. Addition of standard cards without a master card	Position 3	
4. Regular – does not influence the operation	Position 4	
5. Activation of "Trigger" mode	Position 5	
The whole slot Z-2 is used when operating with Z-2 adaptor during transference of card database from the computer		

General properties of programming modes

To activate the required programming mode you should use short (less than 1 sec) and long (about 6 sec) touches with master card. In programming mode there is a time limit after the last touch (about 16 sec), after which the reader is set to initial state, indicating it by a series of five short signals.

1. Standard card addition (1 lM)

Touch the reader with master card and hold it (long touch). In the moment of contact the reader generates a short signal confirming master card identification and, in 6 seconds, the second one, indicating the activation of standard card addition mode. After it the master card should be removed. In order to add a new card touch the reader with them in turn with a pause between touches not more than 16 seconds. Each contact reader indicates with a short confirming signal. If the card is already present in the database, reader generates two short signals. Output from the mode is done automatically in 16 seconds after the last touch. Reader indicates the output from the mode by the series of 5 short signals.

2. Blocking card addition (1 lM)

In the standard card addition mode touch the reader with the chosen card and hold it for about 9 seconds until the long signal (i.e. first the short signal is generated, then the long one, confirming addition of the blocking card). If you will not continue to add blocking cards, then the series of short signals will indicate the output from the programming mode.

3. Master card addition (1 sM, 1 lM)

Touch the reader with master card for a short time (short touch). At the moment of the contact the controller will generate the short signal confirming the identification of the master card, not later than in 6 seconds touch the reader with the master card and hold it (long touch). At the moment of contact the reader generates two short signals, indicating the second touch with the master card in programming mode, and in 6 seconds one signal, indicating the activation of addition of master cards. After it the master card should be removed. In order to add new master cards touch the reader with them in turn with a pause between touches not more than 16 seconds. For each touch with a card reader generates a short confirmation signal. If the card is already present in the database as a master card, there will be no signal. Output from the master keys addition mode is done automatically in 16 seconds after the last touch. Reader indicates the output from this mode by the series of 5 short signals.

4. Deletion of standard cards with a master card (2 sM, 1 lM)

Touch the reader with a master card twice for a short time (short touches). At the moment of the first contact the reader generates the short signal, confirming the identification of the master card. At the moment of the second contact the reader generates two short signals, indicating the second touch with a master card in the programming mode, and in not more than 6 seconds touch the reader with a master card and hold it (long touch). At the moment of the third contact the reader generates three short signals, and in 6 seconds one signal, indicating the activation of standard keys deletion mode. After that the master card should be removed. In order to delete standard cards touch the reader with them in turn with a pause between touches not more than 16 seconds. For each touch with a card reader generates a short confirmation signal. If the c.ard is missing in the database, two signals are generated. Output from this mode is done automatically in 16 seconds after the last touch or by touch with a master card. Reader indicates the output from this mode by the series of 5 short signals.

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5. Reader memory clearance (3 sM, 1 lM)
Touch the reader with a master card three times for a short time (short touches). At the moment of the first contact the reader generates the short signal, confirming the identification of the master card. At the moment of the second contact the reader generates two short signals, indicating the second touch with a master card in the programming mode. At the moment of the third contact the reader generates three short signals, indicating the third touch with a master card, and in not more than 6 seconds touch the reader with a master card and hold it (long touch). At the moment of the fourth touch the reader generates four short signals, and in 6 seconds the series of signals, indicating reader memory clearance and output from the programming mode. Then the master card should be removed. Activation of programming mode will be performed automatically at the power up.
* - During the deletion of the whole base with a master card the programmed time of door opening is not changed.

6. Programming of door opening time (4 sM)
Bring the master card to the reader four times for a short time. At the moment of each contact the controller generates signals, confirming master card identification, and their number corresponds to the number of touches. At the moment of the fourth contact controller generates, correspondingly, four signals and switches to the mode of programming of door opening time. In seconds after the last touch it is necessary to enclose the door pushbutton for the time necessary for the opening. When the pushbutton is released the controller generates the signal and record the time into the memory.
*If the opening button is not installed, contacts #4 and #3 (ground) are closed together.

7. "Blocking" mode (1 lB)
In "Blocking" mode – the passage is possible only with blocking cards and not with the standard ones.
"Blocking" mode is set by blocking card (for blocking card addition see paragraph 2).
Blocking card is assigned to work:
-         as a standard card in general operating mode (i.e. passage is possible with standard and blocking cards, present in the database)
-         for switching to blocking mode (in this mode only blocking cards open the door)
-         for switching to general operating mode
Blocking card opens by release.
In order to switch the blocking mode hold the blocking card by the reader for about 3 seconds until the long continuous signal is generated, indicating the activation of blocking mode.

In this mode all standard cards are blocked. When a standard card is used door in not opened and the series of short signals is generated.
Switching from blocking mode to the general one is performed:
-         similar to switching to blocking mode with blocking card (until the series of short signals)
-         by short time touch by a master card (series of short signals)
* If the power supply fails, preset mode "Blocking" is still activated after the power up.

8. "Accept" mode activation (5 sM)
"Accept" mode is used for record of all brought EM-Marine cards.
In this mode when the card is brought to the reader the door opens and the card is simultaneously recorded into the reader memory. The mode is used for restoration of the customers base without collecting client cards.
The master card is necessary for the activation of this mode.
Bring the master card five times to the reader for the short time. At the moment of each contact the reader generates signals, confirming master card identification, and their number corresponds to the number of touches. At the moment of the fifth contact controller generates, correspondingly, five signals and one long signal, confirming the switching to the "Accept" mode. In order to deactivate this mode bring the master card to the reader, the output signal is the series of short signals.
* If the power supply fails, preset mode "Accept" is still activated after the power up.

9. Recording of reader memory into DS 1996L key (1 sM, 1 lM)
(the contactor should be connected to the reader on DS1996A input)
With a master card switch the reader to the mode of master card addition.
For that touch the reader with the master card (short touch). At the moment of the contact the controller will generate the short signal confirming the identification of the master card, not later than in 6 seconds touch the reader with the master card and hold it (long touch). At the moment of contact the reader generates two short signals, indicating the second touch with the master card in programming mode, and in 6 seconds one signal, indicating the activation of addition of master cards. Then touch the contactor with the DS1996L key and hold it until the series of short signals is generated. Information about recorded cards is copied to the memory of DS1996L key. Later on this information can be copied to other readers or, using Z-2 adaptor, to computer.

10. Recording cards from DS 1996 key to reader memory
The reader memory should be cleared (using master card or jumper). Switch the power supply off and on. Then in the mode of the first switching on bring the DS1996 key to the contactor. When the information from DS1996 is copied to the reader the series of short signals is generated.

Jumper application procedure.

One jumper is included into reader set. It is used in cases of programming and setting into the mode of electromechanical lock (five positions).

Position #1 – set the logic of power stage operation.
without the jumper the electromechanical lock is in closed stage and the power is applied;
with the jumper the electromechanical lock is in closed stage and the power is not applied

Position #2 – for reader memory clearance. In order to perform it switch the power off, insert the jumper and switch the power on. When the procedure is completed the series of short signals is generated.
* - All cards and programmed opening time are cleared. (default time is set - 3 sec.)

Position #3 – for addition of standard cards without a master card. In order to perform it switch the power off, insert the jumper and switch the power on. After the signal is generated the reader is in the mode of standard cards addition (standard and blocking cards can be added without a master card)

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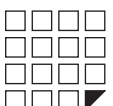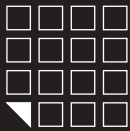
Position #4 – regular position, does not influence the operation of the reader.

Position #5 – "Trigger" mode (add-on device with power supply not greater than 17 V)..
In order to perform it switch the power off, insert the jumper and switch the power on. Reader can be in two states: "closed" and "open".
In order to switch the states bring the standard card, which is present in the database, to the reader.

During the switching from one state into another one the reader generates signals:
- from "open" to "close" – one short buzzer signal;
- from "close" to "open" – the series of short signals.
Controlled device is connected to the terminals #6 (lock) and #3 (Ground)

Slot Z-2 serves for connection to the computer adaptor Z-2. Recording of cards database from the computer is performed via it.

Jumpers

Z-2 slot

H = 18 мм

⌀ 2,5 мм

69,5 мм

85 мм

44 мм
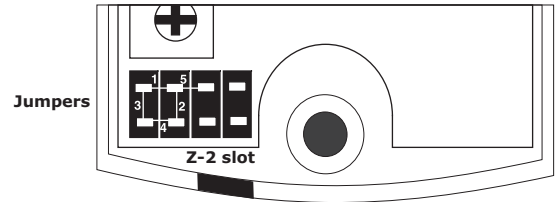
MOUNTING AND CONNECTION

Reader is mounted on flat surface at the place, where PROXIMITY card can be brought to it without obstructions.
Complete following operations for "MATRIX-II" reader mounting:
1. Mark up and drill holes for fastening corresponding to the reader's holes size (fig. 1).
2. By means of wires connect add-on devices to the reader's slot, according to the scheme.
In case of electromechanical lock insert the jumper in position 1.
3. Depending on the direction of mounting of the reader's connection cable remove the thin strap in the reader case and install a cable into it.
When the power is applied to the reader the red LED is lighted and the reader switches to the programming mode (first switching on – master card recording).
4. Mount the reader and fasten it with screws.
Cover the holes in the reader with plugs from the set.

*If two readers are mounted with the distance between them less than 10cm, the response distance can decrease.
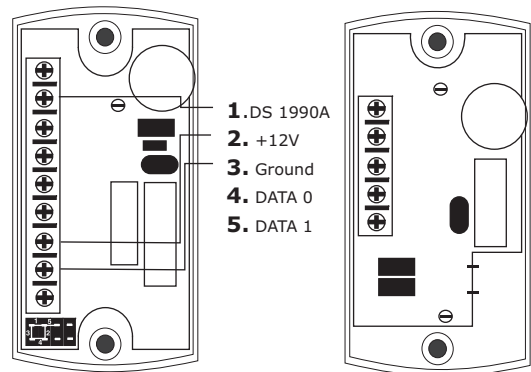Do not mount readers with the distance between them less than 3cm.
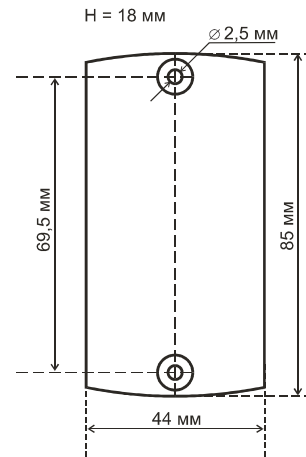
It is not necessary to connect:

- external buzzer
- external LED
- pushbutton

External buzzer

Lock

Button

Power supply
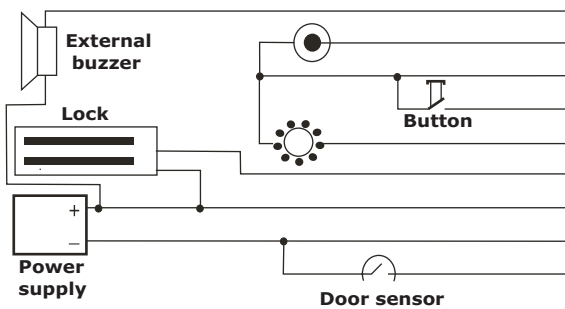
Door sensor

1. Ext. buzzer
2. contactor
3. Ground (+)
4. Door opening button
5. Ext. LED (+)
6. Lock
7. +12V
8. Ground (-)
9. Door sensor

1. DS 1990A
2. +12V
3. Ground
4. DATA 0
5. DATA 1

DELIVERY SET

Reader "MATRIX-II"K	1 pc
Jumper	1 pc
Plug	2 pcs
Screw 3x30	2 pcs
Dowel	2 pcs