



LumiRing

ICON / ICON PE

Network Access Controller

MANUAL

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Purpose and general information

The ICON network access controller is designed to control access to residential, industrial or office premises equipped with electromagnetic or electromechanical locks. The device allows you to automate the passage of vehicles by controlling the barrier, gates and other actuators. The software makes it possible not only to control access, but also solves applied tasks for controlling delays and recording working hours. Connection to a computer network is carried out via Wi-Fi 2.4Ghz or Ethernet + POE (ICON PE model). The device provides work with two Wiegand readers in two modes:

- Input - for connecting any external reader (Wiegand 4,8,26,34 data format)
- Output - for connecting a third-party ACS to the access controller

When connecting via Wiegand interface, the distance between the devices should be up to 100 m.

The RS485 interface with support for the OSDP protocol allows the device to be used with modern readers and controllers that support this protocol. In this case, the distance between the devices should not exceed 1000 m.

In one system, it is recommended to use the connection of readers on the same interface, which will help to avoid differences in reading the card code and subsequent confusion in the system. ICON programming can be carried out from the Mobile Access Control System "MACS Lite" or from the cloud service "UNIMACS". Initial settings are made through the built-in ICON website. Always install the latest firmware for every new installation.

Two power outputs are used to control locks or other actuators:

Output 1 - Relay output 24V 5A (120W) with "Dry contact" / "Wet contact" switching (see Figure 3). In the "Dry contact" mode, the output works like a normal relay. To supply voltage to the control contacts, it is necessary to supply voltage to the contact "C" of the relay. In the "Wet contact" mode, the supply voltage is automatically applied to the "C" contact of the relay.

Output 2 - Open collector output - when the output is turned on, the transistor closes the output to ground. Output load capacity 12V 3A (36W). If it is necessary to switch devices that exceed the output load capacity, use an additional relay (see Figure 12)

ICON provides work in several modes, which can cover a wide range of installer tasks.

Operating modes:

1. Standalone - work without connecting to networks. The user interacts with the controller using the "MACS Lite" software being in close proximity to the controller. Connection of the User's phone to the ICON access point is required.
2. Network - work in a local network. To work with the controllers, the phone with the "MACS Lite" application must be registered in the same network.
3. Cloudy - work in a local network with cloud connection support. This mode allows you to use all ICON features with minimal effort. The main advantages of this mode:
 - Automatic connection
 - Remote administration and monitoring
 - Ability to work with virtual keys

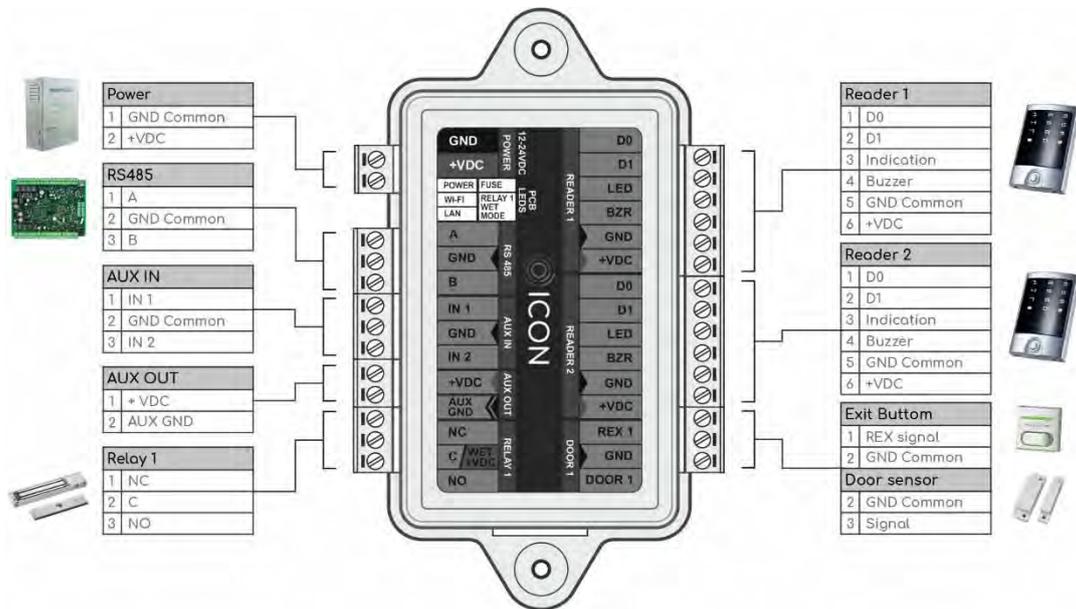


If ICON galvanic isolation from the controlled device (lock, barrier) is required, control of high-voltage devices or devices with significant current consumption (exceeding the rated current for the output), it is recommended to connect these devices via a relay (see Figure 12). It also improves the reliability of the system. When using electromagnetic or electromechanical locks, we strongly recommend using a protective diode (see Figure 11).

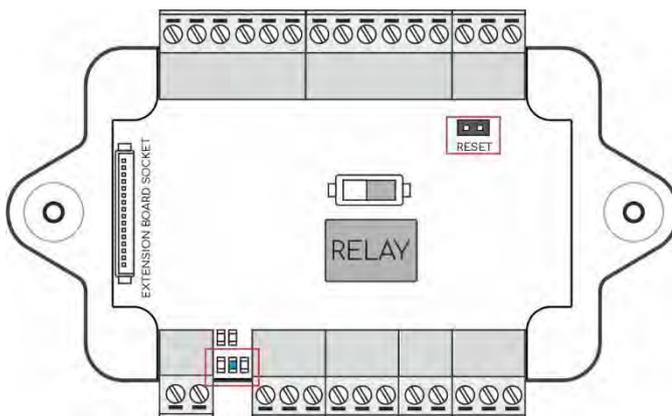
Description of connection methods

To connect ICON to any peripheral or executive equipment, plug-in terminal blocks are used.

Figure 1. Purpose of connectors



Hard reset



To reset the device to factory settings, you must:

1. Remove power from the device
2. Remove the cover of the device
3. Close the RESET jumper
4. Apply power. Wait for indicator D4 to turn on.
5. Remove the RESET jumper



Indication and setting of the operating mode of the relay

To change the operating mode of the relay, it is necessary to dismantle and de-energize the device. Remove the top cover by unscrewing the 4 fixing screws from the bottom of the case. Select the desired mode using the switch on the board according to Fig. 2. Power up the device. Make sure D2 is on. Close the cover of the device.

Figure 2. Relay Mode Control. Indication.

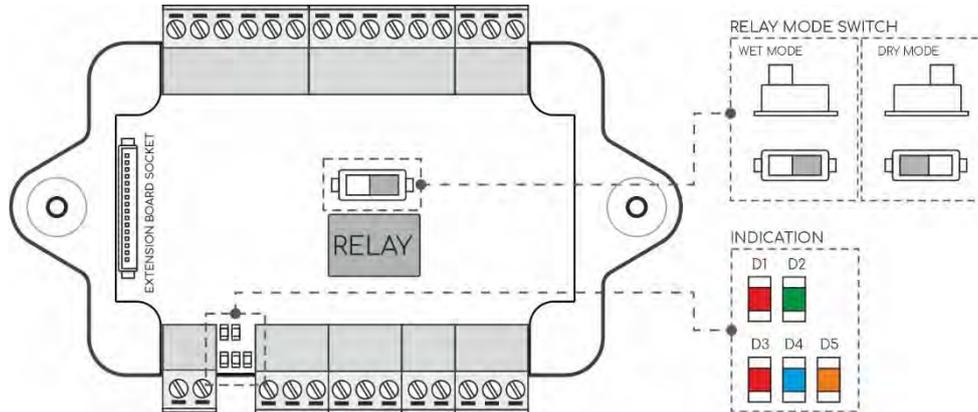


Table 1. Indication

LED	OFF	ON	BLINK
D1		Power trouble	
D2	Relay Dry mode	Relay Wet mode	
D3	No power	Power good	
D4		Connected to cloud	Connection to cloud in progress
D5	No Ethernet connection	Ethernet connected	

Specifications

#	Parameter	Value
Electrical		
1	Supply voltage	9-24B
2	POE IEEE802.3at and IEEE802.3af compliant**	36 B – 57 B
3	Average rated current consumption (at voltage 12V): - No load output, no more	0,11A
4	Maximum current consumption (at voltage 12V): - No load output, no more	0,3A
5	Maximum switching current: - Output 1 - Output 2	24B 5A 12B 3A
6	Maximum switching load voltage of outputs:	24B



	-Output 1 -Output 2	15B
7	Protection types: Power input: Short circuit, Reversal of polarity Output 2: Overtemperature, Short circuit Reader power supply: Short circuit	
Functional		
8	Wireless interfaces	Wi-Fi 2,4Ghz BLE
9	Wired interfaces	2,Wiegand 1,RS485 Ethernet**
10	Events memory during autonomous operation	до 250 000
11	Recommended number of users	до 10 000*
12	Number of ports for connecting Wiegand readers	2
13	Number of outputs of the "Open collector" type	1
14	Number of outputs of the "Relay" type	1
15	Number of inputs	4
16	Maximum distance of wired interface: - RS485 - Wiegand - Ethernet	1000 м 100 м 100 м
Operational		
17	Overall dimensions	(Д)110х(Ш)75х(В)35 мм
18	Working temperature range	от -30 до 70 С
19	Enclosure material	ABS Пластик

* Maximum identification time, with the number of keys 10,000 - no more than 1.5 s. The controller can work with a large number of user keys, which will lead to an increase in the identification time.

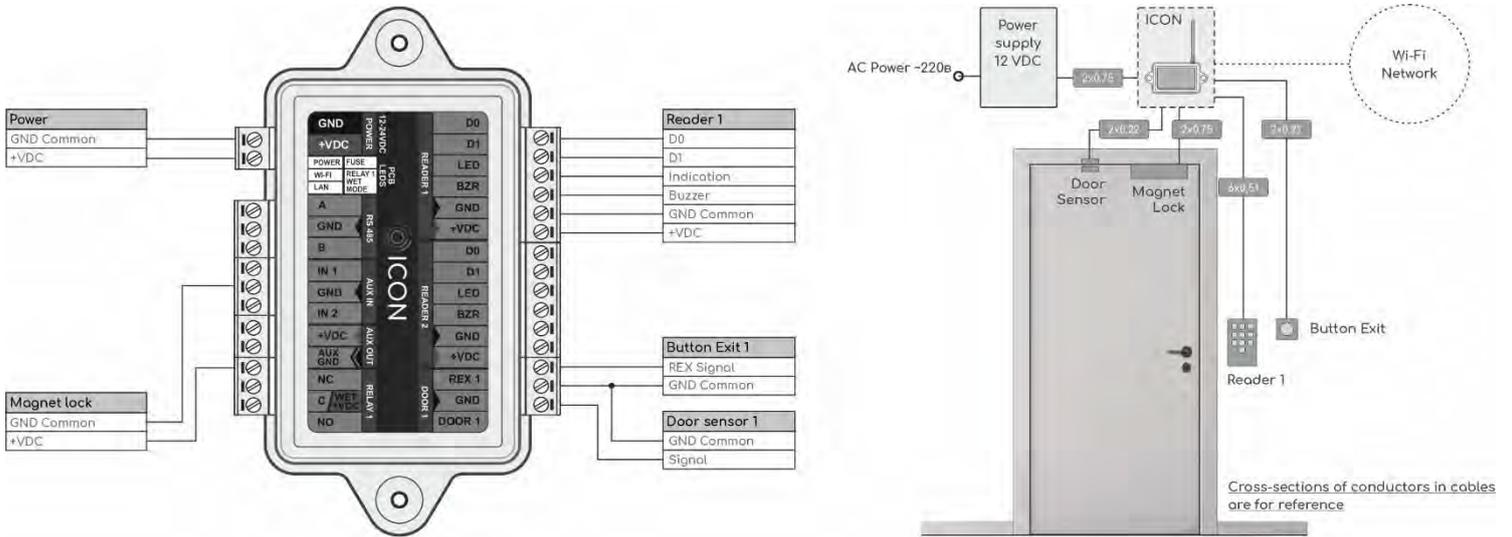
** ICON PE Model



Typical wiring diagrams

One door. Control of the passage of one direction. Relay in Wet Contact Mode

Figure 3.



One door. The relay is in the "Dry contact" mode. Using a second power supply for the lock

Figure 4. Relay in "Dry contact" mode.

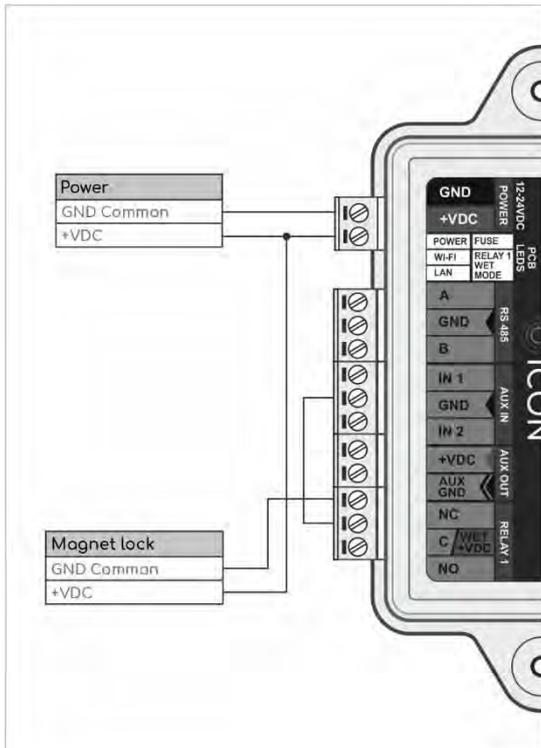
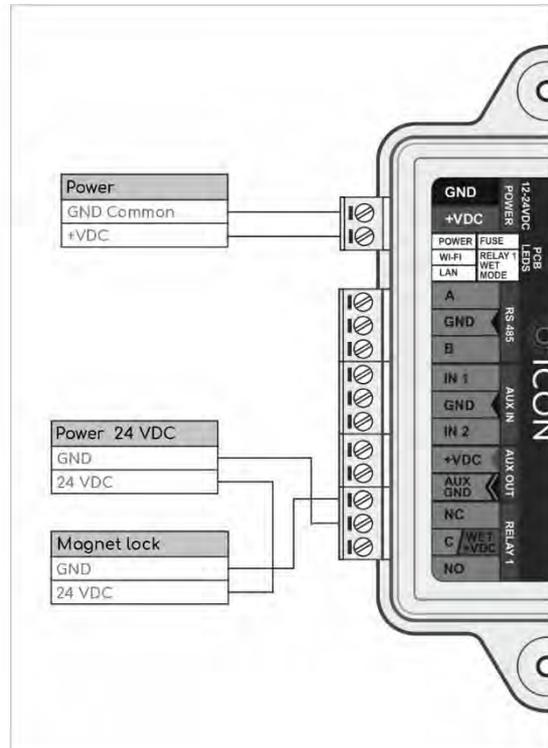


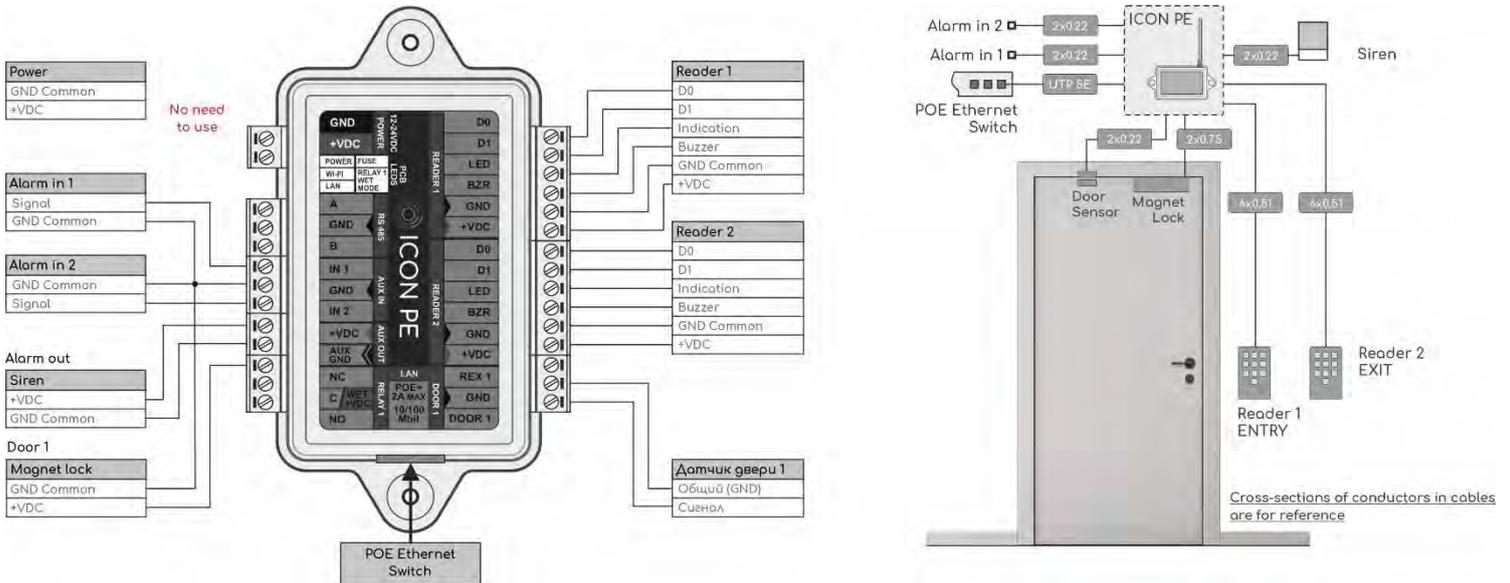
Figure 5. Separate power supply for the lock.





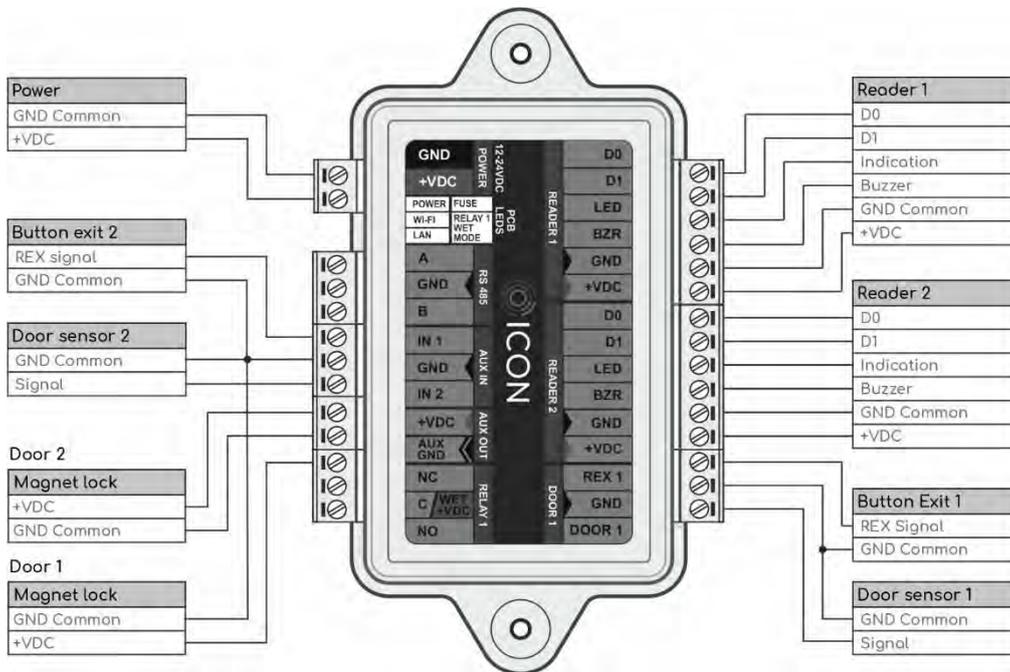
One door. Control of the passage of two directions. The relay is in Wet Contact mode.

Figure 6.



Two doors. Control of the passage of one direction. Relay in Wet Contact Mode

Figure 7.



System installation recommendations

When drawing up a wiring diagram of an object and using Wi-Fi, the controllers should be located as close as possible to the points of the Wi-Fi signal in order to minimize delays in working with a mobile application or cloud service. After

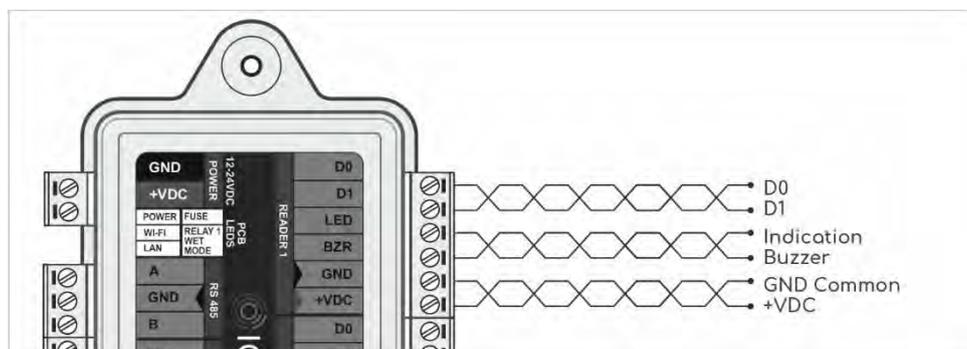


installation, check the Wi-Fi signal strength. The signal strength can be seen in the info page of the embedded website (see the section “Embedded ICON website”). The minimum allowable signal level is -75dB. If your signal strength is lower (the value is higher), then this can have a strong impact on the interactivity of the device with a mobile application or cloud service. We recommend moving the access point closer to the device, or using a stronger antenna on the access point or device.

When installing the ICON PE model with an Ethernet connection and POE power supply, take into account that the entire system, including locks and readers, cannot consume more than your switch or injector gives out. The maximum permissible load on the built-in POE module in the ICON PE model is no more than 1.5A 12V. Your POE equipment should be capable of delivering 30W of power.

The length of the communication line via the Wiegand interface should be no more than 100 m. This interface has very weak protection against interference - we do not recommend laying it parallel to power cables or next to other sources of interference (daylight lamps, etc.). The minimum distance to power cables is at least 0.5m. If your communication line exceeds 5 m, we recommend using a UTP 5E cable.

Figure 8. Recommended Wiegand connection diagram

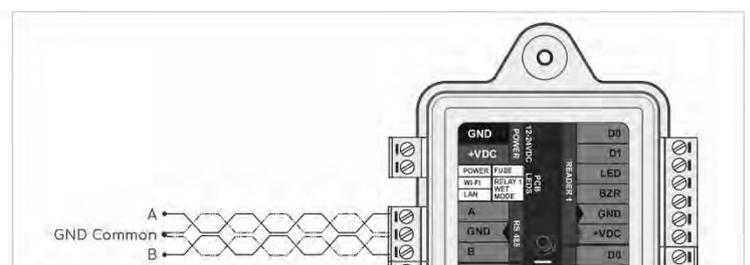
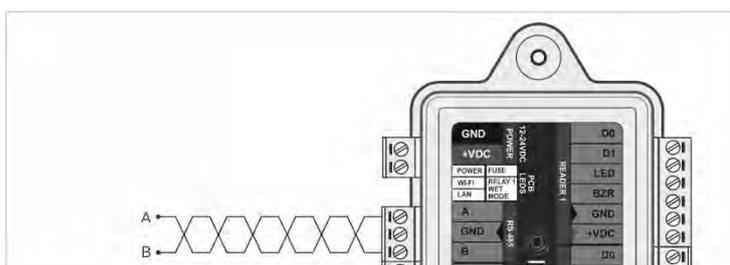


The length of the RS-485 communication line is not critical to the distance - this standard was specially developed for communication with remote objects and has good noise immunity. It is necessary to lay the RS-485 communication line at the maximum distance from power cables and daylight lamps. As a RS-485 communication line, it is necessary to use a twisted pair cable - UTP 5E or FTP 5 (if possible, ground the shield at one end).

Figure 9. Variants of connection via the 485 interface

Simplified.

Recommended.



For reliable operation of the system, it is recommended to separate the power supply for controllers and actuators. The controller supply line wires should be kept as short as possible in order to avoid significant voltage drops across them. After laying the wires, make sure that the supply voltage of the controller with the locks turned on is not lower than 12 V.



Figure 10. Connecting devices via 485 interface

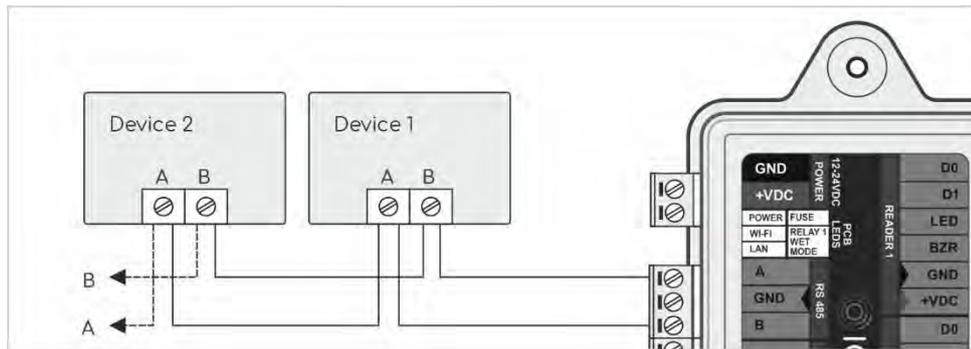
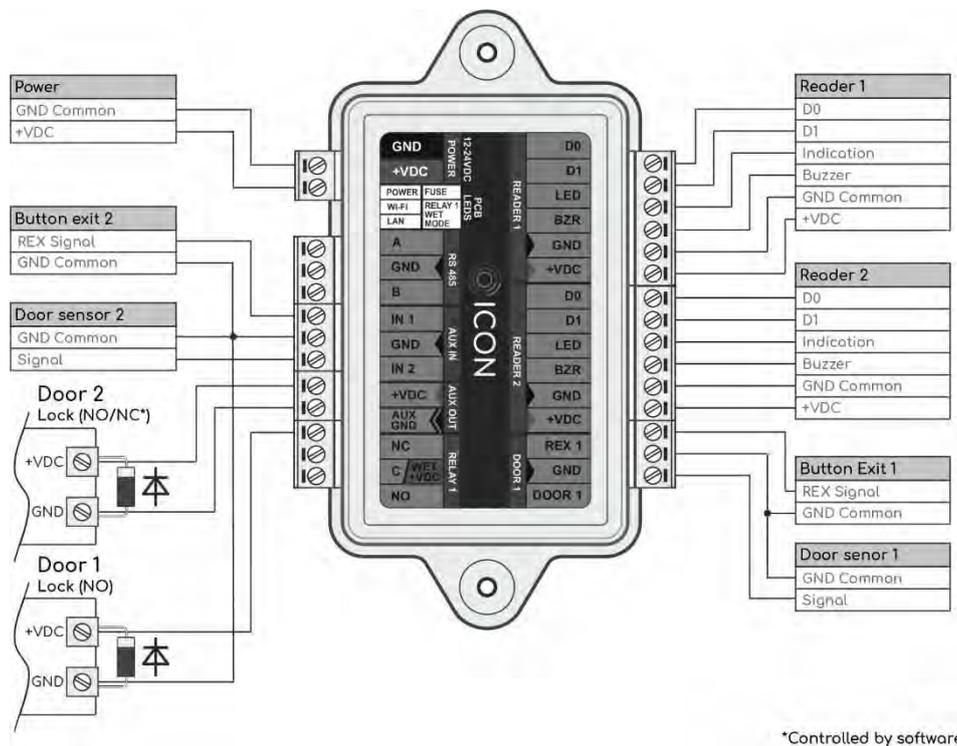


Figure 11. Using a protective diode

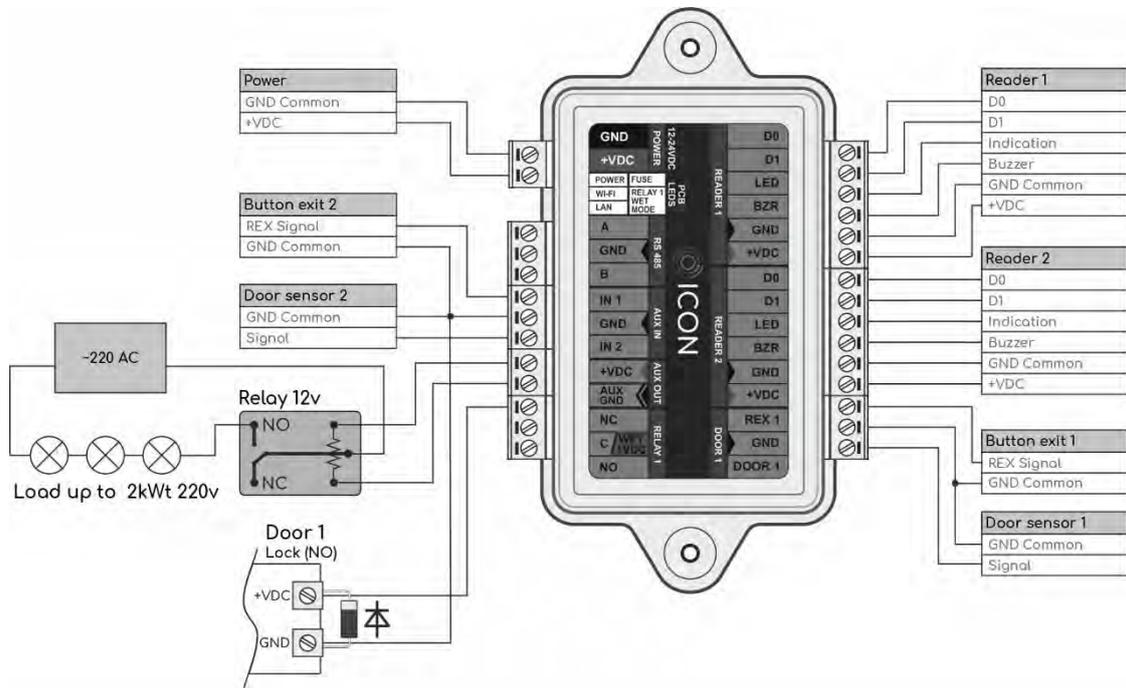


*Controlled by software

A protective diode is used to protect the controller from reverse currents when an electromagnetic or electromechanical lock is triggered. The protective diode is connected in parallel with the contacts of the lock (the diode is connected in reverse polarity). The diode must be installed directly on the contacts of the lock. Suitable diodes 1N5400, 1N5408, 1N5821, HER301 and similar. Instead of diodes, varistors can be used, for which there is no need to observe polarity. Varistors VCR-07D101K S07K60, TVR07101, GNR-07D101K or similar are suitable.



Figure 12. Example of using a 12V relay for switching a load exceeding the output parameters.

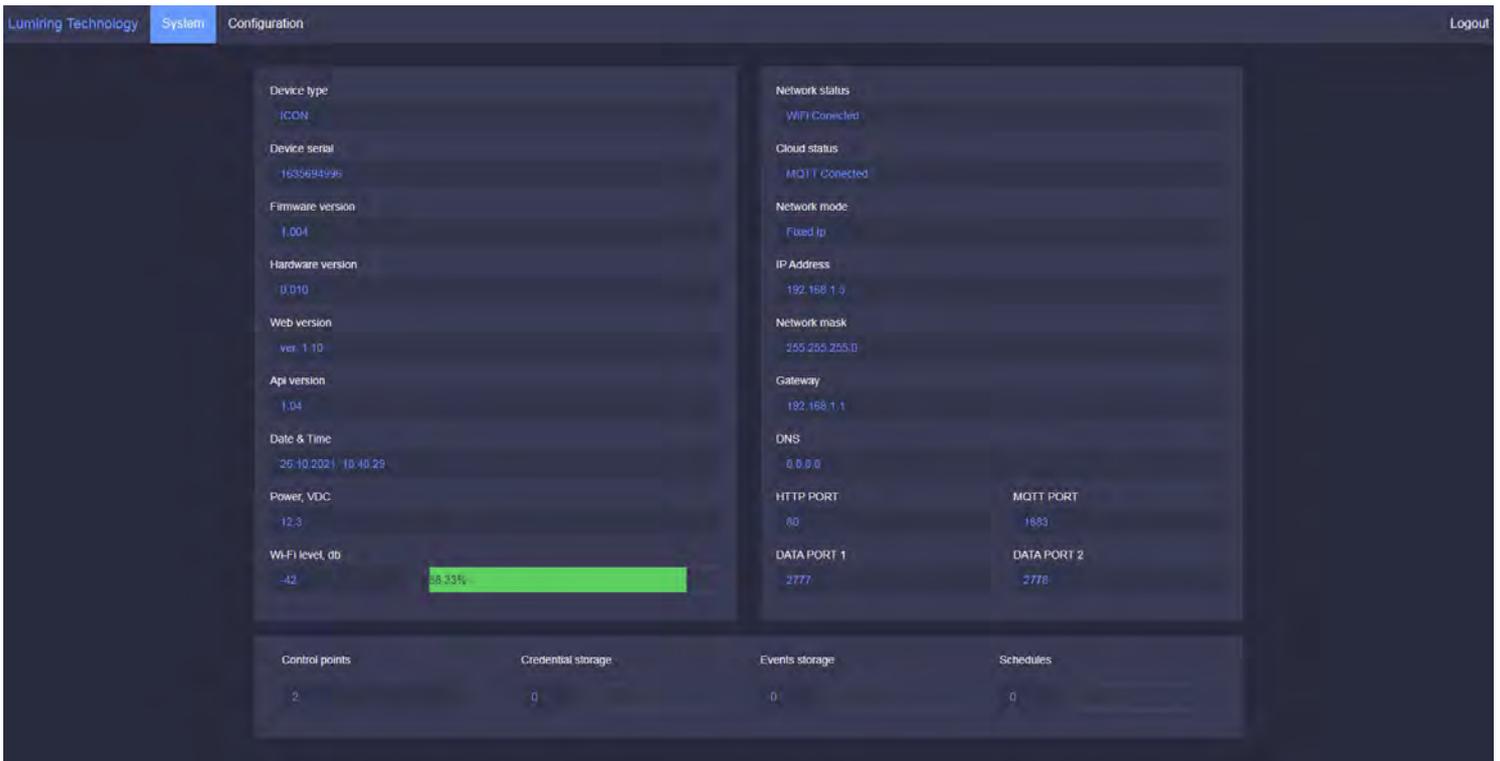


ICON Embedded Website

Initial configuration of ICON is done through the built-in site. To connect to the site, the User must connect to the device's Wi-Fi access point, which has the "ICON" prefix and does not have a password. After connecting to the device, the User must enter the factory IP address of the controller - 192.168.4.1 in the browser line. Login and Password for the first login - admin. We strongly recommend changing the access password and setting a password on the Wi-Fi point of the device.



Figure 9. Information page



This page provides the user with quick access to information on basic settings, network connection statuses and diagnostic data.

Figure 10. Basic network settings

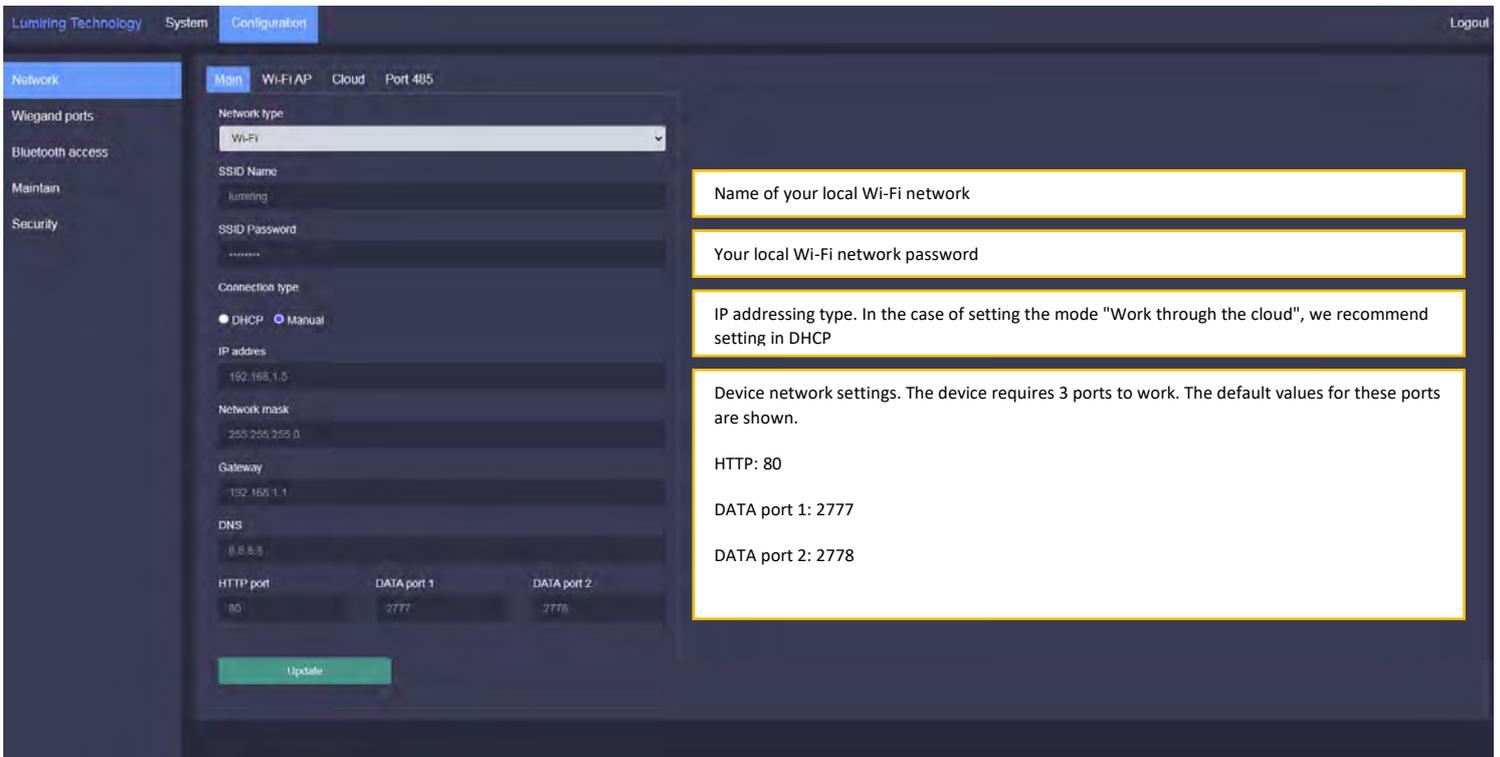




Figure 11. Configuring a local access point

The operating mode can take the following values:

- Always on
The local access point of the device is always on and is displayed when other devices scan the network.
- Always on and hidden
The local access point of the device is always on, but it is not displayed when other devices scan the network. Connection is possible if the SSID is known.
- Enabled by timer (default)
The local point of the device is activated for 5 minutes after power is applied.

If the device loses the network connection, the local access point becomes active.

SSID name - you can specify your own name for the local Wi-Fi network of the device
 SSID password - set a password for the local Wi-Fi network of the device
 Timer - setting the timer for the "Wake on timer" mode

Figure 12. Cloud connection settings

Cloud server - can take the following values:

- Switched off
The device works without a cloud connection. Communication with the device is possible strictly within the local network or through port forwarding.
- UNIMACS
Connection to the UNIMACS cloud service. The user must enter the UNIMACS account universal identifier, Comment (checkpoint name. Example "Main entrance").
- Custom
The user can set up a connection with his own MQTT server to interact with the device. We recommend using a version of the device with a simplified set of "Simple API" commands for such solutions. The connection data is entered according to the requirements of the User's server.

Figure 13. 485 interface settings

The operating mode can take on the following values:

- Switched off
- OSDP
Port works in OSDP protocol
- Own
Lumiring equipment operation protocol.

Speed - setting the speed of work. Recommended value is 9600.

Address - The address of the device in the 485 network.



Figure 14. Configuring the Wiegand interface

If the device supports several Wiegand ports, you can configure their settings by switching the port tabs.

The Wiegand type is set according to the requirements of the connected equipment. It can take on the following values: Wiegand 4,8,26,34,44.

Port operation mode:
Input - when connecting an external reader
Exit - when the device is connected to the access control system controller

Additional options for compatibility with other devices.
Reverse byte order. Parity check.

Figure 15. Configuring Bluetooth access

Name - the user can set the name of the device, which will be displayed when working via Bluetooth

Bluetooth access mode can take on values:
- Bluetooth off
- Remote opening
Identification of the user's mobile phone and opening the door remotely, without user intervention upon reaching a certain distance (signal level) from the user's phone to the device.
- Remote opening with confirmation
This mode remotely identifies the user's mobile phone, but the door is opened with confirmation by a proximity sensor built into the device.

Proximity sensor mode. The settings of this sensor are directly related to the settings of the Bluetooth Access Mode. When "Remote opening with confirmation" is set, the settings of the proximity sensor are locked in the "Confirmation of passage" position.

Sensor Distance - The user can set the range of the sensor. The selection of the parameter is performed by testing.

Figure 16. Device maintenance

On this page, the user can update the software and reset the device partially or completely.



Figure 17. Platform change



Figure 18. Security

