

## WI-FI ELECTRIC POWER METER WITH PROTECTION AND CONTROL FUNCTIONS

EM-129



## OPERATING MANUAL

*Quality control system on the development and deviceion complies with requirements  
ISO 9001:2015*

### **Dear customer,**

Company NOVATEK-ELECTRO LTD. thanks you for purchasing our devices.  
You will be able to use properly the device after carefully studying the Operating Manual.  
Keep the Operating Manual throughout the service life of the device.

**ATTENTION!** ALL REQUIREMENTS OF THIS OPERATING MANUAL ARE COMPULSORY TO BE MET!



**WARNING!** – DEVICE TERMINALS AND INTERNAL COMPONENTS ARE UNDER POTENTIALLY LETHAL VOLTAGE

TO ENSURE THE DEVICE SAFE OPERATION IT IS STRICTLY FORBIDDEN THE FOLLOWING:

- TO CARRY OUT MOUNTING WORKS AND MAINTENANCE **WITHOUT DISCONNECTING THE DEVICE FROM THE MAINS;**
- TO OPEN AND REPAIR THE DEVICE INDEPENDENTLY;
- TO OPERATE THE DEVICE WITH MECHANICAL DAMAGES OF THE CASE.

**ATTENTION!**

- 1) THE DEVICE IS NOT INTENDED FOR LOAD COMMUTATION AT SHORT CIRCUITS. THEREFORE, THE DEVICE SHOULD BE OPERATED IN AN ELECTRIC NETWORK PROTECTED WITH AN AUTOMATIC CIRCUIT BREAKER WITH CUT-OFF CURRENT OF MORE THAN 63 A OF CLASS “B”.
- 2) IT IS FORBIDDEN TO CONNECT A LOAD AT POWER OVER 14 kW TO THE DEVICE.

It is recommended to use the device at load currents not exceeding 70% of the maximum value in order to improve operational characteristics.

IT IS NOT ALLOWED WATER PENETRATION ON TERMINALS AND INTERNAL ELEMENTS OF THE DEVICE.

During operation and maintenance the regulatory document requirements must be met, namely:

- Regulations for Operation of Consumer Electrical Installations;
- Safety Rules for Operation of Consumer Electrical Installations;
- Occupational Safety when in Operation of Electrical Installations.

Installation, adjustment and maintenance of the device must be performed by qualified personnel having studied this Operating Manual.

In compliance with the requirements of this Operating Manual and regulations the device is safe for use.



EM-129 meets the requirements of:

- EN 60947-1;
- EN 60947-6-2;
- EN 55011;
- EN 61000-4-2.

Harmful substances in concentration more than allowed are absent.

**Terms and abbreviations:**

- ❖ **Wi-Fi** – a family of standards for transmitting digital data streams over radio channels;
- ❖ **NTP** – a network protocol for synchronizing the internal clock with use of networks;
- ❖ **RMS** – effective (quadratic) value;
- ❖ **AR** – automatic reclosing;
- ❖ **By default** - predefined parameter values that the device uses in its work, until the user explicitly changes these values;
- ❖ **Web-interface** - a system of user interaction with the device through a computer browser;
- ❖ **Purple** - the color of the indicator obtained by mixing the blue and red glow.

This Operation Manual is intended to get familiarized with the device, safety requirements, operation procedure and maintenance of the WI-FI electric power meter with the protection and control functions (hereinafter referred to as “device”, “EM-129”).

## 1. PURPOSE

### 1.1. Purpose of the device

Meter EM-129 is a microprocessor device to be connected to Wi-Fi and designed for non-commercial electric power metering.

Meter EM-129 allows you to turn on / off electrical equipment (refrigerator, air conditioner, washing machine, television set, video and audio equipment, etc.) according to a schedule or in the manual mode, while protecting it from various accidents in voltage, frequency and overload power.

Meter EM-129 stores in the internal memory a log of its work for the last month and energy consumption data.

Meter EM-129 has protection against overheating and it disconnects the load if the temperature inside the device body exceeds 80 °C (due to exceeding the rated load current, poor contact due to poor clamping of the terminal block screws, etc.).

Meter EM-129 is equipped with one control button (for entering Wi-Fi setup mode or manual load control) and a two-color indicator (for displaying alarms, load status and Wi-Fi network connection status).

When connecting meter EM-129 to the “my.overvis.com” service, it is possible to control EM-129 from anywhere in the world where there is the Internet connectivity.

One can save energy and money by using meter EM-129 to control heating or ventilation appliances according to a pre-planned schedule.

Key features:

- Accounting for electric power consumed by the load;
- Measurement of voltage and frequency in the mains;
- Measurement of current consumed by the load;
- Measurement of power consumed by the load;
- Load protection against emergency voltage in the mains;
- Load protection against excess current consumption;
- Load protection against excess power consumption;
- Protection against internal elements overheating;
- Real-time clock with a power reserve of up to 5 days (if power supply fails);
- Automatic time synchronization with the exact time server (NTP);
- Automatic load control according to the schedule set by the user;
- Limitation of load operation time;
- Manual load control from the front panel;
- Manual control locking after a set period of time.

### 1.2. Controls, overall and installation dimensions of meter EM-129

Controls, overall and mounting dimensions of EM-129 are shown in Fig. 1.

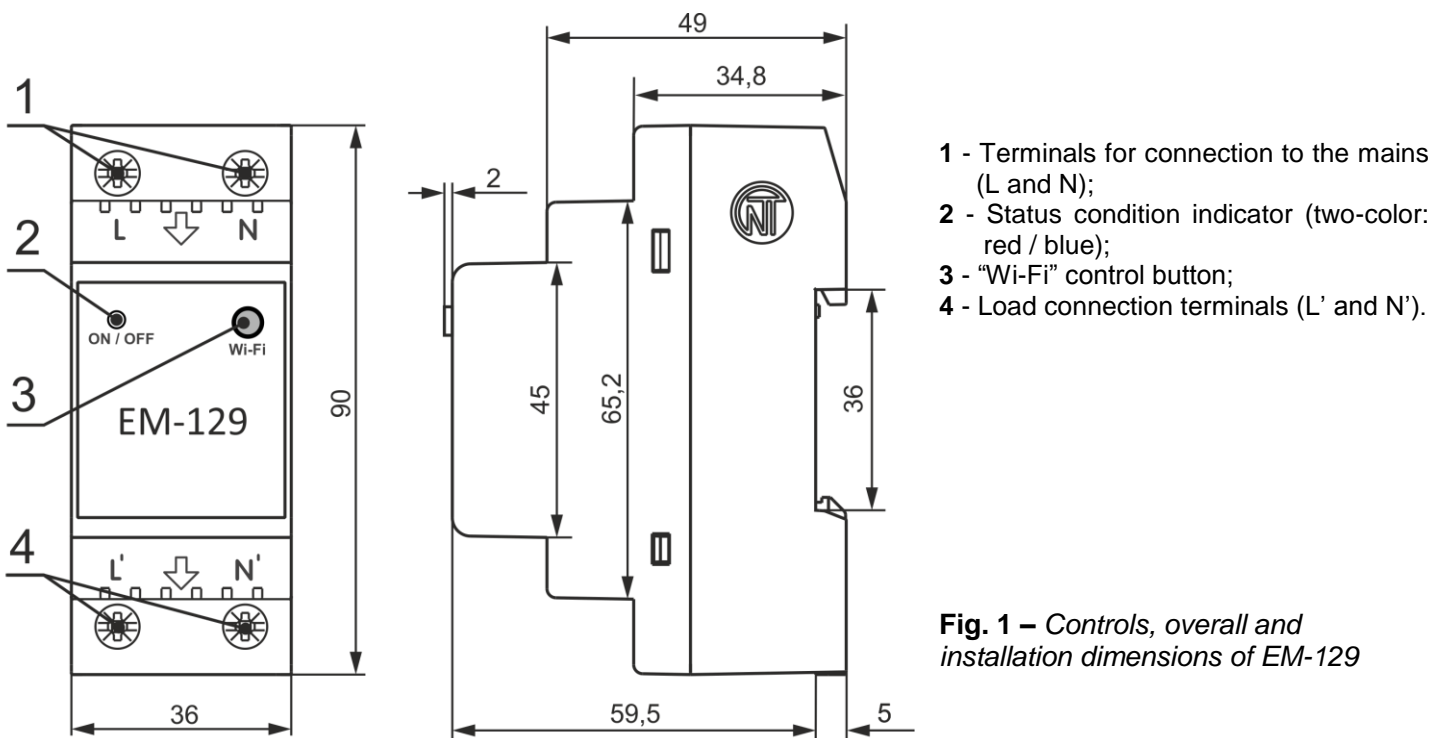


Fig. 1 – Controls, overall and installation dimensions of EM-129

**Status condition indication:**

- Blue (flashes) - connects to a Wi-Fi access point;
- Blue (on) - the load is on, there is a connection to Wi-Fi;
- Blue (flashes once every 5 seconds) - the load is off, there is a connection to Wi-Fi;
- Red flashes) - the countdown of the re-closure time is in progress;
- Red (on) – a failure or the device is blocked due to a failure;
- Blue - red (flashing) - Wi-Fi connection setup mode is on;
- Purple - the settings are reset to the factory settings, the embedded software is updated, or the Wi-Fi control button is pressed.

**1.3. Operation conditions**

The device is intended for operation in the following conditions:

- Ambient temperature: from minus 30 to +50 °C;
- Atmospheric pressure: from 84 to 106.7 kPa;
- Relative humidity (at temperature of +25 °C): 30 ... 80 %.

**ATTENTION! The device is not intended for operation in the following conditions:**

- Significant vibration and shocks;
- High humidity;
- Aggressive environment with content in the air of acids, alkalis, etc., as well as severe contaminations (grease, oil, dust, etc.).

**2. TECHNICAL SPECIFICATIONS**

**2.1 Main technical specifications**

The main technical characteristics of meter EM-129 are shown in Table 1.

The adjustable parameters of meter EM-129 are shown in Table B1 - Appendix B.

**Table 1 - Main technical specifications**

Description	Value
Operating supply voltage, V	220 – 240
Supply frequency, Hz	50 / 60
Voltage at which operability remains, V	100 – 450
Maximum switching current at active load, A	63
Power of connected load, W, no more	14 000
Ready time at supply voltage supply, s, no more	1.5
Shutdown delay at voltage increase of more than 420 V and duration of more than 2.0 ms, s, no more	0.05
Shutdown delay at voltage increase of more than 30 V from the setting "Upper voltage threshold", s	0.2
Shutdown delay when voltage drops below 145 V, s	0.25
Range of voltage measurement, V	100 – 350
Accuracy of measurement of the mains voltage, % (from the range)	±1
Current measurement range, A	0.3 – 65
Load current accuracy measurement, % (from the range)	±2
Range of power measurement, W	300 – 30 000
Power measurement accuracy,% (of range)	±3
Range of frequency measurement, Hz	45 – 65
Accuracy of frequency measurement, Hz	±0.03
Real-time clock accuracy <sup>1</sup> , s / day	±1
Real-time clock reserve <sup>2</sup> , day	Up to 5
Wi-Fi frequency, GHz	2.412 – 2.484
Supported Wi-Fi Standards	IEEE 802.11 b/g/n
Wi-Fi Encryption Protocol	WPA2/PSK
Protocol for synchronizing time with an NTP server	Yes
Protocol for exchanging data with the "my.overvis.com" server	Yes
Maximum number of events (schedule)	512
Maximum log length, entries	10 000
Log Entry Type	In a loop
Log recording period <sup>3</sup> , min	5
Tightening torque of terminal block screws, N * m	2 ±0.2
Designation of the device	Control and distribution equipment
Rated operating mode	Long
Climatic modification	NF 3.1
Device Protection	IP20

Table 1 (continued)

Description	Value
Switching resource of output contacts: - Electrical, number, not less than - Mechanical, number, not less than	10 000 500 000
Power consumption (under load), W, no more	2.5
Allowable pollution	II
Overvoltage category	III
Class of electrical shock protection	II
Rated insulation voltage, V	450
Rated impulse withstand voltage, kV	4.0
Mass, kg, no more	0.160
Dimensions	See Fig.1
Installation (assembling) of the device - standard DIN rail 35 mm	
The device retains its operability in any position in space	
Material of the body frame - self-extinguishing plastic	
-----	
<sup>1</sup> - provided that synchronization with the NTP server is enabled and there is access to the Interweb; <sup>2</sup> - provided that the device has been working from the mains for at least 1 hour; <sup>3</sup> - failures and changes in the condition of relay contacts are stored immediately without waiting for a recording period.	

## 2.2 Modes of Operation of the Device

The device can work in three modes:

- *Automatic mode of operation;*
- *Manual control mode;*
- *Wi-Fi connection setup mode.*

**Automatic mode.** Meter EM-129 performs connection to a user-defined access point, measures and controls mains parameters (voltage, frequency, current, etc.) to protect the load and account for electricity, as well as control (enable / disable) the load according to a user-defined schedule.

In the event of a failure (excess of current or voltage above a predetermined level, voltage drop below a predetermined level) meter EM-129 performs an emergency load disconnection.

**Manual control mode.** If the user changed manually the state of the load (by using the button of the front panel or remotely through the my.overvis.com service), meter EM-129 blocks the execution of the current scheduled event and switches over to the manual control mode.

When the current scheduled event is completed or the next scheduled event occurs, meter EM-129 returns to the automatic mode of operation.

**Wi-Fi connection setup mode.** Meter EM-129 creates its own access point with the name: "EM-129\_XXXXXX", where XXXXXX is the unique device code.

The user, having connected to this access point, and in the Web browser (Opera, Chrome, Fire Fox, others) by going to the address "http://em.com" or "http://192.168.4.1", gets access to the settings of Wi-Fi connection of the device.

## 3. INTENDED USE

### 3.1 Preparation for use

- Unpack and check the device for damage after transportation, if any, contact the supplier or manufacturer;
- Carefully read the Operation Manual;
- If the temperature of the device after transportation or storage differs from the temperature of the environment at which it is intended to be used, then before connecting to the mains, keep the device in operating conditions for two hours (as moisture condensation may occur on the device elements);
- If you have any questions about installation of the device, please contact the manufacturer at the telephone number indicated at the end of the Operation Manual.

### 3.2. Connection of the device

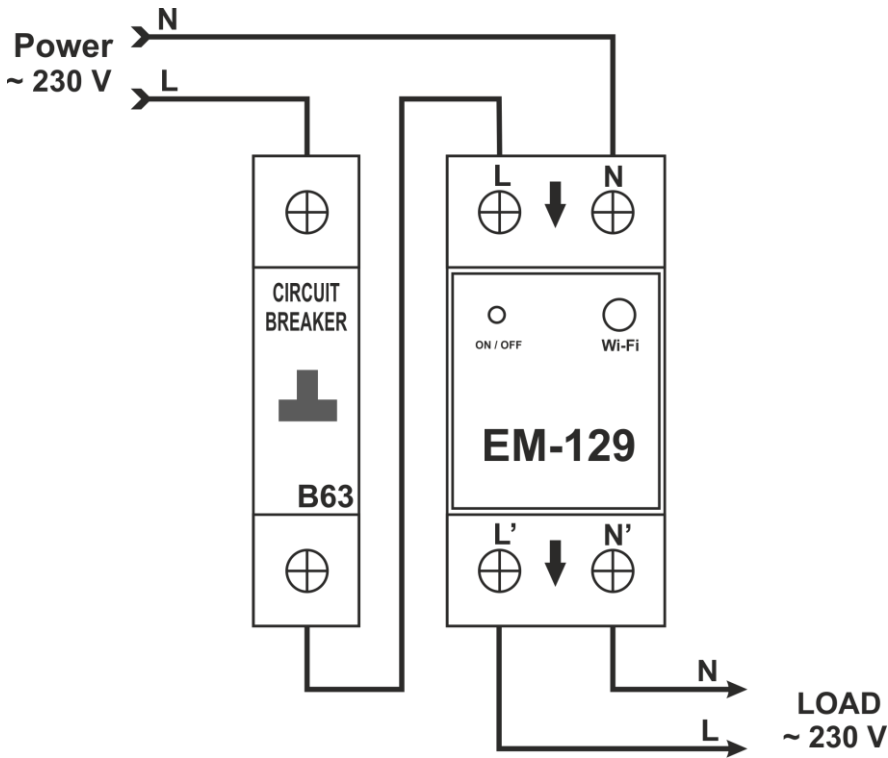
**ATTENTION! ALL CONNECTIONS MUST BE PERFORMED WHEN THE DEVICE IS DE-ENERGIZED.**

**Error when performing the installation works may damage the device and connected devices.**

To ensure the reliability of electrical connections the flexible (stranded) wires with insulation for voltage of at least 450 V should be used, the ends of which it is necessary to be striped of insulation for  $5 \pm 0.5$  mm and tightened with bootlaces. Wires fastening should exclude mechanical damage, twisting and abrasion of the wire insulation. The wire cross section for connecting the equipment protected must be at least 10 mm<sup>2</sup>.

**IT IS NOT ALLOWED TO LEAVE EXPOSED PORTIONS OF WIRE PROTRUDING BEYOND THE TERMINAL BLOCK.**

**For a reliable contact, tighten the terminal screws with the force indicated in Table 1.**



When reducing the tightening torque, the junction point is heated, the terminal block may be melted and wire can burn. If you increase the tightening torque, it is possible to have thread failure of the terminal block screws or the compression of the connected wire.

- 3.2.1 Disconnect the supply voltage with a circuit breaker (Figure 2).
- 3.2.2 Connect the device according to the diagram shown in Figure 2 and check the connection.
- 3.2.3 Close the circuit breaker. In this case, the status indicator (Figure 1, pos. 2) will begin to flash in blue.
- 3.2.4 Configure Wi-Fi connection as described in paragraph 3.4.1.

Fig. 2 – Connection Diagram of EM-129

### 3.3 Control of Wi-Fi Button

The Wi-Fi button (Fig. 1, pos. 3) is used to control the device from the front panel.

While holding the “Wi-Fi” button pressed, the color of the status indicator (Fig. 1, pos. 2) will change its color, depending on the length of time the button is pressed - thereby indicating the action being performed.

To confirm the action, you must release the Wi-Fi button during the glow of the status indicator.

Table 2 lists all the possible actions and colors of the status indicator.

Table 2 - Color of the status indicator when pressing the Wi-Fi button

Color	Time of pressing, s	Action performed
Purple	1	It is detected that the button is pressed, no action will be taken
Red	2 - 5	Turn on the load (if it was disconnected) or disconnect the load (if it was turned on)
Blue-red (flashing)	5 - 20	Enable Wi-Fi connection setup mode
Purple	20 - 25	Reset to factory settings
---	> 25	No actions will be performed

### 3.4 Device setting up

#### 3.4.1. Setting up of Wi-Fi connection

To enter the setup mode, press and hold the Wi-Fi button on the front panel of the EM-129, (Figure 1, pos. 3) for 5-6 seconds.

At the same time, the status indicator (Fig. 1, pos. 2) will flash in blue-red and meter EM-129 will create an access point with name "EM-129\_xxxxx", where xxxxxx is the unique device code (see Figure 3). Release the button.

Using an electronic device (PC with Wi-Fi, phone, i-Pad, laptop, etc.), connect to the access point using the following parameters:

- The name of the access point is "EM-129\_xxxxx";
- Security “No”.

**Note:** to force exit from the Wi-Fi connection setup mode - press and hold the Wi-Fi button on the front panel of the EM-129 for 5-6 seconds. Release the button, while the status indicator stops flashing in blue and red, and the device goes into automatic mode

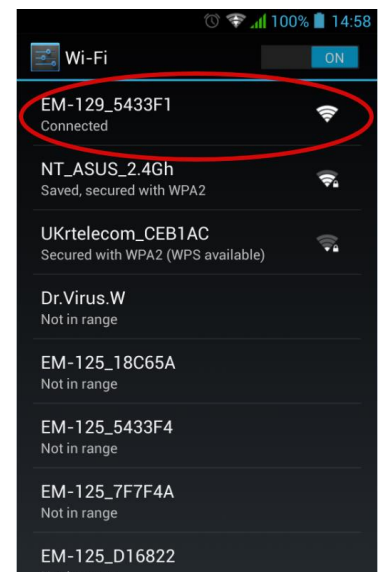


Fig. 3 – Access point of EM-129

Launch a Web browser on the electronic device (Chrome, Opera, Fire Fox, etc.).

In the address bar of the browser, enter “http://em.com” or “http://192.168.4.1” and follow the entered link.

Web-based interface of meter EM-129 will open on the screen of the electronic device (see Figure 4).

Set up Wi-Fi connection by selecting your network and entering a password:

- **Service Set Identifier (SSID)** – name of your Wi-Fi network;
- **Password of the network** – password of your Wi-Fi network;
- **TCP/IP setup** – setup of IP address, subnetwork mask and gateway address (by default it is configured automatically);
- **MAC address** - a unique device address;
- **Device password** - used when connecting to the device remotely (default is “admin”).

To save the settings, click the "Next" button.

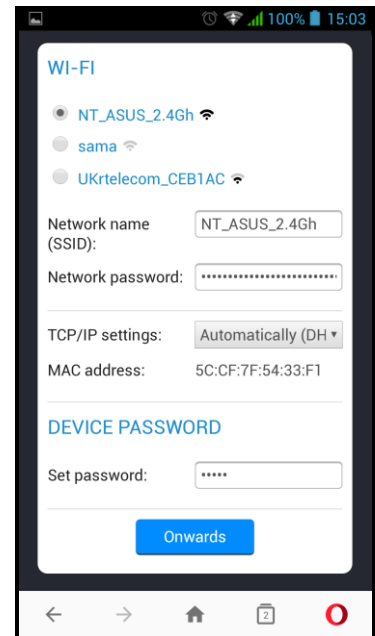


Fig. 4 – Wi-Fi setup

Upon completion of saving the settings, a message on the successful saving will be displayed on the screen of the electronic device.

Wait for connection of EM-129 to the specified Wi-Fi (the status condition indicator will stop flashing often in blue), and follow the link in the form of a green button at the bottom of the screen (see Fig. 5).

**Notes:**

- 1 - if the status condition indicator is constantly flashing blue, check the Wi-Fi network and repeat the Wi-Fi connection settings (see paragraph 3.4.1);
- 2 - if the link does not appear for some time (20 - 30 s), check the connection of the electronic device to the global Internet

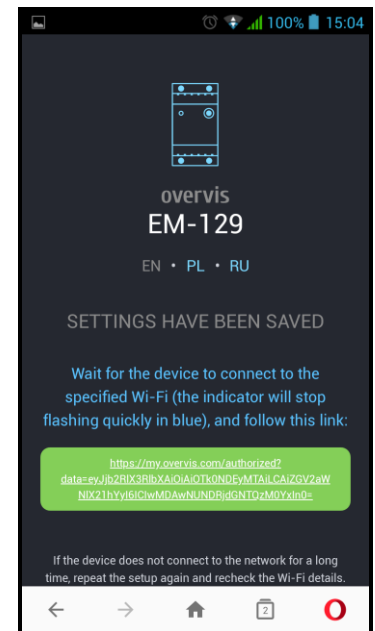


Fig. 5 – connection to “my.overvis.com”

After clicking on the link, the main interface of the EM-129 will be displayed on the screen of the electronic device (see Figure 6).

For subsequent access to your device, use the "my.overvis.com" service.

**Note:** We strongly recommend to create an account on the site “my.overvis.com”, this will allow you to have a safe access to your devices and manage the list of connected devices.

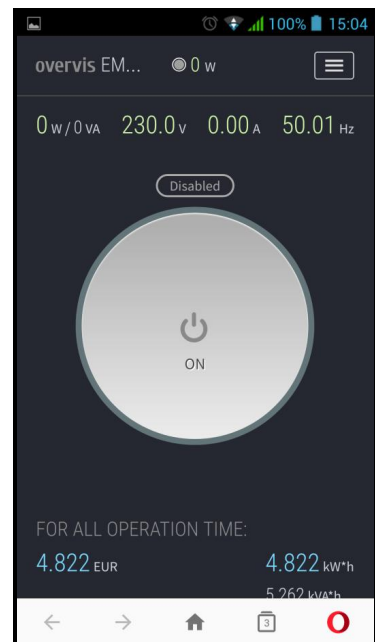


Fig. 6 – interface of EM-129

### 3.4.2. Control and setup via “my.overvis.com” service

Control and setup via "my.overvis.com" service is possible only after preliminary setup of Wi-Fi connection and registration on the "my.overvis.com" server (see paragraph 3.4.1).

Enter the “https://my.overvis.com.com” link on the electronic device (PC, laptop, mobile phone, iPad, etc.), in the address bar of the Web browser (Chrome, Opera, Fire Fox, etc.), and make a click-through.

Options for connecting to EM-129 (Log in to your account, register or connect to the device using a temporary link) will be displayed on the screen of the device from which the transition was made. You must select the most suitable option and follow the on-screen instructions.

To disconnect from the EM-129, you must click the "Exit" button or simply close the "my.overvis.com" page.

### 3.4.3 Control and setup via a local Wi-Fi network

Control and setup via a local Wi-Fi network is possible only after pre-setting the Wi-Fi connection (see paragraph 3.4.1).

In the settings of the router, reserve the IP address for the device by its MAC address (see the Operation Manual for the router). Or, when setting up a Wi-Fi connection, you need to set the value “Manual” in the “TCP/IP Settings” field and specify the static settings.

- **IP address** - an unoccupied address in your network (example: 192.168.0.105 or 10.0.0.5);
- **Subnet mask** - the mask of your subnet (example: 255.255.255.0 or 255.0.0.0);
- **The main gateway** - the IP address of your router (example: 192.168.0.1 or 10.0.0.1);
- **DNS1** - primary name server (example: 208.67.222.222);
- **DNS2** - secondary name server (example: 8.8.8.8).

On an electronic device (PC, laptop, mobile phone, iPad, etc.), in the address bar of a Web browser (Chrome, Opera, Fire Fox, etc.), enter the link “http://192.168.0.105” and click through it (where 192.168 .0.105 is a reserved or statically specified IP address of the device on the router).

On the screen of the device from which the transition was made, the page for entering the device password will be displayed (see Fig. 7), you must enter the password (default is “admin”) and click the “Enter” button.

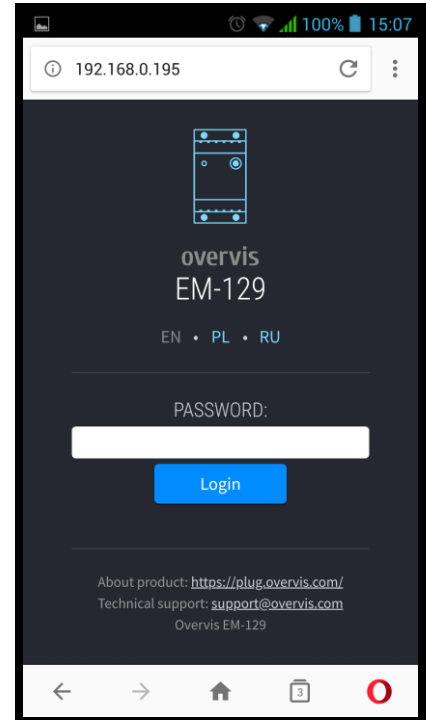


Fig. 7 – local entry to EM-129

## 3.5 Use of the device

In description of the device operation, the settings set by the manufacturer are used.

**Note** - all described thresholds and time delays can be changed by the user in the device settings.

### 3.5.1 Operation of the device

After connecting meter EM-129 to the mains, automatic reclosing time for 5 s will occur, then, if the mains voltage is within the acceptable limits, the device starts turning on / off the load according to the schedule set by the user (automatic operation mode).

**Note** - After 5 seconds, if the schedule is not set, the system automatically switches to the manual mode (the state of manual control is saved when the power is turned off).

Meter EM-129 constantly monitors the value of the mains voltage, and after tripping on the load - the amount of current and power consumed by the load. If one of them goes beyond the established limits, meter EM-129 performs an emergency load disconnection.

In addition, after connecting meter EM-129 to the mains, a connection is made to the user's Wi-Fi network (to synchronize the time with the NTP server and access to the “my.overvis.com” service).

Every 5 minutes, the EM-129 saves the log (voltage, current, power, etc.) to non-volatile memory, for further transmission to the “my.overvis.com” service.

When a manual control command is received (from the front panel or the “my.overvis.com” service), the execution of the current scheduled event will be blocked, the load will be tripped off (or on depending on the command), and the EM-129 switches to manual control mode.

When the current event ends or the next scheduled event occurs, the manual control is turned off and the EM-129 returns to automatic operation.

### 3.5.2 Load voltage protection

During operation, the EM-129 constantly measures the value of the mains voltage.

If the voltage rises above the threshold of 255 V (“Upper cut-off threshold”), the load will be tripped off in 0.5 s (“Shutdown delay by upper threshold”).



With a further increase in voltage by another 30 V (285 V), the load will be tripped off with a fixed time delay of 0.2 s.

When the voltage rises above  $300 \pm 10$  V, the load will be tripped off with a fixed time delay of 0.05 s.

After tripping off the load, if the mains voltage drops below 250 V ("*Upper cut-off threshold*" 255 V minus "*Hysteresis*" 5 V), it will return to automatic operation after the automatic reclosure time (5 s).

If the voltage drops below the threshold of 190 V ("*Lower cut-off threshold*"), the load will tripped off in 12.0 s ("*Cutoff delay* by the lower threshold").

With a further decrease in voltage below 145 V, the load will be tripped off with a fixed time delay of 0.25 s.

After load tripping off, if the mains voltage rises above 195 V ("*Lower cut-off threshold* 190 V plus "*Hysteresis*" 5 V), there will be a return to automatic operation after the automatic reclosure time.

The device operation in the emergency mode is described in paragraph 3.5.6 ("Load tripping off due to a failure").

### 3.5.3 Frequency load protection (disabled by default)

During operation, the EM-129 constantly measures the value of the frequency of the mains voltage.

If frequency rises above the threshold of 51.0 Hz ("*Upper cutoff threshold*"), the load will be tripped off in 10.0 s ("*Cutoff delay*").

After disconnecting the load, if the mains frequency drops below 51.0 Hz ("*Upper cutoff threshold*"), it will return to automatic operation after the automatic reclosure time.

If frequency drops below the threshold of 49.0 Hz ("*Lower cut-off threshold*"), the load will tripped off in 10.0 s ("*Cutoff delay*").

After tripping off the load, if the mains frequency rises above 49.0 Hz ("*Lower shutdown threshold*"), it will return to automatic operation after the automatic reclosure time.

The operation of the device in emergency mode is described in paragraph 3.5.6 ("Load shedding due to a failure").

### 3.5.4 Load current protection

During operation, the EM-129 constantly measures the amount of current consumed by the load.

If the load current rises above the threshold of 63 A ("*Cutoff threshold*"), the load will be off in 5.0 s ("*Cutoff delay*").

After tripping off the load, there will be return to automatic operation after the automatic reclosure time.

The operation of the device in emergency mode is described in paragraph 3.5.6 ("Load shedding due to a failure").

### 3.5.5 Load protection by power consumption (disabled by default)

During operation, the EM-129 constantly measures the amount of power consumed by the load.

If the load power increases above the threshold of 14,490 W ("*Cutoff threshold*"), the load will be off in 5.0 s ("*Cutoff delay*").

After disconnecting the load, there will be return to normal operation after the reclosure time.

The operation of the device in emergency mode is described in paragraph 3.5.6 ("Load shedding due to a failure").

### 3.5.6 Load shedding due to a failure

In the event of an emergency (overvoltage, overcurrent, overvoltage, etc.), the load is off, the reclosure time starts and the status indicator (Figure 1, pos. 2) starts to glow red.

With the end of the emergency, the status indicator blinks red, indicating that the automatic reclosure time is running, after which the load will be automatically tripped on.

If the reclosure time has expired before the emergency disappears, the load will be tripped on without delay after the end of emergency.

If the number of attempts of automatic restarting has been exceeded (for current and power protection "3", for voltage protection "no"), the device will block the load from being switched on, and the status indicator will constantly glow in red. To restore the EM-129, it is necessary to disconnect it from the network, wait for 5 s and turn it on again.

### 3.5.7 Factory Reset

Press and hold the Wi-Fi button on the front panel of the device for 20 seconds.

After 20 seconds, when the status indicator will turn purple, release the Wi-Fi button.

When the factory reset is completed, the status indicator will stop glowing in purple, and the device will automatically reboot.

The device has been reset to factory settings and is ready for use.

### 3.5.8 Protocol of data exchange between EM-129 and the "my.overvis.com" service

The protocol of data exchange between EM-129 and the "my.overvis.com" service is a closed protocol and has not been disclosed for security purposes.

All data is received and sent in encrypted form using 256 bit encryption.

**4. MAINTENANCE**

**4.1. Safety precautions**



**DURING MAINTENANCE IT IS NECESSARY TO DISABLE THE DEVICE AND CONNECTED DEVICES FROM THE MAINS.**

**4.2.** Maintenance of the device must be performed by the skilled professionals.

**4.3.** Recommended frequency of maintenance is **every six months**.

**4.4. Maintenance Procedure:**

- 1) Check the connection reliability of the wires, if necessary, clamp with the force specified in Table 1;
- 2) Visually check the integrity of the housing, in case of detection of cracks and damages take the device out of service and send for repair;
- 3) If necessary, wipe the front panel and the housing of the device with cloth.

**Do not use abrasives and solvents for cleaning.**

**5. SERVICE LIFE AND MANUFACTURER WARRANTY**

**5.1.** The lifetime of the device is 10 years. Upon expiration of the service life, contact the manufacturer.

**5.2.** Shelf life is 3 years.

**5.3.** Warranty period of the device operation is 5 years from the date of sale.

During the warranty period of operation (in the case of failure of the device) the manufacturer is responsible for free repair of the device.

**ATTENTION! IF THE DEVICE HAS BEEN OPERATED WITH THE VIOLATION OF THE REQUIREMENTS OF THIS USER MANUAL, THE USER WILL LOSE THE RIGHT TO WARRANTY MAINTENANCE.**

**5.4.** Warranty service is performed at the place of purchase or by the manufacturer of the device.

**5.5.** Post-warranty service of the device is performed by the manufacturer at current rates.

**5.6.** Before sending for repair, the device should be packed in the original or other packing excluding mechanical damage.

**6. TRANSPORTATION AND STORAGE**

The device in the original package is permitted to be transported and stored at the temperature from minus 45 to +60 °C and relative humidity of no more than 80 %.

**7. ACCEPTANCE CERTIFICATE**

EM-129 has been manufactured and accepted in accordance with the requirements of valid technical documentation and classified as fit for operation.

Head of QCD

Date of manufacture

\_\_\_\_\_

\_\_\_\_\_

Seal

**8. CLAIMS DATA**

*You are kindly requested, in case of the device return and transfer it to the warranty (post-warranty) service please indicate detailed reason for the return in the field of the claims data.*

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*The Company is grateful to you for the information about the quality of the device and suggestions for its operation.*



For all questions, please contact the manufacturer:

NOVATEK-ELECTRO Ltd,  
59, Admiral Lazarev Str.  
Odessa, 65007, Ukraine.

Tel.: +38 (048)738-00-28,  
Tel./fax: +38 (0482) 34-36-73.  
www.novatek-electro.com

Date of sale: \_\_\_\_\_

**VN191227**

## Appendix A (informative)

This appendix describes the WEB-interface of EM-129.

### A1 User authorization

After opening the WEB-interface of EM-129 in the PC browser (or in any other device with a browser installed), the user authorization page will be displayed.

To access the EM-129, you must enter a password (default is “admin”) as shown in Figure A1.

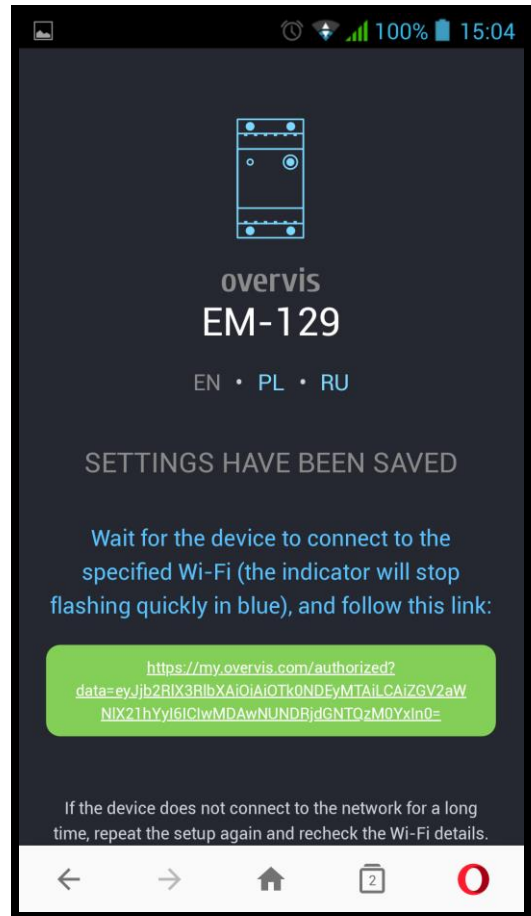



Fig. A1 - User Authorization

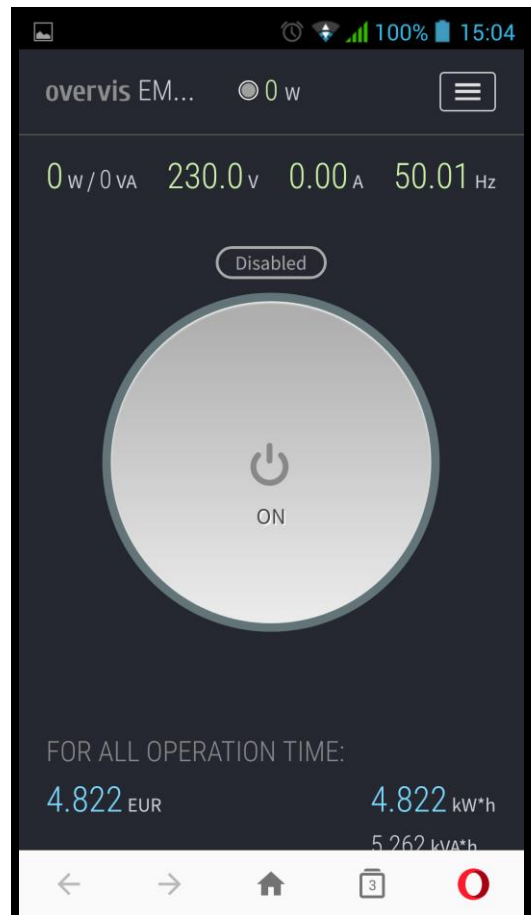
### A2 Status condition

After successful authorization, a status condition page will be displayed (see Fig. A2), where current information on EM-129 status is displayed.


At the top of the screen, the device name “overvis EM-129”, the current power consumption by the load “0 W” and the button «  » to open the main menu are displayed.

In the middle of the screen there is a manual control button and readings of the measured parameters of the mains (current and power of the load, mains voltage and frequency).

At the bottom of the screen are meters of the energy consumed and the amount of money spent.



### A3 Main menu

When you press the «  » button, the main menu of the EM-129 will be displayed, as shown in Figure A3.


In order to close the menu, press the «  » button again.

Fig. A2 – Status condition of EM-129

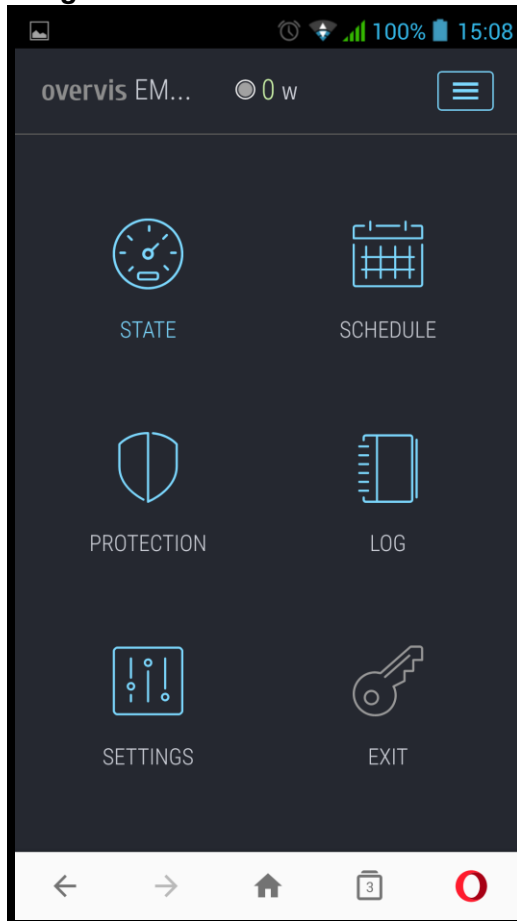




Fig. A3 – Main menu


### A4 Schedule

Opening will occur after clicking on menu item "SCHEDULE" (Figure A4).

Double-clicking on a schedule adds an event.

Double-clicking on an event opens the event settings window.

Changing the duration of the event is carried out by dragging the entire block or using the elements "  " and "  ".

To delete an event, click "  " in the upper left corner of the event.

To save the current schedule in EM-129 - click the "Save" button.

To cancel the changes made, click the "Cancel" button.

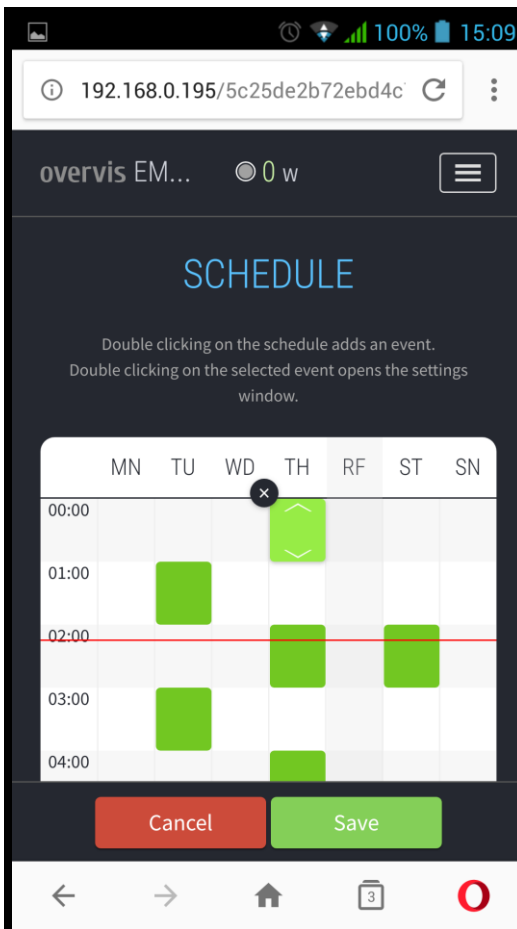


Fig. A4 - Scheduler

### A5 Protection

It opens after clicking on menu item "PROTECTION" (Figure A5).

This menu item includes settings for the protective functions of the EM-129:

- Voltage protection;
- Current protection;
- Power protection.

#### **VOLTAGE PROTECTION**

- **Upper threshold** - the maximum value of voltage, upon reaching it the load will be tripped off;
- **Cutoff delay** - protection response time when a threshold is reached;
- **Lower threshold** - the minimum value of voltage, upon reaching it the load will be tripped off;
- **Hysteresis** - voltage hysteresis value;
- **Delay of re-closure** - delay before reclosing the load after a failure;
- **Re-closures** - the number of allowed re-closings after a failure;
- **Save** - save the settings in EM-129

#### **CURRENT PROTECTION**

- **Current threshold** - current value upon reaching which the load will be tripped off;
- **Cutoff delay** - protection response time when a threshold is reached;
- **Delay of re-closure** - delay before re-closure of the load in the event of a failure;
- **Re-closures** - the number of allowed re-closures in the event of a failure;
- **Save** - save the settings in the EM-129.

#### **POWER PROTECTION**

- **Protection** - permission to protection enabling (disabled, active or full power);
- **Power threshold** – value of power, upon reaching which the load will be tripped off;
- **Cutoff delay** - protection response time when a threshold is reached;
- **Delay of re-closure** - delay before re-closure of the load in the event of an accident;
- **Re-enable** - the number of allowed re-enable in the event of a failure;
- **Save** - save the settings in the EM-129.

#### **FREQUENCY PROTECTION**

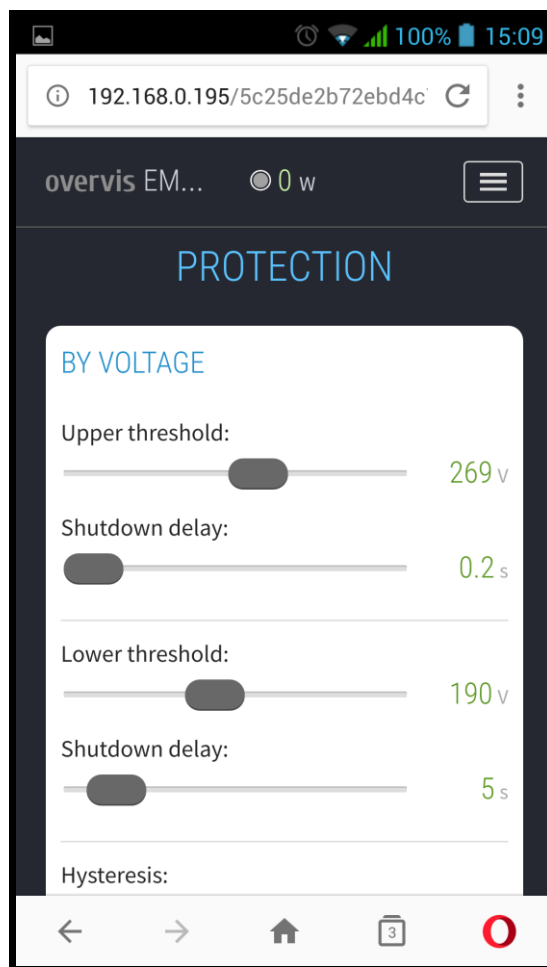
- **Protection** - permission to protection enabling (disabled, enabled);
- **Upper threshold** - the maximum value of frequency upon reaching which the load will be tripped off;
- **Lower threshold** - the minimum frequency value, upon reaching which the load will be tripped off;
- **Cutoff delay** - protection response time when a threshold is reached;
- **Delay of re-closure** - delay before reclosing the load after a failure;
- **Re-closures** - the number of allowed re-closures after a failure;
- **Save** - save the settings in the EM-129.

### A6 Settings

It opens after clicking on menu item "SETTINGS" (Figure A6).

This menu item contains the basic settings for the EM-129:

- Access to the device;
- Cost of electric power supply;
- Wi-Fi;
- Date and time;
- Cloud Overvis;
- Optional



**Fig. A5 – Voltage protection**

### ACCESS TO THE DEVICE

- **Device name** - name of the device;
- **Password** - sets the password for access to the EM-129 via the Web interface;
- **Save** – to save the settings in the EM-129.

### COST OF ELECTRIC POWER SUPPLY

- **Cost of 1 kW \* h** - sets the cost of electric power supply per 1 kW \* h;
- **Currency** - sets the currency in which the cost of consumed electricity is calculated;
- **Save** - to save the settings in EM-129

### WI-FI

- **Service Set Identifier (SSID)** – name of the Wi-Fi network to which the EM-129 is connected;
- **Password of the network** – password of the network to which EM-129 is connected;
- **TCP/IP setup** – TCP / IP configuration mode (manual or automatic DHCP)
- **IP address** - IP address of EM-129 on a Wi-Fi network;
- **Subnet mask** - the subnet mask to which the EM-129 is connected;
- **Main gateway** - the address of the main gateway in the Wi-Fi network:
- **Save** – to save the settings in the EM-129.

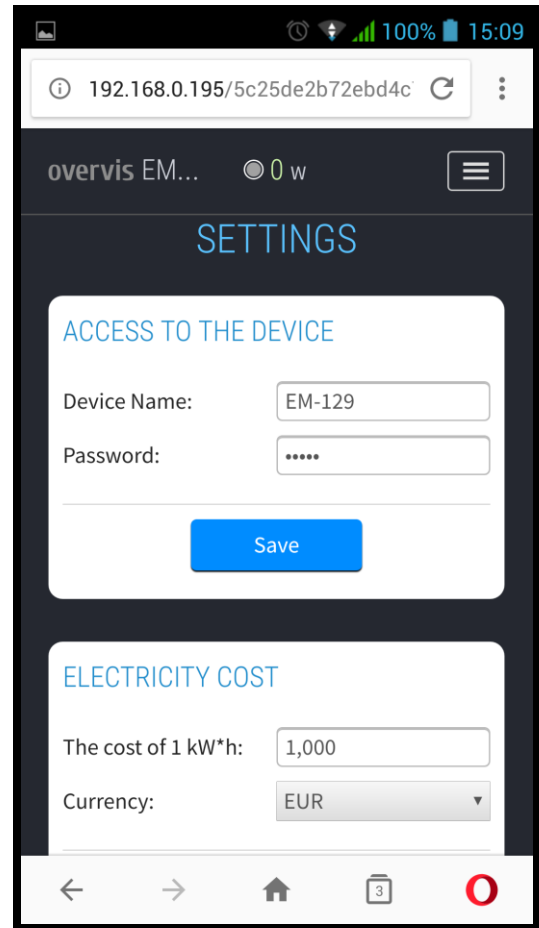


Fig. A6 – Basic settings of EM-129

### DATE AND TIME

- **Time on the device** - the current date and time on the device;
- **Time zone** - the current time zone on the device;
- **To enable automatic daylight saving time** - a parameter that allows you to enable or disable the EM-129 to automatically switching over to daylight saving time;
- **Time correction** - correction of the clock on the EM-129, set in seconds per day;
- **To enable time synchronization** - a parameter that allows you to enable or disable EM-129 to synchronize time with the NTP exact time server;
- **NTP server address** - address of the NTP time server;
- **Port** – a port for connecting to the exact time server;
- **Synchronization period** - a period with which the EM-129 will synchronize with the exact time server;
- **Save** – to save the settings in EM-129;
- **Synchronize with server** – a forced start of time synchronization between the exact time server and EM-129;
- **Synchronize with PC** - to start time synchronization between PC and EM-129.

### CLOUD OVERVIS

- **Enable remote access via the cloud** - connection EM-129 to Overvis Cloud is allowed or denied;
- **Server address** - sets the address of the Overvis cloud;
- **Port** – a connection port;
- **Status** - service information about the status of connecting to the Overvis cloud;
- **Save** – to save the settings in the EM-129.

### ADDITIONAL OPTIONS

- **Front panel lock after-** the time after which the front panel locks after power supply to EM-129 (child protection);
- **Lock the device after** - the time after which the load tripping on will be blocked for all operating modes;
- **Reset time for reclosing counters** - the time after which the counters of allowed re-closures from the moment of the end of failure will be reset;
- **Display brightness** - sets the brightness of glowing of the status condition indicator of EM-129;
- **Save** – to save the settings in the EM-129.

**Appendix B**  
(informative)

The adjustable parameters of meter EM-129 are shown in Table B1.

**Table B1** – Adjustable parameters of meter EM-129

Description	Range		Value after reset
	from	to	
<b>Wi-Fi</b>			
Name of network (SSID)	64 symbols of ASCII		empty
Password of network	64 symbols of ASCII		empty
TCH/IP settings	Manually	Automatically	Automatically
IP address	0.0.0.0	255.255.255.255	192.168.0.2
Subnet mask	0.0.0.0	255.255.255.255	255.255.255.0
Main gateway	0.0.0.0	255.255.255.255	192.168.0.1
DNS1	0.0.0.0	255.255.255.255	208.67.222.222
DNS2	0.0.0.0	255.255.255.255	8.8.8.8
MAC-address	Unique MAC-address of the device		
IP address	Current IP address of the device		
<b>Voltage protection</b>			
Upper threshold, V	240	290	255
Upper threshold cutoff delay, s	0.2	2.0	0.5
Lower threshold, V	160	230	190
Lower threshold cutoff delay, s	0.2	60.0	12.0
Hysteresis, V	5	20	5
Delay of re-closure, s	0.5	600.0	5.0
Number of re-closures	No, 1, 2, 3, 5, 7, 10, always		always
<b>Current protection</b>			
Current threshold, s	1.0	63.0	63.0
Cutoff delay, s	0.2	10.0	5.0
Re-closure delay, s	0.5	600.0	60.0
Number of re-closures	No, 1, 2, 3, 5, 7, 10, always		3
<b>Power protection</b>			
Protection enabling	Off/ in active / in full		in active
Power threshold, W	100	14490	14490
Cutoff delay, s	0.2	10.0	5.0
Re-closure delay, s	0.5	600.0	60.0
Number of re-closures	No, 1, 2, 3, 5, 7, 10, always		3
<b>Frequency protection</b>			
Upper threshold, Hz	50	65	51
Lower threshold, Hz	45	50	49
Cutoff delay, s	5	10.0	5.0
Re-closure delay, s	0.5	600.0	5.0
Number of re-closures	No, 1, 2, 3, 5, 7, 10, always		3
<b>Access to the device</b>			
Name of the device	20 symbols of ASCII		"EM-129"
Password to Web access	20 symbols of ASCII		"admin"
<b>Cost of power supply</b>			
Cost of 1 kW*hr	0.001	9999.999	1.000
Currency	BYR, BGN, CZK, CHF, EUR, GBP, INR, KZT, LVL, LTL, MDL, PLN, PRB, RUB, RON, SEK, UAH, USD		EUR
<b>Date and time</b>			
Greenwich Mean Time (GMT)	UTC-12:00	UTC+13:00	UTC+2:00
Time correction, s	-9.9	+09.9	+0.0
Automatic adjustment for daylight saving time and back	No / yes		No
Time synchronization	Off / On		On
NTP server address	32 symbols of ASCII		"time.windows.com"
Port of connection	1	65535	123
Synchronization period, min.	60	1440	120
<b>"my.overvis.com" cloud</b>			
Permit to work	Off / On		On

Server address	32 symbols of ASCII	"my.overvis.com"
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*Table B1 (continued)*

Port of connection	1	65535	20504
<b>Options</b>			
Front panel blocking, in... min.	No	1-10	No
Meter blocking, in... min.	No	1-720	No
Reset time of re-closure counters, min.	1	60	1
Display brightness	1	15	10