

MULTIFUNCTIONAL TIMER-RELAY EM-126T



OPERATING MANUAL

The quality management system of development and production complies with the requirements of ISO 9001:2015

Dear Customer,

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

DEVICE SERVICE

Multifunctional timer-relay EM-126T (hereinafter referred to as the device, EM-126T) is a microprocessor device designed for home automation - a smart receptacle.

EM-126T allows you to turn on or off the load on a schedule or in a manual mode, while protecting the load from various voltage accidents and power overloads.

EM-126T includes a temperature sensor (for measuring air temperature), which allows EM-126T to control a heating or cooling devices depending on the measured value of air temperature.

EM-126T is equipped with one control button (for entering Wi-Fi setup mode or manual load control) with a two-color indicator (for displaying failures, the state of the load and the state of connection to the Wi-Fi network).

After registration on server «my.overvis.com», EM-126T control and adjustment is possible from anywhere in the world where there is an Internet connection.

EM-126T accumulates real-time energy consumption statistics and sends the accumulated data to the «my.overvis.com» server, as a result of which you can view the saved reports for a week, month, or a year.

You can save electric power consumption by using the device to control climate and water heating devices according to a preplanned schedule.

On the basis of power consumption statistics, the server «my.overvis.com» can offer the most optimal schedule settings.

Key features:

- Air temperature measurement;
- Measurement of the mains voltage and frequency;
- Measurement of the current consumed by the load;
- Measurement of power consumed by the load;
- Metering of the electric power consumed by the load;
- Load protection against emergency voltages in the mains;
- Load protection against overcurrent consumption;
- Load protection against excess power consumption;

- Real-time clock with a reserve of rate of clock up to 5 days (if power supply is off);
- Automatic time synchronization with a SNTP- server;
- Automatic load control according to the schedule set by the user;
- Planning of vacation (with blocking of program execution);
- Limitation of the of work load time;
- Manual load control from the front panel;
- Manual control blocking after a specified period of time (child lock).

Depending on the length of the wire and location of the sensor in the lower or upper part of the housing, EM-126T has several design versions.

Version	Sensor Location	Sensor Wire Length
EM-126T-1	Lower part of casing	10 sm
EM-126T-2		1.6 m

SERVICE LIFE AND WARRANTY

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

Shelf life is 3 years.

Warranty period of the device operation is 3 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 IN VIOLATION OF THE REQUIREMENTS OF THIS MANUAL, THE USER WILL LOSE THE RIGHT TO WARRANTY SERVICE.

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

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

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

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.

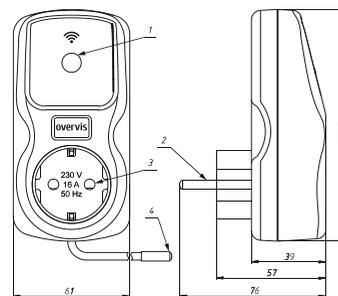
ACCEPTANCE CERTIFICATE

EM-126T has been manufactured and accepted in accordance with the requirements of current technical documentation and classified as fit for operation.

Head of QCD _____ Date of manufacture _____

Seal _____

CONTROLS



- 1 – Control and display button «ENTER»;
- 2 – «Plug» - to connect to the mains;
- 3 – «Receptacle» – to connect the load;
- 4 – Temperature sensor.

Figure 1

Indication of «ENTER» button:

- Blue (flashes with a period of 0.5 s) – connects to a Wi-Fi access point;
- Blue (on) - the load is on;
- Blue (flashes every 5 seconds) – power supply is on, the load is disconnected;
- Red (flashes with a period of 0.5 s) – counting of the AR time;
- Red (on) – the presence of an emergency or the unit is blocked due to an emergency;
- Blue-red (flashes with a period of 0.35 s) – Wi-Fi connection setting mode is on;
- Blue-red (flashes with a period of 0.1 s) – resets to factory settings;
- Purple (flashes with a period of 0.1 s) – embedded software update.

TERMS AND ABBREVIATIONS

Wi-Fi – a family of standards for transmitting digital data streams over radio channels;

RMS – effective (quadratic) value;

AR – automatic restart of the load;

By default - the preset values of the parameters that the unit uses in its work, until the user explicitly changes these values;

Web-interface - the system of user interaction with the unit through a computer browser;

Purple – the color of the indicator, obtained by mixing the blue and red glow.

OPERATION CONDITIONS

The device is intended for operation in the following conditions:

- Ambient temperature: from minus 5 to +40 °C;
- Atmospheric pressure: from 84 to 106.7 kPa;
- Relative humidity (at temperature of +25 °C): 30..80 %.

Store the device in the operating environment for 2 hours before switching to the mains (because of condensation may be on the device elements).

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.).

TECHNICAL SPECIFICATIONS

Rated power supply voltage	230 – 240 V
Mains frequency	45 – 62 Hz
Voltage at which performance is maintained	100 – 400 V
Maximum switched current at active load	16 A
Connected load power, not more	3.6 kW
Readiness time at voltage supply, not more	0.4 s
Precision of mains voltage measurement	±3 V
Precision of load current measurement	±0.3 A
Precision of temperature measurement	±2 °C
Temperature control range	from -10 to +90 °C
Type of temperature sensor ¹	NTC10KB
Accuracy of the real time clock ²	±1 s/day
Reserve time of rate of real-time clock ³	up to 5 days
Wi-Fi frequency	2.412 - 2.484 GHz
Supported Wi-Fi standards	IEEE 802.11 b/g/n
Wi-Fi encryption protocol	WPA2/PSK
Time synchronization protocol with SNTP server	yes
Protocol of data exchange with «my.overvis.com» server	yes
Maximum number of events (schedule)	512
Maximum log (records) length	10 000
Type of log entry	In a loop
Log recording period	5 min
Purpose of the device	Control & distribution equipment
Nominal operation	Long
Climatic performance	NF 4
Level of unit protection	IP30
Switching resource of output contacts at cos φ= 1: - at the load of 16 A, not less - at the load of 5 A, not less	100 000 times 1 million times
Power consumption (under load), not more	2.5 W
Permissible degree of contamination	II
Overvoltage category	II
Electric shock protection class	I
Rated insulation voltage	450 V
Rated impulse withstand voltage	2.5 kV
Mass, not more	0.16 kg
Dimensions, HxBxL	122.5x61x76 mm

The device meets the requirements of the following: EN 60947-1; EN 60947-6-2; EN 55011; EN 61000-4-2

The device maintains its performance at any position in space

Body material - self-extinguishing plastic

Harmful substances in amounts exceeding maximum permissible concentrations are not available

¹ - provided that synchronization with the SNTP server is enabled;

² - provided that synchronization with the SNTP server is enabled;

³ - provided that the unit has worked from the mains at least for 30 minutes.

MODES OF OPERATION

The device can work in three modes:

- Normal operation mode;
- Manual control mode;
- Wi-Fi connection setup mode.

Normal operation mode. EM-126T performs connection to a user-defined access point, measures and controls parameters of the mains (voltage and current) to protect the load, as well as controls the load (on/off) according to a user-defined schedule.

In the event of emergency (overcurrent or overvoltage above a predetermined level, voltage decrease below a predetermined level) EM-126T performs an emergency power cutoff.

Manual control mode. If the user changed the state of the load manually with the front panel or remotely through the «my.overvis.com» server, EM-126T will block the next scheduled event and go into the manual control mode.

When the next scheduled event occurs, EM-126T returns to normal operation.

The state of the manual control will be remembered when EM-126T is disconnected from the mains.

In the **Wi-Fi connection setup mode**, EM-126T creates its own access point with the name «EM-126T_XXXXXXX», where XXXXXXXX – is a unique unit code.

A user having connected to this access point, and in a Web browser (Opera, Google Chrome, Fire Fox, etc.) by going to the address «http://em.com» or «http://192.168.4.1», gets access to the device Wi-Fi connection settings.

EM-126T CONNECTION

When EM-126T is connected to the main, the receptacle and internal elements of the device will be under life-threatening voltage.

It is forbidden to connect a load with power over 3.6 kW to the device.

The device is not intended for load switchin over at short circuits. Therefore, the device should be operated in an electric network protected by an automatic circuit breaker with a cutoff current of no more than 16A.

Load current should not exceed the maximum socket current in which the device is included.

The temperature sensor does not have galvanic isolation and it is designed only for measuring air temperature.

It is strictly forbidden to dip the temperature sensor into liquid.

- Connect the load to the EM-126T receptacle;
- Turn on EM-126T with the load in the wall receptacle.

ADJUSTMENT OF THE DEVICE

Wi-Fi connection setup

To enter the setup mode, press and hold the «ENTER» button (Fig.1, pos.1) on the front panel of device for 5-6 seconds. At the same time, the «ENTER» button will flash in

blue and red, and device will create an access point named EM-126T_XXXXXXX», where XXXXXXXX – is a unique device code.

By means of an electronic device (PC with Wi-Fi, a phone, i-pad, laptop, etc.) connect to the access point using the following parameters:

- The name of the access point is «EM-126T_XXXXXXX»;
- Security «No».

Fire up the Web-browser (Google Chrome, Opera, Fire Fox, etc.) on the electronic device.

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

The electronic device screen will open Web-interface EM-126T.

Following the instructions on the screen, configure the EM-126T Wi-Fi connection and log in to the «my.overvis.com» server.

Note - to force exit from the Wi-Fi connection setup mode - press and hold the «ENTER» button on the front panel of EM-126T for 5-6 seconds, the «ENTER» button will stop flashing blue and red, and the device will go to the normal operation mode.

Web- interface of EM-126T

User authorization

After opening the Web-interface of EM-126T in the PC browser (or any other device with a browser installed), the user authorization page will be displayed.

To access the EM-126T, you must enter a password (default is «admin»).

State

After successful authorization, a state page will be displayed, where current state information is displayed.

At the top of the screen, the device name «overvis EM-126T», current temperature «25.3°C» and the button «☰» to open the main menu are displayed.



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

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



Main menu

When you press the «☰» button, the main menu of the EM-126T will be displayed.

To close the menu, press the «☰» button again.



Schedule

It opens after clicking on menu item «SCHEDULE».

Double-clicking on a schedule adds an event.

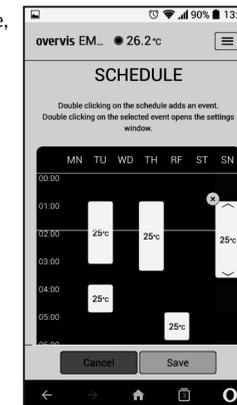
Double-clicking on an event opens the event settings window.

A change in 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-126T - click on the «Save» button.

To cancel the changes made, click the «Cancel» button.



Protection

It is open after clicking on menu item «PROTECTION».

This menu item contains the settings of the EM-126T protective functions:

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

Voltage protection:

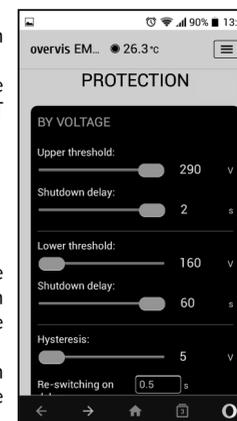
- Upper threshold - the maximum voltage value, upon reaching which the load will be disconnected;
- Shutdown delay - protection response time when the threshold is reached;
- Lower threshold - the minimum voltage value, upon reaching which the load will be disconnected;
- Hysteresis - voltage hysteresis value;
- Delay of re-closure - delay before re-closure of the load in case of a failure;
- Re-closures - the number of allowed re-closures in case of a failure;
- Save - to save the settings in the EM-126T.

Current protection:

- Current threshold - current value upon reaching which the load will be disconnected;
- Shutdown 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 - to save settings in the EM-126T.

Power protection:

- Protection - protection operation mode (disabled, active or full power);



- **Power threshold** – power value, upon reaching which the load will be disconnected;
- **Shutdown 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** – to save settings in the EM-126T.

Settings

Opens after clicking on menu item «SETTINGS».

This menu item contains the main settings for the device:

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

Access to the device:

- **Device name** – a name of the device;
- **Password** – sets a password for access to the device via the Web-interface;
- **Save** – to save settings in the EM-126T.



Temperature:

- **Type of load** - sets a type of load: a heater/cooler;
- **Temperature correction** - allows you to adjust temperature;
- **Temperature hysteresis** - a value of hysteresis in temperature;
- **Save** – to save settings in the EM-126T.

Cost of electric power supply:

- **Cost of 1 kW/h** – sets the cost of electricity per 1 kW/h;
- **Currency** – sets currency in which the cost of consumed power is calculated;
- **Save** – to save settings in the EM-126T.

WI-FI:

- **Service Set Identifier (SSID)** – the name of the network to which EM-126T is connected;
- **Network password** – a password of the network to which the EM-126T is connected;
- **TCP/IP settings** – TCP/IP configuration mode (manual or automatic DHCP);
- **IP address** – IP address of EM-126T in a Wi-Fi network;
- **Subnet mask** – a subnet mask to which the EM-126T is connected;
- **Default gateway** – an address of the main gateway in the Wi-Fi network;
- **Save** – to save settings in EM-126T.

Vacation:

- **Enable scheduled vacation** – vacation scheduler operating mode (disabled or enabled);
- **Start date** – the start date of the vacation scheduler;
- **End date** – the end date of the vacation scheduler;
- **Save** – to save settings in the EM-126T.

Note - during the work of the vacation scheduler, load connection is blocked.

Date and time:

- **Time on the device** – the current date and time on the device;
- **Time zone** – the current time zone on the device;
- **Enable automatic daylight saving time** – a parameter that allows you to enable or disable the EM-126T to automatically switch over to daylight saving time;
- **Time correction** – correction of the clock in the device, it is set in seconds per day;
- **Enable time synchronization** – a parameter that allows you to enable or disable EM-126T to synchronize time with the NTP exact time server;
- **NTP server address** – address of the NTP time server;
- **Port** – a port for connection to the exact time server;
- **Synchronization period** – the period with which the device will synchronize with the exact time server;
- **Save** – to save the settings in the EM-126T;
- **Synchronize with server** – a forced start of time synchronization between the exact time server and EM-126T;
- **Synchronize with PC** – to start time synchronization between PC and EM-126T.

Cloud Overvis:

- **Switch on remote access via the cloud** – connection of EM-126T to Overvis Cloud is allowed or denied;
- **Server address** – sets the address of the Overvis cloud;
- **Port** – a port of connection;
- **State** – service information about the state of connection to the Overvis cloud;
- **Save** – to save settings in the EM-126T.

Optional:

- **Blocking of the front panel after** – the time after which the front panel will be blocked after power supply to the device (child protection);
- **Blocking of the instrument after** – the time after which load connection will be blocked for all operating modes;
- **Reset time for reclosing counters** – the time after which the counters of allowed re-closures will be reset from the moment the failure disappears;
- **Display brightness** – sets brightness of the glow of the EM-126T control button;
- **Save** – to save settings in the EM-126T.

Configurable parameters of EM-126T

Name	Range		Value after reset
	from	to	
Wi-Fi			
Service Set Identifier (SSID)	32 symbols in ASCII		«NT_CHECK_P1»
Password of the network	64 symbols in ASCII		«12345678»
TCP/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
Default gateway	0.0.0.0	255.255.255.255	192.168.0.1
Voltage protection			
Upper threshold, V	230	290	255
Upper threshold shutdown delay, s	0.2	2.0	0.5
Lower threshold, V	100	220	190
Lower threshold shutdown delay, s	0.2	60.0	12.0
Hysteresis, V	0	20	5
Re-closure delay, s	0.5	600.0	5.0
Number of re-closures	No, 1, 2, 3, 5, 7, 10, always		Always
Current protection			
Current threshold, A	1.0	16.0	10.0
Shutdown 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
Power protection			
Protection enabling	Off/ Active/ Full		Active
Power threshold, W	100	3680	2300
Shutdown 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
Vacation			
Work enabled	Off/On		Off
Date of the beginning	dd/mm/yy	17.08.2018	
Date of the end	dd/mm/yy	17.08.2018	
Access to the device			
Name of the device	32 symbols in ASCII		«EM-126T»
Password of access to Web	32 symbols in ASCII		«admin»
Cost of power supply			
Cost of power supply	0.001	999.999	1.000

Name	Range		Value after reset
	from	to	
Currency	BYR, BGN, CZK, CHF, EUR, GBP, INR, KZT, LVL, LTL, MDL, PLN, PRB, RUB, RON, SEK, UAH, USD		EUR
Date and time			
Greenwich Mean Time (GMT)	GMT-12:00	GMT+13:00	GMT+0:00
Time correction, s	-9.9	+9.9	+0.0
Automatic daylight saving time	No/ Yes		No
Time synchronization	Off/ On		On
Address of NTP server	32 symbols in ASCII		«time.windows.com»
Port of connection	1	65535	123
Period of synchronization, s	3600	86400	7200
Temperature			
Type of the load	Heater/ Cooler		Heater
Correction of temperature, °C	-9.9	+9.9	0.0
Temperature hysteresis, °C	0.1	30.0	3.0
Cloud my.overvis.com			
Work enabling	Off / On		On
Server address	32 symbols in ASCII		«my.overvis.com»
Port of connection	1	65535	20502
Optional			
Device blocking after, s	No	60 - 43200	No
Blocking of the control button	No	60 - 600	No
Reset time of re-closure counters, s	60	3600	60
Display brightness	1	15	12

Remote adjustment and control is done through the «my.overvis.com» server

Setup and adjustment through the «my.overvis.com» server is possible only after presetting the Wi-Fi connection and authorizing on the «my.overvis.com» server (see «Wi-Fi connection settings»).

Enter the link «https://my.overvis.com» in the address bar of the web-browser of the electronic device (PC, lap-top, mobile phone, i-pad, etc.) and make the click through it.

Options for connecting to the EM-126T will appear on the screen of the device from which the click-through was made. It is necessary to choose the most suitable option and follow the further instructions displayed on the screen.

After connection to EM-126T, configure the necessary parameters.

