EN

OPTI-TEMP

Installation and Operating Manual

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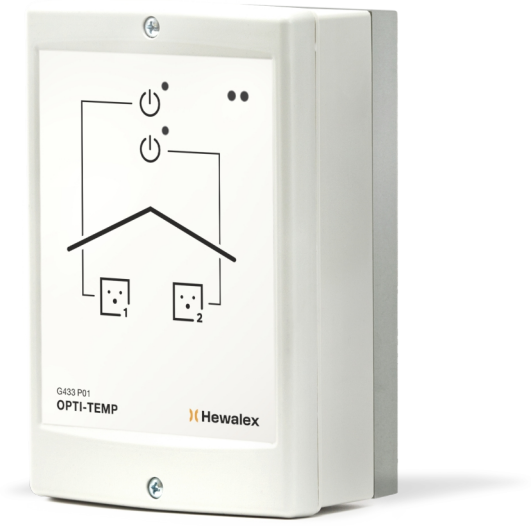
Optional module of OPTI-ENER EMS

EKONTROL
OPTI-ENER



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Check for a newer version of the manual at:
https://www.hewalex.pl/en/technical-documentation/

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1. SAFETY REQUIREMENTS

NOTE:
Read carefully and observe the indicated safety conditions.

a **Safety conditions:**

Before operating this OPTI-TEMP device, please read the following instructions carefully. It contains important safety information with which you should be familiar and which must be strictly observed. The manufacturer assumes no responsibility in the event of non-compliance with safety rules, improper use of the device or incorrect settings of the controls.

b **Safety Warning:**

This equipment is not intended to be operated by persons (including children) with limited physical, sensory or mental ability, or persons without experience or familiarity with the equipment, unless under supervision or in accordance with the instructions for use of the equipment provided by those responsible for their safety.

c **Permitted use:**

Use of the device is carried out from the website or mobile application only with appropriate instructions for safe use.

d **Installation location:**

Due to the degree of protection (IP 41), the device is intended for domestic use only. Outdoor installation of the building is possible, provided that the device is installed in an enclosure with a higher degree of protection, such as electrical switchgear (IP65-IP68). Do not store explosive and flammable materials, such as aerosol cans, and do not store or use gasoline or other flammable materials near the device. Maintain the proper distance of the gas installation from the appliance in accordance with applicable standards. Make sure that the device does not stand near a water source or a dusty place. The device is designed to operate in locations with temperatures of -20° to 60° C and humidity of 5% to 85%. The device may not work properly or may be permanently damaged if it is left for an extended period of time in a room with air parameters exceeding the specified range.

e **Installation:**

Installation or repair should be carried out by qualified personnel with the appropriate electrical licenses. Activities should be performed in accordance with the manufacturer's instructions and applicable local safety regulations. After unpacking the device, check that it has not been damaged during transportation. Before proceeding with any activity related to the installation of the device , it must be disconnected from the electric power supply. It is forbidden to repair or replace parts of the device, if this is not expressly permitted in the instruction manual. Children should not perform activities related to the installation of this device. Children should stay away from the device during installation. Materials from the packaging that pose potential danger (plastic bags, Styrofoam, etc.) should be kept out of the reach of children, both during and after installation. The device can be turned on only after the installation procedure is completed.

f **Cleaning and maintenance:**

Never use steam cleaning equipment. Wear gloves protective gloves for cleaning and maintenance of the device. Disconnect the device from electrical power supply before performing any maintenance activity. Do not use harsh or abrasive cleaners for cleaning plastic parts, such as glass cleaners, scouring cleaners, flammable liquids, cleaning waxes, concentrated detergents, bleach or cleaners containing petroleum-based substances. Do not use paper towels, sponges or other sharp cleaning tools.

WARNING: Do not insert metallic objects into the housing or onto the surface of the control board while the device is operating under the threat of shock. Exception is the opti-temp module reset.

2. DEVICE DESCRIPTION

The OPTI-TEMP module is an optional extension of the OPTI-ENER system. Among other things, it allows stepless control of the power of the electric heater or other heating element. In this way, the OPTI-TEMP module allows you to reduce the amount of energy given off to grid or reduce the current surplus accumulated by a renewable energy micro-installation such as photovoltaic installation.

OPTI-TEMP module parameters:

- Power supply: 230 V AC, 50 Hz
- maximum permissible power of heating element - 2000 W
- maximum permissible current load of contacts NO 1T/5, 2T/6 - 16 A
- dimensions (width/height/depth): 105 x 152 x 45 mm
- operating conditions:
- ambient temperature: from -20° to 60°
- humidity: 5% to 85% (without condensation and/or icing)
- power consumption: <3 W
- degree of protection: IP41

The set includes:

- OPTI-TEMP module
- NTC 10 kΩ temperature sensor
- screw and washer M3
- instruction

! **NOTE:** Use of OPTI-TEMP requires the purchase of an OPTI-ENER controller and an Internet connection.

2.1. Inputs and outputs

OPTI-TEMP is equipped with power and communication (RS485) sockets, as well as one output for stepless control of the power of the heating element with a maximum power of 2000 W (2 kW). On the front of the enclosure you can find signaling LEDs and manual contact switches - their location is shown in Fig. 1. The module also has 4 inputs for sensors temperature and two additional volt-free dry contacts for power management of electrical devices.

! **NOTE:** The rear part of the case acts as a heat sink - cooling the unit. Therefore, it is necessary to provide free airflow.

Fig. 1 OPTI-TEMP module - front view

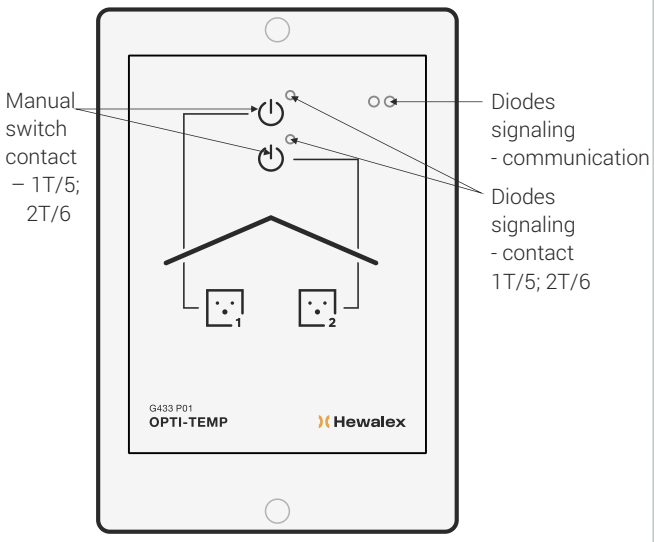
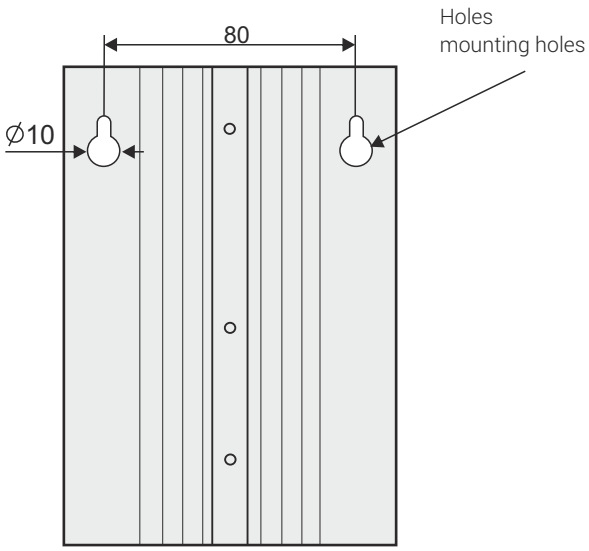


Fig. 2 OPTI-TEMP module - rear view



Tab. 1. Description of the controller connectors

1	**T4**	Temperature sensor T4	9	**COM5**	Relay 5, Imax = 16A
2	**T3**	Temperature sensor T3	10	**NO6**	Normal open contactor relay 6, Imax = 16A
3	**T2**	Temperature sensor T2	11	**COM6**	Relay 6, Imax = 16A
4	**T1**	Temperature sensor T1	24	**RS485 B-**	RS485 communication with OPTI-ENER
5	**L**	Output Heater Power max = 2000W	25	**RS485 A+**	RS485 communication with OPTI-ENER
6	**N**	Neutral wire N	33	**12VDC- (GND)**	Power supply 12VDC minus
7	**L**	Power supply 230 V AC	34	**12VDC+**	Power suppply +12VDC plus
8	**NO5**	Normal open contactor Relay 5, Imax = 16A			

Fig. 3 OPTI-TEMP module - front view

3. INSTALLATION

3.1. OPTI-TEMP installation

OPTI-TEMP is designed for surface mounting. Depending on the substrate, select the appropriate mounting system (wall plugs, screws) and fix the controller using dedicated brackets, the location of which is shown in Fig. 2. Next, you need to supply power with parameters of 230VAC, 50 Hz according to the scheme shown in Fig. 8.

NOTE: NOTE: It is imperative to ensure grounding of the enclosure by using a tinned eyelet connector with an outside diameter of up to 9 mm.

NOTE: It is not recommended to use wire-type wires for the contacts of the spring connector.
ATTENTION: The connection of OPTI-TEMP module should be made in accordance with the art; (do not connect two different cross-sections of wires in one contact of the plug connector, use decent wire terminations, sleeves with appropriately selected cross-section to the wire).

3.2. OPTI-ENER connection

OPTI-TEMP module requires connection with OPTI-ENER controller. For this purpose, make the connection of RS485 ports (A+; B-) according to Figure 4-6. The next step is to pair the devices according to the following instructions (depending on the version of OPTI-ENER controller you have).

OPTI-ENER 1.0

1. make the connection of RS485-2 communication ports in OPTI-ENER and RS485 in OPTI-TEMP according to the instruction.
2. Switch on the OPTI-ENER device.
3. Turn on the OPTI-TEMP device.
4. press and hold button B2 on the OPTIENER controller for 1 second.
5. If the communication LEDs on the OPTI-TEMP have started to flash then communication is correct. If necessary, repeat steps 1-4.
6. If there are communication problems, perform a restart of the OPTI-TEMP module and repeat steps 1-4.

OPTI-ENER 2.0/OPTI-ENER 2.0 DIN

1. make the connection of RS485 communication ports in OPTI-ENER and RS485 in OPTI-TEMP according to the instruction.
2. Switch on the OPTI-ENER device
3. Turn on the OPTI-TEMP device
4. press and hold the configuration button B2 to until the diode (diode icon) "device status" pulsates twice
5. If the communication diodes on the OPTI-TEMP started pulsating then the communication is correct. If needed, repeat steps 1-4.

NOTE: It is not possible to connect more than one OPTI-TEMP module to the OPTI-ENER controller.
NOTE: If two add-on modules (inverter, OPTI-TEMP) are connected, the OPTI-TEMP module should be added to the OPTI-ENER subnetwork first

Fig. 4 OPTI-ENER 1.0 - connection diagram of OPTI-ENER device with OPTI-TEMP

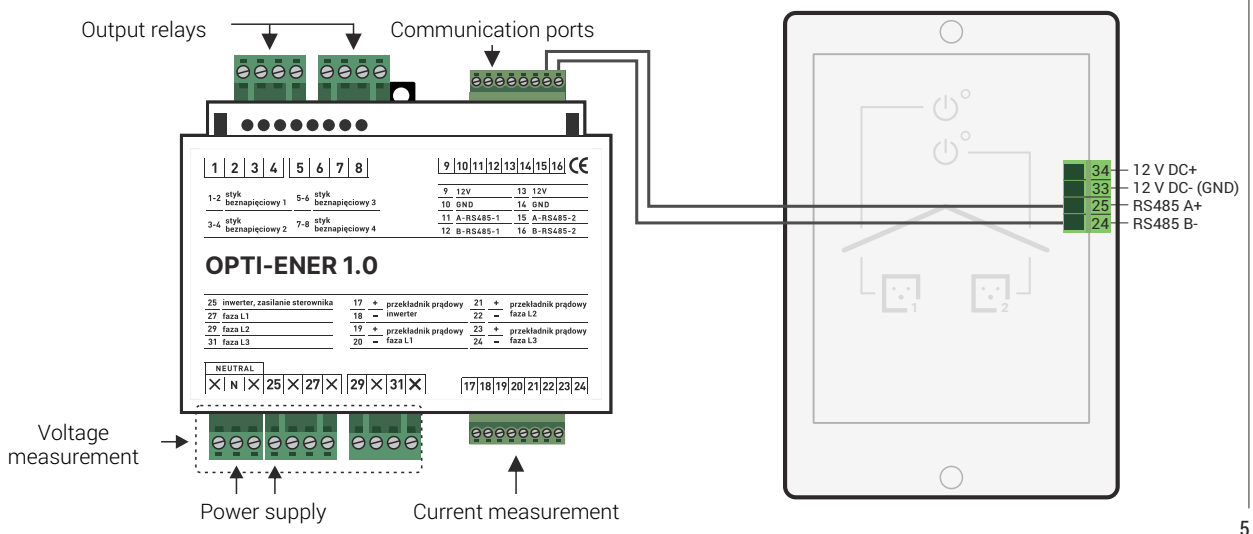
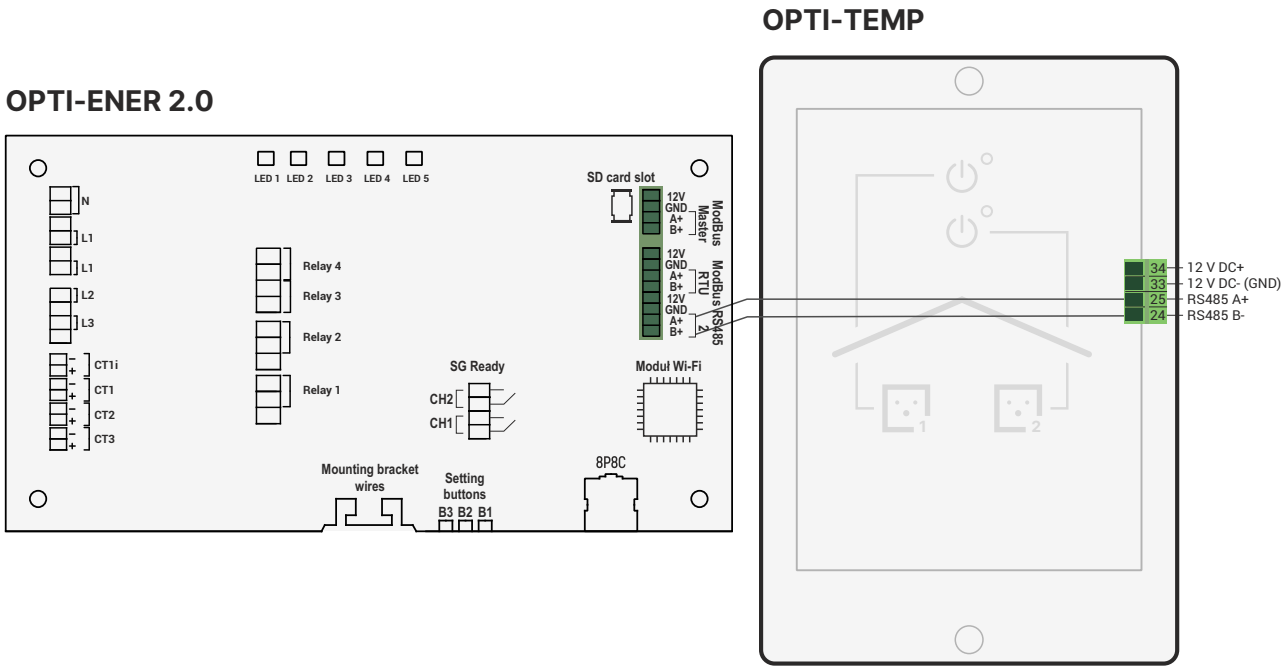
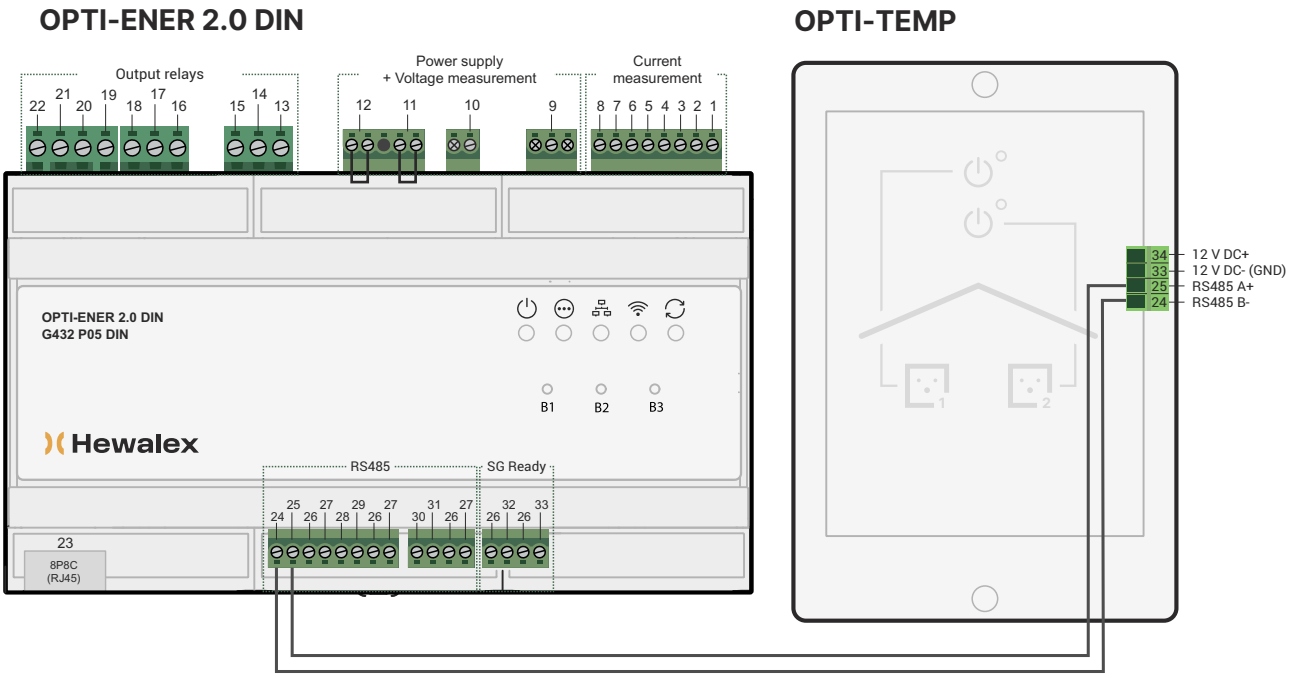


Fig. 5 OPTI-ENER 2.0 - connection diagram of OPTI-ENER 2.0 device with OPTI-TEMP



For a detailed legend, see: Hewalex_Instruction_of_assembly and operation OPTI-ENER_2.0 DIN

Fig. 6 OPTI-ENER 2.0 DIN - connection diagram of OPTI-ENER 2.0 DIN device with OPTI-TEMP



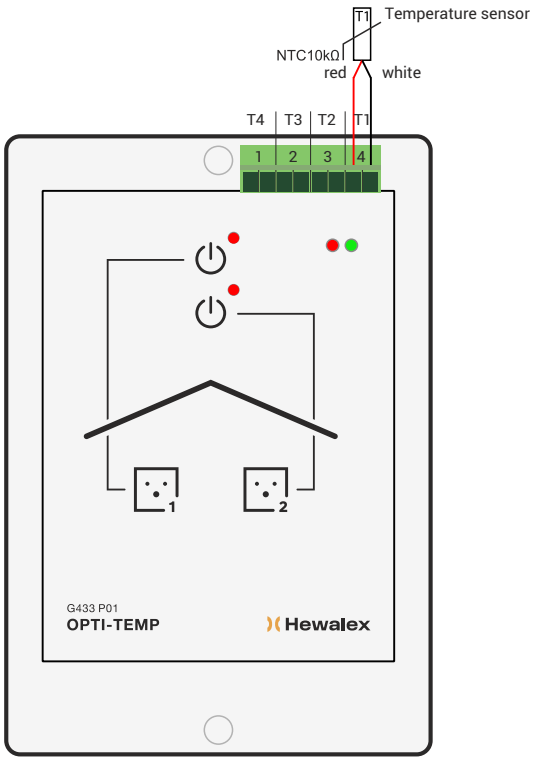
24 | B- | RS485 communication, signal -
25 | A+ | RS485 communication, signal +

For a detailed legend, see: Hewalex_Instruction_of_assembly and operation OPTI-ENER_2.0 DIN

3.3. Temperature sensor connection

Temperature measurement on the first channel (T1) takes direct participation in the control of the electric heater therefore, make sure that it is connected correctly - in accordance with the scheme pre-shown in Figure 7. In the case of non-standard application in order to increase the temperature measurement range in the sensor socket should be placed a resistor with a resistance of 20-30 kΩ. Installation of the sensor should be carried out in accordance with the art and recommendations of the manufacturers of devices such as heaters, tanks buffer tanks, etc.

Fig. 7 Temperature sensor location

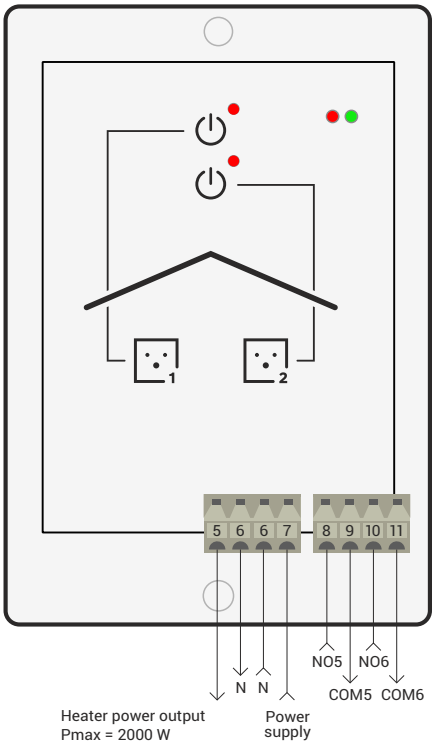


3.4. Power supply and outputs

OPTI-TEMP is equipped with an output that allows smooth power control of a single-phase electric heater. It also has two additional voltage-free NO contacts. Fig. 8 shows wiring diagram of the module's power supply, power output of the electric heater (max. 2000W) and additional relay outputs. Switching on / switching off additional circuits (1T - 5; 2T - 6) can be carried out by directly connecting device under the OPTI-TEMP NO contact or in an indirect way connecting the NO contact with an additional electrical apparatus - contactor. The second way can be used in the case of need to power an electrical device with a power exceeding 3.6 kW or powered three-phase.

NOTE: Connections should be made with due care and ensure protection of the connection site from the effects of the quality of the electrical contact.

Fig. 8 Connecting power and electrical consumers



3.5. State of work - diode indicators

The OPTI-ENER module is equipped with four indicator LEDs - two for communication and two for operating status. Their location can be found in Figure 1. The frequency of illumination and the color of the LED depends on the current operating status of OPTI-TEMP. An overview of diagnostics and solutions depending on signaling is shown in Table 2.

Tab. 2 Operating states - indicator lights

Indicators	Diagnosis	Solution
Communication LEDs flashing fast/still lit	Correct communication with OPTI-ENER module	Working properly - no action
Communication LEDs do not light up - no response	No communication with OPTI-ENER module; No power supply;	Reset the OPTI-TEMP module, remove devices from the OPTI-ENER subnet (button B2) and go through the pairing process again with the OPTI-ENER module; Power supply check - phase voltage
Contact diode 1T/5; 2T/6 - lights up continuously	Contact 1T/5; 2T/6 has been switched manually - automatic shutdown after 180 seconds	Normal operation - no action; Deactivation of contact 1T/5; 2T/6 by pressing the manual switch
Contact LED 1T/5; 2T/6 not lit - no response	Contact 1T/5; 2T/6 in manual mode is off; No power;	No action; Check power supply - phase voltage

4. SETTINGS

After proper installation of the OPTI-ENER controller, OPTI-TEMP module and electric heater, you need to configure your user account. Configuration is available from the ekontrol.pl website in the MENU -> Installer -> OPTI-TEMP circuit control or in the OPTI-ENER mobile application.

For correct settings, you need to fill in the following fields:

- Power of connected heater - a parameter used to calculate the voltage to be applied to the heater, necessary for proper operation of OPTI-TEMP.
- Power held at the input of the building - declaration of the value that will turn on the heater and regulate it in a smooth manner until the excess is equal to the power of the connected heater. At the same time, a drop below the indicated value will disconnect it.
- Guest mode - A mode that turns the heater on at its full power regardless of the time program settings or surplus threshold energy.
- Vacation mode - A mode that disconnects the heater regardless of the settings of the time program or the excess energy threshold.
- Maximum temperature - Declare the temperature value that, if reached, will disable the heater.
- Heater controller hysteresis - declaration of the value of the temperature difference that will cause the heater to switch on when the power surplus threshold is reached .
- Heater switch-on delay time - declaration of the period for which the power surplus must persist for the heater to be switched on.
- Heater cutoff delay time - declaration of a delay period for heater cutoff after the power surplus drops below value of the threshold indicated in point 2.
- Time program - setting of the time program, within which the heater will be controlled in a smooth way or will operate at full power.
- Economic temperature - the temperature that will be maintained in the heat storage tank, associated with the time program eco/comfort.
- Comfort temperature - the temperature that will be maintained in the heat storage tank, associated with the time program eco/comfort.

- Time program - eco/comfort - settings of the time program, within which the heater, regardless of the surplus of energy, will reheat the medium to the economy or comfort temperature.
- Control of circuits 1T/5; 2T/6 analogous to the settings in OPTI-ENER.

NOTE: The thermostat is a device that will override the heater, so pay attention to its settings so that it does not interfere with the operation of the OPTI-TEMP module.

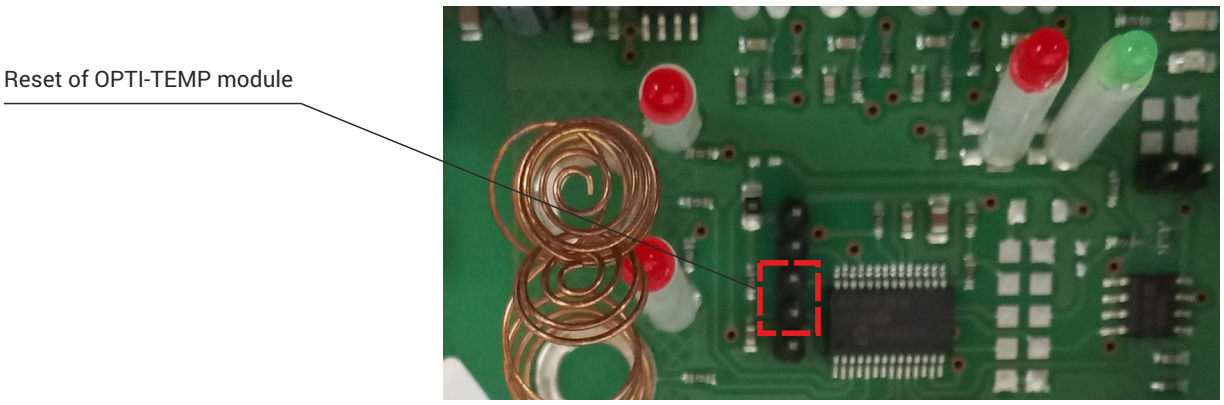
- A detailed description of each parameter is available for calling by clicking on the information button " i ".

5. TROUBLESHOOTING

No.	Diagnosis	Solution
1	OPTI-TEMP device does not respond - no power supply	Check the correctness of the connections according to the wiring diagrams; Check the power supply - phase voltage;
2	OPTI-TEMP does not connect with OPTI-ENER controller; There are no settings of OPTI-TEMP module on ekontrol.pl platform	Update the OPTI-ENER software to the latest version; Check the power supply - phase voltage of both devices; Check the correctness of the RS485 port connections of both controllers; Repeat the device pairing process; Perform a restart of the OPTI-TEMP module according to the following steps: 1. disconnect the plug connector from the RS485 port on the OPTI-TEMP. 2. turn off power to the OPTI-TEMP and OPTI-ENER. 3. Short-circuit the third and fourth pins (from the top) located on the board between the diodes of the manual contacts and the communication diodes - according to Figure 9. 4. Turn on the power supply of OPTI-TEMP. 5. disconnect the connection to the pins. 6. turn on the power supply of OPTI-ENER. 7. clean the subnetwork of the OPTI-ENER controller according to the instructions. 8. turn the OPTI-ENER off and on. 9. plug the plug connector with signal wires into the RS485 port on the OPTI-TEMP. 10. add OPTI-TEMP to the OPTI-ENER subnet according to the instructions. 11. if the signal LEDs have started to pulsate then the communication is correct. 12. in case of failure, repeat steps 1-10.
3	The heater does not turn on;	Update OPTI-ENER to the latest software version; Check correctness of connections from Fig. 8; Check power supply - phase voltage at TH and N inputs in OPTI-TEMP controller; Check if the thermostat does not limit the heater operation; Check if the heater is operational by connecting it to another power source;
4	The heater does not turn off;	Update OPTI-ENER to the latest software version; Check whether the excess power has fallen below the shutdown threshold; Check whether the set medium temperature has been reached; Check whether the eco/comfort time program is off;
5	Circuit 1T/5; 2T/6 does not turn on/off	Update OPTI-ENER to the latest software version; Check whether the excess power has fallen below the shutdown threshold; Check whether the time program is on/off;

The OPTI-ENER system is under constant development. New updates may include new functionality of the system.

Fig. 9 Pin location for resetting the OPTI-TEMP module



6. INFORMATION ON LABELING AND COLLECTION OF WASTE ELECTRONIC EQUIPMENT

The symbol on the product or its packaging indicates the selective collection of used electrical and electronic equipment. This means that this product should not be disposed of with other household waste. Proper disposal of old and used electrical and electronic equipment will help avoid potentially adverse effects on the environment and human health.

The user is responsible for the selective collection of used equipment and should return it to the collection point for used equipment.

NOTE!

- This equipment is not intended for use by persons (including children) with limited physical, sensory or mental ability, or persons without experience or familiarity with the equipment, unless under supervision or in accordance with the instructions for use of the equipment provided by persons responsible for their safety. Children should be watched to ensure that they do not play with the equipment.
- If the non-removable power cord becomes damaged, it should be replaced at the manufacturer or at a specialized repair facility or by a qualified person to avoid danger.

To download the current technical documentation scan the code.