GSM REMOTE CONTROL RELAY	SIMply MAX P03

Purpose

The SIMply MAX P03 relay with built-in GSM communicator serves as a bi-state temperature controller with the ability to remotely manage temperatures via a mobile phone. It performs simple alerting functions about temperature exceeding and allows to control an additional connected device on the ON/OFF basis. Telephone numbers of the users, temperatures, alarms and other functions are determined using the configuration program on the PC. Connection to the relay via USB cable.
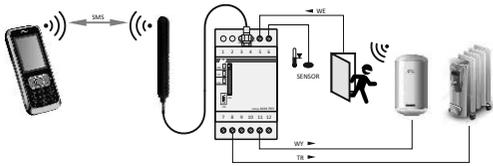
Features

1. System
   * set access password for SMS commands
   * memory of output status
   * current temperature readout
   * sensor status monitoring and fault reporting
2. Temperature control
   * operating modes: heating or cooling
   * ability to turn on/off the controller (ON/OFF)
3. Temperature alarm
   * exceeding of the maximum and minimum temperature
   * notifications to 5 phone numbers
   * ability to enable/disable the alarm function (ON/OFF)
   * repeat SMS feature in case the temperature stays above the threshold beyond the set number of minutes
4. Antifreeze temperature
   * ability to enable/disable the antifreeze function (ON/OFF)
   * activated function works despite inactive temperature control
5. Output OUT
   * output control - 2 separate operating modes: SMS/ALARM:
     SMS:
       - output controlled directly by SMS commands
       - redefine output name, for example OUT=lamp
       - ON/OFF control and time switching of the output
     ALARM:
       - contact associated with temperature alarms - exceeding of the threshold forces the contact action: ON/pulse
       - ON: contact closed above the alarm threshold, contact opens after the fall below the hysteresis
       - pulse: contact closes temporarily for a set number of seconds after the threshold has been exceeded

-1-

       - ON/pulse: set separately for minimum and maximum alarm
     * redefine output name, for example OUT=LIGHT
6. Input IN
   * selection of SMS triggering:
     ON - appearance of the signal;
     OFF - signal loss;
     ON/OFF - signal fades and reappears
   * notification about input activation are sent to up to 5 phone numbers
   * redefine input name, for example IN = SABOTAGE

Functioning

The relay works in GSM 900/1800 cellular networks of any operator operating in Poland (device is unlocked). In order to make the calls and execute the predefined functions, the device must have an active SIM card. The relay has a relay output for the temperature control function, a relay output for the on/off function of the connected device, and a high voltage input for notifications about activation of connected device. Relay operating parameters are set using the configuration program on a PC or via SMS command. Commands and notifications have a form of specific SMS texts exchanged between the controller and the user's phone.

Temperature regulation TR

The temperature is measured by a dedicated probe connected to the relay. The receiver is controlled via the TR contact. Depending on the selected operating mode, you can control the heating or cooling devices. The additional Active/Inactive program option allows you to disable the regulation (TR contact permanently open) without switching off the relay, which allows you to use other functions (temperature alarms, output control and output status notification).

HEATING mode

Until the ambient temperature reach the desired value, the TR contact is closed (heating device on). Reaching of the preset temperature TR results in contact opening (heating device off). The temperature drop by the value of HTR hysteresis HR causes the TR contact to close again.

COOLING mode

For the ambient temperature above the set TR threshold, the TR contact is closed (cooling device on). Temperature drop to TR results in a contact opening (cooling device off). Temperature raise by the value of HTR hysteresis causes the contact to close again


-2-
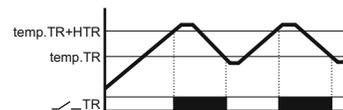
Antifreeze temperature TZ

Automatic heating system protection freezing. In the event of a temperature drop below the set threshold and the lack of active control by the TR heating temperature, the heating will start automatically and will keep the temperature at the TZ level. The Active/Inactive program option allows you to enable or disable regulation. Operation diagram analogous to Heating feature.

Temperature alarms AT

SMS notification to predefined phone numbers about exceeding of minimum TAL and maximum TAH temperatures. In addition, there is the option to repeat SMS notifications if the alarm temperature level persists and to control the contact of the OUT output at the set temperature threshold (output operating option: ALARM).

Minimum TAL alarm
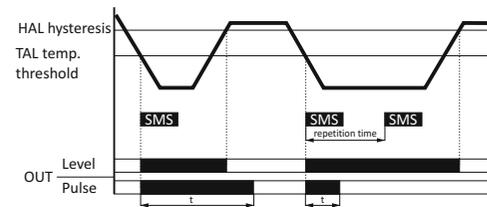
Maximum TAH alarm
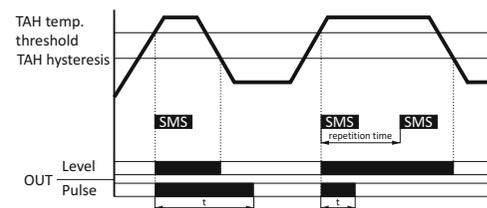
Output OUT

Relay output for direct control via SMS commands or when the AT temperature alarm threshold is exceeded. You can connect to the output any receiver directly or through the contactor.

Input IN

Signal output for direct connection of 230 V voltage. It triggers the SMS notifications to predefined phone numbers about the occurrence or power failure on it.

-3-

SMS commands and notifications

ADMINISTRATOR FUNCTION

Function to remotely restore factory settings and change administrator number.
Define:
ADMIN <phone number> <phone number>
Example: ADMIN +48123456789 +48123456789
To define, enter the phone number twice. In case of an error in the telephone number, the controller sends a message about discrepancy. If the numbers are consistent, controller sends a message about accepting ADMIN. Confirmations are independent of the ODP option.

RESET SETTINGS and ADMINISTRATOR

A feature to restore factory settings and change the number of the administrator.
WARNING!
This option is available only after you have defined the administrator.
Sending the RESET command from any phone, without a password (although it is set), will result in automatic reply to the phone of the administrator. He receives a message with a generated one-time code, for example RESET 12345678. The command along with the code (for example: RESET 12345678) should be send to the relay within 3 minutes.

PASSWORD (4 to 8 digits)

If you work with a password option, the command must be preceded by a password, for example 1234 OUT1 ON.
Configuration via SMS commands:
PASS ON <pass> - to set or change the password,
<pass> - enter the number, for example 12345678.
PASS OFF - disable password option
WARNING!
Reset of a forgotten password is possible through ADMIN administrator function or via configuration program. It is recommended to pre-define the number of the administrator.

CONFIGURATION PARAMETERS

Obtaining information about the configuration via SMS commands to a user's phone.
SETUP - query for configuration parameters
Description of the answers:
OUT: SMS/ALARM - output operating mode (SMS or ALARM)
IN: 1 2 3 4 5 ON/OFF/NF/NONE - telephone numbers, to which the notifications about the activation of the input and the mode of input operation (activation by high state, low state, high and low state, no notification) will be sent. Dashes (1 2 - - 5) instead of the number represent the absence of a selected number for notification.
TA: 1 2 3 4 5 - telephone numbers to which notifications will be sent about temperature alarm MIN. and MAX. Dashes (1 2 - - 5) instead of the number represent the absence of a selected number for notification.
TAL: 5.0/1.0/ON - Lower alarm threshold; preset temperature, hysteresis, alarm on/off.
TAH: 35.0/1.0/ON - Upper alarm threshold; preset temperature, hysteresis, alarm on/off.
TR: H 30.0/1.0/ON - Temperature control: operating mode (H - heating, C - cooling), preset temperature, hysteresis, on - off.
TZ: 4.0/1.0/ON - Antifreeze temperature: preset, hysteresis, on-off
MEMORY ON/OFF - On/Off state memory of the relay.

-4-

ADDING AND DELETING THE PHONE NUMBERS

TEL1 <phone number> - the definition of the first phone number.
Similarly for numbers 2 ... 5. Enter the number with the prefix +48.
TEL1 0 - delete the number.
Example:
TEL1 48123456789 - definition of the number.
TEL1 0 - delete.
TEL - query for defined phone numbers
Reply:
TEL1 +48123456789
...
TEL5 +48987654321

TR REGULATION TEMPERATURE

RTR ON / OFF - regulation active/inactive
ON - regulation on. TR contact depends on ambient temperature;
OFF - regulation off. TR contact permanently open.
TTR H / C - operating mode setting
H - heating; C - cooling
TR <temp> - temperature regulation threshold
<temp> - numerical value in the range -30÷65°C. Specify the number as an integer number (for example 21) or a decimal fraction (for example 21.5). As a separator use " . " (dot).
HTR <hist> - hysteresis
<hist> - numerical value between 0÷10°C. Specify the number as an integer number (for example 1) or a decimal fraction (for example 1.5). As a separator use " . " (dot).
You can send a whole set of commands in the content of one SMS. The commands should be separated with ";" (semicolon).
Example:
RTR ON; TTR H; TR 22.5; HTR 1

TZ ANTIFREEZE TEMPERATURE

RTZ ON / OFF - regulation active/inactive
ON - regulation on; OFF - regulation off.
TZ <temp> - temperature regulation threshold
<temp> - numerical value in the range -30 to 65°C. Specify the number as an integer number (for example 21) or a decimal fraction (for example 21.5). As a separator use "." (dot).
HTZ <hist> - hysteresis
<hist> - numerical value between 0 and 10°C. Specify the number as an integer number (for example 1) or a decimal fraction (for example 1.5). As a separator use "." (dot).
You can send a whole set of commands in the content of one SMS. The commands should be separated with ";" (semicolon).
Example:
RTZ ON; TZ 8; HTZ 1.5

TA TEMPERATURE ALARMS

RTAL / RTAH ON / OFF - active/inactive alarm
RTAL - MINIMUM alarm ; RTAH - MAXIMUM alarm
ON - activation of SMS notifications;
OFF - deactivation of SMS notification.
TAL / TAH <temp> - alarm temperature threshold
TAL - MINIMUM threshold; TAH - MAXIMUM threshold
<temp> - numerical value in the range of -30 to 65°C. Specify the number as an integer number (for example 21) or a decimal fraction (for example 21.5). As a separator use "." (dot).
HTAL / HTAH <hist> - hysteresis
HTAL - MINIMUM hysteresis; HTAH - MAXIMUM hysteresis
<hist> - numerical value between 0 and 10°C. Specify the number as an integer number (for example 1) or a decimal fraction (for example 1.5). As a separator use "." (dot).
You can send a whole set of commands in the content of one SMS. The commands should be separated with ";" (semicolon).
Example:
RTAH ON; TAH 35; HTAH 5

OUTPUT OUT CONTROL

OUT ON / OFF - output control
ON - switching on; OFF - switching off.
Example:
OUT ON - switching on of the output;
OUT OFF - switching off of the output.
If the output has been given a specific name, the control can be carried out by the given name:
<name> ON / OFF
Example:
<name> - up to 10 characters, for example PUMP
PUMP ON - switching on of the output;
PUMP OFF - switching off of the output.

TEMPORARY SWITCHING ON OF THE OUTPUT OUT

OUT ON S <x> - temporary switching on of the output for time x, where x is from the range of 1÷300 sec.
OUT ON M <x> - temporary switching on of the output for time x, where x is from the range of 1÷600 min.
Example:
OUT ON S 45 - switching on of the output for 45 seconds.
OUT ON M 45 - switching on of the output for 45 minutes.
If the output has been given a specific name, the control can be carried out by the given name.
Example:
PUMP ON S 45 - switching on of the output for 45 seconds.

SMS NOTIFICATION ON THE PHONE ABOUT INPUT ACTIVATION

IN ON / OFF - notification about the input status
ON - high state (voltage) at the input; OFF - low state (no voltage) at the input.
Example:
OUT ON - voltage at the input.
OUT OFF - no voltage at the input.
If the output has been given a specific name, the SMS notification will include that name.
Example:
DOOR ON - voltage at the input.

DEFINE NAMES OF INPUT AND OUTPUT

This function allows you to give specific names to input IN and output OUT in place of the ones predefined in factory. Then the content of the SMS with status or notification will include the name of the input or output.
NAME! IN / OUT <text>
<text> - single, inseparable (no spaces) string of maximum 20 characters.
Example:
NAME! IN DOOR   - definition of the input IN name
NAME! OUT PUMP   - definition of the input IN name
Output is still controlled with ON and OFF commands specified after the defined name of the output.

DEFINE CONTENT OF SMS NOTIFICATION

Define content of SMS for notifications about input activation and temperature alarms.
TEXT! INON / INOFF / TAL / TAH <text>
WEON   - for IN input with high state (voltage on)
WEOFF   - for IN input with low state (voltage off)
TAL   - for minimum temperature alarm
TAH   - for maximum temperature alarm
<text>   - a string of up to 10 characters including spaces
Example:
TEXT! TAH Warning! Exceeding of maximum temperature.

STATUS REQUEST

STATUS - query about the status of temperature, input and output.
Example:
Command:	STATUS
Answer:	IN OFF
	OUT ON
	TEMP 22.6

If the input and output have been given a specific name, the SMS notification will include that name.
Example:
Command:	STATUS
Answer:	DOOR OFF
	PUMP ON
	TEMP 22.6

INPUT IN CONFIGURATION

Setting the input status that triggers the notification:
INC NONE / ON / OFF / NF
NONE - no notifications (function inactive)
ON - notification of high state (voltage) at the input
OFF - notification of low state (no voltage) at the input
NF - notification of low and high state
Example:
INC ON - notification of high status.
INC NF - notification of low and high state.

OUTPUT OUT CONFIGURATION

Configuration of output operating mode:
OUTC SMS / ALARM
SMS - SMS commands manual control mode
ALARM - automatic activation mode for minimum or maximum temperature alarms.
Example:
OUTC SMS - SMS control mode
Configuring the ALARM operating mode:
OUTC L/H ON/IMP S/M <time>
L/H - MINIMUM or MAXIMUM alarma control:
L - minimum, H - maximum.
ON /IMP - contact close: ON - option LEVEL, which means permanent switching on above the alarm threshold, IMP - PULSE option, which means switching on for a specified time.
S/M <time> - option to set the pulse time: S - seconds (1 ÷ 300 sec); M - minutes (1 ÷ 600 min.).
Example:
OUTC L IMP S 45 - closing of the contact for 45 sec after the maximum alarm has been exceeded.

MEMORY OF OUTPUT STATUS

Automatic reset of OUT output status after power failure and its return.
MEMORY ON - option enabled
MEMORY OFF - option disabled

AUTOMATIC ANSWER

Optional automatic answer feature on the user's phone with the notification about arriving and accepting the SMS command.
ODP - request an automatic response.
The word shown after the main command. The answer is a confirmation of the execution and the status of input, output or function.
Example:
Command: OUT ON ANSW.
Answer: OK OUT ON
Command: PASS ON 1234 ANSW.
Answer: OK PASS ON 1234

SIM CARD STATUS [USSD]

Performing service tasks such as activation and deactivation of services, status checking and account top up, etc., using the USSD (Unstructured Supplementary Service Data).
USSD? <USSD_code>
In response an SMS with the operator's answer will be sent on the user's phone. It will contain information consistent with the given USSD command, for example about current account status and its expiry date (content and format of the notification depends on the operator).
Example.
*USSD? *111#   Status and expiration date of your account*
*USSD? *123*12345678909876#   top up your account*

Examples of USSD command codes. In fact, they are set up individually by mobile network operators.

LANGUAGE

Select language for automatic SMS notifications.
LANG PL - Polish   LANG EN - English
Example:
LANG PL: WE ON   LANG EN: IN ON
Commands in English are executed parallel to commands in Polish. Equivalents words:

WE <-> IN	ON <-> ON	KONFIG <-> CONFIG
WY <-> OUT	OFF <-> OFF	MEMORY <-> MEMORY
HASLO <-> PASS	ODP <-> ANSW	NAZWA! <-> NAME!
TEXT! <-> TEXT!	TEL <-> PH	STATUS <-> STATUS
WYC <-> OUTC	WEC <-> INC	ADMIN <-> ADMIN

Other commands are the same for both languages.

The answer to the query is automatically set to the language.

SPELLING

Relay recognizes commands in lowercase and uppercase as well as with mixed characters
Example of correctly entered commands:
OUT1ON / out1on / Out1oN
Words of the command should be separated by a space. Otherwise, the command will be confusing for the relay and will be ignored.
Example:
(_ - space)
WY_ON_M_10 - correctly
WY_ON_M10 - incorrectly

COMBINED SMS COMMUNICATIONS

One SMS can contain multiple commands at the same time. They must be separated by a ";" (semicolon).
Example:
TR 22.0; HTR 2.0 - definition of temperature control and hysteresis

P03 Config software

COMMUNICATION
The controller is compatible with a PC running Windows 2000, Windows NT, Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10.
Before the first start you need to install the USB driver. To do this, run the VCP_V1.4.0_Setup file. After installing the USB driver, connect the controller to any USB port using a USB-miniUSB cable.

SOFTWARE
Software and USB driver are available to download on the website
www.p03.fif.com.pl
Run the P03 Config.exe file. This opens the program window. Program connects to the relay automatically.
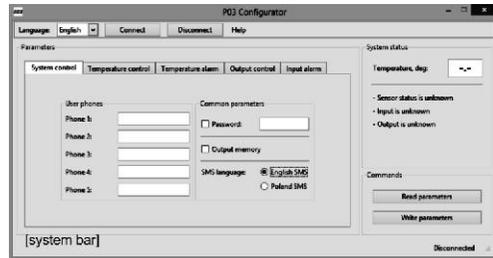
COMMANDS
Language: select language of the program: Polish, English, Russian.
Connect: connect to relay.
Disconnect: disconnect from relay.
Help:
  Log - activation of the console window (internal program log);
  About - software version information.
Read: Read all controller settings.
Save: save new controller settings.

STATUS BAR NOTIFICATIONS
P03 properly connected - communication OK
P03 disconnected - no communication
P03 not found - the program has not found relay
Searching - looking for connections with relay
P03 answer OK - action completed successfully
P03 error - the action is unsuccessful

STATUS
Temperature: indication of measured temperature
Sensor: sensor status:
  OK - correct operation;
  Error - no sensor, bad connection or faulty sensor;
  ??? - no data.
Input: input state IN:
  ON - high state (voltage);
  OFF - low state (no voltage);
  ??? - no data.
Output: output status IOUT:
  ON - switched on;
  OFF - switched off;
  ??? - no data.

SYSTEM
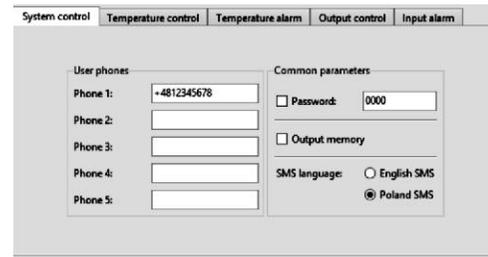
Phone numbers:
Define 5 phone numbers of users to which SMS notifications will be sent. Enter the number with a prefix, for example +48.
Password:
Password for the SMS control consists of 4÷8 digits. If the password is set, the SMS command must be preceded by a password, for example 1234 OUT1 ON. Ticked - work with password; unticked - no password. **Reset of a forgotten password is possible through ADMIN administrator function. It is recommended to pre-define the number of the administrator.**
Output status memory:
Automatic reset of OUT output status after power failure and its return.
Ticked - memory on;
Unticked - no memory.
SMS language:
Select the language for the automatic responses and SMS notifications.

TEMPERATURE REGULATION
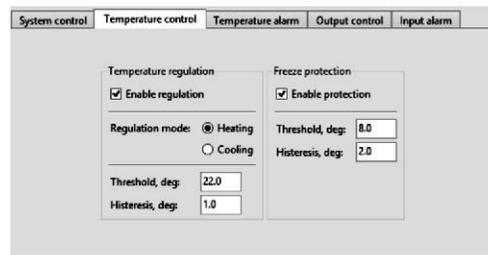
Temperature regulation TR:
  Active: regulation switched on or switched off (TR contact permanently open) without switching off the relay. Ticked - enabled; unticked - disabled.
  Operating mode: Heating or Cooling.
  Threshold: TR temperature value from -30 to 65°C.
  Hysteresis: HTR hysteresis value from 0 to 10°C.
Antifreeze temperature TZ
  Active: regulation switched on or switched off. Ticked - enabled; unticked - disabled
  Operating mode: Heating or Cooling.
  Threshold: TR temperature value from -30 to 65°C.
  Hysteresis: HTR hysteresis value from 0 to 10°C.
Specify the number as an integer number (for example 1) or a decimal fraction (for example 1.5). As a separator use "." (dot).

TEMPERATURE ALARMS
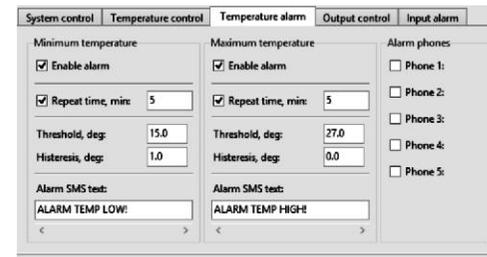
MINIMUM / MAXIMUM alarm :
SMS notification:
  Select active/inactive SMS alarm. Ticked - enabled; Unticked - disabled.
Repeating:
  The number of minutes after which the SMS message will be repeated if the temperature alarm continues. The "0" (zero) parameter does not repeat SMS messages. Ticked - repetitions enabled; unticked - repetitions disabled.
Threshold:
  TAL / TAH temperature value from -30 to 65°C. Specify the number as an integer number (for example 1) or a decimal fraction (for example 1.5). As a separator use "." (dot).
  HTAL / HTAH hysteresis value from 0 to 10°C. . Specify the number as an integer number (for example 1) or a decimal fraction (for example 1.5). As a separator use "." (dot).
SMS text:
  SMS notification content. Up to 160 characters.
Phones:
  Select phone numbers to which the SMS notifications about temperature alarms will be sent. Ticked - phone active; unticked - phone inactive.

OUTPUT
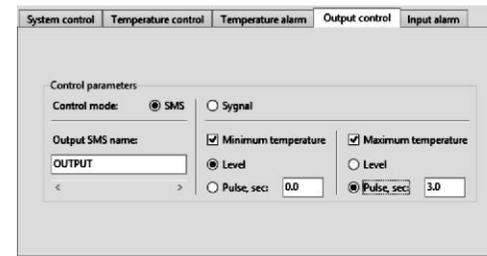
Operating mode: OUT contact control feature
  SMS:
  Direct, manual control through SMS commands.
  Contact:
  Automatic switching on mode for minimum or maximum temperature alarms.
  Output name:
  Give the output a name in place of the factory defined. After that the content of the SMS with the status or notification will contain the new name given to the output. The name is a single, inseparable (no spaces) string of up to 20 characters.

MINIMUM / MAXIMUM alarm:
Select alarm at which the contact will be closed. You can select two together.
  Level:
  Permanent contact closing above alarm threshold.
  Pulse:
  Switch on the contact for a specified time. Setting the pulse time in the range 1÷300 sec. Specify the number as an integer number (for example 1) or a decimal fraction (for example 1.5). As a separator use "." (dot).

INPUT
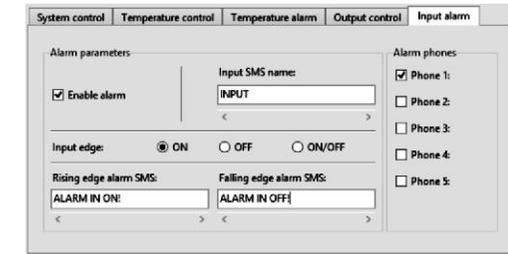
SMS notification:
Select active/inactive SMS alarm about input activation. Ticked - enabled; Unticked - disabled.
Input name:
Give the input a name in place of the factory defined. After that the content of the SMS with the status or notification will contain the new name given to the output. The name is a single, inseparable (no spaces) string of up to 20 characters.
Triggering:
Select which signal at the input will trigger SMS notification:
  ON - notification of high state (voltage) at the input
  OFF - notification of low state (no voltage) at the input
  NF - notification of low and high state at the input
SMS text:
SMS notification content. Up to 160 characters.
  - alarm ON: for high state (voltage)
  - alarm OFF: for low state (no voltage)
Phones:
Select phone numbers to which the SMS notifications about temperature alarms will be sent. Ticked - phone active; unticked - phone inactive.

LED indication

* U - switched power relay
* STAT blink 0.5 sec with period 0.1 sec, GSM off - there is no cardSIM
* STAT flashes 0.25 sec with period of 0.5 sec, GSM off - no SIM cardlogs on to the network operator. With an active SIM card with a PIN code. Deactivate the PIN code for the SIM card used.
* STAT flashes 0.5 sec with period of 1.0 sec, GSM lights on - search GSM network.
* STAT lights on / flashing, GSM blinking - Normal operation:
  - Signalling power range by the number of LED flashes GSM: 0.15 sec with period 6 sec (from 1 to 5 flashes).
  - Communication signals by the number of LED flashes STAT: 0.5sec with period 6sec:
    1 blink - SMS input
    2 blinks - SMS output
    3 blinks - error SMS output
    6 blinks - voice connection
* STAT is off, GSM off - GSM module is not working. Suspension of work function or permanent fault. Make a restart of controller.

Notes on SIM card

SIM of the P03 relay:
* It is recommended to use the SIM card with the so-called **telemetric tariff / m2m**. Ask at the GSM operator!
* The first activation of the SIM card of the controller should be made on any phone of the user (send SMS or make a voice call).
* Clear the memory of the inbox.
* In case of the usual tariff (not telemetric), it is recommended to turn off any additional operator services assigned to the SIM card, for example free text message alerts, voice mail, operator IVR voice menu for free notifications, etc.
* First run of the SIM card on the relay may take several minutes. This is due to the registration of the unknown device model and finding the correct configuration of the system by the operator.

SIM of the user's phone:
* Set the input mode of the text messages as TEXT (not UNICODE)! By default, the GSM operators set the TEXT mode. If the relay ignores text messages you should check the settings and adjust them correctly.

Wiring diagram
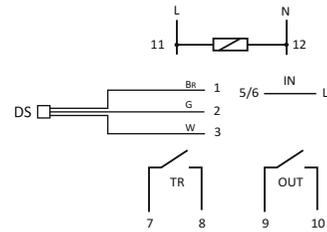
|	
POW	230V~ power supply
IN	inputs
OUT	relay outputs

Assembly and connection

1. Turn off the power.
2. Put the relay on the rail in the switchboard.
3. Connect the power supply to the POW input: current to L; neutral to N.
4. Screw the supplied antenna to the transmitter and attach into the ground outside the switchgear, the site of GSM.
5. In place of the SIM port thin tool (eg. a screwdriver) press the yellow button. Remove the tray, load the SIM card and inserted into the port.
6. Connect the receiver and control input signals in accordance with the description of the I/O connections and examples of implementation.
7. Switch on the power supply.

## Realization of connections

Example of a heating control via contactor connected at the TR output
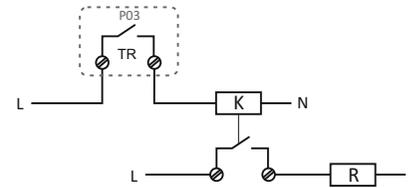
Example of connecting the input signal to the IN input (terminals 5/6) for notification of activation.
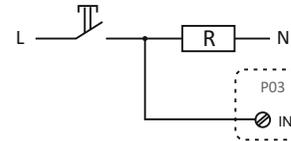
Example of connecting the controlled receiver to the OUT output for remote control.
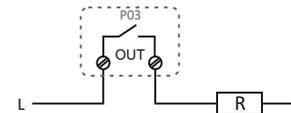
Technical data

power supply	230V AC
inputs	
quantity	1
voltage tolerance	160÷260V AC
relay outputs	
quantity	2
type	1×NO
nominal voltage	230V AC
load	<8A
temperature sensor type	DS1820
temperature probe	RT4
temperature adjustment range	-30÷65°C
hysteresis - adjustable	0÷10°C
accurate setting	0.1°C
measurement accuracy	0.5°C
ports	SIM
power consumption	
standby	1.3W
GSM communication	<3W
working temperature	-10÷50°C
terminal	1.5mm² screw terminals
dimensions	3 modules (52mm)
mounting	on TH-35 rail
GSM antenna	SMA connector 20×100m
length	2.5m
protection level	IP20