

# GSM-R4-DIN, GSM-R4-DINB

## 1. Introduction

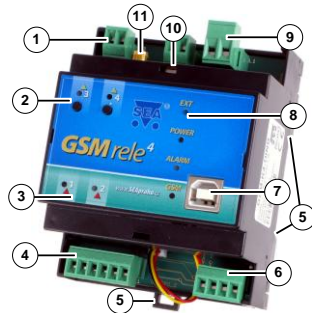
The **GSM-R4-DIN** and **GSM-R4-DINB** (*GSM rele<sup>4</sup>* for short) are designed to be mounted on a DIN rail into a switchboard. *GSM rele<sup>4</sup>* can control two independent electrical circuits in a building e.g. circuit of an accumulator stove and circuit for garage gate control. The control is made via SMS messages or by ringing. After installation into an electrical box insert a SIM card of any GSM operator and the device is ready to operate.

*GSM rele<sup>4</sup>* has **2 galvanically isolated digital outputs** with a semiconductor switch, which can control directly low power circuits up to 230V<sub>AC</sub>/90mA. It's possible to control directly e.g. a thermoregulator circuit of a gas boiler or a coil of one phase contactor 230V AC. The contact of the contactor can then control either one phase high power appliance (e.g. electrical radiator) or a coil of three phase contactor of an accumulation stove.

*GSM rele<sup>4</sup>* has also **2 analog inputs** for temperature measuring and **2 digital inputs** which can be activated by a contact from 4V power provided by *GSM rele<sup>4</sup>* or by an external voltage 3 to 30V DC. *GSM rele<sup>4</sup>* has built in two **automatic regulators** which use analog inputs from temperature sensors to maintain preset temperature. The temperature of sensors can be readout via SMS.

There is an internal **built in Li-Ion accumulator** which enables to send an SMS in case of a power failure and to restore the output status after a power failure. It's also possible to monitor the status of inputs and temperatures via SMS during 230 V<sub>AC</sub> power failure.

- (1) OUTPUT 3, 4 (Y3, Y4) connectors
- (2) Pushbuttons + LED (Y3, Y4)
- (3) INPUT 1, 2 (X1, X2) LED
- (4) INPUT 1, 2 (X1, X2) connectors
- (5) DIN rail holder
- (6) Temperature sensors connector (T5, T6)
- (7) USB connector (for configuration)
- (8) *GSM rele<sup>4</sup>* operation state LED indicators
- (9) 230V<sub>AC</sub> Power supply connector
- (10) SIM card and MicroSD card holder
- (11) External GSM antenna connector
- (-) Temperature sensor GSM-C-T2



## 2. Package Content

- 1 pc *GSM rele<sup>4</sup>* (order code **GSM-R4-DIN** or **GSM-R4-DINB**)
- 1 pc GSM antenna ANT055
- 1 pc temperature sensor GSM-C-T2 (based on KTY81-210), cable - 1 meter
- 1 pc cable USB 2.0 A-B, 1.8m (order code HW-11.02.8818)
- 1 pc connector 5,00 mm
- 2 pcs connector 3,81 mm
- 1 pc connector 3,81 mm
- 1 pc connector 3,81 mm
- 1 pc screwdriver 2 mm
- 1 pc printed documentation



## 3. Installation

1. To operate the *GSM rele<sup>4</sup>* a SIM card of any GSM operator is necessary. SIM card must be functional and active. Also some credit is necessary if SIM card is pre-paid. We recommend to deactivate the PIN code for installation.

**Before inserting the SIM card into the *GSM rele<sup>4</sup>* device, we recommend to turn off setting of the "PIN code"!**

Insert the active SIM card (= at least one call was made) to any mobile telephone and turn off the requirement of setting the PIN. On most mobile telephones, this option can be found in menu "Setting the telephone protection". or "Setup -> Security -> PIN control".

**ATTENTION:**

***GSM rele<sup>4</sup>* must be mounted by qualified personnel only!**

2. Insert this prepared SIM card (cut off corner first) into a slot on the side of the *GSM rele<sup>4</sup>*. The SIM card holder is located in a slot on side of *GSM rele<sup>4</sup>* (close to GSM antenna connector). The proper insertion is indicated by a slight mechanical click noise. To remove the SIM card - press the SIM card in direction into the *GSM rele<sup>4</sup>* until mechanical click. The SIM card can be the freely removed.
3. Now it's possible to connect the device to 230V AC power supply. If the power supply is correct, green LED diode **POWER SUPPLY** goes on. After about 20 seconds, blue LED diode GSM starts flashing with a period 1 per 3 sec.
4. For the first tests of *GSM rele<sup>4</sup>* the connection of inputs and outputs is not important. Please keep in mind that the devices connected to OUTPUTS will be switched on during tests!
5. To test the *GSM rele<sup>4</sup>* press the pushbutton bellow OUTPUT 3. The green LED diode for OUTPUT 3 lights ON. Send an SMS from mobile phone (which will be mainly used to control the *GSM rele<sup>4</sup>*) in form **1234 Y3 OFF** to the telephone number of the SIM card inserted into the *GSM rele<sup>4</sup>*. This will switch off the plugged appliance. The green status LED for OUTPUT3 goes OFF. Simultaneously,

the device automatically sends a confirmation SMS message on performing the operation. The password 1234 can be changed later in configuration. The *GSM rele<sup>4</sup>* reacts on the SMS text message from any telephone as long as the access password matches. The very first one (the sender of the first valid SMS message) will be remembered as master and will receive messages about events on *GSM rele<sup>4</sup>*. This user can also control OUTPUT 4 by "ringing" on the device.

6. Try "ringing" on device. You can make pulse on OUTPUT 4 for approx. 4 seconds by calling to *GSM rele<sup>4</sup>* (with default factory setting). The device hangs up the call and makes pulse on the OUTPUT 4. This pulse can be used for example for opening entrance gate. To test this function call from the phone (which was used to send the first test SMS to switch off the OUTPUT 3). The pulse is indicated by green LED.
7. Try regulation. You can send SMS in form of **1234 Y3 REG 25** to command the device to maintain temperature to 25°C. The range of regulation is between 0°C and +55°C. Regulation can be canceled by SMS with command **1234 Y3 OFF**. By default the regulation of OUTPUT 3 depends on temperature sensor connected to analog INPUT T5 (OUTPUT 4 depends on INPUT T6).
8. A default factory setting of the *GSM rele<sup>4</sup>* can be recovered by an SMS in form **1234 FACTORY**. Your setting can be then restored from backup configuration of **SeaConfigurator** program.

## 4. Technical specifications

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	
Dimensions	Width	S	71		mm	
	Height	V	90		mm	
	Depth	H	58		mm	
Power supply <sup>*1)</sup>	Voltage	V	180	230	V AC	
	Current			11	30 mA	
Digital inputs	INPUT1, INPUT2					
	Voltage	V <sub>IN</sub>	3	12	30	V DC
Digital outputs	OUTPUT3, OUTPUT4 - Semiconductor switch OPTO-MOS					
	Voltage	V <sub>OUT</sub>	5	230	260 (400)	V AC (V DC)
Analog inputs	Current	I <sub>IN</sub>		3,5		mA DC
	2 x temperature sensor GSM-C-T2, Accuracy in range 0 to 30°C ... 1°C					
Temperature	Temperature	-	-30	+55	°C	
	Storage without supply			3 <sup>*2)</sup>	Months	
	Operational	tA	-20	+45	°C	

**Use *GSM rele<sup>4</sup>* - DIN inside the rack with IP44 or better!**

<sup>\*1)</sup> Use breaker max. 10 A before *GSM rele<sup>4</sup>*. For power supply 230V<sub>AC</sub> use lines min. 1 mm<sup>2</sup>.

<sup>\*2)</sup> The *GSM rele<sup>4</sup>* has to be connected to 230V<sub>AC</sub> power supply every 3 months for 24 hours (due to internal accumulator).

## 5. Hardware

The front panel of the *GSM rele<sup>4</sup>* contains a set of status indicating LED diodes located, pushbuttons for local control of outputs, connectors for connecting power supply, input signals, output signals and temperature sensors.

### 5.1 Connectors

*GSM rele<sup>4</sup>* enables to connect 2 external digital inputs, 2 external digital outputs and 2 external temperature sensors GSM-C-T2 with temperature range from -30°C to +55°C.

The line length of a connected external temperature sensor is not limited but the wire has a certain resistance which influences the measured temperature (16 Ω means 1 °C).

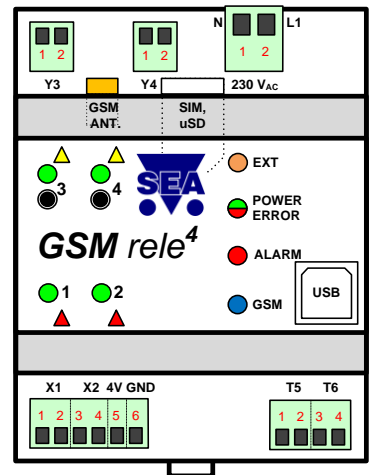
The recommended type of relay for connection of more appliances is GSM-RELE-OUT. When using the *GSM rele<sup>4</sup>* for a gate control by a phone ring, it's possible to connect output 3 and COM directly with a pushbutton of the gate control.

Read **Technical specifications** before connecting external devices! Don't overload inputs and outputs.

Examples of connection of *GSM rele<sup>4</sup>* are placed later in this text.

### 5.2 Pushbuttons

The *GSM rele<sup>4</sup>* has two pushbuttons for local control of outputs. Every press of the pushbutton changes the state of the output.



## 5.3 LED diodes

The front panel of **GSM rele<sup>4</sup>** contains indication LED diodes POWER, ALARM, GSM, EXT and LED diodes which indicates status of digital inputs (INPUT1, INPUT2) and outputs (OUTPUT3, OUTPUT4).

LED	COLOR	Meaning			
		Dark	Light	Blink 1 per 3sec	1:1
EXT	orange	-	-	-	-
SUPPLY	green	Device switched off	Supplied from 230VAC	Supplied from battery, NO 230VAC	-
ERROR	red	Standard operation	GSM error	-	uSD card error
ALARM	red	Function "Alarm" NOT active	Any sensor activated ALARM!	Function "Alarm" active	Function "Alarm" preparation
GSM	blue	no GSM signal	Other GSM error	operational	Fast: Connecting to GSM  Slow: SIM card problem
INPUT1 INPUT2	green	Input not activated	Input is activated	-	-
OUTPUT3 OUTPUT4	green	Output switched off	Output switched on	Inverse blinking during regulation mode	-

## 5.4 Battery

**GSM rele<sup>4</sup>** is equipped with backup 3.7 V Li-Ion battery which enables to operate the **GSM rele<sup>4</sup>** for several hours in normal mode in case of a 230 V<sub>AC</sub> power failure. (the battery life time depends on mode of usage). During the battery supply mode the **GSM rele<sup>4</sup>** the **LED POWER** blinks at an interval of 1 for 3 seconds.

\*) When the battery falls below a certain voltage, the device switches to "Sleeping mode", in which it can stay up to a month. The **GSM rele<sup>4</sup>** wakes up of the sleeping mode, either by applying 230V AC power supply or by change of the logic INPUT 1 or INPUT 2. \*) Not used in this version

## 5.5 External antenna connector

**GSM rele<sup>4</sup>** is supplied with an external antenna GSM-ANT05S. It is not recommended to put this type of antenna on metal surface (the signal quality will degrade).

If a **GSM rele<sup>4</sup>** is used in area with a low GSM signal, it's possible to use another type of the antenna with higher gain.

## 5.6 MicroSD card and data logging

**GSM rele<sup>4</sup>** (version GSM-R4-DIN) can store detailed information of its activities into a log file on a MicroSD card for later analysis. The MicroSD card reader is located under the removable cover close to the SIM card reader.

Note: This function requires a license - ask your supplier for details.

## 6. Configuration

Configuration of the **GSM rele<sup>4</sup>** can be made in several ways.

### 6.1 **GSM rele<sup>4</sup>** - default factory configuration

When the signal on INPUT 3 or INPUT 4 changes, the **GSM rele<sup>4</sup>** sends an SMS message to the main users (to the telephone number from which it received the first valid command). The input signal must be stable for certain time (approx. 1 sec) to avoid sending unwanted SMS messages in case of interference on the input.

Temperature regulators are set up so that the OUTPUT 3 is regulated by temperature sensor on INPUT T5 and OUTPUT 4 from the temperature sensor on INPUT T6.

### 6.2 Configuration of **GSM rele<sup>4</sup>** from PC via USB

The configuration (parameter setting) can be done using program **SeaConfigurator**.

E.g. **GSM rele<sup>4</sup>** can be set to inform of the 230V AC power failure or restoration via SMS or by ringing.



**SeaConfigurator** can be downloaded on the web page:

<http://www.seapraha.cz>

Fill in the word **GSM-R4-DIN** or **GSM-R3-DINB** to the search field.

## 6.3 Configuration of **GSM rele<sup>4</sup>** via SMS

Some parameters of **GSM rele<sup>4</sup>** can be configured via SMS:

List of configuration SMS commands:

Command	Parameter	Meaning
FACTORY	-	All parameters are setup to factory default.
USER DIS	Phone number e.g.: +420777777447	A "disabled" flag for the user is set. If and user is not in the list an error is indicated.
USER CHANGE	Phone numbers e.g.: +420777777447 +420123456789	The first phone number in the list is replaced by the second number. If the first phone number does not exist in the list or the second is already in the list an error is indicated.
CODE ADD	Password e.g. 1234	New user with specified password is added (password max. 20 digits). If the password already exists an error is indicated. If the password already exists and the user is disabled, the user is activated and no error is indicated.
CODE DIS	Password e.g.: 9876	A "disabled" flag for the user is set. If the user is not in the list an error is indicated.
CODE CHANGE	Passwords e.g. 1234 9876	The first password in the list is replaced by the second password. If the first password does not exist in the list or the second is already in the list an error is indicated.

1234 FACTORY ... All parameters of **GSM rele<sup>4</sup>** will be setup up to factory default

1234 USER DIS +420777777497

... the user with phone number +420777777497 is disabled

1234 USER CHANGE +420777777497 +420777777451

... the phone user's number is changed from +420777777497 to +420777777451

1234 CODE ADD 9876 ... the new password 9876 is added

1234 CODE DIS 9876 ... the password 9876 is disabled

1234 CODE CHANGE 1234 9876

... the first password 1234 is changed to new second password 9876

## 7. **GSM rele<sup>4</sup>** - Control

### 7.1 Output control by "ringing"

**GSM rele<sup>4</sup>** is set by the manufacturer to switch ON an OUTPUT 4 for 4 seconds when any user from the list of users calls to **GSM rele<sup>4</sup>** phone number. This pulse is useful for an opening of an entry gate. Test this function by a call to **GSM rele<sup>4</sup>** from your mobile phone (it's important to send a valid command SMS to **GSM rele<sup>4</sup>** from your mobile phone if have inserted a "new" SIM card to **GSM rele<sup>4</sup>**).

**GSM rele<sup>4</sup>** rejects a call and at the same time generates a pulse on an OUTPUT 4.

### 7.2 Remote control of **GSM rele<sup>4</sup>** via SMS

**GSM rele<sup>4</sup>** is controlled via SMS of the GSM network. Text SMS are in form:

<PASSWORD> <COMMAND> [<COMMAND >]

Each command is preceded by Yn, where n is the number of controlled output. If output is not specified, the OUTPUT 3 (Y3) is used as default. Commands **ON** and **Y3 ON** and **Y3ON** has the same meaning.

Example:

1234 Y3 ON ... an appliance connected to OUTPUT 3 will be switched on, confirmation message will be sent back

1234 Y4 OFF NOBACK ... an appliance connected to OUTPUT 4 will be switched off, NO confirmation message will be sent back

#### Password (access code)

Password is a main security item for **GSM rele<sup>4</sup>** control. Command SMS are accepted from any phone number. It means anybody who knows the password and the phone number can control the **GSM rele<sup>4</sup>**. The password is a string of digits (1 to 20) which must be on the beginning of any command SMS. Otherwise the SMS will be ignored. A text before the password is automatically ignored. It is useful when command SMS are sent from Internet GSM gates.

Factory setting of a password is:

1234

## Command

This part of a message specifies a requested action. See the following table for available commands. **GSM rele<sup>d</sup>** commands are not a case sensitive, it's possible to use upper letters as well as lower letters.

Command	Parameter	Meaning
<b>Y3 ON</b>	-	An OUTPUT 3 will be switched on. (Use Y4 ON for OUTPUT 4)
<b>ON</b>	-	This command acts in exactly the same way as command ON3
<b>Y3 OFF</b>	3 or 4	An OUTPUT 3 will be switched off. (Use V4 OFF for OUTPUT 4)
<b>OFF</b>		This command acts in exactly the same way as command OFF3
<b>Y3 PULSE</b> <b>Y3 RESET</b>	4	Generates 4 sec pulse on OUTPUT 3 Generates 4 sec reset on OUTPUT 3
<b>PULSE</b> <b>RESET</b>		These commands act in exactly the same way as command PULSE3 / RESET3.
<b>REG</b>	0 to 55	Setting of requested temperature and starts regulation mode.
<b>STATE</b>	-	Request of status SMS (state of inputs, outputs, temperatures, signal quality and credit).

*Tip:* It's possible to use more commands in one SMS. Commands are separated by a space (see an example).

### Examples:

1234 ON ... an appliance connected to OUTPUT3 will be switched on  
 1234 Y3 ON ... an appliance connected to OUTPUT3 will be switched on  
 1234 Y4 ON ... an appliance connected to OUTPUT4 will be switched off  
 1234 Y4 PULSE 5 ... an OUTPUT 4 will be switched on and then after 5 seconds will be switched off (Notes: if an output is already switched on, it will be just switched off after 5 seconds)  
 1234 Y4 REG 5 ... requested temperature for the function temperature regulation of OUTPUT 4 will be set to + 5°C

an example of more commands in one SMS:

1234 Y3 OFF Y4 REG 25 ... An OUTPUT 3 will be switched off and the requested temperature will be set to 25°C

### Confirmation

If a command message contains a valid password (access code) the **GSM rele<sup>d</sup>** returns a confirmation message which informs if a command was accepted (see chapter Status SMS). If you don't want a confirmation message (e. g. when sending a command SMS from the Internet GSM gates) add a command "NOBACK".

Command	Meaning
<b>NOBACK</b>	No confirmation SMS will be sent

### Example:

1234 Y3 ON NOBACK ... an appliance connected to OUTPUT3 will be switched on. NO status message will be sent back

## 7.3 Local control using pushbuttons

**GSM rele<sup>d</sup>** has 2 pushbuttons for local control of outputs (see. Chapter 5.2)

## 7.4 Status SMS message

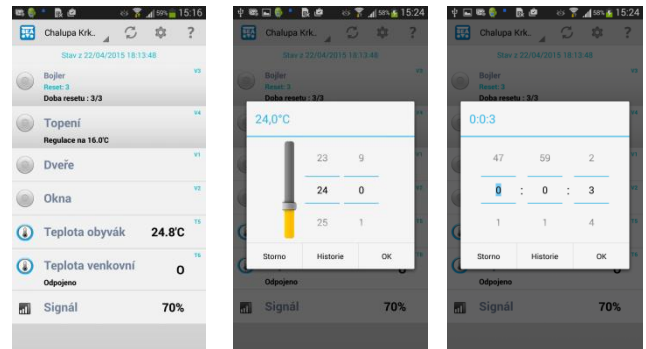
Whenever the command SMS contains valid password the **GSM rele<sup>d</sup>** send back Status message.

Parameter Credit is sent only in case of pre-paid SIM cards. If the actual value of Credit cannot be readout from operator, the last known value is listed in parentheses e.g. Credit=(243.15 Kc).

Example of status SMS	Explanation
Base station: Y3 REG 25/27°C OK;	Device name: Command confirmation: Y3 REG27
X1=ON	INPUT 1 state
X2=ON	INPUT 2 state
Y3=ON(REG 25/27°C)	OUTPUT 3 state
Y4=OFF	OUTPUT 4 state
T5=25°C	INPUT T5 actual temperature
T6=26°C	INPUT T6 actual temperature
Power=Failure	Power supply from 230V <sub>AC</sub> / (from battery)
Signal=38%	GSM signal level
Credit=243.15 Kc	Credit on pre-paid SIM card

## 7.5 Remote Control via the application for OS Android

The application for OS Android called **SeaControl** is used for control and monitoring of GSM RELAY, you can download it for free. For detailed information and downloading the application, go to [www.seapraha.cz](http://www.seapraha.cz) and write GSM-CONTROL into the searchbox. This application communicates with a GSM relay via SMS.



## 8. Warranty

General warranty period is 12 months after purchase, when eventual malfunction device will be repaired free of charge in SEA company while shipping to SEA is paid by customer and SEA pays for shipping back to customer. For SW there is 24 months warranty under following conditions:

Both CPU and PC software is sold "as is". The software was created by the best software engineers in SEA and was carefully tested both in SEA and also by SEA customers using GSM applications products made in SEA. In spite of making all possible to get error free software it can happen, that the software in CPU or PC programming SW or their mutual interaction has some error under some specific conditions. If such error is found and the description of the problem including configuration file is sent by E-mail to SEA Ltd., the error is removed free of charge and SEA will send new SW by E-mail to customer.

SEA Ltd. has NO RESPONSIBILITY for any damage, lost, costs and any other problems direct or inducted, caused by such SW error, by eventual device malfunction from any reason or by undelivered SMS from the device.



### CE Declaration of conformity

in accordance with the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (R&TTE) and Directive 2011/65/EU (ROHS).

We SEA, spol. s r.o., Dolnoměcholupská 1537/21, CZ 102 00 Praha 10, Czech Republic, ID: 47117931 (manufacturer) declare under our sole responsibility, that product device for remote control and monitoring type GSM-R4-DIN is in conformity with the following standards:

health and safety: EN 60 950-1:2005+A1:2009 EN 60 950-1:2006+A11:2009+A1:2010+A12:2011  
 EMC: ETSI EN 301 489-1 ETSI EN 301 489-7 v1.3.1  
 radio frequency: EN 301 511 v 9.0.2

The last two digits of year in which the CE marking was affixed: 14



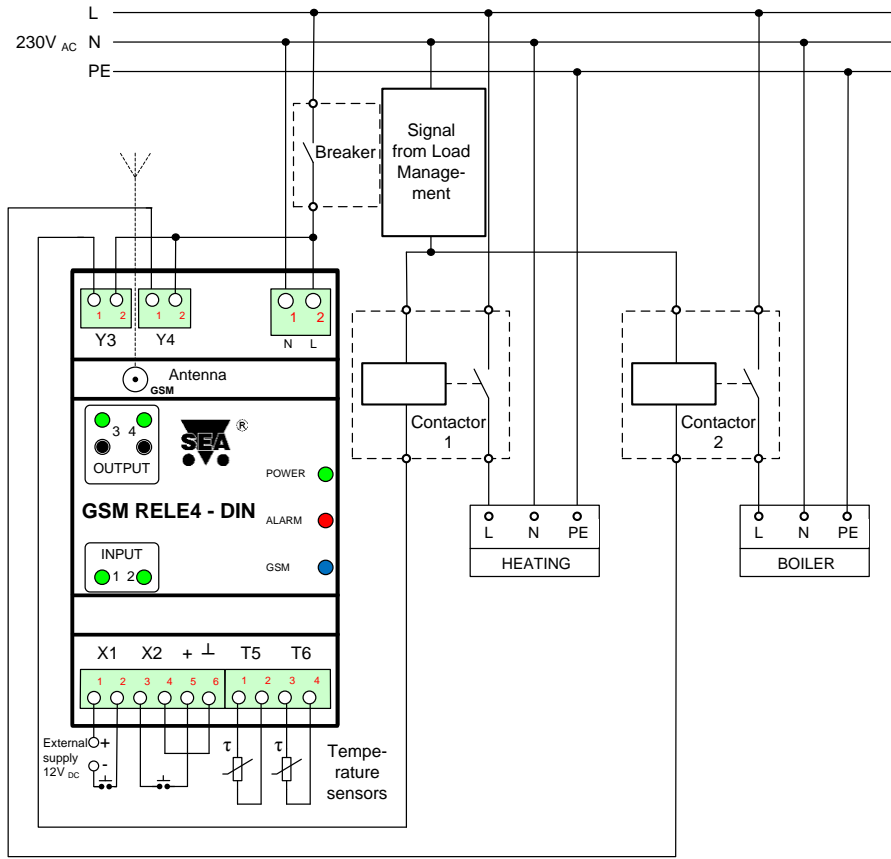
Place of issue: Praha Name: Ing. Mario Vejlupek  
 Date of issue: 18.12.2014 Grade: Technical director



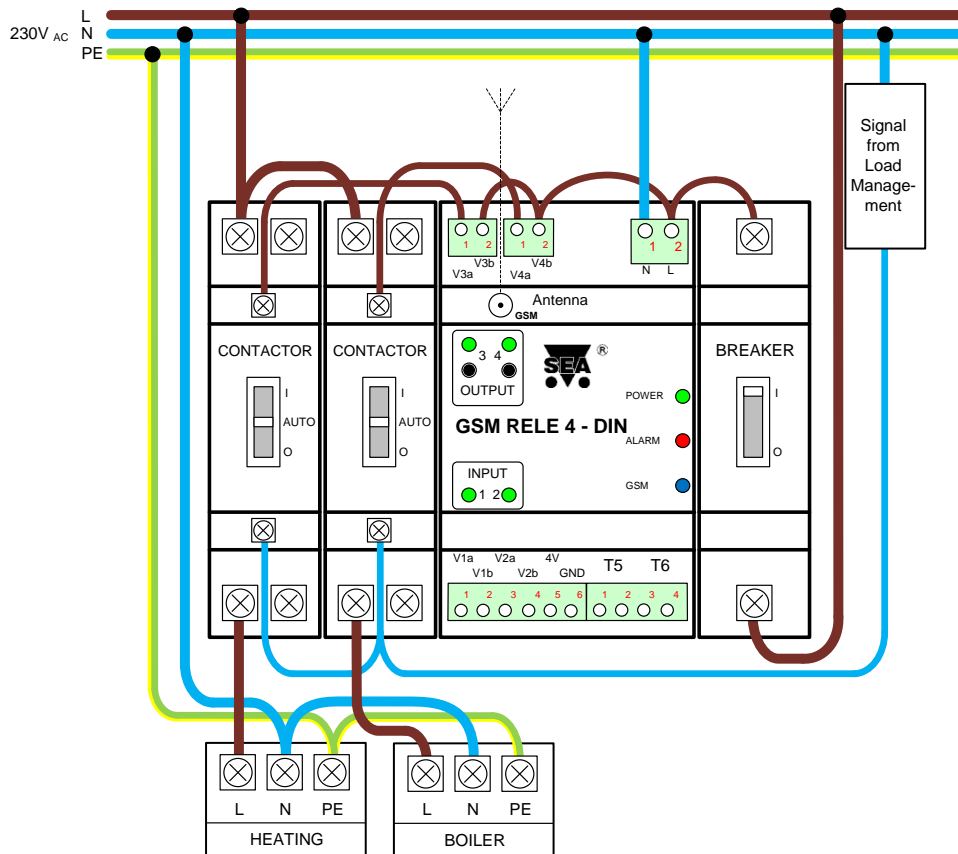
# 9. Examples of connection

An example of usage **GSM rele<sup>4</sup>**. With two power outputs are controlled two electrical appliances such as heating and boiler with contactors, digital inputs detect voltage on switching / opening a door contact and two analog inputs T5, T6 measure temperatures.

The schematics calculate with usage of the "Load Management Signal". Logic input No. 1 is activated by supplying an external 12V DC logic input and input 2 uses internal 4V DC and connects directly to the terminal door contact. The 2 analog inputs T5, T6 connect the temperature sensors. Outputs of the **GSM rele<sup>4</sup>** control contactors of heater and boiler.



Electrical schematics



Wiring

# 10. Frequently Asked Questions (FAQ)

What is necessary to use the *GSM rele<sup>4</sup>*

- **Good quality GSM signal in a place where *GSM rele<sup>4</sup>* will be used (at least 2 bars on your mobile phone)**
- **Sufficient credit on a pre-paid SIM card**
- **No phone call redirection**
- **The user has to know to operate his mobile phone (PIN usage deactivation)**
- **Note: Users who knows to operate older version of GSM RELAY version 2 can use older SMS command form: E.g. 1234 ON3 OFF4**

Problem description	Possible reason	Solution
<b>LED GSM (blue ) flashes 1:1 (slow)</b>	SIM card is not functional	Test the SIM card in your mobile phone. Try to make a call and receive a call from another mobile phone. Try to send a receive SMS message. Switch off using PIN on a SIM card. Cancel all call redirection for a SIM card. (Ask your mobile operator for help if necessary)
	New SIM card is not activated yet	New SIM card has to be activated. (Ask your mobile operator for help if necessary)
	Low credit on a pre-paid SIM card	Check credit on a pre-paid SIM card (Ask your mobile operator for help if necessary)
<b>LED GSM (blue) is off (dark)</b> <b>LED ERROR (red) is on (lights permanently)</b>	Weak/poor GSM signal	Test the SIM card in your mobile phone. The mobile phone should show the signal level at least 2 bars
<b>The pulse on an output is not generated based on incoming ring signal (e. g. for a gate opening)</b>	The incoming phone calls for a SIM card are redirected	Cancel all phone call redirections for the SIM card
<b>The temperature from an external temperature sensor is wrong</b>	Too long lines to an external temperature sensor	The accuracy of temperature depends on a line length to an external temperature sensor (16 Ohms means 1°C). Use thicker wires to temperature sensor