GSM RELAY

User's manual

Version 1.09

Introduction

GSM RELAY is a device for a remote control of one electrical appliance via SMS (SMS - short text message in GSM mobile phone network).

GSM RELAY is extremely easy to install and use. Just plug the GSM RELAY in the power outlet (230V). Now it's possible to switch ON, switch OFF or to interrupt for a while, the output power outlet on the GSM RELAY via SMS.
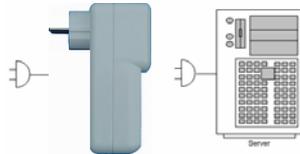
Technical specifications

Parameter		Symbol	MIN.	TYP.	MAX.	Unit
Dimensions PCB	Width	W		71		mm
	Length	L		120		mm
	Depth	D		75		mm
Power Supply	Voltage	V_{CC}	210	230	250	V AC
Digital inputs	Count.	-		1		-
	Type	-	magnetic reed relay			-
Digital outputs	Count			1		
	Voltage	V_{OUT}		230		V AC
	Current	I_{OUT}		10		A
Temperature	Storage	t_{STG}	-40		+85	°C
	Operation	t_A	-20		+40	°C

Installation

1. To operate the device a SIM card of any GSM operator is necessary.

Before inserting the SIM card into the GSM RELAY device, it is necessary to turn off setting of the "PIN code".

Insert the SIM card 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".

2. Insert this prepared SIM card into the GSM RELAY device. The SIM card holder is located on the down side of the device. To slide out the SIM card holder, press on the yellow disc next to the holder..

3. Now you can plug the device into a standard single-phase 230 V wall socket. If the power supply is correct, green LED diode POWER SUPPLY goes on. Simultaneously, after about 1 minute, yellow LED diode GSM starts flashing with a period of 2 sec.

4. Now plug the 230 V electrical appliance, you want to control into the socket on GSM RELAY.

5. To make the first test of the device, use your mobile telephone you want to use to control the appliance and send a SMS text message in the form 1234 ON to the telephone number of the SIM card inserted into the GSM RELAY. This switches on the plugged appliance. The ON status is indicated by means of the green LED diode OUTPUT that is permanently on. Simultaneously, the device automatically sends a confirmation message on performing the operation. (To change the password 1234, insert the SIM card into any mobile telephone and in the directory on the SIM card in field "Names" for name Code change the telephone number 1234 to a number you select. The device reacts to the SMS text message from any telephone as long as the access password matches).

6. If you want to switch off the appliance, just press pushbutton ON/OFF on the GSM RELAY. The appliance is switched off and the green LED diode OUTPUT goes off.

Control

GSM RELAY is controlled via SMS text messages.
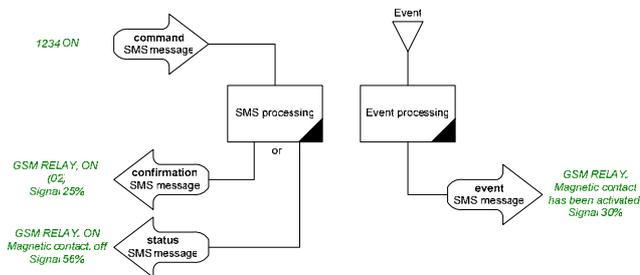
Command messages

GSM RELAY is controlled via SMS of the GSM network. Text SMS are in form:

```
<ACCESS_CODE> <COMMAND> [<RETURN_STATUS>]
```

Example

```
1234 ON                              …electrical appliance will be connected to a power supply
```

Access code

Access code is used for security purposes. It is a string of digits which must be on the beginning of a command message, otherwise the SMS is ignored. It means command messages may be sent by anybody who knows the access code. It's possible to send a command message from the Internet the web portal.

If a **code** parameter is not specified in a phone book on a SIM card (see section *Basic Setting*), the default value 1234 will be used:

```
1234
```

Command

This part of SMS specifies requested GSM RELAY's action. Available values are in the following table. Command is not case sensitive.

Command	Meaning
ON, HIGH, UP, *01, ZAP, ZAPNOUT, ZAPNI	The connected appliance will be switched on (both NO and NC version)
OFF, LOW, DOWN, *00, VYP, VYPNOUT, VYPNI	The connected appliance will be switched off (both NO and NC version)
PULSE, RST, RESET, RESTART, PULS	The connected appliance will be switched on for 4 second and then switched off (NO version). The connected appliance will be switched off for 4 seconds and then switched on (NC version).
STATE, STAV	Status text message request.
GET	The credit request (USSD). The result is sent to you in SMS.
CMD	Command for modem (advanced users only!!!). The result is sent to you in SMS.

Example

`1234 ON`	…	the connected electrical appliance will be switched on
`1234 OFF`	…	the connected electrical appliance will be switched off
`1234 RESET`	…	the connected electrical appliance will be shortly switched on and then off (NO version)
`1234 GET*22#`	…	credit VODAFONE (Czech Republic)
`1234 GET*101#`	…	credit T-MOBILE (Czech Republic)
`1234 GET*104*#`	…	credit EUROTEL (Czech Republic)

No Answer command

If a *command message* contains a proper access code the GMS RELAY always send a configrmation SMS indicating that a command was accepted (see section Confirmation messages). If you don't want to receive confirmation messages (e.g. when sending command from the Internet web portal, or if you receive a SMS delivery confirmation message from your GMS operator automatically) the GSM RELAY's confirmation messages may be switched of by one of following word in a *command message*.

Command	Meaning
NOBACK, NEZPET, STAVNE	Confirmation message is not requested

Example

```
1234 ON NOBACK     …   the connected electrical appliance will be switched on but GMS RELAY will
```
send no confirmation SMS.

Confirmation messages

If an command message contains a valid access code the GSM RELAY always returns a confirmation or status message (depends on the command in a *command message*).

These confirmation messages are listed in the following table:

Message	Message
GSM RELAY: Switched off. (00) Signal 59%	The connected electrical appliance will be switched off.
GSM RELAY: Failed while switching off. (01) Signal 59%	
GSM RELAY: Switched on. (02) Signal 59%	The connected electrical appliance will be switched on.
GSM RELAY: Failed while switching on. (03) Signal 59%	
GSM RELAY: Pulse generated. (04) Signal 59%	The connected electrical appliance shortly switched OFF, then ON again.
GSM RELAY: Failed while generating pulse. (05) Signal 59%	
GSM RELAY: Unknown command. Available commands: ON, OFF, PULSE, RST, RESET, STATE (80) Signal 59%	Wrong command

The numbers in parenthesis are useful for easier machine processing if the outgoing messages are received by a computer. Every outgoing message contains it's unique code.

Note: Success in a confirmation message means that the command was send to the power relay. The real state on a power relay output is not checked. Non-success means that the command was not sent to the power relay.

Status message

This message is generated if a *command message* contains a key word STATE or STAV.

Status message format is as follows:

```
GSM RELAY: (ON | OFF) Magnetic contact: (on | off) Signal: <csq>%
```

Example

```
GSM RELAY: ON Magnetic contact: off Signal 56%
```

Event messages

If an event occurs in a GSM RELAY for a specified time, the device send a following message (LED MG. CONTACT lights immediately – LED indicates just the state, not a SMS sending). The message is sent to a Master's phone number (see section Settings). If the parameter master's phone number is not set up in a SIM phone book, event is ignored and no SMS is sent.

Possible events are:

Message	Meaning
GSM RELAY: Magnetic contact has been activated. (81) Signal 42%	Magnetic contact was activated.
GSM RELAY: Test report. (82) Signal 42%	ON/OFF pushbutton was pressed at least 2 seconds.

Time delay means that the magnetic contact must be permanently switched ON.:

Name		Number	
Parameter	Meaning	Example	Default
DInDelay	Time delay of magnetic contact input in seconds	60	1

Automatic voice call

GSM RELAY has s capability to make a "voice call" in requested intervals. This feature is useful when GSM operator requests to perform at least one paid voice call during certain time period, to keep the SIM card alive. (For example: GSM operator Eurotel in the Czech Republic requests at least one paid voice call to be made during half a year to keep it's "GO" prepaid SIM card alive.)

This function can be set and activated by parameters **autocall** and **autoint** (see. section Settings).

When the requested time period is finished, the voice call will be made between 08:00 and 20:00 o'clock of a local time, not to make night call. If there is no answer on the call, the call will be repeated after 2 minutes.

Example

When you set up the parameter **autcall** on your phone number (e.g. +420123456789) and the parameter **autoint** on value 2, the GMS RELAY device will make a voice call to your phone number every 2 months.

Time setting

It' not necessary to make a real time clock setting. An actual time is automatically set up from incoming SMS messages. This method causes a small time inaccuracy but it's acceptable.

Even more, the GMS REALY writes an actual time to a SIM card (to a phone book) every midnight. After power failure the real time clock is set up from this value.

Basic Setting

Operating parameters of a GSM RELAY's are stored in a SIM phone book. The phone book contains a pairs <name, number>. After Power On of GSM RELAY this phone book is searched for following names: (Names are not case sensitive, code = CODE)

Name		Number	
Parameter	Meaning	Example	Default
Code	Device access code	8465	1234
master	Phone number for outgoing messages	+420123456781	-

When the parameter is not in a phone book, the *default* value is used.

code

Device access code. The string of digits (4 digits recommended). Every *command message* must contain this access code, otherwise SMS will be ignored.

In case that device access code parameter is not in a phone book on a SIM card, the default code 1234 will be used (and written to a SIM card). It's highly recommended to change this default code!

master

The phone number, where the event messages will be sent. If this parameter is not set, no event messages are sent.

In case that master phone number is not in a phone book on a SIM card, it will be set (and written to a phone book on a SIM card) automatically, after receiving the first SMS with correct device access code.

Tip: It's possible to edit the phone book on a SIM card in your mobile telephone. Just switch your mobile phone off. Insert the SIM card which will be used in the GSM RELAY. Then switch your mobile phone on and make necessary changes in the phone book.

Advanced Setting

Advanced setting parameters are listed in a following table. (Parameters are not case sensitive, sca =SCA)

Name		Number	
Parameter	Meaning	Example	Default
sca	SCA Service Center Address for SMS sending	+420603052000	-
autocall	The phone number for automation voice call	+420123456781	-
autoint	The time period between two automation voice call [month]	3	2
redirect	Redirect an incoming SMS text messages without *access code* to a *master's* phone number.	0	1

When the parameter is not in a phone book the *default* value is used.

sca

GSM operator's SCA service centrum for outgoing SMS text messages. If sca parameter is not set up, GSM RELAY will use standard SCA phone number on SIM card which is usually setup by GSM operator before selling the SIM card (recommended).

autocall

The phone number, to which the voice call will be made in requested time period specified in parameter **autoint**. For example value "+420123456789" means that this phone number will be called in specified time intervals.

If the **autocall** parameter is not specified, no voice call will be made (default).

autoint

Time interval for automatic voice call in months. (e. g.: Value 3 means, that every 3 month a voice call will be made, if parameter **autocall** is not empty.

If the **autoint** parameter is not correctly set up the default value 2 (months) will be used.

redirect

If this parameter contains value 1, every incoming SMS text message without correct device access code (for example: "low credit warning" sent by GMS operator) will be resend to the **master's** phone number (if the **master's** phone number is set up).

If this parameter is not set up or contains positive integer the redirect function is active.

Hardware

The GSM RELAY contains power inlet and outlet, SIM reader, a set of a status indicating LED diods located on a front panel and a pushbutton for local switching ON and OFF.

LED

The front panel of a GSM RELAY contains status indication LEDs and a pushbutton for local switch ON/OFF.

LED	COLOR	Meaning
POWER	Green	The GSM RELAY is under power
GSM	yellow	GMS RELAY status: • *blinking 1:1* …GSM RELAY is starting up • *dim* … GSM RELAY is starting up • *short blink once per 4 second* … GSM RELAY is ready and in operational state
MG.CONTACT.	yellow	The magnetic relay is closed.
OUTPUT	green	The connected electrical appliance is switched on

Pushbutton ON/OFF

Press pushbutton for a short time to change a state of the output power relay, which supplies connected electrical appliance.

Press pushbutton for at least 2 second to send a test SMS text message to a **master's** phone number (*GSM RELAY: Test report. (82) Signal 42%*).

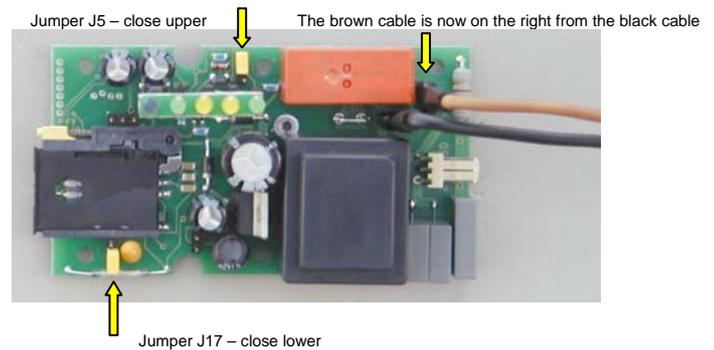## GSM RELAY Version NO and NC

GSM RELAY is delivered in two versions

NO (normally open). The output power relay is normally open and the electrical appliance is not supplied. This version is suite when the output power relay is usually open, e.g. gate opening or cottage heating.

NC (normally closed). The output power relay is normally closed and the electrical appliance is supplied. This version is suite for the opposite situation e. g. when the GSM RELAY is used for a remote server restart via power supply.

Steps:
1. Unplug GSM RELAY from electric power.
2. Unscrew the corner screws and lift off the upper part of a box.
3. Switch over the brown cable (see the picture).
4. Switch over the jumpers J5 (LED "OUTPUT") and J17 (NO/NC).
5. Assemble the GMS RELAY again and screw the box together.

NO Version (e.g. for heating)

Jumper J5 – close upper   The brown cable is now on the right from the black cable

Jumper J17 – close lower

NC Version (e.g. for server reset)

Jumper J5 – close lower   The brown cable is now on the left from the black cable

Jumper J17 – close upper

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