GSM RELAY variant 2-TERM

1. Introduction

GSM RELAY variant 2-TERM called GSM RELAY2 TERM (a member of GSM RELAY2 family) **is designed for DIN rail mounting**. GSM RELAY2 TERM can control one independent electrical circuit in a building, e.g. one circuit of an accumulator stove or circuit for entry gate or garage gate opening. The control is made via SMS messages or by ringing. The device is ready to operate immediately after connection to power supply and inserting of a SIM card of any GSM operator. The GSM RELAY2 TERM has one output with a semiconductor switch, which can control a coil of relay. An electrical appliance e.g. electric heating system can be connected to this relay. The GSM RELAY2 TERM has also one logical input. This input can be activated by external voltage 8 to 30V_{DC}. The GSM RELAY2 TERM can react on input status change by sending and SMS on preset phone number. It is also possible to readout the status of this input via status SMS from GSM RELAY2 TERM.

2. Package content

1pc **GSM-RELE2-TERM**
1pc connector ETB45040G000Z
1pc printed documentation
1pc GSM antenna GSM-ANT11K

3. Installation

1. To operate the GSM RELAY2 TERM a SIM card of any GSM operator is necessary. SIM card must be functional, active and must have PIN code turned off. Also some credit is necessary if SIM card is pre-paid. If you have SIM card supplied with device, continue to paragraph 3.

> **Before inserting the SIM card into the GSM RELAY2 TERM device, it is necessary to turn off setting of the "PIN code"!**
>
> Insert the active SIM card (= at least one call was made) to any mobile phone 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".

2. Insert this prepared SIM card into the **GSM RELAY2 – TERM** device. See the picture.

3. Now it's possible to connect GSM antenna and power supply to **GSM RELAY2 TERM** 1 minute later the blue LED diode **GSM** will start flashing with a period of 3 sec.
4. For the first tests of GSM RELAY2 TERM the connection of an input and output is not necessary.
5. To make the first test of the **GSM RELAY2 TERM**, use your mobile telephone you want to use to control the appliance and send a SMS text message **1234 ON** to the telephone number of the SIM card inserted into the **GSM RELAY2 TERM**. This will switch on the plugged appliance. **GSM RELAY2 TERM** 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 phonebook on the SIM card in field "Names" for name xCode 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. The very first one (the sender of the message) will be remembered as master and will receive message about events on GSM RELAY2 TERM. This user can also switch some output by "ringing" on the device.

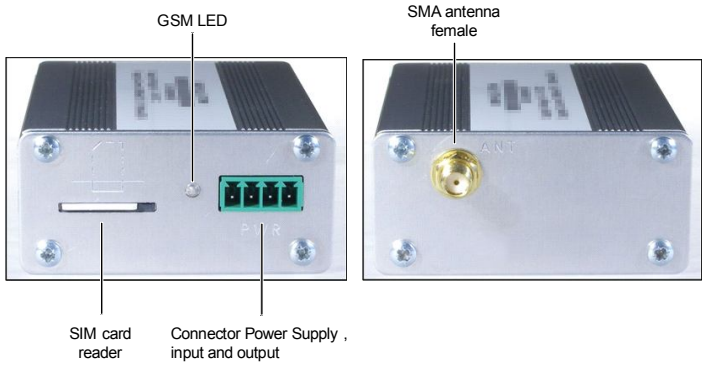
6. Try **"ringing"** on device. You can make pulse on OUT2 for approx. 4 seconds by calling to **GSM RELAY2 TERM** (with factory settings). The device hangs up the call and makes pulse on the output. This can be used for example for opening entrance gate. You have to use the same phone number as was in the very first SMS sent to the device. For more information see chapter List of All Parameters at the end of this document, parameter "xRemUser".

4. Technical specifications

Parameter		Symbol	MIN.	TYP.	MAX.	Unit
Dimensions	Width	W		64		mm
	Height	H		30		mm
	Depth	D (without connectors)		100		mm
Supply	Voltage/ max. current	Vcc / Icc (without load)	8 / 0.6	12 / 0.4	30 / 0.2	V_{DC}/A
	Average sup.	(without load)		1.8		W
Digital input	IN1					
	Voltage	-			Vcc	V
	Current	By V_{CC}=12V			3.5	mA
Digital output	OUT2, semiconductor switching element OPTO-MOS					
	Voltage	-			Vcc	V
	Current	-			90	mA
Tempe-rature	Storage	tSTG	-40		+85	°C
	Operational	tA	-20		+65	°C

Use GSM RELAY2 TERM inside box with ingress protection at least IP44!

5. Hardware

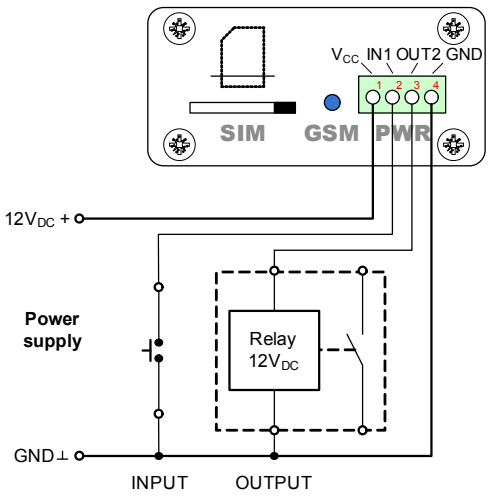


5.1 Power Supply, Input and Output

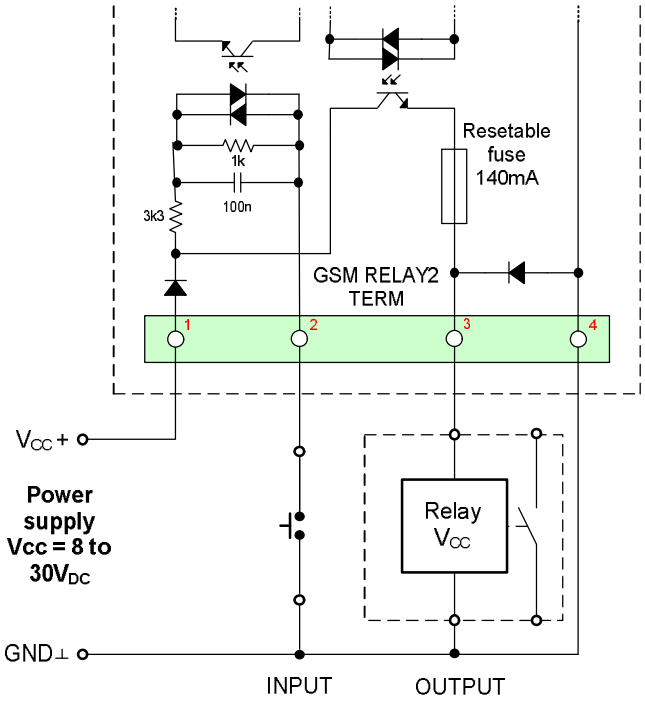
The green connector combines power supply, input and output of the device. Power supply has to be in range +8 V_{DC} to +30 V_{DC}. The device is protected against reversing the polarity by a diode and against overvoltage by Zener diode. It's possible to insert 1.25A fuse into power supply line V_{CC} when requested.

PIN	Description	Parameters
V_{CC}	Power supply: Plus	+8 V_{DC} to +30 V_{DC}
IN1	Input (No. 1), active when connected to GND	I_{MAX} 3.5 mA
OUT2	Output (No. 2) connects V_{CC}. Connect your appliance between OUT2 and GND	I_{MAX} 90 mA
GND	Power supply: Minus	0 V

Recommended connection of **GSM RELAY2 TERM**:



Schematics of internal circuits of input IN1 and output OUT2:



5.2 LED diode

There is an indication blue "GSM" LED on the front panel of the device.

LED	COLOR	Meaning
GSM	blue	GSM RELAY2 TERM status: *dim …* GSM RELAY2 TERM is starting up (reading phonebook about 40 sec) *Blinking 1:1 …* GSM RELAY2 TERM is starting up *short blink once per 3 second …* GSM RELAY2 TERM is ready and in a operational state

5.3 SIM card reader

5.4 Antenna

Use SMA male antenna, impedance 50 Ω.

6. Configuration

Configuration parameters of a GSM RELAY2 TERM are stored on a SIM card phone book. The phone book contains a pairs <name, number>. After Power On of GSM RELAY2 TERM this phone book is searched for the names in a following table: (Names are not case sensitive, xcode = xCODE)

If any parameter is not present, the default value for this parameter will be used. All phone numbers must be in an international form: + (Country code) (phone number) e.g. +420777777497.

Tip: Use your mobile phone to make changes in parameters of GSM RELAY2 TERM: Insert the SIM card from the GSM RELAY2 TERM into your mobile phone. Make necessary changes of parameters in a phone book of a SIM card and put the SIM card back into GSM RELAY2 TERM again.

The first person who sends valid SMS to GSM RELAY2 TERM with a "clear" SIM card inserted became a main user (master) of the device.

In all following examples we suppose the GSM RELAY2 TERM is already fully functioning with a SIM card. (See chapter **Installation**).

6.1 Remote heating control in a cottage

The electrical appliance is connected to OUT2 output of GSM RELAY2 TERM

Example of parameters on a SIM card:

xCode	1234

The following SMS message will switch ON the el. power to a heating:

```
1234 ON
```

6.2 Entry gate opening by call from a mobile phone (without confirmation)

The gate control is connected to OUT2 output of GSM RELAY2 TERM

Example of parameters on a SIM card:

xCode	1234
xRemDout	2
xRemCall	1
xRemConfirm	0
xMaster	+420777111111
xRUser1 *)	+420777222222
xRUserPeter *)	+420777333333
xRUserDaughter *)	+420777444444

GSM RELAY 2 TERM will reject incoming call from these phone numbers and will generate pulse on OUT2 (=open or close entrance gate)

6.3 Entry gate opening by call from a mobile phone (with confirmation)

The gate control is connected to OUT2 output of GSM RELAY2 TERM

Example of parameters on a SIM card:

xCode	1234
xRemDout	2
xRemCall	1
xRemConfirm	1
xMaster	+420777111111
xRUser1 *)	+420777222222

GSM RELAY2 TERM will reject incoming call and if the phone number is in the phonebook on a SIM card it calls back. In case the user rejects the call within 29 seconds the GSM RELEY2 TERM will generate a pulse on OUT2 to open the gate.

6.4 Alarm via SMS for more users (an input IN1 is activated by voltage)

Example of parameters on a SIM card:

xeI1+LH+SMS	+420777111111
xeI1+LH+SMS1 *)	+420777222222

6.5 Call from GSM RELAY 2 TERM when voltage from input IN1 disappears

Example of parameters on a SIM card:

xeI1+HL+CALL	+420777111111

6.6 Limit the number of alarm SMS (max. 1 SMS every 3 days)

Example of parameters on a SIM card:

xLimit	1
xLimitCount	1
xLimitTime	3

6.7 Setup credit limit to 70 CZK

Example of parameters on a SIM card. When credit drops bellow 70 CZK, GSM RELAY2 TERM will send warning SMS message.

xCredit	1
xCreditLimit	70
xEvent8004 *)	+420777111111

6.8 Advanced setup

See the chapter "List of All Parameters".

*) These parameters must be created by user in the phone book on SIM card.

7. Event SMS Messages

Whenever any event appears on the GSM RELAY2 TERM input or output for longer than minimum specified time, the GSM RELAY2 TERM sends an SMS about this event. To increase the probability the user will read the SMS it can be followed by a voice call from GSM RELAY2 TERM. See the **xe[…+…+…..]** parameters.

If you answer the phone call you will hear a voice message in a form of DTMF signals.

8. Advanced functions

8.1 Automatic Voice Call

This function is useful when the GSM operator (e.g. O2 in the Czech Republic) requires at least one paid voice call to be done during certain time period to keep the SIM card active.

The function can be setup by **xAutoCall, xAutoCallInt, xAutoCallIntFrom, xAutoCallIntTo** parameters (see chapter "List of All Parameters"). Format of **xAutoCallInt** parameter is: 1 = 1 month, #2 = 2 days, *3 = hours, 1#2*3 = 1 month 2 days 3 hours.

The GSM RELAY will call you between 9:00 and 18:00 of a local time. It means you will not be woken up in the middle of night. If you will not answer the call, the GSM RELAY will repeat the call after 2 minutes again.

Example

Make a call every 30 days between 9:00 and 18:00.
xAutoCall = e.g. +420123456789
xAutoCallInt = #30
xAutoCallIntFrom = 9
xAutoCallIntTo = 18

8.2 Automatic SMS message

This function is useful for reporting "I am alive" via SMS messages. You can set a phone number to send automatic SMS message (**xAutoSms**), time period between two SMS messages (**xAutoSmsInt**), begin (**xAutoSmsIntFrom**) and end (**xAutoSmsIntTo**) time, when automatic SMS message is allowed to be sent. Format of **xAutoSmsInt** parameter is: 1 = 1 month, #2 = 2 days, *3 = hours, 1#2*3 = 1 month 2 days 3 hours.

Example

Send a SMS message every day between 18:00 and 21:00.
xAutoSms = e.g. +420123456789
xAutoSmsInt = #1
xAutoSmsIntFrom = 18
xAutoSmsIntTo = 21

8.3 Redirection of SMS without valid password

Master (parameter xMaster) can get all messages sent to the GSM RELAY without valid password. This function helps to watch all unauthorized attempts to control the GSM RELAY. Every SMS message without valid password is forwarded to phone number according to parameter xMaster, if this function is switched on. For example credit warning message from provider.

Use parameter **xRedirect** to switch this function on or off (value 1 = function on, value 0 = function off).

9. GSM RELAY2 TERM Control

9.1 Output control by "ringing"

GSM RELAY2 TERM is set by the manufacturer to switch ON an output OUT2 for 4 seconds based on ringing from any user listed in GSM RELAY2 TERM phonebook. This pulse is useful e.g. for opening of an entry gate. Test this function by a call to GSM RELAY2 TERM from your mobile phone (it's important to send a valid command SMS to GSM RELAY2 TERM from your mobile phone if have inserted a "new" SIM card to GSM RELAY2 TERM first).

GSM RELAY2 TERM rejects a call and then immediately generates a pulse on an output OUT2.

9.2 Remote control of GSM RELAY2 TERM via SMS:

GSM RELAY2 TERM is controlled via SMS of the GMS network. Text SMS are in form:

<PASSWORD> <COMMAND> [<RETURN COMMAND>]

Example:

`1234 ON` … GSM RELAY2 TERM will switch ON an appliance connected to output OUT2. This action will be confirmed by an SMS

`1234 OFF NOBACK` … GSM RELAY2 TERM will switch OFF an appliance connected to output OUT2. Confirmation SMS message will not be sent

Password (access code)

Password is a main security item for GSM RELAY2 TERM control. Command SMS are accepted from any phone number. It means anybody who knows the password and the phone number can control the GSM RELAY2 TERM. The password is a string of digits (1 to approx. 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 (see chapter List of All Parameters, parameter xCode) is:

1234

Command

This part of a message specifies a requested action. See the following table for available commands. GSM RELAY2 TERM is not a case sensitive. It's possible to use more commands in one SMS. Commands are separated by a space.

Command	Parameter	Meaning
ON	-	Output OUT2 will be switched ON
OFF	-	Output OUT2 will be switched OFF
PULSE RESET	-	Output OUT2 will be switched ON for 4 seconds (= 4sec. pulse will be generated)
STATE	-	Request of status SMS (state of inputs, outputs, 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 OUT2 will be switched on

`1234 OFF` … an appliance connected to OUT2 will be switched off

`1234 PULSE` … Output OUT2 will be switched ON for 4 seconds (= 4sec. pulse will be generated) (Note: if an output is already switched on, it will be just switched off after 4 seconds)

Confirmation SMS

If a *command message* contains a valid password (access code) the GSM RELAY2 TERM sends back 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
NOBACK, NEZPET	No confirmation SMS will be sent

Example:

`1234 ON NOBACK` … GSM RELAY2 TERM switch on an appliance connected to output OUT2, but no confirmation message will be sent

9.3 Status message

The status message is send whenever the command message contains a valid password. The typical example of status message:

Status message example	Explanation
GSM RELE2 TERM: ON SUCCESS	Command confirmation: to switch OUT2 ON
in1=ALARM	Input IN1 status
out2=on	Output OUT2 status
Sig=80%	GSM signal level
Credit=243.15	Credit on a prepaid SIM card

Note: Status message has maximum length of 160 characters. (Characters over the length of 160 will be lost).

The states of input and output:

in1: ok = state L, ALARM = state H

out2: off = state L, off = state H

9.4 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 and write GSM-CONTROL into the searchbox. This application communicates with a GSM relay via SMS.

10. 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.

11. Frequently Asked Questions (FAQ)

What is necessary to use the GSM RELAY2 TERM?

- Good quality GSM signal in place where GSM RELAY2 TERM will be used (at least 2 bars on your mobile phone)
- Sufficient credit (in case a prepaid SIM card is used)
- No phone call redirection
- The user has to know to operate his mobile phone (PIN usage deactivation, Phonebook contact changing)

Problem description	Possible reason	Solution
Blue LED diode GSM does not start blinking once in 3 sec. during 3 minutes after power on of GSM RELAY2 TERM	No SIM card inserted or 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 prepaid SIM card	Check credit on a prepaid SIM card Tip: in the Czech Republic the codes are: *22# Vodafone (Vodafone karta) *101# T-Mobile (Twist) *104*# O2 (GO)
	Poor GSM signal	Test the GSM signal level with your mobile phone in the same location where you will use the GSM RELAY 2. For a test use a SIM card from GSM RELAY 2 (it's important to test GSM signal of the same GSM operator). The mobile phone should show the signal level at least 2 bars.
Some parameters are missing on the SIM card	The phone book on a SIM card is full. (There is no place on a SIM card for parameters)	Delete some of contacts in a phone book on a SIM card (minimum 60 free places)

12. List of All Parameters

General

Name		Number	
Item	**Explanation**	**Example (Range)**	**Factory setting**
xCode **xCodeJane *)** **xCodeGeorge *)**	Access code = Password String of digits (4 digits recommended). Every SMS has to contain a valid password, otherwise it will be ignored. If there is no item called **xCode** in a phonebook of a SIM card GSM RELAY will create this item **xCode** with a value (=password) **1234**. We recommend to change this default password! It is possible to create more than one **xCode** items. For better readability it is possible to distinguish users by adding their name behind obligatory part **xCode**. E.g. **xCodeGeorge.**	84655647 (The range from 1 digit up to a count accepted by a SIM card) 456456 4321	1234
xMaster	The main (most important) user phone number. If there is no **xMaster** item present in a phonebook of a SIM card it will be created when the first valid SMS is received and it will be written with the sender's phone number.	+420777777497	-
xLanguage	This parameter selects the language of GSM RELAY. Value 1 = Czech (CZE), value 3 = English (ENG)	1 or 3	Depends on GSM operator
xRedirect	Switch on or off redirection function = resending of SMS messages without valid password to xMaster: 0=off, 1=on	0 or 1	0
xSca *)	GSM operator's SCA service center for outgoing SMS text messages. If **xSca** 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).	+420603052000	-
xAutoCall	Some GSM operators request at least one paid call to be done from a SIM card in a specified time period – see chapter **Automatic voice call**. Insert proper phone number (your mobile phone number is recommended) and GSM RELAY will make phone call in requested time periods.	+420777777497	-
xAutoCallInt	The time period between two calls to a phone number in the **xAutoCall** parameter. E. g. for **xAutoCallInt** = 3 the GSM RELAY will make a phone call to a phone number in a **xAutoCall** parameter every 3 months. (1 = 1 month, #2 = 2 days, *3 = hours, 1#2*3 = 1 month 2 days 3 hours)	1#2*3	#30
xAutoCallFrom	This parameter specifies begin time (in hours), when automatic voice call is allowed.	18 (0 - 24)	9
xAutoCallTo	This parameter specifies end time (in hours), when automatic voice call is allowed.	21 (0 - 24)	18
xAutoSms	This parameter specifies phone number to send automatic SMS message. GSM RELAY will send SMS message in requested time periods. Text of SMS is "GSM RELAY2 TERM TT: I'm alive."	+420777777497	-
xAutoSmsInt	The time period (in moths, days, hours) between two SMS to a phone number in the **xAutoSms** parameter. E. g. for **xAutoSmsInt** = 3 the GSM RELAY will send SMS message to a phone number in a **xAutoSms** parameter every 3 months. (1 = 1 month, #2 = 2 days, *3 = hours, 1#2*3 = 1 month 2 days 3 hours)	1#2*3	#30
xAutoSmsFrom	This parameter specifies begin time (in hours), when automatic SMS message is allowed.	18 (0 - 24)	9
xAutoSmsTo	This parameter specifies end time (in hours), when automatic SMS message is allowed.	21 (0 - 24)	18
xVts *)	This parameter allows sending a sequence of DTMF tones (e.g.: 123456789) Max. number of tones is 29.	0-9#*ABCD	-
xVtsRepeat *)	This parameter allows repeating of a sequence of DTMF tones (**xVts**). 0 = no repeat, 1 = repeat	0 or 1	-

Call control

Name		Number	
Item	**Explanation**	**Example (Range)**	**Factory setting**
xRemCall	This parameter with value 1 enables to generate a pulse on an output just by ringing from a phone. This pulse is generated on an output specified by the parameter **xRemDout** (the factory setting is OUT2). This function is useful for a gate opening using a mobile phone. If a parameter **xRUser** is specified the pulse is generated only when the ringing is from the phone number which is set in the **xRUser** parameter. It's possible to set up more parameters of **xRUser** type which can be distinguished by adding a name e.g. **xRUserJane**. Parameter **xRemConfirm** select if the GSM RELAY will open the gate immediately or it will wait for confirmation (which prevent from unwanted opening the gate).	0	1
xRemConfirm	This parameter specifies if confirmation before pulse generation is required. (Confirmation prevents unwanted or accidental gate opening). Principe of confirmation is as follows: GSM RELAY rejects incoming call than immediately calls back to user. In case there is no reaction from user (the user neither answers the call nor rejects the call) then it means no confirmation and the gate will not open. In case there is a reaction from user during 29 seconds - it means the user either answers the call or rejects the call – the gate will open. The **xRemConfirm** parameter value 0 means no confirmation. Value 1 means that GSM RELAY will make a voice call for confirmation. Value 2 means that GSM RELAY will make a data call for confirmation. Data call confirmation is faster but is not supported by all types of mobile phones.	0 or 1 or 2	0
xRemDout	This parameter specifies an output on which the pulse will be generated by ringing. E. g. For a parameter **xRemDout** = 2 than the pulse will be generated on an output OUT2 (factory setting).	2	2
xRUser **xRUserPeter *)**	This parameter specifies a phone number. Whenever a call comes from this phone number pulse 4 seconds long is generated on an output given by **xRemDout** parameter. The first phone number from which comes the first valid SMS to GSM RELAY with a "new" SIM card will be written as a **xRUser**. More parameters of xRUser type can be in a phonebook of the SIM card. This is useful in case when an entry gate should be opened by more users. The users can be distinguished by a text (usually a name) after an obligatory text **xRUser** (e. g. xRUserPeter). If there is no parameter of **xRUser** type on the SIM card (e.g. the **xRUser...** group is cleared from SIM card phonebook), any incoming call will generate a pulse on OUT2 (in case of the factory configuration). This is useful for an entry gate with many users and low level of security. Anybody who knows the proper phone number can open the gate.	+420777777497 +420777111111	- -

Inputs and outputs

Name		Number	
Item	**Explanation**	**Example (Range)**	**Factory setting**
xe[....+....+.....] **(general form)**	It's possible to set events for GSM RELAY inputs and outputs which will send so called "event SMS" or make a voice call. (It's useful to set GSM RELAY to make a voice call after an SMS. It's a higher probability you will read the SMS than). This SMS is sent to a phone number which is in a SIM card phonebook under the name of an event. See the examples how to create an event name below. If the phone call is answered the DTMF tones can be hear.		
xeI1+LH+SMS	SMS is sent when the input 1 changes level L->H. SMS format is: `GSM RELAY2 TERM: In1 ALARM!`	+420777777497	-
xAIn1Level *)	This parameter means temperature level in °C for sending SMS or CALL to user.	0	5
xAIn1Hyst *)	This parameter prevents the GSM RELAY to send warning SMS concerning temperature too often. Example: if **xAIn1Hyst** = 2 and **xAIn1Level** = 5, event SMS is generated if temperature is below 3°C (5°C - 2°C), and next SMS is generated if the temperature goes above 7°C (5°C + 2°C).	2	1
xAIn1State *)	This parameter specifies if the value of this analog input (in this case the temperature of temperature sensor t1) will be in the state message	0	1
xAIn1Delay *)	This parameter specifies how many seconds has the value of analog input (in this case t1) be lower or higher than the level specified in **xAIn1Level** parameter before the event is evaluated and the SMS is sent or a CALL made.	10	1
xIO[i]state	This parameter specifies if a status of **i** input/output will be mentioned in a GSM RELAY status SMS (e. g. for **xIO2state** = 1 the status SMS will contain: "IN1=on"). Value 0 means no status information of **i** input/output will be mention in the status SMS.	0 or 1	1
xIO[i]delayLH	This parameter helps to limit the count of event SMS in case of an input signal changes its level too often. This parameter specifies how many seconds the inputs signal **i** must not change before it is considered to be valid for a change level L->H. Value 0 means immediate reaction.	3	1
xIO[i]delayHL	This parameter helps to limit the count of event SMS in case of an input signal changes its level too often. This parameter specifies how many seconds the inputs signal **i** must not change before it is considered to be valid for a change level H->L. Value 0 means immediate reaction.	2	1
xIO[i]pulseLen	This parameter specifies the length of a pulse on an output no **i** in seconds.	10	4
xIO[i]neg *)	This parameter specifies if the state of input [i] and/or of output [i] inverted. 0 = not inverted, 1 = inverted	0 or 1	0
	Examples of events from inputs: Inputs: xeI**a**+**b**+**c** **a** … input number **1** **b** … **LH** – change level L->H , **HL** – change level L->H **c** … **SMS** – send SMS, **CALL** – ring Example: **xeI1+LH+CALL** *) - Voice call is made when the input 1 changes level L->H. You can accept or reject the call on your mobile phone. Outputs: xeO**a**+**b**+**c** **a** … output number **2** **b** … **LH** – change level L->H, **HL** – change level H->L **c** … **SMS** – send SMS, **CALL** – ring Example: **xeO2+HL+SMS** *) – SMS is sent when the output 2 changes level H->L. SMS format is: `GSM RELAY2 TERM: INOUT2 H->L` **xeO2+LH+CALL** *) – Voice call is made when the output 2 changes level L->H (GSM RELAY2 will call you whenever anybody is opening the gate). It is possible to send more SMS or make more CALLS from one event. Just create another parameter in phone book with the same name (or add some name at the end for better readability, e.g. xeI1+LH+SMSGeorge).	+420777777497	-

Credit

Name		Number	
Item	**Explanation**	**Example (Range)**	**Factory setting**
xCredit	This parameter enables a function "Read Credit" for a prepaid SIM card. The credit level is a part of GSM RELAY status SMS, e. g. Credit=250.48. It's possible to set the **xEvent8004** parameter and GSM RELAY will send an SMS when the credit is lower than **xCreditLimit** parameter. For **xCredit=1** the function "Read Credit" is active. For **xCredit=0** the function "Read Credit" is not active.	0 or 1	1
xCreditCode	A code for the credit reading. This code depends on a GSM operator. GSM RELAY tries to determine this code automatically, but it works only for Czech Republic. In other countries manual correction of this parameter is needed. (Contact your GSM operator for details).	*22# VODAFONE KARTA Vodafone *101# TWIST T-Mobile *104*# GO O2	-
xCreditFreq	This parameter specifies how often the credit will be read. It means how many minutes will GSM RELAY wait between reading the credit again.	300	60
xCreditLimit	Whenever credit goes below **xCreditLimit** parameter in CZK, an SMS can be send. (The **xEvent8004** parameter has to be set for this).	100	50
xEvent8004 *)	This parameter specifies the phone number where the GSM RELAY will send an SMS to inform that a credit on a prepaid SIM card is below the limit specified in **xCreditLimit** parameter.	+420777777497	-

Limits

Name		Number	
Item	**Explanation**	**Example (Range)**	**Factory setting**
xLimit	**xLimit** parameter activates a function which limits the number of SMS/voice calls per time period specified by a **xLimitTime** parameter. For **xLimit=1** the function is active. For **xLimit=0** the function is not active.	0 nebo 1	1
xLimitCount	This parameter specifies the count of SMS/voice calls per a time period (see **xLimitTime**). After restart the device starts counting from zero again.	10	30
xLimitTime	Time period in days for the function of count of SMS/voice call limit. (See parameter **xLimit**).	1	7
xEvent8003 *)	The phone number where the GSM RELAY 2 will send an SMS to inform that the "SMS count limit per specified time period" was reached. (See parameters **xLimitCount** and **xLimitTime)**	+420777777497	-

*) These parameters are not created on phonebook automatically. The user has to insert them manually if change of the default value of the parameter is needed.

Some parameters on SIM card are for future use. Please do not change it (**xgprs, ***1, ***2, ***3, ***4, xhistory**).

Following parameters are added on the SIM card after receiving the first valid SMS **(the phone number of SMS sender is used):**

Name in a phonebook on the SIM card	Description	Event SMS Message
xeI1+LH+SMS	An SMS is sent when INP1 changes from L->H	GSM RELAY2 TERM: In1 ALARM!
xMaster	Setup main user xMaster	
xRUserMaster	Setup user for control by ringing	