GSM Switch
GS 300 KIT

GSM device driven by Mobile Phone

User's Guide

Mikrovlny s.r.o., www.mikrovlny.cz

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1. Description

GSM Switch is designated for remote appliance control by SMS or ring-on from mobile phone. Also GSM Switch can be used as thermostat due to integrated thermal sensor. Other inputs and outputs are – relay output, real time clock and microphone for tapping.

GSM Switch can drive appliance powered by 230V and max. current is 8A.

GSM Switch features:

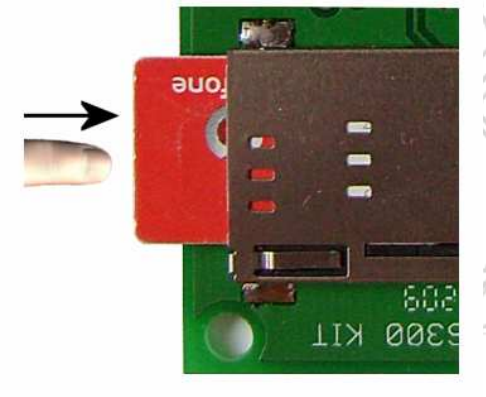
- Turn ON/OFF connected appliance by SMS or Ring-on: 230V, 8A
- Computer Server restart
- Power input and Temperature monitoring
- Other sensors: motion detector, gas detector, door open switch, voltmeter with recorder
- Tapping
- Thermostat function
- Temperature alarm
- Time planning
- Security alarm
- Can be driven by SMS from internet
- Planed switching ON/OFF

SIM CARD – SIM card slot, **TEMP SENZOR** – Temperature sensor
ANTENNA – Connector SMA for connecting any external GSM antennas.
RELAY/GSM/POWER/INPUT – LED indicators.
C NO NC – Switching contacts of bi-stable output relay, C is connect with NC, device is in status TURN ON, LED POWER is shining. C is connect with NO – TURN OFF, LED POWER is off.
MIC – Microphone for TAPPING.
SET – Micro button, press you can turn ON or OFF output relay.
12VAC, 12VDC – Power supply with minimum current 300mA
INPUT – Input JACK 3,5mm stereo, for sensors (gas detection, motion detector etc.)

2. Instalation

2.1. Connection

- Insert SIM card into SIM card slot like on left figure. By pressing SIM card next time you can remove it. (*SIM card should have turned OFF PIN check. PIN check should be set in mobile phone. Please see documentation for your mobile phone.*)



- In case when PIN check is turned ON, GSM indicator is flashing – see Error codes chapter (10.2).
- Connect GSM Switch to 230VAC.
- All indicators are flashing for a while, then start self testing for 10 sec.
- When done, RED indicator Power is shining.
- GSM indicator is flashing (GREEN) when is looking for network. After network register flash for short time each 2 sec.
- Relay indicator is shining/dark if output is ON/OFF.
- Now is GSM Switcher prepared for using.

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2.2. Basic Operating

Commands are send by SMS to phone number assigned with inserted SIM card.

Command example:

1. pinCOMMAND - e.g. 1234Vypni– ***If pin check is turned ON SMSPIN=1234***
2. COMMAND - e.g. Vypni – ***with PIN check (default)***

SMS commands has two types:

1. Control - are used to operate outlet in any time. Are used with SMS PIN and list of Allowed numbers.

2. Configure– are used for configuration other services without any security restriction, but Configure commands can be used only in first 10minutes after turn ON or after last Configure command.

Commands for base outlet control			
SMS command	*Description*	*SMS response*	*Command Type*
TUNROFF	Turn OFF outlet and JACK1 output	TurnedOFF	*Control*
TURNON	Turn ON outlet and JACK1 output	TurnedON	*Control*
TURNOFF=123	Turn OFF outlet for 123 minutes, max. 180 min	TurnedOFF 123 min	*Control*
TURNON=123	Turn ON outlet for 123 minutes, max. 180 min	TurnedON 123 min	*Control*
RESTART	Change Relay state for certain time period	Restarted	*Control*
STATUS	Return switch status	TurnedOFF, Temperature = 25°C, Signal = 35%, Input=Disconnect, Time= rr/mm/dd,hh:mm:ss, Alarm ACT *	*Control*
RINGON	Call back, important for pre-paid SIM card	This SMS is not confirmed	*Control*
CREDIT*XX#	Return credit amount on SIM card VODAFONE KREDIT*22# EUROTEL KREDIT*102# T-MOBILE KREDIT*101#	Your credit is XXX	*Control*

*- Temperature is shown in 10minutes after GSM switch restart. Alarm is shown after activation by **ACT** or **DIS** event from JACK2 when alarm is activated. When alarm is deactivated and there is some activity on input sensor, message **DET** is shown. In normal operating mode is ZAP or VYP message returned.

"Input" show actual value on input JACK2. JACK2 can be used for status monitoring. In case CREDIT command, GSM Switch return the same message like in mobile phone after entering *XX# code, (codes 22, 102 and 101 are used in Czech Republic!)

If you enter wrong command, there is no Error message. Please test command(s) function before using it. If you enter wrong command, you can reconfigure your SIM card. Command TURN ON/TURN OFF= 123 and power outage is time count down from last value before power outage.

2.3. Control by RING-ON

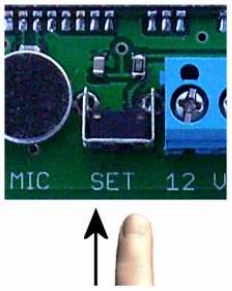
GSM Switch can be controlled by Ringing-on. To set action which start after incoming call is command **RINGING.**

Commands for outlet control			
SMS command	*Description*	*SMS response*	*Command Type*
RINGING=NOACTION	Hang up incoming call	RINGING=NOACTION - OK	*Configure*
RINGING=RESTART	Restart after incoming call, hang up	RINGING=RESTART - OK	*Configure*
RINGING=SWITCH	Switch the outlet, hang up	RINGING=SWITCH - OK	*Configure*
RINGING=TAPPING	Answer the phone and start tapping for one minute	RINGING=TAPPING - OK	*Configure*
RINGING?	Return options for Ring-on configuration. In parenthesisis current settings	RINGING=(NOACTION),RESTART,SWITCH,TAPPING	*Configure*

To set Time delay for **RESTART** you can use command **RESTARTTIME**.

Restart Time setiings			
SMS Command	*Description*	*SMS response*	*Command Type*
RESTARTTIME=XXX	Time in sec. for RESTART, 1 to 180 sec	RESTARTTIME=XXX - OK	*Configure*
RESTARTTIME?	Current settings	RESTARTTIME=10 second	*Configure*

2.4. Manual Control



GSM switch can be controlled by small button beside the SIM card slot (figure on the right). By short press you can turn ON/OFF output outlet.

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3. Safety

GSM Switch can be configured for maximum safety to avoid unauthorized Switch control.
There are two authorization types:

- Allowed phone numbers
- SMS PIN

Both types can be used together. In first case, GSM switch can be controlled only from allowed phone numbers. In second case, only SMS with correct pin are accepted by GSM Switch.

Note: SMS PIN is different from SIM card PIN, it is some kind of security code written in control SMS.

3.1. Basic security settings

Security commands

Advanced configuration			
SMS command	*Description*	*SMS response*	*Command Type*
SMSPIN=NOPIN	Turn OFF PIN checking	SMSPIN = NOPIN - OK	*Configure*
SMSPIN=1234	Turn ON PIN checking	SMSPIN=1234 - OK	*Configure*
SMSPIN?	Show current settings	SMSPIN = (NOPIN), 1234	*Configure*
PERMITNUMBER=NO	Turn OFF allowed numbers checking	PERMITNUMBER=NE – OK	*Configure*
PERMITNUMBER=YES	Turn ON allowed numbers checking	PERMITNUMBER=ANO – OK	*Configure*
PERMITNUMBER=CHECKLIST	Return list of allowed numbers	Nothing or list of allowed numbers XXX	*Configure*
PERMITNUMBER?	Show current settings	PERMITNUMBER=(NE),ANO,CHECKLIST	*Configure*
PERMITNUMBER+420XXXXXXXXX	Insert allowed number for outlet control.	PERMITNUMBER+420XXXXXXXX, OK	*Configure*
PERMITNUMBER-420XXXXXXXXX	Remove number from allowed number(s) list.	PERMITNUMBER-420XXXXXXXXX - OK	*Configure*
PERMITNUMBER-ALL	Delete whole allowed numbers list	PERMITNUMBER-ALL – OK	*Configure*
SMSWWW=NO	Disable control by SMS sent from Internet	SMSWWW=NO - OK	*Configure*
SMSWWW=YES	Enable control by SMS sent form Internet	SMSWWW=YES - OK	*Configure*
SMSWWW?	Show current settings	SMSWWW=(NO),YES	*Configure*

List of Allowed numbers can hold 7 numbers (15 characters long)

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4. Confirmation SMS

Confirmation SMS is used for information that Command was executed successfully. In case of Incoming call GSM switch use Confirmation by Ring-on.

Confirmation SMS			
SMS command	*Description*	*SMS response*	*Command Type*
SMSCONFIRM= YES	Enable confirmation SMS	SMSCONFIRM = YES - OK	*Configure*
SMSCONFIRM=NO	Disable confirmation SMS	SMSCONFIRM = NO - OK	*Configure*
SMSCONFIRM?	Show current settings	SMSCONFIRM = NO,(YES)	*Configure*
RINGCONFIRM=YES	Enable confirmation by Ring-on. Hang up after 10 sec.	RINGCONFIRM = YES - OK	*Configure*
RINGCONFIRM=NO	Disable confirmation by Ring-on.	RINGCONFIRM = NO - OK	*Configure*
RINGCONFIRM?	Show current settings	RINGCONFIRM = (NO),YES	*Configure*
BADRESPONSE=YES	Inform about wrong commands	BADRESPONSE = YES - OK	*Configure*
BADRESPONSE=NO	Disable wrong commands info	BADRESPONSE = NO - OK	*Configure*
BADRESPONSE?	Show current settings	BADRESPONSE = NO,(YES)	*Configure*

5. Thermostat settings

GSM switch has integrated temperature sensor, you can get actual sensor temperature by SMS command **STATUS.** Sensor is used for Thermostat function – switch on or off output outlet depend on temperature boundaries.

Thermostat settings			
SMS command	*Description*	*SMS response*	*Command Type*
THERMOSTAT=NO	Disable temperature check	THERMOSTAT = NO - OK	*Control*
THERMOSTAT=YES	Enable temperature check	THERMOSTAT= YES - OK	*Control*
TEMPON=XX	Temp boundary for switch ON output outlet if value is bellow this value. Default value: 20	TEMPON = XX - OK	*Control*
TEMPOFF=XX	Temp boundary for switch OFF output outlet if temp value exceed this settings. Default value: 25	TEMPOFF = XX - OK	*Control*
THERMOSTAT?	Show current settings	THERMOSTAT = (NO), YES ON=20 OFF=25	*Control*

e.g. for turn ON heating between 20 and 30 °C you set:
THERMOSTAT=YES,
TEMPON=20, TEMPOFF=30*, for air condition* ***TEMPON=30, TEMPOFF=20.***

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6. Actual date and time setting

You can set actual date and time by **DATE** commands. There are two ways how to set datum and time by this command:

- Automatic – used Date and Time from incoming SMS
- Manual – you can enter any time by using this command format **DATE=yy/mm/dd,hh:mm:ss+zz**
  zz is time zone – enter with + or - sign.

GSM Switch has own time generator, which is back-upped by battery for at least 16 hours in Power outage.

Aktuální čas			
SMS command	*Description*	*SMS response*	*Command Type*
DATE	Set date and time from incoming SMS	DATE yy/mm/dd,hh:mm:ss+zz - OK	*Configure*
DATE=yy/mm/dd,hh:mm:ss+zz	Set date and time from command.	DATE=rr/mm/dd,hh:mm:ss+zz – OK	*Configure*
DATE?	Show current settings	DATE rr/mm/dd,hh:mm:ss+zz	*Configure*

6.1. Time planning

GSM Switch can be used as Timer switch. There is Plan function which can hold 8 entries.

Timer planning			
SMS command	*Description*	*SMS response*	*Command Type*
SCHEDULER+ hh:mm,*,ON	Store entry for switch ON output outlet in entered time each day	SCHEDULER+ hh:mm,*,ON - OK	*Control*
SCHEDULER-hh:mm	Remove time plan entry	SCHEDULER-hh:mm - OK	*Control*
SCHEDULER?	Show current settings	hh:mm,*,ACTION	*Control*

Asterisk character (*****) is used for any day in week. If you enter number instead asterisk, the command will be executed in selected time only in entered day.

Day number:
1 – Monday, 2 – Tuesday , 3 - Wednesday , 4 – Thursday, 5 – Friday, 6 – Saturday, 7 – Sunday

Commands for outled shoud be: **ON** or **OFF** for turn ON or turn OFF output outlet in entered time or command **INF** for information send to number configured by **ALARM** command described in chapter 7.

Only 8 entries can by stored in Timer planning.

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Timer planning command **SCHEDULER?** response example (5 actions is stored)

	Description
10:00,*,ON	each day in 10:00 turn on outlet
14:30,*,OFF	each day in 14:30 turn off outlet
01:00,1,AON	each Monday in 1:00 turn on alarm
02:00,2,AOF	each Tuesday in 2:00 turn off alarm
02:11,3,INF	each Wednesday in 2:11 send status about output outlet

7. Alarm

Alarm function is one from most important. You can watch actual status of GSM Switch and connected sensors. Also you can turn on automatic Alarm watch or you can see sensor activation history. This history is stored independent from alarm settings. For example if Motion sensor is connected, into sensor activation history is written each sensor activity. This activity can turn on Alarm, switch outlet, ring-on selected number, send SMS or switch JACK output.

Input JACK for external sensors

If the external sensor is correctly connected, the LED power indicator change color from RED to Green. If GSM Switch detect change on Sensor input, LED indicator start fast flashing. Alarm commands are listed in next table.

Alarm functions			
SMS command	*Description*	*SMS response*	*Command Type*
ALARM+420123456789	Enter callback (or SMS) number for Alarm activate message	ALARM+420123456789 - OK	*Command*
ALARMON	Enable alarm	ALARMON 420123456789 - OK	*Command*
ALARMOFF	Disable alarm	ALARMOFF - OK	*Command*
Error status			
Alarm – No sensor	No sensor connected.		*Error*
Alarm - No number	No callback number		*Error*

If the Alarm is configured, power LED indicator starts flashing in 1 sec. interval.

If the Alarm is activated, power LED indicator change color to RED and starts fast flashing. Selected action is immediately executed. You can configure alarm action by **ALERT** command.

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Alert functions			
SMS command	*Description*	*SMS response*	*Command Tpe*
ALERT=RINGON	Ring-on in alarm is activated	ALARM+420123456789 - OK	*Configure*
ALERT=SMS	Send SMS in alarm is activated	ALERT=SMS - OK	*Configure*
ALERT=SMSCHANGE	If input state changed, sent a SMS	ALERT=SMSCHANGE -OK	*Configure*
ALERT?	Show current settings	ALERT=(RINGON),SMS, SMSCHANGE	*Configure*

If you choose Ring-on action, when alarm is activated, GSM switch call to selected number for 30 sec. After 1 minute is GSM Switch prepared for new alarm event. This function can be used with PIR motion sensor. This function isn't useful for Door contacts or other sensors which stay in activated mode, because GSM switch will execute alarm action each minute (there is still reason for alarm action). In this case you can use command **ALERT=SMSCHANGE**. This command is also useful for UPS monitoring, in case alarm detection GSM Switch send SMS related to input change.

7.2. Time when alarm was activated

You can get list of Alarm or sensor events by DUMPALARM=XX Command. Last 5 events are stored, first one is most current.

Alarm function , events dump			
SMS command	*Description*	*SMS response*	*Command Type*
DUMPALARM=XX	Return all alarm/sensor events with time.	yy/mm/dd:hh:ss	*Control*

This function is useful for monitoring person movement with disabled Alarm function. Entries are updated witch each JACK2 input change.

Important note: If alarm is activated **(ALARMON)**, you can deactivate it by small button beside SIM card slot then you can control JACK output and factory settings – see chapter 11. You can use more sensors with branch piece (see figure on bottom) but watch out the maximum power load - 50mA.

7.3. Temperature Alarm

If you like to be informed about exceeding temperature boundaries, use **TMEPALARM** command. This command is an extension of **TEMPON=MAX** and **TEMPOFF=MIN.** configuration, also is used in Thermostat function.
For proper functionality you have to set Alarm number by **ALARM+0420123456789** command.

Temperature boundary watching is activated 10 minutes after turning ON GSM Switch or after last configuration.

Temperature alarm functions			
SMS command	*Description*	*SMS response*	*Command Type*
TEMPALARM=NE	Disable temp. watching	TEMPALARM=NO - OK	*Control*
TEMPALARM=MAX	Send SMS if MAX temperature is exceeded	TEMPALARM=MAX - OK	*Control*
TEMPALARM=MIN	Send SMS if temperature is bellow MIN temp.	TEMPALARM=MIN -OK	*Control*
TEMPALARM=MIX	Send SMS in both cases (MIN or MAX)	TEMPALARM=MIX -OK	*Control*
TEMPALARM?	Show current settings	TEMPALARM=(NO),MAX,MIN,MIX	*Control*

Note:

- In case of temperature alarm, GSM Switch send: **Alarm ! Temperature : XX C**. To avoid unwanted messaging due temperature changing, temperature must achieve both boundaries. For example – if MAX is exceed, GSM Switch send a SMS. Other SMS is sent after MIN temperature is achieved and after then MAX temperature is exceeded.

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8. Other SMS commands

Other			
Power outlet state after power outage			
SMS Command	*Description*	*SMS response*	*Command Type*
OUTPUT=REMEMBER	Set output outlet to state which was before GSM Switch was turned OFF	OUTPUT=REMEMBER – OK	*Configure*
OUTPUT=ON	After turn ON is power outlet always ON	OUTPUT=ON - OK	*Configure*
OUTPUT=OFF	After turn ON is power outlet always OFF	OUTPUT=OFF - OK	*Configure*
OUTPUT?	Show current settings	OUTPUT=(REMEMBER),ON,OFF	*Configure*
Input JACK2 settings for alarm detect			
INPUT=DISCONNECT	Alarm status for sensor is set to Not Connected. If status changed to Not Connected, alarm function is executed.	INPUT=DISCONNECT -OK	*Configure*
INPUT=CONNECT	Alarm status sensor is set to connected, Alarm function is executed if 0V is switched on Input. Almost all PIR sensors have this behavior.	INPUT=CONNECT - OK	*Configure*
INPUT?	Show current settings	INPUT=DISCONNECT, (CONNECT)	*Configure*
Version of firmware			
VERSION	Show Firmware version	Ver. 1.0.8 © 2008	*Control*

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9. SMS Error response

Error messages are sent only if they are Enabled – see chapter 3.

Error SMSm list	
SMS response	*Description*
Error !	Wrong command or incorrect SMS PIN.
Not permited !	Number is not in allowed numbers list.
Timeout !	Configuration SMS Timeout, you have to Restart GSM Switch. Timeout is 10 minutes after power on or last configuration command.
Full memory !	Memory for Allowed numbers is Full – only 7 numbers can be stored
No sensor	No sensor connected - Alarm related error.
No number	No alarm callback number entered or entered number isn't in allowed numbers list.
No record	Nothing to Erase – in case allowed numbers list or alarm history entry delete

10. LED indicators

10.1. Function indicator

GSM Switch has 3 color LED indicator on main panel:

Power - red, continuous light indicate Power ON, fast flashing for times per second indicated Alarm enabled detection
Green, continuous light = external sensor is connected. Fast flashing four times per second indicated alarm detection without alarm activation.

GSM - green, indicate GSM network, flashing one time per second – looking for GSM network, short flashing – successfully registered in GSM Network.

Relay - yellow, continuous light/dark – indicated outlet status – ON/OFF

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10.2. Error indication

Power - red, flashing two times per second – no SIM card inserted

GSM - green, flashing two times per second, SIM card with PIN enabled was inserted. You have to turn OFF PIN check in your mobile phone. Please see documentation of your phone.

Relay - yellow, fast flashing, HW error – for example due to invalid GSM module and etc.

11. Control button

11.1. Manual Power ON/OFF output outlet

Power outlet can be controlled by small button beside SIM card slot. By short press you can turn ON or OFF outlet.

11.2. Default (factory) settings

Default (factory) configurations can be set by pressing control button for 5 sec. After release all LED indicators flashing for few times. By other short button press are Default values set.

Default settings				
Command	**Value**		**Command**	**Value**
RINGING	NO		THERMOSTAT	NO
RESTARTTIME	10		TEMPON	20
SMSPIN	NOPIN		TEMPOFF	25
PERMITNUMBER	NO		ALERT	RINGON
SMSWWW	NO		OUTPUT	REMEMBER
SMSCONFIRM	YES		INPUT	CONNECT
RINGCONFIRM	NO		TEMPALARM	NO
BADRESPONSE	YES			

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12. Technical Parameters

Model	GSM SOCKET GS300
Power	12VDC or VAC with adaptor 230VAC/12VDC 300mA
Output otlet	230V, CEE 7/4, 10A (resistance load)
Working temperature	0 to 50° C, max 80%
Normal power consumption	30mA , 0.36W
Transmit consumption	100mA, 1.2W
Working condition	Normal
Input JACK2, 3 pins	GND, INPUT, 12V, power load max. 50mA with electronic 140mA shorting fuse.
GSM	900 / 1800 / 1900 MHz
SIM	Plug-in 3V
Antenna	Included external 2dBi
Configuration	By SMS
Temperature sensor	Precision +-2° C, range 0 – 50°C
LED indicators	1x due color POWER, 1x green GSM, 1x yellow RELAY
Weight BRUTTO	0.30 kg
Dimensions HxWxD	70x120x30 mm
Features	Switch ON/OFF connected appliance
	Remote restart
	Temperature monitoring
	Input Monitoring/Alarm
	Tapping
	Sensors watching
Security	SMS PIN and allowed numbers list

13. Maintenance and safeness

- D eviceis not desi gned to secure unplu ggi ng appli ances fro m pow er, it's desi gned for sw itchO N orO FFconnected appli ance.
- G SM Sw itch hasn't his ow nFuse,m ust be connected to pow er netw ork w ith protecti on.
- G SM Sw itchis not A larm –it's just bonus feature of this device.
- G SM Sw itchis desi gned for InD oor usage.D on't exposeG SM Sw itch to hum id, w et or chem i cally aggressi ve envi rom ent.D on't exposeG SM Sw itch to shake, shocks and falls, you can dam ageit.
- Before use, checkifG SM devices are allow edin placew here youw ant to useH SM Sw itch.
- If youw ant use Tappi ng function you have to have perm issi on fro m personw hich youw ant Tappi ng.
- M ax allow ed pow erload connected to pow er outlet is 10A (resistant load), for hi gher load use cl am per.
- Before SIM card insertion, please erase all SM Sstored on your SIM card.
- W atch for children, SIM card can be sw allow ed

14. Other notes

- SMS commands aren't case sensitive – e.g. Turnon = TURNON = TuRnOn
- All incoming SMS longer than 30 characters or SMS contained whitespaces or dots are automatically erased.

15.1 Accessories

Name	Description
PIR-X	Motion detector, cable 5m
DK-X	Door contact, cable 5m
SD-X	Fire alarm, cable 5m
HD-X	Humidity detector, cable 5m
GD-X	Flammable gas detector, cable 5m
COD-X	Carbon dioxide detector
TRAFO4V	Outage watch transformer detector
JACK Splitter	Branch piece for more sensor connection

16. Declaration of Incorporation

Company MIKROVLNY S.R.O. claims to that for product GSM Switch described in this Manual was issued Declaration if Incorporation EU by law 1999/5/ES (R&TTE) and Government Regulations no.426/2000 Sb.

ČMI TESTCOM Praha, test protocols number: 0221-PT-B0017B-08
FTZÚ Ostrava-Radvanice, test protocols number: 08.0764-83/1, 08.0763-83, 08.0764-76, 08.0764-82, 08.0764-77, 08.0764-79.

Warranty

GSM Switch has 2 years warranty from purchase date. Wrong usage, overloading, disassembling or other damage are excluded from Warranty.

Serial number	Purchase date	Provider signature and stamp

Warranty is valid only if GSM switch serial number is identical with number on Certificate if warranty. If the Serial number on GSM Switch is missing, different or unreadable, warranty can't be acceptable. Warranty avoid if GSM switch is used in wrong way, overloaded, damaged by user, over-voltage, modified by user or unauthorized service.

Advise for Customers Please store purchase recipe and Certificate of Warranty. If the Warranty list is empty, warranty period starts with date on receipt.