

GSM-SMS-ETH Controller

User manual

Ver. 2.9

This document contains technical information and user manual for GSM-SMS-ETH Controller models 3D3K and 3D3K-RS232. In this document you can find information how to connect and configure these models.

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Content

Introduction

1. Package contents 6

2. Technical parameters
   - 2.1 Dimensions 7
   - 2.2 Front and rear panels 7
   - 2.3 Operating characteristics 8
   - 2.4 Electrical characteristics 8
   - 2.5 LED indication 8
   - 2.6 GSM 9
   - 2.7 Data interface 9
   - 2.8 RS 232 interface 9
   - 2.9 LAN interface 10

3. Getting started
   - 3.1 SIM card and antenna connection 11
   - 3.2 Connection of consumers and sensors to I/O ports 12
     - sensors 12
     - relays 13
     - audio connection 14
     - backup power 14
     - RS 232 14
     - LAN 14
   - 3.3 Power supply connection 15
   - 3.4 Start the device 15

4. Configuration and software update
   - 4.1 Configuration of the software 16
     - Authorized access numbers 16
     - Configuration of incoming calls 17
     - Configuration of sensors 17
     - LAN configuration 18
     - Email configuration 18
     - RF Control and temperature sensor control ....., ... 18
   - 4.2 Shell commands 19
   - 4.3 Firmware update 19
   - 4.4 Default settings 19

5. Technical support 21

6. Applications 22

Introduction



GSM-SMS-ETH Communicator 3D3K-A is highly professional and intelligent system with digital control.

Thanks to that system you can receive information of changes in the status of your secure or conditioning systems, rooms, etc.

Remotely control of electrical devices, manufacturing process machines, communication equipments and etc. Make audio connection.

Management is done through GSM network with ringing or sending a SMS to the SIM card placed into the device or over Internet using our web-base interface.

Application of GSM-SMS-ETH Controller is very appropriate in:

- Heating systems;
- Alarm systems
- Fire protection systems;
- Systems for monitoring and control;
- Automated systems in manufacturing;
- Pump stations;
- Vehicles;
- Communication equipment and servers;
- Measuring systems for temperature, humidity, fluid levels;
- and more.

Main features:

- 3 outputs for switching active loads with power up to 2 kW via 3 low-voltage relays;
- 3 inputs for sensors;
- 4 Wireless relays for switching active loads with power up to 3.5 kW (additional module connected to RS232 port)
- Switching the relays with SMS with specific text;
- Notification when sensor is activated through SMS, call or e-mail;
- Notification when the main power supply fails, low GSM network signal or low battery charge;
- LAN connection for remote control through Internet;*
- RS 232 port for communication over RS 232 protocol;*
- Monitoring the temperature in rooms and notification when a Minimum or Maximum temperature is reached *
- Remote check the status of relays and sensors over LAN or with SMS;
- Monitoring of power supply, GSM network and battery charge.
- Audio connection through external microphone and headphones;
- Access only from authorized numbers;
- Remember the state of switches even the main power supply fails.
- Easy configuration via USB;
- Backup power supply (external battery) when main supply fails.

* It works only for model 3D3K-RS232.

Attention:

1 Read this manual carefully before exploitation.
2 Do not put the device directly on sun or rain
3 Mount the device on a stable surface
4 Do not put the device in places where it can be soaked with liquid, next to heat-emitting devices (as air conditioner, stoves), dusty or not good conditioning places.
5 Do not cover the device. This can lead to overheating.
6 Do not drop the device. This can lead to its failure.
7 To power up the device use only the adapter included in the box. Using other adapters may damage it.
8 Do not switch the device directly to a 220V electricy. This may damage it.
9 Mounting and setting of the device should be done only from qualified stuff.

1. Contents of the package

GSM-SMS-ETH Controller is delivered to the client in cardboard box with all required supplements necessary for work. Package consists of:

- GSM-SMS-ETH Controller;
- Adapter AC/DC 110-220V/12V, 1200mA;
- Antenna;
- USB cable for settings (USB type A ⇔ mini USB type B);
- CD with software for settings and user manual;
- Supported elements;
- Guarantee sticker.

Please check if all components described in the kit are contained in the cardboard box. If any of the components is missing from your package, please contact manufacturer's representative or salesperson.

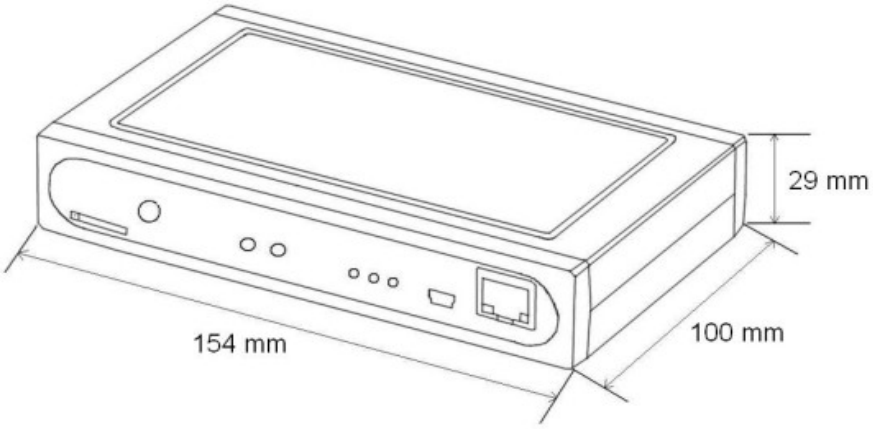
Note: The manufacturer does not provide SIM card, which is necessary for connecting to the GSM network! SIM card can be obtained only from licensed GSM operators!





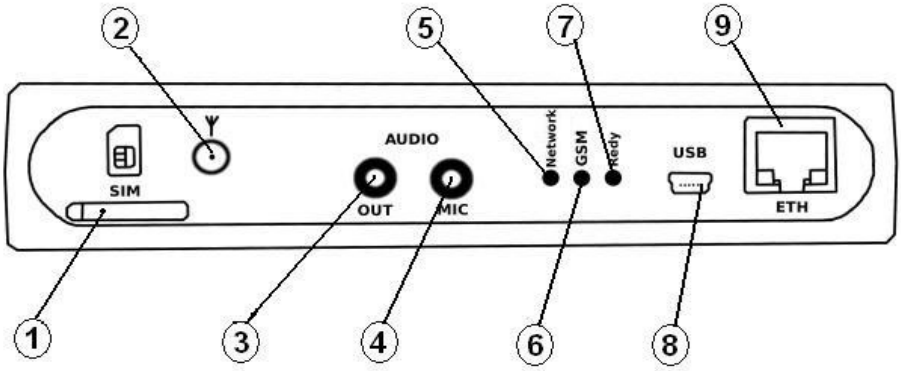
2. Technical characteristics

2.1 Dimensions



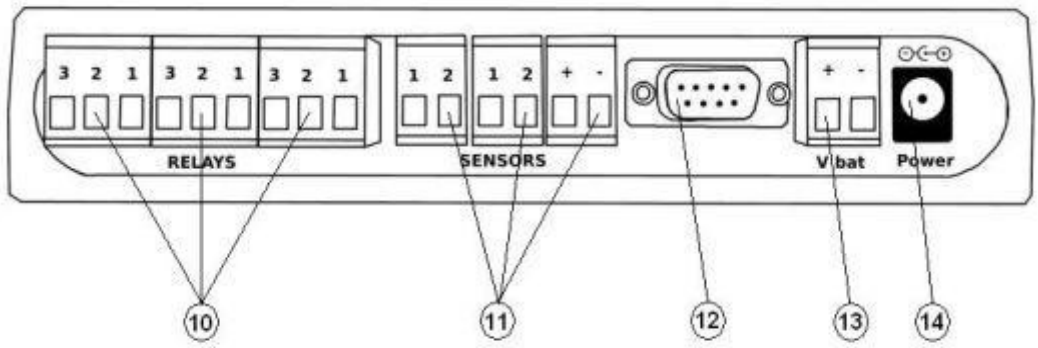
2.2 Front and rear panel

Front panel:



1 - SIM – place for SIM card
2 - Antenna – place for GSM antenna
3 - Audio out – connector for audio signals
4 - Mic – connector for microphone
5 - Network – signaling for GSM network
6 - GSM – signaling for GSM part
7 - Ready – signaling for operating of device
8 - USB – USB connector
9* - ETH – LAN connector

Rear panel:



10 - Relays – outs for relays
11 - Sensors – inputs for sensors
12 - 12 V Out – output for 12V for power a specific sensors
13* - RS 232 – Canon 9 jack for communication over RS 232 protocol
14 - V bat – power connector for back-up power (battery 12V DC)
15 - Power – power connector for adapter 12V DC

*** Only for model 3D3K-RS232.**

2.3 Operating characteristics

- Weight: 250 gr.
- Operating temperature: 0 ÷ 45 ºC
- Storage Temperature: -10 ÷ 60 ºC
- Humidity: 10% ÷ 90%

2.4 Electrical characteristics

- Power supply: 12V DC adapter
- Back-up power: Battery 12V DC
- Consumption in Stand By mode: 70 mA
- Average consumption: 350 mA
- Average power consumption in Stand By mode: 0.84 W
- Maximum power consumption: 4.2 W

2.5 LED indication

Indication of unit is consist of three LED which shows its moment status. The statuses depend of led indicators are shown in table 1:

LED	Status	Modes of GSM-SMS-ETH Controller
Green	Light	Device is starting
Green	Blink	Device is in working mode
Red	Light	GSM is starting
Red	Blink	GSM is in working mode
Blue	Blink every 1 seconds	Search for GSM network
Blue	Blink every 3-4 seconds	Device is connected to the GSM network

Table 1: LED conditions

2.6 GSM

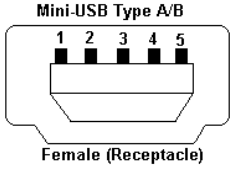
- Frequency range: 850/900/1800/1900 MHz
- Maximum output power: class 4 (2 W) ; class 1 (1 W)
- SIM card: 3V plug-in
- Antenna: SMA connector, female, 50 Ω

2.7 Data interface

For configuration and update of firmware of GSM-SMS-ETH Controller use the USB cable, which consist in the box.

Parameters of the interface:

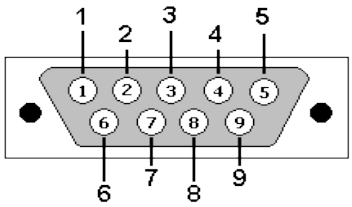
- connector: mini USB, type B
- ver. : USB 1.0



2.8 RS 232 interface

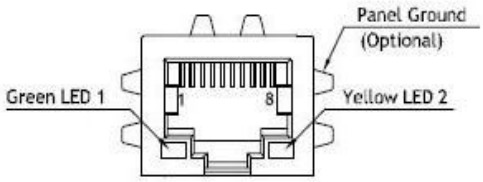
- connector: Canon 9, male
- pins:

2 - Rx
3 - Tx
4 - 12V out
5 - Ground
7 - RTS
8 - CTS



2.9 LAN interface

- connector: RJ45
- standard: Ethernet 10/100 Base-T
- IEEE 802.3



3. Getting started

3.1 SIM card and antenna connection

Before you start GSM-SMS-ETH Controller insert SIM card and switch the antenna as it shown on picture 3.1



picture 3.1

Note: SIM card inserted in the device must be with disabled PIN code. In other case the device will not start properly.

Note: Put the antenna in place where you are sure it has good GSM network coverage. Places with bad coverage (basements, villages etc.) may cause the problems with normal start up of the device and lead to occurrence of noise during dialing or calls.



Picture 3.2

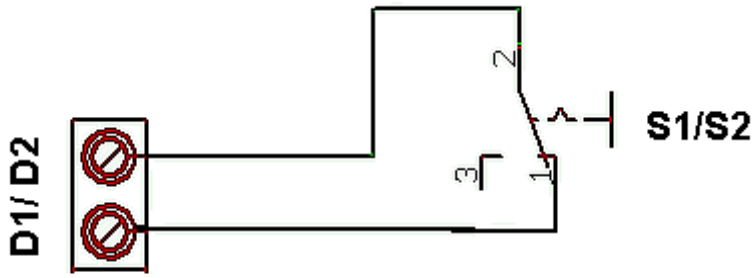
3.2 Connection of consumers and sensors to I/O ports

Sensors

GSM-SMS-ETH Controller has 3 inputs for connection of different sensors, which will alert its owner when is activated.

Inputs 1 and 2 (D1 and D2) serve to connect sensors to them, operable in open contact. When a sensor is activated the device send a SMS to one phone number or group of numbers, ring to one or more numbers preset in its memory or send an email. You can choose how to alert you – with SMS, with ringing or with e-mail.

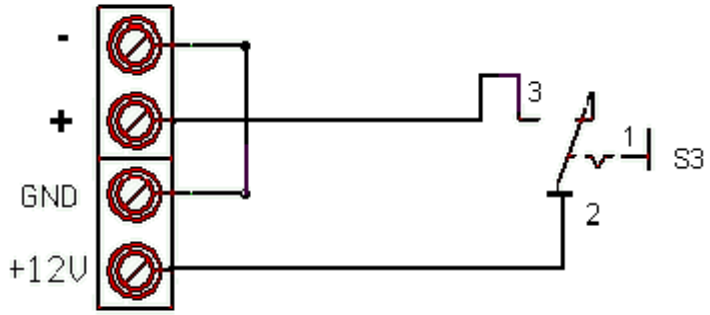
Example of connection of inputs D1 and D2 is shown in the picture 3.2



3.2 Example of connection of sensors to inputs D1 and D2:

Input 3 (D3) serve as inputs 1 and 2 to connect a sensors but its activation is through the flow of current at the entrance.

Example of connection of input D3 is shown in the picture 3.3



3.3 Example of connection of sensors to input D3:

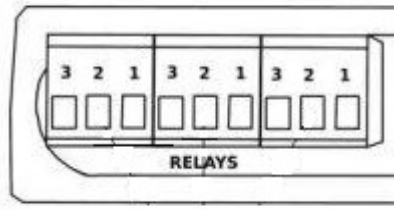
For more information about sensor connection please see Application A

Relays

GSM-SMS-ETH Controller has 3 relays which can switch on/off electrical consumers.

Directly to the outputs of the relays can connect small loads with maximum parameters **10A/30VDC, 10A/250VAC (active loads up to 2kW).** It is not allowed to connect loads with higher power. Switching circuits running over this values must use external switches. For connection of inductive loads is desirable to use external switches.

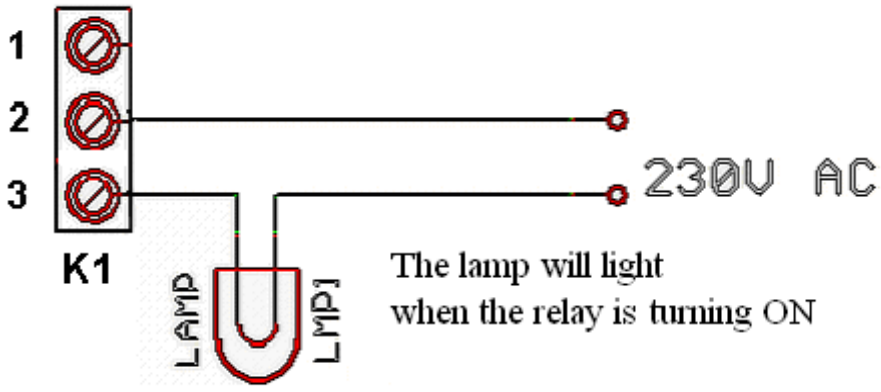
The pins of the relays are shown in the picture below:
1 – normally closed , 2 – middle point , 3 – normally open



Switching of relays is made with SMS with specific text: On:'n' or Off:'n', where "n" is the corresponding number of relay. It is possible to switch more than one relay with one SMS separating the different relays with comma.
Only relay K1 allow to be restarting with ringing.

For model "GSM SMS ETH Controller 3D3K-RS232" is possible to extend the relays up to 7 by means of 4 wireless relays and additional equipment. It can be done with a special module connected to the RS 232 port.

Example: if you want to switch on relay K1 send a SMS with text: On:1 to the number of the SIM card put into the device.



Example of connection of relays K1, K2 and K3

Audio connection

GSM-SMS-ETH Controller has an external connectors for microphone and speaker. Due to this you can make an audio connection when one of the sensors is activated and can hear what happen in the room where the device is. It is possible to make audio connection with direct call to the SIM card inserted into the device too but it is necessary to preset this feature in the configuration file.

RS 232

Due to RS 232 connection you can connect additional modules to GSM-SMS-ETH Controller. The communication between the device and these modules is made with RS 232 protocol. Thanks to this you can expand the number of operated relays or the number of sensors for monitoring and include specialized management schemes on client's request.

Using Telnet server or similar terminal you can connect to devices connected to RS 232 port and control them remotely.

Back-up power supply

GSM-SMS-ETH Controller allow to connect back-up power supply (battery) which will powered the device when the main power fails. Depending on the capacity of the battery unit will continue to work for a certain period of time until the battery voltage reaches the minimum threshold of 10.5 volts.

Requirements for the lead acid battery:

- minimum capacity of the battery: 1200 mAh
- recommended capacity of the battery 4500 mAh
- nominal voltage: 12 V
- maximum charge current: 150 mA
- minimum voltage of the battery: 10.5 V

LAN

The control of the unit can be made not only through GSM network but through LAN connection too. Through LAN, you easily and quickly can check the status of sensors and switch relays.

To control the device through Internet it is necessary to set the IP address to which it will be connected. Configuration is made via USB by using the special configuration software.

Write down the IP in your browser and you will see a page for access to the device. The access to the device is protected with username and password so don't

forget it.

Important Note: Setting of the GSM-SMS-ETH Controller can only be done via USB cable connected to PC. Changing the settings can not be done via Web-based interface or with SMS.

3.3 Connection of power supply

If you are sure that SIM card is inserted, the antenna is switch and all sensors and electrical consumption are properly connected you can connect the power supply.

We strongly recommend you to use the adapter which is included in the set. If you use adapters different from this in the set the manufacturer are not responsible for damage caused by using other power supply.

3.4 Starting

If you done all steps described above, the device will start working.

Initially the red led and green LEDs will light constantly. The green LED will start blinking then the processor is started.

The red LED will start blinking when the GSM module establish connection with the processor.

The blue LED will start blink every 3-4 sec. when the device establish connection with the GSM network. If blue LED blink more often (every 1 sec.) this mean that the GSM can't connect to the GSM network.

The green LED blink when everything work without any problem and light constantly when something not work properly.

Most common reasons for failure to start the unit:

- You forgot to insert SIM card in the unit
- You forgot to disable the PIN code of the SIM card
- The antenna is put in place with bad coverage of GSM network
- Your power supply does not meets the requirements

If launching the device fails for any reason not mentioned above please contact the technical staff for more information and assistance.

It is possible to start the device without inserting SIM card but in this case you can control the device only trough LAN. You will not receive notification when one of the sensors is activated and will be impossible to switch relays with SMS.

4.Configuration and software update

4.1 Configuration of the software

To operate the device according to the client висхес, it must be configured before цоннецтинг all sensors and electrical consumers . The setting is done via USB cable by software installed on your computer.

To set the configuration of GSM-SMS-ETH Controller first install the program „Elexim GSM ETH Controller Tool“ which can be found in the Installation CD. User manual for installation and configuration - „Client manual ver. 0.1.5 EN.pdf“ you can find in the CD in folder Docs.

If you have any troubleshoots with configuration and setting the device please contact the manufacturer or ask for help from the competent staff.

Description of settings of GSM-SMS-ETH Controller

Authorized access numbers:

GSM-SMS-ETH Controller allow to be inserted up to 255 numbers which will have access to control the device. This numbers must be written it menu List in the software for configuration. All numbers must me written in international format and must consist the prefix of the country, prefix of the city or the mobile operator and phone number.

Only the numbers written in this table will have access to control the device. SMS and calls from all other numbers will be rejected.

Configuration of incoming calls:

A ringing from authorized number to the SIM card inserted into the device can:

- restart relay K1;
- establish audio connection;
- nothing to happen.

If you choose to restart relay K1 with ringing you have to set the time of restarting (the time which device wait before go to position 1 again). This time must be in interval of 1 to 60 sec.

Example: if you set rresart time to 5 sec, and you ring to the device relay K1 will go in position '3' for 5 sec. After this time expire the relay will go in position 1.

Note: If at the time of ringing the relay K1 is in position 3 it will not change its position at first, and after the time which is set it will go in position 1.

If you choose to activate audio connection when you ring to the device it will establish audio connection between your Mobile phone and it. You will have the opportunity to listen what happen in the room in which the device is if an external microphone is connected.

Configuration of sensors:

All phone numbers which want to receive information when a sensor is activated must be written in table „Sensors Notification“ in menu List. You can add up to 255 numbers in this table.

When one of the sensor is activated device will:

- ring to one number;
- send a SMS to one number;
- ring to the group of people;
- send SMS to the group of people;
- send SMS and after that ring to one number;
- send e-mail to one mailbox.

Each sensor can set differently how to inform that it is activated. In example sensor 1 can be set to send SMS, sensor 2 to ring to 1 number and sensor 3 to send SMS to all numbers written in the table.

These settings are made in configuration software in tab “Sensors”.

If you want you can change the text of the SMS which you receive. It's length must be not more than 30 symbols.

You can label each sensor with different name so to know which sensor is activated when you receive a SMS.

These two functions is set in Sensor Name and Sensor SMS Text boxes.

When activated one of the sensor you can set the minimum time it must stay activated to send SMS or call to one number. This settings are made in box “Sensor Time” and can be from 0 to 255 seconds.

Example: If you connect magnetic sensor for doors to D1 and set Sensor Time to be 0 seconds,with the shortest opening the door sensor will trigger and GSM-SMS-ETH Controller will inform you that D1 is activated. If you set this time to 5 seconds and someone open the door for shorten time than 5 seconds D1 will not trigger immediately. The device will track D1 for 5 seconds and if it is still activated only then it will send a SMS or ring.

Configuration of notification for low GSM network signal, low battery charge or when main power supply fails:

When the main power fails, the battery is discharged or the GSM network is weak you can receive SMS or email for every one of these cases. Thus you will be always well informed and can take appropriate action fast. You have to make these setting in tab General and to point whether you want to receive or not a SMS or email.
This settings is only usable when you have a back up power supply connected to the device (back up battery).

LAN configuration

To control GSM-SMS-ETH Controller through Internet you have to set it's LAN settings in tab Network. You have to write IP address, Mask and Gateway address of the network. You can change the “username” and “password” of the page for access. By default they are: username: *admin*, password: *password.*

The port which the web server use is port 80 and can't be changed. To access the unit web server when it is connected behind router you have to forward the IP address to different port (Port forwarding setting of your router).

Email configuration

To receive email when a sensor is activated you have to fill the setting for email server (SMTP server) in tab Email. You have to: point an email address from which they will be send, an email for receiver and to write a Subject of the email which will be send.
All these settings are made in tab Email in configuration software and have to be uploaded in the device.

To work sending of emails correctly the SMTP server which is chosen must be with plain text authorization (no encryption is allowed).

RF Control и temperature sensor control:

To switch On/Off the Wireless radio transmission to the Wireless relays you have to use the command RF Control Enable.

When using the additional module - “Wireless module for remote control of 3 relays with in-build temperature sensor ”, you can set a minimum or maximum temperature. When one of these temperatures are reaching an event may occurs - call to a defined phone number, send a SMS or e-mail, switch On/Off a relay.

4.2 Shell commands

Using a proper terminal software for connection to the RS232 port of device you can use some additional system commands.

Commands:

- version – check the software version
- cat /config/config.ini - read the configuration file written in its memory.
- cat /config/mac.ini – read the MAC address of the device
- switch n m, where „n“ is a number of the relays and „m“ is 1=on or 0=off
-serial XXXX – start the connection to the serial port of the device. At XXXX you have to write the speed of transfer of data. If you do not write anything in this place the speed will be by default at 9600 b/sec.

To stop the communication to the serial port use the combination Ctrl+C.

-reset – restore the default configuration.

If you use Telnet server you need to write username and password for access. They are same as this which is use for Web server access.

More about Terminal commands you can find in Application C.

4.3 Firmware update

If you want to install newer firmware version please visit our website at www.elexim.com/downloadbg.php and download the newest version for your unit.

Detailed information about firmware installation can be found in document - **„Firmware update of GSM-SMS-ETH Controller .pdf“** in the folder of the firmware.

Important note: Please be sure that you download the correct firmware version for your device. If you are not sure if the version is compatible with your unit please contact the manufacturer or ask the competent staff for assistance.

4.4 Default settings

You can restore default setting of the unit every time you want. Go to C:\Program Files\Elexim\GSM ETH Controller Tool and use the config.ini file to restore the default settings. Open this file with configuration software and upload it into unit.

Default settings:

- time for restarting relay K1: *5 seconds.*;
- event in activation of the sensor: *ring to 1 number;*

- time for sensor activating: *1 second*;
- name of the sensors: *Sensor1, Sensor2, Sensor3;*
- text of the SMS: *Activated sensor:*
- event for an incoming call: *relay restarting;*
- automatically or manually deleting of SMS: *manually*
- rf control – *inactive*
- save switch mode - *active*
- phone numbers in access lists: *none (empty)*

LAN configuration:

- ipaddr=*192.168.5.150*
- mask=*255.255.255.0*
- gateway=*192.168.5.1*
- username=*admin*
- password=*password*

Email configuration:

- smtpip=*192.168.5.1*
- user=*yourusername*
- password=*yourpassword*
- to=*to@example.com*
- from=*from@example.com*
- subject=*Elexim GSM ETH Controller*
- msg1=*Sensor1 was activated!*
- msg2=*Sensor2 was activated!*
- msg3=*Sensor3 was activated!*

5. Technical support

If you encounter a problem while using the device and you are not able to solve them please follow these direction:

- Please check once again the SIM card, antenna and power supply to be connected as in it describe in User manual.
- Please check the PIN code of SIM card. It must be disabled
- Please check all sensors and electrical consumption that are correct connected
- Set device back to default factory settings if you have problems with some of the functions.
- Download and update newer firmware and configuration file from manufacturer's website at www.elexim.com/downloadbg.php
- If you have troubles with drivers download themwww.elexim.com/downloadbg.php from

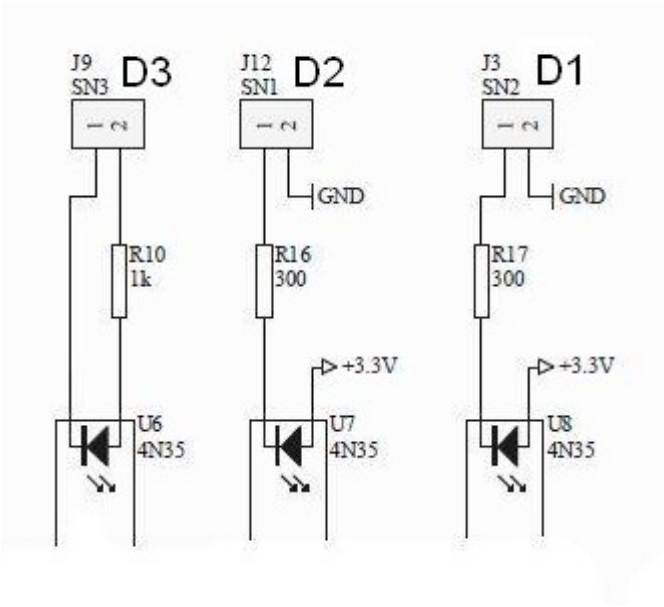
If you have troubles that you can't solve alone please contact us at tel. +359 2 9718880 or write an e-mail to us at support@elexim.com.

We always will assist you to resolve problems associated with our devices.

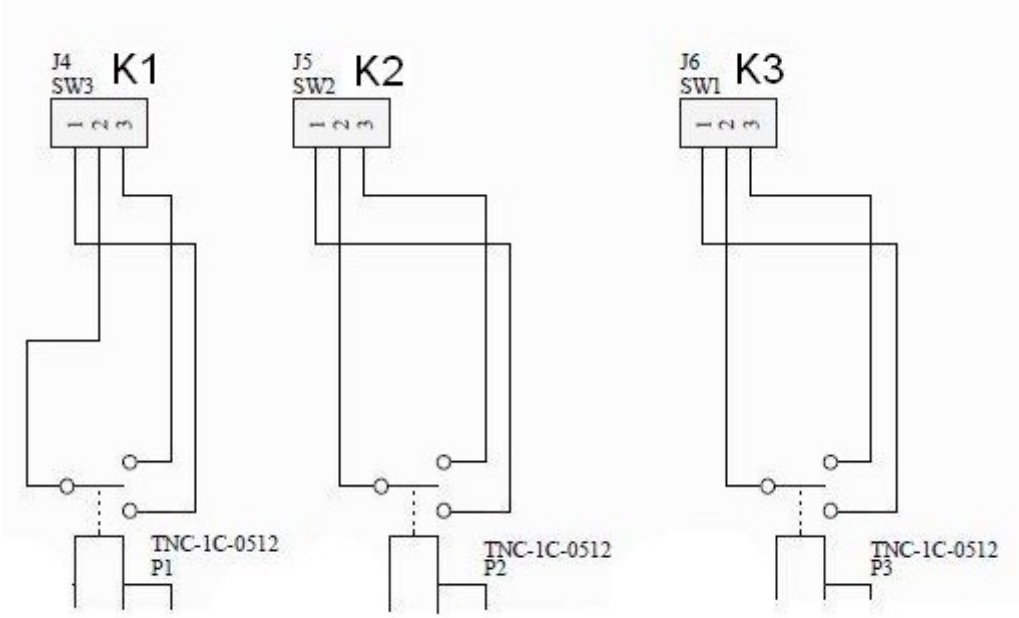
Application

A: Schematic of sensors and relays:

Sensors



Relays



B: SMS commands

Action	Command	Description
Switch On relay	**On:x**	Send a SMS with text **On:X**, where X=1,2 or 3 depending which relay you want to switch On
Switch Off relay	**Off:x**	Send a SMS with text **Off:X**, where X=1,2 or 3 depending which relay you want to switch Off
Restarting relay	**Reset:x**	Send a SMS with text **Reset:X**, where X=1,2 or 3 depending which relay you want to restart. The time of restarting is form 1 to 60 sec.
Checking status of relays and sensors	**?**	Send a SMS with **?** and you will receive a SMS with statements of all relays and sensors
Checking the temperature*	**Temp?**	Send a SMS with text **temp** and you will receive a SMS with the temperature of the temp. module

If you put the sign “?“ at the end of any SMS you send, you will always receive a SMS with the statements of all relays and sensors.

With one SMS you can switch only one relay!!! You can't use SMS with text: On:123 to switch all 3 relays.

* Using only with connected “**Wireless module for remote control of 3 relays with in-build temperature sensor”.**

C: Terminal commands (Telnet or Hyper terminal)

Action	Command	Description
Switching relays	**switch N M**	Switching relays, where N=1, 2 or 3 is the relay number, and M= 1 or 0 where 1= on, 0=off
Checking the status of relays	**switch?**	Command for checking the status of relays
Checking the status of sensors	**sensor?**	Command for checking the status of sensors
Checking the temperature	**temp?**	Command for checking the temperature of the temp. module
Checking theMAC address of the device	**cat /config/mac.ini**	Command for checking theMAC address of the device
Checking the configuration of ht device	**cat /config/config.ini**	Command for checking the configuration of ht device
Checking the wireless relays codes	**cat /config/rfcodes.ini**	Command for checking the wireless relays codes
Checking the software version	**version**	Command for checking the software version
Reset the device settings	**reset**	Command for reset the device settings and write the default settings
Format the device	**format**	Command for formatting the device memory
Access RS232 port	**serial XXXX**	Command for access to the RS port. At the place of XXXX you write the bit rate of transmitting the data (9600 Kb/sec. by default)