- Safeguards of flats, offices, garages, cottage, warehouses and cars.
- Controlling by using SMS in dialog mode with confirmation.
- Announce by using SMS
- Signal sound message in dial mode.
- Listening the object near mobile phone connected with TVGA402.
- Wide facilities in programming the parameters of inputs and relay.
- Versatile tuning of limitation of access from several phone numbers.
- Announce in the case of interrupt external power and discharging of accumulator of mobile phone.
- Built – in charger of battery of mobile phone.
- Configurable input for safeguard.

User Guide

Contents

1. Introduction

The aim of the operating instruction is to help you to learn how to operate GSM Alarm system TVGA402. We try to make these instruction quite easy to learn, but with minute description. Before operating the unit, please read this manual thoroughly, and retain it for future reference. Technical support you can get at place where you have bought. Alternatively, use the Internet http://www.tivald.ee or e-mail: info@tivald.ee

1.1. Supplied accessories

Checking supplied accessories. Make sure that the following accessories are supplied with your GSM Alarm system TVGA402.

- ✓ GSM Alarm system TVGA402;
- ✓ Software for tuning TVGA402.EXE (supplied on CD);
- ✓ Power adapter AC220V 50Hz / DC12V 0,5A;
- ✓ Connecting cable TVGA402 for SIEMENS C35/M35/S35/ME45/MT50/M50;
- ✓ Connecting cable TVGA402 for Personal Computer;
- ✓ This user guide (supplied on CD).

1.2. Words and sentences used in the operating instructions

SMS – term means a service of a short message. Giving by operator of your network. Often abbreviations SM used as "send SM message", "send reminder on SM" or "quantity of SM". Such sentences are widely practiced in modern language. We use, in these operating instructions, such kind of sentences for the purpose of much easier understanding.

Accident rate of the system – it is a situation when your GSM Alarm system TVGA402 close to damage. For example, in case of voltage drop of external power, battery do not hold a charge.

Signal text massage – SM about active sensor and accident rate of the system. This massage sends to users telephones from the list.

Dial – it is on operation of GSM Alarm system TVGA402, turn to connect to subscribers from the list, for send a signal sound massages.

Signal sound massage – a succession of sound signals corresponding to the facts.

Listening to the object. Owner of the system can make it by using a "Listen" of a text massage. Owner can connect with a help of a mobile or a home phone. After having connected you hear two beep signal, and microphone of your phone is activated. The time of connection is not limited. After you have finished you're listening – disconnect the unit.

Name – pseudonym – is a word; it used by the owner in handling of the relay and inputs while making inquires about SMS. Name-pseudonym makes your massage readable for unit. Before operating the unit, user must set the name-pseudonym to the inputs and relay of the unit.

1.3. Warning

After you have connected your mobile phone to TVGA402 all messages on your SIM card will be erased.

You can not make a call from mobile phone which is connected with TVGA402. When it is necessary you must disconnect the phone from TVGA402. Before connected phone to TVGA402 don’t forget turn off your phone.

2. Main features

GSM alarm system TVGA402 is a versatile system of remote control. TVGA402 can commutate an electric circuit as by the order of SM, so in total current events automatically, with a help of built-in relay.

2.1. Basic operation

- **Versatile tuning of limited access from a several phone numbers.** TVGA402 have a list of three phone numbers, that let making access to the system only for the registered users, whose numbers are available in the list. You can, also, make a quantity of signal calls and SM. If necessary, you can allow the control from any other phones.
- **Configurable input for arming have following parameters**:
  - active level input: low or high;
  - mode of stand or take out from guarding: by impulse or level;
  - the time of averaging input signal for protection from causal circumstances in a noise sphere;
  - delay of arm after coming active level.

These parameters let us to tune the TVGA402 more easily for joining usage with maintaining alarm systems.

- **Controlling by using SMS in dialog mode with confirmation.** TVGA402 has a number of commands to controls. Name-pseudonyms are giving to Inputs and relay. The user can form readable controlling message, using the number of commands and names. Every command message begging with password. According of configuration TVGA402 can formed acknowledge message, that is why, user are always know a real condition of the system.
- **Announce by using SMS.** TVGA402 can form a signal message if it has discovered active level on inputs or system fault events (external power fault etc).
- **Signal sound message in dial mode.** TVGA402 can call to mentioned numbers from the list and produce a sound signals, according on current event, if it reveals an active level on inputs or system fault events (external power fault etc) has happened.
- **Listening the object near mobile phone connected with TVGA402** can switch on by making a command on SM. TVGA402 will call to mentioned number.
- **Wide possibility routing of events.** The shift of inputs to active or passive condition could have an influence on a relay condition. You can program an influence of any input of any relay. Switch on ARM or DISARM mode could have an influence on a relay condition. It let use the relay in different configuration. For example, for switch on the hooter or automatic switch off fire emergency sensor when it active.
- **Possibility of giving Name-pseudonyms for input.** Every input and relay has it name which use in testing conditions and control. Every input has its name of active and passive condition. For example, if sensor active in case moving in room1, the user can get SM: ROOM1 MOVE. Name – Pseudonym can programming by user.
- **Independent configuration of every input.** For each input you can to program:
  - the name of input, the name of active and passive condition of the sensor;
  - active level: low, non connected, high;

- averaging time of input signal;
- delay of transmitting of signal message;
- recovery time of scanning;
- 24 hours control, despite of guarding mode, for fire sensor, sensors of leakage of water, gas etc;
- operation with an active level on input: dial, send SM, dial and SM, no operation;
- influence on relay.

- **Independent configuration of every relay.** For each relay you can to program:
  - name of relay;
  - type of commutation: level or impulse, duration of the impulse;
  - to permit/prohibit of control of SM and from another sources.
- **Announce in the case of interrupt external power and discharging of battery of mobile phone.** TVGA402 can form SM and dial to pointing abonents in case of the fall or recovering of outward feeding and also in case of discharging of battery of mobile phone.
- **Economic mode.** You can tune the TVGA402 so, will be formed only in the case of very important emergency events, redundant calls are not possible.
- **Can be use as plain car alarm system, as an additional with the one, which you have already installed on your car.**

2.2. Technical features

TVGA402 is used for work with mobile phones SIEMENS C35/M35/S35/ME45/MT50/M50.

Power supply DC12V (-15% +25%).

TVGA402 has built-in charger of battery of mobile phone.

TVGA402 has 4 inputs for connecting sensors. Every input may be configured as:

- input with active low level (voltage on input < 1V);
- input with active "non connected" (non connected, free);
- input with active high level (2V < voltage on input < 24V).

Table 1. Electrical parameters

Active level if input	Active condition	Passive condition
Low	U < 1V	U > 1V
Non connected	Non connected	U < 1V or U > 2V
High	2V < U < 24V	U < 2V

TVGA402 has two relays with switching contacts (6A, AC240V or 6A, DC28V).

TVGA402 keeps capacity for work after falling external power supply 12V. At that time it can be feeding from the battery of mobile phone here with the switching on relays has been disconnected up to the moment of the relay of capacity.

TVGA402 has current limited output 12V, 100mA.

TVGA402 has connector DB25F for connected with personal computer by RS-232. Use the modem cable for it. To program the parameters and regimes of the TVGA402 you have to use the software TVGA402.EXE.

That connector DB25F you can use for connection of mobile phone with a help of the cable from your set of delivery.

TVGA402 has a possibility of connection outward bottom "ARM" for turn the system to the ARM mode. Active level of the input may be:

- Low (voltage on input < 1V);
- High (+2V < voltage on input < +24V);

Operating temperature -20°C to +40°C.

2.3. The elements of GSM alarm system TVGA402

TVGA402 is designed as a module, witch has a possibility to hang it on the wall. (Figure 1, 2). On the front panel there are the indicators reflecting the condition of inputs "IN1", "IN2", "IN3", "IN4"; "ARM" – ARM/DISARM mode and the power indicator "POWER".

In the case of absents outward power 12V, when the unit is connected with a battery of mobile phone the indicators "IN1", "IN2", "IN3", "IN4" are always switch off.

TVGA402 has a clamp for connection sensors, button "ARM", external led "ARM", external power load and feeding active sensors. The purposes of the contact of clamp are shown on the figure below.

Mobile phone is connected with TVGA402 a help of the connecting cable.

TVGA402 has a jack for connect the feeding of DC12V. For feeding from the means AC220V use the adapter AC220V → DC12V, from your set. For feeding from the currency of your car, use the same jack, but pay attention to the polarity - –(o– +.

2.4. Gabarit and installation size

Gabarit size, not including mount installation and jack: 114x80x30 mm, on figure below.

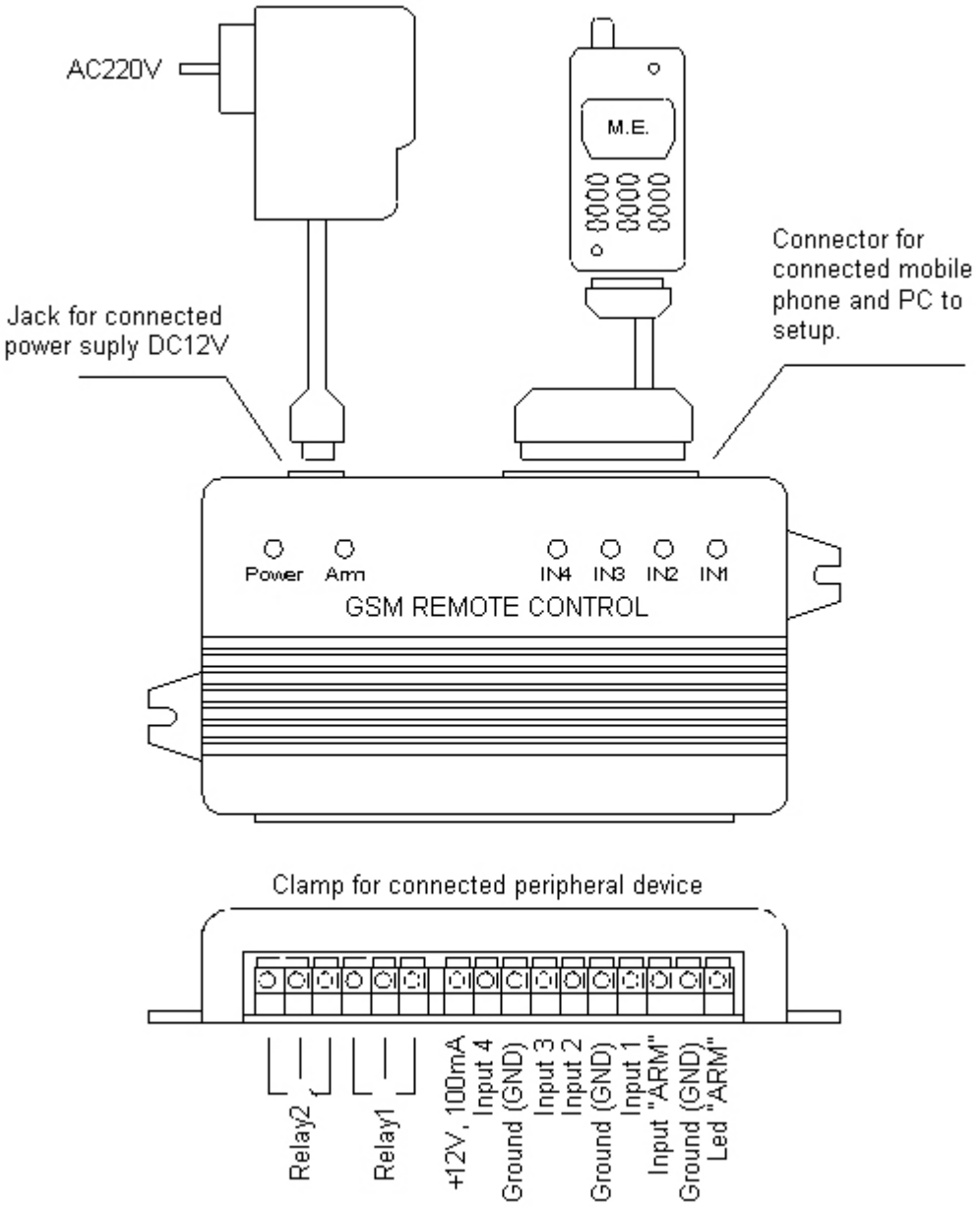

Figure 1. TVGA402 – main elements and contacts description

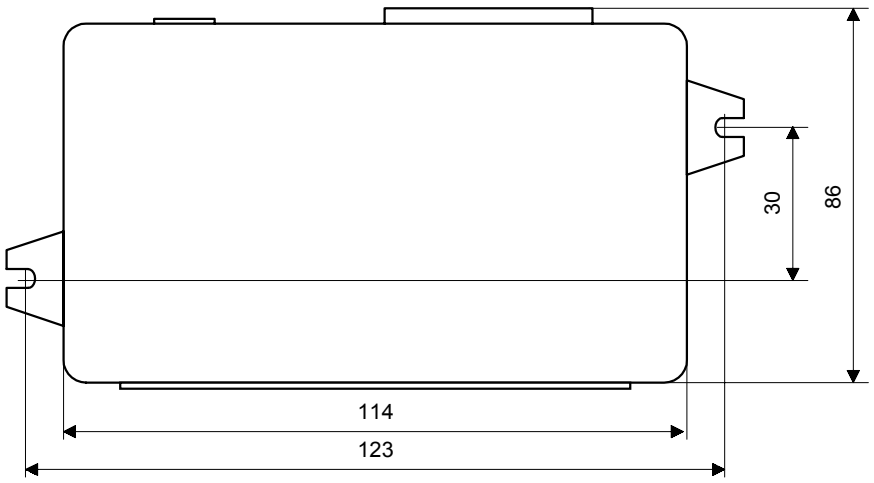

Figure 2. Gabarit and installation size (mm)

3. Regime of the work

GSM alarm system TVGA402 has two regimes of the work: "ARM" and "DISARM". Parameter is keeping in a nonvolatile memory, that is why, after resume feeding, the TVGA402 resume that mode, which has been worked before the interruption. Regime of the work reflected by indicator "ARM" on the case of the unit. The conditions of turning with inputs sensors are reflected by four indicators, independently from regime mode. Sensor is active – led is active and on the contrary. This indication you may use, when you connect sensors and tune parameters of inputs.

3.1. DISARM mode

In that mode the indicator "ARM" not active. TVGA402 make the signal text messages and dial, if only system events took place (fall/reveal external power supply, or discharge of the battery of mobile phone) or if on the input on the mode 24 hour control has an active level. Active level on other inputs can't make a signal message. Otherwise, condition of the sensors which is connected to these inputs can check by forming request of condition with a help of SM.

3.2. ARM mode

In that mode the indicator "ARM" slowly blinks: flash 1 second, pause 2 second. TVGA402 make signal text messages and dial, if system events has happened, or in any enabling input active level has came.

3.3. Change into ARM mode

Change from the DISARM mode to the ARM mode, you can make with activation input "ARM", in accordance with its configuration. If ARM delay has happened, countdown begins with frequent blinks of led "ARM", flash 0,5 second, pause 0,5 second. It is necessary to pay attention, on that following circuitstances. If ARM mode switches on by the command "ARM" of text message, the delay has ignored. After the expiry of time of delay TVGA402 switches in the "ARM" mode. In the case, an influence on the relay has happened. If the relay has programmed, in the case, an influence on the relay has happened. When your switches "ARM" mode, all inputs must be in passive condition. That is why, if the input stay active (may be sensor is defection, check it), the signal test message and dial will be done, in conformity with parameters of input. Pay your attention, that input such exert influence upon the relay, if such influence had programmed before.

If in "ARM" mode, repeated "ARM" has happened, it is possible, when you switch "ARM" in the text message so the situation is the same, like you switch from "DISARM" mode to "ARM" mode.

3.4. Change into DISARM mode

Switch to "DISARM" mode from "ARM" can produced with activation "ARM" input, in conformity with it's configuration, or by the command "DISARM" of text message. In that case, an influence on the relay has happened, if it programmed. Some inputs, can have a delay of signal message, approximately a few second. That is why, if an active level has detected on that inputs, but time of delay was not expired, on the moment of switching in "DISARM" mode, the signal message and dial can't be done. For example:

the sensor of the door, has delay of delivery of the text message 10 seconds. Knowing when is the secret button "ARM" you can come into the room and switch off the "ARM" button during the time without a notice, switch on the hooter and etc.

If in the "DISARM" mode, the control text message with "DISARM" command has come, only influence on the relay has happened, if it was programmed.

In that chapter, we have tucked upon general features only. The interaction of inputs, relay and events, are going in the system dependent on the configuration. The tuning every parameter is described in every detail on the chapter "Tuning parameters".

4. Tuning parameters

Before used of TVGA402, it's necessary to tune of it is configuration. This procedure is making with a help of the software TVGA402.EXE. By the program you can save to file, load and print configuration.

Connect TVGA402 to the free COM port of PC. Run TVGA402.EXE. In the menu **<SETUP>** select **<Communication Port Setup…>**. Now you can make the tuning of configuration.

Before tuning read this text thoroughly.

4.1. Main system parameters

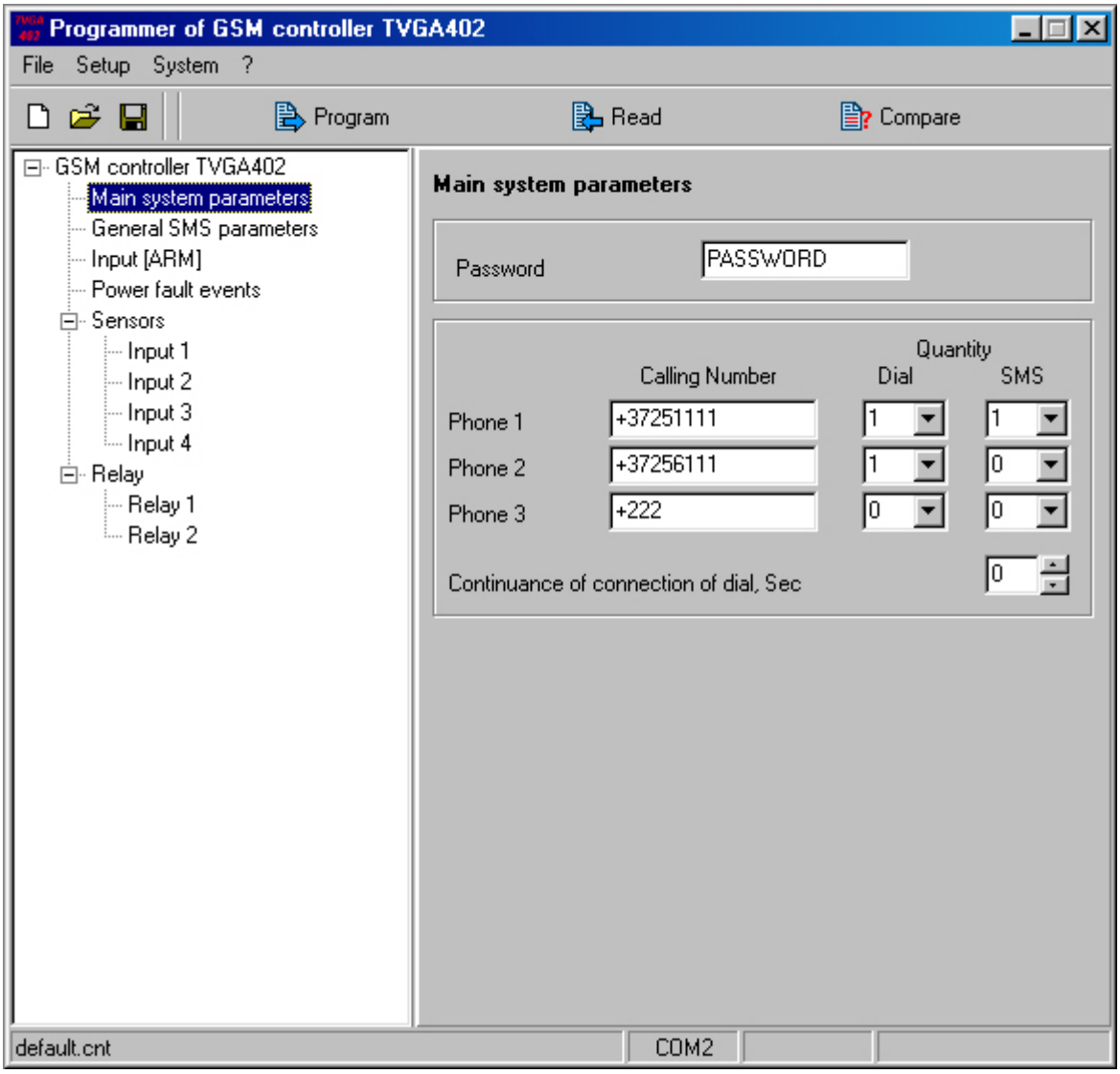

Figure 3. Main system parameters

Password for entering used in text control message for making of commands and requests. The password can consist of not more then 8 symbols of latin alfabetadigit symbols.

Phone 1, Phone 2, Phone 3. On the field the number, you can put phone number abonent in international format. For example: +37251111 or in your local format cell net. For example: 511. All abonents from the list are equal and have an opportunity of control and form request with a use of SMS. For each number, you can make quantity of forming dials and SM in case of alarm events. In the case, when dials and SM you have

0, only control message possibility staged. Text message could not come on this number, even if confirmation was made before. *(See detailed description of command).*
Continuance of connection of dial [0-255Sec] pointing time in seconds from the beginning of connection up to the moment, when TVGA402 has disconnected of dial. Not so much time approx 3 second, don't let you to excelled free time, but possibly, you can not be able to hear signal message. If you have more time, you can hear a message several times, and can interrupt a dial at any moment. If you adjust the time 0 second, a time of connection will be the same, as a time of signal message. This parameters is the same for all numbers from the list.

4.2. General parameters of SMS

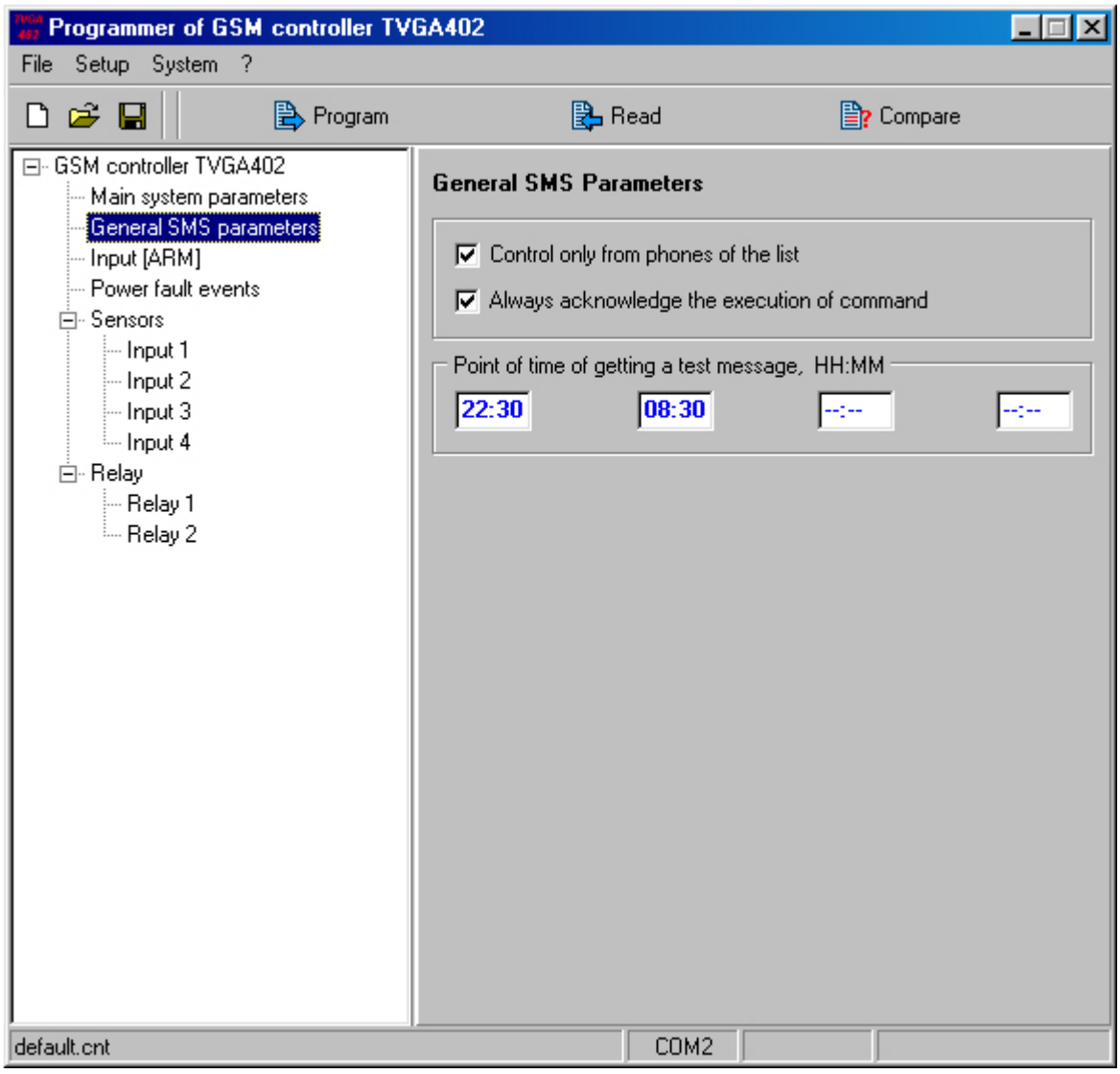

Figure 4. Main SM parameters

Control only from phones of the list. If the parameter switches on, control message, which comes from the phones, not pointing in the list, are not accepted. This mode is considered more protective for the system. If necessary to control the system from many phones, switch off this parameter.
Always acknowledge the execution of command. If parameter switch on, acknowledge in response of controlling message is making always in spite of inquire in the command. As a acknowledge of doing this TVGA402 makes a message, in which you get the information of the condition of the objects you choose.

Point of time of getting a test message in hour and minutes. The parameters is appointing the time of making test massages. Message has an information of during mode, condition of power supply and some another parameters. This message can be asked by command TEST. (See detailed manual of command).

4.3. Input "ARM"

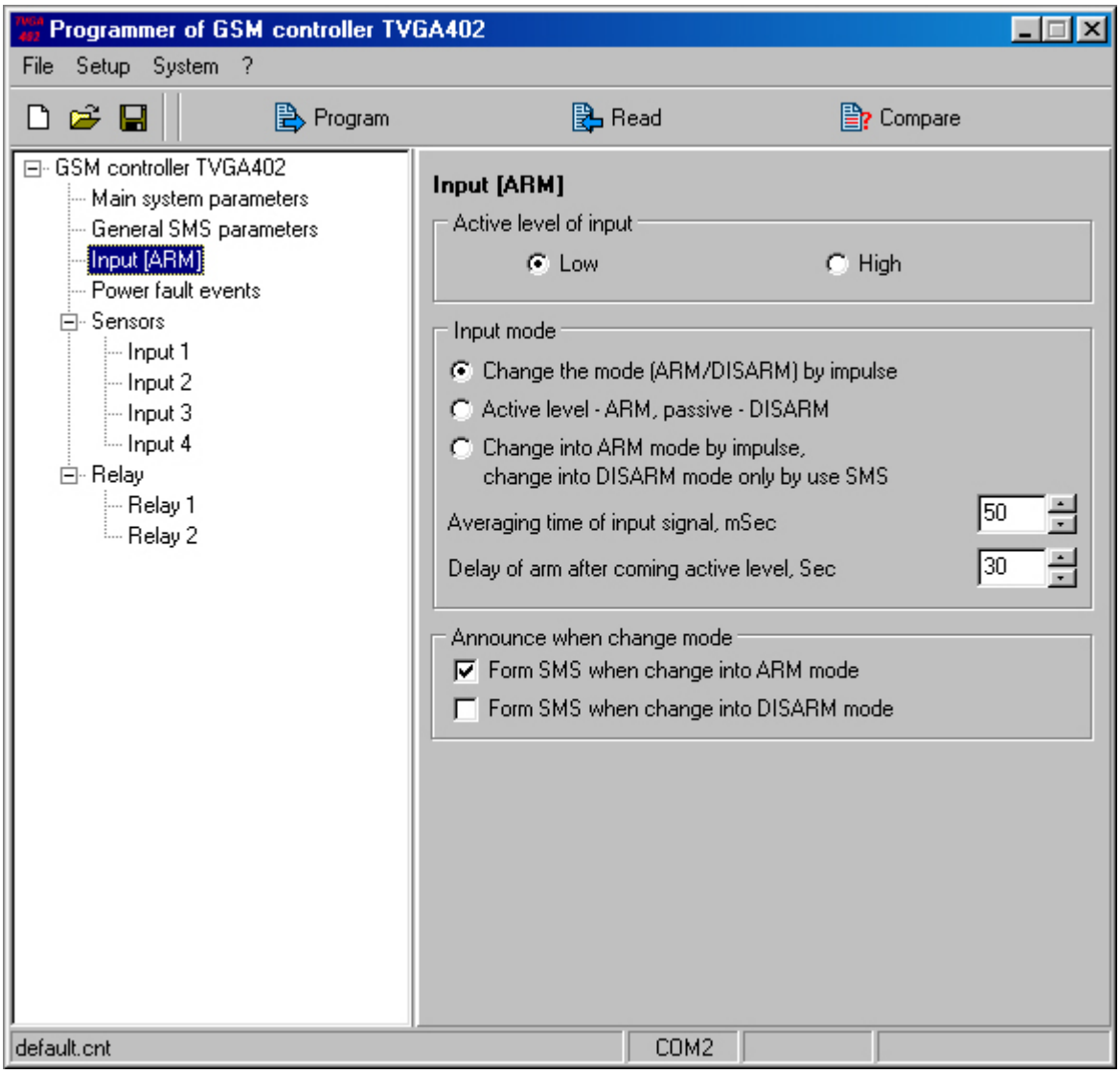

Figure 5. Input "ARM" setup

Active level of input: Low or High. Chose the position, accordingly sheet of switching. See example in chapter "Connecting TVGA402".

Input mode. Change the mode by impulse of active level, are commonly used for switching "ARM" button. Every press on the button changes the mode of TVGA402 in that way "DISARM" → "ARM" → "DISARM"…

The mode: active level – "ARM", passive level – "DISARM" always used for connection with another alarm system.

Third mode: switch to the mode "ARM" by impulse of active level, it is like the first one, but let the system be more protective, so switch in a "DISARM" mode can made only by means of SM.

Averaging time of input signal [50-800mS]. Major value 600-800mS., used for protection input from causal switching in environment with high level of noises. For example in a car. In vast majority of cases you may use a standard meaning 50-100mS.

Delay of "ARM" after of incoming of active level [0-60S]. This time, from the moment of pushing a button "ARM", till the switching the "ARM" time, let you to set the system in a "ARM" mode and quit the accommodation.
Form SM when switched "ARM" mode, form SM when switched "DISARM" mode. This parameters takes into account when the mode of TVGA402 work are changing by input "ARM". If you use text controlling message with a command "ARM", "DISARM", you can control of mode, by using of request of confirmation "!".

4.4. Power fault events

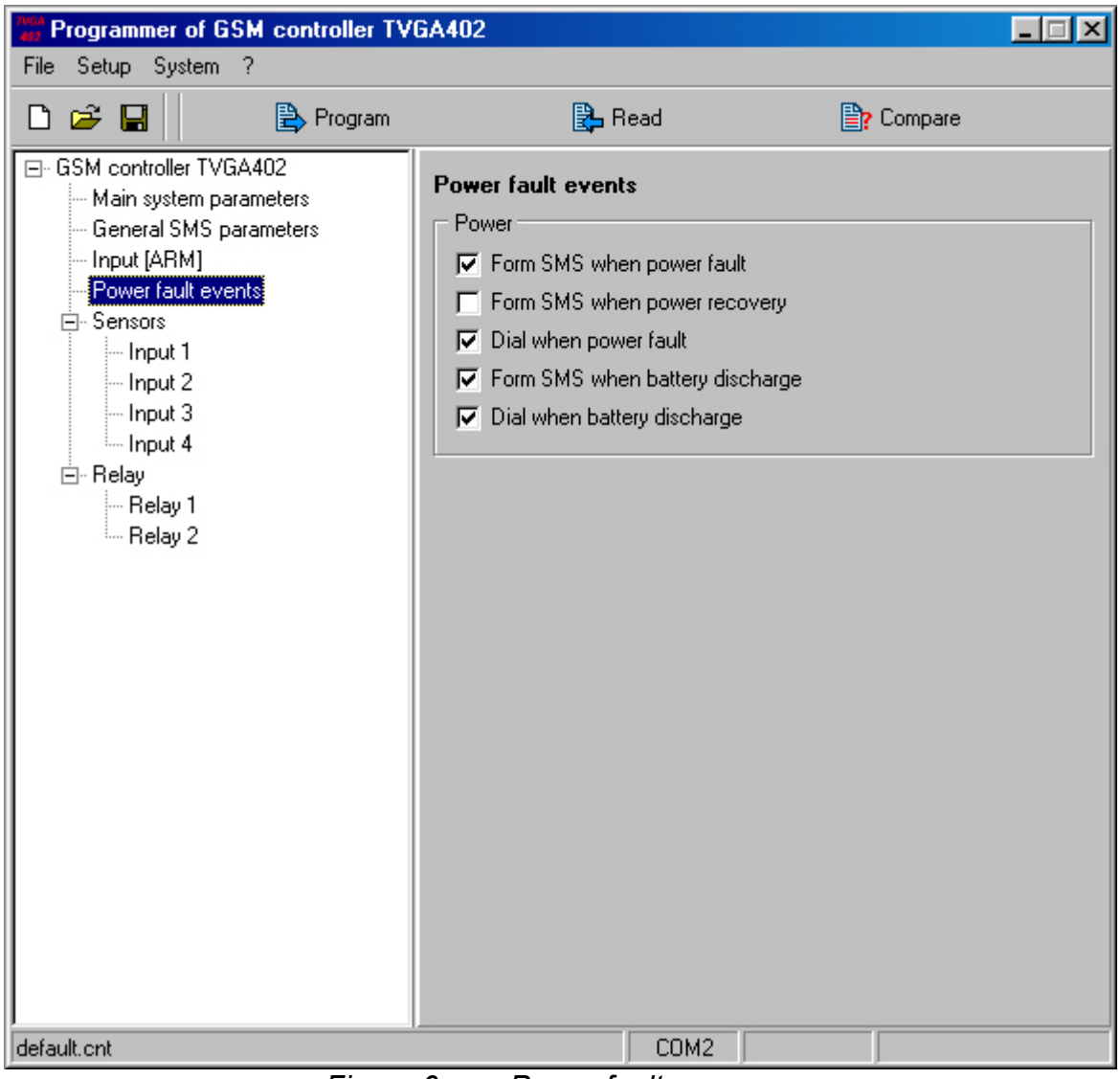

Figure 6. Power fault message

External power fault we understand, that voltage drop is the absents of voltage on connector more then 2 seconds. Recovering of power has fixed, if on the power connector has a voltage for more then 2 second. Forming of signal message, in the case of external power fault or recovery, has taken place not more then 1 time in 15 minutes. Battery consider empty if it is capacity of about ≤ 40%. In the case the system can work for a little time.

Choose the system events, when you want to form signal message.

4.5. Inputs

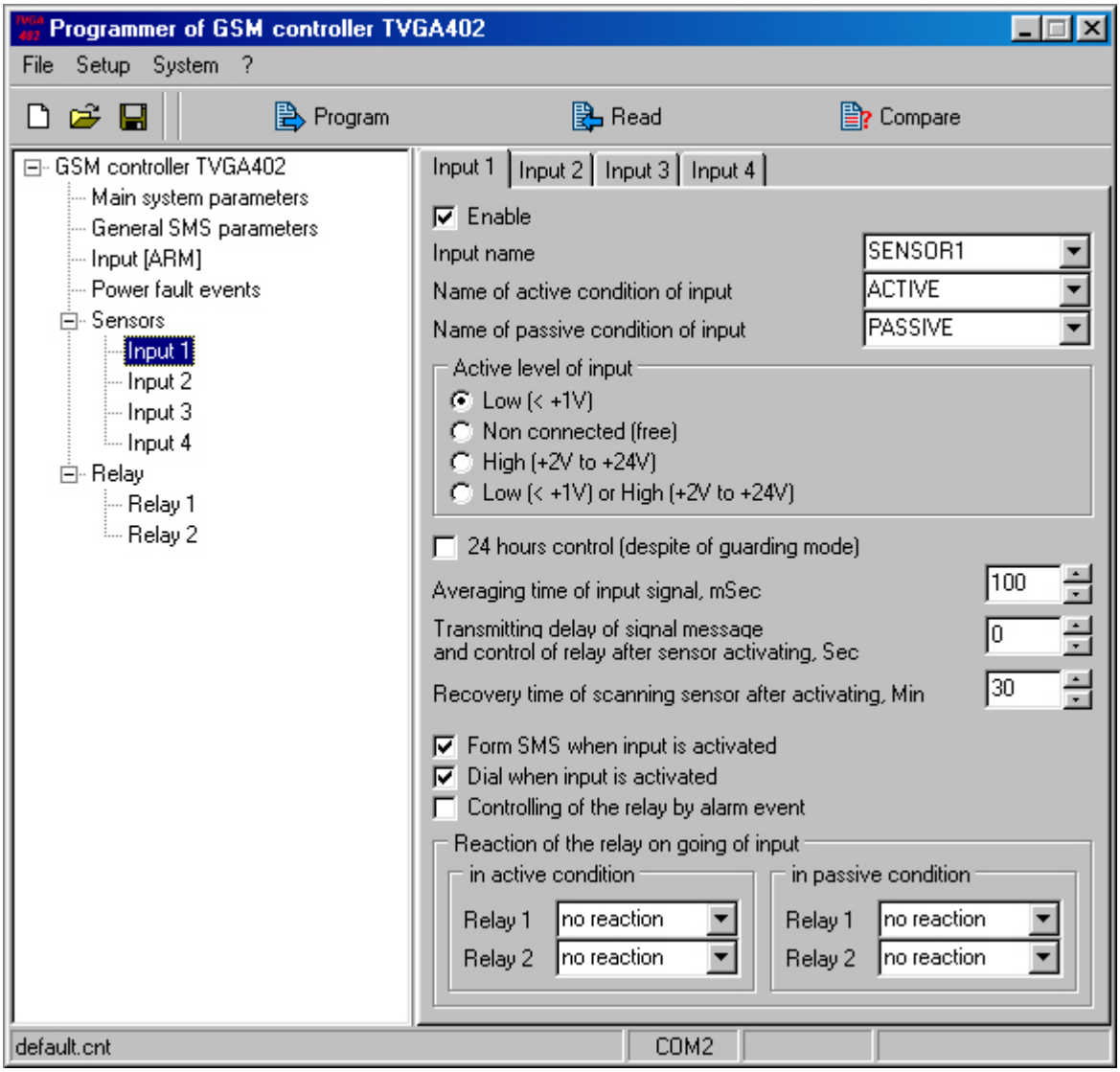

Figure 7. Parameters of input

All inputs have a some tunings, that is why we will look through one example.

Enable. If check box clear – input is disabled, for GSM alarm system TVGA402 that input is logical absence. Not any parameters of input are not used by system. Not any enquiry SMS to name of that input are not. Parameter is comfy for tuning of the system, when routes of act on a relay are have difficult configuration and input will need to disconnect for analyze logic of work.

The name of input – this is a name-pseudonym of the sensor connected with it. Used for making text message.

The name of active condition of input – this is a name-pseudonym of active condition of sensor. Used by discover on input active condition for forming text message.

The name of passive condition of input – this is a name-pseudonym of passive condition of sensor. Used by forming text message in the case of request of input condition.

The names can consist from not more then 8 symbols of Latin alphabet or digit symbols. Don't use in the names special symbols like that '!', '?', '@', '#', '$', '%', '&', '*', '+', '-', '/', '\', space.

Remember, that lower-case and upper-case characters are not equal for the system. For instance "DOOR" and "door" is not the same.

For example let us look through the concrete situation. Let us accept that sensors is control the condition of entrance door – open/closed. Input that is connected with censor gave name-pseudonym "DOOR", gave name-pseudonym "OPEN" to active condition and positive condition "CLOSE". When enquiry of condition of a door/password door, we took answer message 12:30 DOOR CLOSE, if door is closed, or 12:30 DOOR OPEN if door is open.

Choice short and understand name-pseudonym for comfort work.

Active level of input: low, non connected or high. Choice the import in accord with used scheme of switch on and type of sensor. Look through in a division "Connection of TVGA402".

Always control the input (24 hours in a day). If parameter is switched on when active level is appeared on input will formed signal text message or dial, nay when current regime of GSM alarm system TVGA402 "DISARM". Switch on that parameter for inputs that have a fire-sensors, leakage water sensors, gas sensors and so on.

Averaging time of input signal [50-800mS]. Major value 600-800mS., used for protection input from causal switching in environment with high level of noises. For example in a car. In vast majority of cases you may use a standard meaning 50-100mS.

Delivery delay of signal message and control of relay when input is activated [0-60S]. When active level is appeared on input formation of signal message and dial will de late on determinate time. The delay is let for user of system to change into DISARM mode, and annul transfer signal messages or switch on/off relay if it assigned.

Recovery time of scanning sensor after activating [1-60Min]. Signal message is ration out when sensor is activated. If sensor remained in active condition then iteration signal message formed by certain time. Most time is allowed to escape often apparition, for example when sensor is damaged.

Form SM when input is activated. Parameter is let to forbid to formed signal text message when input is activated. May dial used only or control relay.

Dial when input is activated. This parameter can prohibited of dialing by activation of input. You may use only SM, or only control the relay.

Delay of controlling of the relay. If the parameter checked, the relay controlled by input, if controlling is assigned. The controlling is the same in the "ARM" mode, and in the "DISARM". If parameter checked, controlling of relay going with the delay **"Delivery delay of signal message and control of relay when input is activated [0-60S]"** and only if checked the parameter **"Always control the input (24 hours in a day)"**, or TVGA402 mode "ARM". You can notice, that this configuration, let us use the relay, for switching on hooter or other unit like that. Actually, switching on the relay will be in the same time with forming SM and dial.

The reaction of the relay on going of input in active condition. Choose one or few relays and an influence on relays by transition of input in active condition.

The reaction of the relay on going of input in passive condition. Choose one or few relays and an influence on relays by transition of input in passive condition.

This parameters are not canceled of control of relay by SM.

4.6. Relay

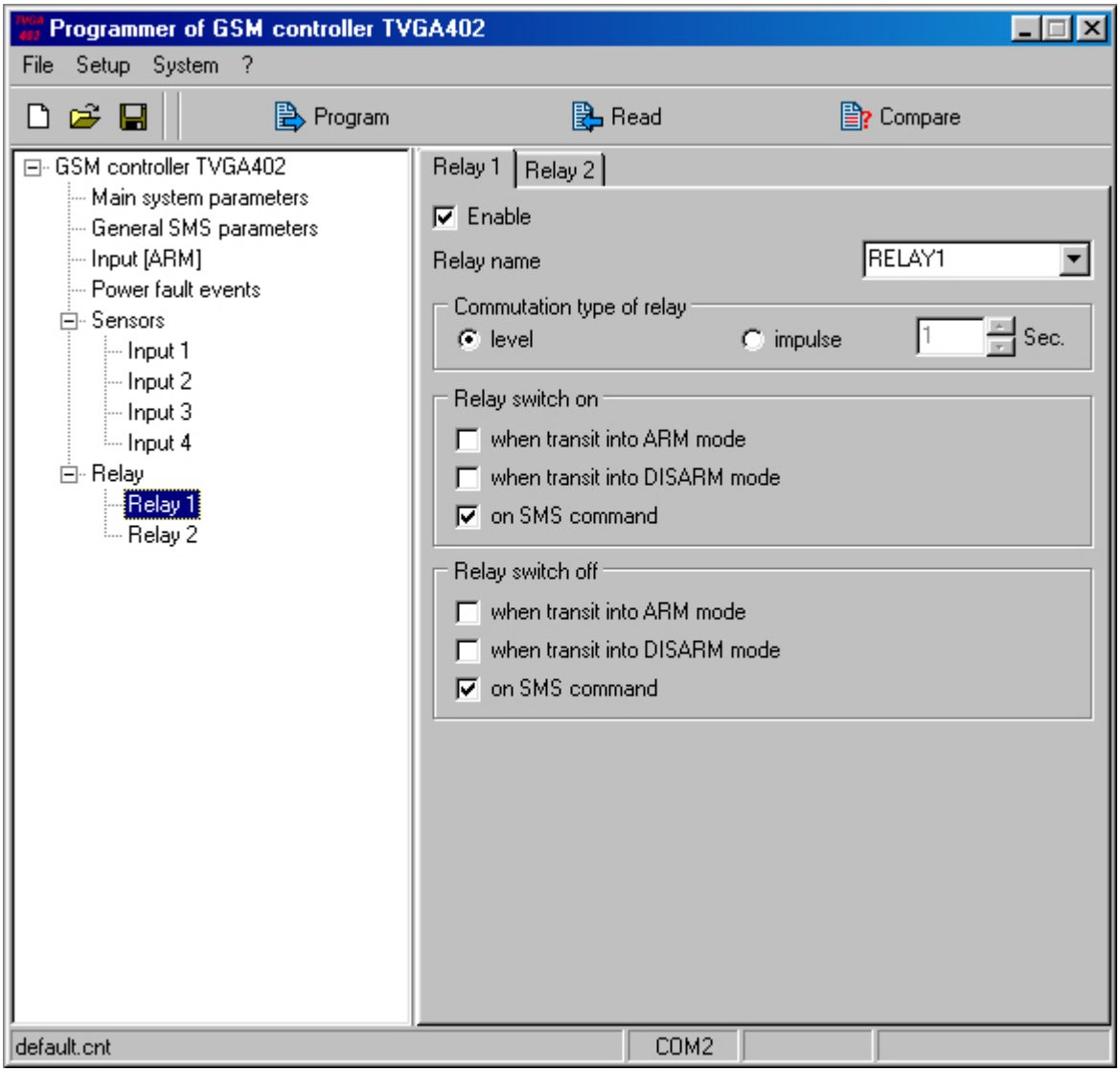

Figure 8. Parameters of relay

All the relay has a same of parameters, so look through of an example.

Enable. If the check box is clear – relay is prohibited. For TVGA402 relay logically not exists. Non of parameters can be used by the system.

The name of the relay – this is the name-pseudonym of the device connected with it. Used for formed of the text message, and by request of condition or controlling. The name can consist from not more then 8 symbols of Latin alphabet or digit symbols. Don't use in the names special symbols like that '!', '?', '@', '#', '$', '%', '&', '*', '+', '-', '/', '\', space.

Remember, that lower-case and upper-case characters are not equal for the system. For instance "LOCK" and "lock" is not the same.

For example, let us see typical situation. The relay connected with electrical lock. So we named the relay by name-pseudonym "LOCK". Now you can lock/unlock the lock and requested it is condition. To close you must send a message **/PASSWORD LOCK ON**, to open **/PASSWORD LOCK OFF**. On the question of condition **/PASSWORD LOCK ?**, we can get the message **12:30 LOCK ON**, if the lock is closed, or **12:30 LOCK OFF**, if the lock is opened.

The type of commutation of relay: the level or impulse of about [1-250Sec]. The type of **level** means, that condition of the relay after having influencing was stay, so long as you want, up to next moment controlling. When the type: **impulse** has choosed, relay switches off, when the setting time comes. For example, type impulse may used for open electrical lock (1 second) or for short use hooter, lamps and so on. (60-250 second).

Switch on/off the relay by transition in "ARM" mode. Choose an influence on the relay. For example, you can switch off all electrical devices, connected with relay by transition in "ARM" mode.

Switch on/off the relay by transition in "DISARM" mode. Choose an influence on the relay. For example, if the hooter connected with the relay, you can switch off by transition in "DISARM" mode.

Switch on/off the relay by used SMS. You can permit only switch on or only switch off the relay by the command of text messages, You can prohibit to control the relay by SM.

After, you end up your tuning, disconnect TVGA402 from PC.

TVGA402 are ready to install on the object.

Notice, in a program of parameters, connecting on the external power supply 12V are not required.

5. Dial and signal sound messages

Dial – is an action of TVGA402, for connecting with abonents by turns, from the list, for transmitting of signal sound messages. Dial can be made of a system events (power fault or discharge of the mobile phone battery) or the event on any input – turn on of sensor. TVGA402 dialing number from the list by turns. Transmitting to dialing the next number be made, if the current number is busy, or the abonent could not answer for about 30 second, including the time of dialing. If TVGA402 is connected, abonent has a signal sound message, according of events. The Message consist of blocks. Every block begins on the trill, after that a number of beep signals according of the events. After sending of the first block, goes second and so on. After the last block – first. Transmitting goes up to indispensable conditions are occupied. Abonent can interrupt the connection or the time of connection comes to the end. In general the time of connection depends from parameter **"Continuance of connection of dial"**.

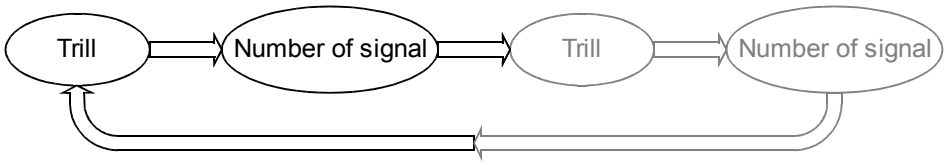

Figure 9. The structure of signal sound message

Table 2. Signal description for dial

Event	Quantity of signal
Active level on input 1	1
Active level on input 2	2
Active level on input 3	3
Active level on input 4	4
External power fault	One falling tone
Discharge of battery of mobile phone	Two falling tones

If TVGA402 has registered the connection and sent the signals, the dial considered successful. If the quantity of dials are empty, the information about events considered transmitted. In the case of not getting a contact with abonent, absence or busy, TVGA4020 keep trying to connect for 20 minutes from the moment of new events comes on. After that time, the events are considered not actual, and dial comes to the end.

In real condition, the time of connection, as a rule, as so it shows in parameter **"Continuance of connection of dial"** but in some cases may be different from it in a few seconds. This is depend of peculiarity of functioning of the mobile phone by simultaneously connected of the voice and transmitting SM.

6. Use SMS for control TVGA402

Short text messages are very convenient for the control of the object condition. In the In the memory of mobile phone you can save some every often sending control messages for example, for "ARM" mode, "DISARM" mode and controlling of relay. When you need it you can easily send corresponding message.

Alarm message from TVGA402 are maximum readable, full of information, thanks to the fact that name-pseudonyms of this inputs and active and passive conditions. For example, when sensor of controlling the door in on, the user gets a message: **22:30 ALARM DOOR OPEN**. Name of input: DOOR. Name of active condition: OPEN.

6.1. Command of control TVGA402

GSM alarm system TVGA402 has seven commands, despite of name-pseudonyms.

Commands and arguments are reserved words. Do not use it as a name-pseudonyms, so it may damages the system work and results may be unexpected. When the system is analyzing the commands it can't be recognized lower-case and upper-case characters, so the commands ARM, Arm and arm, accept as equal.

Table 3. Control command of TVGA402

Command name	Pass	Command	Argument	ACK(!)
Switch ON/OFF the relay	YES	K1, K2	ON | 1 | OFF | 0 | ?	not req.
Request condition	YES	K1, K2, D1, D2, D3, D4	?	-
Change into ARM mode	YES	ARM	-	not req.
Change into ARM mode	YES	DISARM	-	not req.
Request test message	YES	TEST	-	-
Listening	YES	LISTEN	+372nnnnnn | ?	not req.
Adjusting the time	YES	SETTIME	HH:MM	not req.
Enable/disable control only from phones of the list	YES	ACCESS	YES | NO | ?	not req.
Time of send the test message	YES	TTIME	HH:MM HH:MM HH:MM | OFF | ?	not req.

K1, K2 – pseudonyms of the relay. D1, D2, D3, D4 – pseudonyms of the sensors.
Name-pseudonyms are programming by with a help of the software TVGA402.EXE.
? – asking of conditions of the object or parameter.
ON or 1 – switch on the relay. Both arguments are equal.
OFF or 0 – switch off the relay. Both arguments are equal.
YES, NO – enable/disable parameter. HH:MM – hour and minute.
OFF as argument for TTIME – to forbid of delivery of test message on time.
not req. – not required parameter.

6.2. The rules of forming controlling text message

1. In general, the message consists of 4 borders, two from it are obligatory, for someone commands – three. The borders divided by space.

FORMAT: **/PASSWORD COMMAND ARGUMENT REQUEST_CONFIRMATION**

2. Message is always begins with a symbol “/” and password of access. Between symbol “/” and password has no space. By the symbol “/”, TVGA402 detects the beginning of controlling message. It is necessary, when you send a message through the internet gate. Often, the company of going this, a has supplemented the beginning of thee message by some symbols.

3. Field **COMMAND**. Consists command word (ARM ACCESS) or name pseudonym of input (SENSOR1), relay (HEATER). This filed connected with a field **ARGUMENT**, both fields are shown the meaning of the command.

4. Field **ARGUMENT** consist of the list of parameters. Some of commands such as (ARM, DISARM, TEST) don t have parameters. In that case, the filed **ARGUMENT** don't use. When thee command consist of few parameters, the last ones, pointing after the space (TTIME 09:30 12:30 15:00 18:20). If in the filed command used the name pseudonym, in that case, in the filed **ARGUMENT** must be appointed the action on the object, switch on / off the relay, asking conditions of inputs or relay (SENSOR1 ? or RELE1 ON).

5. One message may be have some following one for another commands and arguments. The commands will be done accordingly. Firstling, performing a command which stats in the beginning of the message.

6. If the message has made with mistakes, or argument can not be equal with a command or with the name – pseudonym, such message would be ignore, and reading of the message starts again from the following field.

7. Field **INQUIRE CONFIRMATION**, not necessary. If so confirmation of doing the command, in the end of the sentence you must put "!". For the confirmation TVGA402 make a message, consisting of the condition of the object. Remember that: the confirmation has formed despite of presents in the command “!”, if parameter "always switch on the confirmation of execution of command" switches on.

6.3. Detailed description of the commands

These word are uses in all commands:
PASSWORD – password of access, in examples: "12345".
"!" – inquire of confirmation.

6.3.1. Switch “ON” / “OFF” relay

/PASSWORD RELE_NAME ARGUMENT[RELE_NAME ARGUMENT][!]
RELE_NAME – practically, name of the unit connected with relay.
(HEATER – heating element, LOCK – electro lock and etc.).
ARGUMENT – reflecting of actions: ON or 1 switch on relay, OFF or 0 switch off relay.

Example of use:
/123456 HEATER ON LOCK OFF !

Example of confirmation:
12:30
HEATER ON
LOCK OFF

The command influenced on the relay, only if in configuration permitted switched ON or OFF the relay by SMS.

6.3.2. Inquire of condition of the sensors or relay "?"

/PASSWORD OBJECT_NAME ? [OBJECT_NAME ?]
OBJECT_NAME – name-pseudonym sensor or relay.
? – *the sign of inquire of condition*.

Example of use:
/123456 HEATER ? LOCK ? WINDOW ? DOOR ? HALL ?

Example of confirmation:
12:30
HEATER OFF
LOCK ON
WINDOW OPEN
DOOR CLOSE
HALL MOVE

6.3.3. Transition in ARM mode, command "ARM"

The command "ARM" turns TVGA402 in a "ARM" mode. This operation is the same as, entrance in “ARM” mode made, but the difference in a delay of ARM is ignored in that case. Pay attention: if regime of input "ARM" has programmed on the level, the command “ARM” ignored.
/PASSWORD COMMAND [!]

Example:
/123456 ARM !

Example of confirmation:
12:30
ARM

6.3.4. Change into DISARM mode, command "DISARM"

Command DISARM turns TVGA402 in a "DISARM" mode. The operation is the same as input "ARM". If regime of input "ARM", has programmed on the level, the command "DISARM" ignored.
/PASSWORD COMMAND [!]

Example:
/123456 DISARM[!]

Example of confirmation:
12:30
DISARM

6.3.5. Inquire of the test message, command "TEST"

Test message consist of information about current condition of the system and some parameters. The message formed if time meaning switches by the "TIME" command. Inquire let us get the information in any time.
/PASSWORD COMMAND

Example:
/123456 TEST

Example of confirmation:
TEST 12:30

DISARM
POWER FAULT
BATTERY 100%
ACKNOWLEDGE YES
ACCESS YES
TTIME 12:30 15:30 18:30 21:30

6.3.6. Listening, command "LISTEN"

As we see on the format of the command, the number of the phone is not necessary to use. That possibility for only the registered users in the list of TVGA402. For listening will be dialing number of sender of the command. If listening from another number are necessary, for example from the number of offices-phone, carry this number following by the command.

/PASSWORD COMMAND [PHONE_NUMBER][!]

PHONE_NUMBER – number for listening.

Example:
/123456 LISTEN +37251111 !

Example of confirmation:
12:30
LISTEN +37251111
Connection on this number is preparing or has already existed.

6.3.7. Adjusting he time, command "SETTIME"

The command let us set the time in mobile phone remotely. In the case of a long using the system, some error may be occurred. Connecting the time better to produce at the moment of minimal usage of the cal net, to minimized of transport delay.

PASSWORD COMMAND HH:MM[!]

HH:MM – current time for set.

Example:
/123456 SETTIME 12:30 !

Example of confirmation:
12:30

6.3.8. To forbid/permit the controlling from the phones not including in the list command "ACCESS"

After the command of forbided "NO" you can control TVGA402 only from the phones from the list. SM from the other phones not be accepted.

After the command of permtion "YES" access to the TVGA402 can be possible from any numbers.

/PASSWORD COMMAND ARGUMENT[!],

ARGUMENT – YES – access permition, NO - access forbided.

Example:
/123456 ACCESS YES !

Example of confirmation:
12:30
ACCESS YES
Forbid the access from any numbers, if for register of the users the list is enough.

Remember, that the command of permition may be produce only from the phone on the list. This parameter may be programmed by the configuration the by software TVGA402.EXE.

6.3.9. Adjust the time of delivery test message, command "TTIME"

Test message, consist of information about current condition of the system and some other parameters may deliver automatically by in setting time. For do this is necessary to set time pointing of delivery of message. The command must be consist of 4 time points. You can use only 1, 2 or 3 points.

/ PASSWORD COMMAND HH:MM[HH:MM[HH:MM[HH:MM]]]|OFF[!]

HH:MM – test points.
OFF – announce off.

Example:
/123456 TTIME 09:30 12:00 15:00 20:30 !

or
/123456 TTIME OFF !

Example of confirmation:
12:30
TTIME 09:30 12:00 15:00 20:30

or
12:30
TTIME OFF

First command of example switch on automatic delivery of test message, second command switch off one. Test message may be requested by command "TEST", any time.

In the all examples for rule description of format of the command uses inquire of confirmation "!". However, if then is no inquire and parameter "Always confirm of execution of command" switched off, confirming SM from GSM alarm system don't be transmitted.

6.4. Messages formed TVGA402

TVGA402 automatically formed SMS message in following cases:

- Discover active level on any permitted input.
- External power fault.
- Discharge of the battery of mobile phone.
- Test message in pointing time.
- Answer on inquire of condition or confirmation of execution the command.

Table 4. Information phrases used by TVGA402 in a messages

Message	Description
ARM	Current mode "ARM".
DISARM	Current mode "DISARM".
ALARM	Start alarm message.
POWER OK	External power recovery.
POWER FAULT	External power fault.
BATTERY XX%	Charge of battery of mobile phone XX in percent.
ACKNOWLEDGE YES	Always acknowledge of execution of command.
ACKNOWLEDGE NO	Acknowledge of execution of command, only by inquire.
ACCESS YES	Access permitted from any phones, not only from the list.
ACCESS NO	Access permitted from phones only from the list.
LISTEN +XXXXXXXX	Connecting for listing, with a number +XXXXXXXX, is preparing or has set.
TTIME 09:30 12:30 15:30 21:30	Test messages will be formed in pointing time grades.
TTIME OFF	Test messages don't be formed automatically, only by inquiry.

6.4.1. Discover active level on any permitted input.

HH:MM
ALARM
SENSOR_NAME CONDITION_NAME
HH:MM - time of message formed.
ALARM – alarm message, registered active level on input.
SENSOR_NAME – pseudonym of sensor (SENSOR1, WINDOW, DOOR, HALL).
CONDITION_NAME – pseudonym of condition of sensor (ON, OFF, OPEN, CLOSE, MOVE, STILL, SMOKE). Pseudonym are programmed by TVGA402.EXE.

Example:
22:30
ALARM
DOOR OPEN
HALL MOVE

6.4.2. External power fault

HH:MM
ALARM
POWER FAULT

Example:
22:30
ALARM
POWER FAULT

6.4.3. Discharge of the battery of mobile phone

HH:MM
ALARM
BATTERY X%

Example:
22:30
ALARM
BATTERY 0%

6.4.4. Test message in mentioned time on in response on the command "TEST"

TEST HH:MM
ARM|DISARM
POWER OK|FAULT
BATTERY XX%
ACKNOWLEDGE YES|NO
ACCESS YES|NO
TTIME 09:30 12:30 15:30 21:30

Example:
TEST 12:30
DISARM
POWER FAULT
BATTERY 75%
ACKNOWLEDGE YES
ACCESS YES
TTIME 12:30 15:30 18:30 21:30

6.4.5. Acknowledge of execution of command

HH:MM
OBJECT_NAME OBJECT_CONDITION
[OBJECT_NAME OBJECT_CONDITION]

OBJECT_NAME – assume the name of input, relay. In the case of acknowledge of the command "ARM", will be issue current mode ARM or DISARM.

OBJECT_CONDITION – for relay: "ON", "OFF", for input: condition of sensor etc. All acknowledges answering are reaction on the commands, that is why depends from specific operations of the user.

Example:
12:35
HEATER ON
LAMP1 OFF

7. Connecting of TVGA402

7.1. Connecting the sensors

Clamp connector of TVGA402 let us to connect the wires S = 1,5 mm and less. For reliable and safe connecting, naked part of the wire must be 7-8 mm. For cut of the isolation, use special instrument, don't damage the cooper part of the wire.

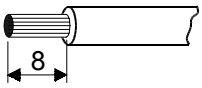

Figure 10. The size of naked part of the wire

7.1.1. Sensors, general notions

Sensors can be divided into too parts: active and passive. Passive sensors don't demanding for work a source of power, for active ones, on the contrary, a source of power are necessary.

A good example of passive sensors may be a simple button, magnetic contact, etc.

An example of active sensors may be sensors of moving, smoke, of liking of the gas etc.

Sensors may have normal open or normal close contact.

7.1.2. Connecting of passive sensors

Before connected the sensors with TVGA402 firstly, it is necessary, to program active level for every input: **low; non connected; high**. Active level of input set according with connected sensor and principal of this work. Let us see through some example.

On the figure below normal open sensor SF4 is connected to input 4, input of TVGA402 connected to noting – "free". When the sensor transited in active condition, on the input of TVGA402 will be low level. For example, the sensor has mounted on the door. If you try to open the door, the contact of the sensor disconnected. Active level of input 4 you must choose "non connected".

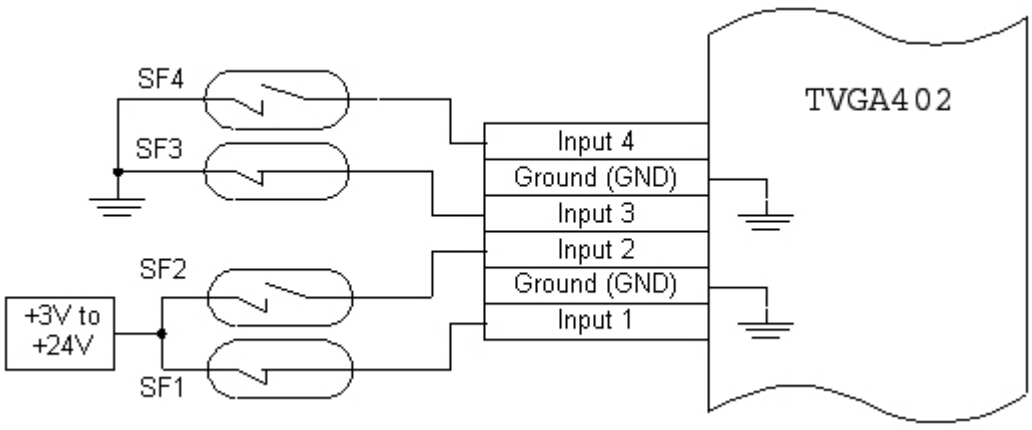

Figure 11. Scheme of connection of sensors

Sensor SF2 with a normal open of contacts is connected with an input 2, in that case one of it's contact connected with a positive potential. Suppose the sensor SF2 has also mounted on the door, and given positive potential while the door closed. If the door

will be open, the sensor contacts will as so be open. For the active level of the input 2 , you must choose, also "non connected".

You probably remarked, TVGA402 receive a like, as not active condition "low" and "high" level, if for active condition, you choose "non connected".

Let's see another example: input 3 has configured on "high". There is normal open sensor SF3, connected with the input 3, which disconnected the input from the ground, when activation has occurred. This input will never be activated, because "low" level and "non connected" are not active for input 3.

Suppose, that you want to control a available of positive voltage and want to get a message when it's done. This situation is shown on the picture, when the normal closed switcher SF1 is connected to the input 1. Configure input 1 on "non connected" and in the case of disconnecting SF1 (disappearance of positive potential) the activation of input, has proceeded.

General rule: If one of condition assigned as active, another too – passive.

7.1.3. Connecting active sensors

For provision for active sensors by feeding TVGA402, has current limited source of power.

On the figure below, you can see the plain scheme of connecting of connecting the sensors on three wires, when "joint" feeding wire of the sensor, is simultaneously "joint" for sensor output. Current limited source of power be able to feed not more then 100mA. In the case of short-circuit, the power will be switch off. Power will has recovered after removal the cause of heighten consumption of curent.

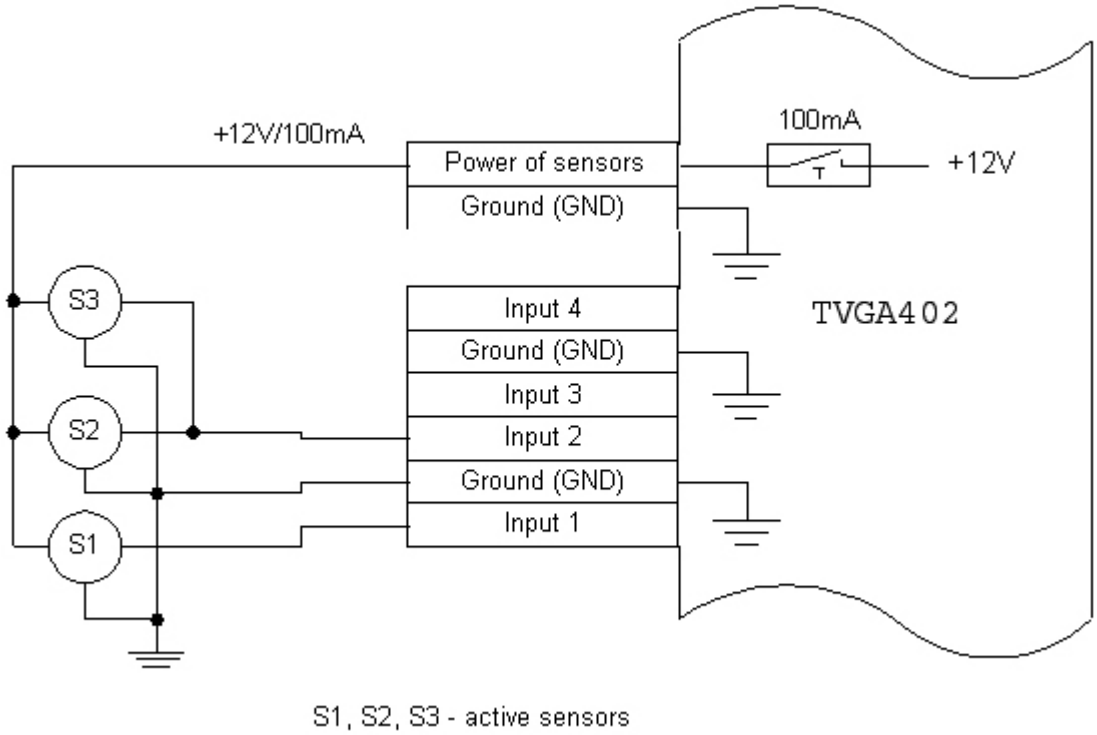

Figure 12. Scheme of connection feeding the sensor from TVGA402

Some sensors for reset after activating demands switch off switch on of currency feeding. For example, some fire alarm sensors. For realization of such mode use the scheme below.

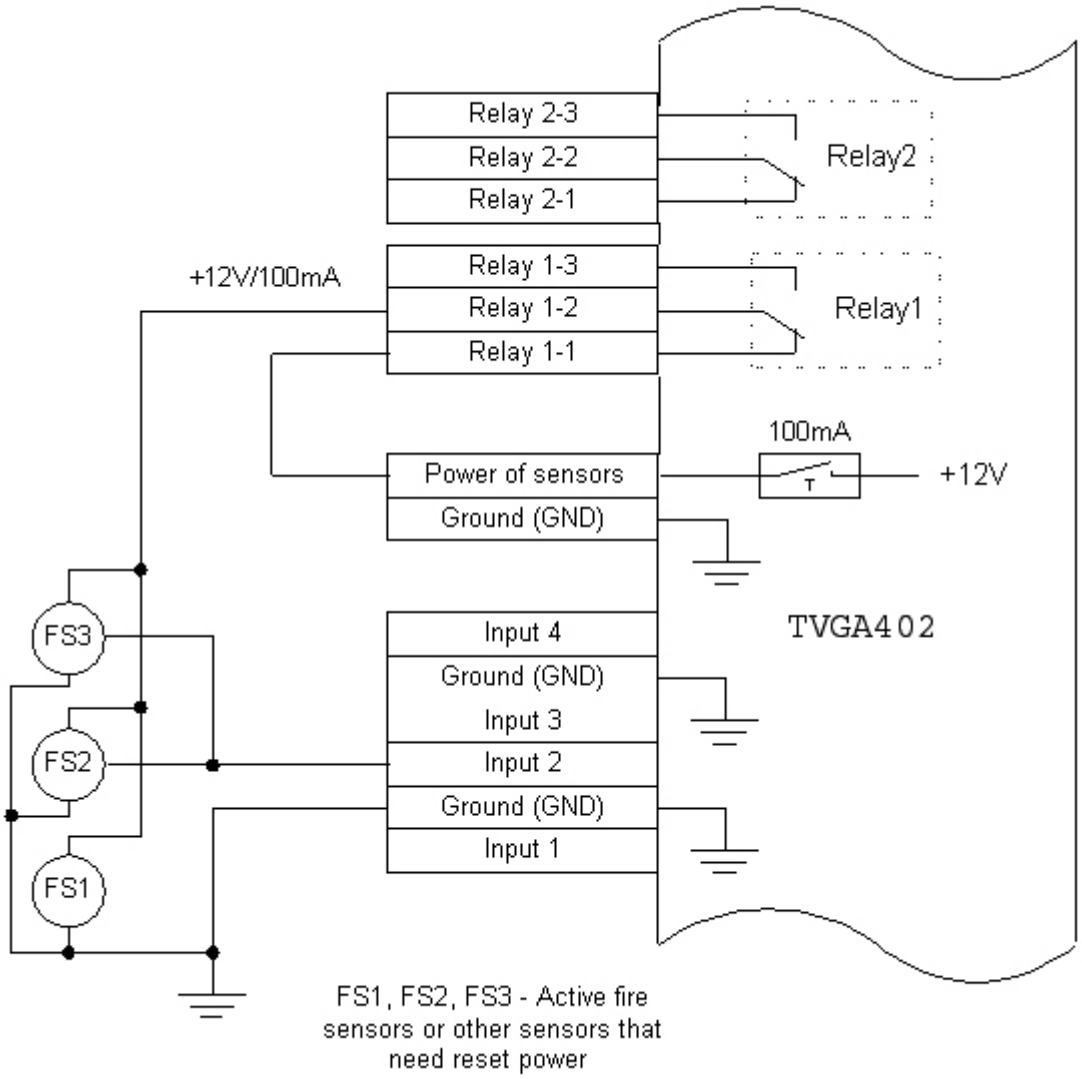

Figure 13. Connecting active fire sensors

It is necessary, in that case, tune coinciding route of the input 1 and input 2 an relay 2 and adjust the "impulse" type of commutation with a few seconds impulse length.

7.2. Connecting load to relay

TVGA402 has to build-in relays with switching contacts. Rating of contacts 6A, AC240V or 6A, DC28V. The contact can switched power can not exceeded the pointed rating. In the same cases, may be of use, the application of switching contact (the power is on, when the relay is switched off), see figure below.

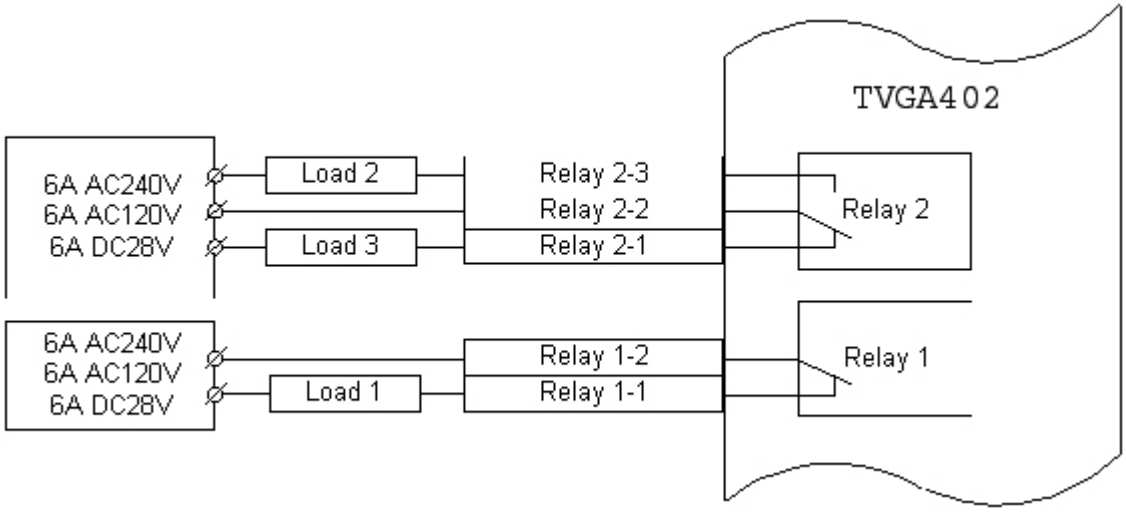

Figure 14. Connection of load

Notes, in the case of external power fault, the relay has switched off, in spite of the TVGA402 is feeding from a battery of mobile phone. After recovery of feeding, the current condition of relay has also be recovery.

The main rules of connecting the load:

- Use wires of according diameter.
- The ends of the wires must be twisted will.
- Keep strictly to the established order of mounting electric circuits.

7.3. Connection of button "ARM" and external led "ARM"

Button "ARM" is connecting with input "DISARM". This input has only two active levels: "low" and "high". Figure below shows you the variant of connecting the button "ARM". Depends of positive potential giving the button, or switching the input with ground circuit (GND), you must choose the active level of input "ARM". It is necessary, also to adjust the regime of work for input.

Come car-alarms in the arm mode gives on output circuit voltage +12V, or connected it to ground. This feature can be used for transition TVGA402 from DISARM mode to ARM mode.

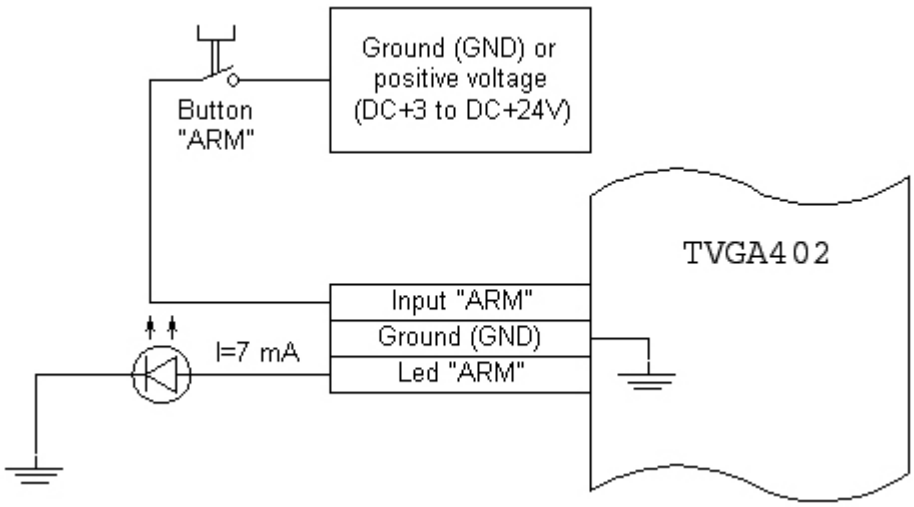

Figure 15. Connecting button "ARM" and led "ARM"

Led connected a cathode to "ground" circuit and anode to "led ARM" circuit. Maximum current of led is 7mA.

7.4. Connection of power

Plug the power supply into an AC outlet with help of adapter. In the case of use the TVGA402 in the car, for connection of power, use the same connector. TVGA402 has a protection from a mistake of polarity.

7.5. Switching the unit

On the giving stage supposed, that the TVGA402 has programmed, sensors adjusted, the wires from the sensors and feeding are at the place where you planed to mount the TVGA402.

- Fix the TVGA402 on the flat surface with a help of too nails.
- Attach mobile phone at 300-800mm length from TVGA402.
- Connect the sensor's wires, relay and "ARM" button to the TVGA402.
- If necessary, connect external led "ARM".
- Plug adaptor 12V to TVGA402. If you do it right, the led "POWER" flashes.
- Switch off request PIN code in the menu of mobile phone.
- Check the number of service center in the menu of mobile phone, for sending short messages.
- Switch off the ring, vibration and lighting in the menu of mobile phone, for economy of battery charge, if the TVGA402 is not connected to external power.
- Switch off the mobile phone, before connecting to TVGA402.
- Connect the mobile phone to TVGA402 with a help of cable from you supplied accessories.

GSM alarm system ready to work.

8. Limited Warranty

The manufacture of TVGA402 guarantee of proper work of the unit and full accordance of described features. In the case of not proper working of the unit into the guarantee period, it must be fixed by the manufacturer or changes for the new one, if the repair don't possible.

What your warranty does not cover:

- damage from misuse or neglect;
- product have been modified or incorporated into other product;
- acts of nature, such as but not emitted of lighting damage;
- insects inside of the unit;

The guarantee period of TVGA402 is twelve month from the day of purchase.

Date of manufacture

Date of sale: