GSM Dialer Emb v1.0

Short description:

• The GSM dialer works with power supply DC 12V/250mA.

• It alerts up to 9 phones (see 1. Entry of phone numbers in the SIM card)

• There are 5 zones/entries (Z1, Z2, Z3, Z4, Z5), each of which can be optionally programmed with 7 types of zones. *Default setting of the type of zones: Z1 type DIAL (dials numbers from 1 to 9). Zones from Z2 to Z5 send an SMS as follows: Z2 type CLOSE!, Z3 type TAMPER, Z4 type PANIC ALARM, Z5 type FIRE ALARM. The SMS are sent to the number entered first in the SIM card* (see 2. Zone programming 2.1 Type of zones - programming).

• Each zone may be optionally controlled : by feeding or dropping "+12V" or by feeding or dropping "-". *Default zone control setting: type 2 - low-to-high control, no external resistors are necessary.* (see 2.2. zone control programming).

• The number of dial cycles are freely programmable – from 1 to 9 cycles. *Default setting:* 3 cycles, i.e. upon activation of DIAL type zone, the dialer selects the 1st to 9th placed numbers in the SIM card three times (see 3. dial cycle programming).

• The GSM Dialer Emb has two outputs: Output 1 (Out1) and Output 2 (Out2) type open collector 400mA/ max peak 500mA which commute mass. They can operate in a trigger (STEADY) or pulsed (Pulsed) mode. *Default setting of the outputs:* STEADY (trigger mode), OFF. (see 4. programming and control of the outputs).

• The module monitors the power supply voltage and sends SMS of the type *"AC Trouble"/"AC Restored", "LOW Battery!"/"Battery OK!"* to the number entered first in the SIM card. *Default setting:* activated (see 5. Text messages 5.1. Power supply and battery).

• The GSM dialer can be programmed to send test messages "Test OK!" in 1 to 99 hours. *Default setting:* OFF. (see 5. Text messages 5.1. Test SMS).

• The zones of the dialer can be virtually divided into two groups (for example, to monitor 2 partitions of the same exchange or to monitor 2 alarm systems). *Default setting:* no division into groups. (see 6. Division of zones into groups).

• HELP menu: The combination ** sent by the number entered first in the SIM card generates a message with the format of the commands.

• The combination ## sent by the number entered first in the SIM card generates a message with the status of the module and its settings.

Power supply:

The GSM module is fed by the alarm exchange's AUX and not directly by the battery! Its consumption in the standby mode is 15 mA; when sending an SMS – 80 mA; calling – 120 mA.

Programming and operation with GSM Dialer Emb

Light indicators:

LED indicator		mode
green	red	
blinks at an interval of about 1 second	does not blink	normal working mode
does not blink	blinks slowly	Process of registration in the network
does not blink	blinks very quickly	There is a problem with the SIM card; switch power supply off, check SIM programming, check the contact plates of the SIM holder and ensure that the SIM card is correctly placed in the holder
blinks when the blinks and pauses in between them are equal in time	does not blink	there is an activated input or a message is sent
blinks intensively	does not blink	a call is ongoing

blinks intensively, consecutively with the red one	blinks intensively and consecutively with the green one	programming/control mode
does not blink	blinks permanently	call the workshop

In the dialer's regular working mode, only the green LED indicator blinks at intervals of about 1 second. When turning the dialer on, until it registers into the network and reads the SIM card, only the red LED indicator is blinking slowly. After the registration and read-out of the SIM card, the red one turns off, leaving only the green LED indicator to rhythmically blink. If, instead, the red LED indicator starts blinking very fast, there might be a problem with the SIM card. In a little while the dialer will restart but most probably the problem will persist. For this reason, turn the power supply off, check the programming of the SIM card, check the contact plates of the SIM holder and make sure that the SIM card has been correctly placed in the holder and its PIN code is turned off. When any of the entries is activated or a message is being sent, only the green LED indicator remains on, the pause and light period being equal. If there is a call, the green LED indicator blinks intensively. In the programming/control mode (there is a call from the outside and a connection has taken place), the red and green LED indicators blink frequently at a high frequency and consecutively.

1. Entry of phone numbers in the SIM card

1. The PIN code requirement is removed.

2. The numbers which are to be alerted upon a given event or events are entered. This happens via a normal GSM device from which there is a possibility to enter the numbers directly into the SIM card. Some of the GSM operators offer SIM cards with preset numbers of the police, fire department, emergency, etc. It is necessary that these numbers be removed from the card since they take the first positions in it. The deletion of the numbers can be made with the GSM device with which the SIM card has been programmed or with the dialer.

Deleting the SIM card via the dialer:

- turn off power supply of the module;

- put the SIM card (with the PIN code being turned off in advance!) into the dialer;

- shorten the jumpers to the left of the plate (to the condenser's left);

- feed in the power supply voltage. Once the dialer is started, in the beginning only the red LED indicator will blink. Then the green LED indicator will start blinking and within several seconds the two LED indicators will blink fast one after the other. This means that at this point in time the records in the SIM card will be deleted. When the operation with the deletion of the numbers is terminated, the two LED indicators will light up.

- turn off power supply voltage.

- remove the shortened ends between the jumpers. The numbers from 1st to 9th in the SIM card are deleted. The card is placed in a GSM device and the necessary numbers are entered. After entering the numbers, the SIM card is put back into the dialer.

2. Zone programming

Attention! Only the number entered first in the SIM card has the right to program all functions in the GSM dialer. From now onwards when speaking about programming, we mean a call from this number to the dialer.

Programming and control may happen only if the SIM card contains at least one number, the dialer has been turned on and has been put into an operating mode. The dialer dials with its first number and after it establishes a connection, the entry of commands from the keyboard (DTMF) into a regular GSM device can begin.

The entry of a first symbol * (followed by other symbols) means that the function or parameter of the dialer will be changed. If there is no *, the dialer expects control of the outputs.

After the entry of the codes into the GSM device keyboard, the dialer responds in a tone mode to the accepted codes. The tones returned to the dialer are:

- two brief confirmation signals, ♫

- three ascending tones about an error, ♬

- low-high tone when turning on (for the outputs)♬

- high-low tone when turning off (for the outputs) ♫

Should the command last more than 20 seconds, the dialler will discontinue the connection. In case the command is wrong, proceed with the entry. There is no need to interrupt the connection or begin right from the start.

2.1 Zone type programming

Format of the command: *ZXY, where:

Z is a number from 1 to 5 and indicates the zone to be programmed (Z1, Z2, Z3, Z4, Z5)

X is a number from 0 to 6 and indicates the zone type

Y is a number: 1 or 2 and indicates the zone programming method

The dialer has 5 programmable zones Z1, Z2, Z3, Z4, Z5. Each zone is independent of the remaining 4. The activation of a certain zone depending on its type alerts the numbers entered in the card with an SMS or with a call. When the alerting is with an SMS, the activation and restoration of the input (zone) is reported. When for alerting purposes a call is being used, only activation at the input (zone) is reported. Each zone can be programmed as a different type. **There are 7 types of zones (from 0 to 6):**

0 - DIAL - If the zone is activated, the numbers entered in the SIM cards start to be dialed.

1 - CLOSE! - Zone activation prompts the sending of an SMS containing the text "Close!". When the zone is restored, an SMS "Open!" is sent.

2 - TAMPER - Zone activation prompts the sending of an SMS containing a "TAMPER". When the zone is restored, an SMS "Restore TAMPER" is sent.

3 - PANIC ALARM - Zone activation prompts the sending of an SMS containing a "PANIC ALARM". When the zone is restored, an SMS "Restore PANIC ALARM" is sent.

4 - FIRE ALARM - Zone activation prompts the sending of an SMS containing a "FIRE ALARM". When the zone is restored, an SMS "Restore FIRE ALARM" is sent.

5 - SYSTEM TROUBLE - Zone activation prompts the sending of an SMS containing a "SYSTEM TROUBLE".

6 - ALARM Zn - The activation of the respective zone prompts the sending of an SMS containing the text "ALARM Z1", "ALARM Z2","ALARM Z3","ALARM Z4","ALARM Z5" depending on the activated zone. Upon activation of the respective zone, the sent SMS is "Restore ALARM Z1", "Restore ALARM Z2", "Restore ALARM Z3", "Restore ALARM Z4", "Restore ALARM Z5".

Only the number entered first in the SIM card receives all text messages. (An exception is made only upon group dialing of the dialer – see item 6).

Example: You want zone Z3 to notify about a breakdown in the system and to receive an SMS "SYSTEM TROUBLE" upon activation and SMS "Restore SYSTEM TROUBLE" upon restoration. Then Z3 has to be type 5 and its programming looks as follows:

*after the dialer "picks up", you dial *35♫(immediately after that, you have to set the control mode, for this reason continue reading)*

2.2 Zone control programming

The zones may be controlled by feeding in "+12V", taking off "+12V", feeding in "-", taking off "-". The method of control for the given input must be preprogrammed and physically wired with an external resistor, if necessary. The dialer has internally mass-connected resistors at its inputs and whenever control is by feeding mass ("-") or taking off mass ("-"), it is necessary to have external resistors valued from 4.3K Ohm to 5.6K Ohm which connect

the respective zone with +12V. In the cases when control is by feeding in "+12V" or taking off "+12V" , no resistors are necessary.

Type of control 1 (Y=1) :

High-to-low transition. The input is activated in the presence of 0V. If the input is inactive, there is +12V.

Type of control 2 (Y=2) :

Low-to-high transition. The input is activated in the presence of +12V. If the input is inactive, there is 0V or "mass".

Type of control of the respective zone is done by entering "1" or "2". By default, all zones are prepared for activation with type 2 low-to-high transition.

Example: we continue the above example with zone Z3: you have decided that control happens by feeding in "+12V" and you have not put any resistors:

*after the dialer "picks up", you dial *352.*

*The final result is: upon **feeding** of "+12V" of Z3, the first number entered in the SIM card will receive a message "SYSTEM TROUBLE" and after the taking "+12V" off - a message "Restore SYSTEM TROUBLE".*

3. Dial cycle programming

Format of the command: *8X, where:

***8** means that we will set the number of dial cycles for the numbers entered in the SIM card.

X is a number from 1 to 9 and indicates the number of cycles we have selected.

If there are several zones programmed as type "0" (i.e. call alerts), the number of dial cycles refers to each one of them. Once started, the dial cycle may cannot be terminated even if any of the dialed numbers responds to the call. If any of the numbers responds, the connection will last about 20 seconds after which the dialer terminates the connection and dials the next number in the SIM card.

*Example: we want 2 dial cycles – from the keyboard of the phone, we dial *82* ♫

4. Programming and control of the outputs

4. 1 Output programming

Format of the command: *XY, where:

X is a number: 6 for Output1 (Out1) or 7 for Output2 (Out2)

Y is a number: 1 for trigger mode (type **1** "**Steady**") or 2 for pulsed mode (type 2 "**Pulsed”**)

The dialer has two independent programmable outputs which are independent from each other. They are of the open collector type and the current of the managed consumer needs not be more than 400 mA. When the load is of the inductive type - relay, it is necessary to use a reverse-biased diode to prevent transistors from over voltage. Transistors at the outputs commute "mass." In "**Steady**" mode, the output retains its status until next switch-on. In "**Pulsed**" mode, upon activation of the output, a single impulse is generated which lasts for 1 second. When the output is programmed to work in "pulsed" mode, there is a possibility to generate both positive and inverted impulses. Only the numbers recorded first in the SIM card are entitled to program the functions at the outputs.

Upon first module switch-on, the outputs' default settings are off, in the trigger mode.

*Example: programming of output 2 in the pulsed mode happens by dialing *72* ♫

*Example: programming of output 2 in the pulsed mode happens by dialing *71* ♫

4.2. Output control

Format of the command: XY, where:

X is a number: 1 for Output1 (Out1) or 2 for Output2 (Out2)

Y is a number: 8 for switch-on or 0 for switch-off

The numbers from the 1st to 4th position in the SIM card are entitled to control the outputs. The GSM communicator "picks up" only to those numbers, it "hangs up" to all the rest. Activation of outputs happens in the following way: you dial the GSM module from any of the numbers with rights and you wait for the dialer to "pick up." Out1 is activated by entering combination **18** from the GSM device's keyboard and is switched off with combination **10**. Activation of Out2 happens with the combination **28**, and the switch-off – with **20**. Out1 and Out2 can work in the *Pulse* mode. The working modes of the outputs are programmed as laid down in point 4.1.

The logic is as follows: imagine that the figures 8 and 0 are in the "up" and "down" position of the toggle switch but before that you have to indicate which switch you are to run with "1" and "2".

4.3. Output status

When dialing any of the first 4 numbers with the module and by dialing ##, the dialer returns an SMS. The numbers recorded on the 2nd, 3rd and 4th place receive information only about the outputs' status, and the 1st number recorded receives the full status and programmed parameters.

4.4. Trigger mode "Steady"

In "**Steady**" mode, the output retains its status until next switching.

Example 1: Output 1, programmed in the trigger mode (type 1 "Steady") is switched off. We want to switch it on: we call from a number entered 1st, 2nd, 3rd or 4th in the SIM card; after connecting to the module, we enter from the keyboard of our GSM device the combination 18 (with 1 we point to the output number we control, with 8 we indicate switch-on).

Example 2: Output 1, programmed in the trigger mode (type 1 "Steady") is switched on. We want to switch it off: we call from a number entered 1st, 2nd, 3rd or 4th in the SIM card; after connecting to the module, we enter from the keyboard of our GSM device the combination 10 (with 1 we point to the output number we control, with 0 we indicate switch-on).

4.5 Pulsed mode "Pulsed"

In this mode, upon activation of the output, a single impulse is generated which lasts for 1 second. When the output is programmed to work in "pulsed" mode, there is a possibility to generate both positive and inverted impulses.

*Example 3: The output we control is continually switched off. We want by calling it to switch it on for a short while and thereafter to let it switch off by itself, i.e. we want to briefly issue a positive impulse. To generate a positive pulse from a given output, it is necessary to program it as type 2 - "Pulsed" (*62 for Out1 or *72 for Out2). If programming is successful and we dial ## (to obtain the status of the outputs), we will receive an SMS with the contents "Out1=0 Pu" or "Out2=0 Pu". Control of programming in the Pulsed mode and the output generating a positive pulse happens with 18 (switching on output 1 for one second and subsequent self-switch off) or 28 (switching on output 2 for one second and subsequent self-switch off). In this case, the entry of outputs' switch-off configurations (10 or 20) are pointless since their normal status is switched off.*

*Example 4: The output we control is continually switched on. We want by calling it to switch it off for a short while and thereafter to let it switch on again by itself, i.e. we want to briefly feed "mass". Control with inverted impulse for output 2 is programmed as follows: *71♫ 28 ♫ *72 ♫*

Here is what we actually did:

**71 (we programmed output 2 in mode 1 Steady) 28 (we activated output 2)*72 (we programmed output 2 in Pulsed mode). We recall that if the default settings are in the trigger mode, off, i.e. if you switch the module on for the first time, there is no sense to dial *71 and your command can only be 28*72. If programming is successful and we dial ## (to obtain the status of the outputs), we will receive an SMS with the contents "Out2=1 Pu". Control of programming in the Pulsed mode and the output generating an inverted pulse happens with 10 (switching offon output 1 for one second and subsequent self-switch on) or 20 (switching off output 2 for one second and subsequent self-switch on). In this case, the entry of outputs' switch-on configurations (18 or 28) are pointless since their normal status is switched on.*

5. Text messages (SMS-и)

All SMS related to the zones and the system messages "AC Trouble/AC Restored", "LOW Battery!"/"Battery OK!" and "Test OK!" are sent only to the numbers entered first.

5.1. Power supply and battery

By default, the SMS about the condition fo the power supply are activated. They can be switched off with the combination ***#0** or to be activated again with ***#1** by dialing the number in the first position.

When switching off the central power supply (220V), the feeding voltage of the exchange reduces to 12.8V, then the dialer sends an SMS with contents *AC Trouble*. If the voltage continues to go down (the battery runs low) and reaches a value of 10.5V, the SMS the module will send is *LOW Battery*! After restoring the central power supply (220V), that of the exchange goes up and once it reaches a value of 12.5V, the SMS dispatched is *Battery OK*. Once restored and the voltage of the battery's value reaches around 13.3V the module sends a message with the contents *AC Restored*.

Summary:

U<=12,8V - SMS *"AC Trouble"*

U<=10,5V - SMS *"LOW Battery!"*

U>=12,5V - SMS *"Battery OK!"*

U>=13,3V - SMS *"AC Restored"*

Note: several minutes after feeding the module's power supply (upon first switch-on or after switch-off for any reason), it sends a signal *AC Restored*.

5.1. Test SMS

Test SMS monitor the operational capacity of the dialer. By default, they are deactivated. They can be activated with the combination ***0, followed by a double-digit figure = the period in hours.**

*For example, *001: the module will send an SMS containing the text "Test OK" to the number entered first in the SIM card, once an hour; *099 - the module will send an SMS with contents TestOK once every 99 hours.*

Deactivation of test SMS happens with *000 (we set 0 hours as a period of dispatch).

6. Division of zones into groups

Format of the command: *9x, where:

***9** indicates division into groups programming

x is a number: 2 for activating the option of division into 2 groups; 1 for deactivation

The dialer can be virtually divided into two groups (for example, to monitor 2 partitions of an exchange or to monitor 2 alarm systems). The number entered first in the SIM card programs both parts!

6.1. Grouping

The first group covers:	**The second group covers:**
zones Z1,Z2	zones Z3,Z4
zone Z5, shared by both groups	zone Z5, shared by both groups
output Out1	output Out2
numbers in the SIM card from 1 to 4	numbers in the SIM card from 5 to 9
output 1 is controlled by the numbers entered in the 1st and 2nd position in the card.	output 2 is controlled by the numbers entered in the 1st, 5th and 6th position in the card.

6.2. Zone 5 (Z5)

If zone Z5 is programmed as a type from "1" to "6" , since it is common for both groups, it will send SMS to the 1st and 5th numbers in the SIM card. If Z5 is configured as type "0" (DIAL), upon its actuation the dialer will dial the 1st to 9th numbers recorded in the SIM card.

6.3. Number of dial cycles

As mentioned above - with the combination *8x (see point 3).

6.4. SMS for the zones

The numbers entered in the 1st or 5th position will receive an SMS depending on the "part" of the dialer the activated zones refer to.

6.5. Utility Test and Power Supply Status text messages

Received only by the number entered first in the SIM card.

6.6. Outputs in a dialer divided into groups

The outputs are assigned to either group, as described above. The outputs are programmed and run as described in item 4. The numbers recorded in the 1st and 2nd position in the SIM card are entitled to control Out1. The numbers recorded in the 1st, 5th and 6th position in the SIM card are entitled to control Out2.

Pay attention that the number recorded 1st in the SIM card can navigate both outputs!

The type of the outputs can be as it would have been had the zones remained undivided.

7. HELP

With the combination **, "HELP" is requested: a message which displays the format in which the dialer's commands have to be issued as well as the possible codes/combinations for dialer's options activation. The number entered first in the SIM card receives a HELP SMS.

The **HELP** message looks as follows:

HELP:
Zone Type +/-
*1-5 0-6 1-2
Out1/2Type
*6-7 1-2
DialCycles
*8 1-9
Partitions
*9 1-2
TestPeriod h
*0 00-99
U_SMS
*# 0-1
GetSet
##

DEFAULT SETTINGS. This is the SMS text which the number recorded first in the SIM card will receive after switching it on for the first time and fialing ##. The commands for reset to the default parameters are also provided.

Status SMS	Description of the text in the SMS	Command
V1.0:	Software version	
Z1+: DIAL	Z1 control with low-to-high transition, zone type "0"	*102
Z2+: CLOSE!	Z2 control with low-to-high transition, zone type "1"	*212
Z3+:TAMPER	Z3 control with low-to-high transition, zone type "2"	*322
Z4+:PANIC ALARM	Z3 control with low-to-high transition, zone type "2"	*432
Z5+: FIRE ALARM	Z4 control with low-to-high transition, zone type "3"	*542
Out1=0	The first output is not activated	*61
Type:St	Is type 1; trigger mode	
Out2=0	The second output is not activated	*71
Type:St	Is type 1; trigger mode	
Dial=3	There are 3 dial cycles	*83
Part = 1	There is one group (one partition)	*91
Test = 0h	No test SMS is sent	*000
U = xxxV	xxx - value of power supply fed in presently	*#1
GSM = xx	Level of GSM signal	

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V1.0:	Software version	
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Z2+: CLOSE!	Z2 control with low-to-high transition, zone type "1"	*212
Z3+:TAMPER	Z3 control with low-to-high transition, zone type "2"	*322
Z4+:PANIC ALARM	Z3 control with low-to-high transition, zone type "2"	*432
Z5+: FIRE ALARM	Z4 control with low-to-high transition, zone type "3"	*542
Out1=0	The first output is not activated	*61
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Test = 0h	No test SMS is sent	*000
U = xxxV	xxx - value of power supply fed in presently	*#1
GSM = xx	Level of GSM signal	

Example for overall dialer programming:

A connection between the number entered first in the SIM card is established. With the keyboard of the GSM device, we enter the combinations and listen to the tone combinations of the dialer. ***We enter and listen:***

***102 ♫ *212 ♫*361♫ *61♫ *72 ♫ *82 ♫*91♫*048♫ *#1 ♫ ## -** the dialer is programmed, we hang up and wait for a status SMS.

Bear in mind that while default settings might be relevant to you, there is no use to confirm this by duplicating them! If you leave the default settings, the communicator will operate like our previous models GSM SIM xxx with the only difference that the zones are by default controlled with a low-to-high transition. *In the above case, if we skip commands which duplicate the default settings, the programming will be reduced to the entry of the following combinations:*

***361♫ *72♫ *82 ♫*048 ♫ ##** , the dialer is programmed, we hang up and wait for a status SMS.

Detailed description of the recorded commands:

***102** – *setting the type and control of zone 1* Zone Type +/-; *1(Z1)0(Dial-zone with a call alert) 2(zone control is type 2). Note: in this case, this is the default setting of the output. For this reason, this command may be skipped.

***212** - *setting the type and control of zone 2* *2(Z2)1(CLOSE!- zone with SMS alerting of "Open!"/"Close!") 2 (zone control is type 2). Note: in this case, this is the default setting of the output. For this reason, this command may be skipped.

***361** - *setting the type and control of zone 3* *3(Z3)6(ALARM Z3 - zone with SMS alerting of "ALARM Z3"/"Restore ALARM Z3") 1 (zone control is type 1).

. we leave Z4 and Z5 with their default settings.

***61** – *programming of output 1 in trigger mode* Out1/2 Type *6 (Out1) 1 (type "Steady"). Note: in this case, this is the default setting of the output. For this reason, this command may be skipped.

***72** - *programming of output 2 in pulsed mode* *7 (Out2) 2 (type "Pulsed")

***82** – *programming of 2 dial cycles upon actuation of zone type 0* Dial Cycles *82 (2 dial cycles)

***91** – *programming of Partitions* *91 (no division into groups). Note: in this case, this is the default setting of the output. For this reason, this command may be skipped.

***048** - *setting of a 48-hour period for the test messages* * TestPeriod h *048 (the test SMS will be send once every 48 hours; if *000 is entered, there will be no test SMS)

***#1** – *we activate the dispatch of test messages* U_SMS *#1(the GSM module will send a power supply status SMS; if 0 is entered, these messages will not be dispatched). Note: in this case, this is the default setting of the output. For this reason, this command may be skipped.

- *we finished with the programming; with this combination, we request that the module's programmed status be displayed - status GetSet . ## the connection with the module is terminated.* ***In a little while, we get an SMS with the following text:***

##

v1.0:	Software version
Z1+:DIAL	Z1 is programmed for control with low-to-high transition and is zone type "0"
Z2+:CLOSE!	Z2 is programmed for control with low-to-high transition and is zone type "1"
Z3-:ALARMZ3	Z3 is programmed for control with high-to-low transition and is zone type "6"
Z4+:PANIC ALARM	Z4 is programmed for control with low-to-high transition and is zone type "3"

Z5+:FIRE ALARM	Z5 is programmed for control with low-to-high transition and is zone type "4"
Out1=0	The first output is not activated
Type:St	and is type "1", trigger mode
Out2=0	The second output is not activated
Type:Pu	and is type "2", pulsed mode
Dial=2	The dial cycles are 2
Part=1	There is one group (one partition)
Test=48h	The test SMS will be sent once every 48 hours
U=12,89V	The option for sending an SMS about the condition of the power supply is activated.
GSM=95	Level of the GSM signal: below 10 critical; 10-30 weak; 30-60 average; above 60 strong.

Warning: The SGM dialer does not send SMS for no reason whatsoever! If the SMS from one site become unusually frequent (especially if with one and the same contents), look into and eliminate the cause. Otherwise, you will incur expenses and/or will exhaust your limit!