GSM NOTIFICATION MODULE

Purpose

GSM module is used to signal various events by sending short text messages (SMS) and calling. The unit can send 4 different messages. With the module you can control two outputs by sending corresponding SMSs. This function can be used for remote activation of certain equipment at home e.g. alarm system, lighting etc. This module is ideal for signaling intrusion, attack, fire, gas leakage or other technical defects. The unit can work independently or in connection with the alarm control panel wherever no standard telephone line is available or there is risk that the line may be cut by a burglar.

Module GSM – N2.0 can work with the following phone models:

NOKIA: 3210, 3310, 3330, 3410, 5110, 5130, 6110, 6130, 6150, 8210.

Installation

Installation of the unit must be done with the disconnected power supply.

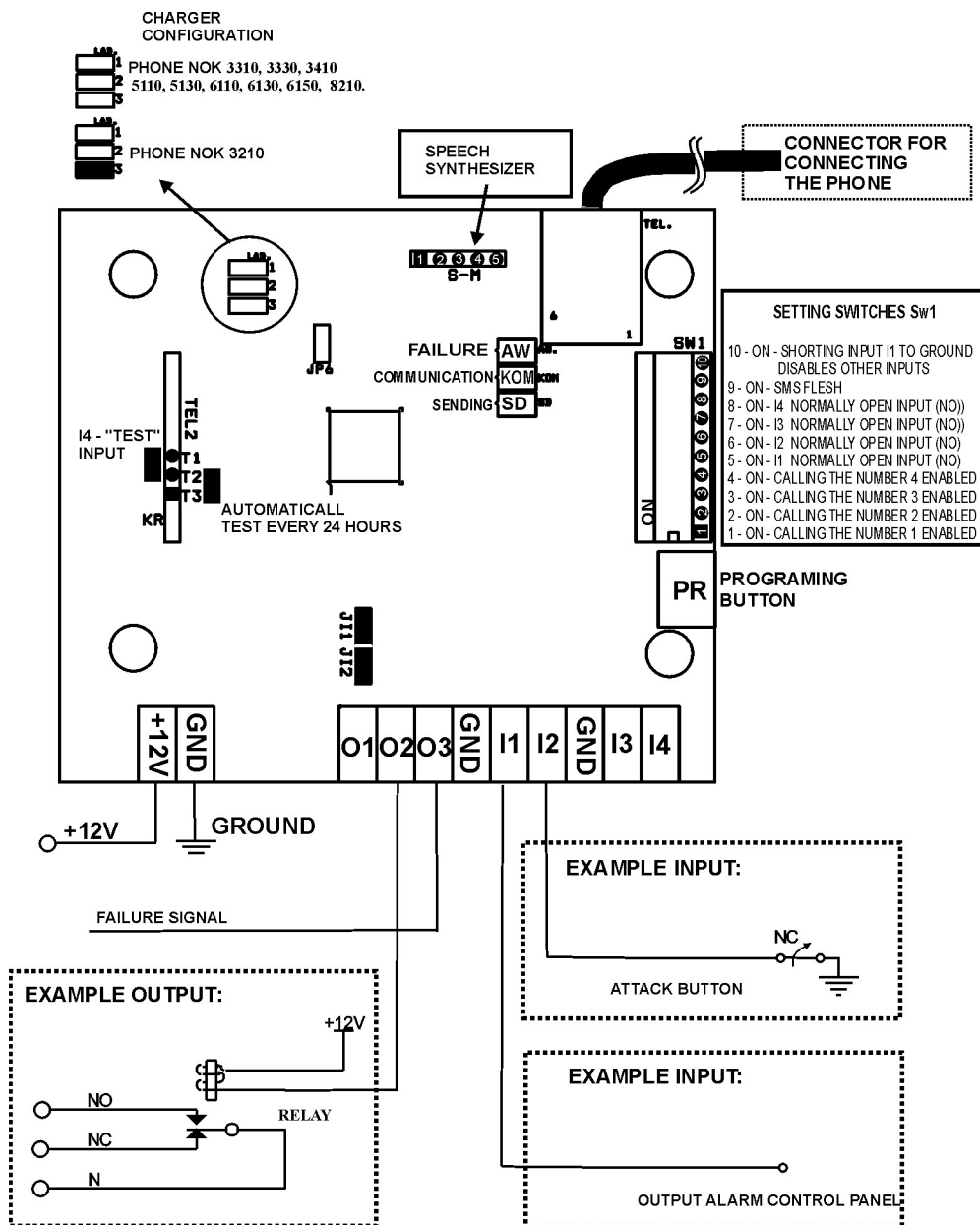The voltage supplying the module should be stabilized and free from impulse interference.

The module board and GSM telephone are sources of electromagnetic interference, therefore they should not be installed near sensitive radio equipment e.g. radiolinks, wireless sensors etc.

Do not place the phone in the immediate proximity of the module.

The module should be installed inside the metal casing.

Connect the cable connecting the module with the phone to TEL. connector, making sure that the plug pins have good and secure contact with the phone connector. Weak contact can result in malfunctioning of the system.

View of the module board

CHARGER CONFIGURATION

PHONE NOK 3310, 3330, 3410 5110, 5130, 6110, 6130, 6150, 8210.

PHONE NOK 3210

SPEECH SYNTHESIZER

CONNECTOR FOR CONNECTING THE PHONE

S-M

TEL.

FAILURE AW
COMMUNICATION KOM
SENDING SD

SW1

SETTING SWITCHES Sw1

10 - ON - SHORTING INPUT I1 TO GROUND DISABLES OTHER INPUTS
9 - ON - SMS FLESH
8 - ON - I4 NORMALLY OPEN INPUT (NO))
7 - ON - I3 NORMALLY OPEN INPUT (NO))
6 - ON - I2 NORMALLY OPEN INPUT (NO)
5 - ON - I1 NORMALLY OPEN INPUT (NO)
4 - ON - CALLING THE NUMBER 4 ENABLED
3 - ON - CALLING THE NUMBER 3 ENABLED
2 - ON - CALLING THE NUMBER 2 ENABLED
1 - ON - CALLING THE NUMBER 1 ENABLED

I4 - "TEST" INPUT

TEL2

T1
T2
T3

KR

AUTOMATICALL TEST EVERY 24 HOURS

JI1 JI2

PR PROGRAMING BUTTON

+12V GND O1 O2 O3 GND I1 I2 GND I3 I4

+12V GROUND

FAILURE SIGNAL

EXAMPLE INPUT:

NC

ATTACK BUTTON

EXAMPLE OUTPUT:

+12V

NO
NC
N

RELAY

EXAMPLE INPUT:

OUTPUT ALARM CONTROL PANEL

TEL. - connector for connecting the phone (description for p. 2.).

T1, T2 - jumpers for configuration of "TEST" function (description for p. 4.).

JI1, JI2 - configuration of inputs I1 and I2 (description for p. 4.).

SW1 - switches for configuration of calling and mode of sending SMSs (description for p. 6.).

PR - module programming button (description for p. 5.).

SD - yellow LED, which indicates calling and sending SMSs (description for p. 8.).

KOM - green LED indicating correct communication of the module with the phone (description for p. 8.).

AW. - red LED indicating failure (description for p. 4.).

LAD. - battery charger configuration (description for p. 7.).

S-M - speech synthesizer output (description for p. 8.).

Description of module connectors.

+12V   - module power supply 12V.

GND   - module ground.

I1÷I4   - NC/NO alarm inputs. Opening / shorting of the circuit GND input for longer than 450 ms will send SMS stored in the module memory to 4 phone numbers.

Type of NO or NC input polarization is set by SW1 5-8 switches.
ON - normally open input (NO),   **OFF -** normally closed input (NC)

Additionally, inputs I1 and I2 can be controlled by shorting to GND or to +12V.

Action of input I1 according to the settings of jumper JI1 and switch SW1 position 5

JI1 \ SW1-5	ON	OFF
ON (plugged)	Short to ground activates	Disconnecting from ground activates
OFF (removed)	Disconnecting from (+) activates	Short to (+) activates

Action of input I2 according to the settings of jumper JI2 and switch SW1 position 6

JI2 \ SW1-6	ON	OFF
ON (plugged)	Short to ground activates	Disconnecting from ground activates
OFF (removed)	Disconnecting from (+) activates	Short to (+) activates

Additional functions of inputs I1 and I4.
I1 - the input can disable other module outputs. effected by applying GND signal on the input, with switch SW1 10 in ON position. With switch SW1 10 set in OFF position the input acts as a normal input.

I4 - mode of operation of input I4 depends on jumper setting to **T1,T2,T3**:
     The following settings are possible:

     Jumper on T1 and T2 contacts:
     On detecting violation of input I4 the module sends one SMS (the 4th from the list) or CLIP **only to the 1st number.** Energizing the input does not activate calling even if switches SW1 1-4 are set to ON position. Typically, input I4 is used for cyclic test of proper operation of the module and the phone (input activated by the timer of the alarm control panel).

     Jumper on T2 and T3 contacts:
     The module automatically sends SMS every 24 hours with the following message "GSM module OK" or test sms entered during programming **only to the 1st number**.
     In this case input I4 is regarded as another standard alarm input.

     No jumper on T1,T2,T3:
     Correct operation test function disabled. Input I4 is working as a standard alarm input.

Note !
The module also features test "on demand". After sending SMS (from any phone) only with the code (e.g. ABC1), the module should answer by sending SMS with the message "GSM module OK"

Notes: •   inputs I1-I4 can be directly activated by low-current output signals e.g. outputs: OUT 5.6,..., at alarm control panels SATEL CA6,CA10,CA64,
         ☐   inputs: I1 I2 can be activated by (+) output signals OUT 1,2,3,4 (removed jumpers J11 and J12).

O1, O2   - transistor OC outputs (after activation they supply GND signal), can be used to control the

actuating relay. Current output 100mA. Activated and deactivated by sending SMS. Output OUT1 can be additionally controlled by a ringer (CLIP).

Activation is effected by sending SMS with the following text: **ONx CODE** or **CODE ONx** or **ONxCODE** or **CODEONx,** where CODE is a 4-character code e.g. 6789 or AABB, and x is a number of output 1 – for O1 2- for O2.

The example of SMS activating the Output O1: **ON1 ABC1**

Deactivation: SMS with the text **OFFx CODE** or **CODE OFFx** or **OFFxCODE** or **CODEOFFx**.

The example of SMS disabling Output O1: **OFF1 ABC1**

Output O1 can be controlled by CLIP rings, to activate this function during parameter programming you should write SMS with the following text: *OUTCLIP* (when the module is connected to Nokia 3210 and 3310 series control of output O1 via CLIP rings is not possible). Output can be activated only by the rings of numbers saved in the module memory, which ensures protection from unauthorized control attempt. The action is as follows: each time the ringer signal is received the module changes the output state to the opposite one. The output can also work in monostable mode i.e. after receiving a ringer signal the module shorts the output to GND for 1s. To activate this mode you have to input SMS with the following text: *OUTCLIP MONO.*

Notes: • state of outputs O1, O2 is memorized after loosing and recovering the power supply to the module. The outputs are reset when programming the module (PR button). The example of output application includes remote deactivation of alarm signaling, arming/disarming of the system, entry gate control etc.

ON and OFF commands can be input using lower case letters or in a mixed way e.g. On.

After receiving sms which controls the output the module automatically deletes it from the incoming box

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O3 - failure signaling OC transistor output. In normal state the output is shorted to ground. When failure occurs the output is opened and red LED is turned on (AW.) The failure is indicated with 5 minute delay. When the failure is gone the output will be automatically shorted.

The number of red diode blinks means:
1 - Low battery level (below 2 "bars").
2 - Weak network signal (below 2 "bars").
3 - The phone not logged on the network
4 - Failure to send 3 x SMS-s in a row e.g. used up the account balance.
5 - Module supply voltage below 9.5V.
6 - Problem with charging the phone battery.
7 - No communication with the phone.
8 - The phone is turned off.
9 - Unused.
10 - Fast blinking means corruption of configuration data in the EEPROM memory.

Information on failure of telephone battery charging and low level of module power supply can be also sent as a special SMS to the first number. The message context is set up when programming with SMS starting with the word *FAILURE*.

Example: *FAILURE power failure*

> **Note !**
> When the module is connected to Nokia 3210 and 3310 series function of output O3 is limited only to signal failure to communicate with the phone and module low power supply voltage.

Programming.

PIN code : Before connecting the module with the phone you have to change its PIN code to **2472**

PIN code is stored permanently in the module and its modification is not possible.

Note !
When you enter a wrong PIN code, the SIM card may be locked (you must enter PUK code), so a great care must be taken when changing the code.

Programming the phone numbers, SMS-s, sms center number

Notification phone numbers, SMS center number as well as alarm SMS-s are all stored in the module memory. The parameters can be transferred from the phone into the module by pressing the button **PR**.

Notes: When entering the phone numbers in the phone it is recommended to delete all numbers and re-enter only those you want, this way you can be sure that the positions taken by the newly entered numbers in the memory are 1,2,3,4 and they will be properly read by the module. If deletion of all numbers is not possible, you should use the Logo Manager program or similar on the PC computer to edit and enter the desired numbers on the first 4 positions.

Note !
Phone numbers, alarm SMSs , output securing code and SMS center number are read from SIM card rather than from the phone memory.

Entering the SMS text messages:

Before you can enter SMSs you must delete all messages from both the outgoing and incoming box (they share common memory area). The context of alarm SMSs, test SMS, output access code etc. can be programmed by means of programming SMSs saved in the outgoing box.

The programming SMS consists of the following:

Command: It instructs the module how to interpret the next part of the SMS, e.g. as the SMS being sent during line activation, or as the output access code etc.

Space

Argument: The text of the SMS or additional parameter

Command		Argument

When writing configuration SMSs you should **disable** T9 dictionary in the phone, don't use local characters and adjust the coding: ALFABET GSM.

Table of SMSs programming module operation mode:

Command	Argument	Description of operation/ function	The example of sms
I1	Text of SMS max 20 characters	SMS sent with violation of line I1	*I1 Intrusion*
I2	Text of SMS max 20 characters	SMS sent with violation of line I2	*I2 Attack*
I3	Text of SMS max 20 characters	SMS sent with violation of line I3	*I3 Gas leakage*
I4	Text of SMS max 20 characters	SMS sent with violation of line I4	*I4 Fire*
TEST	Text of the test SMS max 20 character	SMS is sent during 24-hour transmission test or as a reply in return to external SMS	*TEST Modul Ok.*
CODE	XXXX	Entering the code enabling output control via SMSs	*CODE 1674*
OUTCLIP	None/ MONO	Permission to control output OUT1 by a ringer (CLIP), if argument MONO is applied then after receiving the ringer signal the output is shorted to ground for 1s.	*OUTCLIP*
TESTCLIP	None	Ring transmission test	*TESTCLIP*
FAILURE	Text of SMS max 20 characters	Sends SMS to 1 number when power supply voltage drops to 9.5V or there is a problem with charging the phone battery (only N 5110, 5310, 3330, 3410, 6110)	*FAILURE Power supply failure*
TEL1	phone number	First phone number	*TEL1 +3726000001*
TEL2	phone number	Second phone number	*TEL2 +3726000002*
TEL3	phone number	Third phone number	*TEL3 +3726000003*
TEL4	phone number	Fourth phone number	*TEL4 +3726000004*
CENTER	phone numbers	SMS center number	*CENTER +3721000310*

Notes:

Commands can be written using both lower and upper case letters e.g. TESTCLIP←→ Testclip,

You can add later next control SMSs without having to delete the existing ones, remember however to press PR button.

The sequence of SMS input is irrelevant, what is relevant, is that the SMSs must take the first 9 positions in the outgoing box.

The phone numbers, to which the information should be send, can be changed automatically using SMS messages:

The SMS format: CODE TELx yyyyyyyyyyyy
CODE – 4-character access code.
TELx – TEL1 TEL2 TEL3 TEL4 phone number on the modules list
yyyyyyyyyyyy – new phone number e.g. +3725636033

The SMS format: CODE TELx - deletes TELx phone number from the modules list

Example of module configuration:
during activation of input I1 the module sends SMS with the text "Intrusion",
during activation of input I2 the module sends SMS with the text "Attack",
the code controlling the module outputs must be ADAM,
24-hour transmission test should be performed in form of ringer CLIP,

module power supply failure is alerted by "Low voltage" SMS,
other alarm inputs of the module are left unused.

Programming SMSs:

I1 Intrusion
I2 Attack
CODE ADAM
TESTCLIP
FAILURE Low voltage

During programming green LED (KOM) is lit continuously. After finishing programming the phone numbers and SMSs are saved in internal EEPROM and their later modification in the phone has no effect on the text of SMSs and numbers handled by the module.

> *Note !*
> The module is equipped with a counter of sent SMSs. You can send a maximum of 40 SMSs per day. The counter is reset every 24 hours or when **PR** button is pressed.

Functions of mobile phones working with GSM-N2.0 notifications

NOKIA 5110, 5130, 6110, 6130, 6150	ALL FUNCTIONS AVAILABLE
NOKIA 3330, 3410	ALL FUNCTIONS AVAILABLE
NOKIA 8210	ALL FUNCTIONS AVAILABLE
NOKIA3310	- NO AUTOMATIC TURN-OFF FUNCTION - NO CLIP FUNCTION - FAILURE ALERTS ARE RESTRICTED TO: NO COMMUNICATION AND LOW MODULE SUPPLY VOLTAGE
NOKIA 3210	- NO AUTOMATIC TURN-OFF FUNCTION - NO CLIP FUNCTION - FAILURE ALERTS ARE RESTRICTED TO: NO COMMUNICATION AND LOW MODULE SUPPLY VOLTAGE

Setting SW1 switches

The switches 1,2,3,4 (corresponding to the successive phone numbers memorized by the module) enable / disable calling after finishing sending SMSs

ON   - calling the number enabled,
OFF   - disabled.

Switches 5,6,7,8 – NO/NC polarization of inputs I1, I2, I3, I4

ON   - NO input,
OFF   - NC input.

Switch 9 selects the type of SMSs being sent:

ON   - flash type SMS (after receiving it automatically appears on the display),
OFF   - normal SMS (to read it you have to enter the incoming box).

Switch 10 selects the operating mode of input I1

ON   - shorting input I1 to ground disables other inputs,
OFF   - input works as a standard alarm input.

Charger configuration.

Using jumpers **1,2,3 LAD** you can set the current and voltage of phone charging:

Jumper 1 sets the charge current: shorted = 500mA (from 420 to 670 mA)

opened = 330mA (from 280 – 450 mA)

Jumpers 2 and 3 set the charging voltage (with the phone not connected):

JUMPER **LAD.2**	JUMPER **LAD.3**	CHARGING VOLTAGE
ON	ON	5.00 V
OFF	ON	6.25 V
ON	OFF	6.90 V
OFF	OFF	8.10 V

	Standard settings for NOKIA 3410 models

	Standard settings for the following NOKIA phone models: 3310, 3330, 5110, 5130, 6110, 6130, 8210.
	Standard settings for NOKIA 3210 models

Signaling the operating states of the module.

Proper communication of the module with the phone is signaled by cyclic "short" flashing of green LED (KOM). In case of communication loss the module retries 16 times to establish communication ("free") flashing and switches to initial state (LED is lit continuously).

The process of sending SMS is signaled by yellow LED (SD) flashing in the following way:

1 flash sending to number 1,
2 flashes number 2,
3 flashes number 3,
4 flashes number 4.

If any number is not in the module memory, e.g. number 2 (empty position in the phonebook) then after 1 flash there will be 3 flashes instead of 4. It means there is a problem with sending SMS to number 2. After finishing sending SMSs the module will start to call the preset numbers according to the setting of switches SW1 1-4.

The information on the presently dialed number is indicated similarly as for SMS by orange LED (SD) flashing. When the calling is finished the LED goes off.

The current state of the device can be checked by means of SMS message:
CODE state (where CODE is a 4-character code set during the module configuration)
Return SMS text message:
Inputs: XXXX, where X=0 or 1, 1 – when input is connected to ground, 0 – when input is connected to (+) or disconnected
(*sequence*: I1 I2 I3 I4)

Outputs: YY
(*sequence*: O1 O2)
OUT1 if 1 means shorted to ground, 0 means opened
OUT2 if 1 means shorted to ground, 0 means opened
Failure/No failure

Cooperation with the speech synthesizer.

Connect the speech synthesizer to S-M connector. The message is played back automatically after dialing the number by the telephone.
Make sure that after making connection with the module the following text is shown on the phone display: *Microset,* Microset symbol.
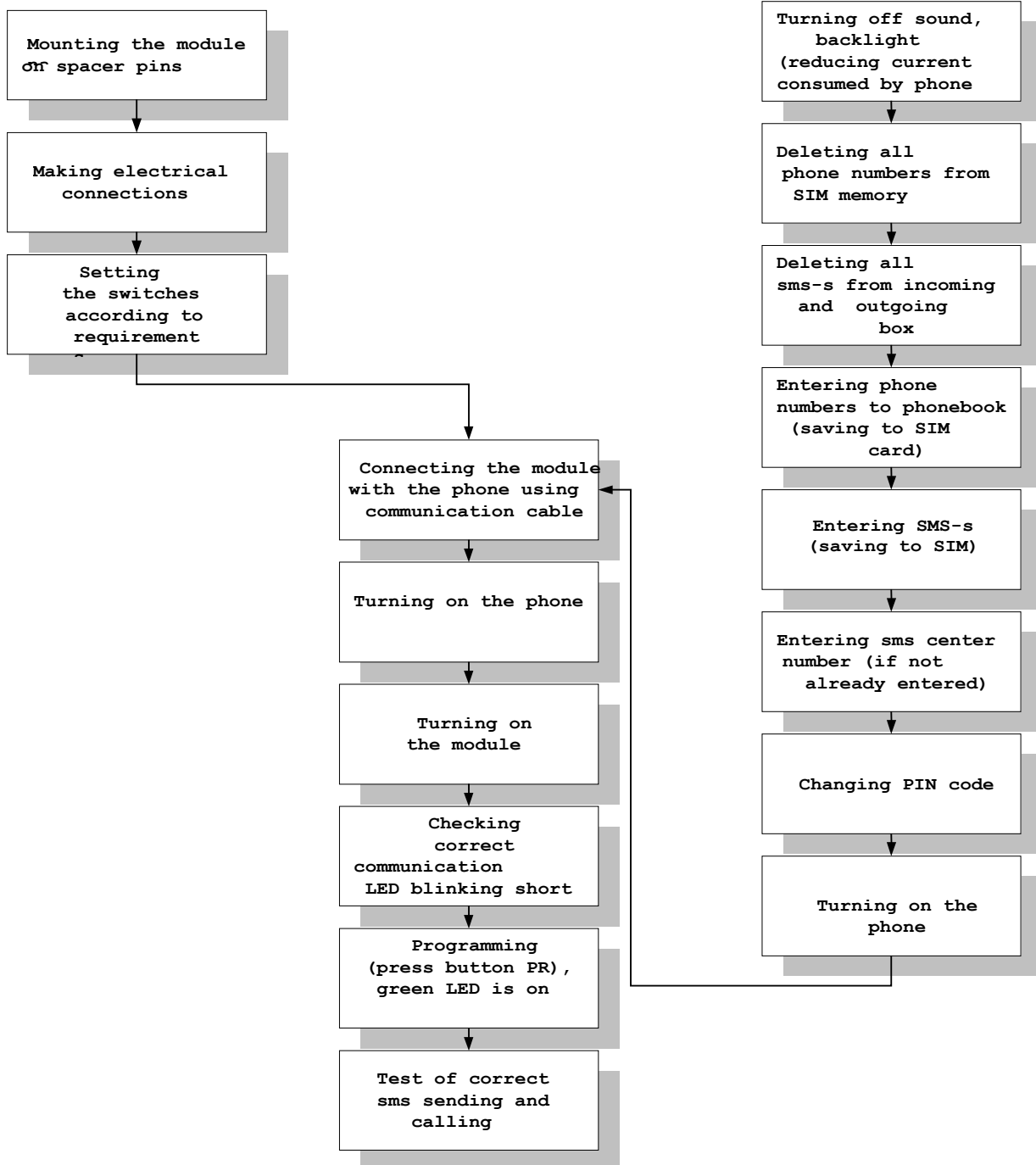

Note !
In case of GSM-N2.0 cooperation with NOKIA 3xxx and 8210 models first connect the plug into the module and then plug in the earphone connector.

Block diagram of the procedures for installation and configuration of module GSM-N2.0

Module   Telephone

Module column:

```
Mounting the module
on spacer pins
        ↓
Making electrical
connections
        ↓
Setting
the switches
according to
requirement
        ↓
Connecting the module
with the phone using
communication cable
        ↓
Turning on the phone
        ↓
Turning on
the module
        ↓
Checking
correct
communication
LED blinking short
        ↓
Programming
(press button PR),
green LED is on
        ↓
Test of correct
sms sending and
calling
```

Telephone column:

```
Turning off sound,
backlight
(reducing current
consumed by phone
        ↓
Deleting all
phone numbers from
SIM memory
        ↓
Deleting all
sms-s from incoming
and   outgoing
box
        ↓
Entering phone
numbers to phonebook
(saving to SIM
card)
        ↓
Entering SMS-s
(saving to SIM)
        ↓
Entering sms center
number (if not
already entered)
        ↓
Changing PIN code
        ↓
Turning on the
phone
```

Examples of problems and their most frequent causes:

Green LED KOM (communication) is not blinking, or is blinking slowly:

   wrong connection between the module and the phone, check the connection quality.

The phone does not connect with the numbers:

   check the settings of switches SW1 1-4 responsible for calling,

   check if the jumper is set to TEST – if input I4 is set to "TEST" then it does not activate calling.

Yellow LED (SD) is flashing but the phone does not send SMSs:

    check SMS center number in the phone and press PR button,

    check account balance (Pre-Paid).

Yellow LED (SD) not flashing and the phone does not send SMSs but makes calls:

    Delete all SMSs in the phone, re-enter them and press PR button, be sure SMS is not longer than 20 characters.

Yellow LED (SD) is not flashing, the phone neither sends SMSs nor makes calls:

    No phone numbers in the module memory: delete all numbers from the phonebook and re-enter them, store them on the SIM card,

    The limit of SMSs and calls has been exceeded: disconnect and reconnect the power supply to the module to reset the counter.

Programmable outputs do not change their state:

    Wrong output access code: check if you entered the output access code into the module memory (sms with the text *CODE xxxx* where *x* digit or letter)

Examples of connection of the module with the alarm control panels

Stand-by on/off connection diagram (alarm reset)

Satel CA5, CA6, CA10

    Program the input Zx as stand-by ON/OFF,

    Program the sensor type as NO,

    (GSM module inputs are activated after sending SMS ONx CODE where CODE = 4 characters x = output number),

    assign the input to the zone, to be disabled remotely,

    notify the user !

Satel CA64

    Program the input Zx as stand-by ON/OFF,

    Disable the option "controlled on stand-by activation",

    Select the standard type of activation by typing "1" as the input time,

    Assign the input to the corresponding zone,

    Notify the user !

Notes:

for CA6 you can reset the alarm without disabling stand-by using CTL input,

for CA64 other modes of operation of ON/OFF inputs are possible, it is possible to reset the alarm via the input "83" alarm reset.

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2) Diagram for connecting the output FAILURE (O3) of the module to control panel outputs

CA5, CA6, CA10

    Program the input Zx as "without alarming",

    Program the sensor as "NC" type (output "FAILURE" applies GND signal in normal state, without failure),

    program "maximum violation time" for input Zx 1-255s, which is the delay time of input failure appearance (value 0 disables the failures),

    notify the user of the mode of reading the type of failure (failure from input).

CA64

    Program the input Zx as "61" type (technical - GSM failure),

    Program the sensor as "NO" type,

    Notify the user of the possibility to encounter this kind of failure..