

GSM Communicators GC-36



Version control

Date	Author	Version	Description
20/04/2018	RAF	V1.0	Initial document.
21/05/2018	TSF	V1.1	Added power supply failure. Made changes to tamper detection description, SMS protocol, PC configuration, menus and access levels.
08/10/2018	RAF	V1.2	Minor changes.
31/10/2018	OMS	V1.3	Minor changes.
30/11/2018	RAF	V1.4	Changed phone number alerts configuration characters. Added more details to periodic phone call functionality.
04/02/2019	OMS	V1.5	Added new feature on costless phone call output actuation with input sensing.
15/03/2019	RAF	V1.6	Added new feature for sending balance in all SMS including input alerts or only in response to configuration and control commands.
25/09/2019	OMS	V1.7	Added new feature for enter SIM card PIN if locked.
26/10/2020	RAF	V1.8	Changed I/O delays and impulses time limit from 3600,0s to 360,0s.
04/12/2020	RAF	V1.9	Re-changed delays and impulses time limit to 3600,0s after software fix.

Table 1: Version control

Contents

1	Description	5
2	Technical Features	5
3	Installation and connections	6
3.1	Power Supply	6
3.2	SIM Card	7
3.3	Bidirectional inputs and outputs	7
3.4	GSM antenna	8
3.5	USB interface	8
4	Functionalities	8
4.1	Local user interface	8
4.2	Access levels	8
4.3	SMS configuration	9
4.4	PC configuration	9
4.5	Monitoring and control	9
4.6	Automatic test calls	10
4.7	Low SIM card balance notification	10
4.8	Tamper detection	11
4.9	Power supply failure detection	11
4.10	Arming and disarming the system	11
5	Local configuration	12
5.1	Configuration menu	13
5.1.1	Configure I/O	13
5.1.2	Configure phonebook	13
5.1.3	Configure tamper detection	14
5.1.4	Configure clock	14
5.1.5	Configure access codes	14
5.1.6	Configure voice messages	14
5.1.7	Configure the system	14
5.1.8	Configure GSM	14

6	SMS configuration	14
6.1	Technical and configuration commands	15
6.1.1	Configure inputs and outputs	15
6.1.2	Configure names of I/Os	16
6.1.3	Configure alert SMS	16
6.1.4	Configure outputs actions on input events	17
6.1.5	Phonebook – Configure SMS alerts	18
6.1.6	Phonebook – Configure voice alerts	19
6.1.7	Phonebook – Configure actions on outputs	20
6.1.8	Phonebook – Configure all actions and events	21
6.1.9	Configure test call	21
6.2	Usage and actuation commands.	22
6.2.1	Change level 2 access code	22
6.2.2	Change level 3 access code	23
6.2.3	Change disarm code	23
6.2.4	Phonebook management	23
6.2.5	Ambient sound call	24
6.2.6	Arm/disarm the system	25
6.2.7	Inputs and outputs	25
6.2.8	Diagnostic	26
7	PC configuration	27
7.1	Connection and diagnostic	27
7.2	General settings	28
7.3	I/O configurations	28
7.4	Inputs configuration	29
7.5	Phonebook management	30
7.6	Event logs	31
7.7	Profile	31
7.8	Factory reset	31
7.9	Firmware update	32
8	Legal conditions	33

List of Figures

1	GC-36 rear view	6
2	Input states with dry contact	7
3	Outputs states with open collector	7
4	GC-36 local user interface	8
5	Menu diagram	12
6	GC Configurator – Diagnostic	27
7	GC Configurator – General settings	28
8	GC Configurator – I/O configuration	29
9	GC Configurator – Input configurations	30
10	GC Configurator – Phonebook management	31

List of Tables

1	Version control	2
2	Technical features	6
3	SMS commands base structure	15
4	I/O configuration command	15
5	I/O configuration codes	15
6	Fields for I/O configuration	15
7	I/O configuration example	16
8	I/O names configuration command	16
9	Fields to configure I/O names	16
10	Example of configuration of I/O names	16
11	SMS alerts configuration command	17
12	Fields to configure SMS alerts associated with input events	17
13	Example of configuration of SMS associated with input events	17
14	Commands to configure outputs actions on input events	17
15	Codes to configure output actions	17
16	Fields to configure output actions in on input events	18
17	Examples of configuration of outputs actions on input events	18
18	Command for SMS alerts configuration	18
19	SMS alert configuration codes	18
20	Fields for SMS alert configuration	18

21	Example of SMS alert configuration	19
22	Command for voice alert configuration	19
23	Voice alert configuration codes	19
24	Fields for voice alert configuration	19
25	Example of voice alert configuration	20
26	Command for outputs actions configuration	20
27	Outputs actions configuration	20
28	Fields for outputs actions configuration	20
29	Examples of outputs actions configuration	21
30	Command for the configuration of all actions and events	21
31	Fields for SMS/voice input alerts and outputs actions configuration	21
32	Examples for the configuration of SMS/voice alerts and outputs actions	21
33	Command for test call configuration	22
34	Fields for the configuration of test call period	22
35	Test call configuration	22
36	Example for the configuration of the test call period	22
37	Command to change level 2 access code	22
38	Fields for the change level 2 access code command	22
39	Example of changing level 2 access code	22
40	Command to change level 3 access code	23
41	Fields for the command to change the level 3 access code	23
42	Example of changing level 3 access code	23
43	Command to change disarm code	23
44	Fields for the command to change to disarm code	23
45	Example of changing disarm code	23
46	Commands to manage phonebook	24
47	Fields for the commands to manage phonebook	24
48	Examples of phonebook management	24
49	Command for ambient sound call	24
50	Command to arm/disarm the system	25
51	Fields to arm/disarm the system or single input	25
52	Example to arm/disarm the system	25
53	Command to read and/or actuate inputs/outputs	25
54	Fields for output action	26
55	Examples for reading inputs status and outputs actions	26

56	Command for diagnostic	26
57	Example for diagnostic	26

1 Description

Congratulations on your purchase of the NIBBLE GC-36 GSM Communicator module!

The NIBBLE GC-36 module was developed taking into account security and remote maintenance needs. Therefore, the module can operate completely by itself providing remote maintenance functions, automatic output actuation (actuation on incoming call and on input changes) and automatic input alerts (SMS and audio).

The module allows for custom SMS and audio messages for each input, tamper and power supply status changes.

It is also possible to associate with each input state actuations on the outputs to provide basic functions like turning on a water pump when flooding is detected or activating a siren when an intrusion is detected.

It is also available the functionality to actuate on the outputs through phone calls allowing for an easy and costless way to activate outputs.

All these features can be configured in the following ways:

- Via local user interface (see section 5);
- Via SMS commands (see section 6);
- Via a Windows application with local USB connection (see section 7).

All the software tools and manuals may be found online at <http://www.nibble.pt/product/viewp/gc>.

2 Technical Features

- Local interface with 2x16 alphanumeric LCD and capacitive keypad;
- 6 bidirectional input/outputs;
- Micro-USB;
- 150 users;
- SMS and voice message alerts for each input;
- Periodic test calls;
- SIM card balance indication (country restriction);
- Disarm code;
- Access levels 2 and 3;
- Output actuation with input changes;
- Output actuation with costless phone call;
- Tamper detection;
- Power supply failure detection;
- Internal antenna (optional external not included);
- Backup 9V battery Ni-MH (not included).

Power supply	+12/32V
Standby consumptions	30mA @ 15VDC
Communication consumption	100mA @ 15VDC
Operation temperatures	0°C to +80°C
GSM antenna	Internal (optional external MMCX)
Communications	GSM Quad-band
Battery	Rechargeable 9V Ni-MH (not included)
Enclosure	ABS UL-94-HB
Dimensions	116.5x104.5x32mm
Weight	165g (220g with battery)

Table 2: Technical features

3 Installation and connections

Installation of the GC-36 is done in the following steps:

1. Pre-configuration of the equipment via the PC application - optional;
2. Inserting an activated SIM card without PIN code lock;
3. Connection of external peripherals (sensors, actuators or other auxiliary devices);
4. Power connection and, optionally, backup battery;
5. Placing the device in the desired location;
6. Configuration of the equipment via the local interface – optional;
7. Enabling tamper detection – optional;

Figure 1 features the rear view of the GC-36 detailing the inputs/outputs, interfaces and power.

3.1 Power Supply

The module can be powered with a 12 to 32VDC power supply. Whatever the chosen voltage, the power supply must provide at least 12W (i.e.: 12V=1A) and allow for current peaks of up to 2A. The positive terminal of the transformer must be connected to the '+' terminal of the module's PWR connector and the negative to the '-' terminal. An optional rechargeable 9V Ni-MH battery should be connected to '+' and '-' terminals of the module's BAT connector. For the optimum performance of the battery, a 15VDC power supply to the module is recommended.



Figure 1: GC-36 rear view

3.2 SIM Card

To insert the SIM card, slide the cover and insert it into the slot.

The SIM card PIN code is requested if it is not deactivated. After 3 failed attempts an error message is displayed, the module must be restarted and the SIM card must be unlocked with the PUK code without GC-36.

To benefit from all the features, your SIM card should allow for the sending and receiving of SMS and phone calls.

The card can be postpaid or prepaid.

3.3 Bidirectional inputs and outputs

The bidirectional inputs and outputs can be accessed in IO1 to IO6 terminals. Each IO terminal is accompanied by a ground terminal to facilitate the connections. Each IO terminal allows the application of voltage levels from 0V to 40V.

Inputs

The inputs have negative logic, that is, they are activated when a ground signal is applied to the IO terminal. To actuate on the inputs, a dry contact should be used with one of the contacts connected to the adjacent ground terminal, as shown in figure 2. No voltage should be applied on the inputs.

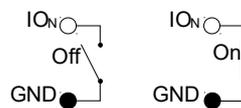


Figure 2: Input states with dry contact

Outputs

The outputs are open collector type. When activated they close the circuit to the ground and when deactivated they open the circuit, as is shown in figure 3. Each output allows up to 500mA maximum current and 40V maximum voltage.

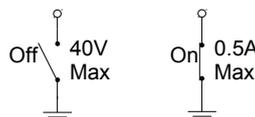


Figure 3: Outputs states with open collector

3.4 GSM antenna

An external GSM antenna can be connector the MMCX RF connector. The antenna is optional as module has an internal antenna. A dual band¹ or quad-band² can be used.

3.5 USB interface

The USB interface allows for configuration via a Windows application, the *GC configurator* (see section 7).

4 Functionalities

4.1 Local user interface

The GC-36 module can be configured via its local user interface, made up by a capacitive keypad with 16 buttons, an alphanumeric LCD screen with 2x16 characters, as shown in figure 4. Section 5 details menu navigation.



Figure 4: GC-36 local user interface

4.2 Access levels

The GC-36 module provides 3 access levels:

- Level 1 – allows arming and disarming of system;
- Level 2 – allows output actuation with SMS;
- Level 3 – allows module configuration.

¹Dual-band - 900MHz and 1800MHz

²Quad-band - 850MHz, 900MHz, 1800MHz and 1900MHz

To arm the system, it is only necessary to press the button with lock symbol.

To disarm the system, it is necessary to insert a 4 digit code. The user does not need to enter a specific menu to disarm the system. The code is configurable and is factory defined to *1234*.

The user with level 2 access should enter a 4-digit code, this code being configurable and factory defined as *1234*.

The level 3 access code is also configurable and is factory defined as *123456*. In the event of level 3 access code loss, contact your distributor.

4.3 SMS configuration

The GC-36 module can be configured via SMS commands. The module must have an active SIM card in order to allow configuration access.

Section 6 details all SMS commands.

4.4 PC configuration

The GC-36 module can be configured with a Windows application via USB connection. Section 7 details the configuration software.

4.5 Monitoring and control

The module can be monitored and controlled remotely via phone calls and SMS.

The following sections detail monitoring and control with these interfaces.

Audio and SMS notifications

It is possible to customize different audio messages of up to 5 seconds for the status changes for any input (logic inputs, tamper and power). The module maintains a phonebook of 150 numbers to send these messages. Each number can be configured to receive multiple notifications for different entries.

When a state of an input is changed (except tamper and power), the module starts sending audio messages to the configured numbers. After receiving the phone call, the user will hear the audio message identifying the notification. To end the notification, the user must press the number '0' or '1' in the phone and the module will terminate the call. If the number '0' is pressed, the user will stop receiving the notification and the module advances to the next number in the list. If the number '1' is pressed, the module will stop the notification for all numbers. If the user does not answer the call or does not confirm the call using the numbers, the module continues to notify up to a configurable number of attempts before giving up.

You can also configure the module to send customizable SMS for status changes to any entry. In addition, it can be configured to send an SMS when the user does not confirm the audio notification.

Input event alerts are disabled or enabled when the module is disarmed or armed, respectively.

Programmable outputs

The outputs can be activated and deactivated automatically, without direct interaction of the user, by changing the state of the inputs (eg: activate a siren when an intrusion alarm is activated). Actuation on the outputs depending on the inputs are disabled or activated when the module is disarmed or armed, respectively.

Remote output actuation with SMS command

It is possible to actuate on the outputs remotely by sending an SMS to the module to activate/deactivate an output.

Remote output actuation with costless phone call

It is possible to actuate on the outputs with a phone call to the module. This call is automatically rejected in order to have no cost.

Actuation on output 1 (if configured as such) by phone call, makes input 2 (if configured as such) sensible, during 60 seconds, to state changes. If any change is detected at this input during this time, the configured SMS for that input is sent to the phone that made the call. A possible use for this feature is the activation/deactivation of an alarm. If there is any configuration for that input, it is processed normally. The GC-36 executes this functionality whether the system is armed or disarmed.

4.6 Automatic test calls

The module can be configured to send a customizable audio message, up to 5 seconds, automatically.

This call has 2 goals, to notify the manager of the module that it is functional and to keep the SIM card active.

Test calls can be configured as daily, weekly, or monthly.

Calls are only made to the first number in the phonebook. The module makes up to 3 attempts to call, if the user doesn't answer the call or doesn't confirm using the numbers, the module sends an SMS to the user to notify that the test call has been lost.

The time for the call, weekday (if weekly) and month day (if monthly) is configured when the device clock is set. For example, if the date and time is configured for December 1st, 2018 (Saturday) 10:25, the calls will be made at 10:00 on Saturdays, if weekly, or at 10:00 on the 1st of every month, if monthly.

4.7 Low SIM card balance notification

The module checks SIM card balance continuously (country restriction). When the balance drops lower the €2.00 (assumes the currency is Euro) a low balance notification is sent to the first number in the phonebook.

4.8 Tamper detection

After installation, it is possible to activate tamper detection. The tamper detection system makes a phone call with a voice message to the first number in the phonebook every time the module is removed or placed in the wall. If the user does not acknowledge or rejects the call a backup SMS is sent indicated the event. The audio and SMS contents can be configured locally or via PC.

Tamper detection is deactivated or activated when the module is disarmed or armed, respectively. The tamper detection is located in the back of the product near the USB connector.

4.9 Power supply failure detection

The power supply failure detection system makes a phone call with a voice message to the first number in the phonebook every time the module is removed or placed in the wall. If the user does not acknowledge or rejects the call a backup SMS is sent indicated the event. The audio and SMS contents can be configured locally or via PC.

4.10 Arming and disarming the system

The GC-36 can be armed and disarmed with access level 1. When the system is disarmed, all inputs and tamper detection are deactivated, that is, all events associated with inputs and tamper detection are not evaluated, except the feature of output actuation with costless phone call.

5 Local configuration

Figure 5 shows a diagram of how to navigate the menu.

From the locked screen a user can:

- Arm the system, pressing the button with the lock symbol (see figure 4);
- Disarm the system by inserting the disarm code;
- Enter configuration and diagnostic menus by pressing the button *OK* and inserting the level 3 access code;
- Check the current system status such as power and battery, armed or disarmed system and ongoing call.

With level 3 permissions the user has access to the configuration and diagnostic menus. In these menus, and subsequent submenus, the user can use the up and down arrows on the keypad and press *OK* to enter, or directly press the corresponding digit (i.e. press digit 2 followed by digit 3 directly enter the *GSM diagnostic* submenu).

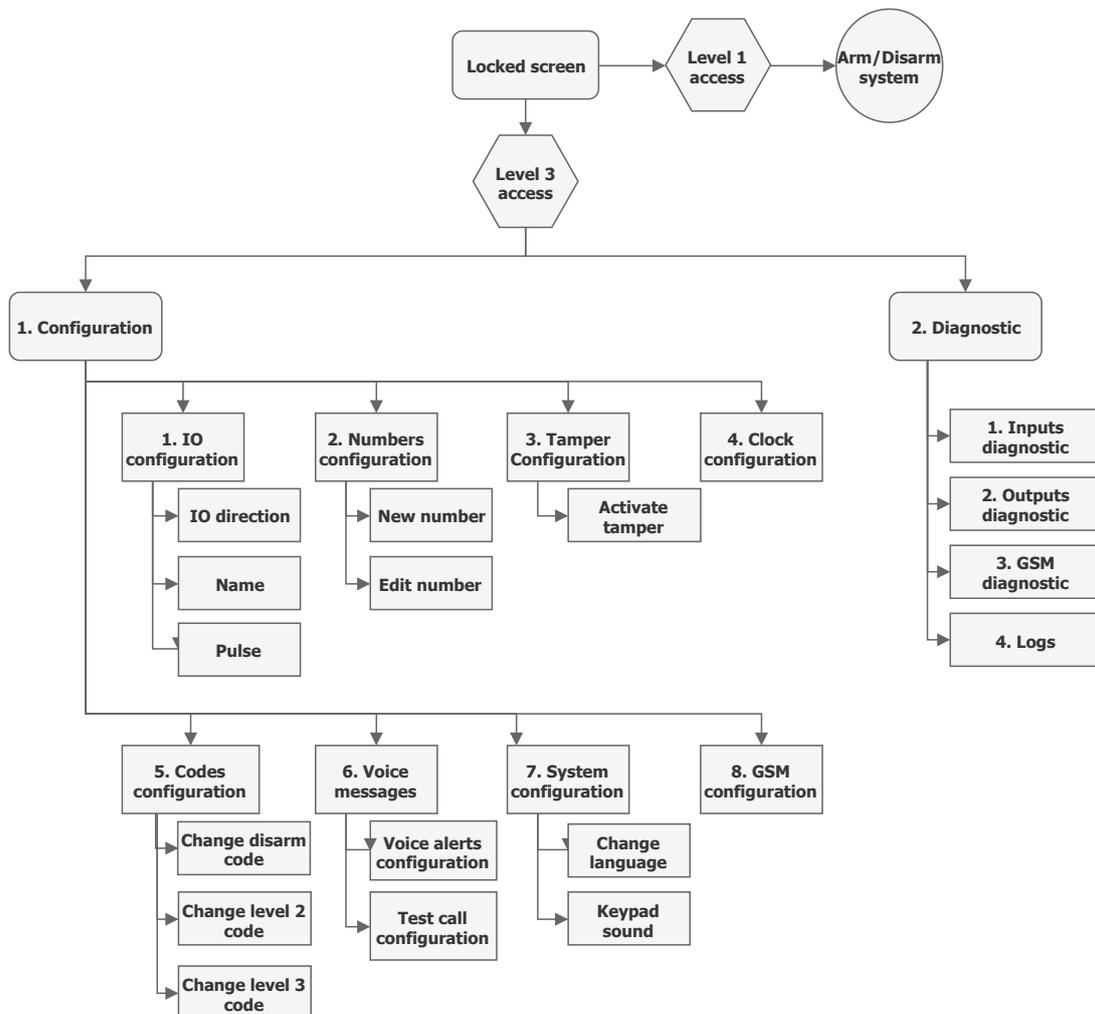


Figure 5: Menu diagram

5.1 Configuration menu

In the configuration menu the user can:

1. Configure I/O;
2. Configure phonebook;
3. Configure tamper detection;
4. Configure clock;
5. Configure access codes;
6. Configure voice messages;
7. Configure the system;
8. Configure GSM.

5.1.1 Configure I/O

This submenu allows for I/O configuration as inputs or outputs, The character 'I' represent the configuration as input and the character 'O' represents the configuration as output.

Pressing *OK*, leads to next submenu which allows to:

1. Configure inputs – configure SMS alerts, voice alerts and outputs actions for logic inputs, tamper and power supply;
2. Configure I/O name;
3. Configure pulse – pulse duration, with tenths of a second precision, when configured as output. Maximum value is 3600,0 seconds;

In the outputs actions configuration menu, the allowed characters are:

- '-' – No action;
- 'X' – Not applicable: I/O is configured as input;
- 'L' – On;
- 'D' – Off;
- 'T' – Toggle;
- 'P' – Positive pulse;
- 'N' – Negative pulse.

5.1.2 Configure phonebook

This submenu allows for complete phonebook management.

To edit or delete a number, it is required to navigate to the desired number with up and down buttons and press *OK*.

In the edit number submenu it is allowed to insert a phone number, configure SMS alerts, voice alerts and outputs action with costless call.

The allowed characters for SMS and voice alerts are:

- '-' – No alert;
- 'X' – Not applicable: I/O is configured as output;
- 'P' – Send on input positive transition;
- 'N' – Send on input negative transition;
- 'B' – Send on any input transition;
- 'V' – Send as voice alert backup (SMS only).

The allowed characters for output actions are the same as in section 5.1.1.

5.1.3 Configure tamper detection

This submenu allows for activation and deactivation of tamper.

The tamper activation must be done only after device installation on the desired place, as it will be calibrated there. The tamper detection component is located in the back of the device next to the USB connector.

5.1.4 Configure clock

The clock is used to log date and time events and to make periodical phone calls. To configure the clock, the user must introduce year, month, day, hour and minute in the corresponding fields.

5.1.5 Configure access codes

This submenu allows to configure the code to disarm the system and levels 2 and 3 access codes.

To configure the disarm code and level 2 access code it is necessary to insert the current code and then the new code twice. These codes consist of 4 digits and are factory defined as *1234*.

To configure the level 3 access code it is necessary to insert the current code and then the new code twice. This code consists of 6 digits and is factory defined as *123456*.

5.1.6 Configure voice messages

This menu allows for the configuration of voice alerts messages, cyclic or step, the number of tries for each alert and recording/reproduction of the test message.

In the cyclic mode, when the voice alert attempts are made to a number in the phonebook, each following attempt is made to the next number in the list. In the step mode, the attempts are exhausted for each number before moving to the next one.

5.1.7 Configure the system

This menu allows to change the menus language and to activate/deactivate keypad sound.

5.1.8 Configure GSM

This menu allows for the configuration of test calls period, SIM card type as prepaid or postpaid and sending of balance status in all SMS including input alerts (All option) or only in responses to configuration and control commands (Partial option).

To improve GSM efficiency, when a postpaid card is used, configuration should be as such, so that there are no unnecessary balance checks. In countries where balance checking is restricted it should be configured as postpaid.

6 SMS configuration

It is possible to configure some functionalities with SMS commands from any number. Safety is guaranteed because of the need to insert the level 2 or 3 access code in all commands. Factory default level 2 access code is '1234' and level 3 access code is '123456' and both can be changed.

All SMS commands follow the base structure shown in table 3. It consists of 3 fields separated by a comma (',').

[PIN_CODE],[CMD],[ARGS]

Table 3: SMS commands base structure

All commands start with the [PIN_CODE] field which is the level 3 access code with 6 digits (except when otherwise stated), followed by the [CMD] field which identifies the command and [ARGS] field which includes all arguments necessary for the command. No commands or arguments are case sensitive.

The SMS command sender will always receive a valid SMS response to all valid commands, except for the PEC command where a call is received instead. The user should avoid sending new commands before receiving the SMS reply of previously sent settings to prevent command losses. All responses included SIM card balance if configured as such.

Commands can be divided in 2 groups:

1. Technical and configuration commands;
2. Usage and actuation commands.

All command identifiers, arguments and response SMS are explained and exemplified in the following sections.

6.1 Technical and configuration commands

6.1.1 Configure inputs and outputs

It is possible to configure inputs and outputs directions. The [CMD] field is IO. The [ARGS] field consists of 6 characters, each corresponding to the configuration of each I/O.

If the [ARGS] field is omitted, the module responds with the current I/O configuration.

[PIN_CODE],IO,[IO₁][IO₂][IO₃][IO₄][IO₅][IO₆]

Table 4: I/O configuration command

Configuration codes	Description
I	Configure as input.
O	Configure as output.

Table 5: I/O configuration codes

Field	Description
IO _N	The configuration as input or output.

Table 6: Fields for I/O configuration

Example	Response	Description
123456,IO,IIIOOI	I/Os configured	I/O 1, 2, 3 and 6 configured as inputs and 4 and 5 as outputs.
123456,IO	I/O States: I/O1: Input I/O2: Input I/O3: Input I/O4: Output I/O5: Output I/O6: Input	Read current I/O configuration.

Table 7: I/O configuration example

6.1.2 Configure names of I/Os

It is possible to configure the names of inputs and outputs. The [CMD] field is ION. The [ARGS] field consists of 2 fields [IO] and [TEXT]. The [IO] field is the index of the I/O to be configured. The [TEXT] field is the associated I/O name and shouldn't contain accent marks in the words. If the [TEXT] field is omitted the module responds with the current name of the I/O.

[PIN_CODE],ION,[IO],[TEXT]

Table 8: I/O names configuration command

Field	Description
IO	The index of the I/O to configure, 1 to 6.
TEXT	The I/O name, limited to 40 characters.

Table 9: Fields to configure I/O names

Example	Response	Description
123456,ION,1,Water pump	Changed Name I/O:1	I/O 1 name configuration.
123456,ION,4,Activate alarm	Changed Name I/O:4	I/O 4 name configuration.
123456,ION,1	Name I/O:1 Water pump	Read name of I/O 1.
123456,ION,4	Name I/O:4 Activate alarm	Read name of I/O 4.

Table 10: Example of configuration of I/O names

6.1.3 Configure alert SMS

It is possible to configure the SMS associated with input alarms. The [CMD] field is IONUD. The [ARGS] field consists of [IO], [TEXT_UP] and [TEXT_DN]. [IO] is the index of the input to be configured. [TEXT_UP] is the text associated with SMS alert on input activation and [TEXT_DOWN] is the text associated with SMS alert on input deactivation. [TEXT_UP] and [TEXT_DOWN] shouldn't contain accent marks in the words.

If [TEXT_UP] and [TEXT_DOWN] are omitted, the module responds with the input's current configuration.

[PIN_CODE],[IONUD],[IO],[TEXT_UP],[TEXT_DN]

Table 11: SMS alerts configuration command

Field	Description
IO	The index, 1 to 6, of the I/O to be configured.
TEXT_UP	The text associated with input activation.
TEXT_DN	The text associated with input deactivation.

Table 12: Fields to configure SMS alerts associated with input events

Example	Response	Description
123456,IONUD,1,Alarm on,Alarm off	UP/DN name changed I/O:1	Configuration of texts of I/O 1.
123456,IONUD,1	Name I/O:1 Text UP: Alarm on Text DN: Alarm off	Read texts of I/O 1.

Table 13: Example of configuration of SMS associated with input events

6.1.4 Configure outputs actions on input events

The field [CMD] is OUP or ODN for activation or deactivation respectively. [ARGS] consists of the field [IO] and the fields [A₁], [A₂], [A₃], [A₄], [A₅] and [A₆]. The [IO] field is the index of the input to be configured. The [A_N] fields are the actions (see table 15) to trigger on output N.

If the [A_N] fields are omitted, the modules responds with the current configuration of the associated input.

[PIN_CODE],OUP,[IO],[A₁][A₂][A₃][A₄][A₅][A₆]
[PIN_CODE],ODN,[IO],[A₁][A₂][A₃][A₄][A₅][A₆]

Table 14: Commands to configure outputs actions on input events

Configuration code	Description
L	On.
D	Off.
T	Toggle.
P	Positive pulse.
N	Negative pulse.
0	No action.
X	Keeps the previous configuration.

Table 15: Codes to configure output actions

Field	Description
IO	The index, 1 to 6, of the I/O to be configured.
A_N	Code for output N action.

Table 16: Fields to configure output actions in on input events

Example	Response	Description
123456,OUP,1,XXXLPX	Outputs changed for input 1	Configuration of outputs actions for input 1 activation: - Output 4: On - Output 5: Positive pulse
123456,ODN,1,XXXDNX	Outputs changed for input 1	Configuration of outputs actions for input 1 deactivation: - Saída 4: Off - Saída 5: Negative pulse
123456,OUP,1	Output state input 1 UP: Output 4: On Output 5: Positive pulse	Read outputs actions configuration for input 1 activation.

Table 17: Examples of configuration of outputs actions on input events

6.1.5 Phonebook – Configure SMS alerts

It's possible to configure SMS alerts in the phonebook. The command is PS and the arguments are [NUM], [S₁], [S₂], [S₃], [S₄], [S₅] and [S₆]. [NUM] is the phone number to be configured and [S_N] is the SMS alert mode for input N (see table 19). If the phone number is not configured, it will be added to the phonebook.

[PIN_CODE],PS,[NUM],[S₁][S₂][S₃][S₄][S₅][S₆]

Table 18: Command for SMS alerts configuration

Configuration code	Description
P	Send on input positive transition.
N	Send on input negative transition (ground).
B	Send on any input transition.
V	Send as backup to voice alert.
0	Does not send.
X	Keeps the previous configuration.

Table 19: SMS alert configuration codes

Field	Description
NUM	The number to configure.
S_N	Configuration of SMS alert for input N.

Table 20: Fields for SMS alert configuration

Example	Response	Description
123456,PS,919999999,PNBXXV	SMS Inputs changed	Inputs SMS alerts configuration for number 919999999: - Input 1: Sends on positive - Input 2: Sends on negative - Input 3: sends on both edges - Input 6: Sends as voice backup
123456,PS,919999999	SMS Input Num. 919999999: I/O1: Send UP I/O2: Send DN I/O3: Send both I/O6: Audio backup	Read SMS alert configuration for number 919999999.

Table 21: Example of SMS alert configuration

6.1.6 Phonebook – Configure voice alerts

It's possible to configure voice alerts in the phonebook. The command is PV and the arguments are [NUM], [V₁], [V₂], [V₃], [V₄], [V₅] and [V₆]. [NUM] is the phone number to be configured and [V_N] is the voice alert mode for input N (see table 23). If the phone number is not configured, it will be added to the phonebook.

[PIN_CODE],PV,[NUM],[V₁][V₂][V₃][V₄][V₅][V₆]

Table 22: Command for voice alert configuration

Configuration code	Description
P	Send on input positive transition.
N	Send on input negative transition (ground).
B	Send on any input transition.
0	Does not send.
X	Keeps the previous configuration.

Table 23: Voice alert configuration codes

Field	Description
NUM	The number to configure.
V_N	Configuration of voice alert for input N.

Table 24: Fields for voice alert configuration

Example	Response	Description
123456,PV,919999999,PNBXXB	Voice Inputs changed	Inputs voice configuration for number 919999999: - Input 1: Sends on positive - Input 2: Sends on negative - Input 3: Sends on both edges - Input 6: Sends on both edges
123456,PV,919999999	Voice Input Num. 919999999: I/O1: Sends UP I/O2: Sends DN I/O3: Sends both I/O6: Sends both	Read voice configuration for number 919999999.

Table 25: Example of voice alert configuration

6.1.7 Phonebook – Configure actions on outputs

It's possible to configure actions on the outputs in the phonebook. The command is PO and the arguments are [NUM], [O₁], [O₂], [O₃], [O₄], [O₅] and [O₆]. [NUM] is the phone number to configure and [O_N] is the action for output N (see table 27). If the number is not configured it will be added to the phonebook.

[PIN_CODE],PO,[NUM],[O₁][O₂][O₃][O₄][O₅][O₆]

Table 26: Command for outputs actions configuration

Configuration code	Description
L	On.
D	Off.
T	Toggle.
P	Positive pulse.
N	Negative pulse.
O	No action.
X	Keeps the previous configuration.

Table 27: Outputs actions configuration

Field	Description
NUM	The number to configure.
O_N	Configuration of the action for output N.

Table 28: Fields for outputs actions configuration

Example	Response	Description
123456,PO,919999999,XXXPNX	Number's outputs changed	Configuration of outputs actions for number 919999999: - Output 4: Positive pulse - Output 5: Negative pulse
123456,PO,919999999	Outputs Num. 919999999: I/O4: Positive pulse I/O5: Negative pulse	Read outputs actions configuration for number 919999999.

Table 29: Examples of outputs actions configuration

6.1.8 Phonebook – Configure all actions and events

This command, PB, is the conjugation of PS, PV and PO commands.

[PIN_CODE],PB,[NUM],[S₁][S₂][S₃][S₄][S₅][S₆],[V₁][V₂][V₃][V₄][V₅][V₆],[O₁][O₂][O₃][O₄][O₅][O₆]

Table 30: Command for the configuration of all actions and events

Field	Description
NUM	The number to configure
S_N	SMS alert configuration for input N.
V_N	Voice alert configuration for input N.
O_N	Output N action configuration.

Table 31: Fields for SMS/voice input alerts and outputs actions configuration

Example	Response	Description
123456,PB,919999999,PNBXXV,PNBXXB,XXXPNX	SMS/voice inputs and outputs actions changed	SMS/voice configuration for inputs and outputs actions for phone number 919999999.
123456,PB,919999999	SMS Input Num. 919999999: I/O1: Send UP I/O2: Send DN I/O3: Send both I/O6: Audio backup Voice Input Num. 919999999: I/O1: Send UP I/O2: Send DN I/O3: Send both I/O6: Send both Outputs Num. 919999999: I/O4: Positive pulse I/O5: Negative pulse	Read SMS/voice alerts and outputs actions configurations for the number 919999999.

Table 32: Examples for the configuration of SMS/voice alerts and outputs actions

6.1.9 Configure test call

It's possible to configure test call period with CT command. The argument is [PER] is the call period (see table 35).

[PIN_CODE],CT,[PER]

Table 33: Command for test call configuration

Field	Description
PER	Test call period.

Table 34: Fields for the configuration of test call period

Configuration code	Description
N	Don't send.
D	Daily.
W	Weekly.
M	Monthly.

Table 35: Test call configuration

Example	Response	Description
123456,CT,M	Test call period changed	Change test call period to monthly.
123456,CT	Test call period: Monthly	Read test call period configuration.

Table 36: Example for the configuration of the test call period

6.2 Usage and actuation commands.

6.2.1 Change level 2 access code

It is possible to change the level 2 access code. [CMD] field is PINU. [ARGS] field consists of [OLD_PIN] which is the current 4 digit level 2 access code and [NEW_PIN] which is the 4 digit code that will replace the current code. All level 2 access commands after this one must use the new code.

[PIN_CODE],PINU,[OLD_PIN],[NEW_PIN]

Table 37: Command to change level 2 access code

Field	Description
OLD_PIN	The current 4 digit level 2 access code.
NEW_PIN	The 4 digit code that will replace the current code.

Table 38: Fields for the change level 2 access code command

Example	Response	Description
123456,PINU,1234,9876	PIN changed	Changing code from 1234 to 9876.

Table 39: Example of changing level 2 access code

6.2.2 Change level 3 access code

It is possible to change the level 3 access code. [CMD] field is PIN. [ARGS] field is [NEW_PIN] which is the 6 digit code that will replace the current code. All level 3 access commands after this one must use the new access code.

[PIN_CODE],PIN,[NEW_PIN]

Table 40: Command to change level 3 access code

Field	Description
NEW_PIN	The 6 digit code that will replace the current code.

Table 41: Fields for the command to change the level 3 access code

Example	Response	Description
123456,PIN,654321	PIN changed	Changing code from 123456 to 654321.

Table 42: Example of changing level 3 access code

6.2.3 Change disarm code

It is possible to change the disarm code. [CMD] field is PIND. [ARGS] field consists of [OLD_PIN] which is the current 4 digit disarm code and [NEW_PIN] which is the 4 digit code that will replace the current code.

[PIN_CODE],PIND,[OLD_PIN],[NEW_PIN]

Table 43: Command to change disarm code

Field	Description
OLD_PIN	The current 4 digit disarm code
NEW_PIN	The 4 digit code that will replace the current code

Table 44: Fields for the command to change to disarm code

Example	Response	Description
123456,PIND,1234,4567	PIN changed	Changing disarm code from 1234 to 4567.

Table 45: Example of changing disarm code

6.2.4 Phonebook management

It is possible to manage phonebook with the following commands:

- PA – Add number to first empty slot;

- PNUM – Read position of a number in the phonebook;
- PPOS – Read number from a position in the phonebook;
- PDN – Delete a number in the phonebook;
- PAP – Add a number to a position in the phonebook;
- PDP – Delete a number from a position in the phonebook.

Arguments [NUM] and [POS] are respectively the phone number to configure, up to 16 characters, and the phonebook position, from 1 to 150,

[PIN_CODE],PA,[NUM]
[PIN_CODE],PNUM,[NUM]
[PIN_CODE],PPOS,[POS]
[PIN_CODE],PDN,[NUM]
[PIN_CODE],PAP,[POS],[NUM]
[PIN_CODE],PDP,[POS]

Table 46: Commands to manage phonebook

Field	Description
NUM	Phone number. Up to 16 characters.
POS	Position in the phone book. From 1 to 150.

Table 47: Fields for the commands to manage phonebook

Example	Response	Description
123456,PA,919999999	Number added	Add the number 919999999 to the first free slot.
123456,PNUM,919999999	Nnumber position 919999999: 1	Read position of number 919999999.
123456,PPOS,1	Position number1: 919999999	Read number from position 1.
123456,PDN,919999999	Number deleted	Delete number 919999999.
123456,PAP,1,918532336	Number added	Add number 919999999 to position 1.
123456,PDP,1	Number deleted	Delete number in position 1.

Table 48: Examples of phonebook management

6.2.5 Ambient sound call

It is possible to send an SMS command to the module and receive a call to listen to the ambient sound of where the device is installed. Unlike the other commands, the module does not respond with an SMS but with a call to the number that sent the command

[PIN_CODE],PEC

Table 49: Command for ambient sound call

6.2.6 Arm/disarm the system

It is possible to arm and disarm the complete system or a single input with the SS command. The argument [ARM] is the code to arm/disarm and the argument [IO], if applicable, is the input to arm/disarm (see table 51).

[PIN_CODE],SS,[ARM],[IO]

Table 50: Command to arm/disarm the system

Field	Description
ARM	Code to arm/disarm the system: A - Arm D - Disarm
IO	Index of input to arm/disarm, from 1 to 6.

Table 51: Fields to arm/disarm the system or single input

Example	Response	Description
123456,SS,A	System status changed	Arm the system.
123456,SS,D	System status changed	Disarm the system.
123456,SS,D,1	System status changed	Disarm input 1.
123456,SS	System: Disarmed	Read the system armed status.

Table 52: Example to arm/disarm the system

6.2.7 Inputs and outputs

It is possible to read state of inputs and outputs and to actuate on the outputs via SMS commands. The commands are: IOI to read input states and IOO to read or actuate outputs. The access code PIN_CODE for the IOO command may be access level 2 or 3. The arguments [O] and [A], applicable only to command IOO, are, respectively, the index of the output and the action code (see table 54).

[PIN_CODE],IOI
[PIN_CODE],IOO
[PIN_CODE],IOO,[O],[A]

Table 53: Command to read and/or actuate inputs/outputs

Field	Description
O	Index of output, from 1 to 6.
A	Output action: L - On D - Off T - Toggle P - Positive pulse N - Negative pulse 0 - No action X - Keeps previous configuration

Table 54: Fields for output action

Example	Response	Description
123456,IOI	Inputs state: Input 1: On Input 2: Off Input 3: Off Input 6: On	Read inputs state. In this example, only I/O 1, 2, 3 and 6 are configured as inputs.
123456,IOO,4,L	Output action: Activate alarm	Activate output 4.
123456,IOO	Outputs state: Output 4: On Output 5: Off	Read outputs status. In this example, only I/O 4 and 5 are configured as outputs.

Table 55: Examples for reading inputs status and outputs actions

6.2.8 Diagnostic

It is possible to diagnose the module with the ST command

[PIN_CODE],ST

Table 56: Command for diagnostic

Example	Response	Description
123456,ST	Global state: SIM card balance: 4,80 EUR Signal quality: Good IMEI: 868325020946499 Power: On Bat.: 80% FW version: 1.0.0 Model: GC-36	Read the global system status

Table 57: Example for diagnostic

7 PC configuration

7.1 Connection and diagnostic

To configure GC-36 with the Windows software *GC Configurator*, the module must be powered by an external power supply and then connected to the PC with a micro-USB cable, and afterwards press button *File->Connect*, insert the level 3 access code(factory default '123456') and press *OK* in the new window.

The configure makes the connection to the module and automatically downloads all the current configurations. This process may take a few minutes. When finished, the message *Profile read* will be readable in the lower left corner of the window, as shown in figure 6.

In the *Diagnostic* window it is possible to:

- Read device's model and firmware version;
- Read GSM modem IMEI;
- Read power supply voltage;
- Read battery voltage and charge status;
- Read GSM operator;
- Read GSM network signal;
- Read SIM card balance;
- Read inputs and outputs states;
- Actuate on the outputs.

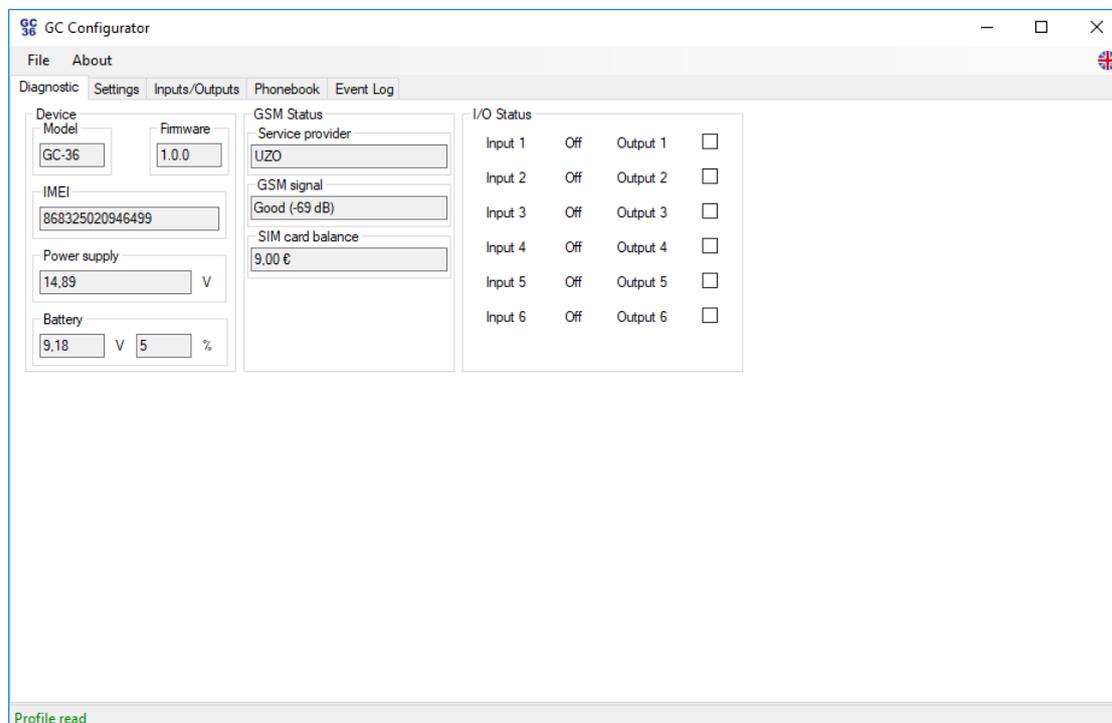


Figure 6: GC Configurator – Diagnostic

7.2 General settings

In the *Settings* window it is possible to configure:

- Device language;
- Mode and number of tries for voice message alerts;
- The SIM card as prepaid or postpaid, if balance is sent in SMS and in input alerts and the command to check balance;
- The company name, as readable in the display lock screen;
- The levels 2 and 3 access codes;
- The disarm code;
- Test call period;
- Recording/reproduction of the periodic test call.

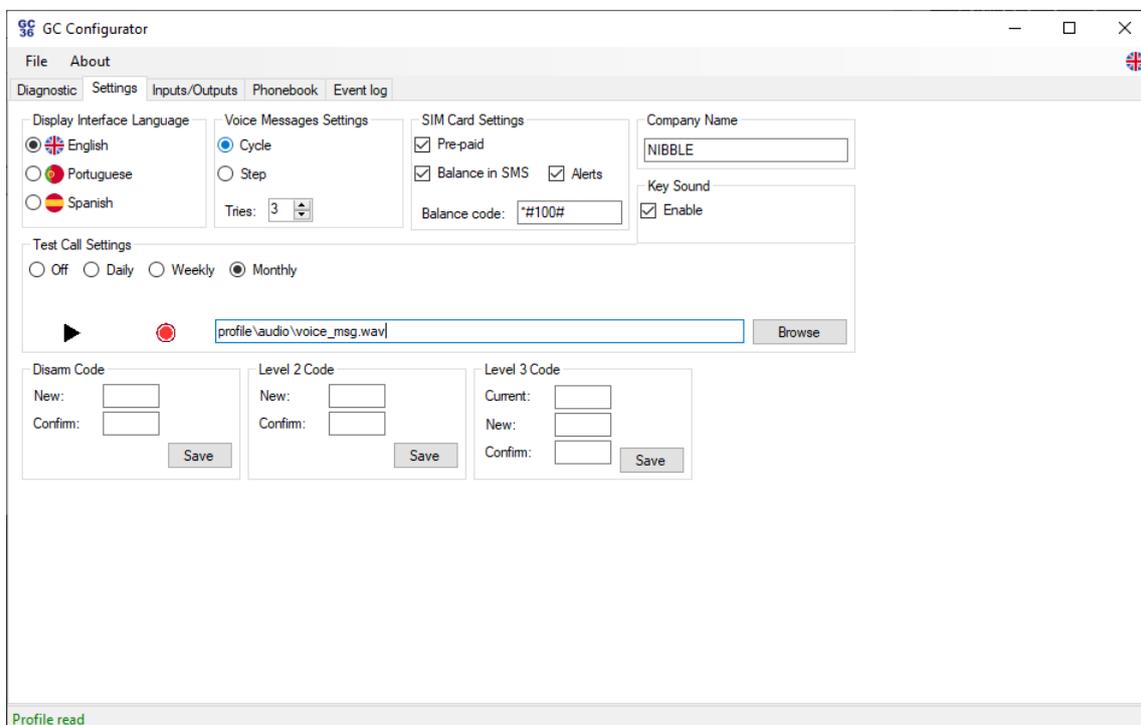


Figure 7: GC Configurator – General settings

7.3 I/O configurations

In the *Inputs/Outputs* window it is possible to configure, for each I/O, in the *I/O* tab:

- As input or output;
- I/O name;
- Pulse duration if configured as output or delay if configured as input. The maximum value is 3600,0s.

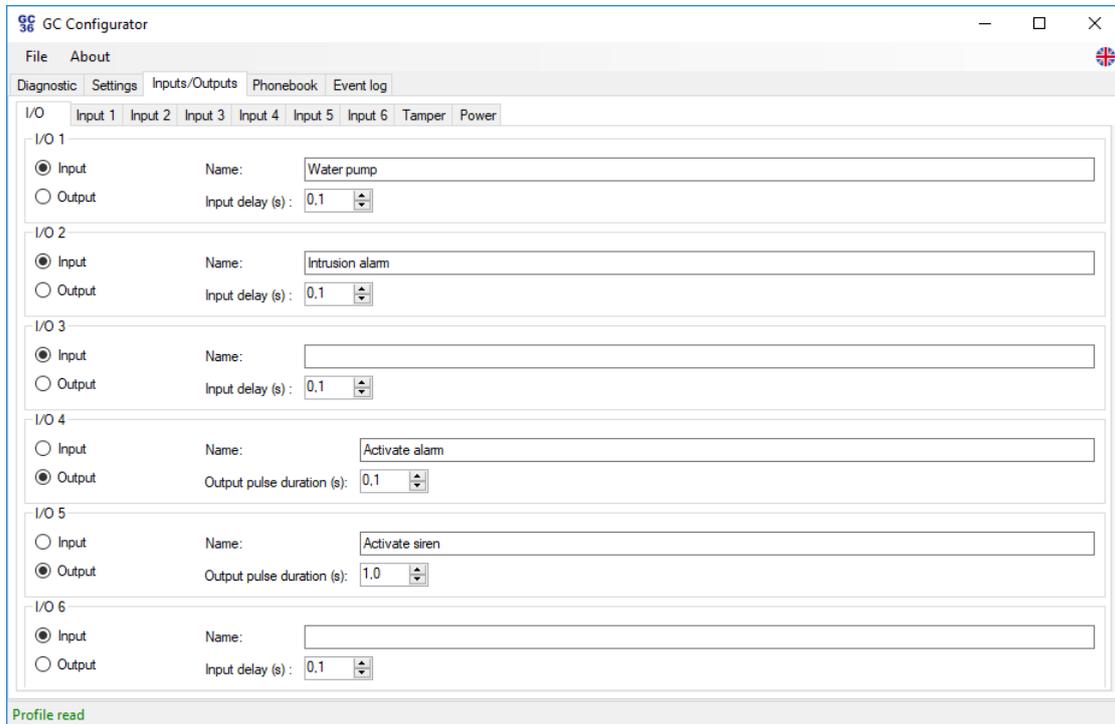


Figure 8: GC Configurator – I/O configuration

7.4 Inputs configuration

In the *Inputs/Outputs* window it is possible to configure, for each input, in the *input 1* to *Input 6*, tamper and power supply tabs:

- Action on each output on input activation or deactivation;
- Text for SMS alert for input activation or deactivation;
- Recording/reproduction of voice alert for input activation or deactivation.

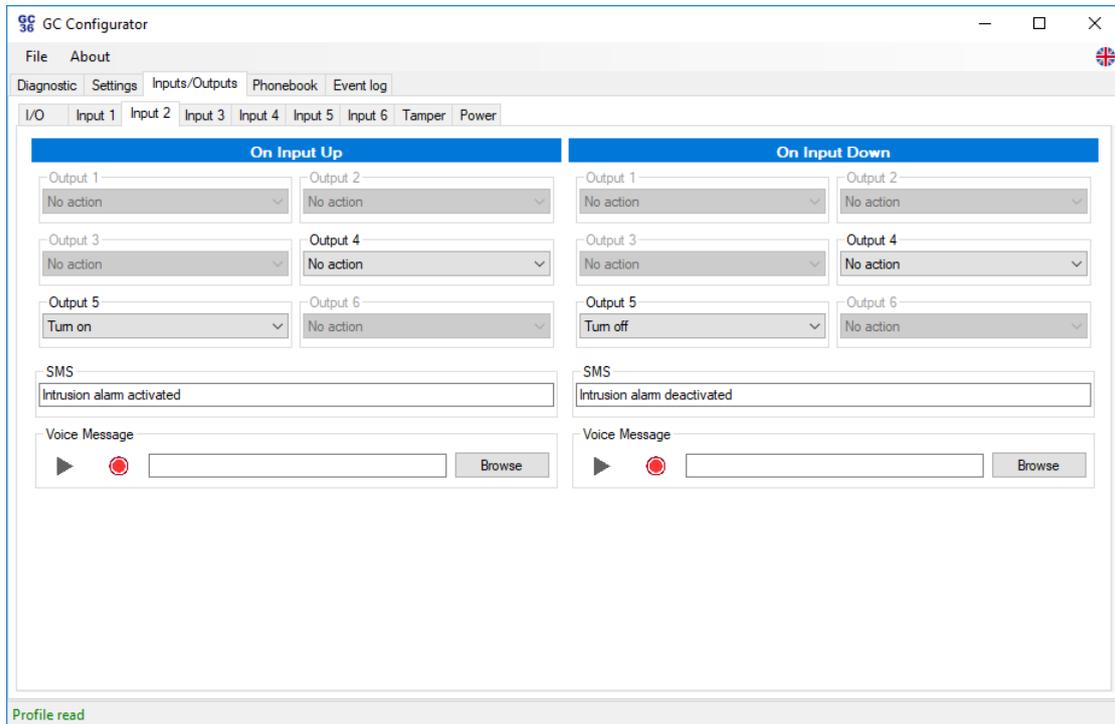


Figure 9: GC Configurator – Input configurations

7.5 Phonebook management

In the *Phonebook* window it is possible to configure for each number:

- The phone number;
- The SMS alerts sending for each input;
- The voice alerts sending for each input;
- The action, via costless call, for each output.

No.	Number	Action	I/O 1	I/O 2	I/O 3	I/O 4	I/O 5	I/O 6
1	919999999	SMS	Do not send	Audio backup	Do not send	Not applicable	Not applicable	Do not send
		Audio	Do not send	Both	Do not send	Not applicable	Not applicable	Do not send
		Outputs	Not applicable	Not applicable	Not applicable	Pulse on	No action	Not applicable
2		SMS	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send
		Audio	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send
		Outputs	Not applicable	Not applicable	Not applicable	No action	No action	Not applicable
3		SMS	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send
		Audio	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send
		Outputs	Not applicable	Not applicable	Not applicable	No action	No action	Not applicable
4		SMS	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send
		Audio	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send
		Outputs	Not applicable	Not applicable	Not applicable	No action	No action	Not applicable
5		SMS	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send
		Audio	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send
		Outputs	Not applicable	Not applicable	Not applicable	No action	No action	Not applicable
6		SMS	Do not send	Do not send	Do not send	Not applicable	Not applicable	Do not send

Figure 10: GC Configurator – Phonebook management

7.6 Event logs

In the *Event log* window it is possible to:

- Download all the device's event logs by pressing *Read*;
- Delete all the device's event logs by pressing *Delete*;
- Save all the device's event logs in a CSV file by pressing *Save*;

7.7 Profile

The *GC Configurator*

O Configurador GC provides a mechanism for profile management:

- Accessing *File->Profile->Read*, all the device's configurations are read;
- Accessing *File->Profile->Send*, the changes made in the *GC Configurator* are sent to the device – may take a few minutes; when finished the message *Profile sent* will be readable in the lower left corner;
- Accessing *File->Profile->Save*, the profile is saved to an XML file;
- Accessing *File->Profile->Load*, an XML file with a profile is loaded.

7.8 Factory reset

The *GC Configurator* allows for factory reset by setting all factory settings.

Factory reset is accessible at *File->Factory reset*. After the command is sent, the *GC Configurator* will lose connection to the module. Wait a few minutes and retry connection with the factory defined code *123456*. Only after a successful connection is the module factory reset.

7.9 Firmware update

The *GC Configurator* allows for module firmware update. To update access *File->Update firmware* and choose the appropriate firmware. After sending the update file, the module will reboot automatically and the *GC Configurator* will lose connection. Wait a few minutes and retry connection. After connection, it should be confirmed that the *Firmware* text box in the *Diagnostic* window has the expected version.

8 Legal conditions

Limited warranty

NIBBLE Engenharia, Lda. guarantees this product free of defects resulting from failures in the manufacturing process in any of its components according to the following terms:

Duration of warranty

The product has warranty for a period of two (2) years after the date of purchase. The replacement or repaired products under warranty will be covered by the remaining time of the original product warranty or for thirty (30) days, with the longest period being taken for this purpose.

Proof of purchase

The warranty liability on this product is subject to:

- Correct identification of the seller and the buyer, in the fields identified for this purpose, present in this document;
- Presentation of Receipt certifying the purchase of the product.

Who is protected?

This warranty may only be executed by the purchaser duly identified herein.

NIBBLE charges

NIBBLE will undertake the repair operation of components that are defective in manufacture under the warranty. However, it shall not undertake the following charges: Expenses with removal or installation of the product; Transport costs of the product; Any other non-product related expenses.

NIBBLE reserves the right to charge a handling fee in case the returned product does not meet the warranty conditions.

Deadlines

NIBBLE warrants replacement or repair within 30 days of receipt of the equipment. Defective material must be returned to NIBBLE (transportation fees paid by the sender).

Damages and losses

NIBBLE is not liable for damages or losses that may arise from the use of its products. NIBBLE's liability for any claim based on breach of contract, negligence, breach of any right or responsibility in the product shall not exceed the amount paid to NIBBLE for that product.

Warranty coverage

Except for the following items, this warranty covers all defects resulting from failures in the manufacturing process of this product. The following items are not covered by the warranty:

- Any product whose serial number is erased, modified, removed or disfigured;
- Any product whose warranty seal has been tampered with, damaged or removed;
- Damage caused by equipment connected to the product;
- Damage, deterioration or malfunction resulting from: Accident, abuse, misuse, neglect, fire, water, lightning or other phenomena of nature, commercial or industrial use, unauthorized modification of the product, or failure to follow the instructions for use of the product;
- Repair of the product by personnel not authorized by the manufacturer;
- Any damages incurred during transportation (complaints must be forwarded to the carrier);
- Any other cause that is not related to a defect in the product;
- Boxes, cartons, packaging and accessories used with the product.

NIBBLE does not warrant that this product meets your requirements; it is the user's responsibility to determine the suitability of the product for its intended purpose.

Exclusion of damages

The manufacturer's obligations and responsibilities under this warranty are limited to repairing or replacing a product that NIBBLE considers to be defective. The manufacturer shall not in any event be liable for any external incident or consequential damages (including, but not limited to, damages resulting from service interruption, loss of data, or loss of business) or liability in connection with this product or resulting from its use or possession.

Limitations on implied warranties

No warranties, expressed or implied, other than those set forth in this document, exist on the product.