Reference Manual

GSM Gateway INTD0909_4G LTE

VOICE / SMS

- Page 2 Firmware Revision
- Page 3 General Description - Features
- Page 4 Specification
- Page 5-6 Wiring-Connection
- Page 7-12 Operation Mode
- Page 13-27 Programming
- Pages 21-27 iOS / Android mobile Application
- Page 28-30 Record Function

Please read carefully the instructions in order to get all the benefits of this device.

GSM Gateway voice / data

INTD0909_2G/4G

www.pelekis.tech

Rev. 1.04 May 2023

Firmware Rev. :

•	v1.01	04/2016	Add Record voice messages.
•	v1.02	06/2017	Selection between PSTN and GSM line, enabled
•	v1.03	07/2017	4 SMS programmable number enabled
•	v1.04	04/2019	iOS / Android Application programming method added
•	V3.2	04/2021	4G Capability
•	V3.3	04/2023	- Power Supply and Battery Back up 12VDC for INTD0901 (Emer.Phone Cabin) - Firmware Update with MicroSD - Modification on the design - Reset Button

General Description:

Our GSM device can provide a reliable and robust voice and data Gateway in the elevators. Combined with every Pelekis Emergency phones, ensures bidirectional communication for both trapped passenger and service personnel.

The GSM gateway INTD0909 has a 12V integrated backup battery and can operates up to 6 hours in case of AC failure. All GSM functions can be programmed remotely by SMS messages. Our GSM also is capable of switching between PSTN and GSM line and announcing up to 2 recorded voice messages for both cabin trapped passengers and rescue service, following the European Standards EN81-20, EN81-28.

Caution : The installation and settings of the device, must be done by a qualified person.

Features :

- Full Voice/SMS functionality.
- On device record capability, for up to 2 voice messages.
- PSTN/GSM Line selection.
- Up to 4 calling number from Internal memory.
- Full user operation customizing via SMS and iOS / Android Application
- Emergency call SIM-less card ability. (IEN 112)
- Up to 4 onboard I/O controlled by SMS or Application.
- Battery charge and real time monitoring.

Specifications:

Power supply	230V AC 50Hz
On board battery type	Sealed Lead Acid GEL type 12V/0.8Ah
Battery charger type	Trickle charging with MCU monitoring
Power consumption	3.5W continuous, all features on, all led on
Network bands	GSM 850/900/1800/1900MHz
Phone Line connection	Terminal Block
Ext. Line connection	Terminal Block
SIM card type	Micro SIM, 3V
On board connectivity	• 2 optically isolated inputs • 2 relay outputs
Operation temperature	0-80°C
Operation humidity	10-80% (non condensing)
Dimensions (External)	60 x 210 x 145 mm (H x W x D)
Weight (Total/w Battery)	1Kg

Wiring-Connection:

Connect the antenna at the round terminal on the top side of the box. Make sure of good locking.

Connect any Pelekis Emergency phone or any conventional telephone device at the PHONE terminal on the left side of the.

Install the SIM Card to SIM holder. **Make sure that PIN password has be deactivated.**

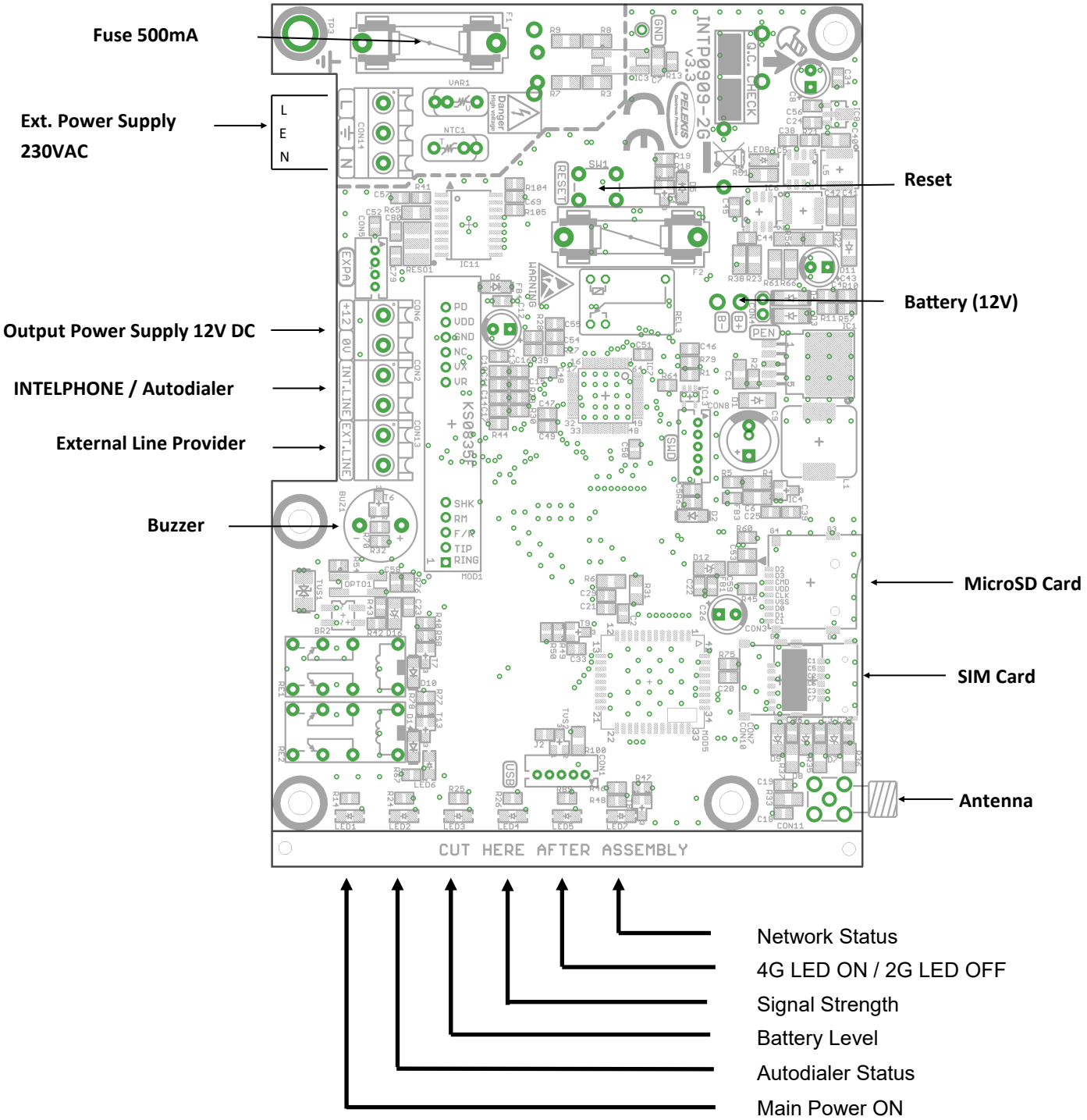
Connect the two poles of the battery to the charging cables located at the bottom of the board. (Connected by factory)

Connect the power cable to the terminals to supply 230V to the device. A red light will light up on the board.

Place the JUMPER at the point marked “RESET” on the board.

Finally, close the lid of the device and connect the antenna cable to the round socket on the side of the device. Ensure correct placement.

Σχήμα 1.


Fuse 500mA
Ext. Power Supply
230VAC
L
E
N
Reset
Battery (12V)
Output Power Supply 12V DC
INTELPHONE / Autodialer
External Line Provider
Buzzer
MicroSD Card
SIM Card
Antenna
CUT HERE AFTER ASSEMBLY
Network Status
4G LED ON / 2G LED OFF
Signal Strength
Battery Level
Autodialer Status
Main Power ON

Operation

Start Up / Initialization :

In order to startup the GSM Gateway device, please power up the device. This could be happen by either connecting a 6,3V battery at battery cables (Red-Black) or placing AC power, or both. Then short RESET pins by placing the RESET jumper. At startup of the device, one short buzz sound indicates the start of the device.

At the startup, device makes a quick check on AC power supply. If there is no AC power, and Batteries are connected and are good charged, device will start being powered from Battery. While device performs the above action all onboard leds are keep blinking every 500 ms .

After 4-5 sec device starts seeking network to connect according the SIM card provider. During this period, RSS, LINE and BAT LEDs are blinking and Network LED is constant ON indicating that no network found. If network can not be found in a specific period of time, device timeouts the process and moves on SIM-less operation limited functionality. On the other hand, if device achieve connection with network, immediately moves on to the Normal Operation mode in full function mode.

When RSS, LINE and BAT LEDs stop blinking and Network LED blink every 500ms then onboard buzzer will buzz 2 times with short pause between.

Double buzzing sound let the user know that the startup process is just finished and device is ready for use.

Functions with SIM Card detected:

- Voice Ready
- SMS Ready
- Data Ready (Not Available)
- Battery check

Functions with SIM Card not detected:

- Limited Voice Ready (International Emergency Number (112))
- Battery check

Normal Operation :

Once the Startup/Initialization is completed, the device moves on to the Normal Operation mode.

In Normal Operation device is performing some actions endless and some action is occurred from internal or external triggers.

Continuous running Actions:

- Battery status check (Real-time).
- Battery health check (Every day at 12:00 pm).
- Network signal status (Real-time).
- SIM Card presents observation (Every 1 minute).

Triggered one-shot Actions:

- Incoming call.
- Incoming SMS.
- Incoming data.(Not Available)
- Emergency outgoing call.
- Emergency outgoing SMS.
- *"LOW BATTERY WARNING"* outgoing SMS.
- *"LOW BATTERY-DEVICE IS SUTTING DOWN"* outgoing SMS.
- *"BATTERY DESTROYED-PLEASE REPLACE"* outgoing SMS.
- Outgoing SMS for Inputs (Auto SMS=1).
- Reset if SIM Card presents is lost.
- Reset if Network signal is lost.

Incoming Calls :

In case of incoming call, device starts ringing the phone device connected to the terminal “Line” and blinking the “LINE” led according to the ringing frequency.

When the connected phone answers and a connection is established, voice communication starts and the “LINE” led starts blinking.

Also, at this state the device is able to detect DTMF codes from the telephone line and make a special function, like caller line hold (if Rescue Service is enabled on the GSM).

If the connected line is terminated for any reason, the “LINE” led turns off and immediately turns on/off according to the current earpiece Hook state.*

While in ringing state, the “LINE” led remains off, if the caller terminates the connection before it is answered.

Outgoing Calls :

In case of an outgoing call, the Line connected device can make Hook Off action and get the Dial Tone.

Call progress function detects special International known telephone Tones* as well as Human Voice, and manages the call progress operation.

Also, at this state the device is able to detect DTMF codes from the telephone line and make a special function, like called line hold (if Rescue Service is enabled on the GSM).

When called number answer and connection is established, voice communication starts and “LINE” led starts blinking.*

If the connected line is terminated for any reason, the “LINE” led turns off and immediately turns on/off according to the current earpiece Hook state.*

**** Hook Off : “LINE” led = On — Hook On : “LINE” led = Off***

Incoming SMS :

In this operation, GSM Gateway device is able to Edit-Delete or Ask stored settings that define its operation.

The device is always ready to receive SMS messages. These messages are processed and executed accordingly, if they are valid. (see «PROGRAMMING» section)

Any valid formatted incoming SMS, is answered with a SMS text “OK” or a text contains the requested action.

Any invalid formatted SMS, isn’t answered with any *SMS* from the device, in order to avoid unnecessary charges on the SIM card.

SMS programming functions are divided into two categories, which differ in term of authorization.

These are USER and ADMIN Authorization.

Caution: Authorization password (User– Admin) must match the SMS code that is requested.

User Actions:

- Program 4 calling number [2].
- Program low battery calling number.
- Program user password.
- Program buzzer function.
- Program Incoming call function[1].
- Ask monitor [2].
- Program Outputs-Relays.
- Program Inputs-Optocouplers.

Admin Actions:

- Program admin password.
- Program auto-run calling number [2].
- Program voice function [2].
- Ask IMEI.
- Program SIM Card notifications [2].

[1] Action not ready — Send *answer* but has no effect on device.

[2] Action not available — Send no *answer*.

Outgoing SMS :

GSM Gateway device is able to send SMS to any number through onboard SIM Card according to the international standards.

Device is equipped with this feature in order to answer every valid Incoming SMS.
Any Incoming SMS that does not match the expected format, is rejected and device does not send *answer SMS*.

Device receives the incoming SMS, check the authorization (User – Admin) of each SMS codes and decides if there will be an answer or not.

Battery Charging:

GSM Gateway device is equipped with an SLA battery 12V—0,8Ah that charges continuously with ~ 13.6V, if AC power is online.

Battery status is represented on “BAT” led with 4 different states.

Battery status :

- Always On — Battery is full charged 100%.
- 3sec. On - 1sec. Off — Battery over 70%.
- 1sec. On - 3sec. Off — Battery over 50%.
- Always Off — Battery not connected or damaged.

Battery is able to power the device while is over 50% of its full charge. Below that threshold device shuts down in order to protect its hardware.

When device is powered from battery and its level is getting low, device activates an alert software mechanism that sends SMS to the stored “Low Battery Number”.

Battery SMS send :

- *“LOW BATTERY”* — Battery status below 65%
- *“SHUTTING DOWN”* — Battery status below 50%

Caution : Battery status SMS function, will work only if “Low Battery Number” is programmed and onboard SIM Card is detected.

Signal Strength:

Device real time monitors the Network signal strength and indicates its status with the led RSSI.

Signal strength status :

- OFF — Signal not Detectable or < -115dBm
- 50ms On - 50ms Off — Signal < -51dBm (Excellent)
- 50ms On - 250ms Off — Signal < -71dBm (Good)
- 1s On - 1s Off — Signal < - 91dBm (Weak)

If the antenna disconnects during normal operation mode, device may cause a RESET event.

Caution : If the signal strength is Weak you must move the antenna in order to find a better signal, consulting the led.

Programming :

GSM Gateway device has on board stored settings which defines its operation mode.

Device can be programmed through 3 different ways and each of the ways program different settings. Each of the following programming method will be explained in depth on next pages.

Programming methods:

- Emergency phone (“Redphone”).
- Conventional telephone device.
- iOS / Android Mobile Application
- SMS messaging (Restricted Access).

Program method: Emergency phone (“Redphone”)

GSM Gateway device is able to fully communicate with Emergency Phone (Redphone) in order to make a full Voice Call Progress operation.

Redphone uploads the 4 stored emergency numbers to the GSM device in order, the last one, to take full control of the Call Progress operation.

The above means that GSM device recognizes whether connection is established or disconnected. Also it can figure out that SIM Card is out of credits or connection can not be established because of weak signal.

When GSM device manage the Call Progress operation then several Call tries should be conducted until a reliable connection established to the first available Rescue Service number.

Available programming ability is fully described on Redphone manual (INTD0900).

Program method: Conventional telephone device

Using any convention telephone device, user can accomplish a full voice communication Call Progress operation.

In order to make this possible , user should plug a conventional telephone device to the Line terminal.

Hanging off the earpiece of the telephone will turn on the “LINE” led and GSM device will send out a continuous Tone. Then user must dial the desired number.

Caution : Pressing the 1st key will stop the playing Tone. This is the expected behavior.

If no key is pressed for period of 3 seconds, the GSM device will temporarily store the currently formed number. After that, GSM device will make the call to the currently stored number.

If something goes wrong while device tries to call the selected number (no credits in SIM Card, SIM Card is not detected), the system will automatically call the International Emergency Number (112).

When connection is established with the desired number, then “LINE” led will start blink every 500ms.

Any time the earpiece goes to Hang on state, Call progress is terminated and the “LINE” led while turn off.

Program method: SMS messaging

With this programming method User and Installer (admin) can Edit-Delete or Ask the stored settings on the GSM Gateway device that defines its operation.

SMS programming method requires credits for SMS messages on the SIM Card.

The exactly programming method is described in depth on
SMS Programming Table at *page 15*.

SMS Programming Table

Command	Description	Edit - Delete	Ask
USER AUTHORIZED			
1	Calling number	#0000#1#...n...,_,...n2..,...n3…* Example : n =00302102323345	#0000#1#?
2	Low battery call number	#0000#2#6974587393* Delete : #0000#2#_*	#0000#2#?
3	User password	#0000#3#1E5D*	-
4	Buzzer function	#0000#4#0*(OFF) #0000#4#1* (ON)	#0000#4#?
5	Incoming Calls	#0000#5#0*(OFF) #0000#5#1* (ON)	#0000#5#?
6	Ask monitor	-	#0000#6#?
7	Outputs-Relays	#0000#7#R1=1*relay 0n #0000#7#R1=1 *relay off	#0000#7#?
8	Inputs-Optocouplers	#0000#8#0*(AUTO OFF) #0000#8#1*(AUTO ON)	#0000#8#?
ADMIN AUTHORIZED			
20	Admin password	#1111#20#1E5D*	-
21	Auto-run number	#1111#21#6974587393* Delete : #1111#21#_*	#1111#21#?
22	Voice function	#1111#22#0* (OFF) #1111#22#1* (ON)	-
23	Ask IMEI	-	#1111#23#?
24	SIM Card notifications	#1111#24#0* (OFF) #1111#24#1* (ON)	-

Note:

‘ _ ’ : Variable reset to 0, delete.

‘ * ’ : All commands must close with *

‘ ? ’ : Ask the content of variable.

‘ # ’ : Change parameter field.

‘ , ’ : Change scope of variable if more than one Ex.(#0000#7#R1=1,r8:0,r7=0,r1=0*)

SMS messaging Programming:

User Command 1 - “Calling Number” :

This command can program remotely the 4 emergency numbers on the GSM’s internal memory. These 4 stored numbers will not be enabled unless call progress operation is been managed from the GSM device.
In this command there is Edit-Delete and Ask possibility.

Edit-Delete

Edit: **#0000#1#69782136554,1394,004467589045,6976473982***
Delete: *place underline symbol at the desired number to be deleted*.

Ask

Ex.: **#0000#1#?**

User Command 2 - “Low battery call number” :

This command stores up to one (1) telephone number that device will notify in case of low battery or battery failure.
In this command there is Edit-Delete and Ask possibility.

Edit-Delete

Edit: **#0000#2#69782136554*** Delete: **#0000#2#_***

Ask

Ex.: **#0000#2#?**

SMS messaging Programming:

User Command 3 - “User Password” :

This command edits the User password of the device. The programming sequence of each User command on the GSM requires a 4 digit user password in order to secure the device’s functionality. The default User password is always “0000” and can be change anytime by this command. When User password is changed, only the program sequence that starts with the new user password will be accepted.
In this command there is only Edit possibility.

Edit

Edit: **#0000#3#1562** *

User Command 4 - “Buzzer function” :

This command enables or disables the buzzer sounds on the device.
In Battery failure or shelf test operation, device informs for its state with the onboard loud buzzer.
In this command there is only Edit and Ask possibility.

Edit

Buzzer ON: **#0000#4#1*** Buzzer OFF: **#0000#4#0** *

Ask

Ex.: **#0000#4#?**

SMS messaging Programming:

User Command 5 - “Incoming Calls” :

This command enables or disables the incoming calls functionality.
When command is enabled, the GSM device will ring any connected telephone device. Otherwise, with command disabled, the GSM will not ring the connected device in case of incoming call.
In this command there is only Edit and Ask possibility.

Edit

Enable: **#0000#5#1*** Disable: **#0000#5#0 ***

Ask

Ex.: **#0000#5#?**

User Command 6 - “Ask monitor” :

This command is not enabled yet for the user.

SMS messaging Programming:

User Command 7 - “Outputs-Relays” :

This command manages the outputs of the GSM device. With this command user can enable or disable each of the 2 onboard dry contact relays.
In this command there is only Edit and Ask possibility.

Edit

Enable relays: **#0000#7#R1=1,R2=1*** Disable relays: **#0000#7#R1=0,R2=0***

Ask

Ex.: **#0000#7#?**

User Command 8 - “Inputs-Optocouplers” :

This command manages the digital inputs of the GSM device. With this command user can get the status of each of the 2 onboard digital inputs.
There is also the possibility to program the GSM device, to send an SMS on the stored “Low Battery number” every time, a digital input changes its status.
This function is called “Auto” and can be enabled or disabled according the program sequence bellow.
In this command there is only Edit and Ask possibility.

Edit

Auto ON : **#0000#8#1*** Auto OFF : **#0000#8#0***

Ask

Ex.: **#0000#8#?**

SMS messaging Programming:

Admin Command 20 - “Admin password” :

This command edits the Admin password of the device. The programming sequence of each Admin command on the GSM requires a 4 digit user password in order to secure the device’s functionality. The default Admin password is always “0000” and can be change anytime by this command.
When Admin password is changed, only the program sequence that starts with the new admin password will be accepted.
In this command there is only Edit possibility.

Edit

Edit: **#0000#20#2546** *

Admin Command 21 - “Auto-run number” :

This command is not enabled yet.

Admin Command 22 - “Voice function” :

This command is not enabled yet.

Admin Command 23 - “Ask IMEI” :

This command returns the IMEI number of the GSM device.
In this command there is only Ask possibility.

Ask

Ex.: **#0000#23#?**

Admin Command 24 - “SIM Card notifications” :

This command is not enabled yet.

Program method: iOS / Android Application

In order to help user make this SMS Messaging programming function as described in previous chapter in a more easier and straight forward way, we have released a mobile Application that is support both iOS and Android devices.

With this Application user can easily configure the parameter of GSM Device through a very simple and friendly user interface.
Application is responsible to construct the correct SMS text according the changes that edited from the user interface.

With the use of this application we ensure that no logic or spelling errors can occur on programming process of our device.

At this section we are going to see how the Application works and what are the available features that it offers.

The first step is to get the “Pelekis GSM Configurator” Application installed on our mobile device. User can easily locate and install the application from the AppleStore or Playstore respectively to him device.

After successful installation user should locate and run the application for first time.

NOTE ! If user don't accept all permissions, application maybe will not work properly.

With the “Pelekis GSM Configurator” application user can operate the following processes:

- Emergency Numbers
- Service Number
- Relay Control
- Input Control

Each of this processes will be described in detail on the following pages.

Step 1: Adding a GSM Gateway device

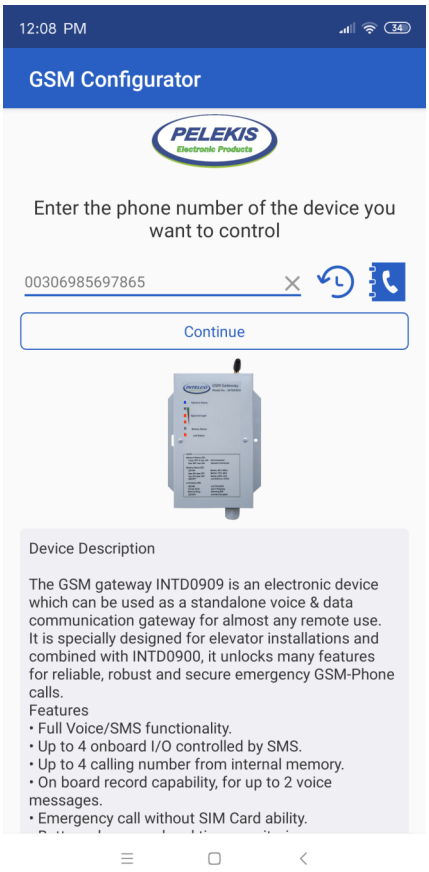
On the main screen of the Application user should add the telephone number of the SIM card that has been previously installed and activated in the GSM Gateway (INTD0909_4G) device that he is trying to program.

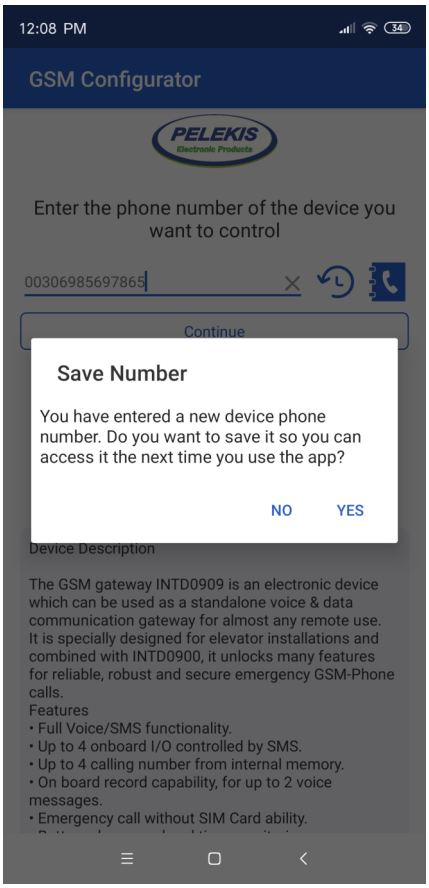
In order to do this, user must place the telephone number in the textbox that appears in the middle of the screen.
This can be done either by placing any number from the keyboard that appears when click on textbox or by pressing the symbol

By pressing the symbol user can add a tele- phone number from the contacts of the device.

When number has been added at the textbox user should press button “Continue” in order to move on the next Select Category screen.

Before move to the next screen user will be asked whether to save or no, the current telephone number on Application’s internal memory for future use.
If “YES” selected Application will hold all the configuration settings and data under this telephone number and so the next time that user will select the same number application will be loaded with all the saved configuration settings (emergency number, battery number, Inputs control) that has been previously saved.





Step 2: Edit device's parameters

After device has successfully added to the Application the user is able to remotely configure some parameters of this device through the "Select Category" screen.

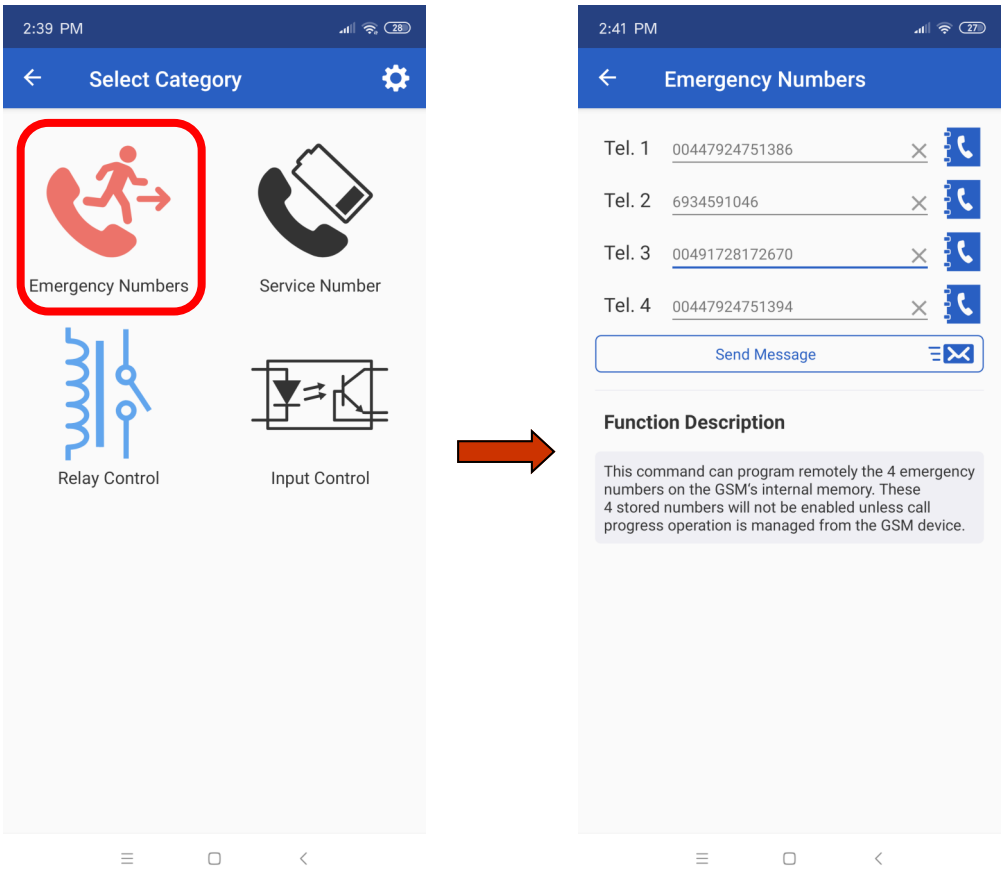
Here user can find all the available parameter that can edit from the Application:

- Emergency Numbers
- Service Number
- Relay Control
- Input Control

Emergency Numbers:

Clicking the "Emergency Numbers" symbol user can store and send to the GSM Device up to 4 emergency telephone number. These 4 numbers will be called from the GSM Device in case of emergency.

To do this user should add from 1 to 4 numbers in the textbox and then press the "Send Message" button located on the bottom of the screen.
User can directly chose an number from his contact list and the same way as done before.

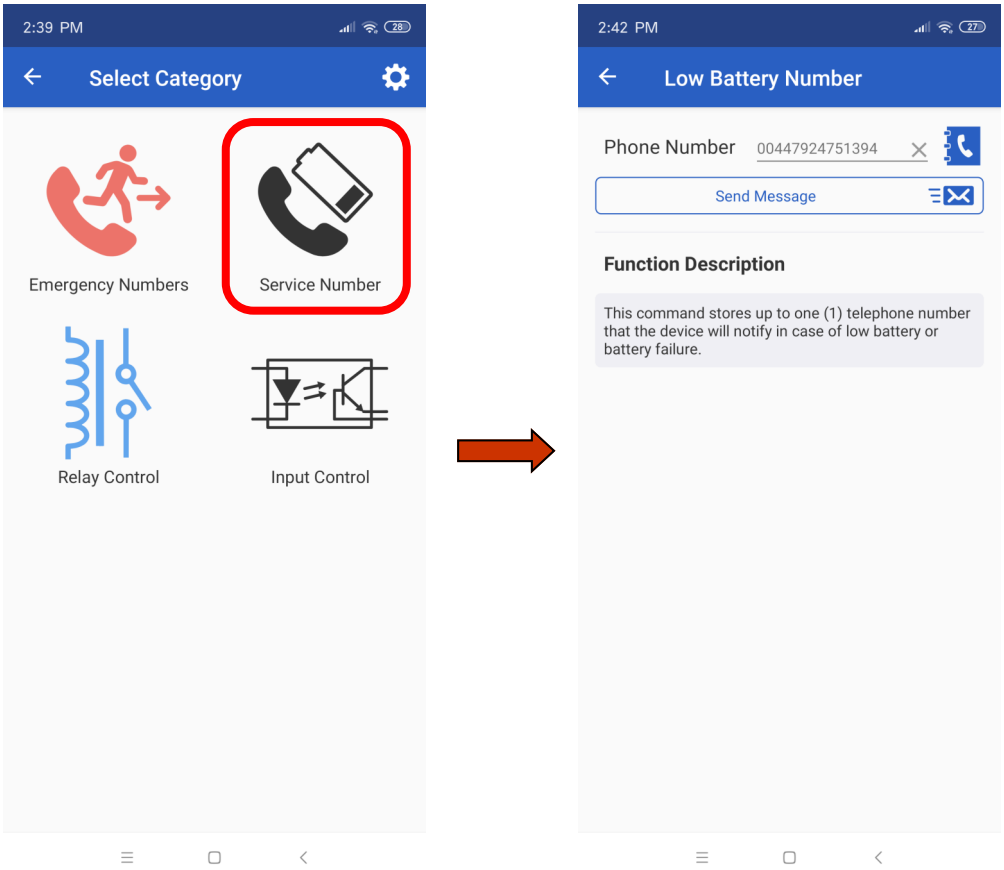


Step 2: Edit device's parameters

Service Number:

Clicking the "Service Number" symbol user can store and send to the GSM Device the Battery Number (described on the SMS Table). This is a telephone number that GSM Device will use in order to send information regarding its battery status. Battery status behavior as well the notification messages regards the battery levels is detail described on page 11.

To do this user should add 1 telephone number in the textbox and then press the "Send Message" button located on the bottom of the screen.
User can directly chose an number from his contact list and the same way as done before.



Step 2: Edit device's parameters

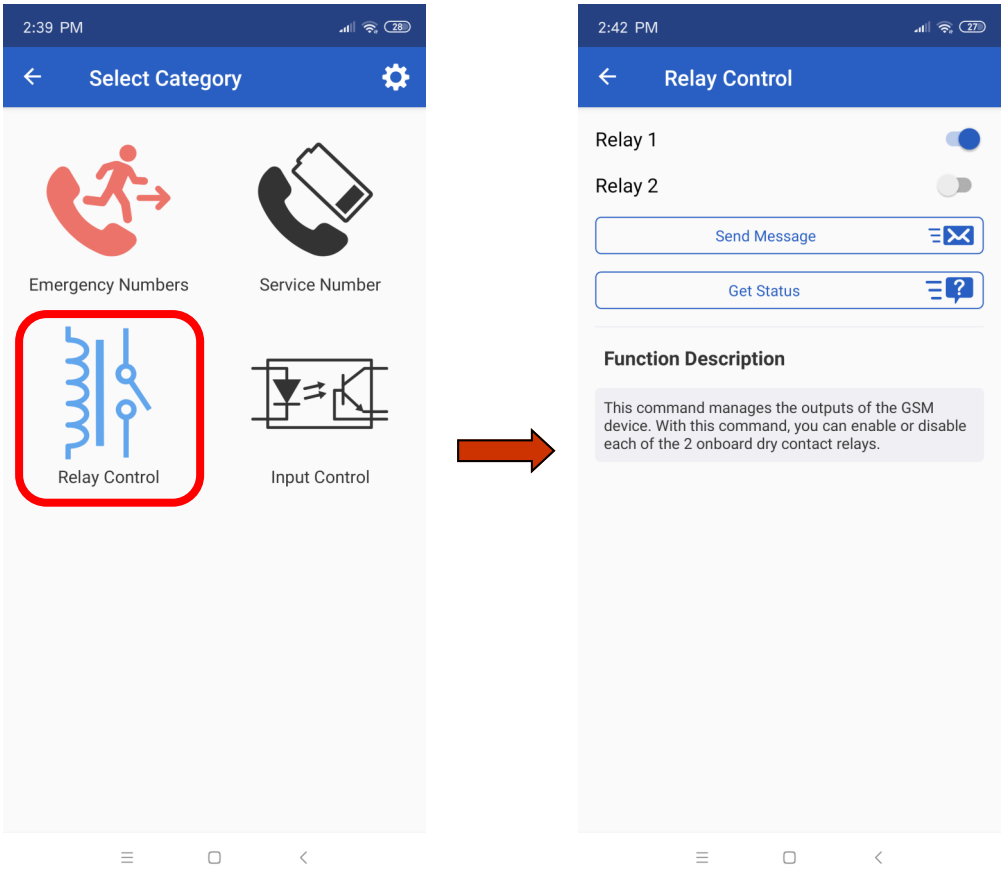
Relay Control:

Clicking the "Relay Control" symbol user can Edit or Get the status of the 2 dry contact relays that are placed on the GSM Device.

In order to Edit the status of the Relays user should swap left or right the swift button located beside each of the 2 Relays appeared on the screen and then press the "Send Message" button.

In case we need to get the status of the Relays user need just to press the "Get Status" Button. If GSM Device operates normally a message will appear on mobile's SMS Inbox informing the user about the status of both relays.

NOTE ! Making the Get Status action will not update the user interface with the current status of the device's Relays.



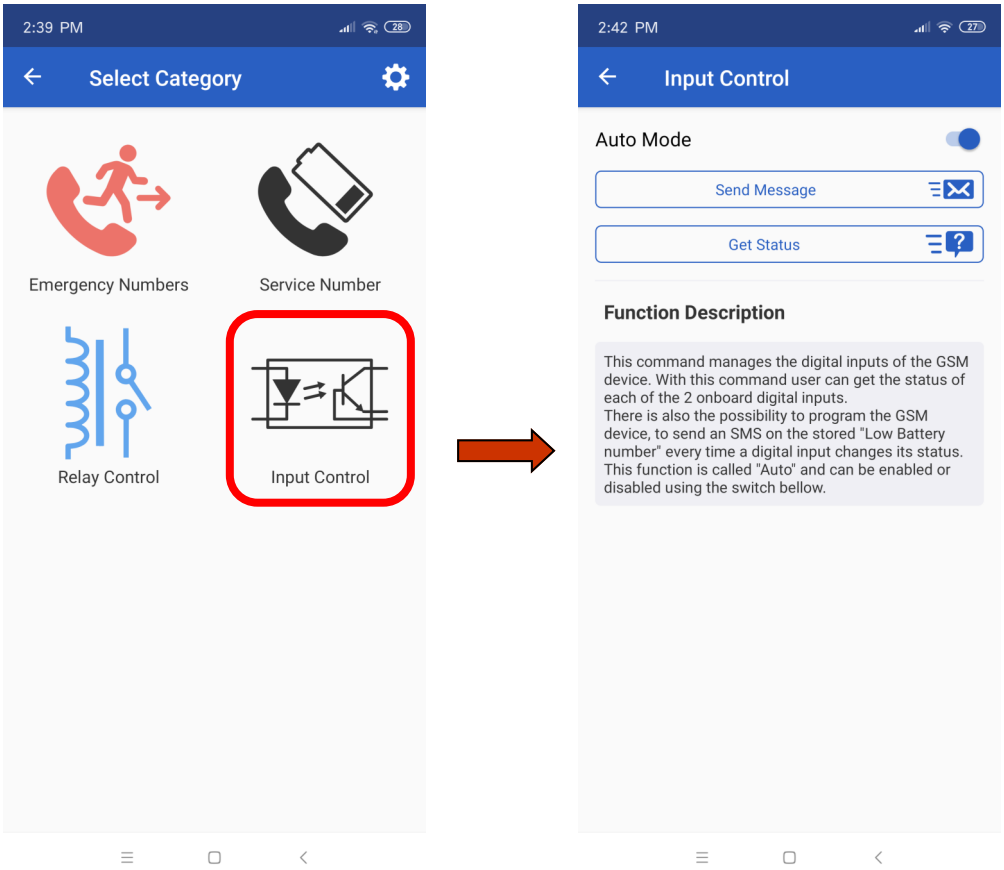
Step 2: Edit device's parameters

Input Control:

Clicking the "Input Control" symbol user can Get the status of the 2 opto-isolated inputs that are placed on the GSM Device.

In order to Get the status of the 2 opto-isolated Inputs user press the "Get Message". If GSM Device operates normally a message will appear on mobile's SMS Inbox informing the user about the status of both inputs.

In addition user is able to program the GSM Device to respond with an emergency SMS each time an opt-isolated input has changes its status.
This function is called "Auto Mode" and can be easily enabled and disabled by swap left and right the swap switch that is placed beside the Auto Mode label.
After editing the status of the Auto Mode switch user should press the "Send Message" button in order to program the GSM Device with this functionality.

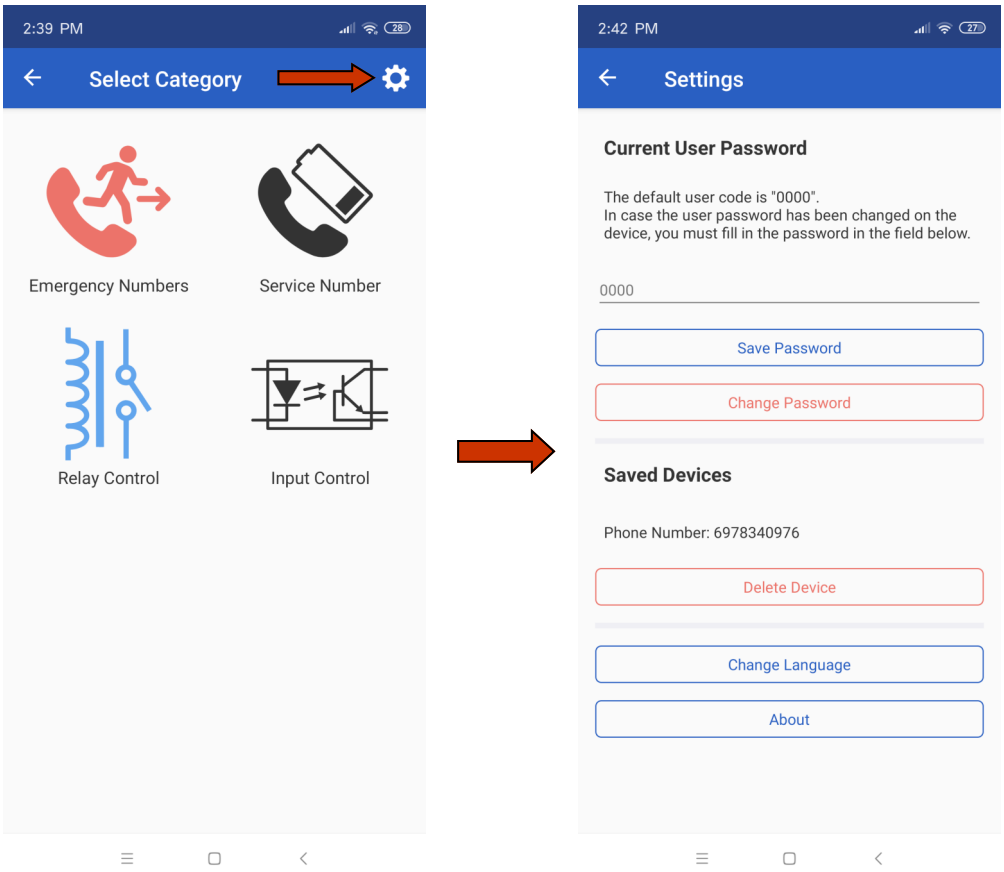


Step 3: Edit device's general settings

Clicking the symbol ⚙ located on the top right corner on the screen user can see 2 crucial im- portance information:

1. SMS Device User Password
   In order to prevent unwanted access to a GSM Device programming process, each GSM Device can be protected with a 4 digits password.
   All devices come with the factory default User password that is "0000".
   If we want to change the User password for our GSM Device we need to place a new 4 digit (only numbers) password and press the "Change Password" button.
   NOTE ! In case that on GSM Device has been protected with a User password different from the default then user should write this password at the textbox before make any action with the password protected GSM Device.

2. Saved Devices
   Here user can see all the Saved telephone number that application has hold on its memory for future use. Every telephone number shown in this section comes with all the save parameters that has been saved during the programming of the each GSM Device, so deleting a record from this list mean also the loss important data of a GSM Device.



Record Function:

This function help user to store the internal GSM Gateway memory, with up to 2 voice messages.

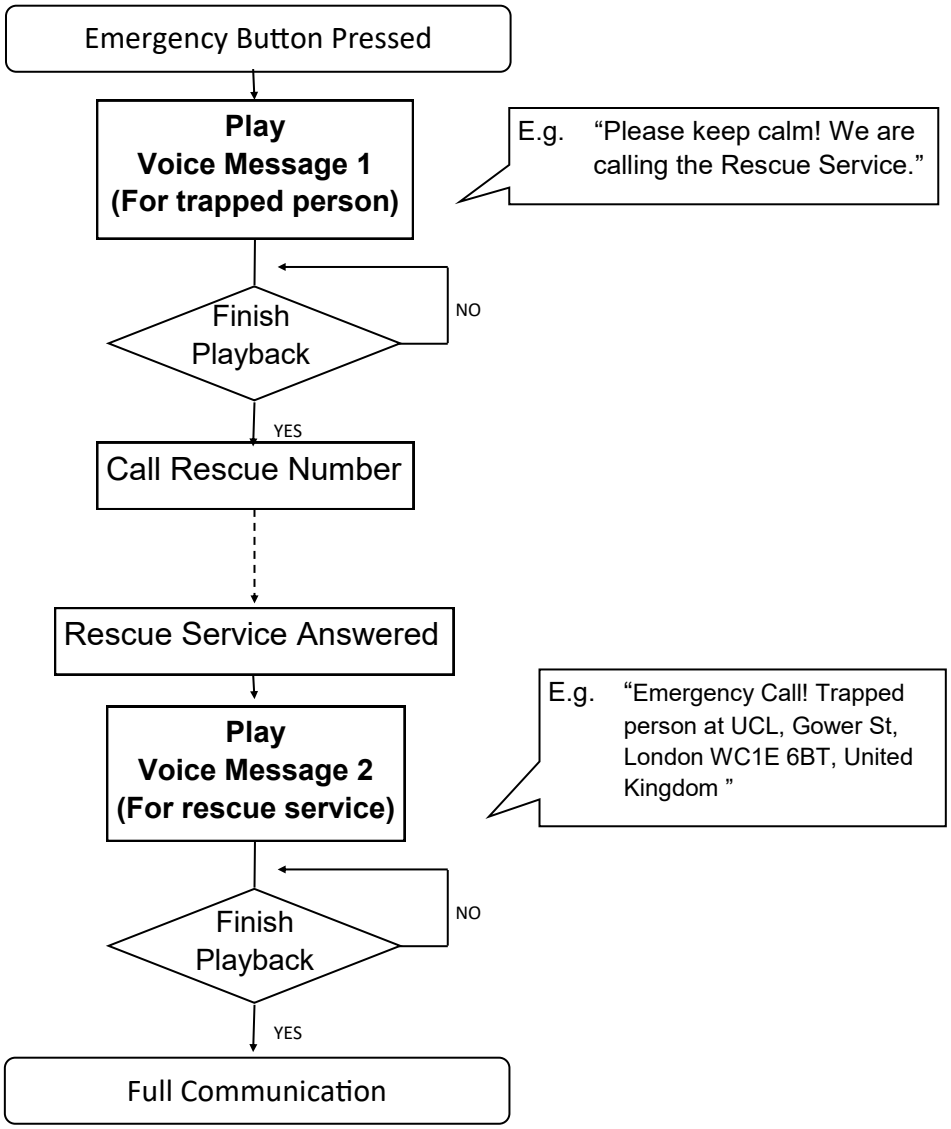
According the European Standards GSM gateways should be capable of announcing up to 2 voice messages for both cabin trapped passenger and rescue service respectively.

Both recorded messages, are being played during the emergency call.

The first voice message *"Voice Message 1"* starts immediately after the emergency button is activated and helps trapped person to keep his temper while being trapped.
In addition, informs the passenger about the upcoming emergency call to a rescue service.

The second voice message *"Voice Message 2"* starts immediately after the connection is established and inform the rescue service about the location as well as general information of the incoming emergency call.

Bellow can be found the block diagram of a typical Voice Messages playback sequence:



Programming Record Function :

Programming the playback voice messages can be done through any conventional telephone device plugged in Line terminal.

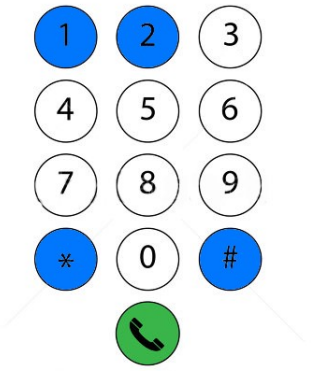
ENTER The Record function

When program will be done through a conventional telephone device, user should Hook Off the earpiece and start typing the key sequence according the record process.

STEP 1 Choose voice message to record between “Voice Message 1” and “Voice Message 2” by pressing the “*15*” or “*16*” key combination accordingly. If the code is accepted, device will return a short sound(500ms) after 1 sec..

STEP 2 In this step GSM Gateway is entered the Record Function and cannot serve any other function. According the bellow table, user can handle the Record Function simply by pressing keys on the keyboard.

STEP 3 Exiting the record process will determine if the recorded message will be enabled or disabled.



Keys	Function
“1”	Start and Stop Record
“2”	Play Recorded message
“*”	Enable Message Playback - Exit
“#”	Disable Message Playback - Exit

Start / Stop Recording:

Pressing the Key “1” device will return one(1) short sound that means record just started. Device will keep recording until max record time.

Voice Message	Seconds
1	15s
2	20s

While recording user can manual Stop the record process by pressing Key “1” again.

After either manual Stop or max record timeout Device returns two(2) short sounds indicating the saving of the current recorded message.

Play Recorded message:

Pressing the Key “2” device will return one(1) short sound and immediately Playback of the recorded message starts. While in Playback process there is no possible way to break the playback process. User should wait until playback finish in order to make any other action

Enable Message Playback – Exit:

Pressing and releasing the Key “*” device will return two(2) short sounds.

The above Enables the current “Voice Message” even if it is an empty message.

In this way, device also exits the record function and get GSM Gateway back in normal operation.

Disable Message Playback – Exit:

Pressing and releasing the Key “#” device will return two(2) short sounds.

The above Disables the current “Voice Message” even if it is an empty message.

In this way, device also exits the record function and get GSM Gateway back in normal operation.

Technical support:

For technical support for this product, contact the local distributor or Pelekis Electronics.

Pelekis Electronics Contact Info :

Tel. :+30 210 23 23 345

Fax :+30 210 23 86 382

E-mail : info@pelekis.eu

Website : www.pelekis.eu