IRIDA GSM

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IRIDA Tiny-GSM

RADIO PAGING - REMOTE CONTROL SYSTEM

Contents

GENERAL CHARACTERISTICS

The "IRIDA" hybrid device is an intelligent and user-friendly **system for radio paging and remote control of devices through GSM network**. It can be used as an autonomous programmed task and event management center, as well as in conjunction with alarm / fire-detection panels, recording systems etc. It has a built-in **GSM/GPRS module (dual band)** and it is compatible with the current mobile telephony networks. It consists of:

♦ **4 independent outputs** for activation or deactivation (with or without time delay) of devices that have been connected to these outputs either at home or in the factory. Examples of such devices are: various household electric or electronic devices, heaters, lights, sirens, alarms, as well as production or special industrial equipment, ventilation systems, heating - cooling systems, pump stations, water supply systems, irrigation systems etc. Besides ON - OFF control, the user can also enter and store corresponding time delays (in minutes or seconds), or use the XOR function for automatic transition from one state to the opposite (either ON or OFF), which enables the intermittent operation of a device.

♦ **4 digital inputs** for the connection of devices with N.O. - N.C. outputs or signals coming from alarms or directly from gas, motion, fire detectors etc.

♦ 4 analog inputs for the connection of temperature sensors, pressure sensors, humidity sensors etc., or any other system that provides readings through analog outputs (Alternatively, the analog inputs may be used as additional digital inputs).

The **activation or deactivation** of all individual devices that the user has connected can be **remotely controlled** with the following methods:

1. By commands through **SMS** that the device receives from a predefined telephone number (**supervisor**) or from any telephone number with a password.

2. By **non-answered**, toll-free calls to the device (utilizing the calling number identification service) from our mobile or fixed phone. To avoid the frequent editing and sending of SMS, which has a corresponding cost in terms of time and money, we can make a simple telephone call and send a command to *IRIDA* to perform predefined tasks. A command from a non-answered call is accepted only if we have previously programmed commands for execution and if the phone number of the incoming call has been stored in the device's memory. In any other case, the system ignores and rejects the incoming telephone call. We can store up to eight different phone numbers (from which the system can accept non-answered calls) in the device's memory (each one assigned to specific sequence of commands) and we can also program the device to automatically notify the caller by SMS for the successful execution of the commands. The command sequence is performed immediately without answering the call and the user can program the number of rings after which the call shall be interrupted.

3. By **keywords** sent by the user in an SMS. We can program up to 8 different keywords (up to ten characters long), which, just like in case (2), are stored in memory and perform the corresponding programmed sequence of commands. Suppose, for example, that we have programmed the device to close all outputs and send us a notification message when it receives the keyword "IRIDA". All we have to do is send the keyword "IRIDA" in an SMS and the device will automatically perform all programmed tasks. The device accepts keywords sent from the supervisor phone number or from any mobile phone, provided that the keyword is accompanied by the password (the factory set password is 1111).

Moreover, we can program:

♦ **8 different combinations of alarm signals**. Each alarm can be independently programmed to send an SMS or to make a non-answered call (or both) to its own phone number according to the combined status of inputs (both digital and analog) and outputs, or according to the status of any independent input. At the same time, when the device receives an alarm signal it manages the outputs, if required, to perform an immediate action.

◆ If an alarm occurs, apart from the message that informs us about the status of inputs - outputs etc., the device can also send to the corresponding phone number a predefined message (e.g. address and area where the alarm occurred) that we have previously edited in our mobile phone and stored in the device's memory.   There are **8 storage locations for predefined messages**, each one corresponding to an alarm.

◆ Just like in an alarm system, if we want to cancel the operation of an alarm **without altering the programmed parameters**, we can individually **disarm or re-arm** any one of the four different alarms by our mobile phone with an SMS.

Depending upon the programming that the user has performed, the device provides information in regular time intervals about the inputs-outputs status by an SMS or even by a non-answered call to the user's mobile or fixed phone, always according to the steps that the user has programmed.

Information regarding the overall status of the device can be provided following a user's query by an SMS or simply by a non-answered call to the device.

Programming can be performed entirely by SMS using small and easy commands, and all programmed values are retained in an **EEPROM** and are not lost when we **disconnect the power supply** or **change the module's SIM card**.   In case of power failure, the GSM remote control remains in operation, powered from the system's rechargeable battery.

Summarizing, we can program the following in the device's memory:

◆ **8** different phone numbers with different sets of commands for each phone from which the device receives calls (using the calling number identification service)
◆ **8** different keywords (each one up to 10 characters long), which can be sent by an SMS and perform different sets of commands.
◆ **8** different ALARMS (individually armed and disarmed by SMS), which send notifications to corresponding phone numbers by SMS or non-answered calls, depending on the conditions we have programmed, and perform certain commands (e.g. siren activation, lighting activation, etc.)
◆ **8** different predefined messages (up to 100 characters long), which are programmed by the user and are sent to the user (corresponding to the 4 alarms) in case of alarm.

TECHNICAL DATA

- Supply voltage: 12V DC
- Device's consumption (idle): 50mA
- Consumption during transmission (call):   500mA
- RS 232 interface
- RS 485 interface
- 4 Relay Outputs (120 V / 0.5 A Contact)
- 4 Digital Inputs (for connection to a closed or open contact)
- 4 Analog Inputs (which can be converted to digital)
- Enclosure dimensions (mm): 100 X 120 X 22mm
- SMS and PC programming
- Dual Band GSM
- I/O – Antenna signal – Alarm Status
- Call back function
- GPRS ready – E-mail ready

INSTALLATION

First of all, we must insert a SIM card to the GSM module (we must first insert that card to a mobile phone and **disable the request for PIN code**) and confirm (provided that we are using a non-flat rate charging connection) that the phone number used for the device has been activated by the mobile telephony provider.

Then we must install the antenna that is included in the package.

We can use a SIM card from any current mobile telephony provider. The connection may be either with or without flat rate charging.

PROGRAMMING OF "IRIDA"

A. FACTORY SETTINGS

The device does not have factory stored phone numbers for receiving or sending SMS or making non-answered calls. The **factory set password is 1111** and it must be sent when we initially attempt to program the device in order to enable access, since the phone number that will send the message has not yet been stored. In order to avoid providing the password each time we perform any programming we must store the number of the phone from which the SMS are sent as supervisor phone number.

B. SUPERVISOR PHONE NUMBER

This is the ten-digit phone number that must be stored the <u>first time</u> we issue a programming command, in order for the device to accept programming commands only from this number without requiring a password. The device can accept programming commands from any phone number, provided that each time the password is sent as well (the password can be changed as described below).
From the "supervisor" phone number the device can accept any command for programming or for remote control, notification, etc.

C. STEP-BY-STEP PROGRAMMING

Following the installation of the device, we are ready for its programming. Programming is performed exclusively by SMS, using the programming commands (a summary of the commands and their description is provided in table 1). We can include both remote control and programming commands in the same SMS to the device without any problem.

SIMPLE SMS EDITING INSTRUCTIONS

The SMS sent to the device for programming or remote control must be written **in English**, with uppercase or lowercase characters. The maximum permitted length of each message, including spaces, punctuation marks and symbols, is 160 characters. You do not have to perform a word count, because your mobile phone does not permit entering more characters. You can enter spaces between words, even though this is **not** required by the system. In a single SMS you can include as many different commands as you wish, in any order. **All commands must be terminated with the 'sharp' symbol (#).**

- Step 1: **Enter the Supervisor phone number** with the **SUPERVISOR** command and the password with the command: **PASS.**

Thus our message will have the following form:
SUPERVISOR **= 69XXXXXXX #** PASS**=1111 #**

- Step 2: We can add the command for password change in the same message. That is **CHPASS=1111.1234#,** where 1234 is the new password.

So we have:
SUPERVISOR = 69XXXXXXX# **PASS**=1111# **CHPASS**=1111**.**1234# (sms-1)

- Step 3: Send the message.

C1. Programming for Remote Control of Devices with non-answered calls.
The SETCALLx command.

Our device is often required to perform certain operations on a daily basis or in shorter time intervals. To avoid frequent editing and sending of SMS, which has a corresponding cost in terms of time and money, we can make a simple telephone call and send a command to IRIDA to perform predefined tasks and to inform us about the performance of these tasks or to simply confirm that the relevant commands were executed, by an SMS or by a callback to our phone. This can be done by programming in the device's memory up to 8 different phone numbers from which it can accept non-answered calls, thus enabling the device to be used by different users. For this purpose we can use the **SETCALLx** command, where **x = 1 to 8** for eight different phone numbers.
The command is entered as follows:

SETCALL4=697XXXXXXX OUT1=ON OUT2=XOR OUT3=OFF-SEC050 OUT4=ON-MIN005 CALLBACK1 REPORT **#**

The commands must always be terminated with a 'sharp' (#).

In more detail:

SETCALL4**=697XXXXXXX**   Store in the 4th memory location (we can store the number in any

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memory location we wish) the phone number from which we will be making calls to the device. The phone number must contain ten digits. **When we call the device from this number, it will be recognized and the following tasks will be performed:**

OUT1=ON	Assign the ON function to output 1 (OUT1)
OUT2=XOR	Assign the XOR function to output 2 (see table 3)
OUT3=OFF-SEC050	Assign function OFF-SEC050 to output 3, i.e. output 3 will be deactivated for 50 seconds (or will remain deactivated if in deactivated state during this period) and then it will be set to ON
OUT4=ON-MIN005	Assign function ON-MIN005 to output 4, i.e. output 4 will be activated for 5 minutes and then it will be set to OFF
REPORT	Request for notification SMS to the phone number stored in the 4th memory location.
CALLBACK1	Request for non-answered call to the phone number stored in the 4th memory location (see Table 1).
#	Command termination

We can include the last example in sms-1 we saw above, so that the message becomes:

SUPERVISOR=69XXXXXXX   **PASS**=1111   **CHPASS**=1111**.**1234   **SETCALL4=** 697XXXXXXX OUT1=ON OUT2=XOR OUT3=OFF-SEC050 OUT4=ON-MIN005 REPORT CALLBACK1# (sms-2)

We can omit certain terms from the **SETCALL4** command, e.g. if we do not want a non-answered callback we can omit "**CALLBACK1**".
If we do not want to use some of the outputs with this particular phone number we can omit them, or we can add some of them. So, if we do not want to use outputs 1 and 2, sms-2 becomes:

SETCALL4=697XXXXXXX   OUT3=OFF-SEC050   OUT4=ON-MIN005   REPORT#
SUPERVISOR= 69XXXXXXX # **PASS**=1111# **CHPASS**=1111**.**1234 #   (sms-3)

Similarly, if we want to program more phone numbers we must add **SETCALL2, SETCALL3,** etc.
If we wish, we can program a new phone number in a memory location occupied by another number that was set by a previous programming message. The old phone number and the corresponding tasks are automatically erased when the new number is stored. Finally, in order to simultaneously erase all previous phone numbers from the device's memory we must send by SMS the **CLEARALL** command (see table 1 for the relevant syntax).

C1i. A few words about the functions of the outputs

The functions that can be assigned to the four outputs are shown in table 3. You must have noticed in examples sms-2 and sms-3 how a function can be assigned to the outputs by using the SETCALLx command. The SETMACROx and SETALARMx commands are used in precisely the same manner. When we want to assign a function with time delay we must use functions 4, 5, 6 and 7, as shown in table 3. We must carefully enter the time using values from 000 to 999 (in minutes or seconds).
Each function is explained in table 3.
Examples:

OUT4=ON-MIN005   (Enter a 5 minute delay)

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OUT3=OFF-SEC050   (Enter a 50 second delay)
OUT1=OFF-SEC035   (Enter a 35 second delay)
OUT2=OFF-MIN240   (Enter a 240 minute delay)

CAUTION! Time must always be entered with a three-digit number, e.g. for a 5 minute delay we must enter ON-MIN005 and not ON-MIN5.

C2. Programming for Remote Control of devices by keyword. The SETMACROx command.

The user who owns and uses the Supervisor phone number can execute predefined tasks by sending an SMS with simple words consisting of letters, numbers or even symbols, in a manner similar to case C1 where non-answered calls are used.   We can store 8 different words, each one 10 characters long, in the device's memory. In order to store the words and the corresponding functions that will be executed, we must use the **SETMACROx** command, where **x is a value from 1 to 8**. When the keyword is sent to the device all corresponding functions will be executed, as in case C1, thus avoiding writing commands with specific syntax since all words we are going to use may be stored in our mobile phone's memory.

Another advantage is that the same stored keyword can be used by other users (apart from the Supervisor), provided that they also send the password along with the keyword. This enables us, for example, to provide access to the system to many different users.

The syntax is similar to that of the SETCALLx command, but this time we enter a keyword and not a phone number. The syntax and the sequence of commands is exactly the same.

Examples:

SETMACRO1**=*GARDEN* OUT1=ON-MIN052 OUT2=OFF OUT3=XOR   OUT4=OFF-SEC035 CALLBACK1 REPORT #**

The command must always be terminated with a 'sharp' (#).

SETMACRO2**=*FRONTDOOR* OUT4=0FF-MIN022 REPORT OUT2=ON CALLBACK2 #**

SETMACRO3**=*YIANNIS*OUT1=ON-SEC030 OUT3=ON-MIN999 CALLBACK1#**

SETMACRO4**=*Yme1974@* OUT3=OFF OUT1=ON-MIN001 CALLBACK1#**

SETMACRO7**=*GARAGE* CALLBACK1 OUT3=ON-SEC030 OUT3=XOR #**

SETMACRO8**=*WATERINGSYSTEM* OUT2=OFF-SEC030 OUT4=OFF #**

In paragraph D3 **remote control by keyword** you can see how this feature can be used.

C3. Programming of a user-predefined message that will be sent in case of alarm. The SETSMSx command

There are four memory locations for storing the corresponding messages (maximum length 100 characters). We use the **SETSMSx** command, where x is 1 to 4.
Examples:

SETSMS1**= <YOU CAN ENTER YOUR MESSAGE HERE> #**

SETSMS2 = <THE VENTILATION SYSTEM OF THE 1ST FLOOR IS OUT OF OPERATION IN PRODUCTION LINE N.5> #

SETSMS3= <THE DOOR CONTACT AT THE APARTMENT IN 22 ERMOY ST. REMAINS OPEN> #

SETSMS4= <THERE IS AN INDICATION FOR OIL LEAK AT TANK 3 IN SECTOR 4> #

♦ **If we want to erase a message**, e.g. the one corresponding to alarm number 3, we must send the following message:
 SETSMS3=DELETE #   (!Preliminary)

♦ If a message has already been stored in a memory location and we want to update that message or replace it with another without altering the correspondence with the alarm, we use the same commands and the new message replaces the previous one.

♦ The factory setting for the four memory locations is blank.

C4. Programming of ALARMS and radio-paging.
The **SETALARMx** command.

As we mentioned in the general characteristics, we can set the conditions under which an alarm shall be provided, as well as the actions that the system will perform immediately after the alarm, apart from the notification message it will send to us.   We can set **4 different alarm conditions**, resulting in a call to the corresponding phone number that we have programmed either by a call or by an SMS.
Since the device has 4 digital and 4 analog inputs we can create various condition combinations, which may include one or more (or even all) inputs, either analog or digital. The most simple case is when a digital input (e.g. IN1) reverses its state (from high to low voltage or from low to high voltage, according to our programming).
The **SETALARMx** command (where x is 1 to 4 different alarms) performs all programming steps and is sent by an SMS.
To summarize, in order to program the conditions for an alarm we must perform the following steps:
1. Set the phone number through which the system will notify us by a call, by a notification SMS or by a predefined SMS.

2. Set the digital input(s) we want to include, and the status of the input(s) that will cause an alarm.

3. Similarly, if we want to use one or more analog inputs, we set for each one of these inputs the upper and lower value limits that must not be exceeded

4. Set the actions to be performed by one or more outputs

5. Request from the system to make a non-answered call or to send a notification SMS or both, using the phone number we entered in step 1.

6. If we have written and stored a predefined SMS in the system's memory, we can request from the system to send that SMS to the phone number we entered in step 1.

Examples:

SETALARM1=697XXXXXXX IN3=OFF IN2=ON AN1>125 AN1<30 AN2<40 AN3>65 OUT1=ON OUT3=OFF-MIN050 SMS CALLBACK2 REPORT #

The command must always be terminated with a 'sharp' (#).

The command terms can be analyzed as follows:

SETALARM1**=697XXXXXXX**	The 1st step for programming an alarm is to enter the phone number to which the system shall make a call or send an SMS if an alarm occurs under the current conditions. The phone number must contain ten digits.

CONDITIONS (if any of these occurs, an alarm will be issued)

IN3=OFF	If the voltage of digital input 3 falls to 0
IN2=ON	or if the voltage of digital input 3 rises to 1
AN1>125	Analog input 1 must not exceed value 125
AN1<30	Analog input 1 must not fall below value 30
AN2<40	Analog input 2 must not fall below value 30
AN3>65	Analog input 3 must not exceed value 65

COMMANDS TO BE EXECUTED

OUT1=ON	Assign the ON function to output 1 (OUT1)
OUT3=OFF-MIN050	Assign function **OFF-MIN005** to output 3, i.e. output 3 will be deactivated for 50 minutes and then it will be set to ON
REPORT	Request for notification SMS
CALLBACK2	Request for two non-answered calls
SMS	Request for a corresponding predefined SMS
	CAUTION! If we request an SMS and the memory location corresponding to the alarm (in this case location 1) is blank, no SMS will be sent.
#	Command termination

SETALARM2**=6889556633 IN1=OFF IN2=ON OUT4=OFF-MIN040 SMS CALLBACK1#**

SETALARM3**=2101234567 AN1<40 AN3>65 OUT1=ON CALLBACK2 #**

SETALARM4**=2101456789 IN4=ON OUT3=OFF-MIN050 CALLBACK2 #**

If the alarm call will be made to a fixed phone, we must not include the commands **REPORT** or **SMS** in the message because they will not be executed.

C4ii. ARMING - DISARMING OF ALARMS FUNCTION

After we have stored our programmed values for the alarms in the system's memory we can activate or deactivate each one of them by using the **ALARMON** and **ALARMOFF** commands respectively. So if want to arm (exactly as in an alarm system) one of the four alarms, for example the 2nd alarm that has been stored in the corresponding memory location, we must include in our SMS the following command:

ALARMON=2 #

Similarly, for the rest of the alarms we must write **ALARMON=3, ALARMON=1** etc.

To disarm the alarm we must write **ALARMOFF=2 #**
The factory settings are: all alarms disarmed, no programmed values stored in memory.

Table 1. PROGRAMMING COMMANDS		
The commandS must always be terminated with a 'sharp' (#).		
COMMAND	**DESCRIPTION**	**SYNTAX**
PASS	Enter access code	**PASS**=1111 **#**
SUPERVISOR	Store the Supervisor phone number in memory	**SUPERVISOR**=6970333330# **PASS**=1111# (the 1st time)
CHPASS	Replace the current code (default 1111) with a new one, e.g. 1234	**CHPASS**=1111.1234 **#**
SETCALLx	Store the phone number from which the system will receive commands and the sequence of commands to be executed	**SETCALL1**=6970333330 OUT1=ON-MIN052 OUT2=OFF OUT3=XOR OUT4=OFF-SEC035 CALLBACK1 REPORT#
SETMACROx	Store a keyword and the sequence of tasks to be executed	**SETMACRO1**=*IRIDA* OUT1=ON-MIN052 OUT2=OFF OUT3=XOR OUT4=OFF-SEC035 CALLBACK1 REPORT#
SETALARMx	Store programming values for alarms 1 to 4	**SETALARM1** = 6977763000 IN1=ON IN2=OFF AN1>80 AN2>55 AN2<35 AN3<10 OUT1=ON-MIN052 OUT2=OFF CALLBACK1 REPORT #
SETSMSx	Store in one of the memory locations (1 to 4) the predefined SMS (max length 100 characters) that the user will receive in case of alarm	**SETSMS1**= <A BURGLARY IS CURRENTLY IN PROGRESS AT THE SHOP IN 34 AEOLOY ST.> #
RINGS	Set the number of rings after which the device will execute the programmed tasks after a call made by the user to the device (then the incoming call will be rejected) - default: 2 rings	**RINGS**=3#
SETDATE	Set and store the time and date in the GSM module	**SETDATE#**
REPORT	Used in combination with the SETCALLx, SETMACROx, SETALARMx commands Indicates if a notification SMS will be sent to the user's phone	SETCALL1 = 6970333330 OUT1=ON-MIN052 OUT2=OFF OUT3=XOR **REPORT** #
SMS	Used in combination with the SETALARMx command Indicates if a user-defined SMS message will be sent to the phone number that has been programmed in memory	SETALARM1 = 6557763000 IN1=ON AN1>80 AN3<10 OUT1=ON-MIN052 **SMS** CALLBACK1 REPORT #
CALLBACKx	Used in combination with the SETCALLx, SETMACROx, SETALARMx commands Indicates if a non-answered call is made to the user's phone	SETCALL1 = 6970333330 OUT1=ON - MIN052 OUT2=OFF OUT3=XOR OUT4= OFF-SEC035 **CALLBACK2** REPORT #

The SETCALLx, SETMACROx, SETALARMx, SETSMSx commands must always be terminated with a #

<table>
<tr><td colspan="3">**Table 2.REMOTE CONTROL COMMANDS**

The commands must always be terminated with a 'sharp' (#).</td></tr>
</table>

COMMAND or COM	Direct outputs management	**COMMAND** OUT1=ON OUT3=XOR OUT4=ON-SEC035 #
STATUS	Request for a notification SMS to the supervisor phone number	**STATUS #**
RESET	System reset	**RESET#**
ALARMON=X	alarm arming	**ALARMON=1#**
ALARMOFF=X	disarm	**ALARMOFF=1#**

The COMMAND command must always be terminated with a #

		Table 3. OUTPUT FUNCTIONS	
1	**ON**	Output activation	**OUT3=**ON
2	**OFF**	Output deactivation	**OUT2=**OFF
3	**XOR**	Transition from activation to deactivation or the reverse depending on the initial state of the output	**OUT1=**XOR
4	**ON-MINxxx**	Output activation for the time indicated by parameter xxx, with values from 000 to 999 minutes. Then the output is deactivated.	**OUT4=**ON-MIN005
5	**ON-SECxxx**	As in previous case, except that the parameter indicates the time in seconds.	**OUT2=**ON-SEC316
6	**OFF-MINxxx**	Output deactivation for the time indicated by parameter xxx, with values from 000 to 999 minutes. Then the output is activated.	**OUT1=**OFF-MIN025
7	**OFF-SECxxx**	As in previous case, except that the parameter indicates a time in seconds.	**OUT3=**OFF-SEC250

D. REMOTE CONTROL OF OUTPUTS

D1. Remote control by SMS

1. *The* **STATUS#** *command*

When we send this command from the Supervisor phone number or from any other mobile phone along with the password in the following form:
STATUS# PASS=XXXX #

the device will send to the supervisor phone number information about the system status in the following form:
STATUS: O1=OFF, O2=OFF, O3=ON, O4=ON, IN1=ON, IN2=OFF, IN3=OFF, IN4=ON, AN1=125, AN2=030, AN3=200, AN4=005, AL1=OFF, AL2=ON, AL3=OFF, AL4=OFF, ALARM=OFF SIGNAL=9

Where:

Ox, the outputs (RELAYS)
INx the digital inputs
ANx the analog inputs
ALx the status of the corresponding alarm signal - armed or disarmed
ALARM, indicates if there is currently an alarm condition in the system
SIGNAL=9, signal level at the antenna, with values from 0 to 9.

2   *The* COMMAND *command*

By using the COMMAND or COM remote control command we can directly manage the outputs with the devices that are connected to them.   Each output can independently perform one of the seven functions described in table 3. (Supposing we are managing all outputs, we will write the command and include it in the message to be sent).
So we have:

COMMAND OUT2=OFF-SEC045 OUT3=ON-MIN200 OUT4=ON OUT1=XOR #   always terminating the command with a 'sharp' # (see also table 2)

If we want to be notified about the execution of the command we must also include the **STATUS** command in the same message.

Example 1:
COMMAND **OUT4=ON OUT2=OFF-SEC045 OUT3=ON-MIN200 OUT1=XOR #** STATUS #

Of course, each time we can modify the function of as many outputs as we wish without affecting the rest of the outputs.

Example 2:
COMMAND **OUT1=OFF-MIN015 OUT2=ON-SEC045#** RINGS**=4 #** SUPERVISOR**= 6915222333 #**

3.   *The* SETDATE# *command*

If we include this command in any SMS we send to the device, the time and date will be automatically updated from the message center of the mobile telephony provider.

4.   *The* RESET# *command*

If this command is sent in an SMS the system will be reset to the factory settings. At the same time, all stored phone numbers, keywords, predefined messages and alarms will be erased from memory.

5.   *The* RINGS# *command*

Defines the number of rings after which the device will disconnect the line when we make a non-answered call to it in order to execute a sequence of actions. Syntax: **RINGS=3** or **RINGS=4** etc.
The factory setting for this command is 2 rings.

6. *The* **CALLBACK1** *or* **CALLBACK2** *command*

This command is not directly sent in an SMS, but in combination with the **SETCALLx, SETMACROx, SETALARMx** commands in case we want a **non-answered** call to our mobile phone**.**

 (!!! WARNING... SINCE THE CALLBACKX COMMAND IS INCLUDED AS A TERM IN THE ABOVEMENTIONED COMMANDS WE MUST NOT TERMINATE IT WITH A 'SHARP' #)

Example: SETCALL1=6970333330 OUT1=ON-MIN052 OUT2=OFF OUT3=XOR OUT4=OFF-SEC035 **CALLBACK1** REPORT#   **(!The 'sharp' indicates the termination of the SETCALL1 command)**

SETCALL2=6870333330 OUT3=XOR OUT4=OFF-SEC035 **CALLBACK1 # (! The 'sharp' indicates the termination of the SETCALL2 command and not of the CALLBACK1 command, which is used as a term).**

    7. *The* **REPORT** *command*

This command is not directly sent in an SMS, but only in combination with the **SETCALLx, SETMACROx**, **SETALARMx** commands in case we want a notification SMS about the system's status to be sent to our mobile phone**.** It has the same effect as the STATUS command.

    8. *The* **SMS** *command*

This command is not directly sent in an SMS, but only in combination with the **SETALARMx** command in case we want a user-defined message that has been stored in the device's memory to be sent to us when the corresponding alarm occurs.

D2. Remote control by a non-answered call to IRIDA

By simply making a call to IRIDA from our fixed or mobile phone, the device will perform the assigned functions (outputs management, sending of notification SMS, non-answered call to the user) according to its programming (see case C1 in 'programming' chapter) and then it will immediately disconnect the line without any charging for the call.

D3. Remote control by sending a predefined keyword to IRIDA

If we have programmed (case C2) a keyword or command and we send that keyword or command in an SMS, the device will automatically perform the predefined tasks we have assigned to it during programming.   If, for example, we have stored in memory the keyword **FRONTDOOR** and we send this keyword in an SMS using the following form:

FRONTDOOR   (the keyword must be prefixed and suffixed by an asterisk),

the device will automatically perform the programmed tasks, which in this case are related to outputs 2 and 4, and then it will send a notification SMS to the supervisor phone number (**REPORT**), and finally the device will make two calls to the supervisor phone number (**CALLBACK2**).

E. INDICATING LEDs - TROUBLESHOOTING

E1. INDICATING LEDs

The device's status and the functions that are being currently performed can be established by the four indicating LEDs of IRIDA.

1. LED 1(**SIGNAL**): indicates the GSM module's status, and in particular:
    A) When the device is connected to the mains, after 3 seconds LED1 starts to flash with a period of approximately one second. This means that the GSM module is operating and is **searching for a network signal**.
    B) **If a network is found and its signal has adequate strength** LED1 remains in the flashing state with a period of approximately four seconds.
    C) If, during the module's normal operation, we **remove the antenna** or **the signal is lost** due to bad weather conditions or **the SIM card is removed**, LED1 flashes as in case A.
    D) When the module is receiving an incoming call LED1 remains on for the duration of the call and then, after the termination of the call, returns to the state of case B.

2. LED 2 (**RECEIVE**): indicates whether the GSM module is receiving an **incoming call** or **an incoming SMS**:
    A) When the module is receiving an incoming call LED2 remains on for the whole duration of the call (together with LED1) and then, after the termination of the call, it is reset (remains off).
    B) When the module receives an SMS LED2 flashes for 4 seconds with a period less than half a second.

3. LED 3(**TRANSMIT**): indicates whether the GSM module is making an **outgoing call** or **is sending an SMS:**
    A) When the module is making an outgoing call LED3 remains on for the whole duration of the call and then, after the termination of the call, it is reset (remains off).
    B) When the module is sending an SMS LED3 flashes for 4 seconds with a period less than half a second.

4. LED 4(**STATUS**): confirms the proper operation of commands or the detection of a problem in a procedure:
    When a command is successfully executed LED4 will provide a confirmation by remaining on for about 4 seconds. In the opposite case it will flash for 4 seconds with a period less than half a second.
    ♦ For example, when the module receives a non-answered call or an incoming SMS from a phone number that has already been stored in the memory it will indicate the successful execution as described above. If the number of the phone that makes the call to the module or the SMS sender are not recognized, LED4 flashes as described above.
    ♦ If, during an outgoing call, there is no signal or the line of the called number is busy, LED4 flashes as described above.
    ♦ If a communication problem occurs between the module and the processor, LED4 flashes and after ten unsuccessful attempts to communicate the processor performs a module reset.
    ♦ If an SMS sent by the user for remote control or programming contains commands with syntax errors, LED4 flashes.

E2. TROUBLESHOOTING

1. I connect the power supply to the device and none of the indicating LEDs turns on.
Check if the power supply is connected to the correct clamp and if the processor is correctly installed on its base.

2. LED1 keeps flashing without achieving a steady rate, turns off for a while and then the same thing is repeated again.
The antenna has not been correctly connected to the module or the module cannot find a network (with a signal of adequate strength) and keeps searching. Relocate the device (if possible, put it close to a window) and check the signal with another mobile phone. If your mobile phone does not receive a signal or the signal is too weak, the same thing happens to the GSM module. In case of bad weather conditions, the transmission signals from the mobile network antennae are usually unsteady, so even if a signal exists but it is weak at the spot where you placed the device, the signal may be lost under bad weather conditions.

3. Following the installation of a new SIM card the device is not operating, while it previously operated normally with the old card.
You must deactivate the PIN number of the new card before installing it in the module.

4. I have programmed the device to provide an alarm when input 1 becomes OFF and to receive from it a notification message and a non-answered call, but this does not happen.
In order to activate the programmed alarm conditions you must also arm the corresponding alarm by sending the **ALARMON=X** command. Also check if the programming message that will be sent to the device has the correct syntax.

5. I am making a call from my mobile phone and I have previously stored correct commands and values in the device's memory (phone number, functions etc.), but nothing happens.
If your phone number is secret, it does not appear when the calling number identification service is used. So, even if it has been stored in memory, the device cannot recognize it and automatically rejects the call.

E3. DEVICE'S SELF-DIAGNOSTIC CHECK

The system periodically performs an auto-diagnostic check of the program flow with its built-in "Watchdog". If any problem is detected the processor and the GSM module are RESET and then the device returns to its previous state. The communication with the GSM module is checked in regular intervals and if any problem is detected the processor deactivates the module (power-off) and then re-activates it (power-on).
If, during an outgoing call, the network signal is lost or the connection with the user's phone cannot be established, the device attempts ten times to make the call or to send the SMS.

E4. EXAMPLES OF PROGRAMMING AND REMOTE CONTROL

1. During the initial activation of the device we must store the supervisor phone number and change the password (default factory setting: 1111).

SUPERVISOR=6965123456# **PASS**=1111# **CHPASS**=1111**.**1234#

In the following examples we assume that the messages are sent form the number that we have just set as the supervisor number, so there is no need to include the PASS command in our message. In the opposite case (that is, when the phone number from which the message is sent has not been set as "supervisor") we must also send the password.

2. <u>Programming of phone numbers</u> that will make calls to the device - the device will perform the programmed tasks and reject the calls:

SETCALL1=6912345689 **OUT1**=ON-MIN052 **OUT3**=XOR **OUT4**=OFF-SEC035 CALLBACK2 REPORT# **SETCALL2**=6912345698 **OUT3**=XOR **OUT4**=ON-MIN015 # **SETCALL3**=6969111118 **OUT1**=ON REPORT #   (message 1)

This message is explained in par. C1

3. <u>**Programming of keywords** that will be sent to the device by SMS for the purpose of remote control or user notification by a message - the device will perform the programmed tasks:</u>

SETMACRO1=*FRONTDOOR* OUT4=0N-MIN02 OUT2=ON REPORT # **SETMACRO2** = *PUMP2* OUT3=ON OUT2=ON-SEC10 CALLBACK1#**SETMACRO8** = *SIREN3* OUT2=OFF OUT1=XOR REPORT#   (message 2)

This message is explained in par. C2
After we send the above message, the device is ready to receive the keywords that we have defined. So each time we send in an SMS one of these commands as follows:

SIREN3

the device will set output 2 to OFF, will reverse the status of output 1 and finally will send a report about the status of all inputs and outputs to the supervisor phone number.

4. <u>**Programming of ALARM signals. See par. C2**</u>

5. <u>**Direct remote control of the outputs by SMS**</u>

    a) To open / close one or more RELAYS we must send the following message:

    COMMAND OUT1=OFF OUT2=ON#

    a) To open / close one or more relays for a certain period we must send the following message:

    COMMAND OUT3=ON-MIN005 OUT4=ON-SEC200#

    Output 3 will become ON and will remain in this state for 5 minutes before returning to OFF status. Similarly, output 3 will become ON and will remain in this state for 200 seconds before returning to OFF status.

6. <u>**Request for notification message about the status of inputs, outputs and alarm signals of the device**</u>

    We send the SMS: **STATUS#**
    IRIDA will respond with a notification SMS. (see par. D1)

7. <u>**Send a RESET command to the device**</u>

    We send the following message: **RESET#**

    The device will return to its factory settings and all programmed values / commands and the current time will be erased from system's memory.

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8. **Send a keyword from a phone number other than the "supervisor" number**
Any user can send an SMS with a keyword, provided that the current password is also sent along with the keyword:

IRIDA PASS=1111#

9. **When digital input 1 becomes OFF i want to receive in my mobile phone the message "PROBLEM AT THE HOUSE IN 33 ERMOU ST. IN ATHENS" and at the same time to turn on the lights connected to outputs 2 and 3 for 5 minutes, to activate the siren (output 1) for 2 minutes and to receive a non-answered call.**

The programming message we must send is as follows:

SETSMS1=< PROBLEM AT THE HOUSE IN 33 ERMOU ST. IN ATHENS>#
SETALARM1=69XXXXXXX IN1=OFF OUT2=ON-MIN005 OUT2=ON-MIN005 OUT1=ON-MIN02 SMS CALLBACK1# **ALARMON=1#**

With the last command (**ALARMON=1#**) we arm the corresponding alarm signal. We can disarm it at any time by sending **ALARMOFF=1#** and vice-versa.

10. Simultaneous arming and disarming of alarm signals.

ALARMON=1# ALARMOFF=2# ALARMOFF=3# ALARMON=4#