DECODE

User's Manual

GSM Utility

GPRS Router | SMS Reporter | GSM Key | SMS Gateway

Legal notice

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Note: The specifications in this document are valid as of the listed versions of software and/or hardware. Revised versions of this manual, as well as software and driver updates are available in the download area of the Decode web site.

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1 Preface

1.1 Symbols

WARNING – Safety notice, which must be followed, may have influence on the user's safety or the function of the device.

IMPORTANT– Notice, which must be followed to avoid possible problems, which can arise in specific cases.

NOTE – Notice, which contains useful advice.

1.2 Safety Instructions

Device must be used in compliance with any and all applicable international and national laws and in compliance with special restrictions regulating the utilization of the communications of the communication module in prescribed applications and environments.

WARNING – We suggest you to adhere to following recommendations so as to avoid any damage to person or property.

- **All the associated (interconnected) equipment, PC and power supply units (PSU) shell comply with requirements of standard IEC 60950- 1:2005+A1:2009+A2:2013.**
- **Power supply must have SELV output and for security reasons connection must include series 1A fuse protection.**
- **Access to relay connections must be checked and restricted in the end installation using potential hazardous voltage.**
- **Installation and technical support of the device can be performed only by a qualified personnel or a person who has enough knowledge about this device and safety requirements.**
- **Unauthorized modifications or utilization of accessories that have not been approved may result in damage to the device and in a breach of applicable regulations, and result in the termination of the validity of the guarantee.**
- **Do not expose the device to extreme ambient conditions. Protect the device against dust, moisture and high temperature.**

IMPORTANT– GSM radio signal level and availability depends on the environment in which it is working, which could affect performance and functioning of device.

1.3 Document versions

Document version	Software version	Date	Note
v1.0	v1.0	18/07/2018	First release

2 Overview

GSM Utility software is intended for easy configuration of DECODE GT900 – 110, GT900 – 343 and GT900 – 686 devices, with functionalities as GPRS Router, SMS Reporter, GSM Key and SMS Gateway.

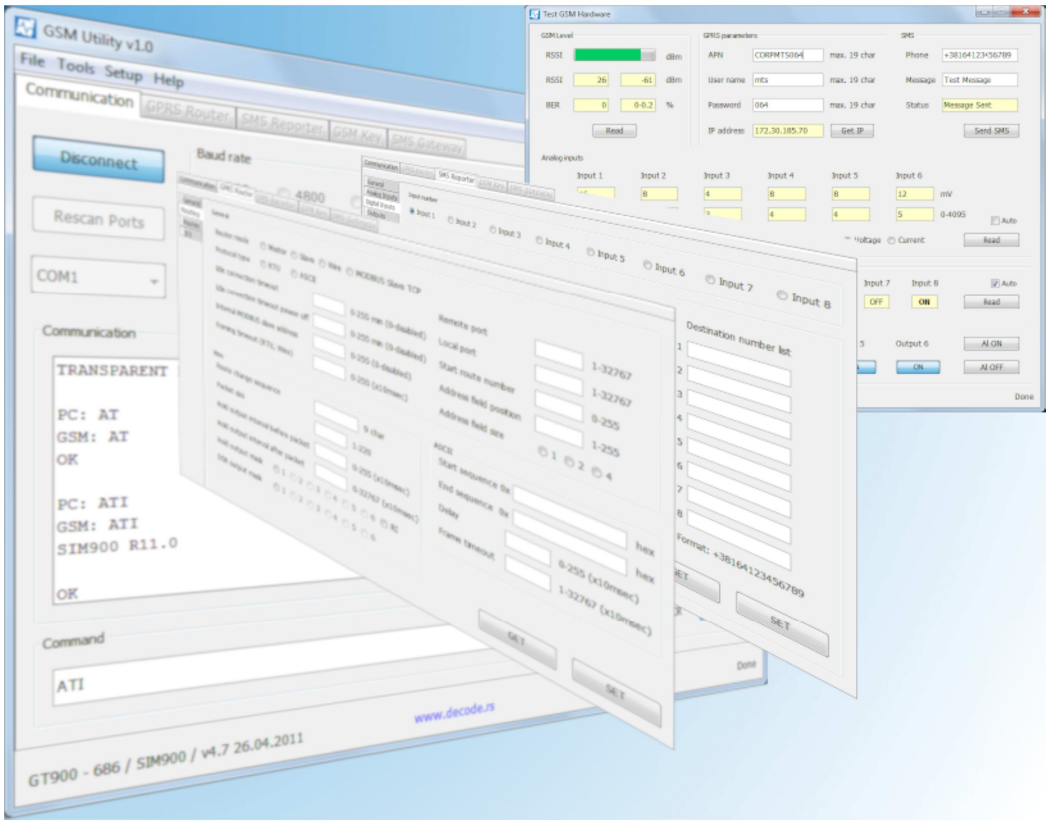

Fig. 1: GSM Utility

Main window is terminal like, whilst depending on device's functionality associated tab window is enabled and brought up to view. User can freely change functionality of device depending on current requests.

The software enables loading and saving device's configuration. This helps with configuration of several devices with same demands.

There is an option of testing GSM hardware, e.g., digital / analog inputs, relay outputs, functionality of GSM module, which is useful in the event of a suspicion of a hardware failure.

If something goes wrong, user can always reset parameters to factory default. Also, user can save current configuration and send the file to DECODE for analysis and help.

3 Installation

The software is written in Java programming environment, so it is necessary to install Java JRE7 (or newer) virtual environment for Windows / Linux operating system.

3.1 Windows OS

Installation package of Java JRE7 (or newer) virtual environment can be downloaded from:

http://www.oracle.com/technetwork/java/javase/downloads/index.html

To install the program under Windows 32bit/64bit operating system, run the file *Setup_GSM_Utiltiy_v1.0.exe*. The file is located on the supplied installation CD or can be downloaded from DECODE web site. Some operating systems, such as Windows 7 Home Basic, do not allow access to system folders (*Program Files*), so it is required to run the file by right-clicking and selecting *Run as administrator*.

At first, language selection window will be shown. Choose language and click *OK*.

Fig. 2: Language selection

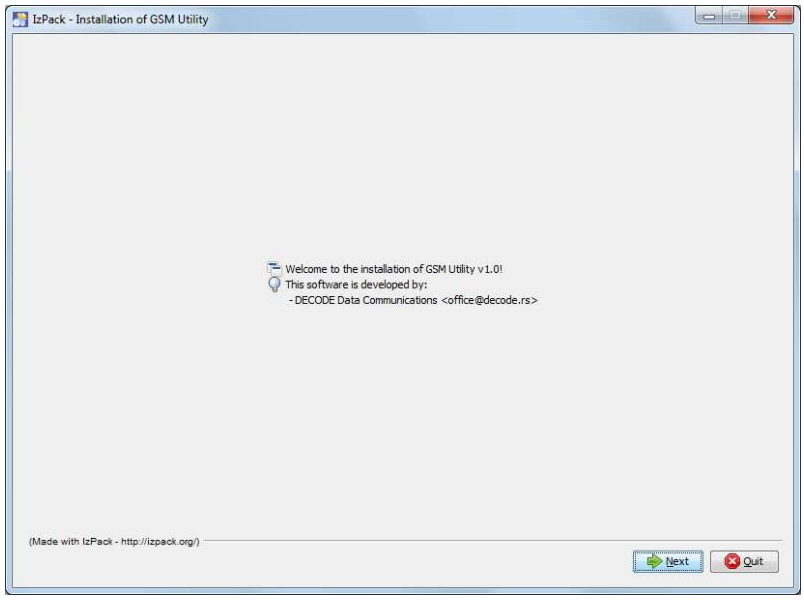

Fig. 3: Welcome message

In the previous window is a welcome message and development information. Click *Next*.

In the next window one can choose the location on computer where to install the software. Typically, it is *C:\Program Files\GSM Utility*:

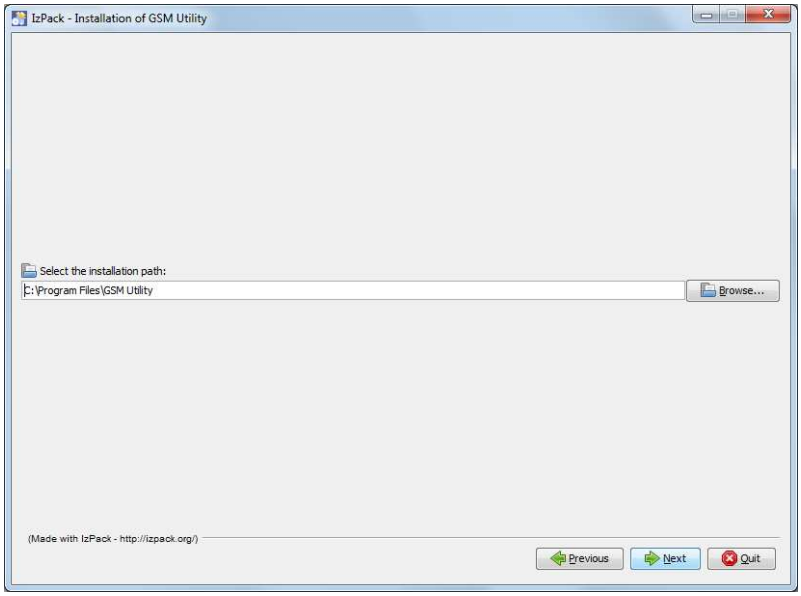

Fig. 4: Installation path

By clicking *Next*, a message appears that a new directory will be created:

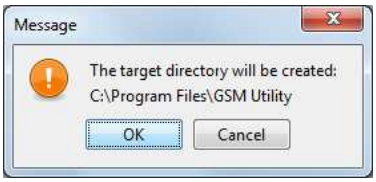

Fig. 5: Creating new directory

Confirm creating a new directory.

The next window is a list of modules that will be installed. *Base* module contains the application itself, whilst the *lib* module contains the necessary libraries.

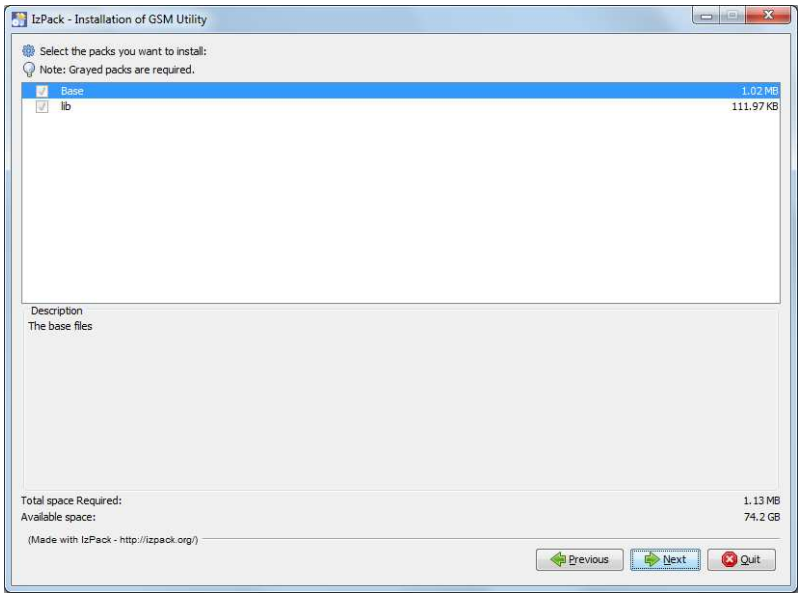

Fig. 6: List of modules

Click on *Next* opens a window in which one can choose to create shortcuts in the Start-Menu list and on the desktop:

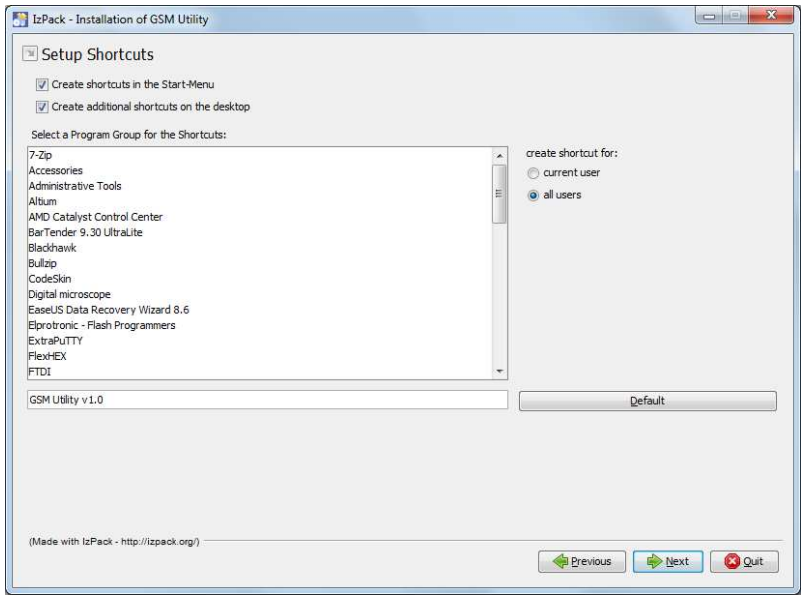

Fig. 7: Setup shortcuts

Click *Next* and start the installation of the software:

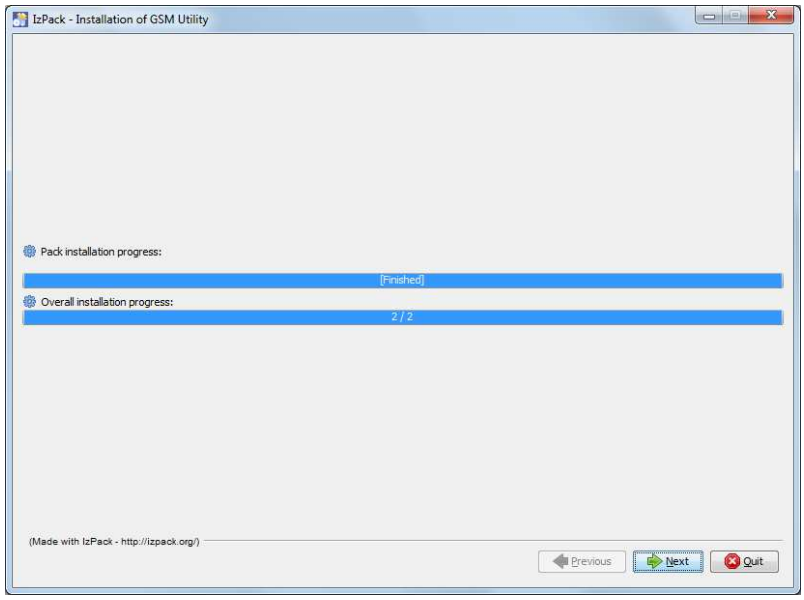

Fig. 8: Installation progress

Click on *Next* opens a window with information about successfully installed software as well as the location of *Uninstaller* program.

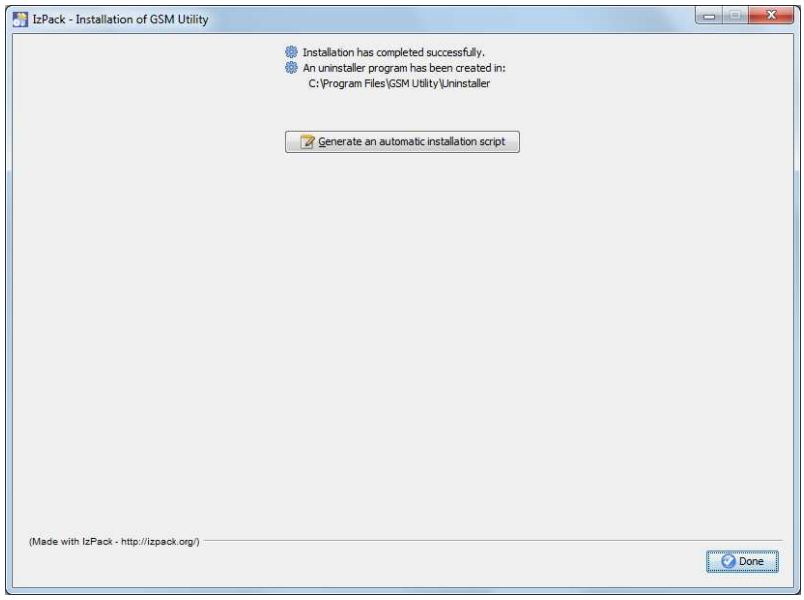

Fig. 9: Installation done

It is possible to generate an automatic installation script xml file by clicking *Generate an automatic installation script*. The file contains the configuration selected by the user at installation and can be used to install the software on other computers.

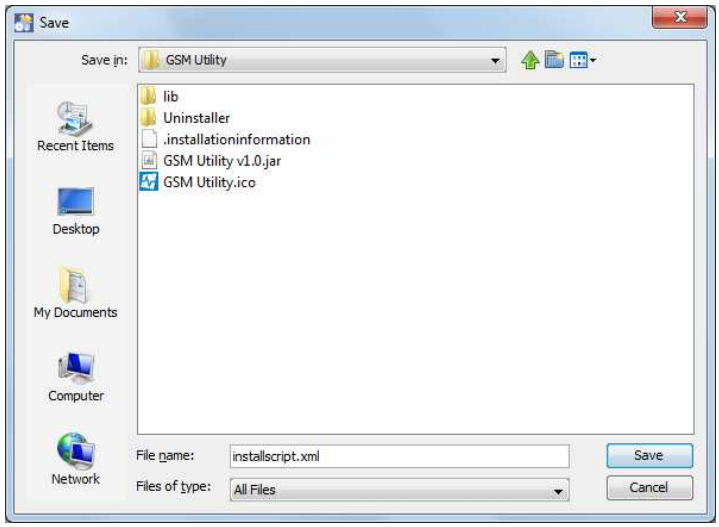

Fig. 10: Installation script

The file name can be, for example *installscript.xml*. It could be run from the command line:

```
java -jar Setup_GSM_Utility_v1.0.jar installscript.xml
```

Click Done to end the installation of GSM Utility software under Windows 32bit/64bit operating system.

Start the software by clicking on *GSM Utility v1.0* desktop schortcut, or *Start→Programs→GSM Utility v1.0→GSM Utility v1.0* .

3.2 Ubuntu Linux OS

For succesful operation of GSM Utility software, it is necessary that Java OpenJDK 1.7 environment (or newer) is installed. Oracle JRE or JDK environment under Linux operating system doesn't support communication with driver for serial port.

Check which versions of Java virtual environment are installed on PC. Type:

```
user@ubuntu:~$ sudo update-java-alternatives --list

java-1.7.0-openjdk-amd64 1071 /usr/lib/jvm/java-1.7.0-openjdk-amd64
java-8-oracle 1081 /usr/lib/jvm/java-8-oracle
java-gcj-4.8 /usr/lib/jvm/java-gcj-4.8
```

If Java OpenJDK 1.7 environment is not installed, or older version is installed, it is necessary to uninstall it and install the latest version by following command:

```
user@ubuntu:~$ sudo apt-get purge openjdk-\*

user@ubuntu:~$ sudo apt-get update
user@ubuntu:~$ sudo apt-get install default-jre
```

or explicitly OpenJDK JRE 1.7:

```
user@ubuntu:~$ sudo apt-get install openjdk-7-jre
```

Java virtual environment will be installed in directory */usr/lib/jvm/* .

Check which version of Java virtual environment is used by default. Type:

```
user@ubuntu:~$ java -version

java version "1.7.0_171"
OpenJDK Runtime Environment (IcedTea 2.6.13) (7u171-2.6.13-0ubuntu0.14.04.2)
OpenJDK 64-Bit Server VM (build 24.171-b02, mixed mode)
```

If OpenJDK is not default Java virtual environment, set it to the default by typing:

```
user@ubuntu:~$ sudo update-java-alternatives --set java-1.7.0-openjdk-amd64
```

Check if environment variable *JAVA_HOME* is properly set. Type:

```
user@ubuntu:~$ echo $JAVA_HOME

/usr/lib/jvm/java-7-openjdk-amd64
```

If it is needed, environment variable *JAVA_HOME* can be set in file */etc/profile*:

```
user@ubuntu:~$ sudo gedit /etc/profile
```

At the end of file type following:

```
JAVA_HOME=/usr/lib/jvm/java-7-openjdk-amd64
JRE_HOME=$JAVA_HOME/jre
PATH=$PATH:$JAVA_HOME/bin:$JRE_HOME/bin
export JAVA_HOME
export JRE_HOME
export PATH
```

Install serial port drivers. Type:

```
user@ubuntu:~$ sudo apt-get install librxtx-java
```

Drivers will be installed in */usr/lib/jni* directory. Verify that the */usr/lib/jni* directory is registered in *java.library.path*. Type:

```
user@ubuntu:~$ java -XshowSettings:properties

...
java.library.path = /usr/java/packages/lib/amd64
                    /usr/lib/x86_64-linux-gnu/jni
                    /lib/x86_64-linux-gnu
                    /usr/lib/x86_64-linux-gnu
                    /usr/lib/jni
                    /lib
                    /usr/lib
...
```

Check whether the user belongs to group *dialout* so the software could access to serial port as *non-root user*. Type (instead of `USER` type the name of PC user):

```
user@ubuntu:~$ groups USER

USER : USER adm dialout cdrom sudo dip plugdev lpadmin sambashare
```

If the user does not belong to the dialout group, add it to the group by typing:

```
user@ubuntu:~$ sudo usermod -a -G dialout $USER
```

NOTE: After changing the file */etc/profile* and/or adding the user to the *dialout* group, it is necessary to reboot the computer.

Unpack the file *Setup_GSM_Utility_v1.0.tar.bz2* in *Home* directory. The file is located on the supplied installation CD or can be downloaded from DECODE web site. Unpacked directory contains „*GsmUtility*“ directory and „*TahomaFont*“ directory.

GSM Utility software uses Tahoma font to display the field names and labels. If PC doesn't have Tahoma font installed, copy this font to directory */usr/share/fonts/truetype*:

```
user@ubuntu:~$ sudo cp ~/Setup_GSM_Utility_v1.0/TahomaFont/tahoma*ttf
/usr/share/fonts/truetype/
```

Change access permissions for Tahoma fonts:

```
user@ubuntu:~$ sudo chmod 644 /usr/share/fonts/truetype/tahoma*
```

Directory *GsmUtility*, which contains sub directory *lib* and file *GSM Utility v1.0.jar*, copy to desired location, e.g., *Home* directory:

```
user@ubuntu:~$ sudo cp -R ~/Setup_GSM_Utility_v1.0/GsmUtility ~/
```

NOTE: If it doesn't already exist, GSM Utility software will create directory *GsmUtility* in *Home* directory for saving configuration and communication files.

Change access permissions for directory *GsmUtility* and containing files. Type:

```
user@ubuntu:~$ sudo chmod -R 777 ~/GsmUtility/
```

Directory *GsmUtility* contains „*Icon.png*“ file. Right click on the file *GSM Utility v1.0.jar* and choose *Properties*. Click on the existing icon and choose *~/GsmUtility/Icon.png*.

The software can be run by typing:

```
user@ubuntu:~$ java -jar ~/GsmUtility/GSM\ Utility\ v1.0.jar
```

Also, the software can be run by double click on the file *GSM Utility v1.0.jar*, or right click on the file and choose „*Open With OpenJDK Java 7 Runtime*“.

NOTE: If the software is run as a sudo user, then the *GsmUtility* directory will be created in the root directory. There is no need to run the program as a sudo user.

4 Software description and usage

Run the software by clicking on desktop shortcut *GSM Utility v1.0* (Windows OS), i.e., right-clicking on *GSM Utility v1.0.jar* and selecting *Open with Java* (Linux OS).

Splash screen will be shown during the initialization of the software and while searching serial ports (embedded and virtual):

Fig. 11: Splash screen

After few seconds, the main software window is shown, as in the next Figure:

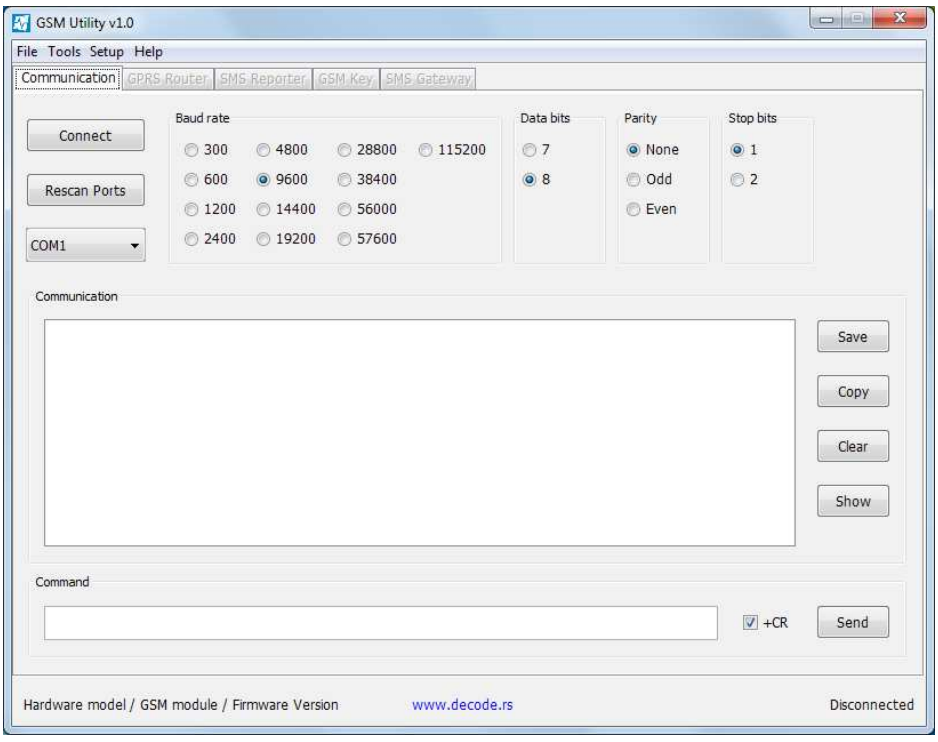

Fig. 12: GSM Utility – Main window

On the top of software window is the Menu bar which consists of *File*, *Tools*, *Setup* and *Help* menus. Expanded menus are shown in the next figure:

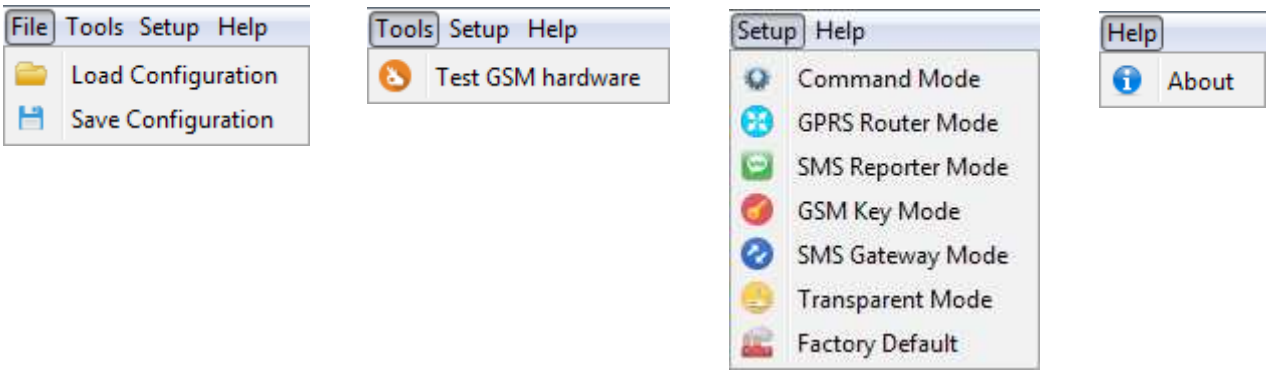

Fig. 13: Menu bar

File menu consist of:

Load Configuration – load configuration from file for connected GSM Device (GPRS Router, SMS Reporter, GSM Key, SMS Gateway). Default location is *My Documents\Gsm Utility* .

Save Configuration – save configuration to file for connected GSM Device (GPRS Router, SMS Reporter, GSM Key, SMS Gateway). Default location and file name is *My Documents\Gsm Utility\ConfigGprsRouter.txt* (*ConfigSmsReporter.txt*, *ConfigGsmKey.txt*, *ConfigSmsGateway.txt*).

These options are useful in the case of configuration of several devices with same demands. Also, user can save current configuration and send the file to DECODE for analysis and help.

NOTE: Menu items *Load Configuration* and *Save Configuration* are enabled only if one of GPRS Router, SMS Reporter, GSM Key or SMS Gateway tabs is enabled.

NOTE: If wrong file is loaded, „Configuration file is not valid“ will appear in *Status Message*.

Tools menu consist of:

Test GSM hardware – opens new window for testing GSM hardware, e.g., digital / analog inputs, relay outputs, functionality of GSM module

NOTE: Menu *Test GSM hardware* item is enabled only if GSM Device is in Command Mode.

Setup menu consist of:

Command Mode – setup GSM Device to Command Mode

GPRS Router Mode – setup GSM Device to GPRS Router functionality

SMS Reporter Mode – setup GSM Device to SMS Reporter functionality

GSM Key Mode – setup GSM Device to GSM Key functionality (only GT900 – 110)

SMS Gateway Mode – setup GSM Device to SMS Gateway functionality (only GT900 – 110)

Transparent Mode – setup GSM Device for direct communication with built in GSM module

Factory Default – setup GSM Device parameters to factory default values

NOTE: *Setup* menu items are enabled if the software is connected to GSM Device.

NOTE: *Factory Default* settings can be applied only if GSM Device is in *Command Mode*. The warning window is displayed when the user starts changing GSM Device *Mode* or setting *Factory Default*.

Help menu consist of:

About – opens window with information about the software

Fig. 14: About window

In the next figures are shown examples of Note and Warning windows.

Fig. 15: Note and Warning before changing Mode

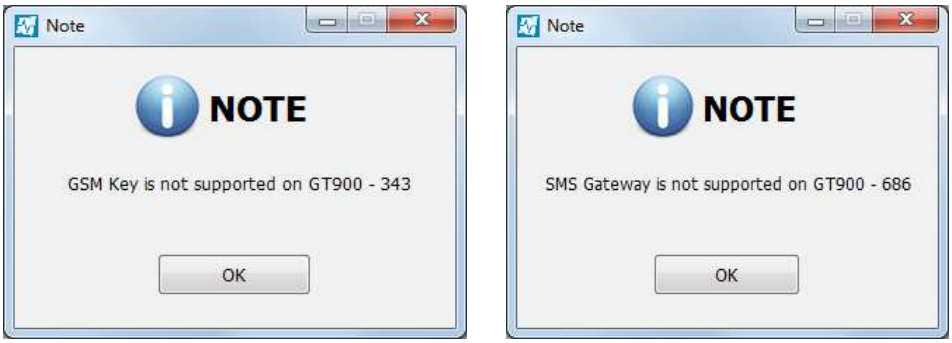

Fig. 16: Note that Mode is not supported on GT900 – 343 / 686

Please read carefully informations in Note and Warning windows, when it appears, before continuing configuration of GSM Device.

At the bottom of the software window is the status bar.

Fig. 17: Status bar

On the left side of status bar is the information about:

Hardware model – GT900 – 110 / GT900 – 343 / GT900 – 686

GSM module – SIM900 / SIM300_B14 / SIM300_B15 / Other

Firmware Version – e. g. v4.7 26.04.2011

Click on the link *www.decode.rs* opens an Internet browser and the website of DECODE Data Communications.

On the right side of status bar is *Status Message* which indicates current state of communication, information and errors.

Information messages appears only for one seconds, like “Some fields are empty or not selected”, while error message “Done with Errors” is permanent.

If the software fails to communicate with GSM Device for three attempts, “No Response” will appear in *Status Message*.

4.1 Communication tab

Communication tab appears after starting the software. This tab is also available when one of the other tabs is enabled (GPRS Router, SMS Reporter, GSM Key, SMS Gateway). It is used for setting communication parameters, connecting to GSM Device, as well as for monitoring communication with GSM Device.

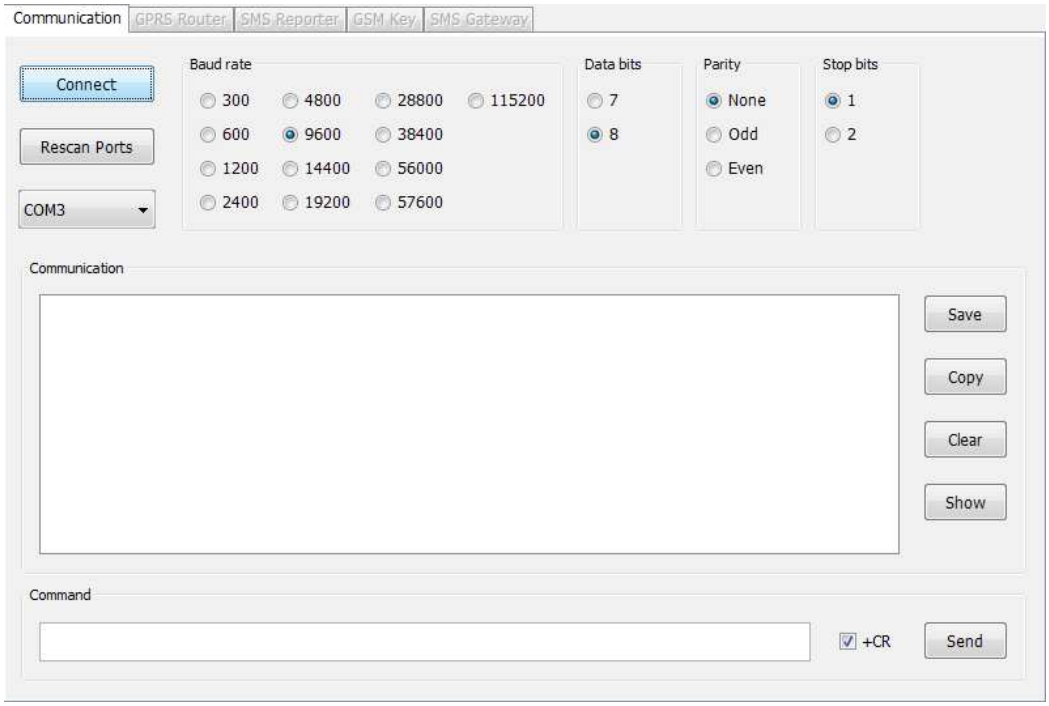

Fig. 18: Communication tab

Before connecting to GSM device, following parameters must be selected:

Baud rate – default is 9600bps

Data bits – default is 8bits

Parity – default is None

Stop bits – default is 1

List of available serial ports is automatically refreshed upon starting of the software. However, user can refresh this list by clicking *Rescan Ports* button. Choose appropriate serial port connected to GSM Device.

Click *Connect* button. The software will try to connect to GSM device by sending set of commands which will appear in the *Communication* field together with responses.

Buttons at the right side of Communication field are:

Save – save communication to file, default is *\My Documents\Gsm Utility\GsmUtilityComm.txt*

Copy – copy communication to clipboard

Clear – clear communication field

Show – show communication field in separate window, which can be resized and moved

Fig. 19: Communication field in separate window

Command field can be used to manually send commands to GSM device. Commands must be separated with semicolon ' ; '. For hex values use $xx, where x is hexadecimal digit (0-9, a-f, A-F). If it is needed to send $ itself, then use $$. Illegal hex values are sent as null characters.

Sending of "carriage return" at the end of commands can be controlled by selecting/deselecting checkbox *+CR*.

Entered commands in Command field can be sent by pressing *Enter* key (Command field is cleared) or by clicking *Send* button (Command field remains unchanged).

NOTE: Description of buttons and fields can be seen as tool tip, by hover the mouse over it.

4.2 GPRS Router tab

GPRS Router tab appears when GSM Device is set to GPRS Router functionality. It consists of four tabs arranged vertically on the left side:

General – Serial Interface parameters, GPRS parameters and GSM Level values

Routing – parameters used for adjust routing

Routes – list of routes

I/O – analog / digital inputs and relay outputs (number varies according to GSM Device type)

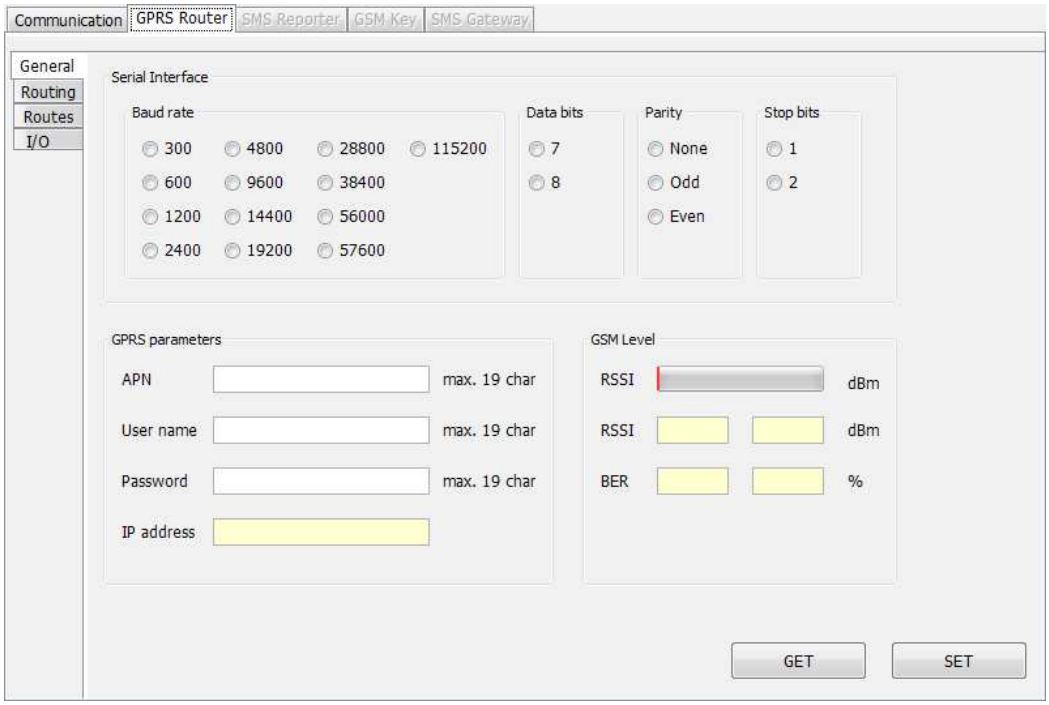

Fig. 20: GPRS Router – General

GET button starts reading of GSM Device parameters only for current window. In the *Status Message* will be displayed "Getting data [xx%]", followed by "Done".

SET button starts writing of GSM Device parameters only for current window. In the *Status Message* will be displayed "Setting data [xx%]", followed by "Done".

NOTE: If some fields are empty or not selected, message "Some fields are empty or not selected" will appear in *Status Message* when *SET* button is pressed. It is recommended to first get data, edit it, and then write to GSM Device by click on *SET* button.

NOTE: White fields are editable, while yellow fields are read only. During getting or setting data, busy mouse pointer will be displayed and *GET*/*SET* buttons will be disabled.

4.2.1 GPRS Router – General

General tab is shown in previous figure. It has following parameters:

Serial Interface – these parameters should be set according to PLC, or other device, connected to serial port of GSM Device.

If these parameters are changed and differ from current settings of *Baud rate*, *Data bits*, *Parity* and *Stop bits* in Communication tab, Note window will be displayed as in next figure:

Fig. 21: Note about changed serial interface settings

User must go to Communication tab and click on *Disconnect* button, then change serial port settings as suggested in Note window, and click on *Connect* button. Otherwise, communication between the software and GSM Device will not be possible.

GSM Device shares the same serial port for configuring via this software and for communication with PLC, or other device, connected to serial port.

GPRS parameters – these should be set according to GSM provider, with appropriate APN (Access Point Name), User name and Password. IP address will be obtained and shown if previous parameters are correctly set. While getting data, obtaining of IP address can last about 5-15 seconds and in *Status Message* will be displayed “Getting IP address...”. Message “No IP address” will be displayed in *IP address* field if GSM Device couldn’t obtain IP address.

GSM Level – shows GSM signal quality. RSSI (Received Signal Strength Indicator) values smaller then 10 (< -93dBm) are shown with red color in progress bar and are considered as poor signal quality, while values greater or equal to 10 (>= -93dBm) are shown with green color in progress bar and are considered as good signal quality. BER (Bit Error Rate) value is desired to be 0. Place GSM antenna so these requirements would be fulfilled.

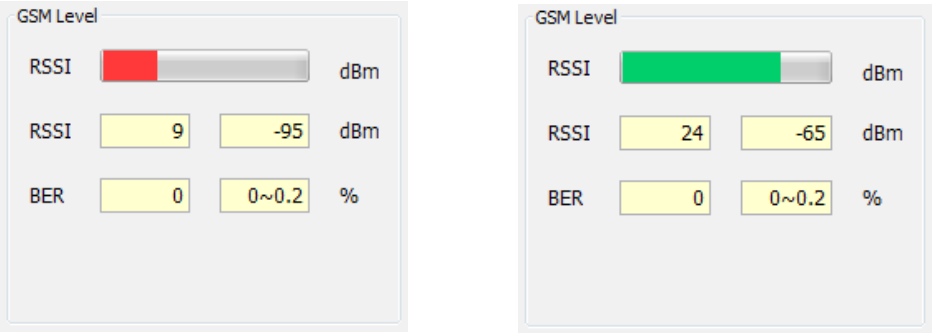

Fig. 22: GSM Level

NOTE: Read “GPRS Router – user’s manual” for detailed description of each parameter.

4.2.2 GPRS Router – Routing

Routing tab is shown in the next figure:

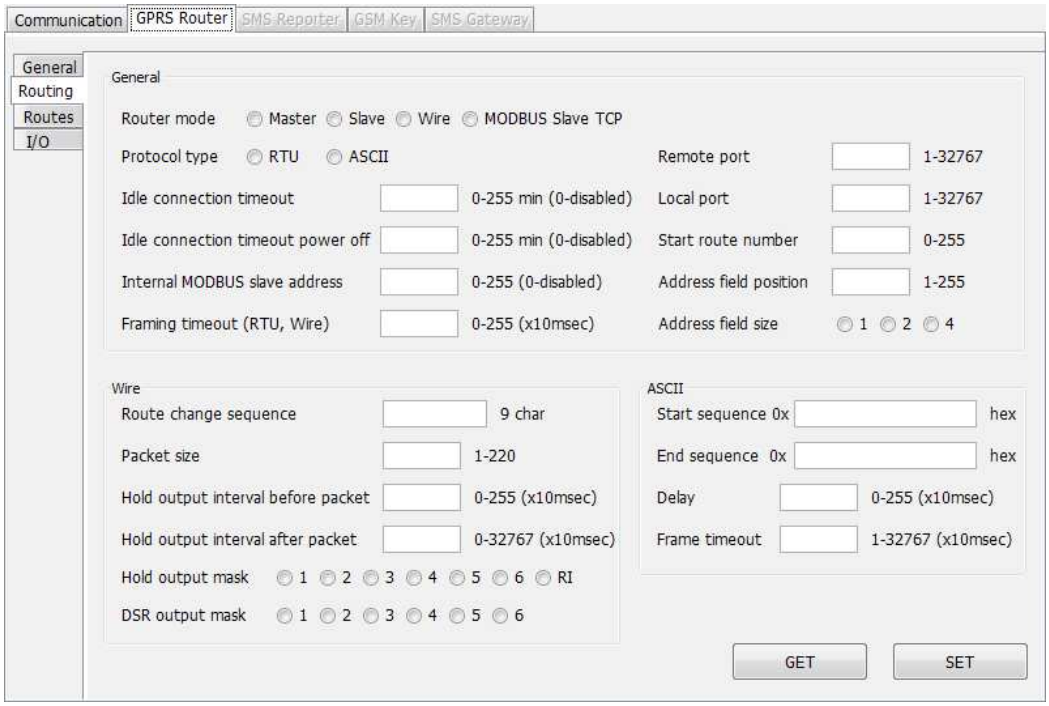

Fig. 23: GPRS Router – Routing

General panel – routing parameters, reboot timeouts, remote/local ports, etc.

Wire panel – parameters for definition of routing in Wire mode. This panel is enabled only if Wire router mode is selected in General panel.

For *Route change sequence* enter first 9 digits of phone number, e.g., +38164123, T+3816412, P+3816412 (T – tone, P – pulse).

Hold output mask and *DSR output mask* have enabled appropriate check boxes (1-6) according to number of relay outputs of connected GSM Device.

ASCII panel – parameters for definition of routing with ASCII protocol. This panel is enabled only if ASCII protocol type is selected in General panel.

For *Start sequence* and *End sequence* enter 9 hex values, e.g., 3A0000000000000000, 0D0A00000000000000.

4.2.3 GPRS Router – Routes

Routes tab is shown in the next figure:

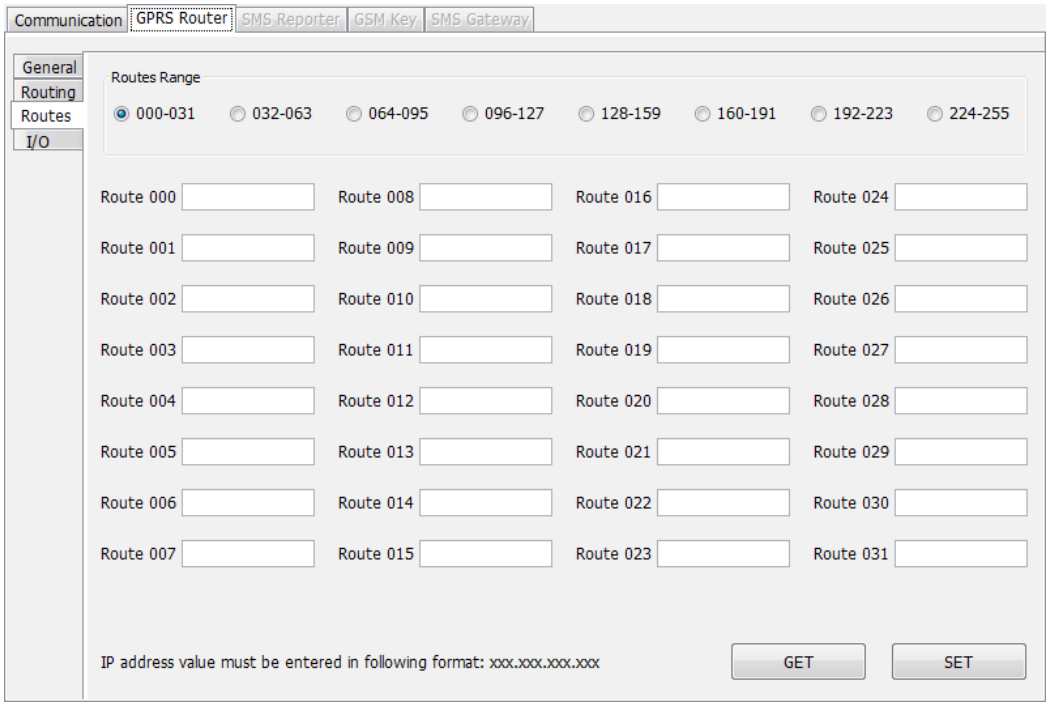

Fig. 24: GPRS Router – Routes

Routes Range panel – allows selection of routes range, e.g., 000-031, 032-063, etc.

Once the routes for selected routes range are get/set from/to GSM Device, it will be stored in software memory, so it doesn't require to get it again if some other routes range is selected.

Data are disposed from software memory when the software is disconnected or closed.

Route field – contains IP address which must be entered in format xxx.xxx.xxx.xxx, e.g., 192.168.1.1, 192.168.100.1, etc.

For routes which doesn't require definition of IP address, enter 0.0.0.0

NOTE: If some field is left empty, message "Some fields are empty or not selected" will appear in *Status Message* when *SET* button is pressed.

4.2.4 GPRS Router – I/O

I/O tab is shown in the next figure:

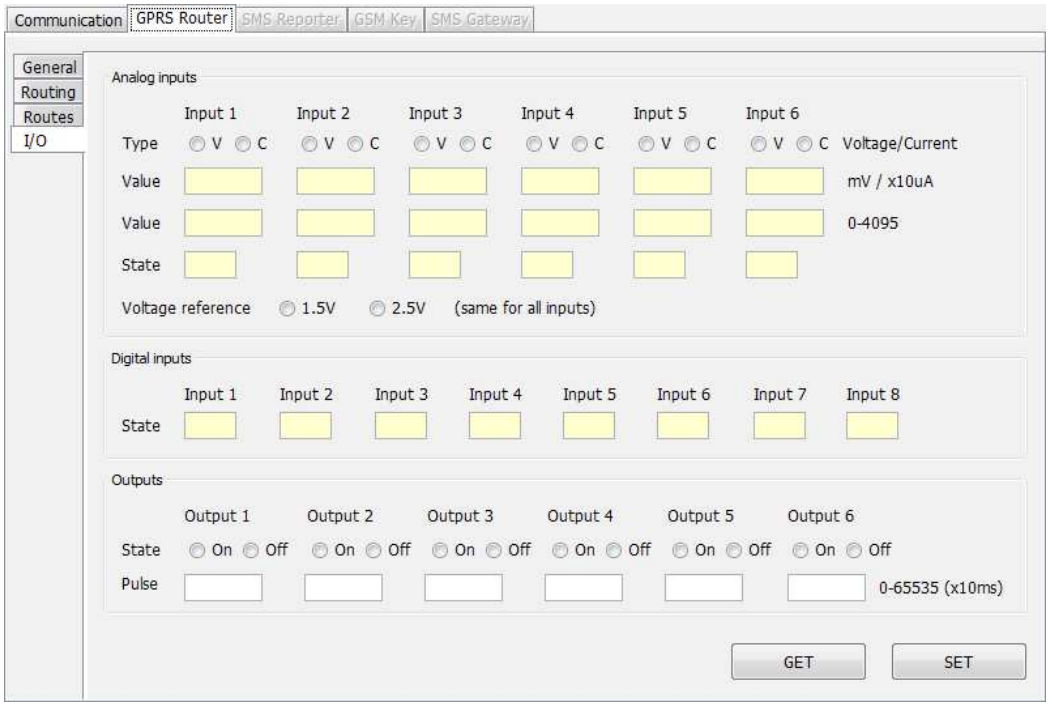

Fig. 25: GPRS Router – I/O

Depending on connected GSM Device (GT900 – 110, GT900 – 343, GT900 – 686) appropriate number of inputs and outputs will be enabled.

Analog inputs panel – allows setting of input type (Voltage/Current) for each analog input, setting voltage reference (1.5V / 2.5V) which is the same for all analog inputs, and getting scaled values (mV / x10uA), incremental values (0-4095) and digital states (ON / OFF) for each analog input.

Digital inputs panel – allows getting states (ON / OFF) for each digital input.

Outputs panel – allows getting / setting state (On / Off) and pulse duration (0-65535 [x10ms]) for each relay output.

NOTE: If some fields are empty or not selected, message "Some fields are empty or not selected" will appear in *Status Message* when *SET* button is pressed.

4.3 SMS Reporter tab

SMS Reporter tab appears when GSM Device is set to SMS Reporter functionality. It consists of four tabs arranged vertically on the left side:

General – SMS Subscriber List, SMS parameters and GSM Level values

Analog Inputs – parameters used to adjust analog inputs

Digital Inputs – parameters used to adjust digital inputs

Outputs – parameters used to adjust relay outputs

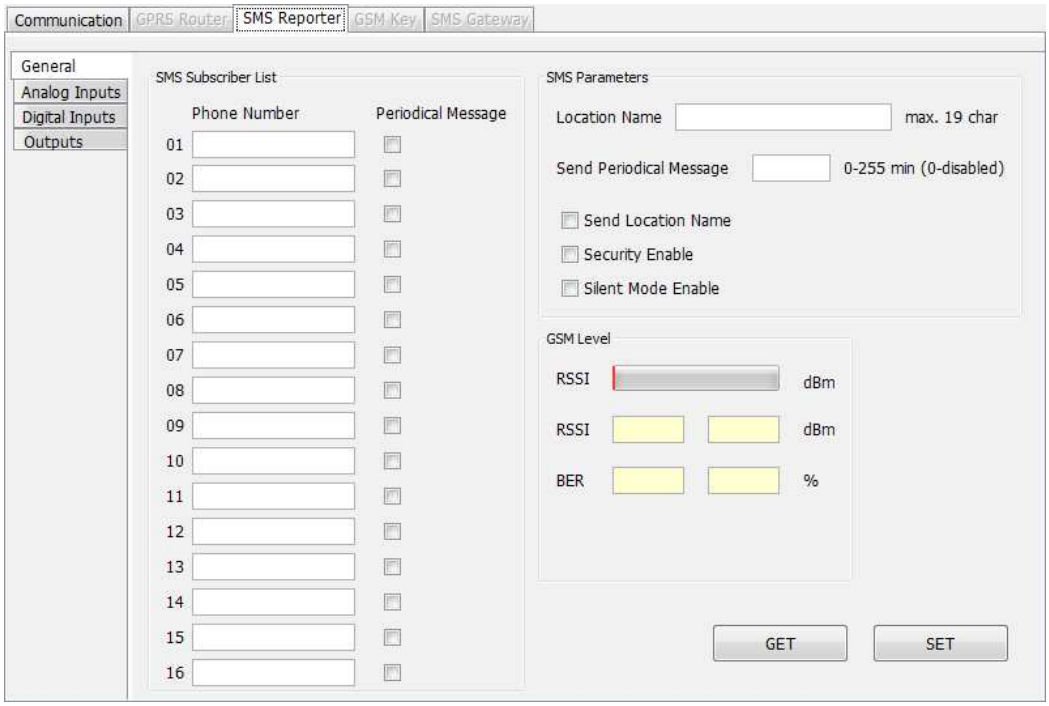

Fig. 26: SMS Reporter – General

GET button starts reading of GSM Device parameters only for current window. In the *Status Message* will be displayed "Getting data [xx%]", followed by "Done".

SET button starts writing of GSM Device parameters only for current window. In the *Status Message* will be displayed "Setting data [xx%]", followed by "Done".

NOTE: If some fields are empty or not selected, message "Some fields are empty or not selected" will appear in *Status Message* when *SET* button is pressed. It is recommended to first get data, edit it, and then write to GSM Device by click on *SET* button.

NOTE: White fields are editable, while yellow fields are read only. During getting or setting data, busy mouse pointer will be displayed and *GET*/*SET* buttons will be disabled.

4.3.1 SMS Reporter – General

General tab is shown in previous figure. It has following parameters:

SMS Subscriber List panel – contains phone numbers of administrators who can configure GSM Device over SMS messages and can receive periodical message reports, if belonging parameter *Periodical Message* is checked and *Send Periodical Message* value is greater then 0.

SMS Parameters panel – contains *Location Name*, periodical message parameters and security options.

GSM Level – shows GSM signal quality. RSSI (Received Signal Strength Indicator) values smaller then 10 (< -93dBm) are shown with red color in progress bar and are considered as poor signal quality, while values greater or equal to 10 (>= -93dBm) are shown with green color in progress bar and are considered as good signal quality. BER (Bit Error Rate) value is desired to be 0. Place GSM antenna so these requirements would be fulfilled.

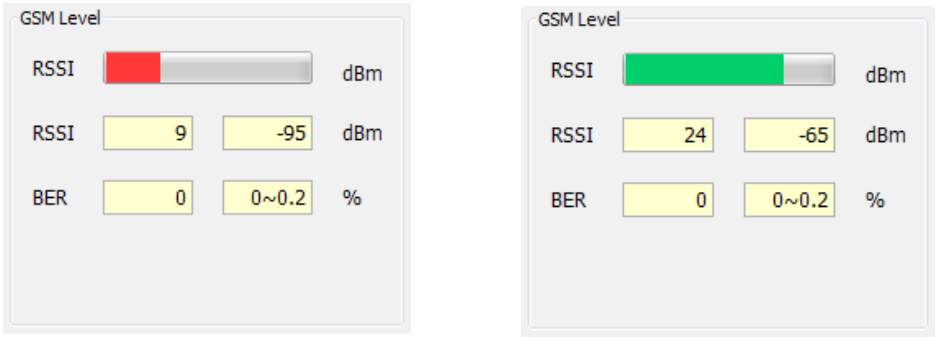

Fig. 27: GSM Level

NOTE: Read “SMS Reporter – user’s manual” for detailed description of each parameter.

4.3.2 SMS Reporter – Analog Inputs

Analog Inputs tab is shown in the next figure:

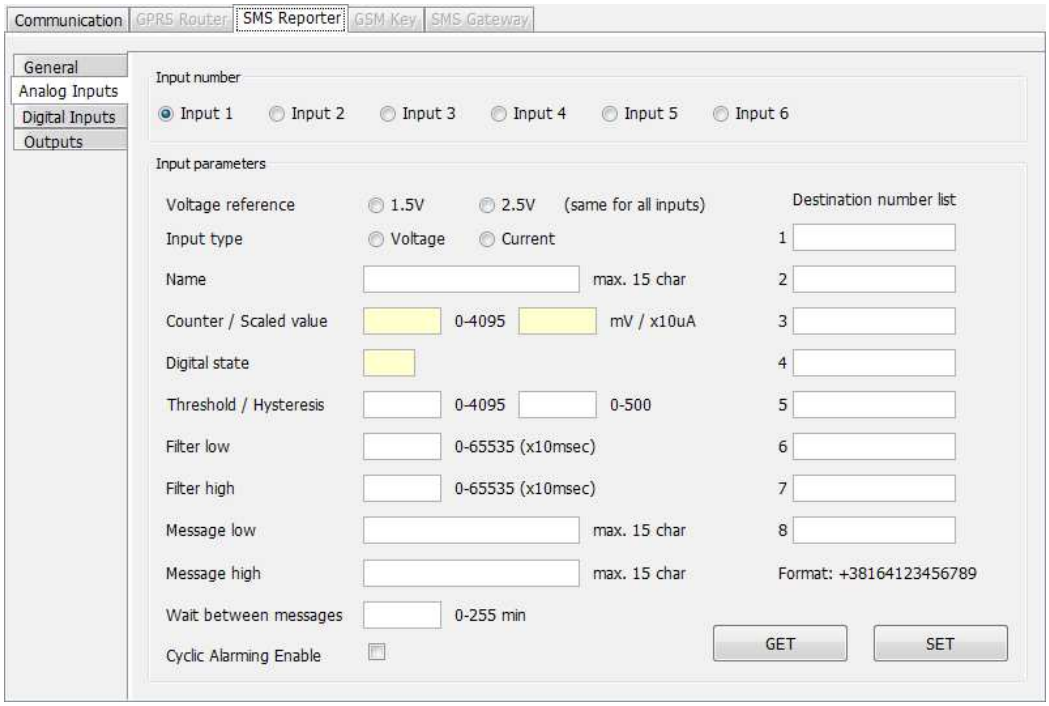

Fig. 28: SMS Reporter – Analog Inputs

Input number panel – allows selection of analog input.

Depending on connected GSM Device (GT900 – 110, GT900 – 343, GT900 – 686) appropriate number of inputs will be enabled.

Input parameters panel – allows setting of various parameters related to the analog input.

Once the parameters for selected analog input are get/set from/to GSM Device, it will be stored in software memory, so it doesn't require to get it again if some other analog input is selected.

Data are disposed from software memory when the software is disconnected or closed.

4.3.3 SMS Reporter – Digital Inputs

Digital Inputs tab is shown in the next figure:

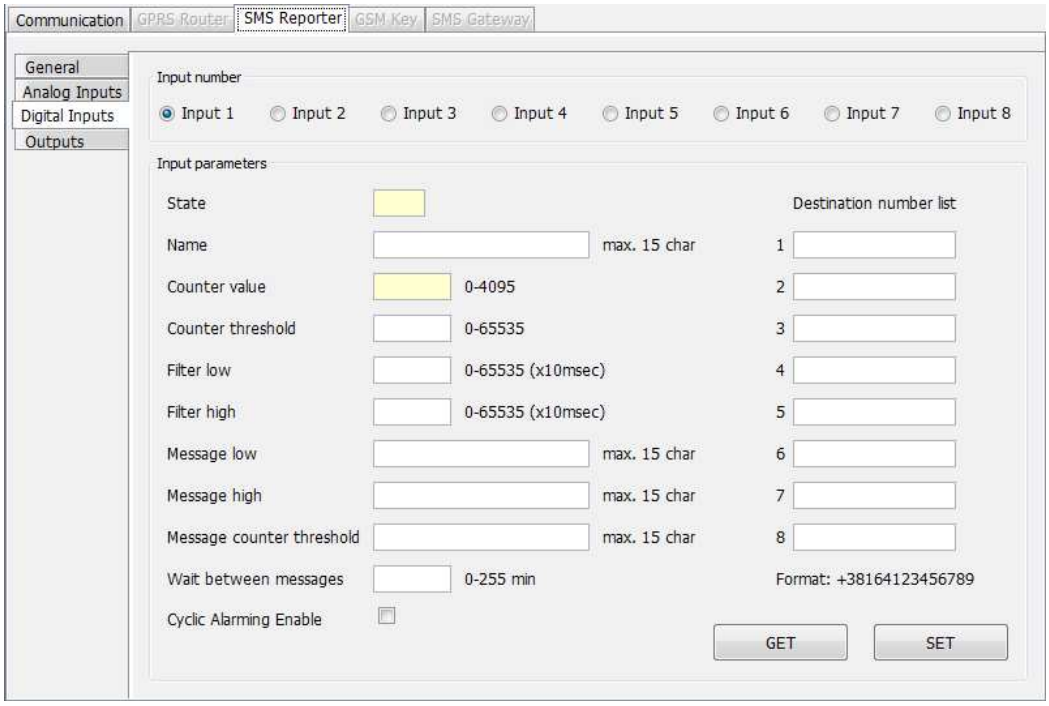

Fig. 29: SMS Reporter – Digital Inputs

Input number panel – allows selection of digital input.

Depending on connected GSM Device (GT900 – 110, GT900 – 343, GT900 – 686) appropriate number of inputs will be enabled.

Input parameters panel – allows setting of various parameters related to the digital input.

Once the parameters for selected digital input are get/set from/to GSM Device, it will be stored in software memory, so it doesn't require to get it again if some other digital input is selected.

Data are disposed from software memory when the software is disconnected or closed.

4.3.4 SMS Reporter – Outputs

Outputs tab is shown in the next figure:

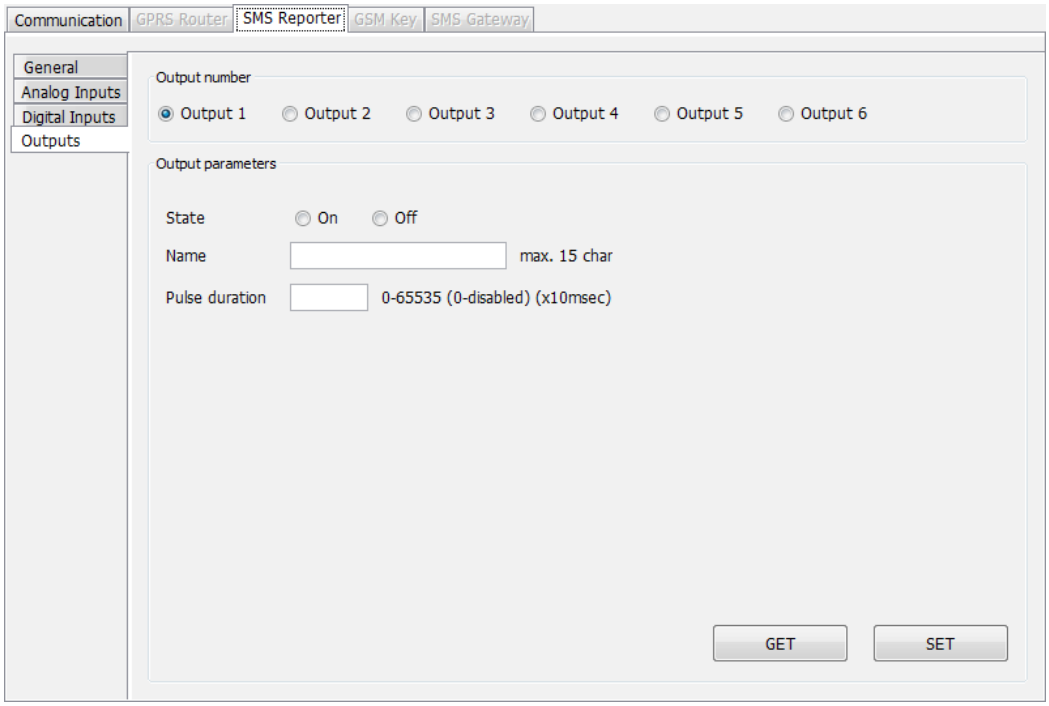

Fig. 30: SMS Reporter – Outputs

Output number panel – allows selection of relay output.

Depending on connected GSM Device (GT900 – 110, GT900 – 343, GT900 – 686) appropriate number of outputs will be enabled.

Output parameters panel – allows getting / setting state (On / Off), name and pulse duration (0-65535 [x10ms]) for each relay output.

Once the parameters for selected output are get/set from/to GSM Device, it will be stored in software memory, so it doesn't require to get it again if some other output is selected.

Data are disposed from software memory when the software is disconnected or closed.

4.4 GSM Key tab

GSM Key tab appears when GSM Device (only GT900 – 110) is set to GSM Key functionality. It consists of three tabs arranged vertically on the left side:

General – SMS Subscriber List, SMS parameters and GSM Level values

Phones – list of phone numbers

I/O – digital input and relay output parameters

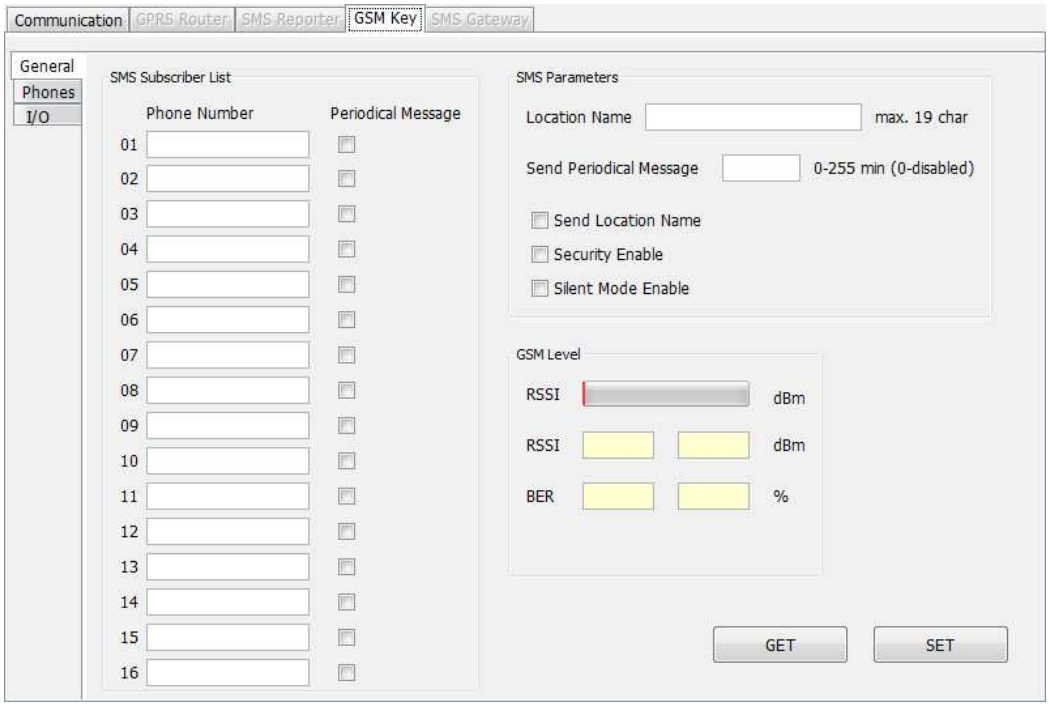

Fig. 31: GSM Key – General

GET button starts reading of GSM Device parameters only for current window. In the *Status Message* will be displayed "Getting data [xx%]", followed by "Done".

SET button starts writing of GSM Device parameters only for current window. In the *Status Message* will be displayed "Setting data [xx%]", followed by "Done".

NOTE: If some fields are empty or not selected, message "Some fields are empty or not selected" will appear in *Status Message* when *SET* button is pressed. It is recommended to first get data, edit it, and then write to GSM Device by click on *SET* button.

NOTE: White fields are editable, while yellow fields are read only. During getting or setting data, busy mouse pointer will be displayed and *GET*/*SET* buttons will be disabled.

4.4.1 GSM Key – General

General tab is shown in previous figure. It has following parameters:

SMS Subscriber List panel – contains phone numbers of administrators who can configure GSM Device over SMS messages and can receive periodical message reports, if belonging parameter *Periodical Message* is checked and *Send Periodical Message* value is greater then 0..

SMS Parameters panel – contains *Location Name*, periodical message parameters and security options.

GSM Level – shows GSM signal quality. RSSI (Received Signal Strength Indicator) values smaller then 10 (< -93dBm) are shown with red color in progress bar and are considered as poor signal quality, while values greater or equal to 10 (>= -93dBm) are shown with green color in progress bar and are considered as good signal quality. BER (Bit Error Rate) value is desired to be 0. Place GSM antenna so these requirements would be fulfilled.

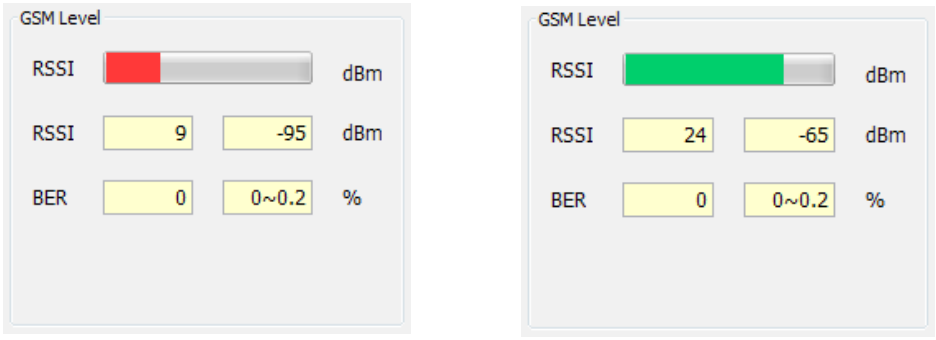

Fig. 32: GSM Level

NOTE: Read “GSM Key – user’s manual” for detailed description of each parameter.

4.4.2 GSM Key – Phones

Phones tab is shown in the next figure:

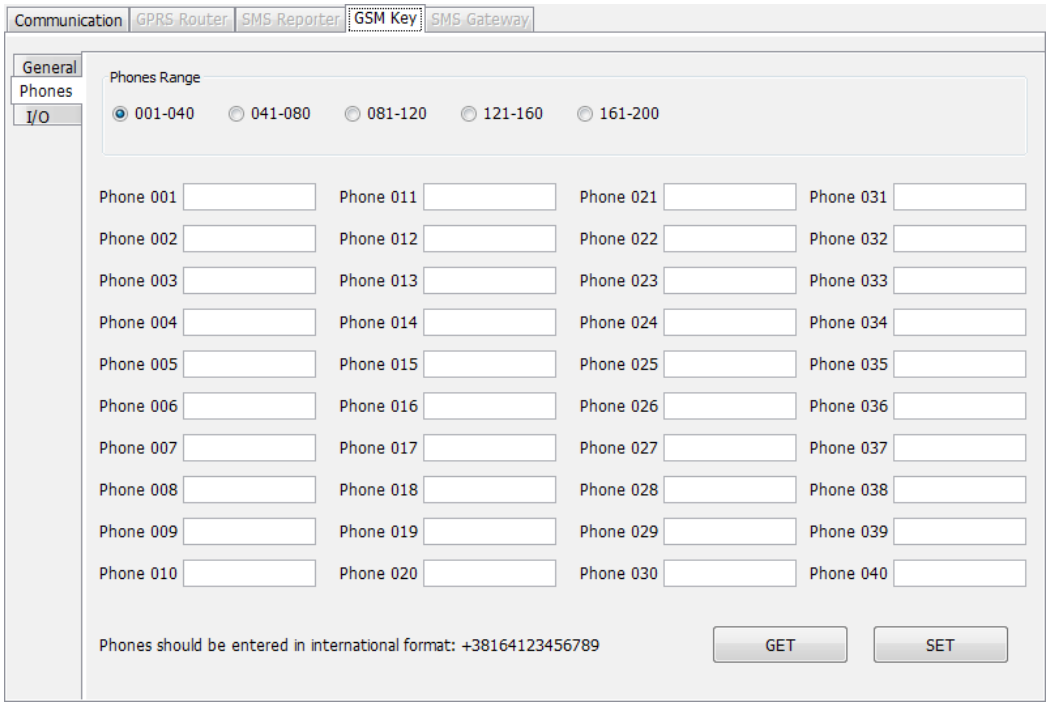

Fig. 33: GSM Key – Phones

Phones Range panel – allows selection of phones range, e.g., 001-040, 041-080, etc.

Once the phones for selected phones range are get/set from/to GSM Device, it will be stored in software memory, so it doesn't require to get it again if some other phones range is selected.

Data are disposed from software memory when the software is disconnected or closed.

Phone field – contains phone number which should be entered in international format, e.g., +38164123456789, but it is not wrong if it is entered in format 064123456789.

4.4.3 GSM Key – I/O

I/O tab is shown in the next figure:

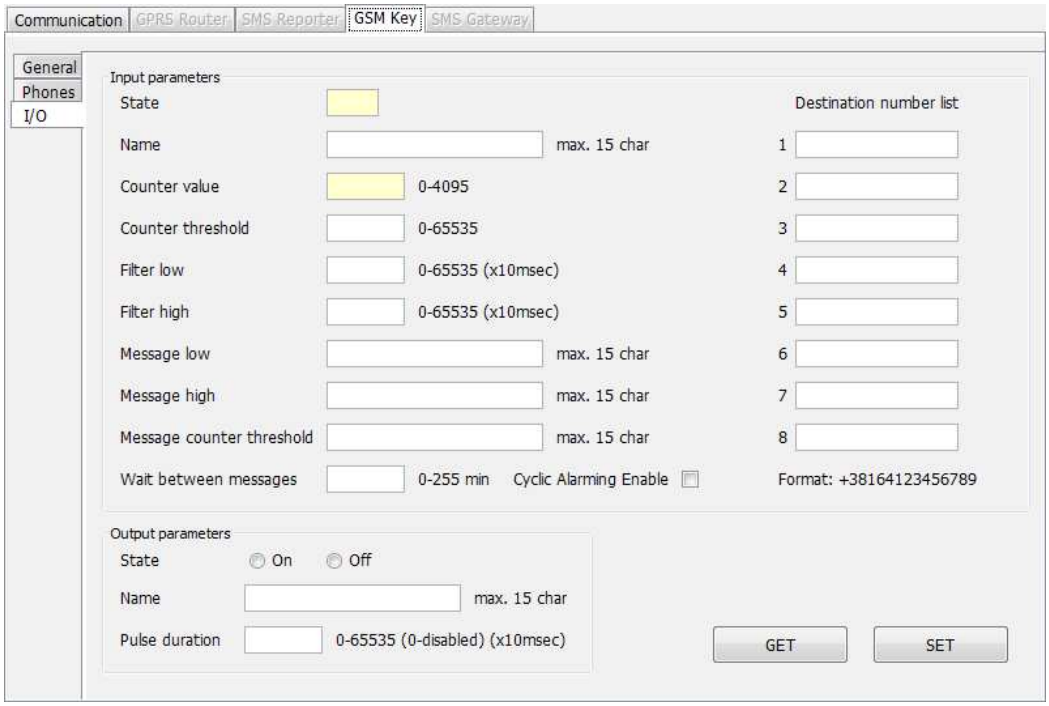

Fig. 34: GSM Key – I/O

Input parameters panel – allows setting of various parameters related to the digital input.

Output parameters panel – allows getting / setting state (On / Off), name and pulse duration (0-65535 [x10ms]) for relay output.

NOTE: If some fields are empty or not selected, message "Some fields are empty or not selected" will appear in *Status Message* when *SET* button is pressed.

4.5 SMS Gateway tab

SMS Gateway tab appears when GSM Device (only GT900 – 110) is set to SMS Gateway functionality. It consists of two tabs arranged vertically on the left side:

General – SMS Subscriber List, SMS parameters and GSM Level values

I/O – digital input and relay output parameters

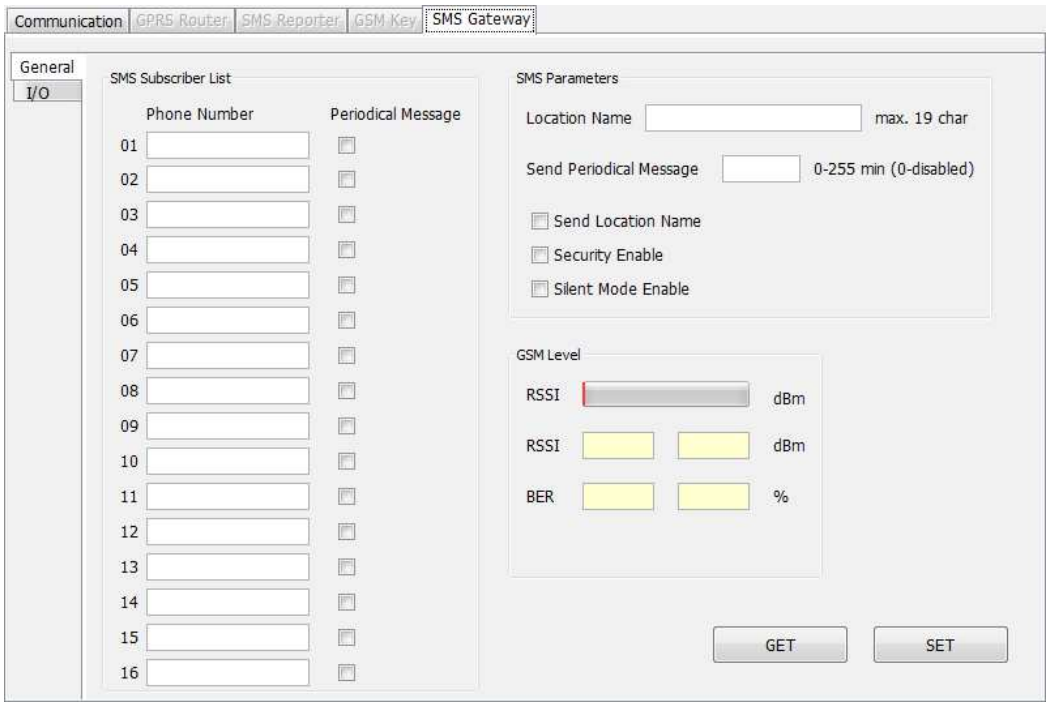

Fig. 35: SMS Gateway – General

GET button starts reading of GSM Device parameters only for current window. In the *Status Message* will be displayed "Getting data [xx%]", followed by "Done".

SET button starts writing of GSM Device parameters only for current window. In the *Status Message* will be displayed "Setting data [xx%]", followed by "Done".

NOTE: If some fields are empty or not selected, message "Some fields are empty or not selected" will appear in *Status Message* when *SET* button is pressed. It is recommended to first get data, edit it, and then write to GSM Device by click on *SET* button.

NOTE: White fields are editable, while yellow fields are read only. During getting or setting data, busy mouse pointer will be displayed and *GET*/*SET* buttons will be disabled.

4.5.1 SMS Gateway – General

General tab is shown in previous figure. It has following parameters:

SMS Subscriber List panel – contains phone numbers of administrators who can configure GSM Device over SMS messages and can receive periodical message reports, if belonging parameter *Periodical Message* is checked and *Send Periodical Message* value is greater then 0..

SMS Parameters panel – contains *Location Name*, periodical message parameters and security options.

GSM Level – shows GSM signal quality. RSSI (Received Signal Strength Indicator) values smaller then 10 (< -93dBm) are shown with red color in progress bar and are considered as poor signal quality, while values greater or equal to 10 (>= -93dBm) are shown with green color in progress bar and are considered as good signal quality. BER (Bit Error Rate) value is desired to be 0. Place GSM antenna so these requirements would be fulfilled.

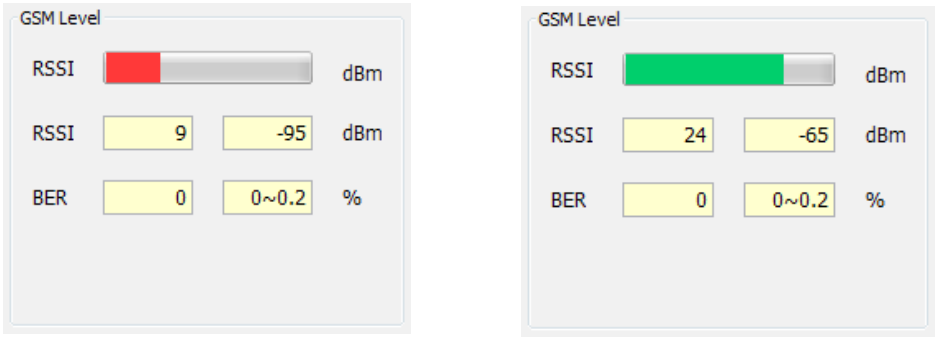

Fig. 36: GSM Level

NOTE: Read “SMS Gateway – user’s manual” for detailed description of each parameter.

4.5.2 SMS Gateway – I/O

I/O tab is shown in the next figure:

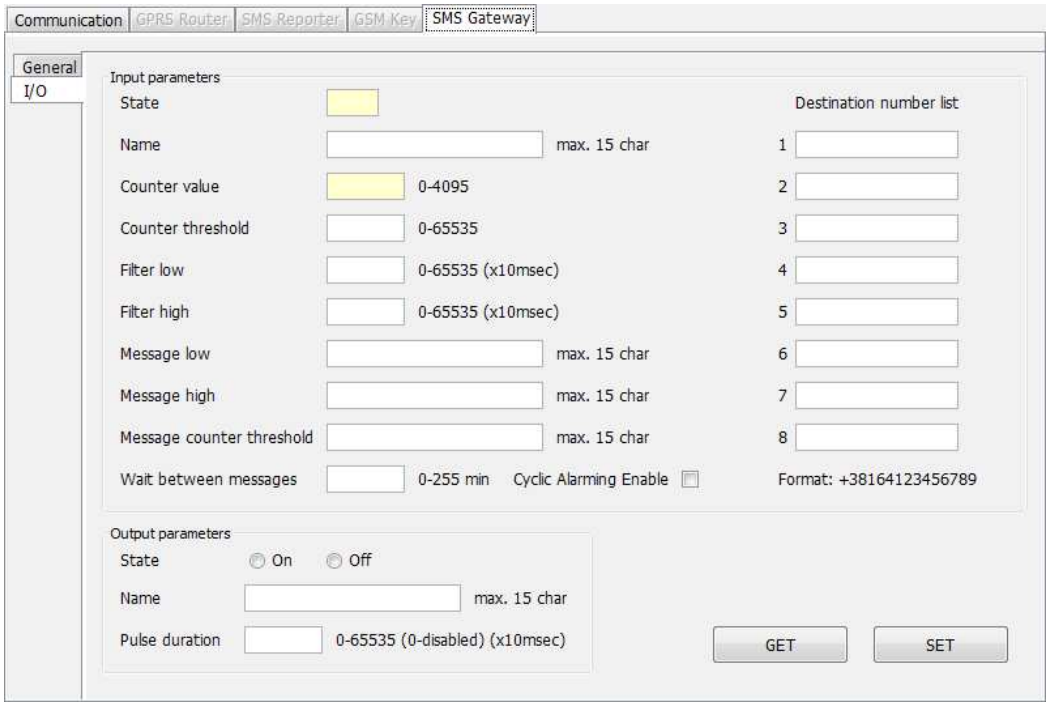

Fig. 37: SMS Gateway – I/O

Input parameters panel – allows setting of various parameters related to the digital input.

Output parameters panel – allows getting / setting state (On / Off), name and pulse duration (0-65535 [x10ms]) for relay output.

NOTE: If some fields are empty or not selected, message "Some fields are empty or not selected" will appear in *Status Message* when *SET* button is pressed.

4.6 Transparent Mode

Transparent Mode enables direct communication with built in GSM module. Click on *Setup→Transparent Mode* and wait for "TRANSPARENT READY" message in Communication field. If the user tries to setup Transparent Mode again, Note message will appear:

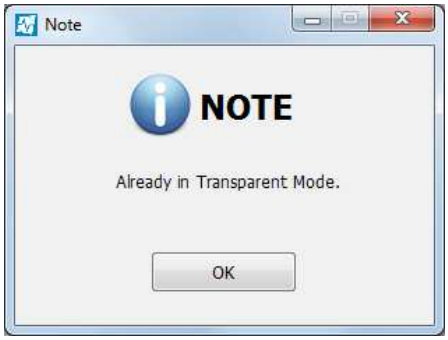

Fig. 38: Note – Already in Transparent Mode

In the following figure are shown responses from GSM module to AT and ATI commands:

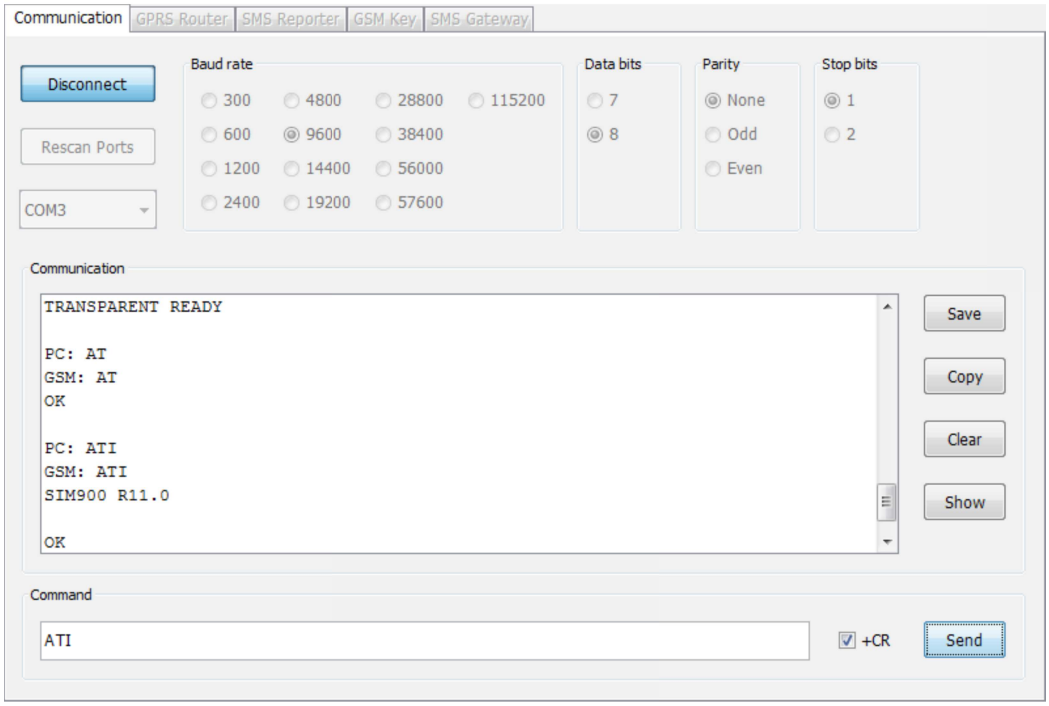

Fig. 39: Transparent Mode

To exit from Transparent Mode, click *Disconnect* button, then click *Connect* and setup *Mode*.

4.7 Factory Default

Factory Default enables reset all parameter to factory values. This is recommended if the functionality of GSM Device is changed.

GSM Device must be in Command Mode to be able to setup Factory Default. Otherwise, Note message will appear:

Fig. 40: Note – Factory Default

From Command Mode click *Setup→Factory Default*:

Fig. 41: Warning – Factory Default

Click *Yes* to confirm setup Factory Default. This process lasts several minutes, usually about 5 minutes, and can not be canceled, except of closing the software.

In the following figure is shown process of setup factory default values.

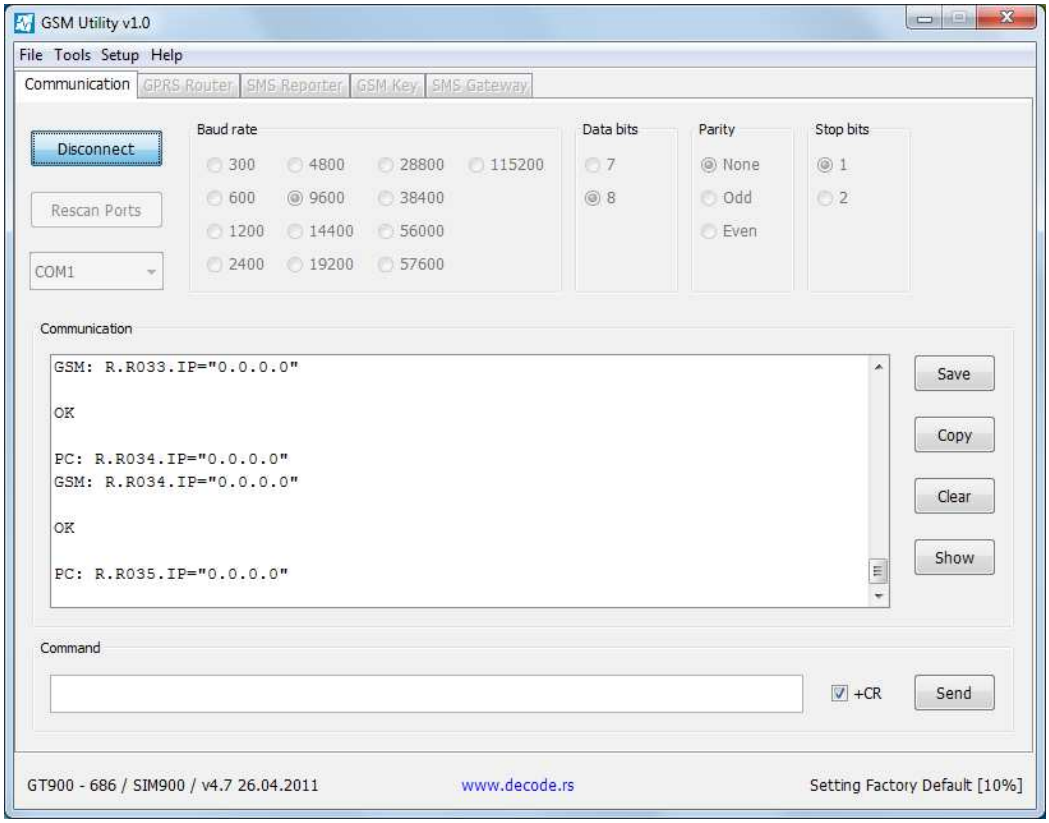

Fig. 42: Setup Factory Default

At the end of process, if the Baud rate, Data bits, Parity or Stop bits have been previously changed in *GPRS Router→General→Serial Interface* panel, it will be reverted to factory default values (9600bps, 8bits, None parity, 1 stop bit) and Note message will appear:

Fig. 43: Note about changed serial interface settings

Click *Disconnect* button, change serial port settings, then click *Connect* and setup *Mode*.

4.8 Test GSM hardware

Testing GSM hardware is useful in the event of a suspicion of a hardware failure.

GSM Device must be in Command Mode to be able to run Test GSM hardware. Otherwise, Note message will appear:

Fig. 44: Note – Test GSM hardware

From Command Mode click *Tools→Test GSM hardware*. New window opens:

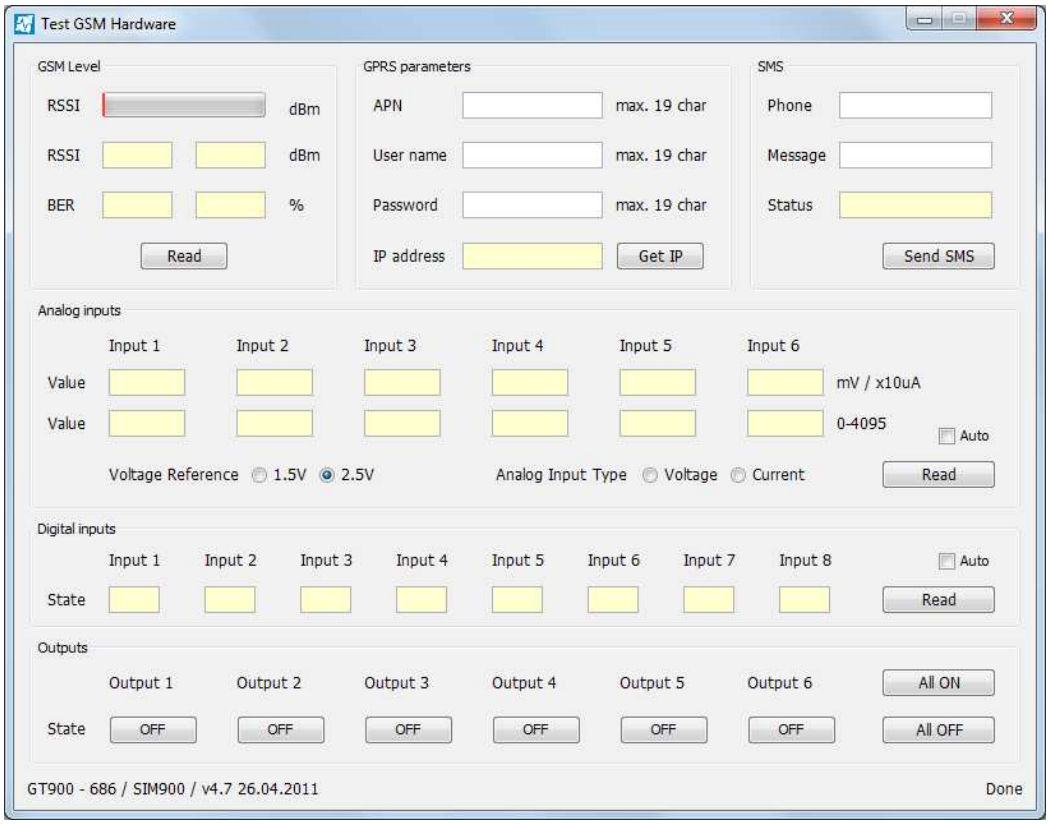

Fig. 45: Test GSM hardware

Depending on connected GSM Device (GT900 – 110, GT900 – 343, GT900 – 686) appropriate number of inputs and outputs will be enabled.

Beside this window, on the right side of it, opens Communication window (can be moved and resized), to ease testing of GSM Device.

After opening these windows, the software sends commands to read GPRS parameters, analog voltage reference and output states.

Test GSM hardware window has following panels:

GSM Level panel – shows GSM signal quality. RSSI (Received Signal Strength Indicator) values smaller then 10 (< -93dBm) are shown with red color in progress bar and are considered as poor signal quality, while values greater or equal to 10 (>= -93dBm) are shown with green color in progress bar and are considered as good signal quality. BER (Bit Error Rate) value is desired to be 0. Place GSM antenna so these requirements would be fulfilled.

Click *Read* button to refresh values.

GPRS parameters panel – these should be set according to GSM provider, with appropriate APN (Access Point Name), User name and Password. IP address will be obtained and shown if previous parameters are correctly set. While getting data, obtaining of IP address can last about 5-15 seconds and in *Status Message* will be displayed "Getting IP address...". Message "No IP address" will be displayed in *IP address* field if GSM Device couldn't obtain IP address.

Click *Get IP* button to set APN, User name, Password and get IP address.

SMS panel – enables sending message (up to 150 characters) from *Message* field to user's phone number in *Phone* field. If either of these fields is left empty, message „Phone field is empty" or „Message field is empty" will appear in *Status Message*. *Status* field shows „Sending Message..." during sending SMS, and „Message Sent" at the end of process.

Type the phone number and message and click *Send* button.

Analog inputs panel – allows setting of *Voltage Reference* (1.5V / 2.5V) and Analog Input Type (Voltage/Current) for all analog inputs, and getting scaled values (mV / x10uA) and incremental values (0-4095) for each analog input.

Choose *Voltage Reference* and *Analog Input Type*. If either of these is not selected, message „Voltage Reference not selected" or „Analog Input Type not selected" will appear in *Status Message*.

Between tested analog input AIx and C connector, apply voltage (e.g. 5Vdc) for *Voltage Analog Input Type*, or current (e.g. 20mA) for *Current Analog Input Type.* Click *Read* to refresh values. Select *Auto* for automatic repeat of reading of analog inputs. Click *Stop* to end reading.

Digital inputs panel – allows getting states (ON / OFF) for each digital input.

Between tested digital input Dix and C connector, apply voltage (> 5Vdc). Click *Read* to refresh values. Select *Auto* for automatic repeat of reading of digital inputs. Click *Stop* to end reading.

Outputs panel – allows getting / setting state (On / Off) for each relay output.

Connect light bulb (or LED with appropriate resistor) to relay output and make connections as in next figure.

Click *ON/OFF* button for appropriate output and test relay output. Click sound can be heard from internal relay.

Click *All ON* or *All OFF* button to turn ON or OFF all outputs.

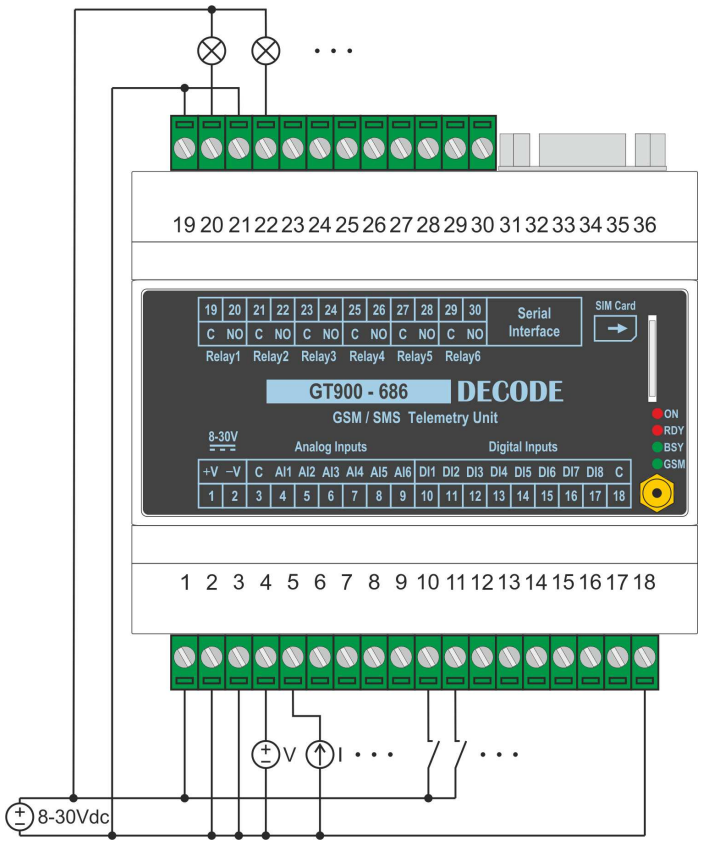

Fig. 46: Example of connecting I/O for GT900 – 686

If all the tests have passed OK, then the GSM Device is functional.

NOTE: *GPRS parameters* and obtaining IP address are important only for GPRS Router functionality. User can skip this for other functionalities.

5 FAQ

The following table lists the most common problems that occur while configuring GSM Device, as well as proposals for solving them.

Problem/Message	Proposal of solution
Can't connect to GSM Device, *Status Message* displays "No Response" after three attempts of sending "+++"	Check that correct serial port is chosen. Check that GSM Device's jumpers are set for RS232 communication. Check the serial port settings, default is 9600bps 8N1. If the GSM Device is previously configured at different serial settings for GPRS Router functionality, choose those serial settings while connecting to it.
Menu items *Load Configuration* and *Save Configuration* are disabeld	Menu items *Load Configuration* and *Save Configuration* are enabled only if one of GPRS Router, SMS Reporter, GSM Key or SMS Gateway tabs is enabled.
Can't load configuration file for chosen GSM Device functionality. *Status Message* displays "Configuration file is not valid"	File is not intended for chosen GSM Device functionality. Choose correct one. First line of the file has the name of functionality. **WARNING:** Don't edit file manually, it will not populate fields correctly in the software while loading, as it should.
Can't load configuration file for chosen GSM Device functionality. *Status Message* displays "Configuration file is corrupted" or "Configuration file is empty" or "Configuration file type is wrong"	As *Status Message* displays, file is corrupted (some lines are missing), empty (contains only file header), or file type is wrong (it should be *.txt).
Can't set parameters for current window. *Status Message* displays "Some fields are empty or not selected" when *SET* button is clicked	Some fields in current window are empty or not selected. It is recommended to first get data, edit it, and then write to GSM Device by click on *SET* button. **NOTE:** All fields has range limitations which are noted at right side of fields.

Some fields or check boxes for I/O are disabled	Depending on the connected GSM Device, GT900 – 110 (1 digital input, 1 relay output), GT900 – 343 (3 analog inputs, 4 digital inputs, 3 relay outputs), GT900 – 686 (6 analog inputs, 8 digital inputs, 6 relay outputs), appropriate number of I/O fields and check boxes will be enabled.
Get IP Address takes too long or get response “No IP Address” in *IP Address* field	Obtaining of IP address lasts 5-15 seconds. Check the GPRS parameters settings according to GSM provider. Check the GSM Level (progress bar should be in green color).

6 Contact

Please contact a Decode office if you have any questions regarding the information contained in this manual or Decode products, or if you have any other inquiries.

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