

Installation and User Manual

for module version 1.20 and higher

Features

Analogue telephone line simulation to transfer Contact ID signals and voice

Handling of wired telephone lines (PSTN), in case of its cessation altering to GSM line simulation

Generating SMS message from the Contact ID codes of monitoring station reports (alarm, opening, closing...)

Automatic dial of pre-set telephone number as a result of picking up the receiver (emergency call function)

Bell 103 / V.21 digital data communication

The alarm system will be programmable through GSM data call (remote maintenance, downloading event code, etc.)

Application areas

Connecting an alarm control panel to monitoring station with Contact ID communication through GSM network

Security reserve (secondary signal) for the already existing wired-telephone communicators

Wired telephone adapter for flats, houses, cottages

A simple emergency alarm for elderly sick people by picking up the receiver

Remote diagnostics of centres built to long distances



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1 Main functions of the GSM Adapter

The main function of the GSM Adapter Mini is to interface to GSM network an alarm system that can inform the security monitoring station through wired telephone line.

This adapter makes it possible to install alarm systems in places where there is no wired PSTN line but it can be necessary to alarm the security monitoring station.

By means of GSM transmission, the adapter improves the reliability of alarm reporting in cases when the wired alarm transmission does not work or fails (e.g. when the phone lines are tampered or the telephone service is suspended due to technical reasons).

1.1 Additional features

- Receiving incoming telephone calls, possibility of restricting incoming calls
- Setting installations to sub-stationary networks
- Synchronizing wired and GSM telephone calls with different prefix numbers
- Forwarding information of GSM account balance
- Converting alarm codes into SMS messages
- Emergency call function
- Interfacing voice diallers
- Remote programming of alarm systems

2 Setting the parameters of the Adapter

Setting the parameters of the GSM Adapter is possible with the help of a PC through USB port as follows:

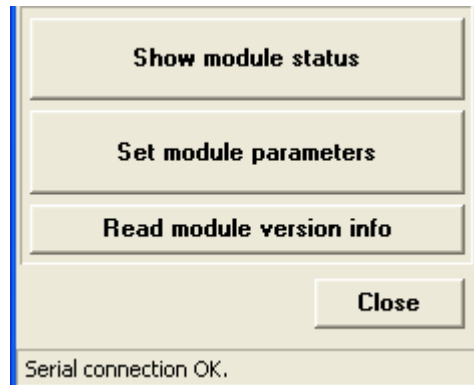
- Start the „**GSM_Adapter_MINI_Prog.exe**” program
- If you have already connected the module to PC then disconnect the USB cable
- Select „**AUTO USB**” option then connect the module to the PC with USB cable (or select the serial port manually after pressing „**Select serial port**” button, then connect the module to PC).
- When the program has detected the serial port used by the module (e.g. COM1) press „**Open serial port**” button to establish connection.



- When you have finished programming, press "Close serial port" button and disconnect the USB cable from the module.

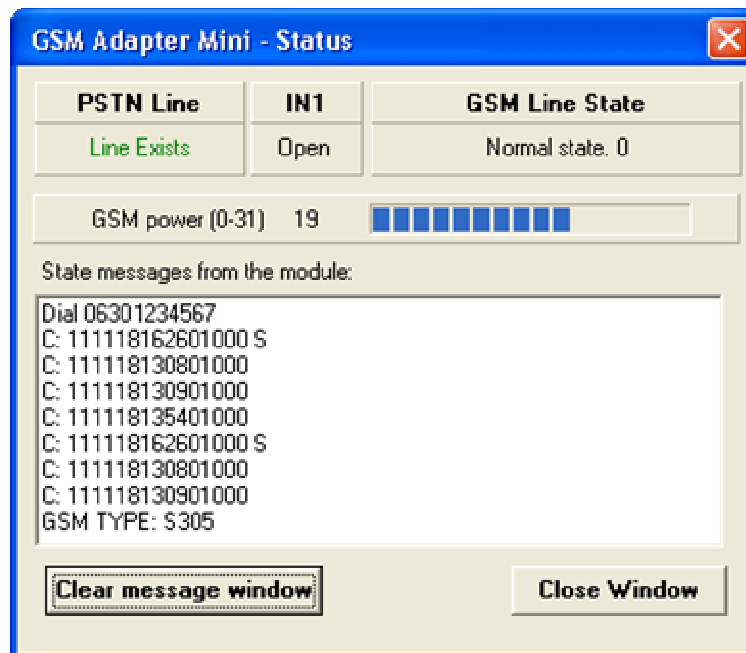
2.1 Further settings

After the connection has been successfully established, module status monitoring, parameter setting, event tracing and module version query will be available:



2.1.1 Monitoring module status

Module status monitoring window can be opened by pressing "**Show module status**" button, where the PSTN line status, the state of the input, the GSM line status, the GSM signal strength and the module's messages can be traced. Module message window can be cleared by pressing "**Clear message window**" button.

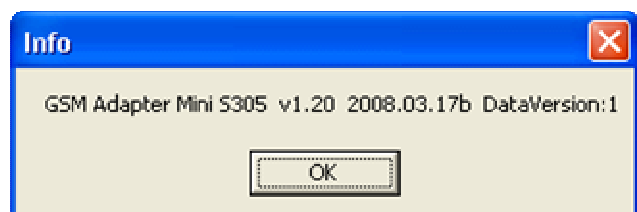


2.1.2 Module version query

Information about the module's software version and its date appears by pressing "**Read module version info**" button:

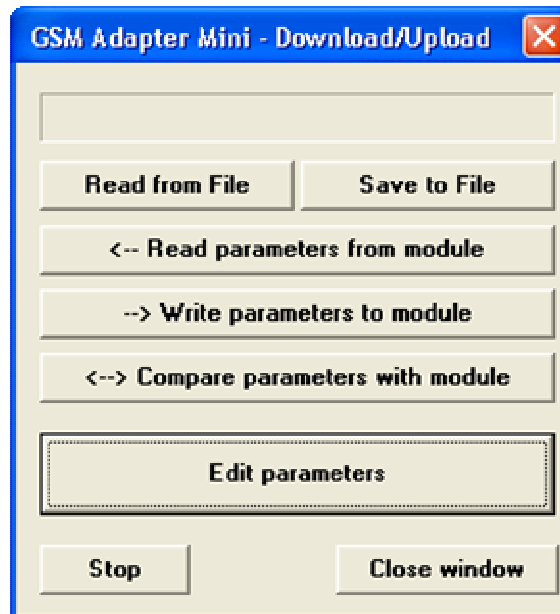
The following important information can be read in the **Info** window:

Module type: GSM Adapter Mini
Firmware version: v1.20
Firmware date: 17.03.2008



2.2 Parameter settings

After pressing "**Set module parameters**" button a new window appears where settings can be loaded from file, saved to file, downloaded from or uploaded into the module and compared.



For the basic operation of the unit, no setting is necessary. So GSM line simulation and handling wired telephone line (PSTN) are automatic.

However, if it is requested, in order to reach the additional functions of the adapter as detailed in the following sections, it is required to set certain parameters (e.g. the owner's phone number, the number to be dialled to access the external PSTN line, the texts of SMS messages, etc.)

2.3 Edit parameters

Parameter settings can be performed in four windows after pressing "**Edit parameters**" button:

The screenshot shows the 'GSM Adapter Mini - Settings' dialog box. The 'SMS settings' tab is selected. The fields are as follows:

- Primary User (#USER1): []
- Secondary User (#USER2): []
- 1. SMS forward nr. (#SMSFW1): []
- 2. SMS forward nr. (#SMSFW2): []
- Automatic dial nr. (#AUTO): []
- Dial prefix number used for outside line (#PREFIX): []
- Prefix to add before phone numbers called in GSM mode (#ADDFIX): []
- Voice caller support (Signal between dial and connect)

Buttons: Store changes, Cancel changes

2.3.1 Setting phone numbers

- **User phone numbers**

Two user phone numbers can be set to which the GSM Adapter sends SMS message with the text specified in "**SMS settings**" window, when the Adapter receives from the alarm control panel a Contact ID event code that is also specified in the list, in the row assigned to the relevant SMS text.

- **SMS forward nr. - forwarding incoming SMS messages**

It is possible to forward messages incoming to the Adapter's SIM card up to two owner or user phone numbers. This makes the use of cheap non-subscription cards safe. If the incoming SMS has been successfully forwarded, it will be deleted from the SIM card to make space for further incoming messages.

Important! Never enter here the phone number of the SIM card placed into the module, because this would initiate an infinite loop of SMS sent to itself right after the first incoming SMS, causing significant expense!

- **Automatic dial nr.**

This function can be used in certain, specific tasks (e.g. emergency telephone calls). The appropriately set module shall immediately initiate a call to the preset number through GSM network when the receiver is picked up.

- Setting a prefix number necessary to access external PSTN line in case of telephone subcentre**
 If the module's wired line input is connected to a telephone subcentre where the dialling of a prefix number (e.g. 9) is necessary to access the external PSTN main line, this number must be entered on the adapter. So the module omits the prefix number (e.g. 9) in case of telephone calls through GSM network, however, it naturally initiates the call starting with the prefix number (e.g. 9) in case the call is directed through a wired line.
- Cases when the prefix number necessary to access GSM and PSTN is different**
 Another prefix number can be set for the module to insert in front of the dialled number in all those cases when the call is directed through GSM network. (e.g. if the panel calls the wired local number without the area code, a prefix can be assigned that is necessary to initiate calls through GSM network.)
 (This function came to be important because of some special characteristics of foreign wired networks.)
- Voice dialler support**
 One main characteristic of speech diallers is that they start playing the message in a certain time, if no ringtone can be heard in the line.
 By setting this function, you will hear a simulated tone signal until the real ringtone can be heard. This way can be avoided that the speech dialler starts to play the message before the call is received.

2.3.2 SMS settings - sending SMS messages in case of alarms or other events

GSM Adapter Mini - Settings

Phone numbers | **SMS settings** | Call Filter | Bell 103

Event Code	SMS text *
1 1 3 *	Alarm \$
1 1 2 0	Panic Alarm

* : The \$ character in the SMS text will be replaced to : "eventcode/partition/zone"

Store changes **Cancel changes**

The GSM Adapter continuously watches the calls initiated through the GSM network, and notices the reports of **CONTACT ID** or **ADEMCO Express** formats. If it observes any of the specified event codes (maximum 10), it will send an assigned SMS message to one or two telephone numbers that has been set by the user. The text of the message to be sent can be set by the user. The event codes can be found in the alarm control panel's installer's manual. The event codes in the list must consist of 4 hexadecimal digits each, where the first digit makes the difference between new event ("1") and restoration event ("3").

When entering event codes in the list, code groups can be specified as well with the use of "*" character within the codes. This means it is indifferent what character is received from the alarm control panel in the place substituted with "*" character but the rest of the code corresponds to the one in the list, the relevant event will be transmitted.

Note: the module does not perceive signals sent through wired telephone lines.

Note: in case of entering ADEMCO-Express code in the "Adapter Mini_programmer" software, double 0 shall be inserted before the code. E.g. 31 = in case of alarm, you shall enter 0031 in the list.

- **Sending SMS messages on event, without being connected to a monitoring station**

If you do not wish the alarm system's signals to be directed to the monitoring station, it is still possible to send SMS messages in case of some events. To do this, enter **123456789** instead of the telephone number of the monitoring station into the alarm control panel. In case of alarm, the alarm control panel will dial this number and the GSM Adapter module will not initiate a real phone call, but will simulate the operation of the monitoring station (gives out handshake signals and acknowledges CONTACT ID and ADEMCO Express signals).

This way it is possible to send SMS messages from the received signals as described in the previous part.

2.3.3 Call filter - receiving calls through the GSM network

The screenshot shows the 'GSM Adapter Mini - Settings' dialog box with the 'Call Filter' tab selected. The 'Filtering incoming calls' section has two radio buttons: 'Accept all incoming call' (unselected) and 'Accept calls from the following phone numbers only' (selected). Below this are four text input fields labeled '1. Enabled phone number' through '4. Enabled phone number', each with a 12-character grid. A note states: 'Do not use any additional prefix number, just area code and phone number.' At the bottom, there is a spin box for 'Incoming call time limitation (0-25 min, 0=no limit)' set to '25'. At the very bottom are 'Store changes' and 'Cancel changes' buttons.

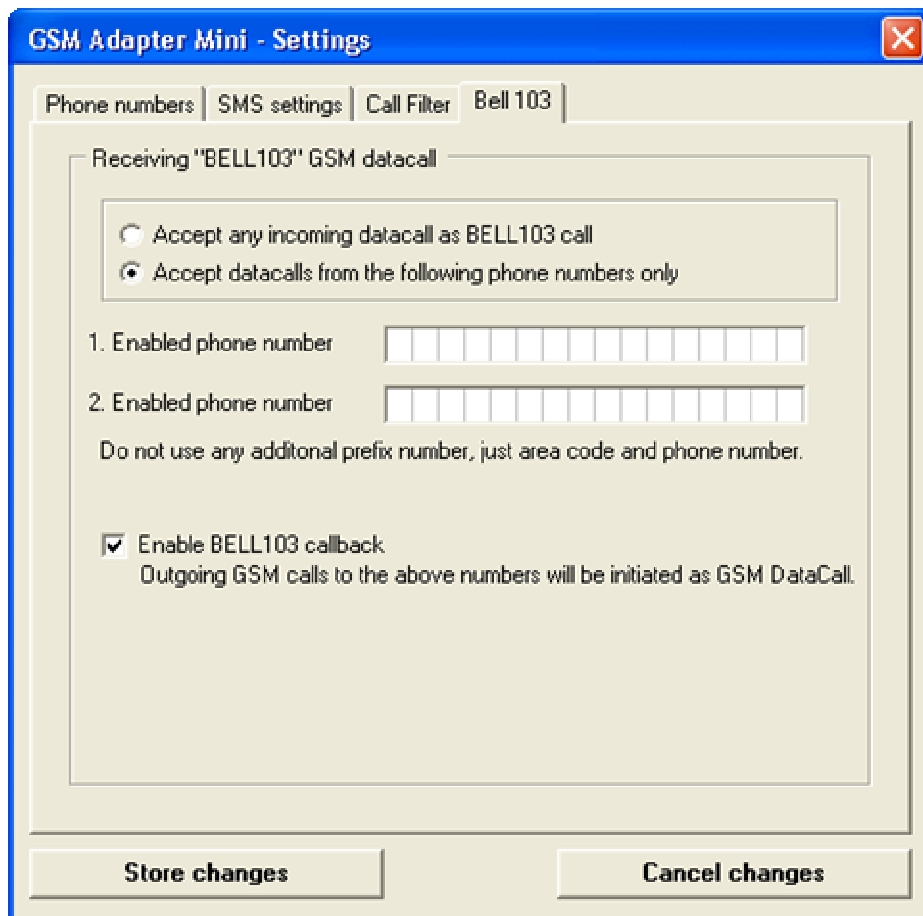
The GSM Adapter Mini is able to manage calls coming in through the GSM network, and to ring up devices (telephone, alarm system) connected to it. With this, it can receive incoming GSM calls in places where there is no wired phone line extension by means of a simple analogue telephone.

This function works only if there is no wired telephone line connected to the module and the **IN** (DIRECT GSM) input is not short-circuited. Furthermore, incoming calls can be restricted according to telephone numbers.

It is also possible to filter incoming voice calls by phone number, which means the Adapter will accept incoming voice calls only from the specified phone numbers. In this case voice calls initiated from other phone numbers will be rejected.

Important note: In case of using telephone number filtering, do not specify the inland area changing prefix before the telephone number, only the area code and the phone number. (The telephone uses international format +3630... while displaying telephone numbers. The module compares the received telephone number with the filtered telephone number by starting to compare them from the last digits. The module handles the two numbers as identical even if +36 is left out.

2.3.4 Remote programming with BELL 103 / V.21 format



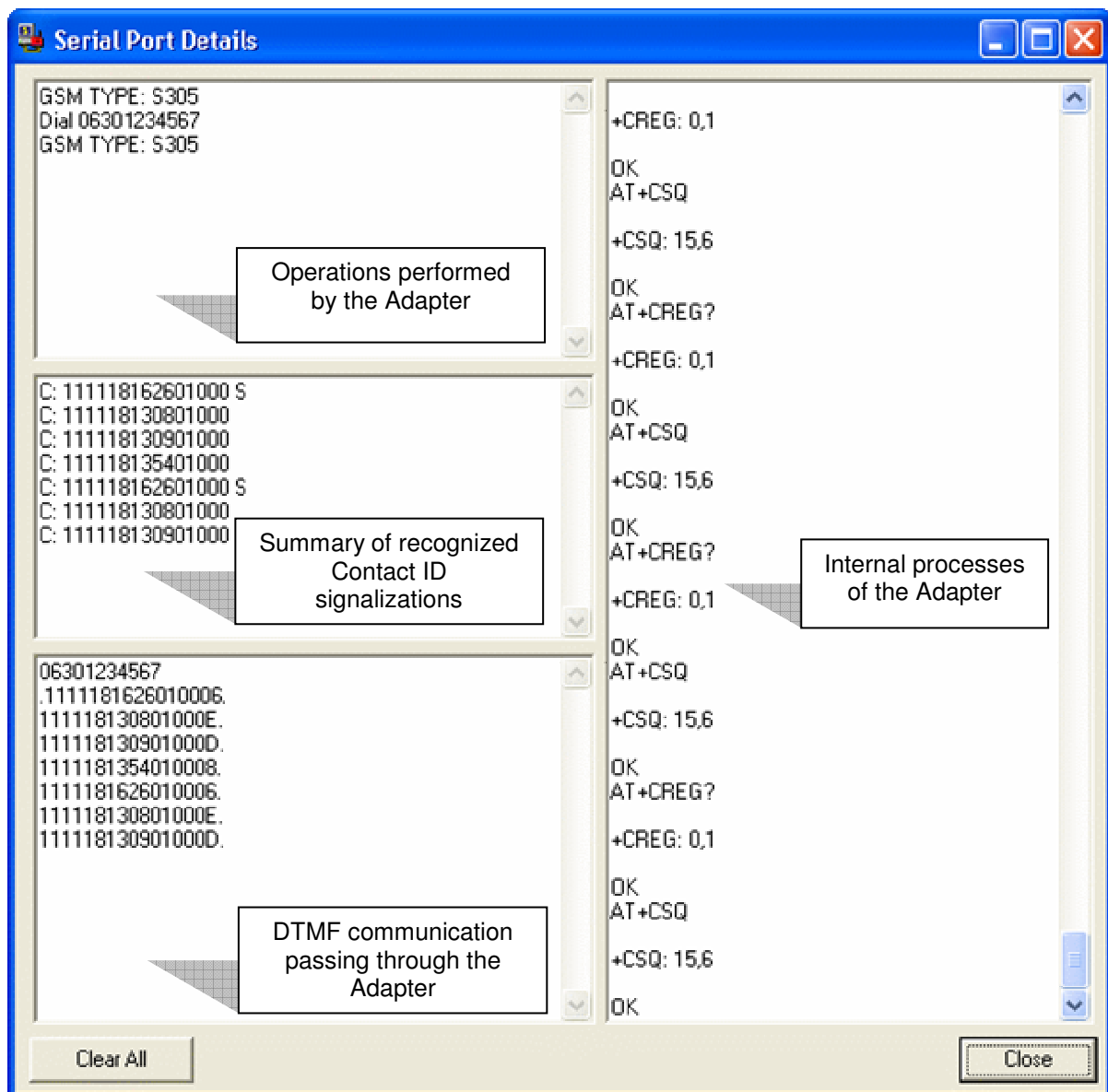
The GSM Adapter Mini uses GSM voice channel, which has 13 kbit/s bandwidth, for calls and monitoring station signals. However, the original sound source is 64 kbit/s, which has been composed to the mentioned value so as to be able to make use of radio channel capacity. Due to this procedure, it is impossible to transmit periodic and constant amplitude signals, like the FSK modulation of Bell 103 coding in a secure way. For this reason, the panel's data communication goes through GSM data channel. Naturally, remote diagnostics operates with call back function too, at the expense of the Adapter's SIM card. If you wish to use this function, then enable "

It is also possible to filter incoming data calls by phone number, which means the Adapter will accept incoming data calls only from the specified phone numbers. In this case data calls initiated from other phone numbers will be rejected.

To be able to program remotely alarm control panels with connected GSM Adapters, a GSM modem is necessary (T.E.L.L. GT64 recommended) on the caller side ! The SIM cards placed in the modem and Adapter must support both way (send and receive data) GSM data call service.

2.4 Monitoring module's processes

It is possible to trace the details of the GSM Adapter's internal processes. To do this, select the starting main window of the software to be active and press **Ctrl+Alt+D** keys on the keyboard simultaneously. A new window will open where details of the module's internal operations, calls and signalizations can be traced and this supplies an easy way to check the communication functionality:



3 External elements and functions of GSM Adapter Mini

3.1 SIM card case

The cover can be removed on its marked end by pressing it and moving it horizontally towards the LED. Insert the SIM card here after doing the following preparations:

Before starting to setup the Adapter, insert the SIM card into a mobile phone and perform the following settings:

- Make sure that the number of the SMS message centre is set correctly on the SIM card, that is SMS can be sent from the phone.
- Disable PIN code request on the SIM card so that it shall not prompt for a PIN code on turning the unit on
- Delete the unnecessary SMS messages from the card.

The SIM card necessary for the operation of the unit can be purchased from any GSM service provider.

The Adapter is independent of GSM networks.

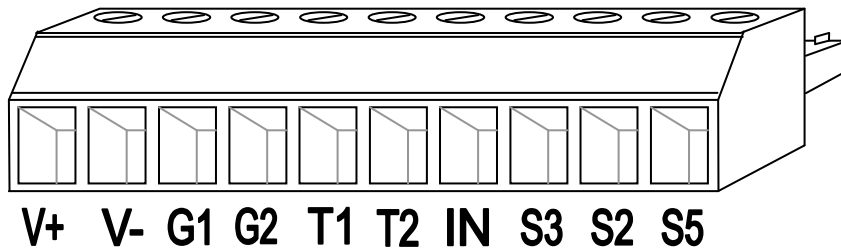
3.2 LED signals

RED is continuously lit	Indicates that the module is powered up but not connected to the GSM network. (If it lasts longer than 30 seconds, check the SIM card and the antenna connection)
GREEN blinks slowly and impulsely	The module is connected to the GSM network is ready to communicate.
GREEN is continuously lit	Indicates that a call is performed through the GSM network
RED and GREEN blink alternately	Indicates that the download process of parameters was not successful. (e.g. download was interrupted) Download has to be repeated.

3.3 Antenna connection

The antenna can be fixed to an FME (pin) connector. The antenna in the package provides good transmission under normal reception circumstances. In case of occasionally occurring field strength problems or/and wave interference (fading), use another type of antenna or try to find a better place for the Adapter.

3.4 Connector terminals



- V+** Power supply voltage 9-24V DC
- V-** Power supply voltage negative polarity
- G1** Simulated line output from the GSM system (to the alarm panel's TIP input)
- G2** Simulated line output from the GSM system (to the alarm panel's RING input)

- T1** Wired phone line (PSTN) input
- T2** Wired phone line (PSTN) input
- IN** Direct GSM (to activate, connect to V-)
- S3** Reserved
- S2** Reserved
- S5** Reserved

Important! If the metal housing of the alarm control panel on which the antenna is mounted is connected to the protective ground then it is necessary to connect the protective ground to the GSM Adapter module's V- terminal as well.

3.5 Function of the IN1 (DIRECT GSM) input

Short-circuiting the **IN1** input (to **V-** terminal), the module switches over to GSM transmission, i.e. irrespective of the existence of an analogue phone line, the Adapter initiates the call through the GSM network. Apart from this, it blocks and rejects incoming calls to the Adapter. This ensures the call transmission in case there is some fault in the telephone exchange or subexchange, i.e. if the wired phone line seemingly works but the alarm system cannot connect to the monitoring station through the wired PSTN network. Most alarm systems can be programmed to give an output PGM signal after a certain number of unsuccessful dialling attempts. If this signal arrives to the IN1 input of the Adapter, i.e. the wired line cannot be used, the unit will initiate the next call through the GSM network.

4 Setting the alarm control panel

Check the following settings on the alarms system:

- **The reporting format must be set to “CONTACT ID” or “ADEMCO Express”.**
- **The phone numbers of the monitoring station must be specified containing the area codes as well, so that they can be called from the SIM card through the GSM network**
- **Set the dialling to TONE mode**

4.1 Further notes

- The Adapter does not know in advance the length of the phone number to be dialled, therefore do not wait too long before entering the next digit, because if you do so the module might suppose that the dialling has already finished. (The Adapter expects at least 7 digits, and does not start dialling until they are entered. It starts calling a number of 7 and 10 digits after a 5 second pause. In case of 11 or more digits, the Adapter starts dialling after a 2 second pause.)
This does not occur problems for alarm control panels due to fast and automatic dial but needs attention on manual dialling.
- Telephone numbers shorter than 7 digits can be dialled by entering # after the number.
- By entering *31# before the telephone number, phone number display can be enabled on the called person's telephone, and by entering #31# this function is disabled.

5 Installation guide

Before installation verify the future environment of the Adapter:

- Check the GSM signal strength using your mobile phone. It may happen that the signal strength is not sufficient in the desired installation place. In this case you have possibility to change the planned installation place before mounting.
- Do not mount the unit in places where it can be affected by strong electromagnetic disturbances (e.g. near electric motors, etc.).
- Do not mount the unit in wet places or places with high degree of humidity.

5.1 Mounting

Suggested installation method: the GSM Adapter should be placed into the same metal housing as the alarm control panel. Drill a hole on the metal housing for the FME connector. Choose the drill size appropriate for the FME base part. Fix the FME base with the enclosed screw nuts into the housing. Ensure that the FME base and the metal housing has galvanic connection.

In case of plastic housing and weak GSM signal strength it may be necessary to use another (directed) type of antenna.

Important! If the metal housing of the alarm control panel on which the antenna is mounted is connected to the protective ground then it is necessary to connect the protective ground to the GSM Adapter module's V- terminal as well.

5.2 Putting into operation

- The SIM card should be placed into the module.
- The caller number identification function must be enabled by the GSM service provider on the SIM card (a few types of SIM cards do not have this function enabled by default).
- The antenna should be secured on the Adapter.
- Cables should be connected as earlier instructed.
- The device can be powered up (9-24 VDC). Make sure that power supply is sufficient at the load of both the alarm control panel and the Adapter. The quiescent current of the Adapter is 200mA, however it can reach up to 500 mA during communication.

6 Technical details

6.1 Technical details of the product

Supply voltage:	9-24 VDC
Maximum power consumption:	500mA
Operational temperature:	-10°C — +60°C
Transmission frequency:	GSM 900MHz /1800MHz
Dimensions:	84x72x32 mm
Net weight:	200g
Gross weight (packed):	300g

6.2 Generated telephone line features

Line voltage:	48 V
Line current:	25 mA
Line impedance:	600 Ohm
Ringing voltage:	±72V (25 Hz)
Dial tone:	400 Hz

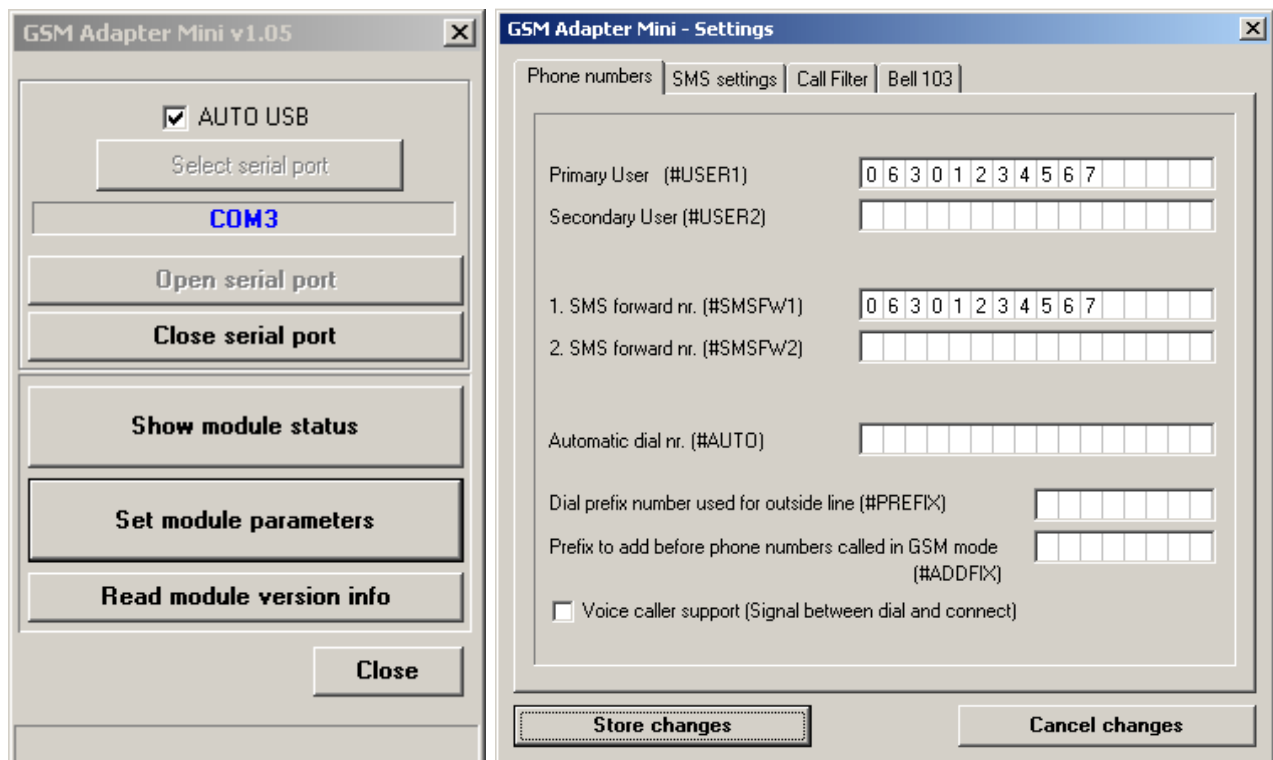
6.3 Content of the package

- GSM Adapter *Mini* + terminal connector
- GSM 900 MHz / 1800 MHz antenna
- User manual, warranty card
- CD
- USB A-B cable

7 Example of application

Demand:

- Connecting the alarm control panel to monitoring station
- Information on balance to the owner about the non-subscription card (Tel: 06-30-123-4567)
- SMS to the owner about burglar alarm (Tel: 06-30-123-4567)



Opening “Mini_programmer”, main steps:

1. Enable AUTO USB or select serial port
2. Open serial port (connecting)
3. Connect USB cable (the port's name will appear, for example: COM3)
4. Set module parameters
5. Edit parameters
6. Set the demanded parameters
 In *Phone numbers* window -> *Primary User:* **061234567**
 SMS forwarding nr1: **061234567**
 In *SMS settings* window -> *event code:* **1130** SMS text: **ALARM**
7. Store changes
8. Write parameters to module
9. Close serial connection