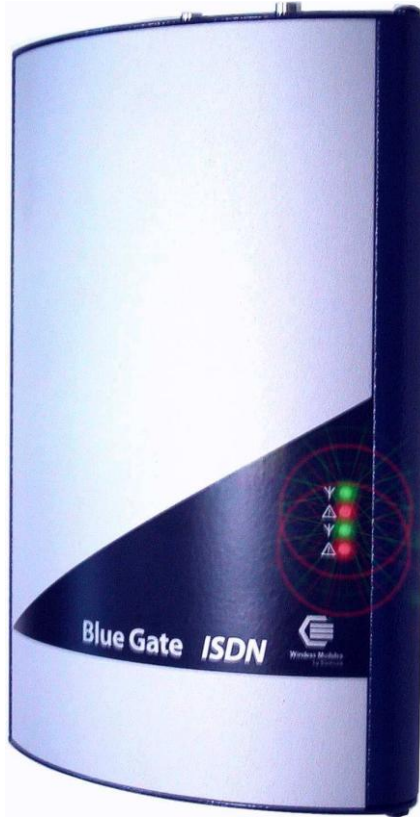




BlueGate ISDN

GSM Gate



Installation and Programming Instruction Manual V 6.5

Basic general features:

- Connection to the exchange through ISDN S0 interface with DSS1 signaling in NT mode
- POINT TO POINT or POINT TO MULTIPOINT exchange S0 interface
- Connection to DTMF extension line through direct dialing
- Connection directly to 2 operators or determined lines up called SIM card
- Connection to the 2 operators after a time period elapse (adjustable) to select an extension line
- Transfer of the number of the calling subscriber in the exchange (CLIP)
- Limitation of outgoing calls in GSM network
- Limitation of incoming calls from GSM network
- Priority connection through either the 1st or the 2nd GSM module (LCR)
- Switchable automatic channels changing
- Smart Call back – automatic incoming calls routing up CLIP
- Direct access – fix assign SIM cards to ISDN - B channels
- Echo Cancellor- switching ON/OFF the Echo canceller
- Volume setting in both directions separately for each GSM module
- Setting own time rate by 1 second or only in case of establishing connection
- Selection of the GSM service provider separately for each GSM module
- OGM module recordable message from PC (MP3, Wav)
- SIM card protection using PIN
- Detailed gate parameters setting from PC through a program for Windows 3.1/95/98/2000/XP
- Power supply 9-15 V DC or 8-12 V AC

BlueGate ISDN

Basic model with the properties described above.

BlueGate ISDN synchro

Moreover, input for synchronization from another ISDN line (exchange line). This type has to be used for exchanges with more ISDN lines that are not able to handle different ISDN synchronization of individual lines by configuration setting.

BlueGate ISDN router

The gate is provided with ISDN input. The cable leading from this input must be connected to the former ISDN line (exchange line). The other connector (output ISDN line) is used as a standard ISDN line (connection to the exchange).

In this way, the user does not lose the former ISDN line. After proper LCR setting, the selected calls are routed in GSM networks; the other calls pass further in the former ISDN line. The incoming calls are merged from both directions in the ISDN output.

Optional modules

The gate can be provided with some of the modules improving its utility properties further, according to an order from production. This Manual describes work with two types of these modules:

OGM module – initial report module for DISA direct dialing

- Recording of initial report directly from ISDN telephone
Or from PC (MP3, Wav)
- Length of initial report up to 10 seconds for each GSM module

Remote configuration module – remote setting of parameters using a modem

- Data transfer and communication rate of 9,600 Bd

Properties of the other modules (RS-232, etc.) are described in separate manuals.

SMS server – via sms server you can send and receive SMS messages under your Outlook

(more detail manual SMS mail).

GSM installation



Plug in SIM cards.

(The compartments for SIM cards will open after pressing the yellow pushbutton).

Before inserting SIM cards, try their condition (switching on with or without PIN, etc.) using any GSM telephone.

If you wish to use

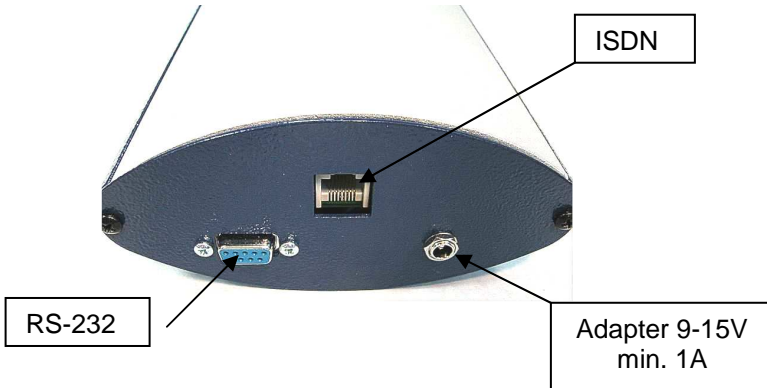
switching on with PIN, you have to set this PIN when programming the gate. The gate will not operate without this setting!

Connect aerials.

The green LEDs indicate GSM modules feeding during operation while the red ones GSM operation (flashing in the interval of approximately 2 seconds – rest condition, quick flashing – active connection).

Connect ISDN, adapter of mains or a cable for RS-232.

ISDN installation on BlueGate ISDN



ISDN configuration:

ISDN configuration is provided through links on the ISDN board (interconnected links are black colored). Currently, only the LT-S mode (preset from the factory) is supported.

LT-S mode setting:

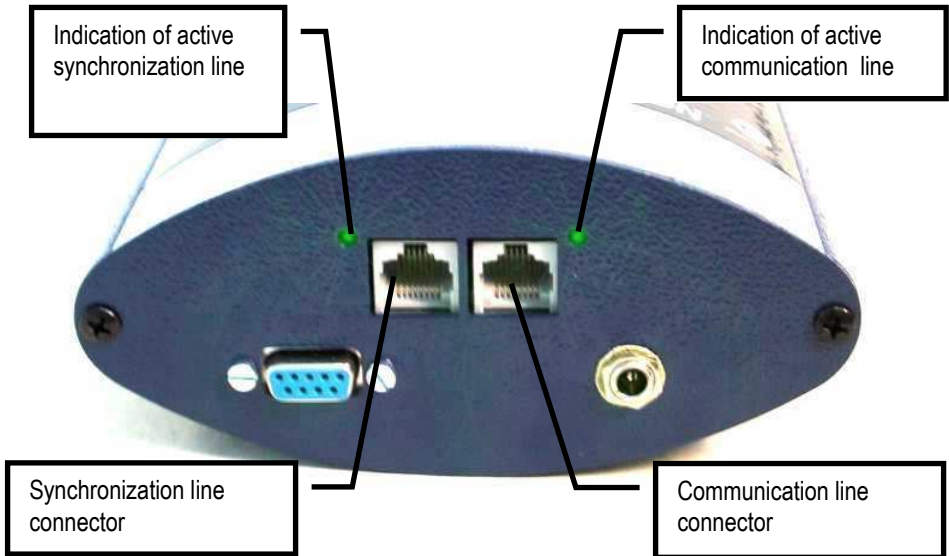
ISDN operates in the function of a public telephone network in this mode, i.e. it is a substitution of its network terminals (NT). ISDN does not provide devices feeds for the connected (terminals).

TE mode setting (by an extra order):

ISDN operates as a digital telephone apparatus, i.e. it is a substitution of ISDN extension line with S_0 interface.

It is necessary to check whether the terminal resistors S_0 of the bus (100R) are in the socket.

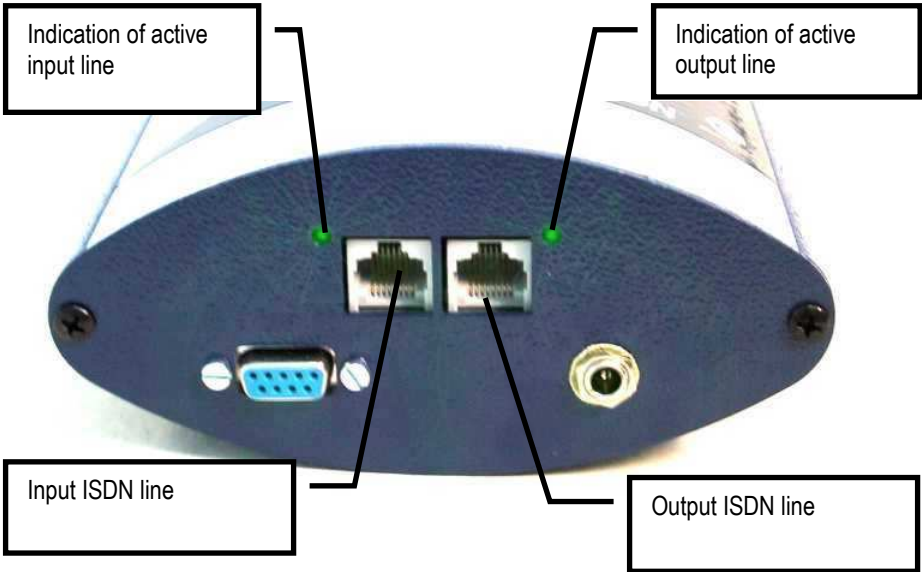
ISDN installation on BlueGate ISDN synchro



Moreover, the gate is provided with a synchronization input. The cable leading from this input can be connected in parallel with permanently activated S_0 (e.g. an exchange line). The other connector is used for standard communication line (connection to the exchange).

Indicating LEDs will light up after activation of individual lines.

ISDN installation on BlueGate ISDN router



Moreover, the gate is provided with an ISDN input. The cable leading from this input can be connected to the former ISDN line (an exchange line). The other connector is used as a standard ISDN line (connection to the exchange).

Indicating LEDs will light up after activation of individual lines.

The gate is to be mounted on the wall using 2 holes in the yoke on the back.

A suitable position for the gate should be selected on the basis of several factors:

- The distance from the exchange – potential interference with other lines on the exchange by GSM emitting.
- Availability of the mains 230V for GSM gate feed.
- The GSM signal quality in the place of gate installation (see below).

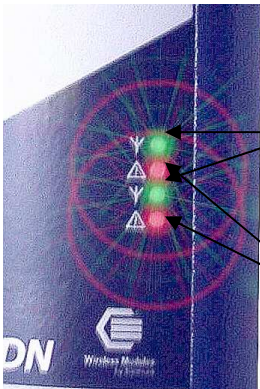
Necessary GSM signal quality:

The sound quality of connection depends strongly on setting of BTS to which you are connected with your GSM gate and phase offsets of the signal on the aerial caused by echoes from the surrounding environment. This phenomenon is well known from normal use of mobile telephones and, especially, from use in cars. We recommend trying other locations for the aerial (with respect to a very short wave length, even a replacement by a mere ten centimeters can help according to experience from practice). When looking for a suitable position, the signal “quality” is more important than its strength (analogy with ghost images in case of TV aerials). If you are not successful, we recommend using a directional aerial for GSM that eliminates reflections in a considerable extent. The signal strength for reliable operation is sufficient within the range of approximately 2 to 3 degrees on the strength indicator of the GSM telephone field. However, even in this case, the situation depends on setting of BTS to which you are connected. We encountered also the places where the incoming calls were connected without problems with such signal strength; however, the outgoing signals were refused by BTS – BTS probably “selected” the requirements with stronger signals during more busy operation.

Connection of "magnetic aerial" (aerial with magnetic foot).
When connecting a "magnetic" aerial to the gate, make sure that their position is on a larger iron object because this object creates a counterbalance of the size where the size of the effective radiated power is dependent above all.

If you have everything ready, connect the gate to the mains.

- All LEDs on the front panel will flash shortly.
- The green LED indicating GSM1 module feed will light up (upper panel).
- The red LED indicating GSM operation will start flashing in an interval of 2 seconds, quick flashing of the red LED (for about 3 seconds) will indicate module logging in the GSM network (upper panel).
- The green GSM1 LED on the front panel is flashing.
- The GSM2 module will also be started within 20 seconds in an identical way.



Operation of GSM1,2 modules (green):
LED is flashing – module logged in the network, rest condition
LED lit up permanently – connection in process (call)

Indication of error conditions in channels (red):
LED extinguished – rest condition
LED is flashing – error (more detailed information on the error can be found out by listing conditions after depressing the "test" pushbutton in the positioning routine – see below)

Possible problems when putting into operation

None of the LEDs are lit up.

Power supply error. Check connection to the mains and connection of the mains' adapter to the gate.

Quick "logging in" flashing of the red LED has not occurred. The module is not logged in the network:

- Defective SIM card (or the card is incorrectly inserted in its compartment);
- Obsolete 5V SIM card (the module supports cards for 3V and lower voltage);
- Logging in GSM with PIN has been set and the PIN has not been set in the gate by the positioning routine;
- GSM signal is too weak.

The device is operating, however, the call contains a humming sound.

Unsuitable positioning of the aerial with respect to any of the analogue telephone lines or an analogue telephone apparatus into which GSM transmission is induced (identical as in case of a car radio). It is necessary to test mutual position or totally relocate it.

The device is operating, however, an "echo" can be heard in the call.

Echo is automatically eliminated by electronic means in the gate. If you hear a beep despite this measure, it could be caused by:

- Too improper impedance adaptation of the BTS channel to which either you or your counterpart are connected;
- Mobile telephone, which you are calling (some older types, some types of protective cases).

One or both red LEDs on the front silver panel are lit up:

- Have the gate tested by an authorized service company.

The green LED indicating line activation after cable connection will not light up:

- Check the cable and its connection.

The green LED indicating PBX line activation will not light up attempting connection:

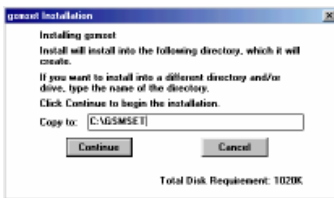
- Check the cable and its connection.

Positioning routine

The routine is intended for setting all the necessary gate parameters and detecting error conditions. The parameters are being set as well as the error conditions can be saved for later utilization. It is intended for Windows 3.1 to 2000 systems.

Installation:

Start the “Install” program from the attached floppy disk and proceed in accordance with commands (select a directory in which you wish to have the program installed in your PC and click on the “Continue“ button). You can position the icon created in the desktop area



of your computer.

Program start:

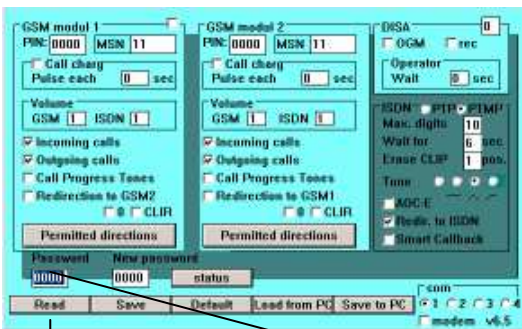
The program can be started in a usual way, i.e. by double clicking on its icon.

Reading the current parameters setting from the gate:

To enable communication with the gate, it is always necessary to enter an access password identical with the

password set in the gate (0000 has been preset as a password).

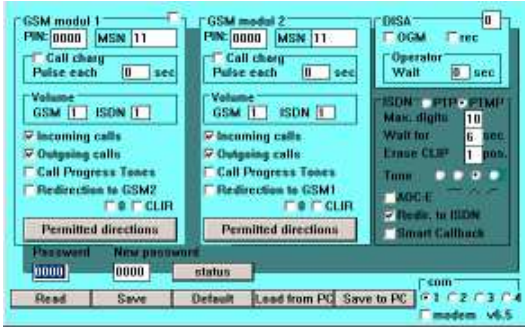
To read the parameters currently set in the gate, click on the “Read” button. All program elements will be set in accordance with the gate.



Reading current parameters
setting from the gate

Password

Writing the parameters being set in the gate:



To enable communication with the gate, it is always necessary to enter an access password identical with the password set in the gate. To save the parameters currently set in the program in

the gate, click on the “Write” button. All program elements will be transferred in the gate. After data transfer, the gate will be reset automatically.

Note:

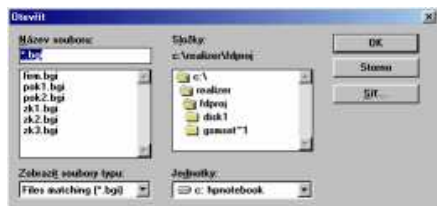
During data transfer from or in the gate, the corresponding button will always “turn grey” and the colour indicators in the button will indicate the type of the transfer (yellow for data send, green for data receive).

If any error occurs during transfer or the access password does not work, the program will react with an error message.

Do not forget to turn the appropriate com1 or com4 on!

Parameters reading from and saving in your PC:

The parameters read from the gate or the parameters set manually in the program can be processed using either the “Read from PC” or “Save in PC” buttons. After displaying a standard dialogue, an already existing file can be selected (parameters reading or rewriting any of the existing files) or a new name entered (when saving parameters). We recommend observing the program suffix to allow better orientation. When starting the



program, the file (firm.bgi) with the factory setting will be read automatically. The file with this name cannot be saved from the program (in order to prevent in its re-writing). Repeated reading the file with the factory setting can be performed anytime using the “factory setting” button.

New access password setting:

If you wish to modify the access password, it is actually necessary to log in the program under its former password and only then to program a new password. That is why a special field “New password” is included in the program to enter a new password. Allow the current access code in the password field. Write the setting in the gate. If transfer is successful, the code in the field “Password” will be rewritten with the new code from the “New password” field. If this is not the case, the “New password” field will be rewritten with the current code from the “Password” field.

Setting GSM module parameters

GSM modul 1

PIN: 0000 MSN 11

Call charg
Pulse each 0 sec

Volume
GSM 1 ISDN 1

Incoming calls
 Outgoing calls
 Call Progress Tones
 Redirection to GSM2
 0 CLIR

Permitted directions

Setting the properties of the modules 1 and 2 is identical, it differs only on indices.

Priority of **GSM module 1**: At 1.modul is one more button for deactivation of regular channels changing (when you don't use LCR). When is not mark the channels are changing regularly while making outgoing calls (to make same costs on 1 and 2 SIM). When it is mark then all calls are firstly going to first

channel.

PIN: set PIN up SIM card in module. When you use SIM card without PIN then this window is not used.

MSN (DDI): is designed for storing automatic dial in – operator – particularly for each GSM module (more via. DISA Setting).

Call charge (taxation): The “Taxation” field is intended for activation of taxation impulses. After marking a field, it is possible to select in the “Impulse after every” field the interval between individual impulses. If zero has been selected in the field, the taxation impulse is only one at the moment of establishing connection. The maximum period can be up to 99 seconds.

Volume: The “Volume” field allows adjusting call volume in both the outgoing direction (“GSM” field) and the incoming direction (“ISDN” field). Volume in the outgoing direction can be set in degrees 1 to 7 while in the incoming direction from 1 to 4.

Incoming calls : permission of incoming calls.

Outgoing calls : permission of outgoing calls.

If e.g. only the “Incoming calls” field will be marked and the “Outgoing calls” will not be marked, calling from this channel out will be blocked; the incoming calls will pass without limitation.

Call Progress Tones: switching ON/OFF tones signaling searching of called part in GSM net.

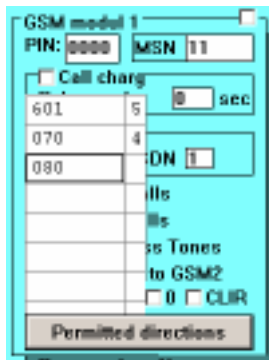
Redirection to GSM2 : . In case of marking the “Re-route in GSM2” (GSM1) field, “overflow” of the enabled directions (selection see below) in the adjacent channel is allowed. If the channel with the enabled direction is already busy calling, the gate will not refuse the call, but it will utilize the other channel (even if the direction is not on the list of enabled directions for this channel).

0: it adds automatically 0 before each outgoing dialed number

CLIR: switch OFF outgoing CLIP

Permitted direction: Up to 12 blocks of enabled directions can be selected in each GSM module. The table of the enabled directions is accessible after clicking on the “Enabled directions” button. **If the table is not filled in, all directions are enabled.** 1- up to 8-digit numbers can be written in the first column of the table. The program substitutes any digits instead of not filled in digits from the right which

checking the enabled direction. This means, instead of writing the numbers 601,602,...609, it is possible to write only 60. Listing of enabled directions in groups is new in this program version. If the operator has three successive numbers differing from each other only by the last digit, this direction can be written as a group on a single line: the first column contains up to 8-digit number of the first direction (“from”) as in the case mentioned above and the last digit of the last direction is stored in the second column (i.e. the last digit of “to”) – see Fig. **A group may be created only within the range of one order of the last position – i.e. from 0 to 9!** By proper filling in the tables of both modules (one module e.g. T-Mobile code, the other module Orange code), it is possible to achieve automatic re-routing of the outgoing call in the module allowing cheaper calling through the given operator (LCR). **Caution! The values are loaded in the table only after pressing the Enter button, marking it with cursor or by mouse clicking on another field of the table!**

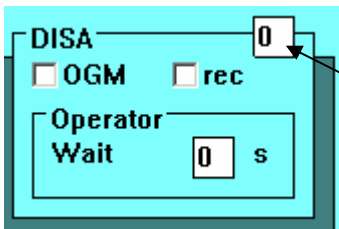


After clicking on the “Enabled directions” button, the table will be verified before closing. The operator is notified of wrong numbers or duplicate selection of values. **In order the verified data can be sent to the gate from the table, close the tables before transfer! If they remain open, they will be closed automatically and a check of data will be performed before transfer. In the event of errors in the tables, transfer will be blocked. After clearing the errors, transfer has to be repeated.**

Direct dialing code selection:

The incoming calls can be handled in two ways:

All calls can be automatically connected to a selected



extension in the connected exchange. Connection takes place in

Number of digits of direct dialing code

accordance with the selected MSNs (DDI) or direct dialing numbers of

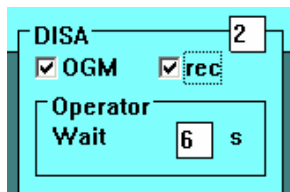
the operator separately for each channel. In this way, it is even possible to distinguish the calls incoming to individual telephone numbers of the GSM channels of the gate – the calls incoming to the telephone number of the first channel will be connected to the direct dialing code 11, incoming calls to the number of the other channel e.g. to the direct dialing code 12.

If a number of digits in the direct dialing code are being set, the number will be higher than zero (max. 4 – **Caution: the number should correspond with the number of digits of the direct dialing code of the exchange and selected MSNs or DDIs of individual GSM modules!**), the callers may themselves dial directly using tone selection by preset number of digits to the required extension. The automatic operator waits for a pre-selected number of seconds for direct dialing code selection. If it is not selected, the pre-selected number of the operator (according to a channel the call is incoming from) is dialed again.

OGM module

Message recording:

The gate can be provided additionally with a board with a digital recorder of “messages” for individual GSM



channels. When collecting an incoming call through direct dialing, these messages are always replayed. Recording of the message is possible by 2 ways:

1. By outgoing call into special numbers. If the “rec” field has been checked, then message for channel 1 is recorded after dialing number 1*#. The same way message for module 2 is recorded after dialing number 2*#. The messages recorded from the phone can be 10 seconds for each channel. The recording is finished by hanging up the phone.
2. By recording from computer. After connection of the convertor into gateway serial port RS 232 as same as connection convertor to PC are messages recorded by attached „recording software“ OGMrec. (via manual OGMrec).

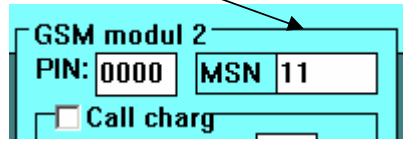


ISDN parameters selection:

Setting protocol on S₀ – PTP or PTMP. In case of PTPM, MSNs are selected in direct dialing code, while a direct dialing identifier) for PTP.

Max.digits: The telephones connected to the GSM gate mostly do not include a pushbutton for establishing connection by the dialed number as GSM telephones. This “defect” is by-passed by selecting a fixed number of digits after which sending of the dialed number (max. digits parameter here) takes place in case of GSM gates.

number as GSM telephones. This “defect” is by-passed by selecting a fixed number of digits after which sending of the dialed number (max. digits parameter here) takes place in case of GSM gates.



Setting a type of dialing tone with which the gate is signalled:

- No tone (silence)
- Continuous tone
- Morse R (preset)
- Morse A

Wait for: Sending the number if another digit is not selected within the preset time (waiting parameter here) period is another way. Of course, both parameters can be combined in a suitable way.

Erase CLIP: The gate supports transfer of CLIP from the GSM network in ISDN, i.e. to a telephone connected to an extension (if the device allows it). Here it is advantageous to use the parameter for deleting the initial digits from CLIP (e.g. deleting +42 in order not to “confuse” LCR exchanges when calling back to the displayed number).

AOC-E: Setting of taxation type. Usually it is charging during the call. When you use this parameter the charging is sent completely after ending of call.

Redir. To ISDN : Re-routing outgoing GSM calls back in ISDN when GSM is busy (only the “router“ version):

If this selection has been marked, the calls will be routed back in the ISDN network (as if the gate would not be included in the line) if the gate is busy (gate call with one SIM, GSM signal drip out – defect).

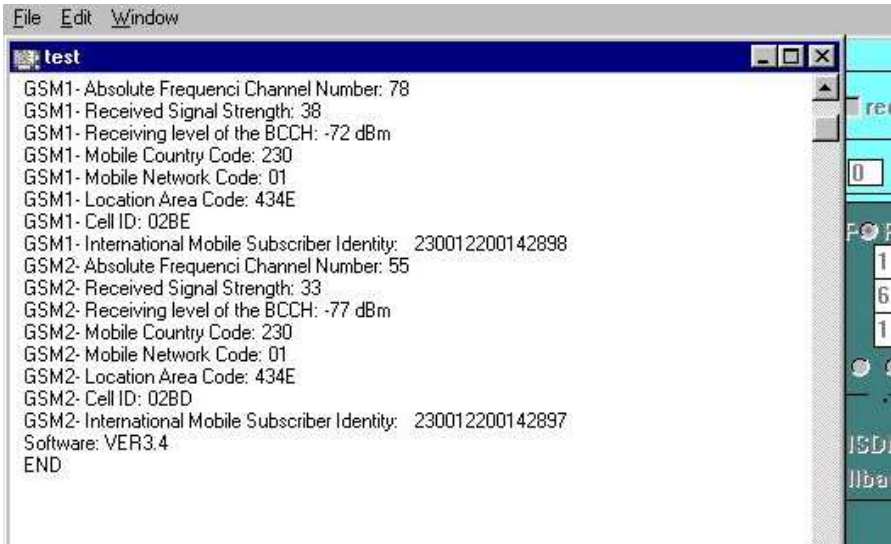
Smart Callback: When you use this parameter then all outgoing calls which has been missed or refused are stored. It stores PBX extension which made the call + called number. When called part calling back then the call is automatically routed to extension which made the call. When connection was successful data are erased from memory. In the gateway memory can be stored up 500 records.

Direct access: by activation this feature you disabled LCR (permitted direction). The first B channel is automatically assigned to 1 SIM card And second B channel is assigned to 2 SIM card. The LCR you can do directly in the PBX

ECHO canceller: this feature restrict ECHO during transfer between digital and analog telephone systems.

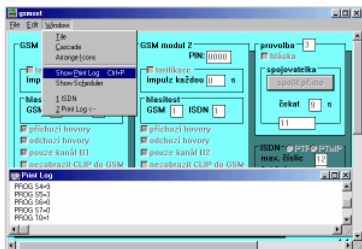
(2wire – 4 wire). When on PBX are connected only digital (4 wire) lines (digital phones) you can by activation this parameter (switch OFF ECHO canceller) reach better voice quality.

status: when click on status button then is open the window where are mentioned all parameters about GSM modules.



- **Absolute Frequency Channel Number:** determine channel number of GSM net – frequency on which is GSM module connected to BTS. The channels 0 – 124 are certain for GSM 900, channels 512 – 885 for GSM1800.
- **Received Signal Strength, Receiving level of the BCCH:** signal power is one of the most important parameter for voice connection quality.
 - -113 to -99 dBm: very bad signal – it is impossible to use any services via GSM network.
 - -98 to -83 dBm: bad signal – you can send SMS messages . Since level -87dBm you can establish voice connection
 - -82 to -71 dBm: good signal – you can send SMS messages and make a calls. Data transmission CSD is not reliable
 - 70 to -51 and better: very good signal – you can use all services of GSM network without any restriction.

- **Mobile Network Code, Mobile Country Code, Mobile Area Code:** Network number (provider), where is GSM module registrated (logged)
- **Cell ID:** BTS number, where is module registrated.



Information mentioned in the window you can print out or after saving send to your Gateway supplier.

Remote configuration module

The gate can be additionally provided with a board allowing identical work at gate configuration as through the RS-232 cable in a remote way through a modem. Enabled data calling for the GSM1 module and a modem connected to PC in which the GSMset program of the version 5 and higher is running are the necessary conditions.

Requirements for the modem:

- GSM, ISDN or modem for analogue commutated line connected to COM1 – COM4 (it can be even a virtual one formed through USB).
- Auto-bauding or fixed communication rate set to 9,600 Bd.

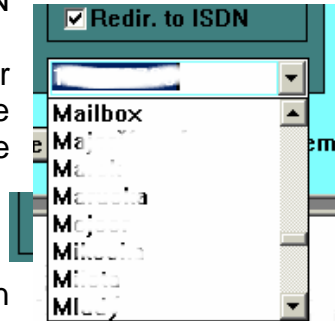
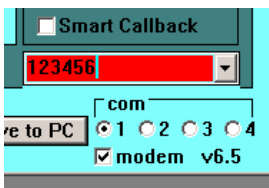
Potential other requirements for modem setting given by the communication network connected that are usually to be set in the initialising chain have to be located in the initializing chain in the national configuration file gsmset.cfg in the directory gsmset. The chain is added behind the command ATE0 (echo switching off):

inimodem="ATE0"

E.g. `inimodem="ATE0X3"` to switch off "dial tone" detection.

Work from configuration through RS-232 can be turned on to configuration through modem by marking the "modem" parameter in the GSMSET program. Another element – "ListBox" for selection of the telephone number of the gate that will be configured in a remote way will appear under the field for ISDN parameters

setting. The background information for this list is read from the file "modems.csv" in the directory of the GSMSET program. The program will list the background data in alphabetical order automatically. The file can be created either manually in any text editor, by export from any database or table program (csv format separated with commas) or by exporting an Outlook directory with the appropriate items (again, csv format separated with commas). The names of individual items or columns should be "name", "modem", "file". The "name" field is to be used to save an identifier (name of location, etc.) of the gate. The telephone number of the first module of the gate should be entered in the "modem" field. The "ref" field is intended for a program for batch (mass) remote configurations that utilizes the same background data. If such background data (file) do not exist, it is possible to write the required telephone number for connection directly in the window.



By confirming your selection from the list (double-click) or by confirmation of the written number (Enter), the system will take the telephone number selected for connection into account. The valid

selection is confirmed by a change of color of the field with the selection. To reduce the number of errors (accidental change of the number by unwanted clicking, etc.), the color of the field is turned to white in case of repeated selection and it is necessary to confirm your selection again.

After confirmed selection of the number of the gate configured in a remote way, it is possible to work with the program in the same way as in case of local configuration. When clicking on the corresponding button, the program will always perform initialization of the modem at first, dial the telephone number selected and establish connection with the selected gate. After connection is established, it reads or stores data. Operation is again indicated with LEDs in the corresponding pushed button. Data transfer at remote configuration is slower and for that



reason, also the LEDs flash slower and configuration takes more time. After data transfer termination, the program will interrupt connection automatically and the modem will hang up. If any error occurs during communication with the modem, the program will report the error. If any error (transfer error, wrong password, etc.) occurs during connection, the program will detect the error again with the corresponding error message and will terminate connection automatically again and the modem will hang up.

Ranges of values of settings of individual parameters

Parameter	No. of digits	Range
PIN	4	0000 - 9999
Pulse each	1 - 2	0 - 99
Volume GSM	1	1 - 7
Volume ISDN	1	1 - 4
Permitted direction	0 - 8	0 - 99999999
Password	4	0000 - 9999
DISA	1	0 - 4
Wait	1	0 - 9

MSN (DDI)	1 – 4	0 – 9999
Max. digits ISDN	1 - 2	1 – 99
Wait for	1 - 2	1 – 99
Erase CLIP	1	0 – 9

Editing the selected values of individual parameters:

With respect to the effort to ensure compatibility with the system base as large as possible (Windows 3.1 up to XP), the way of editing is somehow archaic and unusual for the present age.

Editing in parameter fields:

The values can be written in a standard way upon location of the cursor in the field. **Deleting values can be performed only from the back using the Backspace key.** The complete value can be rewritten in a usual way, i.e. by marking the complete value and, consequently, by loading a new data item.

Editing in tables:

A table cell is always edited as a unit – i.e. individual digits may not be rewritten. If you click with the mouse (or cross with the cursor over) on the selected cell and start writing, the complete value in the cell will be rewritten. The complete value in a cell can be again deleted only using the Backspace key. **The value in a cell can be saved either using the Enter key or only after crossing over with the cursor or mouse clicking on another cell. This rule is applied also to deleting.**

RS-232 interconnection cable:

A standard series cable with 9-pin connector on both ends DTE-DCE (modem 9-9) is used to interconnect the gate with your PC. It is also marketed under the designation “mouse extension cable”. The cable “zero modem” or “lapping“ has RX and TX crossed **and cannot be used directly!** If you wish to

use this cable with an adapter, the adapter has to contain crossing again! If this is not the case, the link DTE-DTE (for interconnection of 2 PCs) will be formed that will not operate. Non-operating cable will be indicated by the message "Invalid password" when attempting to communicate.



ALPHATECH TECHNOLOGIES s.r.o.
Jeremenkova 88, Praha 4, Czech Republic
www.alphatechtechnologies.cz

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Jeremenkova 88
140 00 Praha 4
Czech Republic
VAT: CZ27577350

Company is registered in the Commercial Register
administered by the Municipal
Court in Prague, Section C, Record 116886

Banking details:

Komerční banka, account No. 43-7671450207/0100
IBAN: CZ0801000000437671450207
SWIFT: KOMBCZPPXXX

