



COMMUNICATION MODULE GSM LT-1

USER MANUAL

Firmware version 1.12



gsmLT-1_en 02/11





WARNINGS

For safety reasons, the module should only be installed by qualified personnel.

In order to avoid the risk of electric shock, read carefully this manual before proceeding to installation of the equipment. Any wire connections can only be made after disconnection of power supply.

Never turn on power supply of the module and GSM telephone without external antenna connected.

Making any construction changes or unauthorized repairs is prohibited.

DECLARATION OF CONFORMITY		
Product: GSM LT-1 communications module	Manufacturer: SATEL spółka z o.o. ul. Schuberta 79 80-172 Gdańsk, POLAND tel. (+48 58) 320-94-00 fax. (+48 58) 320-94-01	
Product description: Communications module used to simulate PSTN line over GSM network, allowing for alarm transmission in case of a failure or lack of telephone line.		
The product is in conformity with the following EU Directives: RTTE: 1999/5/EC EMC: 2004/108/EC LVD: 2006/95/EC		
The product meets the requirements of harmonized standards: EN 50130-4:1995/A1:1998/A2:2003, EN 61000-6-1:2007, EN55022:2006/A1:2007, EN 61000-6-3:2007, EN 60950-1:2006, EN 301 489-7:V1.3.1, EN 301 489-1:V1.8.1, EN 301 511 V9.0.2, 3GPP TS 51.010-1 V5.10.0		
Gdańsk, Poland	05.11.2009	Head of Test Laboratory: Michał Konarski 
The latest EC declaration of conformity and product approval certificates are available for downloading on our website www.satel.pl		

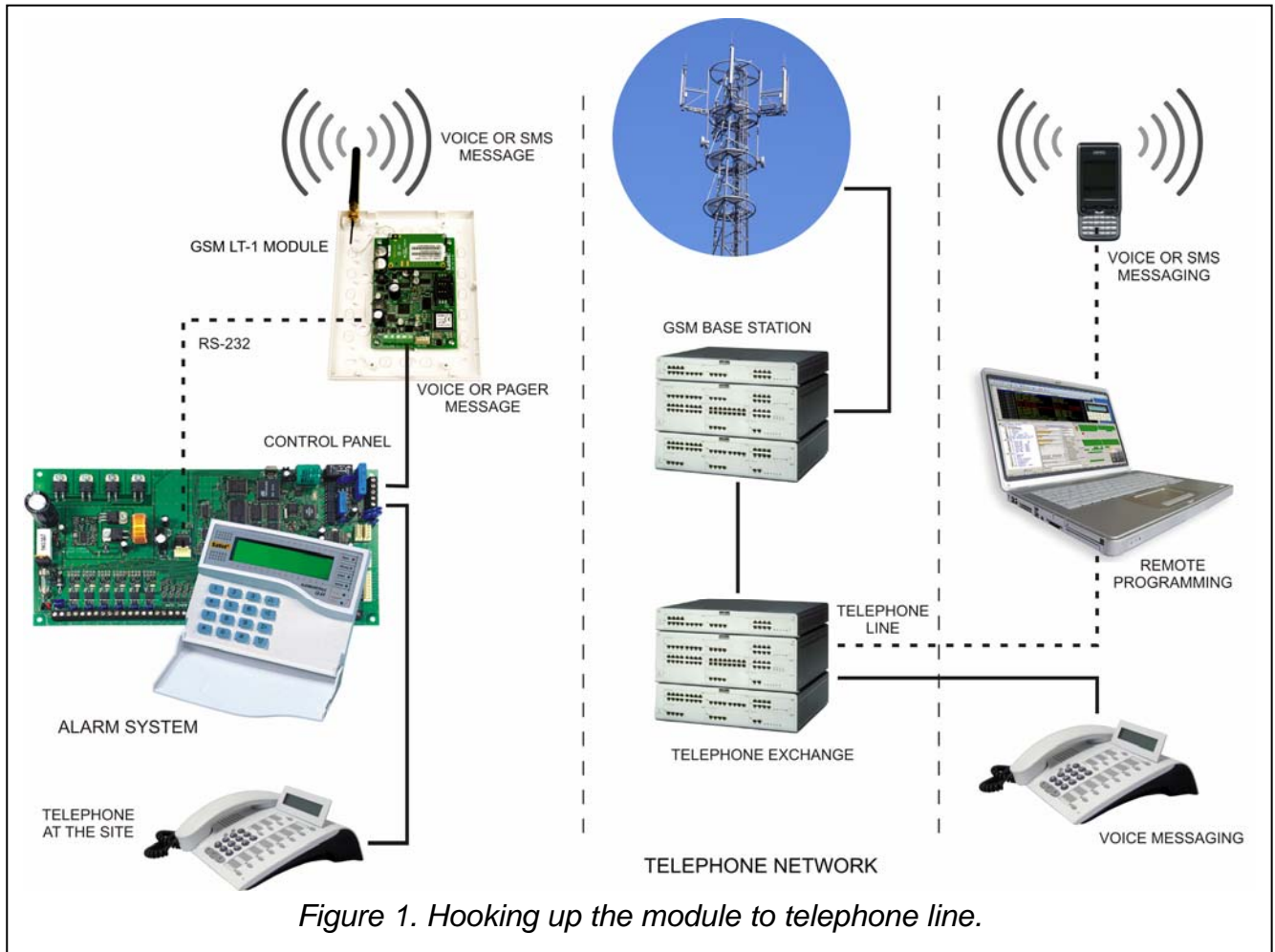
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1. GSM LT-1 MODULE FEATURES

- Simulation of analog telephone line by the use of cellular connection.
- Interaction with alarm control panels and other equipment (e. g. DT-1 telephone dialer) which use the analog telephone line for transmitting voice information about alarms, or for sending text messages to paging system).
- Capability of recognizing messages sent to paging system and transmitting them in the form of SMS text messages to any cellular telephone number.
- Support of calls incoming to and outgoing from wireless (cellular) telephone networks.
- Support of impulse and tone dialing modes.
- Signaling of answering (receiving) a call initiated from the module T-1, R-1 terminals by changing the voltage polarization across those terminals (possibility of tariffication).
- Operation in conjunction with the STAM-1/STAM-2 monitoring station, which makes monitoring of the sites possible with the use of SMS messages.
- Functioning as an external modem for the CA-64* and INTEGRA alarm control panel (support of DLOAD64*, GUARD64*, DLOADX and GUARDX programs).
- Operation with PBX telephone exchanges as an additional subscriber's line.
- Operation based on interaction with the three-range industrial cellular telephone, compatible with GSM 900/1800/1900 MHz networks.
- Control of antenna signal level.
- RS port for:
 - programming the module from a computer by using the DLOAD10 program (version 1.00.25 or later),
 - connecting the module to the STAM-1/STAM-2 monitoring station,
 - connecting the module to the CA-64* and INTEGRA control panel as an external modem,
 - using the module as fax and modem.
- Output for signaling a failure (no possibility to get connection).
- Checking for presence of the module by CLIP test transmissions with acknowledgement of receipt.
- Answering the user CLIP (by means of a CLIP service).

* – function available for the CA-64 control panel with v1.04.03 program and DLOAD64 v1.04.04 and GUARD64 v1.04.03 programs (or later versions).



2. LIMITATIONS OF USE

As the mobile phones are designed for the maximum efficiency of speech conveyance, the data compression feature which is used in them brings about distortions in the transmitted audio signals, which may make difficult or even impossible sending modem signals through a simulated telephone line (downloading, monitoring).

3. DESCRIPTION OF THE MODULE

MODULE TERMINALS:

- +12V** – power supply input (12 V DC $\pm 15\%$)
- GND** – ground (0 V)
- FLT** – alarm output, GSM telephone failure or insufficient range (OC; 50 mA)
- R-1, T-1** – extension telephone line (connection to the alarm control panel or to a telephone set)

The **FLT** output is a generalized fault indicator. It gets active if connection with the base station is not confirmed by the module within 10 minutes. It may be caused by a telephone trouble, antenna failure (antenna cable damage), or loss of range due to other reasons. The fault alarm stops maximum 30 seconds after the alarm causes ceased to exist.

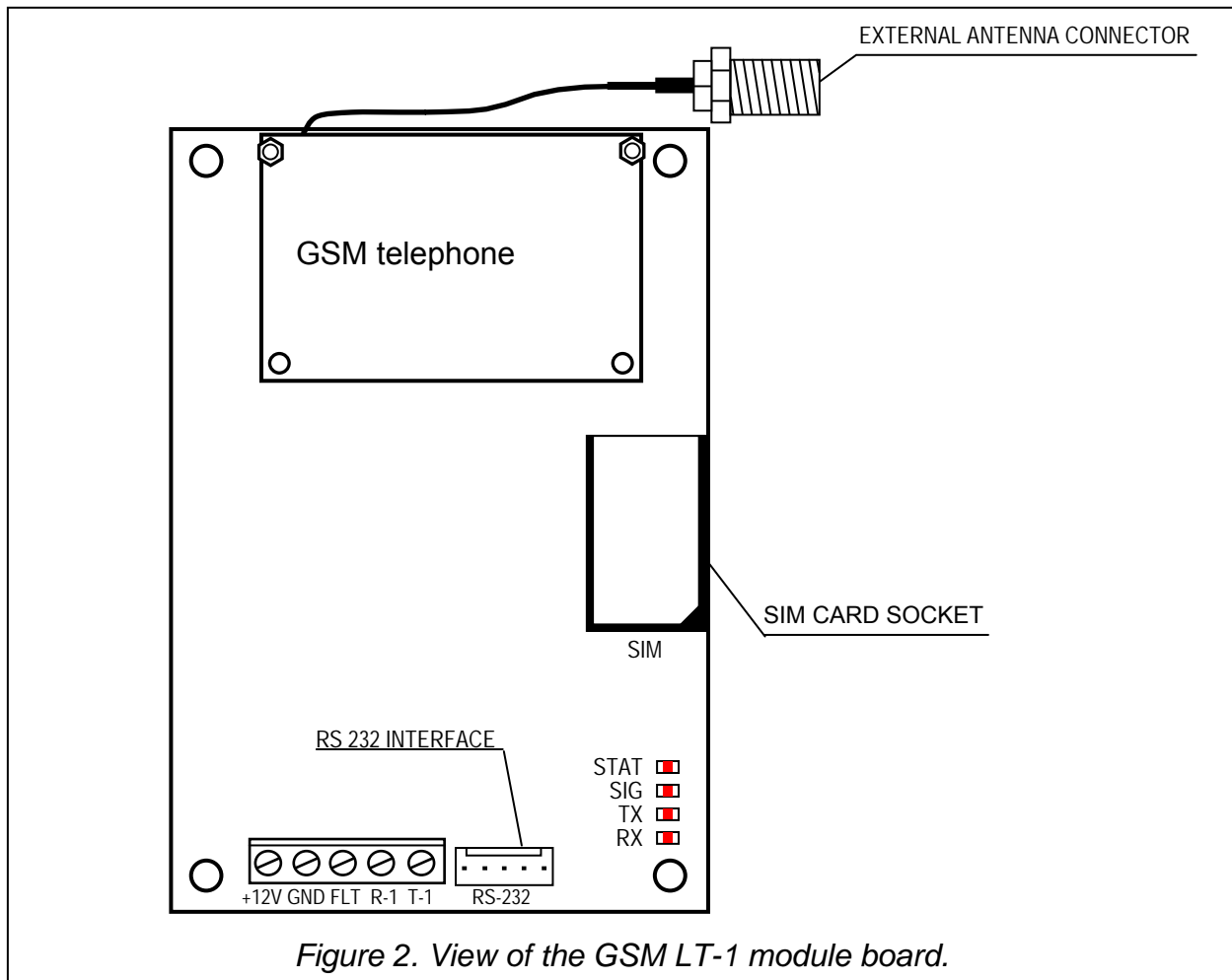


Figure 2. View of the GSM LT-1 module board.






In its active state, the FLT output is shorted to the ground. The FLT output may be connected to the alarm control panel input, or it can directly control the relay operation (its maximum current-carrying capacity is **50 mA**).

LEDs:

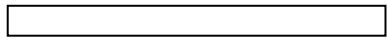
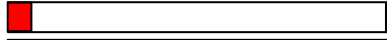
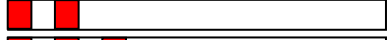
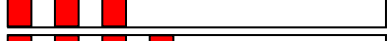
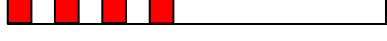
The module indicates its status to the user by means of 4 LED indicators. The mode of lighting of the STAT and SIG LEDs depends on the module status and provides the information described below. The lighting cycle of these LEDs is 4 seconds, repeated after a 1-second pause.

STAT – indicates the module status by a corresponding number of flashes with specified duration. Shown symbolically below are single cycles of various LED lighting modes with their meaning described. The shaded fields meaning the LED "on" and the blank fields – the LED "off":

	– (LED off) module power off
	– no PIN code
	– wrong PIN code
	– PUK code required
	– no communication with GSM telephone
	– active connection
	– normal operation of module
	– module restart on switching power on
	– PH-SIM PIN code required
	– no SIM card
	– SIM card damaged

	– SIM card busy
	– invalid SIM card
	– PIN2 code required
	– PUK2 code required
	– other errors

SIG – indicates level of antenna signal received by GSM telephone (the LED goes out when the module indicates a trouble on the FLT output):

	– no cellular network signal
	– signal power 1
	– signal power 2
	– signal power 3
	– signal power 4 (maximum signal)

TX, RX – data transmission indicators on RS-232 interface.

The cellular telephone is fitted with a special cable, terminated with connector for external antenna (see: Fig. 2).

4. OPERATING THE GSM TELEPHONE

As any other cellular telephone, the industrial cellular telephone requires a **SIM activation card** to operate. The user of the GSM LT-1 module has to obtain such a card on his own. The SIM card should be inserted into a special recess provided on the right-hand side of the printed circuit board. The PIN code, if necessary, is to be entered into the module memory by means of a telephone connected to terminals R-1 and T-1, or by means of a computer and the DLOAD10 program.

Note: *The change of PIN code stored in the SIM card, or entering the PUK code is possible after putting the SIM card into an ordinary cellular telephone.*

5. INSTALLATION

It should be borne in mind during installation that the GSM LT-1 module must not be located in the vicinity of electrical installations, since this may involve a risk of malfunctioning. Pay special attention to how the cable is laid between the module and the telephone terminals of the alarm control panel.



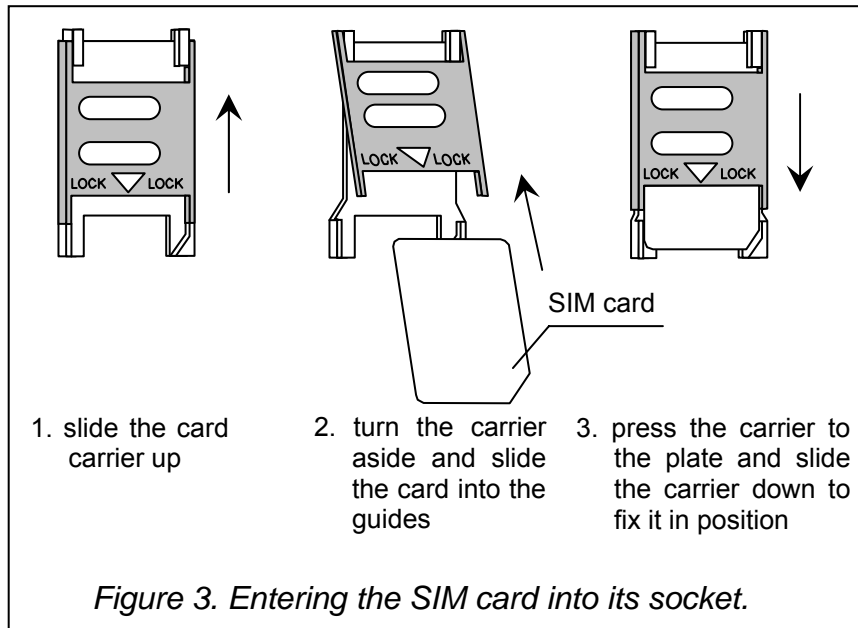
Never turn on power supply of the module and GSM telephone without external antenna connected.

The installation must be carried out in a strict compliance with the following activation procedure:

1. Make a complete wiring.
2. Turn on the module power supply without SIM card inserted.
3. Using a DTMF telephone set or the DLOAD10 computer program, specify the module working parameters (including the PIN code).
4. Turn off power supply.
5. Insert SIM card into the socket (see: Fig. 3).
6. Turn on power supply.

A non-configured GSM LT-1 module will wait 10 minutes after power-up for entering the PIN code of the SIM card. If this does not happen, the device will automatically deenergize the telephone line and generate the trouble signal (i.e. it will short the FLT output to common ground), thus making further programming from the telephone impossible (programming from

the computer by means of the DLOAD10 program will still be possible). If this is the case, turn the module power off and on, so that the module can re-enter the programming mode.



The module power supply should have a sufficient current capacity. The recommended power supply unit (e.g. APS-15; APS-30 manufactured by SATEL) should be equipped with its own battery.

It is suggested that the power supply be located within 3 m from the module.

If the supply voltage is lower than 9.8 V, restart of the module will follow. Therefore, be careful that the module supply voltage never drops during operation below 9.8 V at the maximum current consumption.

6. OPERATION OF THE MODULE WITH ALARM CONTROL PANEL AND STATIONARY TELEPHONE

As shown in Figure 1, the module is to be directly connected to the control panel's public telephone line terminals.

It maintains impedance and voltage across the R-1 and T-1 terminals as necessary for correct operation of the telephone set. The terminals can be automatically deenergized in case of a loss of communication with the base station (which is accompanied by operation of the FLT trouble indicator – see: programming function No. 17).

When the control panel goes „off-hook”, or when a user lifts the handset of a telephone connected to the terminals T-1 and R-1, the module will generate the continuous dialing tone and receive the tone or pulse dialing signals (similarly as the telephone exchange). The telephone number can include digits and special characters: # * +. The phone number should be dialed just like from a cellular phone, as required by the operator of the network into which the telephone is logged. It is recommended that the number begin with the „+” character and country code prefix (48 for Poland). Sometimes you can dial just the mobile phone number, or the area code and stationary telephone number.

Examples:

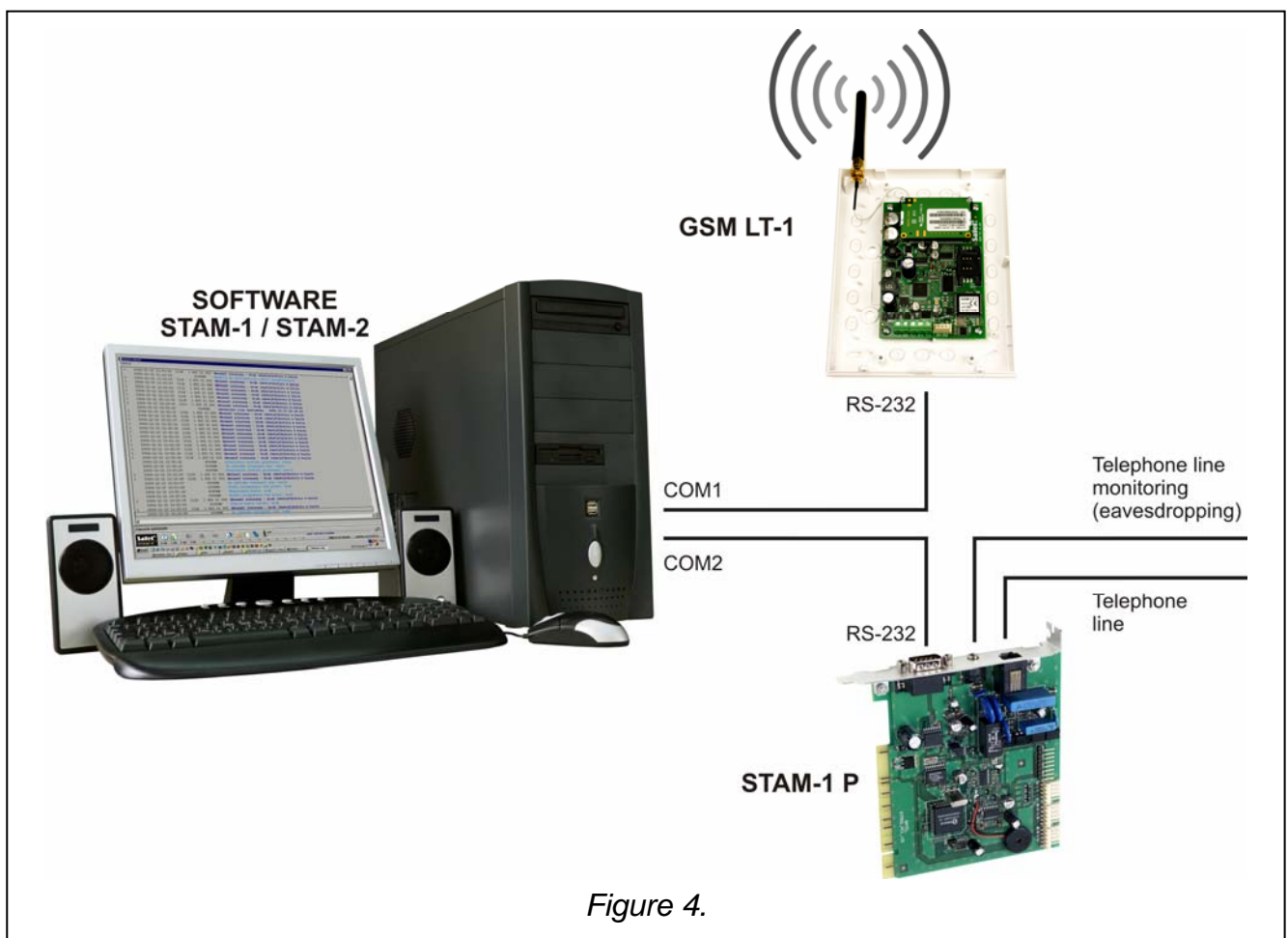
[*][0][4][8][5][0][1][1][2][3][4][5][6]	– connection to mobile phone (with prefix „+48”)
[5][0][1][1][2][3][4][5][6]	– connection to mobile phone (number without prefix)
[5][8] [1][2][3][4][5][6][7]	– connection to stationary telephone, (in this example, 58 is location area code)

If the first four digits of the dialed number correspond to the pre-programmed „*pager station number*“, the module goes to the procedure of receiving the alphanumeric message and sending it as an **SMS text message** (see section „Sending SMS messages“). Checking of the first four digits is always performed.

When connection is established by the cellular telephone, the module will transmit LF audio signals between the extension line T-1, R-1 terminals and the cellular telephone. After the handset is lifted by the subscriber the connection is established with, the module changes the direct voltage polarization across the extension line terminals T-1 and R-1. This function makes it possible to keep individual tariffication of phone calls.

An option is provided for calling the phone number of the module SIM card. The **incoming calls** are directed to the extension line terminals R-1 and T-1, which generates the ringing tone, in much the same way as with operation of the cable telephone line. It is then possible to answer the incoming calls by means of a stationary telephone set connected to that telephone line.

7. GSM LT-1 WITH MONITORING STATION



The GSM LT-1 module permits site monitoring by means of SMS short text messages. This function is offered by the STAM-1 monitoring station program, version 4.07 and STAM-2, manufactured by SATEL. The example of module connection to station is shown in Fig. 4.

Connect the GSM LT-1 module to the computer serial port (COM1 or COM2), by means of the typical cable for programming the GSM module as well as CA-10, CA-64 or INTEGRA control panels (see: Fig. 6).

To make the module interface with the monitoring station, you must enter during setup the communication code, by default 111111. The contents of SMS-messages and the

corresponding codes are to be defined in the STAM-1/STAM-2 program when editing the client.

8. SENDING SMS MESSAGES

If the control panel has the function of messaging to the pager system, it can be used for sending SMS messages.

To enable sending the SMS messages, program in the GSM-LT module the telephone number of Short Message Service Center (function 02 and 10), telephone number of pager station (function 06) and country code (function 114), and in the alarm control panel the telephone number of pager station, as required, and enter into the control panel memory the appropriate text to be sent.

The telephone number to be programmed in the control panel must consist of:

1. The "pager station number" pre-programmed in the GSM LT-1 module.
2. The cellular phone number to which the SMS message is to be sent. The required country code can be put before the phone number or it can be programmed by a function 114.

Note: *Parts of the number may not be separated from each other by any time interval (pause); the digits must be sent by the control panel as one sequence in DTMF or pulse mode. In case the module has any trouble with receiving the „pager“ station number in the tone mode, it is necessary to set the **pulse** dialing mode in the control panel.*

8.1 PROCEDURE FOR CONVERTING PAGER MESSAGES INTO SMS MESSAGES

When the alarm control panel is "off hook" and after dialing the number – the module checks the first four digits of that number. If these digits agree with the programmed "Pager tel. No." in the module, the module receives next digits up to the pause (telephone number to which SMS message will be sent); then the module sends hand shake signal (similar as pager station) and receives the message sent by the control panel. Next, this message is transmitted via the GSM cellular telephone as SMS text message.

Notes:

- The pager station number has the form of 4 optional digits for module firmware version 1.11 and earlier. For module firmware version 1.12 and later, the pager number is a sequence of 1 to 4 optional digits.
- The programmed "Pager station number" must be unique and must not coincide with the beginning of other telephone numbers.

The SMS sending systems may require adding a **prefix with the country code** (48 for Poland). The prefix (without „+“) is programmed with the service function 114. If the cellular phone number is given by the control panel together with the prefix, then the function 114 should not be programmed.

To enable the transmission of SMS messages, the "**SMS center No.**", must be loaded into the module, depending on the GSM network where the telephone is activated. It must be preceded by the „+“ character and the country code suitable for the operated network.

Parameters of the pager system signal should be programmed at the **alarm control panel** (or the DT-1 telephone set) as follows:

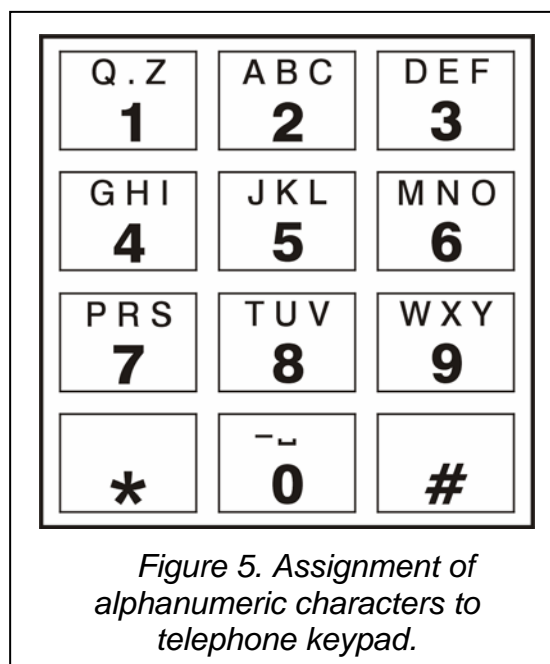
control panel	1	C	2	2	0	A	0	E	7	0	8	A
DT-1	C	1	2	2	A	0	E	0	0	7	A	8

8.2 SENDING SMS MESSAGES FROM A STATIONARY TELEPHONE SET

The GSM LT-1 module user has an option to send SMS messages from a stationary telephone set which generates DTMF signals and is connected to the terminals R-1 and T-1. This operation is done in much the same way as sending SMS messages in the PAGER system.

In order to send an SMS you should:

1. Lift the handset of the telephone.
2. Dial in one sequence the "PAGER station number" and the phone number to which the SMS is to be sent. The number should be entered rather quickly, without any time intervals between consecutive digits (indicate the country code depending on how function 114 is programmed).
3. The properly received number is acknowledged in the handset by two beeps generated by the module. Lack of acknowledgement or a busy signal means a dialing error and then the procedure must be started anew (to facilitate it, you can use the REDIAL option).
4. Enter the text of message following the instructions below (the time of module waiting for subsequent characters is not limited):



After calling the function, the module will accept characters in the numeric mode. Pressing each key of the telephone adds a corresponding digit to the message.

By pressing the [*] key twice you will enter the text mode. In the text mode, each numeric key (from 1 to 9) has three letters assigned to it (see: figure 5). Pressing a key means selection of the middle letter. By pressing in turn the key and [*] you will select the left-hand letter on the given key. The right-hand letter is accessible by pressing the given key and [#]. In order to reach the space, press the [0] key. To reach the dash, press [0][*], the point – press [1]. In order to change between the text mode and the numeric mode, press the keys [0] and [#]. Pressing the [#] key when the module is in the numeric mode results in ending the programming and sending the message.

The GSM LT-1 can store in its memory 62 alphanumeric characters to be sent as an SMS message. At an attempt to enter a longer message, the excessive portion of the text will be omitted. There is no possibility to check the content of entered message. If you hang up the handset when entering the text, the function will be interrupted without sending any SMS.

9. TEST TRANSMISSION

The test transmission makes use of the calling number presentation function (CLIP) and may be used to confirm that the GSM LT-1 module is in good working order. This type of messaging consists in dialing a programmed telephone number and then breaking the connection after 50 seconds or the time specified by the operator has elapsed. The message recipient can read information on the number of the telephone from which the connection was initiated (cellular phone, ISDN, etc.). If the number is busy, the module will repeat the call. The module will consider the messaging completed, if it does not receive the busy signal within approx. 10 seconds from dialing the number. The cellular phone user has an option to early „reject” the connection, but if he carries out this action too early, the module will repeat the call. Answering the call, either by the user or automatically by the „voice mail”, is recognized by the module as completion of messaging. The module will use this function to

complete the test transmission by calling in turn each of the preprogrammed numbers. The phone numbers to be notified should be programmed by means of functions 21 to 24.

The first test transmission is carried out approx. 30 seconds after completion of the module programming; the second one: after the programmed test transmission period, or randomly (after a period not exceeding 20 hrs, unless duration of the programmed transmission period is shorter). Subsequent transmissions are made in accordance with the programmed parameter. Use function 19 or 25 for programming the duration of intervals between the test transmissions.

When programming the test transmission data, remember to set the „test transmission priority” (function 20), as appropriate.

Checking the current module status is also possible (function 99). You should just dial the industrial cellular telephone number and hang up after a few call signals. A moment later the module will answer with a CLIP (one-time, not requiring acknowledgement).

9.1 TEST TRANSMISSION WITH ACKNOWLEDGEMENT

For each of the 4 telephone numbers programmed to be CLIP notified (functions 21–24), you can select a separate option of sending SMS if there is no acknowledgement of receiving the CLIP information (functions 36–39). The transmission acknowledgement consists in the telephone user rejecting or receiving the connection set up by the GSM LT-1 module. The acknowledgement can only take place within 10 to 20 seconds of the connection set-up. In addition, the number of attempts (1–15) to make the transmission (functions 32 to 35) can be programmed individually for each telephone number. Having detected the acknowledgement of CLIP transmission, the module will finish dialing the given telephone number. The module will call in turn each of the programmed numbers, starting from the telephone no. 1. If the module fails to detect such an acknowledgement after making a preset number of attempts, then it will send an SMS to the given telephone number, provided that the messaging mode with acknowledgement and SMS send is selected. The message contents can be standard - „CLIP failed” or programmed. The function 40 makes it possible to delete the message contents or to enter a default text, while using the computer and DLOAD10 program you can type in any text.

9.2 TEST TRANSMISSION WITHOUT ACKNOWLEDGEMENT

In the „without acknowledgement” transmission mode, the module will dial the given telephone number once (provided the number is not busy), irrespective of the programmed number of test transmission attempts (functions 32–35).

Notes:

- *If the cellular phone of the message addressee is OFF or outside the network range, and the voice mail service is inactive, then an automatic message on the existing situation is generated in the receiver and no busy signal is sent back. In such a case, the messaging is considered by the module as completed, while the user loses information on completion thereof.*
- *If the voice mail service is active, the user, after getting access to the network, may be notified, depending on the operator (e.g. by means of an SMS) of the telephone connection with the module number, without leaving any voice message.*

9.3 SMS CONTROL

The telephone numbers to be notified and the test transmission period can be remotely changed by sending SMS messages to the module. Such messages must contain the proper password and the programmable parameter (functions 27–31). The module can inform the user that a change has been made, by sending a return SMS to the telephone number

programmed with function 26. The SMS which is then sent contains information on the current settings (transmission period and 4 telephone numbers to be notified, also for test transmission purpose). For the module to return the SMS, the SMS centre number must be programmed (function 02).

Note: *The message sent to the module may contain just the SMS password, but it can also be longer than the password (the password can be part of a longer word). It is important that the password be inserted in the initial part of the message text (among the first 32 characters). This feature makes it possible to load a verbal description of the performed operation into the memory of the telephone from which the SMS will be sent. Thus the user does not need to remember the passwords and their corresponding functions. Only one control password can be sent in one message. Sending an SMS without any password will cause no reaction of the module. The received message will be deleted, and the telephone will be ready for reception of a next text message.*

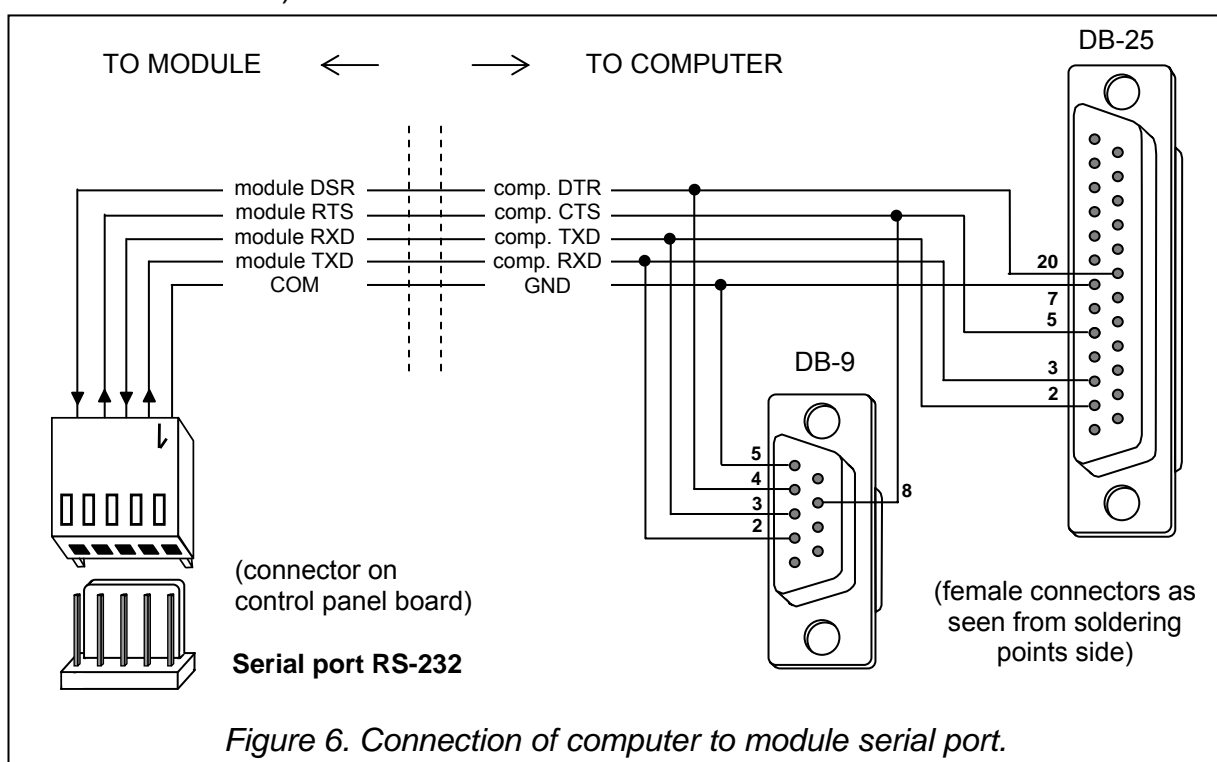
10. MODULE PROGRAMMING

For the module to operate properly, corresponding parameters must be programmed. The programming is possible by means of a stationary telephone capable of generating DTMF signals, or by using a PC computer and the DLOAD10 program (version 1.00.17 or later).

10.1 DLOAD10 PROGRAM

The GSM LT-1 module is delivered together with the DLOAD10 program which enables the module to be programmed from a computer. The program is designed for IBM PC/AT compatible computers. It works in any computer hardware configuration in the **WINDOWS** (9x/ME/2000/XP) environment. It is recommended that the program be installed on the computer hard disk.

The GSM LT-1 module communicates with the computer via the RS-232 interface. To connect the ports, use the cable made as shown on Fig. 6 (the cable symbol acc. to pricelist: DB9F/RJ-KPL).



For installation of the program run the **setup.exe** program from a disc delivered with the module.

Having installed the program, start it. Access to the program is protected with an **access code**. After installation of the program, the access code is: **1234** and can be changed in any string of 16 alphanumeric characters. As long as the code has its factory setting, pressing the „ENTER” key (without entering any code) will start the program with the default access code (1234).

In order to establish communication between the DLOAD10 program and the module, you should follow the procedure below:

1. Open the window with module data by selecting **File→New device→GSM4/LT module** in the program menu (see: figure 7).

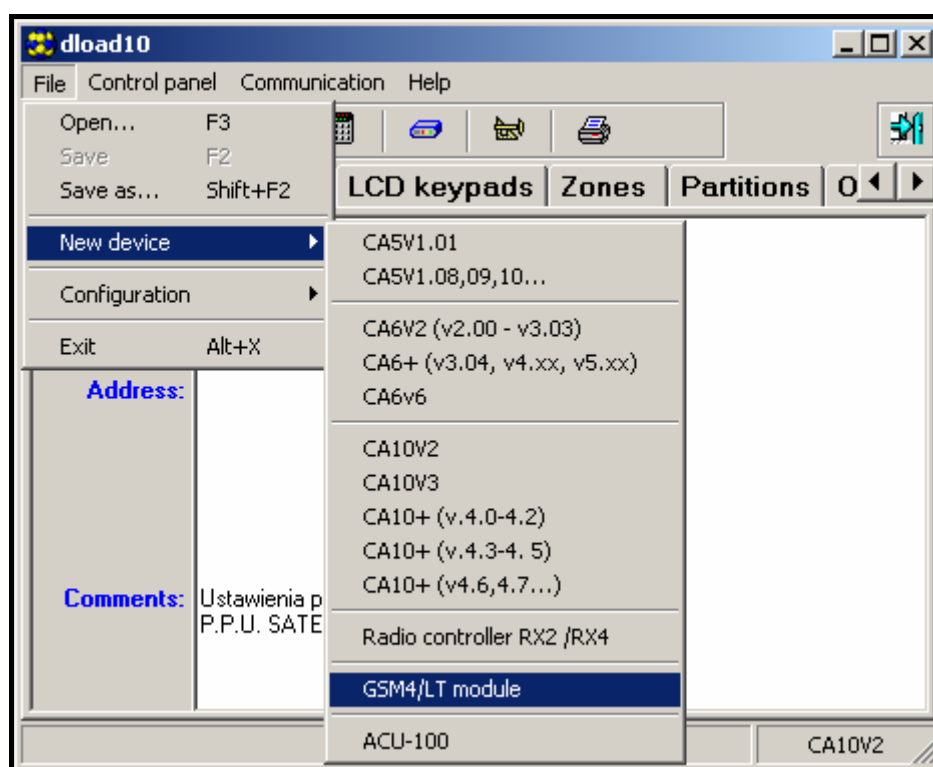





Figure 7.

2. Enter the options of module communication settings by clicking on the  icon (or through the **Communication→Configuration** menu) and select the port through which the computer connects with the module RS-232 port (see: figure 8).
3. Read out data from the module by clicking on the  icon.
4. Program the module. Figure 9 shows the window for programming the module settings. The parameter values in the drawing are just an example. The data related to test transmission and SMS control, as well as the PIN code, are not programmed by default. Particular parameters are described in Section „Module Programming”. The line in the upper part of the window shows the current status of the module as well as the antenna signal level.
5. Save new data in the module by clicking on the  icon.
6. If necessary, the programmed data can be saved as a file on the computer disk.
7. Disconnect the cable used for programming.

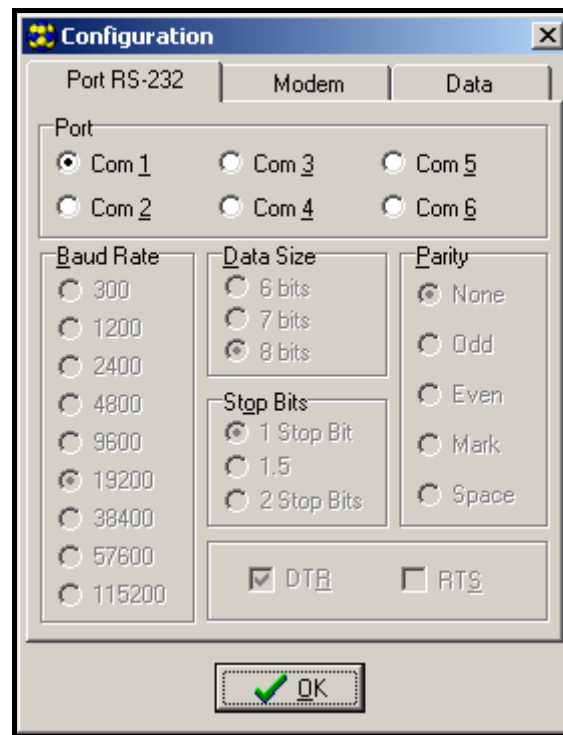


Figure 8.

Note: Never carry out functional test of the module with cable connected to RS port.

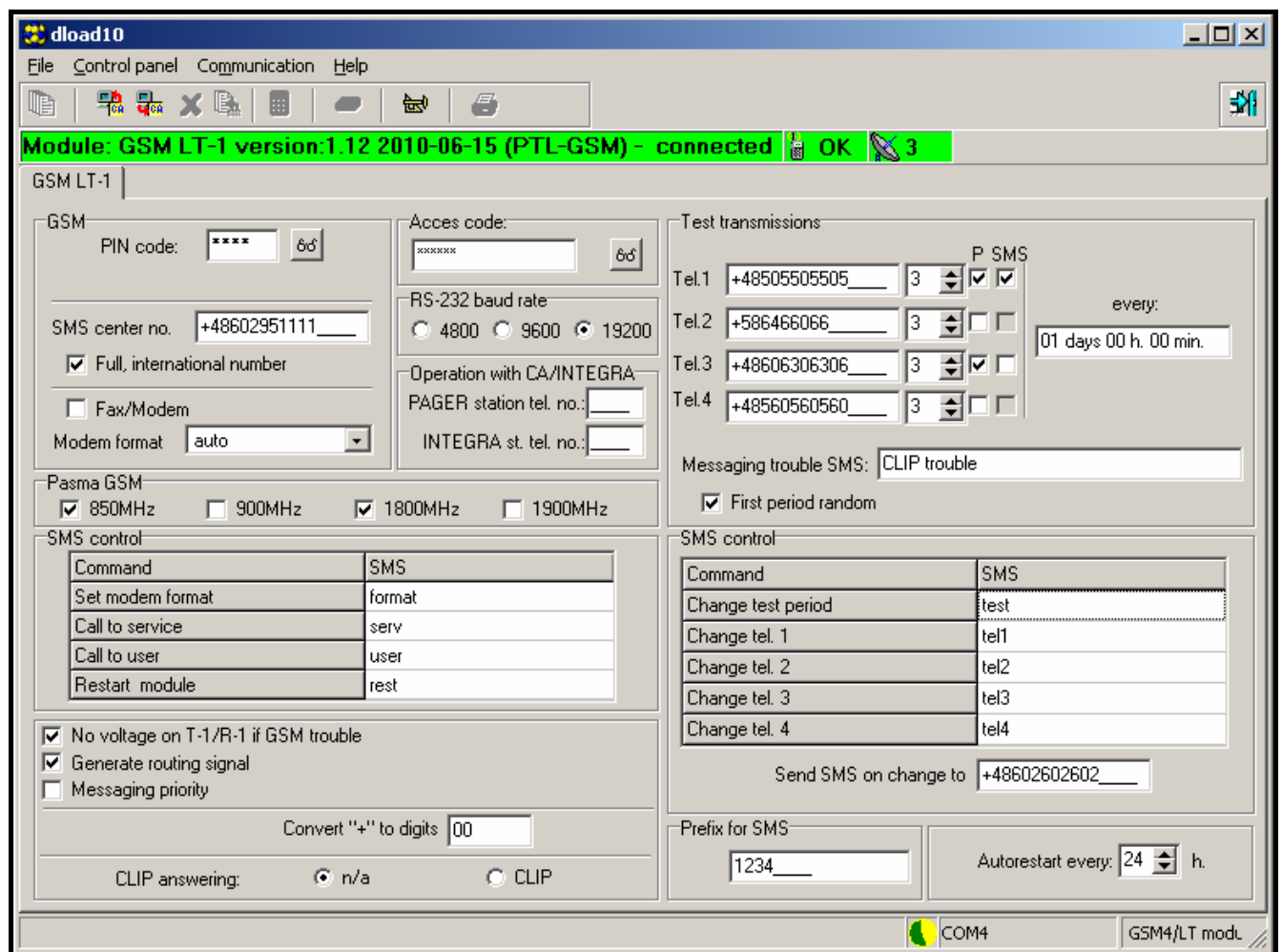


Figure 9.

10.2.3 Function list

[0][1][*][*][?][?][?][?][#] – SIM card **PIN code** (4 digits). The code saved in module memory does not change the code stored on the SIM card. The [0][1][*][*][#] sequence deletes the PIN code from module memory.

[0][2][*][*][?][...][#] – **SMS center number** – the telephone number necessary for sending text messages. The number of its digits must be within the range of 1...16. The entered number depends on the GSM network, where the telephone is activated. **It must be preceded by the country code suitable for the operated network.**

The [0][2][*][*][#] sequence deletes the previously saved SMS center number.

[0][3][*][*][?][?][?][?][?][?][#] – **SMS password** (6 characters) required for a remote **change of the modem format**. Sending to the module of an SMS containing the [?][?][?][?][?][?]=NN sequence will change the modem operating format available in the GSM telephone. The two NN digits define the format as described in the function 08. Using DTMF signals it is possible to program a password comprised of digits only (0...9), while using the DLOAD10 program you can program a password comprised of both letters and digits. The [0][3][*][*][#] sequence deletes the previously programmed password.

[0][4][*][*][?][?][?][?][?][?][#] – **SMS password** (6 characters) which calls the **SERV** modem command. The function applies to interaction between the module and the CA-64/INTEGRA alarm control panel. Sending to the module of an SMS containing the programmed password makes the control panel call back to the number saved in its memory as the "Dload64 telephone"/"DLOADX telephone" in order to start the downloading function. If the control panel is to call back to another number, the number should be put into the SMS content as follows: [?][?][?][?][?][?]=dddd. (password, equality sign, telephone number, point). If the module receives an SMS message initiating connection with the INTEGRA control panel and the access from DLOADX program is blocked, the module will send a SMS message stating that "Remote access from DloadX program is not granted" to the number preprogrammed with function 26. Using DTMF signals it is possible to program a password comprised of digits only (0...9), while using the DLOAD10 program you can program a password comprised of both letters and digits. The [0][4][*][*][#] sequence deletes the previously programmed password.

[0][5][*][*][?][?][?][?][?][?][#] – **SMS password** (6 characters) which calls the **USER** modem command. The function applies to interaction between the module and the CA-64/INTEGRA alarm control panel. Sending to the module of an SMS containing the programmed password makes the control panel call back to the number saved in its memory as the "GuardX telephone"/"Guard64 telephone" in order to start the remote communication with the GUARD64/GUARDX program. If the control panel is to call back to another number, the number should be put into the SMS content as follows: [?][?][?][?][?][?]=gggg. (password, equality sign, telephone number, point). Using DTMF signals it is possible to program a password comprised of digits only (0...9), while using the DLOAD10 program you can program a password comprised of both letters and digits. The [0][5][*][*][#] sequence deletes the previously programmed password.

[0][6][*][*][?][?][?][?][#] – **PAGER station number** is 4 digits or a sequence of 1 to 4 digits (depending on the module firmware version). If the module detects these digits at the beginning of the dialed number, it will handle the further part of the number as the number of cellular phone to which it is necessary to send the SMS. The SMS contents should be transmitted by the alarm control panel in the "pager" system form. The [0][6][*][*][#] sequence will delete the number.

[0][7][*][*][?][?][?][?][#] – **CA-64 station number** (4 digits). This function is not used. It applies to interaction with the CA-64 control panel. The [0][7][*][*][#] sequence will delete the number.

[0][8][*][*][?][?][#] – **modem standard format** (2 digits) – the format in which the module will communicate with the modem of service/user computer. The format code is to be entered as two digits according to the table below:

format code	modem format
00	auto
01	300 V.21
02	1200 V.22
03	1200/75 V.23
04	2400 V.22bis
05	2400 V.26ter
06	4800 V.32
07	9600 V.32
12	9600 V.34
14	14400 V.34
65	300 V.110
66	1200 V.110/X.31
68	2400 V.110/X.31
70	4800 V.110/X.31
71	9600 V.110/X.31
75	14400 V.110/X.31

[0][9][*][*][?][#] – **RS-232 port speed**. Parameter defining the rate of data transfer between the module and the control panel/computer. You should enter a digit to define one of the following rates:

- 0 – 4800 bps,
- 1 – 9600 bps,
- 2 – 19200 bps.

[1][0][*][*][?][#] – **SMS center international number**. The option indicates whether the programmed SMS center number is a full international number.

- 0 – no (for local networks),
- 1 – yes (recommended).

[1][1][*][*][?][#] – **Fax/Modem**. Option indicating whether the user permits a modem transmission to be carried out by the module. You should program one of the following values:

- 0 – transmission disabled,
- 1 – transmission enabled.

[1][2][*][*][?][?][?][?][?][#] – **access code** (6 digits) for programming the module by means of a telephone set. The [1][2][*][*][#] sequence will delete the code i.e. deny the access to programming. When you delete the code and quit the programming mode, you will only be able to change the settings and restore the code by using a PC computer and the DLOAD10 program.

[1][3][*][*][1][2][3][4][#] – **restore default settings** (the default access code for module programming is 123456).

[1][4][*][*][#] – **check antenna signal strength**. The module, by means of handset beeps, informs the user about the level of received antenna signal. The signaling is same as that of the SIG LED. The following answer beeps are possible:

- two long (LL)* – antenna signal strength = 0,

one short (S) – antenna signal strength = 1,
two short (SS) – antenna signal strength = 2,
three short (SSS) – antenna signal strength = 3,
four short (SSSS) – antenna signal strength = 4 (maximum).

[1][5][*][*][#] – check telephone status. The module informs the user about its status. The signaling is same as that of the STAT LED. The following answer beeps are possible:

four short (SSSS) – no SIM PIN code,
three short (SSS) – wrong SIM PIN code,
short and long (SL) – SIM PUK code required,
two short (SS) – no communication with GSM telephone,
oneshort (S) – module operation OK,
two long (LL) – module restart after power-up,
two short and one long (SSL) – PH-SIM PIN code required,
eight short (SSSSSSSS) – no SIM card,
three long (LLL) – SIM card damaged,
four beeps of diminishing length (LISs) – SIM card busy,
long, short, long, short (LSLS) – incorrect SIM card,
three short and one long (SSSL) – SIM PIN2 code required,
four short and one long (SSSSL) – SIM PUK2 code required,
one long, three short and one long (LSSSL) – other error.

[1][6][*][*][?][?][?][?][?][?][?][?][#] – enter PUK code (8 digits) into the SIM card. This function can only be performed when the module status indicates (by LED or beeps) that the PUK code is required. This code is not stored anywhere, but after entry it is transferred to the SIM. When the PUK is entered and the telephone is unblocked, the PIN code currently programmed in the module settings will be loaded into the SIM memory.

Note: *After entering the PUK code, the SIM card will get unlocked and its PIN code **will be changed** to that currently programmed in the module memory. In order to avoid such a situation, the PIN code entered by user into the module memory must be identical to that saved on the SIM card. The DLOAD program enables viewing the PIN code currently programmed in the module, to prevent the card from being blocked.*

Entry of a correct PUK code will be confirmed by three short beeps (SSS) – this confirmation will appear after a few seconds' delay because of the data processing in the GSM telephone. If the PIN code is not entered into the module, the function will not be executed and the device will generate two long beeps (LL).

[1][7][*][*][?][#] – deenergizing the telephone line together with signaling fault at the FLT output:

0 – do not switch off voltage on telephone line terminals,
 1 – switch off voltage on telephone line if FLT is active

(programming mode – if it was turned on before activating FLT, it will be operative, but only until hang-up).

[1][8][*][*][?][#] – generating the routing signal (sound signal for setting up connection):

0 – routing signal OFF,
 1 – routing signal ON.

[1][9][*][*][?][#] – test transmission. The function enters the period of CLIP test transmission in a simplified way. The following values can be entered:

0 – no test transmission,
 1 – test transmission period 2 h 58 min,

- 2 – test transmission period 5 h 57 min,
- 3 – test transmission period 11 h 56 min,
- 4 – test transmission period 23 h 55 min,
- 5 – test transmission period 2 d 23 h 53 min,
- 6 – test transmission period 6 d 23 h 30 min.

If the function is called by entering **[1][9][*][*][?][?][#]**, the second "?" character will determine whether the test function is to be random or not:

- 0 – no,
- 1 – yes.

By default, the random transmission is disabled.

[2][0][*][*][?][#] – **test transmission priority**. This option determines whether the test transmission will override the call being just carried out by the module. If yes, the current connection will be terminated whenever there is a need for the test transmission. If no, the test transmission will be carried out on completion of the call by the control panel/user:

- 0 – no,
- 1 – yes.

[2][1][*][*][?...][#] – **telephone number 1 for the test transmission**. The number of digits must be within the range of 1...16. The number should be programmed with „+“ at the beginning, followed by the country code. The **[2][1][*][*][#]** sequence will erase the previously saved telephone number.

[2][2][*][*][?...][#] – **telephone number 2 for the test transmission**. The same settings as for telephone no. 1.

[2][3][*][*][?...][#] – **telephone number 3 for the test transmission**. The same settings as for telephone no. 1.

[2][4][*][*][?...][#] – **telephone number 4 for the test transmission**. The same settings as for telephone no. 1.

[2][5][*][*][?][?][?][?][?][?][#] – **test transmission period** (6 digits: ddhhmm). As distinct from function 19, this function enables any transmission period to be entered. The programmed digits have the following meaning:

- dd – number of days (max. 31),
- hh – number of hours (max. 23),
- mm – number of minutes (max. 59).

If the function is called by entering **[2][5][*][*][?][?][?][?][?][?][#]**, the seventh "?" character will determine whether the second test transmission is to be random or not:

- 0 – no,
- 1 – yes.

By default, the random transmission is disabled. Programming zeros only will reset the test transmission.

[2][6][*][*][?...][#] – **telephone number to confirm SMS control**. The number to which the module will send an SMS to inform about the current settings, provided that the user has changed the settings by means of an SMS. The telephone number must be preceded by the „+“ character and country code, corresponding to the currently used GSM network. The **[2][6][*][*][#]** sequence will erase the previously saved telephone number.

[2][7][*][*][?][?][?][?][?][?][#] – **SMS password** (6 characters) makes it possible to remotely change the **test transmission period**. Sending to the module an SMS with the **[?][?][?][?][?][?]=P** sequence, where P is a parameter corresponding to the description contained in function 19, will save the new parameter, programmed with function 19, in the module memory. Using the DTMF signals, you can program passwords composed from

digits only (0...9), whereas the DLOAD10 program makes it possible to program passwords composed from letters and digits. The [2][7][*][*][#] sequence will erase the previously programmed password.

[2][8][*][*][?][?][?][?][?][#] – SMS password (6 characters) makes it possible to remotely change the **telephone number 1 for test transmission**. Sending to the module an SMS with the [?][?][?][?][?][?]=nnnn. sequence (password, equality sign, telephone number, dot), where nnnn is the new telephone number 1 for test transmission, will change the parameter programmed with function 21. The new telephone number must be identical in form to that programmed with the appropriate function. Using the DTMF signals, you can program passwords composed from digits only (0...9), whereas the DLOAD10 program makes it possible to program passwords composed from letters and digits. The [2][8][*][*][#] sequence will erase the previously programmed password.

[2][9][*][*][?][?][?][?][?][#] – SMS password, changing the telephone number 2 for test transmission. Settings as for telephone number 1.

[3][0][*][*][?][?][?][?][?][#] – SMS password, changing the telephone number 3 for test transmission. Settings as for telephone number 1.

[3][1][*][*][?][?][?][?][?][#] – SMS password, changing the telephone number 4 for test transmission. Settings as for telephone number 1.

[3][2][*][*][?][...][#] – number of attempts to send test transmission to telephone no. 1.
You can program from 1 to 15 attempts.

[3][3][*][*][?][...][#] – number of attempts to send test transmission to telephone no. 2.
You can program from 1 to 15 attempts.

[3][4][*][*][?][...][#] – number of attempts to send test transmission to telephone no. 3.
You can program from 1 to 15 attempts.

[3][5][*][*][?][...][#] – number of attempts to send test transmission to telephone no. 4.
You can program from 1 to 15 attempts.

[3][6][*][*][?][#] – performance of test transmission to telephone no. 1:

0 – test transmission without acknowledgement,

1 – test transmission with acknowledgement,

2 – test transmission with acknowledgement and SMS send, when there is no acknowledgement.

[3][7][*][*][?][#] – performance of test transmission to telephone no. 2. The same settings as for telephone no. 1.

[3][8][*][*][?][#] – performance of test transmission to telephone no. 3. The same settings as for telephone no. 1.

[3][9][*][*][?][#] – performance of test transmission to telephone no. 4. The same settings as for telephone no. 1.

[4][0][*][*][?][#] – contents of SMS sent in case of no acknowledgement:

0 – delete SMS contents,

1 – enter default contents: „CLIP failed”.

Note: The DLOAD10 program makes it possible to enter any contents of the SMS.

[4][1][*][*][?][...][#] – substitutes the "+" character of incoming number with a randomly chosen sequence (from 0 to 4 digits) – the function refers to the CLIP type information and work in conjunction with STAM-1, STAM-2 monitoring station.

[9][9][*][*][?][#] – type of response to the user's CLIP in order to confirm availability of the device:

0 – none,

1 – CLIP.

[9][9][*][*][7][8][9][0][#] – module test mode. Calling the function will extinguish all the LEDs. Then the LEDs will go on for about 1 second in the following sequence: STAT, SIG, TX, RX. Next, the FLT output will activate.

[1][1][1][*][*][????][#] – GSM bands. The frequency range in which the phone installed in the module can work. Depending on whether the frequency is to be selected or not, the "?" characters corresponding to the consecutive bands (850 MHz, 900 MHz, 1800 MHz, 1900 MHz) can take the following values:

- 0 – no,
- 1 – yes.

You can select any combination of bands. If all or none of them are selected, the module will recognize that all frequencies are available and will choose the most suitable one(s).

Note: The option is only available for some telephone models.

[1][1][2][*][*][?????][#] – SMS code to restart the module. Using DTMF signals, you can program a code composed only of (0–9) digits, and while using the DLOAD10 program - a code composed of letters and digits. The [1][1][2][*][*][#] sequence deletes the previously programmed code.

[1][1][3][*][*][?...][#] – module autorestart time. The function enables programming the time (from the 1 hour to 25 hours) after which the module, if not used, will restart the phone. To use the module means to:

- answer a call when calling from the module,
- receive the ring signal in the module,
- confirm sending SMS message from the module,
- receive SMS message,
- use the module as external modem.

The first restart of the phone will take place after the preprogrammed time from the settings being written to the module has elapsed.

[1][1][4][*][*][?...][#] – a country code prefix added before the cellular phone number, to which SMS message is to be sent after receiving a pager type message. The number of digits must be contained within the 0 to 8 range. The [1][1][4][*][*][#] sequence will erase the previously programmed prefix.

11. SPECIFICATIONS

Supply voltage	12 V DC ±15%
Average current consumption in the GSM telephone standby mode	100 mA
Average current consumption in the GSM telephone active mode	250 mA
Required minimum output current, power supply unit	500 mA
Current-carrying capacity, FLT output.....	50 mA
Weight.....	216 g

ATTENTION: The SATEL Company recommends that performance of the GSM LT-1 communication module be regularly tested. An efficient GSM module, which interacts with the security system, greatly increases the chance of successful transmission of alarm information. However, for reasons beyond the Manufacturer's control, it cannot give 100% guarantees message delivery.

IMPORTANT:

PIN..... **PUK**.....

Telephone No.

.....

.....

.....

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