SATEL®

COMMUNICATION MODULE
GSM LT-2S

USER MANUAL

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⚠️ # 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 SIM300CZ telephone without external antenna connected.

Making any construction changes or unauthorized repairs is prohibited.

DECLARATION OF CONFORMITY		
Product: Communication module, GSM LT-2S	**Manufacturer:**	SATEL spółka z o.o. ul. Schuberta 79 80-172 Gdańsk, POLSKA tel. (+48 58) 320-94-00 fax. (+48 58) 320-94-01
Product description: The GSM LT-2S communication module, designed to interact with the SIM300C mobile phone, makes simulation of the analog telephone line possible by using the cellular communication, and thus enabling telephone messaging about emergency situation in the facility, if the analog line is not available.		
The product is in conformity with the following EU Directives: **LVD** 2006/95/WE **EMC** 89/336/EWG + 91/263/EEC, 92/31EEC, 93/68/EEC		
The product meets the requirements of harmonized standards: LVD: PN-EN 60950:2000 EMC: EN ETS 300 386-2:1997; EN 55022:1998; EN 61000-4-2/-3/-4/-5/-6		
Gdańsk, Poland 14.09.2007	*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***		

CONTENTS

1. GSM LT-2S MODULE FEATURES

- Simulation of analog telephone line by the use of cellular connection.

- Presentation of the calling number (CLIP) by means of FSK or DTMF.

- 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 SIM300C three-range industrial cellular telephone, compatible with GSM 900/1800/1900MHz networks.

- Four inputs, the violation of which (and restoring to normal status) can be monitored by SMS messages or CLIP.

- Control of antenna signal level.

- RS port for:
    - programming the module from a computer by using the DLOAD10 program (version 1.00.29 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.

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* – 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).
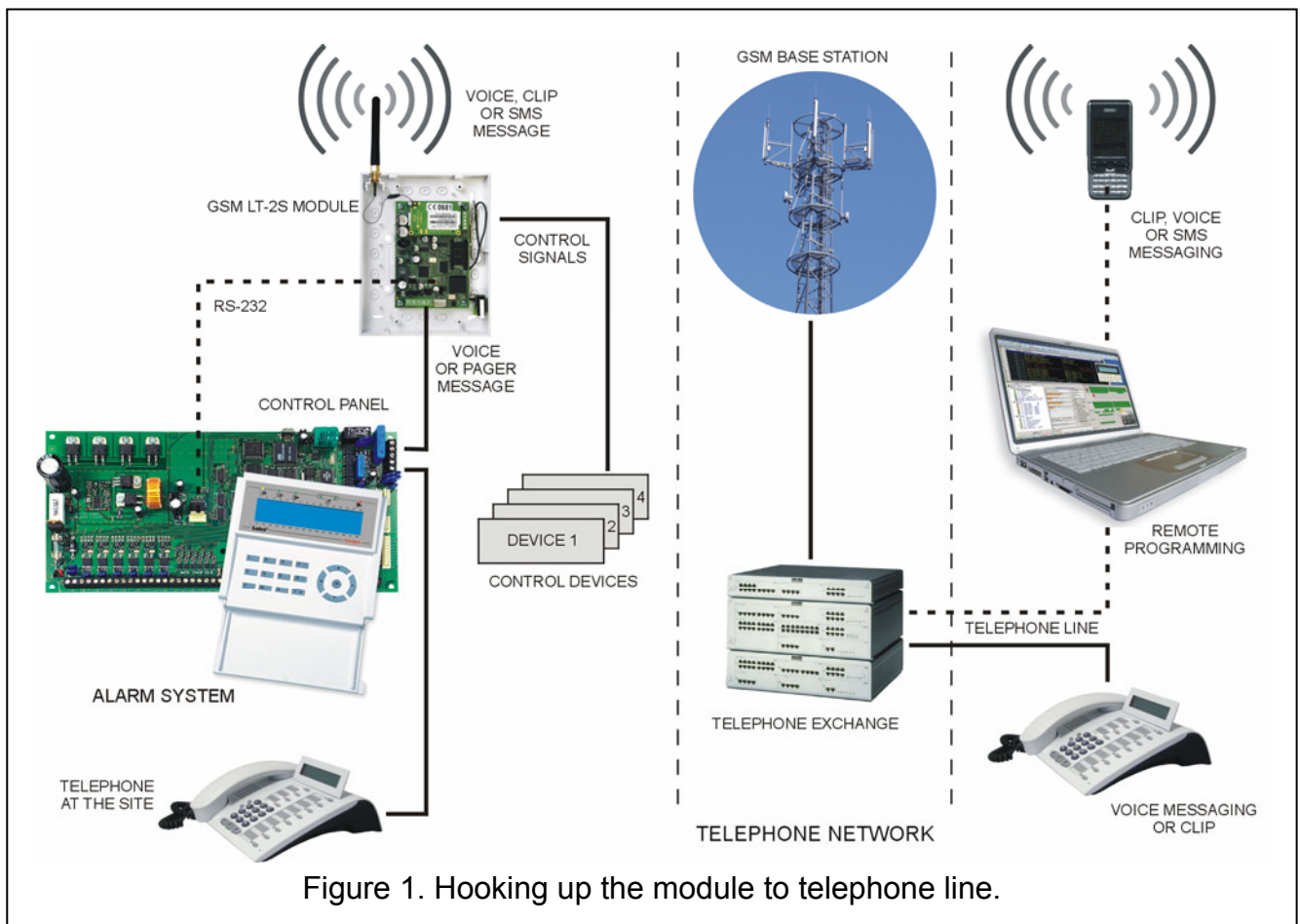
Figure 1. Hooking up the module to telephone line.

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 ±15%)
GND – ground (0 V)
FLT – alarm output, SIM300CZ 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)
IN1–IN4 – inputs

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 (phone damaged or no SIM card), 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.
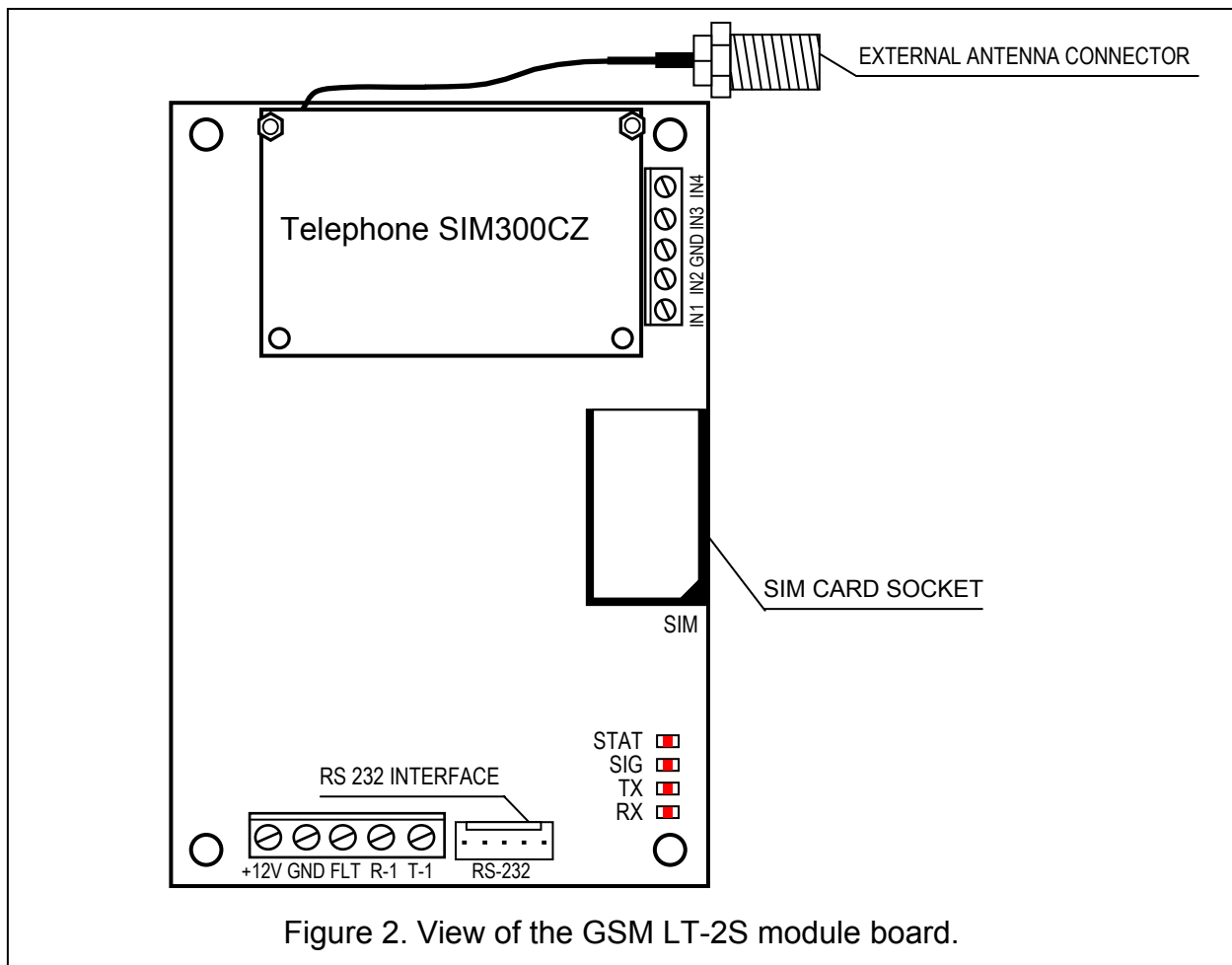
Figure 2. View of the GSM LT-2S module board.

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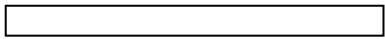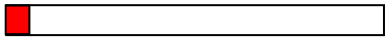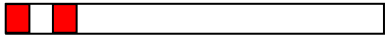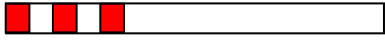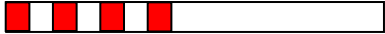
STAT – indicates the module status by a corresponding number of flashes with specified duration. Shown symbolically below are single cycles of various LED lighting modes with their meaning described. The shaded fields meaning the LED "on" and the blank fields – the LED "off":

– (LED off) module power off
– no PIN code
– wrong PIN code
– PUK code required
– no communication with SIM300C 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 SIM300CZ telephone (the LED goes out when the module indicates 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.

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).

Figure 3. Load connection to FLT output.
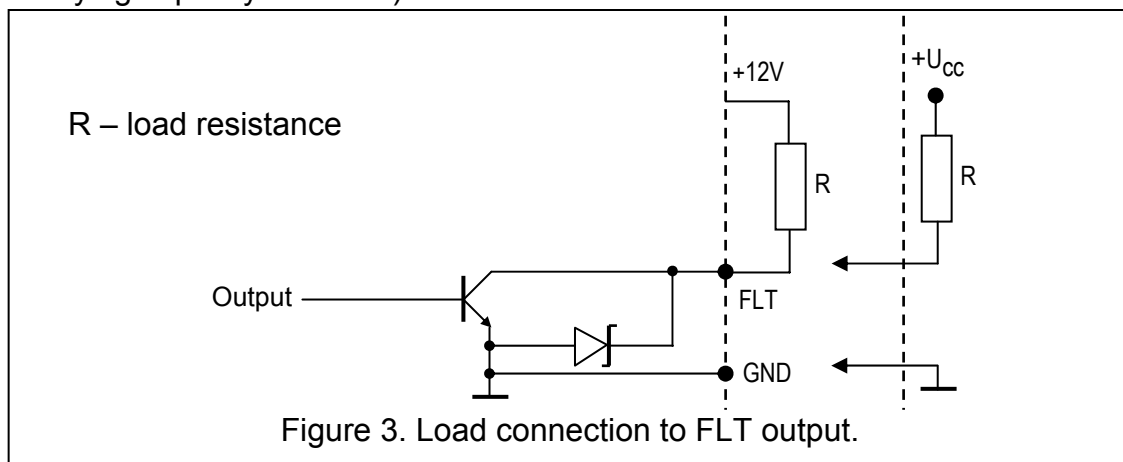
4. OPERATING THE SIM300CZ TELEPHONE

As any other cellular telephone, the SIM300C industrial telephone requires a **SIM activation card** to operate. The user of the GSM LT-2S module and the SIM300CZ telephone 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. 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.

The PUK code can also be entered into the SIM card from an ordinary telephone set connected to the module terminals R-1 and T-1 (programming function 16), however, it requires that the PIN code previously saved in the GSM LT-2S be entered into the SIM card. (function No. 01)

When making connection, the telephone transmits its own identifier (ID), unless this option is reserved at the GSM operator (change of option is available via ordinary cellular telephone).

The SIM300CZ cellular telephone is fitted with a special cable, terminated with connector for external antenna (see Fig. 2).
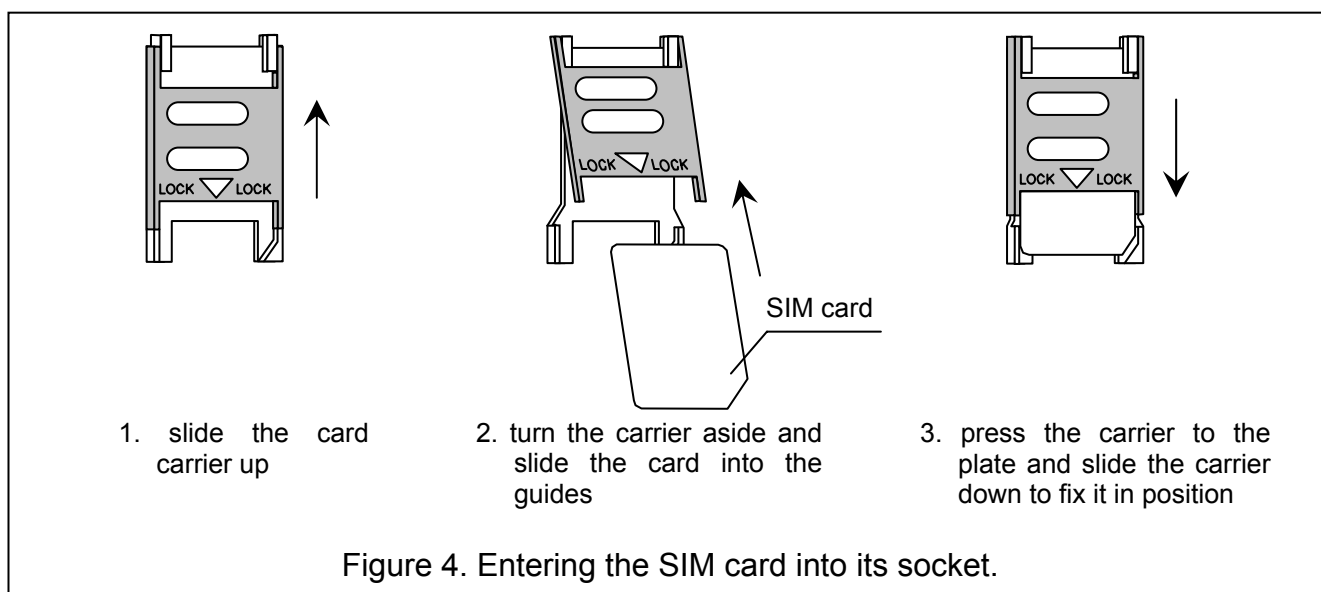
5. INSTALLATION

It should be borne in mind during installation that the GSM LT-2S 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 SIM300CZ 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. 4).

6. Turn on power supply.

1. slide the card carrier up

2. turn the carrier aside and slide the card into the guides

3. press the carrier to the plate and slide the carrier down to fix it in position

Figure 4. Entering the SIM card into its socket.

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

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

If the supply voltage is lower than 9.8 V, restart of the module will follow. 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 output terminals of the control panel telephone circuit. 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** to the SIM300CZ cellular telephone 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.

The GSM LT-2S module makes it also possible to present the calling party number (CLIP) by means of FSK or DTMF.
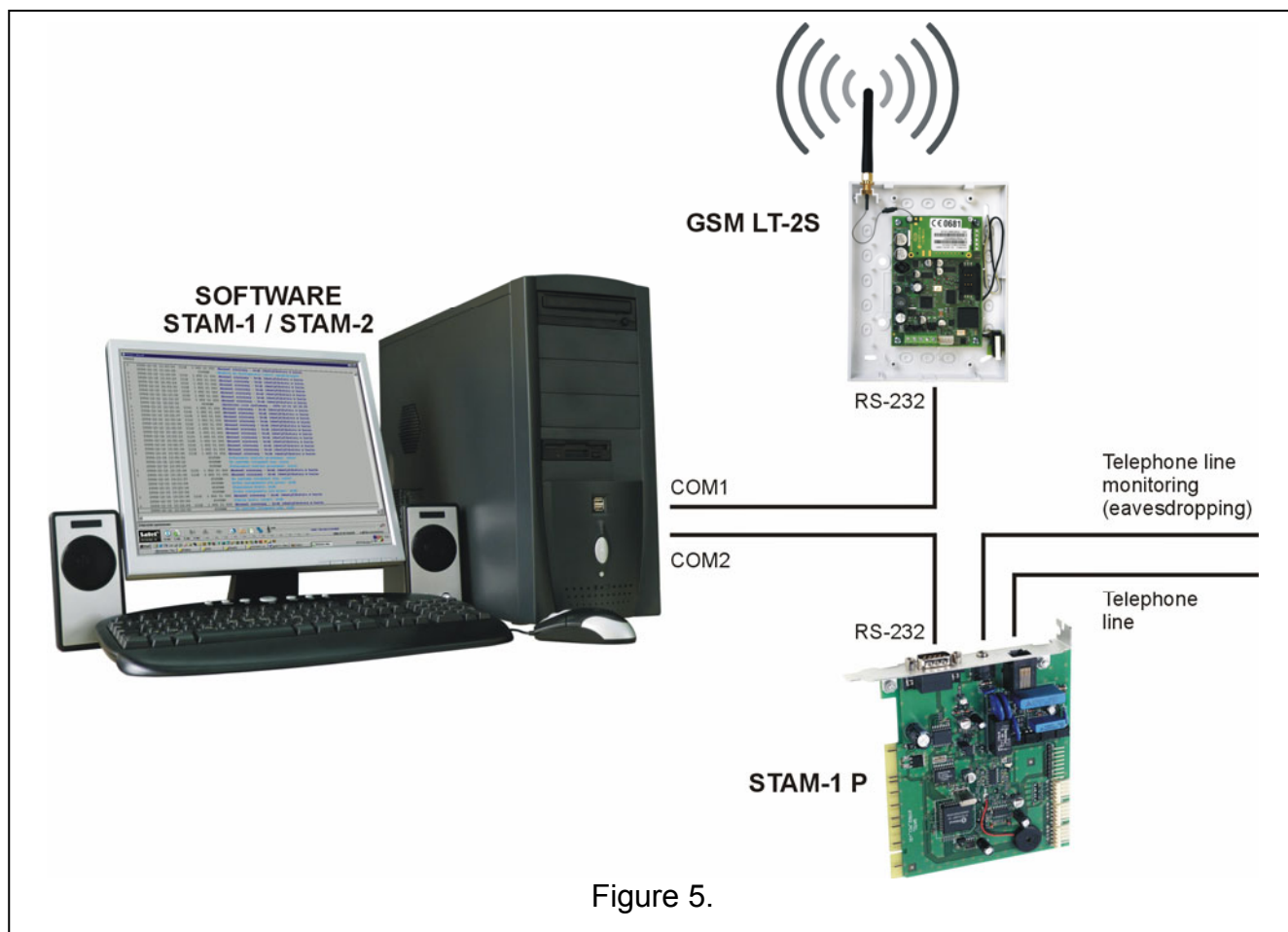
7. GSM LT-2S WITH MONITORING STATION

Figure 5.

The GSM LT-2S 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. 5. The STAM-1 TRNK expansion board can also be used to connect the module.

Connect the GSM LT-2S module to the computer serial port (COM1 or COM2) or, alternatively, to the RS-232 port on the expansion board, by means of the typical cable for programming the CA-10, CA-64 or INTEGRA control panels.

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. INPUTS

The GSM LT-2S module is fitted with four inputs whose technical design is similar to that of the control panel zones. Support of the inputs consists in monitoring any changes of their status. Supervision of individual inputs can be bypassed by the module user. The inputs are supported by the module irrespective of the telephone line support (R-1, T-1).

8.1 DESCRIPTION OF THE INPUTS

The detectors of both types, **NC** and **NO**, can be connected to the module. The type of detectors is to be entered in the service function. The wires from the detector are to be connected between the input terminal IN and ground (GND), as shown in Fig. 6.

Figure 6.
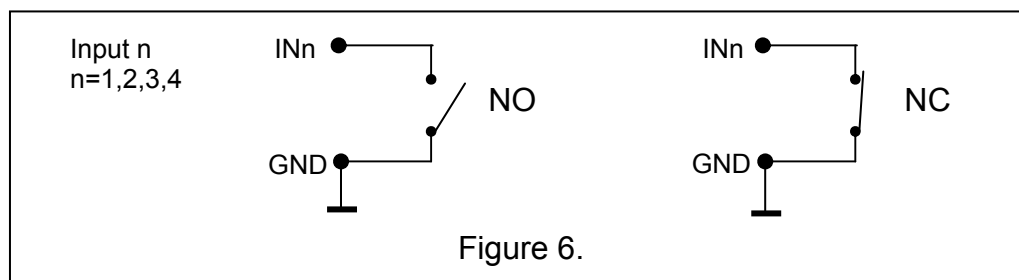
The first parameter, **the sensitivity** of the input is programmed for each input (functions 45–48). The sensitivity of the input is defined as a minimum time which must elapse from the moment of the status change at the input (open for NC input, closed for NO input), in order to classify such change as violation of the input. This time delay can have the values within the range from 20 ms to 1275 ms.

"The time to restore the input" is the next parameter to be programmed for each input (function 44). Time to restore the input is defined as a time delay which must expire from the termination of the input violation to the moment in which the module changes the symbol displayed on LCD display (from **I** to **i** or from **T** to **t**) and re-enables the supervision of input status (4 seconds or 4 minutes).

Controlling the operation of inputs consists in **bypassing** and **unbypassing** their operation. This control can be performed **manually** or **remotely**. The manual bypassing option can be disabled (in service mode, using function 95). The remote control is effected by means of a telephone which supports DTMF signaling (functions 82–91) as well as through SMS messages (functions 71–80).

The input can be **automatically** bypassed after 1–15 violations, for a specified time, or permanently (functions 49–60). The input is bypassed after the end of violation. Input can also be bypassed after violating another input (designated as the bypassing input – function 70).

The bypassed status of the inputs as a result of violating the *Bypassing input* will last as long as the given input is violated.

9. DESCRIPTION OF METHODS OF CONTROLLING THE STATUS OF THE BYPASSING THE INPUTS

The GSM LT-2S module makes it possible to control bypassing the inputs in three ways: locally – by DTMF signal of the telephone set directly connected from the R-1, T-1 terminals ; remotely – by DTMF signal after "reaching" the module number from a telephone (either mobile or stationary); or through SMS message.

9.1 CONTROLLING DTMF SIGNAL FROM R-1, T-1 TERMINALS

To have the remote control by dual tone phone push-button (connected to R-1, T-1 terminals) it is necessary to properly program the module by using the service functions, as follows:

- Enter the device service mode.
- Using function 95, determine the inputs to be bypassed manually.
- Program the (6-digit) **control code** to enable the inputs to by bypassed/unbypassed locally – function 96.
- Exit the service mode by hanging up.

In order to bypass/unbypass an input by using the telephone set connected to the R-1, T-1 terminals, do the following:

- Pick up the telephone receiver and enter the **control code** (if valid – the device will generate four short and one long beeps).
- Program the input status (according to the scheme described in function 96). Acceptance of the command will be acknowledged by three short beeps.

Replace the receiver to make the device return to its normal operating mode.

9.2 REMOTE CONTROLLING BY DTMF SIGNALS FROM TOUCH – TONE TELEPHONE KEYPAD

To have the remote control by dual tone phone push-button, it is necessary to properly program the module by using the service functions. It can be done by using a telephone directly connected to the R-1, T-1 terminals, or a computer with DLOAD10 program installed. To program the module locally – through DTMF – do as follows:

- Lift the telephone receiver and enter the service mode.
- Set the required duration of "*Calling time*" – function 93 (remember that remote control will be prevented by the module if the time value is "0" !).
- Program the (four-digit) **control codes** for bypassing the inputs (functions 82–86). The codes must not be repeated.
- Exit the service mode by hanging up.

For remote bypassing/unbypassing the inputs follow the sequence:

- dial the SIM300CZ telephone number from any telephone having DTMF features (number of the SIM card).
- wait until "Time of ringing" is completed after which the module will answer a call and generate three short sounds (beeps) acknowledging that the module is ready to have the DTMF controlling enabled.

Note: When receiving a call, the module applies ringing tone to extension line for the duration equal to "Time of ringing". Answering a call from this extension line makes it impossible to use the functions for controlling the inputs.

- Enter from dual tone phone keypad the required control passwords (utilizing DTMF tone signals). After recognizing the password by the module, the respective action will be taken, depending on the password loaded. For example, recognizing the password loaded in the module by the function 82 – "*Bypassing IN4*" will bypass the supervision of input 4.

- The module acoustically acknowledges the execution of the function by audible indication as follows:
  - after implementing the function for bypassing/unbypassing the input, the module automatically checks the status of the inputs and generates **four sounds** corresponding to the status of consecutive inputs (1–4):
    - **short beep** – input unbypassed
    - **long beep** – input bypassed

    (for instance: the sequence of signals – short, long, short, long indicate that inputs 1 and 3 are unbypassed, and inputs 2 and 4 are bypassed),
  - **two long beeps** – the password is unknown to the module

- Enter the next control password or hang up.

Note: *If you have made a mistake when entering the code, press the ∗ or # key and re-enter the code from the beginning. If you enter a code unknown to the module three times, the connection will be lost and the module will "hang up".*

9.3 REMOTE CONTROL BY SMS MESSAGES

To have the remote control of the GSM LT-2S by SMS, it is necessary to properly program the module by using the service functions.

Contents of the control SMS messages (6 alphanumeric characters) can be programmed by means of a telephone set connected directly to the R-1, T-1 terminals, or from a computer with the DLOAD10 program installed. However, it should be remembered that using the DTMF signaling you can only program the SMS messages composed of digits (0–9). The DLOAD10 program allows the user to enter SMS messages of any content.

To program the module from R-1, T-1 terminals, do as follows:

- Lift the telephone receiver and enter the service mode.

- Program the content of control SMS messages (bypassing: functions 71–75, unbypassing: functions 76–80). The content of the next SMS messages must not repeat! (function 81 makes it possible to program the content of SMS message informing about the status of inputs. Having received this message, the GSM LT-2S module will send an SMS with input status information to the selected number).

- Exit the service mode by hanging up.

In order to remotely bypass/unbypass an input by using the SMS message, do as follows:

- using any mobile phone (or a stationary one, if equipped with the SMS function), send – to the telephone number SIM300CZ – a text message containing the suitable **control code** (a 6-character string, without any spaces or characters not belonging to the code inside). Recognizing the code by the module in the message body will initiate the action, depending on which code has been sent.

It is possible to send to the module an SMS message containing the code alone, as well as a message longer than the code itself (it can be part of a longer word). It is important that the code be placed in the initial part of the message (among the 32 first characters). Thus a verbal description of the current operation can be placed into memory of the telephone from which the control will be executed (SMS sent). This will relieve the user from the necessity to memorize the codes or the functions realized by them.

Only one control code can be sent in one message. If there are more codes, only the first one will be executed by the module. Sending an SMS message which contains no code (or contains a wrongly entered code) will cause no response from the device. The control function is executed as soon as the message is received and the control code recognized. Once the function has been executed, the received message will be deleted and the telephone will be ready to receive a next control SMS message.

10. MESSAGING

This function is related to the attendance of module's inputs, and is activated by violation or restoration to normal status (termination of violation) of the input, which is not bypassed. The messages can be sent maximally to four telephone numbers. The messaging can have a form of SMS message or CLIP.

Another form of messaging is the "test transmission". In order to inform the user of its operability, the module will send an SMS with suitable contents, or call selected telephone numbers within the programmed time period. Information on the status of inputs, and telephone line availability can be attached to the SMS message (function 94).

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 current 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).

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, set also the "test transmission priority" option (function 20), as required.

10.1 SMS MESSAGES

The SMS messages to be transmitted can have standard contents or can be modified by the user (using DLOAD10 program only). The **length of the message** stored in the module's memory is limited to **32 characters**.

The standard content of the SMS messages sent is as follows:

Event	SMS message
Input 1 violation	Input IN1 violation
Input 1 end of violation	Input IN1 restore
Input 2 violation	Input IN2 violation
Input 2 end of violation	Input IN2 restore
Input 3 violation	Input IN3 violation
Input 3 end of violation	Input IN3 restore
Input 4 violation	Input IN4 violation
Input 4 end of violation	Input IN4 restore
Test transmission	Test message

10.2 "CLIP"

Notification messaging is also possible owing to the CLIP service which consists in displaying the telephone number of the calling subscriber. This type of messaging consists in dialing a programmed telephone number by the SIM300CZ telephone and then breaking the connection after a time period specified in the settings. 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, however it entails a toll being charged by the network operator.

10.2.1 "CLIP" with acknowledgement

The transmission acknowledgement consists in the telephone user rejecting or receiving the connection set up by the GSM LT-2S 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. The module will call in turn each of the programmed numbers. Having detected the acknowledgement of CLIP transmission, the module will finish dialing the given telephone number.

For each of the 4 telephone numbers programmed to be CLIP notified (functions21–24), you can select a separate option of sending SMS if there is no acknowledgement of receiving the CLIP information (functions 36–39). 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 SMS content will correspond to the existing situation.

10.2.2 "CLIP" 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.

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.*

To enable the messaging, it is necessary – after switching ON the SIM300CZ telephone and connecting the sensors to the inputs – to program the module by using the service functions, as follows:

- Enter service mode.

- Program at least one telephone number to which the message is to be transmitted (function 21–24).

- Program the required parameters for the inputs (**type, sensitivity, time to restore, automatic bypassing**)

- If the SMS messaging is selected, program **SMS Centre Number** (function 02) and the **SMS message texts** (only in DLOAD10).

All functions for programming the passwords which control the status of the bypass of inputs are described in section "Description of functions for programming the module" (pages xx–xx).

11. TRANSMITTING SMS MESSAGES

The alarm occurred on secures site can initiate the telephone messaging mode by the alarm control panel. If the alarm control panel has the function for messaging to pager system, it can be used for sending SMS messages to the cellular telephone number. The message transmitted by the control panel is transferred to the GSM LT-2S module, not to pager station. For example: the alarm control panel CA-64 or INTEGRA can send messages to three different paging systems. If one of pager system is assigned to the operation with the GSM LT-2S module, the remaining two can perform normal function.

To enable the SMS messages to be sent, pre-program telephone number of pager station at the alarm control panel and load appropriate text to be sent into the control panel memory.

The telephone number, as programmed in the control panel, must consist of:

1. The "pager station number" preprogrammed in the GSM LT-2S module (function 6).
2. The cellular phone number to which the SMS message is to be sent (with required country code prefix but without "+" mark at the beginning).

*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.*

11.1 DESCRIPTION OF THE PROCEDURE FOR CONVERTING PAGER MESSAGE INTO SMS MESSAGE

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, 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 SIM300CZ cellular telephone as SMS text message. The subscriber's number to whom the message is to be sent, is compiled from the "SMS prefix" pre-programmed in the module and the second part of the number received from the alarm control panel.

Note: Pager number must be unique and can not be the same as any prefix, outgoing numbers or 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 to be programmed together with the cellular phone number.

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.

The parameters of the pager system signal should be **programmed at the alarm control panel** (or telephone set DT-1) 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

11.2 SENDING SMS MESSAGES FROM A STATIONARY TELEPHONE SET

The GSM LT-2S module user has an option to send SMS messages form 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 connected to the terminals R-1 and T-1.

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. The addressee telephone number must be identical in form as when receiving by the module of the PAGER message from the control panel (the country prefix must be entered before the cellular phone number).

3. The properly received number is acknowledged in the handset by two beeps generated by the module (the PAGER station responds in the same way). Lack of acknowledgement or a busy signal means a dialing error and then the procedure must be started anew.

Figure 7. Assignment of alphanumeric characters to telephone keypad.

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 Fig. 6). 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-2S 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.

12. 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 1.00.29 or later).

A non-configured GSM LT-2S 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.

12.1 PROGRAMMING BY MEANS OF A TELEPHONE SET (DTMF)

The stationary telephone set makes it possible to program all the module operating parameters by means of DTMF signals, as well as enables the module status and antenna signal level to be checked.

In order to change the settings or check the status you should first enter the GSM LT-2S module programming mode. This operation requires entering a six-digit access code. By default, this code is **123456** and can be changed. In case you have forgotten the code after the change, you can only view it or restore it by means of the computer and the Dload10 program.

In the process of programming, the module communicates with the user by means of beeps that can be heard in the telephone handset. These beeps (tones) are symbolically denoted in the function description by means of capital letters:

S – short beep

L – long beep

Calling the GSM LT-2S module programming mode:

* Lift the handset of the telephone connected to the module terminals R-1 and T-1 (the telephone must support the DTMF tone system).

* Select the following key sequence on the keypad:

    [∗][∗][∗][∗][∗][∗][?][?][?][?][?][?][∗][∗][∗][∗][∗][∗][#]
    (6 x asterisk;   access code;   6 x asterisk;   #)

* The module will confirm entering the programming mode with four short and one long beeps (SSSSL) hearable in the telephone handset and will wait for individual functions to be called to program the settings. It will remain in the programming mode until the handset is hanged up.

Note: The module accepts the call of programming mode irrespective of the signals it generates in the handset (e.g. the line busy signal can be heard, if there is no SIM card inserted).

Programming the module settings

Programming the module is effected by entering the suitable control functions. The general form of such a function looks as follows:

[x][x][∗][∗][?][?][?][?…][#]

In order to call the programming function, select the **function number** (two digits), press the **[∗][∗]** asterisk key twice, enter the **parameter** suitable for the given function and press the **[#]** key. The parameter length (number of characters [?]) depends on the type of function. Where the number of digits is not precisely defined (e.g. a telephone number), such a parameter is described with the following symbol: **[?...]**.

The numbers of telephones/PAGER stations may contain special characters: #, ∗, +. In order to program such a character from the telephone keypad, call the programming function and press successively the two keys:

[∗][1] = #

[∗][∗] = ∗

[∗][0] = +

Entering a correct command is signaled in the handset by three short beeps (SSS), while commands which are incomprehensible or have an incorrect number of characters are signaled by two long beeps (LL).

The function completed, the module returns to the programming mode. If you hang up, the module will quit the programming mode and return to the normal operating mode.

12.1.1 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 SIM300CZ 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 SMC content as follows: [?][?][?][?][?][?]=dddd. (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][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 "Guard64 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][4][∗][∗][#] sequence deletes the previously programmed password.

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.

[0][6][∗][∗][?][?][?][?][#]   – **PAGER station number** (4 digits). 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 – modem transmission disabled,

1 – modem transmission enabled.

[1][2][∗][∗][?][?][?][?][?][?][#]   – **access code** (6 digits) for programming the module by means of a telephone set (connected to the R-1, T-1 terminals). 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 SIM300CZ module

one short (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.

If the PIN code has not been programmed at all in the module settings, the PUK will not be transferred to the SIM300CZ. 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 SIM300CZ telephone.

[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   2h58min,

2 – test transmission   5h57min,

3 – test transmission period   11h56min,

4 – test transmission period   23h55min,

5 – test transmission period   2d23h53min,

6 – test transmission period   6d23h30min.

If the function is called as [1][9][*][*][?][?][#], the second "?" character will define whether the first test transmission period is to be random, or not:

0 – no,

1 – yes.

When the default settings are restored (function 13), the random transmission will be 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 messaging (including 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 1 for the messaging (including test transmission).** The same settings as for telephone 1 (function 21). The [2][2][*][*][#] sequence will erase the previously saved telephone number.

[2][3][*][*][?...][#]   – **telephone number 1 for the messaging (including test transmission).** The same settings as for telephone 1 (function 21). The [2][3][*][*][#] sequence will erase the previously saved telephone number.

[2][4][*][*][?...][#]   – **telephone number 1 for the messaging (including test transmission)**. The same settings as for telephone 1 (function 21). The [2][4][*][*][#] sequence will erase the previously saved telephone number.

[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 as [2][5][*][*][?][?][?][?][?][?][?][#], the seventh "?" character will define whether the first test transmission period is to be random, or not:

0 – no,

1 – yes.

When the default settings are restored (function 13), the random transmission will be 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 messaging**. 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 messaging,** 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** (6 characters) makes it possible to remotely change the **telephone number 2 for messaging.** The same settings as for telephone 1 (function 28). The [2][9][∗][∗][#] sequence will erase the previously programmed password.

[3][0][∗][∗][?][?][?][?][?][?][#]   – **SMS password** (6 characters) makes it possible to remotely change the **telephone number 3 for messaging.** The same settings as for telephone 1 (function 28). The [3][0][∗][∗][#] sequence will erase the previously programmed password.

[3][1][∗][∗][?][?][?][?][?][?][#]   – **SMS password** (6 characters) makes it possible to remotely change the **telephone number 4 for messaging.** The same settings as for telephone 1 (function 28). The [3][1][∗][∗][#] sequence will erase the previously programmed password.

[3][2][∗][∗][?...][#]   – number of CLIP notification attempts (for test transmission and for input violation/restore) to telephone no. 1. You can program from 1 to 15 attempts.

[3][3][∗][∗][?...][#]   – number of attempts of CLIP type messaging to telephone no. 1. You can program from 1 to 15 attempts.

[3][4][∗][∗][?...][#]   – number of attempts of CLIP type messaging to telephone no. 1. You can program from 1 to 15 attempts.

[3][5][∗][∗][?...][#]   – number of attempts of CLIP type messaging to telephone no. 1. You can program from 1 to 15 attempts.

[3][6][∗][∗][?][#]   – kind of CLIP messaging (for test transmission and for input violation/restore) to telephone no. 2:

0 – CLIP without acknowledgement,

1 – CLIP with acknowledgement,

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

[3][7][∗][∗][?][#]   – kind of CLIP messaging to telephone no. 2:

0 – CLIP without acknowledgement,

1 – CLIP with acknowledgement,

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

[3][8][∗][∗][?][#]   – kind of CLIP messaging to telephone no. 3:

0 – CLIP without acknowledgement,

	1 – CLIP with acknowledgement,
	2 – CLIP with acknowledgement and SMS send, when there is no acknowledgement.
[3][9][∗][∗][?][#]	– kind of CLIP messaging to telephone no. 4:
	0 – CLIP without acknowledgement,
	1 – CLIP with acknowledgement,
	2 – CLIP with acknowledgement and SMS send, when there is no acknowledgement.
[4][0][∗][∗][?][#]	– contents of SMS sent in case of no acknowledgement (default content of these SMS messages can only be changed by means of the DLOAD10 program).
	0 – delete SMS contents,
	1 – enter default contents (see page 11).
[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.
[4][2][∗][∗][?][#]	– identification of the calling number (CLIP):
	0 – disabled,
	1 – FSK,
	2 – DTMF.
[4][3][∗][∗][?][?][?][?][#]	– input types IN1–IN4:
	0 – NC,
	1 – NO.
[4][4][∗][∗][?][?][?][?][#]	– restore times, inputs IN1–IN4:
	0 – short (4 seconds),
	1 – long (4 minutes).
[4][5][∗][∗][?...][#]	– sensitivity of input IN1. The following values can be programmed (in milliseconds): 20, 40, 60, 80, 100, 130, 160, 200, 250, 300, 400, 500, 600, 800, 1000, 1275.
[4][6][∗][∗][?...][#]	– sensitivity of input IN2. The same value settings as for input IN1 (function 45).
[4][7][∗][∗][?...][#]	– sensitivity of input IN3. The same value settings as for input IN1 (function 45).
[4][8][∗][∗][?...][#]	– sensitivity of input IN4. The same value settings as for input IN1 (function 45).
[4][9][∗][∗][?...][#]	– number of violations after which the module will automatically bypass input IN1 (from 0 to 15), 0 – no bypassing.
[5][0][∗][∗][?...][#]	– number of violations after which the module will automatically bypass input IN2 (from 0 to 15), 0 – no bypassing.
[5][1][∗][∗][?...][#]	– number of violations after which the module will automatically bypass input IN3 (from 0 to 15), 0 – no bypassing.
[5][2][∗][∗][?...][#]	– number of violations after which the module will automatically bypass input IN4 (from 0 to 15), 0 – no bypassing.
[5][3][∗][∗][??...][#]	– time, after expiry of which the violation counter of input IN1 will be reset. The first "?" character determines the time unit (0 – seconds, 1 – minutes); enter a numerical value (from 0 to

127) in place of the other "?" characters; 0 – without counter reset.

Note! *The reset time of violation counter must be longer than the input restore time (see: function 44). Otherwise, the input will not be bypassed, because the counter sums up the input violations after the initial status is restored.*

[5][4][*][*][??...][#]   – time, after expiry of which the violation counter of input IN2 will be reset. The same settings as for input IN1 (function 53).

[5][5][*][*][??...][#]   – time, after expiry of which the violation counter of input IN3 will be reset. The same settings as for input IN1 (function 53).

[5][6][*][*][??...][#]   – time, after expiry of which the violation counter of input IN4 will be reset. The same settings as for input IN1 (function 53).

[5][7][*][*][??...][#]   – bypassing time, input IN1. The first "?" character determines the time unit (0 – seconds, 1 – minutes); enter a numerical value (from 0 to 127) in place of the other "?" characters; 0 – permanently bypassed (until manually unbypassed).

[5][8][*][*][??...][#]   – bypassing time, input IN2. The same settings as for input IN1 (function 57).

[5][9][*][*][??...][#]   – bypassing time, input IN3. The same settings as for input IN1 (function 57).

[6][0][*][*][??...][#]   – bypassing time, input IN4. The same settings as for input IN1 (function 57).

[6][1][*][*][????][#]   – programming the telephone numbers to which the input IN1 violation will be notified. The first "?" character refers to telephone 1, the second "?" character – to telephone 2, etc. These characters can have the following value:

0 – no messaging,

1 – CLIP messaging,

2 – SMS messaging.

[6][2][*][*][????][#]   – programming the telephone numbers, to which the input IN2 violation will be notified. The same settings as for input IN1 (function 61).

[6][3][*][*][????][#]   – programming the telephone numbers, to which the input IN3 violation will be notified. The same settings as for input IN1 (function 61).

[6][4][*][*][????][#]   – programming the telephone numbers, to which the input IN4 violation will be notified. The same settings as for input IN1 (function 61).

[6][5][*][*][????][#]   – programming the telephone numbers, to which the input IN1 restore will be notified. The first "?" character refers to telephone 1, the second "?" character – to telephone 2, etc. These characters can have the following value:

0 – no messaging,

1 – CLIP messaging,

2 – SMS messaging.

[6][6][*][*][????][#]   – programming the telephone numbers, to which the input IN2 restore will be notified. The same settings as for input IN1 (function 65).

[6][7][*][*][????][#]   – programming the telephone numbers, to which the input IN3 violation will be notified. The same settings as for input IN1 (function 65).

[6][8][*][*][????][#]   – programming the telephone numbers, to which the input IN4 violation will be notified. The same settings as for input IN1 (function 65).

[6][9][*][*][????][#]   – programming the telephone numbers, which will be notified during test transmission. The first "?" character refers to telephone 1, the second "?" character – to telephone 2, etc. These characters can have the following value:

0 – no messaging to the given number,

1 – CLIP messaging,

2 – SMS messaging.

[7][0][*][*][?????][#]   – function specifying the number of input whose violation will bypass the specified module inputs. The first "?" character indicates the bypassing input (0 – none, 1...4 – respectively IN1–IN4), subsequent 4 "?" characters define which of the other inputs is to be bypassed (0 – no, 1 – yes).

[7][1][*][*][??????][#]   – programming the SMS type code (6 alphanumeric characters) used for bypassing the input IN1. Using the DTMF tone signaling makes it possible to program the SMS content only composed of digits (0–9). The DLOAD10 program enables creating SMS messages of any content. The sequence [7][1][*][*][#] will delete the SMS code.

[7][2][*][*][??????][#]   – programming the SMS type code for bypassing the input IN2. The same settings as for input IN1 (function 71). The sequence [7][2][*][*][#] will delete the SMS code.

[7][3][*][*][??????][#]   – programming the SMS type code for bypassing the input IN3. The same settings as for input IN1 (function 71). The sequence [7][3][*][*][#] will delete the SMS code.

[7][4][*][*][??????][#]   – programming the SMS type code for bypassing the input IN4. The same settings as for input IN1 (function 71). The sequence [7][4][*][*][#] will delete the SMS code.

[7][5][*][*][??????][#]   – programming the SMS type code (6 alphanumeric characters) used for bypassing all inputs. Using the DTMF tone signaling makes it possible to program the SMS content only composed of digits (0–9). The DLOAD10 program enables creating SMS messages of any content. The sequence [7][5][*][*][#] will delete the SMS code.

[7][6][*][*][??????][#]   – programming the SMS type code (6 alphanumeric characters) used for unbypassing the input IN1. Using the DTMF tone signaling makes it possible to program the SMS content only composed of digits (0–9). The DLOAD10 program enables creating SMS messages of any content. The sequence [7][6][*][*][#] will delete the SMS code.

[7][7][*][*][??????][#]   – programming the SMS type code for unbypassing the input IN2. The same settings as for input IN1 (function 76). The sequence [7][7][*][*][#] will delete the SMS code.

[7][8][*][*][??????][#]	– programming the SMS type code for unbypassing the input IN3. The same settings as for input IN1 (function 76). The sequence [7][8][*][*][#] will delete the SMS code.
[7][9][*][*][??????][#]	– programming the SMS type code for unbypassing the input IN4. The same settings as for input IN1 (function 76). The sequence [7][9][*][*][#] will delete the SMS code.
[8][0][*][*][??????][#]	– programming the SMS type code (6 alphanumeric characters) used for unbypassing all inputs. Using the DTMF tone signaling makes it possible to program the SMS content only composed of digits (0–9). The DLOAD10 program enables creating SMS messages of any content. The sequence [7][5][*][*][#] will delete the SMS code.
[8][1][*][*][??????][#]	– programming the SMS type code (6 alphanumeric characters) used for checking the input status. Using the DTMF tone signaling makes it possible to program the SMS content only composed of digits (0–9). The DLOAD10 program enables creating SMS messages of any content. The sequence [8][1][*][*][#] will delete the SMS code.
[8][2][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for bypassing the input IN1. The sequence [8][2][*][*][#] will delete the code.
[8][3][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for bypassing the input IN2. The sequence [8][3][*][*][#] will delete the code.
[8][4][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for bypassing the input IN3. The sequence [8][4][*][*][#] will delete the code.
[8][5][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for bypassing the input IN4. The sequence [8][5][*][*][#] will delete the code.
[8][6][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for bypassing all inputs. The sequence [8][6][*][*][#] will delete the code.
[8][7][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for unbypassing the input IN1. The sequence [8][7][*][*][#] will delete the code.
[8][8][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for unbypassing the input IN2. The sequence [8][8][*][*][#] will delete the code.
[8][9][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for unbypassing the input IN3. The sequence [8][9][*][*][#] will delete the code.
[9][0][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for unbypassing the input IN4. The sequence [9][0][*][*][#] will delete the code.
[9][1][*][*][????][#]	– programming the DTMF tone signaling code (4 digits from the 0–9 range) used for unbypassing all inputs. The sequence [9][1][*][*][#] will delete the code.

[9][2][*][*][????][#] – programming the DTMF tone signaling code (4 digits from the 0–9 range) used for checking the input status. The sequence [9][2][*][*][#] will delete the code.

[9][3][*][*][?..][#] – programming the "calling time". The parameter defines the time (counted in seconds, from the 1 to 99 range), after which the SIM300CZ telephone will:

- reject the connection (if no inputs/outputs control code has been programmed, or nobody will answer the call from the extension line R-1, T-1),

- establish connection (if an inputs/outputs control code has been programmed) to enable remote control.

During the "calling time" the module will transmit the bell signal to the terminals R-1, T-1 and connection can be established from the telephone connected to the extension line. When the "0" value is entered, the device will neither reject, nor receive connections, which will make the DTMF signal control impossible.

[9][4][*][*][?][#] – when this option is enabled, information on the current status of module inputs and on the telephone line availability will be included in the SMS for test transmission. The "?" character can have two values:

0 – SMS test transmission without module input status,

1 – SMS test transmission with module input status.

[9][5][*][*][????][#] – function defining which inputs can be bypassed manually. The "?" characters which correspond to the consecutive inputs (IN1–IN4) can have the following value:

0 – input may not be bypassed,

1 – input may be bypassed.

[9][6][*][*][??????][#] – programming the number which enables manual control of the inputs (through DTMF tone signaling) from a telephone set connected to the extension line (R-1, T-1). Editing is similar as in function 06.

The control is available after dialing the number which has been programmed here, after which you should enter control sequences, consisting of the "*" character and 2 digits: the first digit defines the function, the other one – the input number ("0" meaning that the selected function is used for all inputs). Execution of the entered control sequence will be acknowledged by three short beeps (two long beeps if an error occurs). Press "*" to reset the buffer (i.e. function selection). Functions:

1 – bypass input,

2 – unbypass input,

3 – check input status.

In response, the device will generate the following beeps:

1 short beep – input unbypassed,

3 long beeps – input bypassed.

The sequence [9][6][*][*][#] will delete the number which enables control.

[9][7][*][*][?][#]   – GPRS transmission support:

                                       0 – no,

                                       1 – yes.

Note! The telephone line terminals (R-1, T-1) make it only possible to enable/disable support of the GPRS transmission. All the necessary working parameters for this type of communication can only be programmed by using the computer with DLOAD10 program installed.

 [9][9][*][*][7][8][9][0][[#]   – test mode of the module. Calling this function will make all the indicator LEDs go out. Then they will light up for approx. 1 second in the following sequence: STAT, SIG, TX, RX, and next the FLT output will be activated.

12.2 PROGRAMMING USING COMPUTER WITH DLOAD10 PROGRAM

The GSM LT-2S 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/Vista) environment. It is recommended that the program be installed on the computer hard disk.

The GSM LT-2S module communicates with the computer via the RS-232 interface. To connect the ports, use the cable made as shown on Fig. **8** (the cable symbol acc. to pricelist: DB9F/PIN5).
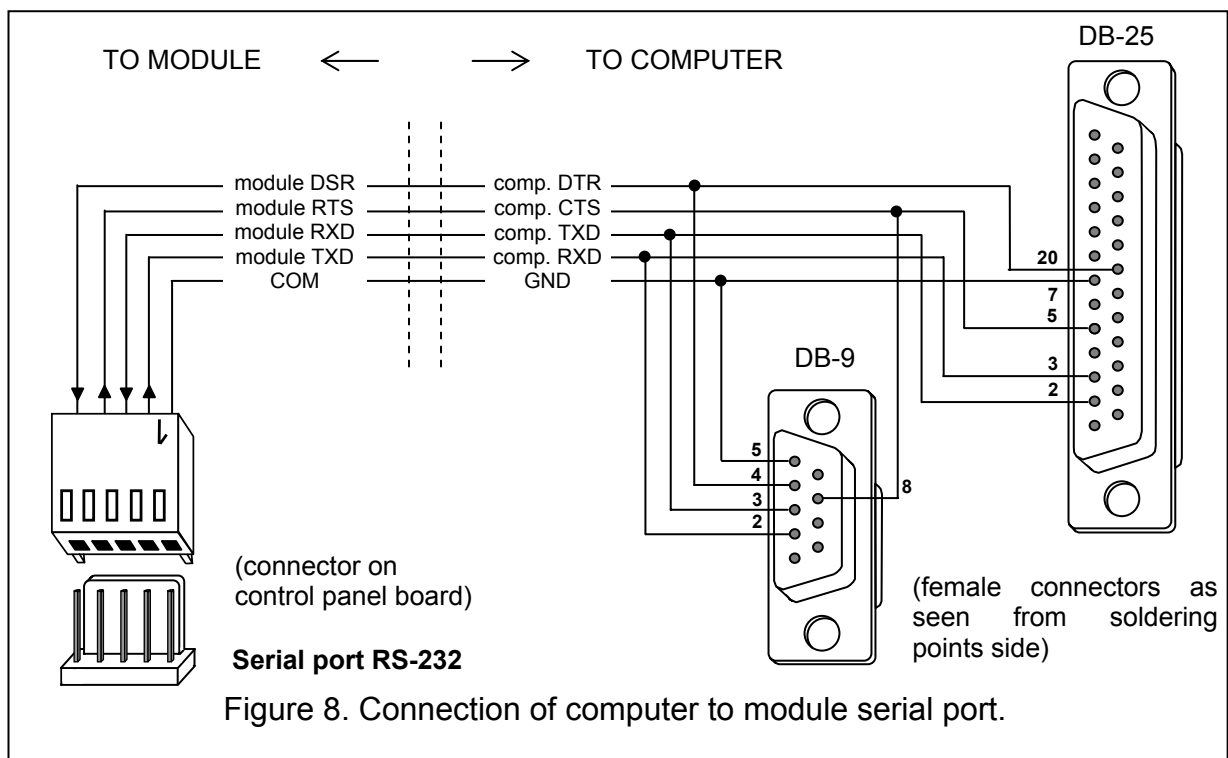

Figure 8. Connection of computer to module serial port.

For installation of the program run the **setup.exe** program from a CD 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: Fig. 9).
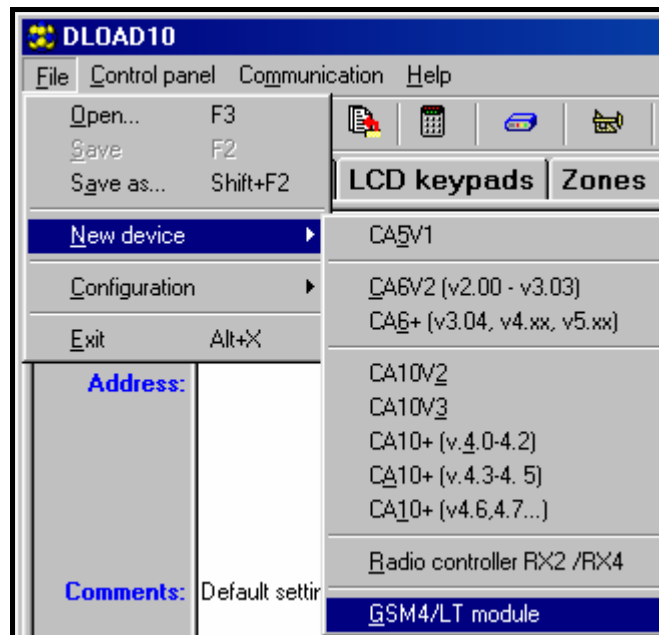

Figure 9.

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: Fig. 10).
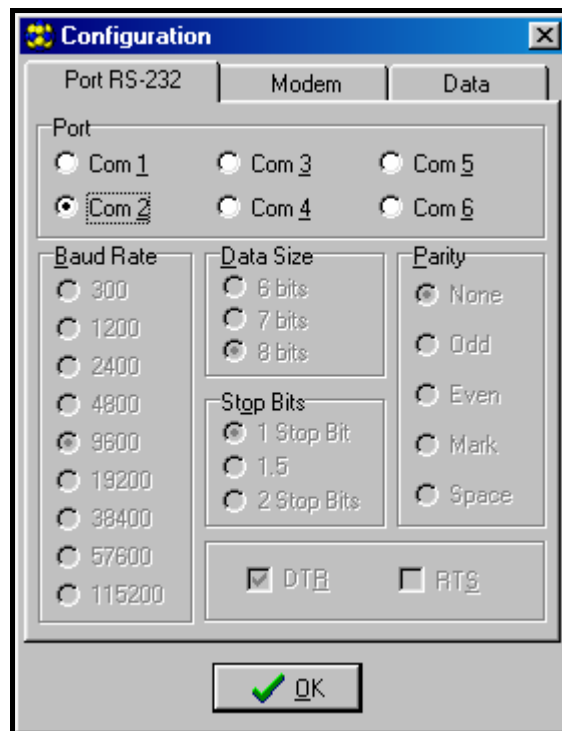

Figure 10.

3. Read out data from the module by clicking on the 🔲 icon.

4. Program the module. After starting the DLOAD10 program, the main window will open (see: Fig. 11). The green bar in the upper part of the window shows the current status of the module, antenna signal level and input status. Just below the green bar you can find 3 tabs: **GSM LT-2**, **Inputs/Messaging** and **GPRS**. They are described below.

5. Save new data in the module by clicking on the [icon] icon.

6. If necessary, the programmed data can be saved as a file on the computer disk.

7. Disconnect the cable used for programming.

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

12.2.1 "GSM LT-2" Tab

This tab allows the user to configure the basic working parameters of the module. The values shown on Fig. 11 are just an example. By default, the data related to test transmission and SMS control, as well as the PIN code, are not programmed. The parameters programmable in the **GSM LT-2** tab correspond to the control functions 1–41 and have been reviewed at the local control (DTMF) description in section *Module Programming* (pages 15–28).
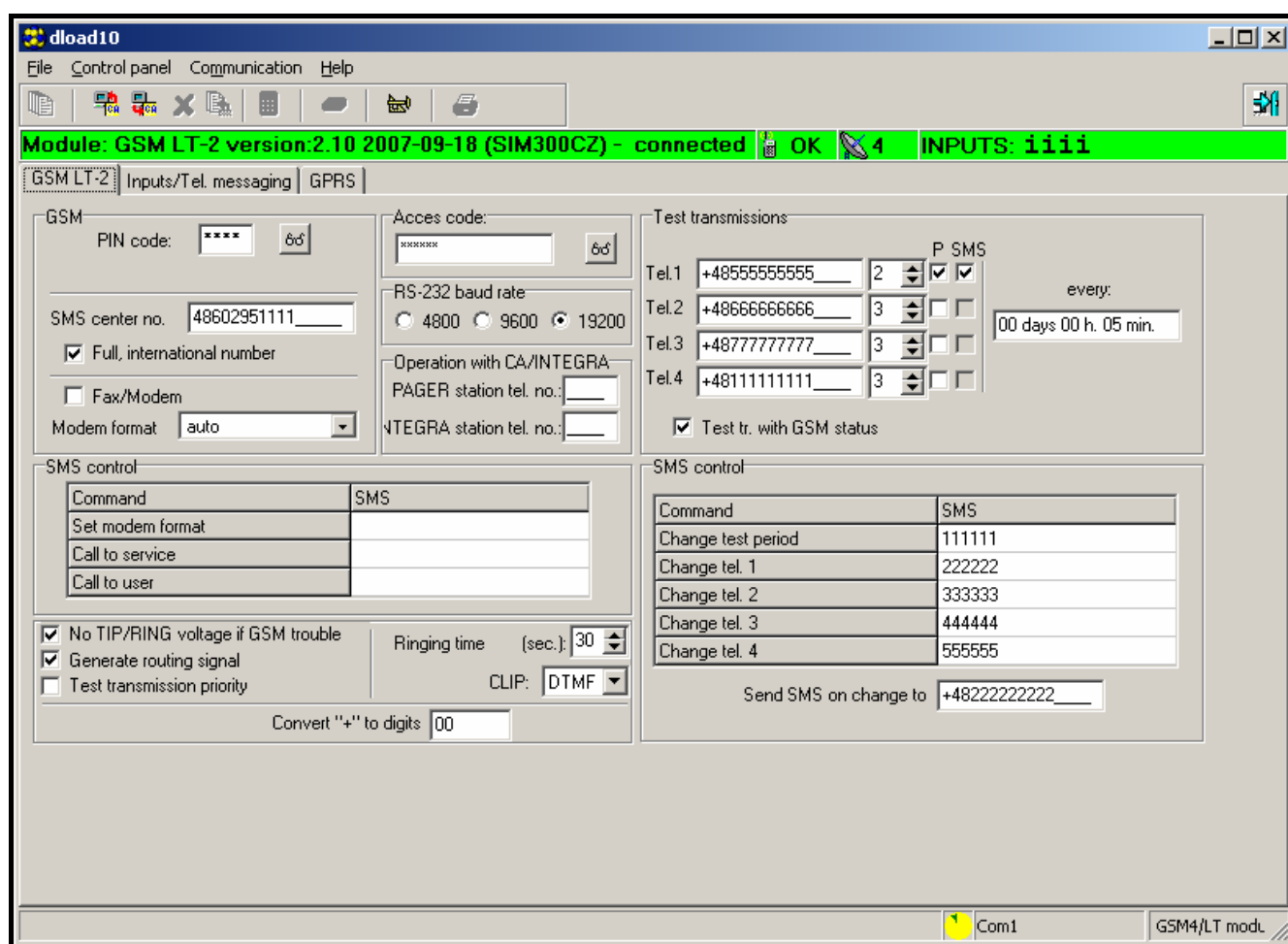

Figure 11.

12.2.2 "Inputs/Messaging" Tab

The options provided in this tab (see: Fig. 12) enable configuration of the module input parameters (i.a. type, sensitivity, restore time), remote control (via SMS and DTMF) and messaging (CLIP and/or SMS about input violation/restore, as well as test transmission enable/disable). The parameters programmable in this tab correspond to the control functions 42–96 and have been reviewed at the local control (DTMF) description in sections: *Inputs* (pages 8–11) and *Messaging* (pages 11–15).
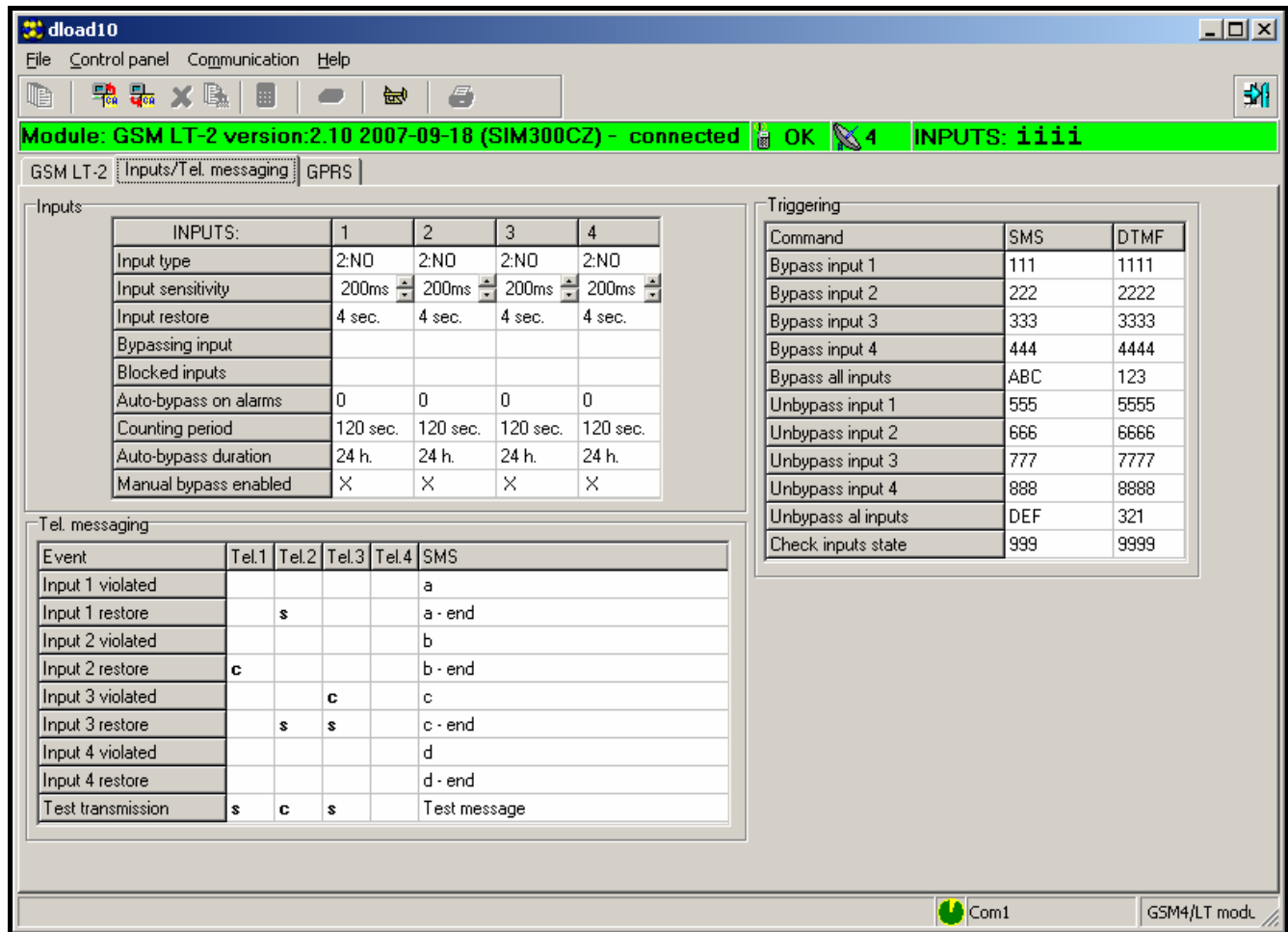
Figure 12.

12.2.3 "GPRS" Tab

The GSM LT-2S module offers support of the GPRS transmission, which enables monitoring of the inputs status. The GPRS transmission is dedicated to working in conjunction with the STAM-2 monitoring station, installed on the computer equipped with the STAM-1 PE or STAM-1 RE card.
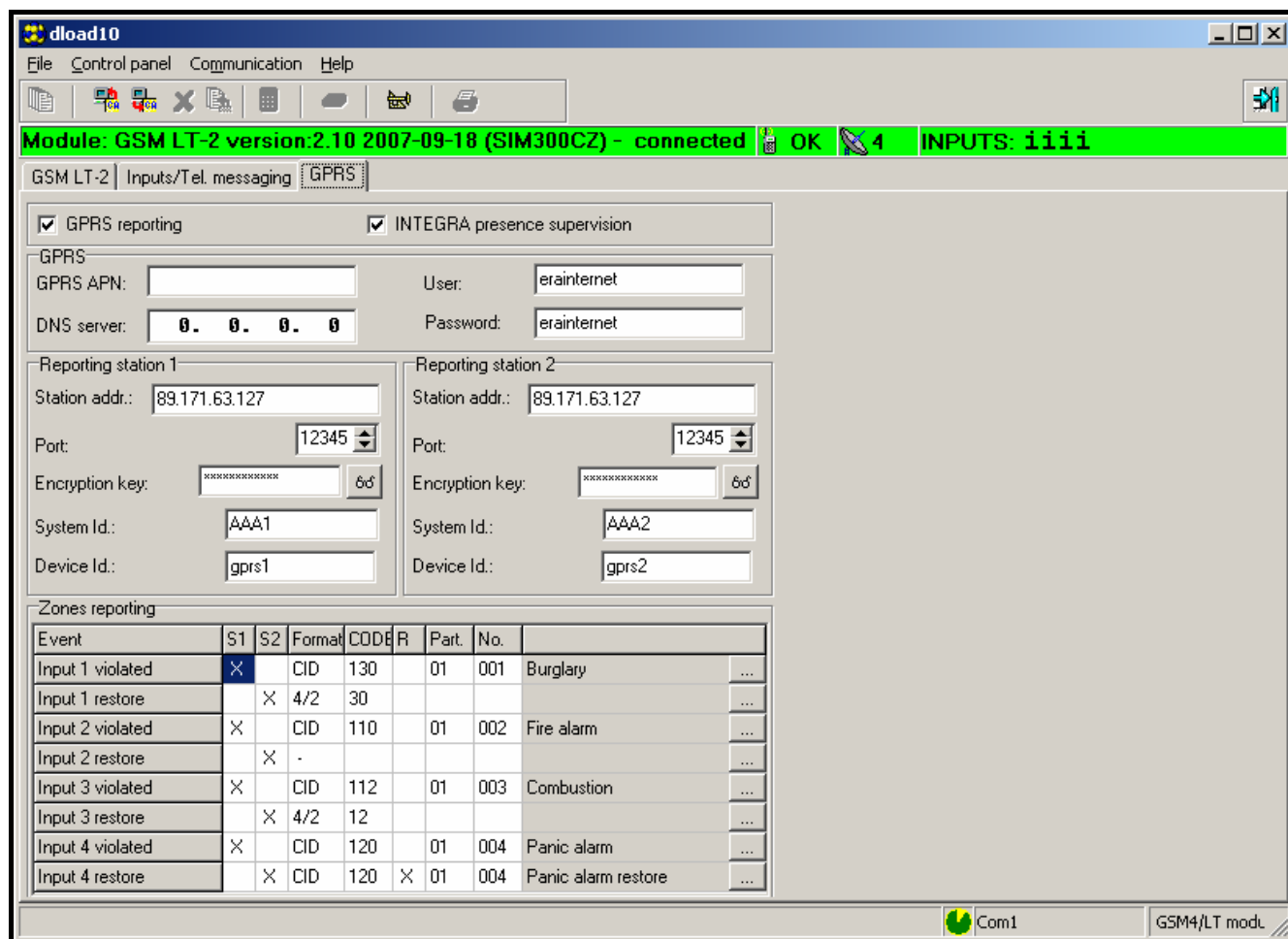
Figure 13.

Figure 13 shows a view of the **GPRS** tab. The presented values are just examples. By default, the data related to GPRS transmission are not programmed. If the GSM LT-2 module is connected to the INTEGRA control panel via the RS232 port, the **Control communication with INTEGRA** option makes it possible to test status of this connection. If there is no communication with the module (failure or tamper of the device), the control panel can inform about this event.

The **GPRS monitoring** option activates the GPRS transmission configuration window. 4 panels can be seen: *GPRS*, *Monitoring station 1*, *Monitoring station 2* and *Monitoring inputs*.

Into the first of them, i.e. *GPRS,* you should enter the basic data **received from the operator of GSM network** in which the SIM300CZ is used:

- **GPRS APN**,
- **Username**,
- **Password**,
- **DNS server** – required only when the **Station address** will be entered in alphanumeric form).

The GPRS parameters for GSM network operators in Poland are show below (as of September 2007):

Operator	ERA	ORANGE	PLUS GSM
GPRS APN	erainternet	internet	www.plusgsm.pl
Username	erainternet	internet	{blank field}
Password	erainternet	internet	{blank field}
DNS	213.158.194.1	194.9.223.79, 194.204.159.1	212.2.96.51, 212.2.96.52

In the *Monitoring station 1* and *Monitoring station 2* windows you should program the parameters – received from **the administrator of given monitoring station** – which enable communication between the GSM LT-2S module and the STAM monitoring station:

- **Station address** – IP address of the monitoring station,
- **Port** – the port through which the module will communicate with the station (within the range 1000–65535),
- **Coding key** – identical to that used at the monitoring station,
- **Object identifier** – 4 digits identifying the monitoring station subscriber,
- **Device identifier** – 5 digits identifying the subscriber's device.

In the *Monitoring inputs* window you should indicate:

- monitoring station to which events will be sent (columns **S1** and **S2**)
- format of events sent in the GPRS transmission (column **Format**). The device supports two event formats:
  - "**–**" – no event,
  - **4/2** – two digits indicating the event code (**CODE** column),
  - **CID** (**Contact ID**) – requires entry of information describing the event (columns **CODE**, **R**, **Part.**, **No.**).

13. TECHNICAL DATA

Supply voltage .... 12 V DC ±15%
Average current consumption in the SIM300CZ telephone standby mode ....50 mA
Required minimum output current, power supply unit ....500 mA
Current-carrying capacity, FLT output...50 mA
Weight..220 g

ATTENTION: The SATEL Company recommends that performance of the GSM LT-2S 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 be a 100% source of such information.

IMPORTANT:

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

Telephone No. ....

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