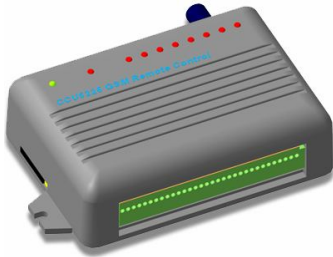*Controller for operating of barrier bars, electrically driven gates + alarm system with an option for remote monitoring and control from GSM mobile phone.*

- Control of barrier bars from 500 telephone numbers with no connections mounted.

- Configurable alert warning system for 4 telephone numbers.

- 2 analogue inputs with adjustable alarm area to control analogue sensors.

- 6 digital inputs for safety sensors to 2 of which it is possible to connect Thermal Sensor RTD-02.

- Control of built-in 2 relay switch and 5 outputs for the time of voice networks with DTMF signals and SMS to be used in online mode with confirmation.

- Voice and/or SMS notification of alarm situations in system.

- Option for connecting of an external microphone and installing of connection by DTMF command.

- Alerting in case of power supply failure and backup battery discharge.

- Built-in backup battery charger.

- Built-in controller of Touch Memory keys.

USER'S MANUAL

FW: LC.05.02

Doc. 16/05/09

Table of contents

1. INTRODUCTION

The present User's Manual aims at helping you to early master the GSM Controller CCU6225-LC's functional capabilities. We have tried to make this manual as simple and detailed as possible. We recommend reading of the entire document in order to have your controller's parameters CCU6225-LC duly and quickly set.

1.1. Delivery in full

Check whether the device has been delivered in full. Should any component lack, refer to the seller.
- ✓ GSM Controller CCU6225-LC-LC
- ✓ Parameters setting software CCU6225-LC.EXE (available on CD)
- ✓ Voice messages programming software VoiceMsgProg.exe (available on CD)
- ✓ Cable (null-modem) for connecting to PC
- ✓ Present User's Manual (available electronically on CD)

1.2. Terms and notions used

SMS - delivery of short messages provided by your network operator.

Alarm System Event - an event hazardous to the controller's fail-safety (external power supply failure, battery discharge).

Signal Text Message - a SMS message containing information on active sensors and alarm system events and which is sent automatically to the telephones of list's users depending according to the controller's configuration.

Voice Notification - the Controller's functions aiming at establishing of sequential connections to list's users to transmit voice messages which might be signal or testing ones.

Room Listening - a system's owner can initiate listening by DTMF command. When connection is established, the user receives a voice message reporting that the listening mode is switched on, after which the external microphone is activated. Connection time is unlimited. No time limits for connections. To deactivate the room listening mode just break the connection.

Aliased name - a word used to refer to inputs and relay when preparing commands and SMS requests messages. The Alias makes a message easily readable. If several outputs or inputs have the very same Alias, the command shall be applied to all of them at the same time.

Current-Limiting Output - a power protected output. If current consumption exceeds the permitted value, voltage shall be cut-off, until causes for heavy consumption are detected.

Routing - Logic event direction from any input to any relay/output, i.e. having established a route (exposure) from the input to the relay, the relay status can be controlled by changing the input voltage.

1.3. Warning notice

When switching-on the controller, all text messages shall be deleted from SIM-card.

Prior to controller's switching-on ensure that PIN-code on SIM-card is disabled or it can be disabled it from your mobile phone.

Ensure also that the SIM-card has a SMS centre's phone number saved or insert it by means of your mobile phone. If the SMS centre's phone number is missing, the controller shall not send SMS messages but it shall receive control ones.

2. KEY FEATURES

The GSM Controller CCU6225-LC is a flexibly adjustable monitoring and control system, which can be used for safeguarding of apartments, offices, garages, holiday homes, storage facilities. Due to its built-in relays, CCU6225-LC can commutate electrical circuits by owner's commands (DTMF signals), SMS command or automatically on an aggregate basis of events.

2.1. Functional Capabilities

- **Control of barrier bars or electrically driven gates.** CCU6225-LC has the 500 telephone numbers' list. Call request from any of the registered phone numbers activates/deactivates the relay for the fixed time with no connection needed.
- **Configurable access from 4 phone numbers.** CCU6225-LC has a 4 numbers' list which allows the access to the system for the registered users only. For each phone number events can be defined the information about which the user wants to receive as voice or SMS messages.
- **Arming Input** has the following parameters:
  - Arming/Disarming Mode by impulse or Touch Memory.
  - Arming delay allows quitting from the guarded room prior to switching to "SECURITY"   mode.
  Touch Memory keys identification module allows to identify the user accessing the system and to send a name by a SMS message to specified numbers or to announce the name by a voice message.
- **Controlling by DTMF signals with voice confirmation of commands' execution** allows users to control the system at the time of voice connection by voice-frequency signals (DTMF) and to receive voice confirmations similarly to mobile network operator's service. Each connection session begins with the password's entry, which provides an additional protection for the system in addition to the user's identification by phone number.
- **Interactive controlling by SMS with confirmation of commands' execution.** CCU6225-LC has the control commands' set. Inputs, relays and outputs have aliased names. The user forms controlling messages by using the set of commands and aliased names. Each command message begins with a password. Depending on the configuration, CCU6225-LC generates a confirmation message thus allowing a user being aware of an actual system status.
- **SMS alerting.** Upon detection of an active input level or in case of an alarm system event (power supply cut-off etc.), CCU6225-LC generates a signal text message to the specified numbers.

- **Signal voice messages.** CCU6225-LC gets through to the specified numbers and generates event-related voice messages, in case of an active input level or alarm system event. Having listened the message, controller switches to MONITORING mode, enabling thus the user to immediately respond to alarm event or break the connection.
- **Test messages** are designed for periodic testing of the system fail-safety. Up to 4 timing points can be fixed, when the controller starts automatically generating voice or SMS messages informing of the system's status.
- **Listening of a guarded room** can be initiated by DTMF control function, after which the controller CCU6225-LC switches to the external microphone directly after DTMF-command is received.
- **Routing of events.** Switching of the input to an active and/or passive status can influence the status of relay or output. It is possible to preset the impact of any input on the relay and outputs. Arming and disarming can also influence the status of the relay and outputs, which enables to use the relay in various configurations. For example, to activate the warning horn or to automatically reset the fire detection sensors if operated.
- **Aliased names for inputs and relay.** Each input and relay has a name, used in case of status requests and controlling. Each input has an active and passive status name. For example, if a room 1's motion sensor operates, the user will receive a SMS message: ROOM1 MOVE. Aliased names are preset by the user.
- **Independent configuration for each input.** Each input can be preset as follows:
  - sensor's name; name of sensor's active and passive status;
  - alarm zone's borders - upper and lower borders specify the stress range, where an input is   considered as active (for analogue inputs only);
  - active level has 4 modes: lower, free, upper etc.;
  - signal message retrieval delay after a sensor is operated;
  - round-the-clock control regardless a security mode for fire detection sensors, water/gas   leak sensors, panic button sensor etc.;
  - impact on the relay.
- **Independent configuration for each relay.** Each relay can be preset as follows:
  - relays' name;
  - commutation type: level or pulse, pulse duration.
- **Alerting upon drop in power supply and boost battery discharge**. The controller CCU6225-LC generates a SMS message and gets through to the specified subscribers when the power supply drops and restores, and also when the battery discharges up to 20%.

2.2. Technical Features

- − Power supply voltage: 15V (-15% +20%).
- − Useful current with the power supply voltage of 12V: standby mode - 50mA; when connected - 100mA.
- − The controller includes a GSM module (EGSM900/1800 MHz). Grade 4 (2V/900MHz). Grade 1 (2V/900MHz).
- − The controller is equipped with integrated lead battery charger 12V/4,5A. With no external power voltage available, the controller switches to the battery backup power supply.
- − 6 digital inputs are designed for sensors equipped with a "clean contact" output. The 0V-5V voltage can be applied to the inputs.
- − 2 analogue inputs for 0V-5V voltage measurement.
- − 2 "double-throw contact" relays enable to commutate load of 6A/30V.
- − 4 "open-collector" outputs, GND, load of 0,5A/12V.
- − 1 "open-drain" output + 15V, current-limited 0,75A.
- − Current-limited output 0,75A, provides power to external sensors or external relay's coil.
- − DB9F plug for computer connection via RS-232 is designed for presetting of controller's parameters and operating modes. Null-modem cable is used for connection.
- − The controller enables connection of external button "ARM" or electric contactor for reading of Touch Memory key to have "SECURITY/MONITORING" mode changed. The controller's mode can be observed through external LED "ARM".
- − Working temperature range: -20°C +55°C.
- − Humidity: 5%...95%.

2.3. GSM controller CCU6225-LC elements

The GSM controller CCU6225-LC is a wall mountable module (see picture). There are indicators reflecting "In1", "In2", "In3", "In4", "In5", "In6", "In7", "In8" inputs' status, indicator "ARM" ("SECURITY/MONITORING" mode) and indicator "PWR/NET" (power supply/status) on front panel.

In case of 15V power supply failure and when backup battery supply is provided, indicators "In1" - "In8" are switched off.

Controller has terminals for connection of power supply, backup battery, sensors, button "ARM" or contactor for reading of Touch Memory key, external LED "ARM", active sensors' load and power. To clamp wiring press orange pusher in terminal's upper part and while holding it place a wire into the opening until bumping and then release pusher. Now the wire is safely clamped by spring contact. Terminal plug's contacts are described in section "Connecting of controller CCU6225-LC".

There is a SIM-card holder in the left part of controller. To remove a card, press yellow button, after which the holder slides ahead for a short distance and you can take it. After SIM-card is exchanged, the holder returns to its initial position and slides back until clicking.

2.4. Dimensional and mounting specifications

Dimensional specifications (fixing space and plug connector are not included: 114*80*30 (width*depth*height).

Sensors In1 - In8

Antenna

Service connector

Connector DB9M for programing

Socket for connection of an external microphone

SIM-card holder
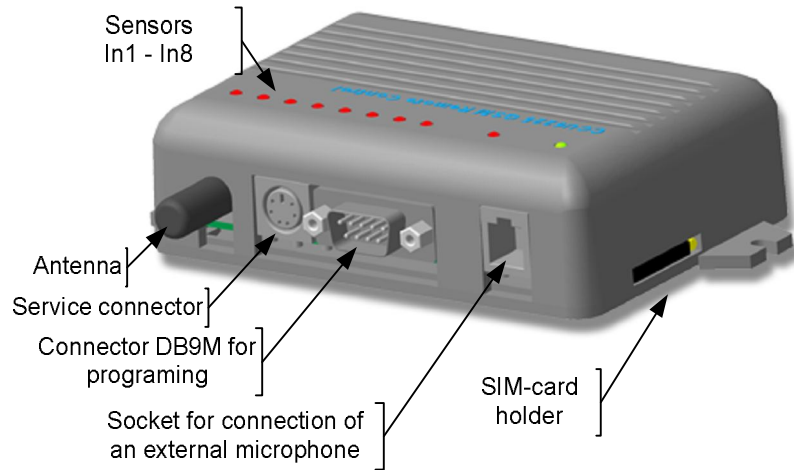
Figure 1. Basic elements of controller CCU6225-LC, service plug connector can be missing

Indicators In1 - In8

Antenna

ARM

Power/Net

SIM-card holder

Clamp connector
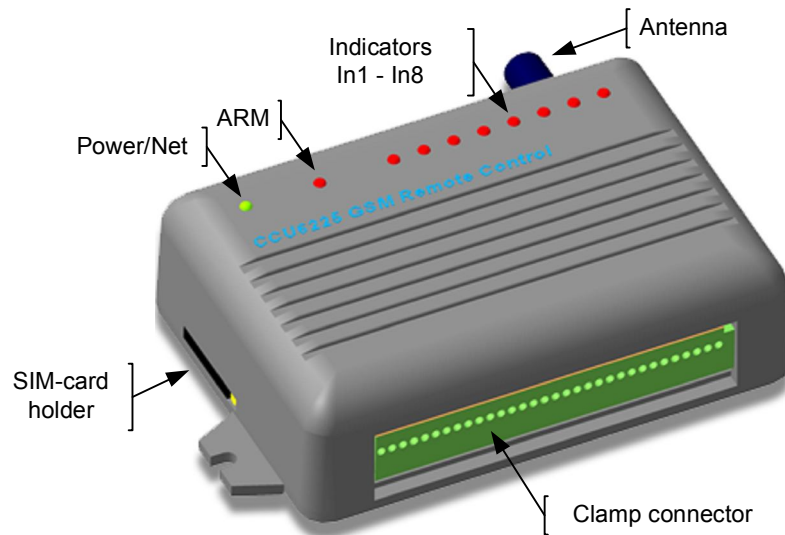
Figure 2. Basic elements of controller CCU6225-LC

Mounting specifications.

Figure 3. Dimensional and mounting specifications

3. OPERATING MODES AND INDICATION

GSM controller CCU6225-LC has 2 basic operating modes: "SECURITY" and "MONITORING". The parameter is saved in non-volatile memory, therefore upon power supply the controller switches to the mode operated prior to power shutoff. Operating mode is reflected by indicator "ARM" on device case. Status of sensors connected to inputs are reflected by 8 indicators regardless the operating mode. When sensor is active, the indicator is also active and vice versa. Such indication can be used when connecting sensors and adjusting inputs' parameters. By flickering the indicator shows a respective input was active at least once since the last switching to "SECURITY" mode. When the system switches to "SECURITY" mode, indicators go off.

There is also a programming mode, to which the controller switches when connecting to the computer with the configuration manager started. Indicator "ARM" is permanently active. No inputs events could activate alerting voice notifications or SMS messages, even if the controller previously operated in "SECURITY" mode. Operating mode shall not be changed by touching with a Touch Memory key, key codes shall be transferred to configuration manager on PC.

3.1. "MONITORING" mode

Indicator "ARM" is not active in this operating mode. The controller generates signal text messages and voice notifications upon occurrence of system events only (shutoff / restoration of external power or battery discharge), or if an input designated for full-time control becomes active. Active levels at other inputs shall not result in generating of signal messages. However, the status of sensors connected to these inputs can be observed by requesting a voice testing message via DTMF command - [9] or by SMS message.

3.2. "SECURITY" mode

Indicator "ARM" flashes not often in this operating mode: 1 second flash, 2 seconds pause. The controller generates signal text messages and voice notifications upon occurrence of system events or if any permitted input becomes active.

3.3. Switching to "SECURITY" mode

Switching from "MONITORING" mode to "SECURITY" mode occurs upon activation of "SECURITY/TOUCH" input as set by its configuration. Arming delay function (if set) initiates countdown, accompanied by frequent flashing of "ARM" indicator (0,5 second flash, 0,5 second pause). It is worth mentioning that delay is ignored, if arming is performed by DTMF command or by "ARM" text message. Upon expiry of delay time the controller switches to "SECURITY" mode, by that the relay is influenced (if preset so). When arming, all inputs are supposed to be non-active. Therefore, in case any input is active (possibly, due to a defective sensor), a signal text message and voice notification shall be generated according to parameters of the input and connections. It should be noted that inputs also affect the relay if such effect is preset upon input activation.

Should arming occur repeatedly in "SECURITY" mode, which is possible by "ARM" text message command or via DTMF control, the system operates in a way similarly to switching from "MONITORING" mode to "SECURITY" mode.

3.4. Switching to "MONITORING" mode

Switching from "SECURITY" mode to "MONITORING" mode occurs upon activation* of "SECURITY/TOUCH" input according to its configuration by DTMF command or by "DISARM" text message command, by that the relay is influenced (if preset so). Some inputs may be equipped with a few seconds' retrieval delay for signal messages. Therefore, if such inputs are registered as active, but delay time does not yet expire at the moment of switching to "MONITORING" mode, no signal text message and voice notifications shall not be generated. For example, a door sensor has 10 seconds' delay for message retrieval. Knowing, where "ARM" hide button is located, it is possible to enter the room and disarm within the specified period of time with no message retrieved, and no warning horn activated etc.

Should a control message with "DISARM" command arrive in "MONITORING" mode, the relay shall be only affected (if preset so).

*Activation of "ARM/TOUCH" input is meant here both as closing of button connected to this input, and as touching by Touch Memory key contactor, connected to the same input. Each particular situation depends on input's configuration.

The given section only contains general peculiarities about the system operation in basic operating modes. Any particular interaction of inputs, relay and events occurring in the system depends on configuration. Each parameter can be adjusted as described in detail in section "PARAMETERS ADJUSTMENT".

3.5. Assessment of received signal's strength

To assess the strength of received signal use indicators IN8-IN1 by selecting check box **"Indicators show the level of received signal"** at the tab **"Power, indication"**. All 8 indicators show the reception quality as a scale. All indicators are active – 100%, which stands for a good signal's level. 4 indicators are active – 50%, which stands for an average signal's level etc. Understandably, in this mode indicators do not reflect the input's status though inputs remain functional.

It should be noted that PWR/NET indicator's colour reflects a type of power supply. In case of normal power supply, indicator is green coloured; in case of backup battery power – it is red coloured. The indicator's orange colour means that the controller is delivering a voice notification.

4. PARAMETERS SETTING-UP

Prior to being used, the GSM controller CCU6225-LC's configuration needs to be set. This procedure is carried out by means of software CCU6225-LC.EXE. By using this software, the controller's configuration can be saved as a file and downloaded from the file.

Connect the controller to a free COM port with power supply having been previously activated. Run the software CCU6225-LC.EXE. In the menu **<Setting>** choose a sub-item **<COM port…>**. Set a number of COM port, to which the controller is connected. Now you can proceed to configuration's setting. When programming, the controller does not necessarily need a SIM-card.

Prior to programming, read the given section all over.

4.1. General parameters of connections
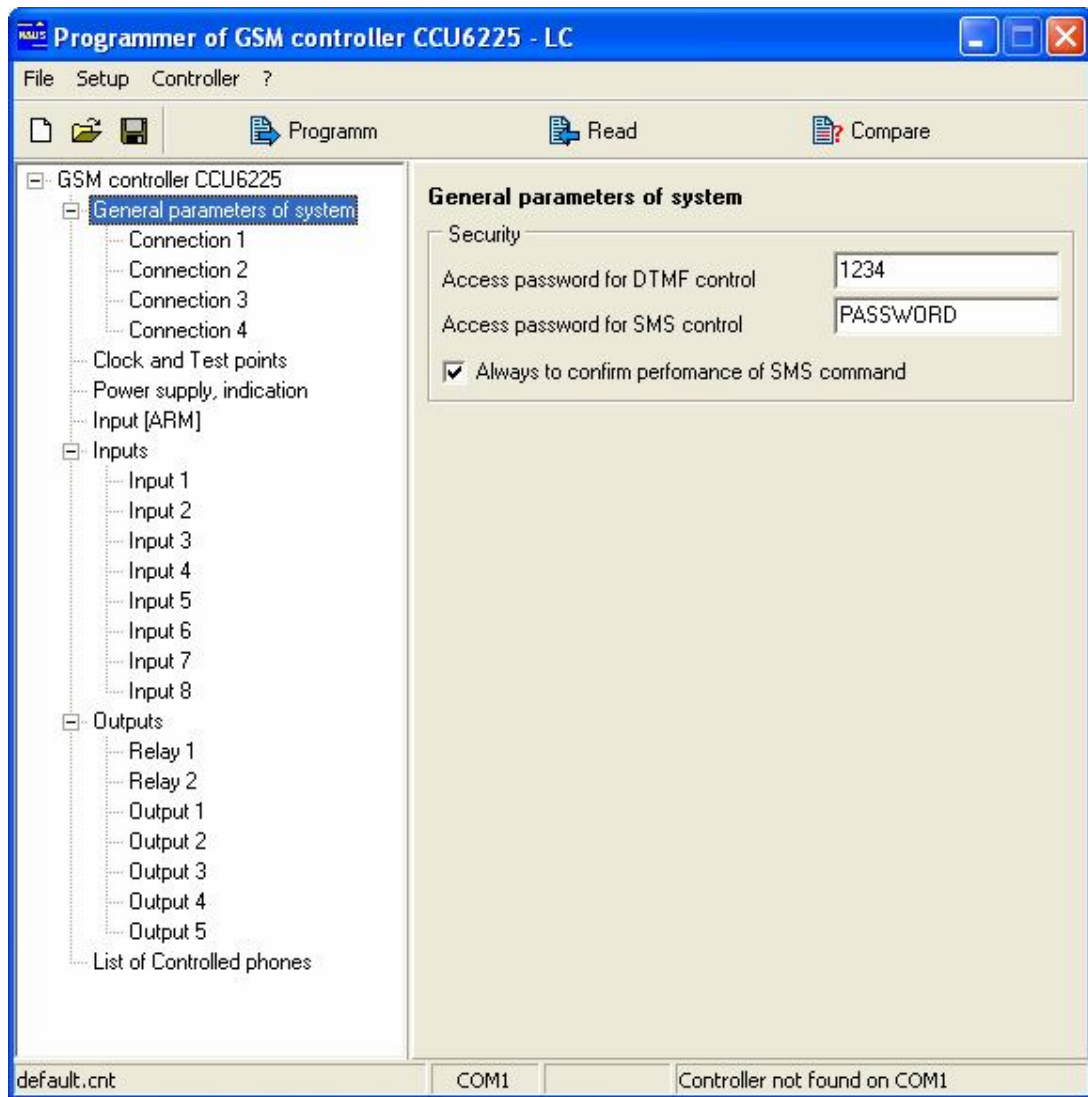
Figure 4. General parameters of connections

Access password for DTMF control is used for accessing DTMF control mode. When one of 4 users dials the controller's number, prior to accessing the voice menu, the user shall be requested to enter a password which may contain up to 4 digit symbols.

Access password for SMS control is used in text control message for commands and requests to be generated. The password may contain up to 8 Latin, Cyrillic or digit symbols.

Always confirm execution of SMS command. If a parameter is enabled, confirmation in reply to control message shall be always retrieved. As a confirmation, the controller generates a message comprising data of the status of inputs affected by command.

It is worth mentioning that the controller accepts control SMS messages, sent from the telephone numbers specified when configuring.

The controller accepts calls made from telephone numbers entered when configuring and requests to enter a password for switching to control mode. Incoming calls from other telephone numbers shall be rejected.
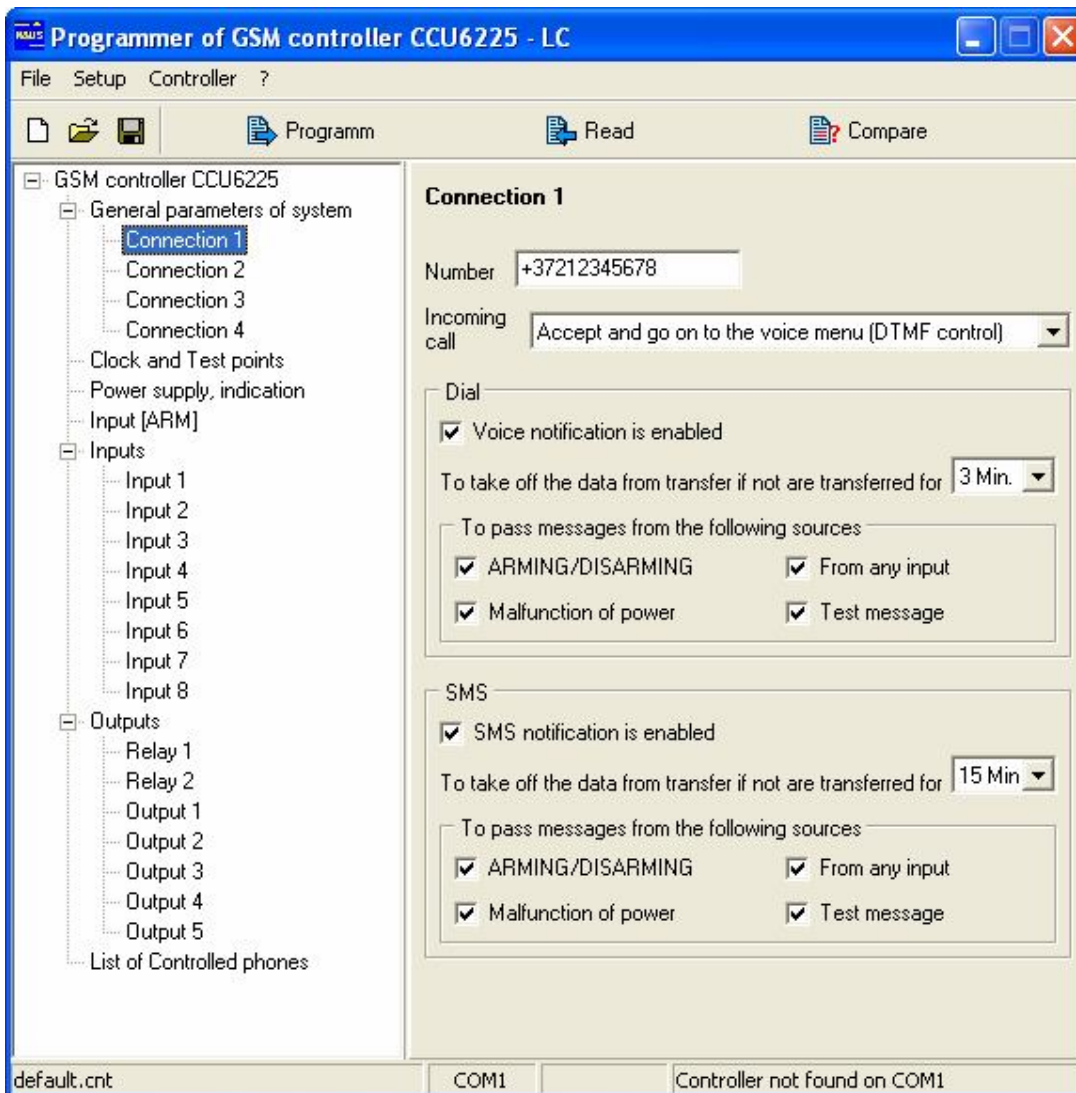
Figure 5. Parameters of connections

Number. A subscriber's number must be entered in the field "Number" according to international format (e.g. +37212345678). All subscribers from the list are equal, they all can control and generate requests, using voice connection by DTMF signals or SMS.

*The system uses voice notification as a priority, i.e. within the time specified in parameter **"Remove data from transmission…"** a subscriber has not listened to the voice notification, an SMS message containing the same information shall be sent, provided that notification by SMS is permitted.*

Upon arrival on the controller of an incoming call from one of the list's numbers, the call shall be accepted and the user shall be requested to enter a password, and if entered correctly, the user proceeds to the voice menu.

It should be remembered that to identify users by a telephone number, automatic number identification function on the calling plan of controller's SIM card must be enabled.

Use voice notification. In case of any alarm events, testing events, operating mode change notifications shall be generated. If a parameter is not active, no voice notifications shall be generated for this number, which can be only used for entering the system for DTMF control.

Upon arrival of a call from the controller the user may listen to the message, after which the controller switches to control mode, by that directly to the main menu with no password requested. It is up to the user to choose whether to break connection or control the system.

Remove data from transmission, if not transmitted within …. min. In case of a failure in message delivery, attempts shall be retried to deliver it within the time specified in this parameter. The time origin is the last event submitted into queue. Upon expiry of the time specified, an SMS message shall be delivered if permitted so.

Forward messages from the next sources. Mark only the events, information on which is needed by using this connection.

Use SMS notification. If the parameter is not active, the system can be controlled only. No text messages shall be retrieved to this telephone number, even if confirmation is meant by command (*see detailed description of commands*). If the parameter is active with no source marked, text messages shall be retrieved to this telephone number upon request only. As to the rest, SMS parameters have the meaning alike voice notification parameters.

When delivering voice notifications or SMS messages, the controller tries to send them one-by-one and to establish connection with the list's numbers.

4.2. Time setting and test messages
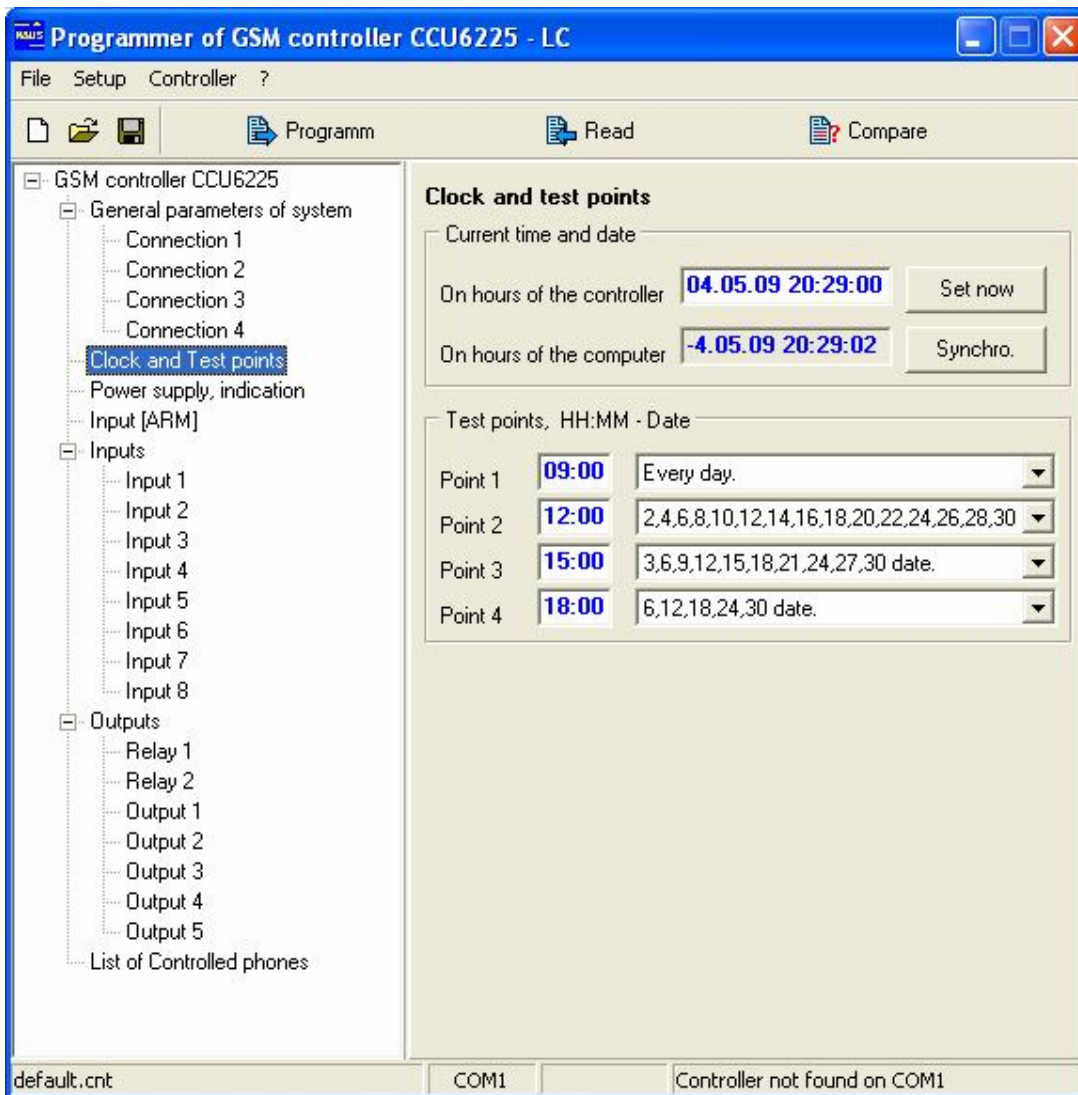
Figure 6. Time setting and test messages

Current time and date. You can set the time and date by this taskbar. To do that, enter a current date and time and click on [Set]. At the moment of time setting, seconds shall be released down to 0. If computer clock gives right time, it is enough just to synchronize the controller's clock by clicking on [Synchro]. At the moment of controller's time setting, seconds shall be released down to 0.

Test message retrieval points in hours, minutes with the date shown. The parameter specifies the time and the date of retrieval of testing SMS or voice notification. A text message contains information on current operating mode, power supply status. This message can be also requested by "TEST" or DTMF command from voice menu (*see detailed description of SMS and DTMF commands*).

4.3. Power supply and indication
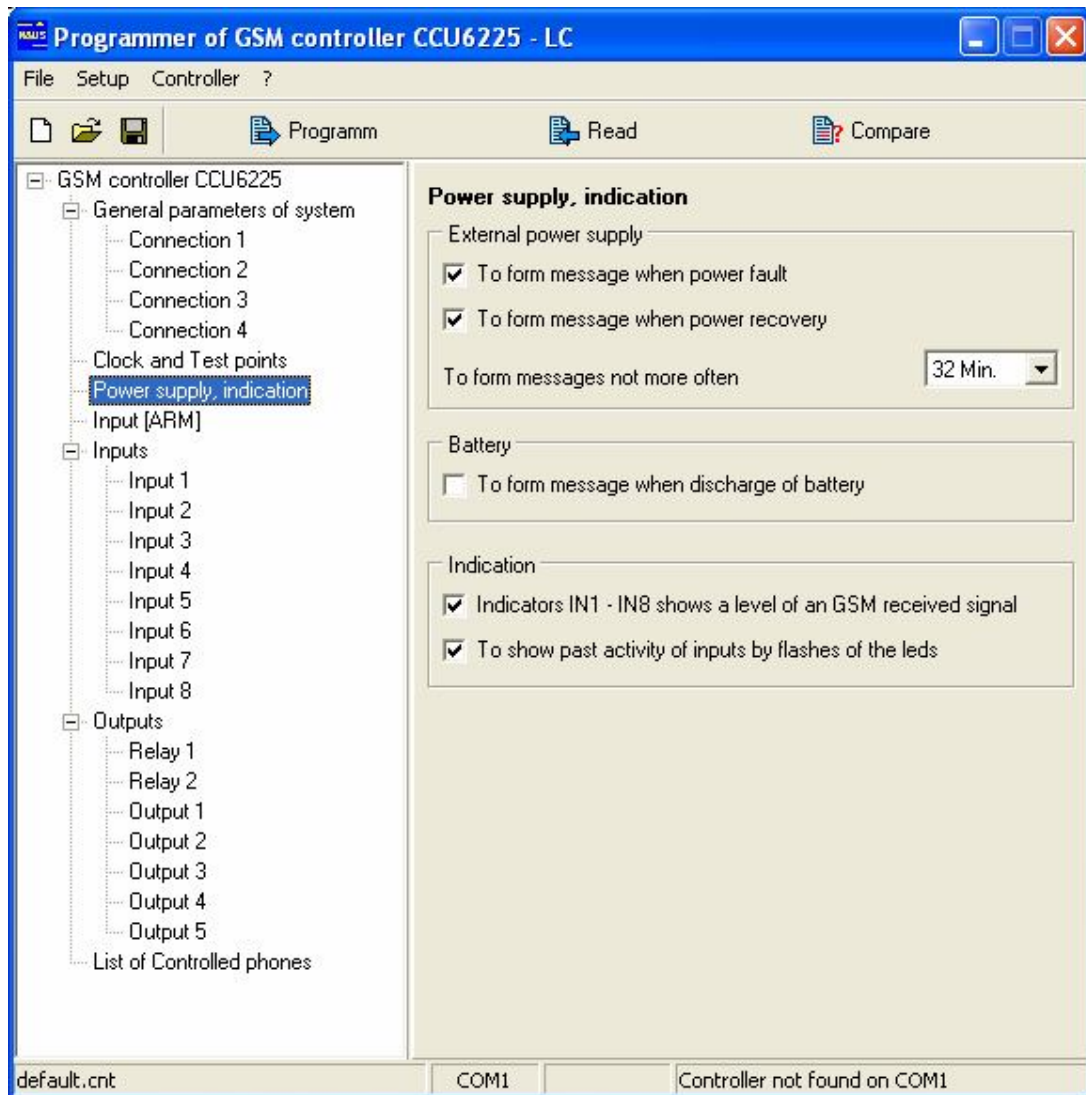
Figure 7. Messages generated upon power supply fault

External power supply is considered as shut-off when there is no voltage at the power plug connector for more than 16 seconds. Power supply is considered as restored when there is a voltage at the power plug connector for more than the specified time. Signal messages upon drop/restoration of external power supply shall not be generated more frequently than it is specified in parameter **"Generate messages not more frequently than"**. The battery is considered as discharged if it is less or equal to 20%. Select system events upon occurrence of which signal messages must be generated.

As a rule, indicators reflect the status of inputs. However, they can be used for assessment of received signal's strength. Select check box **"Indicators show the level of received signal"** at tab **"Power, indication"**. All 8 indicators show the reception quality as a scale. All indicators are active – 100%, which stands for a good signal's level. 4 indicators are active – 50%, which stands for an average signal's level etc. Understandably, in this mode indicators do not reflect the input's status though inputs remain functional.

Show inputs' passed activity by flickering. If this function is enabled, any input activity in "SECURITY" mode shall be stored and reflected by flickering at a respective indicator. This indication shall be released only when switching from "MONITORING" mode to "SECURITY" mode; when switching to "MONITORING" mode, the indication remains. Due to this function inputs' activity during the last security session is in fact registered.

4.4. Input "ARM"
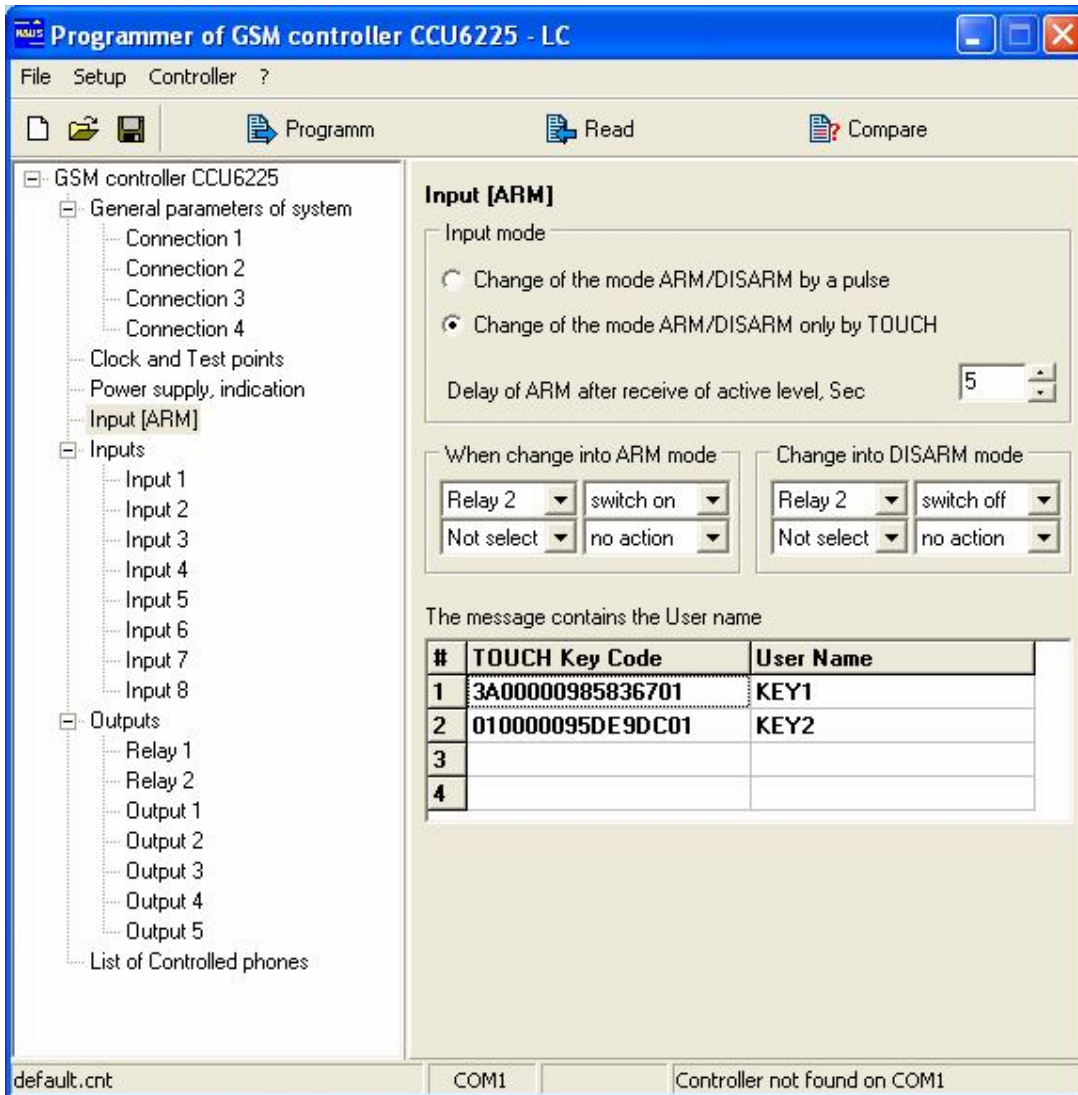
Figure 8. Setting of "ARM" input's parameters

Input's mode. The change of modes by impulse is usually used for connecting of "ARM" button. By each pressing of the button the controller's mode changes respectively: "MONITORING"→"SECURITY"→"MONITORING"… The change of modes by "SECURITY/MONITORING-TOUCH" option enables using of Touch Memory keys to change modes.

Arming delay after entry of active level [0-60 seconds]. The delay time means the time starting from pressing of "ARM" button until switching to "SECURITY" mode, due to which the user has enough time to arm the system and leave the room. Alongside with "SECURITY/MONITORING" mode's change, it might be necessary to control external devices. For example, when arming, to switch on a signal light or to switch off a warning horn after disarming. These effects can be programmed by simply specifying an effect on the relay: no reaction / switch on / switch off.

To use Touch Memory keys, they must be previously registered in the system. When the controller is connected to computer and configuration manager at **Input [ARM]** tab is started, the controller is in the programming mode. When touching with a key the contactor, the key's code appears in a free table cell. You can enter into the column "User's name" a character line (up to 8 characters), which shall be inserted into SMS message following the operating mode's indication. For example, ARM T:Eduard. If desired so, key's code can be entered in to the table directly from the keyboard. Keys' codes and aliased names shall be saved after setting of configuration; until this moment they are available in configuration manager only.

4.5. Inputs
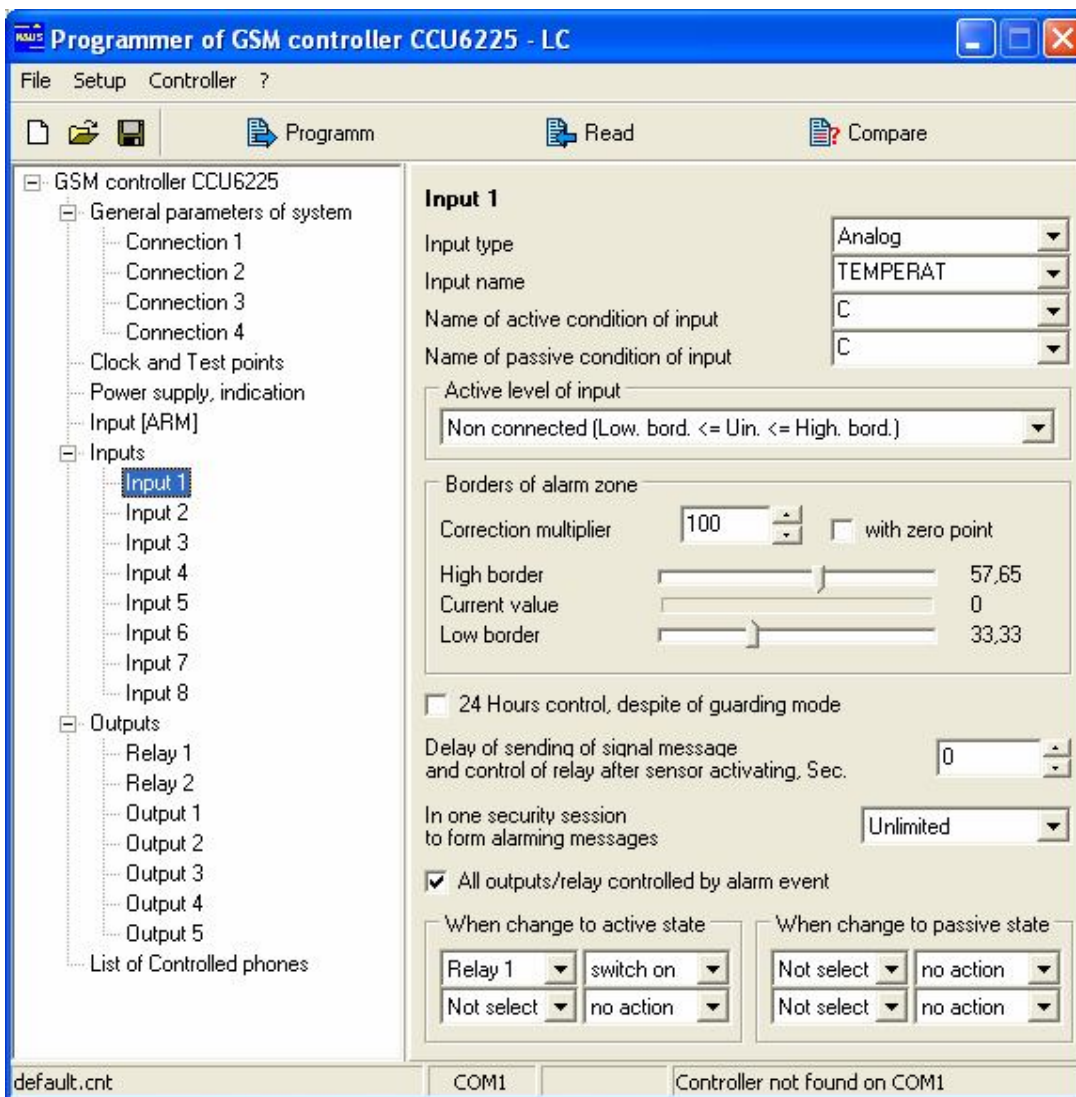
Figure 9. Standard setting-up of analogue input's parameters

All inputs have more or less similar setting-up parameters, therefore one example is given as hereunder with discrepancies specified.

Input's type determines input's assignment, and it can also indicate that input is not allowed. Input is not allowed - logically, this input is missing for the controller with no parameters used by the system nor SMS requests processed for the name of this input.

Digital type is used for connecting of sensors with digital output (volumetric, magnetic-contact ones) when there is no need to have an exact input voltage value, which accordingly leads to generating of an alarm SMS message with no input voltage value included therein: **12:00 ALARM TEMPERAT COLD +.** The inputs (3-8) are used for connecting of "clean contact" output sensors and they have in-built bias circuit of 2,5V. A button, a magnetic-contact sensor, a volumetric sensor can be connected to these inputs. In fact, these inputs control make-and-brake function of the circuit. In case of

analogue inputs (1-2), the SMS message shall contain an input voltage value, given as set in **"Present factor"** parameter. For example, **12:00 ALARM TEMPERAT 28 C -**. In such a way, various values can be measured: voltage, temperature, fluid volume, speed etc.; hereby it is important that the sensor be linear and have voltage of 0V-15V.

Temperature sensor type (for inputs 7 and 8 only) is used for connecting of the thermal sensor RTD-02. In this case, the SMS message shall contain an exact temperature value (±0,5°C) at the sensor's location: 12:00 ALARM TEMPERAT -3 C. No other setting-ups are needed to operate the thermal sensor RTD-02 (see detailed description of **RTD-02_en.pdf**).

Input name - an aliased name of the sensor connected to it, which is used when generating a text message.

Input active status name - an aliased name of input's active status, which is used when detecting an active status of input to generate a respective text message.

Input passive status name - an aliased name of input's passive status, which is used when generating a text message, submitting an input's status request or controlling.

      Fields may contain up to 8 Latin, Cyrillic or digit symbols. Do not use in names a special symbols such as "!", "?", "@", "#", "$", "%", "&", "*", "+", "-", "/", "\", a space element, punctuation marks.

Please note that capital and lower-case letters are recognised by the system as different ones, i.e. e.g. "DOOR" is not equal to "door".

      For example, the sensor controls the status (open/closed) of entrance door. The input to which the sensor is connected has an aliased name "DOOR", input active status has an aliased name "OPEN", input passive status has an aliased name "CLOSE". Upon request about the door's status by **/PASSWORD DOOR ?** command, a reply message **12:30 DOOR CLOSE +** is received (if the door is closed) or **12:30 DOOR OPEN +** (if the door is open). A symbol "+" means that input is not locked.

      For the sake of smooth and convenient operation, choose short and easy-to-understand aliased names.

Active input level: specifies limits, within which the input is considered as active; for digital inputs such limits are constant values.
1. Low or high. If input voltage is lower that the bottom limit or it exceeds the upper limit, the input is considered to be active.
2. Low. If input voltage is lower than the bottom limit, the input is considered to be active with no upper limit taken into account.
3. Free. If input voltage exceeds the bottom limit and lower than the upper limit, the input is considered to be active.
4. High. If input voltage is exceeds the upper limit, the input is considered to be active with no bottom limit taken into account.

Alarm zone limits. Present factor (for analogue input only) enables to set a conventional value, which corresponds to maximum input voltage value. Thus, an input voltage value can be presented against the actual value of measured parameter to be included into a respective SMS message. For example, with the present factor of 1000 and voltage value at the input 1 of 7,5V, a respective SMS message shall contain a value of 500; with the voltage value of 1V, a respective SMS message shall contain a value of 66,66 etc. In case it becomes necessary to measure a positive or negative value, for example a t temperature value, the **"centre-tap"** parameter must be activated. In this case, a scale's centre shall be a zero, a value less than the zero-centre stands for a negative value, a value more than the zero-centre stands for a positive value. For example, with the present factor of 80 and voltage value at the input 1 of 15V, a respective SMS message shall contain a value of 79,38C; with the voltage value of 7,5V, a respective SMS message shall contain a value of 0C; with the voltage value of 0V, a respective SMS message shall contain a value of -80C; with the voltage value of 9,88V, a respective SMS message shall contain a value of 25C etc. By changing the present factor, the reflected value against the actual value can be online presented with the sensor duly connected.

The following parameters allow to set the level for each alarm zone limit directly with sensors connected (analogue only). By that, a current value of the measured input parameter is presented, even in the input is not allowed. Values are presented in accordance with the present factor set. Should a current value falls into the alarm zone, the value's numeral is presented in red colour. By increasing/decreasing the input voltage value it is possible to see the input's activation.

It should be noted that the controller shall apply the specified alarm zone parameters only after programming; hitherto the parameters are only reflected in configuration manager and used by the programme to simulate the input's activity.

Permanently control input (round-the-clock control). If this parameter is enabled, upon detection of an active input level a signal text message and voice notifications, even in case of the current controller's operating mode "MONITORING". Enable this parameter for inputs, to which fire detection sensors, water/gas leak sensors etc. are connected.

Delay in signal message retrieval and control of outputs when activating an input [0-126 seconds]. If an active input level is detected, generating of a signal text message and voice notification shall be delayed for the specified time. Due to delay, the system's user has enough time to go to the hidden button's location and to switch the controller to "MONITORING" mode, cancelling by that the transmission of signal messages or switching on of the relay (if preset so).

Upon sensor's activation, a signal message is retrieved. Should the sensor remains active thereafter, no signal messages shall be generated. Repeated signal message shall be generated when the sensor becomes inactive, and then again active.

Generate alarm messages within one security session [with no limits, nit oftener than 3 times]. It is often a case when a number of generated messages from a particular input within one security session must be limited. Set a desired number of notifications and messages. After the specified number of messages and notification has been reached, the input shall be locked until the system switches to "MONITORING" or "SECURITY" mode, due to which excessive notifying is minimized.

All outputs/relay are controlled by alarm event. If the parameter is disabled, the relay shall be controlled directly by the input (if preset so). The relay shall be controlled both in "SECURITY" and "MONITORING" modes. If the parameter is enabled, the relay is controlled upon input's activation with delay "**Delay in signal message retrieval and control of outputs…",** and only with "**Permanently control input (round-the-clock control)"** parameter enabled. This configuration allows to use the relay for switching on of the warning horn and other similar devices. In fact, switching-on of the relay shall occur at the same time when SMS messages and voice notifications are generated.

Input becomes active. Select one or several relays and an effect on the relay in case the input becomes active. This parameter (effect on the relay) is not available with the input type **Temperature sensor**.

Input becomes passive. Select one or several relays and an effect on the relay in case the input becomes passive. This parameter (effect on the relay) is not available with the input type **Temperature sensor**.
　　　The above setting-ups shall not cancel control of the relay by SMS or DTMF commands.

4.6. Outputs
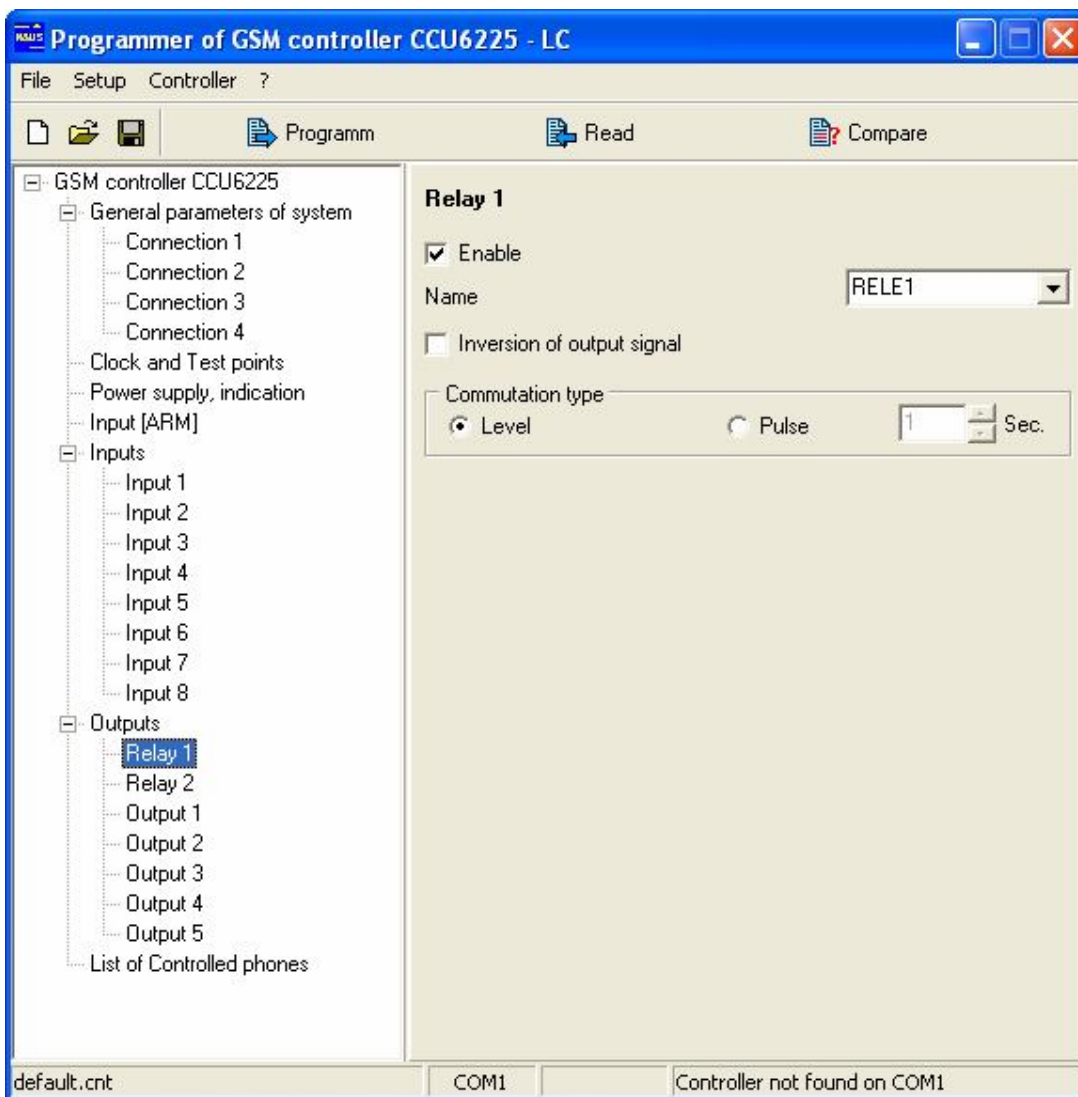
Figure 10. Standard setting-up of outputs' parameters

Since all outputs have the same setting-up parameters, one standard example is given as hereunder.

Allowed. If check box is deselected, the output is not allowed, and logically, this output is missing for the controller with no parameters used by the system nor SMS requests processed for the name of this output.

Name - an aliased name of the device, load connected to the output. Such name is used when generating a text message, submitting an input's status request or controlling. Fields may contain up to 8 Latin, Cyrillic or digit symbols. Do not use in names a special symbols such as "!", "?", "@", "#", "$", "%", "&", "*", "+", "-", "/", "\", a space element, punctuation marks.

Please note that capital and lower-case letters are recognised by the system as different ones, i.e. e.g. "DOOR" is not equal to "door".

For example, the relay commutates an electromagnetic lock. The relay has an aliased name "LOCK". Now you can open/close the lock or submit status request. To close the lock, send a message **/PASSWORD LOCK ON**; to open the lock, send a message **/PASSWORD LOCK OFF.** Upon submission of status request **/PASSWORD LOCK ?**, a reply message **12:30 LOCK ON** is received (if the lock is closed) or **12:30 DOOR LOCK OFF +** (if the lock is open).

Output inversion means that output's physical status shall be opposite to the logical one. With an active output by switching on the output/relay, the user shall receive a message saying that the output is switched on, yet, in fact, the output is switched off, and vice verse. This parameter might be helpful when the device controlled by the output receives an inverted control signal.

Commutation type: level or [1-250 seconds] long impulse. Type **level** means that the output's status after the effect exerted shall remain to the necessary extent until the next control session. With type **impulse** selected, the output shall switch off upon expiry of the specified time. For example, type **impulse** can be used for opening of an electric strike (length - 1 second) or for short-term switching on of warning horn, lighting equipment (length - 60-250 seconds). One of the in-built relays can be used to easily operate the warning horn.

Upon completion of setting-up procedure programme the configuration and disconnect the controller CCU6225-LC from the computer. Now the controller is ready to be mounted at the site.

It should be noted that presetting of parameters needs external and battery power supply. However, when exchanging a SIM-card, power supply must be entirely shutoff!!!

4.7. Control numbers

Programmer of GSM controller CCU6225 - LC

File Setup Controller ?

Programm   Read   Compare

GSM controller CCU6225
- General parameters of system
  - Connection 1
  - Connection 2
  - Connection 3
  - Connection 4
- Clock and Test points
- Power supply, indication
- Input [ARM]
- Inputs
  - Input 1
  - Input 2
  - Input 3
  - Input 4
  - Input 5
  - Input 6
  - Input 7
  - Input 8
- Outputs
  - Relay 1
  - Relay 2
  - Output 1
  - Output 2
  - Output 3
  - Output 4
  - Output 5
  - List of Controlled phones

List of Controlled phones

#	Phone Number	R1	R2	01	02	03	04	05
1	+372256789	1	1	-	-	-	-	-
2	+372256788	-	-	1	-	-	-	-
3	+372256787	-	1	-	0	-	-	-
4	+372256786	-	-	-	-	1	-	-
5	+372256784	-	-	0	-	-	1	-
6	+372256783	-	-	1	-	-	-	-
7	+372256782	-	-	-	-	-	-	0
8		-	-	-	-	-	-	-
9		-	-	-	-	-	-	-
10		-	-	-	-	-	-	-
11		-	-	-	-	-	-	-
12		-	-	-	-	-	-	-
13		-	-	-	-	-	-	-
14		-	-	-	-	-	-	-
15		-	-	-	-	-	-	-
16		-	-	-	-	-	-	-
17		-	-	-	-	-	-	-
18		-	-	-	-	-	-	-
19		-	-	-	-	-	-	-
20		-	-	-	-	-	-	-
21		-	-	-	-	-	-	-
22		-	-	-	-	-	-	-
23		-	-	-	-	-	-	-

default.cnt   COM1   Controller not found on COM1

Figure 11. Control numbers' list

By double clicking in the field **"Telephone number",** the system switches to edit mode. Enter a desired number in a way it is recognised by mobile phone. Set the effect on relay or output necessary for this telephone. By double clicking on a respective cell, the effect's value can be changed. "1! the relay is on; "0" - the relay is off; "-" - no effect specified. After switching on, relay's behaviour depends on its individual setting-ups **(commutation type: impulse/level).** Simultaneous effect on several relays or outputs is also possible. Telephone numbers can be added or deleted from the list by SMS commands.

5. VOICE NOTIFICATION AND DTMF CONTROL

It is often a case when DTMF control mode and access to controller's status information proves to be more efficient as compared to SMS. At the same time, SMS provides detailed numeric information on input voltage and other system's elements, which is not available in voice notification mode.

5.1. Voice notification

Delivery of voice notification - the controller's functions aimed at connection of call with the list's users one-by-one to deliver voice messages. Notifications can be triggered by the system events (power supply drop or battery discharge), arming/disarming or event occurring at any input - sensor's action. The controller dials one-by-one the list's telephone numbers specified for notifications. The controller proceeds on the next number in case the current number is engaged, it is not answering within 30 seconds including dial-up time or the subscriber has listened to the message. When the controller detects the connection, the user shall receive an event-related voice message. The message shall be delivered once, after which the controller switches to voice control mode. The control mode enables the user to immediately respond to the situation occurred.

When the controller has registered the connection and delivered messages, notification shall be deemed as successfully passed. If the subscriber is not answering or the number is engaged, the controller shall continue connecting a call within the time specified in **"Remove data from transmission if left undelivered within"** parameter as from submission of a new event into transmission queue. Upon expiry of the specified time, events shall be considered as outdated and removed from transmission.

In actual practice, the user determines the duration of connection, i.e. the user can cut the call at any moment without a necessity to listen to the end.

If voice messages have been successfully delivered, no SMS messages containing the same information shall be generated.

5.2. DTMF control mode with voice prompts

DTMF control mode is very easy to operate, similarly to servicing of mobile operator's subscribers. After having dialled a controller's number, the list's user shall be identified by a telephone number (automatic number identification is necessary) and requested to enter a password. Users not included in the list shall be rejected, so even at this stage the controller is safely protected against unauthorised access.

After having entered a correct password, the user goes to the main menu and stays there until disconnected. The connection shall be automatically broken, if after several prompts have been made, the user has not initiated any commands or has entered incorrect password for several times.

All controller's parameters are available through the main menu. When selecting a parameter-button 1-9, a message reporting its current status can be heard; the status can be operated by buttons "*" and "#", for so many times as it is required until another parameter is selected. For example, "2*#*#*#*#" command shall enable and disable the relay 2 for subsequent 4 times. After one command is executed, you can proceed on the next, i.e. to select another parameter and control it. There is no need in waiting for the end of voice prompt, due to which it is possible to send commands by a single line previously saved into the notebook. For example, adding another "+" while using

SIEMENS telephones provides a 3 seconds' pause after the connection has been established, e.g.: +3721112233+1234*8*1*

Once the connection has been established, the user shall hear a request to enter a password, after which a password shall be entered as follows: 1234, "*" - end of password's entry, "8" - select control mode by arming/disarming, "*" - arming, "1" - select control mode for relay 1, "*" - activate the relay. The interactive control procedure is carried out in a similarly way, with prompts provided.

Table 1. Main menu commands tree

Parameter No.	Control	Action
1	*	Activate relay 1
	#	Deactivate relay 1
2	*	Activate relay 2
	#	Deactivate relay 2
3	*	Activate output 1
	#	Deactivate output 1
4	*	Activate output 2
	#	Deactivate output 2
5	*	Activate output 3
	#	Deactivate output 3
6	*	Activate output 4
	#	Deactivate output 4
7	*	Activate output 5
	#	Deactivate output 5
8	*	Switch the controller to "SECURITY" mode
	#	Switch the controller to "MONITORING" mode
9	Request a testing message, buttons "*" and "#" are not used	
0	Switch to external microphone, buttons "*" and "#" are not used	

Test messages contain information on alarm events existing in the system at the moment of making a request. Such information may refer to external power supply failure, battery discharge or active sensors. If there are no alarm events registered in the system, a message "Test message, all parameters are ok" shall be generated.

With no automatic number identification activated, none of subscribers shall be able to control the system.

When supplied, the controller is equipped with standard voice messages stored. In some cases, there is a need to alter these messages. Any message, e.g. a long prompting message can be deleted (if desired so). Memory space become available can be used for storing of other messages. Software "Voice messages programmer unit" is used for editing and storing of messages.

For example, there is a heater connected to relay 2. It is more convenient to use instead of a message "Relay 2 is activated" a message "Hall heater is on" etc.

CCU6225-LC – User's manual

6. CCU6225-LC CONTROL BY SMS

Using short mobile messages is a convenient mode of operating and monitoring the status of an item. Several most used control messages, e.g. ARM, DISARM, relay control, may be previously saved in the user's cell phone memory. Thus, all the user has to do is to send an appropriate message when necessary.

A function of assignment aliases to the inputs and their active and passive statuses renders the CCU6225-LC alarm messages most comprehensive and readable. For instance, when the door monitoring sensor is activated, the user will receive the message "**22:30 ALARM DOOR OPEN**". Name of the input: DOOR. Name of the active status: OPEN.

6.1. CCU6225-LC control commands

Apart from aliased commands, CCU6225-LC GSM controller is able to generate eight commands.

Commands and arguments are reserved words. They should not to be used as aliases, as it may subvert operation of the system and cause unpredictable behaviour thereof. When analysing commands, the system does not differentiate between small and capital letters, i.e. commands ARM, Arm and arm will be deemed the same command.

Table 2. CCU6225-LC control commands

Command name	Password	Command	Argument	!
ON/OFF output/relay	Used	K1, K2, K3, K4, K5, K6, K7	ON | 1 | OFF | 0 | ? !	-
Status request	Used	K1, K2, K3, K4, K5, K6, K7, S1, S2, S3, S4, S5, S6, S7, S8	?	!
Set SECURITY mode	Used	ARM	-	!
Set MONITORING mode	Used	DISARM	-	-
Testing message request	Used	TEST	-	!
Time setting	Used	SETTIME	DD.MM.YY.hh:mm	!
Testing SMS generation time	Used	TTIME	N.DD:MM N.DD:MM N.DD:MM N.DD:MM | OFF | ?	
Adding a number to the control list	Used	ADDNUM	NNNNNNN,XXXXXXX	-
Deleting a number from the control list	Used	DELNUM	NNNNNNN	-

K1, K2, K3, K4, K5, K6, K7 – relay aliases.
S1, S2, S3, S4, S5, S6, S7, S8 – sensor aliases.
Aliases are programmed with CCU6225-LC.EXE.
? – request the item or the setting status.
ON or 1 – relay ON. The two arguments are interchangeable.
OFF or 0 – relay OFF. The two arguments are interchangeable.
DD.MM.YY.hh:mm DD – day,MM – month, YY – year, hh – hours, mm – minutes.
N.HH:MM – frequency, hours and minutes.
OFF as an argument for TTIME prohibits generation of test messages at the set time.
NNNN — control number, XXXXXXX — relay control action for this number
! – confirmation request is possible.

6.2. Control SMS generation procedure

1. Generally, a message consists of four fields, two (in some cases three) of which are compulsory. The fields are separated by spaces.

FORMAT: **/PASSWORD COMMAND ARGUMENT CONFIRMATION_REQUEST**

2. An SMS should always begin with symbol "/" and the access **password**. No spaces should be used between "/" and the password. Symbol "/" enables the controller to recognize the beginning of a control SMS.

3. The command field contains a command word (ARM, DISARM) or an alias of an input or a relay (SENSOR1 or HEATER). This field is related to the **argument** field, both fields define the meaning of the command.

4. The argument filed contains a list of settings. Some commands (ARM, DISARM, TEST) have no settings, in which case the **argument** field is not used. If a command contains several settings, these should be listed with the use of spaces (TTIME 09:30 12:30 15:00 18:20). If the **command** field contains an alias, the **argument** field has to define the action taken in regard to the item, e.g. relay ON/OFF, input or relay status request (SENSOR1 ? or RELE1 ON).

5. An individual SMS may contain several commands and actions listed in a sequence. The commands are executed consecutively. The first to be executed is the command in the beginning of the SMS.

6. This procedure is ignored and the message processing begins from the next field if the SMS contains errors or the argument cannot be matched with a command or an alias.

7. The **confirmation request** field is optional. If execution of the command needs confirmation, the SMS has to be finalized with an exclamation mark. CCU6225-LC generates a confirmation message that contains a report on the status of the items controlled by the commands. Keep in mind that that a confirmation message will always be generated despite the presence of "!" in the command if the setting "always confirm command execution" is ON.

6.3. Commands details

The following conventions are used in all the commands:

PASSWORD – access password, the password used in the examples is "123456".

! – confirmation request.

6.3.1. Output/relay ON/OFF "ON, OFF"

/PASSWORD OUTPUT_NAME ARGUMENT [OUTPUT_NAME ARGUEMENT][!]
OUTPUT_NAME – the name of the device connected to the output/relay.
(HEATER – heating unit, LOCK – solenoid lock, etc.).
ARGUEMENT – displays the action: ON or 1 -- relay ON, OFF or 0 relay OFF.

Control example:
/123456 HEATER ON LOCK OFF !

Confirmation example:
12:30
HEATER ON
LOCK OFF

> *The command controls the relay/output only if control by SMS is enabled*
> *in the configuration.*

6.3.2. Inputs or outputs status request "?"

/PASSWORD ITEM_NAME ?[ITEM_NAME?]
ITEM_NAME – alias of a sensor or an output.
? – status request identifier.

Request example:
/123456 TEMPERAT ? HEATER ? LOCK ? WINDOW ? DOOR ? HALL ?

Reply to the request:

For digital TEMPERAT input
12:30
TEMPERAT OK +
HEATER OFF
LOCK ON
WINDOW OPEN +
DOOR CLOSE +
HALL MOVE +
HALL FIRE +

For analogue TEMPERAT input
12:30
TEMPERAT 46 % +
HEATER OFF
LOCK ON
WINDOW OPEN +
DOOR CLOSE +
HALL MOVE +
HALL FIRE +

"+" – the input is unblocked, "-" – the input is blocked.

> *If several inputs or outputs have the same name, there will be a separate report on each homonymous item. The same is valid in the case of control of outputs. See the last two lines in the message above as an example.*

6.3.3. Switching to SECURITY mode, command "ARM"

Command ARM switches the controller to the "SECURITY" mode. The action of this command in regard to the controller is similar to setting to the "SECURITY" mode, except that no delay in arming is used and arming takes place immediately.

/PASSWORD COMMAND[!]

Example:
/123456 ARM ?

Confirmation example:
12:30
ARM

6.3.4. Switching to "MONITORING" mode, command "DISARM"

Command "DISARM" sets the controller to "MONITORING" mode. The action of this command in regard to the controller is similar to setting to "SECURITY" mode.

/PASSWORD COMMAND[!]

Example:
/123456 DISARM ?

Confirmation example:
12:30
DISARM

6.3.5. Test message request, command "TEST"

A test message contains the information regarding the current status of the system and some of the settings. This message is also generated if the time marks were assigned by the command TTIME. This request allows the user to receive information at any time.

/PASSWORD COMMAND

Example:
/123456 TEST ?

Confirmation example:
TEST 12:30
DISARM
POWER FAULT
BATTERY 100%
TTIME 1.12:30 3.15:30 5.18:30 5.21:30

6.3.6. Time setting, command "SETTIME"

This command enables remote setting of the controller clock. Automatic operation of the system over a longer period may result in the clock losing accuracy. It is advisable that the time is corrected when the system is least loaded so that the traffic delay of the SMS is minimized.

/PASSWORD COMMAND DD.MM.YY.HH:MM [!]
HH:MM – setting of current time.

Example:
/123456 SETTIME 19/03/04.12:30 !

A confirmation message containing time is generated:
TEST 12:30
DISARM
POWER FAULT
BATTERY 100%
TTIME OFF

6.3.7. Setting retrieval time of test message, command "TTIME"

A test message containing the information in regard to the current status of the system and some of the settings may be generated automatically within the prescribed time. For that purpose, one has to set the time marks for the hours and the day of the month when the message is generated. A command does not have to contain all the four time marks, one, two or three marks are sufficient.

/PASSWORD COMMAND N.HH:MM[N.HH:MM[N.HH:MM[N.HH:MM]]]|OFF[!]
N.HH:MM – a possible time of test message generation.
OFF – alarm messages OFF.

Example:
/123456 TTIME 1.09:30 2.12:00 5.15:00 5.20:30 !

The first mark will be used every day, the second one will be used only on even dates, i.e. on the 2nd, the 4th, the 6th, the 8th, …, the 30th, the last two marks will be used on the dates divisible by 5, i.e. on the 5th, the 10th, the 15th, the 20th, the 25th, the 30th.

or

/123456 TTIME OFF !

The following confirmation message is generated:

TEST 12:30		**TEST 12:30**
DISARM		**DISARM**
POWER FAULT	*or*	**POWER FAULT**
BATTERY100%		**BATTERY100%**
TTIME 1.09:30 2.12:00 5.15:00		**TTIME OFF**
5.20:30 !		

The first command of an example enables automatic generation of a test message, whereas the second one disables it. In any event, a message may be requested by the command "TEST".

In all examples confirmation request "!" is used for complete description of the format of a command. However, if no request is sent and setting "always confirm command execution" is OFF, the controller will not generate confirmation SMS-s.

6.3.8. Adding a telephone number to control list, command "ADDNUM"

This command adds a control telephone number to the list and indicates the control action in regard to the relay and the outputs. A number on the left indicates the action in regard to relay 1, the one on the right indicates the action in regard to output 5. A reply may contain one of the following versions of confirmation: ADDED — the number has been successfully added, NOT ADDED — the number has not been added because of no empty slots available. This command may also be used for altering the control action requested by any of the previously added telephone numbers. If the number is on the list, its control action will be replaced by a new one. If the number is not on the list, it will be added to the list.

/PASSWORD COMMAND NNNNNNNN,XXXXXX

Example:
/123456 ADDNUM +37234567891,10-----

The following conformation message is generated:
12:30
REMOTE CONTROL INFO
ADDNUM +37234567891,10-----
ADDED
USED: 1
FREE: 499

6.3.9. Deleting a telephone number from control list, command "DELNUM"

This command deletes a control number from the list. A reply may contain one of the following versions of confirmation: DELETED — the number has been successfully deleted, NOT FOUND — the number has not been found on the list.

/PASSWORD COMMAND NNNNNNNN

Example:
/123456 DELNUM +37234567891

The following conformation message is generated:

12:30
REMOTE CONTROL INFO
DELNUM +37234567891
DELETED
USED: 0
FREE: 500

6.4. SMS generated by CCU6225-LC

The controller generates SMS-s automatically in the following cases:

- − An active level detected on any of the enabled inputs.
- − External supply voltage drop.
- − Battery discharge.
- − A test message at the prescribed time.
- − A reply to the status request or a command execution confirmation.

Table 3. Information phrases used by the controller in messages

Message	Description
ARM	Controller "SECURITY" mode.
DISARM	Controller "MONITORING" mode.
ARM T:Eduard	The controller is set to "SECURITY" mode via the Touch Memory key by user Eduard.
DISARM DTMF:+NN…	The controller is set to "MONITORING" mode via DTMF sent from the control number +NN…
ARM SMS:NA	The controller is set to "SECURITY" mode by the SMS command, the user is not on the list.
ARM B	The controller is set to "SECURITY" mode by pressing the ARM button.
ALARM	It precedes an alarm message.
POWER OK	External supply voltage is OK.
POWER FAULT	No external supply voltage.
BATTERY XX%	Backup battery charge percentage XX.
TTIME 1.09:30 2.12:30 6.15:30 3.21:30	Test messages are generated at the prescribed time marks.
TTIME OFF	Test messages are not generated automatically but upon request.

6.4.1. Active level detection at any of the enabled inputs

HH:MM
ALARM
SENSOR_NAME SENSOR_STATUS_NAME
HH:MM - generation time of the message.
ALARM – alarm message, active level registered at the inputs.
SENSOR_NAME - sensor alias (SENSOR1, WINDOW, DOOR, HALL).
SENSOR_STATUS_NAME sensor status alias (ON, OFF, OPEN, CLOSE, MOVE, STILL, SMOKE, %). Aliases are programmed with CCU6225-LC.EXE.

Example:
For digital inputs   *If the first input is analogue*

22:30   **22:30**
ALARM   **ALARM**
DOOR OPEN   **HEATER 67%**
HALL MOVE   **HALL MOVE**

6.4.2. External supply voltage OFF
This message is generated if the supply connector has been de-energised for 16s.

HH:MM
POWER FAULT

Example:
22:30
POWER FAULT

6.4.3. Battery discharge
This message is generated if the charge level of the battery has reached 20%.

HH:MM
BATTERY X%

Example:
22:30
BATTERY 0%

6.4.4. Generating test messages within the specified time or in reply to command TEST

TEST HH:MM
ARM|DISARM
POWER OK|FAULT
BATTERYXX%
TTIME N.HH:MM N.HH:MM N.HH:MM N.HH:MM

Example:
TEST 12:30
DISARM
POWER FAULT
BATTERY75%
/123456 TTIME 1.09:30 2.12:30 6.15:30 3.21:30 !

6.4.5. Command execution confirmation

HH:MM
ITEM_NAME ITEM_STATUS ITEM_STATUS
[ITEM_NAME ITEM_STATUS ITEM_STATUS]
ITEM_NAME – name of the input, name of the output/relay. If the command ARM is confirmed, the current ARM/DISARM mode will be displayed.
ITEM_STATUS – for output/relay: "ON", "OFF", for input:
sensor status, etc. All confirmations are sent in response to the commands and therefore are dependent on the concrete actions of the user.
ITEM_STATUS – this command displays whether the input is locked or not, this setting is available only for inputs as relays/outputs do not have a status.

Example:
12:35
SENSOR ACTIVE -
HEATER ON
LAMP1 OFF

When the system is set to "SECURITY" mode, all the users whose "Connections" inlay requires reception of an SMS upon "SECURITY/MONITORING" mode changeover receive a message containing detailed information about the source of actuation, for instance, the name of the key owner:

Example:
12:35
ARM T:Eduard

7. CCU6225-LC CONNECTION

7.1. External microphone and telephone connection

External devices, e.g. a telephone receiver or a microphone, are connected via a telephone connection in the upper part of the housing. Socket RJ11 has to be reduced to the device cable with the use of a special tool. Differential connection will ensure noise-free quality sound.
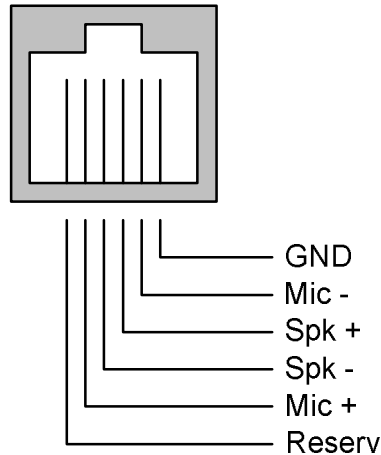
GND
Mic -
Spk +
Spk -
Mic +
Reserv

Figure 12. Phone connector contacts designation

7.2. Connection of sensors

Terminal connection CCU6225-LC allows connection of cable with cross-section 1.5 mm and less. To ensure reliable and safe connection, the protected part of the wire must be at least 7-8 mm. For insulation removal, use a special tool in order not to damage the conducting part of the cable. To connect the supply cable and a backup battery, use a cable with minimal wire cross-section 0.75 mm. To connect sensors, arming buttons, external LED and other low-current circuits, use a cable with minimal wire cross-section 0.2 mm.
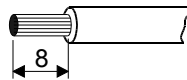
8

Figure 13. Size of the insulated part of the wire

7.2.1. Sensors, general terms

Sensors may be classified as active ones and passive ones. Passive sensors do not need a power source for their operation, whereas the active ones, on the contrary, require a power source. Passive sensors are, for instance, a button, a magnet contact, a fire detector.

Active sensors, are, among other things, motion sensors (glass break sensors), gas leak detectors, moisture detectors (water leak detectors), smoke detectors. Inactive sensors may have normally closed or normally open signal contact.

7.2.2. Connection of passive sensors

Before connecting sensors to the controller, an active level must be programmed for each individual input. An active level of the input is always assigned according to the type and the operating principle of the sensor to be connected. Actuation of an incremental sensor must enable actuation of the input. After connecting an analogue sensor, the limits of the alarm zone must be additionally set in a way that the input voltage of the inactive status would fall in the middle of the inactive zone.

Active level of input

Low (Uin. <= Low. bord.) or High (Uin. >= High. bord.)

Borders of alarm zone

High border   3,333
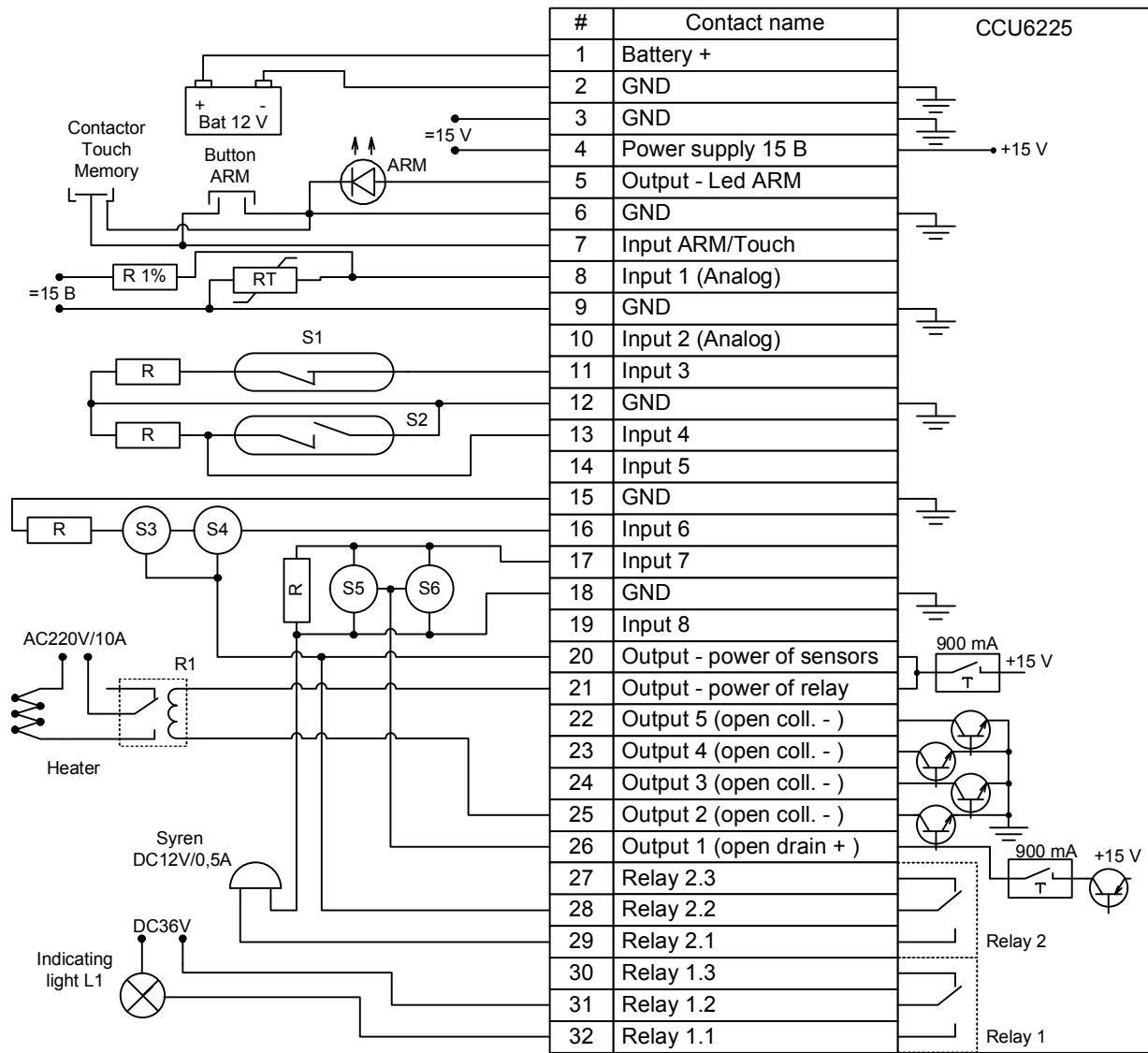Current value   2,529
Low border   1,667

#	Contact name	CCU6225
1	Battery +	
2	GND	
3	GND	
4	Power supply 15 B	+15 V
5	Output - Led ARM	
6	GND	
7	Input ARM/Touch	
8	Input 1 (Analog)	
9	GND	
10	Input 2 (Analog)	
11	Input 3	
12	GND	
13	Input 4	
14	Input 5	
15	GND	
16	Input 6	
17	Input 7	
18	GND	
19	Input 8	
20	Output - power of sensors	900 mA +15 V
21	Output - power of relay	
22	Output 5 (open coll. -)	
23	Output 4 (open coll. -)	
24	Output 3 (open coll. -)	
25	Output 2 (open coll. -)	
26	Output 1 (open drain +)	900 mA +15 V
27	Relay 2.3	
28	Relay 2.2	
29	Relay 2.1	Relay 2
30	Relay 1.3	
31	Relay 1.2	
32	Relay 1.1	Relay 1

Figure 14. Connecting diagram for sensors and other devices

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7.2.3. Connection of active sensors

The connection procedure and the input settings are similar to those of passive sensors, an exception being the supply circuits of the sensors.

A controller is equipped with a current-limited power source intended for active sensors. The figure above presents a simple connection diagram for sensors S3, S4 via three wires where a "common" supply wire of the sensor is at the same time a "common" wire for the sensor output. Some sensors, for instance, smoke detectors S5, S6 a need power-on reset in order to return to the neutral status after actuation. To accomplish this logic, it is practical to power those sensors from output 1, as shown in the figure. To reset the power, the input must be set to control output 1, i.e. when the sensor is actuated, the supply voltage of the sensors must be OFF for several seconds. Select commutation type "pulse" and time 5s in the input settings. The output must be inverse. The supply voltage will be ON until the entry of the input signal and then will be OFF for 5s. Also, several sensors may be connected to one circuit, as shown in the figure. The sensors may be connected to the circuit in the series or in the multiple mode, depending on the type of the signal contact of the sensor.


Limited-current power source is able to supply the current not exceeding 750 mA. In the case of short circuit, the power is switched off and will be restored after the cause for excessive current consumption is eliminated.

Note that inputs 1 and 2 are designed for voltage measurement in the range from 0V to 15V, whereas all the other inputs are discrete ones. Discrete inputs are equipped with an in-built 2.5V bias circuit. A sensor with a dry contact output can be connected directly to the discrete inputs.

7.3. Connection of a load to relay

The controller is assembled with two transfer contact relays. The contacts are rated for 6A, =30V. The contacts use galvanic insulation from the electric circuits of the controller and are capable to commutate loads not exceeding the above-mentioned rated values. In some cases it may be practical to use a transfer contact (the load is connected when the relay is OFF or de-energised).

The figure above shows relay 1 switching a warning lamp. This application may be convenient when the user enters the room. When configuring the ARM input, the following action must be assigned: switch ON relay 1 when going over to the "MONITORING" mode. When setting relay 1, select commutation type **"pulse"** and period 60s. Then, each time when the system is disarmed, the LED will be ON for 60s.
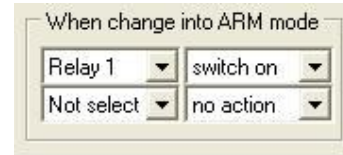
Relay 2 controls the acoustic alarm. Indicate the control action taken by all the inputs used for connection of safety sensors in regard to the relay. Select the setting **"relay control by an alarm event"**. Then, during actuation of any input, the relay will be ON for the time set in the configuration or permanently. For convenience's sake this relay may be switched ON upon "SECURITY/MONITORING" mode changeover, i.e. using the Touch memory key or by SMS or DTMF.

Note that when the external power is OFF, the relay status is saved in the volatile memory of the system. The relay status is restored with restoration of power.

Do not use in-built relays for commutation high induction loads. For commutation of high loads, external relays should be used. The relay coil may be connected to one of the open collector outputs and the relay supply output. For such a connection, an in-built protective diode should be used. The figure above shows connection of a heater unit via an external relay R1. The next chapter presents the methodology for automatic maintenance of the temperature within the set range with the use of this relay and an analogue input.

Basic high load connection procedure:
· Use cables of appropriate section.
· Cable ends must be tightly twisted.
· Electric circuits must be assembled according to the appropriate safety standards.

Observe the appropriate safety measures during remote operation of the equipment. Failures of the equipment may cause fire, flood and other emergencies.

7.4. Connection of "ARM" button and external "ARM" LED

The ARM button is connected to the input ARM/Touch. When the button is closed to the GND circuit (common), the controller receives a signal that the system is set to "SECURITY" or "MONITORING" mode. The figure above shows a connection option for the ARM button. The same input is used for connecting the contact element of Touch memory keys. Depending on the selected input mode, one can use either a button or the keys.

The LED anode is connected to the terminal "LED ARM", and the cathode is connected to the "common circuit". The maximal LED current is 10 mA.

7.5. Connection of power source and backup battery

The system is connected to ~220V mains via an adapter with 15V direct output voltage. Supply voltage is connected via the terminal "15 V supply input". The positive terminal of the backup battery is connected to the terminal "battery +".

The controller has a reverse voltage protection.

7.6. Start-up procedure

At this stage it is supposed that the controller is configured, the sensors are mounted, the sensors' wiring and the controller's supply cable are laid to the mounting point of CCU6225-LC.

· Insert a SIM-card into the controller if it has not been done before configuring.

· Secure the controller to an even surface using two screws.

· Connect the cables of the sensors, the ARM button or the Touch memory keys contactor to the controller.

· If necessary, connect the external LED ARM.

· Connect the 15V adapter connector to the controller. If the connection is correct, a green LED "PWR/NET" on the unit's housing will ignite, whereas blinking of the LED will indicate that registration in the network has started.

If the unit is powered from the backup battery, the colour of the LED will be red. As the registration is successfully completed, the LED will flash for short periods and fade (0.2s flashing and 2s pause), indicating that the unit is in the standby mode. If the controller is connected to a computer, the panel at the bottom of the software window will indicate the status of the controller and the firmware version. GSM controller CCU6225-LC is ready for operation.

The orange colour of the PWR/NET LED indicates that the controller is connecting to the network or is set to the voice messaging mode.

The reason for the controller being unable to register in the network for a longer period after power-on (blinking PWR/NET LED) may be the enabled PIN request option on the SIM-card or a SIM-card suspended from service. It may also mean that the incoming signal is probably too low, in which case one may try to relocate the controller or the antenna.

If the SIM card is not inserted, the PWR/NET LED will blink frequently (0.5s flashing, 0.5s pause).

8. Manufacturer's warranty

The manufacturer of GSM controller CCU6225-LC warrants good performance and conformity with the quoted specifications of the unit.

If the controller fails during the warranty period, the manufacturer will cover all the repair costs or, should the repair be impractical, replace the unit with a new one.

The right for warranty repair does not apply to the situations as follows:

- mechanical damage, unauthorised repair, modification or spare part replacement performed on the unit;
- violation on the part of the customer of transportation, storage, mounting and operation requirements before the failure was discovered;
- a failure caused by such acts as fire, flood, moisture or chemicals penetration into the housing;
- discovery of the signs of insects penetrating into the housing;
- removal of the warranty seal from the mains adapter;
- expiry of the warranty period.

In all the above-mentioned disclaimer situations the controller will be repaired on general terms, i.e. for an appropriate charge.

The warranty period for the controller shall be twelve months since the purchasing date indicated in the certificate. If the certificate does not contain a purchasing date and the seal of the retailer organisation are indicated on the certificate the warranty period shall be counted from the manufacturing date of the controller.

Manufacturing date:

Purchasing date: *Retailer's stamp*

Retailer: _____
                                    retailer's signature

I do herewith acknowledge that I have read the warranty
terms and agree to be bound thereby: _____
                                                                            customer's signature