INSTALLATION GUIDE

Alarm Control Panel

CA10 plus
(Program Version 4.7)

Satel®

GDAŃSK

C E

⚠ WARNINGS

Due to safety reasons, alarm system should be installed by qualified personnel only.

Telephone terminals of the panel should be connected to **PSTN lines only**. Connecting to ISDN lines may lead to damage of the equipment.

Because alarm system may contain hazardous items, its components should be kept out of reach of unqualified personnel.

In order to avoid the risk of electric shock, read carefully this manual before proceeding to installation. Any connections should be made in deenergized state only (i.e. with power supply disconnected).

In the event of service operations consisting in fuse replacement, they must only be carried out after disconnecting the supply voltage. For the replacement, use only the fuses which have identical parameters as the original ones.

It is recommended that the manufacturer's required housings and power supply units be used .

Making any construction changes or unauthorized repairs is prohibited. This applies, in particular, to modification of assemblies and components.

CAUTION !
It is impermissible to connect a fully discharged battery (voltage on terminals without a load less than 11V) to the alarm panel. To avoid hardware damage, fully discharged or never used battery should be precharged using proper charger.

The batteries used in the alarm systems contain lead. The old batteries must not be thrown away, but disposed of as required by the existing regulations (European Directives 91/157/EEC and 83/86/EEC).

CERTIFICATE of CONFORMITY		
Equipment type: Control panel CA-10	*Manufactured by:* SATEL sp. z o.o. POLAND	C E
Complies with **Directives of the Council of the European Union:**		
Low Voltage Directives	73/23/EEC revised by 93/68/EEC	
EMC Directive	89/336/EEC revised by 91/263/EEC, 92/31/EEC, 93/68/EEC	
R&TTE Directive	1999/5/EC (network connection, TBR21)	
EIIS® LVD tested Germany	EIIS® EMC tested Germany	EIIS® R&TTE approved BZT - Germany
GDAŃSK, date: **2003-11-03**	*Head of Test Laboratory:* Stanisław Galla	

NOTE!
The control panels with internal pulse power supply require a different approach (as compared with the previously manufactured CA-10v3.x panels) during the power-up procedure. Refer to the section on connecting power supply and starting the control panel.

History of the manual updates – see the end of this manual.

CONTENTS

CONTENTS

CONTENTS

CONTENTS

GENERAL DESCRIPTION OF THE CONTROL PANEL

The **CA-10 plus** alarm control panel is a new version of the hitherto manufactured CA-10. The changes, as compared with the previous version, refer mainly to the design and technical parameters of the panel. Its resistance to surge currents has been considerably improved, so now it meets by a good margin the requirements of standards consistent with the European Union EMC 89/336/UE Directive. It is a state-of-the-art, microprocessor-based alarm control panel, developed in accordance with the latest trends in the field of burglary and assault signaling.

The alarm control panel incorporates a number of solutions, which were previously encountered only in special purpose equipment. Some of the solutions are an absolute novelty.

Basic functional features:

- operating the panel from remote **LCD text display** keypads or from LED keypads,
- connection of up to **four independent keypads,**
- remote control by means of a telephone set (selected functions) – <u>support of the MST-1 module</u>,
- possibility of **four-partition** operation, with completely separate alarm systems, or common zone partitions or internal partitions,
- **10 to 16 fully programmable zone inputs** (8 zones on the main board, 2 on each keypad, extension through zones of next keypads or expander), each capable of performing one of 21 functions,
- support of any detectors in NO, NC, EOL and two-parameter (2EOL) configuration with individual zone violation,
- **6 programmable outputs**, each being able to perform any of 41 functions.
- built-in **telephone communicator** for:
  - messaging to **two monitoring stations**,
  - messaging alarm condition via **pager** systems,
  - messaging alarm condition with **voice announcement**,
  - **answering a call** and reporting the system status,
  - **remote service** from a modem equipped computer,
- built-in **RS-232 interface** makes it possible to connect a printer (for printing event log or current data) and program the control panel from a PC.
- **internal clock** for automatically arming / disarming partitions with TIMER function,
- operating the system with independent access codes by **32 users** (up to 13 in each partition) - the codes can have different authority levels, and their use is recorded in the event log,
- nonvolatile **memory of 255 last events,** which gathers information about arming, disarming, alarms, troubles, etc., with date and time of occurrence, and panel user number,
- possibility to **supervise guard rounds** with TIMER function,
- automatic monitoring of the alarm system performance, inclusive of finding **a damaged or blocked detector**.

Its comprehensive features and affordable price permit application of the CA-10 plus both in small and medium-size alarm systems.

TECHNICAL DESCRIPTION OF THE CONTROL PANEL

Zones

In its basic configuration, the CA-10 plus control panel has 10 zones: 8 on the panel main board and 2 in the keypad. In its full configuration, with four keypads (or an expander), the panel has 16 zones available. The panel zone inputs can support any detectors in the configuration NC, NO, EOL, 2EOL/NC, 2EOL/NO. The use of two-parameter configuration enables the panel to simultaneously control the detector and its anti-tampering circuit by means of one pair of wires.

The zones (input lines) can perform the following functions in the system:

0   **- ENTRY/EXIT ,** the violation of which, when in the armed mode, will start countdown of the entry delay time and will enable the delay mechanism for "interior delay" type zones (violation of an "interior delay" zone without prior violation of the "entry/exit" zone will trigger an alarm immediately). Upon violation, a "zone violation" code is sent to the station (it is possible to skip sending this message), and, after counting down the "entry delay time" and triggering the alarm - a "zone alarm" code. The "entry delay " countdown can be signaled in the keypad. It is possible to define automatically bypassing zones if no „entry/exit" zone is violated during the exit delay time". Because of its additional functions, this zone type cannot be used as a common zone for several partitions.

1   **- DELAY** - when violated in the armed mode, it starts delay countdown, after which an alarm is triggered. It will not occur if the zone is disarmed before completion of the delay countdown. Upon violation, a "zone violation" code is sent to the station (it is possible to skip sending this message), and, after counting down the "entry delay time" and triggering the alarm - a "zone alarm" code. The delay is not signaled in the keypads.

2   **- INTERIOR DELAY** - when violated in the armed mode after previous violation of the ENTRY/EXIT zone, it behaves like a DELAY zone. When violated in the armed mode without previous violation of the ENTRY/EXIT zone, it behaves like an INSTANT zone.

3   **- INSTANT** - when violated in the armed mode, it immediately triggers an alarm and sends a "zone alarm" message to the monitoring station.

4   **- DAY/NIGHT** - when violated in the armed mode, it behaves like an INSTANT zone, while when disarmed, it will signal violation in the keypad (unless the signaling is disabled) and send a "zone violation" code to the station.

5   **- COUNTING L1** - when violated in the armed mode, it increases the status of the first of three violation counters (a „zone violation" code is sent to the station), until the number of violations specified for that counter is exceeded (programming in FS-7). Then, the violation triggers an alarm (a „zone alarm" code is sent to the station). The violation counter is reset after 30 seconds since the first violation. It is possible to program another counter count-up time (FS-123). If the preset number of violations is not reached within this time, there will be no alarm. The "counting L1" function can be assigned to more than one zone, then violations of those zones will be summed up. Violation of the counting zone in armed mode can be signaled in the keypad in the same way as for the DAY/NIGHT zone.

6   **- COUNTING L2** - operation identical as for the "counting L1", but changes the status of the second of the three counters.

7   **- COUNTING L3** - operation identical as for the "counting L1", but changes the status of the third of the three counters.

8   **- 24H AUDIBLE** - armed all the time, irrespective of whether the partition it is assigned to is armed, or not. Each violation of this zone will trigger alarm on the BURGLARY alarm type outputs, in the keypad, and will send a "zone alarm" code. It makes possible to create anti-tampering circuits and panic buttons.

9   **- 24H AUXILIARY** - armed all the time, irrespective of whether the partition it is assigned to is armed, or not. Each violation of this zone will trigger an alarm in the

keypad and will send a "zone alarm" code. It is intended for connecting detectors not related to the burglary alarm, such as gas or flooding sensors, etc.

10 - 24H SILENT - armed all the time, irrespective of whether the partition it is assigned to is armed, or not. Violation of this zone will only send a "zone alarm" code to the monitoring station.

11 - 24H FIRE - armed all the time, irrespective of whether the partition it is assigned to is armed, or not; intended to manage the fire detectors.

If the control panel contains a zone programmed as the "fire power supply", violation of the zone will actuate the alarm verification mechanism and will signal alarm in the keypad. To perform the verification, disconnect momentarily power supply to the fire detectors and check, whether after reconnection of power supply the violation will be repeated within 90 seconds. If that's the case, the control panel will send a "zone alarm" message to the monitoring station, activate the "fire alarm" outputs, and trigger the fire alarm (intermittent signal) in the keypad.

If there are no fire detector supply zones, the zone violation will immediately send a "zone alarm" code to the monitoring station, activate the "fire alarm" and "fire/burglary alarm " type outputs, as well as trigger the fire alarm (intermittent signal) in the keypad.

12 - ARMING - violation of this zone will arm the partitions the zone belongs to.

13 - SILENT ARMING - violation of this zone will arm in silent mode the partitions the zone belongs to.

14 - DISARMING - violation of this zone will disarm the partitions the zone belongs to.

15 - NO ALARM ACTION - violation of this zone will activate the "zone violation" type outputs.

16 - ARMING/DISARMING – controls arming/disarming of partition to which this zone is assigned. Setting of "PRIORITY" option allows to choose one of two different modes:

- PRIORITY option enabled: zone violation will arm the partition, while end of violation will disarm the partition ("Bistable" action)

- PRIORITY option disabled: each violation of the zone will trigger partition's state between "Armed" and "Disarmed" state ("Monostable" action).

17 - DELAY AUDIBLE – a delayed zone with the delay countdown signaling in keypads.

18 - AUTOMATIC BYPASS ARMING – violation of this zone arms the partition the zone belongs to, simultaneously bypassing the zones programmed as AUTO-BYPASS (see service functions 16,17,18,19)

19 - PERIMETER – zone armed since entering the access code and confirming it with the [#] key (i.e. arming the partition). Violation of this zone during countdown of the "exit delay" will trigger an alarm.

20 - ENTRY/EXIT-FINAL – acts much like the type 0 (entry/exit) zone, but the violated zone RESTORE during exit delay countdown will stop the countdown and begin the partition armed mode.

Reaction time for each zone can be programmed within 0.016 s to 4.08 s.

For each of the delayed zones, an individual time delay can be set.

Each zone involves a few options to determine the reaction in particular situations.

It is possible to determine for each zone the maximum violation time (in seconds), after which the zone will be recognized by the control panel as defective, and to determine the maximum "no violation" time (in hours), after which the zone will be recognized by the control panel as defective.

The zones can be selectively bypassed.

Seven event codes to be sent to the monitoring stations can be determined for each zone.

Outputs

The CA-10 plus is equipped with 6 programmable outputs: 4 high-current and 2 low-current ones.

The OUT1, OUT2, OUT3 and OUT4 outputs are protected by special electronic fuses with current limiters set at 2.2A. The panel monitors presence of voltage, overload, and signals trouble conditions at these outputs. 2.2kΩ resistors must be connected in parallel to these outputs. The above outputs supply the load with +12V voltage.

The OUT5, OUT6 (low-current, up to 50mA) outputs control ground of the load.

All outputs are equipped with protective devices for inductive loads and pulse interference.

Designation of the outputs can be adapted for the needs of the alarm system controlled by the panel. Though individual outputs differ by their design, each of them can perform one of the following functions:

1 - BURGLARY - the output starts on detecting a burglary alarm by the control panel. The alarm is triggered by armed zones, zone anti-tampering circuits, keypad tamper detectors, and by the user (through the ALARM PANIC function). If the zones to which the output is to react are defined, the zone alarms will be limited to those included in the „list of outputs" (the other alarms will be effected irrespective of the source). It is also possible to indicate (in the output options) the partition the output is associated with. If this is the case, the zone alarms will be limited to those from the zones belonging to the partition indicated. When the "list of outputs" is empty and no partitions are indicated, the output reacts to all alarms (except for the fire alarms).
The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During its operation, it can every second change its state (pulsate).

2 - FIRE/BURGLARY - the output starts on detecting by the control panel of a burglary alarm (continuous signal) and/or a fire alarm (intermittent signal). The output operation can be limited to the indicated "list of outputs" or a specific partition (identically as for the **01** output type). The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user.

3 - FIRE - the output starts when the control panel detects a fire alarm. Such an alarm is triggered by fire zones or the user (through the ALARM FIRE function). The output operation can be limited to the specified "list of outputs" or particular partitions (identically as for the **01** output type), indication of any zones other than the fire ones having no sense, as they would not generate a fire alarm. The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During operation, it can every second change its state (pulsate).

4 - KEYPAD ALARMS - the output starts on detecting any keypad alarm (FIRE, PANIC, AUX., keypad tamper alarms). The output operation can be limited to the alarms from specified partitions. The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During its operation, it can every second change its state (pulsate).

5 - KEYPAD FIRE ALARM - the output starts on triggering the fire alarm by the user (with the FIRE ALARM function). The output operation can be limited to the alarms from specified partitions. The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During operation, it can every second change its state (pulsate).

6 - KEYPAD PANIC ALARM - the output starts on triggering the PANIC alarm by the user. The output operation can be limited to the alarms from specified partitions. The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During operation, it can every second change its state (pulsate).

7 - KEYPAD AUX. ALARM - the output starts on triggering the alarm by the user with the ALARM AUX function. The output operation can be limited to the alarms from specified partitions. The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During operation, it can every second change its state (pulsate).

8 - KEYPAD TAMPER ALARM - the output starts on detecting violation of the tamper contact or a change of the keypad address, and also after 3 wrong codes. The output operation can be limited to the alarms from specified partitions. The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During operation, it can every second change its state (pulsate).

9 - DAY/NIGHT + COUNTING - the output starts on detecting violation of disarmed DAY/NIGHT zone or violations of COUNTING zones, which trigger no alarm. Operation of the output can be restricted to a specified "list of outputs" or particular partitions (identically as for the **01** output type). Indication of any other zones than those tested by this output type is irrelevant - they will give no violation signal. The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During operation, it can every second change its state (pulsate).

10 - DURESS alarm - the output starts on using an access code with authority level 4 (DURESS) to disarm the system or to signal an alarm. This code is used to trigger a special "disarm under duress" alarm. Operation of the output can be restricted to alarms from particular partitions. The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. During operation, it can every second change its state (pulsate).

11 - CHIME - the output starts on violating the disarmed zones for which the "chime" option has been activated. Operation of the output can be restricted to the indicated "list of zones" or to specified partitions (identically as for the **01** output type). The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the alarm is cleared by the user. The output signals violations irrespective of the chime lock setting in keypad (the lock is activated with the function 8, called by holding down the key).

12 - SWITCH MONO - the output is activated by calling the user function 7 ([CODE][*][7]) or using a code with authority level 5 ([CODE][#]). Operation of the output can be restricted to specified partitions. The output can remain active for a time from 01 to 99 seconds or from 01 to 99 minutes.

13 - SWITCH BI (ON/OFF) - the output changes its state when the user function 8 is called or a code with authority level 6 is used. Operation of the output can be restricted to specified partitions.

14 - ARM STATUS - the output is active in the armed mode. Operation of the output can be restricted by indicating a „list of zones" or specific partitions. Unless zones and partitions are indicated, the output is active when any partition (zone) is armed.

15 - SILENT ARM STATUS - the output is active in the silent armed mode. Operation of the output can be restricted by indicating a „list of zones" or specific partitions.

16 - EXIT DELAY WARNING - the output is active during the „exit delay" countdown by the control panel. Operation of the output can be limited to indicating the „exit delay" for specified partitions.

17 - ENTRY DELAY WARNING - the output is active during the „entry delay" countdown. Operation of the output can be limited to indicating the „entry delay" for specified partitions.

18 - TEL. USAGE STATUS - the output is active when the control panel is on the telephone line.

19 - GROUND START - the output activated by the control panel to generate the GROUND START pulse (a 2 sec. signal occurring before the control panel "lifts the handset", required by a specific type of telephone exchanges).

20 - MONITORING CONFIRMATION - the output activated for 3 seconds by the control panel, after correct termination of the monitoring session.

21 - BYPASS STATUS - the output is active when some zones are bypassed in the system. Operation of the output can be limited to showing the bypass of zones specified in the list of zones, or the bypass of indicated partition zones.

22 - READY STATUS - the output is active when all the control panel zones are free from violations. Operation of the output can be limited to showing the READY status of zones specified in the list of zones, or the READY status of indicated zones.

23 - ZONE VIOLATION - the output starts when one of the zones is violated. Operation of the output can be limited to the indicated "list of zones" or specified partitions (identically as for the **01** output type). The output can remain active for a specified time (from 01 to 99 seconds or from 01 to 99 minutes) or until the armed mode is deactivated or the alarm cleared.

24 - TELEPHONE LINE FAULT - the output used when telephone messaging is doubled by radio messaging; it makes possible reporting the telephone line faults.

25 - 230V AC LOSS INDICATOR .

26 - LOW BATTERY INDICATOR – activated when the battery voltage in three consecutive tests drops to about 11V.

27 - POWER SUPPLY - the output intended for powering detectors, encoders, radio lines and other equipment with 12V direct voltage. When programming this type of output, pay special attention to permissible current-carrying capacity of each of the control panel outputs.

28 - FIRE POWER SUPPLY - the output intended for powering the fire detectors. The output closely interacts with the 24H FIRE zones. If assigned to any of the control panel outputs, the function activates the fire alarm verification mechanism. The mechanism operates as follows: the first violation cuts the fire detectors power supply off for about 15 seconds. The power-down results in reset of the violated detectors. Then, the power supply is restored, but the panel will not control the 24H FIRE zones for ten to twenty seconds because of the balancing of detectors. Next, the control panel enters the special mode of fire detectors control, which lasts about 90 seconds. If a repeated detector violation occurs during that time, a FIRE alarm will be triggered. Otherwise, the control panel will go over to the normal control of 24H FIRE zones. The output reacts to the "RESET POWER SUPPLY" function (user function 9, cutoff for time programmed as the output active time).

29 - RESET POWER SUPPLY - the output is designated to power detectors which require a periodical power cut-off until the state memory is cleared. The RESET mechanism is activated from keypad through the user function 9 (calling: [CODE][∗][9]). The voltage is cut off for time programmed as the output active time (minimum 5 seconds).

30 - TIMER - the output is controlled by the control panel clock; it is activated / deactivated in the hours indicated by a corresponding TIMER (see Functions programming TIMERS).

31 - AUDIBLE ALARM STATUS - the output signals the audible armed mode. Operation of the output can be limited to the indicated "list of zones" or specific partitions.

32 - FULL ARM STATUS - the output is only active when all zones / partitions assigned to it are in the armed mode.

33 - ARM/DISARM/CLEAR ALARM - the output signals the performance of particular operations with, respectively, one, two, or four pulses 0.16 s each.

34 - KEYPAD ALARM BUZZER - silent alarm signaling in the partition keypad.

35 - POWER SUPPLY IN ARMED MODE - it functions similarly to the arm status output, but goes on right after starting the exit delay countdown, not after changeover from the exit delay to the armed mode (it can be used, for example, as indicator or power supply output for microwave detectors in spaces where people stay).

36 - STATUS LED – the function used in the CIS countries.

37 - STATUS RELAY – the function used in the CIS countries.

38 - ZONE TROUBLE – the output signals that the maximum zone violation time or the maximum zone no violation time have been exceeded.

39 - NO GUARD CODE – the output is activated by a timer programmed as the partition control TIMER, unless a guard code is entered within the timer specified time.

40 - SERVICE MODE INDICATOR – the output is activated if the control panel service mode has been called from any keypad.

41 - LOW BATTERY INDICATOR – the output whose state is updated after each battery voltage test.

Operation time can be defined for each output in seconds (from 1 to 99 seconds), in minutes (from 1 to 99 minutes), or LATCH type (until cut off). It is possible to determine the output polarity for active state (+12V or 0V on the load), and whether it should operate in pulsed or continuous mode.

Assignment of the particular outputs can be restricted to the specific partitions / zones of the system.

Keypads

The keypads are designed for operating and programming the system (or a partition). The CA-10 plus can support four independent LCD or LED keypads, thus making possible creation of four partitions or separate systems. **Each keypad is assigned to one partition.**

The keypad operating mode is set when programming the panel. It is possible to disable some of its functions (e.g. the quick arming by pressing in turn the [0] and [#] keys), and determine what audible signals are to be provided by the keypad.

The keypads have addresses, which make difficult replacement or connection of another keypad, an individual anti-tampering contact and two zones, which operate identically as the zone inputs of the control panel main board. They can be assigned to any partition.

The data concerning the address, anti-tampering contact status and zone status, are sent to the control panel together with keypad data.

LCD Keypad

The CA-10 plus control panel is designed to work with an LCD keypad with software version v2.00 (or later). The LCD keypad provides information on the alarm system status by means of a two-line (2 x 16 characters) LCD display and, additionally, six LEDs.

The LED functions:

- **ALARM** - signals an alarm occurrence.
- **TROUBLE** - blinking, when the control panel signals detection of a technical problem or a telephone messaging problem.
- **PARTITION 1 ... PARTITION 4** - show the partition status: blinking (with the ALARM LED off) means the exit delay countdown; steady light means the armed mode of the partition.

The LED functions change when calling the service mode or entering the user functions mode – they are in keeping with the principles of status display by the control panel LED keypads.

The keypad is provided with 12 keys, designated according to the telephone standard, and intended for entering data. The additional 4 arrow keys in the LCD keypad allow the user to move through the MENU and to select functions. When the function is selected, these keys facilitate programming. The ⇦ ⇨ keys change the cursor position, the ⇧ key deletes the character before the cursor, whereas the ⇩ key changes the data entry mode (adding or changing at the cursor position).

Three operating modes of the keypad are provided:

1) **Text mode.** The first line of the display shows the system date and time. The second line contains messages on the system state. The contents of messages can be either standard (e.g. *SYSTEM OK.*, *ARMED*), or customized by the installer. This mode enables the status to be displayed either with or without priority. In the priority mode, the most important information message from among a few relevant ones (e.g. *ALARM !*) will be constantly on. In the non-priority mode, the display state will change cyclically (e.g. the messages *THERE WAS ALARM* and *ARMED* will be displayed alternately).

2) **Zone state display - LCD standard.** The first line of the display shows the system date and time, while the second serves for monitoring the state of all the 16 zones of the control panel. The zone state is determined by a displayed character (for example: $\square$= zone OK., N = zone violated). At the moment of changing the system state (e.g. when the system is armed), the display shows the status for a while, much in the same way as in the previous mode, then the keypad returns to monitoring the state of zones.

3) **Zone state display - LED standard.** This mode is similar to the mode 2). The difference is that the state of 12 zones of the control panel is being monitored in the second line in the same way as it is the case in the LED keypad.

The operating mode 1 or 2 is recommended for the LCD keypad. The user can temporarily switch the display between the text mode and the zone state mode by holding down the ⇩ key.

The operating mode is defined by the installer with the *State format* service function, available only after activation of the control panel service mode.

The LCD keypad is fitted with a RS-232 port intended for programming the keypad directly from the computer.

LED Keypad

In the LED keypad, the state of partition and selected zones is displayed by means of LEDs. Indication of any 12 zones of the control panel is possible for each partition. The other three LEDs have fixed meanings: the red one signals ALARM, the green one ARMED mode (blinking means the exit delay countdown), and the yellow one TROUBLE.

Access Codes and Authority Levels

The CA-10 plus panel can store in memory 32 access codes (4 to 6 digits long), with different authority levels. The codes are associated with the partitions they are assigned to. The control panel has a MASTER code initialized when restarting with the control panel settings (four-digit access code, beginning with a digit equal to the partition number, 1234 for Partition 1, 2345 for Partition 2, etc.). The master code cannot be deleted, however it can be changed. It provides access to all user functions.

The master code user (User 0) can add new users, assigning various authority levels to them. The code authority level defines which functions of the control panel are accessible by using this code, and which are not.

New users (new codes) are automatically numbered by the control panel as they are entered. This makes it possible to distinguish, who and when operated the control panel, as the user (code) number is stored in the memory of events along with the command given. With the LCD keypad, identification of the users by their name is also possible.

Deletion of the code will not cause renumbering of the other users' access codes. Whenever a new user is added, his code will replace the one left by the deleted user.

Access codes can be declared as the „global access codes" (FS 131). Then they will be accepted in each partition, irrespective of in which partition they are entered. However, with this option it is impossible to identify the user who called the control function when viewing the event log.

Individual users may have the following authority levels:

1 - accessible **all functions,** except creating and deleting users,

2 - accessible **arming and disarming, change of access code**,

3 - accessible **arming,** while **disarming is only possible when the system was armed with the same access code**,

4 - **code trap**: it arms and disarms the system, but disarming sends a DURESS ("disarmed under duress") message to the monitoring station,

5 - activates the MONO SWITCH output, **its use is recorded in the event log,** can serve as a guard code,

6 - changes the state of BI SWITCH output,

7 - **partial arming** - the code arms the system, simultaneously bypassing a group of zones (specified by the installer in service functions), otherwise the code provides the same features as that with authority level 2,

8 - accessible **arming and disarming, without possibility to change own access code**,

9 - accessible **arming only**,

0 - accessible **alarm clearing only**.

Partitions

Creation of a partition consists in assigning at least one zone to it. The CA-10 plus permits four partitions to be created. Any outputs, telephone numbers and pager messages can be assigned to one partition, thus enabling four independent alarm systems to be built on the basis of one CA-10 plus control panel.

In the event of a few keypads being connected to the control panel, each keypad will be hooked up to the particular partition via a special control output. The keypad connected to the CLK1 output will belong to the partition 1, that connected to the CLK2 output - to the partition 2, etc.

Where the system comprises less keypads than partitions, individual partitions can be operated from the existing keypads, by means of the GO TO function (when this function is called, the keypad will for a time belong to another partition). The partition which has no keypad, can be controlled through the zones to which the "arming" and "disarming" functions are assigned. The state of such a partition can be signaled on the outputs.

Partitions can be defined in the following way:

- partitions have no common zones - they are independent sub-systems,
- some zones belong to several partitions - the common zones are only armed when all the partitions these zones belong to are armed,
- all zones of one partition belong at the same time to another partition - the control panel recognizes one partition as the master, and the other as an internal one; arming/disarming the master partition results in simultaneously

arming/disarming the internal partition, while arming/disarming the internal partition only affects the zones within that partition,

- <u>the same zones are assigned to different partitions</u> - these partitions will become mutually internal; arming/disarming one partition causes identical reactions in the other partition: thus defined partitions <u>behave like one partition with two (or more) independent keypads.</u>

When analyzing, if the given partition is an internal one, the control panel checks how the zones <u>for which arming is possible</u> overlap. Therefore, an internal partition can be assigned with separate "24H" zones as well as arming control zones.

The partitions have individual identifiers and event codes for monitoring purposes.

Monitoring

The CA-10 plus control panel can transmit information about the system (partition) status to one or two monitoring stations. Communication with the monitoring stations takes place irrespective of the voice messaging and the messaging to paging systems. It has a priority and is realized before the voice messaging. In case problems occur with getting connected to the station, the control panel will suspend dialing the station number for 60 seconds and, if the message is also to be transmitted by the dialer, it will make the line available to the dialer.

There are a few ways of transmitting information to the monitoring stations.

- **Reporting to one station.**
- **Reporting to Station 1, and if unavailable - to Station 2** (e.g., when the station has two telephone numbers). If this is the case, all events are reported, irrespective of which station was reached by the control panel.
- **Reporting to both stations with event sorting** - depending on what event occurred in the system, e.g. information on alarms to Station 1, and information on troubles to Station 2 (this mode is useful where the station serves many subscribers and it is necessary that the number likely to receive most vital information be busy as little as possible). In this mode, during control panel programming, you can determine which information is to be sent to which station.
- **Reporting to both stations**: Station 1 first, then Station 2. This mode is reached by assigning the same event to both stations.

In case of a system with 16 zones and 32 users, the number of messages to be sent to the monitoring station in order to ensure an appropriate facility protection degree may be large enough to exceed the capacity of standard transmission formats. Therefore, to increase the control panel flexibility, the events occurring in the system have been divided into six groups:

- the first one includes the **zone related events** (this group has the highest priority),
- four groups are represented by the **partition related events** (the event priority depends on the partition number, the first partition having the highest priority),
- the sixth group accounts for the other **system events**.

Individual system identifiers are assigned to each group of events (one for each station). In the event of stations which cannot accept several different identifiers in one communication session, the control panel can send the events in separate sessions, in the order resulting from the priority, grouping events with the same identifiers.

It is possible to send information on nine different zone related events and seventeen partition related events (whereof seven events may contain the user number). The control panel is also capable of sending twenty eight other events which occurred in

the system (e.g. troubles, start of programming mode via a telephone, activation of service mode, etc.). The event codes for both stations are the same. For a majority of events, it is possible to define how the events are to be sorted between the two stations. Information can be sent to the stations in one of the seventeen transmission formats (including the TELIM format, used in Germany).

Because of the analysis of commutation signals (algorithm ToneLOGIC), the CA-10 plus panel controls the process of establishing connection with the station, which in case of the line being frequently busy considerably reduces the time between occurrence of the event and sending information to the monitoring station. As dialing retries are made immediately after detecting the busy signal, the connection is established many times faster than with the equipment which waits for one specific signal for a predetermined period of time and only redials upon detecting that that signal has not occurred .

Dialer

The CA-10 plus control panel is equipped with a telephone dialer, which enables an alarm voice message to be transmitted. The message is stored in an external synthesizer. The control panel directly interfaces with the SM-2 voice synthesizer.

The dialer can also establish connections with paging systems. Four different alphanumeric messages can be programmed.

The CA-10 plus allows programming of eight telephone numbers, 16 characters each.

It is possible to define for each number, which partitions signal alarm at that number and assign to it one of the four text messages for the pager or a voice announcement from the synthesizer.

During the procedure of connection setup, the ToneLOGIC system used in the CA-10 plus panel controls sound signals from the telephone line. Hence, it can recognize that the call is answered, irrespective of the type of telephone exchange.

Messaging for each telephone number is realized in accordance with the following parameters:

- **Number of queues** (1 to 7) – defines how many times it is necessary to call and send information to each number,
- **maximum number of retries** (1-9) – number of attempts, after which the panel will stop dialing the number, for which connection cannot be established (no answer, permanently busy, etc.).

When waiting for the dial tone during dialing (code D, when the control panel is connected to an extension line and is trying to get the outside line), detecting the busy signal does not decrease the counter of queues and attempts.

The control panel dialer can also perform the function of answering the calls and reporting the system state (see functions FS-5 and FS-101):

- with a sound signal: one beep a second if there was no alarm,
- with a voice message (if one hour has not elapsed yet after the alarm),
- with a sound signal: five short beeps every second if at least one hour has elapsed from the alarm.

Another way of getting information on the system state via the telephone is through the control panel operation in conjunction with the SATEL **MST-1** module (see: FS-131, option 2). Additionally, this module enables the system to be remotely controlled, within certain limits, by means of DTMF signals (see *User Manual for the CA-10 plus alarm control panel with LED Keypad*). For the connection diagram refer to the MST-1 module operating instructions.

Remote Programming – DOWNLOADING

In order to facilitate programming, the CA-10 plus panel is equipped with a DOWNLOADING mechanism, which enables a PC computer to be used for programming and service control of the alarm system.

Operation with the computer can be realized in two ways: in the „*local mode*" by means of the RS-232 interface (after connecting the CA-10 plus directly to one of the computer COM ports), or in the „*remote mode*", via the telephone line (in this case the computer must be equipped with a modem).

Programming the data of LCD keypad is available in the local mode through the RS-232 port on the keypad board.

The DLOAD10 program, delivered with the panel, supports both operating modes.

The DLOAD10 program enables:

- downloading (reading) all control panel parameters,
- uploading (writing) new parameters to the control panel,
- downloading (reading) the system event log.

The program does not read or change the user access codes - these are only accessible through the user functions from keypads.

In the **ONLINE** mode, the computer displays current information on the system state, including zone violations, active outputs, control panel clock, and selected partition state. Provision is made for controlling the system in the same way as with a LED keypad. The computer screen keypad works in parallel with the real keypads in partitions, therefore commands for all partitions can be given from one place. The ONLINE mode also permits downloading troubles and programming the clock.

Communication in the local mode (through the RS-232 port) is started with a special service function (FS 112). Connection can also be initialized without using the keypad (e.g. if it is located far from the control panel and the computer). This can be achieved using the "Local connection with…" command in the DLOAD10 program.

Communication through the telephone line can be initialized in three modes:

1) The computer calls the control panel, which after answering the call exchanges handshake signals with the computer. When they are correct, the panel confirms acceptance of the remote programming command, hangs up and calls back to the computer using a number preprogrammed in the control panel. Prior to calling the computer back, the panel notifies the monitoring station that the programming has started.

2) The computer calls the control panel and, after the handshake, the control panel immediately proceeds to the exchange of data. This simplified mode of establishing communication is reached when the computer telephone number is not entered in the control panel. Notification of the monitoring station will take place after communication with the computer is over.

3) Establishing of communication from the control panel by calling the function 0 (zero) by the partition master user. The control panel first notifies the monitoring station that the programming has started (when monitoring is active), then it dials the computer telephone number.

Initialization of communication can be disabled from the computer.

In order to reduce the cost of telephone connections, multiple suspension of the transmission is possible. At the next connection, the control panel does not inform the monitoring station of remote programming. Only after receiving the command to end the communication, a message on completing the remote programming is sent to the station. Initialization of communication can be disabled from the computer. When the communication is suspended from the computer, the control panel is

waiting for a call from the computer for four hours even when the functions of automatically answering the computer call are disabled. When the communication is ended with the "end" command instead of "suspend", the information on ending the communication is entered into the event log and sent to the monitoring station after four hours.

As the control panel is only accessible to the service, a number of protective devices is provided to prevent hacking of the system and change of any data by unauthorized persons. All the data exchanges are authorized by changing the access codes and the data are encoded.

The DOWNLOADING can be particularly useful to installation firms engaged in servicing many alarm systems. Then the user suggested inspections and modifications of software will not necessarily require troublesome and costly traveling - they will be carried out with a computer via the telephone line. Such a method of customer service and technical control of customer systems will allow creation of alarm equipment services at an advanced and professional level.

INSTALLATION OF THE CONTROL PANEL

Description of Control Panel Main Board

The control panel main board contains electronic components sensitive to electric charges. Prior to installation, these charges must be removed. During installation, avoid touching any elements on the control panel main board.

BOARD TERMINALS:

AC	- module power supply inputs (17...24V AC)
Z1 to **Z8**	- zone inputs
OUT1 to **OUT4**	- programmable outputs (current-carrying capacity 2.2A)
OUT5 to OUT6	- programmable outputs (current-carrying capacity 50mA)
+KPD	- keypad power supply output
+12V	- power supply outputs
COM	- ground
DATA	- common terminal of keypads
CLK1 to **CLK4**	- individual terminals of separate partition keypads
⏚	- protective terminal - ground (connect to protective circuit only)
TIP, RING	- terminals of outside telephone line
T-1, R-1	- terminals of extension telephone line (telephone set)
J22	- connector for OUT5 & OUT6 output, power supply and ground lead-outs
J18	- connector for SM-2 voice synthesizer
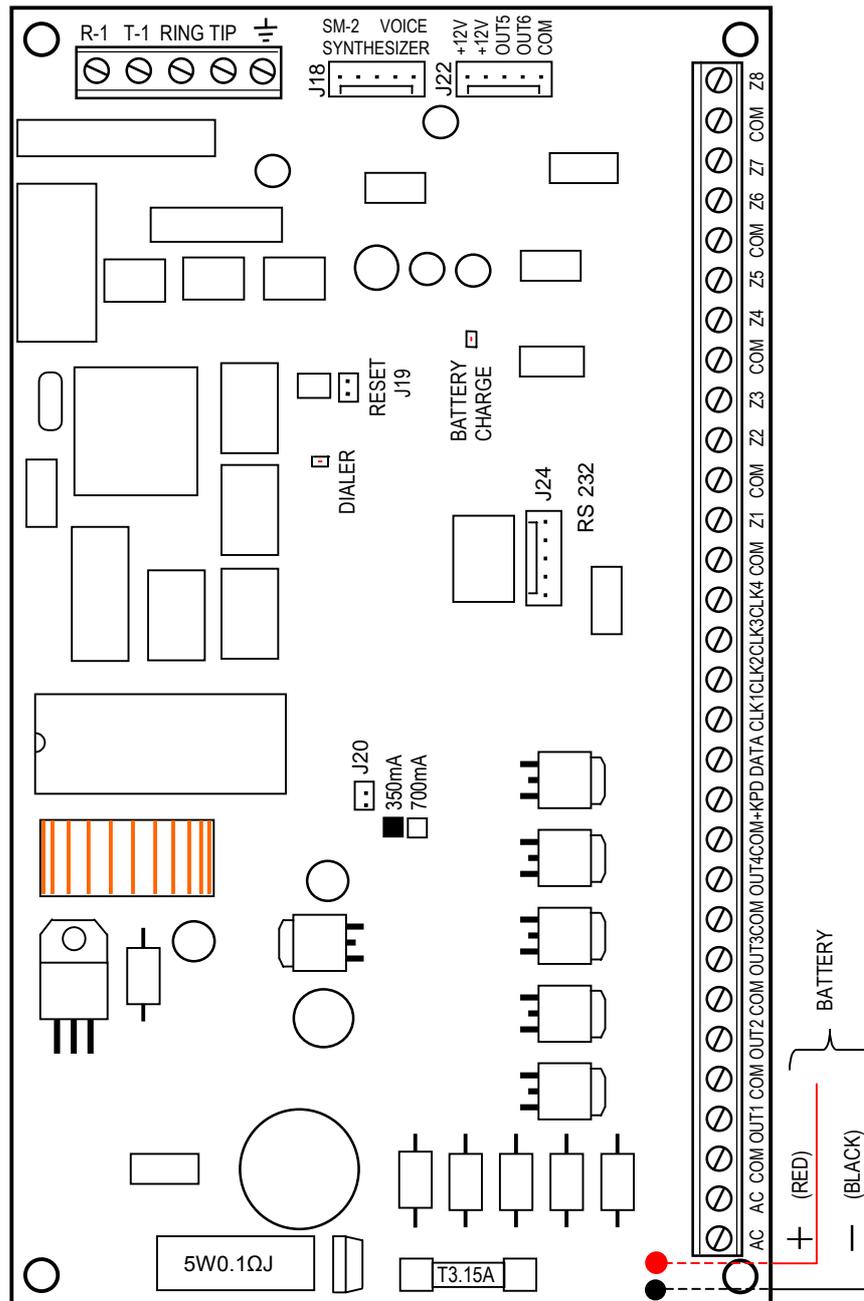
Figure 1 - *Diagrammatic view of control panel main board, version CA10PV4.3.*

The **AC** terminals are intended for providing the **alternating** supply voltage from the mains transformer. The control panel power supply unit is suitable for the **17...24V** AC input voltage. The control panel is fitted with an advanced pulse-type power supply of high energy efficiency and operational reliability, however, its correct functioning requires that the input voltage at the **maximum load** of the transformer by the control panel does not drop below **16V** AC.

The CA-10 main board can be connected to an electric shock protection circuit (grounding). The protective cable terminal is designated by the ⊥ symbol. The „neutral" wire of the 230V AC mains supply must not be connected to it. If the facility has no separate electric shock protection circuit, this terminal must be left free.

The control panel power supply is fitted with:
- battery status monitoring system with optional disconnection of discharged battery,
- visual signaling of the battery testing/charging process (LED indicator on the main board),
- changeover battery charging current (350mA/700mA).

The stabilized voltage of the control panel power supply is 13.6 - 13.8V and is factory set.

The „**DIALER**" LED is on during telephone messaging by the panel, and blinks during pulse dialing of the telephone number.

The **BATTERY CHARGE** LED situated next to the „J20" pins is on when the battery status is being tested by the module and during charging of discharged battery. CA-10 tests the presence of battery every 10 seconds and every 4 minutes it tests (for several seconds) the battery status. During testing, the processor reduces the power supply and the loads are powered from the battery. If the battery voltage drops down to 9.5V, the control panel will cut off the battery in order to prevent it from a complete discharge and damage.

The **J20 pins** are used for setting the battery charging current:

350mA   - pins shorted,
700mA   - pins open.

Two wires (red and black) are intended for connecting the battery, the red one is connected to the battery „+" terminal, the black one to the „-" terminal. The battery circuit is protected with a T 3.15A fuse.

The **J19 „RESET"** pins make it possible to start the service mode without entering any service code. This function can be disabled by the installer with software means (see: FS 131 - Option 1).

Electronic short-circuit and overload protection is provided for each of the outputs OUT1-OUT4 and +KPD.

Attention should be paid so as not to cause overloading of the control panel power supply in the alarm system. It is advisable to make a **load balance** for the power supply. The total current inputs for the consumers (detectors, keypads) and the battery charging current may not exceed the power supply capacity. In case of a higher electric power demand, an additional power supply can be used for some of the security system consumers (e.g. APS -15, APS-30 manufactured by SATEL). Table 1 (at the end of this manual) shows an example of estimated balance of current consumption by the system, and an example of battery selection.

The **telephone line** must be of a four-wire type so that the control panel can be connected before the other equipment (telephone, fax, etc.).

The CA-10 plus control panel should be installed in an enclosed space with normal humidity of air. The space should be fitted with an available permanent (not detachable) 230V power supply circuit with protective grounding.

The control panel can be mounted in the CA-10 OBU housing (this housing comprises a transformer designed for operation with the control panel power supply), which permits installation of a battery with 17Ah capacity. Before the housing is secured to the base, it is necessary to mount inside the housing plastic distance plugs, which are intended for subsequent installation of the main board.

In case the plugs tend to slip out, the catches fixing the plug in the housing need to be slightly bent aside (Figure 2). When inserting the plug, press the central part of the head firmly in so that it is blocked in the housing hole. It is advisable to make sure that the plug, when pressed, does not slip out from the opening. During installation of the housing, be careful so as not to damage the wires which will be passed through the hole in its back panel.

BEND ASIDE   BEND ASIDE

PRESS IN
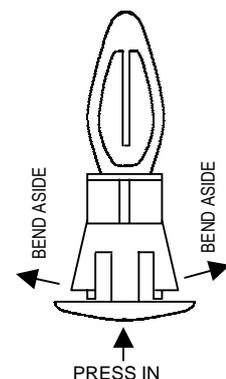
Figure 2

When the housing is secured, you can install the control panel main board and proceed to making the connections.

*IMPORTANT: Do not connect the mains power supply and the **battery**, until all the remaining connections are completed.*

> CAUTION!
> The control panel is power supplied from 230V AC mains. Negligence or wrong connection may result in electric shock and pose a threat to life!
> Therefore, be particularly careful when hooking up the control panel. In the process of installation and connection of the control panel, the cable to be used for mains supply must not be alive!

Connection of Keypads

The CA-10 plus control panel makes it possible to connect four independent keypads, intended to control separate partitions. The keypads are connected to the system by a four-wire line.

Figure 3 shows the keypad connectors: +12V, CLK, DATA, COM designed for connection to the panel, Z1,Z2 – detector inputs, four pairs of pins D C B A - designed to set the address by means of jumpers. The LCD keypad is fitted with a RS-232 port for programming the keypad data.
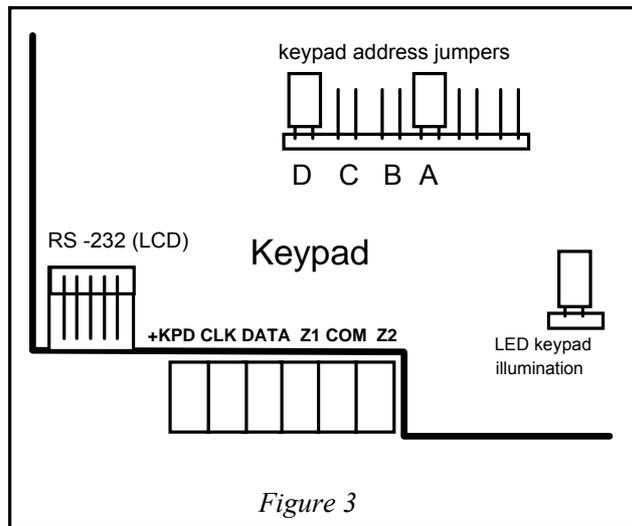
The keypads should be connected to the control panel connectors COM, +KPD, DATA, CLK1, CLK2, CLK3, CLK4. The connectors COM, +KPD and DATA are common for all

Figure 3

partitions, while the connectors CLK1, CLK2, CLK3 and CLK4 determine the partition the keypad belongs to. Where the system will be operated with less than 4 keypads, they should be connected starting from the CLK1.

The keypads may be power supplied from the +KPD panel connector only. This output can also be used for power supply of the keypad connected detectors, provided the total current will not exceed 1.5A.

Each keypad should be connected with a separate cable. The distance between the keypad and the panel can be up to 200m. Unscreened cables are recommended to be used for connecting the keypads.

With a typical cable of the DY 8x0,5 type, the keypad-to-panel distances required to ensure correct power supplying can be as follows:

Distance	Connection	No of cable cores	
		LCD keypad	LED keypad
up to 50 m	Power supply & ground	2 x 1	2 x 1
	CLK & DATA signals	2 x 1	2 x 1
up to 100 m	Power supply & ground	**2 x 2**	2 x 1
	CLK & DATA signals	2 x 1	2 x 1
up to 200 m	Power supply & ground	**2 x 4**	2 x 1
	CLK & DATA signals	2 x 1	2 x 1

As the LCD keypad current consumption is larger than that of the LED keypad (particularly with active illumination of the keypad and display), it is important that resistance of the power supply and ground lead-ins be taken into account when planning the cabling installation.

Caution: The supply voltage measured across the terminal block of LCD keypad with active backlighting should not be less than 11V.

The keypad jumpers determine the address which is an additional anti-tampering protection. **A different (arbitrary) address should be set in each keypad**. The panel does not accept addresses of the „all shorted" and „all open" type addresses. The address is stored in the panel EEPROM (non-volatile) memory, together with the other system parameters.

The keypad Z1 and Z2 connectors permit connecting any detectors. They are supported by the control panel in the same way as the main board zone inputs. The Z1 connector, partition 1 keypad, is recognized by the panel as zone 9, the Z2 connector, partition 1 keypad - as zone 10, etc. Thus, with four keypads, the control panel has 16 zones. Alternately, a lower number of keypads and a zone expander can be used.
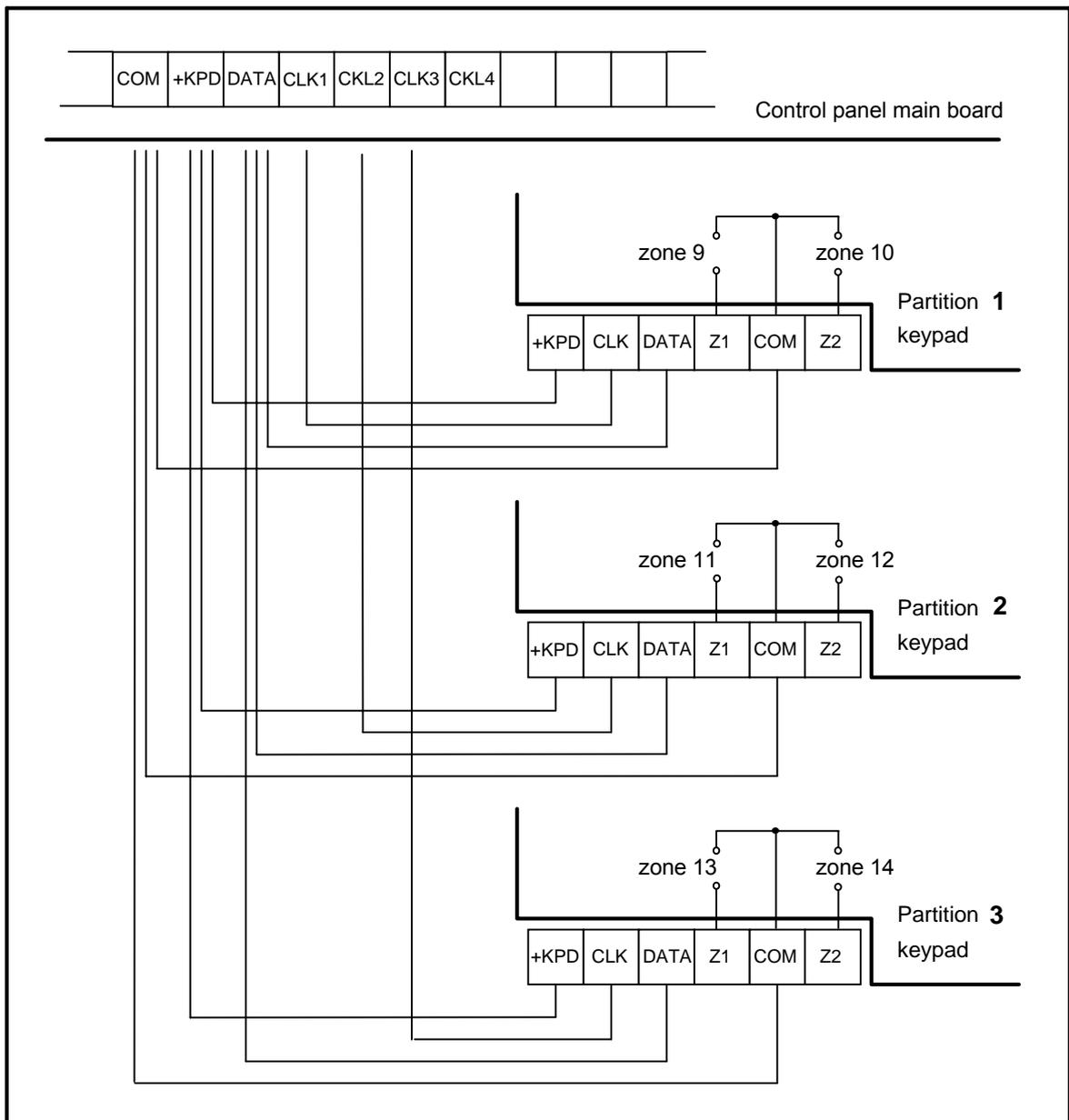
Figure 4 - Connection of three keypads to the control panel.

The keypads are not be connected in parallel to one CLK signal (one partition - two keypads), with the exception of the CA-10 KLED keypads. The other LCD keypads as well as the CA-10 KLED-M and CA-10 KLED-S keypads must not be connected in parallel.

The keypad anti-tampering contact has no connection with the system anti-tampering circuit. Its state is defined by the control panel, based on the data received from the keypad. When the control panel is in the service mode, the anti-tampering contact is not controlled.

Connection of Zone Expander

In order to increase the number of zones, a zone expander can be connected, instead of a full set of keypads. It makes available the zones of keypads required for full configuration. The expander should be connected as a next keypad. It can be used in combination with a different number of keypads.

Figure 5 - *Zone expander.*

Figure 5 shows how the expander is connected to the CA-10 plus control panel.
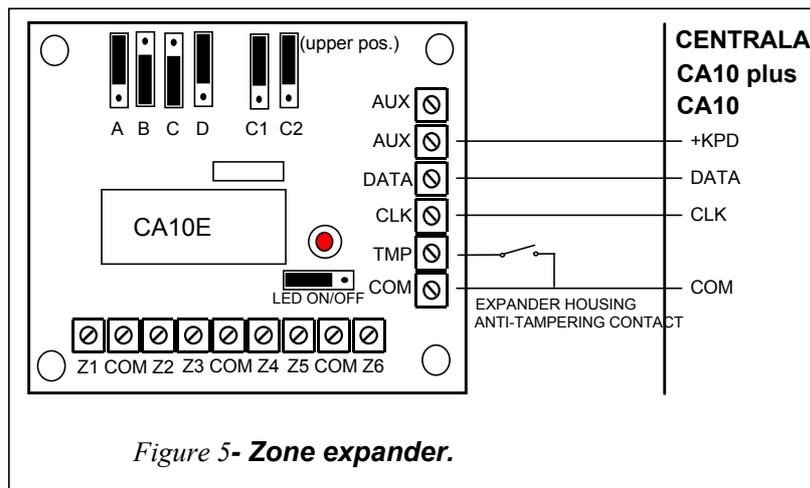
The jumpers A, B, C, D are used for setting the expander address – the upper position corresponds to a jumper set in the keypad. The jumpers C1 & C2 should be set as required by the number of keypads connected to the panel. The expander jumpers must be set in either upper or lower position - they must not be permanently removed.

The expander TMP input is an equivalent to the keypad tamper – normally it should be shorted to ground.

The control panel and expander can be configured in three ways:

1 keypad and expander:
- keypad connected as first keypad (CLK1)
- expander CLK connected to control panel CLK2
- jumpers C1 & C2 in upper position
- expander address programmed as second, third and fourth keypad address in the control panel
- expander zones Z1 to Z6 available as system zones 11 to 16.

2 keypads and expander:
- keypads connected as first and second keypads (CLK1 & CLK2)
- expander CLK connected to control panel CLK3
- jumper C1 in upper position, C2 in lower position
- expander address programmed as third and fourth keypad address in the control panel
- expander zones Z1 to Z4 available as system zones 13 to 16.

3 keypads and expander:
- keypads connected as first, second and third keypads (CLK1, CLK2 & CLK3)

- expander CLK connected to control panel CLK4
- jumpers C1 & C2 in lower position
- expander address programmed as fourth keypad address in the control panel
- expander zones Z1 & Z2 available as system zones 15 & 16.

Where the expander is installed at a large distance from the control panel (a few tens of meters), the power supply and ground of detectors connected to the expander zones should be connected to the control panel with separate wires.

The LCD keypads can only interface in the alarm system with the expander version manufactured since February 1998.

Connection of Detectors

The CA-10 plus can operate with any type of detectors. Each zone of the control panel can work in the configuration:

- NC (normally closed),
- NO (normally open),
- EOL (one-parameter),
- 2EOL/NO (two-parameter, NO type detector),
- 2EOL/NC (two-parameter, NC type detector).

When the zone works in a one-parameter configuration (EOL), a **2.2 kΩ** resistor should be used to make the detector circuit.

With two-parameter inputs (2EOL), the detector circuit is closed by two **1.1 kΩ** resistors. The zones of 2EOL type enable the status of detector and its anti-tampering contact to be monitored at the same time.

The detectors may be power supplied from any of the electronically protected outputs (OUT1 to OUT4). The output should be programmed as the "POWER SUPPLY OUTPUT". Detectors connected to the keypad zones can be power supplied from the +KPD output, however, care must be taken so that the permissible load of 1.5A is not exceeded for that output.

Figure 6 shows how the detectors are connected to the two-parameter configuration zone inputs. Separation of the detector power supply ground and the line ground makes it possible to eliminate the harmful effect of wiring resistance. Assuming that the wire is rather short, and only one detector is connected to it, the installation can be simplified by using one wire for the power supply ground (GND) and the signaling ground (COM).
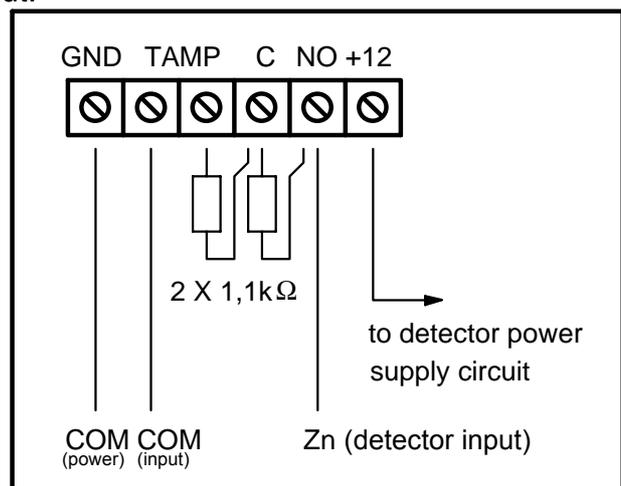
Figure 6 - Connection of 2EOL detector.

The NO and NC detectors in two-parameter configuration are connected in the same way, it is only important to correctly indicate to the control panel, what type of detector is connected to the zone input (2EOL/NO or 2EOL/NC).

Connection of Signaling Devices
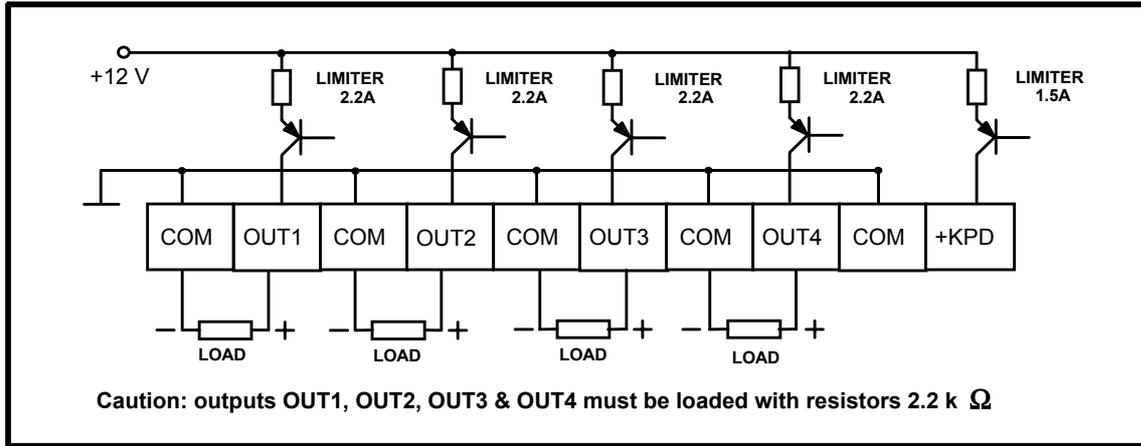
Figure 7 - *Diagram of high-current outputs.*

Figures 7 & 8 show how the signaling devices (loads) should be connected.

The CA-10 plus panel can control signaling devices of any kind. Each of the panel outputs can perform any of 41 different tasks. Therefore, the system is very flexible and can suit almost every application. If there are signaling devices installed in the system, the alarm function will have to be assigned to corresponding outputs.

Where signaling devices are used that give alarm when energized, it is convenient to assign the alarm function to one of the outputs OUT1 to OUT4. If this is the case, the "+" of signaling device power supply should be connected to the control panel respective OUT output, and the signaling device "ground" - to the control panel COM connector. In this mode, even four independent signaling devices can be set. It is possible e.g., after programming one output for operation during a preset time, and the other for operation until cut off, to control the audible / visual signaling device.

The outputs OUT1 to OUT4 perform monitoring for the presence of a load. For their correct operation, the connected signaling devices must incorporate a parallel 2.2kΩ resistor. If there are undesired low sounds in disconnected signaling device, this resistor value should be reduced. The SATEL made signaling devices do not require such a resistor, as they ensure a proper level of the output load.
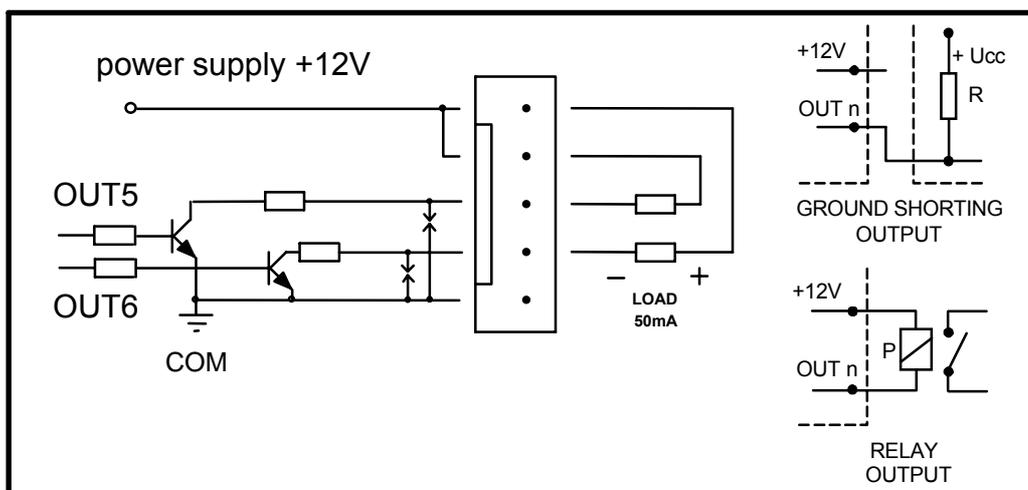
Figure 8 - *Diagram of OUT5, OUT6 low-current outputs and load connection.*

Where signaling devices with their own internal battery are employed, the OUT4 output can be used to power the signaling devices, and the triggering signals can be provided by the OUT5 and/or OUT6 low-current outputs.

The OUT5 and OUT6 outputs can be used to control the relays switching on any signaling devices or other equipment. The relays may be directly connected to the outputs, as shown in Figure 8.
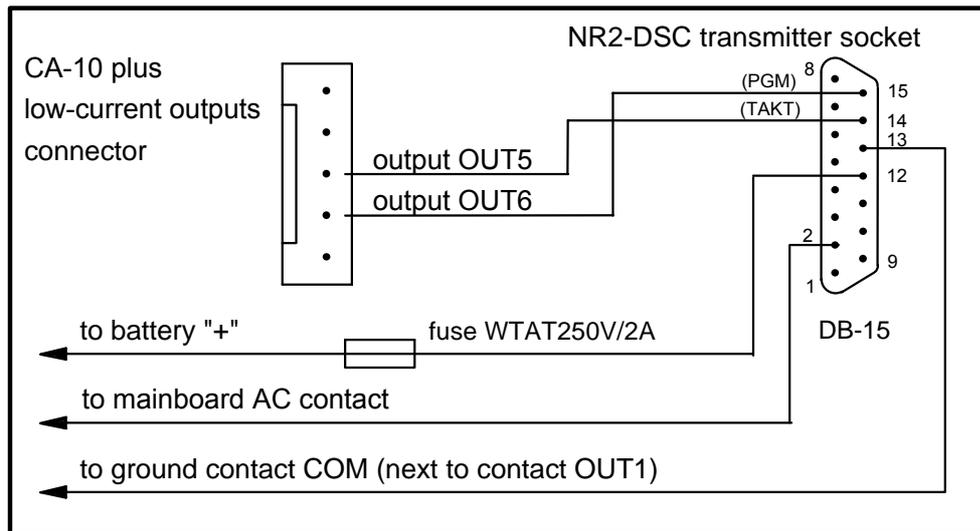
Figure 9 - *Connection of NR2-DSC controlled transmitter, made by NOKTON s.c.*

The OUT4 and OUT5 outputs can also be used to control the NOKTON NR2-DSC radio monitoring transmitter (NEMROD system - format PC16OUT). In such a case it is necessary to change the operating mode of these outputs by activating a suitable option in the service function 5. During operation with the NOKTON transmitter, the outputs are used for transmitting a number of data on the control panel state (zone alarms, fire alarms, troubles, armed mode, etc.) and do not perform functions programmed with the standard service functions.

> **Note**: *When hooking up any equipment with a considerable current consumption (e.g. a radio monitoring transmitter) to the control panel, their "+" should be connected to the battery "+" (a fuse is recommended on the feeder cable). The ground <u>must</u> be connected to any COM contact of the control panel, but not directly to the battery "-". If connected to the battery "-", the ground will actuate the charging current limiter, eventually causing quick discharge of the battery.*

Connections of Telephone Line

If the control panel telephone communicator is used in the alarm system (for monitoring, messaging or remote programming), it is necessary to connect telephone line to the control panel. It should be led to a connector situated on the right side of the printed board. In order to ensure proper messaging, the control panel **must** be directly connected to the line (connectors designated as TIP and RING), and any other devices (telephone, telefax) - after the control panel (connectors designated as T-1 and R-1). Such a connection will make it possible for the control panel to fully engage the line for the time of calling, which prevents the messaging function from being blocked by lifting the handset. Additionally, the telephones connected after the control panel do not signal the dialing by the control panel.

CAUTION!
- *Do not send telephone signals and alarm system signals by one multicore cable. This may result in a damage to the system in case of a high-voltage punch-through from the telephone line.*
- *Telephone terminals of the panel should be connected to PSTN lines only. Connecting to ISDN lines may lead to damage of the equipment.*
- *System installer should give the necessary information on the way of connection with telephone network to system owner.*

Connection of Voice Synthesizer

Where the function of alarm messaging with voice announcements is used, a voice synthesizer must be connected to the control panel.
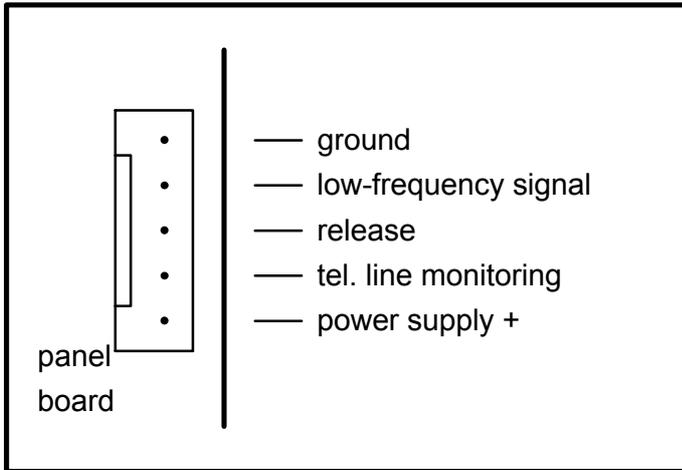
The CA-6 plus panel interfaces with the SM-2 synthesizer. The synthesizer socket (designated as: SM-2 VOICE SYNTHESIZER) is situated on the right-hand side of the printed board, between the telephone line connector and the socket of OUT5, OUT6 outputs. The SM-2 synthesizer should be directly plugged into this connector. It is fitted with minijacks for playback of the message and "monitoring" of the telephone line.

Fig. 10 - Description of SM-2 voice synthesizer connector.

Connection of Printer or Computer

If a detailed documentation of events occurring in the alarm system is required, a printer must be connected.

The printer can be connected either permanently or just for printing the event log. When the printer is connected permanently, all the events occurring in the system are printed instantly. The printout line includes the date, time, description and source of the event (zone number, partition number or user number). The CA-10 plus control panel can record 60 kinds of events.

The control panel is designed to control printers having an RS-232 input. On the control panel board, the RS-232 port is linked to the J24 connector.

The arrangement of signals and the hookup of printers or a computer to this connector are shown in Figure 11. As a rule, the panel TXD signal is supplied to the printer RXD input, and the printer TXD signal to the panel RXD input. The printer notifies the panel with a DTR signal of its readiness to receive data. Lack of this signal is reported by the panel as a trouble of the RS-232 port.
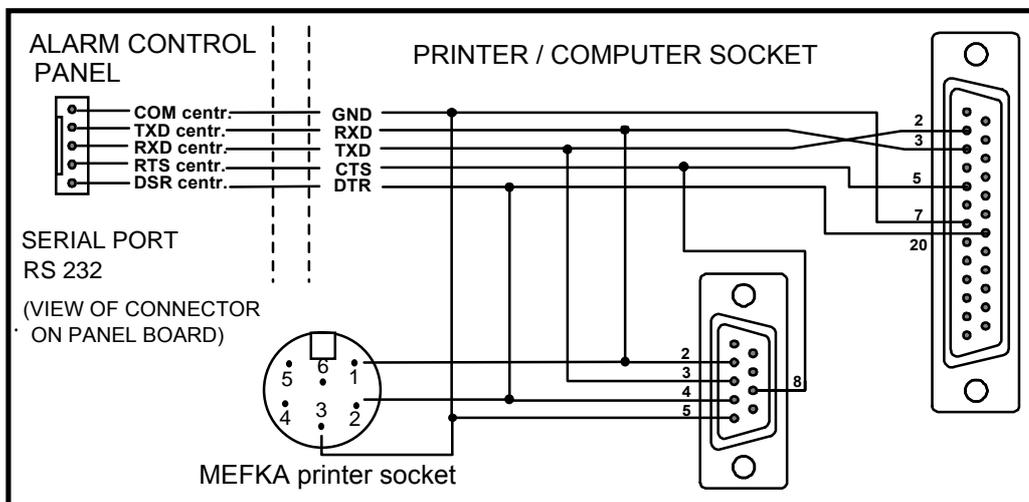
Fig. 11 - Connection of printer or computer to panel RS-232 port.

⚠

NOTES:
- *Do not short or touch the serial port RS-232 pins with your fingers.*
- *Prior to connecting the cable, the installer should <u>remove the electrostatic charge</u>, e.g. by touching a grounded equipment (faucet, heater, etc.). with the top of his hand.*
- *It is recommended that the cable be connected first to the control panel connector, and then to the computer or printer connector.*

The control panel RS-232 port also enables the panel to be connected to the computer. The connection is made in the same way as for the printer (connection of signals RXD, TXD, DTR and ground). After starting the DLOAD10 proprietary program (on the included floppy disk), selecting the appropriate communication port (CONFIGURATION window) and activating the **FS-112** service function in the control panel, it is possible to program the control panel from the computer. Provision is also made for a service start of the panel, while automatically starting the local communication mode (for further information see section Starting the Control Panel).

Programming the CA-10 plus control panel through the RS232 serial link should be carried out by means of a cable identical as for the CA-64 panel (Figure 11). Using the same cable as for the previous panel (CA-10) may entail some inconvenience: when the control panel uses the telephone link during a data exchange with the computer (monitoring, reporting), a message „Attention ! No response from panel" may appear in the DLOAD10 program. This will not take place when the connection is made as shown in the illustration above, because the panel, using the additional RTS cable, will report a temporary break in operation of the RS-232 port.

Connection of Power Supply

The control panel is permanently connected to the mains power supply. Hence, before you start to work on the system cabling, make yourself familiar with the electrical installation in the facility. In order to power the control panel, select a circuit where voltage is always present. This circuit should be protected with an appropriate fuse.

> **CAUTION!**
> Before connecting the control panel to its power supply circuit, you must turn off voltage in that circuit.

Description of electrical connections to the CA-10 OBU housing

The AC power supply unit encased in the plastic box is fully electrically isolated from the metal housing.

- Connect the 230V alternating voltage leads to the transformer terminals marked "**AC 230V**".

- Connect the output voltage wires of the transformer secondary winding to the "**AC**" (~18V) terminals on the control panel main board.

- Connect the wire of the PE electric shock protection circuit to the terminal block situated next to the transformer and marked with the ground symbol ⏚ . This circuit should also be connected to the control panel protective terminal.

<u>Do not connect the "neutral" wire of the 230V AC mains supply circuit to the ground terminal. If there no separate electric shock protection circuit in the facility, this terminal should be left free.</u>

Control panel power-up starting procedure

1. Connect the emergency power supply wires to the corresponding battery terminals (the red one to the battery plus, the black one to the minus). **The**

control panel will not start on connecting the battery alone (without the mains power connected), however, it will keep on working in case of the 230V AC voltage trouble, provided it was already started.

2. Switch on the 230V AC mains supply – the control panel start follows.

Connection of the power supplies in the prescribed order will permit correct functioning of the power supply unit and the control panel electronic safety devices, thus avoiding damage to the security system elements caused by possible installation faults.

NOTE! *Should it be necessary to completely disconnect the control panel power supply (the mains and the battery), re-connection of the power supply is to be performed in the above mentioned order (the battery first, then the 230V alternating voltage).*

Caution !
As the control panel has no isolating switch to disconnect the mains supply, it is important that the owner or the user of the security system be informed on how the system is to be disconnected from the mains (e.g. by indicating the fuse which protects the control panel supply circuit).

Starting the Control Panel

When all electrical connections are made and checked for correctness, you can proceed to starting the system. It is recommended to begin the work with the control panel with no signaling devices connected. These can be connected after programming parameters of the realized alarm system is completed.

If the control panel operates with one keypad, having a default address (jumpers on pins „A" and „D"), then, after the power is switched on, the keypad will report readiness for work with four short beeps followed by a long one.

Upon entering the default **service code** [1][2][3][4][5] and confirming it with the [#] key, the control panel will enter the service mode. The ALARM and ARMED LEDs (PARTITION in the LCD keypad) will be blinking alternately. Now, you can proceed to programming the control panel.

If there are more than one keypad connected in the system and the default address of the first keypad (CLK1) has been changed, or there is a zone expander installed, or, for whatever reason, the panel does not „see" the keypad when the power is on, and does not respond to the keystrokes (access code entry), or keeps on alarming, it is necessary to carry out the procedure of **hardware access to the service mode**. If this is the case, you must carry out programming of the keypad / expander addresses before the normal operating mode is restored. If you fail to do so, the control panel will start alarming right after the power-up because it has detected the keypad tampering.

If this is the case, switch off the power supply (mains and battery) and:

1. Check the keypad address jumpers and anti-tampering contacts for correct settings.

2. Put a jumper on the control panel RESET pins (J19).

3. Switch the power supply on. After the keypad beep, remove the jumper from the RESET pins (J19). The operation will activate the service mode in partition 1 keypad. This will be signaled by the keypads with four short and one long beeps.

4. Call the service function **FS-124**. The function automatically reads the keypad address and prepares the control panel for work in a new configuration.

> ***Note:*** *If LCD keypads are installed in the alarm system, call the FS-124 service function <u>in each LCD keypad</u>. When activated from the LCD keypad, this function automatically performs additional configuring operations and its activation in each LCD keypad is necessary for proper operation of the system.*

The FS-111 service function enables you to set the keypad addresses on your own. After calling the FS-124 function, it is advisable to check in the FS-111 whether the addresses have been properly read out – a mismatch between the address read out with the FS-124 function and the actually set addresses will mean incorrect connection of the keypads. The expander address should be programmed as the address of consecutive keypads:

- second, third and fourth – if the expander is connected to CLK2
- third and fourth – if the expander is connected to CLK3
- fourth – if the expander is connected to CLK4

Do not change the addresses with the FS-111 function, unless they have not been entered from LCD keypads using the FS-124 function.

The user can also program the address himself, by means of the service function **FS 111**. To make sure that all the settings are in accordance with the default values, you can **perform the service functions FS-107, FS-108 and FS-110**.

Having completed the procedure, exit the service mode using the function FS-0 and activate the service mode again - this time from the keypad - by entering the default access code [1][2][3][4][5] confirmed with the [#] key.

If the control panel has re-entered the service mode, it means that its functioning is correct and that you may proceed with further installation of the system (connection of sensors, signaling devices, establishing communication with a computer, if required) and programming of all necessary parameters.

<u>If the described procedure is unsuccessful</u>, the option of hardware access to the service mode must have been disabled in the control panel by software means. If this is the case, it is necessary to carry out another procedure which would **enable the control panel** and restore the default settings - see description of the service function **FS-131**.

If signaling devices are triggered upon power-up, starting the control panel may prove impossible because of the loading level which exceeds the power supply capacity. If this is the case, the system must be started with signaling devices disconnected.

Programming the control panel from the computer via the RS-232 port should be initiated by calling the service mode and the **FS-112** communication function in the control panel. Provision is also made for starting communication without calling the function **FS-112** - which is convenient if the control panel is already installed on the site and there is no keypad in the vicinity. Detailed description of step-by-step procedures is available in prompts to the DLOAD program, after selecting the „Local connection with..." command (Alt-C).

ACTIVATING SELECTED FUNCTIONS

Performance of some functions of the control panel requires that a few to more than a dozen parameters be programmed simultaneously. This section contains detailed information on how to program such functions as: telephone messaging, monitoring and downloading.

Telephone messaging - alarm reporting.

The telephone messaging function requires that the following be programmed:
- **FS-5, FS-131** – activate the "telephone messaging" option, set the "dialing system" option as required by the telephone exchange,
- **FS-87 to FS-94** - enter at least one telephone number,
- **FS-95** – define the partitions from which alarms are to be reported to the telephone numbers programmed in functions FS87-90,
- **FS-100** – number of telephone messaging queues higher than zero and number of redials in a queue.

Note: You should also program in FS-95 what kind of message will be sent - if no message is selected for the pager, the control panel will notify with a voice message from the voice synthesizer.

When the above parameters are correctly programmed and the alarm is triggered, the on-board LED (designated as „DIALER") should go on, which indicates that the panel has started telephone messaging (with pulse dialing the LED is blinking). It is recommended to test the messaging. To this purpose, use the ordinary headset connected to the „telephone line monitoring" jack in the SM-2 synthesizer (parallel connection of a telephone set to „monitor" the communication will interfere with the messaging operation). The telephone messaging will start immediately after triggering the alarm. Alarm clearing will interrupt the telephone messaging.

Typical problems with starting the voice messaging:

- **control panel takes no attempts to call** – not all of the above mentioned items were programmed ;
- **control panel goes on line but fails to dial** – no dial tone or a non-standard dial tone from the telephone exchange – find out the cause of missing signal or deactivate the dial tone test option in FS-5 if the signal is non-standard;
- **control panel establishes connection, but sends no voice message** – wrongly programmed FS-95 – messaging to pager selected, but not voice message from the synthesizer;
- **control panel establishes connection, sends a message too early or too late** – the control panel recognizes answering the call on the basis of sound signals on the telephone line, with permissible message sending delay up to 4 seconds from lifting the handset - if commutation signals on the telephone line are non-standard or there is strong interference (clicks, hum), the panel automatic equipment may not function properly – then you can extend the message by activating the "double message" option in FS-5 or deactivate the call answer recognition option;
- **control panel reports the alarm more times than the preprogrammed number of queues** – the control panel recognizes answering the call on the basis of a callback signal – if the user lifts the handset too quickly (during the first ring), the control panel may disregard the message and call again.

Reporting to Telephone Monitoring Station

The monitoring station operator should provide the installer with the data necessary for the monitoring software. These are:
- monitoring station **telephone numbers**
- **transmission format** or a list of available formats

- alarm system **identifier** (facility number - one or more for detailed reporting from a big system)
- **list of event codes**

In order to start monitoring, the following items should be programmed:

- **FS-43 – monitoring station telephone number** - if there are two numbers or two stations, the other number should also be programmed in FS-44.
- **FS-45, FS-46 – station transmission formats** - in case of a multi-format station, select format which is as fast as possible (e.g. Ademco Express or Radionics 2300 with parity).
- **FS-47 – monitoring options**.
- **FS-48 to FS-59 – monitoring stations identifiers**, an identifier should have 3 or 4 non-zero characters (characters from "1" to "F", "0" - no character), some stations use identifiers composed from digits from 0 to 9 - then character "A" is to be programmed instead of digit "0" (e.g. "A1A2" instead of "0102".
  At least three identifiers should be programmed (can be identical):
  - zone identifier,
  - partition identifier,
  - system event identifier.
- **FS-60 to 66 & FS-69 to 72, FS-81,82,126 – event codes** according to the list from the monitoring station operator, the codes can be one-digit (the other character being 0) or two-digit - as required by the station, the codes with inappropriate length may block communication with the station.
- If reporting with event sorting to both stations has been selected in the options, events assignment should be programmed in the functions FS-67, 68, 73 to 80, 83, 84.
- **FS-5 - activate the option in "MONITORING"** after the above items have been programmed.

Typical problems with starting the monitoring:

- **Control panel takes no attempts to call** – not all of the above mentioned items have been programmed – the control panel will not call the monitoring station if the programmed data do not allow sending a correct transmission to the station because of e.g. missing telephone number, identifier being shorter than 3 non-zero characters, missing event code, etc.
- **Problems with dialing** – no dial tone or a non-standard dial tone from the telephone exchange – find out the cause of missing signal or disable the dial tone test option in FS-5 if the signal is non-standard.
- **Control panel sends no codes when connected to the station -** wrongly selected format or low quality of telephone connection (the panel does not "understand" the station dial tone);
- **Station does not receive or acknowledge the codes sent by the panel -** wrongly selected format, inadequate identifier length (3 characters, while the station requires 4), inadequate event code length (1 character, while the station requires 2) or low quality of telephone connection.
- **Control panel does not send codes of some events**, despite of the codes being properly entered - identifier of the particular group of events is missing, e.g., if the partition 1 identifier is missing, no reports on this partition arming / disarming will be sent.
- **Control panel automatically changes the option „transmission to Station 1 or to Station 2" into transmission to one station only** - if with this monitoring option selected the number of identifiers for Station 1 and Station 2 is different (there are codes which have an identifier for one station, but not for

the other), the panel cannot report to both stations in the „Station 1 or Station 2" mode and will change the option for transmission to the station which has a larger number of identifiers.

Note: For the Ademco Express transmission format the identifier „0000" is correct (sending "zero" is possible), while for the other formats it means no identifier ("zero" is not sent).

A headset connected to the "telephone line monitoring" jack in the SM-2 synthesizer can be helpful in analyzing the problems with communication to the monitoring station

Connection with the station is established in the following way:

- the station answers the call and sends the, so-called, handshake signal (one or a few in sequence if the station supports several transmission formats),

- the control panel recognizes the station handshake signal and if it matches the programmed transmission format, the control panel answers by sending identifier and event code in appropriate tones (once or twice, depending on the selected format) – in the headset connected to the line monitoring jack, these sounds are much louder than the monitoring station signals,

- if the station receives information, it will acknowledge it with the same signal as the handshake,

- the panel disconnects or sends next codes if there still are some other events to be reported to the station.

The most common monitoring problems result from inaccurate information on the transmission formats supported by the given station (e.g., ambiguous names of the formats), errors in the data entered into the control panel, as well as poor quality of the telephone connections. Often only by "monitoring" the course of communication you are able to find the cause of a problem.

NOTE: Some stations do not acknowledge reception of the event code if it has another format (e.g., 4/1 instead of the required 4/2). If this is the case, the control panel will repeat its attempts to establish communication, while telephones in the facility will be disconnected - the costs of such connections may be very high. For this reason, it is recommended that all the programmed codes be very carefully checked. It is possible to activate the options 7 and 8 in FS-47, which makes the panel omit the codes unacknowledged in 16 consecutive retries. Problems of this type do not occur in professional, multi-format monitoring stations (including the Satel STAM-1).

Downloading - Telephone Communication with the Computer

Telephone communication with the computer requires a modem. The modem must meet two essential conditions:

1. enable operation in the transmission format UTI V.21 (CCITT V.21) or BELL 103 (operation at a rate of 300Bps on telephone line),

2. permit operation to be configured **only** in one of these formats (the function of automatic format negotiating disabled).

Before starting the first connection between the computer and the control panel, appropriate settings must be entered in the DLOAD10 program (CONFIGURATION window). Information on the modem configuration is contained in the DLOAD10 program „HELP" file (function activated with F1 key), topic: COMMUNICATION" and in chapter "PROGRAM CONFIGURATION FOR COMMUNICATION WITH THE PANEL" of this manual. In the case of non-standard modems, you must refer to the modem manual for the information on configuration procedures.

Modem initialization

The program initializes the modem after the „MODEM" item is selected from the „COMMUNICATION" menu. In case of any trouble, the program will display one of the two messages:

- which means a technical problem with communication with the modem, e.g. an incorrect COM port number, conflict with the Windows system drivers;

- "**initialization error**" – wrong command initializing the modem.

Correct initialization of the modem does not mean it is properly configured to work with the control panel. The first initializing commands, as suggested in the program, are sufficient for a correct operation of most older-generation modems (i.e. modems with a maximum speed of 2400Bps). The fast modems of a new generation **require** some extra commands being added to limit their operation speed.

Remote communication procedure:

- program in the control panel:
    - **FS-2**: panel communication code (identifier by which the program recognizes the alarm system)
    - **FS-3**: computer communication code (identifier by which the control panel recognizes the computer authorized to establish connection)
    - **FS-4**: computer telephone number (which is not necessary)
    - **FS-5**: "auto download" option (downloading activation from the outside), "double call" option (any setting) and the **FS-101** – number of rings before answer – if communication is to be initiated from the computer

- start the DLOAD10 program, select the CA-10 control panel (CA10v1, 2, 3, 4) - program version 4 corresponds to the CA-10 plus panel, e.g. by opening the data of such a panel and, select the "MODEM" item from the „COMMUNICATION" menu.

Note: The communication codes and the „double call" option settings must be identical in the control panel and in the alarm system computer data.

Telephone connection with the control panel will be set up automatically after selecting any communication command in the program (Read, Write, Event log read, ON-LINE mode). You can also start communication from the panel with the user function 0.

Telephone communication error messages:

- "**modem not responding**" – the modem has not acknowledged the dialed number (a rare case, usually a problem caused by modem hardware or e.g. missing the "V1" initializing command),

- "**connection failed**", "**no control panel signals", "poor quality of connection, no control panel handshake**"
    - connection with the control panel was unsuccessful,
    - the control panel was off hook but did not answer the modem signal because it was much corrupted,
    - the control panel was off hook but did not answer the modem signal because it was not in the transmission format V.21 or BELL 103 (incompatible or **incorrectly configured** modem),

- "**communication code not acknowledged**" – the control panel established connection, but the computer communication code does not correspond to that programmed in the control panel in FS-3 - the panel disconnects,

- "**connection interrupted**" – the control panel stopped answering the computer signals.

Note: If the control panel answers the call but fails to establish communication and disconnects, while the "double call" option is deactivated, it will be answering no calls for the next 5 minutes.

Guard Control Function

The functioning of the guard control function consists in automatically checking that the, so-called, guard code is entered on the keypad with a preset frequency. The entry of the code is saved in the log event, and so is the trouble to enter the code after a preset period of time, which can be signaled on an output which has the proper function. These events can be reported to the monitoring station.

To activate the function you must:

- program the guard code - in the user function 2 (creating new user) a code with authority level 5 (instead of the guard code, the user function 7 can also be used - activation of the „switch MONO" output)
- set a suitable timer to perform the „partition monitoring" function (FS-106)
- program the timer control time (functions FS-102÷105, depending on the partition).

PROGRAMMING - SERVICE FUNCTIONS

Design and program flexibility of the CA-10 plus control panel give the installer a full freedom of choice in defining the alarm system functions and operating mode. Additionally, they allow some extra functions to be assigned to the panel (for example, control of lighting , locks, cameras).

Control panel configuration after reset (with FS 107 function):

- one partition including all the available zones (Z1 to Z10),
- zone 1 (Z1) - ENTRY/EXIT, EOL (one-parameter),
- zones 2 to 8 (Z2 ... Z8), 9, 10 (Z1 & Z2 in partition 1 keypad) - instant, EOL,
- zones 11 to 16 - not used,
- sensitivity of all zones – 0.48 sec.,
- PRIORITY option activated for all zones - see: FS 27, option no. 1,
- other zone options deactivated, detector operation testing disabled,
- output OUT1 - alarm signaling (BURGLARY type, operation time = 1 min., polarity +12V, assigned to all zones),
- output OUT2 - visual signaling device (BURGLARY type, operation time equal to global time, polarity +12V, assigned to all zones),
- output OUT3 - detectors power supply,
- output OUT4 – not used,
- output OUT5 - READY status (for all zones),
- output OUT6 - telephone messaging status (OUT5 & OUT6 output functions are connected with testing the panel during production process),
- partition 1 keypad displays all zones available, no automatic zone bypasses, all functions available, disabled audible trouble signaling only,
- exit delay - 60 seconds,
- exit delay - 30 seconds,

- keypad alarm duration - 60 seconds,
- counting times of counters - 30 seconds; counter values - 0,
- all options deactivated (telephone messaging, monitoring, telephone answering, etc.),
- all data related to monitoring and telephone messaging erased,
- pager station signal parameters in accordance with the POLPAGER system.

All the control panel parameters can be programmed from the keypad, using the service functions. It is also possible to program the control panel by means of a computer (in the local mode - through RS-232, or remotely - through the modem).

Service Mode

Control panel programming is possible after activating the service mode. It can be activated when the control panel is not armed and signals no alarm. The activation consists in entering the service code (default=12345), confirmed by the [#] key. After entering the service mode, the LEDs ALARM and PARTITION (ARMED for the LED keypad) are <u>alternately blinking</u> and <u>a short beep is generated every 3 seconds</u>. The other partitions function normally, alarms being only signaled in the keypads and reported to the monitoring station. No keypad tamper conditions or addresses are checked in the service mode. The service mode is on until deactivated by the service function (FS-0). It can also be exited with a computer command from the DLOAD program.

Programming with the LED Keypad

When in the service mode, the control panel waits until the function number is entered and confirmed with the [#] key. After activation of the function the TROUBLE LED is on, while the others show programmed parameters.

The way of programming and data display in the LED keypad depends on the type of data entered with the service function. The panel programming is based on three types of functions: bit (BIT), decimal (DEC) and hexadecimal (HEX).

BIT Functions

The bit functions are used to program two-state parameters: YES and NO (e.g. the functions of zone assignment to partition, options). During programming with a bit function, the LEDs 1 to 8 show the current setting of particular parameters (diode on - YES, off - NO). Pressing the keys [1] to [8] changes the state of the corresponding diode. The state of 8 parameters is confirmed with the [#] key. If the programming function includes more parameters, the control panel will signal with two short beeps acceptance of the first eight parameters and the LEDs 1 to 8 will display the state of the next group of eight. When all the parameters have been programmed, the control panel will signal exiting the function with four short a one long beeps.
The LEDs 9 to 12 of the control panel indicate which portion of data (set of options) is currently programmed.
The [∗] key makes it possible to quit the function at any time without saving the changes in currently displayed data.

DEC Functions

These functions are used for programming data in the form of a few digits (for example, the test transmission time - 4 digits, individual entry delay time of zones - 16 x 2 digits). When running the function program, the LEDs 1-4 show the first digit (binary), LEDs 5-8 - the second digit, while the LEDs 9-12 display the counter

of digit pairs (binary). The programming consists in entering a two-digit number and confirming it with the [#] key. The control panel will confirm acceptance of the datum with two short beeps. When all the parameters have been programmed, the function is exited which is signaled with four short and one long beeps.

The [∗] key makes it possible to quit the function at any time without saving the changes in currently displayed data.

HEX Functions

The functions are used to program hexadecimal data (e.g., monitoring codes). When running the function program, the LEDs 1-4 show the first hexadecimal digit, LEDs 5-8 - the second digit, while the LEDs 9-12 display the counter of digit pairs.

Programming by means of this type of function consists in entering a parameter (two hexadecimal digits) and confirming it with the #] key. For the digits 0-9 it is sufficient to press the corresponding key, the digits A-F are entered using the combination of keys [∗] and [0]-[5] (i.e. A=[∗][0], B=[∗][1] etc.). Pressing the [∗] key results in blinking of the digit, which will be changed after one of the keys [0]-[5] is pressed.

The [∗][#] combination of keys makes it possible to exit the function without saving the changes in the currently displayed data.

> **Note**: *Both in the decimal and hexadecimal function, consecutive depressions of numeric keys result only in displaying the respective number on the LEDs (the state of LEDs 1-4 and 5-8 is alternately changed). Only by pressing the [#] key you will save the status of the parameter displayed on the diodes .*

Figure 12 shows how to read data from the keypad LEDs. The sixth parameter is being programmed (counter = 6), LEDs 1-8 indicate current value of the parameter equal to A2 (HEX).
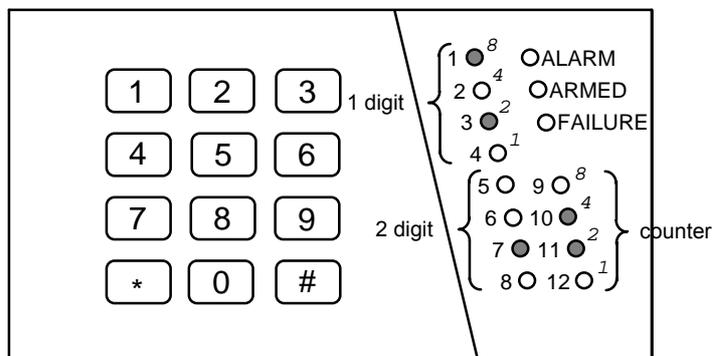
Figure 12

Programming with the LCD Keypad

After entering the service code and pressing the key [#] or [∗], the control panel enters the service mode. It is signaled in the LCD keypad by alternate blinking of the LEDs ALARM and PARTITION1 and appearance of the message:

```
Service mode
Menu: ↑↓←→
```
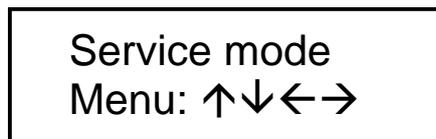
Pressing any arrow key will display the service mode **hierarchical menu**, which facilitates access to the service functions. The menu is built so as to group the particular panel service functions by subjects.

The ⇧ ⇩ keys scroll the list of the actual hierarchy level. The ⇨ key permits „entry" to a more detailed list. The ⇦ key makes it possible to return to the previous Menu level.

For example, if the display arrow indicates *Monitoring* and you will press the ⇨ key, you will be switched over to the first function in the block of functions for programming the monitoring parameters, while the ⇦ key will take you back to the consecutive Menu levels:

> Monitoring   ⇨
>> Stations and options
>>> ⇨
>>>> Telephone St. 1
>>> ⇦
>> Stations and options
> Monitoring   ⇦

Service Functions of the LCD Keypad

The keypad programming functions are accessible after activation of the control panel service mode. They are described in detail in the LCD keypad INSTALLER GUIDE.

Similarly as for the LED keypad, several types of service functions are distinguished when programming the control panel with the LCD keypad: bit, bit with a list, multiparameter, and text programming functions.

Bit Functions

After calling this type of function the ⇦⇨ keys change the cursor position, while the ⇧⇩ keys change the setting of a bit indicated by the cursor. It is also possible to enter the number of the bit, which is to change the value by means of the numeric keys. To indicate the bits from 10 to 16, press in turn the [∗] key and the numeric key. To terminate the function, use the combination of the [∗] and [#] keys. In this way the "zone list" type variables are programmed (e.g. *Programming partition zones*).

Bit Functions with a List

After calling this type of function, the first line of display will show the name of function, and the second one - the first line of the list of bit switches (e.g. *System options*). The ▣ character indicates, that the given option is active, no character - that the option is inactive. In order to change the status of switches, press any numeric key. The ⇧⇩ keys make it possible to scroll through the list of switches.

Multiparameter Functions

In functions, which are used to program several numeric parameters (e.g. the *Global times* function), the ⇧⇩ keys select the parameter to be programmed, the ⇦ key deletes the character before cursor, while the ⇨ key cancels the change of a current parameter. The new parameter value should be entered by means of numeric keys. When programming the HEX parameters, the A ... F characters are obtained by combination of the [∗] and one of the digits [0] ... [5].

Editing Text

When programming the texts, the ⇦⇨ change the position of cursor. The [∗] key changes over the function operating mode (between the numeric mode and the text mode), and the [#] key confirms the whole text. The other keys' functions depend on the operating mode.

Key	Numeric mode	Text mode	
⇧	deletes character before cursor	changes character into previous in alphabet	
⇩	switches "change – add" modes	changes character into next in alphabet	
1	1	.	,
2	2	A	a
3	3	D	d
4	4	G	g
5	5	J	j
6	6	M	m
7	7	P	p
8	8	T	t
9	9	W	w
0	0	space	-

The text mode is signaled by the * character situated in the right upper corner of the display. In the text mode, the numeric keys will bring letters to the cursor position, as shown in the table above. The lower case letters are obtained by pressing the numeric key twice. When the function is in the numeric mode, it is possible to terminate programming of the text by pressing in turn the keys [*] and [#].

CONTROL PANEL SERVICE FUNCTIONS

FS-0 - exiting service mode

Pressing the [0][#] keys calls the service function 0, which ends the control panel operation in service mode. The control panel starts functioning in accordance with the new settings. Restart of all partitions is performed - if any keypad operations are carried out at this moment in another partition (e.g. if a user function has been activated), the panel will terminate the current function and enter the standby state. Exiting the service mode is signaled in all partitions with four short and one long beeps.

Functions programming basic parameters

FS-1 - changing service code

The service access code enables activation of the service mode. It can be from 4 to 6 digits long.

EXAMPLE:

           changing the service code from 12345 to 78901

  [12345] [#] -   enter the service mode

      [1] [#] -   call the service function 1

  [78901] [#] -   enter the new code and confirm it; the function will be automatically exited.

FS-2 - programming control panel identifier (HEX)

FS-3 - programming computer identifier (HEX)

After establishing connection with the computer in the DOWNLOADING mode, the panel sends a six-character system identification code and waits for the code of the answering computer. When the correct identification code is received, transmission to the computer may begin.

Programming of this code in the LED keypad consists in entering three pairs of hexadecimal characters (digits from 0 to 9 and characters A, B, C, D, E, F - see the table of codes). The LEDs will first display previous settings, and, after the change - the values of characters entered (binary, the first character - LEDs 1 to 4, the second - LEDs 5 to 8, number of pair of programmed characters - LEDs 9-12). Having entered the last pair of characters, the panel automatically exits the function.

EXAMPLE (for the LED keypad):

programming the identifier 23C4D5

[2]	[#]	-	call the required function.
[2][3]	[#]	-	enter the two first characters
[∗2][4]	[#]	-	enter the two next characters
[∗3][5]	[#]	-	enter the two last characters; after acknowledging them the panel will automatically exit the function

FS-4 - programming computer telephone number (HEX)

The computer telephone number is necessary so that the control panel can call the computer. The communication can be initiated from the control panel keypad (user function "0"), or from the computer. The panel, after the handshake, will hang up and call the computer back. Thus it is impossible to force programming from any computer, but from the authorized service.

If the computer telephone number is not programmed, the computer initiated communication can be established in a simplified way - the control panel will not hang up and call back.

The length of a telephone number can be up to sixteen digits and special characters. The special characters are used to control the dialing process. In the LED keypad it is programmed by entering the consecutive digits and characters in pairs. Each pair is to be confirmed by the [#] key (see the example below). The LEDs 9,10,11,12 show (in binary form) which pair of characters is being programmed, and the LEDs 1 to 4 and 5 to 8 show (also in binary form) the values of programmed digits.

The following codes has been assigned to the functions mentioned below:

A(HEX) - control character...(combination [∗][0])

B(HEX) - switch to pulse dialing ....(combination [∗][1])

C(HEX) - switch to tone dialing......................................(combination [∗][2])

D(HEX) - wait for dialing tone ....(combination [∗][3])

E(HEX) - short pause (3 seconds).................................(combination [∗][4])

F(HEX) - long pause (10 seconds)................................(combination [∗][5])

∗(HEX) - signal ∗ in DTMF system ....(combination A[0])

#(HEX) - signal # in DTMF system.................................(combination A[1])

a(HEX) - signal a in DTMF system.................................(combination A[2])

b(HEX) - signal b in DTMF system.................................(combination A[3])

c(HEX) - signal c in DTMF system.................................(combination A[4])

d(HEX) - signal d in DTMF system.................................(combination A[5])

Notes:

- **Do not program** the control characters **B, C and D** before the telephone number (these are set in the FS5 options).

- **In case of the busy signal, the waiting for dial tone (code D) does not decrease the counter of queues and retries** (e.g. when the panel is connected to an extension line and the outside line is busy, the panel

will dial the number until it gets through. Only when the number has been dialed in full, the busy or no answer condition will change the counters.

- *If shorter than 16 characters, the telephone number **must** be ended with the special code **AA** (double „AA" means end of number).*

- *Special signals generated in the DTMF system require two characters to be taken up in the telephone number (A and a corresponding digit).*

- *In the LCD keypad, the DTMF special signals are entered by programming the A character and a corresponding digit, according to the above meaning.*

EXAMPLE: programming the number 0 - 556 40 31 (0D 55 64 03 1AA)

[4]	[#]	-	call the required function
[0][∗3]	[#]	-	enter the two first characters
[5][5]	[#]	-	enter the two next characters
[6][4]	[#]	-	enter the two next characters
[0][3]	[#]	-	enter the two next characters
[1][∗0]	[#]	-	enter the next character and the part of special code AA (telephone number end)
[∗0]	[#]	-	enter the second part of special code AA (telephone number end)
[∗]	[#]	-	exit the function after entering 11 characters.

FS-5 - programming the system options (BIT)

The function programs three sets of options which define the control panel operating mode (for the LCD keypad, it is one list of 24 options).

FIRST SET OF OPTIONS (for LED keypad, the LED No. 12 is blinking)

No.	LCD	LED	Option
1	▼	ON	telephone messaging **on**
		OFF	telephone messaging **off**
2	▼	ON	monitoring **on**
		OFF	monitoring **off**
3	▼	ON	call answer **on**
		OFF	call answer **off**
4	▼	ON	printing **on**
		OFF	printing **off**
5	▼	ON	CR+LF mode (printer) **on**
		OFF	CR+LF mode **off**
6	▼	ON	transmission rate to printer **2400 Bps** (RS-232)
		OFF	transmission rate to printer 1200 Bps
7	▼	ON	transmission to printer **with parity** (RS-232)
		OFF	transmission **without parity**
8	▼	ON	transmission to printer with **EVEN** parity
		OFF	transmission with **ODD** parity

Note: The options 4 to 8 of the first set refer to the control panel operation with a printer.

SECOND SET OF OPTIONS (for LED keypad, the LED No. 11 is blinking)

No.	No. LCD		LED	Option
1	9	▮	ON	DOWNLOADING activation from outside **enabled**
			OFF	DOWNLOADING activation from outside **disabled**
2	A	▮	ON	**TONE** dialing
			OFF	**PULSE** dialing
3	B	▮	ON	**double** playback of alarm message from synthesizer
			OFF	**single** playback of alarm message
4	C	▮	ON	**GROUND-START signal generated** before dialing (special tel. line service)
			OFF	**GROUND-START signal blocked**
5	D	▮	ON	**no dial tone test** before dialing the number
			OFF	dialer waits for dial tone before dialing the number
6	E	▮	ON	**no answer test** (synthesizer message emitted 15 seconds after dialing the number)
			OFF	**call answer test activated** (the dialer will send the message after detecting the call answer)
7	F	▮	ON	OUT5, OUT6 outputs control the radio messaging
			OFF	OUT5, OUT6 outputs perform their assigned functions
8	G	▮	ON	**double call** to answer
			OFF	**single call** to answer

THIRD SET OF OPTIONS (for LED keypad, the LED Nos. 11, 12 are blinking)

No.	No. LCD		LED	Option
1	H	▮	ON	service mode unavailable if any partition is armed
			OFF	service mode always available
2	I	▮	ON	communication with the computer unavailable if any partition is armed
			OFF	communication with the computer always available
3	J	▮	ON	alarm if zones are violated after the exit delay elapses
			OFF	control panel does not alarm if zones in a partition are violated after the exit delay elapses
4	K	▮	ON	fire alarm signaled only in partition where it was activated
			OFF	fire alarm signaled in all partitions
5	L	▮	ON	keypad alarm (PANIC, AUX, TAMPER) signaled only in partition where it was activated
			OFF	keypad alarm signaled in all partitions
6	M	▮	ON	in case of problems with transmission to the station monitoring suspended until occurrence of a new event
			OFF	monitoring suspended for 30 min
7	N	▮	ON	OUT5 and OUT6 outputs work in „UA" format
			OFF	OUT5 and OUT6 outputs work in PC16OUT format (options 7, 8 deactivated)
8	O	▮	ON	OUT5 and OUT6 outputs work in „LV&BY" format
			OFF	OUT5 and OUT6 outputs work in PC16OUT format (options 7, 8 deactivated)

Note: Options 7 and 8 of the third set are only relevant with activated option 7 of the second set – „outputs OUT5, OUT6 control NOKTON radio messaging". The „UA" and „LV" data formats are used by foreign users of the control panels CA-10 and CA-10 plus.

FS-6 - programming entry delay, exit delay , and alarm time (DEC)

The settings refer to the global times and are valid for the entries and exits to which no individual times are assigned. **The exit delay time is common for all partitions**. The alarm time programmed in this function refers also to the keypad alarm signaling.

> ***NOTE****: The alarm time set with the function FS-6 defines also the zone alarms cut-off time - when the alarm is on, the subsequent zone violations will not trigger consecutive alarms until the cut-off time has elapsed.*

Programming the times is carried out in the following order:
entry delay (from 01 to 99 seconds) - in LED keypad, the LED 12 is blinking
exit delay (from 01 to 99 seconds) - in LED keypad, the LED 11 is blinking
alarm time (from 01 to 99 seconds) - in LED keypad, the LEDs 11,12 are blinking.

EXAMPLE (for LED keypad):

programming the times: $T_{WE} = 30$ s, T_{WY} - 60 s, T_{AL} - 90 s

[6]	[#]	-	call the required function
[3][0]	[#]	-	enter the entry delay time (two digits)
[6][0]	[#]	-	enter the exit delay time (two digits)
[9][0]	[#]	-	enter the alarm time; after acknowledging the last time, the control panel automatically exits the function.

When programming from the LCD keypad, pressing the [#] key confirms all the three times entered.

FS-7 - programming the counting line counters (DEC)

The control panel is equipped with three independent violation counters which can be associated with any zones. Violation of these zones will trigger alarm <u>after the programmed number of violations is exceeded</u> in the respective zone counter. Each counter can sum up violations of one or several zones defined as the counting ones (e.g. the counter 1 can count violations of zone 2, the counter 2 - violations of zones 4, 5, 6).

- Number „0" programmed – no alarm.
- Number „1" programmed – alarm after second violation.
- Number „2" or higher programmed – alarm after the number of violations equal to the programmed number.

Three counter values are programmed, from 01 to 07, in the following order: counter 1, counter 2, counter 3. If no counting zones are provided in the panel, the programmed values are irrelevant.

Time gates corresponding to the counters are programmed in FS-123.

EXAMPLE (for LED keypad):

programming the counters: the 1st - 2 violations, the 2nd - 5 violations, the 3rd - not used

[7]	[#]	-	call the function
[0][2]	[#]	-	program the first counter (the lower LED B is blinking)
[0][5]	[#]	-	program the second counter (the lower LED A is blinking)
	[*]	-	exit the function - programming of the third counter is omitted

In case of programming three counters, the function is automatically exited after the third counter has been programmed.

Functions programming assignment

FS-8 - programming partition 1 zones (BIT)

FS-9 - programming partition 2 zones (BIT)

FS-10 - programming partition 3 zones (BIT)

FS-11 - programming partition 4 zones (BIT)

The functions FS-8 to FS-11 are used to divide the alarm system into partitions. Full description of the possibilities to divide the panel into partitions -see section TECHNICAL DESCRIPTION OF THE CONTROL PANEL – PARTITIONS.

Programming in the LED keypad consists in lighting up the LEDs which indicate the zones that should be assigned to the given partition. It is a two-stage process. In the first stage the zones 1 to 8 are programmed (LED 12 is blinking). In the second stage - the zones 9 to 16 (LED 11 is blinking), the LED 1 indicating zone 9, LED 2 - zone 10 etc. Use the [#] key to proceed to the next stage, and then to exit the function.

In the LCD keypad, the zones are selected by entering their number (1,2...9, the tenth as „A" – [∗][0], up to the sixteenth „G" – [∗][6]), or by means of the arrow keys. The zone not belonging to a partition is indicated by a dot. Pressing the ⇧ key displays the name of the currently selected zone.

FS-12 - programming zones displayed in partition 1 keypad (BIT)

FS-13 - programming zones displayed in partition 2 keypad (BIT)

FS-14 - programming zones displayed in partition 3 keypad (BIT)

FS-15 - programming zones displayed in partition 4 keypad (BIT)

The control panel makes it possible to determine any zones which will be displayed in the actual **LED** keypad. Twelve out of sixteen zones are selected. The control panel displays the indicated zones arranged from the lowest number zone to the highest number zone, e.g. if the zone 1 has not been selected to be displayed, the first LED will show state of the zone 2. If less than 12 zones are selected, some of the keypad LEDs will be not used.

The functions FS 12 – FS-15 define the zones displayed in the LED keypad controlled, respectively, from the outputs CLK1 (zone 1) – CLK4 (zone 4)

The programming is similar to that in FS-8 (partition zones).

FS-16 - programming bypassed zones in partition 1 (BIT)

FS-17 - programming bypassed zones in partition 2 (BIT)

FS-18 - programming bypassed zones in partition 3 (BIT)

FS-19 - programming bypassed zones in partition 4 (BIT)

The functions 16 to 19 (**AUTO-BYPASS**) apply to the zones which are automatically bypassed after silent or loud arming with the authority level 7 code (partial arming). The programming is similar to that in FS-8.

> *NOTE: The zones to be bypassed at no exit from the partition are programmed with the service functions FS 127÷130 (EXIT-BYPASS).*

FS-20 - programming partition 1 options (BIT)

In order to increase flexibility of the system, some functions of the keypads are optional. They are performed by the CA10 plus control panel only in partitions, where they are not disabled. Two sets of options are programmed for each partition. The first set (LED 12 blinking) defines availability of the functions activated by holding down one key. The other set (LED 11 blinking) defines which audible signals are generated by the partition keypad.

The options selected for each set should be confirmed with the [#] key.

> ***NOTE:*** *The options 1,2 & 3 of the first set in the service functions FS-20 to FS-23 refer to the LED keypads and are irrelevant, when LCD keypads only are installed in the system. To enable GOTO function for the LCD keypads, settings*

must be separately programmed in the keypad itself (see: →Installation Guide for LCD Keypad; →Keypad Service Functions; →Settings; → Function GO TO).

FIRST SET OF OPTIONS (for LED keypad, the LED No. 12 is blinking)

No.	LCD	LED	Option
1	▮	ON	function GO TO Partition **2** disabled
		OFF	function GO TO Partition **2** enabled
2	▮	ON	function GO TO Partition **3** disabled
		OFF	function GO TO Partition **3** enabled
3	▮	ON	function GO TO Partition **4** disabled
		OFF	function GO TO Partition **4** enabled
4	▮	ON	quick arming [0][#] disabled
		OFF	quick arming [0][#] enabled
5	▮	ON	3 wrong codes alarm disabled
		OFF	3 wrong codes alarm enabled
6	▮	ON	PANIC alarm disabled
		OFF	keypad PANIC alarm enabled
7	▮	ON	AUX alarm disabled
		OFF	keypad AUX alarm enabled
8	▮	ON	FIRE alarm disabled
		OFF	keypad FIRE alarm enabled

SECOND SET OF OPTIONS (for LED keypad, the LED No. 11 is blinking)

No.	NR LCD		LED	Option
1	9	▮	1 ON 2 OFF	keypad alarm signal on until cleared
		▮	1 OFF 2 ON	alarm signal for the global alarm time
2	A		1 OFF 2 OFF	no keypad alarm signal
3	B	▮	ON	DAY/NIGHT or COUNTING zone violation signaled in keypad (5 long beeps)
			OFF	no DAY/NIGHT or COUNTING zone violation signaled in keypad
4	C	▮	ON	CHIME signal on (five short beeps)
			OFF	CHIME signal off
5	D	▮	ON	trouble signal on (two short beeps every 3 seconds)
			OFF	trouble signal in keypad off
6	E	▮	ON	EXIT DELAY signal on (one long beep every three seconds)
			OFF	EXIT DELAY signal off
7	F	▮	ON	ENTRY DELAY signal on (one sort beep every three seconds)
			OFF	ENTRY DELAY signal off
8	G	▮	ON	key pressed signal on
			OFF	no key pressed signal

FS-21 - programming partition 2 options (BIT)

The function defines which functions are available in the partition 2 keypad and which events are signaled acoustically.

FIRST SET OF OPTIONS (for LED keypad, the LED No. 12 is blinking)

No.	LCD	LED	Option
1	Y	ON	function GO TO Partition **1** disabled
		OFF	function GO TO Partition **1** enabled
2	Y	ON	function GO TO Partition **3** disabled
		OFF	function GO TO Partition **3** enabled
3	Y	ON	function GO TO Partition **4** disabled
		OFF	function GO TO Partition **4** enabled

The other options as in FS-20.

FS-22 - programming partition 3 options (BIT)

The function defines which functions are available in the partition 3 keypad and which events are signaled acoustically.

FIRST SET OF OPTIONS (for LED keypad, the LED No. 12 is blinking)

No.	LCD	LED	Option
1	Y	ON	function GO TO Partition **1** disabled
		OFF	function GO TO Partition **1** enabled
2	Y	ON	function GO TO Partition **2** disabled
		OFF	function GO TO Partition **2** enabled
3	Y	ON	function GO TO Partition **4** disabled
		OFF	function GO TO Partition **4** enabled

The other options as in FS20.

FS-23 - programming partition 4 options (BIT)

The function defines which functions are available in the partition 4 keypad and which events are signaled acoustically.

FIRST SET OF OPTIONS (for LED keypad, the LED No. 12 is blinking)

No.	LCD	LED	Option
1	Y	ON	function GO TO Partition **1** disabled
		OFF	function GO TO Partition **1** enabled
2	Y	ON	function GO TO Partition **2** disabled
		OFF	function GO TO Partition **2** enabled
3	Y	ON	function GO TO Partition **3** disabled
		OFF	function GO TO Partition **3** enabled

The other options as in FS20.

Functions Programming Zone Parameters

FS-24 - programming zone sensitivity

Each zone of the CA-10 plus panel can have its individual reaction time. Violations lasting shorter than the programmed reaction time are disregarded by the panel. In the LED keypad, the value from 1 to 255 is programmed, which corresponds to the times of 0.016 sec. do 4.08 sec. by the formula:

REACTION TIME = PROGRAMMED VALUE x 0.016 sec.

In the LCD keypad, the time is programmed directly in milliseconds from 16 to 4080 (the value is automatically rounded up to the multiple of the number 16).

By default, all the zones have the same reaction time (30 x 0,016 sec.=0.48 sec). In most cases, no change of the time setting will be required.

The function is intended for advanced installers. It allows the zone sensitivity to be selected where special detectors are used (for example, mechanical detectors of broken glass, or low hysteresis detectors, not fitted with univibrator at the output).

> *Note:* *The minimum sensitivity of the keypad zones and expander zones is 64ms (4 x 0.016sec.). The actual sensitivity values of these zones can amount to n x 64ms (n=1,2,3,...). This results from the way the keypad is handled by the control panel – the status of these zones is read out at intervals of exactly 64ms.*

Programming the zone sensitivity in the LED keypad is carried out in a different way than programming the other parameters: you should enter a number from 1 to 255 (one, two or three digits) and confirm by pressing the [#] key. This will take you over to programming the reaction time of next zone. After the last parameter is entered and confirmed, the control panel quits the function. The LEDs 9 to 12 indicate in binary form the zone the parameter refers to (for zone 1 - the LED 12 is blinking, for zone 2 - the LED 11 is blinking, for zone 3 - the LEDs 11 & 12 are blinking, and for zone 16 - the LEDs 9 to 12 are off). On the LEDs 1 to 8, the panel displays the previously programmed parameter setting in the binary form.

The programming can be interrupted by using the [∗] key.

EXAMPLE

changing the reaction time of zones 1, 3 and 6 to 0.8 s, zone 8 to 0.1 s, the other zones unchanged
0.8s/0.016s = 50 (enter the same value for zones 1,3 and 6)
0.1s/0.016s = 6.25 (enter 6 for zone 8, which will ensure the reaction time = 0.096s)

[2][4]	[#]	-	call the function	
[5][0]	[#]	-	reaction time for the first zone	(LEDs 9-12 = 0001)
	[#]	-	confirm the second zone time	(LEDs 9-12 = 0010)
[5][0]	[#]	-	reaction time for the third zone	(LEDs 9-12 = 0011)
	[#]	-	confirm the fourth zone time	(LEDs 9-12 = 0100)
	[#]	-	confirm the fifth zone time	(LEDs 9-12 = 0101)
[5][0]	[#]	-	reaction time for the sixth zone	(LEDs 9-12 = 0110)
	[#]	-	confirm the seventh zone time	(LEDs 9-12 = 0111)
[6]	[#]	-	reaction time for the eighth zone	(LEDs 9-12 = 1000)
	[∗]	-	quit the function	(LEDs 9-12 = 1001)
			(because the other zones remain unchanged)	

FS-25 - programming detector type (DEC)

It is possible to connect NC, NO, EOL, 2EOL/NC, and 2EOL/NO detectors to the control panel. As each of them provides the panel with a different kind of information, it is necessary to determine the type of detector connected to each zone. For example, an open zone can mean correct state of the NO detector or violation of the NC (or EOL) detector, as well as tamper violation in the case of two-parameter configuration.

Programming in the LED keypad consists in entering the suitable two-digit number (to determine the detector type) for the particular zones. Having confirmed the detector type for one zone, the control panel proceeds to programming the next type of zone, until particular detector types are assigned to all 16 zones. The following numbers are correct:

    00 - no detector (for not used zones)
    01 - NC detector (normally closed)
    02 - NO detector (normally open)

03 - EOL detector (one-parameter - default value)
04 - 2EOL/NC detector (two-parameter – NC detector)
05 - 2EOL/NO detector (two-parameter–NO detector)

During the programming, the control panel will display the current parameter setting (in binary form) on the LEDs 1 to 8. The LEDs 9 to 12 indicate the zone for which the detector type is being programmed.

EXAMPLE:

programming the EOL type zones 1 do 6, NC type zones 7 to 8, the other zones (13 to 16) not used

[2][5]	[#]	-	call the function	
[0][3]	[#]	-	detector type for the first zone	(LEDs 9-12 = 0001)
[0][3]	[#]	-	detector type for the second zone	(LEDs 9-12 = 0010)
[0][3]	[#]	-	detector type for the third zone	(LEDs 9-12 = 0011)
[0][3]	[#]	-	detector type for the fourth zone	(LEDs 9-12 = 0100)
[0][3]	[#]	-	detector type for the fifth zone	(LEDs 9-12 = 0101)
[0][3]	[#]	-	detector type for the sixth zone	(LEDs 9-12 = 0110)
[0][1]	[#]	-	detector type for the seventh zone	(LEDs 9-12 = 0111)
[0][1]	[#]	-	detector type for the eighth zone	(LEDs 9-12 = 1000)
[0][1]	[#]	-	detector type for the ninth zone	(LEDs 9-12 = 1001)
[0][1]	[#]	-	detector type for the tenth zone	(LEDs 9-12 = 1010)
[0][1]	[#]	-	detector type for the eleventh zone	(LEDs 9-12 = 1011)
[0][1]	[#]	-	detector type for the twelfth zone	(LEDs 9-12 = 1100)
[0][0]	[#]	-	no detector on zone 13	(LEDs 9-12 = 1101)
[0][0]	[#]	-	no detector on zone 14	(LEDs 9-12 = 1110)
[0][0]	[#]	-	no detector on zone 15	(LEDs 9-12 = 1111)
[0][0]	[#]	-	no detector on zone 16	(LEDs 9-12 = 0000)

FS-26 - programming zone reaction type (DEC)

The control panel reaction to a zone violation depends on the function assigned to the given zone (e.g., the reaction will be different in the case of a 24 h fire type zone violation, and in the case of an arming zone violation).

The programming consists in entering an appropriate two-digit number for each zone to determine its function (reaction type). Each of the CA-10 plus zones can perform one of the 21 functions:

00- ENTRY/EXIT
01- DELAY
02- INTERIOR DELAY
03- INSTANT
04- DAY/NIGHT
05- COUNTING L1
06- COUNTING L2
07- COUNTING L3
08- 24H AUDIBLE
09- 24H AUXILIARY
10- 24H SILENT
11- 24H FIRE
12- ARMING
13- SILENT ARMING
14- DISARMING
15- NO ALARM ACTION
16- ARMING/DISARMING
17- DELAY AUDIBLE
18- AUTOMATIC BYPASS ARMING
19- PERIMETER
20- ENTRY/EXIT-FINAL

FS-27 - programming zone options (BIT)

Each control panel zone has eight associated options which activate additional functions of the zone. The use of these options depends on the zone type. The control panel tests only the options relevant to the given zone. For example, it is of no use to activate the "auto-bypassed after first alarm" option or the "must not be violated on arming" option for the "arming" type zones. Activation of such options has no effect on the zone functioning.

Activation of the zone options is carried out individually for each zone. Programming in the LED keypad consists in lighting up the LEDs for corresponding options.

The LEDs 1 to 8 have been assigned the following options:

No.	LCD	LED	Option
1	▮	ON	PRIORITY (may not be violated on arming)
		OFF	may be violated on arming
2	▮	ON	CHIME (generates chime signal when disarmed)
		OFF	generates no chime signal
3	▮	ON	AUTO-RESET 1 (auto-bypassed after first alarm)
		OFF	always alarms (when both options 3 and 4 are off)
4	▮	ON	AUTO-RESET 3 (auto-bypassed after third alarm)
		OFF	always alarms (when both options 3 and 4 are off)
5	▮	ON	ABORT DELAY (no violation code reported to monitoring station during "entry delay")
		OFF	violation code reported during "entry delay"
6	▮	ON	POWER UP DELAY (zone not supervised for 120 s after control panel power-up)
		OFF	zone supervised immediately after power-up
7	▮	ON	RESTORE AFTER BELL (zone violation restore code reported to monitoring station after alarm ends)
		OFF	zone violation restore code reported to monitoring station immediately (with option 8 also off)
8	▮	ON	RESTORE AFTER DISARM (zone restore code reported to monitoring station after disarming)
		OFF	zone restore code reported immediately (with option 7 also off)

During programming, the LEDs 9 to 12 A,B,A,B show the number of zone for which the options are being programmed.

> *Note*: *By default, the option no.1 is active for all the zones, which means that none of the zones may be violated during arming.*

FS-28 - programming individual entry delay (DEC)

An individual "entry delay time" (alarm delay) can be programmed for each zone.

The individual entry delays should **only be programmed where different delay times are required for the particular zones**. Otherwise, these times should be equal to zero, and the delay is programmed in **FS 6**..

The programming consists in entering the times for delayed zones from 00 (then the global time specified in FS-6 is valid) to 99 seconds.

The programmed times only refer to the ENTRY/EXIT, DELAY, INTERIOR DELAY and DELAY AUDIBLE zone types.

EXAMPLE:

> programming the entry delay time (alarm delay) for the following zones: zone 4 - delay 30 seconds, zone 7 - delay 45 seconds, zone 8 - delay 60 seconds.

[2][8]	[#]	call the function
	[#]	skip programming entry delay for zone 1
	[#]	skip programming entry delay for zone 2
	[#]	skip programming entry delay for zone 3
[3][0]	[#]	program the entry delay for zone 4
	[#]	skip programming entry delay for zone 5
	[#]	skip programming entry delay for zone 6
[4][5]	[#]	program the entry delay for zone 7
[6][0]	[#]	program the entry delay for zone 8
	[∗]	exit the function - omit programming entry delay for the other zones

FS-29 - programming maximum zone violation times

The FS-29 function defines the boundary value of zone violation time which cannot be exceeded, unless the zone detector is faulty. Information on the trouble is recorded in the control panel event log and sent to the monitoring station. It can also be signaled on the "zone trouble" type of output.

The programming procedure is similar to that in the FS-24 function (programming the zone sensitivity). On the LEDs 1 to 8, the panel displays the previously programmed parameter setting in the binary form.. The LEDs 9 to 12 show the zone the parameter refers to. The zone number is also displayed in the binary form (for zone 1 - the LED 12 is blinking, for zone 2 - the LED 11 is blinking, for zone 3 - the LEDs 11 & 12 are blinking, for zone 16 - the LEDs 9 to 12 are off).

The violation time is set within the range of 0 to 255 seconds. When time 0 has been programmed, the function is inactive. Having entered the time, press the [#] key. Thus you will proceed to programming the time for the next zone. After the last parameter is set and confirmed, the control panel will quit the function.

The programming can be interrupted by pressing the [∗] key.

EXAMPLE:

> programming the maximum violation time for the zones 2 (60 seconds) and 4 (180 seconds)

[2][9]	[#]	-	call the function
[0]	[#]	-	disable the trouble check for the zone 1 (by default, the trouble check for all zones is disabled, so you can skip the zones for which this parameter is not programmed, by pressing the [#] key)
[6][0]	[#]	-	set the time for the zone 2
	[#]	-	skip programming the zone 3
[1][8][0][#]		-	set the time for the zone 4
	[∗]	-	quit the function - skip time programming for the other zones.

Note: The violation time is only checked for the "alarm zones" (reaction type from 00 to 11)

FS-30 - programming the zone no violation time

This function defines the time after which the absence of a given zone violation will be recognized by the panel as a trouble condition (e.g. a faulty or obstructed detector). The time of no violation is only counted when the zone is disarmed.

Information on the zone trouble is saved in the event log, and can be sent to the monitoring station and to the "zone trouble" type of output.

This parameter can be defined individually for each zone in the same way as in the FS-29, within the range of 0 to 255 hours. Having programmed 0 means that the zone no violation time monitoring is disabled.

Note: The no violation time is only checked for the "alarm zones" (reaction type from 00 to 11)

Functions Programming Output Parameters

FS-31 - programming OUT1 output

The function makes it possible to define basic parameters regarding the OUT1 output:

- **output type** (determines in which conditions the output will be activated),
- **output cut-off time,**
- **operation options** (e.g., "polarity").

In the LED keypad, after selecting the function, the LEDs 1 to 8 show the respective parameter setting, while the LEDs 9 to 12 show which parameter is being programmed.

The first parameter defines the **output type** (the LED 12 is blinking). The programming consists in entering a two-digit number (identically as in the DEC functions) and confirming it with the [#] key.

Each of the outputs can be assigned any type from the following list:

```
00 - NOT USED
01 - BURGLARY ALARM
02 - FIRE/BURGLARY ALARM
03 - FIRE ALARM
04 - KEYPAD ALARM
05 - KEYPAD FIRE ALARM
06 - KEYPAD PANIC ALARM
07 - KEYPAD AUX. ALARM
08 - KEYPAD TAMPER ALARM
09 - DAY/NIGHT + COUNTING
10 - DURESS ALARM
11 - CHIME
12 - SWITCH MONO
13 - SWITCH BI (ON/OFF)
14 - ARM STATUS
15 - SILENT ARM STATUS
16 - EXIT DELAY WARNING
17 - ENTRY DELAY WARNING
18 - TEL. USAGE STATUS
19 - GROUND START
20 - MONITORING ACKNOWLEDGEMENT
21 - BYPASS STATUS
22 - READY STATUS
23 - ZONE VIOLATION
24 - TELEPHONE LINE FAULT
25 - 230V AC LOSS INDICATOR
26 - BATTERY TROUBLE INDICATOR
27 - POWER SUPPLY
28 - FIRE POWER SUPPLY
29 - RESET POWER SUPPLY
```

30 - TIMER

31 - AUDIBLE ALARM STATUS

32 - FULL ARM STATUS

33 - ARM/DISARM/CLEAR ALARM

34 - KEYPAD ALARM BUZZER

35 - POWER SUPPLY IN ARMED MODE

36 - STATUS LED

37 - STATUS RELAY

38 - ZONE TROUBLE

39 - NO GUARD CODE

40 - SERVICE MODE STATUS

41 - LOW BATTERY INDICATOR

Output operation time (the LED 11 is blinking) is defined in **the second step** by entering a number from 00 to 99 (as in other DEC functions). A corresponding option defines whether the operation time has been given in seconds or minutes.

The third parameter (the LEDs 11 and 12 are blinking) is **a set of eight options** to define i.a. the output assignment to partitions, and other details of the output operation. The options are programmed in much the same way as the other BIT functions.

OUTPUT OPTIONS:

No.	LCD	LED	Option
1	▓	ON	output belongs to **partition 1**
		OFF	output not assigned to partition 1
2	▓	ON	output belongs to **partition 2**
		OFF	output not assigned to partition 2
3	▓	ON	output belongs to **partition 3**
		OFF	output not assigned to partition 3
4	▓	ON	output belongs to **partition 4**
		OFF	output not assigned to partition 4
5	▓	ON	**pulsating signal**
		OFF	steady signal
6	▓	ON	operation time in **minutes**
		OFF	operation time in **seconds**
7	▓	ON	LATCH type output – **signaling until cleared** (operation time irrelevant)
		OFF	output operates periodically
8	▓	ON	**polarity +12V** when the output is active
		OFF	**polarity 0V** when the output is active

After confirmation of the option, the function is quitted.

NOTE: The option of output assignment to a partition is to be used, when separate signaling devices have to be assigned to individual partitions. If not assigned to a partition, the alarm output will signal every alarm.

EXAMPLE:

programming the OUT1 output for the BURGLARY/FIRE ALARM type operation, for 5 minutes, with polarity 0V in active state

[3][1]   [#]   -   call the function. When it is activated, the LEDs will show current output type (LEDs 1 to 4 and 5 to 8 will show two digits in binary form). The blinking LED 12 signals the output type being programmed.

[0][2]   [#]   -   enter and confirm the output number (the LED 12 starts blinking - operation time programming)

[0][5]   [#]   -   program and confirm the time (LEDs 11 and 12 start blinking - proceed to programming the output option)

[6]   -   LED 6 goes on - the „time in minutes" option is activated

[8]   [#]   -   LED 8 goes off - set the "polarity" = 0V and exit the function.

FS-32 - programming list of zones OUT1 (BIT)

The function is used to program the output controlling zones. The selection of zones limits the output operation only to reaction to violation of those zones.

The zone selection should only be used when it is necessary to have separate signaling for events from a specific zone or a group of zones.

In no list of zones is indicated, the control panel will assume by default that the output reacts to events from any zone – for example, the BURGLARY alarm type output will signal alarms for each alarm zone in the control panel. Of course, the zone function (reaction type) is taken into consideration, e.g. the alarm signaling output will not react to a change of state of the arming zone.

Programming the list of zones makes the control panel to skip the programmed selection of zones when defining which zones are to activate the output.

For the outputs reacting to keypad events, the list of partitions is taken into consideration, while the list of zones is irrelevant (e.g. the 3 wrong codes alarm signaling).

The FS-32 function is used to assign zones to the OUT1 output. The programming procedure is identical as in the functions FS8 – FS19.

The programming in the LED keypad consists in lighting up the LEDs which correspond to the zones (first select the zones 1 to 8 - the LED 12 is blinking, then 9 to 16 - the LED 11 is blinking). Consecutive steps must be confirmed.

FS-33 - programming OUT2 output

The function defines the basic parameters associated with the OUT2 output. The programming procedure is same as for the FS-31.

FS-34 - programming list of zones OUT2 (BIT)

The function programs the list of zones associated with the OUT2 output. The programming procedure is same as for the **FS-32**.

FS-35 - programming OUT3 output

The function defines the basic parameters associated with the OUT3 output. The programming procedure is same as for the **FS-31**.

FS-36 - programming list of zones OUT3 (BIT)

The function programs the list of zones associated with the OUT3 output. The programming procedure is same as for the **FS-32.**

FS-37 - programming OUT4 output

The function defines the basic parameters associated with the OUT4 output. The programming procedure is same as for the **FS-31.**

FS-38 - programming list of zones OUT4 (BIT)

The function programs the list of zones associated with the OUT4 output. The programming procedure is same as for the **FS-32.**

FS-39 - programming OUT5 output

The function defines the basic parameters associated with the OUT5 output. The programming procedure is same as for the **FS-31.**

FS-40 - programming list of zones OUT5 (BIT)

The function programs the list of zones associated with the OUT5 output. The programming procedure is same as for the **FS-32**.

FS-41 - programming OUT6 output

The function defines the basic parameters associated with the OUT6 output. The programming procedure is same as for the **FS-31**.

FS-42 - programming list of zones OUT6 (BIT)

The function programs the list of zones associated with the OUT6 output. The programming procedure is same as for the **FS-32.**

Functions programming parameters of transmission to monitoring stations

FS-43 - programming station 1 number 1 (HEX)

FS-44 - programming station 2 number (HEX)

Numbers of up to 16 characters (digits and control codes) are programmed in the same way as the modem telephone number (FS-4).

FS-45 - programming station 1 format (HEX)

FS-46 - programming station 2 format (HEX)

The functions define the standard of event transmission to the monitoring stations. They are programmed by entering a double-character format number and confirming it with the [#] key.

TRANSMISSION FORMATS:

    00 - Silent Knight, Ademco slow (1400Hz/10Bps)
    01 - Sescoa, Franklin, DCI, Vertex (2300Hz/20Bps)
    02 - Silent Knight fast (1400Hz/20Bps)
    03 - Radionics 1400Hz
    04 - Radionics 2300Hz
    05 - Radionics with parity 1400Hz
    06 - Radionics with parity 2300Hz
    07 - Ademco Express
    08 - Silent Knight, Ademco slow, extended
    09 - Sescoa, Franklin, DCI, Vertex, extended
    0A - Silent Knight fast, extended
    0B - Radionics 1400Hz, extended
    0C - Radionics 2300Hz, extended
    0D   Telim with entry tone – without signalling test of connection
    8D - Telim without entry tone – with full signalling test of connection
    0E   Contact ID selected codes
    0F   Contact ID all codes

FS-47 - programming monitoring options (BIT)

These options define how the communication with monitoring stations is established and how the event codes are transmitted. The programming consists in lighting up the LEDs of selected options and confirming the choice with the [#] key.

MONITORING OPTIONS:

No.	LCD	LED	Option
1		1 OFF 2 OFF	**transmit to station 1 or station 2** (report is only sent to the station which first answers the call, without event sorting)
	▮	1 ON 2 OFF	**transmit to station 1 only**, without event sorting
2	▮	1 OFF 2 ON	**transmit to station 2 only**, without event sorting
	▮▮	1 ON 2 ON	**transmit to both stations, with event sorting** (event sorting programmed with corresponding service functions, separately for each group of events)
3	▮	ON	**event sorting** by identifiers (event groups) during transmission to station **1**
		OFF	**sorting disabled** for station 1
4	▮	ON	**event sorting** by identifiers (event groups) during transmission to station **2**
		OFF	**sorting disabled** for station 2
5	▮	ON	**extend reported partition event code with user number** (access code number)
		OFF	automatic extension with user number **disabled**
6	▮	ON	**extend reported zone event code with user number** (for zone 1 - "1", for zone 2 - "2", for zone 16 no code extension)
		OFF	automatic extension with zone number **disabled**
7	▮	ON	the panel skips sending the event code if STATION **1** fails to acknowledge receiving the information after 16 attempts.
		OFF	the panel skips sending no codes to STATION 1.
8	▮	ON	the panel skips sending the event code if STATION **2** fails to acknowledge receiving the information after 16 attempts.
		OFF	the panel skips sending no codes to STATION 2.

NOTES:

- The options 3 and 4 are used when separate identifiers are assigned to particular event groups, and the station to which messages are sent identifies the system by the first identifier received. In such a case, the control panel can initiate a new connection for each event group. Events from the control panel buffer are then sorted so that all events of the same group (i.e. having the same identifier) can be sent during one connection.

- The options 5 and 6 are only meaningful when double-character codes are reported (with 4/2 or 3/2 format). If this is the case, single-character event codes are programmed, and the panel, with the extension option on, will add the zone number or the user number, respectively, as the second character. The codes programmed as double-character ones will be sent in their programmed form. This solution has been adopted to facilitate programming of the event codes. As a result, programming e.g. the „zone alarm" codes (FS-60) for all the zones from which such a code is to be sent, it is sufficient to give just one (the same) character.

Functions Programming Identifiers

The functions FS-48 to FS-59 are used to program identifiers to be sent to the monitoring stations. Depending on the needs, the control panel can send to the station quite detailed data on the events occurring in the system, or just the basic ones. With two-character codes, it is possible to send information on 225 events.

In order to circumvent restrictions caused by the transmission formats, some solutions have been applied in the CA10 plus control panel, which consist in grouping the events (zone events, partition 1 events, etc.) and assigning a separate identifier to each group.

In case of a small amount of information being sent (less than 225 different events)**, all the identifiers for the particular station are to be programmed identically**, and the event sorting mode is to be disabled in monitoring options.

The functions programming identifiers function so that the LEDs 1 to 8 shown two consecutive characters (see the HEX function description) which can be changed by entering new ones. When programming the first two characters, the LED 12 is blinking, when programming the oter two - the LED 11 is blinking.

For the data formats 3/1 and 3/2, the last character should be 0 - **the control panel will send characters from 1 to F, 0 not being sent**.

*NOTE: If the monitoring station requires an identifier containing the digit **zero**, enter the character "**A**" instead of zero (e.g. the identifier "12**0**3" should be entered as "12**A**3").*

FS-48 - programming zone events identifier for station 1 (HEX)

FS-49 - programming partition 1 events identifier for station 1 (HEX)

FS-50 - programming partition 2 events identifier for station 1 (HEX)

FS-51 - programming partition 3 events identifier for station 1 (HEX)

FS-52 - programming partition 4 events identifier for station 1 (HEX)

FS-53 - programming system events identifier for station 1 (HEX)

FS-54 - programming zone events identifier for station 2 (HEX)

FS-55 - programming partition 1 events identifier for station 2 (HEX)

FS-56 - programming partition 2 events identifier for station 2 (HEX)

FS-57 - programming partition 3 events identifier for station 2 (HEX)

FS-58 - programming partition 4 events identifier for station 2 (HEX)

FS-59 - programming system events identifier for station 2 (HEX)

EXAMPLE:

programming the zone event identifier for the station 1 = A243

[4][8]	[#]	-	call the function
[∗0][2]	[#]	-	enter the first two characters of identifier
[4][3]	[#]	-	enter the next two characters of identifier and confirm them - exit the function

Functions Programming Zone Event Codes

The zone event codes are programmed in the functions FS-61 to FS-66, and also FS-134 and FS-135. Each of them is used for programming a code of one event for each of the 16 zones of the panel.

The zone event codes may be either single or double character.

For the data formats 4/1 and 3/1 (and also when using the mode with code extension by zone number, see FS-47 "Monitoring options"), one of the characters must be 0.

Programming 00 will result in skipping the event when the events are being reported to the station.

The programming consists in entering two characters (from 0 to F) for each zone and confirming them.

When programming in the LED keypad, the LEDs show value of the character entered (from 1 to 4 - the first character, and from 5 to 8 - the second character of the code) and number of the zone for which the code is programmed (LEDs 9 to 12). After confirmation of the last zone code, the control panel exits the function.

FS-60 - programming zone alarm codes (HEX)

The codes programmed with this function are reported when the control panel detects violation of the zone which triggers an alarm. 16 zones of the panel are successively programmed.

EXAMPLE:

programming the alarm codes for the zones 1 to 7 (codes from 41to 47) and 9 to 16 (codes from 48 to 4F), the zone 8 not being an alarm one.

[6][0]	[#]	-	call the function
[4][1]	[#]	-	program the code for zone 1
[4][2]	[#]	-	program the code for zone 2
[4][3]	[#]	-	program the code for zone 3
[4][4]	[#]	-	program the code for zone 4
[4][5]	[#]	-	program the code for zone 5
[4][6]	[#]	-	program the code for zone 6
[4][7]	[#]	-	program the code for zone 7
[0][0]	[#]	-	program the code for zone 8 (no event for zone 8)
[4][8]	[#]	-	program the code for zone 9
[4][9]	[#]	-	program the code for zone 10
[4][∗0]	[#]	-	program the code for zone 11 (code 4A)
[4][∗1]	[#]	-	program the code for zone 12 (code 4B)
[4][∗2]	[#]	-	program the code for zone 13 (code 4C)
[4][∗3]	[#]	-	program the code for zone 14 (code 4D)
[4][∗4]	[#]	-	program the code for zone 15 (code 4E)
[4][∗5]	[#]	-	program the code for zone 16 (code 4F), quit the function.

FS-61 - programming zone tamper alarm codes (HEX)

The codes programmed with this function are reported when the control panel detects violation of the anti-tampering contact in 2EOL/NC and 2EOL/NO zones, which triggers a tamper alarm.

FS-62 - programming zone trouble codes (HEX)

The codes programmed with this function are reported when the control panel detects trouble of a detector associated with the zone (too long zone violation and/or too long zone no-violation time).

FS-63 - programming zone violation codes (HEX)

The function is used for programming the zone violation codes. The zone violation code is transmitted to the monitoring station in case of:

- **violation of an armed delayed zone** (of ENTRY/EXIT, INTERIOR DELAY, DELAY type) when the control panel has started the entry delay countdown,
- **violation of an armed counting zone** – when the number of violations still does not trigger an alarm,
- **violation of a DAY/NIGHT zone when it is disarmed,**
- **violation of an armed zone when the zone already signals an alarm** - during the alarm no subsequent alarms are signaled, and the consecutive detector excitations are recorded in the event log as "zone violation"; when the alarm signaling is over, each next violation of the detector will trigger an alarm.

NOTE: A trouble to program the codes of alarms and violations for <u>all the zones</u> may result in the station being not notified of the alarm. If one of the control panel zones has no alarm code assigned to it, and it will trigger an alarm, the excitations of subsequent detectors which occur during the alarm will be saved in the memory as zone violations, not alarms. If the system comprises any zones triggering an alarm of which the monitoring station is not notified, it is necessary to enter the same violation codes for the monitored zones as for the alarms.

FS-64 - programming zone RESTORE codes (HEX)

The codes programmed with this function are sent after the zone returns to its normal state (according to the setting of corresponding zone options).

FS-65 - programming zone TAMPER RESTORE codes (HEX)

The codes programmed with this function are sent after the anti-tampering contact of detector associated with the zones 2EOL/NC and 2EOL/NO returns to its normal state.

FS-66 - programming zone TROUBLE RESTORE codes (HEX)

The codes programmed with this function will be sent after the trouble ends (i.e. when the zone is restored to its normal state after too long a violation, or when a violation occurs after "too long time of no violation ").

FS-67 - programming zone event assignment to station 1 (BIT)

FS-68 - programming zone event assignment to station 2 (BIT)

The functions define, which zone events are to be sent to station 1, and which to station 2 (monitoring set for both stations in FS-47).
The programming in the LED keypad consists in lighting up the event indicating LEDs and confirming the selection with the [#] key.

No.	LCD	LED	Option
1	▼	ON	send ZONE ALARM code
		OFF	do not send ZONE ALARM code
2	▼	ON	send ZONE TAMPER ALARM code
		OFF	do not send ZONE TAMPER ALARM code
3	▼	ON	send ZONE TROUBLE ALARM code
		OFF	do not send ZONE TROUBLE ALARM code
4	▼	ON	send ZONE VIOLATION ALARM code
		OFF	do not send ZONE VIOLATION ALARM code
5	▼	ON	send ZONE RESTORE code
		OFF	do not send ZONE RESTORE code
6	▼	ON	send ZONE TAMPER RESTORE code
		OFF	do not send ZONE TAMPER RESTORE code
7	▼	ON	send ZONE TROUBLE RESTORE code
		OFF	do not send ZONE TROUBLE RESTORE code
8	▼	ON	send "ZONE BYPASSED" & "ZONE UNBYPASSED" codes
		OFF	do not send "ZONE BYPASSED" & "ZONE UNBYPASSED" codes

Functions programming partition event codes

FS-69 - programming partition 1 event codes (HEX)

FS-70 - programming partition 2 event codes (HEX)

FS-71 - programming partition 3 event codes (HEX)

FS-72 - programming partition 4 event codes (HEX)

In each partition, the control panel distinguishes fifteen events, whose codes are programmed separately for each partition (functions FS-69 to FS-72).

The partition event codes can be single- or double-character. For the data formats 4/1 and 3/1, one of the characters must be equal to 0, and the mode of extension by the user number should be deactivated (see FS-47 "Monitoring options ").

When the event codes are to be double-character ones, the panel can extend some codes with the user number (for the events enabling the user to be identified by the access code). The codes which are to be extended should be programmed as single-character ones (one character must be equal to 0). Additionally, the mode of extension by the user number should be activated.

The code of event caused by the MASTER user is extended by "F", the codes of other users – by "1"..."C". Where the partition is zone controlled, or quickly armed with the [0][#] function, the event code is extended by "D". When the event is caused by the clock (see the "Functions programming TIMERS"), the event code is extended by "E".

Programming the 00 setting means that we omit sending event information to the station.

The programming consists in assigning two characters (from 0 to F) to each partition event and confirming them. When programming, the keypad LEDs 1 to 8

show the programmed code (1 to 4 the first character, 5 to 8 the second character of the code). The LEDs 9 to 12 show the number of event programmed, according to the list below:

Number	LEDs 9-12	Event	
1	○○○◎	Arming	*
2	○○◎○	Silent arming	*
3	○○◎◎	Arming with bypass	*
4	○◎○○	Clearing alarm	*
5	○◎○◎	Disarming	*
6	○◎◎○	*not used*	
7	○◎◎◎	Clock setting	*
8	◎○○○	Zone bypass	*
9	◎○○◎	Keypad FIRE alarm	
10	◎○◎○	Keypad PANIC alarm	
11	◎○◎◎	Keypad auxiliary alarm	
12	◎◎○○	Keypad tamper alarm	
13	◎◎○◎	3 wrong codes alarm	
14	◎◎◎○	DURESS alarm	
15	◎◎◎◎	Internal partition arming	
16	○○○○	Internal partition disarming	

Notes:
- *The event codes marked * can be extended by the panel with the user number (see: MONITORING OPTIONS).*
- *The "arming with bypass" code is sent when some of the partition zones were bypassed at the moment of arming.*
- *The code numbers 15 and 16 are sent when the partition was armed by the superior partition user (the corresponding event code, with the number of that user, is sent as part of handling the superior partition events).*

FS-73 - programming partition 1 event assignment to station 1 (BIT)

FS-74 - programming partition 2 event assignment to station 1 (BIT)

FS-75 - programming partition 3 event assignment to station 1 (BIT)

FS-76 - programming partition 4 event assignment to station 1 (BIT)

The functions FS-73 to FS-76 define which events from a given partition will be reported to the first monitoring station when the mode of reporting to both stations is activated.

The programming in the LED keypad consists in indicating the events which are to be reported, by lighting up the corresponding LEDs. In the first stage (LED 12 is blinking), the LEDs 1 to 8 show directly the event number. In the second stage (LED 11 is blinking) they show the events 9 to 16. Selection of the events should be confirmed with the [#] key.

FS-77 - programming partition 1 event assignment to station 2 (BIT)

FS-78 - programming partition 2 event assignment to station 2 (BIT)

FS-79 - programming partition 3 event assignment to station 2 (BIT)

FS-80 - programming partition 4 event assignment to station 2 (BIT)

The functions FS-77 to FS-80 define which partition events will be reported to the second monitoring station when the mode of reporting to both stations is activated.

Functions Programming System Event Codes

Apart from the events from zones and partitions, the CA-10 plus panel can transmit information on 24 system events (mainly related to the detected troubles).

The codes of these events may consist of single or double characters. For the data formats 4/1 and 3/1, one character must be equal to 0. Information on the events whose code has been programmed as 00 is not reported to the stations.

FS-81 - programming system event codes - set I (HEX)

The function enables the first sixteen out of 26 system events to be programmed. The programming procedure is same as in FS-69.

Number	LEDs 9-12 status	Event
1	○○○◎	AC loss
2	○○◎○	AC restore
3	○○◎◎	Low battery
4	○◎○○	Battery restore
5	○◎○◎	Output OUT1 trouble
6	○◎◎○	Output OUT1 restore
7	○◎◎◎	Output OUT2 trouble
8	◎○○○	Output OUT2 restore
9	◎○○◎	Output OUT3 trouble
10	◎○◎○	Output OUT3 restore
11	◎○◎◎	Printer trouble
12	◎◎○○	Printer restore
13	◎◎○◎	Enter service mode
14	◎◎◎○	Exit service mode
15	◎◎◎◎	Start DOWNLOADING
16	○○○○	End DOWNLOADING

FS-82 – programming system event codes - set II (HEX)

The function enables the other eight system events to be programmed.

The programming procedure is same as in FS-69.

Number	LEDs 9-12	Event
1	○○○◎	Output OUT4 trouble
2	○○◎○	Output OUT4 restore
3	○○◎◎	Transmission problems
4	○◎○○	Event log overflow
5	○◎○◎	Loss of time
6	○◎◎○	RAM memory fault
7	○◎◎◎	System restart
8	◎○○○	Test transmission
9	◎○○◎	Keypad power supply trouble
10	◎○◎○	Keypad power supply restore

Notes:

- *The code 3 is recorded in the event log when the control panel is unable to establish communication with the station. In that case, the control panel will retry after 120 seconds to establish connection. When it gets through, the control panel will transmit all events from the memory. The "transmission problems" code item makes it possible to asses when the oldest event occurred. The events are sent by the panel in the order of their occurrence (the oldest event is sent first), unless the event sorting mode is active. In such a case, the zone events are sent first, then the partition events, and the system events are sent last.*

- *The code 4 is recorded in the event log when lack of communication with the station lasted so long that all the memory intended for the events (255 in all) has been filled up and the oldest events have been erased.*

FS-83 - programming system event assignment to station 1 (BIT)

When the mode of notifying both stations is active, the events programmed with the function FS-82 are sent to both stations, For the other system events (programmed with the function FS-81), it is possible to determine, whether they will be sent to station 1, to station 2, or to both of them. The function FS-83 selects events to be sent to station 1.

Programming in the LED keypad is a two-stage process (similarly as in FS-73 to FS-76). The LEDs 1 to 8 show the following events:

          1 - AC loss
          2 - AC restore
          3 - Low battery
          4 - Battery restore
          5 - Output OUT1 trouble
          6 - Output OUT1 restore
          7 - Output OUT2 trouble
          8 - Output OUT2 restore   in the first stage
          1 - Output OUT3 trouble
          2 - Output OUT3 restore
          3 - Printer trouble
          4 - Printer restore
          5 - Enter service mode
          6 - Exit service mode
          7 - Start DOWNLOADING
          8 - Stop DOWNLOADING   in the second stage

FS-84 - programming system event assignment to station 2 (BIT)

The function makes it possible to select system events sent to the station 2, when the mode of reporting to both stations is active. The programming procedure is identical as in FS-83.

FS-85 - programming test transmission time (DEC)

The control panel can send the test transmission every 24 hours. The function FS-85 sets the hour and minute for sending the test code to the monitoring station. The programming consists in entering two two-digit numbers: hours (00 to 23) and minutes (00 to 59). After confirmation of the minutes, the panel quits the function. Entering 99:99 disables the test transmission function.

EXAMPLE:

		programming the test code to be sent at 1:45
[8][5]	[#]	- call the function
[0][1]	[#]	- enter the hour for message sending
[4][5]	[#]	- enter the minutes and exit the function

FS-86 - programming the „AC loss" report delay (DEC)

The function defines the time from the mains supply loss after which the panel will send an „AC loss" message to the monitoring station. The delay time is programmed in minutes, within the range from 01 to 99 minutes. The mains supply loss is signaled instantly in keypads and on the AC loss indicator outputs.

Functions Programming Dialer

FS-87 - programming telephone number 1 (HEX)

FS-88 - programming telephone number 2 (HEX)

FS-89 - programming telephone number 3 (HEX)

FS-90 - programming telephone number 4 (HEX)

FS-91 - programming telephone number 5 (HEX)

FS-92 - programming telephone number 6 (HEX)

FS-93 - programming telephone number 7 (HEX)

FS-94 - programming telephone number 8 (HEX)

The functions FS-87 to FS-94 are used to program the telephone numbers to which the control panel sends alarm messages. Each telephone number can have up to sixteen digits and special characters. The numbers are to be programmed in the same way as in the function FS-4.

FS-95 - programming assignment of partitions and messages (BIT)

Reporting alarm messages depends on which partition is alarming. The function FS-95 associates telephone numbers with partitions and defines which message is to be sent. The programming consists in indicating, for each telephone number, the partition number and the number of message to be sent.

Programming in the LED keypad:

- telephone number (1 to 8, binary) shown on LEDs 9 – 12
- LEDs 1 to 4 show the assignment of consecutive numbers to partitions:
  1 - telephone number for partition 1
  2 - telephone number for partition 2
  3 - telephone number for partition 3
  4 - telephone number for partition 4
- LEDs 5 to 8 show the message sent to a consecutive number:
  5 - message 1 for paging system
  6 - message 2 for paging system
  7 - message 3 for paging system
  8 - message 4 for paging system

*Note: If no message for the paging system is assigned to the number, the panel will send a **voice message** from the synthesizer.*

EXAMPLE:

programming of the following settings (assuming that LEDs 1 to 8 for all numbers are off)
- 1st telephone number -voice message from synthesizer, with alarm in partition 1,2, 3,
- 2nd telephone number - message No. 2 (pager), with alarm in partition 1,
- 3rd and 4th tel. number - voice message from synthesizer, after alarm in partition 3
- other numbers not used

[9][5][#] - call the function (LED 12 is blinking - 1st number)
[1][2][3] - LEDs 1, 2 & 3 go on (number 1 assigned to partitions 1, 2 & 3)
            other LEDs are off
    [#] - confirm assignment for number 1 (LED 11 is blinking - 2nd number)
    [1] - LED 1 goes on (number 2 assigned to partition 1)
    [6] - LED 6 goes on (message 2 assigned to number 2)
    [#] - confirm assignment for number 2 (LEDs 11, 12 are blinking - 3rd number)
    [3] - LED 3 goes on (number 3 assigned to partition 3)
    [#] - confirm assignment for number 3 (LED 10 is blinking - 4th number)
    [3] - LED 3 goes on (number 4 assigned to partition 3)
    [#] - confirm assignment for number 4 (LEDs 10, 12 are blinking - 5th number)
    [*] - exit the function. As for the other numbers all the LEDs 1 to 8 are off, the control panel will not dial those numbers.

FS-96 - programming message 1 (POLPAGER format)

FS-97 - programming message 2 (POLPAGER)

FS-98 - programming message 3 (POLPAGER)

FS-99 - programming message 4 (POLPAGER)

The message is programmed in the same way as with direct telephone messaging to the POLPAGER receiver. The control panel saves in its memory the consecutively depressed keys, and when transmitting the message, it generates corresponding two-tone signals, according to the telephony standard.

After calling the function, the panel enters the numerical mode (identically, as the POLPAGER exchange). Each depression of a key means that a corresponding digit has been added to the message.
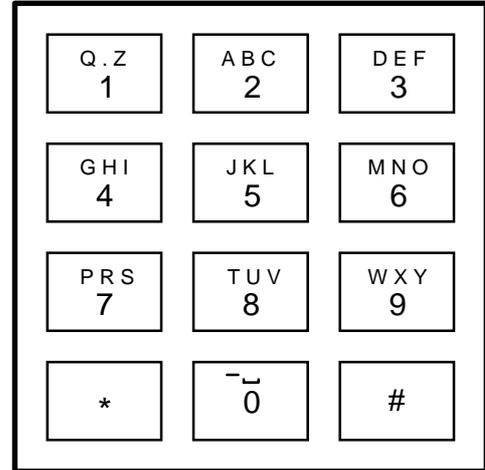
Figure 13

Changeover to the text mode follows a double depression of the [∗] key. When in the text mode, each key (from 1 to 9) has three letters assigned to it. If you want to choose the middle letter, press the key with that letter. If you want to choose the letter on the left side of a key, press that key and [∗]. The letter on the right side of a key can be accessed by pressing that key and [#]. To access the space, press the [0] key. The dash is accessible by pressing the [0][∗] keys. Changeover from the text to numerical mode is effected after pressing the [0][#] keys.

The message is ended after pressing the [#] key when the control panel is in the numerical mode, while the next depression of [#] results in exiting the function.

The control panel saves in memory 80 keystrokes. At an attempt to enter a longer message, the panel quits the function (adding [#] or [0][#][#] if it was in the text mode).

EXAMPLE:

programming the ALARM message
[9][6]	[#]	-	call the function (LED 9 is blinking - programming the 1st message)
[∗]	[∗]	-	activate the text mode
[2]	[∗]	-	A
[5]	[#]	-	L
[2]	[∗]	-	A
[7]		-	R
[6]	[∗]	-	M
[0]	[#]	-	change over to the numerical mode
	[#]	-	end the message
	[#]	-	exit the function.

FS-100 - programming number of queues and retries in a queue (DEC)

The function is used to program two parameters of the telephone communicator which define how the messaging works. These parameters are:
- number of message queues (from 1 to 7) - setting a greater number gives a better reliability of reporting,
- number of dialing retries within one queue (from 1 to 9, and if 0 is entered - until a successful transmission). This parameter has been introduced so as to avoid blocking of the telephone line continuously dialing the number

which cannot be reached (when nobody answers the call or the panel receives the busy signal all the time, etc.).

The programming consists in entering two digits. **The first of them refers to the number of retries, the second - to the number of message queues**. Having programmed these parameters, press the [#] key to exit the function.

FS-101 - programming number of rings before answer (DEC)

The function sets the number of rings after which the CA-10 plus control panel will answer the call in order to report the alarm system status or to establish communication with the computer. The programming consists in entering a number from 00 to 07 and confirming it with the [#] key

Depending on how the answering option bit is set (function FS 5, 8 bit in the second set of options), the control panel will answer the call immediately after detecting the programmed number of rings, or on the first ring detected after an interval lasting less than 5 minutes from detecting the programmed number of rings ("double call").

Notes:
- *Having answered a call in the "single call" mode, the panel will not answer any more calls for about 5 minutes so as to enable access to other equipment connected after the panel (e.g. automatic answering system, fax/modem).*
- *When the option to establish communication with the control panel by the computer is disabled, and the call answering is on, the control panel will only answer the calls when all defined partitions are armed.*

Functions programming TIMERS

The CA-6 plus control panel is equipped with four TIMERS, which compare on the current basis the panel clock with the times set on the TIMERS. If the times are consistent, the timers perform the functions assigned to them.

FS-102 - programming TIMER 1 (DEC)

The function defines the TIMER 1 ON/OFF hour and minute. The programming consists in entering four two-digit numbers, the first two denoting the ON time (hour, minute), and the other two the OFF time (hour, minute).

The timer can only perform either the starting or the stopping function – e.g. if the timer is to be used for starting only, enter the off time as 99:99.

EXAMPLE:

programming the TIMER 1 - ON 16:30, OFF 06:30

[1][0][2] [#] -   call the function
   [1][6] [#] -   program the on hours
  [3][0][#] -   program the on minutes
  [0][6][#] -   program the off hours
  [3][0][#] -   program the off minutes and exit the function.

FS-103 - programming TIMER 2 (DEC)

FS-104 - programming TIMER 3 (DEC)

FS-105 - programming TIMER 4 (DEC)

FS-106 - programming TIMER functions (HEX)

The function defines how the timers are used. They can control outputs (the output indicated in this function must be of the TIMER type), or partitions.

The programming consists in entering four characters from 0 to B (twice two characters), the first character defining the function of TIMER 1, the second - TIMER 2, the third - TIMER 3, and the fourth - TIMER 4.

The entered characters have the following meaning:

      0 - TIMER not used
      1 - controls output OUT1
      2 - controls output OUT2
      3 - controls output OUT3
      4 - controls output OUT4
      5 - controls output OUT5
      6 - controls output OUT6
      7 - partition control timer (guard control)
      8 - controls partition 1
      9 - controls partition 2
      A - controls partition 3 (entered by [*0])
      B - controls partition 4 (entered by [*1])

When the timer controls a partition or a output, both times are relevant: timer "on" and "off". When the guard control function is performed, only the first time programmed in the functions is used. The hour and minute of „switching on" as programmed for that timer define the maximum time that may elapse since the last time the guard code was entered - if it is exceeded, the "no control code" event will be recorded in the memory, the information will be sent to the monitoring station, and the "no partition control code" type output will be activated.

EXAMPLE:

                programming the function: TIMER1 - controls partition 1, TIMER 2 - controls OUT4 output, TIMER 3 and TIMER 4 - control OUT5 output

  [1][0][6] [#] -   call the function
    [8][4] [#] -   program the functions of timers 1 and 2
    [5][5] [#] -   program the functions of timers 3 and 4

Special Functions

FS-107 - restoration of default settings

Calling this function will restore all the default settings of the control panel parameters and will automatically program current address of the keypads (and expander).

The function sets the service code as 12345, but does not change the user access codes. Description of the settings can be found at the beginning of section 4 ("Programming - Service Functions").

FS-108 - clearing event log

Calling this function will erase the memory of events.

FS-109 - programming default identification codes

Calling this function will set the codes of control panel and computer, which are required for the panel to establish communication with the computer. These settings are used for testing the control panel.

FS-110 - restoring default codes

Calling this function will erase all the user access codes and restore the default codes:

- service code   = 12345
- MASTER code, partition 1 = 1234
- MASTER code, partition 2 = 2345

- MASTER code, partition 3 = 3456
- MASTER code, partition 4 = 4567.

FS-111 - programming keypad addresses (BIT)

The keypads of CA-10 plus panel have an individual address, which is set with jumpers. The panel imports this address together with other keypad data (zone state, depressed keys, anti-tampering) and compares with the address programmed in the nonvolatile memory for each keypad. If a difference is detected, a tamper alarm is triggered.

A keypad with incorrect address is not recognized by the control panel. The addresses are not controlled, when the panel is in the service mode.

The keypad addresses are set by the panel automatically with the service function **FS-124** or when programming the default settings **FS-107** (the panel reads out the jumper setting and saves it in memory). The function FS-111 enables the addresses to be checked and programmed manually from keypads.

The programming consists in lighting up the **LEDs** which correspond to the jumper settings. It is performed in two steps. In the first step, the LEDs 1 to 4 show the address of partition keypad 1 (CLK1), and the LEDs 5 to 8 - the address of keypad 2 (CLK2). In the second step, the addresses of keypad 3 (CLK3, LEDs 1 to 4) and keypad 4 (CLK4, LEDs 5 to 8) are set. The settings are confirmed with the [#] key. The [*] key enables you to exit the function.
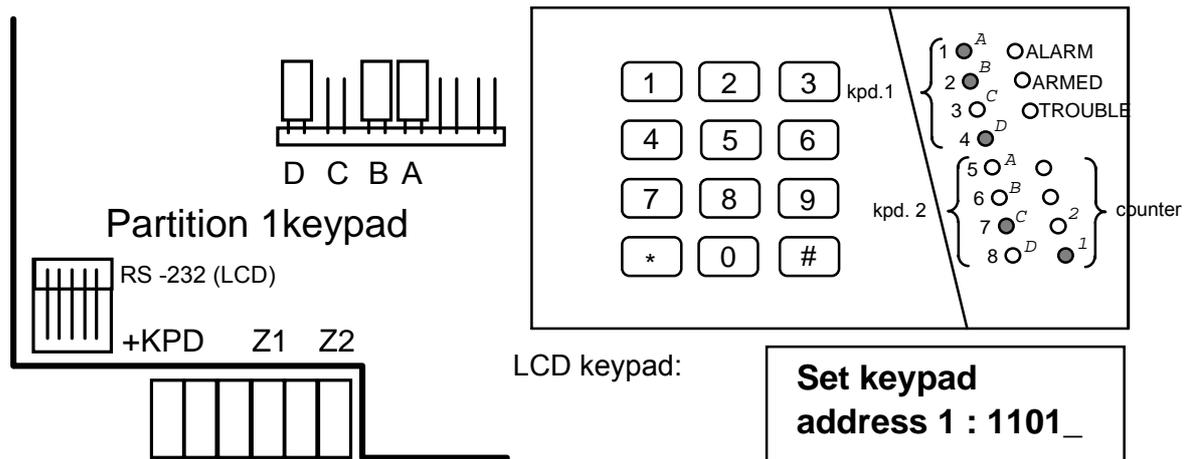
Fig. 14 - Jumper setting and corresponding LEDs during programming.

Notes:
- *The control panel does not support a keypad in which either all jumpers or no jumpers are set.*
- *When programming the keypad addresses be particularly careful, as **having programmed wrong addresses** will trigger a tamper alarm on quitting the service mode and loss of the ability to control the panel from the keypad. Then it is necessary to enter the service mode by hardware means and read the new addresses (see chapter "Starting the Control Panel").*
- *The new addresses (as most of the programmed parameters of the panel) will become valid after exiting the service mode or - when the panel is being programmed from the computer - after the data are sent.*

FS-112 - start of programming through RS-232

The function starts the panel programming through the RS-232 link.

Prior to using the function:
- hook up the control panel to the computer using a suitable cable (see "Connecting a printer or computer"); the length of cable can be from ten to twenty meters;

- start the DLOAD10 program on the computer and select the number of communication port (COM);
- call the service mode in the panel and activate the function FS-112.

Calling the function FS-112 will be signaled by the panel with lighting the TROUBLE LED. If the panel receives no computer readiness signal within 10 seconds (due to an incorrect computer connecting cable or port number) the function will be automatically exited.

The waiting for the computer command during an active connection is signaled by one short beep every 10 seconds. When the connection is broken, the control panel quits the function and enters the service mode.

Having entered the FS-112 function, the keypad accepts no commands from keypad - the control panel receives commands from computer. The function is exited after sending a suitable command by the computer (while exiting the service mode). It is possible to quit the function by pressing and holding down the [∗] key for about 3 seconds.

Programming from the computer with no use of the control panel keypad is possible after connection of a computer with running DLOAD10 program and powering up the system (call the function „Local connection with..." or press the **CTRL-1** keys).

FS-113 - event log printout (all events)

The control panel event log can be printed if a printer with RS-232 port is connected to the control panel. The printout is started by calling the function. No DTR signal from the printer will terminate the function and an error will be signaled (two short beeps). Holding down the [∗] key will stop the printout.

Note: Activation of the "printing on" option is not necessary - it regards a situation, when the printer is connected permanently.

FS-114 - alarm log printout

It operates in the same way as FS-113, but alarms only are printed.

FS-115 - trouble log printout

It operates in the same way as FS-113, but troubles only are printed.

FS-116 - partition event printout (arming/disarming)

It operates in the same way as FS-113, but only arming and disarming events are printed.

FS-117 - permissible telephone line loss delay (DEC)

The function defines how many minutes may elapse from the low voltage condition on the telephone line to the moment the panel reports a trouble. The programming consists in entering a two-digit number from 00 to 99 minutes. If 00 is programmed, the panel will never report a trouble.

EXAMPLE:

programming a twenty-minute delay
[1][1][7][#] - call the function
[2][0]   [#] - program the delay

FS-118 - parameters of pager station signals (HEX)

The function defines parameters of the answer signals generated by automatic pager station. As different answer signals are used in each system, it is necessary to specify the signal parameters of the system to which the panel transmits its

messages. If parameters of such signals change, it will be sufficient to specify new data.

The programming consists in entering six two-character codes which are suitable for the given paging system (after a restart, the POLPAGER system parameters should be entered).

POLPAGER   - [118]#   [81]#[B1]#[51]#[81]#[00]#[40]#
TELEPAGE   - [118]#   [2B]#[2E]#[0E]#[14]#[30]#[3A]#
EASYCALL   - [118]#   [37]#[3D]#[07]#[0B]#[B6]#[C8]#
METRO BIP   - [118]#   [16]#[1A]#[13]#[17]#[0B]#[0F]#

FS-119 - programming message 1 (HEX)

The function permits programming an alphanumeric message for any paging system. The programming consists in entering up to 84 message characters (in two-character pairs), in a convention required by the given system.

Apart from the digits 0 to 9, some systems require additional characters:

A (HEX) =*0 -   [#]
B (HEX) =*1 -   [*]
C (HEX) =*2 -   end of message
E (HEX) =*4 -   pause (required in some systems to separate the pager
                number from the message)
D & F (HEX) -   same as C.

FS-120 - programming message 2 (HEX)

FS-121 - programming message 3 (HEX)

FS-122 - programming message 4 (HEX)

Note: The functions FS 119 - FS 122 are an alternative to the functions FS 96 - FS 99. Each message can be programmed in two ways (in the HEX mode or in the POLPAGER receiver convention).

FS-123- counter count-up times

The function allows programming time intervals for the counters 1, 2 and 3, during which the counters must count up the programmed number of pulses to trigger an alarm. If the number of violations is less than the preset value, the counters will be reset after that time. The programming consists in entering three numbers from between 1 to 255 seconds (each of them should be confirmed with the [#] key), similarly as in FS-24.

FS-124- keypad address auto-detect

The function enables the keypad addresses to be automatically detected without changing the other parameters.

FS-125- testing outputs

The function makes it possible to check that all the wiring of control outputs for signaling devices or other equipment is properly connected. For functional check of an output, call the function and press the key with number of the output (1-6). Enabling the output is acknowledged with two short beeps and illumination of the LED with the output number. The output will be disabled by pressing again the key with the output number (signaled by one short beep and extinguishing of the LED).

Calling the function will disable all the active outputs (if they have been active), while quitting the function will reset the same. If the outputs OUT5 and OUT6 are functioning in the „radio messaging control" mode (FS-5 option 7 of the second set), the function will not make them available for testing.

Additional Functions

Extra functions, which were added in the process of developing the functional features of the CA10, and then the CA10 plus control panels.

FS-126- programming partition control codes (HEX).

Eight event codes are programmed in the following order:
- entry/exit partition 1 (enter control code - partition 1)
- entry/exit partition 2 (enter control code - partition 2)
- entry/exit partition 3 (enter control code - partition 3)
- entry/exit partition 4 (enter control code - partition 4)
- no control code - partition 1
- no control code - partition 2
- no control code - partition 3
- no control code - partition 4

If the "entry/exit" codes are one-digit numbers, they can be automatically extended by the user number.

FS-127- zones bypassed on no exit from partition 1 (BIT)

FS-128- zones bypassed on no exit from partition 2 (BIT)

FS-129- zones bypassed on no exit from partition 3 (BIT)

FS-130- zones bypassed on no exit from partition 4 (BIT)

The **EXIT-BYPASS** functions 127 and 130 make it possible to program for each partition the zones which will be automatically bypassed if, after arming, there is no violation of the ENTRY/EXIT type zone during the exit delay (after arming the system, the user **has not left the facility** and has not violated any detector in the ENTRY/EXIT type zone).

The programming procedure is identical as for the function FS-8.

FS-131 - programming additional options (BIT)

FIRST SET OF OPTIONS (for LED keypad, the LED No. 12 is blinking)

No.	LCD	LED	OPTION
1	ⓨ	on	service mode disabled
		off	service mode enabled
2	ⓨ	on	DTMF (MST-1) module supported
		off	DTMF (MST-1) module not supported
3	ⓨ	on	pulse dialing ration 1:1,5
		off	pulse dialing ratio 1:2
4	ⓨ	on	global codes
		off	individual codes for each partition
5	ⓨ	on	partition 1 timer priority enabled
		off	partition 1 timer priority disabled
6	ⓨ	on	partition 2 timer priority enabled
		off	partition 2 timer priority disabled
7	ⓨ	on	partition 3 timer priority enabled
		off	partition 3 timer priority disabled
8	ⓨ	on	partition 4 timer priority enabled
		off	partition 4 timer priority disabled

Option 1 refers to disabling the hardware access to the service mode. If this option is selected, it is only possible to enter the service mode by using the service access code. If the service code is lost, unblocking the control panel will cause loss of all settings - the panel will return to its default settings, as after calling the service functions FS 107 and FS-110. To enter the service mode not knowing the code, do the following:

- switch off power supply (mains and battery),
- short the RESET pins with a jumper,
- switch on power supply,
- wait about 60 seconds (±5 sec.) and remove the jumper,
- enter from keypad the code: [1][2][3][4][5] (the code should be entered within 15 seconds) and finish by pressing the [#] or [∗] key.

After these operations, the control panel should return to its default settings and remain in the service mode.

Option 2 refers to the control panel working together with the MST-1 module, which enables the panel to be operated via a telephone generating the DTMF signals. For such an operation to be possible, the option 3 of the first FS-5 set („*call answer*") must be activated.

Option 3 refers to the control panel dialer and defines the pulse dialing ratio during pulse dialing of a telephone number. Selecting the option sets its value at 1:1.5. If the option is not selected, the ratio is 1:2.

NOTE: *In Poland, the telecommunication standard requires that the pulse dialing ratio be set at **1:2**.*

Selecting the **option 4** makes the codes entered in one of the partitions be also accepted in other partitions. The event log records no particular user number - the number is always 1, and on the event log printout the annotation **(USER)** is shown instead of the user number.

The options 5-8 set the partition timer priority during disarming. With this option selected, the timer will always disarm the partition, provided the timer function is enabled. If the option is not selected, the timer will disarm the partition only if it has armed it itself.

SECOND SET OF OPTIONS (for LED keypad, the LED No. 11 is blinking)

No.	LCD	LED	OPTION
1	ⓨ	on	Do not allow arming during battery trouble.
		off	Allow arming during battery trouble.
2	ⓨ	on	Automatic reset of zone bypassing at midnight (00:00)
		off	Do not reset zone bypassing AUTORESET 1/3
3	ⓨ	on	Service Mode only available in one partition (access to service mode in other partitions keypads disabled)
		off	Service Mode available in all partitions.
4	ⓨ	on	Display service message after tamper alarm.
		off	No service message after tamper alarm.
5	ⓨ	on	Keypad trouble alarm on until cleared
		off	Keypad alarm on during trouble only
6	ⓨ	on	Audible tamper alarm in armed mode only
		off	Tamper alarm always audible
7	ⓨ	on	Limit number of alarms from one zone to 3
		off	Alarm will not occur if keypad is alarming

NOTE: Don't set option 8.

Option 1 disables the possibility of arming, if the control panel has detected a battery trouble.

When selected, the **option 2** will reset the counters of the zones bypassed after 1 or 3 alarms at 00:00 hour.

Selecting the **Option 3** makes the TS only available in the keypad it was called from, while in the keypads of other partitions the TS is disabled.

Option 4 activates the function of displaying service message after tamper alarm until service intervention (using of service code).

Selecting the **Option 5** results, in the event of trouble, in the keypad LED signaling trouble until the trouble memory review function (key [7]) is called and ended by pressing [#] key.

Option 6 refers to deactivating the audible tamper alarm, if the alarm source partition is disarmed – the alarm is only signaled in the keypad.

Option 7 refers to limiting the number of triggered alarms to 3 per one zone at time intervals shorter than 1 minute. If, when the partition is armed, the control panel receives 3 violation messages concerning one zone in time intervals shorter than 1 minute, it will generate an alarm after each violation, all subsequent violations of that zone being ignored, unless at least one minute elapses since the last violation.

If this option is inactive, violation of a zone when the partition is armed will generate an alarm, provided the keypad is not already signaling a previous alarm. If the keypad is already signaling an alarm, violation of the zone will not cause a new alarm.

FS-132 - programming clock correction (DEC)

As time measurement by the control panel internal clock may differ from the real value, provision has been made for making a daily time correction. The function makes it possible to correct the time measurement by ±19 seconds within 24 hours. For programming the time correction, use the function FS132 to enter the value of daily time shift of internal clock:

00	no correction
01	+1 second
02	+2 seconds
...	
19	+19 seconds
81	-1 second
82	-2 seconds
...	
99	-19 seconds

EXAMPLE:

        program the time correction by -12 seconds
  [1][3][2]   [#]   -   call the function
  [9][2]   [#]   -   enter the correction value (minus 12 seconds)

FS-133 - programming the time of test transmission to the monitoring station (DEC)

The alarm system makes it possible to set a maximum time interval between transmissions of event codes. If the preset time interval elapses after the last monitored event, the control panel will send the test transmission code. The function parameter (three two-digit numbers meaning days, hours and minutes) determines the time counted from the last transmission. If any event, the code of

which will be sent, occurs in the system, the control panel will start counting the time again. This feature can be disabled by programming 00,00,00.

The programming consists in entering three two-digit numbers. After confirmation of all the numbers, the control panel quits the function.

EXAMPLE:

> programming of the test code send after two and a half hours since the last transmission (communication test).

[1][3][3]   [#]   - call the function,
[0][0]   [#]   - enter the number of days,
[0][2]   [#]   - enter the number of hours,
[3][0]   [#]   - enter the number of minutes of the communication test and quit the function.

FS-134 - programming codes to bypass the control panel zones

The codes programmed with this function are sent after calling the user function 4 and bypassing the control panel zones. The codes are programmed in the same way as in the function FS-60.

FS-135 - programming codes to unbypass the control panel zones

The codes programmed with this function are sent after calling the user function 4 and unbypassing the control panel zones. The codes are programmed in the same way as in the function FS-60.

FS-136 – programming of prefix for extension of identifiers in TELIM transmission format

(Transmission format used in Germany.)

FS-137 - programming codes to be sent to the monitoring station in TELIM transmission format

(Transmission format used in Germany.)

Restoring Default Settings, Erasing Codes

If it is necessary to restore the default settings, you should enter the service mode and call the service functions FS 107 (to restore all the default settings, except for the user access codes) and FS 110 (to restore the partition master codes, the other codes being erased). Also, the function FS 108 can be performed (in order to erase the event log contents).

If the service mode is inaccessible (for example, when the control panel stopped responding to keypad commands because of a programming error, or the service code has been lost), follow the procedure below:

1. **Switch off power supply (emergency and mains).**
2. **Set a jumper on J19 RESET pins.**
3. **Switch on mains supply.**
4. **On hearing a beep in the keypad, remove the jumper from J19 pins (the 1st partition keypad will enter the service mode).**
5. **Perform function FS 107 (erasing settings).**
6. **Perform function FS 110 (erasing codes).**
7. **Exit the service mode or proceed with programming the control panel.**

This procedure can be disabled by software means. Then the access to the service mode possible after performance of another procedure described in the service function FS-131, option 1.

> ***Note:*** *Similarly as in other SATEL control panels**,** <u>shorting the pins and powering up alone will not restore any parameters</u>. However, it will activate the service mode thus making it possible to check how the control panel has been programmed, and to analyze any programming errors.*

REMOTE PROGRAMMING – DLOAD10

The DLOAD10 program delivered with the control panel is designed for programming the CA-5, CA-6, CA-6 plus, CA-10 and CA-10 plus panels, as well as the RX2K and RX4K radio controllers, from the computer. Additionally, the program makes it possible to create documentation of alarm systems, sets of settings for various configurations ("patterns" which facilitate the programming of new systems), event sets for each system, as well as to remotely operate the control panel in the same way as with the keypads.

The program is designed for IBM PC/AT compatible computers. It works in any computer hardware configuration in the **WINDOWS** (9x/ME/2000) environment. It is recommended that the program be installed on the computer hard disk.

The control panel communicates with the computer through the RS-232 interface or via the telephone line. For telephone communication with the panel, the program uses a modem controlled by one of the COM ports (internal or external), compatible with the HAYES "AT Command" standard. Communication with the control panel is possible in the **CCITT V.21** or **BELL 103** standard (at 300 Bps). As the control panel transmits data only with a speed of 300 bauds, the modem must support this speed of operation.

Usually a suitable modem configuration is necessary - disabling the transmission standard negotiating function and forcing the transmission speed of 300 Bps.

In order to install the program, run the **D10setup.exe** program from the floppy disk which is delivered with the control panel. The installation completed, start the program . Access to the program is protected with an **access code.** After installation, the code is **1234** and can be changed to any sequence of 16 alphanumeric characters. As long as it has its factory form, you can start the program (with default code 1234) by pressing the „ENTER" key (no access code need to be entered).

Having started the program, configure and initialize the work of RS-232 port or modem by means of which the control panel will be programmed. By default, the program opens a window which enables the CA-10 plus panel to be programmed. Your next step can be starting the connection (either remote or local).

A HELP system is provided which facilitates operating of the program, as well as the very programming of control panel parameters. The system is accessible from the „**HELP**" menu, or by pressing the **F1** key on computer keyboard. To get an instant access to more detailed information, first select the required element in the program window (by moving the mouse pointer to and left-clicking on it), and then press the F1 key.

Program configuration for communication with the panel

In order to begin configuration, click on the icon to open the „Configuration" window. **The „Port RS-232" tab permits selecting the computer port number in the case of direct programming through the panel RS port**. If the control panel is being programmed by means of the modem, select the „Modem" tab and click on the „Details" button.

After opening the „**Modem**" window, select the corresponding modem type or click on the „**! Change**" button to enter data according to the documentation of your modem. Entering a new name and initialization path, and confirming it with the „**OK**" button makes it possible to add new settings to the list of modems. After clicking on the „! Change" button you can also change the communication port number and the maximum transmission rate.

The „✓**Test**" button permits checking interaction between the modem and the program – it opens a window containing information on modem initialization.

Having properly initialized the operation, close the configuration windows.
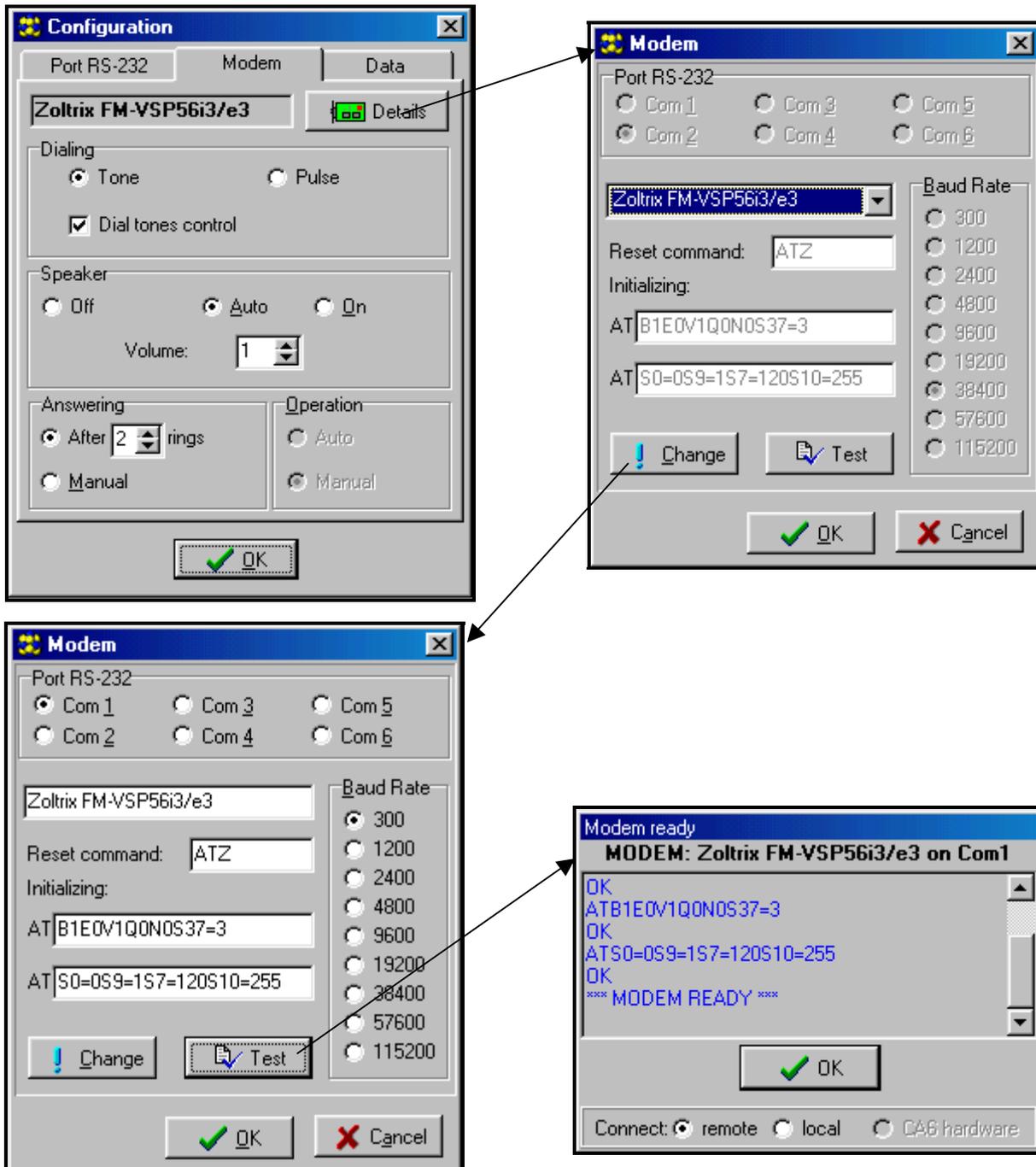
Figure 15. – Dialog boxes in DLOAD10 program.

In order to start communication in local mode, follow instructions attached to the service function FS-112.

The modem communication can be started by clicking on the icon (or selecting the „MODEM" command from the „COMMUNICATION" menu). The program will open a dialog box enabling connection to be established and will prompt the further course of action. For details see the section „Remote programming - DOWNLOADING".

The type of control panel is recognized automatically on establishing connection, or can be selected through the "File" menu.

Calling the function of reading the control panel data (icon) after the communication has been established may speed up the subsequent process of saving the changes made in the control panel programming.

Appendix A

Table of HEX characters

Decimal format (DEC)	Binary format (BIN)	Hexadecimal format (HEX)	State of LEDs 1-4 or 5-8
0	0000	0	◯◯◯◯
1	0001	1	◯◯◯◉
2	0010	2	◯◯◉◯
3	0011	3	◯◯◉◉
4	0100	4	◯◉◯◯
5	0101	5	◯◉◯◉
6	0110	6	◯◉◉◯
7	0111	7	◯◉◉◉
8	1000	8	◉◯◯◯
9	1001	9	◉◯◯◉
10	1010	A	◉◯◉◯
11	1011	B	◉◯◉◉
12	1100	C	◉◉◯◯
13	1101	D	◉◉◯◉
14	1110	E	◉◉◉◯
15	1111	F	◉◉◉◉

Note:
When programming the zone sensitivities, maximum violation time and maximum no violation, the value to be programmed for a given zone is calculated as follows:

*PARAMETER = (value acc. to **LEDs** 1-4)∗16 + (value acc. to **LEDs** 5-8)*

Example:

  State of LEDs 1 to 8: ◉◯◉◯◯◉◯◯ = A4

  PARAMETER = 10∗16+4 =164

Appendix B
States signaled with LEDs

LEDs 1 to 12:

- off - zone free (not violated)
- on - zone violated
- on with a short off period every 2 seconds - anti-tamper circuit violated in 2EOL/NC or 2EOL/NO type zones
- fast blinking - zone has triggered an alarm
- flashing every 2 seconds - zone anti-tamper circuit has triggered an alarm
- slow blinking - zone bypassed

LEDs ALARM, ARMED (PARTITION), TROUBLE :

- ALARM blinking - alarm was triggered in the zone (when none of LEDs 1 to 12 is blinking, the alarm cause will be shown by the function "Viewing alarm log". The alarm may have been caused by a zone not displayed in the partition, or the zone belonged also to another partition, where alarm was cleared)

When the function „service message after tamper alarm" (FS-131) is active, the alarm LED is blinking until the message is cleared with a service code.

- ARMED blinking - partition exit delay
- ARMED on - partition armed
- TROUBLE blinking - control panel has detected some troubles
- ALARM, ARMED & TROUBLE blinking - control panel signals entering the user function
- ALARM blinking, ARMED & TROUBLE on - control panel performs function "Viewing alarm log"
- TROUBLE blinking, ALARM & ARMED on - control panel performs function "Viewing trouble log"

States signaled with sound

The signals produced to confirm the operation on the keypad:
- **three short** - system arming/disarming confirmation, deactivating type 13 (BI switch) output,
- **two long** - wrong access code, canceling a function or incorrect data for a function,
- **three long** - an attempt to arm the system when it is not ready (with violated PRIORITY option zones - see Arming),
- **four short, one long** - correct user function completion, activating type 13 (BI switch) output, or activating type 12 (MONO switch) output.

System events signaling:
- **continuous signal** - alarm condition,
- **intermittent signal** - fire alarm,
- **one short signal every 3 seconds** - entry time countdown,
- **one long signal every 3 seconds** - exit time countdown,
- **two short signals every 3 seconds** - trouble,
- **five short** - CHIME zone violated,
- **five long** - DAY/NIGHT zone violated.

The installer determines which events and in which keypads are to be signaled acoustically.

Appendix C
TECHNICAL DATA

Control panel supply voltage .... AC 230(+10%; -15%)V
Control panel rated current supply 0.17A
Main board supply voltage .... AC 17...24V
DC power supply rated voltage .... DC 13.6...13.8 V
DC power supply total current efficiency 2.2A
Battery charging current (changeover) 350/700mA
Battery cut-off voltage .... 9.5V ±0.3V
Recommended standby battery supply ….. 12V/17Ah
Main board current consumption.. 70mA
LED keypad current consumption min./max 35/90mA
LCD keypad current consumption min/max.. .... 50/170mA
Outputs OUT1 to OUT4 current-carrying capacity 2.2A
Outputs OUT5 & OUT6 current-carrying capacity.. 50mA
Output +KPD current-carrying capacity.. 1.5A
Housing dimensions.. 305x305x85 mm

DELIVERY SET INCLUDES:

Distance plugs (to mount the mainboard in housing) .... 4 pcs
Parametric resistors 2.2kΩ.. 14 pcs
Parametric resistors 1.1kΩ.. 16 pcs
5-pin male connector .... 3 pcs
DLOAD10 program diskette 1   pc
Jumper 1   pc

Table 1.   Example of panel power supply load estimation and battery selection.

No.	Loads	Max current	Mean current consumption
1	Main board CA-10	70mA	70mA
2	Keypads (2 LCD + 2 LED)	520mA	200mA
3	Outputs OUT1...OUT3	3 x 2.2A **	2A
4	Output OUT 4 (detectors 15 pcs.*)	15 x 20mA	15 x 20mA
5	Outputs OUT 5...OUT 6	2 x 50mA	50mA
6	Battery charging current	1000mA	-
	Total max current consumption by the system with no alarm signaling	$\sum I$ = 70mA+520mA+300mA+100mA+1000mA =1990mA	
	Battery selection based on max. and mean current consumption by the system, assumed duration of power trouble 12h, assumed 1 alarm with 15 min (0.25h) duration of signaling	$\sum A_{Max}$= 1.25x(0,07x12+0,52x12+0,3x12+0,1x0,25+ +6,6x0,25) = 1,25 x 12,355 $\approx$ 15,44Ah $\sum A_{Av}$ = 1.25x(0,07x12+0,2x12+0,3x12+0,05x0,25+ +2x0,25) = 1,25 x 7,35 $\approx$ 9,19Ah Recommended standby power supply: battery 12V /17Ah	

* Assumed current consumption by a single detector 20mA.
** In case, where the capacity of the power supply is exceeded, the current is supplied by battery.

⚠ *NOTES:*

- *The control panel power supply unit has been designed for work with lead batteries or other batteries with a similar charging curve (European Directives 91/157/EEC and 83/86/EEC).*

- *It is impermissible to connect a fully discharged battery (voltage on terminals without a load less than 11V) to the alarm panel. To avoid hardware damage, fully discharged or never used battery should be charged initially using proper charger.*

CA-10 plus Alarm System - Connection Diagram (detailed description of main board terminals - see p. 17-18).

CONTROL PANEL

SOCKET OF PRINTER / COMPUTER

COM centr. — GND
TXD centr. — RXD
RXD centr. — TXD
RTS centr. — CTS
DSR centr. — DTR

SERIAL PORT RS 232

(VIEW OF CONNECTOR ON MAIN BOARD)

MEFKA printer socket
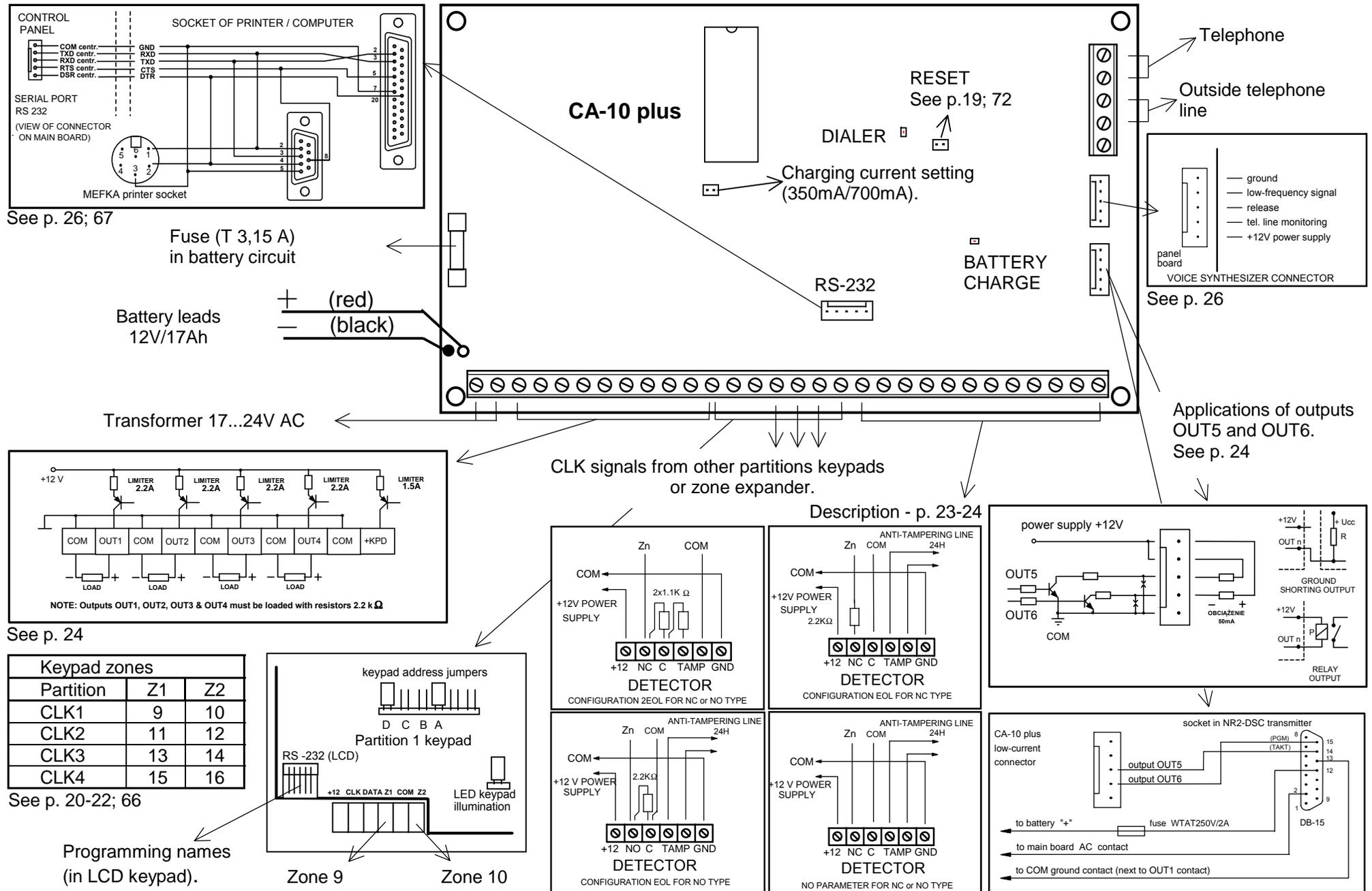
See p. 26; 67

Fuse (T 3,15 A) in battery circuit

Battery leads 12V/17Ah

+ (red)
− (black)

Transformer 17...24V AC

CA-10 plus

RESET
See p.19; 72

DIALER

Charging current setting (350mA/700mA).

RS-232

BATTERY CHARGE

Telephone

Outside telephone line

ground
low-frequency signal
release
tel. line monitoring
+12V power supply

panel board

VOICE SYNTHESIZER CONNECTOR

See p. 26

Applications of outputs OUT5 and OUT6. See p. 24

+12 V

LIMITER 2.2A | LIMITER 2.2A | LIMITER 2.2A | LIMITER 2.2A | LIMITER 1.5A

COM | OUT1 | COM | OUT2 | COM | OUT3 | COM | OUT4 | COM | +KPD

LOAD | LOAD | LOAD | LOAD

NOTE: Outputs OUT1, OUT2, OUT3 & OUT4 must be loaded with resistors 2.2 kΩ

See p. 24

CLK signals from other partitions keypads or zone expander.

Description - p. 23-24

power supply +12V

OUT5
OUT6
COM

+12V / + Ucc / R
OUT n
GROUND SHORTING OUTPUT

+12V
OUT n / P
RELAY OUTPUT

OBCIĄŻENIE 50mA

Keypad zones		
Partition	Z1	Z2
CLK1	9	10
CLK2	11	12
CLK3	13	14
CLK4	15	16

See p. 20-22; 66

keypad address jumpers

D C B A

Partition 1 keypad

RS -232 (LCD)

+12 CLK DATA Z1 COM Z2

LED keypad illumination

Programming names (in LCD keypad).

Zone 9   Zone 10

Zn   COM
COM
+12V POWER SUPPLY
2x1.1K Ω
+12 NC C TAMP GND
DETECTOR
CONFIGURATION 2EOL FOR NC or NO TYPE

ANTI-TAMPERING LINE 24H
Zn COM
COM
+12V POWER SUPPLY
2.2KΩ
+12 NC C TAMP GND
DETECTOR
CONFIGURATION EOL FOR NC TYPE

ANTI-TAMPERING LINE 24H
Zn COM
COM
+12 V POWER SUPPLY
2.2KΩ
+12 NO C TAMP GND
DETECTOR
CONFIGURATION EOL FOR NO TYPE

ANTI-TAMPERING LINE 24H
Zn COM
COM
+12 V POWER SUPPLY
+12 NC C TAMP GND
DETECTOR
NO PARAMETER FOR NC or NO TYPE

power supply +12V

CA-10 plus low-current connector

output OUT5
output OUT6

to battery "+"   fuse WTAT250V/2A
to main board AC contact
to COM ground contact (next to OUT1 contact)

socket in NR2-DSC transmitter
(PGM) 8
(TAKT)
15
14
13
12
2
9
DB-15

History of the Manual Updates

The updates below refer to the manual for the control panel with program version **4.0.**

Date	Program version	Description of updates
01-2002	4.1	▪ Addition of description of the output type 41– low battery indicator. ▪ Description of the DLOAD.exe program replaced with information on the **DLOAD10** program (for work in WINDOWS environment). ▪ Introduction of changes in the description of service function FS-112 (local communication).
03-2002	4.1	▪ Table of contents placed at the beginning of the manual. ▪ Figure 11 - an error corrected in connecting DTR signal to contact no. 20.
08-2002	4.2	DTMF (**MST-1**) control module added – operation of the system via a telephone possible only when the user is calling the panel (see info on pages: 5, 15, 70).

01-2003	4.3	▪ Panel's reaction for Type 16 zone depends on "PRIORITY" option settings (monostable action/bistable action) - p. 7.
		▪ A new type of zone reaction added in function FS-26: „*19 - perimeter*" – p. 7.
		▪ Control panel main board equipped with a protective circuit with the $\perp$ grounding terminal (main board version CA10P V4.2 and next) – p. 18.
		▪ Extension of installation safety notes (p. 17, 18).
		▪ Change of description of power supply connection (p. 27).
		▪ New formats of transmission to the monitoring station added in functions FS-45, FS-46 – p. 53:
		    - 0E - Contact ID selected codes
		    - 0F - Contact ID all codes
		▪ Event no. 6 (disarming & clearing alarm) removed from functions FS-69 to FS-80 – *the code is recommended not to be programmed or assigned to the stations* – p. 58-59.
		▪ A second set of options added in FS-131 function (1-4) – p. 70.
		▪ A new function added: FS-133 – p. 71.
		▪ An example of battery capacity estimation included (p. 80).
		▪ Replacement of the word „lamp" by „LED".

07-2003	4.7	▪ New zone type added: 'Entry/Exit Final' (pp. 7, 47). ▪ Information added on the possibility to connect some keypads in parallel (p. 22). ▪ Option added to program, together with telephone numbers, special DTMF signals generated in the process of dialing (see FS 4 p. 39). ▪ Text concerning the battery status testing has been altered (p. 19). ▪ New TELIM format of transmission to monitoring station has been added FS 45-46 (p. 53). ▪ Assignment of new events to monitoring stations has been added in functions FS 67-68 (p. 58). ▪ New function added: FS 125 – testing outputs (p. 68) ▪ 3 new options added to function FS 131 (pp. 70-71). ▪ 4 new functions FS 134-FS 137 have been added for new types of zone events and for programming monitoring codes in TELIM format (p. 72). ▪ Description of conditions signaled by the ALARM LED blinking has been completed (p. 77).