Alarm Control Panel

CA-6

Firmware Version 5.05

INSTALLER MANUAL

Satel

CE

⚠ WARNINGS

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

The control panel should be connected to **PSTN (analog) lines only**. Connecting the telephone circuit directly to digital network (e.g. ISDN) will cause damage to the equipment.

The alarm system may comprise dangerous devices, therefore it is necessary that its components be kept so as to prevent unauthorized access to the equipment.

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

If the service operations consist in fuse replacement, they must only be carried out with supply voltage disconnected. Only fuses having identical parameters with the original ones can be used for the replacement.

It is recommended that the manufacturer's prescribed 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 (with voltage on unloaded terminals less than 11V) to the alarm panel. In order to avoid equipment damage, the fully discharged / never used battery should be precharged by means of a suitable charger.

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

DECLARATION OF CONFORMITY		
Products: CA6P – mainboard of CA-6 control panels.	**Manufacturer:** SATEL spółka z o.o. ul. Schuberta 79 80-172 Gdańsk, POLAND tel. (+48 58) 320-94-00 fax. (+48 58) 320-94-01	CE
Product description: Mainboard for alarm control panels intended for use in intruder alarm systems.		
These products are in conformity with the following EU Directives: **LVD** 73/23/EEC+93/68/EEC **EMC** 89/336/EWG + 91/263/EEC, 92/31EEC, 93/68/EEC **R&TTE** 1999/5/EC (network connection, TBR21)		
The product meets the requirements of harmonized standards: LVD: EN 50131-1:1997; EN 50131-6:1997; EN60950:2000, EN60335-1:1994/A1:1996 Annex B EMC: EN 55022:1998; EN 61000-3-2/-3; EN 50130-4:1995, EN 61000-4-2/-3/-4/-5/-6/-11 R&TTE: TBR 21(1998)		
Compliance with harmonized standards was checked in an accredited test house: "Electronic Technology Systems Dr. Genz GmbH". LVD test report no: G0M20211-7293-L EMC test report no: G0M20211-7293-E-16 R&TTE test report no: G0M20211-7291-T-15 (TBR21)		
Gdańsk, Poland 07.03.2005	Head of Test Laboratory: Michał Konarski	
Latest EC declaration of conformity and product approval certificates are available for downloading on website **www.satel.pl**		

CONTENTS

GENERAL DESCRIPTION OF THE CONTROL PANEL

The CA-6 alarm control panel is a state-of-the-art, microprocessor-based device, made with the use of automatic surface mount technology.

Its comprehensive features and affordable price permit application of the CA-6 both in small and medium-size security alarm systems and in systems with special requirements.

Basic functional features:

- operating the panel from LED keypads,
- remote control by means of a telephone set (selected functions) – **support of the MST-1 module**,
- possibility of **two-partition** operation, with completely separate alarm systems, or common zone partitions or internal partitions,
- **8 fully programmable zone inputs**, each being able to perform any of 20 functions,
- support of any detectors in NO, NC, EOL and 2EOL configuration,
- **5 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**,
- **remote service** from a modem equipped computer
- intelligent analysis of telephone exchange signals, which enables an alarm voice message to be sent after answering the call,
- support of NOKTON radio messaging in PC16OUT format,
- built-in **RS-232 (TTL) interface** for direct programming of the control panel from computer,
- **internal clock** for automatically arming / disarming partitions with TIMER function,
- operation by **13 users,** whose access codes can have different authority level and can be assigned to one partition or to both partitions,
- possibility to control users by **saving in memory the password entry operation**
- possibility to **supervise guard rounds** with TIMER function,
- 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,
- nonvolatile memory of all parameters and the last condition of the control panel.

DESCRIPTION OF THE CONTROL PANEL

Zones

In its basic configuration, the CA-6 control panel has 8 zones: 6 on the panel main board and 2 in the keypad. The zones can support any detectors in the configuration NC, NO, EOL, 2EOL/NC, 2EOL/NO. The use of 2EOL configuration enables the panel to simultaneously control the detector and its tamper circuit by means of one pair of wires.

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

00 - exit/entry - the violation of which, when in the armed mode, will start countdown of the entry delay time and will enable the delay 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 report 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 both partitions.

01 - delayed - 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 report station, after counting down the entry delay time and triggering the alarm - a "zone alarm" code. The delay is not signaled in the keypads.

02 - interior delayed - 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.

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

04 - 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 function is disabled – FS20, second set, option 3) and send a "zone violation" code to the station.

05 - 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 FS7). Then the violation triggers an alarm (a "zone alarm" code is sent to the report station). By default, the count-up time is set at 30 seconds. It is possible to program another **counter count-up time** (FS-123). If the preset number of violations is not reached within this time, it will be reset. The next zone violation will start the add-up procedure all over again. The violations are added up starting from zero, and the count-up time starts upon the first violation after resetting the counter. The "counting L1" function can be assigned to more than one zone, in that case violations of those zones will be summed up. The zone will trigger an alarm upon exceeding the programmed number of violations added up by a given counter. Alarm can also be triggered after resetting the counting zone counter, if the zone associated with the given counter is still violated.

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

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

08 - 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 tamper circuits and panic buttons.

09 - 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 such as gas or flood 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 for the fire detectors.

> If one of the control panel outputs is programmed as the FIRE DETECTORS POWER SUPPLY, violation of the zone will actuate the alarm verification mechanism and will signal alarm in the keypad. To perform the verification, control panel disconnects momentarily power supply to the fire detectors and checks, 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 and FIRE/BURGLARY ALARM outputs and trigger the fire alarm (intermittent signal) in the keypad.

> If there are no FIRE DETECTORS POWER SUPPLY outputs, 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 - arm/disarm - violation of this zone will arm the partitions the zone belongs to, end of violation will disarm those partitions.

17 - delayed with signalling - a delayed zone with the same function as the 01 type zone, but with delay countdown signaling in keypads.

18 - arming with bypass - violation of this zone arms the partition the zone belongs to, simultaneously bypassing the zones programmed as AUTO-BYPASS (see: FS16, FS19).

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.

Reaction time for each zone can be programmed within 0.016 s to 4.08 s. For delayed zones, an individual time delay can be set. The zones can be selectively bypassed and/or assigned to any partition. In case of messaging to the telephone monitoring stations, five event codes sending to the monitoring stations can be determined for each zone.

The CA-6 has an **additional CTL input,** which is intended for arming or disarming. It can also be used for connecting the panic, fire or emergency button.

Outputs

The CA-6 is equipped with 5 programmable outputs: 3 high-current (2,2A) and 2 low-current (50mA). The OUT1, OUT2 and OUT3 outputs are protected by special electronic fuses with current limiters set at 2,2A. The control panel monitors presence of voltage, overload, and signals trouble conditions at these outputs. When active and at positive polarization, the above outputs will supply +12V for the load.

The OUT4 and OUT5 outputs (low-current, 50mA) control ground of the load – when active and at the positive polarization programmed (+12V), these outputs are shorted to common ground (0V), whereas they are open when inactive.

The +KPD keypad supply output is fitted with an electronic fuse with current limiter 1.5A.

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

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

For each output can be defined the operation time in seconds (from 1 to 99 seconds), in minutes (from 1 to 99 minutes), or LATCH type (until switch 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.

Designation of the outputs can be adapted to 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:

00 - not used - remains inactive from the power-up, according to the setting of "polarity" option.

01 - burglary - the output starts on detecting a burglary alarm by the control panel. The alarm is triggered by armed zones, zones tamper circuits, keypads tamper contacts, 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 zones" (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 chosen partition. When the "list of zones" is empty and there are no chosen partitions, 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).

02 - 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 zones" 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.

03 - 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 zones" or particular partitions (identically as for the 01 output type). There is no sense to choose any other zones than the fire ones, 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).

04 - keypad alarms - the output starts on detecting any keypad 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 its operation, it can every second change its state (pulsate).

05 - keypad fire alarm - the output starts on triggering the fire alarm by the user (with the FIRE ALARM function). 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).

06 - keypad panic alarm - the output starts on triggering the PANIC alarm by the user. 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).

07 - keypad aux. alarm - the output starts on triggering the alarm by the user with the ALARM AUX function. 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).

08 - 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 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).

09 - day/night + counting - the output starts on detecting violation of disarmed DAY/NIGHT zone or violations (triggering no alarm) of COUNTING zones, which trigger no alarm. Operation of the output can be restricted to a specified "list of zones" (identically as for the 01 output type). Selection 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 code) to disarm the system or to clear 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 partition. 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 selected "list of zones" or to specified 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). If the LATCH option (on until switch-off) is enabled for the output, it will be deactivated when the alarm is cleared by the user. The output signals violations irrespective of whether the chime blocking in the keypad is on or off (to enable the blocking, press and hold down the key [8]).

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 partition. The output can remain active for a time from 01 to 99 seconds or from 01 to 99 minutes (do not program the LATCH option for the output).

13 - switch BI (ON/OFF) - the output changes its state when the user function 8 ([CODE][*][8]) is called or a code with authority level 6 ([CODE][#]) is used. Operation of the output can be restricted to specified partition.

14 - arm status - the output is active in the armed mode. Operation of the output can be restricted by selecting a "list of zones" or partition. Unless zones and partitions are selected, 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 selecting a "list of zones" or specific partitions.

16 - exit delay status - 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 partition.

17 - entry delay status - the output is active during the "entry delay" countdown. Operation of the output can be limited to selecting the "entry delay" for specified partition.

18 - telephone usage status - the output is active when the control panel is on the telephone line.

19 - ground start - the output is activated by the control panel if the GROUND START signal is to be generate (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 selected 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 selected partition.

23 - zone violation - the output starts when one of the zones is violated. Operation of the output can be limited to the selected "list of zones" or specified 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 armed mode is deactivated or the alarm cleared.

24 - telephone line trouble - the output used when telephone messaging is doubled by radio messaging; it makes possible reporting the telephone line trouble.

25 - AC power loss.

26 - battery trouble - activated when the battery voltage in three consecutive tests drops to about 11V.

27 - power supply - the output intended for powering detectors, 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 detectors 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, it activates the fire alarm verification function. The verification 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 (duration of the whole verification process is approx. 2 min.). The output reacts to the "RESET POWER SUPPLY" function (user function 9).

29 - power supply with RESET function - the output is designated to power detectors which require a periodical power cut-off until the state memory is cleared. The RESET function 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.

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 selected "list of zones" or partition.

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 particular system states with, respectively, one, two, or four pulses 0.16 s each.

34 - alarm in keypad - silent alarm signaling in the partition keypad.

35 - power supply on armed mode - it functions similarly to the ARM STATUS output, but it is activated right after "exit delay" starts, 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 - Signalling: LED - the output can control a LED to indicate the following statuses:
- off – control panel disarmed
- steady light – control panel armed
- blinking light – the control panel armed, there was alarm or trouble

Note: *If in the armed mode any zones are violated in the system, the LED will be blinking and will only change to steady light after the violation ends.*

37 - Signalling: relay - the output can control a relay. The output becomes active after arming, and inactive after an alarm is triggered, a trouble occurs, or the system is disarmed.

Note: *If in the armed mode any zones are violated in the system, the output will become active after the violation ends.*

38 - *not used* - (do not program).

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 status - the output is activated if the control panel service mode has been called from any keypad.

41 - battery low status - the output, which state is updated after each battery voltage test.

Partitions

A new partition is created when at least one zone is assigned to it. The CA-6 permits creating of two partitions to which any outputs, telephone numbers and pager messages can be assigned, and thus enables two alarm systems to be built on the basis of one CA-6 control panel. The partitions can be controlled from a keypad (access codes assigned to the partitions) as well as by means of control zones. Both partitions can be controlled at the same time.

Because the sirens connected to the outputs can be activated by selected zones, the assignment of zones to partitions will define which codes can clear alarm on particular sirens.

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

Access Codes and Authority Levels

The CA-6 control panel can store in memory **13 access codes** (4 to 6 digit long), with different authority levels. The codes are associated with the partitions they are assigned to. The control panel has a MASTER code – by default [1][2][3][4]. 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 and determining which partition is controlled by the code. The code can be assigned to one partition or to both of them. Thus, both partitions can be armed with a single code. 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.

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.

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 memory,** 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**, the code does not arm / disarm the system.

Keypads

Two modifications of LED keypads are manufactured, intended to work together with the CA-6 control panel and designated CA-6 KLED and CA-6 KLED-S. Up to mid-2006, the CA-6 KLED-M keypad was also made.

The keypads are designed for operating and programming the system (or a partition). The keypad operating mode is set when programming the control panel. It is possible to disable some of functions (e.g. the quick arming by pressing the [0] and [#] keys), and determine what audible signals are to be provided by the keypad.
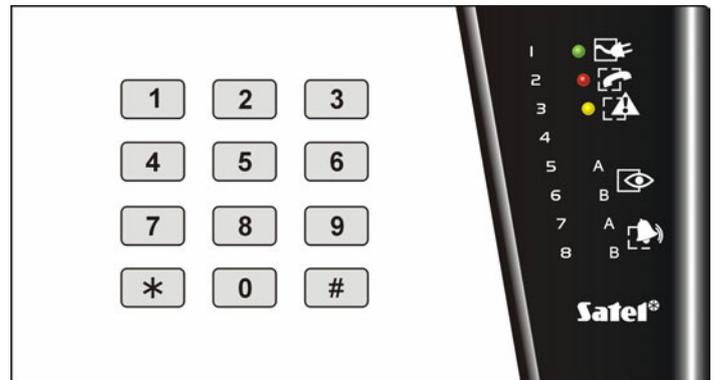
Fig. 1. View of the CA-6 KLED keypad

It is possible to signal the exit delay or entry delay time, trouble, violation of a CHIME option zone, violation of a DAY/NIGHT and COUNTING zone, alarm. You can also disable the signaling of key depression and confirmation of the function performed.

The basic information on the system state is provided by means of light emitting diodes. They present the state of zones and partitions (armed, alarm), as well as information on the status of power supply and telephone line, as well as on troubles found.

The following features are also provided:

- Setting the keypad backlight mode with the key 9: none, automatic, permanent. In the CA-6 KLED keypad, the backlighting can be switched on/off by means of pins located next to the terminal block on the keypad board.

- Visualization of the keypad audible signal - buzzer (CA-6 KLED-S and CA-6 KLED-M keypads).

The keypad has an address, which makes difficult replacement or connection of another keypad, an individual tamper contact and two zones, which operate identically as the zones

of the control panel mainboard. The keypad zones can be assigned to any partition. The data concerning address, tamper contact and zone status, are sent to the control panel together with keypad data.

Provision is made for connecting several keypads in parallel (which does not increase the number of control panel zones).

Monitoring

The CA-6 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, for example, 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.

It is possible to send information on events related to zones, partitions, as well as system events. The event codes for both stations are the same. It is possible to define how the events are to be divide between the two stations. Information can be transmitted to the stations in one of fifteen formats (including Contact ID).

Because of analysis of commutation signals (algorithm ToneLOGIC), the CA-6 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-6 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 SATEL SM-2 voice synthesizer. The dialer can also establish connections with paging systems. Two different alphanumeric messages can be programmed.

The CA-6 allows programming of four telephone numbers, 16 characters each. The numbers can be individually assigned to partitions, or, alternatively, one number can be assigned to both partitions. As the control panel is capable of establishing connections with paging systems, each number can be assigned one of the two text messages, or a voice message from the synthesizer.

During the procedure of connection setup, the panel controls signals from the telephone line (algorithm ToneLOGIC). Hence, it can recognize that the call is answered, irrespective of the

type of telephone exchange. In order to enhance the efficiency of messaging, it is possible to increase the number of calling rounds.

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

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

Messaging can be carried on until successful. It is also possible to determine the maximum number of retries (from 1 to 9), after which the panel stops 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 rounds and attempts.

The control panel dialer function can answer the calls and give information on the system state with a voice message (if one hour has not elapsed yet after the alarm) or with special signals (one beep a second if there was no alarm, or five short beeps every second if 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 (service function FS131). Additionally, this module enables the system to be remotely controlled, within certain limits, by means of DTMF signals. For the connection diagram refer to the MST-1 module operating instructions.

Remote Programming – DOWNLOADING

In order to facilitate programming, the CA-6 is equipped with a DOWNLOADING function, which enables a PC computer to be used for programming and controlling of the alarm system by means of the DLOAD10 program.

The **DLOAD10** program, which is delivered with the control panel, enables:

- reading all control panel parameters,
- writing new parameters to the control panel,
- reading the system event log,
- ONLINE operation.

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. It is possible to control the system in the same way as with a LED keypad. The keypad on the computer screen 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.

The program does not download or change the users' access codes - they are only accessible through the user functions from keypads.

The programming can be performed directly from the RS-232 port of the computer through the **RS port** of the control panel (TTL standard signals), or by means of a modem, through the TIP and RING terminals of telephone line.

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

1. The computer calls the control panel, which after answering the call exchanges communication passwords 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 communication passwords exchange, 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 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.

Communication initialization from the computer can be blocked (FS5, Options set 2, Option 1).

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. 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 has been provided to prevent hacking of the system and change of any data by unauthorized persons. All the data exchanges are authorized by changing the passwords and the data are encoded.

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 **Z6**	- zones
OUT1 to **OUT3**	- programmable outputs (current-carrying capacity 2.2A)
OUT4, OUT5	- programmable outputs (current-carrying capacity 50mA)
DATA, CLK	- keypad terminals
CTL	- control input
+KPD	- keypad power supply output (current-carrying capacity 1.5A)
+12V	- power supply outputs
COM	- common ground
⏚	- 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)
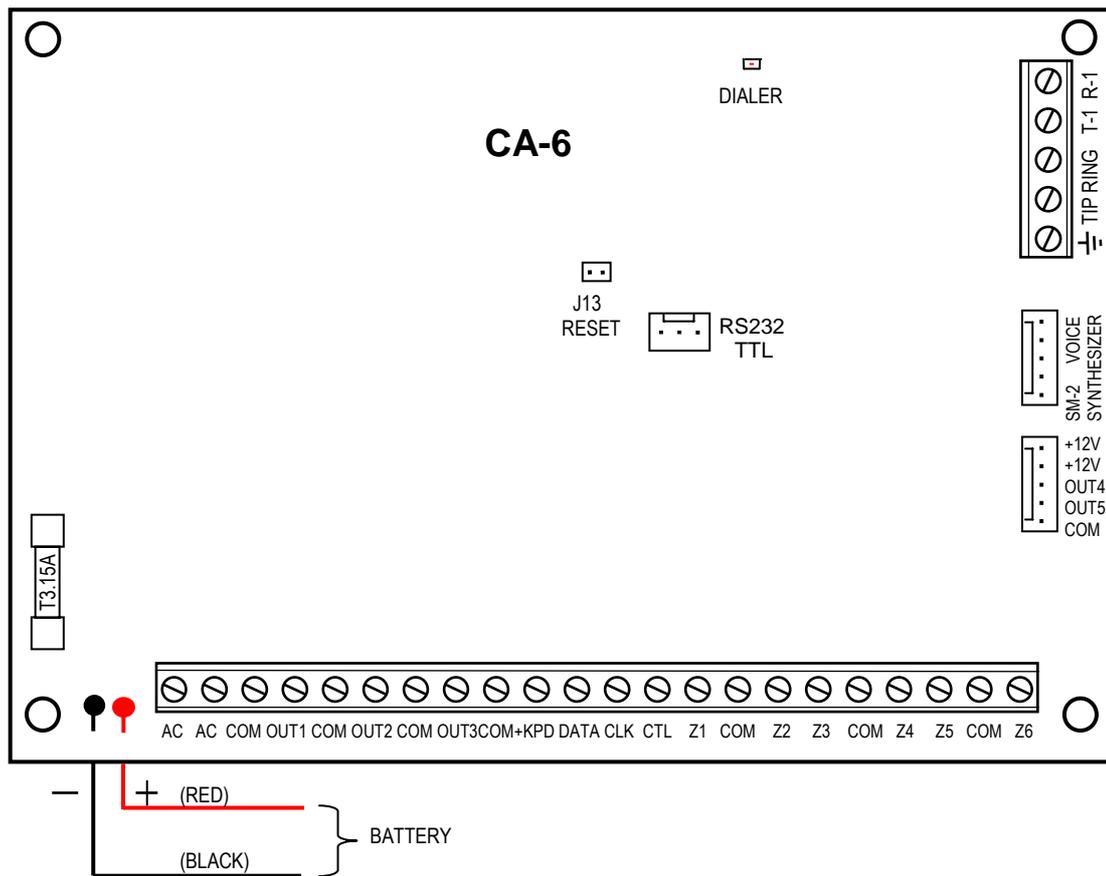
Fig. 2. Schematic view of CA-6 main board.

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

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-6 main board enables a grounding circuit to be connected. The ground lead terminal is designated by the $\perp$ symbol.

The control panel power supply (current capacity 1.2A) is fitted with**:**

- voltage control system,
- battery status monitoring system with optional disconnection of the battery if discharged - during testing the processor reduces the power supply and the loads are powered from the battery. The testing takes place every 4 minutes and lasts for less than twenty seconds. 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 stabilized voltage of the control panel power supply is +13.6V to +13,8V and is factory set.

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). The 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.

Each of the high-current outputs OUT1 - OUT3 and +KPD is fitted with electronic short-circuit and overload protection devices.

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 cables lugs should not be cut off.

The **J13 „RESET"** pins make it possible to start the service mode without entering a service code. This function can be disabled by the installer with software means (see: FS131).

The **RS232 TTL** interface is designed for programming the alarm system parameters from a computer. The panel sends and receives signals in the TTL (0V, +5V) standard, hence, a special cable of SATEL manufacture must be used to connect the panel and computer RS ports. The cable includes a converter changing this signal into a standard corresponding to the RS-232 interface in the computer (-12V, +12V). The data can be transmitted through the cable in both directions.

Notes:

- *The connector may only be used when programming the panel. Never leave the RS cable permanently attached.*

- *It is recommended that the cable be first connected to the control panel, and then to the computer.*

- *Do not close or touch the connector pins with your fingers.*

- *Prior to connecting the cable, the installer should preliminarily remove the electrostatic charge e.g. touching a grounded fixture (a faucet or a heater) with the top of his hand.*

The CA-6 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-6 OBU housing (this housing comprises a transformer designed for operation with the control panel power supply), which permits installation of a battery with 7Ah 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 mainboard. In case the plugs tend to slip out, the catches fixing the plug in the housing need to be slightly bent aside (Figure 3). 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.
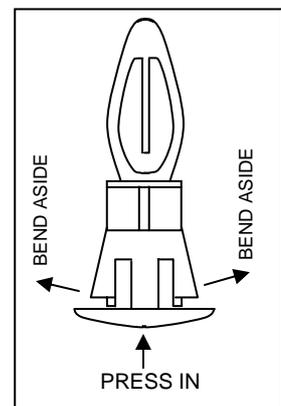

Fig. 3.

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.*

⚠ **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 Keypad

The keypad should be connected to the system with a four-wire line, using the COM, +KPD, DATA, CLK terminals on the panel. Where standard wire is used, the cable length can be up to 200m. Do not use screened wires.

With the YTDY 8x0,5 cable, the following distances between keypad and control panel may be used to ensure appropriate power supply:

Distance	Lead	No. of cores
		LED kpd
from 100m to 200 m	Supply and common ground CLK and DATA signals	2 x 1

The keypads may only be supplied from the +KPD connector of the control panel. This output can also be used to supply detectors connected to the keypads, if the total current value of 1.5A is not exceeded.
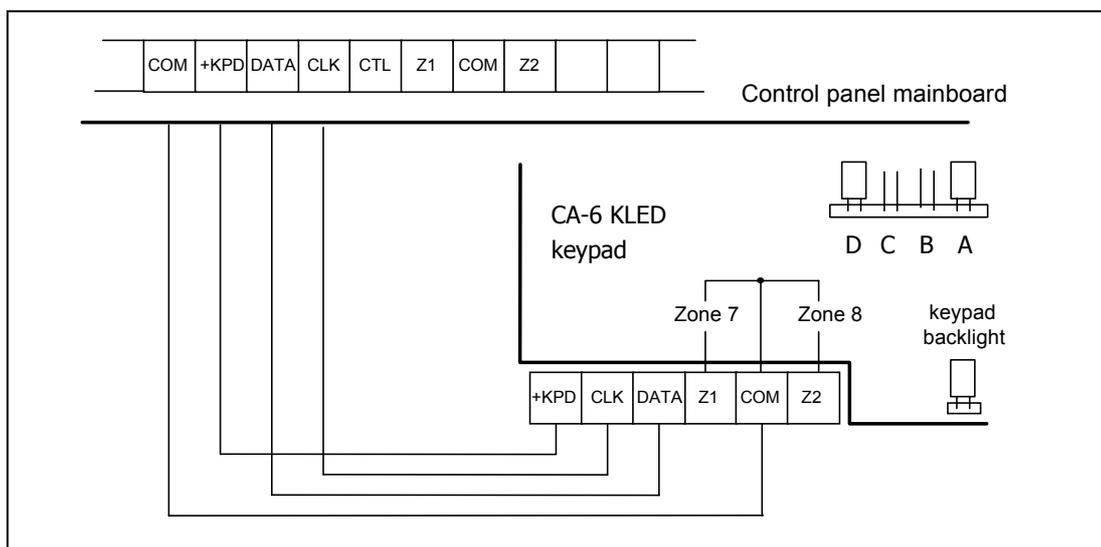

Fig. 4. Connection of keypad to control panel.

The DCBA keypad **jumpers** determine the address which is an additional tamper protection. The pins D and A are shorted by default; it is possible to change the address (see: FS111, FS124). The panel does not accept addresses of the „all closed" 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** terminals permit connecting any detectors. They are supported by the control panel in the same way as the mainboard zone inputs. The keypad Z1 terminal is treated as zone 7, Z2 - as zone 8.

Provision is made for connecting additional keypads (in parallel with the first one). Each keypad should be connected to the control panel by means of a separate cable. **The keypad addresses should be identical, the zone 7 and 8 can only be used in one of them**, elsewhere they should be left open (nothing is to be connected).

There are three types of keypads designed to work together with the CA-6 control panel. All of them should be connected in the way shown in Fig. 4 for the CA-6 KLED keypad. For description of other keypad terminals, see the figures below.
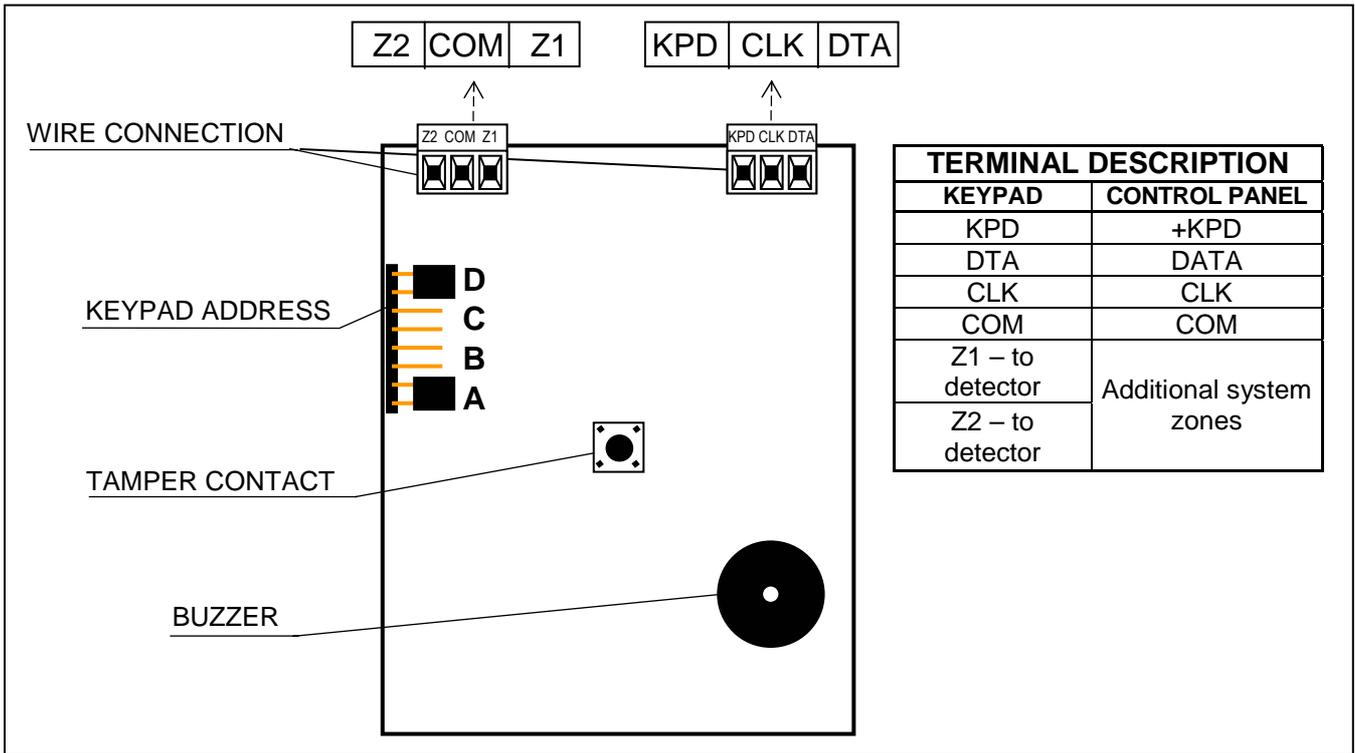
Fig. 5. View of the CA-6 KLED-S keypad board.

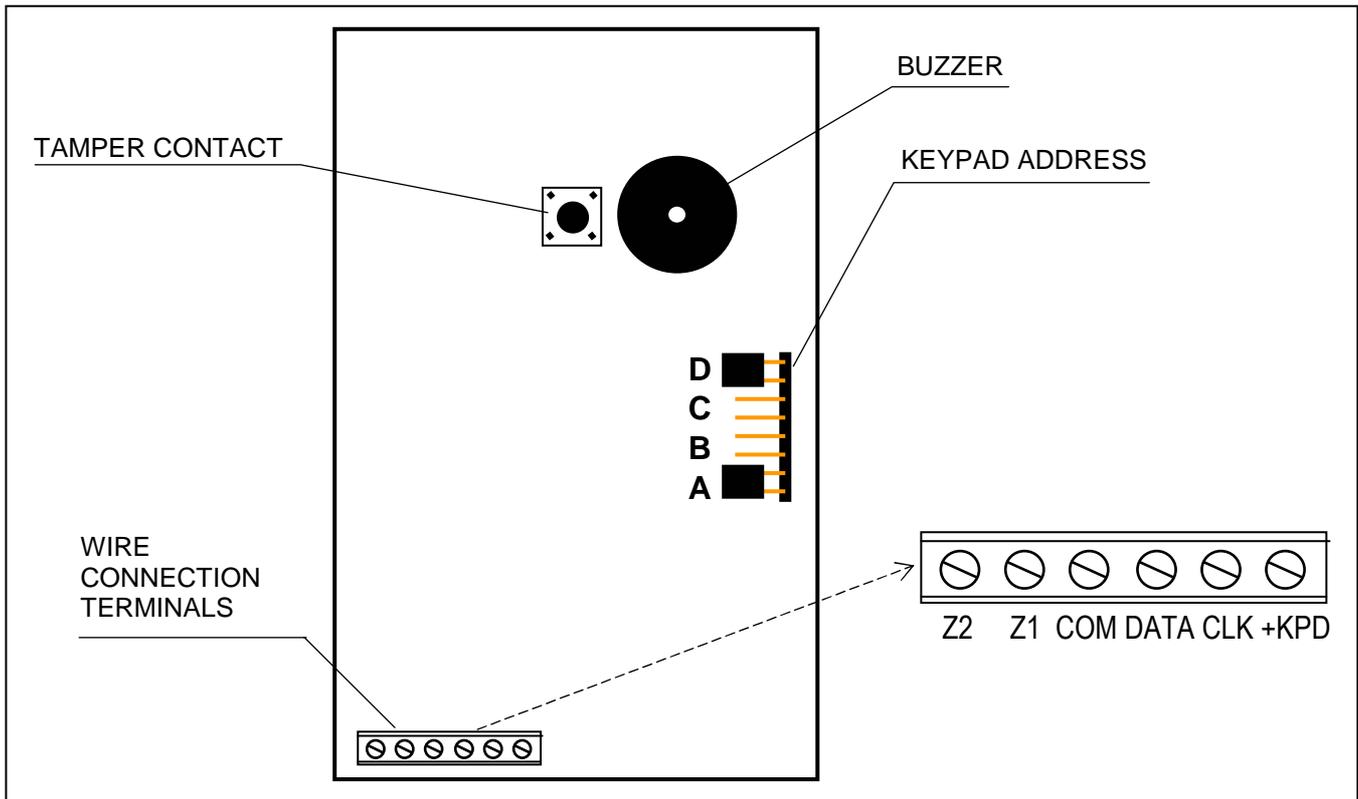| TERMINAL DESCRIPTION	
KEYPAD	**CONTROL PANEL**
KPD	+KPD
DTA	DATA
CLK	CLK
COM	COM
Z1 – to detector	Additional system zones
Z2 – to detector	

Fig. 6. View of the CA-6 KLED-M keypad board.

The spring on the **tamper contact** must cling to the mounting surface so that the contact opens at any attempt to pull off the keypad from the wall. The keypad **tamper contact** has no connection with the system tamper circuit. Its state is defined by the control panel, based on the data received from the keypad. In case two keypads are connected in parallel, the control panel will detect tampering when both contacts are open. When the control panel is in the service mode, the tamper contact and the keypad address are not controlled. Should the panel alarm at the moment of exiting the service mode, it would mean an incorrectly programmed address, or opening of the tamper contact.

Connection of Detectors

The CA-6 can operate with detectors of any type. Each zone of the control panel can work in the configuration NC, NO, EOL, 2EOL/NO, 2EOL/NC. When the zone works in an EOL configuration, a 2.2 kΩ resistor should be used to make the detector circuit. In case of 2EOL configuration, the detector circuit is closed by two 1.1 kΩ resistors. This type of zones enables the status of detector and its tamper contact to be monitored at the same time

The detectors may be supplied from any of the electronically protected outputs (OUT1 to OUT3). The output should be programmed as the "POWER SUPPLY OUTPUT" (function number 27). The use of OUT3 is suggested.

Separation of the detector power supply ground and the line ground makes it possible to eliminate the 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. The NO and NC detectors in 2EOL 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).

The examples in Fig. 7 only show how the alarm relay outputs should be connected. Proper connection of the detectors will require that power supply (COM, 12V) be provided and TMP terminals (tamper contact) of EOL or NO/NC detectors be connected to the tamper circuit.
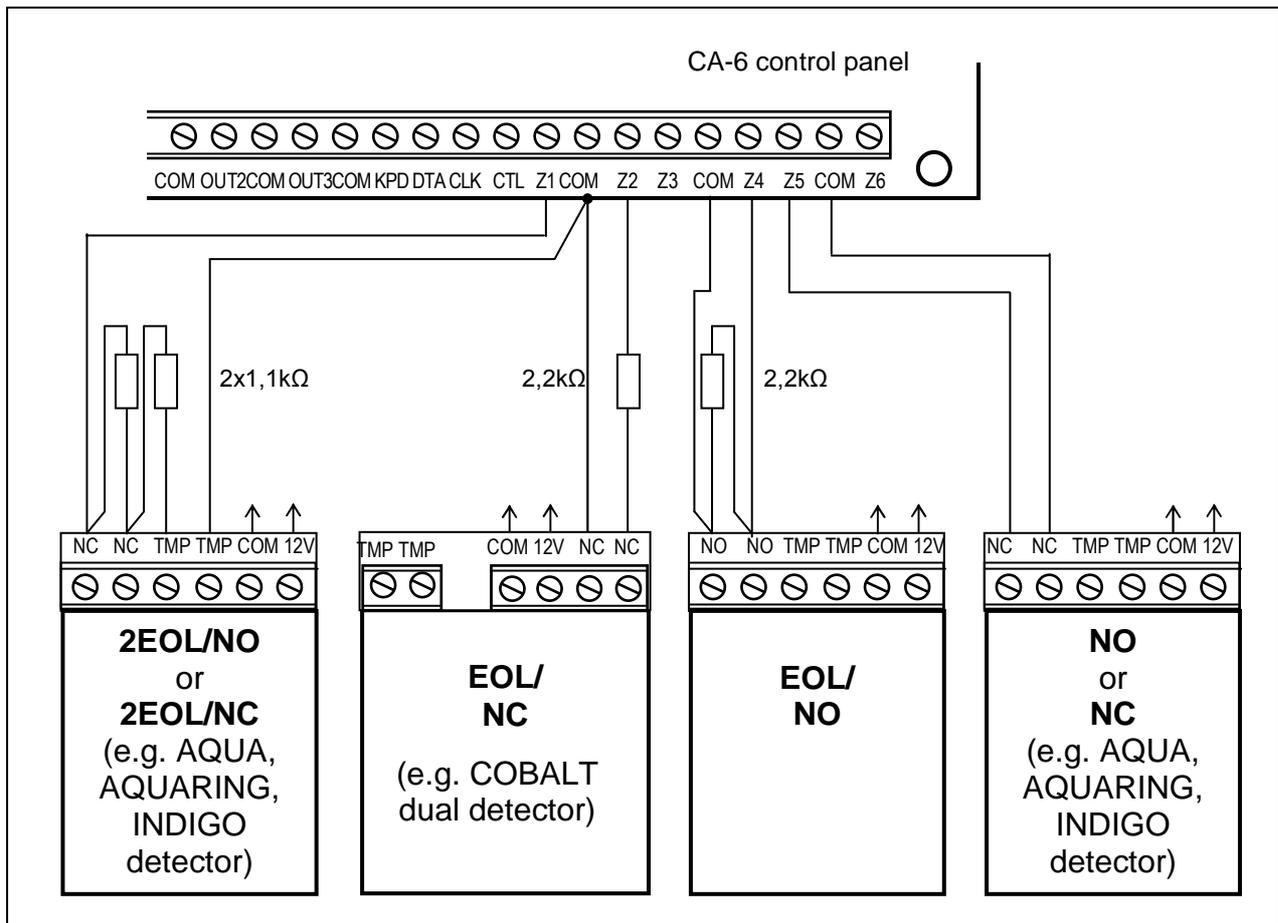
Fig. 7. Example of connecting 4 detectors in various configurations.

Connection of Sirens

The CA-6 can control sirens of any kind. The control panel outputs have no functions permanently assigned to them. They can perform 41 different tasks. Therefore, the system is very flexible and can suit almost every application. If there are sirens installed in the system, the alarm function will have to be assigned to corresponding outputs.
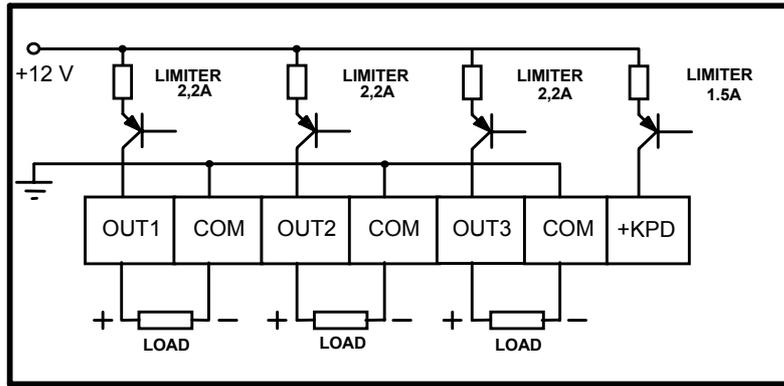
Fig.8. Connection of a load to high-current outputs.

In the case of sirens which alarm after power is supplied, it is convenient to assign the alarm function to the OUT1 and OUT2 outputs. If this is the case, the "+ " of siren power supply should be connected to the control panel respective OUT output, and the siren "ground" - to the control panel COM terminal. In this mode, two independent sirens can be set, or, with one output programmed for a specified time operation, and the other one for a switch-off operation - an acoustic and visual sirens.

Where sirens with their own internal battery are used, the OUT1 or OUT2 output should be used to power the sirens, and the triggering signals should be provided by the OUT4 and/or OUT5 low-current outputs.

Note: *The OUT1, OUT2, and OUT3 outputs must be loaded with resistors installed in the sirens. It is necessary for correct operation of the system and for load presence check. We recommend using 2.2 kΩ resistors. If the acoustic siren, connected to one of the outputs, produces some undesirable low sounds in deactivated state, the resistor should be decreased.*
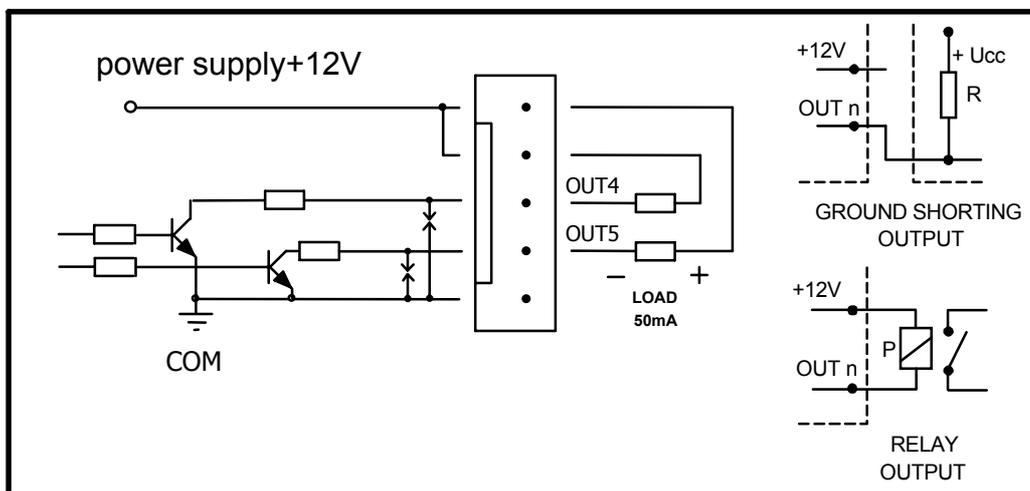
Fig. 9. Diagram of OUT4, OUT5 low-current outputs and load connection.

The OUT4 and OUT5 outputs can be used to control the relays switching on any sirens or other equipment. The relays may be directly connected to the outputs, as shown in Figure 9..

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.

Fig. 10. Connection of NR2-DSC transmitter, made by NOKTON.

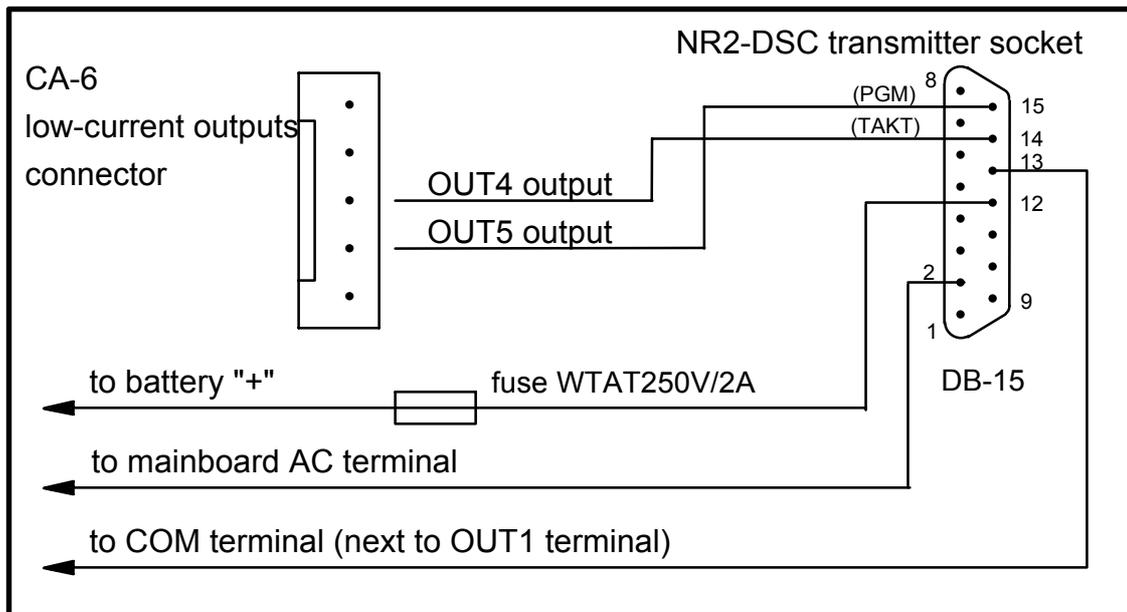⚠ **When hooking up to the control panel any equipment with a considerable current consumption (e.g. a radio monitoring transmitter), their "+" should be connected to the battery "+" (a fuse is required on the feeder cable). The ground must be connected to any COM terminal of the control panel, but not directly to the battery "-". Connecting the common ground of the device to the battery "-" will result in faulty operation of the charging current limiter, which will eventually lead a quick discharge of the battery, or may even cause damage to the control panel.**

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 (terminals designated as TIP and RING), and any other devices (telephone, telefax) - after the control panel (terminals 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.

The telephone line must be a four-wire line so that the control panel can be connected before the other devices (telephone, telefax, etc.).

Notes:

- *Do not send telephone signals and alarm system signals by one multicore cable. This may result in 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 (analog) lines only**. Connecting the telephone circuit directly to digital network (e.g. ISDN) will cause damage to the equipment.*

- *The system installer should give the necessary information on the way of connection control panel to telephone network to the user.*

Connection of Voice Synthesizer

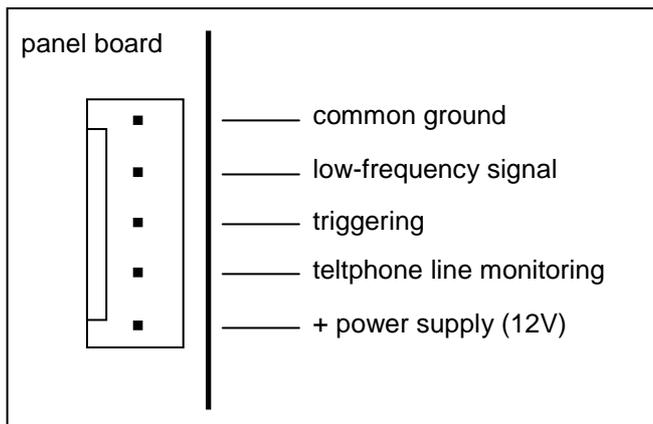| panel board	
▪	——— common ground
▪	——— low-frequency signal
▪	——— triggering
▪	——— teltphone line monitoring
▪	——— + power supply (12V)

Fig. 11. Arrangement of signals on SM-2
voice synthesizer connectors.

Where the function of alarm messaging with voice announcements is used, a voice synthesizer must be connected to the control panel. The CA-6 interfaces with the SM-2 synthesizer produced by SATEL.

The synthesizer socket (designated as: SM-2 VOICE SYNTHESIZER) is located at the right side of PCB, between telephone line connector and low-current output sockets. 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.

Connection of Power Supply

The control panel is permanently connected to the mains supply source. Hence, before making the connections it is necessary to familiarize with the electric system in the facility. For powering the control panel choose the circuit which is always live. The power supply circuit should be protected with a proper fuse.

⚠ **Before connecting the control panel to its power supply circuit, make sure that the supply circuit is not alive**

Description of electric connections for CA-6 OBU housing.

1. Connect the 230V alternating voltage leads to the transformer terminals marked "**AC 230V**".
2. Connect the terminals of the transformer secondary winding to the "**AC**" (~18V) terminals on the control panel mainboard.
3. Connect the wire of the electric shock protection circuit to the terminal block installed next to the transformer and marked with the ground symbol ⏚. This circuit should also be connected to the control panel protective terminal.

⚠ **Never connect the "neutral" wire of the 230V AC mains supply to the ground terminal. If there is no separate electric shock protection circuit in the facility, leave this terminal unconnected.**

Control panel power supply starting procedure.

1. Connect the backup power supply wires to corresponding battery terminals (red to battery plus, black to battery minus). **The control panel will not start after connecting the battery alone** (without mains power supply) but it will operate in case of 230VAC failure provided that it was started earlier.
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 circuits, 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).*

⚠ **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 sirens connected. Sirens can be connected after alarm system parameters programming is completed. If the control panel operates with a keypad, having a default address (1001 - jumpers on pins „D" and „A"), then, after the power is switched on, the keypad will report readiness for work with four short beeps followed by a long one.

Note: The control panel with default settings will not support a keypad if the default address (1001) has been changed in that keypad.

If the 🔔 [ALARM] diode is blinking, cancel it by entering the MASTER code [1][2][3][4] and pressing [#]. Then, enter the default service code [1][2][3][4][5] and confirm it with the [#] key. The control panel will enter the service mode, the 🔌 [POWER] and ☎ [PHONE] diodes alternately blinking. At this moment, you can proceed to programming the control panel.

Entering service mode "from pins"

If 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**. This allows to program keypad address before the normal operating mode is restored. In the other case, the control panel will start alarming right after the power-up because it has detected the keypad tampering.

This procedure is also required when the keypad address is changed - it is necessary to program the address first (see: FS111 or FS124). Otherwise, the control panel may start alarming just after power-up because a keypad tamper has been detected.

To start the service mode by means of jumpers follow the procedure below:

1. Disconnect in turn the AC supply and the battery.
2. Check the keypad address jumpers and tamper contacts for correct settings.
3. Place the jumper on RESET (J13) pins located on the control panel board.
4. Connect in turn the battery and the AC supply.
5. After a minute remove the jumper from RESET (J13) pins – the control panel should automatically enter the service mode. This will be signaled by the keypads with four short and one long beeps.
6. Call the service function **FS124**. The function automatically reads the keypad address and prepares the control panel for work in a new configuration. You can also restore the factory default settings (**FS107**), restart the user passwords (**FS110**), and/or reset the event log (**FS108**).

*Note: **Shorting the pins and power-up alone will restore no parameters!** These operations will call up the service mode, thus making it possible to program any parameters required.*

Having completed the procedure, exit the service mode using the function FS0 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 can proceed with further installation of the system (connection of sensors, sirens

or establishing communication with a computer, if necessary) and programming of all required parameters.

If the described procedure is unsuccessful, the option of hardware access to the service mode must have been disabled in the control panel by software means (see: FS131).

If this is the case, it is necessary to carry out another procedure which would **enable the control panel** and restore the default settings:

1. Disconnect in turn the AC supply and the.
2. Set a jumper on RESET (J13) pins.
3. Connect in turn the battery and the AC supply.
4. Wait for a 60 seconds (±5 s) and then remove the jumper,
5. Enter from keypad the code: [1][2][3][4][5] (the code should be entered within 15 seconds) and confirm by pressing the [#] or [∗] key - the control panel enters the service mode.

ACTIVATING SELECTED FUNCTIONS

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

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 the lack of entering the guard code after a preset period of time 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 function 7 – „partition monitoring" function (FS106)
- program the timer control time (functions FS102, FS103, depending on the partition).

Telephone Messaging - Alarm Reporting

The telephone messaging function requires that the following be programmed:

- **FS5 and FS131** – activate the "telephone messaging" option, set the "dialing system" option as required by the telephone exchange,
- **FS87 to FS90** - enter at least one telephone number,
- **FS95** – define the partitions from which alarms are to be reported to the telephone numbers programmed in functions FS87-90,
- **FS100** – number of telephone messaging rounds higher than zero and than number of redials in a round,

Note: *You should also program in FS95 what kind of message will be sent - if no message is selected for the pager, the CA-6 will use a voice message from the 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 options were programmed;

- **control panel goes online, but dials no number** – 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 FS5 if the signal is non-standard;

- **control panel establishes connection, but sends no voice message** – wrongly programmed FS95 – messaging to pager selected (not a 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. After the handset is lifted a 4 seconds delay in message sending is permissible - if commutation signals on the telephone line are non-standard or there is strong interference (clicks, noises), the panel may not function properly – then you can extend the message by activating the "double message" option in FS5 or you can deactivate the call answer recognition option;

- **control panel reports the alarm more times than the preprogrammed number of rounds** – 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),
- **list of event codes.**

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

- **FS43 – monitoring station telephone number** - if there are two numbers or two stations, the second number should be programmed in **FS44**.

- **FS45, FS46 – 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).

- **FS47 – monitoring options**.

- **FS48 to FS54 – 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".

- **FS60 to FS65 & FS69 to FS70, FS81, FS82, FS126 – 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 FS67, FS68, FS73, FS74, FS77, FS78, FS83, FS84.

- **FS5 - activate the "Monitoring" option** <u>if the above functions are programmed.</u>

Typical problems with starting the monitoring:

- **Control panel takes no attempts to call** – not all of the above mentioned functions 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. The control panel does not make any call attempts also when it is in the computer downloading mode;

- **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 FS5 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.

Note: *For the Ademco Express transmission format, the identifier „0000" is valid (sending zeroes is possible), however it is not valid with the other formats (sending zeroes is impossible).*

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" process 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 - <u>the costs of such connections may be very high</u>. 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 FS47, which makes the panel ignore 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 - Communication with Computer

Programming the control panel through RS TTL serial port

The programming is possible with the use of a special cable intended for programming the CA-5 and CA-6 control panels. To run the software, select a suitable COM port number in the DLOAD10 program (CONFIGURATION window). Then, from the **Communication** menu, select the →**Local connection with...,** and, subsequently, select the control panel type (e.g. "CA6v5 - RS-232(TTL)")**.** Activate the service function FS112 in the control panel. Consistency is required between the panel and the computer communication codes (FS2 and FS3) programmed in the panel and included in the DLOAD10 program data.

Programming with the use of modem

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.

Interaction with the computer by means of a **modem** can be effected in two ways: in a *remote mode* (through the telephone line) or in a *local mode*. The local mode can be used after connecting the modem directly to the TIP and RING telephone terminals on the control panel (see: Fig. 12).

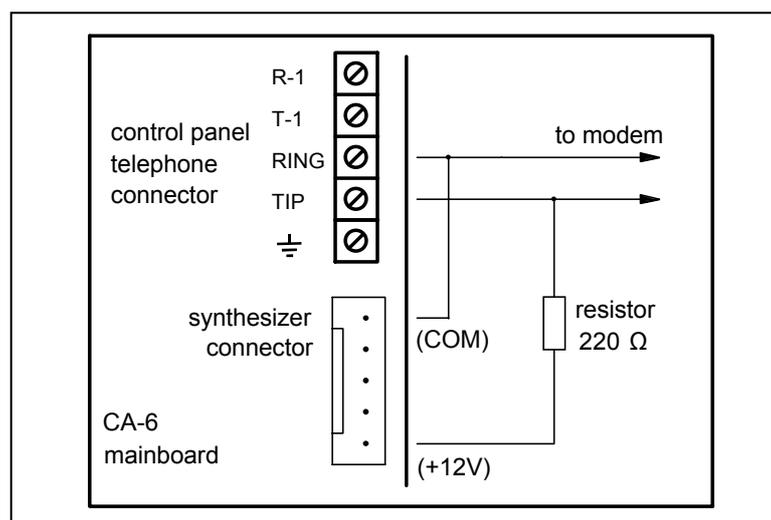Fig. 12. Connecting control panel to modem for local mode programming

Local communication:

- connect the computer modem to the "TIP" and „RING" control panel terminals (**the telephone line must be disconnected!** Connections of the "T-1" and „R-1" terminals are irrelevant), and make sure that the polarity of the telephone signal inputs arrangement in the control panel is as shown at the Fig. 12;

- start the DLOAD10 program, select the CA6 control panel type (e.g. by opening the data of such a panel) and, from the menu „**Communication**", select "**Modem**" and „local" or „CA-6 without keypad" connection mode. Further procedure will be prompted by the program. The „CA-6 without keypad" command in the „Initializing modem" window enables to automatically run the program from the computer with no need for operating the control panel from keypad and calling the function FS112. This feature can be disabled by the installer with software means, with the use of function FS131 (option 2).;

- program the communication passwords - communication passwords in the control panel (FS2 and FS3) and in the alarm system computer data must be identical,

- enable the „external downloading" option (FS5).

   Note: *When starting communication with the function FS112, make sure that the function FS112 is only called when the modem starts sending signal to the control panel - there can be a few seconds lag in some modems.*

Remote communication:

- connect the telephone line to the TIP and RING terminals,

- program in the control panel:
    - **FS2**: panel communication password (identifier by which the program recognizes the alarm system)
    - **FS3**: computer communication password (identifier by which the control panel recognizes the computer authorized to connect to panel)
    - **FS4**: computer telephone number (which is not necessary but ensures a better protection against unauthorized access)
    - **FS5**: "external downloading" option, "double call" option (any setting) and the **FS101** – number of rings before answer – if communication is to be initiated from the PC

- start the DLOAD10 program, select the control panel type (e.g. by opening the data of such a panel) and, from the menu „**Communication**", select the "**Modem**" item and the „remote" connection mode;

- apart from the communication codes, conformity is also required between the above mentioned options in the control panel and the security system data in the computer.

It is also possible to initialize communication with the panel with the user **function 0**

Having established connection, read the control panel data and then you can proceed to reading the events, programming parameters, etc.

Messages on troubles during modem initialization:

- „**modem not responding**" – 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.

Messages on telephone communication errors:

- „**modem not responding**" – the modem has not acknowledged the dialed number (a rare occurrence, 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 picked up the phone but did not answer because the modem signal was corrupted,
  - the control panel went off-hook, but did not answer the modem signal, because it was neither V.21 or BELL 103 transmission format (incompatible or **wrongly configured** modem),
- **"communication password not acknowledged"** – the control panel established connection, but the computer communication password does not correspond to the one programmed in the control panel in FS3 function – 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.*

DLOAD10 program

The DLOAD10 program, delivered with the control panel, is designed for programming the CA-5, CA-6, CA-10 control panels, as well as the RX-2K, RX-4K and RE-4K radio controllers, the GSM-4 module and the ACU-100 wireless system controller, from the computer. Additionally, the program makes it possible to create: documentation of alarm systems, sets of programmed system parameters for various configurations ("patterns" which facilitate the programming of new systems), event sets for each system. It also enables 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 port 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** standards (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: 300 bps speed and disabled function of negotiating the transmission standard.

In order to install the program, run the **D10setup.exe** program from the floppy disk which is delivered with the control panel. When installation is completed, you can start the program. Access to the program is protected with an **access code.** After installation, the code is **[1][2][3][4]** and can be changed to any sequence of 16 alphanumeric characters. As long as it is set by default, you can start the program (with default code [1][2][3][4]) by pressing the "ENTER" key (no access code need to be entered).

Having started the program, you should choose in the computer a proper configuration and initialize the work of RS port or modem by means of which the control panel will be programmed. By default, the program opens the CA-10 window. Than you can select the CA-6 control panel and start the connection (either remote or local).

A HELP system, which facilitates operating of the DLOAD10 and programming of the control panel parameters, is provided. The system is accessible from the "**HELP**" menu, or by pressing the **F1** key on the computer keyboard. To get an instant access to more detailed information, first select the required element in the program window (by clicking on it with the left mouse button), and then press the F1 key.

Program configuration for communication with the control 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.
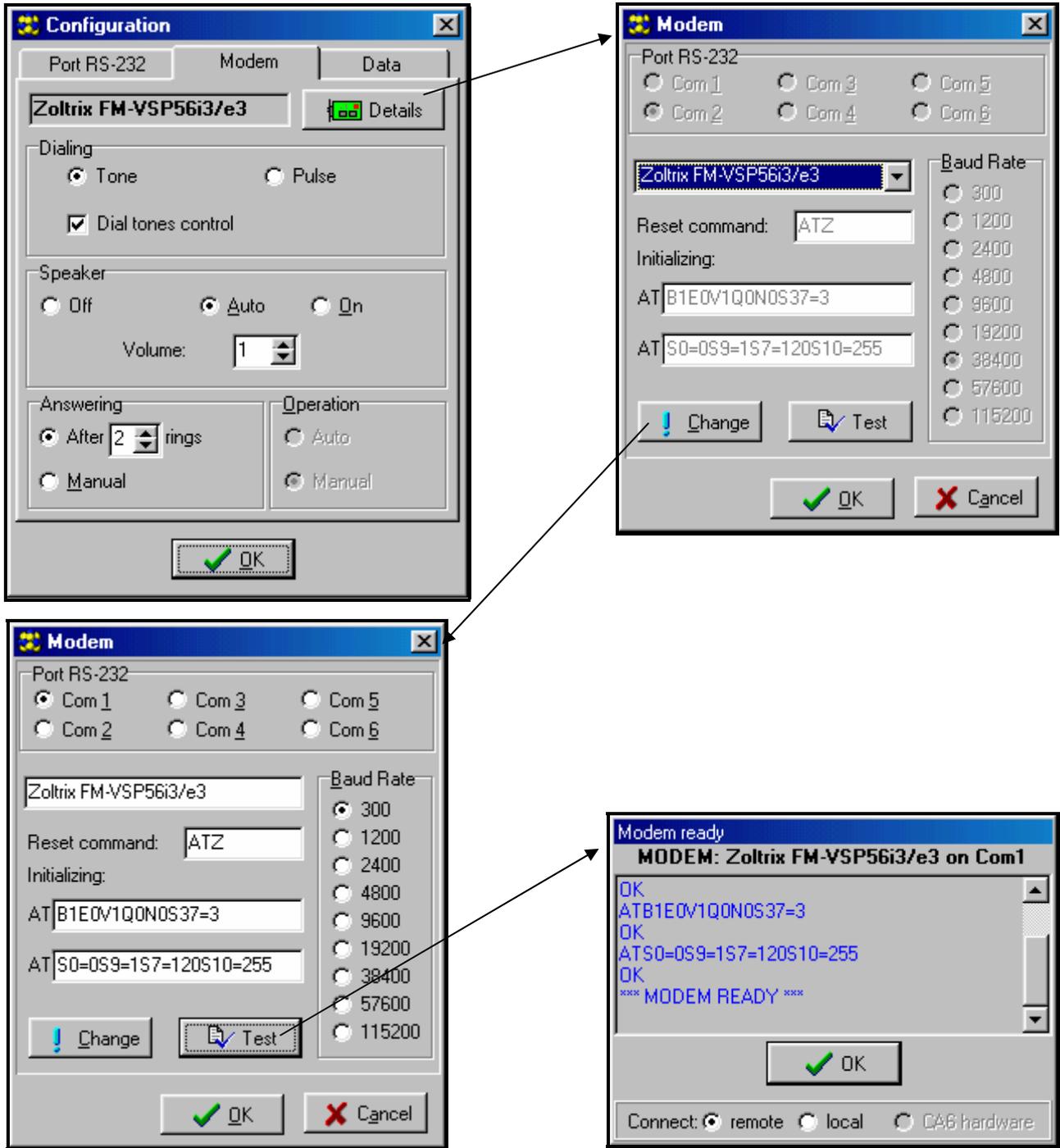

Fig.13. Dialogue windows in DLOAD10.

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 in the control panel settings.

DEFAULT SETTINGS

Control panel configuration (restore with FS107 function):
- service code: 12345,
- master code: 1234,
- control panel password (communication identifier) – 3175B9,
- computer password (communication identifier) – 658709,
- rings to answer – 2,
- exit delay - 60 seconds,
- entry delay - 30 seconds,
- alarm time – 60 seconds,
- counting times of counters - 30 seconds; counter values - 1,
- one partition including all the available zones (Z1 to Z8),
- zone 1 (Z1) – ENTRY/EXIT function, EOL,
- zones 2 to 8 (Z2 ... Z8) – INSTANT function, EOL,
- PRIORITY option activated for all zones (FS 27, first option),
- sensitivity of all zones – 480 ms,
- output OUT1 - audible signaling (BURGLARY ALARM function, operation time equal to global time, polarity +12V, assigned to all zones),
- output OUT2 - visual signaling (BURGLARY ALARM function, operation time - LATCH, polarity +12V, assigned to all zones),
- output OUT3 – 27. POWER SUPPLY,
- output OUT4 - READY STATUS function (for all zones)
- output OUT 5 – BYPASS STATUS function (for all zones),
- all data related to monitoring and telephone messaging erased,
- TROUBLE SIGNALLING function deactivated,
- pager station signal parameters in accordance with the POLPAGER system.

Technical data

Mainboard supply voltage	AC 17...24V
Keypad supply voltage	DC 11...14V
Nominal power supply output voltage	DC 13,6...13,8V
Power supply load capacity	1,2A
Battery charging current	350mA
Battery cut-off voltage	9,5V ±0,3V
Standby power supply (recommended)	battery 12V/7Ah
Battery cutout protection (delay type)	3,15A.
Mainboard current consumption	70mA
Keypad current consumption min./max.	35mA / 90mA

OUT1 – OUT3 outputs load capacity 2,2A

OUT4 and OUT5 outputs load capacity 50mA

+KPD output load capacity.. 1,5A

Housing dimensions... 225x255x75 mm

Operational temperature range ....-10÷55ºC

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

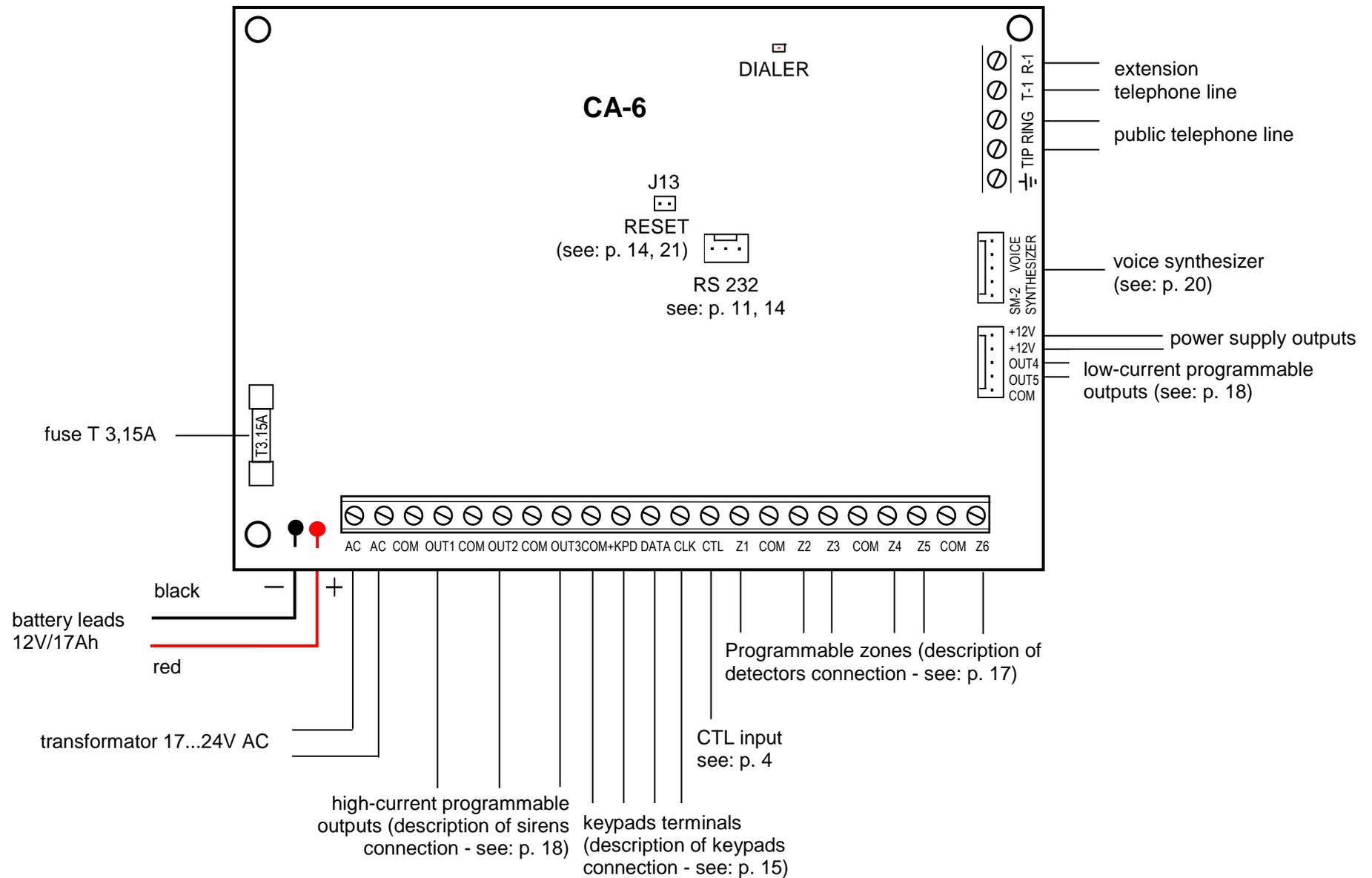| No.	Loads	Max current	Mean current consumption
1	Mainboard CA-6	70mA	70mA
2	+ KPD output (keypad max 90 mA, provided that 3 keypads are installed in the system)	270 mA	120mA
3	OUT3 output (6 detectors) *	120mA	80mA
4	OUT1 and OUT2 outputs	4,4A **	0,5A
5	OUT 4 and OUT5 outputs	2 x 50mA	50mA
6	Battery charging current	350mA	-
Total max current consumption by the system with no alarm signaling	$\sum I$ = 70mA+270mA+120mA+100mA+350mA=910mA		
Battery selection based on max. and mean current consumption by the system, assumed duration of power failure 12h, assumed 1 alarm with 15 min (0.25h) duration of signaling	$\sum A_{Max}$=1.25x(0,07x12+0,27x12+0,12x12+4,4x0,25+ +0,1x0,25) $\approx$ 8,3Ah $\sum A_{Av}$= 1.25x(0,07x12+0,12x12+0,08x12+0,5x0,25+ +0,05x0,25) $\approx$ 4,22 Ah Recommended standby power supply: 12V/7,5Ah battery		

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

Notes:

- *The control panel power supply unit has been designed for work with lead batteries or other batteries with a similar charging curve.*

- *It is impermissible to connect to the alarm panel a fully discharged battery (with voltage on unloaded terminals less than 11V). To avoid damage to the equipment, a fully discharged / never used battery should be precharged with the use of a proper charger.*

ATTENTION!
An efficient security system does not prevent burglary, assault or fire from happening, however it diminishes the risk that such a situation will cause no alarm or notification. Therefore, the SATEL Company recommends that operation of the whole security system be regularly tested.

DIALER

CA-6

J13

RESET
(see: p. 14, 21)

RS 232
see: p. 11, 14

T-1 R-1 — extension
T-1 — telephone line
TIP RING — public telephone line

SM-2 VOICE SYNTHESIZER — voice synthesizer (see: p. 20)

+12V
+12V — power supply outputs
OUT4
OUT5 — low-current programmable
COM — outputs (see: p. 18)

fuse T 3,15A

T3.15A

AC AC COM OUT1 COM OUT2 COM OUT3 COM +KPD DATA CLK CTL Z1 COM Z2 Z3 COM Z4 Z5 COM Z6

black — +

battery leads
12V/17Ah

red

transformator 17...24V AC

Programmable zones (description of detectors connection - see: p. 17)

CTL input
see: p. 4

high-current programmable
outputs (description of sirens
connection - see: p. 18)

keypads terminals
(description of keypads
connection - see: p. 15)

CA-6 Control Panel connection diagram (detailed description of main board terminals - see p. 12).