

**Alarm Control Panels**

**INTEGRA**

Firmware Version 1.00

# **INSTALLER MANUAL**

**Satel**   
GDAŃSK





## WARNINGS

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

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.

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.

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).

<b>DECLARATION OF CONFORMITY</b>		
<b>Products:</b> CA424P, CA832, CA16128P - main boards of INTEGRA control panels. - INTEGRA 24 - INTEGRA 32 - INTEGRA 64 - INTEGRA 128	<b>Manufacturer:</b> SATEL spółka z o.o. ul. Schuberta 79 80-172 Gdańsk, POLAND tel. (+48 58) 320-94-00 fax. (+48 58) 320-94-01	
<b>Product description:</b> Main boards for alarm control panels intended for use in intruder alarm systems.		
<b>These products are in conformity with the following EU Directives:</b> <b>LVD</b> 73/23/EEC+93/68/EEC <b>EMC</b> 89/336/EWG + 91/263/EEC, 92/31EEC, 93/68/EEC <b>R&amp;TTE</b> 1999/5/EC (network connection, TBR21)		
<b>The product meets the requirements of harmonized standards:</b> 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)		
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 our website <b><a href="http://www.satel.pl">www.satel.pl</a></b>		

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## 1. GENERAL

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This manual has been prepared for the whole family of INTEGRA alarm control panels. As a rule, the general information contained herein refers to the INTEGRA 128, which is the biggest of them. During installation of the smaller control panels, it is necessary to make allowance for differences in technical parameters which are characteristic of the particular mainboards (see Table, page **Błąd! Nie zdefiniowano zakładek.**).

All parameters of the INTEGRA alarm system can be **programmed** both with the use of a PC computer, as well as with an LCD keypad.

**Detailed information** about specifications of the alarm system software **is contained in the „Help” system of the DLOADX program** purchased with the alarm control panel or available at the website *www.satel.pl*. In order to make use of the system, install and run the program, and then highlight the required element of the program window and press the F1 key on the computer keyboard. Another way of getting access to the “Help” is by opening the “Information” drop-down menu and selecting the “Help”.

## 2. GENERAL FEATURES OF CONTROL PANELS

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The INTEGRA series alarm control panels are designed for small, medium-size and large facilities. Irrespective of its dimensions, each of the control panels has identical, advanced functional capabilities. The alarm systems which are based on them can be without difficulty extended by using the same expansion modules for all these control panels. It also makes possible to easily replace the control panel with a bigger one, if it is required by development of the system. Owing to such a solution, the optimal control panel can be selected for the particular site. The INTEGRA alarm control panels not only guarantee a perfect protection of the facility against burglary; they also offer advanced functions of access control and automatic operation of a number of devices. At the same time, they are easy to operate and user-friendly.

The control panels are characterized by the following features:

- Processor system with software stored in the FLASH memory, which allows panel firmware updating and adding new functions. New software versions can be loaded via the control panel RS-232 port without removal of the panel from the site.
- Possibility to keep the parameters programmed by service personnel in the FLASH memory. Thus, even on disconnecting the memory back-up battery, the control panel can restore the previous settings.
- Possibility to divide the system into objects and 32 partitions (partition = group of zones). The partitions may be controlled by the user, timers, control zones, or their status may be dependent on the status of other partitions. It is possible to temporarily restrict the access to partitions.
- Possibility of system development by adding the expansion modules (the development extent depending on the control panel size). Creation of a system based on modules (including the module of SATEL wireless detectors) installed at various places throughout the facility can considerably reduce the amount of cabling used.
- Possibility to store in the system from 16 to 240 passwords (codes), which may be either assigned to users or to control functions.
- Advanced functions of simultaneous system control by means of LCD keypads and user computers connected to them. Additionally, the service personnel have an option to control the panel either via the RS-232 port or through a telephone link. Individual partitions can also be controlled through partition keypads assigned to them.

- Possibility to control the access to selected partitions of the facility by means of partition keypads, code locks, proximity card readers and DALLAS chips, which enable monitoring the access doors as well as controlling the locks (electric latches). The monitoring of door status does not reduce the number of zones controlled by the panel.
- Possibility to define the names of users and of majority of system components (partitions, zones, outputs, modules) which facilitates the control and monitoring of system as well as viewing of events log.
- Monitoring is provided to four different telephone numbers (two stations, each with a back-up number), with a possibility to divide events into 8 identifiers. Besides basic transmission formats, the control panel makes possible monitoring in Ademco Contact ID format.
- Alarm messaging to telephones by means of voice messages or to a pager with SMS messages. Reception of a message can be acknowledged with a code entered from the telephone set keyboard (DTMF).
- Function of phone call answering, which enables checking the status of all control panel partitions and controlling the status of outputs. It is performed after user identification (each user may be assigned a special "telephone" password/code).
- Extended function of events printing, which enables the events to be sorted. Event descriptions are in accordance with the events list in Ademco Contact ID format, hence the printouts from the control panel correspond to those from the monitoring station. Besides, the names of zones, modules and users are printed as they are defined in the system.
- Additional function of the control panel RS-232 port, i.e. controlling the external analog modem, ISDN modem, GSM module, or ISDN module of SATEL manufacture, enables communication to be established with the service computer. In this case, the remote programming via telephone network as well as the service are as quick as direct programming from the computer via RS-232 port.
- Possibility of time-based control owing to timers that operate on week work cycle, with an option to define exception periods. Additionally, each partition is provided with its own timer (based on week or day cycle), programmed by the suitably authorized user, to secure automatic arming and disarming.
- Facilitated performance of non-standard functions due to a possibility to make complex logic operations at outputs.
- High-capacity event log where, in addition to the monitored events, also other events (like user access, functions used, etc.) are stored.

### **3. SYSTEM COMPONENTS**

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The control panels are provided with communication buses which enable modules to be added in order to enhance hardware capabilities. This, along with the firmware up-dating feature, which ensures new functionality, facilitates easy upgrading of the system. It allows the system to be extended by new components which will be developed in future in order to better meet the customer's needs and requirements. The INTEGRA control panels are capable of working together with the CA-64 panel dedicated modules, though some of them have to be made with a new program version. The system can operated by means of keypads designed for new alarm control panels.

Described below are the components that can be incorporated in the INTEGRA system.

#### **3.1 MAINBOARDS**

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Show in the table below are technical parameters of the alarm systems based on particular control panels of the INTEGRA family.

Technical parameter (quantity)	INTEGRA 24	INTEGRA 32	INTEGRA 64	INTEGRA 128
Zones, mainboard	4	8	16	16
Zones, system	24	32	64	128
High-current outputs, programmable, mainboard	2	2	4	4
Dedicated power outputs for keypads, expanders and detectors	3	3	2	2
Outputs, OC type, mainboard	2	6	12	12
Outputs, system	20+4*	32	64	128
Connectors for voice synthesizers	1	1	2	2
Keypads, system	4	4	8	8
Expander buses	1	1	2	2
Expanders, system	32	32	64	64
Zone expanders	2	3	6	14
Output expanders	2	3	6	14
Objects	1	4	8	8
Partitions	4	16	32	32
Timers	16	32	64	64
Telephone numbers for messaging	4	8	16	16
Pager messages	16	32	64	64
Voice messages	16	16	16	32
Remote switches	16	16	16	32
Users (w/o master user and service)	16	64	192	240
Event log	899	899	6143	22527
Power supply capacity across terminals [A] (for control panel with keypad connected)	1	1	2,5	2,5
Battery charging current [mA]	350	350/700	500/1000	500/1000
Current capacity, programmable outputs: high-current / OC [A]	2 / 0.05	2 / 0.05	3 / 0.05	3 / 0.05
Current capacity, power-supply outputs: +KPD / +EX1 with +EX2 [A]	-	-	2.5 / 2.5	2.5 / 2.5
+KPD / +EX / AUX [A]	0.5/0.5/0.5	0.5/0.5/0.5	-	-

\* 20 physically available outputs (mainboard + expanders) + 4 virtual outputs (to perform logical functions – see description of output types 46 and 47).

- Zones programmed individually to handle configurations with or without end-of-line resistor (NO, NC, EOL, 2EOL/NO and 2EOL/NC) with functional test of the detector. One of a few dozens of response types can be chosen for each zone.
- High-current outputs with electronic fuses and low-current outputs designed to control relays, with a programmable operating mode and a possibility to select one of a few dozens functions.
- High-current outputs with electronic fuses for “power supply output” function.
- 1 or 2 connectors for voice synthesizers (SM-2 or CA-64 SM).
- Communication bus (keypad bus) for connection of LCD keypads and synoptic board module.
- 1 or 2 communication buses (expander buses) for connection of additional modules to expand the mainboard functional capabilities. 32 or 64 such modules can be connected to the control panel.

- Telephone communicator, provided with a DTMF detection system for reception of commands via the telephone, as well as for monitoring, messaging, answering calls and remote programming.
- RS-232 port enabling the alarm system operation by means of a computer (DLOADX installer program), interfacing with a printer and the use of an external modem.
- Switching-mode power supply with short-circuit protection, provided with battery monitoring and discharged battery disconnection circuit.
- Independent real time clock with calendar, provided with its own back-up battery.
- Visual signaling of operation of all outputs, battery charging circuit and telephone communication unit.
- Protection of all zones, outputs and communication buses.

### **3.2 INTEGRA LCD KEYPAD**

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The INTEGRA keypads are made in two versions: with or without a built-in proximity card reader. Both of them have the following features:

- Large, easy to read 2x16 characters display with permanent or temporary backlighting activated on pressing a key or by any control panel zone.
- 17-key keyboard with backlighting controlled in the same way as the display backlighting.
- 2 zones with properties identical to main panel zones.
- Microswitch for keypad tamper detection.
- RS-232 port enabling the alarm system to be operated by means of computer (GUARDX supervisory and user program – full monitoring of system status, virtual keypad, easier management of users).

### **3.3 SYNOPTIC BOARD**

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**The INTEGRA alarm control panels support synoptic boards with firmware in version v4.0 or later.**

- Visualization of the state of all partitions and 64 zones of the alarm system by means of LEDs.
- Two optional operating modes:
  - monitoring mode (with any number of boards connected)
  - keypad mode (an option to define the way of LEDs blinking and a possibility to connect a computer with GUARDX program to the RS-323 port).
- Switching-mode power supply with short-circuit protection.
- Battery charging and control system with disconnection of a discharged battery.
- Module tamper zone.

### **3.4 INTEGRA PARTITION KEYPAD**

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- 12-key keypad with permanent or temporary backlighting
- 3x2 LEDs (ALARM, ARMED, TROUBLE) showing the status of partition to which the keypad is assigned.
- Microswitch for keypad tamper detection.
- Relay for control of electromagnetic latch, lock or interlock.
- NO/NC input for door status monitoring.



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### **3.5 INTEGRA CODE LOCK**

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- 12-key keypad with permanent or temporary backlighting.
- 3x2 LEDs showing readiness, access allowed and, additionally, system trouble.
- Microswitch for code lock tamper detection.
- Relay for control of electromagnetic latch, lock or interlock.
- NO/NC input for door status monitoring.

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### **3.6 EXPANDER FOR DALLAS CHIP READERS**

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- One or two reading heads (recording entry and exit),
- Relay for electromagnetic door lock control,
- Relay control input (NC),
- Door status control input (NC),
- Additional module tamper zone (NC).

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### **3.7 ZONES EXPANDER**

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- 8 zones with properties identical to the main panel zones.
- Additional module tamper zone.

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### **3.8 OUTPUTS EXPANDER**

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- 8 outputs with functional properties identical to the mainboard outputs in three versions: 8 relay outputs, 8 OC type outputs or 4 relay outputs/ 4 OC type outputs.
- Module tamper zone.

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### **3.9 ZONES EXPANDER WITH POWER SUPPLY UNIT**

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- 8 zones with properties identical to the main panel zones.
- Additional module tamper zone.
- Switching-mode power supply, capacity 2.2A, with short circuit protection.
- Battery charging and control circuit with discharged battery cut-off.

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### **3.10 OUTPUTS EXPANDER WITH POWER SUPPLY UNIT**

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- 8 outputs with functional properties identical to the mainboard outputs in three versions: 8 relay outputs, 8 OC type outputs or 4 relay outputs/ 4 OC type outputs.
- Module tamper zone.
- Switching-mode power supply, capacity 2.2A, with short circuit protection.
- Battery charging and control circuit with discharged battery cut-off.

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### **3.11 ADDRESSABLE ZONES EXPANDER**

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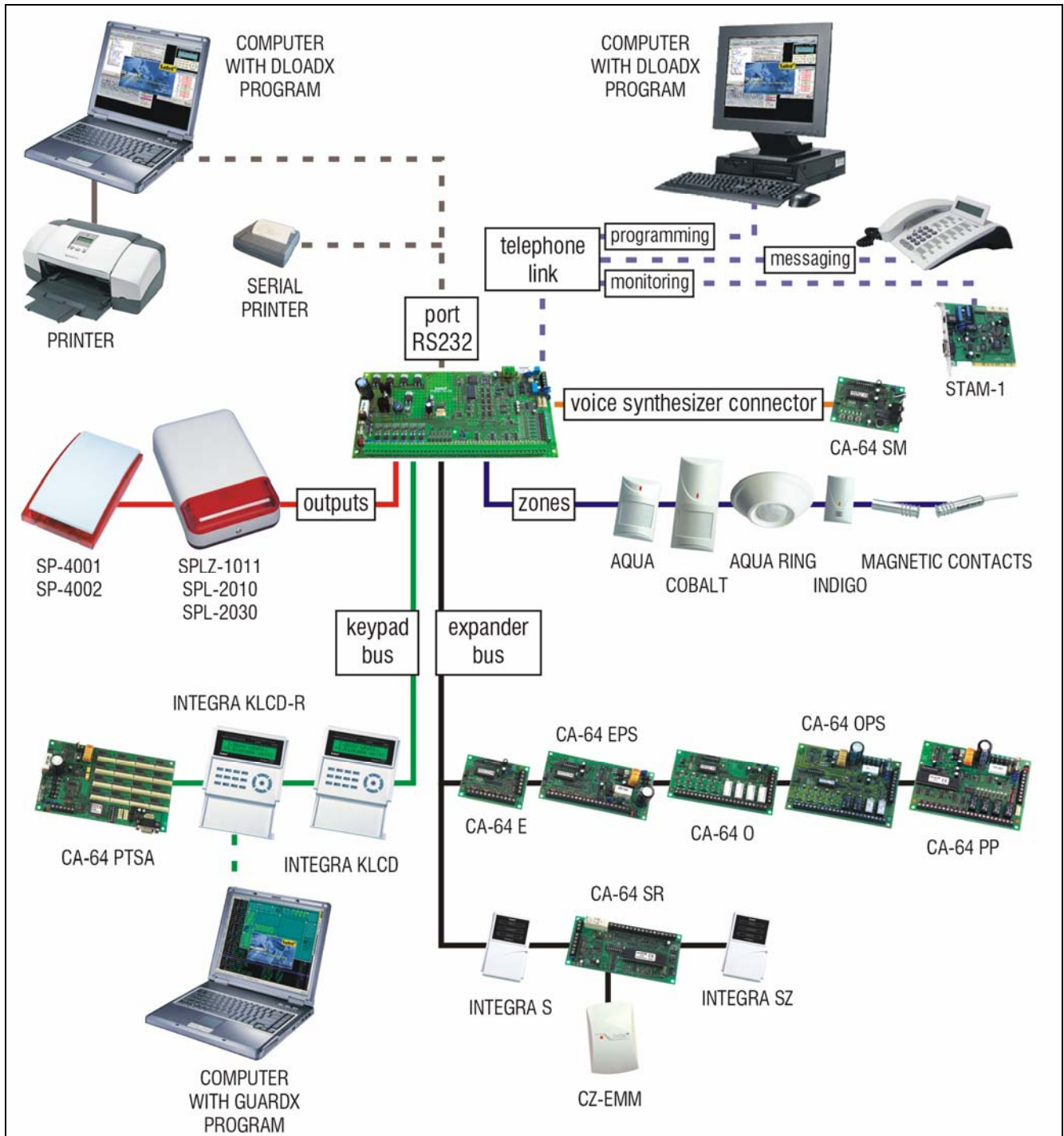
**The INTEGRA control panels support addressable zones expanders having firmware in version v1.5 or later.**

- Bus (3 wires) for connecting up to 48 addressable modules operating with typical detectors, mounted directly in the detector casing; the detector with addressable module mounted inside it is referred to as ADDRESSABLE DETECTOR,
- Additional module tamper zone,

- Switching-mode power supply, capacity 2.2A, with short circuit protection,
- Battery charging and control circuit with discharged battery cut-off.

### 3.12 VOICE SYNTHESIZERS EXPANDER

- Memory module for storing 16 verbal messages, 15 seconds per each message.



Exemplary devices interfacing with the INTEGRA alarm control panel

## 4. FUNCTIONAL DESCRIPTION

This section presents basic information on the INTEGRA control panel features, as defined in the firmware stored in FLASH memory. Views of the DLOADX program windows (version 1.00) are used in the system descriptions.

### 4.1 OBJECTS

Depending on its size, the INTEGRA control panel makes it possible to create 1, 4 or 8 objects. The objects are created in the service mode by using the „Edit object” function or the DLOADX program. They are recognized as separate alarm systems. It is possible to configure the control panel so that individual objects have their own separate controls (LCD keypads, partition keypads, code locks) and signaling units, or, alternatively, they share the equipment (LCD keypads and signaling units).

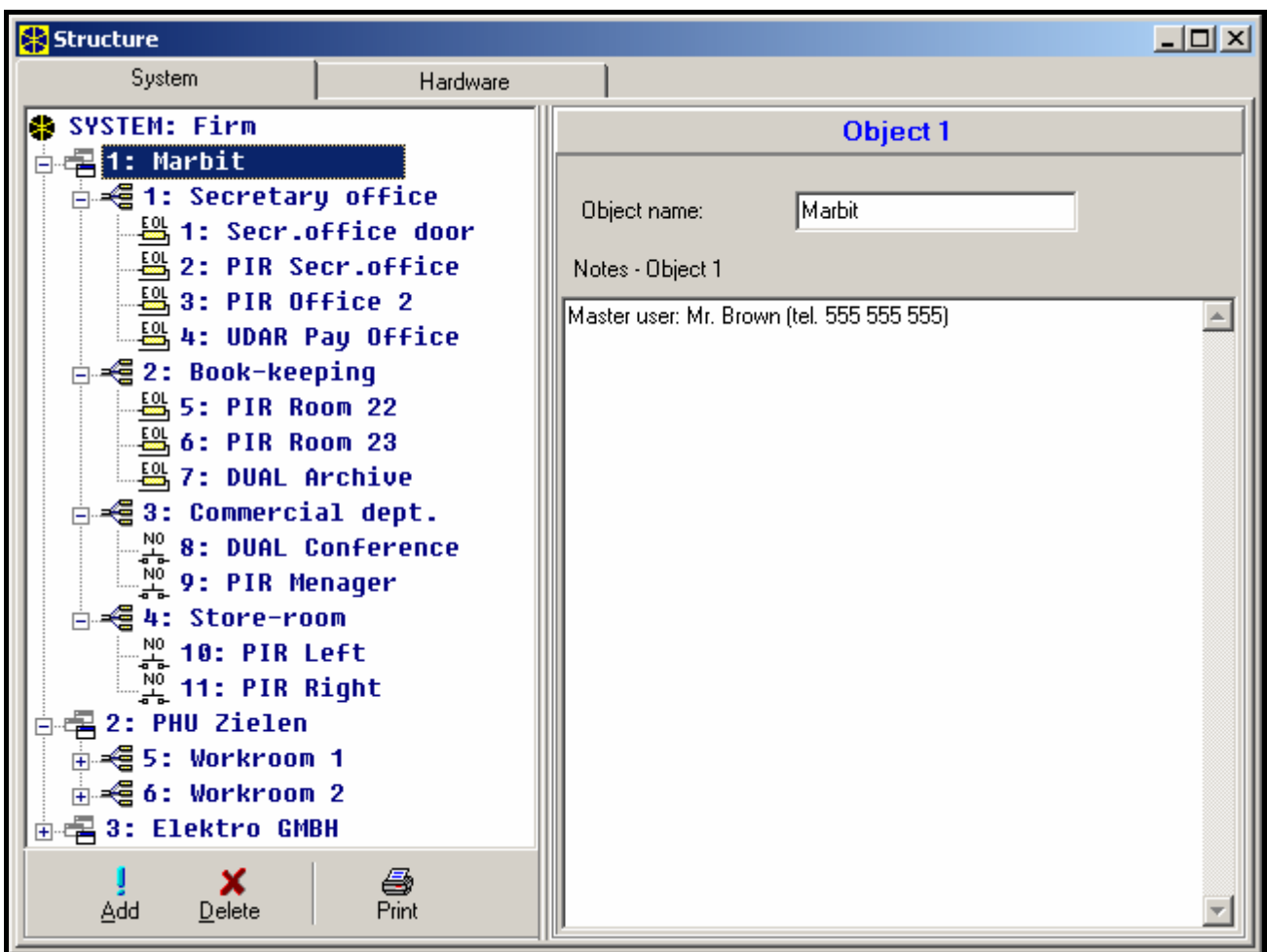


Fig. 1. System division into objects and partitions.

In the case of common LCD keypads, the controlled partition is recognized by the code of the user who gives the command (i.e. the LCD keypad is not "assigned" to the object or partition). Events from particular objects are sent to the monitoring station with individual identifiers. After selecting the Ademco Contact ID format, the control panel sorts the events automatically. For other formats, the events are assigned to identifiers by the installer, according to the assignment of system components (zones, partition, users) to individual objects.

## 4.2 PARTITIONS

The partition is a **group of zones** to supervise a selected part of the object, which are armed or disarmed at the same time. The partition can only belong to one object. Division of the object into partitions improves security of the object (some object partitions may be armed while the others are still accessible to the users), and permits to restrict the users' access to some parts of the facility. For example, in the facility shown in Figure 1, the workers of Commercial Department (partition 3) will not be able to enter the book-keeping offices (partition 2), unless they are granted authorization to arm / disarm the "Book-keeping" partition.

A partition can be created in the service mode with the use of the „Edit object" function, by assigning it to the selected object. When creating a partition, it can be given a **name** (up to 16 characters). Also, the **partition type** should be defined (by default: *Armed with code*). The function also removes partitions from the given object.

The INTEGRA control panel makes it possible to create the following types of partitions:

- **Armed with code** – the basic type of partition. Arming and disarming is performed by the user. Partition of this type is provided with a timer of its own to arm and/or disarm it, if it was not done earlier by the user.
- **With temporary blocking** – it is a version of the previous type of partition. The difference is that at the time of arming the control panel asks to indicate the blockage time period. Disarming of this partition is only possible after expiry of the blockage time. To disarm the partition before the blockage time is up you have to use a code with „access to temporary blocked partitions" authority, or another code, if an alarm occurred in that partition.
- **Follow type "AND"** – the partition controlled by status of other partitions. This partition is not armed directly by the user, but automatically – when all partitions indicated to the control panel become armed. The list of partitions is defined by the service when creating the dependent partition. The arming time is recorded in the event log, with indication of the user who armed the last partition from the list. When any partition from the list is disarmed, the dependent partition will be disarmed as well. Figure 3 shows the selection field of partitions that control partition 3 (partitions 1 and 2 are selected, other colors of background for partitions 3 and 4 show that partitions 3 and 4 cannot be selected

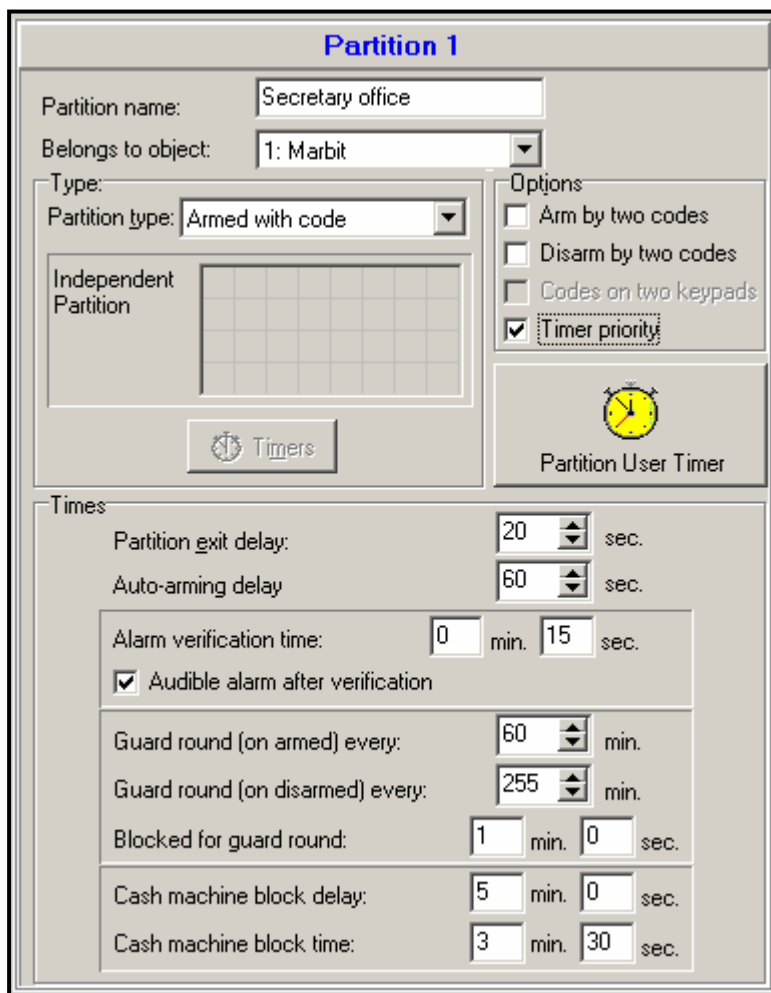


Fig. 2. Partition settings.

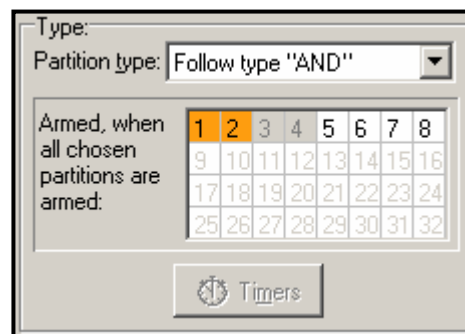


Fig. 3. Definition of *Follow type "AND"* partition.

cannot be selected

for controlling the dependent partition) For *Follow type "AND"* partition no exit delay is defined – the moment of switching over from “exit delay” to “armed” mode is set by the last partition from the control list entering the armed status. The dependent partitions cannot be controlled by timers.

**Note:** *Follow type "AND" partitions are normally used for protection of common corridors.*

- **Follow type "OR"** – the partition becomes armed when any partition from the list of control partitions becomes armed. The partition is disarmed at the moment when the last partition from the list is disarmed. The exit delay time is the same as for the controlling partition which causes arming of the *Follow type "OR"* partition”.
- **Access according to timer** – the partition is controlled by the user, but partition arming and disarming is only possible within time periods determined by operation of selected timers. Depending on the control panel size, an option with 16 or 32 timers is provided. Beyond those time periods neither arming, nor disarming of the partition is possible. For example, if the timer shown in Figure 4 is selected to control access to the “Secretary office” partition, the partition arming / disarming will be possible according to schedule – on Monday between 16:30 and 16:45, on Friday between 18:00 and 18:15 and so on, except for the time periods given in the timer exception table.

**Note:** *The „access to temporary blocked partitions” authority allows the user to freely control the partition armed mode, irrespective of the timer status.*

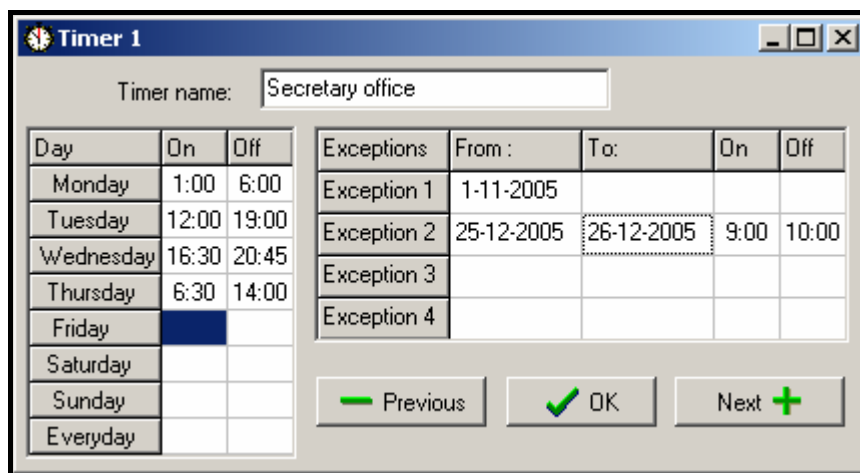


Fig. 4. Timing for *Controlled by timer* partition.

- **Controlled by timer** – the partition, which is armed in time periods determined by selected timers, and may also be controlled by the user code. When creating the *Controlled by timer* partition, you should specify the list of timers which set the periods when the partition is armed. Depending on the control panel size, an option with 16 or 32 timers is provided. The control panel analyzes the status of timers selected, and, if any timer status changes to “ON”, the control panel arms the partition. Countdown of the exit delay time takes place before entering the full armed status. Disarming occurs when all the selected timers are “OFF”. The partition can be also controlled by means of a separate “**Partition user timer**”, whose mode of operation is programmable through the “*Change option*” user function. This timer controls the partition in much the same way as the other timers. This method to control the partition armed status is closely connected with the “*Timer priority*” option.

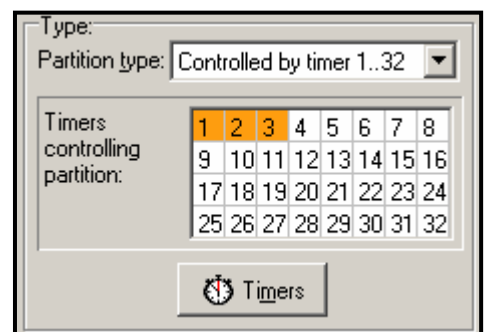


Fig.5. Selection of partition controlling timers.

**Note:** When the partition is armed by the timer, the "Automatic arming" event is recorded. The timer number is included in the event. The "0" number indicates that the user timer armed the partition.

The following **options** and **time settings** can be programmed for the partition:

**Arm by two codes** - arming after two different codes authorized to control the partition are entered in succession.

**Disarm by two codes** - disarming after two different codes authorized to control the partition are entered in succession.

**Codes on two keypads** - enabling this option will prevent codes to be entered from the same keypad (which applies to arming/disarming by means of two codes).

**Timer priority** - with this option selected, the timer will always perform arming and disarming according to the preset times. With this option deselected, the disarming will only follow if the arming is performed by timer - if the user sets armed mode with a code, the timer will not disarm the partition.

EXAMPLE: If the partition is armed/disarmed by timer every day, and the user is leaving and wants the armed mode to be on for a longer period of time - he will arm the partition himself. With the "timer priority" option disabled, the timer will not disarm the partition at the preset time and the user will not have to remember blocking the timer. When the user comes back and disarms the partition by using the code, the automatic control of the partition is restored according to the timer settings.

**Partition user timer** – see: **Controlled by timer partition** (for the DLOADX program the function is only available during connection with the control panel).

**Partition exit delay** - countdown of the partition arming delay as from the moment of entering the code or activating the timer to the actual arming of the partition.

**Auto-arming delay** - the time by which the **timer** will delay the automatic arming of a partition. Countdown of this time may be indicated on the partition keypads, LCD keypads and on the control panel outputs. Entering a value bigger than zero will enable an additional menu, which makes it possible to delay auto-arming (by entering a deferment time). During the auto-arming countdown it is possible to block the auto-arming function (until the next auto-arming time) by entering zeros alone in the *Defer auto-arm* user function. The delay countdown completed, the control panel begins the countdown of the "partition exit time" (provided that it has been set).

**Alarm verification time** - if the partition contains zones with selected **prealarm** option, then alarm on violation of such a zone will only be triggered if during the alarm verification time another zone is violated.

**Audible alarm after verification** - with this option enabled there will be no audible signaling of prealarm, i.e. violation of the zone with prealarm option "on" - the audible signaling will only be triggered when another zone is violated during the alarm verification time.

**Guard round (on armed) every** – setting the maximum period of time that can elapse since the last guard round when the partition is armed. If the time is exceeded, the control panel will record the "no guard round" event.

**Guard round (on disarmed) every** – setting the maximum period of time that can elapse since the last guard round when the partition is disarmed. If the time is exceeded, the control panel will record the "no guard round" event.

#### **Blocked for guard round**

If the facility is watched by guards, the round monitoring and signaling of guard absence at a specified time is possible (the guard enters his code from an LCD, partition keypad or code lock; which is recorded in the event log). The related times are specified separately for each partition; setting the "0" time will disable the monitoring function. It is possible to differentiate monitoring times depending on whether the partition is armed or

not. When the partition round requires violation of detectors and the guard is not authorized to switch the detectors off, it is possible to set the bypass time period, which starts when the guard enters his code to make a round.

The partition can also be bypassed by entering the "Temporary partition bypassing" type of code. The bypass time value is to be specified individually for particular codes.

### **Cash machine block delay**

### **Cash machine block time**

These times are to be programmed if the system supervises the cash machines (dispensers) by means of the 24H CASH MACHINE zones. Just one cash machine may be assigned to each partition. Access to the cash machine is possible after entering the "Access to cash dispenser" type of code. Entering the code from a keypad will start the "time to approach" the cash machine (24H CASH MACHINE zone is still armed), followed by countdown of the bypass time (during the countdown the 24H CASH MACHINE zone is bypassed).

## **4.3 ZONES**

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The zone in the alarm system is the interface of mainboard, LCD keypad or expansion module. Two electrical wires, commonly known as the "**line**", which is terminated with an alarm detector or another type of detector, are connected between the zone terminal and the common ground. Besides the detector, the electric circuit may incorporate the EOL parameter, i.e. a resistance which terminates the line. Depending on the detector configuration, it can be a 2.2k $\Omega$  resistor or 2 resistors 1.1k $\Omega$  each).

### **4.3.1 IDENTIFICATION AND NUMBERING OF ZONES IN THE SYSTEM**

The number of available (existing) zones is recognized by the control panel in the process of expansion module identification. Therefore, prior to assignment of the zones to partitions, it is necessary to:

- complete the whole system installation,
- perform identification of keypads, expanders and zones (using functions available from the control panel LCD keypad in the service mode),
- when the control panel is programmed by means of computer - download the data from the control panel to the computer,
- perform logical partitioning of the system (creating additional objects, assigning partitions to the objects),
- assign zones to the created partitions.

#### **Notes:**

- *After restart of the settings (also in a new control panel), most of the service mode functions are not available until the control panel completes identification of hardware.*
- *The control panel will automatically assign numbers of the system zones to those of the mainboard and expanders (see the „CA-64 E Zone Expander“ manual). The sequence of zone assignment depends on the addresses set at the expanders. The mainboard zones always carry the initial numbers: depending on the board size, these can be numbers 1-4, 1-8 or 1-16.*
- *The expander of addressable zones at the INTEGRA control panels can be installed together with other zone expanders. The identification process will assign to that expander a number of zones being a multiple of 8, depending on the number of actually connected addressable detectors which have an addressable module installed. Identification of the addressable zones (e.g. after adding some zones into the system) is carried out jointly with expander identification.*

- On the LCD keypad, the expander addresses in the name programming function are given in hexadecimal format in the following manner:
  - addresses from **00** to **1F** refer to the first expander bus (the numbering corresponds to the addresses set at microswitches – default names: **Expander 01 ... Expander 32**)
  - addresses from **20** to **3F** refer to the second expander bus in the INTEGRA 64 and INTEGRA 128 control panels (continuation of the first bus addresses calculated as: microswitch setting +32 (20 in hexadecimal format) default names: **Expander 33 ... Expander 64**).
- The same zone cannot be assigned to several partitions at the same time. However, it is possible to create partitions dependent on the status of other selected system partitions.

#### 4.3.2 PARAMETERS

**Zone name** - up to 16 characters

**Assigned to partition**

**Panel reaction type** (see: *Zone types*)

**Alarm delay / Entry delay / Signaling delay / Surveillance time / Bypass time** (parameter name depends on the control panel reaction type)

**Keypad number** – refers to type 58 zones: TECHNICAL - DOOR BUTTON.

**Arming mode** - the following armed modes are to be selected for type 80 and 82 zones:

- 1 – normal armed mode;
- 2 – INTERIOR DELAYED zones (type 3 zones) will be bypassed, EXTERIOR (type 8 zones) will trigger silent alarm, and the other ones - audible alarm;
- 3 – same as 2, but the DELAYED zones type 0, 1 and 2 will act as instant ones.

**Detector configuration** – configuration of the connected detector (NO, NC, EOL etc.). The INTEGRA control panel enables lines terminated with any detectors to be connected to the zones in the following configurations (see: „*Connection of detectors*” p. **Błąd! Nie zdefiniowano zakładek.**):

- NC** (detector with normally closed output),
- NO** (detector with normally open output),
- EOL** (detector in configuration with end of line resistor),
- 2EOL/NO** (NO type detector in configuration with double end of line resistor),
- 2EOL/NC** (NC type detector in configuration with double end of line resistor).

**Zone sensitivity** - the necessary duration of the actual zone violation until it is recorded by the control panel (typically approx. 0.5 sec., e.g. for the PANIC button a shorter time is recommended).

**Max. violation time / Max. door opening time** – exceeding the maximum time of violation / door opening is recognized by the control panel as a detector failure (e.g. damaging or masking the detector) / door. The „0” value will deactivate the time control.

**Max. no violation time** - exceeding the maximum time of no violation is recognized by the control panel as a detector failure (e.g. damaging or masking the detector). The „0” value will deactivate the time control.

**Comment** – this field is intended for entering important information regarding the particular zone. Length of the comment is limited to 256 characters.



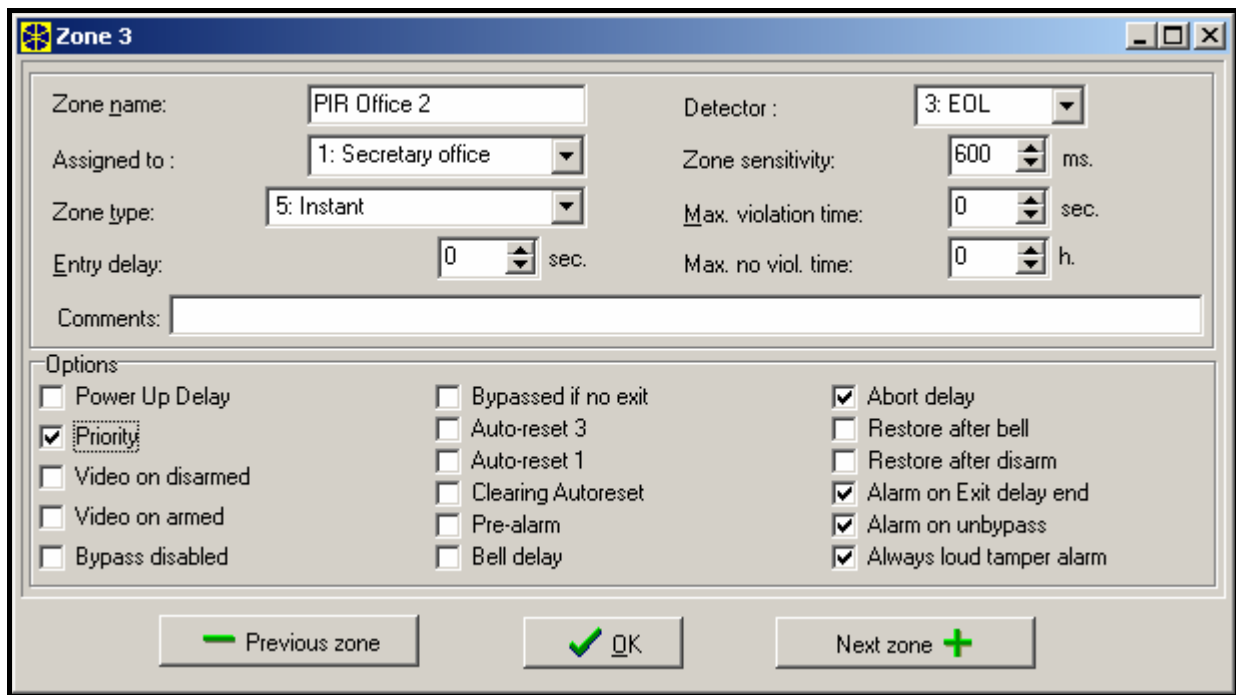


Fig. 6. Details of zone settings.

### 4.3.3 OPTIONS

**Power up delay** - the zone will be bypassed for 120 sec. after power is switched on (which prevents triggering alarms e.g. when starting the alarm control panel).

**Priority** - this option makes arming impossible, if the zone with activated option is violated (e.g. in case when windows have been left open, etc.).

**Note:** *Prior to arming it is possible to preview the names of violated zones for which the „Priority” option has not been activated. To do so, select the „Zones bef. arm” (→Service mode →Options →Various options).*

**Disarm on violation** – option for type 82 zone - consecutive violations of the zone alternately arm / disarm the partition. If the option is not selected, zone violation will arm and end of violation will disarm the partition.

**Video On Disarmed** - violation of the zone will activate the VIDEO ON DISARMED type output (intended for starting cameras and video recorders).

**Video On Armed** - violation of the zone will activate the VIDEO ON ARMED type output (intended for starting cameras and video recorders).

**Disable bypass** - the zone cannot be bypassed by the "zone bypass" user function.

**Bypassed if no exit** - the zone will be automatically bypassed, if during the zone exit delay no zone of the ENTRY/EXIT or EXIT type is violated.

**Alarm if armed** – option available to type 64-79 zones, when the „**No bypass in armed**” option is selected. Violation of the zone when the partition it belongs to is armed will trigger an alarm (provided that the control panel has recorded the partition exit after arming).

**Auto Reset 3** - the zone will be automatically bypassed if 3 alarms have been triggered since arming time.

**Auto Reset 1** - the zone will be automatically bypassed if 1 alarm has been triggered since arming time.

**Clearing Autoreset** - if this option is on, and the zone has *Auto Reset 1* or *Auto Reset 3* option on, the panel will automatically clear the bypass once every 24h, at midnight), provided that the zone was bypassed as a result of an alarm.

**Prealarm** - zone with alarm verification.

**Bell delay** - the zone triggers alarm instantaneously (starts monitoring and telephone messaging), but audible signaling will be delayed by the time set as the "entry delay".

**Clear alarm** – option available to zones type 81 and 82. Violation of the zone will clear alarm in the partition, if it is currently indicated.

**Abort delay** - information on the zone violation will not be reported to the monitoring stations if the violation occurred during the entry delay.

**Partition temporary blocking** – option for the zone type 84. Violation of the zone will block the partition for the time of guard round.

**Restore after bell** - the zone violation end code will be reported to the monitoring station not immediately but only after alarming is over.

**Restore after disarm** - the zone violation end code will be reported to the monitoring station not immediately but only after the alarm is cleared and the zone is disarmed.

**Alarm on Exit delay end** - the zone will trigger alarm if at the moment of ending the exit delay countdown it is in the state of violation (with this option disabled the alarm is triggered only if the zone state changes from normal to violation - when armed).

**Write violations to event log** - option for the zones type 47: NO ALARM ACTION – each zone violation will be recorded in the event log.

**No bypass if armed** – option for the type 64-79 zones. Violation of the zone when the partition it belongs to is in armed mode will block no group of zones (provided that the control panel has recorded the partition exit after arming).

**Abort voice messaging** – option for the zones type 81-83. Violation of the zone will cancel the messaging, if it is currently ongoing.

**Alarm on unbypass** – the zone will trigger an alarm if it is violated after unbypassing, and the partition is armed.

#### 4.3.4 ZONE TYPE

0. **ENTRY/EXIT** - delayed zone combining two functions:

*entry* - violation of the zone starts entry delay counting in the partition and turns on delay for the interior delayed zones; the entry time may be signaled on keypads;

*exit* - during the exit delay the panel keeps watching the zone for violation - in case of no violation (the user has armed the zone but has not left the facility), the zones with the "bypassed if no exit" option active will be bypassed.

1. **ENTRY** - see the ENTRY/EXIT zone.

2. **DELAYED WITH DELAY SIGNALING** – a delayed-action zone with optional signaling of delay countdown in keypads.

3. **INTERIOR DELAYED** - conditionally delayed zone: delay is only activated when the ENTRY or ENTRY/EXIT zone has been violated first.

4. **PERIMETER** - instantly armed zone, allowing no exit delay (total or partition).

5. **INSTANT** - instant zone, without additional functions.

6. **EXIT** - see the ENTRY/EXIT zone.

7. **DAY/NIGHT** - if disarmed, the zone will signal violation acoustically in keypads and on the ALARM DAY type outputs (signaling for a time period preset for the given output); when armed, the zone acts as the INSTANT zone.

8. **EXTERIOR** – a zone with alarm verification: violation of the zone will start counting the observation time (programmed as the zone entry delay) - if a second violation takes place during this time, an alarm will be triggered. The first violation may be signaled at the ALARM DAY type output.

9. **24H TAMPER** - permanently armed zone, intended for the tamper circuits.

**10. 24H VIBRATION** - 24h zone intended for working with vibration detectors: during arming (from LCD keypad), an automatic test of these detectors is performed - prior to starting the „exit delay” countdown, the VIBRATION DETECTORS TEST type output is activated and countdown begins of testing time, during which all vibration type zones in the given partition should be violated.

**11. 24H CASH MACHINE** - zone intended for protection of a cash machine (see: Partitions).

**12. PANIC-AUDIBLE** - permanently armed zone, intended for operating the panic buttons.

**13. PANIC-SILENT** - permanently armed zone; its violation starts reporting to the monitoring station and activates the SILENT ALARM type outputs without activating the audible alarm signaling.

**14. MEDICAL - BUTTON**

**15. MEDICAL - REMOTE CONTROL** - violation of the medical zones will trigger an alarm signaled in keypads and on the SILENT ALARM type outputs. The zone names and the codes of events from those zones are compatible with the Ademco Contact ID monitoring standard.

**16÷31 COUNTING L1÷16** – the counting zones will signal an alarm when the number of violations counted during a specified time period exceeds the set value. The control panel offers the possibility to program 16 different counters, which define how the counting zones will operate. Several zones can be assigned to each counter, thus creating a group of counting zones. Violations of the counting zones in armed mode can be signaled at the ALARM DAY type output.

The following information should be specified for each group of counting zones (counters):

- Max. value - number of zone violations which, if exceeded, will trigger the alarm,
- Counting time - the time in which violations are counted
- Counter type
  - *normal* - all violations of counter group zones are counted
  - *omits recurs*: consecutive violations of the same zone are not counted (alarm will be triggered if the number of violations from different zones exceeds the maximum value).

**32. 24H FIRE**

**33. 24H FIRE – SMOKE**

**34. 24H FIRE – COMBUSTION**

**35. 24H FIRE – WATER FLOW (FIRE)**

**36. 24H FIRE – HEAT**

**37. 24H FIRE – BUTTON**

**38. 24H FIRE – DUCT**

**39. 24H FIRE – FLAME**

All the fire zones (type 32÷39) trigger alarms signaled on the FIRE ALARM type outputs. They differ in the alarm code being sent to the monitoring station in the Ademco Contact ID format. The names of these zones are compatible with the names of event codes in the CID format. The fire outputs (except for the 24H FIRE – BUTTON) can work with alarm verification.

**40. 24H FIRE SUPERVISORY**

**41. 24H LOW WATER PRESSURE**

**42. 24H LOW CO2**

**43. 24H WATER GATE DETECTOR**

**44. 24H LOW WATER LEVEL**

**45. 24H PUMP ACTIVATED**

**46 24H PUMP FAILURE**

**47. NO ALARM ACTION** - zone intended for activating the outputs (e.g. ZONE VIOLATION, READY STATUS etc.). If the "Write violations to event log" option is activated for this zone, every violation will be recorded in the event log.

**48. 24H AUXILIARY – PROTECTION LOOP****49. 24H AUXILIARY - GAS DETECTOR****50. 24H AUXILIARY - REFRIGERATION****51 24H AUXILIARY - LOSS OF HEAT****52. 24H AUXILIARY - WATER LEAKAGE****53. 24H AUXILIARY - FOIL BREAK****54. 24H AUXILIARY - LOW BOTTLED GAS LEVEL****55. 24H AUXILIARY - HIGH TEMPERATURE****56. 24H AUXILIARY - LOW TEMPERATURE**

The zone types from 40 to 56 (auxiliary) signal alarms on the TECHNICAL ALARM type outputs. The names of zones and the codes of events from those zones are compatible with the Ademco Contact ID monitoring standard.

**57. TECHNICAL - DOOR OPEN** - zone intended for supervising the status of the door defined as *Dependent door* in the access control module (which controls the electromagnetic door lock).

**58. TECHNICAL - DOOR BUTTON** - zone intended for opening the door controlled via a partition keypad, code lock (or another access control module). The value of *entry delay* time entered for such a zone means the address of a door control module (from 0 to 31 – modules of bus 1, from 32 to 63 - modules of bus 2, 32 - address 00, 33 - address 01, etc.). Violation of such a zone will switch over the selected module relay and open the door (e.g. entering a room requires the access code to be entered from the keypad installed outside the door, while for exiting it is enough to press the button situated at the door inside the room).

**59. TECHNICAL - AC LOSS** - intended for control of devices working together with the alarm control panel e.g. additional power supply units. Violation of this zone will trigger the trouble alarm in the control panel.

**60. TECHNICAL - BATTERY LOW** - intended for the battery control in additional power supply units working together with the control panel. Violation of this zone will trigger the trouble alarm in the control panel.

**61. TECHNICAL - GSM LINK TROUBLE** - intended for control of the external GSM communication module. Violation of this zone will trigger the trouble alarm on the control panel.

**62,63. RESERVED**

**64÷79 BYPASSING - GROUP: 1÷16** – violation of this type of zone will bypass a specified group of zones. The control panel enables up to 16 zone groups to be defined. The group is created by selecting the zones and defining how they will be bypassed:

- *Bypass only* - violation of the zone bypassing a particular group will bypass the zones. If the bypassing zone has a fixed "entry delay" time, the group will be bypassed for such a time. If the "entry delay" time is equal to zero, unbypassing of the group will follow automatically when the partitions to which the zones belong are disarmed.
- *Bypass on/off* - violation of a bypassing zone will bypass the zones, while end of violation will result in unbypassing the same.

Additionally, the following **options** are available to this type of zone, which are activated when, after arming, the control panel records an exit from the partition to which the bypassing zone is assigned (violated the control panel zone with function 0 or 6 - EXIT):

- **No bypass if armed** – when this option is enabled, the zone will be bypassed, provided that the partition it belongs to is armed.
- **Alarm in arm state** - with this option enabled, violation of the bypassing zone in the armed mode will **trigger an alarm**.

**80. ARMING** - violation of the zone will arm the partition to which the zone belongs.

**81. DISARMING** - violation of the zone will disarm the partition to which the zone belongs, and can also clear the alarm and cancel the messaging.

**82. ARM/DISARM** - the zone controls the arming status of the partition it belongs to. Additionally, activating the "*Controlled when armed*" option enables the user to choose the control mode:

- option deactivated: violation of the zone will arm, and end of violation will disarm the partition ("switch"),
- option activated: consecutive violations will arm/disarm the partition ("button").

Disarming may simultaneously clear the alarm and cancel the messaging.

**83. CLEARING ALARM** - violation of the zone will clear alarm in the partition to which the zone belongs, and can also cancel messaging.

**84. GUARD** - violation of the zone is recognized as recording the guard's round in the partition to which the zone belongs. The partition can be bypassed for the guard round time.

**85. ENTRY/EXIT - CONDITIONAL** - ENTRY/EXIT zone (as type 0) with an extra feature: the zone becomes an instant one upon arming, but without leaving the protected area (i.e. without violating of this zone during exit delay).

**86. ENTRY/EXIT - FINAL** – as type 0, but after arming and detecting the violation end of this zone, the control panel ends the exit delay countdown and enters the armed mode.

**87. EXIT - FINAL** - as type 6, but after arming and detecting the violation end of this zone, the control panel ends the exit delay countdown and enters the armed mode.

**88. 24H BURGLARY** - a permanently armed zone, violation of which will trigger the burglary alarm.

## 4.4 OUTPUTS

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The control panel outputs are intended for switching on / off external devices (signaling, lighting, air conditioning, etc.) connected to corresponding terminals of the mainboard or expander. Each of the outputs can serve one of a few dozen functions or can be activated through a combination of other outputs functions (the *Logical AND* and *Logical OR* type of outputs). Triggering sources for each output are defined separately. All the outputs (in mainboard and/or expanders) are fitted with LEDs to indicate their current status. The numbers of system outputs are determined in much the same way as the zone numbers. The outputs not assigned to expanders can be used to perform logical functions.

### 4.4.1 PARAMETERS

**Output name** - up to 16 characters.

**Output type** (see the list of *output types*)

**Cut off time** – refers to the outputs responding to events (alarm, video control outputs, etc.), for the status indicating outputs this time is irrelevant.

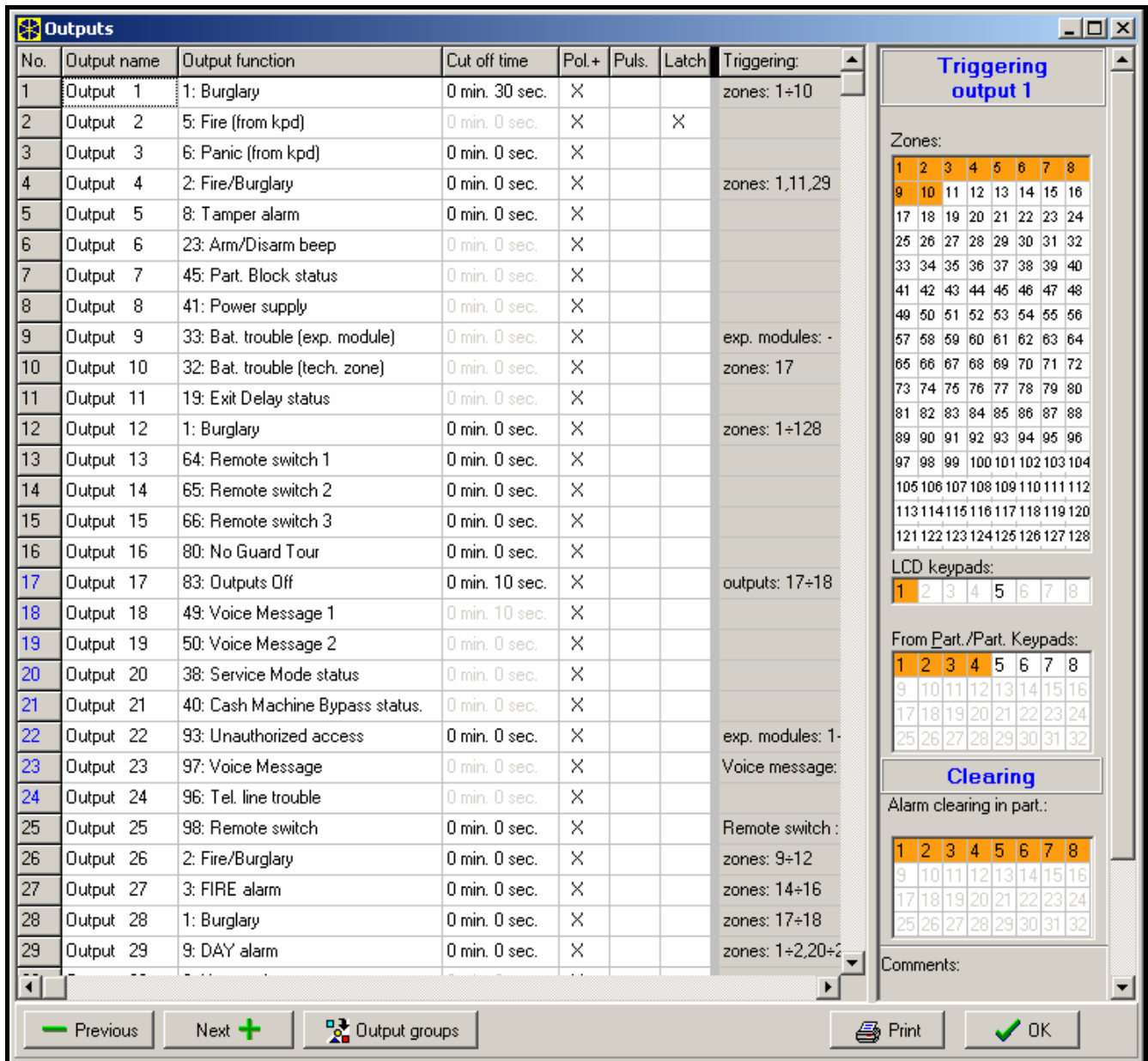


Fig. 7 Details of output settings.

### 4.4.2 OPTIONS

**Polarization** – defines the output operating mode; selecting the option means:

- for high-current outputs: active state +12V, inactive state 0V (common ground);
- for OC type outputs: active state - shorted to common ground; inactive state - cut off from common ground.

**Note:** *If the option is not set (selected) the output will act in the opposite way.*

**Pulsation** - sets whether the output signal is to be continuous or pulsating (0.5/0.5 sec.) - the option only applies to the timed outputs;

**Latch** - (refers to the alarm outputs only) with this option active, the output will be signaling until alarm is cancelled by entering a code.

**Comment** – this field is intended for entering important information regarding the particular zone. Length of the comment is limited to 256 characters.

### 4.4.3 SOURCE OF OUTPUT TRIGGERING

Depending on its type, the output can be triggered in various ways. The control panel makes available lists to select triggering sources suitable for particular types of outputs. For

example, you can program zones, keypads, partitions/partition keypads to control zone for the alarm outputs; master users (administrators) and users for the CODE ENTERED SIGNALING/CODE USED SIGNALING outputs; control timers for the TIMER type outputs, etc.

**Triggering from zones** – allows the user to select any number out of the 64 zones which will cause activation of the output.

**Triggering from LCD keypads** – refers e.g. to the alarms called from keypads and makes it possible to determine which outputs will react to those alarms.

**Triggering from partitions / partition keypads** – refers to the alarms in partitions and the alarms called from partition keypads, including the keypad tamper alarms.

**Triggering from control timers** – provides option to select any timers which will activate the output.

**Triggering by administrators** – refers to the administrator codes which will activate the output.

**Triggering by users** – refers to the user codes which will activate the output.

**Triggering from control outputs** – refers to the outputs, the activation of which will affect the particular output status.

**Triggering from expansion modules** – makes it possible to define which expanders will activate the output.

**Triggering by telephone line trouble** – makes it possible to select the type of failure to be signaled at the output.

**Triggering from reset zones** - makes it possible to indicate zones which will temporary disable the output (verification of fire alarms).

**Triggering by synthesizer** – makes it possible to indicate the synthesizer messages which will activate the output.

**Triggering by remote switches** – makes it possible to indicate the remote switches the activation of which will trigger the output.

#### 4.4.4 CLEARANCE AVAILABILITY

**Alarm canceling** - the list of partitions makes it possible to determine which event will disable the alarm output: the output will only be deactivated if the alarm signaling is cleared in one of selected partitions.

**Note:** *Make sure, that the alarm output canceling is assigned to the partition which triggers that output – otherwise, it will be impossible to cancel alarm at that output since the canceling partition will not be signaling any alarm.*

#### 4.4.5 OUTPUT TYPES

##### 0. NOT USED

1. **BURGLARY ALARM** - signals all burglary and panic alarms (from zones, keypad / expander tamper, keypad Panic, etc.).
2. **FIRE / BURGLARY ALARM** - signals the burglary and panic alarms (continuous sound) and the fire alarms (intermittent sound).
3. **FIRE ALARM** - signals the fire alarms (from fire zones and triggered from keypads).
4. **KEYPAD ALARM** - signals all alarms (fire, panic, auxiliary alarm, 3 bad codes, keypad tamper).
5. **KEYPAD FIRE ALARM** - signals the fire alarms triggered from keypad (by holding down the [\*] key for 3 sec.).
6. **KEYPAD PANIC ALARM** - signals the panic alarms triggered from keypad (by holding down the [#] key for 3 sec.).

7. **KEYPAD AUXILIARY ALARM** - signals the medical assistance call alarm triggered from keypad (by holding down the 0 key for 3 sec).
8. **TAMPER ALARM** - signals the tamper alarms.
9. **DAY ALARM** - signals violation of the DAY/NIGHT type zones when the system is disarmed, or violation of the COUNTING and EXTERIOR type zones before an alarm is triggered.
10. **DURESS ALARM** - signals that a DURESS type code (or prefix) has been used in the system.
11. **CHIME** - signals violation of zones with the *chime control* option on (the user can block the chime signaling from selected partitions by using a suitable function from the user menu; the function can be automatically disabled for a specified time period after violation of the selected zone).
12. **SILENT ALARM** - signals violation of the PANIC-SILENT type zone, from alarm zones with the *Signaling delay* option on, and the medical assistance call alarms from the MEDICAL-BUTTON and MEDICAL-REMOTE CONTROL.
13. **TECHNICAL ALARM** - signals violation of the 24H AUXILIARY zones (zone types 40 - 56).
14. **ZONE VIOLATION** - the output is activated by violation of selected zones.
15. **VIDEO ON DISARMED** - the output is activated by violation of selected zones with the *Video on disarmed* option active (when the zone is disarmed).
16. **VIDEO ON ARMED** - the output is activated by violation of selected zones with the *Video on armed* option active (when the zone is armed).
17. **READY STATUS** - signals "readiness" of selected zones for arming (all zones are free from violations).
18. **BYPASS STATUS** - signals that some selected zones have been bypassed.
19. **EXIT DELAY WARNING** - signals that *Exit delay* is running in selected partitions.
20. **ENTRY DELAY WARNING** - signals that *Entry delay* is running for selected zones or in selected partitions.
21. **ARM STATUS** - the output is activated if at least one of the selected partitions is armed.
22. **FULL ARM STATUS** - the output is activated if all of the selected partitions are armed.
23. **ARM/DISARM ACKNOWLEDGE** - signals arming / disarming of one selected zone (1 signal 0.3 sec. - arming, 2 signals - disarming, 4 signals - alarm canceling /disarming with alarm canceling).
24. **MONO SWITCH** - the output is activated for a specified time with a *MONO output control* type code; the output should be assigned to specific partitions and/or zones, and will be activated by a code entered from keypad / partition keypad serving that partition, or when the selected zone is violated.
25. **BI SWITCH** - the output is activated / deactivated by a *BI output control* type code; the output should be assigned to specific partitions and/or zones, and will be activated by a code entered from keypad / partition keypad serving that partition, or when the selected zone is violated.
26. **TIMER** - the output is armed and disarmed by selected timers.
27. **TROUBLE STATUS** - signals detection of a trouble condition (mains power supply failure, low battery, defect of zones, expander buses, etc.).
28. **AC LOSS - CONTROL PANEL MAINBOARD** - signals mains power failure of the control panel mainboard.
29. **AC LOSS (FROM ZONES)** - signals violation of the selected TECHNICAL-AC LOSS type zones.
30. **AC LOSS (FROM EXPANDERS)** - signals mains power failure of the selected expanders with power supply units (expander selection: from 0 to 31 - bus 1 modules, from 32 to 63 - bus 2 modules).



31. **BATTERY TROUBLE - CONTROL PANEL MAINBOARD** - signals low voltage condition of the backup battery of the control panel mainboard.
32. **BATTERY TROUBLE (FROM ZONES)** - signals violation of the selected TECHNICAL-BATTERY LOW type zones.
33. **BATTERY TROUBLE (FROM EXPANDERS)** - signals low voltage condition of the backup battery of the selected expanders.
34. **ZONE TROUBLE** - signals exceeding the *Maximum violation time* or the *Maximum no violation time* of the selected zones.
35. **TELEPHONE USAGE STATUS** - signals that the telephone line is captured by the control panel.
36. **GROUND START** - the output generates a control pulse necessary for work with some types of telephone exchange.
37. **MONITORING ACKNOWLEDGE** - the output activated after successful completion of connection with the monitoring station.
38. **SERVICE MODE INDICATOR** - signals activation of the service mode on one of the control panel LCD keypads.
39. **VIBRATION DETECTORS TEST** - the output intended for testing the vibration detectors in one selected partition (see: Zone types – 24H VIBRATION). The output cut-off time defines the maximum duration of testing the vibration detectors in the selected partition.
40. **CASH MACHINE BYPASS INDICATOR** - signals bypassing the 24H CASH MACHINE type zones in selected partitions.
41. **POWER SUPPLY** - the output intended for supplying external devices; it is recommended that the control panel mainboard high-current outputs with electronic protection be used as power supply outputs.
42. **POWER SUPPLY IN ARMED STATE** - the power supply output is activated on arming some selected partitions (when the exit delay starts) - it is intended for supplying e.g. ultrasound or microwave detectors, or infrared barriers, which should not be enabled if not used by the system.
43. **RESETABLE POWER SUPPLY** - the power supply output resetable from the user menu in LCD keypad. The reset (power cut-off) time for the resetable output is programmed as that output cut-off time.
44. **FIRE POWER SUPPLY** - the output intended for supplying the fire detectors with automatic alarm verification. The verification takes place in the following way: after detecting violation of one of the fire zones assigned to the given output the power supply is cut off (for a time programmed as the output cut-off time) and, in case next violation occurs after power supply is switched on again, the fire alarm will be triggered. The output can be also reset by the use of a suitable user function (as the RESETABLE POWER SUPPLY type output).
45. **PARTITION BLOCKED INDICATOR** - signals that the partition armed state is temporarily blocked. If "cut off time" of this output is different from zero, the output will signal the ending of partition blocking: output will be activated for programmed period of time just before partition return to arm state.
46. **LOGICAL AND** – output is activated when all the outputs selected as the control ones are active.
47. **LOGICAL OR** - output is activated when at least one of the outputs selected as the control ones is active. An output is considered to be activated when it is energized with +12V voltage - which allows the output *Polarization* option to be used as logical negation.

Each control panel of the INTEGRA series supports all outputs, no matter whether they are physically available (i.e. expansion modules are connected) or not. This makes it possible to use any number of outputs as the control outputs of the LOGICAL AND or LOGICAL OR type.

**Example of using outputs type 46, 47**

Functions are assigned to outputs, which are not physically available:

- output 63 - BURGLARY ALARM (type 1),
- output 64 - ARM/DISARM ACKNOWLEDGE (type 23).

Output 1, to which the siren is connected, is programmed as LOGICAL OR type of output (type 47), while outputs 63 and 64 are selected to be control outputs.

Output 1 will be triggered if output 63 or 64 is activated.

Then a function should be assigned to the next output which is not physically available:

- output 62 – TIMER (type 26), controlled by a timer set to be daily switched "on" at 16:00 and "off" at 8:00.

Output 2, to which the siren is connected, is programmed as LOGICAL AND type of output, while outputs 1 and 62 are indicated as control outputs.

As a result, output 2 will signal alarms and confirm arming/disarming of the partition, but only between the hours 16:00 and 8:00, outside this time period the output being inactive.

**48÷63 VOICE MESSAGE 1÷16** - the outputs activated by the telephone messaging function: it enables any external device to be used for playback of notification messages. When programming telephone notification one should select the message number (synthesizer) which is to be played back after connection is established. The messaging function will activate the corresponding output.

**64÷79 REMOTE SWITCH 1÷16** - the output to be controlled via the telephone line by means of a telephone set and DTMF signals. See section TELEPHONE ANSWERING.

***Note:** If cut-off time is specified for the REMOTE SWITCH, then such an output will work as a MONO SWITCH, i.e. when switched on it remains active for the whole preset time period and only deactivates after this time expires. The status of such an output should be displayed in the keypad through the zone connected to it.*

**80. NO GUARD ROUND** - signals the lack of entering the *guard code* within the specified *round time* in selected partitions.

**81. LONG AC LOSS - MAINBOARD** - signals the mains power supply failure of the control panel mainboard with delay programmed as *Max. AC loss time* (Options - Global times).

**82. LONG AC LOSS - MODULES** - signals the mains power supply failure of the selected extension modules (modules with power supply) with delay programmed as *Max. AC loss time* for each of the modules.

**83. OUTPUTS OFF** - the output is activated when all the selected outputs have been deactivated (the signaling is completed).

**84. CODE ENTERED SIGNALING** - the output is activated on entering the code of a selected user (and pressing the [\*] or [#] key).

**85. CODE USED SIGNALING** - the output is activated on arming or disarming the system, using the code of one of selected users.

**86. DOOR OPEN INDICATOR** - the output is activated on opening the door supervised by the selected modules of access control.

**87. DOOR OPEN TOO LONG INDICATOR** - the output is activated on exceeding the maximum opening time of the door supervised by the selected modules of access control.

**88. BURGLARY ALARM (NO TAMPER OR FIRE ALARMS)** – the output only signals the *alarms from armed zones* and the *PANIC alarms from partition keypads and LCD keypads*.

**89. EVENTS MEMORY 50% FULL** - the output signals that the events memory area has been filled up to 50% (approx. 3000 events) since the last events readout using the DLOADX program. The output remains active until the event memory readout.

**90. EVENTS MEMORY 90% FULL** - the output signals that the events memory area has been filled up to 90% since the last events readout using the DLOADX program.

- 91. PARTITION AUTO-ARM DELAY COUNT SIGNALING** - the output becomes active (for a specified time) on starting *auto-arming delay* countdown for the selected partitions.
- 92. PARTITION AUTO-ARM DELAY COUNT INDICATOR** - the output indicates the fact of *auto-arming delay* countdown for the selected partitions.
- 93. UNAUTHORIZED DOOR OPENING** – the output becomes active when the doors supervised by selected access control modules (partition keypads, coded locks, transponders) are opened without access authorization (i.e. without entering the code or reading in the proximity card).
- 94. ALARM - UNAUTHORIZED DOOR OPENING** – the output works in the same way as the type 93 output but only for the modules with the *Alarm when no authorization* option activated.
- 95. PROXIMITY CARD USED SIGNALING** - the output is activated reading the proximity card of a selected user
- 96. TELEPHONE LINE TROUBLE** - the output signals the state of:
- 1 - no voltage on tel. line.
  - 2 - wrong dial tone
  - 3 - no dial tone
  - 4 - Monitoring Station 1 trouble
  - 5 - Monitoring Station 2 trouble
- 97. VOICE MESSAGE** – this output is similar to outputs 48-63. A message number is to be assigned to the output.
- 98. REMOTE SWITCH** – this output is similar to outputs 64-79. A switch number is to be assigned to the output.

## 4.5 CODES AND USERS

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The INTEGRA control panel recognizes three types of codes, i.e. service, master user (administrator) and user codes. The service and master user (administrator) codes are stored in EEPROM memory, and, consequently, they are not erased after removal of the jumper which cuts off the 3.6V backup battery supporting the settings memory, events memory, and the clock when the control panel power is down. The user codes are stored in RAM memory with a battery backup and are deleted when the MEMORY jumper is removed.

Each user may have his own code which enables him to operate the control panel (including arming/disarming, clearing alarms, controlling outputs, and having access to other functions). The code identifies the user, his authority level in the system and access to partitions and selected parts of the facility (the access is controlled with locks controlled by the INTEGRA control panel). The types of codes, their properties and methods to enter into the system are described in detail in the user manual. Provision is made for the installer to create in the service mode a "template (mask) of basic authority" to be granted to each new user (or master user). Such a template should be created by means of the function called „ACTIVE USER AUTHORITY” (→ *Service mode* → *Options* → *Active authority*). An extra authority level, not included in the template, may be individually granted to the user (or master user) when they are being entered or edited.

Having created a user, the control panel indicates the consecutive user number in the system. The number is sent to the station with events which contain, besides the code, also the user number (when monitoring in Ademco Contact ID format is enabled). After deletion of the user, the control panel may assign the available number to a new user entered into the system.

## 4.6 PREFIXES

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Control of the system may require entering additional digits called a **prefix** directly before the access code. The prefix length (1 to 8 digits) is determined by the installer with the service

function: →*Options*; →*Prefix length* (only from LCD keypad), while the prefix value (contents) is determined by the administrator with the →*Change prefix* user function. There are two kinds of prefixes:

**Normal** – the prefix normally entered before each use of the code, by default programmed as 0 or 00, or 000 ... (the number of zeros depends on the length of prefix).

**Duress** – the prefix normally entered before use of the code in emergency, e.g. when the user is forced by third parties to disarm the system, bypass the zones, etc., by default programmed as 4 or 44, or 444 ... (the number of fours depends on the length of prefix). Using this prefix before the code results in the **duress** alarm code being sent to the monitoring station and activation of the DURESS ALARM output.

For the security reasons, it is useful to periodically change the prefixes. The object administrator is authorized to change the prefixes and define the change *Recall time* (see the →*Change prefix* function).

**Using the installer code** does not require knowledge of the prefix - it is sufficient to enter any digits instead of the prefix. What is important is that the number of entered digits should correspond to the length of prefix.

**Note!** *Changing the length of prefixes restores their default values.*

## 4.7 MONITORING

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The INTEGRA control panel phone communicator may report events to two stations. Two telephone numbers are assigned to each station (one basic and one backup), as well as the possibility to determine various transmission formats. When monitoring to one station and giving both numbers, the control panel makes repeated attempts dialing alternately the basic and backup numbers. When the “Station 1 or Station 2” mode is enabled, the control panel makes consecutive dial attempts in the following sequence: station 1 basic number, station 1 backup number, station 2 basic number, station 2 backup number, station 1 basic number and so on, until the number of attempts specified for each station is reached. After the preset number of attempts is completed, the control panel suspends monitoring either until a next event occurs or for a time period defined by the service (after that time elapses, the control panel starts next series of attempts to transmit the message).

**Note:** *8 is the typical value for the “Repetitions” parameter, and 30- for the “Suspend time” parameter (occurrence of a new event resumes sending all the events not yet transmitted).*

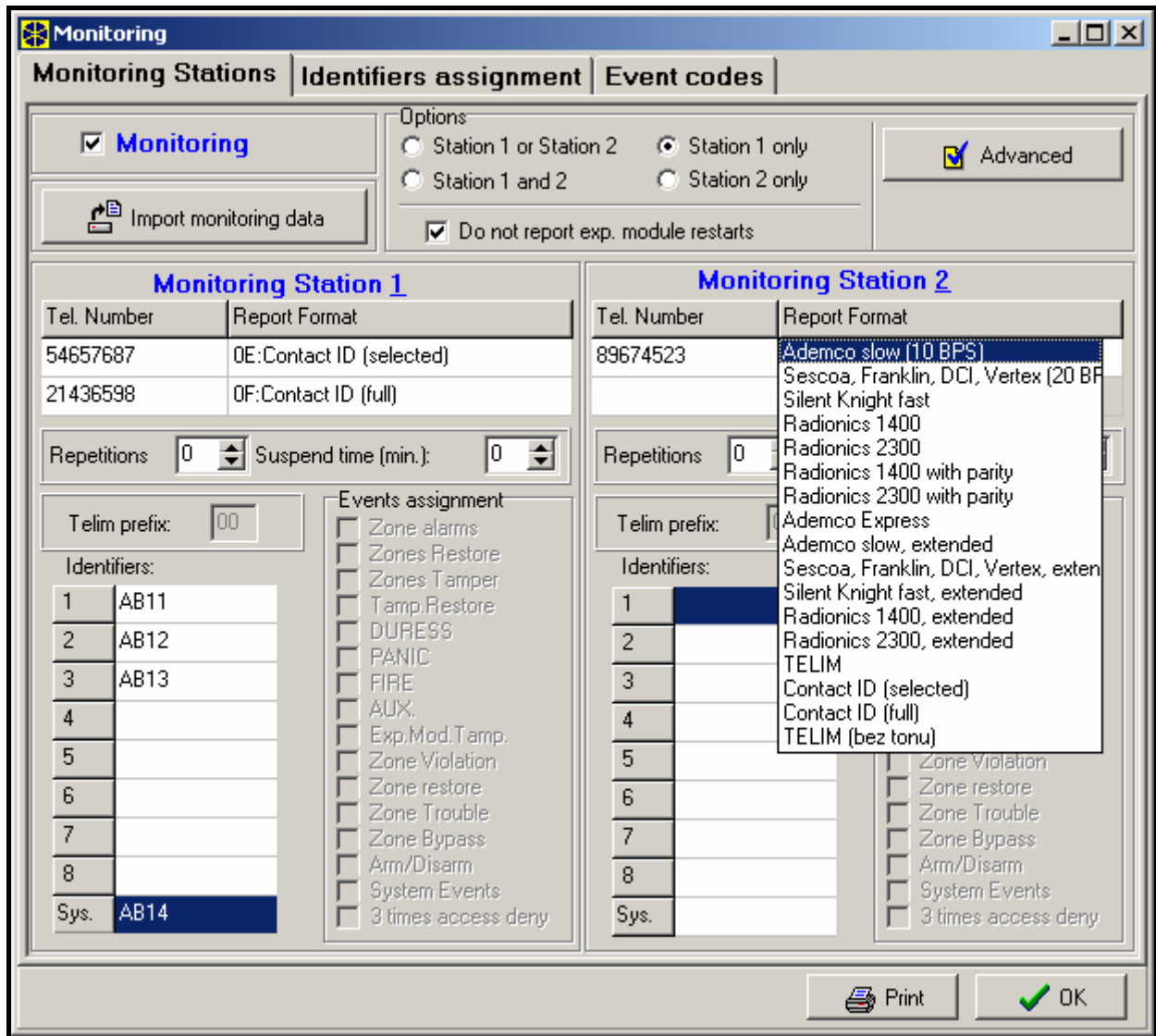


Fig. 8. Window for format selection and definition of identifiers.

Events in the system are divided into eight classes:

1. alarms from zones and tampers,
2. alarms occurring in partitions (e.g. PANIC, fire alarm from the LCD keypad),
3. arming and disarming,
4. zone bypass,
5. access control,
6. system troubles,
7. functions used,
8. other events in the system (e.g. start of the service mode).

Events of class 5 and 7 are not monitored. Other events are transmitted depending on the selected transmission format.

- For pulse formats and Ademco Express it is necessary to program event codes. Only those events are transmitted which are assigned to a valid identifier (i.e. those which have at least three characters different from "0") and whose code is different from "00".
- When the "E: Ademco Contact ID (selected codes)" format is selected, the events are sent which would have been transmitted in pulse formats, the programmed code being of no relevance, since the control panel transmits codes according to the format specification.
- When the "F: Ademco Contact ID (all codes)" format is selected, there is no need for the installer to program any event codes and/or assign events to identifiers. The control panel transmits codes according to the format specification and the defined division into objects.

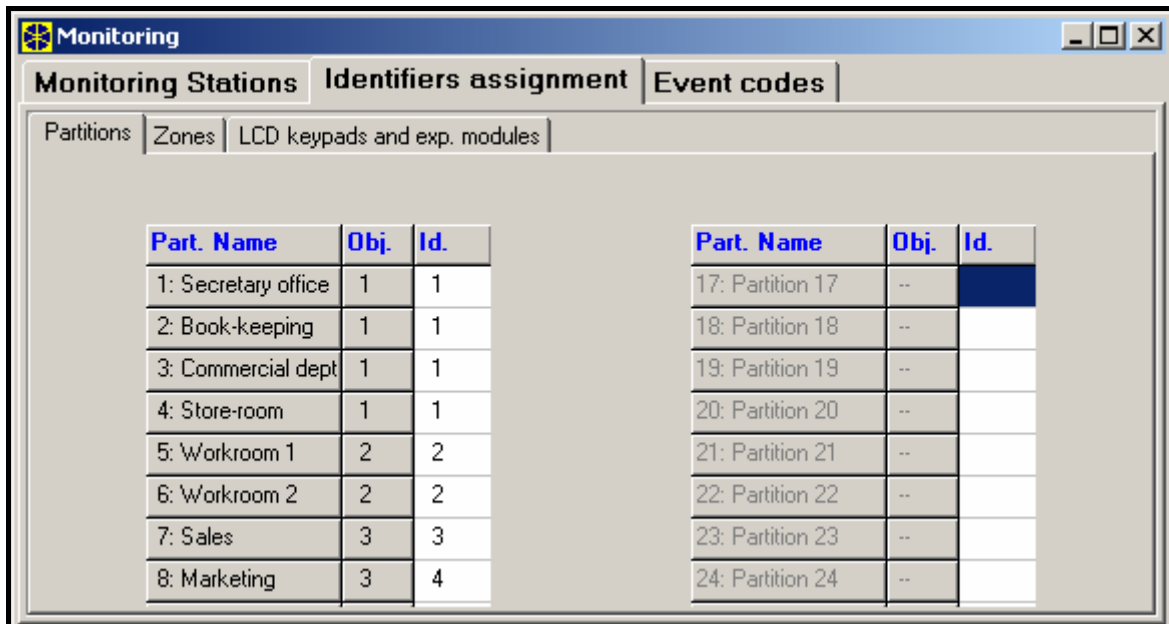


Fig. 9. Window for assigning partition events to identifiers.

**Notes:**

- When the „E: Ademco Contact ID (selected codes)” format is selected, the control panel will only transmit the events which can be transmitted in pulse formats. Not all possible events have their equivalents in pulse formats. Programming of codes for all possible events in the system would require dozens of identifiers to be reserved for the control panel.
- For the E and F (Ademco Contact ID ...) formats, each object has its own identifier. Therefore, the identifiers of non-existing objects need not to be programmed. In the system event identifier field (events of class 6 and 8), you should re-enter the identifier of the object which “is responsible” for the system (for example, the object, where the control panel is installed).
- For the E format, the assignment of partitions, zones, keypads and expanders to identifiers does not need to reflect the division of the system into objects. But it is essential that a value different from “0” be programmed. The control panel transmits all events in the object with a single identifier according to division of system components among the objects.
- For the “Station 1 or Station 2” operating mode (and “Station N only”, with dialing both numbers), it is not possible to select the F format for just one number and another format for the remaining numbers, because it may occur that the event transmitted in format F cannot be converted into the type 4/2 code.

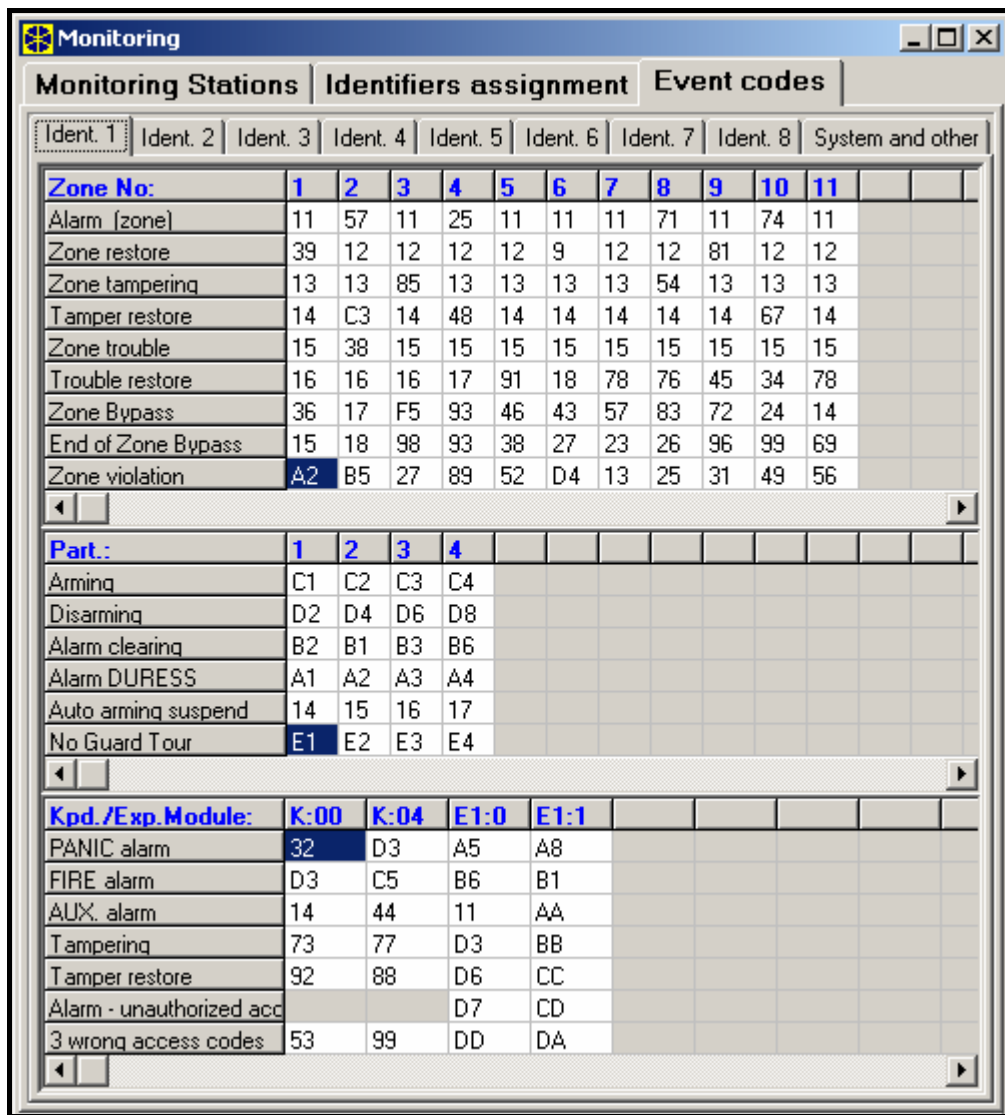


Fig. 10. Programming of monitoring codes for pulse formats.

For the pulse formats, individual events are assigned to identifiers. This enables the available space to be optimally used for codes (8 x 225 codes = 1800 codes) – events from smaller objects may be grouped with a single identifier, and several identifiers may be assigned for larger objects.

Event codes are programmed after the division is made. The DLOADX program (and corresponding service functions) shows all events assigned to the identifier, which facilitates correct programming of codes (the event code window shows only the fields for those codes which will be transmitted with the given identifier – see Figure 10).

System events and troubles are transmitted with their own identifier. Figure 11 shows the events assigned to this identifier.

**Notes:**

- The “Settings reset” event is caused by the service functions, which restore the factory settings of the system. A number transmitted in the Ademco Contact ID format informs which settings are reset (0 – control panel settings reset, 1 – reset of codes). Clearing of the event memory is transmitted with a separate code.
- The “RAM memory error” event informs of error(s) in the settings memory that is backed-up with a 3.6V battery. If the settings are stored in the FLASH memory, detection of this error forces “Module restart” that will be followed by “Settings restore”.
- “Module Restart” appears at each power supply connection.

- The INTEGRA control panel offers two types of a monitoring test: transmitting the “Periodical test of monitoring” event either every day at a specified time or after a preset time period from the last communication with the station (it is possible to activate the both types simultaneously). An additional transmission may be initiated with the user function, provided the “Manual transmission test” code is programmed”.
- Checking communication with the station is facilitated by the “Station XX test” function (in the “Tests” menu of the user functions), accessible after programming the station phone numbers, system event identifier and “Monitoring test” code. Calling of this function initiates monitoring, when the control panel displays on the keypad information on the current transmission phase and the test result.
- The event codes shown in Figures 10 and 11 are taken at random to illustrate an example of programming. They should be programmed as recommended by the monitoring station operating personnel.

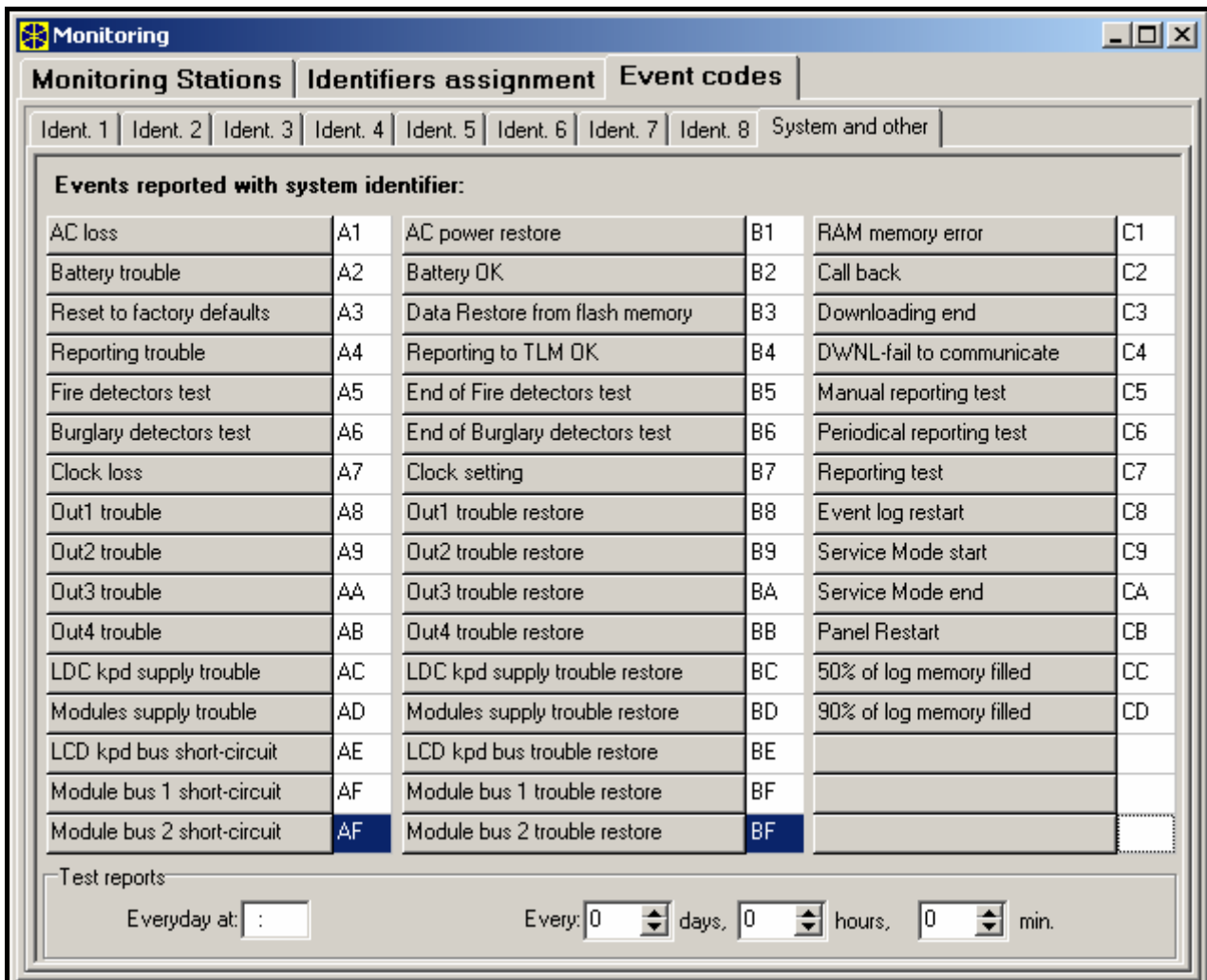


Fig. 11. System event codes.

## 4.8 MESSAGING

The messaging function built in the INTEGRA control panel makes it possible to notify of alarms with messages reproduced from voice synthesizers or transmitted to pagers. Messaging is performed independently from monitoring but monitoring has the priority. If in the course of messaging some events occur which must be reported to the monitoring station by the control panel, monitoring will be included in between the messages sent.



Messages may be transmitted to 4, 8 or 16 phone numbers (depending on the control panel type). It is possible to send up to 32 various voice messages and up to 64 different "pager" messages.

During voice messaging, it is possible to acknowledge the message receipt. A special code connected with a telephone number is used for this purpose (it is possible to set any code – four digits transmitted with DTMF denote receipt of a message). The control panel acknowledges the code receipt with a special signal. If there is a number of messages to transmit to a single phone number, all these messages are transmitted during a single connection. In this case, the signal confirming that the message is received is different (handshaking that informs that further messages are awaited).

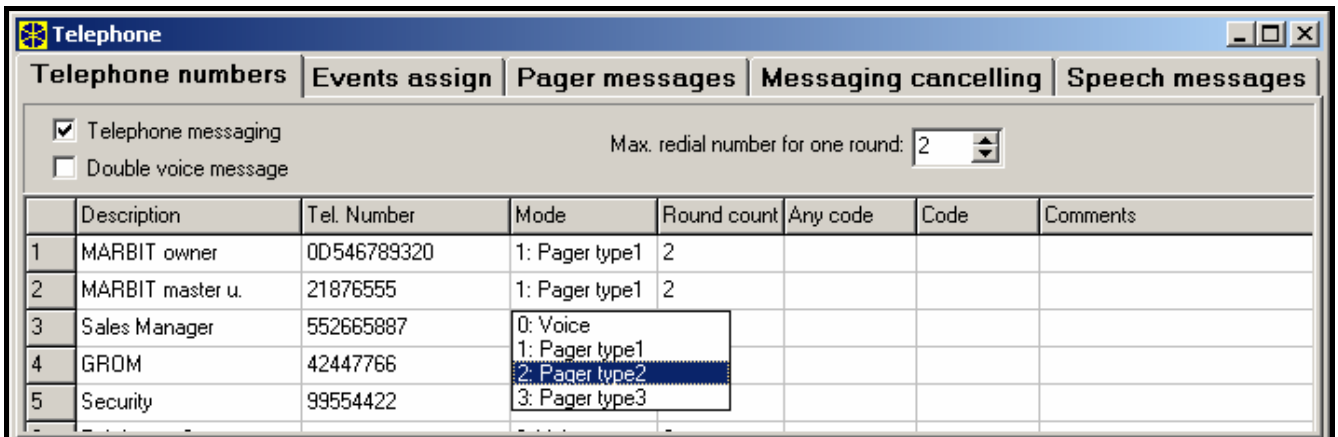


Fig. 12. Programming phone numbers for messaging.

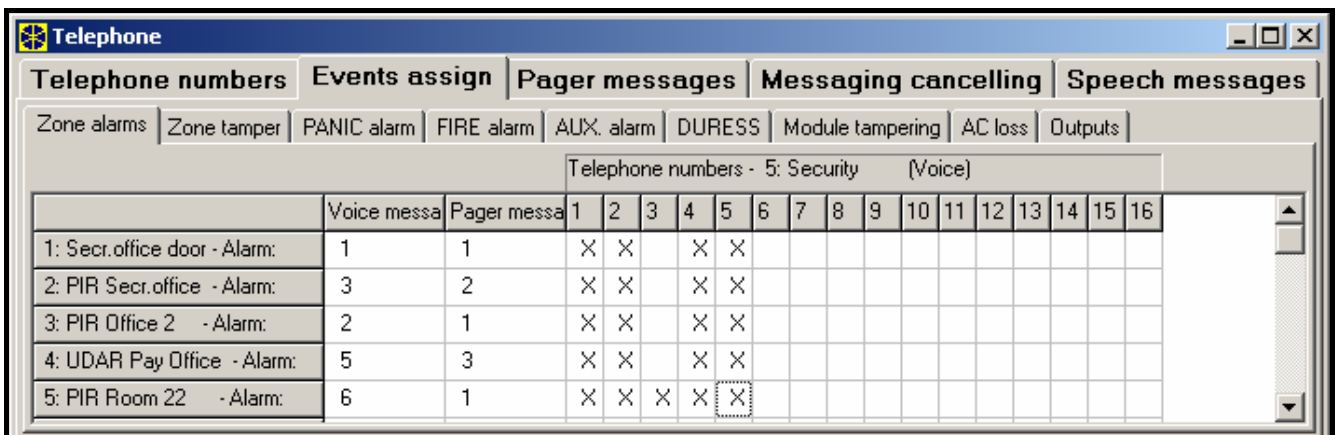


Fig. 13. Defining the way of communicating alarms from zones.

Since it is possible to define in detail how each alarm is to be communicated, the INTEGRA control panel allows to organize an additional monitoring, based on the messaging function, that operates simultaneously with the basic monitoring. The way of defining the rules of reporting the alarms from zones is shown in Figure 13. The rules of communicating the other alarms are programmed in much the same way. The messaging may also include information on AC supply loss.

**Note:** When reporting an alarm, the control panel performs a cycle of phone calls dialing all specific phone numbers in sequence. The numbers which confirmed alarm message receipt with a code are not dialed any more. The other phone numbers are continued to be notified according to the preset number of repeats.

In order to activate the messaging function you should:

1. Select the „Telephone messaging” option and set the maximum number of redials in one queue (from 1 to 7) if the number is busy.
2. If, after voice connection is established, the message is to be repeated twice, select the „Double voice message” option.

3. Program the telephone numbers to be notified, and set the following for each number:
  - description (up to 16 characters)
  - messaging mode (voice, pager)
  - number of queues (how many times the control panel will dial the given number - from **1** to **15**) – by default, zero is set, which means no telephone messaging
  - how the notification receipt is confirmed – select the „*Any code*” option or enter the confirmation code (to cancel subsequent dialing of the given number)
4. Set the following parameters for corresponding events which will initiate messaging:
  - number of voice message synthesizer (from 0 to 16 or 31)
  - number of pager message for test messaging (from 0 to 32 or 64)
  - numbers of telephones to which the messages will be sent.
5. Select partitions for each telephone number, from which the user will be able to cancel messaging.
6. According to the circumstances, set the „*Messaging canceling*” option to enable the telephone messaging to be canceled together with alarm canceling.

## 4.9 ANSWERING PHONE CALLS

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The INTEGRA control panel is provided with the function of answering external phone calls. Only the users, who are assigned a special “**telephone code**” (see: *Codes and users*) have access to this function. The panel can answer calls in one of two modes:

- **single calling mode** - the panel answers the call after a specified number of rings (if the code is incorrect, the control panel will not answer any incoming calls for 4 minutes);
- **double calling mode** – having dialed the control panel number, wait for the specified number of rings, then hang up and (within 3 minutes) redial the control panel number. After the redialing, the control panel should immediately answer the call.

For detailed information on answering the phone calls see the USER MANUAL.

### 4.9.1 CONTROL VIA TELEPHONE

The function of answering phone calls enables also the REMOTE SWITCH type outputs to be controlled (see: USER MANUAL). In order to start the CONTROL VIA TELEPHONE function do the following:

1. Select the „*Answering*” and „*Remote control*” options.
2. Define how the connection to the control panel should be established:
  - double call (if this option is not selected, the control panel will answer the call after the telephone number is first dialed),
  - rings before answer.
3. Where appropriate, select the partitions which must be armed so that the control is available (with a possibility to restrict access to the control). You may also skip this selection.
4. Program telephone access codes for the users who are to perform the control function (USER EDITING).
5. Program suitable outputs as remote switches.
6. Assign the REMOTE SWITCH outputs to the users so that they can effect the control.

**Note:** *Not all cellular telephones allow DTMF control.*

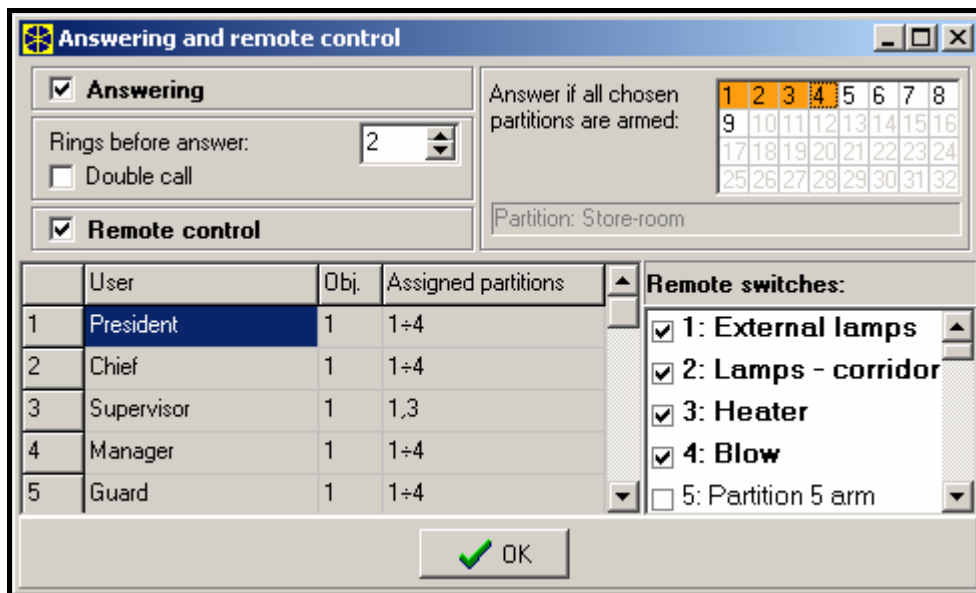


Fig. 14. Defining which remote switches may be controlled by users.

#### 4.10 CONTROL OF OUTPUTS FROM LCD KEYPAD

The control panel makes it possible to control from the LCD keypad the following types of outputs: MONO SWITCH, BI SWITCH and REMOTE SWITCH (see: USER MANUAL). To start the control function you should:

1. Program the parameters of control outputs (type, cut-off time, polarization).
2. Select how the output status will be indicated (standard or selected zone status).
3. Connect suitable devices to the outputs, and supply suitable signals to the zones indicating the equipment status.
4. Assign control outputs to the groups (4 groups can be created) and to the partitions from which triggering will be possible (telephone relays are not assigned to partitions).
5. Grant the CONTROL authority to the users who are to have access to this function, and assign partitions to trigger the controlling outputs.

#### 4.11 REMOTE CONTROL

Programming and control of the INTEGRA control panel are made possible by the use of two programs, i.e. DLOADX intended for the service (installer) and GUARDX intended for the user. Both programs work in Windows9x/ME/2000/XP environment.

The DLOADX program enables data to be exchanged between the computer and the control panel, and ensures convenient monitoring of the status of zones, partitions, outputs, module tampers, panel controlled doors, etc. For the purpose of programming, communication between the computer and the control panel can be established in several ways:

- direct connection via the RS-232 port of the alarm control panel mainboard,
- by means of telephone line via the control panel internal modem (this programming method makes available all the downloading functions, but as the transmission rate is limited to 300 bauds, it takes longer to perform the functions),
- by means of telephone line via an external modem connected to the RS-232 port on the control panel mainboard,
- through the GSM-4 communication module, used as an external modem (connected to the RS-232 port of the control panel mainboard), connecting to the computer via the GSM mobile telephone network,

**Note:** *The data transmission service (HSCSD/CSD - modem transmission) is usually available as part of the basic service pack offered by the cellular network operator, however before running the program it is advisable to make sure that you can use the network.*

- through the ISDN module used as an external modem (connected to the RS-232 port of the control panel mainboard), connecting to the computer via the ISDN digital telephone cable network.

The GUARDX program makes possible visualization of the protected facility on the computer monitor, operating the system from an independent on-screen LCD keypad, access to the event log, as well as creating and editing the system users. For the purpose of programming, communication between the computer and the control panel can be established in a number of ways:

- direct connection through the RS-232 port of LCD keypad - this operating mode can be used simultaneously on all connected LCD keypads,
- LAN/WAN network (TCP/IP communication) by means of the *GUARDSERV* program running on the computer connected to the RS-232 port of LCD keypad,
- by means of telephone line via an external modem connected to the RS-232 port on the control panel mainboard,
- through the GSM-4 or GSM LT-1 communication module, used as an external modem (connected to the RS-232 port of the control panel mainboard), connecting to the computer via the GSM mobile telephone network,
- through the ISDN module, used as an external modem (connected to the RS-232 port of the control panel mainboard), connecting to the computer via the ISDN digital telephone network.

**Note:** *In the telephone programming mode, access to the control panel is protected by a ten-byte code (over  $1.2 \times 10^{24}$  combinations). This ensures a very good safeguard against an attempt to break into the control panel by means of the telephone links. Additionally, the control panel is protected against attempts of scanning the access code – after three consecutive attempts to get access to the panel by using wrong codes during one session, the modem signal answering engine is disabled for 30 minutes.*

## 4.12 CONTROL PANEL STARTER

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The control panel software is stored in the FLASH memory so as to allow on-site programming (without removal of the memory chip from the control panel mainboard). The software consists of two parts: the STARTER program designed for programming the FLASH memory, and the control panel program. When the STARTER program is in use, the control panel normal functions are deactivated, the status of electronic circuit protectors only being monitored.

Operating status of the STARTER program is signaled by rapid blinking of the „DIALER” LED, corresponding message on all LCD keypads, and blinking of the LED indicators in keypads (partition keypads).

The programming mode of the STARTER program may be entered in two ways:

1. By calling it from the service mode function menu.
2. By power-up of the control panel with RESET pins shorted. Remove jumper immediately after the control panel has energized outputs supplying keypads and expanders (when the jumper is not removed before calling the control panel program by STARTER, downloading via RS-232 will be started or the control panel will enter the service mode).

**Notes:**

- *When the STARTER program is in the programming mode, the “STARTER is running...” message is displayed at LCD keypads. This signals readiness to operate with the FLASHX program (which should be started in the computer connected to the control panel mainboard via RS-232). If the STARTER program receives no command from the computer within 2 minutes, the control panel program will be restarted.*
- *When the control panel is connected to the computer, the STARTER program may be stopped by calling the “Restart CA-64” command in the FLASHX program (Ctrl-F2, then indicate the port, to which the control panel is connected).*

## 5. CONTROL PANEL INSTALLATION

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The control panel mainboard 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 board.



The INTEGRA control panel should be installed indoor, in spaces with normal air humidity. Permanent (not disconnectable) 230 VAC power supply with protective ground should be available on site. The telephone line must be made with the use of four-wire cable to enable the control panel to be connected before other equipment (telephone, fax, etc).

The control panels of INTEGRA series can be installed in the following housings:

- CA-64 OBU N (all panels),
- CA-10 OBU N (INTEGRA 24 and INTEGRA 32),
- CA-6 OBU N (INTEGRA 24 and INTEGRA 32).

**Notes:**

- *Prior to mounting the control panel housing, install mainboard fixing pins.*
- *When installing the housing, be careful not to damage cables which will pass through openings in the rear wall of the control panel housing.*
- *Switch off the mains / battery power supply when connecting LCD keypads and other components powered from control panel outputs.*

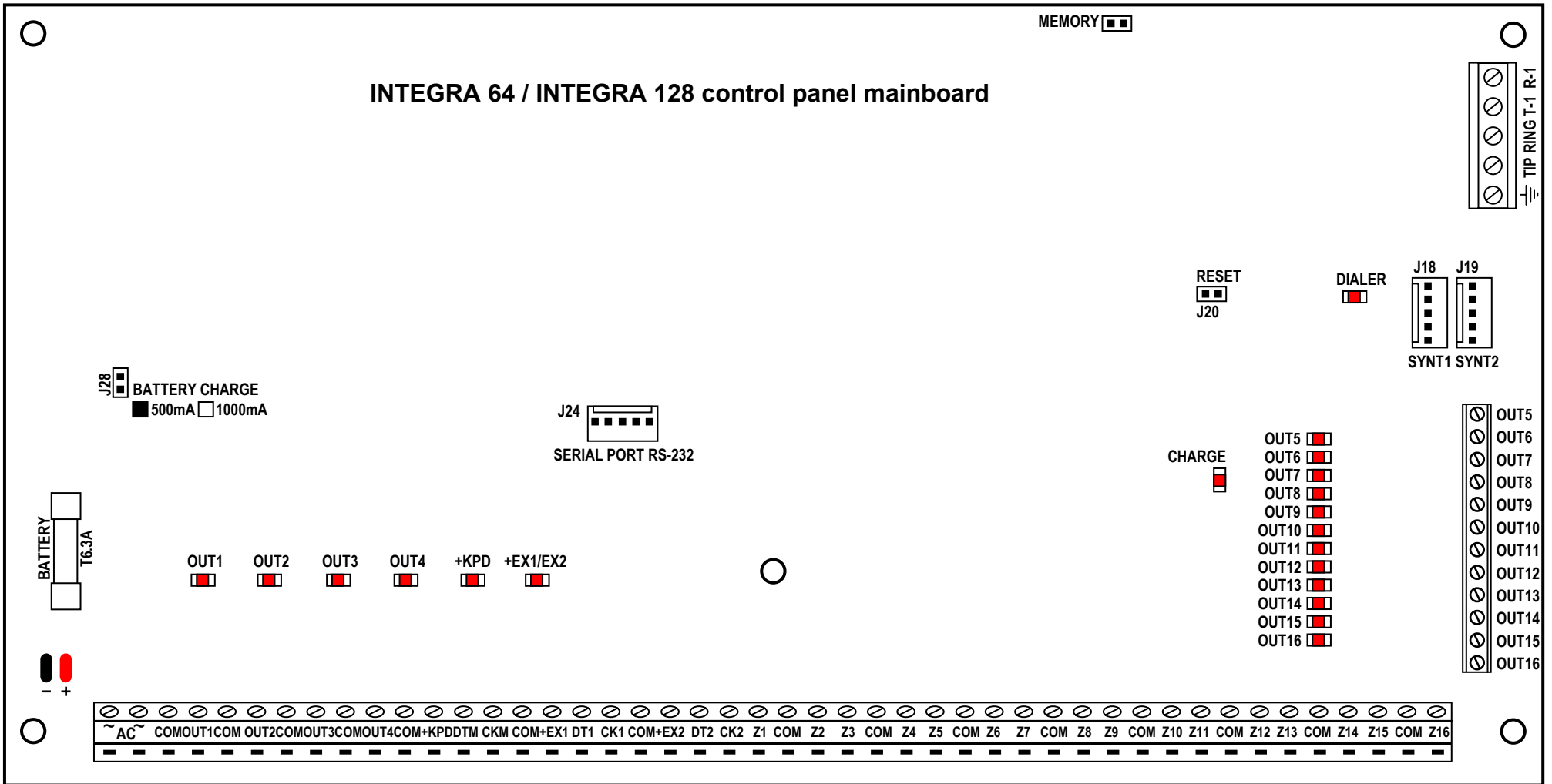
**CAUTION !**

The control panel is power supplied from 230VAC mains - any negligence or mistake in making wire connections may lead to electric shock and pose danger to life!

Be particularly careful when connecting the control panel. During installation and hook-up of the control panel the power supply cable must never be live!

# INTEGRA 64 / INTEGRA 128 control panel mainboard

MEMORY



J28 BATTERY CHARGE  
 ■ 500mA □ 1000mA

J24 SERIAL PORT RS-232

RESET  
 J20

DIALER

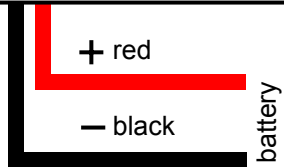
J18 J19  
 SYNT1 SYNT2

CHARGE

OUT5  
 OUT6  
 OUT7  
 OUT8  
 OUT9  
 OUT10  
 OUT11  
 OUT12  
 OUT13  
 OUT14  
 OUT15  
 OUT16

OUT5  
 OUT6  
 OUT7  
 OUT8  
 OUT9  
 OUT10  
 OUT11  
 OUT12  
 OUT13  
 OUT14  
 OUT15  
 OUT16

~ AC ~ COM OUT1 COM OUT2 COM OUT3 COM OUT4 COM +KPD DTM CKM COM +EX1 DT1 CK1 COM +EX2 DT2 CK2 Z1 COM Z2 Z3 COM Z4 Z5 COM Z6 Z7 COM Z8 Z9 COM Z10 Z11 COM Z12 Z13 COM Z14 Z15 COM Z16



Board terminals:

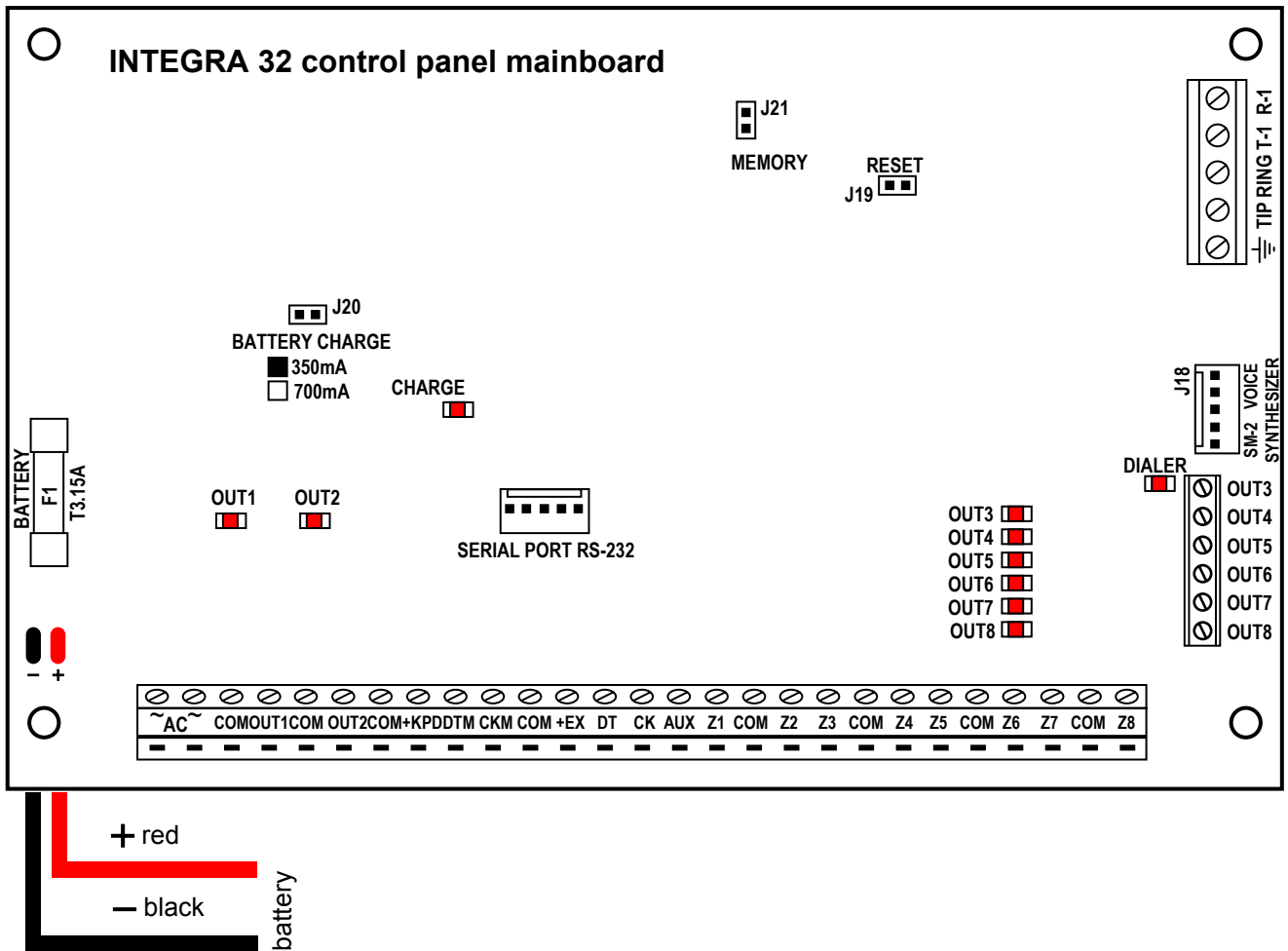
- AC** - power supply inputs (20V AC)
- Z1 to Z16** - zones
- OUT1 to OUT4** - high-current outputs
- OUT5 to OUT16** - low-current outputs
- DTM, CKM** - keypad bus
- DT1, CK1** - expander bus 1
- DT2, CK2** - expander bus 2
- COM** - common ground

**T-1, R-1**

**TIP, RING**

**+KPD, +EX1, +EX2**  
**SYNT1, SYNT2**  
**RS-232**

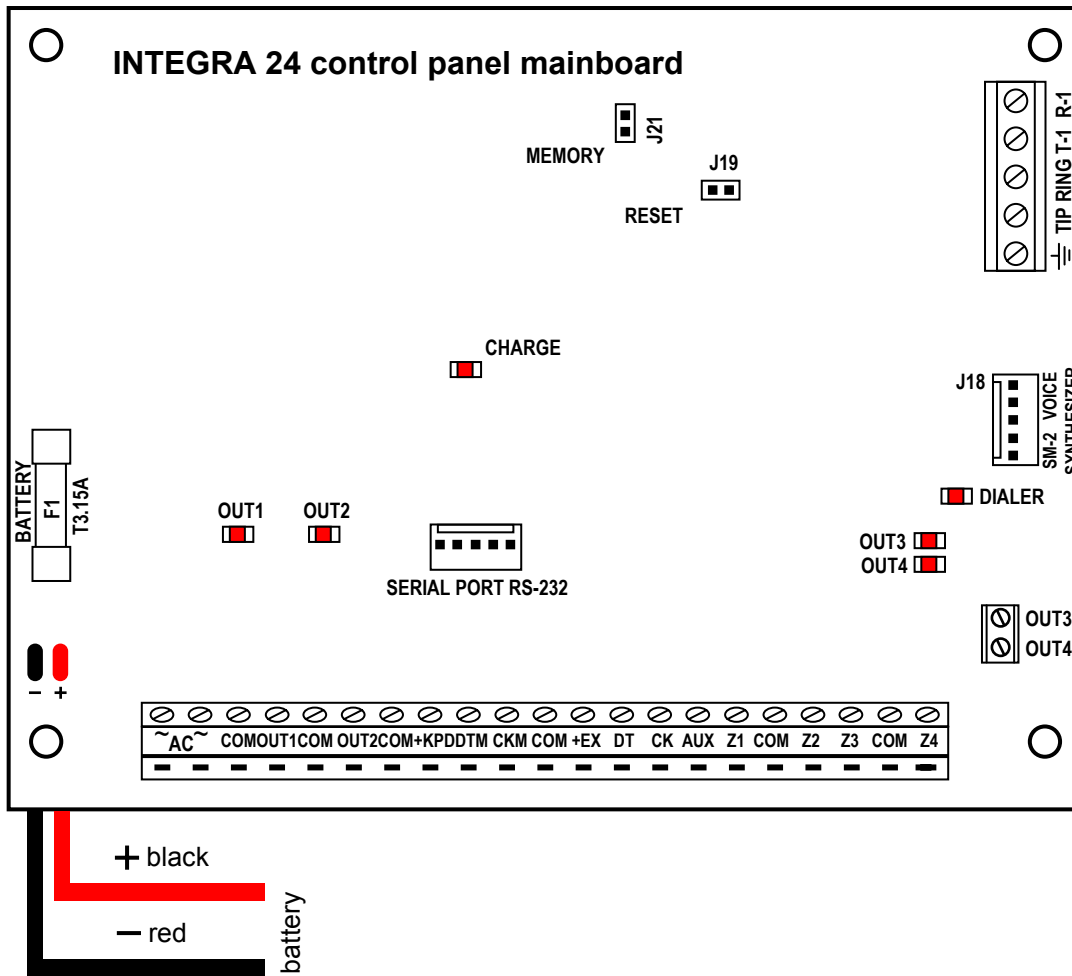
- extension telephone line (telephone set connection)
- public telephone line (analog)
- protective terminal - ground (connect to protective circuit only)
- supply outputs (+12V)
- connectors for voice synthesizers
- connector for service computer



Board terminals :

- ~ AC** - supply inputs (18V AC)
- Z1 do Z8** - zones
- OUT1, OUT2** - high-current outputs
- OUT3 do OUT8** - low-current outputs OC
- DTM, CKM** - keypad bus
- DT, CK** - expander bus
- COM** - common

- T-1, R-1** - extension telephone line (telephone set connection)
- TIP, RING** - public telephone line (analog)
- ⏏** - protective terminal - ground (connect to protective circuit only )
- +KPD, +EX, AUX** - supply outputs (+12V)
- SM-2 VOICE SYNTHESIZER** - connector for voice synthesizer
- RS-232** - connector for service computer



Board terminals :

- ~ AC** - supply inputs (18V AC)
- Z1 do Z4** - zones
- OUT1, OUT2** - high-current outputs
- OUT3, OUT4** - low-current outputs OC
- DTM, CKM** - keypad bus
- DT, CK** - expander bus
- COM** - common

- T-1, R-1** - extension telephone line (telephone set connection)
- TIP, RING** - public telephone line (analog )
- protective terminal - ground (connect to protective circuit only)
- +KPD, +EX, AUX** - supply outputs (+12V)
- SM-2 VOICE** - connector for voice synthesizer
- SYNTHESIZER** - synthesizer
- RS-232** - connector for service computer

### 5.1 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.


#### CAUTION!

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



### 5.1.1 DESCRIPTION OF ELECTRIC CONNECTIONS

- Connect the 230V alternating voltage leads to the transformer terminals marked „**0 - 230V**”.
- Connect the terminals of the transformer secondary winding to the “~**AC**” terminals on the control panel mainboard (“0 - 18V” or “0 - 20V”, depending on the type of housing).
- 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.

The INTEGRA panel mainboard can also be connected to an electric shock protection circuit (grounding). The protective cable terminal is designated by the  symbol. 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.

**Depending on the mainboard, the power supply unit is designed for 18V or 20V input voltage.**

Be careful not to cause overloading of the control panel power supply in the security 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 for particular INTEGRA mainboards.

Stabilized voltage of the control panel power supply is factory set at 13.6 – 13.8V and should not be changed.

### 5.1.2 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.

**Note:** *If during the control panel battery operation the voltage drops to approximately 11V, the control panel will report a battery failure. After the voltage drop to approx. 9.5V, the control panel disconnects the battery (the system is stopped).*

2. Connect the 230VAC mains supply – the control panel starts operating.

The above mentioned power-up sequence (battery first, then 230VAC mains) will enable the power supply unit and control panel electronic protection circuits to work properly, thus avoiding any defects of the alarm system components caused by possible installation errors. Modules fitted with their own power supply should be started in much the same way.

**Caution:** *Should a situation occur when total disconnection of control panel power supply is necessary, disconnect in turn the mains and the battery. When reconnecting the power supply, observe the above mentioned sequence (first the battery, then the 230VAC mains).*

After all electrical connections are made and checked for correctness, you may proceed to starting the system. It is recommended that operation with the control panel begin without sirens connected, the high-current outputs being loaded with 2.2kΩ resistors. The sirens may only be connected after completion of parameter programming for the installed alarm system. For systems with extension modules having their own power supply, it is recommended that the control panel be started first, and then successively the other system components.



**CAUTION !**

Since the control panel is not provided with main switch to disconnect mains, it is important to instruct the alarm system owner or user on how to disconnect it from mains (e.g. by showing the fuse which protects the control panel power supply circuit).

**5.2 CONNECTING LCD KEYPADS**

Up to eight independent LCD keypads, intended for control and programming of the alarm system, may be connected to the INTEGRA control panel. All the LCD keypads dedicated to the INTEGRA control panel ensure full control of the panel and can be installed in one alarm system. Where several keypads are connected to the control panel, they should be connected in parallel. Since keypad bus data are addressed, all keypads operate independently.

The keypads are to be connected to COM, +KPD, DTM and CKM terminals. The +KPD output makes it possible to supply all keypads (this output is provided with electronic circuit breaker). Each keypad must be connected with a separate cable (a typical unscreened cable is recommended). Maximum distance between keypad and control panel can be up to **300m**.

To ensure correct operation of the keypads it is important that the cable resistance be kept as low as possible. For example: depending on the distance between the keypad and the control panel, the number of parallel-connected wires for particular signals (with the DY8x0,5 cable), must be as indicated in the table below.

DISTANCE \ SIGNAL	NUMBER OF WIRES FOR DY8x0,5 CABLE			
	+KPD	COM	CKM	DTM
up to 100m	1	1	1	1
up to 200m	2	2	1	1
up to 300m	4	4	2	2

**Notes:**

- *CKM, DTM and COM leads must be in the same cable!*
- *Supply voltage measured at the LCD keypad terminal block, with the backlighting on, must not be lower than 11V.*
- *Keypads installed far from the control panel may be supplied locally from an independent power source. They are connected to the system by means of CKM, DTM and COM signals.*

TERMINALS DESCRIPTION						
<b>KEYPAD</b>	KPD	DTM	CKM	COM	Z1 – to detector	Z2 – to detector
<b>PANEL</b>	+KPD	DTM	CKM	COM	ADDITIONAL SYSTEM ZONES	

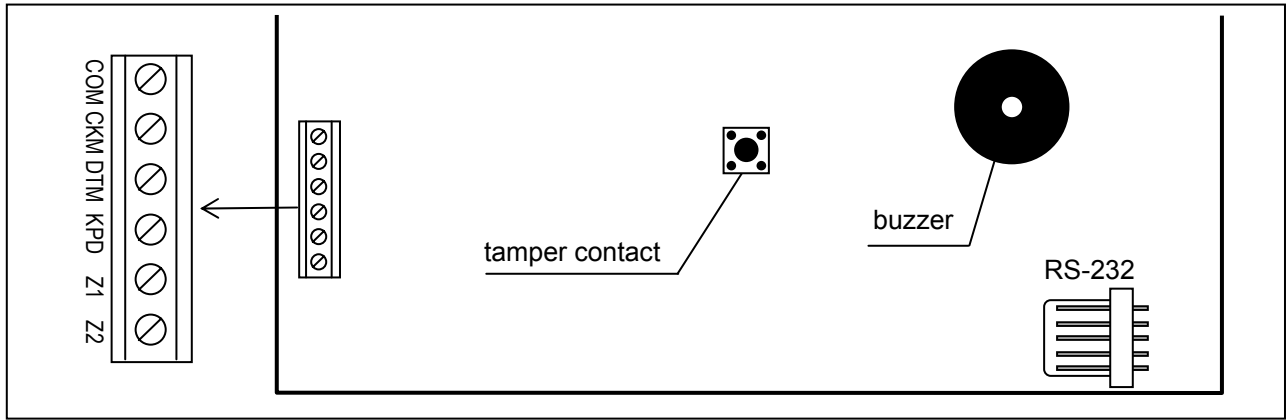


Fig. 17. INTEGRA KLCD keypad board.

The control panel identifies the keypads by their programmable addresses, which are saved in EEPROM (non-volatile memory).

The addresses must not be repeated ! The keypad address also indicates the numbers under which the keypad supervision zones Z1 and Z2 appear in the system. They are supported by the control panel in the same way as the mainboard zones.

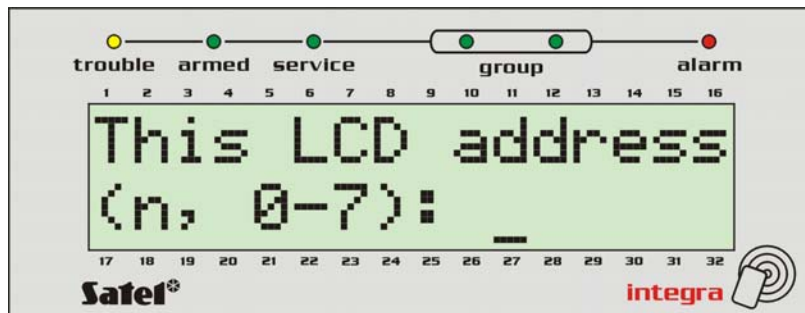
Keypad address	Numbers of <b>Z1, Z2</b> zones in security system							
	INTEGRA 24		INTEGRA 32		INTEGRA 64		INTEGRA 128	
	Z1	Z2	Z1	Z2	Z1	Z2	Z1	Z2
0	5	6	25	26	49	50	113	114
1	7	8	27	28	51	52	115	116
2	21	22	29	30	53	54	117	118
3	23	24	31	32	55	56	119	120
4					57	58	121	122
5					59	60	123	124
6					61	62	125	126
7					63	64	127	128

**Note:** If expanders are connected, a situation may occur that the zone numbers of the keypad and the expander coincide. If this is the case, select the option in the keypad settings to define whether the detector is to be connected to keypad zone or expander zone (→Structure; →Hardware; →Keypads; →Settings; →Keypad name (from list) →Z1 / Z2 (selection of options and settings)).

The keypad address can be programmed in two ways:

1. Directly (skipping the control panel service code), to do so:

- Turn off the keypad power supply +KPD and the data bus wires (CKM, DTM).
- Short the keypad terminals CKM and DTM.
- Turn on keypad power supply.
- The following text will be displayed:



n=0...7, current address of the keypad

Fig. 18. Programming the keypad address

- Enter a new address from the 0-7 range. The keypad will acknowledge performance of the function with four short and one long beeps. To change the address again, press the [\*] key.
  - Connect the keypad to the control panel as required (CKM, DTM).
2. By using the control panel service function; to do so:
- Activate the panel service mode (from any supported keypad): [SERVICE CODE][\*], →Service mode.
  - Select in turn the items from the menu of displayed functions:  
→Structure; →Hardware; →Identification; →Keypad addr.
  - A message will appear on the displays of all keypads as shown in Figure 18.
  - Enter the appropriate address from the 0-7 range; the keypad will acknowledge performance of the function with four short and one long beeps; then, press the [\*] key - the keypad will quit the address change function, and the control panel will end the service mode.

### Notes:

- For the LCD keypads to be properly supported by the INTEGRA control panel, the keypad identification function must be performed after setting the keypad addresses.
- Setting the same address in several keypads will trigger the tamper alarm, and also will display the „This keypad is changed” message and disable operation of such keypads. To restore the operation of keypads, change their repeating addresses into unique ones. The changes can be made as described herein (point 1).

If properly connected, the keypad reports its restart and displays a date and clock or name, while incorrect connection is signaled by displaying the “No communication with control panel” message.

System control is only possible after the *Identification of keypads* service function is performed. This function checks the addresses to which keypads are connected and registers them in the system. Disconnection of a keypad registered in the system will trigger the tamper alarm. Any commands from a keypad not registered by the control panel are rejected (and the “Keypad is not serviced” message appears on the keypad display).

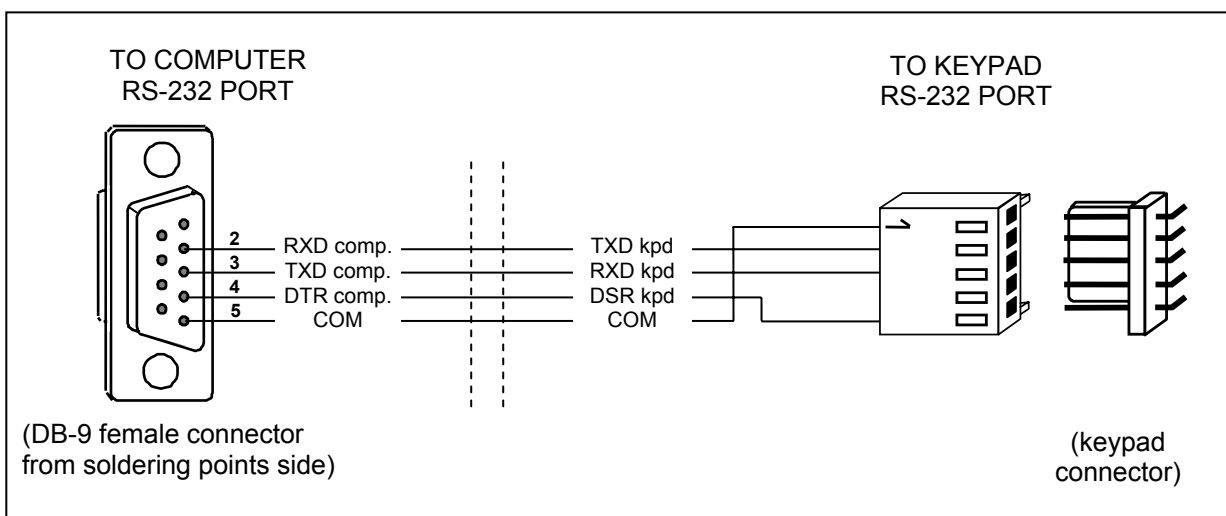


Fig. 19. Connecting computer to LCD keypad RS-232 port.

**The keypad RS-232 port** is designed for connecting the user's computer. The cable should be connected to one of the computer RS-232 ports (e.g. COM1 or COM2). Data received from the keypad are used by the GuardX program, which makes it possible to control the system by means of a computer (virtual keypad, editing users and their authority level) as

well as supervise the facility (a site plan showing status of partitions and detectors, review of events log).

Connection to the computer is permanent, made with the use of an ordinary unscreened cable. For a DY8x0,5 cable, the distance between the computer and the keypad can be up to **10 meters**. Keypad connector signals are shown in Figure 19.

**Note:** *Activate the “RS communication” option in parameters of keypads to which the user’s computer is to be connected. Data exchange with the computer begins automatically when the GuardX program is started.*

Each LCD keypad has an individual name and a set of parameters which determine its way of operation in the system. These are:

- **Partitions managed by keypad** – partitions which can be armed/disarmed or alarm in which may be cancelled from the keypad. Control will be possible for the users who have access to indicated here partitions. When any of the indicated partitions is armed, the keypad LED *ARMED* blinks. When all partitions specified here are armed, this LED lights steadily.
- **Alarm indication** – list of partitions for which a burglary/fire alarm will be shown in the keypad. The alarm will be indicated by the *ALARM* LED and a message on the display (provided that the “Partitions alarm messages” option is active). An additional option determines whether the alarms are signaled audibly.
- **CHIME signal** – list of zones, violation of which generates audible keypad alarm. This signal, as well as key sounds and exit delay signaling can be automatically disabled after violation of selected zone for a time period not exceeding 255s.
- **Quick Arm** – partitions which will be armed after pressing [0][#] on the keypad.
- **Time indication** – the keypad can display the entry/exit delay countdown in the partitions served. Additional options make it possible to define whether the alarm is to be audibly signaled.
- **Keypad zones** - each LCD keypad is provided with two zones which can be used in the security system. These are zones 49 and 50 for the keypad with address 0, and zones 51 and 52 for the keypad with address 1, and so on, up to zones 63 and 64 for the keypad with address 7. These zones can be also accessible in a zone expansion module, if the maximum number of zone modules are connected. Options make it possible for each of the keypad zones to determine whether or not it will be used in the keypad.
- **Auto-backlight** – determines whether the automatic illumination of the keypad is to come on after the particular system event, i.e. start of the entry delay countdown in the selected partition, or violation of the selected zone.
- **Date/Time format** - permits selecting the format of time and date display on the keypad.
- **LCD Backlight** - selection of the display backlighting type.
- **Keys backlight** - selection of the keypad backlighting type.
- **Alarm messages** - the options define whether text messages on alarms in partition and zones are to be shown (the message contains name of partition/zone).
- **Alarms** – the options determine if the following alarms can be called from the given LCD keypad:
  - FIRE - fire alarm triggered by holding down the [\*] key,
  - PANIC - panic alarm triggered by holding down the [#]key,
  - AUX. – auxiliary (medical) alarm triggered by holding down the [0] key.
  - 3 wrong codes - alarm triggered by entering wrong access codes three times.

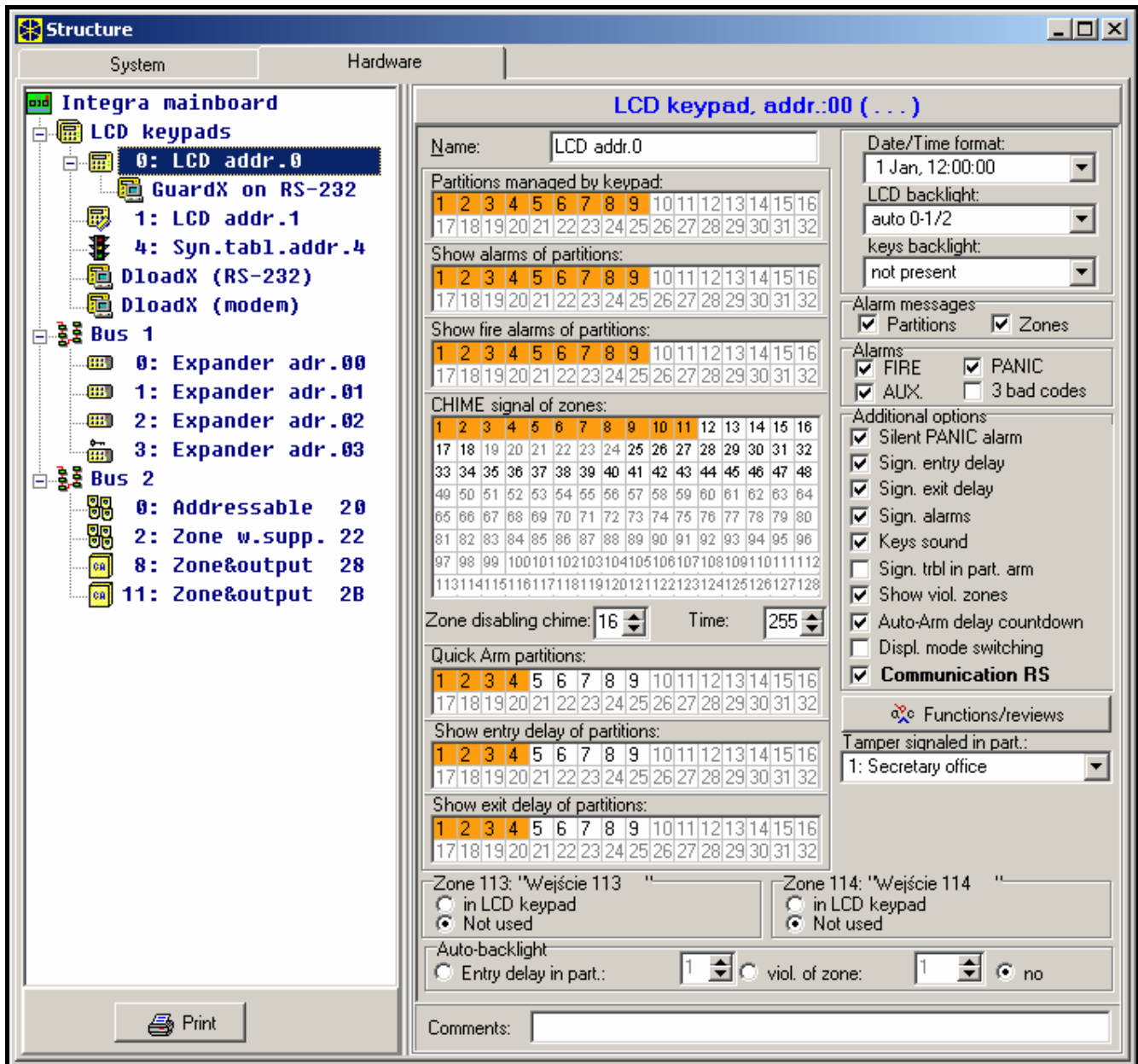


Fig. 20. Parameters defining LCD keypad operation.

- **Additional options** – a set of additional options for activating some functions of the keypad:
  - *Silent PANIC alarm* - determines if the panic alarm called from the LCD keypad will be indicated as a silent alarm (with no signaling on alarm outputs) or as a normal, audible alarm
  - *Signaling entry delay* - determines whether the entry delay counting will be signaled by sound on the keypad
  - *Signaling exit delay* - determines whether the exit delay counting will be signaled by sound on the keypad
  - *Signaling alarms* - determines whether the LCD keypad will signal the alarm by sound
  - *Key sounds* - determines whether pressing the keypad keys will be confirmed by sounds
  - *Signaling troubles in partially arm* - determines whether the keypad will indicate system troubles (yellow LED) if some of the served partitions are armed (when all partitions are armed, troubles are not indicated)
  - *Show violated zones* – enabling the option means that the zones signaling CHIME in the keypad will be shown together with their name

- *Auto-Arm delay countdown signaling* - activates audible signaling of the countdown to arming the partitions by timer (the signaling continues for the partition auto-arming delay time)
- *Display mode switching* – enabling the option makes it possible to switch over the display mode from system status to all-partition status by holding down the key "9"
- *Communication RS-232* - determines whether the keypad RS-232 port is enabled to interface with the GuardX program - with this option enabled, it is possible to program the settings of the computer “virtual” keypad accessible from the GuardX program
- **Functions/reviews** – options which make it possible to:
  - program the access to key functions („press and hold down” type) – for scrolling through system memory and status;
  - define the characters to signal the status of zones and partitions in the viewing functions;
  - select partitions the status of which will be permanently shown on the display;
  - assign the user functions to arrow keys (to be performed after entering the code and pressing the corresponding arrow).

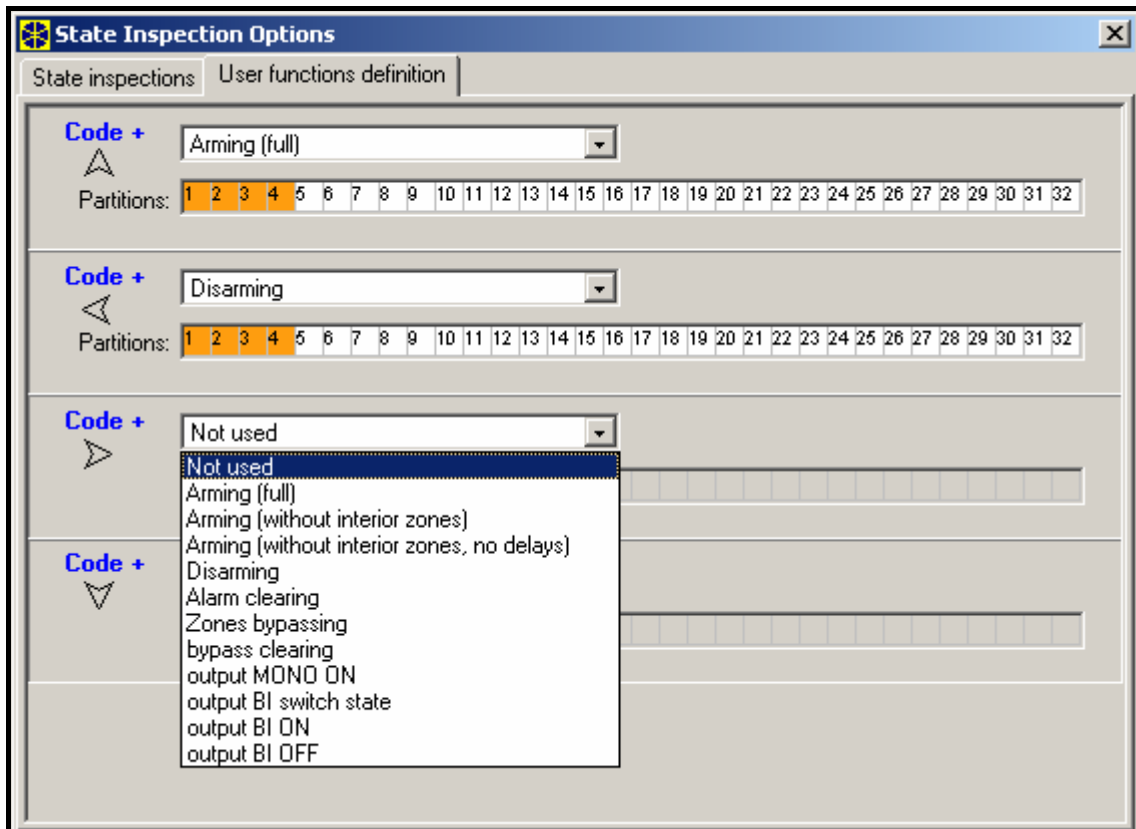


Fig. 21. Programming arrow functions.

- define reaction of a keypad with built-in reader to bringing closer / holding a card, or to an attempt to read in an unregistered card

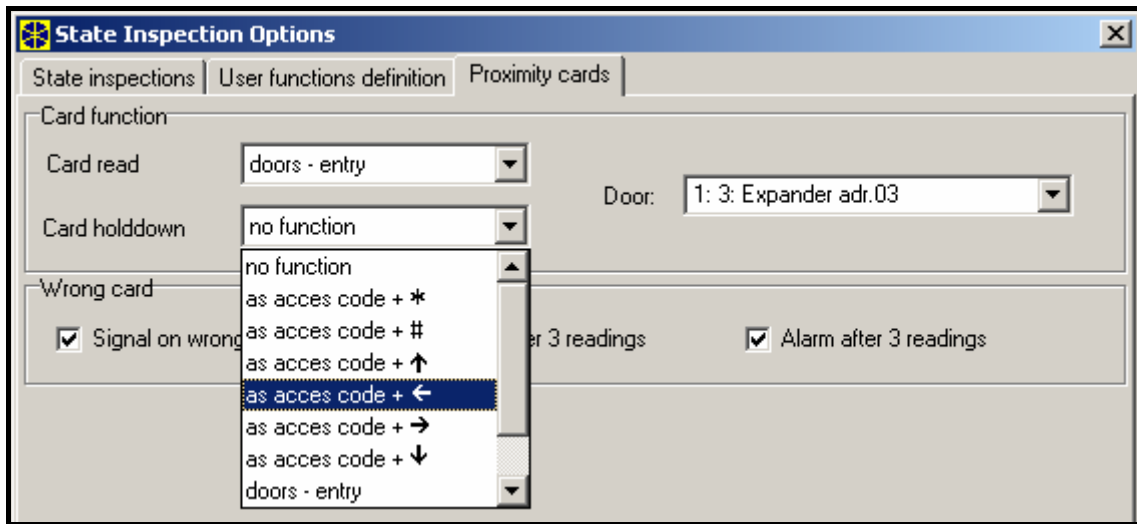


Fig. 22. Handling proximity cards.

- **Tamper signaled in partition** – defines the partition where alarm will be signaled after violation of the keypad tamper circuit and disconnection of the keypad from the system.

**Note:** It is also possible to connect the CA-64 PTSA synoptic board to the control panel keypad bus. It should be borne in mind that the synoptic board working in the keypad mode may not have an address identical with that of any keypad in the system or another synoptic board working in the keypad mode (see also. CA-64 PTSA manual).

### 5.3 CONNECTION OF EXPANSION MODULES

The INTEGRA control panels are provided with one or two buses designed for connecting the expansion modules (expanders). Both buses in the INTEGRA 64 and INTEGRA 128 control panels have the same priority and can be used in parallel (it is irrelevant which modules are connected to each bus). All modules are connected in parallel, and up to 32 modules may be connected to each bus.

Data exchange is carried out via DT1 (DT), CK1 (CK), and COM on the first bus, and via DT2, CK2 and COM on the second bus. Additionally, separate terminals for supplying the modules are provided in the mainboard connectors.

The modules may be connected with the use of a typical unscreened cable used in alarm systems (for example, DY8x0,5). The DT, CK and COM signals of each bus should be supplied by one cable (not by separate cables). For small distances (up to 100 meters), when modules only are connected to the power supply cable, it is permissible to connect some modules one after the other (see Fig. 23). Additional equipment connected to the power supply source must be supplied through separate cables (detectors connected to modules A and B).

**Note:** Connection of a fourth module after module C is not recommended when a DY8x0,5 cable is used. The module connected in this way may be not recognized by the control panel. Resistance of cables at DT and COM may result in the logic level "0" at the control panel input being higher than the maximum allowable level.

For large distances between the control panel and modules (up to **1000m**), modules should not be powered from the control panel, and **DT**, **CK** and **COM** signals should use **2-wire** cable. Additionally, the DT, CK and COM signals must be in one cable. It is possible to connect several modules in parallel and connect them to a single common cable leading to the control panel (Fig. 24). For example, when the distance from the control panel to the cabling node is 800m and the distance from the cabling node to the module is less than 100m, it is possible to connect up to 16 modules.



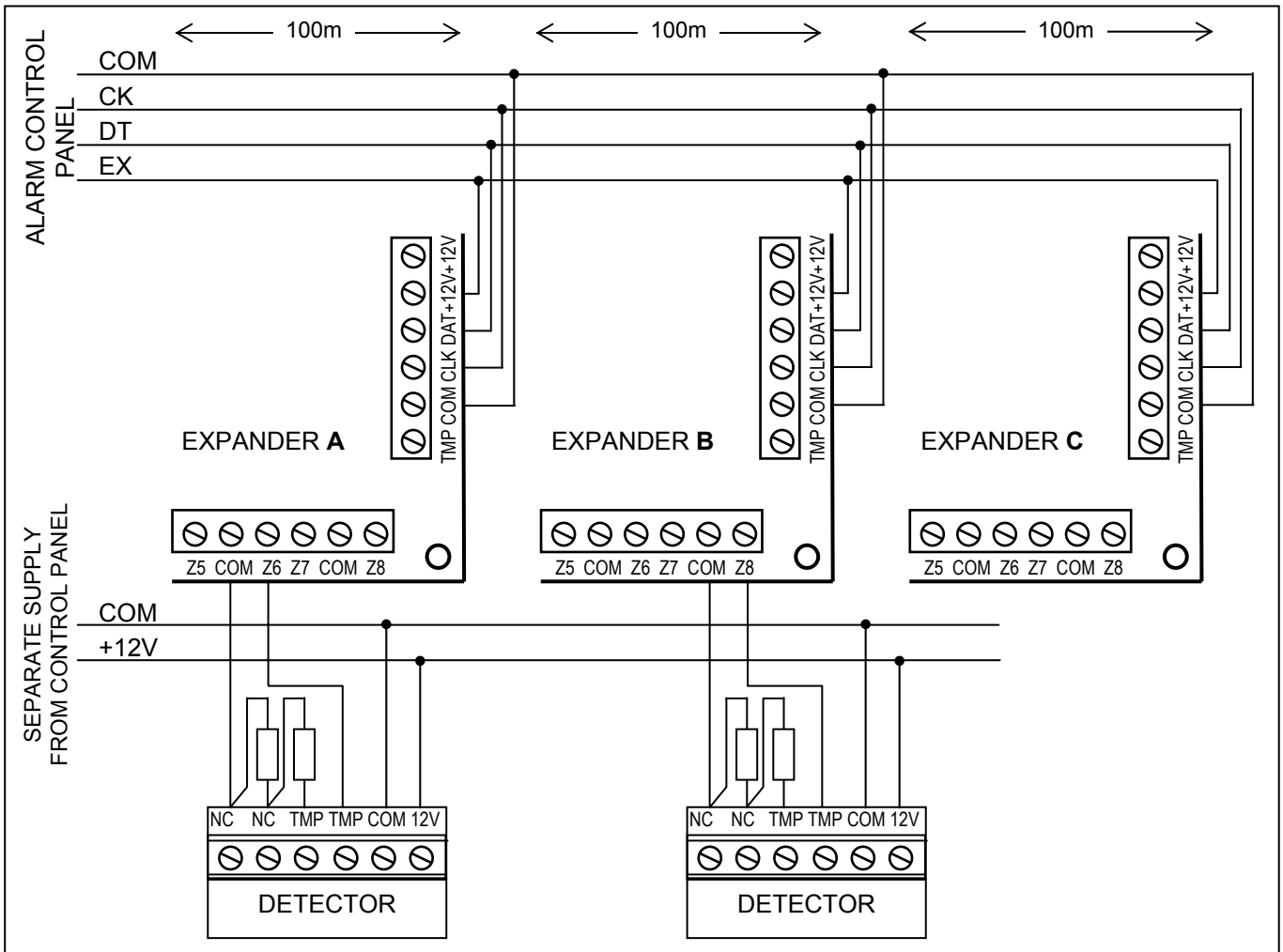


Fig. 23. Correct connection of modules at small distances between control panel and modules, and the way of connecting detectors.

The expansion modules can also be mounted in metal housings, type **CA-64 OBU-EXA**, or plastic housings, type **OPU-1A**.

Each module connected to the bus should have its own, unique address from the 0 ÷ 31 range (decimal). It is irrelevant which addresses are set for individual modules (when identifying the modules, the control panel receives information on the module type and automatically sets an optimum sequence of calling the modules for data). The address is set by means of DIP-switches on keypad electronics boards. The expander addresses are displayed in the keypad in hexadecimal format. The addresses of modules connected to the first expander bus remain within the range from **00** to **1F**, and those of modules connected to the second bus - within the range from **20** to **3F**.

The control panel handles the modules registered in the system by means of the *Identification of expanders* service mode function. This function determines expander addresses and types. Additionally, it sets a special random generated marker by which the module confirms its presence in the system. This marker is stored in module non-volatile EEPROM memory, and it may be changed in a next identification process only. For this reason, each module replacement, address change and change of module type under given address require running of the identification function again.

**Notes:**

- The control panel does not handle the module unless the identification function is completed with the "Found xx exp. (yy new)" message.

- A wrong module connection can make the correct identification of modules impossible, which is signaled by the message: "Error! Two expanders have the same addr. !".
- Too high resistance of cables connecting the module to the control panel (large distance, too small number of wires for a single signal) may result in the module being not recognized by the identification function.
- When modules are served by the control panel, the LEDs on modules of zones, outputs, synthesizers (etc., which are provided with operation signaling for service only) change their status.

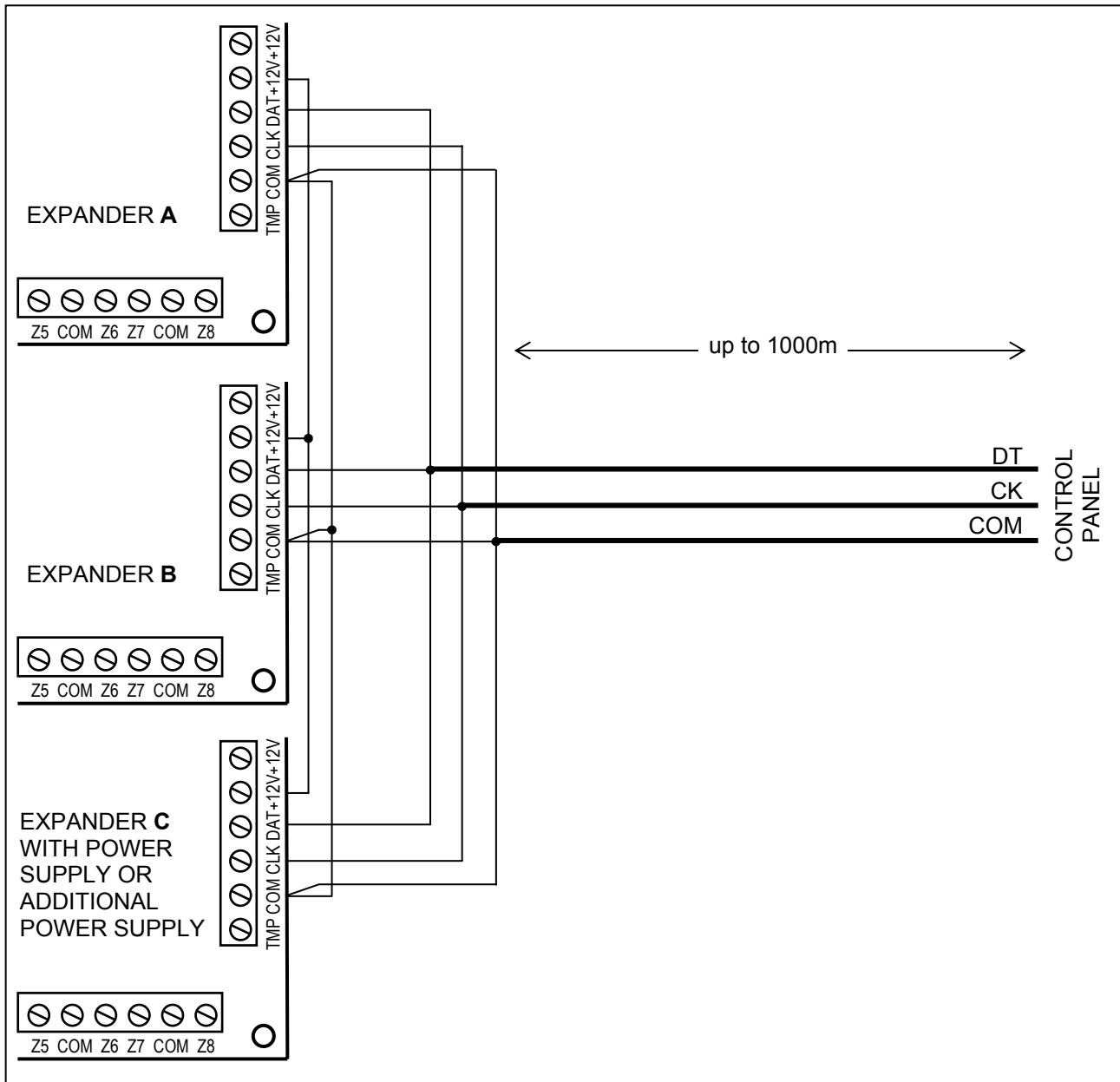


Fig. 24. Connection of module group located far from the control panel.

## 5.4 CONNECTION OF DETECTORS

The INTEGRA can operate with any detectors. Each control panel zone and zones of LCD keypads and zone modules may operate in the following configurations:

- NC (normally closed),
- NO (normally open),
- EOL (end of line resistor),
- 2EOL/NO (NO type detector, double end of line resistor),

- 2EOL/NC (NC type detector, double end of line resistor).

When a zone operates in the EOL configuration, use **2.2 kΩ** resistor to close the detector circuit.

For the 2EOL zones, the detector circuit is closed with two resistors **1.1kΩ**. The 2EOL type zones allow the control panel to simultaneously control the detector status and its tamper contact.

Any output with electronic protection (from OUT1 to OUT4) may be used to power detectors. This output should be programmed as POWER SUPPLY OUTPUT. For larger systems with additional power supply with high capacity batteries, detectors are powered from external power sources.

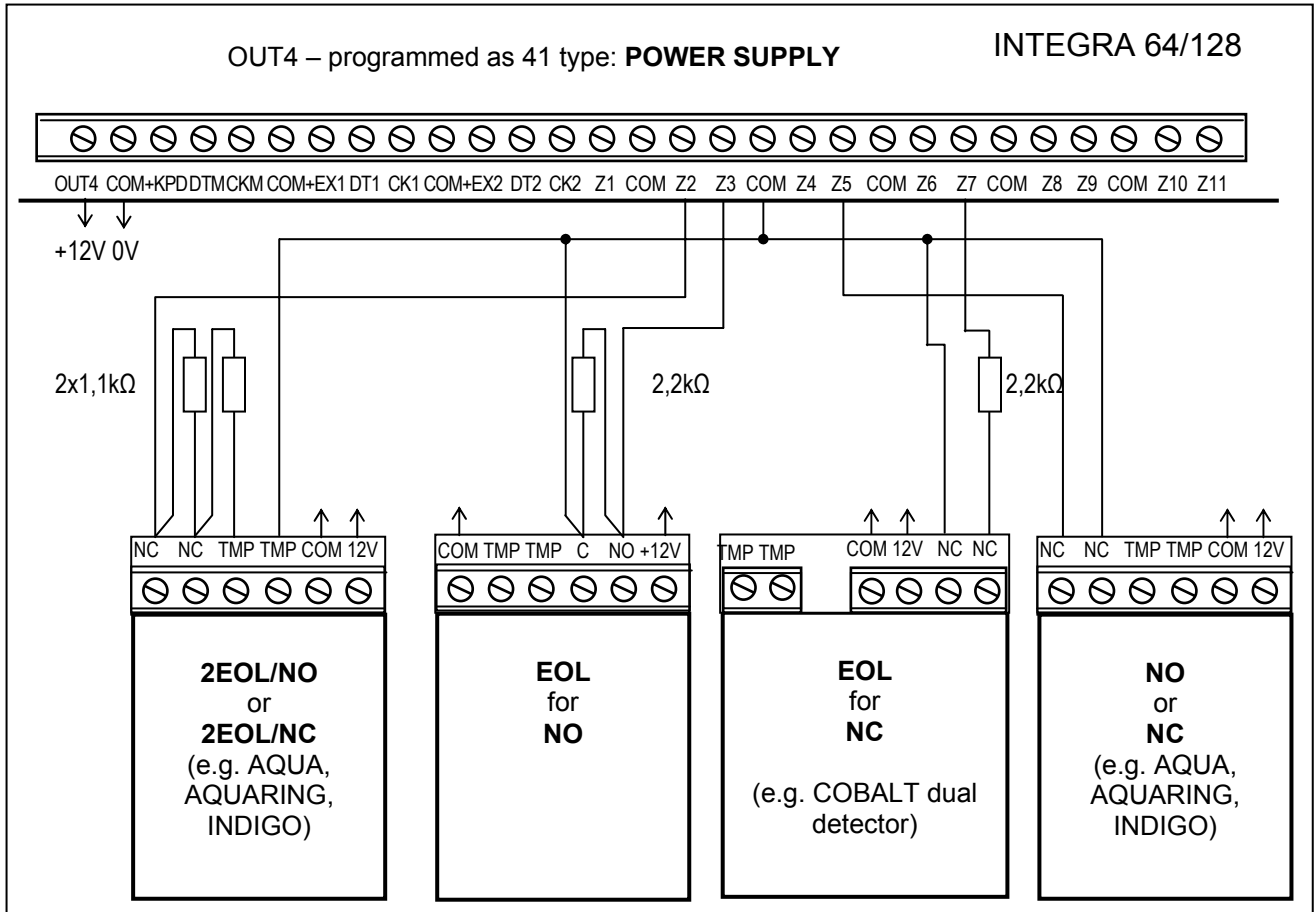


Fig. 25. Example of connecting 4 detectors in various configurations (with Z6 tamper circuit).  
 Figure 25 shows how to connect detectors to zones working in various configurations. Separation of the grounds of detector power supply and signal informing of the status of detector connected to the control panel monitoring zone, eliminates the influence of the resistance of wires on the detector status detection. Assuming that only one detector is connected to the cable and the cable is not very long, the installation may be simplified by leading a common single wire for power supply ground (COM) and signal ground (COM).  
 The NO and NC detectors in 2EOL configuration are connected in the same way, it is only important to properly indicate to the control panel which detector is connected to the zone (2EOL/NO or 2EOL/NC).

**Note:** The recommended power supply circuit for detectors connected to expanders is shown in section "Connection of expansion modules".

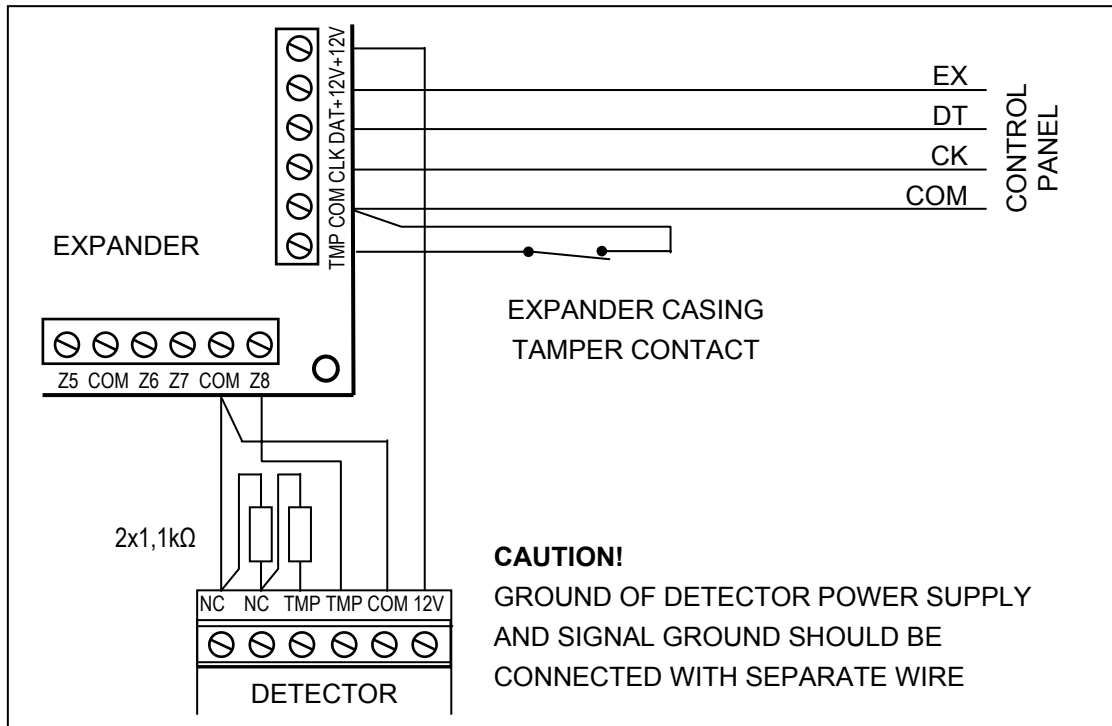


Fig. 26. Connection of 2EOL detector to the expander at a small distance between the control panel and the expander (detector is located far from the expander).

### 5.5 CONNECTION OF SIRENS

The INTEGRA control panel is provided with 16 programmable application outputs. In order to connect a siren to the control panel, it is necessary to set this output as an "alarm" output.

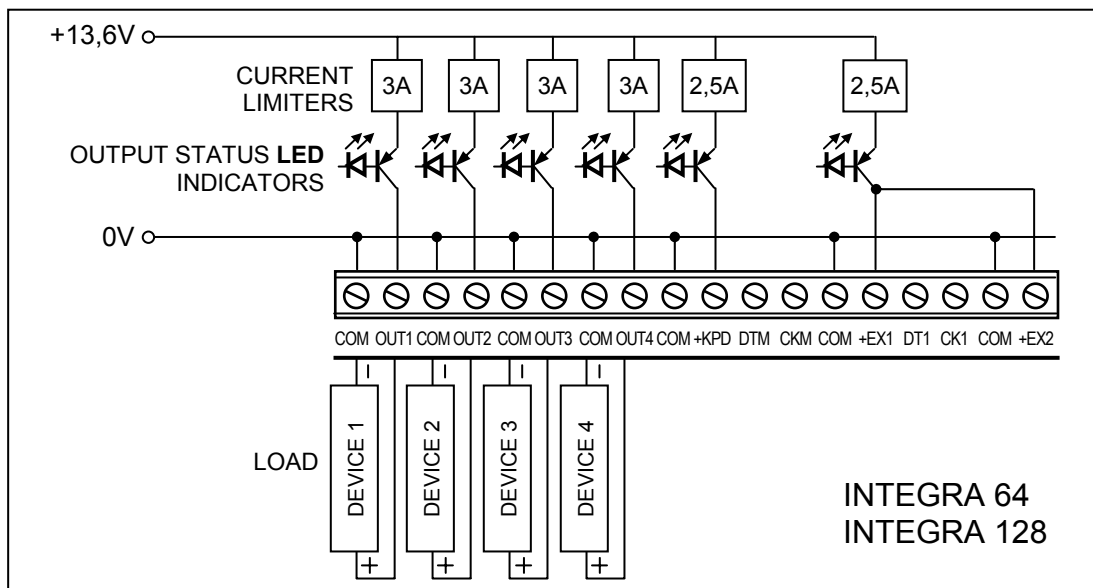


Fig. 27. Connection of a load (e.g. siren) to high-current outputs.

Each programmable high-current output has an electronic circuit breaker and a current limiter. The structure of these outputs and how the sirens without their own power supply (or other loads) are connected to them are shown in Fig. 27.

**Notes:**

- *The programmable high-current outputs are provided with a load presence detection unit, which is active when the output is not active. If a load is connected correctly and the*

control panel indicates the “No output load” trouble, connect a  $2.2k\Omega$  resistor in parallel to the load.

- When the siren connected to the output in parallel to the resistor  $2.2k\Omega$  generates undesirable sounds (if not controlled), reduce the resistance value.
- If the programmable high-current outputs are not used, they should be loaded with  $2.2k\Omega$  resistors.

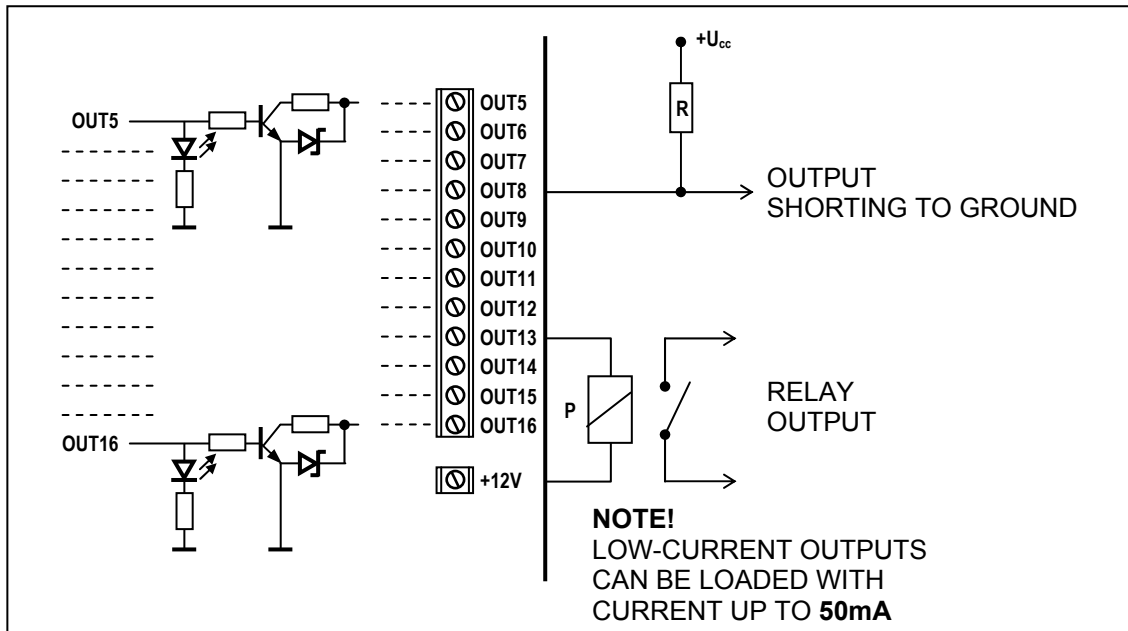


Fig. 28. Connection of loads to low-current outputs (OUT5..OUT16) and signals from these outputs (e.g. to radio messaging transmitter).

The programmable low-current outputs are designed to control equipment (for example, sirens) with their own power supply. Loads connected to these outputs (e.g. relays) must not force the current flow exceeding 50 mA. The structure of low-current outputs and their use are shown in Figure 28.

## 5.6 CONNECTION OF TELEPHONE LINE

If the alarm system makes use of the control panel telephone communicator (for monitoring, messaging or remote programming), it is necessary to connect the analog telephone line to the control panel. The telephone line is plugged to the terminal located in the upper right corner of the PCB. In order to ensure correct messaging function, the **control panel must be connected directly to the telephone line** (terminals marked TIP, RING), and all other equipment (telephone set, fax) – after the control panel (terminals marked T-1, R-1). Such a connection allows the control panel to fully capture the telephone line for the time of calling, which prevents the possibility of the messaging function being blocked when the handset is picked up.

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

### Notes:

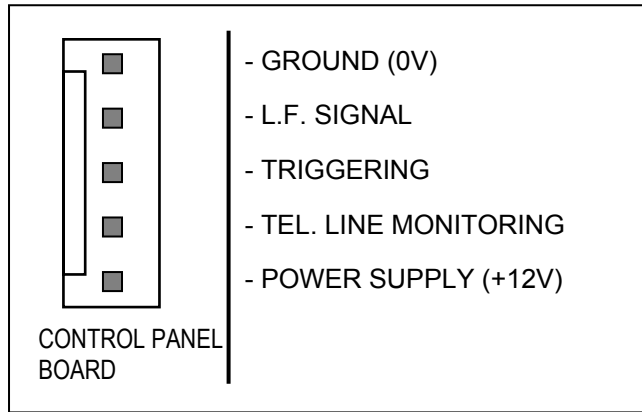
- Do not send telephone signals and alarm system signals by one multicore cable. This may cause damage to the system in case of a high-voltage punch-through coming from the telephone line.
- The control panel may only be connected to **analog lines** only. Direct connection of the telephone circuit to ISDN lines may cause damage to the equipment.



- *The system installer should provide the user with necessary information on how the control panel should be connected to the telephone network.*

### 5.7 CONNECTION OF VOICE SYNTHESIZERS

If the function of reporting alarms by phone with a voice message is used, it is necessary to connect at least one voice synthesizer to the control panel.



The INTEGRA control panels are provided with one or two sockets for connecting the SM-2 voice synthesizers. The sockets are located at the right side of PCB, between telephone line connector and low-current output sockets. The SYNT1 socket on the INTEGRA 64 / INTEGRA 128 boards is used for connection of the *Synthesizer 1* message, and SYNT2 – for the *Synthesizer 2* message. Playback of the message and "monitoring" of the telephone line are possible on both connectors of the SM-2 synthesizer.

Fig. 29. Arrangement of signals on SM-2 voice synthesizer connectors.

When a larger number of messages is needed, it is necessary to use the expander module type CA-64 SM, which enables 16

messages to be generated, 15s each. These synthesizers are controlled via the extension bus, while the audio signals are connected to the SYNT1 or SYNT2 connectors on the INTEGRA 64 / INTEGRA 128 boards, or to the SM-2 VOICE SYNTHESIZER connector on the INTEGRA 24 / INTEGRA 32 boards.

### 5.8 CONNECTION OF PRINTER

The control panel RS-232 port makes it possible to connect a printer provided with serial port. The control panel may print events in a "compressed" format (single event is printed in a single line containing up to 80 characters) or "extended" format, with names of zones, partitions, users and modules (then, the event is printed in two lines, when the printer with up to 80 characters per line is used; the descriptions of a single event are printed in one line with printers printing 132 characters per line).

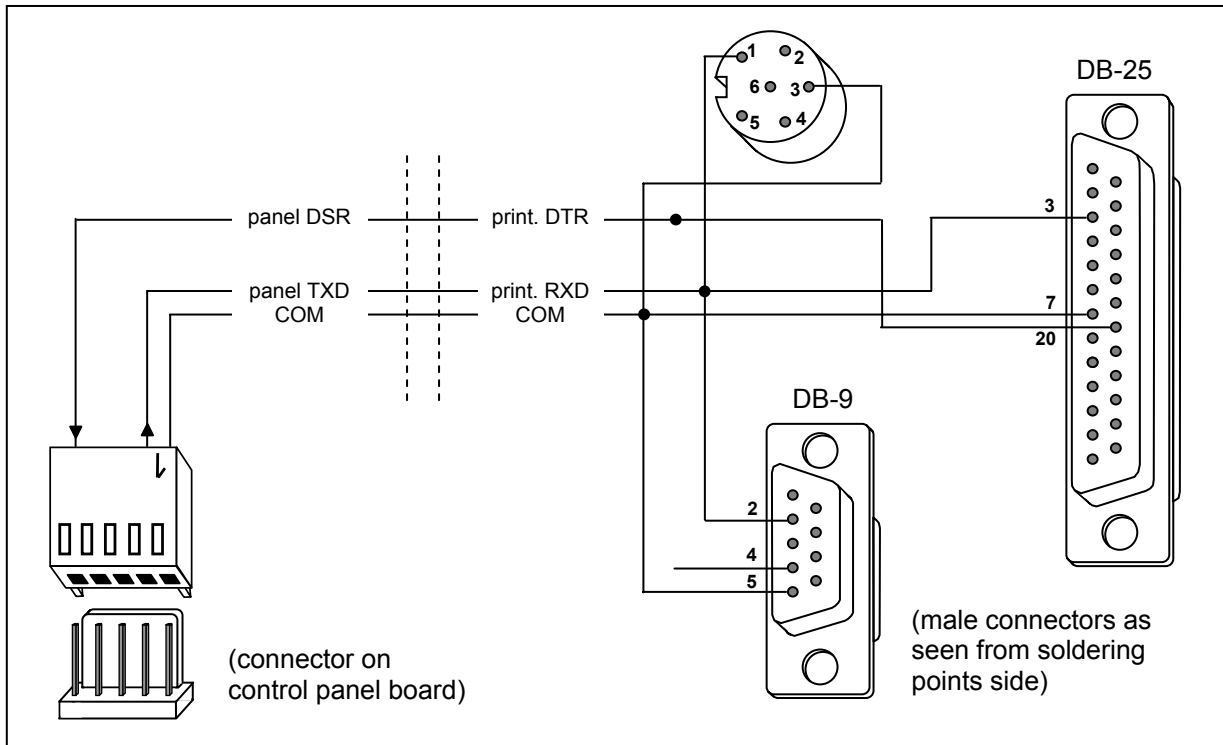


Fig. 30. Connection of a printer to the control panel serial port.

### 5.9 CONNECTION OF SERVICE COMPUTER

When the INTEGRA control panel is programmed by means of a computer using the „Downloading” function through the panel RS-232 port, the computer must be connected as shown in Fig 31.

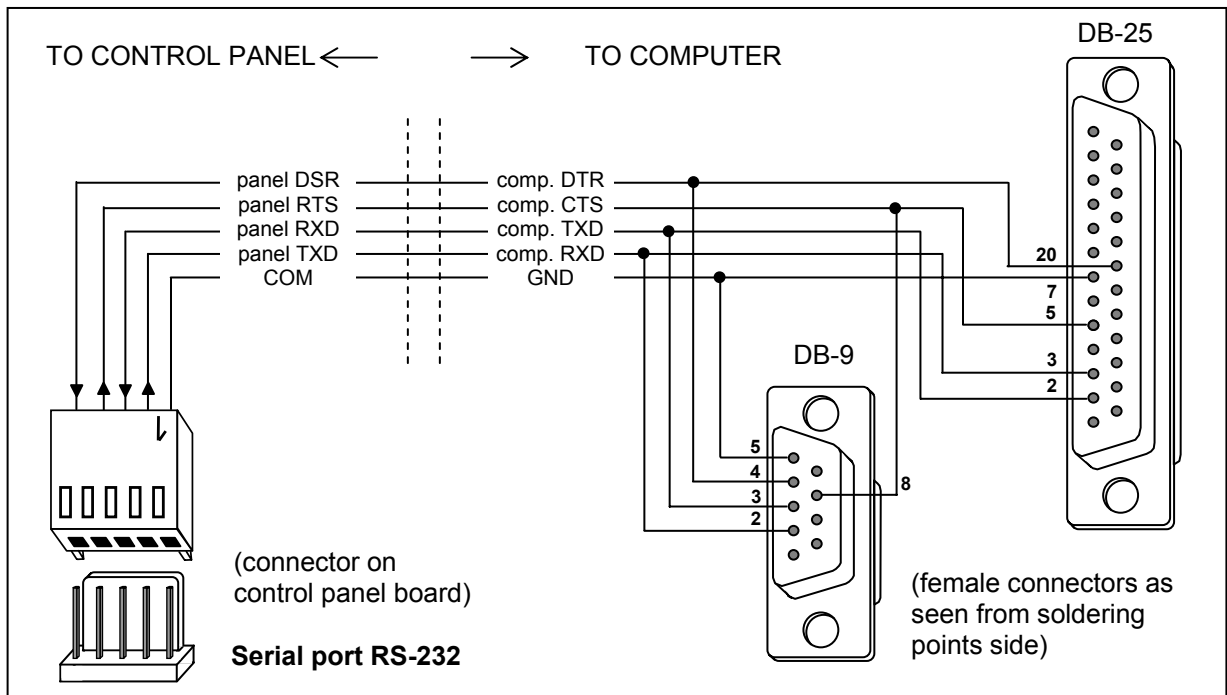


Fig. 31. Connection of computer to the control panel serial port.

**Notes:**

- Do not short or touch the serial port RS-232 pins with your fingers.

- Prior to connecting the cable, the installer should preliminary remove the electrostatic charge, 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 connector.

### 5.10 CONNECTION OF EXTERNAL MODEM AND GSM-4 MODULE

The INTEGRA control panel may be programmed via the telephone line with the use of external modem. A baud rate of 300 bauds is used for programming via the control panel built-in modem. For this baud rate, reading of all control panel settings and programming new ones may take up to one hour. Additionally, programming via internal modem is not accessible by means of a cellular telephone (GSM or DCS) due to the baud rate established in cellular telephony.

Connecting the external modem eliminates all these limitations. A higher baud rate, when an external modem is connected, makes it possible for the DLOADX program to run at the same speed as when the computer is connected directly to the control panel.

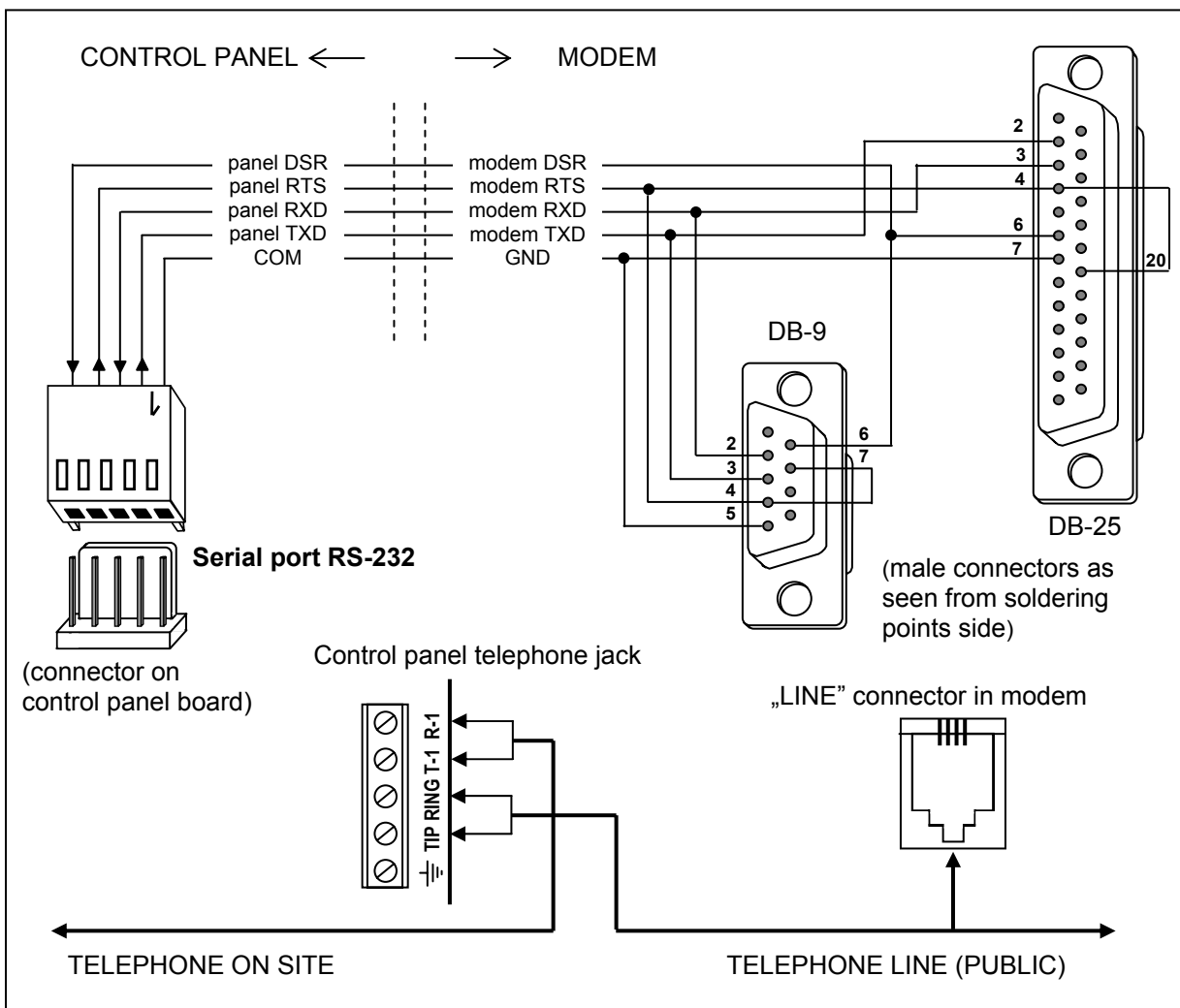


Fig. 32. Connection of external modem to the control panel.

Before connection to the control panel, the modem must be suitably prepared: connect it to the computer and, using the *Terminal* type program, set the suitable operating mode and save its settings.



You should follow the procedure below:

1. Check whether the modem is connected to the terminal – modem should answer OK after writing at↵ (if modem does not answer, try ate1↵ ; if there is still no answer, check the modem connection to the computer and make sure that the COM port is properly selected in settings of the program of *Terminal* type).
2. Check the settings of parameters which determine the modem operation mode. After the command at&v↵, the modem will present a list of parameters for programming. A typical set of parameters is shown in Fig. 33. For the control panel to properly work with the modem just a few parameters must be set – the parameter block stored as “profile 0” („STORED PROFILE 0” in Figure 33) must include E1 Q0 V1 X4 &D2 &S0 and S00:000.
3. If the parameters mentioned above are set correctly, the modem is ready for operation with the control panel. If any parameter is set to other value, set it properly. Command for parameter setting consists of fixed prefix AT and parameter value required (for example, when profile specifies E0 V0, the command for setting the proper parameter value is ate1v1↵, after which the modem answers OK).

```

OK
at&v
ACTIVE PROFILE:
B1 E1 L1 M1 N1 Q0 T V1 W0 X4 Y0 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &S0 &T5 &X0 &Y0
S00:000 S01:000 S02:043 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006
S10:014 S11:095 S12:050 S18:000 S25:005 S26:001 S36:007 S37:000 S38:020 S46:138
S48:007 S95:000

STORED PROFILE 0:
B1 E1 L1 M1 N1 Q0 T V1 W0 X4 Y0 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &S0 &T5 &X0
S00:000 S02:043 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095 S12:050 S18:000
S36:007 S37:000 S40:104 S41:195 S46:138 S95:000

STORED PROFILE 1:
B1 E1 L1 M1 N1 Q0 T V1 W0 X4 Y0 &C1 &D2 &G0 &J0 &K3 &Q5 &R1 &S0 &T5 &X0
S00:000 S02:043 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095 S12:050 S18:000
S36:007 S37:000 S40:104 S41:195 S46:138 S95:000

TELEPHONE NUMBERS:
0=                1=
2=                3=

OK

```

Fig. 33. Correct setting of external modem parameters.

4. Having set the parameter values acc. to the list mentioned above in point 2, save the settings in the “profile 0” (using the at&w0↵ command).
5. Finally, you can check whether all parameters are properly saved – after the atz↵ command followed by at&v↵, the settings in ACTIVE PROFILE should be the same as in STORED PROFILE 0 (note: often STORED PROFILE set contains less parameters than ACTIVE PROFILE set, which is normal).

#### Notes:

- The modem S0 register is to be set with the ats0=0 command (in Figure 33 the modem register is shown in slightly different notation S00:000).
- When restarting the modem, the control panel generates ATZ command, which sets parameters in accordance with the values saved in the “profile 0”. Therefore, the current values of parameters mentioned in point 2 (“ACTIVE PROFILE”) are not important, but it is important that they be correctly set in the “profile 0”.

The INTEGRA control panel with software in version 1.04.03 (or later) can support ISDN type modem, as well as GSM-4 and GSM LT-1 communication modules.

In order to start communication through the **ISDN modem** you should:

- Enter the control panel settings and select the options: „*External modem*” and „*ISDN/GSM modem*” (*Service mode*→*Options*→*Tel. options*→).
- Using a suitable cable, connect the panel RS-232 port to the modem port (Fig. 32).
- Connect, optionally, the modem analog output (if any) to the control panel terminals TIP, RING.
- Program the ID codes and numbers of the control panel / computer telephones – these data must be exactly the same in the control panel and in the data file created for the control panel to be programmed.
- Initialize the modem operation and proceed to establish telephone connection.

#### Notes:

- *The control panel ISDN modem can only be used when an ISDN modem is also present on the computer side.*
- *When the connection is initiated from outside (via the telephone line), the ISDN modem will only send the ringing tone to the control panel through the RS port.*
- *Interaction with the ISDN modem does not preclude using the panel internal analog modem. If the connection is initiated from outside by an analog modem, the ringing signal is passed to the ISDN modem analog output, if any, and the call can be answered by the control panel.*
- *The „Double call” option is only valid for an analog modem.*

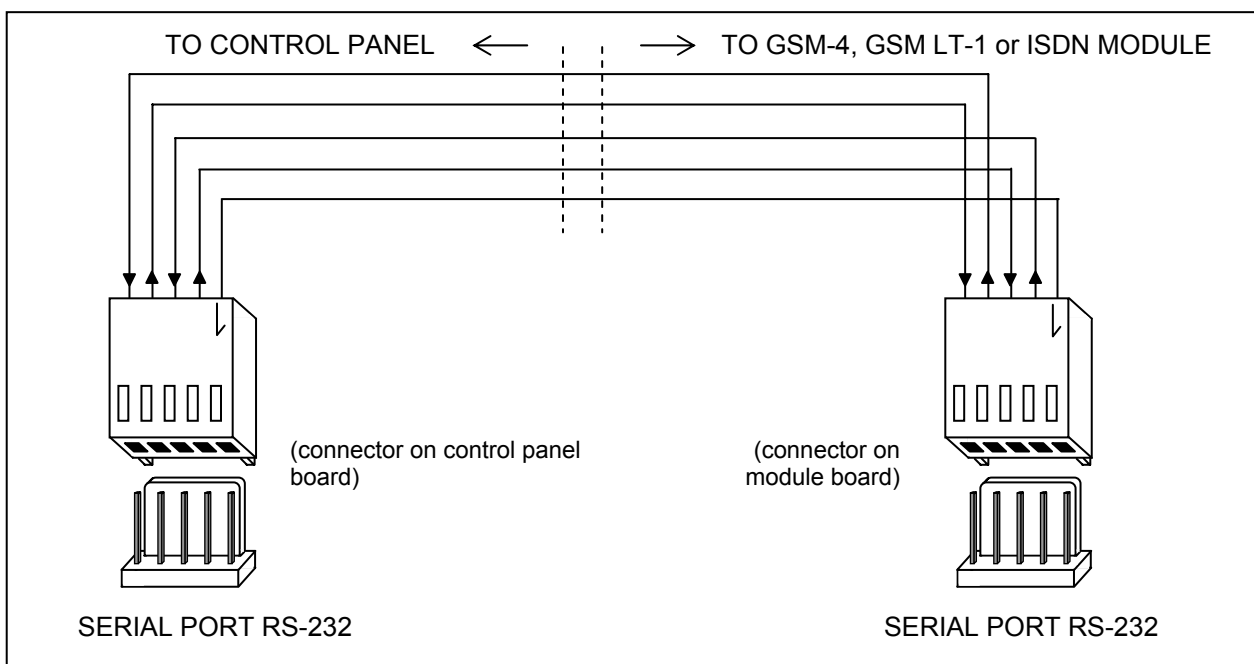


Fig. 34. Connection of RS-232 ports of INTEGRA panel and GSM-4, GSM LT-1 or ISDN modules.

In order to start programming through the SATEL **GSM-4**, **GSM LT-1** or **ISDN** module as an external modem you should:

- Select the options: „*External modem*” and „*ISDN/GSM modem*” in the panel settings.
- Using a suitable cable, connect the panel RS-232 port to the communication module port. The cable connection between the two ports is shown in the drawing 34.

- Program corresponding functions in the GSM module to make interaction with the INTEGRA panel possible (control codes, computer modem format, RS rate) according to the equipment user manual.
- Program the ID codes and numbers of the control panel / computer telephones – these data must be exactly the same in the control panel and in the computer. The GSM modules have an option to call back via the control panel to another computer telephone number which is different from the preset one. To this end, it is necessary to include the required telephone number, terminated with a dot (e.g. CODE=602123456.), after the code initializing the module operation as modem in the SMS sent to the GSM module.

**Note:** *To operate the GUARDX / DLOADX programs, it is necessary to program separate identifiers and numbers of the computer telephone.*

- Start the DLOADX or GUARDX program in the computer, initialize the computer modem operation and send a corresponding SMS to the GSM module, or establish connection with the control panel (ISDN module).

## 6. STARTING THE CONTROL PANEL

---

If correctly installed, the control panel should start without any problems after mains power supply is switched on, as described in section **Starting the system**.

The control panel with the firmware (after restart of settings) can handle all the keypads installed just as if they have been identified. However, it does not monitor keypad tampers and keypad zones, nor does it permit programming of keypad operation parameters – most of the service functions are unavailable until identification of keypads and expanders is completed.

When connected to the computer, it forces generation of a new data set.

### Notes:

- *Hardware identification enables access to the service mode functions.*
- *If the control panel is to be remotely programmed via the telephone line, it is necessary to program telephone number of the service computer.*
- *Hardware identification and programming of the service telephone number are made available by proper service functions.*

### 6.1 STARTING THE SYSTEM

---

After power-up, the control panel start takes place in two stages:

1. First, the STARTER program starts and checks the contents of the control panel program memory. During this operation, the DIALER LED is blinking and appropriate message is displayed on LCD keypads. When the contents of FLASH program memory is correct, the STARTER launches the control panel program.
2. The control panel program starts with checking the memory of settings (RAM memory with backup battery 3.6V/60mAh). If any differences are detected, as compared with the service programmed settings, the proper settings will be restored from FLASH memory (this test is skipped when the control panel settings are not saved in FLASH memory; question about saving the settings appears when exiting the service mode). After the settings are checked, the control panel starts working.

### Notes:

- *If an error in the control panel program is detected, the “Load correct program to control panel” message appears on LCD keypad displays and the STARTER program waits for*

*new program from the computer. An error in the program may only happen when the control panel software up-dating process has been interrupted by switching power supply off.*

- *When the control panel is deenergized, removal of the MEMORY jumper will erase the contents of memory of settings, user data, event memory and clock. After reconnection of power supply, the control panel only restores the memory of settings. The user data must be programmed again. The information on administrator and service codes is stored in separate EEPROM memory and is not lost after removal of the MEMORY jumper.*

## 6.2 SERVICE MODE

---

Control panel programming from LCD keypad is carried out with the use of service functions accessible from service mode menu. This mode is entered by the service (installer) by selecting the “Service mode” item in user function menu.

How to activate the service mode (codes as for restart of settings):

1. Enable service access:
  - a) enter the **master user** (administrator) **code** and press [\*] (press in turn [1][1][1][1][\*]),
  - b) select (point with cursor) the “Service access” from the user functions list and enter this function ([#] or [▶] key),
  - c) specify service access time (in hours) and confirm it with the [#] key.
2. Enter the **service code** and press [\*] (press [1][2][3][4][5][\*]),
3. Select the “Service mode” item from the list and press [#] or [▶].

### Notes:

- *The service mode is indicated with the “SERVICE” LED in LCD keypads. The control panel remains in service mode until the user quits it using the “End service” function.*
- *The only zone alarms possible in service mode are 24H VIBRATION, 24H CASH MACHINE, PANIC-AUDIBLE and PANIC-SILENT.*
- *It is possible to permanently open service access to alarm system. For this purpose the “Permanent service access” option should be activated with the use of the administrator code in the “Change option” user function.*
- *If the master user (administrator) has forgotten his code and the service access is closed (service access time=0), a new master user code may be entered by the installer (without clearing of the previously entered users codes). For this purpose, you should enter the service mode with the use of jumpers (see description below) and quit with the use of “End service” function. Within circa 20 seconds after exiting the service mode, the installer can call the “Administrators” function for editing and enter a new code.*

If starting the service mode to the above description is impossible, because the control panel for some reason does not support the keypad, it is necessary to carry out a special procedure to start the control panel and enter the service mode “**with the use of jumpers**”. To ensure that all settings are in accordance with factory settings, perform the settings restart functions in the service mode.

Follow the procedure below:

1. Disconnect in turn the AC supply and the battery and check keypad connections to the keypad bus.
2. Place the jumper on RESET pins located on the control panel board.
3. Connect in turn the battery and the AC supply - the DIALER LED will start blinking (the control panel will not start when connected to battery only).

4. Wait until the LED goes off, then remove the jumper from pins – the control panel should automatically enter the service mode menu - the message “→End service” appears on the display of keypad with the lowest address number, and the SERVICE LED starts blinking. If the “Clear settings? 1=Yes” message appears on the main display, this means that the access to the service mode “with the use of jumpers” has been disabled in the control panel program (→Service Mode →Configuration →Block SM). Then you can enter the service mode by pressing the number key 1, but this will erase all settings previously programmed in control panel (just like after performing functions mentioned in point 5 of this procedure). Having completed this operation, you may proceed to point 6.
5. Perform restart functions (→Restarts →Clear settings / →Clear codes / →Clear event log).
6. Perform identification functions for modules connected (→Structure →Hardware →Identification →LCD keypads id. / →Expanders id.).

**Note:** *After identification, the addresses in keypads and expanders must not be changed.*

7. Complete the service mode with “End service” function, saving data in FLASH memory. When the “Store settings in FLASH ? 1=Yes” prompt appears on the keypad display, press key with digit 1 – new settings will be saved and the control panel will enter the basic operation mode (waiting for code).
8. Call the service mode again.

If the control panel re-enters the service mode, its operation is OK and you can proceed to further system installation (connection of expanders, detectors, sirens, keypads, etc.), as well as starting communication with the computer and programming all parameters required.

**Notes:**

- *If the control panel is connected to a computer with running DLOADX program, the function of downloading via RS-232 will be started instead of the service mode.*
- *Entering the service mode “with the use of jumpers” may be blocked with the “Block SM” function (function in “Configuration” position). Entering the service mode “with the use of jumpers” may be restored after acceptance of factory setting restoration.*

When exiting the service mode, the INTEGRA control panel checks whether the service programmable parameters have been changed. The „Wait...” message appears on the LCD display. If there are no changes in settings, the control panel prompts: “Store settings in FLASH ? 1=Yes” - after pressing the key [1] new settings will be saved in FLASH type memory.

In large systems, the parameters which define the control panel operation are usually stored in the memory with independent battery backup.

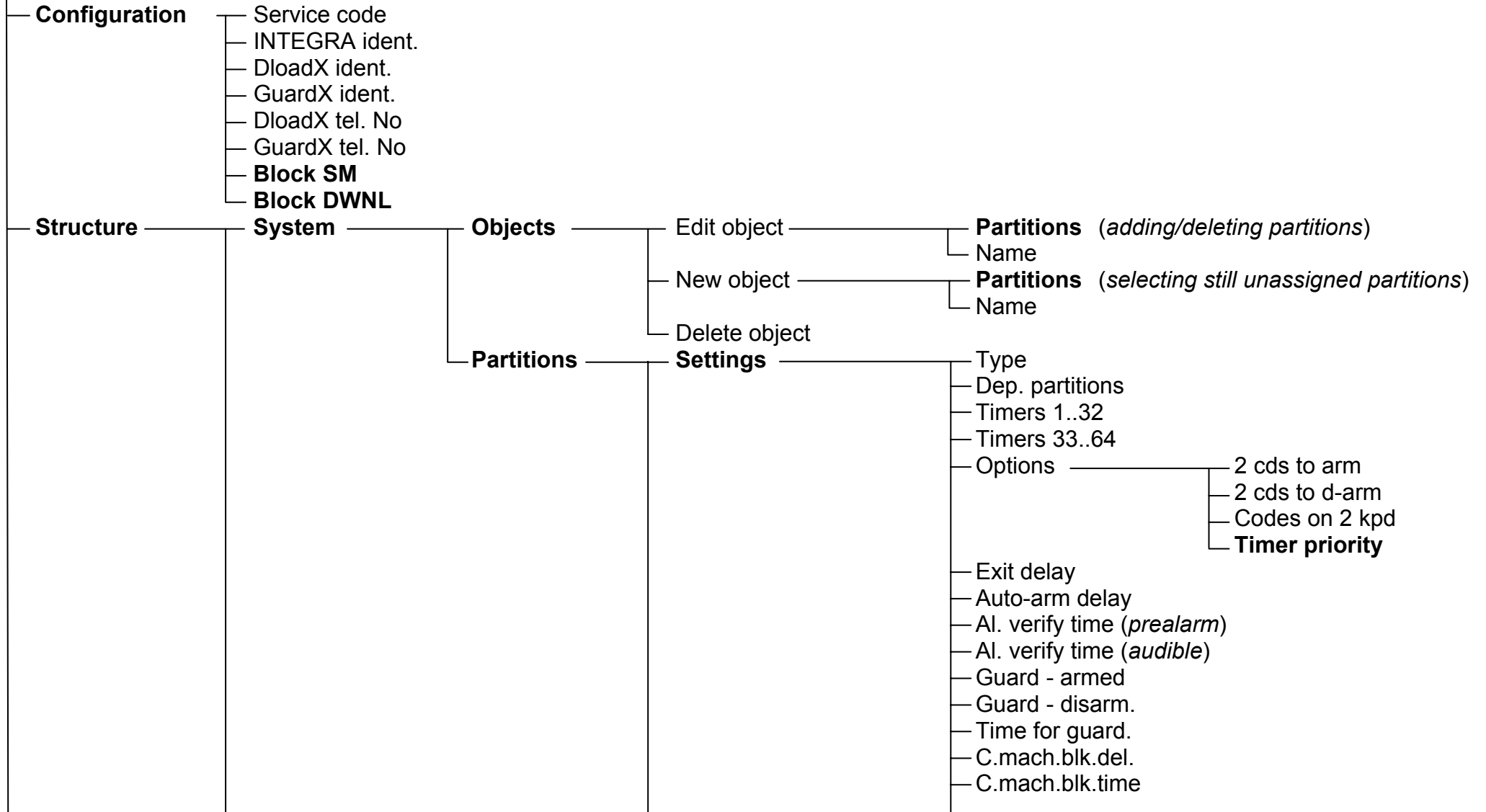
Disconnection of the memory power supply when the control panel is not supplied from the mains or 13.6V buffer power supply will erase the settings. Saving the data in FLASH memory prevents the erasure of settings and allows the control panel to restore them when an error is detected.

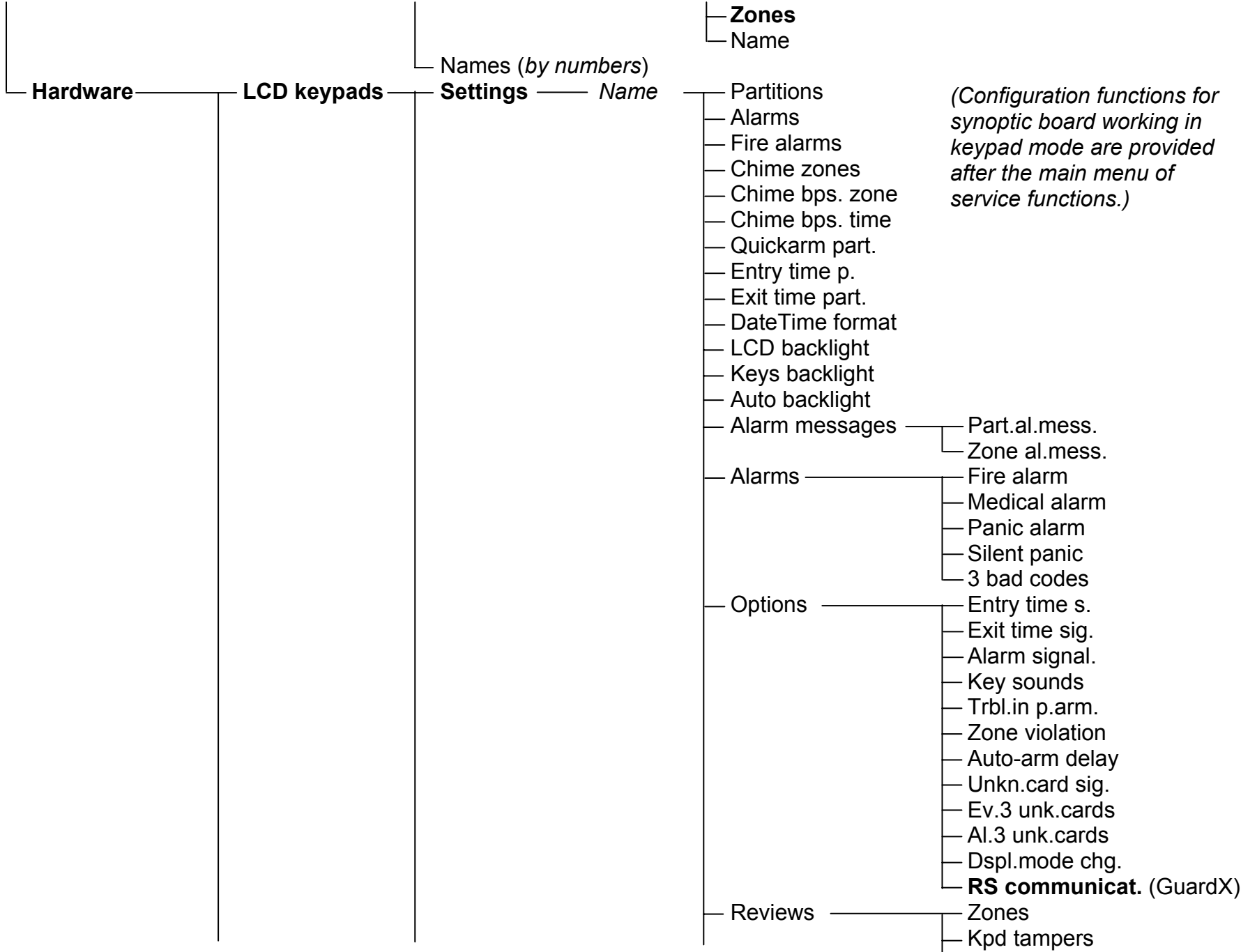
**Note:** *RAM memory errors should not occur, if the system is correctly configured and properly supplied.*

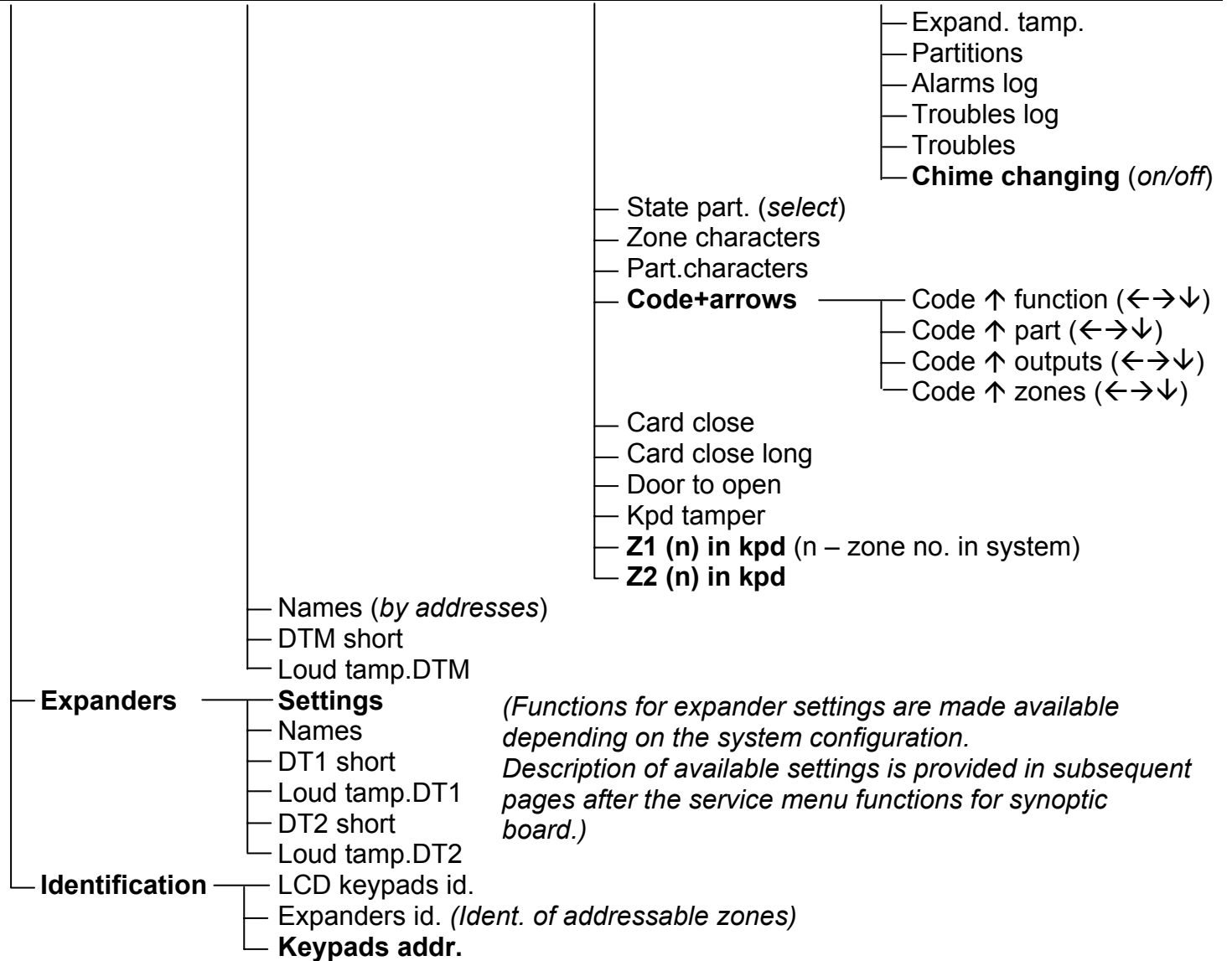
### 6.2.1 SERVICE MODE MENU

[SERVICE CODE][\*][9] (starting the service mode with a shortcut)

→ **Service end**









**Options**

**Tel. options.**

- Monitoring
- Tel.messaging
- Modem answer.
- Voice answer.
- Remote control
- Tone dialing
- Ground start
- No dialton.tst
- No answer test
- Dbl.voice msg.
- Double call
- External modem
- ISDN/GSM modem
- Pulse 1/1.5

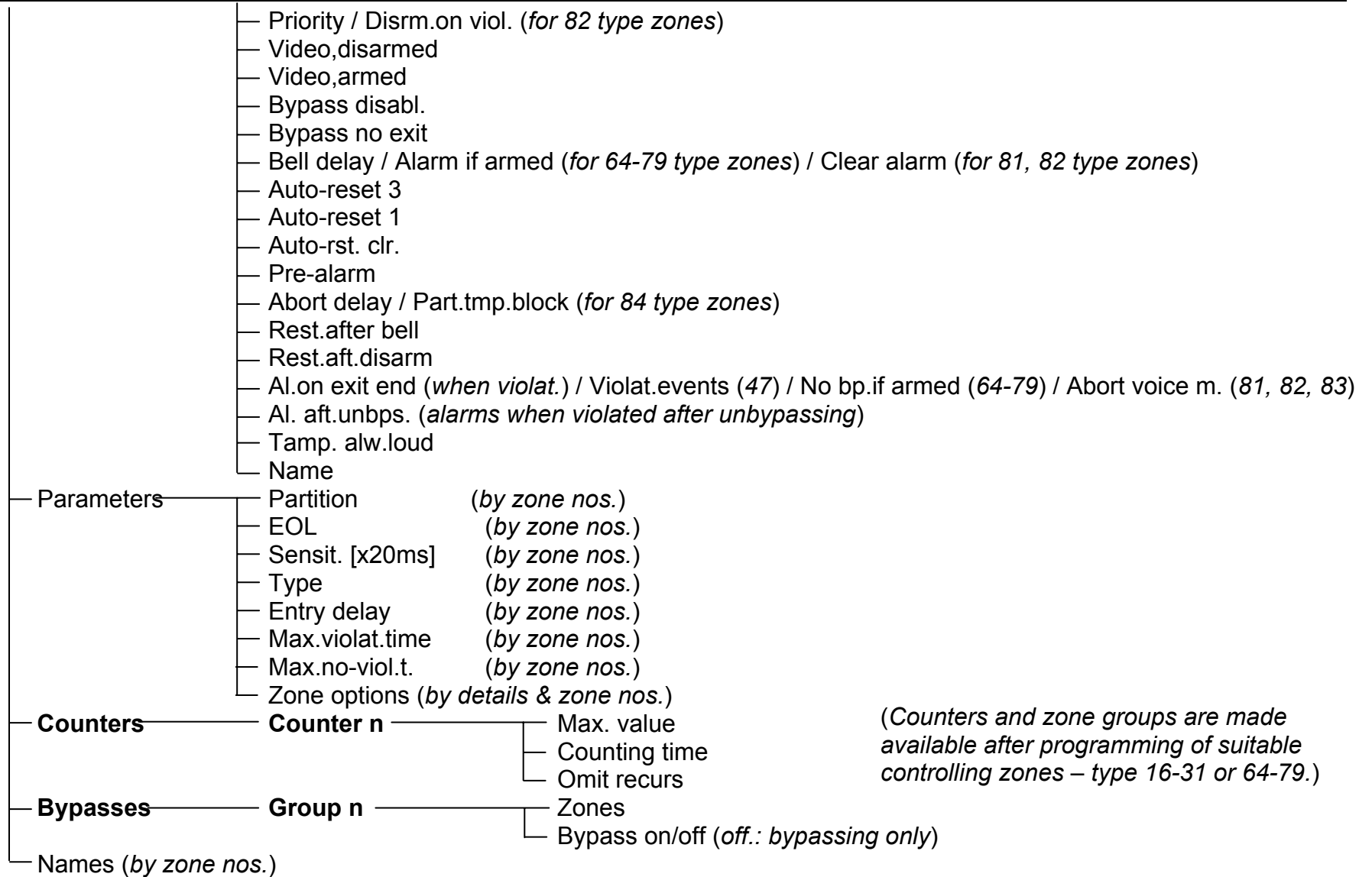
**Printer options**

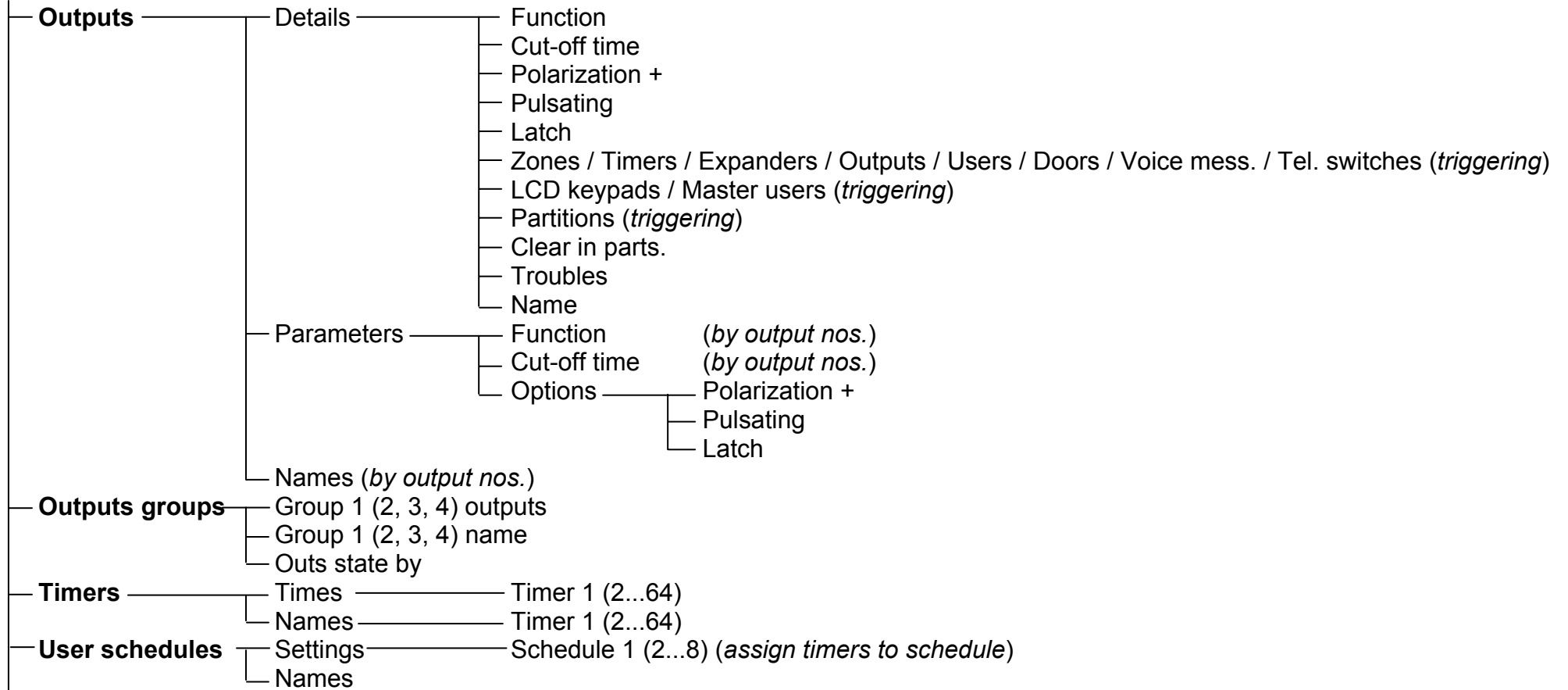
- Printing
- Monitor.status
- Names/descript
- Wide paper
- 2400bps (*off: 1200 bps*)
- CR+LF (*off: CR*)
- Parity bit
- Parity: EVEN (*off: ODD*)
- Zone alarms
- Part/mod. al.
- Arming/disarm.
- Bypasses
- Access control
- Troubles
- User functions
- System events

**Active rights**

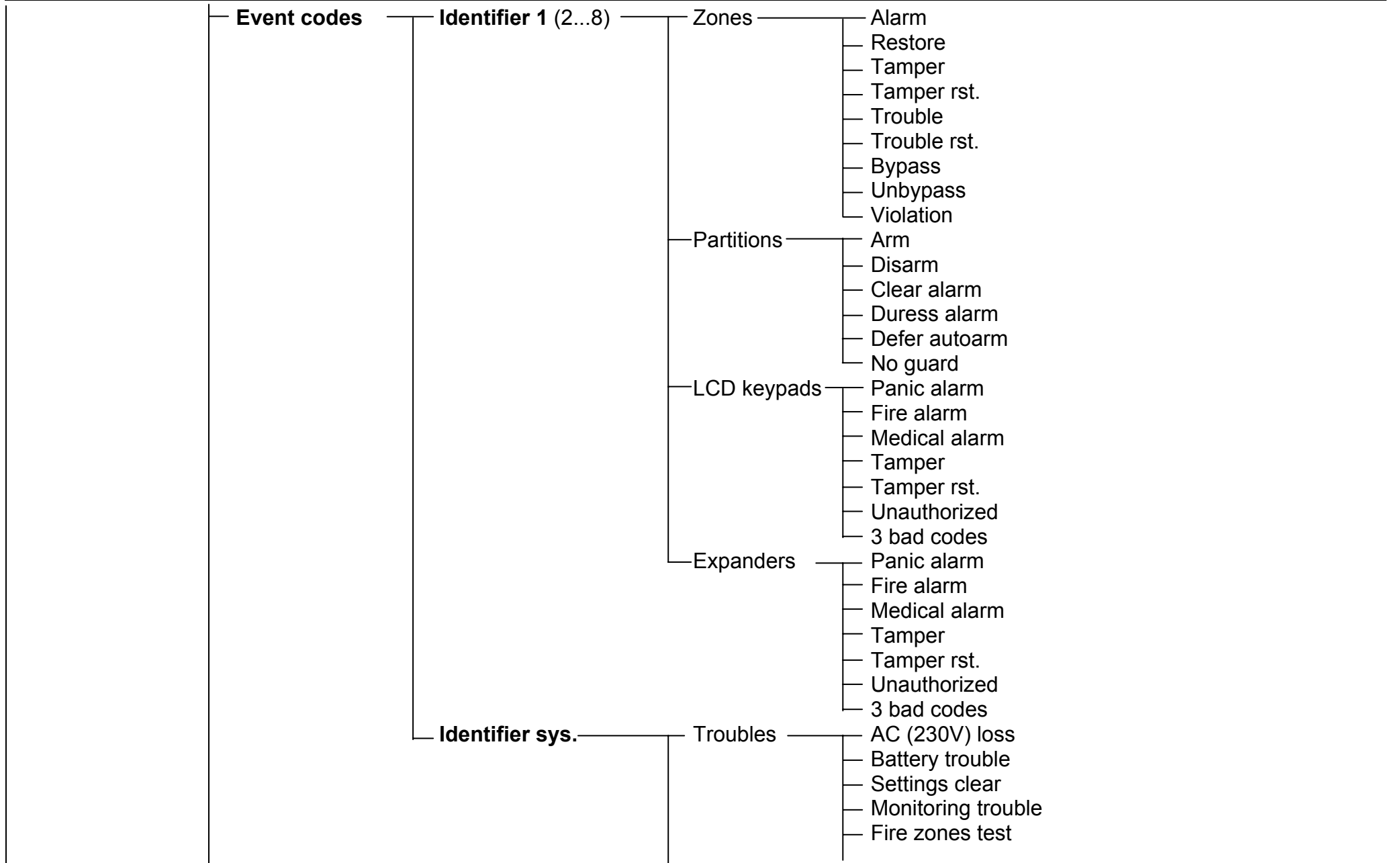
(see: *USER MANUAL – USERS function*)

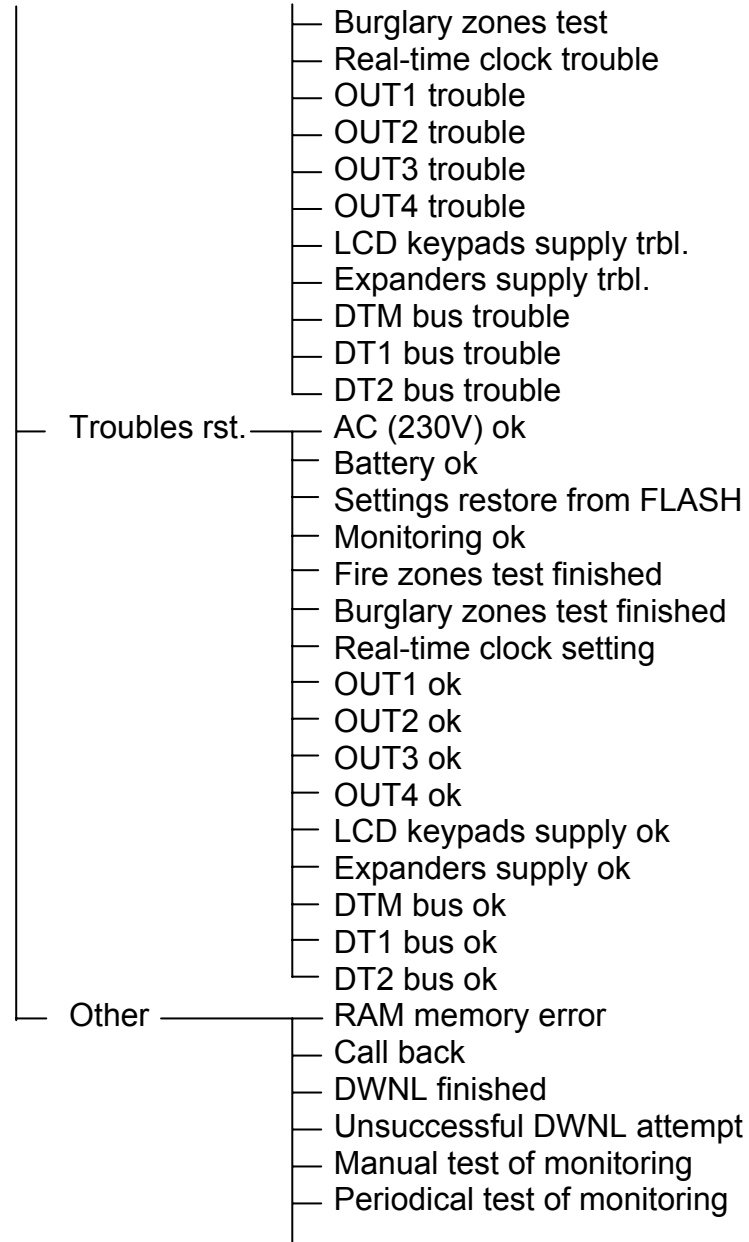
	<ul style="list-style-type: none"> <li>— <b>Various options</b></li> <li>— <b>Times</b></li> <li>— Rings to answer</li> <li>— <b>Prefix length</b></li> <li>— Clock adjustm.</li> <li>— Daylight saving</li> <li>— Summer time</li> <li>— Winter time</li> </ul>	<ul style="list-style-type: none"> <li>— Simple codes</li> <li>— Notify of code</li> <li>— Confirm with 1</li> <li>— Autoabort msg. <i>(cancel messaging together with alarm clearance)</i></li> <li>— SM -&gt; menu <i>(reset)</i></li> <li>— Tests -&gt; menu <i>(reset)</i></li> <li>— Powersaver <i>(switch off display/keys backlighting on AC loss)</i></li> <li>— Fast exp. bus <i>(fast data transmission on expander buses)</i></li> <li>— No rest. mon. <i>(do not monitor module restarts)</i></li> <li>— Inf.aft.tamper <i>(display message after tamper alarm until service intervention)</i></li> <li>— No BATT,no arm <i>(do not arm during battery trouble)</i></li> <li>— Exp.trb.no arm <i>(do not arm during expander trouble)</i></li> <li>— Arm, trb.warn. <i>(warn of troubles before arming)</i></li> <li>— Zones bef. arm <i>(view violated zones before arming)</i></li> <li>— Global entry delay</li> <li>— Global alarm time</li> <li>— Suppr.arm status after</li> <li>— AC loss report delay</li> <li>— Tel. loss report delay</li> </ul>
<ul style="list-style-type: none"> <li>— <b>Zones</b></li> </ul>	<ul style="list-style-type: none"> <li>— Details</li> </ul>	<ul style="list-style-type: none"> <li>— EOL</li> <li>— Sensitivity [x20ms]</li> <li>— Type</li> <li>— Entry delay / Alarm delay / Surveillan.time / Signal. delay / Bypass time (64-79) /</li> <li>— Max.viol.time / Max.opening t. <i>(for 57 type zones)</i>      Kpd number (58) / Arming mode (80, 82)</li> <li>— Max.n-viol.time</li> <li>— Partition</li> <li>— Power up delay</li> </ul>

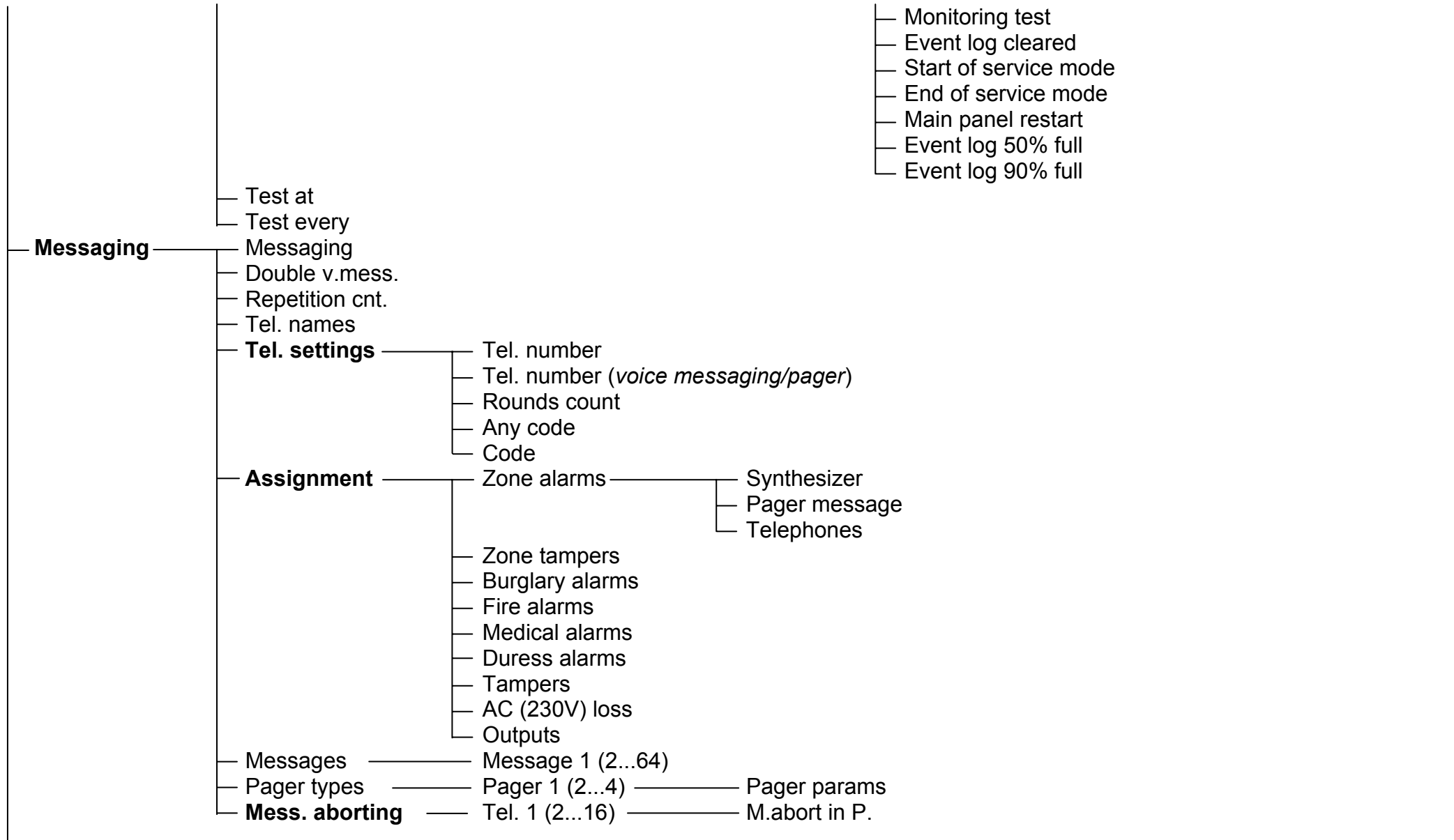




- **Monitoring**
  - Monitoring
  - Dont rep.rsts.
  - Stations
  - Advanced
    - Long hsk.s1t1
    - Long hsk.s1t2
    - Long hsk.s2t1
    - Long hsk.s2t2
    - Long hsk.wait.
  - **Station 1**
    - Tel. 1 number
    - Tel. 2 number
    - Tel. 1 format
    - Tel. 2 format
    - Repetition cnt.
    - Suspension time
    - TELIM prefix
    - Identifier 1 (2...8)
    - Identifier sys.
    - Event assign.
  - **Station 2**
    - Tel. 1 number
    - Tel. 2 number
    - Tel. 1 format
    - Tel. 2 format
    - Repetition cnt.
    - Suspension time
    - TELIM prefix
    - Identifier 1 (2...8)
    - Identifier sys.
    - Event assign.
  - **Id. assignment**
    - Partitions
    - Zones
    - LCD keypads
    - Expanders
  - TELIM codes



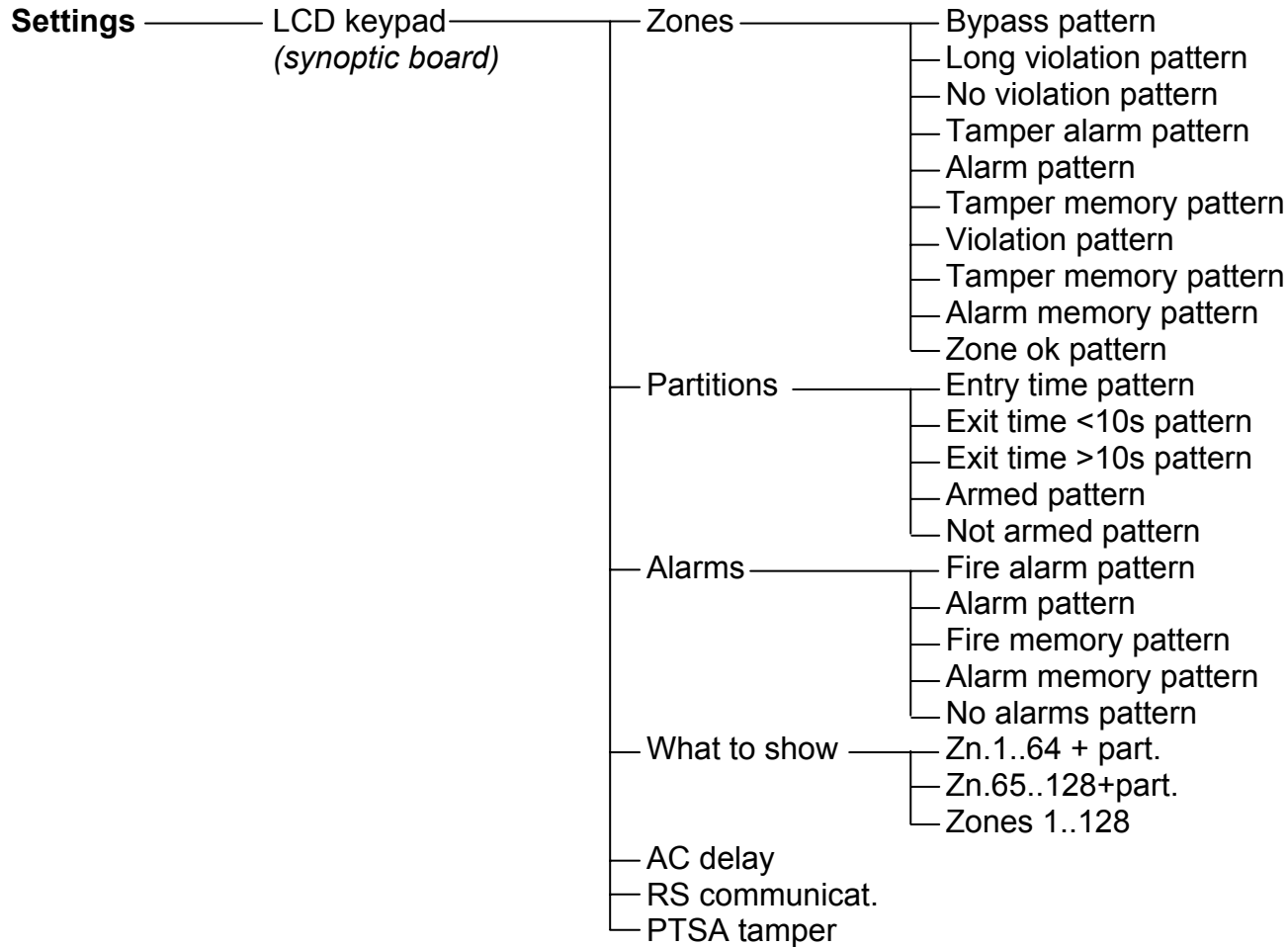




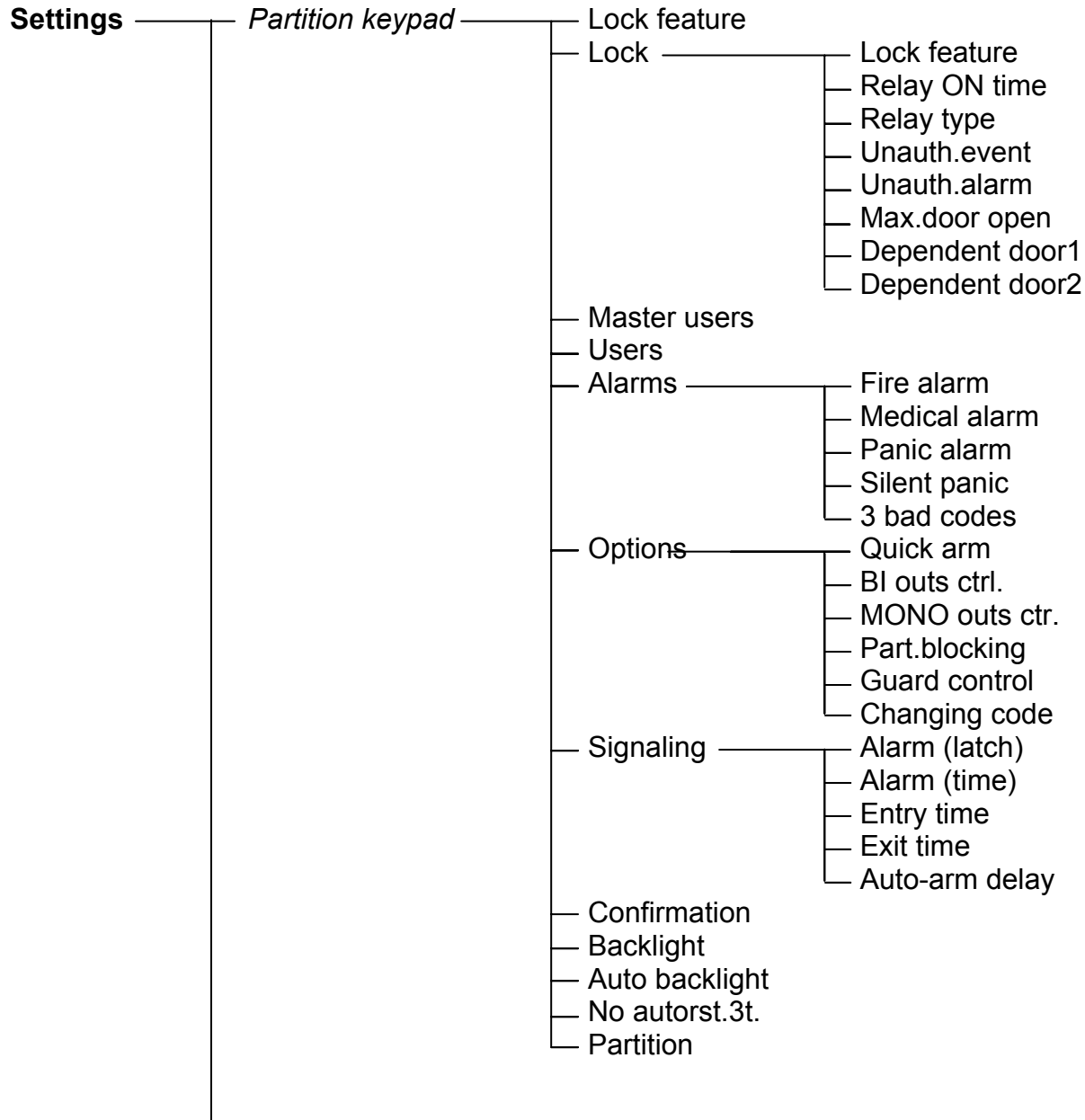


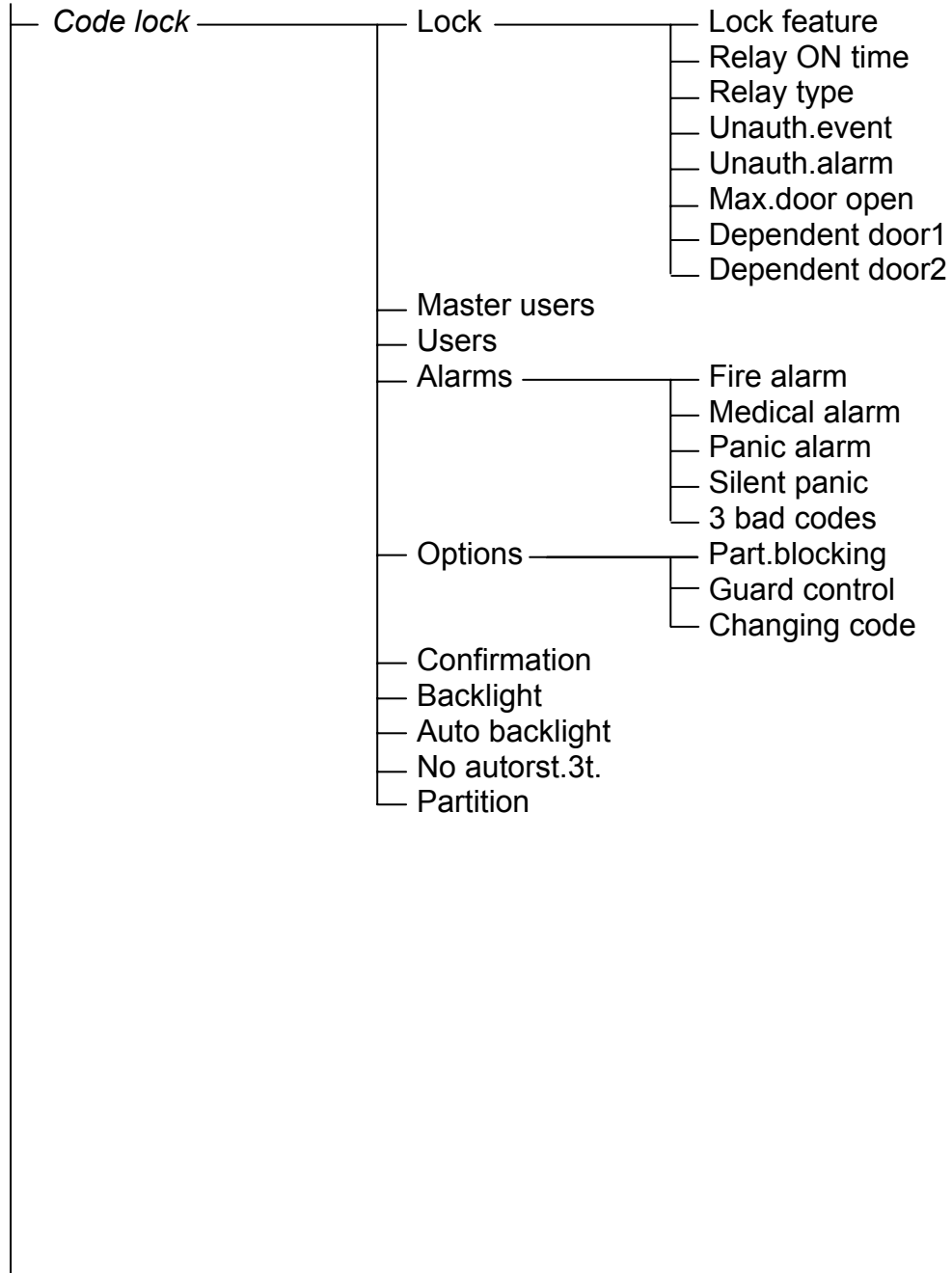
— <b>Tel.answ./ctrl.</b>	— Answering
	— Double call
	— Rings count
	— On armed part. ( <i>select partitions</i> )
	— Remote control
	— Users (all) ( <i>assign remote switches to control</i> )
	— Users (t.code) ( <i>assign remote switches to control</i> )
— <b>Note</b>	— Text
	— Valid ( <i>days</i> )
	— From ( <i>date</i> )
	— For ( <i>select user</i> )
	— Who can erase ( <i>select user</i> )
— <b>System status</b>	— Partitions
	— Zones
	— LCD keypads ( <i>tamper</i> )
	— Expanders ( <i>tamper</i> )
	— Troubles
	— <b>Supply voltage</b>
— <b>Restarts</b>	— Clear all
	— Clear settings
	— Clear codes
	— Clear event log
	— Settings<-FLASH
	— <b>Starter</b>

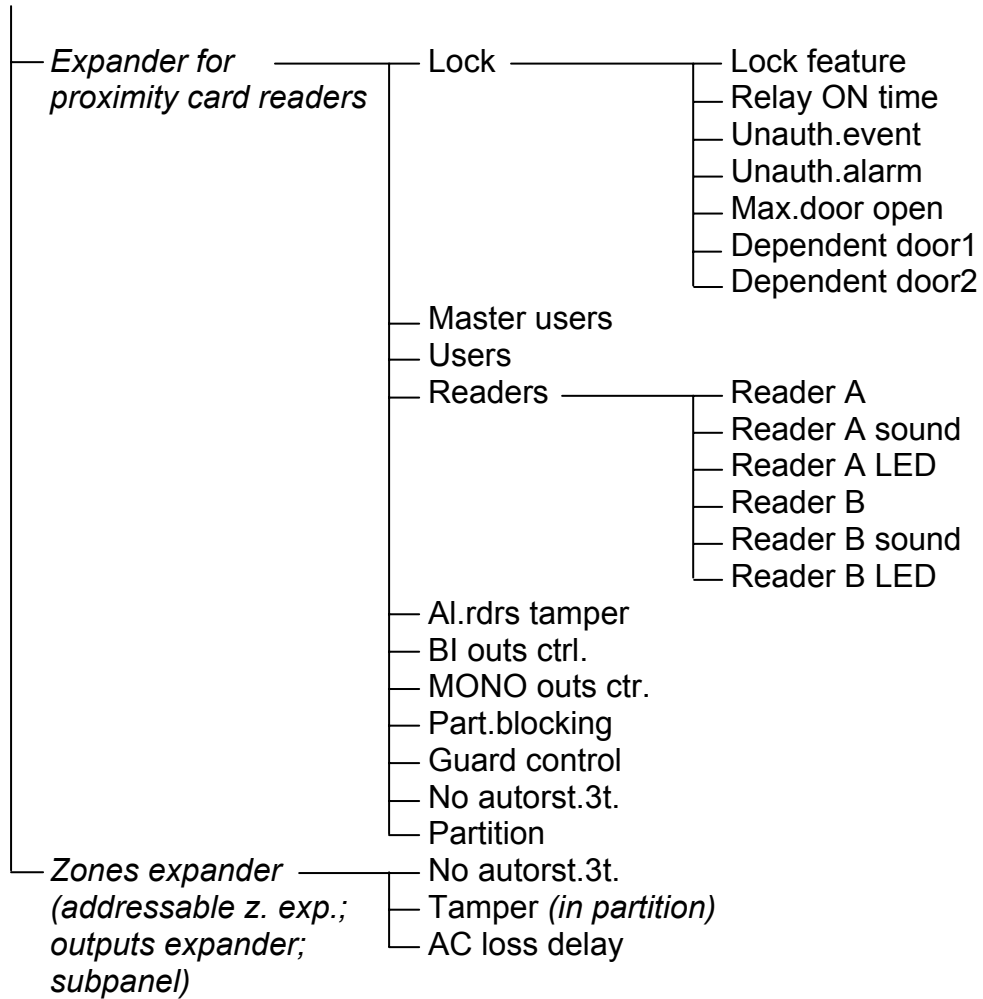
Menu of service functions for a **synoptic board** working in keypad mode (→Structure →Hardware →LCD keypads →Settings).



Menu of service functions for particular **expanders** (->Structure ->Hardware ->Expanders ->Settings).







### 6.3 CONTROL PANEL PROGRAMMING

---

The best way of programming the control panel is by means of a computer with the use of the RS-232 serial port. To do so you will need the DLOADX program which is delivered with the control panel. Connect the control panel with computer as shown in Figure 31. The data exchange is carried out after activating the DOWNLOADING function, which is called by the service (installer) from the user menu. If the control panel settings have already been restarted (factory settings), follow this procedure:

1. Enable the service access:
  - a) enter the master user (administrator) code and press [\*] (press [1][1][1][1][\*]),
  - b) select the "Service access" item from the list and enter this function (press [#] or [▶] ),
  - c) specify service access time (in hours) and confirm it with the [#] key
2. Enter the service code and press [\*] (press [1][2][3][4][5][\*]),
3. Select the "Downloading" item from the list and press [#] or [▶] ,
4. "Start DWNL-RS" will appear on the display - press [#] or [▶] .

#### Notes:

- *The control panel will remain in downloading function until it receives the "Terminate communication" command from the computer (the last item in "Communication" menu) or until it exits the function after the "Finish DWNL-RS" command. This command appears in user function menu "Downloading" item if the function menu is called by the service.*
- *Launching the DLOADX program in the computer connected to the control panel will automatically start the communication. A window is displayed on the screen showing which system is communicated with.*
- *To protect data, the INTEGRA allows disabling of the downloading function "with the use of jumpers". The "Block DWNL-RS" service mode function (in „Configuration" menu) is provided for this purpose.*
- *The control panel stores and makes available to the user the date and time of saving the data in the panel as well as the file name in the DLOADX program (user function: TESTS→File in DloadX).*

The downloading function starts automatically when the INTEGRA control panel is connected via RS-232 to the computer on which DLOADX is running, and then the control panel power supply is switched on.

### 6.4 PROGRAMMING BY TELEPHONE

---

When restart with restoration of the control panel factory settings has already been done, it is necessary to program the service computer telephone number to start programming. Proceed as follows:

1. Enter the service mode,
2. Select the "Configuration" item,
3. Select the "Computer telephone" item,
4. Program the computer telephone number (0..9 – digits, B – switch over to pulse dialing, C – switch over to tone dialing, D – waiting for additional signal, E – 3-second pause, F – 10-second pause, \* # a b c d – signals additionally generated in DTMF mode).

Programming of special characters in telephone number using LCD keypad is done in the following way:

- enter a corresponding digit (in accordance with the table) in place of the special character,
- press the [▼] key – a blinking cursor appears (big rectangle)

- move the cursor back (the [◀] key) so that it shows the entered digit and press again the key with the same digit – a corresponding special character will be displayed,
- using the key with digit 8, enter DTMF special characters designated with small letters (“abcd”) by repeatedly calling the above mentioned selection procedure.

Special character	Function description	Key with digit
A	end of number	0
B	switch over to pulse dialing	1
C	switch over to tone dialing	2
D	waiting for additional signal	3
E	3-second pause	4
F	10-second pause	5
*	signal * in DTMF mode	6
#	signal # in DTMF mode	7
a b c d	other signals generated in DTMF mode	8

**Note:** Do not program the “A” character for a telephone number (A is a marker of number end), as it is automatically added after the last indicated digit.

Establishing of communication with the computer via telephone line is ensured by the “Start DWNL-TEL” function. This function is available in the user functions menu for the master user (administrator) and the service (if the service personnel are authorized to start downloading).

## 7. BASIC SPECIFICATIONS

	Type of control panel			
	INTEGRA 24	INTEGRA 32	INTEGRA 64	INTEGRA 128
Mainboard supply voltage, nominal	18V		20V	
Control panel current consumption (with LCD keypad connected)	90 ÷ 140mA			
Power supply unit voltage, nominal (±10%)	13.8V			
Power supply unit output current (for control panel with LCD keypad connected)	1A		2.5A	
LCD keypad current consumption min. / max. (±10%)	20 ÷ 90mA			
Load capacity, high-current programmable outputs (±10%)	2A		3A	
Load capacity, low-current programmable outputs	50mA			
Load capacity, +KPD output (±10%)	500mA		2.5A	
Load capacity, AUX output	500mA			
Load capacity, +EX output	500mA			
Load capacity, +EX1, +EX2 outputs			2.5A	
Battery charging current (±20%)	350mA	350/700mA	500/1000mA	
Working temperature range	+5 ÷ 45°C			



Table 1. Example of INTEGRA 24 panel power supply load estimation / battery selection.

No.	Loads	Max current	Mean current consumption
1	Mainboard INTEGRA 24 with LCD keypad	140mA	70mA
2	AUX - 4 detectors*	90mA	70mA
3	Outputs OUT1...OUT2	2x2.5A**	4A
4	Outputs OUT3...OUT4	2x50mA	70mA
5	Outputs +EX	150mA***	150mA***
6	Battery charging current	350mA	-
Total mean current consumption by the system with no alarm signaling		$\Sigma I_{Av} = 90mA + 70mA + 70mA + 300mA + 150mA = 680mA$	
Total max current consumption by the system with no alarm signaling		$\Sigma I_{Max} = 140mA + 90mA + 100mA + 300mA + 150mA = 780mA$	
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		$\Sigma A_{Max} = 1.25x(12x0.14 + 12x0.09 + 0.25x5 + 0.25x0.1 + 12x0.3) \approx 7.3Ah$ $\Sigma A_{Av} = 1.25x(12x0.09 + 12x0.07 + 0.25x4 + 0.25x0.07 + 12x0.15) \approx 5.9Ah$ Recommended standby power supply: 12V/7Ah battery	

\*Assumed presence of 2 microwave detectors with current consumption 25mA/Av and 30mA/Max, and 2 PIR detectors with current consumption 10mA/Av and 15mA/Max

\*\*From battery

\*\*\*Usually the max / mean current to supply the expanders with assumed presence of 2 expanders does not exceed 150mA

Table 2. Example of INTEGRA 32 panel power supply load estimation / battery selection.

No.	Loads	Max current	Mean current consumption
1	Mainboard INTEGRA 32 with LCD keypad	140mA	70mA
2	AUX - 8 detectors*	165mA	125mA
3	Outputs OUT1...OUT2	2x2.5A**	4A
4	Outputs OUT3 ... OUT8	6x50mA	150mA
5	Output +EX	300mA***	300mA***
6	Battery charging current	350mA/700mA	-
Total mean current consumption by the system with no alarm signaling		$\Sigma I_{Av} = 90mA + 125mA + 150mA + 150mA + 700mA = 1365mA$	
Total max current consumption by the system with no alarm signaling		$\Sigma I_{Max} = 140mA + 165mA + 300mA + 150mA + 700mA = 1605mA$	
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		$\Sigma A_{Max} = 1.25x(12x0.14 + 12x0.165 + 0.25x5 + 0.25x0.3 + 12x0.3) \approx 10.7Ah$ $\Sigma A_{Av} = 1.25x(12x0.09 + 12x0.125 + 0.25x4 + 0.25x0.15 + 12x0.3) \approx 9.2Ah$ Recommended standby power supply: 12V/17Ah battery	

\* Assumed presence of 3 microwave detectors with current consumption 25mA/Av and 30mA/Max, and 5 PIR detectors with current consumption 10mA/Av and 15mA/Max

\*\*From battery

\*\*\* Usually the max / mean current to supply the expanders with assumed presence of 4 expanders does not exceed 150mA

Table 3. Example of INTEGRA 64, INTEGRA 128 panel power supply load estimation / battery selection.

No.	Loads	Max current	Mean current consumption
1	Mainboard INTEGRA 64 / INTEGRA 128 with LCD keypad	140mA	90mA
2	OUT4 - 16 detectors*	315mA	235mA
3	Outputs OUT1 ... OUT3	3x2.5 A**	6A
4	Outputs OUT5 ... OUT16	12x50mA	250mA
5	Outputs + EX1 and + EX2	300mA***	300mA***
6	Battery charging current	500mA/1000mA	-
Total mean current consumption by the system with no alarm signaling		$\Sigma I_{Av} = 90mA + 235mA + 250mA + 300mA + 1000mA = 1875mA$	
Total max current consumption by the system with no alarm signaling		$\Sigma I_{Max} = 140mA + 315mA + 600mA + 300mA + 1000mA = 2355mA$	
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		$\Sigma A_{Max} = 1.25x(12x0.14 + 12x0.315 + 0.25x7.5 + 0.25x0.6 + 12x0.3) \approx 13.8Ah$ $\Sigma A_{Av} = 1.25x(12x0.09 + 12x0.235 + 0.25x6 + 0.25x0.25 + 12x0.3) \approx 11.3Ah$ Recommended standby power supply: 12V/17Ah battery	

\* Assumed presence of 5 microwave detectors with current consumption 25mA/Av and 30mA/Max, and 11 PIR detectors with current consumption 10mA/Av and 15mA/Max

\*\*From battery

\*\*\* Usually the max / mean current to supply the expanders with assumed presence of 4 expanders does not exceed 300mA



#### 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.**

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