Alarm Control Panels
INTEGRA
Firmware Version 1.05

INSTALLER MANUAL

Satel

GDAŃSK

CE

⚠ 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 11 V) to the alarm panel. In order to avoid equipment damage, the fully discharged/never used battery should be precharged by means of a suitable charger.

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

DECLARATION OF CONFORMITY		
Products: CA424P, CA832, CA16128P - mainboards of INTEGRA control panels. - INTEGRA 24 - INTEGRA 32 - INTEGRA 64 - INTEGRA 128	**Manufacturer:** SATEL spółka z o.o. ul. Schuberta 79 80-172 Gdańsk, POLAND tel. (+48 58) 320-94-00 fax. (+48 58) 320-94-01	CE
Product description: Mainboards for alarm control panels intended for use in intruder alarm systems.		
These products are in conformity with the following EU Directives: **LVD** 73/23/EEC+93/68/EEC **EMC** 89/336/EWG + 91/263/EEC, 92/31EEC, 93/68/EEC **R&TTE** 1999/5/EC (network connection, TBR21)		
The product meets the requirements of harmonized standards: LVD: EN 50131-1:1997; EN 50131-6:1997; EN60950:2000, EN60335-1:1994/A1:1996 Annex B EMC: EN 55022:1998; EN 61000-3-2/-3; EN 50130-4:1995, EN 61000-4-2/-3/-4/-5/-6/-11 R&TTE: TBR 21(1998)		
Gdańsk, Poland 07.03.2005	Head of Test Laboratory: Michał Konarski	
Latest EC declaration of conformity and product approval certificates are available for downloading on website **www.satel.pl**		

The INTEGRA alarm control panels meet requirements as per CLC/TS 50131-3, Grade 3, and have been certified by Det Norske Veritas Certification AS, Norway.

New functions of the INTEGRA control panels in version 1.05

Expanders	Support of new expanders: – INT-SCR-BL – multifunctional keypad which may work as a partition keypad (identified as INT-S/SK), a partition keypad with reader (identified as INT-SCR) or an entry keypad (identified as INT-ENT) – INT-ORS – DIN-rail outputs expander – INT-IORS – DIN-rail zones/outputs expander – INT-RX – 433 MHz remote key fob operation expander Support of the ABAX ACU-100 wireless system controller with firmware in version 1.06.
Zones	Support of roller shutter motion detectors (rope detectors) and vibration detectors connected to the CA-64 E and CA-64 EPS expander zones (refers to the modules manufactured from 2007, identified by the control panel as CA-64 Ei and CA-64 EPSi). Optional programming of resistor values for EOL and 2EOL configuration in case of zones in CA-64 E and CA-64 EPS expanders (refers to the modules manufactured from 2007, identified by the control panel as CA-64 Ei and CA-64 EPSi). Optional control of the zone status by means of the output, with no need for making a physical connection, which enables virtual zones and outputs to be used in the system.
Monitoring	Transmission format: SIA.

CONTENTS

1. Introduction

This manual has been prepared for the whole family of INTEGRA alarm control panels. Information contained herein refers mainly to the INTEGRA 128 control panel, 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 4).

Devices incorporated in the INTEGRA alarm system meet requirements of the following standards: 50131-3, 50130-4, 50130-5 and 50131-6.

2. General Features of Control Panels

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 wireless system controller of SATEL manufacture) 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 effected by means of built-in telephone communicator to two monitoring stations (four telephone numbers).

- Optional connection of additional communication modules, enabling monitoring with the use of Ethernet (TCP/IP), GSM (GPRS technology) or ISDN networks.

- The control panel makes possible monitoring in several formats, including Contact ID and SIA.

- Alarm messaging to telephones by means of voice messages or to a pager with text 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 Contact ID standard. 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, ISDN module and ETHM-1 module of SATEL manufacture, enables communication to be established with the service computer. In this case, the remote programming via telephone network or Ethernet 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.

- Internal program structure allows to process all the incoming events. Because of the processing power, there's no need to individually prioritize particular signals.

- Shared indicators (like the LCD display) use the following display priority for the zone state (listed from highest to lowest priority): Bypass, Fault, Tamper Alarm, Intruder Alarm, Tamper violation, Intruder violation, Tamper memory, Intruder memory, Zone OK.

3. System Components

3.1 Mainboards

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
Security Grade	3			
Available messaging options	A, B, C			
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 [A]	1.2	1.2	3	3
Battery charging current [mA]	350	400/800	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. The zone status may also depend on the output status (if this is the case, the selected output does not need to be physically connected to a zone, which enables virtual zones and outputs to be used in the system). 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 some of the additional modules.

- 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 LCD keypads

The keypads interacting with INTEGRA control panels are made with or without a built-in proximity card reader. They 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.
- 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).

3.3 Optional modules

The control panels are equipped with communication buses to allow for addition of expansion modules, which, along with the firmware updating feature to enhance their functionality, provides means for an easy upgrading of the system. It enables the system to be expanded by adding new components in order to better meet individual needs of the customer. The INTEGRA control panels interact with the CA-64 control panel dedicated modules, though some of them require a new program version.

3.3.1 Modules to be connected to keypad bus

CA-64 PTSA. Mimic Board. Enables visualization of the state of partitions/zones in the security system. The INTEGRA control panels support the mimic boards made in version CA64T v 1.4 and having firmware in version v4.0 or later.

ETHM-1. Ethernet Module. Makes it possible to operate the control panel through the Ethernet. INTEGRA control panels with firmware version 1.04 support ETHM-1 modules version 1.02 or later.

3.3.2 Modules to be connected to expander bus

INT-S-GR/INT-S-BL/INT-SK-GR. Partition Keypad. Controls the armed mode in one partition; can perform the access control functions and operate the electromagnetic door lock.

INT-SCR-BL. Depending on its settings, the device can work as a **partition keypad** (identified as INT-S in the control panel), a **partition keypad with reader** (identified as INT-SCR in the control panel) or an **entry keypad** (identified as INT-ENT in the control panel). If it operates as a partition keypad or a partition keypad with reader, the device can control arming of one partition, execute access control functions, and control operation of the electromagnetic door lock. The main task of the entry keypad is activation the delay for zones with reaction type 3 INTERIOR DELAYED. After the time period programmed in the keypad has elapsed and the system has not been disarmed, the interior delayed zones will operate again as the instant ones.

INT-SZ-GR/INT-SZ-BL/INT-SZK-GR. Code Lock. Enables performance of the access control functions and operation of the electromagnetic door lock.

CA-64 SR. Expander of Proximity Card Reader. Supports the SATEL made proximity card readers to enable performance of the access control functions and operation of the electromagnetic door lock.

CA-64 DR. Expander of "DALLAS" Chip Readers. Supports the DALLAS chip readers to enable performance of the access control functions and operation of the electromagnetic door lock.

CA-64 E Zone Expander. Enables the system expansion by 8 zones. The expander with electronics in version 2.1 (or later) and firmware in version 2.0 (or later), where the DIP-switch 8 is set in ON position, will be identified by the control panel as CA-64 Ei. Roller shutter motion detectors (rope detectors) and vibration detectors (2 additional line types) can be connected to the CA-64 Ei expander zones .

CA-64 EPS Zone Expander with Power Supply. Enables the system expansion by 8 zones. Equipped with a 2.2 A built-in switching mode power supply. The expander with electronics in version 2.1 (or later) and firmware in version 2.0 (or later), where the DIP-switch 8 is set in ON position, will be identified by the control panel as CA-64 Ei. Roller shutter motion detectors (rope detectors) and vibration detectors (2 additional line types) can be connected to the CA-64 Ei expander zones.

CA-64 ADR Addressable Zone Expander. Enables the system expansion by 48 zones. Equipped with a 2.2 A built-in switching mode power supply. The INTEGRA control panels support the addressable zone expanders having firmware in version v1.5 or later.

CA-64 O-OC/CA-64 O-R/CA-64 O-ROC. Output Expander. Enables expansion of the system by 8 outputs. Made in three versions: 8 OC type outputs, 8 relay outputs and 4 relay outputs/4 OC outputs.

INT-ORS. DIN-rail outputs expander. Enables the system to be expanded by 8 relay outputs. The relays can control the electrical devices supplied with 230 V AC voltage.

Note: If the sixth DIP-switch in the INT-ORS expander is set in the upper position, the device will be identified by the control panel as the CA-64 O outputs expander.

CA-64 OPS-OC/CA-64 OPS-R/CA-64 OPS-ROC. Output Expander with Power Supply. Enables expansion of the system by 8 outputs. Made in three versions: 8 OC type outputs, 8 relay outputs and 4 relay outputs/4 OC outputs. Equipped with a 2.2 A built-in switching mode power supply.

INT-IORS. DIN-rail zones/outputs expander. Enables the system to be expanded by 8 zones and 8 relay outputs. The relays can control the electrical devices supplied with 230 V AC voltage.

Note: If the sixth DIP-switch in the INT-IORS expander is set in the upper position, the device will be identified by the control panel as the CA-64 PP zone/output expander.

CA-64 PP Zone/Output Expander with Power Supply. Enables expansion of the system by 8 zones and 8 outputs (4 relay and 4 OC type). Equipped with a 2.2 A built-in switching mode power supply.

CA-64 SM Speech Synthesizer Expander. Capable of storing 16 voice messages, each with 15 second duration. The messages are used for alarm notification via telephone.

VMG-16 Voice Message Generator. Plays back prerecorded messages when specified events occur in the system.

ACU-100 Controller of ABAX Wireless System. Enables expansion of the system by adding wireless devices.

INT-RX. 433 MHz remote key fob operation expander. Makes it possible to assign a system of remote key fobs to the users so that by using them the users can control the system.

Fig. 1. Example of devices interfacing with the INTEGRA alarm control panel.
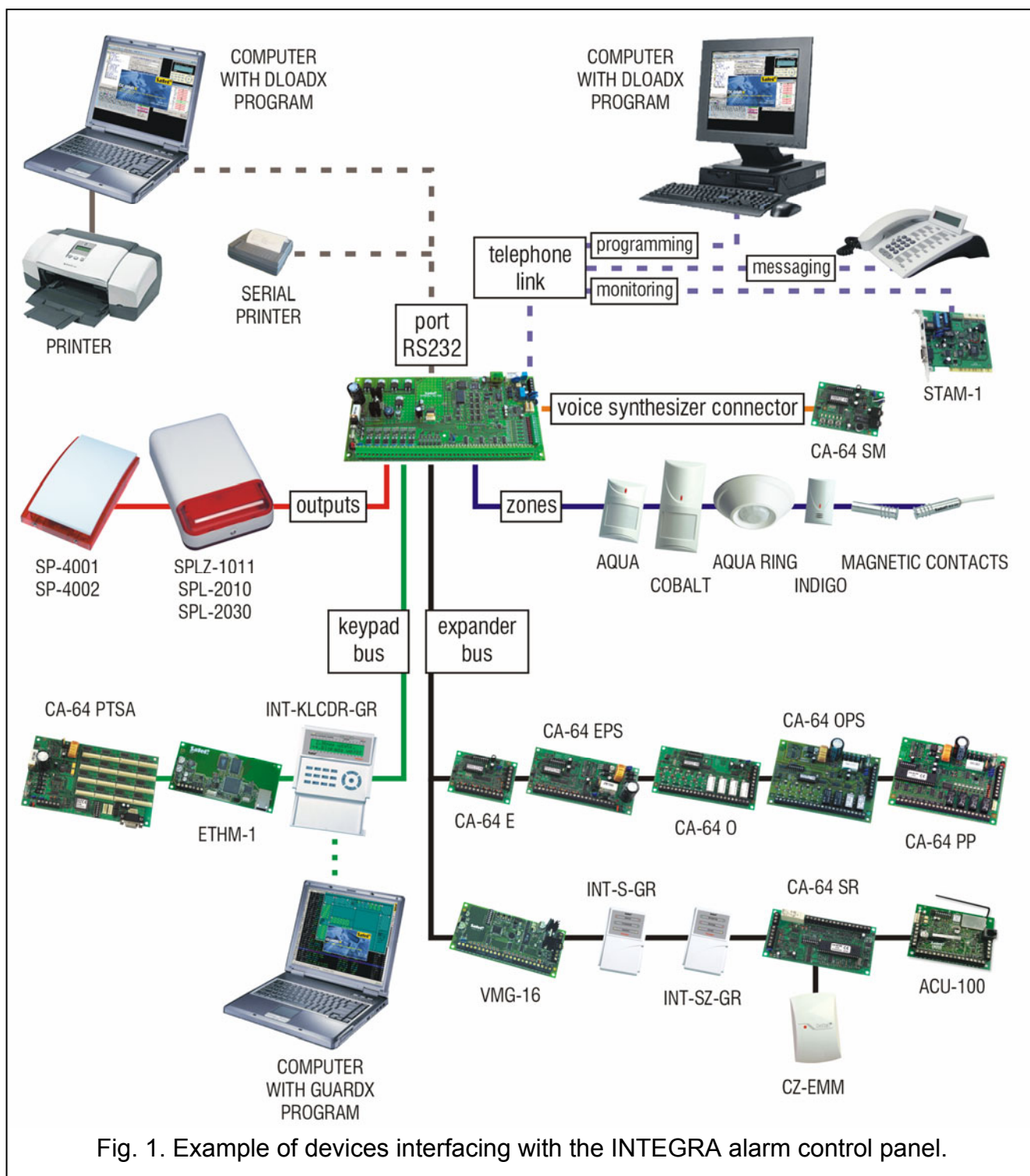
4. Control panel installation

⚠️ **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 control panel and other intruder system components should be installed within the protected premises. Permanent (not disconnectable) 230 V AC 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).
- OMI-3 (INTEGRA 64, INTEGRA 128) – required for conformance to Standard 50131-3,
- OMI-2 (INTEGRA 24, INTEGRA 32) – required for conformance to Standard 50131-3,
- OMI-1 (INTEGRA 24) – required for conformance to Standard 50131-3.

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 230 V AC 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!

The following tools will be useful during installation:

- screwdriver, flat 2.5 mm,
- screwdriver, phillips,
- pliers, precision,
- pliers, flat nose,
- driller c/w a set of drill bits.

INTEGRA 64/INTEGRA 128 control panel mainboard

MEMORY

TIP RING T-1 R-1

RESET
J20

DIALER

J18 J19

SYNT1 SYNT2

J28
BATTERY CHARGE
500mA 1000mA

J24

SERIAL PORT RS-232

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

BATTERY
T6.3A

OUT1 OUT2 OUT3 OUT4 +KPD +EX1/EX2

− +

~AC~ COMOUT1COM OUT2COMOUT3COMOUT4COM+KPDDTM 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

+ red

− black

battery

Board terminals:

AC	– power supply inputs (20 V AC)	**T-1, R-1**	– extension telephone line (telephone set connection)
Z1 to **Z16**	– zones		
OUT1 to **OUT4**	– high-current outputs	**TIP, RING**	– public telephone line (analog)
OUT5 to **OUT16**	– low-current outputs		– protective terminal – ground (connect to protective circuit only)
DTM, CKM	– keypad bus		
DT1, CK1	– expander bus 1	**+KPD, +EX1, +EX2**	– supply outputs (+12 V)
DT2, CK2	– expander bus 2	**SYNT1, SYNT2**	– connectors for voice synthesizers
COM	– common ground	**RS-232**	– connector for service computer

INTEGRA 32 control panel mainboard

Board terminals :

~ AC	– supply inputs (18 V 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 (+12 V)
SM-2 VOICE SYNTHESIZER	– connector for voice synthesizer
RS-232	– connector for service computer

INTEGRA 24 control panel mainboard

MEMORY J21

J19

RESET

TIP RING T-1 R-1

CHARGE

J18 SM-2 VOICE SYNTHESIZER

BATTERY F1 T3.15A

DIALER

OUT1   OUT2

OUT3
OUT4

SERIAL PORT RS-232

OUT3
OUT4

− +

~ AC~ COM OUT1 COM OUT2 COM +KPD DTM CKM COM +EX DT CK AUX Z1 COM Z2   Z3 COM Z4

+ black

− red

battery
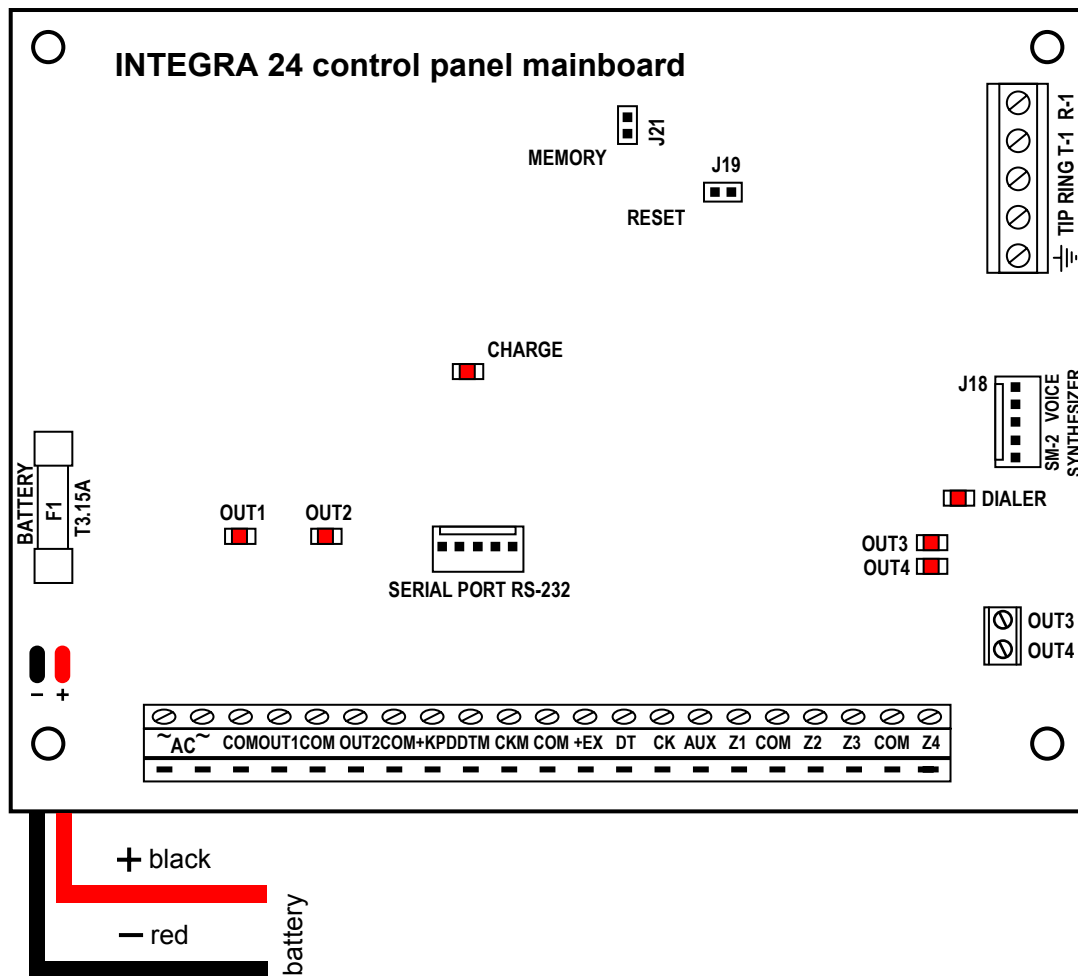
Board terminals :

~ AC	– supply inputs (18 V AC)	**T-1, R-1**	– extension telephone line (telephone set connection)
Z1 do **Z4**	– zones		
OUT1, OUT2	– high-current outputs	**TIP, RING**	– public telephone line (analog)
OUT3, OUT4	– low-current outputs OC	⏚	– protective terminal – ground (connect to protective circuit only)
DTM, CKM	– keypad bus		
DT, CK	– expander bus		
COM	– common	**+KPD, +EX, AUX**	– supply outputs (+12 V)
		SM-2 VOICE SYNTHESIZER	– connector for voice synthesizer
		RS-232	– connector for service computer

4.1 Connecting LCD keypads

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 **300 m**.

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, in case of 8-conductor straight-through cable with conductor cross-section 0.5 mm^2 (the use of twisted-pair wire is not allowed), the number of parallel-connected wires for particular signals must be as indicated in the table below.

SIGNAL / DISTANCE	NUMBER OF CONDUCTORS			
	+KPD	COM	CKM	DTM
up to 100 m	1	1	1	1
up to 200 m	2	2	1	1
up to 300 m (12 conductors)	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 11 V.*

- *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.*

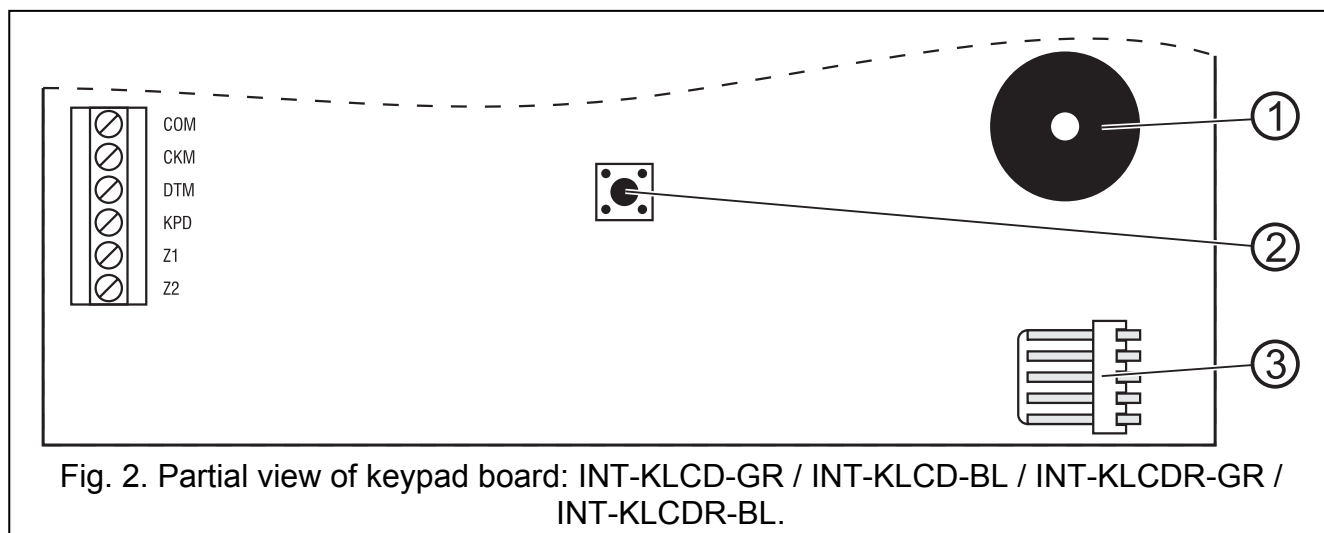|	TERMINALS DESCRIPTION					
KEYPAD	KPD	DTM	CKM	COM	Z1 – to detector	Z2 – to detector
PANEL	+KPD	DTM	CKM	COM	ADDITIONAL SYSTEM ZONES	

Fig. 2. Partial view of keypad board: INT-KLCD-GR / INT-KLCD-BL / INT-KLCDR-GR / INT-KLCDR-BL.
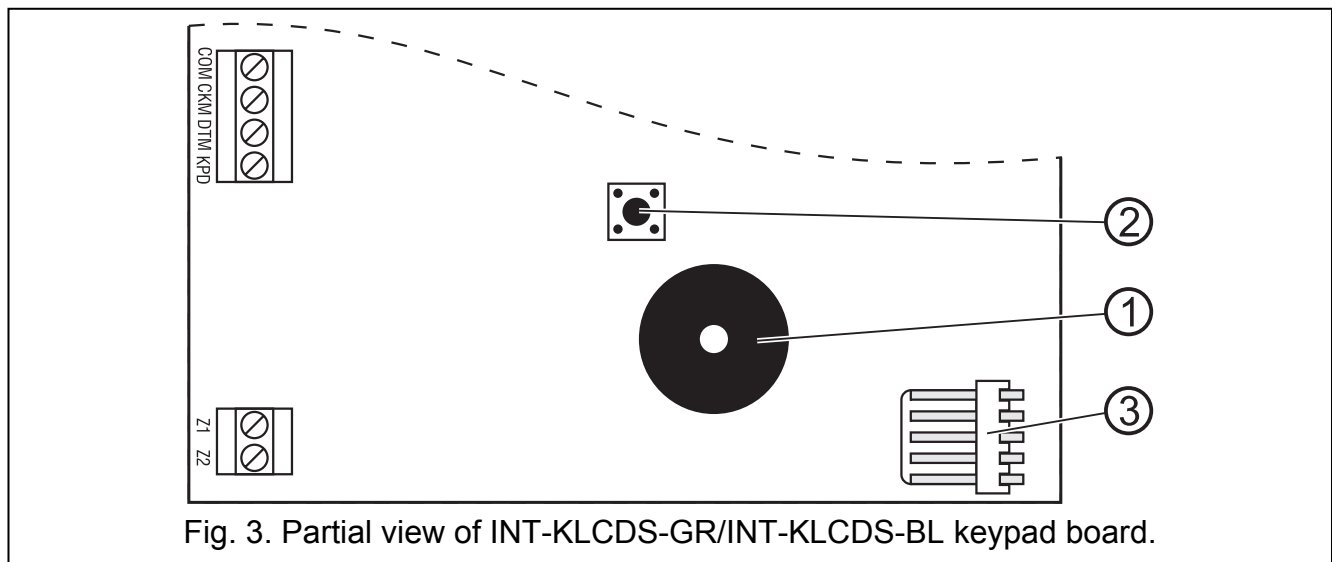
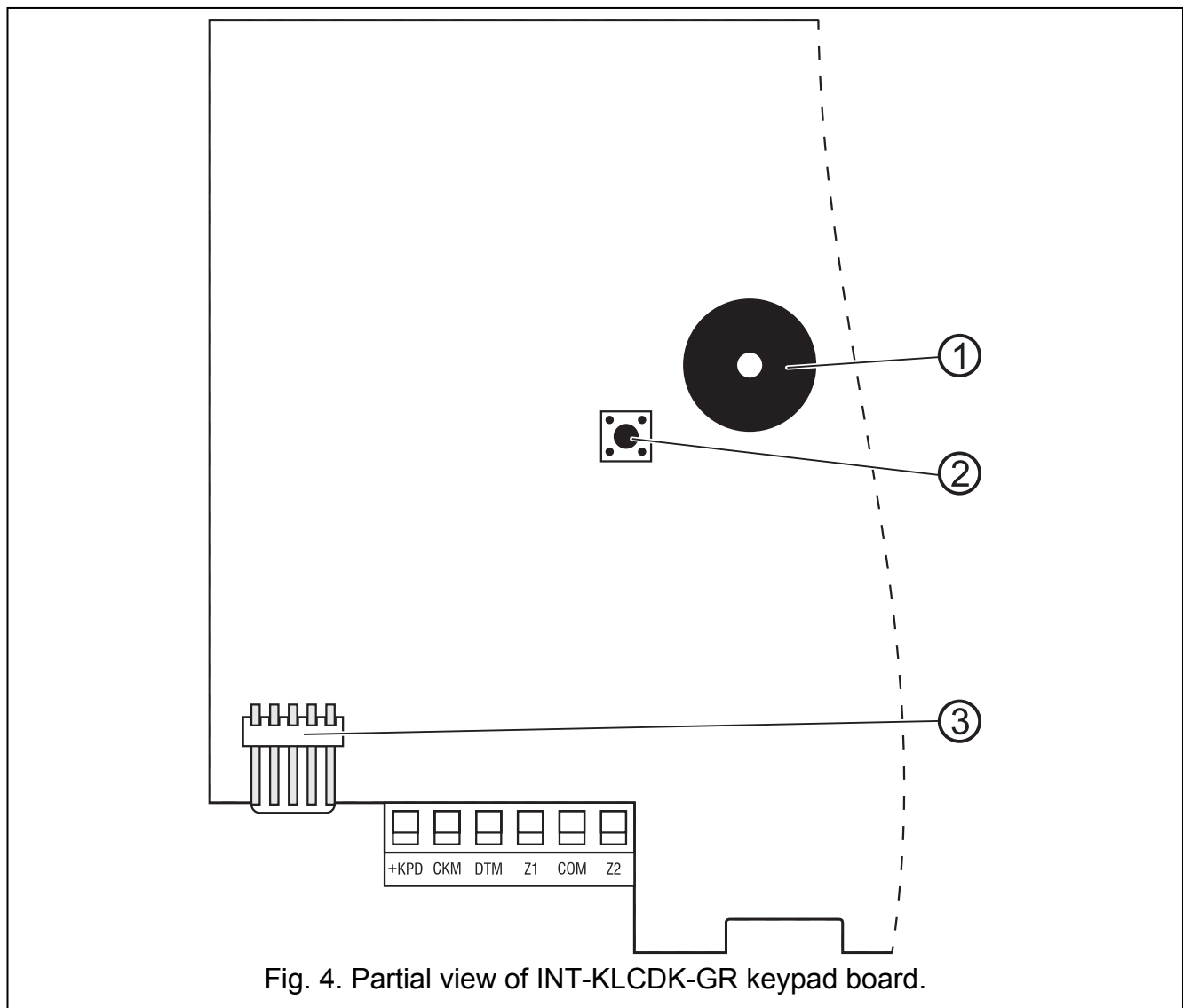Fig. 3. Partial view of INT-KLCDS-GR/INT-KLCDS-BL keypad board.

Fig. 4. Partial view of INT-KLCDK-GR keypad board.

Explanations to Figures 2, 3 and 4:

1 – buzzer

2 – tamper contact

3 – RS-232 port

The control panel identifies the keypads by their addresses, set by software tools and saved in EEPROM system (non-volatile memory).

The addresses cannot repeat themselves! The keypad addresses also indicate the numbers assigned by the system to the keypad zones Z1 and Z2. They are served by the control panel in the same way as the mainboard zones.

Keypad address	Numbers of **Z1, Z2** 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

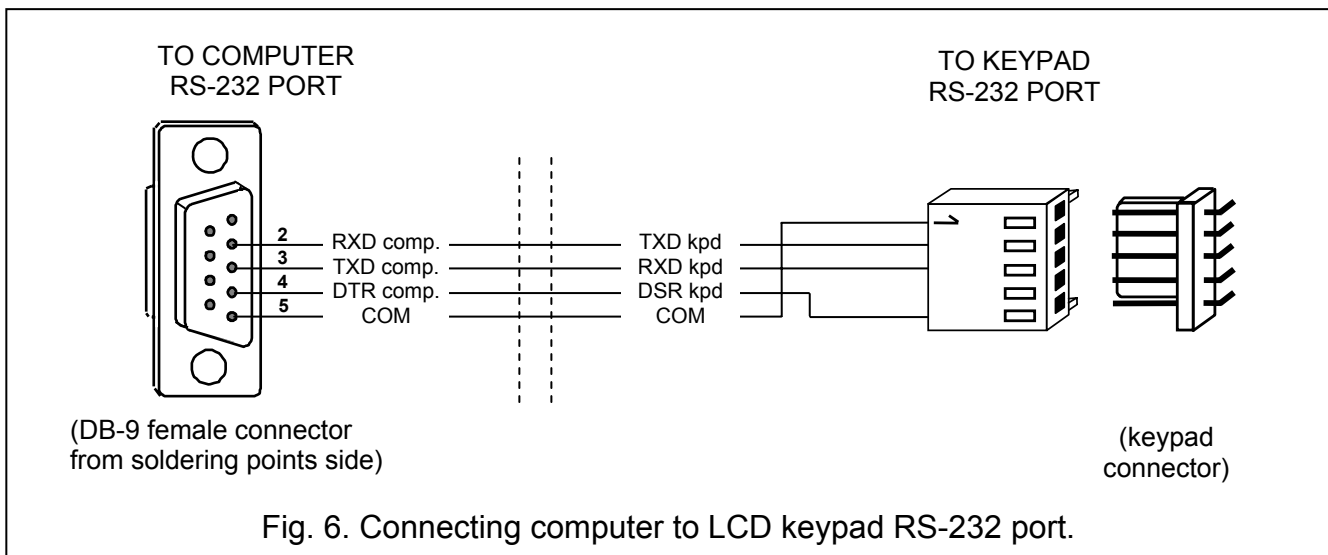Fig. 5. Programming the keypad address

    - 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 5.
    - 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).

TO COMPUTER
RS-232 PORT

TO KEYPAD
RS-232 PORT

2 RXD comp. ——— TXD kpd
3 TXD comp. ——— RXD kpd
4 DTR comp. ——— DSR kpd
5 COM ——— COM

(DB-9 female connector
from soldering points side)

(keypad
connector)

Fig. 6. 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. In case of 8-conductor straight-through cable with conductor cross-section 0.5 mm^2 (the use of twisted-pair wire is not allowed), the distance between the computer and the keypad can be up to **10 meters**. Keypad connector signals are shown in Figure 6.

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.

4.2 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.

Connect the modules by means of the typical unshielded straight-through cable (using the twisted-pair type of cable is not allowed) as used in the security alarm systems (e.g. 8-conductor straight-through cable with conductor cross-section 0.5 mm^2). All the signal wires must run in one cable (do not use separate cables for this purpose).
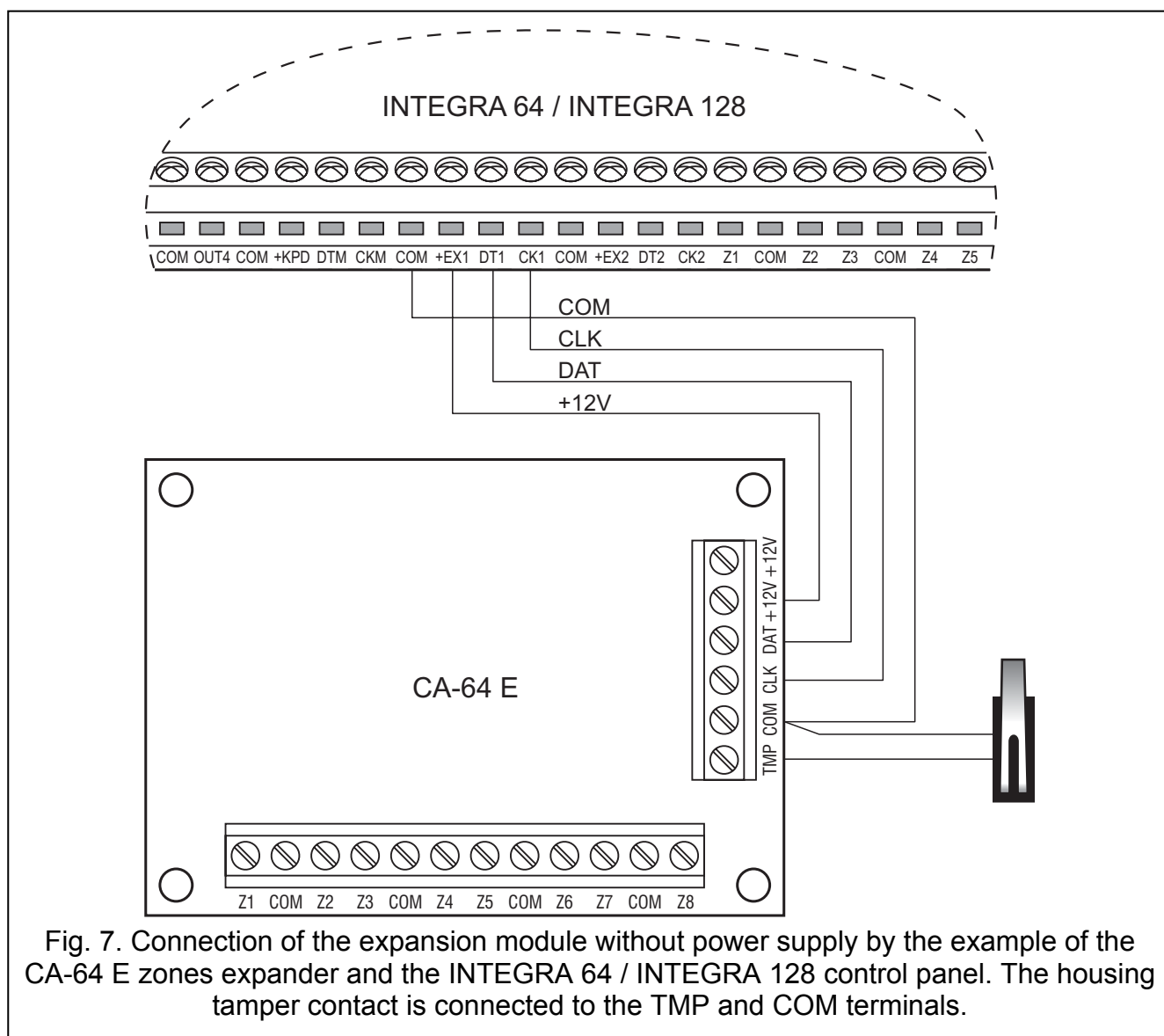

Fig. 7. Connection of the expansion module without power supply by the example of the CA-64 E zones expander and the INTEGRA 64 / INTEGRA 128 control panel. The housing tamper contact is connected to the TMP and COM terminals.

Fig. 8. Connection of the expansion module with power supply by the example of the CA-64 EPS zones expander and the INTEGRA 64 / INTEGRA 128 control panel. The housing tamper contact is connected to the TMP and COM terminals. The AC terminals are to be connected to the terminals of mains transformer secondary winding.
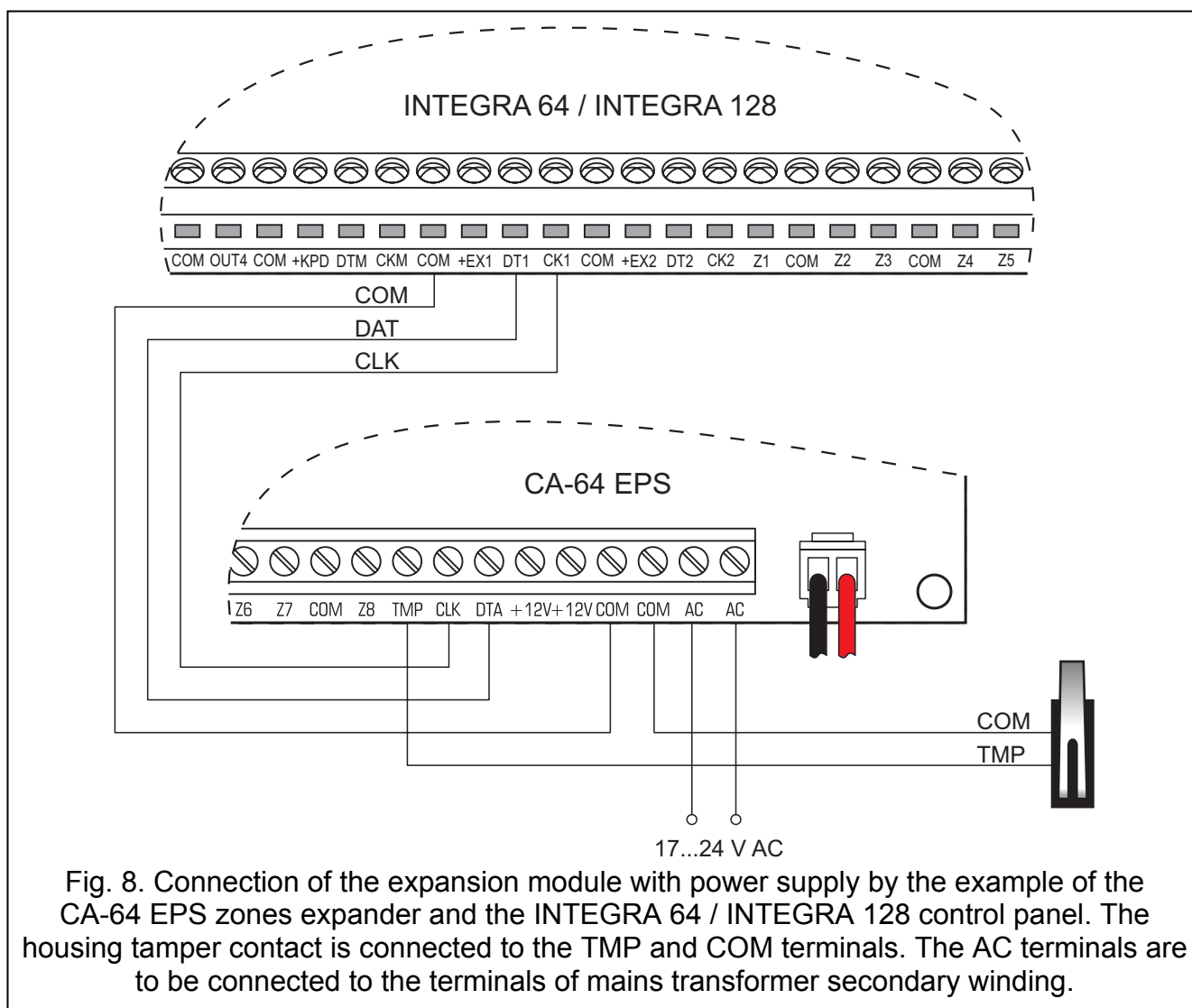
The total length of the expander bus must not exceed 1000 m. If the distance between the control panel and the modules is larger, use several conductors connected in parallel for each signal to allow for the conductor resistance. Where the 8-conductor straight-through cable with conductor cross-section 0.5 mm^2 is used, the number of conductors connected in parallel is shown in the table below.

distance between module and control panel	number of signal conductors		
	CLK	DAT	COM
up to 300 m	1	1	1
300 – 600 m	2	2	2
600 – 1000 m	2	2	4

The modules without power supply unit may be supplied directly from the control panel if the distance between control panel and module is not higher than 300 m. Cross-section of the +12 V and COM conductors should be selected so that the supply voltage drop across the outermost module does not exceed 1 V as against the control panel output voltage. With small distances (up to 100 m), the modules without power supply unit may be connected one after the other to one supply cable (see Fig. 9).

If this is the case, devices connected to the expanders must be independently supplied (by means of a separate cable from the control panel, expander with power supply, or a power supply unit).
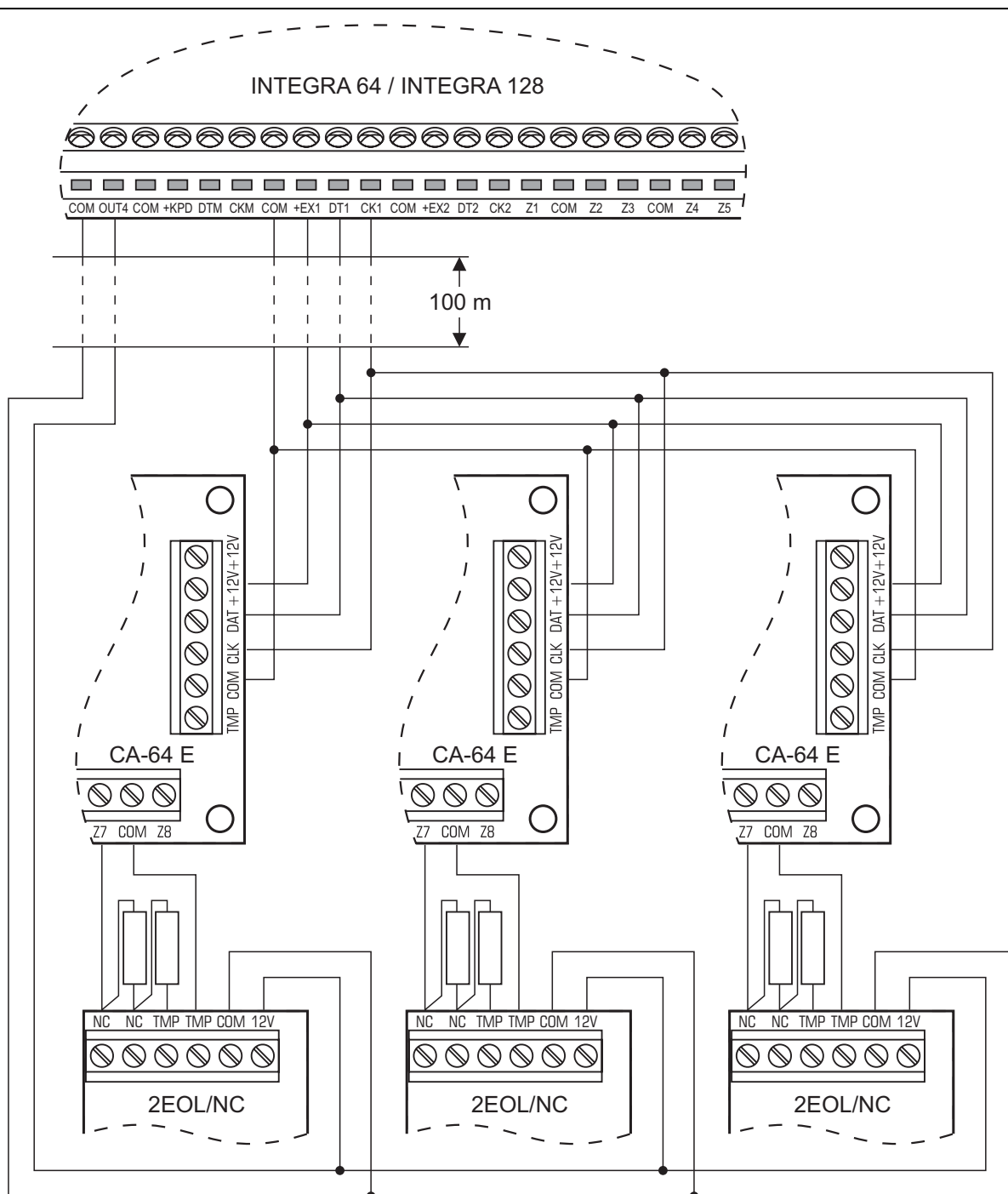
Fig. 9. Connection of modules without power supply unit to the control panel when the distance between panel and modules is very small (by the example of CA-64 E zones expander). Several modules (parallel connection) are connected to the cable leading to the control panel. Expanders only may be connected to the +EX1 supply terminal. Detectors must be supplied through separate conductors. It is not recommended that a fourth expander be added, if the 8-conductor straight-through cable with conductor cross-section 0.5 mm^2 is used. Such a module may not be recognized by the control panel. Due to the conductor resistance, the logical "0" level on the control panel input may be higher than the maximum permissible value.

When the distance between the control panel and the modules exceeds 300 m, the modules without power supply unit should not be supplied from the control panel. They should have an independent supply source (a power supply unit or an expander with power supply).
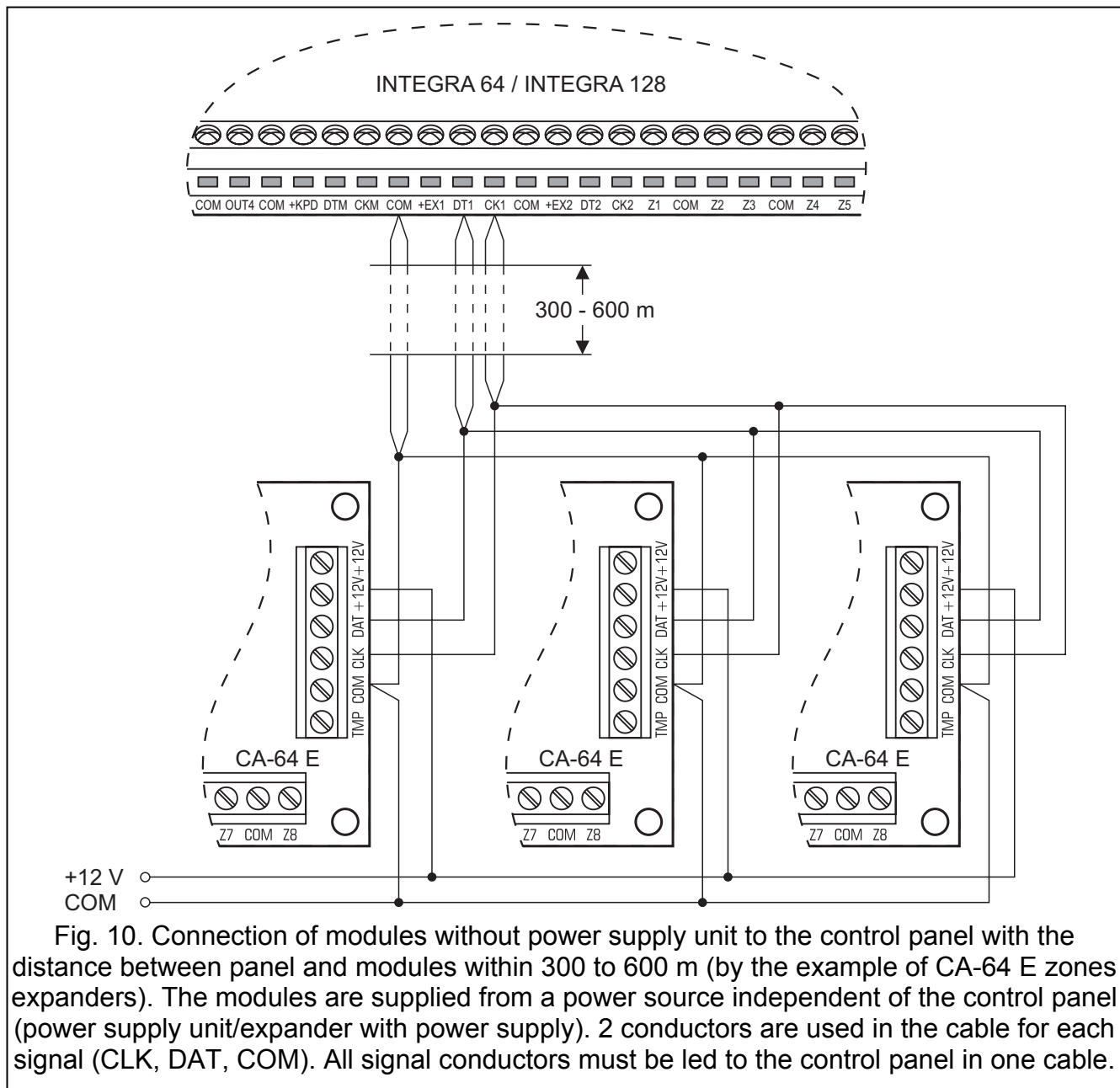
Fig. 10. Connection of modules without power supply unit to the control panel with the distance between panel and modules within 300 to 600 m (by the example of CA-64 E zones expanders). The modules are supplied from a power source independent of the control panel (power supply unit/expander with power supply). 2 conductors are used in the cable for each signal (CLK, DAT, COM). All signal conductors must be led to the control panel in one cable.

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.*

4.3 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).

In case of the CA-64 E expander (with electronics version 2.1 or later and program version 2.0 or later) and the CA-64 EPS expander (with electronics version 2.0 or later and program version 2.0 or later), the value of resistors used in EOL and 2EOL configurations is programmable. The resistor value for EOL configuration should be determined within the range from 500 Ω to 15 kΩ (for 2EOL configuration, the single resistor value is equal to half the defined value). To make the circuit in the alarm control panels, LCD keypads and other expanders (CA-64 ADR, INT-IORS, CA-64 PP) in EOL configuration, use the 2.2 kΩ resistor, and in 2EOL configuration – the 1.1 kΩ resistors.

The zones in the CA-64 E expander (with electronics version 2.1 or later and program version 2.0 or later) and in the CA-64 EPS expander (with electronics version 2.0 or later and program version 2.0 or later) may additionally work in the following configurations:

- roller (dedicated to connecting the roller shutter motion detectors (rope detectors)),

- vibration (normally closed, dedicated to connecting the vibration detector – an NC type of detector, e.g. magnetic contact, may be connected in series with the vibration detector).

All zones in the system can work in the configuration:

- follow output.

In case of this configuration, activating the output amounts to a zone violation (the output and the zone does not need to be physically connected). The zone does not need to exist physically, because virtual zones may be used as well. In case of the physically existing zones, programmed as the „follow output" ones, the physical violations and tampers of the zone are disregarded.

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.

Figures 11, 12, 13 and 14 show how the detectors are connected in various configurations. In the presented examples, the OUT4 output feeds the detectors (type 41 POWER SUPPLY). The detector signal is fed to the Z1 zone of the control panel. The Z2 zone, Figures 11, 12 and

13, has been programmed as type 9 (24H TAMPER). 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).
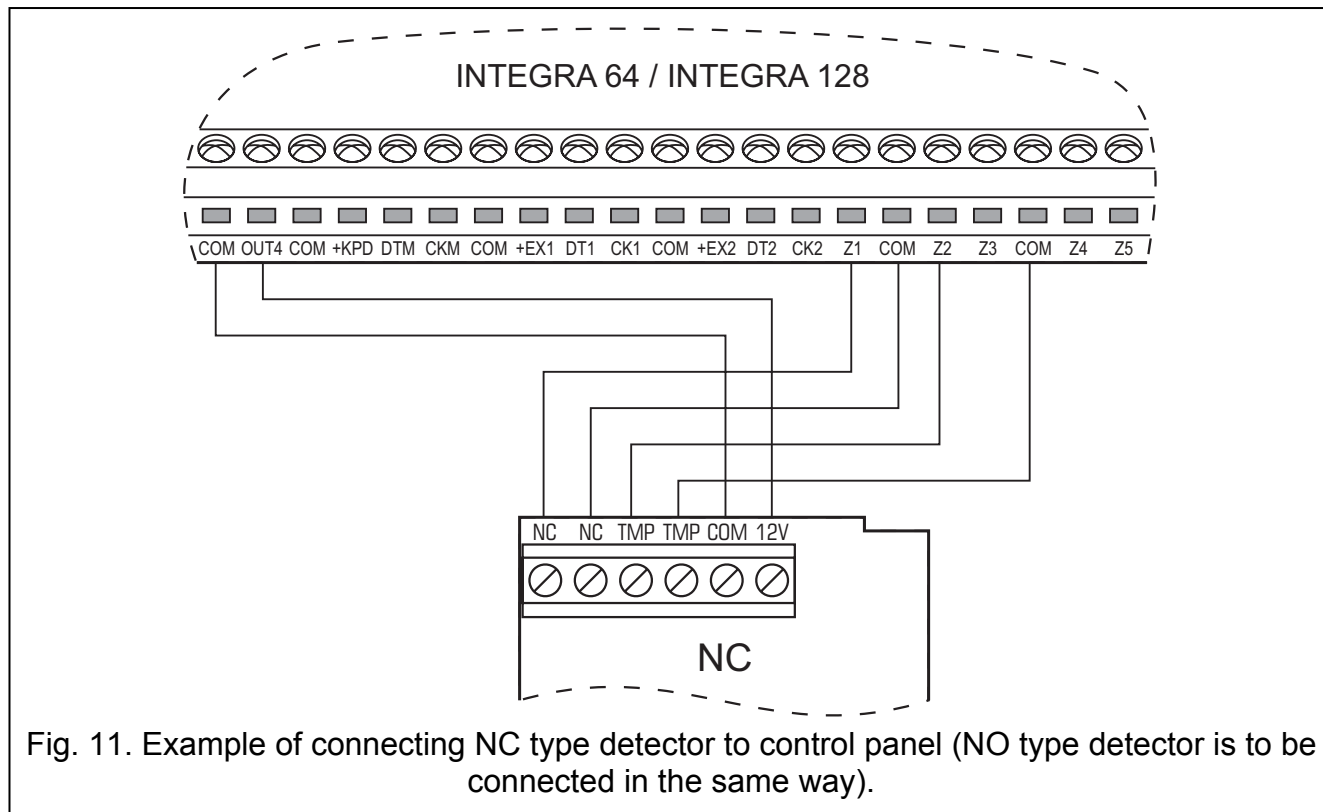

Fig. 11. Example of connecting NC type detector to control panel (NO type detector is to be connected in the same way).
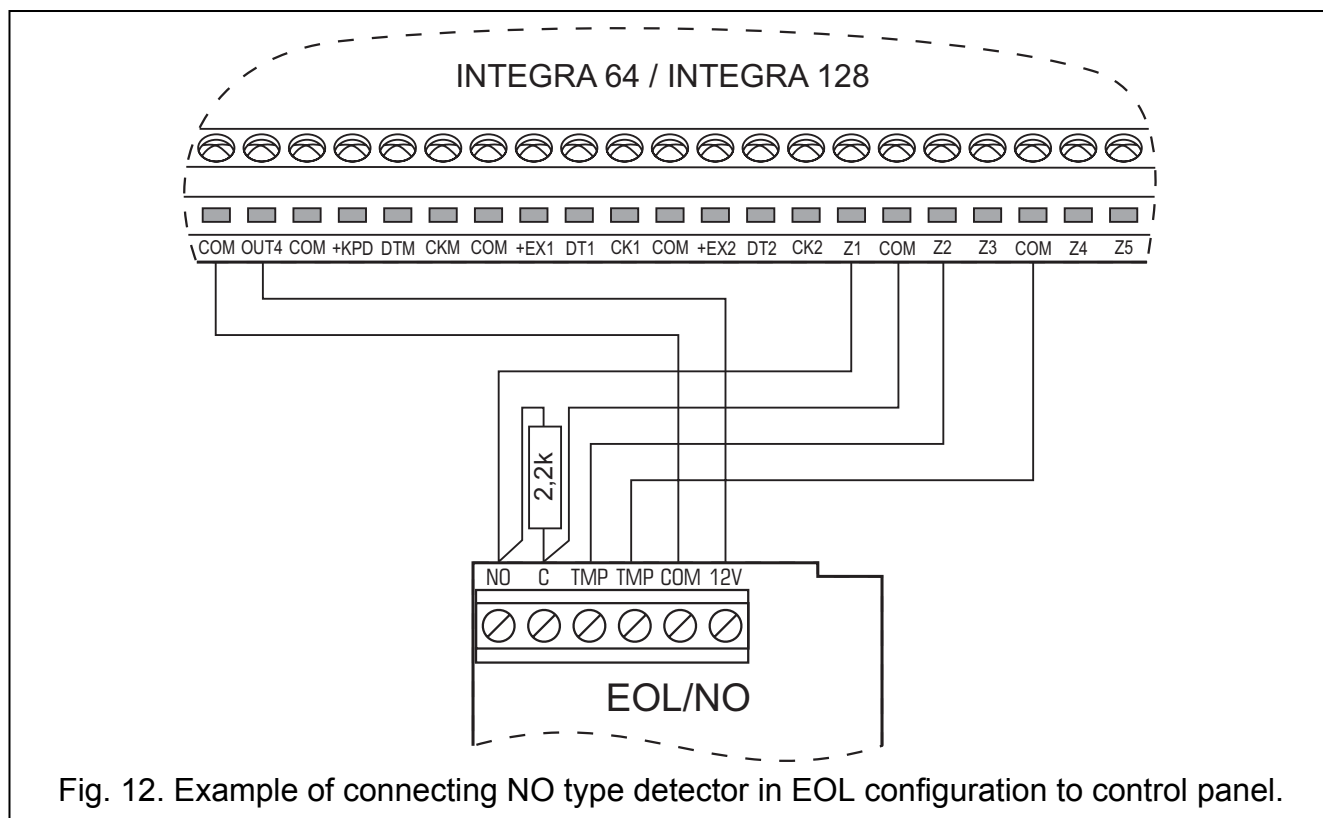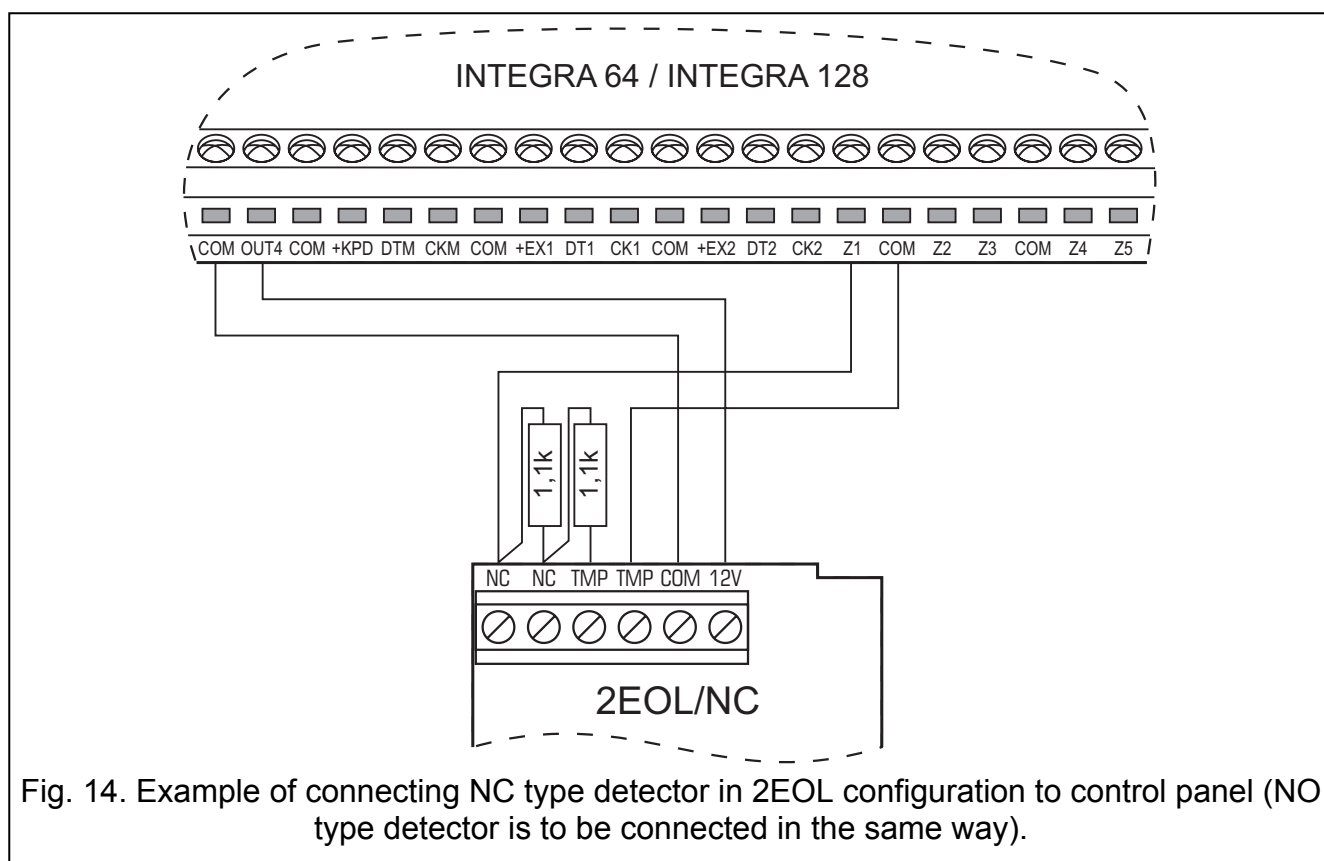

Fig. 12. Example of connecting NO type detector in EOL configuration to control panel.

Fig. 13. Example of connecting NC type detector in EOL configuration to control panel.

Fig. 14. Example of connecting NC type detector in 2EOL configuration to control panel (NO type detector is to be connected in the same way).
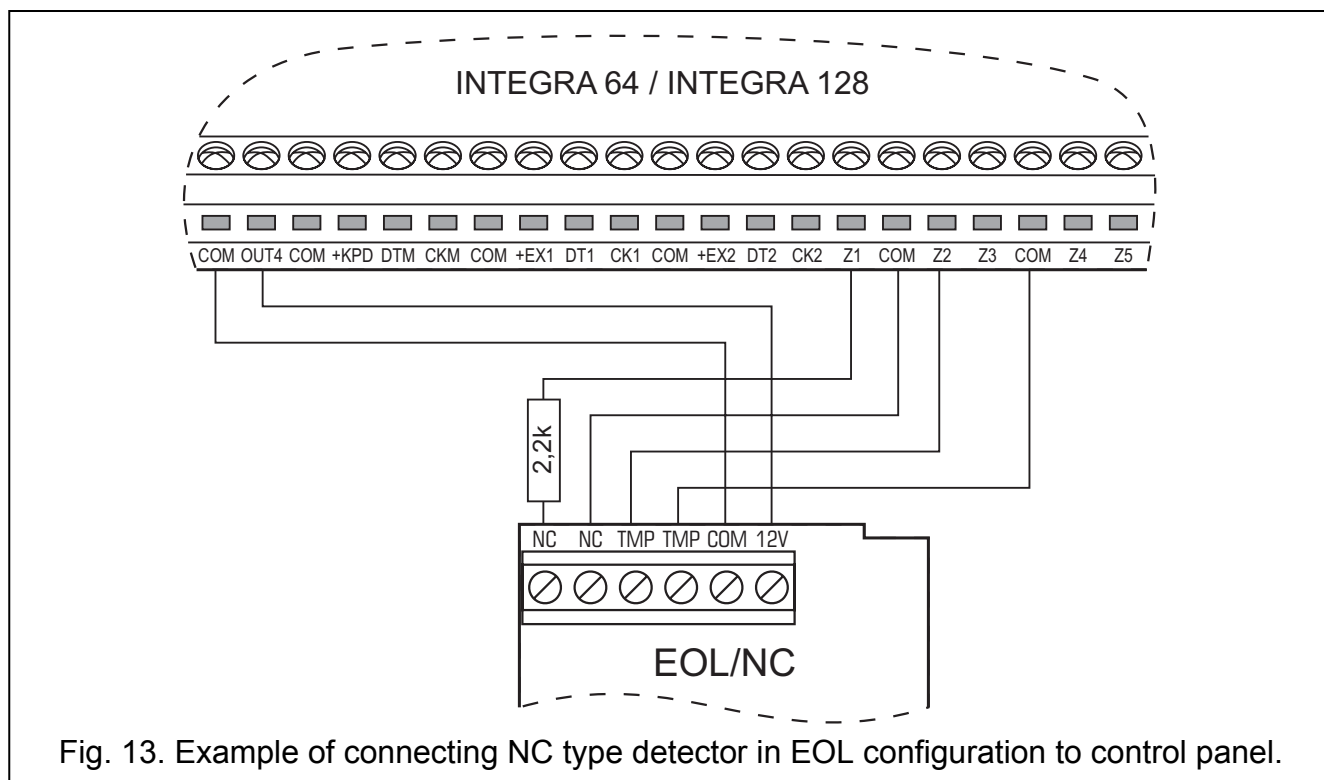
The NO and NC detectors in 2EOL configuration are connected in the same way, it is only important to properly indicate to the control panel which detector is connected to the zone (2EOL/NO or 2EOL/NC).

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

Fig. 15. Example of connecting 2EOL/NC detector to CA-64 E expander (the NO type detector is to be connected in the same way). **Power supply common of the detector and signal common should be connected by a separate conductor. If more expanders are connected to one supply cable, the detectors should be independently supplied (not from the expander).**
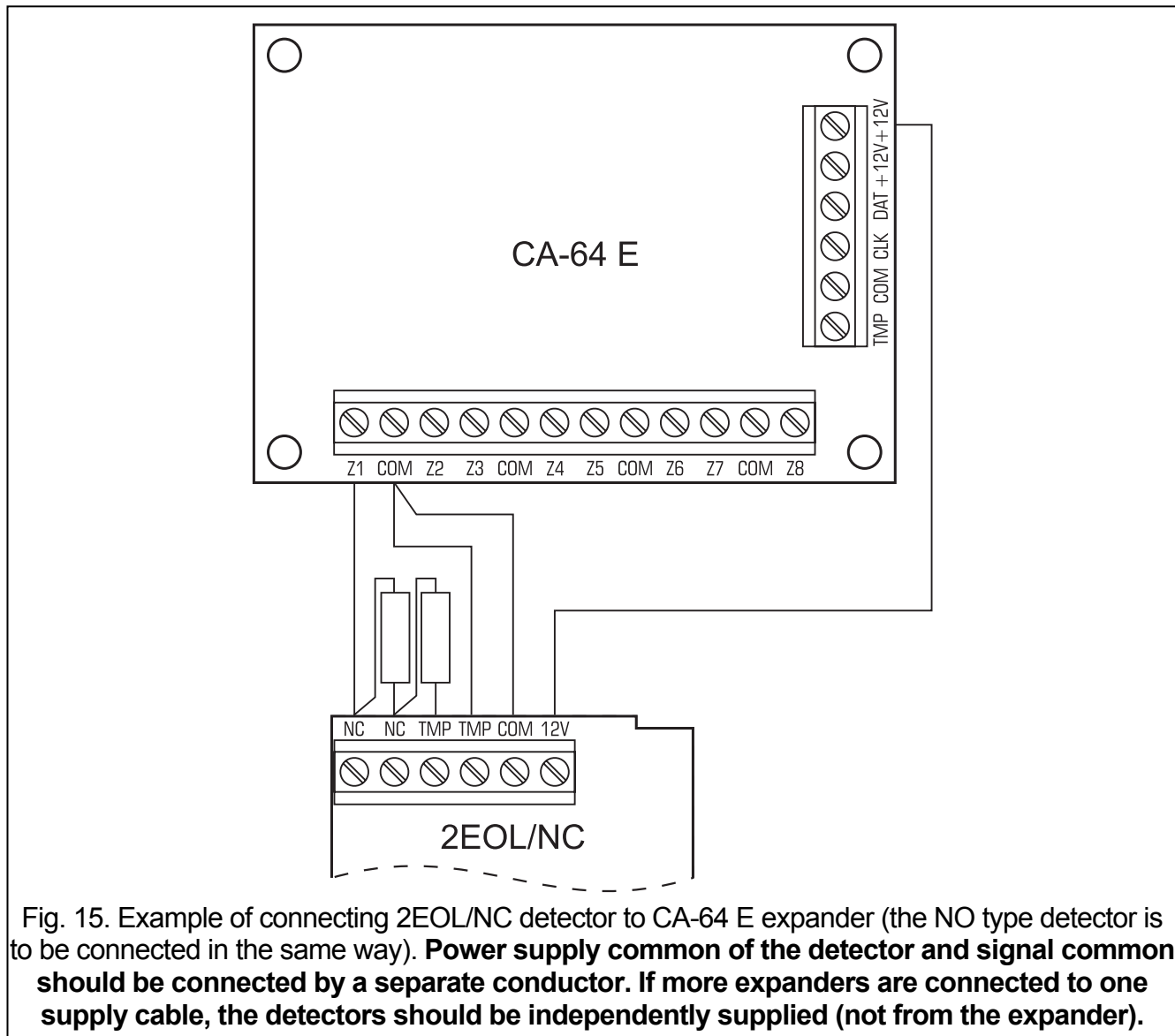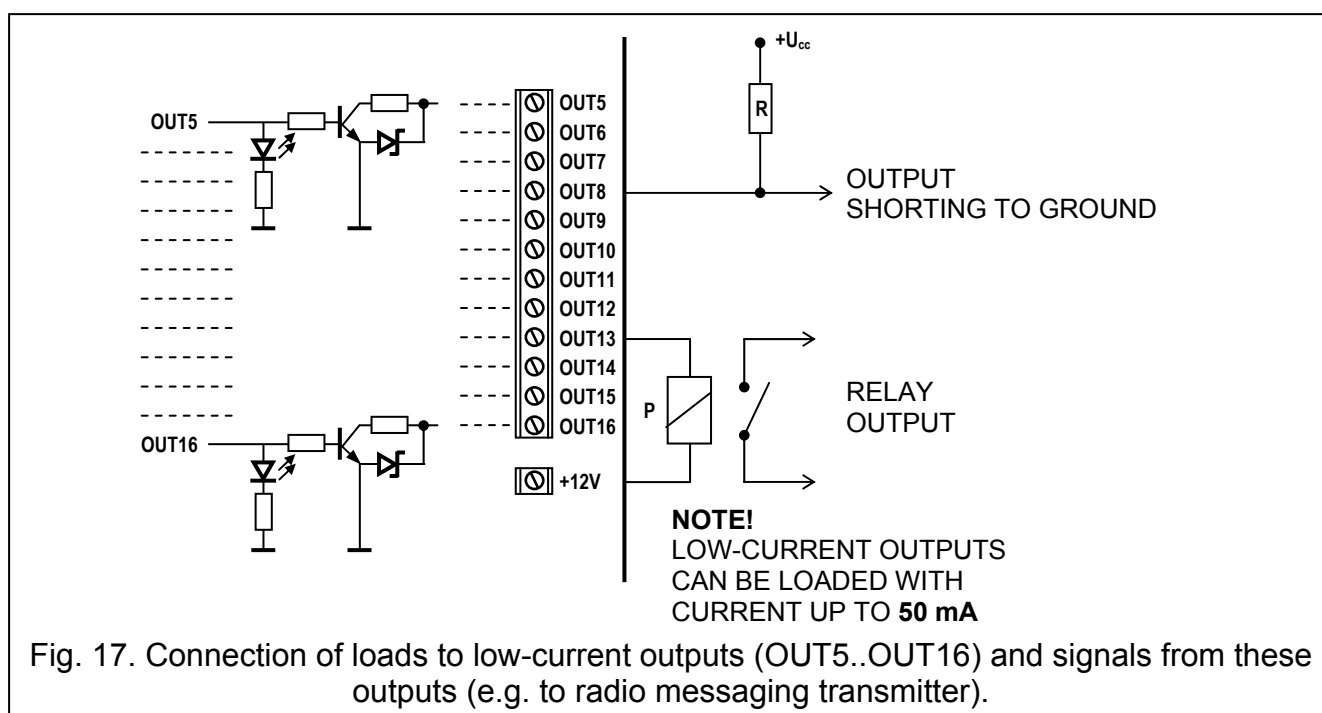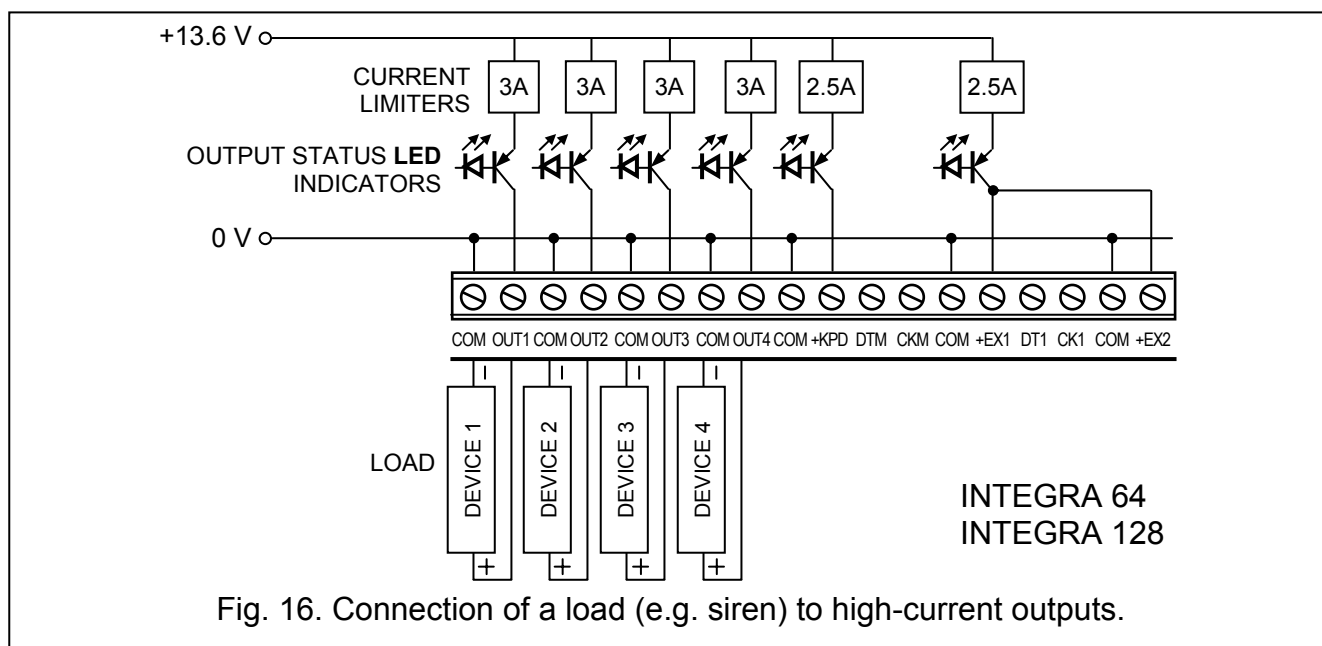
4.4 Connection of sirens

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.

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. 16.

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 2.2 kΩ resistor in parallel to the load.*

- *When the siren connected to the output in parallel to the resistor 2.2 kΩ generates undesirable sounds (if not controlled), reduce the resistance value.*

- *If the programmable high-current outputs are not used, they should be loaded with 2.2 kΩ resistors.*

Fig. 16. Connection of a load (e.g. siren) to high-current outputs.

Fig. 17. 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 17.

4.5 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.).

⚠️ **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.**

The control panel may only be connected to <u>analog lines</u> 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.

4.6 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.
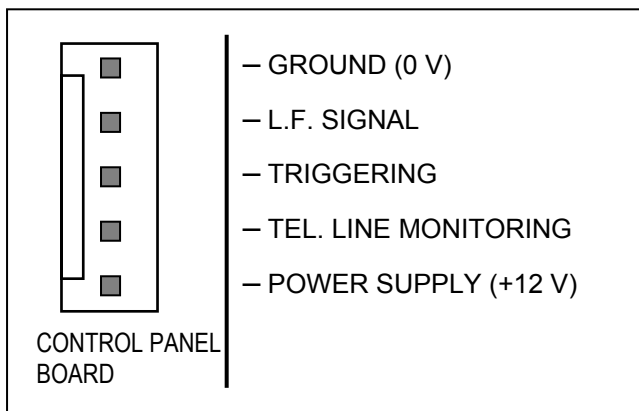

Fig. 18. Arrangement of signals on SM-2 voice synthesizer connectors.

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.

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 expansion 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.

4.7 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. 19. Connection of a printer to the control panel serial port.
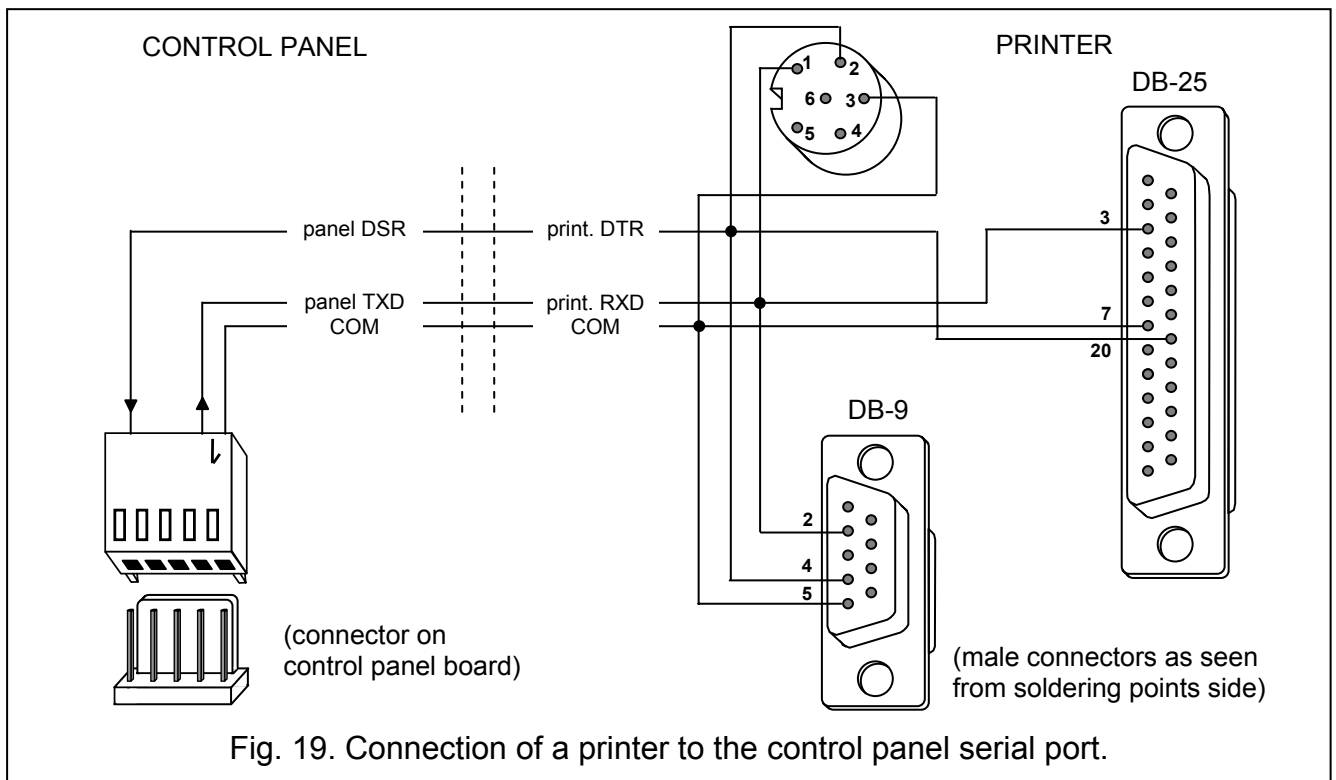
4.8 Connection of power supply

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.

4.8.1 Description of electric connections

- Connect the 230 V 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). Only one device with switching-mode power supply unit can be connected to one transformer.
- 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. <u>Never connect the "neutral" wire of the 230 V AC mains supply to the ground terminal. If there is no separate electric shock protection circuit in the facility, leave this terminal unconnected.</u>**

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

<u>Be careful not to cause overloading of the control panel power supply in the security system.</u> 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 13.6–13.8 V and should not be changed.

4.8.2 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 is delivered complete with adapter connectors for connection of the battery with twisted ends (e.g. the 17 Ah capacity battery). Therefore, the ends of the battery cables must not be cut off. **The control panel will not start after connecting the battery alone** (without mains power supply) but it will operate in case of 230 V AC failure provided that it was started earlier.

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

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

The above mentioned power-up sequence (battery first, then 230 V AC 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 230 V AC 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 2.2 kΩ resistors. The sirens may only be connected after completion of parameter programming for the installed alarm system.

For systems with expansion 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. 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.*

5.1 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 3.6 V/60 mAh). 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 mode 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. Compliance with CLC/TS 50131-3 requirements

To meet the requirements of CLC/TS 50131-3:

- for the detectors provided with the antimasking feature, connect the detector alarm output in parallel with the masking attempt alarm output and program the "Maximum zone violation time" so that it is slightly longer than the violation signaling on the detector alarm output;
- for all the expansion modules with integrated power supplies, an additional supervised overcurrent protection (like the ZB-2) must be used for each power supply output. Overload signaling output (OVL) should be connected to zone programmed as type 62 (TECHNICAL – OVERLOAD).

7. Basic specifications

7.1 Technical data – alarm control panels

		Control panel type			
		INTEGRA 24	**INTEGRA 32**	**INTEGRA 64**	**INTEGRA 128**
Mainboard supply voltage, nominal (±10%)		18 V AC, 50–60 Hz		20 V AC 50–60 Hz	
Mainboard current consumption	minimum	110 mA	115 mA	135 mA	
	typical	121 mA	127 mA	149 mA	
	maximum	204 mA	234 mA	337 mA	
Power supply type, control panel		A			
Power supply unit voltage, nominal (±10%)		13,8 V DC			
Output voltage range		9,5 V…14 V			
Batt. failure voltage thr. (±10%)		11.0 V			
Battery cut-off voltage (±10%)		9.5 V			
Power supply load capacity		1,2 A		3 A	
Load capacity, high-current programmable outputs (±10%)		2 A		3 A	
Load capacity, low-current programmable outputs		50 mA			
Load capacity, +KPD output (±10%)		500 mA		2.5 A	
Load capacity, AUX output		500 mA			
Load capacity, +EX output		500 mA			
Load capacity, +EX1, +EX2 outputs				2.5 A	
Battery charging current (±20%)		350 mA	400/800 mA	500/1000 mA	
Environmental class		II			
Operational temperature range		-10 °C…+55 °C			
Weight		178 g	211 g	341 g	341 g

7.2 Technical data – keypads

		Keypad type				
		INT-KLCD-GR **INT-KLCD-BL**	**INT-KLCDR-GR** **INT-KLCDR-BL**	**INT-KLCDK-GR**	**INT-KLCDL-GR** **INT-KLCDL-BL**	**INT-KLCDS-GR** **INT-KLCDS-BL**
Supply voltage, nominal (±15%)		12 V DC				
Current consumption	minimum	15 mA	55 mA	25 mA	55 mA	30 mA
	typical	17 mA	60 mA	30 mA	61 mA	33 mA
	maximum	101 mA	156 mA	110 mA	147 mA	151 mA
Housing dimensions width x height x thickness		140x126x26 mm		160x126x38 mm	145x115x26 mm	114x94x23.5 mm
Environmental class		II				
Operational temperature range		-10 °C…+55 °C				
Weight		231 g	236 g	317 g	217 g	141 g

7.3 Technical data – expansion modules

	INT-S-GR INT-S-BL	CA-64 E	CA-64 EPS	CA-64 O			CA-64 OPS			CA-64 PP	CA-64 ADR	ADR-MOD	CA-64 SM
				Module type									
Supply voltage, nominal (±15%)	12 V DC	12 V DC	18 V AC	12 V DC			18 V AC			18 V AC	18 V AC	12 V DC	12 V DC
Current consumption — minimum	22 mA	16 mA	35 mA	15 mA			35 mA			41 mA	42 mA	1,5 mA	15 mA
Current consumption — average	24 mA	18 mA	39 mA	17 mA			39 mA			45 mA	46 mA	1,8 mA	17 mA
Current consumption — maximum	66 mA	70 mA	91 mA	116 mA			138 mA			194 mA	55 mA	5 mA	72 mA
Supply unit capacity	-	-	2.2 A	-			2.2 A			2.2 A	2.2 A	-	-
Current-carrying capacity of AUX output with ZB-2 module connected			1.7 A				1.7 A			1.7 A	1.7 A		
Output voltage, nominal	-	-	13.8 V	-			13.8 V			13.8 V	13.8 V	-	-
Output voltage — minimum	-	-	9.5 V	-			9.5 V			9.5 V	9.5 V	-	-
Output voltage — maximum	-	-	14 V	-			14 V			14 V	14 V	-	-
Battery charging current (±20%)	-	-	400/800 mA	-			400/800 mA			400/800 mA	400/800 mA	-	-
Battery failure voltage thr. (±10%)	11 V												
Battery cut-off voltage (±10%)	9.5 V												
Battery charging time, maximum	24 h												
Environmental class	II												
Operational temperature range	-10°C…+55°C												
Weight	110 g	47 g	131 g	OC 74 g	R 118 g	ROC 96 g	OC 155 g	R 197 g	ROC 181 g	190 g	125 g	9 g	41 g

7.4 Battery selection

⚠ **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 11 V). To avoid damage to the equipment, a fully discharged/never used battery should be precharged with the use of a proper charger.

	Control panel type			
	INTEGRA 24	INTEGRA 32	INTEGRA 64	INTEGRA 128
Battery type	lead-acid, sealed			
Capacity, maximum	8 Ah	19 Ah	24 Ah	24 Ah
Max. charging time, 80% capacity	24 h			

The batteries should be individually selected for each system. Presented below are some examples of accumulator batteries energy balance as recommended by EN 50131-1:2005 for the power supply units Type A, Grade 3. They assume that in the event of mains supply failure the alarm system will have to work for 30 hours on emergency power supply, while being able to remotely report the on the power supply trouble.

7.4.1 INTEGRA 24 – battery 7 Ah

The available 30 hr current for the 7 Ah battery is:

I_{30h} = 7 Ah/30 h $\approx$ 0.233 A (233 mA)

The average currents consumed by the components of the model alarm system based on the INTEGRA 24 control panel:

- mainboard, INTEGRA 24: 121 mA;
- zones, NC: 4 x 5 mA;
- keypad, INT-KLCD-GR: 17 mA;
- partition keypad, INT-S-GR: 24 mA;
- 2 movement detectors, PIR: 2 x 10 mA;
- 2 magnetic detectors: 0 (require no power supply).

$\sum I_s$= 0.121 + 4x0.005 + 0.017 + 0.024 + 2x0.010 = 0.202 A (202 mA)

The summed average current consumed by the system is 202 mA, therefore it is lower than the current that can be provided by the battery.

7.4.2 INTEGRA 32 – battery 7 Ah

The available 30 hr current for the 7 Ah battery is :

I_{30h} = 7 Ah/30 h $\approx$ 0.233 A (233 mA)

The average currents consumed by the components of the model alarm system based on the INTEGRA 32 control panel:

- mainboard, INTEGRA 32: 127 mA;
- zones, NC: 8 x 5 mA;
- keypad, INT-KLCD-GR: 17 mA;
- partition keypad, INT-S-GR: 24 mA;
- 2 movement detectors, PIR: 2 x 10 mA;

- 6 magnetic detectors: 0 (require no power supply).

$\sum I_s$= 0.127 + 4x0.005 + 0.017 + 0.024 + 2x0.010 = 0.228 A (228 mA)

The summed average current consumed by the system is 228 mA, therefore it is lower than the current that can be provided by the battery.

7.4.3 INTEGRA 32 – battery 17 Ah

The available 30 hr current for the 17 Ah battery is:

I_{30h} = 17 Ah/30 h $\approx$ 0.566 A (566 mA)

The average currents consumed by the components of the model alarm system based on the INTEGRA 32 control panel:

- mainboard, INTEGRA 32: 127 mA;
- zones, NC: 8 x 5 mA;
- 2 keypads, INT-KLCD-GR: 2x17 mA;
- 2 partition keypads, INT-S-GR: 2x24 mA;
- 3 movement detectors, PIR: 3 x 10 mA;
- 3 microwave detectors: 3 x 25 mA
- 2 magnetic detectors: 0 (require no power supply).

$\sum I_s$= 0.127 + 8x0.005 + 2x0.017 + 2x0.024 + 3x0.010 + 3x0.025 = 0.354 A (354 mA)

The summed average current consumed by the system is 354 mA, therefore it is lower than the current that can be provided by the battery.

7.4.4 INTEGRA 64/128 – battery 17 Ah

The available 30 hr current for the 17 Ah battery is:

I_{30h} = 17 Ah/30 h $\approx$ 0.566 A (566 mA)

The average currents consumed by the components of the model alarm system based on the INTEGRA 64 or INTEGRA 128 control panel:

- mainboard, INTEGRA 64/128: 149 mA;
- zones, NC: 16 x 5 mA;
- 3 keypads, INT-KLCD-GR: 3x17 mA;
- 4 partition keypads, INT-S-GR: 4x24 mA;
- 10 movement detectors, PIR: 10 x 10 mA;
- 3 microwave detectors: 3 x 25 mA
- 2 magnetic detectors: 0 (require no power supply).

$\sum I_s$= 0.149 + 16x0.005 + 3x0.017 + 4x0.024 + 10x0.010 + 3x0.025 = 0.551 A (551 mA)

The summed average current consumed by the system is 551 mA, therefore it is lower than the current that can be provided by the battery.

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.

All circuits are designated by their version and date. The program periodically checks the memory content. The program run is supervised by hardware means. If a memory error occurs, the trouble signal is generated. In case of a run-time error, the processor is restarted.

8. History of the manual updates

Given below is a description of changes as compared with the manual for the control panel with firmware in version v1.04.

DATE	PROGRAM VERSION	INTRODUCED CHANGES
2007-08	1.05	• Added information on SIA, a new format of transmission to monitoring station (p. 4). • Added information on a new method of zone configuration: the zone status can change as the output status changes (pp. 5 and 21). • Added information on new devices supported by the control panel (p. 6-7). • Added information on the optional connection of roller shutter motion detectors (rope detectors) and vibration detectors to the CA-64 E and CA-64 EPS expanders (modules in the version manufactured from 2007) (pp. 7, 7 and 21). • Modified contents and figures in the section on connecting expansion modules to the control panel (p. 16). • Added information on the optional programming of resistor values for EOL and 2EOL configuration in case of zones in the CA-64 E and CA-64 EPS expanders (modules in the version manufactured from 2007) (p. 21).