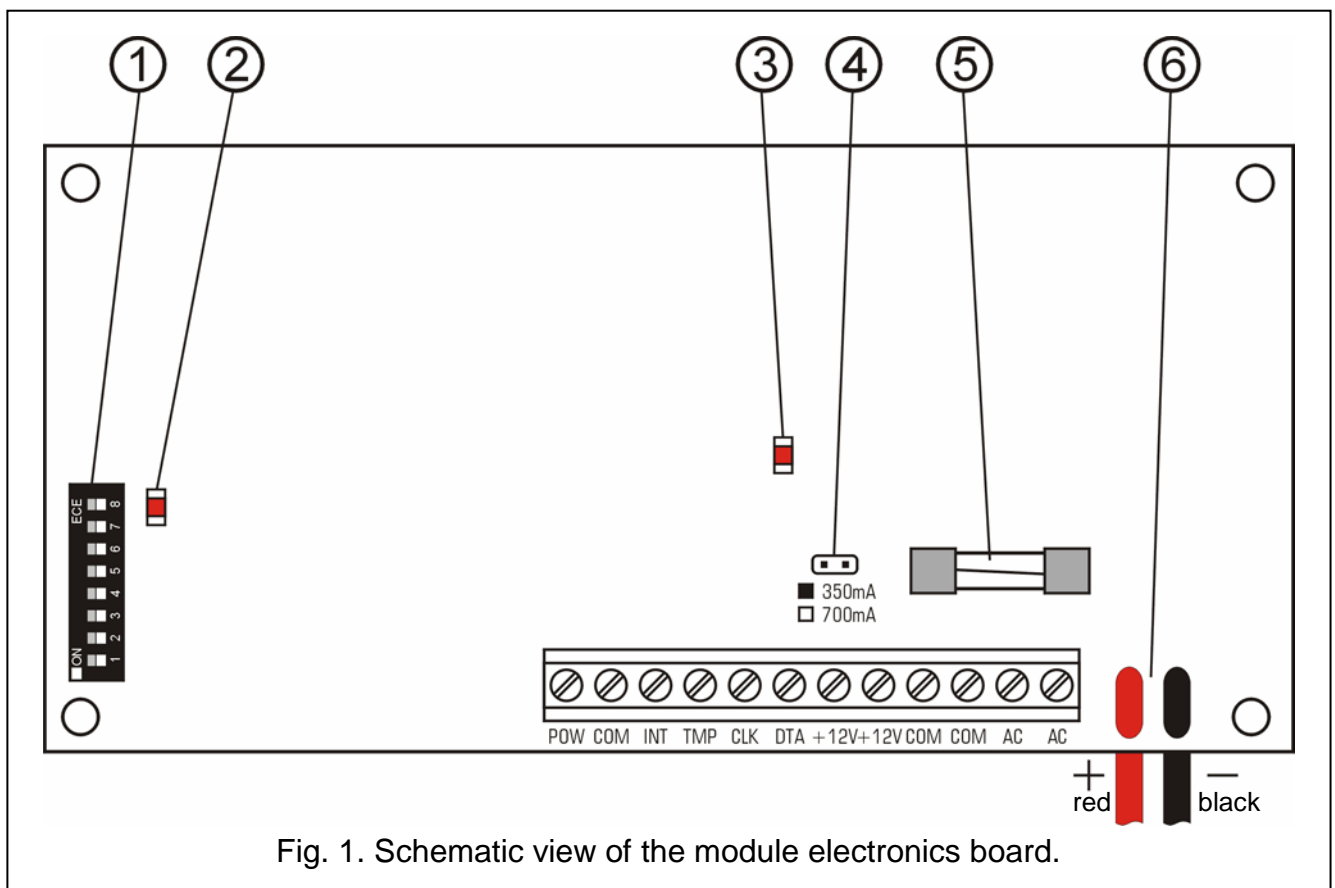


The CA-64 ADR addressable zones expander is a device intended to work with the CA-64 and INTEGRA alarm control panels. It allows extension of the alarm system by up to **48 zones** (depending on the control panel type) which have identical features as the main board zones. The expander module is fitted with a built-in switching-mode power supply of 2.2A capacity. It also has battery charging circuit and testing circuit with disconnection of discharged battery.

Note: *Installation of the CA-64 ADR expander in the CA-64 alarm system will exclude the option to install other zones expanders as well as the CA-64 PP zone / output expander.*

This manual has been drawn up for the expander with firmware in version 1.5 or later.

1. Description of electronics board



Explanations to Figure 1:

- 1 – **package of DIP-switches** designed for setting individual address of the module (switches 1-5) and for selecting the type of control panel the module interacts with (switch 8: OFF – CA-64; ON – INTEGRA).
- 2 – **LED** indicator of the process of communication with the control panel. In the normal operating mode of the module, the LED is blinking with variable frequency.

- 3 – **LED indicator of the battery testing / charging.** The battery test takes place every 4 minutes and lasts less than twenty seconds. During that time the processor lowers the supply unit voltage, while the devices are powered from the battery.
- 4 – **pins for setting the battery charging current:**
 - pins shorted – 350 mA;
 - pins open – 700mA.
- 5 – **fuse T3.15A.** Used to protect the battery circuit.
- 6 – **battery connecting leads** (red +; black -).

Note: *The RESET pins are used in production process and are not to be shorted.*

Description of the terminals:

- POW** - supply output for addressable detectors (electronic current limiter 1,5A).
- COM** - common ground.
- INT** - data input from addressable detectors (internal data bus).
- TMP** - module tamper detection circuit (NC) – if not used, it should be shorted to ground.
- CLK, DTA** - expander bus.
- +12V** - expander power supply outputs. Additional power consumers can be connected to the expander supply (e.g. modules with no supply unit). However, be careful not to cause overload. It is advisable to make a **load balance** for the power supply. The sum of current consumption by all the consumers and the battery charging current must not exceed the power supply capacity.
- AC** - expander supply input (17...24V AC). The AC terminals are used to connect windings of the secondary mains transformer. The minimum input voltage at the **maximum load** of the transformer by the module can be **16V** (AC).

2. Operation description

Operation of the expander consists in handling the addressable detectors connected **in parallel to the internal data bus** (leads: INT, COM, POW). The addressable detector is obtained from a typical detector (NO, NC) upon installing inside it the SATEL CA-64 ADR MOD addressable module (see: CA-64 ADR MOD module instructions). Using digital transmission via the INT lead (black), the expander will test, in turn, the status of detector contacts (closed/open) and will send information through the bus to the control panel on the status of zones.

Each of the addressable detectors represents one zone of the alarm system.

Note: *The minimal sensitivity of zones handled by the expander (i.e. the duration of zone violation to allow detection of detector activation) is 200ms. The actual sensitivity of these zones may have values $n \times 200ms$ ($n=1,2,3,\dots$). This is due to the way the addressable modules are handled by the expander – the status of these zones is read out at intervals of precisely 200ms.*

3. Addressing the expander

To set the address, use the 1 to 5 switches. This address must differ from those of the other modules connected to the control panel expander bus. In order to determine the expander address, add up the numbers set on particular DIP switches, according to Table 1.

Switch number	1	2	3	4	5
Numerical equivalent (for switch in ON position)	1	2	4	8	16

Table 1.

Five switches allow addresses to be assigned to 32 expanders (numbers from 0 to 31). Addresses of the expanders connected to one bus can not be repeated. It is recommended that you assign consecutive addresses, starting from zero, to expanders and other modules connected to one bus. This will permit problems to be avoided during extension of the alarm system.

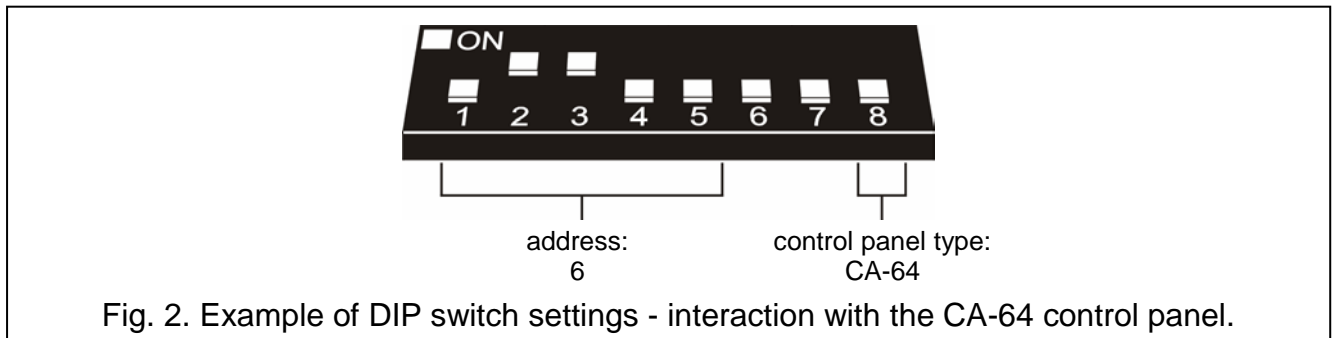


Fig. 2. Example of DIP switch settings - interaction with the CA-64 control panel.

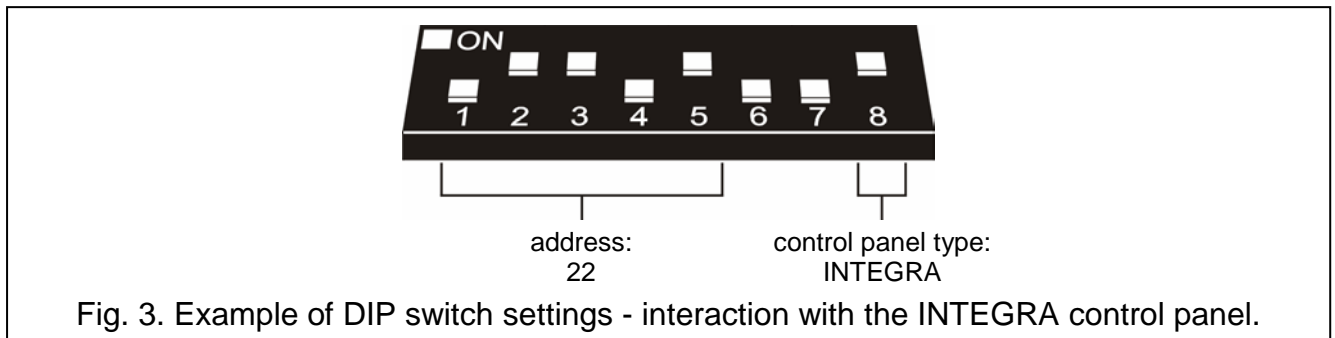


Fig. 3. Example of DIP switch settings - interaction with the INTEGRA control panel.

3.1 Interaction with the CA-64 control panel (switch 8 in OFF position)

When interfacing with the CA-64 control panel, the CA-64 ADR expander will always take up 6 addresses on the expander bus, i.e. the address set in the expander and 5 consecutive ones. For example, if address 0 has been set in the module, addresses 1 to 5 will be additionally assigned to the expander during the identification procedure. It should be borne in mind, that if e.g. address 29 is set in the expander, then, during the identification procedure, addresses 30, 31, and also 0, 1 and 2 will be additionally assigned to the module. Should these addresses be already taken, the control panel would be unable to correctly complete the identification procedure.

3.2 Interaction with the INTEGRA control panels (switch 8 in ON position)

When interfacing with the INTEGRA control panel, the CA-64 ADR expander can take from 1 to 6 addresses on the expander bus. Which addresses will be reserved by the control panel depends on the number of connected detectors with installed CA-64 ADR MOD modules, and on the addresses set in those modules (see Table 2). For each group of 8 addresses of the CA-64 ADR MOD modules, 1 address on the expander bus and 8 zones in the system are reserved. Remember, however, that having even one detector with installed CA-64 ADR MOD module, in which an address from any group of 8 addresses is set, will take up an address on the expander bus and reserve 8 zones in the system. Therefore, it is advisable that you set consecutive numbers with no skips in the CA-64 ADR MOD modules. Thus you can avoid blocking of the expander bus addresses, as well as the control panel zone numbers, which can be used by other expanders.

Addresses assigned in the identification process	Addresses of the CA-64 ADR MOD modules
expander address	0-7
expander address +1	8-15
expander address +2	16-23
expander address +3	24-31
expander address +4	32-39
expander address +5	40-47

Table 2.

4. Numbering the addressable zones

The CA-64 ADR MOD module has a package of DIP switches designed for setting individual address of the module. 64 different addresses can be set (from 0 to 63). In order to determine the module address, add up the numbers set on particular DIP switches, according to Table 3.

Switch number	1	2	3	4	5	6
Numerical equivalent (for switch in ON position)	1	2	4	8	16	32

Table 3.

Note: Modules with addresses above 47 are not seen by the control panel.



Fig. 4. Examples of addressing the CA-64 ADR MOD modules.

The address set in the CA-64 ADR MOD module determines the zone number assigned to the detector with installed module.

Note: Do not set the same addresses in the CA-64 ADR MOD modules, because the detectors having such modules will have the same zone number assigned in the system.

4.1 Interaction with the CA-64 control panel (switch 8 in OFF position)

When the CA-64 ADR expander is used in conjunction with the CA-64 control panel, the zone number assigned to the detector with installed CA-64 ADR MOD module is closely connected to the address set in the module. To determine the zone number, add 17 to the address set on the switches. The zone numbers for the examples shown in Fig. 4 would be as follows:

address 4 = zone 21 (4+17);

address 10 = zone 27 (10+17);

address 41 = zone 58 (41+17).

4.2 Interaction with the INTEGRA control panels (switch 8 in ON position)

When the CA-64 ADR expander is working together with the INTEGRA control panel, there is no direct interdependence between the address set in the CA-64 ADR MOD module and the zone number assigned to the addressable detector. You can connect the CA-64 ADR expander as well as other zone expanders (CA-64 E, CA-64 EPS, CA-64 PP) to the

INTEGRA control panel. Depending on the number of connected detectors with CA-64 ADR MOD modules installed, and the addresses set in those modules, the control panel will assign a specific number of zones in the system. This number is a multiplicity of number 8. Up to 48 zones are possible. The zone numbers are assigned to all expanders, based on the bus addresses (from the lowest to the highest).

Notes:

- *The INTEGRA 24 control panel enables the system to be expanded by up to 16 addressable zones. Addresses from the 0-15 range should be set in the CA-64 ADR MOD modules.*
- *In case of the INTEGRA 32 control panel the system can be expanded by up to 24 addressable zones. Addresses from the 0-23 range should be set in the CA-64 ADR MOD modules.*

Example 1. Numbers of addressable zones - interaction of the CA-64 ADR expander with INTEGRA 32 control panel.

2 LCD keypads (addresses 0 and 1) are connected to the keypad bus. All the keypad zones are used in the system. CA-64 ADR expander with address 0 is connected to the expander bus. 20 detectors with installed addressable modules are connected to the control panel by means of the expander (the module addresses must be set within the ranges 0 to 15 and 20 to 23). Consequently, addresses 1 and 2 are additionally assigned to the CA-64 ADR expander. The system zones are numbered as follows:

- 1-8 – main board zones;
- 9-24 – zones assigned to detectors with addressable modules installed (detector with address 0 – zone 9; detector with address 1 – zone 10, etc., up to the detector with address 15 – zone 24);
- 25-28 – zones assigned to the keypad zones;
- 29-32 – zones assigned to the detectors with addressable zones installed (detector with address 20 – zone 29; detector with address 21 – zone 30, etc.).

In order to obtain continuity of addressable zones numbering, the LCD keypad addresses should be changed to 2 and 3 (the keypad zones will be given numbers 29-32), and addresses 0-19 should be set in the addressable modules (the zones assigned to detectors with addressable modules installed will be given numbers 9-28).

Example 2. Numbers of addressable zones - interaction of the CA-64 ADR expander with INTEGRA 128 control panel.

4 LCD keypads (addresses from 0 do 3) are connected to the keypad bus. All the keypad zones are used in the system. Connected to the first expander bus are 2 CA-64 E expanders (addresses 0 and 1), 2 CA-64 EPS expanders (addresses 8 and 9), and CA-64 ADR expander (address 2). 48 detectors with installed addressable modules are connected to the control panel by means of the expander (the module addresses set within the range from 0 to 47). Consequently, addresses from 3 to 7 are additionally assigned to the CA-64 ADR expander. The system zones are numbered as follows:

- 1-16 – main board zones;
- 17-24 – zones in CA-64 E expander with address 0;
- 25-32 – zones in CA-64 E expander with address 1;
- 33-80 – zones assigned to the detectors with addressable zones installed (detector with address 0 – zone 33; detector with address 1 – zone 34, etc.);
- 81-88 – zones in CA-64 EPS expander with address 8;
- 89-96 – zones in CA-64 EPS expander with address 9;
- 113-120 – zones assigned to the keypad zones.

5. Connecting the addressable zones

It is recommended that all detectors and addressable modules be supplied from the POW output. If the expander power supply capacity is too low, a separate power supply unit may

be used provided that the addressable module will still be supplied from the POW output (such a connection is shown in Fig. 5).

In case of full configuration (48 expander zones used), when connecting the detectors with DY 8x0,5 cable, the corresponding number of wires connected in parallel is to be provided for the common ground of signal and the common ground of addressable modules supply (see Table 4).

Distance	Number of wires
up to 200m	1
up to 400m	2
up to 600m	3

Table 4.

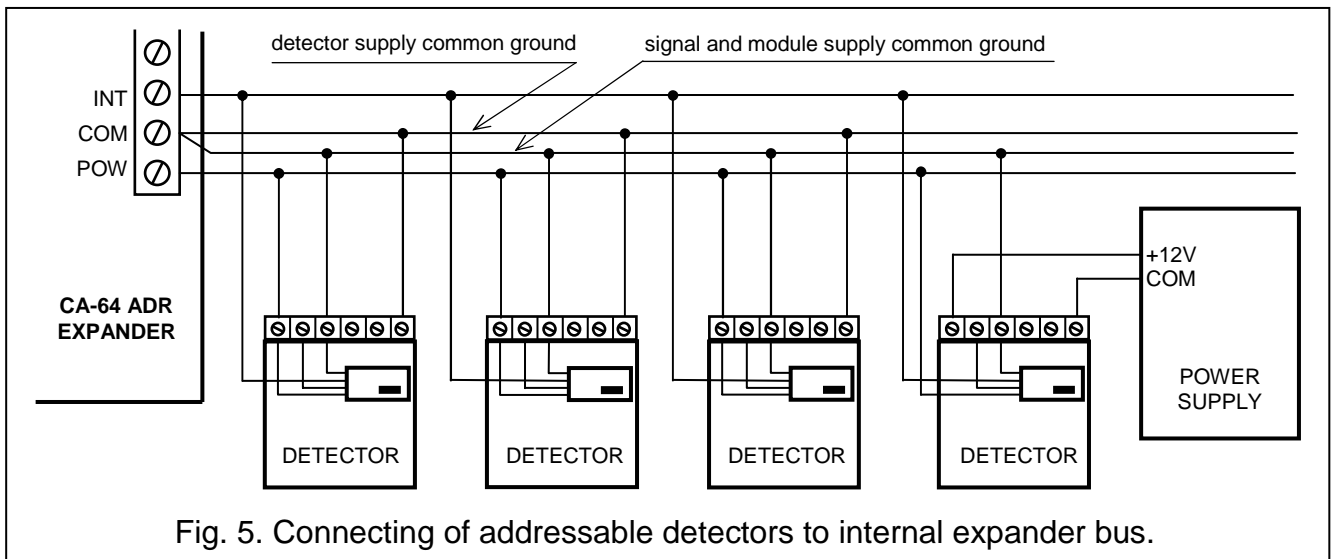


Fig. 5. Connecting of addressable detectors to internal expander bus.

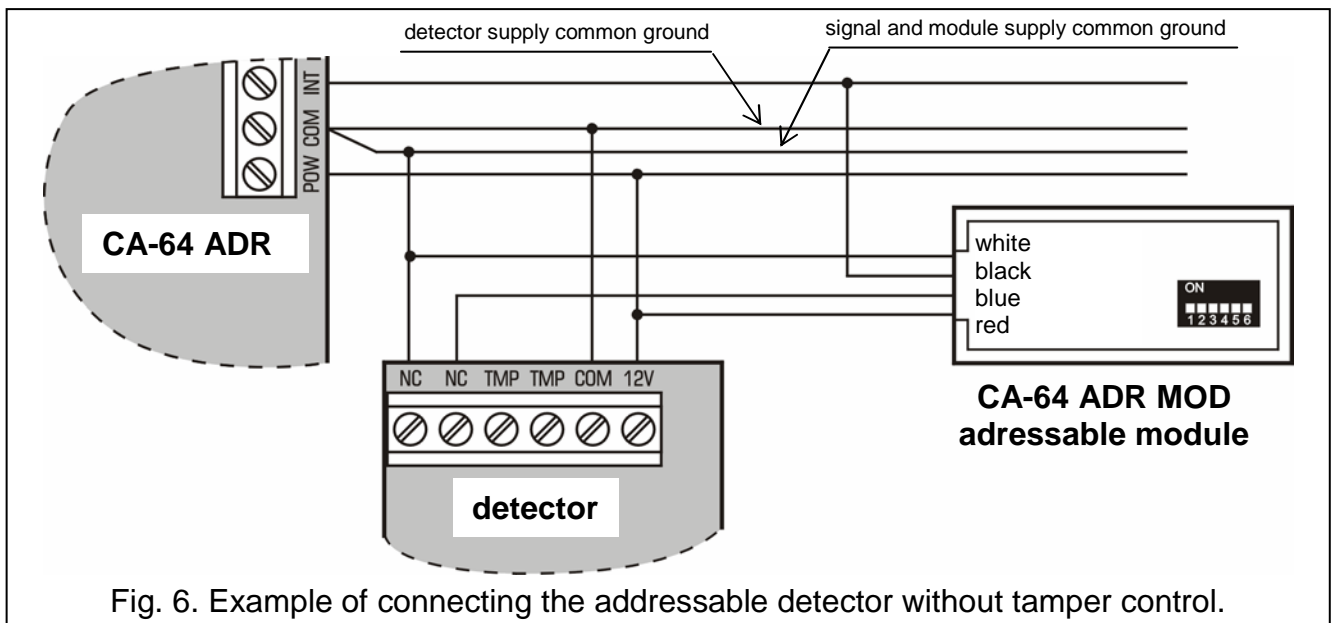


Fig. 6. Example of connecting the addressable detector without tamper control.

6. Installation

The addressable zones expander may be installed in any housing designed for control panel (with transformer and place for battery). Begin installation of the housing with placement of distance pins inside.


7. Expander connection and power supply activation

The expander power supply unit should work being permanently connected to 230V AC mains supply. Therefore, before you commence on the cabling work, make yourself familiar with the electrical system of the site. Choose a circuit that is always live to power the module. The circuit should be protected with a suitable fuse.



Before connecting the power supply unit to the circuit, from which it is to be supplied, switch off voltage in that circuit.

Prior to the commencement of connecting the module to the existing alarm system, turn off power supply of the whole system.

1. Secure the expander board on the distance pins previously installed in the housing.
2. Connect the 230V alternating voltage leads to the transformer terminals marked "AC 230V".
3. Connect the wire of the electric shock protection circuit to the terminal block provided next to the transformer and marked with the symbol .
4. Connect the conductors leading-out alternating voltage from transformer to the terminals designated with the "AC" symbol on the control panel board. **Only one device with switching-mode power supply unit can be connected to one transformer.**
5. Depending on the control panel type, connect the module terminals CLK, DTA and COM to the first or second expander bus (first bus: CK1, DT1, COM; second bus: CK2, DT2, COM - designations on the control panel board).
6. Using the DIP-switch, set up the expander address.
7. Connect the leads of internal data bus to the inputs: INT, POW and COM, and connect the addressable detectors to the bus. If current consumption by the addressable detectors and battery exceeds capacity of the power supply unit, some of the detectors are to be powered from an additional power supply (e.g. the SATEL APS-15 or APS-30 power supply units).
8. Connect the leads of the housing tamper contact to the TMP input. Details of the cable connections to the alarm control panel and modules are presented in the control panel manual.
9. Set the battery charging current (by shorting or leaving open the onboard pins – see Fig. 1)
10. Switch on the expander 230VAC power supply. Measure the voltage on battery cables, making sure it has the correct value of approx. 13.7V, and check that all consumers are properly powered.
11. Switch off the module power supply and connect the battery. The module will not become active on connecting the battery alone.

Note: *If during system operation the battery voltage drops below 11V (e.g. because of 230V power failure), the expander will signal battery malfunction to the control panel, and when the voltage drops to abt. 9.5V, the battery will be disconnected.*

12. On completion of all the connections and making sure they are correct, you can proceed to activating the expander zones.



As the expander module has no switch to make possible disconnection of the mains supply, it is important to inform the owner or user of the equipment, how to disconnect it from the mains (e.g. by showing him the fuse which protects the expander supply circuit).

8. Starting the module

Note: In systems having expansion modules with their own power supply, it is recommended to start the panel first, and then the other components of the system.

1. Switch on power supply of the alarm system and the expander (the LED which indicates communication with the alarm control panel will flash with steady light).
2. Call the "Expander identification" function in the LCD keypad (→Service mode →Structure →Hardware →Identification). Having identified the CA-64 ADR expander, control panel will automatically identify the CA-64 ADR MOD addressable modules. When the identification is completed, the LED indicator of communication with the control panel will start blinking. After identification, all the **new** zones are programmed to factory defaults, the detector type being set to zero (no detector).

Notes:

- In the process of identification, the control panel writes to the module memory a special (16-bit) number intended to detect the module presence in the system. Replacement of the expander with another (even one having the same address set up on the switches) without a new identification will trigger alarm (module tamper - verification error).
 - Extension of the alarm system by new zones (addressable detectors), which so far have not been used, will require an identification of the expanders.
3. Using the DLOAD64 / DLOADX program or LCD keypad, set the zone parameters (refer to the CA-64 ADR MOD addressable module manual).
 4. End the service mode operation, saving data in the FLASH memory.

9. Technical data

Expander supply voltage.....	17V...24V AC
Internal power supply output voltage, rated	13.6V...13.8V DC
Current efficiency	2.2A
POW output current-carrying capacity	1.5A
Battery charging current (switchover)	350mA / 700mA
Dimensions of CA-64 ADR module electronics board.....	68x140 mm
Number of handled addressable detectors (zones)	48
CA-64 ADR MOD module current consumption.....	1.2mA

The latest EC declaration of conformity and product approval certificates are available for downloading on website www.satel.pl



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