EXPANDER FOR PROXIMITY CARD READERS
CA-64 SR

ca64sr_en 07/09

The CA-64 SR expander for proximity card readers is a device designed to work together with the CA-64 and INTEGRA alarm control panels. The expander supports the SATEL made CZ-EMM / CZ-EMM2 / CZ-EMM3 / CZ-EMM4 proximity card readers. The expander can simultaneously interact with two readers of this type. The expander function is to control the access to and operate the electromagnetic door lock (or to control the operation of another device requiring the access control). This manual is drawn up for the expander with PCB version 1.6 and firmware version 2.01 or later.

Note: *Full use of all the options available in the module is only possible when working with the INTEGRA control panels.*

1. Description of electronics board

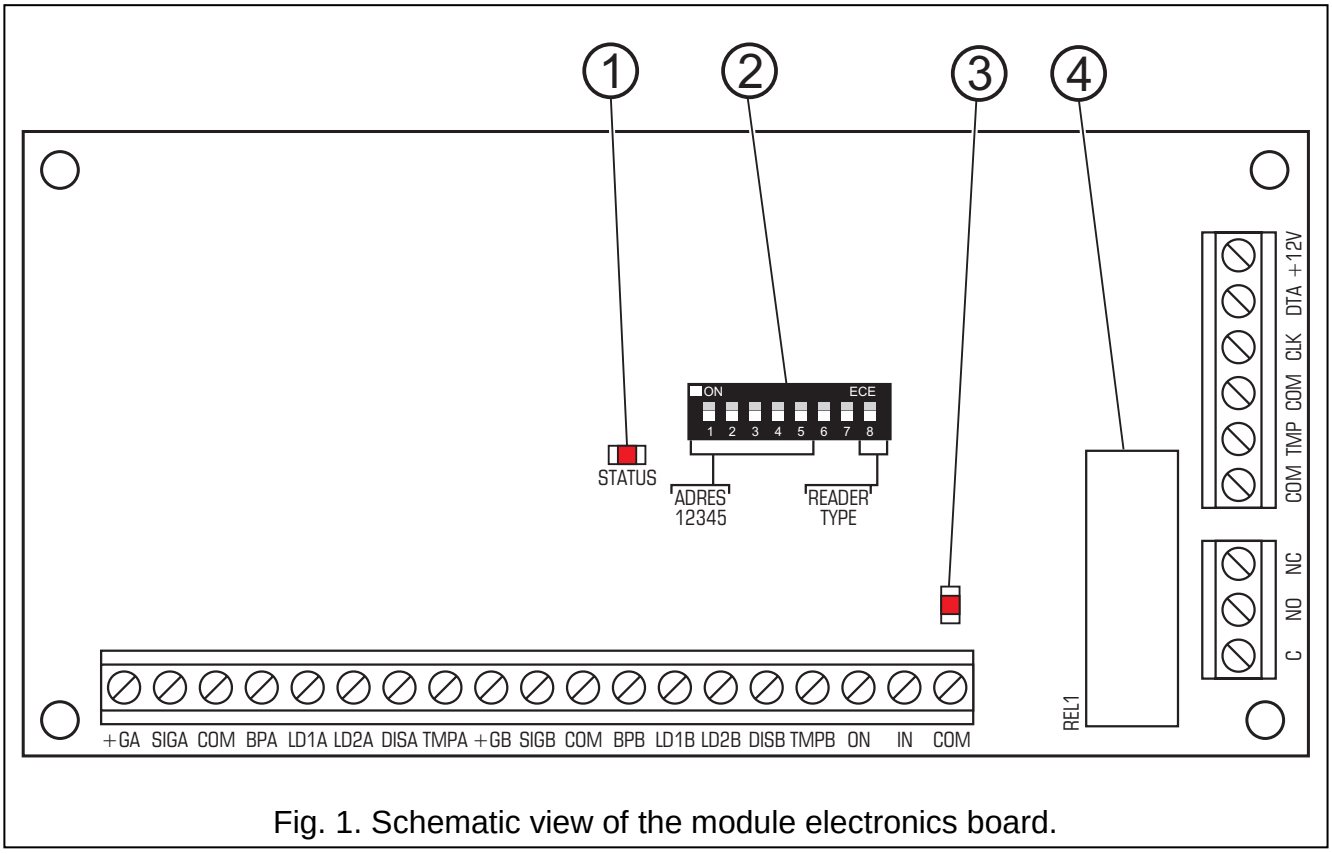

Fig. 1. Schematic view of the module electronics board.

Legend:

1 – **LED SATUS** to indicate the process of communication between control panel and expander:
- blinking – data exchange with the panel;
- ON – no data exchange with the panel (the module and the control panel connecting wire is damaged, identification of module is not carried out or the STARTER program is started in the control panel).

2 – **package of DIP switches** designed for setting individual address of the module and for selecting the type of supported readers (see: DIP SWITCHES).

3 – **LED** to indicate the relay ON state.

4 – **relay**. The **C**, **NC** and **NO** (terminals of the relay) are galvanically isolated from electric circuits of the module. In normal state the C terminal is shorted to the NC terminal, while the NO terminal is isolated. On actuation of the relay, the C terminal becomes shorted to the NO terminal, and the NC terminal becomes cut off (which is signaled by the LED going on).

Description of the terminals:

+12V – power supply input

CLK, **DTA** – expander bus

COM – common ground

TMP – module tamper detection circuit (NC) – if not used, it should be shorted to ground.

C, **NC**, **NO** – relay terminals

+GA – power supply output, reader A

+GB – power supply output, reader B

SIGA – data input, reader A

SIGB – data input, reader B

BPA – sound signaling control (reader A)

BPB – sound signaling control (reader B)

LD1A – LED green color control (reader A)

LD1B – LED green color control (reader B)

LD2A – LED red color control (reader A)

LD2B – LED red color control (reader B)

DISA – disabling reader A

DISB – disabling reader B

TMPA – reader A presence control circuit input.

TMPB – reader B presence control circuit input.

Note: *If the connected readers have no presence control circuit, disable the READER CONTROL option in expander settings or short the TMPA/TMPB input to ground.*

ON – relay control input (NC) – if not used, it should be shorted to ground.

IN – door status control input (NC) – if not used, it should be shorted to ground.

The RESET pins are used in the manufacturing process and should not be shorted.

1.1 DIP switches

By using the DIP-switches you can set an individual address of a device and select the type of reader to be served.

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, while the addressing sequence is optional. 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.

The type of readers to be connected to the expander can be determined by means of the switch 8. For the CZ-EMM readers manufactured up to May 2005, this switch should be set in the OFF position. For the CZ-EMM readers manufactured from June 2005 and for the CZ-EMM2 / CZ-EMM3 / CZ-EMM4 readers, the switch should be set in the ON position. How events are signaled by the reader buzzer depends on position of the switch.

Position of the switches 6 and 7 is irrelevant.

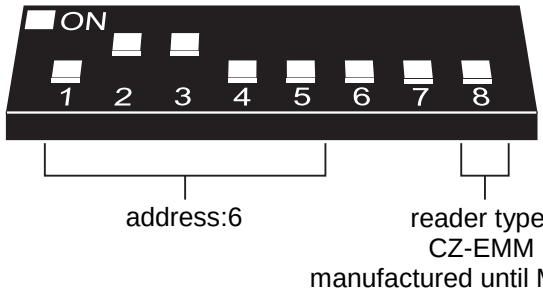

Fig. 2. Example of DIP switch settings.

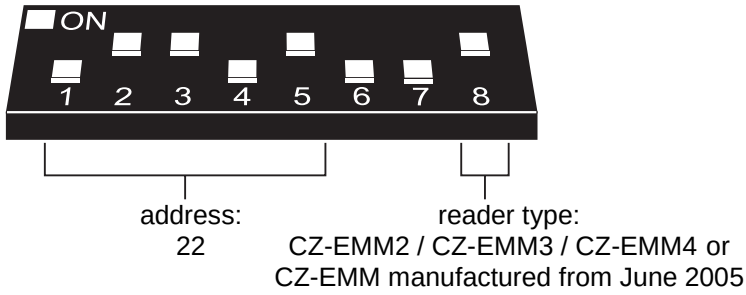

Fig. 3. Example of DIP switch settings.

2. Mounting and installation

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

Caution: *Prior to starting the module hookup, switch off power supply of the security system.*

1. Fasten the expander board in its housing.
2. Using cables, connect the terminals CLK, DTA and COM to the expander bus on the control panel main board.
3. Using the DIP switches, set up the appropriate expander address and the type of the connected readers.
4. Connect the leads of proximity card readers (see the readers manual for the connection description).
5. Where the door is to be opened with a monostable switch, the leads of that button are to be connected to the terminals ON and COM.

6. Connect the leads of the tamper contact on expander housing to the terminals TMP and COM. Where two expanders are installed in the housing, the TMP input of one expander is to be shorted to ground, and the contact leads are to be connected to the TMP input of the other expander.
7. Connect leads of the door status control detector to the terminals IN and COM.
8. Connect the leads for operation control of the door electromagnetic lock to the relay terminals C, NC and NO.
9. Connect the module power supply leads to the terminals +12V and COM. The expander supply voltage need not be provided from the control panel main board. A power supply unit or another expander with power supply can be used for this purpose.

3. Starting the expander

1. Turn on power supply of the security system. The LED indicating communication with the alarm control panel will come on with steady light.
2. Call the "*Expander identification*" function in the LCD keypad (→Service mode →Structure →Hardware →Identification). When the identification is completed, the LED which indicates communication with the alarm control panel will start blinking.

Note: *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 – verificationn error).*

3. Using the LCD keypad or computer (DLOAD64 or DLOADX program, depending on the control panel type), perform programming of the module functions and assign the users authorized to use the given reader.
4. Save the module settings in the control panel memory.

4. Description of the expander operation

The expander can simultaneously interact with two readers (designated in this manual with the letters **A** and **B**), which read out the unique code of a proximity card.

The card presented (brought in proximity) to the reader will be recognized by the expander similarly as the entry of code from the partition keypad, confirmed by pressing the [*] key. Holding the card (for about 3 seconds) will be recognized as the entry of code, confirmed by pressing the [#] key. The way of reaction to presenting/holding the card depends on the expander settings. By means of the proximity card you can:

- control the expander relay. To perform the relay control, bring the card closer to the reader. The relay can be used to control the door electromagnetic lock, latch, lighting, actuating devices (ventilation, pumps, etc.). The mode of relay operation depends on the programmed function.
- disarm the system and clear alarms. Disarming/alarm clearing takes place after the card is presented, unless the "ON if partition armed" function is selected for the relay. If this is the case, the card must be held longer.
- arm the partition (only INTEGRA series control panels). In order to do so, activate the "Arming" option for the selected reader and held the card.

Having received the proximity card code from the reader, the expander will send the code to the alarm control panel. The panel will verify whether the user of the particular card is

authorized to operate the expander. Information on positive or negative verification is sent to the expander, and from there – to the reader, which can signal accordingly by means of LEDs or sounds whether the command has been carried out or rejected (the way of signaling depends on the control panel firmware and is described below in this document). If the verification is positive, the expander will perform the command according to its preprogrammed settings.

The expander has the **ON input** to control operation of the relay independently of the readers. The relay can be controlled by means of this input in the same way as provided for the heads. For example, this input can be used instead of the head B to open the door when leaving the room. In the normal state, the common ground (0V) should be connected to the ON input. In order to activate the relay, disconnect the input from the ground. It is possible to connect e.g. an NC type monostable switch or a remote control set to the ON input.

Performance of the relay control function through the head A will generate a "User access" type of event, and through the head B – the "User exit" type of event in the system. Control of the ON input will not be recorded in the memory of events.

5. Programming the module settings

The expander can be programmed by means of LCD keypad (→Service mode →Structure →Hardware →Expanders →Settings →*expander selection*) or computer with a suitable program (DLOAD64 or DLOADX). The settings and options available for programming are described below. Abbreviations from the LCD keypad display are shown at some of the functions in square brackets.

Note: *Some options are only available when the module is working in conjunction with the INTEGRA control panels. These are marked by the* **INTEGRA** *name.*

Name – the option to give an individual (16-character) name to the module. This option can be accessed in the LCD keypad as follows: →Service mode →Structure →Hardware →Expanders →Names →*expander selection*.

Partition – assignment of the module to a partition selected from the list.

Lock feature – option available in the LCD keypad – its activation provides access to the **Lock** submenu. **INTEGRA**

Lock – option available in the DLOADX program – its activation provides access to the lock operation options. **INTEGRA**

The options "Lock feature" (LCD) and "Lock" (DLOADX) refer to operating the electromagnetic door lock (or another device that requires the access control to be operated) **by means of the reader.** This function is made available to any user selected in the "Users" option. The operation is effected by control of the relay contacts.

Lock function

ON if partition armed [On if part. armed] – selecting this option sets the bistable operating mode of the relay (i.e. the status of NO and NC relay contact changes to the opposite one when the partition is armed and returns to the normal state when the partition is disarmed). **INTEGRA**

Note: *The expander relay is activated after the partition is armed in any way. Return of the relay to its normal state will take place after reading the card in the head connected to the particular expander (holding the card – if the system is armed; presenting – if the system has been disarmed).*

Fixed ON time – when the proximity card code has been read out, the relay gets activated for the time period entered in the "**Relay ON time**", and then returns to its normal state.

Fixed ON time – OFF if door open [ON, open →OFF] – the relay is active until the door is opened (the IN input disconnected from common ground), but not longer than for the "relay ON time".

Fixed ON time – OFF if door closed [ON, close→OFF] – the relay is active during the time when the door is open (the IN input disconnected from common ground) and deactivates on closing the door (reconnection of the IN input to common ground), but not longer than for the "relay ON time".

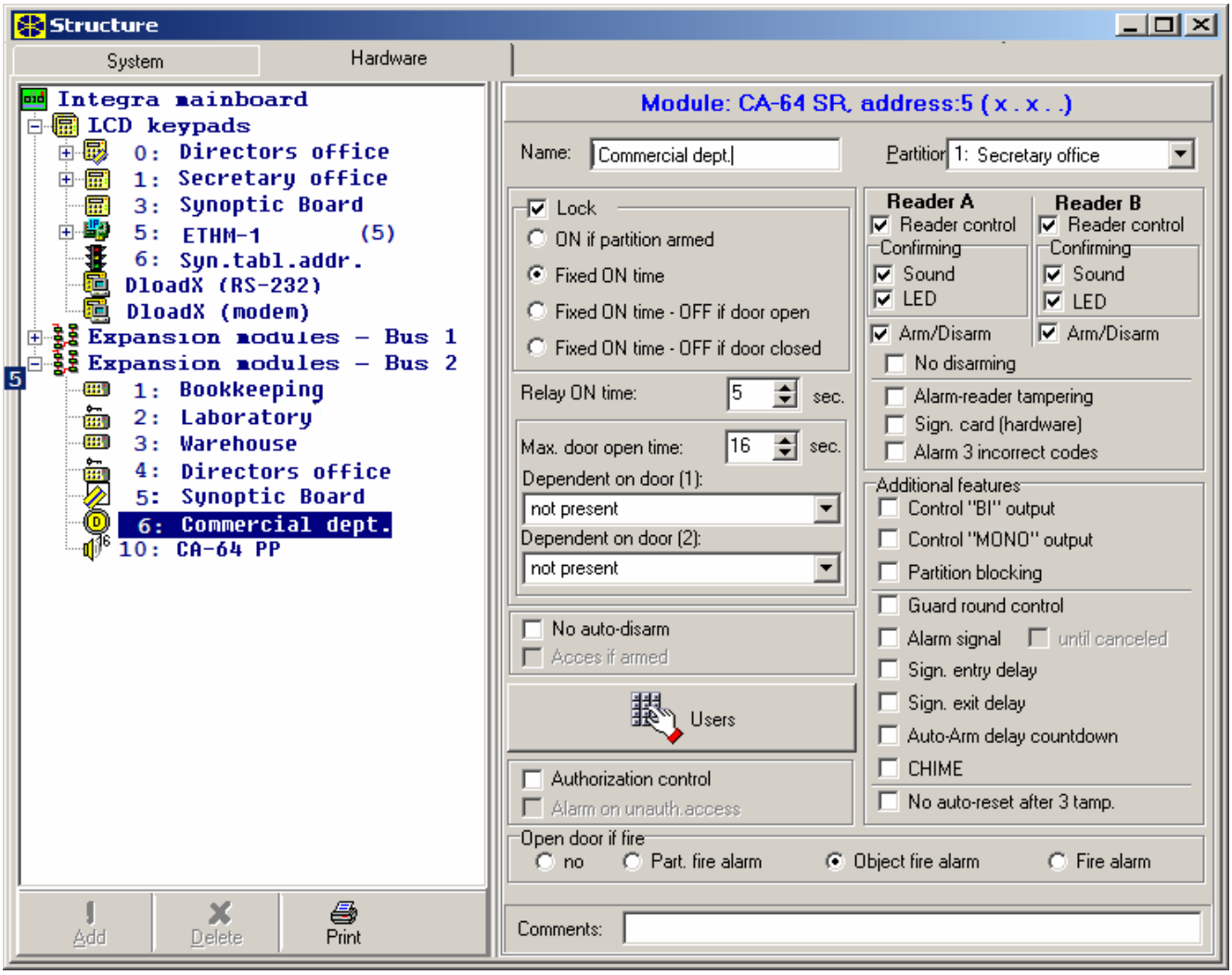

Fig. 4. DLOADX program window with options related to expanders of proximity card readers.

Relay ON time – the time period during which the relay is active. Duration of the "relay ON time" can be from **1** to **255** seconds.

Authorization control [Unauthor. event] – opening the door without using the proximity card will generate an "Unauthorized door opening" event, it can also be signaled on the output type 93 (UNAUTHORIZED DOOR OPENING).

Alarm on unauth. access [Unauthor.alarm] – when the partition to which the module is assigned is armed, unauthorized opening of the door will trigger the alarm and can be additionally signaled on the output type 94 (ALARM – UNAUTHORIZED DOOR OPENING).

Max. door open time – this option defines the time after expiry of which the module will report the "long open door" event to the control panel and activate the audible alarm.

The duration can be set from **0** to **255** seconds. Setting the zero will deactivate the door status control function.

Dependent on door 1 (or **Dependent on door 2**) – this function provides a list to choose the door which must be closed for the lock to operate. Monitoring of the door state is effected through the IN input or the zone type 57 (TECHNICAL – DOOR OPEN). Two dependent doors can be selected. The function allows creating a "sluice" type passage.

No auto-disarm [Code* n. disarm] – with this option enabled, touching the reader with the DALLAS chip will neither disarm the partition nor activate the relay (will prevent the door from being opened).

Acces if armed [Code* in arm] – with this option enabled, touching the reader with the DALLAS chip will not disarm the partition, but it will activate the relay (and enable opening of the door). The option is available when the NO AUTO DISARM [Code* n. disarm] is enabled.

Master users/Users – this function defines master users/users authorized to use the readers.

Readers – functions directly related to the proximity card readers.

Reader control [Reader A/Reader B] – option defining whether the control panel is to perform the head presence check. Lack of the controlled head will be signaled as trouble and can also trigger the tamper alarm (if the "Alarm-reader tampering" option is active).

Note: *The function can be realized, if the reader has the wire of reader presence control circuit, which can be connected to TMPA or TMPB terminal.*

Sound confirmation [Reader A sound/Reader B sound] – after the proximity card code is read out by the control panel, appropriate sound signals will be generated (see SIGNALING).

LED confirmation [Reader A LED/Reader B LED] – after the proximity card code is read out by the control panel, visual signals will be generated on the LEDs, in much the same way to the audible signals (see SIGNALING).

Arm/Disarm [Reader A arms/Reader B arms] – this option defines whether the partition can be armed by using the proximity card. Hold the card at the reader to arm the partition. **INTEGRA**

Alarm-reader tampering [Al. rdrs tamp] – with this option active, detection by the expander of a missing head will trigger the tamper alarm. The option is available when the "Reader control" option is enabled.

Sign. card (hardware) [Hardw. signal.] – activation of this option will start the card code readout signaling which is independent of the control panel. **INTEGRA**

Alarm 3 incorrect codes – with this option enabled, alarm will be generated after three failed attempts to read in incorrect card. **INTEGRA**

Control BI output – reading the code of proximity card assigned to the "*Bi outputs*" type of code will control the output type 25 (BI SWITCH) in the given partition (if the code is authorized to access the given partition and is included in the list of module users).

Control MONO output – reading the code of proximity card assigned to the "*Mono outputs*" type of code will control the output type 24 (MONO SWITCH) in the given partition (if the code is authorized to access the given partition and is included in the list of module users).

Partition blocking – reading the proximity card of the guard or a user having the "*Temporary partition blocking*" type of code when the partition is armed will temporarily block the zones in the partition the module is assigned to. The blocking duration is determined in the partition parameters (for the guard) or in the user code parameters.

Guard round control – reading the proximity card of the user having the "*Guard*" type of code will be recorded as completion of the round.

Signaling – options related to signaling by LEDs/buzzer of the readers. **INTEGRA**

Alarm signaling – acoustic alarm signaling in the given partition (through the total duration of alarm).

Alarm signaling (until canceled) [Alarm (latch)] – acoustic alarm signaling in the given partition until the alarm is cleared.

Signaling entry delay – acoustic signaling of the countdown of entry delay time.

Signaling exit delay – acoustic signaling of the countdown of exit delay time.

Auto-Arm delay countdown – acoustic signaling of auto arming delay countdown in the group to which the module is assigned.

No auto-reset after 3 tampers – each expander will automatically disable its tamper alarm function after three consecutive (not cleared) tamper detection alarms, which prevents the same events from being saved repeatedly in the control panel memory. This option allows the blocking function to be disabled.

Open door if fire [Doors on fire] – control mode for the door blocking during fire alarm:

- **no** – fire alarm has no effect on the door blocking,
- **Partition fire alarm** – fire alarm in the partition will unblock the door controlled by the module,
- **Object fire alarm** – fire alarm in the object will unblock the door controlled by the module,
- **fire alarm** – fire alarm in the system will unblock the door controlled by the module.

6. Signaling

The CZ-EMM and CZ-EMM2 / CZ-EMM3 / CZ-EMM4 readers are provided with the means of signaling, both acoustic (built-in buzzer) and optical ones (two-color LED indicator).

Meanings of the sound signals generated on reading the proximity card code are as follows:

- one short beep (accompanied by a single flash of the LED) – acknowledgement of the card code readout – a hardware function, performed by the expander;
- two short beeps – starting the card read-in function, acknowledgement of the first card read-in,
- one long beep – arming refused – there are violated zones for which the "Priority" option is activated;
- two long beeps – card code not recognized by the panel,
- three long beeps – card code recognized, but the user is not authorized to get access to the lock (relay control),
- four short and one long beeps – acceptance of the card code and activation of the relay, the second correct readout of the user's new card,
- five short beeps – dependent door open (the relay has failed to activate);
- short beeps (with no duration limit) – long open door.

- a sequence of two short beeps repeated three times – the code of the given card user needs to be changed (the "Notify of necessity to change access code" is selected in the control panel).

Additionally, when the reader is interacting with an INTEGRA control panel, the following situations can be signaled in the reader:

- **Alarm in partition** – the sound signal depends on the position of switch 8 (see DIP SWITCHES):
  - if the switch is in ON position – continuous beep;
  - if the switch is in OFF position – intermittent beep.
- **Fire alarm** – the sound signal depends on the position of switch 8 (see DIP SWITCHES):
  - if the switch is in ON position – one long beep every second;
  - if the switch is in OFF position – two beeps every second.
- **Countdown of entry delay** – short beeps every 3 seconds.
- **Countdown of exit delay** – long beeps every 3 seconds terminated with a series of short beeps (lasting 10 seconds) and one long beep. The mode of "exit delay" signaling indicates that the countdown is drawing to an end before arming.
- **Auto arming delay countdown** (timer-controlled partitions) – a series of 7 sounds (of diminishing length).

Meanings of the reader visual signaling:

- LED blinking red steadily – no communication with the control panel (such a situation may occur, when the special program to initiate the system operation (STARTER) is running in the control panel, the reader module has not been identified, or the cable connecting the module and the panel is damaged),
- LED blinking red with varying frequency – exit delay countdown
- green LED light – the system is disarmed;
- red LED light – the system is armed (only in case of cooperating with INTEGRA control panel);
- LED blinking alternately red and green:
  - Alarm (only in case of cooperating with INTEGRA control panel);
  - waiting for the first read-in of the new card;
  - waiting for the repeated read-in of the new card.

The installer can also activate the "LED confirmation" option. In this case, the LED color will change from green to red after the card readout in accordance with the above described audible signaling.

7. Technical data

Supply voltage	10.5V...14V DC
Maximum current consumption (without readers)	70mA
Maximum relay switchable voltage	AC 250V
Maximum relay switchable current	2A
Environmental class	II
Operating temperature range	-10 °C...+55 °C
Dimensions of module electronics board	68x140 mm
Weight	89g

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

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