



INT-R

**Universal expander
for card / ibutton readers**



IMPORTANT

The device should be installed by qualified personnel.

Prior to installation, please read carefully this manual.

Changes, modifications or repairs not authorized by the manufacturer shall void your rights under the warranty.

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The declaration of conformity may be consulted at www.satel.eu/ce

The following symbols may be used in this manual:



- note,



- caution.

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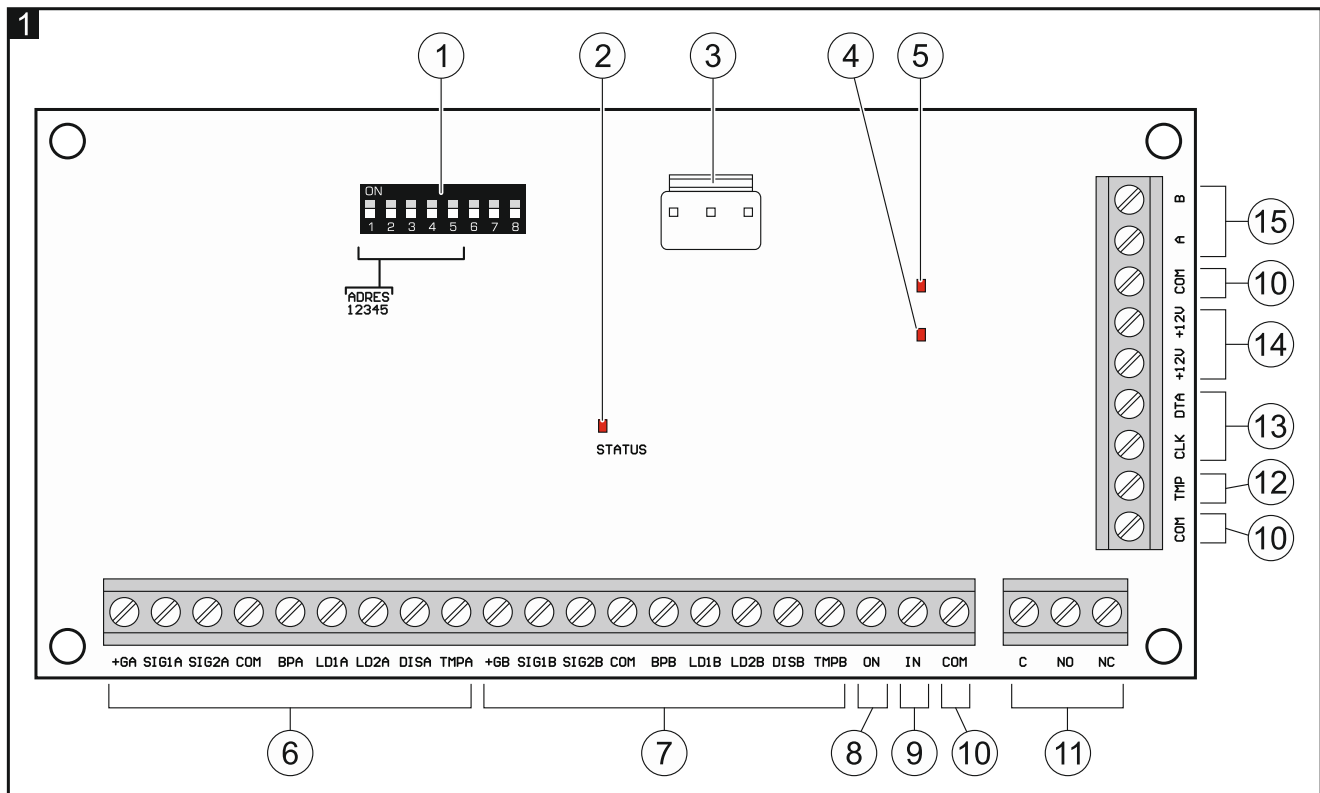
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The INT-R expander allows installation of proximity card / Dallas iButton readers in the alarm system. In addition, the expander makes it possible to control access to a single door. The expander works with the INTEGRA / INTEGRA Plus alarm control panels. This manual applies to the expander with electronics version 2.0.

1. Features

- Ability to connect up to two readers.
- Support for SATEL proximity card readers (EM-Marin format), Wiegand interface readers (26-bit, 34-bit, 42-bit and 56-bit) or Dallas iButton readers.
- Arming / disarming and alarm clearing in the partition by using readers.
- Single door control:
 - relay output for control of electric strike, electromagnetic lock or another door actuator,
 - door status input (NC),
 - request to exit input (NO).
- Control of “24. MONO switch” and “25. BI switch” type outputs.
- Tamper input (NC).
- Connector for SATEL power supply.

2. Electronics board



- ① DIP-switches (see “Operating mode selection” p. 5 and “Address setting” p. 6).
- ② LED indicating the status of communication with the control panel:
 - ON – no communication with the control panel,
 - flashing – communication with the control panel OK.

③ connector for SATEL power supply (e.g. APS-412).



The power supply can be connected to expanders made after 09/09/2014.

④ LED indicating the status of relay output (ON when the output is on).

⑤ LED indicating the status of power (ON when power is present).

⑥ terminals to connect the reader A (see “Connecting the readers” p. 6):

- +GA** - power,
- SIG1A** - data (0),
- SIG2A** - data (1),
- COM** - common ground,
- BPA** - sound control,
- LD1A** - green LED control,
- LD2A** - red LED control,
- DISA** - disabling reader operation,
- TMPA** - reader presence control.

⑦ terminals to connect the reader B (see “Connecting the readers” p. 6):

- +GB** - power,
- SIG1B** - data (0),
- SIG2B** - data (1),
- COM** - common ground,
- BPB** - sound control,
- LD1B** - green LED control,
- LD2B** - red LED control,
- DISB** - disabling reader operation,
- TMPB** - reader presence control.

⑧ **ON** terminal – request to exit input (NO).

⑨ **IN** terminal – door status input (NC). If the input is not to be used, connect the IN terminal to the COM terminal.

⑩ **COM** terminals – common ground.

⑪ relay output terminals:

- C** - common contact,
- NO** - normally open contact,
- NC** - normally closed contact.

⑫ **TMP** terminal – tamper input (NC). If the input is not to be used, connect the TMP terminal to the COM terminal.

⑬ communication bus terminals:

- CLK** - clock,
- DTA** - data.

⑭ **+12V** terminals – +12 VDC power input / output.

⑮ RS-485 bus terminals.

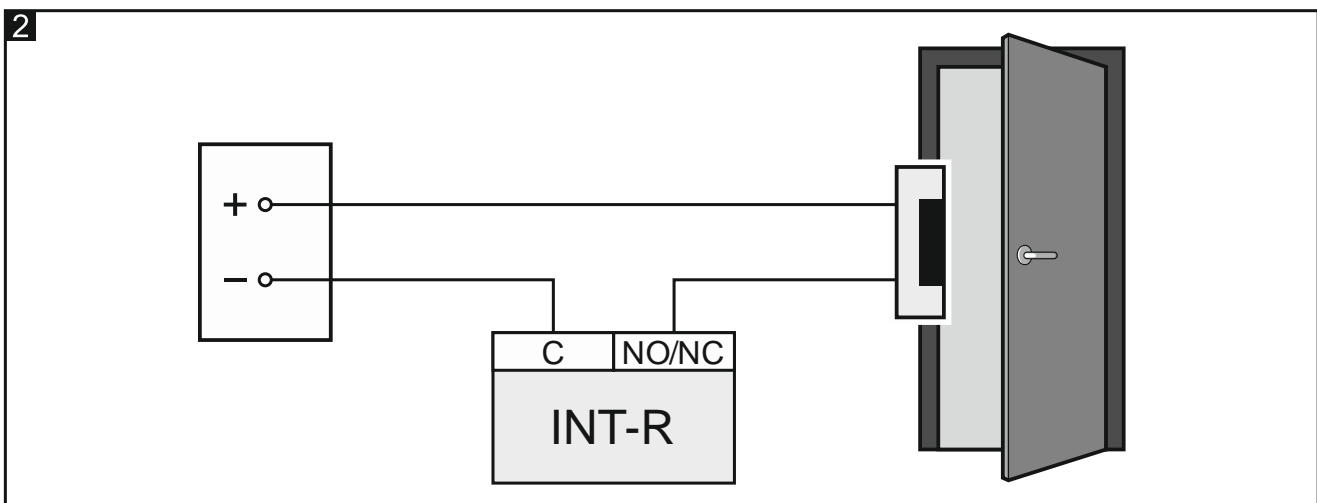
3. Installation



Disconnect power before making any electrical connections.

The expander should be installed indoors, in spaces with normal air humidity.

1. Fasten the expander electronics board in the enclosure (a variety of enclosures in which the expander can be installed are available from SATEL).
2. Change the expander operating mode if it is to be other than the factory default one (see “Operating mode selection” p. 5).
3. Set the expander address (see “Address setting” p. 6).
4. Connect the CLK, DTA and COM terminals to the appropriate terminals of the control panel expander bus (see the control panel installer manual). The wires must be run in one cable. It is recommended that an unshielded non-twisted cable be used. If you use the twisted-pair type of cable, remember that CLK (clock) and DTA (data) signals must not be sent through one twisted-pair cable.
5. Connect the readers to the expander (see “Connecting the readers” p. 6).
6. If the reader cannot emit sounds, because it has no built-in sounder (e.g. the iButton reader), you can install an external sounder (5 V). In the case of reader A, connect it to the BPA and COM terminals of the expander, and in the case of reader B – to the BPB and COM terminals.
7. If the expander is to control an electric strike, electromagnetic lock or another door actuator, connect this device to the relay output as shown in Fig. 2. Depending on the device type, use the NO or NC terminal. It is not recommended that the door actuator be powered from the same source as the expander.



8. If the expander is to supervise the door status, connect the detector supervising the door status to the IN and COM terminals. If the expander is not to supervise the door status, connect the IN terminal to the COM terminal or, when configuring the expander, set value 0 for the “Max. door open time” parameter.
9. If the door is to be unlocked by using the request to exit button or another device (e.g. detector), connect that device to the ON and COM terminals.
10. If the expander is to supervise the enclosure tamper contact, connect the wires of tamper contact to the TMP and COM terminals. If the expander is not to supervise the enclosure tamper contact, connect the TMP terminal to the COM terminal.
11. Depending on the selected method of expander powering, connect the dedicated power supply unit to the connector on expander electronics board or connect the power leads to

the +12V and COM terminals (the expander may be powered directly from the control panel, from an expander with power supply or from a power supply unit).



Never connect power simultaneously to the electronics board connector and the terminals.

12. Power on the alarm system.

13. Start the identification function in the control panel (see the control panel installer manual). How the expander will be identified depends on selected operating mode.

3.1 Operating mode selection

The operating mode defines which readers are supported by the expander. The expander with factory default settings supports SATEL readers made since May 2005. If you want to select another operating mode, follow the procedure below.

1. Power off the expander (if it is powered on).

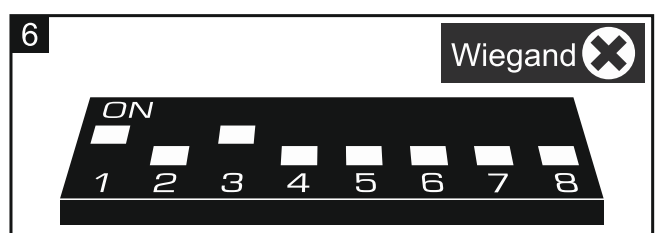
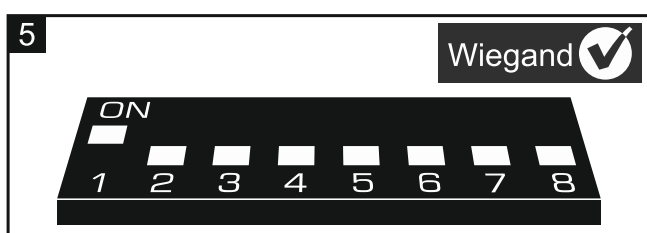
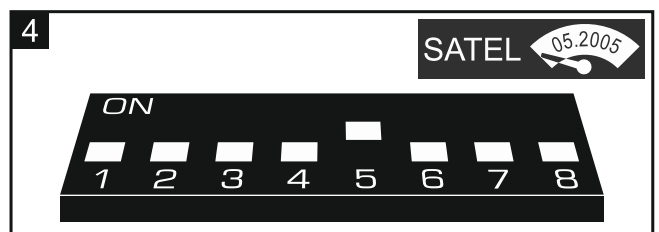
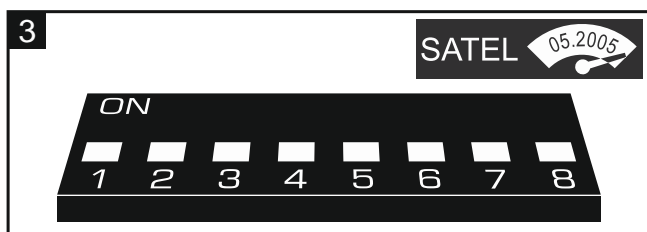
2. Set the DIP-switches as required for the selected operating mode:

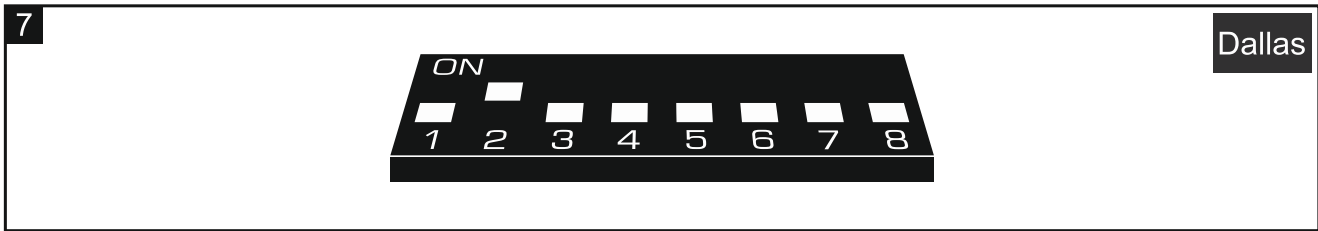
- Fig. 3 – **support for SATEL proximity card readers made since May 2005** (CZ-EMM / CZ-EMM2 / CZ-EMM3 / CZ-EMM4) [factory setting] – the expander will be identified as CA-64 SR,
- Fig. 4 – **support for SATEL proximity card readers made before May 2005** (CZ-EMM) – the expander will be identified as CA-64 SR,
- Fig. 5 – **support for Wiegand interface readers** (formats: 26-bit, 34-bit, 42-bit and 56-bit) – the expander will be identified as CA-64 SR,
- Fig. 6 – **support for Wiegand interface readers without parity check** (formats: 26-bit, 34-bit, 42-bit and 56-bit) – the expander will be identified as CA-64 SR,
- Fig. 7 – **support for Dallas iButton readers** – the expander will be identified as CA-64 DR.



The SATEL proximity card reader support mode is designed for readers using the EM-Marin format. If the CZ-EMM3 or CZ-EMM4 reader uses the Wiegand 26 protocol, choose another, suitable expander operating mode.

If you install proximity card readers with the Wiegand interface in the alarm system, the cards assigned to users by means of such readers will be supported only by these readers. SATEL readers using the EM-Marin format, keypads with readers, etc. will not support these cards. Similarly, the Wiegand interface readers will support no cards assigned to users by means of readers using a protocol other than Wiegand.





3. Short-circuit the CLK and DTA terminals.
4. Power on the expander.
5. The selected operating mode will be saved, which will be confirmed by the slow flashing of the STATUS LED.
6. Power off the expander.
7. Open the CLK and DTA terminals.

3.2 Address setting

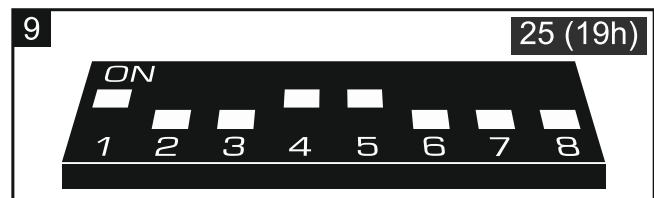
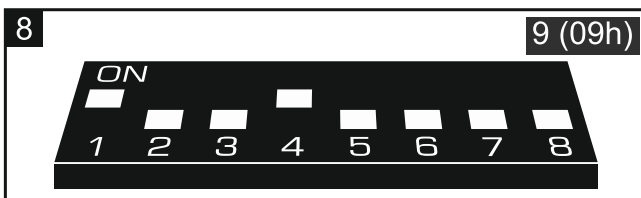
An individual address (different from that in the other devices connected to the control panel bus) must be set in the expander.

To set the address, use the DIP switches on the device electronics board. The switches have numbers assigned to them. The number for OFF position is 0. The numbers assigned to the switches in ON position are presented in the table 1. The sum of these numbers is the address set.

Switch (ON position)	1	2	3	4	5
Number	1	2	4	8	16

Table 1.

Figures 8 and 9 show examples of addresses set by using DIP switches.



3.3 Connecting the readers

The length of the cable connecting the reader to the expander should not exceed 30 meters.

Connecting the SATEL proximity card reader

Connect the reader wires to the expander terminals as shown in Table 2.

i The black wire is available in the CZ-EMM3 and CZ-EMM4 readers. Connect it if the expander is working in the Wiegand interface reader support mode and the Wiegand 26 format is selected in the reader.










Expander terminal		Reader wire
Reader A	Reader B	
+GA	+GB	 red
SIG1A	SIG1B	 green
SIG2A	SIG2B	 black
COM	COM	 blue
BPA	BPB	 yellow
LD1A	LD1B	 pink
LD2A	LD2B	 gray
DISA	DISB	 brown
TMPA	TMPB	 white

Table 2.

Connecting the Dallas iButton reader

Connect the reader wires to the expander terminals as shown in Table 3.






Expander terminal		Reader wire
Reader A	Reader B	
SIG1A	SIG1B	 white
COM	COM	 yellow
		 gray
LD1A	LD1B	 green
LD2A	LD2B	 brown

Table 3.

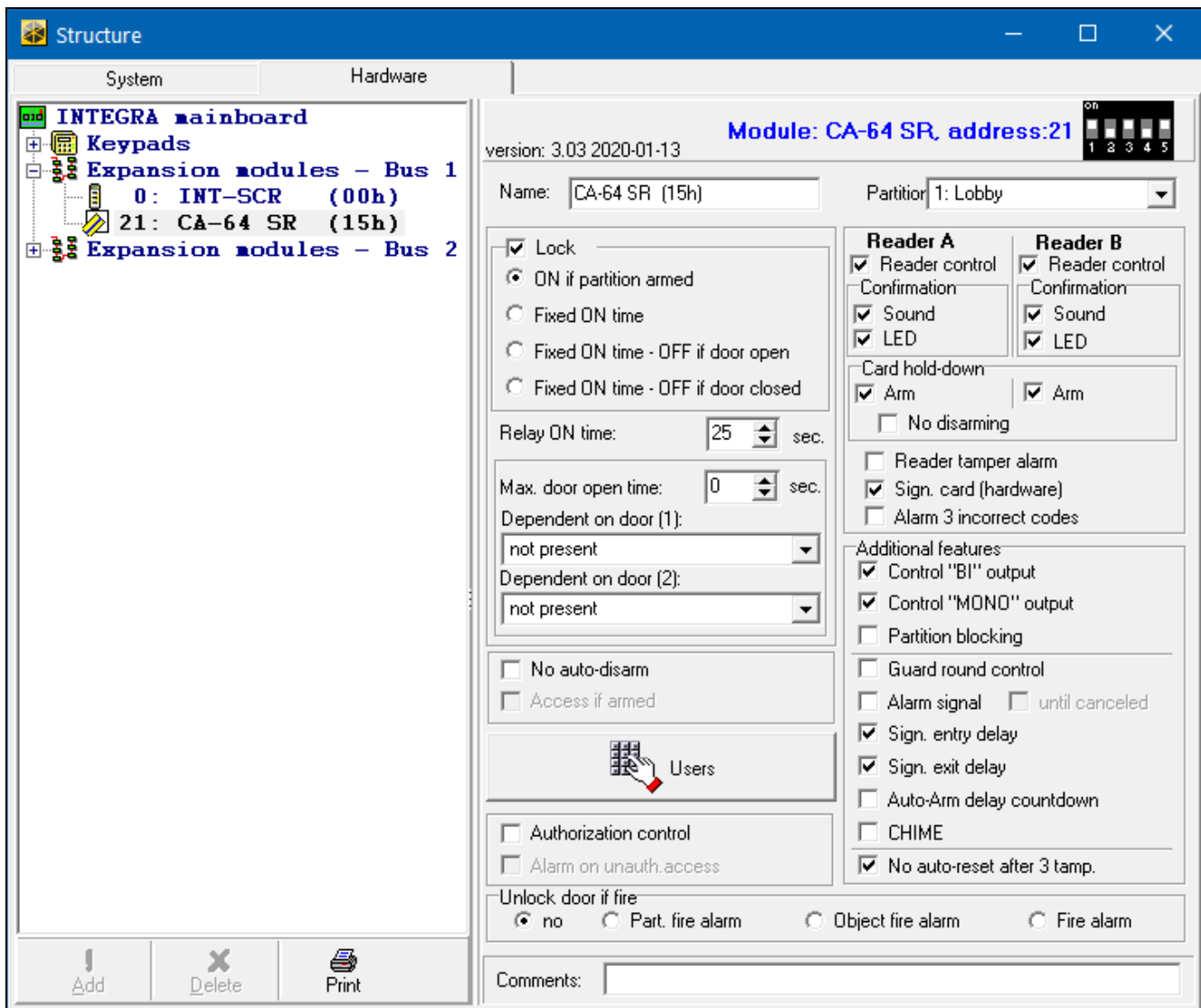
4. Configuring

The expander settings you can configure using:

- DLOADX program: →“Structure” window →“Hardware” tab →“Expansion modules” branch →*[expander name]*,
- LCD keypad: ►“Service mode” ►“Structure” ►“Hardware” ►“Expanders” ►“Settings” ►*[expander name]*.

4.1 Description of parameters and options

Names of parameters and options from the DLOADX program are used in this manual. Shown in square brackets at the description of a parameter or option is the name presented on the display of the LCD keypad.



Name – individual name of the device (up to 16 characters).

Partition – partition operated by the expander.

Lock [Lock feature] – if the option is enabled, the expander can control access to a single door and you can select how the relay output will behave after access is granted.

ON if partition armed [On if part.armed] – the relay output will be turned on until the partition is armed. When the partition is armed, users cannot get access (to get access, the user must disarm the partition).

Fixed ON time [ON time] – the relay output will be turned on for the “Relay ON time”.

Fixed ON time – OFF if door open [ON, open→off] – the relay output will be turned on until the door is opened (door status input is disconnected from common ground), however not longer than for the “Relay ON time”.

Fixed ON time – OFF if door closed [ON, close→off] – the relay output will be turned on until the door is closed (door status input is reconnected to common ground), however not longer than for the “Relay ON time”.

Relay ON time – the time during which the relay output can be turned on after access is granted. You can program from 1 to 255 seconds. The parameter does not apply to the “ON if partition armed” mode.

Max. door open time [Max. door open] – the maximum period of time during which the door can be open (the door status input can be disconnected from common ground). If the door is open longer, the event will be saved to the control panel memory, and audible signal will

be triggered in the readers (unless the reader cannot emit sounds). You can enter from the 0 to 255 seconds. If you enter 0, the door can be open for any long period of time.

Dependent on door (1) / Dependent on door (2) – you can select the door that must be closed so that the user can get access (turn the relay output on). It allows you to create an airlock. You may select a door supervised by another expander or alarm system zone programmed as type “57 Technical – door open”.

No auto-disarm [Code* not dis.] – if the option is enabled, the partition will be disarmed after holding the card / iButton. If the option is disabled, the partition will be disarmed after presenting the card / touching the iButton to the reader. The option does not apply to the “ON if partition armed” mode.

Access if armed [Code* in arm] – if the option is enabled, the users can gain access (turn the relay output on) when the partition is armed. If the option is disabled, the users cannot gain access when the partition is armed. The option is available, if the “No auto-disarm” option is enabled. The option does not apply to the “ON if partition armed” mode.

Users [Master users / Users] – the administrators and users which are permitted to use the readers.

Authorization control [Unauth. event] – if the option is enabled, unauthorized opening of the door will save the event to the control panel memory.

Alarm on unauth. access [Unauth. alarm] – if the option is enabled, unauthorized opening of the door when the partition is armed will trigger an alarm. The option is available if the “Authorization control” option is enabled.

Reader A / Reader B – options and parameters relating to the readers:

Reader control [Reader A / Reader B] – if the option is enabled, the expander controls the reader presence. The reader must have a wire for presence control (white wire in SATEL proximity card readers). If there is no reader, trouble will be reported. The option is available in the expander identified as CA-64 SR.

Confirmation – how feedback is delivered to the user after using a card / iButton.

Sound [Reader A sound / Reader B sound] – if the option is enabled, the reader will use sounds to give feedback to the user.



If the reader cannot emit sounds, you can install an external sounder (see “Installation” p. 4).

LED [Reader A LED / Reader B LED] – if the option is enabled, the reader will use the LED to give feedback to the user.

Arm [Reader A arms / Reader B arms] – if the option is enabled, the reader can be used for arming the partition.

No disarming [C.long not dis] – if the option is enabled, disarming by using readers will not be possible.

Reader tamper alarm [Al.rdrs tamper] – if the option is enabled, reader unavailability will trigger a tamper alarm. The option is available when the “Reader control” option is enabled for at least one reader.

Sign. card (hardware) [Hardw.signal.] – if the option is enabled, the readers will signal by a single beep that the card / iButton code has been read (the signal is independent of the control panel). The signaling is useful when there is a delay between using the card / iButton and the sounds emitted after verification of the card / iButton by the control panel.



If the reader cannot emit sounds, you can install an external sounder (see “Installation” p. 4).

Alarm 3 incorrect codes [3 wrong codes] – if the option is enabled, using an unknown card / iButton three times will trigger an alarm.

Control “BI” output [BI outs ctrl.] – if the option is enabled, the ““BI” output operating” type of users can use the readers to control outputs.

Control “MONO” output [MONO outs ctr.] – if the option is enabled, the ““Mono” output operating” type of users can use the readers to control outputs.

Partition blocking [Part.blocking] – if the option is enabled, using the card / iButton by a user of the “Blocking partition” or “Guard” type will block the armed partition (violating a zone belonging to the partition will trigger no alarm). The duration of blocking is to be defined for the partition or the user (the user of “Blocking partition” type).

Guard round control [Guard control] – if the option is enabled, using the card / iButton by a user of the “Guard” type will be registered as the guard round.

Alarm signal [Alarm (time)] – if the option is enabled, the readers will audibly signal alarms throughout the “Global alarm time” (parameter programmed in the control panel).

until canceled [Alarm (latch)] – if the option is enabled, the readers will audibly signal alarms until they are cleared.

Sign. entry delay [Entry time] – if the option is enabled, the readers will audibly signal the entry delay countdown.

Sign. exit delay [Exit time] – if the option is enabled, the readers will audibly signal the exit delay countdown.

Auto-Arm delay countdown [Auto-arm delay] – if the option is enabled, the readers will audibly signal the auto-arm delay countdown.

CHIME [Chime zones] – if the option is enabled, the readers will audibly signal violation of zones with “Chime in module” option enabled, belonging to the partition operated by the expander.

No auto-reset after 3 tamp. [No autorst.3t.] – if the option is enabled, the feature reducing the number of tamper alarms from the expander to three is disabled (the feature prevents multiple logging of the same events and applies to successive uncleared alarms).

Unlock door if fire [Doors on fire] – you can define whether and when the fire alarm will unlock the door controlled by the expander (i.e. will activate the relay output):

no [no open] – the door will not be unlocked in the event of fire alarm.

Part. fire alarm [on partit. fire] – the door will be unlocked in the event of fire alarm in the partition to which the expander is assigned.

Object fire alarm [on object fire] – the door will be unlocked in the event of fire alarm in the object to which the expander is assigned.

Fire alarm [on any fire] – the door will be unlocked in the event of fire alarm in the alarm system.

5. Using the readers

In order to run any function, you must use a proximity card / Dallas iButton. The proximity card / iButton code will be sent to the alarm control panel. The control panel will make the decision whether or not to run the function. The reader can give you feedback by using visual and audible signals.

For description of how to add proximity cards / Dallas iButtons to the users, please refer to the control panel user manual.

5.1 Available functions

The expander recognizes:

- presenting the card / touching the iButton to the reader – the card / iButton code is read one time,
- holding the card / iButton – you must hold the card / iButton to the reader for about 3 seconds, while its code is being read multiple times.

Presenting the card / touching the iButton to the reader can start other functions than holding the card / iButton.



The Wiegand interface readers do not support the card holding feature.

Availability of the functions depends on:

- type and rights of the user,
- expander settings,
- partition state.



If you use the reader A to gain access, a “User access” event will be saved to the control panel memory.

If you use the reader B to gain access, a “User exit” event will be saved to the control panel memory.

Presenting the card / touching the iButton to the reader

Present the card / touch the iButton to the reader to:

- gain access (turn on the expander relay output),
- disarm the partition,
- clear alarm,
- toggle the state of “25. BI switch” type outputs,
- turn on the “24. MONO switch” type outputs,
- confirm the guard round,
- temporary block the partition.

You can start two or more functions at the same time (e.g. disarming, alarm clearing and gaining access).

Holding the card / iButton

Hold the card / iButton to:

- start the procedure of partition arming / arm the partition,
- gain access (turn on the expander relay output),
- disarm the partition,
- clear alarm,
- confirm the guard round,
- temporary block the partition,
- unblock access to cash machine.

You can start two or more functions at the same time (e.g. disarming, alarm clearing and gaining access).

5.2 Optical signaling

The SATEL readers come with one bi-color LED (producing red and green light) or with two LEDs (red and green).

Status indication

Green LED is ON – partition disarmed.

Green and red LED flashing alternately – alarm.

Red LED is ON – partition armed.

Red LED flashing with increasing frequency – exit delay countdown.

Red LED flashing steadily – no communication with the control panel.

Indication after using the card / iButton



This optical indication can be disabled by the installer.

The indication is provided by the LED that at the given moment indicates no status information, so it can be either the green LED or the red LED.

2 short flashes repeated three times – code change is required.

3 short flashes – confirmation of:

- starting the arming procedure (there is exit delay in the partition) or arming (there is no exit delay in the partition),
- disarming and/or alarm clearing.

4 short flashes and 1 long flash – function is executed.

1 long flash – refusal to arm (there are violated zones in the partition or there is a trouble).

2 long flashes – unknown card / iButton.

3 long flashes – unavailable function.

5.3 Sound signaling

The SATEL proximity card readers are equipped with a sounder for audible signaling. For the other readers that cannot emit sounds, you can install an external sounder (see "Installation" p. 4).

Event signaling



The installer defines whether events are to be signaled audibly.

5 short beeps – zone violation (CHIME).

Long beep every 3 seconds, followed by a series of short beeps for 10 seconds and 1 long beep – countdown of exit delay (if the time is shorter than 10 seconds, only the final sequence of short beeps will be generated).

A sequence of 7 beeps of diminishing duration, repeated every few seconds – countdown of auto-arming delay.

2 short beeps every seconds – countdown of entry delay.

Continuous beep – alarm.



In the mode of support for SATEL proximity card readers made before May 2005, the alarm is signaled in the same way as the fire alarm (a long beep every one second).

Long beep every 2 seconds – alarm memory.

Long beep every second – fire alarm.

Short beep every 2 seconds – fire alarm memory.

Short beep every 150 ms – door open too long.

Signaling after using a card / iButton



This audible signaling can be disabled by the installer.

1 short beep – confirmation of the card / iButton code readout.

2 short beeps repeated three times – code change is required.

3 short beeps – confirmation of:

- starting the arming procedure (there is exit delay in the partition) or arming (there is no exit delay in the partition),
- disarming and/or alarm clearing.


4 short and 1 long beeps – function is executed.

1 long beep – refusal to arm (there are violated zones in the partition or there is a trouble).

2 long beeps – unknown card / iButton.

3 long beeps – unavailable function.

6. Expander firmware update

1. Using the RS-485 bus, connect the expander to the ACCO-USB converter (see ACCO-USB converter manual).
2. Connect the ACCO-USB converter to the computer USB port.
3. Download the expander firmware update program from the www.satel.eu website.
4. Launch the downloaded program.
5. Click on the  button.
6. In the window that will open, indicate the COM port to which the ACCO-USB converter is connected, and then click “OK”.
7. When a command is displayed prompting you to power the expander off and on, restart the device.
8. The program will read information on the installed firmware version from the expander.
9. When a window prompt is displayed asking you whether to continue the firmware update, click on the “Yes” button.
10. The expander firmware will be updated.

7. Specifications

Supply voltage	12 VDC ±15%
Standby current consumption	110 mA
Maximum current consumption.....	150 mA
Relay output (resistive load)	5 A / 30 VDC
+12V output	2,5 A / 12 VDC
Environmental class according to EN 50130-5	II
Operating temperature range.....	-10°C...+55°C
Maximum humidity	93±3%
Dimensions	140 x 68 mm
Weight.....	80 g