



EN 50131-1  
EN 50131-3  
EN 50131-6  
EN 50131-10  
EN 50136-1  
EN 50136-2  
EN 50130-4  
EN 50130-5  
CEB T031



# sol

Anti-intrusion control panels and security systems



## GameOver

Installation manual

## Warranty

INIM Electronics s.r.l. (Seller, Our, Us) warrants the original purchaser that this product shall be free from defects in materials and workmanship under normal use for a period of 24 months. As INIM Electronics s.r.l. does not install this product directly, and due to the possibility that it may be used with other equipment not approved by Us; INIM Electronics s.r.l. does not warrant against loss of quality, degradation of performance of this product or actual damage that results from the use of products, parts or other replaceable items (such as consumables) that are neither made nor recommended by INIM Electronics. Seller obligation and liability under this warranty is expressly limited to repairing or replacing, at Seller's option, any product not meeting the specifications. In no event shall INIM Electronics s.r.l. be liable to the purchaser or any other person for any loss or damage whether direct or indirect or consequential or incidental, including without limitation, any damages for lost profits, stolen goods, or claims by any other party caused by defective products or otherwise arising from the incorrect or otherwise improper installation or use of this product.

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INIM Electronics s.r.l. shall not be liable to the purchaser or any other person for damage arising from improper storage, handling or use of this product.

Installation of this Product must be carried out by qualified persons appointed by INIM Electronics. Installation of this Product must be carried out in accordance with Our instructions in the product manual.

## Directive 2014/53/EU

Hereby, INIM Electronics s.r.l., declares that the following devices are in compliance with the essential requirements and other relevant provisions of Directive 2014/53/UE:

Sol030S, Sol030G, Sol030P, all Air2 devices and variants

All the devices mentioned here above can be used in all EU countries without restrictions.

## Documents for the users

Declarations of Performance, Declarations of Conformity and Certificates concerning to INIM Electronics S.r.l. products may be downloaded free of charge from the web address [www.inim.biz](http://www.inim.biz), getting access to Extended Access and then selecting "Certifications" or requested to the e-mail address [info@inim.biz](mailto:info@inim.biz) or requested by ordinary mail to the address shown in this manual.

Manuals may be downloaded free of charge from the web address [www.inim.biz](http://www.inim.biz), getting access to Extended Access and then selecting "Manuals".

## Leading-edge systems (DM37/08)

The devices described in this manual, depending on the settings selected during the installation phase and the implementation of the concepts illustrated in this guide, allow you to create an Intrusion Detection and Hold-up Alarm System (I & HAS) compliant with EN 50131-1:2006 + A1: 2009, safety grade 3 (at highest) and an alarm transmission system (ATS) compliant with EN 50136-1: 2012 in category ATS6 (at highest SP6 or DP4).

The devices described are compliant with European standards EN 50131-3: 2009 (in reference to control and indicating equipment - CIE), EN 50131-6: 2008 + A1: 2014 (in reference to power supplies - PS), EN 50131- 10: 2014 and EN 50136-2: 2013 (in reference to transceivers on supervised sites - SPT).

As a support to the design, planning, operation, installation, commissioning and maintenance of intrusion alarm systems installed in buildings, the following regulatory documents should be consulted: CEI 79-3 and CEI CLC / TS 50131-7.

Depending on the State where the components described are installed, certified compliance with local laws and regulations may be required.

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# About this manual

DCMIINE0SOLE    **MANUAL CODE**  
1.00    **REVISION**

## Terminology

## 0-1

The main control unit or any constituent part of the Sol intrusion control system.

**CONTROL PANEL,  
SYSTEM, DEVICE**

Directions as seen by the operator when directly in front of the mounted device.

**LEFT, RIGHT,  
BEHIND, ABOVE,  
BELOW**

Persons whose training, expertise and knowledge of the products and laws regarding security systems, are able to create, in accordance with the requirements of the purchaser, the most suitable solution for the premises to be protected.

**QUALIFIED  
PERSONNEL**

Click on a specific item on the interface (drop-down menu, options box, graphic object, etc.).

**SELECT**

Click-on/push a video button/key on a keypad or screen.

**PRESS**

## Graphic conventions

## 0-2

---

The notes contain important information relating to the text.

---

**Note**

---

**The attention prompts indicate that total or partial disregard of the procedure could damage the device or its peripherals.**

---

**ATTENTION!**

---

**The DANGER warnings indicate that total or partial disregard of the procedure could injure the operator or persons in the vicinity.**

---

**DANGER!**



# Chapter 1

## General information

### 1-1

### Manufacturer's details

Manufacturer: INIM ELECTRONICS s.r.l  
Production plant: Centobuchi, via Dei Lavoratori 10  
63076, Montepandone (AP), Italy  
Tel.: +39 0735 705007  
Fax: +39 0735 704912  
e-mail: info@inim.biz  
Web: www.inim.biz

The persons authorized by the manufacturer to repair or replace the parts of this system have authorization to work only on devices marketed by INIM Electronics.

### 1-2

### Patented technologies

The Sol series of control panels has the following patented technologies.

- **Input/Output Terminals:** each terminal on-board the control panel, keypads and expansion boards can be configured as either an input or output zone.
- **nBy/X proximity reader:** this reader has been especially designed to flush-mount to all models of electrical outlet boxes.
- **Learn zone balancing:** under opportune conditions, this option allows the installer to start the process of automatic learning of the balancing of all the system zones, thus eliminating the task of entering the value of each zone in separately.

### 1-3

### Manuals

The manuals which are not supplied with the apparatus can be ordered, making reference to their respective codes, or downloaded from [www.inim.biz](http://www.inim.biz).

#### INSTALLATION AND PROGRAMMING GUIDE

The guide, supplied with each control panel, provides all the instructions and illustrations necessary for fast installation and programming of the Sol system.

This leaflet provides step by step descriptions of the procedures required for the system wiring, the various connections and first power up. It also provides a table for the addressing of peripherals and a quick guide to programming and the setting up of default values of the programming parameters.

#### INSTALLATION MANUAL (THIS MANUAL)

The installation manual contains the technical specifications of all the system components and the instructions for their installation, including instructions and wiring diagrams relating to the various modules.

It also contains the instructions for system commissioning

In order to provide adequate protection, the installer must adhere to all the manufacturer's guidelines relating to the active and passive security devices of this system.

#### PROGRAMMING MANUAL

The Programming manual contains instructions for the configuration and programming of the Sol system, as well as the descriptions of all the parameters and options, regardless of the means chosen for the programming process (keypad, software, etc.).

It also contains the instructions for commissioning, maintenance and troubleshooting.

The Sol/STUDIO software manual contains the description of the software and the instructions for its installation and use.

**SOFTWARE  
PROGRAM**

It is the responsibility of the person who programs the Sol system to adhere to the instructions and to have complete knowledge of the software in order to work swiftly and properly through the configuration and programming procedures.

This manual provides the installer and programmer of the Sol system with useful information.

**SUPPORT MANUAL**

This manual contains instructions relating to the user interface of the Sol control panel, its functions and use.

**USER'S MANUAL**

This manual is supplied with every control panel and must be given to the end-user for consultation, in order to ensure that the end-user fully understands how the system works and is aware of the configuration set by the installer.

## Operator Qualifications

**1-4**

The installer is the person (or group of persons) who sets up and programs the entire security system in accordance with the purchaser's requirements and in respect of the safety laws in force. It is the installer's responsibility to instruct users on how to use the security system properly.

**INSTALLER**

Under normal circumstances, the installer is not allowed to arm/disarm the system without previous authorization from the user. All the system partitions must be disarmed before accessing the parameter programming phase.

The access code of the installer is a level 3 access code.

The users are the occupants of the premises where the Sol intrusion control panel is installed. Only authorized users can access and operate the system.

**USER**

Thanks to the extreme flexibility of the system, the most common operations can be carried out without authorization. This operating method must be expressly requested by the main user, as it considerably lowers the security level of the system and may cause false alarms, accidental arm/disarm operations, etc.

A system access code is associated with each user. The programming process allows you to define the code hierarchy:

- **User**
  - **Manager**
  - **Master**
- Each code, in accordance with its assigned level in the system-hierarchy (the "User" being the lowest level), is capable of carrying out the following operations on all other codes that are hierarchically inferior:
- enable/disable
  - change PIN
  - change several programming parameters

## Access levels

**1-5**

The normative defines the following system-access levels, regardless of system-access limitations:

- **Level 1** - access by any person (e.g. passer-by)
- **Level 2** - access by a user
- **Level 3** - access by the installer or maintenance operator access (authorized by a level 2 user)
- **Level 4** - manufacturer access

## Chapter 2

# The control panel and peripherals

### 2-1

## Sol control panels

#### 2-1-1

### Inside the box

Inside the box you will find:

- Metal enclosure containing the motherboard and wired power supply
- User's Manual
- Quick guide to installation and programming
- Plastic bag containing:
  - 4 x 3k9 Ohm 1/4W resistors
  - 4 x 6k8 Ohm 1/4W resistors
  - 7.2V NiMH, 2200mAh backup battery, already installed
  - Sticker
  - Glass-cleaning cloth



The control panel data labels are affixed to the outside of the control panel enclosure.

#### 2-1-2

### Control panel descriptions

#### COMPLIANCE

- EN 50131-1:2006+A1:2009,
- EN 50131-3:2009,
- EN 50131-6:2008+A1:2014,
- EN 50131-10:2014,
- EN 50136-1:2012
- EN 50136-2:2013
- EN 50130-4:2011+A1:2014,
- EN 50130-5:2011
- CEB T031:2014-12 (ed.1)

**Table 2-1: Control panels - electrical and mechanical features**

|   |                     |   |
|---|---------------------|---|
| Voltage   | power supply        | 100-240V~ -15% +10% 50/60Hz   |
|   | nominal output      | 13.8V $\overline{=}$  |
| Current draw                                      |                     | 200mA @220V   |
| Fault voltage on power outputs                    | maximum             | 15.4V $\overline{=}$  |
|   | minimum             | 9.7V $\overline{=}$   |
| Short-circuit current                             | +AUX                | 100mA   |
|   | + I- BUS            | 200mA   |
| Deep discharge shutdown                           |                     | 6V  |
| Type of alarm notification (EN 50131-1, par. 8.6) |                     | D <sup>(a)</sup>  |
| IP Protection grade                               |                     | 30  |
| Environmental Conditions                          | Temperature         | from -10° to +40° C   |
|   | Maximum humidity    | 75% (without condensation)  |
|   | Environmental class | II  |
| Enclosure Dimensions (W x H x D)                  |                     | 266 x 197 x 51mm  |
| Weight  |                     | 1100g   |
| Security rating                                   | EN50131-3           | 2   |
|   | EN50131-6           | 2   |
| ATS Categories                                    |                     | up to SP6 or DP4 (depending on the configurations, see ATS Category tables) |

a. Also notification types A, B and C are possible depending on the configuration of the control panel and system.

**Table 2-2: SD Type and distribution of the currents**

|  |                       |         |
|--|-----------------------|---------|
| SD type<br>(backup battery)                      | nominal voltage       | 7.2V    |
|  | maximum capacity      | 2200mAh |
|  | maximum recharge time | 3h      |
| Maximum current output @ 12V on I-BUS            |                       | 200mA   |
| Max. current available on each +AUX terminal     |                       | 100mA   |
| Maximum output current to open-collector outputs |                       | 250mA   |

The following table shows the maximum number of devices supported by the various control panel models.

**Table 2-3: Control panel - main features**

| Sol control panel models                                    | Sol-S                                  | Sol-G                    | Sol-P   |
|---|--|--------------------------|---|
| Graphic display   | /                                      | built-in LCD<br>(192x64) | built-in touch-screen<br>(4.3", 480x272,<br>65.000 colours) |
| Keypad  | /                                      | Built-in, touch<br>keys  | /   |
| Partitions  | 5                                      |                          |   |
| Terminals configurable as inputs/outputs/roller blind/shock | 2                                      |                          |   |
| Wireless zones  | 30                                     |                          |   |
| Wireless terminals  | 8                                      |                          |   |
| Wireless sounder/flasher                                    | 8                                      |                          |   |
| Voice memo slots  | 1                                      |                          |   |
| Readers   | 1 on I-BUS and 1 on board              |                          |   |
| Wireless transceiver  | 1 on I-BUS (Air2-BS200) and 1 on board |                          |   |
| Digital keys and wireless command devices                   | 150                                    |                          |   |
| Possible key combinations                                   | 4294967296                             |                          |   |
| Sol-3G (GSM/GPRS/2G/3G communicator)                        | 1 (optional, on board)                 |                          |   |
| Sol-PSTN (PSTN interface)                                   | 1 (optional, on board)                 |                          |   |
| Sol-LAN (LAN interface)                                     | 1 (optional, on board)                 |                          |   |
| Sol-WiFi (WiFi interface)                                   | 1 (optional, on board)                 |                          |   |
| Codes   | 50                                     |                          |   |
| Arming scenarios  | 30                                     |                          |   |
| Output scenarios  | 50                                     |                          |   |
| Timers  | 20                                     |                          |   |
| Recordable Events   | 4000                                   |                          |   |
| Programmable events   | 30                                     |                          |   |

Following is an illustration of an open Sol control panel showing its assembled parts and completed wiring, as supplied.

Table 2-4: Sol control panels - external

|   |  |
|---|--|
| A | Graphic display  |
| B | Keypad   |
| C | Signalling LEDs  |
| D | Microphone   |
| E | Proximity reader                                       |
| F | Buzzer/Speaker   |
| G | Sounder-flasher  |
| H | Brightness sensor                                      |
| I | Control panel closure screws                           |
| J | Cable entry  |
| K | Mounting screw hole                                    |
| L | Hole for the anti-opening/anti-dislodgement protection |

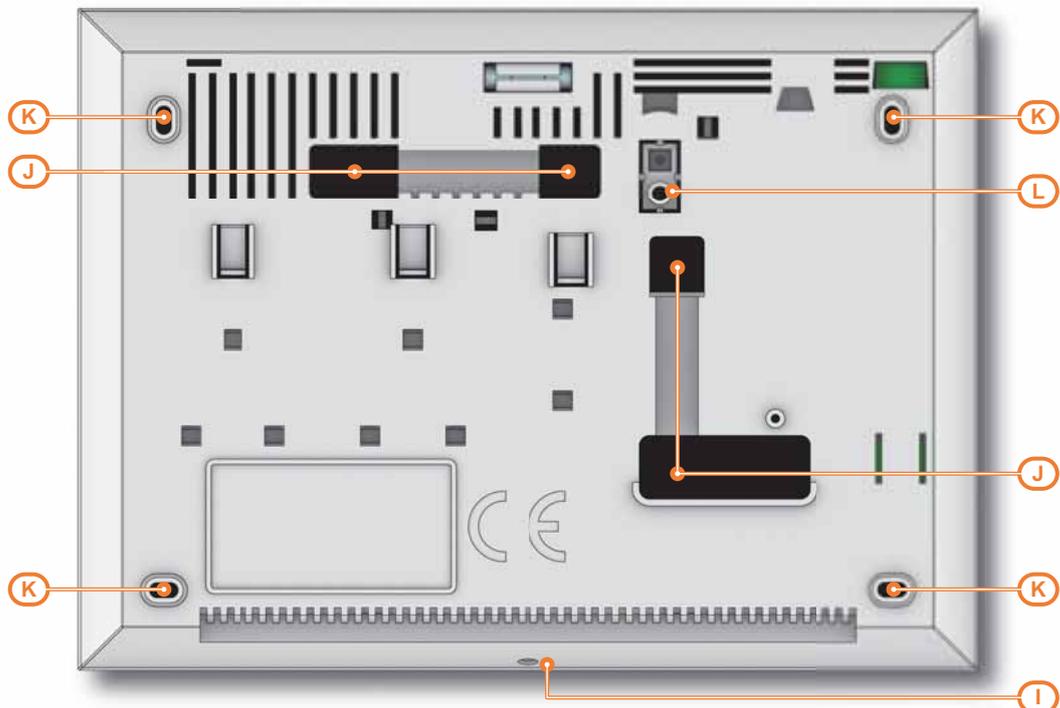
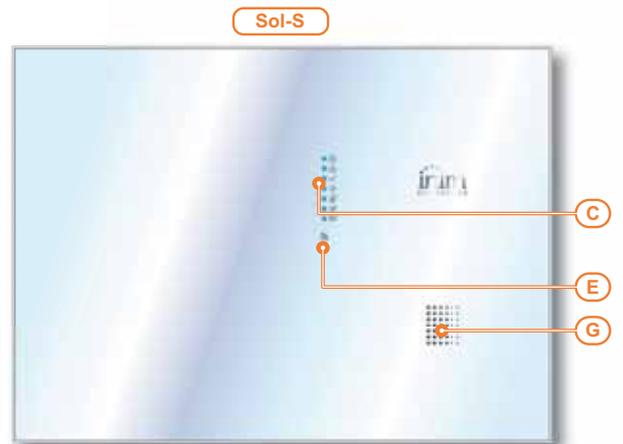
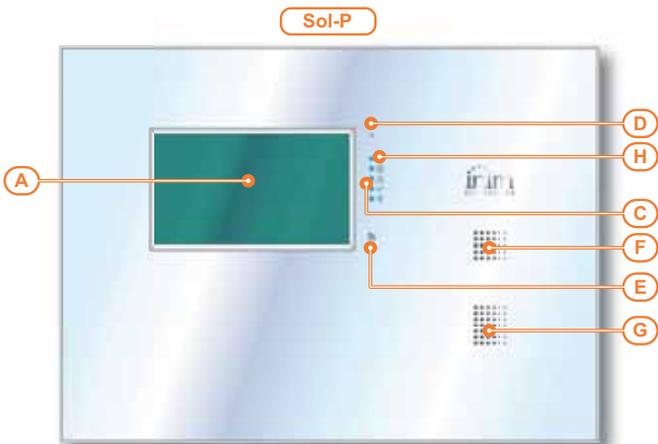
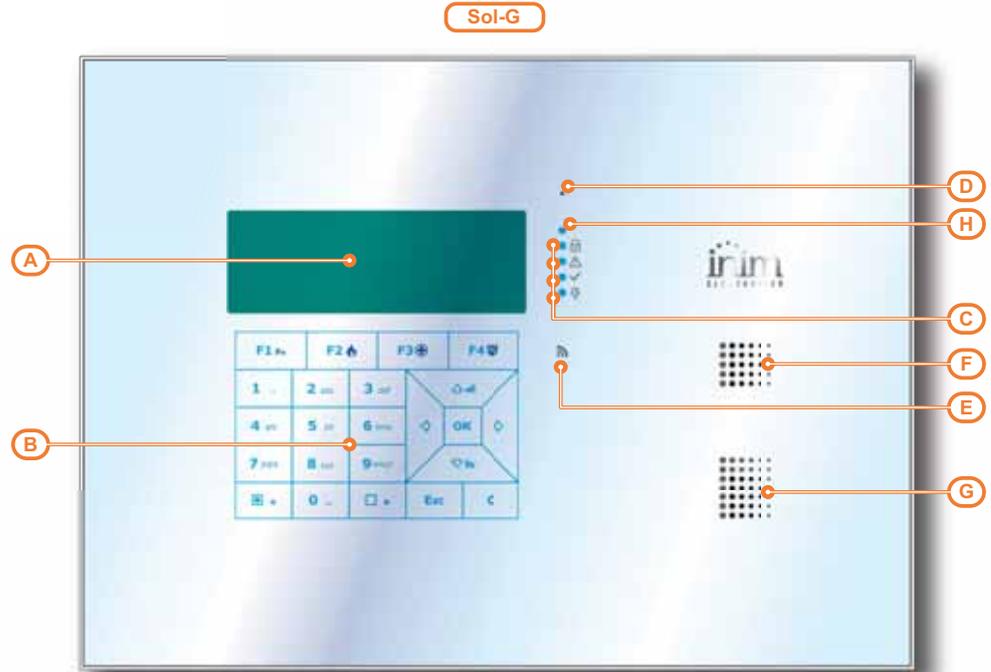


Table 2-5: Sol control panels - internal

|    |   |   |
|----|---|---|
| A  | Back\   |   |
| B  | Front-plate/Cover   |   |
| C  | Battery   |   |
| D  | Power supply  |   |
| E  | Power supply terminals  |   |
| F  | Cable entry   |   |
| G  | Mounting screw hole   |   |
| H  | Hole for the open-panel/dislodgement tamper protection device             |   |
| I  | Adjustment screw for the open-panel/dislodgement tamper protection device |   |
| J  | Level   |   |
| K  | Mother board  |   |
| L  | Connection terminal board   |   |
|    | + D S -   | I-BUS connections                                   |
|    | + AUX -   | 13.8V output terminals                              |
|    | T1 T2   | Control panel input/output terminals                |
|    | COM NC NO   | Voltage-free contacts of the relay output           |
| M  | Securing hooks for the optional LAN module                                |   |
| N  | Terminals for the optional LAN module                                     |   |
| O  | Securing hooks for the optional PSTN module                               |   |
| P  | Terminals for the optional PSTN module                                    |   |
| Q  | Securing hooks for the optional GSM module                                |   |
| R  | Terminals for the optional GSM module                                     |   |
| S  | Housing for the optional LAN WiFi board                                   |   |
| T  | Connector for the optional LAN WiFi board                                 |   |
| U  | Sounder-flasher   |   |
| V  | Buzzer/Speaker  |   |
| W  | Battery connector   |   |
| X  | <b>SERV-FACT</b>  | Button to reset default settings (factory settings) |
| Y  | <b>RESET</b>  | Restart button for the graphic display              |
| Z  | USB micro connector   |   |
| A1 | Voice board connector   |   |
| B1 | Activity LED  |   |
|    | VCC   | Green power LED                                     |
|    | CHARGE  | Red battery-charge status LED                       |
|    | BUS   | Yellow activity on BUS LED                          |
| C1 | RUN   | Blue activity LED                                   |
|    | Open-panel/dislodgement tamper micro-switch                               |   |

Table 2-6: Sol-P - motherboard

|   |                        |                           |
|---|------------------------|---------------------------|
| A | Mother board           |                           |
| B | PCB / display          |                           |
| C | <b>RESET</b>           | System reset button       |
| D | <b>CALIBRATE-TOUCH</b> | Forced calibration button |
| E | Slot for micro-SD card |                           |

**ATTENTION!**

**Do not tamper with or disconnect any wiring that has been completed at the factory. In the event of replacement by the installer of one of the parts listed below (for maintenance or repairs), the manufacturer recommends that connection or disconnection of any wires is done only after disconnecting both the AC mains voltage and the battery.**

**TOUCH-SCREEN CALIBRATION**

If the touch screen of the Sol-P does not respond properly to taps, you must implement the forced calibration process.

This process is initialized by simply pressing and holding the respective button for 7 seconds (*Table 2-6: Sol-P - motherboard, D*).

Once the calibration process starts, simply follow the instructions provided on the screen.

**2-1-3****Activity LED**

The LEDs on the control panel motherboard (refer to *Table 2-5: Sol control panels - internal, B1*) can provide information regarding the proper operating capacity of the control panel firmware and I-BUS.

Specifically:

**GREEN VCC LED**

Green LED On solid indicates the power supply is present. If On solid it indicates that the control panel is operating properly. If Off the power supply has failed or has problems.

**BLUE RUN LED**

If the control panel is operating properly, the blue LED on the motherboard will blink rapidly. At the end of a programming session via PC, during reset of factory default settings and during re-programming operations on the control panel and peripheral firmware, the LED may be either On solid or Off for the entire time. However, once the operation is complete it will start blinking again as previously described.

If the LED is On or Off permanently for no apparent reason (see above), it means that all the system functions are blocked.

**YELLOW BUS LED**

During normal functioning of the control panel, the yellow LED will flicker. At the end of a programming session via PC, during reset of factory default settings and during re-programming operations on the control panel and peripheral firmware, the LED may be either On solid or Off for the entire time. However, once the operation is complete it will start blinking again as previously described.

If the LED is On or Off permanently for no apparent reason (see above), it means the I-BUS is blocked. This condition is confirmed by the loss of communication with the keypads, readers and expansion boards.

The blue and yellow activity LEDs will remain Off when the control panel front/cover is closed.

**RED CHARGE LED**

If the red LED is On solid it means the battery is under charge. The LED will switch Off when the charging process is complete.

If blinking it indicates that the battery is disconnected.

**2-1-4****ATS Categories**

Sol control panels, when used alone or together with any of the following optional devices, constitute an SPT (Supervised Premises Transceiver) which can be used to create an ATS (Alarm transmission System) as defined in EN 50136-1 and EN 50136-2 standards.

The following table shows the maximum ATS categories achievable with the SPT configurations and main communication channel in use, together with the respective parameters.

Table 2-7: ATS categories based on configurations

| SPT Configurations |          |         |          |        | SPT primary network interface | ATS Categories   |                |
|--------------------|----------|---------|----------|--------|-------------------------------|------------------|----------------|
| Sol control panels | Sol-PSTN | Sol-LAN | Sol-WiFi | Sol-3G |                               | Single Path (SP) | Dual Path (DP) |
| X                  | X        |         |          |        | PSTN                          | 2                | /              |
| X                  |          | X       |          |        | Internet                      | 6                | /              |
| X                  |          |         | X        |        | Internet                      | 6                | /              |
| X                  |          |         |          | X      | GSM/GPRS                      | 6                | /              |
| X                  |          | X       | X        |        | Internet                      | 6                | /              |
| X                  |          | X       |          | X      | Internet or GSM/GPRS          | 6                | 4              |
| X                  |          |         | X        | X      | Internet or GSM/GPRS          | 6                | 4              |
| X                  |          | X       | X        | X      | Internet or GSM/GPRS          | 6                | 4              |
| X                  | X        | X       |          |        | Internet                      | 6                | 2              |
| X                  | X        |         | X        |        | Internet                      | 6                | 2              |
| X                  | X        |         |          | X      | GSM/GPRS                      | 6                | 2              |
| X                  | X        | X       | X        |        | Internet                      | 6                | 2              |
| X                  | X        | X       |          | X      | Internet or GSM/GPRS          | 6                | 4              |
| X                  | X        |         | X        | X      | Internet or GSM/GPRS          | 6                | 4              |
| X                  | X        | X       | X        | X      | Internet or GSM/GPRS          | 6                | 4              |

Table 2-8: ATS Parameters

| ATS Categories |   | Transmission time |                | Time relation | Replacement security | Information security | Operating mode |
|----------------|---|-------------------|----------------|---------------|----------------------|----------------------|----------------|
|                |   | Classification    | Maximum values |               |                      |                      |                |
| Single Path    | 2 | D2 (60s)          | M2 (120s)      | T2 (25h)      | S0                   | I0                   | Pass-through   |
|                | 6 | D4 (10s)          | M4 (20s)       | T6 (20s)      | S2                   | I3                   |                |
| Dual Path      | 2 | D3 (20s)          | M3 (60s)       | T3a (30min)   | S0                   | I0                   |                |
|                | 4 | D4 (10s)          | M4 (20s)       | T5 (90s)      | S2                   | I3                   |                |

## Events log memory

## 2-1-5

The control panel events are saved to a non-volatile semiconductor-memory which retains data without the need of power.

The electrical characteristics of semiconductor devices diminish over time. However, a minimum period of 40 years data retention is guaranteed.

## Peripherals on I-BUS

## 2-2

Sol control panels are equipped with a 4-wire BUS for the interconnection of the following peripherals (2 power-supply wires and 2 data exchange wires, refer to *paragraph 4-2-1 Connecting to the I-BUS line*).

- Readers (nBy/S and nBy/X)
- Transceiver (Air2-BS200)

The intellectual property rights regarding the electrical, structural and protocol features of the BUS are the sole property of INIM Electronics s.r.l.

The I-BUS is not a RS485 differential BUS.

**The connectible peripherals must have firmware versions higher than or equal to 6.00.**

**ATTENTION!**

## 2-2-1

## Readers - nBy/S and nBy/X

Table 2-9: nBy - electrical and mechanical features

| Model                  | nBy/S                         | nBy/X                      |
|------------------------|-------------------------------|----------------------------|
| Voltage                | from 9 to 16V $\overline{DC}$ |                            |
| Typical current draw   | 40mA                          | 35mA                       |
| Temperature            | from -25° to +70° C           | from -10° to +40° C        |
| Maximum humidity       | 93% (without condensation)    | 75% (without condensation) |
| Environmental class    | IV                            | II                         |
| IP Protection grade    | 34                            | 30                         |
| Dimensions (W x H x D) | 64 x 80 x 17 mm               | 19 x 50 x 51 mm            |
| Weight                 | 45g                           | 25g                        |

Table 2-10: nBy - description of parts

| Model | nBy/S  | nBy/X             |
|-------|--|-------------------|
| A     | Terminal board                               |                   |
| B     | /  | Buzzer            |
| C     | LED  |                   |
| D     | Antenna                                      |                   |
| E     | Open panel/<br>dislodgement<br>tamper device | /                 |
| F     | Cable entry                                  | /                 |
| G     | Mounting<br>screw hole                       | /                 |
| H     | /  | Light guide       |
| I     | /  | Mounting<br>screw |

Following are the descriptions of the reader terminals:

Table 2-11: nBy - terminal board

| n. | identifier | description                           |
|----|------------|---------------------------------------|
| 1  | +          | Terminal "+" for the I-BUS connection |
| 2  | D          | Terminal "D" for the I-BUS connection |
| 3  | S          | Terminal "S" for the I-BUS connection |
| 4  | -          | Terminal "-" for the I-BUS connection |

**Note**

nBy/X is a registered patent

## 2-2-2

## Air2-BS200 Transceiver, Aria/W Keypads and Hedera sounders

The wireless transmission diffusion of Sol control panels can be amplified by means of the installation of an Air2-BS200 transceiver on the I-BUS. This provides further terminals (wireless zones for enrollment, thus adding to those already enrolled by the integrated transceiver, for a total of 30 terminals).

The integrated transceiver of the control panel can manage up to 4 Aria/W keypads and 4 Hedera sounders.

The installation of an Air2-BS200 transceiver allows management of a further 4 Aria/W keypads and 4 Hedera sounders.

The descriptions of Air2 devices and their installation instructions can be found in their respective manuals.

## Accessory modules for connectivity

### 2-3

Sol control panels allow the use of accessory modules in order to increase the already available functions.

These are modules, for installation directly inside the control panel enclosure via the allocated connectors, which interface with the control panel in addition to the on-board USB port, via other communication channels.

- **Sol-3G** GSM/GPRS interface
- **Sol-WIFI** LAN WiFi interface
- **Sol-LAN/S** LAN Ethernet interface
- **Sol-PSTN** PSTN interface
- **SmartLogos30M** Voice board

### Sol-3G, GSM communicator module

#### 2-3-1

The optional Sol-3G module is a device that interfaces control panels with mobile network communication channels (2G, GPRS, 3G).

The functions available for duly equipped Sol control panels are:

- voice calls via the SmartLogos30M voice board installed on the control panel
- digital calls via CONTACT-ID protocols
- transmission of SIA-IP events
- sending of SMS texts for each event using alternatively:
  - the description provided by the events log
  - a customizable description
- commands sent by the user via SMS
- commands using recognition of user's telephone number (CALLER-ID)
- answerphone function
- connection to INIM Cloud services

**Table 2-12: Sol 3G - technical specifications**

|                                |   |  |
|--------------------------------|---|--|
| <b>Antenna</b>                 | dipole GSM-UMTS, SMA-Male connector (impedance 50Ohm) |  |
| <b>Frequency</b>               | <b>2G (GSM/GPRS)</b>                                  | Quad band (850/900/1800/1900 MHz)      |
|                                | <b>3G (UMTS/HSPA)</b>                                 | World wide (800/850/900/1900/2100 MHz) |
| <b>Maximum RF output power</b> | 2W @ 1W   |  |
| <b>Temperature</b>             | from -10° to +40° C                                   |  |
| <b>Maximum humidity</b>        | 75% (without condensation)                            |  |
| <b>Environmental class</b>     | II  |  |
| <b>IP Protection grade</b>     | 30  |  |
| <b>Dimensions</b>              | 51 x 138 x 21 mm                                      |  |
| <b>Weight</b>                  | 61g   |  |

**Table 2-13: LED signalling**

| LED |                        | function                                       | ON  | OFF               |
|-----|------------------------|--|---|-------------------|
| COM | GSM communications     | Indicates an ongoing GSM communication         | This LED lights during ongoing GSM communications (voice calls, ARC calls, emergency calls, sending of SIA-IP data packets, sending of SMS texts) | Not communicating |
| BUS | Communication over BUS | Indicates communication with the control panel | The LED blinks during ongoing communications  | Not communicating |
| NET | Connection             | Indicates the status of the wireless network   | Slow flashing (ON 64ms / OFF 3000 ms) - device registered to the cellular network   | Device Off        |
|     |                        |  | Regular flashing (ON 64ms / OFF 800 ms) - device not registered and in search of the network provider   |                   |
|     |                        |  | Fast flashing (ON 64ms / OFF 300 ms) - data communication in progress   |                   |

When the control panel enclosure is closed, these LEDs will be Off.

**Table 2-14: 3G - description of parts**

|   |   |                                |
|---|---|--------------------------------|
| A | Antenna                                     |                                |
| B | SIM card housing (non included)             |                                |
| C | COM   | GSM communication LED (red)    |
| D | BUS   | BUS communication LED (yellow) |
| E | NET   | Connection LED (green)         |
| F | Control panel connector (on the under side) |                                |

## 2-3-2

### Sol-LAN/S and Sol-WIFI, LAN interfaces

Sol control panels provide the possibility to connect to LAN networks and to the Internet via the optional Sol-LAN/S modules for connections to Ethernet networks, or via Sol-WIFI for WiFi connections.

Network connectivity allows the installer to remotely program and supervise the system via LAN using Sol/STUDIO software, a web-browser, the AlienMobile application or Cloud connection.

For a more detailed explanation of how to use the Web interface, refer to the User Manual of the control panel in use.

**Table 2-15: LAN modules - technical specifications**

| Module                 | Sol-LAN/S                    | Sol-WIFI         |
|------------------------|------------------------------|------------------|
| Antenna                | /                            | integrated       |
| Band frequency         | /                            | 2400-2483.5 MHz  |
| RF output power (max)  | /                            | 100mW e.i.r.p.   |
| Wi-Fi protocols        | /                            | 802.11 b/g/n     |
| Encryption             | An AES 128 bit symmetric key |                  |
| Temperature            | from -10 to +40°C            |                  |
| Relative humidity      | ≤75% without condensation    |                  |
| IP Protection grade    | 30                           |                  |
| Environmental class    | II                           |                  |
| Dimensions (W x H x D) | 36 x 77 x 21 mm              | 23 x 49.5 x 8 mm |
| Weight                 | 37g                          | 5g               |

**Table 2-16: LAN modules - description of parts**

|   |                         |
|---|-------------------------|
| A | Antenna                 |
| B | Ethernet connector      |
| C | Control panel connector |

## Sol-PSTN, PSTN communicator module

### 2-3-3

The use of an optional Sol-PSTN module allows you to connect the PSTN line (Public Switched Telephone Network line) to the control panel and to activate all the functions that use this line:

- voice communicator
- automatic answerphone
- ARC services

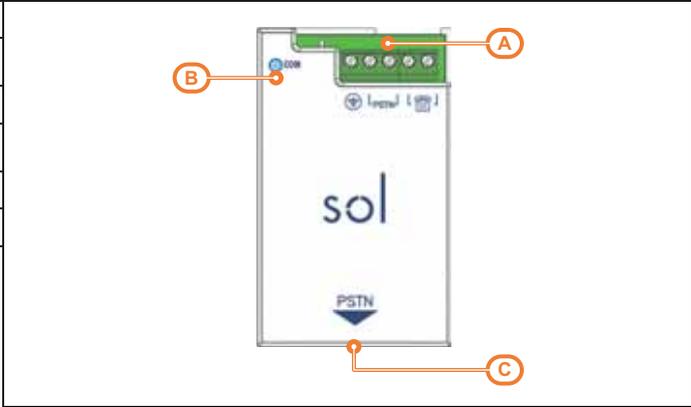
If the control panel is not equipped with a SmartLogos30M voice board, voice calls will produce a continuous beep for 30 seconds.

**Table 2-17: Sol-PSTN - technical specifications**

|                            |                            |
|----------------------------|----------------------------|
| <b>Temperature</b>         | from -10° to +40° C        |
| <b>Maximum humidity</b>    | 75% (without condensation) |
| <b>Environmental class</b> | II                         |
| <b>IP Protection grade</b> | 30                         |
| <b>Dimensions</b>          | 51 x 85 x 21 mm            |
| <b>Weight</b>              | 54g                        |

**Table 2-18: Sol PSTN - description of parts**

|          |   |  |
|----------|---|--|
| <b>A</b> | Terminal board for the line terminals   |  |
|          |  | Earth connection                         |
|          | <b>PSTN</b>   | Land-line connection (PSTN)              |
|          |  | Internal telephone-line connection       |
| <b>B</b> | <b>COM</b>  | Red LED for communications over the PSTN |
| <b>C</b> | Control panel connector (on the under side)                                       |  |



The red **COM** LED On solid indicates the ongoing progress of:

- a phone call over the PSTN line
- an ARC call over the PSTN line

When the control panel enclosure is closed, this LED will be Off.

## SmartLogos30M

### 2-3-4

The optional SmartLogos30M voice board is necessary when voice functions are required by the control panel:

- Voice mailbox, to record, play and delete voice messages.
- Voice dialer, to send voice calls to programmed phone contact numbers.
- Answerphone, to answer incoming calls. After the pre-set number of rings, the control panel will pick-up and play the recorded answer message. During the call, the recipient can type-in a valid PIN (enabled for over-the-phone control) and access the authorized functions.

The SmartLogos30M voice board provides 500 voice message slots, 310 of which are pre-recorded at factory. The messages are arranged in such way as to produce event-related voice calls which clearly describe the related event. For this purpose it is necessary to use the appropriate modules for communications via PSTN or GSM.

## Chapter 3

# Wireless systems

All Sol control panels have integrated transceivers and, therefore, can manage the Air-2 two-way wireless system.

**Table 3-1: Technical specifications of Air2 system**

|                     |                     |                        |
|---------------------|---------------------|------------------------|
| Operating frequency | range               | 868.0 - 868.6MHz       |
|                     | selectable channels | 868.1, 868.3, 868.5MHz |
| RF output power     |                     | 25mW e.r.p.            |
| Communication type  |                     | Two-way                |
| Modulation          |                     | GFSK                   |
| Device monitoring   |                     | from 12 to 250 minutes |

### Note

In order to comply with the EN 50131-1 standard the alarm system monitoring time must be less than 120 minutes.

The installer has the choice of 3 transmission channels between modules. This feature allows you to select the channel in such way as to avoid over-the-air interference between two close-proximity wireless systems (for example, in two adjoining apartments).

Description of the Air2 system devices:

- **Air2-BS200/50** transceiver module, 50 terminals
- **Air2-BS200/30** transceiver module, 30 terminals
- **Air2-BS200/10** transceiver module, 10 terminals
- **Air2-MC200** magnetic contact with shock and tilt sensor in white or brown
- **Air2-MC300** magnetic contact with two I/O terminals, in white or brown
- **Air2-KF100** 4 button remote-control key
- **Air2-Pebble** 4 button remote-control key
- **Air2-Ergo** 4 button remote-control key
- **Air2-FD100** smoke detector
- **Air2-Aria/W** keypad with graphic display
- **Air2-Hedera** outdoor sounder, in white or chrome effect
- **Air2-DT200T** dual technology curtain detector, in white or brown
- **Air2-XIR200W** PIR detector, range 12m
- **Air2-XDT200W** dual technology detector
- **Air2-UT100** universal transceiver
- **Air2-ODI 100W** outdoor wireless dual-infrared detector
- **Air2-OTT100W** wireless triple-technology detector for outdoor use

For the technical descriptions and installation instructions of Air2 devices, refer to the manuals included in the respective packages.

### Note

The Air2 devices are certified by IMQ-Sistemi di sicurezza (Italian certification body).

The information relating to the power-supply batteries required by Air2 devices is shown in the Technical Specification table that follows. The manufacturer cannot guarantee the declared battery life.

### ATTENTION!

**Do not use batteries other than those indicated by the manufacturer as they may explode.**

Used batteries must be disposed of in accordance with the information provided in the leaflet inside the package.

# Air2 devices

# 3-1

## Air2 remote-control key

## 3-1-1

The Air2 remote-control key has 4 buttons which can be programmed from the control panel.

**Table 3-2: Technical features of Air2 remote-control keys**

| Models                                    | KF100  | Pebble                                     | Ergo  |
|---|--|--|---|
| Battery                                   | Lithium CR2032 3V                                    |  |   |
| "Low battery" fault voltage               | Less than 2.4V                                       |  |   |
| Current draw                              | during standby                                       | 0A   |   |
|   | maximum  | 30mA                                       |   |
| Buzzer                                    | Multitone  |  |   |
| Operating environmental conditions        | temperature  | from -10 to +40°C                          |   |
|   | relative humidity                                    | ≤93% without condensation                  |   |
| Dimensions (W x H x D)                    | 61 x 41 x 12mm                                       | 69 x 42 x 15 mm                            | 72 x 41 x 16mm                              |
| Weight                                    | 15g  | 23g  | 25g   |
| Keys                                      | 2 models:<br>• with icons<br>• with numbered buttons | in plastic with icons and numbered buttons | in silicone with icons and numbered buttons |
| Security rating                           | 2  |  |   |
| Environmental class                       | II   |  |   |
| Number of available PIN code combinations | 2 <sup>24</sup>                                      |  |   |

EN 50131-1  
EN 50131-5-3  
EN 50130-4  
EN 50130-5

INCERT  
CEB T031

**Table 3-3: Description of Air2-KF100 parts**

|   |                              |
|---|------------------------------|
| A | Key1/F1, LED1-red            |
| B | Key2/F2, LED2-red            |
| C | Key3/F3, LED3-red            |
| D | Key4/F4, LED4-red            |
| E | Confirmation LED - red/green |
| F | Icon graphic keys            |
| G | Keys with numbers            |

Each model of the Air2 remote-control is capable of notifying the user, via visual and audible feedback signals (beep and LED signals), of the successful/unsuccessful outcome of requested operations thanks to the two-way transceiver.

**Table 3-4: Air2 remote-control keys**

| Push button | LED 1   | LED 2     | LED 3     | LED 4   | Buzzer signal | Operation                           |
|-------------|---------|-----------|-----------|---------|---------------|-------------------------------------|
| F1          | 1 flash |           |           |         | beep          | Activates shortcut 1                |
| F2          |         | 1 flash   |           |         | beep          | Activates shortcut 2                |
| F3          |         |           | 1 flash   |         | beep          | Activates shortcut 3                |
| F4          |         |           |           | 1 flash | beep          | Activates shortcut 4                |
| F2 + F3     |         | 1 flash   | 1 flash   |         | beep          | Block/Unblock remote-control device |
| F3 + F4     |         |           | 1 flash   | 1 flash | beep          | Enrolling                           |
| Any         |         | 4 flashes | 4 flashes |         |               | Keyfob locked signal                |

Failure of the LED to light, after pressing the corresponding button and the successful execution of the command, is an indication that the wireless battery is running low.

**Table 3-5: Panel notifications**

| Panel response       | Confirmation LED |           | Buzzer signal |
|----------------------|------------------|-----------|---------------|
|                      | green            | red       |               |
| Command not received |                  | 1 flash   |               |
| Operation not done   |                  | 4 flashes | bop           |
| Operation done       | 3 flashes        |           | long beep     |

## ROLLING-CODE AUTHENTICATION

A further guarantee of security regarding the signal transmissions from Air2 remote-controls is provided by the use of a rolling code algorithm. This allows the transceiver module to check the validity of each wireless keyfob transmission.

In the event of irregular wireless activity, denial-of-request will be signalled by an audible error signal ("bop").

To reset the transmissions and rolling code it is necessary to press and hold keys "F3" and "F4".simultaneously.

The function is active at default but can be disabled during the programming phase. The deactivation can be useful to the installer when the same wireless command device is used on several systems.

### 3-1-2

## Air2-MC200 magnetic contact

The Air2-MC200 is supplied with a magnet which is to be secured (by means of two screws) to the side of the contact, in the position indicated by the two notches.

The Air2-MC200 integrates shock and tilt sensors that allows its use without the need of the magnet.

The Air2-MC200 is equipped with open and dislodgement tamper protection.

The device uses separate channels for the different types of signalling,, thus allowing precise identification of the alarm source.

### Note

The shock and tilt sensors are not subject to certification of this product.



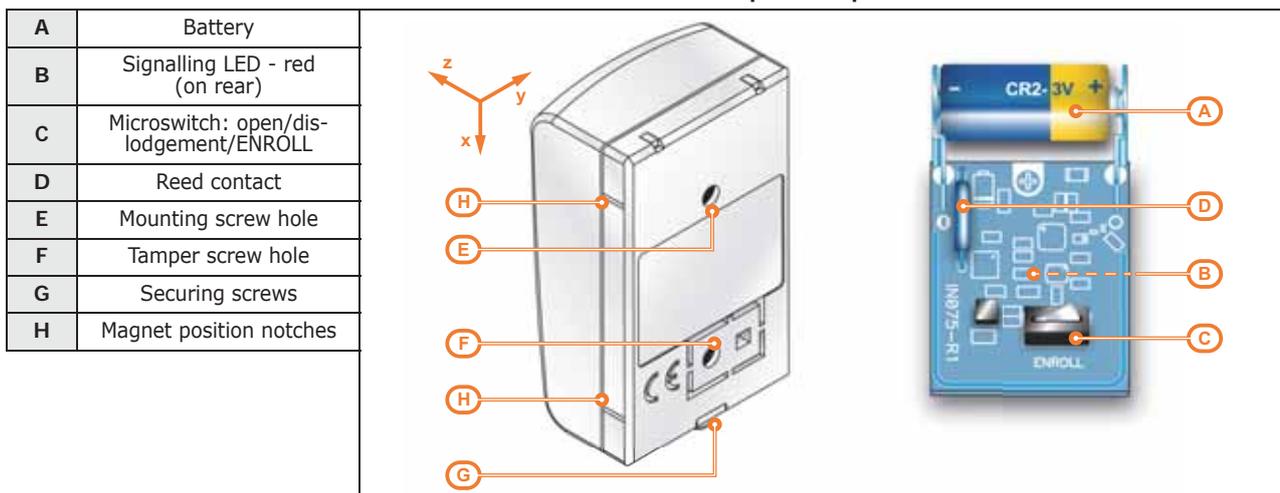
EN 50131-1  
EN 50131-5-3  
EN 50131-2-6  
EN 50130-4  
EN 50130-5

INCERT  
CEB T031

Table 3-6: Air2-MC200 technical specifications

|                                    |                   |                           |
|------------------------------------|-------------------|---------------------------|
| Battery                            | type              | Lithium CR2 3V            |
|                                    | estimated life    | 4 years                   |
| "Low battery" fault voltage        |                   | Less than 2.4V            |
| Current draw                       | during standby    | 10µA                      |
|                                    | maximum           | 30mA                      |
| Operating environmental conditions | temperature       | from -10 to +40°C         |
|                                    | relative humidity | ≤93% without condensation |
| Dimensions (W x H x D)             |                   | 35 x 58 x 23mm            |
| Weight                             |                   | 30g                       |
| Magnet dimensions                  |                   | 13 x 40 x 14mm            |
| Colours                            |                   | White, Brown              |
| Security rating                    |                   | 2                         |
| Environmental class                |                   | II                        |

Table 3-7: Air2-MC200 - description of parts



## MAGNET DETECTION RANGE

The following table indicates the distance in millimeters of the operating capacity of the magnet depending on the side in use and the axes illustrated in the figure (values starting from a nominal distance of 10mm, except for axis y-):

Table 3-8: Distance between magnet and contact (mm)

| Axis  | Contact long side |      |
|-------|-------------------|------|
|       | Withdrawn         | Near |
| x +/- | 18                | 14   |
| y -   | 18                | 14   |
| z +/- | 22                | 18   |

Signalling of shock waves is achieved through a tri-axial vibration sensor. The vibration sensibility can be set either from a keypad or via the programming software application.

**SHOCK DETECTION**

Signalling of tilting (angle change) is achieved through tri-axial tilt sensing. The tilt-variation value (angle) can be set in relation to the standby position, which is saved to the memory during the reset-after -alarm phase.

**TILT DETECTION**

If both shock and tilt sensing are activated, alarm signalling will occur as soon as one of the two conditions exceeds its respective alarm threshold.

**Air2-MC300 magnetic contact**

The Air2-MC300 magnetic contact has two screw-in positions for placement optimization of the device magnet, 90° one from the other.

The magnet is contained inside its own enclosure and a base which can be selected from one of the three available, that differ in size (26.5, 20 e 13.5 mm).

The Air2-MC300 also provides two terminals which can be configured individually as input or open-collector output.

Alarms deriving from magnetic contacts and distinctly from the two terminals are signalled separately on the control panel.

The device is protected against dislodgement and open-cover tamper.

**3-1-3**



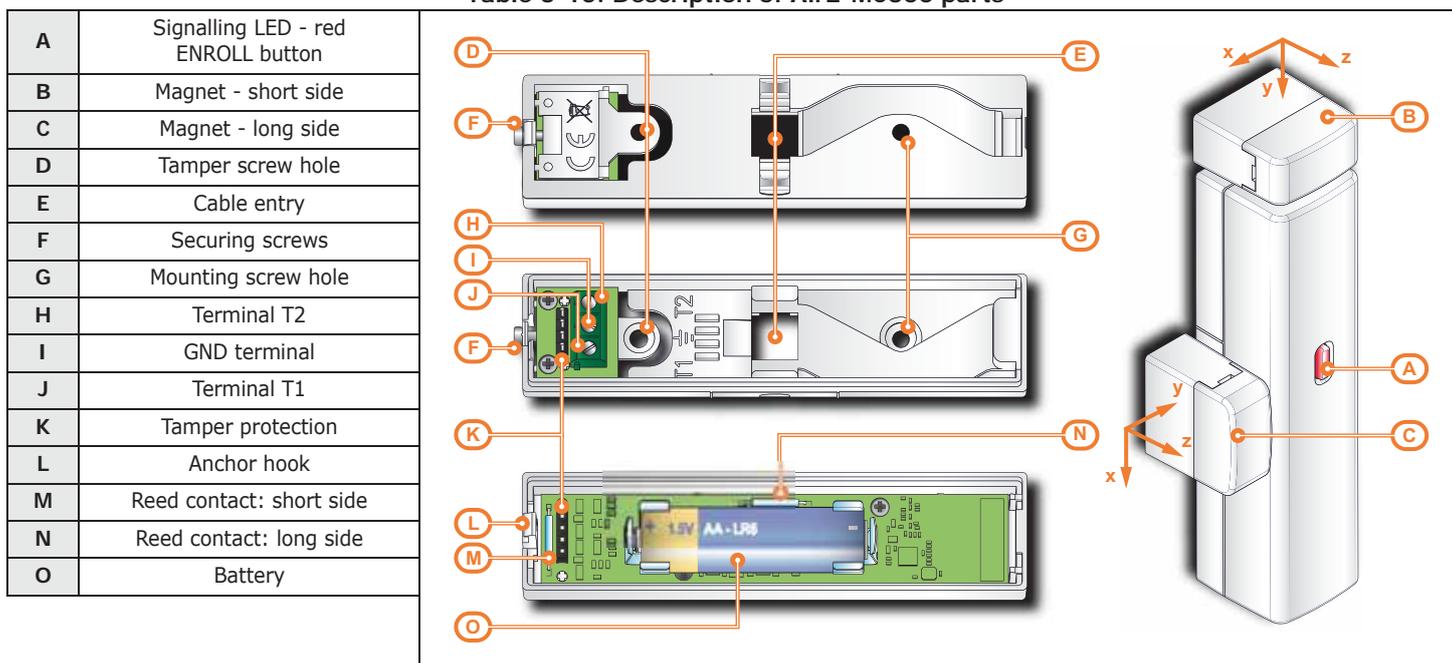
EN 50131-1  
EN 50131-5-3  
EN 50131-2-6  
EN 50130-4  
EN 50130-5

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CEB T031

**Table 3-9: Air2-MC300 technical specifications**

|   |                          |  |
|---|--------------------------|--|
| <b>Battery</b>                            | <b>type</b>              | Alkaline LR6 AA 1.5V   |
|   | <b>estimated life</b>    | 4 years  |
| <b>"Low battery" fault voltage</b>        |                          | Less than 1.15V  |
| <b>Current draw</b>                       | <b>during standby</b>    | 30µA   |
|   | <b>maximum</b>           | 45mA   |
| <b>Open-collector output</b>              |                          | Max 50mA   |
| <b>Operating environmental conditions</b> | <b>temperature</b>       | from -10 to +40°C  |
|   | <b>relative humidity</b> | ≤93% without condensation                                    |
| <b>Dimensions (W x H x D)</b>             |                          | 26 x 108 x 26.5mm  |
| <b>Weight</b>                             |                          | 50g  |
| <b>Magnet dimensions</b>                  |                          | 26.5 x 26 x 12.5mm<br>20 x 26 x 12.5mm<br>13.5 x 26 x 12.5mm |
| <b>Colours</b>                            |                          | White, Brown   |
| <b>Security rating</b>                    |                          | 2  |
| <b>Environmental class</b>                |                          | II   |

**Table 3-10: Description of Air2-MC300 parts**



The following table indicates the operating distances of the magnet in accordance with the side used and the angles shown in the figure (these values have been calculated by positioning the magnet in contact with the device, except for the angle  $\gamma$ -, and with the highest part of the contact cover aligned with that of the magnet cover):

**Table 3-11: Distance between magnet and contact (mm)**

| Axis  | Contact long side |           | Contact short side |           |
|-------|-------------------|-----------|--------------------|-----------|
|       | Near              | Withdrawn | Near               | Withdrawn |
| x +/- | 11                | 9         | 15                 | 14        |
| y -   | 28                | 24        | 27                 | 23        |
| z +/- | 40                | 35        | 37                 | 33        |

### 3-1-4

## Air2-FD100 smoke detector

EN 50131-1  
EN 50131-5-3  
EN 50130-4  
EN 50130-5

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The Air2-FD100 detector is capable of sensing the presence of smoke particles and thus detecting a fire in its early stages.

Air2-FD100 optical smoke detector is equipped with a sampling chamber (based on light scattering mass - Tyndall effect). In order to ensure the proper operating capacity of the device, it must be installed away from drafts and large objects which may alter the airflow to the sampling chamber.

### ATTENTION!

The Air2-FD100 smoke detector that can be used exclusively for the detection of smoke in the protected area. Therefore, in no way can an Air2-FD100 smoke detector be considered a fire control system.

**Table 3-12: Air2-FD100 technical specifications**

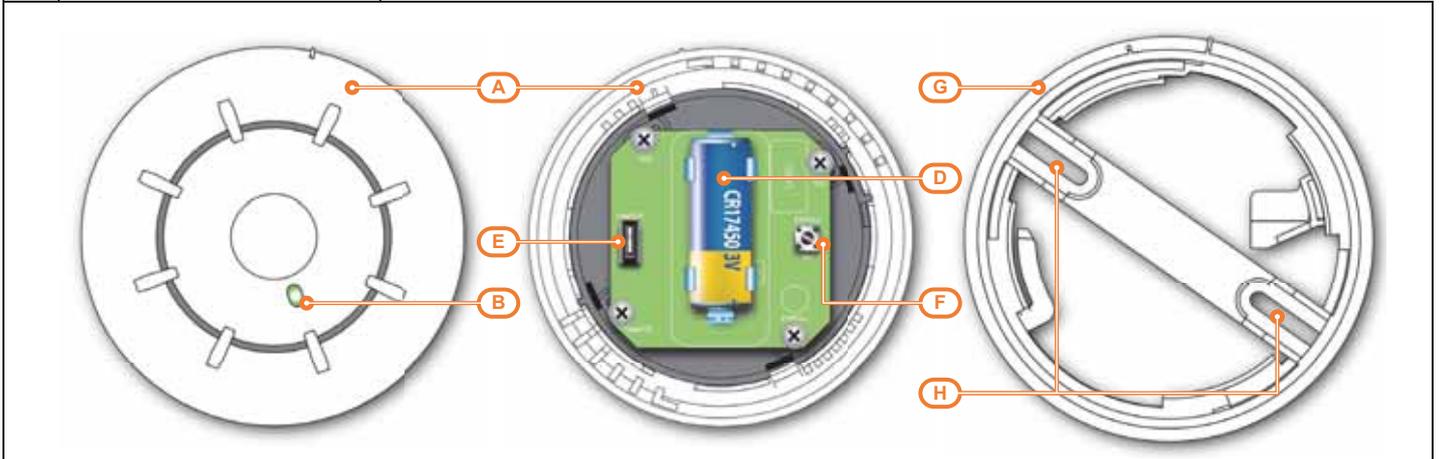
|                                    |                   |                                 |
|------------------------------------|-------------------|---------------------------------|
| Battery                            | type              | Lithium CR17450 3V              |
|                                    | estimated life    | 3 years                         |
| "Low battery" fault voltage        |                   | Less than 2.4V                  |
| Current draw                       | during standby    | 70 $\mu$ A                      |
|                                    | maximum           | Max 40mA                        |
| Operating environmental conditions | temperature       | from -10 to +40°C               |
|                                    | relative humidity | $\leq$ 93% without condensation |
| Height (base included)             |                   | 60mm                            |
| Diameter (base included)           |                   | 114mm                           |
| Weight (base and battery included) |                   | 182 gr                          |
| Security rating                    |                   | 2                               |
| Environmental class                |                   | II                              |

The operating parameters of detectors can be changed and adapted to the environmental conditions, either from the control panel or via the programming software. The detector signals alarm status when the level of smoke in the protected environment reaches the following levels:

- 0.08 dB/m (pre-set mode)
- 0.10 dB/m
- 0.12 dB/m
- 0.15 dB/m

Table 3-13: Description of Air2-FD100 parts

|   |                      |
|---|----------------------|
| A | Detector             |
| B | LED red/yellow/green |
| C | Optical chamber      |
| D | Battery              |
| E | Tamper microswitch   |
| F | ENROLL microswitch   |
| G | Base                 |
| H | Mounting screw hole  |



The tricolour LED (360° visibility) indicates the detector status.

- **Green - one flash every 15 seconds:** detector operating properly.
- **Green - one flash every 40 seconds:** low battery.
- **Yellow - On solid:** fault present.
- **Yellow - flashing:** sampling chamber contaminated.
- **Red - On solid:** detector in alarm status.

# Chapter 4

## Installation

### 4-1

### Installing the control panel

#### 4-1-1

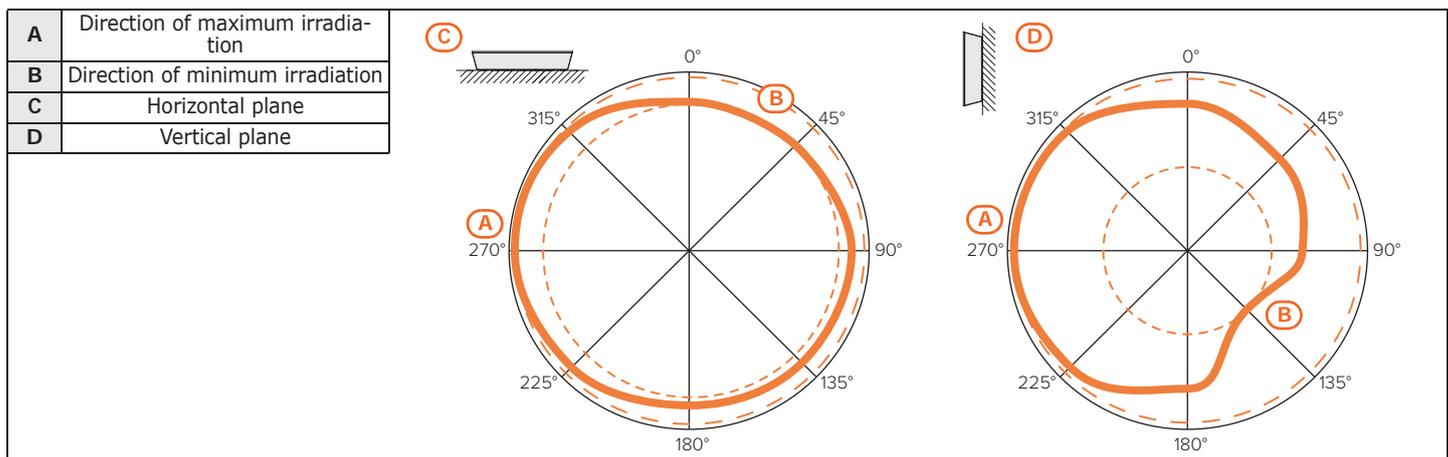
#### Wall-mounting

The control panel should be installed indoors in a place adapted to its intended use and that also allows easy access to it via keypad or reader.

For optimal functioning of the wireless system, the control panel must be placed in a position that is central to the detectors and range of use of the remote-control devices.

Following, and in support of this, are diagrams of the irradiation lobes of the wireless transmissions of a Sol control panel:

Table 4-1: Irradiation lobes



All wireless devices should be installed in elevated positions in order to increase range and prevent inadvertent blinding caused by large objects or building occupants.

It is possible to view on keypads or via the programming and monitoring software, the strength of the wireless signal on each wireless device, this data can be used to optimize the installation process.

#### Note

For a good installation, the manufacturer recommends a signal strength superior to level 3.

3 transmission channels are available. Changing the channel can be useful in situations in which wireless systems are close proximity (for example, in two adjoining apartments).

1. Remove the frontplate screws and open the control panel (*Table 2-4: Sol control panels - external, I*).
2. Note the positions of the mounting-screw holes on the back of the control panel enclosure (*Table 2-4: Sol control panels - external, K*) and the hole for the open-panel/dislodgement tamper switch (*Table 2-4: Sol control panels - external, L*).
3. Using the metal enclosure, mark the fixing screw locations on the wall. Be sure not to drill in the vicinity of electrical wiring or plumbing/gas pipes, etc.
4. Insert the screw anchors (recommended size 6mm).
5. Pull the connection wires through the wire entry (*Table 2-4: Sol control panels - external, J*).
6. Using the screws, attach the back of the enclosure to the wall.

#### Note

The cable gland must be flame class rating V-1 or higher.

## Connecting the Mains power supply

4-1-2

The control panel must be powered through a separate line coming from the Mains box. The line must be protected by a safety-standards compliant circuit breaker (trip switch).

The circuit breaker (trip switch) must be located externally to the apparatus and should be easily accessible. The distance between contacts must be at least 3mm. The manufacturer strongly advises the use of a magnetothermic switch with C intervention curve and nominal (maximum) current - 16A.

The protective earthing system must be compliant with all safety standards and laws in force.

**Ensure that the Mains is switched Off during the mains connection phase. Danger of electric shock.**

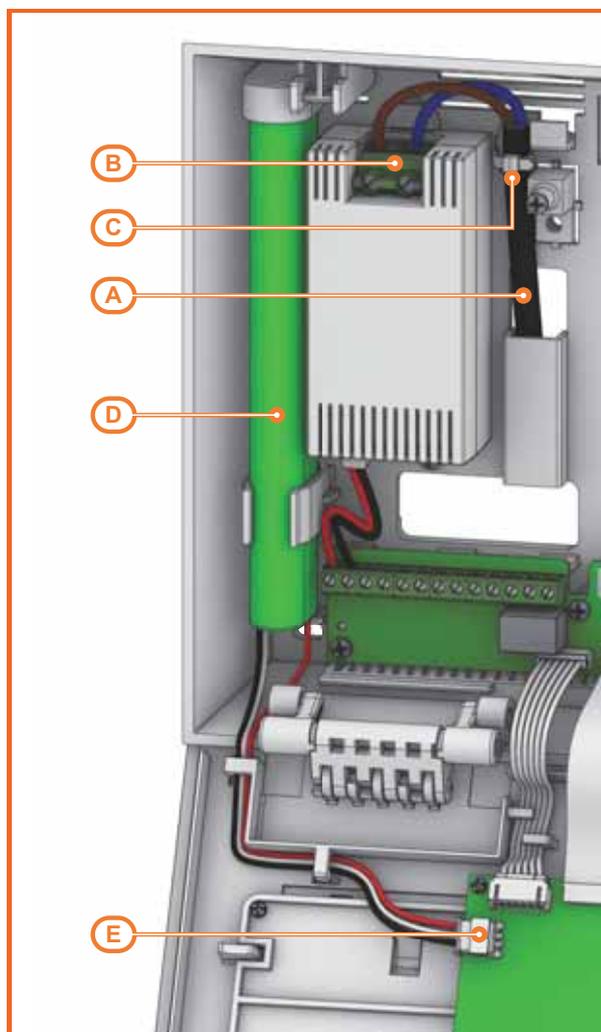
**DANGER!**

1. Pull the power-supply wires through the wire entry [A].
2. Connect the primary power-supply to the appropriate terminals [B] (*Table 2-5: Sol control panels - internal, E*).
3. Ensure that very low safety voltage or signal wires do not come into contact with dangerous voltage points.  
Using a cable tie, bunch the wires together and secure them to one of the wire hooks on the back of the enclosure [C].

The end of a stranded wire must not be consolidated with soft soldering in points where the wire is subjected to contact pressure.

**Note**

4. Connect the backup battery [D] to the appropriate connector on the motherboard [E].



The Sol control panel enclosure provides housing for a backup battery that must be connected to the motherboard.

**BACKUP BATTERY**

The battery is the secondary power source which powers the system when the primary (mains) power source fails (230V 50Hz).

Once powered up, the panel will charge and monitor the batteries automatically. The panel tests the efficiency of the batteries by simulating load current demand at regular 4 minute intervals.

Ongoing faults  
Low battery

If the battery does not result efficient, that is, the control panel detects an internal resistance superior to 1 Ohm, the system will generate a "Low Battery" event which will clear when the resistance drops below 900 mOhm.

This fault will be signalled on the yellow LED on the keypads. To view the fault event, work through the following steps:

User menu, **View**, **Faults**.

If the Sol control panel is being powered solely by the battery, due to temporary mains power failure, the internal resistance test will not be implemented and the battery-charge fault will be signalled at a voltage below 6.5V. The fault will clear when the voltage restores to over 6.6V.

#### THERMAL PROBE

The battery has an integrated thermal probe for compensation of the charge voltage in accordance with the battery temperature. The thermal probe protects against overheating and the consequent permanent damage to the battery.

### 4-1-3

### Maintenance mode

Maintenance  
Away



Maintenance mode is signalled on the keypads by the "Maintenance" message and the address of the keypad.

During maintenance mode, the control panel:

- forces the relay output on the motherboard (*Table 2-5: Sol control panels - internal, L*) to standby status.
- does not activate the outputs (and will force to standby any active outputs) triggered by:
  - alarm or zone/partition tamper
  - peripheral tamper
  - open/dislodged panel tamper
- in the event of peripheral loss, the BUS will not be reset repeatedly in an attempt to retrieve them
- it will, at least in the cases mentioned in the previous points, continue to operate as normal

During maintenance mode the Sol control panel, via the touch-screen:

- does not require user-code entry to access the sections which correspond to the "Settings" button
- the bottom left-hand corner of the home page screen will show the letters relating to the operating status of the partitions.

The control panel can be placed in maintenance mode by:

- pressing and releasing the **SERV-FACT** button (*Table 2-5: Sol control panels - internal, X*). Pressing the button again will disable maintenance mode.
- Enabling the "Maintenance" option  
The control panel enters "Maintenance" mode when this option is enabled and exits "Maintenance" mode when it is disabled. You can enable/disable this option at the keypad or via computer.

#### Via keypad

1. Access the "Programming Panel options" section.

Type in code (Installer PIN), **PROGRAMMING Panel options**

2. Press  \* to enable the "Maintenance" option, or  # to disable it.
3. Press **OK** to exit and save.

#### Via software



This option is made available by clicking on the **Control panel parameters** button in the section on the left and accessing the "Programming" section on the right. The "Control panel parameters" section provides the "Maintenance" option, click-on this option to enable/disable it.

### 4-1-4

### Opening and closing the control panel

In order to carry out any type of work on the installed control panel, it is necessary to open the enclosure in the following way.

#### Via keypad

1. Type-in the installer code on the keypad and press **OK**: accessing the installer menu inhibits the activation of the output and any report calls associated with the open-panel event.

#### Via Reader

1. Hold a valid key, enabled on all the partitions and with the "Maintenance" option activated, in vicinity of the proximity reader (refer to Programming keys section). Open the control panel within 40 seconds of this operation.
2. Remove the frontplate screws and open the control panel enclosure (*Table 2-4: Sol control panels - external, I*).
3. Place the system in "Maintenance" mode (refer to *paragraph 4-1-3 Maintenance mode*)
4. Carry out the necessary work.

To close the control panel, work carefully through the previously mentioned steps in reverse order.

1. Exit maintenance mode.
2. Replace the frontplate screws.
3. Exit the Installer menu.

Via keypad

On exiting the Installer menu with the control panel still open, the system panel will not generate an "Open-panel" event.

Note

Such an event will be generated if the control panel is opened 15 seconds after closing the open/dislodgement tamper microswitch (*Table 2-5: Sol control panels - internal, C1*).

## Connecting to a PC

4-1-5

In order to program the control panel via PC, it is necessary to have the Sol/STUDIO software (refer to the programming manual) and a connection with the Sol control panel.

It is possible to set up a connection with the PC in the following ways:

- insert the cable with the micro USB terminal in the appropriate port (*Table 2-5: Sol control panels - internal, Z*)
- insert the LAN cable in the appropriate port, if you have a Sol-LAN/S Ethernet module (*Table 2-16: LAN modules - description of parts, A*)
- access the WiFi network, if you have a Sol-WIFI/S board

For details regarding the connection, refer to the Sol/STUDIO software manual.

## Installing peripherals

4-2

### Connecting to the I-BUS line

4-2-1

Any peripheral readers and transceivers of the Sol system (not integrated in the control panel) must be connected to control panel via the I-BUS.

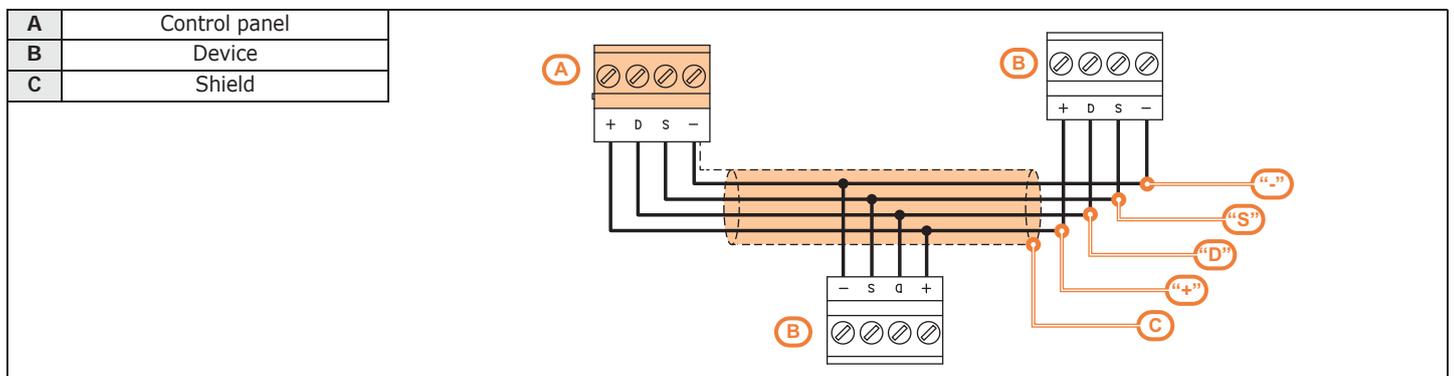
The connection between the control panel and its peripherals is achieved through a 4 wire (or more) cable. The cable specifications depend on the length of the BUS (from the panel terminals to the most distant point), Baud rate and the load current draw.

The connection to the control panel is done using terminals "+ D S -" on the motherboard (*Table 2-5: Sol control panels - internal, L*).

The shield must be connected to the "-" terminal at the control panel end only, and must run along the BUS without being connected to ground at any other point.

The maximum operative distance of the I-BUS line depends on the distribution of the peripherals on the line and the current draw. The BUS potentiality can be improved by means of the use of an IB-200 BUS isolator, the characteristics of this are best explained in the respective manual.

Table 4-2: I-BUS connection



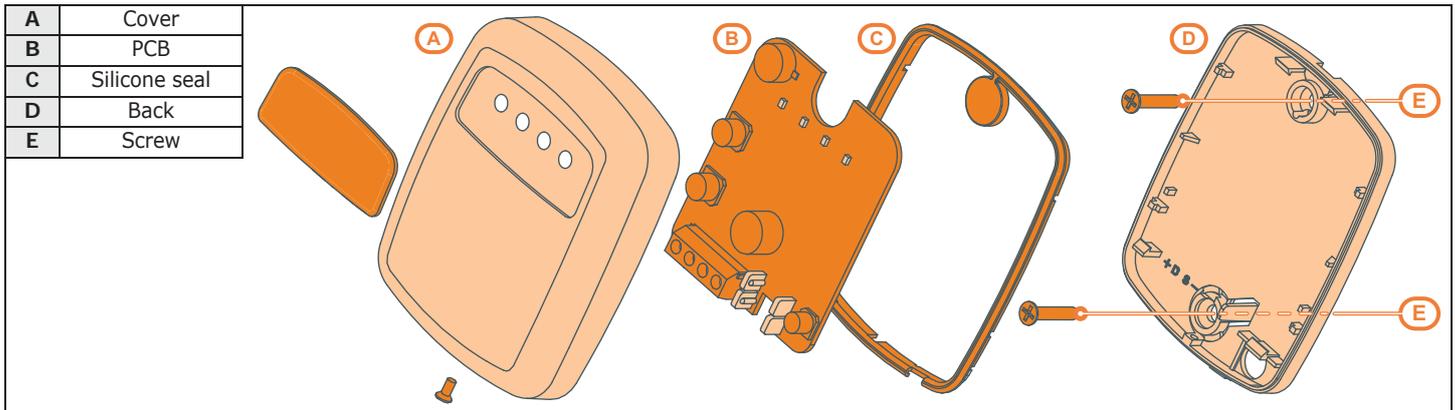
## 4-2-2

### Installing nBy/S readers

The wall-mount nBy/S reader is suitable for indoor and outdoor installation.

Insert the two anchor screws (included) into the two screw locations on the back of the plastic enclosure.

Table 4-3: nBy/S installation



### ATTENTION!

Do not pierce the silicone seal as this will jeopardize the waterproofing of the enclosure. Insert the screws before fitting the seal.

## 4-2-3

### Installing nBy/X readers

The flush mount By/X reader (Registered patent) has been especially designed to integrate with all brands of cover plates. It is possible to use any type of cover plate by drilling two holes for insertion of light guide.

Use the adhesive drill-pattern (see opposite) to mark the drilling locations accurately.

1. Ensure that the centre of the cover plate coincides with the crossing of the axes x and y on the drill-pattern. In this way, the two drilling locations (1 x 7mm diameter and 1 x 8mm diameter) will be indicated precisely.
2. Using the screw, supplied with the reader, assemble and secure the reader components.
3. Insert the cover plate (with the reader already assembled) into the light switch box.

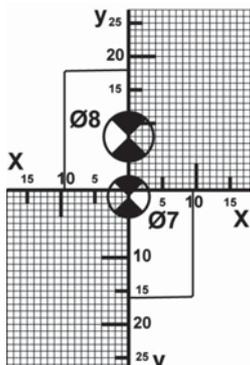
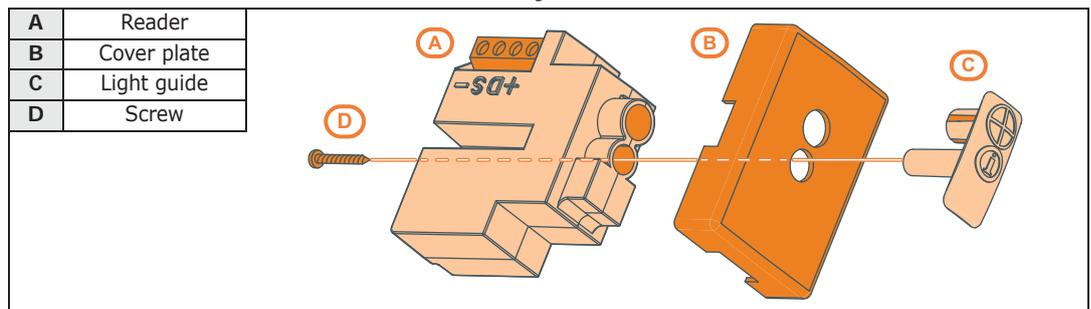


Table 4-4: nBy/X installation

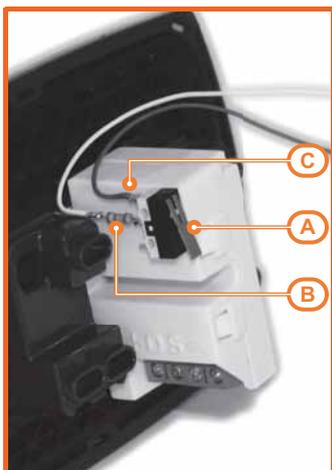


### DISLODGE- MENT TAMPER

The nBy/X reader is not equipped with built-in dislodgement-tamper protection. However, the following section describes how to protect nBy/X reader against this manner of tamper.

Please note that in order to comply with security standards, all the system peripherals must be protected against tamper. Installation of a microswitch will allow the reader to signal tamper events. To obtain this type of protection, work carefully through the following steps.

1. Use a microswitch with at least two normally-open contacts [A]. The one shown in figure 3 has 3 contacts: COM-NO-NC.
2. Configure one of the terminals as follows: Input; 24H; "Tamper reader x" as description; single balancing with 6K8Ω [B] resistor; unlimited alarm cycles, assigned to a partition that can be viewed on at least one keypad.
3. Using 2 wires, connect the microswitch to the 24H input terminal.
4. On the microswitch:
  - 4.1. identify the common contact (COM) and connect it using one of the two wires to the GND terminal of the 24H terminal [C].
  - 4.2. identify the normally open contact (N.O., that is the contact that generates a short-circuit between the contact itself and the COM contact when the switch lever is



compressed) and connect one end of the 6k8Ω resistor to it [D]. Connect the other end of the resistance to the wire which is connected to the 24h input terminal.

5. Install the microswitch as shown in the previous figure, so that the switch lever is compressed. If an unauthorized attempt to dismantle the nBy/X reader occurs, the lever will expand in order to open the contact which triggers instant alarms on the 24H terminal.

This wiring method can be applied in most situations, however, it is only a point of reference. In order to ensure proper protection, you must always take in to account the specific mechanical and electrical conditions of the device you are working on.

**Note**

**In order to avoid malfunction, it is advisable not to install nBy/X readers onto metal plates.**

**ATTENTION!**

## Connecting and balancing alarm detectors

The wiring and respective balancing method depend on the type of detector you are installing, and the level of protection you wish to achieve. The detectors can be powered through:

- terminals "+AUX" and "-" (ground) present on the control panel
- from any 12V ancillary source on condition that its ground (GND) reference is in common with that of the control panel.

The resistors used for balancing are:

- 3K90hm 1/4W
- 6K80hm 1/4W

The following Table indicates the protection level of each detector type and the balancing options provided by the control panel:

**Table 4-5: Protection level**

| BALANCING              | N.O.     | N.C. | Single | Double | Double zone | Double zone with EOL |
|------------------------|----------|------|--------|--------|-------------|----------------------|
| PIR or Dual technology | very low | low  | medium | high   | medium      | high                 |
| Magnetic contact       | very low | low  | medium | /      | medium      | high                 |

Single balancing provides the same level of protection as Double balancing, when the tamper contact of the detector is connected to a balanced zone on the control panel.

**Note**

### Balancing N.C./ N.O.

For N.C. (normally closed) and N.O. balancing (normally open), it is possible to detect two distinct zone conditions:

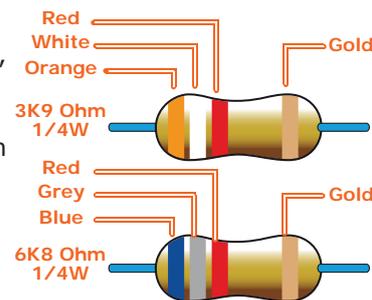
- standby
- alarm

For each of these, the control panel reads different resistance values on the terminal, expressed below in Ohm.

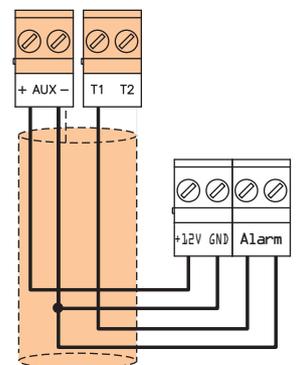
| Ohm               | N.C. Zone | N.O. Zone |
|-------------------|-----------|-----------|
| > 2 x 3900 + 6800 | alarm     | standby   |
| > 2 x 3900 + 6800 | alarm     | standby   |
| 3900 + 6800       | alarm     | alarm     |
| 2 x 3900          | alarm     | alarm     |
| 3900              | standby   | alarm     |
| 0                 | standby   | alarm     |

If you wish the detector to signal tamper events, connect the detector "Tamper" terminal to a "24h" zone on the control panel.

### 4-3



### 4-3-1



### 4-3-2

## Single balancing

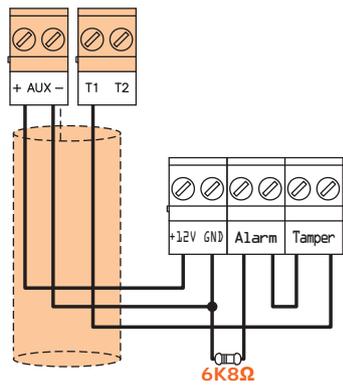
Single zones can discriminate 3 conditions on the entire terminal:

- standby
- alarm
- tamper (short-circuit)

For each of these, the control panel reads different resistance values on the terminal, expressed below in Ohm.

| Ohm    | Zone    |
|--------|---------|
| > 6800 | alarm   |
| 6800   | standby |
| 0      | tamper  |

If you wish the detector to signal tamper events, connect the detector "Tamper" terminal to a "24h" zone on the control panel.



### 4-3-3

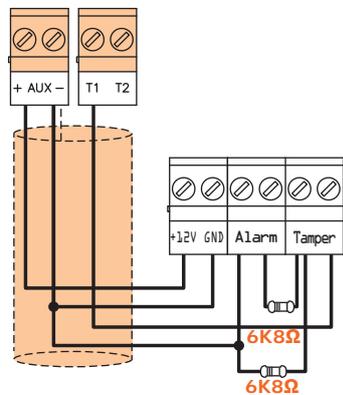
## Double balancing

Double balancing discriminates 4 distinct conditions on the zone terminal:

- standby
- alarm
- tamper (short-circuit)
- tamper (wire cutting)

For each of these, the control panel reads different resistance values on the terminal, expressed below in Ohm.

| Ohm        | Zone                   |
|------------|------------------------|
| > 6800     | tamper (wire cutting)  |
| 6800       | alarm                  |
| $6800 / 2$ | standby                |
| 0          | tamper (short-circuit) |



### 4-3-4

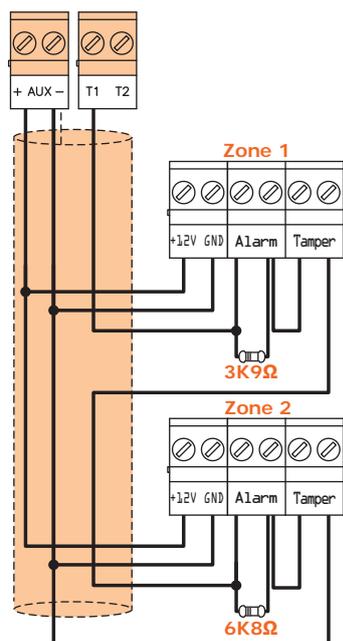
## Double-Zone balancing

Double zones without EOL resistor can discriminate 5 conditions on the entire terminal:

- stand-by on both zones
- alarm on zone 1 and standby on zone 2
- alarm on zone 2 and standby on zone 1
- alarm on both zones
- tamper (wire cutting)

For each of these, the control panel reads different resistance values on the terminal, expressed below in Ohm.

| Ohm             | Zone 1  | Zone 2 (double) |
|-----------------|---------|-----------------|
| > $3900 + 6800$ | tamper  |                 |
| $3900 + 6800$   | alarm   | alarm           |
| 6800            | standby | alarm           |
| 3900            | alarm   | standby         |
| 0               | standby | standby         |



## Double Zone balancing with EOL

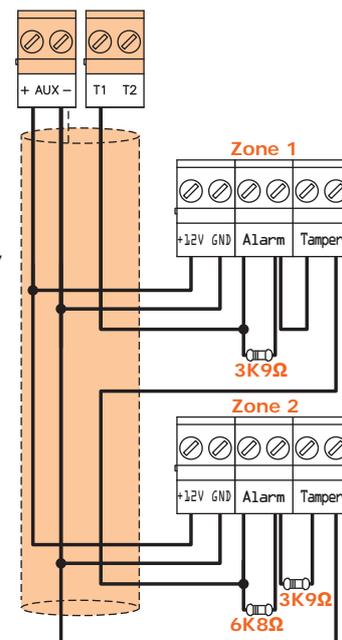
Double zones with EOL resistors can discriminate 6 conditions on the entire terminal:

- stand-by on both zones
- alarm on zone 1 and standby on zone 2
- alarm on zone 2 and standby on zone 1
- alarm on both zones
- tamper (wire cutting)
- tamper (short-circuit)

For each of these, the control panel reads different resistance values on the terminal, expressed below in Ohm.

| Ohm                      | Zone 1                 | Zone 2 (double) |
|--------------------------|------------------------|-----------------|
| $> 2 \times 3900 + 6800$ | tamper (wire cutting)  |                 |
| $> 2 \times 3900 + 6800$ | alarm                  | alarm           |
| $3900 + 6800$            | standby                | alarm           |
| $2 \times 3900$          | alarm                  | standby         |
| 3900                     | standby                | standby         |
| 0                        | tamper (short-circuit) |                 |

### 4-3-5



## Connecting and balancing roller blind/shock sensors

### 4-4

It is possible to choose between two types of balancing for roller-blind and shock sensors:

- Normally closed (N.C.)
- Single balancing (N.C. with EOL)

The following table compares the protection level of roller-blind/shock sensors using the two balancing options provided by the control panel:

Table 4-6: Protection level

| BALANCING                    | N.C.     | Single balancing (N.C. with EOL) |
|------------------------------|----------|----------------------------------|
| Roller blind or Shock sensor | very low | high                             |

If the roller-blind or shock sensor is connected to a terminal of a wireless device, the connection cable must be less than 2 meters long.

The roller-blind sensor must generate pulses with a length of between 500µsec and 10msec.

## Normally closed (N.C.)

### 4-4-1

In this case, the alarm condition is revealed exclusively by the number of pulses (pulse count) the control panel detects on the terminal.

If this balancing method is applied, the control panel will be unable to detect tamper, wire-cutting or short-circuit.

The discriminated conditions are:

- standby
- alarm

The alarm condition is detected exclusively by the pulse count and sensitivity, in accordance with the programmed parameters (refer to the Programming manual, *paragraph 4-2 Zones/Inputs, Detector type*).

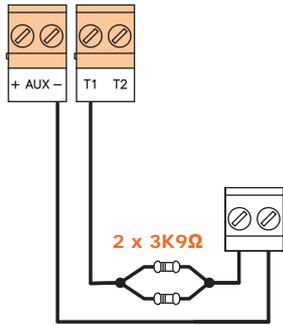
## 4-4-2

## Single balancing (N.C. with EOL)

In this case, the discriminated conditions are:

- standby
- alarm
- tamper (wire cutting)
- tamper (short-circuit)

For each of these, the control panel reads different resistance values on the terminal, expressed below in Ohm.



| Ohm        | Zone                   |
|------------|------------------------|
| > 3900 / 2 | tamper (wire cutting)  |
| 3900 / 2   | standby                |
| 0          | tamper (short-circuit) |

The alarm condition is detected exclusively by the pulse count and sensitivity, in accordance with the programmed parameters (refer to the Programming manual *paragraph 5-2 Zones/Inputs, Roller-blind/Shock*).

## 4-5

## Learn zone balancing

After completing the zone wiring and balancing, it is possible to start the Learn zone balancing phase thus avoiding the need to type on each zone balancing value individually (refer to the Programming manual, *Chapter 16, Default settings, Learn zone bal.*).

## Note

The Self-balancing feature is a Registered patent.

## 4-6

## Connecting the outputs

It is possible to set up the outputs to activate in response to the events the control panel manages.

The Sol control panel is equipped with an output relay and two configurable terminals (*Table 2-5: Sol control panels - internal, L*). Terminals **T1** and **T2** on the control panel, configured as outputs, are "open collector" outputs, capable of driving maximum voltages in accordance with *Table 2-1: Control panels - electrical and mechanical features*.

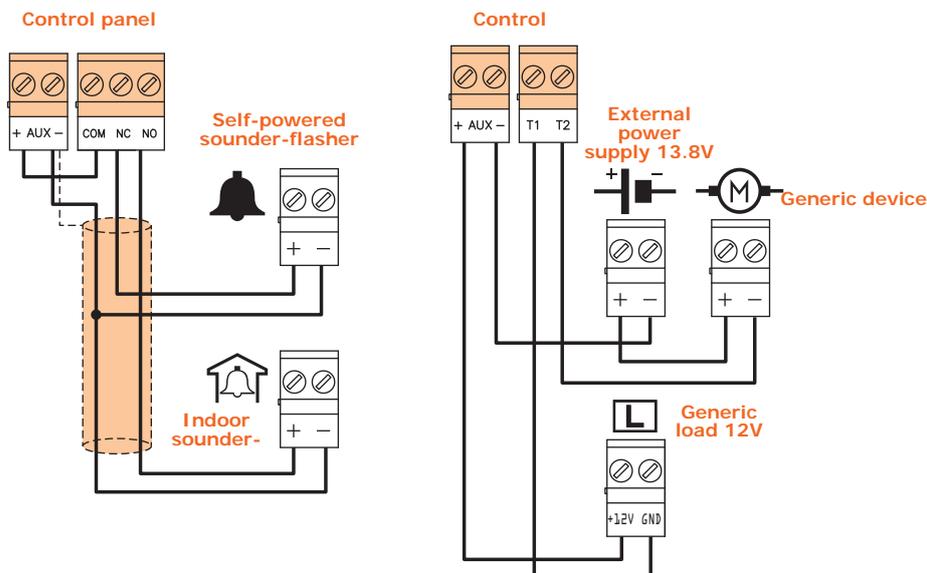
For the connection of the outputs to terminals **T1** and **T2** of the Air2-MC300 device, refer to the Installation *paragraph 4-9 Installing wireless devices*.

## CONNECTING THE SOUNDERS

The Sol control panel is equipped with a sounder built into the panel front (*Table 2-4: Sol control panels - external, G*). If required, it is possible to connect other audible-visual signalling devices.

The alarm output which is most commonly used to drive a self-powered sounder is formed by the relay output on the control panel (*Table 2-5: Sol control panels - internal, L*).

The following wiring diagram shows the connection of a self-powered sounder (IVY manufactured by INIM) and an indoor sounder.



## Installing optional modules and boards

4-7

### Installing internal modules

4-7-1

The installation of **Sol-PSTN**, **Sol-3G** and **Sol-LAN/S** optional connectivity modules can be achieved using the connectors integrated into the PCB board and hooks on the back of the control panel enclosure.

This operation can be carried out while the control panel is powered ("hot"), without disconnecting the mains power supply or battery.

1. Open the control panel enclosure.
2. Locate the relative connector and placement for the module concerned.

Table 4-7: Sol Control panels - description of parts

|   |                                     |
|---|-------------------------------------|
| A | Securing hooks for Sol-LAN/S module |
| B | Terminals for Sol-LAN/S module      |
| C | Securing hooks for Sol-PSTN module  |
| D | Terminals for Sol-PSTN module       |
| E | Securing hooks for Sol-3G module    |
| F | Terminals for Sol-3G module         |
| G | Blocking hooks                      |

3. Position the rear side of the module on the appropriate hooks on the back of the enclosure, then push the module downwards until it clicks into place.
4. For hot installation, put the control panel into maintenance mode (*paragraph 4-1-3 Maintenance mode*).
5. Close the control panel.
6. If the control panel is in maintenance mode, reset it to normal operating mode.

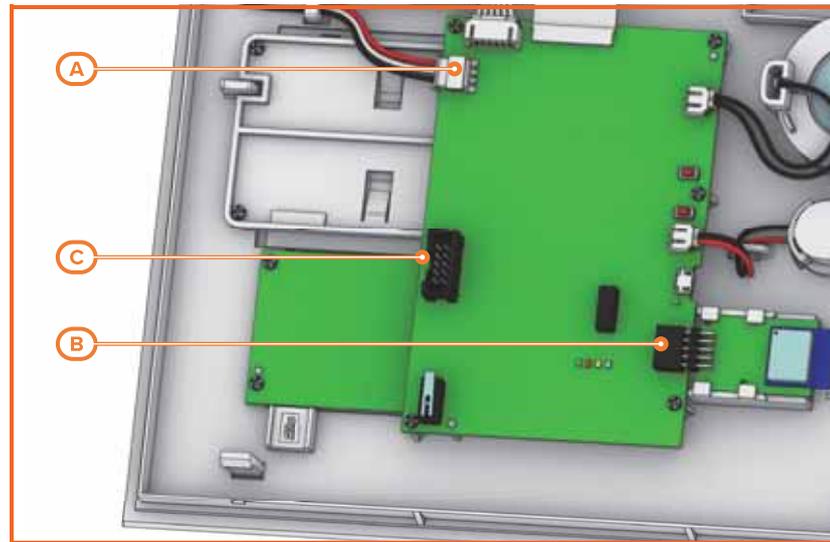
## 4-7-2

### Installing optional internal boards

The installation of **Sol-WIFI** and **SmartLogos30M** optional boards can be achieved via the connectors integrated into the PCB.

This operation must be carried out when the mains power supply and battery are disconnected:

1. Remove all power from the control panel by disconnecting the primary power supply to the control (230V~).
2. Open the control panel enclosure.
3. Disconnect the backup battery from its connector on the motherboard [A].
4. Insert the board into the appropriate connector:
  - [B], for the Sol-WIFI board, use the appropriate slot
  - [C], for the SmartLogos30M board
5. Reconnect the backup battery.
6. Close the control panel.
7. Power up the control panel by reconnecting the mains power supply (230V~).



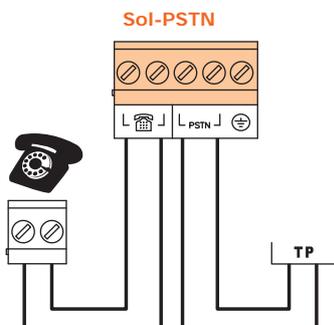
## 4-8

### Connecting the Land-line (PSTN)

Connect the land line to the PSTN terminals on the Sol-PSTN module (*Table 2-18: Sol PSTN - description of parts, A*).

#### Note

If an ADSL line is present, it is necessary to connect the control panel downstream of the ADSL filter on the line dedicated to telephone equipment (this line is clearly indicated on the filters).



If the control panel is not equipped with a SmartLogos30M voice board, voice calls will produce a continuous beep for 30 seconds.

All the functions of the Sol control panel that use the PSTN line (voice dialer, answerphone, alarm receiving centre and teleservice) can be managed completely over the GSM network by the Sol-3G module.

## Installing wireless devices

4-9

### Installing the Air2 remote-control key

4-9-1

The Air2 requires enrolling only.

If it becomes necessary to replace the rubber button cover or battery, work through the following steps.

1. Remove the securing screw on the back of the keyfob and open the device.
2. Remove the rubber button cover.
3. Replace the rubber button cover/battery as required.
4. Close the device and replace the enclosure screw.
5. Enroll the key.

### Installing the Air2-MC200

4-9-2

1. Choose a suitable mounting placement.

---

**Ferromagnetic materials which are located in the vicinity of the mounting position can influence the magnetic field and can result in the reduced operating capacity of the device.**

---

**ATTENTION!**

2. Using a flat-bladed screwdriver in the enclosure screw location, push open the enclosure and separate the two parts.
3. Hold the base to the chosen mounting placement and mark the screw holes and tamper protection position.
4. Using the screws, secure the base and the tamper protection in position.
5. Insert the battery, ensure you respect the proper polarity.
6. Enroll the device.
7. If you wish to fit the magnet, work through the steps described in the previous paragraph.
8. Re-attach the cover to the base of the contact and replace the enclosure screw.

### Installing the Air2-MC300

4-9-3

1. Choose a suitable mounting location.

---

**Ferromagnetic materials which are located in the vicinity of the mounting position can influence the magnetic field and can result in the reduced operating capacity of the device.**

---

**ATTENTION!**

2. Open the enclosure by pushing lightly on the anchor tab and separate the two parts.

---

**Be careful not to remove the circuit from its housing.**

---

**ATTENTION!**

3. If you are using terminals **T1** and **T2**, pass the cables through the cable entry and connect them. Take care to ensure that inadmissible cable filaments do not come into contact with each other or with the + clip of the battery.
4. Hold the base to the chosen mounting placement and mark the points for the base attachment and tamper protection.
5. Using the screws, secure the base and the tamper protection in position.
6. If you wish to fit the magnet by means of the screws (included) or change the magnet base for installation purposes, remove the base with the help of a flat-bladed screwdriver.

---

For proper installation of the magnet, the manufacturer strongly advises that the upper part of the contact cover is aligned with that of the magnet.

---

**Note**

7. Position the magnet base on the desired side (long or short) of the magnetic contact at a distance of about 2mm.  
If you are using the long side, centre the notches on the side of the base in such a way as to obtain the correct alignment and functioning capacity of the magnet.  
In the case of the short side, align the magnet with the detector itself.
8. Using the screws or the adhesive tape, attach the magnet.
9. Remove the battery tab.
10. Re-attach the cover to the base of the contact and replace the enclosure screw.
11. Enroll the device.

## 4-9-4

## Connecting Air2-MC300 wireless detectors

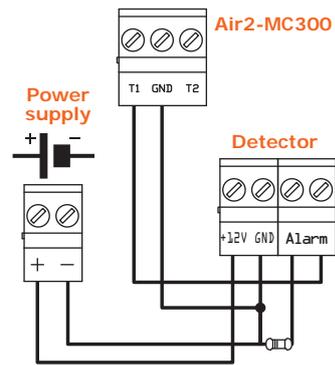
The two terminals, **T1** or **T2**, on the Air2-MC300 magnetic contact are configurable as either input or open-collector output.

Configuring the terminals as inputs allows management of standard zone balancing (N.O., N.C., single balancing, double balancing) and also direct interfacing with roller-blind and shock sensors.

For the connection and balancing of sensors connected to terminals **T1** and **T2** of the Air2-MC300 device, refer to paragraphs 4-3-1, 4-3-2, 4-3-3, 4-4-1 and 4-4-2.

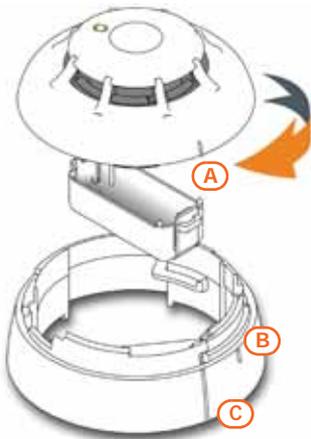
In order to comply with the EN 50131 series of standards, double balancing is required when either terminal **T1** or **T2** is configured as an input.

It is necessary for the GND terminal of the Air2-MC300 device to be connected to negative (**GND**) of the power supply of the sensor connected to terminal **T1** or **T2**.



## 4-9-5

## Installing the Air2-FD100



1. Choose a suitable mounting placement.
2. Hold the base to the chosen mounting placement and mark the mounting locations. Insert the battery ensuring that the polarity is correct.
3. Attach the battery cover.
4. Position the detector over the base and, pressing lightly, turn it clockwise until notch [A] aligns with notch [B] attaching the detector to the base; turn it a little further until notch [A] aligns with notch [C], in order to allow the base to close the tamper micro-switch.
5. Enroll the device.

## 4-9-6

## Enrolling wireless devices

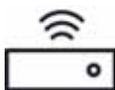
The final installation phase of each wireless device is the enrollment and configuration on the control panel.

This phase involves a procedure that can be carried out using different modalities and depending on the registration of the Sol installation to Inim Cloud service:

- using only the InimTech Security App, in this case registration to Inim Cloud is necessary;
- using only the Sol/STUDIO software, in this case registration to Inim Cloud is not necessary;
- using the Sol/STUDIO software and the InimTech Security App, in this case registration to Inim Cloud is not necessary.



### Programming via InimTech Security App



1. Start the App and access the side menu using the ☰ button shown top left.
2. Access the "Programming" section.
3. Follow the guided procedure for fast system configuration up to the request to program the wireless peripherals.
4. In the section reached by means of the ⊕ button it is possible to add new wireless devices.
5. Activate the Smartphone camera you will use for reading the QR code of the device to be enrolled. The application recognizes automatically the various devices and puts them in a list.
6. On exiting the video capture mode, the application will show a list of recognized devices. In this section it is necessary to complete the configuration of the devices in order to proceed. The devices which are not completed will have the description bordered in red.
7. Access the last section of the guided procedure.  
This section changes in relation to the registration of the Sol control panel to Inim Cloud service.

The last section of the guided procedure provides the **SEND** button that sends all the acquired data to the Sol control panel via Inim Cloud.

**CONTROL PANEL  
REGISTERED TO  
INIM CLOUD**

The last section of the guided procedure provides the **SHOW** button that displays a QR code on the screen, for use during the wireless device enrollment phase via the Sol/STUDIO software.

**CONTROL PANEL  
NOT REGISTERED  
TO INIM CLOUD**

Use of the Sol/STUDIO software requires a PC on which to run it and a connected camera.

**Via software**

1. Open the system solution in configuration.
2. Access the "Home" section using the button on the left. .
3. In the section on the right, click-on the icon relative to the transceiver you want to use to enroll the devices:
  - transceiver integrated into the control panel.
  - Air2-BS200 transceiver connected to the I-BUS
4. Click-on the  button to start the enrollment process.
5. A window will open where you can select the required procedure :
  - "Add device" - to proceed with the enrollment of each device, by entering the serial number of the device or pressing **ENROLL**.
  - "Add codes" - to proceed with the enrollment of each device via QR code.
6. Select the type of device to be enrolled.
7. Follow the guided process for the device configuration.
8. The enrollment section provides the possibility to select the modality:
  - access the "Code enrolling" section and enter the serial number and firmware revision indicated on the label on the PCB of the device
  - access the "Manual enrolling" section and press the section Send button.  
At this point the software will wait until the **ENROLL** button on the device is pressed.
6. This section provides buttons that allow you to select and start one of the video capture devices on the PC in use. Select one of these.
7. Using the camera frame capture the QR code of the device to be enrolled, obtained at the end of the guided procedure of the InimTech Security App.  
All the recognized devices will be shown in a list at the bottom of the window.
8. Click-on the **Enroll** button to acquire all the devices in the list.



**ADD DEVICE**

**ADD CODES**



**Informative notice regarding the disposal of electrical and electronic equipment (applicable in countries with differentiated waste collection systems)****WEEE**

The crossed-out bin symbol on the equipment or on its packaging indicates that the product must be disposed of correctly at the end of its working life and should never be disposed of together with general household waste.

The user, therefore, must take the equipment that has reached the end of its working life to the appropriate civic amenities site designated to the differentiated collection of electrical and electronic waste.

As an alternative to the autonomous-management of electrical and electronic waste, you can hand over the equipment you wish to dispose of to a dealer when purchasing new equipment of the same type.

You are also entitled to convey for disposal small electronic waste products with dimensions of less than 25cm to the premises of electronic retail outlets with sales areas of at least 400m<sup>2</sup>, free of charge and without any obligation to buy.

Appropriate differentiated waste collection for the subsequent recycling of the discarded equipment, its treatment and its environmentally compatible disposal helps to avoid possible negative effects on the environment and on health and favours the re-use and/or recycling of the materials it is made of.

**Information about disposal of batteries and accumulators (applicable in Countries with separate collection systems)**

This marking on batteries and/or their manual and/or their packaging, indicates that batteries of these products, at the end of their working life, should not be disposed of as unsorted municipal waste, but must be object of a separate collection. Where marked, the chemical symbols Hg, Cd o Pb indicate that the battery contains mercury, cadmium or lead above the reference levels of the directive 2006/66/EC. If batteries are not properly disposed of, these substances, together with other ones contained, can cause harm to human health and to the environment.

To protect human health and the environment, to facilitate treatment and recycling of materials, separate batteries from other kind of waste and use the collection scheme stated in your area, in accordance to current laws.

Before disposing of the batteries, it's appropriate to remove them from their holders avoiding to damage them or causing short circuits.





ISO 9001 Quality Management  
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