



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



SmartLevel

Power supply stations

Installation and programming manual



GameOver

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ELECTRONICS

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Hereby INIM Electronics s.r.l. declares that the SmartLevel series of power supply stations are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/CE.

Moreover, INIM Electronics s.r.l. also declares that all other devices mentioned in this manual are in compliance with the essential requirements and other relevant provisions of Directives 2014/35/UE and 2014/30/UE.

The full declarations of conformity can be found at URL:

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In order to provide adequate protection and instructions for proper use, you (the installer) should be familiar with the operating procedure of this device. As the only individual in contact with system users, it is your responsibility to instruct them on how to use this device properly.

Our professional engineers are readily available to assist you. Call us, and you will be connected right away to a person who will answer all your questions and provide you with full technical support.

Warranty

Limited warranty

Copyright

European Directive compliance

Note to the installer

Technical support

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ABOUT THIS MANUAL

DCMIINIESPS12

MANUAL CODE

2.50

REVISION

Terminology 0-1

- If not otherwise specified, refers to the SmartLevel power-supply station,
described in *Chapter 2 - Device description*.
- Refers to the SmartLiving intrusion control panel of the security system.
- Directions as seen by the operator when directly in front of the mounted device.
- Qualified personnel: those persons whose training, expertise and knowledge of
the laws and bylaws regarding service conditions and the prevention of accidents,
are able to identify and avoid all possible situations of danger.
- DEVICE
- CONTROL PANEL
- LEFT, RIGHT,
BEHIND, ABOVE,
BELOW
- QUALIFIED
PERSONNEL

Graphic conventions 0-2

Following are the graphic conventions used in this manual.

Conventions	Example	Description
Text in italics	Refer to <i>paragraph 0-2 Graphic conventions</i>	Directs you to the title of a chapter, section, paragraph, table or figure in this manual or other published reference.
[Uppercase letter]	[A]	Reference relating to a part of the system or video object.

- The detached notes contain important information about the text.
- The “Attention” prompts indicate that total or partial disregard of the procedure could damage the device or its peripherals.
- Note
- ATTENTION!

Chapter 1

GENERAL INFORMATION

Manufacturer's details 1-1

Manufacturer: INIM Electronics s.r.l.
 Production plant: Centobuchi, via Dei Lavoratori 10
 63076, Monteprandone (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, hold authorization to work on INIM Electronics brand devices only.

Description of the product and various models 1-2

The SmartLevel power-supply station is a switching power-supply module capable of generating 12V $\Rightarrow$ nominal current to the system loads and the lead battery.

SPS12060XG3 - Power station with internal 12V@2.5A switching power supply and housing for 12V 7Ah battery **MODELS**

SPS12160XG3 - Power station with internal 12V@5.0A switching power supply and housing for 12V 17Ah battery

EN 50131-1:2006+A1:2009,
 EN 50131-6:2008,
 EN 50130-4:2011,
 EN 50130-5:2011,

Certifying body: IMQ S.p.A.

Security rating: 3

COMPLIANCY



Application and use 1-3

The SmartLevel power station is an optional part of the intrusion control system, which is capable of supplying 12V $\Rightarrow$ power to the remote loads of the system.

The power station supplies typical loads such as: BUS peripherals (keypads, readers, expansion modules, etc.), detectors and, in general, any other system device which functions at 12V $\Rightarrow$.

Main features:

- metal enclosure
- grade 2 power outputs protected by thermofuses
- grade 3 power output monitored and driven with high-side driver
- relay output for device-tamper signalling
- open-collector output for mains-failure signalling
- open-collector output for inefficient-battery signalling
- open-collector output for current earth dispersion signalling
- open-collector outputs for power output-failure signalling, only for grade 3 power outputs

The system parts 1-4

This is the board which, starting from the nominal voltage stabilized at 12V $\overline{=}$, supplies the voltage to the power outputs it is equipped with, which have grade 2 or lower security rating.

SMARTLEVEL MOTHER BOARD

The board communicates over the I-BUS line with the LIPWVR100 board in order to monitor its operating status and the status of the power supply module. In the event of malfunction it enables or restores the appropriate signalling outputs.

The board also communicates via the RS232 serial line with the PC it receives firmware upgrades from.

This is the board which, starting from the nominal voltage stabilized at 12V $\overline{=}$, supplies the voltage to the grade 3 power outputs it is equipped with. It also manages the monitoring of the grade 3 power outputs and the activation of their protection devices.

LIPWVR100 BOARD

The board communicates with the power supply module in order to monitor its operating status.

This is the module which, starting from the voltage value (230V $\sim$, 50Hz) supplied by the mains network it is connected to, supplies the SmartLevel motherboard and the LIPWVR100 board with the nominal voltage stabilized at 12V $\overline{=}$ (measured voltage value: 13.8V) required to power the installation and recharge the batteries.

POWER SUPPLY MODULE

The power-supply module is housed beside the board and is certified EN50131-6 compliant.

The mains current (230V $\sim$) is the primary power source of the system. Refer also to *paragraph 3-2 Connecting the Mains power supply*.

The secondary power-source of the system. The power station casing houses a lead battery (12V 7Ah or 12Ah, depending on the model). The power station monitors the battery status (efficiency and charge). A fault signal will be generated if inefficient battery conditions are detected. If primary (230V $\sim$) power failure occurs, the battery will take over automatically. Refer also to *paragraph 3-3 Connecting the backup battery*.

BATTERY

This wire must be connected to the station and attached to the battery pack. This device monitors the temperature of the external battery pack and regulates the battery charge accordingly. Refer also to *paragraph 3-3 Connecting the backup battery*.

THERMAL PROBE

Chapter 2

DEVICE DESCRIPTION

Inside the box 2-1

The package contains the SmartLevel power supply station with its components:

- metal enclosure with the following devices, already mounted and connected:
 - SmartLevel mother board (IN088)
 - Switching power supply
 - LIPWPR100 board (IN140)
 - thermal probe
 - tamper-protection device
- Installation manual (this manual)
- Plastic bag with:
 - backup-battery wire
 - earth connection ring terminal

The backup battery is not included in the package.

Functions and features 2-2

The grade 3 ancillary outputs are available on the LIPWPR100 board and are:

- **+AUX1**
- **+AUX2**
- **+AUX3**

POWER OUTPUTS GRADE 3

Each output is independent and is monitored and protected by a protection circuit. In the event of overvoltage, short-circuit or overload, the circuit will block the power supply which will be restored only after the cause of the problem has been removed.

The ancillary power outputs with grade 2 or lower security rating, each protected by a resettable fuse in case of current requirements of over 1.35A, are available on the motherboard and are:

- **+AUX1**
- **+AUX2**
- **+AUX3**

POWER OUTPUTS WITH GRADE 2 OR LOWER SECURITY RATING

Hotmelt fuses, unlike filament fuses, interrupt the power supply when current absorption exceeds the allowed threshold. Once the cause of excessive current absorption has been removed, the hotmelt fuse will restore the normal power supply without need for component replacement.

The signalling outputs are available on the motherboard and are:

- **NO, NC and COM** terminals of the relay output activate in the event of open enclosure or enclosure dislodgement tamper.
- **OC1**, output that will be activated in the event of primary power source failure (Mains)
- **OC2**, output that will be activated in the event of disconnected or inefficient battery
- **T6**, output that will be activated in the event of current dispersion to earth
- **T7, T8, T9** outputs that will signal faults relating to power outputs with grade 3 security rating (AUX1, 2, 3 on the LIPWPR100 board)

SIGNALLING OUTPUTS

- **T7**, output that will signal the intervention of a protection device of one of the protected outputs AUX1, 2, 3
- **T8**, output that will signal faults on the power-supply module of the SmartLevel power-supply station
- **T9**, output that will signal the loss of communication between the LIVPWR100 board and the power-supply unit or between the SmartLevel motherboard and the LIVPWR100 board
- **T10**, output that will be activated in the event of the total loss of operating capacity of the SmartLevel motherboard

Description and technical specifications 2-3

Table 1: Technical specifications

Model		SPS12060XG3	SPS12160XG3
PS type		A	
Power supply voltage		230V~ (-15% + 10%) 50/60Hz	
Maximum current draw 230V~		0.5A	1.1A
Output voltage	nominal	13.8V===	
	range	from 9.5 to 15V===	
	maximum ripple	1%	
Maximum current draw of the boards	mother board (IN088)	65mA @ 13.8V===	
	LIVPWR100 board (IN140)	35mA @ 13.8V===	
Maximum deliverable current for external loads	security grade 2 system (12 hour autonomy)	500mA	1.35A
	security grade 3 system (30 hour autonomy)	130mA	450mA
Maximum deliverable current on each +AUX terminal	mother board (IN088)	1.35A	
	LIVPWR100 board (IN140)	2A	
Threshold for overload protection		15.4V===	
SD low voltage		11V===	
Fault voltage on power outputs		9.8V===	
Threshold for deep discharge protection		9.5V===	
Battery maximum internal resistance (Ri max)		2.7Ohm	1Ohm
Battery specifications	Type	YUASA NP-12 FR or similar with case flame class UL94-V2 or higher	
	Rated voltage	12V	
	Maximum capacity	7Ah	17Ah
	Maximum recharge time	24h (80% charged)	
Internal fuse of switching power supply module (non-replaceable)		T 3.15A 250V	
Dimensions (W x H x D)		215 x 305 x 85mm	375 x 510 x 85mm
Weight (without battery)		2.2 Kg	5.3 Kg
Operating environmental conditions	Temperature	from -10°C to +55°C	
	Relative humidity	≤93%, without condensation	
Enclosure protection class (EN 60529)		IP30	
Isolation class(EN 60950-1)		I	
Safety grade (EN 50131-6)		3	
Environmental class (EN 50130-5)		II	

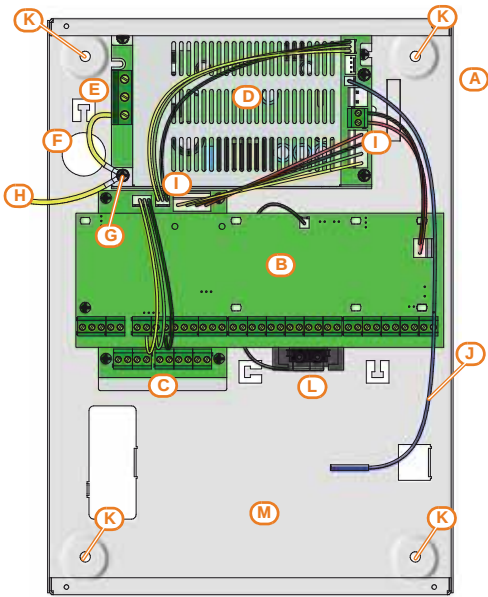
Use of the **+AUX** terminals on the mother board (IN088) annuls I&HAS grade 3 compliance.

Note

Table 2: Description of parts

A	Metal enclosure
B	Mother board
C	LIVPWR100 board
D	Switching power supply
E	Connection terminal board to mains 230V~
F	Mains cable entry
G	Ground connection screws
H	Frontplate earth wire
I	Wires between switching-power supply and station
J	Thermal probe
K	Anchor-screw locations for the metal backbox
L	Dislodgement tamper
M	Compartment for backup battery

SPS12060XG3



SPS12160XG3

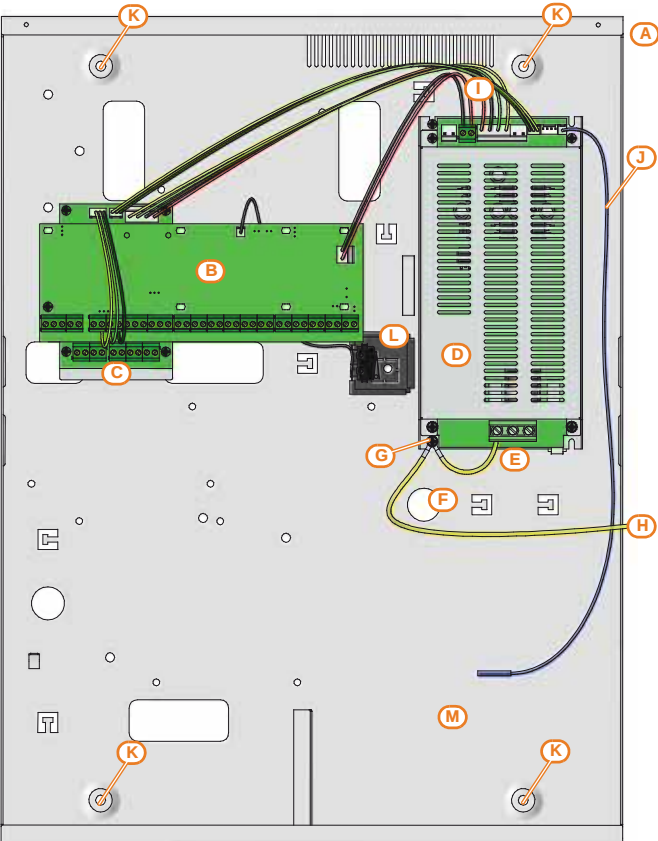


Table 3: Mother board (IN088)

A	Terminals
B	Control panel to PC serial cable connector
C	Blue and yellow activity LEDs
D	Dislodgement microswitch connector*
E	Open-enclosure microswitch connectors*
F	Open-panel tamper microswitch
G	Power supply cable connector

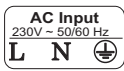
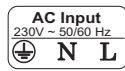
Table 4: Mother board - terminal board

n.	icon / identifier	description
6-7-8-9	+ D S -	Connection to LIVPWR100
10-11-12	NO NC COM	Voltage-free terminals of the relay output
13-16	+AUX1	12V Ancillary power supply
27	+AUX2	
37	+AUX3	
14	OC1	Open-collector output
15	OC2	
28	T6	
30	T7	Output terminal
32	T8	
34	T9	
36	T10	
17-29-31-33-35		Power supply negative (earth or GND)

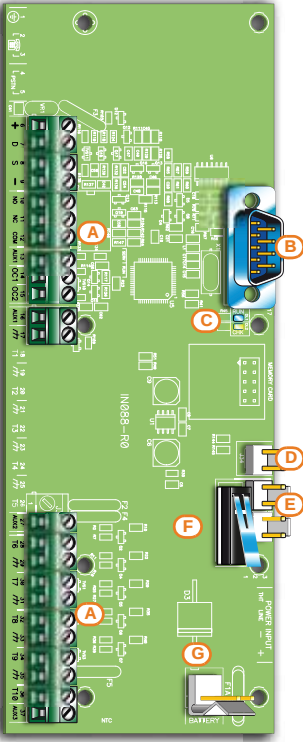
Table 5: LIVPWR100 board - terminal board

n.	icon / identifier	description
1-2-3-4	+ D S -	Not used
5	+AUX1	12V Ancillary power supply
7	+AUX2	
9	+AUX3	
6-8-10		Power supply negative (earth or GND)

Table 6: Power supplies

	IPS12060G	IPS12160G
A		
	Mains input terminal board	
B	Mother board connector	
C	Thermal probe connector	
D	Battery connector	
E	Earth fault signalling jumper input	

Mother board



IPS12060G
switching power supply



IPS12160G
switching power supply



Chapter 3

INSTALLATION

Wall-mounting 3-1

1. Using the backbox, mark the anchor screw (*table 2, K*) and the tamper screw (*table 2, L*) locations on the wall. Be sure not to drill in the vicinity of electrical wiring or plumbing/gas pipes, etc.
2. Insert the screw anchors (recommended size 6mm).
3. Pull the wires through the wire entry.
4. Using the screws, attach the backbox to the wall.
5. Screw the tamper to the wall.

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

Note

If further open/dislodgement tamper devices are required, use the two connectors (*table 3, E*) on the PCB.

Connecting the Mains power supply 3-2

The switching power supply module (located at the bottom of the enclosure) is mains powered and provides the power source to the entire system and recharges the battery.

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.

ATTENTION!

1. Pull the power-supply wires through the wire entry [A].
2. Connect the primary power-supply to the appropriate terminals [B] (*table 2, E, table 6, A*).
Follow the indications on the label [C] located near the mains terminal board.
For a safety standard compliant installation the phase wire must be connected to the "L" terminal and the neutral wire to the "N" terminal.
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 connect them firmly to one of the cable hooks on the backplate of the enclosure.

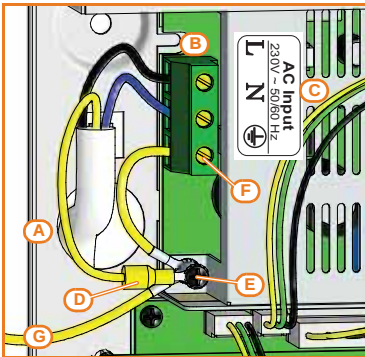
The end of a stranded wire must not be consolidated with soft soldering in points where the wire is subjected to contact pressure.

Note

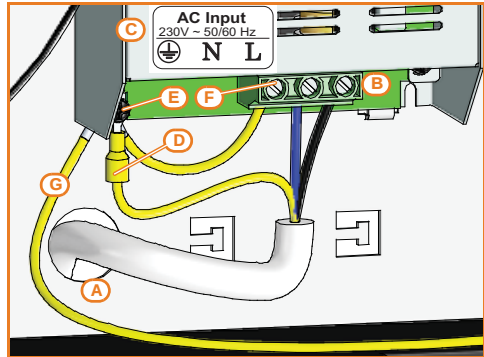
4. Crimp the earth wire to the ring terminal [D] (included).
5. Attach the ring terminal wire to the earth screw [E] of the control panel.

6. Ensure that terminal “⏏” of the power supply module [F] and the front-plate [G] are connected to earth.

SPS12060XG3



SPS12060XG3



Connecting the backup battery

3-3

The connection of the backup battery [A] must be done after completion of the primary power source connection (*paragraph 3-2 Connecting the Mains power supply*) and after powering up the station.

Note

The metal enclosure of the SPS12060XG3 is capable of housing one lead battery @12V 7Ah. The metal enclosure of the SPS12160XG3 is capable of housing one lead battery @12V 17Ah.

The battery casing must have HB flame rating or higher.

Note

Using the battery wire [B] (included), connect the battery directly to the control panel motherboard.

Ensure that battery polarity is correct:

- black wire = negative
- red wire = positive

ATTENTION!

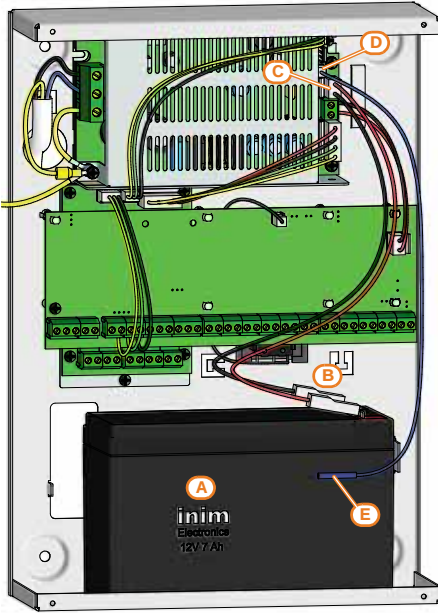
Connect the cable to the control panel using the appropriate connector on the switching power supply ([C], *table 6, D*).

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

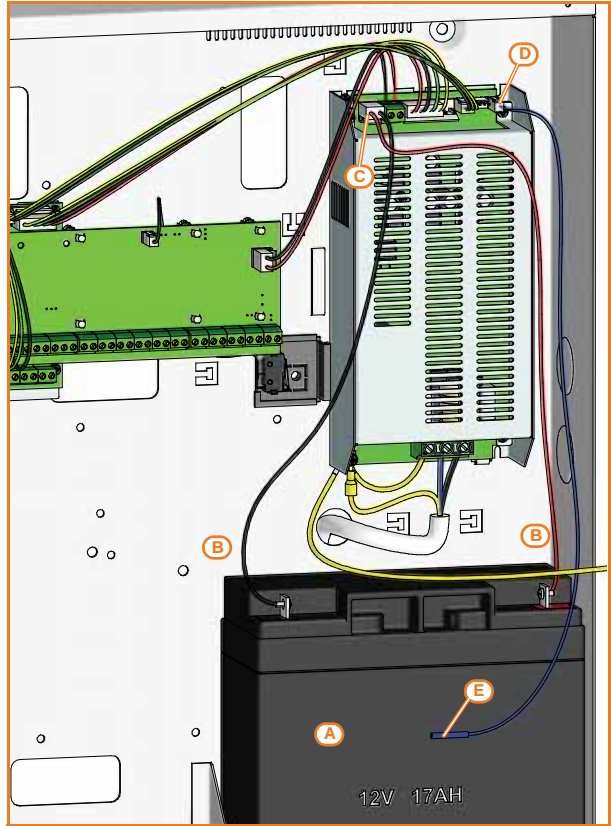
The power station monitors the battery status (efficiency and charge). The battery-test of the power supply station operates periodically.

If the battery fails to meet the load demand, the power station will activate the **OC2** output.

SPS12060XG3



SPS12060XG3



The thermal probe optimizes the battery charge process. This device regulates the charging process in accordance with the battery temperature.

THERMAL PROBE

The thermal probe protects against battery overheating and consequent permanent damage to the battery.

It is supplied and inserted in the connector on the power supply unit ([D], table 6, C). Using adhesive-insulating tape, attach the thermal probe to the battery [E], in such way as to provide optimized heat-transfer measurements.

Chapter 4

USING THE DEVICE

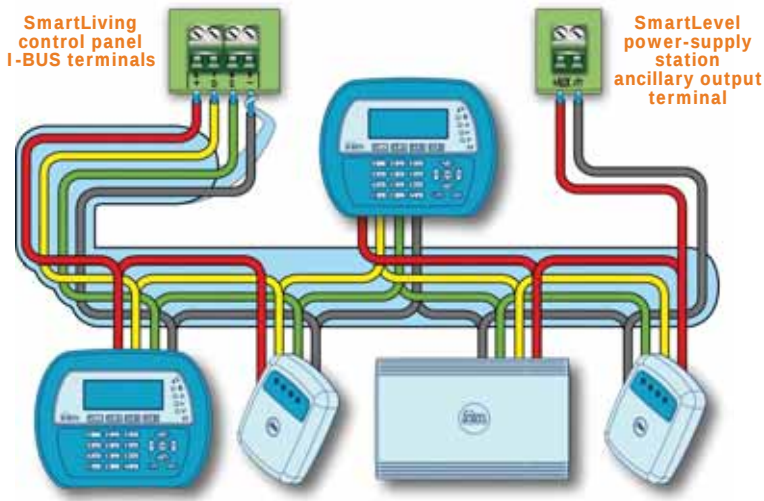
Powering devices 4-1

Connect the devices to be powered to the ancillary power outputs **AUX1**, **AUX2** and **AUX3** of the power supply station.

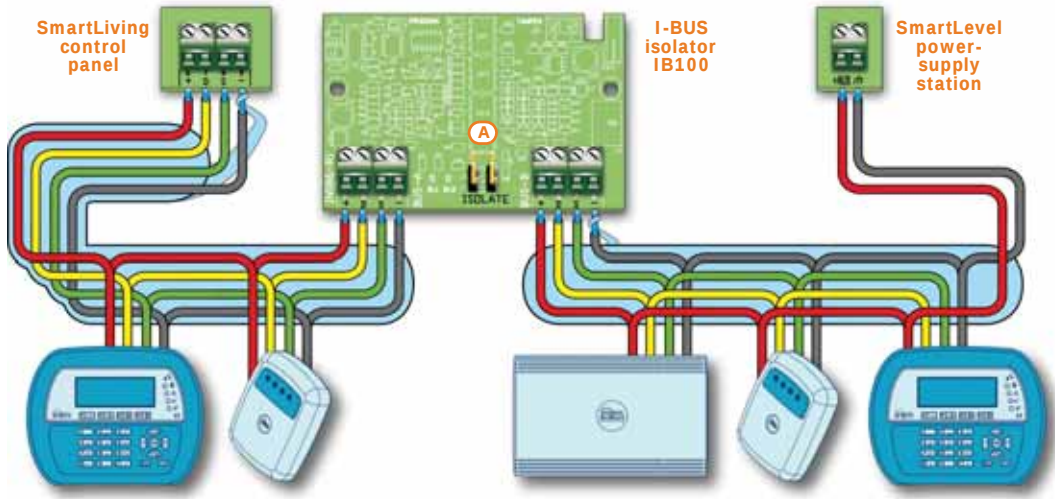
If the SmartLevel station is used to power the devices of an installation with grade 2 or lower security rating, the **AUXx** outputs on the motherboard must be used (*table 4 "Mother board - terminal board"*).

If the SmartLevel station is used to power the devices of an installation with grade 3 security rating, the **AUXx** outputs on the LIVPWR100 board must be used (*table 5 "LIVPWR100 board - terminal board"*).

If the SmartLevel is used to power the peripherals connected to the I-BUS of the SmartLiving intrusion control panel, the connection must be completed as follows:



If an isolator is required on the I-BUS line (*IB100RU or IB100RP*) between the control panel and the power-supply station, the connection must be completed as follows:



The jumpers on the isolator board [A] must be cut.

Relay Output 4-2

The output relay (terminals **NC**, **NO** and **COM**) provides a contact capable of switching a 30V 1A maximum load.

The relay is normally active during standby status and maintains the COM contact closed to NC. In the event of tamper on the device enclosure (forced opening or dislodgement) the relay will close COM to NO.

The COM contact will close back to NC when the tamper event ceases.

OC1 and OC2 4-3

The **OC1** and **OC2** terminals are both open-collector outputs. When the output activates, its terminal is floating. During standby status, the terminal closes to ground.

The OC1 output activates in the event of mains failure (primary power source). The OC2 output activates in the event of battery trouble (disconnected or inefficient).

Both outputs reset to standby (closed to ground) when their respective activation causes cease.

Tx terminal outputs 4-4

The **T6**, **T7**, **T8**, **T9** and **T10** outputs are open-collector outputs.

When activated, the terminal is connected to the 13.8 V internal power-supply of the board by means of an 18kOhm pull-up resistor. During standby status, the terminal closes to ground.

The **T6** output signals a fault relating to the dispersion to earth of the current in some point the system.

Removal of the jumper from the earth fault signalling connector (*table 6, E*) deactivates the earth fault check.

The **T7** output signals a fault relating to the **AUXx** power output with grade 3 security rating caused by the intervention of the protection circuit it is equipped with. Activation can occur in the event of:

- Overvoltage on the power output
- Short-circuit on the power output
- Overload on the power output

The **T8** output signals a fault relating to the **AUXx** power output with grade 3 security rating caused by a fault on the power supply unit. Activation can occur in the event of:

- Overload on the power supply unit
- Overheating on the power supply unit

The **T9** output signals a fault relating to the **AUXx** power output with grade 3 security rating caused by communication problems between the station boards. Activation can occur in the event of:

- Loss of communication between the SmartLevel motherboard and the LIPWVR100 board
- Loss of communication between the LIPWVR100 board and the power supply unit

The **T10** outputs signals a fault caused by the total loss of operating capacity of the SmartLevel motherboard.

Connection to intrusion control systems

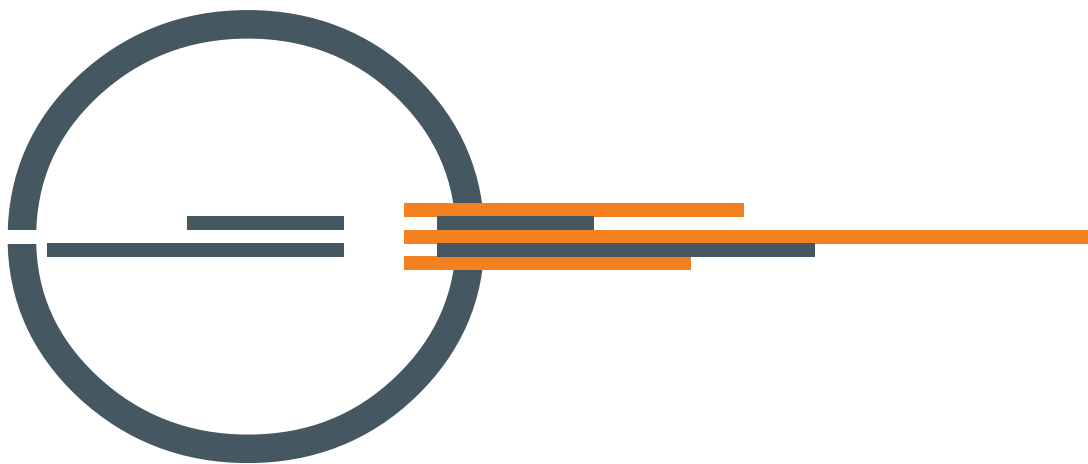
4-5

Compliance with standard EN50131-6 grade 3 provides the following programming directions for intrusion control-panel terminals which are connected to the signalling outputs of the SmartLevel power-supply station:

Table 7: Programming of the signals to the control panel

SmartLevel output	Control panel input terminal		
	Type	Option	Description
Relay	24 hour Zone	/	G3 station tamper
OC1	Instant Zone	Fault zone	G3 station mains fault
OC2	Instant Zone	Fault zone	G3 station battery fault
T6	Instant Zone	Fault zone	Earth dispersion
T7	Instant Zone	Fault zone	G3 power output fault
T8	Instant Zone	Fault zone	G3 station power supply fault
T9	Instant Zone	Fault zone	G3 station monitoring fault
T10	Instant Zone	Fault zone	G3 station main PCB fault

Notes



ISO 9001 Quality Management
certified by BSI with certificate number FM530352

Centobuchi, via Dei Lavoratori 10
63076 Montepandone (AP) ITALY
Tel. +39 0735 705007 _ Fax +39 0735 704912

info@inim.biz _ www.inim.biz