SPEED 4-8 P3A

Self-powered input expansion

Installation

Document release:	1.0
FW release:	0.5
HW release:	0.1
Programming SW release:	5.31 - - - →
Update:	11/2018
Language:	English

Tecnoalarm
Hi-Tech Security Systems

CONFORMITY

The manufacturer, Tecnoalarm S.r.l., declares that the present equipment complies with the Directives LVD 2014/35/EU and EMC 2014/30/EU. The full text of the EU Declaration of Conformity is available at the following internet address: www.tecnoalarm.com

The product features can be subject to change without notice. Unauthorized reproduction or distribution of this manual, or any portion of it, on any device and in any form, is prohibited. The contents of this manual may be subject to change without notice.

INDEX

1 - TECHNICAL AND FUNCTIONAL SPECIFICATIONS		
		7
2 - WARNINGS FOR INSTALLATION		
2-1	Description	9
2-2	Distribution of load current	9
2-3	Casing	10
2-4	Mains and ground connection	10
2-5	Power supply	11
2-6	Installation of the anti-detachment tamper	11
2-7	Conformity with EN 60950-1 - Electrical safety	12
2-8	General warnings	12
2-9	Fixing of the casing	13
2-10	Power supply	13
2-11	Failures	14
3 - HARDWARE		
3-1	CPU board	15
3-2	Connection	17

1 - TECHNICAL AND FUNCTIONAL SPECIFICATIONS

SPEED 4-8 P3A - Technical and functional specifications

Inputs	Total logic zones	**8**
	Wired zones	**4 conventional***
		8 Sensor Bus
Signaling outputs	Outputs	**4 programmable**
Power supply outputs	Outputs	**Serial Bus**
		Sensor Bus/conventional
		Siren Bus/+14.4V
	Overvoltage protection	**>16V DC ±10%**
	Overload signaling	**3 LED**
Connection	RS485	**Serial Bus**
		Sensor Bus
		Siren Bus
	Baud rate	**38,400bps**
Signaling	Power supply overload (under voltage)	✔
	Loss of power supply	✔
	Power supply failure	✔
	Low battery	✔
	Battery failure	✔
	Battery deep discharge	✔
	Module loss	✔
	Burnt fuse	✔
	Sabotage	✔
Tamper	Anti-opening and anti-detachment	**Micro-switch**
Electrical specifications CPU board	CPU consumption	**100mA @ 13.8V DC**
	Logic outputs	**I max. 30mA**
	Output voltage	**10.5V...15V DC**
	Rated output voltage detectors	**Vout 13.8V DC**
	Rated output voltage sirens	**Vout 14.4V DC**
Power supply (PS)	Type	**A - 230V AC +10% -15% 50Hz**
	Conformity	**EN 50131-6**
	Max. consumption	**450mA AC**
	Rated output current	**3A @ 14.4V DC**
	Max. current available	**I max. 3A**
	Max. ripple	**80mV @ 3A**
	Failure signaling	**<8.0V**
	Overvoltage protection	**Per Vout >15.6V DC**
	Mains fuse (non replaceable)	**F1:T1.6AL**

Load current available	CPU board	**0.1A @ 13.8V DC**
	Battery charge	**0.8A @ 14.4V DC**
	Serial Bus	**0.8A @ 13.8V DC**
	Sensor Bus/conventional	**0.5A @ 13.8V DC**
	Siren Bus/+14,4V	**0.3A @ 14.4V DC**
Battery Storage Device (SD)	Capacity	**12V/12Ah**
	Flame class	**UL94-HB**
	Battery voltage test	**Automatic each 60s**
	Battery failure test	**Automatic each 24h**
	Low battery threshold	**11.6V**
	Restore voltage	**12.2V**
	Release voltage	**<8.8V DC**
	Recharge time	**80% approx. 15h**
	Autonomy grade 2	**12h (1Ah**)**
	Autonomy grade 3	**60h (0.2Ah**)**
	Autonomy grade 3 remotely managed	**30h (0.4Ah**)**
Physical specifications	Environmental class	**II**
	Casing	**Metal**
	Dimensions (L x H x D)	**315 x 260 x 108mm**
	Weight	**3.2kg**
	Operating temperature	**-10°C...+55°C**
Conformity	Standards	**EN 50131-1 EN 50131-6**
	Security grade	**2 or 3 depending current and autonomy**
	Notified body	**IMQ**

* Only available as an alternative to the 4 Sensor Bus inputs (max. 8 logic zones managed)
** Load current available in case of power failure

2 - WARNINGS FOR INSTALLATION

2-1 - Description

The SPEED 4-8 P3A is a self-powered input expansion that is connected via the RS485 serial bus to the Tecnoalarm alarm system. The expansion module is equipped with 4 conventional zone inputs, a Sensor Bus port for the connection of a total of 8 RSC® detectors and a Siren Bus port for the connection of the RSC® sirens.
The standard zone inputs support conventional devices, as well as RDV® and Zone Bus detectors.
The module also provides 4 programmable outputs and a 3A switching power supply.

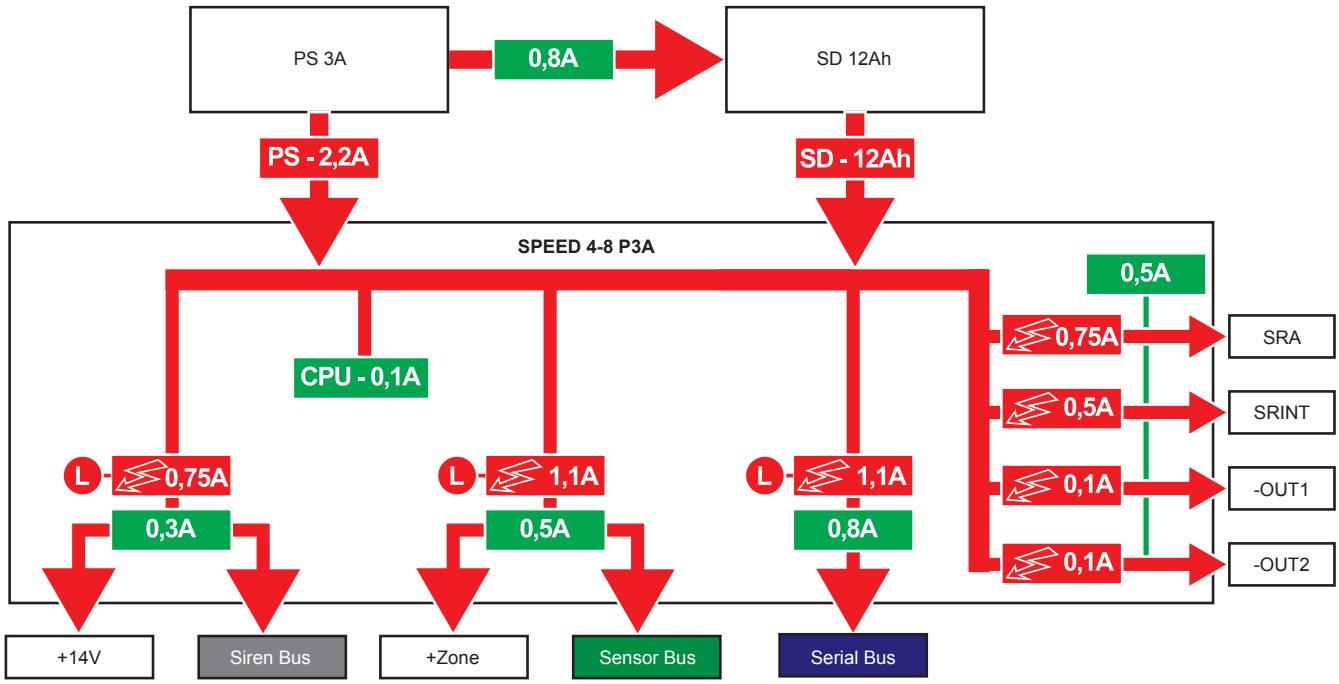
Distribution of zones
The input expansion manages 8 logic zones which can be associated with the standard zones and Sensor Bus inputs. In the case of coexistence of conventional (max. 4) and Sensor Bus zones, the conventional zones must always be assigned to the first four logical zones (Z1...Z4), while the Sensor Bus zones will be assigned to the subsequent logical zones, e.g. 2 conventional zones (Z1 and Z2) and 6 Sensor Bus zones (from Z3 to Z8).

The input expansion is certified according to the standards EN 50131-1 and EN 50131-6. The casing provides a bay for a 12V/12Ah battery. The use of batteries with lower capacity invalidates the certification and has a negative impact on the autonomy and the available current in case of power failure. The module provides a self-test function able to detect failures of the main (PS - Power Supply) and secondary power supply (SD - Storage Device).

2-2 - Distribution of load current

The power supply of the input expansion consists in a 3A switching power supply and a battery providing 12Ah in case of power failure (the battery must be ordered separately). The 0.8A required for battery recharge must be subtracted from the available load current. The remaining load current of 2.2A is available for powering the CPU board and the connected peripherals. Consequently, the consumption of the board and the connected devices must not exceed 2.2A. The below schema represents an example of the distribution of the load current.

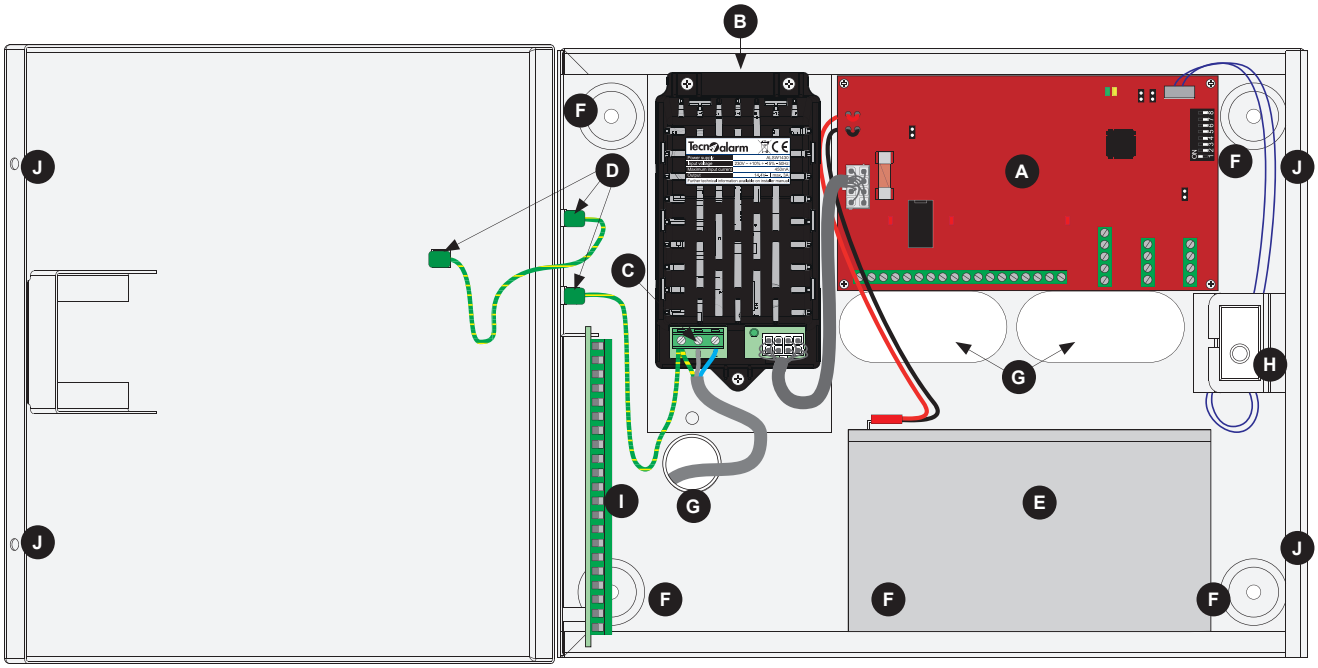
N.B. The energy consumption of the system can vary according to the configuration and require a specific logical distribution of the available load current. In this case, it is important to make sure that the consumption of the individual devices does not exceed the overload threshold of the corresponding output.



Legend		x,xA	Overload threshold
PS - 2,2A	Available load current	L	Status LED for power supply overload
SD - 12Ah	Available battery current in case of power failure	x,xA	Logical distribution of the available current for load

2-3 - Casing

The SPEED 4-8 P3A module must be installed in indoor areas, monitoring of temperature and humidity is not required. The module is composed of three macro-elements: the metal casing, the CPU board and the switching power supply (main power supply).
The casing provides a battery bay (secondary power supply). In addition, the casing provides a space for installing a SPEED 8 (I) input expansion which is not connected to the module.

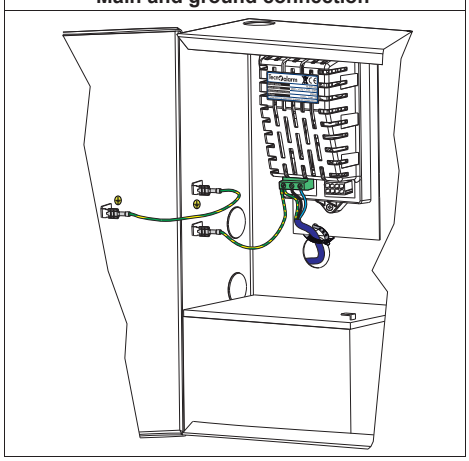


A	CPU board	F	Mounting holes
B	Power supply ALSW1430	G	Cable entry
C	230V AC mains connection	H	Anti-tamper protection
D	Ground connectors	I	Mounting prosition for SPEED 8
E	12V/12Ah battery	J	Holes for locking scews of the casing

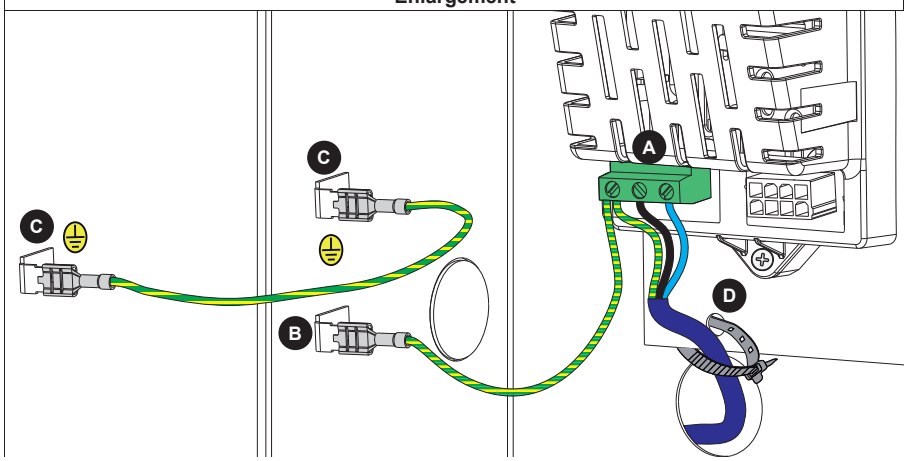
2-4 - Mains and ground connection

Connect the mains conductor and the groung conductor as illustrated in the below figure.
The mains conductor must be connected in the absence of voltage.
The ground conductor must be connected to the ground terminal soldered to the casing.
It is mandatory to connect the ground conductor between the casing and the door.
For safety reasons, attach the connection cable with a cable tie to the mounting base of the power supply.

Main and ground connection



Enlargement



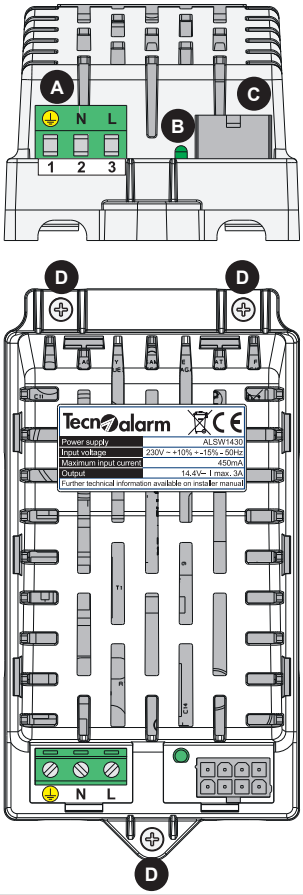
A	230V AC mains connection	C	Ground connectors
B	Ground connector	D	Cable tie

2-5 - Power supply

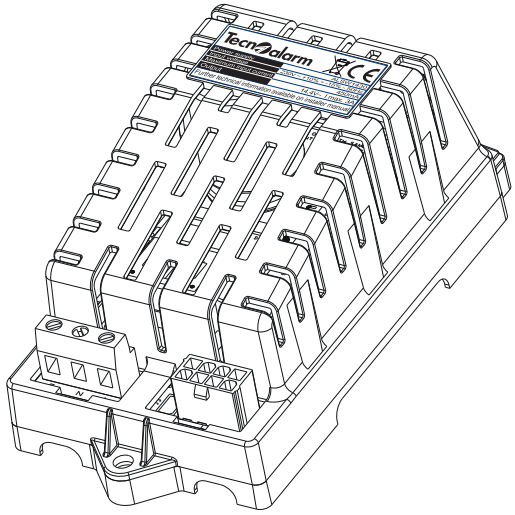
The module is equipped with a switching power supply (ALSW1430) providing a maximum output current of 3A (14.4V DC).
The connection to the control panel is made through a polarized connector. The connection cable transmits both the power supply and the diagnostic signals to the alarm system.

Input protection
The 230V AC mains input is protected against overvoltage by varistors and a non replaceable fuse.
The interruption of the fuse is necessarily attributed to a failure or an exceptionally violent electromagnetic discharge (e.g. lightning) and requires repair by the manufacturer.

Output protection
The outputs are protected against short circuits and overcharge. If one of these events occurs, the power supply is automatically deactivated and will only be reactivated after restoring the normal functioning conditions.



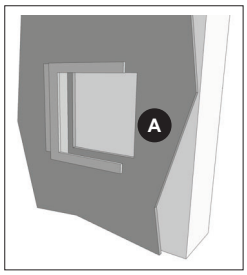
A	N L 1 2 3	**Terminals**		
		1		Ground conductor
		2	**N**	Neutral conductor 230V AC
		3	**L**	Phase conductor 230V AC
B		**LED**		
		Green		On = normal functioning
C		Pre-wired polarized connector		
D	Screws for fixing with mounting plate of the power supply			

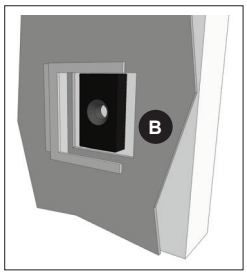


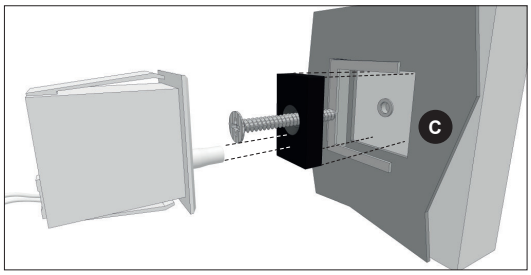
2-6 - Installation of the anti-detachment tamper

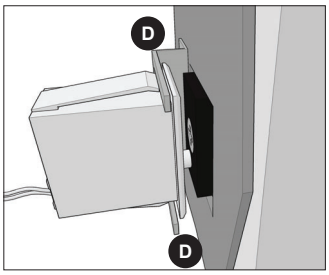
The support and the window for the installation of the anti-detachment switch can be found in the lower rear part of the casing.
Fix the plastic plate of the tamper to the wall at the height of the window and hook the tamper switch into its support as indicated in the bellow figures.

N.B. To ensure compliance with the standard EN 50131-6, it is mandatory to install the anti-detachment tamper.









A	Windows for the anti-deatachment tamper	C	Fix the plastic plate to the wall
B	Place the plastic plate and drill a 5mm hole	D	Hook the anti-tamper switch into its support

2-7 - Conformity with EN 60950-1 - Electrical safety

Ground connection
The ground connection must comply with the valid European standards.
It is mandatory to connect the ground conductor between the casing and the door.

External circuit breaker
The power supply is not equipped with a circuit breaker. To guarantee accordance of the installation with the valid European standards, it is mandatory to install an external magnetothermal or bipolar circuit breaker switch (16A curve C, opening stroke min. 3mm) near the module.
The circuit breaker can be installed in a switch box on condition that it is clearly identifiable by the user.

Rules for mains connection (230V AC)
The mains cable is not included. To reduce the risk of electric shoks in normal operating conditions, observe the following precautions:

- Use a double insulation cable (with shielding) for the connection to mains power.
- The mains cable should have a diameter of minimum 3x 1.5 mm^2 and, once it has been connected to the corresponding power supply input, it should be attached with a cable tie to the mounting base of the power supply.
- To guarantee the electrical safety and correct functioning, always connect the ground conductor to the corresponding terminal and between the casing and the door.

Rules for the output use
The relays and the electrical outputs of the alarm system and its peripherals form a SELV voltages network (EN 60950-1).
These outputs can only be connected to circuits that comply with SELV voltages.

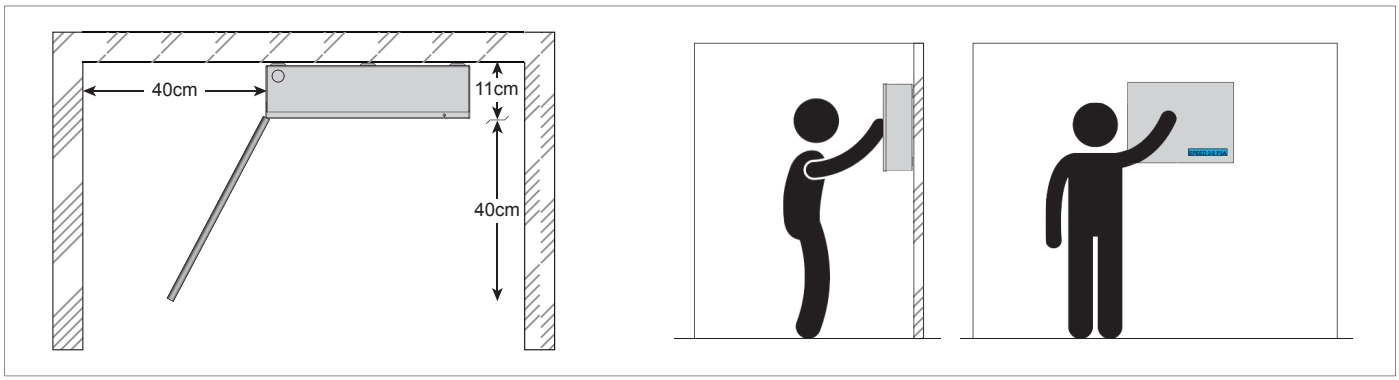
2-8 - General warnings

For the safety of the operators protect the casing, as any electronic device, against splashes and avoid placing recipients containing liquids next to it. The casing must be installed so as to ensure adequate ventilation. Do not cover the device with things that may hinder a correct heat dissipation. Install the casing at an adequate distance from heat sources (e.g. radiators) and any device that may cause electromagnetic disturbances (e.g. radio antennas).

2-9 - Fixing of the casing

The casing must be fixed in a position that guarantees adequate protection from accidental shocks and at a height which permits full access to the operator. Consider the space necesary to fully open the casing door (approx. 40cm). Fix the casing horizontally on a solid surface using 4 dowels with 8mm diameter.

N.B. To ensure compliance with the EN 50131 standards, it is mandatory to block the battery (e.g. with a double-sided adhesive tape).



2-10 - Power supply

Main power supply - Power supply (PS)
The power supply complies with the provisions of the standard EN 50131-6 and performs the following controls imposed by the standard:

- Every 24h the status of the alternative power supply (APS) is checked. The battery test is executed under load. In the absence of voltage the test is not executed.
- Every 10 seconds the output voltage is checked.
- The battery is disconnected if voltage drops below <8,8V (protection against the deep discharge).

N.B. All the functions listed are subject to the status of the W1 jumper on the CPU board (must be open).

Secondary power supply - Battery (SD)
The module must be equipped with a secondary power supply, the battery used must have a capacity of 12V/12Ah.

Autonomy
The below table shows the provisions regarding autonomy defined by the standard EN 50131 depending to the security grade (2 or 3, with or without remote management). In particular, it shows the distribution of the available current:

Self consumption - Current needed for the CPU board.

Recharge current - Current needed for recharge of the battery within the charging time imposed by the standard.

Load current - Total current available for the devices connected to the module.

The consumption of the CPU board and the devices connected to the module must be subtracted from the indicated current values.

AUTONOMY						
SPEED 4-8 P3A		EN 50131-1 COMPLIANT	12V/12Ah Battery			
			Autonomy required	CPU self consumption	Battery recharge current	Load current
Security grade 2	Non-remotely managed system		12h	Max. 50mA	Max. 800mA	12Ah/12h - 50mA = 950mAh
Security grade 3	Non-remotely managed system		60h			12Ah/12h - 50mA = 150mAh
Security grade 3	Remotely managed system		30h			12Ah/12h - 50mA = 350mAh

2-11 - Failures

The self-test functions of the module detect and signal the operating failures with the following delays:

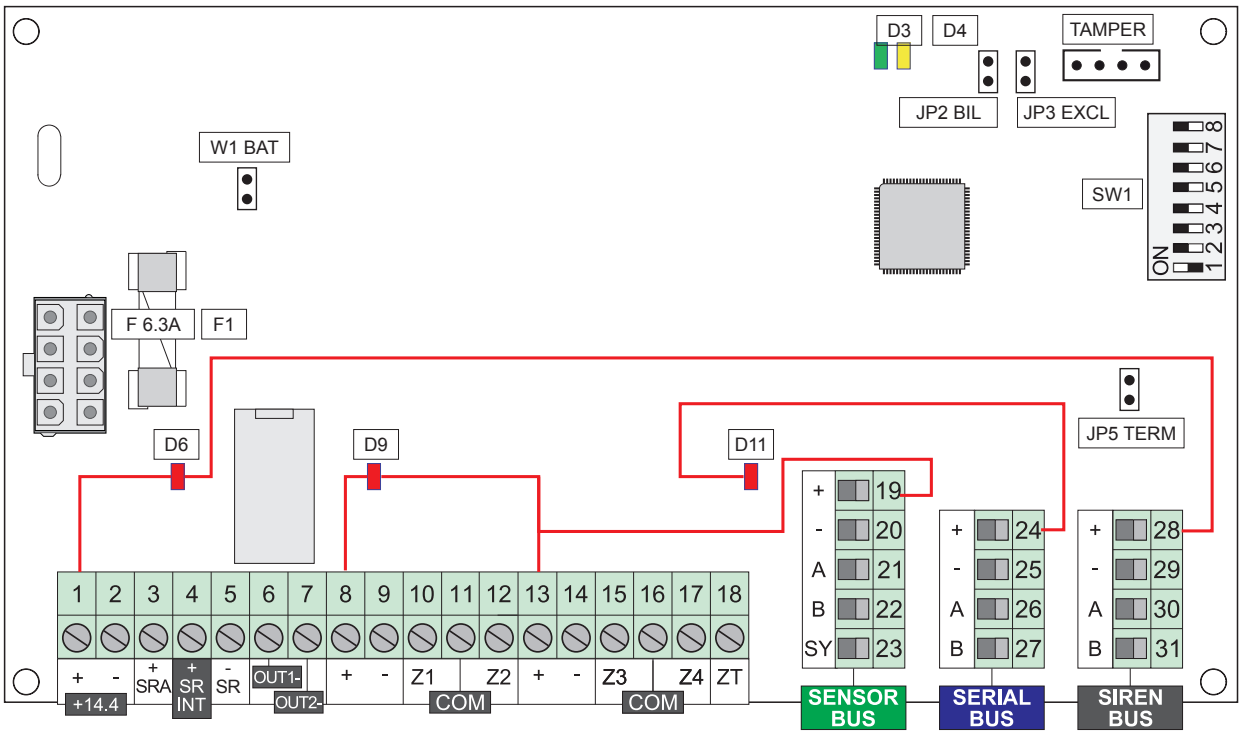
- **Power failure (PS) -** The signal is activated immediately with a delay of only a few seconds.
- **Low battery (SD) -** The signal is activated 20 seconds after the failures has been detected (undervoltage threshold 11V ± 200mV, restore voltage 12V ± 200mV).
- **Battery failure (SD) -** The signal is activated about 10 after the failures has been detected. The test will not be performed in case of power failure (undervoltage threshold 9,4V ± 200mV, restore voltage 10,6V ± 200mV).
- **Deep discharge of the battery (SD) -** The signal is activated immediately with a delay of only a few seconds.
- **Power supply overload (PS) -** The signal is activated immediately with a delay of only a few seconds.
- **Aditional power supply overload (PS) -** The signal is activated immediately with a delay of only a few seconds.
- **Battery charge failure (SD) -** The signal is activated immediately with a delay of only a few seconds.
- **Interrupted fuse (F1) -** The signal is activated immediately with a delay of only a few seconds.

The failures are displayed on the LCD consoles as follows (where xx = number/address of the corresponding module):

Error	Notification on the console	Error	Notification on the console	Error	Notification on the console
Power failure	**PWR FAILURE Module xx**	Battery failure	**BATTERY FAULT Module xx**	Overload / Low output voltage	**OVERLOAD FAULT Module xx**
Low battery	**LOW BATTERY Module xx**	Deep discharge of the battery	**Beg. loss Module xx**	Power failure, Battery recharge failure, Interrupted fuse	**PWR SUPPLY FAULT Module xx**

3 - HARDWARE

3-1 - CPU board



JP2 - BIL	**Contact type of ZT tamper input**	
	● ●	NC
	▬	BIL
JP3 - EXCL	**Tamper anti-opening and anti-detachment**	
	● ●	Enabled
	▬	Disabled**
JP5 - TERM	**End-of-serial bus**	
	Insert on the last device of the serial line.	
W1 - BATT*	**Automatic battery disconnection**	
	● ●	Enabled (disconnection for Vbat <8.8V DC)
	▬	Disabled**

* To activate functioning only with the battery, insert the jumper for 2s than remove it.
** Not permitted under EN 50131

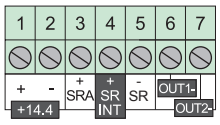
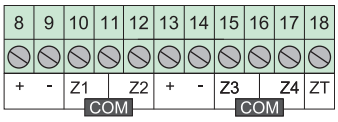
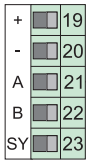
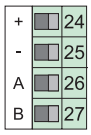
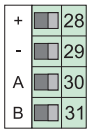
TAMPER	Tamper connector
● ● ● ●	Connect prewired tamper contacts

F1	Fuse
	Protection of main power supply (F 6.3A).

LED		Señalización	
LD3	Green	**On**	Power supply OK
		Off	Power supply failure
LD4	Yellow	**Off**	Communication KO
		Blinking slowly	Communication on the serial bus OK
		Blinking quickly	Failure of the communication on the serial bus
LD6	Red	**On**	Output power supply overload (terminals 1, 28)
LD9	Red	**On**	Output power supply overload (terminals 9, 13, 19)
LD11	Red	**On**	Output power supply overload (terminal 24)

SW1	1	2	3	4	5	6	Address	1	2	3	4	5	6	Address	1	2	3	4	5	6	Address
	OFF	OFF	OFF	OFF	OFF	OFF	0							11							22
	ON	OFF	OFF	OFF	OFF	OFF	1							12							23
	OFF	**ON**	OFF	OFF	OFF	OFF	2							13							24
	ON	**ON**	OFF	OFF	OFF	OFF	3							14							25
	OFF	OFF	**ON**	OFF	OFF	OFF	4							15							26
	ON	OFF	**ON**	OFF	OFF	OFF	5							16							27
	OFF	**ON**	**ON**	OFF	OFF	OFF	6							17							28
	ON	**ON**	**ON**	OFF	OFF	OFF	7							18							29
	OFF	OFF	OFF	OFF	OFF	OFF	8							19							30
	ON	OFF	OFF	OFF	OFF	OFF	9							20							32
	OFF	**ON**	OFF	OFF	OFF	OFF	10							21							32
	7	**Baud rate**																			
	OFF	Do not use																			
	ON	38,400bps																			
	8	**Tamper**																			
	OFF	Enabled																			
	ON	Disabled*																			

* Not permitted under EN 50131

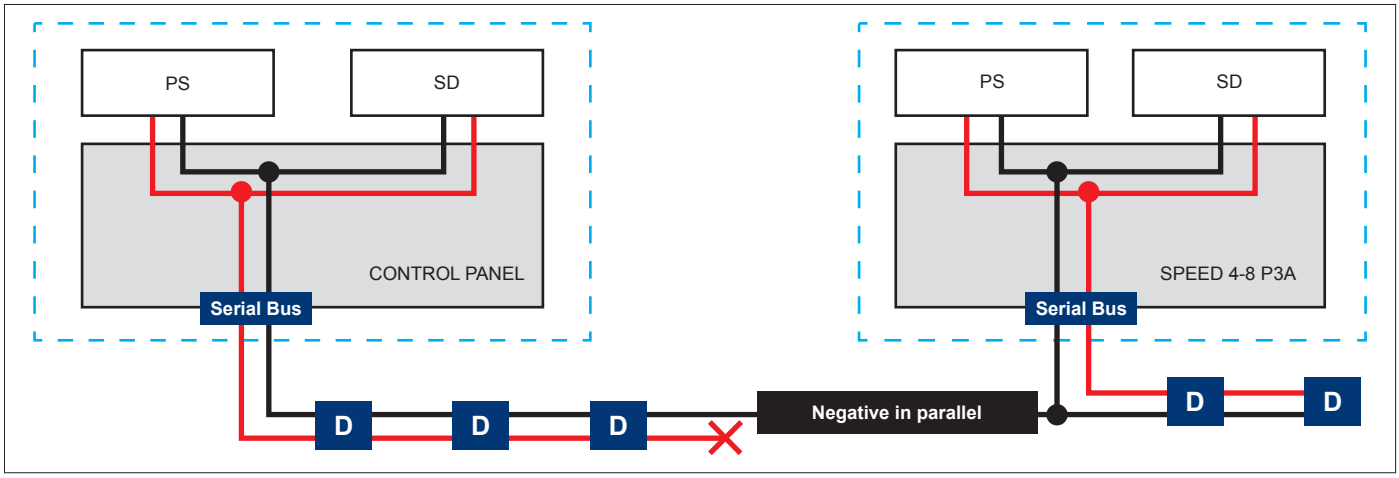
	**Outputs**			**Signal**	**Max. current**
	1	**+14.4**	Positive recharge voltage for siren (missing in case of power supply)	+14.4V DC	750mA*
	2	**-**	Negative voltage	-	
	3	**SRA+**	Positive control voltage for self-powered siren (missing in alarm status)	+13.8V DC	750mA
	4	**SRINT+**	Positive control voltage for indoor siren (present in alarm status)	+13.8V DC	500mA
	5	**SR-**	Negative reference voltage for siren		
	6	**OUT1-**	Negative logic output (programmable logic)	- / O.C.	100mA
	7	**OUT2-**	Negative logic output (programmable logic)	- / O.C.	100mA
	**Zone inputs**			**Signal**	**Max. current**
	8	**+**	Positive power supply voltage for detectors	+13.8V DC	1100mA**
	9	**-**	Negative power supply voltage for detectors		
	10	**Z1**	Zone input 1 (NC - NO - BIL - B24)		
	11	**COM**	Commun terminal for Z1 and Z2		
	12	**Z2**	Zone input 2 (NC - NO - BIL - B24)		
	13	**+**	Positive power supply voltage for detectors	+13.8V DC	1100mA**
	14	**-**	Negative power supply voltage for detectors		
	15	**Z3**	Zone input 3 (NC - NO - BIL - B24)		
	16	**COM**	Commun terminal for Z3, Z4 and ZT		
	17	**Z4**	Zone input 4 (NC - NO - BIL - B24)		
	18	**ZT**	Tamper input (NC - BIL)		
	**Sensor Bus**			**Signal**	**Max. current**
	19	**+**	Positive power supply voltage Sensor Bus	+13.8V DC	1100mA**
	20	**-**	Negative power supply voltage for Sensor Bus		
	21	**A**	Channel A Sensor Bus		
	22	**B**	Channel B Sensor Bus		
	23	**SY**	Synchronization output		
	**Serial Bus**			**Signal**	**Max. current**
	24	**+**	Positive power supply voltage Serial Bus	+13.8V DC	1100mA**
	25	**-**	Negative power supply voltage for Serial Bus		
	26	**A**	Channel A Serial Bus		
	27	**B**	Channel B Serial Bus		
	**Siren Bus**			**Signal**	**Max. current**
	28	**+**	Positive power supply voltage Siren Bus	+13.8V DC	1100mA**
	29	**-**	Negative power supply voltage for Siren Bus		
	30	**A**	Channel A Siren Bus		
	31	**B**	Channel B Siren Bus		

* The value refers to the maximum current provided for the power supply of the conventional and RSC® sirens, without the intervention of the overload protection. The current is distributed among the terminals 1 and 28 and supplies a total of 2 sirens.

** The value refers to the maximum current provided for the power supply of the conventional and RSC® detectors, without the intervention of the overload protection. The current is distributed among the terminals11, 16 and 22.

3-2 - Connection

The control panel and the input expansion are connected via the RS485 serial bus. The input expansion shares with the control panel the data channels A and B as well as the negative power supply voltage which must be connected in parallel, while the positive power supply voltage, coming from the control panel, is interrupted and continues after the module.



NOTES

Tecnoalarm

Via Ciriè, 38 - 10099 - San Mauro T.se Torino (Italy)
Tel. +39 011 22 35 410 - Fax +39 011 27 35 590
info@tecnoalarm.com - www.tecnoalarm.com

ISO 9001

Tecnoalarm FRANCE

495, Rue Antoine Pinay
69740 Genas - Lyon (France)
Tél. +33 (0)4 78 40 65 25 - Fax +33 (0)4 78 40 67 46
tecnoalarm.france@tecnoalarm.com
www.tecnoalarm.com
Agence de Paris:
125, Rue Louis Roche
92230 Gennevilliers

Tecnoalarm ESPAÑA

c/Vapor 18 (Pol. Ind. El Regas)
08850 Gavá - Barcelona (España)
Tel. +34936622417
tecnoalarm@tecnoalarm.es
www.tecnoalarm.com