GENT
by Honeywell

Data and Installation Instructions

Nano panel-based

Fire detection and alarm system

nano

Contents

Preface

This is the seventh issue of the Installation instructions for the **Nano panel based system** with information on products that are compatible with Version 2.xx software. The manual covers information on how to install the panel and wiring external equipment, such as loop devices. This issue covers the mains 60Hz frequency.

These instructions must be read in conjunction with the recommendations in *BS5839:Part 1,* which is the *code of practice for Fire detection and alarm systems for buildings.*

Associated Documents

Document Pack, includes:

- ☐ Operating instructions
- ☐ Installation instructions
- ☐ Log book
- ☐ Quick ref. / Template.

Conventions

This is a note to highlight important text that is normally hidden in the main text.

This is either a caution to prevent damage to the equipment or a warning to inform of dangerous conditions that may result in injury or death.

Abbreviations

ac - Alternating current
AS - Anti surge
C - Common
CH -Channel
dc - Direct Current
DIL - Dual in line
DEV - Device
EOL - End of line
EP - Environmentally protected
GND - Ground
I/F - Interface
IO or I/O - Input Output
IP - Ingress protection
LCD - Liquid crystal display
LED - Light-emitting diode
LPCB - Loss prevention council certification board
LVD - Low voltage directive
MCP - Manual call point
MICC - Mineral insulated copper cable
N/C - Normally closed
N/O - Normally open
NVM - Non Volatile Memory
OC or O/C - Open circuit
PCB - Printed circuit board
PIN - Personal identification number
(Usercode, password or access code)
PSU - Power supply unit
QB - Quick blow (fuse)
SC or S/C - Short circuit
SPCO - Single pole change over (relay contacts)
T - Anti-surge (fuse)
USB - Universal Serial Bus

Notes on system installation

The power-up of the control panel and commissioning of the system is done by the Servicing organisation.

Installation requirements

It is recommended that the installer follow the general requirements of BS 5839 : Part 1 : 2013, which is the code of practice relating to fi re detection and alarm systems for buildings. The installer must follow the relevant parts of BS 7671 : 2008 Requirements for Electrical installations, IEE wiring regulations 17th edition if installation is in the United Kingdom.

Second fix installation

To prevent the possibility of damage or dirt degrading the performance or appearance of the products, the installation of the panel should be delayed until all major building work in the area is complete.

The installation of all outstanding parts and panel the panel power up is usually carried out during system commissioning.

Fixture and fittings

It is the installer's responsibility to provide adequate fixtures and fittings for the type of construction surface onto which a product is to be mounted, whilst utilising the fixing points on the product. As an aid to this decision, the weight and overall size of each full assembly together with implications on cable entries and routing should be taken into consideration.

All these procedures assume that the cable, gland, steel box (BESA box) and other related accessories are provided by the installer.

As fitted drawings

The installer should acquire site specific information from the interested parties, for details on the location of products for installation. The acquired information together with this guide and the relevant standards should be used to assist the work.
Each product assembly can be identified from its package label. The contents of all packages should be checked for any discrepancies.

Cable type and routing

Appropriate attention must be given to ensure the correct cable type is installed in accordance with 'as fitted drawings', site specific information and recommendations of *BS5839 Part 1 : 2013*. The cables must be installed using cable manufacturers recommended fixing and accessories.

Fire sensor cover

Each fire sensor may be supplied with a plastic dust cover. The cover must be fitted to prevent dust and dirt from the building work contaminating the fire sensor.

Earth continuity

All earth connection points should be **clean to provide a good electrical conductivity path. To maintain the earth continuity: all earth leads and fittings** provided should be installed. The **loop cable** screen must be continued through each system device on the loop circuit, whether the earth is connected to the device or not.

Do not use any part of building structure for earthing.

Some of the system products having metal enclosure with **zinc coating** around the cable termination points, the coating provides a good electrical conductivity path for cable earth termination. The zinc coating on metal enclosures should not be damaged. Any damage will expose bare metal, which can corrode and make a poor earth connection.

Power supply

The power to the system is derived from the mains and battery supplies. Before removal of the electronic module from the panel or disconnection of any cable from the board ensure both mains and battery supplies are disconnected.

Mains supply

Mains supply to any fire alarm control and indicating equipment must be via an unswitched 5A fused spur unit. A disconnect device must be provided to disconnect both poles and must have a minimum gap of 3mm. The disconnect device should be available as part of the building installation and must be easily accessible after installation is complete.

All mains powered equipment must be earthed.

Devices

Always install new devices on the loop circuit. Never use devices that have been previously installed on the loop circuit of another system.

Local Manual Call Point

To comply with the requirements of EN54-2 : 1997 a manual call point must be installed near the control panel. The call point when activated must be set up to sound all alarms without delay.

Failure to install and configure a local manual call point in the manner described above when delays are set up on the system will result in the panel not complying to EN54- 2 : 1997.

EN54 information

Optional functions with requirements of this European standard

The Control panel complies with the requirements of EN54 : Part 2 : 1997. In addition to the basic requirements of the standard the panel conforms to the following optional clauses:

Clause	Description
7.8	Output to fire alarm devices
7.11	Delays to action outputs
8.3	Fault signals from point
10	Test condition

System wiring

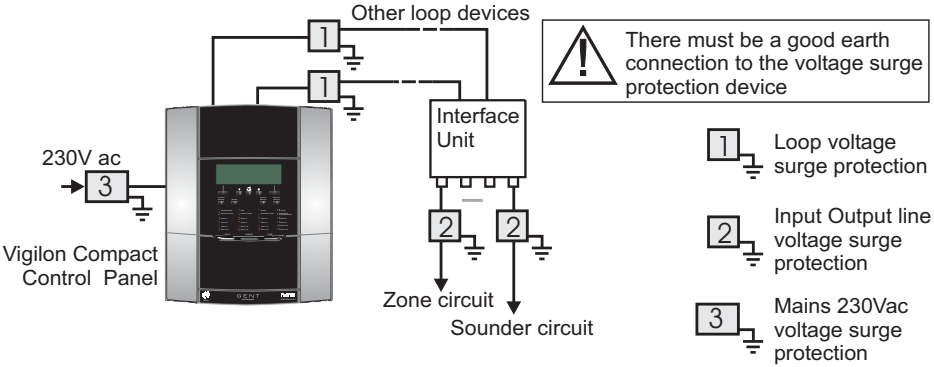
If instructed, the installer may need to terminate as well as connect the cables to the appropriate terminal blocks.

Cable separation

Where the outgoing and return cables of a loop circuit covers more than the equivalent of one zone they must **not** run together, for example, either close to the **Control Panel** or in a **service duct**. There should be as much physical separation as possible between the cables and the mechanical protection of the cable should be to a particularly high standard. This is to minimise the risk of accidental damage to both cables.

Lightning protection

Where a loop cable is mounted to an external wall or between two buildings then consideration should be given to the use of lightning protection devices.



Requirements of cables

The *British Standard BS5839 Part 1 : 2013 Code of practice for system design, installation, commissioning and maintenance* states the requirements for standard and fire resisting cables in Clause 26.2 section d and e.

"d) **Standard fire resisting cables** should meet PH 30 classification when tested in accordance with EN50200 and maintain circuit integrity if exposed to the following test:

- a sample of the cable is simultaneously exposed to flame at a temperature of 830ºC- 0+40ºC and mechanical shock for 15min, followed by simultaneous exposure to water spray and mechanical shock for a further 15min.

e) **Enhanced fire resisting cables** should meet the PH120 classification when tested in accordance with EN 50200 and maintain circuit integrity if exposed to the following test:

- a single sample of the cable is simultaneously exposed to flame at a temperature of 930ºC - 0+40ºC and mechanical shock for a period of 60min, followed by simultaneous exposure to water spray and mechanical shock for a further 60min."

The cables listed in this manual are those that have been tested for EMC compliance with the system products.

Loop Cable usage

There is a maximum limit of 1Km loop cable usage allowed per loop circuit. This maximum limit is the sum of the cable used on main loop circuit, spurs off main loop circuit, plus cable runs to all input / output lines off loop powered interface units installed on the loop.

There is a further maximum limit of 100m cable run allowed per input/output line off loop powered interface unit.

Mains Supply cable

The mains supply cable must be a standard fire resisting type and should meet PH30 classification, such as any of the standard and enhanced cables listed above.

Repeat indicator to Control panel cable

A maximum of 1Km cable distance is allowed between Control Panel and Repeat indicator panel

- ☐ Belden No. 9842 EIA RS485 Applications, O/A Beldfoil® Braid having two twisted pairs

Loop cable

A loop cable carries both data and power, therefore its selection is important. Note the following:

- ☐ In countries where the European EMC directive is in force, only ***EMC Compliant*** cables are to be used.
- ☐ The loop cable usage must not exceed **1Km**. This includes the cable used on main loop and spur circuits.
- ☐ Single pair cable must be used. It is **NOT** permissible to run mixed loops or outgoing and return pairs in a multi core cable, due to inadequate separation and possible electrical interference problems.
- ☐ Each core of the loop cable must be **1.5mm^2** cross section area.
- ☐ The cable screen must be **capable** of being earthed at each system device.
- ☐ **Red** is the preferred cover sheath for fire applications.
- ☐ The specified loop circuit cables are **also suitable** for wiring master alarm, auxiliary relay, input/output lines and mains supply.

Enhanced loop cables

Approved cables for loop wiring (EMC Compliant)

- ☐ Draka Firetuf FT120 **Enhanced -** FTPLUS2EH1.5RD (formally Firetuf FT Plus)
- ☐ Datwyler Pyrofil **Enhanced**
- ☐ Mineral insulated cable (MICC) to BS6207:Part 1
- ☐ Prysmian (previously Pirelli) **FP PLUS ***

Standard loop cables

Approved cables for loop wiring (EMC Compliant)

- ☐ AEI Cables **FIRETEC ***
- ☐ Alcatel cable **PYROLON E *** distributed by Winstonlead
- ☐ BICC Pyrotenax **FLAMESIL FRC ***
- ☐ Cavicel SpA **FIRECEL SR 114H *** distributed by Cables Britain
- ☐ Datwyler Pyrofil **Standard *** (previously LIFELINE)
- ☐ Draka Firetuf EMC Standard 1.5mm^2 **FTEMC2EH1.5RDR**
- ☐ Draka Firetuf **FTES2EH1.5** (previously FTZ2E1.5 FIRETUF OHLS *) fire resistant data cable
- ☐ Huber & Suhner **RADOX FR ***
- ☐ Prysmian (formally Pirelli) **FP200 FLEX ***
- ☐ Prysmian (formally Pirelli) **FP200 GOLD ***
- ☐ Raydex CDT **FG950 ***

The cables marked * utilise laminated aluminium tape with a tinned drain wire for electrostatic screening. Under certain environmental conditions *galvanic action* may take place between the aluminium and the drain wire. This will severely *degrade EMC performance* as the foil to drain wire *impedance will increase.* Armoured variants of these can also be used for wiring a loop circuit.

Devices per Device loop

It is important that redundancy is built into the system to accommodate future expansions.

The number of devices on the loop circuit can be limited by the total number of addresses available, the electrical load on the circuit, the maximum cable length and other geographical considerations.

- ☐ The loop circuit must not cover more than **10,000m²** of floor area of a protected site.
- ☐ In total a maximum of **127** devices are allowed on the loop circuit.
- ☐ As a general rule allow **1000** load factor for the loop circuit and only use the 2nd value when calculating the maximum load factor.

The following table can be used as a rough guide only to determine loop load.

For a precise battery standby value use the Battery Standby Calculator. The Battery Standby Calculator in the Commissioning tool, which should be used during system design stage to determine the loop loading. The tool can be downloaded from the Gent Expert forum (wwwgentexpert.co.uk), which is accessible to registered users.

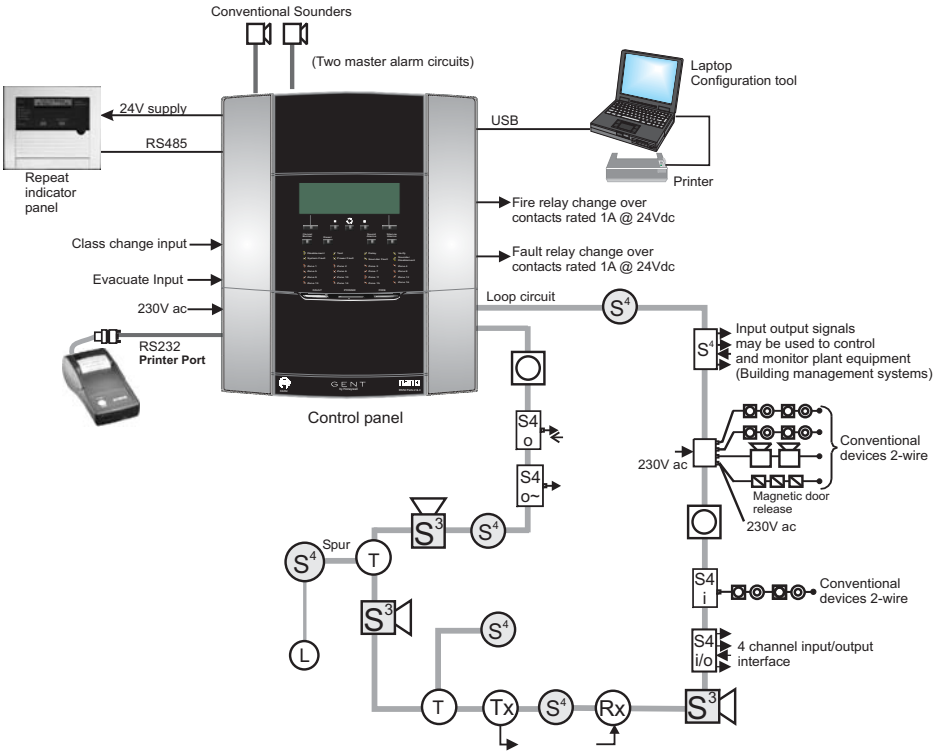
Device code number	Description	Load factor per device	Maximum devices per loop
S2IP-ST-XR (Low profile range) S2IP-ST-XW (Low profile range)	Strobe Red Strobe White	10 25	100 40
S3-SN-X (low profile range) S3IP-SN-X (low profile range) inc. suffix -V2	Sounder tone	5	127
S3-VP-X (low profile range) S3IP-VP-X (low profile range) S2IP-VP-X (system range)	Sounder with speech	18	55
S3IP-VP-ST-XX (low profile range)	Sounder with red strobe + speech	18	55
S3IP-SN-ST-XR (low profile range) inc. suffix -V2	Standard tone with red strobe	45	22
S3IP-SN-ST-RW(low profile range) inc. suffix -V2	Standard tone with white strobe	28	35
S4-34410	1 - LV Input interface module inc. zone excluding zone	1 24	100 32
S4-34450	4 - LV Input/Output interface module inc. zone excluding zone	 5 27	 32 32
S4-34420	1 - LV Output Interface module	1	127
S4-34410 or S4-34415	1 - MV Output Interface module	1	127
S4-34440-12	New Mains powered interface	1	32 (8#)
S4-770-S	Optical heat sounder	7 13*	127 75*
S4-780-S	Heat sounder	8 15*	120 65*
S4-771-S	Dual optical heat sounder	0.5	127
S4-720	Heat Sensor	0.5	127
S4-780	Heat Sensor & Sounder	8 - 15*	120 - 65*
S4-720-ST-VO	Heat Sensor, Speech & Strobe	17 - 25*	55 - 40*

Device code number	Description	Load factor per device	Maximum devices per loop
S4-715	Optical Sensor	0.5	127
S4-710	Optical Heat Sensor	0.5	127
S4-770	Optical Heat Sensor & Sounder	7 - 13*	127 - 75*
S4-711-VO	Dual Optical + Heat Sensor & Speech	8 - 15*	120 - 65*
S4-711	Dual Optical Heat Sensor	0.5	127
S4-711-ST	Dual Optical Heat Sensor & Strobe	10	100
S4-771	Dual Optical Heat Sensor & Sounder	7-12*	127 - 75*
S4-711-ST-VO	Dual Optical Heat Sensor, Speech & Strobe	18-25*	55 - 40*
S4-911	Dual Optical Heat Sensor & CO	0.5	127
S4-911-ST-VO	Dual Optical Heat Sensor CO, Speech & Strobe	18-25*	55 - 40*
S4-34800-EN S4-34805-EN	Manual Call Point	3	127
S4-34760	Venturi-Air Duct Kit	0.5	127
S4-34740	Beam sensor pair	3 per pair	8 pair
S4-34418	Keyswitch interface	4	127
34701	Tee breaker	0.5	127

The maximum devices per loop and load factor per device have been revised due to changes in product specification.
~ - A maximum of up to 100 input channels are allowed for the loop.
* - These values are applicable when sounder is operating in turbo mode or with bell tone.
# - 8 maximum if outputs are sectored
LV - Low voltage
MV - Medium voltage

Nano System Architecture

The loop circuit allows wiring of addressable devices like **fire sensors, alarm sounders, manual call points and interface units,** a combined maximum of up to **127** devices is allowed on the loop circuit.



Addressable System Devices

- S-Quad Sensor Speech Sounder & Strobe
- S-Cubed Voice enhanced Speech, Sounder, Strobe Unit
- Manual Call Point
- T Breaker
- Beam sensor Transmitter and receiver
- S4 4-Input/Output loop powered interface
- S4 1-Input loop powered interface
- S4 1-Output + Confirmation input loop powered interface
- S4 Mains switching output loop powered interface
- 4 - Input/Output mains powered interface unit

Conventional Products off interface inputs

- Magnetic door release
- Alarm sounder
- Conventional Fire Detector
- Manual Call Point
- End of Line Unit

LED off S⁴ sensor

- Remote LED

Nano panel

The Nano panel is designed to meet the requirements of EN54-2 : 1997 and EN54-4 :1997. The panel can accommodate a loop circuit of analogue addressable devices, like fire sensors, sounders, manual call points and interface units. The panel gives local visual and audible indications of system events by means of indicators, a message display and an integral sounder. An integral mains derived supply provides power to the panel and the loop circuit in normal conditions and the integral batteries provides a standby supply for up to 24 hours with 0.5hours of alarms should the mains supply fail. The controls are PIN code protected. The panel is designed for surface and semi flush mounting and facilitates both rear and top cable entry points.

Features

- ☐ Single loop fire control panel.
- ☐ Up to 127 addressable devices can be connected to a loop circuit, devices like sensors, call point and interface units.
- ☐ Two master alarm circuits.
- ☐ RS485 Port to connect to repeat indicator panel(s).
- ☐ RS232 Port to connect to an external printer.
- ☐ USB Port to connect to a Commissioning computer.
- ☐ Fire Output - One set of clean voltage-free change over contacts.
- ☐ Fault Output - One set of clean voltage-free change over contacts.
- ☐ Class Change input that actions class change signal to selected sectors
- ☐ Evacuate input that actions all alarm sounders including master alarms and fire output
- ☐ Standby supply to power the system via batteries for 24 hours plus 0.5 hour alarm load.
- ☐ Alphanumeric LCD with back light to display event information.
- ☐ Integral 16 zone LEDs (with First fire zone LED flashing).
- ☐ LED lights for event indications.
- ☐ Local audible buzzer for event announcement.
- ☐ Push buttons for essential controls and menu driven commands.

Technical data

Control panel

Standard	Designed to EN54-2 : 1997
Approval	LPCB approved
Panel dimensions in mm	height 419 x width 347 x depth 85.5
Panel weight	approximately 3.12Kg without batteries 8.2Kg with batteries 2 - 12V 7Ah batteries are required (each battery weighing 2.54Kg [5.6lbs])
Storage temperature	-10ºC to +55ºC
Operating temperature	-5ºC to +40ºC
Relative Humidity (Non condensing) Temperature 5ºC to 45°C	up to 93%
Emission	BS EN 61000-6-3:2007 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN 50130-4: 1996: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30
Colour	Door: Silver and Black Backbox: Black
Devices per loop	A maximum of up to 127 addressable devices on the loop
Device labels	Each device can be given a 32 character label for loop device location
Relays	Voltage-free contacts rated 1A @ 24Vdc
Fire	1 - set of change over contacts that are configured to operate immediately on a Fire event. The relay is normally de-energised
Fault	1 - set of change over contacts configured to operate immediately on occurrence of a Fault event. The relay is normally energised
Master alarm circuits and fuses	2 - Master alarm circuits operating at 24 volt nominal, 200 mA maximum per circuit MA1 - Fuse FS2 250mA AS MA2 - Fuse FS3 250mA AS Both fuses are Ceramic type 20mm x 5mm in size and are located on the MCB
Evacuate Input	A closed input will trigger all alarms to sound evacuate signal to include master alarms and activation of fire output
Class Change input	A closed input will trigger all configured sectors to sound the class change signal.
RS485 Port	RS485 - (PP3) Repeat indicator panel
RS232 Port	RS232 - (PP10) Printer
USB Port	USB - (P2) Commissioning tool
24V supply	Maximum output current of 200mA is protected by a Ceramic Fuse FS1 0.25A AS 20mm x 5mm in size, located on the MCB. Power taken from this supply will affect the battery standby duration.
Indicators	Fire (red) Power (green) Fault 'Common' (amber) 16 - Zones (red) Verify (amber) Disablement (amber) System fault (amber) Power fault (amber) Sounder Fault (amber) Test (amber) Delay (amber) Sounder Disablement (amber)
Display	Alpha-numeric display - 8 lines by 40 characters per line, back-lit, (LCD having black characters on green background)
Internal sounder	Audible announcement of Fire and Fault events.
Controls at Access level 1	Menu navigation buttons to view events and for PIN code entry to other access levels.

Controls at Access level 2 (Customer mode)	As for controls at Access level 1 plus controls for: ☐ Cancel buzzer ☐ Emergency controls ☐ Clock set ☐ Day/Night mode ☐ Enablement/Disablement ☐ Weekly test ☐ Zone test mode ☐ Display test ☐ Loop status/repair ☐ Firmware version ☐ Site data
Controls at Access level 3 (Engineer mode)	As for controls at Access level 2 plus controls for: ☐ Delay settings ☐ Calendar settings ☐ External inputs ☐ Serial ports ☐ Weekly test settings ☐ Zone label and linkage ☐ Device settings ☐ Interface channel settings ☐ Sound Signal settings ☐ Zone Cause and Effect ☐ Sound alarm mode & operation ☐ Signal settings ☐ Loop status and map ☐ Site data backup & restore
Controls at Access level 4 (Maintenance mode)	As for controls at Access level 3 plus controls for: ☐ Clear logs ☐ Maintenance reminder ☐ Firmware upgrade ☐ Device time averages ☐ Device condition codes ☐ Diagnostics ☐ Reset codes, configuration and labels to factory default settings ☐ Backup & restore changes ☐ Fast find ☐ Loop power up/down ☐ Start detection ☐ Commissioning mode ☐ Beam alignment ☐ Proprietary Logo

Always use the recommended replacement or equivalent type battery, as there is a risk of an explosion if incorrect battery is used.

Power supply

Standard	Designed to EN54-4 : 1997
Mains supply voltage and fuses	230V -15% +10% 50Hz/60Hz protected by: FS3 Fuse - 3.15A (T) 250V Ceramic 20mm x 5mm, located on PSU. Input current - 0.45A
Nominal supply voltage for master alarm circuits	24V +/- 4V
Lithium Battery	BATT3 on MCB. Type Panasonic CR2032 3V cell. **CAUTION: Replacement battery must be the same or equivalent type battery. Dispose of used batteries according to the manufacturer's instructions.**
Battery circuit 'BAT1' and fuse	FS1 Fuse 3.15A (T) TE5 on PSU
PSU volts & fuses	
43V (quiescent)	FS6 Fuse 1.0A (T) TE5 on PSU
24V	FS4 Fuse 1.0A TE5 on PSU
Battery	Powersonic PS-1270 F1 2- 12V 7Ah sealed lead acid batteries that will provide 24 hours standby and 30 minutes alarms, determined by system loading via Nano battery standby calculator.
Storage temperature	-10 to +55ºC
Operating temperature	-5ºC to +40ºC
Relative Humidity (Non condensing)	up to 93% (Temperature +5 to +45°C)
Maximum current from battery without mains connected	1.5A
EN54 Part 4 data	
I max a	1.5 A
I max b	1.4 A
I min	300 mA
UVLO	20.7 V ±400mV
Ri max	1.5 Ω

After power down hazardous voltages may still be present even if indications are extinguished.

Panel installation

The Nano panel is supplied fully assembled, it is important to check the contents to ensure all the parts are supplied.
Note the 2 x 12V 7Ah batteries are supplied in a separate pack.

Parts in the Spares packages		Quantity
Fuse T3.15A H 250V 20mm x 5mm Ceramic		1
Fuse T250mA H 250V 20mm x 5mm Ceramic		3
Fuse T1A TE5		2
Fuse 3,15A TE5		1
10K Ohms Resistor		4
Battery Link		1
Battery Lead		1
Allen Key#		1
Screw cover		1
Panasonic CR2032 3V cell		1
Trimmer tool		1
Document pack : Operating, Installation, Quick reference + template and Log book		1

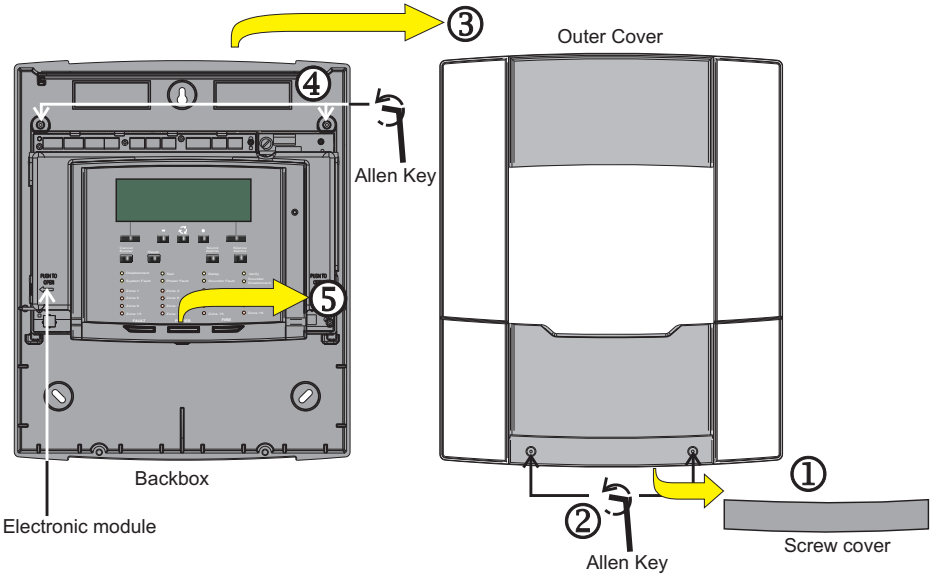
- part supplied in a plastic bag fitted to the enclosure.

How to disassemble the panel to gain access to the Backbox

a Pull out the 'screw cover' ① which may be supplied fitted to the Outer Cover, the 'screw cover' is held in place by magnets.

b Open the two captive screws ② on the 'Outer cover' using the allen key and unhook the 'outer cover' ③ from the 'backbox'.

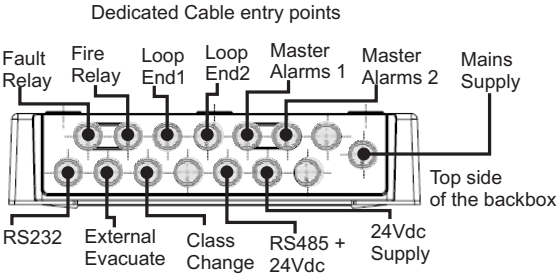
c Open the two captive screws ④ on the 'electronic module' and lift out the module ⑤ from the 'backbox'.

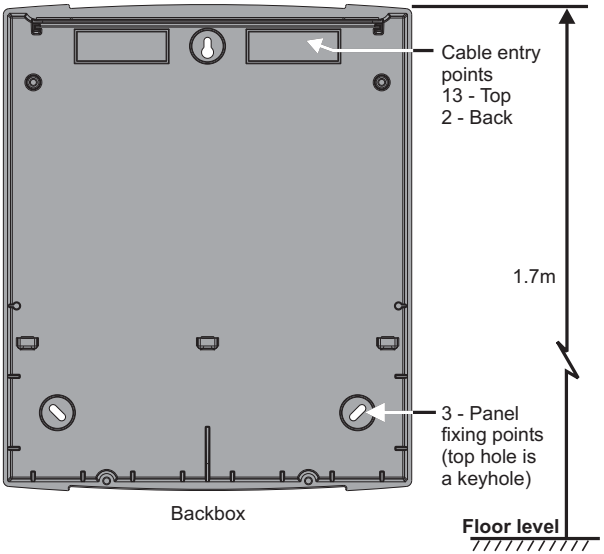


How to mount the backbox and dedicated cable entry points

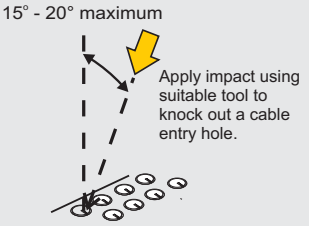
Unused knockouts that have been removed should not be left open.

Knockout the required dedicated cable entry points from the back box. Use the correct method of knocking out the entry points, as illustrated below. Using the three fixing points to mount the backbox onto a flat wall using suitable fixings.





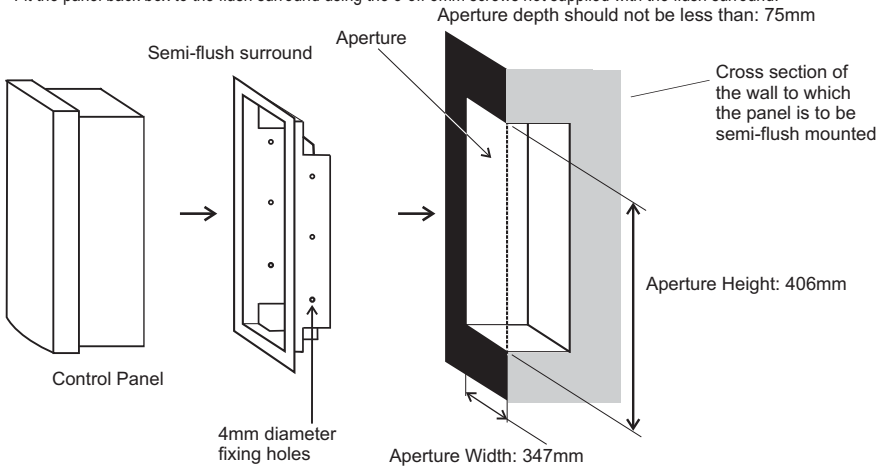
How to knock out cable entry points



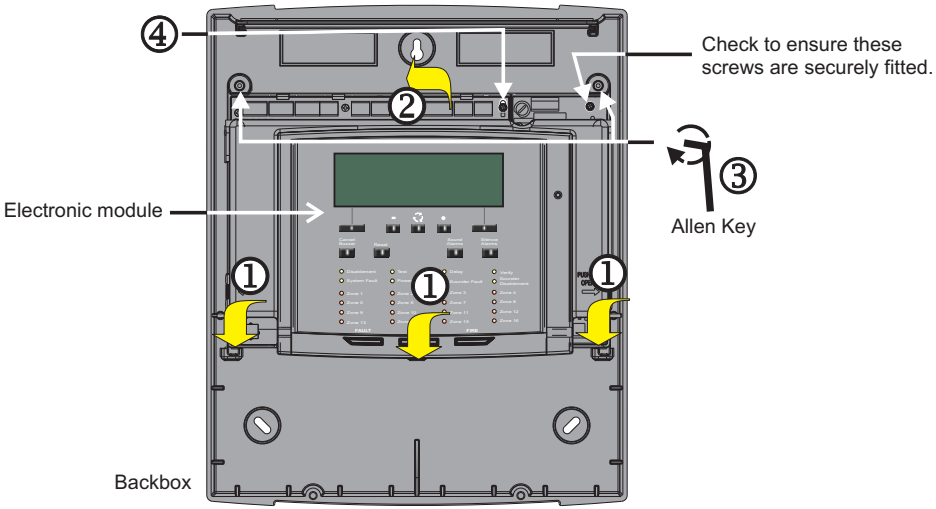
Flush Mounting the backbox

The control panel may be flush mounted using a flush surround NANO-FLUSH.

a Cut out an aperture in the wall to allow the flush surround to be fitted, see diagram for dimension of the aperture.
b Using the fixing holes on the flush surround, secure it into the aperture side walls.
c Route the cables through the cable entry points into the panel and at the same time insert the panel into the flush surround.
d Fit the panel back box to the flush surround using the 3-off 5mm screws not supplied with the flush surround.



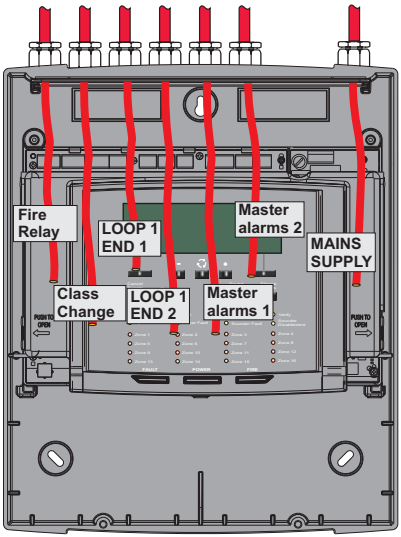
Refitting the electronics module

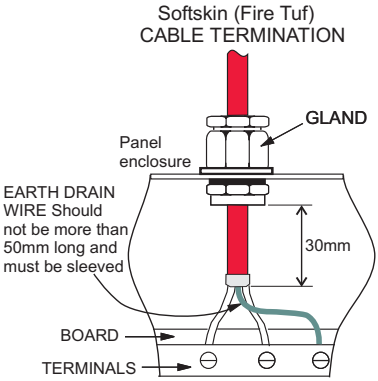


Locate the three tabs of the electronic module ① into the backbox and close the upper part ② of the module into the backbox and then secure the assembly by tightening the two captive screws ③ using the allen key. Ensure the two PCB fixing-screws ④ that provides earth bonding are securely fitted and are not loose.

Cable termination on enclosure

The wire length between the cable termination and point of connection must be as short as possible. Cable earth drain wire, where applicable, must be connected to the respective drain termination point.





Cables that are not required to be connected to terminals must be neatly coiled up and carefully tucked away into the backbox in the space above the electronic module.

Terminate each cable at the dedicated entry point on the enclosure, using the cable manufacturers recommended techniques.

Where the cable is not required to be connected, leave **300mm** (unless otherwise specified) tail wire length and mark each **core** identifying its final point of connection. Where the cable is required to be connected, ensure it is securely fitted to the respective terminal.

Wiring test

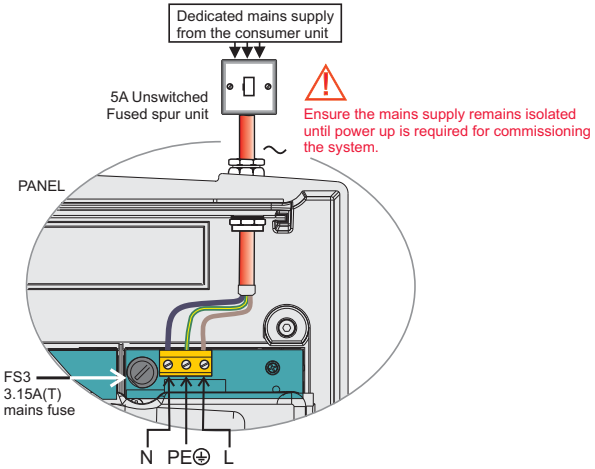
DO NOT undertake high voltage insulation tests WITH THE CABLES CONNECTED to the panel and system device terminals. Such a test may damage the electronics circuitry in loop devices and at the panel.

Mains supply

Ensure that the mains supply cable enters the panel through a dedicated cable entry, located adjacent to the mains terminal block and that is also segregated from loop wiring.

These fire alarm system products are not designed to be powered from IT Power systems.

All mains powered equipment must be earthed. The mains supply to any fire alarm control and indicating equipment must be via an unswitched 5A fused spur unit. A disconnect device must be provided to disconnect both poles and must have a minimum gap of 3mm. The **disconnect device** should be available as part of the building installation and must be easily accessible after installation is complete.



The fused spur isolator cover should be marked:

FIRE ALARM - DO NOT SWITCH OFF

The fire alarm equipment's fused spur unit must be fed from a dedicated switch or protective device at the local mains supply distribution board.

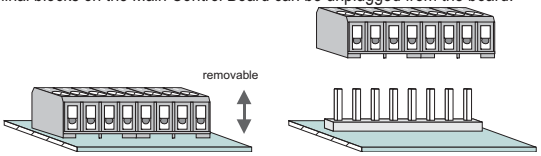
Mains and battery supply connections

The mains and battery supply cables must be installed to a stage to **facilitate the power up** for commissioning, which is carried out by the Servicing organisation.

Where the mains cable is to remain disconnected, its tail ends must be insulated to prevent dangerous conditions arising in the event of accidental switching on of the mains supply.

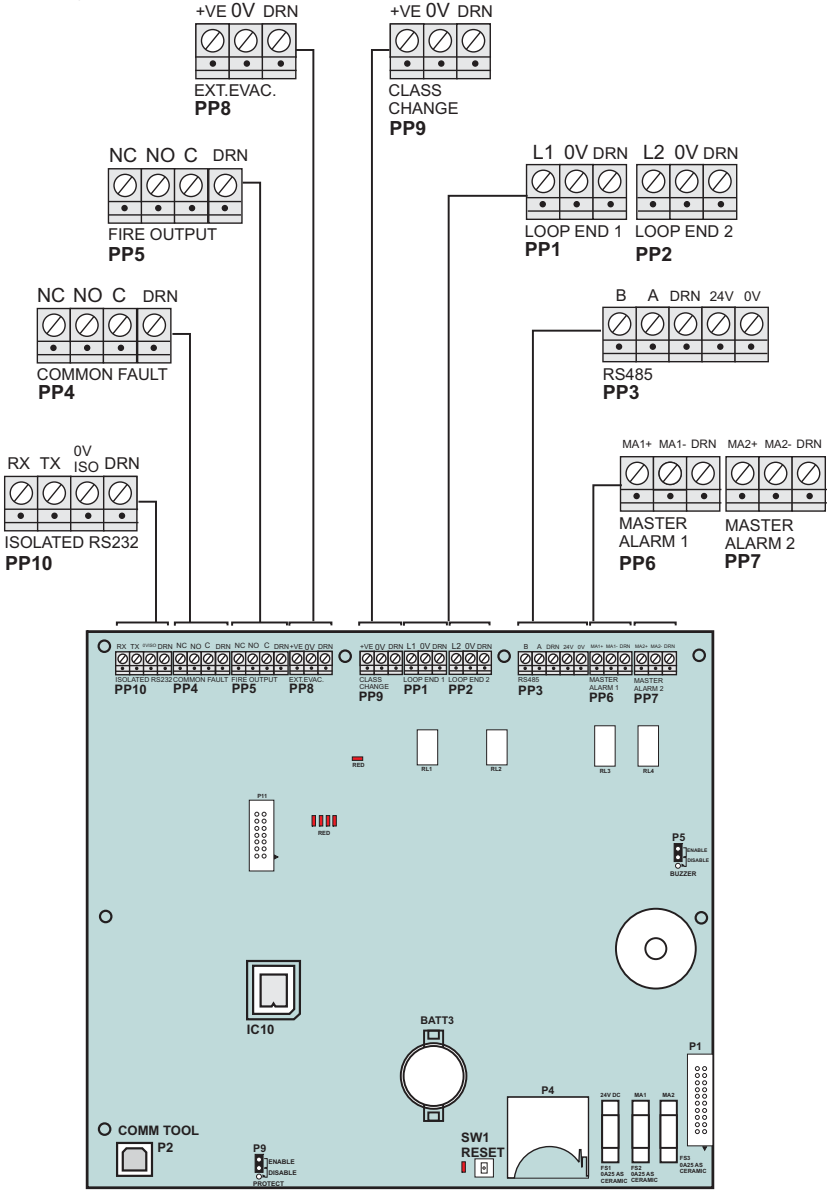
Removable terminal blocks

To ease installation the terminal blocks on the Main Control Board can be unplugged from the board.



Terminals for external circuits on Main Control Board

The Main Control Board (MCB) holds all the terminals for the connection of fire alarm loop circuit, master alarms, fire and fault relays, class change, evacuate input and repeat indicator panel.

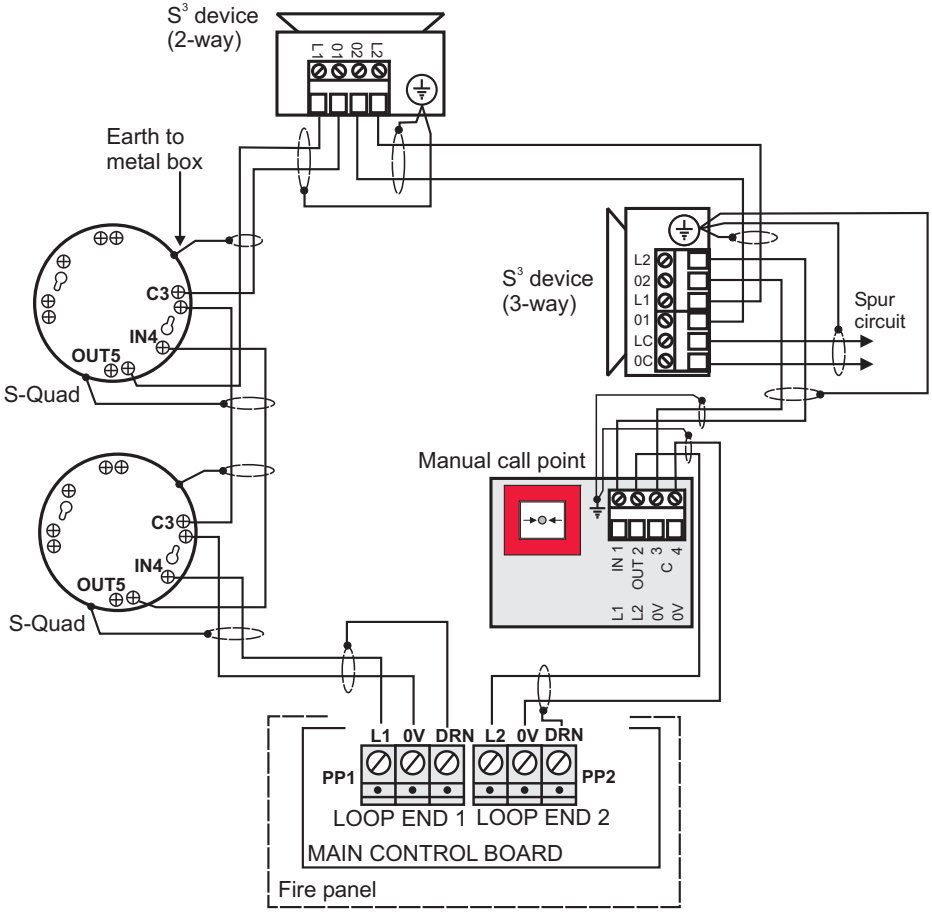


Main Control Board

Device loop circuit

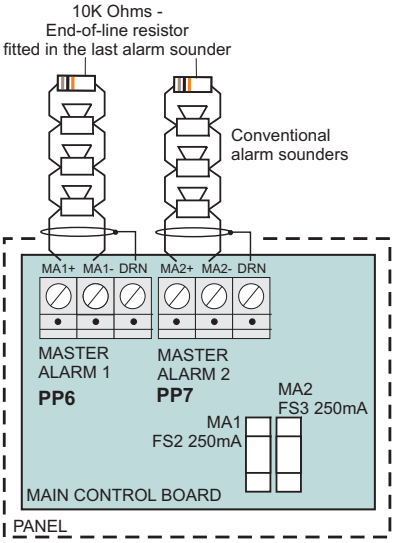
The device loop circuit can accept connection of addressable devices, up to 127 maximum. To maintain earth continuity on the loop, the **loop cable screen** must be continued through each system device, whether the earth is connected to a device or not.

The loop circuit must not cover more than 10,000m² of floor area of a protected site.
A spur circuit must always be taken from the "line common" terminals of a 3-way device.
A spur must not cover more than the equivalent of one zone as defined in BS5839 Part 1.
As every device has a loop isolator, the application of more than 32 devices does not require any special consideration.
Ensure the maximum cable length between loop devices does not exceeded 250m. This is the cable distance between previous and next device on the loop.

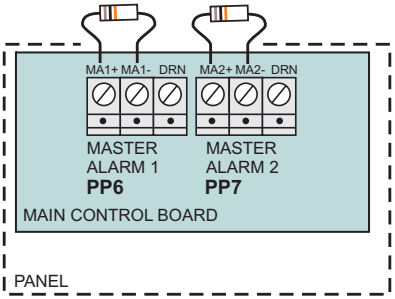


Master alarm circuits

There are two MASTER ALARM circuits that can accept the connection of conventional alarm sounders including the conventional Speech-Sounder-Strobe S-Cubed products.

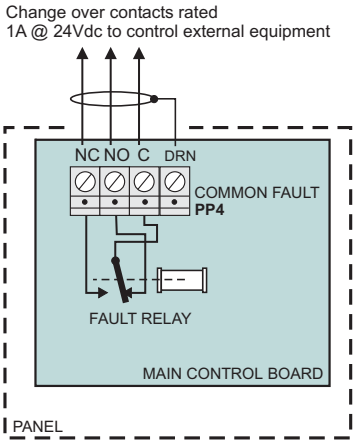


If master alarms are not being used then connect the 10K ohms End-of-line resistors to the master alarm terminals.



Common Fault contacts

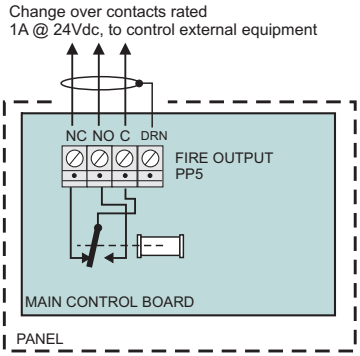
The control panel has a COMMON FAULT relay having voltage free contacts that can be used to signal external equipment. The relay is normally energised and will de-energise on occurrence of a fault event. The relay contacts return to their normal state when the panel has no fault present. The contacts should be powered from an independent power supply, where required.



The fault relay is shown in its normal state with panel powered up and with no active fault.

Fire Output contacts

The control panel has a FIRE OUTPUT relay having voltage free contacts that can be used to switch plant equipment, such as lift control system. The relay is normally de-energised and will energise on occurrence of a fire event. The relay can be configured to operate with a zone immediately or after a delay. The relay will operate with 'External Evacuate' input and on operating the 'Sound Alarms' button if configured during commissioning. The relay operates in the event of a fire event. The contacts should be powered from an independent power supply, where required. The fire output can be used to signal external equipment that in turn signal Alarm Receiving Centre.

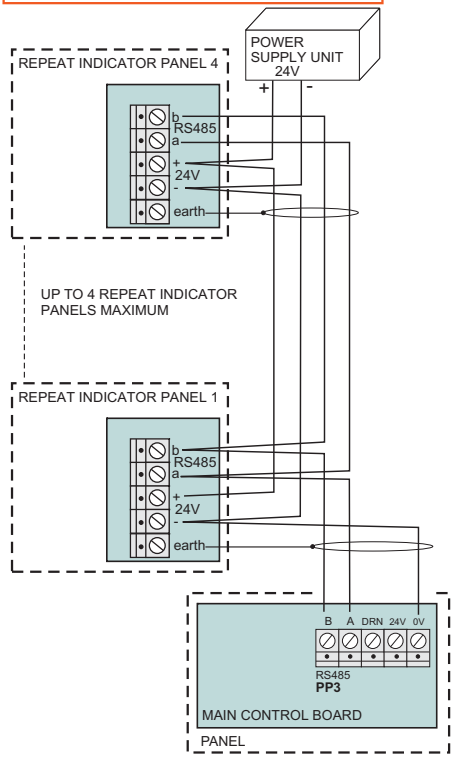


The relay is normally de-energised and operates with a fire event.

Repeat indicator panel

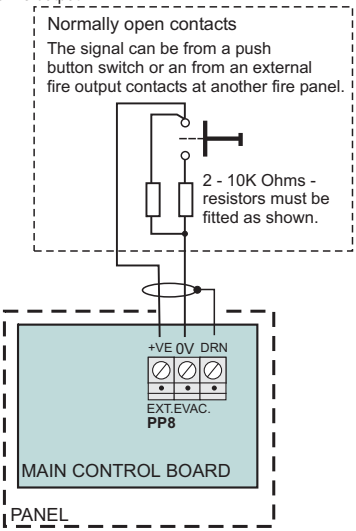
Up to four REPEAT INDICATOR PANELS can be connected directly to the fire panel to its RS485 Port. The furthest repeat indicator panel can be installed a maximum of 1Km cable distance away from the fire panel. The factory default setting assumes there is no repeat indicator panel connected to the RS485 port, the fire panel must be configured during commissioning to know there is a repeat indicator panel installed in the system.

If there is only one repeat indicator panel connected then it is possible to use the 24V supply on the Main control board.



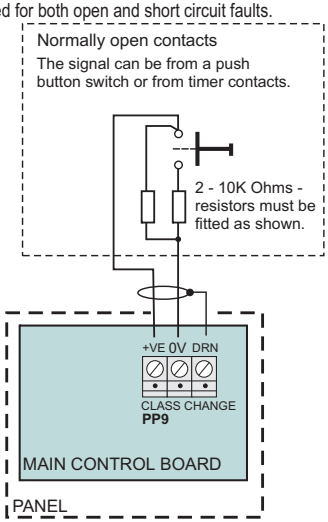
External Evacuation input

The EVACUATION INPUT function is activated on operation of an external switch wired in the manner shown below. The switch can be installed a maximum of up to 100m cable distance away from the fire panel. The wiring is monitored for both open and short circuit faults. If this function is used, it will sound site wide evacuate signal to all the sector alarms and master alarms, plus activate fire output.



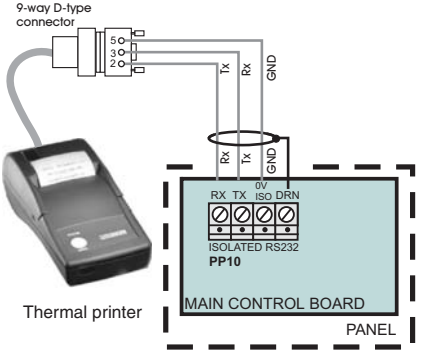
Class Change input

The CLASS CHANGE function, if configured, will sound class change signal to the respective sectors when the external switch is operated. The switch can be installed a maximum of up to 100m cable distance away from the fire panel. The input wiring is monitored for both open and short circuit faults.



RS232 Port

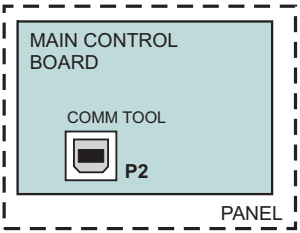
The RS232 port of the fire panel can be configured to allow connection of external printer.



The panel's RS-232 port is set at 9600 baud.

USB Port

The USB port is used to connect to the commissioning tool for ease of configuring the system.



Battery installation

The batteries are fitted inside the backbox and connected up in the manner shown, however the final connection to power up the panel is made during system commissioning, which is done by the servicing organisation.

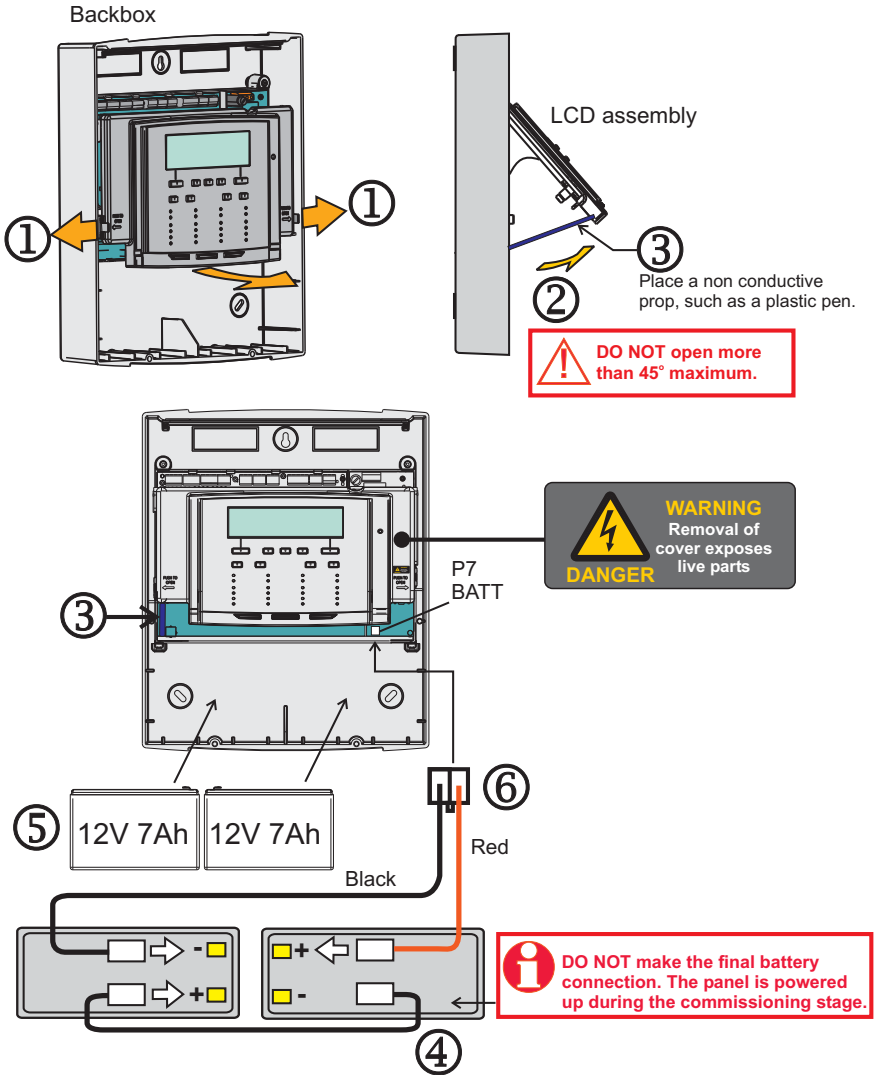
To fit the batteries inside the panel enclosure:

a Open out the two tabs on the electronic module at positions ① and lift open the 'LCD assembly' to an angle 45° maximum ②, use a non conductive prop ③, such as a plastic pen, to keep the 'LCD assembly' open.

b Connect the batteries in the manner illustrated ④ ensuring one of the + connection is left disconnected. Then fit the batteries inside the enclosure as illustrated ⑤ .

c Fit the connector of the battery lead ⑥ to socket P7 on the Power supply unit.

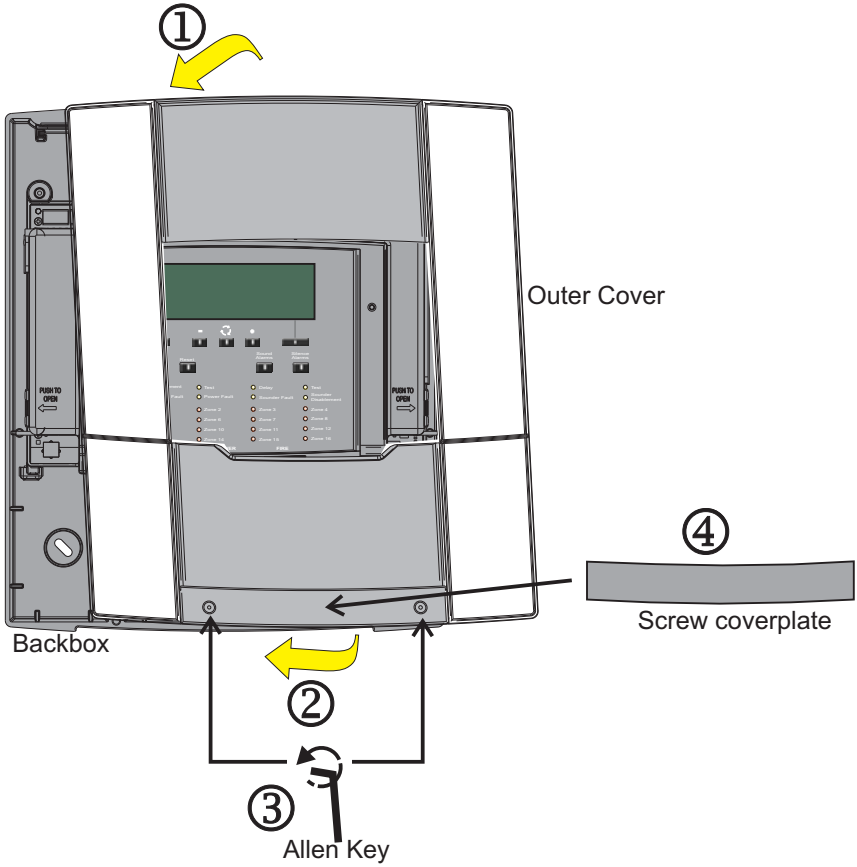
d Remove the prop and close the LCD assembly.



On completion of panel installation

On completion of all cable installation ensure the wires are neatly stored in the space above the electronics module.

Fit the 'outer cover' by hooking it over the top edge ① of the 'backbox' and then close the bottom of the 'outer cover' ② onto the 'backbox' and secure the cover by the captive screws ③ using the allen key. Fit the 'screw cover plate' ④ which is held in place magnetically.



All the remaining parts must be kept in a safe and secure place for the servicing organisation to fit during commissioning of the system.

S-Quad Sensors

The following is information on the S-Quad product range. The S-Quad product integrates dual angle smoke, heat and carbon monoxide gas detection with electronic sounder, speech and LED flasher (Strobe) in one assembly.

General specification

Operating voltage	35V - 41V
Weight	110g (with base - 170g)
Dimensions	117mm diameter by 49.6mm height With base the height increases to 63.8mm
IP rating	IP30 IP20 when mounted on a metal back box
Enclosure	ABS
Colour	RAL 9010
Approval	LPCB approved#
Storage temperature	-20°C to +70°C (for S-Quad with CO -20°C to +50°C)
Ambient operating temperature	-10°C to +50°C
Relative Humidity	95% non condensing (+5°C to +45°C)
Heat (H) Standard	EN54 : Part 5
Optical (O) Standard	EN54 : Part 7
Dual Optical (O^2) Standard	EN54 : Part 7
Sounder (S) Standard	EN54 : Part 3
Gas (CO) Standard *	LPS 1274
Multi sensor standard	CEA 4021

EN54-17 : 2005 (section 4.8) data:

V_{max}	42V	$I_{C\ max}$	0.4A
V_{nom}	40V	$I_{S\ max}$	1A
V_{min}	24V	$I_{L\ max}$	20μA
$V_{SO\ max}$	16V	$Z_{C\ max}$	0.1Ω
$V_{SO\ min}$	8V		

S4-720, S4-780, S4-711, S4-771, S4-711-ST, S4-711-ST-VO, S4-911 and S4-911-ST-VO.

* The 'Gas' sensing is designed to meet the requirements of LPS 1274

Information on minimum sound output levels to include polar dispersion is covered in a technical note TECH7018.033, available on request from manufacturer.

Base

The base has terminals for external cables to allow it to be electrically connected to the panel loop circuit and to the monitored input or output circuit. Any S-Quad device can be plugged into an S-Quad base.

Base Gasket

The optional foam rubber base gasket S4-BASE-GASKET can be fitted to the base to prevent water damage from dripping water from the ceiling.

Base labels

An optional label S4-BASE-LABEL can be fitted to the base. The label can be marked up with device location information.

Indicators

The S-Quad has a red LED that gives an indication in the event of a fire. The LED can be configured to flash periodically, as an 'in operation' confirmation, this indication is given system-wide at all S-Quads. The S-Quad with a CO sensor also has a blue LED to indicate when a fire signal senses the presence of CO.

Dust Cover

A dust cover is supplied with the S-Quad, to prevent dust from building work contaminating the sensor. The cover is removed prior to the commissioning of the fire alarm system.

Do's and Don't

DO NOT locate smoke detectors where products of combustion may be present such as kitchens, garages, furnace rooms, welding shops etc.

DO NOT locate heat detectors above boilers or heaters or where the temperature is normally very high or liable to sudden fluctuations.

DO NOT locate smoke or heat detectors: -

- **In dusty or dirty environment.**
- **Near heating or air-conditioning grilles.**
- **Outdoors in stables, sheds etc.**
- **In excessively damp areas.**
- **In dead air spaces at the junctions of ceilings and walls.**
- **At ceiling locations where a 'thermal barrier' may exist.**

DO NOT locate a CO detector: -

- **In buildings where farm animals are kept.**
- **In excessive damp areas.**
- **In battery room where non sealed batteries are kept.**
- **In a Car park where exhaust fumes will be present.**

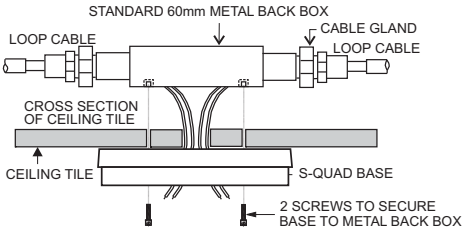
Follow recommendations detailed in section 22 of BS5839 : Part 1 : 2002.

Siting

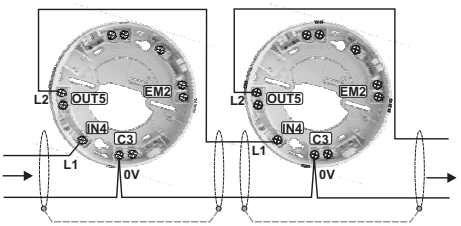
A S-Quad device plugs into a dedicated Base that is installed in the protected premises. The Bases should be sited in locations as defined by the project plans and by BS5839 : Part 1 : 2002.

Metal back box

A metal back box must be used for base or semi-flush mounting. The earth continuity must be maintained throughout the whole loop. The earth must be securely connected to the back box.



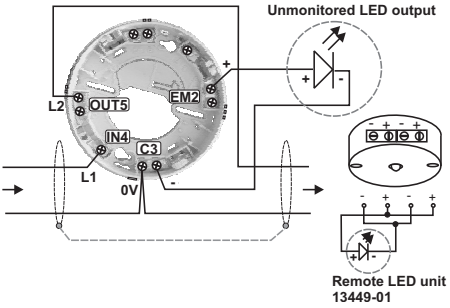
In - Out wiring to S-Quad bases

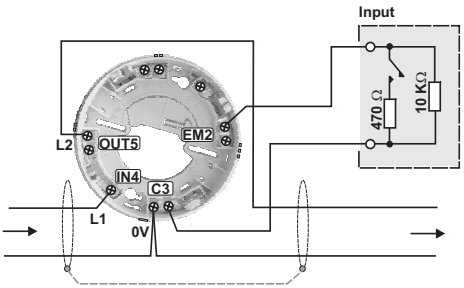


Programmable input/output

All S-Quad devices can be configured as either monitored input or unmonitored output. The factory setting of the programmable input / output is unmonitored output, to drive an external repeat LED without a series resistor.

There is a maximum cable length limit of 15 metres from the S-Quad base to the external I/O Unit.





The input can accept signals such as fire, non fire or fault, these are configured during commissioning. As a fire input it is possible to connect a conventional Manual Call Point (non UK application only) with a series resistor of value 470 Ohms coupled with an end-of-line 10Kohms resistor. In this case the fire input is fully monitored for open or short circuit faults.

The input can be setup as a non-fire or fault input using a similar arrangement with series and parallel resistors as shown. It is possible for such an input to trigger a command that is configured to action an output elsewhere in the system to control plant equipment such as the ventilation system.

Tools for S-Quad

An extractor tool allows removal and fitting of the S-Quad device head into the base. By fitting a screw-on adaptor, the tool can be used to remove the sensor dust cover.

To remove an S-Quad

Fit the tool onto the S-Quad. Turn S-Quad anticlockwise until it stops and remove the S-Quad from the base.

To fit an S-Quad

Fit the S-Quad on to the tool. Offer S-Quad to base and rotate clockwise until it moves upwards on to the base and rotate it again until it clicks and goes no further, the lines on the base and S-Quad will align.

To fit a dust cover

Place the dust cover onto the tool inside the cradle. Offer the cover to the S-Quad, locate and push to fit it onto the assembly. Withdraw the tool when the dust cover is in place.

To remove a dust cover

A dust cover remover tool must be fitted to the main tool to extract the dust cover. Press the pad of the dust cover remover tool onto the dust cover, this creates an air tight grip, to allow the cover to be pulled off from the S-Quad.

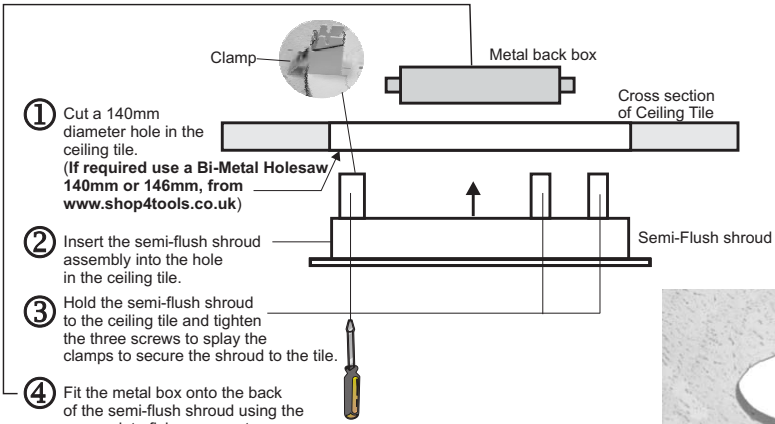
S-Quad Semi-flush fixing kit (S4-FLUSH)

An S-Quad device can be semi-flush mounted to a ceiling tile to a depth of the approximate 20mm, which is slightly deeper than the base assembly. To semi-flush mount a special housing must be used, which consists of a main assembly and a trim ring.

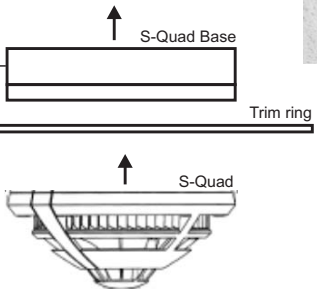
There is an enhanced volume output of sound and speech from a semi flush mounted S-Quad.

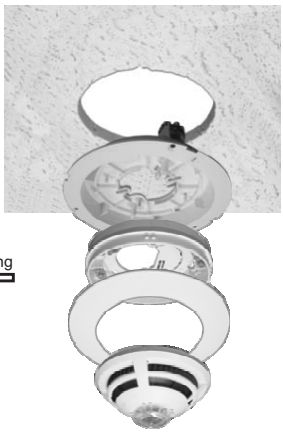
Technical data

Weight	164g with trim ring
Dimensions	174mm diameter by 50mm depth
Enclosure	ABS
Colour	RAL 9010
Storage Temperature	-20°C to +70°C
Ambient temperature	-10°C to +50°C
Relative Humidity	95% non condensing (+5 to +45°C)



1. Cut a 140mm diameter hole in the ceiling tile. (**If required use a Bi-Metal Holesaw 140mm or 146mm, from www.shop4tools.co.uk**)
2. Insert the semi-flush shroud assembly into the hole in the ceiling tile.
3. Hold the semi-flush shroud to the ceiling tile and tighten the three screws to splay the clamps to secure the shroud to the tile.
4. Fit the metal box onto the back of the semi-flush shroud using the appropriate fixing screws to secure the box to the flush shroud.
5. Locate the S-Quad Base into the semi-flush shroud, such that the two locating pillars on the shroud feeds through the two elongated holes on the Base. Push the Base into the shroud until the Base click locks into the shroud.
6. Make the cable connections.
7. Offer the trim ring to the shroud and slowly rotate ring clockwise until it clicks and goes no further. This will lock the ring in position.
8. Offer the S-Quad to the Base and rotate the S-Quad clockwise until it moves upwards into Base, and then rotate the S-Quad again until it clicks and goes no further.





Do not over tighten the clamping screws as this will cause the clamps to cut into the ceiling tile.

Nano system parts

This section lists all the parts that can be used in a nano system. For further details on the availability of the parts, contact your supplier.

Control Panel

NANO-24	Nano Control panel c/w 2-12V 7Ah batteries for 24hr standby - supplied
NANO-FLUSH	Flush Surround for the Nano Control panel

Printer

PRINTER-HAND	Handheld serial thermal printer
PRINTER-H-PAPER	Thermal paper for the handheld printer

S-Quad

The latest S-Quad publications lists the product range. These publications can be downloaded from www.gentexpert.co.uk by registered users.

Notes

Notes

WEEE Directive:
At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre.
Do not dispose of with your normal household waste. Do not burn.

At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre and in accordance with national or local legislation.

CE

0832

Gent by Honeywell
Hamilton Industrial Park, 140 Waterside Road, Leicester LE5 1TN, UK
0832-CPD-1257

NANO-24

EN54-2: 1997, A1:2006
Control and Indicating equipment for fire detection and fire alarm systems in buildings.
7.8 Output to fire alarm devices
7.11 Delays to action outputs
8.3 Fault signals from point
10 Test condition
EN54-4: 1997, A1:2002, A2:2006
Power supply equipment for fire detection and fire alarm systems in buildings.

GENT by Honeywell
Hamilton Industrial Park, Waterside Road, Leicester LE5 1TN, UK
Website: www.gent.co.uk
Telephone +44 (0) 116 246 2000
Fax (UK): +44 (0)116 246 2300