GENT
by Honeywell

Data and Installation Instructions

Nano panel-based
Fire detection and alarm system



nano

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Preface

This is the fifth 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.

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 *BS5839:Part 1:2002*, which is the *code of practice relating to fire detection and alarm systems for buildings.* The installer must follow the relevant parts of *BS7671 : 1992 Requirements for Electrical installations, 17th edition of IEE wiring regulations* if installation is in the United Kingdom, UK.

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 : 2002*. 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

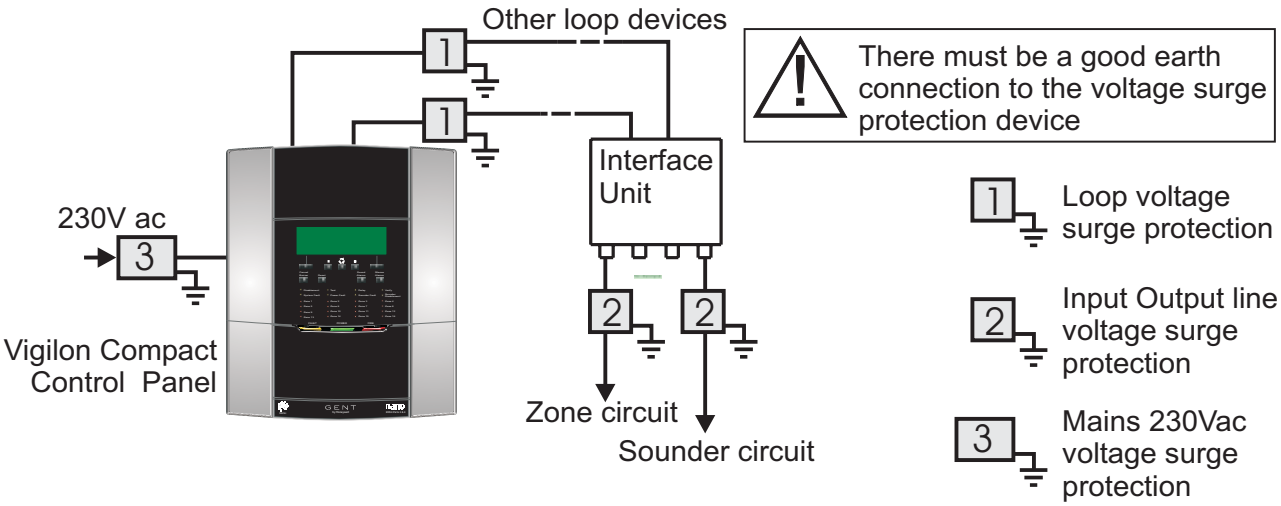
If instructed, the installer may need to terminate as well as connect the cables to the appropriate terminal blocks.

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 : 2002 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 cables

- ☐ Mineral insulated cable (MICC) to BS6207:Part 1
- ☐ Approved Enhanced cable:
  Draka Firetuf Plus Enhanced **FTPLUS2EH1.5RD**

Standard cables

Approved EMC cables for loop wiring

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

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 tool 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-XX (Low profile range)	Strobe Red / Amber Strobe White	10 23	100 40
S3-SN-X (low profile range) S3IP-SN-X (low profile range) S2IP-SN-X/XX (system range)	Standard tone	5	127
S3-VP-X (low profile range) S3IP-VP-X (low profile range) S2IP-VP-X (system range)	Standard tone with speech Complex tone 'Tone n' with speech	5 15	127 55
S3IP-VP-ST-XX (low profile range)	Standard tone with red strobe + speech Complex tone 'Tone n' with red strobe	16 23	80 40
S3IP-SN-ST-WA (low profile range)	Standard tone with red or amber strobe	10	80
S3IP-SN-ST-RW(low profile range)	Standard tone with white strobe	28	25
S4-34410 S4-34450 S4-34420	1 - LV Input interface module 4 - LV Input/Output interface module 1 - LV Output Interface module Switch Input Relay Output Zone Input Every LED Output	 1 2 26 5	 127 127 32 100
S4-34410 or S4-34415	1 - MV Output Interface module	5	127
S4-34440-12	New Mains powered interface	1	8
34440	Old Mains powered interface	4	
S4-720	Heat Sensor	0.5	127
S4-780	Heat Sensor & Sounder	7 - 13*	127 - 70*
S4-720-ST-VO	Heat Sensor, Speech & Strobe	17 - 25*	60 - 40*
S4-715	Optical Sensor	0.5	127
S4-710	Optical Heat Sensor	0.5	127
S4-770	Optical Heat Sensor & Sounder	6 - 12*	127 - 80*
S4-711-VO	Dual Optical + Heat Sensor & Speech	8 - 15*	120 - 60*

Device code number	Description	Load factor per device	Maximum devices per loop
S4-711	Dual Optical Heat Sensor	0.5	127
S4-711-ST	Dual Optical Heat Sensor & Strobe	10	127
S4-771	Dual Optical Heat Sensor & Sounder	7-12*	127 - 80*
S4-711-ST-VO	Dual Optical Heat Sensor, Speech & Strobe	16-24*	60 - 40*
S4-911	Dual Optical Heat Sensor & CO	0.5	127
S4-911-ST-VO	Dual Optical Heat Sensor CO, Speech & Strobe	16-24*	60 - 40*
34800-EN	Manual Call Point	1	127
S4-34760	Venturi-Air Duct Kit	0.5	127
34740	Beam sensor pair	3 per pair	8 pairs
S4-34740	Beam sensor pair		
S4-34800	Manual call point	1	127
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.

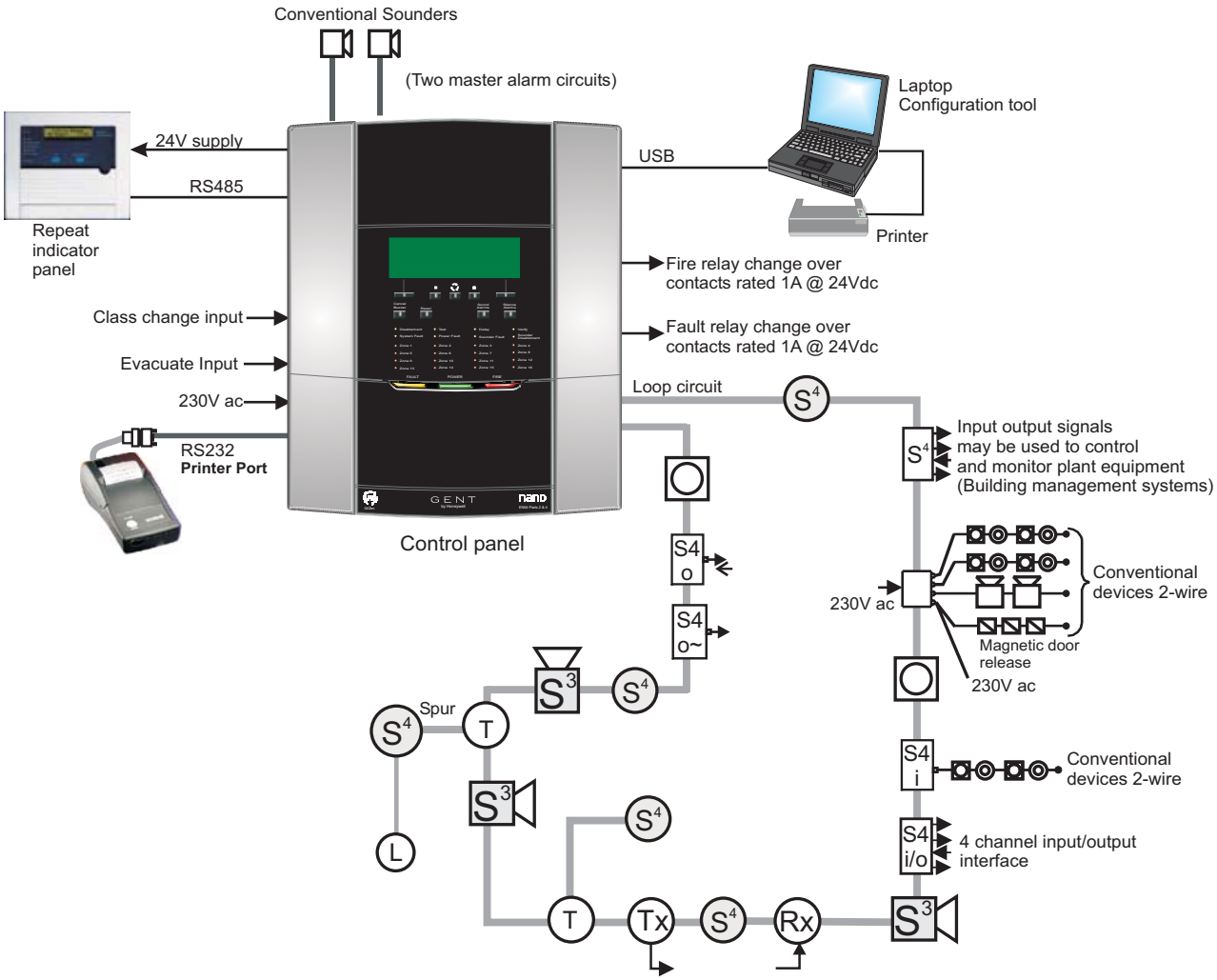
* - These values are applicable when sounder is operating in turbo mode or with bell tone.

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 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.

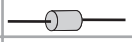
Power supply

Standard	Designed to EN54-4 : 1997
Mains supply voltage and fuses	230V 50Hz 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

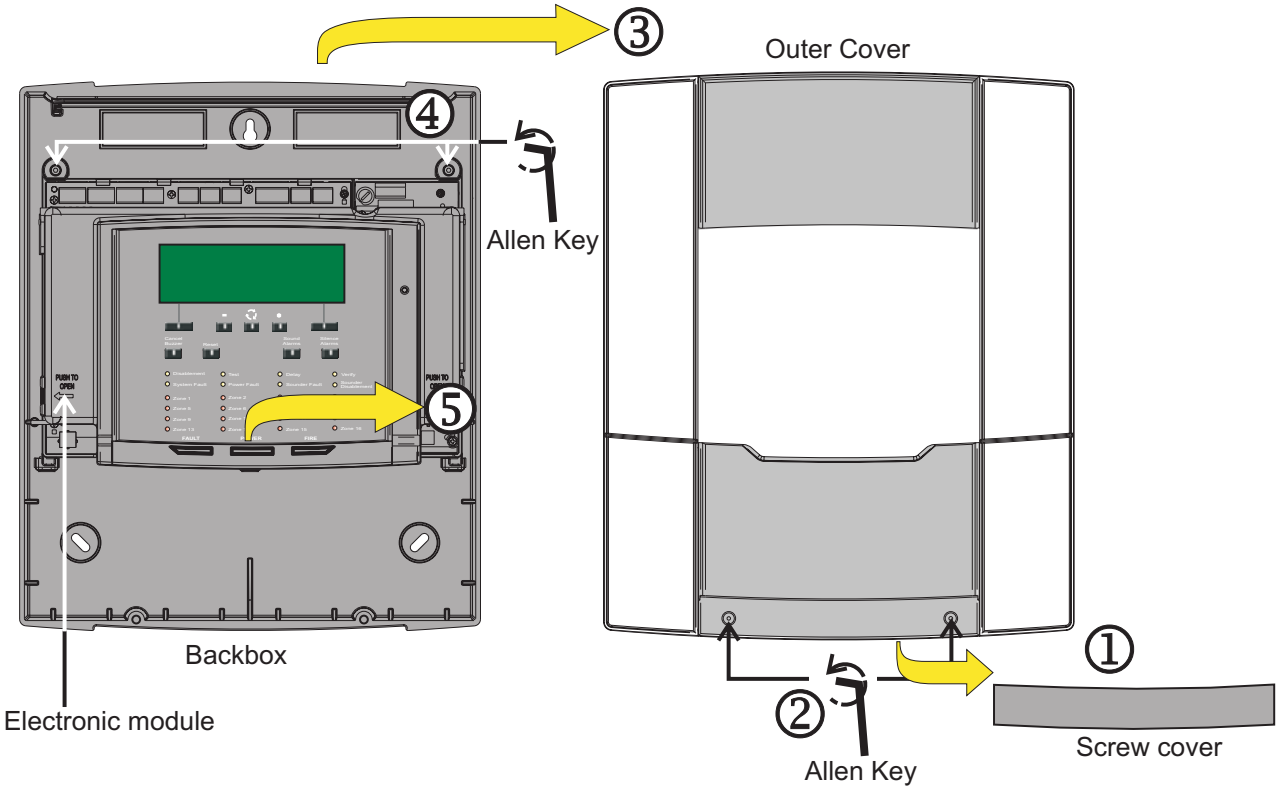
- part supplied in a plastic bag fitted to the enclosure.

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'.

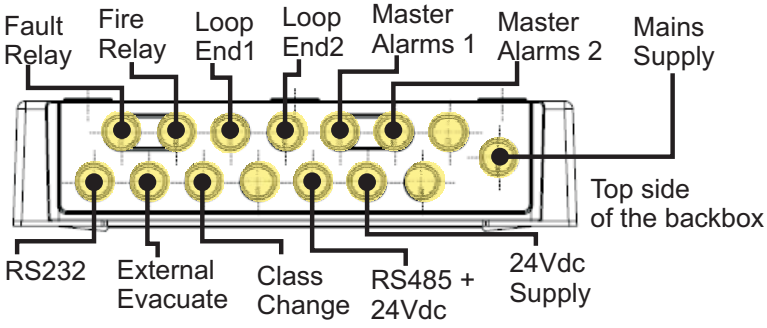


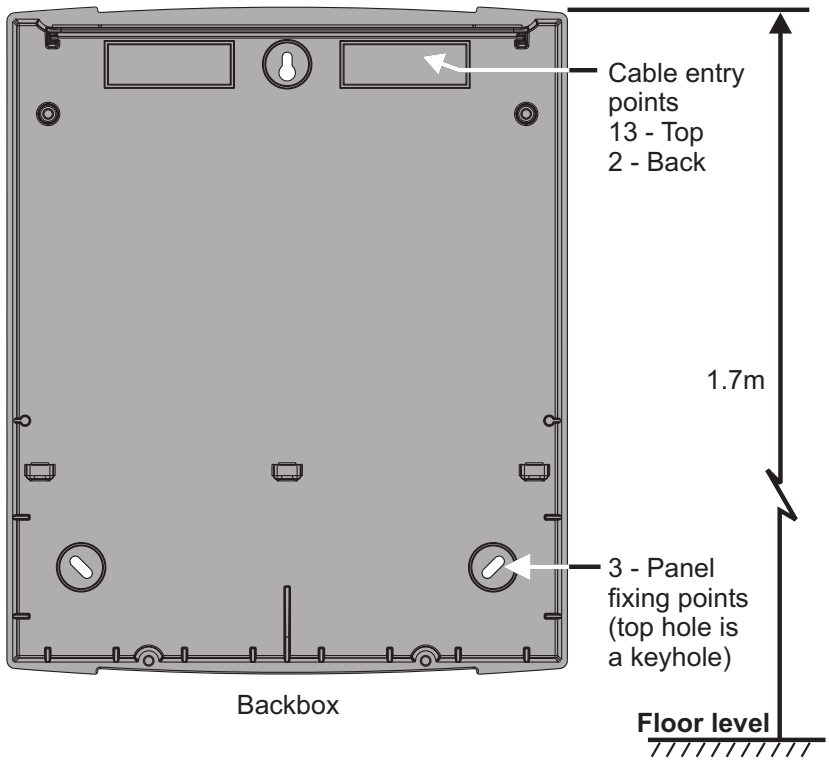
How to mount the backbox and dedicated cable entry points

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.

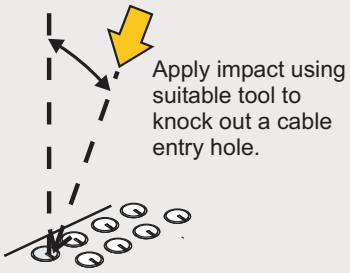
Dedicated Cable entry points





How to knock out cable entry points

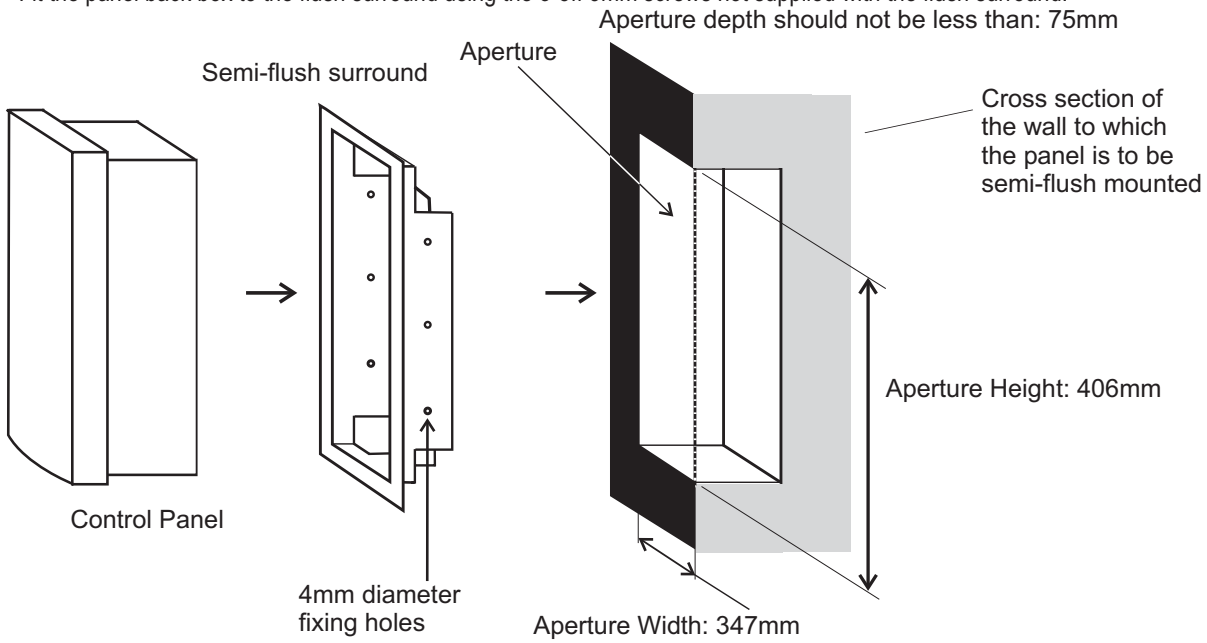
15° - 20° maximum



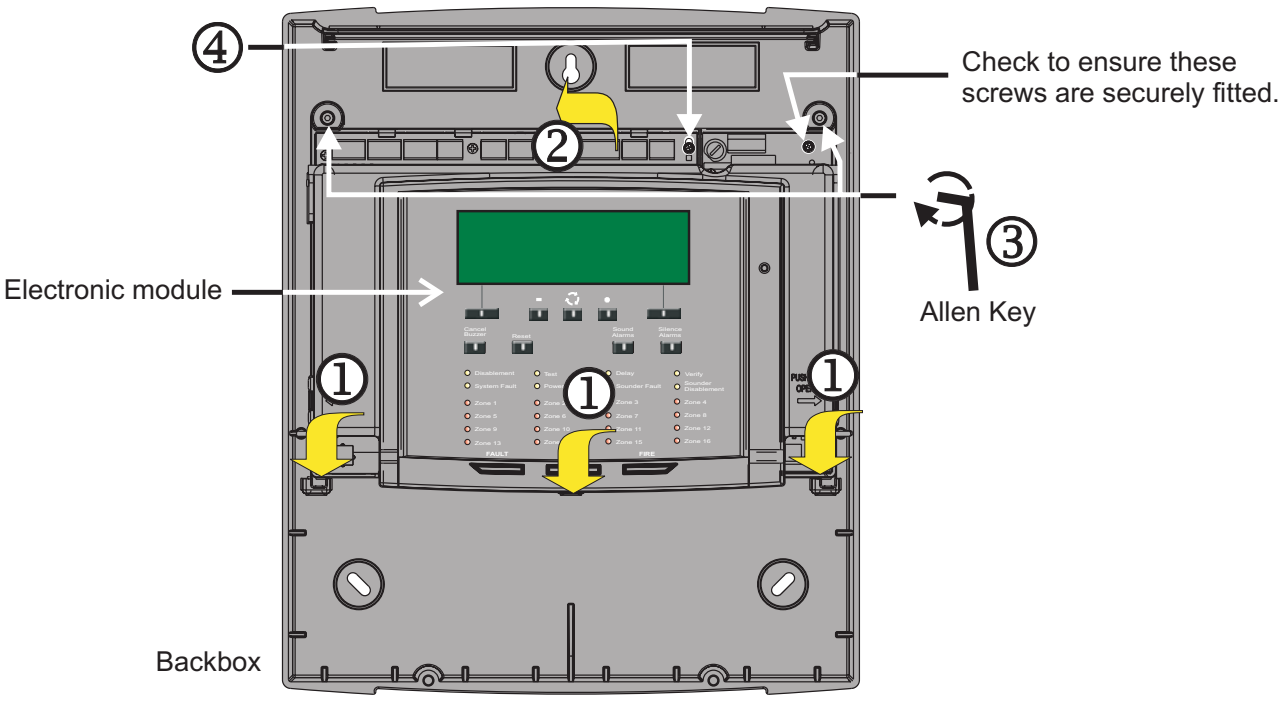
Flush Mounting the backbox

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.



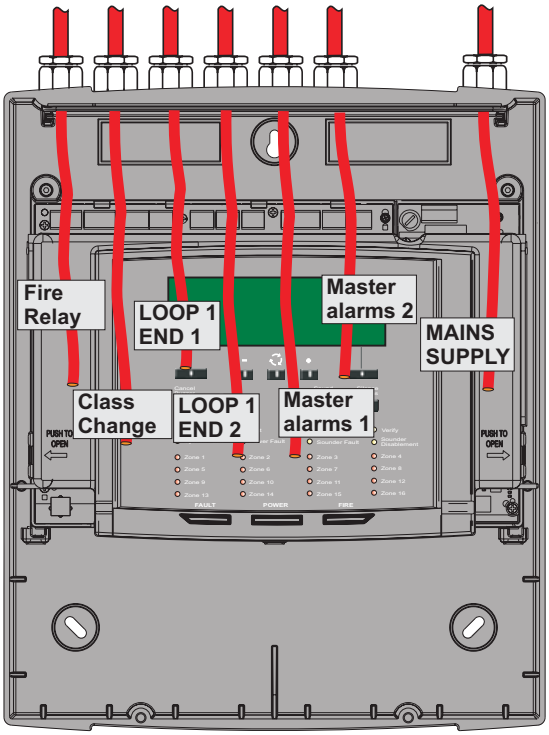
Refitting the electronics module

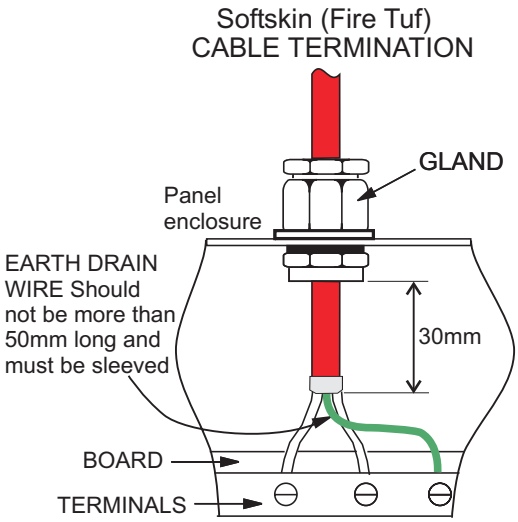


Locate the three tabs of the electronic module ① into the backbox and close the upper part ② of the module into the backbox and then secure the assembly by tightening the two captive screws ③ using the allen key. Ensure the two PCB fixing-screws ④ that provides earth bonding are securely fitted and are 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

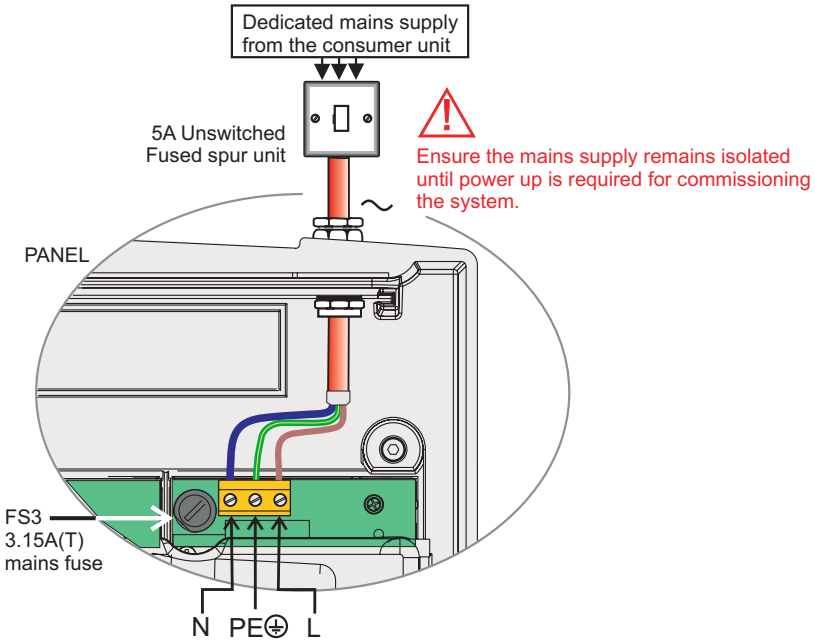
DO NOT undertake high voltage insulation tests WITH THE CABLES CONNECTED to the panel and system device terminals. Such a test may damage the electronics circuitry in loop devices and at the panel.

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.

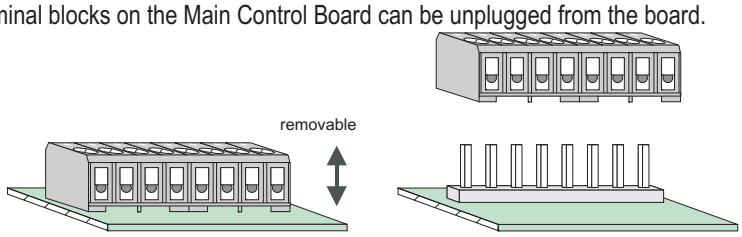
Mains and battery supply connections

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.

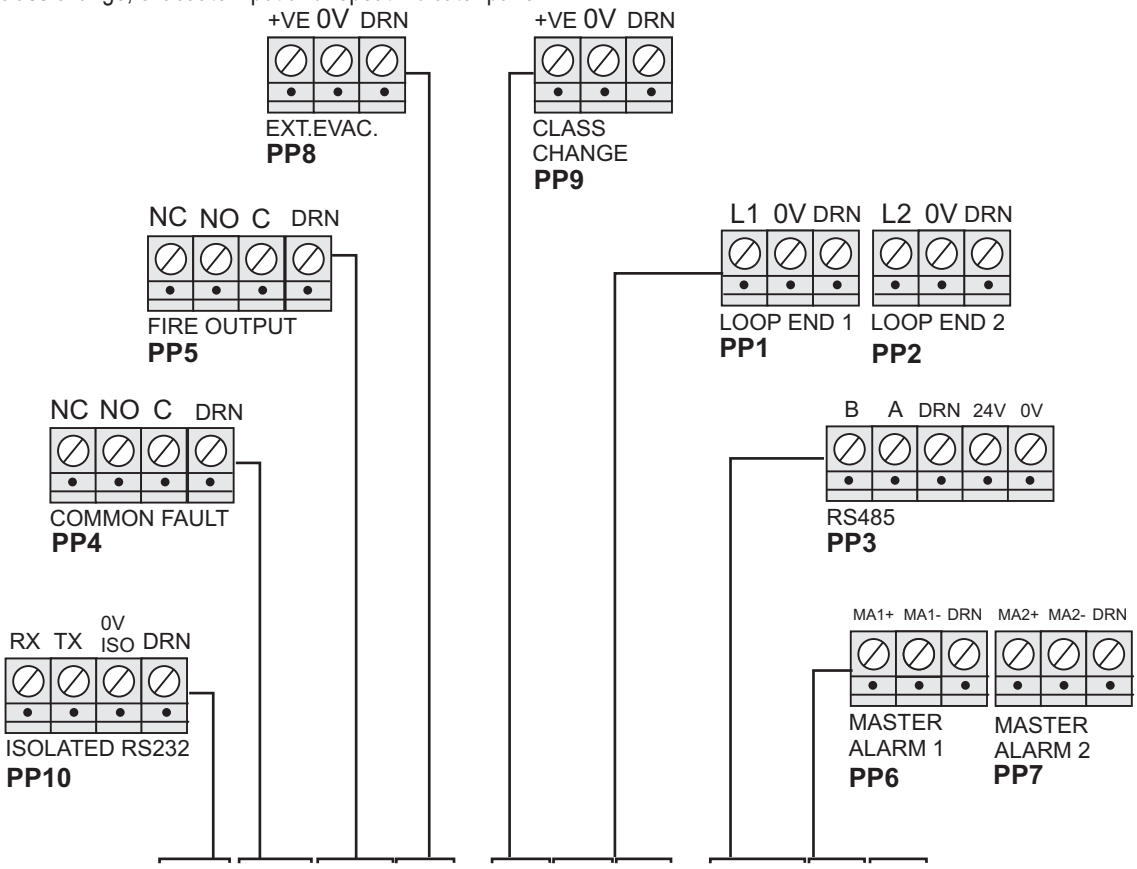
Removable terminal blocks

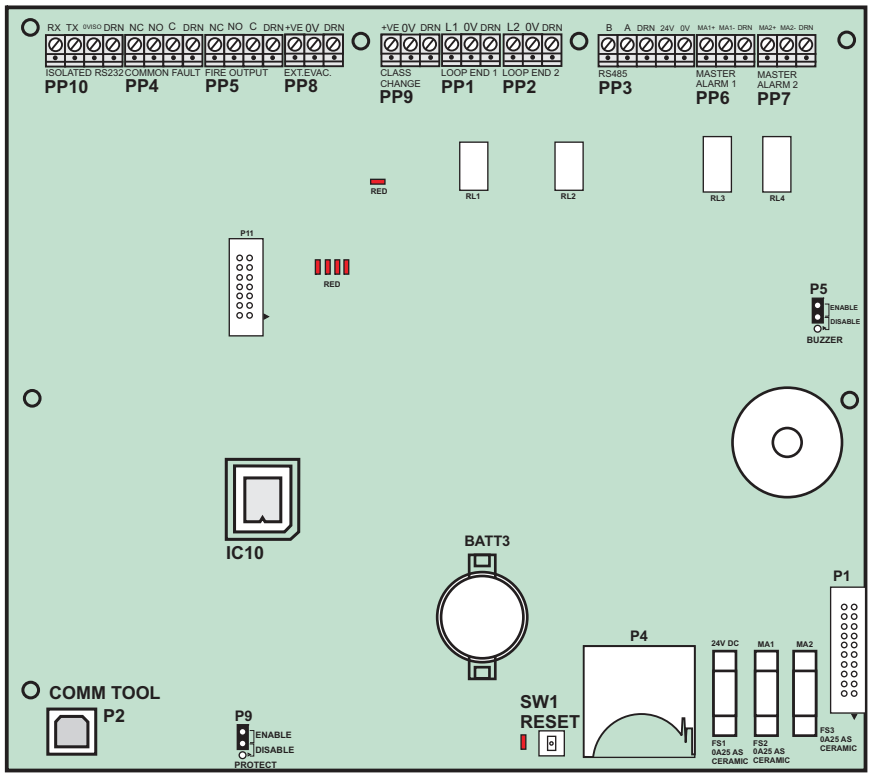
To ease installation the terminal blocks on the Main Control Board can be unplugged from the board.



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.



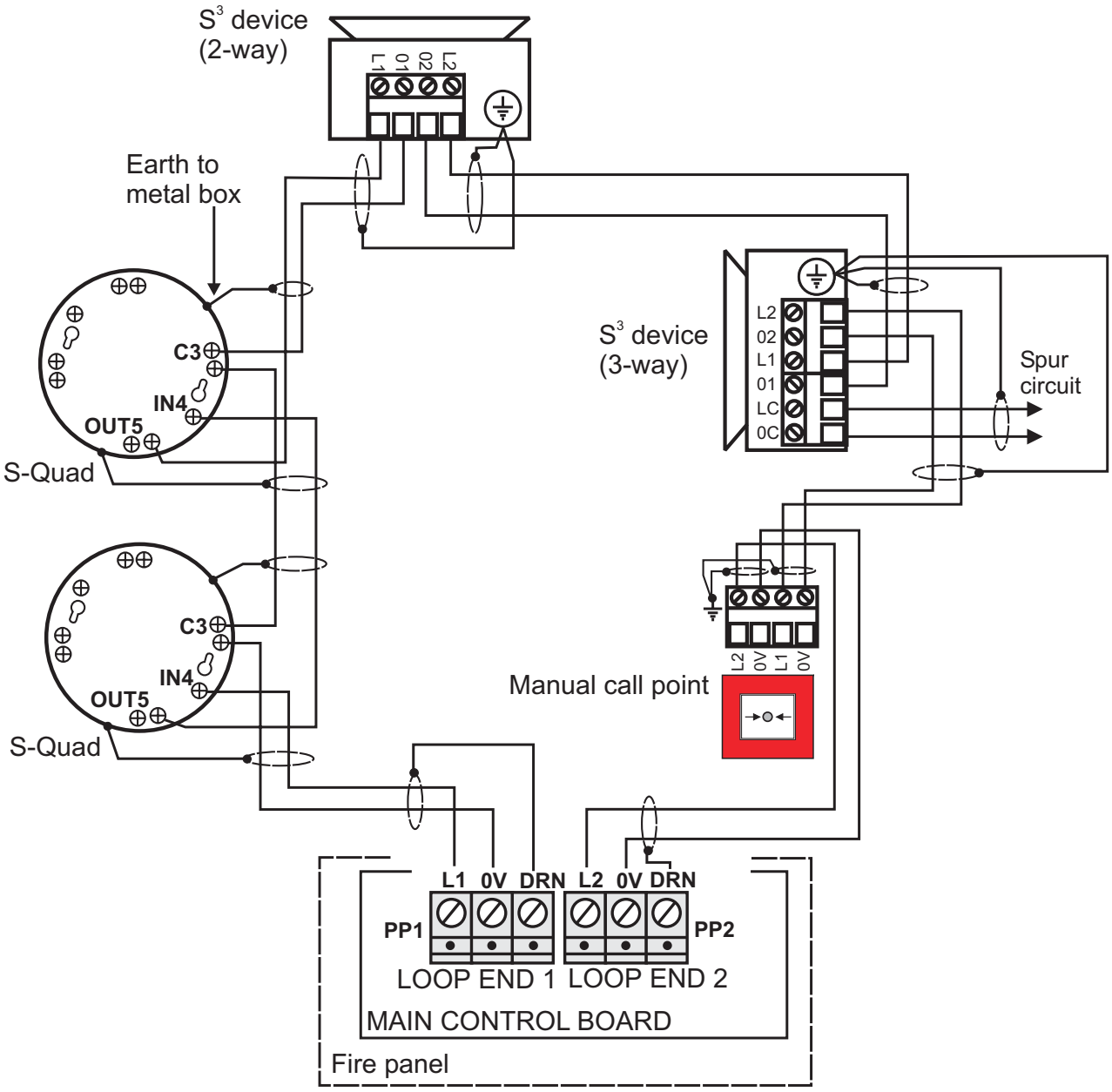


Main Control Board

Device loop circuit

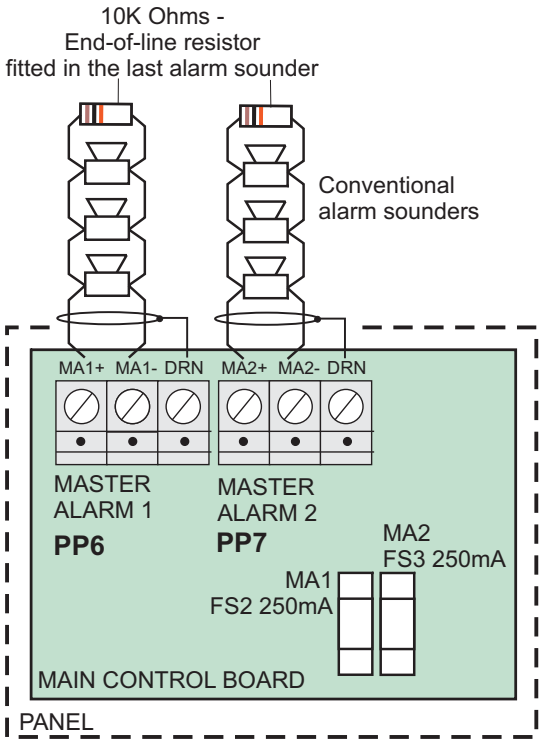
The device loop circuit can accept connection of addressable devices, up to 127 maximum. To maintain earth continuity on the loop, the **loop cable screen** must be continued through each system device, whether the earth is connected to a device or not.

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.

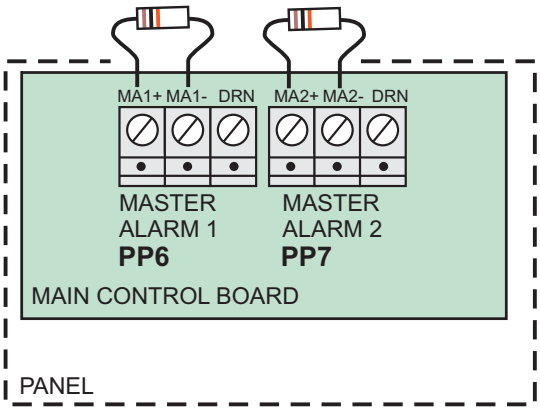


Master alarm circuits

There are two MASTER ALARM circuits that can accept the connection of conventional alarm sounders including the conventional Speech-Sounder-Strobe S^3 products.

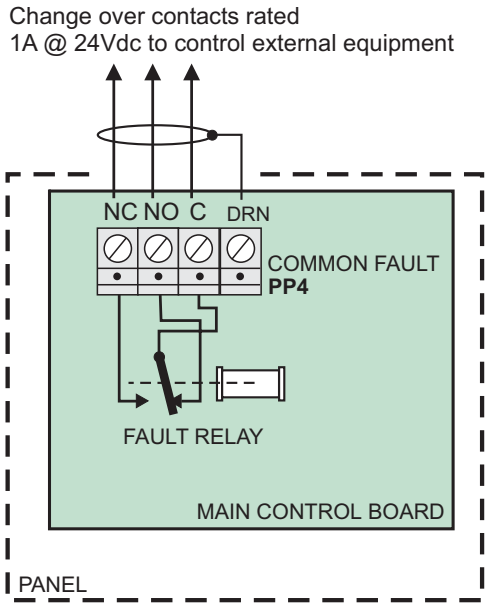


If master alarms are not being used then connect the 10K ohms End-of-line resistors to the master alarm terminals.



Common Fault contacts

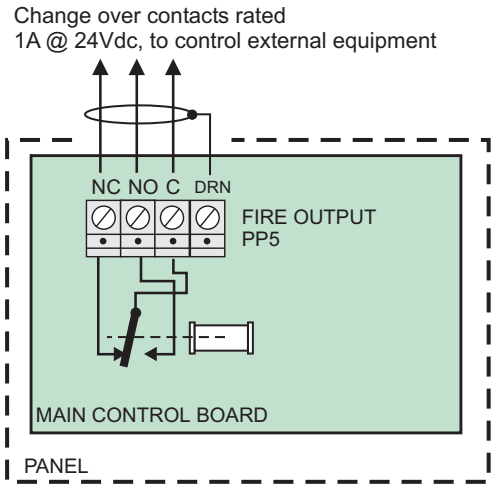
The control panel has a COMMON FAULT relay having voltage free contacts that can be used to signal external equipment. The relay is normally energised and will de-energise on occurrence of a fault event. The relay contacts return to their normal state when the panel has no fault present. The contacts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

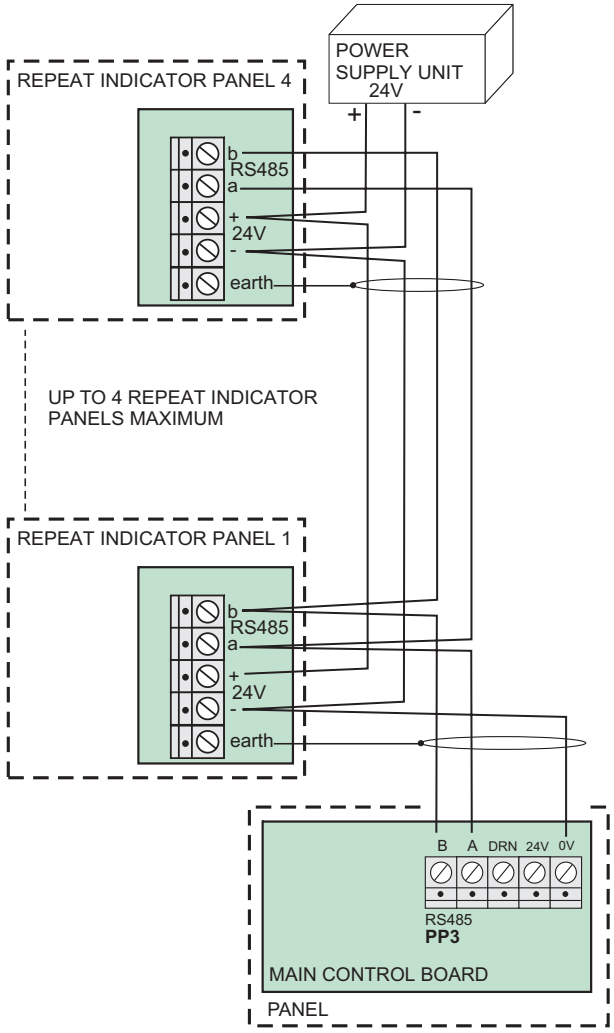


The relay is normally de-energised and operates with a fire event.

Repeat indicator panel

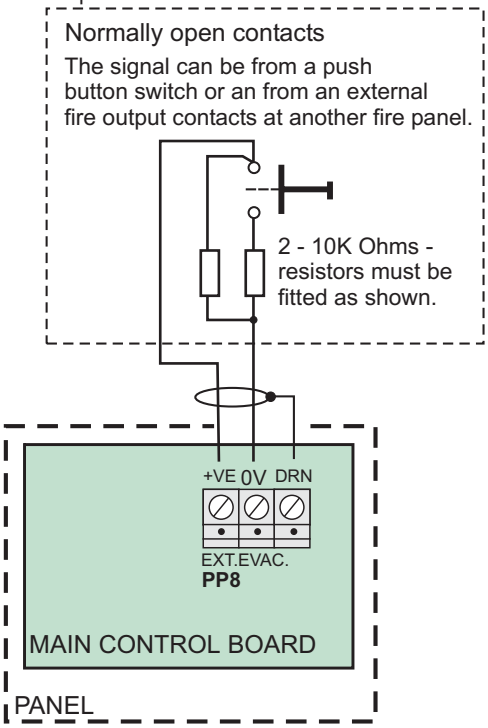
Up to four REPEAT INDICATOR PANELS can be connected directly to the fire panel to its RS485 Port. The furthest repeat indicator panel can be installed a maximum of 1Km cable distance away from the fire panel. The factory default setting assumes there is no repeat indicator panel connected to the RS485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



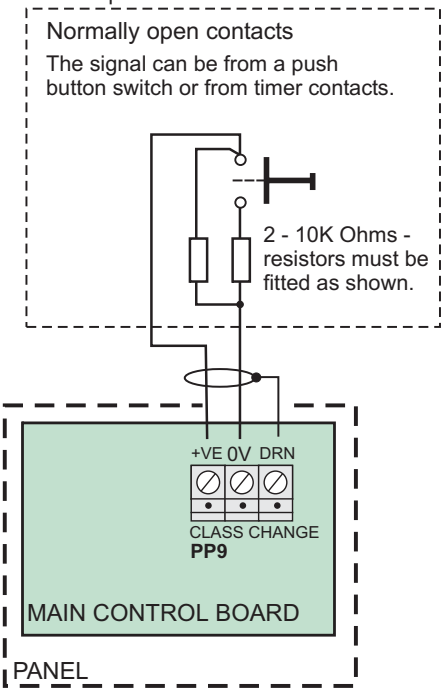
External Evacuation input

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.



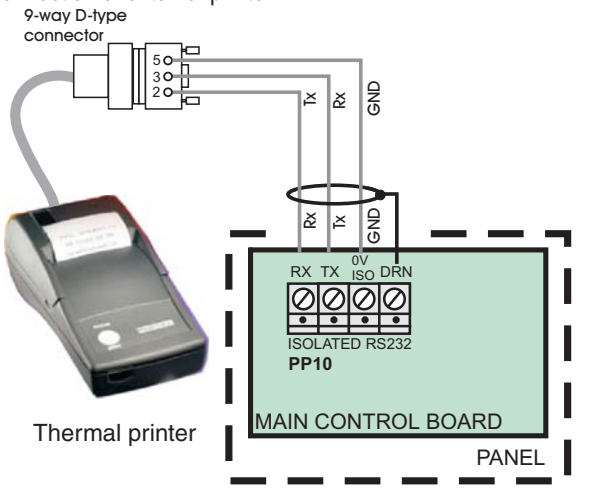
Class Change input

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

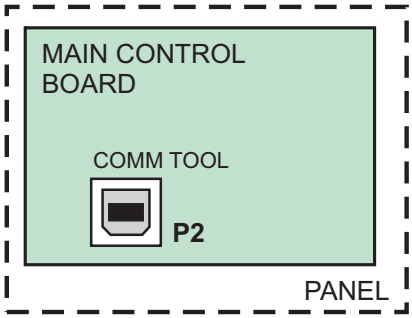
The RS232 port of the fire panel can be configured to allow connection of external printer.



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.

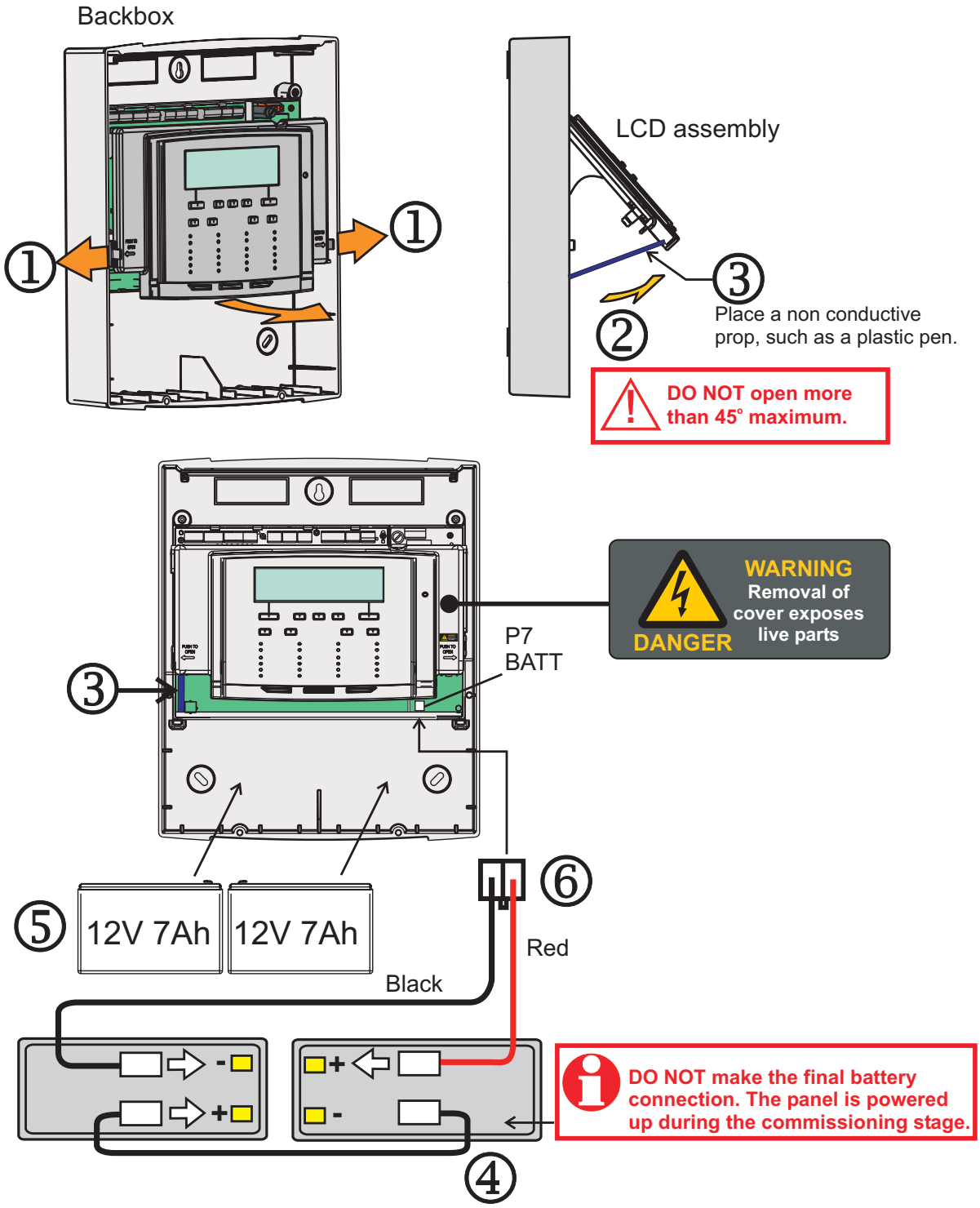
To fit the batteries inside the panel enclosure:

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.

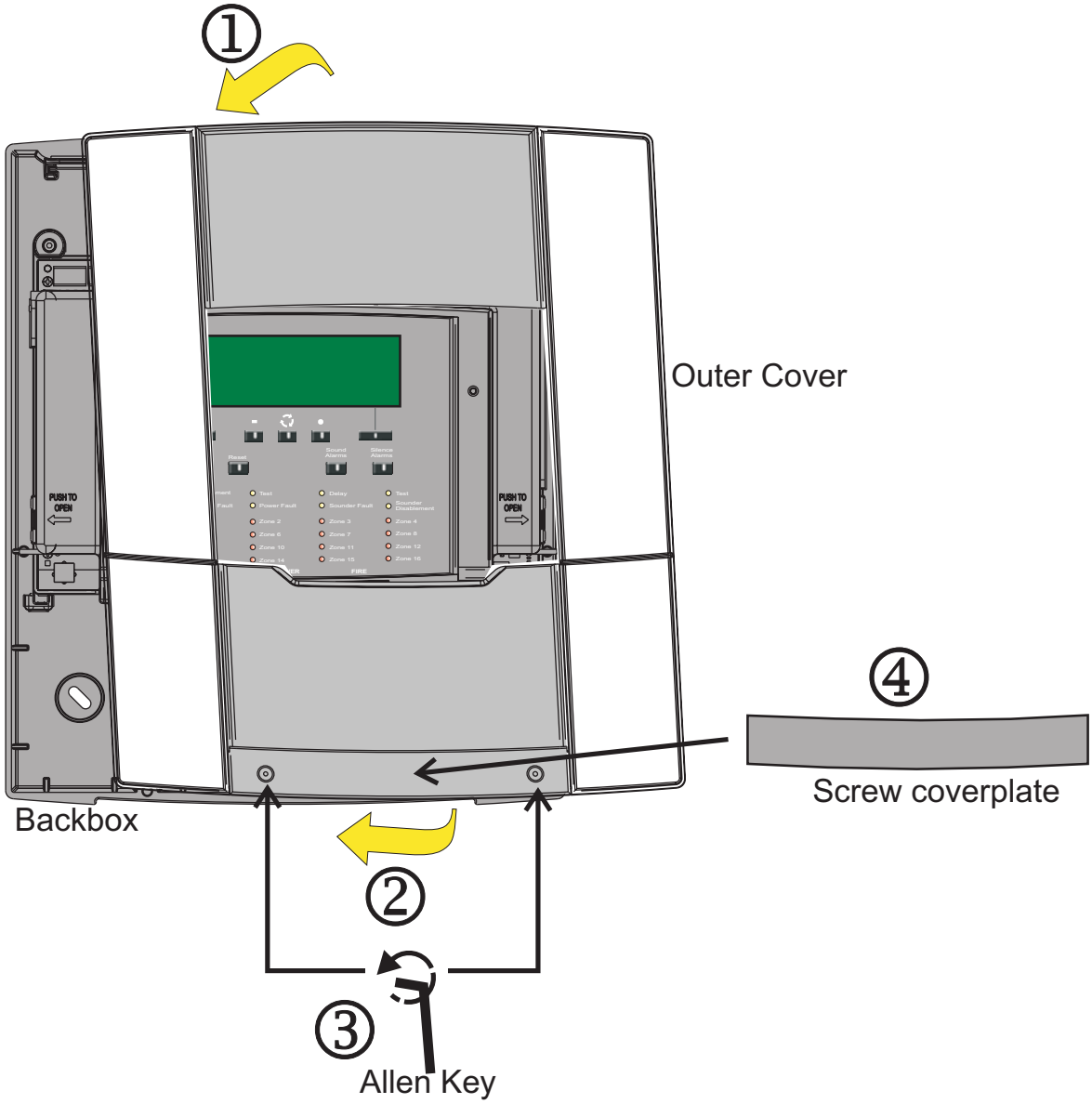
d Remove the prop and close the LCD assembly.



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.

Repeat Indicator panel

The repeat indicator panel provides messages and indications of system events and connects directly to the fire panel.



Technical data

Dimensions in mm	height 177 x width 206 x depth 48.5
Full assembly weight	750g
Storage temperature	0 to 60ºC
Operating temperature	0 to 45ºC
Relative humidity (Non condensing)	up to 90% Temperature 5 to 45°C
Ingress protection	IP30 estimated
Colour	White
Indicators	Fire, Fault, Disablement, Power On, System fault, Sounder 2 line 20 character per line, back-lit, display.
Controls (with flap closed)	Test and Cancel buzzer
Controls (with flap open)	Fire, Fault, Disablement, Warning, Display Mode and Numeric keypad.

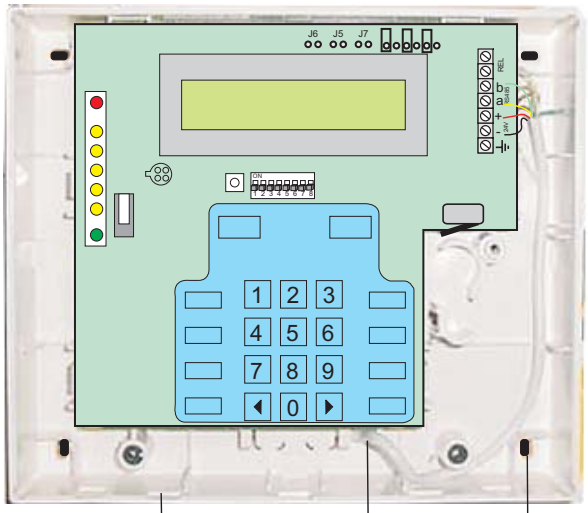
If only one repeat indicator panel is to be connected to the fire panel then make use of the 24V supply at the panel, there is no need to use an external power supply

☐ Belden No. 9842 EIA RS485 Applications, O/A Beldfoil® Braid **1Km** maximum cable distance ***from the control panel to the last repeat indicator panel*** must have following characteristics:

- Two twisted pairs
- 24AWG (7 strands x 32 AWG) conductors

Installation

a. Open the outer cover.

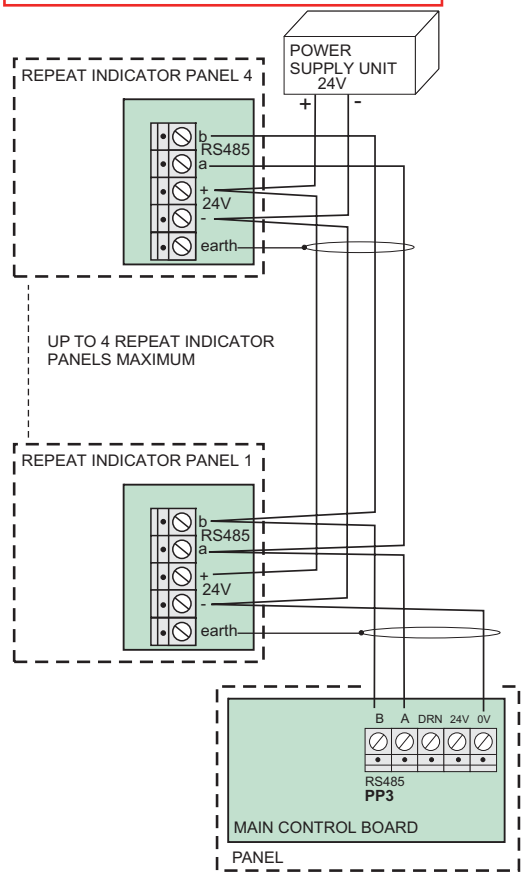


b. Insert the external cable into the backbox assembly at the required entry point.

c. Mark the fixing points and secure the backbox to the wall.

d. Connect the wires to the respective terminals.

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



e. Refit the front cover and flap.

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.**

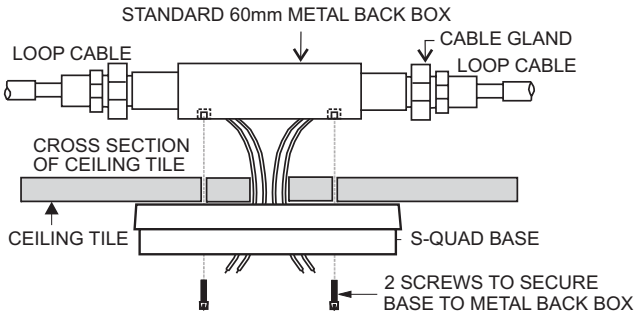
Follow recommendations detailed in section 22 of BS5839 : Part 1 : 2002.

Siting

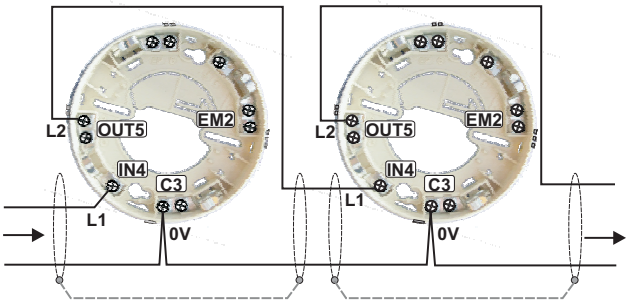
A S-Quad device plugs into a dedicated Base that is installed in the protected premises. The Bases should be sited in locations as defined by the project plans and by BS5839 : Part 1 : 2002.

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.



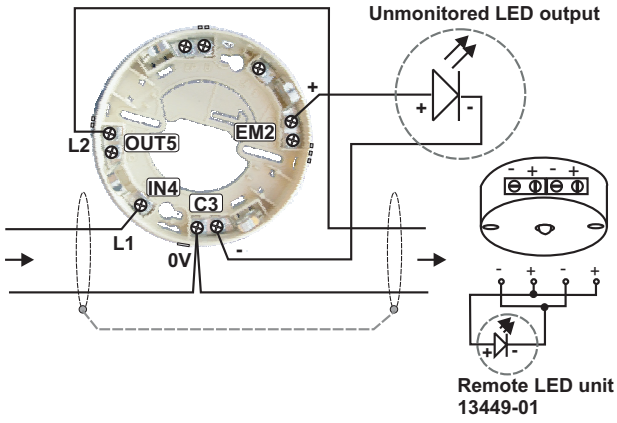
In - Out wiring to S-Quad bases

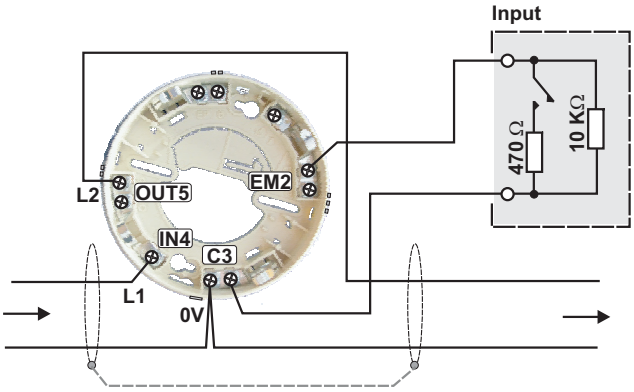


Programmable input/output

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.



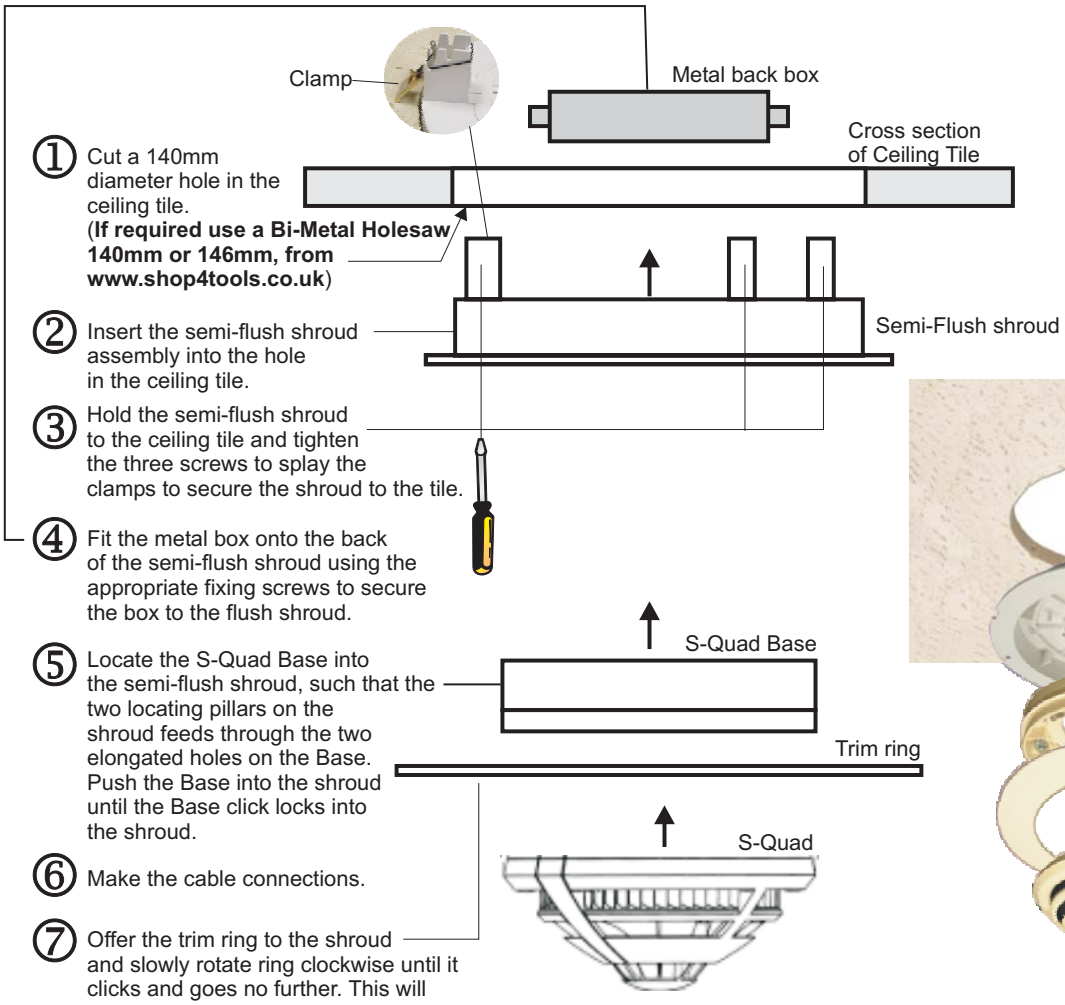
S-Quad Semi-flush fixing kit (S4-FLUSH)

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.

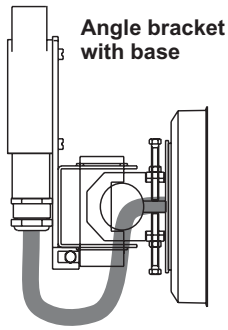


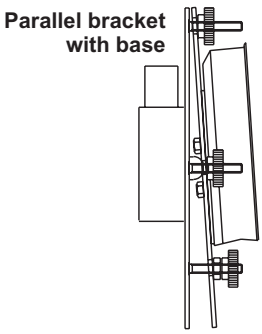
Do not over tighten the clamping screws as this will cause the clamps to cut into the ceiling tile.

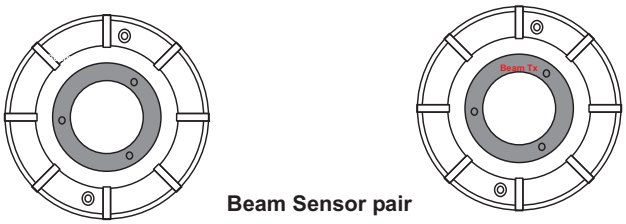
For instructions on the S4 Beam sensor and brackets see leaflets supplied with the products.

Beam sensor

The beam sensor allows detection of smoke over distances up to 100 metres. The beam sensor comprise 2 parts, a transmitter head and a receiver head, each must be mounted on a base fixed to a beam sensor bracket.







Beam Sensor pair

Options

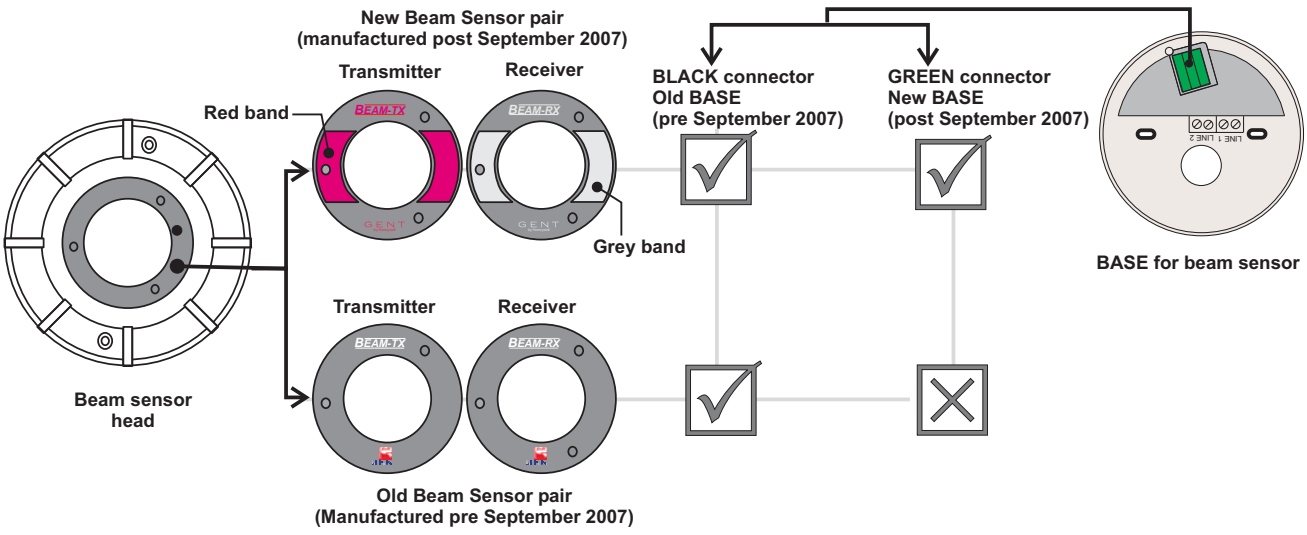
☐ Beam sensor pair on Angle bracket with base for applications from **2m to 100m.**

☐ Parallel bracket with base version is intended for use with short paths of up to **10m**.

Technical data

Standard - Smoke	BS5839 : Part 5
Dimensions in mm	Angle bracket and sensor: height 145 x width 106 x depth 130
Full Assembly weight	Angle bracket and sensor: 660g (800g with head)
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing)	up to 95% Temperature 5 to 45°C
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits.**
Immunity	BS EN50130-4: 1996: Part 4 Alarm systems
Ingress Protection	IP42 estimated
Colour	White
Operating voltage	20-50V
Indicators	Two Red LEDs visible at 500LUX ambient light levels 3m

Compatibility of old and new Beam Sensor heads and Bases



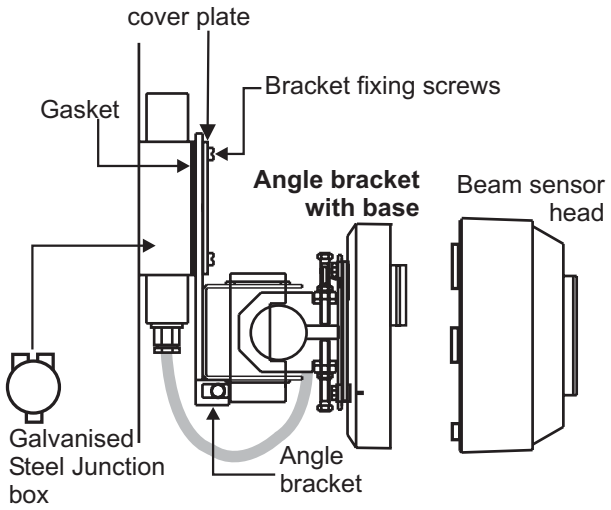
Installation

The **beam sensor pair** consist of two heads a receiver head and a transmitter head, each head is designed to fit into a **bracket having a base**.

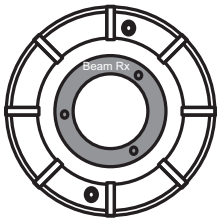
The beam sensor TRANSMITTER head and RECEIVER head should be installed on the same loop facing each other for alignment purposes.

a. Check the contents of the bracket and base package:

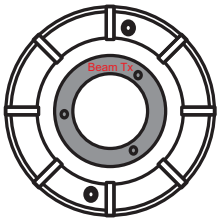
Component	Quantity
Bracket + base assembly	1
Screws	2
Terminal Block	1
Gasket	1

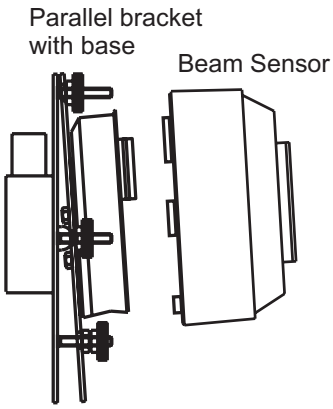


Beam Receiver head

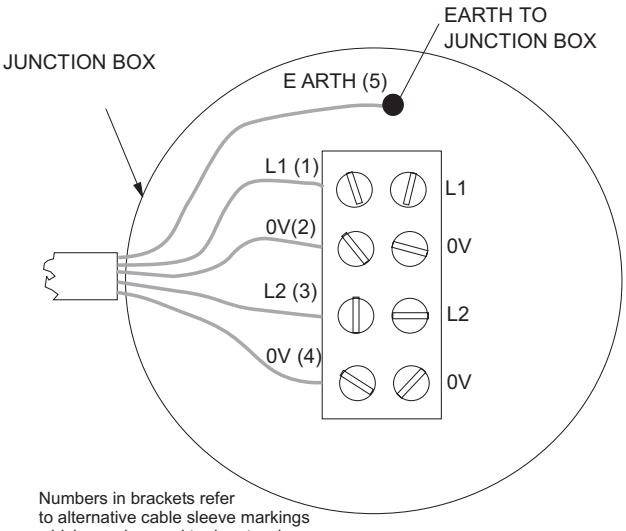


Beam Transmitter head





The junction box used for mounting the bracket must be of the galvanised type. The 2-way base can be recognised by the black plastic PCB cover moulding.



Numbers in brackets refer to alternative cable sleeve markings which may be used to denote wires.

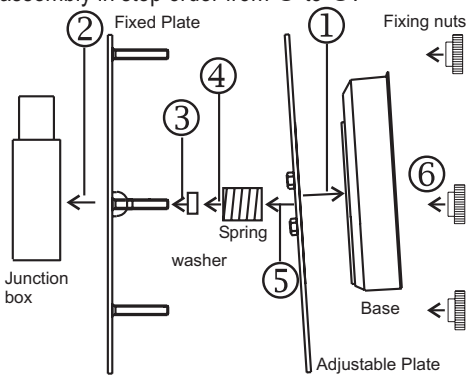
b. Fit the **terminal block** supplied into the junction box and make the loop cable connection. Ensure the cable earth connects to an earth point in the junction box.

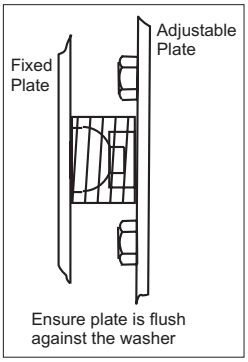
c. Secure the **angle bracket** assembly onto the junction box using the gasket and **angle bracket** fixings.

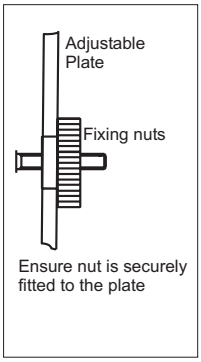
d. The applicable **sensor head** may now be fitted to the base assembly by twist and lock action.

Parallel bracket assembly

Follow assembly in step order from ① to ⑥.







S³ Speech, Sounder Strobe mark II

The low power addressable **Voice Enhanced Sounder** and **combined Strobe** products provide audible and visual alarm signals, and are designed for use in analogue and addressable fire alarm systems.

The S³ devices are supplied with standard speech messages along with sounder and strobe option. The devices are configured during commissioning to operate to site specific requirements. The devices are supplied with either a deep base (40mm) or a shallow base (25mm), offering IP55C and IP31C ratings respectively, with the exception of the system range (see diagram below) which is available with deep base only.

The S³ product range incorporates innovative design features protected by Patents GB2388994, GB2388995 and GB2388916. The product design has also been registered.



Low profile S³
Available in deep or shallow base

System S³
Available in deep base only

If you have a speech/sounder only product, then ignore the strobe information given.

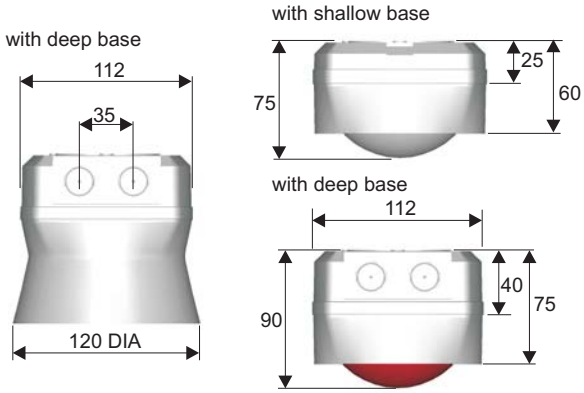
Speech messages

Message Number	Speech message
Message 2	*Attention please this is an emergency please leave the building by the nearest available exit.* (female voice).
Message 3	*An incident has been reported in this building please await further instructions.* (female voice).
Message 4	*This is a test message no action is required.* (female voice).
Message 5	*This is a fire alarm! Please leave the building immediately by the nearest available exit.* (male voice).

Tone No.	Description of tone.
Message 1	**Alarm Bell** (equivalent to 8" Solenoid Bell) **106dBA @ 1m.**

The addressable S³ products are fully synchronised.

Technical data



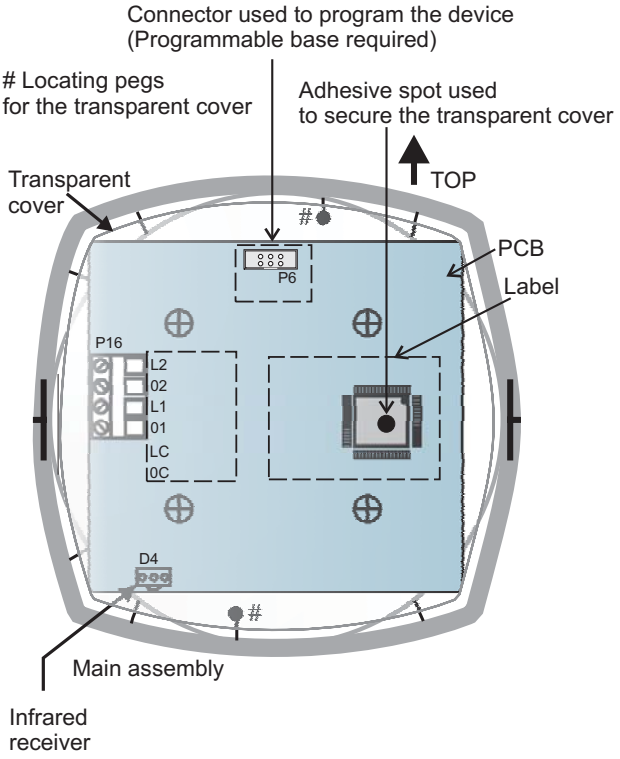
Sound output for standard tone (levels given are **typical values** with measurement taken at 90° anechoic - fast response)	Low profile S³ - 100dBA +/-3dBA System S³ - 103dBA +/-3dBA
Standard (sounder only)	EN54 : Part 3
Messages, Tones and Strobe flash rate	see instructions supplied with the product
Strobe light output with red lens	equivalent to 3W Xenon flasher
Operating voltage	range 35V - 41V
Terminal size	2.5mm² maximum
IP rating with deep base with shallow base	IP55C IP31C
Enclosure colour	White and Red (with red translucent lens cover fitted to units with Strobe).
Enclosure material	Flame retardant ABS (Strobe cover is polycarbonate) The plastic enclosures meet the flammability requirements of ISO 1210:1992 Class FH-2.
Weight	0.3Kg (approximate).
Operating temperature	-10°C to 50°C
Storage temperature	-20°C to 70°C
Relative humidity (non condensing)	up to 90%
IR operating distance (to select volume level)	3m
Message and attention Tone period	10 seconds default Configurable up to 60 seconds

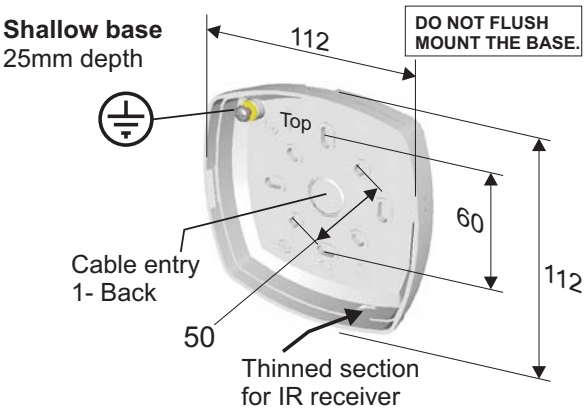
Installation

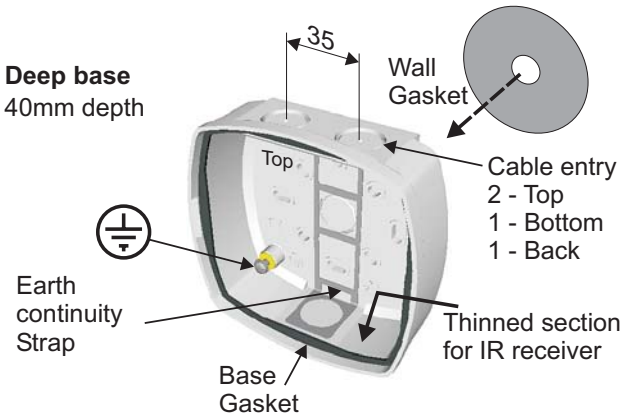
a. Drill or knockout the required cable entry points on the **base**.

b. If using the deep **base** option and IP55C protection is required, then stick the circular **wall gasket** on to the centre back of the **base.**

c. Secure the **base** to the wall whilst ensuring Top of the base is in correct orientation.







d. Terminate the cable at the entry point leaving no more than 10cm (4") tail wire length for connection.

e. Ensure the **transparent cover** is in place over the **PCB**. Connect the wires to the terminal block.

f. Close the **main assembly** to the base.

Environmentally protected Heat Sensor

This unis has **IP55** rating as specified in the *British Standard* BS 5490:1977 which is the *specification for classification of degree of protection provided by enclosures.*



a. Remove the front cover of the unit disconnecting any flying leads attached to the terminal block.

b. Place the unit in the desired position and mark the four fixing holes. When the product is mounted ensure the pre-machined cable entries are at the bottom.

c. Drill the four fixing holes and mount the unit.

When using PYROTENAX cable, the cables MUST be terminated using PYROTENAX glands (Code No. RGM 2L1.5), screw-on seals (Code No. RPS 2L1.5) or equivalent and a standard M20 locknut.

d. Feed the cables into the unit. Ensure that the sealing washer supplied is fitted between the cable gland and the unit (rubber part of the washer against the unit). Use the earth continuity straps provided to maintain loop cable earth continuity.

e. Connect the earth tails into the earth termination point.

f. Terminate the cable at the entry point and connect ends into the appropriate terminals on the sealed printed circuit board module, see connection diagram.

Failure to promptly replace the cover will result in environmental damage.

g. Reconnect the flying leads from the cover into the appropriate terminals on the sealed printed circuit board module. Refit the cover to the unit. For maximum protection ensure that the cover screws are tight and secure.

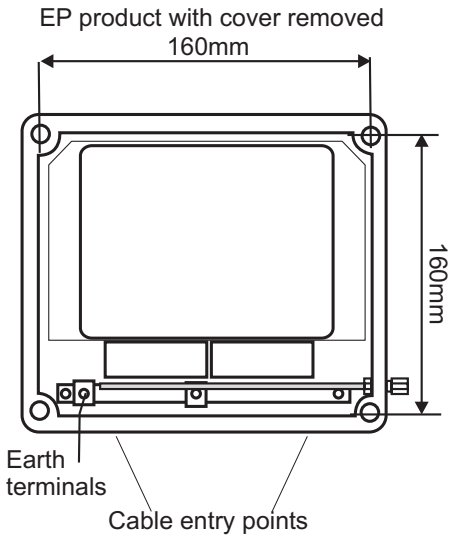
Forcing the cover to fit the wrong way round will damage the unit.

Heat Probe

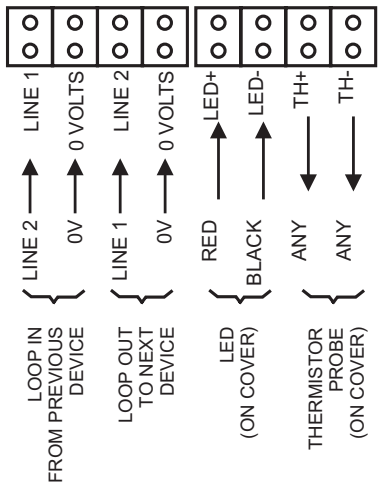
For carriage purposes the probe on the heat sensor is fully retracted. It is important that the heat probe is positioned correctly. There should be a minimum of 20mm of the probe protruding from the front face of the probe gland. The probe gland can only be tightened up once, as the gland uses an olive joint which should be replaced rather than re-tightened. Once the probe is in the correct position the gland has to be tightened finger tight plus $1\frac{1}{2}$ turns.

General data

Box dimensions	height 175 mm x width 175 mm x depth 75 mm.
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Ingress Protection	IP55 estimated
Case	ABS engineering plastic.
Indication	Red LED that illuminates when the active.
Operating voltage	20 to 50V



Heat sensor

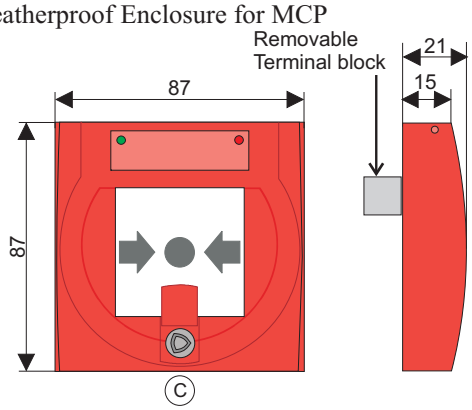


Manual Call Points

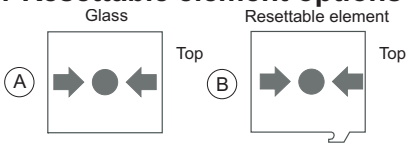


Options

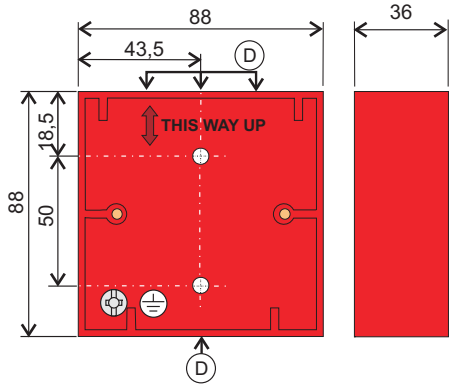
- ☐ Manual Call Point (Glass)
- ☐ Manual Call Point (Glass) with Protective cover
- ☐ Manual Call Point (Resettable element)
- ☐ Manual Call Point (Resettable element) with Protective cover
- ☐ Weatherproof Enclosure for MCP



Glass or Resettable element options



Optional Back box



The optional back box has recessed centres 'D', 3 at the top and 1 at the bottom, a maximum of 2 are usable.

Technical data

Standard	EN54: Part 11: 2001
Dimensions	height 88 mm x width 88 mm depth 21 mm or 57 mm when surface mounted
Full assembly weight	110g - approximate
Storage temperature	-30 to 70ºC
Operating temperature	-25 to 70°C
Relative Humidity (Non condensing)	up to 95% Temperature 25 to 55°C
Emission	BS EN61000-6-3:2001 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: Part 4 :1996
Ingress Protection	IP43 estimated standard type IP55 estimated with protective cover and back box
Colour	Red (similar to RAL3020)
Case	ABS engineering plastic
Indicators	
Normal	Green LED for status and find device application
Active	Red LED and Yellow tab for active or Fire indication
Testing	The operation of the MCP is tested by using a test key
Terminals	2.5mm^2 maximum
LPCB Approved	S4-34842 and S4-34800
Operating voltage	35V to 41V

Installation

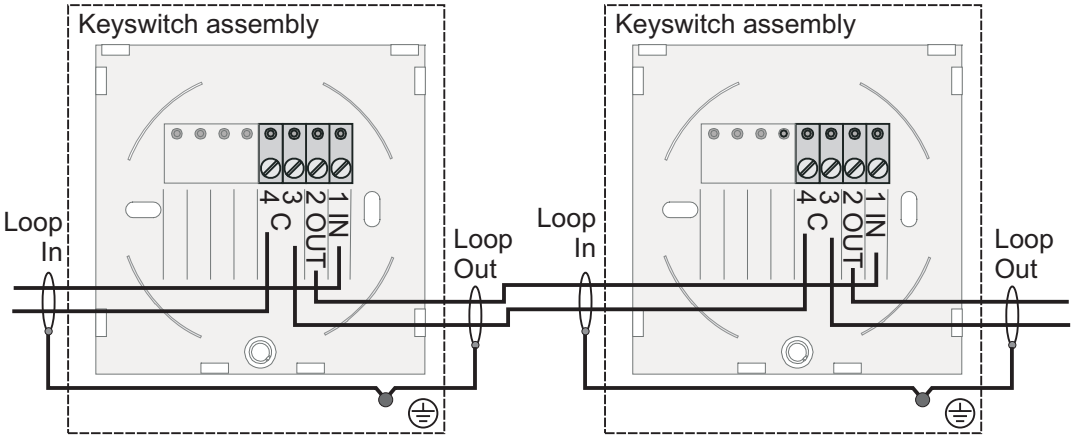
a. Check the contents of the package:

	Component	Quantity
	Call point assembly	1
	Earth Strap	1
	Test Key	1
	Long Screw	2

b. The call point assembly may be mounted on a standard electrical box or on the optional red back box S4-34895.

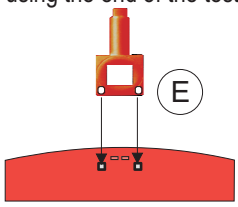
c. Feed the fire rated cables through the entry holes and mount an electrical box or the red optional back box to an even wall surface using suitable fixing.

When semi flush fixing the call point assembly a standard electrical box must first be flushed into the wall before the call point assembly is fitted.



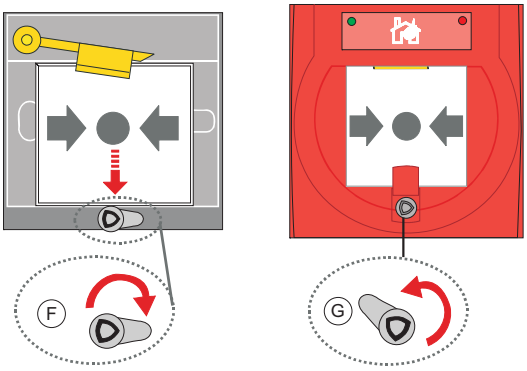
d. Terminate each cable entry at the back box. Use the *earth strap* or the *earth point* in the back box to maintain loop cable earth continuity. Connect the loop cable to the terminals.

e. Disengage front cover from the call point assembly using the end of the test key 'E' and lift out the cover from the bottom edge.



f. Secure the call point assembly to the back box using the 2 long screws supplied.

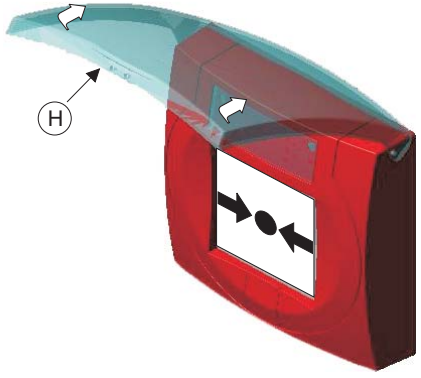
g. To re-assemble the glass or resettable element, using the test key turn the tab to position 'F' and insert the glass 'A' or optional resettable element 'B'.



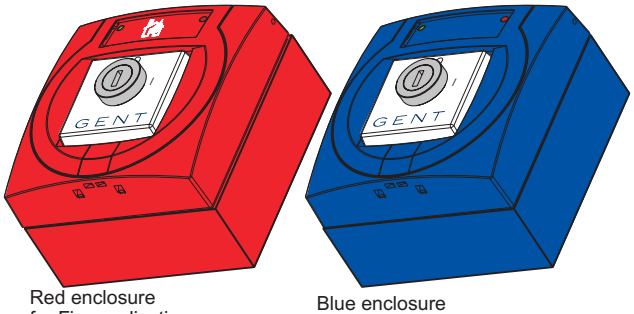
h. Hook the front cover onto the top edge of the call point assembly and then push the bottom edge down until it click shut. Check both hooks on the top of the front cover are locked onto the call point assembly.

i. Turn the test key anticlockwise to position 'G' (not visible) such that the glass or optional resettable element is held under the yellow arm.

j. Where applicable, ensure the protective cover 'H' is securely fitted to the call point assembly.



Keyswitch Interface / MCP



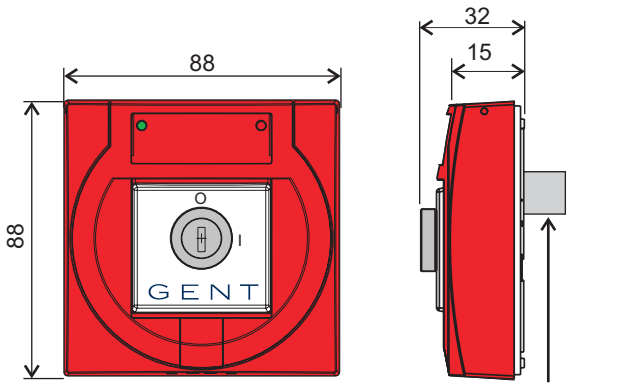
Red enclosure
for Fire applications
(supplied with backbox)

Blue enclosure
for Plant interface applications
(supplied with backbox)

The keyswitch units covered in this leaflet are suitable for installation in GENT analogue addressable fire alarm system. The product range covered here include:

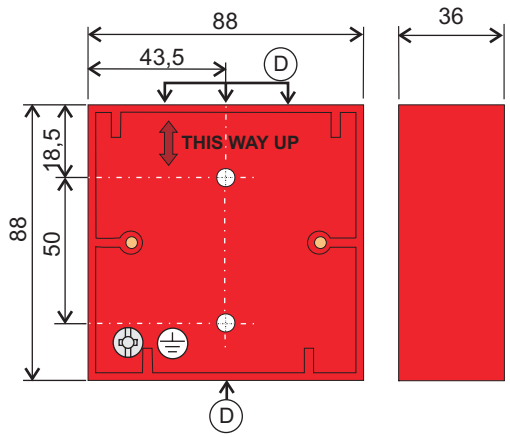
- ☐ Keyswitch MCP (Red)
- ☐ Keyswitch Interface (Blue)
- ☐ Spare Keys (Pack of 2)
- ☐ Surface Back Box for Interface Red Plastic (Pack of 10)

Keyswitch assembly



Removable
Terminal block

Back box



The back box has recessed centres 'D', 3 at the top and 1- at the bottom, a maximum of 2 are usable.

Technical data

Standard	EN54: Part 17 EN54: Part 18
Dimensions	height 88 mm x width 88 mm depth 32mm or 66mm when surface mounted
Full assembly weight	128g - without backbox 192g - with backbox
Storage temperature	-30 to 70ºC
Operating temperature	-25 to 70°C
Relative Humidity (Non condensing) Temperature 25 - 55°C	up to 95%
Emission	BS EN61000-6-3:2001 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: Part 4 :1996
Ingress Protection	IP43 estimated standard type
Colour	Red (similar to RAL3020) Blue (similar to RAL5015)
Case	ABS engineering plastic
Indicators Normal	Green LED for status and find device application
Active	Red LED for active or Fire indication
Terminals	2.5mm^2 maximum
LPCB Approved	-
Operating voltage	35V to 41V
EN54-17 data	V_{max} 42V V_{nom} 40V V_{min} 24V $V_{SO\ max}$ 16V $V_{SO\ min}$ 8V $I_{C\ max}$ 0.4A $I_{S\ max}$ 1A $I_{L\ max}$ 20µA $Z_{C\ max}$ 0.1Ω

Installation

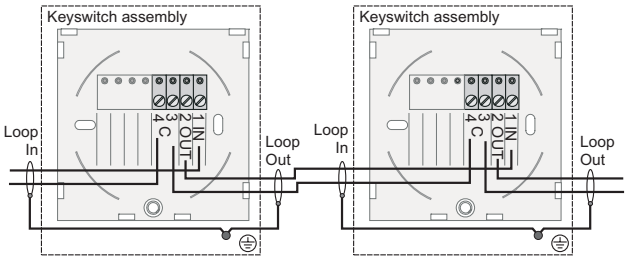
a) Check the contents of the package:

	Component	Quantity
	Keyswitch Interface assembly (red / blue)	1
	Earth Strap	1
	Operating Key	2
	Opening Key	1
	Long Screw	2
	Instruction leaflet	1
	Blue Back box supplied with Blue keyswitch interface assembly	1

b) The keyswitch assembly may be mounted on a standard electrical box or on the backbox.

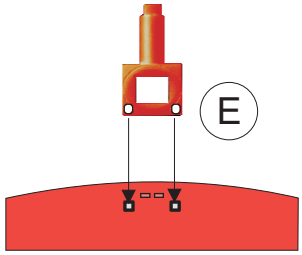
c) Feed the fire rated cables through the entry holes and mount an electrical box or the red/blue back box to an even wall surface using suitable fixing.

When semi flush fixing the keyswitch assembly a standard electrical box must first be flushed into the wall before the keyswitch assembly is fitted.



d) Terminate each cable entry at the back box. Use the *earth strap* or the *earth point* in the back box to maintain loop cable earth continuity. Connect the loop cable to the terminals.

e) Disengage front cover from the keyswitch assembly using the end of the opening key 'E' and lift out the cover from the bottom edge.



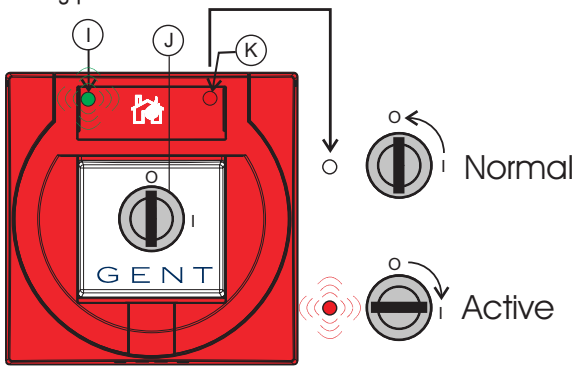
f) Secure the keyswitch assembly to the back box using the 2 long screws supplied.

g) Hook the front cover onto the top edge of the keyswitch unit and then push the bottom edge down until it click shut. Check both hooks on the top of the front cover are locked onto the keyswitch assembly.

Operation

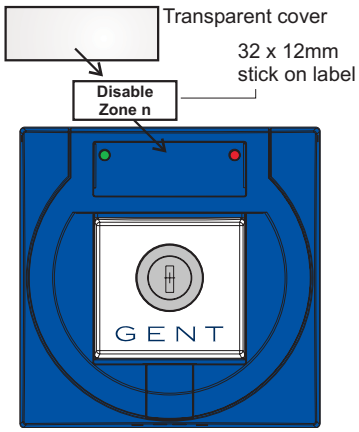
To operate the keyswitch insert the operating key into the keyhole 'J' and turn clockwise to the stop position, the red LED 'K' is flashing. The green LED 'I' gives an operating indication.

Apply the reverse procedure to return the keyswitch to a normal operating position.



Label

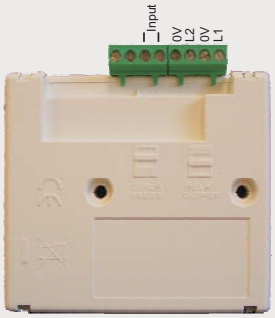
When using the blue keyswitch interface to control plant ensure the unit is labelled to describe what is being controlled by the keyswitch.



It is suggested that an A4 sheet white paper label 32 x 12mm is used, such as the one from RS, part number RS495 385. The required text can be printed onto the label. The label is stuck centrally inside the aperture behind the transparent cover. Ensure LEDs remain visible and are not covered by the label.

Interface Modules for Vigilon - Low voltage (LV) Input/Output

S4-34410
S4 1-Input Interface Module
(low voltage)

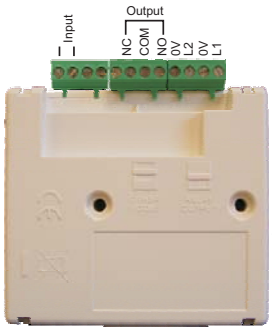


1- End-of-line Capacitor unit



2- 10K Resistors

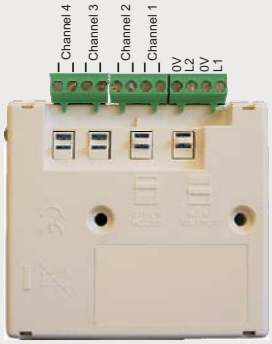
S4-34420
S4 1-Output & 1-Input Interface Module (low voltage)



2- 10K Resistors

Only the 'Output' of S4-34420 is applicable of for use in this Nano system.

S4-34450
S4 4-Input / Output Interface Module (low voltage)



1- End-of-line Capacitor unit



8- 10K Resistors

Now supplied fully assembled

S4-34490
Plastic box



1- Allen key
2 - M4 Screws
2 - M4 Posi Pan Screws
7 - Hole plugs

S4-34492
Metal box

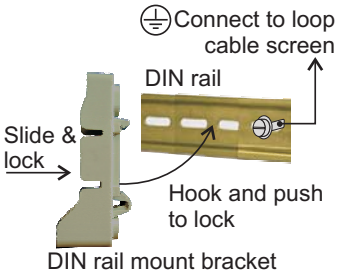




S4-34491
DIN rail mount bracket

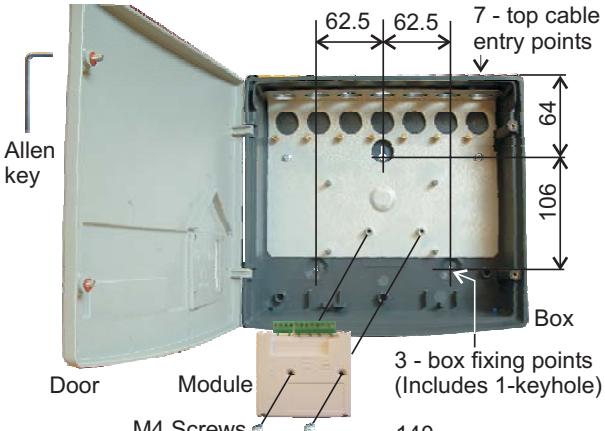
These instructions cover the above interface modules and accessories. The S4 interface modules are designed for use with any Vigilon and Nano fire alarm system. Each module includes a loop isolator for device isolation. Each module use one of 127 available device addresses on a loop and responds to regular polls from the control panel reporting the type of device and the status (open/normal/short) of its supervised input circuit(s).





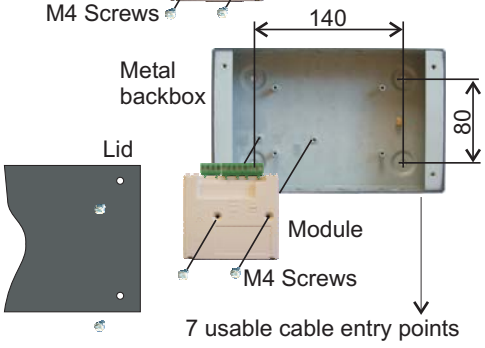
Features

- ☐ Analogue addressable communications
- ☐ Built-in type identification automatically identifies these devices to the control panel
- ☐ Reliable communication technique with high noise immunity
- ☐ Soft or SAFE addressing
- ☐ Common mounting options including surface mount, panel mount and DIN rail mount
- ☐ Dual-colour LEDs
- ☐ Plug-in terminal connections for ease of wiring
- ☐ EN54-17:2005 and EN54-18:2005



Cables

The cables recommended for wiring the input / output lines are the same as those used for loop wiring, see instructions supplied with the fire control panel.



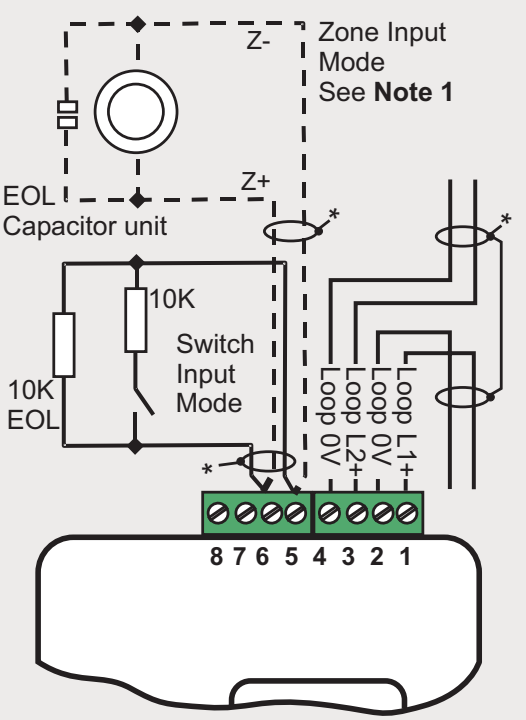
Installation

The S4 interface modules can be mounted in other equipment housings using the DIN rail mount brackets (S4-34491). A module can also be fitted into a plastic box (S4-34490) or metal box (S4-34492). The boxes have cable termination points on the enclosure.

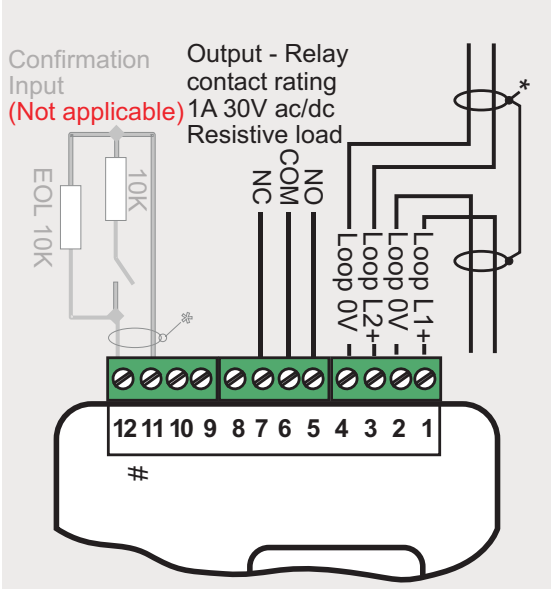
Wiring diagrams

The loop cable screen must be continued through each interface module. The loop, switch input, zone input and LED output cable screens where used must connect to an earth terminal.

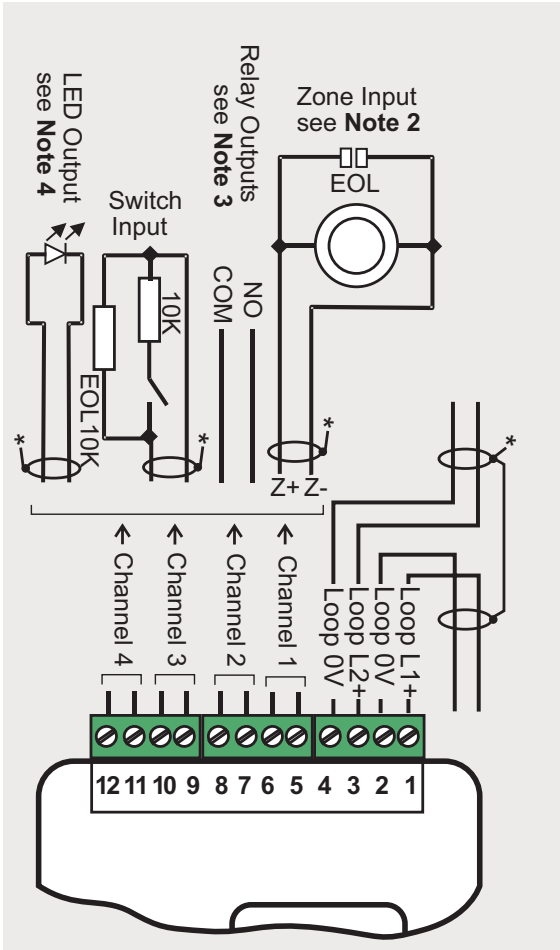
S4 1-Input module connection details



S4 1-Output & 1-input module connection details



S4 4-Input/Output module connection details



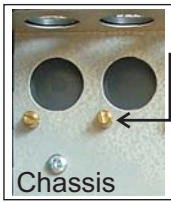
Note 1 - When the input is configured as a Zone input it is possible to attach conventional detectors and MCPs (with 470 Ohms or 3V9 zener diode in series with normally open contacts), maximum load is 2mA @ 24V nominal (18V minimum) with End-of-line capacitor.

Note 2 - Only channel 1 (terminals 5 & 6) can be configured as an zone input.

Note 3 - Contact rating 1A 30V ac/dc Resistive load.

Note 4 - Output is 1.5mA @ 24V dc.

Can be configured as LED output

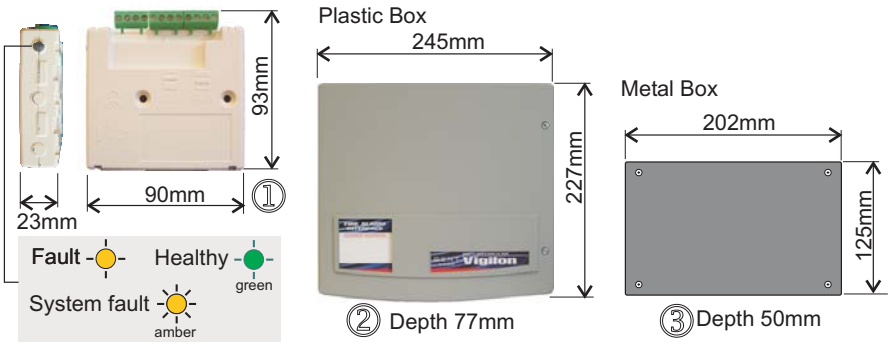


* The cable screens must be connected to an **earth terminal** on the chassis or in the metal box.

If a module is mounted on a **DIN rail** then the DIN rail must electrically connected to the **loop cable screen via the earth terminal.**

Technical data

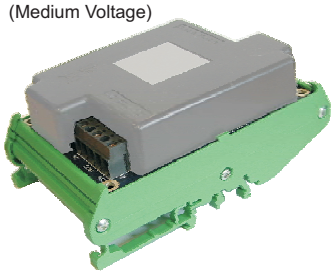
	S4-34410 S4 1- Input	**S4-34450** S4 4-Input /Output	**S4-34420** S4 1-Output & 1-Input (Input N/A for Nano system)
Approval	EN54-17:2005 and EN54-18:2005 (Approved)		
Weight-dimen. module module in plastic box module in metal box	92g ① 1047g ② 782g③	100g ① 1055g ② 790g ③	100g ① 1055g ② 790g ③
Storage temperature	-30ºC to 70ºC		
Operating temperature	-10ºC to 60ºC		
Relative Humidity	Up to 95% - Temperature 5ºC to 45°C (Non condensing)		
Emission	BS EN 61000-6-3:2001 Residential, Commercial & Light Industry **Class B limits**		
Immunity	BS EN50130-4: 1996: Part 4		
LVD	BS EN 60950-2002		
Ingress Protection	IP31 for plastic box S4-34490 & IP40 estimated for metal box S4-34492		
Colour	Module-white / Plastic box-dark grey (Lid-light grey) / Metal box-dark grey		
Input mode	Input channel-1 only can be configured as a zone input to accept conventional devices, with a load of 2mA quiescent and 9mA alarm maximum at 24V nominal (18V minimum). With configurable 2s to 5s reset period and 5s to 40s alarm validation delay.		
Switch input can work with or without a delay.	Input channel can be configured as a **switch input** of Fire*, Fault*, Supervisory* (non fire) or Confirmation# signal. * with input acceptance delay of up to 10 seconds for a Fire input and up to 300s for Fault or Supervisory input. # A fault is generated if confirmation input is not seen within predefined period of the output action (Confirmation function is not a feature of the single input module).		
Output mode	-	A relay output of either NO or NC set of contacts rated 1A - 30Vac/dc resistive load.	A relay output of change over contacts NC, COM and NO rated 1A - 30Vac/dc resistive load.
LED output	1.5mA at 24Vdc (Normally On or Normally Off)		
Load Factor	1-4 switch inputs = **1** (maximum 200 per loop) 1-4 relay outputs = **2** (maximum 200 per loop only 8 individually sectored) Zone Input = **26** (maximum 30 per loop) Every LED output = **+5** (maximum 100 LED outputs per loop)		
EN54-17 data	**Vmax** Vnom **Vmin** VSO max **VSO min** *I*C max ***I*S max** *I*L max **ZC max** **42V** 40V **24V** 16V **8V** 0.4A **1A** 20µA **0.1OΩ**		
Panel compatibility	Nono panel based system		



Interface Module for Vigilon Medium Voltage (MV) Output

These instructions cover the above interface options and accessories.

S4-34411
Single Output Interface Module
DIN rail mountable
(Medium Voltage)





S4-34415
Single Output Interface PCB with cover
(Medium Voltage) in a metal box

These S4 Single Output Interfaces are designed for use with any Vigilon fire alarm control panel. Each module includes loop isolators for device isolation.

The S4 Single Output Interfaces are suitable for mains switching, they provide normally closed and normally open contacts rated at 13A 250Vac (nominal 230Vac) resistive load.

The S4 interfaces use one of 127 available device addresses on a loop and respond to regular polls from the control panel reporting the type of device.

Features

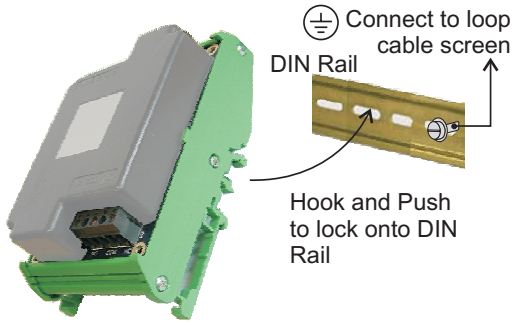
- ☐ Analogue addressable communications
- ☐ Built-in type identification automatically identifies these devices to the control panel
- ☐ Reliable communication technique with high noise immunity
- ☐ Soft or SAFE addressing
- ☐ Common mounting options including surface mount and DIN rail mount
- ☐ EN54-17:2005 and EN54-18:2005

Cables

Any suitably rated cable may be used for wiring the output lines to drive the required load. For information on cables recommended for wiring the loop circuits see instructions supplied with the fire control panel.

Installation

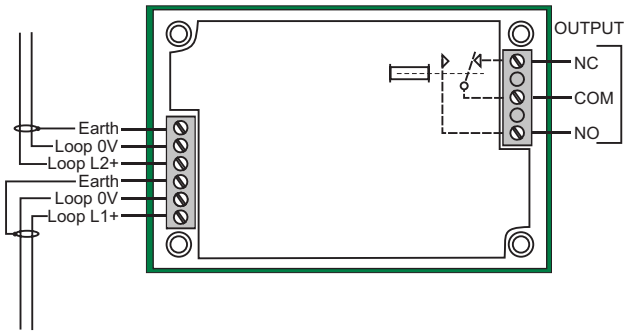
The S4 Single Output Interface module - DIN rail mountable (S4-34411) can be mounted in other equipment housing using a DIN rail.



The S4 Single Output Interface is available in a metal box (S4-34415). The box provides cable termination points on the enclosure.

Wiring

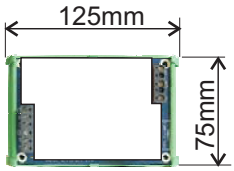
The loop cable screen must be continued through each interface module.
If a module is mounted on a DIN rail, then the DIN rail must be electrically connected to the loop cable screen.



The output contacts are rated at 13A 230V ac resistive load. In order to meet the requirements of European Safety Standards, ensure that all cables carrying voltages in excess of 48V (Live and Neutral) are suitably fused.

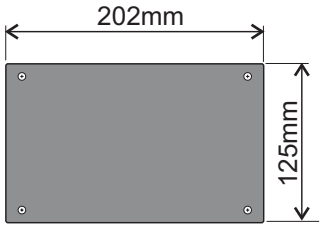
Technical data

Approval	EN54-17:2005 & EN54-18:2005 (Approved)
Dimensions in mm	See illustrations
Weight	DIN mountable:138g PCB with cover in metal box:800g
Storage temperature	-30ºC to 70ºC
Operating temperature	-10ºC to 60ºC
Relative Humidity	Up to 95% - Temperature 5ºC to 45°C(Non condensing)
Emission	BS EN 61000-6-3:2001 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1996: Part 4
LVD	BS EN 60950-2002
Ingress Protection	Metal box - IP40 estimated
Colour - Metal Box	Dark Grey
Output Contact ratings Type Cycle	Single pole change over contacts rated at 13A 230V ac Resistive load. 1hp @ 240V ac, 1/2hp @ 120V ac (UL508) $6x10^3$
Terminals	$2.5mm^2$
Load Factor	5 (maximum 127 devices on loop)
EN54-17 data	V_{max} 42V V_{nom} 40V V_{min} 24V $V_{SO\ max}$ 16V $V_{SO\ min}$ 8V $I_{C\ max}$ 0.4A $I_{S\ max}$ 1A $I_{L\ max}$ 20µA $Z_{C\ max}$ 0.1Ω
Panel compatibility	Nano panel based system



Depth 48mm

PCB on DIN rail mountable module



Depth 50mm

PCB in metal box

For instructions on the new compatible Mains Powered Interface Unit S4-34440-02 see leaflet supplied with the product.

Old Mains powered interface unit

This interface unit operates from mains power and incorporates its own battery-backed power supply. It has 4 channels, each may be configured as input or output and are configured as conventional zone and sector circuits respectively.



Technical data

Dimensions in mm	height 305 x width 504 x depth 98
Full assembly weight	8.6Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing)	up to 90% Temperature 5 to 45°C
Mains Operating voltage	230V 50Hz +10% -6%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1996: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Colour	Grey and Black
Number of channels	4 channels, (each configurable as input or output)
Batteries	2 - 12V 2.1Ah sealed lead acid batteries

Input (zone) channels	2-wire inputs for conventional zone circuits. Circuits are monitored for: ☐ Detector fire ☐ MCP fire ☐ Wiring open circuit fault ☐ Wiring short circuit fault Monitoring conforms to BS5839 by detecting a MCP activation if a detector is removed providing detector heads are fitted to diode bases. Maximum detector load: 2mA. An end-of-line capacitor/diode (supplied) must be used. The input circuits may be configured to operate with various manufacturers detectors and MCP's: Gent, Apollo, Hochiki, Menvier, Nittan, Notifier and Thorn On certain sites where older type detectors and MCPs are used that give a short circuit fire, set the rotary switch to position 'F'.
Output (sector) channels	Output (sector) channel will operate conventional equipment such as sounders / bells and door holders. A maximum current of 500mA is allowed and can be shared between the output channels (each fused at 800 mA). Sectors are monitored for: ☐ wiring open circuit fault ☐ wiring short circuit fault End-of-line 22K resistor (supplied) must be used. Optional up to 4 Octal relays with diode packs may be fitted within the enclosure. These provide DPCO voltage-free contacts rated at 10 amps, 240 Vac, resistive load.

Installation

Fuse	Rating	Location
Mains	1.6A HRC - 20x5 mm	Top left -back box
FS1	800mA - 20mm x 5mm	Board
FS2	800mA - 20mm x 5mm	Board
FS3	800mA - 20mm x 5mm	Board
FS4	800mA - 20mm x 5mm	Board
FS5	2.5A - 20mm x 5mm	Board
FS6	250mA - 20mm x 5mm	Board

a. Check the package contents, open the door using the **key** and check all components.

Component	Quantity
Unit	1
Interface Board#	1
Screws (for board)#	7
12V 2.1Ah Battery	2
Key	1
Battery Link	1
Battery lead assembly	1
250mA Aux Fuse (Spare)	1
1.6A Mains Fuse (Spare)	1
2.5A Battery Fuse (Spare)	1
800mA Quick Blow Fuse (Spare)	4
Capacitor Unit (EOL)	4
EOL Label	5
22k Resistor (EOL)	4

these components are packaged separately.

b. If necessary, remove the door on the unit to ease installation and remove the covers fitted over the **mains terminal**.

c. Knockout the required cable entry points from the back box.

d. Mark the 3 fixing positions on the wall to which the unit is to be mounted and secure the unit to the wall with suitable fixings.

If the unit is to switch heavy *non-mains loads*, then optional POWER RELAYS 19104-52 must be used. The relays may be installed on the DIN rail inside the unit. The relay unit must include a diode unit.

e. Terminate each cable at the entry point.

f. Fit the **interface board** inside the back box using the **screws** provided.

g. Connect the incoming cable ends to the appropriate terminals.

h. Connect the transformer secondary wires to terminal block P7 on the interface board.

i. Place the batteries inside the back box, however **do not make the connection,** this is done during commissioning by the Servicing organisation.

j. Fit the cover over the **mains terminal** and **battery restraint bracket**.

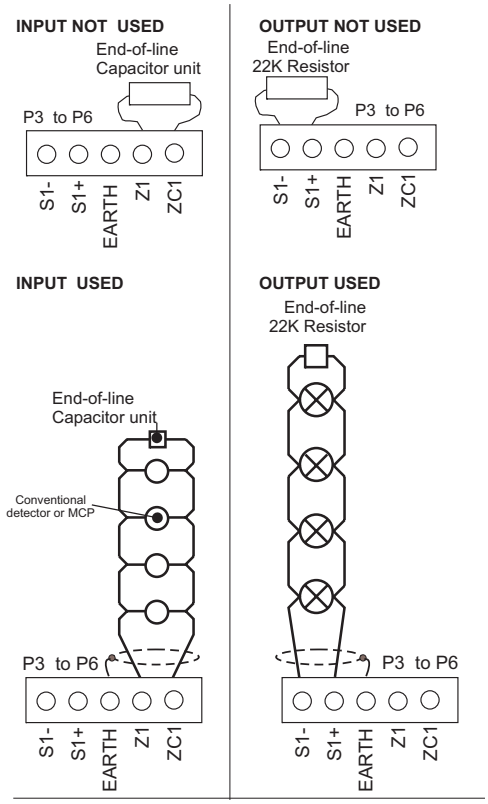
k. If removed, re-fit the door and earth lead.

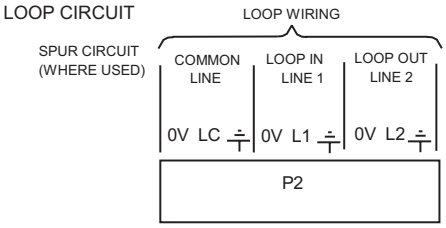
The *capacitor unit* and the *22k Resistor* must be fitted to the end-of-line (EOL) of each circuit. Also stick an *EOL label* on the last device in which the EOL unit is fitted.

l. Close the door on the Unit using the Key.

m. Leave all outstanding parts and installation work to the Servicing organisation.

External circuits

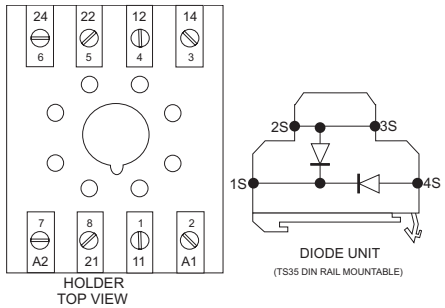


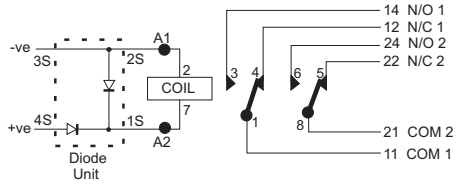


Power relay

Up to 4 relays can be fitted inside the interface unit on the DIN rail.

- ☐ Octal relay operates from a 24V supply
- ☐ DIN rail mountable
- ☐ Relay coil resistance 470R
- ☐ Contacts rated 10A at 230Vac





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

Repeat panel

COMPACT-RPT	Repeat indicator panel RS485 (connects directly to the panel)

Mimic panel

VIG-MIM -A3	Zonal and Mimic panel (EN54)
VSRPT-BATT-A3	Battery back from A3 Mimic (2 x 6V 7Ah)

Manual call points

S4-34800	Manual Call Point (Glass)
S4-34842	Manual Call Point (Glass) + Protective cover
S4-34845	Manual Call Point with resettable element
S4-34805	Manual Call Point with resettable element + protective cover
S4-34890	Resettable Element for MCP (Pack of 10)
S4-34891	Glass for MCP (Pack of 10)
S4-34892	Protective cover for MCP (Pack of 10)
S4-34895	Surface Back Box for MCP red plastic - (Pack of 10)
S4-34898	Manual Call Point weather resistant kit
S4-34899	Test Key (Pack of 10)
S4-34895	Keyswitch call point (Red)

Keyswitch MCP

S4-34807	Keyswitch MCP (Red) with back box
S4-34499	Spare Keys (Pack of 2)
S4-34895	Surface Back Box for Interface Red Plastic (Pack of 10)

Environmentally protected enclosure for MCP

S4-34896	MCP Weather proof enclosure for S4-34805 and S4-34800

S-Quad Sensors / Sounder / Strobe / Speech units

S4-710	Optical Heat Sensor (OH)
S4-715	Optical Sensor (O)
S4-720	Heat Sensor (H)
S4-720-ST-VO	Heat Sensor Strobe Speech (HStSp)
S4-780	Heat Sensor Sounder (HS)
S4-770	Optical Heat Sounder (OHS)
S4-711	Dual Optical Heat Sensor (O^2H)
S4-711-ST	Dual Optical Heat Sensor Strobe (O^2HSt)
S4-771	Dual Optical Heat Sensor Sounder(O^2HS)
S4-711-ST-VO	Dual Optical Heat Sensor Speech Strobe (O^2HSpSt)
S4-711-VO	Dual Optical Heat Sensor Speech (O^2HSp)
S4-911	Dual Optical Heat CO Sensor (O^2HCO)
S4-911-ST-VO	Dual Optical Heat CO Sensor Speech Strobe ($O^2HCOSpSt$)

Associated products

S4-700	S-Quad Base
13449-01	Remote LED for use with S4-700
S4-FLUSH	Semi-Flush fixing kit
S4-COVER-DUST	Sensor dust cover (50 pack)
S4-COVER-BASE	Base dust cover (50 Pack)
S4-EXTRACTOR	Removal tool
S4-BASE-LABEL	Label plate (50 pack)
S4-BASE-GASKET	Base IP Gasket (50 pack)
S4-COVER-REMOVER	Dust cover remover tool (spare adaptor)

Environmentally protected sensor

34729	Environmentally protected Heat sensor

Duct Sensor

S4-34760	Venturi-Air Duct Kit

Beam Sensors

S4-34740	Beam sensor pair
S4-34741-01	Angle bracket with base
S4-34741-03	Parallel bracket with base
S4-34741-99	Light shield for beams (5 per pack)
S4-34741-50	Test Cards

T Breaker

34701	T breaker Unit

LV & MV Interfaces

Keyswitch Interface

S4-34418	Keyswitch Interface (Blue) with back box
S4-34499	Spare Keys (Pack of 2)

Low voltage interface range

S4-34410	1-Input Interface module (low voltage)
S4-34420	1-Output & 1-Input Interface module (low voltage)
S4-34450	4-Input / Output Interface module (low voltage)

Options

The above interface modules can be mounted in any of the following optional enclosure or DIN rail mount bracket.

S4-34490	Interface enclosure Large Plastic box
S4-34492	Interface enclosure Metal box
S4-34491	DIN rail mount bracket
S4-34493	Interface enclosure Small Plastic box

Medium voltage interface range

S4-34411	Single Output Interface Module DIN rail mountable (Medium Voltage)
S4-34415	Single Output Interface PCB with cover (Medium Voltage) in a metal box

Mains powered interface unit

S4-34440-02	S4 Mains Powered Interface Unit
34440	4 -Channel Mains powered fire alarm interface
19104-52	Power relay for mains powered interface (up to 4 maximum can be fitted inside the interface - supplied with base and diode unit)

S³ Addressable Speech, Sounder Strobe units

Strobe

Low profile range

Body	Strobe - Deep base	
White	S2IP-ST-WR (red lens)	S2IP-ST-WA (amber lens)
Red	S2IP-ST-RR (red lens)	S2IP-ST-RW (white lens)

Sounder Strobe

Low profile range

	Sounder		Sounder Strobe (red lens)	
Body	Deep base	Shallow base	Deep base	Shallow base
White	S3IP-SN-W	S3-SN-W	S3IP-SN-ST-WR	S3-SN-ST-WR
Red	S3IP-SN-R	S3-SN-R	S3IP-SN-ST-RR	S3-SN-ST-RR

Low profile variants

	Sounder Strobe
Red	S3IP-SN-ST-RW (white lens)
White	S3IP-SN-ST-WA (amber lens)

System range

	Sounder	
Red	S2IP-SN-R (2-way)	S2IP-SN-R3 (3-way)
White	S2IP-SN-W (2-way)	S2IP-SN-W3 (3-way)

Note: The system range of products do not support the strobe option. The S2IP-SN-R3 and S2IP-SN-W3 products are suitable for retrofitting and are supplied with a 6-way terminal block to ease cable connection.

Speech Sounder Strobe

Low profile range

	Speech Sounder		Speech Sounder Strobe (red lens)	
	Deep base	Shallow base	Deep base	Shallow base
White	S3IP-VP-W	S3-VP-W	S3IP-VP-ST-WR	S3-VP-ST-WR
Red	S3IP-VP-R	S3-VP-R	S3IP-VP-ST-RR	S3-VP-ST-RR

Remote Control

S3-CONTROL Remote control for the S³

Surge protection

5530440 1 x Mains, 1 x Loop & 1 x Zone/Sector suppression (enclosure has space for 1 extra loop (2 x 2817958)

5530478 1 x Mains suppressor

Replacement Plug ins

2798844 Mains suppressor

2817958 Loop suppressor

2838351 Zone / Sector suppressor

Manuals

2534-221 Nano Document Pack

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
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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.

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