



FUSION

**EN54 APPROVED COMBINED ANALOGUE ADDRESSABLE
/ CONVENTIONAL CONTROL PANEL**

Quick Start Guide

Software version 1.14 and above



810a/01/02



0832

Haes Systems Ltd, Columbia House, Packet Boat Lane, Cowley Peachey, Uxbridge, UB8 2JP

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Model Number

Fusion 1-4 loop / 4-20 zone conventional panel FBUS X-Y-Z series

Fusion 1-8 loop / 4-36 zone conventional panel FBUL X-Y-Z series

CPD Number

0832-CPD-1431

0832-CPD-1432

Note: X = qty of LED indicators. Y = qty of zone circuits. Z = qty of loops

European Standard EN54-2 : 1997 + A1 : 2006
Control and indicating equipment for fire detection and fire alarm systems for buildings.

Provided Options:

Output to fire alarm devices, output to fire alarm routing equipment, delays to outputs, disablement of each address point, test condition

European Standard EN54-4 : 1997 + A1 : 2002 + A2 : 2006
Power supply equipment for fire detection and fire alarm systems for buildings.

Other technical data is contained in the installation and commissioning manual (Approved Document MFBU-01)

Document No. 2578M iss 1

IMPORTANT NOTE

**PLEASE READ THIS MANUAL BEFORE HANDLING THE EQUIPMENT AND
OBSERVE ALL ADVICE GIVEN IN IT**

THIS PARTICULARLY APPLIES TO THE PRECAUTIONS NECESSARY TO AVOID

E.S.D



IMPORTANT SAFETY NOTES

ATTENTION

The panel is safe to operate provided it has been installed in compliance with the manufacturer's instructions and used in accordance with this manual.

Hazardous voltages are present inside the panel— DO NOT open it unless you are qualified and authorised to do so. There is no need to open the panel's enclosure except to carry out commissioning, maintenance and remedial work. This work must only be carried out by competent service personnel who are fully conversant with the contents of the panel's separate installation manual and have the necessary skills for maintaining this equipment.

This fire alarm system requires periodic checks as specified in BS 5839 Part 1 It is the responsibility of the system user to ensure it is regularly serviced and maintained in good working order.

Disclaimer

No responsibility can be accepted by the manufacturer or distributors of this fire alarm panel for any misinterpretation of an instruction or guidance note or for the compliance of the system as a whole. The manufacturer's policy is one of continuous improvement and we reserve the right to make changes to product specifications at our discretion and without prior notice. E & O E.

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PRODUCT OVERVIEW

Fusion is a combined multi loop, up to 64 zone analogue addressable and/or conventional/Twin Wire control panel with integral power supply and space for standby batteries. Fusion panels are fully approved to European standards EN54-2 & 4, Fire Detection and Alarm Systems - Control and Indicating Equipment.

The control panel comprises a sheet steel enclosure suitable for wall mounting with a hinged, lockable front access door. It can be semi-recessed, if required, by using a suitable recessing bezel. Cable entry is via 20mm 'knockouts' provided in the top and rear of the cabinet.

Different key types are used for the door lock and the 'enable' key switch, to control levels of access. A 2 x 40 character, backlit LCD is fitted to display event information, function and configuration menus. Alarm and status information is provided by LED indicators. There is a 12 button keypad which controls the system and allows access to the function and configuration options.

The control panel operates with Apollo, XP95/Discovery analogue addressable protocols. The panel also supports a large range of conventional detectors including Apollo, Hochiki & Nittan.

Four, configurable, conventional radial circuits plus four dedicated, conventional sounder circuits are included as standard on the main PCB. Two additional sounder circuits are provided on each modular, analogue addressable loop card. Further, configurable, conventional radial circuits can be provided by the addition of modular, 4 way radial cards, up to 64 circuits. (N.B. panels above 52 radial circuits will require a remote power supply).

Each radial circuit is configurable in one of 3 possible ways. The default is for a traditional conventionally wired monitored fire detection circuit.

The circuit can be set as 'Twin Wire' where detectors, sounders and call points can be connected to the same pair of wires. In this configuration special 'Twin Wire' detector bases and call points must be used.

The Third possible configuration is as a monitored sounder circuit to activate fire alarm sounder devices. Each circuit is assigned to a detection 'zone' by default dependant on the card address. The zone number can be reassigned.

Each Radial can have a 40 character location message. The radial circuits integrate seamlessly with the analogue addressable devices and programmed zones. The Radial circuits can be used as inputs or outputs to any cause and effect groups on the panel.

Fusion panels are available in two different cabinet sizes. The standard cabinet unit, FBUS, can accommodate up to four additional modular, loop or radial circuit cards. The larger cabinet unit, FBUL, can accommodate up to 12 additional modular loop or radial circuit cards. N.B. Maximum number of loops = 8.

The panels are provided with an internal power supply module. The standard FBUS models have a 3 amp module and the FBUL versions have a 5 amp module. These modules comply with the requirements of EN54-4 : 1998 and provide temperature compensated battery management charging and earth fault monitoring. The power supply modules have two independent, current limited, outputs for supplying power to the panel circuits.

It is possible to power the panel from a remote power supply, if required, and input terminals are provided to facilitate the remote supply input and also to monitor the unit for mains and battery failure.

Access to the panel functions and configuration options is at different levels, enabling restricted access to certain functions. At the user level it is possible to disable parts of the system, set the time and date, put the system into walktest mode and view the system status. Advance options include; configuration, maintenance checks and fault finding mode.

The control panel incorporates a useful 'auto-learn' feature which enables the system analogue addressable devices to be recognised on initial power up. The sequence can be selected to only learn new devices or selected parts of the loop and, if required, can unlearn devices from the system. Full configuration of the system operation can be achieved via the panel controls or by downloading data created in a PC software program. (Download kits supplied separately).

The Fusion has networking capabilities as standard, utilising reliable CAN bus technology, with response settings to evacuate 1st alarm, 2nd alarm, precinct and fault signals, with programmable responses for loop sounders, panel sounder circuits, remote relays and loop modules. Up to 15 panels can be networked.

In addition to the requirements of EN54-2 the control panel has the following facilities:

Test Condition

To allow the automatic resetting of zones in alarm for testing purposes. EN54-2 Section 10, option with requirements.

Outputs to Fire Alarm Devices

To enable an audible warning to be sounded throughout a premises upon the detection of a fire condition or the operation of a manual call point. EN54-2 Section 7.8, option with requirements.

Output to Fire Alarm Routing Equipment

Monitored signal for use with remote, manned stations etc. EN54-2 Section 7.9.1, option with requirements.

Delays to Outputs

Programmable delays to outputs can be configured. EN54-2 Section 7.11, option with requirements.

Note: If delays are configured, a manual call point must be installed near the panel for the purpose of overriding the delay.

Disablements of Addressable Devices

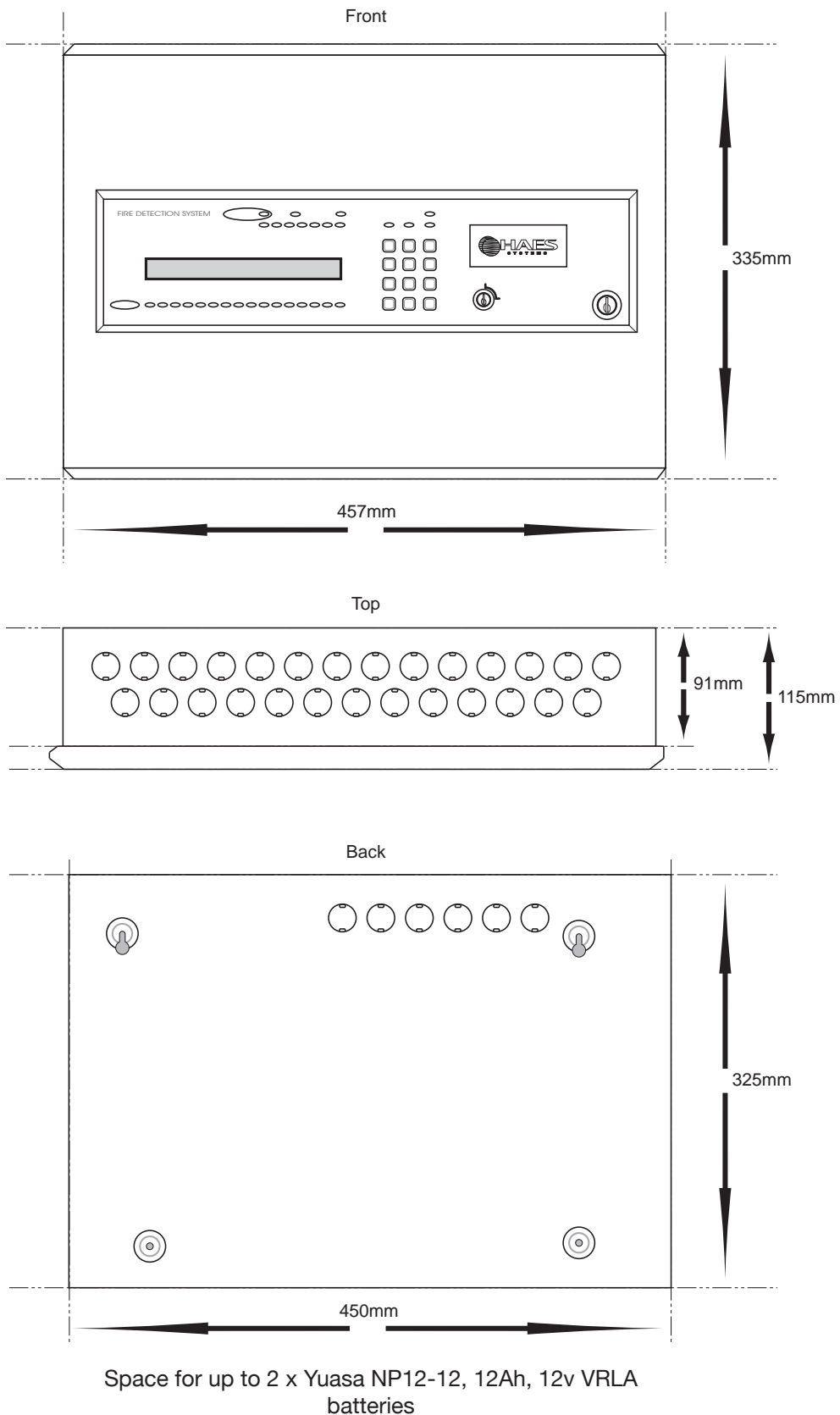
EN54-2 Section 9.5, option with requirements.

Fault Signals From Points

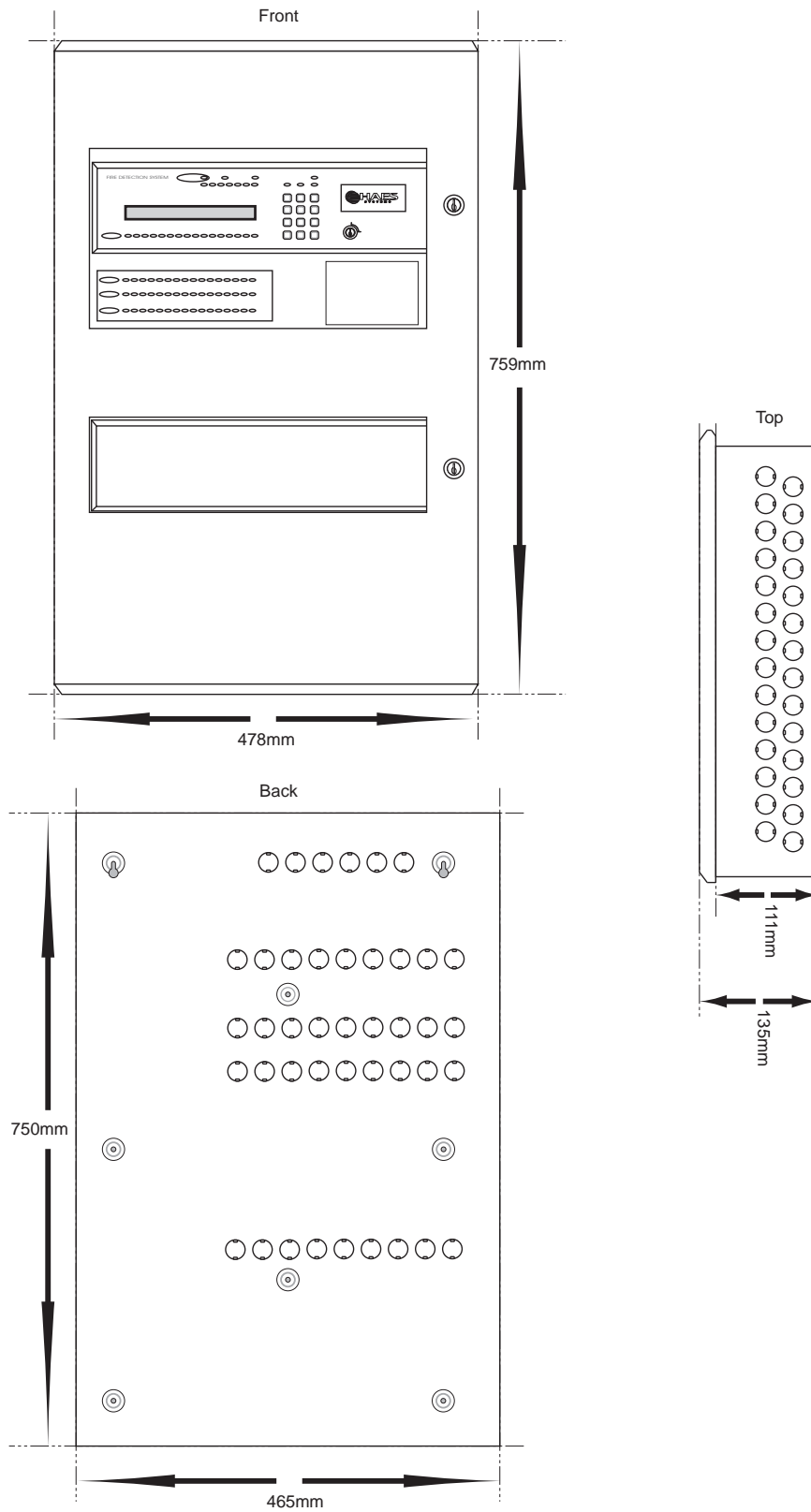
EN54-2 Section 8.3, option with requirements.

In addition to the requirements of EN54-2, all control panels have voltage free relay contacts for faults and fire. These are to be used for local control and signalling.

STD CABINET - FBUS



LARGE CABINET - FBUL

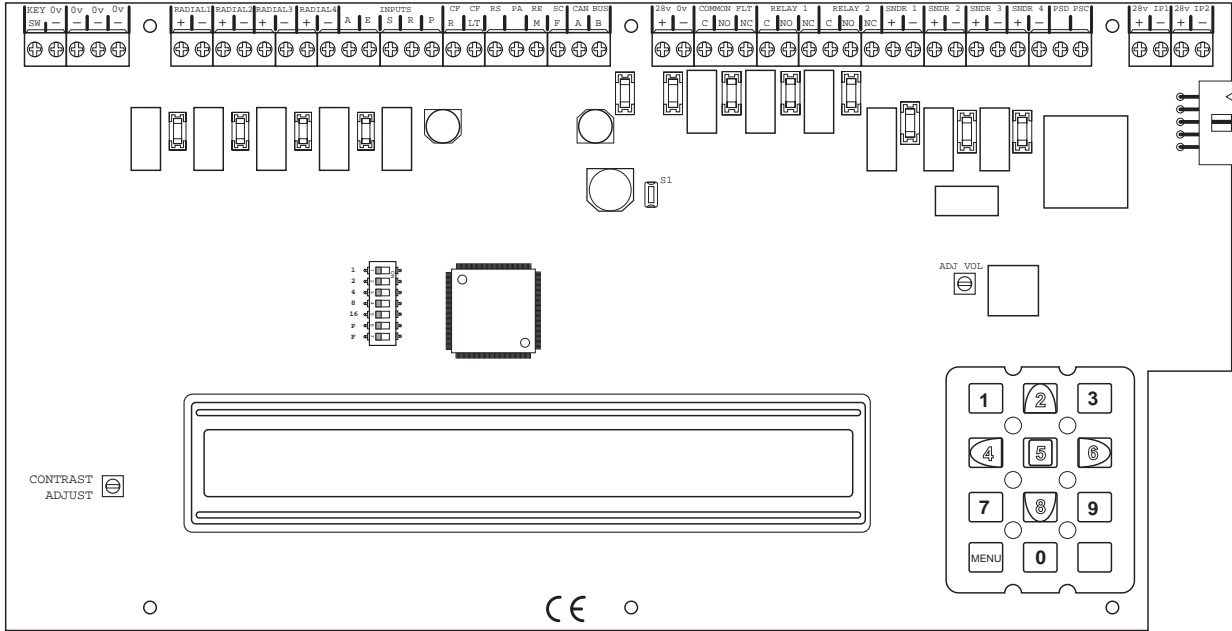


Space for up to 2 x Yuasa NP18-12, 18Ah, 12v VRLA batteries

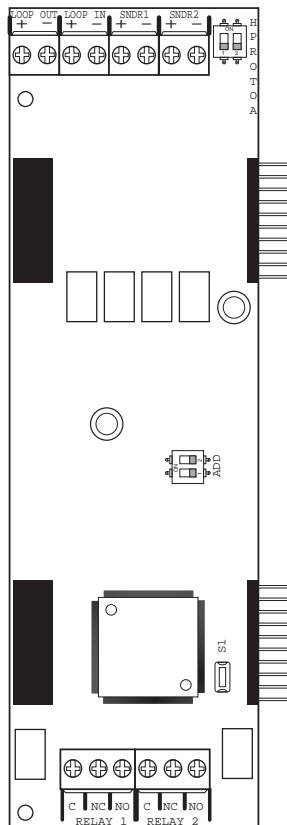
CIRCUIT BOARDS

Fusion panels are made up with a combination of the following main circuit boards:

TPCFSB17 - Master PCB

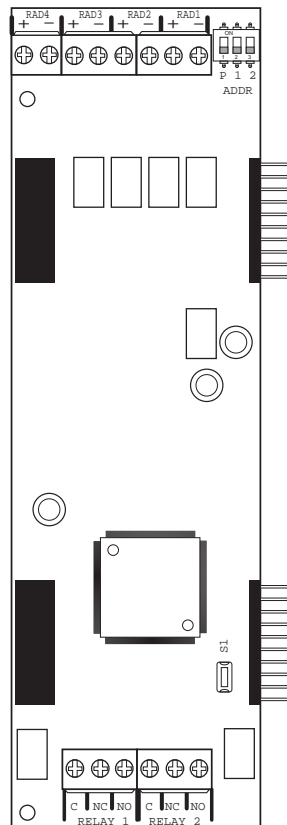


TPCFSB11 - Single Loop PCB



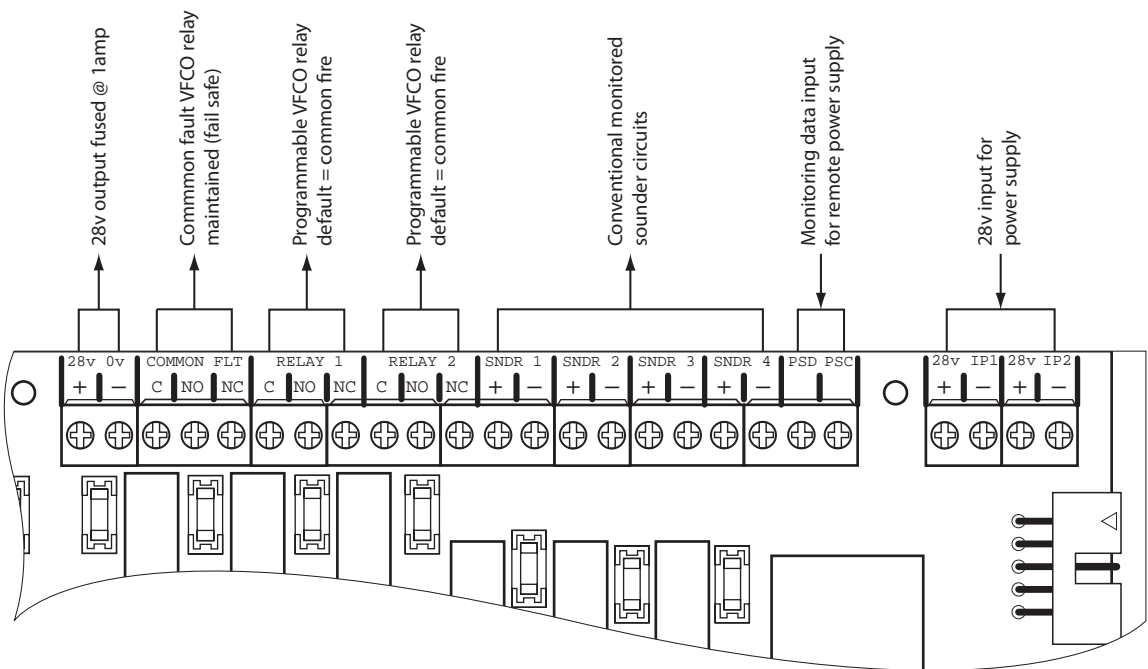
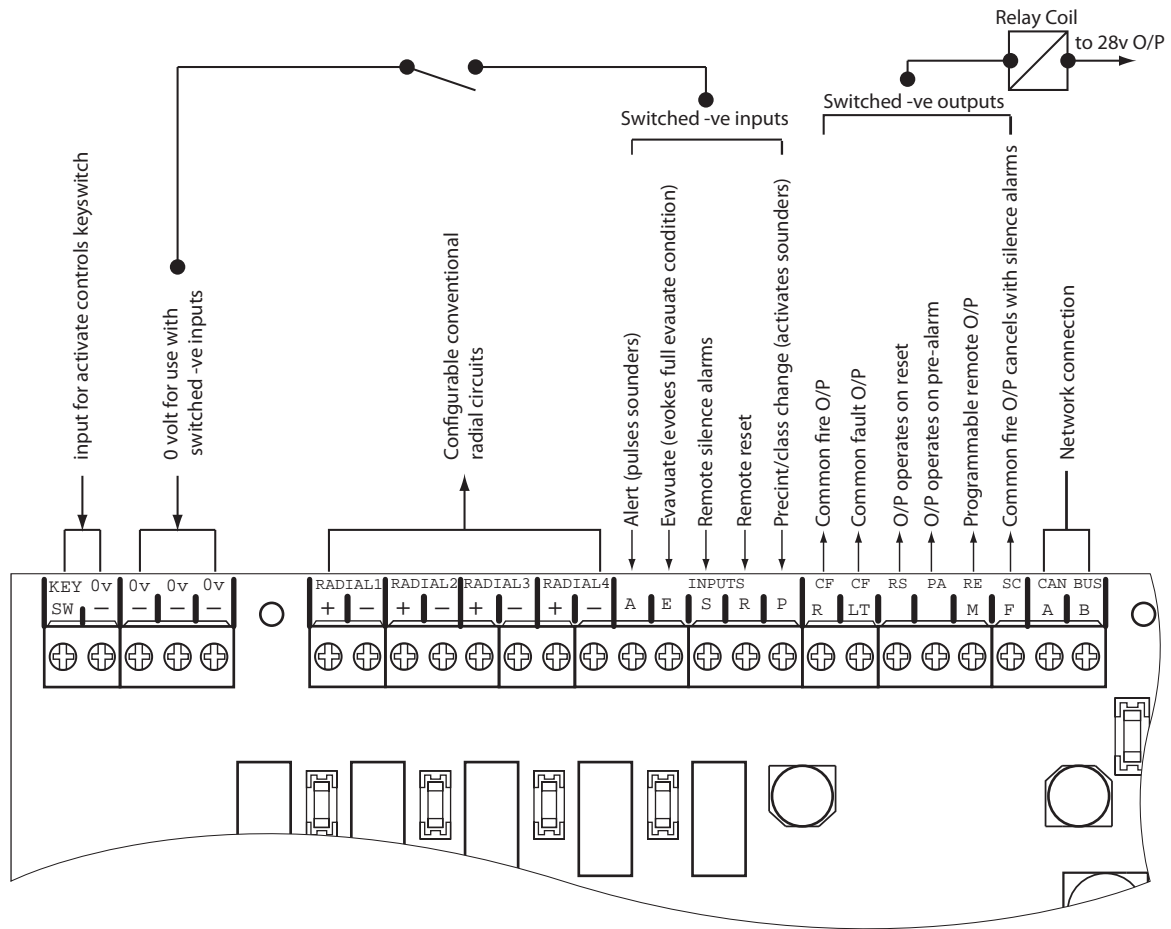
- 1 x analogue loop
- 2 x monitored sounder circuits
- 2 x VFCO relay contacts

TPCFSB18- 4 Way Radial Circuit PCB



- 4 x configurable, conventional radial circuits
- 2 x VFCO relay contacts

MAIN PCB TERMINALS



TECHNICAL SPECIFICATION

Electrical Specification Inputs & Outputs - TPCFSB17		
Cabling	Fire resistant screened cable, minimum size 1mm ² . Max cable length 1Km (20 Ohm). FireBurn, FP200 or equivalent (max capacitance 1uF, max inductance 1 millihenry).	Suitable cable glands must be used.
Terminal capacity	0.5mm ² to 2.5mm ² solid or stranded wire.	
KEY SW, 0v terminals	Connection for activate controls key-switch. Internal use only.	Protected via 10K Ohm impedance, 5v1 zener diode.
Radial 1 - 4	Configurable fire alarm circuits. Conventionally wired detection circuit, Twin Wire combined detection / sounder circuit or sounder circuit only. 4K7 Ohm 5% 0.25W EOL resistor.	Monitoring current limit 50mA, fused @ 500mA. Typical max load 22 alarm devices @ 18mA each per circuit. Ensure I MAX A is not exceeded.
Inputs; A, E, S, R, P	Switched -ve inputs, connect to 0v to trigger. Max input voltage = 28vdc. Non latching, max resistance 100R	Protected via 10K Ohm impedance, 5v1 zener diode.
Outputs; CFR, CFLT, RS, PA, REM, SCF	Switched -ve voltage outputs for relay control. Programmable via cause and effects. Used with common supply from 28vdc O/P.	Overload voltage protected to 52vdc. Max intended load = 100mA each. Protection via 1A fuse on 28vdc output.
CAN BUS (A/B)	Communications Bus connection for network panels/repeaters, 5vdc.	CAN BUS 2.0 special protocol. 120R termination resistor. Short circuit protected, ESD over voltage protected. +/- 8Kv
28v+, 0v- power output	28vdc supply output for fire alarm accessory relays etc. Max continuous use = 800mA	Fused @ 1A. Fuse = 1A quick blow Nano
Common fault relay	Maintained fault relay contact. Clean C/O 30vdc 1A max.	Fused @ 1A. Fuse = 1A quick blow Nano
Relay 1 & 2	Programmable alarm relay contacts. Clean C/O 30vdc 1A max.	Fused @ 1A. Fuse = 1A quick blow Nano
SNDR 1 - 4	28vdc polarity reversal monitored sounder outputs to fire alarm devices. 4K7 Ohm 5% 0.25W EOL resistor.	Monitoring current limit 28mA, fused @ 500mA. Typical max load 22 devices @ 18mA each per circuit. Ensure I MAX A is not exceeded.
PSD / PSC	Remote power supply clock & data 5vdc signal inputs.	Protected via 10K Ohm impedance 5v1 zener diode.
28vdc IP2 & IP2	28vdc supply inputs. Diode protected for reversal and independent short circuit. Max current 10 amps.	Max input current 10 amps. Input voltage 19.2vdc to 32vdc.
Download adaptor connector	RS232 serial port c/w 5vdc output for plug in adaptor.	Use with SW-FSB25 or SWPROG adaptors only.

TECHNICAL SPECIFICATION

Electrical Specification Inputs & Outputs - TPCFSB11		
Cabling	Fire resistant screened cable, minimum size 1mm ² . Max cable length 1Km (20 Ohm). FireBurn, FP200 or equivalent (max capacitance 1uF, max inductance 1 millihenry).	Suitable cable glands must be used. Cabling specification is subject to loop lengths and loading.
Terminal capacity	0.5mm ² to 2.5mm ² solid or stranded wire.	
Loop In / Out	Analogue addressable loop circuit. 126 devices Apollo protocol or 127 devices Hochiki protocol, 28 - 36vdc. Max loop current = 500mA.	Short circuit protection via thermal fuse, 500mA. Sounder load subject to cable resistance.
SNDR 1 - 4	28vdc polarity reversal monitored sounder outputs to fire alarm devices. 4K7 Ohm 5% 0.25W EOL resistor.	Monitoring current limit 28mA, fused @ 500mA. Typical max load 22 devices @ 18mA each per circuit. Ensure I MAX A is not exceeded.
Relay 1 & 2	Programmable alarm relay contacts. Clean C/O 30vdc 1A max.	Unprotected relay contacts. Protection via 1A fuse on 28vdc output. Recommended usage.

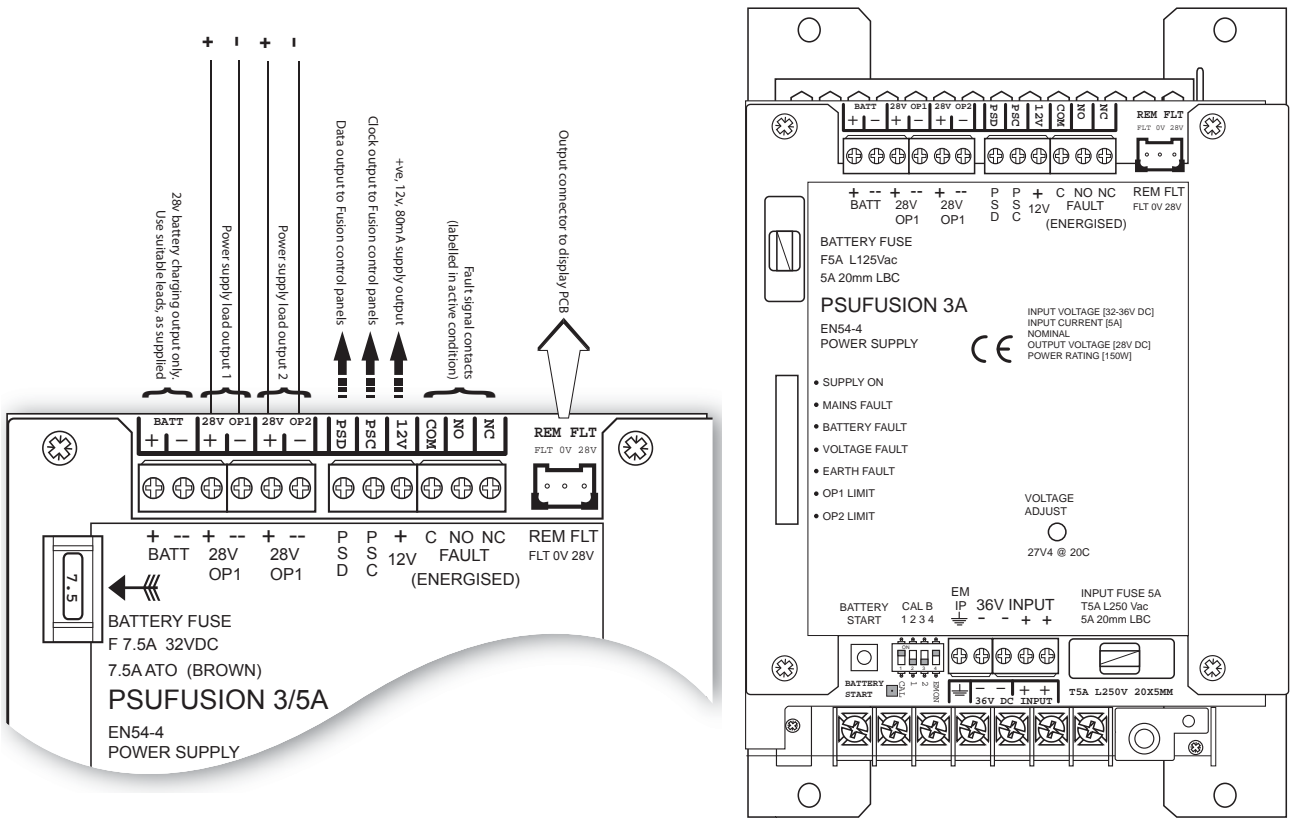
Electrical Specification Inputs & Outputs - TPCFSB18		
Cabling	Fire resistant screened cable, minimum size 1mm ² . Max cable length 1Km (20 Ohm). FireBurn, FP200 or equivalent (max capacitance 1uF, max inductance 1 millihenry).	Suitable cable glands must be used.
Terminal capacity	0.5mm ² to 2.5mm ² solid or stranded wire.	
Radial 1 - 4	Configurable fire alarm circuits. Conventionally wired detection circuit, Twin Wire combined detection / sounder circuit or sounder circuit only. 4K7 Ohm 5% 0.25W EOL resistor.	Monitoring current limit 50mA, fused @ 500mA. Typical max load 22 alarm devices @ 18mA each per circuit. Ensure I MAX A is not exceeded.
Relay 1 & 2	Programmable alarm relay contacts. Clean C/O 30vdc 1A max.	Unprotected relay contacts. Protection via 1A fuse on 28vdc output. Recommended usage.

General Specification	
Enclosure	Steel IP30. Epoxy powder coated Interpon Radon, silver grey
Temperature range	-5 deg C to +40 deg C max RH 95%
Number of fire zone LED indicators	16 (std) or 64 (optional)
Maximum number of addressable loops	FBUS = 4, FBUL = 8. Max 126 (Apollo) addressable points per loop
Maximum conventional detection circuits	FBUS = 20, FBUL = 64. (N.B. Panels above 52 radial circuits will require a remote power supply).
Max loop current	500mA per loop
Analogue addressable detection protocol	Apollo: S90, XP95, Discovery.
Conventional/Twin Wire detector compatibility	Apollo: S65, Orbis. / Hochiki CDX. / Nittan EV Conventional
Networking	2 wire comms, CAN 2.0 bus. Up to 15 panels. Max cable length 1Km fire resistant, screened cable
PC connection	Download configuration only via USB - RS232 serial conversion adaptor SW-FSB25
Event log	100 fire events, 100 fault events, 100 user events

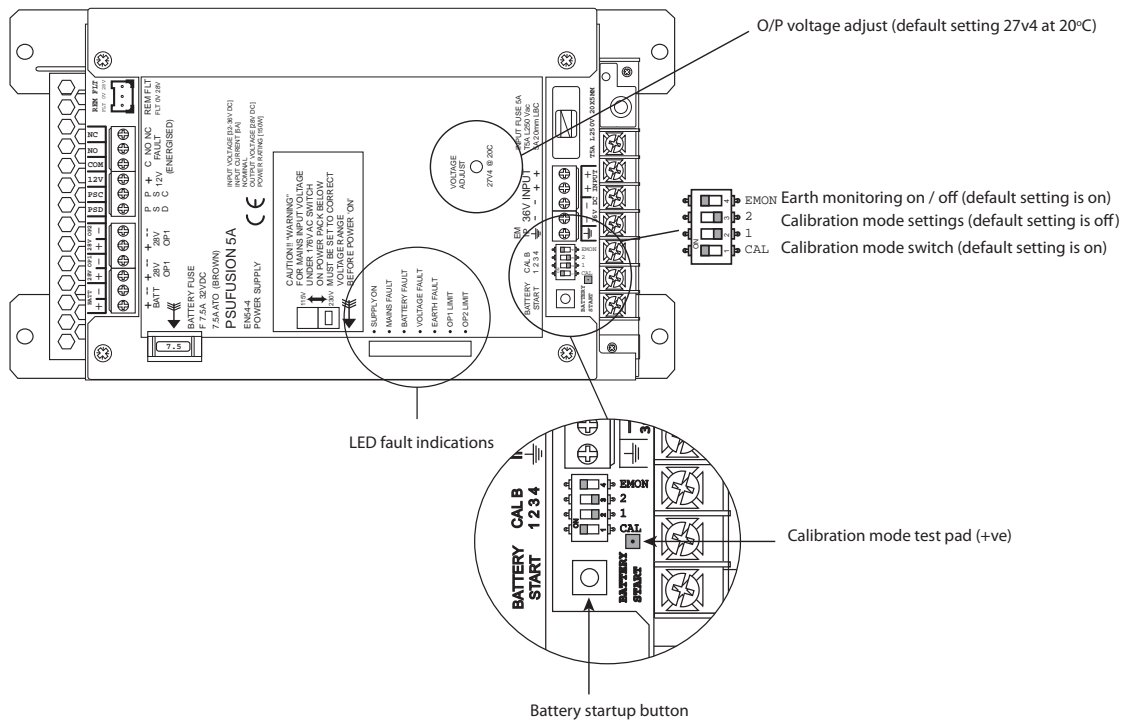
POWER SUPPLY MODULE

Power Supply Specification		
Mains supply	230vac +10% / -15% 50Hz max current 1A	
Mains supply fuse	(FBUS) = 4 Amp (F4A 250V) (FBUL) = 5 Amp (F5A 250V)	Not accessible for servicing. Internal to switch mode power unit
Internal power supply rating	(FBUS) 3 Amps total including battery charging (max load I _{max.a} = 1.281A) Output current limited to 3A @230vac I _{max.b} not specified	(FBUL) 5Amps total including battery charge (max load I _{max.a} = 1.580A) Output current limited to 5A @ 230vac I _{max.b} not specified
Minimum current drawn by panel (examples)	FBUS64-4-0 I _{min} = 150mA	FBUL64-8-7 I _{min} = 297mA
Maximum ripple	250 millivolts	Supply and charger fault monitored
Min/max battery size and type	(FBUS) min = 2 x 3.2Ahr 12volt VRLA max = 2 x 12 Ahr 12volt VRLA. Use Yuasa NP range batteries	(FBUL) min = 2 x 7Ahr 12volt VRLA max = 2 x 18 Ahr 12volt VRLA. Use Yuasa NP range batteries
Battery charging voltage	27.3 vdc nominal at 20 deg C	Temperature compensated
Battery charging output current	(FBUS) 3A PSU 1.3A max Current limited	(FBUL) 5A PSU 1.85A max Current limited
Battery high impedance fault (Batt Hi Z)	Resistance > 0.8 Ohms	1 hour reporting time
Max current drawn from batteries	(FBUS) 3 Amps with main power source disconnected. Battery fuse 5A LBC 20mm. PSU limits battery current draw to 3A from outputs	(FBUL) 5 Amps with main power source disconnected. Battery fuse 7.5 A auto. PSU limits battery current draw to 5A from outputs
Earth fault monitoring	< 100K Ohms to 28vdc supply rail or 0vdc supply rail	Monitored via earth terminal input to PSU PCB
36vdc input	(FBUS) 36vdc +/- 2v input from switch mode unit. 100w max current 3.3A @36v Fused T3.15A L250v 20mm	(FBUL) 36vdc +/- 2v input from switch mode unit. 150w max current 4.73A @36v. Fused T5A L250v 20mm
28vdc OP1 & OP2	(FBUS) Monitored supply outputs, short circuit & over-current protection 3.6A shared between outputs. Min Load current 20mA per OP	(FBUL) Monitored supply output, short circuit & over-current protection 3.6A shared between outputs. Min Load current 20mA per OP
PSD	Power supply data output, serial data pulses	Open collector current limited via 2K7 Ohm. Receiver pull up to 5vdc
PSC	Power supply clock output, serial clock pulses	Open collector current limited via 2K7 Ohm. Receiver pull up to 5vdc
12vdc output	12vdc supply output, 100mA	Limit 100mA thermal fuse
Fault relay C/NC/NO	Maintained fault relay contacts, unprotected	Switching current Max 2A @ 30vdc
REM FLT	Internal connector for display PCB. 28vdc Open collector	Unprotected not for external use.

POWER SUPPLY MODULE



Internal Indications & Controls



SYSTEM DESIGN & PLANNING

What is a detection zone?

This guide is intended as an aid to designers and installers of fire detection systems. It is NOT to be used as a substitute to BS5839 which should be read in full.

In order to direct those responding to a fire alarm signal, particularly the fire service, to the area of a fire, all buildings, other than very small buildings, need to be divided into detection zones. Detection zones need to be small enough for a fire to be located quickly.

- If the total floor area of the building is greater than 300m², each zone should be restricted to a single storey
- If the total floor area of the building is less than 300m² a zone may cover more than a single storey
- For voids above or below the floor area of a room, these may be included within the same zone of the room, provided that the void and the room constitute a single fire compartment
- The floor area of a single zone should not exceed 2000m².

Detectors

- A person searching a zone for a fire in a non- addressable fire system should not have to travel more than 60m to identify the source of a fire
- The sensing element of a smoke detection device should not be less than 25mm and not more than 600mm below ceiling
- The sensing element of a heat detector should not be less than 25mm and not more than 150mm below ceiling
- When mounted on a flat ceiling, smoke detection devices have an individual coverage of 7.5m radius. However these radii must overlap to ensure there are no 'blind spots'. Therefore individual coverage can be represented by a square measuring 10.6m x 10.6m giving an actual coverage of 112m² per device
- When mounted on a flat ceiling, heat detection devices have an individual coverage of 5.3m radius. However these radii must overlap to ensure there are no 'blind spots'. Therefore individual coverage can be represented by a square measuring 7.5m x 7.5m giving an actual coverage of 56.3m² per device.

Call Points

- A person should not have to travel more than 45m along an escape route to reach a Manual Call Point (25m if disabled person to operate, or rapid fire development is likely). Manual Call Points should be sited at all stair wells and exits from the building.
- The frangible element of the manual call point should be positioned 1.4m (+/- 200mm) from the floor level. (Unless a wheelchair user is likely to be the first person to raise the alarm).

Sounders

- Sounder device cabling should be arranged so that in the event of a fault, at least one sounder will remain operational during a fire condition.
- The minimum sound level should be 65dB(A) or 5dB(A) above a background noise which is louder than 60dB(A) (if lasting more than 30 seconds) and at a frequency of between 500Hz and 1000Hz. The maximum sound level should not be greater than 120dB(A) at any normally accessible point. This may be reduced to 60dB(A) in stairways, enclosures up to 60m² and specific points of limited extent.
- For areas where people are sleeping, sounder devices should produce a minimum 75dB(A) at the bed-head with all doors shut. In buildings providing sleeping accommodation for a significant number of people, all bedrooms should have both audible and visual alarms.

Beacons

- Visual alarms such as beacons, should always be mounted at a minimum height of 2.1m from floor level.

General

- Fire Alarm Control Panels should be installed at a location appropriate for staff and fire fighters
- All mains supply isolators must be double pole and suitably marked
- All joints to be fire resisting, junction boxes to be labelled 'FIRE ALARM'.
- All cables to be fire resisting with a minimum cross-sectional area of 1mm².
- Cable using trunking as a means of containment must be clipped using fire resistant supports WITHIN THE TRUNKING.
- Zone charts should be fitted in all appropriate locations (adjacent to control equipment and repeaters).

CABLE TYPES & LIMITATIONS

To comply with EMC (Electro Magnetic Compatibility) regulations and to reduce the risk of electrical interference in the system wiring, we recommend the use of screened cables throughout the installation. Acceptable, commonly available, screened cables, which can be used on both the sounder and detector circuits include, NoBurn™ FP200™, Firetuff™, Firecel™, MICC (Pyro™) or any other cable complying with BS 6387 categories C, W, Z.. Refer to BS 5839 pt1 clause 26 for detailed information on cables wiring and interconnections.

CABLING

Suitable cables should be brought into the cabinet using the knockouts provided via a suitable cable gland recommended for use with that cable. The screen or drain wire of loop circuits should be bonded to earth at one location only, and should be continuous throughout the circuit. Drain wires should be terminated in the cabinet using the 4 way brass earthing terminal block provided.

CABLE LENGTHS

The maximum recommended cable length for a loop or radial circuit is 1Km. This, however, is highly dependant on the number and type of devices connected.

We recommend the use of the Apollo or Hochiki loop calculator tools when planning cable layouts.

MAINS PROVISION

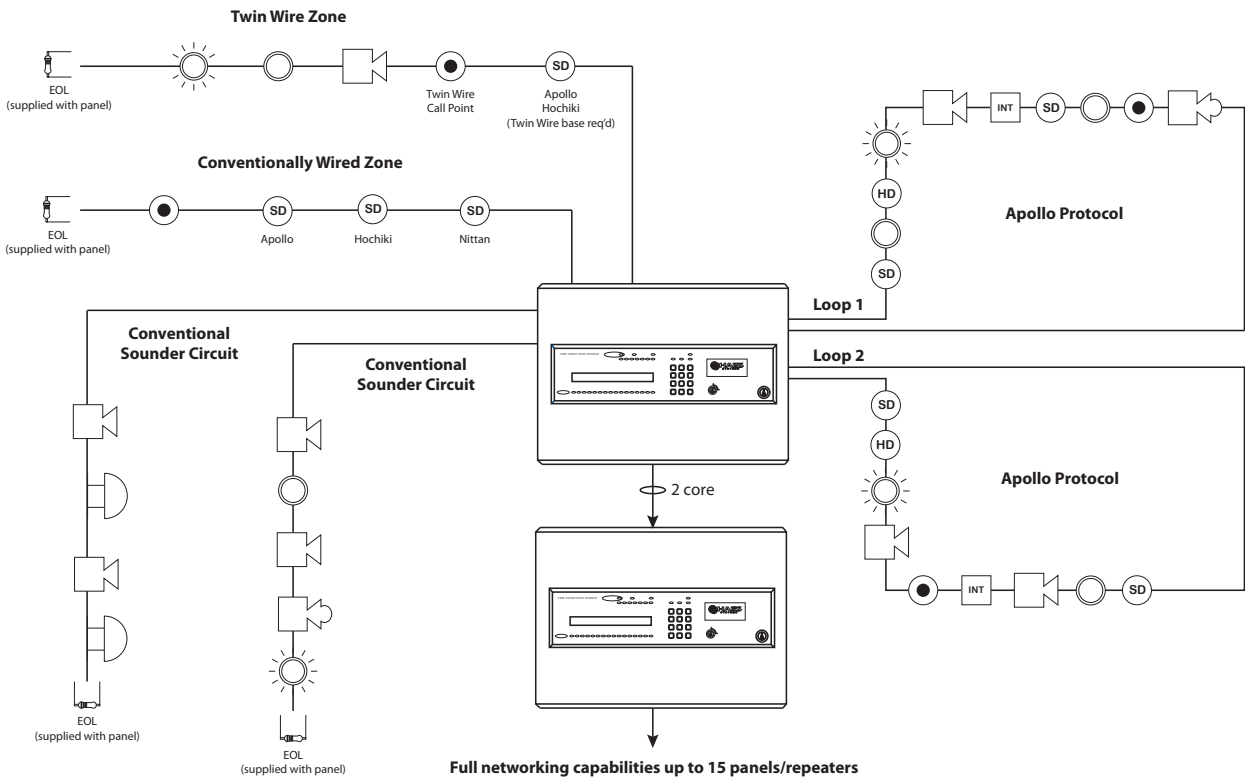
The mains supply to the fire alarm panel should be hard wired, using suitable three core cable (no less than 1.0 mm² and no more than 2.5mm²) or a suitable three conductor system that meets the appropriate national wiring regulations. The panel should be fed from an isolating switched fused spur, supplied directly from the Main Distribution Board, fused at 3A. This should be secure from unauthorised operation and be marked 'FIRE ALARM'.

The mains supply must be exclusive to the fire panel.

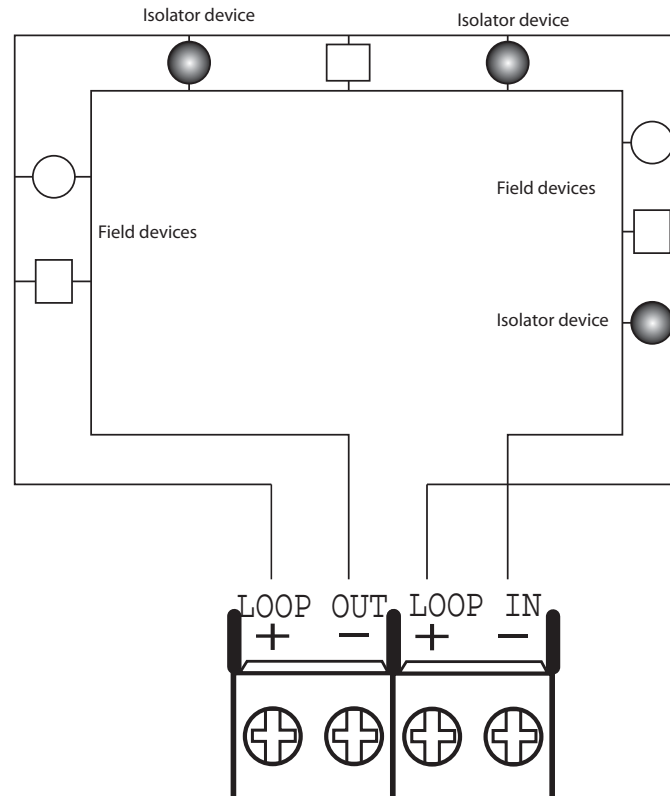
As an alternative to a switched fused spur, an appropriately fused double pole isolating device may be used providing it meets the appropriate national wiring regulations.

All system wiring should be installed to meet BS5839 Pt 1 : 2002 and BS7671 (Wiring Regulations). Other national standards of installation should be used where applicable.

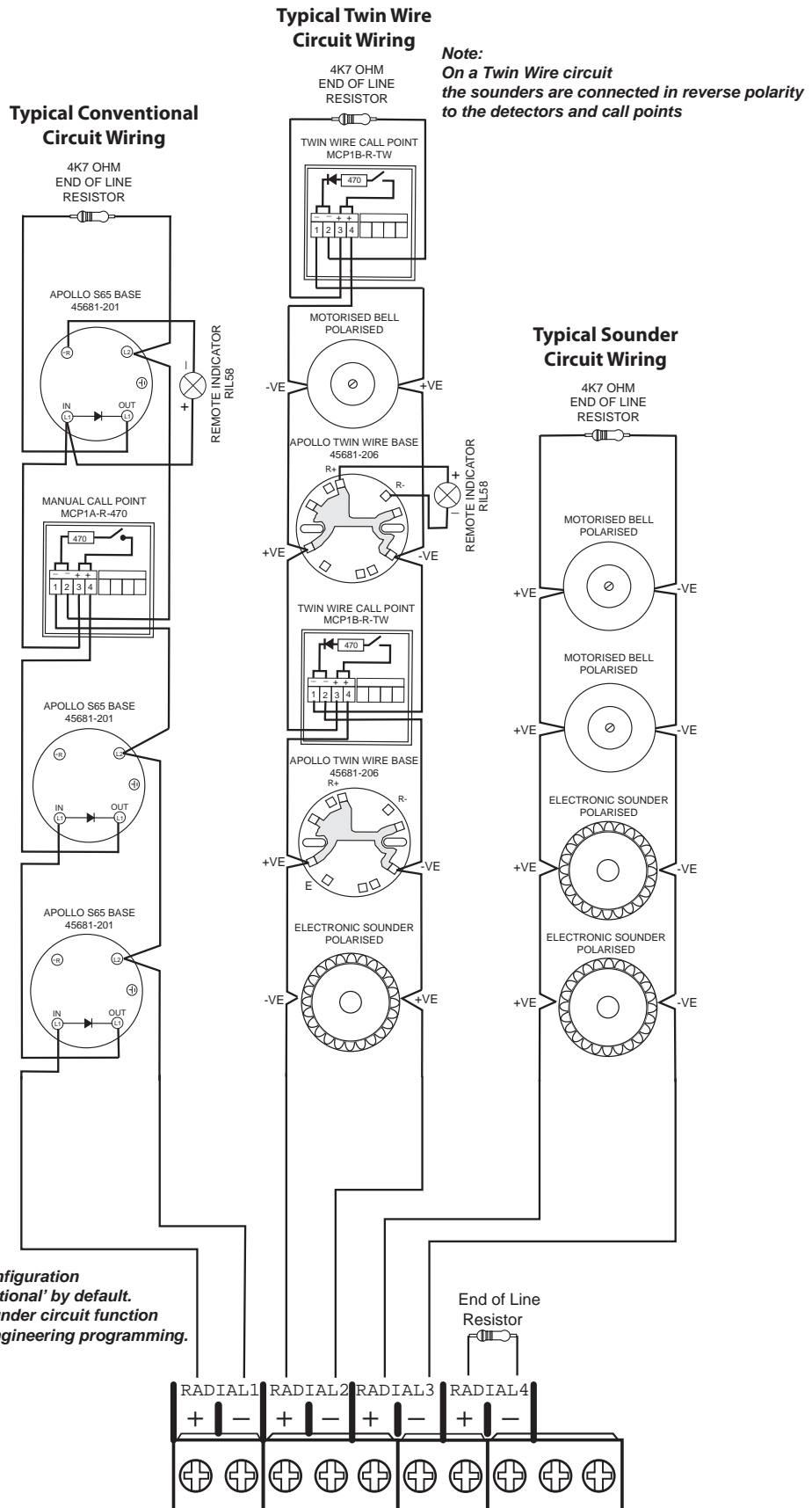
GENERAL SYSTEM SCHEMATIC



GENERAL LOOP SCHEMATIC



GENERAL RADIAL SCHEMATIC



Note:
On a Twin Wire circuit the sounders are connected in reverse polarity to the detectors and call points

Note:
Radial circuit configuration is set to 'Conventional' by default. Twin Wire or Sounder circuit function must be set in engineering programming.

SAFETY

Suppliers of articles for use at work are required under section 6 of the Health and Safety at Work Act 1974 to ensure as reasonably as is practical that the article will be safe and without risk to health when properly used. An article is not regarded as properly used if it is used “without regard to any relevant information or advice” relating to its use made available by the supplier.


It is assumed that the system, of which this control panel is a part, has been designed by a competent fire alarm system designer in accordance with BS 5839 Part 1 and with regard to BS EN 54 parts 2 and 4 in the case of control equipment and power supplies. Design drawings should be provided to clearly show the position of any field devices and ancillary equipment.

This product should be installed, commissioned and maintained by, or under the supervision of, competent persons according to good engineering practice and,

- (i) BS 7671 (IEE wiring regulations for electrical installations)
- (ii) Codes of Practice
- (iii) Statutory requirements
- (iv) Any instructions specifically advised by the manufacturer


According to the provisions of the Act you are therefore requested to take such steps as are necessary to ensure that any appropriate information about this product is made available by you to anyone concerned with its use.

This equipment is designed to be operated from 230V AC 50/60 Hz mains supplies and is of Class I construction. As such it must be connected to a protective earthing conductor in the fixed wiring of the installation. Failure to ensure that all conductive accessible parts of this equipment are adequately bonded to the protective earth will render the equipment unsafe.

	<p>This equipment must only be installed and maintained by a suitably skilled and technically competent person.</p> <p>THIS IS A PIECE OF CLASS 1 EQUIPMENT AND MUST BE EARTHED</p>
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These panels are designed to comply with the requirements of EN 54 part 2 , but include integral facilities to enable connection to older systems, which may not comply with current standards.

Installation of the panel should only be carried out by qualified personnel. The electronic components within the panel can be damaged by static charge. Suitable precautions must be taken when handling circuit boards. Never insert or remove boards or components, or connect cables, with the mains power on or batteries connected.

Equipment Guarantee	
This equipment is not guaranteed unless the complete system is installed and commissioned in accordance with the laid down national standards by an approved and competent person or organisation.	
	This product has been manufactured in conformance with the requirements of all applicable EU Council Directives

ESD PRECAUTION



Electronic components are vulnerable to damage by Electrostatic Discharges (ESD). An ESD wrist strap, suitably grounded, should be worn at all times when handling pcbs. These wrist straps are designed to prevent the build up of static charges, not only within a persons body, but on many other materials. ESD damage is not always evident immediately, faults can manifest themselves at anytime in the future. All pcbs should be stored in static shielded bags (silvered) for safe keeping, when not mounted in the control panel.

GENERAL

Care should be taken with regards to avoiding the close proximity of high voltage cables or areas likely to induce electrical interference. Earth links should be maintained on all system cables and grounded in the control panel. The detection and sounder circuit cabling is classed as extra low voltage and must be segregated away from mains voltage.

- Any junction boxes used should be clearly labelled FIRE ALARM.
- Any ancillary devices, e.g. door retaining magnets, must be powered from a separate power source.
- Any coils or solenoids used in the system must be suppressed, to avoid damage to the control equipment.

MOUNTING THE CABINET

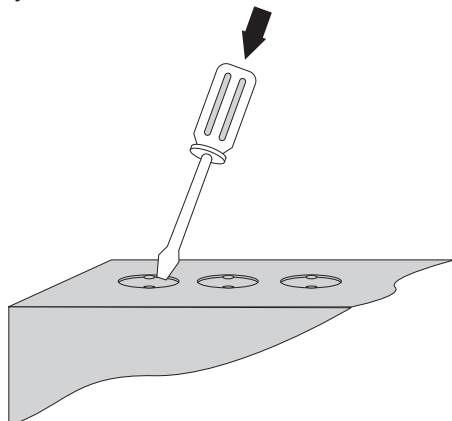
The site chosen for the location of the panel should be clean, dry and not subject to shock or vibration. Damp, salt air or environments where water ingress or extremes of temperature may affect the panel must be avoided. The temperature should be in the range -5° to +40°C, and the relative humidity should not exceed 95%.

Before mounting the cabinet remove the main PCB and any additional loop or radial circuit cards. The circuit boards are all mounted on a single chassis frame and can easily be removed by unscrewing the four cross headed screws located in the corners of the chassis frame.

Remove the power supply module connecting wires from the main PCB and the loop power PCB before unscrewing the chassis, taking care to note where to re-connect them. The two white wires from the activate controls keyswitch will also need to be removed from the main PCB.

Secure the cabinet to the wall using the four indented holes in the back box. Ensure the box is mounted level and in a convenient location where it may be easily operated and serviced.

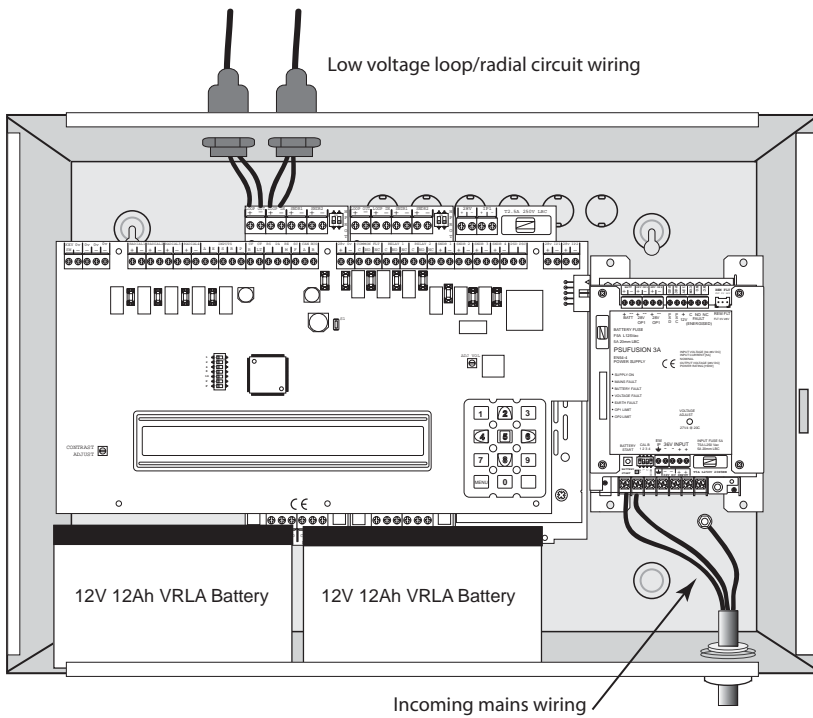
External cables should be glanded via preformed knockouts at the top and rear of the cabinet. Remove any knockouts and ensure the cabinet is clear of swarf etc prior to refitting the PCBs. Always ensure that if a knockout is removed, the hole is filled with a good quality cable gland. Any unused knockouts must be securely blanked off.



Knockouts should be removed with a sharp tap at the rim of the knockout using a flat 6mm broad bladed screwdriver.

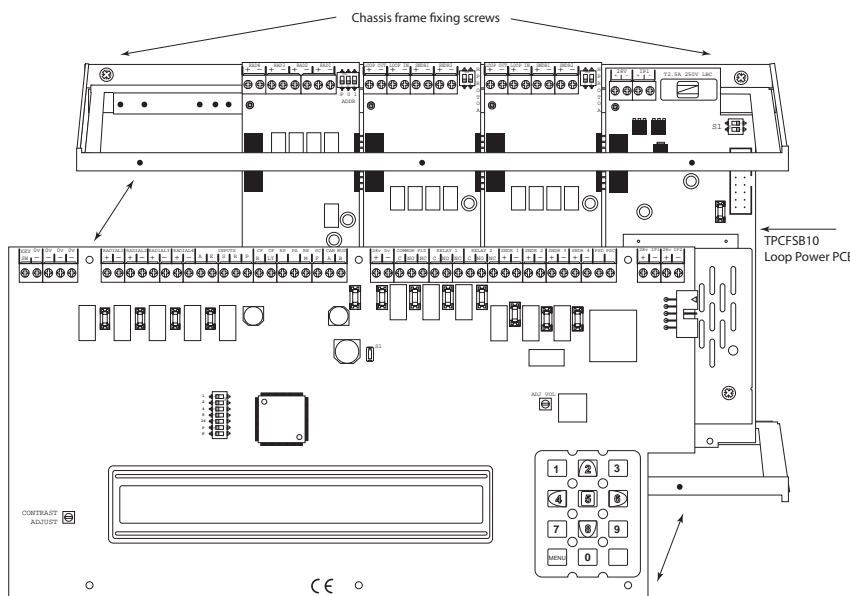
Use of excessive force will damage the enclosure around the knockout.

Typical panel layout



Drawing shows typical internal layout of the std cabinet panel with two loop cards fitted

Typical circuit board assembly



Drawing shows a typical circuit board assembly with two loop cards and one radial card fitted.

All circuit boards are mounted to a chassis frame which can be easily removed by undoing the four fixing screws.

The loop and radial cards are fitted to the frame behind the main circuit board. The loop power PCB (TPCFSB10) is factory fitted as standard.

The frame can hold up to four loop or radial cards. Large cabinet panels have space for an additional two, loop and radial card, mounting chassis frames.

Note:

Any additional loop or radial cards that have not been supplied factory fitted will require addressing and initialising.


Please refer to the full installation and commissioning manual for further details.

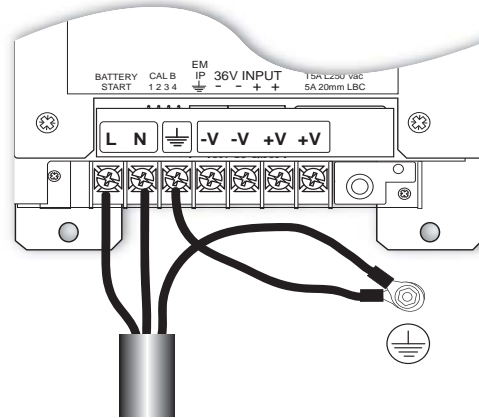
MAINS CONNECTIONS

Do not connect the mains supply to the panel until you are fully conversant with the layout and features of the equipment.

A rating plate is fitted in the bottom right hand corner of the panel describing the nature of the supply permitted.

The incoming mains supply should be brought into the panel in the bottom right hand corner, via the knockout provided.

A suitable cable gland must be used to secure the outer sheath of the cable used. The earth must first be connected to the primary earth stud (peg) marked with a  symbol, using the ring crimp provided.

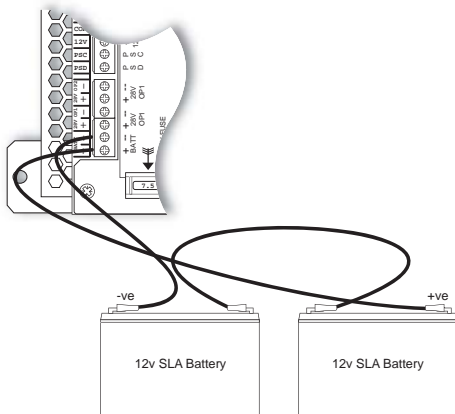


Sufficient earth lead should be left to allow Live and Neutral connections to be accidentally pulled from the terminal block while leaving the earth connection intact. Secondary earths may be connected to the brass earthing block.

CONNECTING THE BATTERIES

Batteries of even very small capacity are capable of delivering very high currents which can cause fire or injury, therefore battery connections should be done with caution.

The panel is supplied with battery leads already connected to the battery terminals on the power supply module. These leads are coloured red for +ve and black for -ve.

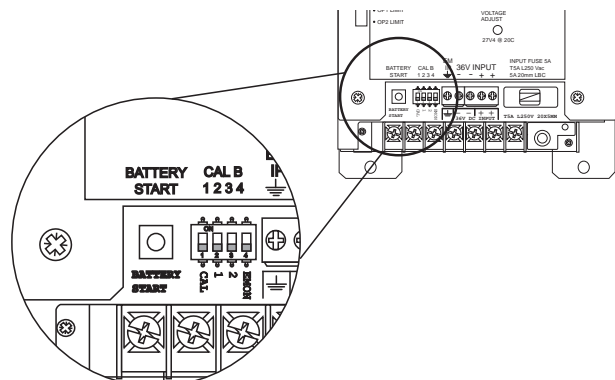


2 x 12v batteries should be connected in series using the white jumper lead provided. See diagram.

To optimise the service life of the batteries, the battery charger output voltage varies with temperature.

N.B.
In the event of mains failure, the battery charger circuit will protect the batteries from full discharge by disconnecting them when they reach below 19v. When the mains supply is restored the batteries will be automatically reconnected.

To power up the panel without a mains supply, connect the batteries as shown above and press the battery startup button on the power supply module.



INITIALISING

The following section is a quick guide for initialising the control panel and running the auto-learn facility for analogue addressable devices.

The auto-learn is a useful feature when the system needs to be up and running prior to any programming being applied. Once auto-learn has been run, the data can be uploaded to the Fusion configuration software which can save a lot of time and keystrokes when programming.

For full details on commissioning and programming please refer to the full Installation, Commissioning and Operating manuals which can be downloaded from www.haes-systems.co.uk. It is also highly recommended that you attend one of our training courses before attempting to commission a Fusion analogue addressable system.

Note - this guide assumes the following have been carried out :

- Loop cables are installed correctly and are clear of any earth faults.
- All loop devices are installed and addressed correctly as required.
- Panel is correctly mounted and mains 230vac supply is available.

STEP 1 - Initial Power Up

Before connecting any of the loop cables and with all the loop terminal links still in the panel, connect the mains 230v ac supply and the batteries to the panel as per instructions in the INSTALLATION section. The panel will power up and the fault buzzer will bleep momentarily, the 'Supply Present' LED will stay illuminated while the LCD display will show as below.



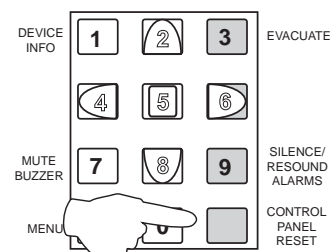
After a short delay of approximately two minutes the panel LCD will display message as below.



Turn the 'ACTIVATE CONTROLS' key-switch to the 'ON' position and press the RESET button.

All LEDs will illuminate momentarily.

Any faults displayed at this stage should be rectified before proceeding. Please call our Technical Support department if required.



STEP 2 - Connect the Cables

Disconnect the mains supply and the batteries to power down the panel completely. Remove the loop terminal links, connect the loop circuit, and then power up the panel as described above.

We strongly recommend that loops are connected and auto-learned one at a time.

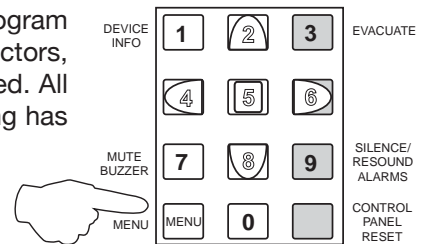
After a few minutes the panel will start to detect any addressable devices attached to the loop cables and will display the following typical message:



Note - the first four figures on the LCD display indicate the amount of addressable devices found by the panel. This figure should coincide with the number of devices actually installed. Any differences at this stage should be corrected before moving on to the next section.

STEP 3 - Auto-Learn Procedure

The 'auto-learn' procedure will allow the panel to detect and self program all addressable devices into its memory. Once complete all detectors, call points, sounders and outputs will operate as normal, if activated. All devices will be placed in zone 1 until full configuration programming has been applied.



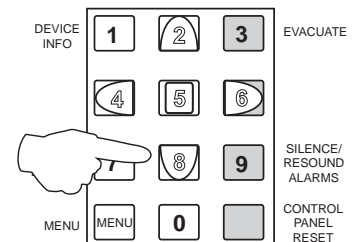
Start by pressing the MENU button on the keypad

The LCD will display a message as shown below:



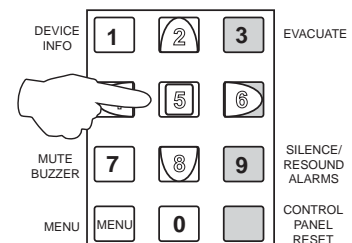
Press the ARROW DOWN button [8] until menu option 12 is shown

The LCD will display as shown below:



Press the ENTER button [5]

The LCD will ask for a 4 digit code as shown below:

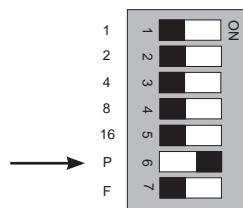


Enter the engineers code **1-9-5-0**, using the corresponding buttons on the keypad.

Once the [0] button has been pushed the LCD will display as per below:



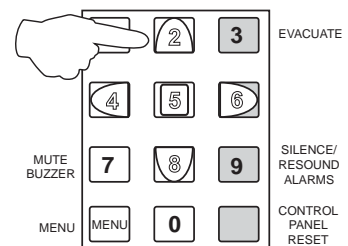
At this point it is necessary to turn on the programming switch on the main PCB. This is the DIL switch marked 'P' which can be found in the centre left of the main circuit board (near the LCD)



Switch P (6) to ON position

With the programming switches ON it is now possible to gain access to engineers options, 1, 2, 3 & 4.

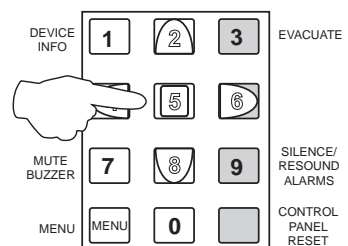
Press the ARROW UP button [2] on the keypad until the LCD displays message as shown below:



Now press the ENTER button [5]. The panel will scan and auto-learn the addressable devices on loop 1. If the system consists of more than one loop you will be prompted to enter the loop number before proceeding.

After the initial auto-learn scan the LCD will display three options as shown below:

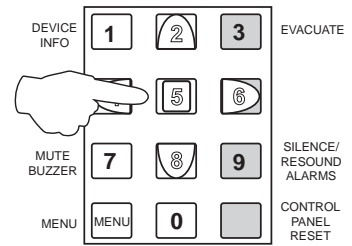
Use the ARROW UP [2] and ARROW DOWN [8] buttons to toggle between the options.



- Option 1 will overwrite all the devices in the memory to zone 1.
- Option 2 only updates added or removed devices without affecting existing programming.

With the chosen option selected, press the ENTER button [5].

The LCD will typically display as shown below:



The LCD display now reports the amount of devices found on the selected loop.

Choosing 'YES' at this point enables manual editing of devices for zone number and text etc. This process can be time consuming and so we recommend it is only used for small systems.

Selecting 'NO' will default all the devices to zone 1 and is the faster option. Use the ARROW LEFT [2] and ARROW RIGHT [6] buttons to select and then press the ENTER button [5] to proceed.

The LCD will typically display as shown below:



The display is now showing the first addressable device it has found on the loop, starting with the lowest address first. You can scroll through all the devices found by using the ARROW UP [2] and ARROW DOWN [8] buttons.

Any missing devices can be investigated at this point and corrected as needed. After correcting any missing addresses the auto-learn procedure can be re-run by using the MENU button and following the procedure as described above.

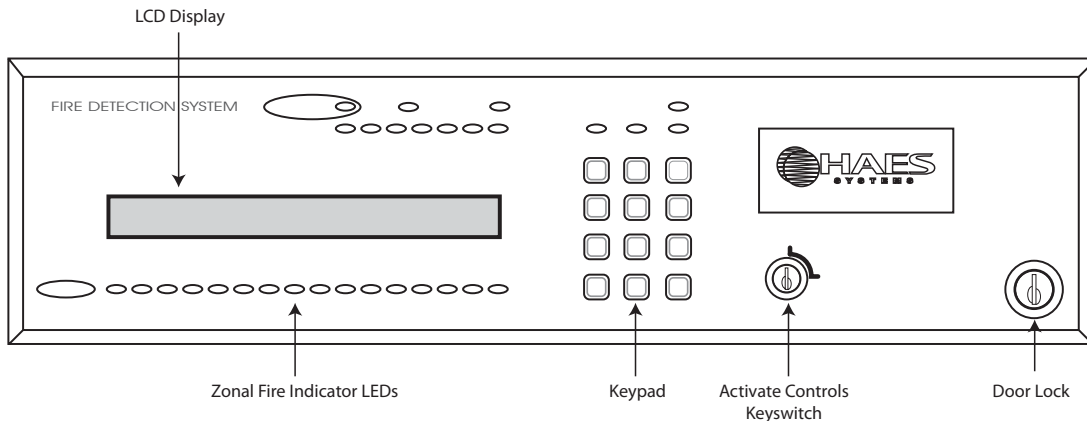
When finished with the auto-learn function press the MENU button twice to exit the programming mode. The display will show a warning that the programming switch is still ON.



Return the programming DIL switch (P) on the main circuit board back to the OFF position. The panel will save any updated information and the display should return to normal mode as shown below:



PANEL CONTROLS & INDICATIONS



Activate Controls

In normal mode the keypad controls are inactive to protect from unauthorised operation. Controls can be activated by turning the ‘Activate Controls’ keyswitch to the ‘ON’ position or by entering a four digit code, 5-8-3-9, using the keypad.

The use of the code entry to activate controls is on by default but can be disabled in the engineering functions. Code entry activation will automatically time out after 2 minutes and the panel will return to normal.

Limited MENU options are available for viewing status information without the need to ‘activate controls’.

If the keyswitch is in the ‘ON’ position then the keypad becomes fully functional.

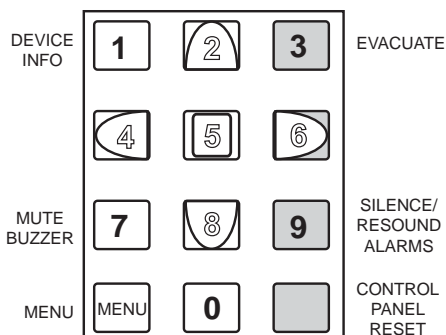
NOTE : It is not possible to remove the key in the ‘ON’ position.

Door Lock

This allows authorised engineering personnel access to the inside of the control unit.

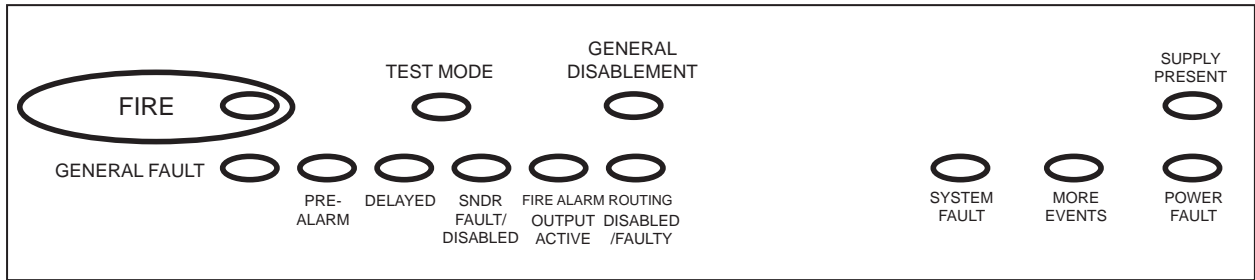
WARNING : The power to the control panel should be isolated before gaining access. The voltages are high enough to cause severe injury.

Keypad



- [1.] Press for more information about an active device
- [2.] Scroll up
- [3.] Generate full alarm (evacuate). Override active delay (if a delay is running)
- [4.] Scroll left
- [5.] Select to view option or ENTER
- [6.] Scroll right
- [7.] Mute internal fire/fault buzzer
- [8.] Scroll down
- [9.] Toggle: Silence/re-sound alarm. Halt/restart active delay (if a delay is running)
- [0] MENU Access to menu functions
- [] (Bottom right) Control panel reset

LED Indicators



FIRE

Indicates the presence of a fire alarm signal or an evacuate command. Flashes red when there is a fire and goes steady when alarm is silenced. Subsequent alarms will re-start the flashing.

TEST MODE

Indicates the system is in the engineers test mode.

GENERAL DISABLEMENT

Indicates that part of the system has been disabled (isolated).

SUPPLY PRESENT

Indicates that the mains or battery supply is present.

GENERAL FAULT

Indicates that a fault is present on the system. The LCD will display the details.

PRE-ALARM

Indicates that a detector has recorded a higher than normal analogue value which could signal an impending fire condition.

DELAYED

Lit when one or more output delays have been programmed. Flashes when one or more output delays are running.

SNDR FAULT/DISABLED

Indicates a fault on the alarm system sounder circuit. Sounder devices/circuits may be faulty or disabled.

FIRE ALARM ROUTING OUTPUT ACTIVE

Indicates that the (remote output) signal has been activated.

FIRE ALARM ROUTING OUTPUT DISABLED/FAULTY

Indicates that the (remote output) signal has been isolated for maintenance or testing or is faulty, open or short circuit.

SYSTEM FAULT

Indicates that the processor has halted. This can only be reset by an engineer. The lamp will remain on even if the system has automatically re-started.

MORE EVENTS

Indicates that there are more events. Scroll to view them.

POWER FAULT

Indicates power supply failures. The LCD will display details

LCD Display

The LCD displays event information, status information, and the option menus. It has two lines of text, each with 40 characters, and is backlit when there is an active event on the system or the menu options are accessed. In the normal operating mode the backlight is dim and the top line displays a default text message or user-defined text. The second line displays the current time and date, e.g.

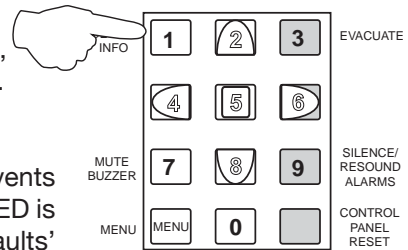


When an event occurs, the backlight is activated and the LCD displays the event details, e.g.



The display shows the event type, i.e. Fire, the zone that the activated device is in, i.e. zone 3, the number of events and event number, i.e. 01 of 01 and the device location text

Pressing button [1] reveals further device information such as type, i.e manual call point, address number and time and date of the event. This button will function without the need to activate controls.



NOTE : Fault conditions on the system are suppressed when Fire events are present, except sounder or remote faults. The GENERAL FAULT LED is illuminated and faults can be viewed if required via the ‘View Active Faults’ option - when button [1] is pressed.

In the normal operating mode only the green Supply Present LED should be illuminated. The LCD should be displaying the company name (if programmed) and the current time and date.

Other messages that may be displayed on the LCD during normal operation are:

CONTROLS ACTIVE	If the keyswitch is in the ON position or the activate code has been entered on the keypad. The code entry activation will time out after two minutes and the panel will return to normal mode.
DELAYED	Is displayed if any output delays have been programmed.
GENERAL DISABLEMENTS	Is displayed if any zones or devices have been disabled or isolated. Details of disablements can be viewed in MENU item: View Active Disablements.
TEST MODE	Will show if the engineers test mode has been set to areas on the system. Test mode should only be used by authorised personnel.
PRECINCT ACTIVE	Remote input to sound alarms is active.
ALERT ACTIVE	Remote input to pulse alarms is active.

USER INSTRUCTIONS

If an alarm condition is present YOU MUST FOLLOW YOUR NORMAL FIRE DRILL PROCEDURES.

A responsible person should then:-

1. Check the control panel to see which area or zone has caused the system to go into alarm. This will be indicated by a red LED and the LCD display on the front of the control panel.
2. Go to the area which has caused the alarm to check if a fire exists.
3. Only when it is safe to do so should the alarms be silenced. Turn the “activate controls” keyswitch to the ON position (fig.1). The LCD display will change to show that the controls are now active. Now press SILENCE/RESOUND ALARMS, (fig.2). Pressing this button again will cause the alarms to resound.
4. In the event of a false alarm look for the device that has caused the alarm. A detector will have a red LED lit, or check to see if a call point glass is broken (if so replace the glass or call an engineer). If using addressable devices the LCD display on the control panel will indicate the exact location and address number of the device.
5. When fully satisfied that there is no fire, return to the control panel and press the RESET button, (fig 3). The panel display should return to normal and only the green SUPPLY PRESENT lamp should be lit on the control panel.

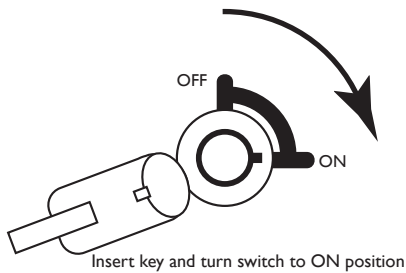


fig. 1

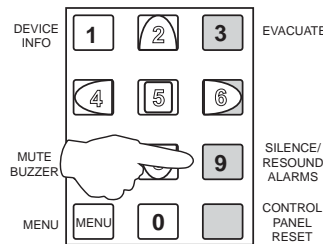


fig. 2

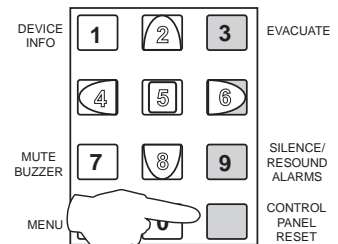


fig. 3

If the system continues to false alarm, call an engineer

Fault Condition

If a buzzer is sounding in the control panel but the sounders or bells are not ringing, then there is either a fault on the system, or zones / sounders have been disabled. CALL AN ENGINEER

The internal fault buzzer can be silenced by pressing MUTE BUZZER (button 7 on the keypad). DO NOT RESET THE SYSTEM UNTIL AN ENGINEER HAS INVESTIGATED THE FAULT.

The following section is a summary of the requirements in BS5839 Part 1

For comprehensive information a copy of BS5839 Part 1 can be purchased from the British Standards Institution via their web site at www.bsi-global.com.

THE NEED FOR MAINTENANCE

Your Fire Alarm System is working 24 hours a day, 365 days a year. The detectors and control & indicating panel are operating continuously and the fire alarm circuits are constantly monitored.

Legislation such as the Regulatory Reform (Fire Safety) Order 2005 and other legislation protecting both employees and the public require premises operators to conform with standards for Fire Alarm Systems.

It is a requirement of BS 5839 Part 1 that the system is subject to periodic inspection and servicing so that faults are identified, preventive measures can be taken to ensure the continued reliability of the system, false alarm problems are identified and suitably addressed, and the user is made aware of any changes to the building that affect the protection afforded by the system.

The inspection and servicing recommendations in this clause should be carried out by a competent person. A 'Competent Person' is a person or fire alarm servicing organisation with specialist knowledge of fire detection and fire alarm systems, including knowledge of the causes of false alarms, sufficient information regarding the system, and adequate access to spares.

The period between successive inspection and servicing visits should be based upon a risk assessment, taking into account the type of system installed, the environment in which it operates and other factors that may affect the long term operation of the system. The recommended period between successive inspection and servicing visits should not exceed six months. If this recommendation is not implemented, it should be considered that the system is no longer compliant with this part of BS 5839

DUTIES OF THE RESPONSIBLE PERSON

The system user needs to appoint a single, named member of the premises management to supervise all matters pertaining to the fire detection and fire alarm system. The role of this person is to ensure that the system is tested and maintained in accordance with the recommendations of BS 5839 Part 1, that appropriate records are kept and that relevant occupants in the protected premises are aware of their roles and responsibilities in connection with the fire detection and fire alarm system.

This person also needs to ensure that necessary steps are taken to avoid situations that are detrimental to the standard of protection afforded by the system and to ensure that the level of false alarms is minimized.

ROUTINE MAINTENANCE & TESTING

DAILY

The 'Responsible Person' should check the control panel to make sure no faults or pre-alarm conditions are indicated and that the green 'Supply Healthy' lamp is lit.

WEEKLY

The Fire Alarm System should be tested on a weekly basis as recommended in BS5839 Part 1 clause 44.2.

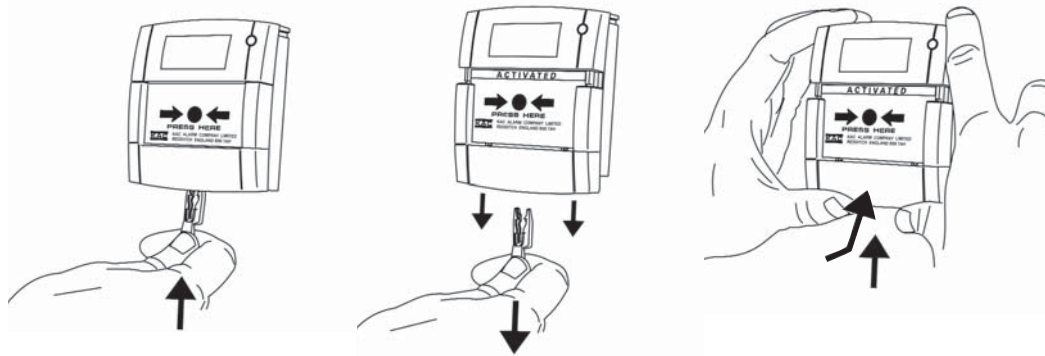
Every week a manual call point should be operated during normal working hours. The weekly test should be carried out at approximately the same time each week. Instructions to the occupants should be that they report any instance of poor audibility of the fire alarm signal.

A different manual call point should be used at the time of every weekly test so that all manual call points in the building are tested in rotation over a prolonged period.

The result of the weekly test and the identity or location of the manual call point used should be recorded in the system log book.

WEEKLY TEST

The call point test key should be inserted firmly and deliberately into the bottom of the manual call point. Once activated it may be necessary to wait up to four seconds before the alarms sound.



Your manual call points may not be the same as the ones described above. If not please refer to your service and maintenance company for instructions.

Note:

Before testing the fire alarm system it may be necessary to isolate ancillary outputs.

It is essential that any alarm receiving centre is contacted immediately before and immediately after, the weekly test to ensure that unwanted alarms are avoided and that fire alarm signals are correctly received at the alarm receiving centre.

PERIODIC INSPECTION & SERVICING

Inspection & servicing should only be carried out by a ‘Competent Person’ who has sufficient knowledge to check the whole system. This would normally be a qualified electrical contractor or fire alarm specialist.

Inspection & servicing visits are normally conducted on a quarterly basis unless such factors as a dirty environment warrant servicing on a more regular basis. The maximum period between inspections must not exceed six months.

Recommendations of BS5839-1 for periodic service visits include:

- Every device on the system should be tested annually. The testing of each device can be split between periodic visits but with a minimum of one detector or call point tested on each circuit, per visit.
- On each visit the ‘Competent Person’ should check the record of false alarms. Any persistent occurrence should be investigated and corrective action taken as appropriate.
- Battery and connections should be examined and load tested to check serviceable condition and that they are not likely to fail before the next service visit.
- All other devices and control & indicating equipment should be checked for correct operation and any faults should be recorded and rectified.
- Details of the service visit must be recorded in the log book

EVERY FOUR YEARS

Renew the sealed lead acid batteries and record the fact in the log book

SCHEDULE OF TESTING

This Section To Be Used To Record ALL Weekly Tests Of The Fire Alarm System

DATE & TIME OF TEST	DEVICE TESTED & LOCATION	COMMENTS <i>(IF ANY)</i>	INITIALS OF TESTER

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DATE & TIME OF TEST	DEVICE TESTED & LOCATION	COMMENTS <i>(IF ANY)</i>	INITIALS OF TESTER

FALSE ALARMS, FAULTS & ENGINEERS VISITS

Fault/Reason For Call-Out	Action Taken	Date	Work Completed	Engineer's Details

FALSE ALARMS, FAULTS & ENGINEERS VISITS

Fault/Reason For Call-Out	Action Taken	Date	Work Completed	Engineer's Details

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