

FUSION

**Combined Conventional / Analogue Addressable
Fire Alarm Control Panel**



Installation & Commissioning Manual

Software version 1.14 and above





0832

**HAES SYSTEMS Ltd, Columbia House, Packet Boat Lane,
Cowley Peachey, Uxbridge, Middlesex, UB8 2JP**

10

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

Note: X = qty of LED indicators, Y = qty of zone circuits, Z = qty of Loops

CPD Number

0832-CPD-1431

0832-CPD-1432

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:- 2478m iss1

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

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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INTRODUCTION

The Fusion combines a powerful multi-loop analogue addressable control panel with conventional and TWIN WIRE technologies and has been designed in accordance with European standards EN54-2 and EN54-4, Fire Detection and Alarm systems - Control and Indicating Equipment. It utilises the latest surface mount technology with a flash programmable 32 bit micro-controller for easier software updates.

The panel operates with Apollo, XP95 & Discovery analogue addressable protocols and also supports the Apollo and Hochiki ranges of conventional field devices. Four internal sounder circuits are provided in the base unit, with an additional two circuits per loop card. Extra sounder circuits can be provided with the use of modular PCBs.

The control panel is programmable via the keypad controls or via a PC or laptop, allowing the configuration to be created off-site and uploaded.

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 these 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

Also 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.

The Fusion has individually isolatable panel contacts via the menu with an auto enablement feature and the option to remove all disablements. The menu is comprehensive, yet easy to use, allowing electrical isolation of the loop via the keyboard. The menu also includes an enhanced test mode, with or without sounders allowing all zones to be tested simultaneously if required. It has a real time clock, with back up, utilising a smart cap rather than a battery, thus eliminating battery life issues.

The Fusion incorporates a very fast auto learn sequence, only learning selected parts of the loop, and if required can unlearn devices from the system. It supports the Apollo ancillary base sounders and relays, local, zonal or common operation. A device monitoring mode allows activation of the device outputs and control of the loop polling direction. Also there is a selectable maintenance scanning threshold.

The Fusion has full 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.

INTRODUCTION (continued)

It is assumed that users of this manual are competent fire alarm engineers with experience of fire alarm installation and the relevant standards. It is recommended that the manual is read and understood before attempting to commission or configure the control panel. The system should be thoroughly tested following commissioning and prior to handover to confirm that it operates in accordance with the specification and applicable legislation.

ITEMS SUPPLIED WITH THIS CONTROL PANEL

- A) Fusion Quick Start Guide
Approved document No - UI-FBU-03
- B) CD Containing Programming Software and pdf versions of the full Installation & Commissioning manual (UI-FBU-01) and the full Operating manual (UI-FBU-02)
- C) 2 off KEY801 Door lock keys
- D) 2 off KEY107 Activate control keys
- E) Spares pack containing:-

Small Cabinet Version

2 x 4K7, 0.25W EOL resistor

2 of each of the following fuses:

- FNANO-0.5 - 500mA NANO Fuse (radials and sounder circuits)
- FNANO-1.0 - 1A NANO Fuse (aux relay contacts, fault relay & relay 1 & 2)
- FAS2.5A - 2.5A TIME DELAY. 20mm glass (loop supply)
- FAS3.15A - 3.15A TIME DELAY, 20mm glass (PSU input)
- FQ5A - 5A FAST BLOW, 20mm glass (battery)

Large Cabinet Version

2 x 4K7, 0.25W EOL resistor

2 of each of the following fuses:

- FNANO-0.5 - 500mA NANO Fuse (radials and sounder circuits)
- FNANO-1.0 - 1A NANO Fuse (aux relay contacts, fault relay & relay 1 & 2)
- FAS2.5A - 2.5A TIME DELAY. 20mm glass (loop supply)
- FAS5A - 5A TIME DELAY, 20mm glass (PSU input)
- FAUTO7.5A - 7.5A, 32V FAST BLOW AUTO, (battery)

Note:- For continual protection against risk of fire replace fuses only with same type and rating of fuse.

PRODUCT OVERVIEW

The control panel is combined multi loop, up to 64 zone, analogue addressable and / or conventional unit with integral power supply and space for standby batteries. It has two additional sounder circuits per loop card as well as, auxiliary volt free contacts and various remote inputs and outputs. Also 150 soft groups are provided for cause and effects configuration, per loop or 100 per conventional radial card.

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 flushing bezel. Cable entry is via the top or rear of the cabinet, where 20mm 'knockouts' are provided.

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 and function or configuration menus. Alarm and status information is provided by LED indicators and there is a 12 button keypad which controls the system and allows access to the function and configuration options.

The control panel has 4 conventional Radial circuits supplied as standard and can accommodate additional 4 way conventional circuit cards up to 64 circuits. Each radial circuit is configurable in one of 3 possible ways. The default is for a traditional conventional monitored fire detection circuit. The circuit can be set as a 'TWIN' wire where detectors and sounders can be connected to the same pair of wires. In this configuration special 'TWIN' wire detector bases must be used for detector removal monitoring. 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.

The Fusion panel is provided with an internal power supply module. The smaller 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 :1988 and provide temperature compensated battery management, charging and earth fault monitoring. The power supply modules consist of an assembly comprising AC mains to 36vdc power pack and a control PCB with heat-sink which provides the control and monitoring functions and 28vdc nominal power output. The power supply modules have two independent current limited outputs for supplying power to the panel circuits.

Both power supply units are designed for use with VLRA sealed lead acid type batteries see Installation manual for details of battery models and sizes. These rechargeable batteries provide power in the case of a loss of AC mains power.

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. An integral 5 amp power supply and expansion box to allow space for 17Ah batteries is also available.

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. Advanced options include configuration, maintenance checks and fault finding mode.

The control panel incorporates an 'auto-learn' feature which enables the system devices to be recognised on initial power up. Configuration of the system operation can be achieved via the panel controls or by downloading data created in a PC software program.

INSTALLATION

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.

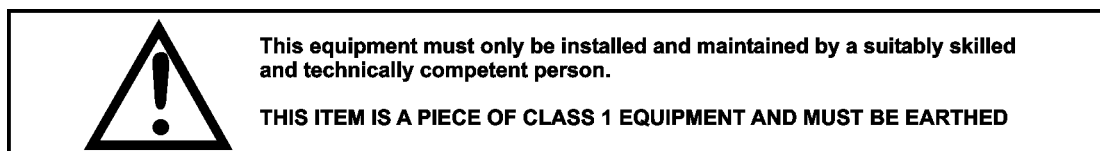
It is assumed that the system, of which this control panel is a part, has been designed by a competent fire alarm system designer in accordance with BS 5839 Part 1 and with regard to BS EN 54 parts 2 and 4 in the case of control equipment and power supplies. Design drawings should be provided to clearly 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, +10%, -15%, 1A 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.



General

The control panel is a micro-processor controlled, analogue addressable fire alarm control system, comprising of one circuit board, plus add on modular circuit boards.

The enclosure consists of back box and hinged, removable lid. Constructed of 1.2mm (18swg) zintec mild steel and powder coated in textured light grey. The enclosure is designed to give protection to IP30 level.

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.

INSTALLATION (Continued)

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.

Mounting the cabinet

The installation of fire detection and alarm systems should be carried out in accordance with current IEE wiring regulations and in line with BS 5839 British Standard codes of practice for fire alarm installations. The installation should be carried out by suitably qualified and experienced technicians.

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.

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.

The site chosen for the location of the panel should be clean and dry, and not subject to shock or vibration. Damp or 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%.



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.

All system wiring should be installed to meet BS 5839: Pt 1: 2002 and BS: 7671 (Wiring Regulations). Other national standards of installation should be used where applicable

INSTALLATION (Continued)

Cable types and 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 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.

Integrity of transmission paths

To satisfy the requirements of EN45 -2. and to ensure a reliable system, it should be designed and maintained to local design and installation regulations.

The Fusion has loop isolators included in the panel, and external loop isolators must be included in the loop wiring. A single short circuit fault will only disable devices in the section of wiring between isolators. In the case of a single open circuit no devices will be lost, since monitoring will be from both ends of the loop, a fault will be indicated in this circumstance.

A design issue with any analogue fire system is the combined effect of loop resistance, loop capacitance and the current demand of items connected to the loop. Factors that influence this include loop length, cable diameter, cable type, the number of isolators used and the number and type of devices between isolators. We recommend the use of the Apollo loop calculator program which can be used to check the integrity of a proposed installation. The following guidelines can be used as a rule of thumb.

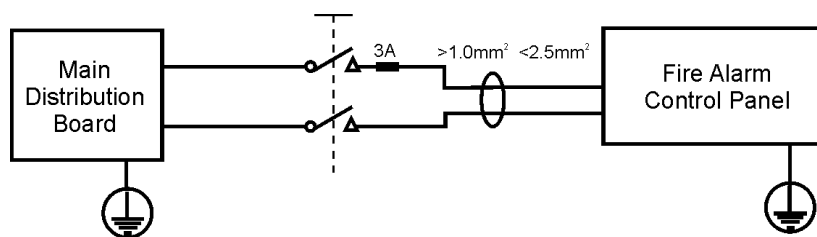
- **Maximum addressable loop length = 1km, with either 1mm² or 1.5mm² cables.**
- **Maximum conventional Radial length = 500 metres, either 1mm² or 1.5mm² cables.**
- **Approx 20 addressable devices between loop isolators of which no more than 6 should be loop sounders.**
- **Maximum 32 conventional detectors per radial circuit. Note a radial circuit must not cover more than one physical zone area.**
- **If loop sounders are used, use 1.5mm² cable and do not fit more that 32 loop sounders per loop in total.**
- **Where conventional sounders are used, use 1.5mm² cable and do not fit more than 22 sounders per radial circuit in total.**

INSTALLATION (Continued)

Mains wiring

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: DO NOT SWITCH OFF'. 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 (see diagram) providing it meets the appropriate national wiring regulations.



Recommended Batteries

The following batteries are approved for use with the Fusion control panels.

Yuasa NP range of sealed lead acid batteries or equivalent. 2 of each required for 24volt operation

FBUS small 3A version of control panel.

NP3.2-12	3.2 Ahr, 12 volt
NP7-12	7.0 Ahr, 12 volt
NP12-12	12 Ahr, 12 volt

FBUL large 5A version of control panel

NP7-12	7.0 Ahr, 12 volt
NP12-12	12 Ahr, 12 volt
NP 17-12	17 Ahr, 12 volt

The size of battery will be subject to battery standby calculations as required for BS5839 recommendations.

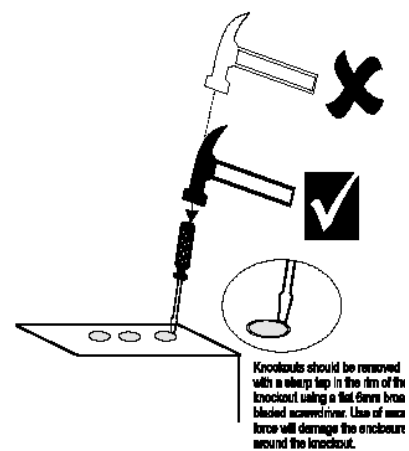
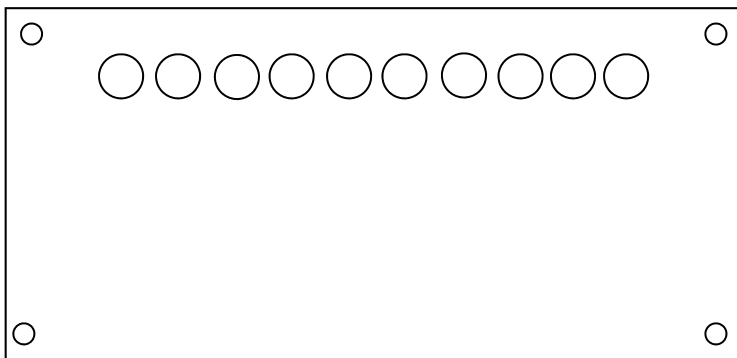
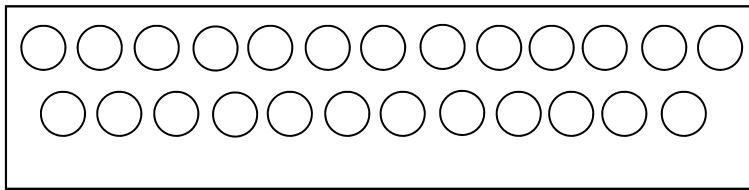
INSTALLATION (Continued)

Planning the cable layout in the panel

The detector and sounder circuit cabling is classed as extra low voltage and must be segregated away from mains voltages.

NOTE. The Main PCB should be removed before any knockouts.

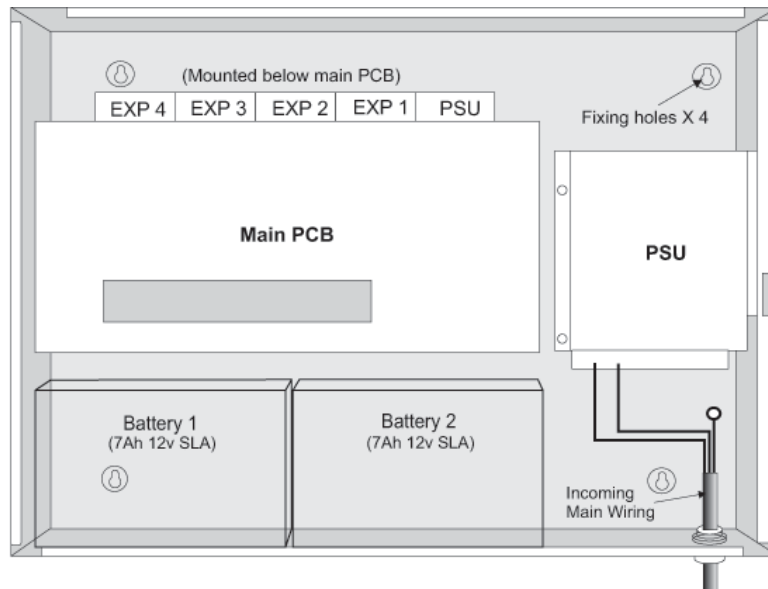
Always ensure that if a knockout is removed, the hole is filled with a good quality cable gland. Any unused knockouts must be securely blanked off.



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.

Fixing the cabinet

Secure cabinet to the wall using the four indented holes in the back box . Ensure that the box is mounted level in a convenient location where it may be easily operated and serviced and where it is away from possible sources of vibration or shock and ingress of moisture .



External cables should be glanded via pre-formed knockouts at the top and rear of the box as provided.

The enclosure should be cleaned of swarf etc., prior to re-fitting of the printed circuit board.

Replace the cross head screws in the accessory PCBs and Main PCB and reconnect the cables in TB3 & TB4. Locate the white jumper lead and connect to the batteries as per the drawing on page 31. Locate the two battery connections from the PSU board and connect to the batteries. Carefully place the batteries as indicated in the drawing above. **Ensuring that the terminals are kept well clear of the PCB support pillars.**

Important.

For the FBUL (large fusion cabinet) to maintain the integrity of Access level 3 and prevent unauthorised access to the internal parts of the control panel. M3 torx screws must be fitted to the locations at the bottom and top of the inner door as shown.




INSTALLATION (Continued)

Mains connections.

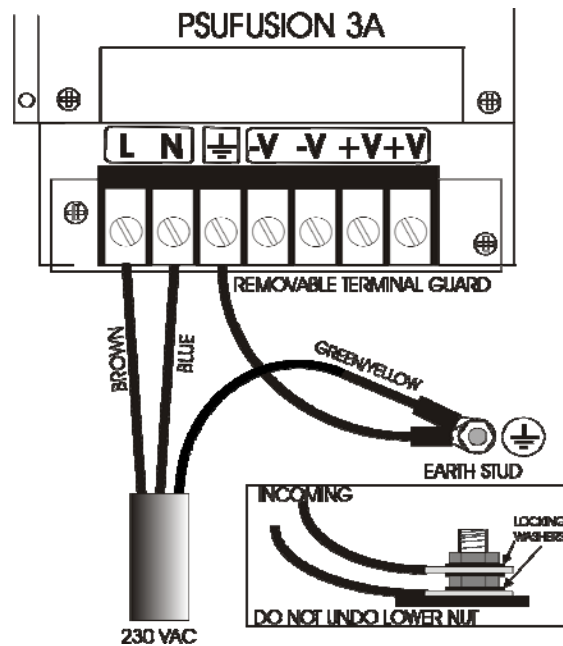
Do not connect the mains supply to the panel until you are fully conversant with the layout and features of the equipment.

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 terminal block, while leaving earth connection intact. Secondary earths may be connected to the brass earthing block.



Field devices

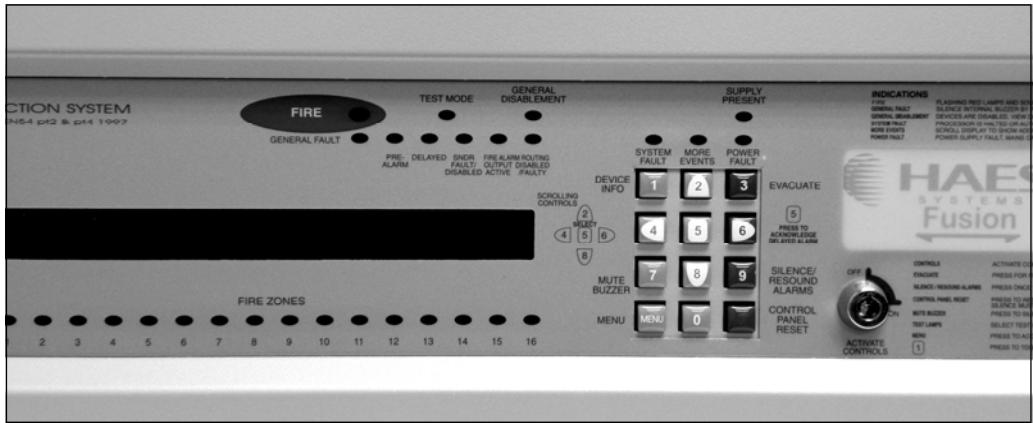
Sensors, call points and input/output devices are supplied with full installation instructions.

Warning

High voltage testing of the wiring must be carried out **before** the control panel and any devices are connected.

CONTROL PANEL

Panel Controls



Activate Controls

Controls maybe activated via key switch or 4 digit code entry. Use of the key switch precludes the necessity to enter a code. Limited menu functions are available for viewing status information without the need for key switch or code entry. See menu and control functions section of this manual for further information.

If the key switch is turned to the ON position then the keypad becomes fully functional.

NOTE: It is not possible to withdraw the key in the ON position.

Key lock

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

WARNING : The power to the alarm unit should be isolated before gaining access, to prevent danger. The voltages in this unit are high enough to cause injury.

CONTROL PANEL continued

General description

The control panel comprises a sheet-steel wall mounted enclosure with a lockable hinged door. All the user controls and indicators are mounted on the fascia of the unit - there are no user controls within the panel.

Normal Operation

In the normal operating mode only the green Supply Present LED (light emitting diode) should be illuminated. The LCD (liquid crystal display) should be showing the current time, date and company name, if programmed. Other indications that may show in normal operation are:

1. **System normal** – Controls are not active, limited menu available
2. **Controls Active** - If key-switch is in the 'on' position
3. **Delayed** – (LED) is displayed if any output delays are programmed
4. **General Disablement** – (LED) also shows 'disablements active' (LCD) displayed if any zones or devices have been disabled, details of disablements can be viewed in ; Menu item / View active disablements
5. **Test mode** – (LED) will show if engineer test mode has been set to areas on the system. Test mode should only be used by authorised personnel.
6. **Precinct Active** - (LCD) remote input to activate alarm sounders is active (often referred to as class change)
7. **Alert Active** - (LCD) remote input to pulse alarm sounders is active
8. **Delays are Inactive** - (LCD) programmed delays have been set to 'off'.

Fire Alarm Event

A fire alarm event is caused by the activation of a field device. It may be generated automatically by a smoke or heat detector sensing smoke or heat, or manually by the operation of a call point. In either case it will cause an audible alarm to be given (usually throughout the building) and the event details to be displayed and indicated on the control panel.

NOTE . Each system is individually configured for the required operation. Space is provided in the manual to record the method of operation of this system, which should be completed by the installer.

The prescribed emergency fire alarm drill should commence immediately the alarm is heard (see System Operation)

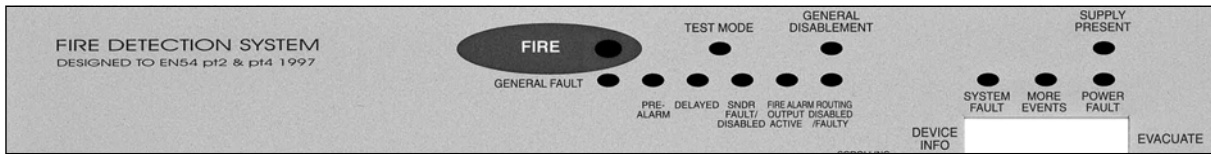
Fault Event

A fault event is generated when the control panel detects an internal malfunction or a fault on an external circuit or device. A fault is indicated by the relevant LED/s and the buzzer sounding. A fault description is shown on the LCD. Additional information about the fault may be obtained by pressing button [1]

Control Event

A control event is caused by the operation of one or more of the keyboard pushbuttons. All controls are inoperable until the 'Controls' keyswitch is set to the 'on' position, to prevent unauthorised operation. A keypad is provided to silence and reset the system following a fire or fault event, initiate an evacuation alarm, and to access the menu functions.

PANEL 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 system is in the Engineers Test mode.

General Disablement

Indicates that part of the system is 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 show 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 sounder circuit. Sounder devices / circuits may be faulty or disabled. (Fault = flashing, Disabled = steady)

Fire alarm routing output active.

Designated output to inform monitoring service is activated.

Fire alarm routing output disabled/faulty

Designated output to inform monitoring service has been disabled or has a fault condition

System Fault

Indicates that the processor has halted. This can only be reset by manual reset at access level 2. 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 show the details.

Fire Detection Zones

Up to 64 indicators (Zones 1-64) to show which area (group of devices) has activated in a fire condition. LED will flash for new zone in alarm and become steady when alarm is silenced.

KEYPAD



All the numbered keys are digits in their own right but also have the following additional functions:-

- [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. Acknowledge fire alarm and start investigation delay
(if a delay is running)
- [6]** Scroll right
- [7]** Mute internal fire/fault buzzer
- [8]** Scroll down
- [9]** Toggle: silence/re-sound alarm.
- [0]**
- [MENU]** Access to menu
- []** (Bottom right) Control panel reset

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.



FUSION PANEL
SYSTEM NORMAL 9:36 15/03/04

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



FIRE ZONE 01 OF 01 ZONES 01 OF 01
PANEL 01 RECENT ZONE 01

The display shows the event type, i.e. Fire, the zone that the activated device is in, i.e. zone 1, and the number of events, i.e. 1. The bottom line alternates with the device location text (if programmed)

Pressing button **[1]** reveals the device information, Type, i.e manual call point, address number and time and date of the event. This button will function regardless of status of keyswitch.

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

The bottom line displays a text message describing the device location.

In the menu mode, menu options are displayed as follows:



SELECT MENU OPTION
5 — TEST LAMPS

The Keypad is used to navigate through the menu options and select functions as described in the installation and commissioning manual.

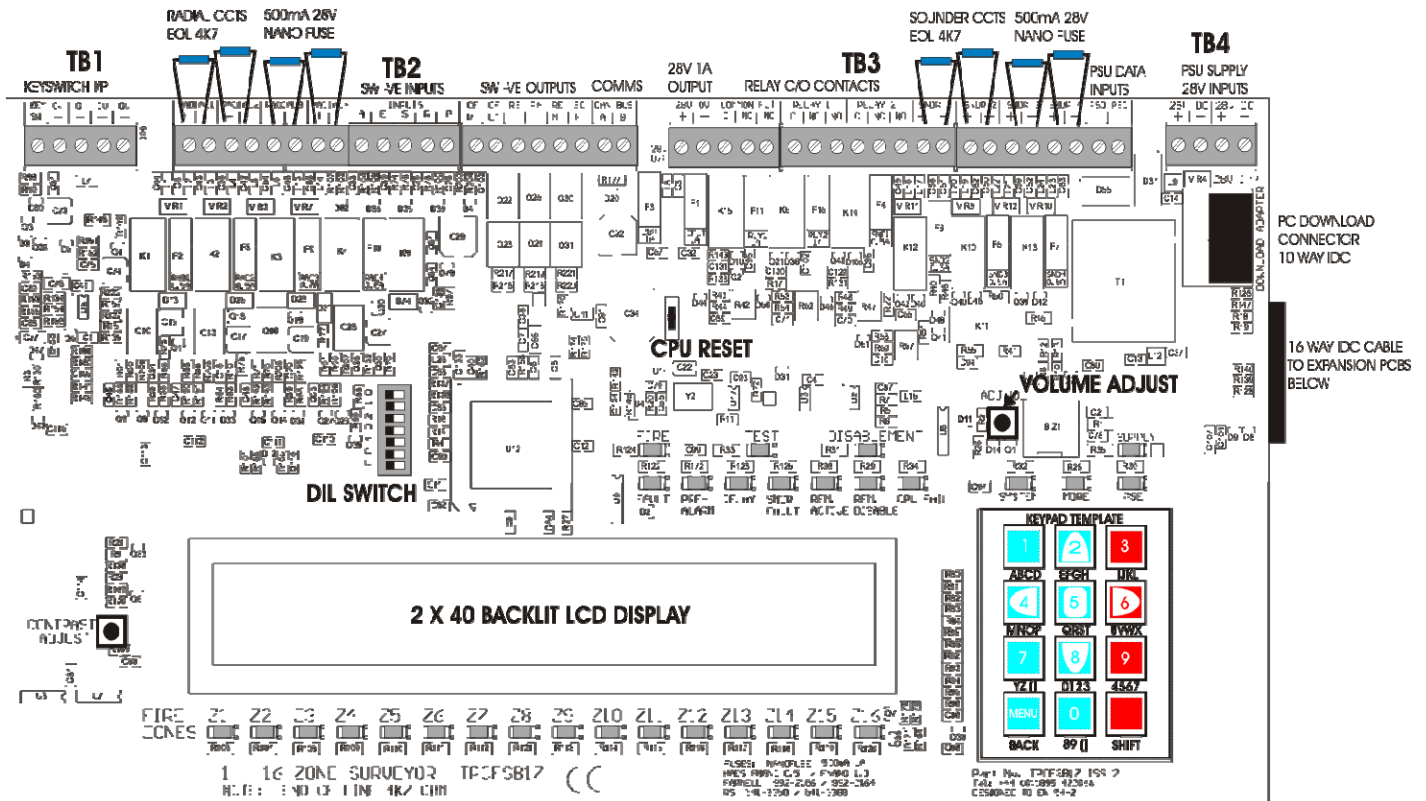
FUSION SYSTEM COMPONENTS

The fusion control panel is made up of the following system components

Part number	Description	Features
TPCFSB17	Main display /control board 2 x 40 character LCD display 12 button elastomer keypad 16 zonal fire indicators	4 conventional radial circuits 4 sounder circuits , fault relay 2 configurable relays, remote control inputs , 6 programmable outputs
TPCPSUF-3A	3 Amp Power supply control PCB	Battery charging up to 12Ahr batteries, Fully monitored EN54
PSULS100-36	Mains to 36v DC switch mode power pack for 3Amp power supply	Universal mains input
TPCPSUF-5A	5 Amp power supply control PCB	Battery charging up to 17Ar batteries , Fully monitored EN54
PSULS150-36	Mains to 36v DC switch mode power pack for 5Amp power supply	Universal mains input (Note :- range switch selected)
TPCFSB10(E)	Expansion cards Bank mother board supports up to 4 loop / radial cards (E) denotes expansion board for further banks of cards beyond 4 loops	28v power input 36v loop power (E) version has additional 5v supply for loop/radial cards
TPCFSB11	Analogue addressable loop card Apollo xp95 / discovery protocol Hochiki ESP protocol	Single loop up to 500mA load 2 conventional sounder ccts 2 configurable relays
TPCFSB18	4 way radial card Conventional, TWIN or sounder ccts	4 conventional radial circuits 2 configurable relays
TPCFSB12-64	Expansion zone led card	48 additional zonal fire leds
SW-FSB25	USB to serial download adaptor, leads and software disk kit	Std programming and download kit

MAIN PCB

FSB17



Adjustments

Contrast

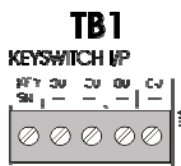
The display contrast should be adjusted for convenient viewing in the light available.

Volume Adjust

The Fault buzzer volume can be adjusted to suit requirements. **It should be noted however that on the minimum setting the buzzer is muted. The Fire buzzer and system fault buzzer Volumes cannot be adjusted.**

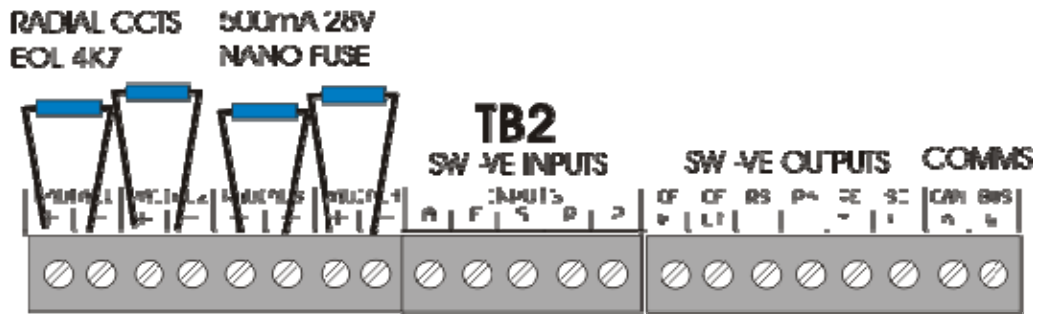
Connections

Terminal block 1.



Key switch connections. 'KEY SW' '0V' With the key switch in the "ON" position these terminals are shorted together. Extra 0v terminals are provided for use with inputs.

MAIN PCB(continued)



Terminal Block 2 - Radials 1 –4

Connections for four conventional circuits. Monitored 4K7 0.25w end of line resistor. Max load 500mA (Fused) 19.2 v min 28volts max.

Inputs. (connect to 0v to trigger, max input voltage 28v)

Note:- These inputs will operate at any time and are not influenced by the 'access level' status of the controls

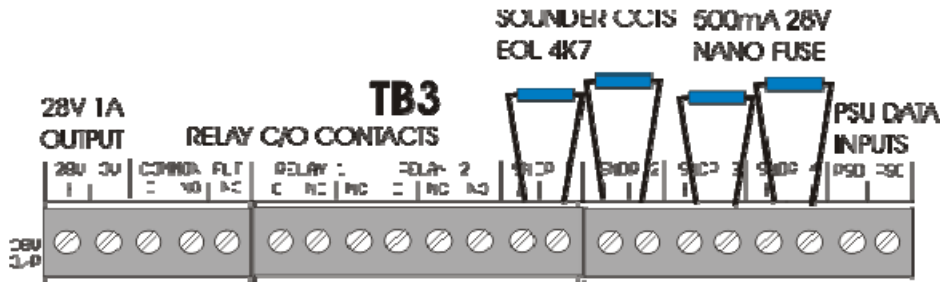
A	ALERT	pulsing sounders (non latching input)
E	EVAVUATE	continuous sounders (latching input)
S	SILENCE	remote silence alarms input
R	RESET	remote reset input
P	PRECINCT	(class change) sounder activation (non latching input)

CF/R	common fire
CF/LT	common fault
RS	reset
PA	pre-alarm output
RE/M	remote output
SC/F	common fire (silenced by system silence)
CAN	comms link for networking purposes

DC Outputs. (grounded when o/p. max current 100mA, Max voltage 28v)

MAIN PCB (continued)

Terminal Block 3



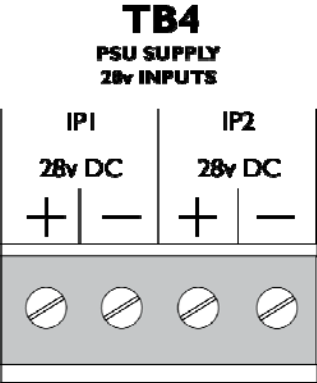
- 28V 1A** ancilliary 28v supply output, fused @ 1A, for fire alarm use only
- COMMON FLT** relay o/p, volt free contacts fail safe operation
- C** common
- NO** normally open
- NC** normally closed
- RELAY 1** configurable relay, isolated by menu, volt free, NO/NC as above
- RELAY 2** configurable relay, isolated by menu, volt free, NO/NC as above
- SNDR 1 - 4** conventional sounder circuits 28V fused 500mA

Note :- sounder circuit 4 can be reconfigured to be a remote output (output to fire alarm routing equipment) EN54-2 option with requirements section 7.9.1

- PSD** power supply data signal input
- PSC** power supply clock signal input

MAIN PCB (continued)

Terminal Block 4



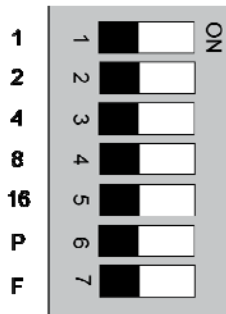
28V DC 28 volt supply inputs from power supply to power panel. Separately short circuit protected and monitored . Maximum input capacity 5Amps

IMPORTANT! DO NOT LINK THE TWO 28V INPUTS TOGETHER

The short circuit protection will be compromised. Wire the 2 inputs separately from the 2 outputs at the power supply. A short or open circuit on either of these input channels will be reported as faults on the Panel display.

MAIN PCB(continued)

Dual in Line Switch.



Switch 1 - 4 These four switches are used for network addressing and set the panel number. They represent a binary value with switch 1 as the least significant bit (LSB) and switch 4 as the most significant bit (MSB). All switches have a 0 value when switched off.

- Switch 1** (labelled 1 on PCB legend) = 1
- Switch 2** (labelled 2 on PCB legend) = 2
- Switch 3** (labelled 4 on PCB legend) = 4
- Switch 4** (labelled 8 on PCB legend) = 8

panel address range = 00 to 15

- Switch 5** (labelled 16 on PCB legend) not currently in use
- Switch 6** (labelled P on PCB legend) This switch is for program mode. It enables the engineer menu options for configuration. This switch is also a memory write protect switch.
- Switch 7** (labelled F on PCB legend) This switch is for use when re-programming the processor firmware. **DO NOT OPERATE THIS SWITCH IN NORMAL USE!**

NOTE:-

Each panel on the network must occupy a different panel address, including network repeater panels.

Panel addresses may be contiguous. i.e not in numerical sequence gaps are permitted. If a network error is present the following message is shown on the LCD display.

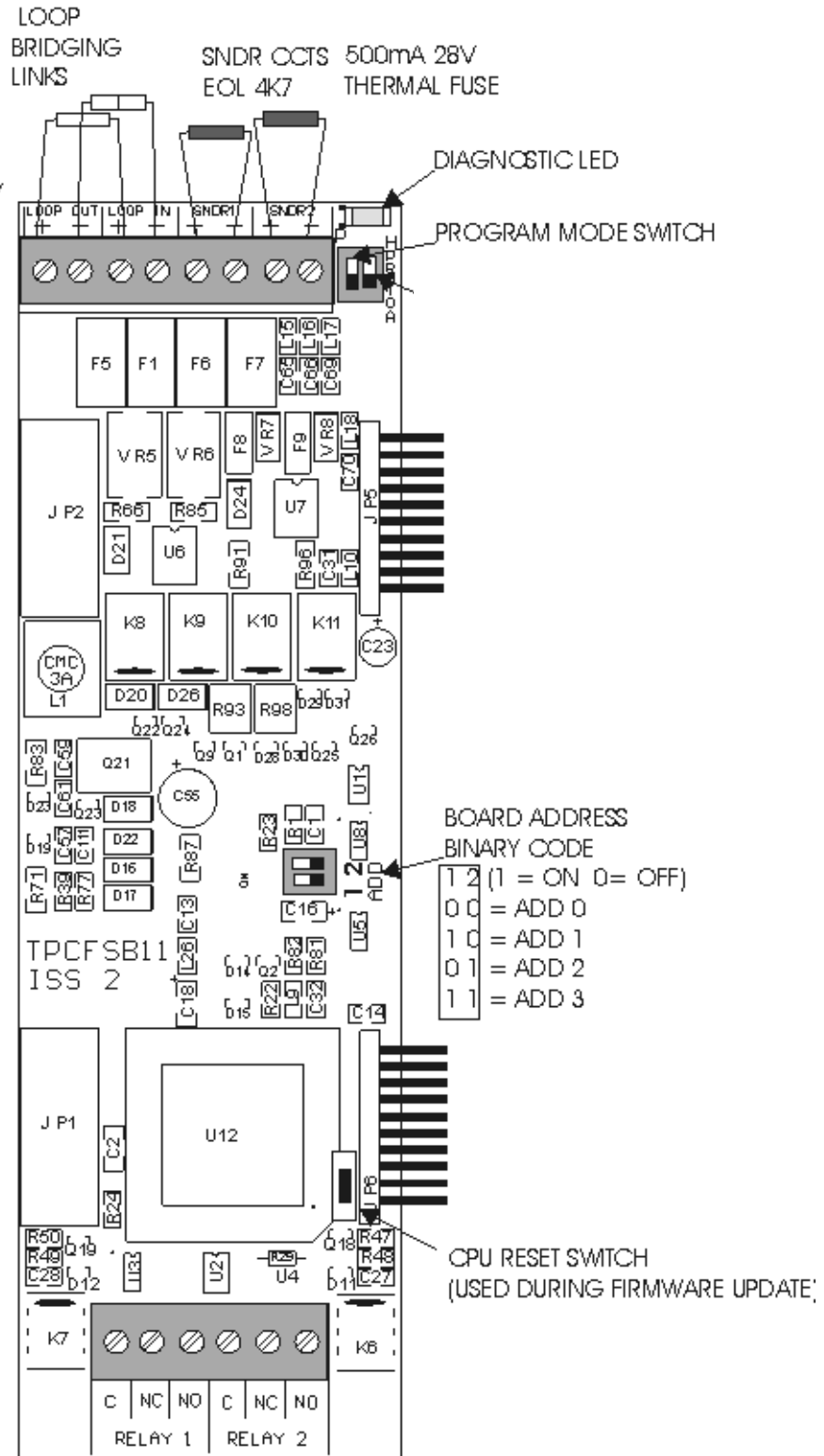
**NETWORK ERROR
PANELS FOUND -1L34- - - -**

From this display it is possible to determine the network status, The — signifies a missing panel, a number shows address present. L signifies the address location of the currently viewed panel. This information must be compared to the known system setup.

LOOP PCB

PCFSB11 Loop Card FSB11

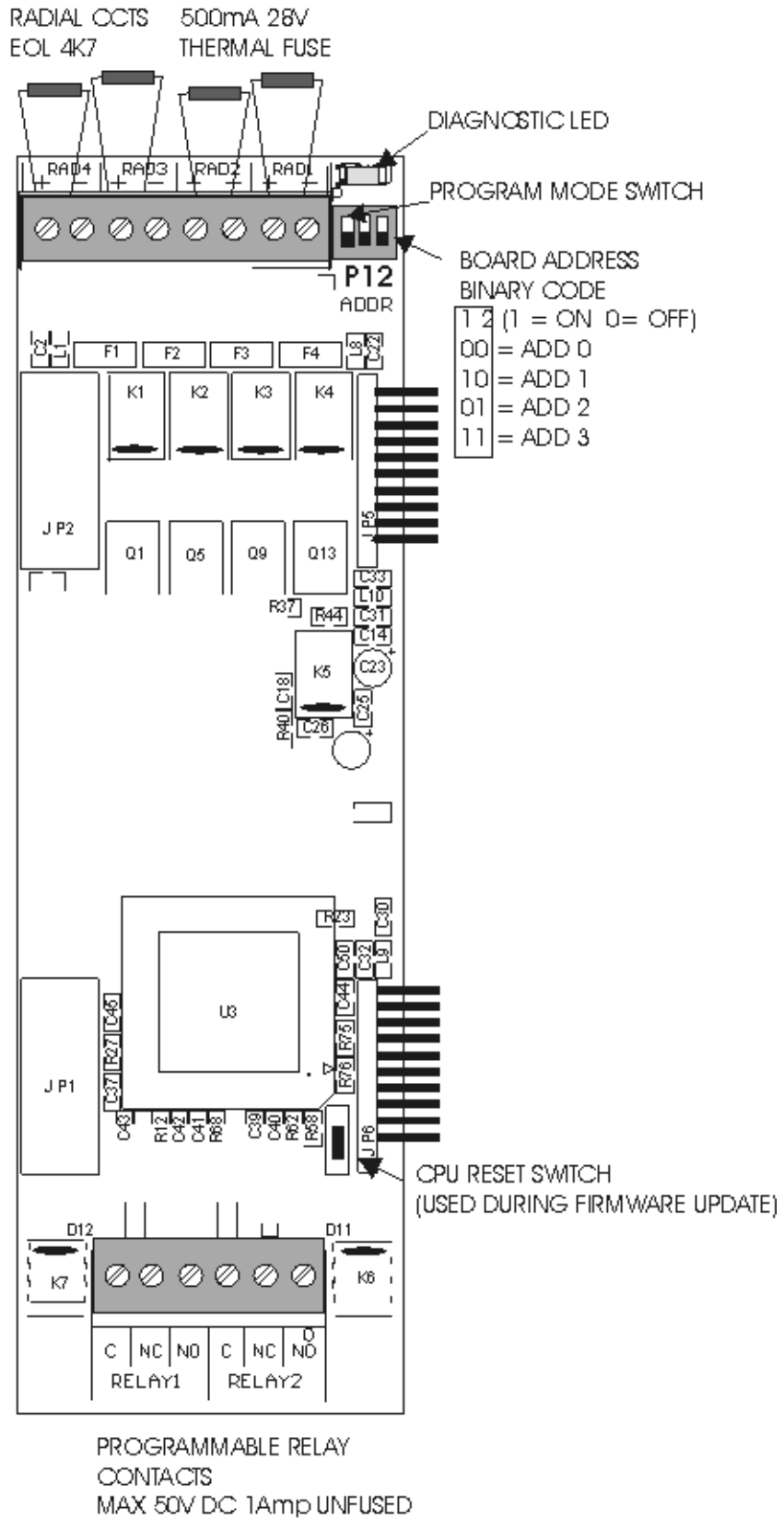
ADDRESSABLE DETECTION
LOOP MAX 500mA LOAD
APOLLO Xp95/ DISCOVERY
PROTOCOL.
(HOCHIKI ESP TBA)



PROGRAMMABLE RELAY
CONTACTS
MAX 50V DC 1Amp UNFUSED

Conventional PCB

FSB18

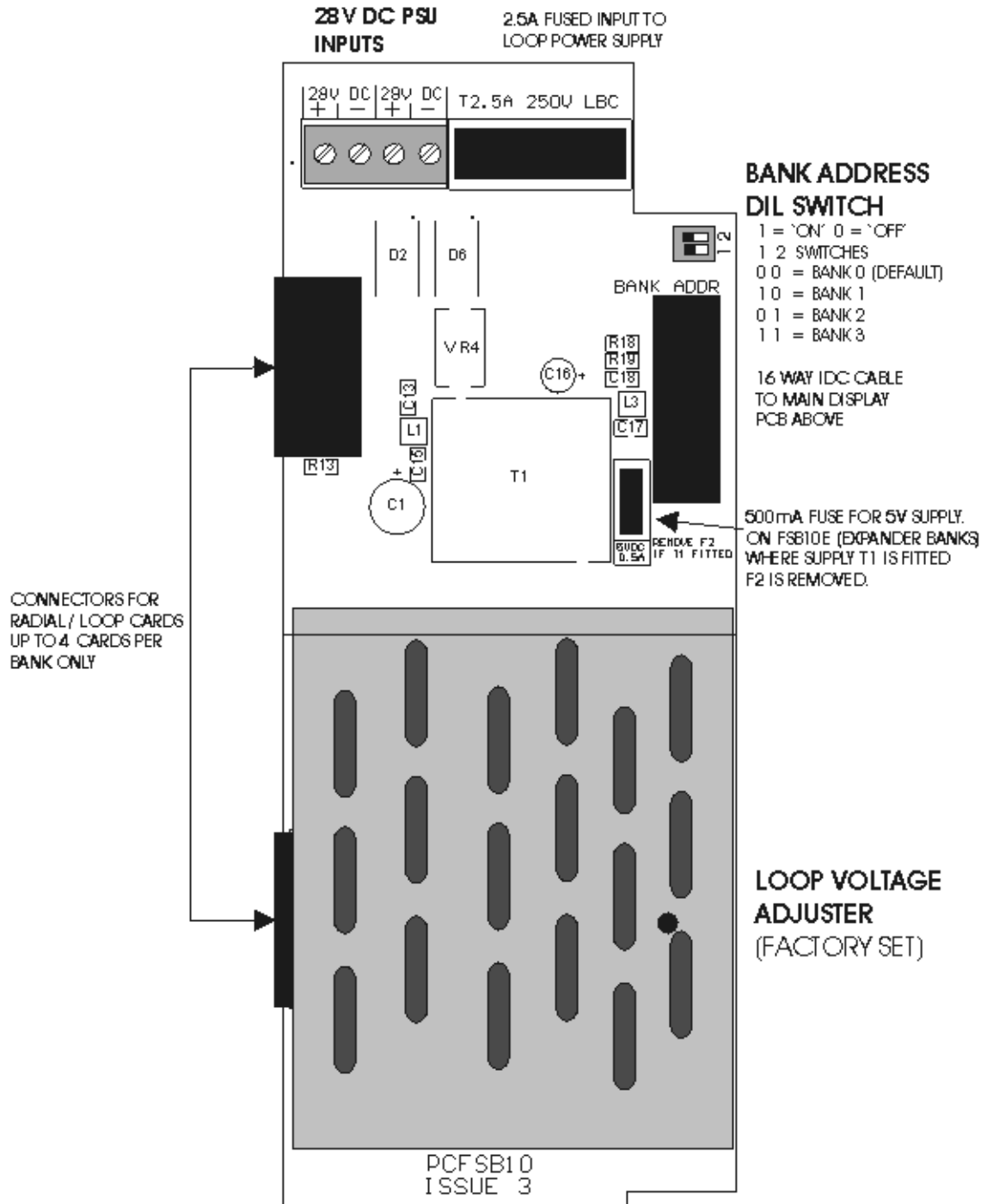


PCFSB18 Radial Card (conventional circuits)

LOOP POWER PCB

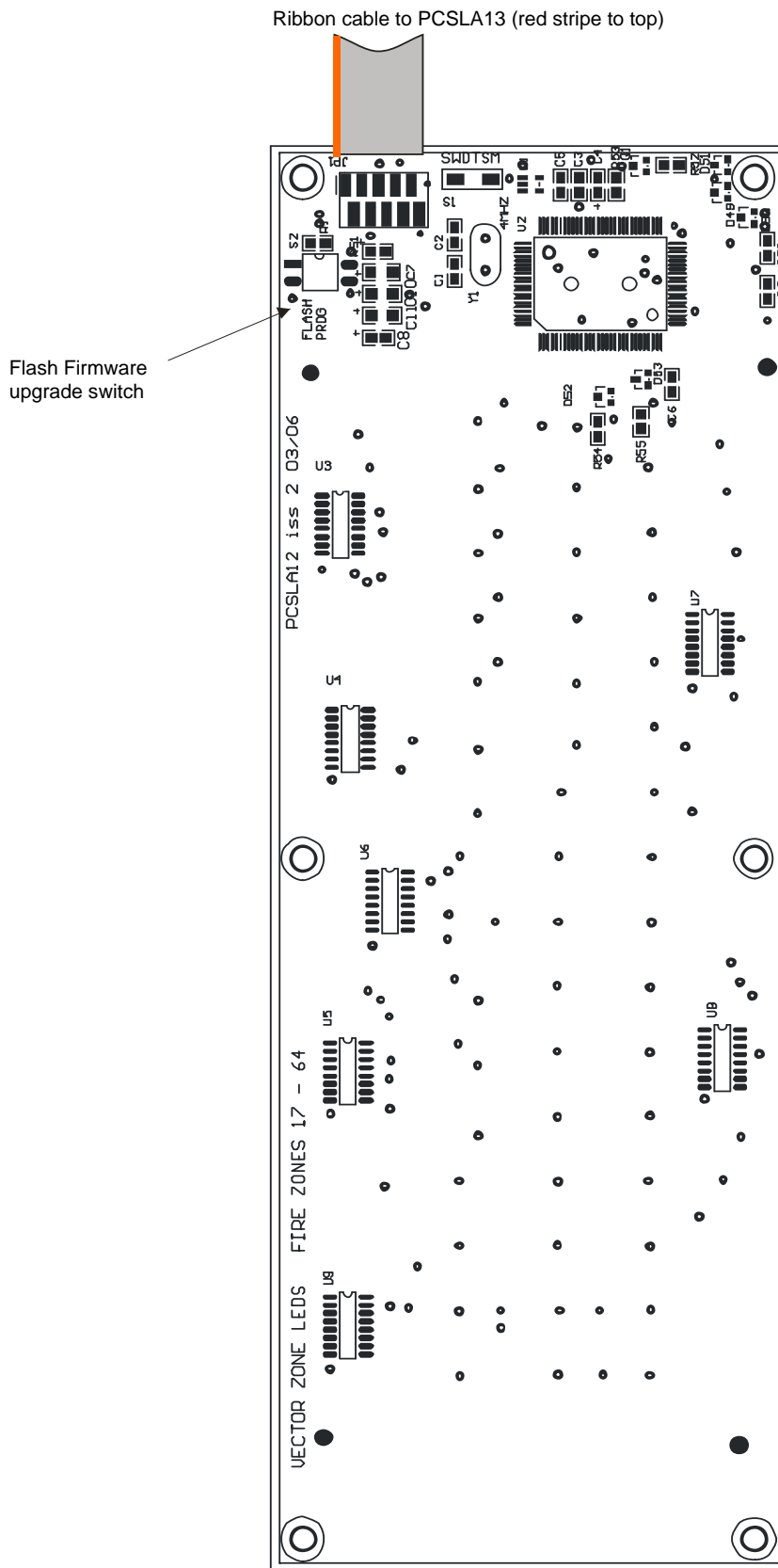
PCFSB10

FSB10



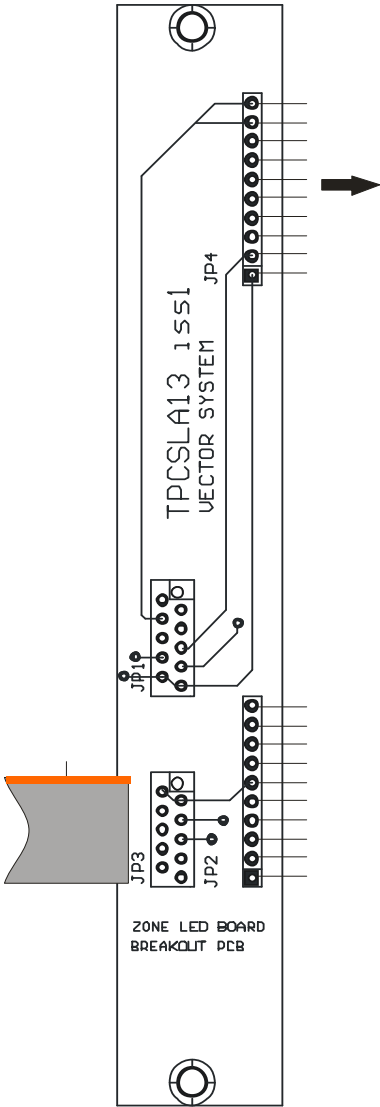
ZONE EXPANSION LEDs PCB

PCFSB12



ZONE LED BREAKOUT BOARD

PCSLA13

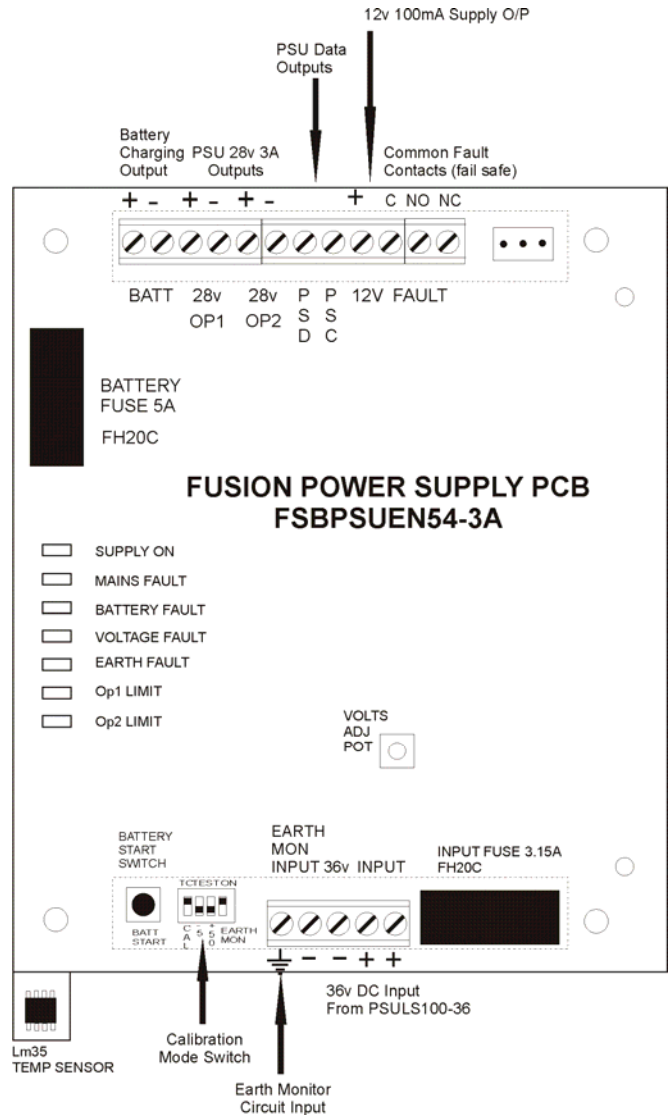


POWER SUPPLY MODULE

PSUFM-3A

The Voltage output is factory adjusted to 27.6 volts \pm 0.2 volts. (off load), and with the batteries disconnected. The power supply is temperature compensated in line with battery manufacturers recommendations.

For details of the battery connections see page 49.



1	12V	Ancillary 12 volt to the main PCB unit. Fused on the Main PCB at 100mA. For use on ancillary devices.
2	PSC	Clock output from power supply PCB to main PCB
3	PSD	Data output from power supply PCB to main PCB.
4-5	28v DC OP1 / OP2	27.3 volt supply from PSU to power Panel. Separately protected at full output current.
6-7	BATT	Battery charging output

POWER SUPPLY MODULE

The Fusion power supply is a sophisticated fully compliant EN54-4 unit. The following indications are provided on the power supply in addition to information given by the main control panel display

Supply On (green)	Indicates the presence of power at all times (battery and or mains supply)
Mains Fault (amber)	Mains supply has been disconnected or power from 36v power pack is not present.
Battery Fault (amber)	The battery is not connected or the battery voltage is below 19.8vdc or the battery has a high resistance (greater than 0.8R)
Battery Disconnection	To prevent deep discharge to sealed lead acid cells. If the load current is greater than 500mA the battery will be cut off at 19.2vdc. If the load current is less than 500mA the battery will be cut off at 22vdc
Voltage Fault (amber)	Indicated if the charger voltage is less than 23vdc or greater than 29.2vdc
Earth Fault (amber)	Indicated if there is a connection between the 28 volt supply rails and Earth lower than 100K Ohms impedance
OP1 Limit (amber)	There is a short circuit or excessive load on 28v OP 1
OP2 Limit (amber)	There is a short circuit or excessive load on 28v OP 2

Testing and maintenance

Disconnect the mains supply. The 'General Fault LED' and the 'Power Fault LED' will show and the internal buzzer will sound. The LCD will indicate 'MAINS FAIL'.

Mute the buzzer by pressing the No. 7 key on the keypad, 'mute buzzer'. Reconnect the mains, all Fault LEDs will extinguish.

Disconnect the battery. After a period of time in the region of 60 to 80 seconds, The 'General Fault LED' and the 'Power Fault LED' will show and the internal buzzer will sound. The LCD will indicate 'Low battery fault'.

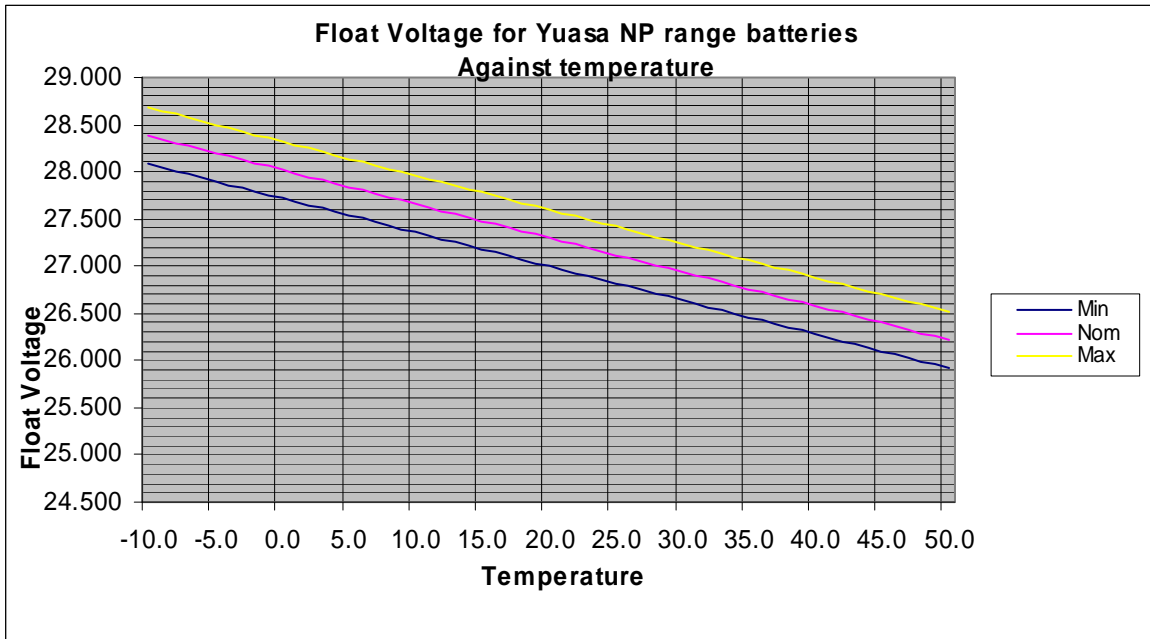
Mute the buzzer by pressing the No. 7 Key on the keypad, 'mute buzzer'. Reconnect the battery, all Fault LEDs will extinguish after a 60—80 second delay.

Calibration Mode

The Fusion Power supply has a calibration mode to enable simple checking of the battery charging voltage setting. The Voltage setting is normally calibrated in the factory and should not require adjustment. However local conditions may require small adjustments.

The power supply has a temperature compensation circuit so the ambient temperature will need to be taken into account. see the attached chart detailing possible battery charging voltage Vs temperature.

The calibration mode is entered using the calibration mode dil switch. This switch will set the PSU into CAL mode for 60 seconds only. The normal state for the CAL mode switch is in the 'ON' position switching 'OFF' will invoke the CAL mode. During Cal mode the charger voltage should be monitored with a voltmeter calibrated to a known NAMAS standard source. There is a small square pad on the pcb next to the CAL switch labelled + this point is for the +Ve lead of the voltmeter and the -ve lead of the voltmeter should be connected to 0V which can be the nearby -36v terminal. During CAL mode all the PSU LEDs will flash together intermittently and the battery is disconnected internally from the charger. (Note a mains fail during CAL mode will cause the panel power down). The Voltage setting can be checked now. There are also two additional switches which will cause the PSU to simulate the charging voltages for a range of temperatures. Voltages will be checked in the area of 26—30V DC (For meter setting information.) Procedure continues on next page.



When starting CAL mode:- Ensure CAL switch is in 'ON' and 1 & 2 are 'OFF'

Set CAL switch to 'OFF' observe fault LEDs flashing, check voltage at test pin against chart for ambient temperature e.g. for 20 Deg C should be 27.3V +/- 0.3 volts.

If this is within limits Operate the 1 switch to 'ON' and check the voltage is within limits for >30 deg C, (26.7v +/- 0.3v).

Switch 'ON' 2 and check the voltage within limits for <5 deg C (28.1v +/- 0.3v). Then Switch 'OFF' 1 & 2 and return CAL switch to 'ON' (normal) position.

If any voltage is outside the limits the voltage can be adjusted at the CAL mode only setting for the correct level for the ambient voltage. Ideally the settings should be along the middle line above or at least within the two limit lines.

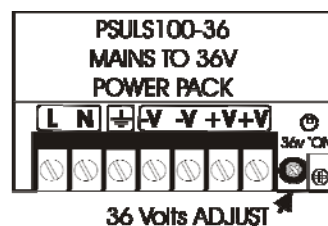
CAL mode will automatically drop out after 60 seconds, recycle the CAL switch to restart.

EMON SWITCH - Electronic monitoring, selects PSU comms protocol. This is normally set to 'on' for Fusion panels.

EARTH MONITORING - To disable earth fault monitoring, disconnect wire from earth monitor circuit inputs.

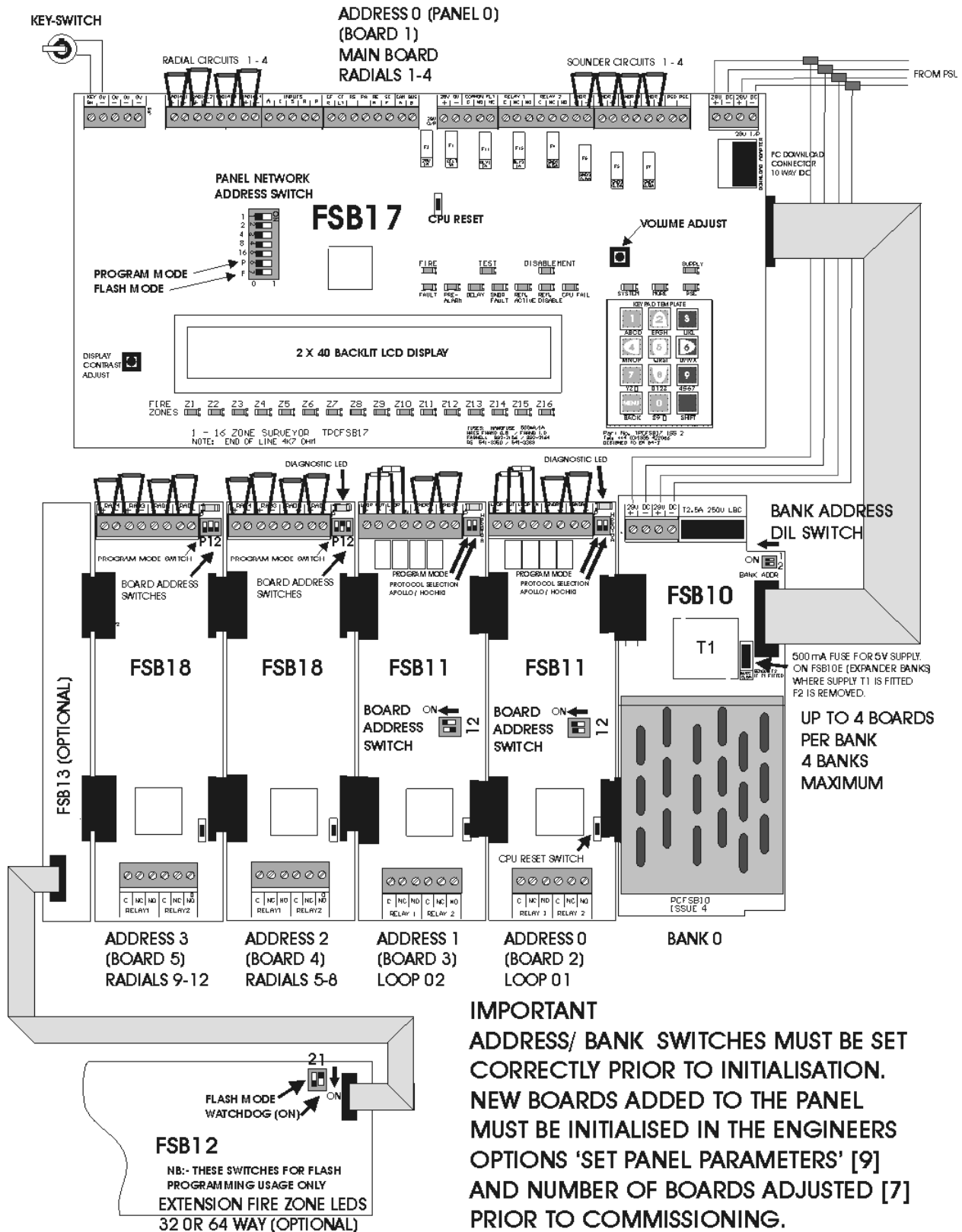
NOTE:- Earth faults should be rectified urgently as further earth faults could lead to equipment damage or false alarms.

Mains to 36V DC Switch mode power supply



The PSUFUSION utilises a Switch mode power supply to convert the mains voltage to 36V DC. The unit is factory set to 36V DC +/- 0.5V and can be checked by measuring across -V and +V terminals. There is an adjuster potentiometer next to the terminals.

FUSION PANEL HARDWARE LAYOUT AND ADDRESS SWITCH CONFIGURATION



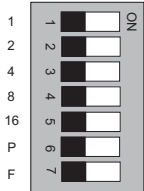
IMPORTANT
ADDRESS/ BANK SWITCHES MUST BE SET CORRECTLY PRIOR TO INITIALISATION. NEW BOARDS ADDED TO THE PANEL MUST BE INITIALISED IN THE ENGINEERS OPTIONS 'SET PANEL PARAMETERS' [9] AND NUMBER OF BOARDS ADJUSTED [7] PRIOR TO COMMISSIONING.

PANEL SET UP AND INITIALISATION

As delivered from the factory the control panel will be supplied completely set up and no initialisation will be required.

The addition of expansion boards will require changes to the configuration of the panel. This will involve changes to the DIL switches and settings in the control panel parameters.

FSB17 Main Board DIL Switch Setup



Panel	Switch	1	2	3	4	5	6	7
1	Address 0	0	0	0	0	x	x	X
2	Address 1	1	0	0	0	x	x	X
3	Address 2	0	1	0	0	x	x	X
4	Address 3	1	1	0	0	x	x	X
5	Address 4	0	0	1	0	x	x	X
6	Address 5	1	0	1	0	x	x	X
7	Address 6	0	1	1	0	x	x	X
8 - 15	Address 7 etc	1	1	1	0	x	x	X
16	To address 15	1	1	1	1	x	x	X
P	Program mode	x	x	x	x	x	1	0
F	Flash upgrade	x	x	x	x	x	0	1

SWITCHES

1 - 4 = PANEL NETWORK ADDRESS
 5 = NOT IN USE
 6 = PROGRAM MODE (WRITE PROTECT)
 7 = FLASH PROGRAM MODE

KEY

0 = OFF, 1 = ON, X = NOT USED

Set 'ON' when required

FSB10 BANK Address DIL Switch Setup



BANK ADD

Bank	Switch	1	2
1	Address 0	0	0
2	Address 1	1	0
3	Address 2	0	1
4	Address 3	1	1

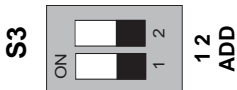
SWITCHES

1 - 2 = BOARD BANK ADDRESS

MAX 4 BANKS

*N.B.
 For BANK 1, the switches are no longer fitted*

FSB11 Loop Card DIL Switch Setup



S3

Board	Switch	2	3
1	Address 0	0	0
2	Address 1	1	0
3	Address 2	0	1
4	Address 3	1	1

S3 BOARD ADDRESS SWITCH

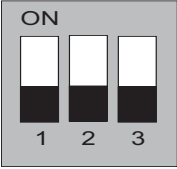
1 & 2 BOARD ADDRESS MAX 4 BOARDS PER BANK

IMPORTANT

BANK/BOARD ADDRESS WILL SET LOOP/ZONE No SEQUENCE BY ADDRESS ORDER

PANEL SET UP AND INITIALISATION

FSB18 Radial Card DIL Switch Setup



P12

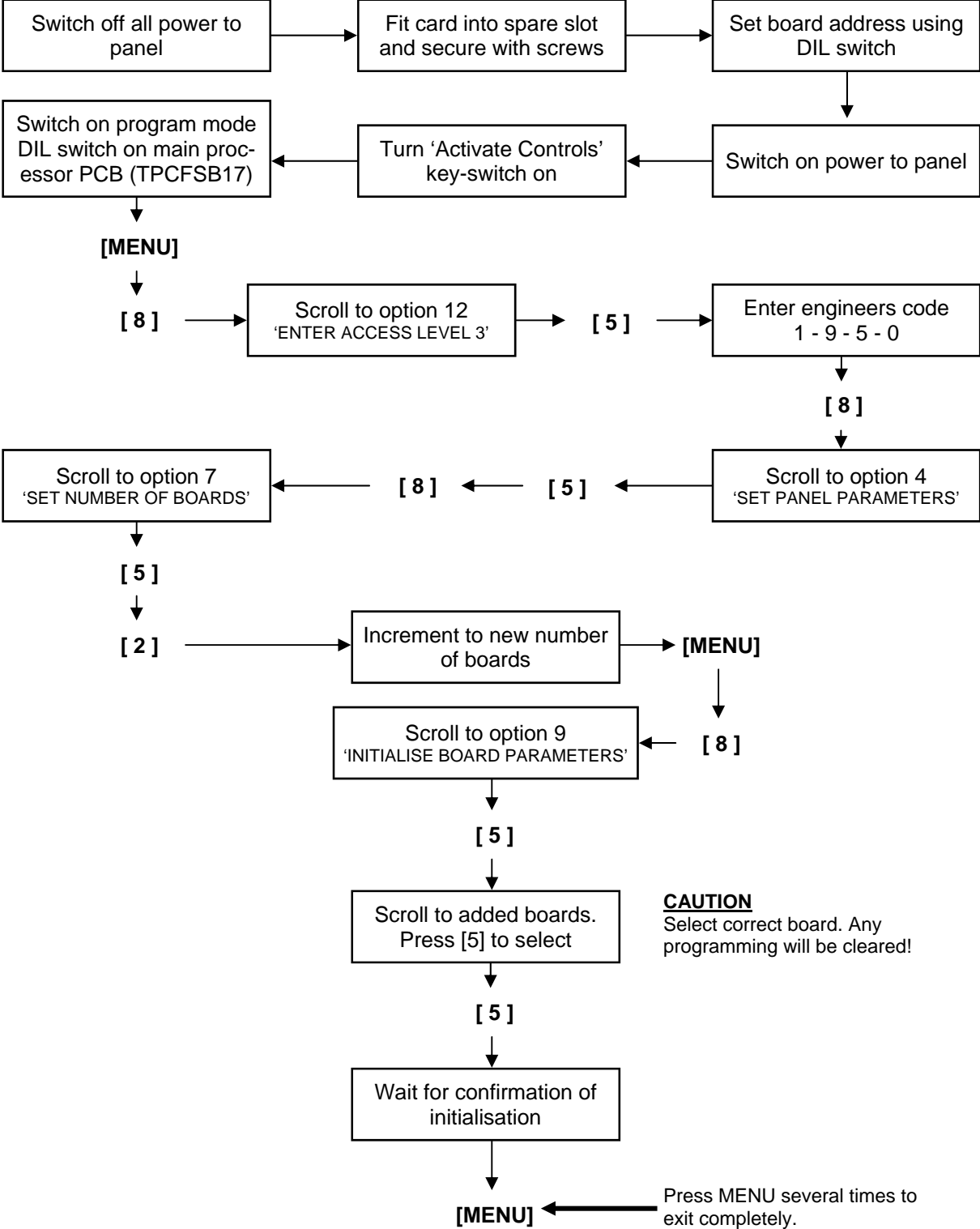
Switch	1	2	3
Address 0	x	0	0
Address 1	x	1	0
Address 2	x	0	1
Address 3	x	1	1

SWITCHES

1 = NOT USED

2 & 3 = BOARD ADDRESS. MAX 4 BOARDS PER BANK

INSTALLING ADDITIONAL LOOP OR RADIAL CARDS



MAINTENANCE.

Periodic system maintenance should be carried out in line with the local design, maintenance and installation regulations.

The standby batteries should be checked for physical condition to include checking integrity of the connections and battery cables, The batteries should be load tested to ensure they have adequate capacity. Any sign of venting or case warping should be dealt with by replacement and careful checking of charging voltages etc.

The panel should require no other regular maintenance other than cleaning with a soft cloth and a light application of a non abrasive cleaning agent (soapy water) to clean the fascia. Do not use strong solvents to clean the panel.

The event logs should be inspected and any recurring faults should be investigated.

**FIRE ALARM
SYSTEM LOG BOOK**

Site address _____

Telephone _____
Person on site responsible for fire alarm system _____
For service and maintenance contact _____
Telephone _____

THIS FIRE ALARM SYSTEM REQUIRES PERIODIC CHECKS AS SPECIFIED IN B.S. 5839 PART 1:2002.
IT IS THE RESPONSIBILITY OF THE USER OF THE SYSTEM TO ENSURE IT IS REGULARLY SERVICED AND
MAINTAINED IN GOOD WORKING ORDER.
PLEASE USE THIS LOG BOOK TO RECORD ALL TESTS AND TO REPORT ANY ALARMS OR FAULTS AS THEY
OCCUR.

MSL-B-01 Issue 3.0 August 2007

COMMISSIONING

General

When the control panel is installed and the wiring is complete, the system can be commissioned. The commissioning procedure comprises two main elements:-

- (i) connecting the external wiring circuits and powering the panel.
- (ii) configuring the system for the required operation.

Conventional Field devices

The control panel operates with the Apollo series 65 Conventional devices, Hochiki CDX range conventional and accepts a wide range of Conventional field devices of other manufacture. Field devices should be connected to the radial circuits in accordance with the manufacturers instructions supplied with them, ensuring that where necessary a 24V DC supply is available, and monitoring resistors are fitted. The following chart is a brief overview of the supported devices and relevant part numbers. Please consult with Technical support for details of unlisted devices.

Device	Part no.
Apollo series 65 Ionisation smoke detector	55000-217
Apollo series 65 optical smoke detector	55000-317
Apollo series 65 A1R combined heat detector 57 deg C	55000-122
Apollo series 65 detector base with diode	45681-201
Apollo series 65 TWIN wire detector base	45681-206
Hochiki CDX Optical smoke detector	SLR-E3N
Hochiki CDX combined heat detector 60 deg C	DCD-AE3
Hochiki CDX fixed heat detector 60 deg C	DFJ-AE3
Hochiki CDX detector base with diode	YBN-R-6SK
Hochiki CDX TWIN wire detector base	YBO-R-6PA
Haes Systems remote indicator led for smoke detectors	RIL58
KAC Indoor call point with 470 OHM resistor	MCP1A-R-470
KAC indoor call point with 220 OHM resistor (priority alarm)	MCP1A-R-220
KAC indoor call point for use with TWIN wire	MCP1B-R-TW
Fulleon Squashni base mounted sounder	SQ-03-W
Fulleon Roshni wall mounted sounder	ROLP-R
Fulleon Symphony wall mounted sounder	SY-R
Fulleon motorised centrifugal bells	CFB6D-24
Fulleon Solista low current led beacon	SOL-RL-R

COMMISSIONING

Radial circuit options

The radial circuits are initially configured as normal conventional detection circuits. There are three possible modes of operation which can be configured in the control panel parameters.

CONV = conventional detection using shottky diode detector removal monitoring

TWIN = twin wire operation whereby detectors and sounders may be fitted on the same pair of cables. Special detector bases and call points are required for this function (refer to list on p 35)

SDR = sounder circuit function. The circuit can be used as a conventional polarity reversal sounder circuit up to 500mA load

Refer to the wiring diagram on next page for connection details. All three circuits utilise a 4K7 end of line resistor. No more than 32 conventional devices or sounders should be added to any radial circuit.

Zoning

Radial circuits adopt a default fire detection zone during initialisation depending on the address of the PCB. Zone numbers can be altered in the panel configuration. Note:- In the programming the circuit will be referred to as a radial number which remains unchanged whichever zone the radial is programmed . Radial circuit zones can be seamlessly shared with addressable device zones to accommodate existing wiring layouts in upgraded systems.

Input and output attributes

For CONV and TWIN type radials a number of input attributes can be adjusted in the panel configuration. These are mostly to assist with interfacing or compatibility with legacy systems.

IMPORTANT ! certain attributes which can be used may be in contradiction with current EN54 and BS 5839 codes of practice. If these apply they should be noted on the commissioning certificate as variances and the implications understood by the system user.

Attribute	Default setting	Alternate setting	Possible conflict with EN54 requirements	Notes
Fire latching	latching	Non latching	If applied to smoke detectors	Useful for interfacing panels
Short as Fire	Short cct gives fault condition	Short circuit gives Fire	Non –compliant	Interfacing and old call points
Intrinsically safe mode	Normal mode	Intrinsically safe		Adjusts threshold by 300R for ISB
Silent mode	Normal mode	Silent mode	If applied to fire detection devices	Used for information alarms
Priority alarm	Priority alarm	No priority alarm		220R MCP overrides delayed zones
Detector removal	Schottky	Off—Zener	If applied to smoke detectors	Ensure correct bases are used

COMMISSIONING

Radial circuit options (continued)

output attributes

TWIN and SDR circuits have additional output attributes. These control the function of the output in relation to events occurring on the panel e.g. Fire . These attributes are the same as those available for addressable loop output devices.

The device response refers to the fundamental signals which affect the output.

The default setting is 'COMMON' which means that any alarm signal will activate the output

Other settings that may be applied:

'GROUPS' the output can be set to respond only to the status of preset cause and effect groups.

'LOCAL' the output will only respond to the local device alarm. (Valid for TWIN circuits only)

'ZONAL' The output will respond continuously to its assigned zone number being in alarm
And follow the default sounder response of 'pulsing' or 'off' when other zones are in alarm.

'COMMON' the output will respond continuous to all alarm events.

The other output attributes which can apply are

[S] = silence , if 'Y' the output will silence from the command of the silence button if 'N' the output will continue until panel reset occurs

[E] = Evacuate if 'Y' the output will activate if an evacuate status occurs. If 'N' then evacuate will not operate it.

[P] = Precinct (or class change) If 'Y' the output will respond to the precinct input being active. If 'N' the out put will not respond to the precinct input.

Investigation delays

A facility is provided to set an investigation delay. The investigation delay can be set on a Zonal basis and is set in the engineers options menu.

Investigation delays can be overridden by operation of a manual call point. In the case of conventional circuits this must be a special 'PRIORITY ALARM'. Call point containing a 220 Ohm alarm resistance (MCP1A-R-220)

COMMISSIONING

Fire alarm with output delays

The system can be programmed with delays to outputs (fire alarm sounders). If a delay has been programmed this is indicated by the DELAY LED which will be illuminated. Delays can be applied to all zones or individual zones as required.

A programmed delay can be turned off if required in the menu option 11: Set delays. If a delay is turned 'OFF' DELAYS INACTIVE will be displayed alternately on the normal display. If the delay is set 'ON' the DELAY LED will be illuminated.

If the acknowledgement and investigation delay option is enabled. A fire alarm is registered at the panel but does not immediately activate the sounders or remote output (dependant on program settings). The display will show:-

[FIRE /DELAY 019 ZONE 01 OF 01 ZONES ACK TIME]
[40 CHARACTERS LOCATION TEXT]

The delay timer shows how much time is left for acknowledgement. If the alarm is not acknowledged before the first timer expires the panel will enter full alarm

The alarm can be acknowledged by pressing button [5] on the keypad. If the sounders are active they may be silenced by pressing SILENCE / RESOUND ALARMS button. Once acknowledged the display will show:-

[FIRE /DELAY 120 ZONE 01 OF 01 ZONES INVEST]
[40 CHARACTERS LOCATION TEXT]

The delay timer shows how much time is left for investigation. If the alarm is not RESET before the second timer expires the panel will enter full alarm..

Pressing EVACUATE or operating a manual call point will terminate the investigation delays and activate all programmed sounders.

IMPORTANT

The Fusion panel large box (FBULxx-xx-xx) has a clear acrylic window protecting the display and controls. If investigation delays are used, a manual call point must be mounted near to the panel to enable instant override of the delay at access level 1, to ensure EN54-2 compliance.

The investigation timer can be disabled in the Set Delays menu. Note:- When the investigation alarms are disabled. Sounders will activate immediately following a detector alarm.

Radial circuit alarm / fault thresholds

CONVENTIONAL RADIAL CIRCUITS

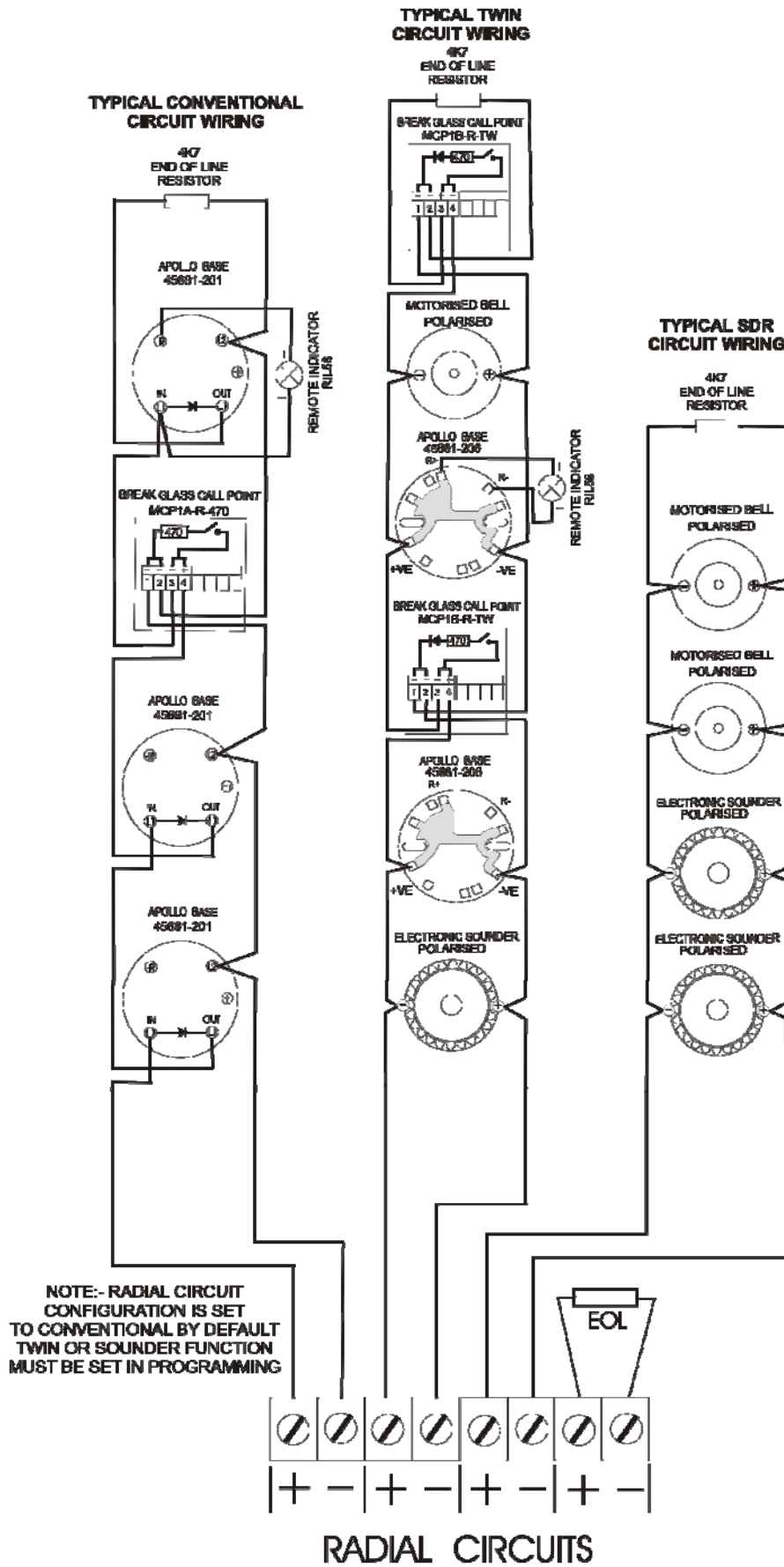
OPEN CIRCUIT	INFINITY TO 5K4	0 - 4.5mA
NORMAL	5K3 to 2K0	11mA - 4.5mA
FIRE	2K0 to 80R	40mA - 12mA
PRIORITY ALARM	300R to 80R	40mA
SHORT CIRCUIT	80R to 0R	42mA - 58mA

TWIN WIRE RADIAL CIRCUITS

OPEN CIRCUIT	INFINITY TO 5K4	0 - 4.5mA
NORMAL	5K3 to 1K1	16.8mA - 4.5mA
DETECTOR REMOVAL	1K1 to 700R	40mA - 12mA
FIRE	690R to 150R	42mA - 25mA
PRIORITY ALARM	300R to 80R	40mA
SHORT CIRCUIT	150R to 0R	58mA - 42mA

SDR SOUNDER RADIAL CIRCUITS

OPEN CIRCUIT	INFINITY TO 5K4	0 - 4.5mA
NORMAL	5K3 to 1K1	16.8mA - 4.5mA
SHORT CIRCUIT	1K1 to 0R	16.8mA - 42mA



COMMISSIONING (Cont'd)

Analogue Addressable Field devices

The control panel operates with the Apollo XP95 & Discovery protocols and accepts the full range of field devices. Field devices should be connected to the loop circuit in accordance with the instructions supplied with them ensuring that, where necessary, a 24V DC supply is available and monitoring resistors are fitted.

Device address

Each device on the system (excluding short circuit isolators) must have a unique address.

Apollo detectors are addressed by means of the 'XPERT address card' which is either supplied blank for on-site configuration, or pre-configured to simply slot into the appropriate device.

The standard address range for Apollo devices is 1 - 126. Please refer to Apollo device instructions for further information.

Devices do not have to be addressed in the order in which they are wired. An error message will appear on the LCD display to indicate any duplicated addresses.

The chart on the following page is a brief overview of the supported devices and relevant type codes.

Part numbers are correct at time of publication. For further devices not listed, please contact our technical support department.

Analogue Addressable Field devices

Code	Device	Part no.	Protocol
SDR	Integrated Base Sounder With Isolator XP95	45691-277	Apollo XP95
SDR	Integrated Sounder Beacon Base XP95	45681-331	Apollo XP95
SDR	Beacon Base XP95	45681-335	Apollo XP95
SDR	Sounder Beacon Base With Isolator Discovery	45681-393	Apollo Discovery
SDR	Intelligent Open Area Sounder With Isolator Red XP95	55000-001	Apollo XP95
SDR	Intelligent Open Area Beacon With Isolator Red XP95	55000-009	Apollo XP95
TEM	Analogue Heat Sensor XP95	55000-400	Apollo XP95
ION	Analogue Smoke Detector Ionisation XP95	55000-500	Apollo XP95
RIO	3 Channel Input/Output Interface With Isolator XP95	55000-588	Apollo XP95
OPT	Analogue Smoke Detector Optical XP95	55000-600	Apollo XP95
RIO	Mini Switch Monitor XP95	55000-760	Apollo XP95
RIO	Switch Monitor Interface With Isolator XP95	55000-843	Apollo XP95
ZMU	Zone Monitor Interface With Isolator XP95	55000-845	Apollo XP95
RIO	Input/Output Interface With Isolator XP95	55000-847	Apollo XP95
RIO	Output Interface With Isolator XP95	55000-849	Apollo XP95
SDR	Sounder Control Interface With Isolator XP95	55000-852	Apollo XP95
RIO	Mains Switching Input/Output Interface XP95	55000-875	Apollo XP95
SDR	Loop Powered Beacon Red XP95	55000-877	Apollo XP95
OPT	Analogue Multi Sensor XP95	55000-885	Apollo XP95
MAN	Analogue Call Point With Isolator Red XP95	55100-908	Apollo XP95
SDR	Open Area Sounder Beacon Red Discovery	58000-005	Apollo Discovery
ION	Analogue CO Detector Discovery	58000-300	Apollo Discovery
TEM	Analogue Heat Sensor Discovery	58000-400	Apollo Discovery
ION	Analogue Smoke Detector Ionisation Discovery	58000-500	Apollo Discovery
OPT	Analogue Smoke Detector Optical Discovery	58000-600	Apollo Discovery
OPT	Analogue Multi Sensor Discovery	58000-700	Apollo Discovery
MAN	Analogue Call Point With Isolator Red Discovery	58100-908	Apollo Discovery

COMMISSIONING (continued)

Loop wiring

The loop wiring should be tested in accordance with the requirements of BS 5839 Part 1 before connecting devices.

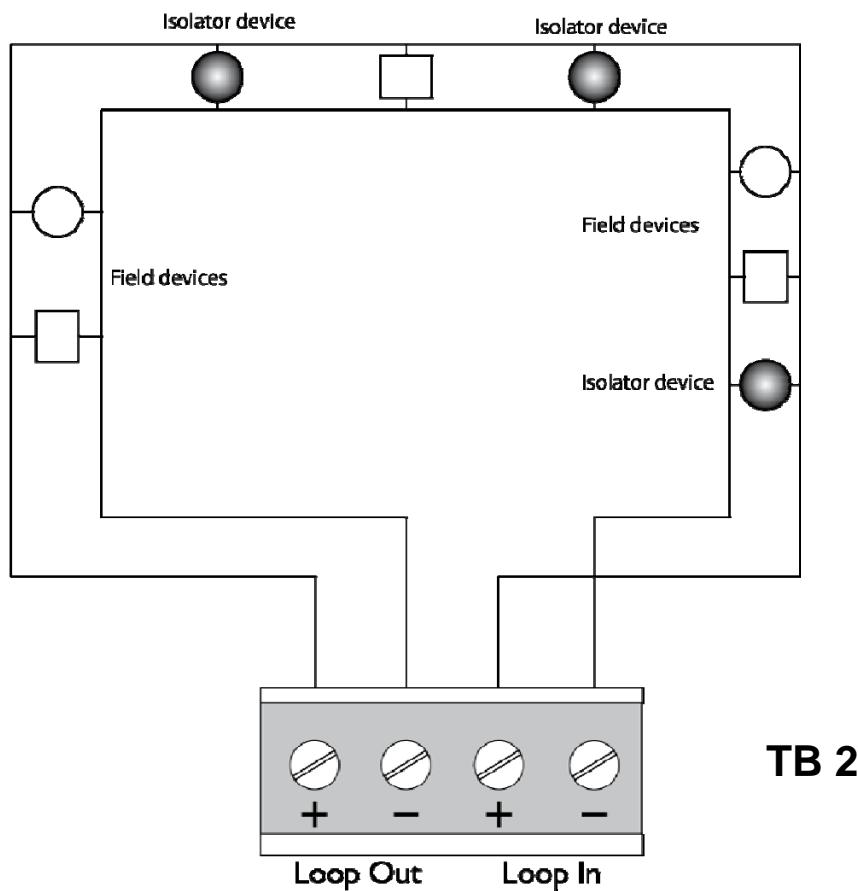
When the detector bases and other field devices have been connected, the loop should be checked for continuity and earth faults using a multimeter only. To measure the continuity it is necessary to link the L1 IN and L1 OUT terminals in each isolator.

NOTE : Unlike other XP95 devices, isolators are polarity sensitive and must be connected correctly.

Measure the resistance of the loop and ensure that it does not exceed 50 ohms. Check there are no earth faults present. When the loop wiring checks have been satisfactorily completed, reinstate the isolators and connect the circuit as indicated in the figure below.

Important

Loop circuits have short circuit isolation at loop out and loop in terminals. For maximum integrity against short circuit faults we recommend the use of short circuit isolator devices. For guidance on location of short circuit isolators, please refer to BS 5839-1:2002 section 12.2.2, System Integrity.



LOOP CIRCUIT CONNECTION DETAIL

COMMISSIONING (continued)

Powering the panel

It is recommended that following the connection of the loop circuit the panel is powered up and tested before proceeding with the connection of the sounders, remote outputs and auxiliaries.

When the panel is first powered up, the panel must be initialised, or a configuration program downloaded. The loop is scanned and the devices are identified. Each device is displayed showing its address and type, and the zone as 'unassigned', allowing the operator to allocate each device to the required zone (see Initialisation).

Mains connection

Ensure that the incoming mains supply is fully isolated. Remove the fuse from the mains terminal block and connect the incoming live, neutral and earth wires to the L, N and Primary Earthing Stud.

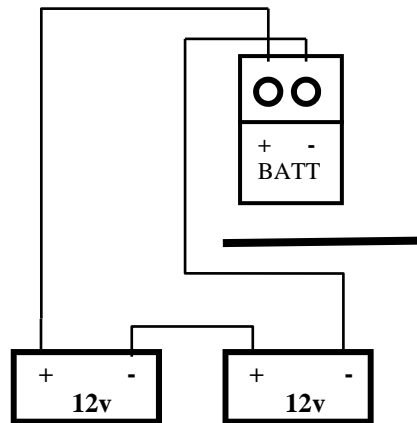
Switch on the supply (do not replace the fuse at this stage).

COMMISSIONING (continued)

Connecting the battery

Prepare to connect the battery as indicated in the figure below (do not connect the battery at this stage).

NOTE. There is a 60-80 second default delay on the indication of a battery fault when the battery is disconnected. Similarly, when the battery is reconnected, the fault continues to be indicated for 60-80 seconds. The power supply has temperature compensation. The sensor is integral at the bottom of the power supply control circuit board.



BATTERY CONNECTION DETAIL

Starting the panel on battery power

It is possible to start the panel without the mains supply, e.g. during commissioning if the supply is not yet available. Press the battery start switch to override the battery cut off function to allow the panel to power up on batteries only.

A 'Mains Fault' is indicated and the buzzer pulses. The buzzer can be silenced by pressing the 'mute buzzer' button, on the key pad.

The fault clears automatically when the supply is restored.

COMMISSIONING (continued)

Sounder circuits

The four sounder circuits are connected as follows:

Remove the 4K7 resistor from the sounder circuit terminals on the main PCB and fit to the last device on each circuit

Circuits are fused at 500mA each.

Sounder circuit No 4 can be altered in the programming to be a remote signal output:

Output to Fire Alarm Routing Equipment, monitored signal for use with remote, manned stations etc. EN54-2, section 7.9.1, option with requirements. When this is set in the parameters an indication is given when this output is active (remote active). Also the output can be separately disabled from other outputs and has its own unique indication (remote disabled / fault).

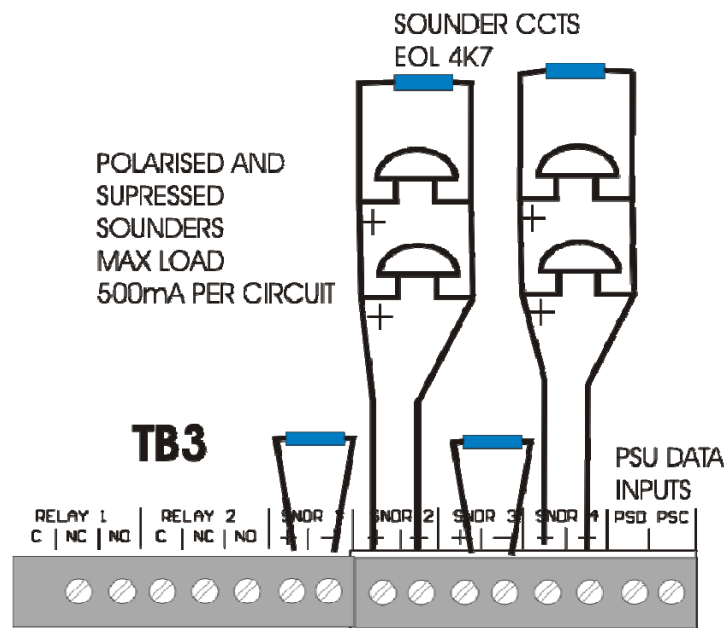
NOTE : To comply with BS 5839 Part 1, at least 2 circuits should be utilised.

Remote relay contacts

Three sets of volt free changeover relay contacts are available for control functions. By default the relays activate on a common fire basis.

- Relay One Programmable relay, energises on a Fire Alarm and de-energises on Reset
- Relay Two Programmable relay, energises on a Fire Alarm and de-energises on Reset
- Common Fault De-energises on any fault condition and stays de-energised until the fault is cleared. ie: failsafe.

NOTE : Fault relay is normally energised when the system is healthy.



Sounder circuit connection detail

COMMISSIONING (continued)

Remote outputs

The remote output terminals provide a switched 0V supply in conjunction with system events and can be used for control and/or signalling purposes. The load applied to any remote output should not exceed 100mA.

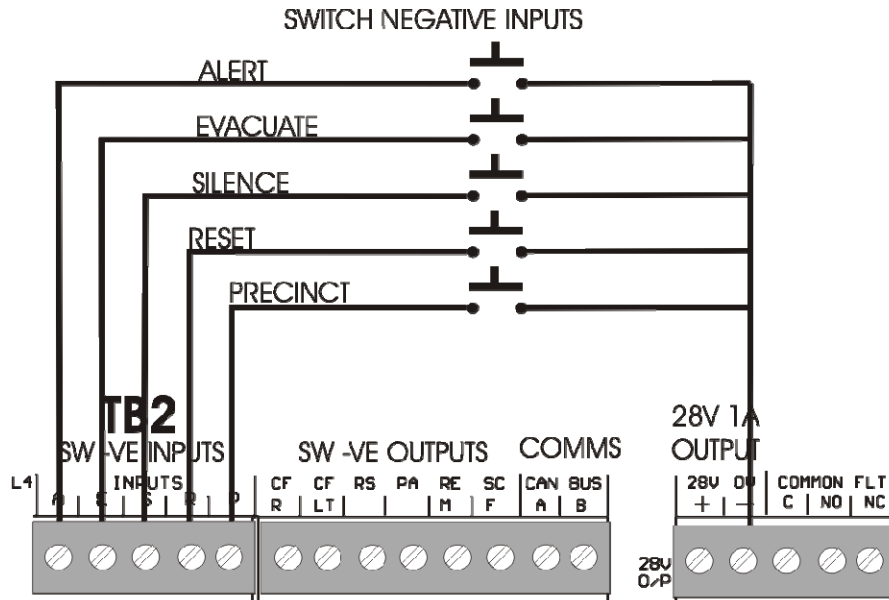
The following outputs are available and are switched on when the relevant event occurs:

- CFR** Common fire (switched off when Reset is pressed)
- CFLT** Common fault (switched off when fault clears)
- RS** Reset (3 second pulse when Reset is pressed)
- PA** Pre-alarm (switched off when condition clears)
- REM** Remote signal (switched off when Reset is pressed)
- SCF** Common fire (switched off when Silence is pressed)

Remote inputs

The remote inputs provide control functions from remote switches and are energised by applying 0V (-28v) via a switch or relay contact.

Remote input connection detail



COMMISSIONING (continued)

Remote power supply

If required, the supply to the control panel can be derived from a remote power supply and battery unit. Input terminals are provided in the control panel on the main pcb for the 28V supply, charger and battery fault conditions. The clock and data lines must be maintained. For connections see the Terminal Block 4 diagram .

In the event of remote supply failure the LCD shows 'Power Supply Fault'.

CPU reset

The 'CPU Reset' pushbutton on the main pcb is provided to manually restart the system following the failure of the software to execute a command. The effect is the same as disconnecting and reconnecting power to the panel.

Checking the system

Any fault conditions indicated at this stage should be investigated and cleared before putting the system into operation.

Check that the system operates in accordance with the operation described in the following pages.

Clear SYSTEM FAULT

Following an incident where the panel failed to execute software or crashed during operation a 'SYSTEM FAULT ' previously known as 'ARW' (Automatic Reset Warning) indication is present. This must be cleared by operating the RESET switch on the front panel.

If SYSTEM FAULT warnings occur during normal system operation, there may be 'interference' or a software problem. The source of the problem must be investigated. Contact the manufacturer for further advice.

Operation of the control panel in the event of a system fault.

In the event of a system fault where the memory contents of a loop card may not be relied upon the panel will enter a 'safe' state utilising a set of default parameters for that loop (unless the loop is completely inoperable). In this case devices will report as belonging to zone 1 and in the case of an alarm condition outputs will revert to a common fire operation (i.e. any special programmed cause and effects will not apply). The device loop and address will be displayed in the event of a fault or fire condition.

In the Fusion panel each loop or 4 way radial card is controlled by it's own independent micro-controller, so no more than 126 devices would be affected by a system fault on a single processor.

In the event of a system fault affecting the display PCB, fire events are indicated via a pure hardware link which operates the 'General Fire' LED, panel buzzer and the four sounder circuits / remote signal (if programmed)

Note If sounder circuit 4 is 'not' programmed for use as 'Fire alarm routing' output A diode 'D53' located above the supply healthy LED can be snipped from the PCB to prevent the 'Fire alarm routing active' LED being lit in the case of a Fire alarm whilst the display PCB is in 'system fault' condition. If sounder 4 is in use as a 'Fire alarm routing output' leave the diode D53 intact.

NETWORKING

The Fusion utilises CAN (controller area networking) Protocol to provide a fast reliable network of up to 16 control panels and / or repeater panels.

Up to 1,000 metres of cable can be used over the network. The recommended cable for use with Control panel networking is a Screened twisted pair fire resistant cable.

Typical cables for networking use include:-

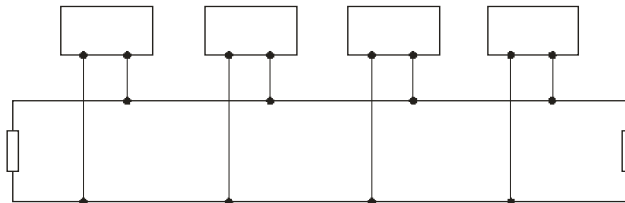
Cable Manufacturer	Cable Type	Cable Sizes		5839-1 Rating	
		1.0mm	1.5mm	30 min	120 min
AEI	FireTec Multicore FS2C		x	x	
Cavicel SpA	Firecel SR/114H	x	x	x	
Draka	Firetuf PLUS	x	x		x
Prysmian (Pirelli)	FP200 Gold	x	x	x	
Tyco	MICCtwistedpyroECCMT	-	-	-	-
Ventcroft	VFP-215ERH		x	x	

Note:- Belden 8760 1 pair cable can be used but is not suitable where a fire resistant cable is required.

The CAN bus requires to be terminated at the furthest ends by 120R (ohm) resistors, these are supplied ready fitted to the FSB17 circuit board just under the CAN BUS terminals (position R177).

Where more than two panels are on a single network the resistors should be removed from the panels other than the two furthest. Using a fine pair of wire cutters to snip the resistor legs. CAN bus connections are labelled A and B. All A terminals are connected together and all B terminals. They can be connected in any wiring configuration but not in a loop. Signal levels around 5 volts would typically be seen when the bus is running.

Typical CAN bus wiring:-



Setting up network

Each panel in the network must be set with a unique address starting at 0 this is set on the address switches on each panel in turn (refer to page 24 for details). Each panel has a parameter in the engineering options menu 'set system parameters' option No 3 to set the number of remote panels. This quantity needs to be set on each panel to represent the number of other panels fitted in the system e.g. in a network of five panels this figure will be set to 4 in each case. Once set correctly the system will be in the quiescent state.

Network diagnostics

As each panel operates on a peer to peer basis i.e. independently. All panels monitor each other. Each panel sends a regular ident pulse which is monitored by all others. If an error is present it will be enunciated on all panels. A fault message is given if a panel is lost or if a panel is seen on the network which is not expected. Also the integrity of the message packets received is constantly monitored. If data corruption is occurring (perhaps due to cabling faults) this will be enunciated as a 'network message error' along with the number relating to the panel affected. (Note due to display restrictions panels 10 to 15 are indicated by letters A=10, B=11, C=12, D=13, E=14, F=15,) This indication may also be given if there are two identical addresses on the network. To clear the fault check all address settings or cable integrity.

SYSTEM OPERATION

Fire alarm

During normal operation the only active indication on the control panel is the green Supply Present LED. The LCD shows the system normal message and the time, date and company name, if utilised.

The control keyswitch should be in the OFF position and the key should be removed and stored in a secure place, readily available when required.

If a manual call point is activated, or an automatic detector senses smoke or heat, a fire alarm signal is generated and the following occurs:

- 1 The alarm sounders operate in accordance with the programmed configuration. This is normally a general evacuation (continuous) alarm throughout the building, but may be an alert (intermittent) signal, or alarm in certain parts of the building only.
- 2 The common FIRE LED flashes on the front panel.
- 3 The relevant zone LED flashes (1-64).
- 4 The LCD illuminates and shows the event information.
- 5 The internal buzzer pulses rapidly.
- 6 The remote output operates and signals the fire brigade (if this has been configured in the system).
- 7 Remote control functions are initiated in accordance with the program, e.g. doors closed, ventilation shutdown, etc.

The actions to be taken in the event of a fire alarm should be fully documented and implemented immediately upon hearing the alarm.

After the event, note the event details, i.e. the activated zone and the device details if not already determined.

SYSTEM OPERATION (continued)

Silencing the alarm

Before the alarm sounders can be silenced the CONTROLS keyswitch must be set to the ON position by inserting the key and turning it clockwise a quarter of a turn. Alternatively a code may be entered to the keypad to enable the controls. (providing this option is set in the parameters)

With the controls enabled, press the SILENCE/RESOUND ALARMS keypad button once:-

- 1 The alarm sounders on the system are silenced.
- 2 The LCD will illuminate to indicate the current status.
- 3 The flashing common fire and zone LEDs change to steady.
- 4 The buzzer tone changes to an intermittent bleep.
- 5 The LCD continues to show the event information.

NOTE : If another device is activated, the sounders are re-energised and the new event information is displayed.

If there are multiple events on the system, the information for each event may be viewed by using the toggle function with keypad buttons 2/8.

The 'MORE' LED is illuminated if there are other events. The LCD shows the total number of events.

Resounding the alarm

If, having silenced the sounders, it is necessary to reactivate them, e.g. because there are personnel still within the building, press the SILENCE/RESOUND ALARMS keypad button again.

Resetting the system

To restore the system to normal operation after a fire alarm it is necessary to reset the control panel by pressing the RESET button. (Key 9 on keypad)

All the LEDs illuminate for 3 -4 seconds (lamptest function) following which the panel reverts to its normal mode.

NOTE :

- 1 It is not possible to reset the system until the alarms have been silenced.
- 2 The system will not reset if the cause of the alarm is still present, i.e broken glass in call point or smoke/heat in the vicinity of a detector.

SYSTEM OPERATION (continued)

Evacuate

The EVACUATE button, keypad **[3]** may be operated at any time to activate the alarm sounders, except in 'Engineering Menu' mode.

The CONTROLS keyswitch must be in the ON position.
Press the EVACUATE button once:
The sounders are energised and the common FIRE LED will flash.

To turn the Evacuate signal off:

Press the SILENCE button, keypad **[6]** (This will be displayed on the LCD and the flashing 'FIRE' LED will change to steady).

Press RESET, keypad **[9]**

Pre Alarm

If a detector reaches a pre defined threshold before reaching a full fire condition, a 'red' pre alarm LED and the panel buzzer is activated. The LCD display will indicate the zone of activation. Press button **[1]** to display device details. A pre alarm may indicate, device contamination, failure or early warning of a fire condition and should be investigated urgently.

Panel buzzer

The internal panel buzzer operates whenever an abnormal event is on the system.

It operates in the following modes:

Fire/Evacuate	Fast pulse.
Fault	Slow pulse.
Disablement	Double pulse.
Silenced	Intermittent bleep.

Monitoring

The control panel internal circuitry is fully supervised in accordance with the requirements of EN54-2 and indicates a failure as a fault condition. Loop and sounder circuits are monitored for open circuit and short circuit fault conditions. Essential fuses are monitored.

SYSTEM OPERATION (continued)

Fault conditions

When the control panel detects a fault condition one of the following occurs:

1. The **GENERAL FAULT** led will flash and the LCD will show the details.
2. The **SYSTEM FAULT** led will flash, indicating that the processor has halted. This can only be reset by an engineer.
3. The **SNDR FAULT** led will flash to indicate a fault on the alarm circuit.
4. The **POWER FAULT** led, when flashing, indicates a power supply failure. The LCD will show the details
5. For each of the above or combination of them, the internal buzzer pulses (slow pulse)
6. The LCD will display the event information, e.g.

NO RESPONSE	ZONE 001	01 OF 01
TYPE MAN	ADD 003	18:20 23/03

The fault message is normally self-explanatory, for instance, in the above example the message is **NO RESPONSE** indicating that the panel cannot communicate with the device **A003**, which could indicate that it had been removed. The fault condition can be accepted by pressing the **MUTE BUZZER** key [7]. To view the text description of the device press keypad [1]

The flashing LEDs go steady and the buzzer tone changes to an intermittent bleep. The panel automatically returns to normal operation when the fault condition clears; however, certain faults, e.g. **SYSTEM FAULT**, require the CPU to be reset.

SYSTEM OPERATION (continued)

Fault messages

The following events are detected and reported :-

<u>Message</u>	<u>Fault Condition</u>
Det. removed	Conventional detector removed
No response	Addressable device removed
Type error	Device fault / wrong device type installed
Calibration	Device has reached calibration limits
Loop open circuit	Loop circuit open
Incorrect protocol	Wrong device protocol setting
Loop short circuit	Loop circuit short
Power supply fault	PSU failed
Sounder short / open	Open / short circuit on sounder circuit
Radial short / open	Open / short circuit on conventional circuit
Mains fail	Mains failed
Battery fault	Battery disconnected (max 80s delay)
Supply calib.mode	Power supply set to calibration mode
Earth fault	Earth fault
Output limit 1/2	Power supply path output 1 or 2 shorted
Double response	Duplicate address
CPU fault	CPU failed
Network	Communications failure
Charger fault	PSU failure (external only)
Voltage fault	28 volts outside spec. (<22v, >30v)
Device fault	Analogue value low
Warning - Prog switch 'on'	SW 6 on DIL switch set to 'on' or switch 1 on additional loop / radial boards.
Bad response	Loop data corruption
Ancillary relay fault Ancillary sounder fault	A device is unplugged from an ancillary unit which relies on it for operation

MENU AND CONTROL FUNCTIONS

General

The control panel incorporates facilities to alter the status of the system, e.g:- it is possible to isolate parts of the system if there is work in progress, or a particular device is faulty and causing unwanted alarms. The system can be put into test mode to allow an engineer to activate devices without causing a general alarm, and the time and date can be changed, e.g. for British Summer Time.

These functions are accessible to the user at access level 2 but care should be exercised when utilising the functions as it is possible to disable some or all of the system. It is recommended that before attempting to enter the options menu the features are fully understood, and the operator is familiar with the controls used to navigate the menus and select options.

Function buttons

Four of the keypad buttons are used as function buttons when the options menu is invoked.

Most of the panel functions, including configuration, are controlled by these buttons which have the following functions:-

[MENU]

The Menu button is used to initially invoke the options menu. Press once to enter the Menu , and press again to Exit.

[1]

If an active event is present, press button 1 to reveal more information about the event

[2] and [8]

The 2 and 8 buttons are used to move to and then select the Menu options. Once an option has been selected, the Menu button should be pushed again to exit.

[5]

The 5 button on the keypad is pressed when the option selected needs to be viewed, or to view the text or an active event. Button 5 is used during an investigation delay to acknowledge the alarm and start the investigation timer.

[4] and [6]

The 4 and 6 buttons are used to position the cursor along a full display line in order to adjust various options available.

MENU AND CONTROL FUNCTIONS continued

Access levels

To prevent unauthorised operation of the panel controls and functions, access is restricted in accordance with the requirements of EN54 -2.

The following access levels apply:-

- Level 1** Accessible without keyswitch or code entry. Full restrictions. The internal buzzer MUTE only is available at this level and Scroll and Select if 'Fire' is active.
- Level 2** CONTROL keyswitch ON, or code entered. The control switches are operable and menu level 2 functions available.
- Level 3** An access code must be entered to gain access to the configuration and advanced options. An additional switch operation is required at engineer level to access configuration data. Special tool is required to access internal control panel circuits at level 3 . The Inner door on the FBUL model is secured via security Torx screws.
- Level 4** Configuration software. Download facilities are available for off-site programming.

NOTE :- Amending the system configuration can have serious effects on the operation of the equipment and should only be undertaken by a competent person who has information concerning the devices installed and the specified operational requirements.

The system should be fully tested after any alterations to the configuration program.

Menu Procedures

The following procedures are common to all of the menu options and should be understood before attempting to alter the system status.

Press the **[MENU]** button on the KEYPAD to display the following :-



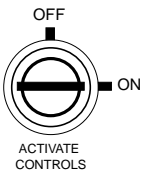
Use the **[2]** and **[8]** keypad buttons to toggle (scroll) to the required option, then press **[5]** to display the required information.

At any time, pressing **[MENU]** again will return you to the menu options, or in some cases return you to the last step.

Depending on the option selected, there will be sub-menu items which can be accessed by the **[5]** key or scrolled across to, using the **[4]** and **[6]** keypad buttons.

When satisfied with the data obtained, press **[MENU]** to return to the initial screen.

MENU AND CONTROL FUNCTIONS continued

Press 'Menu' button on keypad **OR** 



Menu Button = Enter / Exit option
 Button [5] select or toggle option
 Buttons, 2,4,6,8, navigate menu

Access Level 1 (open to all personnel)	
0	Enter access level 2 (enter access code 5839)
1	View active faults
2	View active disablements
3	View event logs
4	Test lamps

Access Level 2 (authorised personnel only)	
1	View active faults
2	View active disablements
3	View event logs
4	Test lamps
5	Clear event logs
6	Set disablements
7	Set clock
8	Activate test mode
9	Print options
10	Set delays / dependency
11	View groups
12	Enter access level 3

1	Set relays disablement
2	Set sounders disablement
3	Set loop isolate
4	Set zones disablement
5	Set radial/loop device disablements
6	Set auto enables
7	Remove all disablements

1	Relay #1
2	Relay #2
3	Set remote isolate *
4	Common fault
5	Loop modules

* Dependant upon program settings

Enter access code
xxxx

Access level 3 (for service personnel only)
 Refer to Installation Manual

MENU AND CONTROL FUNCTIONS (Continued)

Menu Procedures

The following procedures are common to all of the menu options and should be understood before attempting to alter the system status.

To access the Options Menu the CONTROLS key switch must be in the ON position. Press the **[MENU]** button on the KEYPAD to display the following :-

*** SELECT MENU OPTION ***
2. VIEW ACTIVE FAULTS

Use the **[2]** and **[8]** keypad buttons to toggle (scroll) to the required option, then press **[1]** to display the required information.

At any time, pressing **[MENU]** again will return you to the menu options, or in some cases return you to the last step.

Depending on the option selected, there will be sub-menu items which can be accessed by the **[5]** key or scrolled across to, using the **[4]** and **[6]** keypad buttons.

When satisfied with the data obtained, press **[MENU]** to return to the initial screen.

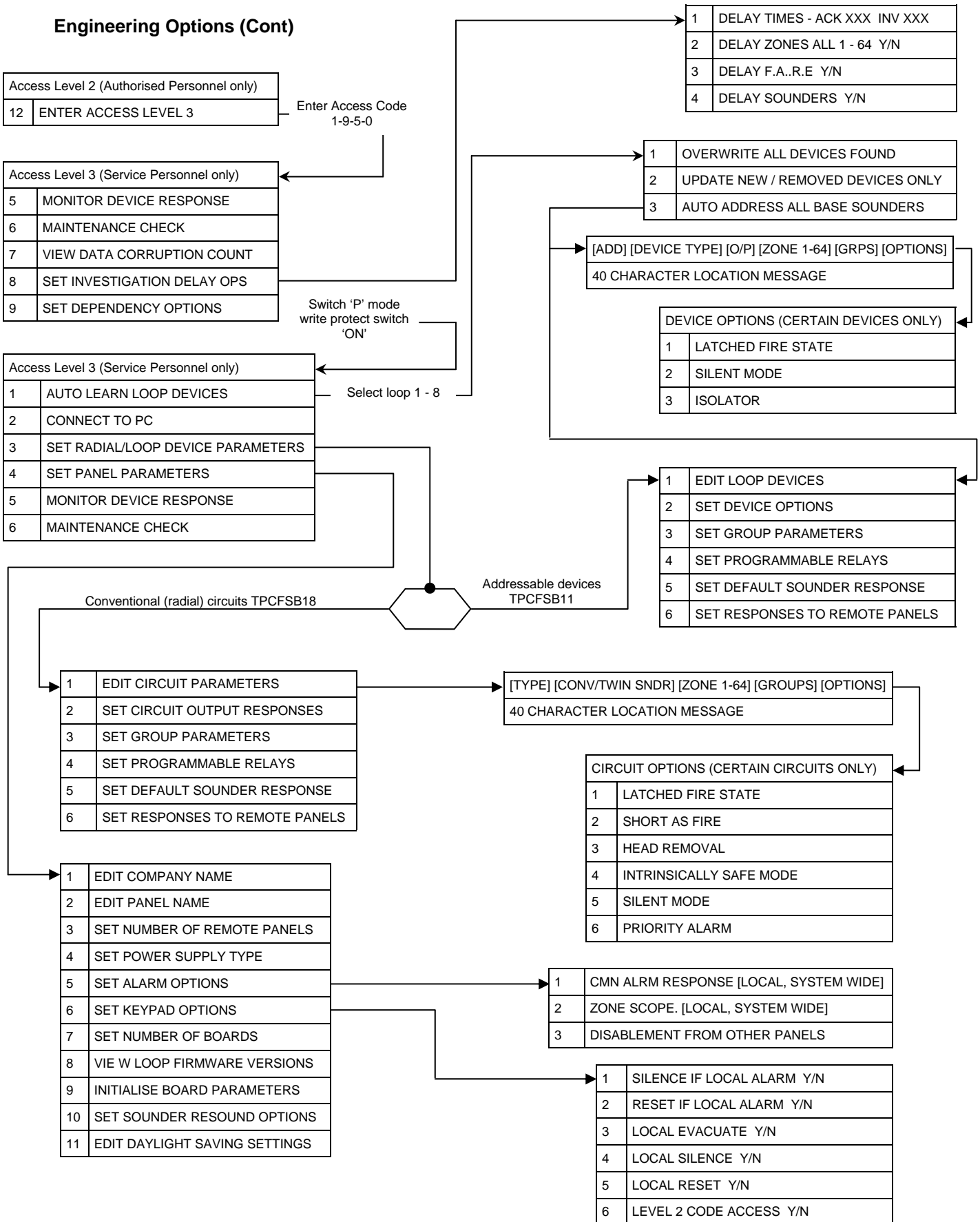
MENU AND CONTROL FUNCTIONS continued

Key to menu.

1. **View active faults.**
This option provides a method of viewing faults on the system when there are active fire events present.
2. **View active disablements.**
This option allows the user to identify parts of the system that have been isolated.
3. **View event logs.**
This option allows the Alarm log and the Event log to be inspected.
4. **Test lamps**
5. **Clear event logs**
6. **Set disablements.**
This option allows remote outputs, sounders, loop and zones to be disabled and also enabled manually or automatically at a preset time and date.
 - Remote Contacts can be disabled or enabled for test purposes. This applies to relay 1, relay 2, common fault or the loop module relays.
 - Sounders can be disabled if required and enabled again.
 - The Loop can be isolated on this option.
 - Any selected zone can be disabled or enabled.
 - Any of up to 126 devices on the loop can be disabled or enabled.
 - Timers can be set for devices or outputs, to be re-enabled automatically at a specified time and date with this option.
 - Programmed delays can be disabled .
 - All disablements, on whatever device or line, can be cleared simultaneously
 - A programmable option is available to use a switch monitor or input module to isolate pre-determined groups of devices. This is set up via the cause and effects parameters.
7. **Set clock.**
Allows the time and date to be entered via the keypad.
8. **Activate test mode.**
Allows zones to be tested individually or all together. With or without sounder. An optional managers code can be used to allow access to this function.
9. **Print options (if printer is fitted)**
10. **Set delays / dependencies (if programmed)**
Switches delays / dependencies 'off' or 'on'
11. **View Groups**
Status of cause and effect groups can be viewed.
12. **Enter access level 3 (Engineering options)**
In order to access the Engineering options a security code is needed which is normally restricted to engineering personnel only. The code is 1950+

MENU AND CONTROL FUNCTIONS (Continued)

Engineering Options (Cont)



MENU AND CONTROL FUNCTIONS (Continued)

Engineering options (Cont)

This option requires the operator to input a security code **(1950)** in order to access all engineering options. The 'program mode switch' must be in the **ON** position on the display board.

1. **Auto learn loop devices.** This facility is provided to enable an engineer to configure the system with the minimum of effort. The entire contents of the loop are read in by the control panel and placed in the memory for subsequent editing or downloading to the PC program.

Overwrite All Devices Found

existing settings

Selecting this will re-learn all devices and remove any

Update New/Removed Devices Only

Use this option to modify an existing system if new devices have been added, removed or modified. This option will not overwrite any existing settings.

Caution:- Ensure any changed device settings are correct, i.e. input & output responses.

NOTE. Before auto-learning takes place it is important that the placement of components and the addressing of them on the loop, has been completed. Auto-learning can only take place once the control panel has been initialised, if this option is selected during initialisation, a warning message is displayed and auto-learn is halted until initialisation is completed. An option is provided either to learn the complete loop and overwrite all the previous data or just learn new or removed devices without affecting the rest of the programming. As a default all auto learned devices are placed in zone 1. The device zone designations may be altered at the next step by selecting the edit loop devices option

2. **Connect to PC.** This is to allow access to the processor software for initial configuration of the system, updates or modifications by a PC equipped with the correct configuration program. For further details see the section on 'PC Configuration'.
3. **Set Loop Parameters.** For details see the section on 'Panel Configuration' .

MENU AND CONTROL FUNCTIONS (Continued)

Engineering options (Cont)

4. Set Panel Parameters.

- 1) **Edit Company Name.** Using the template around the keyboard, to be found under the main cover, the displayed company name can be altered.
- 2) **Edit Panel Name.** Using the template, enter the panel name.
- 3) **Set Number of Remote Panels.** Using buttons 2 & 8 input the number of remote panels.
- 4) **Set Power Supply Type.** Set to 'No' if a non Fusion type PSU is in use. This option will inhibit the comms data monitoring, the PSD & PSC inputs may then be used for 'Charger Fault' and 'Battery Fault' inputs (switched –ve) from other PSU types.
- 5) **Set Common Response Mode, (Local or System Wide).** Output devices respond to a common alarm. This option sets whether the common alarm signal can be received from other panels within the network. When set to 'local', if an output is required to operate due to activation of a remote panel, it would have to be programmed via 'network responses'. If set to 'system wide', any outputs set as 'common' would activate for a fire condition on any panel within the network.
- 6) **Set Zone Scope, (Local or System Wide).** This option is only relevant for networked systems. If set to 'local' the zones 1 - 64 are unique to the particular panel. If set to 'system wide', the zones are shared with other network panels. When set to 'system wide', zone disablements can be set at any panel for the entire network.
- 7) **Disablements From Other Panels, (No or Yes).** When set to 'yes', if a disablement exists on another panel, the following message will appear on the LCD display; DISABLEMENTS ACTIVE AT PANEL X'. **Note:-** Details of the disablement can only be viewed on the originating panel. If set to 'no', no message is displayed. If the zone scope option has been set to 'system wide', zone disablements will be displayed regardless of this setting.

5. Keypad Options.

- 1) **Silence If Local Alarm.** If set to 'no' the silence button will silence all fire conditions on the network. If set to 'yes' the silence button will silence only local panel fire conditions.
- 2) **Reset If Local Alarm.** If set to 'no' the reset button will reset all fire conditions on the network. If set to 'yes' the reset button will reset only local panel fire conditions.
- 3) **Local Evacuate.** Setting this option to 'no' will disable the Evacuate button input on the panel.
- 4) **Local Silence.** Setting this option to 'no' will disable the Silence button on the panel.
- 5) **Local Reset.** Setting this option to 'no' will disable the Reset button on the panel.
- 6) **Level 2 Code Access.** Setting this option to 'yes' enables the panel controls to be activated by use of a code entry (5 - 8 - 3 - 9) as well as the 'Activate Controls' key-switch. If set to 'no' controls can only be activated with the key-switch.

MENU AND CONTROL FUNCTIONS (Continued)

Engineering options (Cont)

- 7) Set number of boards. This must be set to correct quantity of radial / loop boards in the panel. Also If an extension LED board is in use this must be set. A fault is enunciated if this is not correct.
 - 8) View loop Firmware versions. Select to view software version No. for each loop.
 - 9) Initialise board parameters. Use this option to select a board to reset the memory. **Caution** this will erase all previous settings. This option will reset the zone allocations of radial cards.
 - 10) Set sounder resound options. Resound options control if a new alarm is sounded when another fire is detected in the same zone. 'Resound' causes sounders to be activated by a new alarm, 'Silent' causes new alarms not to re activate sounders in the same zone if a new alarm is detected, Can be set for 'all' zones or individually.
 - 11) Set daylight saving options. Daylight saving is automatically set to start on the last Sunday of March and end on the last Sunday of October. DST can be turned off or alternate dates selected, depending on local requirements.
5. **Monitor device response.** Once the device is selected then the direction of polling can be altered by the 4 / 6 toggle. Then the 3 bit outputs can be checked.
6. **This is a device maintenance check**, where the maintenance threshold can be set, perhaps for servicing purposes, then anything outside of this limit is displayed on the LCD.
7. **View data corruption count.** This facility gives some indication of the integrity of the loop wiring. Initially select the loop to be scanned. E.g. select loop number 1.

A display is given thus:

VIEW LOOP 1 CORRUPTION COUNT
000 CORRUPTED RESPONSES PER SCAN TOTAL 0000

It is necessary to wait for a short time period (about 10 seconds) for the measurement to be updated. The number is the quantity of data errors and corrupted returns given from the loop. The total number since count started is displayed.

A high number may indicate that the wiring should be checked for earth faults or potential interference from high voltage sources.

It is natural for any system to have a few data errors. The panel will report bad responses as a fault if there is excessive noise.

8. **Set investigation delay options.**
- 1. Set delay times
 - Ack 000 :S Acknowledge delay, max 180 secs
 - Invest 000 :S Investigation delay, max 420 secs
 - 2. Delay zone Select individual or all zones for delay.
 - 3. Delay remote Set 'Yes' to delay remote output
 - 4. Delay sounders Set 'Yes' to delay all sounders

CONFIGURATION

Following the initialisation procedure, the control panel has basic functionality, i.e. if a detector or call point is activated, the alarm is annunciated and the sounder circuits are energised.

For the system to function in any other way it must be configured for the required operation. This configuration is also known as 'cause and effect', i.e. the action in the event of a particular occurrence is specified.

The cause and effect capability of the panel is quite powerful and provides sufficient flexibility to enable the system to be configured for the required operation in most cases. Where there are special requirements which cannot be met by the standard features, it is possible for the software to be customised to satisfy a particular project. The supplier should be consulted in such circumstances.

Of the configuration options available, full editing may be carried out via the panel control switches. Configuration editing, including assigning devices to groups, etc. can also be carried out via the PC software program which is used to download a program directly to the panel.

To provide a better understanding of how the system may be configured, the various device types and their operation is explained in more detail in the following paragraphs.

Zones

The Fusion is equipped with up to 64 'Fire Zones' which are used to indicate the location of a device, or group of devices, on the system. Any device which is required to provide an indication must be assigned to one of these zones. All devices may be assigned to the 'Fire Zones' 1 - 64. A device which has no zonal function for example an output unit can be assigned purely to GROUPS this will then be available to be assigned into cause and effect groups and will not be affected by zonal activity.

The Fusion can be supplied with 16 or 64 zonal indications.

CONFIGURATION (continued)

Device configuration

Standard operational features

- a: **Fire response.** Activation of alarms and fire displays
- b: **Pre alarm.** Fault warning of impending fire level
- c: **Silent mode.** Non fire input activation
- d: **Non latching.** Input activation clears without reset (types limited).
- e: **Isolator.** Device used for activating disablement groups (types limited)
- f: **Sounder resound options.** Set all zones or specific zones to resound on new alarm or remain silent.
- g: **Ancilliary bases,** SDR or RLY, zonal/common/local or groups output response, silenceable, evacuate status, precinct response
- h: **Output device responses.** Zonal/common/local or groups output response,
- i: **Group parameters.** Group action: - Isolator / coincidence / normal / 2 stage, Group response: - off / pulsing / continuous / evacuate. Group combo A - Z, Delay time 0-255 sec's, Group pre delay response: - off / pulsing / continuous / evac. Group delay halt on silence:- yes / no
- j: **Default sounder response.** Default ring mode: - pulsing or off.
- k: **Responses to remote panels.** Set responses of loop sounders and loop modules to First alarm / second alarm / evacuate / Alert or precinct from other panels in the network: - off , pulsing or continuous.

Special operational features

Device options:

- i. **Device sensitivity and mode settings; range for day & night**
- ii. **Polling indicator option, on or off**

Output attributes

[S] Silenceable. Is device output stopped at silence or reset

[E] Evacuate. Is device output activated by evacuate signal

[P] Precinct. (Class change) Device responds to 'P' Input active.

Response. Common, zonal, groups or local. Describes operation of output

Input attributes

[S] Silent mode. Attribute for devices in alarm. 'non silent mode' or 'silent mode' Silent mode devices cause an activated message rather than a fire and can be used to input to cause and effect groups to operate outputs, 'non silent mode is default'

[I] Isolator. Existing attribute, device can be set to isolate a group with Isolator status in C&E. When using this attribute the device will not report fire. 'Non isolator' is default.

[L] Latching. Existing attribute, RIO devices can have a non latching status for use when interfacing to other systems, Setting either 'Latching' (default) or 'non latching'.

CONFIGURATION (continued)

Device configuration

Device types

Generic types are used for setting the expected type for programming purposes. The panel will use the specific device type code found and deal with the device according to its requirements as detailed below:

OPT (optical types)

Part Number	Type	Sensitivity	Input attribute
55000-600	XP95 Optical	n/a	[s]
55000-885	XP95 Multi sensor	n/a	[s]
58000-600	Discovery Optical	1-5	[s]
58000-700	Discovery Multi sensor	1-5	[s]
55000-268	XP95 5-50M beam	n/a	[s]
55000-273	XP95 10-100M beam	n/a	[s]
55000-028/9	Flame detectors	n/a	[s]

ION (ionisation types)

Part Number	Type	Sensitivity	Input attribute
55000-500	XP95 ionization	n/a	[s]
58000-500	Discovery ionization	1-5	[s]
58000-300	Discovery CO detector	1-5	[s]

These devices have only one associated text message & zone allocation. If the device is Discovery protocol, a sensitivity setting can apply. The default settings for this type are: - blank text, unassigned for zone, sensitivity mid range , non silent mode, no group allocations, no base type set.

CONFIGURATION (continued)

Device configuration

Device types

TEM (heat detector types)

Part Number	Type	Sensitivity	Input attribute
55000-400	XP95 Heat detector	n/a	[s]
55000-401	XP95 High heat detector	n/a	[s]
58000-400	Discovery heat detector	1-5	[s]

These devices have only one associated text message & zone allocation. If the device is Discovery protocol a sensitivity setting can apply. The default settings for this type are: - blank text, unassigned for zone, sensitivity mid range, non silent mode, no group allocations, no base type set.

MAN (manual call point types)

Part Number	Type	Sensitivity	Input attribute
55000-908	XP95 Man call point	n/a	[s]
58000-908	Discovery Man call pt	n/a	[s]

These devices have only one associated text message & zone allocation. The default settings for this type are: - blank text, unassigned for zone, non silent mode, no group allocations.

SDR (sounder / beacon types)

Part Number	Type	Output attributes
45681-276	XP95 ancillary sounder base	S,E,P
45681-277	XP95 base sounder	S,E,P
45681-331	XP95 bounder beacon base	S,E,P
45681-335	XP95 beacon	S,E,P
55000-001	XP95 open area sounder beacon	S,E,P
55000-009/877	XP95 beacon	S,E,P
55000-278/291	XP95 sounder	S,E,P
55000-852	XP95 sounder controller	S,E,P

The sounder devices have only one associated text message & zone allocation. The default settings for this type are: - blank text, unassigned for zone, no group allocations. Output attributes 'Common' 'Silenceable' 'Evac' 'Precinct'. Default volume setting [4]. Non Auto shutdown.

CONFIGURATION (continued)

Device configuration

Device types

RIO (remote input / output types)

Part Number	Type	Special Features	Output Attributes	Input Attributes	Names
55000-847	XP95 Input / output unit	1 input 1 output	S,E,P	s,i,l	2
55000-760	XP95 mini switch monitor	1 input	n/a	s,i,l	1
55000-843	XP95 switch monitor	1 input	n/a	s,i,l	1
55000-849	XP95 output module	1 output	S,E,P	s,i,l	1
55000-875	XP95 Mains relay module	1 output	S,E,P	s,i,l	1

These devices have one, two or four associated text messages & zone allocation. The default settings for this type are: - blank text, unassigned for zone, no group allocations. Output attributes 'Common' 'Silenceable' 'Evac' 'Precinct'.

ZMU (zone monitor unit types)

Part Number	Type	Input Attributes	Names
55000-845	XP95 Zone monitor unit	[s]	1
55000-810	XP95 Switch monitor unit	s,i,l	1

These devices have one associated text message & zone allocation. Input attributes, 'latching, isolator, silent mode. The default settings for this type are: - blank text, unassigned for zone, no group allocations. All ZMU types are sent a reset command to clear any latched fire conditions they may hold.

CONFIGURATION (continued)

Device configuration

Text message

Moving the cursor further will allow editing of the device text. Up to 40 characters of text can be used for each device. With reference to the keypad template letters and numbers can be entered for each key. Press shift or back to place the cursor and enter the desired character by pressing the appropriate button. When complete press the menu button to return to the upper line

Set Device Options

The Fusion panel supports the following functions:-

- Device sensitivity mode settings
- Selection of Day / Night mode sensitivity changing
- Device LED 'polling' indication (refer to Apollo Discovery literature for more details)

Default Device Sensitivity

Initially the screen shows:

'Confirm default all sensitivities' select 'yes' to set all device sensitivities on the loop back to the factory defaults (mid range) Individual sensitivity settings can be set in the edit loop devices menu.

Set polling indicator

Some analogue addressable devices have the option for the polling LED to flash whilst the loop is being polled by the panel. This is normally switched off. This menu offers a selection to pulse the LED on the devices. Setting yes will cause the Indicator LEDs on all Discovery protocol devices to Flash briefly when being scanned.

Ancillary Base settings

Apollo sounder devices in general occupy addresses on the loop in the range of address1 to 126. Ancillary bases can be assigned to the back of a smoke detector. These bases are controlled by the remote LED output of the detector device and therefore will only operate if the detector is present at the address. Ancillary sounder bases come in two varieties 'sounder' or 'relay'. The panel is unable to scan these devices and they can only be added manually to the loop in the programming. If no base is set then the base sounder or relay will not operate! Removing the base will not generate a fault condition. If a detector is removed at an address with a base sounder attached a sounder fault is generated. Ancillary sounders have only 1 tone available. Other output options are available and they can be operated zonally or included in groups.

CONFIGURATION (continued)

Device configuration

Group assignments:

1. Devices

Select individual devices and allocate them as inputs and/or outputs to the group

NOTE:- Ancillary bases must be set for the address before they are available as outputs in groups.

2. Zones (not available in download program)

Quick set up utility to insert all addresses in a zone (only in the one loop) into a group as inputs and/or outputs. Set the parameter as Add or Remove using scroll button. This option can also remove devices from a group by zone.

NOTE:- This utility works as a 'once off' command and cannot be reviewed other than at device level.

Loop - Set programmable relays

There are four programmable relays available for each loop. The common sounder circuits 1 & 2, which are monitored polarity reversal outputs and the common fire contact and remote signal contact. These are clean changeover contacts. The remote signal contact has an LED associated with the output on loop one and is intended for connection to remote signalling equipment.

Select the required relay using the scroll buttons **[2]** & **[8]**

1. Sounder 1
2. Sounder 2
3. Sounder 3
4. Sounder 4 (Note may be configured as remote signal output)
5. Programmable relay 1
6. Programmable relay 2

When selected:

Option 1: Default assignments will set the relay to function with factory set defaults, which is common operation.

Option 2: Signals. NOTE: () defines default setting. Responses can be defined for:

EVACUATE	(ON), Off or Pulse
COMMON FIRE	(ON), Off or Pulse
ALERT	On, Off or (PULSE)
PRECINCT	(ON), Off or Pulse
COMMON FAULT	On, (OFF), or Pulse
SILENCE	(ON), Off

Option 3: Zones 1 - 16, On (continuous), Off or Pulsing for each zone

Option 4: Zones 17 - 32

Option 5: Zones 33 - 48

Option 6: Zones 49 - 64

Option 7: Groups 001 - 016, On, Off or Pulsing for each group

Option 8: Groups 017 - 032

Etc..... Up to Group 150

CONFIGURATION (continued)

Loop - Set default sounder response

This option informs sounders and loop sounders how to react when not in the active fire group. The choice is Pulsing or Off.

Loop - Set responses to remote panels

This effectively programs the network interaction between control panels. Each loop must be set up according to requirements.

The signals available from each panel, 00 - 16 are:-

EVACUATE, 2ND ALARM, 1ST ALARM, ALERT, PRECINCT, FAULT.

The responses can be set for each of the following outputs:

Loop Sounders (en bloc)	Off, Continuous, Pulsing
Common Sounder 1	Off, Continuous, Pulsing
Common Sounder 2	Off, Continuous, Pulsing
Common Sounder 3	Off, Continuous, Pulsing
Common Sounder 4	Off, Continuous, Pulsing
Loop Modules (RIO) (en bloc)	Off, Continuous, Pulsing
Remote Signal Output	Off, Continuous, Pulsing

The settings should be checked for every loop on all panels in a network.

PLEASE NOTE:- With many options available it is possible to select conflicting requirements which affect one output. Take care with assignments.

CONFIGURATION (continued)

Set panel parameters

1) Edit company name

A 40 character display message can be set here using the text entry template on the keypad. Press menu to exit.

2) Edit panel name

A 14 character name may be given to the panel for identity purposes. Use text entry template to edit. Press menu to exit.

3) Set number of remote panels

In a network system, the quantity of other panels must be entered to all panels, for integrity monitoring purposes. Use scroll buttons to edit the quantity. Press menu to exit.

Set power supply type

Is the standard Fusion power supply being used or an alternative? Unticking this box removes the standard data based monitoring function of the power supply input and converts the PSD and PSC inputs into switched negative battery and charger fault inputs from alternative power supplies.

Set 'common' response mode

Scroll **[2]** & **[8]** to edit

- 1) Local panel only
- 2) System-wide

In a network system, this setting determines if 'common' as applied to output device responses, is restricted to the local panel or activated from all panels in the network.

Set keypad options

This option specifies, in a network, if this panel has the ability to silence and/or reset alarms on other panels. If set to YES then the silence and/or reset will only function if there is an alarm locally. If set to NO then the panel can silence or reset any alarm on any panel. This is to provide the possibility of providing a silence or reset command from an originating panel only.

LOCAL EVACUATE, SILENCE and RESET buttons.

When set to 'NO' the buttons operate system wide.

When set to 'YES' buttons operate locally only

Set number of boards

Set quantity of boards expected in the panel. An incorrect quantity will show a panel fault.

The menu also offers a 'yes' or 'no' setting for the presence of an extension LED zone indicator PCB (zones 17-64). Set to 'yes' if this is fitted.

PC CONFIGURATION

The FUSION PC Configuration program enables a system to be programmed via a PC to operate in accordance with specific requirements, and includes options for zonal sounder operation, 2-stage and coincidence functions, selective output device operation, etc.

The program also enables device types to be programmed, devices to be assigned to zones, and device location text to be entered. In addition devices can be assigned to groups.

Configuration files are created via the PC program and downloaded to the on board processor. This program will affect the way that the panel functions and could result in a system operation that does not comply with British Standards and/or the specification. The fact that there are no faults indicated does not necessarily infer compliance. Therefore, persons using this program should be in possession of the full system information, and should be familiar with the procedures described in this manual before attempting to create or edit a configuration program.

It is assumed that users of the PC Configuration program are experienced fire alarm system engineers with basic computer skills. It is recommended that the configuration program is copied from the CD or Flash memory stick on which it is supplied, to the machine's hard disc, using the installation routing "SETUP.EXE"

Configuration options

On a new project there are basically two ways of loading the required configuration data into the panel.

If the initialisation procedures described previously are carried out, the program from the panel can be read into the configuration program and edited as required, e.g. group assignments, etc., by using the 'Read panel data' option. This method ensures that the device information is correct, i.e. the device type programmed for each address matches the installed device.

Preferably, a configuration file can be created via the PC program and downloaded to the on board processor. If this method is chosen, the programmer must ensure that the device details entered into the program match the installation. Newly created or edited files can be saved to disk for record purposes, and the data can be subsequently retrieved for editing. To retrieve a file from disk, select 'Load an existing project file' option and follow the on-screen prompts.

The 'Create a new project' option is selected to display the client data and the 'edit' screen where a configuration program is created or edited before being saved and/or downloaded.

Finally, the configuration file can be printed as a hard copy record of the system program.

PC CONFIGURATION (Continued)

Before creating or editing a configuration file it is important to understand the available options and the program/system limitations. The following paragraphs describe the basic functions of the program and how they affect the system operation when downloaded to the on board micro-processor.

The programmer should also be in possession of the device information, i.e. address, type, location, etc., and understand the specified operation. The available device types and their function are described in the configuration section earlier in this manual, but are outlined again here for clarification.

The device types are:-

Sensors; i.e. Ionisation (ION), Optical (OPT) and Temperature (TEM)
Manual Call Point (MAN)
Sounder module / Addressable sounder / Beacon (SDR)
Input/output module (RIO)
Zone Monitor (ZMU)

NOTE . The device type assigned to each address must match the installed device type.

Assigning devices to zones.

Devices which are to be indicated zonally by the panel, i.e. sensors, call points, zone modules and input modules must be assigned to a zone in the range 1 to 64. SDR device types (sounders) can be assigned to a zone in the range 1 to 64. Sounders assigned to a specific zone operate according to output response settings. All other sounders are either silent or pulsed, depending on the 'default ringing mode' which is selected in the edit screen.

Input/output modules (RIO) can be assigned to a zone in the range 1 to 64

I/O modules assigned to a specific zone turn their output on according to output response settings.

PC CONFIGURATION (Continued)

Example 1

In a multi-storey building the sounders are required to operate continuously on the floor where the activation occurs and intermittently elsewhere.

Assuming each floor comprises one zone only, the sounder modules/ addressable sounders on the floor are assigned to that zone, the output response to zonal and the default ringing mode is set to 'Pulsed'.

When a device is activated, the associated sounders operate continuously and all others are pulsed. If, however, each floor comprises more than one zone, the above method is not suitable as only the sounders associated with the activated zone will sound continuously. In this case it is necessary to assign devices to a Group, or Groups.

Assigning devices to groups

The program is highly flexible with 150 groups available in each loop for programming. With careful planning and forethought at the installation stage, reasonably complex operating modes can be achieved.

Groups are used to link devices so that, for instance, the activation of a device in any one of several zones can activate common sounders or turn on a particular output. Groups spanning several loops can be created using the group scope setting.

Each group has options in the way it operates, i.e. Normal, Coincidence or 2-stage. Basically, the selection has the following effect :-

- | | |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Normal | The activation of any input device in the group will operate sounders/ outputs in the group. Other sounders, i.e. those not in the group, are silent or pulsed depending on the default ring mode. |
| Coincidence | The activation of two or more devices in the group is necessary to operate sounders/outputs in the group. |
| 2-stage | The activation of a single input device in the group causes sounders only in the group to pulse; and the activation of a subsequent device causes the sounders to go steady. |
| ISOLATOR | Devices in this group will be disabled by an active isolator device. |

Devices may be assigned to one or more groups to achieve the required operation. Sounders and output modules can be assigned to zones and groups, or just groups depending on the required operation. Input devices are always assigned to a zone, irrespective of any groups they may also be assigned to.

Example 2

In the example above, if each floor comprises, say four zones, the required operation is achieved by assigning the devices in the relevant zones and the applicable sounders to a group (set to Normal).

If additional functions are required such as generating a general alarm when a call point, or two or more devices are active, additional groups are set to the appropriate mode and programmed to provide the required result.

PC CONFIGURATION (Continued)

For further information on the configuration program, please refer to the comprehensive help files within the application.

UPLOADING OR DOWNLOADING FUSION PANEL FROM PC

To download program data to the panel a special adapter device is required. This device is supplied as part of a kit together with the software and leads (SW-FSB25). The device provides an opto-isolated serial communication between the panel and the PC or laptop, protecting against damage from earth faults or stray voltages. This adaptor connects to the Fusion panel via a special 10 way IDC connector and to the PC by USB cable (supplied with kit).

Firstly set the program mode DIL switches on the display PCB to 'on'. Place the panel to be programmed in the 'waiting for pc' mode via the engineers menu. Connect the pc or laptop and then invoke the 'Read /write panel data' window.

COMMS PORT: - The dialogue box will offer the available connected adaptor port, "COMXX: USB SERIAL PORT (COMMXX)-FTD1".

Ensure the adaptor is connected to the panel and click the 'connect' button. The process window should display, PCBs present and software versions found. Check that the expected information is present then proceed to Read or Write.

'Read' takes data from the panel and loads it into the PC program.

'Write' takes data from the PC programming software and overwrites the config data in the panel.

IMPORTANT

Before you upload a panel make sure you have saved any data which you have created in the program with an appropriate filename. More importantly make sure that you have saved any data in the program prior to downloading the panel.

When you download to the panel the current panel parameters will be uploaded and you will be offered a dialog box to save the file with an alternative name for safety backup purposes. It is recommended you do this in case there is a problem with the new panel configuration.

Following a 'Write' to the panel config, it is necessary to 'reboot' the panel by powering off completely and back on again to ensure all data etc is fully updated.

FIRMWARE FLASH UPGRADE

Flash programming software

The control panel operating software (firmware) can be updated. This may be required if new features or software corrections have been applied. The version of software currently loaded in the panel is shown when the option is selected in the set panel options menu in the engineers' options. The version is shown in square brackets [1.00]. for each loop fitted to the panel 1.00 being the first version of Fusion code.

Included on the Disk is a copy of a Fujitsu programming utility which enables the possibility to upgrade the firmware of the control panel.

Install the software by following the directions of the install program.

To reprogram a panel:-

NOTE: - Panel configuration parameters will be corrupted by the reprogramming process. Make sure you have downloaded a copy of the panel Config data and saved it to disc as a backup.

First to reprogram the main display PCB. Insert the connector from the download adaptor to the connector at the right hand end of the main display circuit (TPCF17).

Connect to a serial port on your PC (COM1 to COM16). Switch 'on' the flash Programming switch (Lowermost of the 7 way dip switch). Alternatively on Issue 3 PCB and below, select 'Flash Program Mode Enabled' in Engineers menu.

Run the Fujitsu flash MCU programming software. When the window opens the following data must be selected. Important this utility must be the FUJITSU FME_FR flash programming utility V4.0.2.1 or above and 'NOT' the utility for programming the old Vector firmware.

TARGET MICROCONTROLLER - MB91F467C
PROGRAMMING BAUD RATE—19200
FILE TO PROGRAM FSB17#4-V111-b004:mhx (as issued by haes) . Click ON browse to select file.

Select com port in the box next to the connect button .

Click on the AUTOMATIC MODE button and at the same time press and release the CPU reset switch on the target PCB. The software will be upgraded as indicated by ticks for each process and a progress bar on the PC screen. When complete press the CPU reset button and the PCB should restart. After all PCBs have been upgraded Remove the connector from the programming adapter and switch the 'flash' switch off on the PCB.

To subsequently program the radial or loop cards. Select the required file. Note each PCB type has a separate file. Denoted by the PCB reference at the beginning of the file name i.e FSB17 main card, FSB11 loop card, FSB18 radial card etc. To Program the next PCB press the CPU reset on the desired card whilst clicking on the AUTOMATIC MODE button on the programming utility.

It may be necessary to recycle the flash mode switch in between the re-programming of each board, to prevent the recently programmed board interrupting the process.

FIRMWARE FLASH UPGRADE CONT'D

To reprogram a panel:- Continued

Repeat the procedure for each PCB in turn press CPU reset at the end of each session the diagnostic LED on the PCB will flash when the card is operating following re-programming. Then press CPU reset on the next PCB to be programmed and so on.

Panel will be programmed with latest software version, when finished, close down program and disconnect leads etc,

Restore the panel to normal operation by switching off the 'flashprog' switch.

Then it is necessary to restore factory defaults in the eeprom memory to prevent erroneous data caused by any parameter changes that may have occurred .This is done by holding down button 2 on the panel keypad during a restart of the main display PCB .i.e press CPU reset whilst holding button 2. A menu will appear which allows you to select each board of the system in turn Make sure that all boards fitted are initialized. Then re download the control panel from the back up file you made before starting.

NOTE:-occasionally the download software may be updated and if new parameters are needed an import facility will be provided to enable conversion of existing panel parameters to any new requirements. Please check with supplier if in doubt.

During initialization you will be asked to confirm the number of boards (note for the board count and FSB10 boards are not included in the count. The qty of remote panels will be reset to zero and any power supply and device setting will be cleared.

TECHNICAL SPECIFICATION

General Specification.

Enclosure	Steel IP 30. Epoxy Powder coated Interpon Radon silver grey.
Dimensions. Std cabinet (FBUS)	340H x 460W x 120D mm Weight 7.22 Kg (1 loop) 7.38 Kg (4 loop) 20mm knockouts 27 top, 6 rear , 2 bottom
Dimensions. Large cabinet (FBUL)	750H x 470W x 140D mm Weight 17.54 Kg (8 loop) 20mm knockouts 28 top, 40 rear, 2 bottom
Temperature range	-5 deg C to + 40 deg C max RH 95%
Number of fire zones (both cabinets)	16 (std) 32 or 64 (optional)
Max Number of loops	4 (FBUS) 8 (FBUL) Max 126 addressable points per loop
Max conventional detection circuits	20 (FBUS) 36 (FBUL) Max 32 conventional detectors per circuit.
Max loop current	500mA per loop
Detection protocol	Apollo: S90, XP95 & Discovery, Apollo conventional series 65, Orbis +Twin Wire. Hochiki conventional CDX range + Twin Wire.
Networking.	2 wire Comms, CAN 2.0 bus. Up to 16 panels / repeaters. Max cable length 1KM fire resistant screened cable.
Printer	Optional panel printer (rs232) Not currently available.
PC connection	Download configuration only. Via USB – rs232 serial conversion adapter SW-FSB25
Event log	100 Fire events ,100 fault events, 100 user events

TECHNICAL SPECIFICATION (continued)

Power Supply Specification.

Mains supply	230vac +10%/-15% 50Hz max current 1A	Note:- (FBUS) = Std cabinet (FBUL) = large cabinet
Mains supply fuse	(FBUS) 4Amp (F4A 250V) (FBUL) 5Amp (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) 2 x 3.2Ahr 12volt VRLA / 2x 12 Ahr 12volt VRLA. Use Yuasa NP range batteries	(FBUL) 2 x 7 Ahr 12volt VRLA / 2x 17 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) 3Amps with main power source disconnected. Battery fuse 5A LBC 20mm. PSU limits battery current draw to 3A from outputs	(FBUL) 5Amps 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
28v dc 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.

TECHNICAL SPECIFICATION (continued)

Electrical Specification Inputs / Outputs.

Cabling	Fire resistant screened cable minimum size 1mm ² Max cable length 1KM (20 Ohm) 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.	
28vdc IP1 & IP2 (FSB17)	28vdc supply inputs. Diode protected for reversal and independent short cct . max current 10Amps	Max input current 10 Amps Input voltage 19.2vdc to 32vdc
Download adapter connection	RS 232 serial port c/w 5vdc output for plug in adapter	Use with SW-FSB25 adapter only.
PSD / PSC	Power supply clock and data 5vdc signal inputs	Protected via 10K Ohm impedance. 5v1 zener diode.
SNDR1 – 4 (FSB17)	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 & Relay 2 (FSB17)	Programmable alarm relay contacts Clean C/O 30vdc 1A max load	Fused 1A Fuse FNANO 1 A
Common fault relay	Maintained fault relay contact Clean C/O 30vdc 1A max	Fused 1A Fuse FNANO 1 A
28v + 0v – Power output.	28vdc supply output for fire alarm accessory relays etc. Max continuous use 800mA	Fused 1A Fuse FNANO 1 A
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 overvoltage protected. +/- 8Kv
Outputs. CFR,CFLT,RS,PA,REM, SCF,	Switched negative voltage outputs for relay control , Programmable via cause and effects. Used with common supply from 28vdc OP	Overload voltage protected to 52vdc, Max intended load 100mA each. Protection via 1A fuse on 28vdc output..
Inputs. A,E,S,R,P	Switched negative, Connect to 0v to trigger. Max input voltage 28vdc. Non latching ,Max resistance 100R.	Protected via 10K Ohm impedance. 5v1 zener diode
Radial 1 – 4 (FSB17) Radial 1 – 4 (FSB17) Contd.	Configurable fire detection circuits. Conventional detection. TWIN wire combined detection / sounder circuit or sounder circuit only. End of line resistor 4k7 Ohm 5% 0.25W	Monitoring current limit 50mA. Fused 500mA .Typical max load 22 alarm devices @ 18mA each per circuit. Ensure I MAX A is not exceeded
KSW , 0v terminals	Connection for activate controls key-switch. Internal use only.	Protected via 10K Ohm impedance. 5v1 zener diode
Loop in / out (FSB11)	Analogue Addressable loop circuit, Apollo protocol 126 devices 28-36vdc . max loop current 500mA	Short circuit protection via thermal fuse 500mA. Sounder load subject to cable resistance
SNDR1 – 2 (FSB11)	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 & Relay 2 (FSB11 & FSB18)	Programmable alarm relay contacts Clean C/O 30vdc 1A max load	Unprotected relay contacts. . Protection via 1A fuse on 28vdc output. Recommended usage.

