AMPAC

ADVANCED WARNING

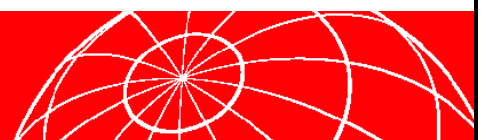**SYSTEMS**

FireFinder™

**FireFinder™ SP Series
Fire Alarm Control Panel
(AS4428)
Installation, Commissioning &
Operation**

MAN 2744-20

*WORLD LEADER OF INNOVATIVE SOLUTIONS
IN FIRE DETECTION AND ALARM SYSTEMS*

1.   INDICATION   (*INCOMING FIRE ALARM CONDITION* **)**

●ALARM   ALARM LED FLASHING

```
Loop X  sensor X                    TYPE
LX  SX  ZX        STAT: ALARM
DATE & TIME
ZONE ALARMS X OF XX
```
LCD DISPLAY OF DESCRIPTION
TYPE, ADDRESS, DATE & TIME
AND NUMBER OF
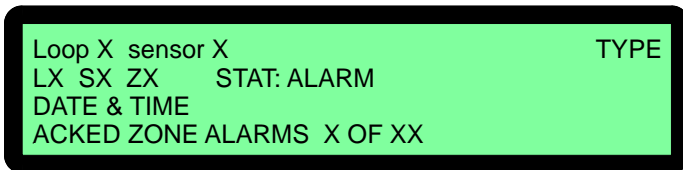UNACKNOWLEDGED ALARMS

2.   ACKNOWLEDGE ALARM

ACKNOWLEDGE   PRESS ACKNOWLEDGE KEY

NEXT ▼   PRESS NEXT TO SCROLL TO NEXT ALARM

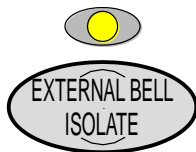**3.   REPEAT THE ABOVE STEPS TO ACKNOWLEDGE ALL ALARMS**

```
Loop X  sensor X                    TYPE
LX  SX  ZX        STAT: ALARM
DATE & TIME
ACKED ZONE ALARMS  X OF XX
```
LCD DISPLAY OF DESCRIPTION
TYPE, ADDRESS, DATE & TIME
AND NUMBER OF
ACKNOWLEDGED ALARMS

●ALARM   ALARM LED STEADY

4.   ISOLATE BELL

EXTERNAL BELL
ISOLATE   PRESS TO ISOLATE BELLS
INDICATOR WILL TURN ON

5.   RESET ALARMS

RESET   PRESS TO RESET ALL
ACKNOWLEDGED ALARMS

6.   ACKNOWLEDGE RESET

ACKNOWLEDGE   PRESS ACKNOWLEDGE KEY

Table Of Contents   Page No

1   *Non Disclosure Agreement*

This contract has been entered into by the person or company user of this document (hereafter called the Trader) and AMPAC Technologies (hereafter called AMPAC) of 7 Ledgar rd, Balcatta, WA 6021, Western Australia 6017. Under terms and conditions as specified here under.

Whereas AMPAC and the Trader for their mutual benefit and pursuant to a working relationship which may be established, anticipate that AMPAC will disclose in the form of this document, information of a secret, or confidential or proprietary nature (hereinafter collectively referred to as Proprietary Information).

Whereas AMPAC desires to ensure that the confidentiality of any Proprietary Information is maintained in accordance with the terms of this Agreement;

NOW, THEREFORE, in consideration of the foregoing premises, and the mutual covenants contained herein, the Trader hereby agrees as follows:

1. The Trader shall hold in trust and confidence, and not disclose to any person outside its organisation, any Proprietary information which is disclosed to the Trader by AMPAC under this Agreement. Proprietary Information disclosed under this Agreement may be used by the Trader only for the purpose of carrying out work on or with AMPAC supplied equipment and may not be used for any other purpose whatsoever.

2. The Trader shall disclose Proprietary Information received by AMPAC under this Agreement to persons within its organisation only if such persons are legally bound in writing to protect the confidentiality of such Proprietary Information.

3. The undertakings and obligations of the Trader under this Agreement shall not apply to any Proprietary Information which :

    1. Is disclosed in a printed publication available to the public, is described in patent anywhere in the world, or is otherwise in the public domain at the time of disclosure;

    2. Is generally disclosed to third parties by AMPAC without restriction on such third parties;

    3. Is shown by the Trader to have been in its possession prior to the receipt thereof from AMPAC;

    4. Is approved for release by written authorisation of AMPAC; or

    5. Is not designated by AMPAC in writing or by appropriate stamp or legend to be of a secret, confidential or proprietary nature.

4. This Agreement will be binding upon and inure to the benefit of the parties hereto, and their respective successors and assigns.

5. This Agreement, and all rights and obligations hereunder, shall expire on the 10th anniversary of the date of issue of this document.

These terms are accepted by the Trader on receipt and retention of this document.

2   About This Manual

2.1   Introduction

This manual contains all the information required to install, commission and operate the *FireFinder™ SP* series Fire Alarm Control Panel (FACP) fitted with Version 6 software and is only available to and for the use of personnel engaged in its installation, commissioning and operation.

2.2   General Requirements

The *FireFinder™ SP* series FACP has been designed and manufactured from high quality commercial components so as to comply with major world standards. To ensure these standards are not compromised in any way installation staff and operators should;

1.   be qualified and trained for the task they undertake;

2.   be familiar with the contents of this manual prior to the installation, commissioning or operation of a *FireFinder™* control system;

3.   observe anti-static pre-cautions at all times; and

4.   be aware that if a problem is encountered or there is any doubt with respect to the operational parameters of the installation the supplier should be contacted.

2.3   References

FireFinder™ **Technical Manual**

ConfigManager **(V6)**

FireFinder™ **Detector Manual**

Australian Standards:

AS1670 - Automatic Fire Detection and Alarm Systems, system design, installation, and commissioning, Part 1 & Part 4

AS1851 - Maintenance of Fire Protection Systems and equipment - Fire Detection and Alarm Systems.

AS4428 - Fire Detection, Warning, Control and Intercom Systems – Control and Indicating Equipment. Part 1 and Part 4

2.4   Symbols

ⓘ   Important operational information

＋ **Note:**   Configuration considerations

        Observe antistatic precautions

        Mains supply earth

        DANGER mains supply present

3   *System Overview*

The ***FireFinder™ SP*** series is an Intelligent Analogue / Addressable and / or Conventional Fire Alarm Control Panel capable of supporting:

- ® Apollo Discovery and XP95 Intelligent Detectors, Multisensor, Photoelectric, Ionisation, Thermal (heat) and CO detectors.
- ® Addressable Initiating Devices: Modules that monitor any conventional normally open contact such as supervisory switches and flow switches.
- ® Conventional two wire zone detector circuits
- ® Multiple input/outputs
- ® High Level Interfaces
- ® Graphical Interfaces
- ® Remote LCD Annunciators
- ® Remote LCD Repeaters
- ® Remote LED mimics
- ® Peer to Peer networking
- ® Master Slave (Main - Sub) networking
- ® Main panel plus Data Gathering Panels networking

and; is built to comply with the following standards:

- ® Australian Standard: AS 4428.1
- ® New Zealand Standard: NZ4512
- ® European Standard: EN54
- ® Malaysian Standard: MS1404
- ® Singapore Standard: CP10
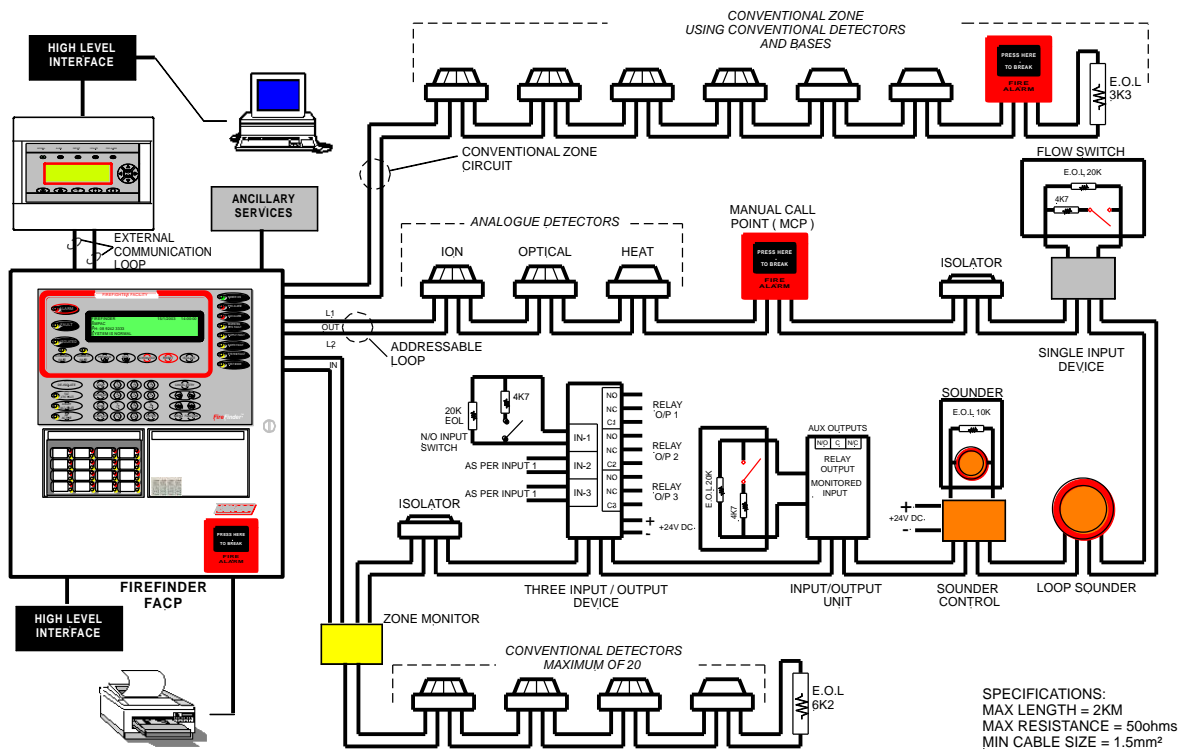
Figure 1: Typical Application

FACP Configuration Examples
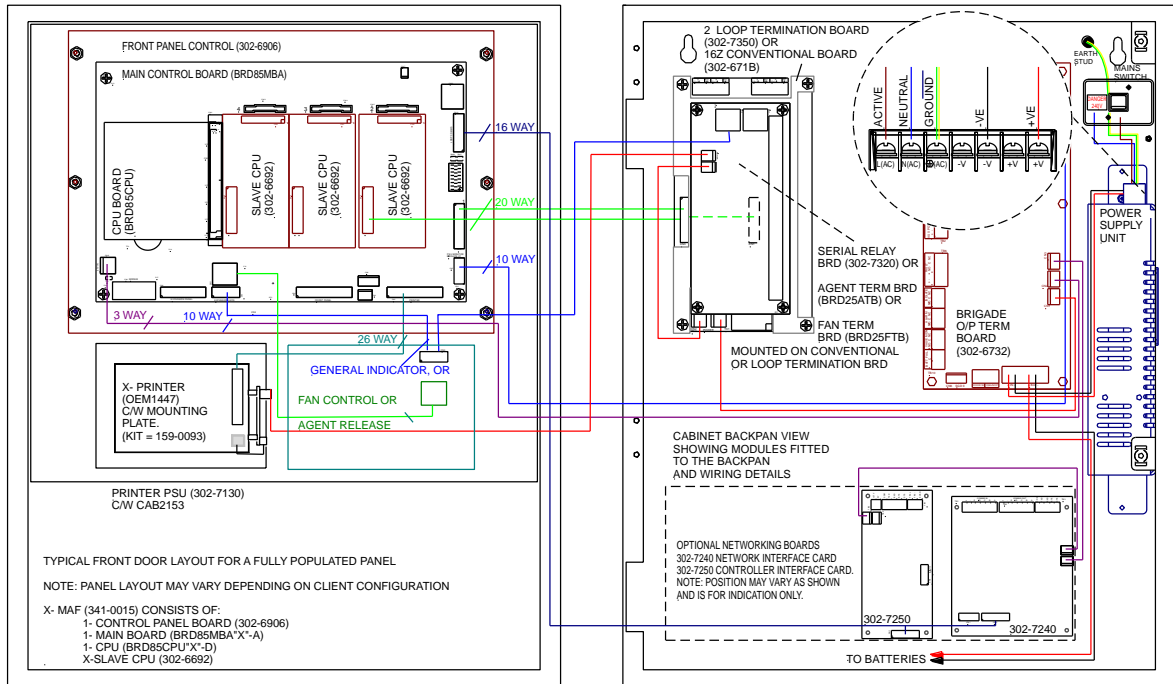
Figure 2: Typical Example of an SP1X Layout
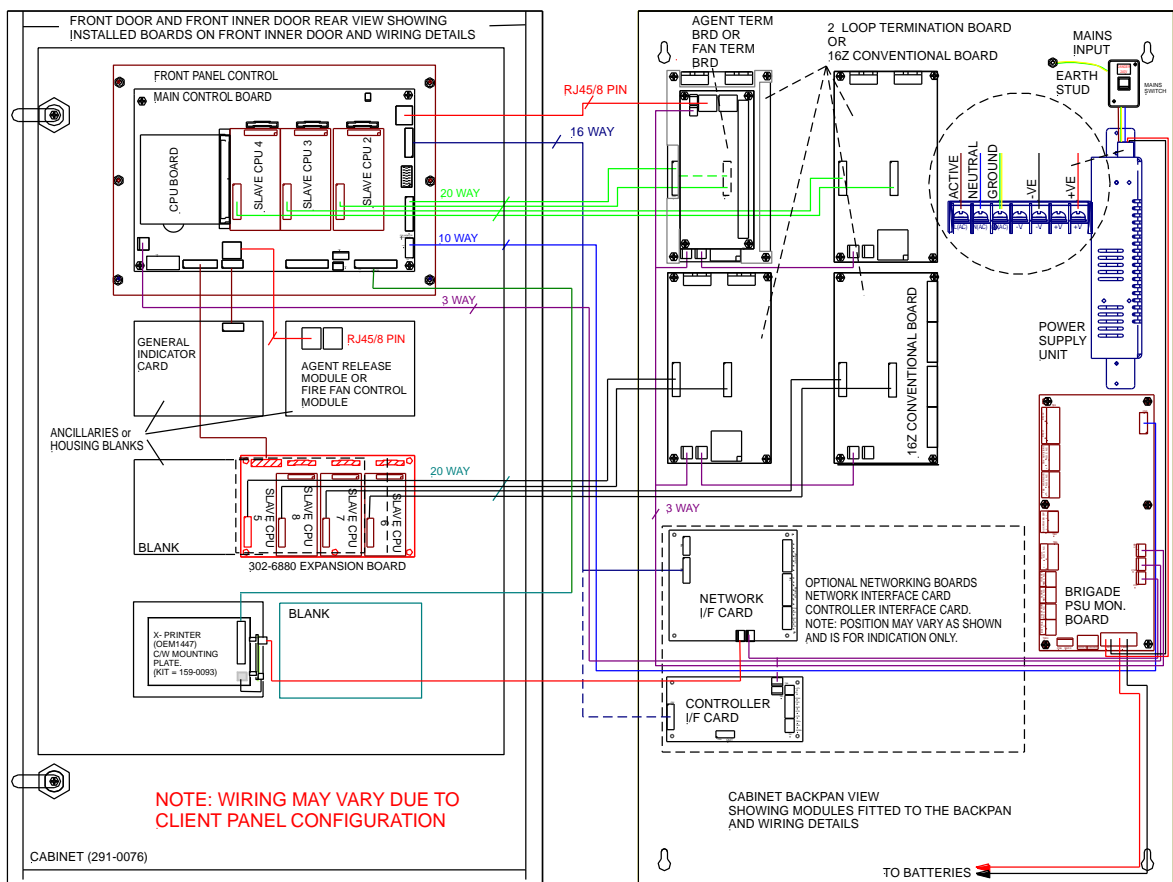
Figure 3: Typical Example of an SP8X Layout

4   _FireFinder™ Description_

The following description does not relate to specific cabinets as the size of each cabinet will vary with the amount of hardware fitted.

The heart of the _FireFinder_™ consists of two boards collectively known as the **Controller**. These boards are the Main Board (BRD85MBA) and the CPU board (BRD85CPU). Combining these two boards with a front panel (302-690) forms the basis for a _FireFinder_™ FACP. A single _FireFinder_™ **Controller** without an expansion board has the capacity to interface to four (4) _FireFinder_™ Slave CPU's modules. Each of these Slave CPU's can interface to 16 Zone Conventional Termination Boards, Loop Termination Boards or Input/Output Boards as well as communicate with the Brigade / PSU Monitor Board (302-673).

The Main Board (BRD85MBA) has the Slave CPU Board for the first Loop Termination Board and the provision for mounting of up to three additional _FireFinder_™ Slave CPU's. The _FireFinder_™ Slave CPU's all have the same software installed and the manner in which they operate is automatically determined by the type of termination or interface board onto which they connect.

If the system is to be expanded to have more than four Slave CPU's an Expansion Board (302-688) is required. This board contains _FireFinder_™ Slave CPU No. 5 and expansion sockets for three more. This configuration allows for a maximum number of 8 Slave CPU's that any one **Controller** can accommodate.

If a system is required to be expanded beyond eight Slave CPU's then either local networking using up to a total of four controllers (max 32 Slave CPU's) within the one cabinet may be fitted or external networking must be used.

The _FireFinder_™ has an internal ASPI (**A**mpac **S**erial **P**eripheral **I**nterface) serial bus. This serial bus provides interfacing to the Brigade /PSU Monitor Board and if required up to eight (8) Sounder Board/s (302-7420/1).

FireFinder™ has a second serial interface that connects to ancillary boards that can be designed into a system to control / monitor field plant / equipment and agent release .

Where the system design exceeds the capability of one _FireFinder_™ then other _FireFinder_™ panels can be networked together to provide an expanded system containing multiple boards in a variety of applications.

Some of these applications include:

> ➢   A Master / Slave (Main Sub) FACP arrangement (MFACP / SFACP)
> ➢   A Peer to Peer System
> ➢   Use of Data Gathering Panels (DGP's)
> ➢   LCD Annunciators
> ➢   LCD Repeater Panels (LCDR)
> ➢   _SmartGraphics_

A Network _FireFinder_™ System supports a combination or all these options on a single network. Each panel on the network is regarded as a "node". The NETWORK BUS can be accessed using either a Network Interface Card (NIC 302-724) and/or Controller Interface Card (CIC 302-725). Modules that are supported on the network are Remote LED Mimic Board (302-715), Remote Liquid Crystal Display Repeater (302-720, 302-721), remote _FireFinder_™ main panels and other _FireFinder_™ remote data gathering panels. The network configuration determines whether a NIC or a CIC or a combination of both is required.

Master / Sub FACP **:** Where there are one or more FACP's configured as local panels then each report the status of their associated zones/devices to a MFACP. There is no control between local panels as the MFACP is structured to have full control of the entire system.

Peer to Peer **:** Each FACP is regarded as a Master FACP and therefore a user can take control of the entire fire system from any FACP.

Data Gathering Panel **:** The use of this type of panel may be installed where there is a need to have field terminations only at one location and all control is performed by an FACP that is remotely located.

LCD Repeater Panel : The LCDR's are network compatible and provide the user with the ability to monitor the status of designated areas or an entire site as well as execute specific interrogation tasks.

SmartGraphics: Is an active graphics system connected to the *FireFinder*™.
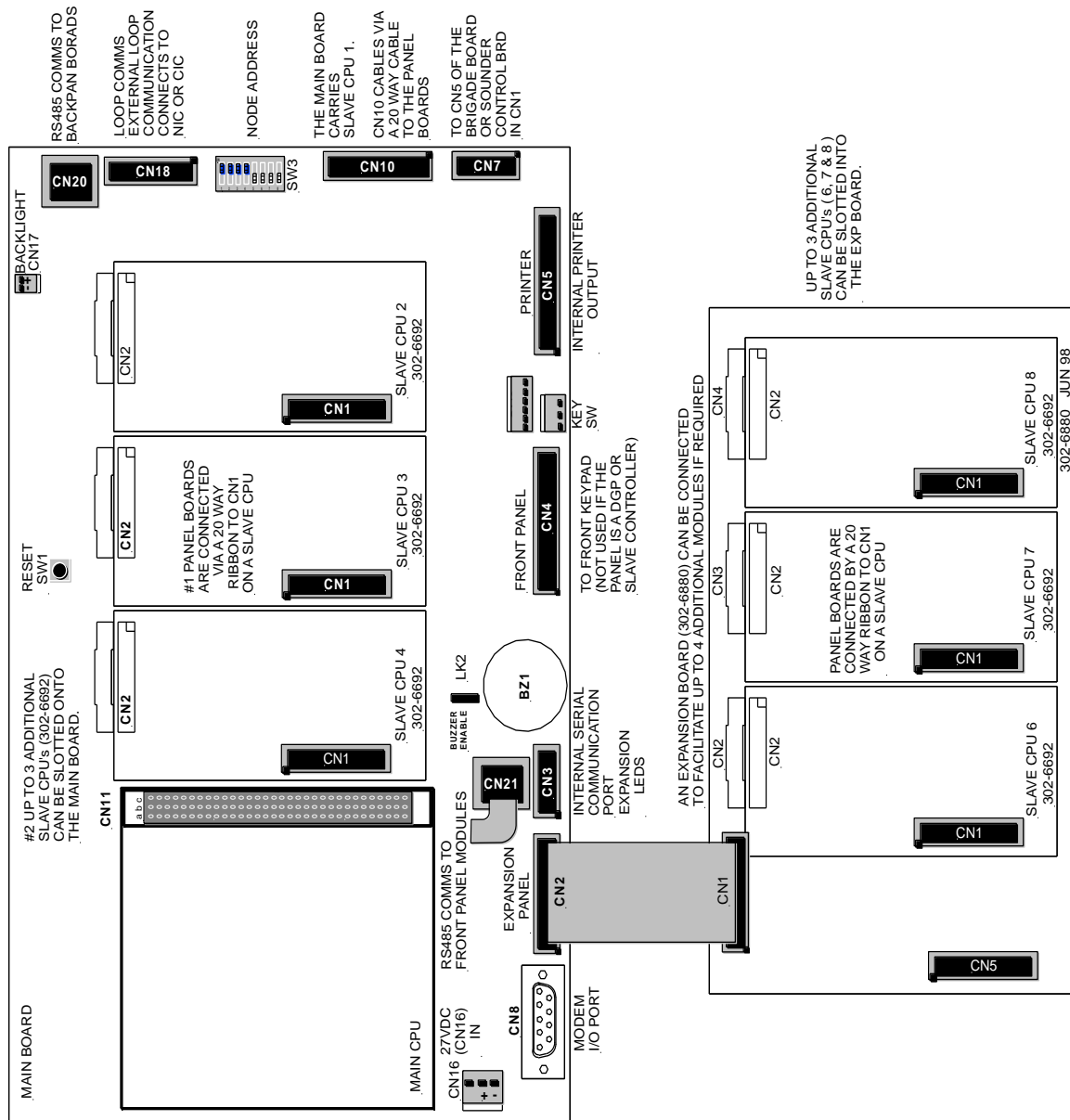
Figure 4: Single Controller Board with Expansion Board

5   *Placing The Basic System Into Operation*

5.1   Unpacking

Carefully unpack the *FireFinder*™.
The package should include:
- ®   *FireFinder*™ Fire Alarm Control Panel
- ®   An Operators manual
- ®   003 keys

5.2   Anti-Static Precautions

To prevent damage to components, modules and boards, anti-static precautions *MUST* be observed while performing any task within the FACP. The same applies to those situated in the field

5.3   Working On The System

Prior to unplugging any connector, connecting or disconnecting any wiring, removing or replacing any module or board ensure that both the Mains and Batteries have been isolated to prevent damage to panel components.

5.4   The Cabinet
Features:
- ®   The cabinet is available in three different styles. Each style has the capability of being either surface or flush mounted. With flush mounting though a surround is required.
- ®   Normally painted Arch White Ripple. Other colors are available on request.
- ®   The inner and outer door hinges are mounted on the left-hand side of the cabinet which allow the doors open to an angle of 100⁰. Locking is normally keyless though keyed entry is available on request.
- ®   Knockouts are positioned at the top and rear of the cabinet to simplify cable entry.

5.5   Mounting The Cabinet

✛ **Note:** It is recommended the cabinet should be installed in a clean, dry, vibration-free area.

Open the front door. Use the keyhole mounting holes in the top corners and in the lower middle of the unit to mount it on the wall. Cables to connect the system to its external actuating devices are brought in through the knockouts on the top or bottom of the cabinet.

12 mm

R 6mm.

Tap lightly around the rim of the knockout
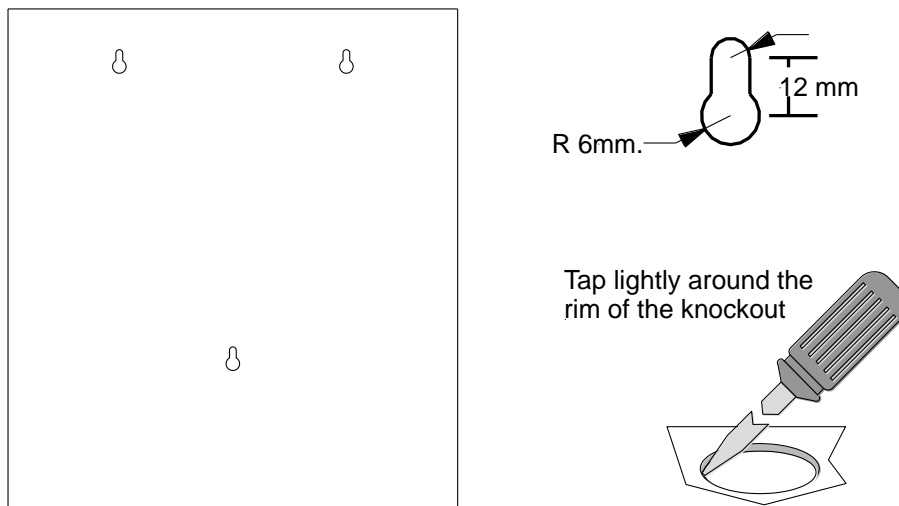
Figure 5: Example SP1X Back Pan Mounting Hole & Removing Knockouts

5.6   Operational Parameters

Temperature:	-5°C to + 55°C
Humidity:	25% to 75%
IP Rating	IP51
Maximum Number of Devices per Loop:	126
Maximum Number of Devices per Conventional Zone:	40
Cable Loop Characteristics:	2 core. 1.5 to 2.5mm²
Power Supply Output Voltage:	27V (Set to 27.2V)
Power Supply Output Current:	2Amp, 5.6Amp or 18Amp
Power Supply Input:	85 - 240V AC
Panel Current Draw:	450 mA (min)
Battery Type and Capacity:	2 x 12V sealed lead-acid batteries (capacity is determined by the installation configuration and supplementary documentation Power Supply and Battery Calculation).
Minimum Operating Voltage:	19.2 V

5.7   Cabling Recommendations

Conventional Zones
Cabled in red Twin Plastic Sheath (TPS) or fire rated Radox or approved equivalent.

Analogue Loop
Two core cable. The minimum cable size is 0.75mm², the maximum loop resistance is 50 ohms and the maximum loop distance is 2km.

RS 422 Loop
Two twisted pair screened (4 core) cable originating from FACP extending through the protected areas and returning to the FACP.

> **Cable Specifications**
> Capacitance of 100 picofarads per metre or less
> Resistance of 100 milliohms per metre or less
> Impedance of loop typical 100 to 120 ohms

Maximum distances between modules 1.2km providing cable meets above specifications.
Recommended cable type
> Belden 8132 or 9842 (non fire rated)
> Radox FR Communication 0.75mm 1 pair (fire rated) x 2

LCD Repeater
Two by two twisted pair shielded cable (4 core) plus 2 core power, or local supply. Maximum distance between LCD mimic panel and FACP. is 1.2km.

✛ **Note:** If the LCD operates in a redundant path mode the total cores including power is 10. The preferred cabling method in this case is 1 X 2 pair twisted shielded cable (4 core) and 1 X two pair twisted shielded cable (4 core) plus 2 core power

LED Mimic (RS485)
Two core twisted shielded cable (No return loop) plus 2 core power or local supply.
Maximum distance between each LED repeater card and FACP. is 1.2km.
Recommended Cable Type
> Hartland HC2335
> Belden 9841
> Radox FR Communication

Fire Alarm Bell Connection
Two core 1.5mm^2 PVC sheathed MIMS (**M**ineral **I**nsulated **M**etal **S**heathed) to the bell location.

Brigade Connection Via Telecom
Two core 1.5mm² PVC sheathed MIMS from the FACP to the Telecom MDF.

RJ45 Multi-drop Serial Port

5.8   Power Supplies and AC Mains Installation

AC Mains will be connected to either a 2 Amp, 5 Amp or 18Amp 27 volt supply. These supplies will be either mounted in the upper or lower right hand corner of the cabinet with the Brigade Board mounted above or below. The wiring should enter the cabinet through the nearest knockout entry hole on that side. See the following diagrams for the actual wiring and fusing details for each supply.

Common Power Supply Features & Specifications

®	High efficiency, low working temp.	®	High efficiency; low ripple noise
®	Universal AC input/ full range	®	Soft start with limiting AC surge current
®	Short circuit/ over load	®	100% full load burn-in test
®	Built in EMI Filter and PFC Circuit	®	Remote control on/off (option)
®	Over voltage protection	®	Over temp. protection (option)

®	Input Voltage:	85 to 264 VAC	®	Tolerance at 27V	+/- 1%
®	Input Freq	47 to 63Hz.	®	Load Regulation	+/- 0.5%
®	PFC	0.95~230VAC	®	Line Regulation	+/- 0.5%

Power Supply Specifications

Type No	Output	Tolerance	R & N	Efficiency
S-60-27	27V @ **2.2A**	$\pm$ 1%	150mV	79%
SP-150-27	27V @ **5.6A**	$\pm$ 1%	150mV	84%
SP-500-27	27VDC @ **18A**	$\pm$ 1%	200mV	86%

Connecting the Mains Power to the Power Supply
Terminate the mains power to the 240 VAC switch terminal block as shown below.

NOTE:
Output Voltage is Set to 27.4Volts.

FUSE Rating
1 Amp 3AG Slow Blow

Mains cable should be no less than 0.75mm″
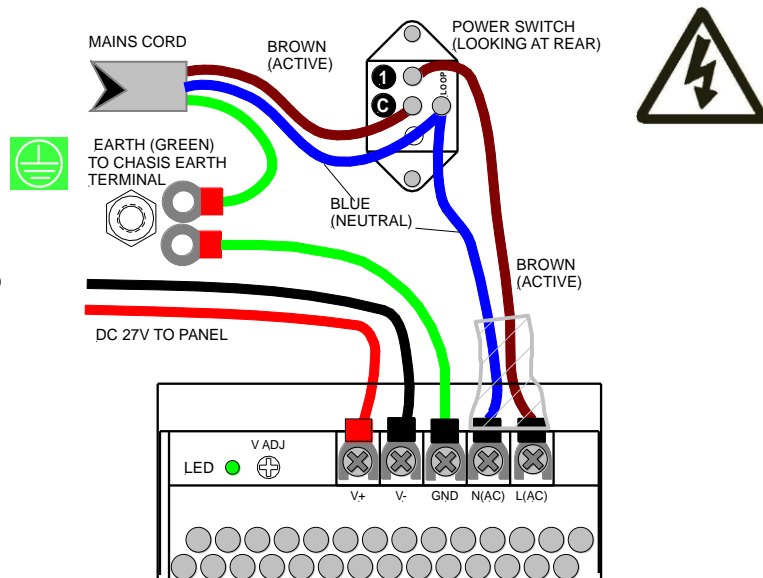
Figure 6: Mains Power Connection to the 2 Amp Power Supply

MAINS CORD

BROWN (ACTIVE)

POWER SWITCH (LOOKING AT REAR)

BLUE (NEUTRAL)

EARTH (GREEN) TO CHASSIS EARTH TERMINAL

27VDC TO BRIGADE PSU MONITOR BOARD

BLACK

RED

NOTE:
Output Voltage is Set to 27.4 Volts.

FUSE Rating
2 Amp 3AG Slow Blow

Mains cable should be no less than 0.75mm″

L(AC) N(AC) (AC) -V -V +V +V

Fuse is under this cover

V ADJ
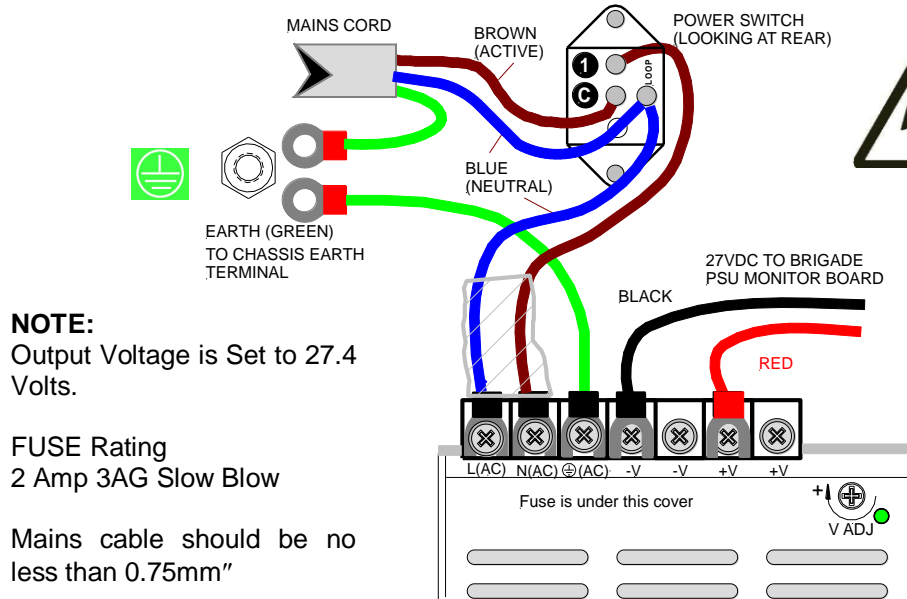
Figure 7: Mains Power Connection to the 5 Amp Power Supply

MAINS CORD

BROWN (ACTIVE)

POWER SWITCH (LOOKING AT REAR)

BLUE (NEUTRAL)

EARTH (GREEN) TO CHASSIS EARTH TERMINAL

NOTE:
Output Voltage is Set to 27.4 Volts.

FUSE Rating
5 Amp 3AG Slow Blow

Mains cable should be no less than 0.75mm″

L   N   FG   NC   NC   G   RC
(AC)
(AC) (AC) (AC)

RED

DC 27V TO PANEL

BLACK

+S   +27V 18A   -V   -S

V ADJ
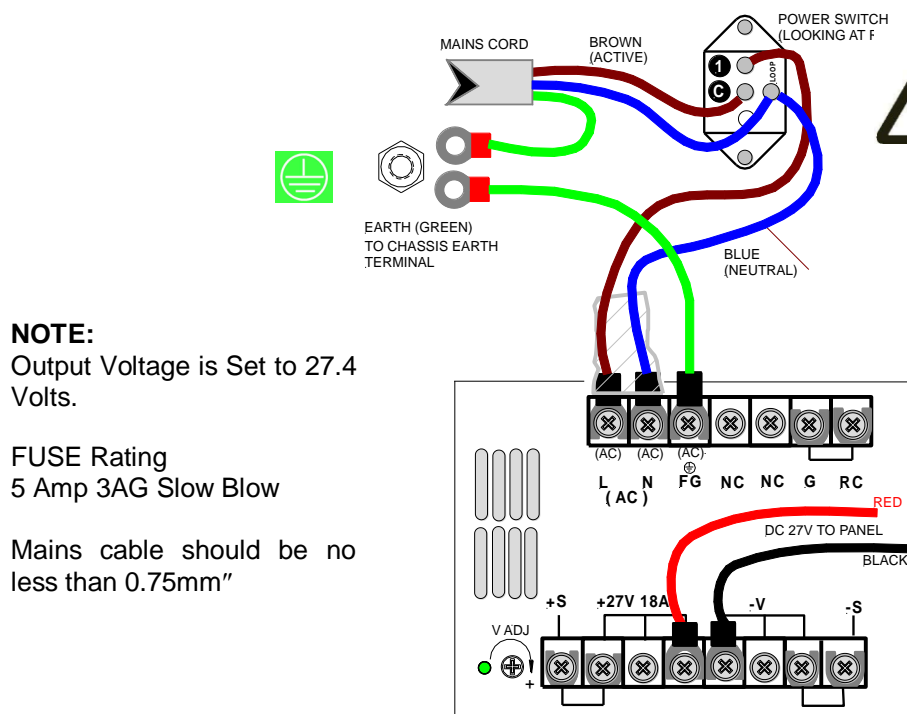
Figure 8: Mains Power Connection to the 18 Amp Power Supply

5.9 Current Limiter, Fuse Board

The Current Limiter, Fuse Board provides protection for the boards, cards and other 27VDC distribution within the FACP when the 18Amp power supply is used. The four LED's associated with the board indicate that 27VDC is available at each of the outputs CN1 – 5.
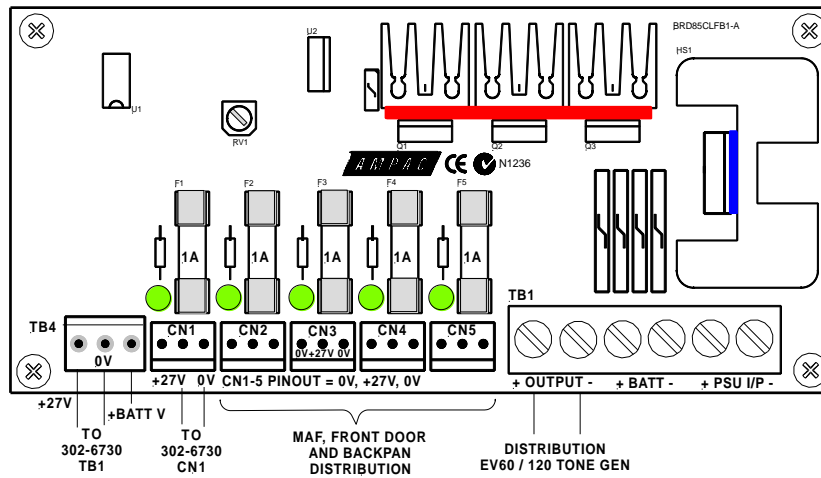
Figure 9: Current Limiter Fuse Board

Connecting the Mains Earth

1. All earth cabling shall be terminated to the panel Chassis Earth Terminal in a star configuration.

2. The earth cable closest to the cabinet body shall have an M4 SPW beneath the lug then an M4 SPW and M4 nut.

3. Each additional earth cable shall be terminated with an M4 SPW and M4 nut.

4. An additional M4 nut and M4 SPW are fitted to the Chassis Earth Terminal for installers to connect their Mains Earth.
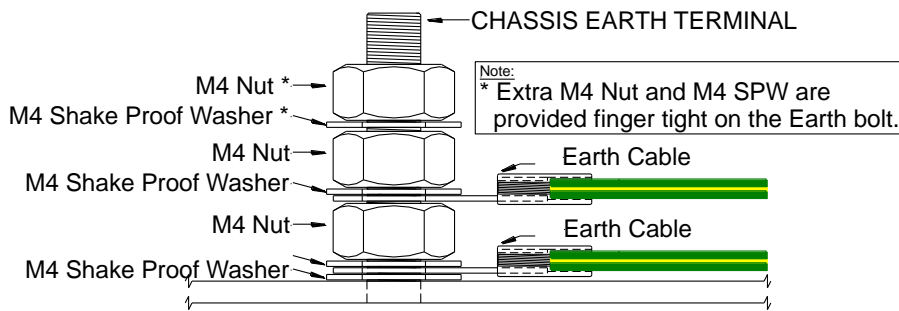
Figure 10: Panel Earthing

5.10   Brigade / PSU Monitor Board 302 - 6730

The Brigade / PSU Monitor Board monitors and controls the power supply, battery charging, monitored / un-monitored inputs, outputs and the 7 relay outputs.

Providing the Power supply has adequate capacity monitored Bell/Sounder O/P's are capable of driving 2 X 2Amp circuits. Each circuit, terminated in a bell/sounder or not, requires a 10K EOL resistor to give a system normal indication. If either circuit is open or shorted, the panel buzzer will sound and a Sounder Fault will be indicated on the Panel. Monitoring is achieved using a small reverse polarity current. For this reason it is necessary to ensure that all alarm devices are fitted with a series diode (1N4004 recommended) and correct polarity is observed for both the output and the sounders they are connected to.

Relay outputs marked NO, C and NC are voltage free relay contacts. Outputs marked +ve and -ve are fitted with resistors (10k) to allow the circuit to be monitored. If these outputs are un-used they must be terminated at the terminal block or turned off in *ConfigManger*.

For all outputs combined, total output current is 2A (if 2.5A power supply is being used).

Once all the field devices are installed and the wiring has been correctly terminated the *FireFinder*™ is ready to turn on. Turn the Mains power on, and connect the batteries observing correct polarity. The green power on LED should be illuminated.

OUTPUT RATINGS

TB	Function	Type of Output	Fuse	Relay
3	Bell 1	2 Amp Fused	F2	RL 1
	Bell 2	2 Amp Fused	F3	RL 1
4	Plant (Aux) Monitored	1 Amp Fused	F4	
	Plant (Aux) Non-Monitored	1 Amp Voltage Free Contacts		RL2
5	Warn Sys (Evac) Monitored	1 Amp Fused	F5	
	Warn Sys (Evac) Un-Monitored	1 Amp Voltage Free Contacts		RL3
6	Fault Monitored	1 Amp Fused	F6	
	Fault Non-Monitored	1 Amp Voltage Free Contacts		RL 4
7	Isolate	1 Amp Voltage Free Contacts	RL6	
8	Alarm	1 Amp Voltage Free Contacts		RL 5
9	Valve Monitor	1 Amp Voltage Free Contacts		RL 8
10	Batt Fail *(Relay Normally Energised)*	1 Amp Voltage Free Contacts		RL 7
1	Battery Output	Thermistor Protected		
2	Aux Power Output 1	1 Amp Fused Not Monitored	F7	
	Aux Power Output 1 – EV40 use	3 Amp Fused Not Monitored	F7	
	Aux Power Output 2	1 Amp Fused Not Monitored	F8	

Fuse Information
1. All fuses are of the Glass M205 style.
2. F1 is 6.3A
3. Voltage Free contacts are rated at 1A @ 30V

Back EMF Protection
ⓘ *Inductive loads fitted to the Brigade PSU Monitor Board MUST be fitted with "Flyback" diodes at the load for back EMF protection.*

Transient Protection
ⓘ *Recognised[1] transient line protection methodologies at the FACP and the load MUST also be considered when connecting any control devices to the outputs be they in close or remote proximity to the FACP.*
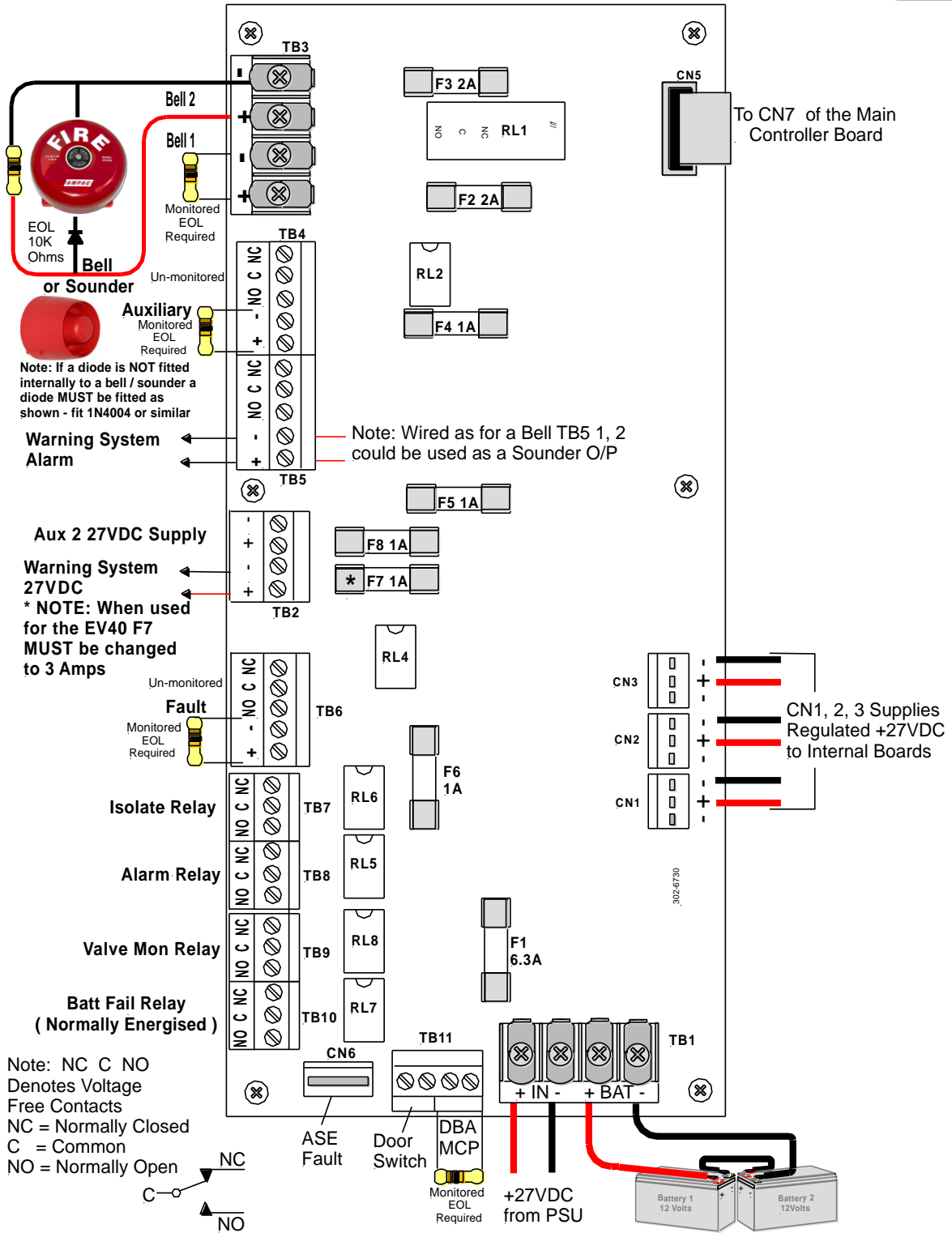
Figure 11: Brigade / PSU Monitor Board Layout

Note: When connecting to the Brigade PSU Monitor board transient and "Flyback" (Back EMF) protection methodologies MUST be applied.

5.11 Brigade / PSU Monitor Board & Battery Connections

A **FireFinder™** can be supplied with two (2) 12 volt batteries. The batteries should be placed into the bottom right hand side of the cabinet. A red and black lead coming from TB1 on the Brigade Board will be clearly seen in the same area, this lead is to be connected to the batteries red to positive and black to negative once the system is operating on Mains supply.
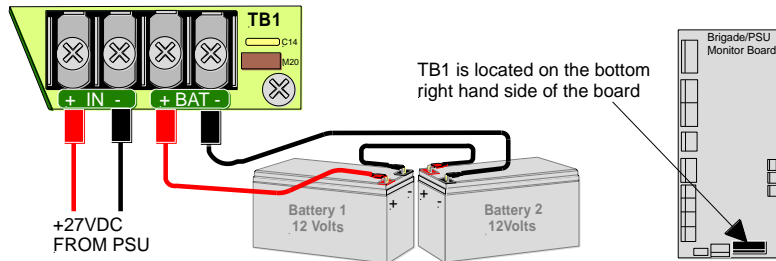
Figure 12: Battery Connection To The Brigade Board

5.12 Brigade / PSU Monitor Board Auxiliary 27 Volt Power

Two (2) 1 Amp outputs are available from TB2 terminals 1+ (plus) and 2- (minus) or 3+ and 4- on the Brigade Board. It is important to note these outputs are not monitored.
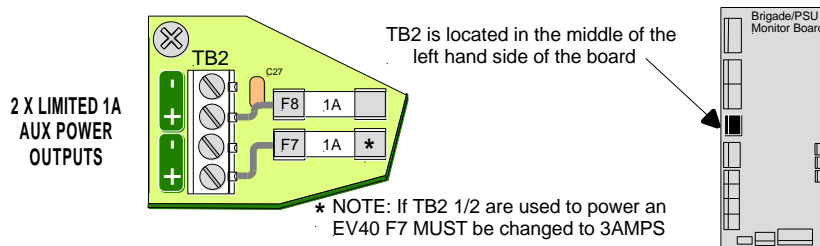
Figure 13: Auxiliary 27v Power Output

5.13 Brigade / PSU Monitor Board DBA / MCP & Door Switch Connections

If used the DBA / MCP & Door Switch Connections are shown below.
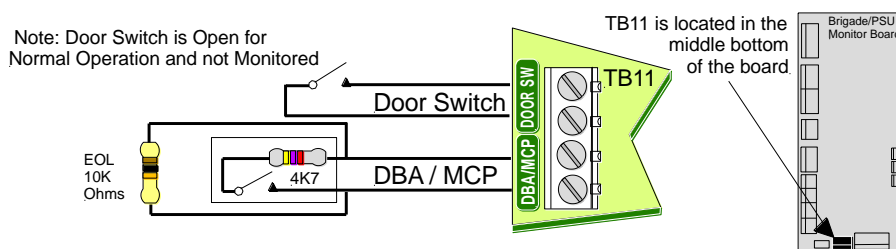
Figure 14: DBA /MCP and Door Switch Wiring

5.14 Brigade PSU Monitor Board ASE Fault Brigade Box Connection

If an ASE Brigade Box is included in a system CN6 is used to convey a fault in the box to the FACP.
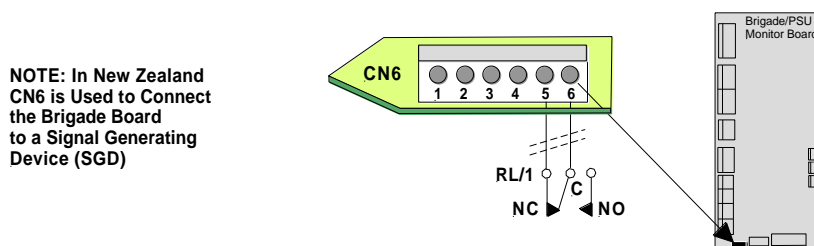
Figure 15: ASE Fault Switching

5.15 Connecting a Bell / Sounder to the Brigade / PSU Monitor Board

Sounders are connected to the Brigade / PSU Monitor Board as shown below. If more sounders are required, the Sounder / Bell Control Board (302-7420) must be used.
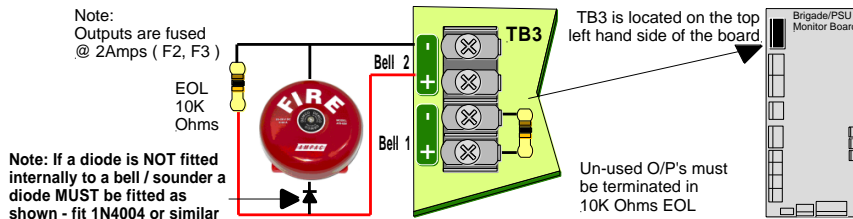
Figure 16: Sounder / Bell Wiring (Diagram 1)
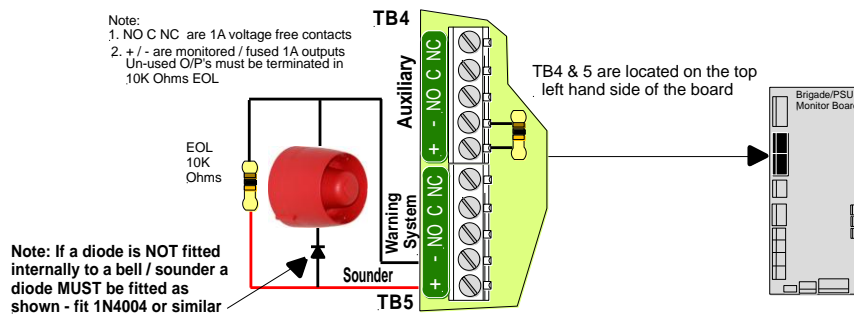
Figure 17: Use of Warning System Control for Sounder / Bell Wiring (Diagram 2)

5.16 Warning System Connections

Warning systems such as the EV20 and EV40 are connected to the Brigade / PSU Monitor Board as shown below.
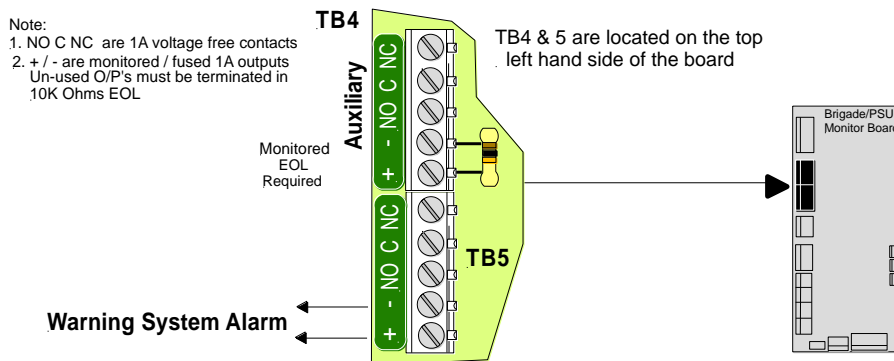
Figure 18: EV20 / EV40 Warning System Cabling (Alternate to Sounder / Bell Wiring)

5.17 Brigade / PSU Monitor Board Relay Output Connections

The relay contacts are connected as shown below.
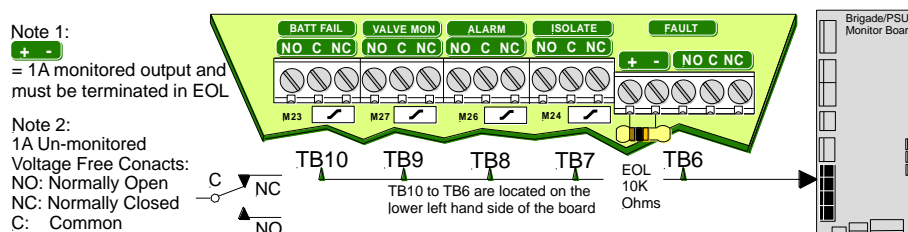
Figure 19: Relay Outputs

5.18 Main Board BRD85MBA

The Main Board is the " heart " of the FACP and carries the devices for interconnecting to all the other Boards, a buzzer for auditory indication, the backlight power supply for the LCD and CPU Reset.

The Main CPU is mounted on this board and connected to it by CN11. The main connection board then provides interfacing to

- ®   Up to 4 Slave CPU's
- ®   A printer
- ®   A Modem/Graphics Output
- ®   An Expansion Panel
- ®   An Internal serial bus
- ®   An External communication bus.

CN8 provides a serial data (RS232) port for interfacing to the outside world eg modems. This facility is implemented via U15.

U21 provides the real time clock for the panel.

U19 provides non volatile memory in the form of an EEPROM.

The board also provides a data bus for the BRD85CPU processor.

RV1 – LCD contrast adjust

Supply and Current = 27VDc @ 120mA

Connections

CONNECTOR	CONNECTS TO
CN1	Keyswitch Input
CN2	Expansion Panel
CN3	Serial Communication Port
CN4	Front Keypad
CN5	Printer
CN6	Misc
CN7	Brigade Output
CN8	Modem
CN10	Slave CPU output 1
CN11	Main CPU
CN12	LCD Expansion Lead
CN13	Slave CPU connection
CN14	Slave CPU connection
CN15	Slave CPU connection
CN16	27VDC in
CN17	To LCD Backlight supply
CN18	External Loop Communication
CN19	LCD Characters
CN20	RS485 Communications Port 1
CN21	RS485 Communications Port 2
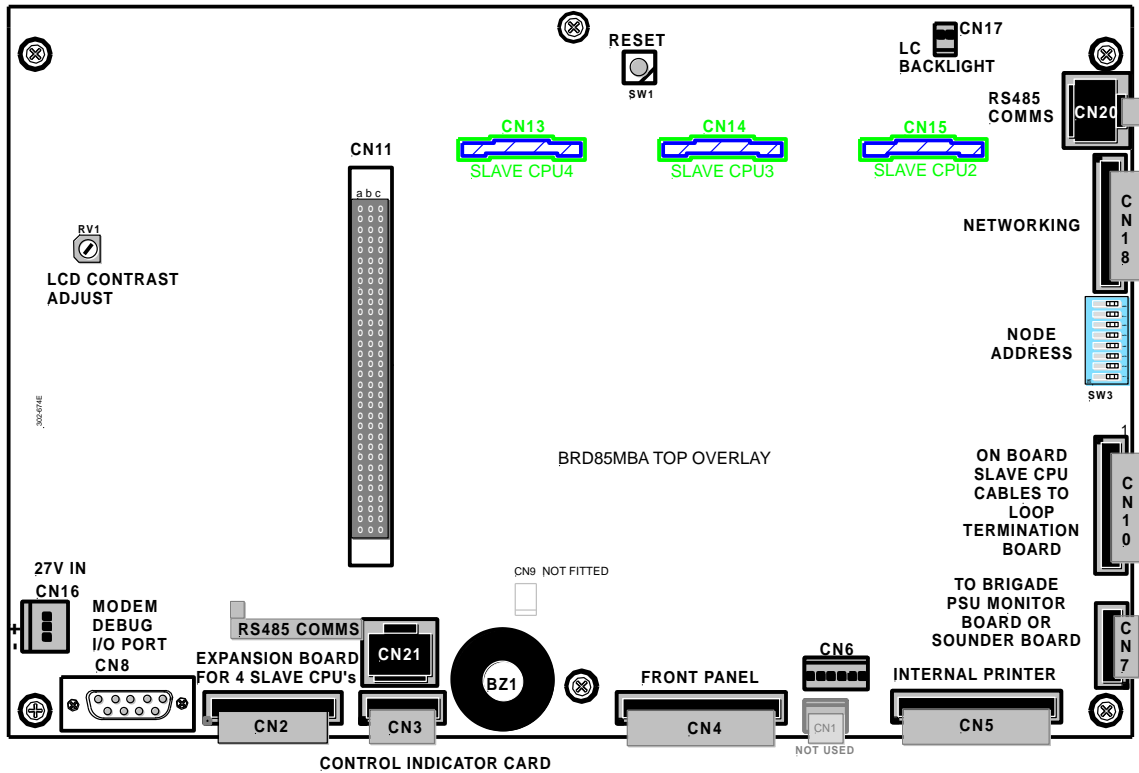
Figure 20: Main Board Layout with no Main CPU or Slave CPU's

5.19   Front Panel Board 302 -690

The Front Panel Board provides the buttons used to control the FACP as well as all LED indications. All LED's are surface mounted and the buttons are embedded within the board. The LCD is viewed / protected by a clear perspex screen.
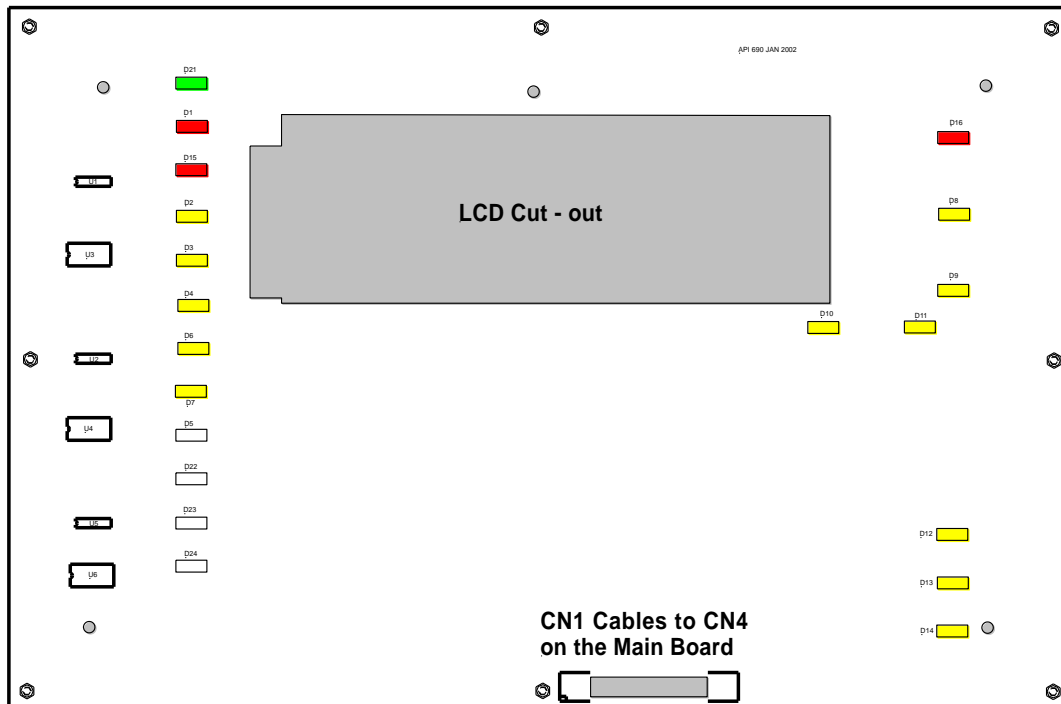
5.20 Main CPU BRD85CPU

The Main CPU holds the main central processing unit for the FACP.

- ® BRD85CPU is a 4-layer surface mount board
- ® The processor (U1) is a Motorola MC68302, running at 20MHz.
- ® The external data bus is 16 bits wide.
- ® The board has 256 Kbytes (128K x 16) of EPROM (U2,U3).
- ® 2Mbytes (1M x 16) of FLASH (U6,U9).
- ® 2Mbytes (2M x 16) of static RAM (U4,U5,U16,U17).
- ® U8 is a programmable logic device which implements control signal timing and decoding.
- ® External address, data and control lines are buffered by U10, U11, U13, U14 and U15.
- ® U7 is a watchdog control and will reset the processor if there as an error in software execution.
- ® Two sockets (U2 and U3) are provided for 27C010 EPROMS.
  U2 provides the even bytes. (D0 toD7) and U3 the odd bytes (D8 to D15

Connections

CONNECTOR	CONNECTS TO
CN2	The Main Board BRDMBA CN11

Board Overlay
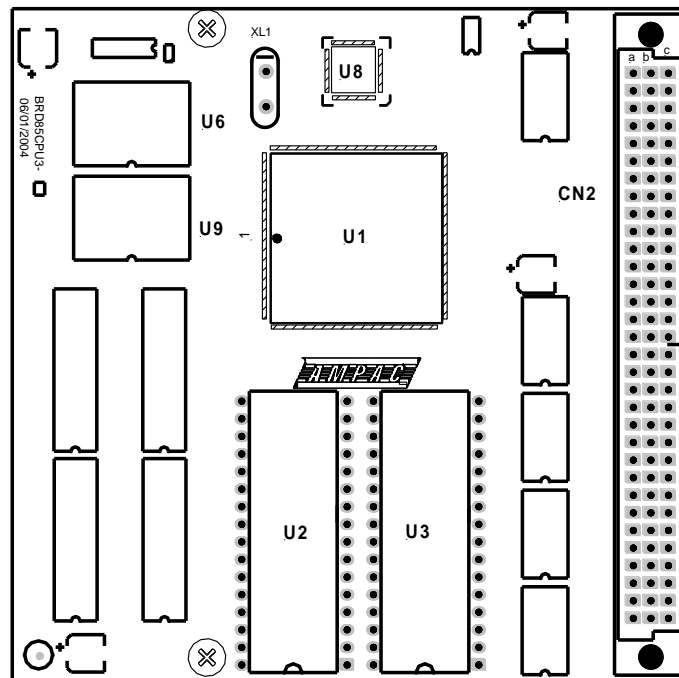
Figure 22: The Main CPU Board PCB Layout

5.21 Slave CPU 302-669

The Slave CPU (Central Processing Unit) provides the interfacing signals and I/O's required to allow the FACP to connect / communicate to a variety of termination boards.

A single chip micro controller U1 controls all operations of the FACP Slave CPU. This device contains the control program within Read Only Memory (ROM).

Communication to the main system is via an eight bit bi-directional bus (CN1). Integrated circuits U5, U3 and U7 provide buffering and data latches that allow data flow between the Main and Slave CPU's. The buffers hold one output byte and two input bytes.

CN1 provides the interconnection to the Termination Board. Within CN1 are ten analogue input lines, two input/output lines, two current loop outputs (RS422) and one current loop input (RS422).

All analogue inputs are de-coupled then fed to an eight-bit analogue to digital converter (ADC) U4. The data from the ADC is sent via a serial peripheral interface to the micro controller U8.

The current loop inputs and outputs are used to provide various signals according to the board connected. The signals provided can be serial peripheral interface clock and data signals or full duplex asynchronous data and a timing output. U6 provides the signal multiplexing and buffering required to switch between different functions.

Automatic Termination Board Sensing

A unique feature of the Slave CPU is its ability to automatically sense the type of board it is connected to without the user having to configure the board to suit. Board sensing is done by measuring the voltage on analogue input ten (CN1-10), denoted *Type Voltage*. Each termination board provides a unique predefined voltage. After the Slave CPU has determined the board type the Slave CPU will set the appropriate operating conditions, signal the Main CPU of the installed type and wait for the Main CPU to inform the Slave to begin executing the program.

Connections

Connector	Connects to
CN1	302-735, 302-671 and 302-672

Main Connection Board (BRD85MBA)
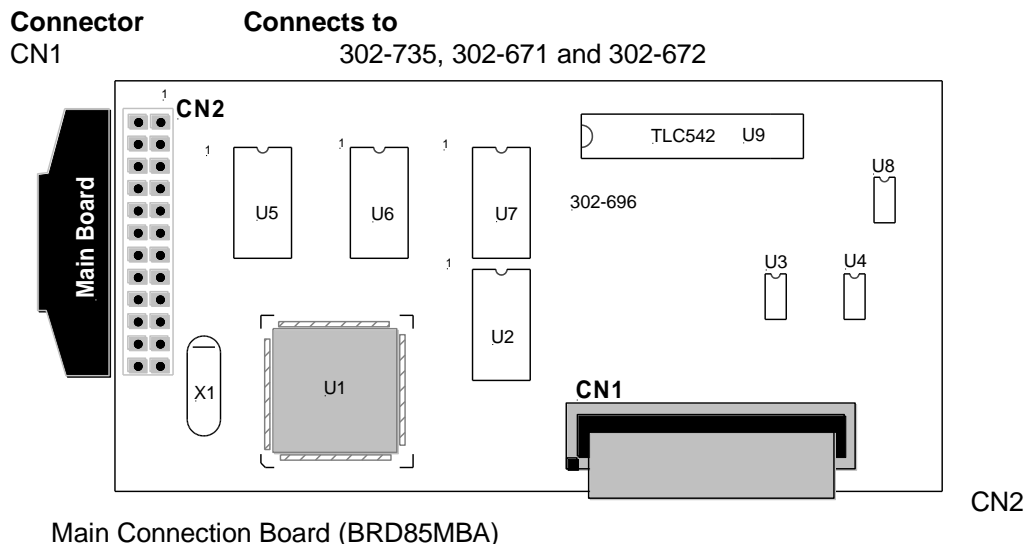
Figure 23: Slave CPU Board

5.22 RS232 Modem / Programming / Debug Interfacing

The modem I/O port is a DB9 connector (CN8 situated on the lower left hand corner of the Main Board BRD85MBA) that is normally used for programming of the FACP via the serial port of a PC or Laptop. The Controller also has the required hand shaking to support connection to a Modem, thus allowing the FACP to be programmed from a remote site that has an established telephone connection. This allows the system software to be upgraded by simply transmitting a file via the serial port of the PC or Modem external to the FACP. Diagnostic facilities are also available via the same connection.
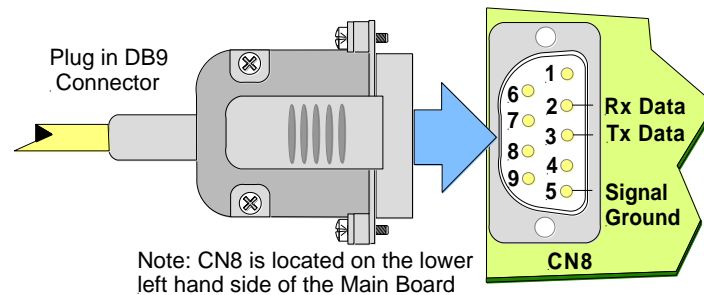
Figure 24: DB9 Connector CN8 as Mounted on the Main Board
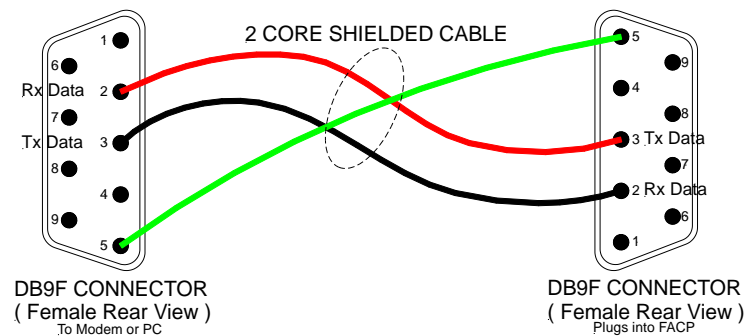
Figure 25: Modem / Programming / Debug Cabling

5.23 Ancillary Services

The FACP has been designed such that detectors and/or call points, in addition to giving an alarm and calling the fire brigade, will close or open circuits of ancillary services by means of relays or similar devices.

Examples of these services are:

       (a)   actuation of fixed fire-extinguishing systems;
       (b)   closing of windows, smoke and fire doors,
       (c)   control of ventilating systems;
       (d)   covering of tanks containing flammable liquids and controlling their valves to isolate the contents from direct contact with the fire, etc.

To facilitate safe maintenance of these services an option is available that allows for the isolation and visual indication of the disablement of ancillary services that does not affect the normal operation of the fire alarm system.

To ensure power to the fire alarm system is not prejudiced in any way, power for the ancillary services must be included in the calculation of the power supply and battery capacity.

5.24 *Conventional Zone Board 302 - 6710*

Under the control of a Slave CPU the 302-6710 Conventional Zone Board provides the interface between it and the external conventional devices.

16 Conventional zones can be connected to TB4   to   TB1. All un-used zone connections MUST be terminated in an EOL resistor of 3K3Ω as shown below.
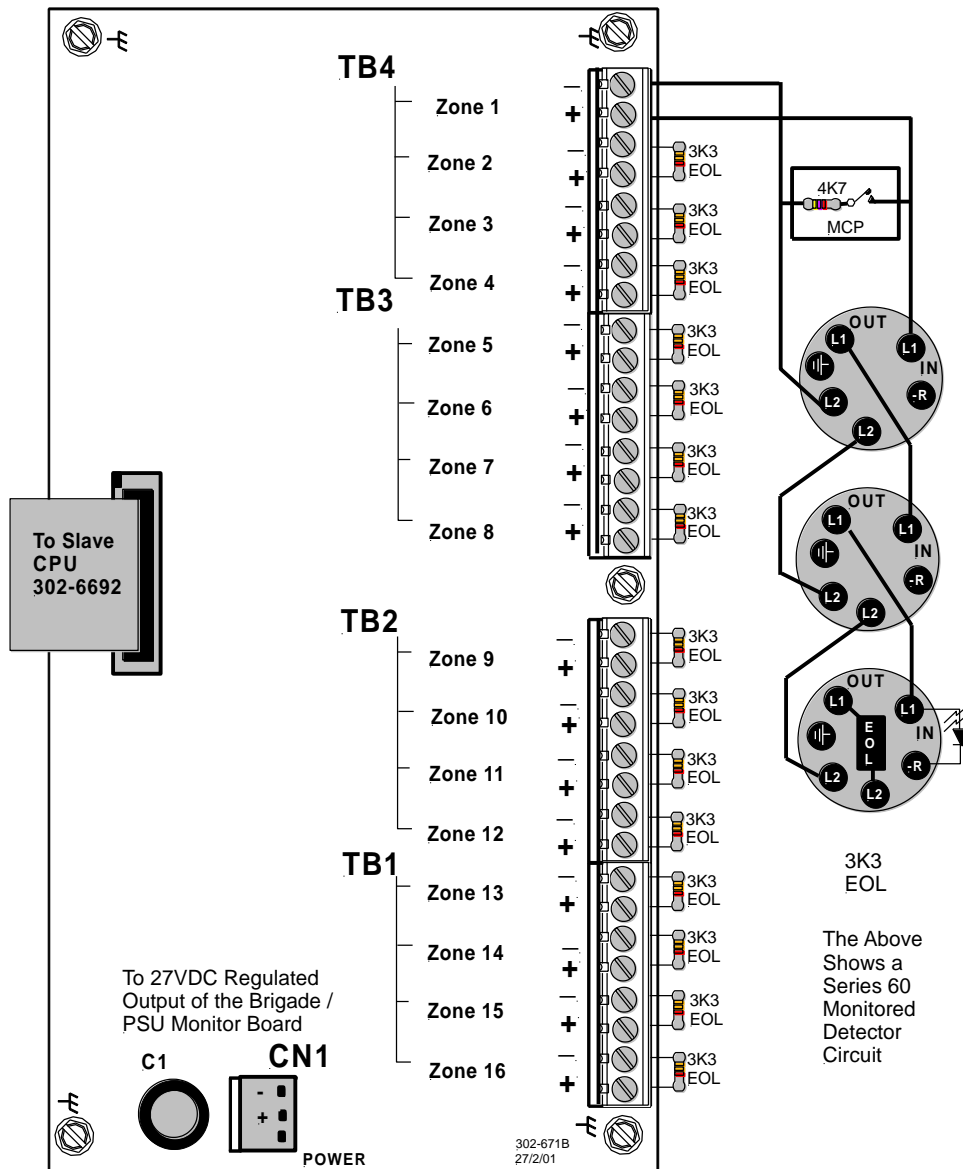
Figure 26: Conventional Board Layout

Alarm Zone Facilities (AZF) Parameters

Maximum Line Voltage: The maximum line voltage is limited to the system voltage. With a nominal battery voltage of 27V, system voltage and therefore open circuit voltage would be approximately 26.4V.

5.25   Addressable Loop Termination Board 302 - 7350

The Addressable Loop Termination Board acts as the interface between the external addressable devices and the control and monitoring functions of the *FireFinder™*. Each board provides terminations for two loops. One slave CPU is required per loop. The 2 Addressable loops are connected to TB1 and TB2.

✛   **Note:** Apollo devices L2 is +ve (positive), L1 is -ve (negative)

Connect the XP-95 / DISCOVERY loop to the panel as shown below.

AMPAC strongly recommend that the *LoopManager* test set is used to check that the Apollo loop has been correctly installed and commissioned before connecting it to the *FireFinder™*.

Loop Parameters
- 126 Apollo Devices
- 250mA Current Max
- S/C protection circuitry activates at approximately 300mA

LOOP 1 ADDRESSABLE DEVICES

LOOP 2 ADDRESSABLE DEVICES

LOOP NORMAL
LED A monitoring each Loop is ON

LOOP IN FAULT
LED A & B ON indicates a fault on the Loop (S/C, O/C) and the Loop is being monitored in both directions

T0 SLAVE CPU 302-6692 CN1

T0 SLAVE CPU 302-6692 CN1

Wiring Shown Above is for a XP95 Circuit with one Detector Having LED Monitoring

F1: 3AMP M205 27V INTO DC TO DC CONVERTOR

F1
3A

REGULATED 27VDC In / Out

26V ADJ

CN2   CN4

POWER

Figure 27: Loop Termination Board

6   *Expanding the FACP with Compatible FireFinder™ Boards*

ⓘ   Numbers in *Italic* are *Panel Add On Order Codes*

Module / Function	Order Codes	Max Number Off
• 16/16 Input / Output Board	(302-6720)	8 per Slave CPU
(SP1X: 159-0113, SP8X: 159-0051, SP16X: 159-0009)		
• 8 Way Relay Board	(302-6760)	16 per Slave CPU
(SP1X: 159-0013, SP8X: 159-0013, SPX16X: 159-0015)		
• 16 Way Input Board	(302-6770)	8 per Slave CPU
(SP1X: 159-114, SP8X: 159-0010, SP16X: 159-0011)		
• Serial Relay Board	(302-7320)	16 per Controller
(SP1X: 159-0079, SP8X: 159-0072, SP16X: 159-0072)		
• Fire Fan Module / Fire Fan Termination Board	(159-0103 H/W)	15 per Controller
(SP1X: 159-0103, SP8X:159-0104, SP16X: 159-0119)		
• Fire Fan Module (Loop Driven)	(159-0105)	
• General Indicator Card [32 Zone Alarm]	(85BRDGIBB)	* 16
(SP1X: 159-0106)	** Configuration dependant*	
(SP8X: 159-0089, SP16X: 159-0120)		
• General Indicator Card [16/16 Zone Alarm / Fault]	(85BRDGIBB)	* 16
(SP1X: 159-0107)	** Configuration dependant*	
(SP8X: 159-0108, SP16X: 159-0121)		
• General Indicator Card (Amber LED's)	SP1X: 159-0123, SP8X &16: 159-0124	
• Printer	(TPUP-AT)	1 per Controller
(SP1X: 159-0084, SP8X: 159-0110)		
• Sounder/Bell Controller Board 8 X 1A per Circuit	(302-7420)	8 per Controller
(SP1X, SP8X: 159-0071)		
• Sounder/Bell Controller Board 4Volt free, 4x1Amp	(302-7421)	8 per Controller
(SP1X, SP8X: 150-0069)		
• Agent Release Module / Agent Termination Board	(BRD25ARB-A)	8 per Controller
(SP1X:159-0099, SP8X: 159-0100, SP16X: 159-0117)		
• Local Control Station (IP40)	(BRD25ARB-B)	4 per Termination Board
(N/A)		
• Expansion Board	(302-6880)	1 per Controller
(SP8X: 159-0112, SP16X: 159-0022)		
• Expansion Controller	*(SP16X: 159-0077)*	3 per Node
(Rack: 159-0067)		
• Occupant Warning System – EV20	Factory fit	
• Occupant Warning System – EV40 / 60 / 120	Factory fit	
• Occupant Warning System – EV3000	Factory fit	
• Brigade Devices	Factory fit	

Compatible Networking Devices

• Network Interface Card	(302-7240)	1 per Controller
(SP1: 159-0053, SP8X: 159-116, SP16X: 159-0053)		
• Controller Interface Card	(302-7250)	1 per Controller
(SP1X: 159-0054, SP8X: 159-0115, SP16X: 159-0054)		
• LCD Repeater (Supplied Complete)	(302-7200)	Note # 2
(159-0044)		

✝   **Note # 1 :** This comprises 4 on the Main Controller and 4 on the Expansion Board.

+   **Note # 2 :** Depends on the configuration and the number of Panels in the System.

6.1 16/16 Input / Output Board 302 - 6720

The Input / Output Board is connected to the slave CPU via CN1 and acts as the interface between the Slave CPU, 8 Way Relay Board and the 16 Way Opto Input Board.

Dependant on the panel configuration a maximum of 8 Input / Output boards can be daisy chained together.
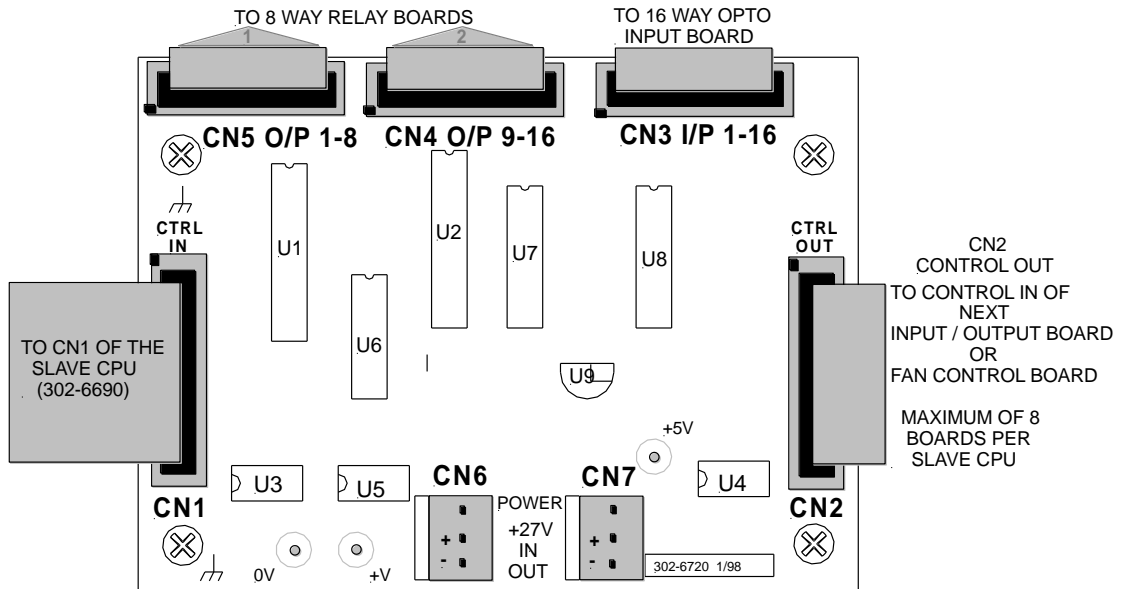
Figure 28: 16 / 16 Input / Output Board

6.2 8 Way Relay Board 302 – 6760 / 1

Relay Outputs: Each 8 Way Relay Board 302-676 is fitted with either eight 1A, RL1 to 8, (302-6760) or 5A, RL9 to 16, (302-6761) relays with voltage free contacts which can be used for control (eg. releasing doors) or monitoring (eg. driving indicators, door open / closed) purposes.
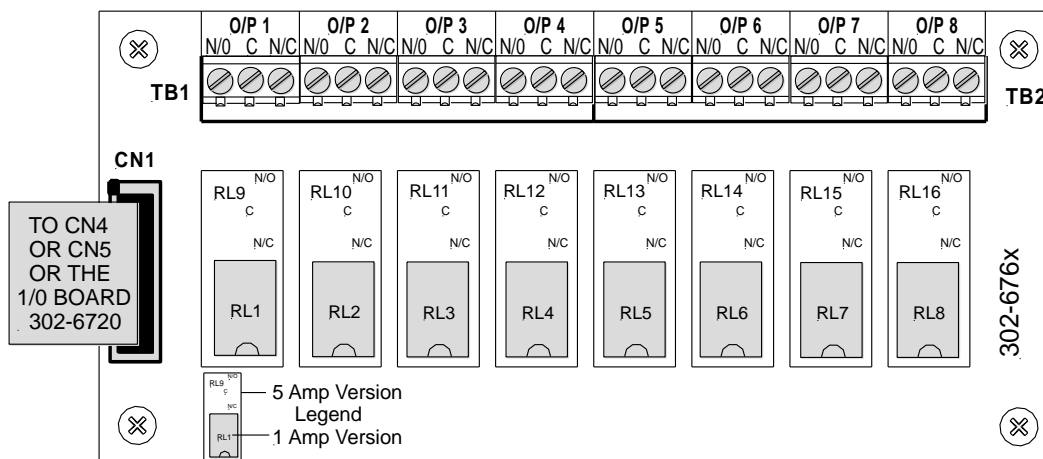
Figure 29: 8 Way Relay Board With 1A Relays Fitted (302-6760)

6.3 16 Way Input Board 302 - 6770

Opto-Inputs: Up to 16 inputs can be connected to the 16 Way Input Board. These inputs are required to be voltage free contacts as shown below.
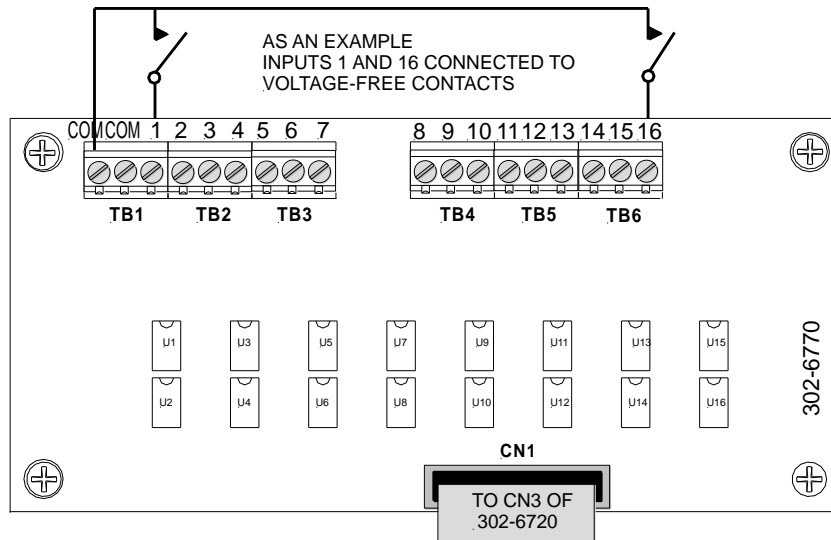
Figure 30: 16 Way Input Board (302-6770)

6.4 Serial Relay Board 302 - 7320

Relay Outputs: Each Serial Relay Board 302-7320 communicates with the Main Controller via the Serial Bus and is fitted with eight 1A relays with voltage free contacts. A maximum of 16 boards can be daisy chained together per Controller.
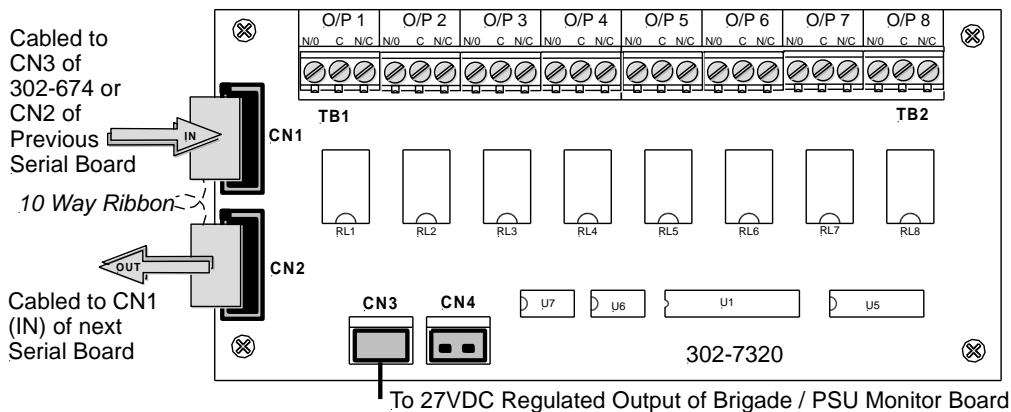
Figure 31: Serial Relay Board (302-7320)

☞ *Note: These boards are not monitored so should not be used for brigade calling or with occupant warning systems*

6.5   Fire Fan Module BRD25FCB

The Fire Fan Module has four (4) separate fan controls each having an On, Auto and Off function switch and a set of three (3) monitoring LED's. The LED's indicate the status of the equipment eg. Run, Fault or Stop. The two (2) arrow head keys are used to step up and / or down through the three (3) conditions. A slip in label can also be inserted into the hinged cover for identification purposes.

A loop driven version is also available (159-0105)

+   **Note#:** As per AS 1668.1 1991, Clause 14.17.4 lettering on any of the slip in labels must be at least 5mm in height.

Quiescent Current: 13.5mA
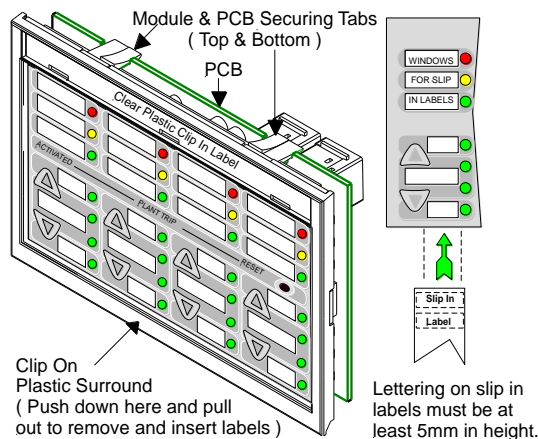
Figure 32: Fire Fan Module Front Panel
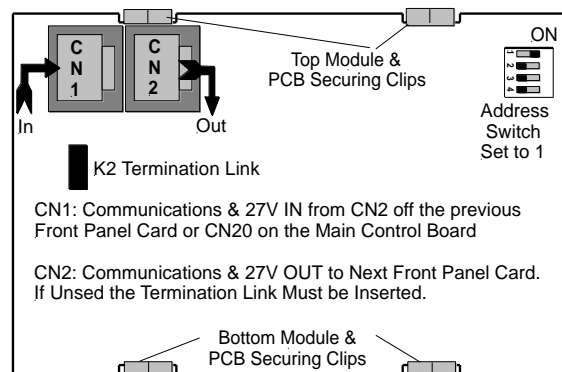
Figure 33: Fire Fan Module PCB Layout

6.6   Fan Termination Board BRD25FTB

The Fan Termination Board interfaces between the Fire Fan Module and the plant/equipment it controls via the 24 volt 250mA Start, Stop, current limited, relay outputs and monitor inputs. Programmable monitoring of the field equipment is achieved using 0 volts as an input level to indicate run, fault and stop conditions of that equipment. Monitoring is programmed in the Function Menu for a 3, 4 or 5 Wire Start / Stop, Run, Fault, Stop & Common functions. The inputs are protected by way of resetable transorbs and resistive / capacitive networks.

Connectors
CN5   Is used for factory programming only and may not be available on all boards.

Terminal Blocks
TB2 – 5 Are used to connect the fan control and monitoring wiring to the board.
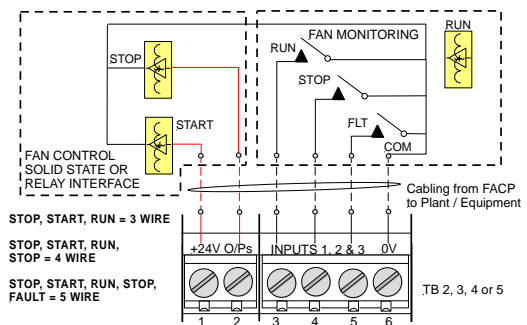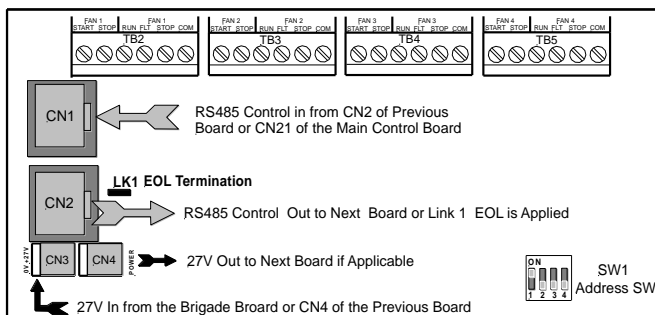
Figure 34: Fan Termination Board Layout and Typical I/O Wiring

6.7   *Zone & General Indicator Card*

The General Indicator Card (BRD85GIBB) comes in two versions each consisting of a front clip on surround, decal, mounting frame, PCB and is clipped into the front panel of the FACP to provide visual LED indication of; Zones in alarm x 32 [red], or Zones in alarm x 16 [red] / Zones in fault x 16 [yellow].

Each Indicator can identified by way of slip in labels.
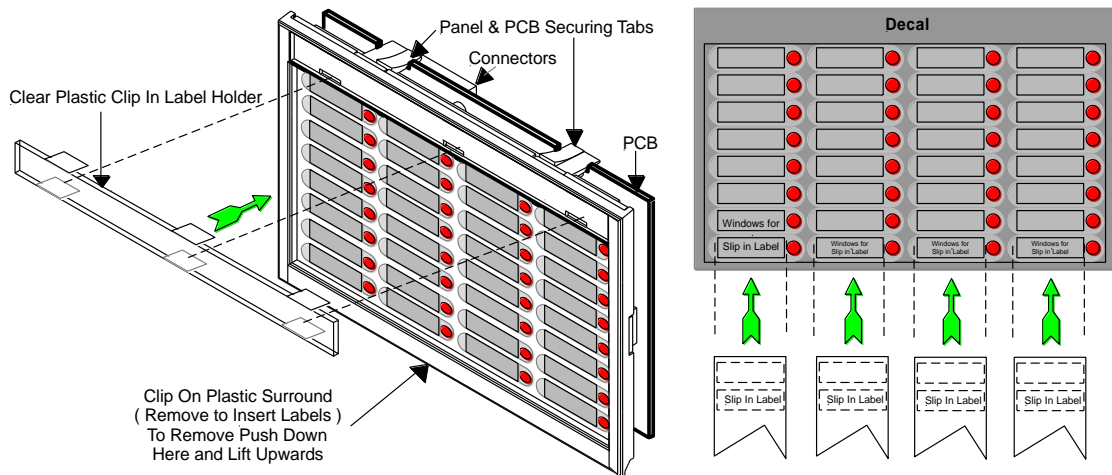
Figure 35: 32 Zone Alarm General Indicator Card
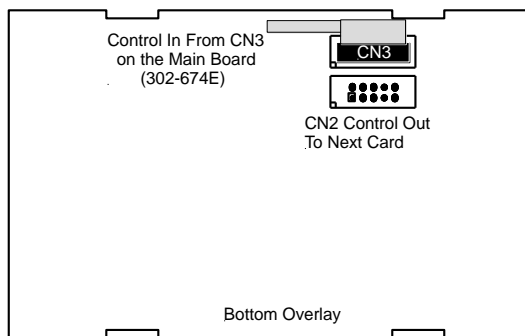
Figure 36: Bottom Overlay
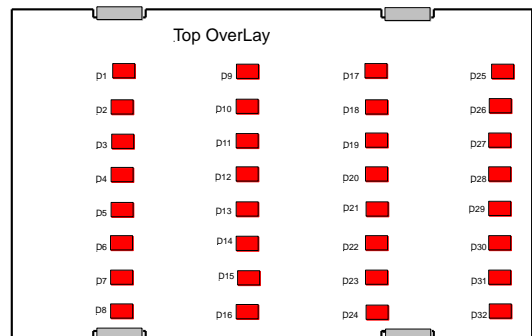
Figure 37: Top Overlay

+   **Note #1:** *DO NOT USE* excessive force to remove any component once it is clipped into position.

+   **Note #2:** If the indicator becomes illuminated it remains so until "Reset" is pressed.

+   **Note #3:** The indicators are tested by the Lamp Test control.
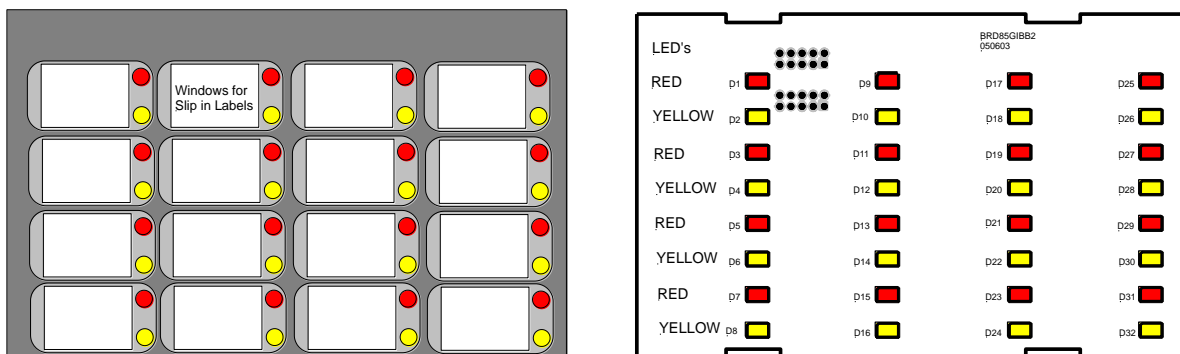
Figure 38: 16 Zone Alarm / Fault Card Decal & PCB Layout

6.8   8 Way Sounder Monitor Board 302 – 7420 / 1

The 8 way Sounder Monitor Board allow a larger number of bells and sounders to be connected to the *FireFinder*™ System.

The 302-742 is built in two versions:
1. 302-7420: All outputs are monitored and provide 1 Amp per circuit.
2. 302-7421: The first 4 circuits are Voltage free contacts, the second 4 are as per the 302-7420.
Wiring to the Monitored sounder outputs is as per the 302-6730.

The Sounder/ Bell monitor board connects to the serial peripheral interface (SPI) bus. This is the same bus that connects to the Brigade Output Board and a maximum of 8 boards can be daisy chained together.

✛   **Note:** Output current is dependent on the capacity of the Power Supply
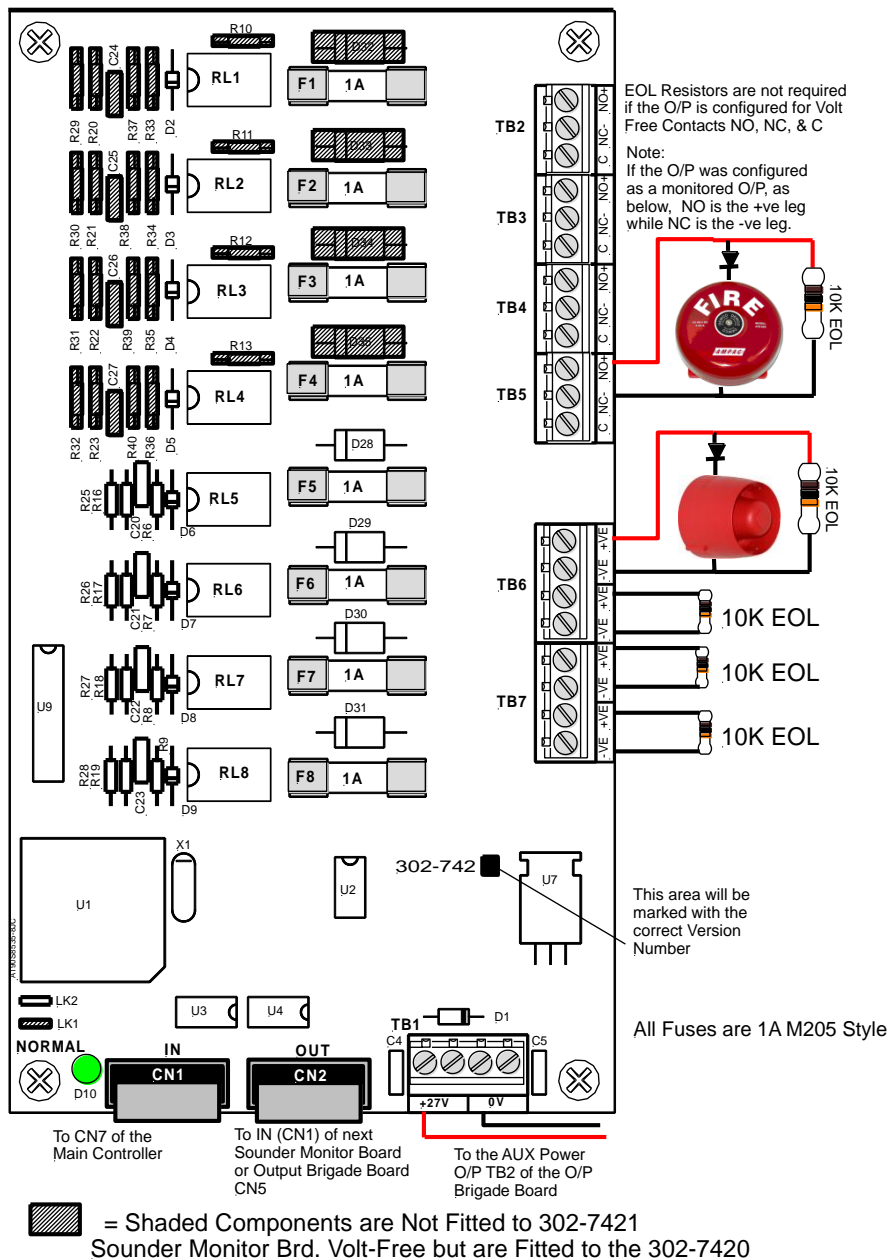
Figure 39: Sounder / Bell Controller Board 302-742x

6.9   Printer
Specifications
- ✓ Printing method: directed impact dot matrix
- ✓ Printing mechanism: 4/6 pin shuttle
- ✓ Interface: 8 bit parallel interface
- ✓ Interface port: 26 PIN flat plug

6.9.1 Indicators and Buttons
The front panel has an LED indicator and two buttons SEL (SELECT), LF (LINE FEED).
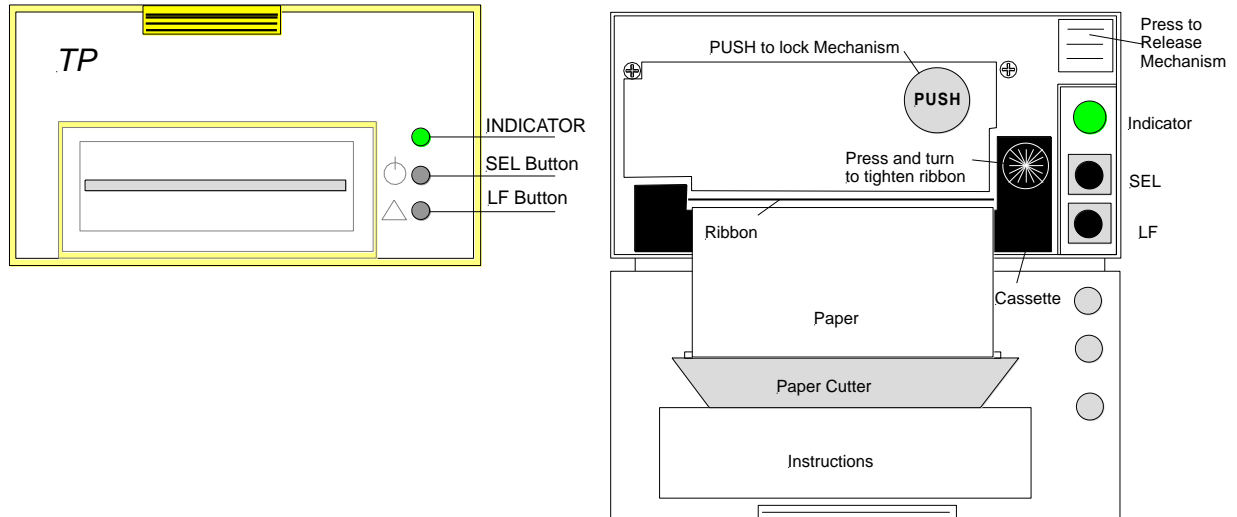
Figure 40: Printer Front Panel Layout (Front Cover Closed / Open)

1.   Indicator
When the 3 colour LED indicator is illuminated;
- ➢   red it indicates the printer is offline with no paper;
- ➢   green it indicates the printer is On Line;
- ➢   yellow it indicates the printer is On Line with no paper; or if it is
- ➢   off indicates the printer is Off Line or printer is busy.

2.   SEL Button
a) On Line / Off Line State
The printer enters the On Line state automatically when power is applied or on exiting from the Self-Test mode. (LED is green).
Press the SEL button, the LED is turned off and the printer goes Off Line.
Press the SEL button again, the LED turns on and the printer is On Line again.

✛   **Note :** *The printer will not receipt data when the printer is off line.*

b) Pausing the Printer While It Is Printing.
Press the SEL button while the printer is printing, the printer will pause and enter the Off Line mode after it finishes printing the row it was currently printing. The printer will continue to print when the SEL button is pressed again.

c) Enter the HEX-DUMP mode
Remove power from the printer, press the SEL button, then reconnect the printer to the power supply. The printer will enter the HEX-DUMP mode. In this mode any programs sent from the host CPU will be printed out in Hexadecimal.

LF Button
While the printer is Off Line press the LF button, paper feed will be initiated press again to cancel.

4.   Self-Test Mode
With power applied (green LED illuminated) push the SEL button. This will turn off the LED, press and hold in the LF button then press the SEL button again and the printer will enter the Self Test mode. Self-test will print out all the valid characters in the character sets.

5)   **Exit the Self-Test Mode:**
   a) After printing out the complete Self-Test list the printer will exit the mode automatically; or
   b) Press the SEL button and the printer will immediately exit the Self-Test mode.

6.9.2 Maintenance

Installing The Ribbon Cassette
The printer has a factory loaded ink ribbon cassette.

Ribbon Replacement;
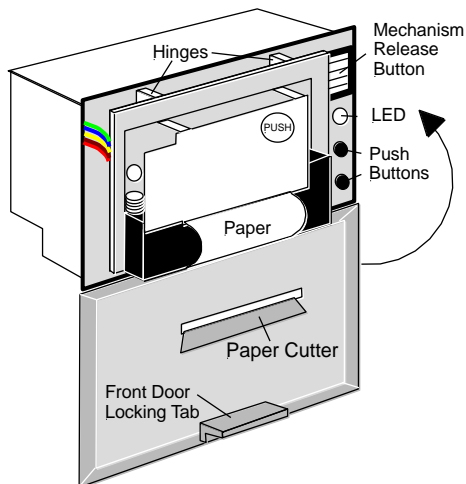
Figure 41: Front Panel

1. Remove the power from the printer.
2. Unlock the front cover by pushing down on the tab at the top of the front panel.
3. Push the mechanism release button in the top right corner to release the print head.
4. To remove the ribbon cassette gently pull out the left end then the right.

Replace the cassette by putting the right end of the new cassette slightly onto the drive axle then gentle pushing the left end into the clips.

The left end of the cassette can only be pressed in after the right end has been correctly seated onto the drive axle. If alignment is difficult it may be necessary to turn the knob on the cassette slightly. Now check that the ribbon is tight across the face of the cassette, that is on the inside of the cassette and across the paper. Turn the knob clockwise again if the ribbon is on the outside of the cassette.

Push back the mechanism head and lock it, close the cover of the printer and reconnect the power.

Loading the Paper Roll
1. Disconnect the power, unlock and open the front cover.
2. Push down on the mechanism release button in the top right corner to release the head.
3. Lift the mechanism as shown below.
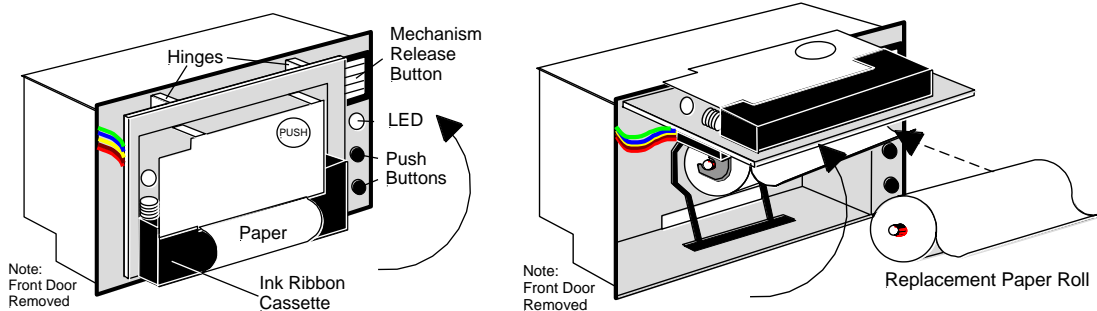
Figure 42: Head Mechanism Rotation and Paper Roll Removal / Insertion

4. Take out the empty paper roll and roller
5. Put the new paper roll onto the paper roller and replace as shown above.
6. Connect to the power supply.
7. Press the SEL button to take the printer Off Line, (LED is off).
8. Press the LF button, (paper feed).
9. Feed the edge of the paper into the mechanism and allow it to feed through.
10. Once it established the paper is feeding through the head mechanism correctly press the SEL button to stop the paper feed.
11. Return the printer head to its original position.
12. Pushing on the affixed label **PUSH** the head mechanism back into position.
13. Close the front cover.

✚   **Note #1:** *Press only on the **PUSH** label to return the head mechanism back into position.*

✚   **Note #2 :** *The above instructions are graphically displayed on the inside of the front cover..*

6.9.3 Printer Connections and Jumpering

Mounted on the back of the printer mechanism is the PCB that carries the;
1.   connectors for interconnection to the Main Board,
2.   jumper links required to set the programmed print modes; and
3.   Printer 5 volt DC Power Supply.
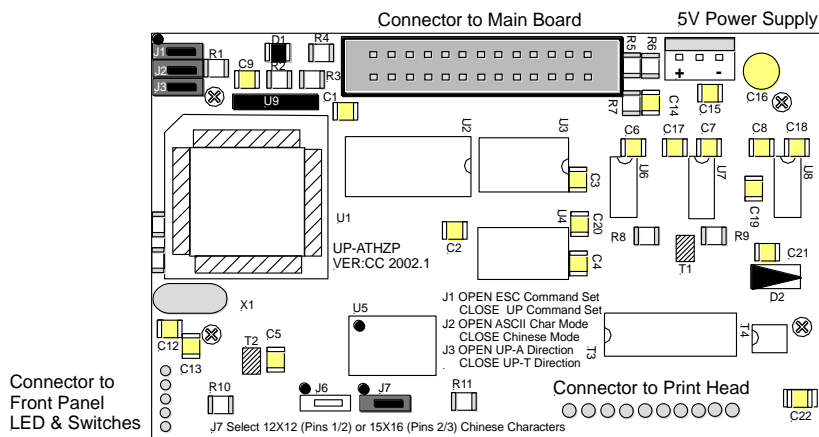
Figure 43: PCB Layout

Jumper Settings

Designator	Jumper State	Function
J1	NOT Inserted	Selects ESC Commands
	Inserted	Selects UP Commands
J2 *Set as Default*	NOT Inserted	Selects ASCII Character Printing Mode
	Inserted	Selects Chinese Character Printing Mode
J3	NOT Inserted	Select Printing by Contrary Direction
	Inserted	Select printing in the Normal Direction
J7 *Set as Default*	Insert the Shorting Clip Between Pins 1 and 2	Selects the 12 X 12 Font
	Insert the Shorting Clip Between Pin 2 and 3	Selects the 15 X 16 Font

6.9.4 Printer 5 Volt Power Supply (302-713)

27 volts DC is taken from Brigade / PSU Monitor Board and fed to CN 2 of the 5volt Printer Power Supply Board. It is this board that drops this voltage from 27volts to 5volts for use by the Printer.
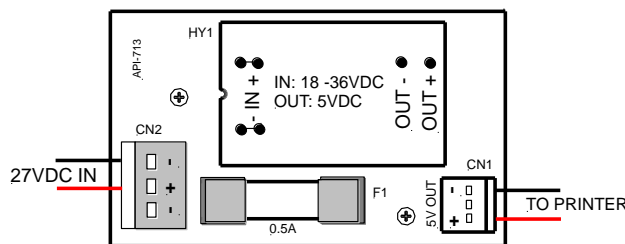
Figure 44: Printer Power Supply Board Layout

7   *Expanding the System Through Networking*

Expanding the system can be achieved in various ways and requires the use of boards specifically designed for communications purposes and boards that actually expand the system.

7.1   *Communications: Controller Interface Card 302 - 725*

The Controller Interface Card (CIC) provides 1 X RS232 O/P for High Level Interfaces, Graphics etc., 1 X half duplex RS485 O/P for external LED Mimics, High level Interfaces – EWIS- , Graphics etc and option to allow for multiple CIC interconnection.
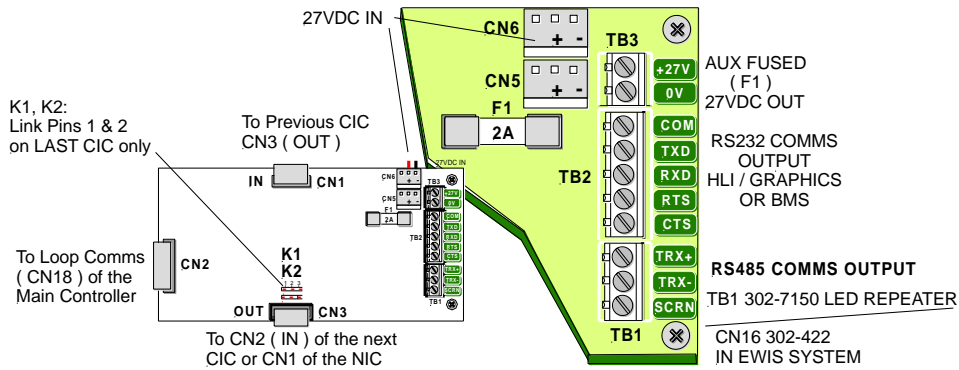
Figure 45: Controller Interface Card

7.2   *Communications: Network Interface Card 302 - 724*

The Network Interface Card provides two communication buses, RS232 and RS422, to allow the networking of multiple panels in different combinations, eg. from Data Gathering panels to Peer to Peer panels. Intercommunication can be via CN18 on the Main Controller (Loop Comms) or by way of a Controller Interface Card connector CN3 (Out). Fitted to the rear of the NIC is the CPU IO Controller (BRD85CPU) with NIC software to control the flow of communications in and out of the NIC.
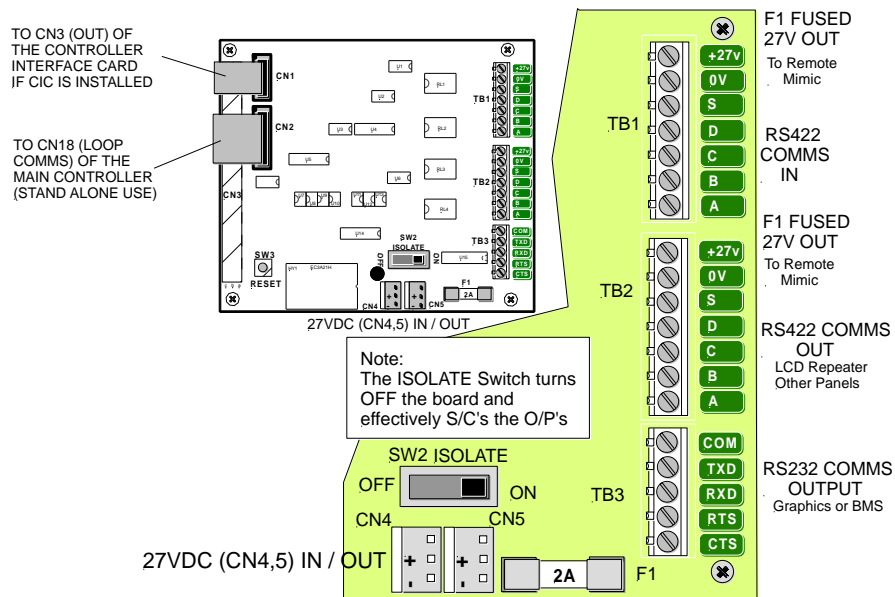
Figure 46: Network Interface Card

7.3 Expansion Board (302-688)

The Expansion Connection Board is used t increase the capacity of the controller from 4 Slave CPU's to 8. Connection from the Controller to the Expansion Board, which must be mounted within 200mm of the Controller, is made via a 20 way flat cable

Connections

Connector	Connects to
CN1	To Main Connection Board
CN2	Slave CPU 2
CN3	Slave CPU 3
CN4	Slave CPU 4
CN5	On board Slave CPU to 302-670. 302-671 and 302-672

Board Overlay
Slave CPU number 5 is an integral part of the Expansion Board, only Slave CPU's 6, 7 and 8 are plug ins.
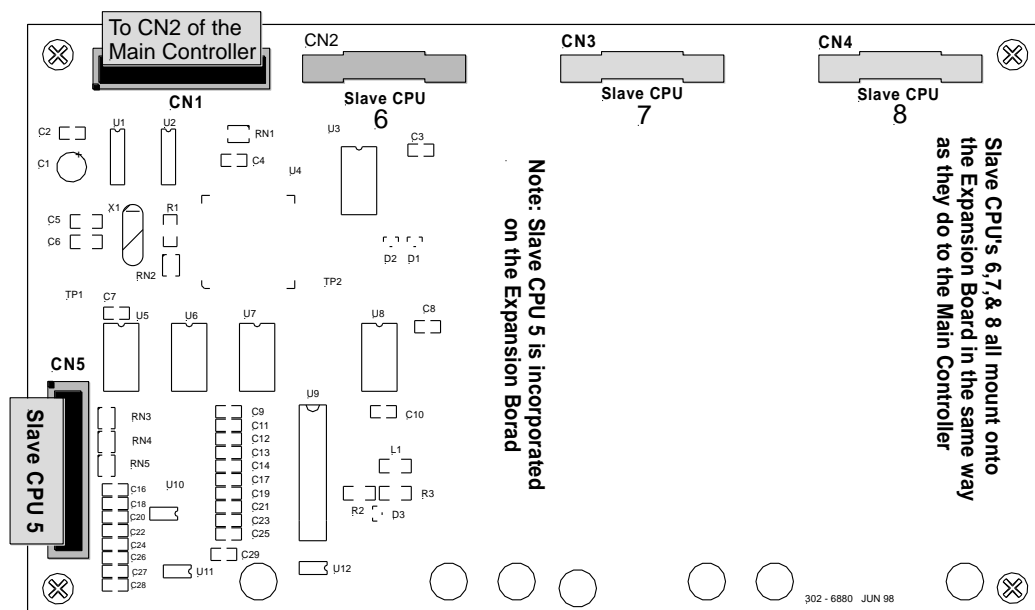
Figure 47: *Expansion Board*

7.4 Expansion Controller

An Expansion Controller (Fast Fit Kit Number 159-0077) can be described as a Main Controller without a without a Front Panel. A maximum of 3 can be introduced into any one Node, that is into any one FACP and require Controller Interface Cards (CIC) and Network Interface Cards in order to communicate with the Main Board / Controller.

Connecting Controllers together (Networking within the same cabinet) expands the system beyond 8 Slave CPU's, that is the Main Board plus an Expansion Board.

Networking in this way enables the connection of up to 4 Expansion Controllers within the same FACP cabinet. This requires the use of CIC's and NIC's but offers the added advantage that the RS422 communication bus is internal and all Controllers are physically and logically located at the same Node. It is now possible to Network up to 32 Slave CPU's in one cabinet with each Slave CPU connected to an Addressable Loop, 16 Conventional Zone Board or Digital I/O Board. With this configuration only one Controller has a Front Panel Board.

Once the system has been expanded to this degree it is obviously quite large and some form of indication at a point remote from the FACP may become necessary. This is achieved with the use of a Controller Interface Card (CIC) and a Remote LED Mimic or a CIC, a Network Interface Card (NIC) and a Remote LCD Repeater.

7.5   Networking

When FACP's are connected to each other they form a " NETWORK ". Individual FACP's in the Network are referred to as NODES. The Network as defined by the limitations of the installation can consist of a number of Nodes, the number of Nodes being dependant on the configuration of each Node. Typically an entire Network could consist of 60 Slave CPU's connected to loops, zones and or input / output devices spread over several nodes. The Network is Peer to Peer with the entire system configuration being stored at each Node. The system is then programmed so that information can be made invisible to particular Nodes or visible to all Nodes. Likewise system commands can be global or restricted to specific parts of the network.

The entire system can be programmed from Node 1 in the Network and is connected as a data loop which provides redundancy should there be a single cabling fault.

ⓘ   IMPORTANT

While it is important that proper documentation is kept and maintained for any installation it becomes even more important as a system develops into the larger types described above.
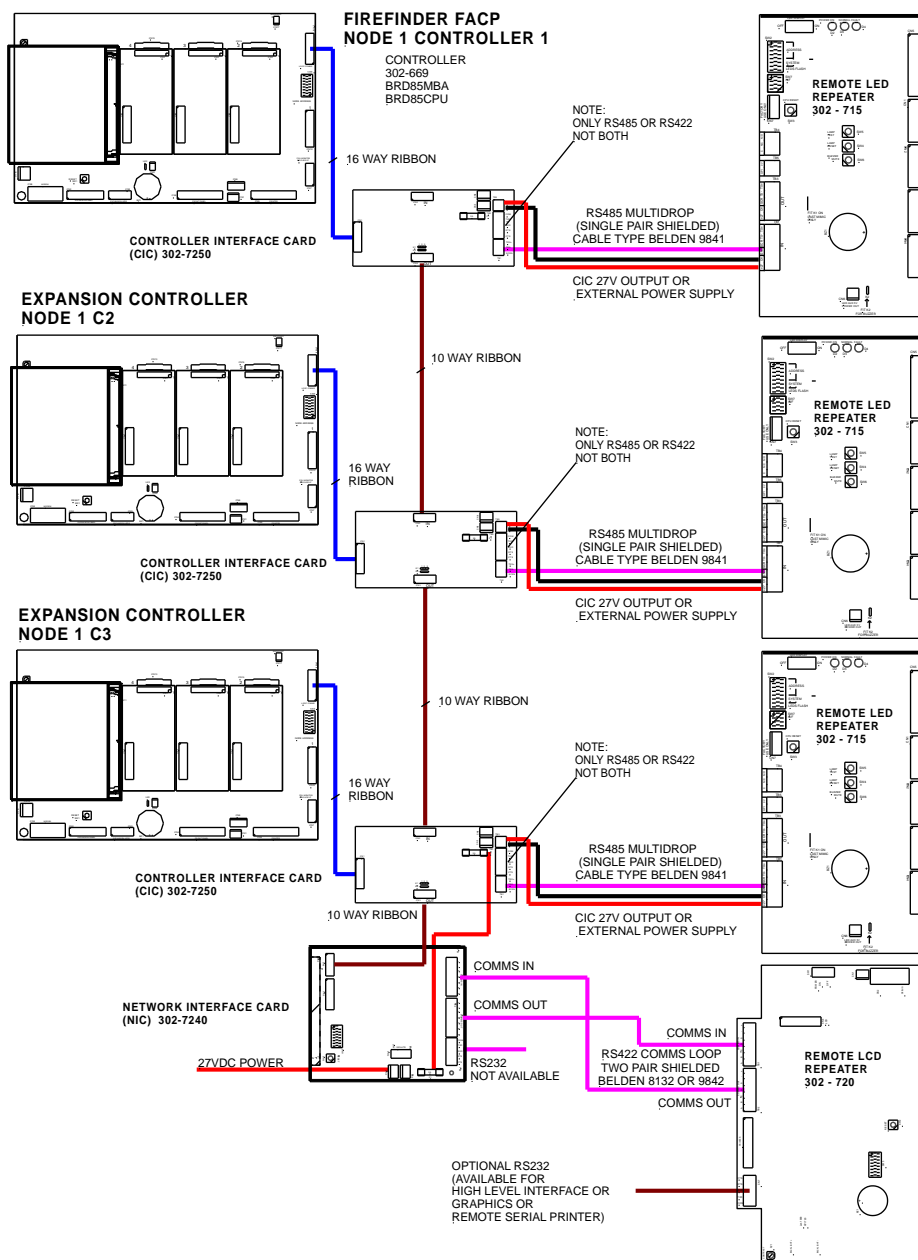
Figure 48: Example of 2 Expansion Controllers within an FACP

FIREFINDER
PANEL No1

CONTROLLER

16 WAY RIBBON

NETWORK INTERFACE CARD
(NIC) 302 - 724

27VDC POWER

COMMS IN

COMMS OUT

OPTIONAL RS232
(AVAILABLE FOR
HIGH LEVEL INTERFACE OR
GRAPHICS OR
REMOTE SERIAL PRINTER)

NOTES:
MAXIMUM DISTANCES BETWEEN PANELS = 1.2KM
IF GREATER DISTANCE ARE REQUIRED A RS422 REPEATER
(BLACK BOX 352A or 352A-F) TO BE FITTED EVERY 1.2KM
AFTER THE FIRST 1.2KM
CABLE TO BE USED = BELDEN 8132 OR 9842 TWO PAIR SHIELDED.

REMOTE LCD REPEATER
302 - 720

COMMS IN

COMMS OUT

RS422 COMMS LOOP
TWO PAIR SHIELDED
BELDEN 8132 OR 9842

OPTIONAL RS232
(AVAILABLE FOR
HIGH LEVEL INTERFACE OR
GRAPHICS OR
REMOTE SERIAL PRINTER)

TOP LAYER

FIREFINDER
PANEL No2

CONTROLLER

16 WAY RIBBON

NETWORK INTERFACE CARD
(NIC) 302 - 724

27VDC POWER

COMMS IN

COMMS OUT

OUT

IN

TO OTHER LCD REPEATER PANELS
IF INSTALLED

OPTIONAL RS232 (AVAILABLE FOR HIGH LEVEL INTERFACE OR
GRAPHICS OR REMOTE SERIAL PRINTER)

Figure 49: Example of Networking 2 Panels with LCD Repeaters

FACP (INTERNAL)

CONTROLLER MAIN BOARD

MAIN CPU   SLAVE   CPU's   2,3,4

16 WAY RIBBON

EXTERNAL FIELD

REMOTE
LED MIMIC 1

2 CORE SHIELDED
CABLE TYPE BELDEN
9841 OR SIMILAR

CIC 27V OUTPUT
(OR EXTERNAL
SUPPLY)

27VDC POWER

OPTIONAL RS232
(AVAILABLE FOR
HIGH LEVEL
INTERFACE
OR GRAPHICS OR
REMOTE SERIAL
PRINTER)

CONTROLLER
INTERFACE
CARD

RS485 MULTIDROP

REMOTE
LED MIMIC 2

NOTES:
MAXIMUM DISTANCE BETWEEN PANELS = 1.2KM
CABLE = BELDEN 9841 OR SIMILAR
SINGLE PAIR SHIELDED.

POWER REQUIREMENTS
27VDC CAN BE DERIVED FROM THE FIREFINDER OR
AN EXTERNAL APPROVED 27VDC SUPPLY CAN BE
USED AND WIRED INTO TB1 + AND - TERMINALS

TO MAXIMUM OF
32 LED MIMICS

Figure 50:Example of Networking 1 Panel and 2 LED Mimics

7.6   *Liquid Crystal Display Repeater Panel 302 - 7200*

The LCDR mimics all displays as those shown at the main panel, provides controls to interrogate the system and would normally connect / communicate with the Network Interface Card using RS422 communication protocol. The controls function in the same way as those on the FACP.
.
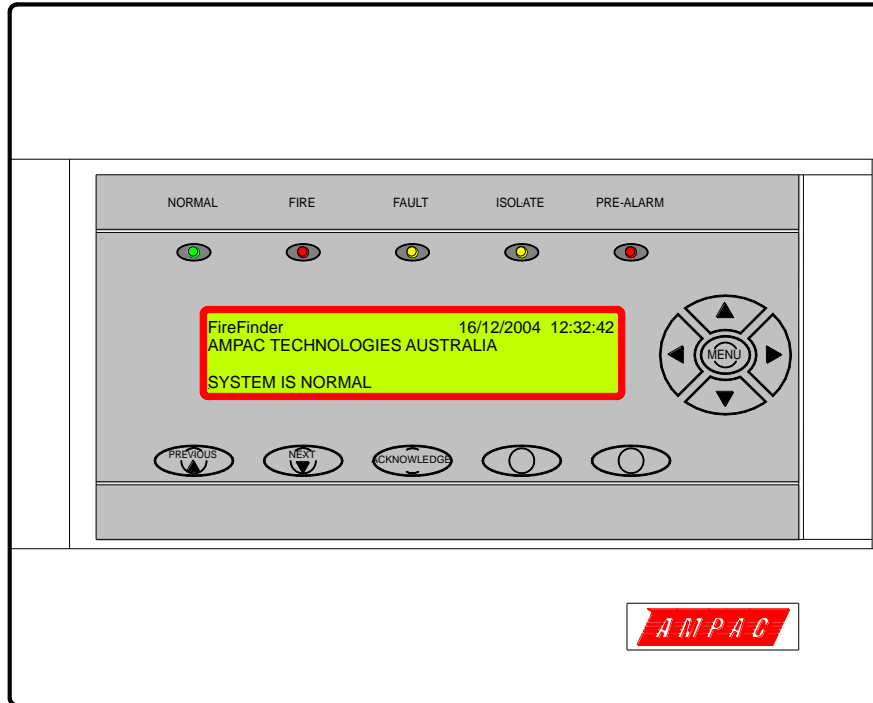
Figure 51: Liquid Crystal Display Repeater Front Panel
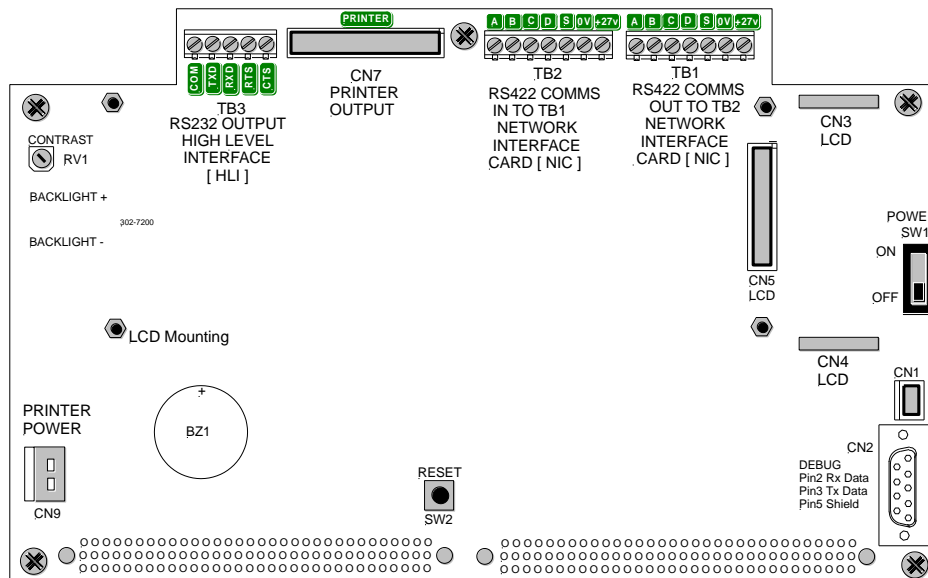
Figure 52: Liquid Crystal Display Repeater Panel Board Layout

To set the address of the LCDR plug a PC into the Debug port, go to "Boot Mode" (BT) then type in EP82, followed by a space and the Node address eg EP82 02. This address is hexadecimal format. The address is that displayed on the screen in ConfigManager, typically NX. To display an address that has already been set go to "Application Mode" and type in DA.

8   *Smart Terminal*

Smart Terminal connects to the *FireFinder*™ Fire Alarm Control Panel (FACP) via the RS485 multidrop communication port. Generally it is designed to be used anywhere where the status of the FACP is required to be monitored by local personnel and limited control is required.

Smart Terminal;
✓   Has front panel controls that allow the resetting of alarms and activation/silencing of alarm devices. Enabling operational access to the controls is via a key-switch;
✓   reports events from devices that are accessible to the host FACP. For example if the host FACP is configured with global access then the connected *Smart Terminal* reports events from all devices. If the host FACP is configured as local then the connected *Smart Terminal* reports events from devices that are directly connected to the host FACP.

8.1   Operation

The operation of *Smart Terminal* can be considered to be in one of three states, these are;
1.   power up - when the *Smart Terminal* is *initialising*
2.   *normal* - when the *Smart Terminal* address has been set and is communicating with the FACP, reporting normal / abnormal conditions and controlling the FACP via the front panel controls
3.   *fault* where the *Smart Terminal* is in fault and/or is unable to communicate with the FACP.

Power Up

The LCD displays a message telling the operator *Smart Terminal* is being powered up and that the hardware is being initialised. Once the hardware has been successfully initialised set the address and *Smart Terminal* should automatically transition to the normal state. Should a failure occur on power up press the "RESET" button located on the LCD PCB (see *Figure 5*) and check the address is correct.

Normal

The Normal state is entered from the "Power-up" or a return from the "Fault" state and is displayed on the LCD if the *Smart Terminal* is communicating with the FACP and operating correctly. In this state the front panel Power indicator is illuminated.

Fault

Smart Terminal enters the Fault state upon;
1.   a hardware failure
2.   LCD module failure or
3.   a loss of communications with the FACP (indicated by the "DIAGNOSTIC" LED – not flashing and the "no communications " message being displayed)

In a Fault condition the front panel NORMAL indicator is extinguished and the details of the fault are displayed on the LCD. The FACP will also indicate a fault in a similar manner.

8.2   Access levels

There are two levels of access.

Access level 1 only the Acknowledge, previous and next front panel controls are operative. All other controls operate in access level two.

Access level 2 is entered when the key-switch is in the ENABLED position.

Keyswitch disabled   Keyswitch enabled

Figure 53: Keyswitch in the Disabled / Enabled Postions

8.3   Specifications

Mechanical	
Dimensions ABS Cabinet: (mm)	300H x 360W x 100D
Environmental	
Temperature:	-5ºC to + 55ºC
Humidity:	25% to 75%
Input Power	
Operating Voltage (nominal):	27VDC
Operating Voltage (minimum):	18VDC
Quiescent Current @ 26.5VDC:	12.4mA (back light, off buzzer off")
Maximum Current:	43.8mA (back light on, buzzer on)
Cabling Requirements:	2 core 1.5 to 2.5mm²
Optional 27VDC Power Supply:	1.8A plus 400mA Battery Charging
Batteries:	12Ahr
27VDC Outputs	
Auxiliary 27VDC Distribution Protection:	24VDC 500mA Monitored
Cabling Requirements:	2 core 1.5 to 2.5mm²
Communications	
Internal to FACP:	RS485
External to FACP:	RS485
Cabling Requirements:	Twisted pair plus power
Fault monitoring:	O/C, S/C
Maximum Number of *SmartTerminals* per FACP:	30
Maximum Distance (from FACP):	1.2Kms.
LCD	4 line X 40 character - backlit

8.4   Overview

SmartTerminal essentially consists of three PCBs;

1. BRD82CEB2 – FACP – Communications Extender Board (Item Number 159-0129)
The Communications Extender Board is mounted inside the FACP and provides the protected RS485 communications and 27VDC to the *SmartTerminal* Termination Board/s and LCD/s.

2. BRD82LTB2 – Termination Board
A Termination Board is mounted in each *SmartTerminal* to protect and interface the RS485 communications and 27VDC supply to the LCD Board

3. BRD82ICC2 – Control, LCD Communications and LCD Driver Board

✚ **Not**e: A maximum of 30 *SmartTerminals* may be connected to the communications bus over a distance of approximately 1.2Kms

8.5   Operational & Key Features

SmartTerminal complies with AS4428 /NZS4512 and designed for use with the **FireFinder**™ series of FACP's.

®   4 line by 40 character LCD with backlight and navigation keys ▲ ▼ keys allow the **SmartTerminal** to be used for FACP operation and interrogation. Note the backlight is only energised when alarms are present, a key has been pressed or controls enable key switch is enabled

®   Buzzer and system Reset.

®   System expansion capabilities / options:

®   A wide range of secure user functions. This includes the ability to isolate / de-isolate a large number of system functions.

®   Flush or surface mountable enclosure.

®   Controls have tactile and audible feedback of operation.

®   All terminals cater for 2.5mm cables.

8.6   Mechanical

SmartTerminal is supplied in a ABS cabinet and consists of;

   1.   The Main Card, with all controls and indicators mounted directly onto it
   2.   1 X Termination Board
   3.   2 X ABS door keys
   4.   2 X 003 Enable / Disable keys
   5.   2 X Jumper links

✛ **Note:**   *A Communications Extender Board will be required if the Comms Bus in the FACP is fully utilised and / or if one is not fitted.*

The front door of the ABS version is locked by way of two clips on the right hand side of the cabinet. A special locating key which has two raised pins that are inserted into the side of the cabinet unlocks the door.

DOOR RELEASE PINS   DOOR RELEASE PINS
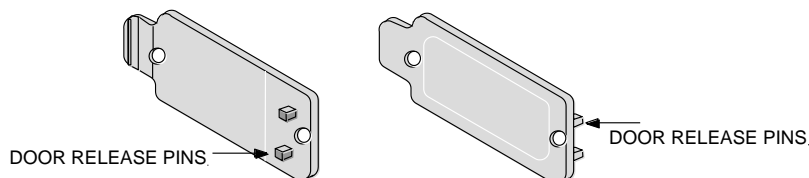
Figure 54: ABS Door Key and Front Panel Add On Card Surround Release Clip
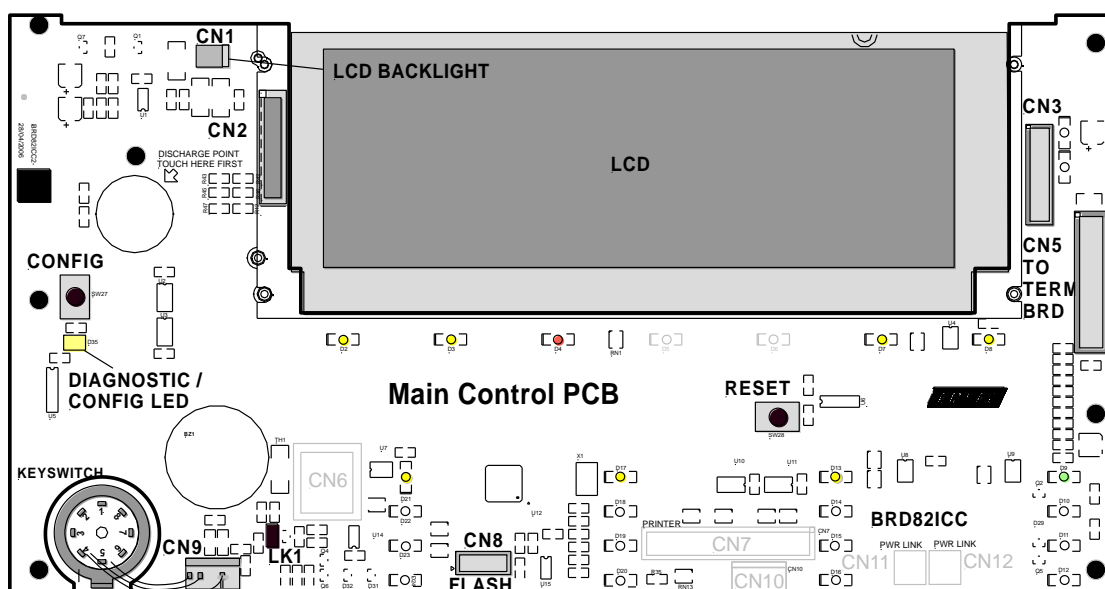
Figure 55: Main PCB Layout
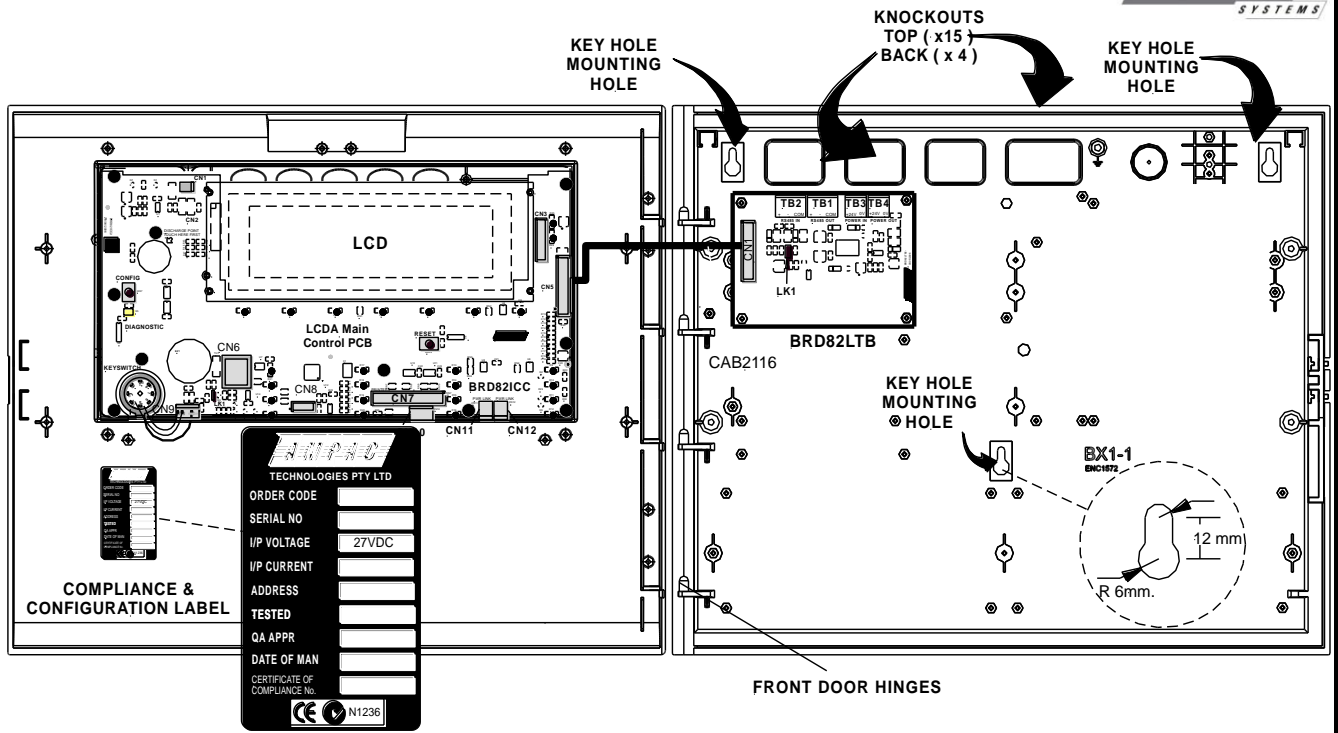
Figure 56: Typical Layout (Externally Powered) and Location of Keyholes

8.7   Installation & Cabling

The Communications Extender Board (Item Number 159-0129) should be mounted into the FACP and cabled as shown below.

It should be noted the Communications Extender Board and its supporting plate is mounted in a piggy back fashion onto one of the loop / zone boards.
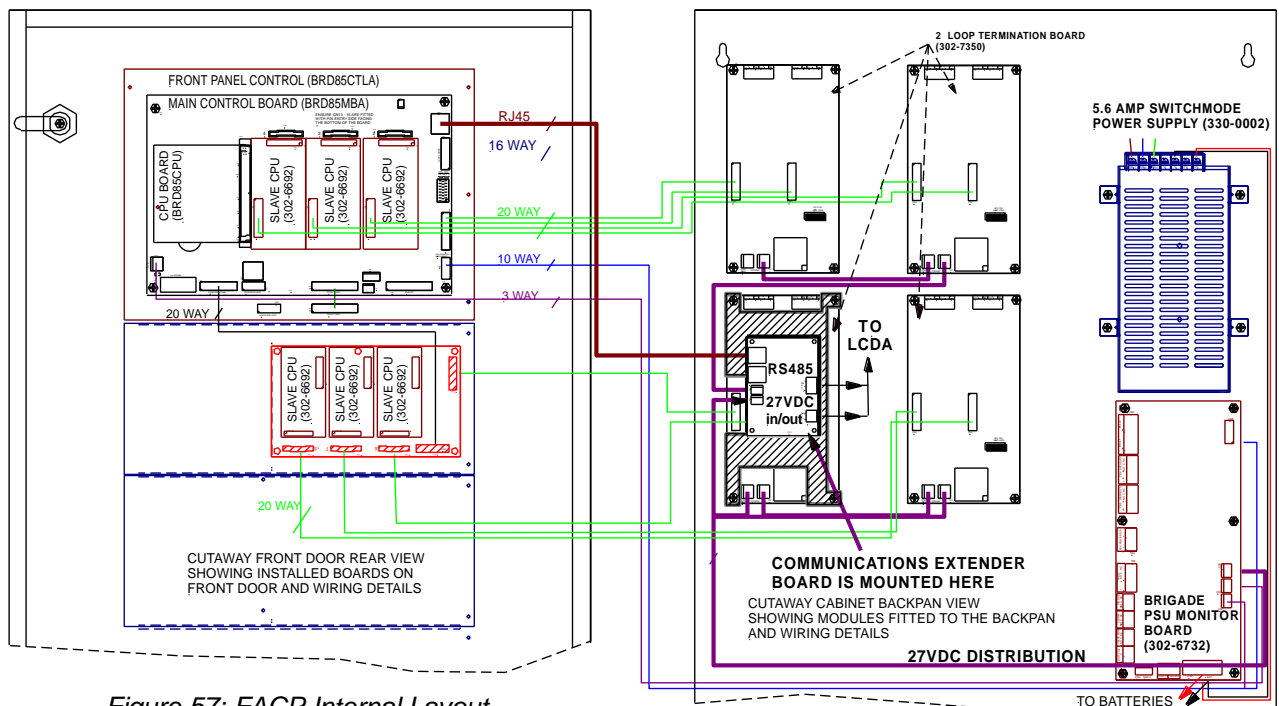
Figure 57: FACP Internal Layout

*Smart**Terminal*** is then connected to the FACP as shown below.
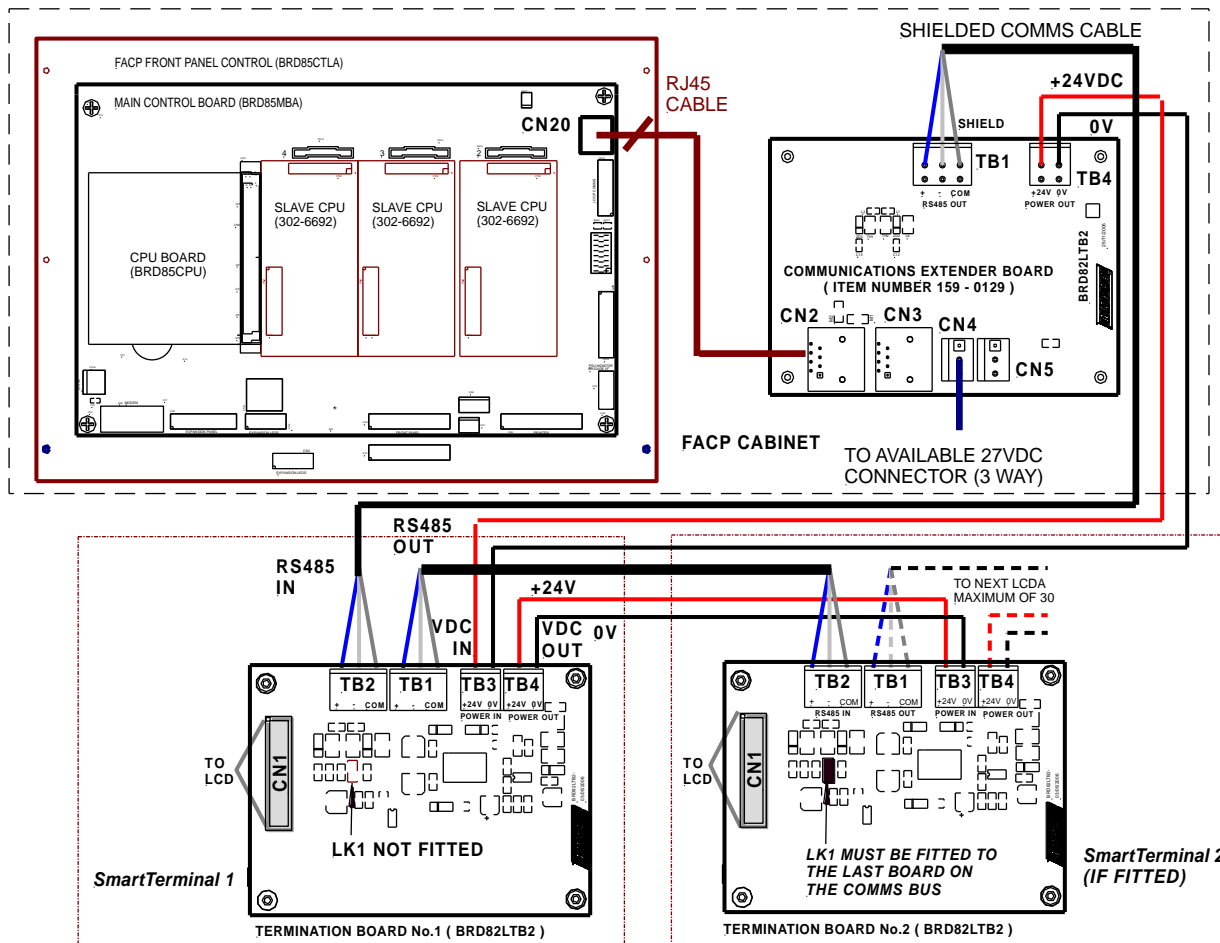
*Figure 58: Connecting Smart**Terminal/s** to the FACP*

8.8   Setting the Address

1.   Open the front door, locate the "CONFIG" button situated on the left hand side of the PCB and press for 3 seconds. The buzzer and "Config" LED will double beep and flash respectively to indicate that the Configuration mode has been entered. The LCD will now display the Configuration screen. This screen consists of the code version number, current address and four adjustment markers. These markers A-, A+, C-, and C+ are used to indicate the keys that adjust the address and LCD contrast.

2.   Use the "PREVIOUS (A-) and NEXT" (A+) keys to select the desired address. The default value for this address is 255 which is not a valid *Smart**Terminal*** address. The user must then select an address value from 1 to 30, ie the same address as that set in the FACP. The keys corresponding to C- (ACK) and C+ (RESET) are used in a similar manner to decrease and increase the LCD contrast level. There is audible feedback for all key presses.

3.   Once the address has been set press the "CONFIG" button again for 3 seconds and the screen will return to its default and the "DIANOSTIC" LED will return to a slow flash. This slow flash indicates *Smart**Terminal*** and the FACP are communicating normally ie the LED flashes if communications data is being received from the FACP.

✛ **Note:**   *If the address is not set within the time out period of approximately 75 seconds Smart**Terminal** will return to its normal state.*

8.9 Setting the *Smart*Terminal Controller Configuration in ConfigManager

Right click on the Controller icon and select "Edit Module Types" to bring up the following screen/s.
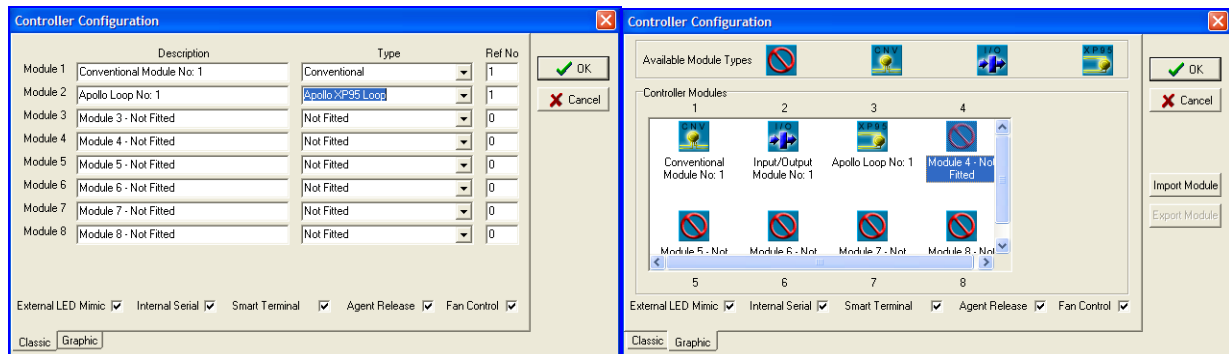
Figure 59: The Controller Edit / Add Module Types Screens

Click within the check box to "tick" the [Smart Terminal] check box and click OK. Double click on the Controller to open the Panel screen and the *Smart*Terminal tab should now be visible along with the other installed functions.

8.10 Setting the *Smart*Terminal Reporting Parameters in ConfigManager

To set the *Smart*Terminal parameters click on the *Smart*Terminal tab and the following screen will be displayed. Under the assigned *Smart*Terminal Card designator, 1 to 30, click in the Active box to change the "N" (NO not fitted) to "Y" (YES fitted) and then enter or type in a "Description". The description should be a name given to the *Smart*Terminal or its physical location. Double click in each of the "Report" boxes to display and set the, "Y" (Yes reports the parameter) and "N" (No does not report the parameter) "Alarms, Faults, Disables" parameters that *Smart*Terminal will display on each *Smart*Terminal at each location.

✛ **Note:**   *A maximum of 30 Smart Terminals can be used in the configuration of the FACP.*
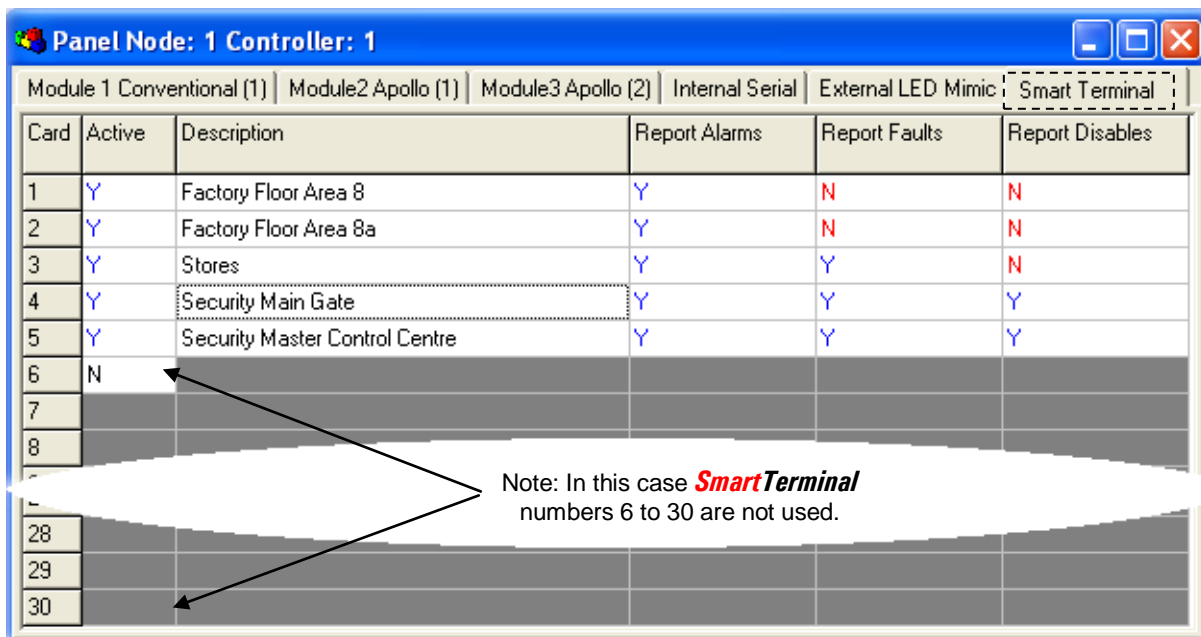
Figure 60: Example of Smart Terminal Configuration Settings Screen

In the above example **Card 1 & 2;**
  i.   are active
  ii.   are situated in the factory floor area 8
  iii.   will display all Alarms
  iv.   will *not* display any Faults, and
  v.   will *not* display any Disables

Card 3
  i.   is active
  ii.   is situated in the stores area
  iii.   will display all Alarms
  iv.   will display any Faults, and
  v.   will *not* display any Disables

Card 4 & 5
  i.   are active
  ii.   are situated in the security areas
  iii.   will display all Alarms
  iv.   will display any Faults, and
  v.   will display any Disables

8.11   *SmartTerminal Controls*
All controls, except for the Enable / Disable keyswitch, are of a momentary push button style.
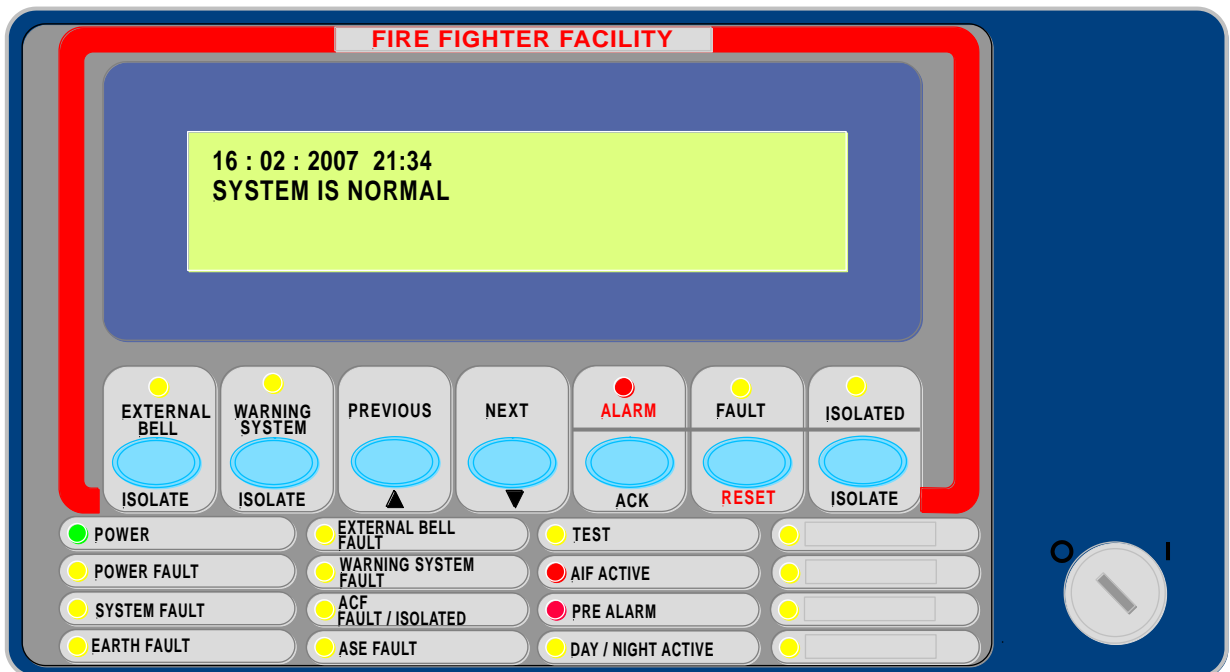
Figure 61: SmartTerminal Front Panel Layout

External Bell Isolate
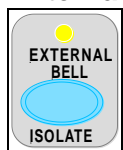
Press to isolate the External Bell output (associated LED illuminated).

Press again to re-enable the output (associated LED extinguished).

Active at access level 2.

Warning System Isolate
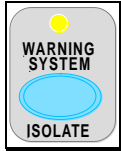
Press to isolate the Warning System output (associated LED illuminated).

Press again to re-enable the output (associated LED extinguished).

Active at access level 2 only.

Previous

Primary Function
Press to display the previously displayed LCD screen

Secondary Function
Set *SmartTerminal* address – A – (minus) decrement number

Active at access level 1 and 2

Next
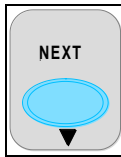
Primary Function
Press to display the next displayed LCD entry

Secondary Function
Set *SmartTerminal* address – A + (plus) increment number

Active at access level 1 and 2

Acknowledge
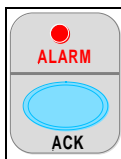
Acknowledges the alarm condition of the sensor or conventional zone that is currently displayed on the LCD.

If the key is held down for 3 seconds a lamp test is initiated. The Lamp Test illuminates all indicators, segments on the LCD and momentarily sounds the buzzer

Active at access level 1 and 2.

Reset
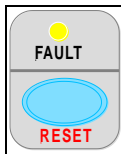
Resets the acknowledged alarm condition of the sensor or conventional zone currently displayed on the LCD

Active at access level 2 only.

Isolate
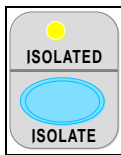
Isolates (or de-isolates) the sensor or conventional zone currently displayed on the LCD

Active at access level 2 only

Key Switch

Controls enable key switch. The *SmartTerminal* by default is in access level 1, and when the control enable key switch is in the ENABLED position, the *SmartTerminal* is in access level 2. Access level 2 is used to restrict access to certain controls.

Buzzer

The Buzzer is activated under the following conditions and can be silenced by pressing the Acknowledge (ACK) control locally or on the FACP.

- ✓   Alarm condition
- ✓   Devices – missing, out of calibration, wrong type, reporting an internal error
- ✓   Loops – short circuit or open circuit
- ✓   Monitored inputs and outputs on loop devices are in fault
- ✓   Sounders – missing, wrong type or reporting an internal error
- ✓   Modules within the panel – missing, wrong type or hardware error
- ✓   Main and / or secondary power supply fault

8.12 *SmartTerminal Indicators*

Introduction

The following section details the operation of the front panel indicators on the *SmartTerminal.*

Isolate
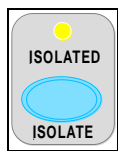
Indicator is illuminated when one or more device/s or conventional zones are isolated either at the *SmartTerminal* or the FACP.

Fault
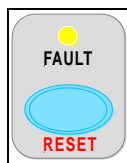
Indicator is illuminated when there is one or more faults on the system. Faults can be;
Devices – missing, out of calibration, wrong type, reporting an internal error
Loops – short circuit or open circuit
Monitored inputs and outputs on loop devices
Sounders – missing, wrong type or reporting an internal error
Modules within the panel – missing, wrong type or hardware error
Main and secondary supplies

Alarm

General fire alarm indicator. The LED will flash until all alarms have been acknowledged. Once Acknowledged the LED will remain steady until all alarms have been cleared by Reset.

Warning System
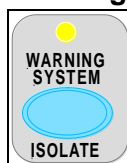
Illuminated when the Warning System output has been isolated either at the *SmartTerminal* or the FACP.

External Bell
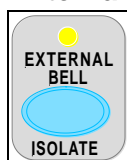
Illuminated when the External Bell output has been isolated either at the *SmartTerminal* or the FACP.

Power

Illuminated to show the presence of power. Flashes when mains have failed

Power Fault

| POWER FAULT |

Illuminated when there is a fault with the power supply. Fault can be no mains, high charger voltage, low battery voltage or missing/damaged battery

System Fault

| SYSTEM FAULT |

Illuminated when the FACP is unable to provide mandatory functions. Indicator is latched, until cleared by reset

Earth Fault

| EARTH FAULT |

Illuminated when there is an earth fault detected on the panel

External Bell Fault

| EXTERNAL BELL FAULT |

Illuminated if the External Bell output is in fault

Warning System Fault

| WARNING SYSTEM FAULT |
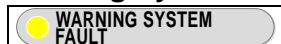
Illuminated is the Warning System output is in fault

ACF Fault / Isolated

| ACF FAULT / ISOLATED |

Illuminated steady if the ACF output has been disabled and flashes if the ACF output is in fault (open or short circuit). Isolate has priority over fault

ASE Fault

| ASE FAULT |
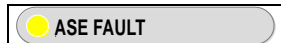
Illuminated when the ASE output is in fault

Test

| TEST |

Illuminated when the FACP is in the test mode. Possible tests are alarm, fault, walk, lamp and loop.

AIF Active

| AIF ACTIVE |

Illuminated when the AIF facility is active at the FACP

Pre - Alarm

| PRE ALARM |

Illuminated when one or more devices are in the pre-alarm condition and not disabled

Day / Night Active

| DAY / NIGHT ACTIVE |

Illuminated when day / night facility has been enabled on the FACP

Programmable

| |

Programmable 1 to 4 – *For future use*

9   LCD Screen Format

There are 3 events that can be reported and displayed by *SmartTerminal*. The types of event are;

    1.   Fire
    2.   Faults and
    3.   Disables.

The types of events are only associated with sensors and detectors hence faults associated with modules, loops O/C – S/C, power supplies and so forth are not reported on the LCD.

The *SmartTerminal* has front panel indicators for each type of event. When *SmartTerminal* is configured not to report a type of event and that event type is present (and the corresponding front panel indicator is illuminated on the *SmartTerminal*), then a standard information screen is displayed on the LCD stating the system is not normal and the operator should see the FACP.

Alarm

If configured the screen format for reporting loop / sensor / zone fire condition is:

LCD Line Number	Information
1	Device descriptor (up to 33 characters) Type Descriptor (up to 6 characters)
2	Loop address and zone number(Lxx Syyy.zz Zwww) current device status
3	Date and Time of occurrence (DD/MM/YYYY HH:MM:SS)
4	Alarm sequence number (Device Alarms nnn of nnn)

Fault

If configured the screen format for reporting loop / sensor / zone fault condition is:

LCD Line Number	Information
1	Device descriptor (up to 33 characters) Type Descriptor (up to 6 characters)
2	Loop address and zone number(Lxx Syyy.zz Zwww) current device status
3	Blank
4	Fault sequence number (Device Fault nnn of nnn)

Note: The fault types only relate to devices.

In the event of a loss of communications, for a period of greater than 15 seconds the *SmartTerminal* will default to the No Communications screen. The format for this screen is:

LCD Line Number	Information
1	
2	No Communications
3	
4	

Device Isolate / Disables

If configured the screen format for reporting loop / sensor / zone disable condition is:

LCD Line Number	Information
1	Device descriptor (up to 33 characters) Type Descriptor (up to 6 characters)
2	Loop address and zone number(Lxx Syyy.zz Zwww) current device status
3	Blank
4	Isolate / Disable sequence number (Device Fault nnn of nnn)

Pre-alarm

If configured the screen format for reporting loop / sensor / zone Pre-alarm condition is:

LCD Line Number	Information
1	Loop address and zone number(Lxx Syyy.zz Zwww)
2	Pre-alarm descriptor (up to 15 characters)
3	Line is left blank
4	Pre-alarm sequence number (Device Pre-alarms nnn of nnn)

Normal / Default

The format for reporting that everything is normal is:

LCD Line Number	Information
1	Current Date and Time (DD/MM/YYYY HH:MM)
2	System Status
3	Blank
4	Blank

The screen is only displayed when there are no alarms, fault or disables on the panel.

The default screen is only displayed when there are no device alarms, device faults or device disables present on the system. The highest priority current system status will be displayed and can be one of the following listed in order of highest to lowest priority:

1. "SYSTEM ALARM"
2. "SYSTEM PRE-ALARM"
3. "SYSTEM FAULT"
4. "SYSTEM ISOLATE"
5. "SYSTEM NORMAL"

Config

The Config screen displays the following

LCD Line Number	Information
1	VX.X (This is the code software version number)
2	Address
3	
4	A - A + C - C+

A - A + : adjusts the address 1 to 30, 30 being the maximum number of **SmartTerminals** that can be connected to the FACP, (default is 255 which is not a valid address).
The function keys perform the following;

           A – press "Previous"   A+ press "Next"

C - C+: decreases [-] and increases [+] the LCD contrast level.
The function keys perform the following;

           C – press "Silence Buzzer"   C+ press "Reset"

9.1 Trouble Shooting Chart

Problem	Solution
Normal Supply LED not illuminated	Check supply voltage it should be set to 27.2VDC. Nominal fault voltages are - Low = (<18VDC) High = (> 28VDC)
FACP Earth Fault LED illuminated	Check all input and output cabling and wiring assemblies for short to ground
FACP System Fault LED illuminated	Ensure correct panel configuration Check all connections for loose wiring
FACP Warning System Fault LED illuminated	Check correct E.O.L is fitted Check wiring is connected correctly
RS485 Communication Bus not working	Refer FACP LCD. This may identify where there is a break in the communication line Check the **SmartTerminal** Diagnostic Config LED is flashing. If not the FACP is not communicating with the **SmartTerminal**. Check the RS485 cabling. If flashing check the **SmartTerminals** address.

10   *Agent Release Control*

Agent Release control consists of a Agent Release Module, Termination Board and an optional Local Control Station.

10.1 Operation

Introduction
The Agent Release Module and Termination Board communicate with the FACP via the RS485 multi-drop bus.

The Local Control Station communicates only with the Termination Board via a separate RS485 bus. Up to 4 Local Control Stations can be connected to one termination board.

Agent discharge operates in two modes – automatic and manual. The manual mode is selected by pressing the Inhibit switch on any Local Control Station. To indicate the system is in manual the Inhibit LED will be illuminated. Pressing Inhibit again will toggle or return the mode to automatic and extinguish the Inhibit LED.

The " Agent Released " Pressure Switch (PSW) is wired to the PSW input on the Termination Board and is used to confirm that the agent has been released. The circuitry involved in this process can be configured to accept a normally open contact, normally closed contact, normally open mechanically operated (manual) or is ignored (not fitted) and is selected via FACP on-site programming. If the mechanical (manually operated) option is selected the module monitors the pressure switch input and provides notification the agent has been released manually, initiates an alarm and illuminates the "Agent Released " indicator.

Manual Mode
When the system is in manual mode, then;
- ☺   The Local Control Station Inhibit indicator is lit at the FACP and all Local Control Station's.
- ☺   The buzzer at all Local Control Stations will sound until the inhibit is released.
- ☺   The System Inoperative output is turned on.
- ☺   The Automatic discharge sequences are prevented from starting.
       If an automatic discharge sequence was underway and the inhibit switch is activated (switched to manual mode) the discharge sequence is aborted and the sequence is reset. This means the Stage 1 and Stage 2 outputs are switched off.

To manually discharge the agent the " Lock Off Valve " must be open and the Manual Release switch on the Local Control Station pressed. The manual discharge sequence is;
- ☺   Manual Activation indicator is lit on the FACP and Local Control Station.
- ☺   The FACP activates its brigade alarm output.
- ☺   Stage 1 outputs are switched to +24VDC. [FIRE ALARM sign illuminated, aural alarm sounds].
- ☺   Stage 2 outputs are switched to +24VDC. [FIRE ALARM, EVACUATE & DO NOT ENTER signs illuminated, aural alarm sounds].
- ☺   The optional pre-release start delay is activated (Selected via FACP on-site programming), time out and an ON Interlock signal will then operate the selected release circuitry.
- ☺   The Agent Discharge LED on the Agent Release Module and Local Control Station will illuminate when the Pressure Switch input on the Termination Board is activated.
- ☺   Activate gas-fired output.

✚   **Note:** The Interlock Input can be defaulted to the on position by placing a 10KΩ EOL termination resistor across the terminals TB2. 7 / 8 of the Agent Release Module and Local Control Station.

Auto Mode
Automatic discharge is when one or two zones going into alarm initiate the agent discharge sequence.

✚   **Note:** A "manual release" can still be initiated in "auto mode" but the LCS "Inhibit" control **WILL NOT** inhibit / abort the agent release sequence.

Single Zone Activation, the following discharge sequence is executed;
- ◎ Automatic Activation LED is illuminated on the Agent Release Module and Local Control Station.
- ◎ Stage 1 outputs are switched to +24VDC. [FIRE ALARM sign illuminated, aural alarm sounds].
- ◎ Stage 2 outputs are switched to +24VDC. [FIRE ALARM, EVACUATE & DO NOT ENTER signs illuminated, aural alarm sounds].
- ◎ Optional pre-release delay is started (Selected via FACP on-site programming).
- ◎ The delay times out and if the Interlock signal is ON, the selected circuit will activate.
- ◎ The Pressure Switch field input on the Termination Board is activated and the Agent Discharge LED on the Agent Release Module and Local Control Station will be illuminated.
- ◎ Activate gas-fired output.

Dual Zone Activation, if the <u>first zone goes into alarm</u> the following steps are initiated;
- ◎ The automatic activation LED on the Agent Release Module and Local Control Station will flash.
- ◎ Stage 1 outputs are switch to –24VDC. [FIRE ALARM sign illuminated, aural alarm sounds].

When the <u>second zone goes into alarm</u>, then the following steps occur;
- ◎ Automatic activation LED goes steady.
- ◎ Stage 1 outputs are switched to +24VDC. [FIRE ALARM & EVACUATE signs illuminated, aural alarm sounds].
- ◎ Stage 2 outputs are switched to +24VDC. [DO NOT ENTER sign illuminated].
- ◎ Optional pre-release delay commences (Selected via FACP on-site programming).
- ◎ The delay times out and if the Interlock signal is on the selected circuit will activate.
- ◎ The Pressure Switch field input on the Termination Board is activated and the Agent discharge LED on the Agent Release Module and Local Control Station will be illuminated.
- ◎ Activate gas-fired relay output.

Service Switch
The service switch is situated on the Agent Release Module when activated causes the following;
- ◎ Electrically isolates the activation circuitry from the agent release device.
- ◎ Operates the System Inoperative output.

✛   **Note:** The service switch is **<u>NOT</u>** overridden by a manual discharge.

Lock-Off Valve
When the manual lock-off valve is operated;
- ◎ The agent is blocked from reaching the release valve.
- ◎ The lock-off valve inhibit indicator LED's on the Agent Release Module and Local Control Station are illuminated.
- ◎ The system inoperative output operates.

Fault Monitoring
Fault conditions are initiated by:
- ◎ The Pressure Switch monitoring circuit.
- ◎ The Low Pressure Switch monitoring circuit.
- ◎ The Lock-off Valve monitoring circuit.
- ◎ Activation circuitry.
- ◎ Stage 1 outputs. (Aural & visual discharge alarms).
- ◎ Stage 2 outputs. (Aural & visual discharge alarms).
- ◎ A Zone Fault.
- ◎ A Fault on the interlock input.
- ◎ A Fault with a LCS.

✛   **Note #1:** The common fault indicator on the Agent Release Module and Local Control Station is illuminated for any Fault condition.

Note #2: For a pressure switch fault, low pressure switch fault, lock-off valve fault, stage 1 output fault, stage 2 output fault and interlock fault, the FACP will signal the brigade.

Note #3: When there is a fault in the activation circuit or in the trigger zones, in addition to the above, the system inoperative output is operated.

Note #4: The FACP fault buzzer will sound for all faults.

Note #5: The FACP will report the type of fault on the LCD.

Isolation

If a trigger zone is isolated at the FACP the trigger zone isolated indicator at the Agent Release Module and Local Control Station is illuminated, and the system inoperative output is operated.

System Inoperative Output

The system inoperative output is switched to +24VDC under the following conditions;

- ◎ Operation of the Service Switch.
- ◎ A Fault in the selected trigger circuit.
- ◎ Operation of the Lock-off valve.
- ◎ Operation of the Inhibit at an Local Control Station.
- ◎ A Fault in any of the activation zones.
- ◎ If any of the activation zones are isolated.

Manual Mechanical Release of the Agent

With agent release systems, a manual mechanical means can be provided to release the agent.

If the pressure switch is activated (indicating that the agent has been released), and the agent release module has not activated the selected activation circuit, then the following will occur:

- ◎ Stage 1 output is switched to +24VDC and stage 1 relay is output closed
- ◎ Stage 2 output is switched to +24VDC and stage 2 relay output is closed
- ◎ Light the agent release led on the ACC and LCSs
- ◎ Activate gas-fired relay output

Monitoring of the Pressure Switch

Due to the requirements of Manual Mechanical Release of the Agent, the pressure switch input conveys two pieces of information:

1. When the pressure switch input is active, it signals that the agent has been released. The release can be as a result of the agent release module or due to a manual mechanical release.

2. When the pressure switch is not active, it signals that there is a full bottle of agent available to be discharged.

In order for the agent release module to respond to a manual mechanical release, the pressure switch must have been previously not active, to signify that a full bottle of agent is available

10.2 Agent Release Module BRD25ARB –A

The Agent Release Module controls and monitors all the requirements for agent release and carries the slide in label for identification of the agent and application area.

Figure 62: Front Panel Layout
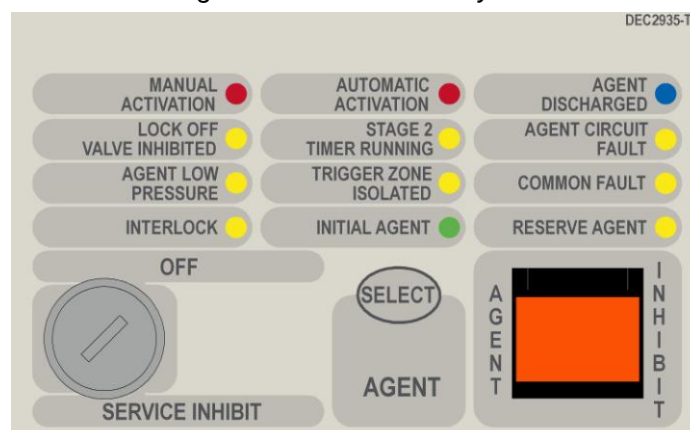
10.3 Controlled Access

Service Inhibit When activated, the module goes into service mode, which results in the selected agent activation circuit being electrically isolated. Control to be secured from unauthorised use, therefore a key-switch is required. Key is only removable in the off position.
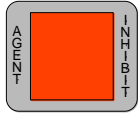
Lifting the switch cover and pressing the push button places the system in manual mode – which prevents an automatic release sequence from starting, and sounds the buzzer at the Local Control Station(s). This two action safety feature prevents any accidental operation of the control and should not be disabled.

When activated, causes the selected agent to toggle between Initial and Reserve. Indicators show which agent has been selected.

Agent Release Module PCB Layout

The PCB is fitted with two 2 x RJ45 connectors CN6 & 7 for power (27VDC) and communications (RS485) for communications between the Agent Release Module and the FACP Main Control Board.
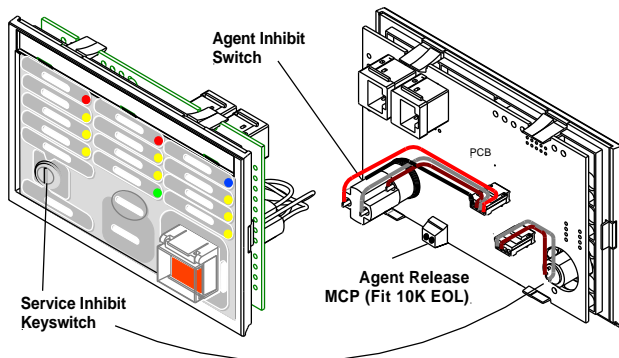
Figure 63: Exploded View

Quiescent Current: 28.5mA
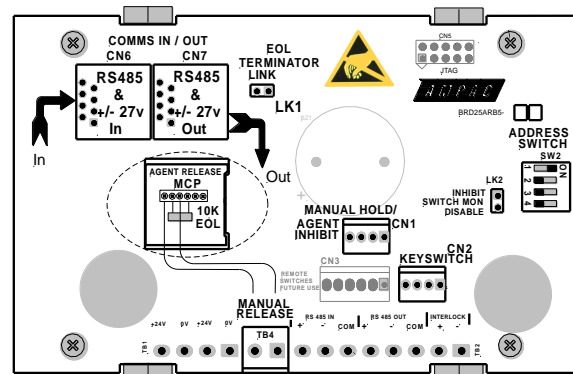
Figure 64: Underside of the Module PCB

✛   **Note**: If the keyswitch is not used CN2 will carry a link so as to enable the panel.

10.4   Local Control Station

The Local Control Station is supplied fitted into enclosure and has the same indicators and "Agent Inhibit switch as the Agent Release Card but no Agent Select button or Service Inhibit keyswitch (this is replaced by the Inhibit push button).

The Comms line is RS485 and is cabled to the Agent Termination Board.

The Interlock is a monitored input with 10KΩ EOL. This input is used to determine if air conditioning dampers and doors are closed but can be defaulted to the "ON" condition by terminating the input with a 2K2Ω EOL.

☞   **Note**: *Typically the agent is not discharged until all dampers / doors are closed.*

LCS MCP Control

Lifting the cover and pressing the MCP starts the manual agent release sequence. This two action safety feature prevents any accidental operation of the control and should not be disabled.

Buzzer (located at the FACP)
    i.   Buzzer sounds;
    ii.   under all fault conditions and can be silenced by using the FACP buzzer silence control.
    iii.   when the LCS Inhibit control is activated – after 8 hours – treated as an isolate condition.
    iv.   when the service inhibit is activated - after 8 hours – treated as an isolate condition

Buzzer Located at the LCS - To comply with AS4214 – the buzzer at the LCS sounds when the automatic discharge of the agent has been inhibited via the agent inhibit push button located at the ACC or LCS(s). In some installations, it is preferred not to sound the buzzer when the automatic discharge of the agent has been inhibited because workers have a set exit procedure which includes checking the agent inhibit condition has been removed. In order to meet both requirements, the continual sounding of the buzzer when the automatic discharge of the agent has been inhibited is configurable through the "Programming" menu at the FACP. This only affects the buzzer at the LCS(s).

LCS Local Control Panel Inhibit

**TO INHIBIT AUTOMATIC AGENT RELEASE
LIFT COVER AND PRESS BUTTON** ➡️   PRESS AND HOLD UNTIL THE LAMP IS ILLUMINATED
which indicates the inhibit is activated at the ARC or any of the LCSs. To disable the "Inhibit" PRESS AND HOLD again until the lamp is no longer illuminated.

Local Control Station Interconnections
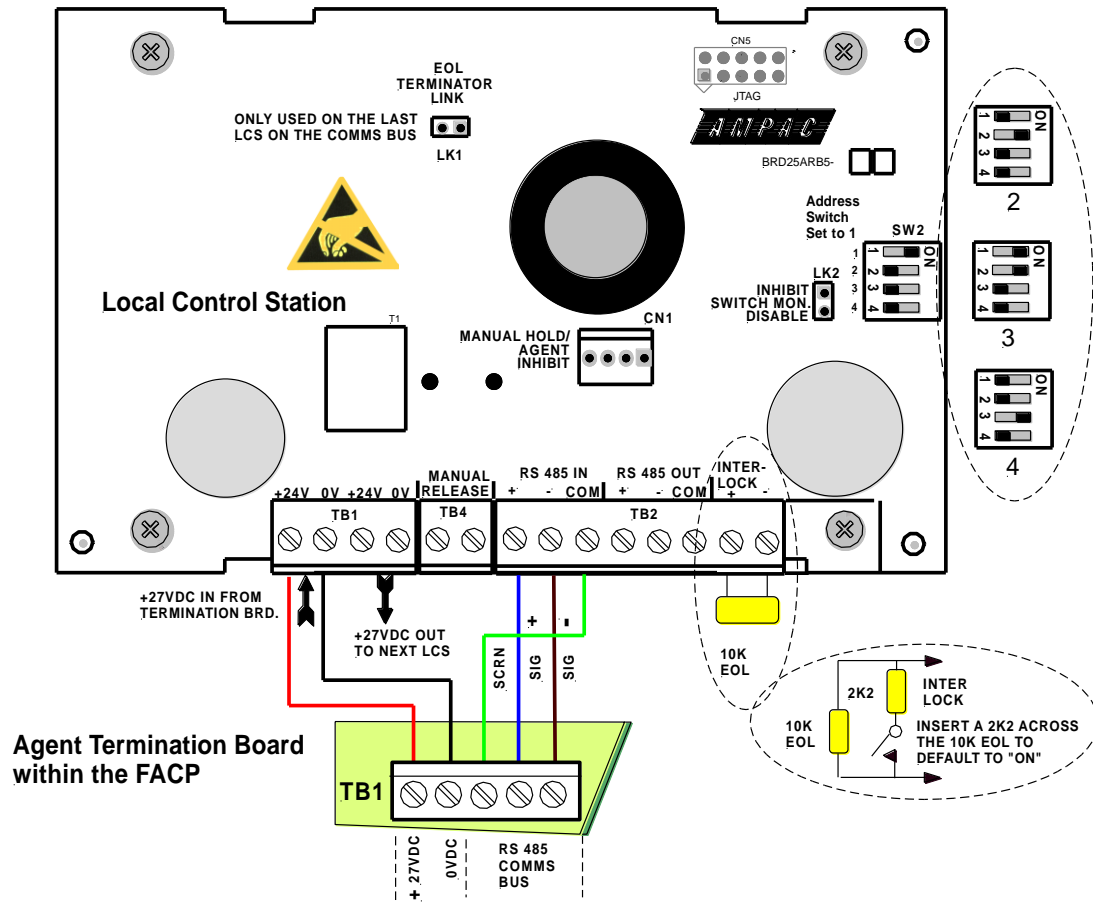
LCS Interconnections

Quiescent Current: 18.5mA

The LCS is fitted with a 3 terminal strips TB1, 2 & 3

Pin	Assignment	
TB1 1 & 3	+27VDC	
2 & 4	0VDC	
TB4 1& 2	Manual Release	
TB2 1 & 4	RS485 + In/Out	The Comms line is RS485 and supports communications between the local control station and the termination board.
2 & 5	RS485 – In/out	
3 & 6	RS485 Com	
7	Interlock+	The Interlock is a supervised input which is used to determine if air conditioning dampers and doors are closed. Typically the agent is not released until all dampers and doors have been closed.
8	Interlock-	
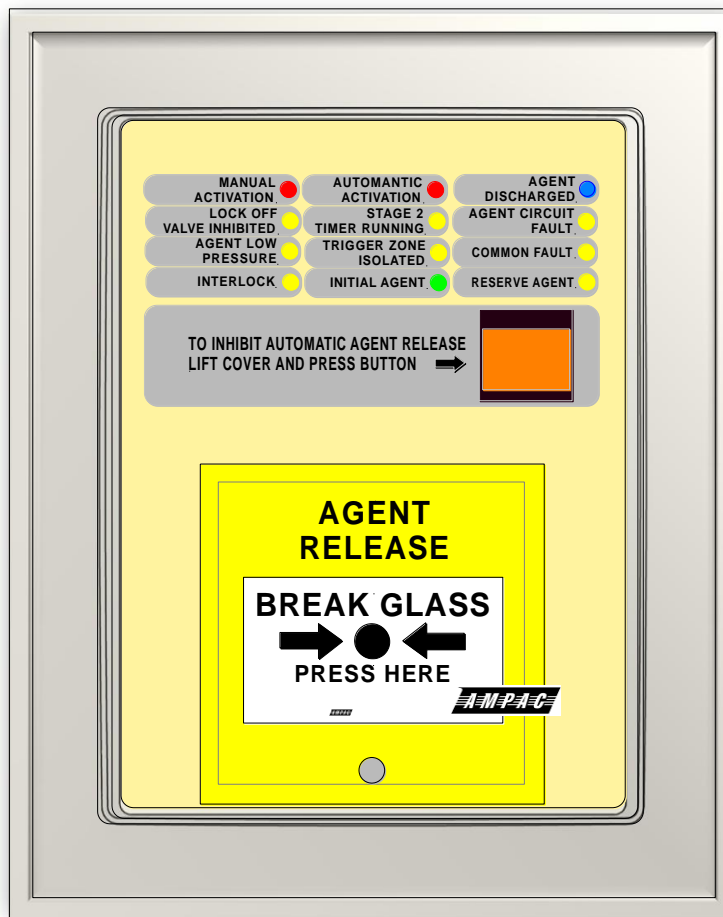
Figure 65: Local Control Station Layout

Common Agent Release & LCS Indicators

There are 12 indicators on both the Agent Release Module and Local Control Station. They are;

MANUAL ACTIVATION ● **– Red** Illuminated when a manual release sequence has commenced. Manual release sequence can only be started by activating the manual release at the ACC or LCS.
Indicator is extinguished by initiating a "RESET" on the FACP.

AUTOMATIC ACTIVATION ● **– Red** Illuminated when an automatic release sequence has commenced. This occurs when the selected zone(s) on the FACP have gone into alarm. For dual zones, the indicator should flash when the first zone goes into alarm, and steady when the second zone goes into alarm.
Indicator is extinguished by activating RESET on the FACP.

AGENT DISCHARGED ● **– Blue** Illuminated when the pressure switch indicates the agent has been released. For Pyrogen, feedback is from the thermal switch. If there is no pressure switch fitted, the indicator will be illuminated immediately the agent release signal is activated (Selected via FACP on-site programming – refer to relevant FACP Manual). Indicator is extinguished by activating RESET on the FACP.

LOCK OFF VALVE INHIBITED ● **– Yellow** Illuminated when the lock-off valve has been activated.

STAGE 2 TIMER RUNNING ● **– Yellow Stage 2 Timer Running** Illuminated when the pre-discharge delay timer is running. Indicator is extinguished by activating the RESET control on the FACP.

AGENT CIRCUIT FAULT ● **– Yellow** Illuminated when there is a fault on the monitored Main or Reserve activation circuits. Eg S/C or O/C.

AGENT LOW PRESSURE 🟡 **– Yellow** Illuminated when the low pressure switch is activated. This indicates a leakage at the agent cylinder. The low pressure switch is a separate switch. It is not the same pressure switch as used for the agent discharged indicator.

TRIGGER ZONE ISOLATED 🟡 **– Yellow** Illuminated when any of the programmed trigger zones on the FACP are isolated.

COMMON FAULT 🟡 **– Yellow** Illuminated under the following fault conditions;
  ➢ pressure switch monitoring fault,
  ➢ low pressure switch monitoring fault,
  ➢ lock-off valve monitoring fault,
  ➢ activation circuit fault,
  ➢ stage 1 output fault,
  ➢ stage 2 output fault,
  ➢ LCS fault (missing or extra),
  ➢ trigger zone(s) fault,
  ➢ low agent pressure and interlock fault.

INTERLOCK 🟡 **– Yellow** Illuminated when the interlock input (eg from dampers, doors etc) is off during the discharge sequence – meaning the dampers, doors etc are not closed as they should be or a fault exists. The "Interlock" is overridden after 10 seconds and the agent is released

➕ **Note:** *The Interlock is a Monitored Input and can be defaulted to the ON position by terminating the input (TB2 7 & 8) into a 2.2KΩ EOL resistor.*

INITIAL AGENT 🟢 **– Green** Illuminated when the " Initial" Agent is selected.

RESERVE AGENT 🟡 **– Yellow** Illuminated when the " Reserve " Agent is selected.

10.5 *Agent Release Termination Board BRD25ATB*
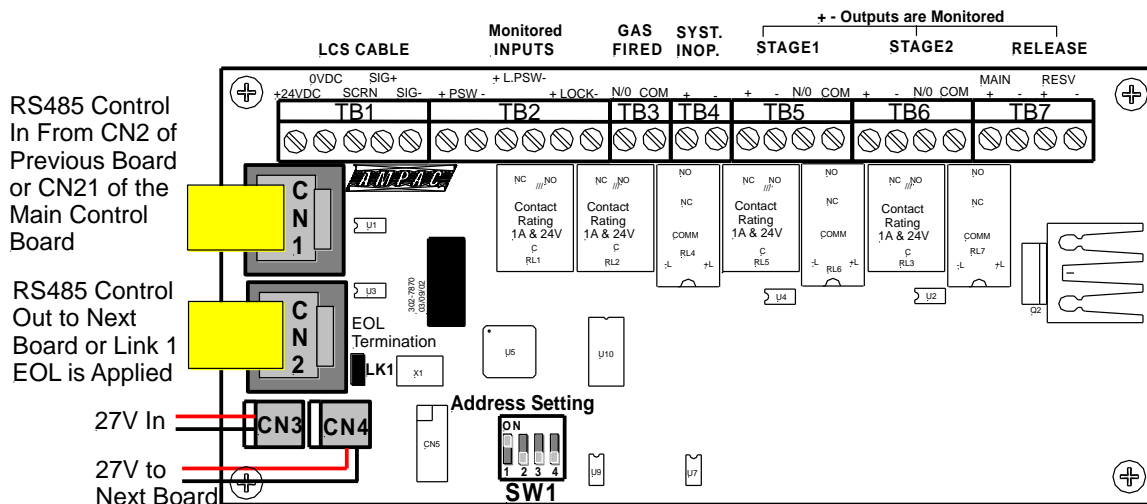
Figure 66: Agent Termination Board PCB Layout

The Agent Termination Board interfaces to;

1. The FACP via CN1, CN2 continuing the RS485 communications bus if required. LK1 is inserted if this is the last backpan board on the bus.

2. LCS's (up to 4) via TB1. LK1 is inserted in the last board in the RS485 Bus

3.   **Monitored Inputs:** via TB2. (EOL Resistance 22KΩ, Series Resistance 4K7Ω)
   (a)   Pressure Switch (**PSW**) agent released
   (b)   Low Pressure Switch (**LPSW**) agent storage cylinder pressure has dropped to a pre-determined level; and
   (c)   Inter**lock**, the manual lock-off valve has been operated.

4.   **Gas Fired:** Output via RL2 N/O contacts rated at 1A @ 24VDC wired to TB3. Used to indicate to other monitoring devices the agent has been released.

5.   **Sys**tem **Inop**erative: via RL1 N/O contacts rated at 1A @ 24VDC wired to TB4. Used to warn by way of signage / audible alarm and/or monitoring that the system is inoperative.

6.   **Stage 1:** Output; initiates the visual and audible Fire Alarm and Evacuate warnings.
   (a)   Monitored; via RL4 C/O contacts wired to TB5 1 & 2 (EOL required 10KΩ) and
   (b)   un-monitored; via RL5 N/O contacts wired to TB5 3 & 4.

7.   **Stage 2:** output; initiates the visual and audible Fire Alarm and Do No Enter warnings
   (a)   Monitored; via RL6 C/O contacts wired to TB6 1 &2; (EOL required is 10KΩ) and
   (b)   Un-monitored; via RL3 N/O contacts wired to TB6 3 & 4

8.   **Release: Main** actuating circuit, monitored (10KΩ EOL required) via TB7 1 & 2 (2A current limited),
   Release: Reserve actuating circuit, monitored (10KΩ EOL required) via TB7 3 & 4 (2A current limited)
   (a)   To Pyrogen Igniter (max of 10)
   (b)   Metron Igniters (*max of 10 – a series 2watt 10Ω resister must be added to the circuit*)
   (c)   Solenoid valve (max current of 2 amps & 27VDC)

10.6 Interface Wiring

Monitored Inputs TB2 1 & 2
Pyrogen,

This input relies on a thermal fuse used in conjunction with 22KΩ EOL and 4K7Ω series resistors. The type of agent release mechanism has to be set in the Programming Menu for the input to function as per the manufacturers specifications and be in accordance with the relevant Standard.
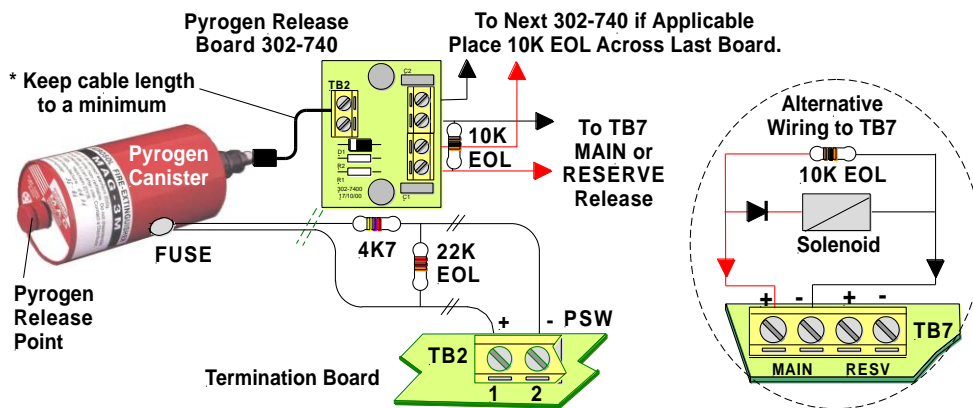
Figure 67: Pyrogen Wiring

Solenoid & Metron

This input relies on N/O or N/C relay contacts used in conjunction with 22KΩ EOL and 4K7Ω series resistors. The type of agent release mechanism and contacts used has to be set in the Programming Menu for the input to function as per the manufacturers specifications and be in accordance with the relevant Standard.
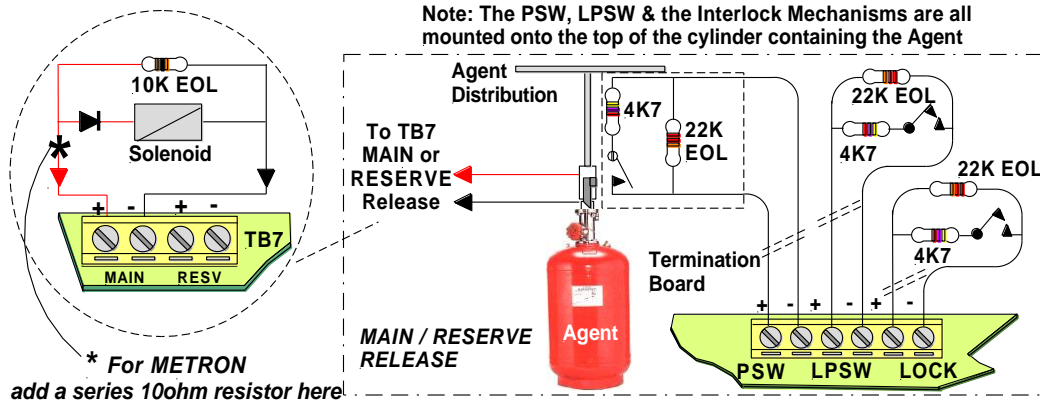
Figure 68: Solenoid, Metron PSW, LPSW and "LOCK" Wiring

LPSW & Lock

These inputs are also monitored and should be wired as shown above
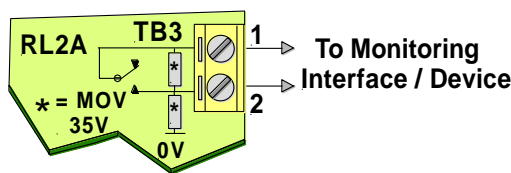
Figure 69: Gas Fired Wiring   *Figure 70: System Inoperative Wiring*
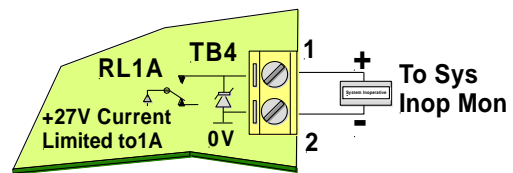
As can be seen from above the;

Gas Fired Output can be wired to any interfacing or 1A monitoring circuit that requires a closed relay contact to indicate a change of state. This could be a relay or a solid state device.

System Inoperative Outputs 27V @ 1A to supply interfacing, signage and aural alarms to indicate the system has been taken out of service or has developed a fault.

Stage 1, Stage 2
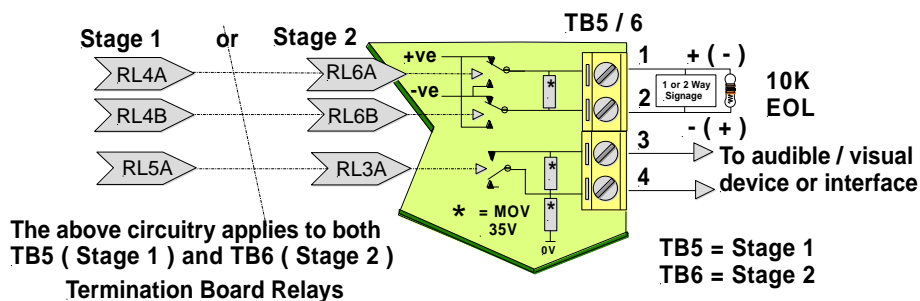
Figure 71: Stage 1 and 2 Wiring

10.7 *Warning Signs*

Description

The warning signs are driven by a 2 wire system and may be configured for single or dual stage operation.

An on-board buzzer provides an audible warning which may be disabled by removing JP3.

External evacuation devices, eg sounders may be connected to TB3 of the input termination board. An external mute push-button (N/O contacts) may also be connected to Term 3 on the warning sign PCB to enable the user to silence the internal buzzer and evacuation device. Inserting JP4 disables this function.

Enclosures

The **IP50** is a metal enclosure. The facia surround is fitted by removing the screw on the left hand side of the enclosure and pulling it away to the left. The facia sign is fitted in place and the tabs bent over to hold it in place. Two holes in the backpan of the chassis allow for mounting.

The **IP65** ABS enclosure has 10 screws, tightened evenly but not over tightened, hold the facia in place. Do not over tighten. 4 holes in the backpan allow for mounting.

Specifications:

- Operational Voltage 28VDC
- Power Consumption Continuous .... At 24VDC 55mA   Stage 1
   .... At 24VDC 140mA   Stage 2 (100mA Muted)
- IP Ratings .... IP50 (Dim: 190H x 315W x 73D mm)
   IP65 (Dim: 200H x 295W x 65D mm)
- Environmental .... -10˚C to +55˚C Dry heat
   .... +40˚C @ 0 to 93% Relative Humidity

Installation

1. Remove the backpan from the enclosure to ensure it is not damaged while mounting the enclosure.
2. Bring the cabling into the enclosure by removing the knockouts most appropriate for the installation.
3. Mount the enclosure, remount thebackpan, set the configuration and then cable as per the following diagram.
4. ***ENSURE THE AGENT IS ISOLATED*** and test from the Agent Release Module.

Cabling
Term 3 (Buzzer Mute)
BUZZER MUTE   Normally Open [N/O] Push Button Switch (Optional)

INPUT

Term 4 (Single pair polarity reversing / 2 Stage Input)	
Stage 1	0V – 24VDC
Stage 2	24VDC – 0V

Configuration – Jumper Settings

JP 1 (Continuous / Flashing)		**JP 2** (Single / Dual Stage)	
1-2 Continuous	LED's Permanently ON	1-2 Single Stage	Full sign on for Stage 1&2
2-3 Flashing *(DEFAULT)*	LED's flashing at 1.5Hz	2-3 Dual Stage (*DEFAULT*)	Half sign on for Stage 1
			Full sign on for Stage 2

JP 3 (Enable Buzzer)		**JP 4** (Disable External Mute)	
1-2 ENABLE BUZZER *(DEFAULT)*	Buzzer activates for both Stage 1 & 2	1-2 EXTERNAL MUTE *(DEFAULT)*	Disable external mute for internal Buzzer

JP 5 (Enable External Evacuation Device) [*not used*]
1-2 ENABLE EXTERNAL EVACUATION   External evacuation device will activate on Stage 1 & 2
DEVICE *(DEFAULT)*   with the tone dependent on the input polarity
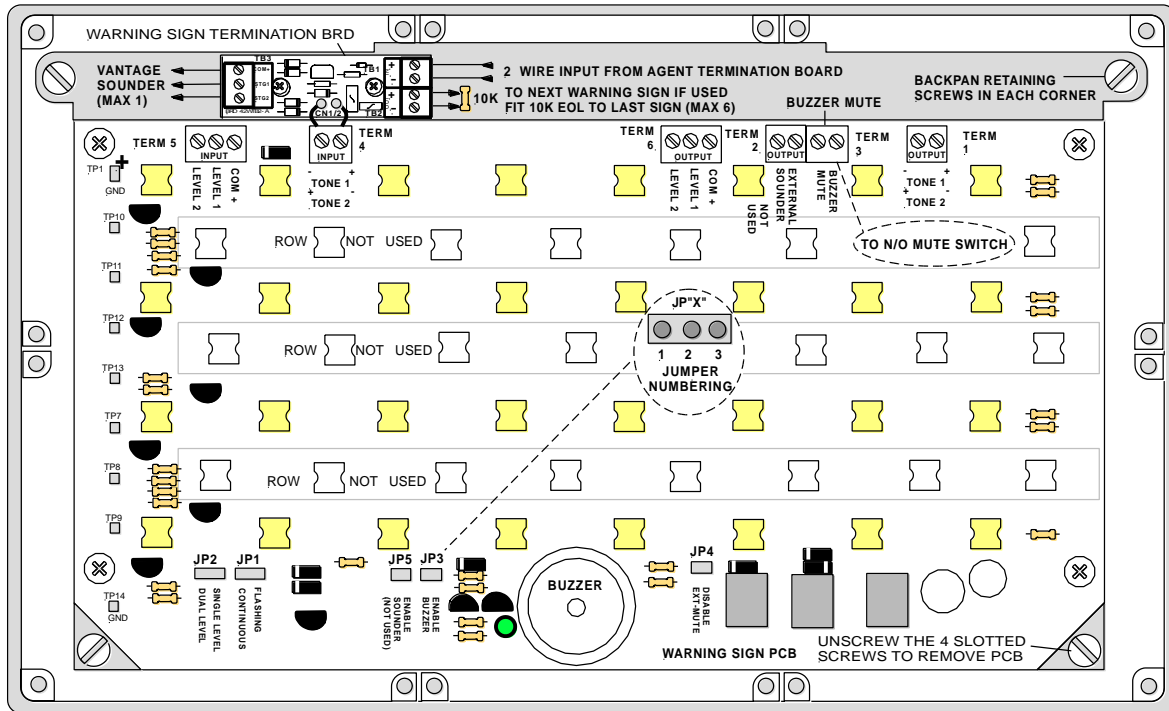
Figure 72: Warning Sign PCB Layout and Cabling
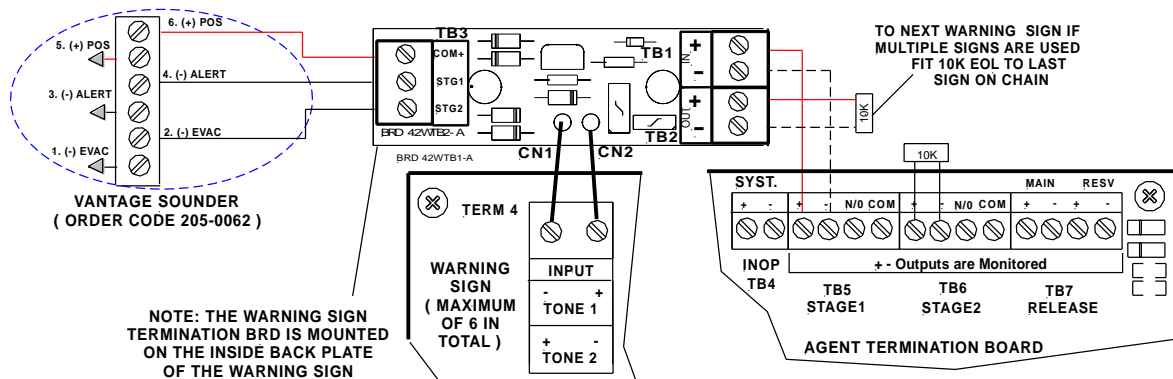
Figure 73: 2 Wire Cabling from the Agent Termination Board to the Warning Sign/s & Evacuation Device/s

11   *Occupant Warning Systems*

The EV20, EV40, EV60 and EV120 are compact single zone occupant warning devices that when triggered produce *Alert* and *Evacuation* signals to meet the requirements of AS1670.4.

EV20
At the heart of an EV20 single zone occupant warning system is a microprocessor that generates the alert and evacuation signals, controls timing and the input / output.

If an FACP warning system input is received when the rotary switch is in the AUTO position the EV20 will begin to output the "Alert" signal for a duration determined by the setting of the 4 way DIL switch SW1. The set duration is termed the changeover timeout and ranges from 0 seconds to a maximum of 300 seconds. If the time out is set to 0 seconds then the alert signal is bypassed and the evacuation signal commences immediately. The operator can manually stop the sequence by turning the rotary switch to the ISOLATE position.

IC4 performs the task of an audio amplifier with TX1 providing the impedance matching to a 100 volt speaker line. The alert and evacuation signal output Stages are set by adjusting RV1 and RV2 respectively.

Short or open circuit speaker faults are detected by the fault monitoring circuitry and will result in the illumination of the FAULT indicator mounted on the front panel control module.

Public Address
A microphone and pre-amplifier (Order Code 222-0007) is used to provide the public address capabilities.

EV20 Verbal Messaging
An optional verbal messaging PCB (Order Code 222-0026) is available and is mounted directly onto the main board.

EV40
At the heart of an EV40 single zone occupant warning system is a microprocessor that generates the alert and evacuation signals, controls timing and the input / output.

If an FACP warning system input is received when the rotary switch is in the AUTO position the EV40 will begin to output the "Alert" signal for a duration determined by the setting of the 4 way DIL switch. The set duration is termed the changeover timeout and ranges from 0 seconds to a maximum of 540 seconds. If the time out is set to 0 seconds then the alert signal is bypassed and the evacuation signal commences immediately. The operator can manually stop the signal sequence by turning the rotary switch to the ISOLATE position.

Amplifier 1 & 2 provides 40watts of audio output at 8 ohms which feeds TX1 to provide the impedance matching to a 100 volt speaker line. The "ALERT" and "EVAC" Stage controls adjust the output Stage of each set of signals.

Short or open circuit speaker faults are detected by the fault monitoring circuitry and will result in the illumination of the FAULT indicator mounted on the front panel control module and "SPEAKER SHORT" (red) or "SPEAKER OPEN" (yellow) LEDs on the main board.

Public Address
A microphone (Order Code 294-0001) is used to provide the public address capabilities.

EV40 Verbal Messaging
An optional verbal messaging PCB (Order Code 222-0013) is available and is mounted directly onto the main board.

EV20 / 40 Verbal Message
Alert / Evacuation – "*Emergency Evacuate Now*"

Control Module

When the control switch is in;

AUTOMATIC - occupant warning signals and if applicable verbal messaging is under the control of the microprocessor and outputted to the speaker system when it receives a "warning system" signal from the FACP.

ISOLATE – the occupant warning system is isolated from the FACP "warning system" signal and even if the signal is present there will be no output.

PUBLIC ADDRESS – the occupant warning system can be used locally as a PA system.

MANUAL EVACUATION – the occupant warning signal/s will be transmitted over the system.

Indicators

⬭**LINE FAULT** - In the event of an open or short circuit speaker line the LINE FAULT indicator (yellow) will be illuminated

⬭ **ISOLATED** - the LED will be illuminated (yellow) when the warning system is isolated

Signal Structures

ALERT SIGNAL

Australian AS1670.4 Alert Signal
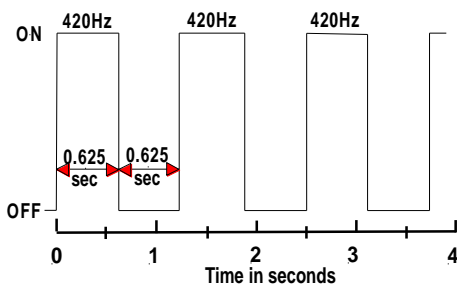
AS1670.4:
420Hz pulsed on for 0.625 seconds at 1.25 second intervals

EVACUATION SIGNAL

Australian AS1670.4 Evacuate Signal
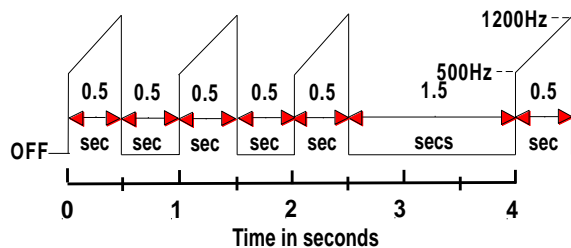
AS1670.4:
0.5 second sweep signal 500-1200 Hz for 2.5 seconds at 4 second intervals

EVACUATE SIGNAL WITH VERBAL MESSAGE
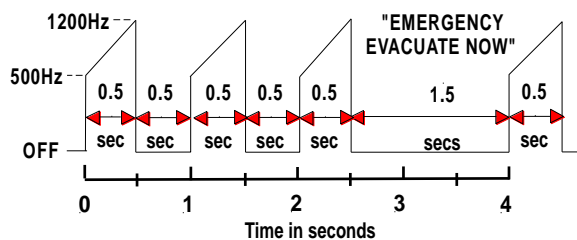
Figure 74: Alert & Evacuation Signal Structures

EV20 Cabling
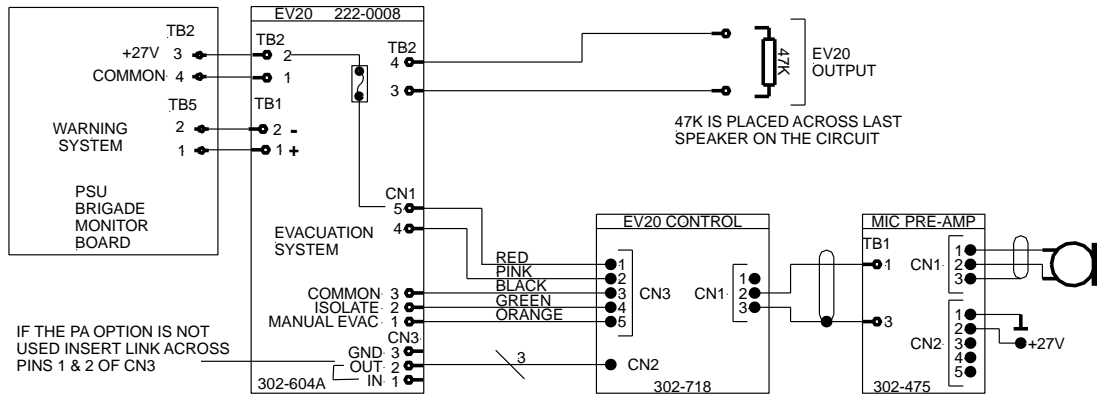
Figure 75: Typical EV20 & PA Wiring

Note: "WARNING SYSTEM" is a monitored O/P. The EOL is on board the EV20 and is effectively made to be O/C (at TB1) during an EV20 fault condition. This produces the fault condition at the FACP.
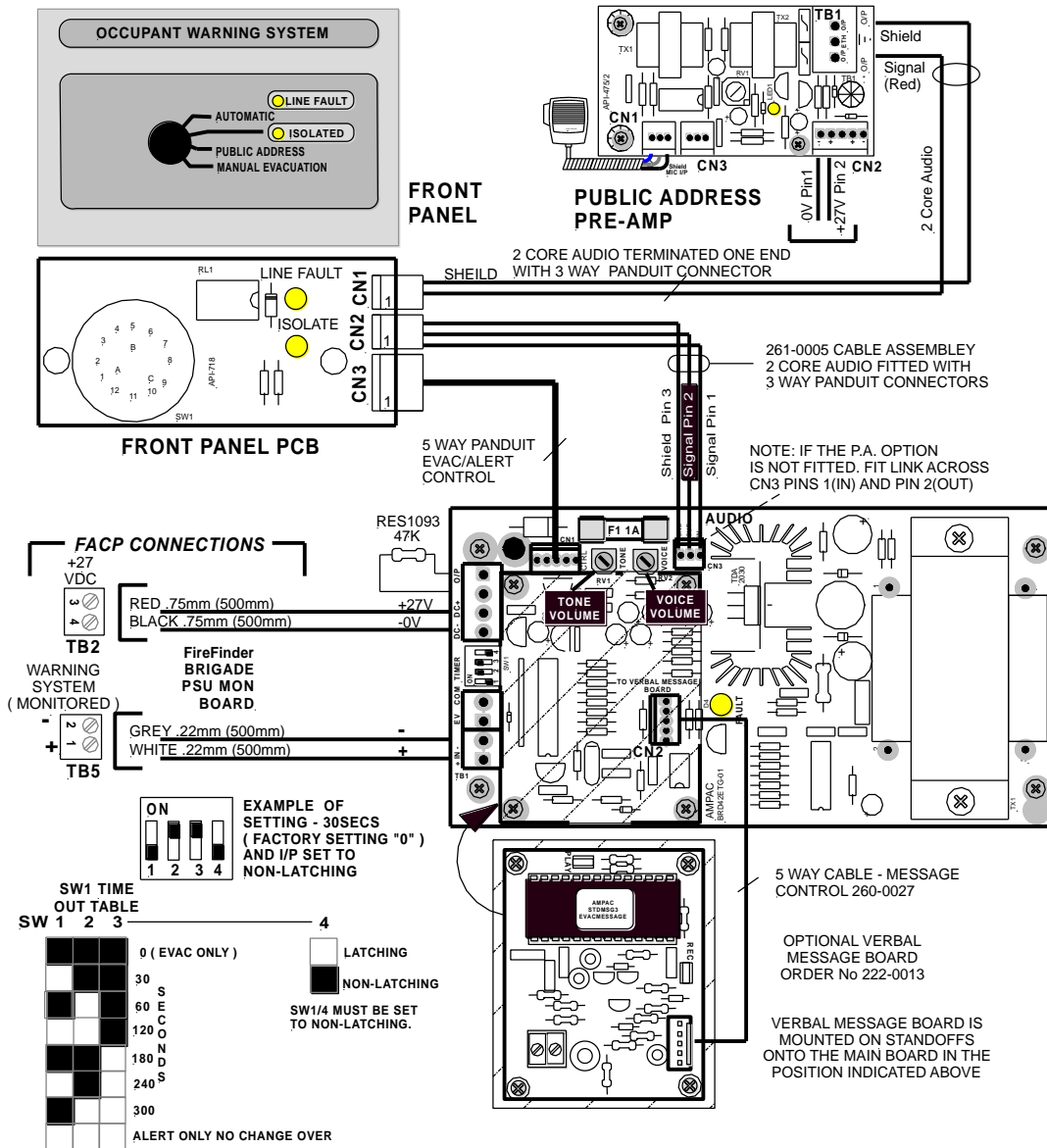
Figure 76: EV20 Wiring to Control Module, FACP Cabling and Time Out Table

EV40 Cabling

NOTE 1: "WARNING SYSTEM" IS A MONITORED FACP O/P. THE EOL IS ONBOARD THE EV40 AND IS EFFECTIVELY MADE TO BE O/C (AT TB1) DURING AN EV40 FAULT CONDITION. THIS PRODUCES THE FAULT INDICATION AT THE FACP

NOTE 2: IF NO SPEAKER MONITORING IS REQUIRED PLACE A 22K RESISTOR ACROSS TB4 TERMINALS 1 & 2 TO DISABLE OPEN CIRCUIT LED
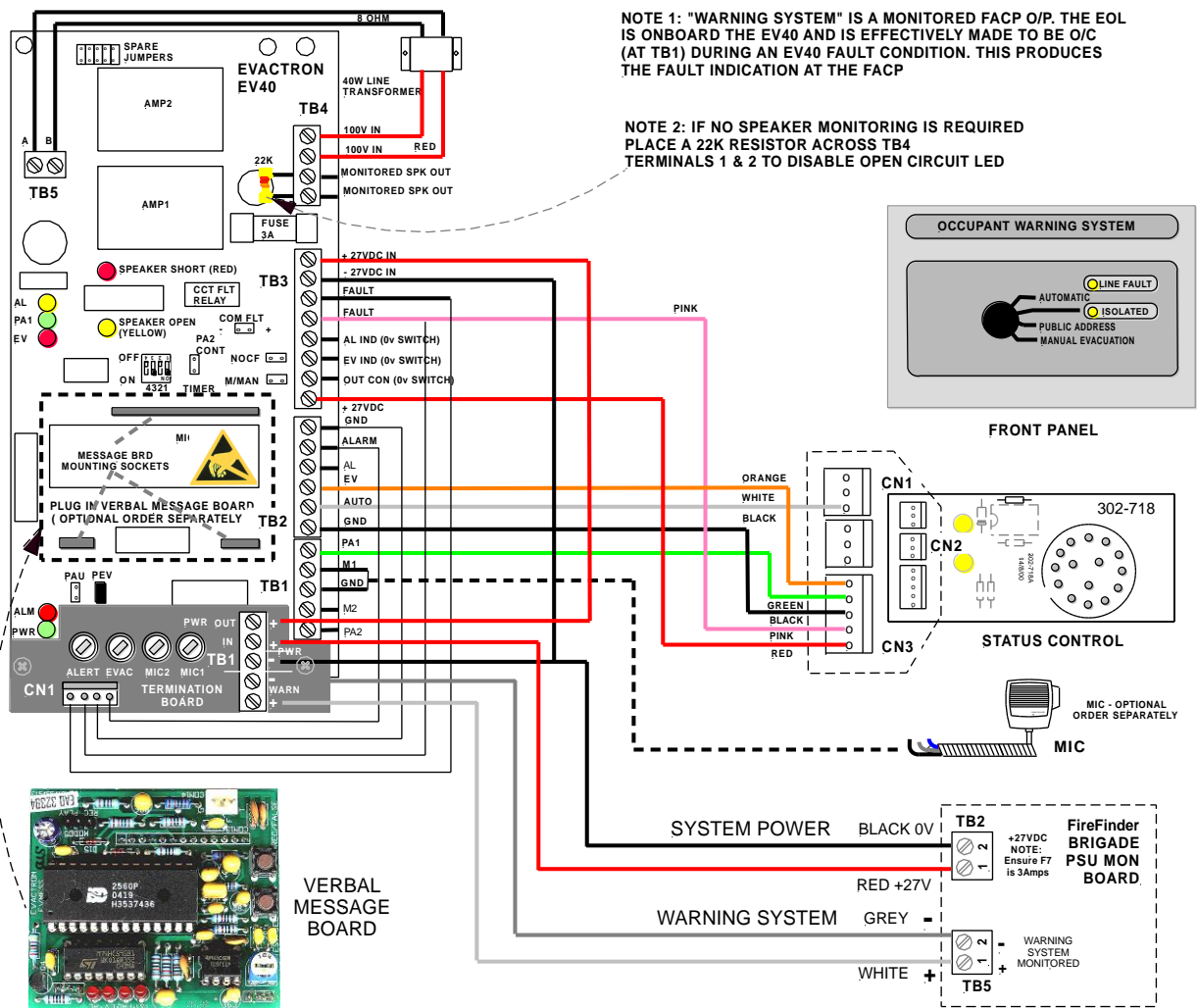
Figure 77: Typical EV40 Wiring to Control Module and FACP
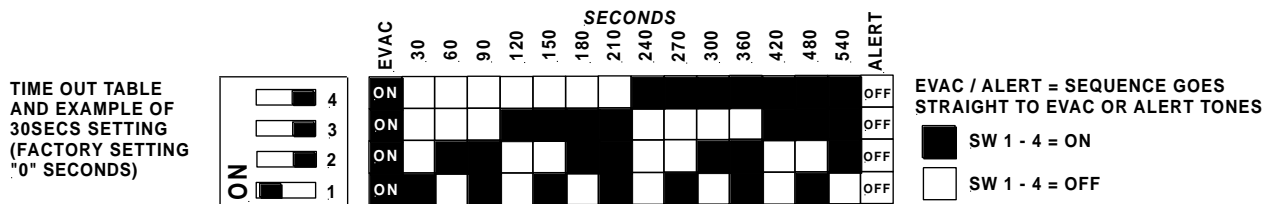
Figure 78: EV40 Time Out Table

Jumper settings

PEV: - PA + Evac – must be inserted when a selector switch is connected.

PAU: - PA in Auto – if inserted allows Mic 1 input (hand held microphone) to be used in "Auto" (with no FACP alarm) and paging in "Evac" mode.

PA2 CONT: - PA2 Control – if inserted allows the PA2 input to also switch the Control Output.

M2 1milli volt: - if inserted enables a 1mV microphone input for Mic 2, not inserted enables the input for 100mV line level (background music etc.)

11.1   EV60 / 120

The EV60 & 120 are essentially an EV20 MPU and driver but with 60 and 120 watt output amplifiers powered from a Current Limit Fuse Board.
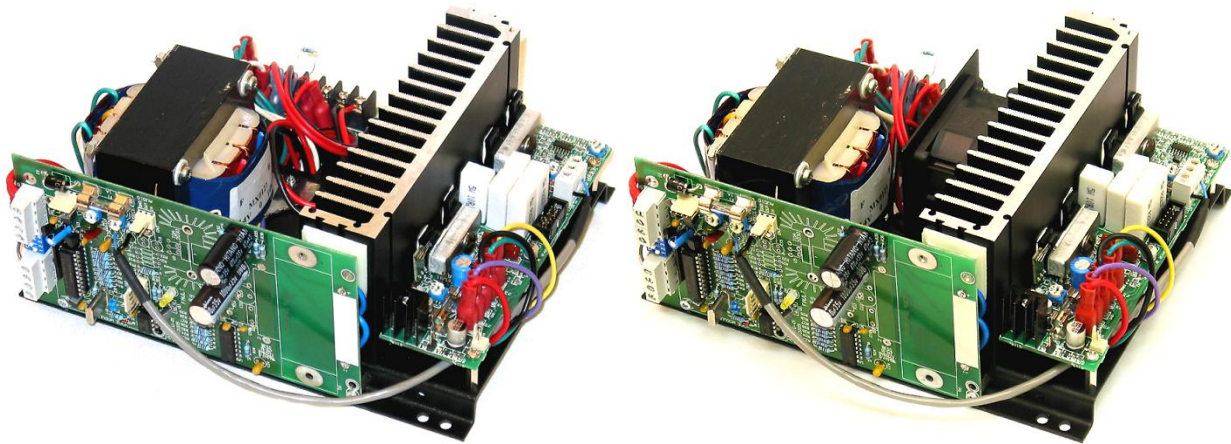
Figure 79: EV60   *EV120*

11.2   EV3000

Relay Board Operation

One of the relays on the 8 Way Relay Board will be programmed to operate on "Alarm". The subsequent shorting of the 10KΩ EOL initiates the Alert / Evac sequence
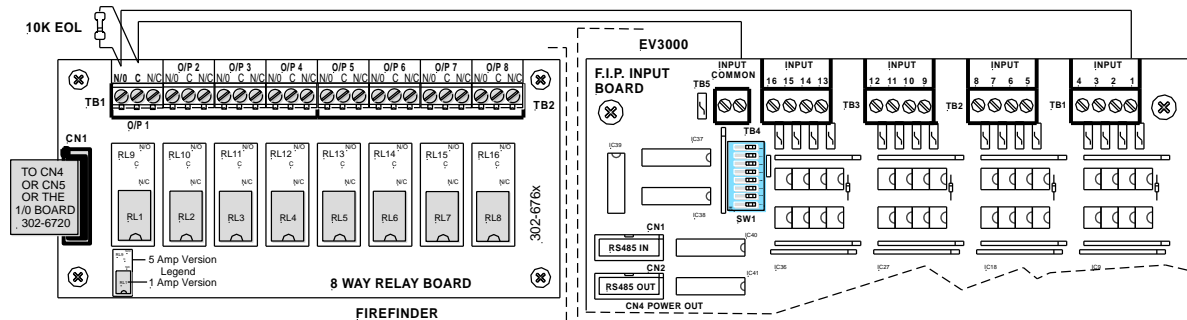
Figure 80: FACP / EV3000 Cabling Using Relay1 and I/P 1

HLI Interface Operation

The EV3000 Occupant Warning and Intercommunications System (OWIS) main central processing unit communicates via a RS485 bus with a Controller Interface Card (CIC) in an FACP.

A fault in the EV3000 will be indicated by the Master Control Panel which in turn initiates, via the Common Fault Relay Board and Brigade PSU Monitor Board, a Warning System Fault indication on the FACP.
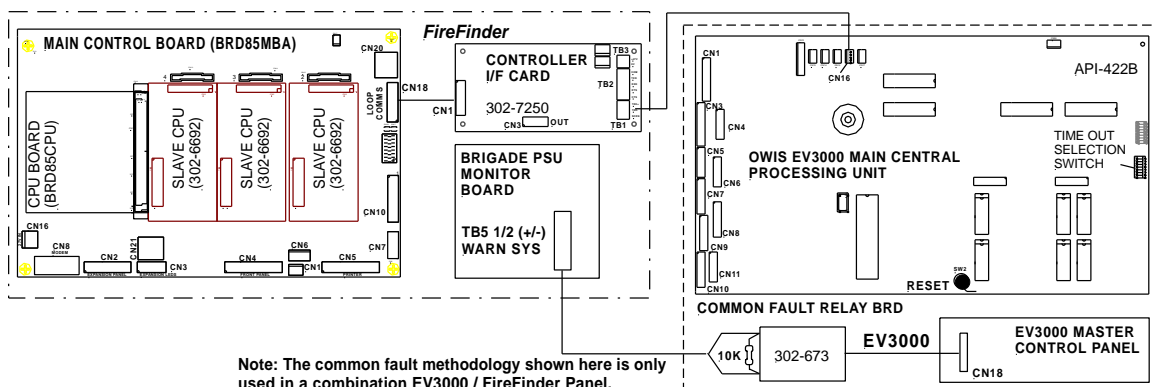
Note: The common fault methodology shown here is only used in a combination EV3000 / FireFinder Panel.

Figure 81: HLI & Common Fault Cabling To & From the FACP and EV3000

12   *Brigade Devices*

12.1   *ASE (Vic Metro) Brigade Box*

The ASE Brigade Box interfaces the Victorian Fire Brigade into the *FireFinder™* SP series of FACP's.
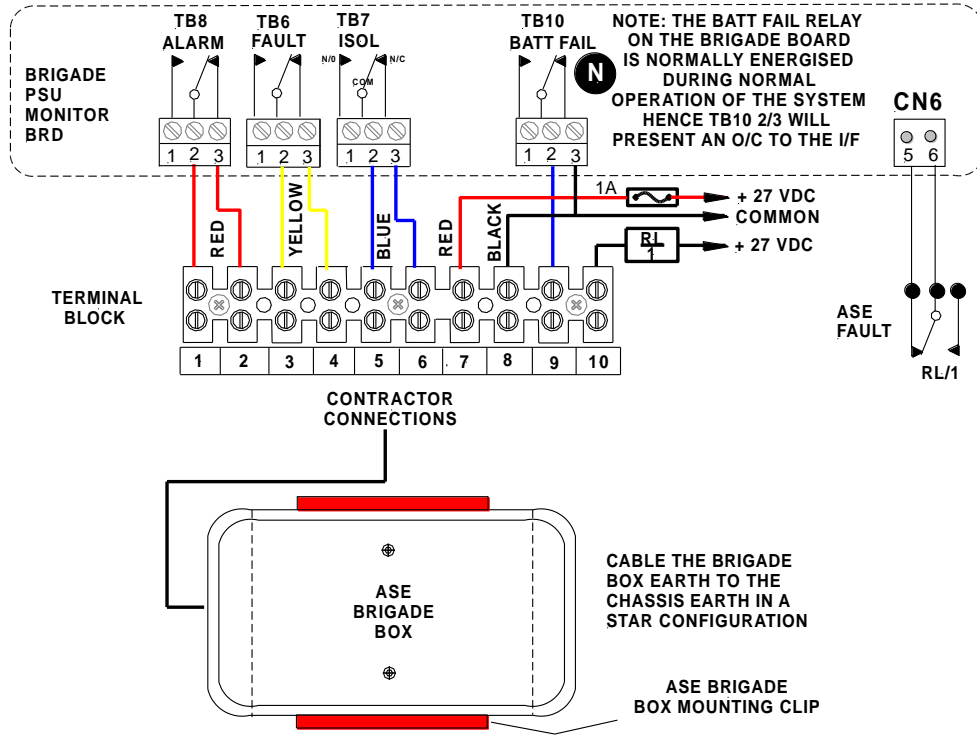
Figure 82: ASE FACP Internal Wiring

12.2   *Brigade Box (Deltec WA, SA, TAS,QLD)*

The Brigade Box interfaces the Fire Brigade to the *FireFinder™* SP series of FACP's.
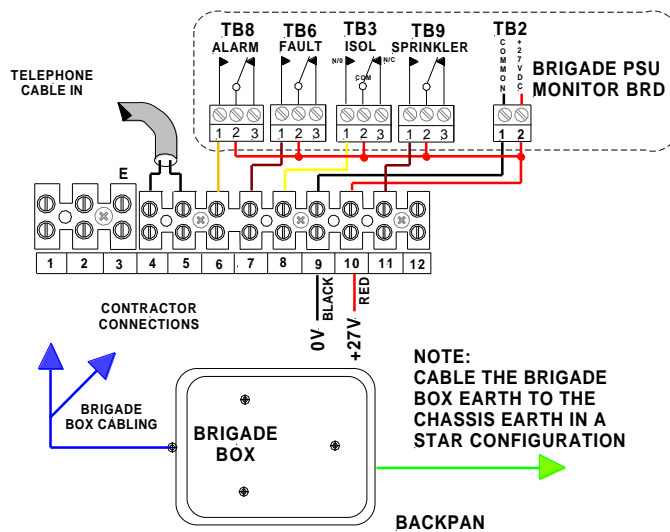
Figure 83: Brigade Box FACP Internal Wiring

13   *FireFinder™ Operation*

13.1   *The Control Panel*
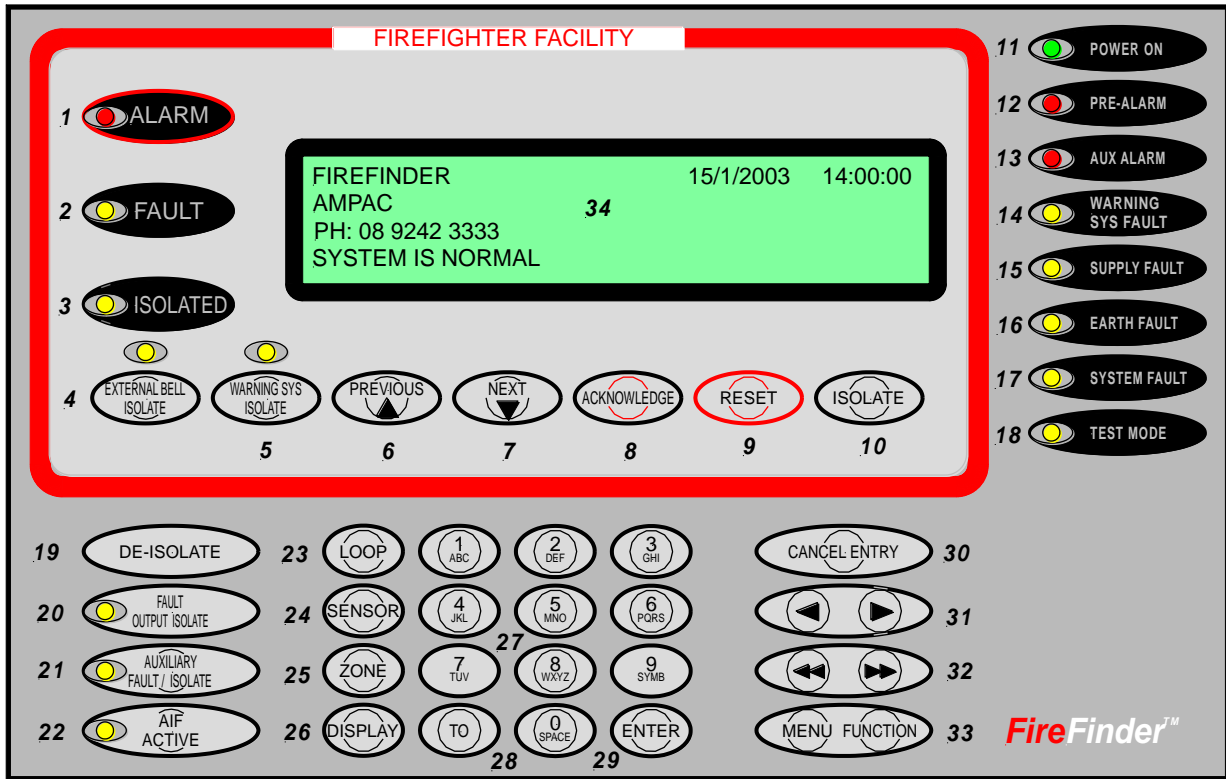
Figure 84: The ***FireFinder****™ Control Panel with a 4 Line LCD*
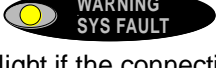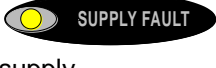
+   **NOTE:** The *Italic* numbers next to each of the Indicators and Keys / Buttons in the diagram above relate to the explanations below.

FIRFIGHTER FACILITY

1.   **(Red):** This LED will flash if any unacknowledged alarms are present on the system. If all alarms have acknowledged it will light steady.

2.   **(Yellow):** This LED will light steady if there are any faults on the system, whether they are loop faults, module faults, device faults etc.

3.   **(Yellow):** This LED will light steady if any detectors, devices or zones in the system have been isolated.

4.   **(Yellow):** Pressing this button will isolate any bells connected to the fire panel If the bell is isolated the LED just above the button will glow steady yellow. Pressing the button again will de-isolate the bell.

5.   Pressing this button will isolate the FACP output to the Warning System if it is connected to one. Pressing the button again de-isolates the Warning System output. When the Warning System is isolated the LED just above the button will be illuminated steady.

6. Pressing this key scrolls the display backwards through the alarms, faults, or isolates.

7. Pressing this key scrolls the display forwards through alarms, faults, or isolates .

8. Pressing this key will acknowledge an alarm currently displayed on the LCD. It will also silence the panel buzzer, which sounds whenever there is an alarm (optional) or fault.

9. Pressing this key will reset the panel, clearing any acknowledged alarms and taking the LCD display back to its default screen, unless there are any uncleared faults or isolated devices, these will continue to be displayed.

10. This key is used to isolate individual or groups of detectors, devices or zones.

Indicators

11. **(Green):** This LED will light when the mains power is turned on.

12. **(Red):** This LED will light when a sensor/detector is in the pre-alarm state.

13. **(Red):** This LED will light if the auxiliary alarm output has been activated.

14. **(Yellow):** When a warning system is connected to the fire panel, this LED will light if the connection to the warning system becomes faulty.

15. **(Yellow):** This LED will light if there is one of the following faults on the power supply.

- The output voltage is too low (less than 26.5V)
- The output voltage is too high (greater than 28V)
- The battery is not connected properly.

16. **(Yellow):** This LED will light if there is an incorrect earth on any of the signal cables of the system.

17. **(Yellow)** This LED will light if the main system CPU is in fault.

18. **(Yellow):** This LED will light when the panel is in any of the test modes.

19. If a detector currently displayed on the LCD has been isolated, pressing this key will de-isolate it.

20. **(Yellow):** Pressing this button will isolate the fault output relay on the brigade board. If the relay is isolated the associated LED will light. Pressing the button again will de-isolate the relay.

21. **(Yellow):** Pressing this button or if the FACP is fitted with a
door switch and the door is opened the auxiliary output relay on the brigade board will be isolated.
If the auxiliary fault / isolate is isolated the associated LED will light steady. Pressing the button
again will de-isolate the auxiliary fault / isolate relay.
The auxiliary output line is monitored, should it go into fault, the LED will flash.

22. **(Yellow):** Pressing this button will activate the Alarm Investigation Facility.
The LED just above the switch shall turn on.

23. LOOP   Press this key followed by a number to select the loop you wish to access eg LOOP 4.

24. SENSOR   After selecting the Loop number press this key to enter the sensor number for the device
to be interrogated.

25. ZONE   Press this key followed by a number eg ZONE 4 to select the required zone.

26. DISPLAY   Press this key after selecting the Zone number or the Loop and Sensor numbers to
display the state of the device.

27. 9 SYMB   These keys are used to navigate around the panel's menus and enter data. If entering a
descriptor, or some other data that contains characters as well as numbers, pressing the keys
multiple times will scroll through the available letters written on the button, in sequence. Eg 1,A,B,C

28. TO   Use this key to access a range of devices. Eg, 2 TO 7.

29. ENTER   Press the ENTER key when using the panel, to enter data.

30. CANCEL ENTRY   The CANCEL ENTRY key is used to delete data in a current field or return to
the previously displayed menu.

31. ◀ ▶   Used to move the cursor back and forth when entering data in a field.

32. ◀◀ ▶▶   These keys are used to move between fields when entering data.

33. MENU FUNCTION   Pressing the MENU key will display the main menu on the LCD. Similarly
pressing the FUNCTION key will display the function menu on the LCD.

34. **LCD DISPLAY** - This screen can be configured with the servicing companies name and phone
number. It also displays the current date, time and that the system is normal (no faults and alarms).

If there are any faults or alarms the LCD will display the device in question, if multiple detectors or zones
are not in their normal state, the PREVIOUS and NEXT keys are used to scroll through them.

```
FIREFINDER                    15/7/2005   14:00:00
AMPAC
PH: 08 9242 3333
SYSTEM IS NORMAL
```

IMPORTANT NOTE:

It is strongly recommended that all field programming changes be properly recorded.

Function And Menu

13.2 The Default LCD Display

In its normal state the *FireFinder™* will display a screen similar to that shown below.

```
FIREFINDER                    15/7/2005   14:00:00
AMPAC
PH: 08 9242 3333
SYSTEM IS NORMAL
```

Figure 85: The Default LCD Display

This screen can be configured with the servicing company's name and phone number via a laptop or modem. The current date, time is set in the Function menu while system status is automatically displayed.

13.3 Accessing Functions and Menus

At Levels 2 and 3 access to the panel Functions are password protected.
A new panel has a pre-programmed password of **2222** for Level 2 and **3333** for Level 3. When the customer takes control of the panel the password can be changed to suit their requirements.

✛   **NOTE:** *All menus are provided with screen prompts and a "Quick Reference Guide" (see Section 24) guides the operator through the operation of the FAC .*

From the **DEFAULT DISPLAY**, press **MENU** or **FUNCTION**. The **FUNCTION** menu is password protected (actually a pass-number as it can only contain numbers) to prevent unauthorised changes to the panel's configuration.

(MENU FUNCTION)

13.4 *Function Menu and Access Levels*

Three levels of ACCESS are available. Level 1 has access to MENU only while Password protected Levels 2 and 3 access MENU and FUNCTION as listed below. (also see the Quick Reference Guide, Section 24)

Level II: Allows access to:
- **Date:**   Enter the Day, Month and Year (4 digit year).
- **Time:**   Enter the hours and minutes (24 hour mode).
- **Day/Night Settings:**   Enter the Day / Night ON times and Enable - Disable.
- **Logs:**   Fire Alarm, Fault, Isolate, System & Input / Output logs.
- **Tests:**   Walk and loop tests.
- **I/O:**   Sets the functionality of Input / Output devices.
- **Access:**   Password entry to Level 3

Level III: In addition to the Level I & II facilities, Add, Delete, Delete all passwords and Mode (Zone / Sensor) onsite Programming**.**

13.4.1   Forgotten Passwords

Follow the following process if a password has been forgotten or misplaced;
      <u>**a.**</u>   entering 9999 into the password field;
      <u>**b.**</u>   take note of the 4 digit password number displayed on the screen; then
      <u>**c.**</u>   contact the AMPAC head office and quote the above number;
A temporary password will be issued and a new password can then be programmed into the FACP.

✛   **NOTE:** *The temporary password becomes invalid if 9999 is entered again or if the panel is re-powered after 9999 has been entered.*

14   *The Main Menu*

The **MAIN MENU** is accessed by pressing MENU.
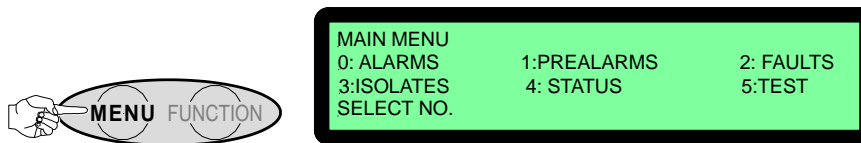
Figure 86: The Main Menu

Pressing the appropriate number on the keypad while in the MAIN MENU the user can view any;

❿   **FIRE ALARMS**;

❶   **PRE-ALARMS**,

❷   **FAULTS**; Pressing **❷** brings up a sub-menu from which a more detailed description of the fault can be displayed. With a Fault present select a field (**❿** to **❻**) to view details of the fault.

❿ Zones Sensors	**❶** Loops	**❷** Modules	**❸** Power Supply	**❹** Brigade	**❺** Test Failures	**❻** Bells

❸   **ISOLATES** on the system.

If there are no alarms, pre-alarms, faults or isolates, a message, eg. NO ZONES OR SENSORS IN ALARM, will be displayed for 1 to 2 seconds and then the display will return to the Main menu.

14.1   Status Menu

❹ Is pressed to access the STATUS MENU.

FACP WITHOUT NETWORKING   *FACP WITH NETWORKING*

Figure 87: The Status Menu

From the STATUS MENU the status of system components and settings can be selected and displayed as listed below. Note that different screens are displayed for a system with and without networking.

   Press

❿   **Loops:** Enter the loop number and the LCD will display its status, eg normal, type of fault etc.

   ❿   *Press* to print all devices on the loops (*Press* RESET to stop printing)

   ❶   *Press* to print totals of the loops (*Press* RESET to stop printing)

❶   **Modules:** Select the type of module, Slave **❿**, P/S **❶**, Brigade **❷** or External LED Mimic **❸** and follow the screen prompts to display the status of the selected field.

❷   **I/O:** The LCD will display the status of an input or output in a panel or on a loop.
   ❿   *Press* to display Output status – **❿** IN A PANEL or **❶** ON A LOOP

   ❶   *Press* to display Input status - – **❿** IN A PANEL or **❶** ON A LOOP

   Once the above is selected follow the prompts and enter the;
   i)   I/O controller number then the input or output on that controller or,
   ii)   loop, sensor and output number on that device.

   The LCD will display if it is configured and if so a description of what that input or output does and its current state.

Network: *Note***:** *This option is only available if the system configuration is networked.*

❸ Is pressed to access NETWORK STATUS.

```
DISPLAY NETWORK STATUS
0: NETWORK POINTS      1: REMOVE SLAVE MODULES
2: REMOTE EXTERNAL MIMIC MODULES
SELECT NO.
```

Figure 88: Display Network Status

❶ **Network Points:**

```
DISPLAY NETWORK POINTS
0: STATUS        1: POWER SUPPLY        2: BRIGADE

SELECT NO.
```

Figure 89: Display Network Points

Network Points Screens are

Press	*or*	*or*
❶ **Status**	❷ **Power Supply**	❸ **Brigade**
LCD	*LCD*	*LCD*
Displays ⬇	*Displays* ⬇	*Displays* ⬇
Select network point	Charger volts	Operational
Eg. Loop number	Battery Detected	Non- Op
	Mains OK	
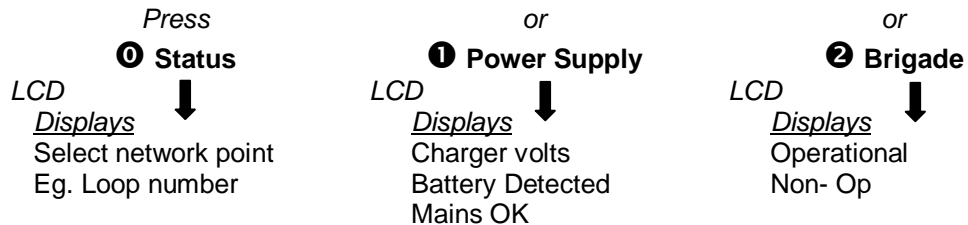
❶ **Remote Slave Modules:**

Select from Network Status Remote Slave Modules, then Module number, then **ENTER** .

```
Apollo Loop No: 1
TYPE: APOLLO        LOOP NO: 1            VER: 6.2
NP: 1              MOD: 1              STAT: NORMAL
REMOTE MODULE STATUS
```

Figure 90: Display Remote Module Status

❷ **Remote External LED Mimic Modules:**

Select from Network Status Remote External LED Mimic Modules, then NP number, then **ENTER,** then External LED Mimic number, then **ENTER**

❹ Is pressed to access SYSTEM STATUS.(*If the system configuration is not networked Press* ❸ *)*

```
SYSTEM STATUS
ALARMS: 0000    PREALARMS: 0000      ISOLATES: 0000
SENSOR FAULTS: 0000  MOD FAULTS: 0000  WDOG: 00
LOOP FAULTS: 00        VERSION: 6.0.30/AS4428
```

Figure 91: System Status

A Values:

❺ Is pressed to access AVALUES. Enter Loop number, then **ENTER** , then Sensor number, then **ENTER** . *(If the system configuration is not networked Press* ❹ *)*

```
Loop 1 Sensor 1                    SMOKE
L1  S1  Z2  STAT: NORMAL
AVALUE: 25  MODE: 0  1:  000  O: 000
```
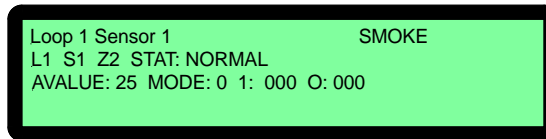
Figure 92: Analogue Values

14.2   Testing Menu

❺ Is pressed to access the ALARM, FAULT AND LAMP TESTING MENU.

```
TESTING MENU
0: ALARM       1: FAULT       2: LAMP

SELECT NO:
```
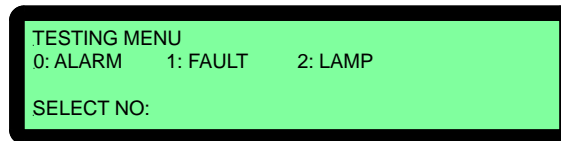
Figure 93: The Testing Menu

14.2.1   Alarm Test

ⓘ   **Important:** *Ensure "Alarm" outputs are isolated / inhibited before commencing the test.*

❶ is pressed to initiate an Alarm Test: Alarm tests either a zone or a sensor on a loop or a range

of zones or sensors on a loop if the ⓣ꜀ key is used, eg, ZONE 1 ⓣ꜀ 3.
This test will force a zone/s or sensor/s to go into the Alarm state or a conventional zone to a simulated Alarm condition. Pressing ENTER initiates the test.

```
ALARM TEST
0: ALARM       1: SENSOR

SELECT NO:
```
```
ALARM TEST
ZONE
select ZONE NO. then ENTER or TO key
SELECT NO:
```
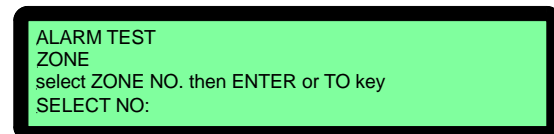
Figure 94: Alarm Test Selection Screens

14.2.2   Fault Test

❶ is pressed to initiate a Fault Test: Fault tests either a zone or a sensor on a loop or a range of zones or sensors on a loop in the same way as for the Alarm test above.
This test will force a sensor to go into the Fault state or a conventional zone to a simulated Fault condition. Pressing ENTER initiates the test.

```
FAULT TEST
0: ALARM       1: SENSOR

SELECT NO:
```
```
FAULT TEST
ZONE
select ZONE NO. then ENTER or TO key
SELECT NO:
```
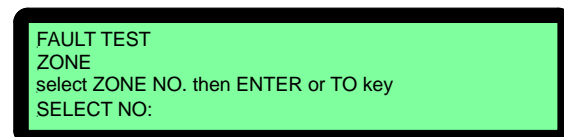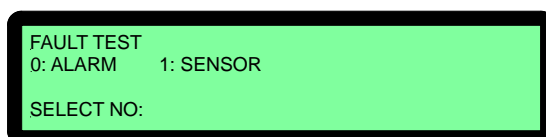
Figure 95: Fault Test Selection Screens

Once the above tests have been completed the TEST FAILURE screen will appear. Each ALARM

and FAULT that was detected can be viewed by scrolling through them using the ⓝₑₓₜ and
ⓟᵣₑᵥᵢₒᵤₛ keys. If an Alarm or Fault was not detected a short message displays this result and the screen returns to the Fault Test default screen.

14.2.3   Lamp Test

❷ is pressed to initiate a Lamp Test: The test will sequentially flash the LED's on the front panel and illuminate the various segments on the LCD display.

15   *Main Functions*

```
LEVEL II MAIN FUNCTIONS
0: DATE   1: TIME   2: DAYNIGHT SETTINGS   3: LOGS
4: TESTS  5: I/O  6: ACCESS
SELECT NO:
```

```
LEVEL III MAIN FUNCTIONS
0: DATE   1: TIME   2: DAYNIGHT SETTINGS   3: LOGS
4: TESTS  5: I/O  6: PASSWORDS
SELECT NO:
```
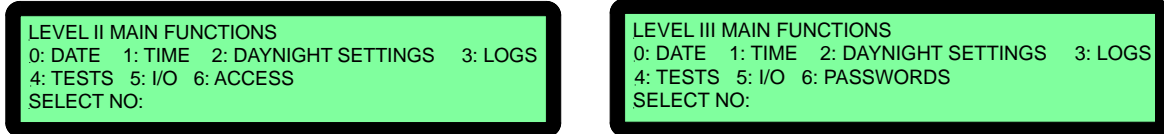
Figure 96: The Level II & III Functions Menu

15.1   Setting the Function Date Facility

Select **FUNCTION** . A prompt will ask for a **PASSWORD** if the control panel is not currently active. Using the keypad key in the Level 2 or 3 PASSWORD and press **ENTER** .

Press
0   to select the set **DATE SCREEN**. The prompt will ask for the date to be entered in this format, **DD/MM/YYYY** (EG 18/08/2005), key in and press **ENTER** .   The screen will then return to the **MAIN FUNCTIONS MENU**.

15.2   Setting the Function Time Facility

Press
1   then in the following format key in the time, **HH:MM** (EG 16:00) *using the 24 hour mode*. Press **ENTER**   and the screen will return to the **MAIN FUNCTIONS MENU**.

15.3   Setting the Function Daynight Facility

Press
2 The **DAY-NIGHT SETTINGS** screen will appear. Time entry is the same as setting the "Time" facility
   Press
      0   to enter the **DAY ON** time then **ENTER** and,

      1   to enter the **NIGHT ON** time then **ENTER** .

      2   to **ENABLE / DISABLE** then **ENTER** .
      For this Function to have control it must be **ENABLED**, press **2**   Re-pressing **2** will toggle to **DISABLE**.

15.4   Function Logs Facility
Press
3 and the **EVENT LOG MENU** will be displayed.

The **LOGS MENU** allows the operator to select and view the events that have occurred of all;
   Press: **0** **ALARM,** **1**   **FAULT**, **2**   **ISOLATE**, **3** **SYSTEM**

```
EVENT LOG MENU   ( MAXIMUM SIZE = 1162 )
0: ALARM   1: FAULT   2: ISOLATE   3: SYSTEM
4: I/O
SELECT NO:
```

```
FAULT LOG  7/7          11/7/2005        14:56 05
SUPPLY FAULT
ST: EARTH  FAULT
SELECT  0: PRINT ENTRY   1: SHOW OPTIONS
```
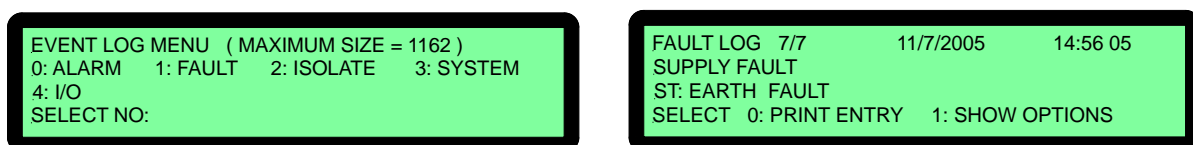
Figure 97: Logs Function Menu   &   Fault Log Selected

Once the type of log is selected, eg. FAULT above, each entry can be viewed by stepping through them
using the ⬇NEXT and ⬆PREVIOUS keys

The type of log, number and totals logged, date and time of the ALARM, FAULT, ISOLATE, SYSTEM or I/O as well as device information will be displayed. The SYSTEM screen displays events and watchdog activity. From these screens the operator can select two other facilities, they are;

> *Press*
> **0**   **PRINT ENTRY** will print out the displayed information if a printer is installed, or
>
> **1**   **SHOW OPTIONS** allows the operator to select how the Logs are viewed*.*
> *Press*
> **0** to **VIEW BY ENTRY NUMBER** or **1** to **VIEW BY DATE**. In each case the screen will ask for the appropriate information (ENTRY NUMBER or DATE) to be entered before the selected option will be displayed.

✛   **NOTE:** *it is possible to scroll through the alarms by using the PREVIOUS and NEXT keys.*

15.5 The Function Test Facility

Press
4   **TESTS:** prompts the operator to select either the **WALK** or **LOOP** test.
> *Press*
> **0**   **WALK TEST;** the operator will be prompted to select either **ZONE** or **SENSOR** test.
>
> > *Press*
> > **0**   **ZONE WALK TEST MENU;**

This screen requires the operator to select a Zone or number of Zones to be tested, that is enter the �框Zone number⎤   press ⎾ENTER⏋ or enter the ⎾Zone number⏋ press ⎾TO⏋   then the next highest ⎾Zone number⏋ to be tested EG. 2 TO 7 then ⎾ENTER⏋.

The **TEST MODE LED** will be illuminated for the duration of the test and the test will run until the operator **RESETS** the system or the test times out [Time Out = 15 minutes + 3 to 5 seconds].

> > *Press*
> > **1**   **SENSOR WALK TEST MENU**

This screen requires the operator to select a ⎾Zone⏋ and then a ⎾Sensor⏋ or number of Sensors (using the ⎾TO⏋ key) to be tested then pressing ⎾ENTER⏋ to start the test.

The **TEST MODE LED** will be illuminated for the duration of the test and the test will run until the operator **RESETS** the system or the test times out [Time Out = 15 minutes + 3 to 5 seconds].

> *Press*
> **1**   **LOOP TEST** requires the operator to select a **LOOP** for **DIAGNOSTIC TESTING**

Entering the ⎾LOOP number⏋ and pressing ⎾ENTER⏋ will initiate the **DIAGNOSTIC TEST**.

✛ **NOTE:** *The LEDs on the Brigade Board will indicate which leg is being tested*.

The tests displayed are;
®   TESTING SIDE A   IDENTIFING DEVICES on SIDE A, and

®   TESTING SIDE B   IDENTIFING DEVICES on SIDE B.
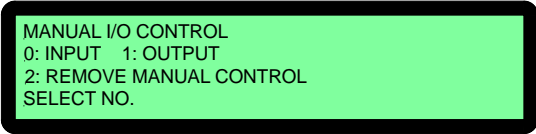
Once the testing is completed the final screen will display the number of devices found and tested on the LOOP and a Reset is requested to return the system to normal.

✛   **NOTE:** *If the data is not entered within 2 minutes the screen will time out and return to the DEFAULT SCREEN.*

15.6 *Function Manual I/O Control*

Press

❺ to display the Manual I/O Control menu

```
MANUAL I/O CONTROL
0: INPUT     1: OUTPUT
2: REMOVE MANUAL CONTROL
SELECT NO.
```

Figure 98: The Manual I/O Control Menu

Manual I/O control allows the technician to turn ON or Off inputs and outputs off a device to facilitate testing or isolation of plant during maintenance. Removal of manual control returns control to the panel.

   Press

   ❶ **Input Selected:**

   Press

   ❶ **IN A PANEL:** Enter the I/O Controller number then the input number. This will display the description for the input and its current state, you can then turn the input ON or OFF or remove manual control.

   ❷ **ON A LOOP:** Enter the loop number, the sensor number and the input number. This will display the description for the input and its current state, you can then turn the input ON or OFF or remove manual control.
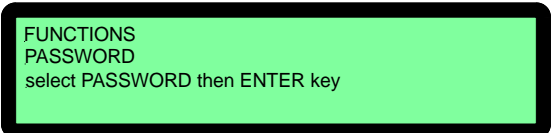
   ❷ **Remove All Manual Input Control:** Will remove all manual input control.

   ❷ **Output Selected:**   Same sequences as above for inputs but substitute outputs for inputs.
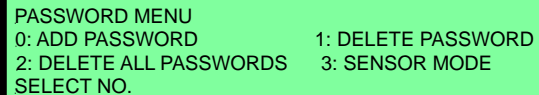
   ❷ **Remove All Manual Control Selected:**   Globally removes all manual control.

15.7 *Function Access (Level II) / Passwords (Level III)*

```
FUNCTIONS
PASSWORD
select PASSWORD then ENTER key
```

```
PASSWORD MENU
0: ADD PASSWORD              1: DELETE PASSWORD
2: DELETE ALL PASSWORDS      3: SENSOR MODE
SELECT NO.
```

Figure 99: The Level II Password Entry   &   Level III Password Menu Screens

Press

❻ while in the Main Functions menu and enter the Level III Password if in Access Level II or, if in Access Level III to display the Password Menu.

   ❶   **Add Password:** Enter the new password, then press **ENTER** . The password is always a 4 digit number.

   ❷   **Delete Password:** Enter the password that you want to delete, then press **ENTER**.
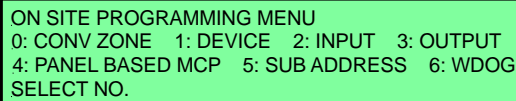
   ❷   **Delete All Passwords:** This asks you to confirm that you want to delete all the passwords. Press **ENTER** then **ENTER** again.

   ❸   **Zone / Sensor Mode:** This sets the mode in which Alarms, Faults, Prealarms and Isolates status information will be displayed. "Zone" is the default setting.

15.8   Function Programming
Press

❼ to display the Level III Programming Menu.

```
ON SITE PROGRAMMING MENU
0: CONV ZONE    1: DEVICE    2: INPUT    3: OUTPUT
4: PANEL BASED MCP    5: SUB ADDRESS    6: WDOG
SELECT NO.
```

Figure 100: The Programming Menu

15.8.1   Conventional Zone Programming
Press
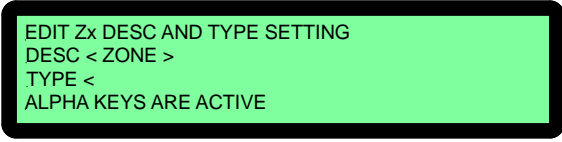
⓿   Zone:

Key in the zone number and enter or change the description (**DESC**) by pressing the numeric buttons multiple times to access characters while at the same time using
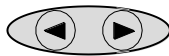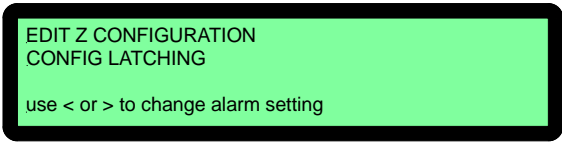
◀ ▶   buttons to move the flashing underline or curser.

```
EDIT Zx DESC AND TYPE SETTING
DESC < ZONE >
TYPE <
ALPHA KEYS ARE ACTIVE
```

Figure 101: Zone Description & Type Programming

```
EDIT Z CONFIGURATION
CONFIG LATCHING

use < or > to change alarm setting
```

Figure 102: Brigade Options
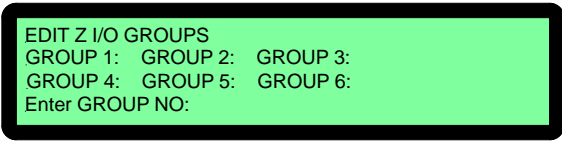
Press ● to move to the **TYPE** field or edit the information.

Press ● to move between fields use the reciprocal button
By going through all the fields a second screen can also be accessed to show the Output options.

Press ● to step through these fields.

The keys ◀ ▶ are used to set the Y/N field, that is the selected Zone that will activate the Brigade Options ALRM, BELL etc and Config.
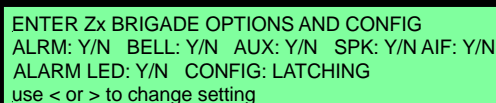
```
EDIT Z I/O GROUPS
GROUP 1:    GROUP 2:    GROUP 3:
GROUP 4:    GROUP 5:    GROUP 6:
Enter GROUP NO:
```

Figure 103: Zone Configuration Latching / Unlatching

Use ◀ or ▶ to change the setting

Configuration settings are Latching, Non-Latching, AVF, Self Reset (0 to 99 seconds). After setting the Configuration the ZONE I/O GROUPS are programmed.

```
ENTER Zx BRIGADE OPTIONS AND CONFIG
ALRM: Y/N    BELL: Y/N    AUX: Y/N    SPK: Y/N AIF: Y/N
ALARM LED: Y/N    CONFIG: LATCHING
use < or > to change setting
```

Figure 104: Zone I/O Groups

After scrolling through the groups and entering what I/O GROUPS will be turned on by what module/s or device/s in a zone/s the operator is prompted to press **ENTER** to confirm the entries and / or changes.

15.8.2   Device Programming
Press
❶   **DEVICE:**

Screen: ◀ use these keys ▶ to **EDIT** and move through wording &

these ⏪ ⏩ keys to **MOVE** between fields ie: DESC & TYPE and next parameter

Enter the Loop and Sensor number then scroll through the following screens.
Press   or   Press
❿ to **EDIT**   or   ❶ to **DELETE**

1. EDIT LxSx DESCRIPTION AND TYPE STRING.   Edit then *press.*   ⏩
eg: ***DESC   Loop 1 Sensor 1***
        TYPE   SMOKE

2. Allocate / Edit the Sensor to a Zone and set the device type then   *press.*   ⏩
eg: *XP95 Photo, XP95 Heat etc-*

3. Set /Edit and display the Output Configurations or options then   *press.*   ⏩
eg: *Latching, AVF, Non-latching etc*

4. Set / Edits and enables / disables the day/night settings then   *press.*   ⏩

5. Allocates / Edits the Loop and Sensors Groups.   ⏩

After scrolling through the groups a prompt tells the operator to press ENTER to confirm the changes.

15.8.3   Input Programming
Press
❷   **INPUT:**
By following the screen prompts as above Edit or Delete an **INPUT** in a panel or a loop.

Screen: PROGRAM MENU SELECTING AN INPUT

❿ **IN A PANEL**	❶ **ON A LOOP**
I/O MODULE	**LOOP**
Select I/O MODULE **NO.** then ENTER	Select **LOOP NO**. then ENTER
INPUT	**SENSOR**
Select I/P NO then ENTER	Select **SENSOR NO**. then ENTER
EDIT / **DELETE** DESC	**INPUT**
	Select **INPUT NO**. then ENTER key
ALPHA KEYS ARE ACTIVE	**EDIT** LxSxI/Px DESC STRING DESC

15.8.4   Output Programming
Press
❸   **OUTPUT:**
By following the screen prompts as above Add, Edit or Delete an output in a panel or on a loop.

15.8.5   Manual Control Point (MCP)

Press

❹   **MCP:**

The operator will be prompted to enter the NODE Number, that is the Node or panel on which the MCP is mounted.

15.8.6   Sub Address

Press

❺   Sub Address lets the operator EDIT or DELETE the address of an IO device on a Loop.

✛   **Note:** *an input is the only function that can bring up an alarm*.

Select the LOOP, then ENTER , SENSOR, then ENTER then the SUBADDRESS (eg 1, 2 or 3 for 3IO device), or press ❿ to EDIT or press ❶ to DELETE.

Editing

If editing, the screen will display the Loop number, Sensor number and sub address followed by DESC <   TYPE < INPUT > and advise the Alpha keys are active. Once edited and pressing ENTER the message UPDATE TO MEMORY message will be displayed.

ENTER *should not be pressed* if the CONFIGURATION is to be edited, instead press ▶▶ to go to the next screen where the output is configured to be latching (general alarm requiring a Reset to be returned to normal), NON-LATCHING (hence self resetting) or FAULT which clears when the fault is cleared.)

15.8.7   Watchdog

❻   This Function provides a counter to record any re-initialisation of the processor. If due to a software failure the panel is automatically reset then the counter will increment by 1 The maximum count is 99 after which the counter resets to 00. Pressing ❿ will reset the counter. When the panel is commissioned this counter **MUST** be reset to 0 as must be the **Events Logs**.

15.9   Self Learn

Self Learn is enabled / disabled in the EEPROM programming. If enabled ***FireFinder*™** has the ability to detect extra or missing modules or devices, (that is devices or modules that have been added or removed) or there has been a change of the type of module or device.

✛   **Note:** *If a change does occur the FACP will take 30seconds to register the event on the LCD and illuminate the FAULT LED*.

15.9.1   Extra Devices Detected

The ***FireFinder*™** LCD will indicate extra devices have been detected by displaying the screen below and the FAULT LED will be illuminated.
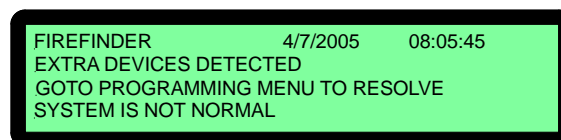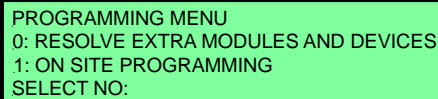
Figure 105: Resolving Extra Modules And Devices

To resolve select **FUNCTION**, enter **PASSWORD**, press ❻ and the screen below will appear
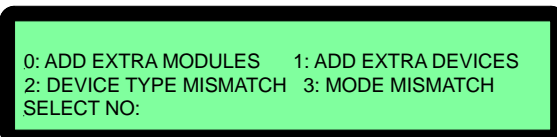
```
PROGRAMMING MENU
0: RESOLVE EXTRA MODULES AND DEVICES
1: ON SITE PROGRAMMING
SELECT NO:
```

Figure 106:Added Module Or Device

Select ❶ (Selecting ❶ presents the **PROGRAMMING MENU**) then ❶ or ❶ (as seen below) then ENTER to ADD the module or device to the configuration, or skip to resolve the changes manually in the Programming Menu.
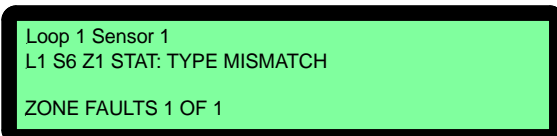
```
0: ADD EXTRA MODULES     1: ADD EXTRA DEVICES
2: DEVICE TYPE MISMATCH   3: MODE MISMATCH
SELECT NO:
```

Figure 107: Resolving Extra Modules Or Devices

15.9.2   Mismatch Detected

If a mismatch is detected the Normal Default Screen will change to that shown below. Go to the Programming Menu and select either ❶ *Resolve Extra Modules and Devices* then ❷
(*Device Type*) or ❸ (*Mode*) to resolve the mismatch, OR On Site Programming to resolve manually.
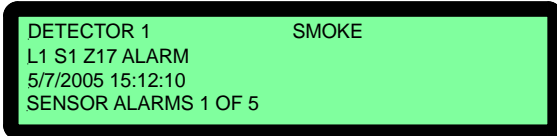
```
Loop 1 Sensor 1
L1 S6 Z1 STAT: TYPE MISMATCH

ZONE FAULTS 1 OF 1
```

Figure 108: Resolving A Mismatch

16   *Incoming Fire Alarm Signal*

- Will operate the red common LED fire indicator
- Will display location of fire alarm origin on the LCD
- Will activate external alarm.
- Will activate the internal FACP buzzer. (optional)
- Will activate any ancillary equipment so programmed.
- Will abort any test in progress.

The LCD will always display the first fire alarm signal received in the top section of the LCD. The lower section of the LCD will also permanently display the most recent zone in alarm. Other essential fire alarm information and fault or disablement information is available via the PREVIOUS and NEXT keys. After 30 seconds if no key is pressed the top section of the display will revert to displaying the first zone in alarm.

```
DETECTOR 1              SMOKE
L1 S1 Z17 ALARM
5/7/2005 15:12:10
SENSOR ALARMS 1 OF 5
```

Figure 109 LCD Screen With 5 Devices In Alarm

Note: The displayed information changes to that associated with the device as the PREVIOUS / NEXT push buttons are pressed**.** If there is a fault condition or a fire alarm and the buzzer is sounding, press the

ACKNOWLEDGE button to stop it sounding

17   _Accessing a Loop, Sensor or Zone_

LOOP OR SENSOR
1. From the default display, press **LOOP**
2. Enter the **loop number** you wish to interrogate then press **SENSOR.**
3. Press the button for the **sensor number**.
4. Press the **TO** button if you wish to access a range of sensors on the loop,
5. Press the **DISPLAY** button if you wish to display the status of a sensor,
6. Press the **ISOLATE** button if you wish to isolate a sensor then **ACKNOWLEDGE**
7. Press the **DE-ISOLATE** button to de-isolate a sensor.
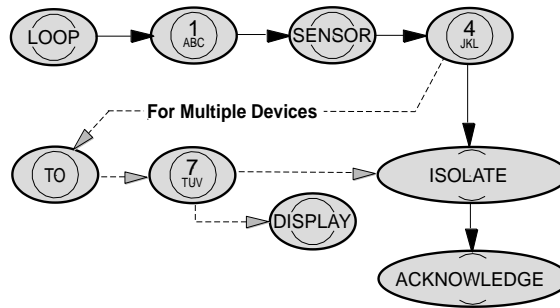
Figure 110: Steps for Isolating Single and / or Multiple Devices

ZONE
1. From the default display, press **ZONE**
2. Press the button for the **zone number**.
3. Press the **TO** button if you wish to access a range of zones,
4. Press the **DISPLAY** button if you wish to display the status of a zone,
5. Press the **ISOLATE** button if you wish to isolate a zone then **ACKNOWLEDGE**
6. Press the **DE-ISOLATE** button to de-isolate a sensor.

18   _List of Compatible Devices_

18.1 *Short Circuit Isolation*

The Ampac modules listed above feature built-in Short Circuit Isolation that continually monitors the Apollo detection loop. In the event the loop voltage drops below 14.0V DC, an open circuit condition is introduced on the negative line of the loop. This action effectively isolates the short circuit condition, and allows the device to function by drawing power from the unaffected side of the loop. The isolated section of the loop is tested every four (4) seconds, and is automatically reconnected when a loop voltage of greater than 14 V DC can be maintained.

Note: Should an OC/SC condition eventuate on a loop the LEDs A & B on the Loop Termination Board will both be illuminated.
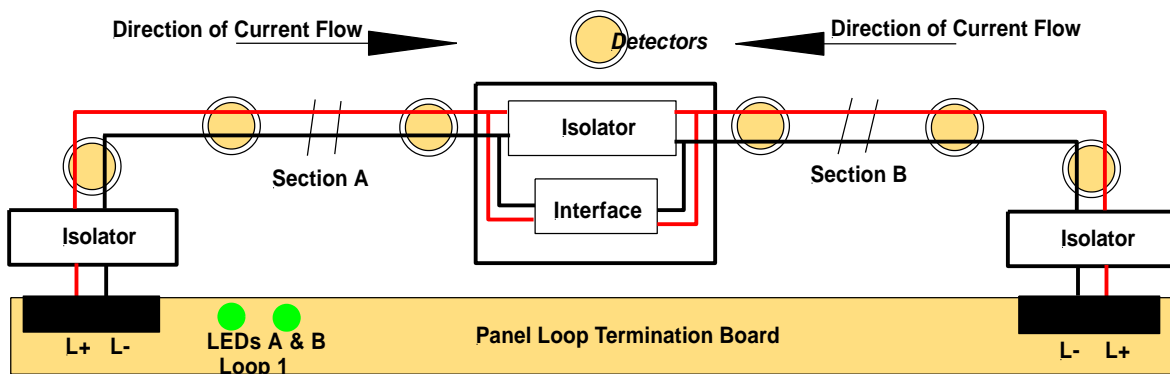
Figure 111: Short Circuit Isolation Block Diagram

18.2 Compatible Devices

Description	Ampac Order Code
XP95 Analogue Thermal – 'A' & 'B'	201-0001
Discovery Analogue Thermal 'C'	201-0089
Discovery Analogue Thermal 'D'	201-0090
XP95 Analogue Ionisation	201-0002
XP95 Analogue Photo Optical	201-0003
XP95 Analogue Universal Base	201-0004
XP95 Short Circuit Isolator	201-0005
XP95 S/C Isolator Base	201-0006
XP95 Input / Output Unit	201-0007
XP95 Sounder Control	201-0010
XP95 Zone Monitor	201-0012
XP95 Xpert Card (Nos. 1 – 126)	201-0013
XP95 Analogue Duct Probe inc. Detector	214-0004
XP95 1 Metre Inlet Tube	214-0005
XP95 Manual Call Point	213-0028
XP95 MCP Spare Glass	213-0030
XP95 Waterproof MCP	213-0034
XP95 Ionisation Black	201-0091
XP95 Photo Optical Black	201-0092
XP95 Universal Base Black	201-0093
Discovery Multisensor	201-0094
Discovery Carbon Monoxide Detector	201-0102
XP95 XPert Card blank	201-0095
Zone Interface Device	201-0100
Single Input Device Enc	201-0300
Single Input/Output Device Enc	201-0301
3 Input Device Enc	201-0308
3 Input/Output Device Enc Loop Powered	201-0309
3 Input/Output Device Enc Ext Powered	201-0310
Single Input Device DIN	201-0350
Single Input/Output Device DIN	201-0351
3 Input Device DIN	201-0358
3 Input/Output Device DIN Loop Powered	201-0359
3 Input/Output Device DIN Ext Powered	201-0360
Alarm Acknowledge Module	226-0001
ACP-01 Manual Call Point Square Red	213-0017
ACP-01 Manual Call Point Protective Cover	213-0014
Glass for ACP-01 MCP	213-0015
FP2 Manual Call Point Resettable Red	213-0021
FP2 Manual Call Point Resettable White	213-0022
FP2 Manual Call Point Protective Cover	213-0023

Description	Ampac Order Code
Thermal Type A Series 60 White Dot	201-0023
Thermal Type B Series 60 Blue Dot	201-0024
Thermal Type C Series 60 Green Dot	201-0025
Thermal Type D Series 60 Red Dot	201-0026
Smoke Ionisation Series 60	201-0027
Smoke Optical Series 60	201-0028
Universal Base Series 60	201-0029
S60 Duct Probe inc Detector	214-0001
Type E Detectors available on request	223-0001
Remote Indicator Latching Type E	209-0019
S60 I.S. Heat Grade 3	201-0032
S60 I.S. Heat Grade 1	201-0033
S60 I.S. Ionisation	201-0034
S60 I.S. Universal Base	201-0035
XP95 I.S. Ionisation Detector	201-0103
XP95 I.S. Photo Optical Detector	201-0104
XP95 I.S. Heat Detector	201-0105
XP95 I.S. Base	201-0106
XP95 I.S. Manual Call Point	201-0107
XP95 Protocol Translator Single Channel	201-0108
Beam Detector Fireray 2000	220-0004
EV20 single zone EWS AS1670.4	222-0020
EV40 single zone EWS AS1670.4	222-0021
EV60 single zone EWS AS1670.4	222-0022
EV120 single zone EWS AS1670.4	222-0023
Vantage Sounder Red Inc Shallow Base AS1670.4	205-0062
Vantage Sounder White Inc Shallow Base AS1670.4	205-0063
Vantage Combi Red Inc Shallow Base AS1670.4	205-0066
Vantage Combi White Inc Shallow Base AS1670.4	205-0067
Vantage Combi Red Inc Deep Base AS1670.4	205-0064
Vantage Combi White Inc Deep Base AS1670.4	205-0065
Vector White AS1670.4	205-0077
XP95 Ana Uni Base Inc Vector Sounder AS1670.4	205-0078
Ampac Integrated Base Sounder AS1670.4	201-0110
Ampac Integrated Base Sounder Lid AS1670.4	201-0114
Ampac Loop Powered Beacon	201-0113

19   *Certification Information*

The *FireFinder*™ is designed and manufactured by:

AMPAC TECHNOLOGIES PTY LTD

7 Ledgar Rd

Balcatta 6021

Western Australia

PH: 61-8-9242 3333

FAX: 61-8-9242 3334

HEAD OFFICE

Manufactured to: AS4428

SSL Certificate of Compliance Number:

Equipment Serial Number: _____

Job Number   _____

Date of Manufacture: _____

20   *Statement of Compliance*

Please PRINT

1. Name of building

_____

2. Address

_____

3. I/WE have installed in the above building   *Fire Alarm Control Panel Brand Name*

an alteration to the system manufactured by,   *OR*   _____

a system manufactured by   _____

4. The system is connected to the   *Name of Service Provider*

monitoring service provider   _____

     by a permanent ☐,   non-permanent ☐ connection (*tick*)

5. Date of connection   _____ / _____ / _____

6. Ancillary equipment connected to the control and indicating equipment (attach).

7. Current drain of ancillary loads powered from the CIE power supply   _____

8. Primary power source voltage   _____

9. Battery type and capacity   Manufacturer   _____ AH

10. Is maintenance agreement held for the system?   Yes ☐   No ☐

11. Operator's handbook supplied?   Yes ☐   No ☐

12. Logbook supplied?   Yes ☐   No ☐

13. 'As-installed' drawings supplied?   Yes ☐   No ☐

14. Portions of the building not protected by this system are; (*Please PRINT*)

1.	_____	**2.**	_____
3.	_____	**4.**	_____
5.	_____	**6.**	_____
7.	_____	**8.**	_____
9.	_____	**10.**	_____

15. I/We

1. _____ 2. _____ 3. _____
Print Name/s

hereby certify that the installation has been thoroughly tested from each actuating device and that a test of the transmission of the alarm signal to the monitoring service provider has been satisfactorily carried out.

I/We further certify that the whole system and all components called up in Clause 1.3 in connection therewith are installed entirely in accordance with the current requirements of AS 1670.I, -

except with regard to the following details which have already been approved", approval attached.
Strike out the bolded sentence if there have not been any exceptions.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Signature _____ Date ____/____/____

Installing Company _____
Please PRINT or Stamp

20.1 Installation Details

Indicate with a number in brackets the number of actuating devices in concealed spaces.

* Add addressable loop number in brackets where applicable.

Zone Alarm Zone #	* No of Actuating Devices per Zone	Thermal					Fire		Flame		MCP	Other
		A	B	C	D	E	Smoke	CO	IR	UV		
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												
11.												
12.												
13.												
14.												
15.												
16.												
17.												
18.												
19.												
20.												
21.												
22.												
23.												
24.												
25.												
26.												
27.												
28.												
29.												
30.												
31.												
32.												

Additional Information:
(Attach if necessary)

_____

Name   **Company**   **Signature**   **Date**

_____   _____   _____   _____

21   *Commissioning Test Report*

This *FireFinder*™ Fire Alarm Control Panel is installed at:

Company Name

Street

Suburb

State / Country

(*Company Name & Installation Address*)   Postcode

Owner or Owners' Authorized Representative:

Company Name

Street

Suburb

State / Country

Postcode

Type of Installation: NEW   MODIFIED   ADDITION   UPGRADE
(Circle)

Date of commissioning tests: /   /

Name and address of commissioning company,   (*in 'BLOCK LETTERS'*)

Company Name

Street

Suburb

State / Country

Postcode

Commissioning Representative: Name (*Print*)

Signature:

21.1 Procedure

The following tests are the minimum that shall be performed when commissioning a system using the *FireFinder*™ Fire Alarm Control Panel. Supplements to these test may be added by way of attachments or notation (*using waterproof ink*) to this documentation. If supplements or tests are added reference to them shall be made at an appropriate point on this document.

This Commissioning Record is to be completed in conjunction with the -
   1.   operator's manual;
   2.   installer's statement(s);
   3.   'as-installed' drawings; and
   4.   detector test records,

The Record provides a complete description of the installed system and its tested performance at the time of being commissioned.

21.2 System Information

Check relevant box

GENERAL

	YES ☑	NO ☒	NA
(a) *Equipment*: Equipment has been designed and constructed in accordance with the relevant Standards.	☐	☐	☐
(b) *Installation*: Equipment has been located, installed and interconnected in accordance with the system documentation	☐	☐	☐
(c) *Compatibility*: All detectors and other devices used in the system are —			
(i) listed in the operator's manual;	☐	☐	☐
(ii) compatible with the relevant parts of CIE, particularly that the permitted number of detectors and other devices for each circuit is not exceeded;	☐	☐	☐
(iii) installed in an environment for which they are suitable;	☐	☐	☐
(iv) not set to a sensitivity outside that prescribed in the relevant product Standard.	☐	☐	☐
(d) *Alarm zone limitations:* The alarm zone limitations in Clause 2.4 of AS 1670.1 are not exceeded.	☐	☐	☐
(e) *Primary power source*			
(i) The primary power source for the system has been provided in accordance with AS/NZS 3000.	☐	☐	☐
(ii) The isolating switch disconnects all active conductors.	☐	☐	☐
(iii) Five operations of the primary power source switch did not cause an alarm to be indicated on the system.	☐	☐	☐
(f) *Secondary power source*			
(i) The secondary power source is of a suitable type and capacity complying with the requirements of Clause 3.16.2 of AS 1670.1.	☐	☐	☐
(ii) The float voltage, charger type and setting is correct and in accordance with the battery manufacturer's recommendation.	☐	☐	☐
(g) *Battery temperature and voltage:* The battery voltage corresponds to that specified by the battery manufacturer for the temperature measured after 24 h quiescent operation.	☐	☐	☐

(h) *Alarm zone parameters:* Each alarm zone circuit is within the equipment manufacturer's specifications. ☐ ☐ ☐

(i) *Wire-free alarm zones:* Wire-free actuating device parameters meet the minimum parameters specified by the manufacturer, including that the receiver responds to signals from an actuating device for alarm, tamper, low standby power signals and gives a fault signal when the supervisory signal condition is absent. ☐ ☐ ☐

(j) *Operation of fault and alarm signals:* Fault and alarm conditions correctly detect and indicate as the correct. alarm zone, operating other required indicators, and operate relevant outputs of the CIE. ☐ ☐ ☐

(k) *Mimic panel:* All mimic panels, annunciators, etc., operate correctly. ☐ ☐ ☐

(l) *Alarm zone controls:* Alarm test, fault test, isolate and reset facility of each alarm zone operates correctly. ☐ ☐ ☐

(m) *Alarm dependency:* Alarm dependency works correctly and does not apply to devices listed in Clause 3.3 of AS 1670.1. ☐ ☐ ☐

(n) *CIE response to actuating device operation:* Each actuating device has operated when tested with a medium suitable for the device type and the alarm has indicated on the FIP and at the tested device. ☐ ☐ ☐

(o) *Fault response time:* The response to a fault does not exceed 100 s for each alarm zone circuit. ☐ ☐ ☐

(p) *Alarm response time:* At least one detector in each alarm zone has been tested and the response to the alarm does not exceed 10 s or the period specified when dependency on more than one alarm signal is used. ☐ ☐ ☐

(q) *Supervisory signal response time:* At least one supervisory device in each alarm zone circuit has been tested and the response to the supervisory device does not exceed 100 s. ☐ ☐ ☐

(r) *Alarm acknowledgment facility:* Alarm acknowledgement facilities operate in accordance with the requirements of Clause 3.2 AS 1670.1. ☐ ☐ ☐

(s) *Occupant warning system*

   (i) A fault signal is displayed at the CIE when the circuit wiring at the last speaker or sounder is short or open circuited. ☐ ☐ ☐

   (ii) Each sounder/speaker operates in accordance with the requirements of Clause 3.22 of AS 1670.1 and a record of the sound pressure level has been made. ☐ ☐ ☐

(t) The external alarm indication is visible from the main approach to the building. ☐ ☐ ☐

(u) *Manual call points*

   (i) Each manual call point operates correctly. ☐ ☐ ☐

   (ii) The activation of manual call points do not cause existing detector alarm indications to be extinguished. ☐ ☐ ☐

   (iii) Manual call points are not subject to alarm dependency. ☐ ☐ ☐

(v) *Smoke and fire door release:* Each door-release device operates correctly. ☐ ☐ ☐

(w) *Flame detectors*

   (i) The number and type of flame detectors provide adequate protection for the area. ☐ ☐ ☐

   (ii) There are no 'blind' spots in the area protected. ☐ ☐ ☐

   (iii) Detectors are rigidly fixed. ☐ ☐

   (iv) Detector lenses are clean and adequately protected from dust and extraneous radiation sources. ☐ ☐ ☐

   (v) Detectors respond to a flame or simulated flame source. ☐ ☐ ☐

(x) *Multi-point aspirating smoke detectors*

   (i) Response time of all sampling points meets the requirements of AS 1670.1. ☐ ☐ ☐

   (ii) Alarm settings and indicators operate correctly. ☐ ☐ ☐

   (iii) Remote indication of alarm and fault signals operate correctly. ☐ ☐ ☐

   (iv) Airflow failure indicator operates correctly. ☐ ☐ ☐

   (v) System (signal) failure indicators operate correctly. ☐ ☐ ☐

   (vi) Isolate and reset functions operate correctly. ☐ ☐ ☐

   (vii) Alarm and fault test facilities operate correctly. ☐ ☐ ☐

(y) *Duct sampling unit*: The alarm indicator is clearly visible from a trafficable area and the duct air velocity exceeds the minimum velocity specified for the unit. If not, the measured differential pressure is at least the minimum specified for the unit. ☐ ☐ ☐

(z) *Ancillary control functions:* Each ancillary control function operates with the activation of associated alarm zones. ☐ ☐ ☐

(aa) *Alarm signalling equipment:* Alarm signalling equipment initiates a fire alarm signal to the monitoring service provider. ☐ ☐ ☐

(bb) *Labelling:* Alarm zone location is immediately apparent from the alarm zone labelling. ☐ ☐ ☐

DOCUMENTATION

The following documentation is located in or adjacent to the FIP:

(a) 'As-installed' drawings. ☐ ☐ ☐

(b) CIE documentation required by AS 4428.1 or AS 7240.2. ☐ ☐ ☐

(c) Commissioning test report. ☐ ☐ ☐

(d) Installer's statement in accordance with Appendix E of AS 1670.1. ☐ ☐ ☐

(e) A log complying with the requirements of Clause 7.3 of AS 1670.1. ☐ ☐ ☐

(f) Aspirating system design tool calculation. ☐ ☐ ☐

22   *Troubleshooting Chart*

Problem	Solution
No Mains Power	Check mains Fuse
Supply fault LED illuminated	Check output voltage it should be set to 27.6V. Low = (less than 26.5V) High = (greater than 28V) Check the battery has been connected properly
Earth Fault LED illuminated	Check all input and output cabling and wiring assemblies for short to ground
System Fault LED illuminated	Ensure correct software is installed Check all connections for loose wiring
Warning System Fault LED illuminated	Check correct E.O.L is fitted (10K) Check wiring is connected correctly
Maintenance Alarm cleared but *FireFinder*™ still displays Maintenance Alarm	Carry out Loop Test
LCD displays LOOP (number) open circuit	Check in and out legs are connected correctly at the loop termination board
Unable to clear an O/C or S/C on a loop	You must perform a loop test to clear the fault. This is a level 1 function.
Communication Loop not working	Check for correct software installed in all communication boards. Check LCD at Main controller. This may identify where there is a break in the communication line
Can not access Function menu	Incorrect Password entered
Forgotten password	Ring AMPAC and directions will be given to provide you with a temporary code
An Analogue Fault occurs when using a Zone Monitor to monitor a switch.	A 1.8k Ohm resistor must be placed in series with the switch contacts.
Sounder Fault	Make sure you have a 10K Ohm EOL resistor fitted and a diode (1N4004) in series with the sounder

23   *Address Setting*
BINARY ADDRESS SETTING (APOLLO)
SERIES XP95 - ADDRESS DATA
DIL SWITCH: ON = 1 OFF = 0 ADDRESS TAG FOR DETECTORS (I/O DEVICES)

ADDRESS 1234567	ADDRESS 1234567
01 = 1000000	64 = 0000001
02 = 0100000	65 = 1000001
03 = 1100000	66 = 0100001
04 = 0010000	67 = 1100001
05 = 1010000	68 = 0010001
06 = 0110000	69 = 1010001
07 = 1110000	70 = 0110001
08 = 0001000	71 = 1110001
09 = 1001000	72 = 0001001
10 = 0101000	73 = 1001001
11 = 1101000	74 = 0101001
12 = 0011000	75 = 1101001
13 = 1011000	76 = 0011001
14 = 0111000	77 = 1011001
15 = 1111000	78 = 0111001
16 = 0000100	79 = 1111001
17 = 1000100	80 = 0000101
18 = 0100100	81 = 1000101
19 = 1100100	82 = 0100101
20 = 0010100	83 = 1100101
21 = 1010100	84 = 0010101
22 = 0110100	85 = 1010101
23 = 1110100	86 = 0110101
24 = 0001100	87 = 1110101
25 = 1001100	88 = 0001101
26 = 0101100	89 = 1001101
27 = 1101100	90 = 0101101
28 = 0011100	91 = 1101101
29 = 1011100	92 = 0011101
30 = 0111100	93 = 1011101
31 = 1111100	94 = 0111101
32 = 0000010	95 = 1111101
33 = 1000010	96 = 0000011
34 = 0100010	97 = 1000011
35 = 1100010	98 = 0100011
36 = 0010010	99 = 1100011
37 = 1010010	100 = 0010011
38 = 0110010	101 = 1010011
39 = 1110010	102 = 0110011
40 = 0001010	103 = 1110011
41 = 1001010	104 = 0001011
42 = 0101010	105 = 1001011
43 = 1101010	106 = 0101011
44 = 0011010	107 = 1101011
45 = 1011010	108 = 0011011
46 = 0111010	109 = 1011011
47 = 1111010	110 = 0111011
48 = 0000110	111 = 1111011
49 = 1000110	112 = 0000111
50 = 0100110	113 = 1000111
51 = 1100110	114 = 0100111
52 = 0010110	115 = 1100111
53 = 1010110	116 = 0010111
54 = 0110110	117 = 1010111
55 = 1110110	118 = 0110111
56 = 0001110	119 = 1110111
57 = 1001110	120 = 0001111
58 = 0101110	121 = 1001111
59 = 1101110	122 = 0101111
60 = 0011110	123 = 1101111
61 = 1011110	124 = 0011111
62 = 0111110	125 = 1011111
63 = 1111110	126 = 0111111
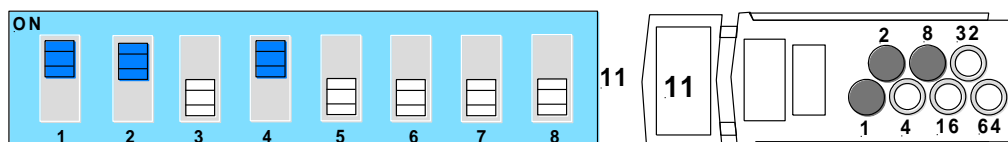
Figure 112: Switch and Tab Set to 11

24   *Battery Capacity Calculation*

INTRODUCTION

The standby power source capacity, or battery capacity, determines how long the system will continue to operate in the event of the loss of the primary power source. It therefore becomes necessary to calculate the battery and hence power supply / battery charger capacity required for each installation.

The following calculator has been designed to determine the required capacity to meet the required standards. Should an existing panel be expanded the required battery and power supply capacity should be recalculated to ensure the panel continues to operate within the required standards.

The standards considered in this document are:

AS1603/4428   EN54   NZS4512   UL72   MS1404   GB4717

DESCRIPTION

Enter the number of units listed in the left hand column which go to make up the panel, complete the multiplication to obtain the quiescent current then multiply by the standby and alarm hours required by the standard.

POWER SUPPLY RATING

The minimum Power Supply Rating (4) is obtained by calculating the manufacturers recommended battery charge current [see Note] (1) then adding the quiescent current of the entire system (2) and the alarm current (3).

1. $\dfrac{\text{Battery Capacity (AH) (determined from Calculator)}}{24 \times 0.8}$ =   Amps

2.   **Add**   Quiescent Current of the System (Iq)   =   Amps

3.   **Add**   the extra current that is drawn when in alarm (Ia)   =_____Amps

4.   Minimum Current Rating of Power Supply is   =_____Amps

✚   **Note: Point 1 Battery Capacity**
The capacity of the battery shall be such that in the event of failure of the primary power source the batteries shall be capable of maintaining the system in normal working (quiescent) condition for at least 24 h, after which sufficient capacity shall remain to operate two worst case AZFs and associated ACFs for 30 min.

When calculating battery capacity, allowance shall be made for the expected loss of capacity over the useful life of the battery. A new battery shall be at least 125% of the calculated capacity requirements, based on a loss of 20% of its capacity over the useful life of the battery.

✚   **Note:** Where the fire control station will not receive the system's total power supply failure signal, the battery should have sufficient capacity to maintain the system for 96 h.

POWER SUPPLY & BATTERY CALCULATOR

Panel Configuration	Iq Calculation		Iq		Evac Type	Iq in mA	Ia in mA
	No Off	X mA	= Iq				
Basic 1 loop panel		240			EV20	41	650
Basic 2 loop panel		254					
Basic 16 Zone panel		360			EV40	140	2500
Extender		1.8			EV60	150	3800
LCD repeater		156.2			EV120	150	8500
LED repeater		27					
Evac Module							

Interface Modules

	No Off	X mA	= Iq
Additional 3,5 loops add		40 each	
Additional 2,4 loops add		15 each	
16 zone		143	
16/16 I/O		5	
Fire Fan Control		14	
32 Zone LED		0	
Network I/F		74	
Controller I/F		5.1	
Valve or Pump Display		3.7	
8 Way Bell Monitor		20	
Agent Release		29	

Loop Devices

	No Off	X mA	= Iq
XP95 Thermal A / B		0.25	
Discovery Thermal C&D		0.5	
XP95 Ion		0.28	
XP95 Photo		0.34	
Discovery Multisensor		0.5	
Discovery Photo		0.4	
Discovery Ion		0.5	
XP95 Short cct isolator		0.11	
XP95 I/O module		1.2	
XP95 Sounder control		1.9	
XP95 MCP		0.35	
XP95 Zone Monitor		6	
Ampac 3 I/O loop power		2.1	
Ampac 3 I/O ext. power		1.5	
Ampac SID / SIOD		1.7	

$$Iq = \underline{\qquad}$$

Devices activating when the system is in alarm

8 x Relays		60	
Bell		30	
Other			

$$Ida = \underline{\qquad}$$

Devices de-activating when the system goes into alarm

Aircon Relays		20	
Electric locks		100	
Other			

$$Idd = \underline{\qquad}$$

$$I\ Alarm\ (\ Ia = Iq + Ida - Idd\ ) = mA$$

Battery capacity at end of battery life	=	(Iq x 24) + Fc(Ia x 0.5)
	=	**Note: The figure of 24 above should be replaced with 96 if Agent Release is used**
NOTE: ➲		
	=	
	=	Ah

Note: + 1,000ma = 1 Amp
    Fc = capacity de-rating factor
AS 1670.1 states a factor of 2 is deemed
to satisfy the criteria.

New battery capacity requirement	=	Ah x 1.25
	=	Ah
Rounded up to nearest available		Ah
	=	

PRIMARY POWER SOURCE CALCULATIONS

Battery Charger Current
Requirement: Battery is charged for 24 hrs. to provide 5Iq + 0.5Ia

	=	(5x Iq) + Fc(0.5 x Ia)
	=	
	=	
Ah Requirement	=	Ah

Battery Charging Current Required	=	Ah above
		24 x **e**
e is the battery efficiency, 0.8	=	A

Power Supply Requirement
Select the greater of 1 or 2

1. Ia + non- battery backed ancillary alarm loads

2. Iq + non – battery backed quiescent loads

If the power supply is used as the charger the current rating of the supply shall be [(1 or 2) + battery charger current].

EXAMPLE CALCULATION

Panel Configuration	Iq Calculation		Iq		Evac Type	Iq in mA	Ia in mA
	No Off	X mA	= Iq				
Basic 1 loop panel	1	240	**240**		EV20	41	650
Basic 2 loop panel		254	**0**				
Basic 16 Zone panel		360	**0**		EV40	140	2500
Extender	1	1.8	**1.8**		EV60	150	3800
LCD repeater		156.2	**0**		EV120	150	8500
LED repeater	2	27	**54**				
Evac Module			**0**				

Interface Modules

	No Off	X mA	= Iq
Additional 3,5 loops add		40 each	**0**
Additional 2,4 loops add		15 each	**0**
16 zone	3	143	**429**
16/16 I/O	1	5	**5**
Fire Fan Control	1	6	**6.7**
32 Zone LED		0	**0**
Network I/F		74	**0**
Controller I/F		5.1	**0**
Valve or Pump Display	1	3.7	**3.7**
8 Way Bell Monitor		20	**0**
Agent Release		29	

Loop Devices

	No Off	X mA	= Iq
XP95 Thermal A & B	30	0.25	**7.5**
Discovery Thermal C&D		0.5	**0**
XP95 Ion		0.28	**0**
XP95 Photo		0.34	**0**
Discovery Multisensor	30	0.5	**15**
Discovery Photo		0.4	**0**
Discovery Ion		0.5	**0**
XP95 Short cct isolator		0.11	**0**
XP95 I/O module	5	1.2	**6**
XP95 Sounder control		1.9	**0**
XP95 MCP		0.35	**0**
XP95 Zone Monitor		6	**0**
Ampac 3 I/O loop power		2.1	**0**
Ampac 3 I/O ext power		1.5	**0**
Ampac SID / SIOD		1.7	**0**
			0

$$Iq = 768.7$$

Devices activating when the system is in alarm

8 X Relays	10	60	**600**
Bell	4	30	**120**
Other			

$$Ida = 720$$

Devices de-activating when the system goes into alarm

Aircon Relays	2	20	**40**
Electric locks	4	100	**400**
Other eg LAM			

$$Idd = 440$$

I Alarm (Ia = Iq + Ida – Idd) = 769 + 720 – 440 = 1049mA

Battery capacity at end of battery life = $(Iq \times 24) + Fc(Ia \times 0.5)$

= $(769ma \times 24) + 2(1049ma \times 0.5)$

= $18456ma + 1050ma$

= $19.506Ah$

Note: $+$ 1,000ma = 1 Amp

New battery capacity requirement   = 19.5×1.25

= 24.375 Ah

Rounded up to nearest available   25 Ah

PRIMARY POWER SOURCE CALCULATIONS

Battery Charger Current
Requirement: Battery is charged for 24 hrs. to provide 5Iq + 0.5Ia

= $(5x\ Iq) + Fc(0.5 \times Ia)$

= $(5 \times 769) + 2(0.5 \times 1049)$

= $3845 + 1050$

Ah Requirement   = $4.895Ah$

Battery Charging Current Required   = $\dfrac{4.895}{24 \times e}$

e is the battery efficiency, 0.8   =   0.26A (rounded)

Power Supply Requirement
Select the greater of 1 or 2

1. Ia + non- battery backed ancillary alarm loads

2. Iq + non – battery backed quiescent loads

If the power supply is used as the charger the current rating of the supply shall be
[(**1** or **2**) + battery charger current].

List of Compatible Batteries
(tested by SSL to comply with AS 1603 . 4 1987 Appendix G [valid until June 2002]).
Note 1: afp number is the SSL Listing Number.
      Note 2: Types are the Manufacturers and not the suppliers.
      Note 3: Automotive type batteries are not normally suitable for stationary use.

afp - 791	afp - 792	afp - 1220	afp - 1228
Yuasa	**Power-Sonic**	**Matsushita**	**B & B**
NP Series	**PS Series**	**LCR Series**	**BP Series**

NPH1.3-12	PS-1208	LCR12V4BP	BP 1.2-12
NPH2-12	PS-1212	LC-R125P	BP 1.9-12
NPH3.2-12	PS-1219	LC-RC1217P	BP 4 –12
NPH5-12	PS-1232	LC-R127P	BP 7 –12
NPH16-12	PS-1240	LC-R127R2P	BP 12-12
NP0.8-12	PS-1270		BP 17-12
NP1.2-12	PS-12120	**afp - 1221**	BP 24-12
NP1.9-12	PS-12180	**Matsushita**	BP 40-12
NP2.3-12	PS-12240	**LCL Series**	
NP2-12	PS-12330	LC-LA12V33P	
NP2.6-12	PS-12400		
NP4-12	PS-12650	**Afp - 1222**	
NP7-12		**Matsushita**	
NP12-12		**LCX Series**	
NP24-12		LC-X1224P9(AP)	
NP24-12B		LC-X1228P(AP)	
NP38-12		LC-X1238P(AP)	
NP65-12		LC-X1242P(AP)	
		LC-X1265P	
		LC-XA12100P	

25   *Glossary of Terms*

ACF :	ANCILLARY CONTROL FACILITY
ACKD :	ACKNOWLEDGED
AHU :	AIR HANDLING UNIT
ALM :	ALARM
AVF :	ALARM VERIFICATION FACILITY
AZF :	ALARM ZONE FACILITY
AZC :	ALARM ZONE CIRCUIT
C :	RELAY COMMON CONTACT (WIPER)
CIC :	CONTROLLER INTERFACE CARD
CN :	CONNECTOR
CPU :	COMMON PROCESSOR UNIT
DGP :	DATA GATHERING POINT
EARTH :	BUILDING EARTH
EOL :	END OF LINE
FDS :	FIRE DETECTION SYSTEM
FACP :	FIRE ALARM CONTROL PANEL
FLT :	FAULT
GND :	GROUND (0 VOLTS) NOT EARTH
I/O :	INPUT/OUTPUT
LCD :	LIQUID CRYSTAL DISPLAY
MAF :	MASTER ALARM FACILITY
MCP :	MANUAL CALL POINT
MOV :	METAL OXIDE VARISTOR (TRANSIENT PROTECTION)
NIC :	NETWORK INTERFACE CARD
N/C :	NORMALLY CLOSED RELAY CONTACTS
N/O :	NORMALLY OPEN RELAY CONTACTS
N/W :	NETWORK
PCB :	PRINTED CIRCUIT BOARDS
P/S :	POWER SUPPLY
PSM :	POWER SUPPLY MODULE
REM :	REMOTE
SPOT :	SINGLE PERSON OPERATING TEST
TB :	TERMINAL BLOCK
VDC :	DIRECT CURRENT VOLTS

26   *Definitions*

Addressable system - a fire alarm and detection system that contains addressable alarm zone facilities or addressable control devices.

Alarm Verification Facility (AVF) - that part of the FACP, which provides an automatic resetting function for spurious alarm signals so that they will not inadvertently initiate Master Alarm Facility (MAF), or ACF functions. Using ConfigManager prior to downloading to the *FireFinder*™ sets this option

Alarm zone - the specific portion of a building or complex identified by a particular alarm zone facility.

Alarm Zone Circuit (AZC) - the link or path that carries signals from an actuating device(s) to an alarm zone facility(s).

Alarm Zone Facility (AZF) - that part of the control and indicating equipment that registers and indicates signals (alarm and fault) received from its alarm zone circuit. It also transmits appropriate signals to other control and indicating facilities.

Alert signal - an audible signal, or combination of audible and visible signals, from the occupant warning system to alert wardens and other nominated personnel as necessary to commence prescribed actions.

Ancillary Control Facility (ACF) - that portion of the control and indicating equipment that on receipt of a signal initiates predetermined actions in external ancillary devices.

Ancillary equipment - remote equipment connected to FACP.

Ancillary relay - relay within FACP to operate ancillary equipment.

Ancillary output - output for driving ancillary equipment.

Approved and approval - approved by, or the approval of, the Regulatory Authority concerned.

Card-detect link - a link on a module connector to indicate the disconnection of the module.

Conventional System - is a fire detection system using a dedicated circuit for each alarm zone.

Distributed system - a fire alarm and detection system where sections of the control and indicating equipment are remotely located from the FACP or where sub-indicator panel(s) communicate with a main FACP.

Field connections - are connections made to FACP or ancillary equipment during installation.

Fire alarm system - an arrangement of components and apparatus for giving an audible, visible, or other perceptible alarm of fire, and which may also initiate other action.

Fire detection system - an arrangement of detectors and control and indicating equipment employed for automatically detecting fire and initiating other action as arranged.

Fire Alarm Control Panel (FACP) - a panel on which is mounted an indicator or indicators together with associated equipment for the fire alarm or sprinkler system.

Fire resisting - an element of construction, component or structure which, by requirement of the Regulatory Authority, has a specified fire resistance.

Indicating equipment - the part of a fire detection and or alarm system, which provides indication of any warning signals (alarm and fault), received by the control equipment.

Interface - The interconnection between equipment that permits the transfer of data.

Main equipment - equipment essential to the operation of the system including, control equipment, amplification equipment and power supply modules.

Master Alarm Facility (MAF) - that part of the equipment which receives alarm and fault signals from any alarm zone facility and initiates the common signal (alarm and/or fault) for transmission to the fire control station. Bells and other ancillary functions may be initiated from this facility.

Power Supply - that portion of the FACP which supplies all voltages necessary for its operation.

Regulatory Authority - an authority administering Acts of Parliament or Regulations under such Acts.

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MAIN MENU OPTIONS   MENU FUNCTION   *MENU KEY / FUNCTION KEY*
(TO ENTER MENU / TO FUNCTION MENU)

- **(0 SPACE)** *ALARMS (DISPLAY ALARMS)*
- **(1 ABC)** *PREALARMS (DISPLAY PRE-ALARMS)*
- **(2 DEF)** *FAULTS (DISPLAY FAULTS OF SELECTED FIELDS)*
  - **(0 SPACE)** ZONES/SENSORS   (FAULT FIELDS)
  - **(1 ABC)** LOOP
  - **(2 DEF)** MODULE
  - **(3 GHI)** P/SUPPLY
  - **(4 JKL)** BRIGADE
  - **(5 MNO)** TFAILS   *(TEST FAILURES)*
  - **(6 PQRS)** BELLS
- **(3 GHI)** *ISOLATES (DISPLAY ALL SYSTEM ISOLATES)*
- **(4 JKL)** *STATUS (DISPLAY STATUS OF SELECTED FIELDS)*
  - **(0 SPACE)** LOOPS (LOOP / SENSOR No)
    - **(0 SPACE)** PRINT ALL DEVICES
    - **(1 ABC)** PRINT TOTALS
  - **(1 ABC)** MODULES (MODULE No)
    - **(0 SPACE)** SLAVE
    - **(1 ABC)** P/S
    - **(2 DEF)** BRIGADE
    - **(3 GHI)** EXTERNAL LED MIMICS
  - **(2 DEF)** I/O
    - **(0 SPACE)** OUTPUTS (OUTPUT No)
    - **(1 ABC)** INPUT (INPUT No)   (STATUS FIELDS)
  - **(3 GHI)** NETWORK   *(IF NETWORK IS ENABLED)*
    - **(0 SPACE)** NETWORK POINTS
    - **(1 ABC)** REMOTE SLAVE MODULES
    - **(2 DEF)** REMOTE LED MIMICS
    (IF NETWORK IS ENABLED)
  - **(4 JKL)** SYSTEM   **(3 GHI)** *NETWORK NOT ENABLED*
  - **(5 MNO)** AVALUES (ANALOGUE VALUE OF DET)   **(4 JKL)** *NETWORK NOT ENABLED*
- **(5 MNO)** *TESTING (TESTING THE SELECTED TEST FIELDS)*
  - **(0 SPACE)** ALARM (TEST ALARM FIELDS)
    - **(0 SPACE)** ZONE (ZONE No)
    - **(1 ABC)** SENSOR (LOOP/SENSOR No)
  - **(1 ABC)** FAULT (TEST FAULT FIELDS)   (TEST FIELDS)
    - **(0 SPACE)** ZONE (ZONE No)
    - **(1 ABC)** SENSOR (LOOP/SENSOR No)
  - **(2 DEF)** LAMP

FUNCTION MENU OPTIONS

FireFinder ™ Quick Reference

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MENU FUNCTION — FUNCTION KEY (TO ENTER FUNCTION FIELD (ENTER PASSWORD))

LEVEL 1 FUNCTIONS

- 0 SPACE — DATE (DD/MM/YYYY)
- 1 ABC — TIME (HH:MM)
- 2 DEF — DAY/NIGHT SETTINGS (SET ON/OFF FIELDS)
  - 0 SPACE — DAY TIME (HH:MM)
  - 1 ABC — NIGHT TIME (HH:MM)
  - 2 DEF — ENABLE
- 3 GHI — LOGS
  - 0 SPACE — ALARM (ALARM LOG)
    - 0 SPACE — PRINT ENTRY (PRINT TO PANEL PRINTER (IF FITTED))
    - 1 ABC — SHOW OPTIONS
      - 0 SPACE — VIEW BY ENTRY NO.
      - 1 ABC — VIEW BY DATE
      - 2 DEF — PRINT MULTIPLE ENTRIES
  - 1 ABC — FAULT (FAULT LOG)
    - AS FOR ALARM
  - 2 DEF — ISOLATE (ISOLATE LOG)
    - AS FOR ALARM
  - 3 DEF — SYSTEM (SYSTEM LOG)
    - AS FOR ALARM
  - 4 JKL — I/O (INPUT / OUTPUT LOG)
    - AS FOR ALARM
- 4 JKL — TESTS (TEST SPECIFIED FIELD)
  - 0 SPACE — WALK (ZONES OR SENSORS)
    - 0 SPACE — ZONE (ENTER ZONE No)
    - 1 ABC — SENSOR (ENTER LOOP / SENSOR No)
    - 2 ABC — LOOP (ENTER LOOP No)

MENU FUNCTION — FUNCTION KEY (TO ENTER FUNCTION FIELD (ENTER PASSWORD))

LEVEL 2 FUNCTIONS

- 5 MNO — I/O (MANUAL INPUT /OUTPUT CONTROL FIELDS)
  - 0 SPACE — INPUT (INPUT FIELDS)
    - 0 SPACE — IN A PANEL (SELECT I/O CONTROL NUMBER AND INPUT No)
      - 0 SPACE — OFF (TURN INPUT OFF)
      - 1 ABC — ON (TURN INPUT ON)
      - 2 DEF — REMOVE MANUAL CONTROL (RETURN INPUT TO ORIGINAL STATE)
    - 1 ABC — ON A LOOP (SELECT LOOP No, SENSOR No, INPUT No)
      - 0 SPACE — OFF (TURN INPUT OFF)
      - 1 ABC — ON (TURN INPUT ON)
      - 2 DEF — REMOVE MANUAL CONTROL (RETURN INPUT TO ORIGINAL STATE)
    - 2 DEF — REMOVE ALL MANUAL INPUT CONTROL (RETURN ALL MANUAL INPUTS TO ORIGINAL STATE)
  - 1 ABC — OUTPUT (OUTPUT FIELDS)
    - 0 SPACE — IN A PANEL (SELECT I/O CONTROL NUMBER AND OUTPUT No)
      - 0 SPACE — OFF (TURN OUTPUT OFF)
      - 1 ABC — ON (TURN OUTPUT ON)
      - 2 DEF — REMOVE MANUAL CONTROL (RETURN OUTPUT TO ORIGINAL STATE)
    - 1 ABC — ON A LOOP (SELECT LOOP No, SENSOR No, OUTPUT No)
      - 0 SPACE — OFF (TURN OUTPUT OFF)
      - 1 ABC — ON (TURN OUTPUT ON)
      - 2 DEF — REMOVE MANUAL CONTROL (RETURN OUTPUT TO ORIGINAL STATE)
    - 2 DEF — GLOBAL REMOVE ALL MANUAL OUTPUT CONTROL (RETURN ALL MANUAL O/PS TO ORIGINAL STATE)

MENU FUNCTION — FUNCTION KEY (TO ENTER FUNCTION FIELD (ENTER PASSWORD))

LEVEL 2 FUNCTION

- 6 PQRS — ACCESS LEVEL 3 (ENTER LEVEL 3 PASSWORD)

LEVEL 3 FUNCTION

- 6 PQRS — PASSWORDS (EDIT PASSWORD FIELDS)
  - 0 SPACE — ADD PASSWORD (ADD PASSWORD (MAX 4 CHAR), LEVEL No)
  - 1 ABC — DELETE PASSWORD (DELETE SELECTED PASSWORD)
  - 2 DEF — DELETE ALL PASSWORDS (DELETE ALL PASSWORDS)
  - 3 DEF — MODE ZONE / SENSOR
- 7 TUV — PROG (PROGRAMMING FEILDS)
  - 0 SPACE — CON ZONE (EDIT ZONE NUMBER, DESCRIPTION)
  - 1 ABC — DEVICE (ENTER LOOP / SENSOR)
    - 0 SPACE — EDIT (DESCRIPTION, ZONE No, DEVICE TYPE, BRIGADE OPTIONS, CONFIGURATION, GROUP No)
    - 1 ABC — DELETE (LOOP / SENSOR)
    - 2 DEF — INPUT (EDIT INPUT FIELDS)
      - 0 SPACE — IN A PANEL (SELECT INPUT CONTROL No AND INPUT No)
        - 0 SPACE — EDIT (EDIT DESCRIPTION)
        - 2 DEF — DELETE (DELETE DESCRIPTION)
      - 1 ABC — ON A LOOP (LOOP / SENSOR No)
        - 0 SPACE — EDIT (EDIT DESCRIPTION)
        - 1 ABC — DELETE (DELETE DESCRIPTION)
    - 3 DEF — OUTPUT (EDIT OUTPUT FIELDS)
      - 0 SPACE — IN A PANEL (SELECT OUTPUT CONTROL No AND OUTPUT No)
        - AS FOR INPUT
      - 1 ABC — ON A LOOP (LOOP / SENSOR No)
        - AS FOR INPUT
    - 4 JKL — PANEL BASED MCP (DESCRIPTION / NODE)
    - 5 MNO — SUB ADDRESS (EDIT / DELETE)
    - 6 PQRS — WATCHDOG RESET

DISABLED IF FACP IS NETWORKED