Ampac

Fire detection and evacuation solutions that save lives

FireFinder

Fire Alarm Control Panel
Series II AS4428

Installation, Commissioning & Operation

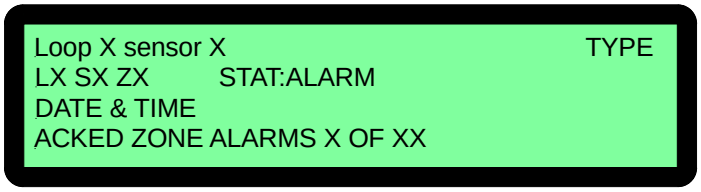
MAN 2986-2

A Halma company

FIRE BRIGADE RESPONSE GUIDE

1. INDICATION (INCOMING FIRE ALARM CONDITION)

ALARM LED FLASHING



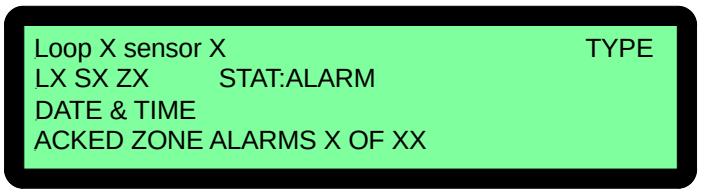
LCD DISPLAY of
DESCRIPTION TYPE, ADDRESS,
DATE & TIME
and No of ACKNOWLEDGED ALARMS

2. ACKNOWLEDGE ALARM

PRESS ACKNOWLEDGE KEY

PRESS NEXT TO SCROLL TO NEXT ALARM

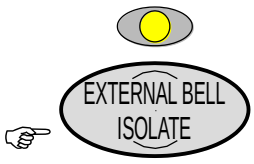
3. REPEAT THE ABOVE STEPS TO ACKNOWLEDGE ALL ALARMS



LCD DISPLAY of
DESCRIPTION TYPE, ADDRESS,
DATE & TIME
and No of ACKNOWLEDGED ALARMS

ALARM LED STEADY

4. ISOLATE BELL



PRESS TO ISOLATE BELLS INDICATOR WILL TURN ON

5. RESET ALARMS

PRESS TO RESET ALL ACKNOWLEDGED ALARMS

6. ACKNOWLEDGE RESET

PRESS ACKNOWLEDGE KEY

Contents

1 About This Manual

1.1 Introduction

This manual contains all the information required to install, commission and operate the ***FireFinder SERIES II*** 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.

1.2 General Requirements

The ***FireFinder Series II*** 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;

- Be qualified and trained for the task they undertake;
- Be familiar with the contents of this manual prior to the installation, commissioning or operation of a FireFinder control system;
- Observe anti-static pre-cautions at all times; and
- 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.

1.3 References

FireFinder Technical Manual

ConfigManager

FireFinder Detector Manual

Australian Standards:

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 5

1.4 Symbols

ⓘ Important operational information

☞ **Note:** Configuration considerations

Observe antistatic precautions

Mains supply earth

DANGER mains supply present

2 System Overview

The ***FireFinder Series II*** 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
- ***SmartGraphics***
- ***SmartTerminal***
- Remote LED mimics
- Peer to Peer networking
- Master Slave (Main - Sub) networking
- Main panel plus Data Gathering Panels networking

The panel is built to comply with the following standard:

- Australian Standard: AS 4428 parts 1 & 5

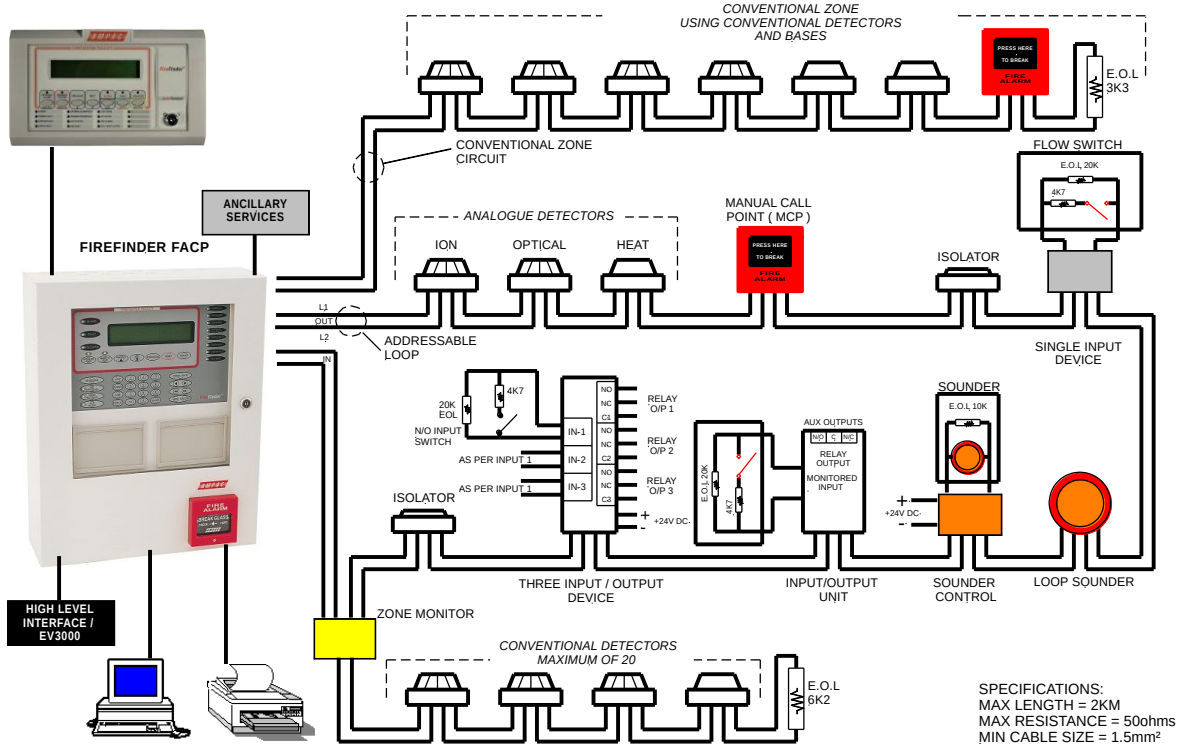


Figure 1: Typical Application

2.1 FACP Configuration Examples

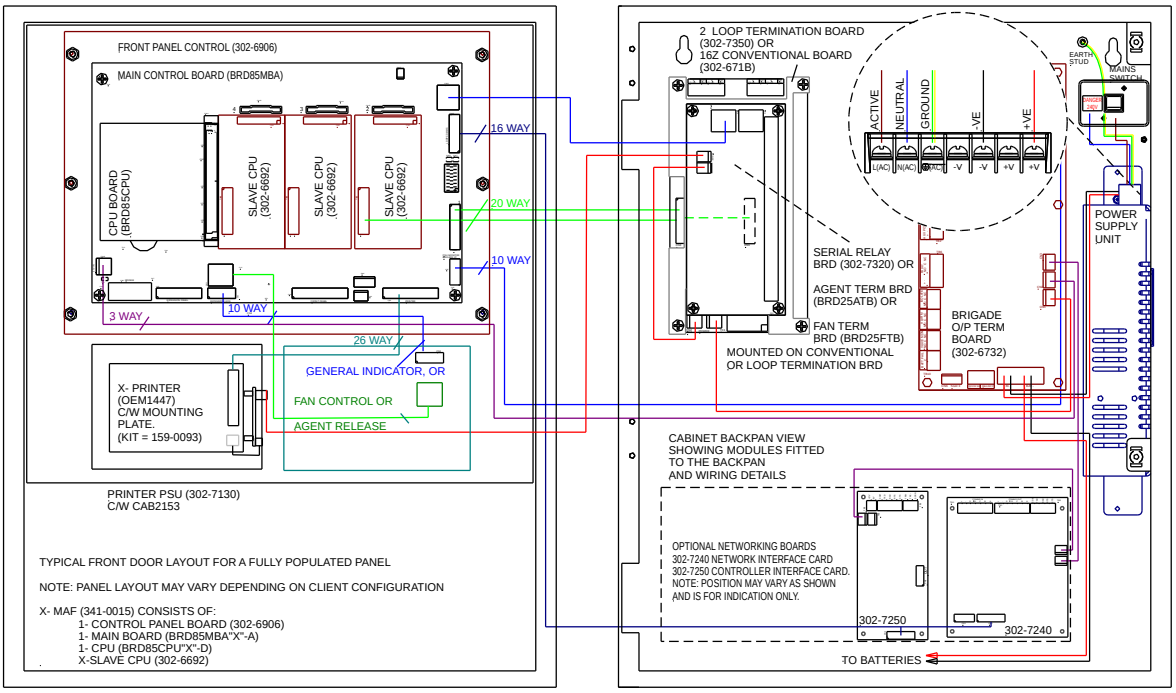


Figure 2: Typical Example of an SP1X Layout

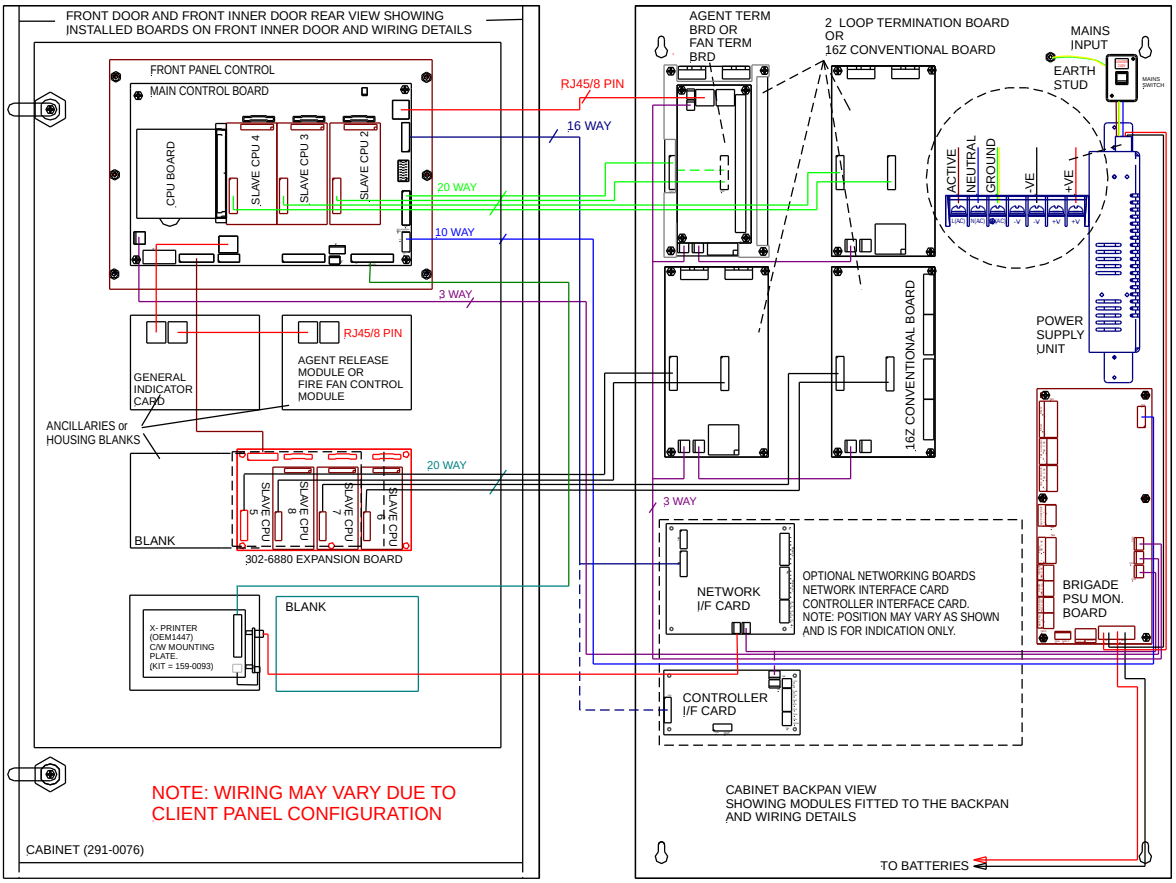


Figure 3: Typical Example of an SP8X Layout

3 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 Series II*** 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 forms the basis for a ***FireFinder Series II*** FACP. A single **Controller** without an expansion board has the capacity to interface to four (4) 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.

The Main Board has the Slave CPU Board for the first Loop Termination Board and the provision for mounting of up to three additional Slave CPU's. The 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 is required. This board contains 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 Series II*** 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.

FireFinder Series II has a second serial interface that connects to ancillary boards these can be used to control and monitor field plant equipment or the addition of an agent release module.

Where the system design exceeds the capability of one ***FireFinder Series II*** then other ***FireFinder Series II*** 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)
- ***SmartTerminal***
- ***SmartGraphics***

A Network ***FireFinder Series II*** 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 is accessed using a Network Interface Card. The network configuration determines whether a NIC is required. Configurations can be;

Master / Sub FACP**:** Where there is 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.

SmartTerminal: 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 Series II***.

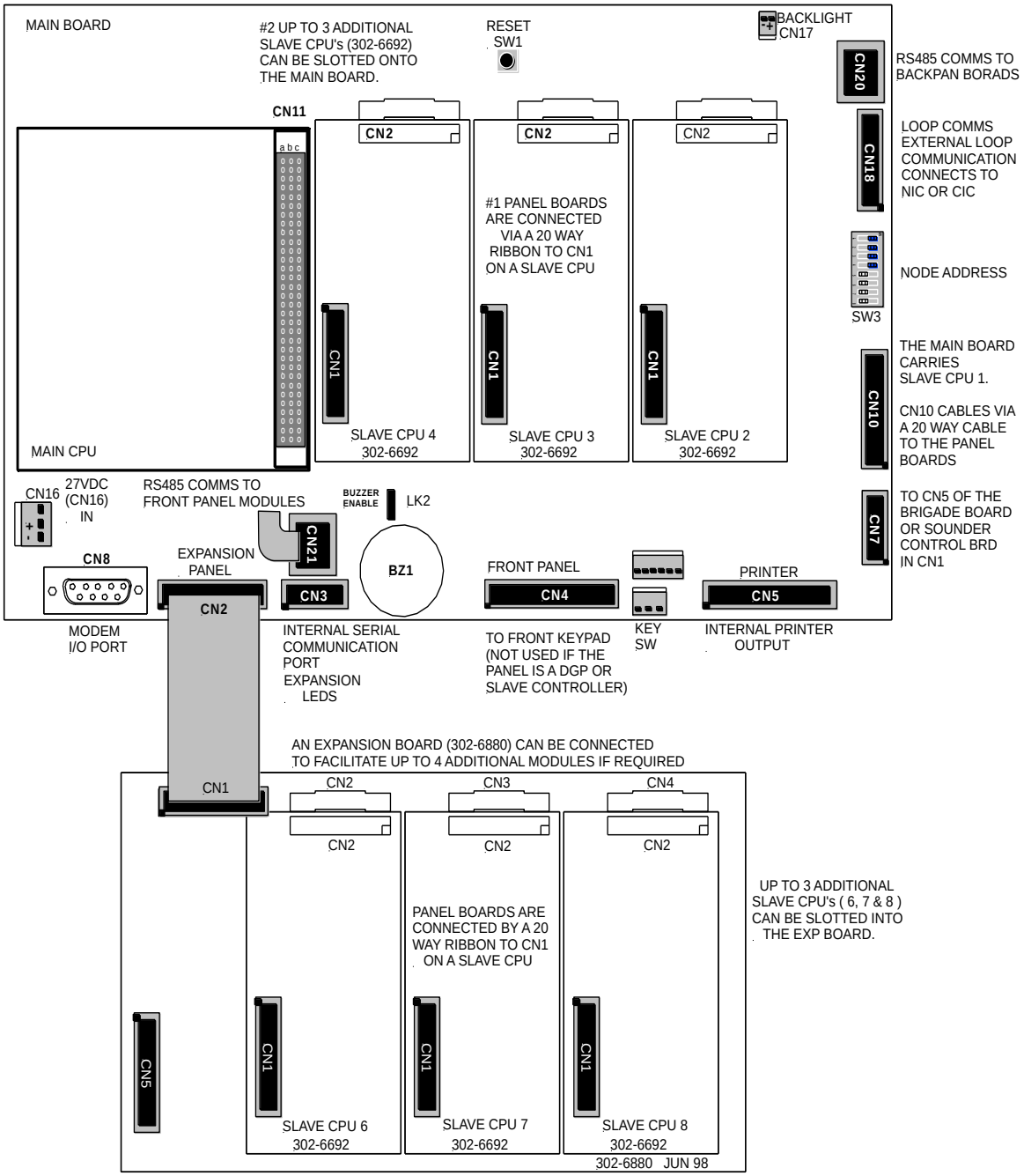


Figure 4: Single Controller Board with Expansion Board

4 Placing the Basic System into Operation

4.1 Unpacking

Carefully unpack the ***FireFinder***.

The package should include:

- ***FireFinder SERIES II*** Fire Alarm Control Panel
- An Operators manual
- 003 keys

4.2 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

4.3 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.

4.4 The Cabinet

Features:

- The cabinet is available in three different styles. Each style has the capability of being either surface or flush mounted. When flush mounted a separate surround is required.
- Normally painted Arch White Ripple. Other colours 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 100º. 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. The larger range of cabinets use a removable gland plate to allow for the greater amount of cabling

4.5 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.

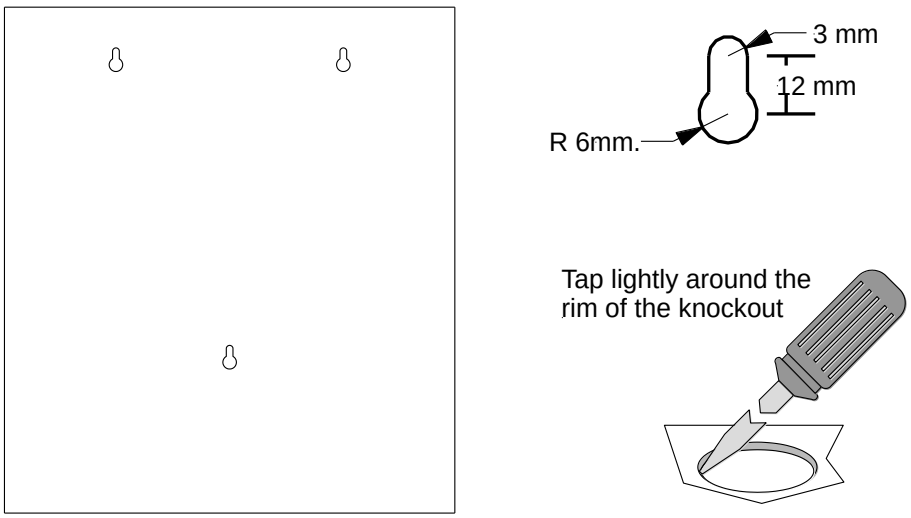


Figure 5: Example SP1X Back Pan Mounting Hole & Removing Knockouts

4.6 Operational Parameters

GENERAL	
Max No of Devices per Loop	126
Max No of Devices per Conventional Zone	40
Cable Loop Characteristics	2 core. 1.5 to 2.5mm²
POWER SUPPLY	
Power Supply Output Voltage	27.4V
Power Supply Output Current	2Amp, 5.6Amp or 18Amp
Power Supply Input	85 - 264VAC (47 – 63Hz)
Panel Current Draw	220 mA (min)
Minimum Operating Voltage	19.2 V
Battery Type & Capacity **Note: A greater range of batteries can be supplied if using and remote battery bike.**	2 x 12V sealed lead-acid SP1,2 & M = 12AH SP4 = 24AH SP8 = 24AH
ENVIROMENTAL	
Temperature	-5ºC to + 55ºC
Humidity	25% to 75%
IP Rating	IP51
MECHANICAL	
Material	1.2mm Steel
Finish	Arch White Ripple Coat
Dimensions	495mm (H) x 397mm (W) x 125mm (D)
Dimensions	450mm (H) x 400mm (W) x 130mm (D)
Dimensions	420mm (H) x 515 mm (W) x 140mm (D)
Dimensions	840mm (H) x 515mm (W) x 140mm (D)

4.7 Cabling Recommendations

Conventional Zones

Cabled in red Twin Plastic Sheath (TPS), 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 485 Network

Single twisted pair screened (2 core) cable originating from FACP extending through the protected areas and returning to the FACP.

Cable Specifications

Capacitance of 100 Pico farads 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

SmartTerminal

Single twisted pair shielded cable (2 core) plus 2 core power, or local supply. Maximum distance between from the last ***SmartTerminal*** and the FACP is 1.2km.

LED Mimic (RS485)

Single 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 1.5mm^2 PVC sheathed MIMS from the FACP to the Telecom MDF.

RJ45 Multi-drop Serial Port

8 core Flat cable

4.8 Power Supplies and AC Mains Installation

Generally the 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			
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	± 1%	150mV	79%	
SP-150-27	27V @ 5.6A	± 1%	150mV	84%	
SP-500-27	27VDC @ 18A	± 1%	200mV	86%	

4.8.1 Connecting the Mains Earth

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

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

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

An additional M4 nut and M4 SPW are fitted to the Chassis Earth Terminal for installers to connect their Mains Earth.

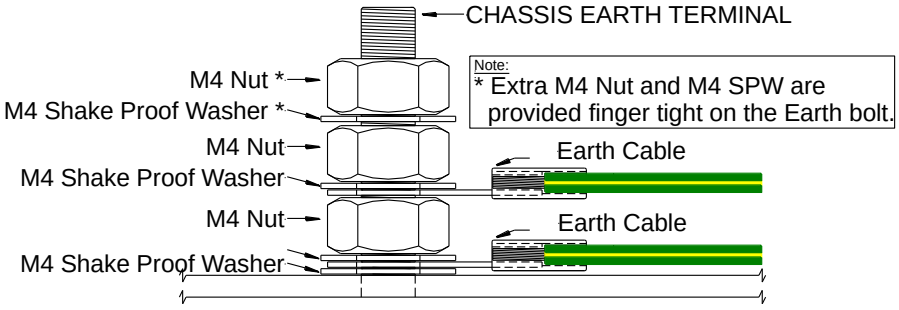


Figure 6: Panel Earthing

4.8.2 Connecting the Mains Power to the Power Supply

Terminate the mains power to the 240 VAC switch terminal block as shown below.

2 AMP Power Supply

Output Voltage: is set to 27.4Volts.

Mains cable should be no less than 0.75mm″

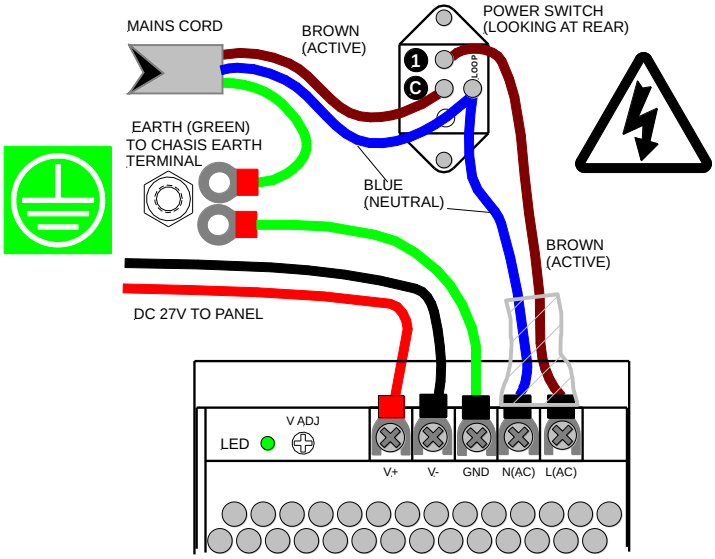


Figure 7: Mains Power Connection 2 AMP Power Supply

5 AMP Power Supply

Output Voltage: is set to 27.4 Volts.

Mains cable should be no less than 0.75mm″

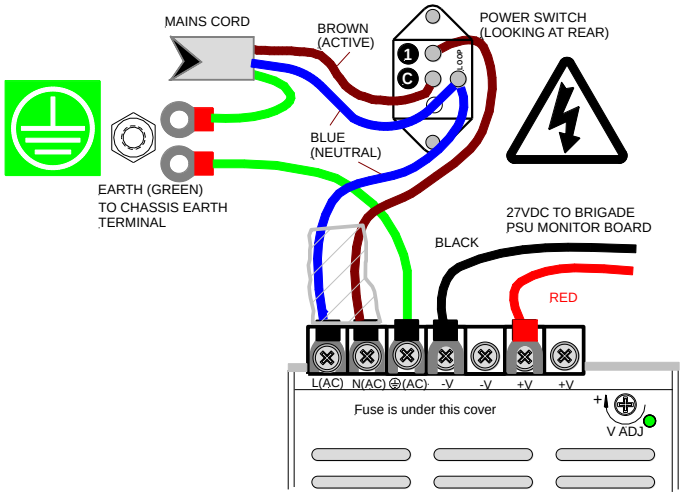


Figure 8: Mains Power Connection to the 5 AMP Power Supply

18 AMP Power Supply

Output Voltage: is set to 27.4 Volts.

Mains cable should be no less than 0.75mm″

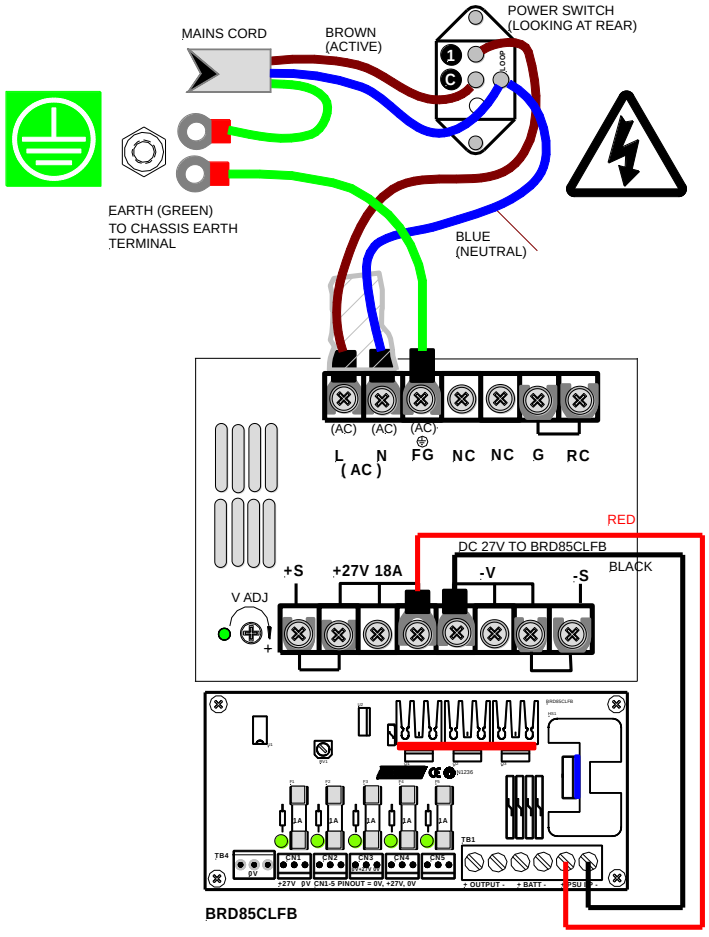


Figure 9: Mains Power Connection to the 18 AMP Power Supply C/W Current Limit Board

4.9 Current Limiter, Fuse Board (BRD85CLFB)

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.

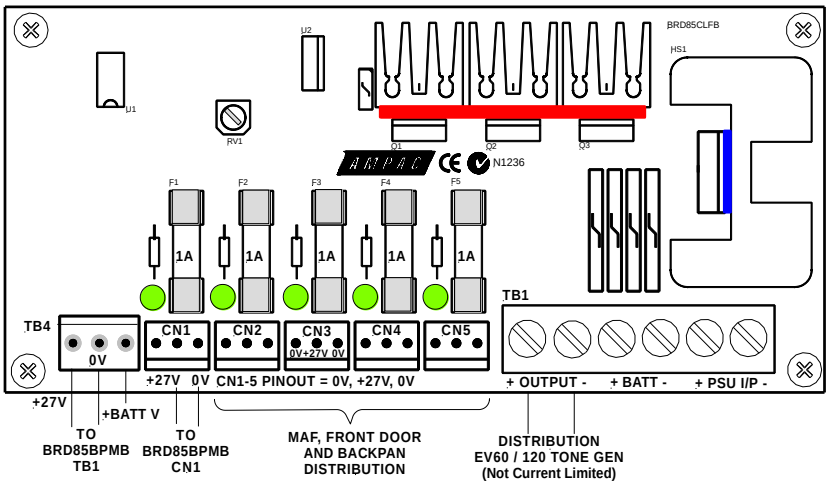


Figure 10: Current Limiter Fuse Board

4.10 Brigade / PSU Monitor Board (BRD85BPMB)

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 monitoring is enabled in ConfigManager. If either circuit is open or shorted, the panel buzzer will sound and a Bell 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 bells 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 ***ConfigManager***.

For all outputs combined, total output current is 2A (if 2A 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 transient line protection methodologies at the FACP and the load MUST be considered when connecting any control devices to the outputs be they in close or remote to the FACP.***

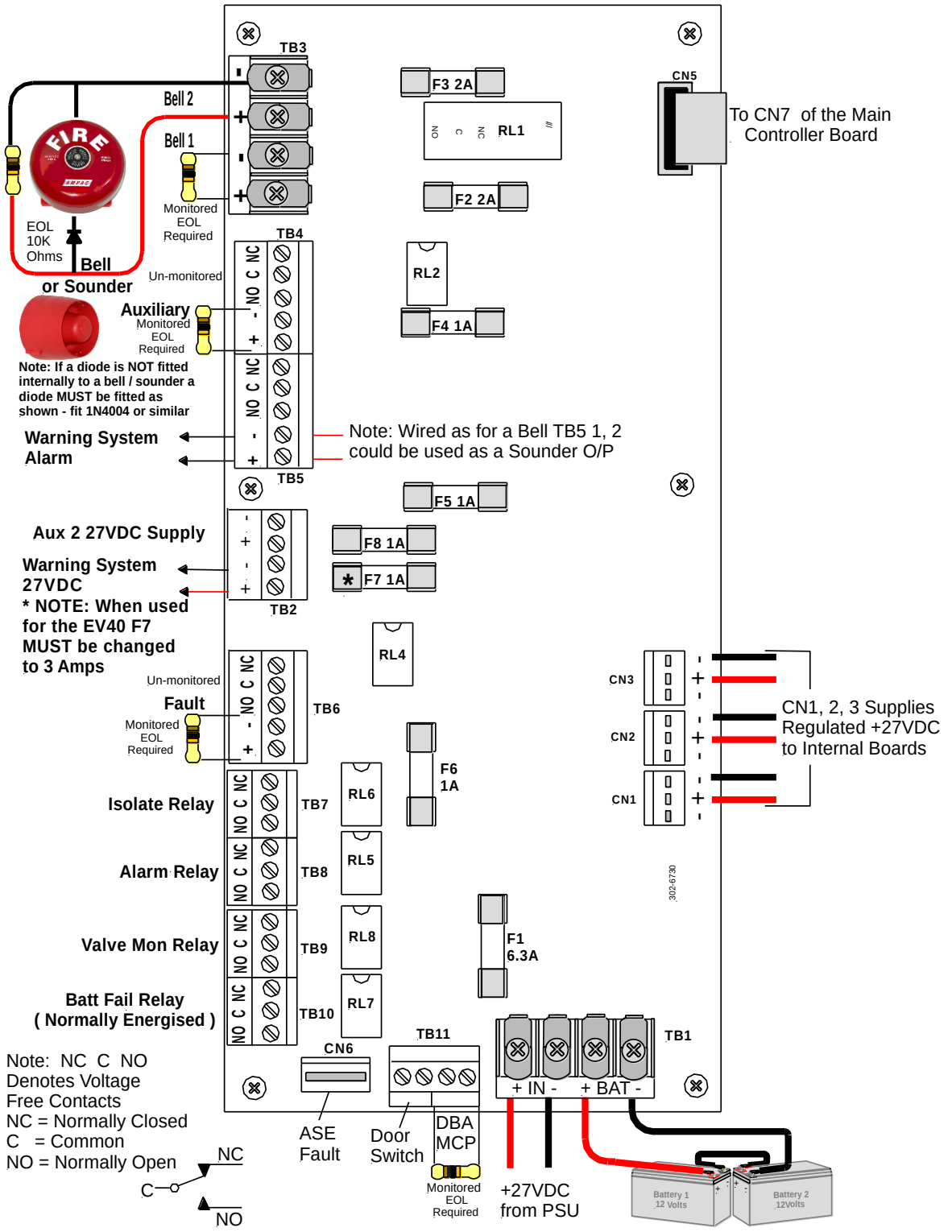


Figure 11: Brigade / PSU Monitor Board Layout

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

4.10.1 Battery Connections (TB1)

A ***FireFinder*** requires 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. Battery size is dependant on system configuration and can vary from 12 AHr to over 100 AHr.

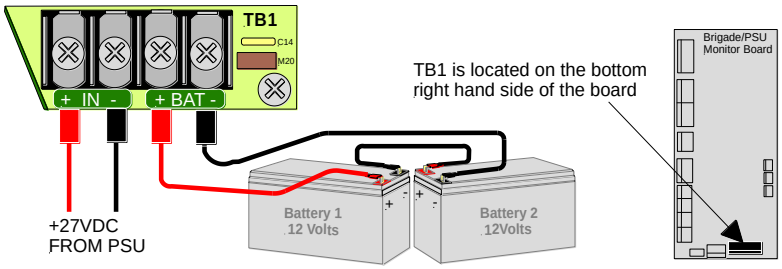


Figure 12: Battery Connection to the Brigade Board

4.10.2 Auxiliary 27 Volt Power (TB2)

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.

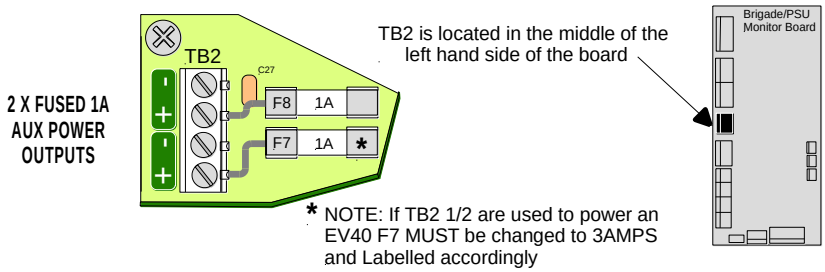


Figure 13: Auxiliary 27v Power Output

4.10.3 Bell / Sounder Monitored Outputs (TB3 & TB5)

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.

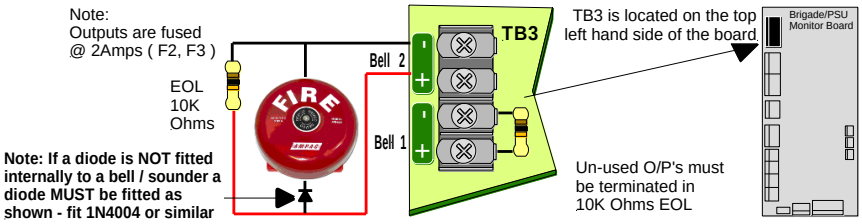


Figure 14: Use of Warning System Control for Sounder / Bell Wiring

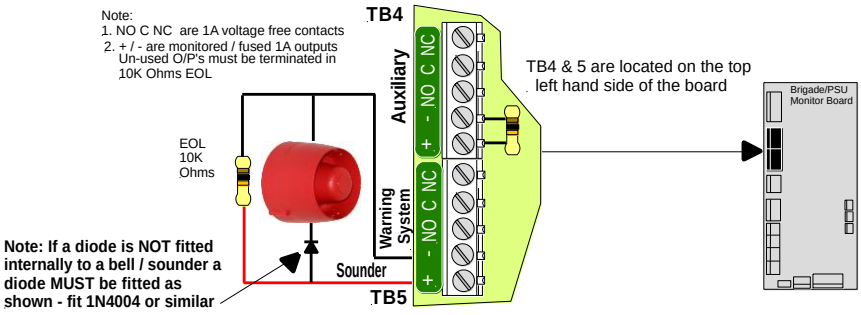


Figure 15: Use of Warning System Control for Sounder / Bell Wiring

4.10.4 Warning System connections (TB5)

Warning systems such as the EV20 and EV40 are connected to the Brigade / PSU Monitor Board as shown below.

☞ **Note:** *EOL not required in connection as it is fitted at the EV20/EV40 module*

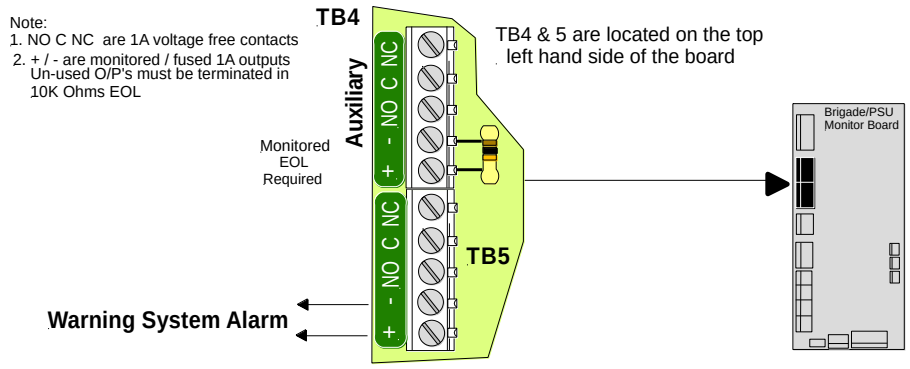


Figure 16: EV20 / EV40 Warning System Cabling (Alternate to Sounder / Bell Wiring)

4.10.5 Relay Output Connections (TB6 – TB10)

The relay contacts are connected as shown below.

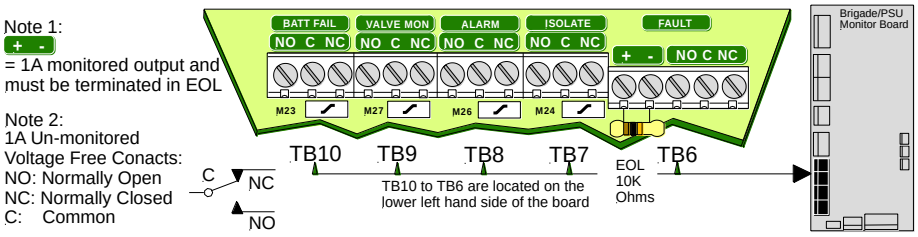


Figure 17: Relay Outputs

4.10.6 DBA / MCP & Door Switch Connections (TB11)

If used the DBA / MCP & Door Switch Connections are shown below.

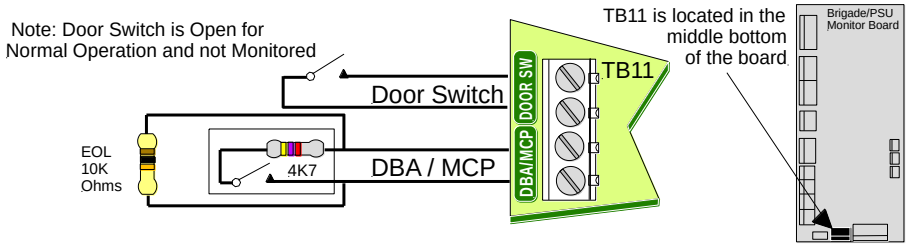


Figure 18: DBA /MCP and Door Switch Wiring

4.10.7 ASE Fault Brigade Box Connection (CN6)

If an ASE Brigade Box is included in a system CN6 is used to convey a fault in the box to the FACP.

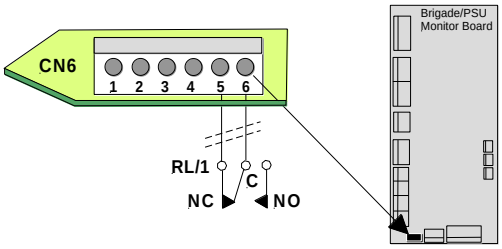


Figure 19: ASE Fault Switching

4.11 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.

RV1 – LCD contrast adjust

Supply and Current = 27VDc @ 120mA

Connections

CN1	Keyswitch Input	CN12	LCD Graphic
CN2	Expansion Panel	CN13	Slave CPU connection
CN3	Serial Communication Port	CN14	Slave CPU connection
CN4	Front Keypad	CN15	Slave CPU connection
CN5	Printer	CN16	27VDC in
CN6	Misc	CN17	To LCD Backlight supply
CN7	Brigade Output	CN18	External Loop Communication
CN8	Modem [RS232]	CN19	LCD Characters
CN9	External Buzzer Output	CN20	RS485 Communications Port 1
CN10	Slave CPU output 1	CN21	RS485 Communications Port 2
CN11	Main CPU		

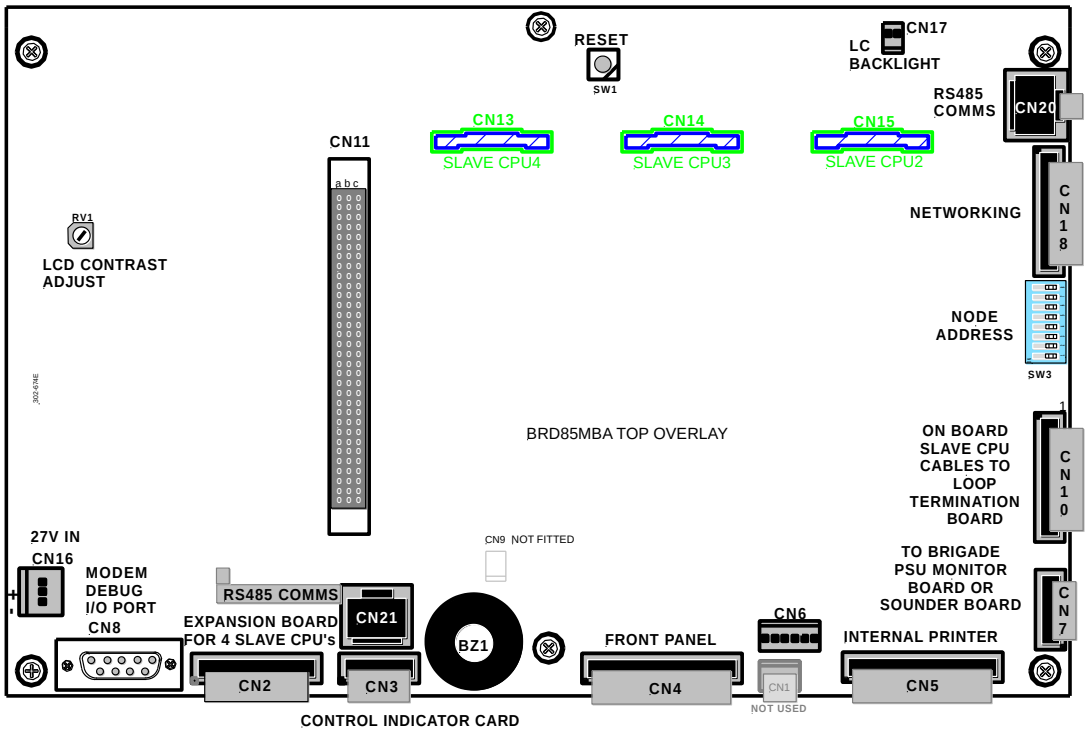


Figure 20: Main Board Layout with no Main CPU or Slave CPU's

4.12 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.

CONECTIONS

CN1	To CN4 BRD85MBA

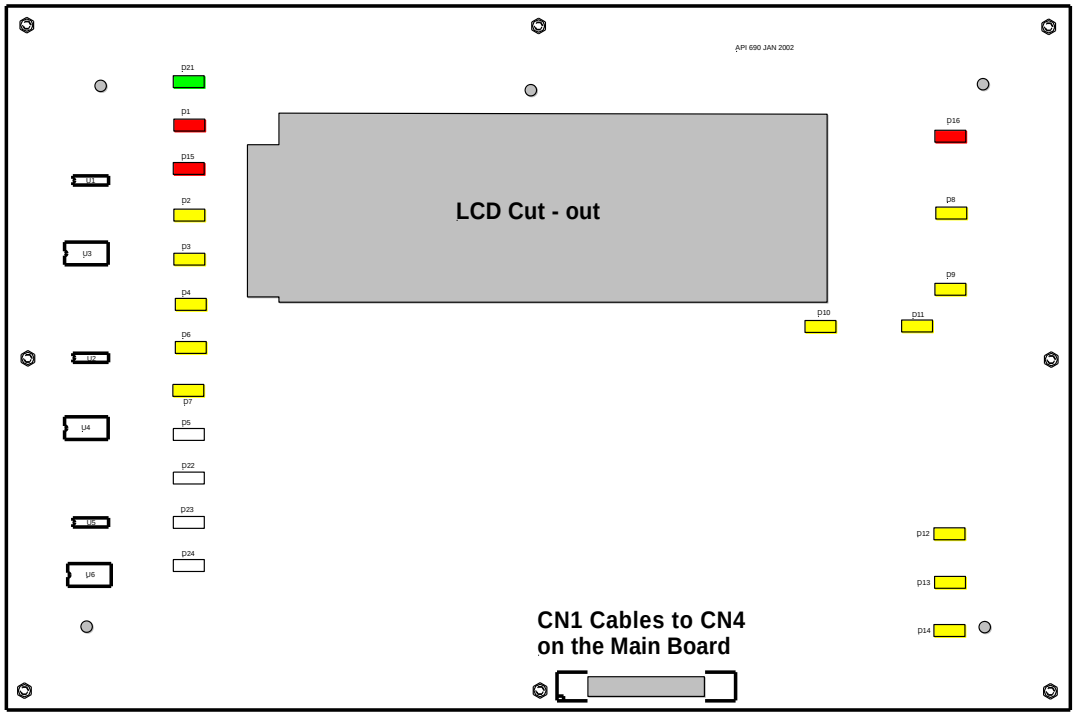


Figure 21: Front Panel Board

4.13 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 M27C1001 EPROMS. U2 provides the even bytes. (D0 toD7) and U3 the odd bytes (D8 to D15

Connections

CN2	To Main Board BRD85MBA CN11

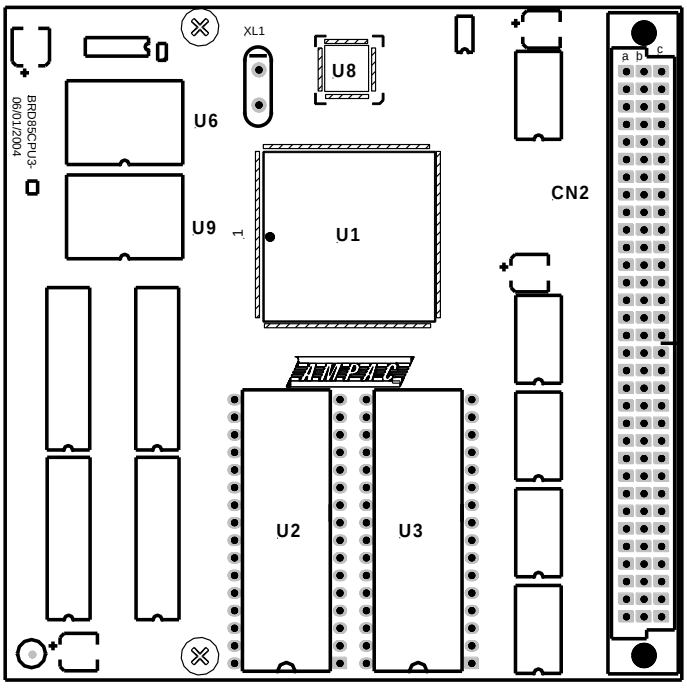


Figure 22: The Main CPU Board PCB Layout

4.14 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 U1.

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

CN1	To 302-735 or 302-671 or 302-672 or BRD85DLTB-B

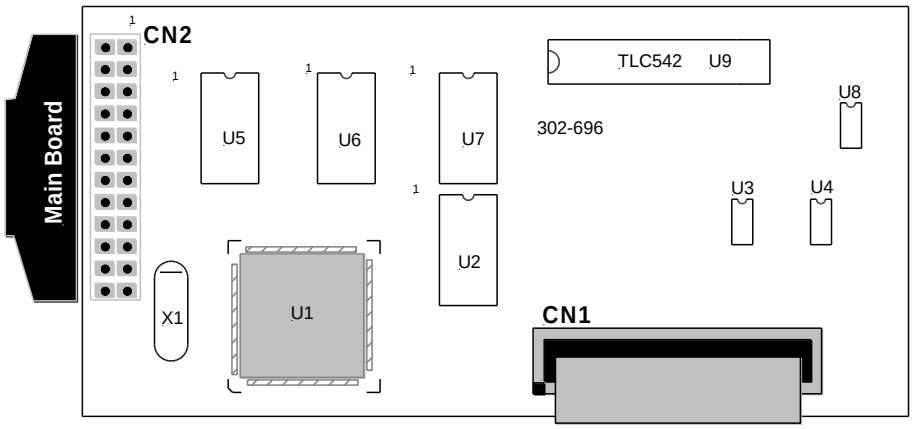


Figure 23: Slave CPU Board

4.15 Conventional Zone Board (302-671)

Under the control of a Slave CPU the Conventional Zone Board provides the interface between it and the external conventional devices. 16 Conventional zones can be connected to TB4 to TB1, with a limit of 32 conventional detectors can be connected to TB4 to TB1.

Connections

CN1	To 27VDC
CN2	To 302-699
TB4 / 5	To Conventional Detectors

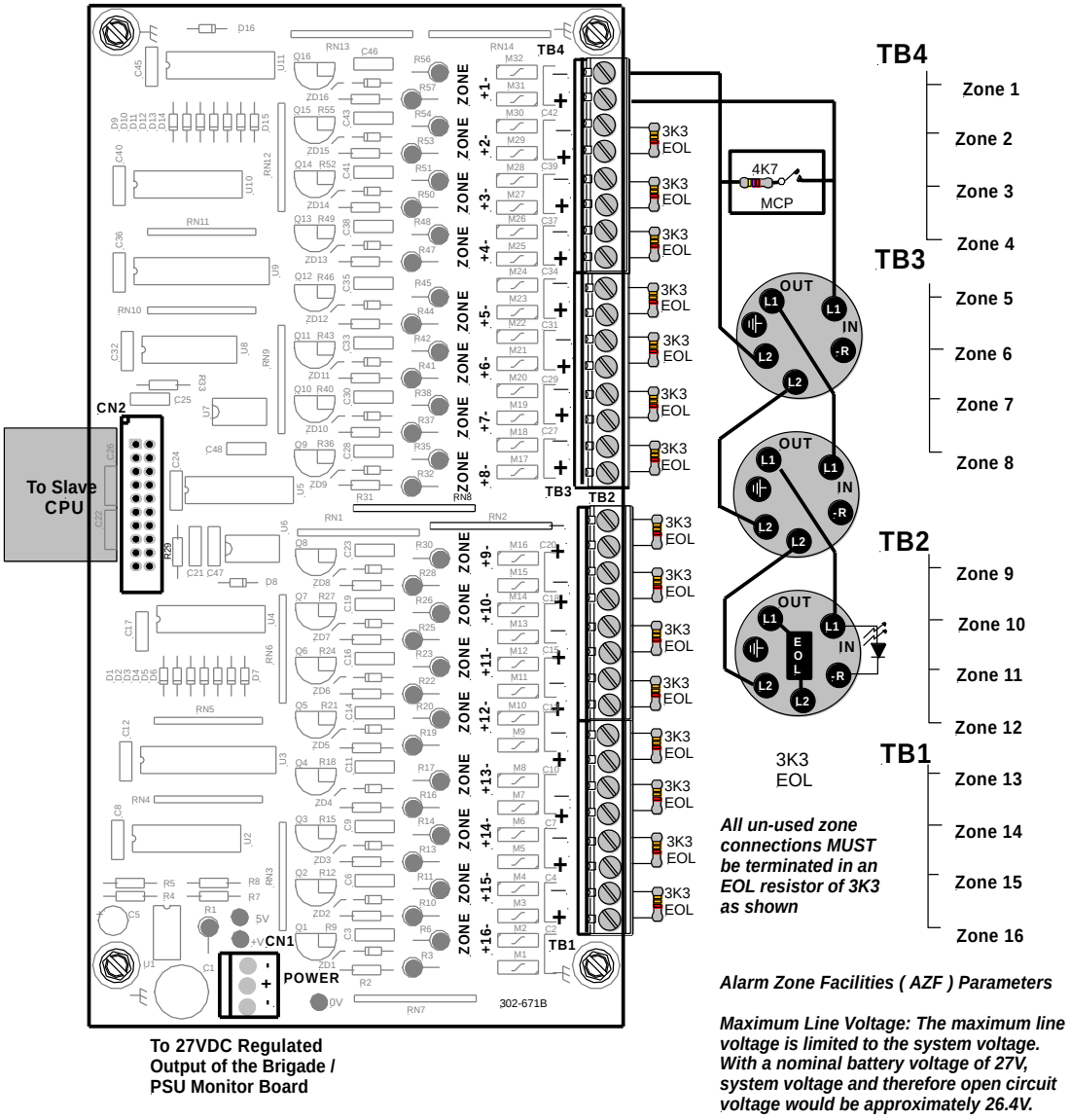


Figure 24: Conventional Board Layout

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.

4.16 Addressable Loop Termination Board (302-735)

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

CONNECTIONS

CN1 / 3	To 302-699
CN2 / 4	27VDC in / out
TB1 / 2	To Addressable loop devices

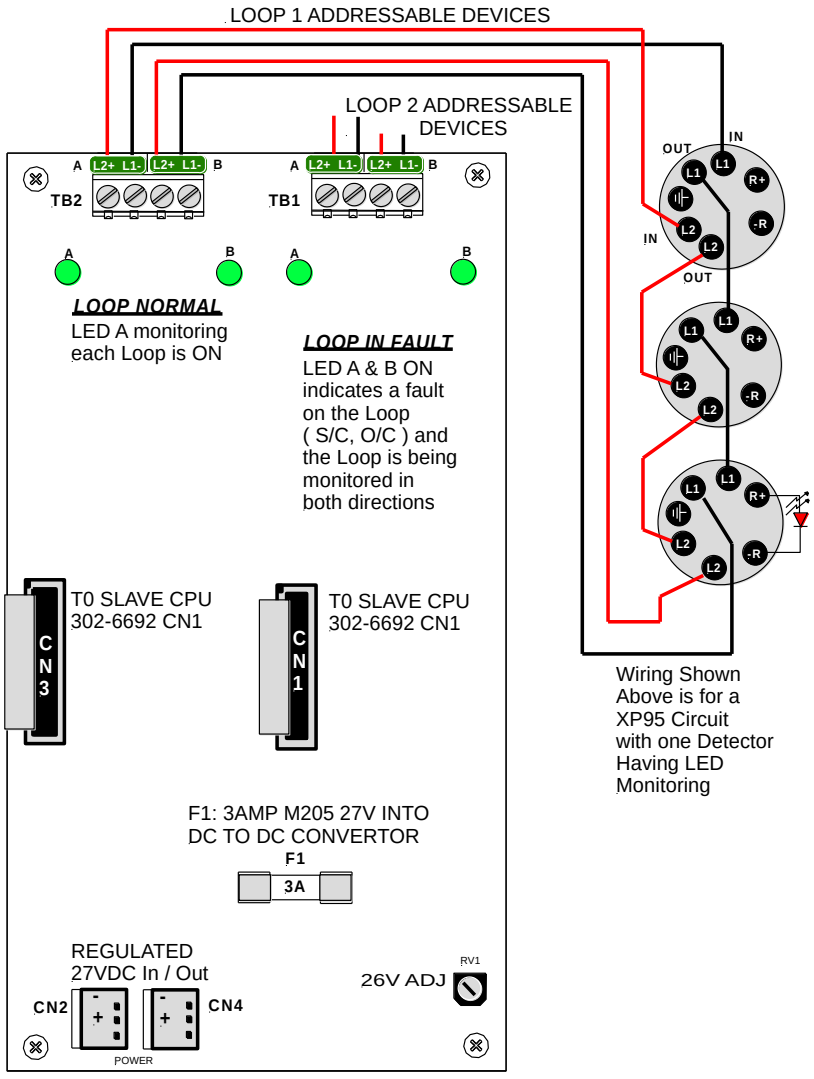


Figure 25: Addressable Loop Termination Board

4.17 Addressable Loop Termination Board (BRD86DLTB-B)

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.

☞ **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 (i.e. maximum address range)
- 500mA Current Max
- S/C protection circuitry activates at approximately 650mA
- Maximum length 1.2km

☞ **Note:** *To achieve full current, the Loop Trip current in Loop Parameters needs to be set to 300mA (**ConfigManager**)*

CONNECTIONS

CN1 / 2	To 302-699
CN3 / 4	27VDC in / out
TB1 / 2	To Addressable loop devices

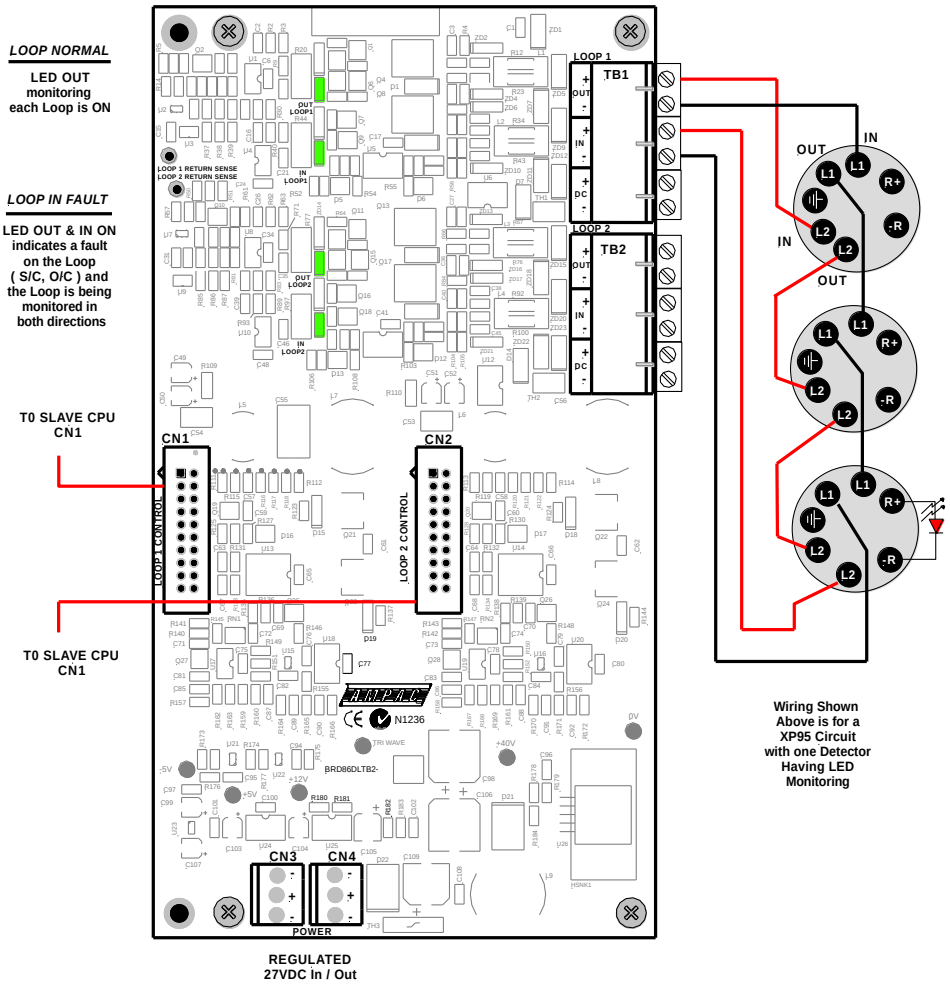


Figure 26: Addressable Loop Termination Board

5 FireFinder Control Panel

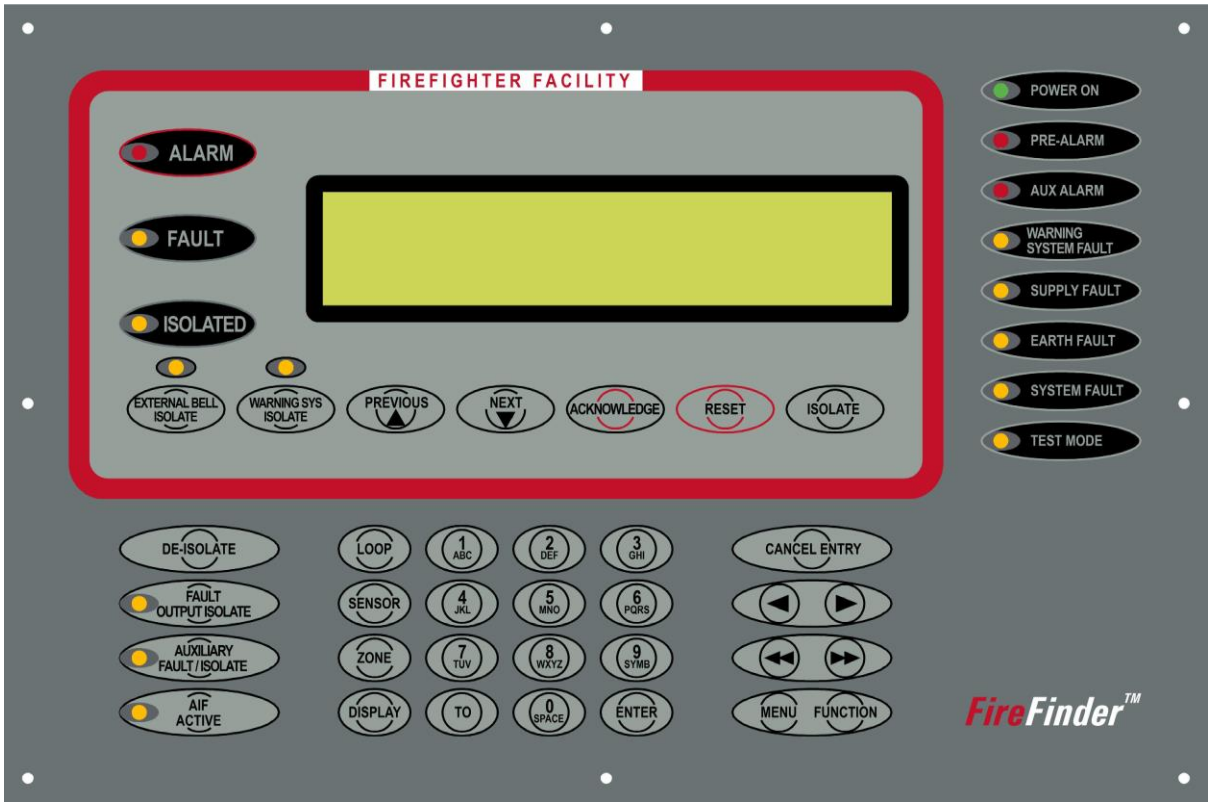


Figure 27: The FireFinder™ Control Panel with a 4 Line LCD

FIRFIGHTER FACILITY

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

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

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

(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.

(Yellow): 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.

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

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

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.

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 un-cleared faults or isolated devices, these will continue to be displayed.

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

Indicators

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

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

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

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

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

- Mains power is not available.
- The output voltage is too low (less than 24.5V)
- The output voltage is too high (greater than 28V)
- The battery is not connected properly.

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

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

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

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

(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.

(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.

(Yellow): Pressing this button will activate the Alarm Investigation Facility. The LED shall turn on.

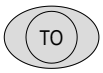
Press this key followed by a number to select the loop you wish to access e.g. LOOP 4.

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

Press this key followed by a number e.g. ZONE 4 to select the required zone.

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

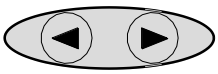
These keys are used to navigate around the panel's menus and enter data. If entering a descriptor, or some other data that contains characters as well as numbers, pressing the keys multiple times will scroll through the available letters written on the button, in sequence e.g. 1, A, B, C

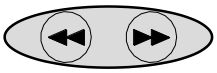


Use this key to access a range of devices e.g. Zone 2 TO 7.

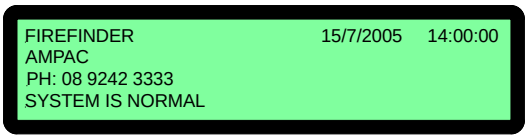
Press the ENTER key when using the panel, to enter data.

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


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


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

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.



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.

IMPORTANT NOTE:

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

6 Functions And Menus

6.1 The Default LCD Display

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

Figure 28: 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.

6.2 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.

☞ **Note:** *Only Authorised Service Technicians / Engineers have the ability to change passwords.*

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

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.

6.3 Function Menu and Access Levels

Three levels of ACCESS are available via separate passwords so that access to certain facilities can be restricted (such as the ability to enter new passwords).

Level I: has access to MENU only while Password protected Levels 2 and 3 access MENU and FUNCTION as listed below.

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**.**

☞ **Note:** *The following should be read in conjunction with the Quick Reference Guides in Section 21*

7 The Main Menu

The **MAIN MENU** is accessed by pressing MENU.

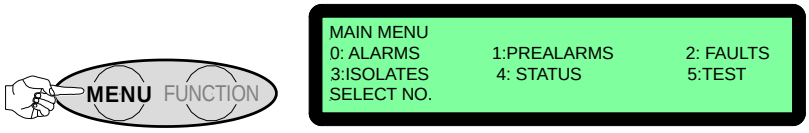


Figure 29: The Main Menu

Numbering System: ❶ denotes the menu structure number and ① denotes the sub-menu numbering.

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

❶ **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 (⓪ to ⑦) to view details of the fault.

⓪	①	②	③	④	⑤	⑥	⑦
Zones Sensors	Loops	Modules	Comms	Power Supply	Brigade	Test Failures	Sounders

❸ **ISOLATES** on the system.

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

7.1 Status Menu

❹ Is pressed to access the STATUS MENU.

FACP WITHOUT NETWORKING *FACP WITH NETWORKING*

Figure 30: 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

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

⓪ *Press* to print all devices on the loops (*Press* RESET to stop printing)

① *Press* to print totals of the loops (*Press* RESET to stop printing)

❶ **Modules:** Select the type of module, Slave⓪, P/S①, Brigade② or External LED Mimic③ 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.

⓪ *Press* to display Output status – ⓪ IN A PANEL or ① ON A LOOP

① *Press* to display Input status - – ⓪ IN A PANEL or ① 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.

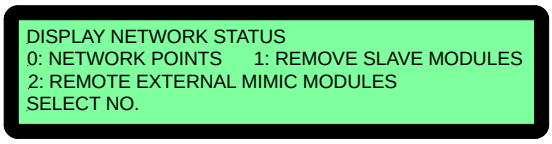


Figure 31: Display Network Status

⓪ **Network Points:**

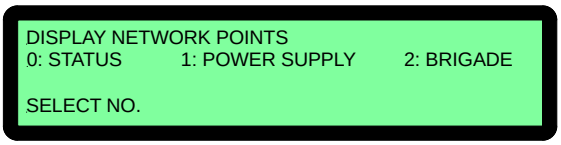


Figure 32: Display Network Points

Network Points Screens are

⓪ **STATUS:** *Press,* Select network point e.g. Loop Number

① **POWER SUPPLY:** *Press* to display Charger Volts, Battery Detected and Mains OK

② **BRIGADE:** *Press* to display Operational or Non-Operational

❶ **Remote Slave Modules:**

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

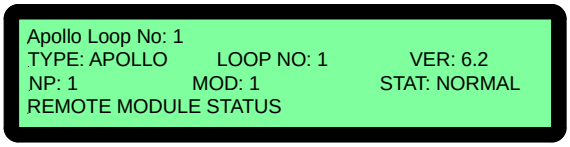


Figure 33: Display Remote Module Status

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)

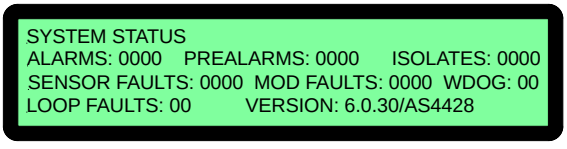


Figure 34: System Status

AValues:

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*)*

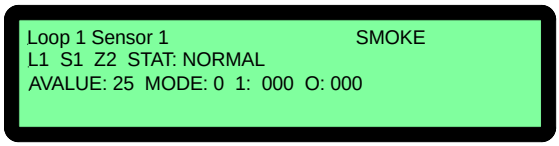


Figure 35: Analogue Values

7.2 Testing Menu

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

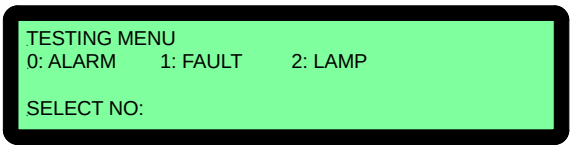


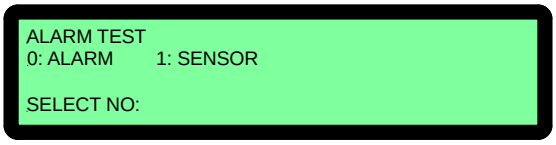
Figure 36: The Testing Menu

7.2.1 Alarm Test

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

⓪ 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 TO key is used, e.g., ZONE 1 TO 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. Pressing RESET clears the test.



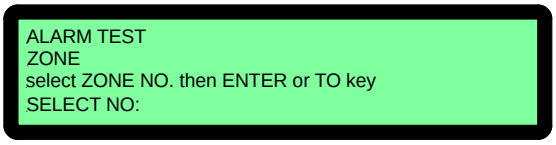
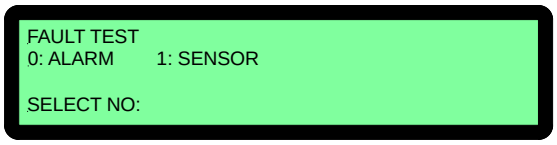


Figure 37: Alarm Test Selection Screens

7.2.2 Fault Test

① 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.



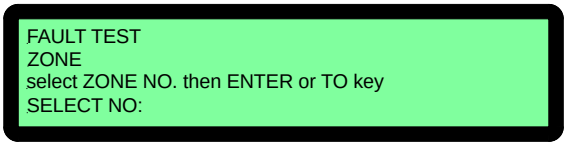


Figure 38: Fault Test Selection Screens

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 NEXT and PREVIOUS 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.

7.2.3 Lamp Test

② 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.

8 Main Functions

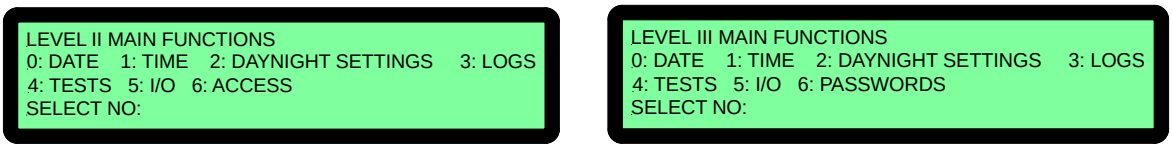


Figure 39: The Level II & III Functions Menu

8.1 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

❶ To select the set **DATE SCREEN**. The prompt will ask for the date to be entered in this format, **DD/MM/YYYY** (e.g. 01/01/2011), key in and press **ENTER**. The screen will then return to the **MAIN FUNCTIONS MENU**.

8.2 Setting the Function Time Facility

Press

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

8.3 Setting the Function Daynight Facility

Press

❷ 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**.

8.4 Function Logs Facility

Press

❸ 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

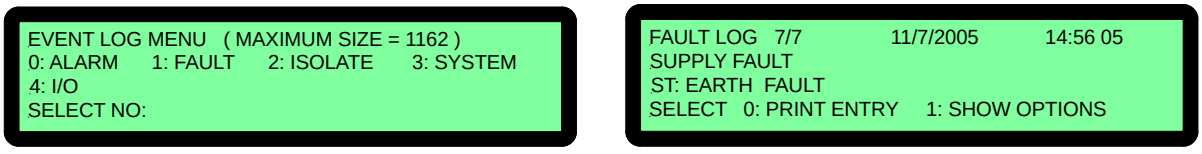


Figure 40: Logs Function Menu & Fault Log Selected

Once the type of log is selected, e.g. 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.

8.5 The Function Test Facility

Press

❹ **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 Zone number pres ENTER or enter the Zone number press TO then the next highest Zone number o 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 LED's 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.

8.6 Function Manual I/O Control

Press

❺ To display the Manual I/O Control menu

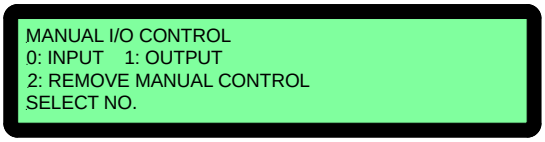


Figure 41: The Manual I/O Control Menu

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

⓪ **Input Selected:**

Press

⓪ **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.

① **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.

② **Remove All Manual Input Control:** Will remove all manual input control.

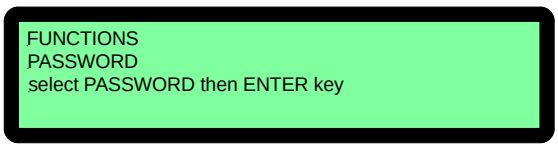
① **Output Selected:** Same sequences as above for inputs but substitute outputs for inputs.

② **Remove All Manual Control Selected:** Globally removes all manual control.

8.7 Function Access (Level II) / Passwords (Level III)

Press

❻While 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.



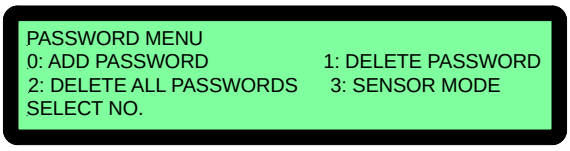


Figure 42: The Level II Password Entry & Level III Password Menu Screens

⓪ **Add Password:** Enter the new password, then press **ENTER**. The password is always a 4 digit number.

① **Delete Password:** Enter the password that you want to delete, and then press **ENTER**.

② **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, Pre-alarms and Isolates status information will be displayed. “Zone” is the default setting.

8.7.1 Forgotten Passwords

Follow the following process if a password has been forgotten or misplaced;

Entering 9999 into the password field;

Take note of the 4 digit password number displayed on the screen; then

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.

8.8 Function Programming

Press

❼ To display the Level III Programming Menu.

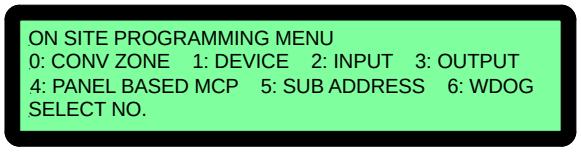
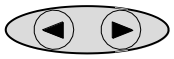


Figure 43: Programming Menu

8.8.1 Conventional Zone Programming

Press

⓪ **Zone:**

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

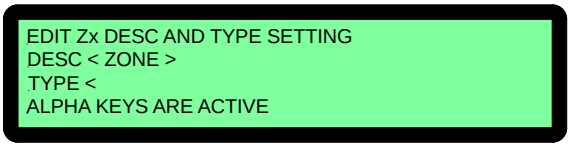


Figure 44: Zone Description & Type Programming

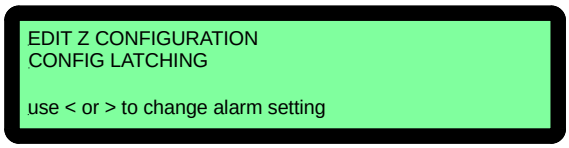
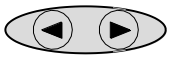


Figure 45: Brigade Options

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.

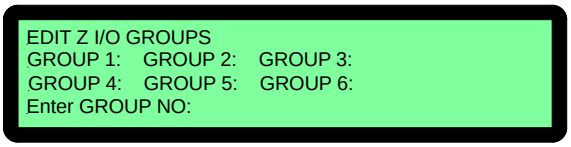


Figure 46: Zone Configuration Latching / Unlatching

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.

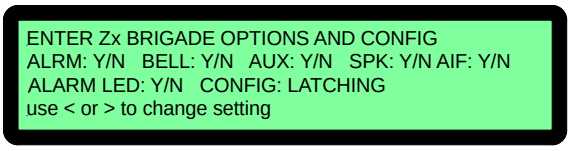


Figure 47: Zone I/O Groups

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.

8.8.2 Device Programming

Press

① DEVICE:

Screen: ◄ use these keys ► to **EDIT** and move through wording &

These ● ● keys to **MOVE** between fields i.e.: DESC & TYPE and next parameter

Enter the Loop and Sensor number then scroll through the following screens.

Press or Press

⓪ to **EDIT** or ① to **DELETE**

1. EDIT LxSx DESCRIPTION AND TYPE STRING. Edit then. *Press* ●

e.g.: DESC Loop 1 Sensor 1

TYPE **SMOKE**

2. Allocate / Edit the Sensor to a Zone and set the device type then. *Press* ●

e.g.: XP95 Photo, XP95 Heat etc-

3. Set /Edit and display the Output Configurations or options then. *Press* ●

e.g.: 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.

8.8.3 Input Programming

Press

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

⓪ **IN A PANEL**	① **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** Lx Sx I/Px DESC STRING DESC

8.8.4 Output Programming

Press

③ **OUTPUT:**

By following the screen prompts as above Add, Edit or Delete an output in a panel or on a loop.

8.8.5 Manual Call Point (MCP)

Press

MCP:

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

8.8.6 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 (e.g. 1, 2 or 3 for 3IO device), or press ❶ 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.

8.8.7 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 ❶ will reset the counter. When the panel is commissioned this counter **MUST** be reset to 0 as must be the **Events Logs**.

8.8.8 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.

8.8.9 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.

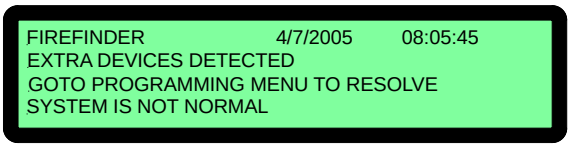


Figure 48: Resolving Extra Modules and Devices

To resolve select **FUNCTION**, enter **PASSWORD**, press ❻ and the screen below will appear

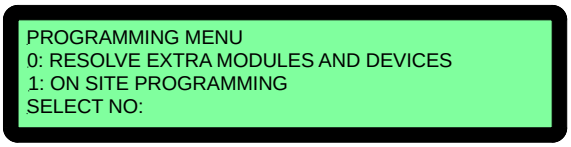


Figure 49: Added Module or Device

Select ⓿ (Selecting ❶ presents the PROGRAMMING MENU) then ⓿ 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.

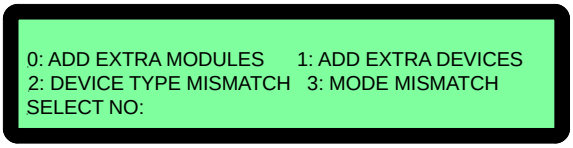


Figure 50: Resolving Extra Modules or Devices

8.8.10 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 ⓿ *Resolve Extra Modules and Devices* then ❷

(*Device Type*) or ❸ (*Mode*) to resolve the mismatch, OR On Site Programming to resolve manually.

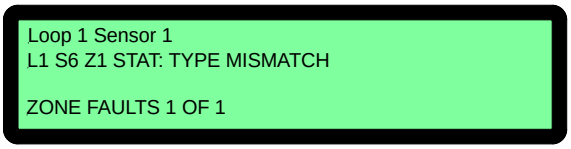


Figure 51: Resolving a Mismatch

9 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.
- 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.

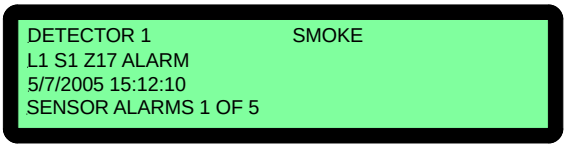


Figure 52: LCD Screen with 5 Devices in Alarm

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

10 Accessing a Loop, Sensor or Zone

LOOP OR SENSOR

- From the default display, press LOOP
- Enter the loop number you wish to interrogate then press SENSOR.
- Press the button for the sensor number.
- Press the TO button if you wish to access a range of sensors on the loop,
- Press the DISPLAY button if you wish to display the status of a sensor,
- Press the ISOLATE button if you wish to isolate a sensor then ACKNOWLEDGE
- Press the DE-ISOLATE button to de-isolate a sensor.

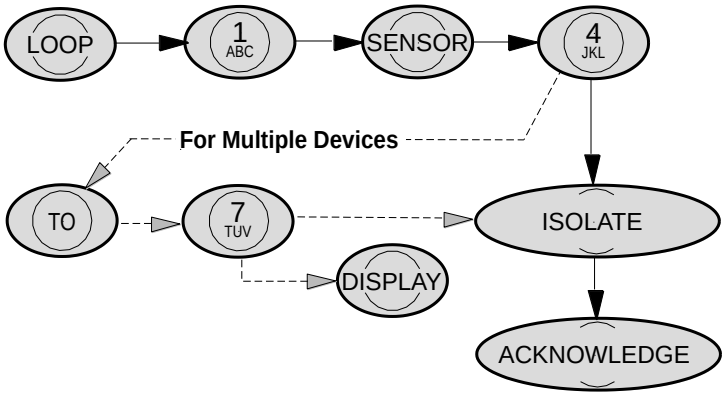


Figure 53: Steps for Isolating Single and / or Multiple Devices

ZONE

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

11 Expanding the FACP with Compatible FireFinder Boards

11.1 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:

- Actuation of fixed fire-extinguishing systems;
- Closing of windows, smoke and fire doors,
- Control of ventilating systems;
- 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.

11.2 Compatible *FireFinder* Boards

Module / Board	Part No	Fast Fit Kit Item No	Max No
Slave CPU	302-669	159-0007	8 per Controller # 1
Conventional Zone Board	302-671	159-0005	8 per Controller
Apollo Loop Termination Board	302-735	159-0003	8 per Controller
16/16 Input / Output Board	302-672	SP1X: 159-0113 SP8X: 159-0051 SP16X: 159-0009	8 per Slave CPU
8 Way Relay Board	302-676	SP1X: 159-0013 SP8X: 159-0013 SPX16X: 159-0015	16 per Slave CPU
16 Way Input Board	302-677	SP1X: 159-0114 SP8X: 159-0010 SP16X: 159-0011	8 per Slave CPU
Serial Relay Board	302-732	SP1X: 159-0079 SP8X: 159-0072 SP16X: 159-0072	16 per Controller
Fire Fan Module / Fire Fan Termination Board	BRD25FCB BRD25FTB	4310-0021	15 per Controller
General Indicator Card (32 Zone Alarm)	BRD85GIBB	SP1X: 159-0106 SP8X: 159-0089 SP16X: 159-0120	* 16 * Config dependant
General Indicator Card 16/16 Zone Alarm & Fault	BRD85GIBB	SP1X: 159-0107 SP8X: 159-0108 SP16X: 159-0121	* 16 * Config dependant
General Indicator Card Amber LED's	BRD85GIBB	SP1X: 159-0123 SP8X &16: 159-0124	* 16 * Config dependant
Printer	OEM1447	SP1X: 159-0084 SP8X: 159-0110	1 per Controller
Sounder/Bell Controller Board 8 x 1A per circuit	302-7420	SP1X & SP8X: 159-0071	8 per Controller
Sounder/Bell Controller Board 4 x Volt free, 4 x 1Amp	302-7421	SP1X & SP8X: 150-0069	8 per Controller
Agent Release Module / Agent Termination Board	BRD25ARB-A BRD25ATB	SP1X:159-0099 SP8X: 159-0100 SP16X: 159-0117	8 per Controller
Local Control Station (IP40)	BRD25ARB-B		4 per Termination Brd
Expansion Board	302-688	SP8X: 159-0112 SP16X: 159-0022	1 per Controller
Expansion Controller		SP16X: 159-0077 Rack: 159-0067	3 per Node
Occupant Warning System EV20	Factory Fit		
Occupant Warning System EV40, EV60 and EV120	Factory Fit		
Occupant Warning System EV3000	Factory Fit		
Brigade Devices	Factory Fit		
Compatible Networking Devices			
Expansion Controller		SP16X: 159-0077 Rack: 159-0067	3 per Node
Network Interface Board	BRD85NIC	SP1: 159-0053 SP8X: 159-116 SP16X: 159-0053	1 per Controller
High Level Interface Expander	BRD43SPB	4310-0080	3 per Controller
Communication Extender Brd	BRD82LTB		1 per Controller

☞ **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.

11.3 16/16 Input / Output Board (302-672)

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.

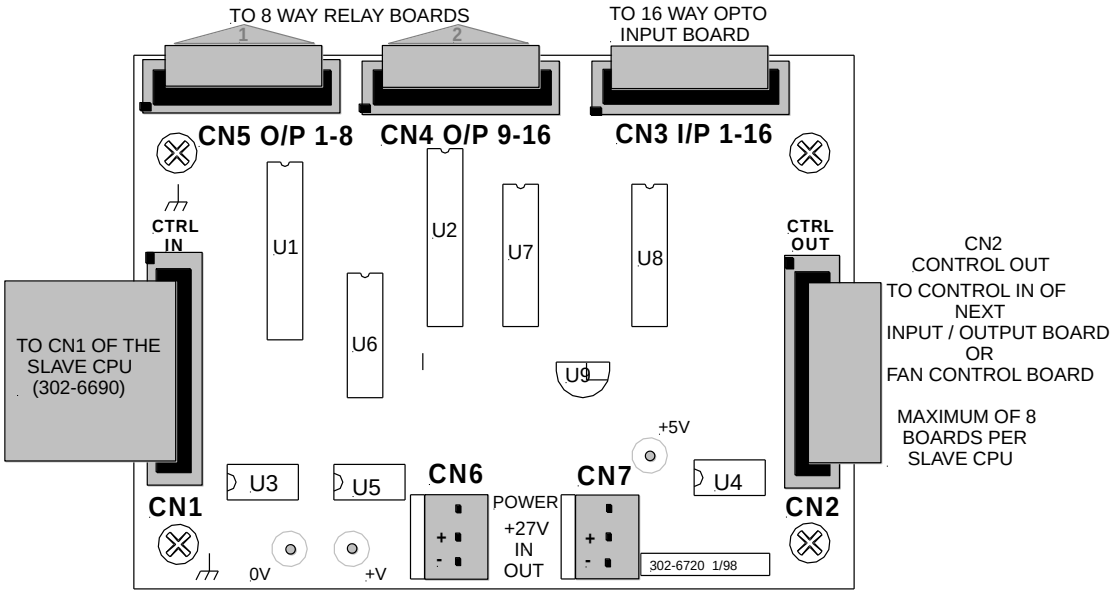


Figure 54: 16 / 16 Input / Output Board

11.4 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 (e.g. releasing doors) or monitoring (e.g. driving indicators, door open / closed) purposes.

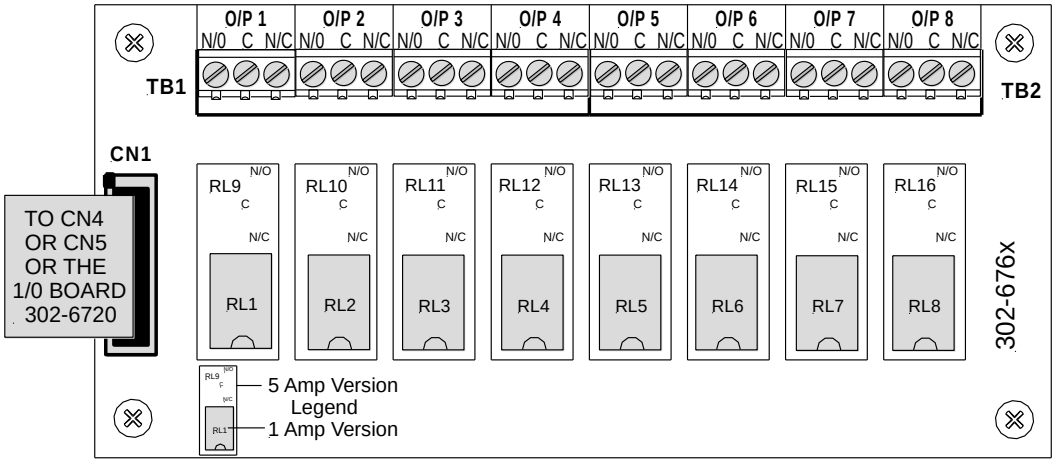


Figure 55: 8 Way Relay Board with 1A Relays Fitted

11.5 16 Way Input Board (302-677)

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.

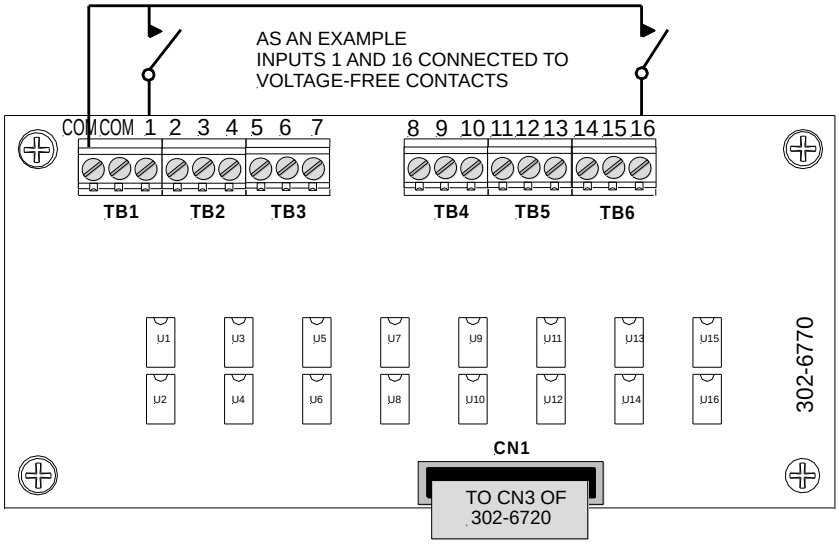


Figure 56: 16 Way Input Board

11.6 Serial Relay Board (302-732)

Relay Outputs: Each Serial Relay Board communicates with the Main Controller via the Serial Bus and is fitted with eight 1A relays fitted with voltage free contacts. A maximum of 8 boards can be daisy chained together per Controller.

To CN3 of Main Controller, other Serial Boards, LED Mimic or Valve Display Boards

To CN1 (IN) of next Serial Board

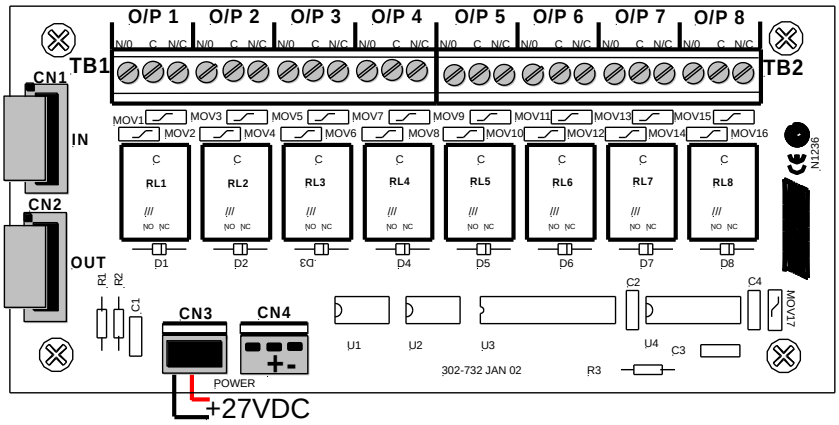


Figure 57: Serial Relay Board

11.7 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 e.g. 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.

The "Plant Trip" Reset is used to locally restart plant and equipment that has been automatically shut down because the FACP has initiated an alarm once that alarm has been cleared.

Quiescent Current: 13.5mA

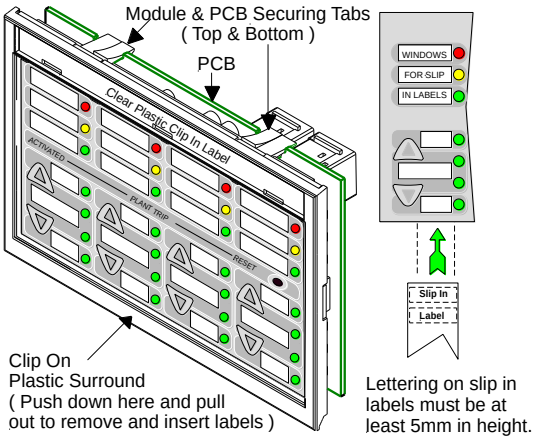


Figure 58: Fire Fan Module Front Panel

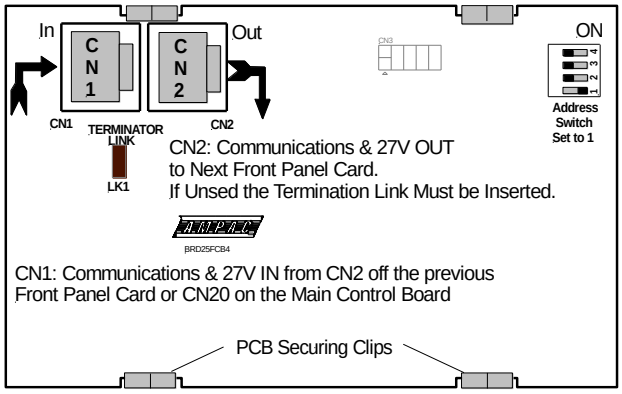


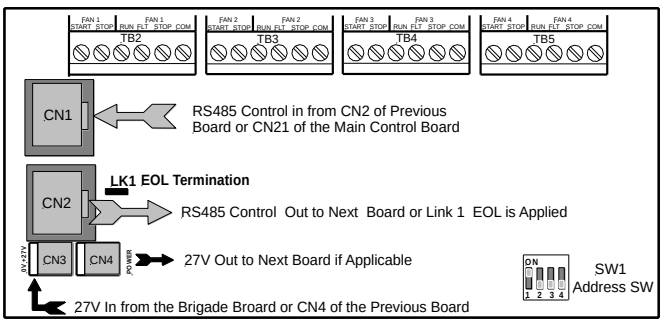
Figure 59: Fire Fan Module PCB Layout

11.8 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 resettable transorbs and resistive / capacitive networks.

Connectors

CN3 & CN4	27VDC in and out on boards mounted external to the FACP
CN5	Factory programming only and may not be available on all boards
TB2	Connect the fan control and monitoring wiring to the board.



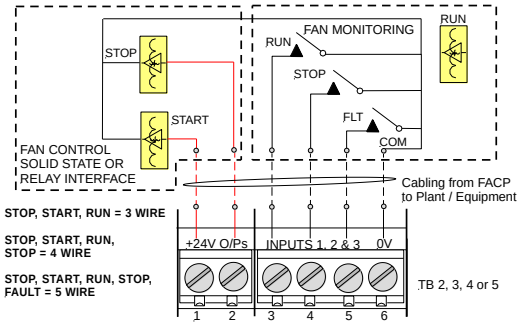


Figure 60: Fan Termination Board Layout and Typical I/O Wiring

11.9 Zone & General Indicator Card (BRD85GIBB)

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 be identified by way of slip in labels.

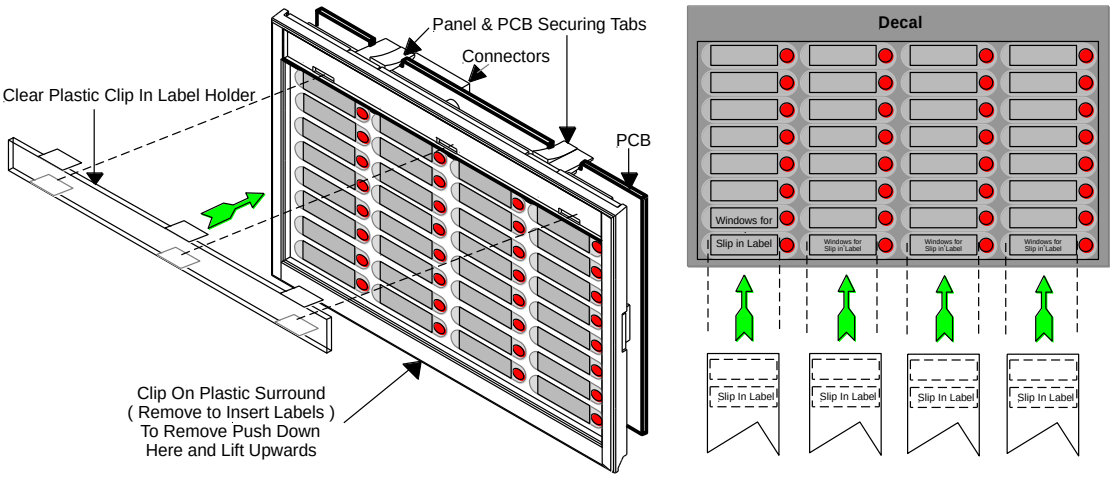


Figure 61: 32 Zone Alarm General Indicator Card

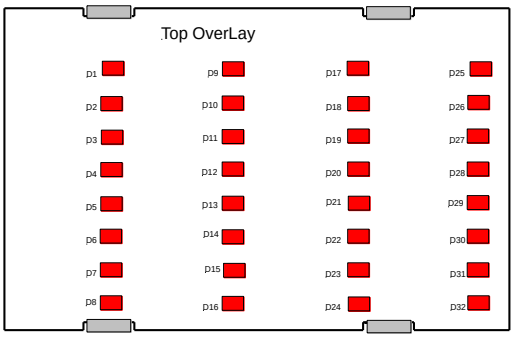


Figure 62: Bottom Overlay

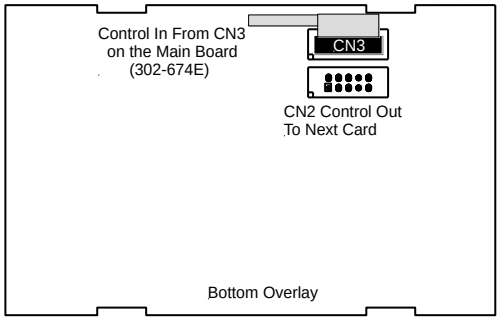


Figure 63: Top Overlay

☞ **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.*

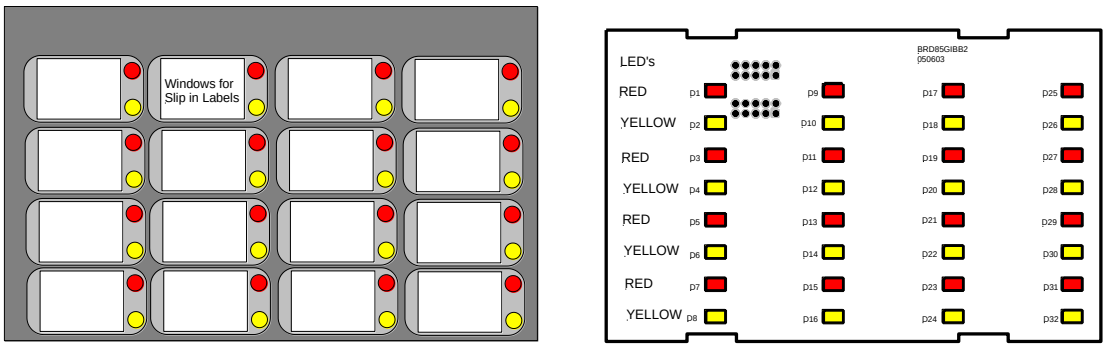


Figure 64: 16 Zone Alarm / Fault Card Decal & PCB Layout

11.10 Switch and Indicator Card (BRD25GIB – B)

This Card can effectively perform 2 different functions. Firstly the indicators monitor the first 8 inputs of the 16 Way Input Termination Board while secondly the switches can be programmed to manually operate a specific relay in the system.

Quiescent Current: 3.6mA

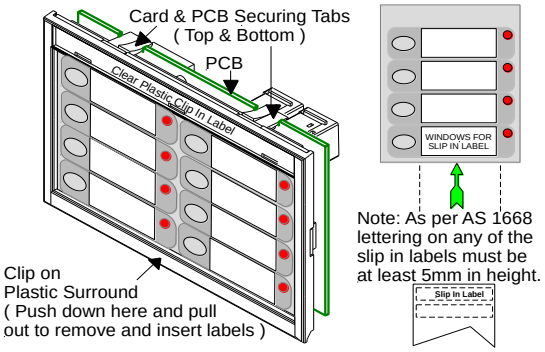


Figure 65: Front Panel Card Layout

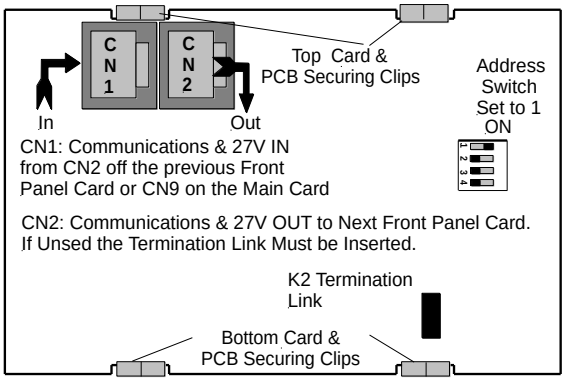


Figure 66: Front Panel Card PCB Layout

11.11 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 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

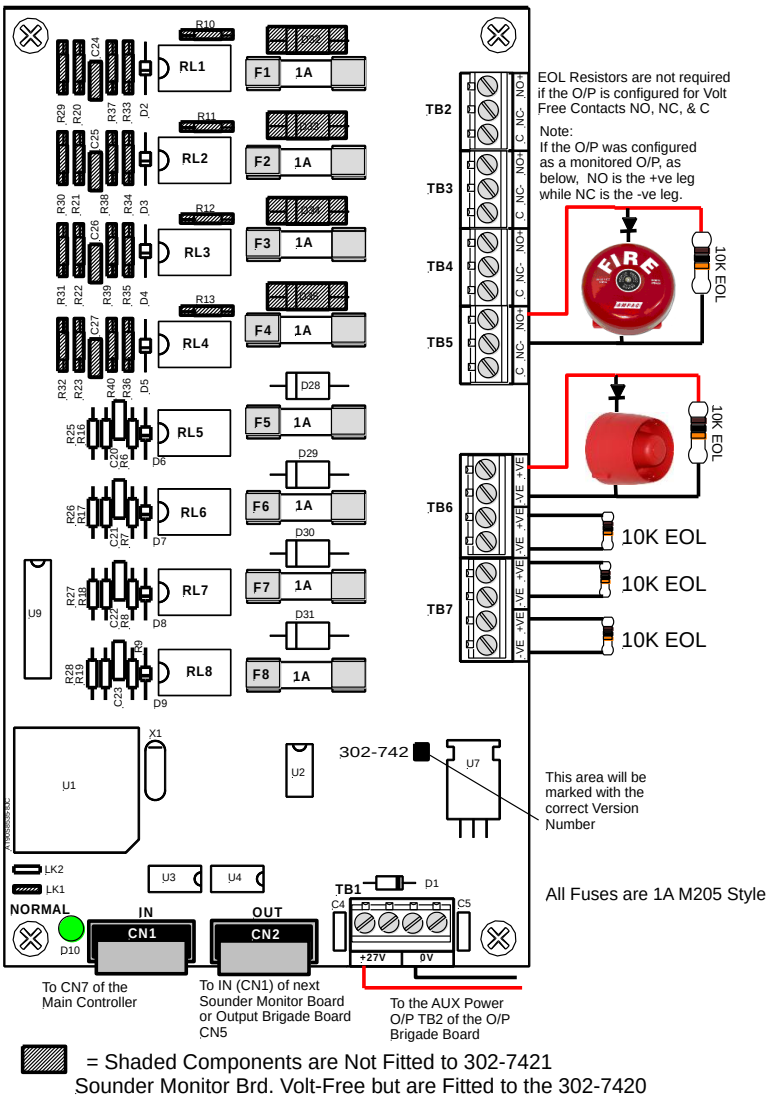


Figure 67: Sounder / Bell Controller Board

☞ **Note:** *Output current is dependent on the capacity of the Power Supply*

11.12 Printer

Specifications

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

11.12.1 Indicators and Buttons

The front panel has an LED indicator and two buttons SEL (SELECT), LF (LINE FEED).

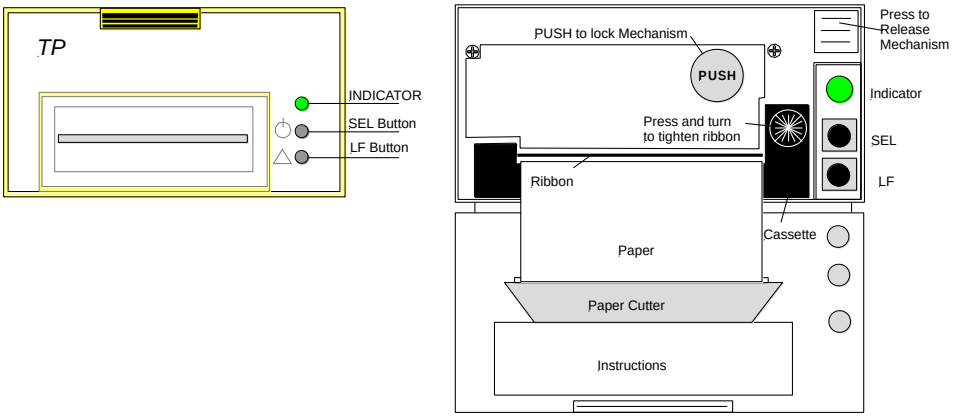


Figure 68: Printer Front Panel Layout (Front Cover Closed / Open)

Indicator

When the 3 colour LED indicator is illuminated;

- Red indicates the printer is offline with no paper;
- Green indicates the printer is On Line;
- Yellow indicates the printer is On Line with no paper; or if it is
- Off indicates the printer is Off Line or the printer is busy.

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 and hold the LF button, paper feed will be initiated. Release the LF button and the paper feed will be cancelled.

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.

Exit the Self-Test Mode:

After printing out the complete Self-Test list the printer will exit the mode automatically; or

Press the SEL button and the printer will immediately exit the Self-Test mode.

11.12.2 Maintenance

Installing the Ribbon Cassette

The printer has a factory loaded ink ribbon cassette. Remove the power from the printer.

Unlock the front cover by pushing down on the tab at the top of the front panel.

Push the mechanism release button in the top right corner to release the print head.

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 and 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.

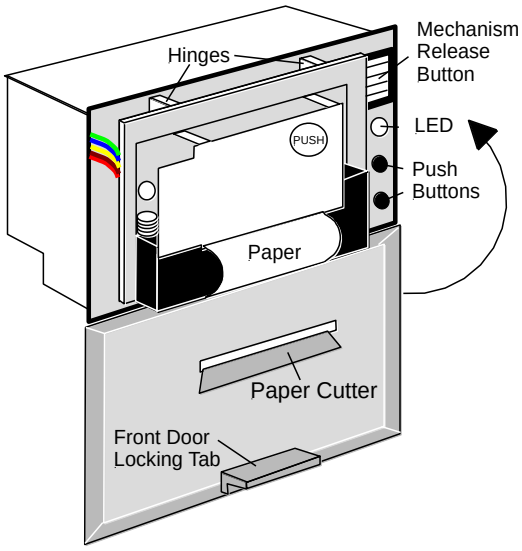


Figure 69: Paper Access

Ribbon Replacement;

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

Loading the Paper Roll

Disconnect the power, unlock and open the front cover.

Push down on the mechanism release button in the top right corner to release the head.

Lift the mechanism as shown below.

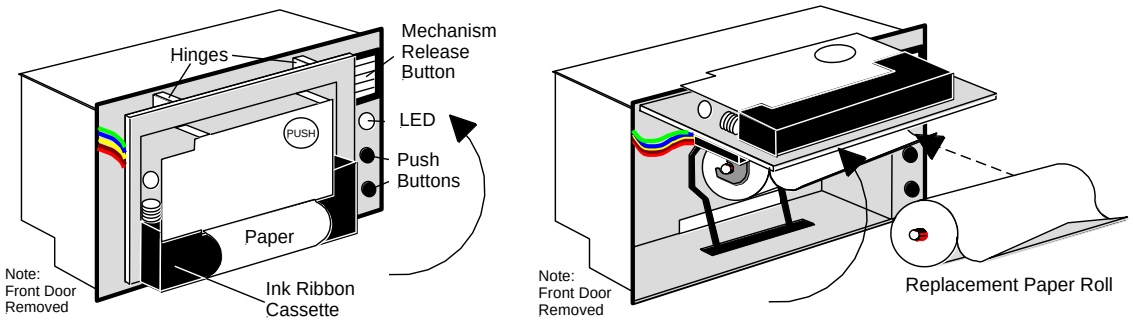


Figure 70: Head Mechanism Rotation and Paper Roll Removal / Insertion

Take out the empty paper roll and roller

Put the new paper roll onto the paper roller and replace as shown above.

Connect to the power supply.

Press the SEL button to take the printer Off Line, (LED is off).

Press the LF button, (paper feed).

Feed the edge of the paper into the mechanism and allow it to feed through. If difficulties are encountered while feeding the paper thru the mechanism, cut the leading edge of the paper into a triangle as shown above. This makes it easier to feed the paper thru

Once it established the paper is feeding through the head mechanism correctly press the SEL button to stop the paper feed.

Return the printer head to its original position.

Pushing on the affixed label PUSH the head mechanism back into position.

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.*

11.12.3 Printer Connections and Jumpering

Mounted on the back of the printer mechanism is the PCB that carries the;

- Connectors for interconnection to the Main Board,
- Jumper links required to set the programmed print modes; and
- Printer 5 volt DC Power Supply.

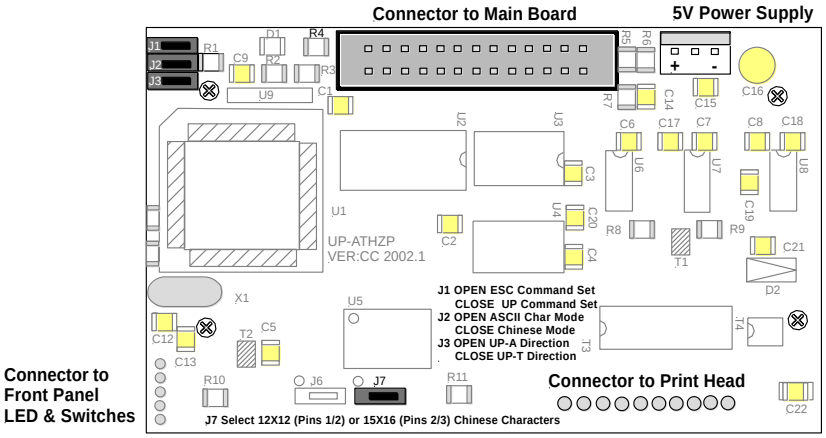


Figure 71: PCB Layout

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

11.12.4 Printer 5 Volt Power Supply (BRD42PVCB1)

27 volts DC is taken from Brigade / PSU Monitor Board and fed to CN1 of the 5volt Printer Power Supply Board. It is this board that drops this voltage from 27volts to 5volts for use by the Printer. Mounted to rear of printer

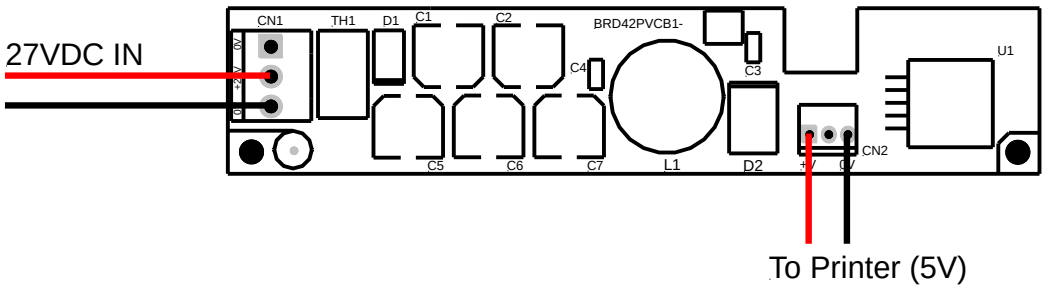


Figure 72: Printer Power Supply Board Layout

11.13 Agent Release Control

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

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 Discharged” 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 Discharged “ 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 button 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 Discharged 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.

Auto Mode

Automatic discharge is when one or two zones going into alarm initiate the agent discharge 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 first zone goes into alarm 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 second zone goes into alarm, 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 Inhibit Switch

The service inhibit 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 **NOT** 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 LCS's
- 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:

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.

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

11.13.1 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.

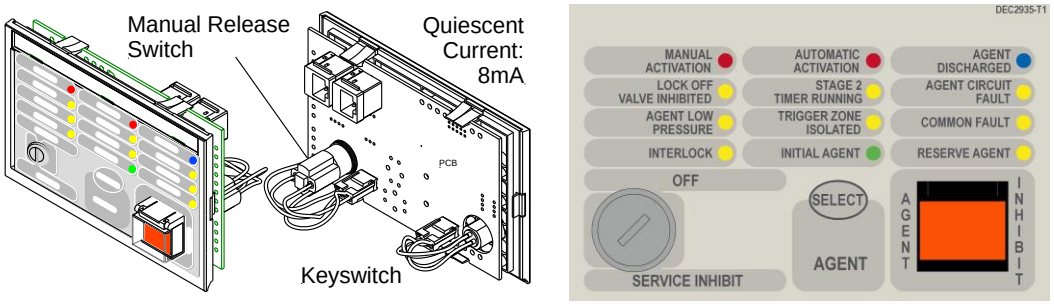
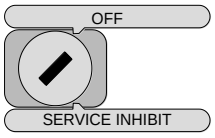


Figure 73: Exploded View of Module and Front Panel Layout

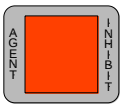
Controlled Access



It is a requirement that control be secured from unauthorised use. A keyswitch has therefore been included in the control process.

The FCP goes into service mode when the keyswitch is switched to SERVICE INHIBIT. This results in the selected agent activation circuit being electrically isolated and a Common Isolate condition being indicated at the FACP. This condition can also confirmed through the Status Menu. To remove the key it is necessary for the switch to be in the **OFF** position.

Pressing Select toggles the selection of either the Main or Reserve release agent. Selection is indicated by the Main and Reserve Agent LED's



If activated the Manual Release will commence the discharge sequence of the selected agent and an alarm condition is initiated. Progress of the release can be monitored through the Status Menu. To prevent accidental operation this switch has a hinged clear plastic cover that has to be raised to access the switch.

Agent Release Module PCB Layout

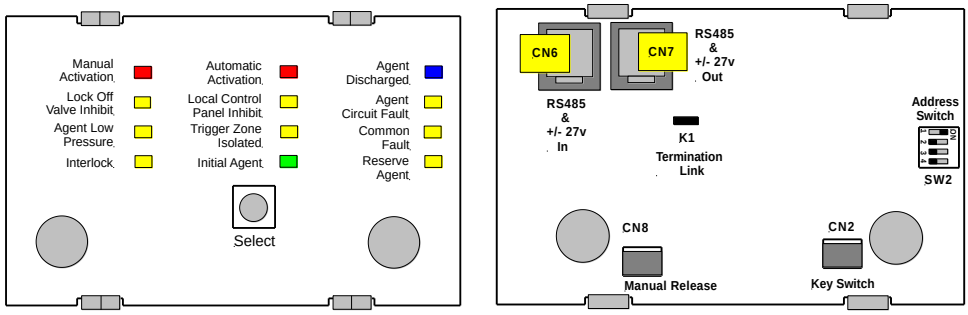


Figure 74: Module PCB Layout Front and Rear

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.

Quiescent Current: 28.5mA

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

11.13.2 Local Control Station (BRD25ARB-B)

The Local Control Station (LCS) is supplied fitted into an IP40 rated enclosure and has the same indicators and Manual Release switch as the Agent Release Module within the Fire Alarm Control Panel (FACP) but no Agent Select button or Service Inhibit keyswitch.

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.

Double action switching is achieved by way of protective lift up covers seen here and manual operation of the MCP or Inhibit switch.

To ensure correct operation and prevent accidental release of the agent these covers **should not** be disabled for any reason

Figure 75: Local Control Station

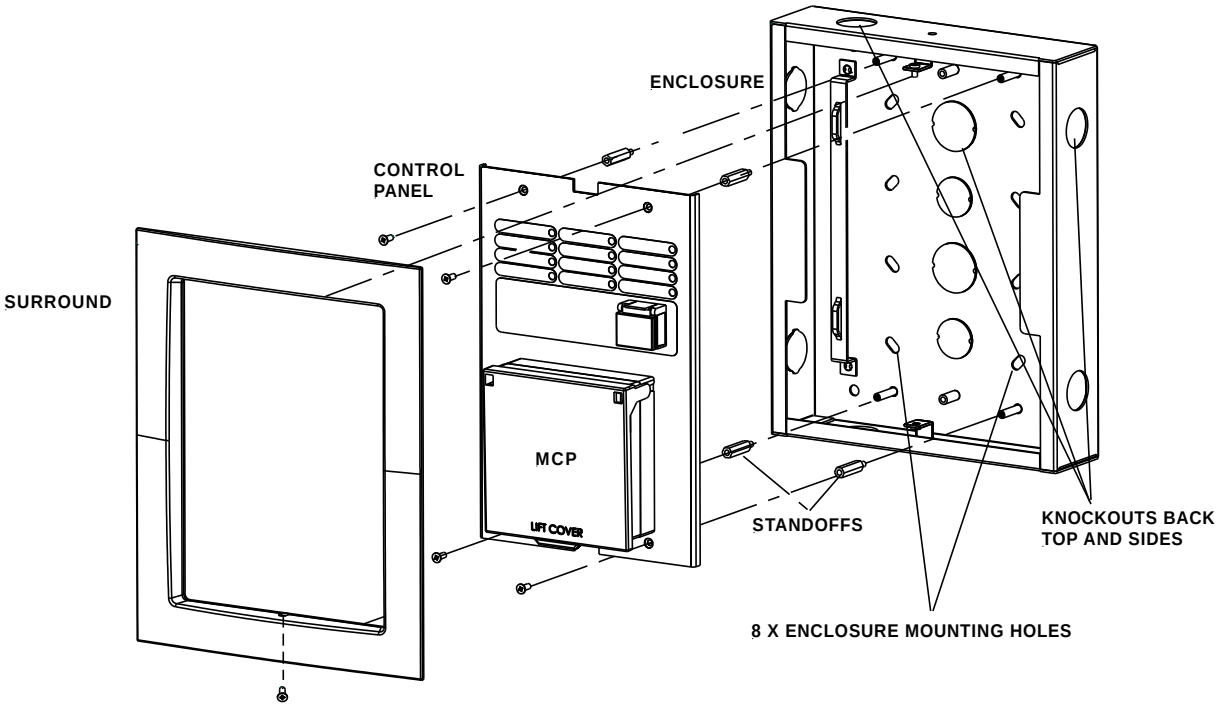


Figure 76: Local Control Station Layout

LCS Operation & Controls

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.

Agent Release / LCS Indicators

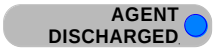
There are 12 indicators on both the Agent Release Module and Local Control Station. They are;

(Red) Illuminated when a manual release sequence has commenced. A Manual release sequence can only be started by activating the manual release at the FACP or LCS.

The indicator is extinguished by activating RESET on the FACP.

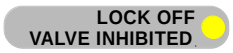
(**Red)** Illuminated when an automatic release sequence has commenced. This occurs when the selected zone(s) on the FACP have gone into alarm. For dual zones, the indicator should flash when the first zone goes into alarm, and steady when the second zone goes into alarm.

Indicator is extinguished by activating RESET on the FACP.



(Blue) Illuminated when the pressure switch indicates the agent has been released. If there is no pressure switch fitted, the indicator shall be illuminated immediately the agent release signal is activated (Selected via FACP on-site programming – refer to relevant FACP Manual)

The indicator is extinguished by activating RESET on the FACP.



(Yellow) Illuminated when the lock-off valve has been activated.

(Yellow) Illuminated when the pre-discharge delay timer is running.

The indicator is extinguished by activating the RESET control on the FACP.

(Yellow) Illuminated when there is a fault on the monitored Main or Reserve activation circuits e.g. S/C or O/C.

(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.

(Yellow) Illuminated when any of the programmed trigger zones on the FACP are isolated.

(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.

(Yellow) Illuminated when the interlock input (e.g. 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 2K2Ω resistor.*

INITIAL AGENT **(Yellow)** Illuminated when the “Initial“Agent is selected.

RESERVE AGENT **(Yellow)** Illuminated when the “Reserve “Agent is selected.

Local Control Panel Inhibit

The agent inhibit switch has an internal lamp fitted with yellow lens. Illuminated when the inhibit is activated at the FACP or any of the LCS’s.

Buzzer (located at the FACP)

The Buzzer sounds;

- Under all fault conditions and can be silenced by using the appropriate FACP buzzer silence control.
- When the LCS Inhibit control is activated – after 8 hours – treated as an isolate condition.
- When the service inhibit is activated - after 8 hours – treated as an isolate condition

Connecting the LCS to the Agent Termination Board

ISOLATE THE AGENT

Check the FACP is functioning correctly then power down

Connect the LCS to the Agent Termination Board within the Fire Alarm Control Panel and Interlock as shown below. If applicable take into consideration warning signs at this point

Insert the link LK1 onto the last LCS in the chain. If un-used place the link onto one of the LK1 pins

Set the address of the LCS,

Power up the system and program the FACP for the addition of the LCS

Check the FACP is functioning correctly and test

De-isolate the Agent

Caution - TO PREVENT ACCIDENTAL AGENT RELEASE DO NOT DE-ISOLATE THE AGENT UNDER ANY CIRCUMSTANCES UNTIL THE SYSTEM AS A WHOLE IS FUNCTIONING CORRECTLY

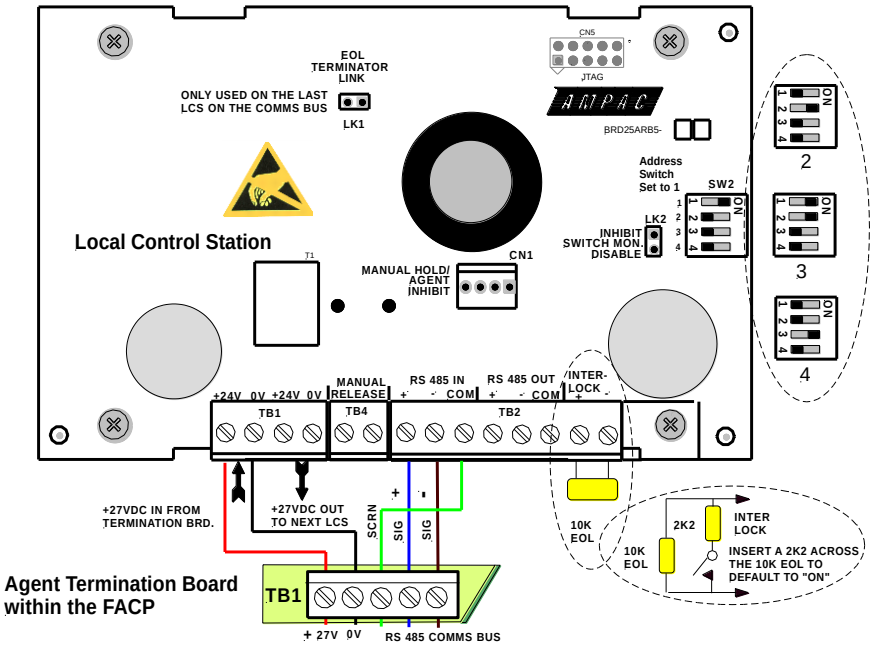


Figure 77: PCB Layout & Cabling Details

11.13.3 Agent Release Termination Board (BRD25ATB)

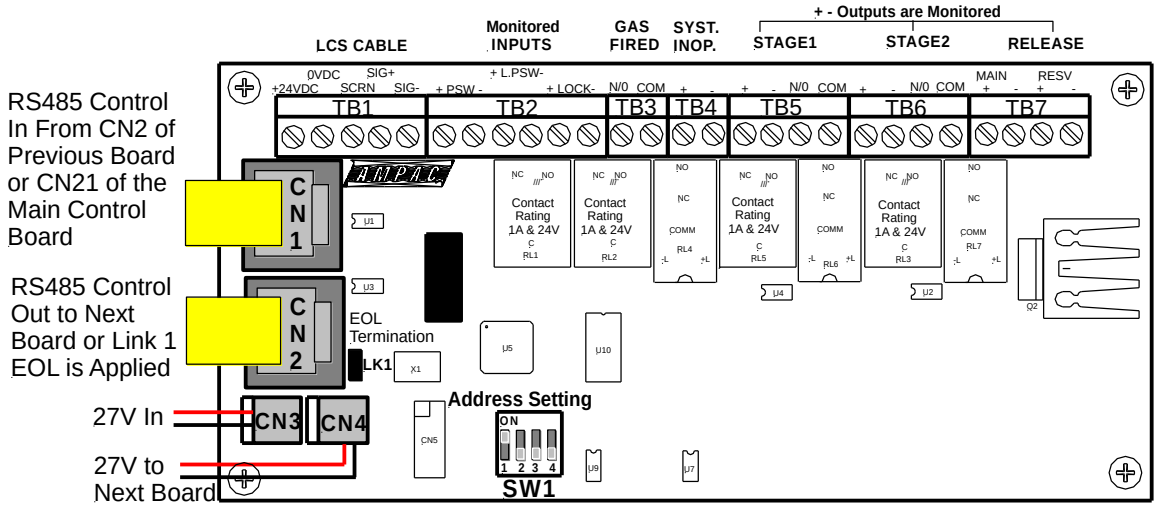


Figure 78: Agent Termination Board PCB Layout

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)
   - Pressure Switch (PSW) agent released
   - Low Pressure Switch (LPSW) agent storage cylinder pressure has dropped to a pre-determined level; and
   - Interlock, 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. System Inoperative: 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.
    - Monitored; via RL4 C/O contacts wired to TB5 1 & 2 (EOL required 10KΩ) and
    - 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
    - Monitored; via RL6 C/O contacts wired to TB6 1 &2; (EOL required is 10KΩ) and
    - 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),
9. Release: Reserve actuating circuit, monitored (10KΩ EOL required) via TB7 3 & 4 (2A current limited)

Metron Igniters (max of 10 – a series 2watt 18Ω resister must be added to the circuit)

Solenoid valve (max current of 2 amps & 27VDC)

11.13.4 Interface Wiring

Monitored Inputs TB2 1 & 2

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.

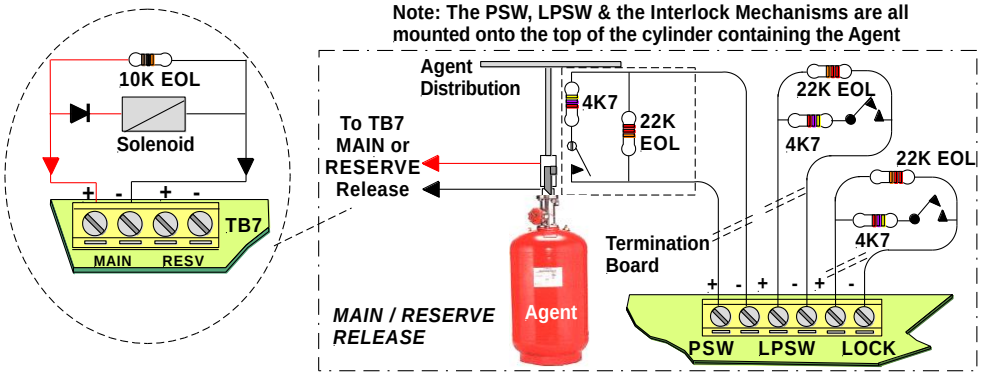


Figure 79: Solenoid, Metron PSW, LPSW and "LOCK" Wiring

LPSW & Lock

These inputs are also monitored and should be wired as shown above

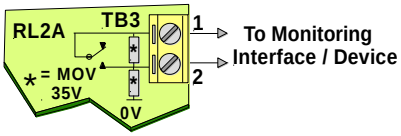


Figure 80 Gas Fired Wiring

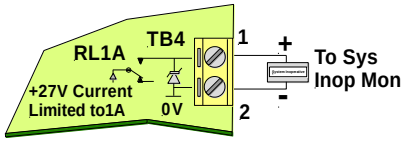


Figure 81: System Inoperative Wiring

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

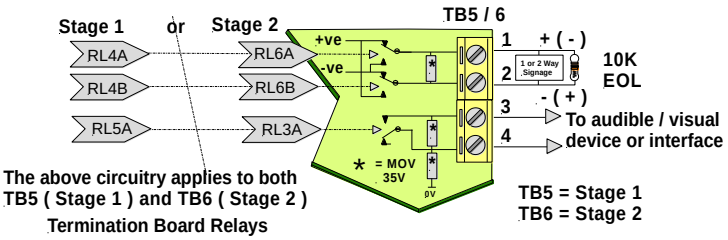


Figure 82: Stage 1 and 2 Wiring

11.14 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, e.g. 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. 4 holes in the backpan allow for mounting.

Specifications:

Operational Voltage	27VDC
Power Consumption Continuous	At 24VDC 55mA Stage 1 At 24VDC 140mA Stage 2 (100mA Muted)
IP Ratings	IP50 190mm (H) x 315mm (W) x 73mm (D) IP65 200mm (H) x 295mm (W) x 65mm (D)
Environmental	-10˚C to +55˚C Dry heat +40˚C @ 0 to 93% Relative Humidity

Installation

- Remove the backpan from the enclosure to ensure it is not damaged while mounting the enclosure.
- Bring the cabling into the enclosure by removing the knockouts most appropriate for the installation.
- Mount the enclosure, remount the back pan, set the configuration and then cable as per the following diagram.
- 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		

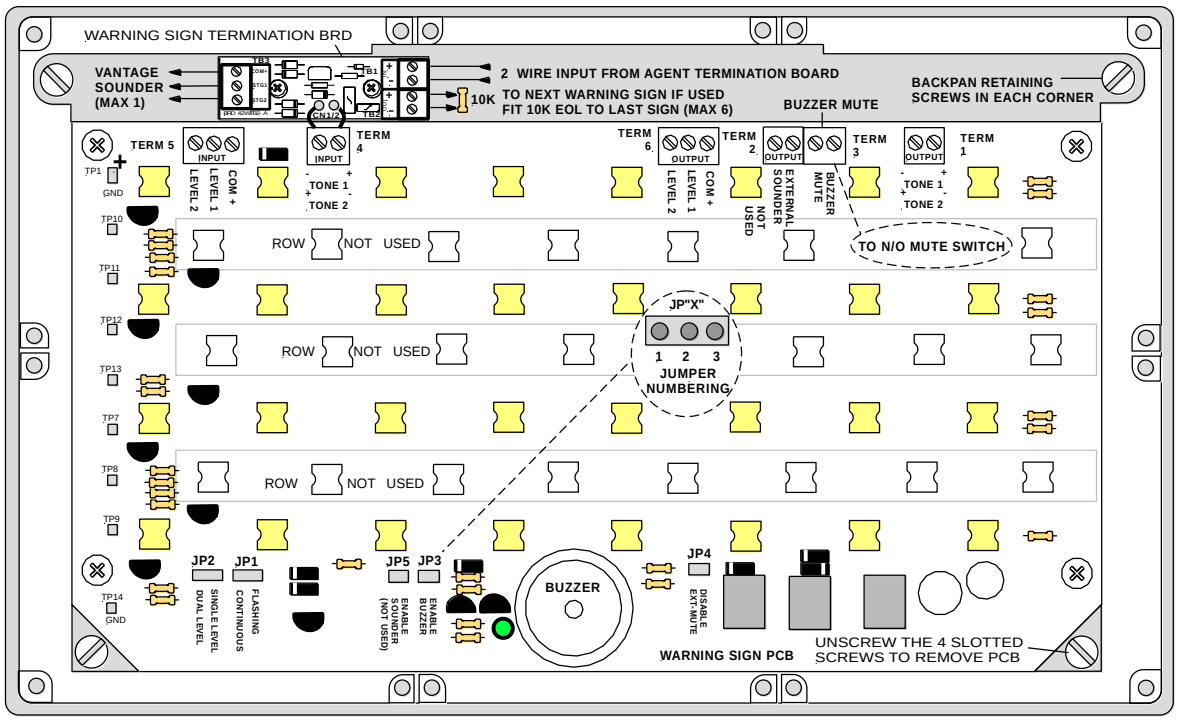


Figure 83: Warning Sign PCB Layout and Cabling

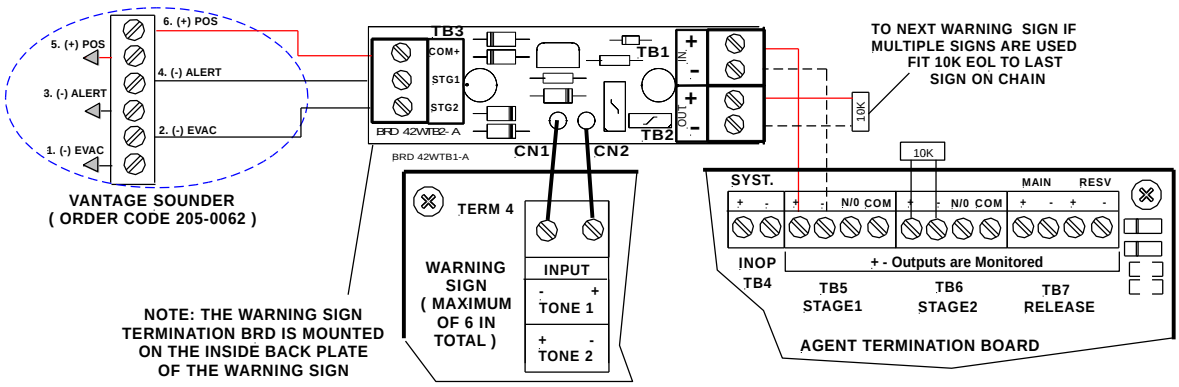


Figure 84: 2 Wire Cabling from the Agent Termination Board to the Warning Sign/s & Evacuation Device/s

11.15 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 AS1670.1.

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 EVAC only 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.

The Amplifier 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) LED’s 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

Standard message for 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.

☞ **Note:** *Tones are isolated while in PA*

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

Indicators

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

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

EV20 Cabling

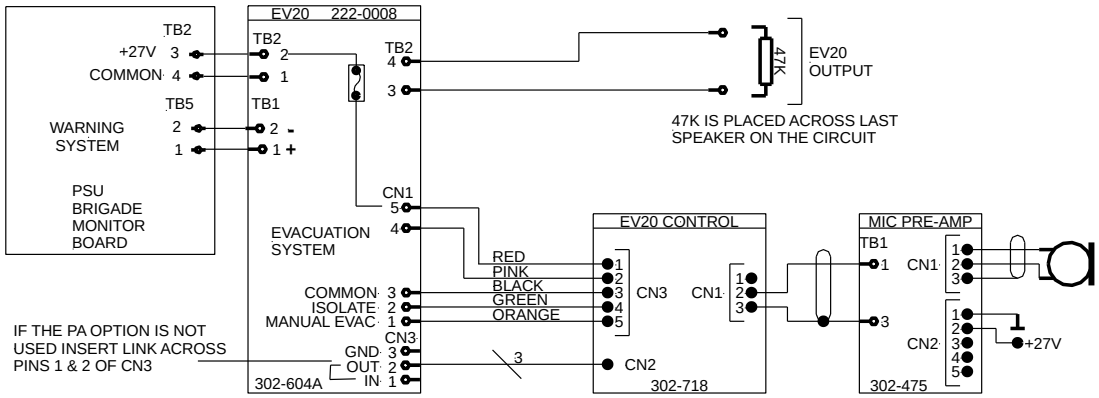


Figure 85: Typical EV20 & PA Wiring

☞ **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.*

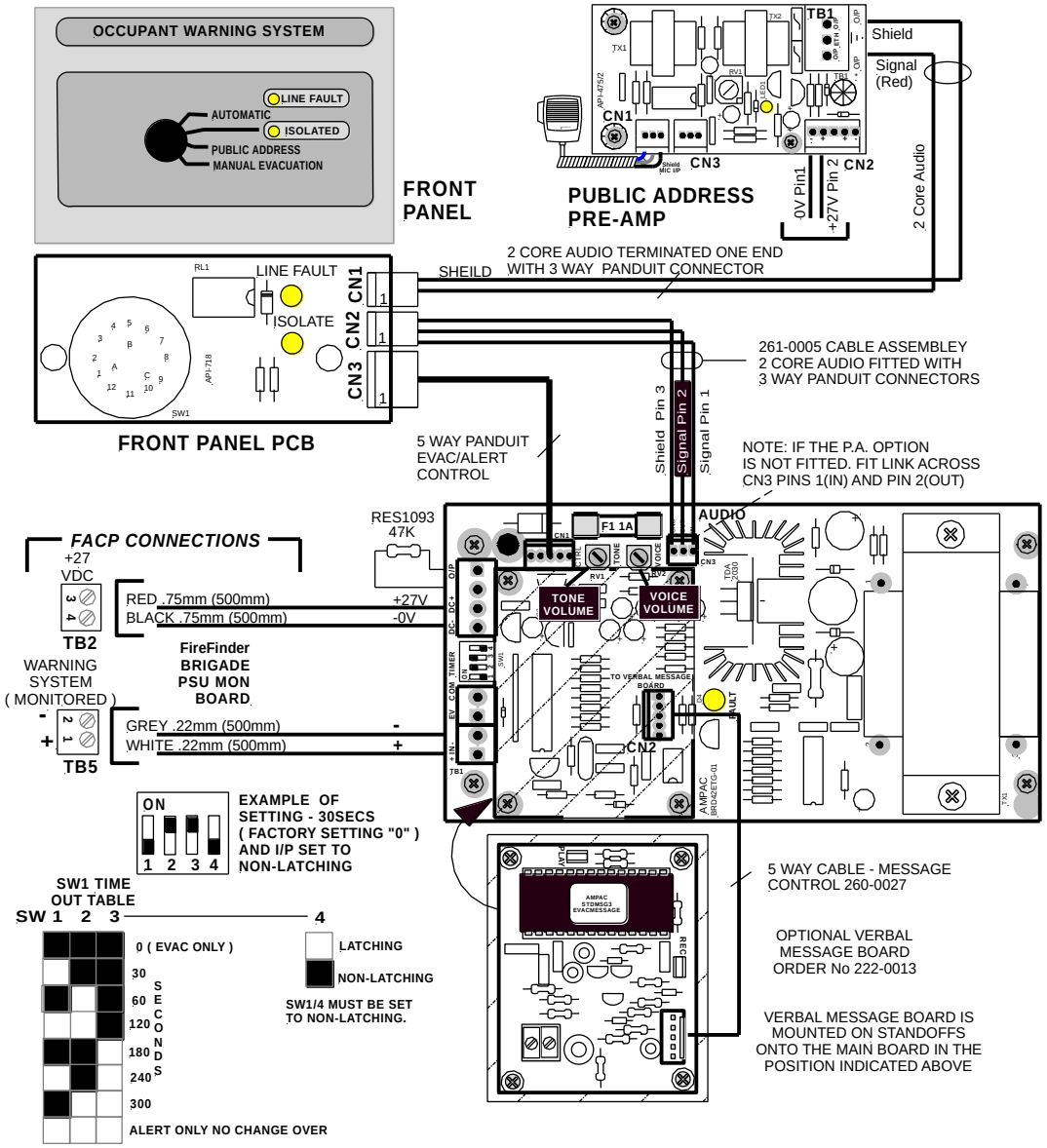


Figure 86: EV20 Wiring to Control Module, FACP Cabling and Time Out Table

EV40 Cabling

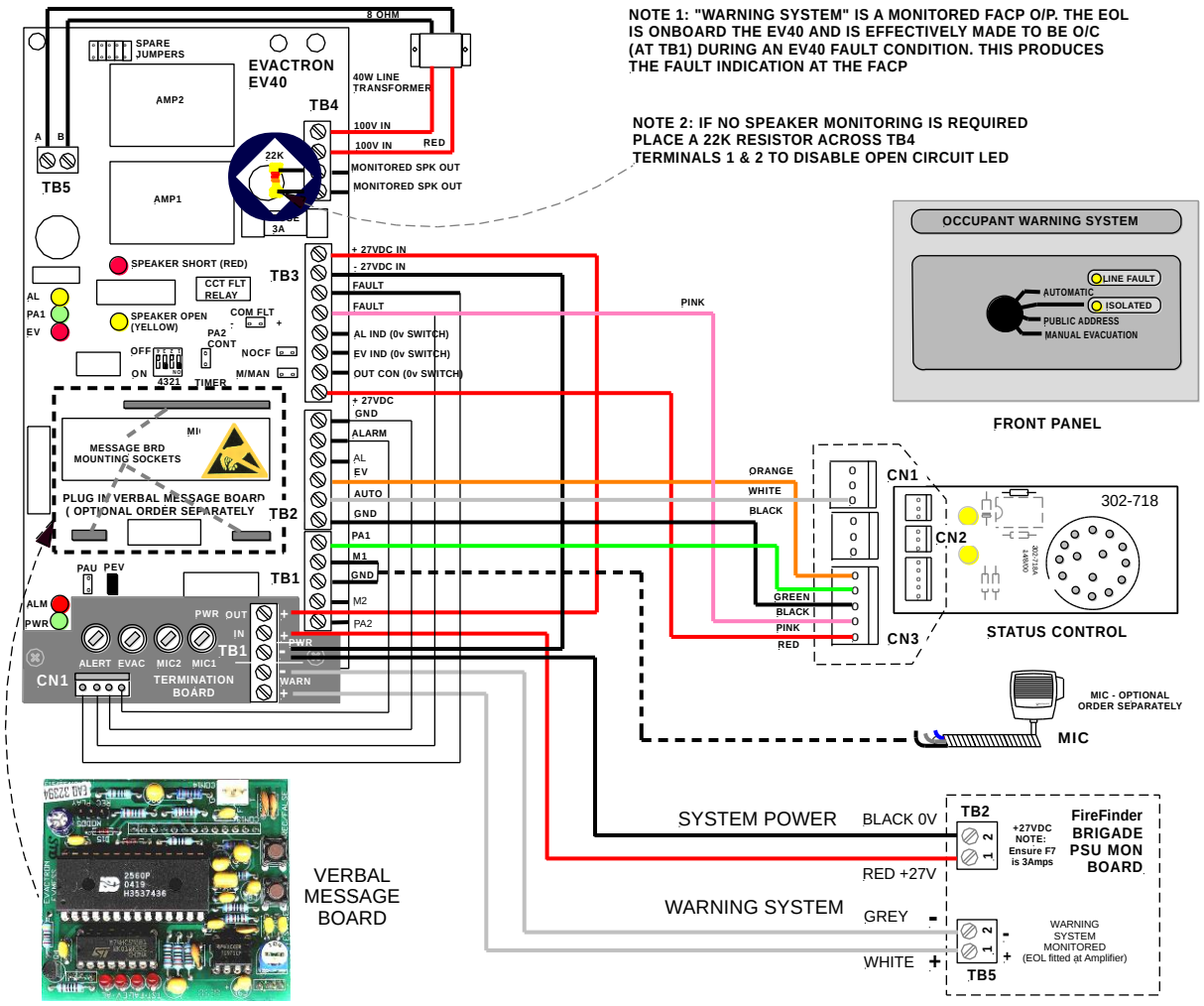


Figure 87: Typical EV40 Wiring to Control Module and FACP

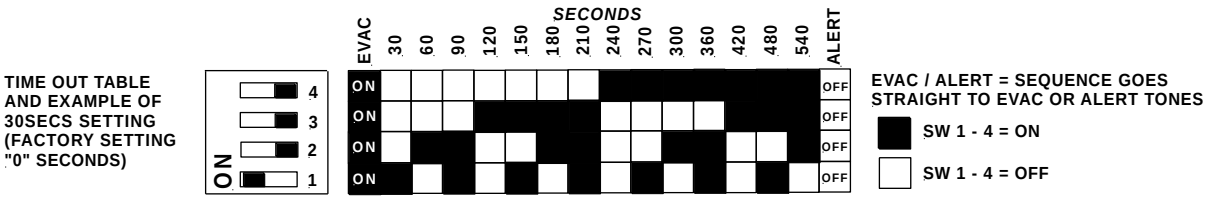


Figure 88: EV40 Time Out Table

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.)

11.16 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.

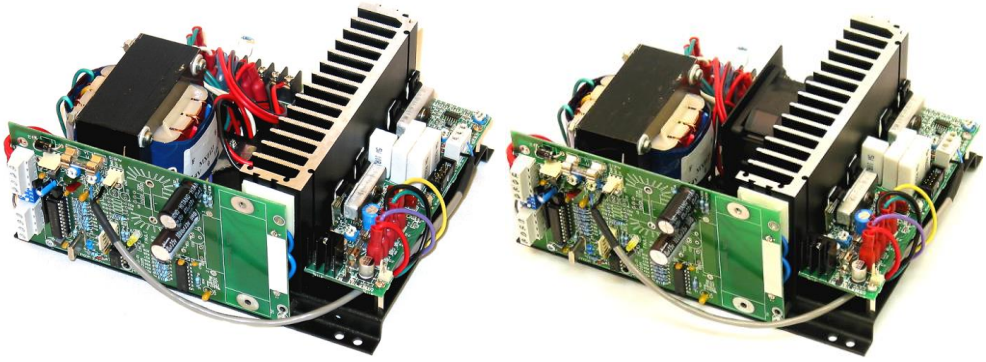


Figure 89: EV60 *EV120*

11.17 EV3000

HLIE Interface Operation

The EV3000 Emergency Warning and Intercommunications System (EWIS) main central processing unit communicates via a RS485 bus with a High Level Interface Expander in an FACP or Serial Parallel Board.

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.

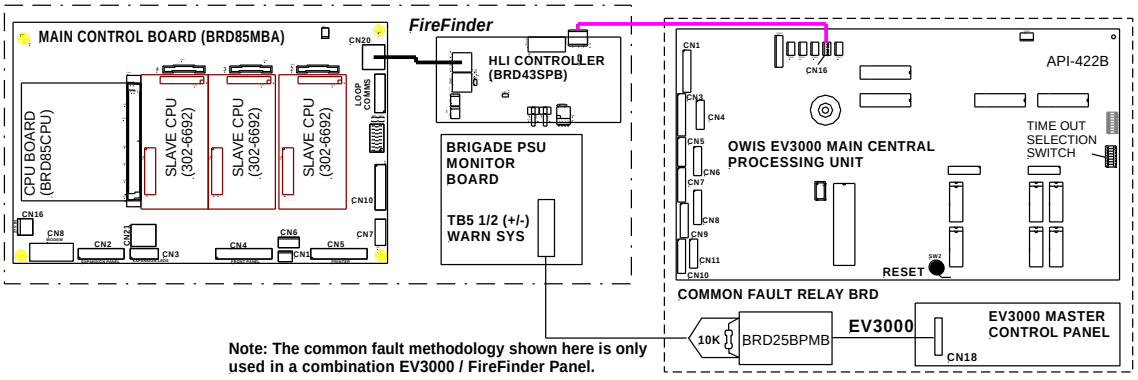


Figure 90: HLI & Common Fault Cabling To & From the FACP and EV3000

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.

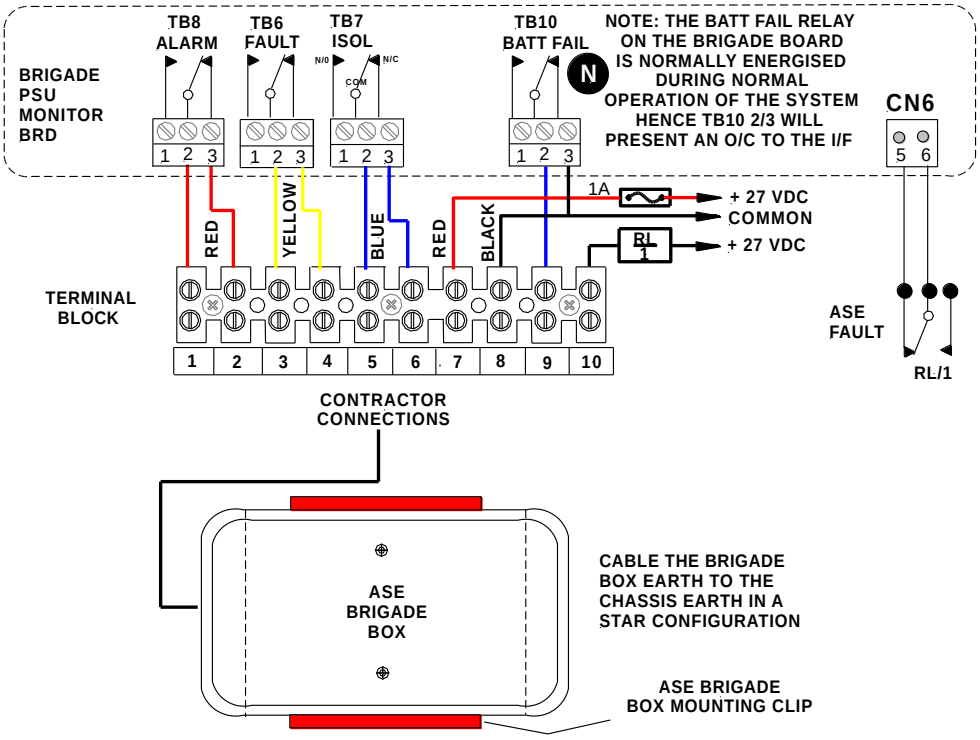


Figure 91: ASE FACP Internal Wiring

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

The Brigade Box interfaces the Fire Brigade to the ***FireFinder*** SP series of FACP's.

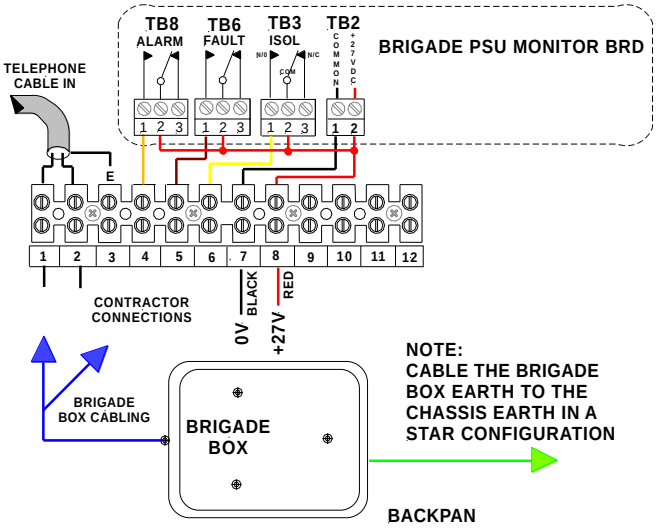


Figure 92: Brigade Box FACP Internal Wiring

13 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.

13.1 Communications: Network Interface Card (BRD85NIC)

The Network Interface Board provides the RS485 communication buses via CN18 on the Main Controller (Loop Comms) to allow the networking of multiple panels in different combinations, e.g. from Data Gathering Panels (DGP) to Peer to Peer panels. Fitted to the NIC is the CPU IO Controller (BRD85CPU) with NIC software to control the in out flow of communications.

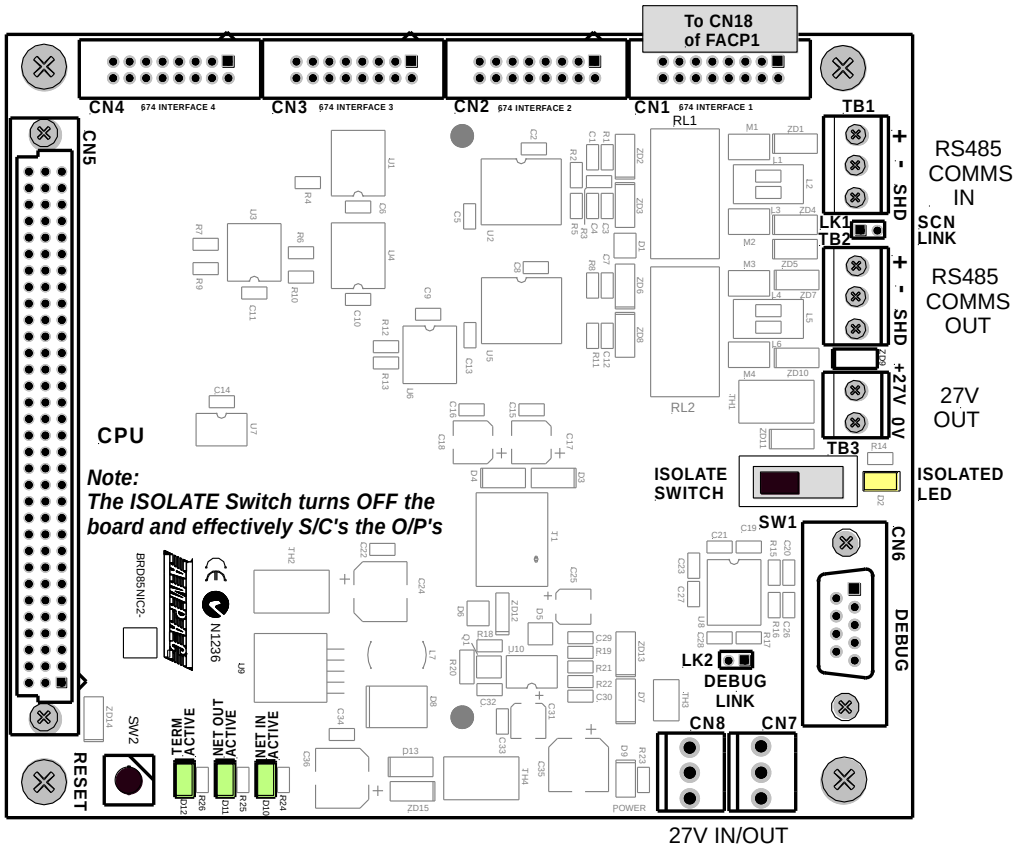


Figure 93: Network Interface Board Layout

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.

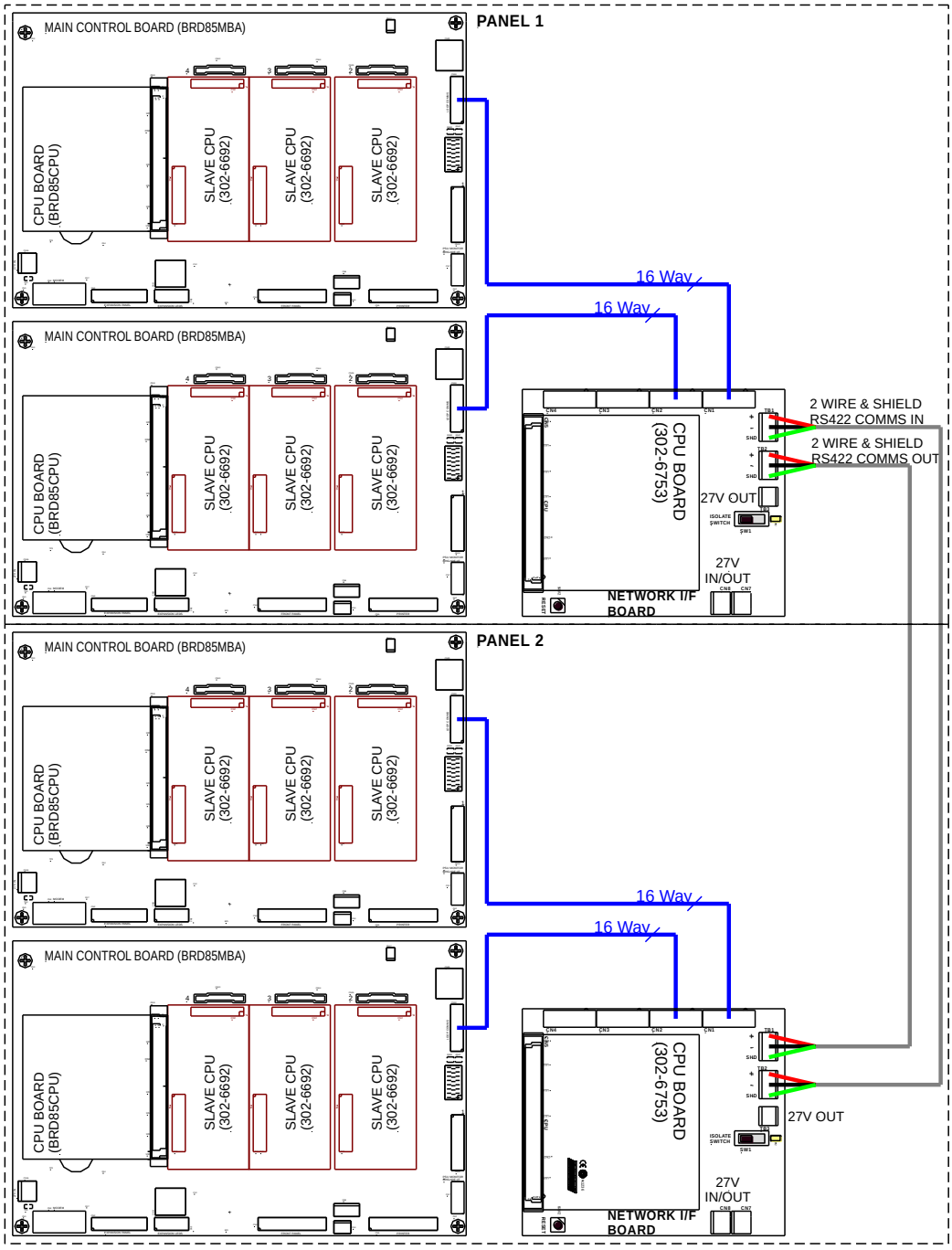


Figure 94: General Wiring of Two FACP's on a network

☞ **Note:** *Maximum distances between panels = 1.2km if greater distances are required a rs422 Repeater (black box 352a or 352a-f) is to be fitted every 1.2km after the first 1.2km.*
Cable to be used = Belden 8132 or 9842 two pair shielded.

13.2 Communications Extender Board (BRD82LTB)

The Communications Extender Board is mounted inside the FACP and provides protected RS485 communications and 27VDC to the ***SmartTerminal*** Termination Board/s and LCD/s and LED Mimics.

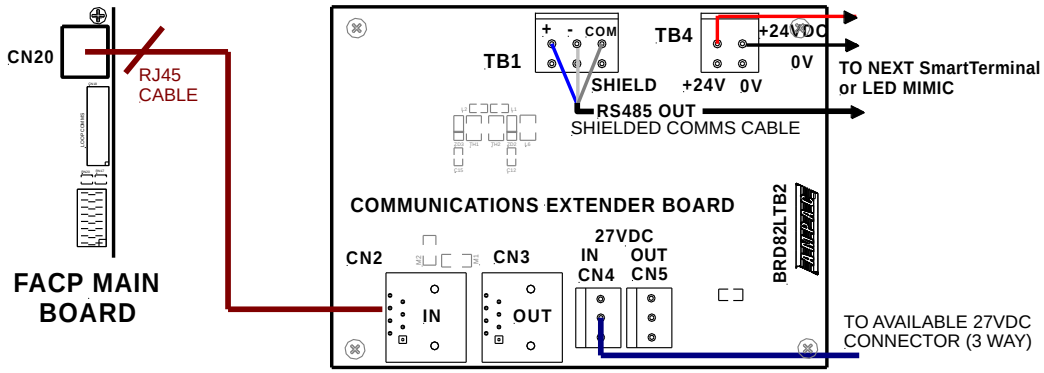


Figure 95: Communications Extender Board PCB Layout

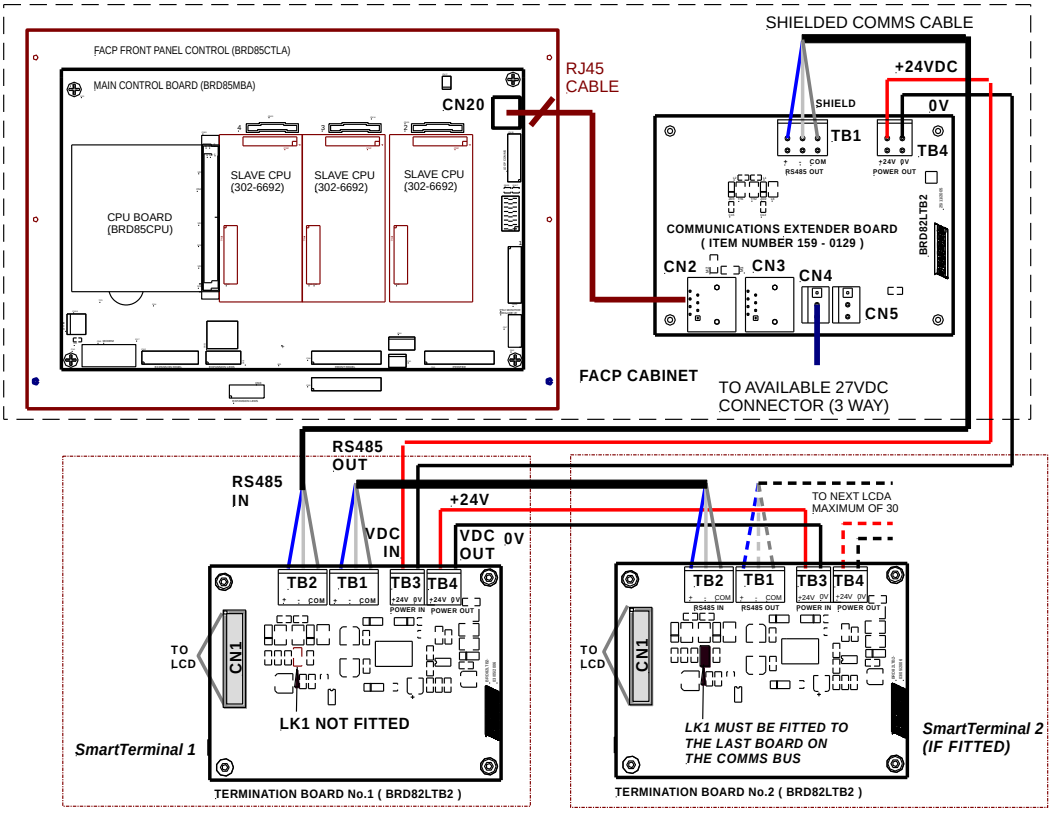


*Figure 96: Connecting the **SmartTerminal** to the FACP*

13.3 High Level Interface Expander (BRD43SPB)

Hardware

The High Level Interface Expander consists of a serial port under the control of a microcontroller. Communications between the FACP and this board is via the RS485 control bus with each board having a dedicated link and selectable 4 bit address.

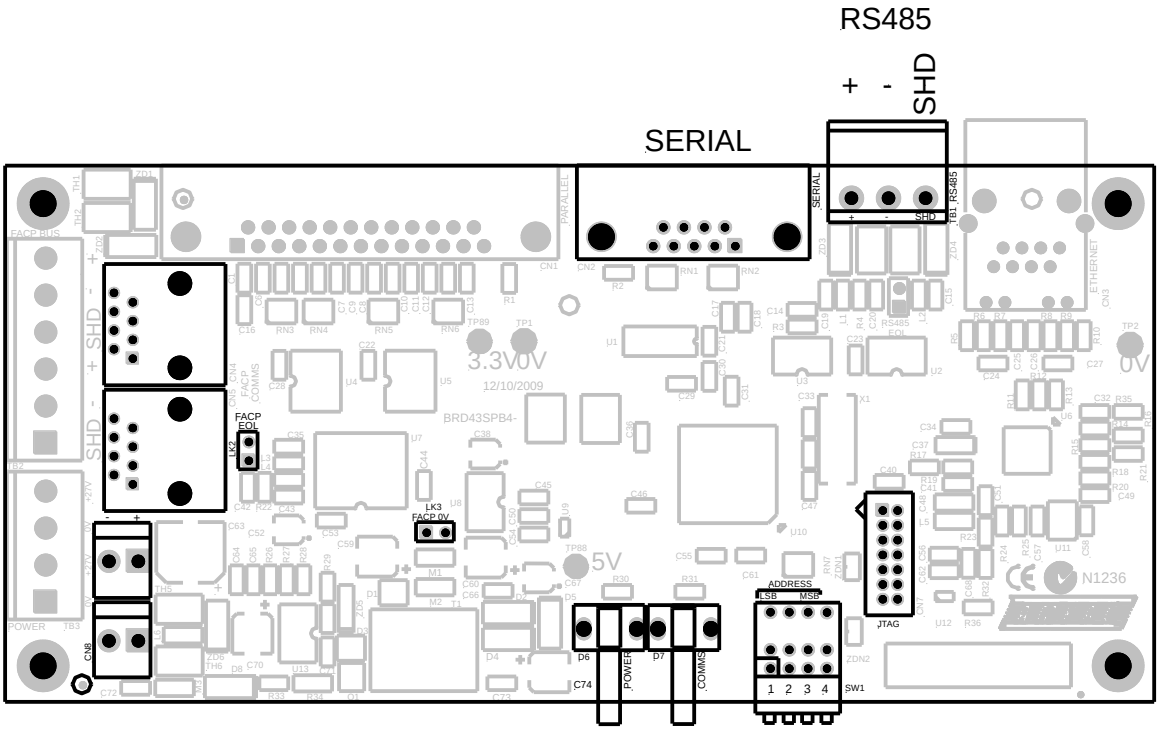


Figure 97: High Level Interface Expander PCB Layout

Software

The port supports the following protocols:-

HLI – Functionality matches the FireFinder (8510/8610) panel which supports text or positive ack protocol. Configurable attributes are: logical output, physical output, alarm output, pre-alarm output, fault output, disable output and descriptors

SmartGraphics interface - Serial Port or RS485 Port

MODBUS interface - Serial Port or RS485 Port

EV3000 - RS485 port

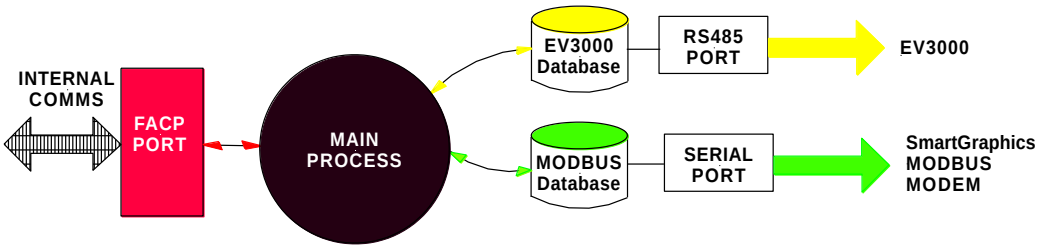


Figure 98: Software Block Diagram

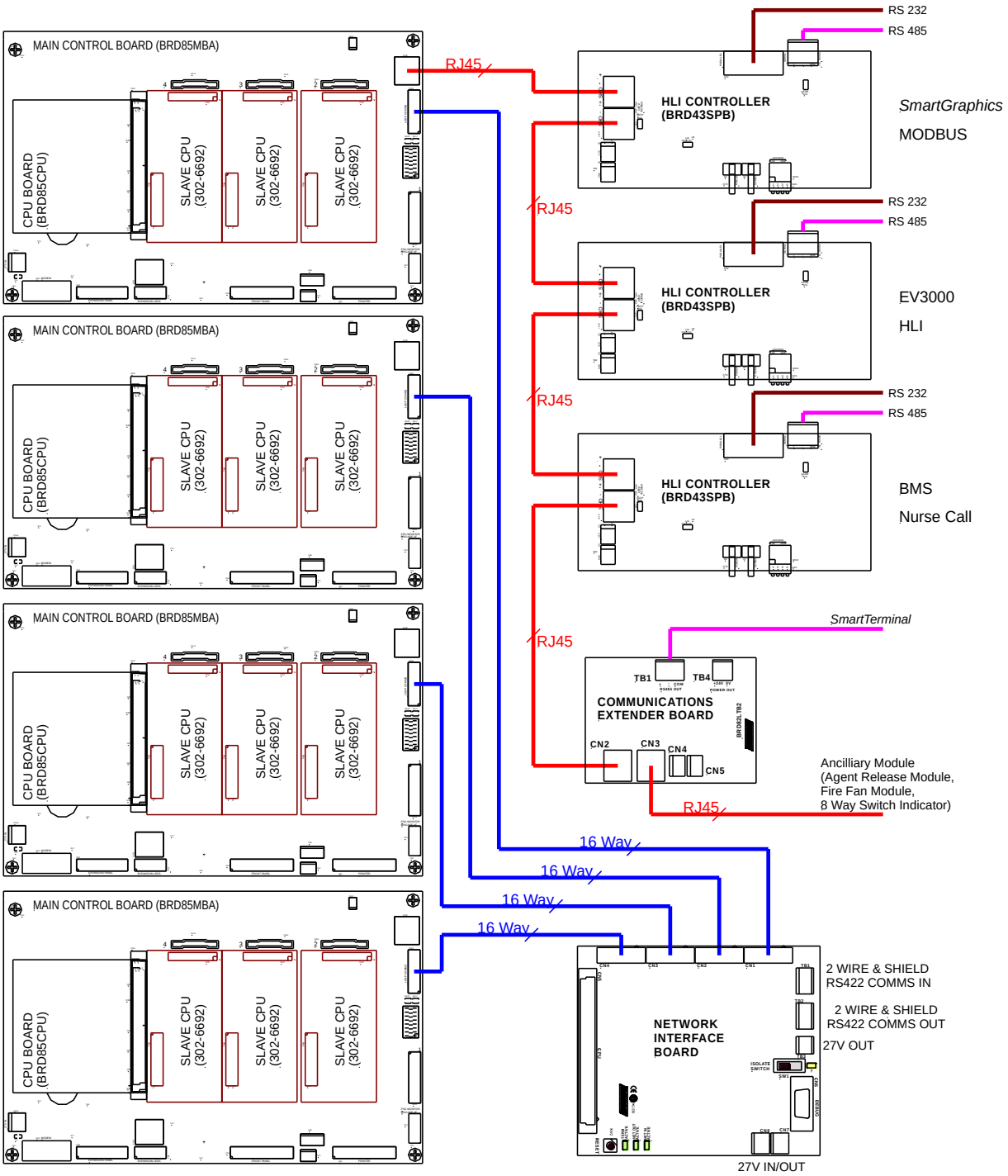


Figure 99: Example of Networking Configurations

☞ **Note:** *Maximum distances between panels = 1.2km if greater distances are required a rs422 Repeater (black box 352a or 352a-f) is to be fitted every 1.2km after the first 1.2km.*

Cable to be used = Belden 8132 or 9842 two pair shielded.

13.4 Expansion Board (302-688)

The Expansion Connection Board is used to 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 Slave CPU number 5 is an integral part of the Expansion Board, only Slave CPU's 6, 7 and 8 are plug ins.

Connections

CN1	To Main Connection Board
CN2	Slave CPU 2
CN3	Slave CPU 3
CN4	Slave CPU 4
CN5	On board Slave CPU

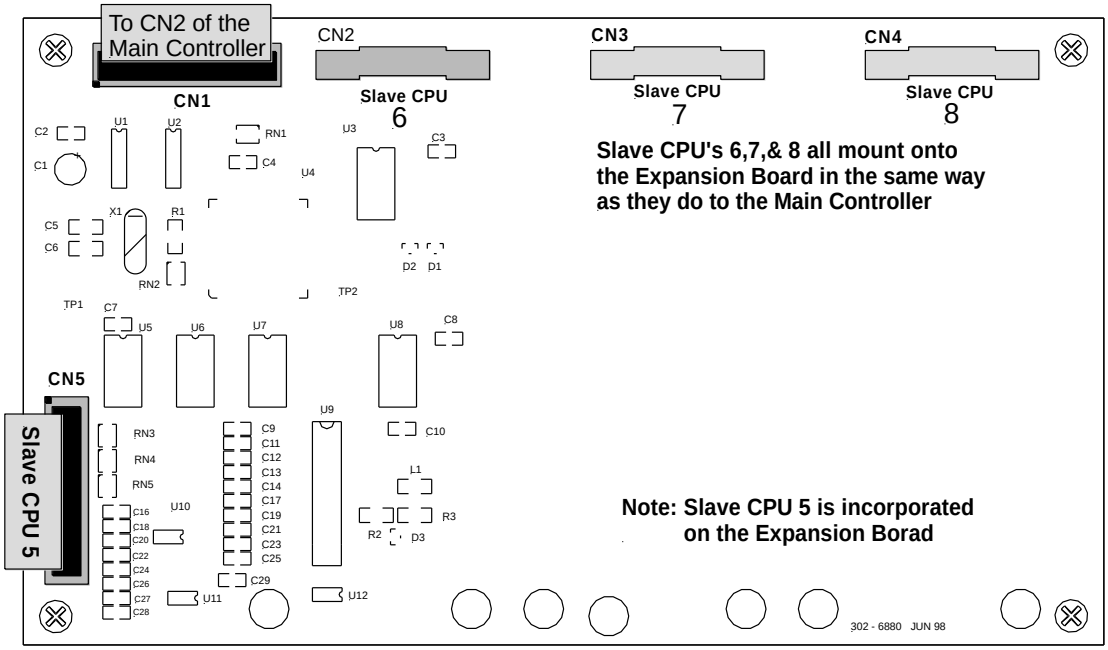


Figure 100: Board Overlay

13.5 Expansion Controller (159-0077)

An Expansion Controller (Fast Fit Kit Number 159-0077) can be described as a Main Controller without a Front Panel. A maximum of 3 can be introduced into any one Node that is into any one FACP and require a 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 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 Communications Extender Board for ***SmartTerminal's*** and/or LED Mimic. Adding a High Level Interface Expander to the Communications Extender Board allows for the addition of HLI, EV3000, Remote Serial Printer or ***SmartGraphics*** facilities.

14 SmartTerminal

SmartTerminal 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.

- Have 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 ***SmartTerminal*** reports events from all devices. If the host FACP is configured as local then the connected ***SmartTerminal*** reports events from devices that are directly connected to the host FACP.

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.

14.1 *SmartTerminal* Controls and Indicators

All controls, except for the Enable / Disable keyswitch, are of a momentary push button style.

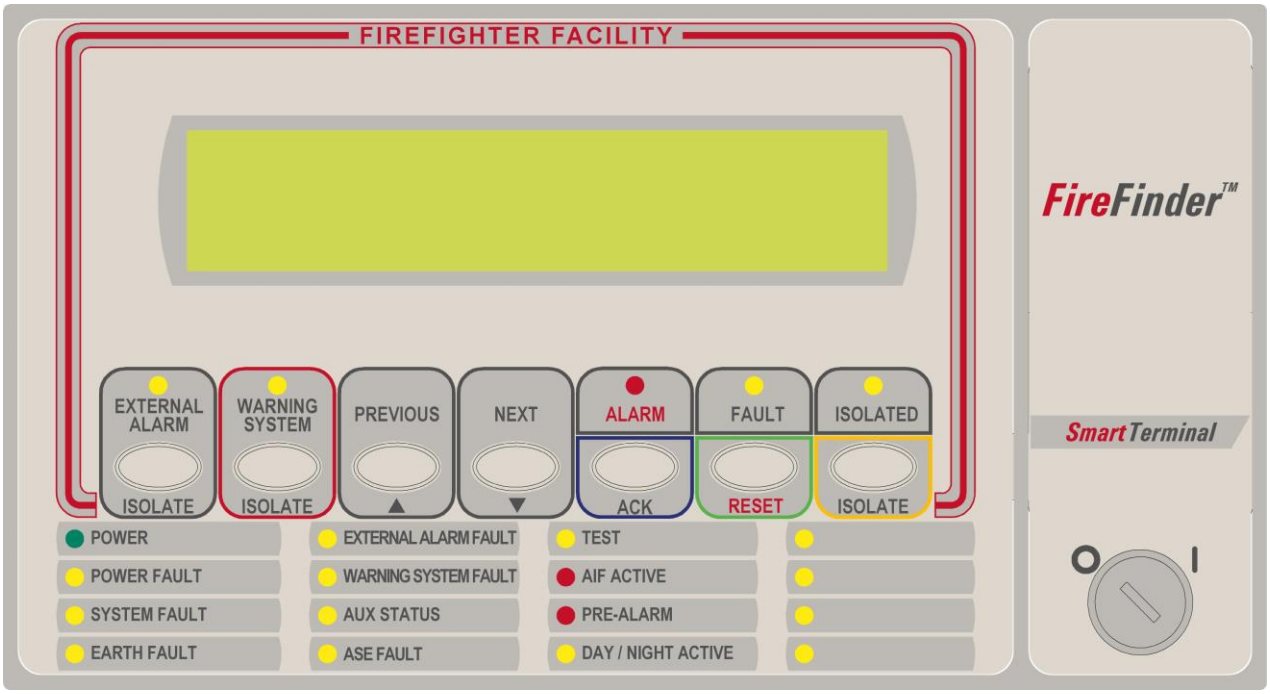


*Figure 101: **SmartTerminal** Front Panel Layout*

Controls & Indicators

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

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.

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

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.

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

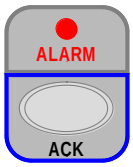
Primary Function

Press to display the next displayed LCD entry

Secondary Function

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

Active at access level 1 and 2



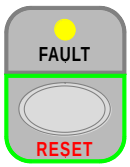
(Red) General fire alarm indicator. The LED will flash until all alarms have been acknowledged. Once Acknowledged the LED will remain steady until all alarms have been cleared by Reset.

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.



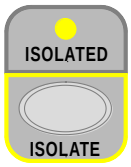
(Yellow) Indicator is illuminated when there is one or more faults on the system. Faults can be;

- 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

Reset

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

Active at access level 2 only.



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

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. = OFF, = ON

Access level 1 (OFF) By Default. Only the Acknowledge, previous and next front panel controls are operative. All other controls operate in access level two.

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

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

POWER **(Green)** Illuminated to show the presence of power. Flashes when mains has failed

POWER FAULT **(Yellow)** 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 **(Yellow)** Illuminated when the FACP is unable to provide mandatory functions. Indicator is latched, until cleared by reset

EARTH FAULT **(Yellow)** Illuminated when there is an earth fault detected on the panel

EXTERNAL BELL FAULT **(Yellow)** Illuminated if the External Bell output is in fault

WARNING SYSTEM FAULT **(Yellow)** Illuminated is the Warning System output is in fault

ACF FAULT / ISOLATED **(Yellow)** 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 **(Yellow)** Illuminated when the ASE output is in fault

TEST **(Yellow)** Illuminated when the FACP is in the test mode. Possible tests are alarm, fault, walk, lamp and loop.

AIF ACTIVE **(Yellow)** Illuminated when the AIF facility is active at the FACP

PRE ALARM **(Red)** Illuminated when one or more devices are in the pre-alarm condition and not disabled

DAY / NIGHT ACTIVE **(Yellow)** Illuminated when day / night facility has been enabled on the FACP

(Yellow) Programmable 1 to 4 – *For future use*

14.2 LCD Screen Format

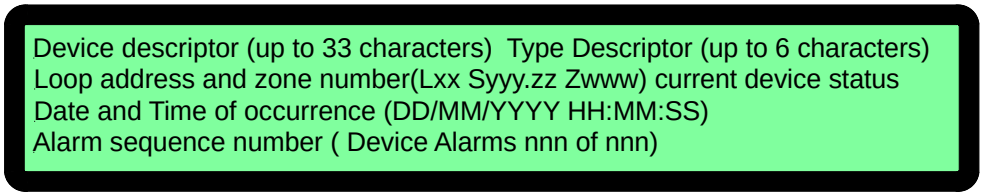
There are 3 events that can be reported and displayed by ***SmartTerminal***. The types of event are;

- Alarm
- Faults and
- Isolates.

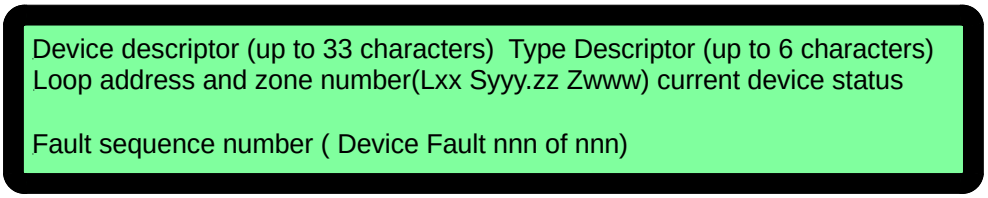
The types of events are only associated with sensors and detectors hence faults associated with modules, loops O/C – S/C, power supplies and so forth are not reported on the LCD.

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:



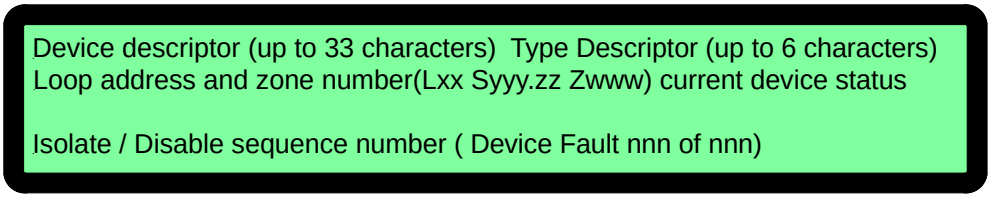
Fault: If configured the screen format for reporting loop / sensor / zone fault condition is:



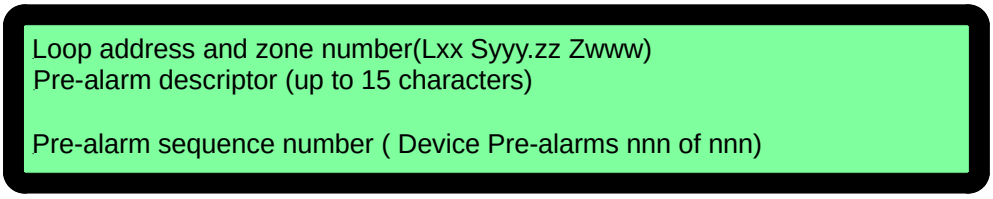
Note: The fault types only relate to devices.

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:

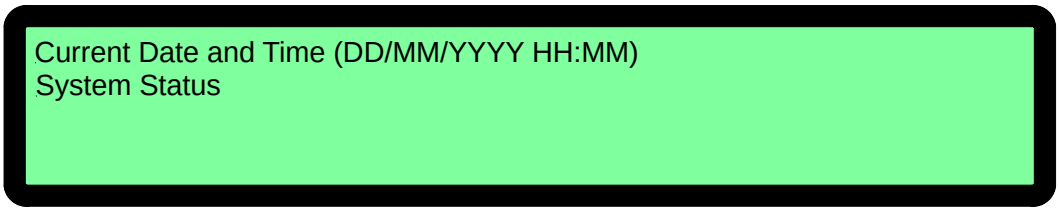
Device Isolate / Disables: If configured the screen format for reporting loop / sensor / zone disable condition is:



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



Normal / Default: The format for reporting that everything is normal is:



This 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:

“SYSTEM ALARM”

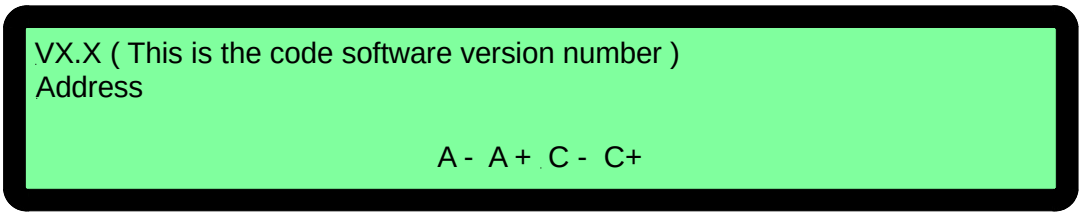
“SYSTEM PRE-ALARM”

“SYSTEM FAULT”

“SYSTEM ISOLATE”

“SYSTEM NORMAL”

Config: The Config screen displays the following



Adjusting Address: (see section 14.4)

A - A +: adjusts the address 1 to 30, 30 being the maximum number of ***SmartTerminal’s*** 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**”

Adjusting Contrast:

C - C+: decreases [-] and increases [+] the LCD contrast level.

The function keys perform the following;

C – Press “**SILENCE BUZZER**” C + press “**RESET**”

14.3 Operation

The operation of ***SmartTerminal*** can be considered to be in one of three states, these are;

1. Power up - when the SmartTerminal is initialising
2. Normal - when the SmartTerminal 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 SmartTerminal is in fault and/or is unable to communicate with the FACP.

Power Up

The LCD displays a message telling the operator ***SmartTerminal*** is being powered up and that the hardware is being initialised. Once the hardware has been successfully initialised set the address and ***SmartTerminal*** should automatically transition to the normal state. Should a failure occur on power up press the “CONFIG” button located on the LCD PCB and check the address is correct.

See Figure 107

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 ***SmartTerminal*** is communicating with the FACP and operating correctly. In this state the front panel Power indicator is illuminated.

Fault

SmartTerminal enters the Fault state upon;

- A hardware failure
- LCD module failure or
- A loss of communications with the FACP (indicated by the “DIAGNOSTIC” LED – not flashing and the “no communications“ message being displayed. See Figure 107)

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.

14.4 Setting the Address

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.

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 ***SmartTermina***l address. The user must then select an address value from 1 to 30, i.e. 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.

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 ***SmartTerminal*** and the FACP are communicating normally i.e. 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* ***SmartTerminal*** *will return to its normal state.*

☞ **Note:** *Each* ***SmartTerminal*** *must have its own individual address.*

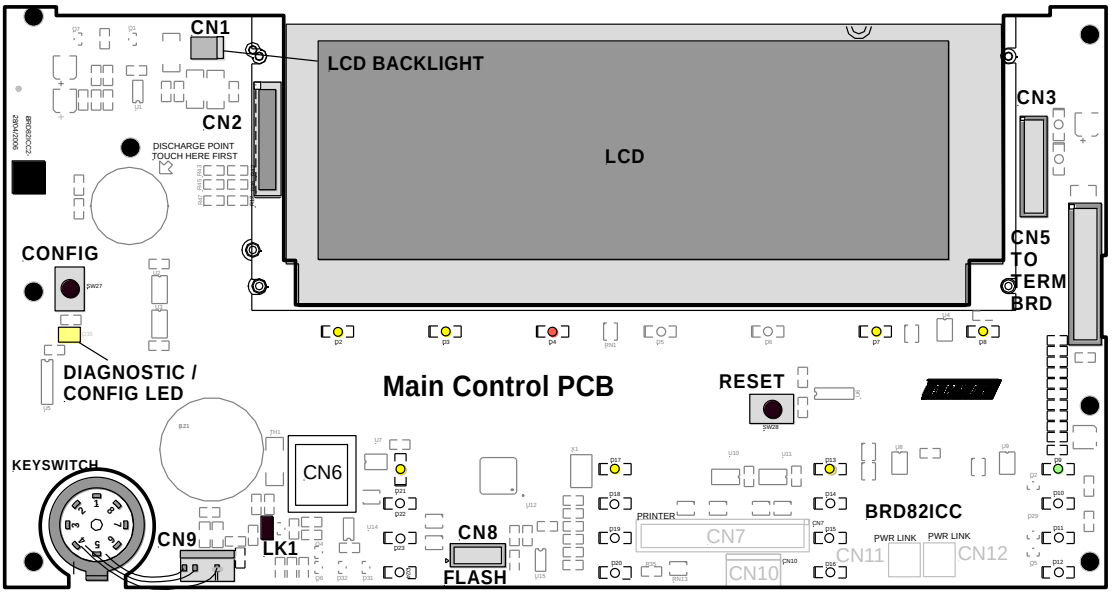


Figure 102: Main PCB Layout

14.5 Mechanical

SmartTerminal essentially consists of two PCBs;

1. BRD82LTB – FACP –. The LCDA Termination Board is mounted inside the FACP and provides the protected RS485 communications and 27VDC to the ***SmartTerminal***.
2. BRD82ICC – Control, LCD Communications and LCD Driver Board

SmartTerminal can be supplied in three variants Slim Line ABS (externally powered) BX1 ABS (externally powered) and BX1 ABS (internally powered) and consists of;

☞ **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.

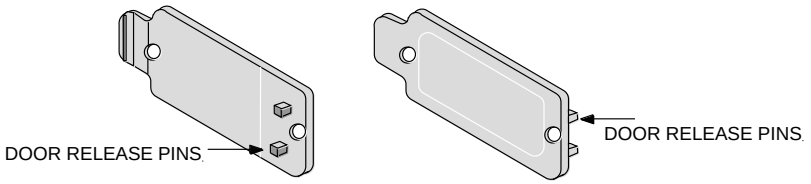


Figure 103: ABS Door Key and Front Panel Add On Card Surround Release Clip

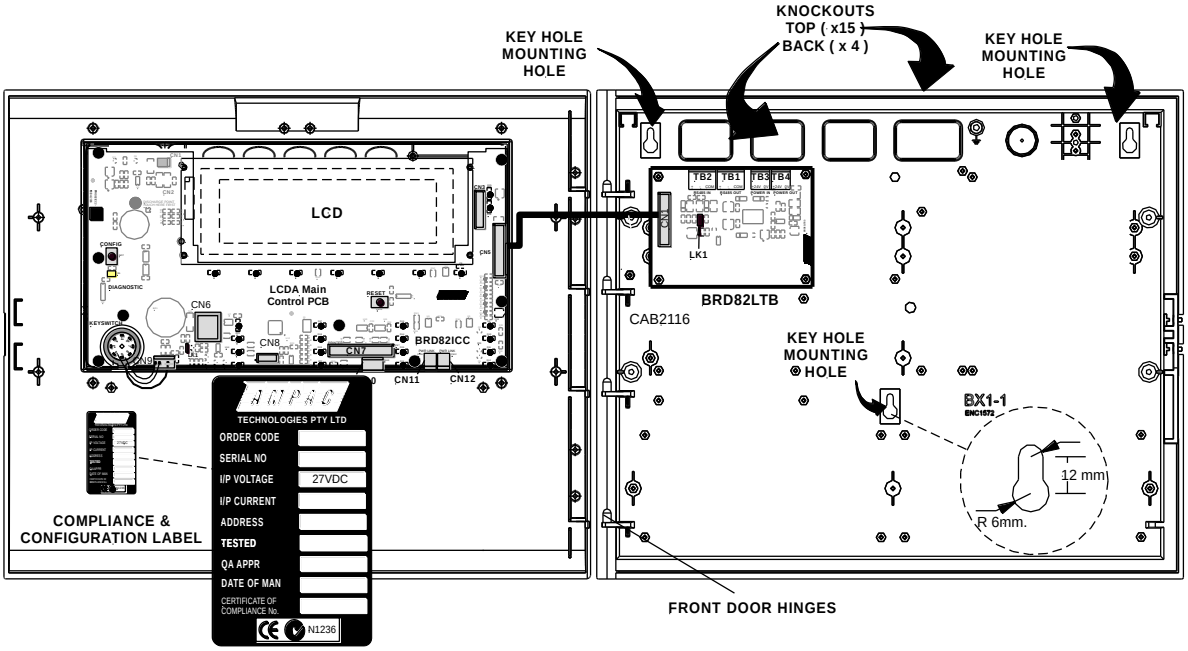


Figure 104: Typical Layout (Externally Powered) and Location of Keyholes

14.6 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.

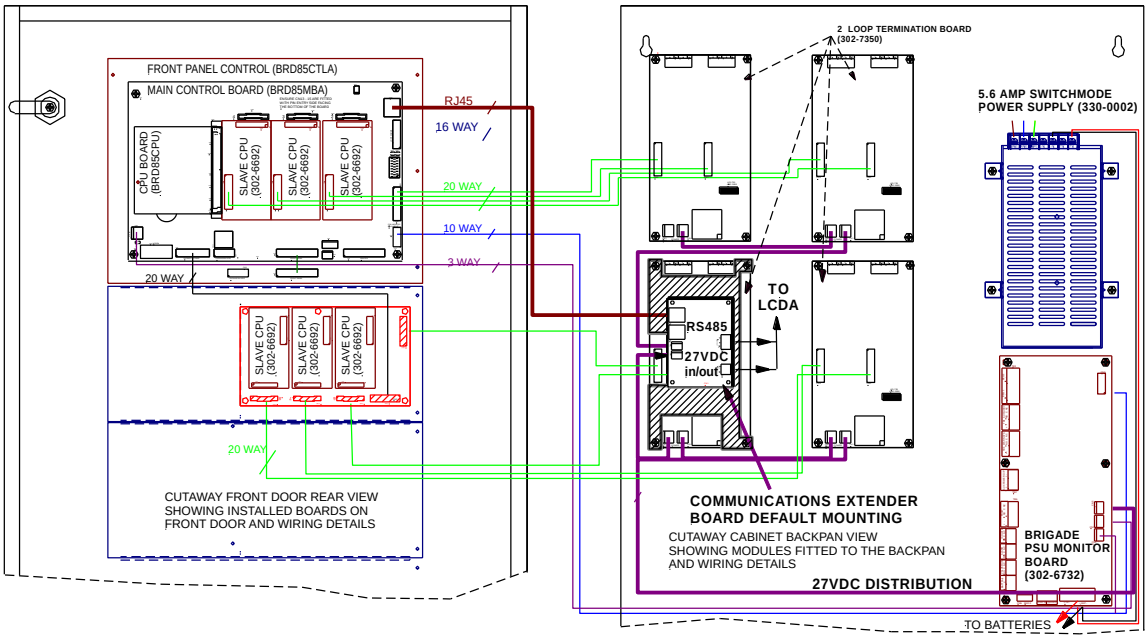


Figure 105: FACP Internal Layout

SmartTerminal is then connected to the FACP as shown below.

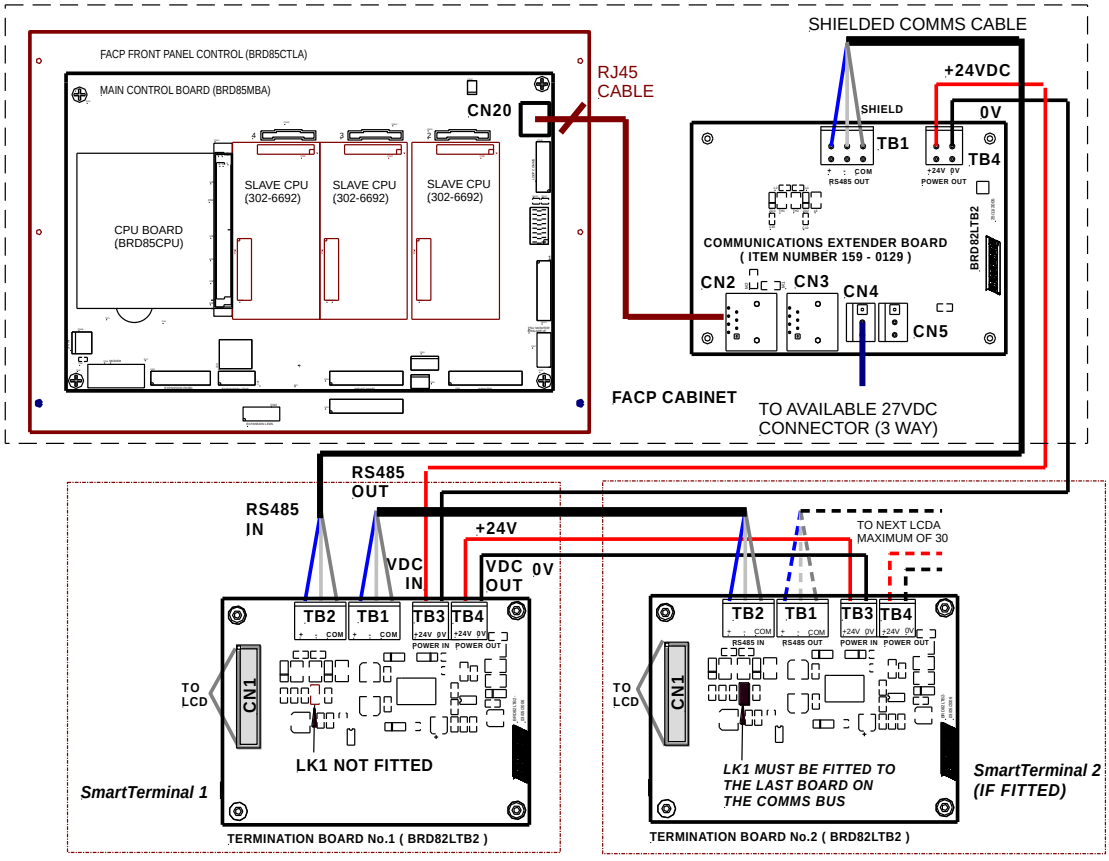


*Figure 106: Connecting **SmartTerminal's** to the FACP*

14.7 Specifications

MECHANICAL	
Dimensions ABS Cabinet: (mm)	195mm (H) x 345mm (W) x 50mm (D)
ENVIROMENTAL	
Temperature: Humidity:	-5ºC to + 55ºC 25% to 75%
INPUT POWER	
Operating Voltage (nominal): Operating Voltage (minimum): Quiescent Current @ 26.5VDC: Maximum Current: Cabling Requirements: Optional 27VDC Power Supply: Batteries:	27VDC 18VDC 12.4mA (back light, off buzzer off") 43.8mA (back light on, buzzer on) 2 core 1.5 to 2.5mm² 1.8A plus 400mA Battery Charging 12Ahr
27VDC OUTPUTS	
Auxiliary 27VDC Distribution Protection: Cabling Requirements:	24VDC 500mA Monitored 2 core 1.5 to 2.5mm²
COMMUNICATIONS	
Internal to FACP: External to FACP: Cabling Requirements: Fault monitoring: Maximum Number of ***SmartTerminal's*** per FACP: Maximum Distance (from FACP):	RS485 RS485 Twisted pair plus power O/C, S/C 30 1.2Kms.
LCD	4 line X 40 character - backlit

☞ **Note:** *A maximum of 30* ***SmartTerminal's*** *may be connected to the communications bus over a distance of approximately 1.2Kms*

14.8 Setting the *SmartTerminal* Controller Configuration in ConfigManager

Right click on the Controller icon and select “Edit Module Types” to bring up the following screen/s.

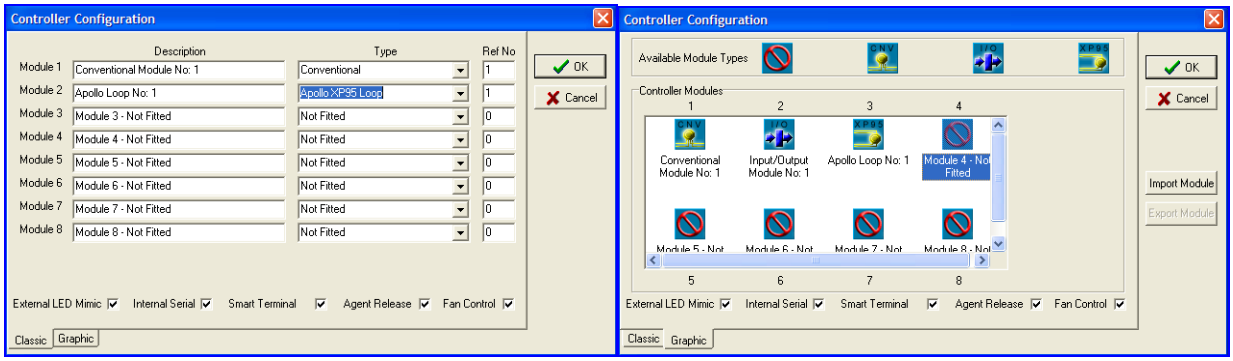


Figure 107: The Controller Edit / Add Module Types Screens

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 ***SmartTerminal*** tab should now be visible along with the other installed functions.

14.9 Setting the *SmartTerminal* Reporting Parameters in ConfigManager

To set the ***SmartTerminal*** parameters click on the ***SmartTerminal*** tab and the following screen will be displayed. Under the assigned ***SmartTerminal*** 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 ***SmartTerminal*** (LCDA) 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 ***SmartTerminal*** will display on each ***SmartTerminal*** at each location.

☞ **Note:** A maximum of 30 ***SmartTerminal’s*** can be used in the configuration of the FACP.

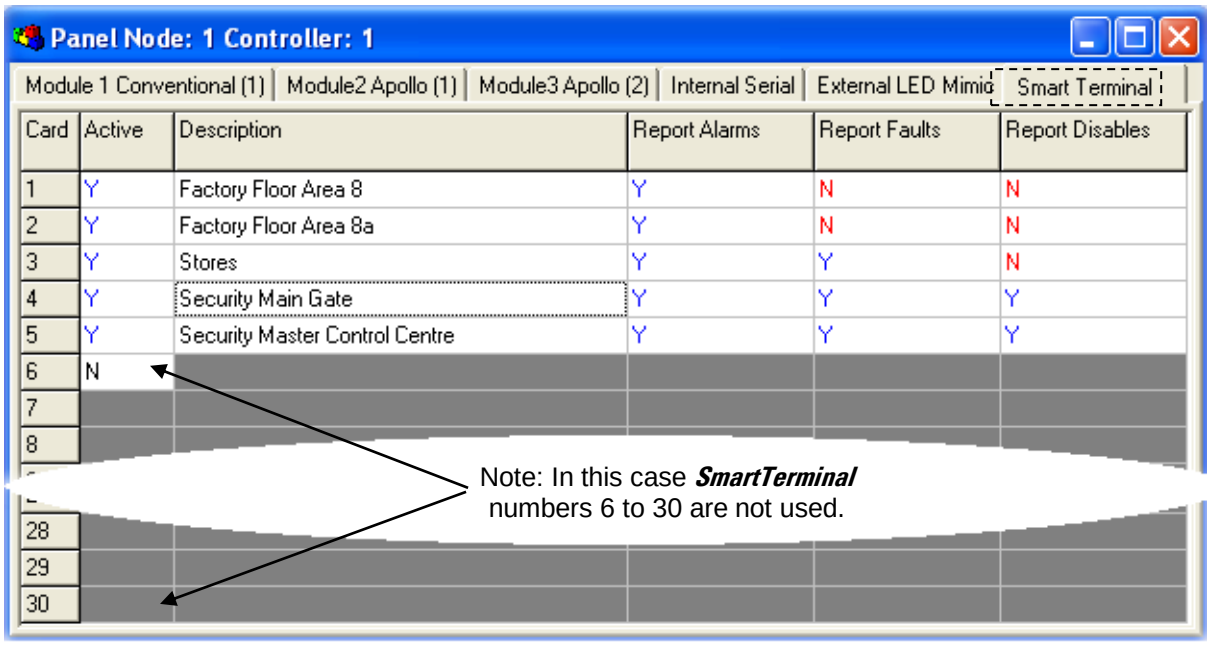


*Figure 108: Example of **SmartTerminal** Configuration Settings Screen*

In the above example **Card 1 & 2;**

- Are active
- Are situated in the factory floor area 8
- Will display all Alarms
- Will not display any Faults, and
- Will not display any Disables

Card 3

- Is active
- Is situated in the stores area
- Will display all Alarms
- Will display any Faults, and
- Will not display any Disables

Card 4 & 5

Are active

- Are situated in the security areas
- Will display all Alarms
- Will display any Faults, and
- Will display any Disables

14.10 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 ***SmartTerminal's*** address.

15 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.

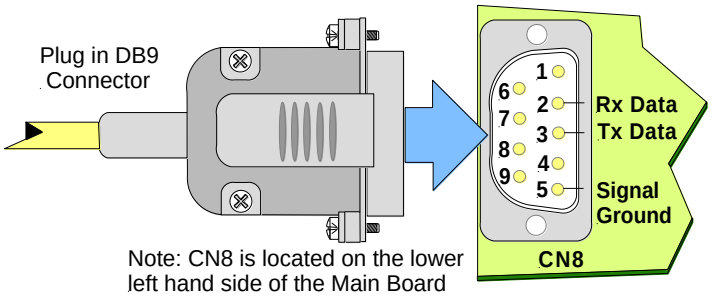


Figure 109: DB9 Connector CN8 as Mounted on the Main Board

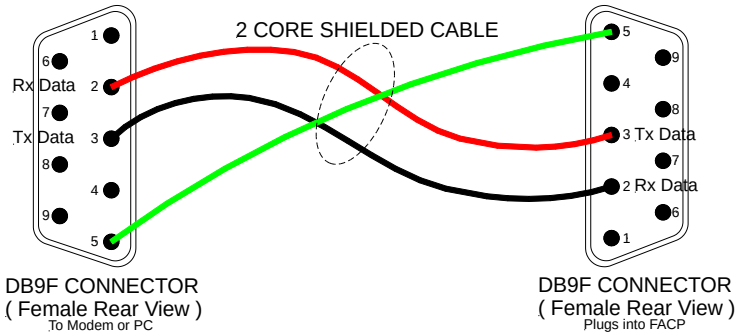


Figure 110: Modem / Programming / Debug Cabling

☞ **Note:** *Debug/Notebook cables are available from AMPAC*

16 List Of Compatible Detectors

Conventional Detectors

The following range of conventional detectors has approval to be used with the ***FireFinder***™ conventional zone board (302-6710).

Apollo Actuating Device	MAX No Of Devices
Apollo Series 60, 55000-100 grade 1 heat (60deg Celsius)	32
Apollo Series 60, 55000-101 grade 2 heat (65deg Celsius)	32
Apollo Series 60, 55000-102 grade 3 heat (75deg Celsius)	32
Apollo Series 60, 55000-103 range 1 heat (80deg Celsius)	32
Apollo Series 60, 55000-104 range 2 heat (100deg Celsius)	32
Apollo Base 45681-200 (for above detectors)	
Apollo Series 60, 55000-200 Ionisation Smoke	32
Apollo Series 60, 55000-300 Photoelectric Smoke	32
Apollo Series 60, 53546-014 Duct Sampling Unit	32
Apollo Base 45681-205 (for above detectors)	

Apollo / Ampac Addressable Devices

The following range of addressable detectors has approval to be used with the ***FireFinder***™ addressable Loop Board (BRD86DLTB-B).

Device Type	Part Number
Apollo XP95 Ionisation Smoke Monitor	55000-520
Apollo XP95 Optical Smoke Monitor	55000-620
Apollo XP95 Temperature Monitor (STANDARD)	55000-420
Apollo XP95 Temperature Monitor (HIGH)	
Apollo Discovery Ion Smoke Monitor	58000-500
Apollo Discovery Optical Smoke Monitor	58000-600
Apollo Discovery Heat	58000-400
Apollo Discovery Multi - sensor	58000-700
Apollo XP95 Base	45681-210
Apollo XP95 Isolator	55000-700
Apollo XP95 Isolator Base	45681-211
Apollo XP95 Manual Call Point	55000-905
Apollo Discovery Manual Call Point	58000-910
Input/Output Unit	55000-818
Switch Monitor Plus	55000-809
Mini Switch Monitor	55000-833
Sounder Control Unit	55000-823
Apollo XP95 Intrinsically Safe Protocol Translator	55000-855
Zone Monitor	55000-813
Loop Sounder	55000-261
Ampac 3-IOD 3 Input / 3 Output Device	*Consult your local*
Ampac SID Single Input Device	*Ampac*
Ampac Zone Interface Device	*Distributor*

17 Certification Information

The ***FireFinder***™ is designed and manufactured by:

AMPAC TECHNOLOGIES PTY LTD
7 Ledgar Rd
Balcatta
WA 6021
Western Australia
PH: 61-8-9242 3333
FAX: 61-8-9242 3334

HEAD OFFICE

Manufactured to: _____

Certificate of Compliance Number: _____

Equipment Serial Number: _____

Date of Manufacture: _____

18 Troubleshooting Chart

Problem	Solution
No Mains Power	Check mains Fuse
Supply fault LED illuminated	Check output voltage it should be set to 27.4V. Low = (less than 24.5V) 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

19 Address Setting

BINARY ADDRESS SETTING (APOLLO)

SERIES XP95 - ADDRESS DATA

DIL SWITCH: ON = 1 OFF = 0 ADDRESS TAG FOR DETECTORS (I/O DEVICES)

DIL switch setting		DIL switch setting		DIL switch setting		DIL switch setting		DIL switch setting	
Addr	**1234567**	**Addr**	**1234567**	**Addr**	**1234567**	**Addr**	**1234567**	**Addr**	**1234567**
1	1000000	26	0101100	51	1100110	76	0011001	101	1010011
2	0100000	27	1101100	52	0010110	77	1011001	102	0110011
3	1100000	28	0011100	53	1010110	78	0111001	103	1110011
4	0010000	29	1011100	54	0110110	79	1111001	104	0001011
5	1010000	30	0111100	55	1110110	80	0000101	105	1001011
6	0110000	31	1111100	56	0001110	81	1000101	106	0101011
7	1110000	32	0000010	57	1001110	82	0100101	107	1101011
8	0001000	33	1000010	58	0101110	83	1100101	108	0011011
9	1001000	34	0100010	59	1101110	84	0010101	109	1011011
10	0101000	35	1100010	60	0011110	85	1010101	110	0111011
11	1101000	36	0010010	61	1011110	86	0110101	111	1111011
12	0011000	37	1010010	62	0111110	87	1110101	112	0000111
13	1011000	38	0110010	63	1111110	88	0001101	113	1000111
14	0111000	39	1110010	64	0000001	89	1001101	114	0100111
15	1111000	40	0001010	65	1000001	90	0101101	115	1100111
16	0000100	41	1001010	66	0100001	91	1101101	116	0010111
17	1000100	42	0101010	67	1100001	92	0011101	117	1010111
18	0100100	43	1101010	68	0010001	93	1011101	118	0110111
19	1100100	44	0011010	69	1010001	94	0111101	119	1110111
20	0010100	45	1011010	70	0110001	95	1111101	120	0001111
21	1010100	46	0111010	71	1110001	96	0000011	121	1001111
22	0110100	47	1111010	72	0001001	97	1000011	122	0101111
23	1110100	48	0000110	73	1001001	98	0100011	123	1101111
24	0001100	49	1000110	74	0101001	99	1100011	124	0011111
25	1001100	50	0100110	75	1101001	100	0010011	125	1011111
								126	0111111

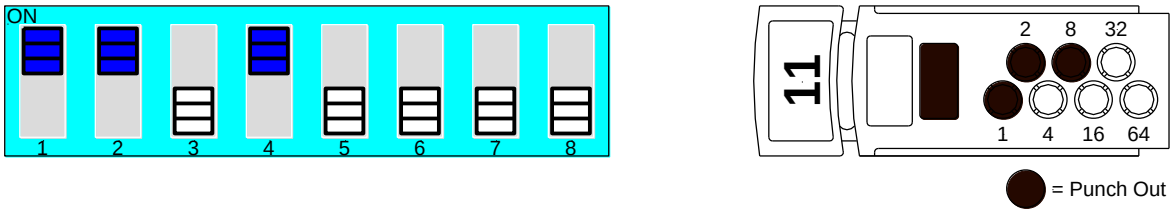


Figure 111: Switch and Xpert card set to Address 11

20 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

21 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.

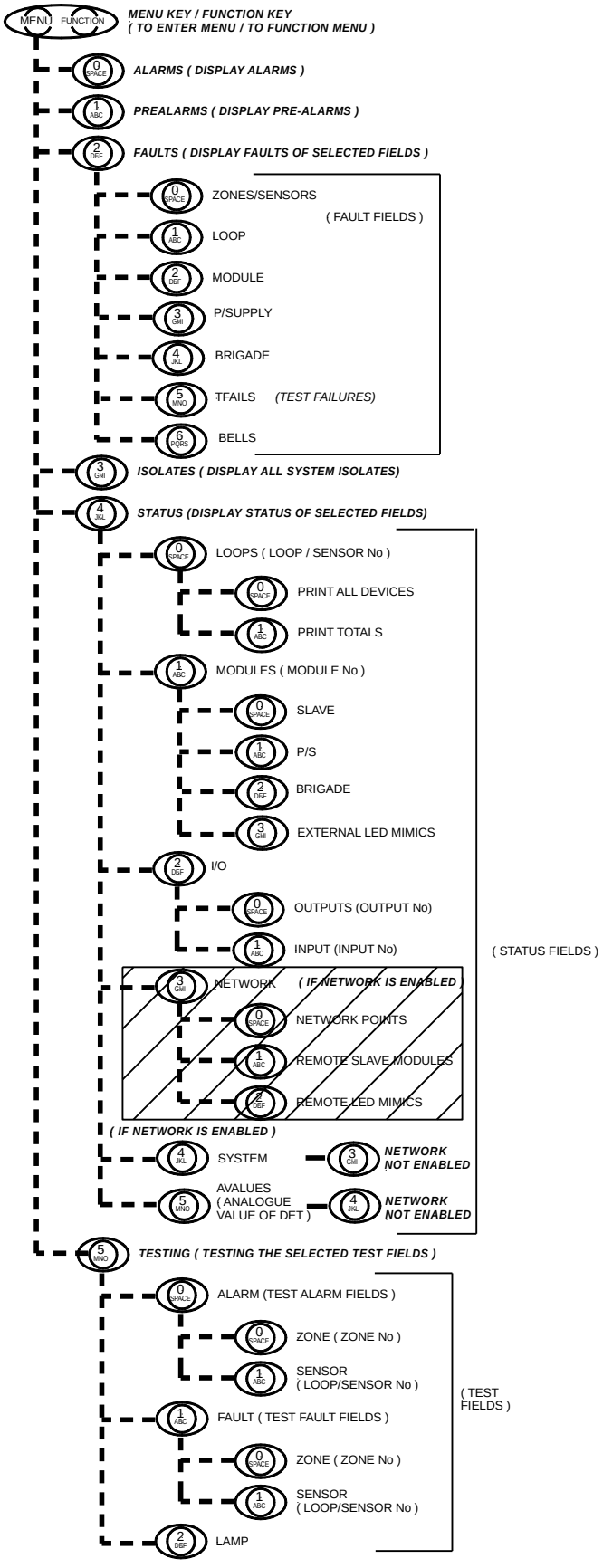
Master Alarm Facility (MAF) - that part of the equipment which receives alarm and fault signals from any alarm zone facility and initiates the common signal (alarm and/or fault) for transmission to the fire control station. Bells and other ancillary functions may be initiated from this facility.

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.

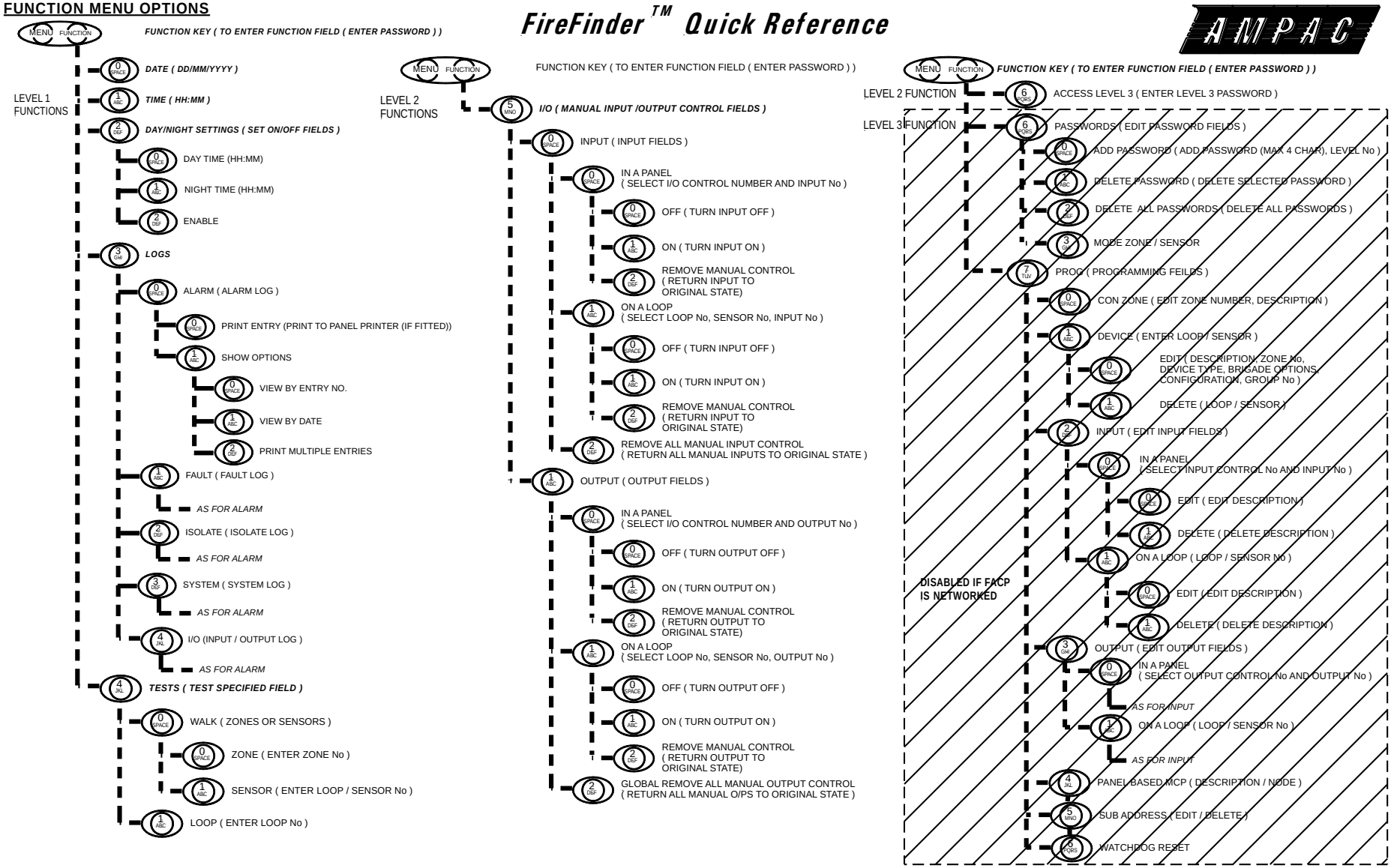
22 Quick Reference Guides

MAIN MENU OPTIONS



FUNCTION MENU OPTIONS

FireFinder™ Quick Reference



23 Statement of Compliance

Please PRINT

1. Name of building	
2. Address	
3. I/WE have installed in the above building an alteration to the system manufactured by, OR	*Fire Alarm Control Panel Brand Name*
a system manufactured by	
4. The system is connected to the monitoring service provider	*Name of 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.l, -

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

23.1 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	Number and Type of Actuating Devices											
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												
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29												
30												
31												
32												

Additional Information: _____

(Attach if necessary) _____

Name	Company	Signature	Date

24 Commissioning Test Report

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

Company Name _____

Street _____

Suburb _____

State / Country _____

Post Code _____

(Company Name & Installation Address)

Owner or Owners' Authorized Representative:

Company Name _____

Street _____

Suburb _____

State / Country _____

Post Code _____

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 _____

Post Code _____

Commissioning Representative: Name (*Print*) _____

Signature: _____

24.1 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 -

- operator's manual;
- installer's statement(s);
- 'as-installed' drawings; and
- detector test records,

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

24.2 System Information

	Check relevant box YES ☑ NO ☒ NA		
GENERAL			
(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 hour 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 signaling equipment: Alarm signaling equipment initiates a fire alarm signal to the monitoring service provider. ☐ ☐ ☐

(bb) Labeling: Alarm zone location is immediately apparent from the alarm zone labeling. ☐ ☐ ☐

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. ☐ ☐ ☐

25 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. $\frac{\text{Battery Capacity (AH) (determined from Calculator)}}{24 \times 0.8}$ = 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 AZF's and associated ACF's 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* No Off X	mA	*Iq* = Iq
Basic 1 loop panel		240	
Basic 2 loop panel		254	
Basic 16 Zone panel		360	
Extender		1.8	
SmartTerminal		156.2	
LED repeater		27	
Evac Module			

Evac Type	Iq in mA	Ia in mA
EV20	41	650
EV40	140	2500
EV60	150	3800
EV120	150	8500

Interface Modules

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

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 =	_____

Devices activating when the system is in alarm

8 x Relays		60	
Bell		30	
Other			
		Ida=	_____

Devices de-activating when the system goes into alarm

Aircon Relays		20	
Electric locks		100	
Other			

Idd= _____

I Alarm (Ia = Iq + Ida – Idd) = mA

Battery capacity at end of battery life	=	(Iq x 24) + Fc(Ia x 0.5)
	=	
NOTE: ➲		**Note: The figure of 24 above should be replaced with 96 if Agent Release is used**
	=	
Note: + 1,000ma = 1 Amp	=	Ah
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
e is the battery efficiency, 0.8	=	24 x **e** 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*
		No X	Off mA	= Iq
Basic 1 loop panel		1	240	**240**
Basic 2 loop panel			254	**0**
Basic 16 Zone panel			360	**0**
Extender		1	1.8	**1.8**
LCD repeater			156.2	**0**
LED repeater		2	27	**54**
Evac Module				**0**
Interface Modules				
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				
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				

Evac Type	Iq in mA	Ia in mA
EV20	41	650
EV40	140	2500
EV60	150	3800
EV120	150	8500

$$Idd = \frac{440}{}$$

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

Battery capacity at end of battery life	=	(Iq x 24) + Fc(Ia x 0.5)
	=	(769ma x 24) + 2(1049ma x 0.5)
	=	18456ma + 1050ma
Note: + 1,000ma = 1 Amp	=	19.506Ah
New battery capacity requirement	=	19.5 x 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 x Ia)
	=	(5 x 769) + 2(0.5 x 1049)
	=	3845 + 1050
Ah Requirement	=	4.895Ah
Battery Charging Current Required	=	4.895
		24 x 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 NP Series	Power-Sonic PS Series	Matsushita LCR Series	B & B BP Series
NPH1.3-12 NPH2-12 NPH3.2-12 NPH5-12 NPH16-12 NP0.8-12 NP1.2-12 NP1.9-12 NP2.3-12 NP2-12 NP2.6-12 NP4-12 NP7-12 NP12-12 NP24-12 NP24-12B NP38-12 NP65-12	PS-1208 PS-1212 PS-1219 PS-1232 PS-1240 PS-1270 PS-12120 PS-12180 PS-12240 PS-12330 PS-12400 PS-12650	LCR12V4BP LC-R125P LC-RC1217P LC-R127P LC-R127R2P **afp - 1221** Matsushita LCL Series LC-LA12V33P **Afp - 1222** Matsushita LCX Series LC-X1224P9(AP) LC-X1228P(AP) LC-X1238P(AP) LC-X1242P(AP) LC-X1265P LC-XA12100P	BP 1.2-12 BP 1.9-12 BP 4 –12 BP 7 –12 BP 12-12 BP 17-12 BP 24-12 BP 40-12