



ADVANCED WARNING

SYSTEMS

FireFinder



**Fire Alarm Control Panel
Series II
SE Asia (CP10, MS1404)**

**Installation, Commissioning &
Operation**

MAN 2536-6

WORLD LEADER OF INNOVATIVE SOLUTIONS
IN FIRE DETECTION AND ALARM SYSTEMS

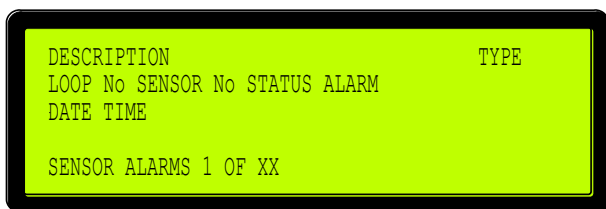


INCOMING ALARM CONDITION

1) INDICATION

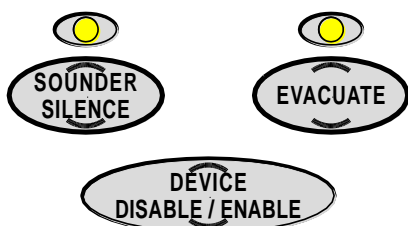


FIRE LED STEADY



LCD DISPLAY OF DESCRIPTION TYPE, ADDRESS, DATE TIME AND NUMBER OF ALARMS

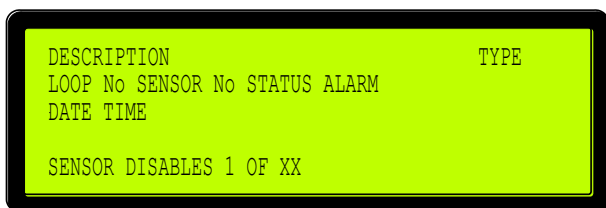
2) SOUNDER SILENCE OR SOUND EVACUATION



PRESS KEY

DISABLE ALARM

REPEAT THE ABOVE STEPS AFTER PRESSING NEXT TO DISABLE ALARMS



LCD DISPLAY OF DESCRIPTION TYPE, ADDRESS, DATE TIME AND NUMBER OF DISABLES

3) SOUNDER SILENCE



FIRE LED STEADY



IF NECESSARY PRESS TO SILENCE SOUNDERS INDICATOR WILL TURN OFF

3) SOUNDER SILENCE



PRESS TO REST ALL ALARMS

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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

National Standards:

Singapore CP10: 2005

Malaysia: MS1404: 1996

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:

- AMPAC Discovery and XP95 Intelligent Detectors, Multisensor, Photoelectric, Ionisation, Thermal (heat) and CO detectors and Hochiki range of 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

Panel is built to comply with the following National standards:

- Singapore CP10: 2005
- Malaysia: MS1404: 1996

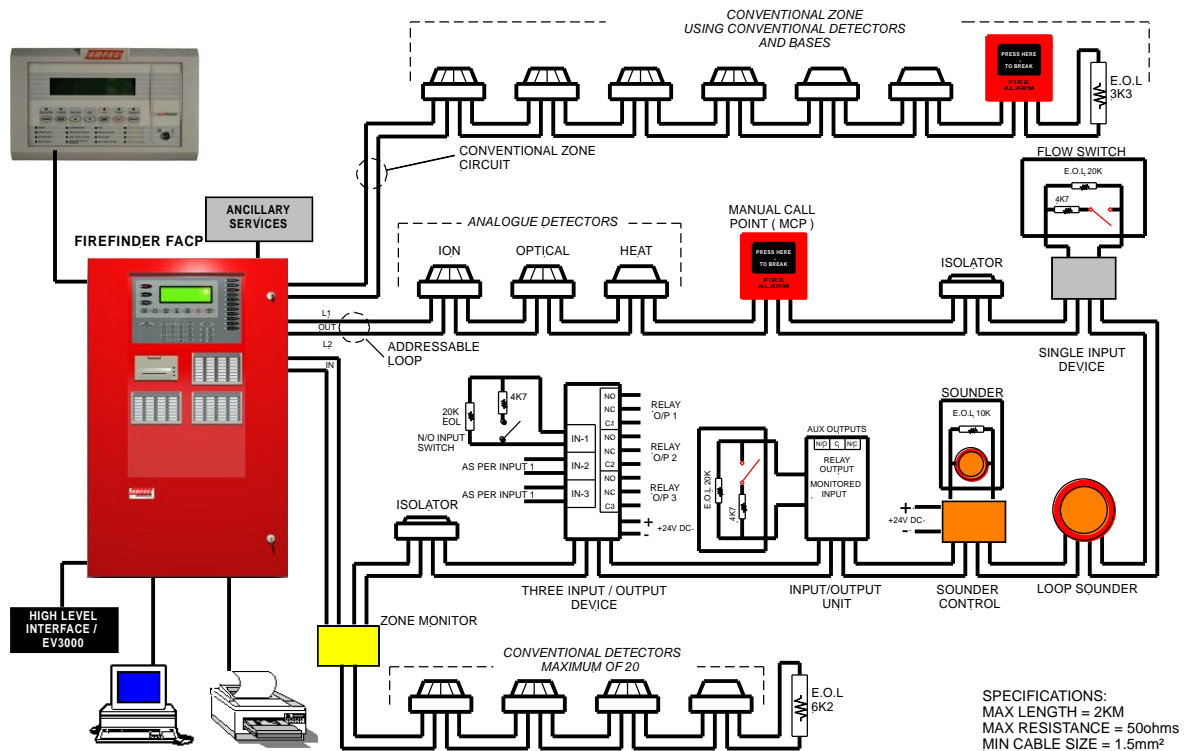
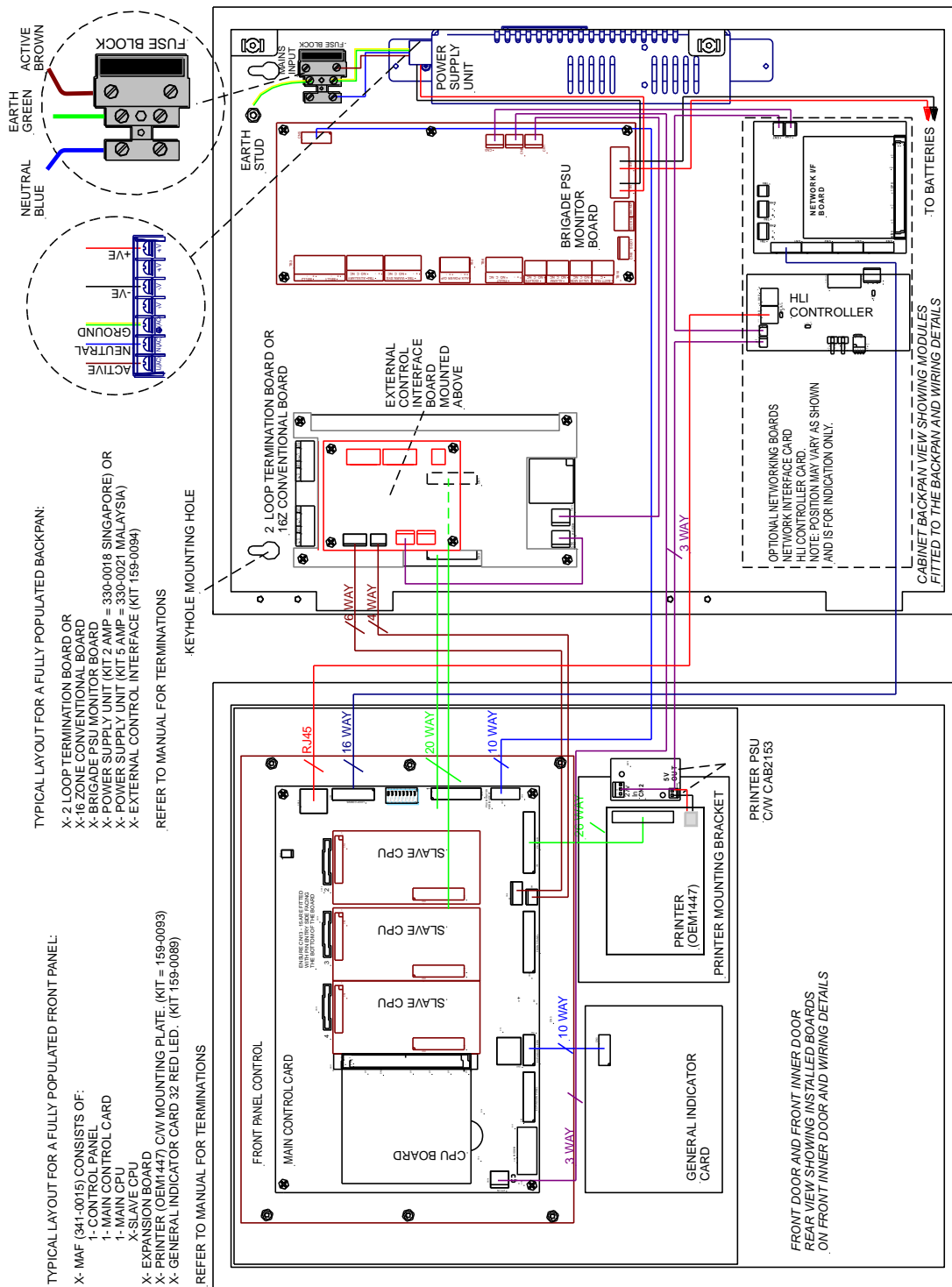


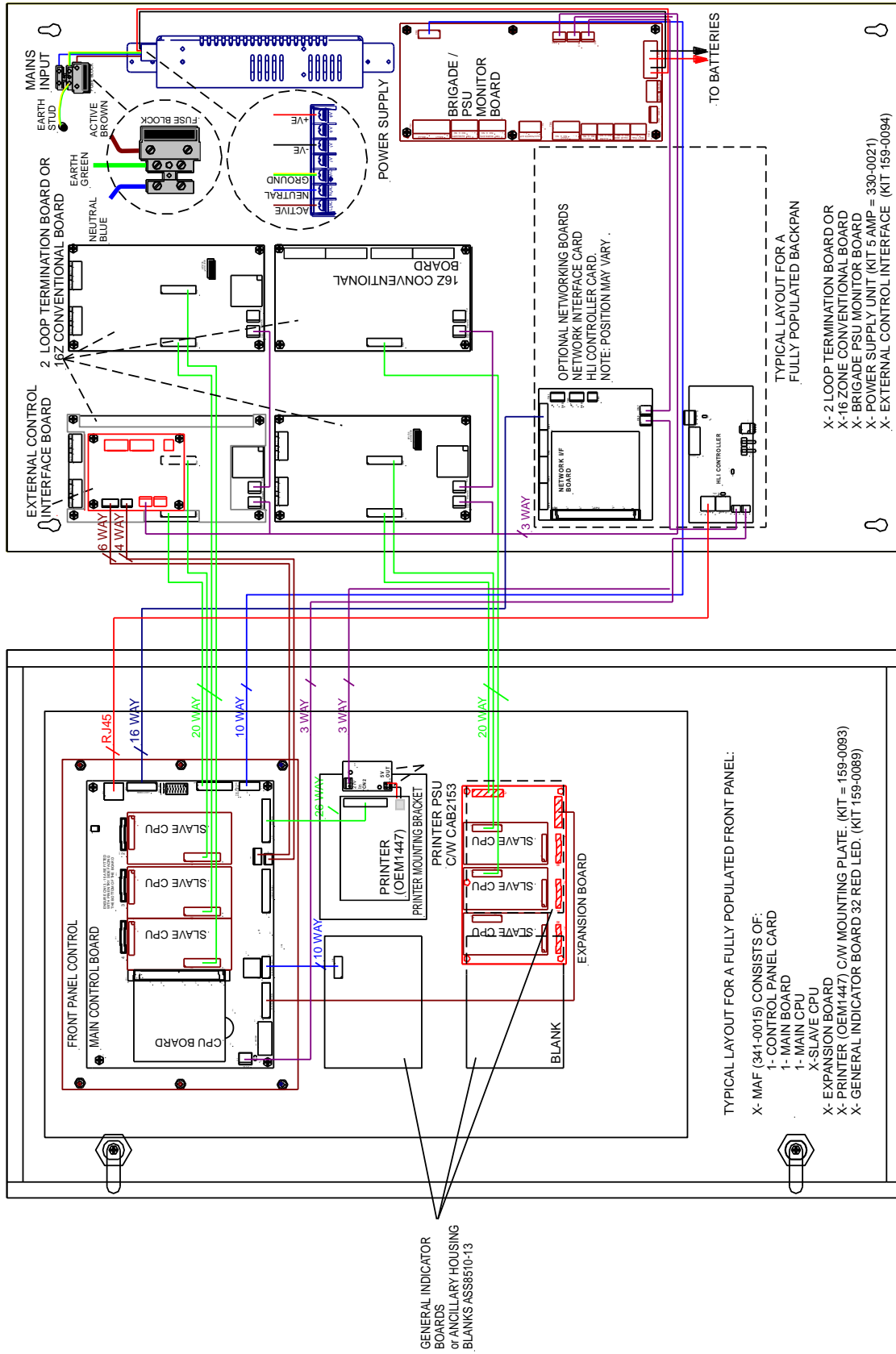
Figure 1: Typical Application

2.1 FACP Configuration Examples



NOTE1: WIRING MAY VARY DEPENDING ON PANEL CONFIGURATION
NOTE2: AN EXTERNAL BATTERY CABINET WILL BE REQUIRED IF THE FACP IS FULLY OPTIONED

Figure 2: Typical Example of a CP10-1 Layout



NOTE: WIRING MAY VARY DEPENDING ON PANEL CONFIGURATION

Figure 3: Typical Example of a CP10-4 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 and the CPU board. 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.



Figure 4: CP10-1 FACP Layout



Figure 5: CP10-4 FACP Layout

The **FireFinder Series II** has an internal ASPI (**Ampac Serial Peripheral Interface**) 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.

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**.

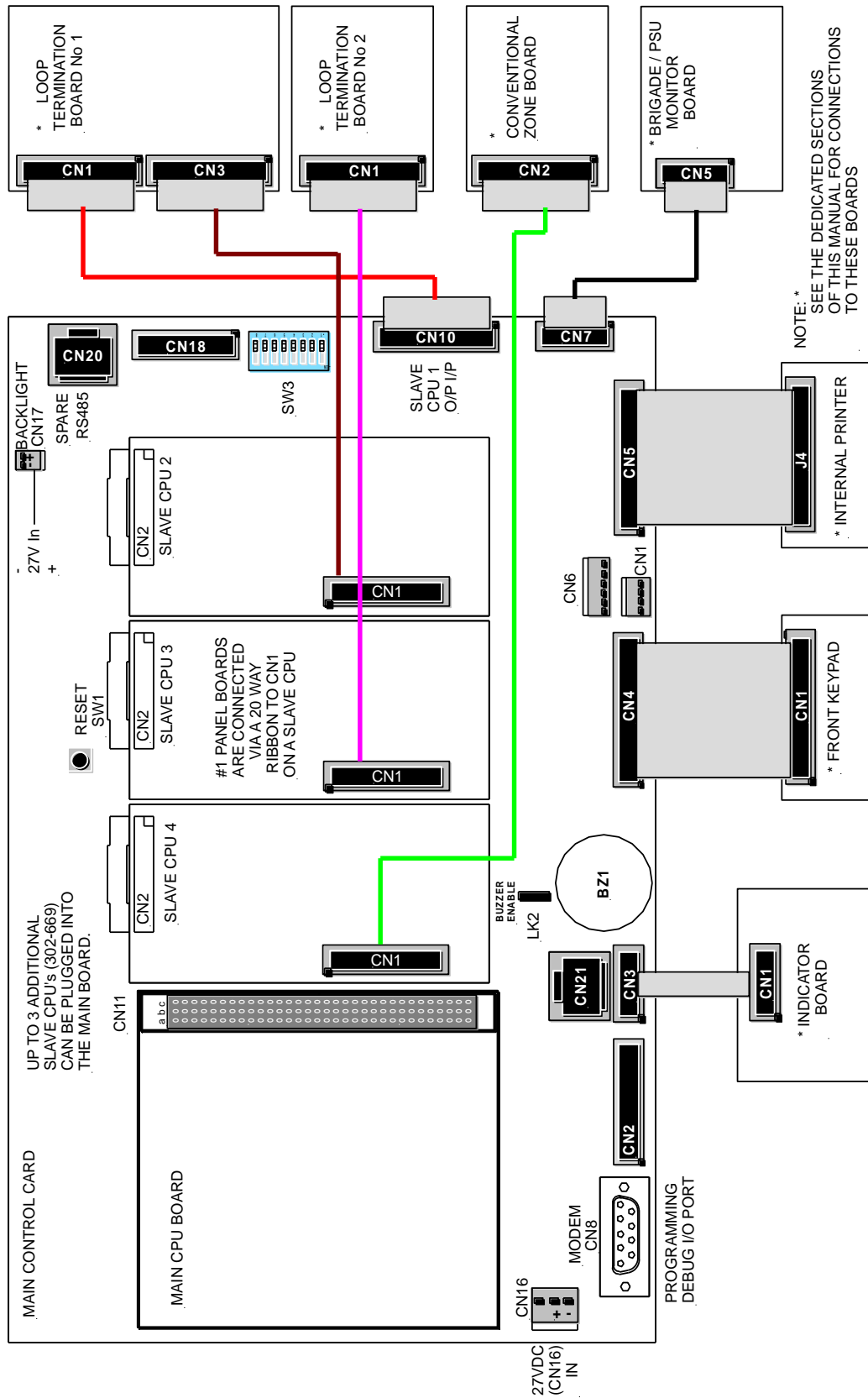


Figure 6: Basic FACP Configuration

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

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 four different styles. Each style has the capability of being either surface or flush mounted. With flush mounting though a surround is required.
- Normally painted Signal Red. 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 100°. 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.

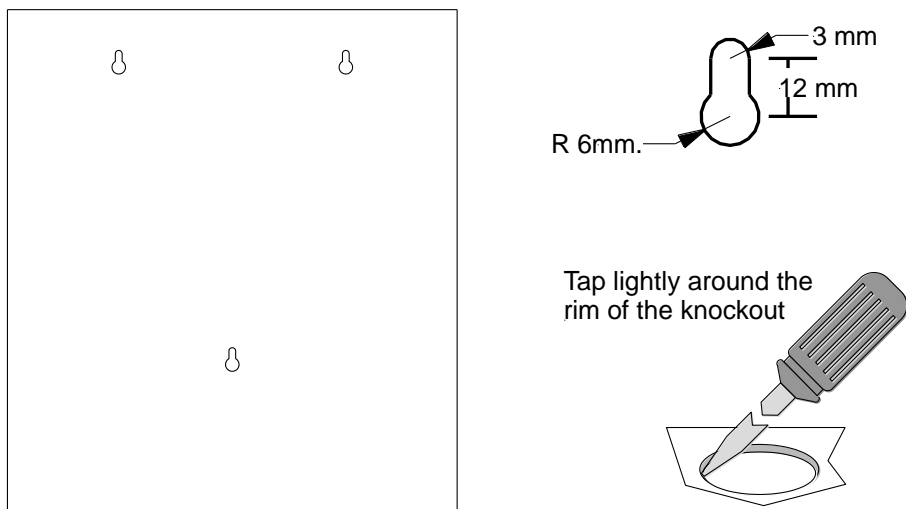





Figure 7: Example FireFinder Back Pan Mounting Hole & Removing Knockouts

4.6 Operational Parameters

GENERAL	
Communication Protocol	AMPAC XP95 / Discovery
Max No of Devices per Loop	126
Max No of Devices per FACP	512
Max No of Devices per Conventional Zone	32
Cable Loop Characteristics	2 core. 1.5 to 2.5mm ² Max loop resistance 50Ω. Max core to core capacitance 0.5uF
Max/Min conductors sizes terminals can accept	0.2 – 4mm ²
POWER SUPPLY	
Power Supply Output Voltage	27.4V
Power Supply Output Current	5.6Amp
Power Supply Input	85 - 264VAC (47 – 63Hz)
Panel Current Draw	240 mA (min 1 loop fitted) 310 mA (min 4 loops fitted)
Minimum Operating Voltage	19.2 V
Battery Type & Capacity	2 x 12V sealed lead-acid
<i>Note: A greater range of batteries can be supplied if using a remote battery cabinet</i>	CP10-1 = 12AH CP10-4 = 24AH
ENVIROMENTAL	
Temperature	-5°C to + 55°C
Humidity	25% to 75%
IP Rating	IP30
MECHANICAL	
Material	1.2mm Steel
Finish	RED powder coat
Dimensions CP10-1	500mm (H) x 405mm (W) x 140mm (D)
Dimensions CP10-4	840mm (H) x 515mm (W) x 140mm (D)

 **Note:** Except for the batteries component life expectancy is in the order of 15 years. Battery life will depend on the environment and the quality of the battery.

 **Note:** Short Circuit Isolation should be provided on the analogue loop in appropriate places so that a short circuit on the loop does not prevent more than 32 fire detectors from indicating an alarm.

 **Note:** A separate cabinet for the batteries is available should the FACP be optioned to capacity.

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 1.5mm² PVC sheathed MIMS (**M**ineral Insulated **M**etal **S**heathed) to the bell location.

Brigade Connection via Telecom

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

RJ45 Multi-drop Serial Port

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	
SP-150-27	27V @ 5.6A	± 1%	150mV	84%	

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.

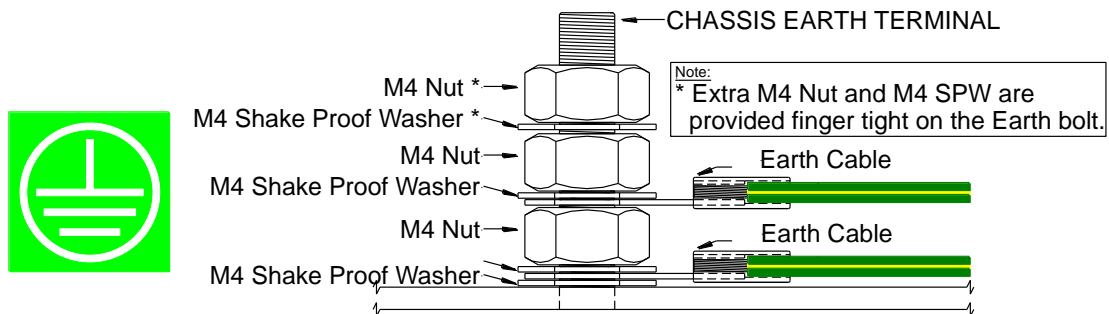


Figure 8: Panel Earthing

4.8.2 Connecting the Mains Power to the Power Supply

5 AMP Power Supply

Output Voltage: is set to 27.4 Volts.

Mains cable should be no less than 0.75mm²

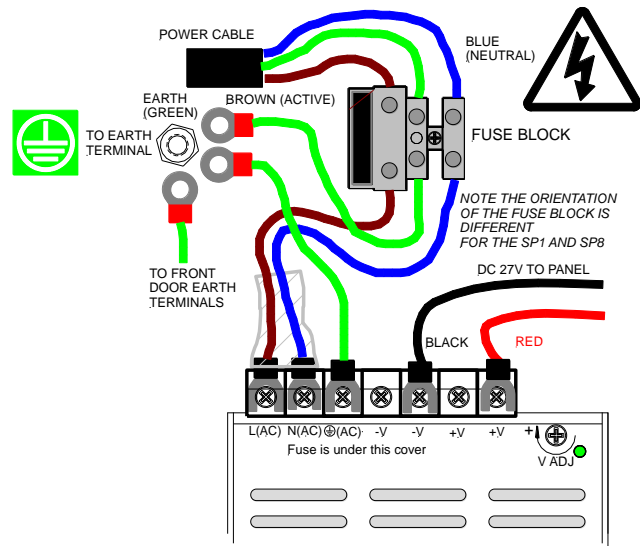


Figure 9: Mains Power Connection to the 5 AMP Power Supply

4.9 Brigade / PSU Monitor Board

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 10KΩ 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 Sounder Fault will be indicated on the Panel. Monitoring is achieved using a small reverse polarity current. For this reason it is necessary to ensure that all alarm devices are fitted with a series diode (1N4004 recommended) and correct polarity is observed for both the output and the sounders they are connected to.

Relay outputs marked NO, C and NC are voltage free relay contacts. Outputs marked +ve and -ve are fitted with resistors (10KΩ) 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	Sounder 1.1	2 Amp Fused	F2	RL 1
	Sounder 1.2	2 Amp Fused	F3	RL 1
4	F.A.R.E Monitored	1 Amp Fused	F4	
	F.A.R.E Non-Monitored	1 Amp Voltage Free Contacts		RL2
5	Sounder 2 Monitored	1 Amp Fused	F5	
	Spare Non-Monitored	1 Amp Voltage Free Contacts		RL3
6	F.W.R.E Monitored	1 Amp Fused	F6	
	F.W.R.E Non-Monitored	1 Amp Voltage Free Contacts		RL 4
7	Disable	1 Amp Voltage Free Contacts		RL 6
8	Alarm	1 Amp Voltage Free Contacts		RL 5
9	Valve Monitor	1 Amp Voltage Free Contacts		RL 8
10	Batt Fail	1 Amp Voltage Free Contacts		RL 7
1	Battery Output	Thermistor Protected		
2	Aux Power Output	1 Amp Fused Not Monitored	F7	
	Aux Power Output	1 Amp Fused Not Monitored	F8	

Fuse Information

- All fuses are of the Glass M205 style.
- F1 is 6.3A
- 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.**

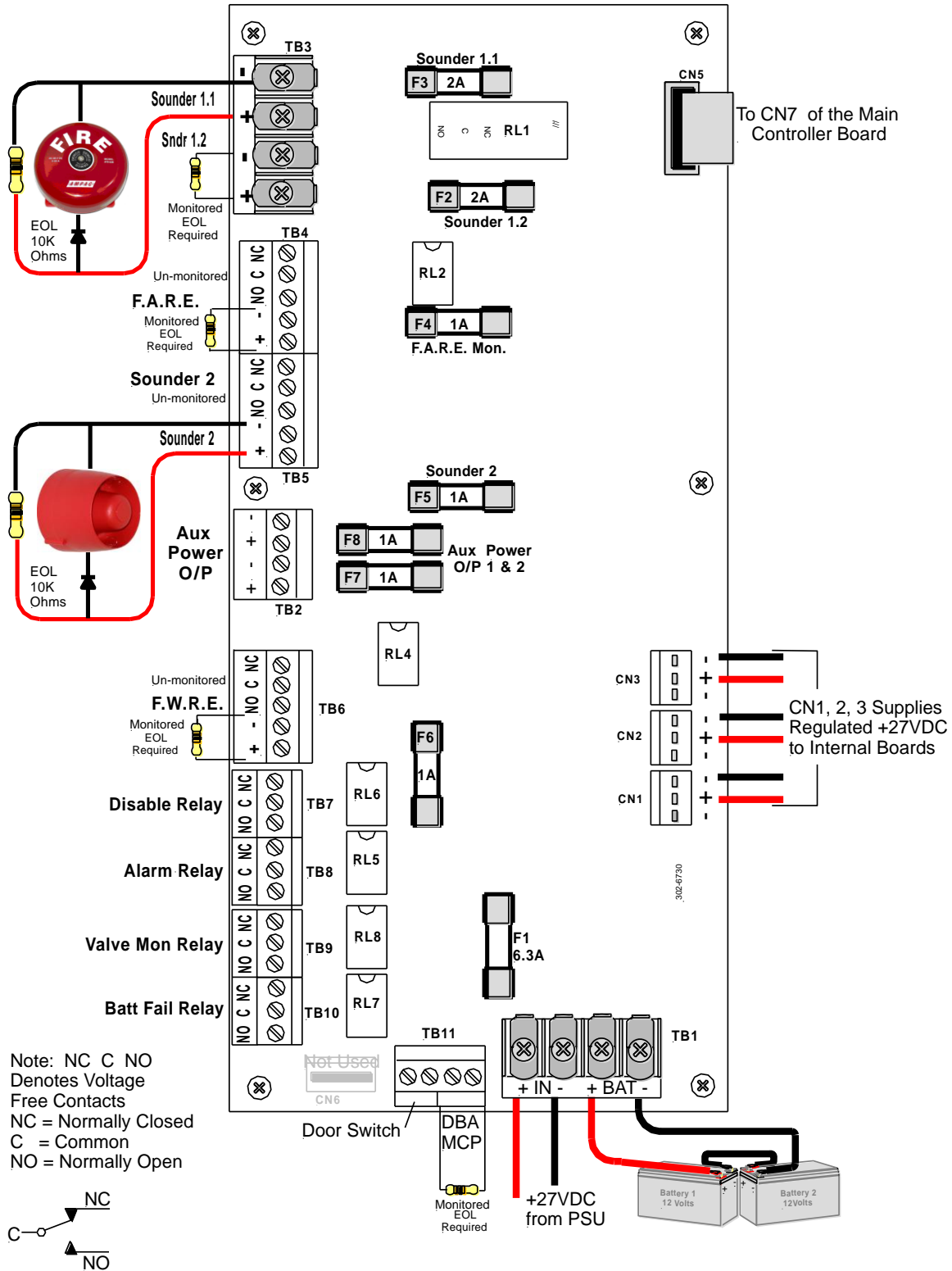


Figure 10: Brigade / PSU Monitor Board Layout

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

4.9.1 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.

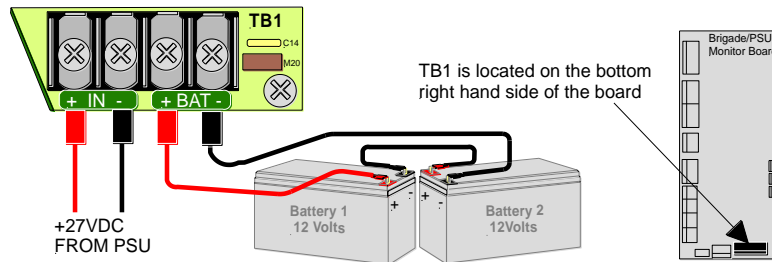


Figure 11: Battery Connections to the Brigade / PSU Monitor Board

4.9.2 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.

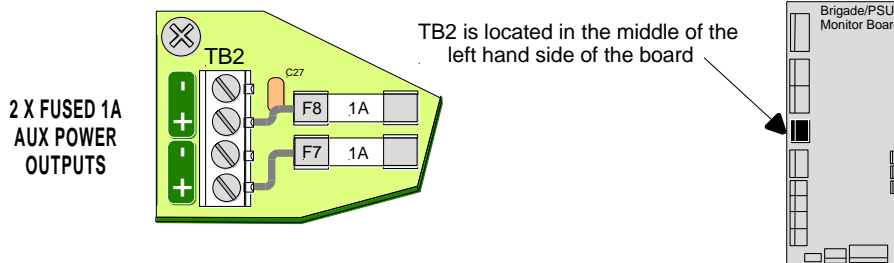


Figure 12: Auxiliary 27VDC Power Output

4.9.3 Bell / Sounder Monitored Outputs (TB3 & TB5)

Bell and Sounders are connected to the Brigade / PSU Monitor Board as shown below.

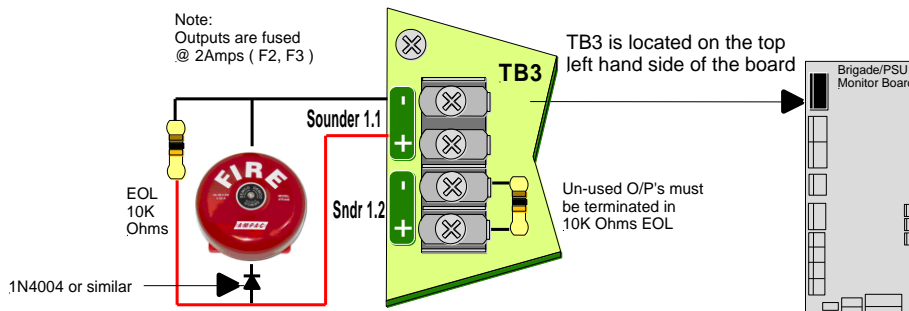


Figure 13 Connecting a Bell / Sounders TB3

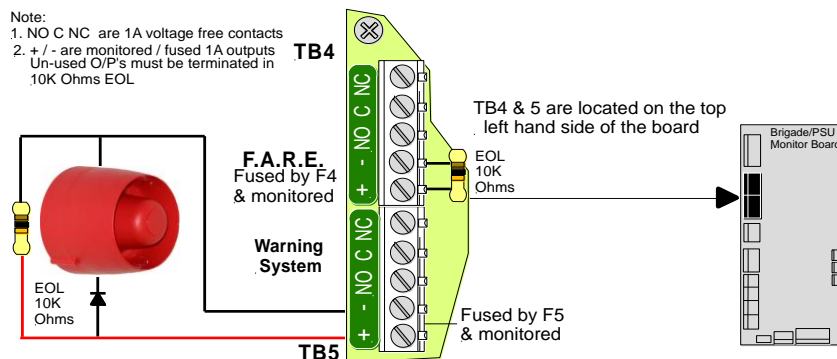


Figure 14: Connecting a Bell / Sounders TB5

4.9.4 Relay Output Connections (TB6 – TB10)

The relay contacts are connected as shown below.

Note 1: **+ -**
 = 1A Fused monitored output F6 must be terminated in EOL

Note 2:
 1A Un-monitored Voltage Free Conacts:
 NO: Normally Open
 NC: Normally Closed
 C: Common

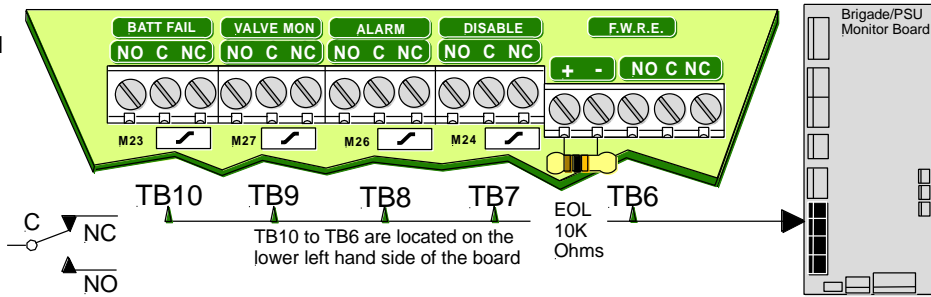


Figure 15: Relay & F.W.R.E. Outputs

4.10 Main Board

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 (not used)	CN12	LCD Graphic
CN2	Expansion Panel (not used)	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 (not used)
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		

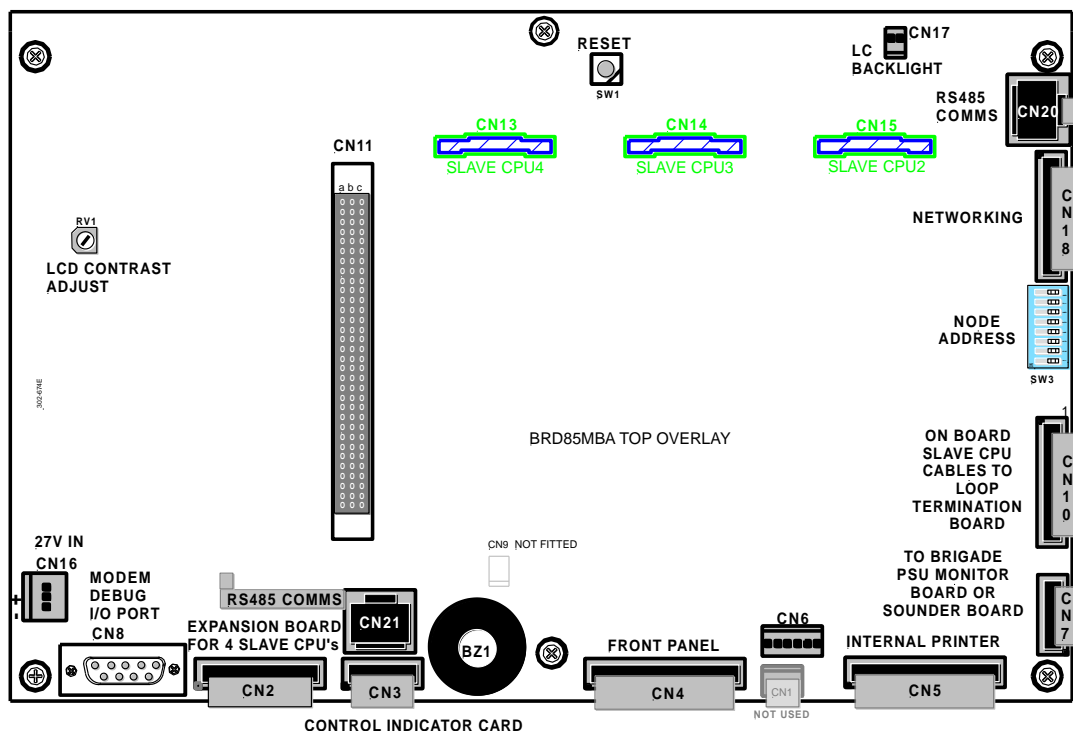


Figure 16: Main Board Layout with no Main CPU or Slave CPU's

4.11 Front Panel Board

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.

CONNECTIONS

CN1	To Main Board CN4
-----	-------------------

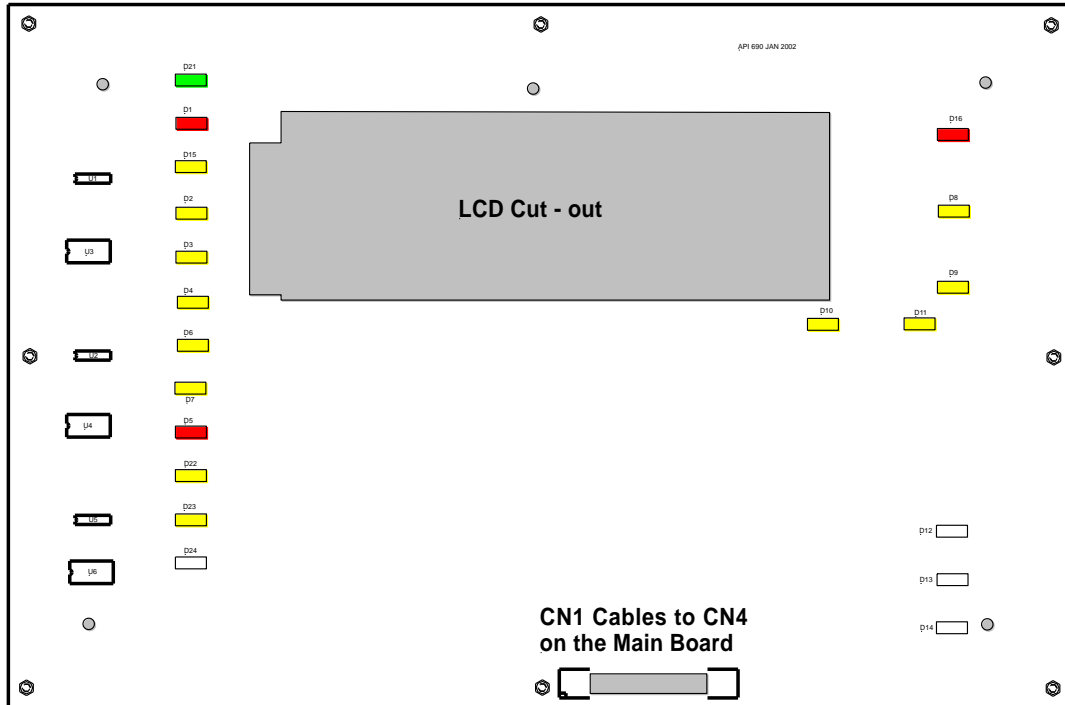


Figure 17: Front Panel Board

4.12 Main CPU

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

- The CPU is a 4-layer surface mount board
- The processor (IC1) is a Motorola MC68302, running at 16MHz.
- The external data bus is 16 bits wide.
- The board has 256 Kbytes (128K x 16) of EPROM (IC2, IC3).
- 4Mbytes (2M x 16) of FLASH (IC9).
- 1Mbytes (512K x 16) of static RAM (IC4, IC5).
- IC8 is a programmable logic device which implements control signal timing and decoding.
- External address, data and control lines are buffered by IC10, IC11, IC13, IC14 and IC15.
- IC7 is a watchdog control and will reset the processor if an error occurs in software execution.
- Two sockets (IC2 and IC3) are provided for 27C010 EPROMS.
- IC2 provides the even bytes. (D0 to D7) and IC3 the odd bytes (D8 to D15)

Connections

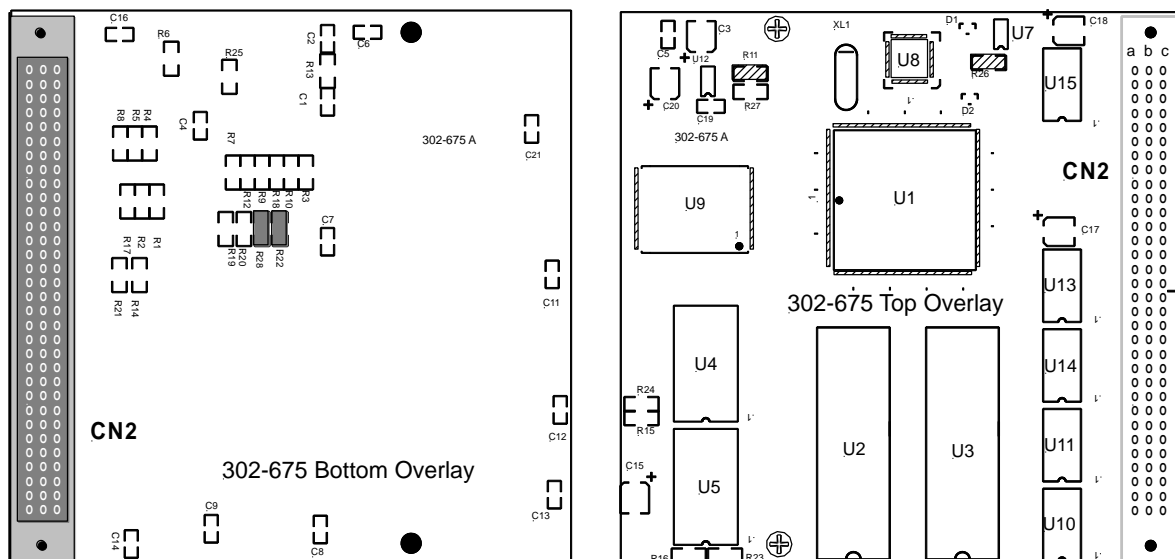
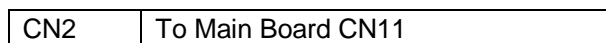


Figure 18: The Main CPU Board PCB Layout

4.13 Slave CPU

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.

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 Addressable Loop termination Board or Conventional Zone Board or 16/16 Input Output board
-----	--

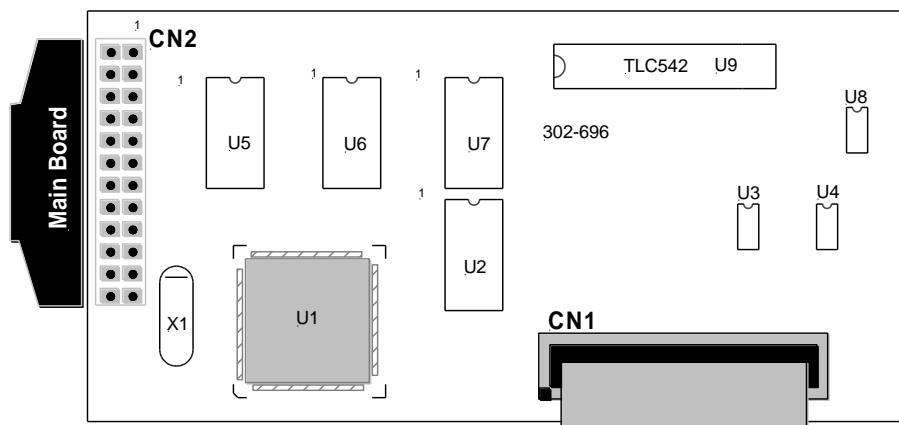


Figure 19: Slave CPU Board

4.14 Conventional Zone Board

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

Connections

CN1	To 27VDC
CN2	To Slave CPU
TB4 / 5	To Conventional Detectors

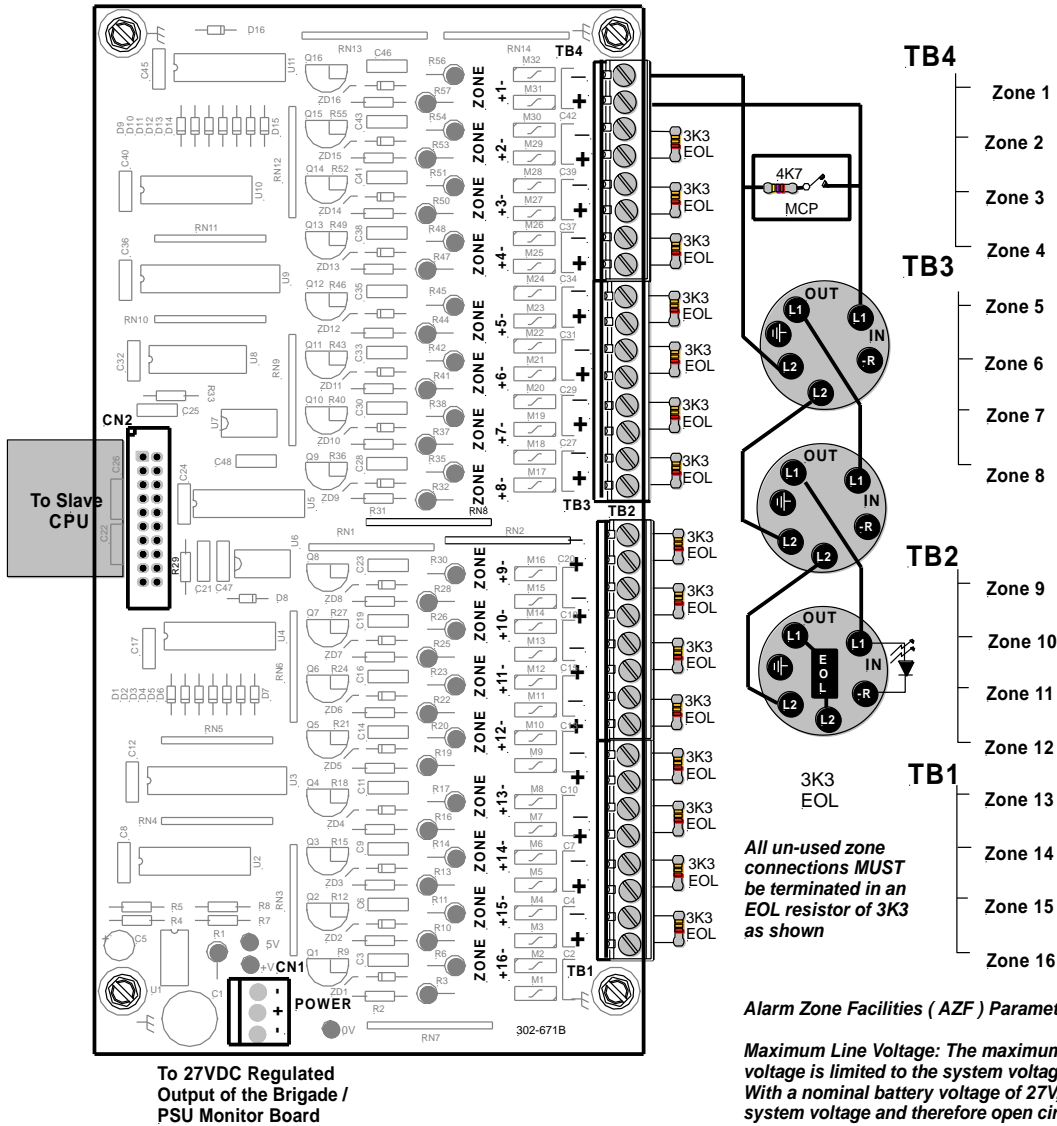


Figure 20: Conventional Board Layout

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.

Protection: Current limited

Maximum number of points per zone: 32

Cable Requirements: No special requirements, 2 Core 1.5mm² to 2.5mm², total resistance must be less than 50 ohms, maximum length 2000m, maximum core to core capacitance 0.5uF.

4.15 Addressable Loop Termination Board

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: AMPAC 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 AMPAC loop has been correctly installed and commissioned before connecting it to the FireFinder™.

Loop Parameters

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

Note: Short Circuit Isolation should be provided on the analogue loop in appropriate places so that a short circuit on the loop does not prevent more than 32 fire detectors from indicating an alarm.

CONNECTIONS

CN1 / 3	To Slave CPU
CN2 / 4	27VDC in / out
TB1 / 2	To Addressable loop devices

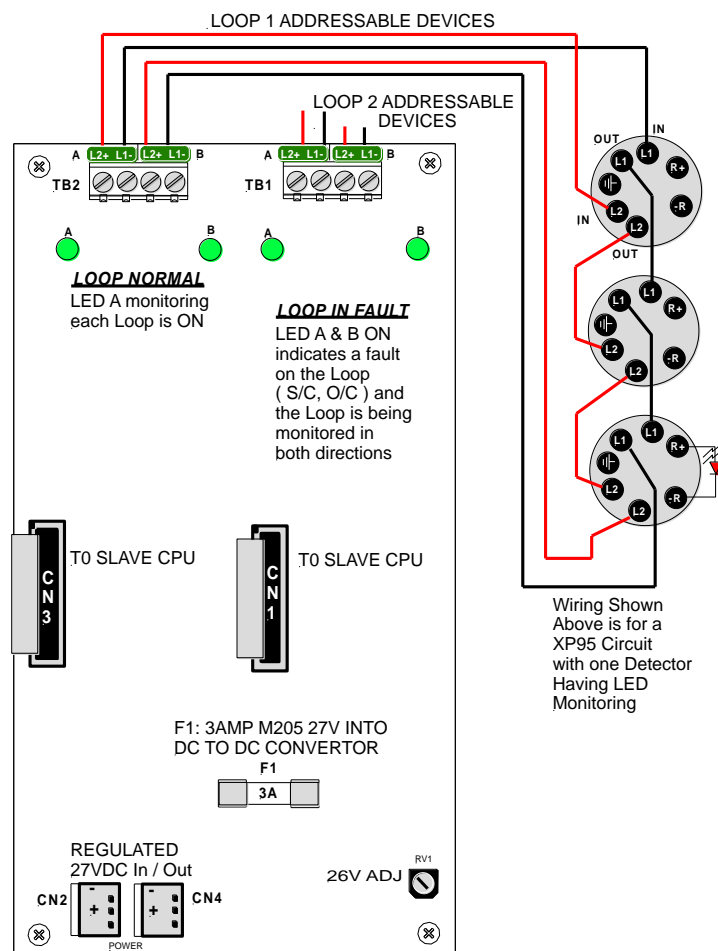


Figure 21: Addressable Loop Termination Board

5 Expanding the FACP with Compatible FireFinder Boards

5.1 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.



Note: 3: See *Product Data Sheets* for complete details.

5.2 Expansion Board

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. See Figure

Connections

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

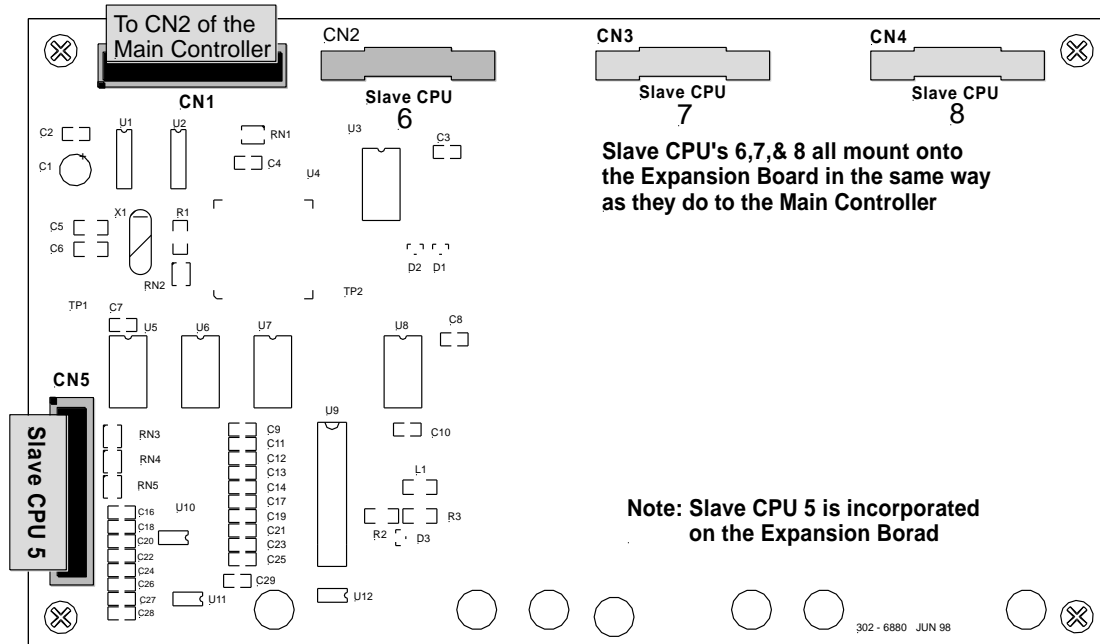


Figure 22: Board Overlay

5.3 Expansion Controller

An Expansion Controller 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 Board to the Communications Extender Board allows for the addition of HLI, EV3000, Remote Serial Printer or **SmartGraphics** facilities.

5.4 16/16 Input / Output Board

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.

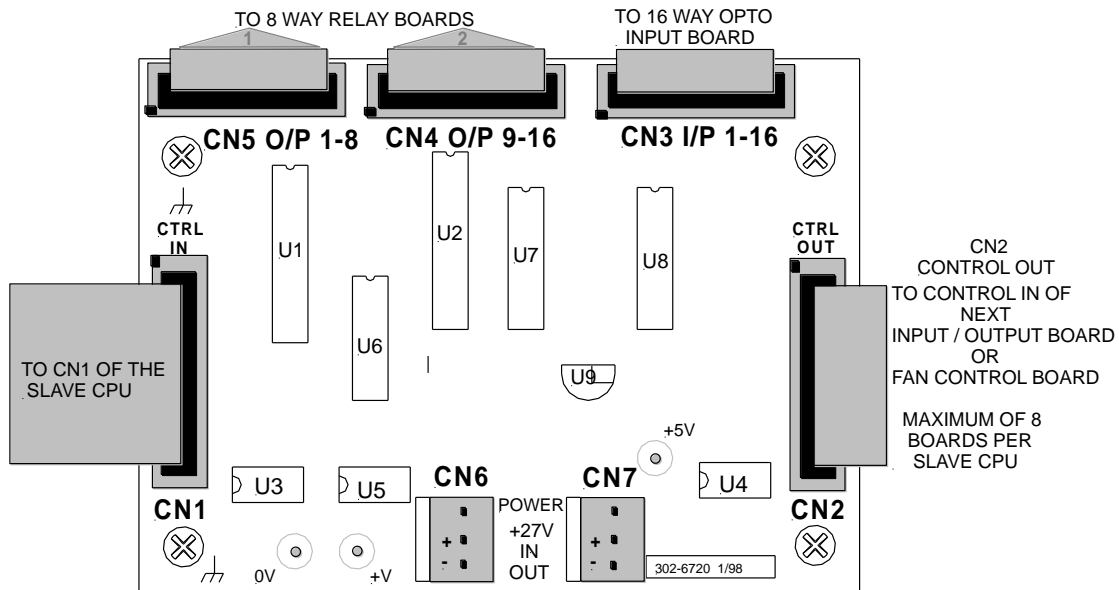


Figure 23: 16 / 16 Input / Output Board

5.5 8 Way Relay Board

Relay Outputs: Each 8 Way Relay Board is fitted with either eight 1A, RL1 to 8, or 5A, RL9 to 16, 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.

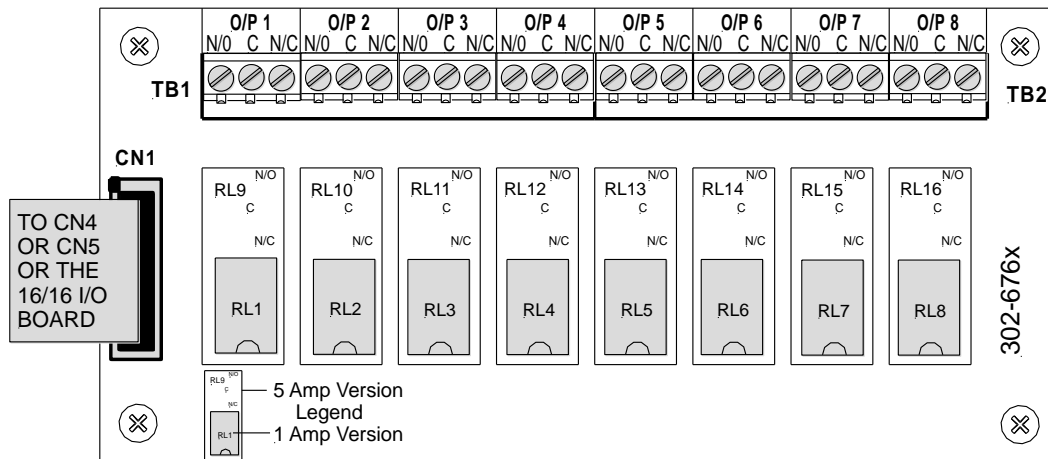


Figure 24: 8 Way Relay Board with 1A Relays Fitted

5.6 16 Way Input Board

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.

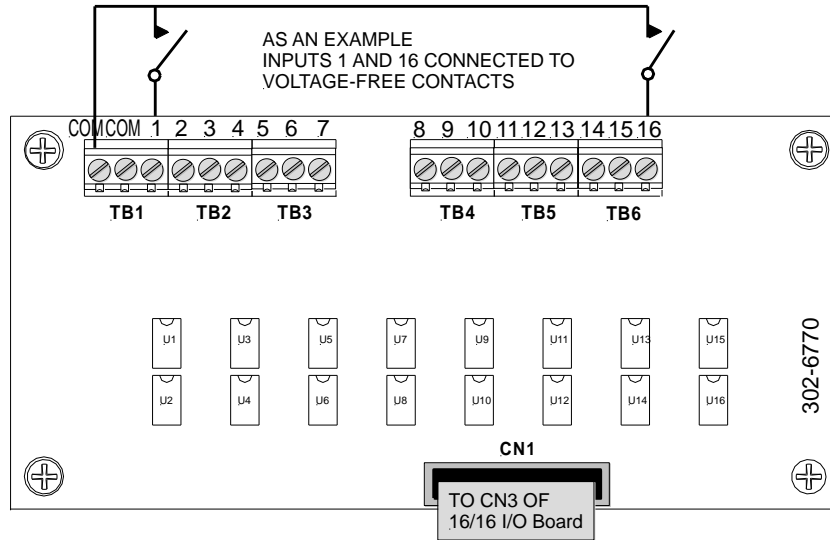


Figure 25: 16 Way Input Board

5.7 Serial Relay Board

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.

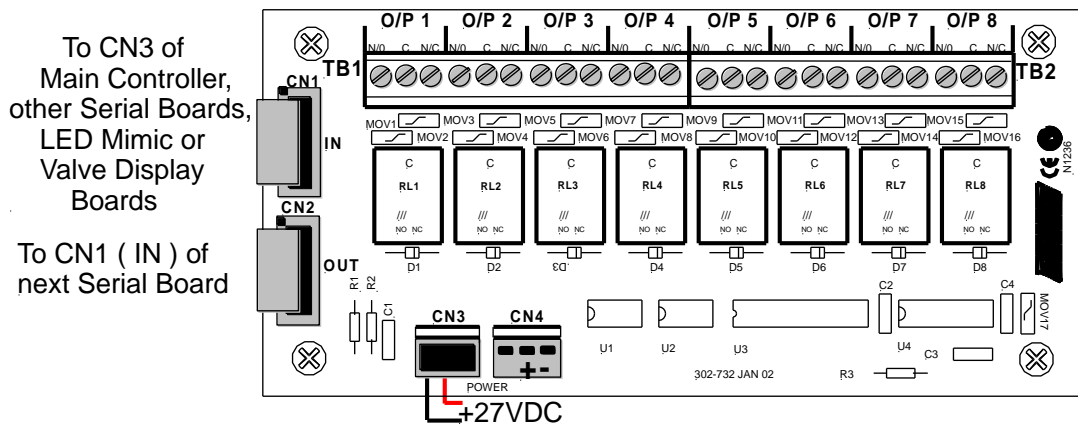


Figure 26: Serial Relay Board

5.8 External Control Interface Board

The External Control Interface Board provides interfacing for 8 external 0V control inputs that are configured as outlined in the table below.

The FACP is programmed to recognise the individual inputs as listed and initiates the appropriate response.

0V control is configured for a normally open contact for each input with the facility to monitor whether or not the controls are enabled.

Link1 (LK1) is fitted when the control “Enable” switch is not fitted to the FACP

Configuration Cabling:

Input	TB	Purpose	Input	TB	Purpose
-	1/1	0Volts	-	2/1	0Volts
1	1/2	ALERT	5	2/2	EXTERNAL FAULT
2	1/3	EVACUATE	6	2/3	SILENCE BUZZER
3	1/4	SILENCE ALARMS	7	2/4	CLASS CHANGE
4	1/5	SYSTEM RESET	8	2/5	CONTROLS ENABLED

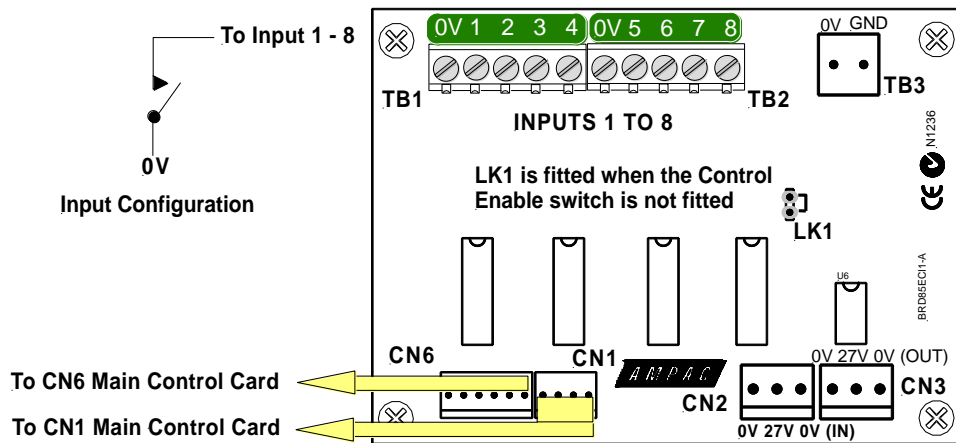


Figure 27: External Control Interface Board Layout and Cabling

5.9 Zone & General Indicator Card

The General Indicator Card 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.

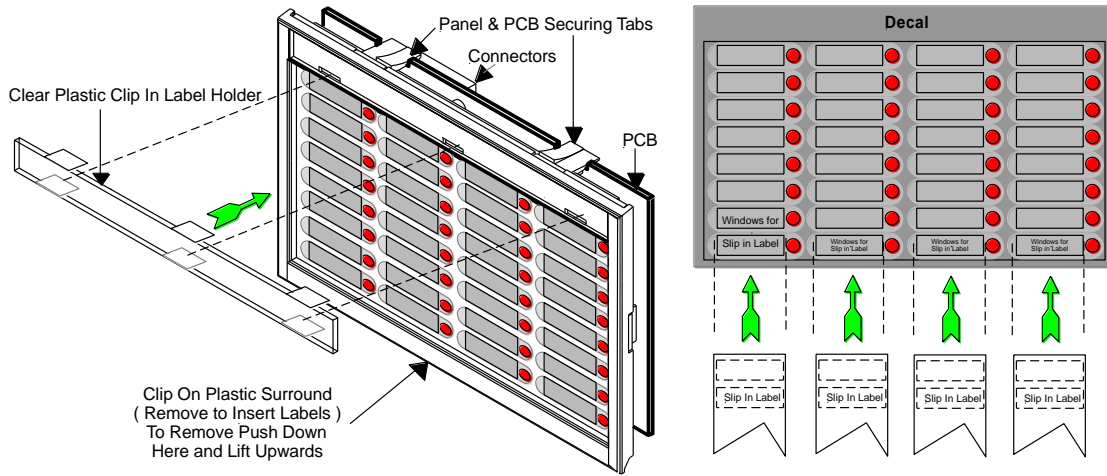


Figure 28: 32 Zone Alarm General Indicator Card

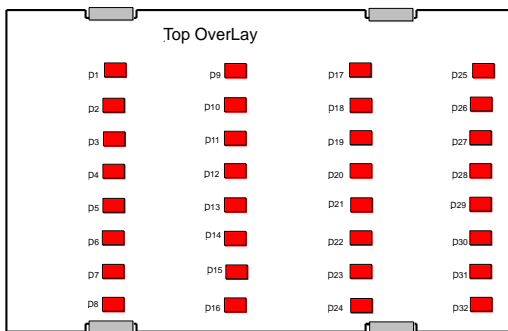


Figure 29: Bottom Overlay

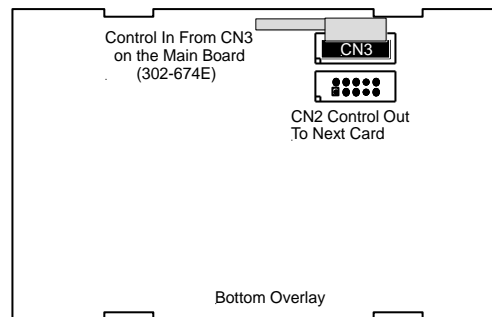


Figure 30: Top Overlay

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.

5.10 8 Way Sounder / Bell Monitor Board

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

The 8 way Sounder Monitor Board is built in two versions:

1. Build 1: All outputs are monitored and provide 1 Amp per circuit.
2. Build 2: The first 4 circuits are Voltage free contacts, the second 4 are as per Build 1.

Wiring to the Monitored sounder outputs is as per the Brigade Board.

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

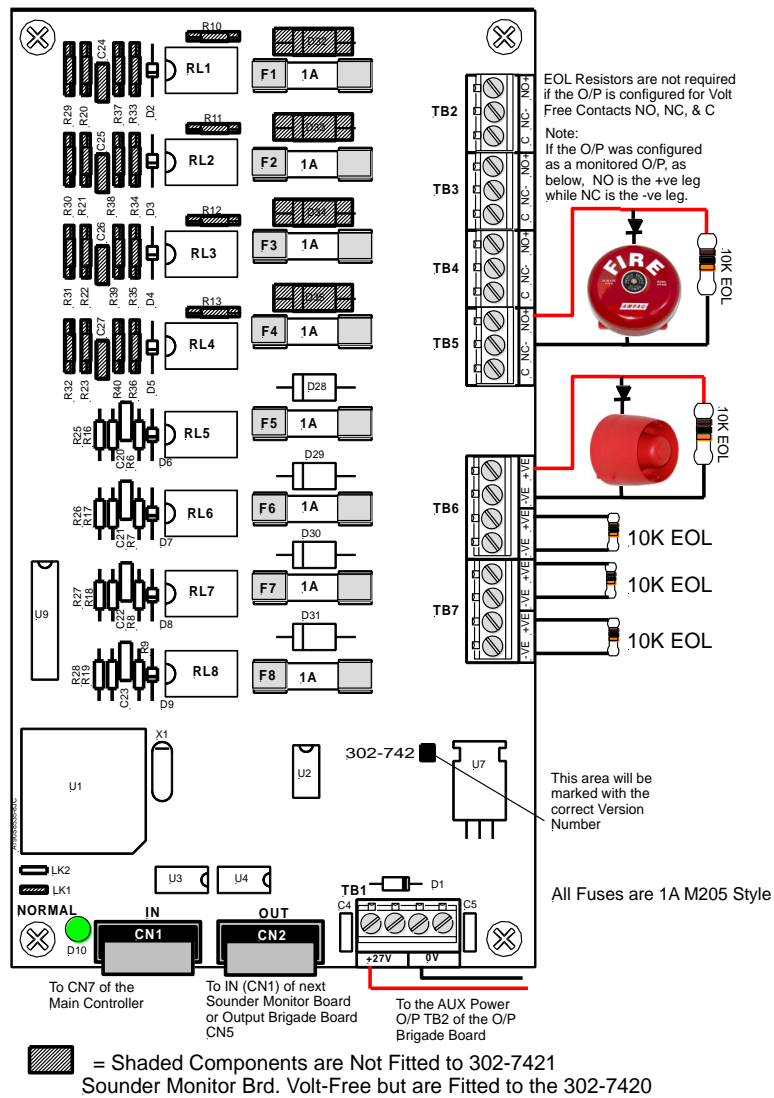


Figure 31: Sounder / Bell Controller Board

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

5.11 LED Mimic Board

The LED Mimic Board has been designed to communicate with the Main Panel using RS485 protocol so as it can remotely mimic that panel's LED's and switches. The Mimic therefore can display the status of 32 Zones, 5 specific common outputs (Alarm, Pre-alarm, DBA, Fault, Normal) and can be configured to have 5 input switches (Mimic Reset, Lamp Test, Buzzer Mute, Bell Disable, Evacuate), 1 remote Buzzer output as well as 1 software configurable 1A relay output and 1 voltage free driven input. On board switches are,

- SW1: turns off the LED's
- SW2 1-5: sets the board address
- SW2 6: configures for FireFinder
- SW2 7: sets the LED's to flash or be steady
- SW3: resets the CPU
- SW4: resets the LED's
- SW5: tests the LED's
- SW6: mute the Buzzer

The Remote LED Mimic board connects to the external RS485 Communication bus via the Controller Interface Card (C.I.C). Up to 31 of these boards may be connected together. The comms is NOT a redundant bus.

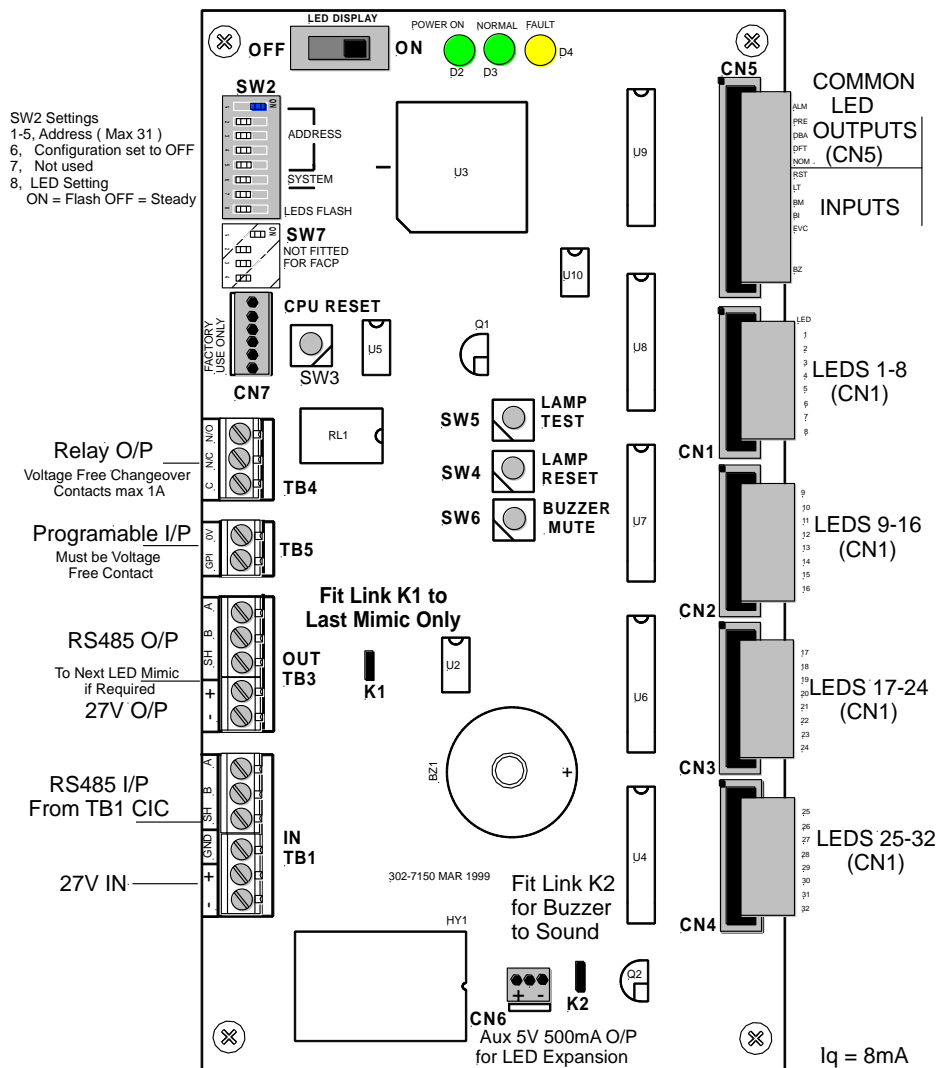
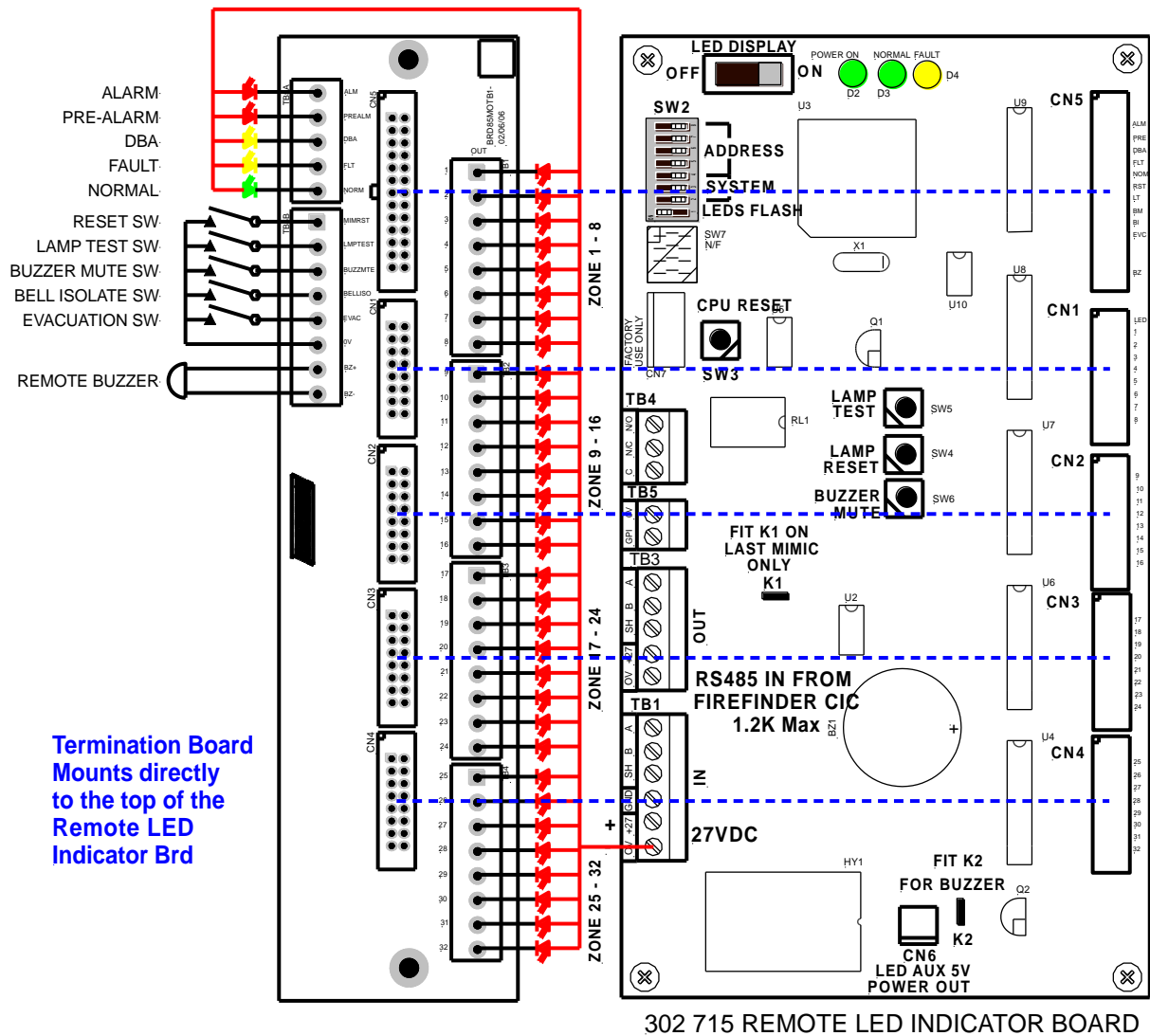


Figure 32: Remote LED Mimic Board



Termination Board Mounts directly to the top of the Remote LED Indicator Brd

302 715 REMOTE LED INDICATOR BOARD

Figure 33: Mimic Output Termination Board Connections

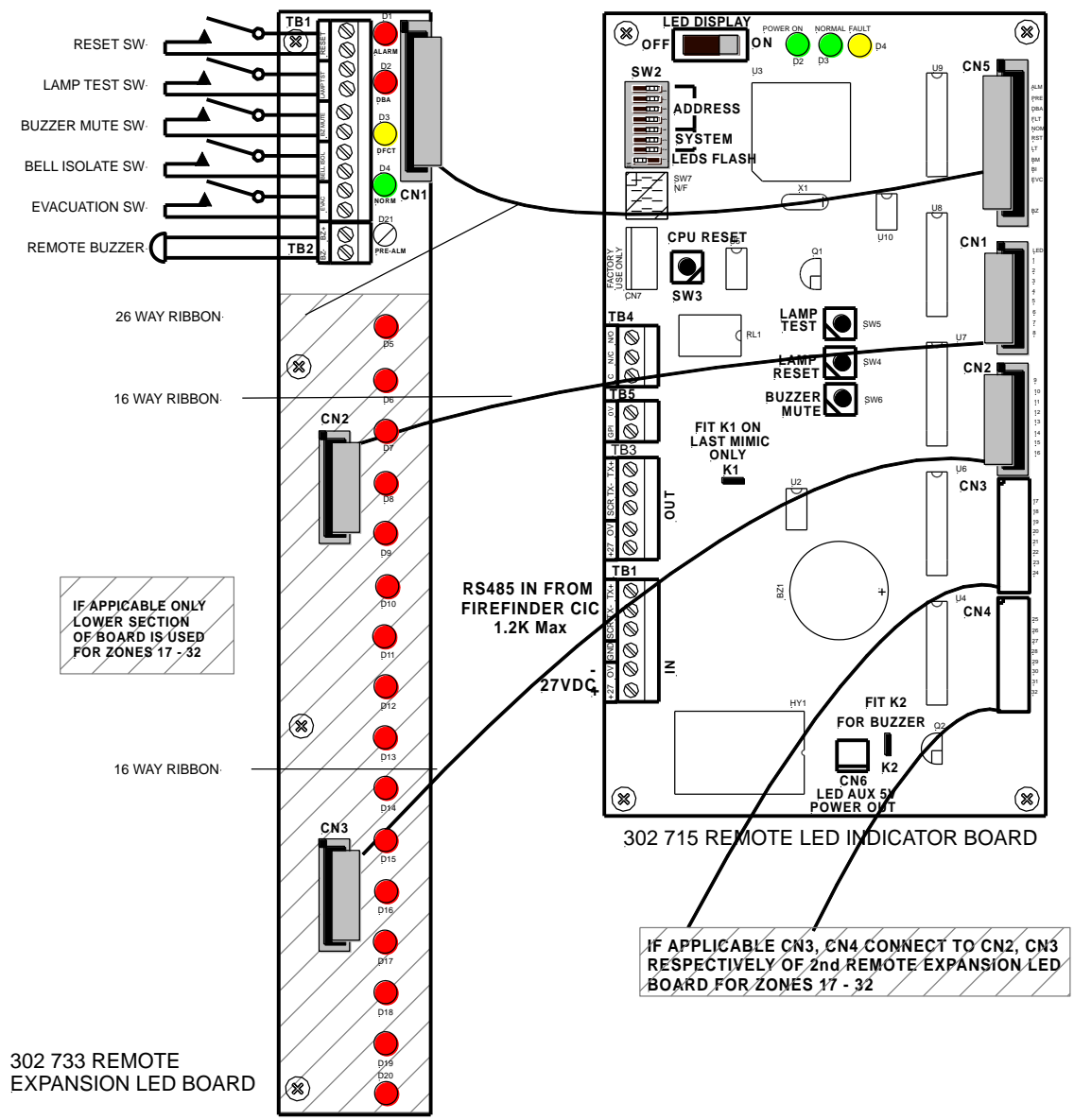


Figure 34: LED Expansion Board Layout and Wiring to the Indicator Board

5.12 High Level Interface Expander

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.

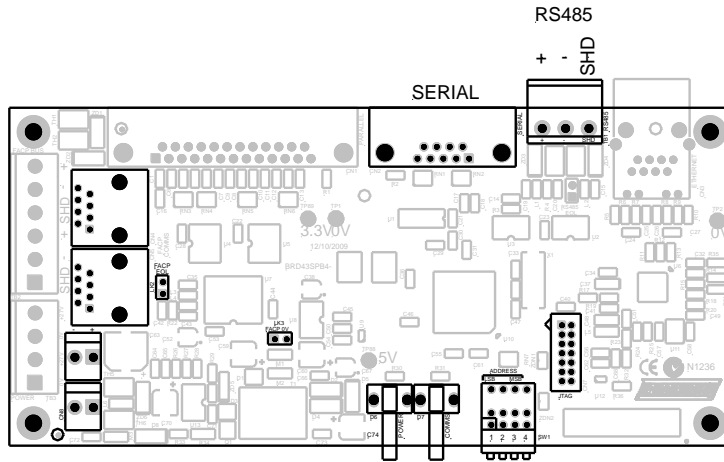


Figure 35: High Level Interface Expander PCB Layout

Note: See Section 17 for Addressing Details (SW1)

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

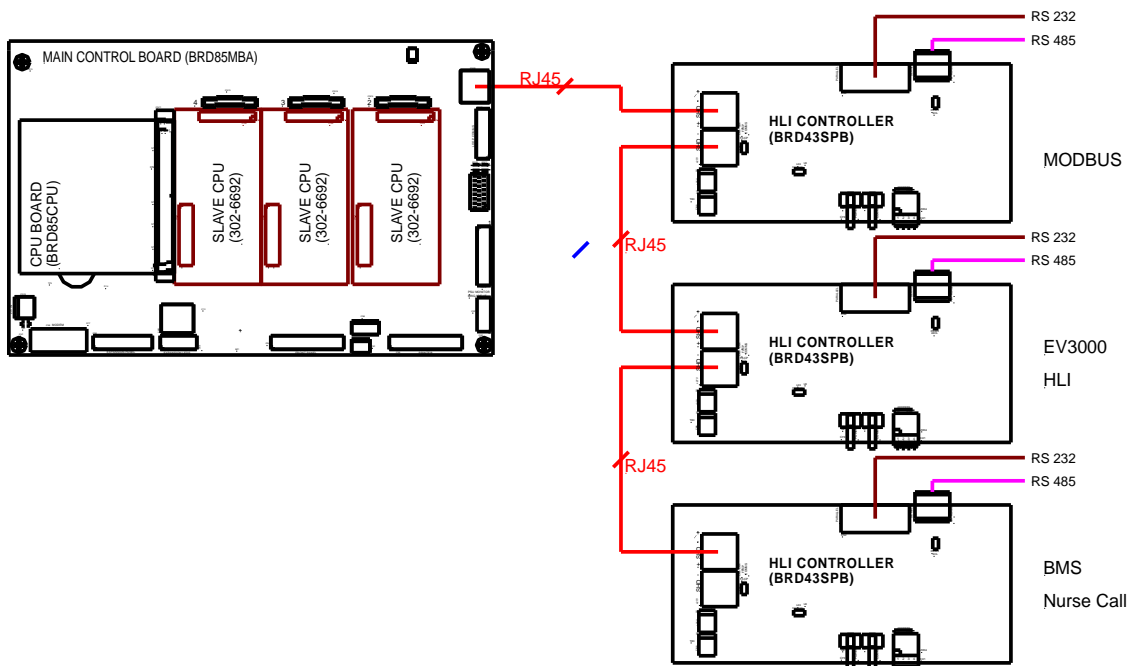


Figure 36: Example of High Level Interfaces

5.13 Communications Extender Board

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.

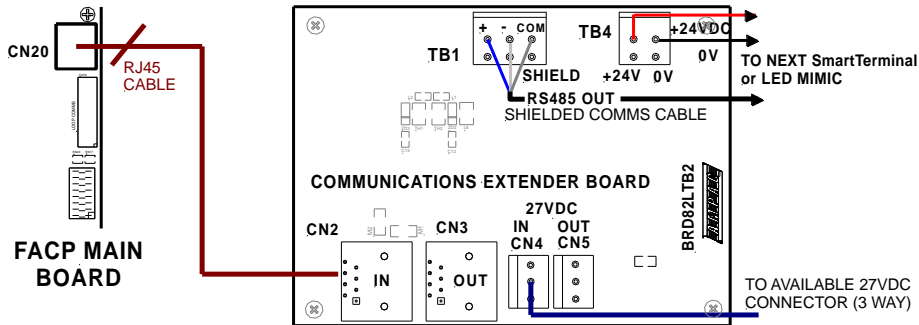


Figure 37: Communications Extender Board PCB Layout

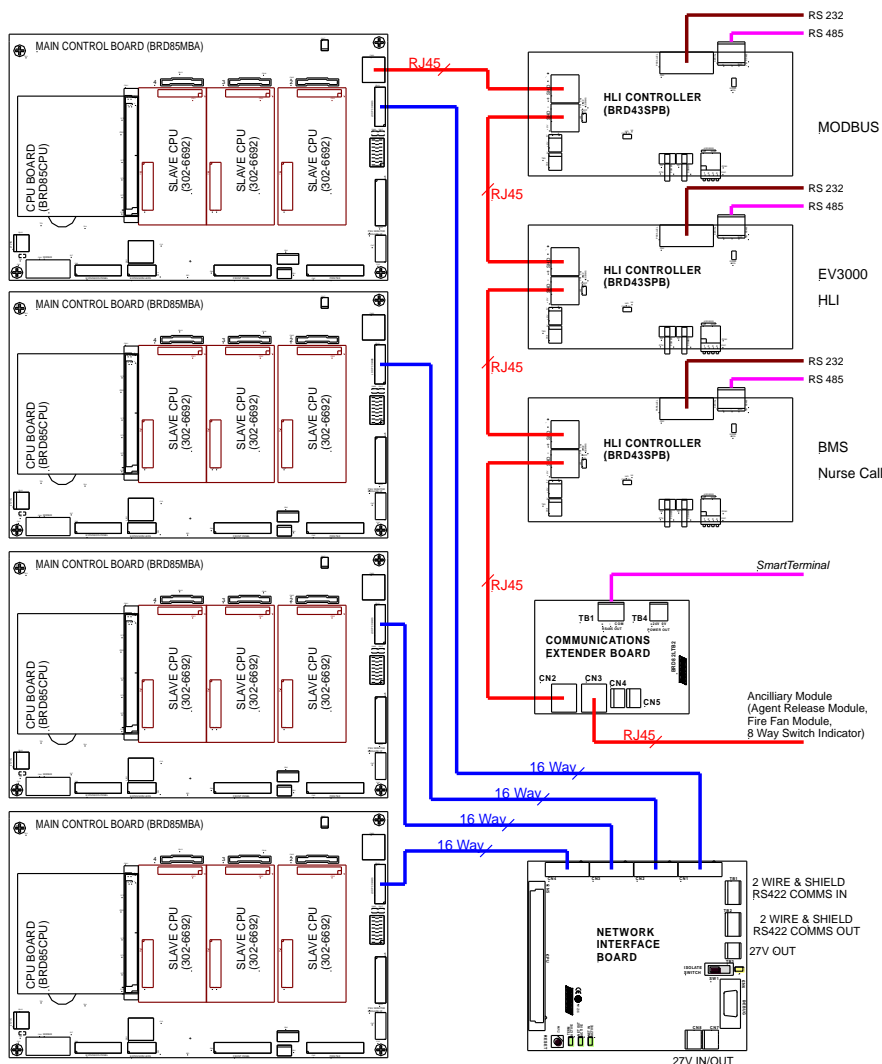


Figure 38: Example of Networking Configurations

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.

5.14 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 has been 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 disable / re-enable 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.

5.14.1 Overview

SmartTerminal consists of two PCBs;

1. SmartTerminal Termination Board. A Termination Board is mounted in each SmartTerminal to protect and interface the RS485 communications and 27VDC supply to the LCD Board
2. BRD82ZICC – Control, LCD Communications and LCD Driver Board

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

5.14.2 Mechanical

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.

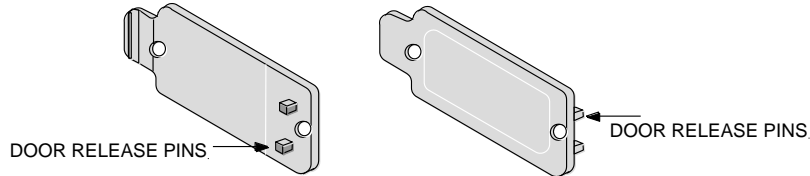


Figure 39: ABS Door Key and Front Panel Add On Card Surround Release Clip

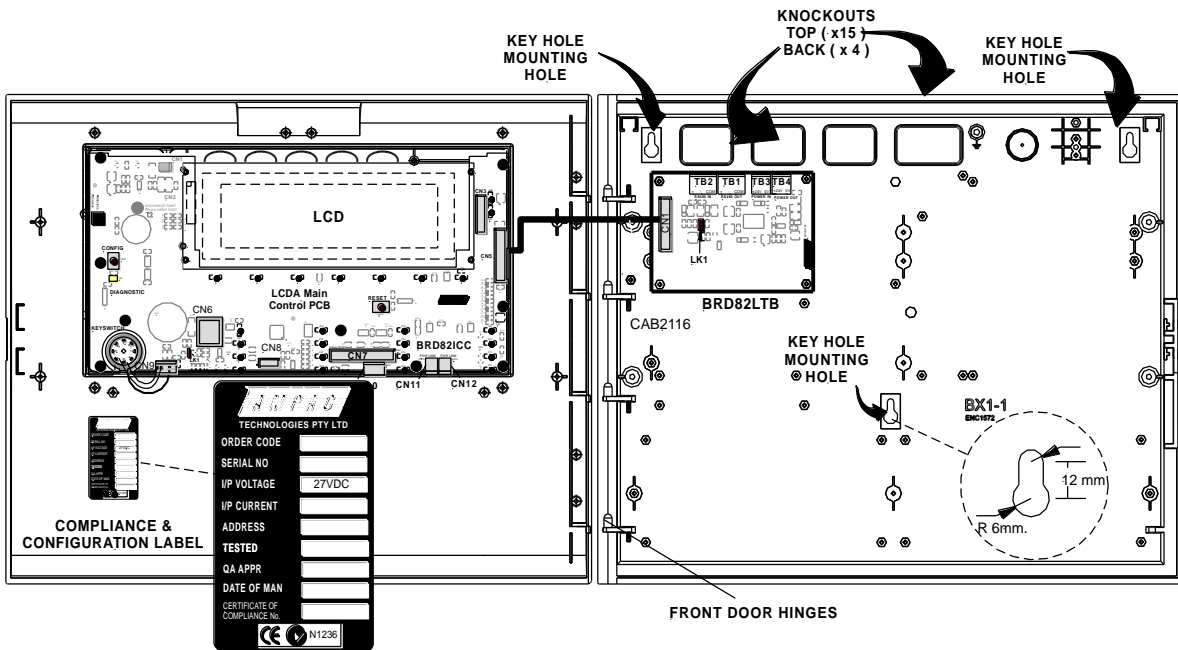


Figure 40: Typical Layout (Externally Powered) and Location of Keyholes

5.14.3 Installation & Cabling

The Communications Extender Board 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.

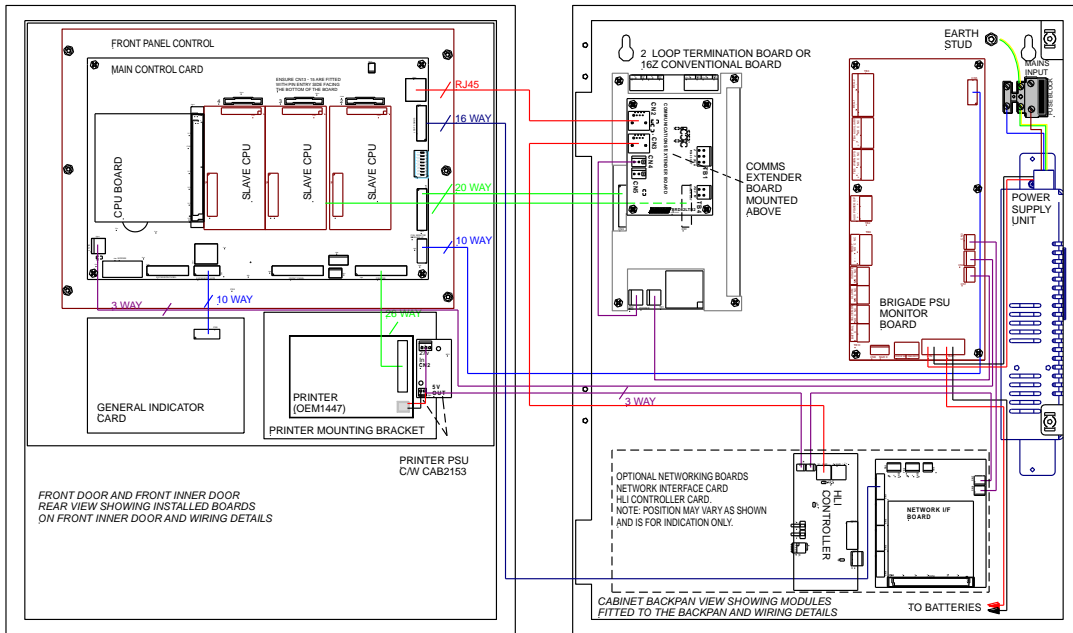


Figure 41: FACP Internal Layout

SmartTerminal is then connected to the FACP as shown below.

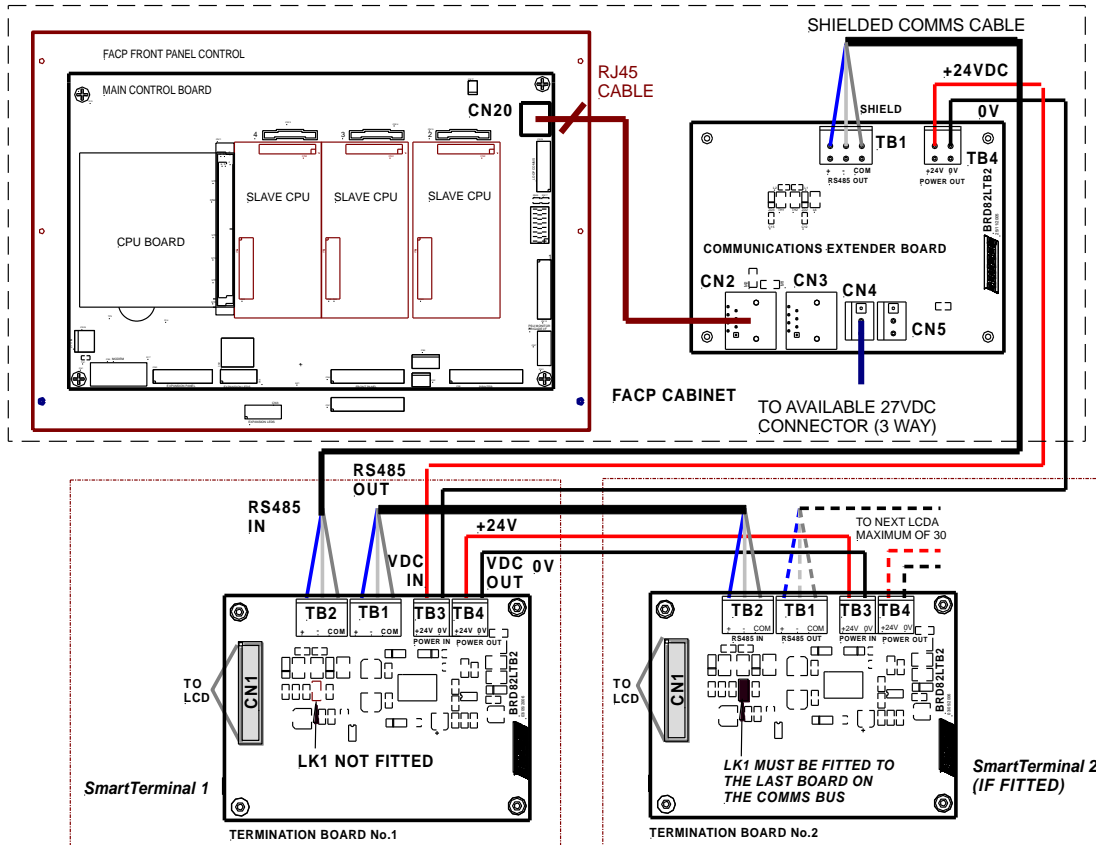



Figure 42: Connecting SmartTerminal's to the FACP

5.14.4 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 **SmartTerminal** 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.*

5.14.5 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 (see *Figure 5*) and check the address is correct.

Normal

The Normal state is entered from the "Power-up" or a return from the "Fault" state and is displayed on the LCD if the **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)

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.

Access levels

There are two levels of access.

Access level 1 only the silence buzzer, previous, next and override front panel controls are operative. All other controls operate in access level 2.

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



Figure 43: Keyswitch in the Disabled Position



Figure 44: Keyswitch in the Enabled position

5.14.6 SmartTerminal Controls and Indicators

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

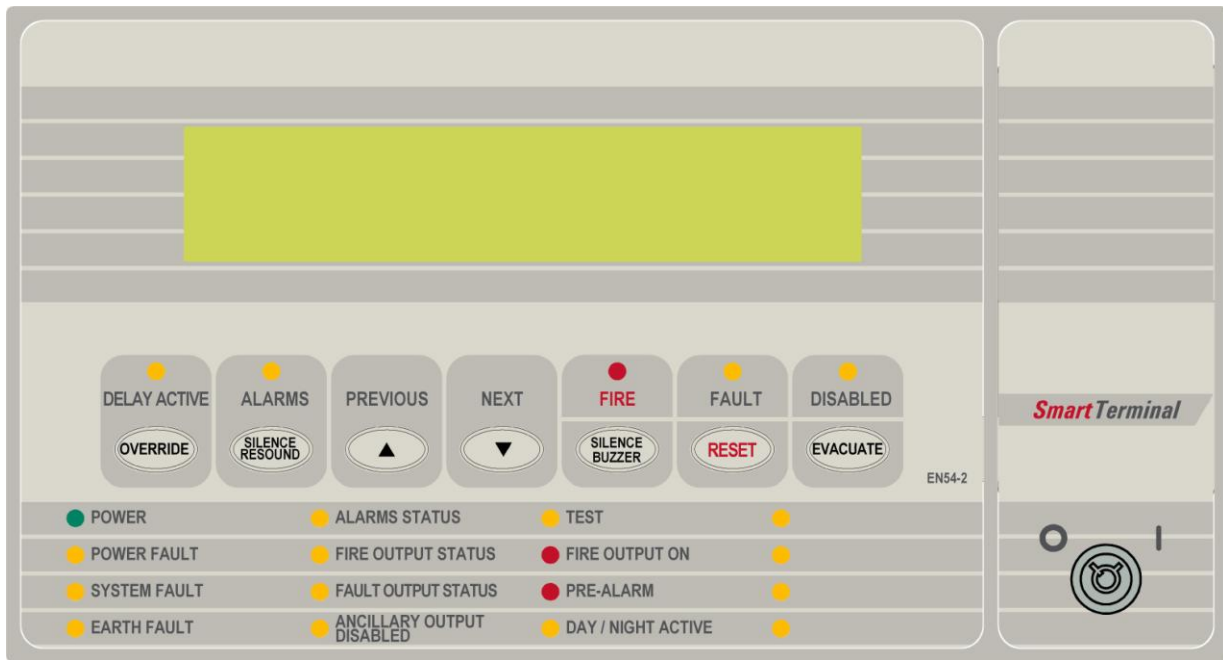


Figure 45: SmartTerminal Front Panel Layout

5.14.7 SMARTTERMINAL Screen Format

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

1. Fire
2. Faults
3. Disables.

The types of events are only associated with loop devices 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 the **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.

FIRE: If configured the screen format for reporting fire condition is:

```

<point location>   FIRE
<point descriptor> <type>
<date> <time>     CONTROL*
FIRE XXX OF XXX   ZONE
    
```

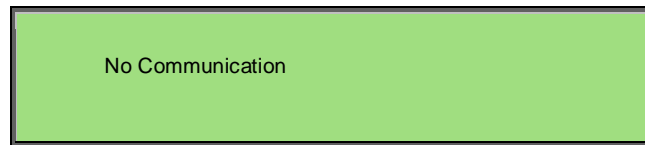
Fault: If configured the screen format for reporting fault condition is:

```

<point location>   FAULT
<point descriptor> <type>
<date> <time>     CONTROL*
FIRE XXX OF XXX   ZONE
    
```

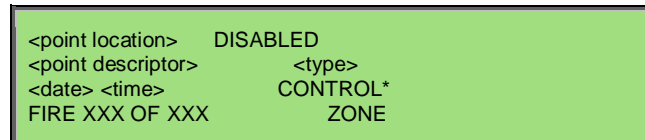
Note: The fault types only relate to devices.

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



No Communication

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



```
<point location>   DISABLED
<point descriptor> <type>
<date> <time>     CONTROL*
FIRE XXX OF XXX   ZONE
```

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



```
<DATE> <TIME>

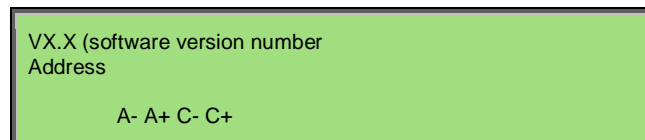
<SYSTEM STATUS>
```

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

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

1. "SYSTEM EVACUATE"
2. "SYSTEM FIRE"
3. "TRIAL EVACUATION"
4. "SYSTEM DBA"
5. "SGD INTERLOCK"
6. "SOUNDERS INOPERATIVE"
7. "SYSTEM GENERAL FAULT"
8. "SYSTEM PRE-ALARM"
9. "SYSTEM EMERGENCY"
10. "SYSTEM SECURITY"
11. "SYSTEM USER"
12. "SYSTEM DISABLE"
13. "PARTIAL DISABLE"
14. "SYSTEM NORMAL"

Config: The Config screen displays the following



```
VX.X (software version number
Address

A- A+ C- C+
```

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"

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

The function keys perform the following;

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

5.14.8 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.

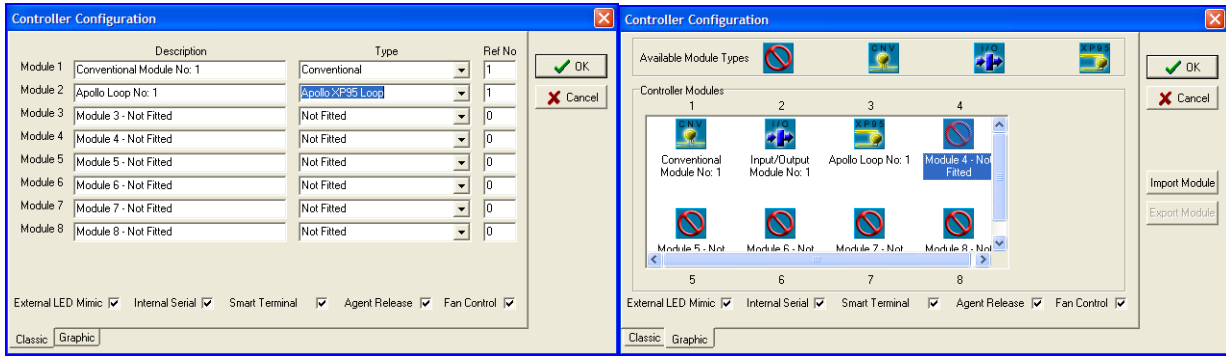


Figure 46: The Controller Edit / Add Module Types Screens

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.

5.14.9 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.

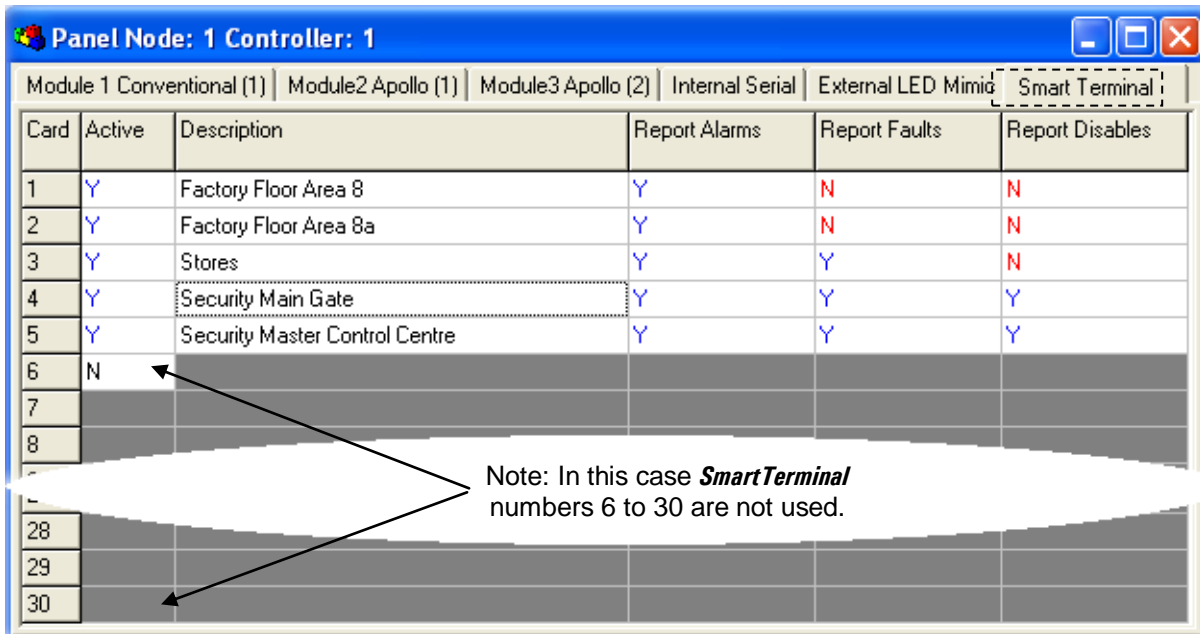


Figure 47: Example of **SmartTerminal** Configuration Settings Screen

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

5.14.10 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.

5.14.11 Specifications

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

5.15 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

5.15.1 Indicators and Buttons

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

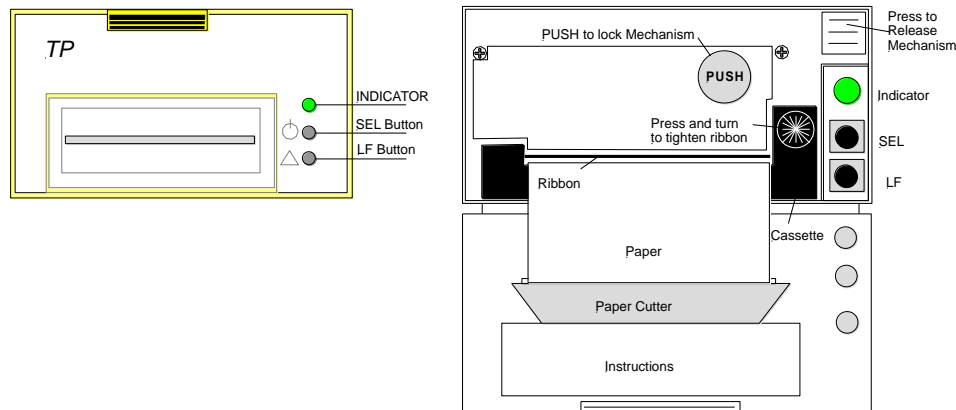


Figure 48: Printer Front Panel Layout (Front Cover Closed / Open)

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.

5.15.2 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, which 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.

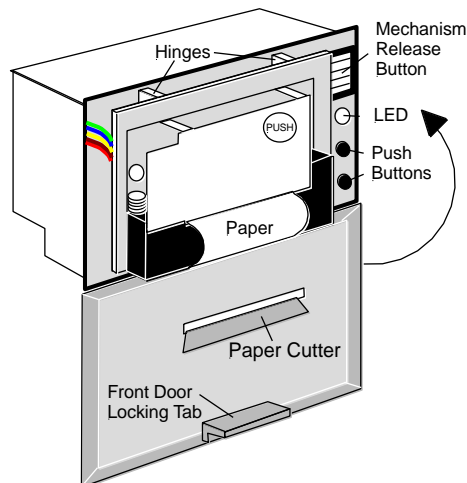


Figure 49: Paper Access

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.

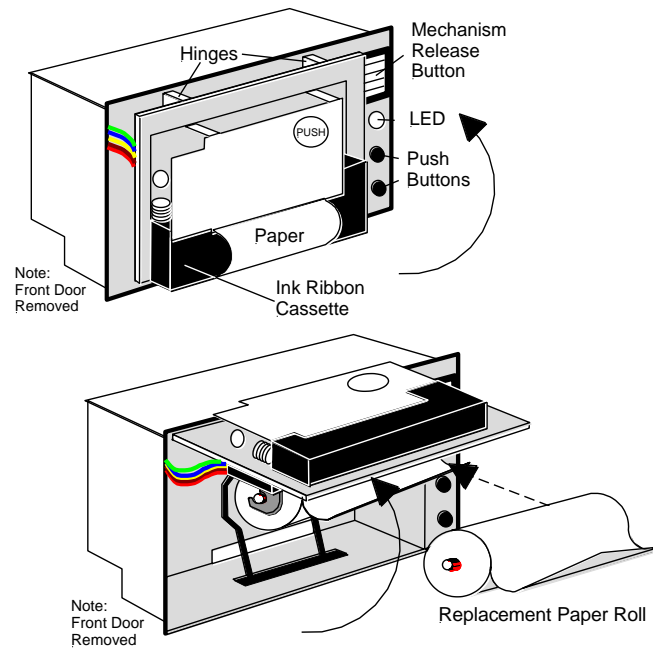


Figure 50: Head Mechanism Rotation and Paper Roll Removal / Insertion

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.

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.

5.15.3 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.

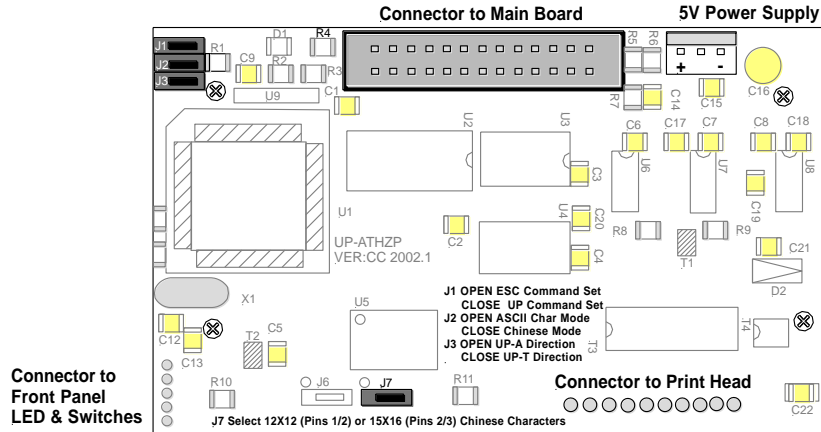


Figure 51: PCB Layout

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

5.15.4 Printer 5 Volt Power Supply

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

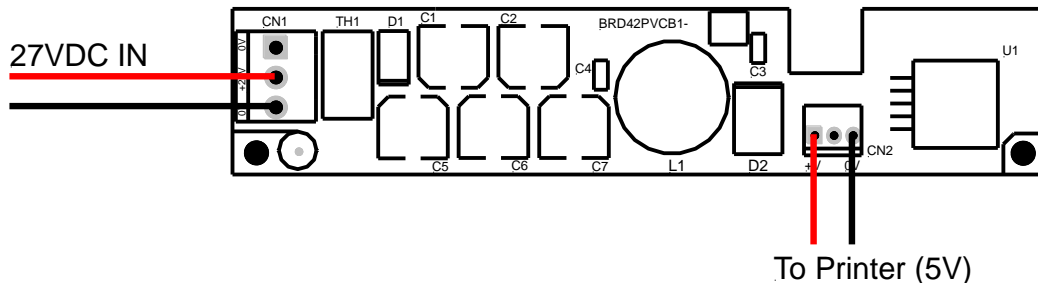


Figure 52: Printer Power Supply Board Layout

6 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.

6.1 Communications: Network Interface Card

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 with NIC software to control the in out flow of communications.

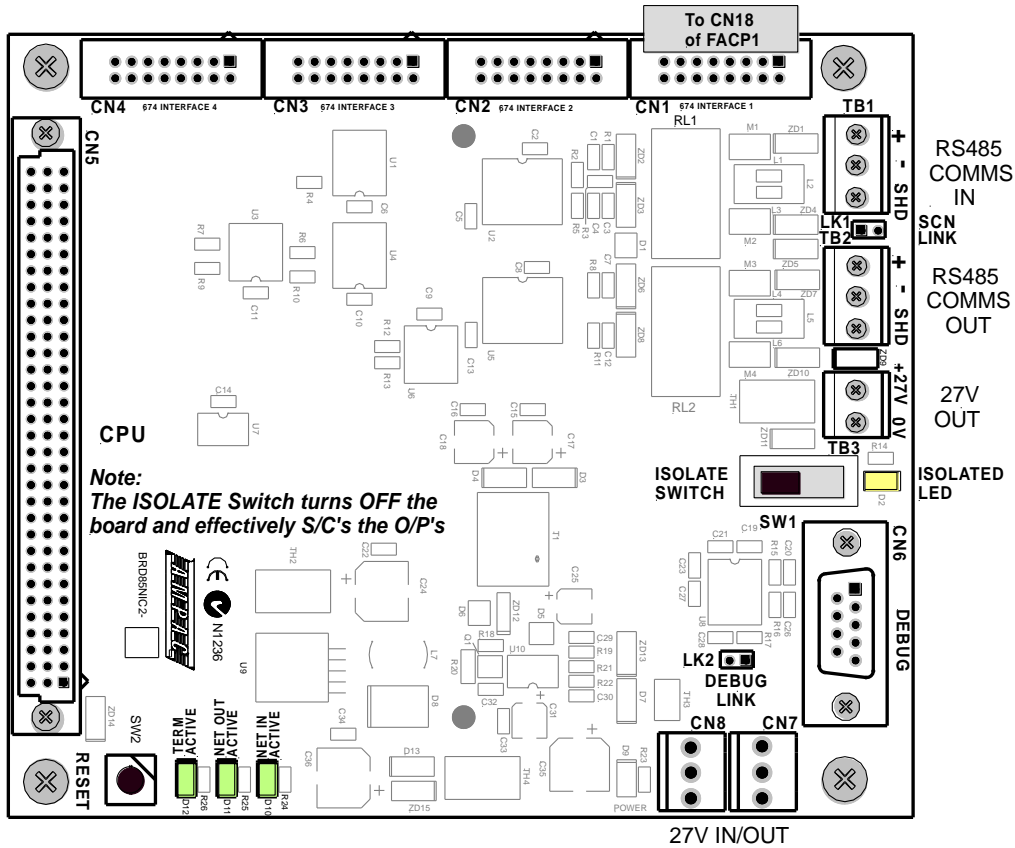


Figure 53: Network Interface Board Layout

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.

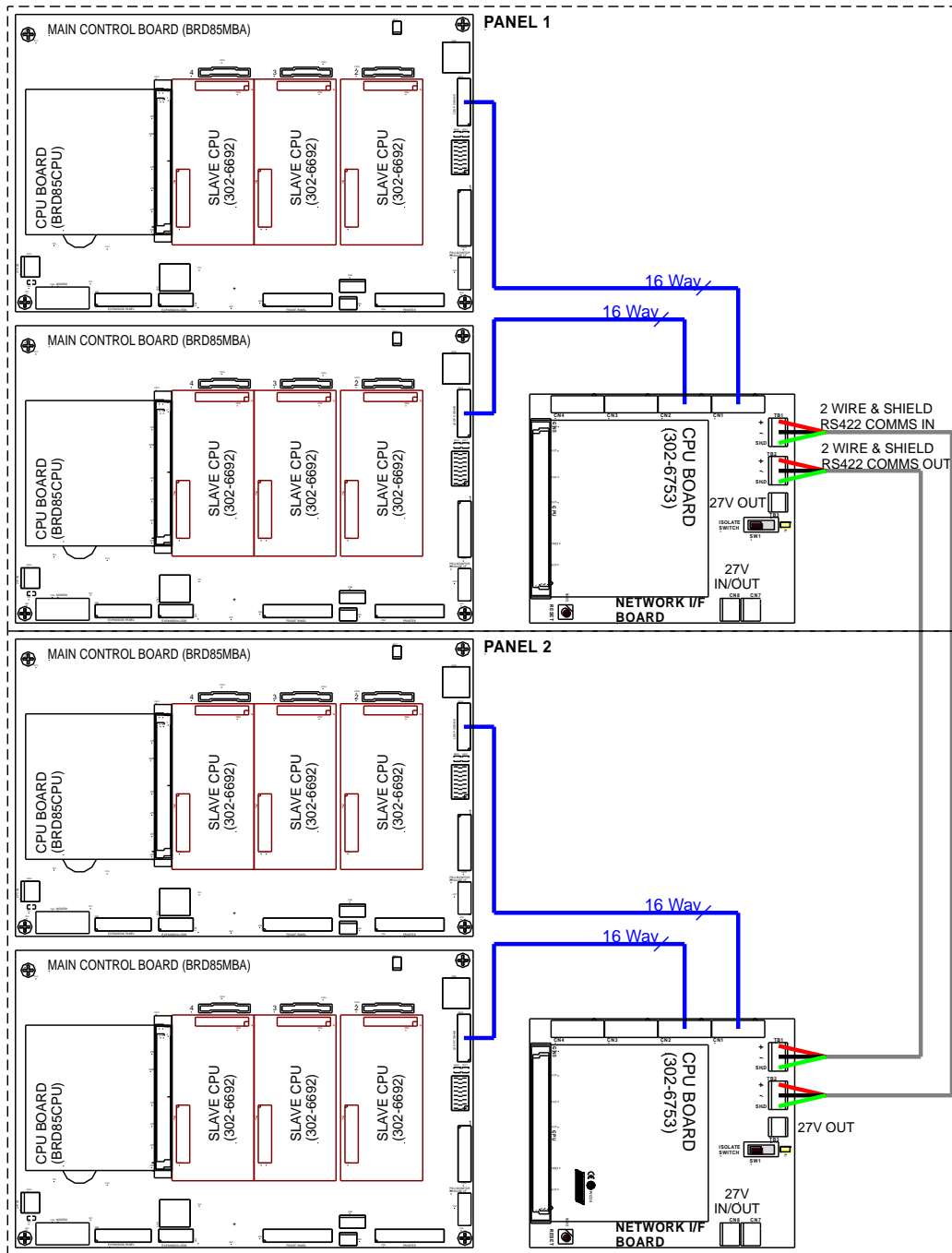


Figure 54: General Wiring of Two FACP's on a network

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.

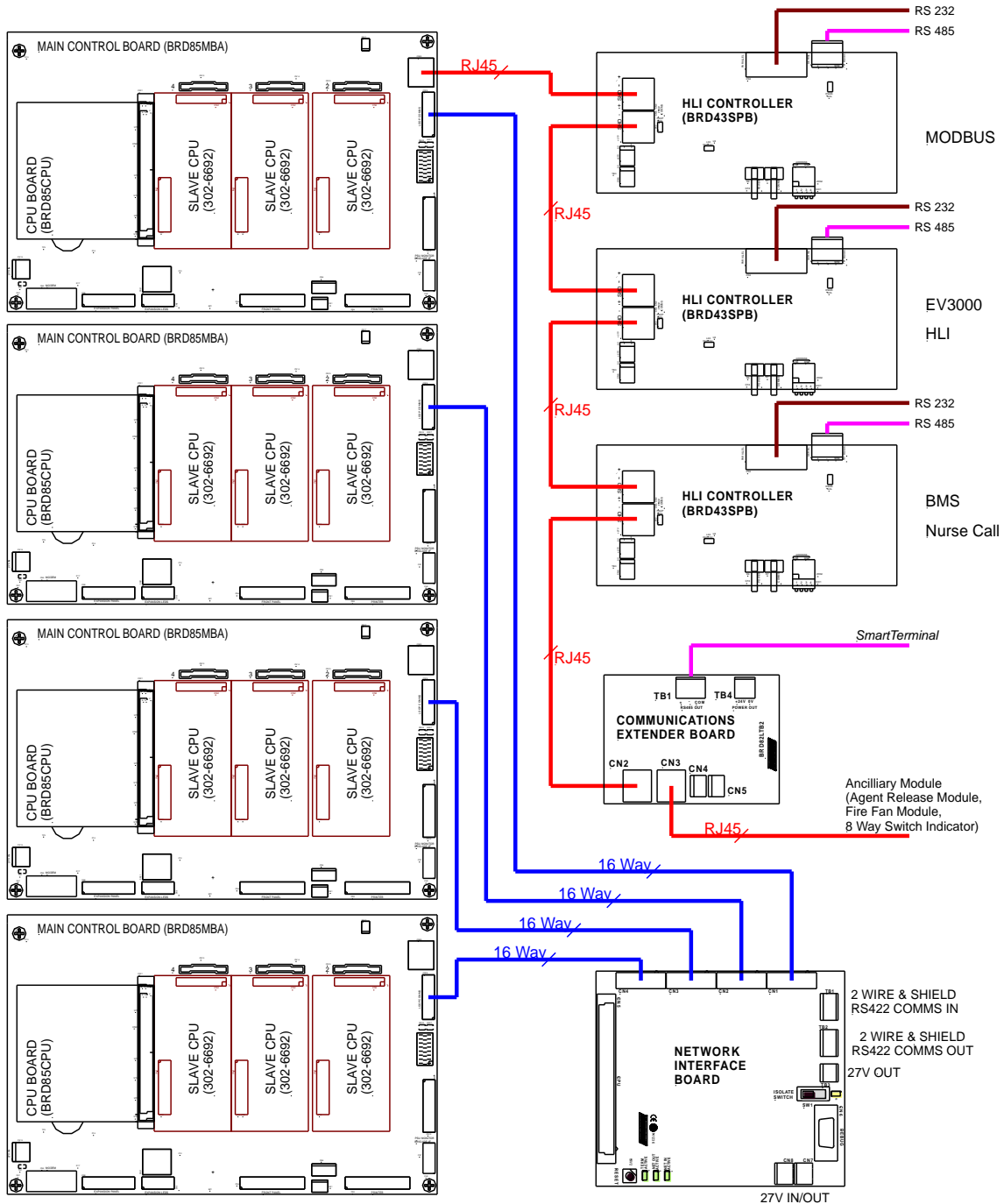


Figure 55: Example of Networking Configurations

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.

6.2 Conventional Network Board

The Conventional Network Board provides a simple wired OR interface between **FireFinder** systems and existing Singapore Fire Systems such as the Patent 88, allowing reuse of existing cabling

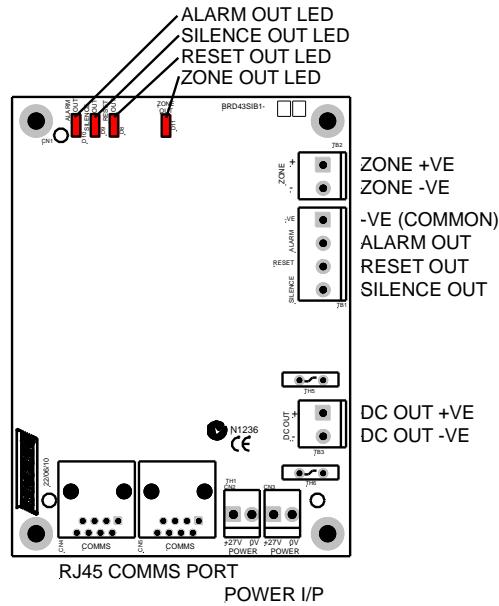


Figure 56: Conventional Network Board

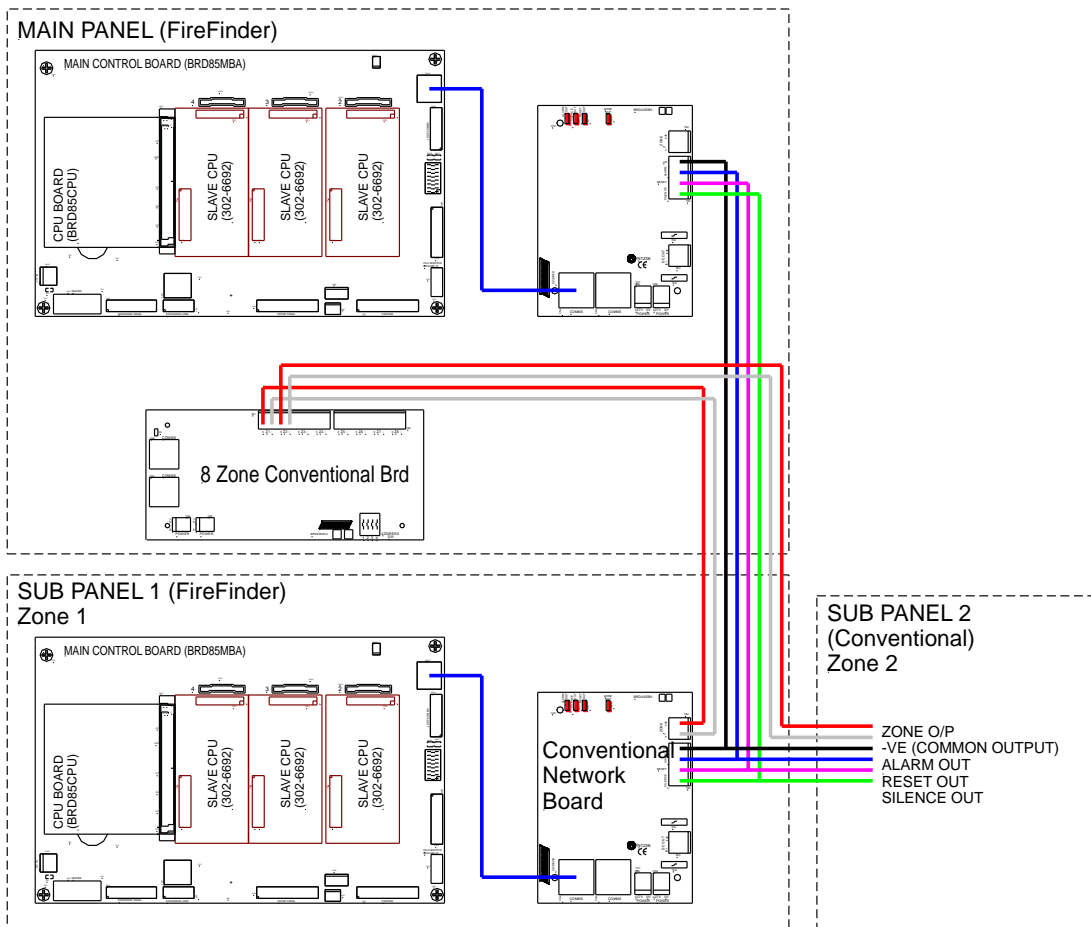


Figure 57: General Wiring Singapore Interface Board

7 FireFinder Control Panel

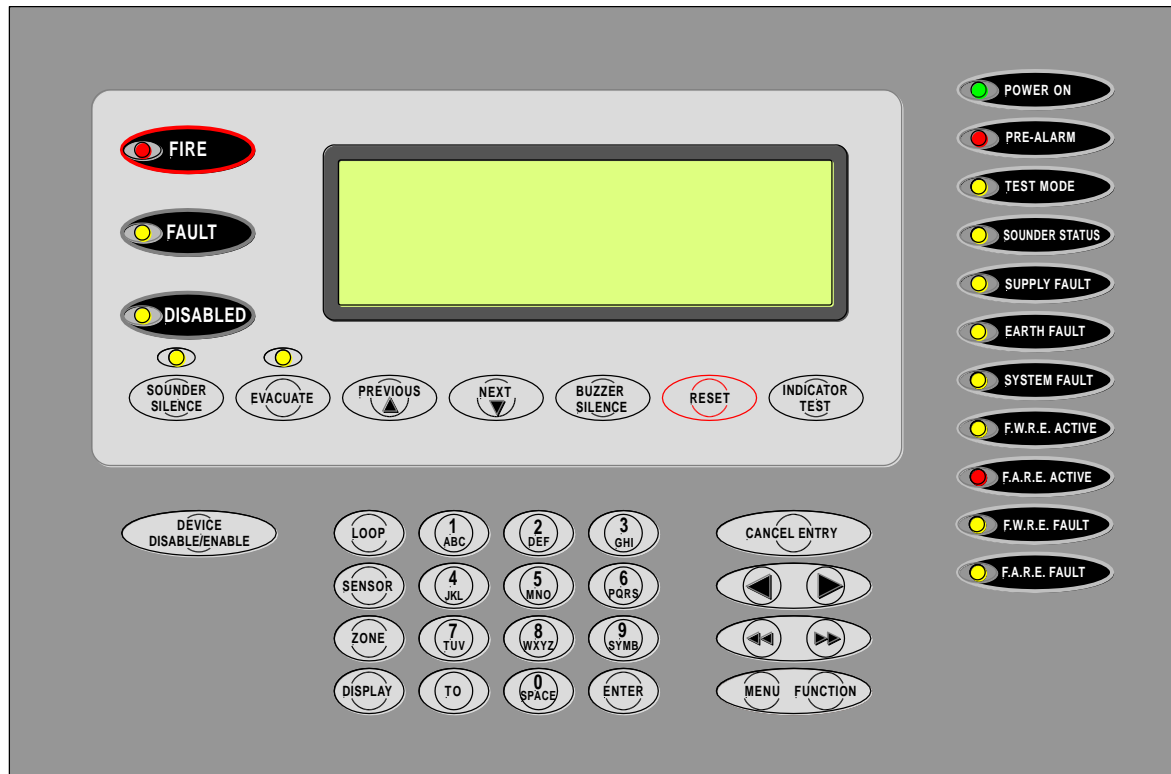
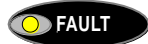


Figure 58: The FireFinder Control Panel with an 8 Line LCD

Controls & Indicators



(Red): This LED will be illuminated steady if any fire alarms are present on the system.



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



(Yellow): The LED will light steady if any detectors, devices or zones in the system have been disabled or if an output relay has been de-activated. The display will show the conditions as per EN54 9.2 and 9.4.2



(Yellow): Pressing this button will silence any Bells or Sounders (activated either by a fire alarm, a manual evacuation or a manual alert) that are connected to the fire panel. If the bells or sounders are silenced the LED just above the button will be illuminated steady indicating that the sounders have been silenced and a sounder resound is available. If a manual evacuate or manual alert condition is present when the Sounder Silence button is pressed, these conditions will remain visible indicating the conditions are still present for resounding. A new Fire Alarm, manual evacuate or manual alert will resound all the previously silenced Bells and Sounders. Pressing Sounder Silence a second time while the Sounder Silence LED is illuminated, will also re-sound the Bells and Sounders.



(Yellow): Pressing this button will activate the Sounders and Bells that have been programmed for manual evacuation and the LED just above the button will be illuminated steady. If the sounders have been previously silenced the LED above the Sounder Silence button will turn off and the Sounders and Bells that were previously silenced will resound. This manual evacuate condition can only be cleared by a Reset and will override a manual "Alert" condition.



This button is used for scrolling backwards through fire alarms, faults, or disablement's displayed on the LCD.



This button is used for scrolling forwards through fire alarms, faults, or disablement's displayed on the LCD.



Pressing this button will silence the panel buzzer, which sounds whenever there is a fire alarm or fault. The sound for a fire alarm is a steady sound where as for a fault it is intermittent.



Pressing this button will reset the panel, clearing any fire alarms and taking the LCD display back to its default screen, unless there are any un-cleared faults or disabled devices, these will continue to be displayed. Pressing reset will also clear the manual evacuate, the manual alert condition and the sounder silence condition.



Note: Pressing reset will not clear any disablements including Sounder Disable.



Starts a lamp test. Lamp test tests all indicators and segments of the LCD including the indicators on the General Indicator Board (Zone Alarms).

Indicators



(Green): This LED will be illuminated when power is connected to the FACP and switched on.



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



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



(Yellow): This LED will flash when there is a fault on the external sounder output. The LED will go steady if the sounder is disabled. If the sounder is both in fault and disabled the LED will flash and then go steady in a cycle.



(Yellow): This LED will be illuminated when there is a supply fault. The following conditions constitute a fault.

- Mains power is not available.
- The output voltage is too low.
- The output voltage is too high.
- The battery is not connected properly or has failed.



(Yellow): This LED will be illuminated if there is an earth fault (+ or -) on any of the signal cables of the system.



(Yellow) This LED will be illuminated if the main system CPU is in fault



(Yellow): This LED will be illuminated when the FWRE output is active.



(Red) – This LED will be illuminated when the FARE output is active.



This button is used to disable or re-enable selected individual or groups of detectors, devices or zones.



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



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



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



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



These buttons 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 buttons multiple times will scroll through the available letters written on the button, in sequence. E.g. 1, A, B, C



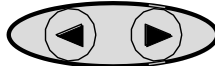
Use this button to access a range of devices. E.g., 2 TO 7.



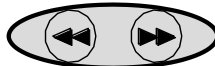
Press the ENTER button when using the panel, to enter data.



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



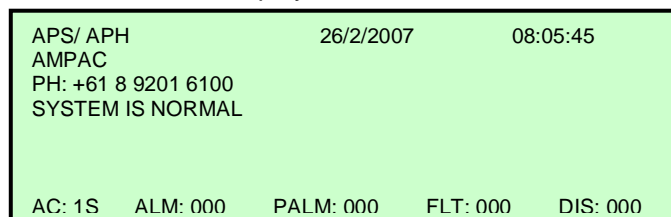
Used to move the cursor back and forth when entering data in a field.



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



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



LCD DISPLAY - This screen can be configured with the servicing company's 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 buttons are used to scroll through them.

IMPORTANT NOTE:

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

8 Functions And Menus

8.1 The Default LCD Display

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

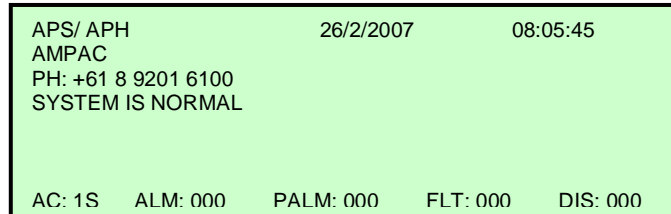


Figure 59: The Default LCD Display

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.

AC: = Access Level.

ALM: = Number of Alarms present.

PALM: = Number of Pre-Alarms present.

FLT: = Number of Faults present.

DIS: = Number of disables present

8.2 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 21) 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.

8.3 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: Allows access to indications and controls to investigate and respond to a fire or fault warning.
- Level II: In addition to the level I facilities, quiescent, fire alarm fault warning, disable and test conditions.
- Level III: In addition to the level II facilities, reconfigure specific data or control and maintain the panel in accordance with the manufacturers' specifications.
- Level IV: In an addition to level III trained and authorised by the manufacturer to repair or alter the firmware of a panel.



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

9 The Main Menu

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

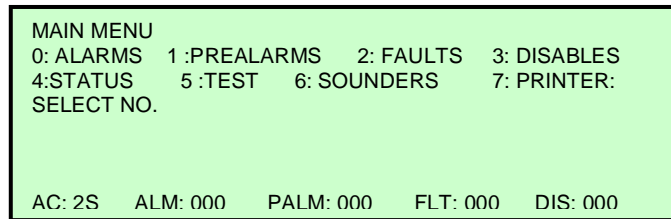


Figure 60: The Main Menu

Numbering System: ❶ denotes the menu structure number and ❶ 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 (❶ to ❷) to view details of the fault.

❶	❶	❷	❸	❹	❺	❻	❼
Zones Sensors	Loops	Modules	Comms	Power Supply	Brigade	Test Failures	Sounders

❸ **DISABLES** on the system.

If there are no alarms, pre-alarms, faults or disables, 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.

9.1 Status Menu

❹ Is pressed to gain access to the STATUS MENU.

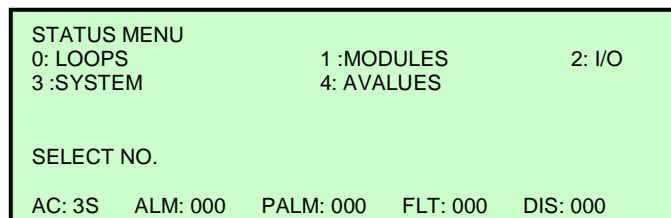


Figure 61: The Status Menu

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.

❶ **Modules:** Select the type of module, Slave❶, P/S❶, Brigade❷ or External LED Mimic❸ 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.

Enter (i) the I/O controller number then the input or output on that controller or, (ii) the loop and sensor number and the output on that device.

Once entered the LCD will then display 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.

3 Is pressed to gain access to NETWORK STATUS.

```

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

AC: 2S  ALM: 000  PALM: 000  FLT: 000  DIS: 000
  
```

Figure 62: Display Network Status

0 Network Points:

```

DISPLAY NETWORK POINTS
0: STATUS  1: POWER SUPPLY  2: BRIGADE
SELECT NO.

AC: 2S  ALM: 000  PALM: 000  FLT: 000  DIS: 000
  
```

Figure 63: 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

1 Remote Slave Modules:

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

```

Apollo Loop 1
TYPE: APOLLO  LOOP NO: 1  VER: 6.1
NP: 1  MOD: 4  STAT: NORMAL
REMOTE MODULE STATUS

AC: 2S  ALM: 000  PALM: 000  FLT: 000  DIS: 000
  
```

Figure 64: Display Remote Module Status

2 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**

③ Is pressed to access SYSTEM STATUS - ④. For a network panel

```

SYSTEM STATUS
ALARMS: 0000   PRE-ALARMS: 0000   DISABLES: 0000
DEVICE FAULTS: 0000   MOD FAULTS: 00   WDG: 00
LOOP FAULTS: 00           VERSION: 6.1 EN54

AC: 2S  ALM: 000  PALM: 000  FLT: 000  DIS: 000
  
```

Figure 65: Display System Status

AValues:

④, ⑤ for a network panel is pressed to access AVALUES. Enter the Loop number then **ENTER** then Sensor number then **ENTER**.

```

Loop 1  sensor 1
L1 S1 Z2 STAT: NORMAL
AVALUE: 25   MODE: 0   I: 000   O:: 000

AC: 2S  ALM: 000  PALM: 000  FLT: 000  DIS: 000
  
```

Figure 66: Analogue Values

9.2 Testing Menu

⑤ Is pressed to access the ALARM, FAULT AND LAMP TESTING MENU.

```

TESTING MENU
0: ALARM      1: FAULT      2: LAMP
SELECT NO.

AC:3S  ALM: 000  PALM: 000  FLT: 000  DIS: 000
  
```

Figure 67: The Testing Menu

9.2.1 Alarm Test

① 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 .



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.

9.2.2 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.

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  and  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.

9.2.3 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.

9.2.4 Sounders

Press ⑥ To select Sounders then ① to enable / disable as required.

9.2.5 Printer Menu

Press ⑦ To select the panel printer (if installed) then ① to forces it to Go ON or OFF Line while ① sets the printer to an alarm mode operation only.

10 Main Functions

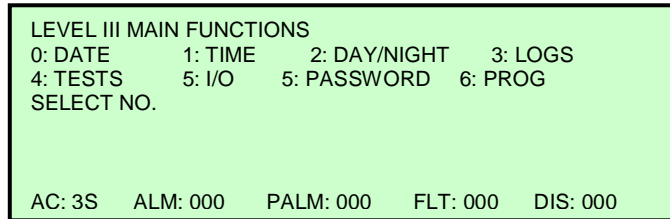


Figure 68: The Level II & III Functions Menu

10.1 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

① To select the set **DATE SCREEN**. The prompt will ask for the date to be entered in this format, **DD/MM/YYYY** (EG 01/01/2011), key in and press **ENTER**. The screen will then return to the **MAIN FUNCTIONS MENU**.

10.2 Setting the Function Time Facility

Press

① Then in the following format key in the time, **HH:MM** using the 24 hour mode. Press **ENTER** and the screen will return to the **MAIN FUNCTIONS MENU**.

10.3 Setting the Function Daynight Facility

Press

② The **DAY-NIGHT SETTINGS** screen will appear. Time entry is the same as setting the "Time" facility

Press

① 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**.

10.4 Function Logs Facility

Press

③ And the **EVENT LOG MENU** will be displayed.

The **LOGS MENU** allows the operator to select and view the events that have occurred of all;

Press: ① ALARM, ① FAULT, ② DISABLE

Once the type of log is selected, e.g. **FAULT** above, each entry can be viewed by stepping through

them using the  and  keys

The type of log, number and totals logged, date and time of the ALARM, FAULT, DISABLE, 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

① **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

① 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.

10.5 The Function Test Facility

Press ④ **TESTS**: prompts the operator to select either the **WALK** or **LOOP** test.

Press ① **WALK TEST**; the operator will be prompted to select either **ZONE** or **SENSOR** test.

Press ① **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 IDENTIFYING DEVICES on SIDE A, and
- TESTING SIDE B IDENTIFYING 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**.

10.6 Function Manual I/O Control

Press ⑤ To display the Manual I/O Control menu

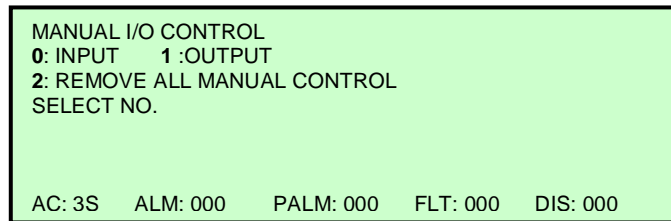


Figure 69: The Manual I/O Control Menu

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 ① **Input Selected:**

Press

① **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.

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

Press **6** While in the Main Functions menu and enter the Level III Password if in Access Level II or, if in Access Level III to display the Password Menu.

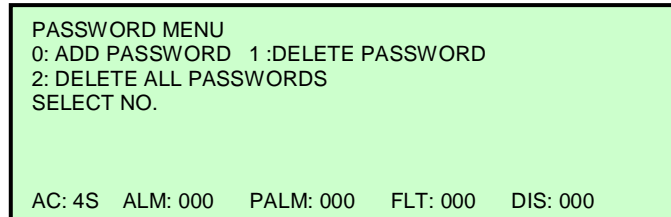


Figure 70: The Password Menu

① **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, 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.

③ **Zone / Sensor Mode:** This sets the mode in which Alarms, Faults, Pre-Alarms and Disables status information will be displayed. “Zone” is the default setting.

10.7.1 Forgotten Passwords

If you have forgotten your password,

- Enter 9999 into the password field;
- Take note of the 4 digit password button displayed on the screen;
- Contact the AMPAC head office and quote this number;
- A temporary password will be issued to allow access to the level 3 functions
- A new password can now be programmed.

 **Note:** temporary password will become invalid if 9999 is entered again or if the panel is re-powered.

10.8 Function Programming

Press **7** To display the Level III Programming Menu.

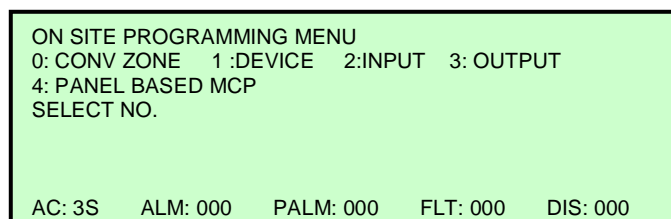
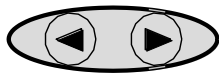


Figure 71: Programming Menu

10.8.1 Conventional Zone Programming

Press Zone:



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

```

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

AC: 3S   ALM: 000   PALM: 000   FLT: 000   DIS: 000
    
```

Figure 72: Zone Description & Type Programming

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.

```

EDIT ZX BRIGADE OPTIONS AND CONFIG
ALRM: Y/N  BELL: Y/N  AUX: Y/N  SPRK: Y/N  AIF: Y/N
ALARM LED: Y/N  CONFIG: LATCHING
Use < or > to change setting

AC: 3S   ALM: 000   PALM: 000   FLT: 000   DIS: 000
    
```

Figure 73: Brigade Options



The keys are used to set the Y/N field, which is the selected Zone that will activate the Brigade Options ALRM, BELL etc and Config.

```

EDIT Z CONFIGURATION
CONFIG: LATCHING

Use < or > to change alarm setting

AC: 3S   ALM: 000   PALM: 000   FLT: 000   DIS: 000
    
```

Figure 74: Zone Configuration Latching / Non-latching

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.

```

EDIT Z I/O GROUPS
GROUP1:          GROUP2:          GROUP3:
GROUP4:          GROUP5:          GROUP6:
Enter GROUP NO.

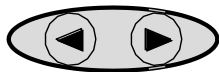
AC: 3S   ALM: 000   PALM: 000   FLT: 000   DIS: 000
    
```

Figure 75: Zone I/O Groups

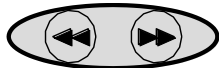
After scrolling through the groups and entering what I/O GROUPS will be turned on by what module/s or device/s in a zone/s the operator is prompted to press **ENTER** to confirm the entries and / or changes.

10.8.2 Device Programming

Press ① **DEVICE:**



Use these keys to **EDIT** and move through wording & numbering



Use 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

① 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.

10.8.3 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

① 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

10.8.4 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.

10.8.5 Watchdog

Press ④ 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 ① will reset the counter. When the panel is commissioned this counter **MUST** be reset to 0 as must be the **Events Logs**.

10.8.6 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.

10.8.7 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.

```

FIREFINDER          26/2/2007      08:05:45
EXTRA DEVICES DETECTED
GOTO PROGRAMMING MENU TO RESOLVE
SYSTEM IS NOT NORMAL

AC: 3S   ALM: 000   PALM: 000   FLT: 000   DIS: 000
  
```

Figure 76: Resolving Extra Modules and Devices

To resolve select **FUNCTION**, enter **PASSWORD**, press ⑥ and the screen below will appear

```

PROGRAMMING MENU
0: RESOLVE EXTRA MODULES AND DEVICES
1: ON SITE PROGRAMMING
SELECT NO.

AC: 3S   ALM: 000   PALM: 000   FLT: 000   DIS: 000
  
```

Figure 77: Added Module or Device

Select ① (Selecting ① presents the PROGRAMMING MENU) then ① or ② (as seen below) then ENTER to ADD the module or device to the configuration, or skip to resolve the changes manually in the Programming Menu.

```

0: ADD EXTRA MODULES          1: ADD EXTRA DEVICES
2: DEVICE TYPE MISMATCH      3: MODE MISMATCH
SELECT NO.

AC: 3S   ALM: 000   PALM: 000   FLT: 000   DIS: 000
  
```

Figure 78: Resolving Extra Modules or Devices

10.8.8 Mismatch Detected

If a mismatch is detected the Normal Default Screen will change to that shown below. Go to the Programming Menu and select either ❶ *Resolve Extra Modules and Devices* then ❷

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

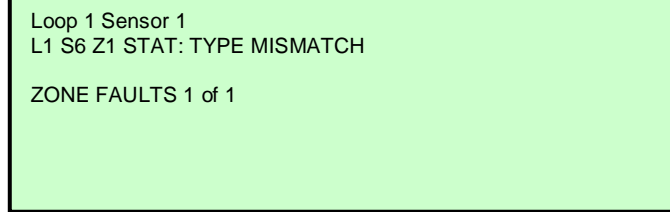




Figure 79: Resolving a Mismatch

11 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  and  keys. After 30 seconds if no key is pressed the top section of the display will revert to displaying the first zone in alarm.

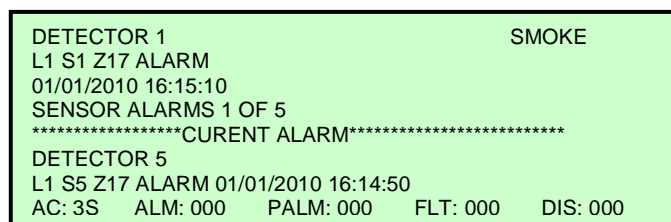




Figure 80: LCD Screen with 5 Devices in Alarm

 **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  button to stop it sounding

12 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 DISABLE button if you wish to disable a sensor then ACKNOWLEDGE
- Press the DE-DISABLE button to de-disable a sensor.

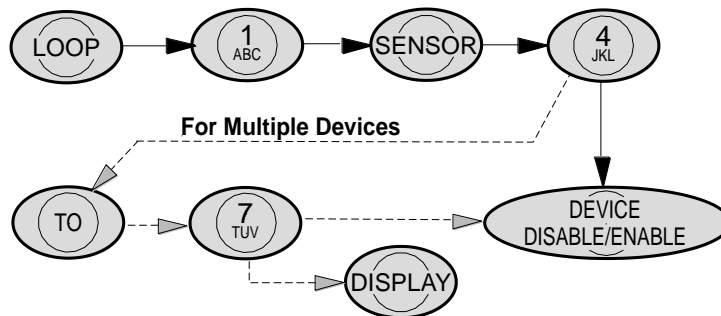


Figure 81: Steps for Isolating Single and / or Multiple Devices

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 DISABLE button if you wish to disable a zone then ACKNOWLEDGE
- Press the DE-DISABLE button to de-disable a sensor.

13 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.

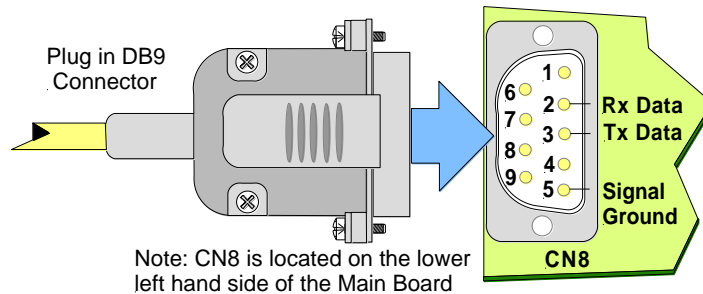


Figure 82: DB9 Connector CN8 as Mounted on the Main Board

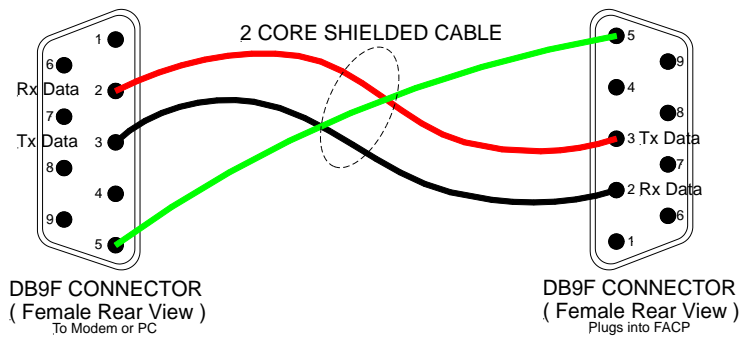


Figure 83: Modem / Programming / Debug Cabling

Note: Debug/Notebook cables are available from AMPAC.

14 Certification Information

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

AMPAC TECHNOLOGIES PTY LTD

7 Ledger 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: _____

15 Troubleshooting Chart

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

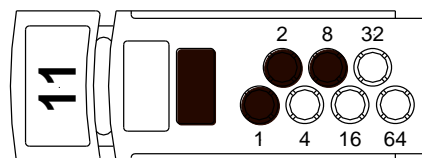
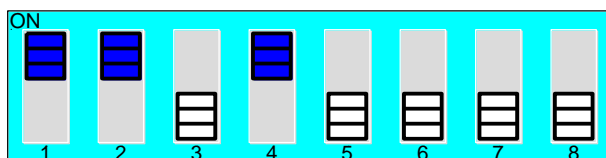
16 Address Setting

BINARY ADDRESS SETTING (AMPAC)

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



● = Punch Out

Figure 84: Switch and Xpert card set to Address 11

17 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
NW:	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

18 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.

19 Maintenance

To ensure continuous reliability of the system, an agreement to carry out regular maintenance of the installation should be made with the manufacturer or manufacturer's representative or competent contractor. The arrangements for maintenance should be such as will ensure that a qualified person is available on call at all times to provide service in the event of any fault developing at the installation. When a service contract cannot be arranged, an employee of the user, with suitable experience of electrical equipment and special training with the makers, suppliers or contractors should be appointed to deal with the simpler servicing. But he should have instructions not to attempt to exceed the scope of such training.

The details of any emergency service call shall be entered in the log book. The record plans and operating Instructions shall be kept available for convenient reference, preferably with the control and the Indicating equipment. The alarm monitoring station and building owner or agent are to be notified when any portion of a system is isolated for maintenance and likewise notified when this portion is reconnected.

19.1 Regular Testing and Inspection

19.1.1 General

It is the responsibility of the owner of the protected building to ensure that the installation is tested in accordance with the requirements specified in this Code and with any additional tests which may be required by the relevant authority. The tests should be conducted by the owner or his representative responsible for the maintenance of the installation and all results of the tests should be recorded in the log book and signed by the owner or his representative.

19.1.2 Daily Check

A check should be made every day to ascertain if the system is operating normally. Fault(s) detected should be recorded and steps taken immediately to ensure that the fault(s) is rectified.


If a fault is detected, the responsible person should ensure that the following actions are taken:

- Determine the area affected by the fault and decide whether special action (such as fire patrols) are needed in that area;
- If possible, determine the reason for the fault, or note the activities immediately prior to the fault in the area affected;
- Record the fault in the log book, inform the organisation responsible for servicing and arrange for repair.

19.1.3 Weekly Test

The following tests and checks should be made every week:

- Carry out a simulated fire alarm call by operating any alarm zone so as to transmit a fire alarm signal to the monitoring station and reset the system;

 **Note:** *It will be necessary to contact the monitoring station prior to the transmitting of the fire alarm signal to warn them of the simulated fire condition to be tested and also to check with the monitoring station after completion of the test to ensure the fire alarm signal was received and to advise them that the system has been reset*

- Check the battery voltage and conditions;
- On completion of the tests ensure that all switches are in the correct operating condition, and should fault(s) condition exist take immediate steps to rectify the fault(s);
- The person carrying out the test should record in the log any fault(s) identified and that the above test has been carried out.

19.1.4 Monthly Test

In addition to the Weekly Test specified above, the following Inspection and testing procedures should be carried out each month:

- Simulate fire conditions on all alarm zones and reset the system to normal. Confirm with the monitoring station when the test has been completed.
- Check battery voltage and charging current in accordance with the manufacturer's instructions.
- Check batteries and their terminals as specified by the manufacturer to ensure that they are in good serviceable condition. Where applicable, examine to ensure that the specific gravity and the level of the electrolyte in each cell is correct
- Check condition of battery cabinet for corrosion and to ensure that batteries are stored in a secure condition.
- Check to ensure that all indicating lights are operating correctly and replace if faulty.
- Check operation of all alarm sounders.
- Disconnect the battery supply and ensure that the visual and audible fault signals are activated at the main alarm panel.
- Simulate main power supply failure and ensure that the system will operate correctly with the standby battery power supply.
- Simulate fire alarm conditions and check the output signals available to initiate the remote auxiliary functions that is required to be in operation in the event of fire as in accordance with the appropriate codes.
- Simulate fault conditions on all alarm zones to ensure that the main alarm panel is operating correctly.
- Check that the main alarm panel is in a clean and operative condition.
- Visually inspect the condition of components, terminations and cables.
- Ensure that faulty parts are replaced and the replacement has been carried out satisfactorily. Record in the log book any circuit fault that required repair.
- Check that all switches are returned to their operating position after the test.
- The person carrying out the test should record in the log any fault(s) identified and that the above test has been carried out.

19.1.5 Annual Test

The Annual Test should consist of all the inspection and testing procedures specified in Sub clause 2.14.4 and the following:

- The maintenance personnel should arrange to check the operation of at least 20 percent of the detectors in an Installation each year. The selection of detectors to be tested should be spread over as many zones as possible and should be made in such a way that all the detectors in an installation should have been checked at least once in 5 years.
- The checking of detectors should take the form of either:
 - The testing of a detector in-situ; or
 - The removal of a detector and its replacement by a detector which has been checked and calibrated by the supplier.
- Circuits requiring automatic voltage regulated supplies should be checked to ensure correct operation and voltage output.
- Where the heat-sensitive element of thermal detectors or the enclosure of other detectors are found to be coated with paint or any other material likely to affect the operation of the detectors, such material should be cleaned off or If necessary, have the detector replaced.



Note: *In certain environments it may be necessary to clean and adjust smoke detectors at more frequent intervals.*

- The person carrying out the test should record in the log any fault(s) identified and that the above test has been carried out.

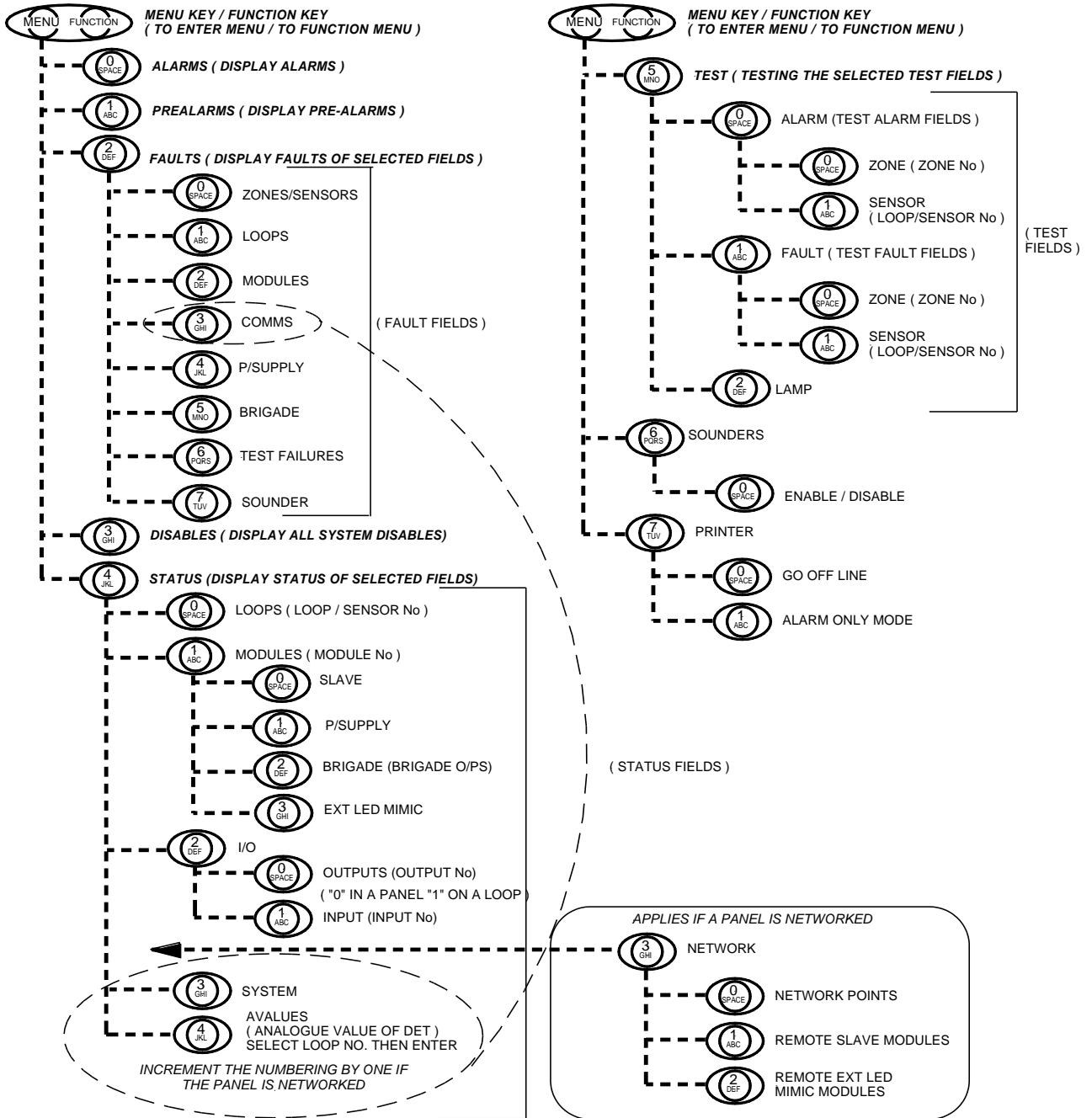
20 Quick Reference Guides

The following guides;

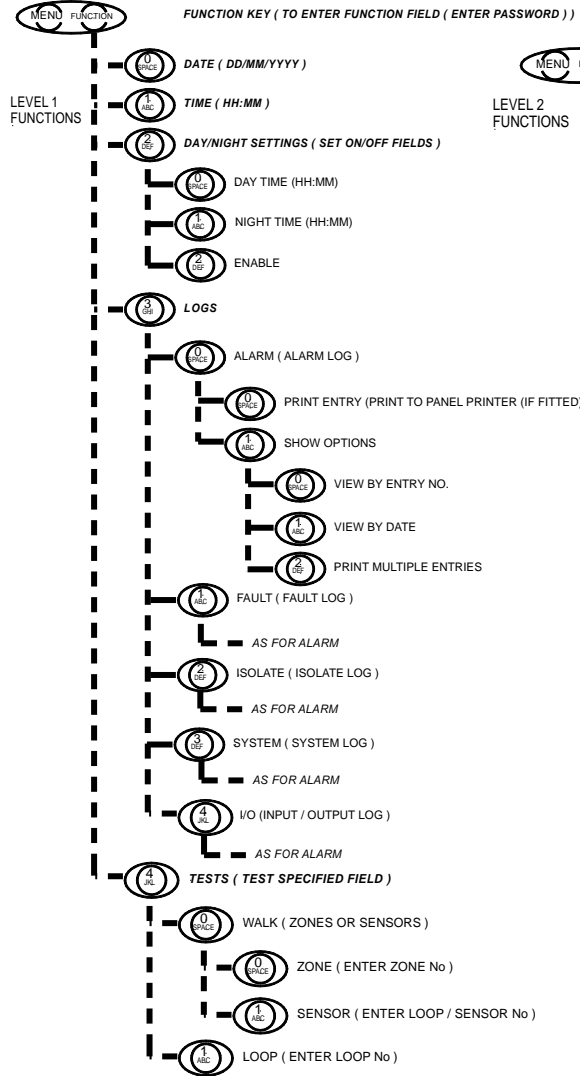
- Prompt / assist an experienced operator to move through the Menu and Function facilities of the FACP without having to consult the main body this manual; and
- Provide a proforma for Brigade response to an alarm

MAIN MENU OPTIONS

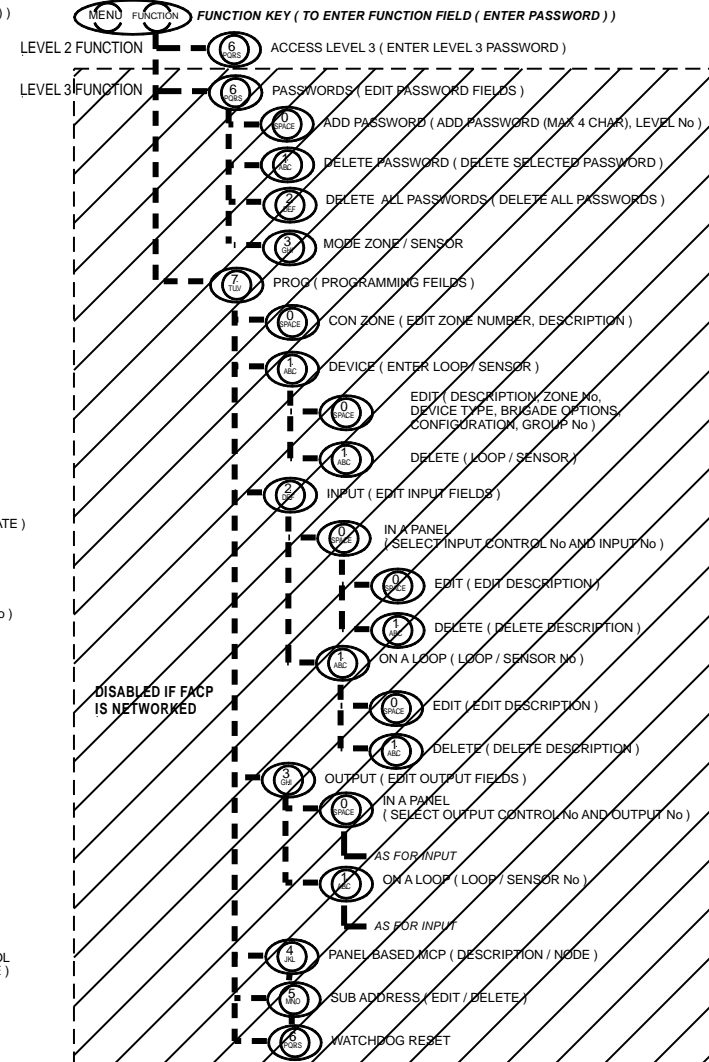
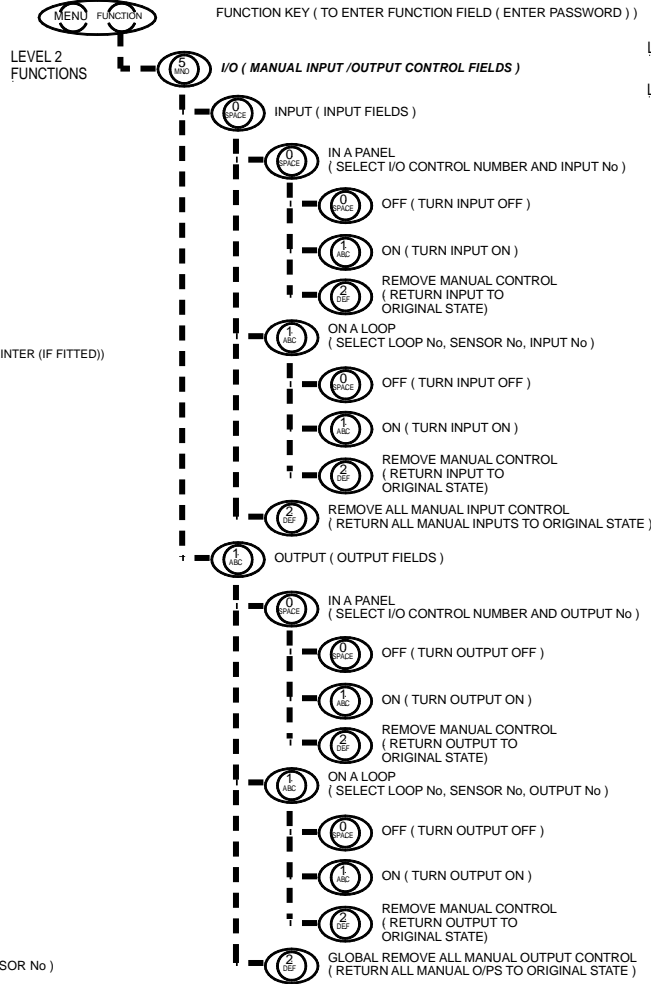
FireFinder™ Quick Reference



FUNCTION MENU OPTIONS



FireFinder™ Quick Reference



NOTES:

UNCONTROLLED DOCUMENT

NOTE: Due to AMPAC's commitment to continuous improvement specifications may change without notice.