



Installation Commissioning & Operation

FireFinder™



Fire Alarm Control Panel SE Asia (CP10, MS1404)

“ Our aim is to provide ‘ *Consistently Excellent Service* ’ in the eyes of our customers ”

Table Of Contents**Page No****Section**

1.	Introduction	1
1.1	About This Manual.....	1
1.2	General Installation Requirements	1
1.3	References	1
2.	System Overview.....	2
2.1	Operational Parameters	2
3.	System Components.....	3
4.	Placing The Basic System Into Operation	7
4.1	Unpacking	7
4.2	Anti-Static Precautions	7
4.3	Working On The System	7
4.4	The Cabinet	7
4.5	Mounting The Cabinet.....	7
4.6	Cabling.....	8
4.6.1	Cable Entry	8
4.6.2	Cabling Recommendations.....	8
4.7	Power Supply	8
4.7.1	Common Power Supply Features & Specifications.....	8
4.7.2	AC Mains Installation.....	9
4.8	Main Board 302-674E	10
4.9	Front Panel Board 302-690	11
4.10	Main CPU 302-675.....	11
4.11	Slave CPU 302-669	12
4.12	Brigade / PSU Monitor Board 302 - 673.....	13
4.12.1	Battery Connection	15
4.12.2	Auxiliary 27 Volt Power	15
4.12.3	Connecting a Bell / Sounder	16
4.12.4	Relay Output Connections	16
4.13	Conventional Zone Board 302 - 671.....	17
4.14	Loop Termination Board 302 -735.....	18
4.15	RS 232 Programming / Modem Interfacing	19
5.	Expanding the System Through Optional Devices	19
5.1	Introduction.....	19
5.2	Printer	20
5.3	General Indicator Card BRD85GIBB	23
5.4	Serial Relay Board 302-732.....	23
5.5	8 Way Relay Board 302 – 6760 / 1	24
5.6	16 Way Input Board 302 - 677.....	24
5.7	16/16 Way Input / Output Board 302-672	24
5.8	Bell / Sounder Monitor Board 302-742.....	25
6.	Expanding the System & Networking.....	26
6.1	Expansion Controller	26
6.2	Networking	26
6.3	Expansion Board 302-688.....	29
6.4	Controller Interface Card 302-725	29

6.5	Network Interface Card 302-724	30
6.6	LED Mimic Board 302 - 7150.....	31
6.7	Remote Expansion LED Board.....	33
6.8	SmartTerminal	34
7.	Control Panel	35
8.	Functions and Menus	39
8.1	The Default LCD Display	39
8.2	Accessing Functions and Menus.....	39
8.3	Function Menu And Access	39
9.	The Main Menu	40
9.1	Status Menu	40
9.2	Testing Menu.....	41
9.2.1	Alarm Test.....	41
9.2.2	Fault Test	41
9.2.3	Lamp Test	41
9.3	Printer	42
10.	Functions	42
10.1	Setting the Function Date Facility.....	42
10.2	Setting the Function Time Facility	42
10.3	Setting the Function Day Night Facility	42
10.4	Function Logs Facility	43
10.5	The Function Test Facility	43
10.6	Function Manual I/O Control	44
10.7	Function Passwords	45
10.7.1	Forgotten Passwords	45
10.8	<i>Function Programming</i>	45
10.8.1	Conventional Zone Programming	45
10.8.2	Device Programming	47
10.8.3	Input Programming	47
10.8.4	Output Programming	48
10.8.5	Sub Address	48
10.8.6	Watchdog.....	48
11.	Incoming Fire Alarm Signal	49
12.	Accessing a Loop, Device or Zone	50
13.	Troubleshooting Chart	51
14.	Binary Address Setting	52
15.	Glossary of Terms	53
16.	Definitions	54
17.	Maintenance	55
17.1	Regular Testing And Inspection	55
17.1.1	General.....	55
17.1.2	Daily check.....	55
17.1.3	Weekly test.....	55
17.1.4	Monthly test.	56
17.1.5	Annual test.....	56
18.	Quick Reference Guides	1

1. Introduction

1.1 About This Manual

This manual is the reference for the installation, commissioning and operation of the **FireFinder™** series of Fire Alarm Control Panels (FACP).

ⓘ Important

It should be noted at this point how board identification numbering is applied to our products.

The Main CPU Board will have the number 302-6750 printed on the top left hand corner of the board. The “ 0 ” on the end of the identification number 302-6750 identifies the “BUILD” number and will vary depending on the “ BUILD ” of the board. On the other hand if the board identification number was 302-674E, the “ E ” identifies the revision number of that board.

1.2 General Installation Requirements

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

1. be qualified and trained for the task they undertake;
2. observe anti-static pre-cautions at all times;
3. 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:

National Standards:

Singapore CP10: 1993

Malaysia: MS1404: 1996

2. System Overview

The Fire Alarm Control Panel (FACP) is an Intelligent Analogue / Addressable and / or Conventional FACP capable of supporting:


- Analogue Photoelectric, Ionisation and Thermal (heat) detectors.
- Addressable Initiating Devices.
- Multiple input/outputs.


and; is built to comply with:
Singapore CP10: 1993 and Malaysia: MS1404: 1996

FireFinder™ Cabinet Size: (in mm) BX20: 500h x 405w x 140d
FireFinder™ Cabinet Size: (in mm) SP 8: 840h X 515w X 140d

2.1 Operational Parameters

Temperature:	-5°C to + 55°C
Humidity:	25% to 75%
IP Rating:	IP30
Max Number of Devices per Loop:	126
Communications Protocol	Apollo XP95 / Discovery
Max Number of Devices per Conventional Zone:	32
Maximum Number of Devices per FACP	512
Cable Loop Characteristics:	2 core 1 to 2.5mm ² Max loop resistance 50 ohms, max. core to core capacitance 0.5µF
Max/Min conductor sizes terminals can accept:	0.2 – 4mm ²
Power Supply Output Voltage:	27V
Power Supply Output Current:	5.6 Amp
Power Supply Input:	85 - 264V AC @ 47 – 63 Hz
Panel Current Draw Quiescent:	240mA (min 1 loop fitted) 310mA (min 4 loops fitted)
Battery Type and Capacity:	2 x 12V sealed lead-acid batteries (battery capacity is determined by the installation configuration). A matching battery cabinet is available should it be required.
	BX 20 12AH (housed within the panel)
	SP 8 24AH (housed within the panel)
Minimum Operating Voltage:	19.2 V

 **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.*

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

3. System Components

The following descriptions do not relate to specific cabinets as the size of the cabinet will vary depending on the amount of hardware required.

The heart of the FACP consists of two boards collectively known as the **Controller**. These boards are the Main Board (302-674E) and the CPU Board (302-675). Combining these with a Front Panel (302-790) forms the basis for the FACP.

A single **Controller** has the capacity to interface to (4) Slave CPU's (302-669) each of which may interface to a 16 Zone Conventional Board or Loop Termination Board. The Main Board (302-674E) carries the Slave CPU for the first board and provision for the mounting of up to the three additional Slave CPU's.

Summary

In a basic FACP the Main Board interfaces to the;

INTERNAL BOARDS

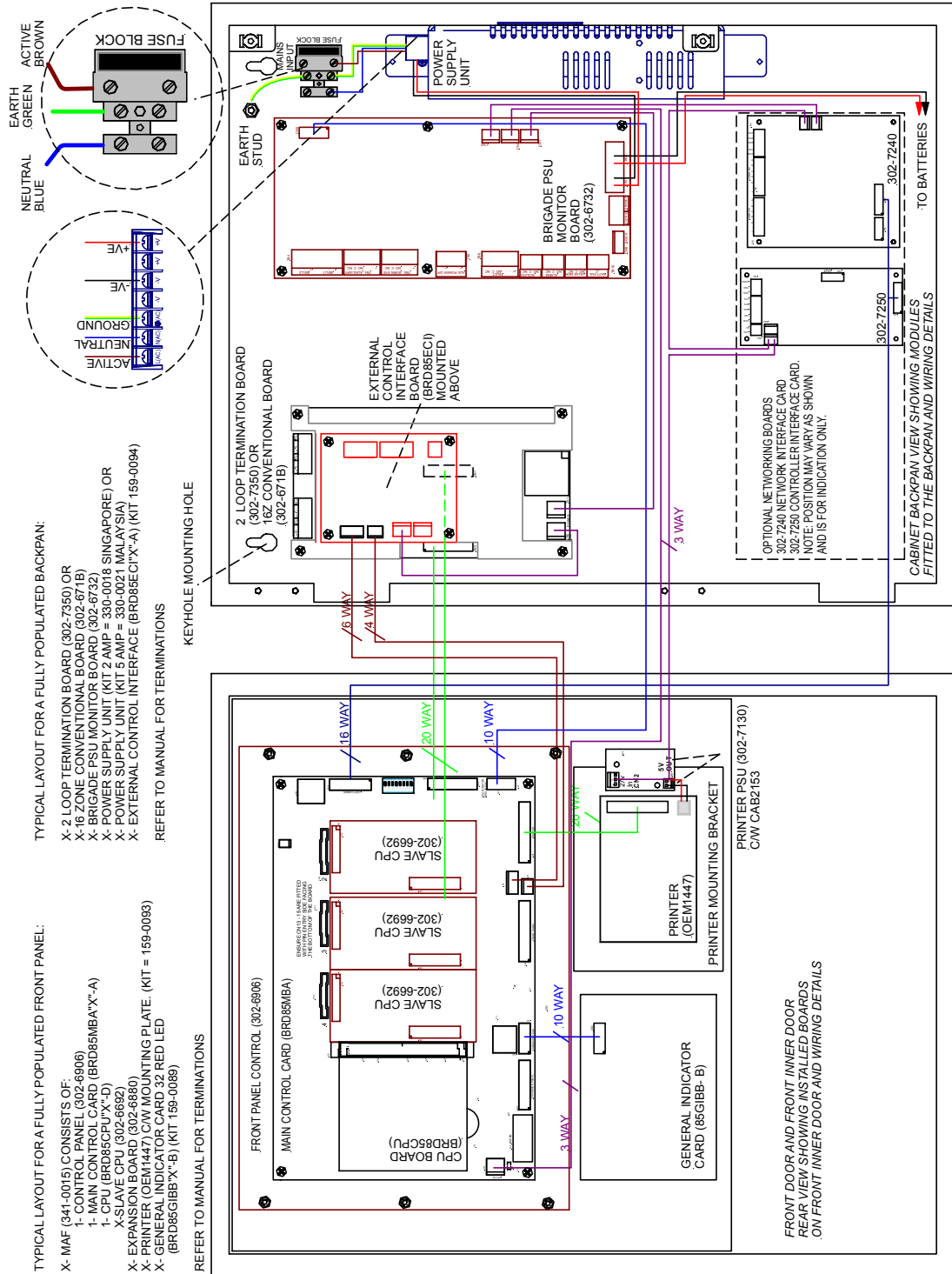
- Brigade / PSU Monitor Board. (302-673);
- Conventional Zone Board (302-671);
- Loop Termination Board. (302 – 735);

FUNCTIONAL

- Front Panel (302-790);
- General Indicator Module (BRD85GIBB); and
- Printer as shown below.



Fig 1: Typical BX20 & SP8 FACP Front Panel Layout



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

Fig 3: Typical BX20 Layout & Cabling

4. Placing The Basic System Into Operation

4.1 Unpacking

The package will include:

- The **FireFinder™** series Fire Alarm Control Panel.
- An Operators manual.
- Locking as applicable.

4.2 Anti-Static Precautions



To prevent electrostatic damage to components, modules and boards, anti-static precautions **must** be observed while performing any task within the FACP.

4.3 Working On The System

Prior to unplugging any connector, connecting or disconnecting any wiring, removing or replacing any component or board both the Mains and Batteries must be isolated to prevent damage to panel components.

4.4 The Cabinet

Features:

- The cabinet can be either surface or flush mounted. If flush mounted a surround is required
- Normally painted Red.
- The inner and outer doors are hinged to allow the doors to open to an angle of 100°.
- 20mm knockouts are positioned in the top, and bottom of the cabinet to simplify cable entry.

4.5 Mounting The Cabinet



Note: *The cabinet should be installed in a clean, dry, vibration-free environment.*

Mount the cabinet into position such that the panels LCD will be at an average eye height. Ensure the surface is of a suitable material and the mounting hardware is correctly sized for the combined weight of the cabinet and batteries. Check that the panel mounting screws in the wall are loose enough to enable the cabinet to be positioned over them and moved down over the shank of the screws. Tighten these screws and the panel should now be firmly fixed to the frame.

Example Cabinet Mounting

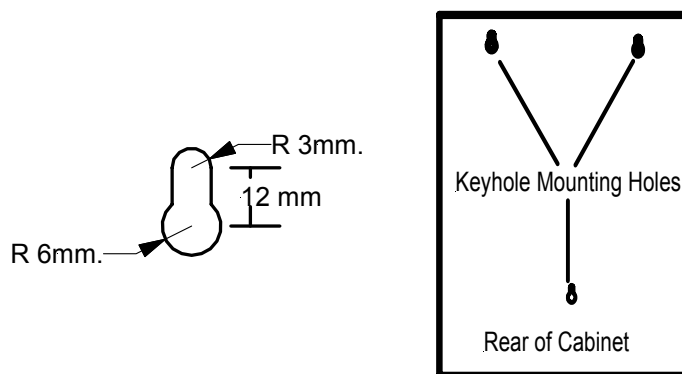


Fig 5: Example **FireFinder™** Keyhole & Mounting Details

4.6 Cabling

4.6.1 Cable Entry

Cables connecting the FACP to the external actuating devices and mains power will be brought in through the knockouts in the top or bottom of the cabinet.

4.6.2 Cabling Recommendations

It is recommended, and in some cases dictated that the low voltage wiring (loops, sounders Aux supply) be treated as one wiring loom, the relay switching wiring as another and the mains wiring as another. Spacing of the circuits must be in accordance with the applicable Regulations.

Analogue Loop

Two / three core cable. The Loop Calculator should be used to calculate the loading of the circuit but as a guide the minimum cable size is 0.75mm² over a maximum loop distance of 2km.

Bell Circuits

Two core, 1.5mm² minimum, PVC sheathed to the bell location.

4.7 Power Supply

4.7.1 Common Power Supply Features & Specifications

- | | |
|---------------------------------------|---|
| ➤ High efficiency, low working temp. | ➤ High efficiency; low ripple noise |
| ➤ Universal AC input/ full range | ➤ Soft start with limiting AC surge current |
| ➤ Short circuit/ over load | ➤ 100% full load burn-in test |
| ➤ Built in EMI Filter and PFC Circuit | ➤ Remote control on/off (option) |
| ➤ Over voltage protection | ➤ Over temp. protection (option) |
| ➤ Input Voltage: 85 to 264 VAC | ➤ Tolerance at 27V +/- 1% |
| ➤ Input Freq 47 to 63Hz. | ➤ Load Regulation +/- 0.5% |
| ➤ PFC 0.95 @ 230VAC | ➤ Line Regulation +/- 0.5% |

5 Amp Power Supply Specifications

Type No	Output	Tolerance	R & N	Efficiency
SP-150-27	27V @ 5.6A	± 1%	500mV	84%

4.7.2 AC Mains Installation

AC Mains will be connected to the 5 Amp 27 volt supply. This supply is normally mounted in the upper or lower right hand corner of the cabinet with the Brigade Board mounted 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.

CONNECTING THE MAINS EARTH

Earthing of the FACP shall be as per the following instructions

1. All earth cabling shall be terminated to the panel Chassis Earth Terminal in a star configuration.
2. The earth cable closest to the cabinet body shall have an M4 SPW beneath the lug then an M4 SPW and M4 nut.
3. Each additional earth cable shall be terminated with an M4 SPW and M4 nut.
4. An additional M4 nut and M4 SPW are fitted to the Chassis Earth Terminal for installers to connect their Mains Earth.

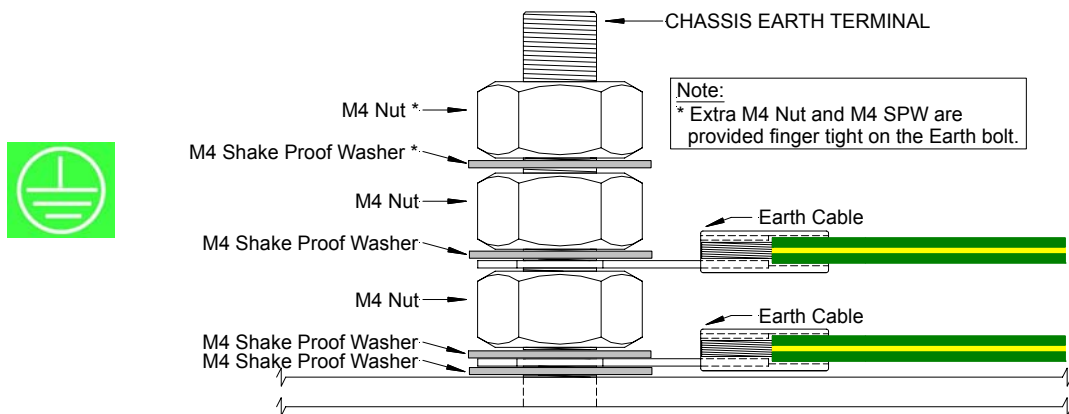


Fig 6: Connecting the Earth Wire

5 AMP POWER SUPPLY

Note #1: FUSE Rating
2 Amp 3AG Slow Blow.

Note #2: Mains cable
should be no less than
0.75mm²

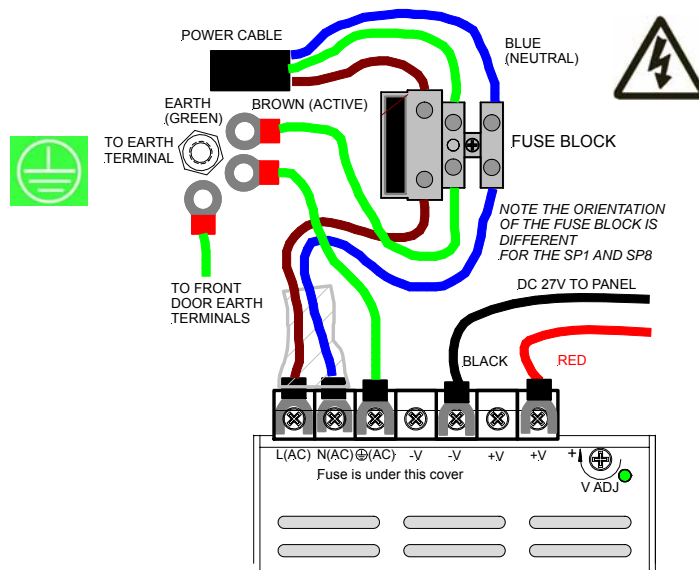


Fig 7: Connections to the **5 AMP** Power Supply

4.8 Main Board 302-674E

The Main Board carries the Main CPU, a data bus for the 302-675 processor, devices for interconnecting to all the other boards, a buzzer for auditory indication, CPU Reset, the backlight power supply for the LCD and provides interfacing to;

- 1 onboard and up to 3 additional plug in Slave CPU's
- A printer
- A Modem, programming / debug port
- An Internal serial bus
- An External communication bus.

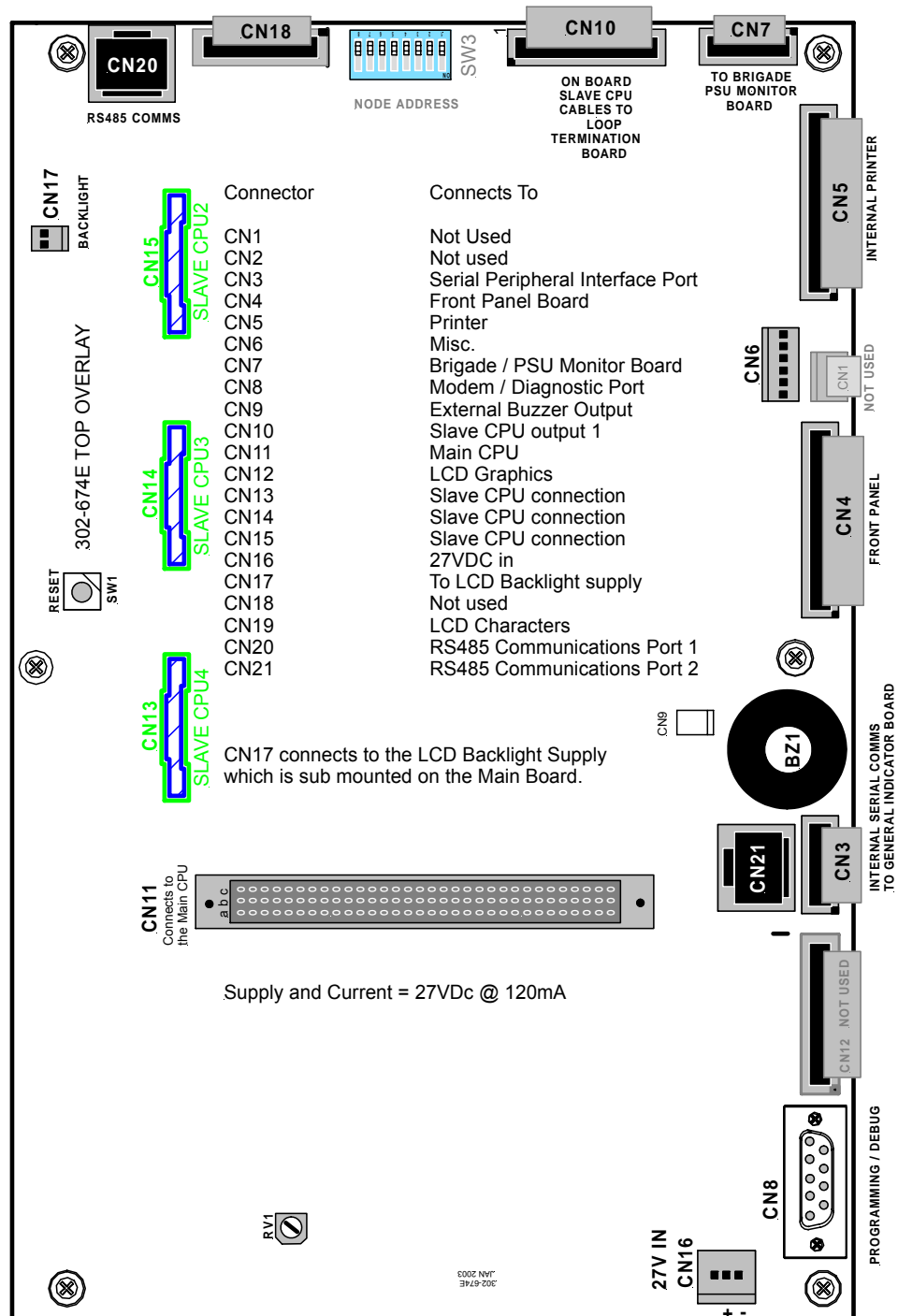


Fig 8: Main Board Layout

4.9 Front Panel Board 302-690

The Front Panel board provides;

- the buttons that are used to control the FACP;
- all LED indications;
- the LCD; and connects via CN1 to CN4 on the Main Board.

All the LED's are surface mounted, and the buttons are embedded within the board.

Connections: CN1 connects to **CN4 302-674E**

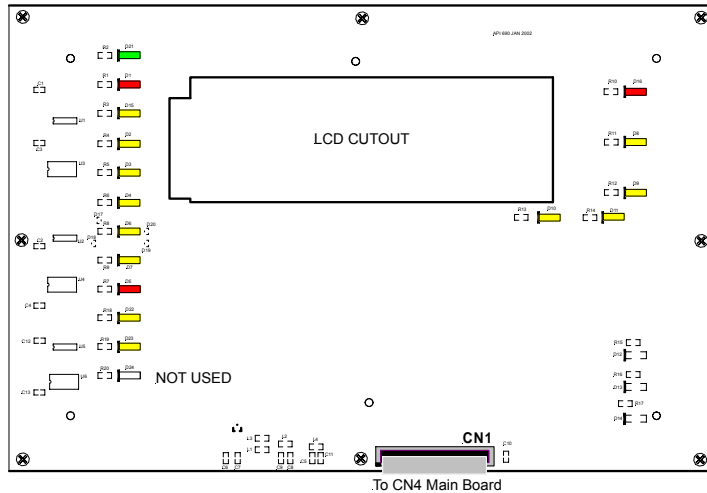


Fig 9: *Front Panel Board Overlay*

4.10 Main CPU 302-675

The 302 675 holds the main central processing unit for the FACP.

- 302- 675 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 toD7) and IC3 the odd bytes (D8 to D15)

Connections: CN2 connects to **CN11 302-674E**

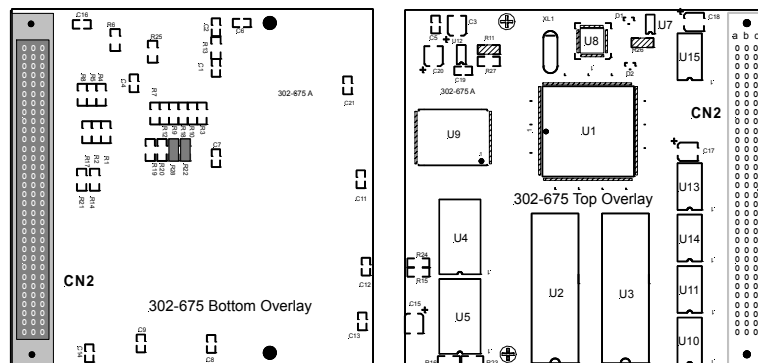


Fig 10: *The Main CPU Board*

4.11 Slave CPU 302-669

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

A single chip micro controller U1 contains the control program within read only memory (ROM) and controls all operations of the FACP Slave CPU.

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

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

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

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

Board Sensing

A unique feature of the Slave CPU is its ability to automatically sense the type of board connected to it without the user having to configure the board to suit. Each termination board returns a unique predefined voltage called the " *Type Voltage* ". Board sensing is therefore achieved by measuring this voltage on analogue input ten (CN3-10). After the Slave CPU has determined the board type the Slave CPU will set the appropriate operating conditions, signal the main CPU of the type of board that is installed and wait for the Main CPU to inform the Slave to begin executing the program.

Connections

Connector	Connects to
CN1	302-670, 302-671 and 302-672
CN2	Main Connection Board (302-674E)

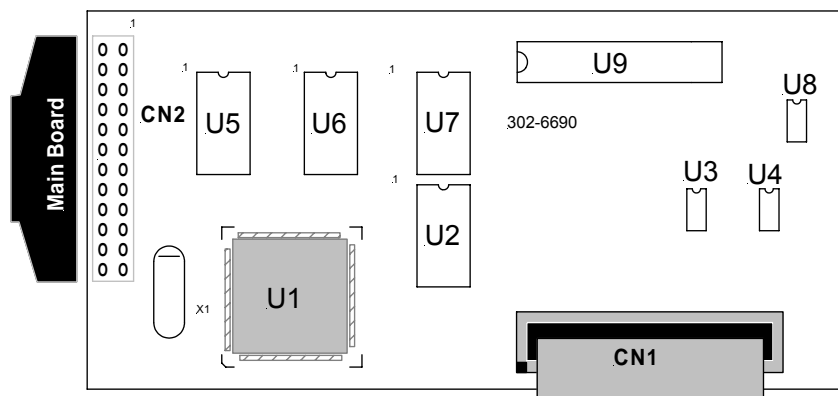


Fig 11: Slave CPU Board

4.12 Brigade / PSU Monitor Board 302 - 673

The Brigade / PSU Monitor Board monitors and controls the Power Supply, battery charging, monitored / unmonitored inputs and outputs and provides the 7 relay outputs.

Providing the Power Supply has adequate capacity the monitored Sounder Outputs are capable of driving 2 X 2Amp circuits. Each circuit, terminated in a Sounder or not, requires a 10K EOL resistor to give a system normal indication. If either circuit is open or shorted, the buzzer will sound on the panel and a Sounder Fault will be indicated on the LCD in the Output Status display. Monitoring is achieved using a small current in reverse polarity to normal. For this reason it is necessary to ensure that all alarm devices are fitted with a series diode (1N4004 recommended) and correct polarity conditions are observed for both the outputs and sounders.

Relay outputs marked NO, C and NC are voltage free contacts. Outputs marked +ve and -ve are fitted with monitoring 10KΩ resistors to allow the circuit to be monitored. If these outputs go unused they must be terminated at the terminal block.

For all outputs combined, the total current is 5 A (if a 5.6A power supply is being used).

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 also be considered when connecting any control devices to the outputs be they in close or remote proximity to the FACP.*

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		RL4
7	Disable	1 Amp Voltage Free Contacts		RL6
8	Alarm	1 Amp Voltage Free Contacts		RL5
9	Valve Monitor	1 Amp Voltage Free Contacts		RL8
10	Batt Fail	1 Amp Voltage Free Contacts		RL7
1	Battery Output	Thermistor Protected		
2	Aux Power Output	1A Fuse (not monitored)	F7	
	Aux Power Output	1A Fuse (not monitored)	F8	

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

BATTERY SPECIFICATION

Battery Charger Output: Float Charger 27V nominal @ 5A
Maximum Battery Load: 6.5A
Battery Type: 2 off 12V 17Ah seal lead acid standby
Battery Size: 181mm x 76mm x 167mm
Battery Circuit Protection: PTC, mounted on Brigade / PSU monitor board
 Battery capacity is dependent on specific system configuration / loading and should be verified.

Brigade / PSU Monitor Board cont.

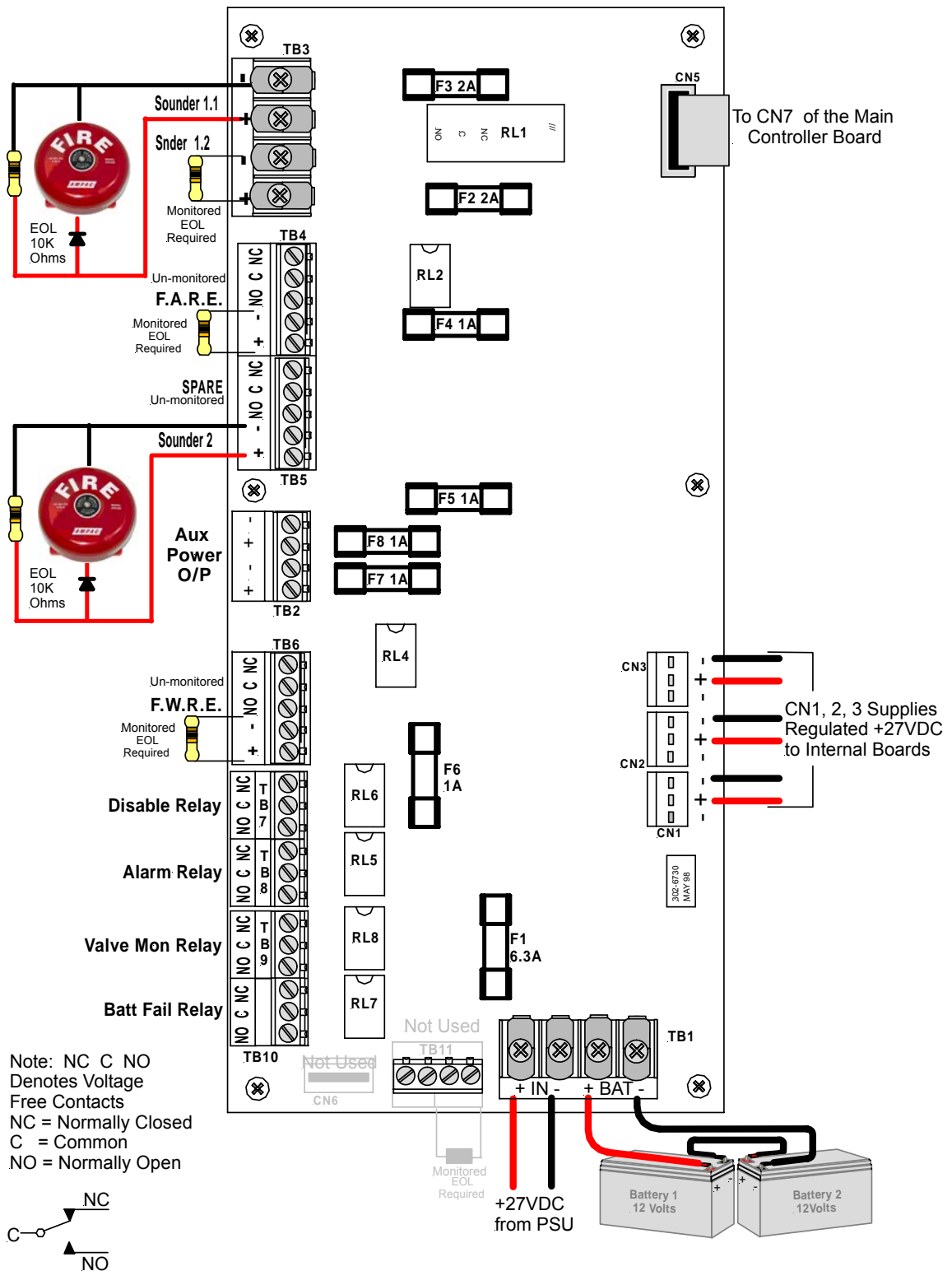


Fig 12: 302-673 Brigade / PSU Monitor Board

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

4.12.1 Battery Connection

A FACP 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 board (302- 673) 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.

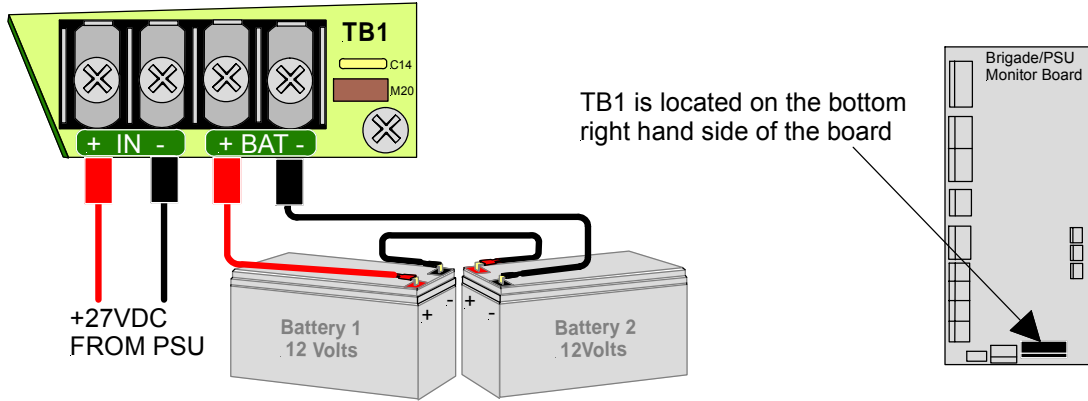


Fig 13: Battery Connection To The Brigade / PSU Monitor Board

4.12.2 Auxiliary 27 Volt Power

Two (2) fused 1 Amp outputs are available from TB2 terminals 1+ (plus) and 2- (minus) or 3+ and 4- on the Brigade / PSU Monitor Board (302- 673). *It is important to note these outputs are not monitored.*

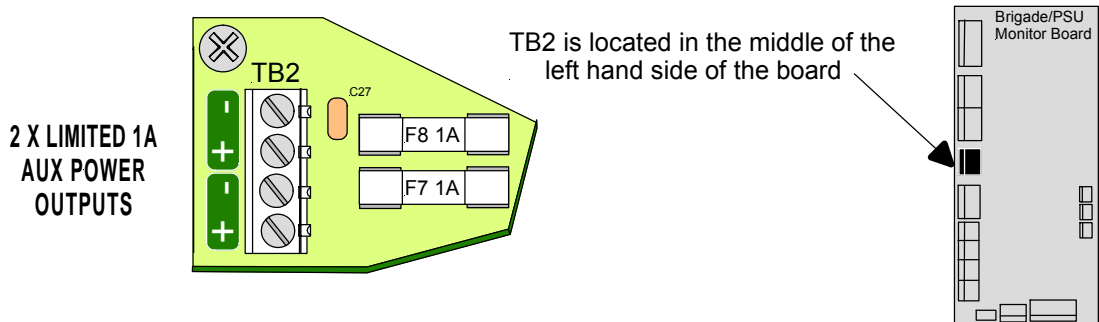


Fig 14: Auxiliary 27v Power Output on the Brigade / PSU Monitor Board

4.12.3 Connecting a Bell / Sounder

Bells, Sounders are connected to the Brigade PSU Monitor Board (302- 673) as shown below.

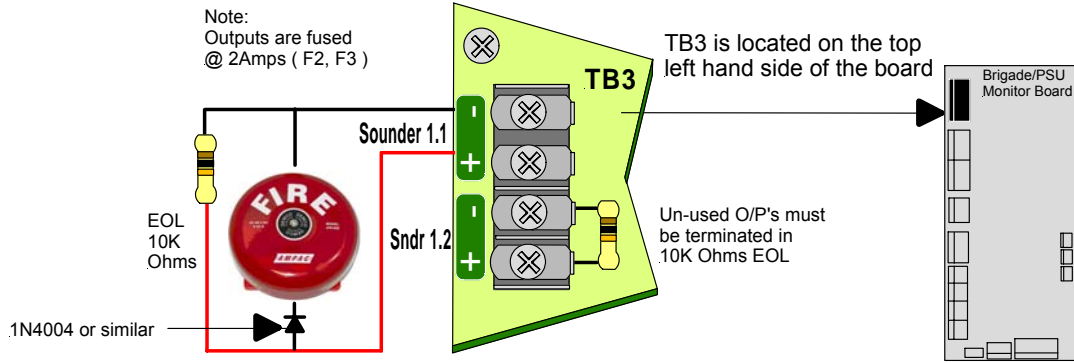


Fig 15: TB3 Bell Sounder Wiring on the Brigade / PSU Monitor Board

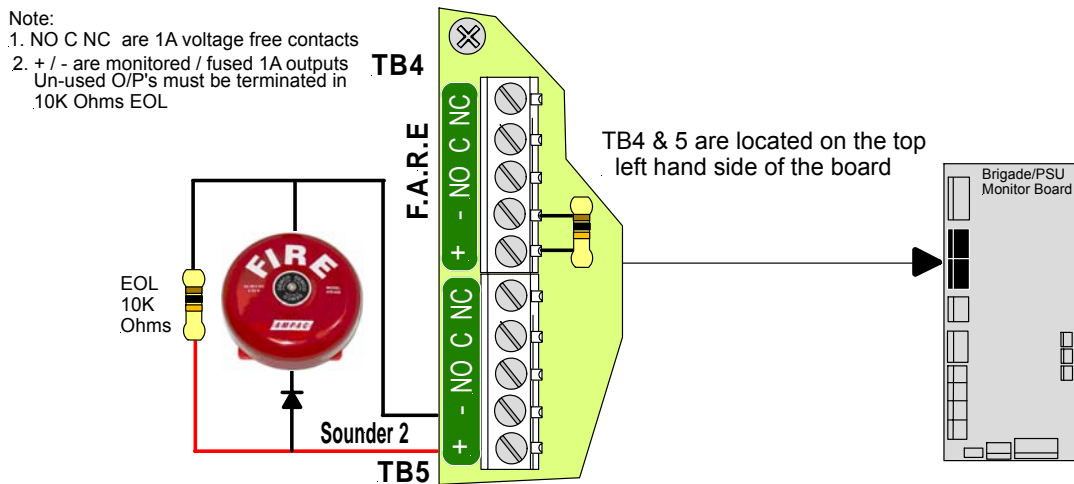


Fig 16: TB5 Bell Sounder Wiring on the Brigade / PSU Monitor Board

4.12.4 Relay Output Connections

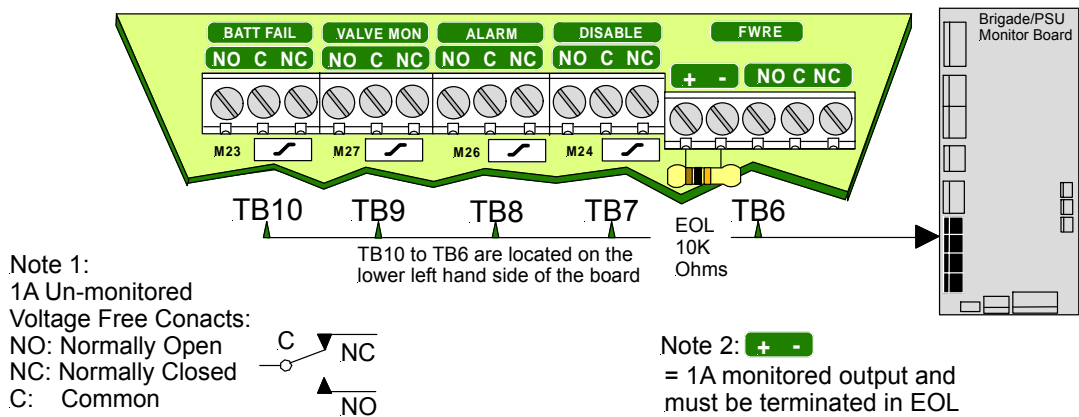


Fig 17: Relay Outputs on the Brigade / PSU Monitor Board

4.13 Conventional Zone Board 302 - 671

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

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

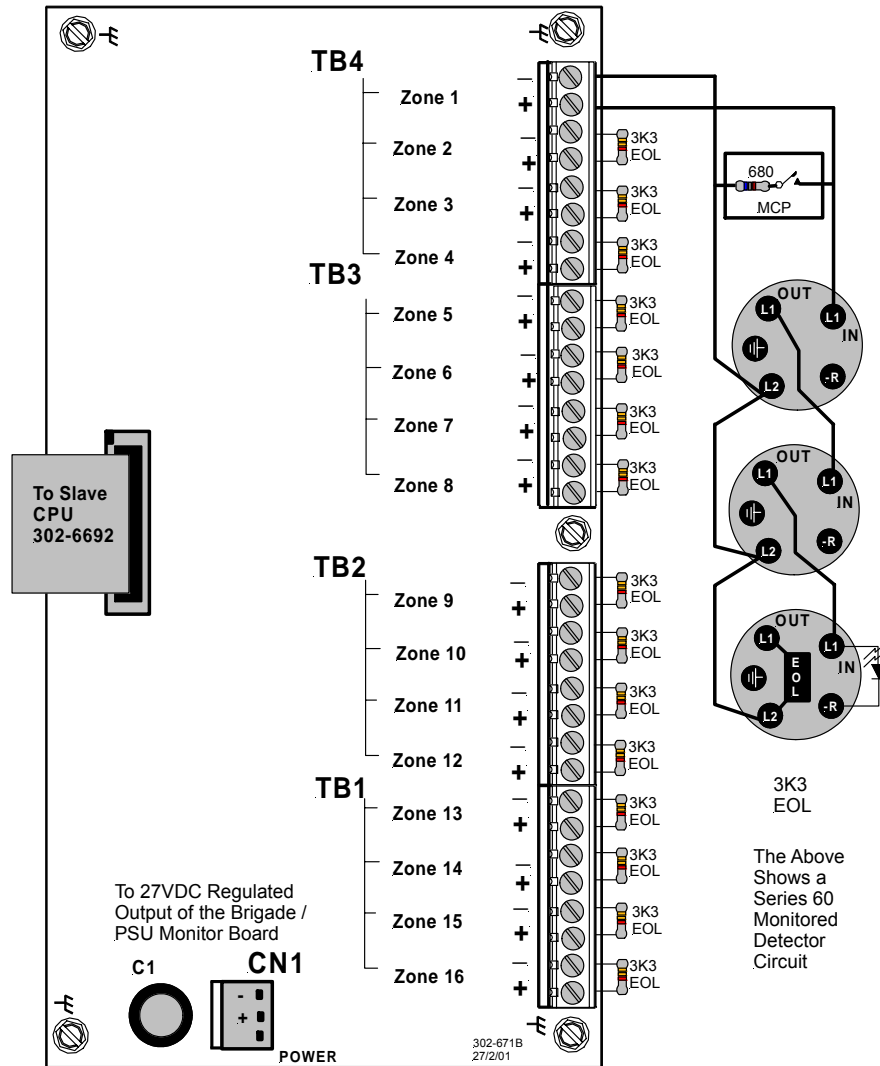


Fig 18: Conventional Board Layout

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 0.5µF.

4.14 Loop Termination Board 302 -735

The Loop Termination Board provides the terminations and interfacing for two loops between the external addressable devices and the FACP. One Slave CPU is required per loop. Addressable loops are connected to TB1 and TB2. This board also has its own switched mode regulator to maintain the loop voltage under low battery conditions.

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

Loop Parameters

Loop Parameters:

Max Current:	250mA
Protection:	Short circuit protected
Communications:	Apollo XP95 / Discovery protocol
Pedestal Voltage:	27.8V to 28.5V
Pulse Voltage:	7.5V to 9V
Maximum points per loop:	126
Maximum number of zones:	No restriction on allocation to loops
Cable Requirements:	No special requirements, 2 Core 1.5mm ² to 2.5mm ² , total resistance must be less than 50 ohms, maximum length 2000m, maximum core to core capacitance 0.5µF. Loop design should be verified using Loop Calculator program.

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.

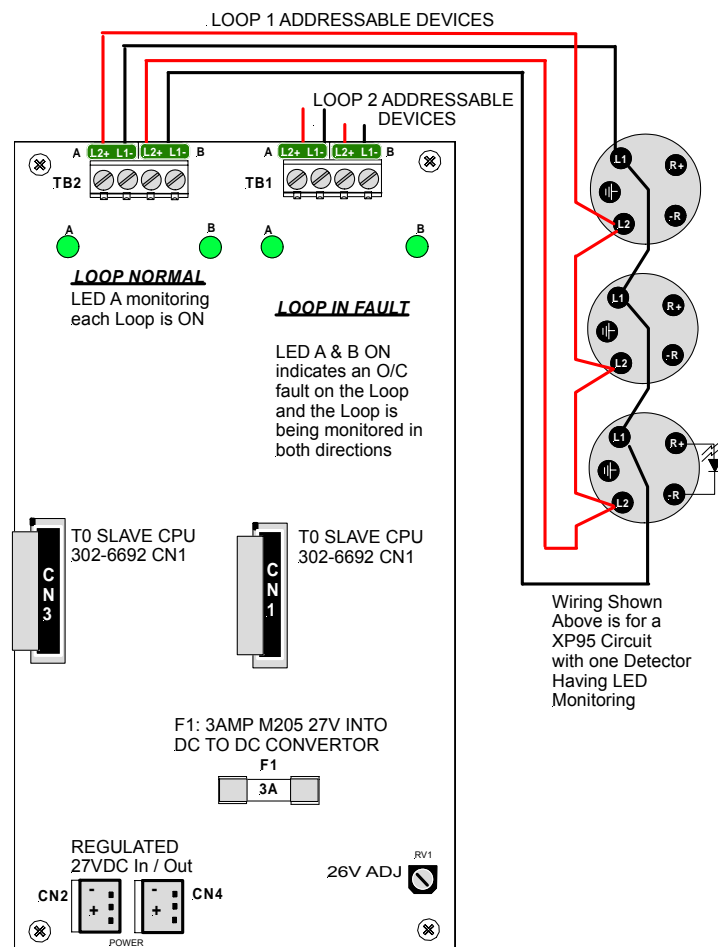


Fig 19: Loop Termination Board

4.15 RS 232 Programming / Modem Interfacing

The modem I/O port is a DB9 connector (CN8) situated on the lower left hand corner of the Main Board (302-674E). This port 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. This support allows the FACP system software to be programmed, reprogrammed or upgraded from a remote site that has an established telephone connection 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.

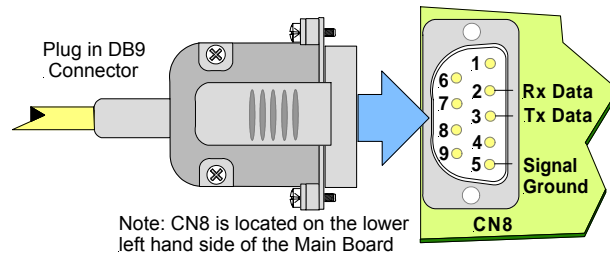


Fig 20: DB9 Connector CN8 (Male Front View) Situated on the Main Board

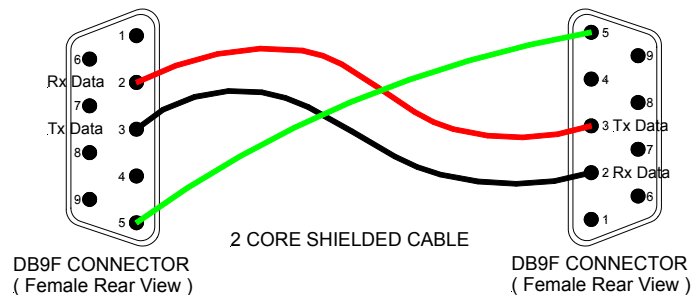


Fig 21: Modem / Programming / Debug Cable Wiring

5. Expanding the System Through Optional Devices

5.1 Introduction

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 optional devices by means of relays or interfacing devices and supply remote or local functionality indication.

Examples of these services are:

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

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

5.2 Printer

Specifications

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

Indicators and Buttons

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

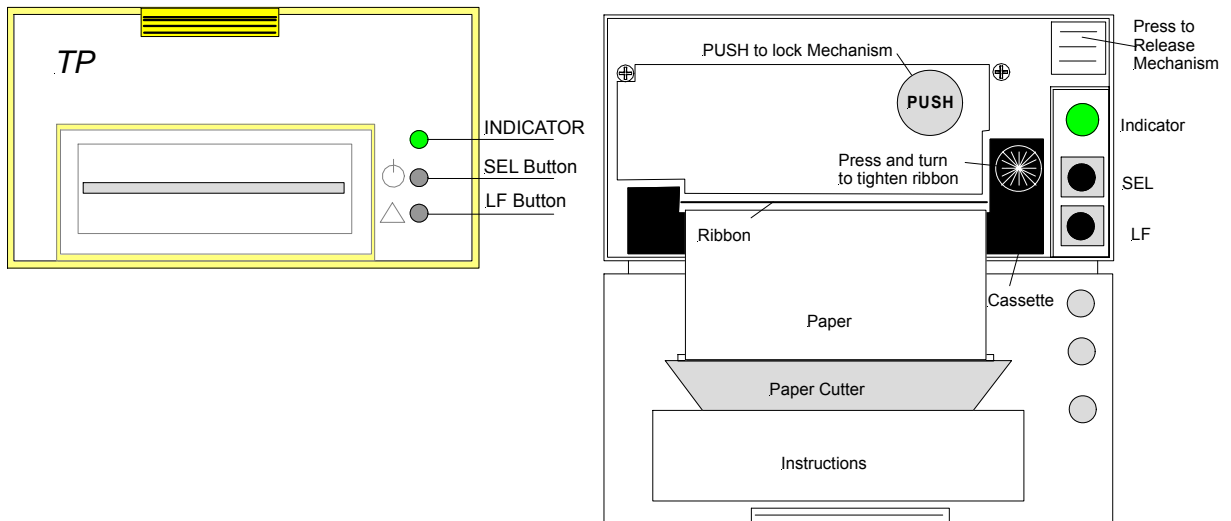


Fig 22: Printer Front Panel Layout (Front Cover Closed / Open)

1. Indicator

When the 3 colour LED indicator is illuminated;

- red it indicates the printer is offline with no paper;
- green it indicates the printer is On Line;
- yellow it indicates the printer is On Line with no paper; or if it is off indicates the printer is Off Line or printer is busy.

2. SEL Button

a) On Line / Off Line State

The printer enters the On Line state automatically when power is applied or on exiting from the Self-Test mode. (LED is green).

Press the SEL button, the LED is turned off and the printer goes Off Line.

Press the SEL button again, the LED turns on and the printer is On Line again.



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

b) Pausing the Printer While It Is Printing.

Press the SEL button while the printer is printing, the printer will pause and enter the Off Line mode after it finishes printing the row it was currently printing. The printer will continue to print when the SEL button is pressed again.

c) Enter the HEX-DUMP mode

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

3. LF Button

While the printer is Off Line press the LF button, paper feed will be initiated. Pressing LF again cancels the paper feed.

4. Self-Test Mode

With power applied (the green LED should be illuminated) push the SEL button. This will turn off the LED, press and hold in the LF button then press the SEL button again and the printer will enter the Self Test mode.

Self-test will print out all the valid characters in the character sets.

5) Exit the Self-Test Mode:

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

Installing The Ribbon Cassette

The printer has a factory loaded ink ribbon cassette.

Ribbon Replacement;

1. Remove the power from the printer.
2. Unlock the front cover by pushing down on the tab at the top of the front panel.
3. Push the button in the top right corner to release the print head mechanism.

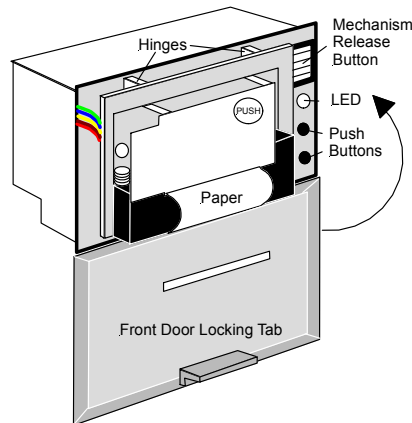


Fig 23: Front Panel

4. To remove the ribbon cassette gently pull out the left end then the right.

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

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

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

Loading the Paper Roll

1. Disconnect the power, unlock and open the front cover.
2. Push down on the button in the top right corner to release the head mechanism.
3. Lift the mechanism as shown below.

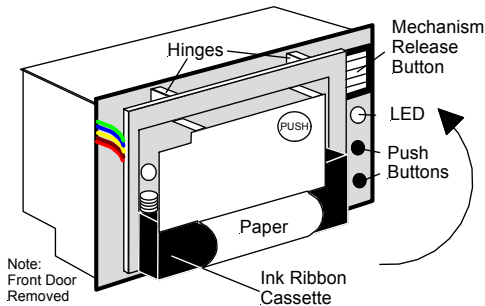


Fig 24: Head Mechanism Rotation

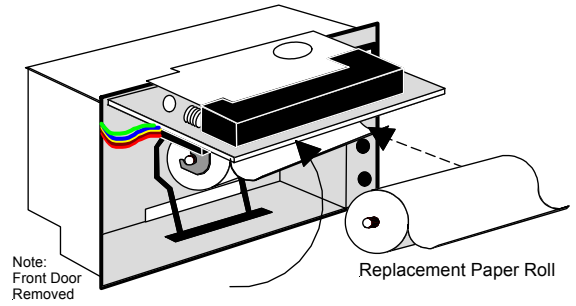


Fig 25: Paper Roll Removal / Replacement

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



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



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

Printer 5 Volt Power Supply (302 – 713)

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

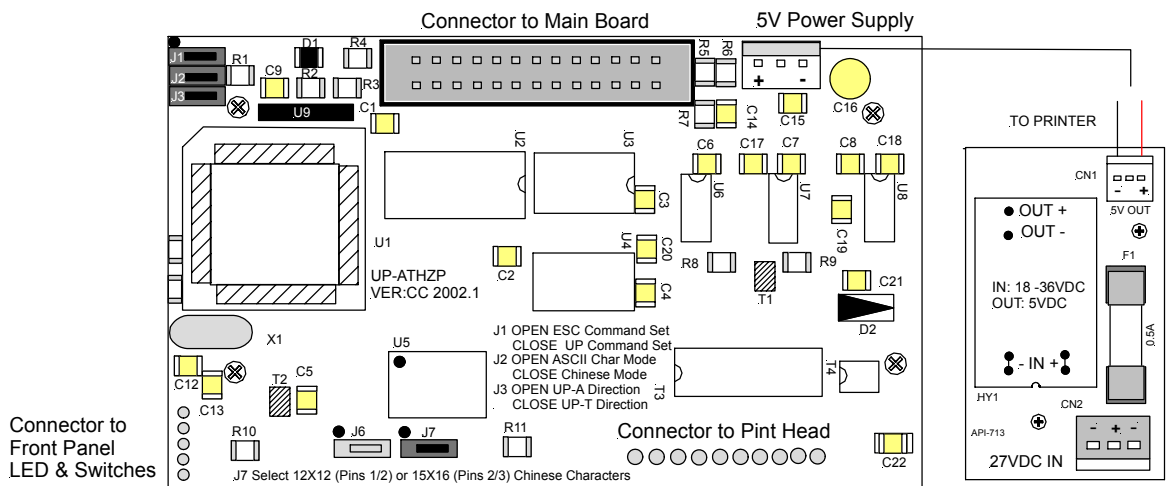


Fig 26: Printer PCB Layout and 5volt Power Supply Board

5.3 General Indicator Card BRD85GIBB

The General Indicator Card is clipped into the front panel of the FACP to provide resettable visual indication of a Zone in Alarm. Each Zone is identified by way of slip in labels.

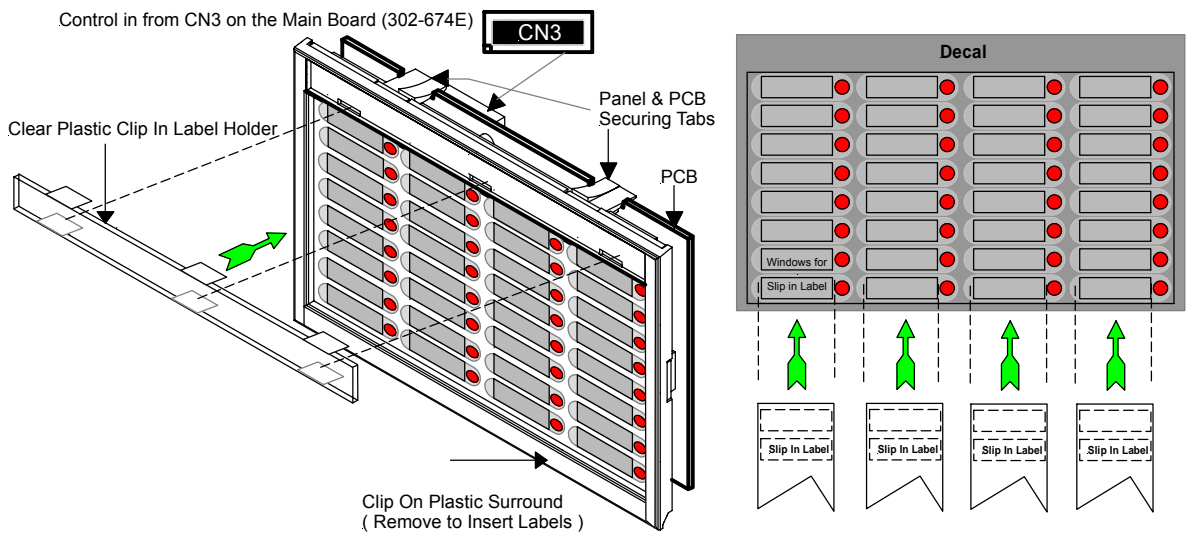


Fig 27: General Indicator Card Layout



- Note #1:** Do not use excessive force to remove any component once it is clipped into position.
- Note #2:** If the indicator becomes lit it remains illuminated until Reset is pressed.
- Note #3:** The indicators are tested by the Lamp Test control.

5.4 Serial Relay Board 302-732

Relay Outputs: Each Serial Relay Board is fitted with eight relays with 1A voltage free contacts. A maximum of 8 boards can be daisy chained together per controller.

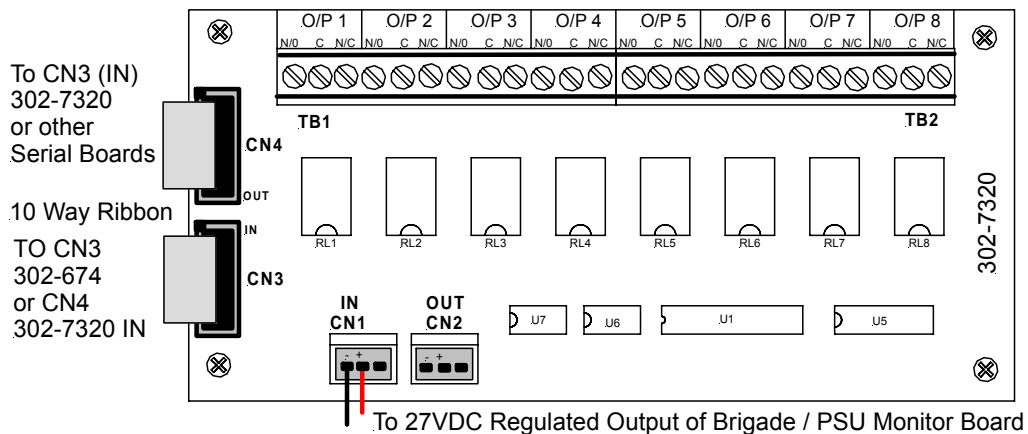


Fig 28: Connecting to the Sounder Board

5.5 8 Way Relay Board 302 – 6760 / 1

Relay Outputs: Each 8 Way Relay Board is fitted with either eight 1A (302-6760) or 5A (302-6761) relays fitted with voltage free contacts that can be used for control (eg. releasing doors) or monitoring purposes (eg. driving indicators, door open / closed) .

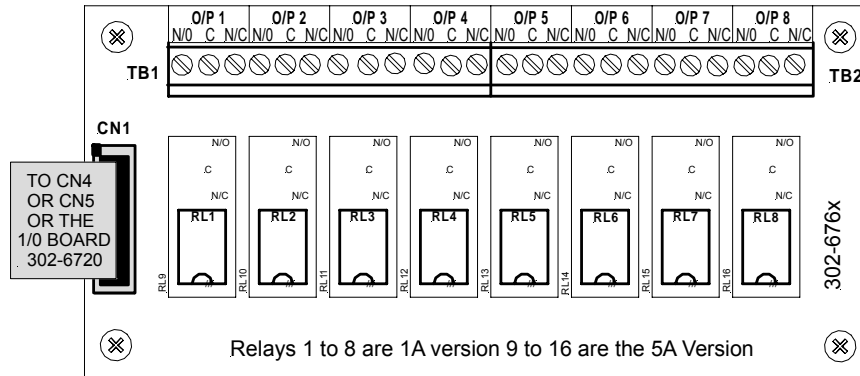


Fig 29: 8 Way Relay Board

5.6 16 Way Input Board 302 - 677

Opto-Inputs: Up to 16 inputs can be connected to the 16 Way Input Board. The inputs require voltage free contacts as shown below.

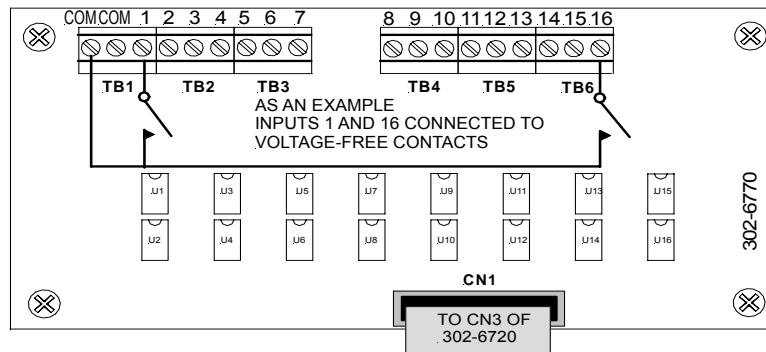


Fig 30: 16 Way Input Board

5.7 16/16 Way Input / Output Board 302-672

The 16/16 Way 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 Opto Input Board.

Dependant on the configuration a maximum of 8 I/O Boards can be daisy chained together.

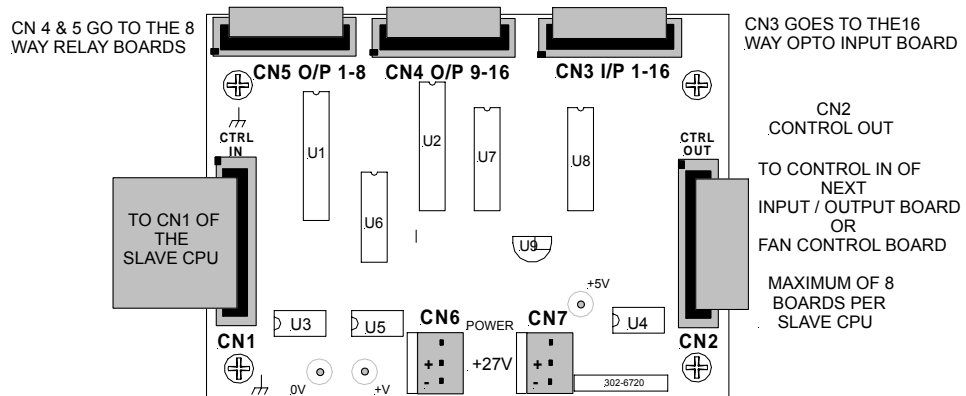


Fig 31: 16 Way Input / Output Board

5.8 Bell / Sounder Monitor Board 302-742

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

The 302-742 is built in two versions:

1. 302-7420: All outputs are monitored and provide 1 Amp per circuit.
2. 302-7421: The first 4 circuits are Voltage free contacts, the second 4 are as per the 302-7420.

Wiring to the Monitored sounder outputs is as per the 302-673.

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

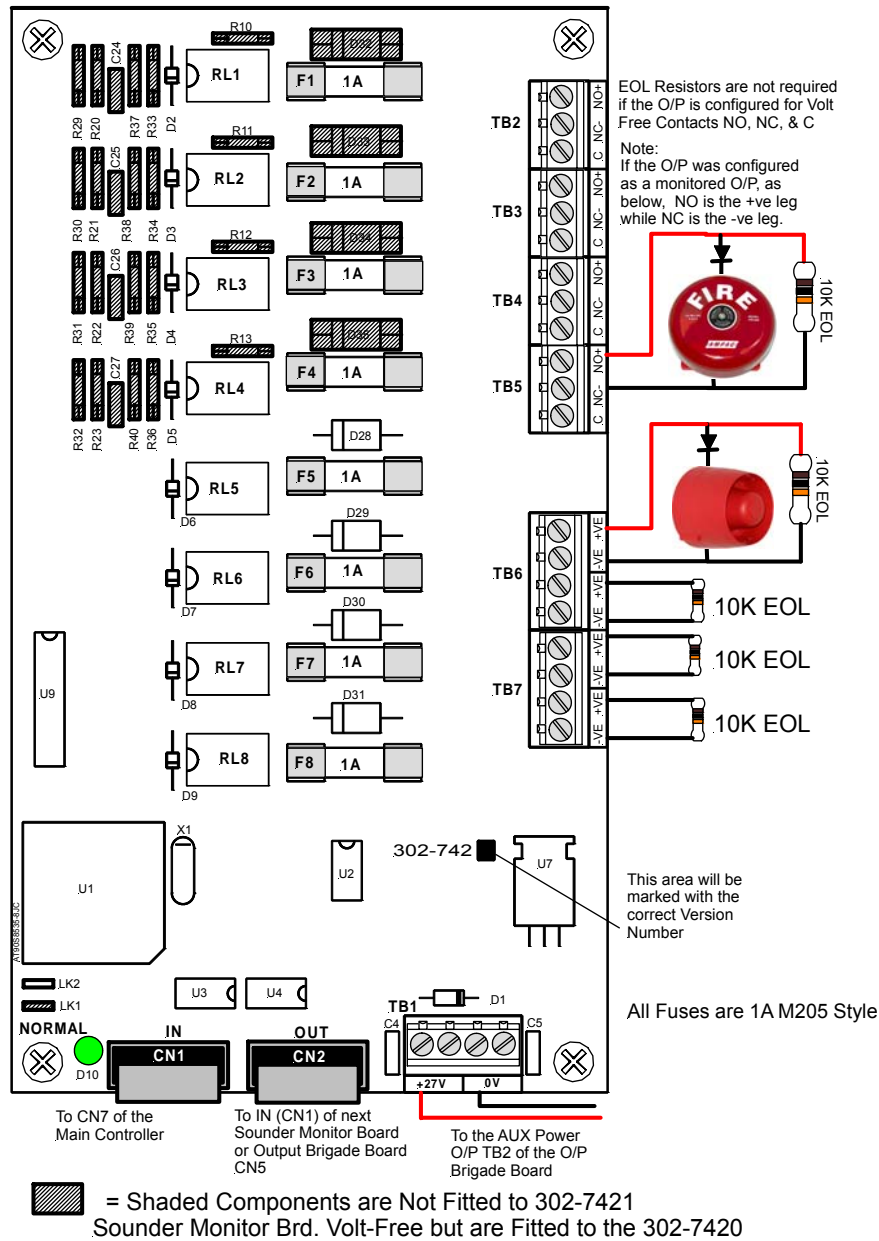


Fig 32: Bell /Sounder Monitor Board

6. Expanding the System & 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 Expansion Controller

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

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

Networking in this way 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.

6.2 Networking

When FACP's are connected to each other they form a " NETWORK ". Individual FACP's in the Network are referred to as NODES. The Network as defined by the limitations of the installation can consist of a number of Nodes, the number of Nodes being dependant on the configuration of each Node. 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 via a data loop from Node 1 in the Network.

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.

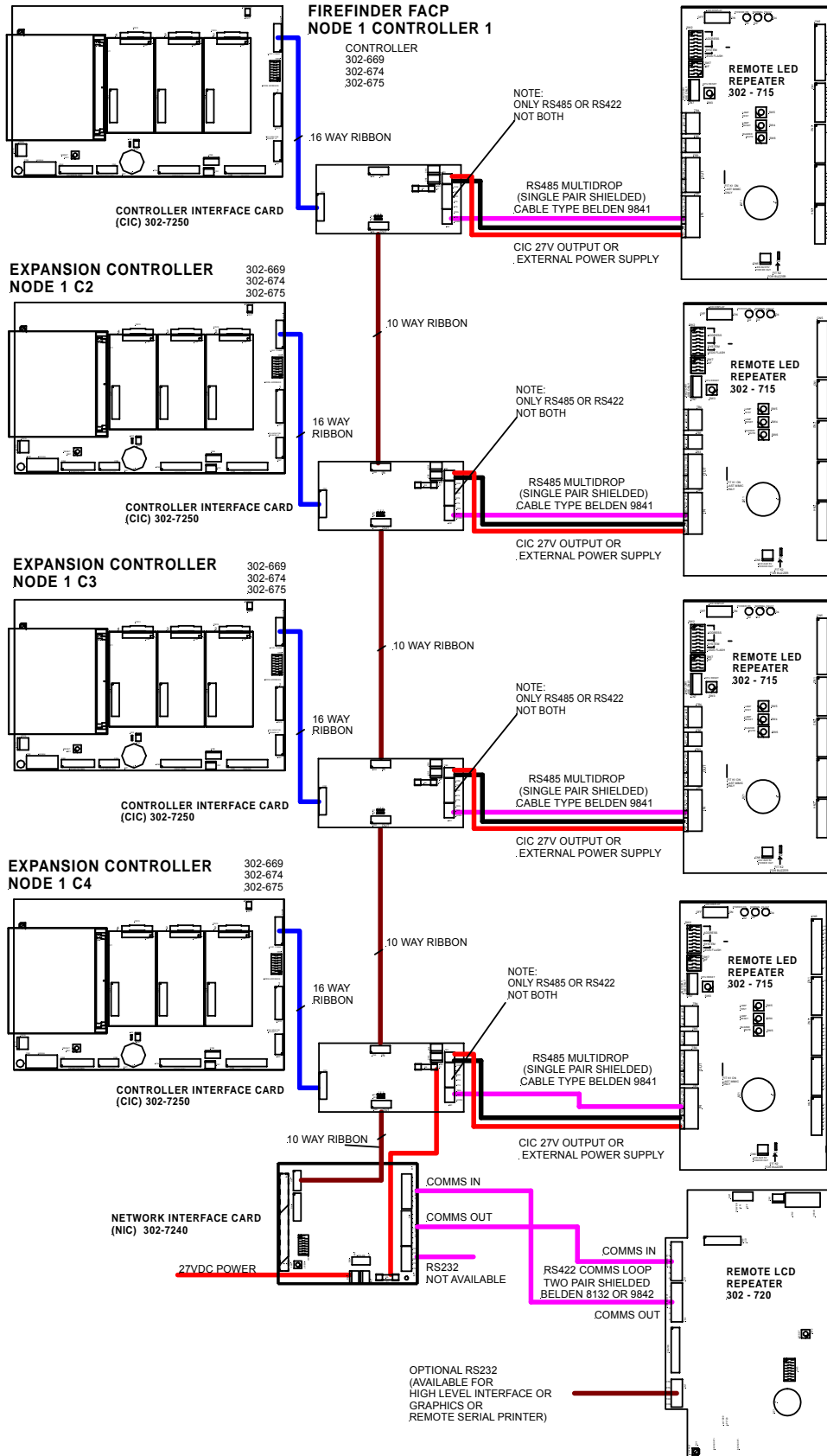


Fig 33: Example of 3 Expansion Controllers within an FACP

6.3 Expansion Board 302-688

The Expansion Connection Board is used to increase the capacity of the controller from 4 Slave CPU's to 8. The Expansion Board must be mounted within 200mm of the Controller. Connection from the Controller to the Expansion Board is made via a 20 way flat cable

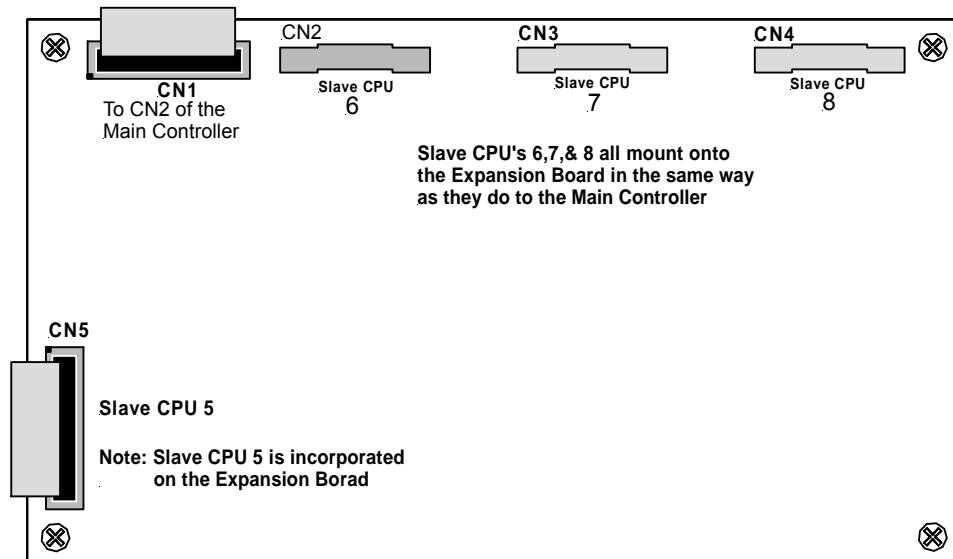


Fig 36: Expansion Board

6.4 Controller Interface Card 302-725

The Controller Interface Card provides connections to the communication ports on a Controller. The module connects to the Loop Communication connector (CN18) on the 302-674. It may provide two communications ports (RS232 and RS485) dependent upon the mode in which it is used.

RS232 is available for communications with graphics and building management systems at terminal block TB2 terminals A to E.

RS485 is used to drive Remote LED Mimics and is available at TB1 terminals A to C.

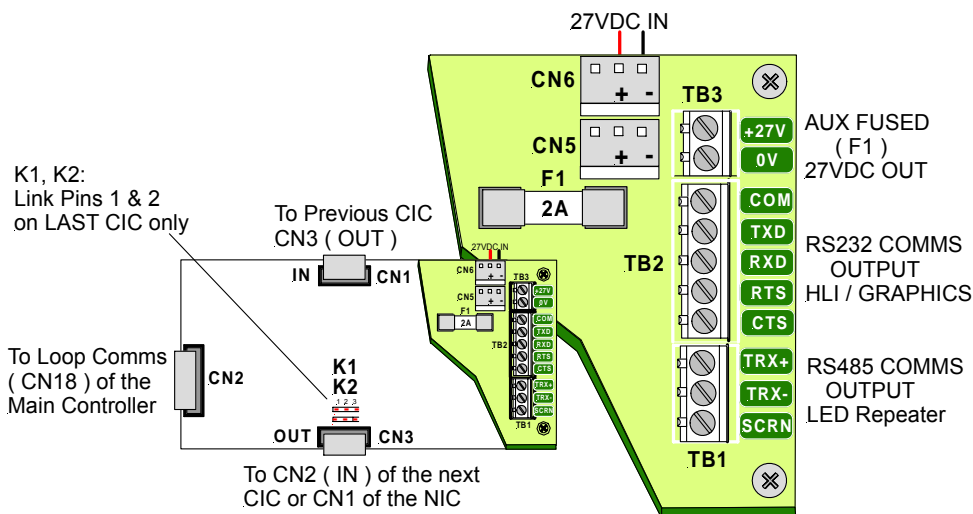


Fig 37: Controller Interface Card

6.5 Network Interface Card 302-724

The Network Interface Card allows the networking of multiple panels in different combinations, from Data Gathering panels to Peer to Peer panels. The NIC provides two communication buses RS232 and RS422. The NIC can either connect to the main board via connector CN18 (Loop Comms) or to a Controller Interface Card connector CN3 (Out). Fitted to the rear of the NIC is the CPU IO Controller (302-675) with NIC software to control the flow of communications in and out of the NIC.

The RS422 is used to communicate with any LCD Repeater Panels that may be on the system. This output is available at TB2 terminals 1 to 7. Maximum distances between Panels is 1.2Km. RS232 is also available from TB1 terminals 1 to 5.

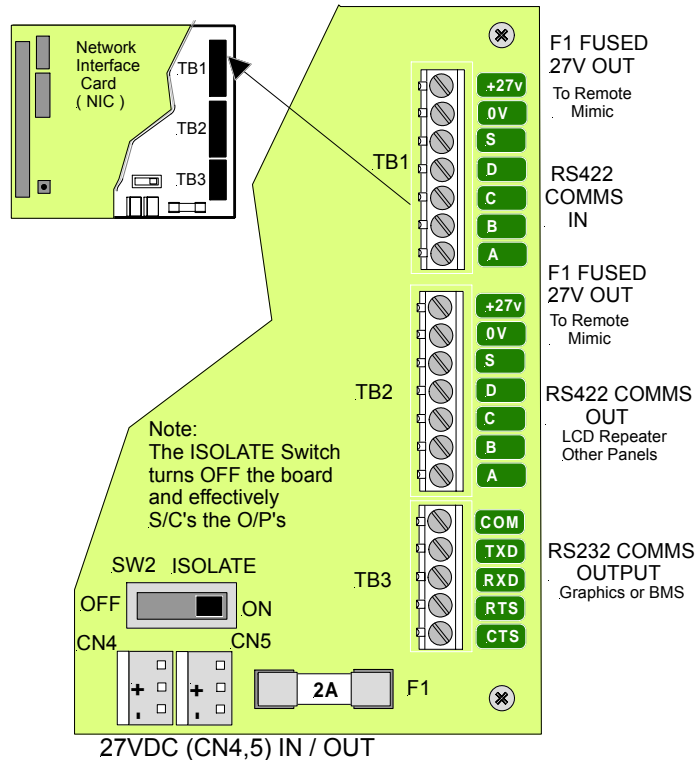
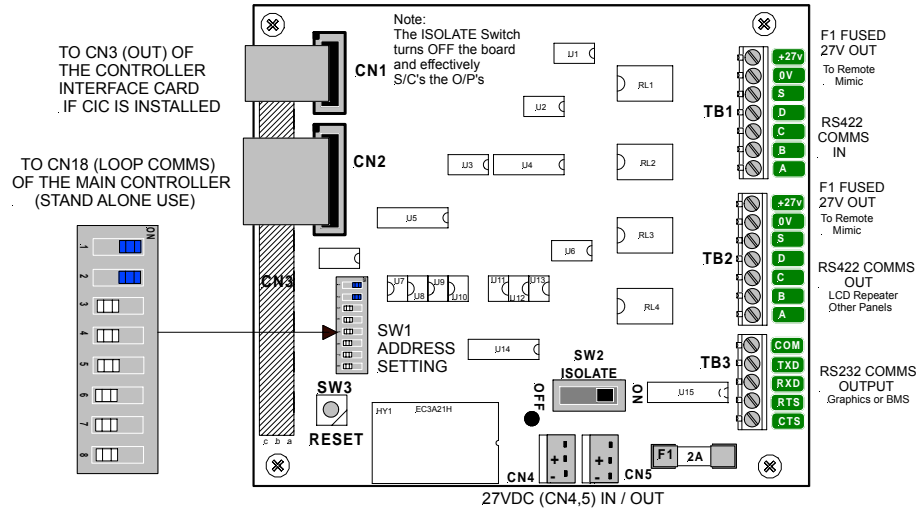


Fig 38: Network Interface Card

6.6 LED Mimic Board 302 - 7150

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 Isolate, Evacuate), 1 remote Buzzer output as well as 1 software configurable 1A relay output and 1 voltage free driven input. On board switches,

SW1: turns off the LED's

SW3: resets the CPU

SW4: resets the LED's

SW5: tests 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

SW6: mute the Buzzer

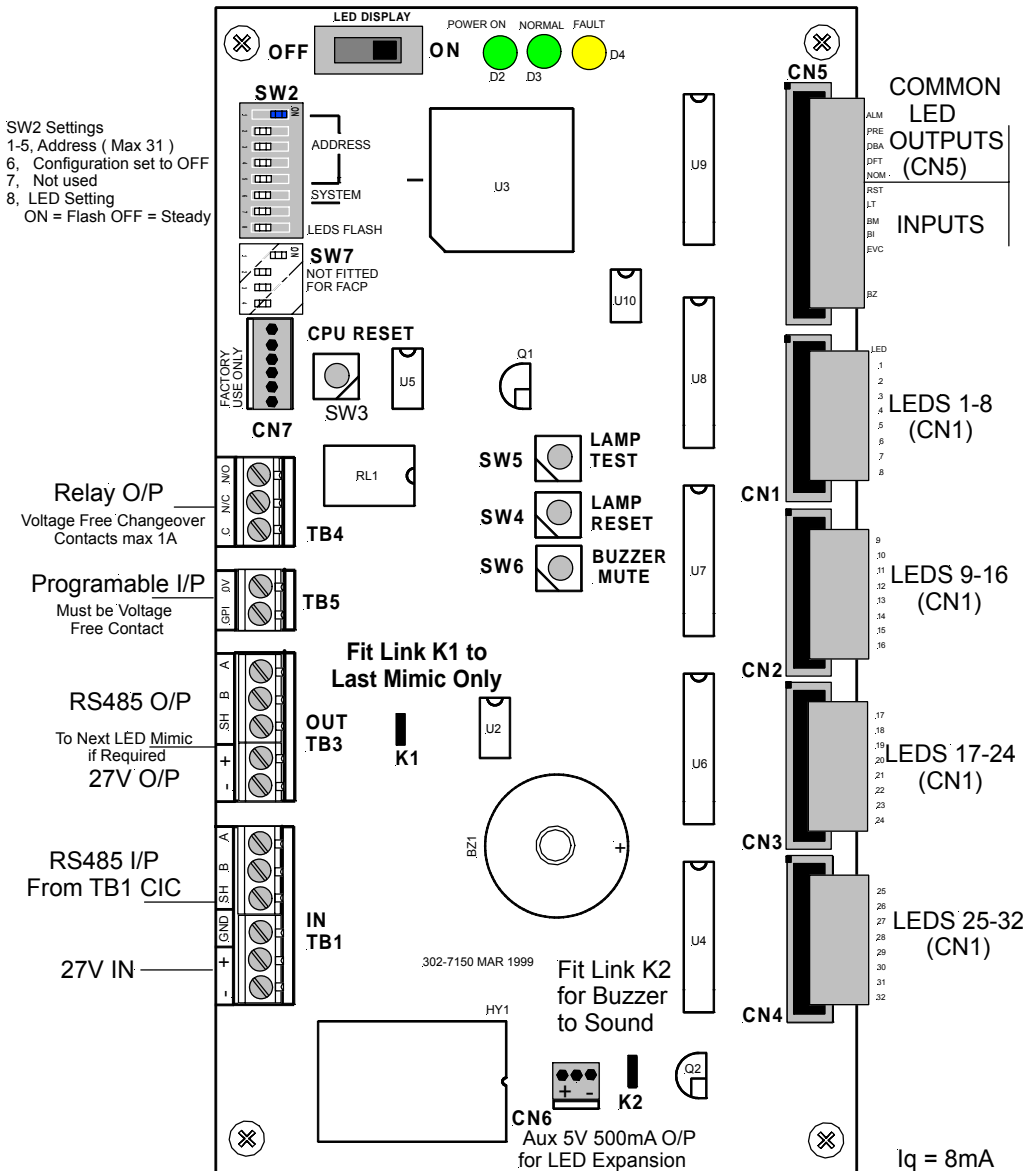


Fig 39: Remote LED Mimic Board

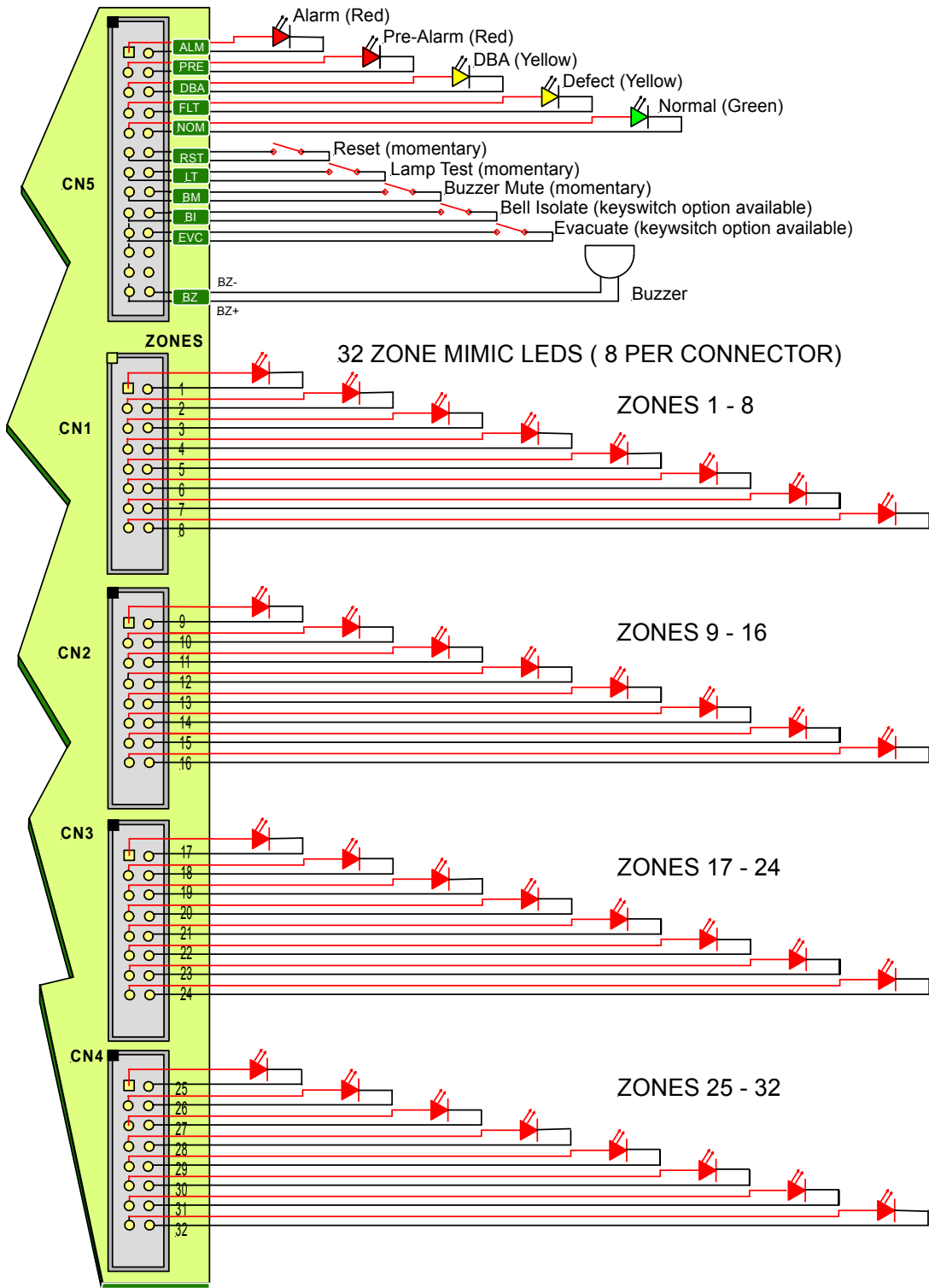


Fig 40: Control and LED Indication Connections

If more than one LED is required per Zone, use the AUX 5V Output to supply the extra current.

6.7 Remote Expansion LED Board

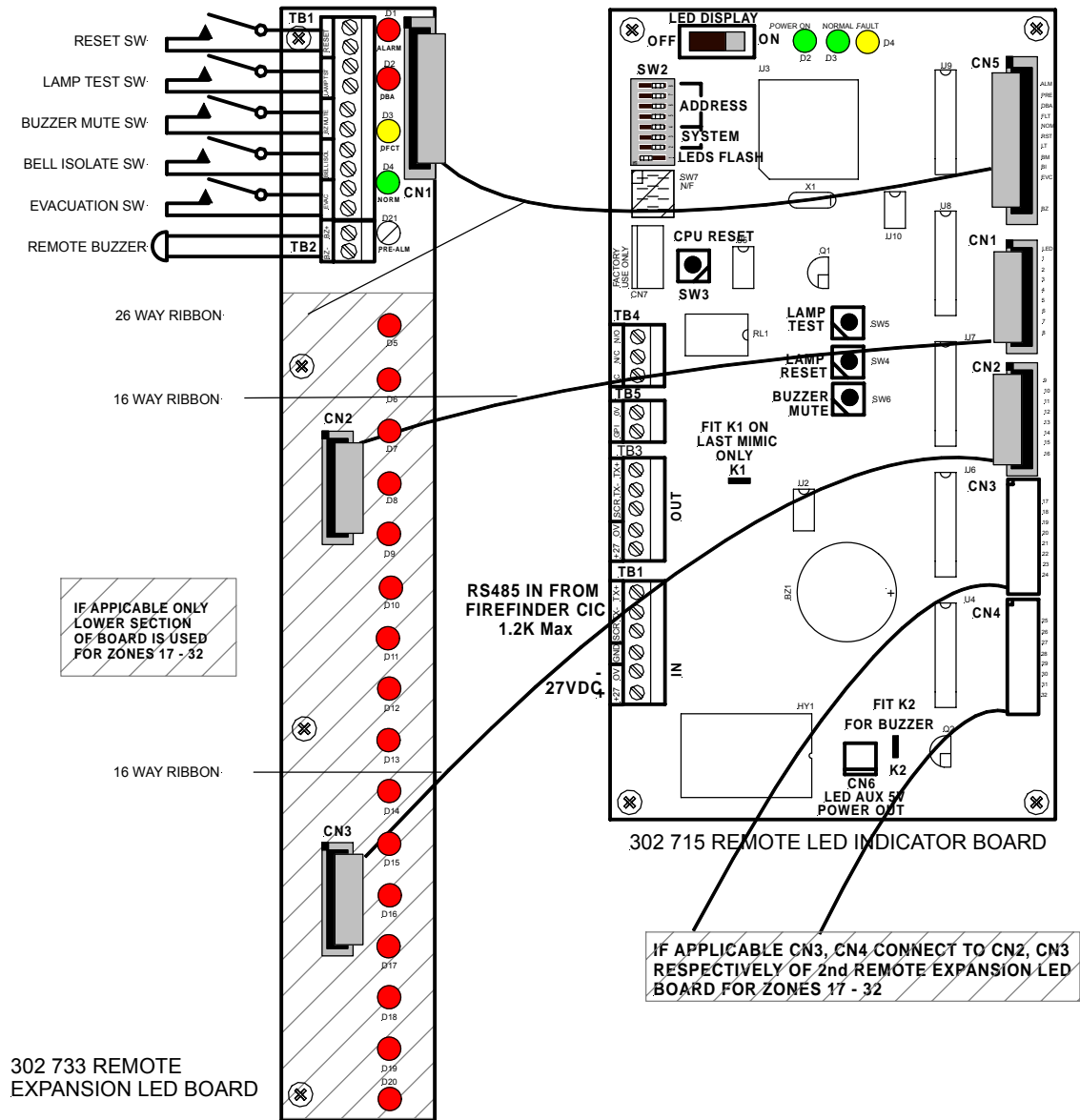


Fig 41: LED Expansion Board Layout and Wiring to the Indicator Board

6.8 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.

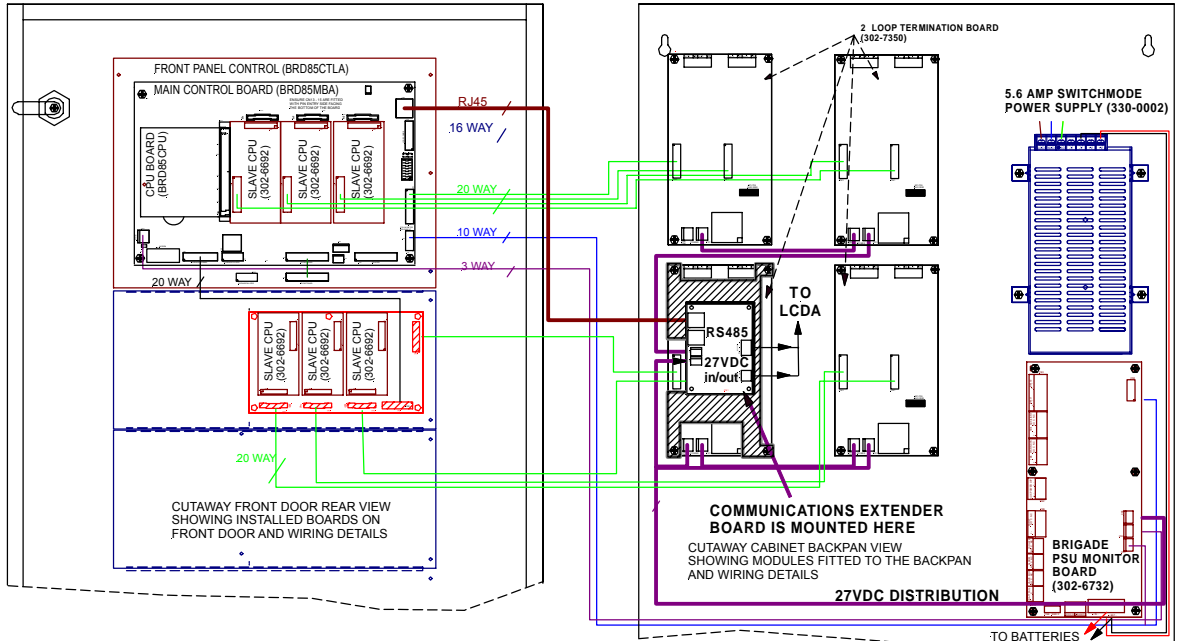


Fig 42: FACP Internal Layout

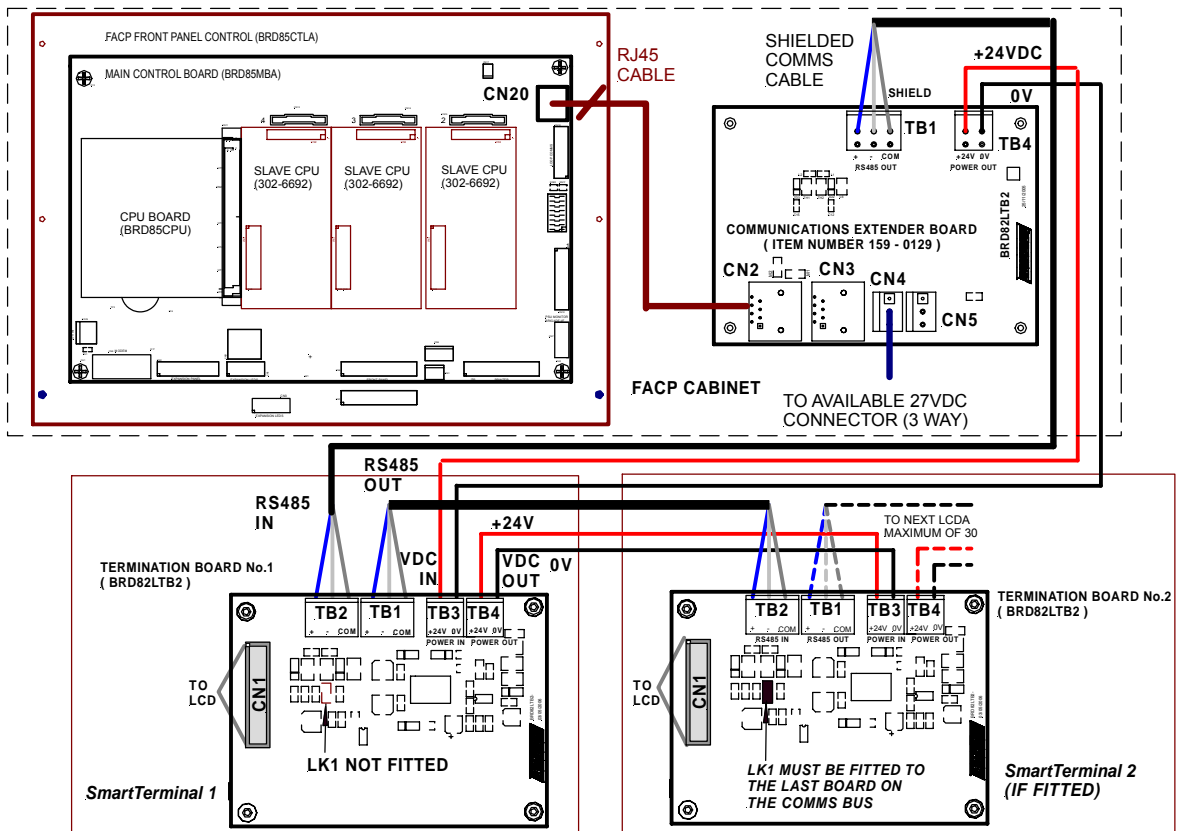


Fig 43: Connecting the **SmartTerminal** to the FACP

7. Control Panel

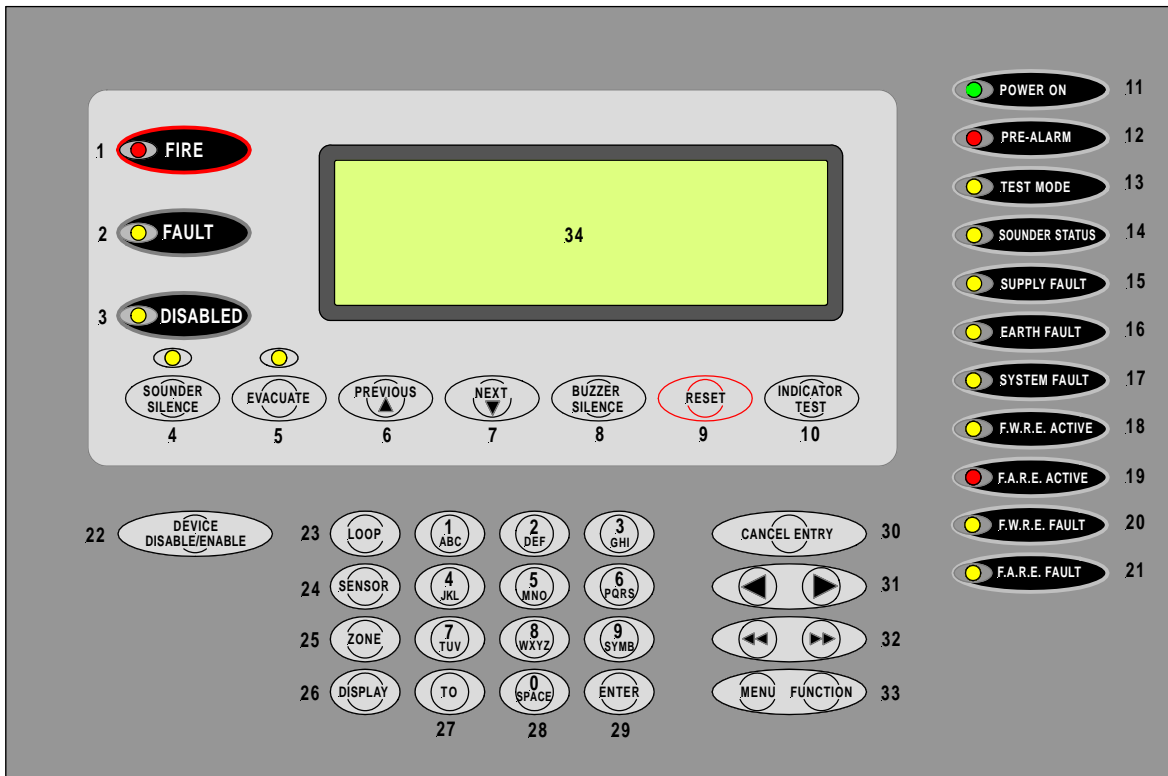






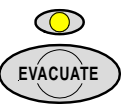










Fig 44: Control Panel Layout










Note: The following defines the numbering next to each function in the above diagram.




- 1.**  **FIRE** **FIRE (steady Red) –**
 This LED will be illuminated if one or more of the devices in a system that have not been disabled have initiated an alarm in the panel.
- 2.**  **FAULT** **FAULT (steady Yellow) –**
 This LED will be illuminated if there are one or more faults on the system. Faults can be caused by:









 - Devices – missing, out of calibration, wrong type, reporting an internal error
 - Loops – short circuit or open circuit
 - Monitored inputs and outputs on loop devices
 - Sounders – missing, wrong type or reporting an internal error
 - Modules within the panel – missing, wrong type or hardware error
 - Main and secondary power supply – see below under power fault
- 3.**  **DISABLED** **DISABLED (steady Yellow) –**
 The LED will be illuminated if any devices or zones in the system have been disabled. The LCD will display the part of the system that has been disabled.
- 4.**  **SOUNDER SILENCE** **SOUNDER SILENCE –**
 Pressing will silence any Sounders connected to the FACP that have been activated by a fire alarm, pressing Evacuate or initiating a Sounder Test. If the sounders are silenced the LED just above the button will be illuminated. A new Fire Alarm or pushing this button again will reactivate the Sounders.

5.  **EVACUATE** –
This button activates all Sounders. The LED will be illuminated when the sounders are active.
6.  **PREVIOUS** –
This button is used to scroll back through the entries displayed on the LCD.
7.  **NEXT** –
This button is used to scroll forwards through the entries as displayed on the LCD.
8.  **SILENCE BUZZER** –
Silences the panel Buzzer which is active under the following conditions;
- Devices: missing, out of calibration, wrong type or an internal error;
 - Loops: short or open circuit;
 - Monitored inputs and or outputs on a loop are in fault;
 - Sounders: missing, wrong type or reporting an internal error;
 - Boards within the panel: missing, wrong type or hardware error;
 - Mains and or secondary power supply.
9.  **RESET** –
Pressing this button will reset the panel clearing any fire alarms and take the LCD display back to its default screen if there are no uncleared faults or disabled devices to be displayed.
10.  **INDICATOR TEST** –
Starts a lamp test. Lamp test tests all indicators and segments of the LCD including the indicators on the General Indicator Board (Zone Alarms).
11.  **POWER ON (Green)** –
This LED is illuminated when AC power is connected to the panel.
12.  **PRE-ALARM (Red)** –
This LED is illuminated when one or more devices are in the pre-alarm state and not disabled.
13.  **TEST MODE (Yellow)** –
This LED is illuminated when the panel is in any of the test modes. Eg alarm, fault, loop, walk test.
14.  **SOUNDER STATUS (Yellow)** –
This LED will flash when there is a fault on the external sounder output and 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 repeating cycle.
15.  **SUPPLY FAULT (Yellow)** –
This LED is illuminated when there is a fault in the main or secondary supplies. Faults are;
- Mains power is not available
 - The output voltage is too low (typically 26 volts)
 - The output voltage is too high (typically 28 volts)
 - The battery is not connected properly or has failed.

16.  **EARTH FAULT (Yellow) –**
The LED is illuminated if there is a connection detected between the panel's 0V rail and earth.
17.  **SYSTEM FAULT (Yellow) –**
This LED is illuminated if there is a failure of the main processor in the fire panel or if there is a missing / incorrect type of Board fitted to the system.
18.  **FWRE ACTIVE (Yellow) –**
The LED is illuminated when the FWRE output has been activated.
19.  **FARE ACTIVE (Red) –**
The LED is illuminated when the FARE output has been activated.
20.  **FWRE FAULT (Yellow) –**
The LED is illuminated when the FWRE output is in fault.
21.  **FARE FAULT (Yellow) –**
The LED is illuminated when the FWRE output is in fault.
22.  **DEVICE DISABLE / ENABLE –**
This button is used to disable / enable devices and loop based sounders. When the control is activated without any other control being active and the device is displayed on the LCD, then the device can be toggled (switched) between disabled and enabled.

The *loop*, *sensor* and *to* keys can be used in conjunction with the *disable/enable* key to disable/enable a range of devices on a loop.

The *zone* and *to* keys can be used in conjunction with the *disable/enable* key to disable/enable a range of zones. Zones consist of one or more devices. The devices can be from different loops.
23.  **LOOP –**
The LOOP key is used in conjunction with the *DEVICE* and *TO* keys to specify a device / range of devices. Press this button followed by a number to select the loop you wish to access, eg LOOP 4. See also the *DEVICE ENABLE / DISABLE* and *DISPLAY* key explanation.
24.  **SENSOR –**
The *SENSOR* key is used in conjunction with the *LOOP* and *TO* keys to specify a device or range of devices.
25.  **ZONE –**
The *DEVICE* key is used in conjunction with the *TO* key to specify a Zone or range of Zones.

- 26.  DISPLAY –**
The *DISPLAY* key is used to display the status of detectors and loop based sounders.
- The *loop* and *sensor* keys can be used in conjunction with the *display* key to display the status of a nominated device on a loop.
- The *zone* key can be used in conjunction with the *display* key to display the status of the first device allocated to the selected zone
- 27.  TO –**
Use this button to access a range of devices. Eg, 1 TO 7, - 7 TO 14.
- 28.  THE ALPHA/NUMERIC BUTTONS –**
These buttons are used to navigate around the panel's menus.
- 29.  ENTER –**
Press the ENTER button when prompted to enter data.
- 30.  CANCEL ENTRY –**
The CANCEL ENTRY button is used to delete any data in the current field or return to the previously displayed menu.
- 31.  SINGLE ARROW BUTTONS –**
These are used to move the cursor back and forth when entering data into a field.
- 32.  DOUBLE ARROW BUTTONS –**
These are used to move between fields when entering data.
- 33.  MENU / FUNCTION –**
Pressing the **MENU** button will display the main menu on the LCD. The menu selections are ALARMS, PRE-ALARMS, FAULTS, DISABLES, STATUS, TEST and PRINTER.
- The STATUS selection can display LOOPS, BOARDS, POWER SUPPLY BRIGADE, INPUT / OUTPUT, NETWORK, SYSTEM and AVALUES.
- Similarly pressing the **FUNCTION** button will display the Function menu on the LCD. The Function selections are dependent on the level of access granted to an operator. The highest level selections are DATE, TIME, DAYNIGHT SETTINGS, LOGS, TESTS, INPUT / OUTPUT and ACCESS to PROGRAMMING and PASSWORD.
- 34. LCD DISPLAY –**
This screen can be configured with a name, the servicing companies name and phone number, system status, the current date, time and that the system is normal (no faults and fire alarms).
- If there are any faults or fire alarms the LCD will display the device in question, (the clock will also display the time of the 1st fire alarm) if multiple devices or zones are not in their normal state, the PREVIOUS and NEXT buttons are used to scroll through them.

IMPORTANT NOTE:

It is strongly advised that all field changes or programming of a *FACP* should be properly recorded.

8. Functions and Menus**8.1 The Default LCD Display**

In its normal state the display screen will be similar to that shown below.

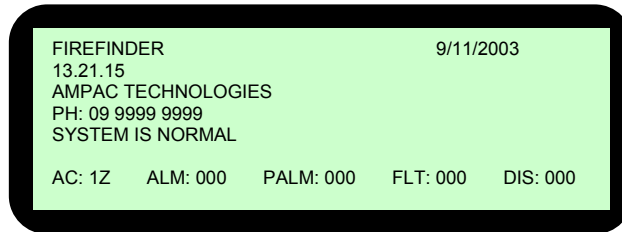


Fig 45: The Default LCD Display

This screen can be configured with the servicing company's name and phone number via a laptop or modem. The current date, time, system status, access levels (**AC**) and Mode, **S**ensor or **Z**one (set to default to Zone), total number of alarms (**ALM**), Pre-alarms (**PALM**), Faults (**FLT**) and Disable (**DIS**) is also displayed.

8.2 Accessing Functions and Menus

From the **DEFAULT DISPLAY**, press **MENU** or **FUNCTION**.



The Programming and Password editing features are password protected (actually a pass-number as it can only contain numbers) to prevent unauthorised access to the panel's configuration. A new panel has a pre-programmed password of **3333**. Once the customer takes control of the panel the password can be changed to suit their requirements.

Once entered and validated it is possible to access the panel's Functions.

 **Note:** All menus are provided with screen prompts to guide the operator through the operation.

8.3 Function Menu And Access

On site Function programming and changes to the password are only available once a password has been entered through the **ACCESS** Menu. If the **ACCESS** Menu is selected the operator will be prompted with a message on the LCD to enter a password. If the password is;

- entered correctly a message will be displayed which indicates the password has been validated and the operator is free to manipulate the selections offered;
- entered incorrectly a message will be displayed to that effect and access will be denied;
- not entered within 2 minutes the display will return to the show the default screen.

9. The Main Menu

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

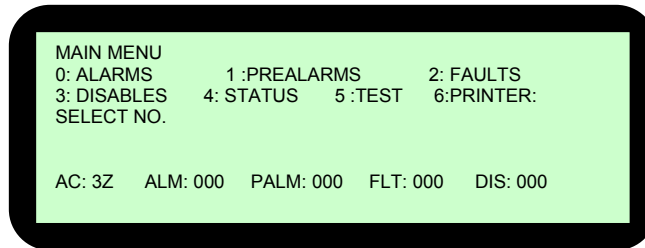


Fig 46: The Main Menu

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

① **FIRE ALARMS**

① **PRE-ALARMS**

② **FAULTS**; if a fault occurs pressing ② brings up a sub-menu from which a more detailed description of the Fault will be displayed (① – ⑥) on the LCD; or

① Zones Device	① Loops	② Modules	③ Power Supply	④ Brigade	⑤ Test Failures	⑥ Sounder
-------------------	---------	-----------	-------------------	-----------	--------------------	-----------

③ **DISABLE** on the system.

If there are no alarms, pre-alarms, faults or disables, a message to that effect will be displayed for approximately 1 to 2 seconds.

9.1 Status Menu

④ is pressed to access the STATUS MENU.

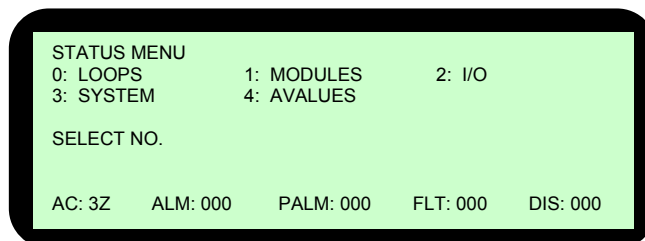


Fig 47: The Status Menu

From the STATUS MENU the status of all of the system components and settings listed below can be displayed.

Press

① **Loops**: Enter the loop number and the LCD will display its status.

① Press to print all devices on the loops (Press RESET to stop printing)

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

① **Modules**: Select the type of Module, that is press ① for Slave or ① for Power Supply or ② for Brigade or ③ for External LED Mimic then either follow the screen prompts as requested on the LCD or read off the information on the screen, eg Charger voltage / status, Battery detect and Mains status.

② **I/O**: The FACP can display the status of an input or output on a loop.

Enter the loop and device number and the input or output on that device.

Once entered the LCD will then display a description of what that input or output does and its current state.

③ **System:** is pressed to access SYSTEM STATUS

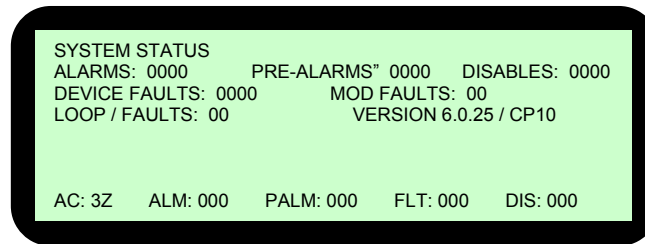


Fig 48: *System Status Screen*

Displayed on the screen will be the number of alarms etc.

A values:

④ is pressed to access AVALUES. Enter the Loop Number then **ENTER** then Device number then **ENTER** Showing on the one screen will be;

- a) the description of the detector
- b) the type of detector
- c) its state and the Raw Analogue Value.

9.2 Testing Menu

⑤ is pressed while in the Main Menu to access the TESTING MENU. From here the following can be tested:

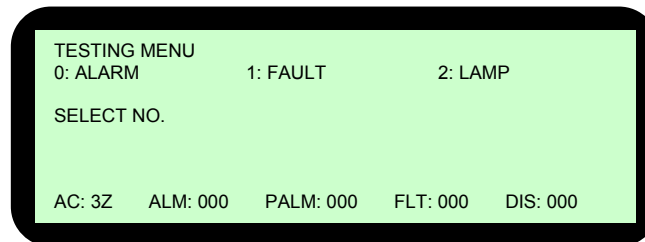


Fig 49: *The Testing Menu*

9.2.1 Alarm Test

① Alarm tests either a zone or a device or a range of zones or devices. (This test will force a device to go to the Alarm State).

9.2.2 Fault Test

① Fault tests either a zone or a device or a range of zones or devices. (This test will force a device to go to the Fault State).

Once the above tests have been completed the TEST COMPLETE screen will appear. Each ALARM and FAULT that was detected can be viewed on the screen by scrolling through them using the NEXT and PREVIOUS buttons.

9.2.3 Lamp Test

② Will flash the LED's in sequence on the front panel and illuminate the various segments on the LCD display.

9.3 Printer

⑥ If pressed will present a screen where by when pressing ① the operator can force the printer to GO OFF-LINE or be ON-LINE by pressing ① again. Pressing ① sets the printer to print in the Normal Mode, pressing ① again will return the printer setting to print in the Alarm Mode only.

10. Functions

The FUNCTIONS MENU is accessed by FUNCTION.

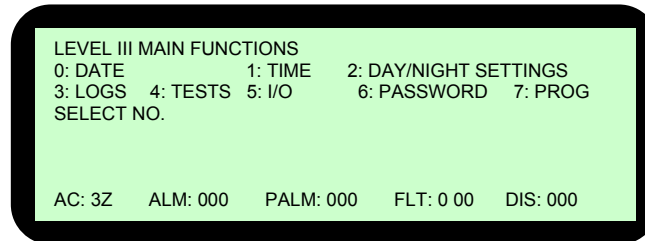


Fig 50: The Level III Functions Menu

10.1 Setting the Function Date Facility

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 18/06/2003), key in and press **ENTER**. The screen will then return to the **MAIN FUNCTIONS MENU**.

10.2 Setting the Function Time Facility

Press

① while in the **MAIN FUNCTIONS MENU** 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 Day Night Facility

Press

② while In the **MAIN FUNCTIONS MENU** The **DAY-NIGHT SETTINGS** screen will appear.

Press

① to enter the **DAY ON** time then **ENTER** and,

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

To enter this mode the function must be **ENABLED**, press ② Re-pressing ② will **DISABLE** the DAYNIGHT function.

10.4 Function Logs Facility

Press

③ while in the **MAIN FUNCTIONS MENU** and the **EVENT LOG MENU** will appear.

The **LOGS MENU** functions allows the operator to select and view the events of all;

- ① **ALARMS**
- ① **FAULTS**
- ② **DISABLES**
- ③ **SYSTEM**
- ④ **I/O**

Press ①, ① or ② and the date and time of the ALARM, FAULT or DISABLE as well as the device information will be displayed. This screen also allows the operator to select two other facilities;

Press

① **PRINT ENTRY** will print out the displayed information If a panel printer is installed, or



① **SHOW OPTIONS** allows the operator to view how the Logs are viewed.

Press

① **VIEW BY ENTRY NUMBER** or ① **VIEW BY DATE**. In each case the screen will ask for the appropriate information (ENTRY NUMBER or DATE) to be entered before anything can be displayed.

Pressing ③ will display any System information, the Watchdog Count and offer the same ①, ① as above.

Pressing ④ will display the I/O information and offer the same ①, ① as above.

The Previous  and Next  keys are used to scroll through the logs, the maximum number being 2,000

10.5 The Function Test Facility

Press

④ To enter this Function (**TESTS**).

The resulting screen is the TESTING MENU and prompts the operator to select the type of test they wish to perform, the ① **WALK** test or the ① **LOOP** test.

① **WALK TEST**; again the operator will be prompted to select either a **ZONE** or **DEVICE TEST**.

① **WALK TEST MENU ZONE**;

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

The **TEST MODE LED** will be illuminated for the duration of the test. The test will run until it times out after 30min. or until the operator **RESETS** the system.

① **WALK TEST MENU DEVICE**

This screen requires the operator to select a and then a or number of devices (using the TO key) to be tested then pressing to start the test.

The **TEST MODE LED** will be illuminated for the duration of the test. The test will run until it times out after 30min. or until the operator **RESETS** the system.

① LOOP TEST

This screen 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.



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 while in the MAIN FUNCTIONS MENU to display the Manual I/O Control menu

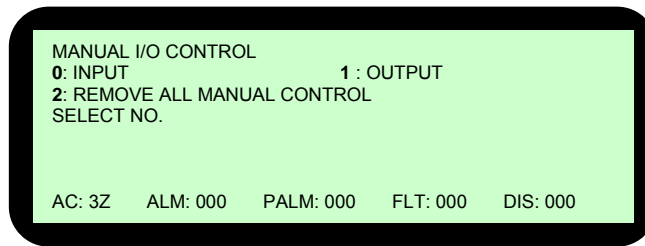


Fig 51: The Manual I/O Control Menu

MANUAL I/O CONTROL

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

① Input Selected:

① **ON A LOOP:** Enter the **loop number**, the **device number** and the **input number**. This will display the description for the input and its current state, you can then turn the input OFF (Press ①) or ON (Press ①) or remove manual control (Press ②).

① **Remove All Manual Input Control:** Will remove all manual input control.

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

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

10.7 Function Passwords

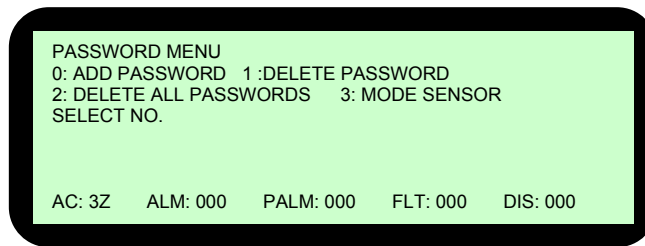


Fig 52: The Password Menu

Press

⑥ while in the Main Functions Menu to display 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 **Mode:** If SENSOR is displayed the FACP will be in the default setting ZONE MODE (the LCD indicates the FACP's next MODE option is the SENSOR MODE. To alter the setting to SENSOR press ③.

Note 1: If an un-zoned device goes into alarm the alarm will not appear on the LCD but the Alarm LED will be illuminated. To display the alarmed device go to MODE and alter the setting to SENSOR, the alarm condition will then be displayed. Remember to return the setting to ZONE before returning the system to normal.

Note 2: If an LCD Repeater is installed on the system it is defaulted to the SENSOR MODE hence the repeater LCD will display the alarm (and the LED will be illuminated) even though the FACP LCD does not.

10.7.1 Forgotten Passwords

If you have forgotten your password,

- a.** enter 9999 into the password field;
- b.** Take note of the 4 digit password button displayed on the screen;
- c.** contact the Ampac head office and quote this number;
- d.** a temporary password will be issued to allow access to the level 3 functions
- e.** a new password can now be programmed.

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

10.8 Function Programming

10.8.1 Conventional Zone Programming

Press

⑦ while in the Main Functions Menu to display the Password Menu.

Press

① **Zone:**

Key in the zone number and enter or change the description (**DESC**) by pressing the numeric buttons multiple times to access characters while at the same time using the move left, move right



buttons to move the flashing underline cursor.

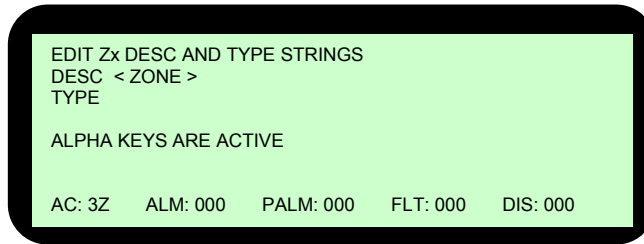


Fig 53: *Zone Description & Type Programming*

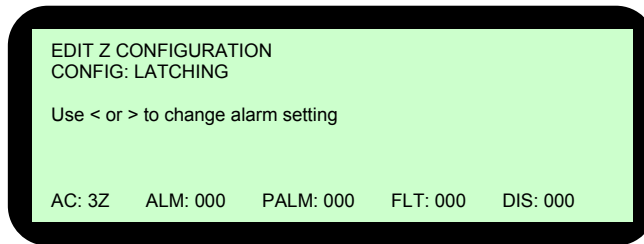


Fig 54: *Zone Configuration Latching / Unlatching*



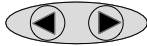
Press to move to the **TYPE** field or edit the information.



Press to move between fields use the reciprocal button



By going through all the fields a second screen can also be accessed to show the Output options. Press to step through these fields.



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

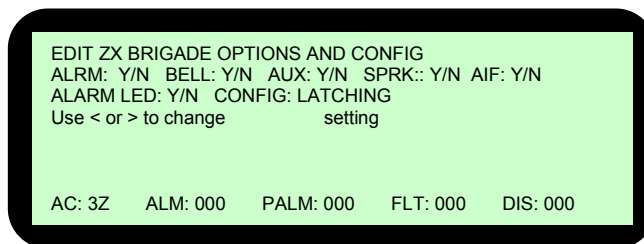


Fig 55: *Brigade Options*

Use and / 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.

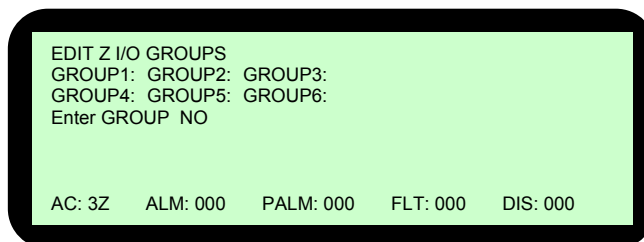


Fig 56: *Zone I/O Groups*

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 ie: DESC & TYPE and NEXT PARAMETER SETTING

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

Press **or** Press

0 to **EDIT** or **1** to **DELETE**

1. EDIT LxSx DESCRIPTION AND TYPE STRING. Edit then press

eg: **DESC** **Loop 1 Sensor 1**
TYPE **SMOKE**

2. Allocate / Edit the Sensor to a Zone and set the device type then press.

eg: XP95 Photo, XP95 Heat etc-

3. Set /Edit and display the Output Configurations or options then press.

eg: Latching, AVF, Non-latching etc

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

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

10.8.3 Input Programming

Press

2 **INPUT:**

By following the screen prompts and moving through the screens as above Edit or Delete an **INPUT** in a panel or a loop.

Screen: PROGRAM MENU SELECTING AN INPUT

0 **IN A PANEL**
I/O MODULE

1 **ON A LOOP**
LOOP

5. Allocates / Edits the Loop and Sensors Groups.

Select I/O MODULE **NO.** then **ENTER**

INPUT

Select I/P NO then **ENTER**

EDIT / DELETE DESC

ALPHA KEYS ARE ACTIVE

Select **LOOP NO.** then **ENTER**

SENSOR

Select **SENSOR NO.** then **ENTER**

INPUT

Select **INPUT NO.** then **ENTER** key
EDIT LxSxI/Px DESC STRING DESC

10.8.4 Output Programming

Press

③ OUTPUT:

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

10.8.5 Sub Address

Press

⑤ Sub Address lets the operator EDIT or DELETE the address of an IO device on a Loop.



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

Select the LOOP, then **ENTER**, SENSOR, then **ENTER** then the SUBADDRESS (eg 1, 2 or 3 for 3IO device), or press **0** to EDIT or press **1** to DELETE.

Editing

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

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

10.8.6 Watchdog

Press

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

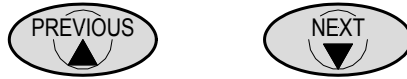
11. Incoming Fire Alarm Signal

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 buzzer. (optional)
- Will activate any ancillary equipment so programmed.
- Will abort any test in progress.

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

If there are any faults or fire alarms the LCD will display the device in question in the top screen, if multiple detectors or zones are not in their normal state, the



buttons are used to scroll through them.

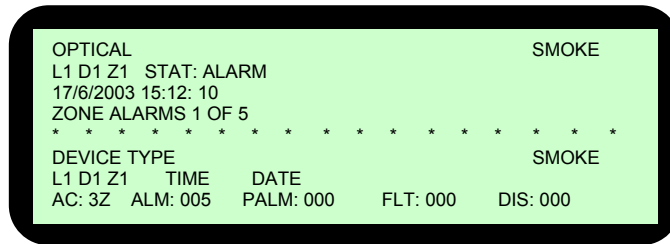


Fig 57: LCD Screen With 5 Sensors In Alarm



Notes:

1. The top half of the screen can be scrolled through to view any other alarms.
2. The lower half of the screen displays the alarm / activity in the last.

If there is a fault condition or a fire alarm and the buzzer is sounding, press the button to silence the Buzzer.



12. Accessing a Loop, Device or Zone

LOOP OR DEVICE

1. From the default display, press **LOOP**
2. Enter the **loop number** you wish to interrogate then press **DEVICE**.
3. Press the button for the **device number**.
4. Press the **TO** button if you wish to access a range of devices on the loop,
5. Press the **DISPLAY** button if you wish to display the status of a device,
6. Press the **DEVICE DISABLE / ENABLE** button if you wish to disable a device
7. Press the **DEVICE DISABLE / ENABLE** button again to enable a device.

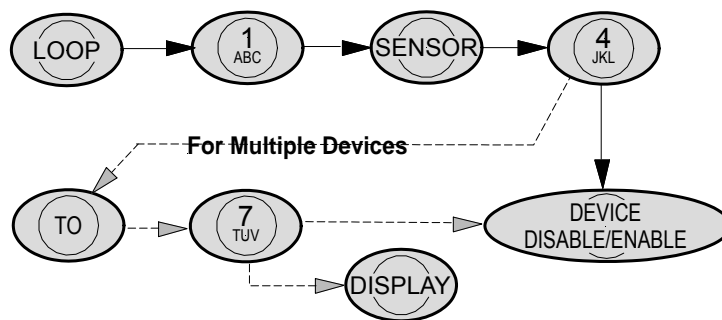


Fig 58: Accessing Sequence

ZONE

1. From the default display, press **ZONE**
2. Press the button for the **zone number**.
3. Press the **TO** button if you wish to access a range of zones,
4. Press the **DISPLAY** button if you wish to display the status of a zone,
5. Press the **DEVICE DISABLE / ENABLE** button if you wish to disable a zone
6. Press the **DEVICE DISABLE / ENABLE** button again to enable a zone.

13. Troubleshooting Chart

Problem	Solution
No Mains Power	Check mains Fuse
Supply fault LED illuminated	Check Fuse 1 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 Make sure nothing is plugged into the Programming / Debug Port, eg. Laptop, PC
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 the FACP still displays Maintenance Alarm	Perform a Loop Test on the Loop on which the device is fitted.
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	Perform a loop test to clear the fault. This is a level 3 function.
Can not access Function menu	Incorrect Password entered
Forgotten password	Ring the manufacturer 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

14. Binary Address Setting

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

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

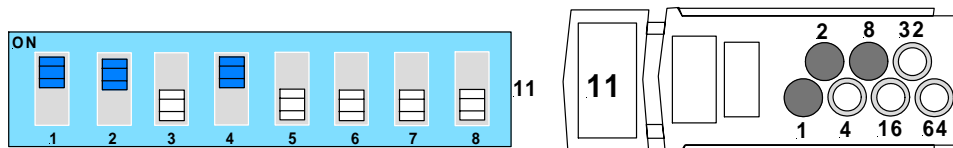


Fig 59: Example of Addressing Switch Set and Detector Tag Set to 11

15. 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
FACP :	FIRE ALARM CONTROL PANEL
FDS :	FIRE DETECTION SYSTEM
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
PCB :	PRINTED CIRCUIT BOARD
P/S :	POWER SUPPLY
PSM :	POWER SUPPLY MODULE
REM :	REMOTE
SPOT :	SINGLE PERSON OPERATING TEST
TB :	TERMINAL BLOCK
VDC :	DIRECT CURRENT VOLTS

16. 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 initiate master alarm facility (MAF), or ACF functions inadvertently. Using the configuration manager prior to downloading to the FACP sets this option

Alarm zone - the specific portion of a building or complex identified by an 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 emergency 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 Board connector to indicate the disconnection of the Board.

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

Factory connections - are connections made during manufacture and should not require any field alterations.

Field connections - are connections made to FACP or ancillary equipment at the project 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.

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 Boards.

Master Alarm Facility (MAF) - that part of the control and indicating 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 where appropriate. Bells and other ancillary functions may be initiated from this facility.

Power Supply - that portion of the control and indicating equipment (FACP) which supplies all voltages necessary for operation of the FACP.

17. 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 more simple 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.

17.1 Regular Testing And Inspection

17.1.1 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.

17.1.2 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:

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

17.1.3 Weekly test

The following tests and checks should be made every week:

- (a) 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

- (b) Check the battery voltage and conditions;
- (c) 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);
- (a) The person carrying out the test should record in the log any fault(s) identified and that the above test has been carried out.

17.1.4 Monthly test.

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

- (a) Simulate fire conditions on all alarm zones and reset the system to normal. Confirm with the monitoring station when the test has been completed.
- (b) Check battery voltage and charging current in accordance with the manufacturer's instructions.
- (c) 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
- (d) Check condition of battery cabinet for corrosion and to ensure that batteries are stored in a secure condition.
- (e) Check to ensure that all indicating lights are operating correctly and replace if faulty.
- (f) Check operation of all alarm sounders.
- (g) Disconnect the battery supply and ensure that the visual and audible fault signals are activated at the main alarm panel.
- (h) Simulate main power supply failure and ensure that the system will operate correctly with the standby battery power supply.
- (i) 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.
- (j) Simulate fault conditions on all alarm zones to ensure that the main alarm panel is operating correctly.
- (k) Check that the main alarm panel is in a clean and operative condition.
- (l) Visually inspect the condition of components, terminations and cables.
- (m) 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.
- (n) Check that all switches are returned to their operating position after the test.
- (o) The person carrying out the test should record in the log any fault(s) identified and that the above test has been carried out.

17.1.5 Annual test

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

- (a) 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:
 - (i) the testing of a detector in-situ; or
 - (ii) the removal of a detector and its replacement by a detector which has been checked and calibrated by the supplier.
- (b) Circuits requiring automatic voltage regulated supplies should be checked to ensure correct operation and voltage output.
- (c) 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.

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

18. Quick Reference Guides

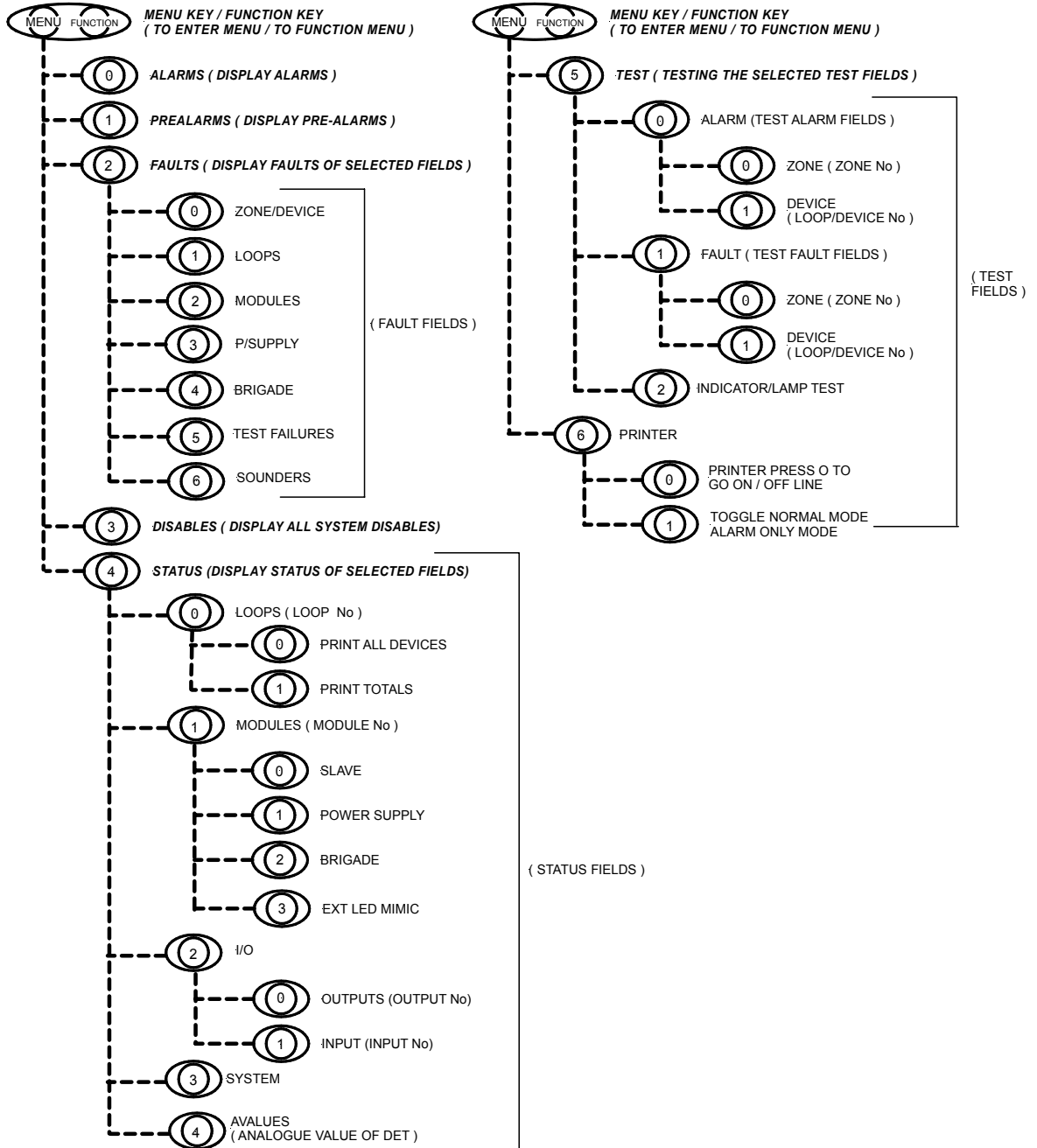


Press

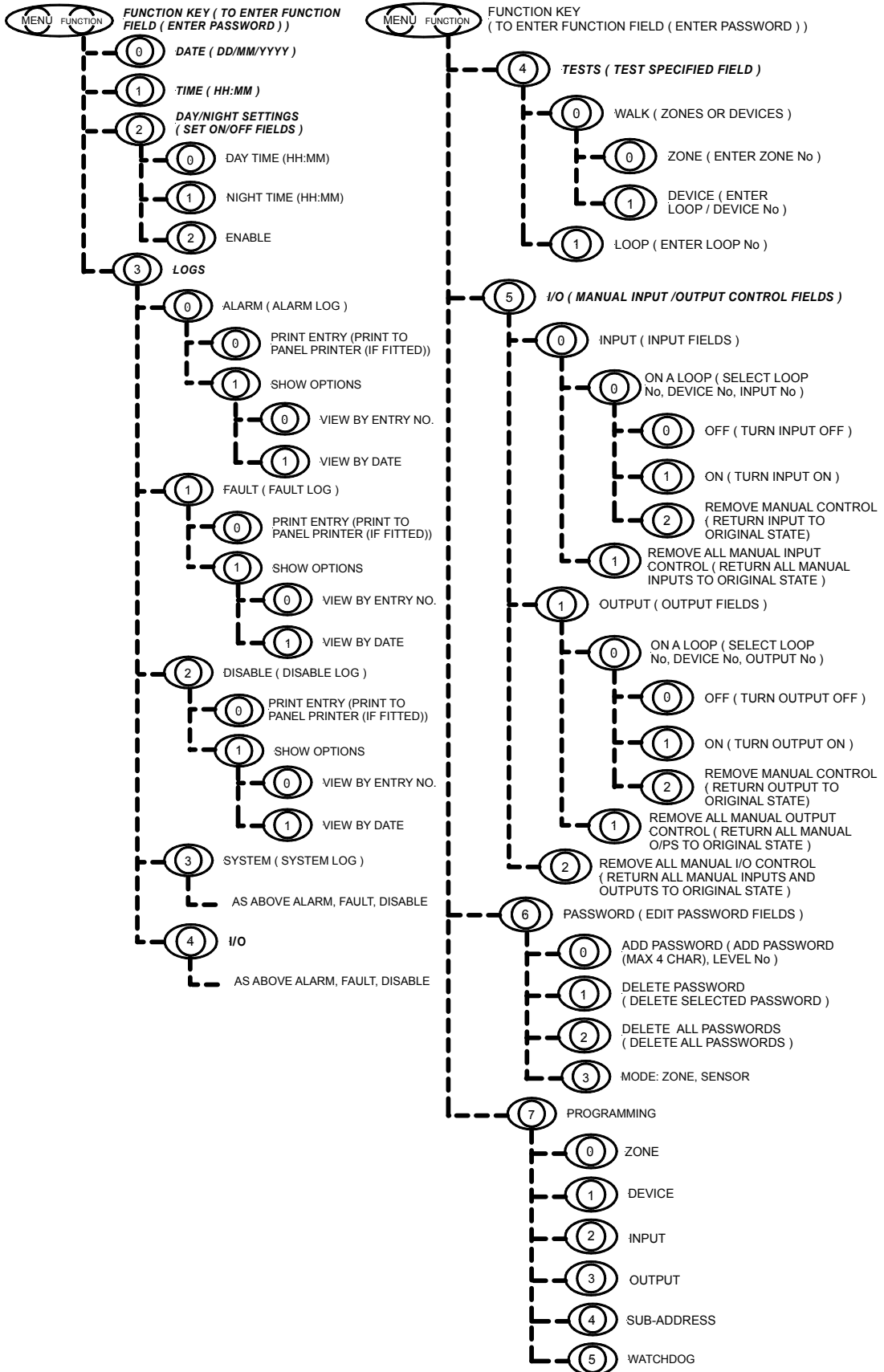


Quick Reference

MAIN MENU OPTIONS



FUNCTION MENU OPTIONS





www.ampac.net

AUSTRALIA
AMPAC TECHNOLOGIES PTY LTD
97 Walters Drive
Osborne Park 6017
Western Australia

Tel: 61 8 9242 3333
Fax: 61 8 9242 3334
Email: info@ampac.net

EUROPE
AMPAC EUROPE LTD.
Unit 18 West Moor Park,
Networkcentre
Doncaster
England DN3 3GW

Tel: 44 (0) 1302 833 522
Fax: 44 (0) 1302 835 021
Email: info.eu@ampac.net

NEW ZEALAND
AMPAC INDUSTRIES LTD.
Unit 4 101 Diana Drive
Glenfield, Auckland
New Zealand

Tel: 64 9 443 8072
Fax: 64 9 443 8073
Email: info.nz@ampac.net



UNCONTROLLED DOCUMENT

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