

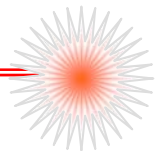


Installation

&

Commissioning

PLUS
ZoneSense



AS4428 Part 1

Fire Alarm Control Panel

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

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1 Non Disclosure Agreement

This contract has been entered into by the person or company user of this document (hereafter called the Trader) and AMPAC Technologies (hereafter called AMPAC) of 97 Walters Drive, Osborne Park Western Australia 6017. Under terms and conditions as specified hereunder.

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

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

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

1. The Trader shall hold in trust and confidence, and not disclose to any person outside its organisation, any Proprietary information which is disclosed to the Trader by AMPAC under this Agreement. Proprietary Information disclosed under this Agreement may be used by the Trader only for the purpose of carrying out work on or with AMPAC supplied equipment and may not be used for any other purpose whatsoever.
2. The Trader shall disclose Proprietary Information received by AMPAC under this Agreement to persons within its organisation only if such persons are legally bound in writing to protect the confidentiality of such Proprietary Information.
3. The undertakings and obligations of the Trader under this Agreement shall not apply to any Proprietary Information which :
 - i. Is disclosed in a printed publication available to the public, is described in patent anywhere in the world, or is otherwise in the public domain at the time of disclosure;
 - ii. Is generally disclosed to third parties by AMPAC without restriction on such third parties;
 - iii. Is shown by the Trader to have been in its possession prior to the receipt thereof from AMPAC;
 - iv. Is approved for release by written authorisation of AMPAC; or
 - v. Is not designated by AMPAC in writing or by appropriate stamp or legend to be of a secret, confidential or proprietary nature.
4. This Agreement will be binding upon and inure to the benefit of the parties hereto, and their respective successors and assigns.
5. This Agreement, and all rights and obligations hereunder, shall expire on the 10th anniversary of the date of issue of this document.

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

2 About This Manual

2.1 Purpose

This manual is an instructional tool for the installation and commissioning of the **ZoneSense PLUS** Fire Alarm Control Panel (FACP). Once the FACP has been installed refer to the Programming and Operation manual for instructions on how to program the FACP to the installation.

2.2 Scope

The information within this manual is only available to and for the use of personnel engaged in the installation and commissioning of the **ZoneSense PLUS** FACP.

ZoneSense PLUS has been designed 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/s they undertake;
2. be aware this manual should be read prior to the installation and commissioning of the **ZoneSense PLUS** FACP;
3. observe anti-static pre-cautions at all times; and
4. if a problem is encountered or there is any doubt with respect to the operational parameters of the installation, the supplier should be contacted.

2.3 References

ZoneSense PLUS Technical Manual

ZoneSense PLUS Operation and Programming

Apollo Detector / Device Manuals

Ampac Product Data Sheets

Australian Standard AS4428



Figure 1: Examples of the ABS cabinet and a special optional metal cabinet fitted with Fire Fan and Agent Release Cards

3 Specifications

Mechanical

Dimensions Metal Cabinet: (mm)	500H x 405W x 145D
Dimensions ABS Cabinet: (mm)	300H x 360W x 100D

Note: A battery box is available should either model be optioned to capacity.

Environmental

Temperature:	-5°C to + 55°C
Humidity:	25% to 75%

Mains Input

Input Voltage:	90 - 264VAC
Protection (Quick Acting Fuse):	1.25 Amp M205
Minimum Cable Requirements:	Not less than 0.75mm

Power Supply

Voltage: (Set to 27.2V)	27.5VDC +/- 0.1VDC
Power Supply Ripple Voltage:	100mV
Power Supply Regulation:	2%
Power Supply Fault Indication (at room temperature)	Volts High 28VDC Volts Low 26.5VDC
Power Supply Output Current:	2Amps
Protection:	Current Limiting 4Amps

Batteries / Battery Charger

Charger O/P Voltage: (@ 25 °C	27.3 +/- 0.1VDC
Battery Type: Sealed Lead Acid	2 x 12V Sealed Lead Acid
Maximum Battery Capacity:	7AH - 12AH for metal cabinet
Maximum Charger Current Limited:	400mA
Battery Supply Current Limited:	3A (PTC)
Battery Discharged Cut-off Voltage:	21VDC

Main Card

Quiescent Current (Iq) (Add 8mA / zone for 3K3 EOL)	25mA
Iq plus Zone 1 in Alarm	90mA
Maximum Current Draw per Output (Current Limited)	500mA

Zones

Maximum Number of Devices per Conventional Zone:	40 max
Cabling Requirements:	2 core 1.5 to 2.5mm ²
Fault monitoring:	O/C, S/C, (EOL default = 3K3)

Outputs

Alarm (Current Limited)	24VDC @ 500mA Max
Alarm / Fault Monitored Open Collector (Current Limited)	24VDC @ 30mA Max
Alarm Fault Relay Contacts	24VDC @ 1A
Auxiliary VDC	24VDC 500mA Monitored

Inputs

MCP, Door Switch and Fault	0VDC Closing Contact
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Communications

Internal to FACP	RS485
External to FACP	RS485

4 Overview & Key Features

The **ZoneSense PLUS** 4 and 8 zone FACP complies with the highest level of approval for any applicable code and can be connected to an appropriate Fire Service monitoring facility.

As a Minimum, the conventional panel meets the following Standards;

1. AS4428
2. AS4214



Note: Only devices compatible with **ZoneSense PLUS** should be used in an installation. These are listed in this document.

4.1 Features

- The front panel 8 x 2 line LCD, navigation keys ◀ ▶ ▲ ▼ and the Menu/Enter keys allow the **ZoneSense PLUS** to be programmed “on site”. The same LCD and keys are also used for panel operation and interrogation.
- Four monitored conventional Alarm circuits.
- Two optional auxiliary input connections.
- Two open collector outputs (fire and fault).
- Two relay outputs (ancillary and fault).
- Optional external buzzer or reset output.
- System expansion capabilities / options:
- Password entry to a wide range of programming and diagnostic functions which include;
 1. Zone configurations;
 2. MCP Zone assignment;
 3. Default display; and
 4. Zone labels;
- A wide range of secure user functions. This includes the ability to isolate / de-isolate a large number of system functions.
- Flush or surface mountable enclosure. A surround is required for the metal cabinet
- Controls have tactile and audible feedback of operation.
- All terminals cater for 2.5mm cables.

5 Mechanical

The basic **ZoneSense PLUS** is available in a metal or ABS cabinet and consists of a;

1. Main Card, with all controls and indicators mounted directly onto it;
2. a switch-mode power supply;
3. 2 X 12 Volt batteries connected in series.
4. 2 X ABS and / or 003 keys

All of which are easily removed should it be necessary.

Inside the door is a matrix label for the recording of the panel configuration. (See Section 23)

The front door of the ABS version is locked by way of;

1. 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. The other end of this key is used to lever out the clip in surrounds of the optional front panel cards; or
2. normal key operation using the 003 keys.

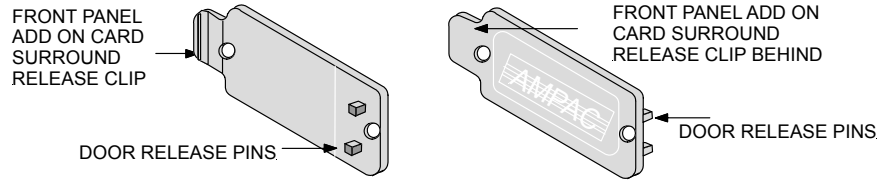


Figure 2: ABS Door Key and Front Panel Add On Card Surround Release Clip

5.1 Mounting the Enclosure

The panel MUST be mounted in an area that is NOT subject to conditions likely to affect its performance, e.g. damp, salt-air, water ingress, extremes of temperature, abuse etc. is at an easily accessible height and such that the indicators are at eye level.

Typical locations for the panel are the first and most obvious point of contact for emergency services or a security office that is likely to be permanently staffed.

5.1.1 Enclosure Details

ZoneSense PLUS can be surface or semi-flush mounted. The ABS version is supplied with a detachable front door, a mountable back box and a minimum of two separate PCBs as shown below. If the FACP is optioned to capacity a separate battery box of the same dimensions as the cabinet is required. This is normally mounted in the same way, directly below the FACP.

Depending on the configuration it may be necessary to remove the batteries to expose the lower mounting keyhole.

5.1.2 Fixing the Chassis to the Wall

Taking into account the weight of the panel securely mount it by using the three keyhole mounting holes in the case of the ABS version and the two top keyholes and two indented holes in the lower section of the metal cabinet. Use suitably sized screws and plugs for the type of mounting surface. The battery cabinets (if used) are mounted in the same manner.

Mounting is best achieved by positioning the box against the surface it is to be mounted to, marking the holes, taking the box well away from the surface and then drilling the holes.

Caution: Any dust or swarf created during the fixing process must be kept out of the cabinet and great care should be taken not to damage any wiring or components.

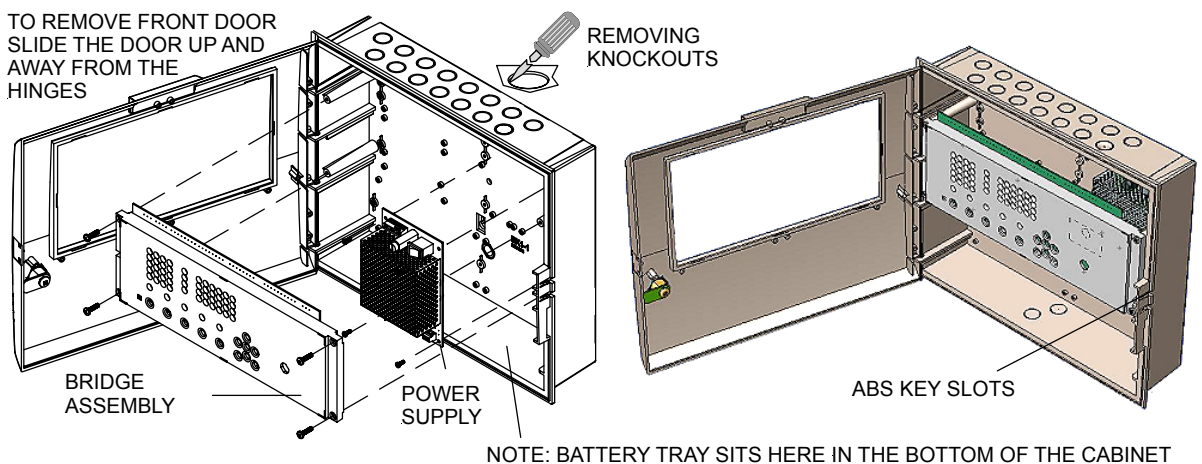


Figure 3: Exploded and Assembled View of the Basic ABS Model FACP with 003 Key Entry

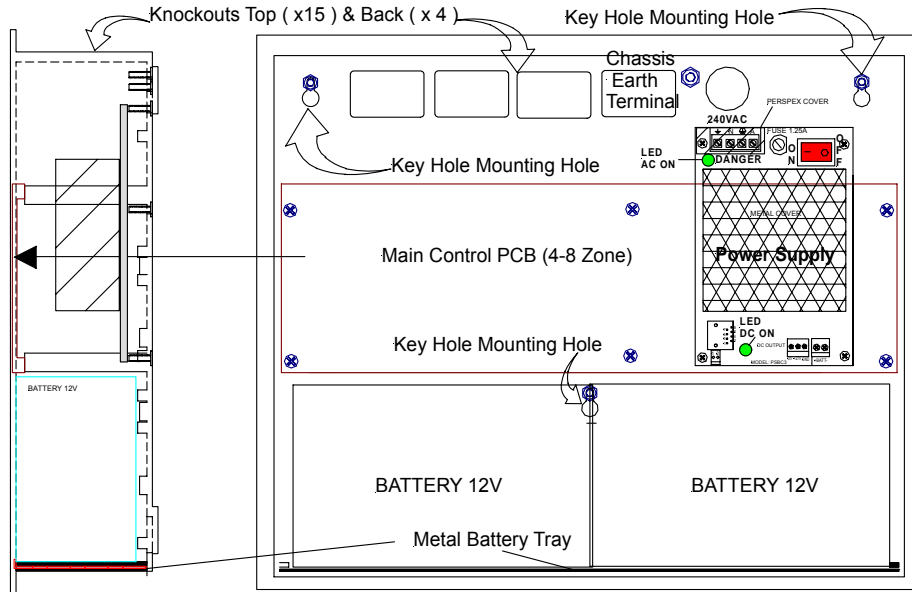


Figure 4: Typical Layout and Location of Keyholes for the ABS Model

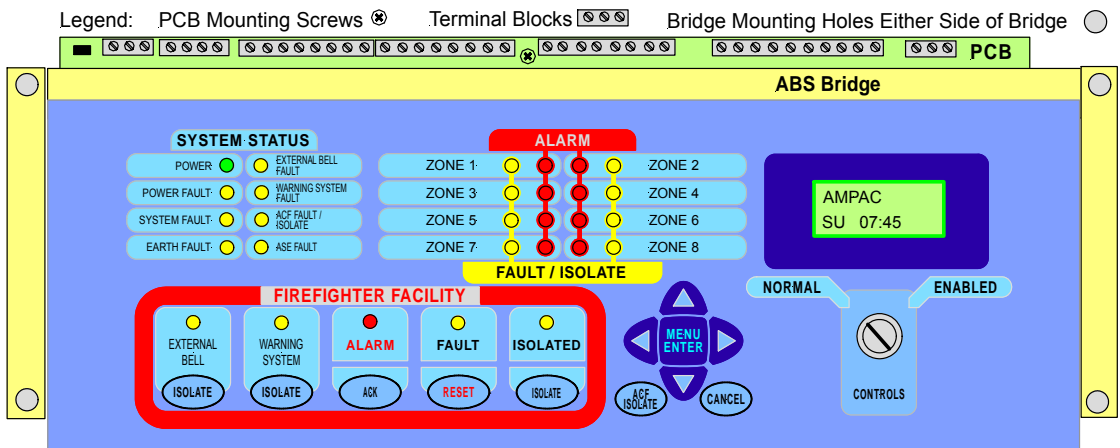


Figure 5: Exploded Front View of Membrane, Bridge and PCB for the ABS Model

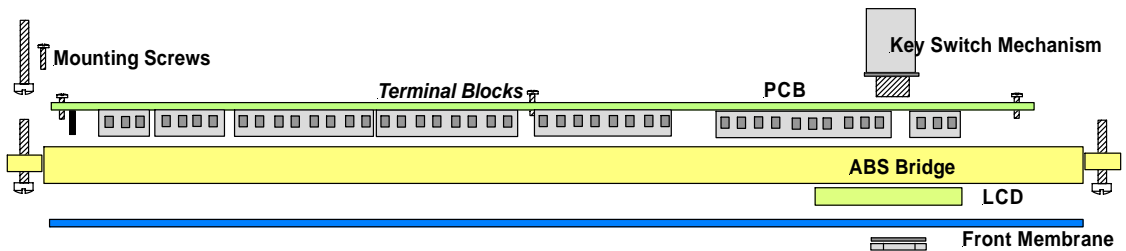


Figure 6: Exploded Top View of Membrane, Bridge and PCB

5.1.3 Board Removal / Replacement

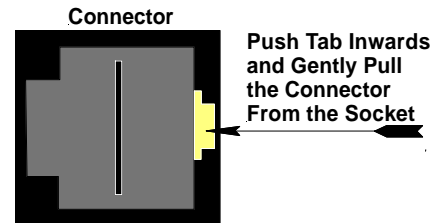
If a board has to be removed the following precautions should be observed;



1. Removing the door of the ABS version will provide better access to the boards and ensure the hinges are not accidentally stressed.
2. Personal anti- static procedures must be followed.
3. When disconnecting the telecom style connecting cable from the PCB, make sure that the cable remains connected to at least one board to prevent it being misplaced.



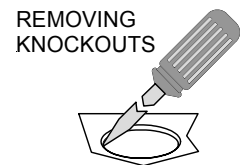
Note: Care should be taken when detaching this connector as it is necessary to depress the small locking tab to unlock the connector from its base. To reconnect the cable the connector must first be correctly aligned then pushed into the socket so it locks into position.



4. Carefully remove the retaining screws at each corner of the board taking care not to damage any of the components.
5. Place each board into anti- static storage once removed.

5.1.4 Removing the Knockouts

Carefully decide how the wiring will be brought into the panel then remove the required knock-outs for the bushes and cables.



The knock-outs should be removed with a sharp tap in the rim of the knock-out using a flat broad-bladed screwdriver. Use of excessive force could damage the enclosure around the knock-out.

Always ensure if a knock-out is removed, the hole is filled with a good quality cable gland. Any unused knock-outs must be securely blanked off.

6 Electrical

6.1 Primary Power Supply

The Power Supply is;

- > a switch-mode design and operates from a mains supply of 180VAC to 264VAC at 47Hz to 63Hz; and
- > capable of supplying the system while all zones are in alarm.

6.1.1 Mains wiring

The requirement for the Mains supply to the FACP is fixed wiring, using three core cable (no less than 0.75mm² and no more than 2.5mm²) or a suitable three conductor system, fed from an isolating switch fuse spur, fused at 3A. This should be secured from unauthorised operation and be marked 'FIRE ALARM: DO NOT SWITCH OFF'. The Mains supply must be exclusive to the FACP.

6.1.2 Connecting the Panel

Connecting **ZoneSense PLUS** internal connections and boards is best undertaken immediately prior to Commissioning.

Before beginning ensure all devices on the circuits are correctly connected and that cable integrity is verified throughout the installation.

ⓘ Important: DO NOT use an insulation tester ('Megger') with any electronic devices connected. Faults occurring in the wiring which are not picked up at this stage will almost certainly result in spurious and intermittent faults when the equipment is energised.

6.1.3 Installing the Power Supply

ZoneSense PLUS Power Supply combines the functions of a mains to d.c. switched mode power supply unit, battery charging unit and battery monitoring unit.

ⓘ Important: Under no circumstances should the **ZoneSense PLUS** panel be operated without the Power Supply correctly mounted in the enclosure and the retaining screws securely tightened.

6.1.4 Connecting the Mains



The technician should NOT attempt to connect mains to the panel until fully conversant with the layout and features of the Power Supply.

The incoming Mains cable should be brought into the Panel at the top right hand side of the enclosure and correctly terminated on the Chassis Earth Terminal and then to the Power Supply connector block.

👉 Note: Fuse F1 (1.25 Amp / 250VAC M205) is field replaceable.

Before switching on the power supply the earth MUST be connected to the chassis earth terminal.

1. All earth cabling must be terminated to the panel chassis earth terminal in a Star configuration.
2. The earth cable closest to the cabinet body must have an M4 SPW beneath the lug then an M4 SPW and M4 nut.
3. Each additional earth cable must be terminated with an M4 SPW and M4 nut.
4. An additional M4 nut and M4SPW are fitted to the earth terminal for installers to connect the mains earth

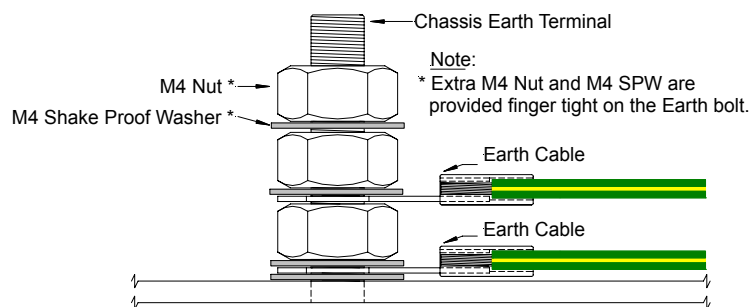


Figure 7: Chassis Earth Terminal Connection

6.2 Battery Charger

The battery charger is an integral part of the power supply and is capable of;

- recharging standard sized system batteries within 24 hours;
- detecting a missing, damaged or undercharged battery;
- protecting the battery against reverse or a short circuit condition;
- charging batteries in line with sealed lead acid battery manufacturers circuit temperature compensation guidelines.

👉 Note: Battery disconnect has been incorporated to prevent the battery from discharging through the battery charger should the charging voltage be less than the battery voltage.

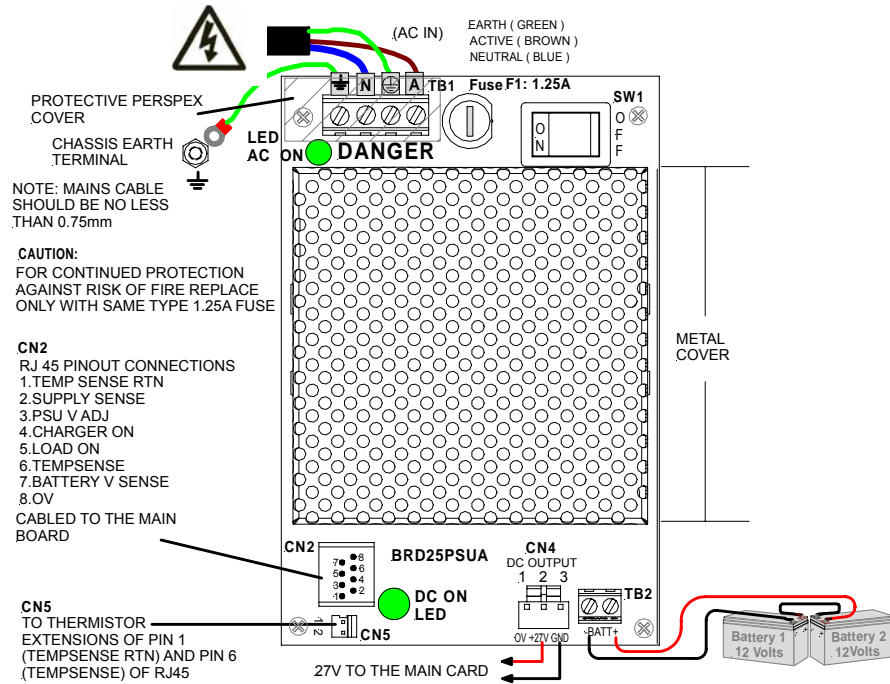


Figure 8: Power Supply Battery Charger Wiring

6.3 Secondary Supply

In the event of a mains failure the backup battery is capable of maintaining the quiescent condition for 72 hours as well as full alarm load for a further period of 30 minutes.



Note: AS4428 requires any power supply fault to be indicated within 1 hour. **ZoneSense PLUS** meets this criteria.

6.3.1 Connecting the Stand-By Batteries

Two new, good quality and fully charged 12V sealed lead acid batteries are required as the emergency stand-by power supply for the FACP. They are to be mounted in the bottom of the cabinet. In the ABS version a protective tray is supplied in the packaging.

The batteries should be connected in series using the series link wire provided and located within the panel enclosure. The red and black battery leads from the Power Supply (CN 3) should be run to the batteries in such a way there is no risk of them being damaged then, connect the red wire to the positive terminal and the black wire to the negative terminal .

The panel's sophisticated battery monitoring protects the batteries against deep discharge by activating a cut off circuit when the stand-by supply voltage reaches approx 21 volts. If batteries are not fitted, are discharged or in poor condition, the POWER FAULT LED will be illuminated.

The capacity of the batteries to be installed depends on the panel configuration and required stand-by time. To calculate the required AH capacity of the batteries refer to the calculation guide on page 26 of this manual.

6.4 Cable Types and Limitations

All System wiring should be installed to meet AS1670.1 wiring regulations.

7 Main Control Card BRD25MCB –A (4 Zone) B (8 Zone)

The Main Control Card and its front display panel combined with the Power Supply / Battery Charger and batteries form the basis for the **ZoneSense PLUS** FACP .

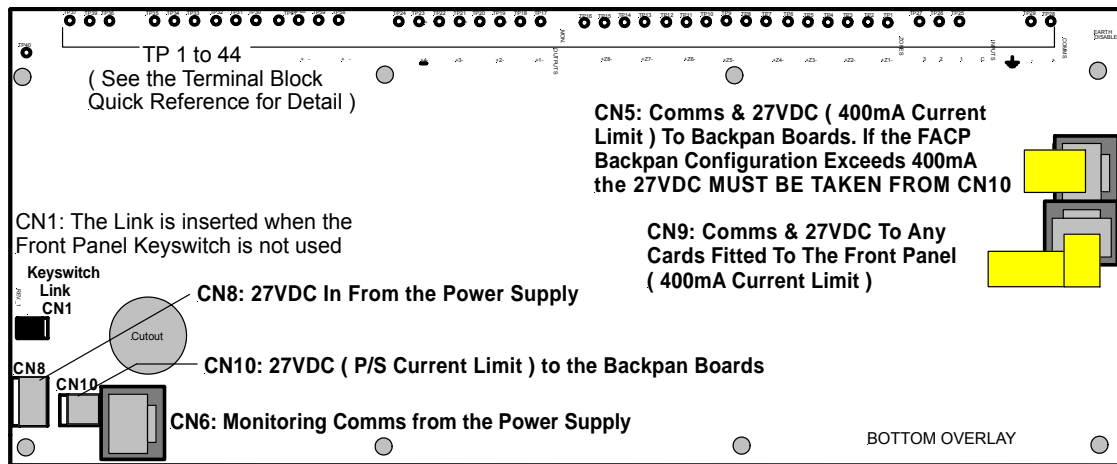
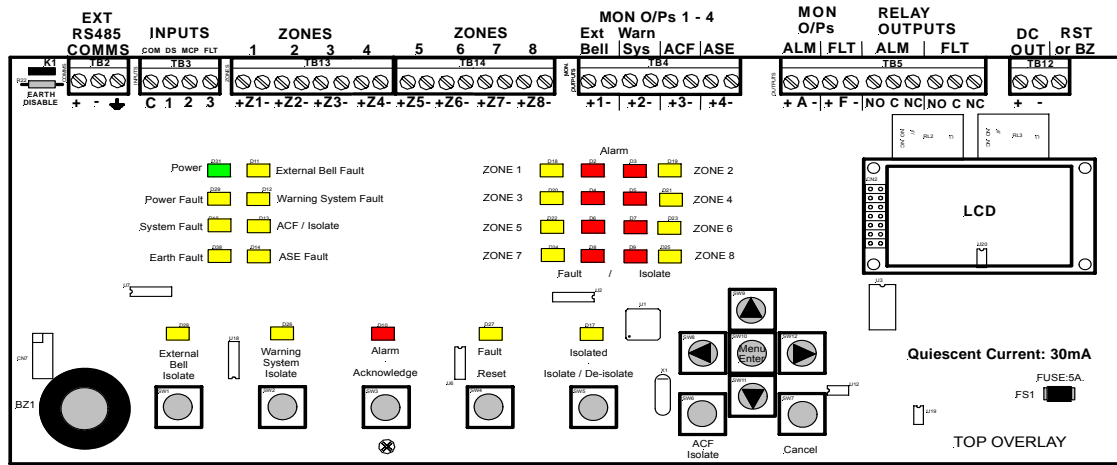


Figure 9: Main Control Card Top and Bottom Layout

Cabling Connector	Purpose /Pins
CN1	Link pins ① & ② when the front panel keyswitch is NOT used.
CN2	LCD Driver
CN3 & 4	LCD Back Lighting
CN5	Coms and +/- 27V and earth to the backpan boards. (I _{max} = 400mA)
Pins	① & ③ 0V ② & ⑦ +27V, ③ & ④ RS 485 Bus, ⑤ Tx. Enable
CN6	Monitoring / Comms from the Power Supply.
Pins	① & ③ 0V ② PSU Sense ③ PSU Adjust ④ Charger ON ⑤ Batt Load ⑥ Temp sense ⑦ Batt V Sense.
CN7	Factory Use Only
CN8	+/- 27V and earth from the Power Supply / Charger.
Pins	① 0V ② +27V ③ Earth
CN9	Comms to the internal front panel cards. (I _{max} = 400mA)
Pins	Pin connections are the same as CN5
CN10	① +27V and ② 0V to the Sounder, Agent Release and Fan Termination backpan boards (I _{max} = P/S limit). All other backpan boards 27VDC supply is via the RJ45 Comms cable.

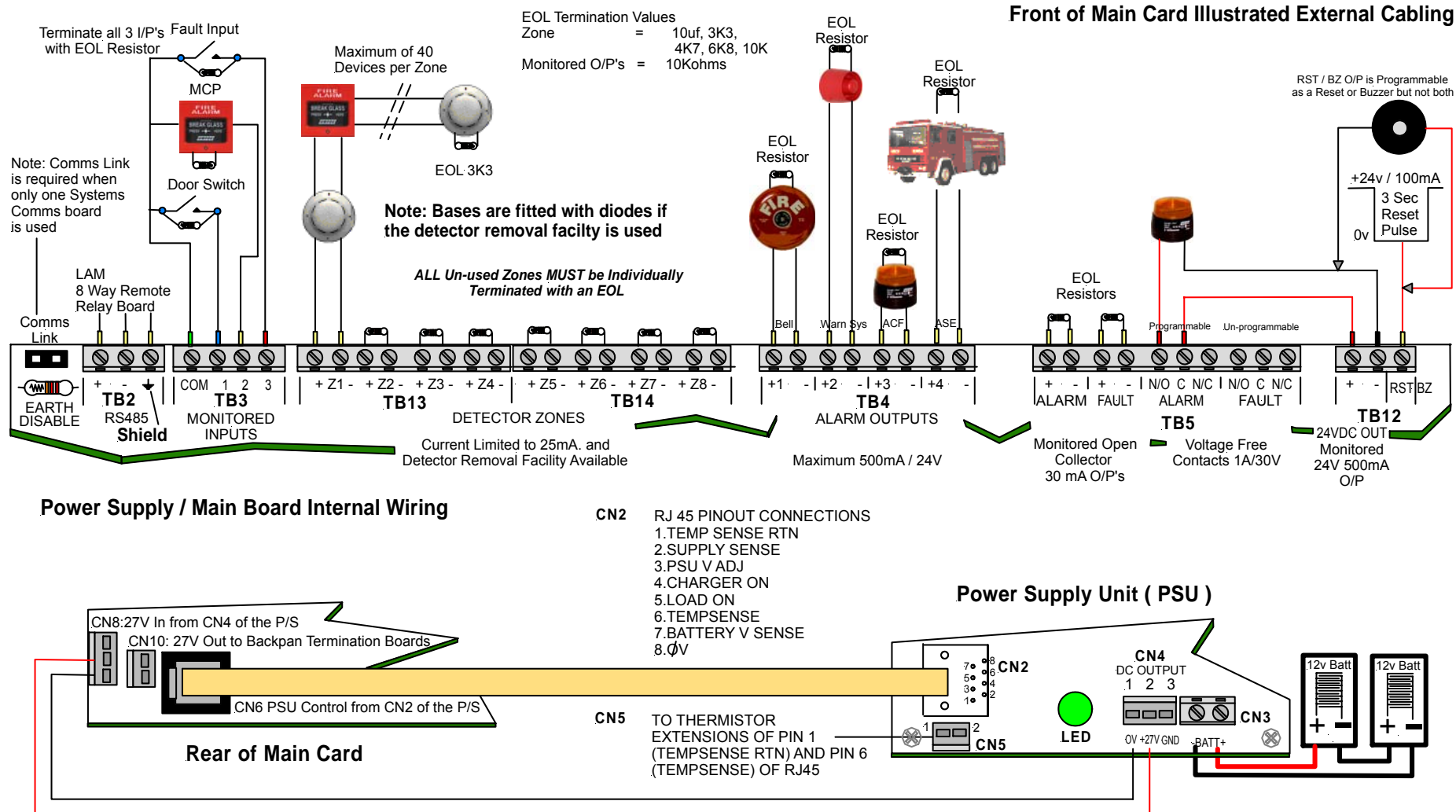


Figure 10: Simple Wiring Diagram of the Basic FACP

IMPORTANT: ON COMPLETION OF THE INSTALLATION FILL IN THE CONFIGURATION LABEL

8 Wiring to the Main Card BRD25MCB

8.1 Earth Monitoring

The earth monitoring disable/enable feature is accessible via the SYSTEM menu at access level 3. Disabling the earth monitoring does not illuminate the Earth Fault LED on the control panel.

Note If *ZoneSense PLUS* is connected to a third party system which has earth monitoring and it's earth monitoring is being affected by *ZoneSense PLUS* even after being disabled through programming the resistor R22 on the Main Card in *ZoneSense PLUS* can be removed.

8.2 Communications

External Communications Terminals (RS485) TB2 1, 2 & 3

The RS 485 output drives the remote cards and mimics up to a distance of 1.2km from the FACP. The external cabling (1 pair twisted shielded cable plus power) is wired to TB2 +, - and earth.

Note: If a fault occurs on the communications line the common FAULT and SYSTEM FAULT LED'S will be illuminated. Selecting the Faults Menu will display the fault details on the LCD.

Remote Cards

The number of cards that can be installed on the external communications bus are:

- > Max 8 x LED Annunciator Master (LAM)
- > 1 x 8 Way Remote Relay Output Board. This board provides 8 sets of normally open (NO), normally closed (NC) and Common (C) voltage free contacts rated at 1A @ 30VDC.

Main Card Comms Link K1

K1 **MUST** be inserted when;

1. front door panel cards and the Main Card are used as an FACP; or
2. backpan boards and the Main Card are used as an FACP; or
3. remote boards and the Main Card are used as an FACP.

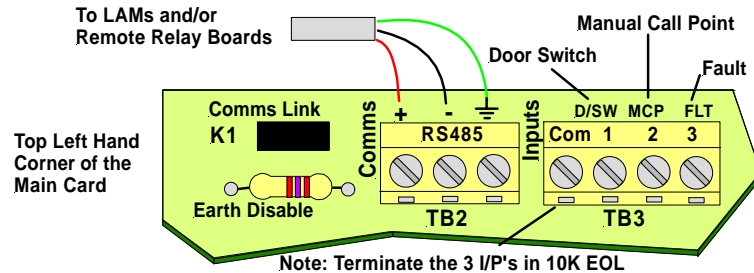


Figure 11: Wiring Detail

8.3 TB3 Inputs

Common Terminal TB3 Com

The COM terminal is used as the common for the following three 0v potential inputs.

Panel MCP TB3 Com / 2

The MCP I/P is monitored for normal operation, mounted on the cabinet door and must be mapped to a particular zone.

To test the input insert the test key provided into the side of the MCP. Removal of the key resets the MCP.

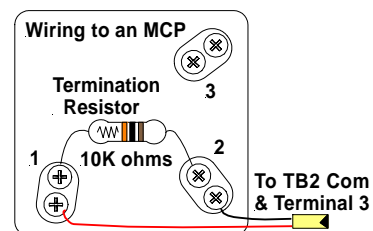


Figure 12: Typical MCP Wiring

Door Switch Input TB3 Com / 1

This input is used for connecting the FACP's door switch. Connection is to TB3 COM & 1

Fault Input TB3 Com / 3

This input is used to bring a fault into the system from an external source. Requirements for the input are an open collector or 0 volt, voltage free contact to initiate a fault. Connection is to TB3 COM & 3

8.4 Zones

8.4.1 Detector Interface

Zone circuit connections are made directly to **TB13 & TB14** on the Main Card and if screened cabling is used the screen is terminated at the panel's chassis earth terminal. All zones can be programmed to operate in one of the 6 different configuration modes each with a reset time in the order of > 1 second < 2 seconds.

8.4.2 Detector Configuration

The operating configuration modes are,

- > Normal
- > Alarm Verification Facility
- > Non Latching
- > Self Reset
- > Agent
- > Agent

LCD abbreviations shown are;

- = Normal
- = AVF
- = No Latch
- = Self Reset
- = T1
- = T2

Note: AS1670 SECTION 8.6 ALARM VERIFICATION FACILITY states that alarm zone facilities used for the following shall not be subject to alarm verification:

- (a) Manual call points.
- (b) Sub-indicator panels.
- (c) Detectors used to activate fire suppression systems.
- (d) Detectors installed in hazardous areas.
- (e) Fire suppression systems.
- (f) Beam detectors where a beam-interrupt fault overrides the alarm state.
- (g) AZFs containing fixed temperature detectors only.
- (h) Detectors that have integral alarm confirmation delays such as some multipoint aspirated smoke detector systems.

Since the provision of alarm verification delays transmission of a signal to the monitoring service, it is desirable that it only be provided where other efforts to eliminate unwanted alarm signals have been unsuccessful.



Reminder 1: A maximum of 40 **ZoneSense PLUS** compatible Optical / Heat and Ionisation Detectors or Manual Call Points can be fitted to each circuit and mixed in any order.



Reminder 2: An End of Line (Factory set default = 3K3) device must be connected across the terminals of the last device on each zone circuit to allow the circuit to be monitored. Zones that are not used must also have an EOL fitted to the zone terminals on the Main Control Board.

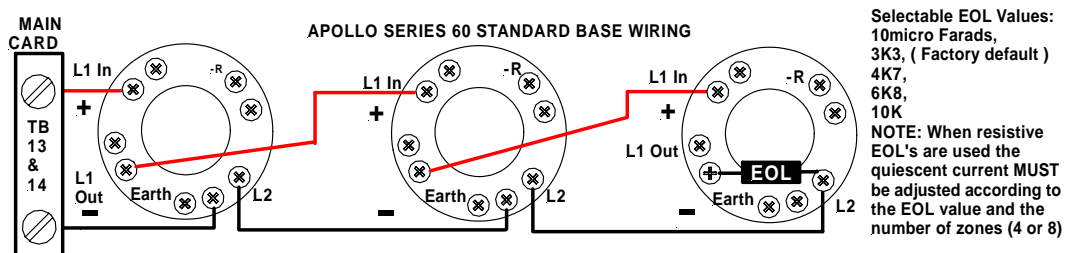


Figure 13: Typical Detector Wiring



Note: EOL type (capacitive / resistive) and value are set in the Programming Menu

8.5 Monitored Outputs TB4

8.5.1 Alarm Outputs

The panel has 4 dedicated individually monitored outputs which are;

- rated at 500mA @ 24VDC nominal;
- protected against short circuits;
- monitored for open and short circuit conditions even when an output is active. The monitoring operates on a reverse voltage principal and will indicate a fault within 60 seconds.

Programming which zones will operate any of the outputs is done via the front Panel.

1. External Bell Output TB4 1/2

- Is switched 24VDC.
- Will be operated by an alarm from a non-isolated zone.
- Is controlled by the “External Bell Isolate” switch. When pushed the “External Bell” output is inhibited and the LED is illuminated. If pushed again the output is toggled back to the normal state.
- Operates the audible fault indication if the output is still in fault and left isolated for longer than 8 hours.

2. Warning System Output TB4 3/4

- Is switched 24VDC.
- Will be operated by an alarm from a non-isolated zone.
- The “Warning System Isolate” switch controls this output. When pushed the “Warning System” output is inhibited and the LED is illuminated. If pushed again the output is toggled back to the normal state.
- Re-activates the audible fault indication if the output is still in fault and left isolated for longer than 8 hours.

3. Ancillary Control Facility (ACF Output) TB4 5/6

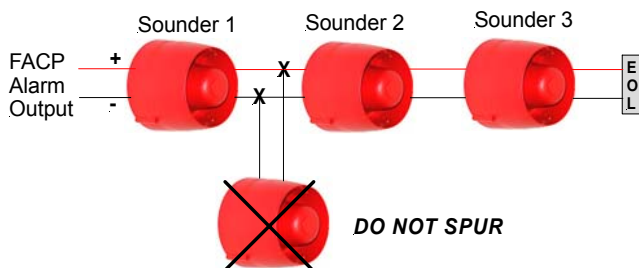
- Is switched 24VDC.
- Will be operated by an alarm from a non-isolated zone
- The “ACF Isolate” switch controls this output. When pushed the “ACF” output is inhibited and the LED is illuminated. If pushed again the output is toggled back to the normal state.
- Re-activates the audible fault indication if the output is still in fault and left isolated for longer than 8 hours.

4. Alarm Signalling Equipment (ASE Output) TB4 7/8

- Is a dedicated switched 24VDC output controlled via programming through the menu structure and operated by an alarm from a non- isolated zone.
- Re-activates the audible fault indication if the output is still in fault and left isolated for longer than 8 hours.

8.6 Conventional Sounder Circuit Wiring

The four alarm outputs can be used for conventional sounder circuits.



Note: All Sounders must be polarised.

An end of line resistor (10kΩ) must be connected at the end of each circuit to allow the wiring to be monitored.

The wiring for each circuit is connected to the relevant 2.5mm connector block on the Main Control Card and the screens terminated to the chassis earth terminal.

Figure 14: Typical Sounder Circuit Wiring

8.6.1 Sounder Loading and Distribution

The FACP's power supply is designed to give a maximum output current of 1.8A. In addition to powering the sounders, this current is also used for handling short circuit faults, supplying the FACP's battery charging circuit and any output relays that may be fitted. As a safe margin and to allow for these other loads, the total sounder loading for the panel should not exceed a maximum of 1.5A.

Each output and or sounder circuit is current limited to a maximum alarm current of 500mA. The Sounders should be distributed throughout the building according to the sound levels required, and the load distributed as equally as possible across each circuit.

8.7 Outputs – Monitored Open Collector TB5

Definition: A monitored open collector output for user connections.

Via the front panel it is possible to program which zones will operate any of the outputs.

8.7.1 Alarm Output TB5 1/2

- The output operates in parallel to the Alarm Output relay and energises if a zone is not isolated and is in the alarm condition.
- The output is current limited to 30mA.
- If a zone is configured as non-latching it will not operate this output.

8.7.2 Fault Output TB5 3/4

- The output operates in parallel to the Fault Output relay and de-energises in any fault condition.
- The output is current limited to 30mA.
- All faults automatically cancel on clearance (buzzer and indication).

8.8 Outputs – Volt Free Relay Programmable

Definition: A relay with voltage free change over contacts for user connections.

Programming which zones will operate any of the outputs is done via the front panel.

8.8.1 Alarm Output TB5 5/6/7

- The relay is energised in the alarm condition of a zone that is not isolated.
- The contacts are to rated at 1A 30VDC.
- This output is not monitored.

8.9 Outputs – Volt Free Relay Non-Programmable

Definition: A relay with voltage free change over contacts for user connections.

8.9.1 Fault Output TB5 8/9/10

- The relay is energised in any fault condition.
- All faults automatically cancel on clearance (buzzer and indication).
- The contacts are rated at 1A 30VDC.
- This output is not monitored.

8.9.2 Auxiliary Power Output TB12 1/2

An output supplying power, with both the + TB12/1 and – TB12/2 legs fused is provided for ancillary devices.

- The output is rated at 500mA @ 24VDC.
- The output is protected against short circuit conditions.
- In the event of the protection device operating a fault shall be signalled.
- The monitoring is only up to the terminal block and does not extend to the field.
- Current drawn from this output reduces that available to the sounders.
- A fault on this output is indicated by the common FAULT LED illuminating steady and indication on the LCD.

8.9.3 Buzzer

The buzzer is required to operate on any alarm, fault or isolate condition. If the buzzer has been muted there is provision for the buzzer to resound again after an 8 hour period has elapsed if a new condition has not occurred. This provision is provided for;

1. Zone isolated
2. Warning system isolated
3. External bell isolated
4. When fitted Ancillary control functions have been isolated.

8.9.4 Reset Terminal / Buzzer Output. TB12/3

An output rated at 24VDC @ 100mA that can be configured to the users requirement to provide either of the following 2 functions:

1. Reset.

Reset is used to reset field devices such as beam detectors, that is Reset switches negative for a period of 1.2 seconds on operation of the "Reset" button.

2. Buzzer.

Buzzer is connected to an external Buzzer which will sound at the same time as the internal panel buzzer. The output is protected against transient voltages.

9 Adding Control and Monitoring Facilities

The addition of or a combination of the modules / boards / cards listed below mounted on the back pan or the front panel of the FACP provide additional control and monitoring facilities to a standard panel. All board inputs or outputs are programmable to any combination of zones.



Note: Only one of each board type can be installed in any one panel. The board types are;

Backpan

- Relay Board, BRD25EWRB –A (Panel mounted)
- Input Board BRD25SIPB.
- Sounder Board BRD25SOPB.
- Brigade Interface Board BRD25BBA.
- Emergency Warning System (EV20 or EV40 - metal cabinet only)

Front Panel

- Fire Fan Module consists of a Termination Board (BRD25FTB) and front panel card BRD25FCB -.
- Agent Release Module consists of a Termination Board (BRD25ATB), front panel card (BRD25ARB–A) and if required a remote local control station (BRD25ARB–B).
- General Indicator Card. BRD25GIB -A
- Switch and Indicator Card BRD25GIBA
- Emergency Warning System control panel (EV20 or EV40 - metal cabinet only)

Remote

- Zone Mimic Indicator Card (External Power normally remote) BRD25GIB – D
- LED Annunciator Master BRD25 GIB – E
- Remote Relay Board BRD25EWRB –B



Note: To add or remove add on's from the FACP go to the SYSTEM and PROGRAM Menus.

9.1 Internal Communications Connector (RS485)

PCB mounted connectors provide serial communications to internal ancillary boards. CN9 on the Main Card cables to CN1 or 2 on the front panel cards and CN5 on the Main Card cables to CN1 or 2 on the back pan boards

9.2 Installation and Wiring of Add On Cards and Boards

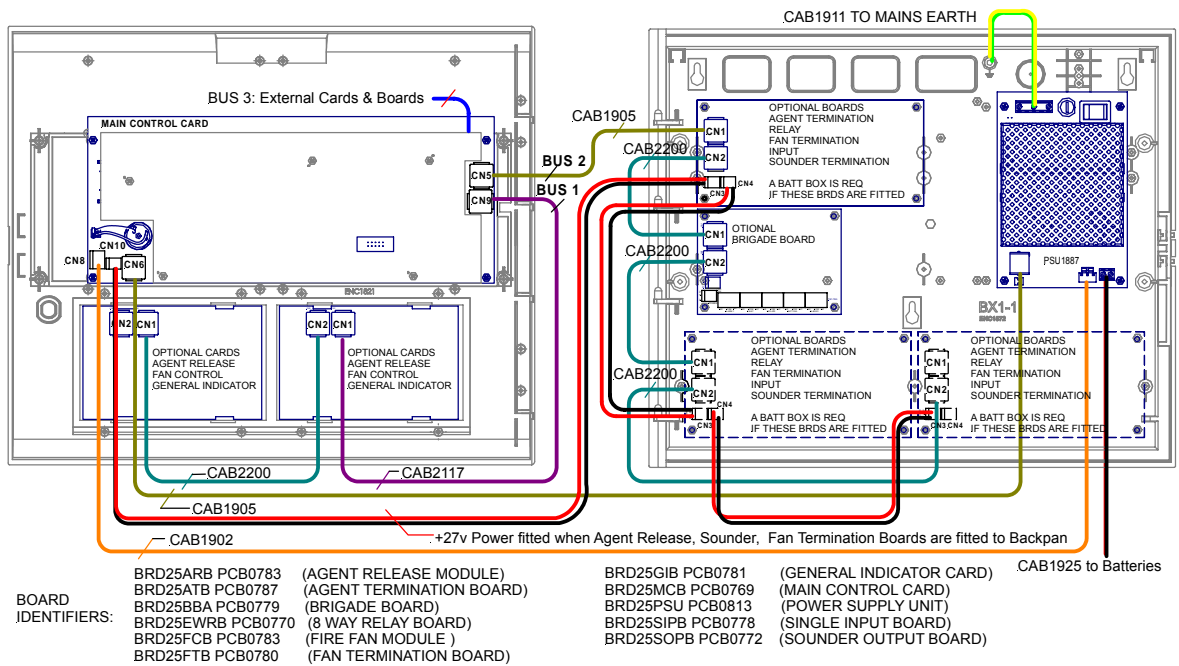


Figure 15: Add On Card and Board Positioning Within the FACP

9.3 Terminating the Communications Bus

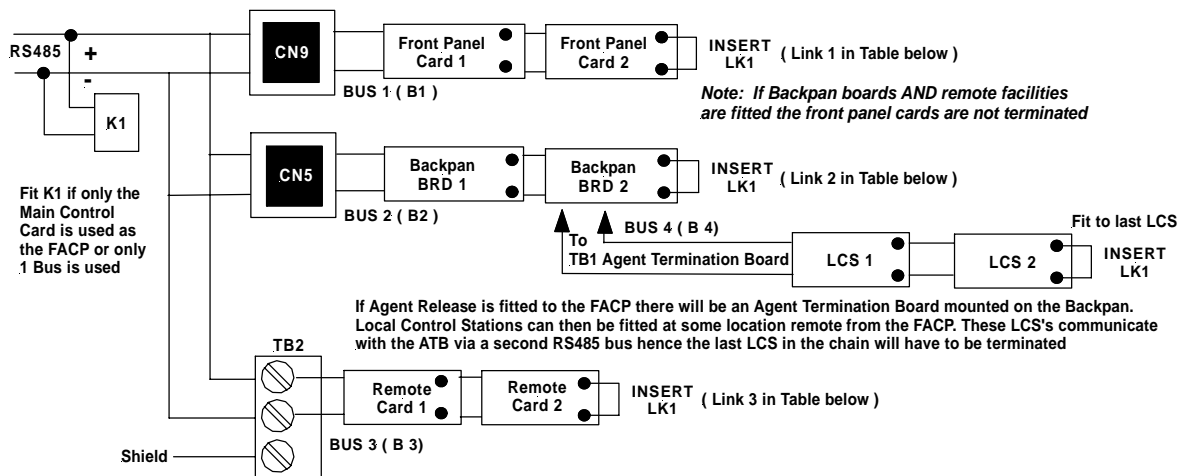


Figure 16: RS485 Communication Bus Terminating

Linking Table

K1 is fitted as standard on the Main Control Board. It is removed when more than one Bus is used as defined in the Linking Table below.

Link	Bus Configuration						
	B1	B1,2	B1,3	B1,2,3	B,2	B2,3	B3
1	X & K1	X	X				
2		X		X	X & K1	X	
3			X	X		X	X & K1

X = Insert Link

B1: Bus 1 Front Panel Cards

B2: Bus 2 Backpan Boards

B3: Bus 3 Remote facilities

B4: Bus 4 Local Control Station fitted to the backpan Agent Release Board.

10 Internal Terminal Block Numbering Quick Reference

Terminal Block	TP Number	AS4428
COMMUNICATIONS EXTERNAL		
TB2/1		RS485 +
2	28	RS485 -
3	29	Shield
INPUTS		
TB3/1		Common
2	25	Door Switch (monitored)
3	26	Manual Call Point (monitored)
4	27	Fault Input (monitored)
ZONES (25mA / Zone)		
TB13/1	1	+ Zone 1
2	2	- Zone 1
3	3	+ Zone 2
4	4	- Zone 2
5	5	+ Zone 3
6	6	- Zone 3
7	7	+ Zone 4
8	8	- Zone 4
TB14/1	9	+ Zone 5
2	10	- Zone 5
3	11	+ Zone 6
4	12	- Zone 6
5	13	+ Zone 7
6	14	- Zone 7
7	15	+ Zone 8
8	16	- Zone 8
MONITORED OUTPUTS (500mA / O/p)		
TB4/1	17	External Bell +
2	18	External Bell -
3	19	Warning System +
4	20	Warning System -
5	21	ACF + Aux Control Function
6	22	ACF -
7	23	ASE + Alarm Signalling Equipment
8	24	ASE -
OPEN COLLECTOR OUTPUTS (30 mA /O/P)		
TB5/1	25	Alarm +
2	26	Alarm -
3	27	Fault +
4	28	Fault -
OUTPUTS VOLT FREE RELAY (1A @ 30V)		
5	29	NO Alarm
6	30	C Alarm
7	31	NC Alarm
8	32	NO Fault
9	33	C Fault
10	34	NC Fault
AUX, RESET / BUZZER		
TB12/1	35	Aux 24VDC + (Mon 500mA)
2	36	Aux 24VDC -
3	37	Reset/Buzzer 100mA max

11 List of Approved Compatible Devices

Apollo	Order Code
Series 60, Type A Heat	201-0023
Series 60, Type B Heat	201-0024
Series 60, Type C Heat	201-0025
Series 60, Type D Heat	201-0026
Series 60, Ionisation Smoke	201-0027
Series 60, Photoelectric Smoke	201-0028
Base (for above detector)	201-0029
Series 60, Duct Sampling Unit	214-0001
AMPAC Fireray 2000 Beam Detector	220-0004
AMPAC ACP-01 Manual Call Point Red,	213-0017
AMPAC ACP-01 Manual Call Point Yellow	213-0018
AMPAC ACP-01 Manual Call Point, White	213-0019
AMPAC ACP-01 Manual Call Point, Green	213-0020
AMPAC FP2 Manual Call Point Red	213-0021
AMPAC FP2 Manual Call Point White	213-0022
EV20 single zone EWS AS1670.4	222-0020
EV40 single zone EWS AS1670.4	222-0021
EV60 single zone EWS AS1670.4 (<i>info only-can not be</i>	222-0022 *
EV120 single zone EWS AS1670.4 (<i>fitted into cabinet</i>)	222-0023 *
Vantage Sounder Red Inc Shallow Base AS1670.4	205-0062
Vantage Sounder White Inc Shallow Base AS1670.4	205-0063
Vantage Combi Red Inc Shallow Base AS1670.4	205-0066
Vantage Combi White Inc Shallow Base AS1670.4	205-0067
Vector White AS1670.4	205-0077

12 Glossary of Terms

ACF :	ANCILLARY CONTROL FACILITY
ACKD :	ACKNOWLEDGED
AH:	AMP HOUR
AHU :	AIR HANDLING UNIT
ALM :	ALARM
ASE:	ALARM SIGNALLING EQUIPMENT
AVF :	ALARM VERIFICATION FACILITY
AZF :	ALARM ZONE FACILITY
AZC :	ALARM ZONE CIRCUIT
COM :	RELAY COMMON CONTACT (WIPER)
CIC :	CONTROLLER INTERFACE CARD
CN :	CONNECTOR
C/O :	CHANGE OVER CONTACTS
CPU :	COMMON PROCESSOR UNIT
DGP :	DATA GATHERING POINT
EARTH :	BUILDING EARTH
EOL :	END OF LINE
FACP :	FIRE ALARM CONTROL PANEL
FDS :	FIRE DETECTION SYSTEM
FFF:	FIREFIGHTER FACILITY FORMAT
FLT :	FAULT
FP :	FRONT PANEL
GND :	GROUND (0 VOLTS) NOT EARTH
Ia:	CURRENT DRAW IN ALARM
Ida:	CURRENT DRAW IN ALARM WITH DEVICES ACTIVATED
Idd:	CURRENT DRAW IN ALARM WITH DEVICES DEACTIVATED
Iq:	QUIESCENT CURRENT
I/O :	INPUT/OUTPUT
LCD :	LIQUID CRYSTAL DISPLAY
LCS :	LOCAL CONTROL Station
LED :	LIGHT EMITTING DIODE
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 BOARDS
P/S :	POWER SUPPLY
PSM :	POWER SUPPLY MODULE
REM :	REMOTE
SPOT :	SINGLE PERSON OPERATING TEST
TB :	TERMINAL BLOCK
VDC :	VOLTS DIRECT CURRENT

13 Definitions

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

Alarm Signalling Equipment (ASE) – circuitry that provides the necessary indication to the monitoring service providers.

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. Programming 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 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 card connector to indicate the disconnection of the card.

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 fire indicator panel or where sub-indicator panel(s) communicate with a main fire indicator panel.

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.

FIREFIGHTER FACILITY FORMAT – is the minimum front panel layout as prescribed by AS 4428

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 cards.

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 FACP which supplies all voltages necessary for its operation.

Regulatory Authority - an authority administering Acts of Parliament or Regulations under such Acts, eg;

Australian Standards AS4428

British Standards EN54

Watchdog – circuitry that monitors for the correct operation of the software used by any processor.

14 Battery Capacity Calculation

INTRODUCTION

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

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

The standards considered in this document are AS1670.1 2004

DESCRIPTION

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

POWER SUPPLY RATING

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

1. $\frac{\text{Battery Capacity (AH) (determined from Calculator)}}{24 \times 0.8}$ = _____ Amps
2. **Add** Quiescent Current of the System (Iq) = _____ Amps
3. **Add** the extra current that is drawn when in alarm (Ia) = _____ Amps
4. Minimum Current Rating of Power Supply is = _____ Amps



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



Note #2: Where the fire control station will not receive the system's total power supply failure signal the battery shall have sufficient capacity to maintain normal system operation for 72 hours plus 30min. in alarm.



Note #2: Where the fire control station will not receive the system's total power supply failure signal and Agent Release is incorporated in the FACP, the battery shall have sufficient capacity to maintain normal system operation for 96 hours plus 30min. in alarm.



Note #3: When calculating battery capacity, allowance shall be made for the expected loss of capacity over the useful life of the battery. A new battery shall be at least 125% of the calculated capacity requirements, based on a loss of 20% of its capacity over the useful life of the battery.


POWER SUPPLY & BATTERY CALCULATOR

Panel Configuration	Criteria Iq Calculation			Iq = Iq	Example Iq Calculation			Iq = Iq
	No	Off	X mA		No	Off	X mA	
Add 8mA / zone for 3K3 EOL								0
Basic 4 zone panel (Cap. EOL)			35					0
Basic 8 zone panel (Cap. EOL)			37		1	37		37
Interface Cards/Boards								
Sounder Board			5.6		1	5.6		5.6
Brigade Board			9		1	2		18
Input Board			2.6		1	2.6		2.6
Fire Fan Module			13.5		1	13.5		13.5
General Indicator Card			3.6		1	3.6		3.6
Relay Board (Internal)			2.4		1	2.4		2.4
Switch & Indicator Card			3.6					0
Agent Release Module			28.5					0
EV20SZEWS			41					0
EV40SZEWS			140					0
LED Annunciator Master (LAM)			11.5		1	11.5		11.5
Local Control Station			18.5					0
Relay Board (Remote)			16					0
								57.2
Zone Devices								
Series 60 Heat ABCD			0.057		21	0.057		1.2
Series 60 Photoelectric			0.038		32	0.038		1.2
Series 60 Ionisation			0.043		12	0.043		0.5
Fireray 2000 Beam Det.			13					0
								Iq = 97.1

Devices activating when the system is in alarm								
1 Zone in Alarm			77.5		1	77.5		77.5
Sounder Board			48		1	48		48
Brigade Board			13		1	13		13
Input Board			3.6					0
Fire Fan Module			53		1	53		53
General Indicator Card			12.8					0
Relay Board (Internal)			19.8					0
Switch & Indicator Card			8					0
Agent Release Module			117					0
EV20SZEWS			650					0
EV40SZEWS max 30Watt Load			1500					0
Local Control Station			21					0
Relay Board (Remote)			102					0
Bells			100		1	100		100
Strobe			125		2	125		250
Other								0
								Ida = 541.5

Devices de-activating when the system goes into alarm								
Aircon Relays			20		2	20		40
Electric locks			100		2	100		200
Other								
								Idd = 240

I Alarm (Ia = Iq + Ida - Idd) = mA
Ia = 97.1 + 541.5 - 240 = 388.6 rounded for calculation 400

	Criteria	Example
Battery capacity at end of battery life	= $(I_q \times 24) + (I_a \times 0.5)$	= $(I_q \times 24) + F_c(I_a \times 0.5)$
NOTE: 	Note: the figure of 24 above should be 96 if Agent Release is used.	F _c – capacity de-rating factor. AS1670.1 states a factor of is deemed to satisfy the criteria. (using rounded figures)
Note: 1,000ma = 1 Amp	= Ah	= $(100mA \times 24) + 2(400mA \times 0.5)$
New battery capacity requirement	= Ah x 1.25	= 2400mA + 400mA = 2800mA
		= 2.800 Ah(rounded)
Rounded up to nearest available battery rating		= 2.800 x 1.25
		= 3.5 Ah
		= 4 Ah

PRIMARY POWER SOURCE CALCULATIONS

Battery Charger Current

Requirement: Battery is charged for 24 hrs. to provide $5I_q + 0.5I_a$

$$= (5 \times I_q) + (0.5 \times I_a) = (5 \times I_q) + F_c(0.5 \times I_a)$$

$$= (5 \times 100) + 2(0.5 \times 400)$$

$$= 500 + 400$$

$$= 0.900Ah$$

Ah Requirement

Battery Charging Current Required

$$= \frac{Ah \text{ above}}{24 \times e} = \frac{0.900}{24 \times e}$$

$$= 0.046A$$

e is the battery efficiency, 0.8

Power Supply Requirement

Select the greater of 1 or 2

1. I_a + non battery backed ancillary alarm loads
2. I_q + non battery backed quiescent loads

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







Note:

Remember to take into account ALL outputs that will be switched on when calculating I_a .

15 Battery Guidelines

(tested by SSL to comply with AS 1603 . 4 1987 Appendix G).

-  **Note #1:** **afp** number is the SSL Listing Number.
-  **Note #2:** Types are the Manufacturers and not the suppliers.
-  **Note #3:** Those listed below in small *Italic* are not generally used by Ampac.
-  **Note #4:** Automotive type batteries are not normally suitable for stationary use.

afp - 791	afp - 792	afp - 1220	afp - 1228
Yuasa NP Series	Power-Sonic PS Series	Matsushita LCR Series	B & B BP Series
<i>NPH1.3-6</i> <i>NPH3.2-6</i> NPH1.3-12 NPH2-12 NPH3.2-12 NPH5-12 NPH16-12 <i>NP1-6</i> <i>NP1.2-6</i> <i>NP2.6-6</i> <i>NP3-6</i> <i>NP4-6</i> <i>NP4-6W</i> <i>NP4.2-6H</i> <i>NP7-6</i> <i>NP8-6</i> <i>NP10-6</i> NP0.8-12 NP1.2-12 NP1.9-12 NP2.3-12 NP2-12 NP2.6-12 NP4-12 NP7-12 NP12-12 NP24-12 NP24-12B	<i>PS-605</i> <i>PS-610</i> <i>PS-630</i> <i>PS-632</i> <i>PS-640</i> <i>PS-650L</i> <i>PS-670</i> <i>PS-6100</i> PS-1208 PS-1212 PS-1219 PS-1232 PS-1240 PS-1270 PS-12120 PS-12180 PS-12240 PS-12330 PS-12400 PS-12650	<i>LC-R065P</i> LCR12V4BP LC-R125P LC-RC1217P <i>LC-R064R2P</i> <i>LC-R067P</i> <i>LC-R0011P</i> LC-R127P LC-R127R2P afp - 1221 Matsushita LCL Series LC-LA12V33P Afp - 1222 Matsushita LCX Series <i>LC-X1224P9(AP)</i> <i>LC-X1228P(AP)</i> <i>LC-X1238P(AP)</i> <i>LC-X1242P(AP)</i>	<i>BP 1.2-6</i> <i>BP 4.0-6</i> <i>BP 4.5-6</i> <i>BP 6-6</i> <i>BP 7-6</i> <i>BP 8-6</i> <i>BP 10-6</i> BP 1.2-12 BP 1.9-12 BP 4-12 BP 7-12 BP 12-12 BP 17-12 BP 24-12 BP 40-12

16 Trouble Shooting Chart

Problem	Solution
No Mains Power	Check mains Fuse
Supply fault LED illuminated	Check output voltage it should be set to 27.2VDC. Low = (less than 26.5VDC) High = (greater than 28VDC) 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 panel configuration Check all connections for loose wiring
Warning System Fault LED illuminated	Check correct E.O.L is fitted Check wiring is connected correctly
RS485 Communication Bus not working	Refer LCD. This may identify where there is a break in the communication line
Can not access a menu	Incorrect Password entered
Forgotten Password	Ring AMPAC and directions will be given to provide you with a temporary code
Bell / Sounder Fault	Make sure you have a 10K Ω EOL resistor fitted and a diode (1N4004) in series with the bell / sounder

17.1 Procedure

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

This Commissioning Record is to be completed in conjunction with the -

1. operator's manual;
2. installer's statement(s);
3. 'as-installed' drawings; and
4. detector test records,

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

17.2 System Information

		<i>Tick relevant box</i>	Yes	No	Not Applicable
1.	Ensure that all detectors used in the system -				
	i Are listed in the operator's manual;		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ii Are compatible with the installed AZF,		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	iii Do not exceed the permitted number of detectors on each circuit; and		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	iv Are installed in an environment for which they are suitable.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.	Check that the primary power source for the system has been provided in accordance with AS 3000, and that the isolating switch disconnects the active conductors.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.	Check that the detector and the FACP locations are in accordance with the appropriate clauses of, AS 1670.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Alarm zone circuit:				
	i Measure each alarm zone circuit voltage, and ensure each is within the equipment manufacturer's specifications.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ii Insulation resistance of all installation wiring measured in accordance with AS 3000 or similar approved method and record the worst case result in the logbook.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.	Open circuit and short circuit the end of line device on each alarm zone circuit, or conduct other appropriate tests to ensure that fault and alarm conditions are operating correctly on all alarm zone facilities on other sections of the control and indicating equipment.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.	FACP test to be carried out as follows:				
	i Operate each alarm test, fault test, isolate and reset facility provided for each alarm zone facility to determine correct operation.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ii Operate the primary power source switch on and off at least five times to check the system will not cause a false alarm from primary power source interruptions.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

		Yes	No	NA
7.	Detector testing to be carried out as follows:			
	i Test each installed detector or sampling point with an approved in-situ tester, and ensure that each detector has operated in the correct range, and the alarm has indicated on the control and indicating equipment and, if applicable, at the detector tested.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ii Confirm that response of the system does not exceed 6 s from the time the detector operates until the master alarm facility registers the alarm (while in normal mode) on each zone, or 32 s when AVF is fitted.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	iii Record tests on detector test record as required by AS 1851.8 and attach to the report.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.	Check the operation of each manual call point and all other actuating devices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9.	For flame detectors, perform the following:			
	i Check that the number and type of detectors provide adequate protection of the area.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ii Check that there are no 'blind' spots in areas protected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	iii Check that detectors are rigidly fixed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	iv Check that detectors are properly connected to compatible control and indicating equipment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	v Check that detector lenses are clean and adequately protected from dust and extraneous radiation sources where these are present.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	vi Test the detection response to a flame source or simulated flame.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10.	For smoke detection sampling systems, perform the following:			
	i Measure the response time of all sampling points using smoke placed at each sampling point.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	ii Check the back-up power supply capacity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	iii Check the operation of alarm settings and indicators.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	iv Check operation of remote indication of alarm and fault signals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	v Check the operation of airflow failure indicators.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	vi Check the operation of the system (signal) failure indicators.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	vii Check the isolate/reset functions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	viii Check the fault and alarm test facilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11.	Test each ancillary function by operating the alarm zone facility(ies), associated with the ancillary function.			

- 7. Current drain of ancillary loads powered from the FACP power supply _____
- 8. Primary power source voltage _____
- 9. Battery type and capacity Manufacturer _____ AH
- 10. Is maintenance agreement held for the system? Yes No
- 11. Operator's handbook supplied? Yes No
- 12. Logbook supplied? Yes No
- 13. 'As-installed' drawings supplied? Yes No
- 14. Portions of the building not protected by this system are; (*Please PRINT*)

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

- 15. I/We
 - 1. _____
 - 2. _____
 - 3. _____

Print Name/s

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

I/We further certify that the whole system and all components called up in Clause 1.3 in connection therewith are installed entirely in accordance with the current requirements of AS 1670.1, -

except with regard to the following details which have already been approved, approval attached.

Strike out the bolded sentence if there have not been any exceptions.

Signature _____ Date ____ / ____ / ____

Installing Company _____
Please PRINT or Stamp

19 Installation Details

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

* Add addressable loop number in brackets where applicable.

Alarm Zone #	* Number of Actuating Devices per Zone	Number and Type of Actuating Devices									
		Thermal					Smoke Ion Photo	Flame		Manual Call Point	Other
		A	B	C	D	E		IR	UV		
1.											
2.											
3.											
4.											
5.											
6.											
7.											
8.											

20 Certification Information

The *ZoneSense PLUS* is designed and manufactured by:

AMPAC TECHNOLOGIES PTY LTD

97 Walters Drive
 Osborne Park 6017
 Western Australia
 PH: 61-8-9242 3333
 FAX: 61-8-9242 3334



Manufactured to: _____

Certificate of Compliance Number: _____

Equipment Serial Number: _____

Date of Manufacture: _____

21 Commissioning Of Installed Cards And Boards

Confirm a Card / Board is in use and functional at the time of commissioning by ticking the appropriate circle.

Cards

Type	Fitted Y/N	Checked Y/N	Function / Location
Main Card BRD25MCB-A (4 Zone)	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Main Card BRD25MCB-B (8 Zone)	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Fire Fan Card BRD25FCB Order Code 4310-0020	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
General Indicator BRD25GIB-A Order Code 4310-0032	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Switch and Indicator BRD25GIB-B Order Code 4310-0030	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
LED Annunciator Master LAM Order Code 4310-0036	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Agent Release Card BDR25ARB-A Order Code 4310-0010	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Local Control Station BRD25ARB-D Order Code for IP40 - 4310-0014 Order Code for IP65 - 4310-0015	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Other (List)			
	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	

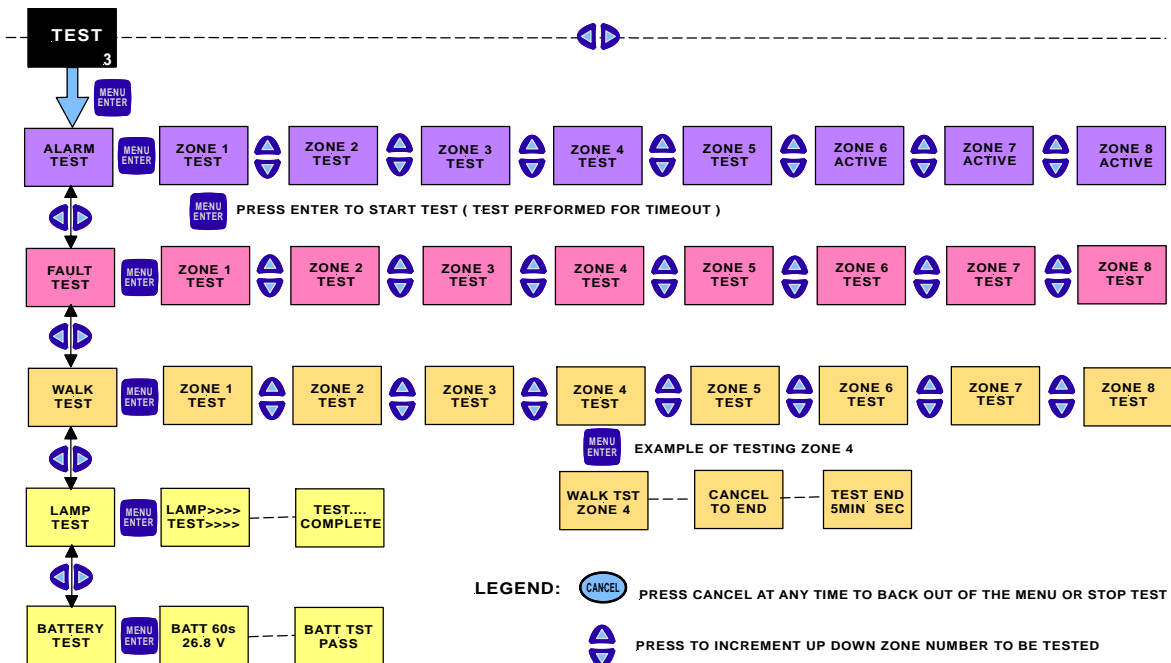
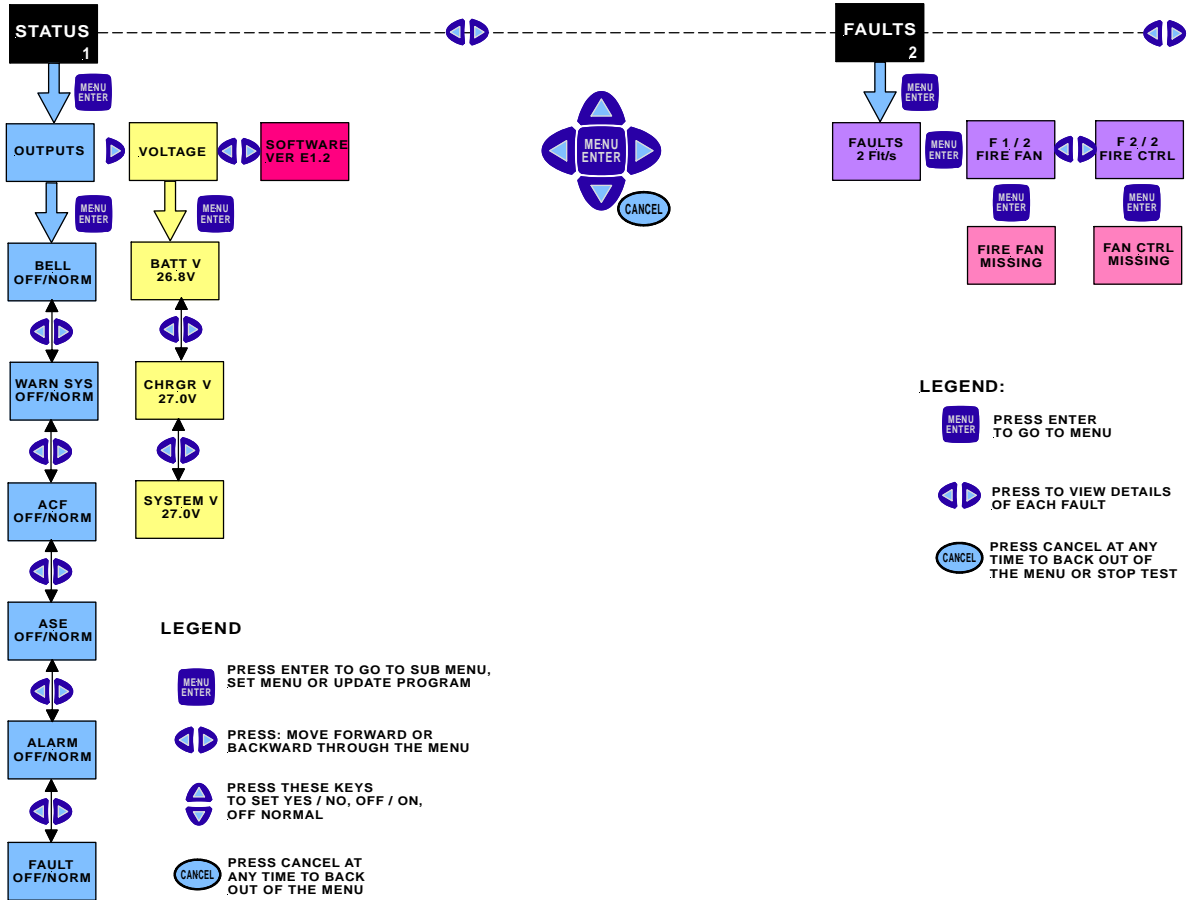
Boards

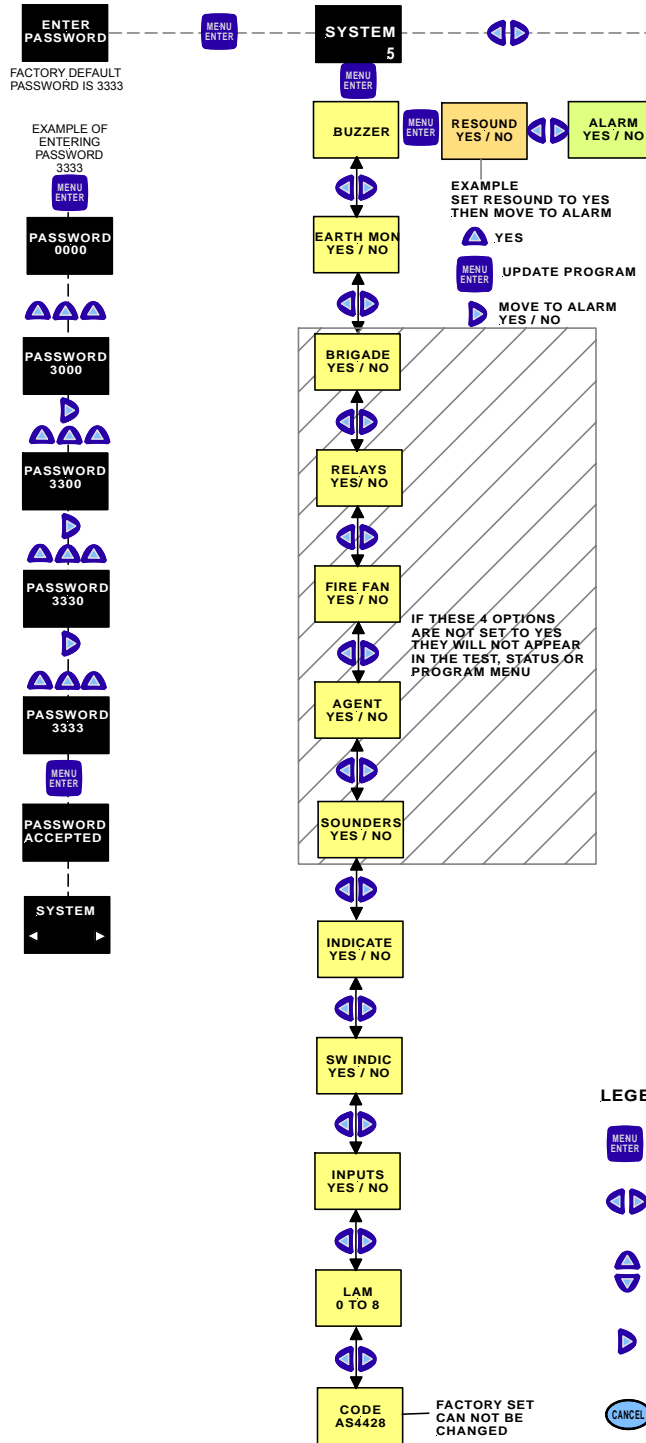
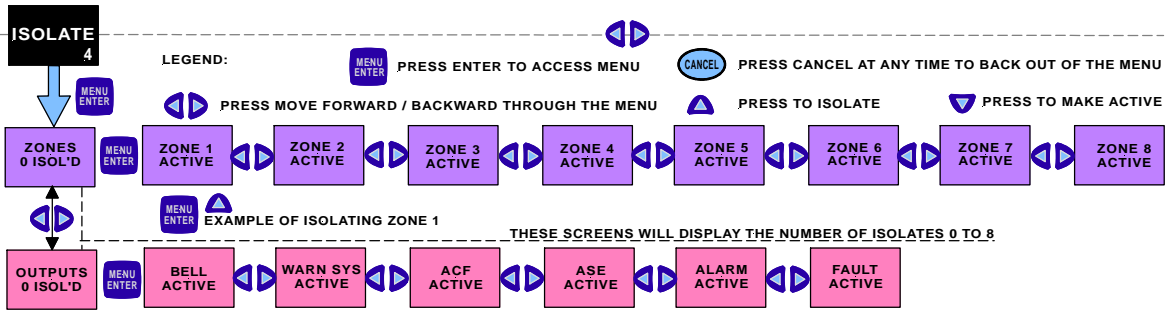
Input Board BRD25SIPB Order Code 4310-0040	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Relay Board (Panel) BRD25EWRB Order Code 4310-0050	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Relay Board (Remote) BRD25EWRB Order Code 4310-0055	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Fire Fan Termination Board BRD25FTB Order Code 4310-0020	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Brigade Interface Board BRD25BBA-A Order Code 4310-0070	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Sounder Board BRD25SOPB-A Order Code 4310-0060	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Agent Termination BRD25ATB Order Code 4310-0020	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
Other (List)			
	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	
	Y <input type="radio"/> N <input type="radio"/>	Y <input type="radio"/> N <input type="radio"/>	

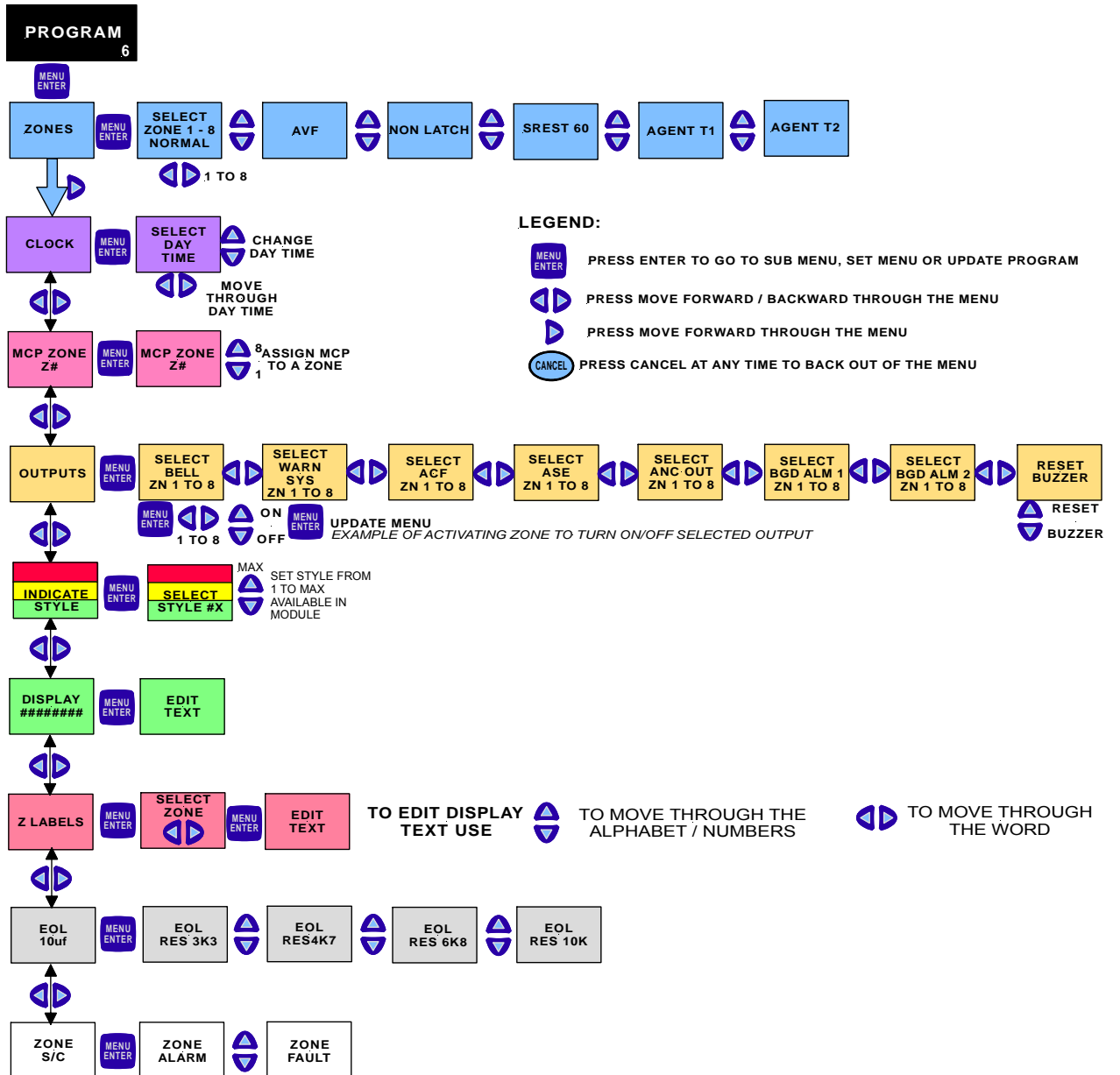
On completion off the installation mark up the Configuration Label as outlined in Section 23.

22 Basic AS4428 Menu Structure & Programming

STATUS	FAULTS	TESTS	ISOLATE	SYSTEM	PROGRAM
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UNCONTROLLED DOCUMENT

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