



# FS-1600 Fire Alarm Panel

## Operation, Installation & Programming Manual

**Revision E**  
**20/04/2016**

**Manufactured by:**



Approvals:

Australian Standard AS 7240.2-2004

Australian Standard AS 7240.4-2004

Australian Standard AS 4428.3-2010

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## Installation Precautions

*Adherence to the following will aid in problem-free installation with long-term reliability:*

**WARNING - Several different sources of power can be connected to the fire alarm control panel.** Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energised. Do not attempt to install, service, or operate this unit until manuals are read and understood.

**Verify that wire sizes are adequate** for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% voltage drop from the specified device voltage.

**Like all solid state electronic devices**, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility. Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes. Consult with the Technical Services Department if any problems are anticipated or encountered.

**Disconnect AC power and batteries** prior to removing or inserting circuit boards. Failure to do so can damage circuits.

**Remove all electronic assemblies** prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

**Do not over tighten screw terminals.** Over tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

**This system contains static-sensitive components.** Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the unit.

**Follow the instructions in the installation**, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

**This equipment must be correctly programmed and installed to suit the specific application.** Please ensure correct operational parameters are set prior to commissioning. If further details on programming options are required, please consult the programming manual or contact our helpful technical support personnel.

### EMC WARNING:

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Electromagnetic Interference (EMI) tests were performed in accordance with the Class A requirements of AS/NZS CISPR 22:2009.

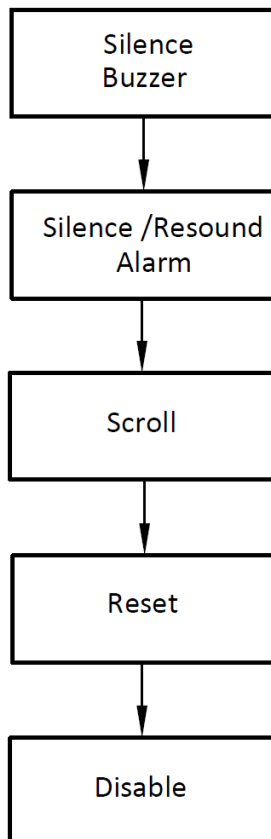
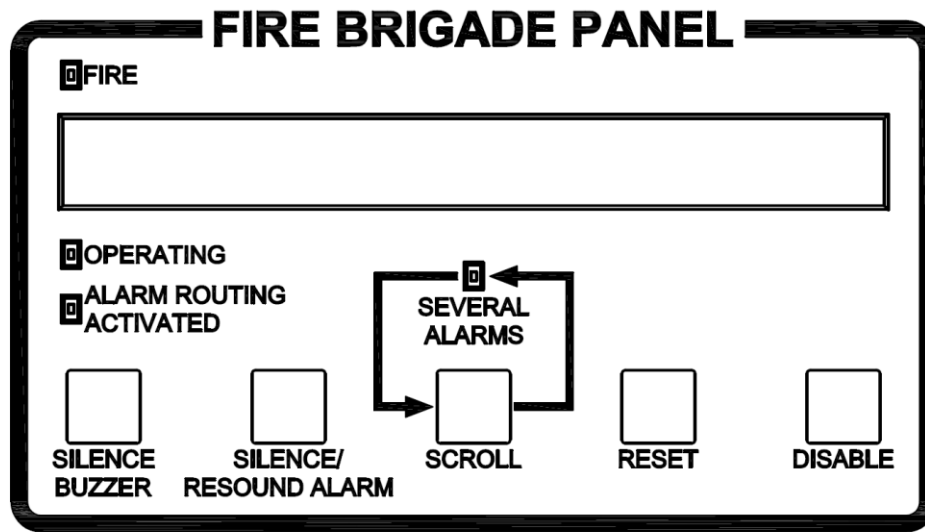
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# EMERGENCY OPERATION



Press *Silence Buzzer* to switch off the Panel Buzzer.

Press *Silence/Resound Alarm* to switch off any active Alarm Devices.

Press *Scroll* to navigate through multiple Alarm Events.

Press *Reset* once the hazards have been neutralized.

The panel will re-enter an Alarm state if the hazards have not been neutralised.

Press *Disable* to disable all active alarms.

# Section 1 About this Manual

## 1.1. Notes, Cautions and Warnings

This manual contains notes, cautions and warnings to alert the reader as follows:



**CAUTION:** Information about procedures that could cause programming errors, runtime errors or equipment damage.



**WARNING:** Indicates information about procedures that could cause irreversible equipment damage, irreversible loss of programming data or personal injury.



**NOTE:** Supplement information for a topic such as tips and references.

## 1.2. Related Documentation

| Title                                     | Document Number |
|---|-----------------|
| NPS Power Supply Installation Sheet       | DOC-03-057      |
| Zone Expansion Card Installation Sheet    | DOC-03-051      |
| Keypad Installation Sheet                 | DOC-03-054      |
| ARE Interface Board Installation Sheet    | DOC-03-062      |
| Battery Connection Installation Kit       | DOC-03-046      |
| Zone Mimic Manual                         | DOC-01-028      |
| ACM-8RA Installation Sheet                | DOC-03-052      |
| Intrinsically Safe Manual                 | DOC-01-029      |
| Zone Label Plate Installation Sheet       | DOC-03-060      |
| DA Series BOWS Manual                     | DOC-01-004      |
| Extinguishing Agent Release Module Manual | DOC-01-005      |

Table 1-1 - Related Documentation



# Section 2 System Overview

## 2.1. Introduction

The FS-1600 is an Australian designed fire panel that supports building managers in the management of their fire safety responsibilities.

The FS-1600 helps building managers facilitate and manage:

- The monitoring of a buildings fire safety systems.
- The successful alert of building occupants during a fire emergency.
- The timely evacuation of a building.
- A rapid response from the emergency services.

Complementing the monitoring, alert, evacuation and response capabilities the testing functionality permits building managers to self-manage the testing of the buildings fire safety systems.

This manual has been created as a first point of reference for:

- Technicians installing the fire panel and the range of fire ancillaries.
- Technicians programming the fire panel.
- User groups operating the fire panel.
- User groups who need assistance in running diagnostic operations.

## 2.2. Agency Approvals

- AS 7240.2-2004  
Fire detection and alarm systems  
Part 2: Control and indicating equipment  
(ISO 7240-2:2003, MOD)

The FS-1600 supports the following optional functions of AS7240.2:

- Output to fire protection equipment – Output type B to clause 7.10.2
- Dependency on more than one alarm signal – Type A dependency to clause 7.12.1
- Fault signals from points to clause 9.3
- Output to fault warning routing equipment to clause 9.9
- Disabled condition to clause 10
- Test condition to clause 11

- AS 7240.4-2004  
Fire detection and alarm systems  
Part 4: Power supply equipment  
(ISO 7240-4:2003, MOD)

The FS-1600 supports the following optional functions of AS7240.4:

- Battery function check to clause 5.5

- AS 4428.3-2010  
Fire detection, warning, control and intercom systems - Control and indicating equipment  
Part 3: Fire brigade panel

## 2.3. Features and Specifications

### 2.3.1 Hardware Features

- Eight fire detection zones (16 with Zone Expansion Card fitted).
- A Two line, 40-character LCD for viewing events and zone/output status and fault finding.
- Silicone keypad;
  - With an alpha-numeric 3 x 4 grid keypad and navigation buttons.
  - With 16 zone status indication LEDs used for showing alarms, faults and disable states of detection zones.
  - With Silence Buzzer, Silence Alarms, Scroll Reset and Disable buttons for use in emergencies by the Fire Brigade.
  - With ancillary buttons of Alarm Devices (Disable and Test), Smoke Control and Disable.
- Compact 5.6 or 11.7 amp power supply with built in battery charger.
- Available in multiple cabinet sizes including CAB650 and CAB900.
- Brigade Interface port to permit the external monitoring of the panel by the Fire Brigade.
- Door Holder Output to enable the connection of electro-magnetic Door Holder devices.
- Three form C relays.
- Three NAC circuits to control Notification Appliances.
- Support for connecting an Intrinsically Safe Barrier for use with Intrinsically Safe detectors.
- Capacity to connect optional ACS devices such as;
  - ACM-8RA, Programmable eight output Relay Card.
  - ACM-ZM, Zone Mimic Card with Expansion Module.

### 2.3.2 Software Features

- Control by event (CBE) programming, providing panel with powerful and flexible output programming.
- History Log to provide time- stamped events enabling easy interpretation of panel events.
- Test functionality; including Zone Walk Tests and automatic battery tests.
- Manual reset to clear faults.
- AVF feature, providing detection verification to prevent environmental conditions from giving false alarms.

### 2.3.3 Environmental Specifications

| Parameter            | Details   |
|----------------------|---|
| Environmental Limits | 0 °C to 55 °C dry heat.<br>40 °C @ 93% relative humidity. |
| IP Rating            | IP30  |

Table 2-1 - Environmental Specifications (CAB650 and CAB900)

### 2.3.4 Supply Rating

| Parameter                      | Details   |
|--------------------------------|---|
| Input Fuse Rating              | M205 Fuse - 250V, 8.0A  |
| Input Voltage Rating           | NPS-5CHS – 240Vac, 0.8A, 50Hz<br>NPS-11CHS – 240Vac, 1.5A, 50Hz |
| <b>Output Ratings</b>          |   |
| Output Current                 | (5.6 A) NPS-5CHS<br>(11.7A) NPS-11CHS                           |
| <b>Output Ratings: Charger</b> |   |
| Charger Voltage                | 27.3V   |

Table 2-2 - Power Supply Specification

## 2.4. Recommended Standby Battery Sizes

A list of available batteries is shown in Table 2-3 – Recommended Battery Specifications.



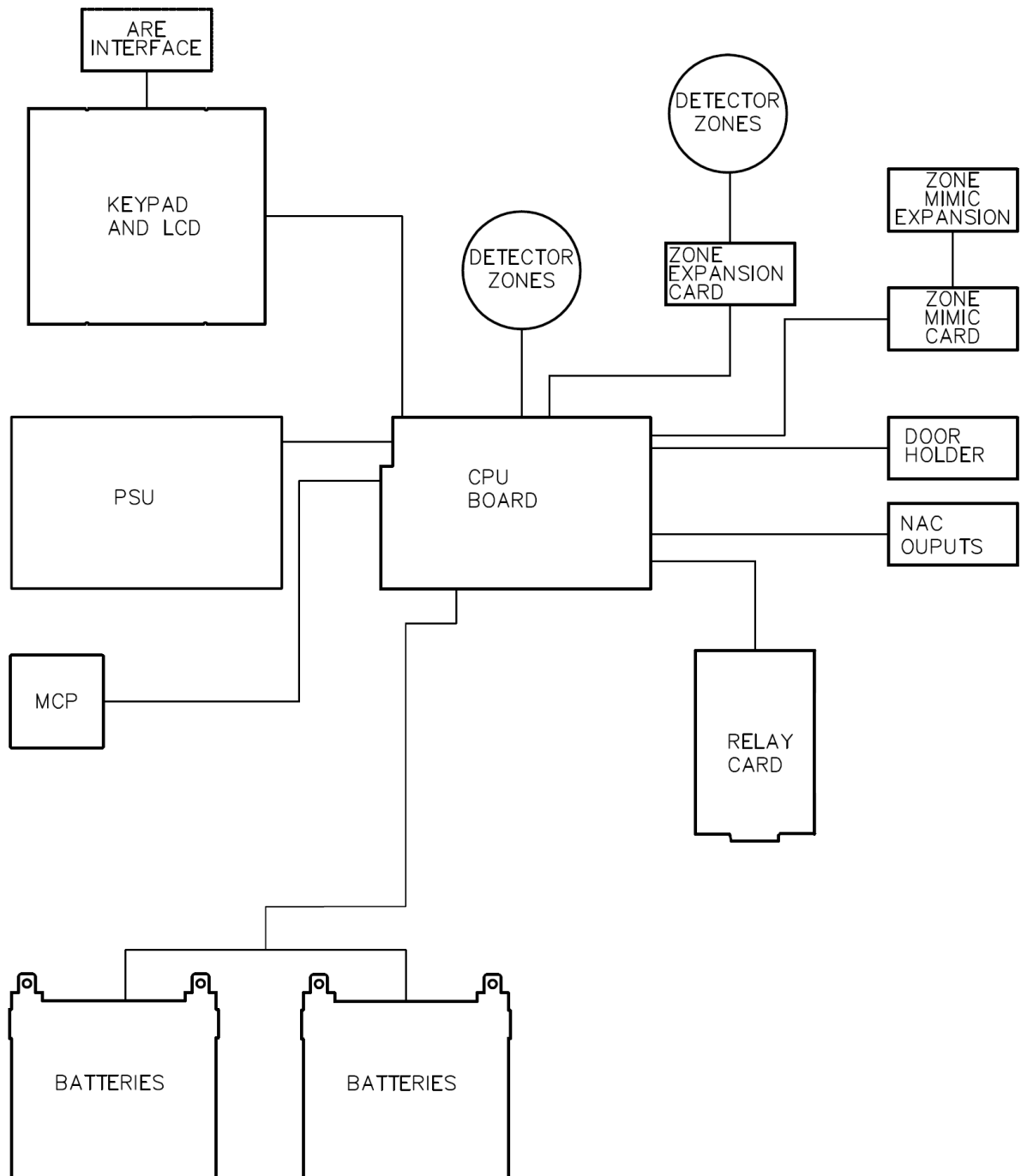
**NOTE:** Connect only sealed lead acid batteries.

| Battery Descriptions                          | Voltage | Capacity (Ah) | Quantity |
|---|---------|---------------|----------|
| Olympic, 7AH 12V Battery - BATT/7 (CJ12-7)    | 12      | 7             | 2        |
| Olympic 12AH 12V Battery - BATT/12 (CJ12-7)   | 12      | 12            | 2        |
| Olympic, 18AH 12V Battery - BATT/18 (CJ12-18) | 12      | 18            | 2        |
| Olympic, 26AH 12V Battery - BATT/26 (CJ12-26) | 12      | 26            | 2        |
| Olympic, 33AH 12V Battery - BATT/33 (CJ12-33) | 12      | 33            | 2        |
| Olympic, 40AH 12V Battery - BATT/40 (CJ12-40) | 12      | 40            | 2        |
| Olympic, 85AH 12V Battery - BATT/85 (CJ12-85) | 12      | 85            | 2        |

**Table 2-3 – Recommended Battery Specifications**

## 2.5. System Diagram

The System Diagram shows the ancillaries that can be used with the panel.



**Figure 2-1 - System Diagram**

## 2.6. Available Kits

The standard devices that can be fitted to the fire panel are listed in Table 2-4 – Standard Devices.

The complementary devices that can also be fitted to the fire panel are listed in Table 2-5 - Complementary Devices.

| Title                              | Part Number |
|------------------------------------|-------------|
| FS-1600 Replacement CPU            | ASY-02-025  |
| Replacement NPS-5CHS Power Supply  | ASY-02-034  |
| Replacement NPS-11CHS Power Supply | ASY-02-033  |
| FS-1600 Keypad Installation Kit    | ASY-02-026  |
| Battery Connection Pack            | ASY-01-035  |
| 3V BR2335 Lithium Battery          | FG-65-012   |

**Table 2-4 – Standard Devices**

| Title                                     | Part Number |
|---|-------------|
| FS-1600 Zone Expansion Card               | ASY-01-039  |
| Replacement Name Plate                    | ASY-02-031  |
| ACM-8RA, Programmable 8 Output Relay Card | ASY-01-040  |
| ACM-ZM Zone Mimic Remote Module           | ASY-02-023  |

**Table 2-5 - Complementary Devices**

## 2.7. Compatible Devices

The devices listed in Table 2-6 - Compatible Devices are compatible with the fire panel.



**NOTE:** AS1670.1 limits the number of detectors that can be installed on a zone circuit to 40.



**NOTE:** Clean contact devices are also compatible, provided they are the only devices fitted to the zone.

| Model Number | Device Description                                       | Maximum number of detectors per circuit |
|--------------|--|---|
| 2151BAUS     | System Sensor, Photoelectric Smoke Detector              | 42                                      |
| 2151AUS      | System Sensor, Photoelectric Smoke Detector              | 42                                      |
| 1151AUS      | System Sensor, Ionization Detector                       | 46                                      |
| 5151AUS      | System Sensor, Rate of Rise, 63°C detector, type A2R     | 50                                      |
| 5151RAUS     | System Sensor, Fixed Temperature, 63°C detector, type A2 | 50                                      |
| 5151RHAUS    | System Sensor, Rate of Rise, 90°C detector, type CR      | 50                                      |
| 5151HAUS     | System Sensor, Fixed Temperature, 90°C detector, type C  | 50                                      |
| 51A51        | System Sensor, Type A Heat Detector                      | 30                                      |
| 51B51        | System Sensor, Type B Heat Detector                      | 30                                      |
| 51C51        | System Sensor, Type C Heat Detector                      | 30                                      |
| 51D51        | System Sensor, Type D Heat Detector                      | 30                                      |
| M400KR       | System Sensor, Manual Call Point                         | No limit                                |
| 885WP        | System Sensor, Weatherproof Type B detector              | 50                                      |
| D2-AUS       | System Sensor, InnovairFlex Duct Smoke Detector          | 42                                      |
| DH100LP      | System Sensor, 2-Wire Photoelectric Duct Smoke Detector  | 21                                      |

| <b>Model Number</b> | <b>Device Description</b>                             | <b>Maximum number of detectors per circuit</b> |
|---------------------|---|--|
| 1151EISE            | System Sensor, Intrinsically Safe detector            | See IS Manual<br>DOC-01-029                    |
| 5451EISE            | System Sensor, Intrinsically Safe detector            | See IS Manual<br>DOC-01-029                    |
| 5351TE              | System Sensor 58°C Fixed Temp Heat 300 Series         | 30   |
| 4351E               | System Sensor 78°C Fixed Temp Heat 300 Series         | 26   |
| 2351E               | System Sensor Photoelectric Smoke 300 Series          | 35   |
| 2351TEM             | System Sensor Photoelectric Smoke/ Thermal 300 Series | 28   |
| 5351E               | System Sensor Rate of Rise 300 Series                 | 30   |
| SIJ-ASN             | Hochiki, Ionization Detector                          | 101  |
| SLZ-AS              | Hochiki, Photoelectric Detector                       | 101  |
| DFG-60BLKJ          | Hochiki, Waterproof Heat Detector                     | No limit                                       |
| DCD-A               | Hochiki, Type A Combination Thermal Detector          | 72   |
| DCD-C               | Hochiki, Type C Combination Thermal Detector          | 50   |
| DFJ-60B             | Hochiki, Type B Combination Thermal Detector          | 72   |
| DFJ-90D             | Hochiki, Type D Combination Thermal Detector          | 50   |
| 53531-271           | Apollo Heat Type A                                    | 34   |
| 53531-272           | Apollo Heat Type B                                    | 34   |
| 35531-273           | Apollo Heat Type D                                    | 34   |
| 53551-201           | Apollo Photo-Electric Series 30 (53551-201)           | 34   |
| 53541-161           | Apollo Smoke Ionization Series 30 (53541-161)         | 40   |

**Table 2-6 - Compatible Devices**

# Section 3 Connecting and Installing

## 3.1. Mounting the Panel

There are four mounting holes drilled into the back of the cabinet to permit the mounting of the panel to a wall. For details on the dimensions of the cabinet mounting holes, refer to the CAB650 and CAB900 Mounting Details in Appendix A Mounting Details on page 84.

## 3.2. Connecting the AC Power Supply

The fire panel requires 240 Volts to be connected to the fuse block to operate.



**WARNING:** Remove all power sources to equipment while connecting electrical components. Leave the external, main power breaker *OFF* until installation of the entire system is complete.

1. Wire the site to the panel fuse block, as per Figure 3-1 - AC Power to Fuse Block

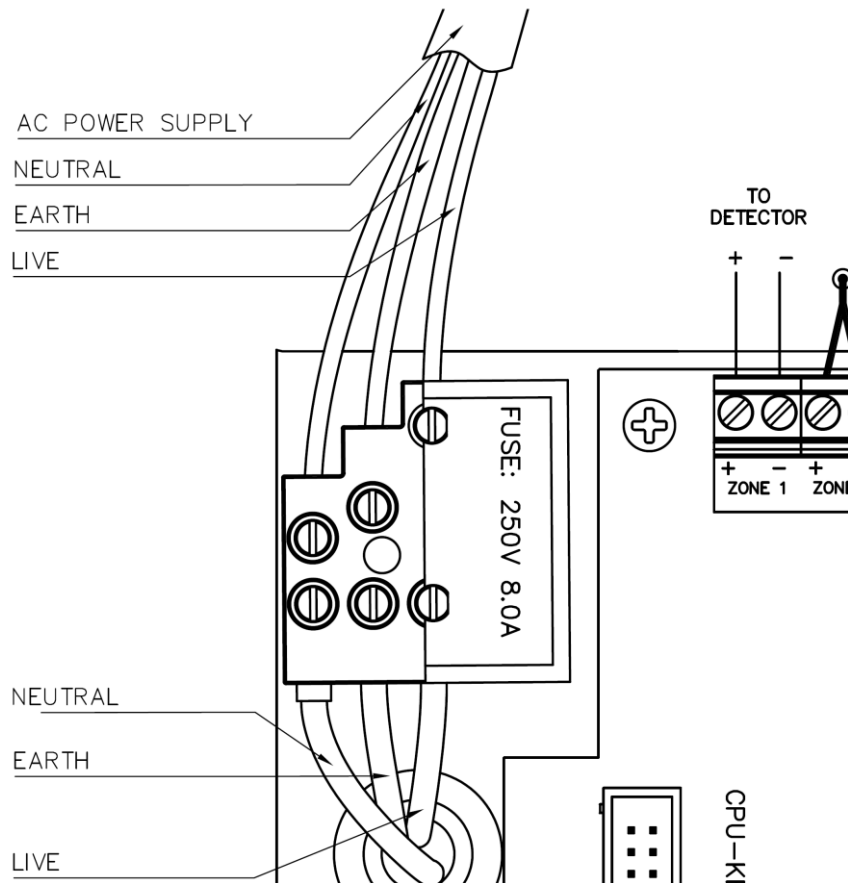


Figure 3-1 - AC Power to Fuse Block



### 3.3. Batteries

#### 3.3.1 Connecting Batteries

The fire panel has been designed to run on standby battery power should there be a power outage. This section describes how to connect the battery power. For details on the recommended batteries refer to Table 2-3 – Recommended Battery Specifications.



**WARNING:** Remove all power sources to equipment while connecting electrical components. Leave the external, main power breaker *OFF* until installation of the entire system is complete.



**CAUTION:** There is a risk of explosion if a battery is replaced by an incorrect battery type.



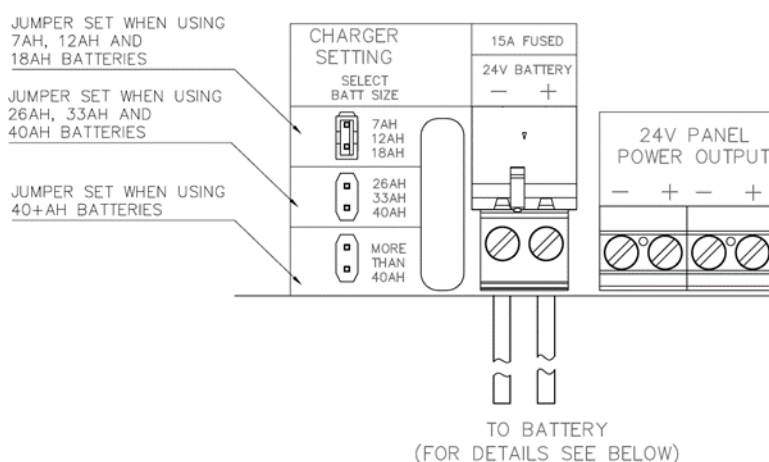
**CAUTION:** Dispose of any used batteries according to the manufacturer's instructions.



**CAUTION:** The maximum current rating of the batteries is 11.6A. The battery connection is fused. If the fuse needs to be replaced it must be replaced with a 15A blade fuse.

To connect the battery power to the fire panel:

1. Connect the exposed end of the battery cables to the CPU Board via the 2-way header.
2. Set the charger setting jumper to the relevant pins. Figure 3-2 - Battery Charger Jumper Settings shows the charger setting for different sized batteries in amp hours (Ah).



**Figure 3-2 - Battery Charger Jumper Settings**



**CAUTION:** If the charger setting does not match the size of the battery there is a risk that the battery will be damaged.



**WARNING:** Only use the supported batteries listed in Table 2-3 – Recommended Battery Specifications.

3. For batteries with a bolt termination refer to Figure 3-3 - Bolt Termination Connections. The bolt terminal can be connected to the battery cables supplied with the panel.

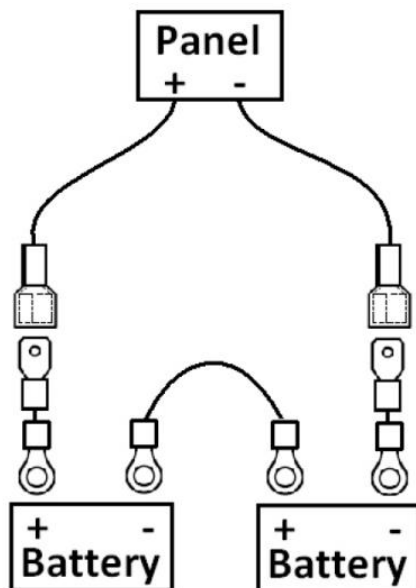


Figure 3-3 - Bolt Termination Connections

4. For batteries with a spade terminal refer to Figure 3-4 - Spade Terminal Connections. The spade terminal can be connected to the battery cables supplied with the panel.

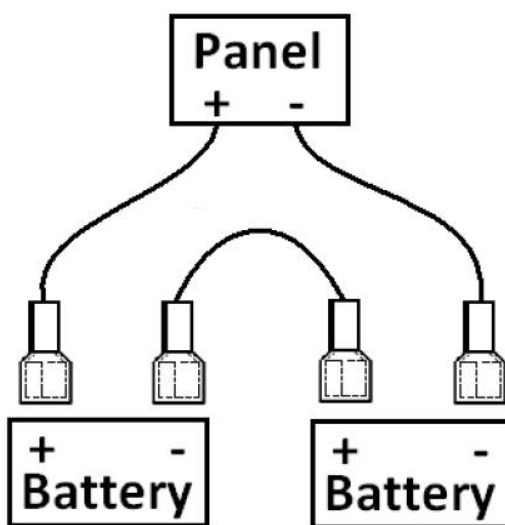


Figure 3-4 - Spade Terminal Connections



**WARNING:** Never connect more than two batteries in series with each other - this will expose the panel to a higher voltage than what it is designed for and may damage the panel and/or the batteries.

---



**NOTE:** When connecting two pairs of batteries together, all four batteries must be the same size, from the same manufacturer and the same age.

---

### 3.3.2 Battery Calculations

To calculate the size of the battery required use the equations and calculations in Appendix B Battery Calculations on page 86.

### 3.3.3 Replacing the 3V Battery

The 3V battery powers the system clock. The 3V battery is located on the CPU board. The system clock will only run on the 3V battery if both the 240AC and the battery supplies fail. If the 3V battery goes flat, or is removed the display will show a clock error message the next time the panel restarts.



**WARNING:** Remove all power sources to equipment while connecting electrical components. Leave the external, main power breaker *OFF* until installation of the entire system is complete.

---



**CAUTION:** There is a risk of explosion if a battery is replaced by an incorrect battery type.

---



**CAUTION:** Dispose of any used batteries according to the manufacturer's instructions.

---

To replace the 3V battery:

1. Lift up the battery clip.
  2. Slide the existing battery out the bottom of the battery holder.
  3. Slide the new 3V battery into the battery holder.
- 

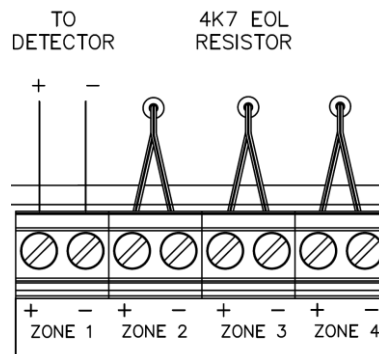


**NOTE:** A replacement 3V BR2335 Lithium battery can be ordered by quoting the part number FG-65-012.

---

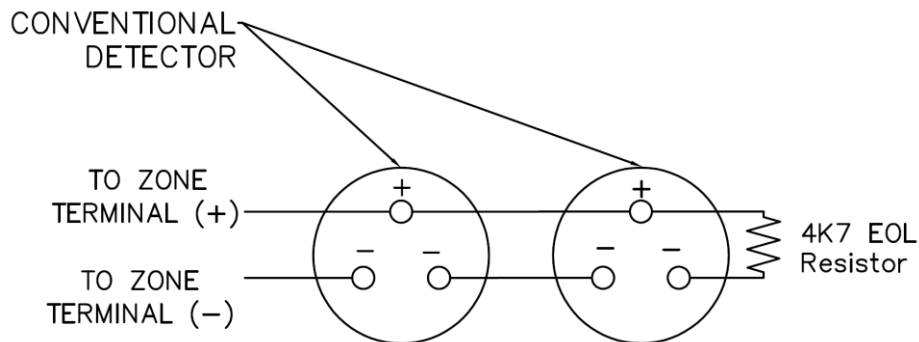
### 3.4. Connecting Detectors

1. Connect the positive and negative cables from the detector to the zone terminal as per Figure 3-5 - Detector Cables to Zone Terminal.



**Figure 3-5 - Detector Cables to Zone Terminal**

2. Wire the detectors to each other as per Figure 3-6 - Detector to Detector Circuit.
3. Ensure the 4K7Ω End of Line (EOL) resistor is connected across the terminals of the last detector in the circuit.



**Figure 3-6 - Detector to Detector Circuit**



**NOTE:** For a list of compatible detectors and the maximum number of supported devices refer to Table 2-6 - Compatible Devices.



**NOTE:** IS circuits require a different value EOL resistor, refer to DOC-01-029 the IS Solutions Manual for more information.



**NOTE:** For specific detector installation instructions refer to documentation supplied with the detector.



**NOTE:** The zones are current limited to 40mA. Refer to Appendix F Cabling Requirements on page 102 for the cable requirements when connecting detectors to the zone circuits.

### 3.5. Installing an Intrinsically Safe Barrier (IS Barrier)



---

**WARNING:** Refer to the safety warning labels on the IS enclosure during installation of the IS barrier.

---

An IS barrier protects an environment where there is a high risk of fire and explosion due to a spark from an electrical device. Intrinsically safe detectors can be used with the FS-1600 but must be connected using the MTL barrier specified.

For more information regarding the IS barrier refer to DOC-01-029, Intrinsically Safe Barrier Manual.

### 3.6. Connecting Notification Devices

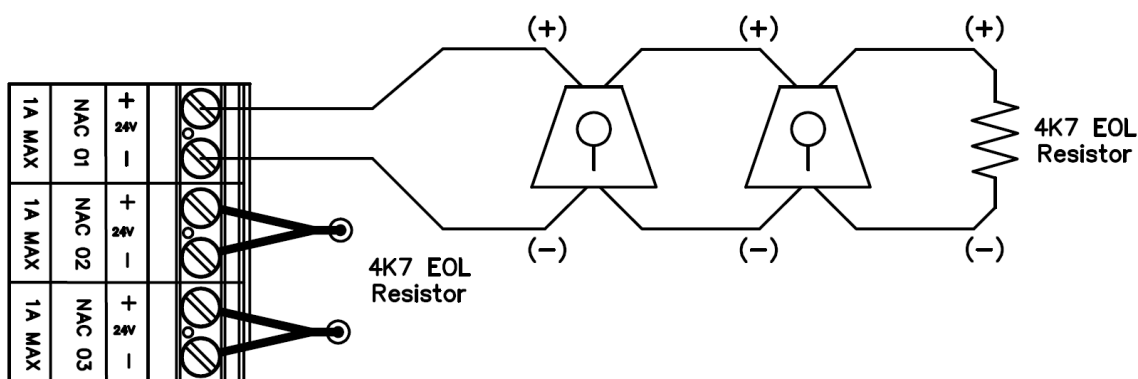
The Notification Appliance Circuit (NAC) permits the connection of notification devices, such as strobes, sounders and bells.



**NOTE:** The maximum current rating for each NAC output is 1.0A.

To connect the notification devices to the CPU Board:

1. Wire the NAC devices to the applicable NAC output on the CPU Board, see Figure 3-7 - NAC Connections.



**Figure 3-7 - NAC Connections**

2. If there are multiple NAC devices, connect the positive and negative cables running from the previous NAC device to the next NAC device.
3. Fit a 4K7Ω EOL resistor across the last device in a NAC circuit.



**NOTE:** Leave the 4K7 EOL resistor in place on the CPU Board if no NAC devices are to be connected.



**NOTE:** The device should not allow current to run in a reverse direction, otherwise a short circuit fault will appear on the display.



**NOTE:** Refer to Appendix F Cabling Requirements on page 102 for devices connected to NAC Circuit types.

### 3.7. Connecting Door Holders

Door holder devices control the open state of a door during normal and alarm conditions.



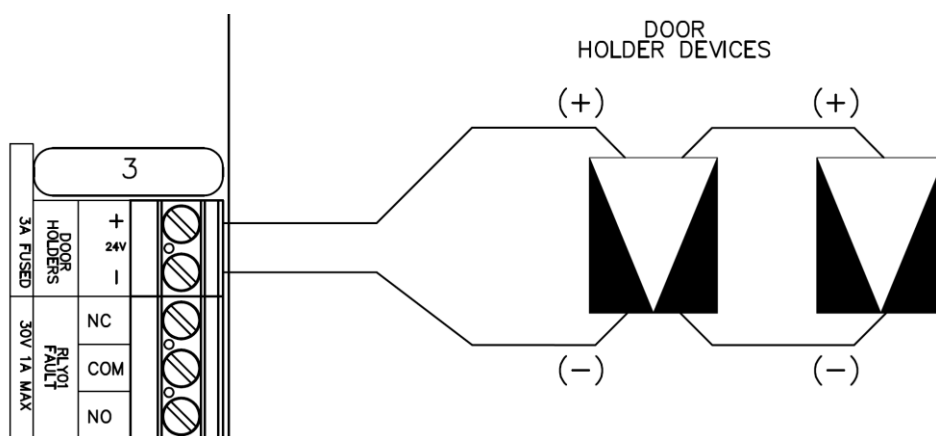
**NOTE:** Door holder devices are powered by the PSU and will not be powered by the panel batteries.



**NOTE:** The maximum current rating for the Door Holder Output is 3.0A. If the fuse needs to be replaced it must be replaced by a 3A blade fuse.

To connect the door holders to the CPU Board:

1. Wire the door holder devices to the door holder output on the FS-1600, see Figure 3-8 - Door Holder Connections.



**Figure 3-8 - Door Holder Connections**

2. If there are multiple door holders, connect the positive and negative cables running from the previous door holder to the next door holder.



**NOTE:** When resetting the fire panel, any devices connected to the door holder output will be energised.



**NOTE:** Door holders can be connected to other relays. When this occurs the door holder Output type needs to be selected.



**NOTE:** Refer to Appendix F Cabling Requirements on page 102 for the Door Holder Cable requirements.



### 3.8. Installing the Zone Expansion Card

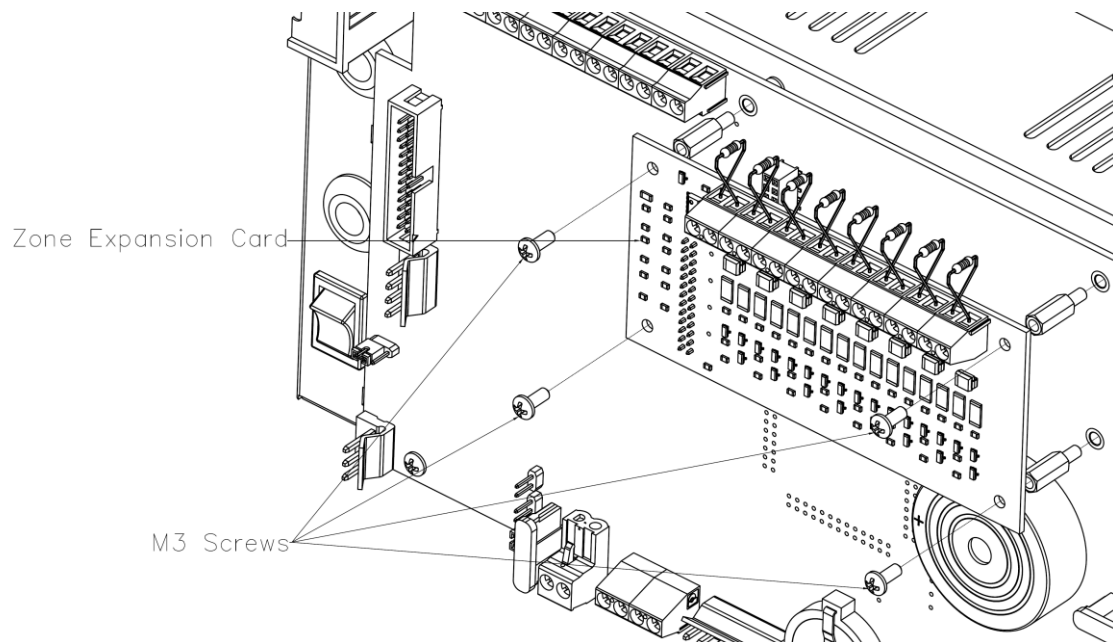
The Zone Expansion Card increases the number of zones from 8 to 16.



**CAUTION:** Power down the fire panel before adding or removing the Zone Expansion Card.

To connect the Zone Expansion Card:

1. Remove the screws closest to the Zone Expansion Socket from the CPU Board.
2. Fit the four stand offs to the CPU Board (if not already fitted).
3. Align the Zone Expansion Socket on the CPU Board with the Zone Expansion Header on the Zone Expansion Card.
4. Press the Zone Expansion Card Header into the Zone Expansion Socket.
5. Secure the Zone Expansion Card to the CPU Board with the screws.



**Figure 3-9 - Fitting Zone Expansion Card**

6. Connect the detectors to the Zone Expansion Card as shown in Figure 3-5 - Detector Cables to Zone Terminal.
7. Program the panel to recognise the Zone Expansion Card. See Section 5.10 Programming the Zone Expansion Card on page 74.

### 3.9. Installing Relay Cards (ACM-8RA)

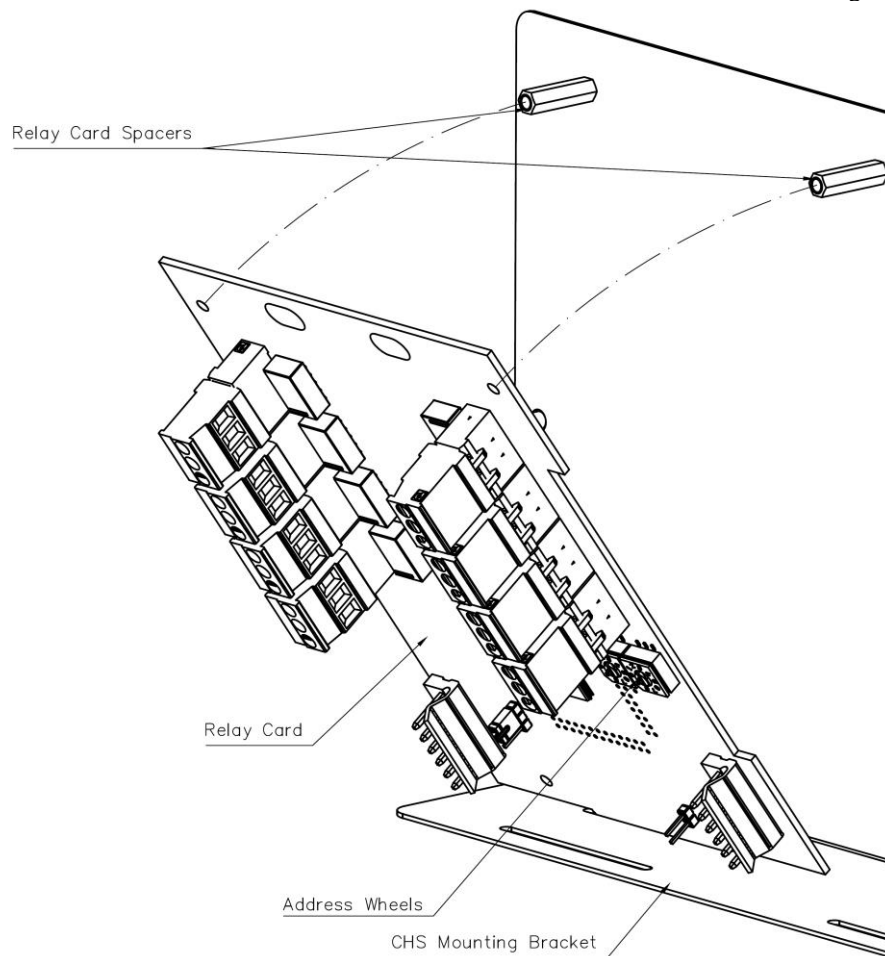
The ACM-8RA permits the connection of additional relay outputs to the fire panel.



**CAUTION:** Power down the panel before adding or removing the ACM-8RA.

To fit an ACM-8RA:

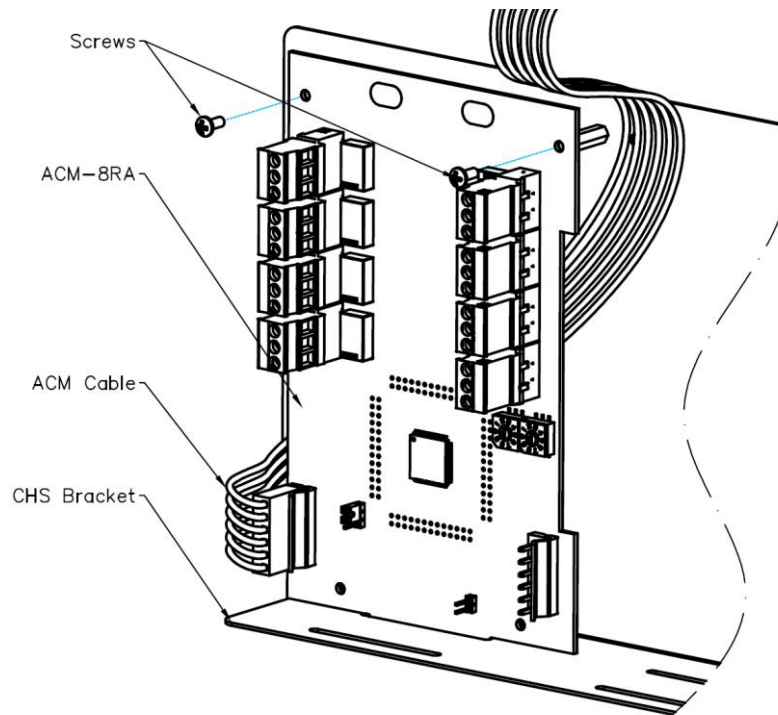
1. Set the ACM-8RA address using the address wheels.
2. Fix the supplied spacers to CHS Mounting Bracket.
3. Position the ACM-8RA into the slot at the bottom of the CHS Mounting Bracket.



**Figure 3-10 - Positioning ACM-8RA**

4. Rotate the ACM-8RA so that the holes on the top of the card align with the spacer threads.

5. Secure the ACM-8RA to the CHS Mounting Bracket with the supplied screws.



**Figure 3-11 - Securing ACM-8RA to CHS Bracket**

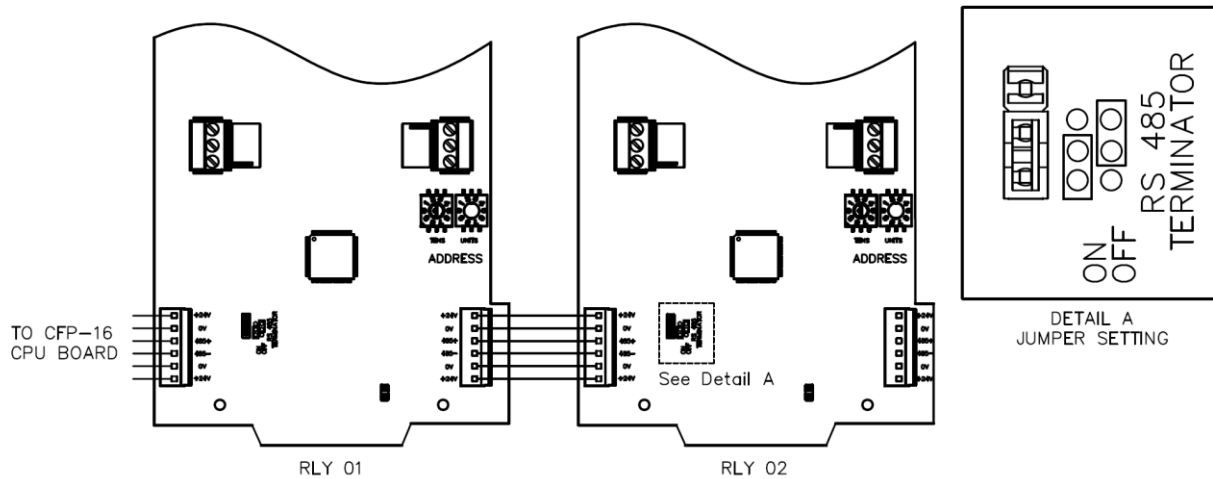
6. Ensure that the EOL jumper is set to the ON position.
7. Connect the ACM-8RA into the CPU Board at the ACM Interface Socket with the supplied 6-way ACM cable.
8. Program the ACM-8RA as per Section 5.4.1 Programming a Relay Card (ACM-8RA) on page 67.



**NOTE:** The 6-way ACM cable needs to pass behind the ACM-8RA during installation.

To connect additional ACM-8RAs;

1. Remove the jumper from the first ACM-8RA or set the jumper on the first ACM-8RA in the chain to the *OFF* position.
2. Connect the first and second relay cards with the 6-way ACM cable as per Figure 3-12 - Relay to Relay connection.
3. Set the EOL Jumper on the last ACM-8RA in the circuit to the *ON* position.



**Figure 3-12 - Relay to Relay connection**

4. Power up the unit and refer to Section 5.4.1 Programming a Relay Card (ACM-8RA) on page 66 for programming instructions.

### 3.10. Installing the Alarm Routing Equipment (ARE) Interface Board

The relays (Fault, Alarm, Disabled and three programmable relays) on the ARE Interface Board control the signal transmission between the fire panel and the Fire Brigade.



**CAUTION:** Power down panel before adding or removing the ARE Interface Board

1. Remove the flanged nuts from the inner door studs.
2. Position the ARE Assembly over the inner door studs.
3. Secure the ARE Assembly to the inner door studs with the flanged nuts.

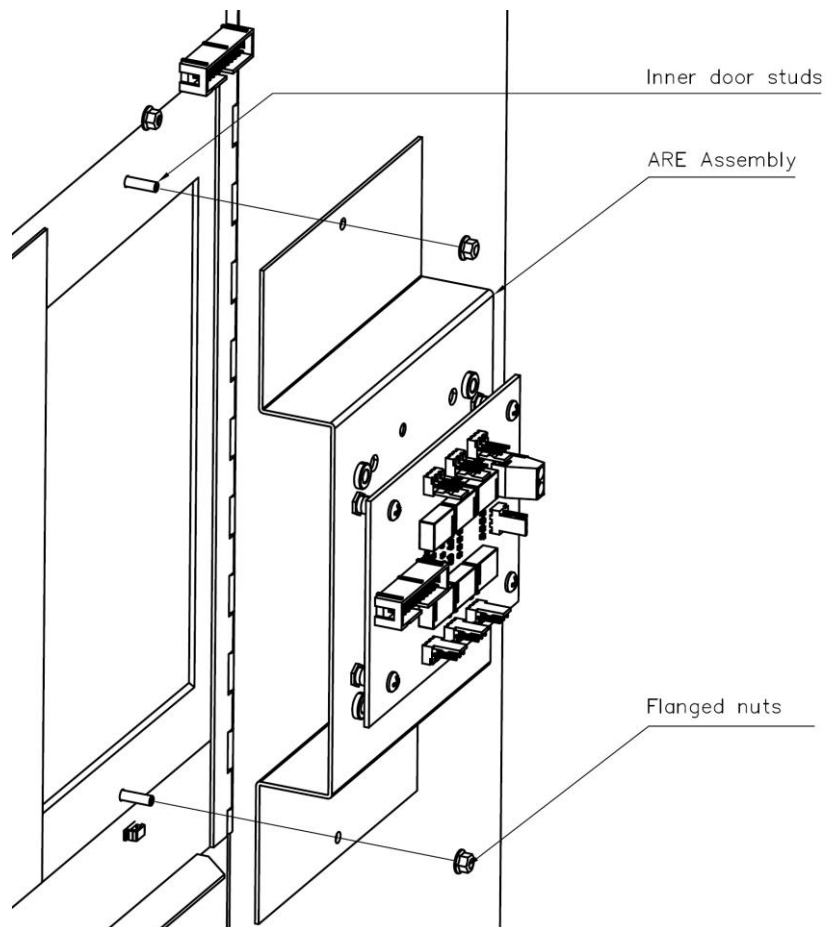
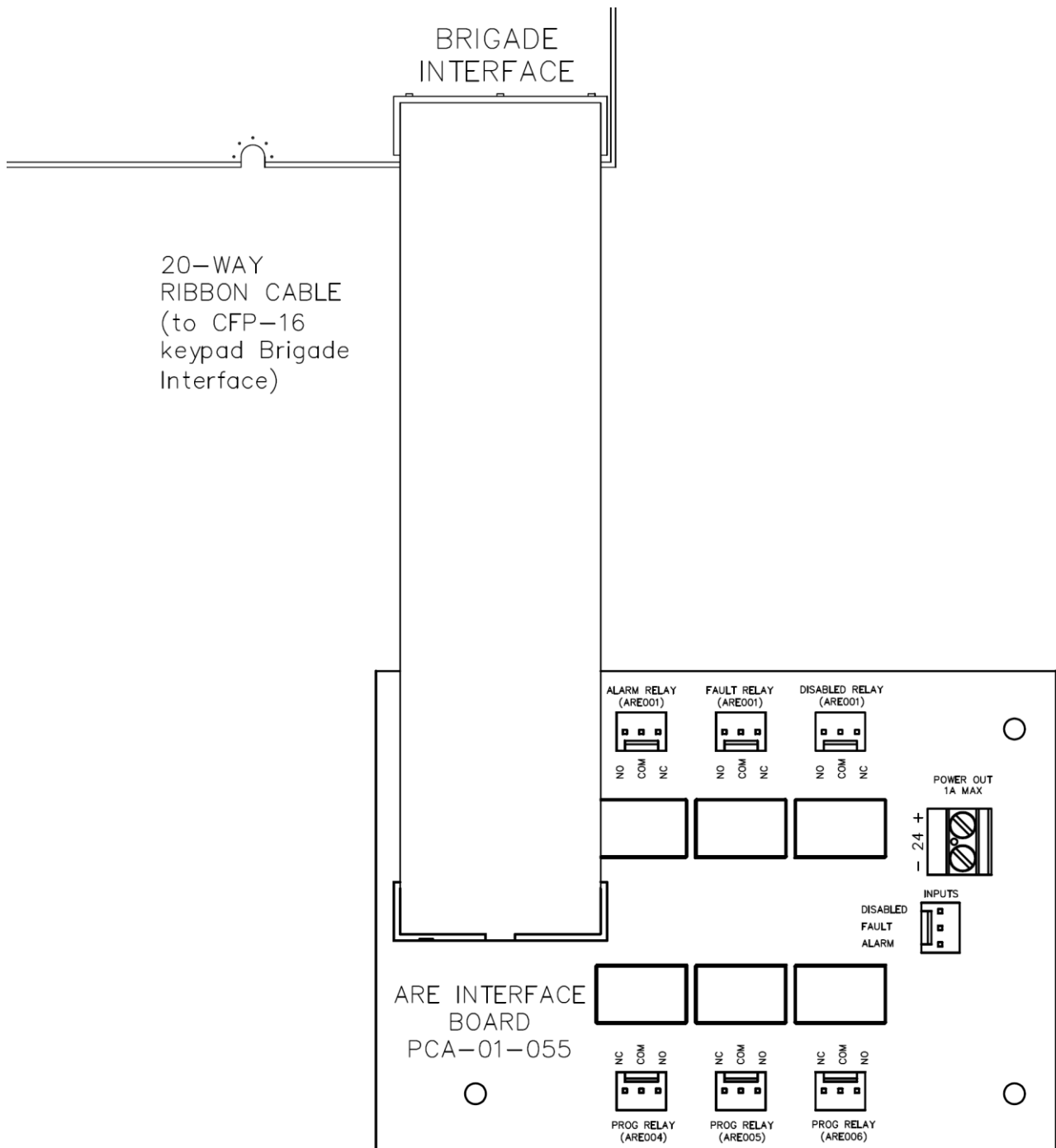


Figure 3-13 - Installing ARE Assembly

4. Remove the Brigade Interface jumper from the keypad Brigade Interface header.
5. Connect the ARE Interface Board to the keypad Brigade Interface header with the 20-way Ribbon Cable



**Figure 3-14 - Keypad to ARE Device Connection**

6. To program the outputs connected to the ARE Interface refer to Section 5.3 Programming Outputs on page 63.
7. For further Information regarding the connection of the ARE Interface Board Relays to the site's Brigade Interface refer to the ARE schematic in Appendix G Schematics on page 107.

### 3.11. Connecting a FS-1600 to a Remote Mimic

The Remote Mimic is a smaller cabinet containing a Zone Mimic. The Zone Mimic permits an operator to see the state of the panel remotely.



**CAUTION:** Power down the fire panel before connecting the Remote Mimic.

To connect a Remote Mimic

1. Wire the power and comms to the Field ACM terminal on the FS-1600 CPU Board.
2. Wire the other ends of the comms and power cables to the ACM-ZM as per Figure 3-15 - ACM-ZM to FS-1600 Connection.
3. Ensure that the EOL Termination jumper is fitted to the last ACM-ZM in the circuit.
4. Program the ACM-ZM as per Section 5.3 Programming ACS Modules on page 66.

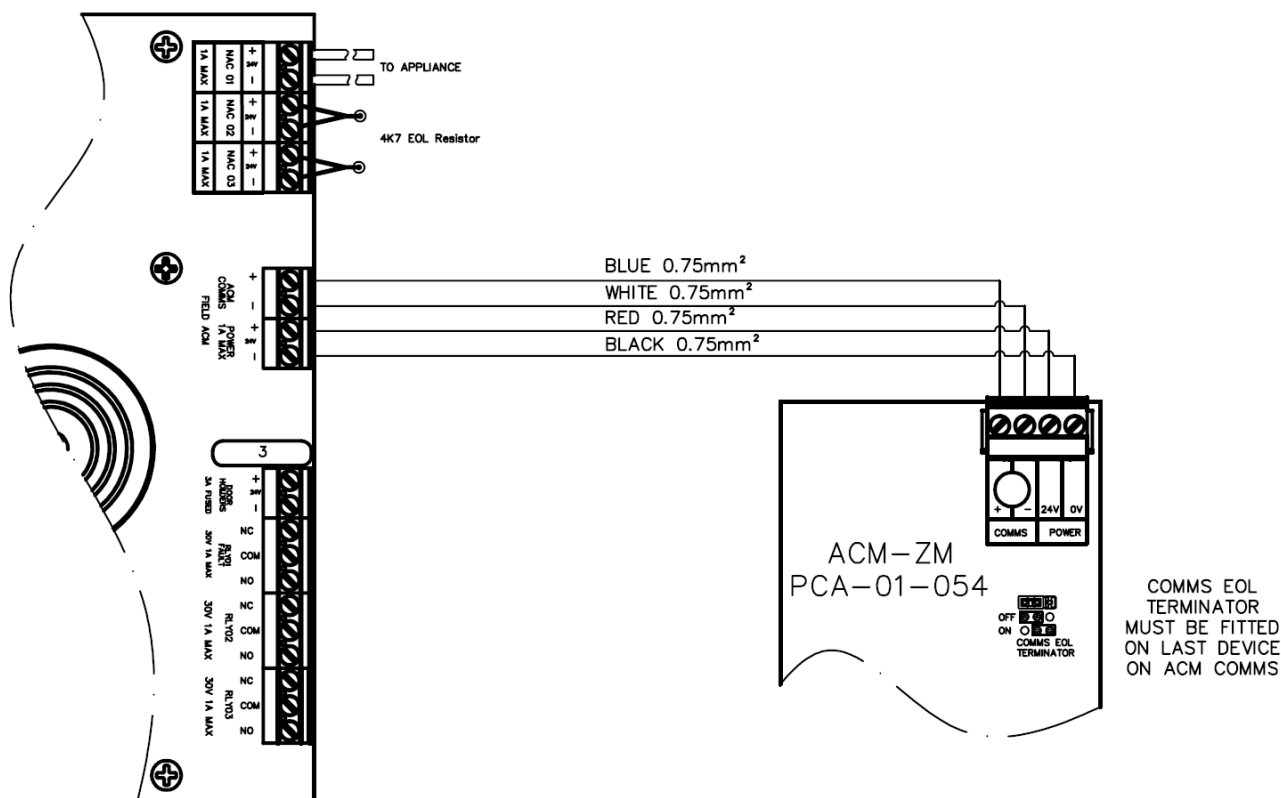


Figure 3-15 - ACM-ZM to FS-1600 Connection



**NOTE:** Refer to Appendix F Cabling Requirements on page 102 for the cable requirements when connecting Zone Mimic Cards to the FS-1600.

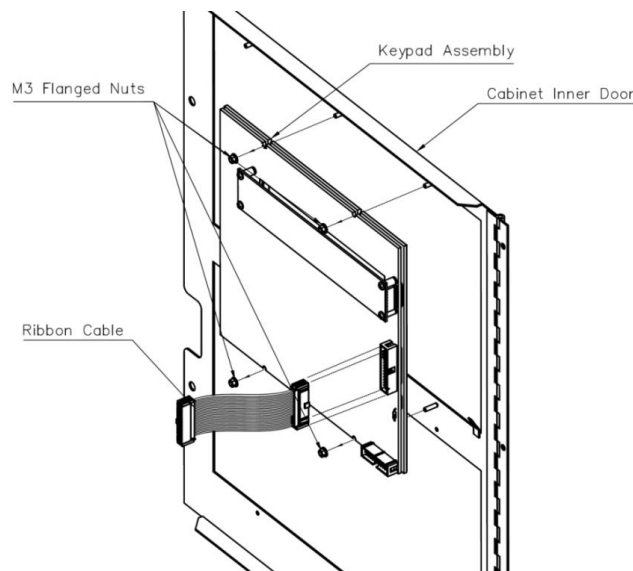
## 3.12. Installing a replacement Keypad

The keypad enables a user to operate and program the fire panel.



**CAUTION:** Power down the fire panel before fitting the keypad.

1. Unplug from the keypad:
  - a. The ribbon cable connecting the keypad to the Brigade Interface Board.
  - b. The ribbon cable connecting the keypad to the CPU Board.
2. Open the cabinet inner door and remove:
  - a. The flanged nuts from the inner door studs.
  - b. The keypad from the studs as per Figure 3-16 - Removing Keypad from Inner Door



**Figure 3-16 - Removing Keypad from Inner Door**

3. Mount the replacement keypad to the inner door studs.
4. Connect the:
  - a. Ribbon Cable from the CPU Board to the replacement keypad.
  - b. Ribbon Cable from the Brigade Interface Board to the replacement keypad.
5. Place the replacement keypad over the Inner Door Studs.
6. Secure the replacement keypad to the Inner Cabinet Door with the flanged nuts.
7. Connect the MCP as per Section 3.15 Connecting the Cabinet Manual Call Point (MCP) on page 29.
8. If the ARE interface is not used, a link must be fitted to the brigade interface header on the back of the keypad, see Figure 3-17 - Keypad ARE Jumper Position.



**Figure 3-17 - Keypad ARE Jumper Position**



### 3.13. Installing a replacement CPU Board

The CPU Board controls the operation of the fire panel and provides a point of termination for the devices connected to the panel.

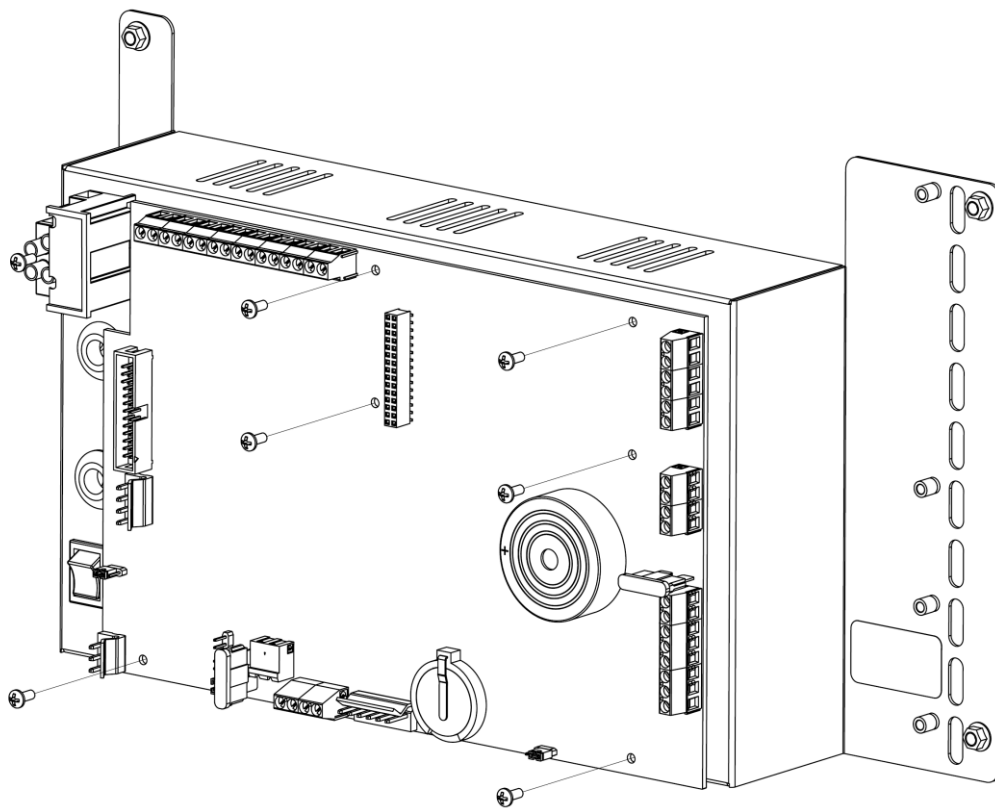


**CAUTION:** Power down the fire panel before replacing the CPU Board.



**NOTE:** The configuration on an existing CPU Board will not be transferred to the replacement CPU Board. Any existing devices need to be reprogrammed.

1. Disconnect the batteries and the PSU supply from the CPU Board.
2. Unplug the Zone Expansion Card from the CPU Board (if fitted).
3. Unscrew and remove the CPU Board.
4. Screw the replacement CPU Board on to the NPS Mounting Bracket as per Figure 3-18 - Mounting Replacement CPU Board.

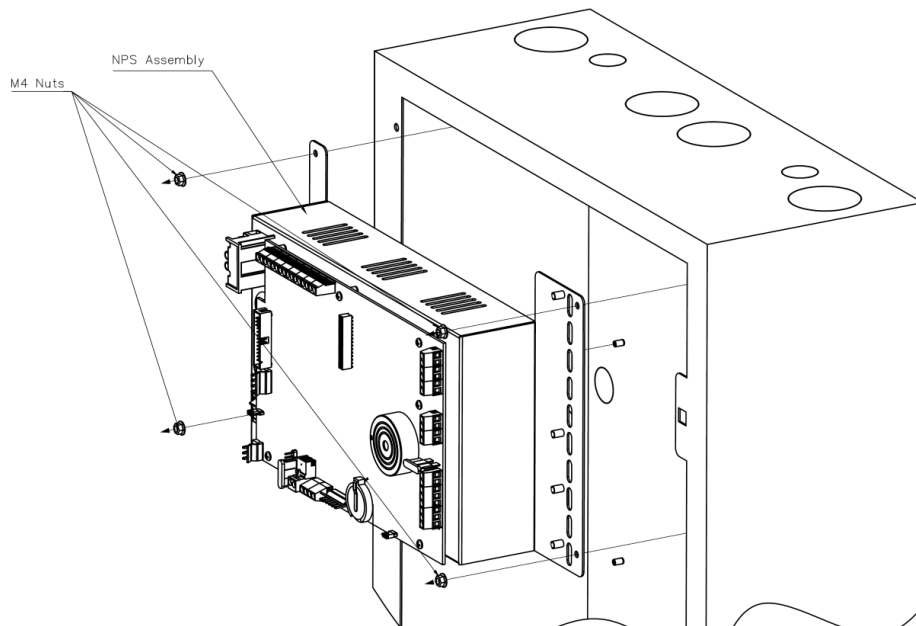


**Figure 3-18 - Mounting Replacement CPU Board**

5. Re-connect devices previously disconnected from the CPU Board (including MCP).
6. Re-connect the power supply.
7. Set the system time.
8. Re-program any devices previously removed from the CPU Board.

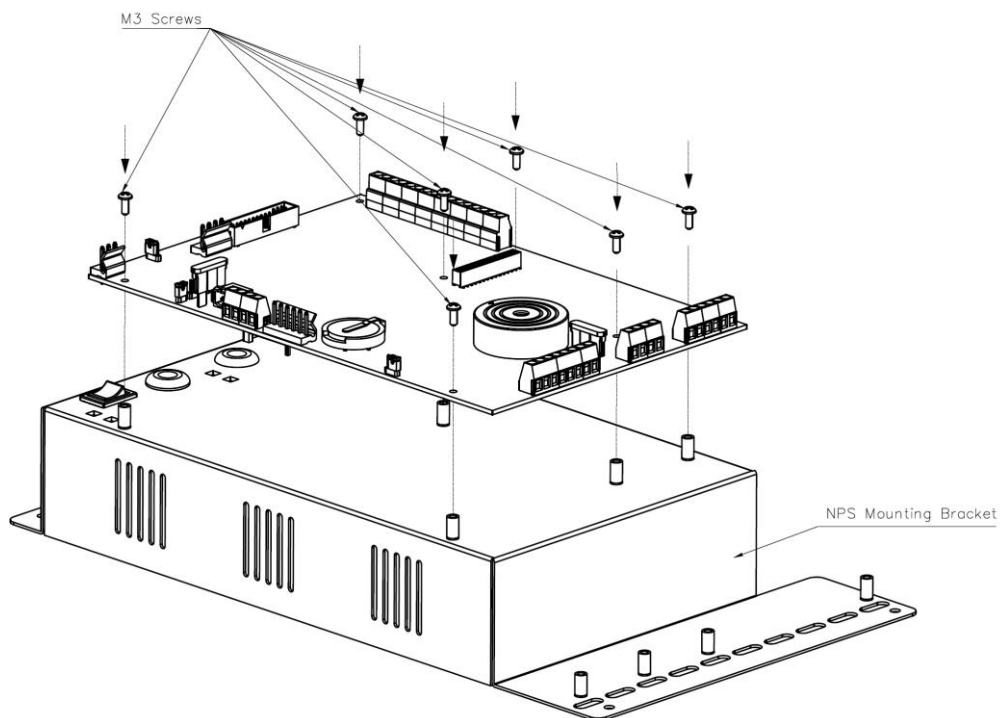
### 3.14. Installing a replacement NPS Power Supply

1. Open the cabinet and disconnect any circuit boards, outputs and cables from the CPU board.
2. Unplug both ends of the PSU cable running from the CPU Board to the existing PSU box.
3. Unscrew the flanged nuts from the cabinet studs and remove the NPS Assembly.



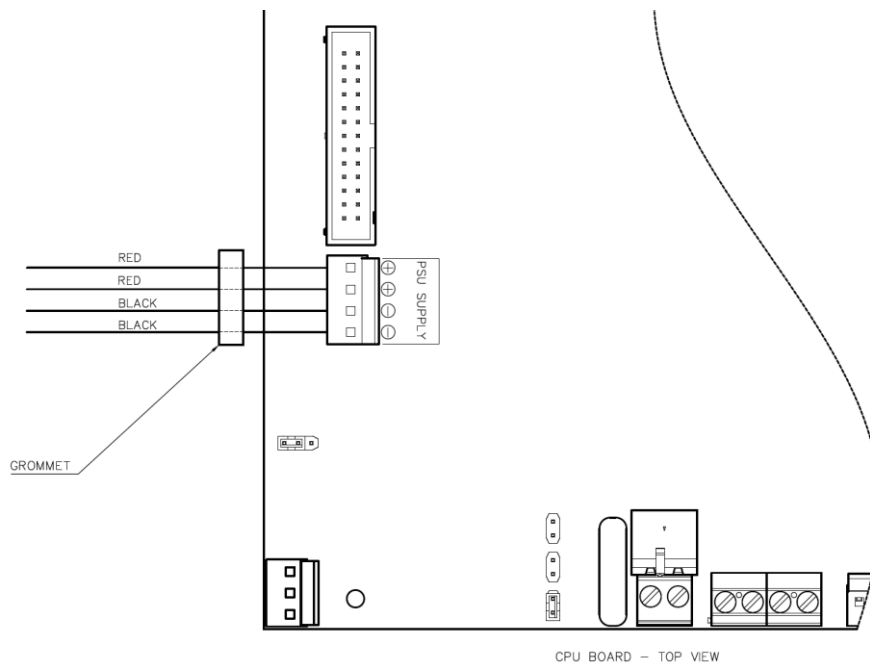
**Figure 3-19 - Removing Existing NPS Power Supply**

4. Remove the CPU Board from the existing NPS Mounting Bracket.
5. Remove the AC power supply from the fuse block.
6. Secure the replacement NPS Assembly to the CPU Board.



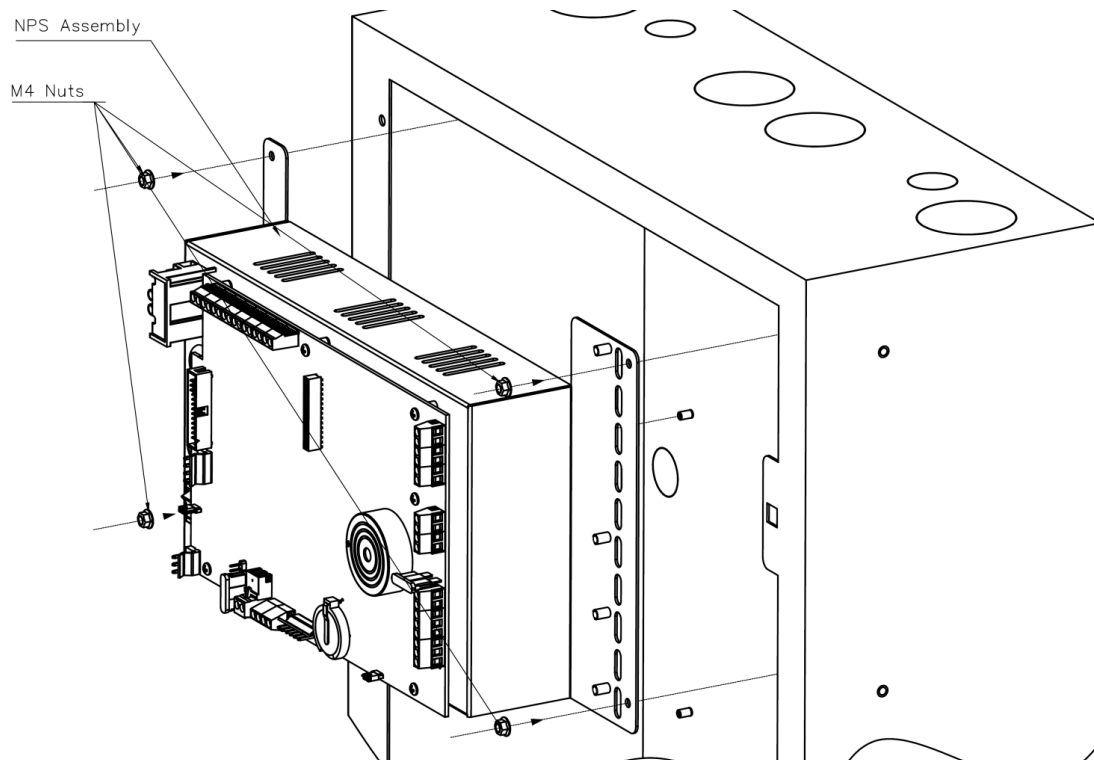
**Figure 3-20 - Securing CPU Board to Replacement NPS Assembly**

7. Connect the PSU to the CPU Board as per Figure 3-21 - NPS to PSU Connections.



**Figure 3-21 - NPS to PSU Connections**

8. Slide the replacement NPS Assembly over the studs at the back of the cabinet and secure the replacement NPS Assembly to the cabinet body with the flanged nuts.



**Figure 3-22 - Replacement PSU Supply**

9. Wire a 240V power supply to the fuse block as per Figure 3-1 - AC Power to Fuse Block  
 10. Reconnect any circuit boards, cables and outputs previously removed from the CPU Board.  
 11. Power up the fire panel.

### 3.15. Connecting the Cabinet Manual Call Point (MCP)

In the event of a fire, the MCP provides a means of activating an alarm manually.

1. Connect the MCP cable to the CPU Board via the three pinned terminal, as per Figure 3-23 - Manual Call Point Connection.

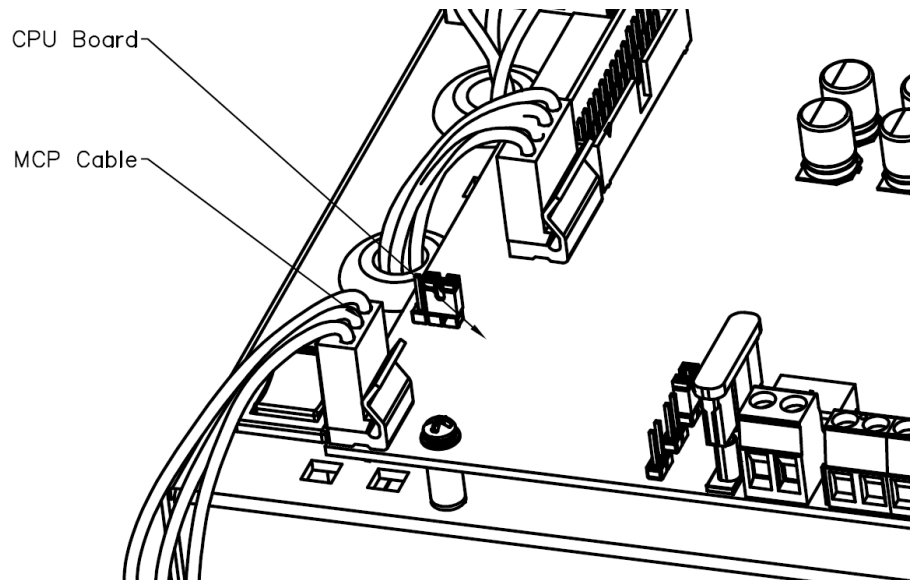


Figure 3-23 - Manual Call Point Connection

2. Wire the MCP cable to the MCP, see Figure 3-24 - Manual Call Point Switch.

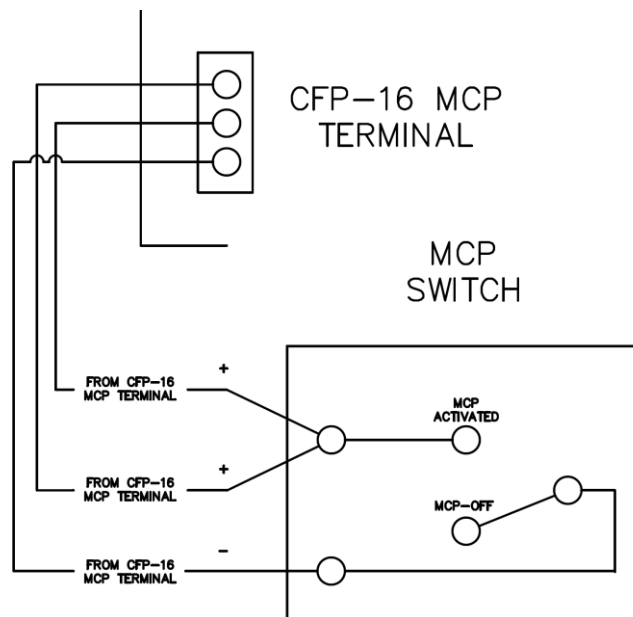
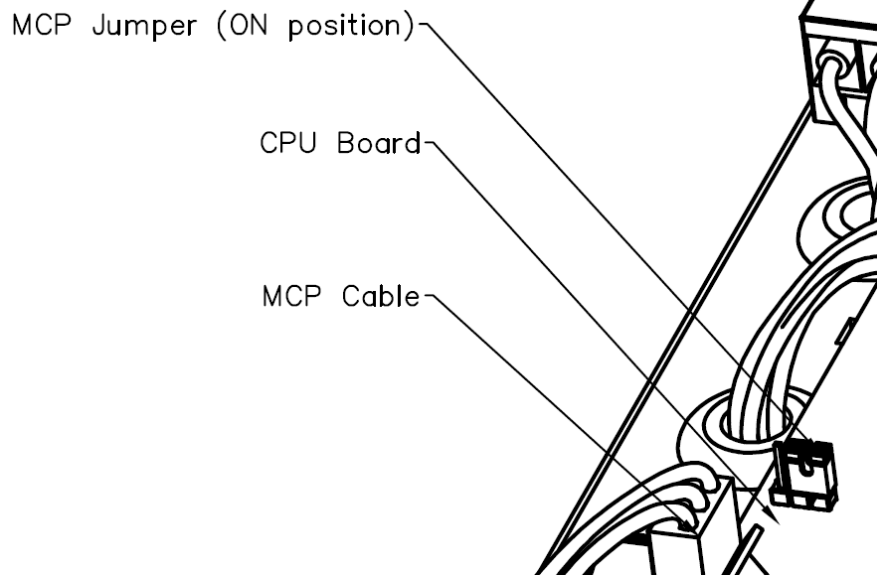


Figure 3-24 - Manual Call Point Switch

3. Once the MCP is connected, the MCP monitoring jumper needs to be set to the *ON* position. See Figure 3-25 - Cabinet MCP Monitoring Jumper.



**Figure 3-25 - Cabinet MCP Monitoring Jumper**



---

**NOTE:** By default, the MCP is connected to the zone one.

---

# Section 4 Operation

## 4.1. Operation Overview

The Operation Section describes the operations and the steps required to complete a task. It also includes the keypad functions and the software functions that appear via the display.

## 4.2. System Normal

When there are no active or current events the display will show the system date and time.



Figure 4-1 - System Normal Display

## 4.3. Alarm Event

When there is an alarm, the display will show the details of the alarm event and the first alarm event.

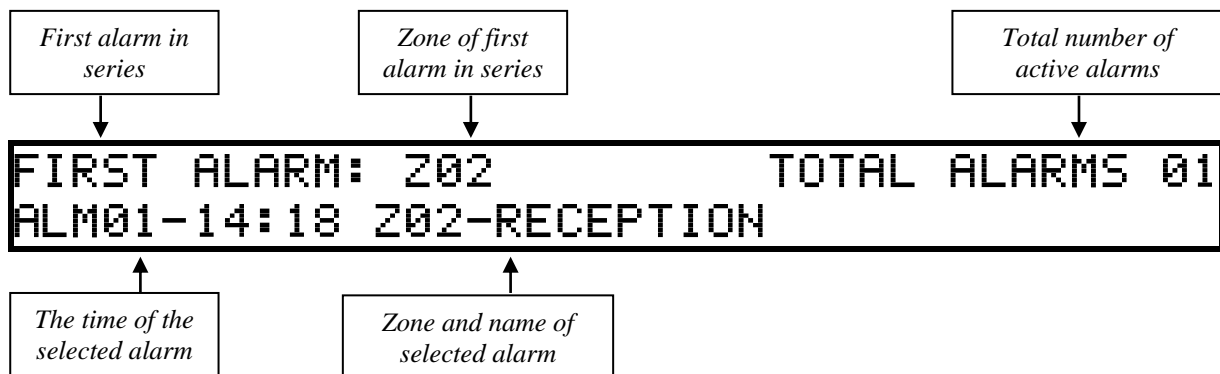


Figure 4-2 - Alarm Display

## 4.4. User Interface Hierarchy

The Main Menu can be accessed by pressing **ESC|MENU**

The Main Menu is shown in Figure 4-3 - Main Menu Display.

|           |          |           |
|-----------|----------|-----------|
| 1:EVENTS  | 2:STATUS | 3:HISTORY |
| 4:DISABLE | 5:TEST   | 6:PROGRAM |

Figure 4-3 - Main Menu Display

To access the Main Menu options press the number on the keypad that matches menu option. An overview of the entire menu hierarchy is shown in Figure 4-4 - System Overview.

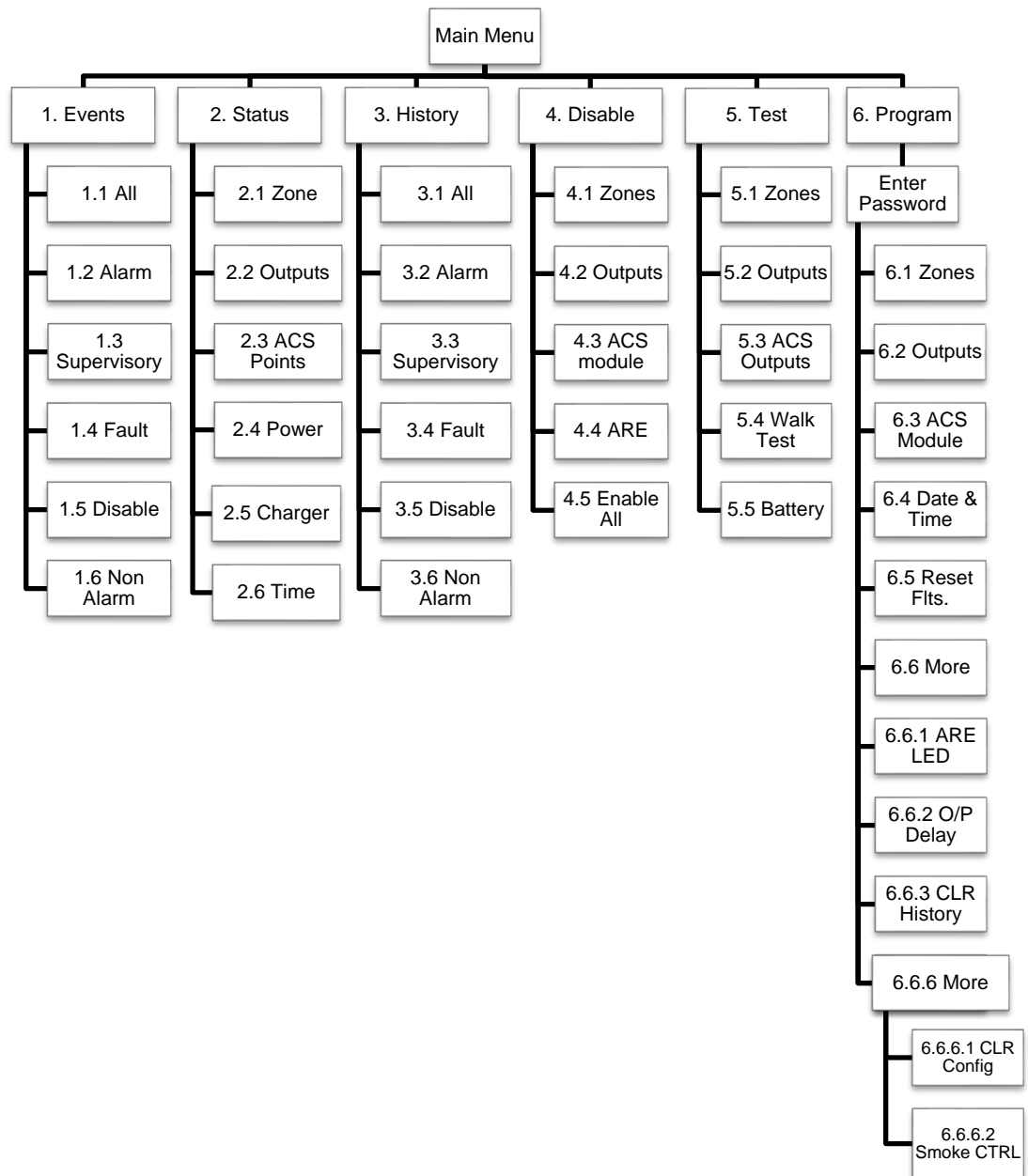
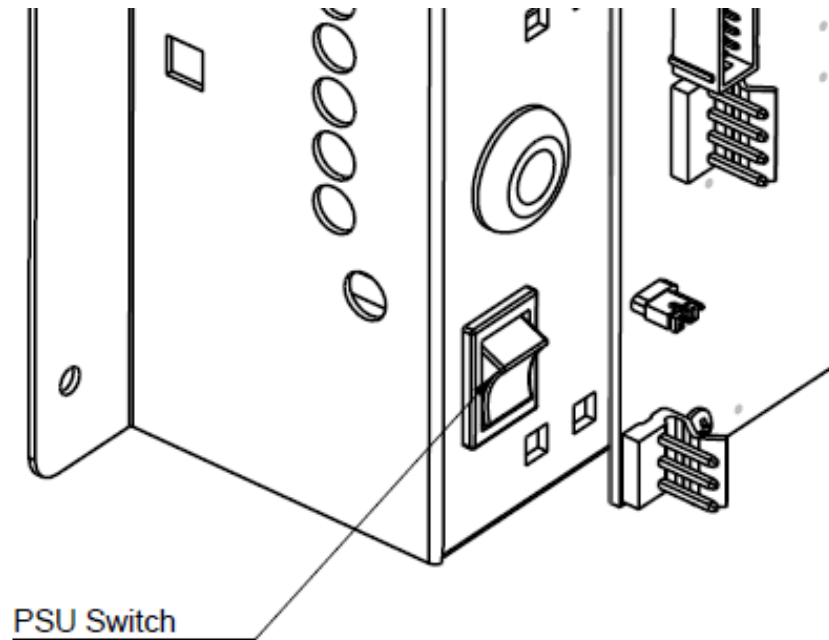


Figure 4-4 - System Overview

## 4.5. Switching on the Fire Panel

1. Power up the fire panel by switching the on PSU switch. The device will be on when the PSU switch is illuminated (red).



**Figure 4-5 - Location of Fire Panel PSU Switch**

2. Connect the batteries as per Section 3.3.1 Connecting Batteries on page 10.



## 4.6. Keypad Overview

The keypad permits interaction with the functions controlling the panel.

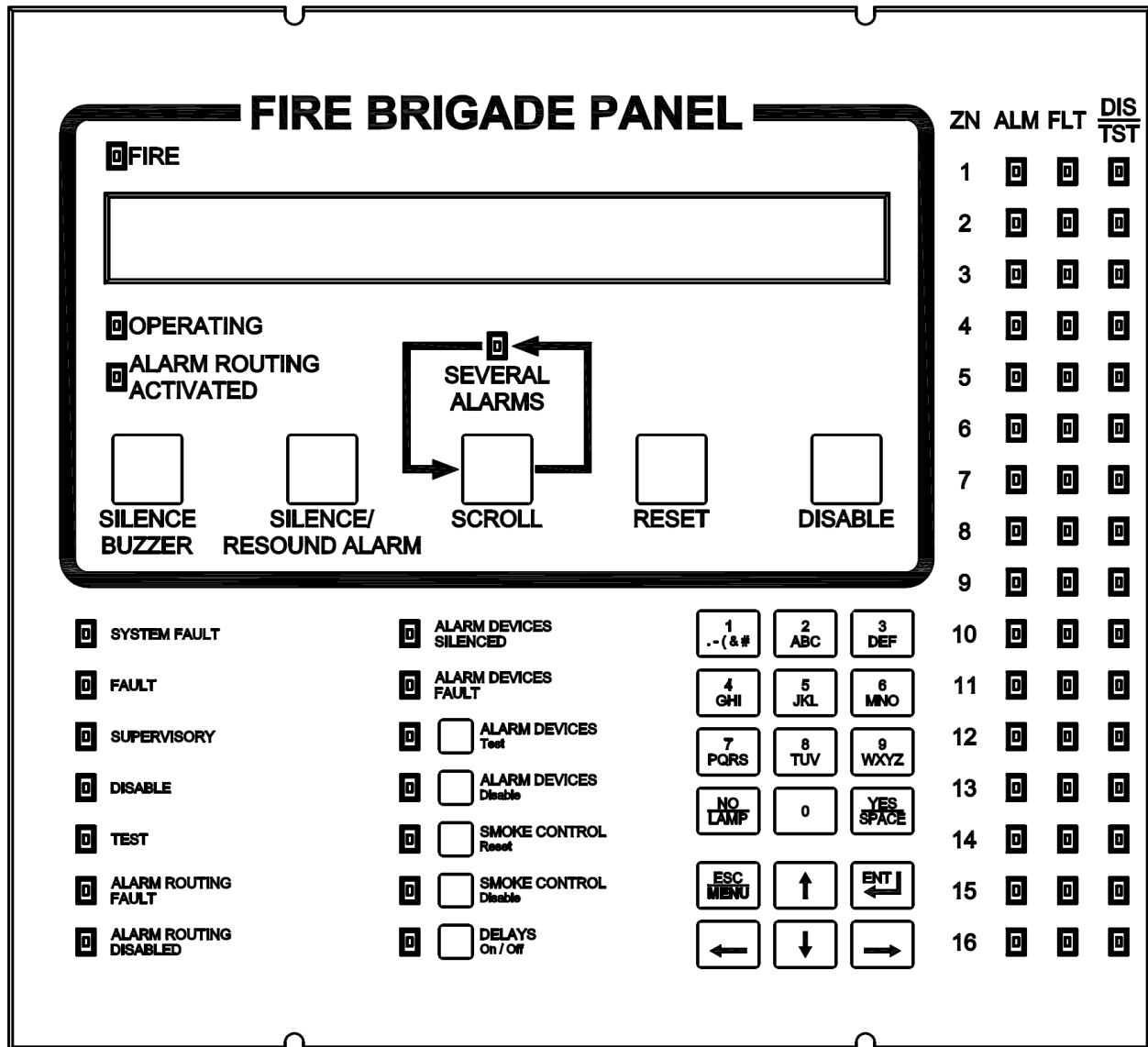


Figure 4-6 - Keypad Overview

## 4.7. Complementary Features

Complementary Features describes the features which are not accessible from the programming menus. The keypad button shortcuts are included in the Complementary Features section of this manual. The active state of a complementary feature is shown by the LED next to the button. If the LED is illuminated the feature is considered to be active.

### 4.7.1 Silencing the Buzzer

The buzzer can be silenced by pressing **SILENCE BUZZER**.

### 4.7.2 Silencing Alarms

An alarm can be silenced by pressing **SILENCE/RESOUND ALARM**.

### 4.7.3 Scrolling through the Display

The **SCROLL** button permits the back and forth navigation between events shown on the display.

When an object property is selected pressing the **SCROLL** button changes the values of the selected property and/or navigates to the previous and next object attributes.

### 4.7.4 Resetting the Panel

To clear the alarm condition from the panel press the **RESET** button. If the fire hazard has not been cleared, the panel will re-enter an alarm condition.

### 4.7.5 Disabling Zones, Outputs and Modules

Pressing the **DISABLE** button disables all active alarms that are currently listed on the display.

When viewing the status of a point, pressing **DISABLE** will disable and enables the point.

### 4.7.6 Alarm Devices Overview

Alarm Devices are used to control the Notification Devices that alert occupants there is a fire. The output type IDs that are relevant to alarm device outputs are, *Alarm Devices* and *Alarm Devices (Delayed)*.

To test the alarm devices press **ALARM DEVICES Test**. The Alarm Devices Test LED (next to the button) will illuminate.

When a zone goes into alarm, the alarm devices will switch on based on their CBE. To silence all alarm devices press **SILENCE / RESOUND ALARM**. When the alarm devices are silenced, the Alarm Devices Silence LED will illuminate. To resound the alarms press **SILENCE / RESOUND ALARM**.

If there is a fault with any of the Alarm Device outputs, the Alarm Devices Fault LED will illuminate.

Pressing **ALARM DEVICES Disable** will disable all of the alarm device outputs on the panel.

### 4.7.7 Smoke Control Overview

The Smoke Control function is used to hold Smoke Control outputs on, even if the fire brigade has reset the panel. Once the panel receives an alarm the Smoke Control function will be activated. The Smoke Control outputs will be activated based on their CBEs. Once activated the smoke control will latch on, even if the CBE is no longer active. These Smoke Control outputs will remain active until the Smoke Control function has been reset.

There are 2 options for resetting the Smoke control function;

- 1) Pressing **RESET**

When the **RESET** button is pressed the smoke control outputs are reset when the panel is reset.

- 2) Pressing **SMOKE CONTROL RESET**

The Smoke Control must first be programmed by setting the Smoke Control to *Required*. For details see Section 5.13 Programming Smoke Control Reset on page 78. Only after the Smoke Control has been set to *Required* can the smoke control outputs be reset using **SMOKE CONTROL Reset**.

When the Smoke Control has been set to *Required* the LED next to the **SMOKE CONTROL Reset** button will illuminate.



**NOTE:** When using the Smoke Control button to reset the Smoke Control outputs, the panel must be reset first by pressing the *Reset*. This gives building management time to check any smoke control equipment before resetting it.

---

The output Type IDs that are relevant to Smoke Control outputs are SMOKE CONTROL and DOOR HOLDER.

The Smoke Control function can be disabled (prevents smoke control outputs from operating) by pressing **SMOKE CONTROL Disable**. When disabled the LED next to the **SMOKE CONTROL Reset** button will illuminate.

### 4.7.8 Initiating Delays to Outputs

The delays function initiates a delay from when an alarm registers in the panel to when the Fire Brigade is called and/or when the building is evacuated. During this delay the alarm is investigated to see if it is a false alarm. The delay function will delay the control of any outputs programmed with a type ID *Alarm (Delayed)* or *Alarm Devices (Delayed)*. To set the delays refer to section 5.8 Programming the Output Delay Setting on page 72. If there are multiple Alarms the delay will commence from the first alarm, the delays function does not reset with additional alarms. All outputs will activate based the delay associated with the first alarm.

The Delay LEDs next to the **DELAYS On / Off** button will illuminate if the panel is set to delay the outputs. Delays can be switched on by pressing **DELAYS On / Off**. To turn the delays function off press **DELAYS On / Off**.

A flashing delays LED indicates that an alarm has been received but the outputs are being delayed. Delays can be overridden by activating (Pressing) the Manual Call Point on the front of the panel.

If it is a false alarm, the panel can be reset after it has been silenced by pressing **SILENCE /** **RESOUND ALARM** then **RESET**. This prevents the outputs from activating.

Zones can be configured to override the delays, this depends on their type ID, see Appendix C Type IDs on page 88.

## 4.7.9 Alarm Routing Equipment (ARE) Overview

The ARE interface is used to interface the panel with a Brigade Interface. When an alarm occurs the alarm output on the ARE interface (AREO01) will activate to call the Brigade.

See Section 5.7 Programming ARE (Alarm Routing Equipment) Indication LED on page 71 for details out how to program the Alarm Routing Activated LED.

A delay can be applied to the outputs on the ARE Interface, for details refer to Section 4.7.8 Initiating Delays to Outputs on page 37.

There are three inputs on the ARE to provide feedback to indicate the status of the Brigade Interface. The ALARM ROUTING FAULT LED will illuminate if there is a fault with any of the Brigade inputs connected to the ARE interface. The ALARM ROUTING DISABLE LED will illuminate if any of the Brigade inputs connected to the ARE interface are disabled.



**NOTE:** The inputs and outputs and on the ARE interface cannot be individually disabled. If the ARE Module is disabled the inputs and outputs are also disabled [except for the ARE003 (Disabled) output]. This remains the case even if the disable is changed.

### 4.7.10 Running a Lamp Test

The Lamp Test activates the display, the buzzer and the keypad indicator LEDs to ensure they are working correctly.

- Pressing **NO/LAMP** when at the Main Menu causes the keypad LEDs to illuminate, the buzzer to and the panel display cells to activate simultaneously.
- Holding down **NO/LAMP** for more than three seconds results in the display showing the Panel Firmware and Configuration Display.

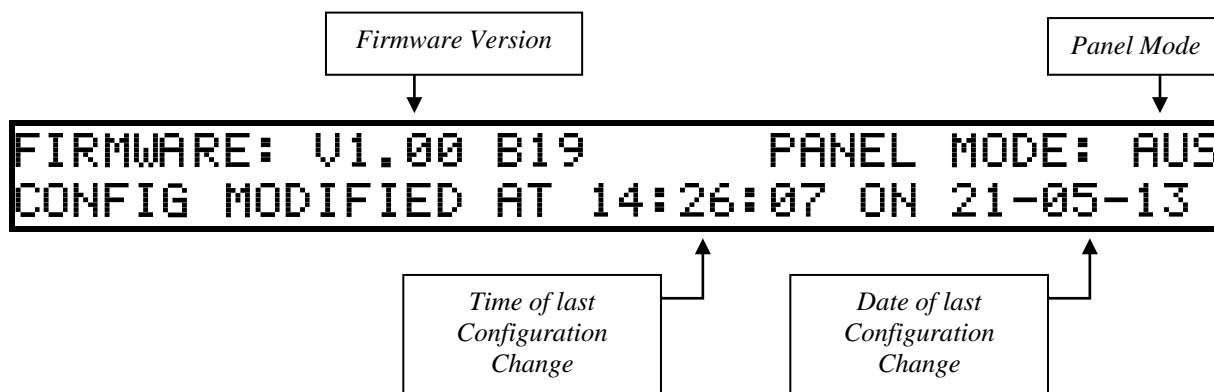


Figure 4-7 - Panel Firmware and Configuration Display

#### **4.7.11 Navigation buttons**

The navigation buttons control the movement of the cursor on the display. The navigation buttons have the up, down, left and right arrows printed on the button.

#### **4.7.12 Numerical and letter buttons**

The numerical/letter buttons have the numbers *0-9*, the letters *A to Z* and the characters *.-)&* and *#*. printed on the keypad. The text entry behaves in the same manner as a mobile phone SMS service.

#### **4.7.13 Zone Indication LEDs**

The zone LED indicators indicate the current state of the zones. In the normal state, the zone LEDs remain switched off. When there is a zone fault or zone alarm the relevant zone LED will illuminate. The zone LEDs are located on the right-hand side of the keypad.

When the DIS-TST LED is illuminated the zone is either under walk test or is disabled.

For more detailed information, see Section 4.9.1 Viewing the Zone Status on page 41.

## 4.8. Viewing Events

*Main Menu > Events (1)*

The Events Menu lists current panel events.

The events are categorised into one of the menu options shown in the Events Menu. To view the panel events press the keypad number that corresponds with the event type.

|          |            |                |
|----------|------------|----------------|
| 1: ALL   | 2: ALARM   | 3: SUPERVISORY |
| 4: FAULT | 5: DISABLE | 6: NON ALARM   |

Figure 4-8 - Events Menu

Should a panel event occur the event will appear on the display with the properties listed in the Event Properties Display.

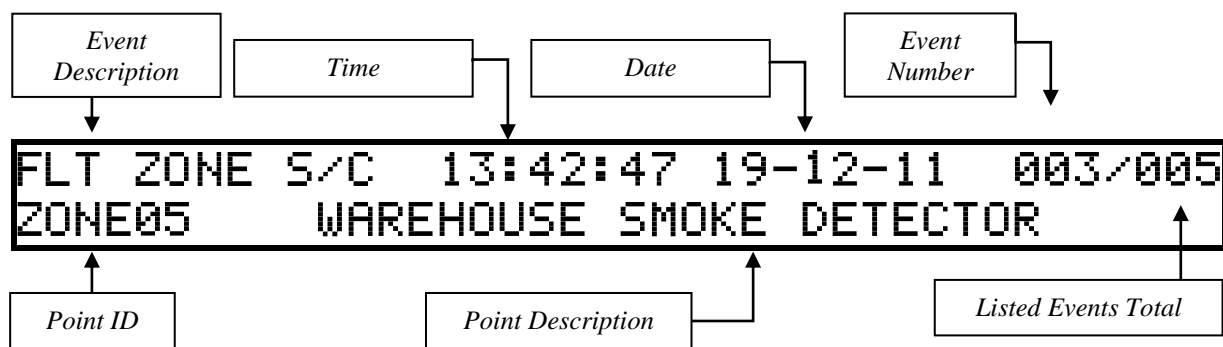


Figure 4-9 - Event Properties Display

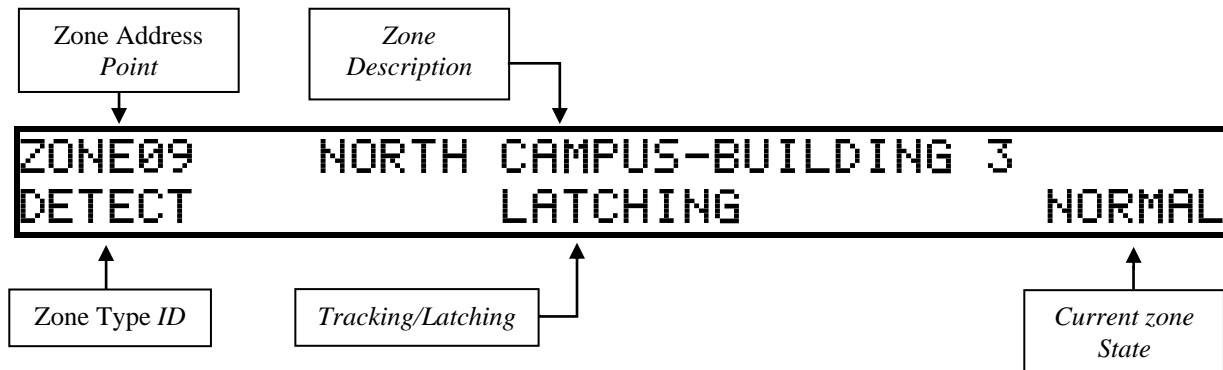
- Pressing the **▲** and **▼** or the **SCROLL** button will change the display to the next or previous event.

## 4.9. Status

### 4.9.1 Viewing the Zone Status

*Main Menu > Status (2) > Zone (1)*

The Zones Status Display shows the status of a zone. The Zone properties are shown in Figure 4-10 - Zone Status Display.



**Figure 4-10 - Zone Status Display**

- Pressing the **▲** and **▼** or the **SCROLL** button will change the display to the next or previous zone.
- The available zone states are shown in Table 4-1 - Zone Status Tables.

| State         | Definition  |
|---------------|---|
| DISABLED      | Zone is disabled  |
| INITIALISING  | Zone is first initialising on power up  |
| FLT EXPN CARD | Zone Expansion Card has been programmed via system but the expansion card is faulty |
| UNDER TEST    | Zone is under walk test   |
| NORMAL        | Zone is normal  |
| ALARM         | Zone is in alarm  |
| O/C FAULT     | There is an open circuit fault on the zone  |
| SUPERVISORY   | Zone is in a supervisory state  |
| ACTIVE        | The zone is active  |

**Table 4-1 - Zone Status Tables**



4.9.2 Viewing the status of an Output device

Main Menu > Status (2) > Output (2)

The Output Status Display shows the properties of an output. See Figure 4-11 - Output Status Display.

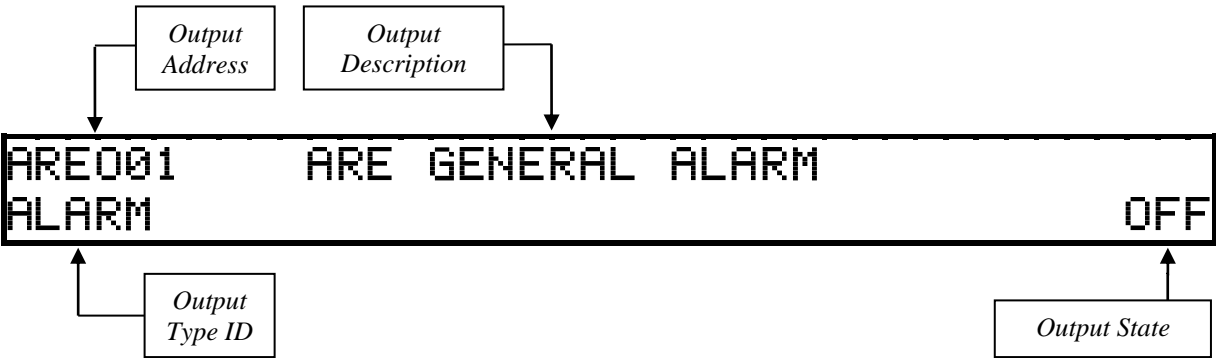




Figure 4-11 - Output Status Display

- Pressing the  and  or the **SCROLL** button will change the display to the next or previous output.
- The available zone states are shown in Table 4-2 - Output States.

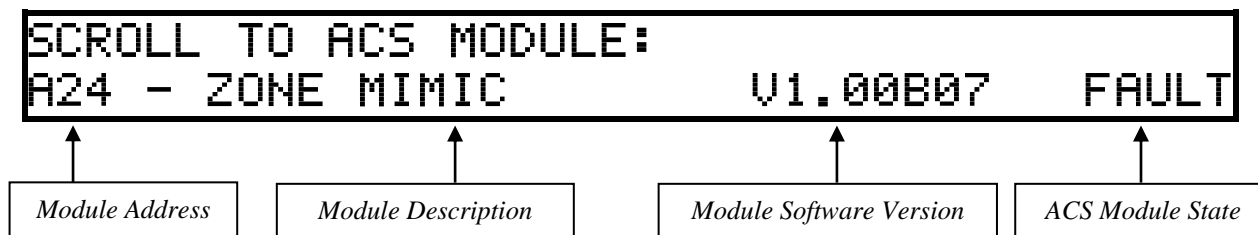
| State   | Definition  |
|---------|---|
| ON      | Output is on  |
| OFF     | Output is off   |
| FAULT   | There is a fault with the output. Refer to FS-1600 Faults table in Appendix D Faults and Events on page 92. |
| DIS-ON  | The Output has been disabled whilst being held on.  |
| DIS-OFF | The Output has been disabled whilst being held off.   |

Table 4-2 - Output States

### 4.9.3 Viewing the status of an ACS Module

*Main Menu > Status (2) > ACS Points (3)*

The ACS Module Status Display enables the status of an ACS Module to be seen.



**Figure 4-12 - ACS Module Status Display**

- Pressing the **▲** and **▼** or the **SCROLL** button will change the display to the next or previous ACS Module address.
- Pressing **ENT** when the Module Address field is selected will show more detailed attributes of the chosen Module Output, see Section 4.9.2 Viewing the status of an Output on page 42.
- The available ACS Module states are shown in Table 4-3 - ACS Module Status;

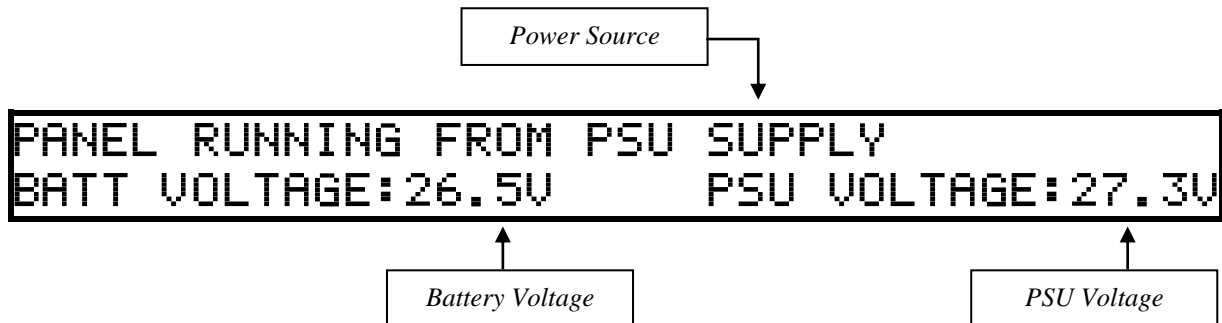
| State   | Definition   |
|---------|--|
| -       | The module is operating normally   |
| DISABLE | The module has been disabled   |
| FAULT   | There is a fault with the module. For the Fault details refer to ACS Module Faults in Appendix D Faults and Events on page 96. |

**Table 4-3 - ACS Module Status**

#### 4.9.4 Viewing the Power Status of the FS-1600

*Main Menu > Status (2) > Power (4)*

The Power Status Display shows the power status of the PSU and the battery power supply. The Power Status Display indicates which supply the panel is operating from.



**Figure 4-13 - Power Status Display**

### 4.9.5 Viewing the Status of the Battery Charger

*Main Menu > Status (2) > Charger (5)*

The Charger Status Display shows the status of the Battery Charger.



```
CHARGER IS: CHARGING BATTERIES
CHARGING WITH LOW CURRENT LIMIT
```

Figure 4-14 - Charger Status Display

The charger status is effected by the battery size (Amp hours) and the position of the Charger Jumper. During battery charging the charge state will appear as one of the following:

**Low Current Limit** – Positioning the jumper to the 7AH/12AH/18AH pins will charge the battery with a 2.0 Amp current limit.

**High Current Limit** – Positioning the jumper to the 26AH/33AH/40AH pins will charge the battery with a 3.0Amp current limit.

**No Current Limit** – Positioning the jumper to the MORE THAN 40AH pin will charge the battery with the current limited by the PSU.

**Trickle Charging** – When the trickle charging value is being displayed, the battery is being charged at a low rate. The trickle charge will vary between 10 – 100 mA.



**NOTE:** For information on the Charger Jumper setting, refer to Figure 3-2 - Battery Charger Jumper Settings.



```
CHARGER IS: CHARGING BATTERIES
TRICKLE CHARGING LOW BATTERIES
```

Figure 4-15 - Trickle Charger Display

**Battery power not connected** – If the battery power is not connected to the panel the display will appear as:



```
CHARGER IS: NOT CHARGING
BATTERY VOLTAGE TOO LOW (LESS THAN 15V)
```

Figure 4-16 - Battery Power not Connected Display



**NOTE:** The PSU battery charging voltage range is between 26.7V – 27.9V.

#### 4.9.6 Viewing the System Time

*Main Menu > Status (2) > Time (6)*

The Time Status Display shows the date and time of the panel. To change the date and time set in the panel see Section 5.5 Setting the Date and Time on page 69.



```
THE DATE IS: 30-05-13
THE TIME IS: 11:51:05
```

Figure 4-17 - Time Status Display

## 4.10. Viewing the Panel History

*Main Menu > History (3)*

The History Menu permits the viewing of past panel events. The panel events have been grouped into six categories, which are shown in Figure 4-18 - History Menu.

|          |            |                |
|----------|------------|----------------|
| 1: ALL   | 2: ALARM   | 3: SUPERVISORY |
| 4: FAULT | 5: DISABLE | 6: NON ALARM   |

Figure 4-18 - History Menu

An example display of an event recorded within the panels event history is shown as:

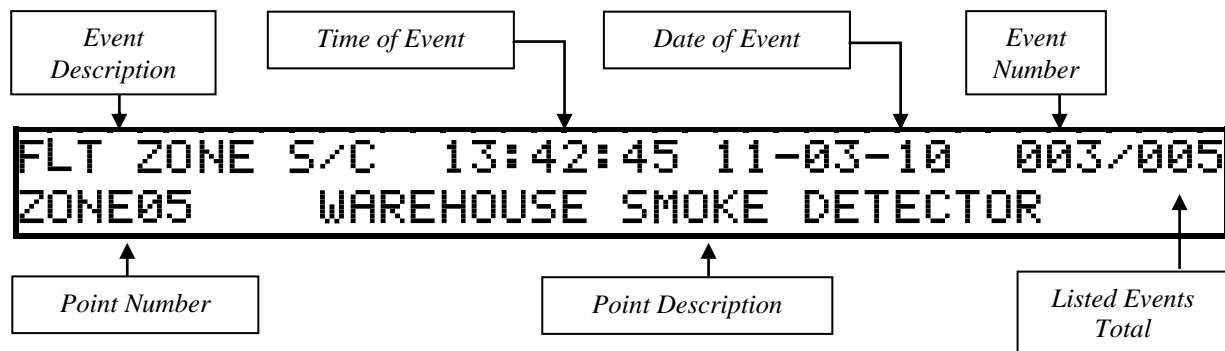


Figure 4-19 - Viewing All History Display



**NOTE:** The panel will store the last 999 events. It will also store the last 200 alarm events. Once the number of events exceeds this limitation the oldest events will be lost.

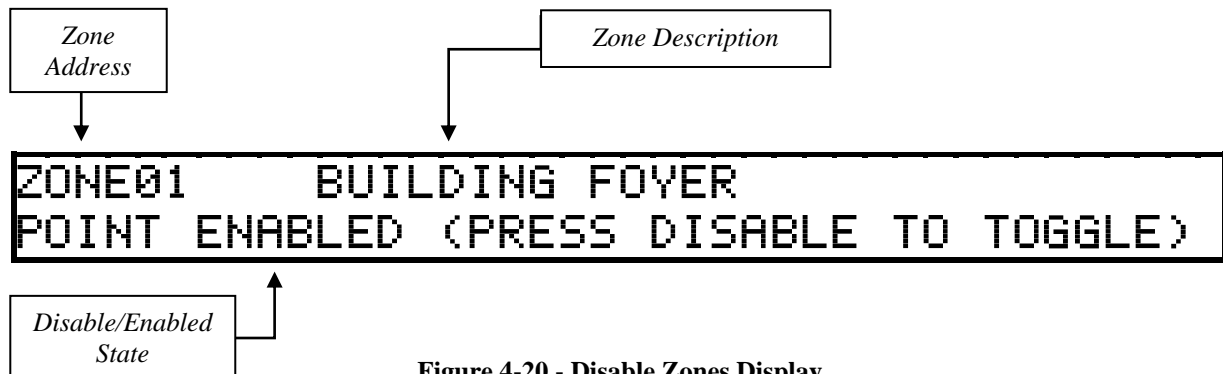
## 4.11. Disabling

### 4.11.1 Disabling Zones

*Main Menu > Disable (4) > Zones (1)*

Activating the Disable Zones feature disables a selected zone.

A disabled zone can still detect a fire hazard or fault. In these scenarios the alarm or the fault LED on the keypad will still illuminate, however any outputs programmed to respond to that zones fault or alarm will not be affected by the state of that zone.



**Figure 4-20 - Disable Zones Display**

- The zone being displayed will change to the next or previous zone when the **▲** and **▼** or the **SCROLL** buttons are pressed. The zone description and zone status will be displayed for the selected zone.
- The zone can be toggled between enabled and disabled by pressing **DISABLE**.

### 4.11.2 Disabling Outputs

*Main Menu > Disable (4) > Outputs (2)*

By disabling an output, the output is held in a system normal state. To select the output to disable select the module that the output is part of. The available modules are the Termination Board (CPU Board), Alarm Routing Equipment Interface, ACM-8RA Relay Card (if programmed) and ACM-ZM Zone Mimic (if programmed).

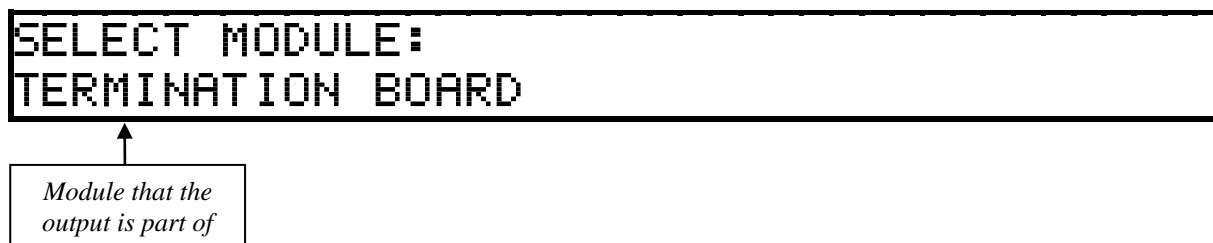


Figure 4-21 - Select Module Display

Once the module is selected, press the **ENT** button to go to the modules outputs.

An example display for a NAC output would be:

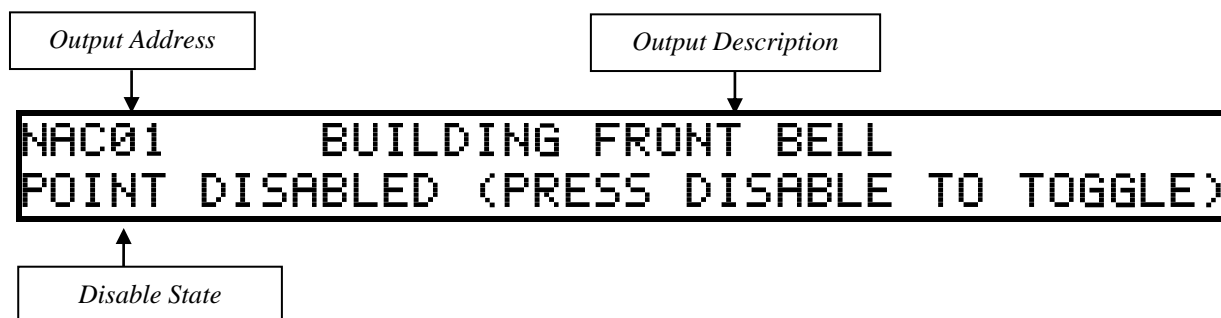


Figure 4-22 - Disable Output Display

- The Disable Output Display will change to the next or previous output when the **▲** and **▼** or the **SCROLL** buttons are pressed. The output description and output status will be change in line with the selection of a different output.
- The output can be toggled between enabled and disabled by pressing **DISABLE**.
- Pressing the **ESC|MENU** button will cause the display to change to Figure 4-21 - Select Module Display.

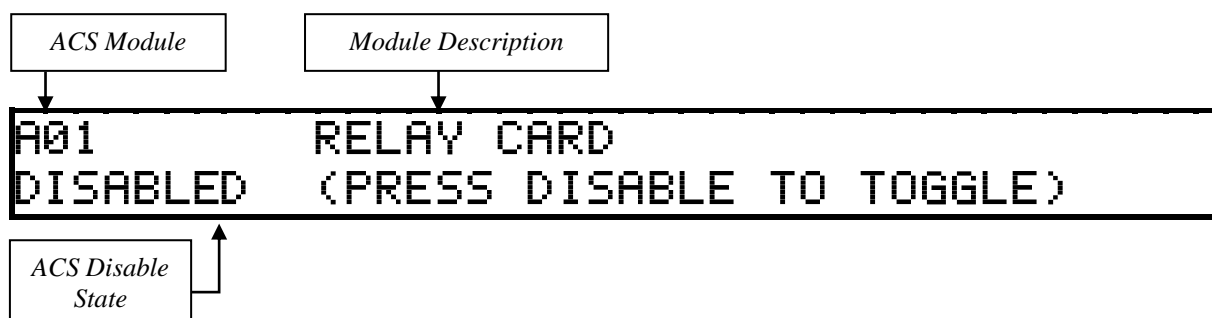


### 4.11.3 Disabling ACS Modules



*Main Menu > Disable (4) > ACS (3)*

The Disable ACS option permits the disabling of any ACS modules that are connected to the fire panel for instance, the ACM-8RA or the ACM-ZM. When an ACS module is disabled faults from the module will be suppressed, inputs from the module will appear normal and the outputs on the module will be held in their normal state. To disable a specific output on an ACS module see Section 4.11.3 Disabling ACS Modules on page 50.

An example disable ACS display will appear as:



**Figure 4-23 - Disable ACS points Display**

- The ACS module will change to the next or previous ACS module when the  and  or the **SCROLL** buttons are pressed. The module description and status fields will be displayed for the selected ACS module.
- The ACS module can be toggled between enabled and disabled by pressing **DISABLE**.
- Pressing the **ESC|MENU** button will change to the display to:



**Figure 4-24 - Disable Menu**



**NOTE:** Individual outputs connected to the ACS module cannot be disabled independently; the outputs are disabled when the module is disabled.

#### 4.11.4 Disabling Alarm Routing Equipment (ARE)

*Main Menu > Disable (4) > ARE (4)*

The Alarm Routing Equipment (ARE) can be disabled from the Disable ARE Display.

Disabling the ARE prevents the sending and receiving of signals to and from the Fire Brigade.



Figure 4-25 - Disable ARE Display

- The ARE operation state can be toggled between enabled and disabled by pressing **DISABLE**.



**NOTE:** Disabling the ARE module will not disable the ARE 'Disabled' output, AREO03.

#### 4.11.5 Enabling all Points

*Main Menu > Disable (4) > Enable All (5)*

The purpose of the Enable All option is to enable all zones, outputs, ACS points and ancillary functions. The Enable All Points Display is shown below;



Figure 4-26 - Enable All Points Display

- Pressing **YES|SPACE** will enable all points.
- Pressing **NO** or **ESC|MENU** will change the display to Figure 4-24 - Disable Menu.

## 4.12. Testing

### 4.12.1 Testing Zones

*Main Menu > Test (5) > Zones (1)*

The Zone Test simulates a zone activation in order to test the panels operation. The Zone Test replaces the need for manually activating a detector to test the zone.

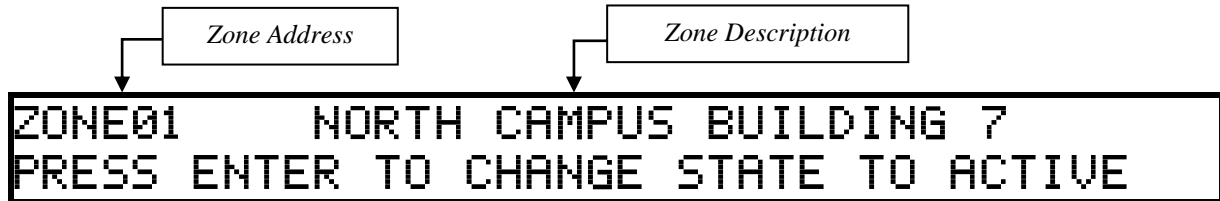




Figure 4-27 - Zone Test Display

- Pressing the  and  or the **SCROLL** button will change the display to the next or previous zone to be tested.
- Pressing **ENT** puts the selected zone into its test state for three seconds.
- During a Zone Test, any outputs controlled by the zone will activate.



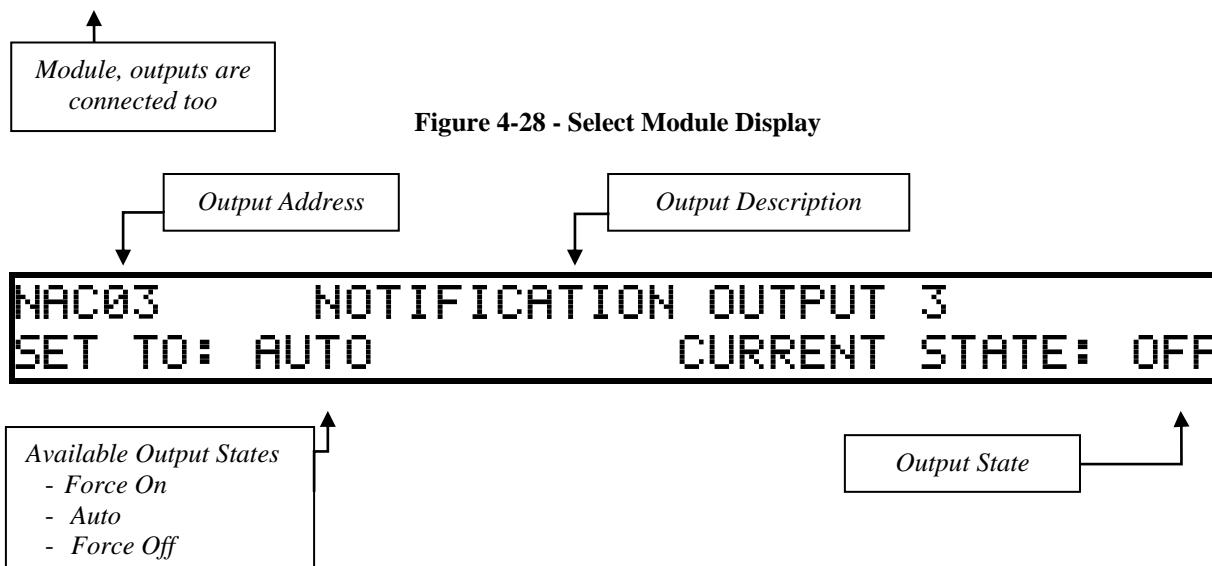
**NOTE:** If the zone goes into alarm during testing, the display will change to the Alarm Display.

### 4.12.2 Testing Outputs

*Main Menu > Test (5) > Outputs (2)*

The Testing Outputs function tests the chosen output only. To test an output, select the module that the output is part of. See Figure 4-28 - Select Module Display.

```
SELECT MODULE:
TERMINATION BOARD
```



**Figure 4-29 - Test Outputs Display**

1. Pressing the **▲** and **▼** or the **SCROLL** button will change the output address to the next or previous output.
2. Pressing **◀** or **▶** will toggle the display between the output address and the set to fields.
3. Pressing **▼** and **▲** will when the available output states have been selected toggles the states between *Force On*, *Force Off* and *Auto*.
4. Once the **ENT** button is pressed, the output will respond to the state request.
5. Pressing **ESC|MENU** or navigating to a different output will stop the test. The output will return to its default operation.



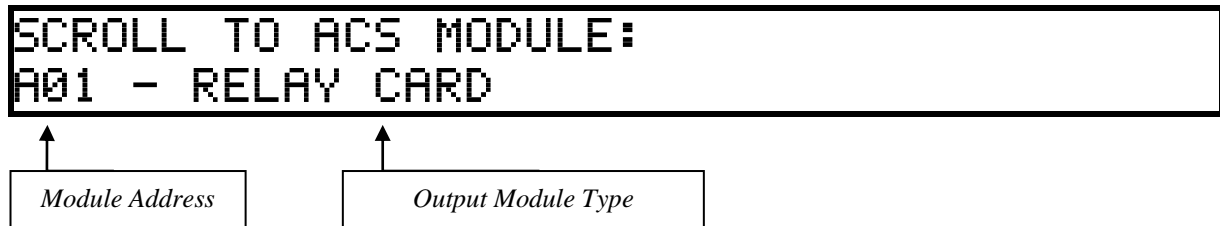
**NOTE:** If there is an alarm during an Output Test or the user navigates away from the Test Outputs Display the Output Test will stop and the output will be under automatic control.

### 4.12.3 Testing ACS Outputs

*Main Menu > Test (5) > ACS Outputs (3)*

The ACS testing function tests that an ACS point activates as intended during a fire event. To test an ACS output refer to the steps below:

1. Select the address of the ACS module. Pressing the **▲** and **▼** or the **SCROLL** button will change the module address.
2. Select the ACS module with the output to test by pressing the **ENT** button.
3. Test the output using the method as described in Section 4.12.2 Testing Outputs on page 53.



**Figure 4-30 - ACS selection Display**

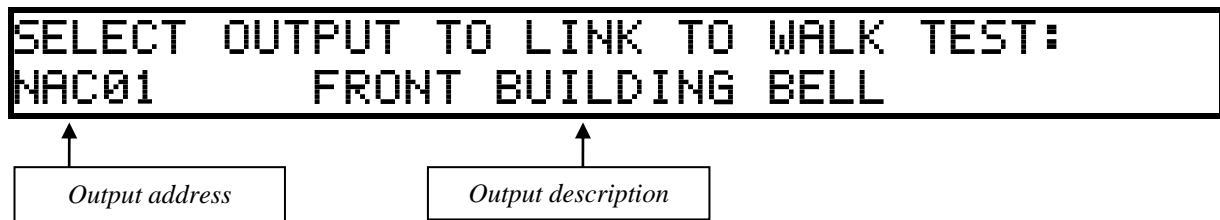
#### 4.12.4 Conducting a Walk Test

*Main Menu > Test (5) > Walk Test (4)*

The Walk Test verifies that the detectors are working without putting the panel into an alarm state.

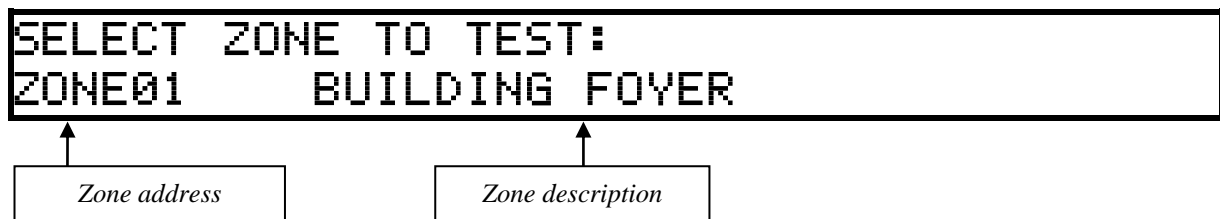
An output can be selected to activate to provide indicate that the zone under walk test has been activated.

During a Walk Test the detector LED will flash normally and once activated the LED will switch on for three seconds. After switching on for the three seconds the LED will switch off and return to its normal operation flashing repeatedly.



**Figure 4-31 - Walk Test Display**

- Pressing the **▲** and **▼** or the **SCROLL** button will scroll through the available outputs.
- Pressing the **ENT** button accepts the output selection.
- After confirming the output selection, the display will prompt for a zone to be selected for testing.



**Figure 4-32 - Walk Test Zones Selection Display**

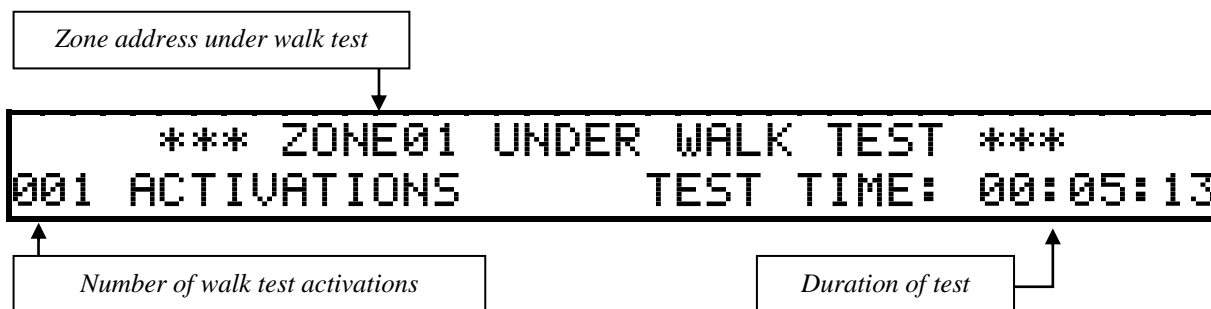
- Pressing the keypad arrow buttons or the **SCROLL** button will scroll through the available zones. Either an individual zone or all zones can be selected to undergo the walk test.
- Pressing **ENT** will initiate the walk test.

The output linked to the walk test will activate for three seconds when a device in the zone under walk test activates.



**NOTE:** If the zone is in fault or in alarm state already the Walk Test will not start. The display will display the message 'Cannot Start Walk Test'.

Once a Walk Test has started, the Walk Test Status message will appear on the display.



**Figure 4-33 - Walk Test Status Display**

A Walk Test can only be terminated manually by pressing **ESC|MENU** or pressing **RESET**.



**NOTE:** If there are more than 999 activations, the display will sit at 999 and go no further, the Walk Test will continue to run.



**NOTE:** Should the Walk Test time reach 08:00:00 the timer will not tick over any further. A fault will be added to the Panel the Walk Test will continue operating.



**NOTE:** Should a zone not under Walk Test conditions go into alarm the display will change from the Walk Test Status Display to the Alarm Event Display. The zone under walk test will continue to run in the background.

### 4.12.5 Conducting a Battery Test

*Main Menu > Test (5) > Battery (5)*

The purpose of the Battery Test is to check the condition of the battery. The Battery Test will run for 60 minutes – and can be initialised manually or automatically.

The Battery Test will run automatically at the following times:

- Every Monday at 6:00 am
- Every Wednesday at 6:00 am
- Every Friday at 6:00 am

An Automatic Battery Test will not start if:

- There is a PSU fault
- The panel is in alarm
- The Alarm Devices Test is running
- The Smoke Control function is active
- A Battery Test is already running.

The Battery Test will terminate if:

- There is a Battery Fault – In this event, the Battery Fault will stay ‘latched’ for the remainder of the test, unless a new test commences. Once the test is completed, the Battery Fault will reflect the true state of the battery voltage.
- There is an intervention, such as a PSU fault, an alarm condition, an alarm device test is activated, the smoke control feature is activated, the test is aborted by a user (either by ending the test, changing the system time or the system entering the safe state).
- The test has run for 60 minutes without intervention or fault.

An example display of a Battery Test is shown below:

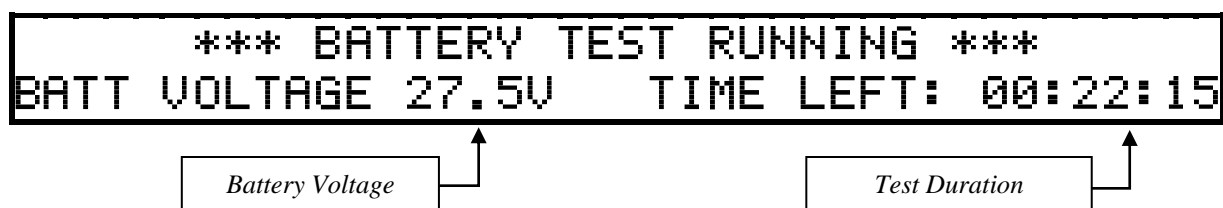


Figure 4-34 - Battery Test Display (Manual)

- Pressing **ESC|MENU** during a Battery Test will change the display to;



Figure 4-35 - Exiting Battery Test Display



- If **NO|LAMP** is pressed the test will continue run in the background.
- Pressing **YES|SPACE** will result in the display presenting an aborted Battery Test message.



Figure 4-36 - Battery Test Aborted Display

If the test fails due to a Battery Fault, the display will show a test aborted fail message.

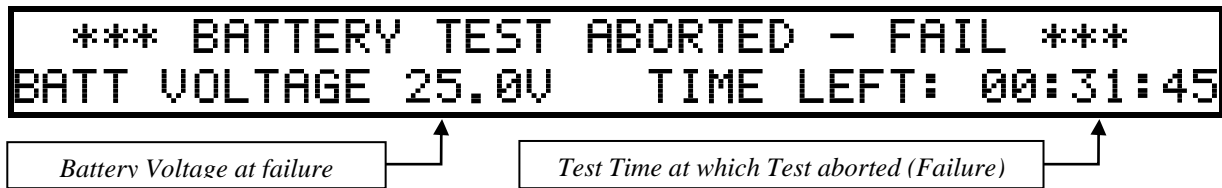


Figure 4-37 - Battery Test Aborted (FAIL) Display

A Battery Test will abort if any of the events below occur during the battery test:

- A PSU fault
- An alarm condition
- An alarm device test
- Smoke Control (latched)
- A manual abort (by either ending the test or changing the system time).

The display will alternate between the Event message that caused the abort and the Battery Test Aborted (Fail) message.



**NOTE:** The Battery Test will not begin if any of the events above are current events.

Once the event has been cleared, the test can be restarted.



Figure 4-38 - Battery Test Restart

Once the battery test has finished the display will show a Battery Test Complete Pass Message.

```
*** BATTERY TEST COMPLETE - PASS ***  
BATT VOLTAGE 26.0V    TIME LEFT: 00:00:00
```

Figure 4-39 - Battery Test Complete (PASS)



**NOTE:** The power for the Door Holder is supplied by the PSU and will continue to be drawn from the PSU during a battery test.

---

### 4.13. Muting the Panel Buzzer

The buzzer can be enabled or disabled by changing the Buzzer Control Jumper on the CPU Board.

- Setting Control Jumper to *MUTE* results in no tone being emitted from the buzzer.
- Setting the Control Jumper to the *ON* position will allow the buzzer to sound.

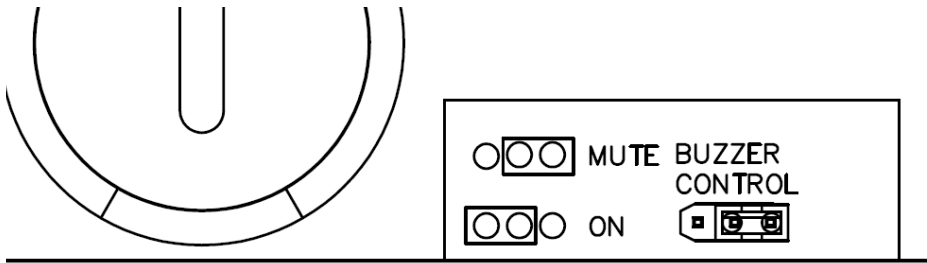


Figure 4-40 - Panel Buzzer Control Jumper



**NOTE:** Muting the buzzer will add a fault to the panel. The fault will appear on the display and remain until the buzzer has been enabled. See Figure 4-41 - Buzzer Muted Display



Figure 4-41 - Buzzer Muted Display

# Section 5 Programming

## 5.1. Overview

The Programming instructions show how to configure the fire panel and any ancillaries correctly.

The programming functions are password protected. Each time the programming menu is accessed the Enter Password display will appear. See Figure 5-1 - Enter Password Display.



```
ENTER PASSWORD: *****  
DEFAULT IS '00000', PRESS ESC TO ABORT
```

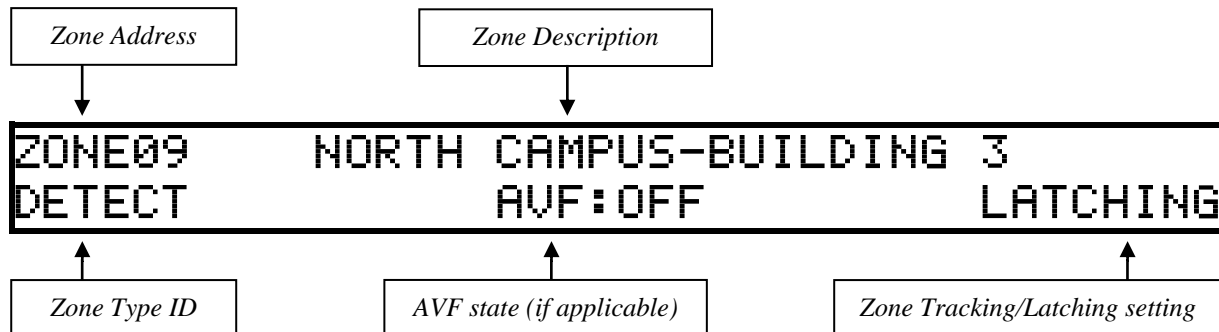
**Figure 5-1 - Enter Password Display**

To configure the password refer to Section 5.11 Changing the Password on page 75.

## 5.2. Programming Zones

*Main Menu > Program (6) > Zones (1)*

The Configure Zones feature permits the labelling, identification and the setting of zone detection properties.



**Figure 5-2 - Zone Configuration Display**

- The zones can be accessed from the Configure Zones Display by pressing the and or the **SCROLL** button.
- Zone properties can be changed by scrolling through the different values by selecting the attribute and changing the setting by pressing the and or the **SCROLL** buttons.

The zone properties are:

**Zone address** – unique number for the zone on the display.

**Zone description** – enables the creation of a meaningful description that identifies the selected zone. When entering a zone description a full range of letters (A-Z), numbers (0-9) and characters, (-):&#+\*/? and \_ can be selected. The zone description can be entered by using the keypad as an SMS style text entry or by pressing or to scroll through the available characters.



**NOTE:** The zone description is limited to 24 characters (includes spaces).

**Zone Type ID** – determines how the zone behaves. The zone type IDs are listed in Appendix C Type IDs on page 88.

**AVF (Alarm Verification Facility)** – can be toggled on and off by pressing the and . The AVF can only be toggled *On* and *Off* for the zone type IDs that have an AVF setting.

A zone will be either a *Latching* or *Tracking* type and it cannot be changed. The latching or tracking property will appear automatically on the display depending on the zone type ID.

### 5.3. Programming Outputs

*Main Menu > Program (6) > Outputs (2)*

The Configuring Outputs feature permits the labelling, identification and the setting of output properties. To configure an output, select one of the modules, such as Termination Board (CPU Board), Alarm Routing Equipment Interface, ACM-8RA Relay Card (if programmed) and ACM-ZM Zone Mimic (if programmed). See Figure 5-3 - Output Selection Display.

```
SELECT MODULE:
TERMINATION BOARD
```

Module

Figure 5-3 - Output Selection Display

```
Output Point      Output Description
RLY01            GENERAL FAULT RELAY
ALARM(DELAY)     DELAYED                                CBE
Output Type ID    Delay Setting                          Control by Event (CBE)
```

Figure 5-4 - Output Configuration Display

- The different outputs can be accessed from the Configure Outputs Display by pressing the **▲** and **▼** or the **SCROLL** button.
- Output properties can be changed by scrolling through the different values by selecting the property and changing the setting by pressing the **▲** and **▼** or the **SCROLL** buttons.
- Pressing **ENT** when the CBE prompt is flashing will bring up the CBE Display.

**Output Description** enables the creation of a meaningful description that identifies the selected zone. When entering an output description a full range of letters (A-Z), numbers (0-9) and characters, (-):&#+\*/? and \_ can be selected. The output description can be entered by using the keypad as an SMS style text entry or by pressing **▲** or **▼** to scroll through the available characters.

**Output Type ID** describes the output response state when an output point is triggered by a zone event. The outputs type IDs are listed in Appendix C Type IDs, on page 88.

**The Control by Event (CBE)** is a software function that provides a means to program a variety of output responses based on various initiating events. See 5.3.1 Using Control by Event Expressions (CBE) to program Output Devices on page 65.



**NOTE:** Not all zone driving types (any point, any two points, any of and any two of...) are available for each Output Type ID. For details refer to the CBE options column found in the Output Types ID table in Appendix C on page 90.



**NOTE:** If unsupported CBE expressions are used to program an output the CBE conflict display will be shown (Figure 5-5 - CBE Conflict Display). This is a result of the type ID being changed but the CBE remaining unchanged as an unsupported CBE for the new type ID. To rectify this change the CBE expression.

```
*** OUTPUT TYPE CBE CONFLICT ***  
PLEASE CHECK OUTPUT TYPE AND CBE
```

Figure 5-5 - CBE Conflict Display

### 5.3.1 Using Control by Event Expressions (CBE) to program Output Devices

CBE is a software function that provides a means to program a variety of output responses based on various initiating events. The control panel operates CBE through lists of zones. To program the CBE of an output, from the output programming display select CBE.

Once CBE is selected the CBE Display will be shown.

The top line on the display describes how the output will be activated or deactivated. The second line of the display shows the list of zones or points that the output is controlled by.

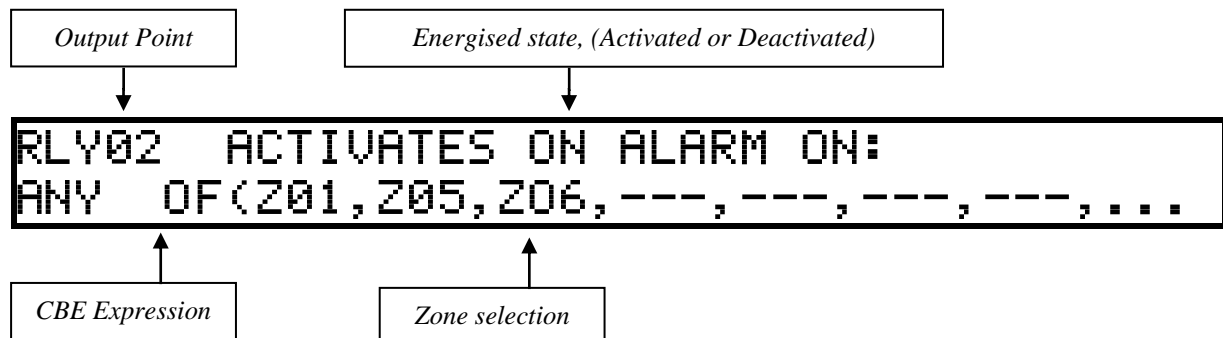


Figure 5-6 - CBE Display

The CBE expressions are;

**Any...** (point/zone) – An output will energise (activate) when any zone point becomes active.

**Any two of...** (point/zone) – An output will energise (activate) when any two of the chosen zone points becomes active.

**Any of...** (point/zone) – An output will energise (activate) when any of the chosen zone points become active.

**All...** (point/zone) – An output will energise (activate) when all chosen zone points activate.



**NOTE:** Not all expression are available for all output type IDs. For information on the available CBE expressions for each of the Output type IDs refer to Appendix C Type IDs on page 90.

---



**NOTE:** Up to 16 zones can be programmed into a CBE. Zones 9-16 are only available if the *Zone Expansion Card* is fitted.

---



To set the zones when configuring an outputs CBE.

- Select the CBE option from the Output Configuration Display by pressing the **ENT** button.
- The second line of the Display will start flashing, press the **▲**, **▼** or **SCROLL** button to move between the available CBE Expressions.

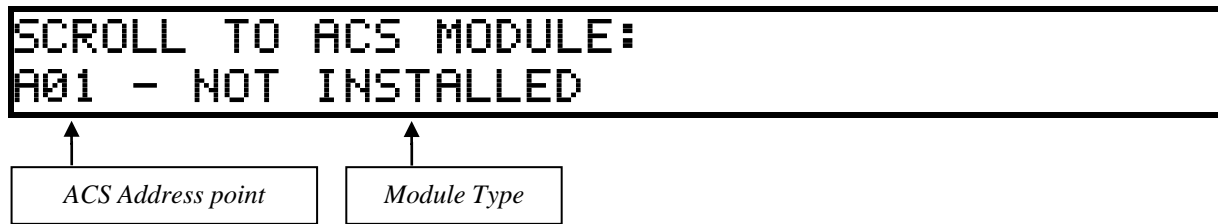
For the **Any of ...**and the **Any two of...** CBE, the zones will need to be selected.

- Press the **ENT** button when the required CBE is flashing.
- When the first available zone starts flashing, press the **◀** and **▶** or **SCROLL** button to change the zone.
- Pressing **▲** and **▼** will scroll to the next or previous zone.
- Once all the zones have been selected press the **ESC|MENU** button twice.
- The Save Changes display will appear, press the **YES|SPACE** to save changes or press **NO|LAMP** to cancel the changes.





## 5.4. Programming ACS Modules

*Main Menu > Program (6) > ACS Module (3)*

The FS-1600 has been designed in a manner that allows additional ACS modules to be fitted. The supported ACS modules that can be fitted are the ACM-8RA and ACM-ZM.



**Figure 5-7 - Programming ACS Modules Display**

- By default the ACS address point will be blinking.
- Pressing  and  will scroll to the next or previous the ACS point.
- Pressing  and  will change the cursor to the ACS module type.
- With an ACS module type selected, pressing the **ENT** button will change the display to a Save Changes Display.
- Pressing **ENT** again will change the display to the ACS modules output settings.



**NOTE:** There can be up to 32 ACS modules connected to the fire panel.

### 5.4.1 Programming a Relay Card (ACM-8RA)

The ACM-8RA provides 8 additional clean contact form C relay outputs for the panel.

To program an ACM-8RA, follow the steps in Section 5.4 Programming ACS Modules on page 67, ensuring the *Relay Card* is selected as the module type.

The outputs on the relay card can be programmed as per Section 5.3 Programming Outputs on page 63.

See Appendix E Factory Defaults on page 99 for the point numbers and default output Type IDs for the ACM-8RA.

### 5.4.2 Programming a Zone Mimic (ACM-ZM)

The ACM-ZM provides LED indications of the status of the panel. To program an ACM-ZM, follow the steps in Section 5.4 Programming ACS Modules on page 67, ensuring the Zone Mimic is selected as the module type.

The outputs on the zone mimic card can be programmed as per Section 5.3 Programming Outputs on page 63.

See Appendix E Factory Defaults on page 99 for point numbers and default output Type IDs for the ACM-ZM.

### 5.4.3 Programming the Zone Mimic Expansion Card

The Zone Mimic Expansion Card provides an additional 8 LED outputs on the ACM-ZM.

The Zone Mimic Expansion Card is part of the ACM-ZM and hence its points are part of the ACM-ZM module, see Section 5.4.2 Programming a Zone Mimic (ACM-ZM) on page 68.



**NOTE:** The maximum number of Zone Mimic Expansion Cards that can be fitted to an ACM-ZM is three. This results in a total of 36 LEDs being available for programming.

---

## 5.5. Setting the Date and Time

*Main Menu > Program (6) > Date and time (4)*

The date and time of the panel can be set to help an operator determine the date and time of an event.



**NOTE:** The date and time is set to a 24-hour clock. The fire panel does not accommodate daylight savings or different time zones. When daylight savings commences the default panel time will need to be changed manually.

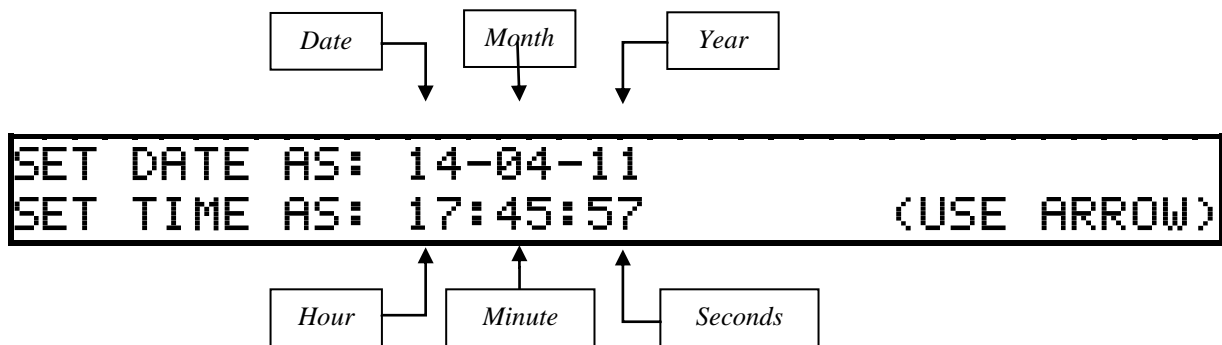


Figure 5-8 - Date and Time Configuration Display

- Pressing **ENT**, **◀** or **▶** will scroll the cursor to the next field.
- Pressing the **▲** and **▼** will change the values for date, month, year, hour, minute and second fields.
- Pressing **ESC|MENU** will change the display to the Save Changes Display.



Figure 5-9 - Save Changes Display

- Pressing **NO|LAMP** will reject the time and date changes.
- Pressing **YES|SPACE** will accept the time and date changes.



**NOTE:** The panel time setting will commence after the time and date properties have been set, not after the settings have been saved.

## 5.6. Resetting System Faults

*Main Menu > Program (6) > Reset FLTS (5)*

The resetting of System Faults is required when any latched-on System Faults need to be cleared.



\*\*\* WARNING PANEL WILL RESET \*\*\*  
CLEAR HARDWARE SYSTEM FAULTS? (YES/NO)

Figure 5-10 - Reset System Faults Display

- Pressing **YES|SPACE** will clear any latched System Faults and return the user to the Main Menu.
- Once all faults have cleared, the display will change to the Programming Menu.
- Pressing **NO|LAMP** will not clear any faults from the display changing to the previous menu.
- If there are no faults, the display will change to the No System Faults Message for three seconds, after which the LCD will change to the previous menu.



\*\*\* NO SYSTEM FAULTS TO REMOVE \*\*\*

Figure 5-11 - No System Faults

## 5.7. Programming ARE (Alarm Routing Equipment) Indication LED

*Main Menu > Program (6) > More (6) > ARE LED (1)*

The ARE LED on the keypad indicates that the alarm routing has been activated. The ARE LED can be configured to illuminate when the alarm output has been activated to signal to the brigade that there is an alarm. Or the LED can be configured to illuminate when confirmation has been received from the brigade interface that the brigade has been called. When any of the outputs on the Brigade interface activate an event is added to the history to keep a record of when the brigade was called.

- The first configuration indicates that an alarm signal has been sent to the *ARE*. See Figure 5-12 - ARE LED Output Display. The keypad *ARE LED* will illuminate to confirm the sending of the alarm signal to the *ARE*.





Figure 5-12 - ARE LED Output Display

- The second configuration indicates that an alarm signal has been received from the *ARE*. See Figure 5-13 - ARE LED Input Display. The keypad *ARE LED* will illuminate to confirm the acknowledgement of the alarm by the *ARE*.



Figure 5-13 - ARE LED Input Display

- Pressing the  and  or the **SCROLL** button will change the activation control options (Output to ARE or Input to ARE).
- Pressing **ENT** will confirm the activation control configuration.
- Pressing **YES|SPACE** will accept the *ARE LED* configuration.
- Program the ARE board as per the instructions in Section 5.3 Programming Outputs on page 63.



**NOTE:** When programming the outputs connected to the ARE ensure the programming matches the Relay the outputs are connected to. For instance, Disable Outputs programmed to respond to a Disable event need to be connected to the ARE Disable Relay.

## 5.8. Programming the Output Delay Setting

*Main Menu > Program (6) > More (6) > O/P Delay (2)*

The output delay setting permits the setting of an output's response time when a point goes into an alarm state. By setting an output delay the Alarm event can be validated to ensure it is not a false alarm.

The image shows a rectangular digital display with a black border. Inside, the text 'OUTPUT DELAY TIME (MM:SS): 01:00' is displayed in a monospaced, uppercase font. The text is white on a black background.

**Figure 5-14 - Output Delay setting Display**

- Pressing **▲** and **▼** will change the output delay time in 30-second intervals.
- The output delay time can be set from 00:00 minutes up to 10:00 minutes.
- Once the output delay is set, pressing **ENT** will change the display to the Save Changes Display.
- Pressing **NO|LAMP** will reject changes and the display will change to the Programming Menu.
- Pressing **YES|SPACE** will accept changes and change the display to the Programming Menu.

## 5.9. Clearing Panel History

*Main Menu > Program (6) > More (6) > CLR history (3)*

The Clear Panel History Display permits the removal of all events from the panel history.



```
CLEAR PANEL HISTORY? (YES/NO)
PASSWORD REQUIRED TO CLEAR
```

Figure 5-15 - Clear Panel History Display

- Pressing **YES|SPACE** will bring up a password prompt on the display.
- Pressing any keypad button will cancel the clear history action.
- Once the password check has been completed, the Clearing Panel History Display will appear until the panel history has been cleared. At this point all history events will be removed, including alarm events.



```
*** CLEARING PANEL HISTORY ***
```



Figure 5-16 - Clearing Panel History Display



## 5.10. Programming the Zone Expansion Card

*Main Menu > Program (6) > More (6) > Zone EXPN (4)*

The Zone Expansion Card Configuration Display programs the configuration of the Zone Expansion Card. The Zone Expansion Card needs to be set to *Fitted* for the additional zones to be recognised by the panel.

- Pressing  and  will toggle the Zone Expansion Card status field between *Fitted* and *Not Fitted*.
- When the Zone Expansion Card is fitted the display will appear as:



9-16 ZONE EXPANSION CARD IS: FITTED  
NOTE: REMOVING CARD MAY AFFECT O/P CBE

Figure 5-17 - Zone Expansion Card Configuration Display (FITTED)

- If the Zone Expansion Card is not fitted the display will appear as:

9-16 ZONE EXPANSION CARD IS: NOT FITTED  
NOTE: REMOVING CARD MAY AFFECT O/P CBE

Figure 5-18 - Zone Expansion Card Configuration Display (NOT-FITTED)

- Pressing  will accept the changes.
- Pressing  will accept the change.
- Pressing any keypad button will reject the configuration change.



**NOTE:** Once a zone expansion card is programmed as *Fitted*, the Zone Expansion zone type IDs will need to be configured for these zones, see Section 5.2 Programming Zones on page 74.

## 5.11. Changing the Password

*Main Menu > Program (6) > More (6) > Password (5)*

The Configure Password feature permits the changing of the password. The password has to be a five-digit number.



**NOTE:** The factory default password is '00000'.

When creating a new password, enter the existing password into the panel.

```
ENTER PASSWORD:
DEFAULT IS '00000', PRESS ESC TO ABORT
```

Figure 5-19 - Existing Password Display

After entering the existing password the display will change to:

```
ENTER NEW PASSWORD:
```

Figure 5-20 - New Password Display

If the old password is entered incorrectly the panel display will change to:

```
*** INCORRECT PASSWORD ***
RETRIEVAL CODE: UU0C0000
```

Figure 5-21 - Incorrect Password Display

If this occurs contact Technical Support with the Retrieval Code to retrieve the password.

To leave the Incorrect Password Display press **ESC|MENU**.

```
ENTER NEW PASSWORD: *****
CONFIRM NEW PASSWORD: *****
```

Figure 5-22 - New Password Confirmation Display

Once the password has been changed successfully the display will acknowledge the password change.



**Figure 5-23 - Password Changed Display**

After 3 seconds the display will revert back to the main Programming Menu

If the new confirm new password fields do not match the Password Failure message will be displayed.  
If this message is displayed restart the change password process.



**Figure 5-24 - Password Failure**

## 5.12. Clearing the Panel Configuration

*Main Menu > Program (6) > More (6) > More (6) > CLR Config (1)*

Clearing the panel configuration sets the panel to its factory default settings.



```
CLEAR PANEL CONFIGURATION? (YES/NO)
PASSWORD REQUIRED TO CLEAR
```

Figure 5-25 - Clear Panel Configuration Display

- Pressing **YES|SPACE** will display a reboot warning (Figure 5-26 – Reboot Warning Display).
- Pressing **NO|LAMP** or any other keypad button will change the display to the previous menu.



```
WARNING, PANEL WILL REBOOT!
CONTINUE? (YES/NO)
```

Figure 5-26 – Reboot Warning Display

Once the password check has been completed the display changes to the clearing configuration message. This message will be displayed until the panel configuration has been cleared.



```
*** CLEARING CONFIGURATION ***
```

Figure 5-27 - Clearing Panel Configuration Display



**NOTE:** Clearing a configuration will not clear the panel password or its history.

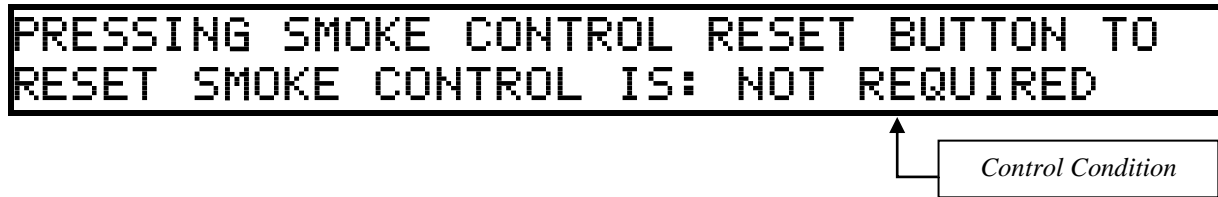
When clearing the panel configuration;

- All zones and CPU board outputs change to the default configuration. For details regarding the default configuration refer to Appendix E Factory Defaults on page 99.
- The configuration of all ACS modules changes to not installed. If any ACS modules have been disabled, the ACS modules are removed from the disabled list. All other disabled points remain on the disabled list.
- All global settings are changed to their defaults, except for the system time, the password and the panel history.

### 5.13. Programming Smoke Control Reset

*Main Menu > Program (6) > More (6) > More (6) > Smoke CTRL (2)*

The purpose of the Smoke Control reset feature is to permit the Smoke Control and Door Holder Outputs to be reset separately from the rest of the panel.



**Figure 5-28 - Smoke Control Reset Display**

- Pressing the **▲** and **▼** or the **SCROLL** buttons will toggle the Smoke Control Condition property between 'Required' or 'Not required'.
- Once the Smoke Control value is set, pressing **ENT** or **ESC|MENU** will save changes.

Once activated:

- The **SMOKE CONTROL reset** LED will illuminate when the fire panel enters an alarm state.
- If, the Smoke Control reset is set to 'Required' the Smoke Control outputs need to be reset separately after the panel has been reset.
- If, the Smoke Control rest is set to 'Not Required' the Smoke control outputs are automatically reset when the panel is reset.

## Section 6 Diagnostics

### 6.1. Diagnostics Overview

Diagnostics describes the types of system monitoring tasks that occur in the background during the operation of the fire panel. The Diagnostics section also includes some basic troubleshooting. For a comprehensive list of the panel faults refer to Appendix D Faults and Events on page 92.

### 6.2. Safe States

#### 6.2.1 System CRC Error Safe State

When the fire panel firmware is corrupted, the System CRC Error Display will appear. All programs stop once the System CRC Safe State is entered.

Should the System CRC Error Display appear, contact Technical Support.

A rectangular display box with a black border. Inside, the text is in a monospaced, pixelated font. The top line reads '\*\*\* SYSTEM CRC ERROR \*\*\*' and the bottom line reads 'CONTACT TECHNICAL SUPPORT'.

Figure 6-1 - System CRC Error Display

#### 6.2.2 Flash Connection Fault Safe State

When the system enters Flash Connection Safe State, the Flash Connection Fault display will appear. The Flash Connection Fault is displayed when there is a fault with the CPU hardware. All programs stop once the Flash Connection Fault Safe state is entered.

Should the Flash Connection Fault Safe State Display appear, contact Technical Support.

A rectangular display box with a black border. Inside, the text is in a monospaced, pixelated font. The top line reads '\*\*\* FLASH CONNECTION FAULT \*\*\*' and the bottom line reads 'CONTACT TECHNICAL SUPPORT'.

Figure 6-2 - Flash Connection Fault Safe State Display

#### 6.2.3 Configuration Corrupt Safe State

When the system enters the Configuration Corrupt Safe State, the Configuration Corrupt Safe State will appear. All programs will stop once the Configuration Corrupt Safe State is entered.

A rectangular display box with a black border. Inside, the text is in a monospaced, pixelated font. The top line reads '\*\*\* CONFIGURATION CORRUPT \*\*\*' and the bottom line reads 'ATTEMPT TO ERASE CONFIGURATION? (YES)'.

Figure 6-3 - Configuration Corrupt Display

The Configuration Corrupt Safe State Display will appear if an error has occurred in the configuration. The only way that the system can be restored is to erase the current configuration.

If a configuration error is not found the fire panel will run as normal. Should the Configuration Safe State message continue to appear contact Technical Support.



**CAUTION:** When an existing configuration is erased all programming will need to be re-entered.

### 6.2.4 EEPROM CRC Error Safe State

When power is applied, (before the voltage gets above the 25.0V threshold) the system will check the CRC of the EEPROM to see if the calibration values are correct. If the CRC check on the EEPROM data is unsuccessful, the EEPROM CRC Error Safe State Display will appear.

Should the EEPROM CRC Error Safe State Display appear, contact Technical Support.

A rectangular display box with a black border containing two lines of text in a monospaced font. The first line reads '\*\*\* EEPROM CRC ERROR \*\*\*' and the second line reads 'CONTACT TECHNICAL SUPPORT'.

Figure 6-4 - EEPROM CRC Error Display

### 6.2.5 Serial Chain Error Safe State

When the system enters Serial Chain Error Safe State, the CPU Serial Chain Fault Display will appear. The CPU Serial Chain Fault is displayed when there is a fault with the CPU hardware. All programs stop once the safe state is entered.

Should the Serial Chain Fault Safe State Display appear, contact Technical Support.

A rectangular display box with a black border containing two lines of text in a monospaced font. The first line reads '\*\*\* CPU SERIAL CHAIN FAULT \*\*\*' and the second line reads 'CONTACT TECHNICAL SUPPORT'.

Figure 6-5 - CPU Serial Chain Fault Display

### 6.2.6 Keypad Missing Safe State

When the system enters Keypad Missing Safe state, the Keypad Missing Display will appear. The Keypad Missing error is displayed when there is a fault with the keypad connection. All programs stop once the safe state is entered.

When the Keypad Missing Display appears, the operator should check the ribbon cable connections to the keypad and restart the panel.

A rectangular display box with a black border containing two lines of text in a monospaced font. The first line reads '\*\*\* KEYPAD MISSING \*\*\*' and the second line reads 'CHECK KEYPAD AND RESTART PANEL'.

Figure 6-6 - Keypad Missing Display

### 6.2.7 Invalid Keypad Detected Safe State

When the system enters Invalid Keypad Safe State, the Invalid Keypad Detected Display will appear. The Invalid Keypad Detected fault is displayed when there is a fault with the attached keypad, or an incorrect keypad is attached. All programs stop once the invalid keypad detected safe state is entered.

A rectangular display box with a black border containing two lines of text in a monospaced font. The first line reads '\*\*\* INVALID KEYPAD DETECTED \*\*\*' and the second line reads 'CHECK KEYPAD AND RESTART PANEL'.

Figure 6-7 - Invalid Keypad Detected Display

When this fault occurs check the ribbon cables connected to the keypad and restart the panel. If the problem persists, contact Technical Support.

## 6.2.8 24 Volt Power Short Circuit Error

If the panel has too much load (amperage) connected on the 24V Panel Power, or the ACM interface, or there is a short circuit on these terminals, the Short Circuit on 24V Power message will appear on the display. See Figure 6-8 - Short Circuit on 24V Power Error.

To remove the 24 Volt Power Short Circuit Error:

- Remove power to the panel,
- Remove the short circuit/overload condition on the panel's power outputs.
- Reboot the panel.
- If the problem persists, contact Technical Support.



**NOTE:** The maximum current draw from the 24 V Panel Power outputs is the rated output current of the NPS-xCHS power supply (see Table 2-2), less the current drawn by any other devices connected to the power supply.

e.g. A FS-1600 CPU & Keypad draw 0.215 A. If a further 1 A is drawn by devices on NAC 1, and 1.7 A is drawn by a DA-BOWS connected to one 24 V Panel Power terminal, a maximum of 2.685 A can be drawn from the remaining 24 V Panel Power terminal on a NPS-5CHS (5.6 A).

```
*** SHORT CIRCUIT ON 24V POWER ***  
REMOVE SHORT TO BOOT PANEL
```

Figure 6-8 - Short Circuit on 24V Power Error

## 6.2.9 Watchdog Hardware Error

A Watchdog Hardware Error appears when the watchdog chip cannot be read properly. As a result the panel display will change to the safe mode shown in Figure 6-9 - Watchdog Hardware Error Display.

Should the Watchdog Hardware Error Display appear, contact Technical Support.

```
*** WATCHDOG HARDWARE ERROR ***  
CONTACT TECHNICAL SUPPORT
```

Figure 6-9 - Watchdog Hardware Error Display

## 6.2.10 ACM Faults

For ACM Faults refer to Appendix D Faults and Events on page 92.



## 6.3. Troubleshooting

Before trying to trouble shoot the panel, as many faults as possible should be cleared from the panel, no matter how trivial they may appear. For a list of fault causes and resolutions, see Appendix D Faults and Events on page 92.

### 6.3.1 The panel will not start!

If the panel does not start up:

1. Check to see if there are any Panel, Board and Keypad LEDs illuminated. If there are no LEDs illuminated the panel is not receiving any power. Check;
  - a. The mains PSU supply (the red 240V mains switch should be illuminated)
  - b. The connections to the battery, the spade terminals should be connected to the batteries
  - c. That the fuse inside the Fuse Block is not blown.
2. If the *Low Power* LED (see Figure 6-10 - Location of Power Failure LED) is flashing there is enough voltage to power the processor but something else is preventing the software from executing this could be;
  - a. **Not enough power to start the panel.**  
At least one of the power supplies (mains power or battery power) must be above 25V for the panel to boot up. Check the voltage into the panel CPU Board at the PSU input and the battery input.
  - b. **A short circuit on the power output of the panel.**  
If this is the case, the buzzer and the system fault and fault LEDs will turn on briefly every 10 seconds and a short circuit on 24V power message will be shown on the display. To fix, remove the short circuit from the power output, see Section 6.2.8 24 Volt Power Short Circuit Error on page 81.
  - c. **If the keypad LED is on, the panel has enough power to start but there is a problem with the keypad.**  
Check the connection between the CPU and the keypad to make sure the ribbon cable is making a clean connection.
  - d. **If the fault and system fault LEDs are on and the buzzer is on**  
There is a hardware fault with the CPU. Contact Technical Support.

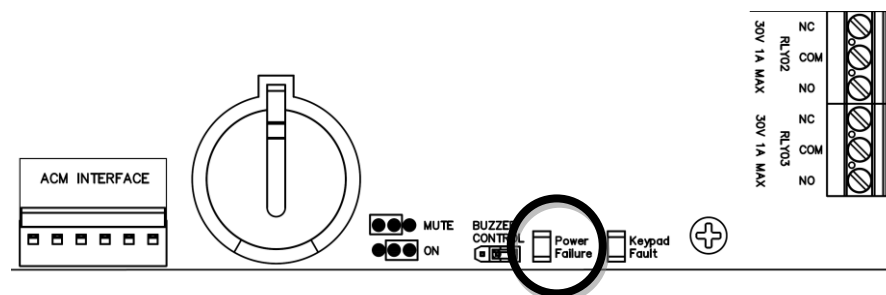


Figure 6-10 - Location of Power Failure LED

### **6.3.2 What does the flashing fault LED on my ACM device mean?**

If the yellow fault LED on an ACM-8RA or ACM-ZM is flashing there is a fault on the ACM device. The number of flashes indicates different fault conditions. An explanation of these fault conditions can be found in Appendix D Faults and Events on page 92.

### **6.3.3 My panel is connected but nothing is lighting up on my ACM!**

If the panel is operating and the ACM device is operating. Is the green heartbeat LED flashing? If not the ACM device is not receiving power.

1. Check the connection between the ACM device and the panel, measure the voltage of the power coming into the ACM device, it should be between 21V and 30V.
2. If the ACM device is connected via the field ACM interface, there could be a short circuit on the power line. If this is the case, there will be a fault on the panel.

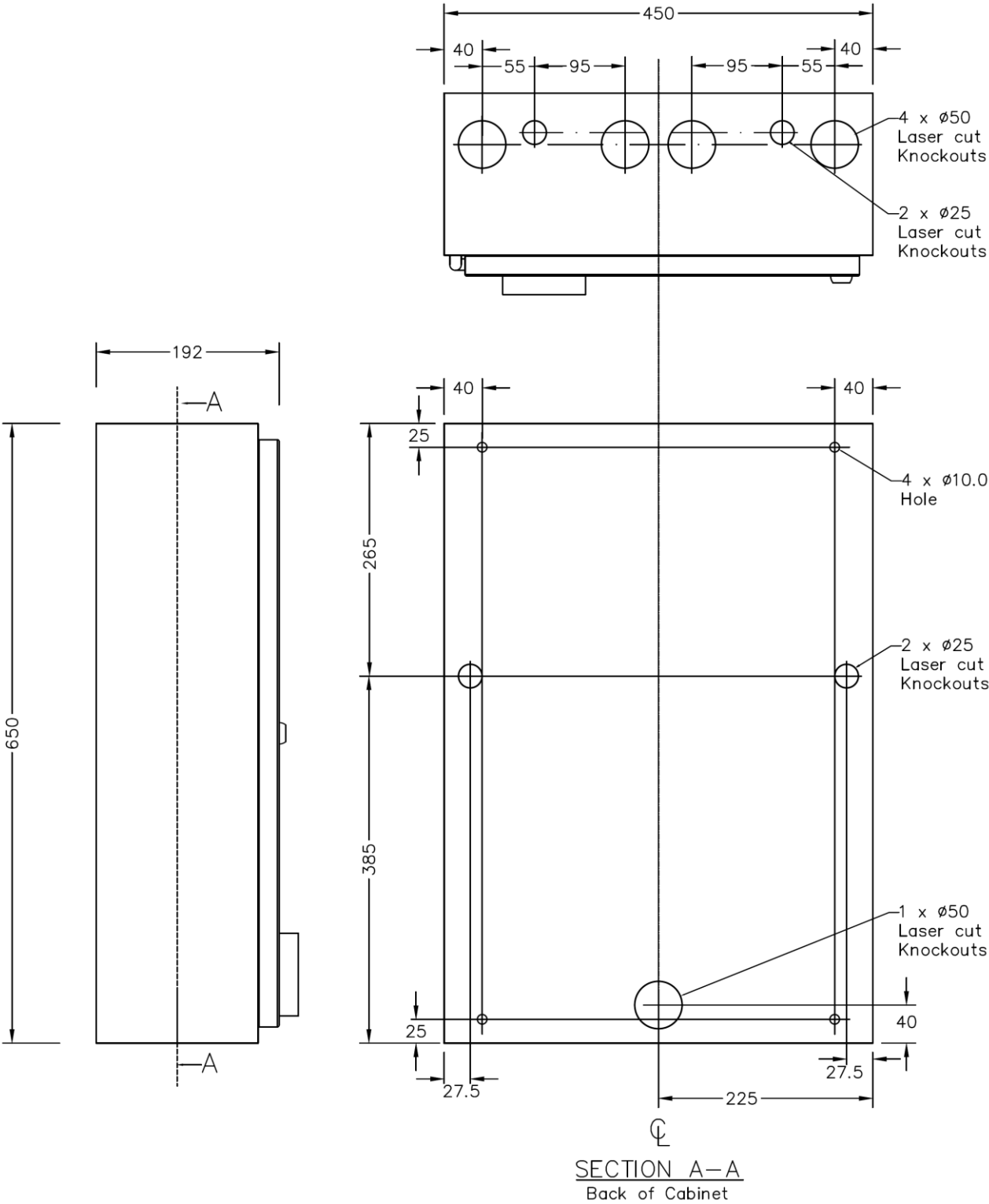
If after trying the steps above the problem still cannot be resolved, contact Technical Support.

### **6.3.4 How can I find out the software version?**

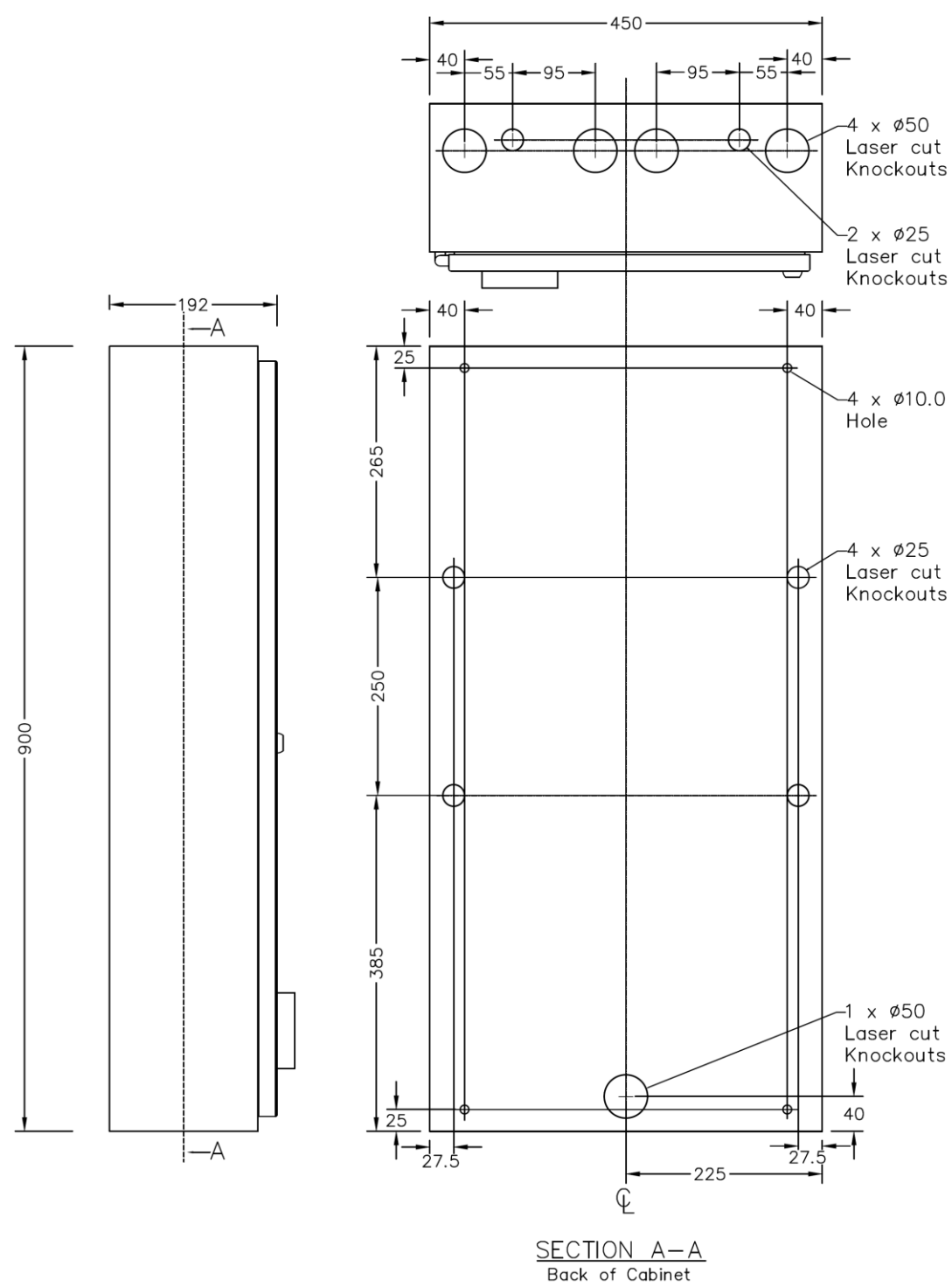
Hold down the Lamp Test Button for three seconds, the software version will appear on the display.

# Appendix A Mounting Details

## CAB650 Mounting Details



CAB900 Mounting Details



# Appendix B Battery Calculations

## Battery Power Calculations

| Fire Panel Set up                    | Quiescent Current (Amps) |                    |              | Alarm Current (Amps) |                    |              |
|--------------------------------------|--------------------------|--------------------|--------------|----------------------|--------------------|--------------|
|                                      | QTY                      | x [current draw] = | Total (Amps) | QTY                  | x [current draw] = | Total (Amps) |
| FS-1600 CPU Board and Keypad         | [ 1 ]                    | x [0.090] =        | 0.090        | [ 1 ]                | x [0.215] =        | 0.215        |
| Zone Expansion Card                  | [ ]                      | x [0.048] =        |              | [ ]                  | x [0.048] =        |              |
| Brigade Interface Card               | [ ]                      | x [0.020] =        |              | [ ]                  | x [0.035] =        |              |
| ACM-8RA Relay Card                   | [ ]                      | x [0.025] =        |              | [ ]                  | x [0.040] =        |              |
| ACM-ZM Zone Mimic Card               | [ ]                      | x [0.020] =        |              | [ ]                  | x [0.025] =        |              |
| ACM-ZM Zone Mimic LED Expansion Card | [ ]                      | x [0.005] =        |              | [ ]                  | x [0.025] =        |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | [ ]                      | x [ ] =            |              | [ ]                  | x [ ] =            |              |
|                                      | Quiescent Current Total  |                    |              | Alarm Current Total  |                    |              |

## Battery Power Equations

To calculate the battery size in accordance with AS 1670.1-2004, use the formula below:

$$C_{20} = 1.25 [(I_Q \times T_Q) + F_C (I_A \times T_A)]$$

Where:

$C_{20}$  = battery capacity in Ah at 20 h discharge rate

$I_Q$  = total quiescent current

$T_Q$  = quiescent standby power source time, (normally 24 h)

$F_C$  = capacity de-rating factor

$I_A$  = total current in alarm state

$T_A$  = alarm load standby power source time (normally 0.5 h)

1.25 = compensation factor for expected battery deterioration

Where the load may vary, the worse case average over required period shall be used.

# Appendix C Type IDs

## Zone Type IDs

| Zone Type ID    | AVF available (Yes/No) | Latching/ Tracking setting | Definition  |
|-----------------|------------------------|----------------------------|---|
| M.C.P.          | No                     | Tracking                   | Used with Manual Call Points.<br><br>When activated this zone will add an alarm event to the events list and put the panel into the alarm condition.<br><br>When the zone is activated it will override the delay to outputs.   |
| FAULT MONITOR   | No                     | Tracking                   | Used to check monitoring equipment for faults. When activated this zone will add a fault event to the events list.  |
| SUB F.I.P.      | No                     | Tracking                   | This zone type is used for connecting a Sub Fire Indicator Panel to the FS-1600.<br><br>When activated the panel will add an alarm event to the event list.   |
| IS DETECT       | No                     | Latching                   | Intrinsic Detectors connected through an IS Barrier. See Section 3.5 Installing an Intrinsically Safe Barrier (IS Barrier) on page 15.<br><br>When activated this zone will add an alarm event to the events list and put the panel into the alarm condition.<br><br>When this zone is activated it will override the delay to outputs. |
| SPRINKLER       | No                     | Latching                   | Used to control sprinkler systems.<br><br>When activated this zone will add an alarm event to the events list and put the panel into the alarm condition.<br><br>When this zone is activated it will override any output delays.  |
| NON-FIRE (DUCT) | No                     | Tracking (timed)           | Used for Duct Detectors.<br><br>When activated this zone will add a non-alarm event to the events list.<br><br>When the duct detector clears, the zone will stay active for 60 seconds.   |
| NON-FIRE        | No                     | Tracking                   | Used for equipment that only needs to indicate an activation on the panel, not put the panel into alarm.<br><br>When activated this zone will add a non-alarm event to the events list.   |

| <b>Zone Type ID</b> | <b>AVF available (Yes/No)</b> | <b>Latching/ Tracking setting</b> | <b>Definition</b>  |
|---------------------|-------------------------------|-----------------------------------|--|
| SUPERVISORY         | No                            | Latching                          | Used for equipment that only needs to indicate a supervisory activation on the panel, not put the panel into alarm.<br>When activated this zone will add a supervisory Event to the events list. |
| DETECT (OVRD)       | Yes                           | Latching                          | This is the same as the Detect Zone Type ID, however when this zone is activated it will override the delay to outputs.  |
| DETECT              | Yes                           | Latching                          | Used for detectors.<br>When activated this zone will add an alarm event to the events list and put the panel into the alarm condition.   |



## Output Type IDs

| Output Type ID        | CBE Options  | Definition  |
|-----------------------|--|---|
| FAULT<br>(ENERGISED)  | ANY ZONE OR<br>ANY SYSTEM<br>POINT,<br>ANY OF Z1...Z16                 | This output energises when there is no fault on the panel.<br>The CBE will only look at fault events.<br>When configured as 'ANY ZONE OR SYSTEM POINT' the output will deactivate when there is any fault on the panel.<br>This output will stay energised when disabled. |
| FAULT                 | ANY ZONE OR<br>ANY SYSTEM<br>POINT,<br>ANY OF Z1...Z16                 | The CBE will only look at fault events.<br>When configured as 'ANY ZONE OR SYSTEM POINT' the output will activate when there is any fault on the panel.   |
| ALARM                 | ANY ZONE,<br>ANY OF Z1...Z16,<br>ANY 2 OF Z1...Z16,<br>ALL OF Z1...Z16 | The CBE will only look at alarm events.   |
| ALARM<br>(DELAYED)    | ANY ZONE,<br>ANY OF Z1...Z16,<br>ANY 2 OF Z1...Z16,<br>ALL OF Z1...Z16 | The CBE will only look at alarm events.<br>This output will activate after an alarm event has occurred and the delays have subsequently expired. See Section 4.7.8 Initiating Delays to Outputs on page 37.   |
| NOT USED              | -  | This output will never activate.  |
| BUZZER OUTPUT         | -  | This output mimics the buzzer state on the panel to an external buzzer. It is only programmable to CPU board outputs.<br>Note that the external buzzer may beep asynchronously to the panel buzzer, depending on its distance from the panel.                             |
| SYSTEM<br>INOPERATIVE | ANY ZONE OR<br>ANY SYSTEM<br>POINT<br>ANY OF Z1...Z16                  | The CBE will look at fault events, disable events to indicate that a zone or the panel is inoperative.  |
| SYSTEM<br>NORMAL      | ANY ZONE OR<br>ANY SYSTEM<br>POINT,<br>ANY OF Z1...Z16                 | The CBE will look at alarm events, fault events and supervisory events and be energised when the zone or the panel is normal.<br>This output will be energised when it is disabled.   |
| SMOKE CONTROL         | ANY ZONE,<br>ANY OF Z1...Z16,<br>ANY 2 OF Z1...Z16,<br>ALL OF Z1...Z16 | The CBE will only look at alarm events.<br>This output is part of the smoke control and will latch until the smoke control has been reset. If the smoke control is disabled this output will also be disabled.  |
| ALARM DEVICES         | ANY ZONE,<br>ANY OF Z1...Z16,<br>ANY 2 OF Z1...Z16,<br>ALL OF Z1...Z16 | The CBE will look at alarm events or an alarm device test..<br>This output will de-activate when the panel has been silenced.<br>This output will be disabled when the alarm devices are disabled.  |

| Output Type ID             | CBE Options  | Definition   |
|----------------------------|--|--|
| ALARM DEVICES<br>(DELAYED) | ANY ZONE,<br>ANY OF Z1...Z16,<br>ANY 2 OF Z1...Z16,<br>ALL OF Z1...Z16 | The CBE will look at alarm events or an alarm device test.<br><br>This output will de-activate when the panel has been silenced.<br><br>This output will be disabled when the alarm devices are disabled.<br>This output will only activate once the panel delays are expired if the delays are active. See Section 4.7.8 Initiating Delays to Outputs on page 37.   |
| DOOR HOLDER                | ANY ZONE,<br>ANY OF Z1...Z16,<br>ANY 2 OF Z1...Z16,<br>ALL OF Z1...Z16 | This output is normally energised and will de-energise when the CBE is activated after the alarm event or when the panel loses the mains supply.<br><br>This output is part of the Smoke Control and will latch until the Smoke Control has been reset. If the Smoke Control is disabled this output will stay energised (unless the mains power is lost).<br><br>This output will stay energised when disabled. |
| GENERAL O/P                | ANY ZONE,<br>ANY OF Z1...Z16,<br>ANY 2 OF Z1...Z16,<br>ALL OF Z1...Z16 | The CBE will look at alarm events, supervisory events and non-alarm events.  |
| DISABLE                    | ANY ZONE OR<br>ANY SYSTEM<br>POINT,<br>ANY OF Z1...Z16                 | The CBE will only look at disable events.<br><br>When configured as 'ANY ZONE OR SYSTEM POINT' the output will activate when there is any disable on the panel.  |

# Appendix D Faults and Events

## FS-1600 Faults

| Point ID | Display Text | Cause   | Fault Resolution  |
|----------|--------------|---|---|
| ASC      | FLT MISSING  | No communication signal is detected with ACS module   | <p>Check that the address on the panel and the ACS device match.</p> <p>Check the connection and the polarity of the wiring.</p> <p>Check the ACS address to ensure there is only one device set at that address.</p>             |
| ACS      | FLT TYPE     | ACS (hardware) does not match the corresponding ACS programmed into panel.  | <p>Check that the programmed ACS matches with the hardware device type.</p> <p>Check that the address on the panel and the device match.</p>  |
| ACS      | FLT RESPONSE | <p>The ACS module responds to communication, but with incorrect information.</p> <p>The panel is trying to activate a point on an ACS module that is not installed.</p> | <p>Check the ACS address to ensure there is only once device set at that address.</p> <p>Check number of ACM-ZM expansion cards. Set all outputs that do not have LED boards connected as the output type ID <i>not used</i>.</p> |
| ACS      | FLT MODULE   | There is a fault on an ACS module which is not related to the communications.   | Check ACS module hardware.  |
| BATT     | FLT LOW BATT | The battery voltage is less than 24.5V.   | Charge or replace battery.  |
| BUZZER   | FLT BUZZER   | Buzzer has been muted by the operator.  | Remove buzzer muted jumper from the buzzer muted header on the termination board.   |
| DORHLD   | FLT OVERLOAD | Door holder circuit has overloaded with a current greater than 3.0A.  | <p>Short circuit needs resolving.</p> <p>Replace the door holder fuse on the termination board.</p>   |
| EARTH    | FLT LEAKAGE  | The panel is making an electrical connection to earth somewhere, which could be effecting the operation of the panel  | <p>Investigate the panel and site wiring to identify the cause of the earth fault.</p> <p>Disconnect one cable at a time from the CPU board to identify where the fault is and insulate the connection from earth.</p>            |
| FPOWER   | FLT OVERLOAD | The field power circuit has overloaded with a current greater than 1.0A.  | <p>Remove the short circuit.</p> <p>Check current load is under 1.0A</p>  |
| KEYPAD   | FLT KEYPAD   | There is a fault at the connection between the CPU board and the keypad.  | <p>Check or replace the ribbon cable between CPU and keypad</p> <p>Reset system faults from the programming menu.</p>   |

| Point ID | Display Text | Cause   | Fault Resolution   |
|----------|--------------|---|--|
| LCD      | FLT LCD      | There is a fault at the connection between the CPU board and the keypad.  | Check or replace ribbon cable between the CPU and keypad   |
| NAC      | FLT NAC S/C  | The NAC line resistance is low while the NAC is not active. This indicates a short circuit across the NAC wiring.   | <p>Check wiring for shorts.</p> <p>The NAC devices may not have blocking diodes fitted.</p> <p>The EOL resistor may not be the correct value (4K7). There should only be one fitted.</p> <p>With the EOL resistor fitted and the NAC device switched off, check that the voltage across the NAC circuit is around -2.0V.</p> |
| NAC      | FLT NAC O/C  | <p>The NAC line resistance is high when it is not active.</p> <p>The NAC line has an open circuit.</p>  | <p>Check NAC wiring for an open circuit.</p> <p>The EOL resistor may not be the correct value (4K7). There should only be one fitted.</p> <p>With the EOL resistor fitted and the NAC device switched off, check that the voltage across the NAC circuit is around 2.0V.</p>   |
| NAC      | FLT OVERLOAD | The NAC circuit has been overloaded. This is only monitored when the NAC is switched on.  | Turn the NAC off and check if there is a NAC Short Circuit Fault. If so, diagnose that fault first. If not, there are too many devices on the line, the line must only be loaded with 1.0A worth of devices.   |
| PSU      | FLT CHARGER  | <p>The PSU is out of range (26.7V – 27.9V) to charge the batteries.</p> <p>When there is a charger fault, the charger circuit will disconnect from the battery.</p> | <p>Check that the current draw from the panel is not exceeding current limits</p> <p>Replace the PSU or contact Technical Support.</p>   |
| PSU      | FLT LOW PSU  | The PSU voltage is less than 21.0V.   | <p>Check that the mains (240V) is connected and switched on (the red power switch will be illuminated).</p> <p>Check that there is not too much load connected to the power output of the panel.</p> <p>Replace the PSU or contact Technical Support.</p>  |
| SYSTEM   | FLT FIRM CRC | There is a firmware CRC error. This fault is never cleared from the fault events list. The panel must be rebooted.  | Contact Technical Support.   |
| SYSTEM   | FLT CFG CRC  | The site configuration data has been corrupted.   | Reset the panel configuration to the factory defaults. If the problem persists replace the CPU Board.  |
| SYSTEM   | FLT PCA      | There is a hardware failure on the CPU board.   | Reset power to the panel. If the problem persists replace the CPU Board.   |

| Point ID | Display Text           | Cause   | Fault Resolution   |
|----------|------------------------|---|--|
| SYSTEM   | FLT WATCHDOG           | There is a fault with the software monitoring hardware.   | If the problem persists replace the termination board.   |
| SYSTEM   | FLT TIME               | The Time Fault will appear if the panel is reset and there is no 240V mains power, 24 V batteries and no 3V Battery.      | Power down the panel, replace the 3V clock battery. See Section 3.4.3 Replacing the 3V Battery on page 16.<br><br>Power up the panel and re-program the time and date.   |
| ZONEXP   | FLT EXP CARD           | Status ( <i>Fitted</i> or <i>Not Fitted</i> ) does not match Zone Expansion Card programming.                             | Check that the Zone Expansion Card is programmed as <i>Fitted</i> or <i>Not Fitted</i> .<br><br>Check that the Zone Expansion Card is fitted securely.<br><br>Reset system faults from the Programming Menu.<br><br>Replace the Zone Expansion Card or CPU Board.  |
| ZONE XX  | FLT ZONE SHORT CIRCUIT | There is a zone short circuit fault.  | Check wiring for shorts.<br><br>The EOL resistor may not be the correct value (4K7). There should only be one fitted.  |
| ZONE XX  | FLT ZONE O/C           | There is a zone open circuit fault.<br><br>The MCP jumper on the FS-1600 CPU board is set to the ON position.             | Check wiring for an open circuit.<br><br>The EOL resistor may not be the correct value (4K7). There should only be one fitted.<br><br>If the fault is on zone one check the status of the connected MCP and the MCP monitoring jumper.   |
| SYSTEM   | FLT SHUTDOWN           | The panel has powered up and after being shutdown from an abnormal shutdown.  | Reset system faults via Programming Menu.<br><br>If the problem persists, contact Technical Support.   |
| SYSTEM   | FLT MODE               | Keypad mode does not match the firmware mode.   | Contact Technical Support.   |
| ARE      | ARE FAULT INPUT        | The ARE is in fault or it has been disconnected.<br><br>If there is no ARE fitted, the ARE Fault Jumper has been removed. | If there is no ARE fitted fit the ARE Fault Jumper to the Brigade Interface Header on the back of the Keypad PCB.<br><br>Check the cable connections to the ARE including the ribbon cable to the ARE Interface Board. The fault input on the ARE interface must be shorted to 0V to indicate normal.<br><br>Check the ARE is receiving power. |
| ARE      | ARE DISABLED INPUT     | The ARE has been disabled.  | Enable the ARE.<br><br>Check wiring of the Disabled input on the ARE Interface.  |

| Point ID | Display Text                    | Cause   | Fault Resolution  |
|----------|---------------------------------|---|---|
| ZONE     | ALL ZONES ZONE MONITORING FAULT | The zones cannot be monitored for open circuit faults because the power supply is too high. | Fix the charger fault first. Once the charger fault is removed this fault will also be removed. |

## ACS Module Faults

The table below describes how the LED behaves during a fault and the steps to resolve the fault. The Faults table is relevant to the Zone Mimic (ACM-ZM) and Relay Card (ACM-8RA).

| <b>Fault Description</b>                   | <b>LED Indication<br/>(Fault cycle every 2 seconds)</b> | <b>Resolution</b>   |
|--|---|---|
| Communications with the fire panel failed. | Flashes once every 2 seconds.                           | Check wiring between panel and ACM.<br>Check ACS module is programmed to the correct address.   |
| Address is set out of the range of 1-32.   | Flashes twice every 2 seconds.                          | Set module address.   |
| Serial chain circuit is short or opened.   | Flashes three times every 2 seconds.                    | Check serial chain cables are connected properly and there is a path to close the serial chain loop.<br>Restart card to remove fault. |
| Firmware CRC Check failed.                 | Flashes four times every 2 seconds.                     | Possible hardware fault.<br>Contact Technical Support.  |

## Events Table

| Event        | Event Description Text         | Explanation   |
|--------------|--------------------------------|---|
| DISABLED     | ALARM ROUTING EQUIPMENT        | ARE outputs have been disabled (except for the disabled output).                                      |
| ENABLED      | ALARM ROUTING EQUIPMENT        | ARE outputs have been enabled.  |
| ACTIVE       | A.R.E. ALARM ROUTING INPUT     | From the ARE to say that it has sent an alarm signal to the Fire Brigade.                             |
| ACTIVE       | A.R.E. FAULT INPUT             | The ARE is in fault.  |
| ACTIVE       | A.R.E. DISABLED INPUT          | The ARE has been disabled.  |
| OUTPUT ON    | POINT DESCRIPTION              | The ARE outputs have switched on.   |
| OUTPUT OFF   | POINT DESCRIPTION              | The ARE outputs have switched off.  |
| TEST STARTED | BATTERY TEST STARTED           | The battery test has started.   |
| TEST ABORTED | BATTERY TEST ABORTED BY USER   | The battery test has been aborted by the user.  |
| TEST PASSED  | BATTERY TEST FINISHED - PASSED | The battery test has passed and is successful.  |
| TEST FAILED  | BATTERY TEST FAILED            | The battery test has failed.  |
| TEST BLOCKED | BATTERY TEST BLOCKED BY PANEL  | The battery test has been stopped from a panel operation, for instance an alarm or alarm device test. |
| CHANGED      | PANEL CONFIGURATION CHANGED    | The panel configuration has changed.  |
| ERASED       | PANEL HISTORY ERASED           | The panel history has been erased.  |
| DISABLED     | POINT DESCRIPTION              | A point is disabled.  |
| ENABLED      | POINT DESCRIPTION              | A point is enabled.   |
| POWER UP     | SYSTEM POWER UP                | System has been is powered up.  |
| SHUTDOWN     | SYSTEM SHUTDOWN                | System has been shut down.  |
| TEST         | ALARM DEVICES TEST STARTED     | An alarm device test has been started.  |
| SILENCE      | ALARM DEVICES SILENCED         | The panel has been silenced.  |
| RESET        | PANEL RESET                    | The panel has been reset by user.   |
| TRIAL EVAC   | POINT DESCRIPTION              | This is when there is a trial evacuation from the Trial Evac. Bulgin switch                           |



| Event        | Event Description Text | Explanation   |
|--------------|------------------------|---|
| BRIGADE SIL  | POINT DESCRIPTION      | This is when the panel is being silenced from the Silence Bulgin switch.  |
| DOOR OPEN    | POINT DESCRIPTION      | The outer cabinet door is opened.<br>Relevant only if the door switch is connected to the ACM-ZM.<br>If there is no door switch used, the door switch terminals must be shorted together. |
| DOOR CLOSED  | POINT DESCRIPTION      | The outer cabinet door is closed after being opened.<br>Relevant only if the door switch is connected to the ACM-ZM.  |
| ALARM        | POINT DESCRIPTION      | A zone is in an alarm state.  |
| ALARM-SMOKE  | POINT DESCRIPTION      | A zone is in a smoke alarm state.   |
| SUPERVISORY  | POINT DESCRIPTION      | A supervisory event is active.  |
| SFIP ALARM   | POINT DESCRIPTION      | A Sub Fire Indicator Panel is active.   |
| NON ALARM    | POINT DESCRIPTION      | A point that is a non- alarming point is active.  |
| ZONE TESTED  | POINT DESCRIPTION      | This event appears when a zone has had a device activated during a walk test.   |
| TEST STARTED | POINT DESCRIPTION      | A walk test has started.  |
| TEST FINISH  | POINT DESCRIPTION      | A walk test is finished.  |
| DBA ACTIVE   | POINT DESCRIPTION      | The Direct Brigade Access panel is active.  |
| DISABLED     | SMOKE CONTROL          | Smoke Control is disabled.  |
| ENABLED      | SMOKE CONTROL          | Smoke Control is enabled.   |
| DISABLED     | ALARM DEVICES          | Alarm Devices are disabled.   |
| ENABLED      | ALARM DEVICES          | Alarm Devices are enabled.  |

# Appendix E Factory Defaults

The default panel configuration is listed below.

## Zone Point Defaults

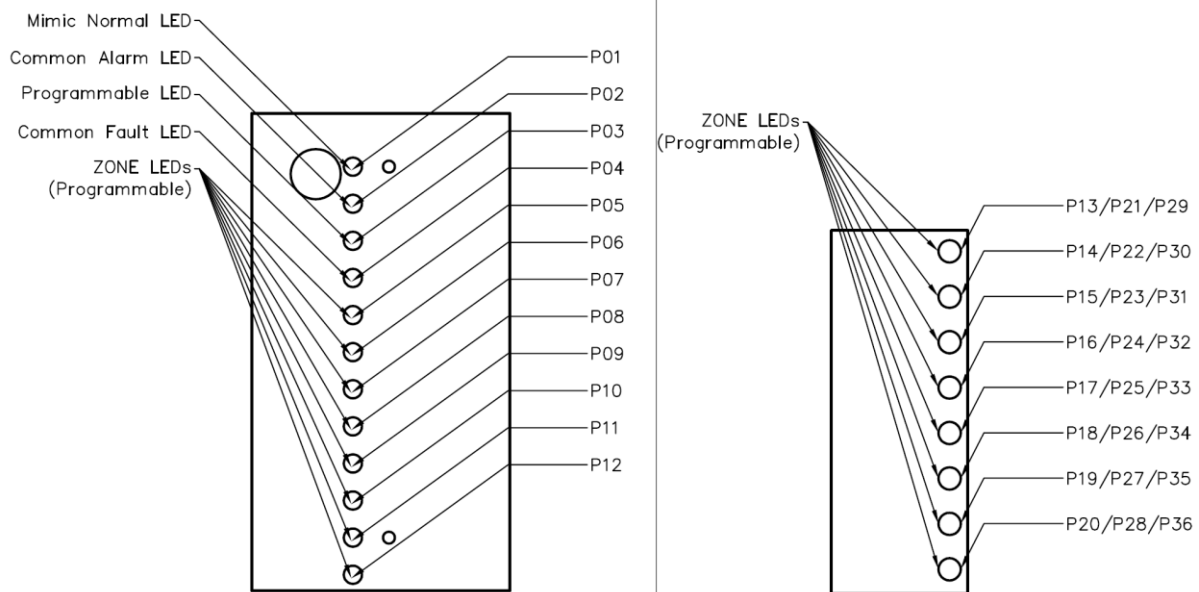
| Point  | Default ID | Default Description |
|--------|------------|---------------------|
| Zone 1 | MCP        | ZONE01              |
| Zone 2 | Detect     | ZONE02              |
| Zone 3 | Detect     | ZONE03              |
| Zone 4 | Detect     | ZONE04              |
| Zone 5 | Detect     | ZONE05              |
| Zone 6 | Detect     | ZONE06              |
| Zone 7 | Detect     | ZONE07              |
| Zone 8 | Detect     | ZONE08              |

## Output Defaults by Output Type

| Output | Default ID      | Default CBE | Default Description          |
|--------|-----------------|-------------|------------------------------|
| RLY01  | Energised Fault | Any point   | GENERAL FAULT RELAY          |
| RLY02  | Alarm           | Any zone    | GENERAL ALARM RELAY          |
| RLY03  | Alarm           | Any zone    | PROGRAMMABLE ALARM RELAY     |
| NAC01  | Alarm Device    | Any zone    | GENERAL ALARM NAC            |
| NAC02  | Alarm Device    | Any zone    | GENERAL ALARM NAC            |
| NAC03  | Alarm Device    | Any zone    | GENERAL ALARM NAC            |
| DPOWER | Door Holder     | Any zone    | DOOR HOLDER OUTPUT           |
| AREO01 | Alarm (Delayed) | Any zone    | ALARM ROUTING (BRIGADE CALL) |
| AREO02 | Energised Fault | Any point   | GENERAL FAULT A.R.E. RELAY   |
| AREO03 | Disable         | Any point   | GENERAL DISABLE A.R.E. RELAY |
| AREO04 | Not Used        | -           | PROGRAMMABLE A.R.E. RELAY    |
| AREO05 | Not Used        | -           | PROGRAMMABLE A.R.E. RELAY    |
| AREO06 | Not Used        | -           | PROGRAMMABLE A.R.E. RELAY    |

## ACM-ZM Defaults

| Point Label   | LED Label  | Default Output Type ID |
|---------------|--|------------------------|
| AxxP01        | System Normal LED (Green)                            | SYSTEM NORMAL          |
| AxxP02        | Common Alarm LED (Red)                               | ALARM                  |
| AxxP03        | Programmable LED (Red)                               | NOT USED               |
| AxxP04        | Fault LED (Amber)                                    | FAULT                  |
| AxxP05-AxxP12 | Alarm LED Zones 1-8 (Red) on ACM-ZM                  | GENERAL OUTPUT         |
| AxxP13-AxxP20 | Alarm LED Zones 9-16 (Red) on first ACM-ZM expansion | GENERAL OUTPUT         |
| AxxP21-AxxP28 | Programmable LED (Red) on second ACM-ZM expansion    | NOT USED               |
| AxxP29-AxxP36 | Programmable LED (Red) on third ACM-ZM expansion     | NOT USED               |



**NOTE:** The alarm LEDs for zones 9-16 are a part of the Zone Mimic Expansion Card.

## ACM-8RA Defaults

| Point Label | Relay Label | Default Output Type ID |
|-------------|-------------|------------------------|
| AxxP01      | Relay 1     | ALARM                  |
| AxxP02      | Relay 2     | ALARM                  |
| AxxP03      | Relay 3     | ALARM                  |
| AxxP04      | Relay 4     | ALARM                  |
| AxxP05      | Relay 5     | ALARM                  |
| AxxP06      | Relay 6     | ALARM                  |
| AxxP07      | Relay 7     | ALARM                  |
| AxxP08      | Relay 8     | ALARM                  |

## Global Defaults

| Global Option      | Default Setting   |
|--------------------|---|
| ARE LED            | LED based on output to ARE  |
| ACS Loop Style     | Loop Open   |
| Delay to Output    | One minute  |
| Expansion Card     | Not Fitted  |
| Zone Short Circuit | Short Circuit as Alarm  |
| Smoke Control      | Pressing 'Smoke Control Reset' button to reset Smoke Control is <i>NOT REQUIRED</i> |



**NOTE:** ACS modules are set to '*Not Installed*' by default.

---

# Appendix F Cabling Requirements

## Circuit Type Connections

The table below displays the cable requirements for each of circuit types used in the FS-1600.

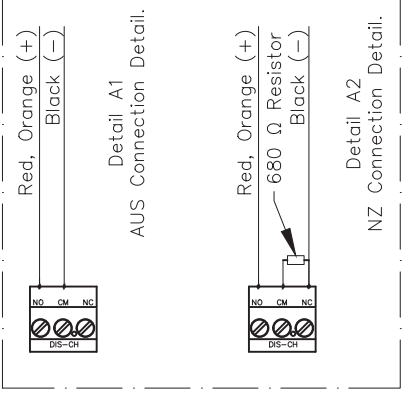
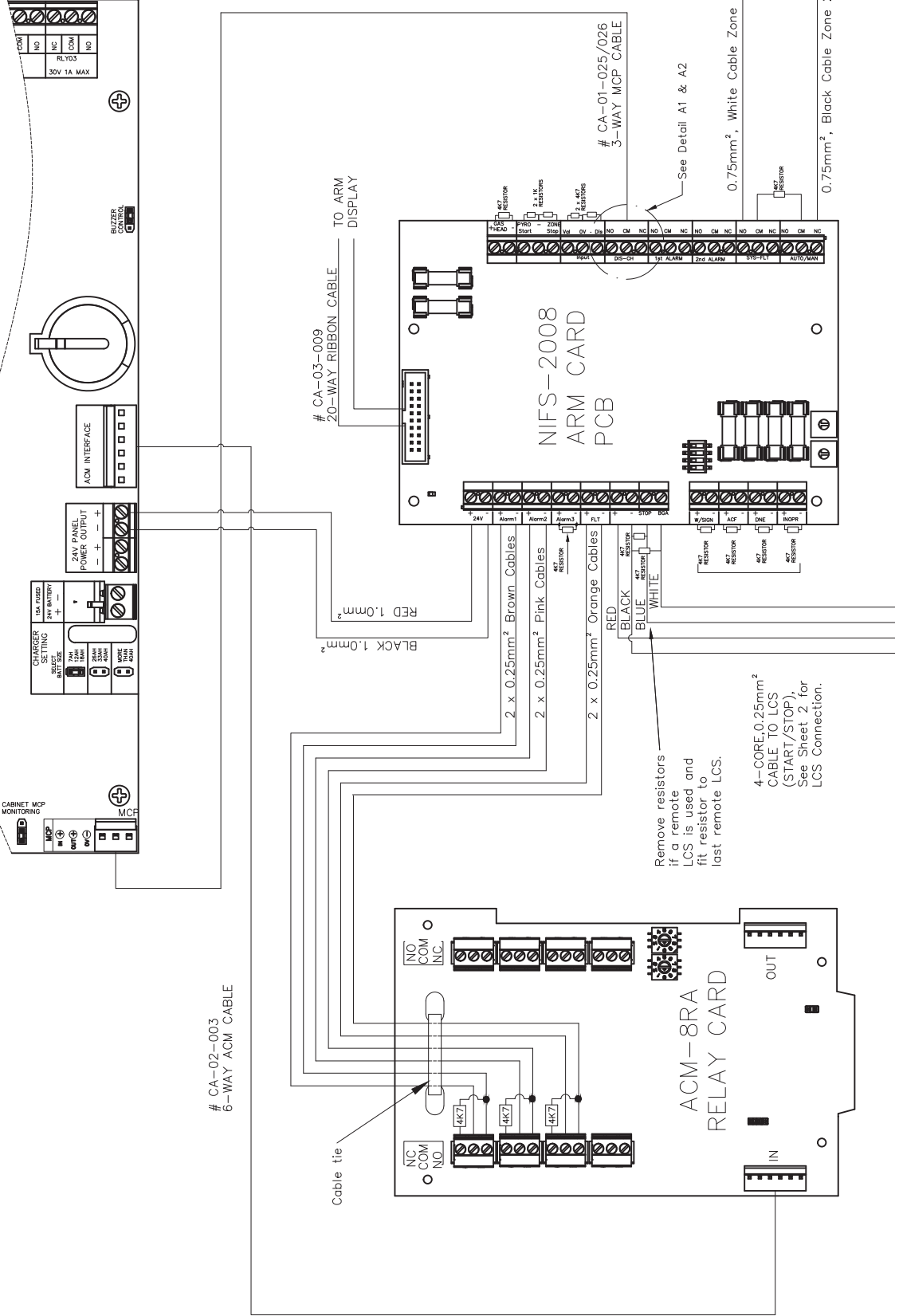
| Circuit Type                          | Circuit Function  | Wire Requirements  | Max Cable Distance (metres)   |
|---------------------------------------|---|--|---|
| EIA-485 ACS Modules                   | Communicates to ACS modules namely the ACM-8RA and ACM-ZM. The communications protocol is RS-485 running at 57.6 Kbps. The last module on the comms chain must be terminated with 120Ω (485 Terminator set to on) | Twisted shielded pair with characteristic impedance of 120 ohms. 18 AWG (0.75mm <sup>2</sup> ) minimum   | 1800m   |
| NAC (notification appliance circuits) | Communicates to NAC devices namely strobes sounders and bells.  | 2-core, Non-shielded.<br>12-18 AWG (2.5mm <sup>2</sup> -0.75mm <sup>2</sup> )<br>At alarm current level, no more than a 1.2 V drop at the end of the circuit.                        | To meet 1.2 V drop.   |
| 24 Volt DC power runs (power limited) | Supplies power from the FS-1600.  | 2-core, Non-shielded.<br>12-18 AWG (2.5mm <sup>2</sup> – 0.75mm <sup>2</sup> )<br>Size wire so that no more than 1.2 V drop across wire run from supply source to end of any branch. | To meet 1.2 V drop.   |
| Zone Circuits                         | Permits detectors to be connected to the FS-1600.   | 2-core, non-shielded.<br>12-18 AWG (2.5mm <sup>2</sup> – 0.75mm <sup>2</sup> ).  | Cable length 1000m, 18 AWG (0.75mm <sup>2</sup> ) with a maximum short circuit resistance of 40 ohms. |

# Appendix G Schematics

The table below lists the relevant Schematics found in Appendix G. To locate the correct schematic cross- reference the drawing number shown in the table with the drawing number shown on the engineering drawing.

| Title   | Drawing Number |
|---|----------------|
| ARM Schematic                                 | DWG0928        |
| ARE Schematic                                 | DWG0926        |
| ACM-8RA Schematic                             | DWG0927        |
| DA-XX Connection Schematic                    | DWG0925        |
| ACM-ZM Schematic, Including IFS-721 Expansion | DWG0919        |

|   |           |      |      |
|---|-----------|------|------|
| ONLY USE FOR CONSTRUCTION IF REV 'CKD' IS INITIALLED! | 12        | 13   | 14   |
| REV DESCRIPTION                                       | DATE      | BY   | CKD  |
| F Swapped blue & white wires between gas card & LCS.  | 24/MAR/16 | J.L. | S.F. |



# CA-02-009  
2-core Cable  
System Inoperative  
Feedback to  
CFP-16 CPU

0.75mm², White Cable Zone 2 (+)

0.75mm², Black Cable Zone 2 (-)

**NOTIFIER**  
by Honeywell

9 Colubic Way  
Norwest Business Park  
Bayswater Hills  
NSW 2153  
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Ph: +612 9894 1444  
Fax: +612 9894 4193

TITLE:  
**ARM-CFP-16 SCHEMATIC**  
TO SUIT CFP-16

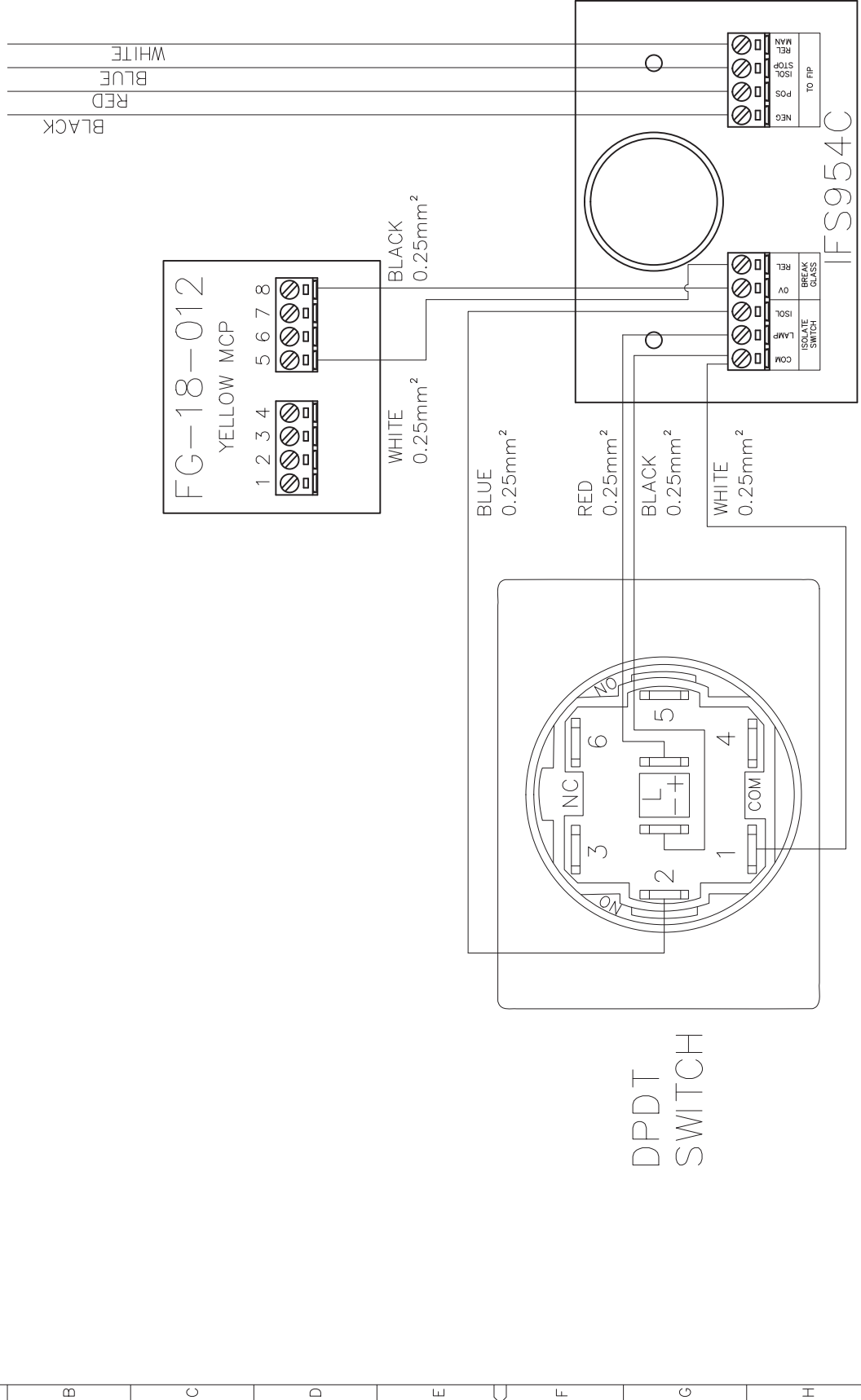
SYSTEM:  
CFP-16


SHEET 1 OF 2 NOT TO SCALE

DWG No:DWG0928

SIZE  
A2

|   |   |   |   |   |   |   |   |   |   |    |         |    |           |    |
|---|---|---|---|---|---|---|---|---|---|----|---------|----|-----------|----|
|   | 1   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11      | 12 | 13        | 14 |
| A | ONLY USE FOR CONSTRUCTION IF REV 'CKD' IS INITIALLED! |   |   |   |   |   |   |   |   |    |         |    |           |    |
|   | REV DESCRIPTION                                       |   |   |   |   |   |   |   |   |    | DATE    |    | BY        |    |
|   | F Swapped blue & white wires between gas card & LCS.  |   |   |   |   |   |   |   |   |    | 24MAR16 |    | J.L. S.F. |    |



**NOTIFIER**  
by Honeywell

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Ph: +612 9894 1444  
Fax: +612 9894 4193

TITLE:  
ARM—CFP—16 SCHEMATIC  
TO SUIT CFP—16

SYSTEM:  
CFP—16

SHEET 2 OF 2

DWG No: DWG0928

NOT TO SCALE

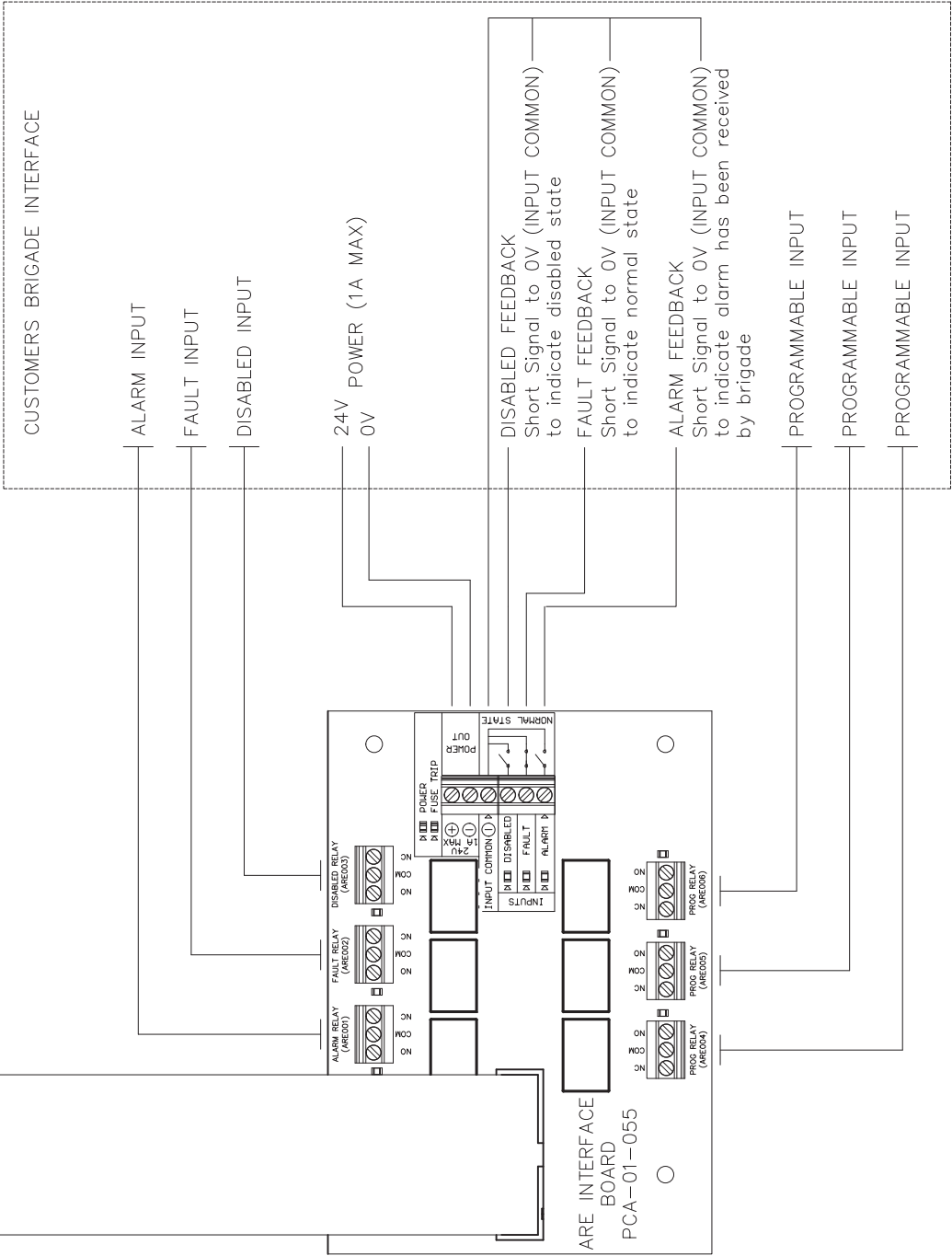
SIZE  
A2

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|  |   |   |   |   |   |   |   |   |    |    |    |    |    |
|--|---|---|---|---|---|---|---|---|----|----|----|----|----|
| 1  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| ONLY USE FOR CONSTRUCTION IF REV 'CKD' IS INITIALLED!        |   |   |   |   |   |   |   |   |    |    |    |    |    |
| REV DESCRIPTION DATE BY CKD                                  |   |   |   |   |   |   |   |   |    |    |    |    |    |
| D Updated PCB layout with screw terminals. 16NOV15 J.L. S.F. |   |   |   |   |   |   |   |   |    |    |    |    |    |

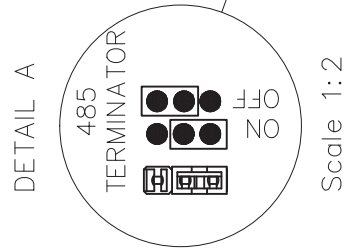
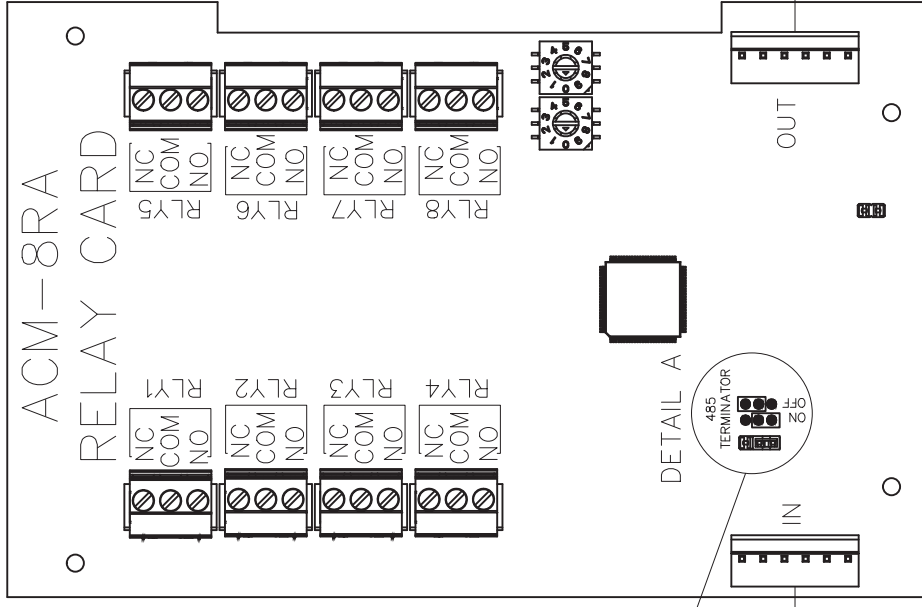
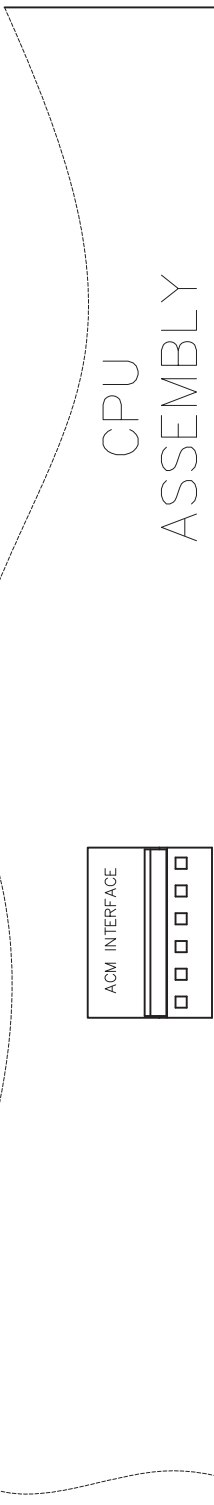
20-WAY  
RIBBON CABLE  
(to Brigade  
Interface)



|   |  |  |  |                              |  |  |  |
|---|--|--|--|------------------------------|--|--|--|
| NOTIFIER <sup>®</sup> by Honeywell  |  |  |  | TITLE: ARE SCHEMATIC         |  |  |  |
| 9 Columbic Way<br>Norwest Business Park<br>Brimbank Hills<br>NSW 2153<br>Australia<br>Ph: +612 9894 1444<br>Fax: +612 9894 4193 |  |  |  | SYSTEM:<br>CFP-16 & AFP-3030 |  |  |  |
| SHEET 1 OF 1  |  |  |  | NOT TO SCALE                 |  |  |  |
| DWG No: DWG0926   |  |  |  | SIZE<br>A2                   |  |  |  |

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| A |   |   |   |   |   |   |   |   |    |    |    |    |    |
| B |   |   |   |   |   |   |   |   |    |    |    |    |    |
| C |   |   |   |   |   |   |   |   |    |    |    |    |    |
| D |   |   |   |   |   |   |   |   |    |    |    |    |    |
| E |   |   |   |   |   |   |   |   |    |    |    |    |    |
| F |   |   |   |   |   |   |   |   |    |    |    |    |    |
| G |   |   |   |   |   |   |   |   |    |    |    |    |    |
| H |   |   |   |   |   |   |   |   |    |    |    |    |    |
| I |   |   |   |   |   |   |   |   |    |    |    |    |    |
| J |   |   |   |   |   |   |   |   |    |    |    |    |    |

|   |         |                 |          |     |      |  |  |  |  |  |  |  |  |
|---|---------|-----------------|----------|-----|------|--|--|--|--|--|--|--|--|
| ONLY USE FOR CONSTRUCTION IF REV 'CKD' IS INITIALLED! |         |                 |          |     |      |  |  |  |  |  |  |  |  |
| REV   | ECN     | DESCRIPTION     | DATE     | BY  | CKD  |  |  |  |  |  |  |  |  |
| A   | 12-0069 | Initial Release | 12.03.13 | CB. | S.F. |  |  |  |  |  |  |  |  |
| B   | -       | Added AFP-3030  | 21OCT14  | JL. | S.F. |  |  |  |  |  |  |  |  |



Note

1) Set the End of Line Jumper on the last Relay Card in the chain to the ON position.

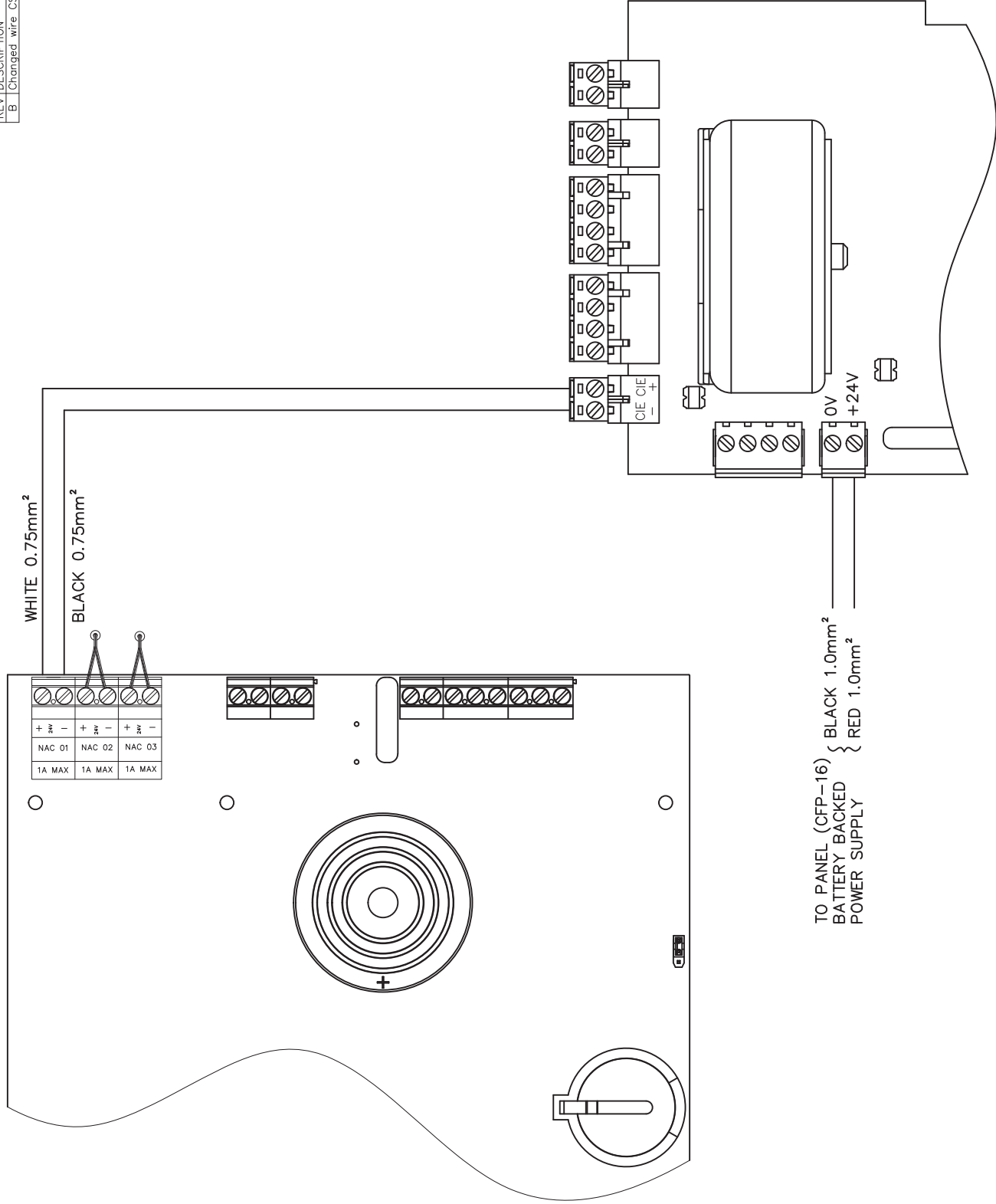
**NOTIFIER**  
 by Honeywell

9 Columbia Way  
 Norwest Business Park  
 Baulkham Hills  
 NSW 2153  
 Australia  
 Ph: +612 9894 1444  
 Fax: +612 9894 4193

TITLE: ACM-8RA SCHEMATIC  
 SYSTEM: CFP-16 & AFP-3030  
 SHEET 1 OF 1 NOT TO SCALE  
 DWG No: DWG0927

SIZE  
 A2

|   |         |      |      |
|---|---------|------|------|
| ONLY USE FOR CONSTRUCTION IF REV 'CKD' IS INITIALLED! | 12      | 13   | 14   |
| REV/DESCRIPTION                                       | DATE    | BY   | CKD  |
| B Changed wire CSA.                                   | 26MAY15 | J.L. | J.C. |



by Honeywell

9 Columbic Way  
Norwest Business Park  
Baulkham Hills  
NSW 2153  
Australia

Ph: +612 9894 1444  
Fax: +612 9894 4193

TITLE:

DA-XX TO CFP-16

CONNECTION SCHEMATIC

SYSTEM:

CFP-16

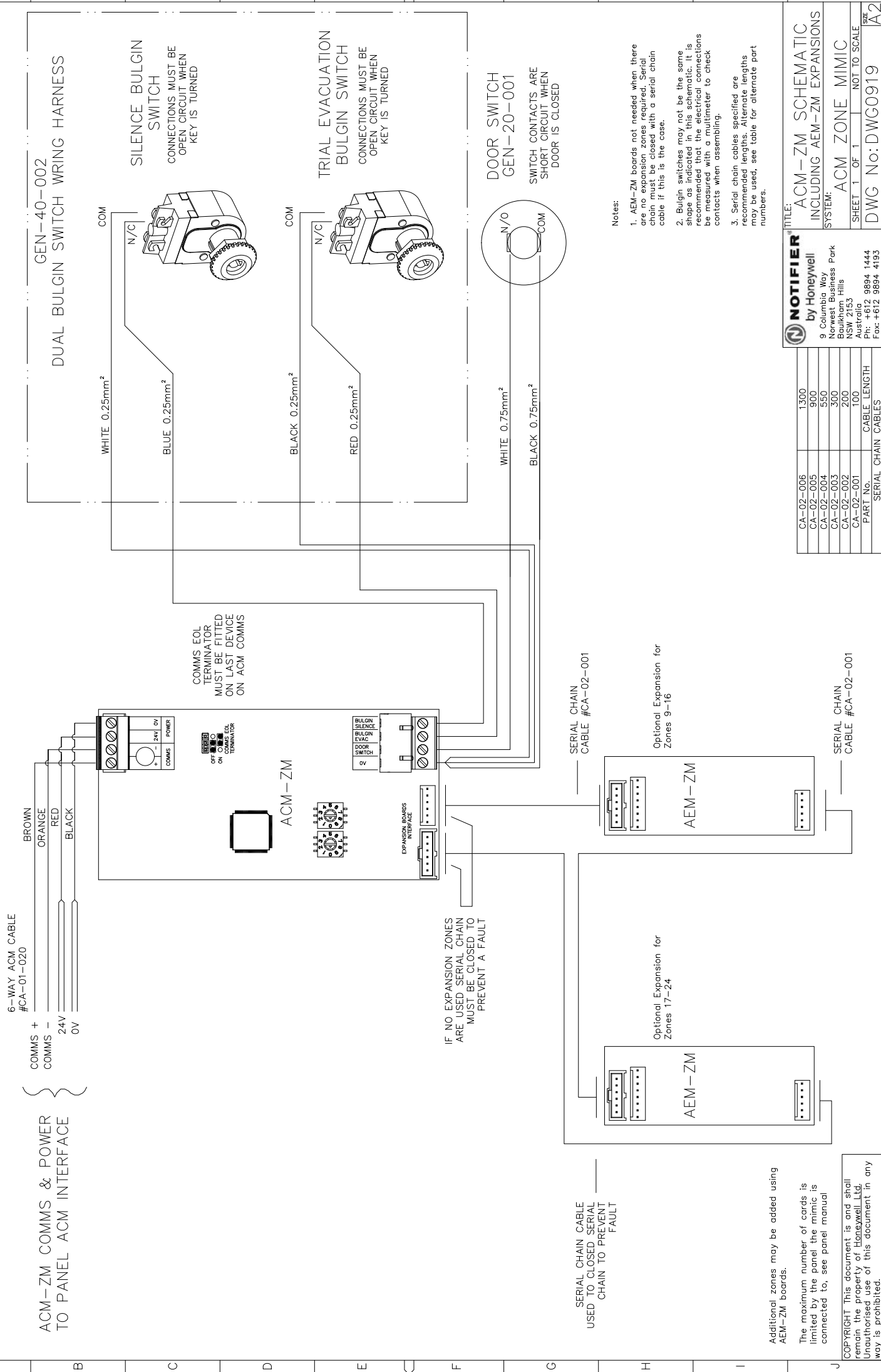
SHEET 1 OF 1

NOT TO SCALE

DWG No: DWG0925

SIZE  
A2

|   |         |      |      |
|---|---------|------|------|
| ONLY USE FOR CONSTRUCTION IF REV 'CKD' IS INITIALLED! | 12      | 13   | 14   |
| REV DESCRIPTION                                       | DATE    | BY   | CKD  |
| D Fixed ACM-ZM cable colours.                         | 31MAR16 | J.L. | J.C. |



Additional zones may be added using AEM-ZM boards.

The maximum number of cards is limited by the panel the mimic is connected to, see panel manual

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# Glossary

The Glossary includes definitions of acronyms, abbreviations and fire industry and electrical terminology used in the FS-1600 Manual.

| Term                  | Definition  |
|-----------------------|---|
| ACS                   | Annunciator Control System<br>The Communications protocol that exists between the panel and the ancillary devices, such as ACM-8RA (Relay Card) and the ACM-ZM (Zone Mimic)                       |
| ACM                   | Annunciator Control Module<br>A module that communicates to the panel via RS-485 communications.  |
| ACM-8RA or Relay Card | A circuit board module with 8 relays permitting the connection of additional site devices to the panel.   |
| ACM-ZM or Zone Mimic  | A module that can be used remotely to show operators the states of the panel.   |
| ARM                   | Agent Release Module<br>A module used to control the release of fire extinguishing agents in accordance with AS4214.  |
| ARE                   | Alarm Routing Equipment<br>Device that when connected alert the Fire Brigade to an alarm, disable or fault event with a buildings fire system.  |
| CAB                   | Abbreviation referring to the metal cabinet holding the FS-1600 circuit boards  |
| CBE                   | Control By Event<br>A software function that provides a means to program a variety of output responses based on various initiating events. The control panel operates CBE through lists of zones. |
| COMMS                 | Abbreviation referring to the communication cables between two modules  |
| CPU Board             | The module that controls the FS-1600 software and directs power to the connected modules. This is the module at the back of the panel at the very top.  |
| CHS Bracket           | A metal bracket that is fixed to the inside of the panel allowing for additional modules (such as relay cards) to be installed.   |
| CRC                   | Cyclic Redundancy Check<br>A processor driven operation whereby the memory components containing the panels operation are monitored.  |
| DA                    | Digital Amplifier<br>An audio module used to warn building occupants of an emergency and aid in the evacuation of the building.   |

| Term                   | Definition  |
|------------------------|---|
| Door Holder            | An electro-magnetic device that holds doors open when the door holder output is energised.  |
| EEPROM                 | Electrical, Erasable, Programmable, Read Only Memory<br>A component used to store a panels configuration.   |
| EMC                    | Electro-Magnetic Classification<br>A means of categorising an electrical devices potential level of radio interference to other electrical devices. |
| EOL                    | End of Line<br>A device used at the end of an electrical circuit to close the circuit. Can be a resistor or jumper.                                 |
| Event                  | A recorded occurrence at a point in time that results in a response from the panel.   |
| Ionization Detector    | The ionization detector detects changes to atmospheric conditions and responds to particles consistent with smoke by sending an alarm to the panel  |
| IP Rating              | A code assigned to panels indicating its level of protection to persons against any hazardous parts and it's level of water and dust resistance.    |
| IS Barrier             | A safety device used to limit of current and voltage and hence the risk of sparks in hazardous environments, for example oil rigs and mines.        |
| Lamp Test              | A type of test that ensures the LCD and all keypad KED LEDs are working.  |
| Latched                | If a detector is detects a hazard its state will change to active. The active state is said to be latched when the detector remains switched on.    |
| MCP                    | Manual Call Point.<br>A user operated device that when activated results in an Alarm Event in the Panel.  |
| NAC                    | Notification Appliance Circuit<br>A monitored output from the CPU board, which when activated provides power for sounders and strobes.              |
| NAC Device             | An output device that alert occupants, for example a strobe, sounder or bell.   |
| NPS                    | Notifier Power Supply<br>Module that contains a PSU in a metal housing for mounting in a panel.   |
| NPS Mounting Bracket   | The metal bracket containing the power supply, this is the bracket that the FS-1600 CPU is mounted on.  |
| Photoelectric Detector | A detector that uses a beam of light to monitor for smoke.  |
| Point                  | A software reference to a unique hardware input or output.  |

| Term                                   | Definition   |
|--|--|
| PSU                                    | Power Supply Unit<br>Converts 240V AC into 27.3V DC.   |
| Smoke Control                          | Used to describe devices that have been assigned to respond to smoke.  |
| Tracking                               | Process of resetting a detector on a zone. Tracking zones will drop power to them once an alarm is received to reset any detectors. If the zone is found to be normal after it is reset, the activation will be removed. |
| Walk Test                              | An operating mode of the panel to test the detectors connected to a zone without putting the panel into alarm.   |
| Watch Dog                              | Hardware which monitors the CPU hardware to ensure it is operating.  |
| Zone Expansion Card                    | A module that increase the number of zones from 8 to 16.   |
| Zone Mimic Expansion Card<br>(IFS-721) | An expansion modules that adds eight additional LEDs to the Zone Mimic Card (ACM-ZM)   |

