*Loop*Sense

Fire Alarm Control Panel
(EN54. 2 & 4)

Installation and Commissioning

MAN 1553-11

Responding to a Fire

Access Level 1

Indicators   Controls

The **OVERRIDE** key is pressed to override any delays to outputs

Activating the "SILENCE ALARMS. BRIGADE USE ONLY" Key will silence all Alarm Outputs.

Access Level 2

 The **EVACUATE** key is pressed to turn ON all alarm devices.

 The **SILENCE/RESOUND** key is pressed to silence any silence-able outputs that have been activated.

The **ALARMS LED** will be illuminated to indicate that the silence-able outputs have been silenced and resound is available. The operation of the SILENCE key will be logged.

 The **RESET** key is pressed to reset the fire condition. All outputs activated in response to the fire will deactivate and the panel will revert to the normal condition providing there are no other abnormal conditions present. – RESET IS LOGGED.

Disabling a Zone

The following example DISABLES a ZONE. Place the Keyswitch in the ENABLED position.

Press

```
CONTROL MENU
1►ZONE              3|PANEL
2|DEVICE            4|GLOBAL CONTROL
```

Then to open the "Control" menu. By following
the screen prompts select the type of control, 1 to 4. Once selected simply step through the menu again to implement.

Press to open the "Zone" menu.

Selecting the Zone Control menu prompts the user to select the zone number using the generic zone point selection screen followed by the corresponding zone control menu. (Sounder access is available at Level 3 only)

```
Zzzz                <status>
<zone descriptor>
1:DISABLE INPUTS    2:DISABLE SOUNDERS
3:SILENT WALK TEST  4:WALK TEST DEVICE►
```

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1. About This Manual

1.1 Introduction

This manual contains all the information required to install, commission and operate the *LoopSense* series Fire Alarm Control Panel (FACP) and is only available to and for the use of personnel engaged in its installation, commissioning and operation.

1.2 General Requirements

The *LoopSense* has been designed and manufactured from high quality commercial components so as to comply with major world standards. To ensure these standards are not compromised in any way installation staff and operators should;

➢ Be qualified and trained for the task they undertake

➢ Be familiar with the contents of this manual prior to the installation, commissioning or operation of a LoopSense FACP

➢ Observe anti-static pre-cautions at all times

➢ Be aware that if a problem is encountered or there is any doubt with respect to the operational parameters of the installation the supplier should be contacted.

1.3 References

LoopSense Operation & On Site Programming Manual

LoopSense Users Manual

Apollo Detector / Device Manuals

Ampac Product Data Sheets

British Standard　　　BS 5839

European Standard　　EN54 Parts 2 & 4

1.4 Symbols

ⓘ　　　　Important operational information

☞ **Note:**　　　Configuration considerations

　　　　Observe antistatic precautions

　　　　Mains supply earth

　　　　DANGER mains supply present

2. Introduction

2.1 System Overview

The purpose of the **LoopSense** Fire Alarm Control Panel (FACP) is to monitor changes in inputs, report those changes and update selected outputs as programmed.

The FACP processes changes in inputs such as fire, fault, pre-alarm, emergency, security, user, transparent and system and has a built-in menu structure to view its status, perform operational tests, and modify the panel's configuration and programming.

The **LoopSense** FACP is compliant with EN54-2 and EN54-4.

In addition to the mandatory requirements of EN54-2 the **LoopSense** FACP meets the following optional features with requirements:

- ➢ 7.8   Output to fire alarm devices
- ➢ 7.9   Control of fire alarm routing equipment
- ➢ 7.9.1   Output to fire alarm routing equipment
- ➢ 7.9.2   Alarm Confirmation input from fire alarm routing equipment
- ➢ 7.11   Delays to outputs
- ➢ 7.12   Dependencies on more than one alarm signal Type A, B and C
- ➢ 8.3   Fault signals from points
- ➢ 8.9   Output to fault warning routing equipment
- ➢ 9.5   Disablement of each addressable points
- ➢ 10   Test condition

The *LoopSense* FACP has the capabilities to include functions and features that are additional to the requirements of EN54-2. These additional functions and features are outlined in section 10 of this manual.

2.2 System Components

The following illustrates the main components of the system and the connectivity between them.
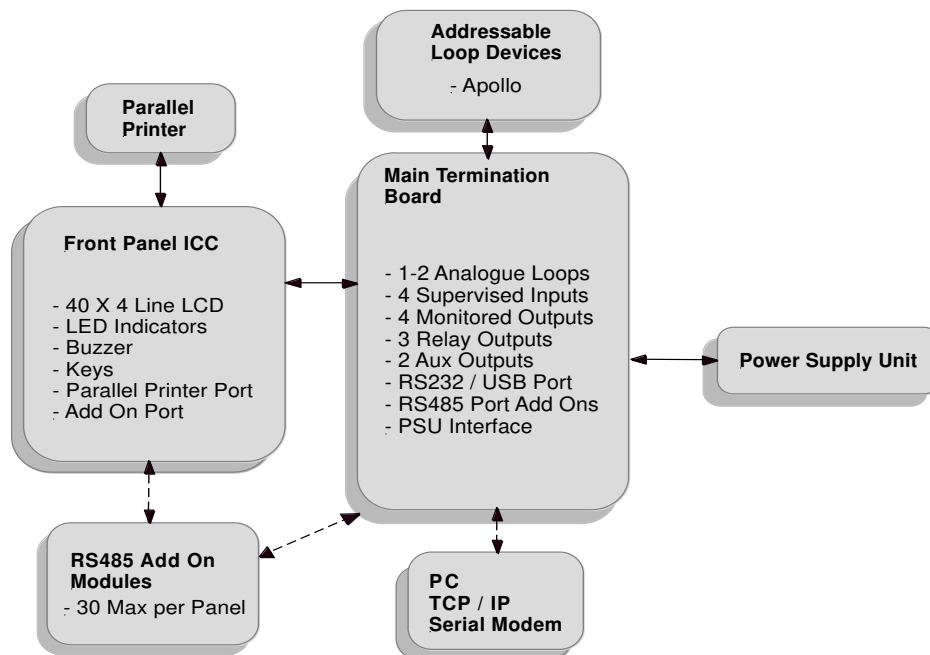
Figure 1: The LoopSense Concept

3. Overview & Key Features

LoopSense is a 1 - 2 loop Intelligent Analogue / Addressable FACP capable of supporting the following modules:

- ➢ Apollo protocol - 126 detectors / devices per loop
- ➢ SmartTerminal

➢ 8 Way Relay
➢ 8 Way Sounder
➢ 32 Indicator
➢ Switch & Indicator
➢ 8 Zone Conventional
➢ 2nd. Loop enablement by way of a "Loop Activation Key" and programming
➢ Printer
➢ Networking (future)

☞ **Note:** *Only devices compatible with **LoopSense** should be used in an installation.*

3.1 Features

➢ The front panel 40 x 4 line LCD, navigation keys ◀ ▶ ▲ ▼ , alpha numeric keypad and the Menu/Enter keys allow the **LoopSense** to be programmed "on site". The same LCD and keys are also used for panel operation and interrogation
➢ 4 X supervised input and outputs connections
➢ 3 X relay outputs
➢ Password entry
➢ 2 models available [ABS cabinet with 2 Amp supply & metal cabinet with 3Amp supply.
➢ Flush or surface mountable enclosure. A surround is required for the metal cabinet
➢ Controls have tactile and audible feedback of operation
➢ All terminals cater for 2.5mm cables

3.1.1 Device Alarm LED activation

Due to the limited current available from the analogue loop, the number of alarm LED's allowed to be illuminated simultaneously is limited to the first 10 devices in fire on each loop; after this limit is reached any new devices in fire will not have its alarm LED's illuminated until the original fires have been cleared on that loop.

3.1.2 Analogue Loops

Each FACP supports up to 2 loops. The standard configuration is one loop, enabling the second loop involves obtaining and plugging in the "Loop Activation Key" into CN7 on the main termination board and activating it within **LoopMaster**. The number of loops enabled and the protocol used is selectable in the configuration software and is site configurable.

3.1.3 Loop Activation Key Mounting CN7
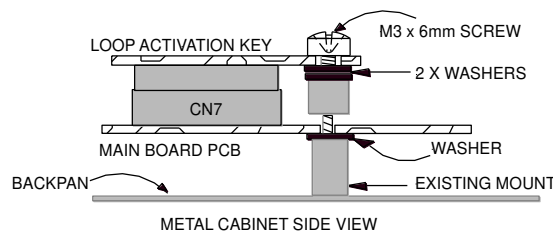
Figure 2: Loop Activation Key Mounting

The loops consist of a positive and common and are able to source up to 500mA of current. The loops;

- ➢ Operate in single ended and redundant configurations
- ➢ Are monitored for over current and short circuit in single ended mode
- ➢ Monitored for over current, short circuit and open circuit in the redundant mode.

☞ **Note:** *A loop test function is available via the FACP user interface.*

3.1.4 FACP Main Termination Board Inputs & Outputs

1 to 4 Supervised Inputs:

- ➢ TB1 6-9.-Programmable digital inputs compatible with voltage free type outputs supervised for open, short and earth faults. EOL is 10k. I/P4's configuration can be changed to FARE if required.
- ➢ Inputs default configurations are:
- ➢ IP1 Class change
- ➢ IP2 Evacuate
- ➢ IP3 Fault
- ➢ IP4 Reset

1 to 4 Supervised Sounder Outputs:

- ➢ TB3 - Programmable Supervised switched 24VDC output sourcing up to 750mA and supervised for short, open and earth faults. O/P's are also supervised for overload when they are ON. EOL is 10K
- ➢ Output default configurations are:
- ➢ Sounder Outputs 1-4.

1 to 2 Open Collector Outputs:

- ➢ Ancillary Output1 TB6/2 – low current (limited to 30mA), activated when there is a fire condition present on the FACP.
- ➢ Ancillary Output2 TB6/3– low current (limited to 30mA); activated when there is an ancillary condition present on the FACP.

1 to 3 Relay Outputs:

- ➢ TB4 – Programmable Voltage free relay contacts. Consists of NC, C and NO contacts.
- ➢ Relay default configurations are:
- ➢ Fire
- ➢ Alarm
- ➢ Fault

1 to 2 Auxiliary 24VDC Outputs:

- ➢ TB1 3 and 4 & TB5- Programmable, supervised for over current, switched 24VDC output sourcing up to 1A. Set to continuous as default

4. Specifications

	Metal	ABS
Standard		
EN54 2&4 1997, Amd 1&2	LPCB Approved	Complies with
Mechanical		
Dimensions Cabinet: (mm)	425 (H) x 400 (W) x 125 (D)	300 (H) x 360 (W) x 100 (D)
Environmental		
Temperature:	0ºC to + 40ºC	
Humidity:	25% to 95%	
Mains Input		
Input Voltage (Nominal):	230VAC	230VAC
Protection (Quick Acting Fuse):	2Amp M205	1.25Amp M205
Minimum Cable Requirements:	Not less than 0.75mm²	Not less than 0.75mm²
Power Supply		
Voltage with Mains connected:	25 – 29VDC	25 – 29VDC
Power Supply Ripple Voltage:	<100mV	<100mV
Power Supply Fault Indication		
Volts High (at room temperature)	28VDC	28VDC
Volts Low	26.5VDC	26.5VDC
Power Supply Output Current:	3Amps	1.8Amps
Imax A	3Amps	1.8Amps
Protection	Current Limiting	Current Limiting
Batteries / Battery Charger		
Charger O/P Voltage	26.6-28.1VDC	
(Temp compensated):	(27.3VDC nom)	
Approved LPCB Battery:	Enersys NP18-12R	
Battery Type:	2x12V Sealed Lead Acid	
Max Battery Capacity:	17AH	7AH
Max Charger Current Limited:	600mA	400mA
Battery Supply Current Limited:	3A and 2A PTC	
Battery Low:	<23.5VDC	
Battery Discharged Cut-off Voltage:	<21VDC	
Battery Damaged:	<22VDC	
Max Battery Resistance	1.2Ω	
Main Card		
Quiescent Current (QI) 1 Loop	115mA	
1 Loop in Alarm (Min)	155mA	
Quiescent Current (QI) 2 Loop	135mA	
2 Loop in Alarm (Min)	180mA	
Loop		
Maximum Number of Zones:	32 in total (for 1 or 2 loop panel)	
Maximum Number of Devices:	126 / loop	
Loop Current	500mA / loop	
Cabling Requirements:	2 core 1.5 -2.5mm2 Max length 1km	
Fault supervision:	O/C, S/C , over current	
Outputs		
Supervised Alarm (Current Limited)	24VDC @ 750mA Max O/C, S/C, 10K EOL	
Alarm / Fault Relay Contacts	24VDC @ 1A	
Auxiliary VDC – Protected	24VDC @ 1A	
Cabling Requirements:	2 core 1 -2.5mm2 Max length 1km	
Inputs		
Supervised	O/C, S/C, 10K EOL	
Cabling Requirements:	2 core 1 -2.5mm2 Max length 1km	
Communications		
Internal to FACP	RS485	
External to FACP	RS485	

5. *Mechanical*

The basic LoopSense FACP consists of:

➢ Main PCB
➢ Front Panel control and indicator board
➢ 3Amp switch-mode power supply for the metal version 2Amps for the ABS version;
➢ 2 X 12 Volt batteries connected in series.
➢ Access keys
➢ Loop activation key for 2 Loop version.

5.1   Mounting the Enclosure

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

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

5.1.1   Enclosure Details

LoopSense can be surface or semi-flush mounted, is supplied with a detachable door, a mountable back box with backpan, power supply and a minimum of two separate PCBs.

5.1.2   Fixing the Chassis to the Wall

Taking into account the weight of the panel securely mount it by using, the three keyhole mounting holes, suitably sized screws and plugs for the type of mounting surface.

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

Caution: Any dust or swarf created during the fixing process must be kept out of the panel and great care is taken not to damage any wiring or components.
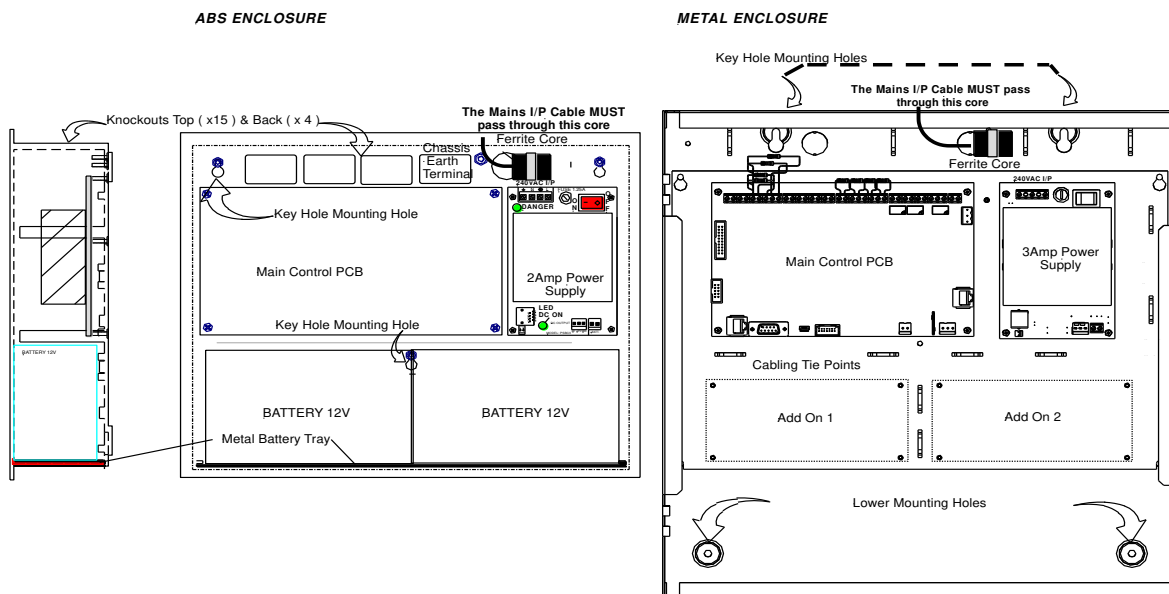
Figure 3: Typical Layout and Location of Keyholes for the ABS & Metal Enclosures

5.1.3   PCB Removal / Replacement

If the PCB's have to be removed the following precautions should be observed;

➢ Removing the door will provide better access to the boards and ensure the hinges are not accidentally stressed.

➢ Personal anti- static procedures must be followed.

➢ When disconnecting the 20 way connecting cable from the PCB, make sure that the cable remains connected to at least one board to prevent it being misplaced.

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

➢ Carefully remove the retaining screws at each corner of the board taking care not to damage any of the components.

➢ Place each board into anti- static storage once removed.

Connector

Push Tab Inwards and Gently Pull the Connector From the Socket
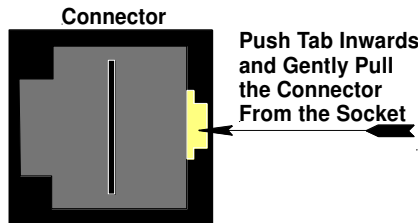
5.1.4   Removing the Knockouts

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

☞ **Note:**It is recommended that Data and Signal cables are kept separate from the mains cable entry for EMC compliance.
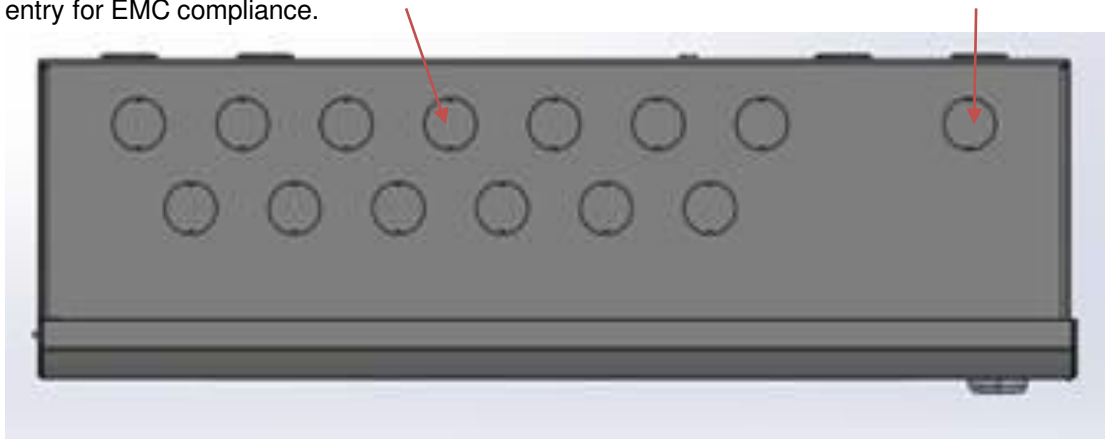
The knock-outs should be removed with a sharp tap in the rim of the knock-out using a flat broad-bladed screwdriver. Use of excessive force could damage the enclosure around the knock-out.

REMOVING KNOCKOUTS

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

6. Electrical

6.1 Primary Power Supply

The *LoopSense* Power Supply PCB combines the functions of;

A Mains to D.C. switched mode power supply unit that operates from a supply of; 230VAC (Nominal) @ 47 – 63Hz supplying the system while all zones are in alarm

A battery charging and monitoring unit

A mains fail is detected when the PSU voltage drops below 24V.

6.1.1 Mains wiring

The requirement for the mains supply to the FACP is fixed wiring, using three core cable (no less than 0.75mm^2 and no more than 2.5mm^2) or a suitable three conductor system, fed from an isolating switch fuse spur, fused at 3A. This should be secured from unauthorised operation and be marked 'FIRE ALARM: DO NOT SWITCH OFF. The Mains supply must be exclusive to the FACP.

6.1.2 Connecting the Panel

Connecting *LoopSense* internal connections and PCBs is best undertaken immediately prior to commissioning. Before beginning ensure all devices on the circuits are correctly connected and that cable integrity is verified throughout the installation.

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

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

6.1.3 Connecting the Mains

⚠ The technician should NOT attempt to connect Mains to the Panel until fully conversant with the layout and features of the Power Supply PCB.

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

☞ **Note:** *Fuse F1 (2Amp (3A supply) or 1.25Amp (2A supply) / 250VAC M205) is field replaceable*

Before switching on the Power Supply the Earth MUST be connected to the chassis earth terminal.

- ➢ All earth cabling must be terminated to the Panel Chassis Earth Terminal in a Star configuration.
- ➢ The earth cable closest to the cabinet body must have an M4 SPW beneath the lug then an M4 SPW and M4 nut.
- ➢ Each additional earth cable must be terminated with an M4 SPW and M4 nut.
- ➢ An additional M4 nut and M4SPW are fitted to the earth terminal for installers to connect the mains earth
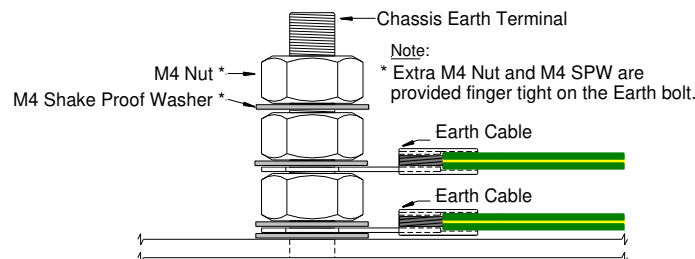
Figure 4: Chassis Earth Terminal Connection

6.1.4 Earth & Earth Fault

If a resistance of <50Ω exists between 0V and the building earth a fault indication will be indicated.

Resistance to Earth	Status
< 50Ω	Earth Fault
50 ≤ to ≤ 500 KΩ	Indeterminate
> 500 KΩ	Normal

6.2   Battery Charger

The battery charger is an integral part of the Power Supply and is capable of

> ➢ Recharging standard sized system batteries within 24 hours
> ➢ Detecting a missing, damaged or undercharged battery
> ➢ Protecting the battery against reverse or a short circuit condition
> ➢ Charging batteries in line with Sealed Lead Acid battery manufacturers circuit temperature compensation guidelines

The following table contains the thresholds for the corresponding battery faults:

Battery Voltage	Battery Fault Condition
VBATT < 23.5V	BATTERY LOW
VBATT < 20V	BATTERY MISSING
*VBATT < 22V	BATTERY DAMAGED

☞ **Note:** *Battery disconnect has been incorporated to prevent the battery from discharging through the battery charger should the charging voltage be less than the battery voltage.*
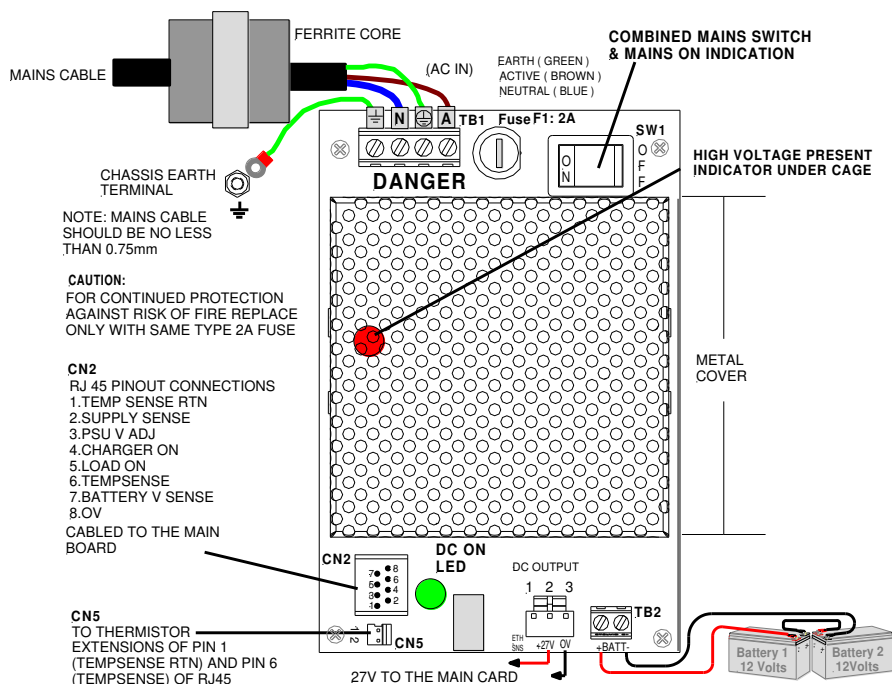
Figure 5: Power Supply Battery Charger Wiring (3A PSU SHOWN

6.2.1   Connecting the Stand-By Batteries

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

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

The batteries should be connected in series using the series link wire provided and located within the panel enclosure. The red and black battery leads from the Power Supply (TB2) should be run to the batteries in such a way that there is no risk of them being damaged, and then connect the red wire to the positive terminal and the black wire to the negative terminal.

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

6.3   Cable Types and Limitations

All System wiring should be installed in accordance with the national wiring regulations where the panel is being installed.

To comply with EMC (Electro Magnetic Compatibility) regulations and to reduce the risk of electrical interference in the system wiring, we recommend the use of Fire-resistant screened cables throughout the installation, examples of which include the following:

Manufacturer	Cable Type	CoreSize (mm^2)		
		1	1.5	2.5
Ventcroft*	No Burn Platinum	✓	✓	✓
Ventcroft	Diamond	✓	✓	✓
Prysmian cables & systems Ltd	FP200 Gold LSOH	✓	✓	✓
Prysmian cables & systems Ltd	FP Plus	✓	✓	✓
AEI Cables Ltd	Firetec Multicore LSZH	✓	✓	✓
CAvicel SpA	Firecel SR/114H	✓	✓	✓
Tratos Cavi SpA	FIRE-Safe TW950	✓	✓	✓
Eland Cables	FireForce	✓	✓	✓
Draka	Firetuf (OHLS)	✓	✓	✓
Draka	Firetuf Plus	✓	✓	✓

* For LPCB approval the panel was tested with Ventcroft No Burn Platinum $1.5mm^2$ cable.

6.4   Powering Up The Panel

☞ **Note:** It is not recommended to connect the batteries before applying mains power first.

Ensure that the panel is free from swarf, wire ends, knockout blanks and any other debris

Ensure that all cable connections to Loops, zones, sounder circuits and other inputs or outputs being used are correct and that the wiring is formed neatly away from the surface of the circuit boards before applying power.

Connect the mains, and turn on the Panel by switching the power supply switch to the on position.

Check the polarity of the battery connections carefully before proceeding.

Connect the batteries together first by fitting the battery link (typically a white cable) to a +ve terminal of one battery and to a –ve terminal of the second battery.

Connect the red battery lead to the +ve terminal of the second battery and the black battery lead to the –ve terminal of the other battery.

☞ **Note:** It is not recommended to connect the batteries before applying mains power first.

7. Front Panel Control Card

The Front Panel Control Card interfaces to the Main Control Board by way of CN5, and supports;

- ➢ all the controls and functional indicators
- ➢ the FACP Reset
- ➢ the Configuration (CONFIG) control
- ➢ Serial or Parallel Printer port
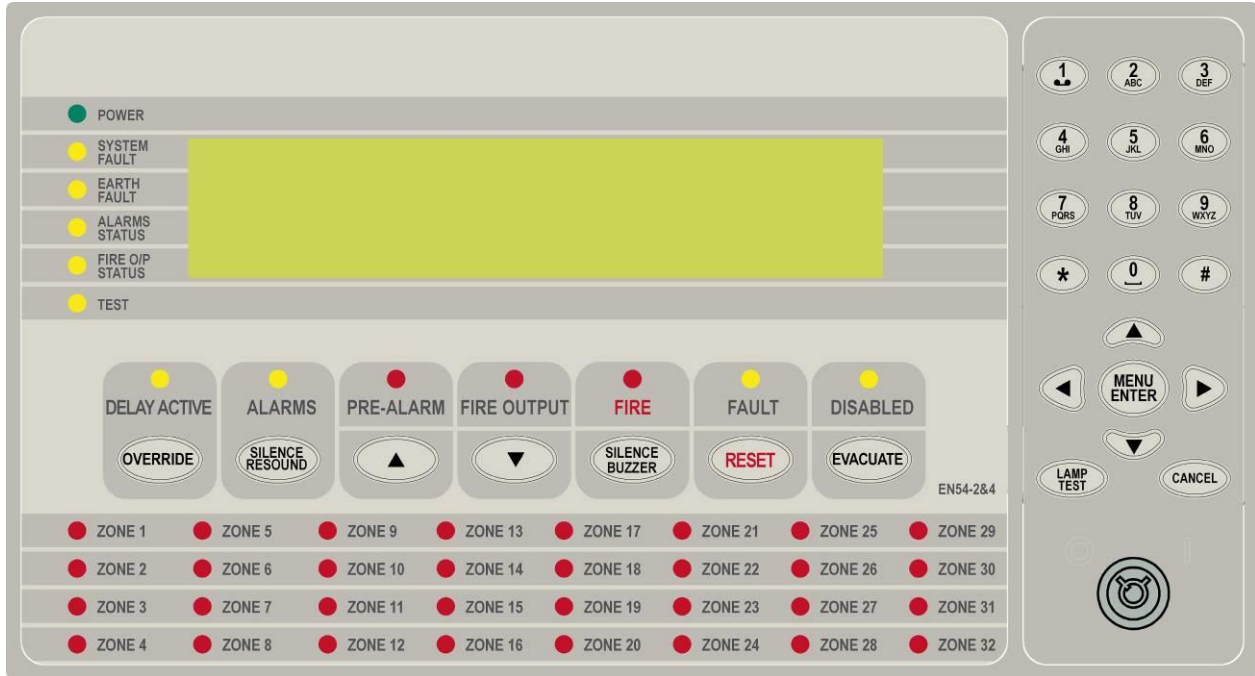
Figure 6: Front Panel Layout

7.1 Levels of Access

The FACP supports three levels of access.

Access Level 1 (Untrained User):

The FACP is in Access Level 1 by default.

Only the OVERRIDE, PREVIOUS, NEXT, SILENCE BUZZER and LAMP TEST controls are active.

Access Level 2 (Authorised User):

To enter Access Level 2 the user has to enter a password using the alpha numeric keys. The password entry screen will be presented if any higher access level key is pressed. Alternatively turning the Keyswitch to the ON position will force the panel into access level 2. The user is able to navigate through the menu system in access level 2 however the ENTER PASSWORD menu item will be displayed in place of the PROGRAMMING and SETUP menus.

☞ **Note:** *PROGRAMMING and SETUP menus are not accessible during a Fire condition*

If ENTER PASSWORD is selected, the password entry screen will be presented allowing the user to enter the access level 3 password. The user is able to enter the password when the password screen is presented.

The access level 1 controls are active as well as SILENCE RESOUND, RESET, EVACUATE and MENU ENTER controls. All menu items are active apart from the programming menu.

Access Level 3 (Authorised Service Technician/Engineer):

All access level 1 and 2 controls, PROGRAMMING, SETUP menus and individual sounder output disable options are active.

If ENTER PASSWORD is selected, the password entry screen will be presented allowing the user to enter the access level 3 passwords.

7.1.1 Passwords

The FACP will support 99 user programmable passwords. Each password includes an access level which can be either 2 or 3 corresponding to the access levels and a unique ID which ranges from 1 to 99. There is also a facility in the access level 3 SETUP menu to add, edit or delete passwords.

☞ **Note:** *Onsite programming only allows for the editing of ID1 and ID2 all other ID's need to be set using the* **LoopMaster** *configuration tool*

All passwords are a 4 digit numeric entry and the system default passwords are as follows:

ID	Password	Access Level
1	3333	3
2	User Defined	User Defined

Password Conditions

1. All password IDs that have not been assigned a password are set to access level 1 to prevent false entries.
2. The entering of a password will be logged using the ID.
3. If no key is pressed for 5 minutes the access level will timeout to the default access level being 2 or 1 depending on the key-switch position.
4. The access level timeout and key-switch operations will also be logged.
5. The intervals between key presses when entering the password must not exceed 30 seconds otherwise the password entry screen will timeout returning the panel to the default access level.
6. The FACP can also be forced to the default access level by pressing the CANCEL key 4 times while default screen is displayed.

7.1.2 Misplaced Password

In the situation, where access to the panel is required, and the passwords are not available, there is a facility for the appropriate service personnel to gain access to the panel.

The procedure is as follows:

1. The password " # , ▲ , ▼ , ◄ , ► , # " is entered.
2. The panel responds by displaying a unique 10 digit key
3. Contact the local Ampac Service Centre and they will issue a temporary password
4. The temporary password is entered, and access is gained to the panel. The operator can now access the password menu and set the passwords up as appropriate for the installation

The temporary password will be deleted, the next time a password is successfully entered into the FACP.

7.2   System Controls & Indicators

The front panel has fourteen push button controls, a key switch and an alpha numeric keypad.

Controls, Normal – Enabled (Key Switch)

CONTROLS ENABLE KEY SWITCH. ◯ = OFF, ▯ = ON

If the key switch is in the OFF position (access level 1), then the OVERRIDE, PREVIOUS, NEXT, SILENCE BUZZER and LAMP TEST controls are active.

If the key switch is in the ON position (access level 2), then the SILENCE RESOUND, RESET, EVACUATE and MENU ENTER controls are also active.

The key switch is optional. If the key switch is not used, then a pass-code is entered (using the alpha numeric keys) to gain access to level 2 or 3.

☞ **Note:** *Keys, when pressed, will present an audible feedback "beep" to the user.*

Delay Active / Override

Available at access level 1 and above

Delay Active – Indicator is illuminated steady when one or more zones are configured with Investigation delays and Delay Mode is active. The indicator will flash if any Investigation delay timer is running.

If the override control or evacuate control is activated while the investigation delay timer is running, then the indicator will go steady and the investigation zone enters the fire condition.

The indicator will only be OFF if:

➢ The Delay Mode is OFF
➢ No investigation delays are configured
➢ The panel has switched to day or night mode where no delays have been configured.

Override – Momentary push button. - (EN54-2:1997, clause 7.11), When Delay Mode is ON and one or more zones configured with investigation delays have their delay timer running, activating the OVERRIDE control overrides the investigation delay timer allowing the zone or zones to enter the fire condition immediately.

Alarm - Silence / Resound Alarms

Available at access level 2 and above

Alarms – The indicator is lit when the sounders configured to be silence-able have been silenced in response to any activation sources, indicating the resound function is active.

Silence Resound – Momentary push button. Used to silence any alarm devices and resound them by way of a "Toggle" function if the ALARMS indicator is illuminated. Only alarm devices configured with the silence-able attribute set shall respond to silence/resound. Silenced alarm devices shall automatically resound on the occurrence of a new fire event.

Pre-Alarm / Previous ▲

Available at access level 1 and above

Pre-alarm – Illuminated when one or more devices are in the pre-alarm condition and not disabled

Previous ▲ Momentary push button. Used to scroll the LCD display to view the previous available entry.

Fire Output / Next ▼

Available at access level 1 and above

Fire Output – Illuminated steady if a designated fire output has been activated and flashes if a FARE input is configured and active and remains so until the fire alarm condition is reset.

Next ▼ Momentary push button. Used to scroll the LCD display to view the next available entry.

Fire / Silence Buzzer

Available at access level 2 for the alarm buzzer, available at access level 1 and above for the fault buzzer

Fire – Indicator is illuminated when one or more devices are reporting a FIRE condition or the evacuate control has been activated.

Silence Buzzer – Silences the panel buzzer. Buzzer is activated under the following conditions:

Alarm Buzzer -
  ➢ Fire condition

Fault Buzzer -
  ➢ Fault with loop devices
  ➢ Fault with the loops
  ➢ Fault with the fire alarm routing equipment or fault warning routing equipment
  ➢ Fault with alarm devices or circuit
  ➢ Fault with connected modules, cards and boards
  ➢ Fault with secondary power supply
  ➢ Fault with main power supply

Fault / Reset

Available at access level 2 and above
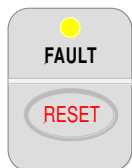
Fault – Indicator illuminated when there are one or more faults on the system.
  ➢ Fault with loop devices
  ➢ Fault with the loops
  ➢ Fault with the fire alarm routing equipment or fault warning routing equipment
  ➢ Fault with alarm devices or circuit
  ➢ Fault with connected modules, cards and boards
  ➢ Fault with secondary power supply
  ➢ Fault with main power supply
  ➢ Lit in conjunction with System Fault indicator

Reset – Momentary push button. Pressing RESET returns the FACP to its normal default state, by clearing all fire alarm conditions, updating the relevant indicators and outputs. If fault conditions are cleared they shall be re-established within 20 seconds

Disabled – Evacuate

Available at access level 2 and above

Disabled – The indicator is illuminated when one or more zone detectors, loop devices or panel outputs are disabled.

Evacuate - Momentary push button. Turns on all alarm devices, illuminates the FIRE indicator, activates the output to the fire alarm routing equipment and announces the evacuate condition on the LCD.

Also if there any alarm devices configured with delays, the evacuate key will override these and force the alarm devices into evacuate.

☞ **Note:** *If there are any zones configured for Investigation or Dependency A, B or C, these shall be bypassed when the EVACUATE key is pressed.*

Lamp Test – Pressed for 2 to 3 seconds turns ON all indicators (including any ancillary cards), segments of the LCD and the local buzzer in a logical sequence.

Cancel – Used to cancel a navigation step or entry in the MENU function
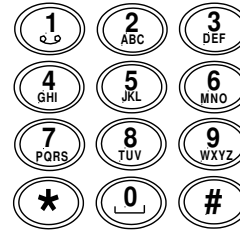
MENU / ENTER, 0-9, *, #, CANCEL and ◄▼▲► - Provides a means for entering the menu system, and carrying out interrogation, control and programming activities

● **POWER**   Illuminated to show the presence of mains power and flashes when the mains have failed

● **SYSTEM FAULT**   Illuminated when the FACP is unable to provide mandatory functions. Indicator is latched, until cleared by the RESET control

● **EARTH FAULT**   Illuminated when there is an earth fault detected on the panel

● **ALARMS STATUS**   Illuminated steady if any of the alarm devices (sounders and/or strobes) have been disabled and flashes if any of the alarm devices (sounders and/or strobes) are in fault. Disable has priority over fault

● **FIRE OUTPUT STATUS**   Illuminated steady if the fire output has been disabled and flashes if the fire output is in fault (open or short circuit condition). Disable has priority over fault
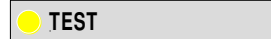
● **TEST**   Illuminated when the panel is in the "Walk Test" mode.

● **ZONE 1**   Illuminated when the associated zone1-32 is in alarm.

7.3   Liquid Crystal Display

LCD is used to display abnormal conditions and for interrogation, control and programming activities. When the FACP is in its normal state a default screen is displayed.

Backlight (refer to EN54.2:1997: 12.8.5):

The associated backlight is energised;

> ➢ In access level 1 during initialisation
> ➢ for 1 hour if a new fire or fault event occurs
> ➢ for 25 seconds following any key press, otherwise it shall be switched OFF.

In access level 2 or higher the backlight shall always be ON.

Alarm, Fault and Isolate information is accessed through the Main Menu.
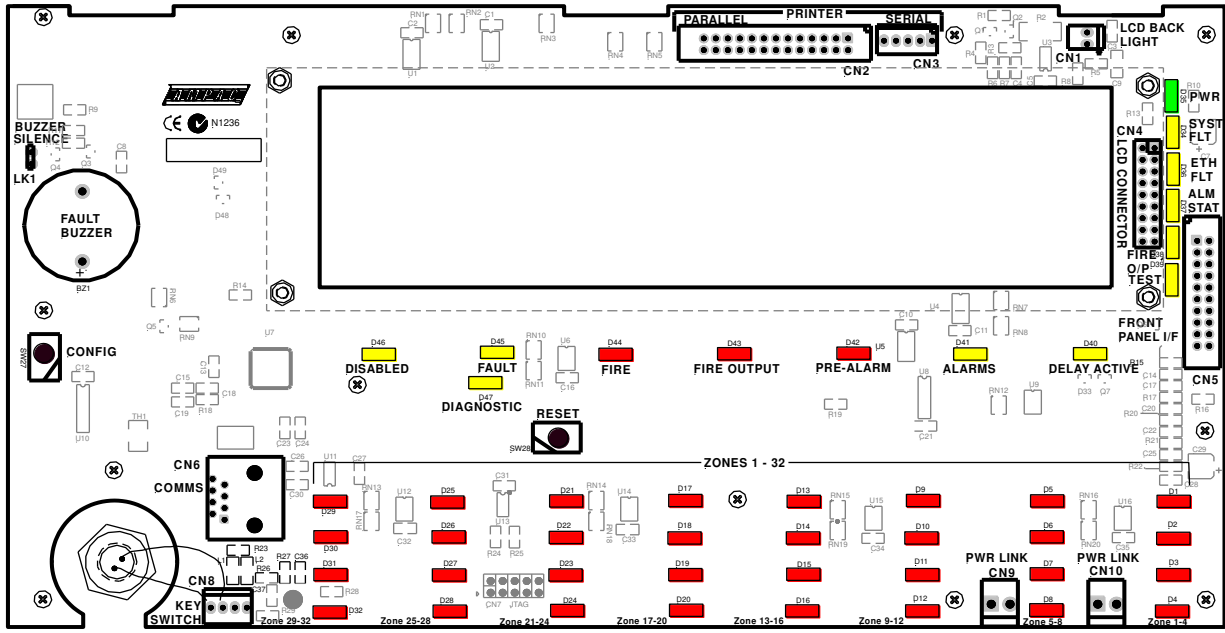
Figure 7: Control Card PCB Layout

8. Main Control Card

The Main Control Card and its front display panel combined with the Power Supply / Battery Charger / batteries forms the basis for the LoopSense FACP.
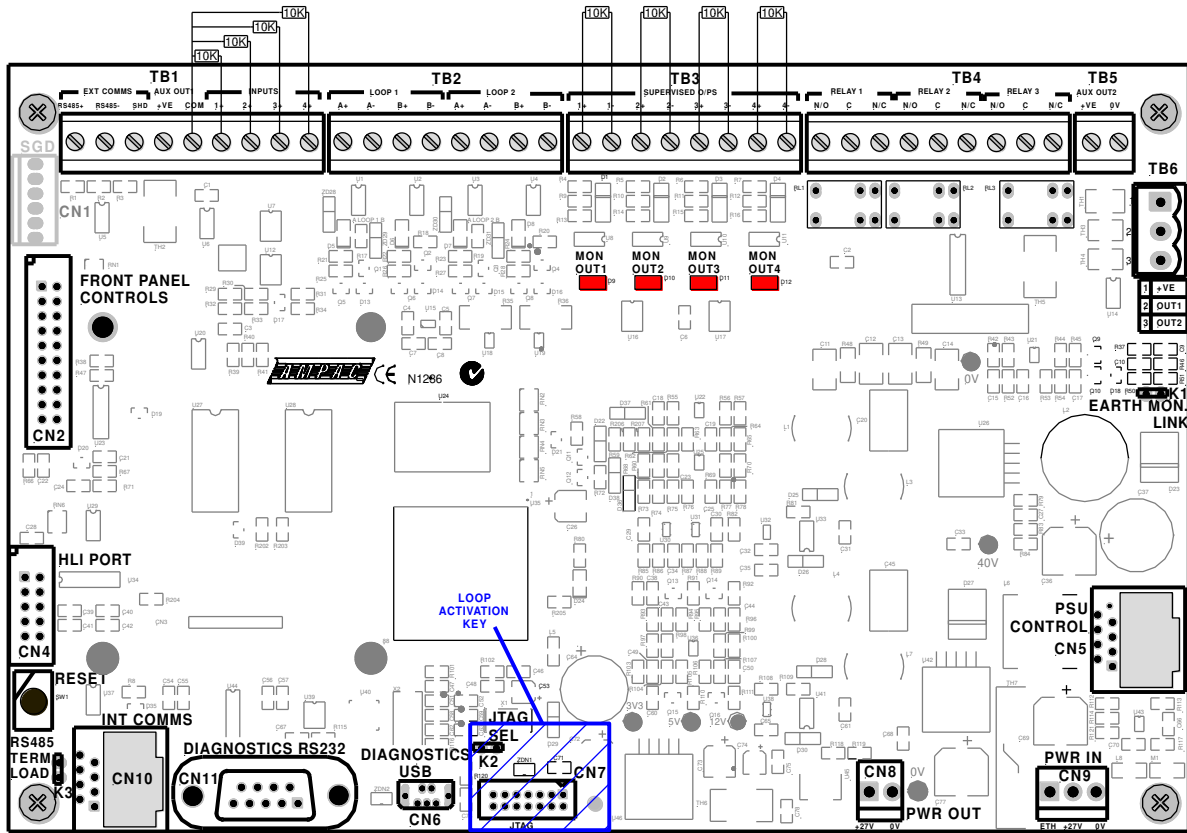
Figure 8: Main Control Card Top and Bottom Layout

8.1   Input / Output System Connections

I/P 1-4 DEFAULT USAGE
1. Class Change
2. Evacuate
3. Fault/Defect
4. RESET

OTHER (PROGRAMMABLE)
1. Latching
2. Non-Latching
3. Self Reset
4. FARE

Alert Input

EOL Resistors

Class Change Input

SmartTerminal Ext. Add On's

EOL Resistors

PRESS HERE TO BREAK — FIRE ALARM

EOL Resistor

EOL Resistor

EOL Resistor

EOL Resistor

EOL Resistor

Main Board Illustrated External Cabling

Note: TB1 & 5 are protected programmable "Continous" or "Re-settable" AUXILIARY 24VDC 1A O/P's Factory DEFAULT is "Continuous"

11secs

+27V   0V   AUX OUT 2

RS485 COMMS   +VE COM AUX OUT 1   1 2 3 4 INPUTS   **TB1**

+ -

A+ A- B+ B- LOOP 1   A+ A- B+ B- LOOP 2   **TB2**

+1 - +2 - +3 - +4 -   **TB3**
4 X Supervised Outputs Maximium 750mA / 24V

N/O C N/C N/O C N/C N/O C N/C   **TB4**

+VE 0   **TB5**

TB6

AUX OUT
Low current O/P's 30 - 300mA

1	+VE	1
2	OUT1	2
3	OUT2	3

Power Supply Unit

CN9:27V In from P/S

CN8
27V Out   **CN9**

CN2
7 8
5 6
3 4
1 2

1   2
CN5

CN4
DC OUTPUT
1 2 3
ETH
SNS +27V 0V

TB2
+BATT-

12v Batt   12v Batt

Figure 9: Simple Wiring Diagram of the FACP

Cabling

Connector	Purpose /Pins
CN1	Not used.
CN2	Front panel Control / LCD Interface
CN3	Network Connection (Future)
CN4	High Level Interface (Future)
CN5	Monitoring / Coms from the Power Supply.

Pins ❶ & ❽ 0V ❷ PSU Sense ❸ PSU Adjust ❹ Charger ON
❺ Batt Load ❻ Temp sense ❼ Batt V Sense.

Connector	Purpose /Pins
CN6	USB Diagnostics
CN7	Loop Activation Key for second loop
CN8	+/- 27VDC Out

Pins ❶ +27VDC ❷ 0V

Connector	Purpose /Pins
CN9	+/- 27VDC and earth from the Power Supply / Charger.

Pins ❶ Earth ❷ +27VDC ❸ 0V

Connector	Purpose /Pins
CN10	Coms and +/- 27VDC and earth to internal Add-Ons.

Pins ❶ &❽ ❷ & ❼ + 0V, ❸ & ❹ RS 485 Bus, ❺ Tx. Enable
27VDC

Connector	Purpose /Pins
CN11	Diagnostics RS232

❶ CD, ❷ RXD, ❸ TXD, ❹ DTR, ❺ 0V, ❻ DSR, ❼ RTS, ❽ CTS, ❾ RI

9. Wiring to the Main Card

9.1 Introduction

The system is microcontroller based, with the main processor situated on the Main Board. A secondary microcontroller is used on the front panel card to control the user interface functions such as the display and keyboard. System program and configuration memory is "flash" EEPROM in design. Common interfaces are built onto the main board while other interfaces are provided via Add-On boards.

9.2 Communication Interfaces

➢ *RS485 Add-On Module Port* – RJ-45 (CN10) and terminal block connectors (TB1 1, 2, 3), switchable for internal and external communications, connect to Ampac designed Add-Ons.

➢ *PC Interface port* – USB Device CN6 and RS232 DB9 connectors (CN11). If the USB port is connected it will disable the RS232 port. This port is for panel diagnostics, firmware and configuration download, remote FACP control, TCP/IP and serial modem interfacing.

➢ *JTAG Interface* – 14-way IDC connector (CN2) for panel firmware development

➢ *Power Supply Interface* – RJ-45 connector (CN5) - monitoring and battery charger control.

➢ *Printer Ports* – 26-way IDC connector on the front panel ICC used for standard Centronics parallel printer communications.

➢ The panel supports a parallel printer connected to the front panel ICC (CN2) and can be set for the following printer modes by the panel:

➢ *Fire Only Mode* - The Fire Only mode will allow the panel to only print fire events.

➢ *Event Mode* - Event mode will allow the panel to print all printable event updates.

9.2.1 External RS485 Communications Port (TB1)

An RS485 9600 baud communications port is provided to allow connection of remote Add-Ons.

Remote Cards

The number of and type of Add-On's that can be installed on the external communications bus are:

➢ SmartTerminal

➢ 1 x Remote Relay Board provides 8 sets of normally open (NO), normally closed (NC) and Common (C) voltage free contacts rated at 1A @ 30VDC.

➢ 32 Indicator

This port;

➢ Must always be terminated

➢ Has a nominal cabling impedance of 100Ω

➢ Termination impedance is AC coupled to reduce the systems quiescent current

➢ The cable to the port is terminated into a screw terminal block

➢ A fault on lines to external add-ons does not impede communications to any internal modules

The RS 485 output drives the remote cards and mimics up to a distance of 1.2km from the panel itself. The external cabling (2x2 shielded pair plus power) is wired to TB2 +, - and earth.

☞ **Note:** *If a fault occurs on the communications bus the common FAULT and SYSTEM FAULT LED'S are illuminated. The fault details can be displayed on the LCD by selecting the Faults Menu.*

Main Card Comms Link K3

LK3 **MUST** be inserted when only the Main Card is used as an FACP. If this is not the case and any RS485 add-ons are connected a link is inserted in the last board to complete the communication circuit.

9.2.2 Internal Communications Port

The 9600 baud internal communications port is provided to permit the connection of Add-Ons within the FACP. The port also provides the 27VDC (up to 400mA) to power the modules. The port conforms to AMPAC's standard RJ45 8 pinned design.

Pin	Function
1	Power +VE
2	Power –VE
3	Direction (future use)
4	RS 485 communications A
5	RS 485 communications B
6	NC
7	Power –VE
8	Power +VE

9.3 Input Interfaces

9.3.1 Supervised Digital Inputs

Four supervised inputs are provided. Each input is supervised independently and designed to operate with a 10K end-of-line resistor. Termination is via a 5mm pitch screw terminal block.

	INPUT 1	INPUT 2	INPUT 3	INPUT 4
COMMON	General Purpose			
USAGE	Fire (MCP/DBA)			
CONFIGURA	Fault/Defect			
TION	Class Change			
SETTINGS	Evacuate			
OF INPUTS 1	Alert (C&E)			
– 4 BESIDE	Sounder Silence (C&E)			
THE	Master Reset			
DEFAULTS	Door Switch			
LISTED	FARE			
BELOW				
EN54 DEFAULT	I/P 1 CLASS CHANGE	I/P 2 EVACUATE	I/P 3 FAULT	I/P4 RESET

Resistance and Operational Criteria

Line resistance	Sensed condition
0Ω – 325Ω	Short circuit
325Ω – 6KΩ	Active condition
6KΩ – 17.5KΩ	Normal condition
Above 17.5 KΩ	Open circuit

9.4 Fire Detector Analogue Loop Interface TB2

Two loop driver circuits capable of sourcing a maximum of 500mA of current for loop devices are provided. The connection to the analogue loop is capable of communication with devices using Apollo Discovery/XP95 protocols. Termination is via a 5mm pitch screw terminal block.

The loop is capable of being driven and sensed from either side or both sides of the loop simultaneously. To reduce heating effects the driver is based on D-class switching topology and can be operated in single-ended or redundant modes

The return signal of the loop is sensed using analogue to digital converters which allows analysis of total loop current and improves rejection of incorrect signals. A noise reduction technique utilizing common mode noise rejection has also been employed

9.4.1 Detector loop Isolator Installation

In applications where it is not necessary to use an isolating base for each detector, up to 20 detectors may be installed between isolating bases.

☞ **Note:** *Refer to Apollo Isolating specifications and guidelines for further details.*

If a short circuit or abnormally low impedance occurs, the base isolates the negative supply in the direction of the fault. When the short circuit is removed the power will automatically be restored.

☞ **Note:** *Isolating base is polarity sensitive.*
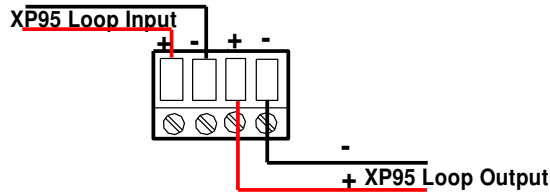
Figure 10: Terminal Block Connections
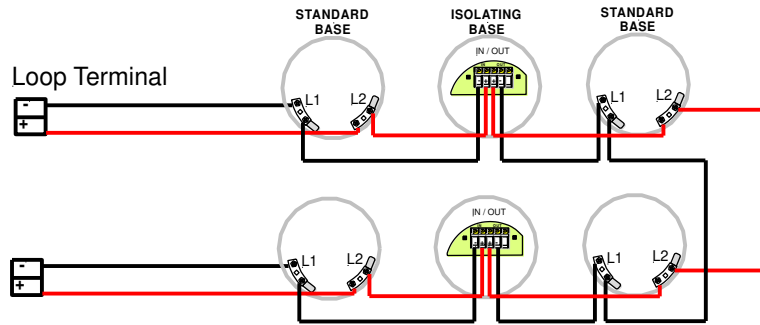
Figure 11: Typical Loop Arrangement

The number of isolating devices on the loop can limit the maximum loop cable length depending on the type of cable used and the total loop current. Refer to the tables below for reference.

Number of Isolators	0	5	10	15	20	25	30	35	40	45	50
Loop Current Total(mA)	MAX CABLE LENGTH using 1.5mm²										
50	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
200	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	960
250	1000	1000	1000	1000	973	933	893	853	813	773	733
300	971	931	891	851	811	771	731	691	651	611	571
350	850	810	770	730	690	650	610	570	530	490	450
400	756	716	676	636	596	556	516	476	436	396	356
450	680	640	600	560	520	480	440	400	360	320	280
500	618	578	538	498	458	418	378	338	298	258	218

Number of Isolators	0	5	10	15	20	25	30	35	40	45	50
Loop Current Total(mA)	MAX CABLE LENGTH using 2.5mm²										
50	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
100	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
150	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
200	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
250	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
300	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	952
350	1000	1000	1000	1000	1000	1000	1000	950	883	817	750
400	1000	1000	1000	1000	993	926	859	793	726	659	593
450	1000	1000	1000	933	867	800	733	667	600	533	467
500	1000	964	897	830	764	697	630	564	497	430	364

9.5 Outputs

9.5.1 Supervised Outputs TB3

Four supervised output are provided on the Main Board. These supervised switched outputs supply a nominal 24VDC, at up to 750mA. Outputs are independently controlled and supervised. Supervision of the outputs for short, open and earth faults applies in both the ON and OFF state.

The supervised outputs use a 10K resistor as an end-of-line device. Line conditions are supervised as outlined below. Dependant on the usage of the input some conditions may be ignored.

Line impedance	Reported condition
$0 - 1.5K\Omega$	Short Circuit fault
$1.5K - *12K\Omega$	Normal
$*12K\Omega$ to ∞	Open Circuit fault
I >= 650mA when Output is ON	Over Current

*The open circuit threshold in the ON condition may vary significantly with tolerance and temperature approximately ranging between 11K and 20K. Termination is via a 5mm pitch screw terminal block.

9.5.2 Relay Outputs TB4

Three relay outputs are provided. These outputs are designed to be able to switch loads considered to be predominately resistive as listed below.

Switching voltage	Maximum switching current
24 V DC	1 A
24 V AC	1 A
50 V DC	250 mA
40 V AC	250 mA

The relay contacts are "voltage free" and have some degree of protection in reference to the system voltage. Termination is via a 5mm pitch screw terminal block.

9.5.3 Auxiliary 24VDC Outputs TB1 & 5

Programmable Continuous / Re-settable (11 seconds) independently switched 24V DC (nominal) 1A output.

Each auxiliary output is supervised for continuity of power output hence a short circuit on the output terminal will register as a fault. Overload circuit protection is also included to prevent a short circuit on the output from damaging the system. Termination is via 5mm pitch screw terminal block.

9.5.4 Low current outputs TB6

Two low current open collector outputs suitable for driving the coil of a relay are provided.

The outputs are capable of supplying a minimum of 30mA but no more than 300mA when an overload is applied for more than 5 seconds.

Debug Connection CN6 & 11

The main board provides a debug connection with only one connection being operational.

Universal Serial Bus Connection CN6

A Universal Serial Bus connection is provided. Generally this will be for connection to a laptop. Compatibility will be to USB standard V2.0 minimum. Termination is via a USB Type B connector or USB Type B connector.

RS 232 Connection CN11

A serial connection compatible with RS232 standard is provided. The serial port is DTE style (Device Terminal Equipment) which enables connection to a MODEM communicating at up to 115,200 bps.

The communication lines are

- ➢ TXD   - Transmitted data from system.
- ➢ RXD   - Data received by system.

The following lines can also be provided.

- ➢ RI   - Ring indication
- ➢ DSR   - Data Set Ready
- ➢ DTR   - Data Terminal Ready
- ➢ CD   - Carrier detect.

Termination is via a 9 pin 'D' canon connector designed to be compatible with the IBM PC pin configuration for serial communication interfacing.

9.5.5   Printer Connection ICC CN2

Two printer connections (parallel and serial) are provided on the front panel board.

The parallel printer conforms to the IBM PC specification, with the exception of the termination which is a 26 pin, 2.54mm pitch dual row header. The pin out is such that an Insulation displacement connection header may be used to connect the output to a 25 pin 'D' canon connector. The serial printer connector is a 5 way Panduit style connector

Only signals required by basic printing operation are provided. Bi-directional is not supported.

This port is designed for the printer to be either installed internally or within 1-2m of the FACP.

9.5.6   Earth Monitoring

The system provides earth monitoring to detect a short circuit from system cabling to the building earth.

Earth Detection Limits

A resistor of 50Ω placed between a circuit and building earth should be registered as a fault, whereas a single resistor of value greater than 500KΩ should not be registered as a fault.

Earth monitoring can be disabled either by removing the link LK1 or through software

10. Adding Control and Monitoring Facilities

The internal communications connector CN10 provides RS485 serial communications to internal Add-Ons. CN10 on the Main Card cables to CN1 or 2 on the internal Add-Ons and TB1/1, 2, 3 cables to CN1 or 2 on the remote cards.

10.1 8-Way Relay Board

The Relay Board provides 8 programmable relays with 30VDC 1 Amp voltage free change over contacts for control or monitoring purposes and comes fitted for internal or external FACP use.

The functionality and programming of the relays is similar to the relays on the main board of the FACP. By default the relays default to Common Alarm functionality.

Protection

All terminal points are protected.

The board switches the relays as determined by the panel. The relays can be controlled by:

➢ Zones going to alarm

➢ Zones going to fault

➢ Zones Disabled

➢ Reset – relay is activated for 3 seconds when reset depressed

Internal Relay Board
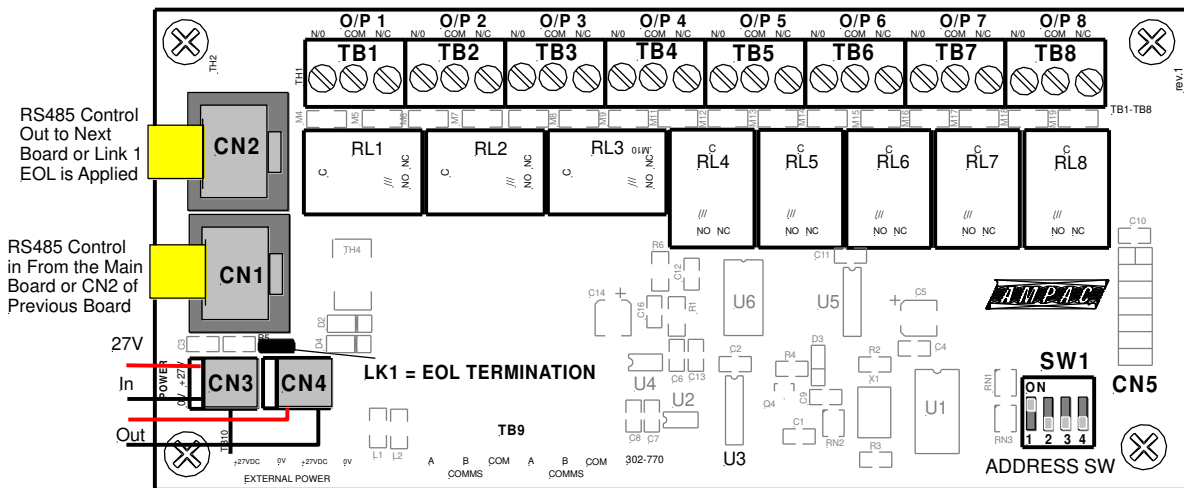
Figure 12: Internal 8 Way Relay Board PCB Layout

Remote Relay Board

In the remote version the Comms In and Out Terminal Block TB9 is cabled to the RS485 Comms terminal block TB1/1, 2, 3 on the Main Board and can be installed up to 1.2kms from the FACP.

☞ **Note:** *Can be powered from the panel or an external 27 volt source.*

Communications Connections

Terminal	Function	
1	RS485+	Communications In
2	RS485-	
3	Shield	
4	RS485+	Communications Out
5	RS485-	
6	Shield	
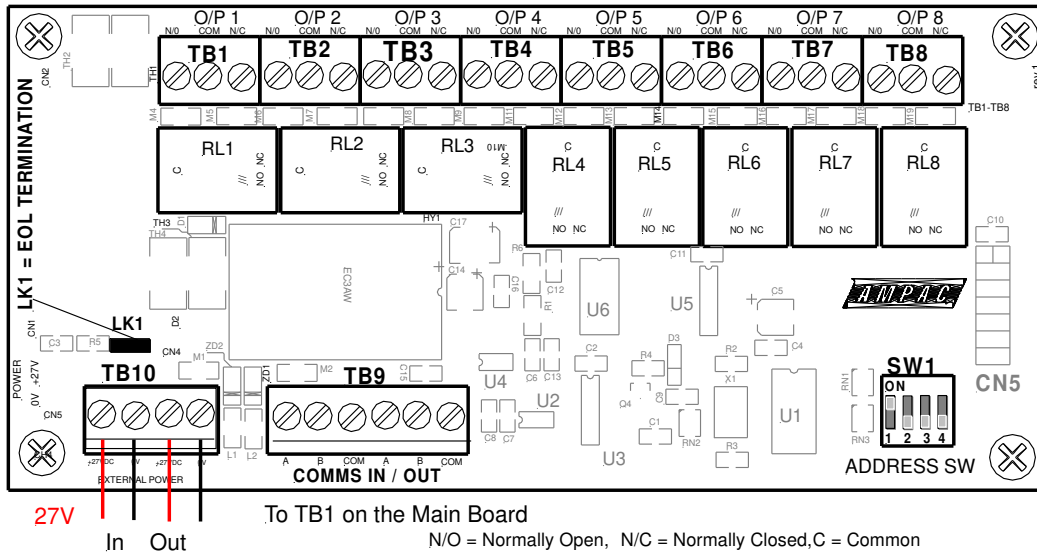
Figure 13: Remote 8 Way Relay Board PCB Layout

Relay Connections

Terminal/s	Function	
TB1 to 8 / 1, 2, 3	N/O = Normally Open,	Relay 1 to 8
	C = Common	
	N/C = Normally Closed	

10.2 8-Way Sounder Board

The Sounder Board expands the number of sounders that can be used on an FACP by 8. Each output is of a solid state design, rated at 24VDC / 750mA and requires a 10KΩ End of Line (EOL) resistor regardless of whether or not a sounder is wired to the circuit.

The sounder board is only available in a local version hence can not be mounted remotely from the FACP.

The sounder board will switch ON the sounders as configured (output off, continuous or pulsed) at the FACP and supervise the sounders for their open circuit, short circuit & line fault conditions.

☞ **Note:** *Sounder polarity MUST be observed.*
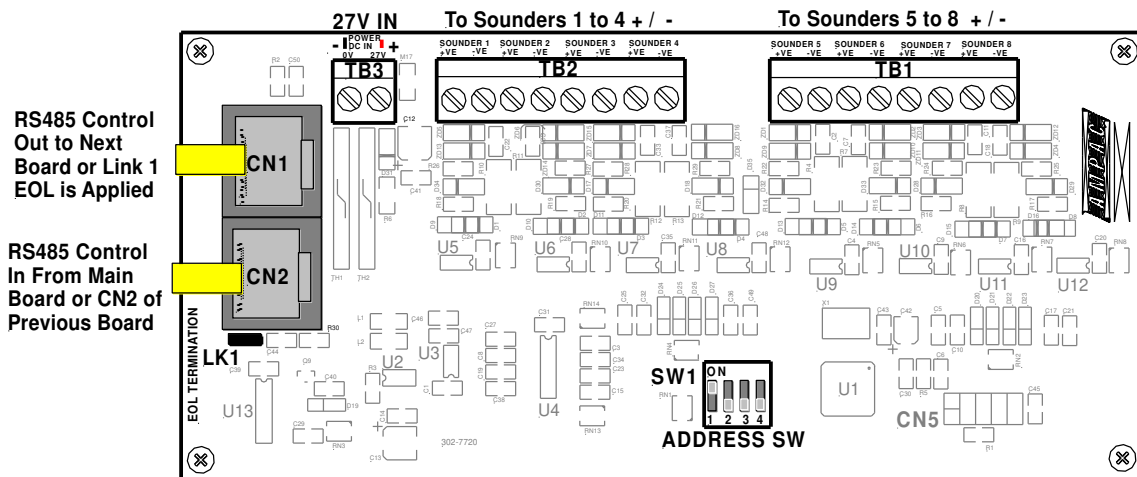
Figure 14: 8 Way Sounder Board

Maximum Current per Output: 750mA.

Hardware

Control Panel Interface

+27VDC and RS485 communication

Input Interfaces

The input provides for a +27VDC external power supply feed. In addition filtering
and protection devices are used to reject transients.

Output Interfaces

To facilitate supervision of open and short circuits and line faults when "On" a 10K End of Line
resistor is required on each output.

8-Way Dip Switch Setting

SW1 is provided to set the Module address in the range from 1 to 15.

8-Way Sounder Board Connections

Terminal		Function
1	+VE	Sounder 1
2	-VE	
3	+VE	Sounder 2
4	-VE	
5	+VE	Sounder 3
6	-VE	
7	+VE	Sounder 4
8	-VE	
9	+VE	Sounder 5
10	-VE	
11	+VE	Sounder 6
12	-VE	
13	+VE	Sounder 7
14	-VE	
15	+VE	Sounder 8
16	-VE	

10.3 32 Zone Indicator Card

This card has 32 bi-coloured LED's which can be used to display the status of up to 32 Zones. The zone numbers assigned to each LED are configurable and the LED's will operate in the following manner for the respective zone statuses:

ZONE STATUS	LED STATE	LED COLOUR
FIRE	ON STEADY	RED
DISABLED	ON STEADY	YELLOW
FAULT	FLASH	YELLOW
ALL OTHER	OFF	n/a

The card will also respond to a lamp test when instigated on the panel to which it is connected.
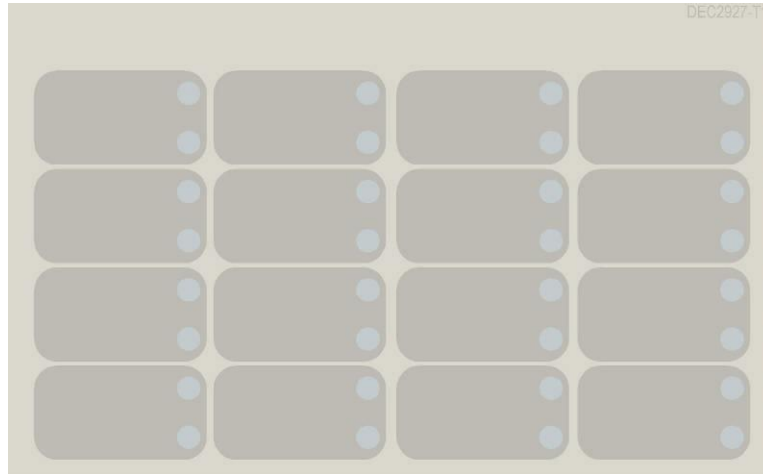
Figure 15: 32 Zone Indicator Decal

10.4 8 Way Switch and Indicator Card

This card has 8 switch inputs and 8 LED indicator outputs.

The switch inputs and LED outputs may be used in Cause and Effects.

The switches are configurable as either momentary or toggle switches. When configured as momentary pressing the button once will cause an event to occur as programmed in C&E and the LED's can be programmed to operate as an output C&E effect.

When configured as toggle, pressing the button once will cause a condition to be held until the button is pressed again. The associated LED is not available as an output in C&E and shall always be illuminated when the toggle condition is active. Also, when configured as a toggle, there shall be an option for a timer override. If the toggle switch is activated it shall be de-activated automatically after the timeout period.
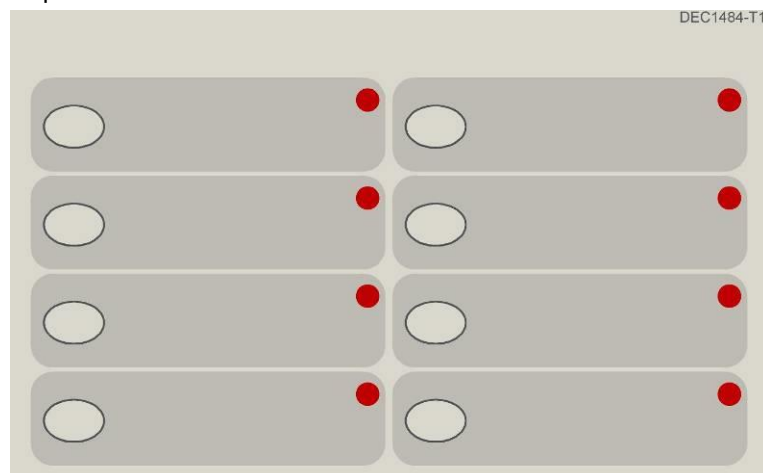
Figure 16: 8 Way Switch and Indicator Decal

10.5 Eight Zone Conventional Board

This board has 8 conventional zones. Up to 32 zones max may be configured.

The zones may be used in panel programming and cause and effects.

The end of line type used for the board is configurable to be any one of the following:

➤ 10uF bipolar capacitor (EN54 default)

➤ 4k7 resistor

➤ 6k8 resistor

➤ 10k resistor

Figure 17: 8 Zone Conventional Board

10.6 *SmartTerminal*

SmartTerminal connects to the ***LoopSense*** Fire Alarm Control Panel (FACP) via the RS485 multidrop communication port. Generally it is designed to be used anywhere where the status of the FACP is required to be monitored by local personnel and limited control is required.

***SmartTerminal*;**

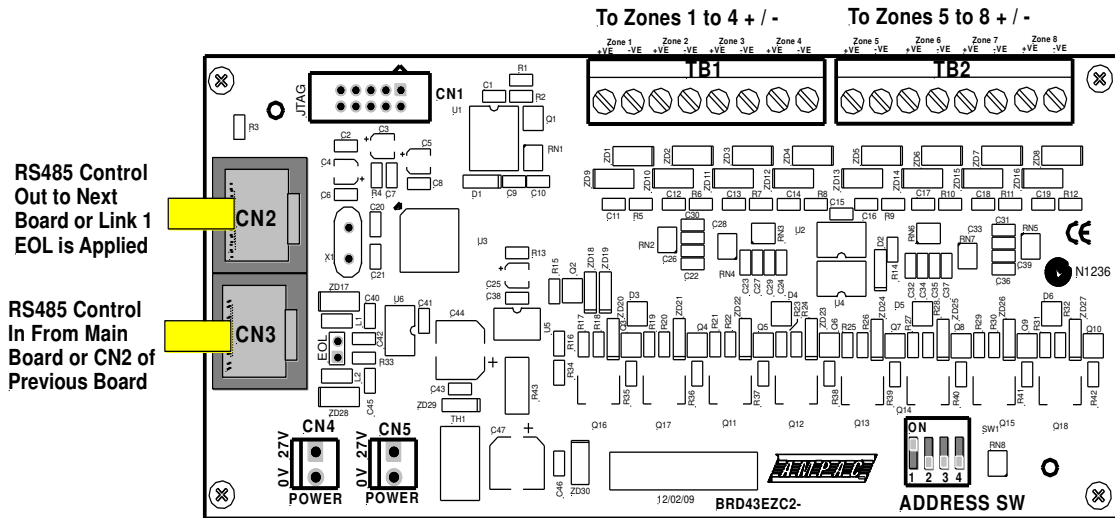> ➢ Includes front panel controls that allow the resetting of alarms and activation/silencing of alarm devices. Enabling operational access to the controls is via a key-switch;

> ➢ Reports events from devices that are accessible to the host FACP. For example if the host FACP is configured with global access then the connected SmartTerminal reports events from all devices. If the host FACP is configured as local then the connected SmartTerminal reports events from devices that are directly connected to the host FACP.

10.6.1 Operation

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

1. Power up - when the ***SmartTerminal*** is initialising
2. Normal - when the ***SmartTerminal*** address has been set and is communicating with the FACP, reporting normal / abnormal conditions and controlling the FACP via the front panel controls
3. Fault where the ***SmartTerminal*** is in fault and/or is unable to communicate with the FACP.

10.6.2 Power Up

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

10.6.3 Access levels

There are two levels of access.

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

Access level 2 is entered when the key-switch is in the ENABLED position.
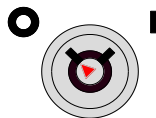
Figure 18: Keyswitch in the Disabled Position
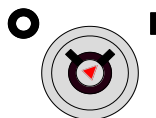
Figure 19: Keyswitch in the Enabled position

10.6.4 Overview

SmartTerminal essentially consists of two PCBs;

BRD82LTB – Termination Board

A Termination Board is mounted in each SmartTerminal to protect and interface the RS485 communications and 27VDC supply to the LCD Board

BRD82ICC – Control, LCD Communications and LCD Driver Board

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

10.6.5 Specifications

Mechanical

Dimensions ABS Cabinet: (mm)	195 (H) x 324 (W) x 52 (D)
Weight (without batteries)	2Kg

Environmental

Temperature:	0ºC to +40ºC
Humidity:	25% to 75%

Input Power

Operating Voltage (nominal):	27VDC
Operating Voltage (minimum):	18VDC
Quiescent Current @ 26.5VDC:	12.4mA (back light off, buzzer off)
Maximum Current:	43.8mA (back light on, buzzer on)
Cabling Requirements:	2 core 1.5 to 2.5mm²

27VDC Outputs

Auxiliary 27VDC Distribution:	24VDC 500mA Monitored
Cabling Requirements:	2 core 1.5 to 2.5mm²

Communications

Internal to FACP:	RS485
External to FACP:	RS485
Cabling Requirements:	Twisted shielded pair plus shield
Fault monitoring:	O/C, S/C
Maximum Number of SmartTerminal per FACP:	30
Maximum Distance (from FACP):	1.2Kms.
LCD	4 line X 40 characters – backlight operation same as for FACP

10.6.6 Operational & Key Features

SmartTerminal has been designed for use with *AMPAC's* range of intelligent FACP's.

➢ 4 line by 40 character LCD with backlight and navigation keys ▲ ▼ keys allow the SmartTerminal to be used for FACP operation and interrogation.

➢ Buzzer and system Reset.

➢ Flush or surface mountable enclosure.

➢ Controls have tactile and audible feedback of operation.

➢ All terminals cater for 2.5mm cables.

☞ **Note:** *The backlight is only energised when alarms are present, a key has been pressed or controls enable key switch is enabled*

10.6.7 Mechanical

SmartTerminal is supplied in an ABS cabinet and consists of;

The Main Card, with all controls and indicators mounted directly onto it

➢ 1 X Termination Board

➢ 2 X ABS door keys

➢ 2 X 1502 control Enable / Disable keys

➢ Termination link

10.6.8 *SmartTerminal* **Termination Board Interconnection**
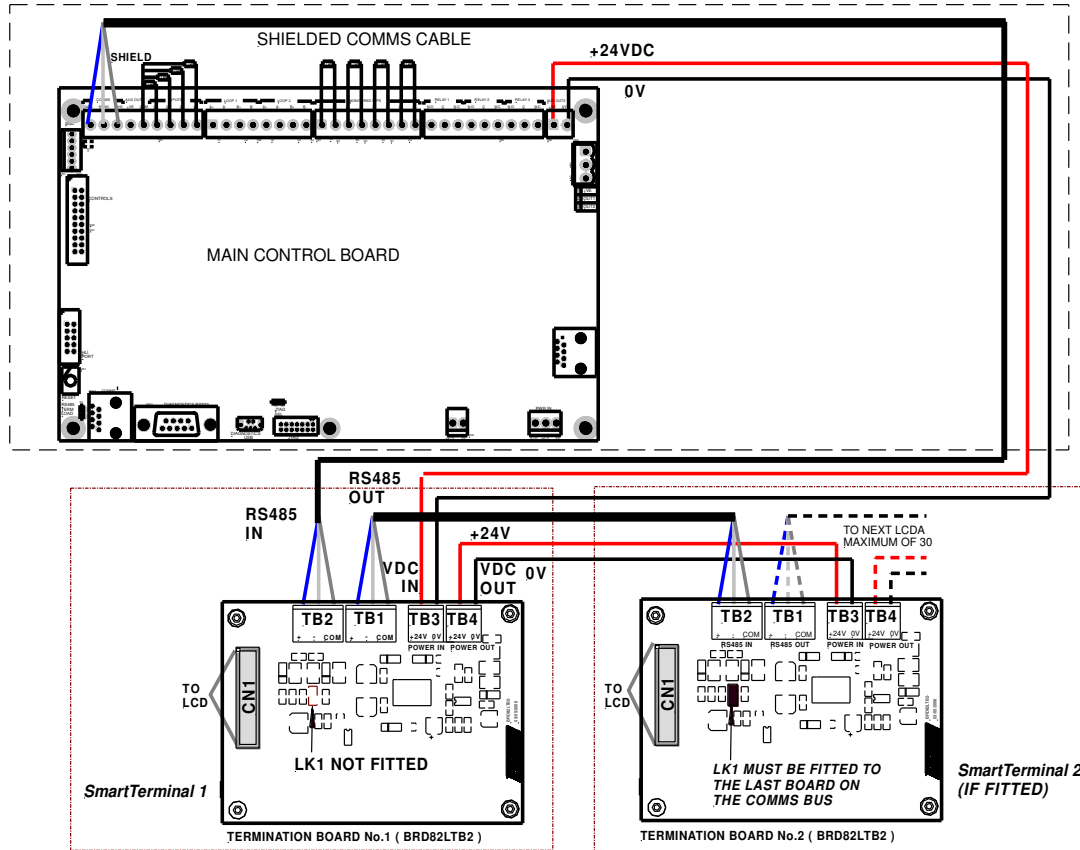
10.6.9   Setting the *SmartTerminal* Address

> ➤ Open the front door; locate the "CONFIG" button situated on the left hand side of the PCB and press for 3 seconds. The buzzer and "Config" LED will double beep and flash respectively to indicate that the Configuration mode has been entered. The LCD will now display the Configuration screen. This screen consists of the code version number, current address and four adjustment markers. These markers A-, A+, C-, and C+ are used to indicate the keys that adjust the address and LCD contrast.

> ➤ Use the "PREVIOUS (A-) and NEXT" (A+) keys to select the desired address. The default value for this address is 255 which is not a valid SmartTerminal address. The user must then select an address value from 1 to 30, i.e. the same address as that set in the FACP. The keys corresponding to C- (SILENCE BUZZER) and C+ (RESET) are used in a similar manner to decrease and increase the LCD contrast level. There is audible feedback for all key presses.

> ➤ Once the address has been set press the "CONFIG" button again for 3 seconds and the screen will return to its default and the "DIAGNOSTIC" LED will return to a slow flash. This slow flash indicates SmartTerminal and the FACP are communicating normally i.e. the LED flashes if communications data is being received from the FACP.

☞ **Note:** *If the address is not set within the time out period of approximately 75 seconds* ***SmartTerminal*** *will return to its previous state.*

10.6.10 Setting the *SmartTerminal* Annunciator in *LoopMaster*

The ***SmartTerminal*** is primarily used as a remote 'terminal', allowing users to view panel statuses and interact, to some extent, with the panel, while not being physically at the main panel. A general description on how ***SmartTerminal*** can be configured via the Windows application follows.
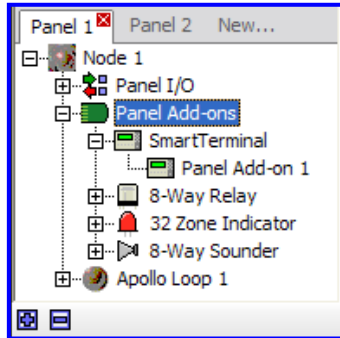
Figure 20: Panel Tree View

The Tree View shows the expanded view of the ***SmartTerminal*** add-on type. In the case above the panel in question has 1 ***SmartTerminal*** assigned to it, entitled 'Panel Add-on 1'.

Selecting one of these Add-On modules will update the Details Pane with the respective module's information, while double-clicking on the module will open its editing dialog box.

☞ **Note:** *It is possible to have a maximum of 30* ***SmartTerminal*** *Add-On per panel, however, this value will reduce as other module types are added (the entire panel can have a maximum of 30 modules, of any type, at any one time).*

The Details View

Figure 21: SmartTerminal Properties

The above is displayed as part of the ***SmartTerminal*** Details Pane representation of the information available to the configuration of the data. It is displayed at the top portion of the Details Pane and is a non-editable, accurate representation of editable fields for a ***SmartTerminal***.

The List View

Address	Ref	Descriptor	Multicast	External
1	1	Panel Add-on 1	Alarm/Fault/Disable	Y
2	5	Panel Add-on 5	Alarm/Fault/Disable	Y

Figure 22: SmartTerminal Properties List View

The ***SmartTerminal*** Add-On module List View appears immediately below the ***SmartTerminal*** Add-On Details View and consists of a summary of all available ***SmartTerminal*** Add-On modules assigned to the current panel. In the above, there are 2 Add-On ***SmartTerminal's*** assigned to this panel, entitled 'Panel Add-on 1' and 'Panel Add-on 5' respectively.

Double-clicking on any entry in this list will open the editing dialog box for that particular module.

Editing
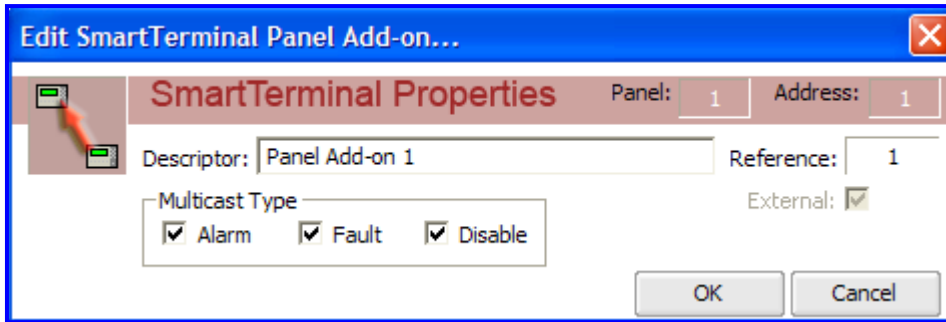
Figure 23: Editing Screen

The **SmartTerminal** Add-On editing dialog box consists of two types of fields:

1. Non-editable (informational) fields:
    - ➢ Panel – The panel number this module belongs to,
    - ➢ Address – The hardware address of this particular module; addresses can be in the range of 1 to 30,
    - ➢ Reference – The reference number of this module
2. Editable fields:
    - ➢ Multicast Type – The user can select one or more Multicast Types for this module to process,
    - ➢ External – If this checkbox is checked then this Add-On module is to be used on the external module bus,
    - ➢ Descriptor – Allows the user to enter a 40 character descriptor describing this Add-On module,

The **SmartTerminal** Menu

Right-clicking on the **SmartTerminal** Add-On parent item from the Tree View opens the menu,
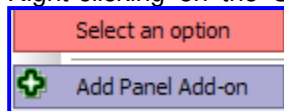
 It contains an option to add a panel Add-on to the panel.

Right-clicking on an existing **SmartTerminal** Add-On module from the Tree View opens the menu,
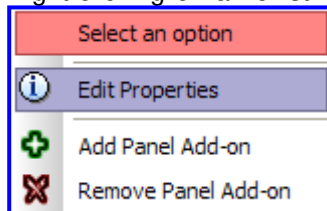
 It contains an option to add another module to the panel or remove the current module. It also allows the user, via the 'Edit Properties' option to open the Add-On editing dialog box.

10.6.11 *SmartTerminal* Controls and Indicators

All controls, except for the controls Enable / Disable Keyswitch, are of a momentary push button style and operate in exactly the same way as does the FACP itself.
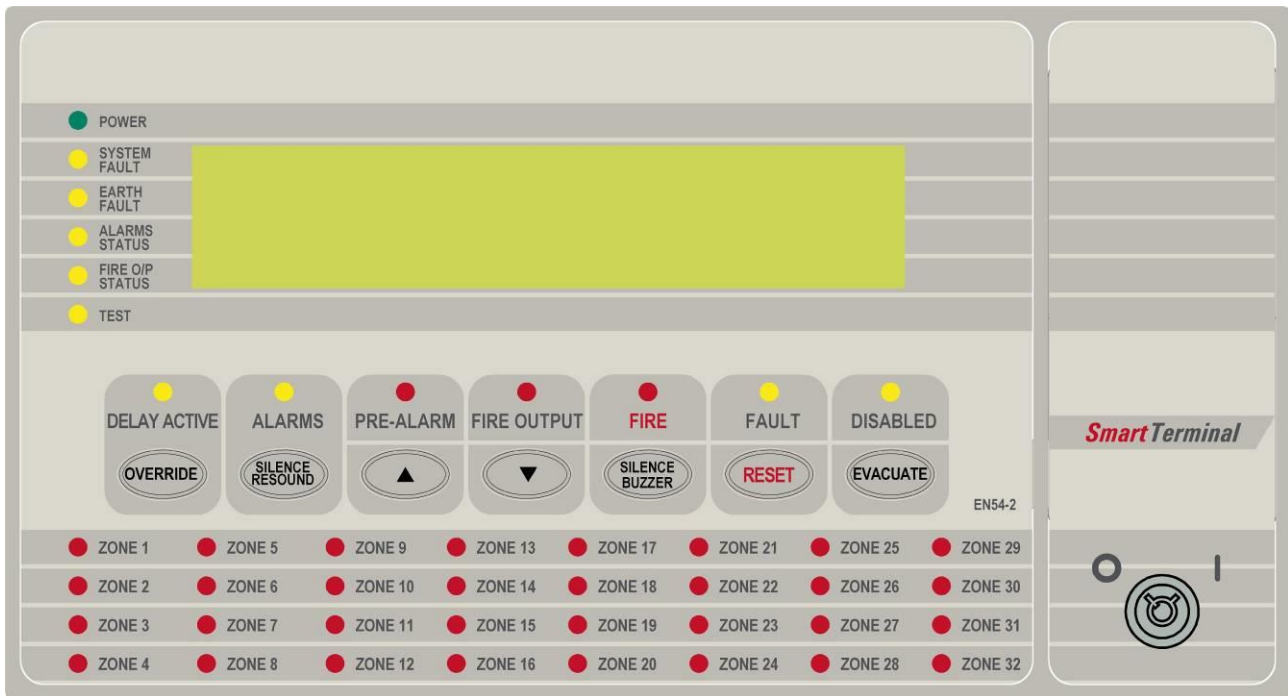
Figure 24: SmartTerminal Front Panel Layout

10.6.12 *SmartTerminal* Screen Format

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

1. Fire
2. Faults
3. Disables.

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

The **SmartTerminal** has front panel indicators for each type of event. When the **SmartTerminal** is configured not to report a type of event and that event type is present (and the corresponding front panel indicator is illuminated on the **SmartTerminal**), then a standard information screen is displayed on the LCD stating the system is not normal and the operator should see the FACP.

FIRE: If configured the screen format for reporting loop / sensor / zone fire condition is:

Device descriptor (up to 33 characters) Type Descriptor (up to 6 characters)
Loop address and zone number(Lxx Syyy.zz Zwww) current device status
Date and Time of occurrence (DD/MM/YYYY HH:MM:SS)
Alarm sequence number (Device Alarms nnn of nnn)

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

Device descriptor (up to 33 characters) Type Descriptor (up to 6 characters)
Loop address and zone number(Lxx Syyy.zz Zwww) current device status

Fault sequence number (Device Fault nnn of nnn)

☞ **Note:** *The fault types only relate to devices.*

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

> No Communication

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

> Device descriptor (up to 33 characters) Type Descriptor (up to 6 characters)
> Loop address and zone number(Lxx Syyy.zz Zwww) current device status
>
> Isolate / Disable sequence number (Device Fault nnn of nnn)

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

> Current Date and Time (DD/MM/YYYY HH:MM)
> System Status

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

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

1. "SYSTEM EVACUATE"
2. "SYSTEM ALARM"
3. "SYSTEM FAULT"
4. "SYSTEM PRE-ALARM"
5. "SYSTEM EMERGENCY"
6. "SYSTEM SECURITY"
7. "SYSTEM USER"
8. "SYSTEM DISABLE"
9. "SYSTEM NORMAL"

Config: The Config screen displays the following

> VX.X (This is the code software version number)
> Address
>
> A - A + C - C+

A - , A+ : adjusts the address 1 to 30, 30 being the maximum number of **SmartTerminal's** that can be connected to the FACP, (default is 255 which is not a valid address).

The function keys perform the following; A – press "Previous"　　　　A+ press "Next"

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

The function keys perform the following; C – press "Silence Buzzer"　　C+ press "Reset"

10.7   Printer

Specifications

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

10.7.1 Indicators and Buttons

The front panel has an LED indicator and two buttons SEL (SELECT), LF (LINE FEED).
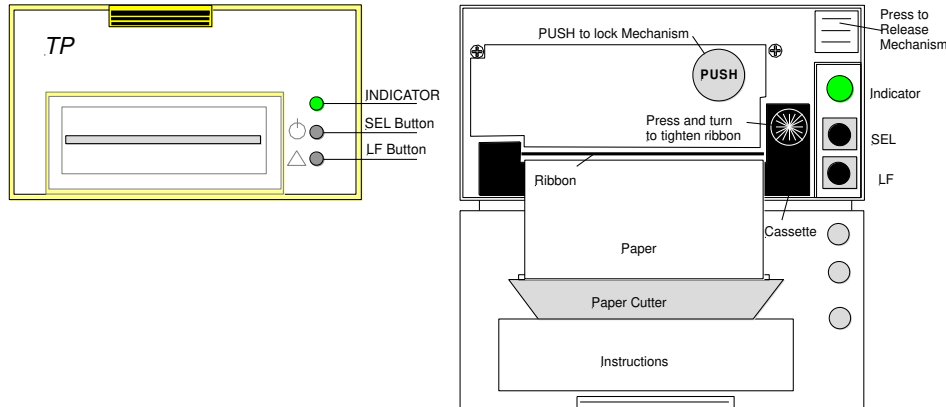
Figure 25: Printer Front Panel Layout (Front Cover Closed / Open)

Indicator

When the 3 colour LED indicator is illuminated;

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

SEL Button

a) On Line / Off Line State

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

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

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

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

b) Pausing the Printer While It Is Printing.

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

c) Enter the HEX-DUMP mode

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

LF Button

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

Self-Test Mode

With power applied (green LED illuminated) push the SEL button. This will turn off the LED, press and hold in the LF button then press the SEL button again and the printer will enter the Self Test mode. Self-test will print out all the valid characters in the character sets.

Exit the Self-Test Mode:

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

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

10.7.2   Maintenance

Installing the Ribbon Cassette

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

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

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

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

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

The left end of the cassette can only be pressed in after the right end has been correctly seated onto the drive axle. If alignment is difficult it may be necessary to turn the knob on the cassette slightly. Now check that the ribbon is tight across the face of the cassette and is on the inside of the cassette and across the paper. Turn the knob clockwise again if the ribbon is on the outside of the cassette.
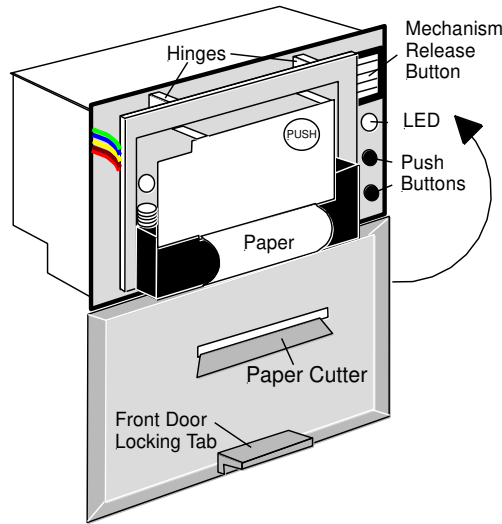
Figure 26: Paper Access

Ribbon Replacement;

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

Loading the Paper Roll

Disconnect the power, unlock and open the front cover.

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

Lift the mechanism as shown below.
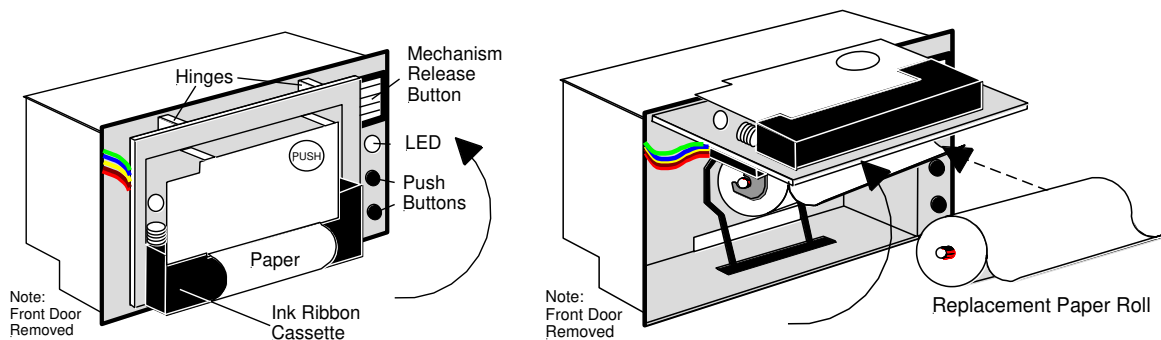
Figure 27: Head Mechanism Rotation and Paper Roll Removal / Insertion

Take out the empty paper roll and roller

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

Connect to the power supply.

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

Press the LF button, (paper feed).

Feed the edge of the paper into the mechanism and allow it to feed through.

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

Return the printer head to its original position.

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

Close the front cover.

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

☞ **Note:** *The above instructions are graphically displayed on the inside of the front cover.*

10.7.3 Printer Connections and Jumper Link Settings

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

➢ Connectors for interconnection to the BRD82ZICC,

➢ Jumper links required to set the programmed print modes; and

➢ Printer 5 volt DC Power Supply.
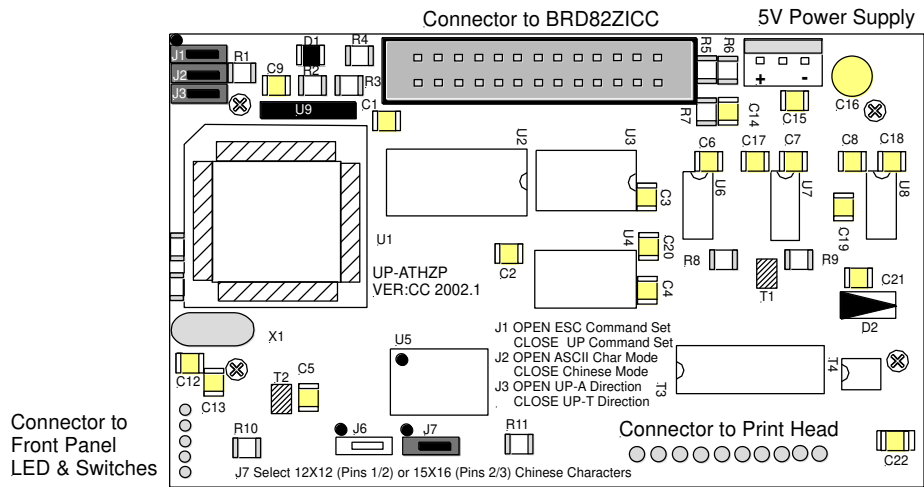
Figure 28: PCB Layout

Jumper Settings

Designator	Jumper State	Function
J1	NOT Inserted	Selects ESC Commands
	Inserted	Selects UP Commands
J2 Set as Default	NOT Inserted	Selects ASCII Character Printing Mode
	Inserted	Selects Chinese Character Printing Mode
J3	NOT Inserted	Select Printing by Contrary Direction
	Inserted	Select printing in the Normal Direction
J7 Set as Default	Insert the Shorting Clip Between Pins 1 and 2	Selects the 12 X 12 Font
	Insert the Shorting Clip Between Pin 2 and 3	Selects the 15 X 16 Font

10.7.4 Printer 5 Volt Power Supply (BRD42PVCB1)

27 volts DC is taken from BRD82ZICC and fed to CN1 of the 5volt Printer Power Supply Board. It is this board that drops this voltage from 27volts to 5volts for use by the Printer.
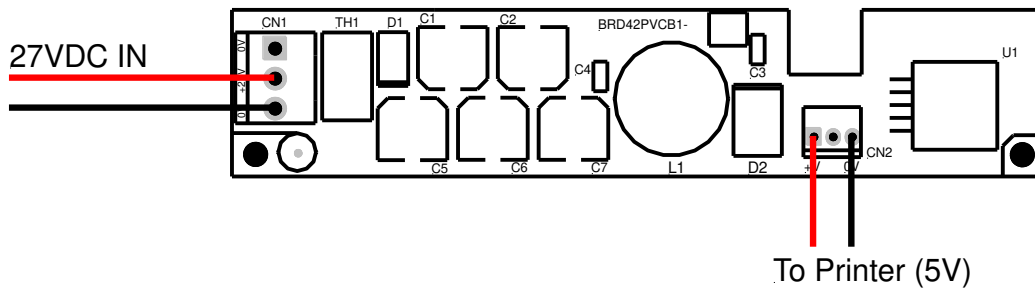
Figure 29: Printer Power Supply Board Layout

11. Battery Capacity Calculation

INTRODUCTION

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

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

DESCRIPTION

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

POWER SUPPLY RATING

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

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

☞ **Note:** *The capacity of the battery shall be such that in the event of failure of the primary power source the batteries shall be capable of maintaining the system in normal working (quiescent) condition for at least 24 h, after which sufficient capacity shall remain to operate two worst case AZF's and associated ACF's for 30 min.*

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

POWER SUPPLY & BATTERY CALCULATOR

Criteria

Example

Panel Configuration

	Iq Calculation			Iq Calculation		
	No Off	**X mA**	**= Iq**	**No Off**	**X mA**	**= Iq**
Basic 1 Loop Panel		115		1	115	**115**
Basic 2 Loop Panel		135				
						0

Interface Cards/Boards

8 Way Sounder Board						
8 Way Relay Board						
8 Zone Conventional						
SmartTerminal		12.4		1	12.4	**12.4**

Loop Devices (using Loop calc)

						0
L1 Iq				100		**30**
L2 Iq						

Iq = _____   **Iq = 157.4**

Devices activating when the system is in alarm

L1 I alarm (max 500mA)				100		**150**
L2 I alarm (max 500mA)						
Relays				10	20	**200**
Sounders				4	80	**320**
Total other Outputs mA						**150**

Ida= _____   **Ida= 820**

Devices de-activating when the system goes into alarm

Aircon Relays				2	20	**40**
Electric locks				4	100	**400**
Other						**0**

Idd= _____   **Idd= 440**

I Alarm (Ia = Iq + Ida – Idd) = mA
Ia = 157.4 + 820 – 440 = 537.4

	Criteria	*Example*
Battery capacity at end of battery life	= (Iq x 24) + (Ia x 0.5)	= (Iq x 24) + (Ia x 0.5) (rounded)
	=	= (157mA x 24) + (537mA x 0.5)
	=	= 3768 + 269 = 4037 mA
Note: 1,000ma = 1Amp	= Ah	= 4.037 Ah
New battery capacity requirement	= Ah x 1.25	= 3.329 x 1.25
	= Ah	= 5.04625 Ah
Rounded up to nearest available	Ah	7 Ah

PRIMARY POWER SOURCE CALCULATIONS

Battery Charger Current

Requirement: Battery is charged for 24 hrs to provide 5Iq + 0.5Ia

	= (5x Iq) + (0.5 x Ia)		= (5x Iq) + (0.5 x Ia)
	=		= (5 x 157) + (0.5 x 537)
	=		= 785 + 269
Ah Requirement	= Ah		= 1.054Ah

Battery Charging Current Required

Where **e** is the battery efficiency, 0.8

$$= \frac{\text{Ah above}}{24 \times e} \qquad = \frac{1.054}{24 \times e}$$

$$= \quad A \qquad\qquad = .055A$$

Power Supply Requirement

Select the greater, 1 or 2

1. Ia + non- battery backed ancillary alarm loads

2. Iq + non – battery backed quiescent loads

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

☞ **Note:** *Remember to take into account ALL outputs that will be switched on when calculating Ida.*

Abbreviations Used

Ia:	CURRENT DRAW IN ALARM
Ida:	CURRENT DRAW IN ALARM WITH DEVICES ACTIVATED
Idd:	CURRENT DRAW IN ALARM WITH DEVICES DEACTIVATED
Iq:	QUIESCENT CURRENT

12. Maintenance and Trouble Shooting Chart

12.1 Maintenance

The **LoopSense** FACP should be maintained so as to comply with all standards / regulations applicable to the country and location it has been installed. Failure to do so could put at risk compliance and the integrity of the system. As a minimum it is recommended the following be used as a guide to periodic maintenance especially if there is an absence of standards regulations.

General

To implement a site maintenance regime, responsibilities should be established by responsible persons, training implemented if required, maintenance delegates appointed and all outcomes clearly communicated to all parties.

Daily Operations (operator level)

➢ The delegated operator checks for normal operation
➢ If any faults are detected, record them in an established "Site Log Book" and report them to the assigned body.
➢ Ensure all faults are signed off as they are resolved and follow up on those that are still outstanding.

Monthly Operations (operator level)

➢ In addition to Daily Operational checks
➢ Visually inspect in and around the panel for any signs of pests, moisture or general damage
➢ Ensure any non FACP standby power facilities are in a state of operational readiness
➢ Force a suitable device, such as an MCP or detector, into an alarm state so that it generates a know alarm outcome. This process should be controlled and established in consultation with all interested parties (installing engineers include) so that maximum benefit is obtained from the test.
➢ Ensure the Site Log Book" is up to date, faults have been attended to and the latest test are recorded

Quarterly Operations (service contractor)

➢ In addition to Monthly Operational checks
➢ Check all internal connections and perform "alarm", "fault" and site specific tests
➢ Perform a "walk around" of the site to determine if the system integrity is free of possible faults
➢ Ensure the Site Log Book" is up to date, faults have been attended to and the latest test are recorded

Annual Operations (service contractor)

➢ In addition to Monthly Operational checks
➢ Initiate both a "lamp" and "walk" test and any other tests as determined necessary for the site
➢ Inspect and test (as per the manufacturers specifications) batteries
➢ Ensure the Site Log Book" is up to date, faults have been attended to and the latest test are recorded

Replacement Components (service contractor)

Batteries and fuses are seen as the only field replaceable components.

If a board field change is required all necessary anti-static precautions must be taken.

☞ **Note:** *If the Main Board is changed the power supply may require re-calibration.*

12.2 Trouble Shooting *LoopSense*

ⓘ Resolution of all suspected faults MUST only be carried out by suitably qualified technical operatives.

Problem	Solution
No Mains Power	Check mains Fuse
Power LED flashing	Check output voltage it should be set to 27.2V. Low = (less than 26.5V)

	High = (greater than 28V)
	Check the battery has been connected properly
Earth Fault LED illuminated	Check all input and output cabling and wiring assemblies for short to ground
System Fault LED illuminated	Ensure correct panel configuration
	Check all connections for loose wiring
RS485 Communication Loop not working	Refer to LCD. This may identify where there is a break in the communication line
Can not access a menu	Incorrect Password entered
Forgotten Password	Ring AMPAC
Alarms Status	Make sure you have a 10KΩ EOL resistor fitted and a diode (1N4004) in series with any sounders

12.3 Trouble Shooting *SmartTerminal*

Problem	**Solution**
	Check supply voltage it should be set to 27.2VDC.
Normal Supply LED not illuminated	Nominal fault voltages are; Low = (< 18VDC) High = (> 28VDC)
FACP Earth Fault LED illuminated	Check all input and output cabling and wiring assemblies for short to ground
FACP System Fault LED illuminated	Ensure correct panel configuration
	Check all connections for loose wiring
RS485 Communication Bus not working	Refer FACP LCD. This may identify where there is a break in the communication line. Check the SmartTerminal Diagnostic Config LED is flashing. If not the FACP is not communicating with the **SmartTerminal.** Check the RS485 cabling. If flashing check the SmartTerminal address.

13. Certification Information

The **LoopSense** is designed and manufactured by:

AMPAC PTY LIMITED

7 Ledgar Rd

Balcatta

WA 6021

Western Australia

PH: 61-8-9201 6100

FAX: 61-8-9201 6101

HEAD OFFICE

Manufactured to: _____

Certificate of Compliance Number: _____

Equipment Serial Number: _____

Date of Manufacture: _____

14. Compatible Devices

AMPAC Type Code	Auto Learn Default	Device Type	Displayed Type (19 chars)	Type Desc
		Optical		
05h	✓	XP95 Optical	XP95 PHOTO	PHOTO
05h		XP95 Optical with base sounder	XP95 PHOTO + SNDR	PHOTO
05h		XPander Optical	XPANDER PHOTO	PHOTO
05h		S90 Optical	S90 PHOTO	PHOTO
05h		Xplorer Optical	XPLORER PHOTO	PHOTO
05h		Xplorer Optical with base sounder	XPLR PHOTO + SNDR	PHOTO
05h		XP95 Beam	XP95 BEAM	PHOTO
0Dh	✓	XP95 Reflective beam	XP95 REFLECT BEAM	BEAM
105h	✓	Discovery Optical	DISC PHOTO	PHOTO
105h		Discovery Optical with base sounder	DISC PHOTO + SNDR	PHOTO
11Dh	✓	Discovery Multisensor	DISC MULTISENSOR	MULTI
11Dh		Discovery Multisensor with base sounder	DISC MULTI + SNDR	MULTI
15h	✓	XP95 Flame	XP95 FLAME	FLAME
1Dh	✓	XP95 Multisensor	XP95 MULTISENSOR	MULTI
1Dh		XP95 Multisensor with base sounder	XP95 MULTI + SNDR	MULTI
1Dh		XPander Multisensor	XPANDER MULTI	MULTI
31Dh	✓	Enhanced Discovery Multisensor	EDSC MULTISENSOR	MULTI
31Dh		Enhanced Discovery Multi + base sounder	EDSC MULTI + SNDR	MULTI
		Heat Detectors		
06h	✓	XP95 Heat	XP95 HEAT	HEAT
06h		XP95 Heat with base sounder	XP95 HEAT + SNDR	HEAT
06h		XPander Heat	XPANDER HEAT	HEAT
06h		S90 Heat	S90 HEAT	HEAT
06h		Xplorer Heat	XPLORER HEAT	HEAT
06h		Xplorer Heat with base sounder	XPLR HEAT + SNDR	HEAT
0Eh	✓	XP95 Hi temp	XP95 HI HEAT	HHEAT
0Eh		XP95 Hi temp with base sounder	XP95 HI HEAT + SNDR	HHEAT
0Eh		XPander Hi temp	XPANDER HI HEAT	HHEAT
0Eh		Xplorer Hi temp	XPLORER HI HEAT	HHEAT
0Eh		Xplorer Hi temp with base sounder	XPLR HI HEAT + SNDR	HHEAT
106h	✓	Discovery Heat	DISC HEAT	HEAT
106h		Discovery Heat with base sounder	DISC HEAT + SNDR	HEAT
		Ionisation		
03h	✓	XP95 Ion	XP95 ION	ION
03h		XP95 Ion with base sounder	XP95 ION + SNDR	ION
03h		S90 Ion	S90 ION	ION
103h	✓	Discovery Ion	DISC ION	ION
103h		Discovery Ion with base sounder	DISC ION + SNDR	ION
10Bh	✓	Discovery Carbon Monoxide	DISC CO	CO
10Bh		Discovery Carbon Monoxide with base sndr	DISC CO + SNDR	CO

		Manual Call Points		
07h	✓	S90 MCP	S90 MCP	MCP
11Fh	✓	Discovery MCP	DISC MCP	MCP
1Fh	✓	XP95 MCP	XP95 MCP	MCP
1Fh		XPander MCP	XPANDER MCP	MCP
1Fh		XP95 Mini switch monitor with interrupt	XP95 MINI SW + INT	MCP
1Fh		Xplorer MCP	XPLORER MCP	MCP
		Sounders		
01h	✓	XP95 sounder / sounder control unit	XP95 SOUNDER	SNDR
01h		XPander sounder	XPANDER SOUNDER	SNDR
01h		XP95 integrated base sounder	XP95 INTGR BSE SNDR	SNDR
01h		XP95 Intelligent base sounder	XP95 INTEL BSE SNDR	SNDR
01h		XP95 sounder beacon base	XP95 SND BEACN BSE	SNDR
01h		XP95 loop powered beacon	XP95 LOOP PWR BEACN	SNDR
01h		S90 sounder control unit	S90 SCU	SNDR
111h	✓	Discovery sounder beacon base/open area	DISC SOUNDER BEACN	SNDR
		I/O Units		
02h	✓	XP95 input / output module	XP95 I/O	I/O
02h		XPander I/O (Relay) Unit	XPANDER I/O	I/O
02h		XP95 three channel input / output module	XP95 3I/O	I/O
02h		XP95 output module	XP95 OUTPUT	I/O
02h		XP95 mains switching input / output module	XP95 MAINS I/O	I/O
02h		S90 single channel I/O unit	S90 SINGLE I/O	I/O
02h		S90 3 channel I/O unit	S90 3I/O	I/O
02h		S90 3 channel analogue I/O unit	S90 3I/O + ANALOGUE	I/O
02h		S90 switch monitor unit	S90 SWITCH	I/O
02h		Xplorer output module	XPLORER OUTPUT	I/O
		Zone Monitors		
04h	✓	XP95 zone monitor	XP95 ZONE MONITOR	CONV
04h		XPander Loop Interface	XPANDER INTERFACE	RADIO
04h		S90 zone monitor	S90 ZONE MONITOR	CONV
0Ch	✓	XP95 switch monitor	XP95 SWITCH	SWITCH
0Ch		XP95 mini switch monitor	XP95 MINI SWITCH	SWITCH
0Ch		XP95 switch monitor plus	XP95 SWITCH PLUS	SWITCH
1Ch	✓	FastSense XP95 APIC	XP95 FASTSENSE	FSENSE
		User Defined		
10h	✓	XP95 AAF	XP95 AAF	AAF

Glossary of Terms

ACKD :	ACKNOWLEDGED
AH:	AMP HOUR
ALM :	ALARM
COM :	RELAY COMMON CONTACT (WIPER)
CN :	CONNECTOR
C/O :	CHANGE OVER CONTACTS
CPU :	COMMON PROCESSOR UNIT
EOL :	END OF LINE
FACP :	FIRE ALARM CONTROL PANEL
FLT :	FAULT
GND :	GROUND (0 VOLTS) NOT EARTH
I/O :	INPUT/OUTPUT
LCD :	LIQUID CRYSTAL DISPLAY
LED :	LIGHT EMITTING DIODE
MCP :	MANUAL CALL POINT
N/C :	NORMALLY CLOSED RELAY CONTACTS
N/O :	NORMALLY OPEN RELAY CONTACTS
PCB :	PRINTED CIRCUIT BOARDS
P/S :	POWER SUPPLY
TB :	TERMINAL BLOCK

CE

2831

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2831-CPR-F2743

EN54-2 & 4 1997 including amendments 1 & 2

Control and Indicating equipment and Power Supply equipment for fire detection and
fire alarm systems for buildings

8281-0105 1 Loop 32 Zone analogue addressable control and
indicating equipment
8281-0205 2 Loop 32 Zone analogue addressable control and
indicating equipment

Provided options:
Output to fire alarm devices
Output to fire alarm routing equipment
Alarm confirmation input from fire alarm routing equipment
Delay to outputs
Dependencies on more than one alarm signal – Type A
Dependencies on more than one alarm signal – Type B
Dependencies on more than one alarm signal – Type C
Fault signal from point
Output to fault warning routing equipment
Disablement of each addressable point
Test condition