AMPAC

ADVANCED WARNING SYSTEMS

LoopSense

Fire Alarm Control Panel (CP10:2005 & EN54- 2 & 4)

Installation, Commissioning & Operation

MAN 3033

WORLD LEADER OF INNOVATIVE SOLUTIONS
IN FIRE DETECTION AND ALARM SYSTEMS

Responding to Fire

Access Level 1

Indicators

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

Zone Indicators – are illuminated to identify the location and spread of the fire.

Silence Buzzer – When key is pressed it silences the panel buzzer.

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.

Note: *The First Alarm cannot be silenced for 3 minutes as per CP10: 2005 standard.*

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.

Note: *For CP10, If alarm devices are not silenced, the user shall be prompted to "<SILENCE ALARM> DEVICES FIRST" and the reset shall not be actioned.*

Disabling a Zone

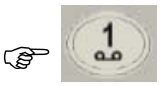
The following example DISABLES a ZONE. Place the Keyswitch in the ENABLED position.

Press 

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.

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

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►
```

Note: *Option 2 “Disable Sounders” in the Zone Menu is disabled as per the requirements of CP10:2005 standard*

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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 MAN3034

LoopMaster Users Manual MAN3042

Apollo Detector / Device Manuals

Ampac Product Data Sheets

Singapore Standard CP10:2005

European Standard EN54-2&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 CP10:2005 and EN54-2&4.

The LoopSense consists of:

- 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
- A metal cabinet with 3Amp supply.
- Flush or surface mountable enclosure. A surround is required for flush mounting.
- Controls have tactile and audible feedback of operation
- All terminals cater for 2.5mm cables

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
- 7.91 Output to fire alarm routing equipment
- 7.92 Alarm Confirmation input from fire alarm routing equipment
- 7.11 Delays to outputs (For CP10 panels this doesn't apply to Outputs configured as Sounder or Fire Outputs.)
- 7.12 Coincidence detection
- 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 CP10:2005 and EN54-2.

2.2 System Components

The following illustrates the main components of the system and the connectivity between them.

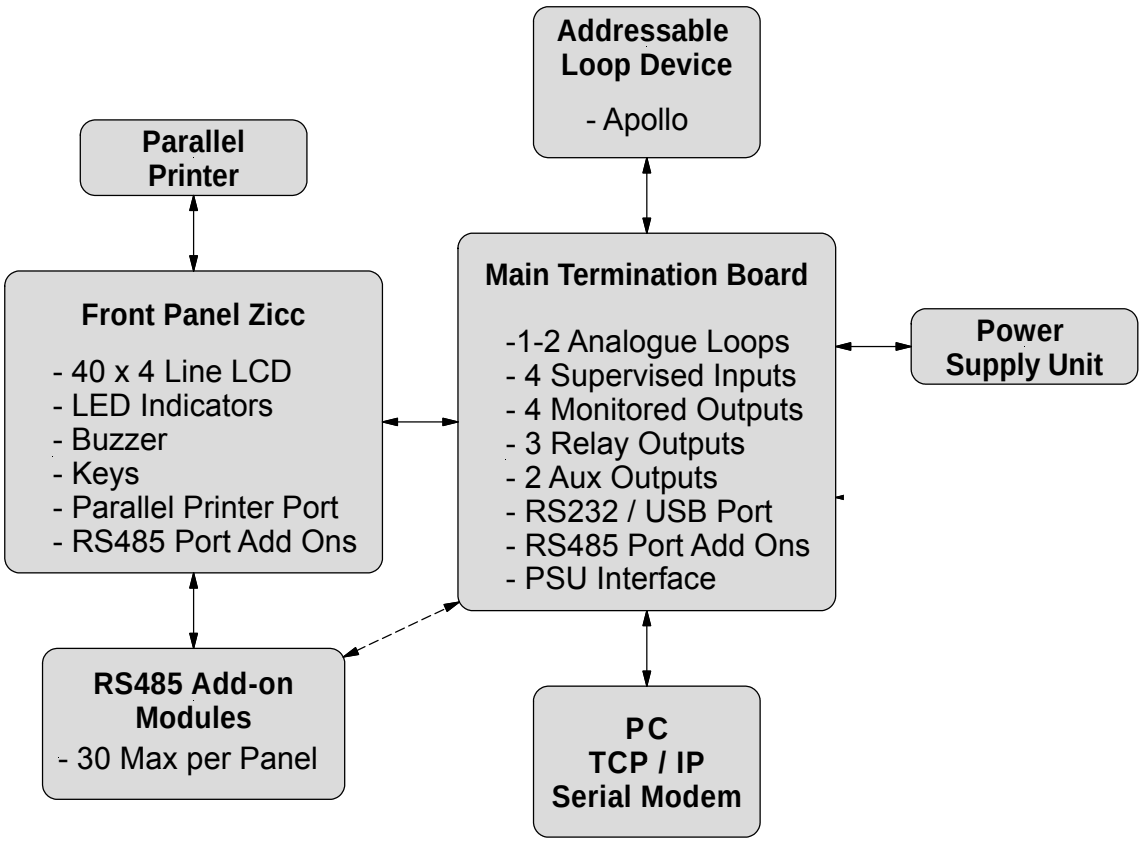


Figure 1: The LoopSense Concept

2.3 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 Zone Indicator
- Switch & Indicator
- 8 Zone Conventional
- Zone Disable & Indicator
- Conventional Network
- Remote LED Mimic
- 2nd. Loop enablement by way of a “Loop Activation Key” and programming
- Printer

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

3. *Placing the Basic System into Operation*

3.1 Unpacking

The basic LoopSense FACP consists of:

- Main PCB
- Front Panel control and indicator board
- 3Amp switch-mode power supply
- Access keys
- Loop activation key for 2 Loop version.

3.2 Anti-Static Precautions

To prevent damage to components, modules and boards, anti-static precautions ***MUST*** be observed while performing any task within the FACP. The same applies to those situated in the field

3.3 Working On The System

Prior to unplugging any connector, connecting or disconnecting any wiring, removing or replacing any module or board, ensure that both the Mains and Batteries have been isolated to prevent damage to panel components.

3.4 The Cabinet

Features:

- The cabinet has the capability of being either surface or flush mounted. When flush mounted a separate surround is required.
- Normally painted Red
- The inner and outer door hinges are mounted on the left-hand side of the cabinet which allow the doors open to an angle of 100º. Locking is normally keyless though keyed entry is available on request.
- Knockouts are positioned at the top and rear of the cabinet to simplify cable entry. The larger range of cabinets use a removable gland plate to allow for the greater amount of cabling

3.5 Mounting the Cabinet

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.

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

Taking into account the weight of the panel securely mount it by using, the two keyhole mounting holes and two pre punched holes using 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.

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

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

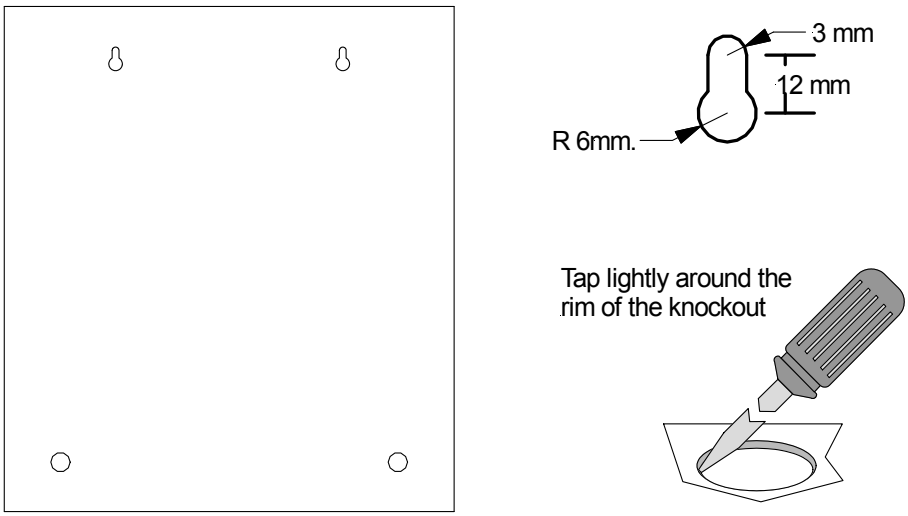


Figure 2: Example SP1X Back Pan Mounting Hole & Removing Knockouts

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.*

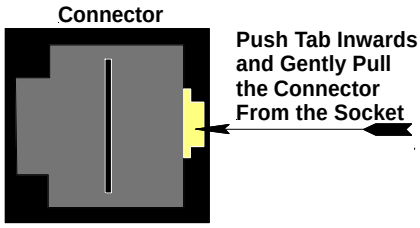
3.6 PCB Removal / Replacement

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.



3.6.1 General Panel Layout

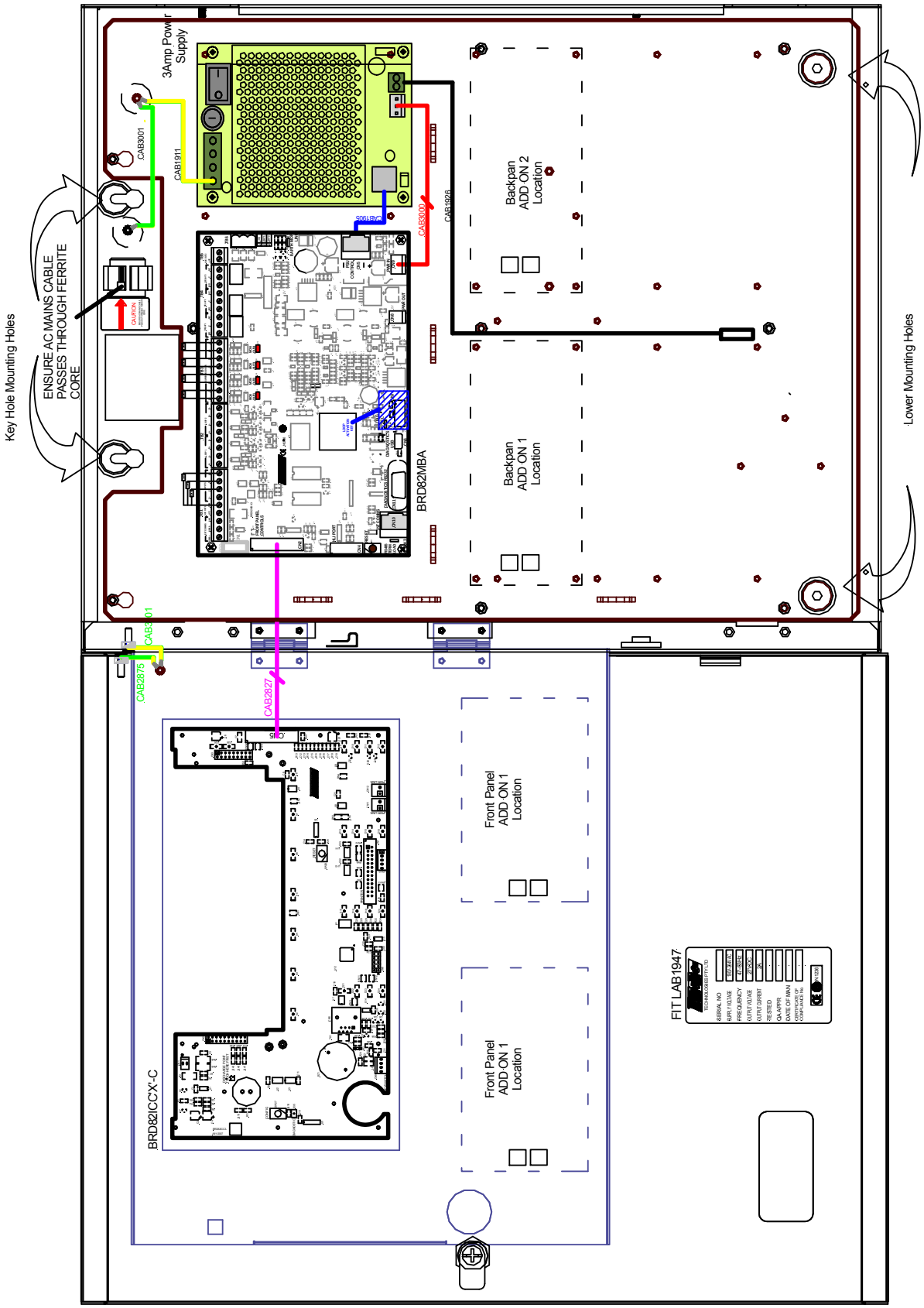


*Figure 3: **LoopSense** SP1X General wiring and PCB layout*

3.7 Power Supply and AC Mains

3.7.1 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; 204 - 264VAC @ 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.

3.7.2 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.

3.7.3 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.

3.7.4 Connecting the Earth

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) / 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

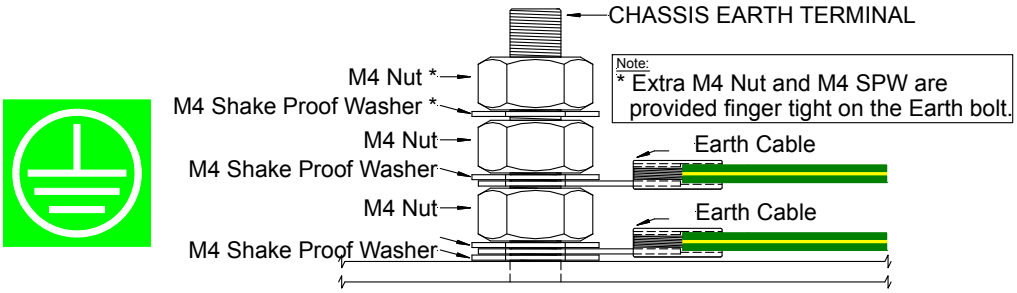


Figure 4: Chassis Earth Terminal Connection

3.7.5 Connecting the Mains Power to the 3 Amp Power Supply

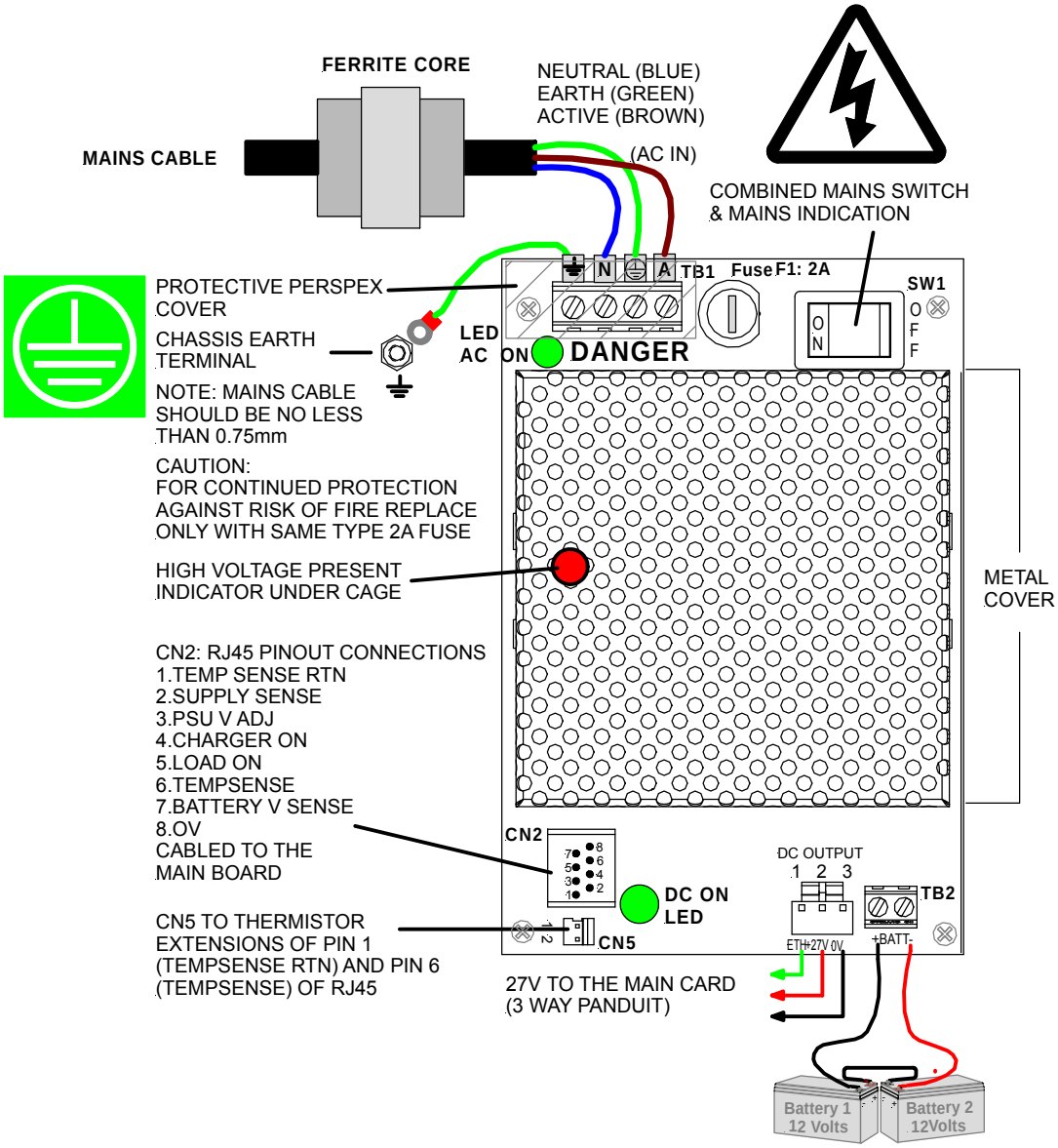


Figure 5: Power Supply Battery Charger Wiring (3A PSU SHOWN)

3.8 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.*

3.8.1 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.

3.8.2 Battery Cable Test

Battery cable fault detection is only available when using the PSU 2397 3 Ampere power supply.

A “BATTERY CABLE FAULT” is registered when the combined internal resistance of the battery and the resistance of the battery leads exceed approximately 1.2Ω. This test is conducted every 8 seconds in conjunction with the check for battery missing.

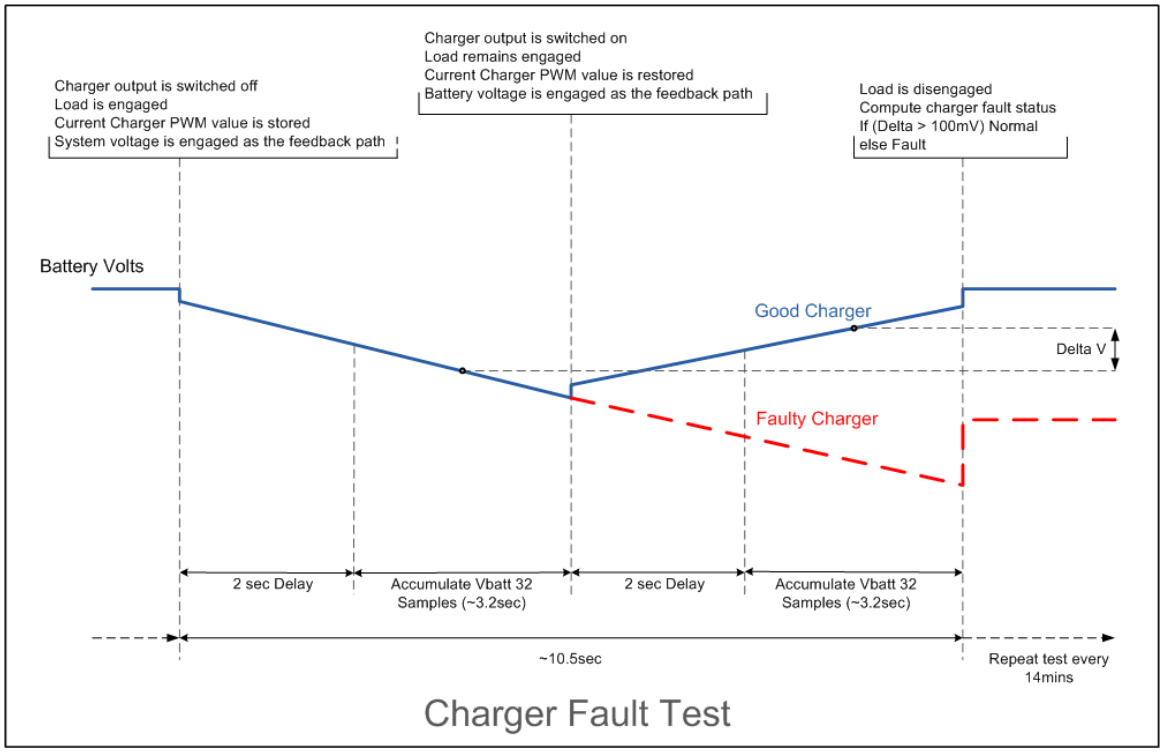
3.8.3 Charger Voltage Test

A charger low condition is recognized when the charger voltage drops less than 0.8V below the optimal charger voltage for a given temperature. A charger high condition is recognized when the charger voltage is more than 0.8V above the optimal charger voltage for a given temperature.

Temperature (°C)	Optimal Voltage (VC)	Charger Low (VC - 0.8V)	Charger High (VC + 0.8V)
-8	28.2	27.4	29.0
-4	28.1	27.3	28.9
0	28.0	27.2	28.8
4	27.8	27.0	28.6
8	27.7	26.9	28.5
12	27.5	26.7	28.3
16	27.4	26.6	28.2
20	27.3	26.5	28.1
24	27.2	26.4	28.0
28	27.0	26.2	27.8
32	26.9	26.1	27.7
36	26.7	25.9	27.5
40	26.6	25.8	27.4
44	26.5	25.7	27.3
48	26.4	25.6	27.2

3.8.4 Charger Fault Test

A Charger fault test is performed every 14 minutes for duration of approximately 10.5 seconds. It effectively confirms if the charger is able to recharge the battery by discharging the battery slightly using the PSU dummy load then attempting to recharge the battery. If the charger has successfully recharged the battery (Delta V > 100mV) then no fault is reported, otherwise a charger fault is reported.



3.9 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.

3.10 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.

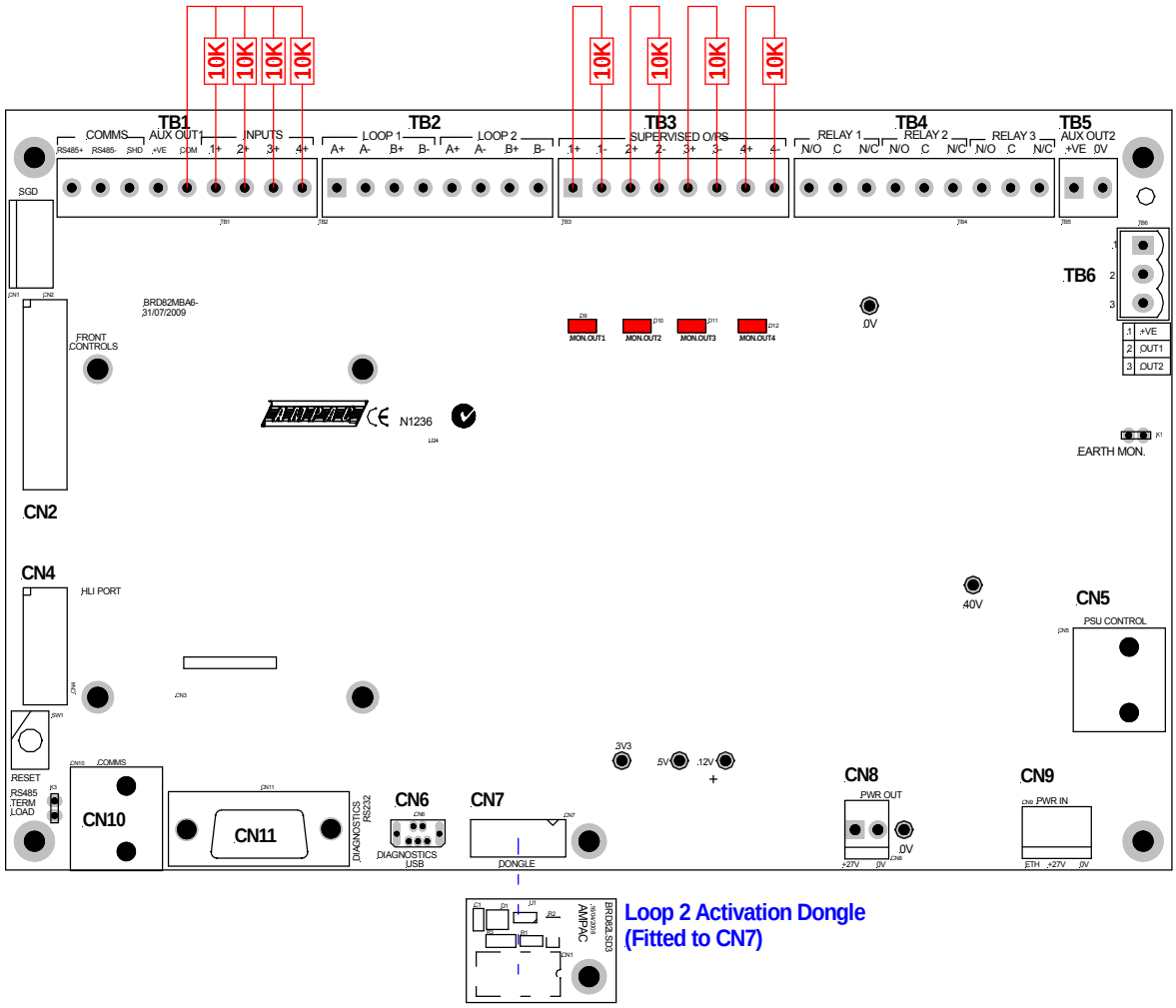


Figure 6: Main Control Card showing Loop 2 Activation Dongle

3.11 Input / Output System Connections

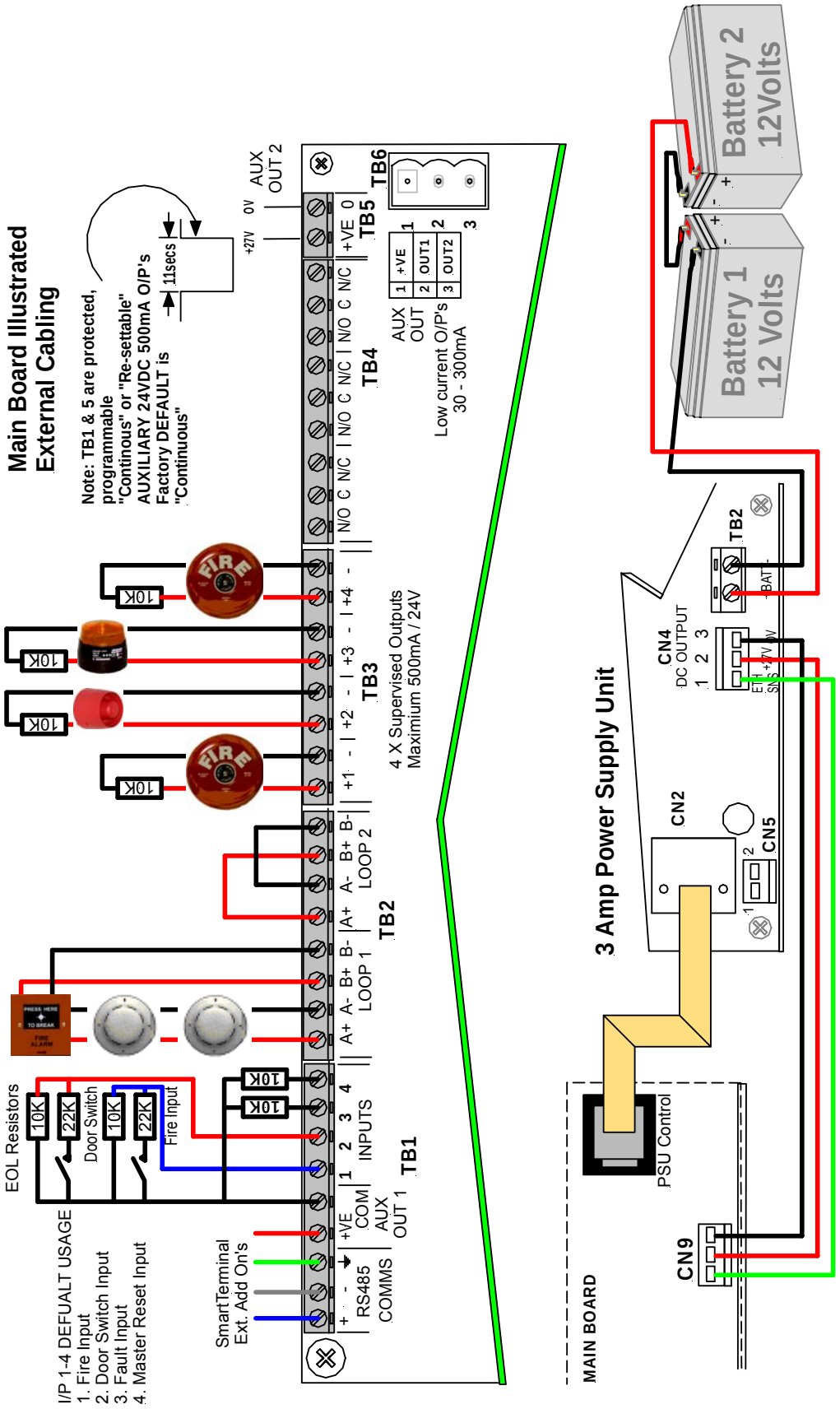


Figure 7: Simple Wiring Diagram of the FACP

3.12 Wiring to the Main Card

3.12.1 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.

3.12.2 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.

3.12.3 External RS485 Communications Port

An RS485 9600 baud communications port (TB1) is provided to allow connection of remote Add-Ons.

Remote Cards

The number of and type of Add-Ons 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.*

3.12.4 Main Card Comms Link

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.

3.12.5 Internal Communications Port

The 9600 baud internal communications (CN10) 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

3.13 Input Interfaces

3.13.1 Supervised Digital Inputs

Four supervised inputs (TB3) 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.

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

Each Input can be configured to be one of the following types:

- Latching
- Non-Latching
- Self Reset
- Class Change
- Evacuate
- FARE – Fire Alarm Routing Equipment
- Master reset

EN54 & CP10 Default Input settings are as below

- **INPUT 1:** Class Change
- **INPUT 2:** Evacuate
- **INPUT 3:** Fault
- **INPUT 4:** Reset

3.14 Fire Detector Analogue Loop Interface

Each FACP supports up to 2 loops (TB2). 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.

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.

☞ **Note:** *See Section 6 for list of Supported Devices*

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

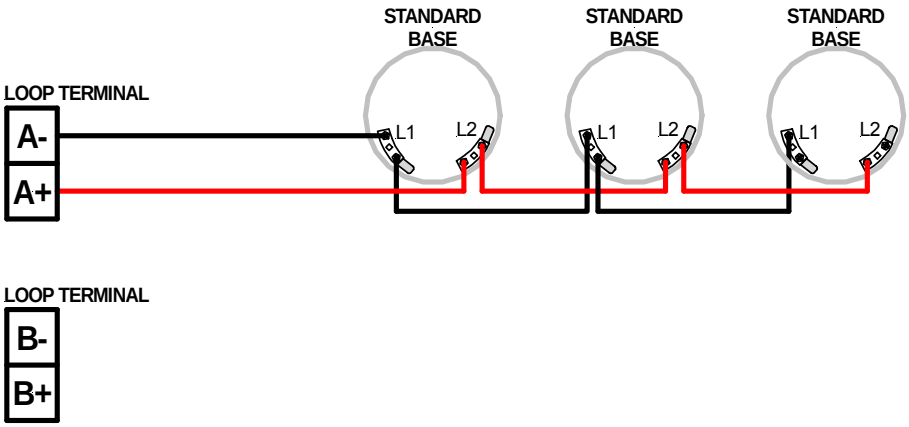


Figure 8: Single-Ended Mode

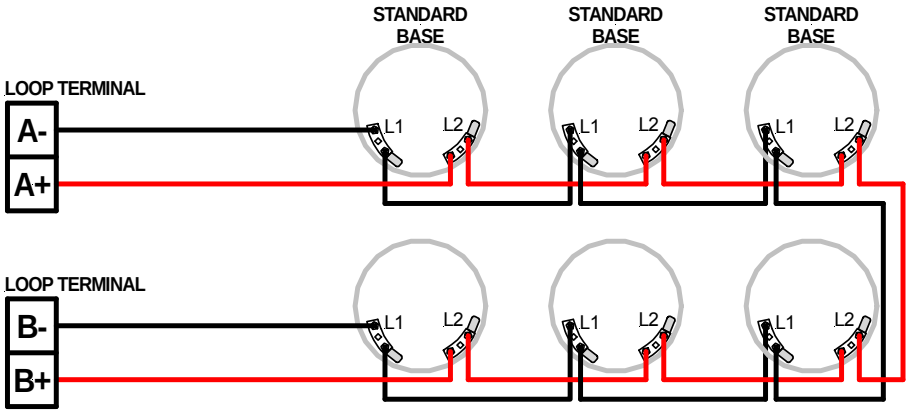


Figure 9: Redundant Mode

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

3.14.1 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.

3.14.1 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.*

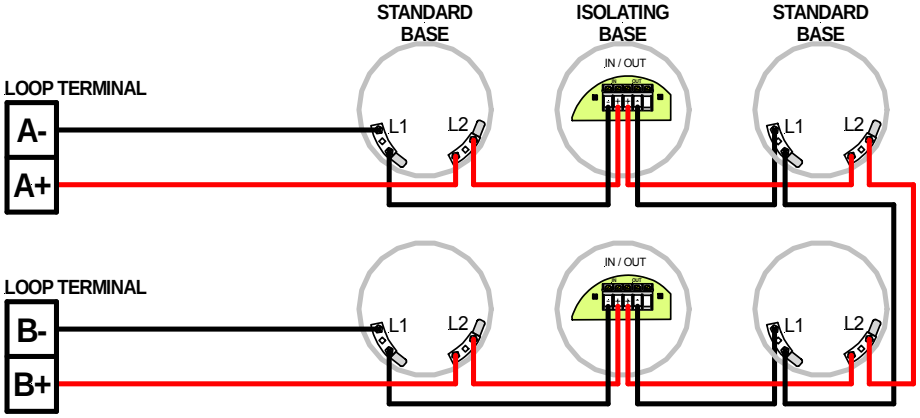


Figure 10: Typical Loop Arrangement

3.14.2 Loop Isolator calculator

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

3.15 Outputs

3.15.1 Supervised Outputs

Four supervised output are provided on the Main Board (TB3). 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 – 1.5KΩ	Short Circuit fault
1.5K – *12KΩ	Normal
*12KΩ 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.

Each Output can be configured to be one of the following Types:

- Unsupervised
- Supervised
- Sounder
- Fire
- Fault
- Ancillary
- Evacuate

Fixed Activation Types:

- None/Post Delay
- Continuous
- Door Holder
- Resettable
- Disable
- Battery Fail

EN54 & CP10 Default Output settings are as below

- **OUTPUT 1:** Sounder
- **OUTPUT 2:** Sounder
- **OUTPUT 3:** Sounder
- **OUTPUT 4:** Sounder

3.15.2 Relay Outputs

Three relay outputs are provided (TB4).

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.

Each Output can be configured to be one of the following Types:

- Unsupervised
- Sounder
- Fire
- Fault
- Ancillary

Fixed Activation Types

- None/Post Delay
- Continuous
- Door Holder
- Resettable
- Disable
- Battery Fail

EN54 & CP10 Default Output settings are as below

- **RELAY 1:** Fire
- **RELAY 2:** Alarm
- **RELAY 3:** Fault

3.15.3 Auxiliary 24VDC Outputs

Programmable Continuous / Re-settable (11 seconds) independently switched 24V DC (nominal) 1A output. (TB1 & 5)

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.

Each Auxiliary Output can be configured to be one of the following types:

Fixed Activation Types

- None/Post Delay
- Continuous
- Door Holder
- Resettable
- Disable
- Battery Fail

3.15.4 Low current outputs

Two low current open collector outputs suitable for driving the coil of a relay are provided (TB6).

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.

Each Output can be configured to be one of the following types:

- Unsupervised
- Sounder
- Fire
- Fault
- Ancillary

Fixed Activation Types

- None/Post Delay
- Continuous
- Door Holder
- Resettable
- Disable
- Battery Fail

EN54 & CP10 Default Output settings are as below

- **OUTPUT 1:** Fire
- **OUTPUT 2:** Ancillary

3.15.5 Debug Connection CN6 & 11

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

3.15.6 Universal Serial Bus Connection

A Universal Serial Bus connection is provided (CN6). 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.

3.15.7 RS 232 Connection

A serial connection compatible with RS232 standard is provided (CN11). 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.

3.15.8 Loop Activation Key Mounting

A Loop Activation key needs to be fitted to access Loop 2 (CN7)

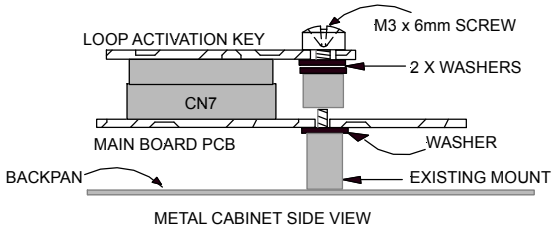


Figure 11: Loop Activation Key Mounting

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 (see section 3.14)
- 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.

3.15.9 Earth Monitoring

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

Earth Detection Limits

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

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

3.15.10 Cabling

Connector	Purpose /Pins
CN1	Not used.
CN2	Front panel Control / LCD Interface
CN3	Network Connection (Future)
CN4	High Level Interface (Future)
CN5	Monitoring / Comms 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.
CN6	USB Diagnostics
CN7	Loop Activation Key for second loop
CN8	+/- 27VDC Out
Pins	❶ +27VDC ❷ 0V
CN9	+/- 27VDC and earth from the Power Supply / Charger.
Pins	❶ Earth ❷ +27VDC ❸ 0V
CN10	Comms and +/- 27VDC and earth to internal Add-Ons.
Pins	❶ &❽ ❷ & ❼ + 0V, ❸ & ❹ RS 485 Bus, ❺ Tx. Enable 27VDC
CN11	Diagnostics RS232
	❶ CD, ❷ RXD, ❸ TXD, ❹ DTR, ❺ 0V, ❻ DSR, ❼ RTS, ❽ CTS, ❾ RI

4. 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

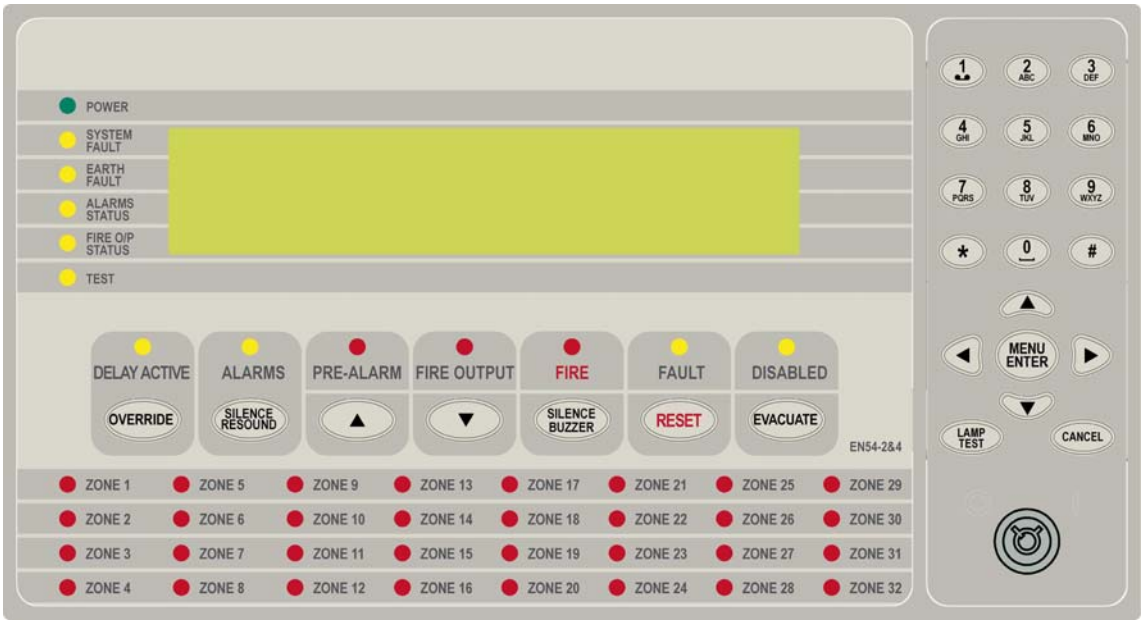


Figure 12: Front Panel Layout

The 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.

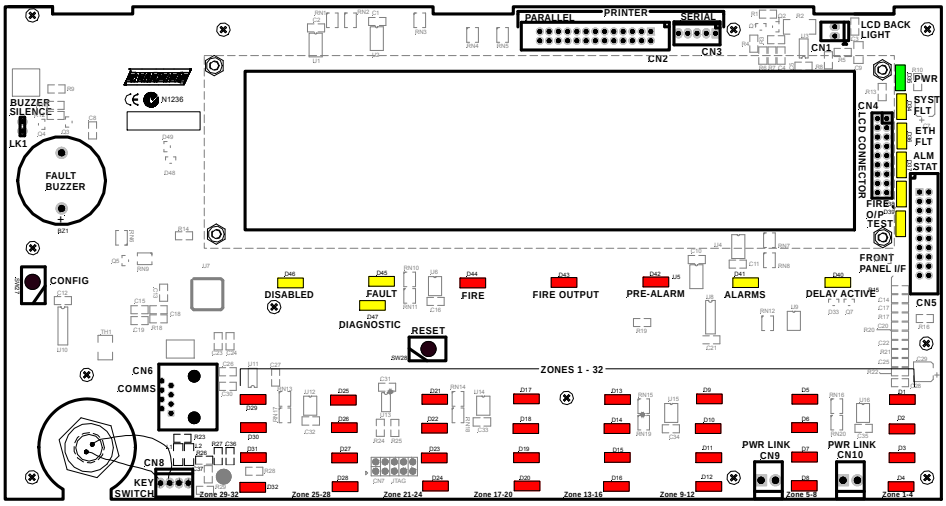


Figure 13: Control Card PCB Layout

4.1 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.

4.1.1 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.

4.1.2 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.

4.2 System Controls & Indicators

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

Controls, Normal – Enabled (Key Switch)

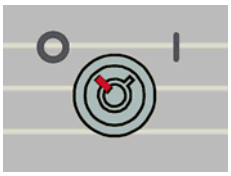
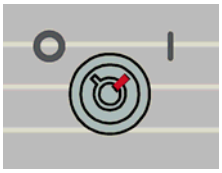
 Keyswitch disabled  Keyswitch enabled

Figure 14: Keyswitch in the Disabled / Enabled Positions

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.

☞ **Note:** *"Delay Active" Function is not available in CP10 panels.*

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.

☞ **Note:** *The First Alarm cannot be silenced for 3 minutes as per CP10: 2005 standard.*

Pre-Alarm / Previous ▲

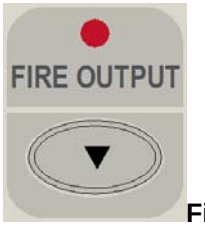
Available at access level 1 and above

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

☞ **Note:** *For CP10, If alarm devices are not silenced, the user shall be prompted to "<SILENCE ALARM> DEVICES FIRST" and the reset shall not be actioned.*

Disabled – Evacuate

Available at access level 2 and above

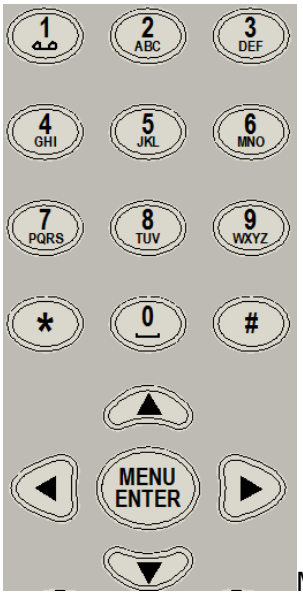
Disabled – The indicator is illuminated when one or more zone detectors, loop devices or panel outputs are disabled.

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.

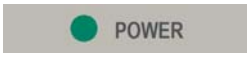
☞ **Note:** *If there are any zones configured for Investigation or Dependency A, B or C, these shall be bypassed when the EVACUATE key is pressed.*

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



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

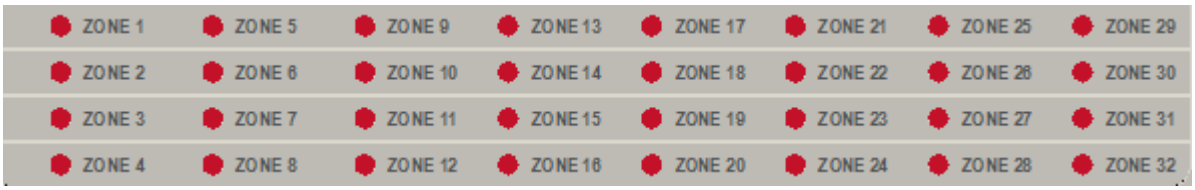
Illuminated when the FACP is unable to provide mandatory functions. Indicator is latched, until cleared by the RESET control

Illuminated when there is an earth fault detected on the panel

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

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

Illuminated when the panel is in the “Walk Test” mode.



Illuminated when the associated zone1-32 is in alarm.

4.2.1 Printer Connection ICC

Two printer connections (parallel and serial) are provided (CN2) 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.

5. *Expanding the FACP with compatible Ancillary Boards*

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.

5.1 Ancillary Services

The FACP has been designed such that detectors and/or call points, in addition to giving an alarm and calling the fire brigade, will close or open circuits of ancillary services by means of relays or similar devices.

Examples of these services are:

- Actuation of fixed fire-extinguishing systems;
- Closing of windows, smoke and fire doors,
- Control of ventilating systems;
- Covering of tanks containing flammable liquids and controlling their valves to isolate the contents from direct contact with the fire, etc.

To facilitate safe maintenance of these services an option is available that allows for the isolation and visual indication of the disablement of ancillary services that does not affect the normal operation of the fire alarm system.

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

5.2 Compatible *LoopSense* Boards

Module / Board	**Max No**
8 Zone Conventional Card	15 per FACP
32 Zone Alarm Indicator Card	15 per FACP
8 way Switch and Indicator Card	15 per FACP
Zone Disable and Indicator Card	15 per FACP
8 Way Relay Board	15 per FACP
8 Way Sounder Board	15 per FACP
Conventional Network Board	1 per FACP
Remote LED Mimic	15 per PACP
Printer	1 per FACP

☞ **Note:** *Max Numbers of boards depends on the configuration and the number of Panels in the System.*

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

5.3 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
- 3K3 resistor

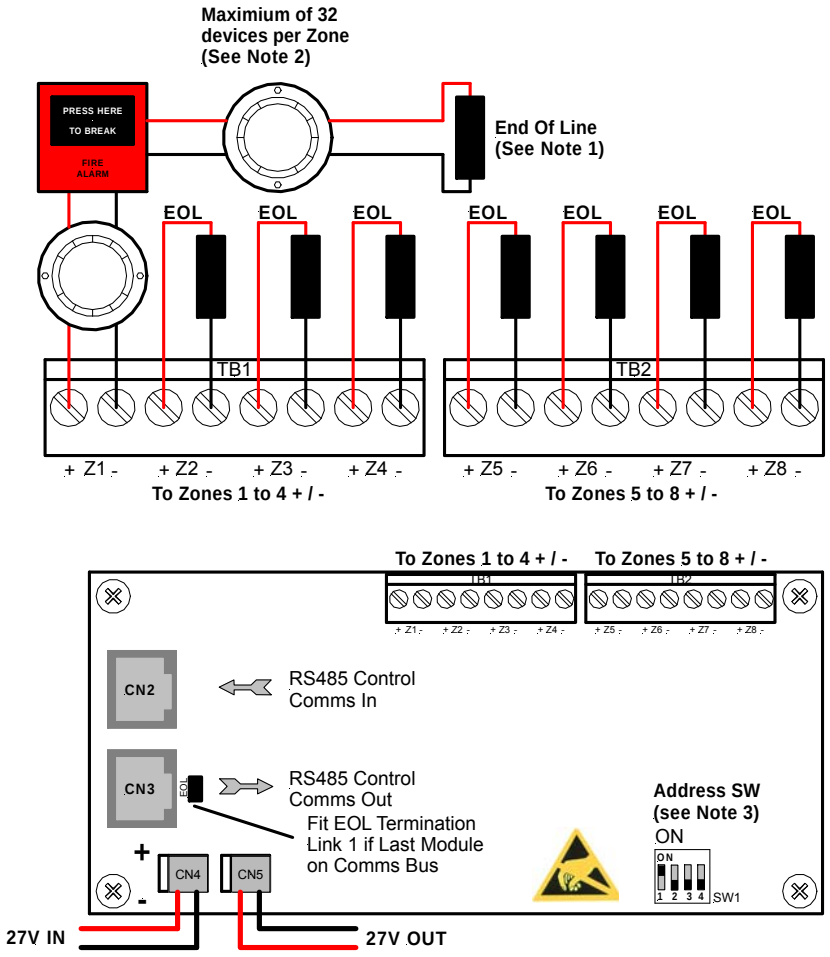


Figure 15: 8 Zone Conventional Board

Connections

Terminal/s	Function	
TB1 to 2	ZONE + ZONE -	Zones1 to 8

☞ **Note 1:** *Each Zone circuit MUST be terminated with a 3K3, 4K7, 6K8, 10K Ohm resistor or 10uF 50V Bi-Polar Capacitor EOL*

☞ **Note 2:** *If Diode Bases are used ONLY the 10uF CAP can be used.*

☞ **Note 3:** *See Section 10 for Addressing Details (SW1)*

5.4 32 Zone Alarm Mimic 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
DEPENDENCY B	FLASH	RED
DISABLED	ON STEADY	YELLOW
FAULT	FLASH	YELLOW
ALL OTHER	OFF	N/A

By default, the LED's designated D1 to D32 shall be programmed to indicate the statuses of ZONE 1 to ZONE 32 respectively; however these can be re-assigned via the configuration tool.

The LED's may also be configured to respond to the activation of Virtual Points from C&E, and the active LED colour is also programmable when using Virtual Points.

VIRTUAL POINT	LED STATE	LED COLOUR
1 - 100	ON STEADY	RED / AMBER / GREEN
	FLASH	RED / AMBER / GREEN

The card will respond to a lamp test when instigated on the panel to which it is connected.

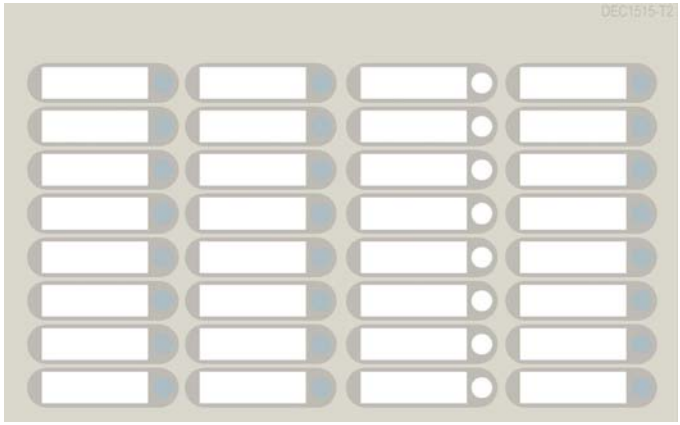


Figure 16: DEC1515-T2 Zone Indicator Decal (See LAB1516.doc for Slip in Label)

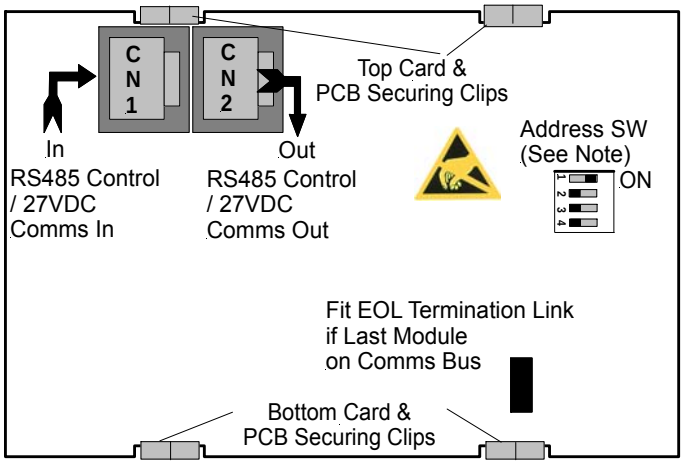


Figure 17: Zone Alarm Mimic Card Rear View showing connectors and Address Switch

☞ **Note:** *See Section 10 for Addressing Details (SW1)*

5.5 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.

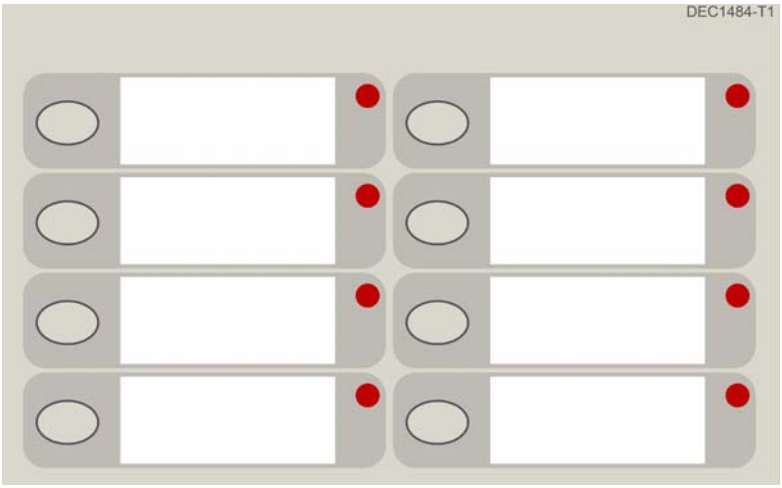


Figure 18: DEC1484-T1 8 Way Switch and Indicator Card Decal (See LAB1483.doc for Slip in Label)

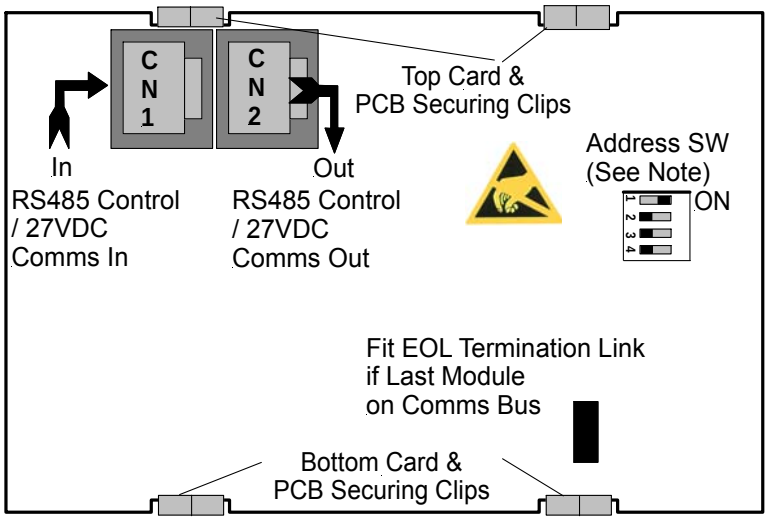


Figure 19: 8 Way Switch and Indicator Card Rear View showing connectors and Address Switch

☞ **Note:** *See Section 10 for Addressing Details (SW1)*

5.6 Zone Disable and Indicator Card

This card has 8 switch inputs and 16 LED indicators.

Each switch may be programmed to be assigned to a zone and has a corresponding Fire indicator (Red) and a Disable/Fault indicator (Amber).

Each switch operates a toggle function to either Disable or Enable the associated zone.

If the zone is disabled the Disable/Fault indicator shall turn on steady and if there is a fault present within the zone and the zone is not disabled, then the Disable/Fault indicator shall flash. The Fire indicator shall turn on steady if there is a fire within the zone.

The card can also be programmed to allow fire disablement (Note: Enabling this feature contravenes EN54.2). If Fire disablement is enabled in the configuration then pressing a switch corresponding to a zone in fire shall disable that zone and clear the fire. If the card is programmed to not permit fire disablement, then the switches shall only function if the corresponding zone is not in fire.

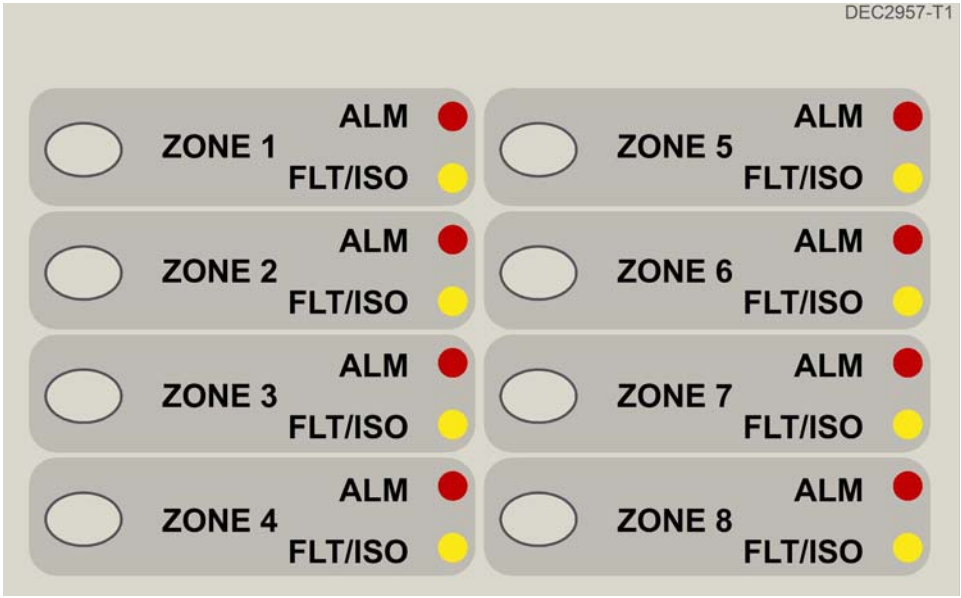


Figure 20: DEC2957-T1 Zone Disable and Indicator Card Decal (See LAB2957.doc for Slip in Label)

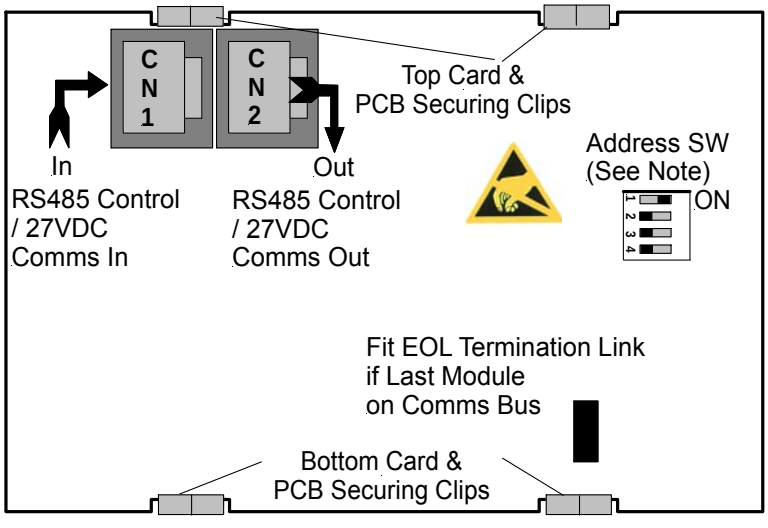


Figure 21: Zone Disable and Indicator Card Rear View showing connectors and Address Switch

☞ **Note:** *See Section 10 for Addressing Details (SW1)*

5.7 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
- Programmable I/O

5.7.1 Internal Relay Board

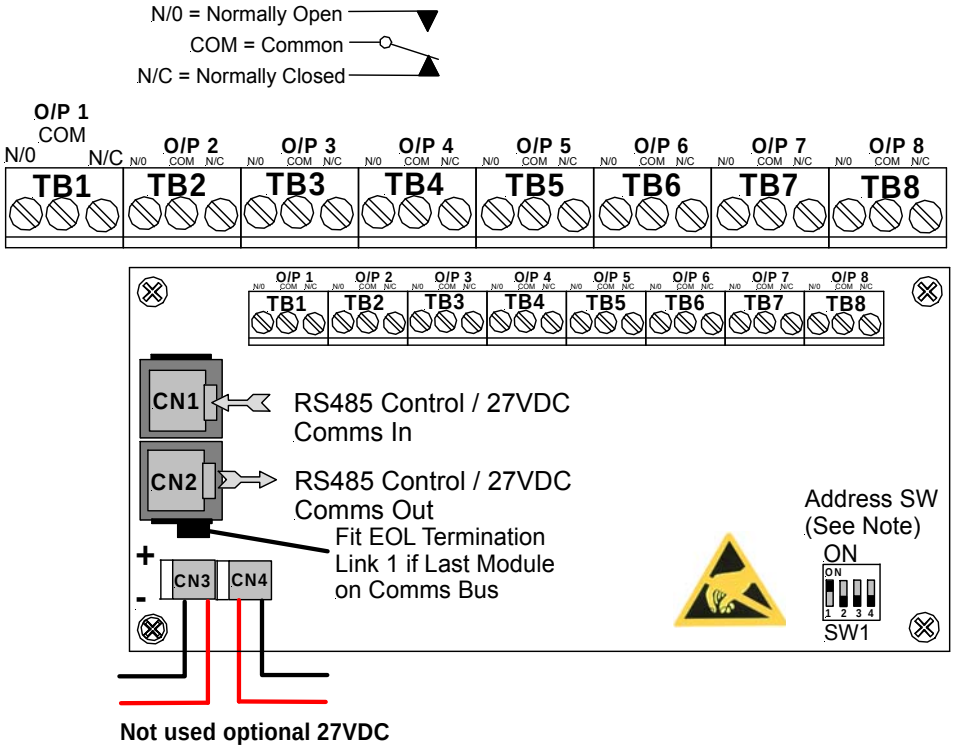


Figure 22: Internal 8 Way Relay Board Front View showing connectors and Address Switch

Relay Connections

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

☞ **Note:** *See Section 10 for Addressing Details (SW1)*

5.7.2 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.*

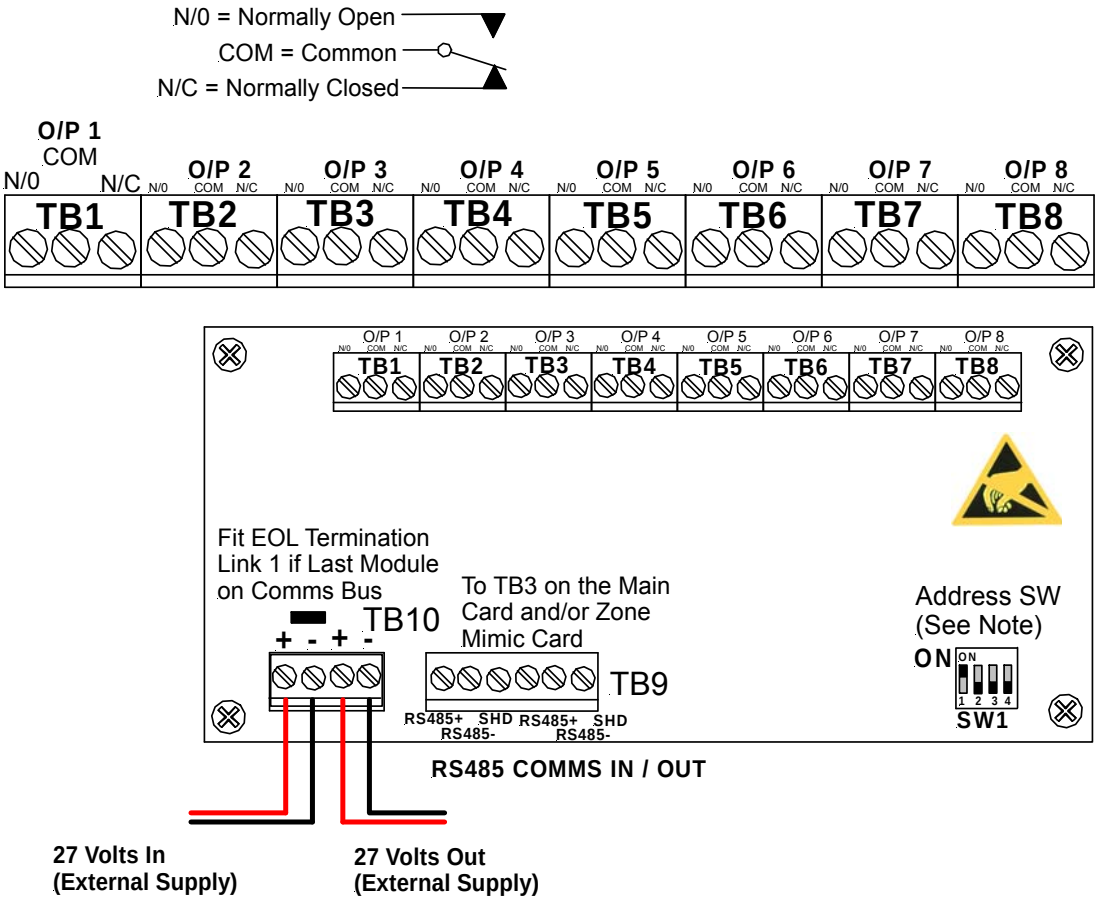


Figure 23: Remote 8 Way Relay Board Front View showing connectors and Address Switch

Relay Connections

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

Communications Connections

Terminal	Function	
TB9	RS485+ RS485- Shield	Communications In
TB9	RS485+ RS485- Shield	Communications Out

☞ **Note:** *See Section 10 for Addressing Details (SW1)*

5.8 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 27VDC / 500mA and requires a 10KΩ End of Line (EOL) resistor regardless of whether or not a sounder is wired to the circuit.

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.*

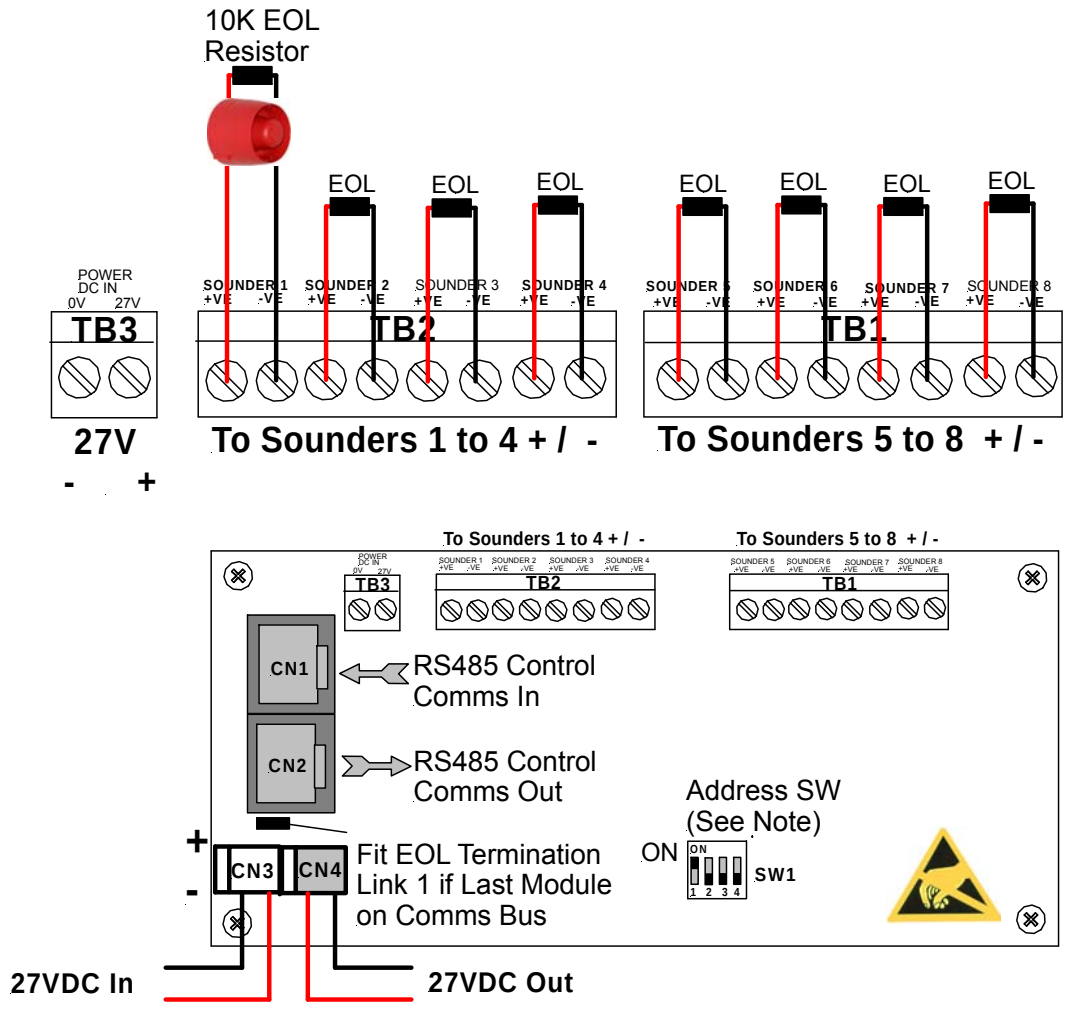


Figure 24: 8 Way Sounder Board Front View showing connectors and Address Switch

Maximum Current per Output: 750mA.

A +27VDC external power supply feed is required

In addition filtering and protection devices are used to reject transients.

Connections

Terminal/s	Function	
TB1 to 2	+ve	Sounder 1 to 8
	-Ve	
TB3	0V	Power DC IN
	27V	

☞ **Note:** *See Section 10 for Addressing Details (SW1)*

5.9 Conventional Network Board

The Conventional Network Board (CNB) facilitates connection between FACP's via a conventional network in a Master/Slave configuration. Only one CNB may be configured per FACP. The board may be configured as a master by enabling the "Global" attribute for the CNB in LoopMaster otherwise it operates as a slave; Only one Master may be configured on a network and a separate configuration file is required for each node on the conventional network.

There are three I/O connections on the board which facilitate network switching communication – Silence, Reset and Alarm. These I/O all operate as both inputs and outputs on the network and are connected in parallel with each CNB. There is also a DC output for supply of DC power to external devices and a slave Zone output for connection to a Fire input on the master FACP. Connection between Master and Slave CNB's are as follows:

Master CNB	Slave 1 CNB	Slave 2 CNB
Alarm	Alarm	Alarm
Silence	Silence	Silence
Reset	Reset	Reset
Fire Input 1	Slave 1 Zone Output	
Fire Input 2		Slave 2 Zone Output

The Zone output on the Slave CNB's may be mapped to any of the available Fire inputs on the Master including Loop, Add-on and panel fire inputs.

The Alarm line on the CNB is activated when the attached FACP has a Fire or Evacuate condition which is. The CNB also detects activation of this line and activates a Conventional Network Alarm on the attached FACP. The Conventional Network Alarm is not a fire condition and is displayed as a system status on the default screen. The Conventional Network Alarm can also be programmed as a System Input in LoopMaster C&E to drive any sounder or other outputs within the system.

The Silence line is activated momentarily when the Silence/Resound control is pressed at the connected FACP. When a transition of the Silence line is detected by the other CNBs on the network the connected FACP shall perform a Silence or Resound function depending on the state of the silence-able outputs on the FACP.

The Reset line is supported differently depending on if the CNB is configured to be Global (Master) or Local (Slave):

Global Reset:

If the Master Reset control is invoked at the Master FACP, the Reset line at the attached master CNB shall be activated momentarily; this Reset transition shall be detected by all slave CNBs on the network and a Master Reset shall be performed on all slave FACP's provided that there is an active Fire or Evacuate condition at the slave FACP and the Alarm line is not active.

Local Reset:

If the Master Reset control is invoked at any Slave FACP, the slave CNB shall not affect the Reset line on the network. Only the local Master Reset shall be performed at the panel at which it is invoked.

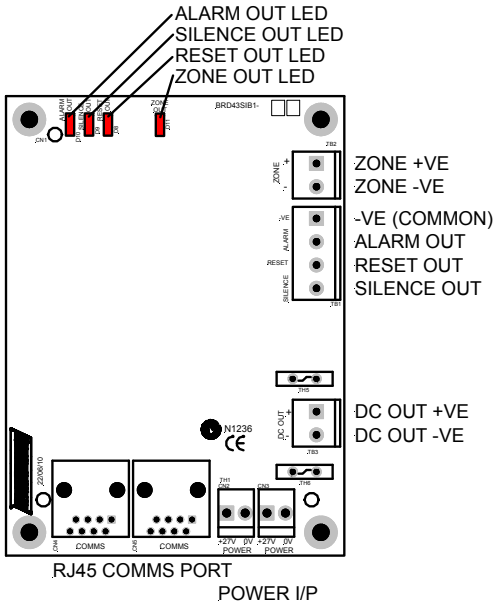


Figure 25: Conventional Network Board

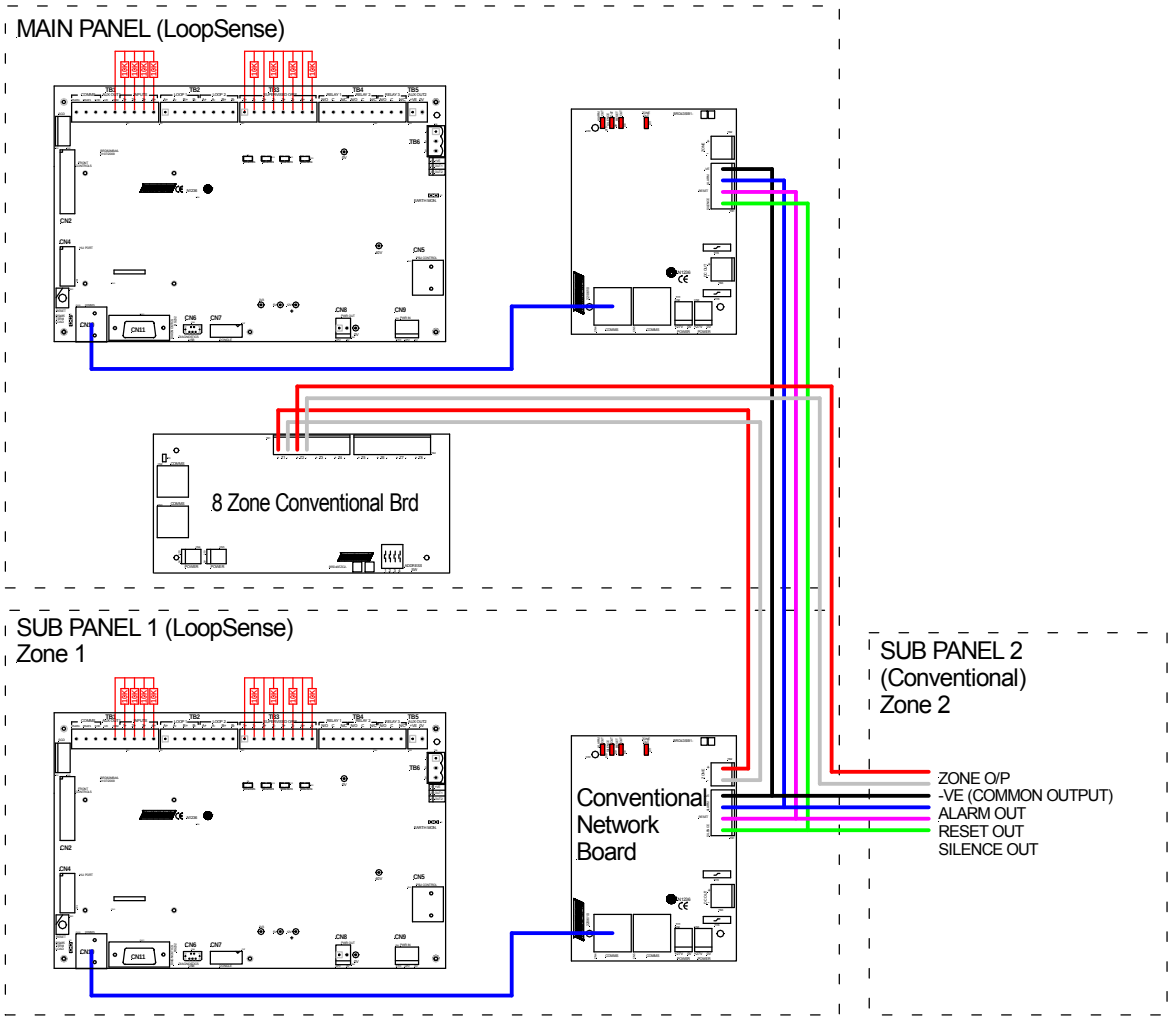


Figure 26: General Wiring Singapore Interface Board

5.10 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 complies with AS4428 and designed for use with the ***LoopSense*** series of FACP's.

- 4 line by 40 character LCD with backlight and navigation keys ▲ ▼ keys allow the SmartTerminal to be used for FACP operation and interrogation. Note the backlight is only energised when alarms are present, a key has been pressed or controls enable key switch is enabled
- Buzzer and system Reset.
- System expansion capabilities / options:
- A wide range of secure user functions. This includes the ability to isolate / de-isolate a large number of system functions.
- Flush or surface mountable enclosure.
- Controls have tactile and audible feedback of operation.
- All terminals cater for 2.5mm cables.
- 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.

5.10.1 Overview

SmartTerminal essentially consists of two PCBs;

1. SmartTerminal Termination Board. A Termination Board is mounted in each SmartTerminal to protect and interface the RS485 communications and 27VDC supply to the LCD Board
2. BRD82ICC2 – Control, LCD Communications and LCD Driver Board

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

5.10.2 Mechanical

SmartTerminal can be supplied in three variants Slim Line ABS (externally powered) BX1 ABS (externally powered) and BX1 ABS (internally powered) and consists of;

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

- 1 X Termination Board
- 2 X ABS door keys
- 2 X 003 Enable / Disable keys
- 2 X Jumper links
- 2A Power Supply only if internally powered

☞ **Note:** A Communications Extender Board will be required if the Comms Bus in the FACP is fully utilised and / or if one is not fitted.

The front door of the ABS version is locked by way of two clips on the right hand side of the cabinet. A special locating key which has two raised pins that are inserted into the side of the cabinet unlocks the door.

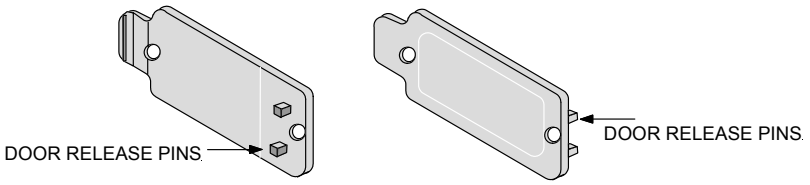


Figure 27: ABS Door Key and Front Panel Add On Card Surround Release Clip

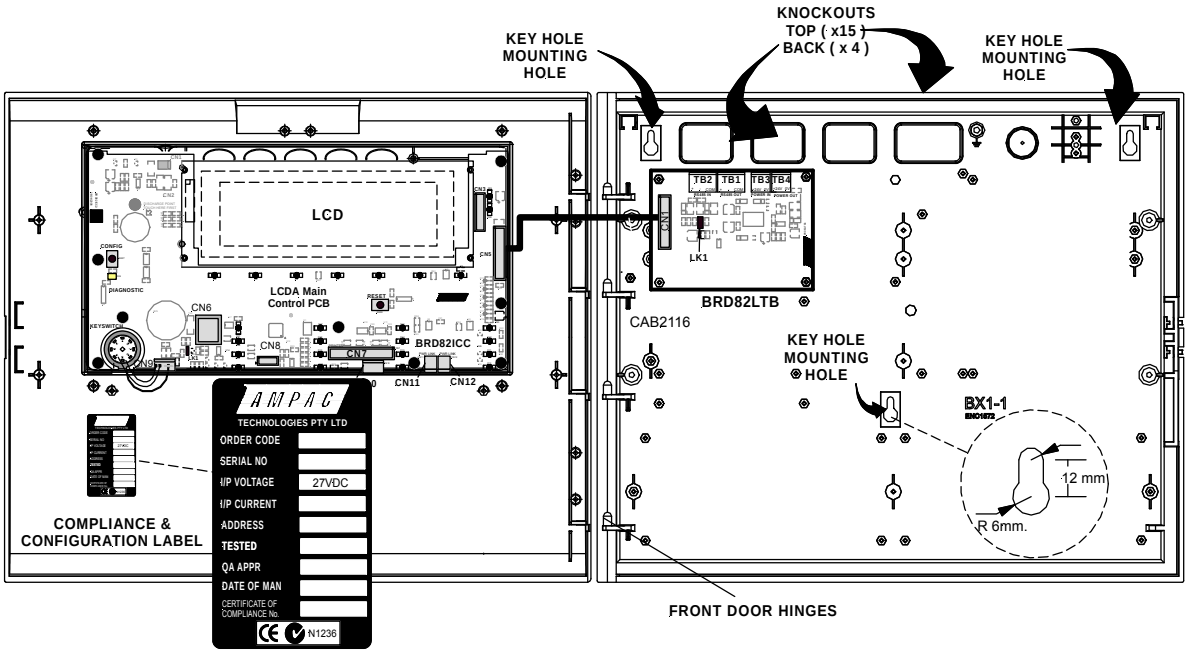


Figure 28: Typical Layout (Externally Powered) and Location of Keyholes

5.10.3 Installation & Cabling

SmartTerminal is connected to the FACP as shown below.

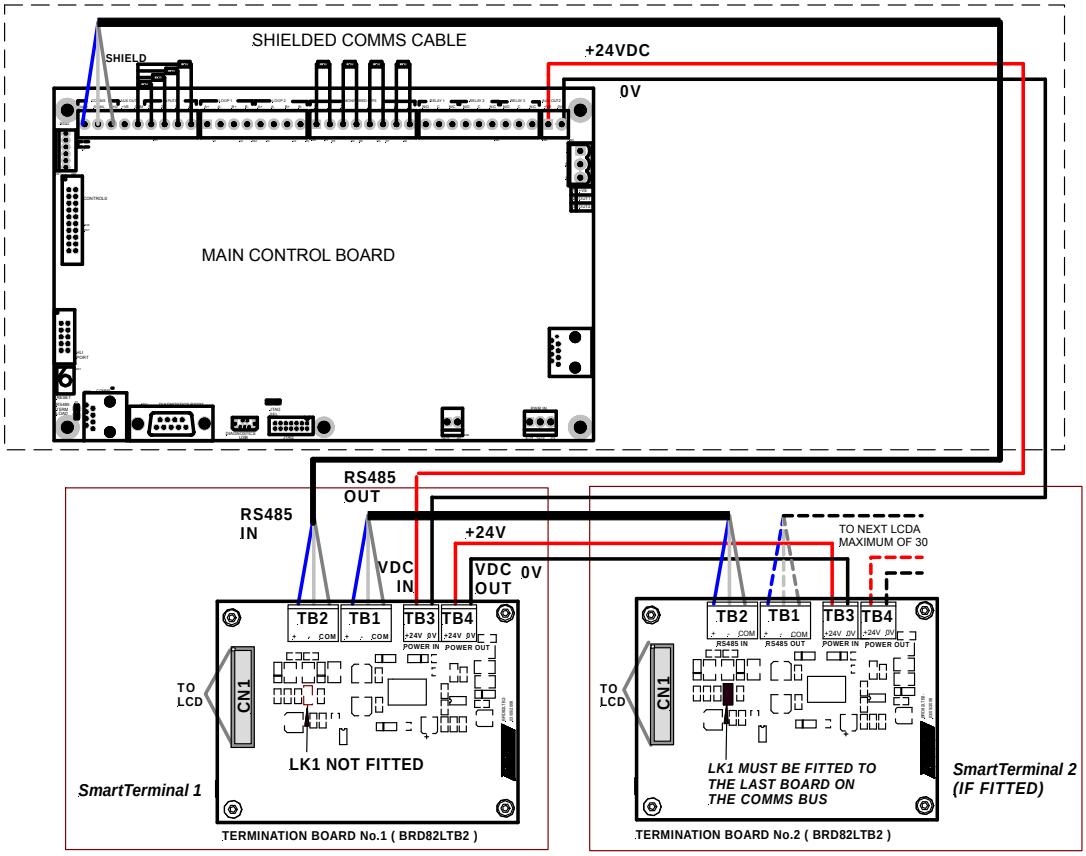


*Figure 29: Connecting **SmartTerminal's** to the FACP*

5.10.4 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.*

5.10.5 Operation

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

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

Power Up

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

Normal

The Normal state is entered from the “Power-up” or a return from the “Fault” state and is displayed on the LCD if the ***SmartTerminal*** is communicating with the FACP and operating correctly. In this state the front panel Power indicator is illuminated.

Fault

SmartTerminal enters the Fault state upon;

- A hardware failure
- LCD module failure or
- A loss of communications with the FACP (indicated by the “DIAGNOSTIC” LED – not flashing and the “no communications “ message being displayed)

In a Fault condition the front panel NORMAL indicator is extinguished and the details of the fault are displayed on the LCD. The FACP will also indicate a fault in a similar manner.

Access levels

There are two levels of access.

Access level 1 only the Acknowledge, Previous and Next front panel controls are operative. All other controls operate in access level two.

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

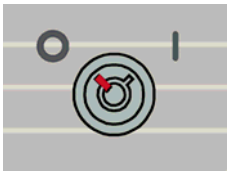


Figure 30: Keyswitch in the Disabled Position

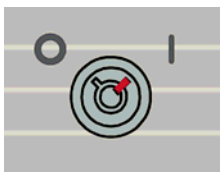


Figure 31: Keyswitch in the Disabled Position

5.10.6 *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.

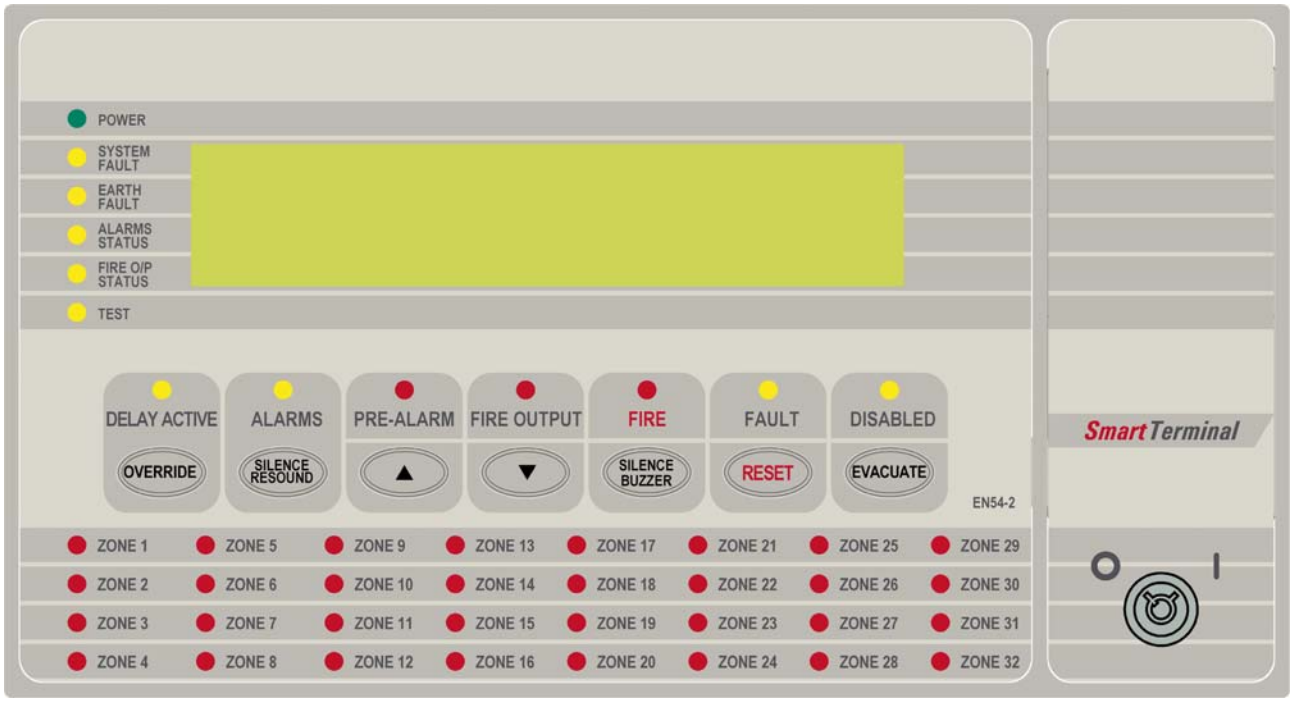


Figure 32: SmartTerminal Front Panel Layout

5.10.7 *SmartTerminal* Screen Format

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

1. Fire
2. Faults
3. Disables.

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

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

FIRE: If configured the screen format for reporting 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:

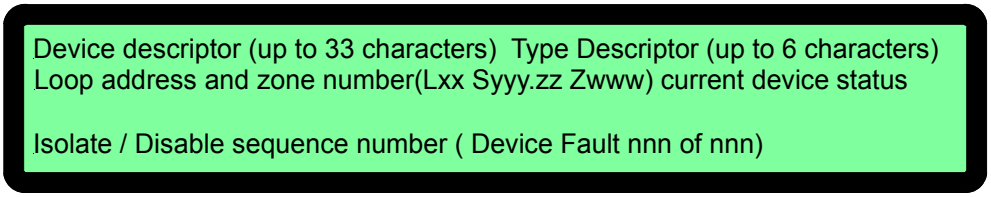
```
Device descriptor (up to 33 characters)  Type Descriptor (up to 6 characters)
Loop address and zone number(Lxx Syyy.zz Zwww) current device status

Fault sequence number ( Device Fault nnn of nnn)
```

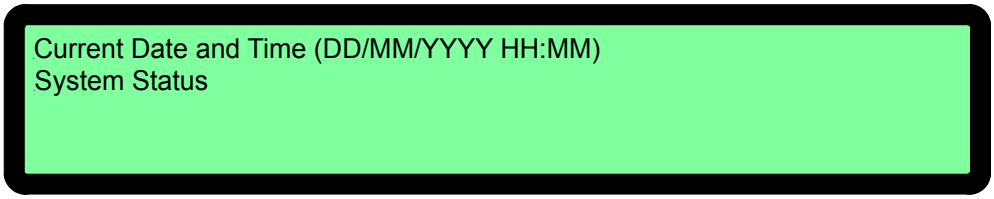
☞ **Note:** *The fault types only relate to devices.*

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:

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



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

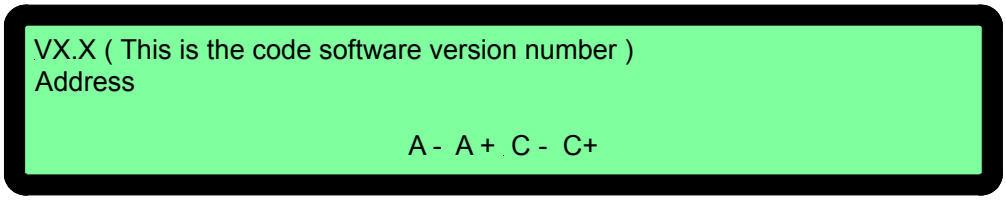


The screen is only displayed when there are no alarms, fault or disables on the panel.

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



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

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

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

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

5.11 Printer

Specifications

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

5.11.1 Indicators and Buttons

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

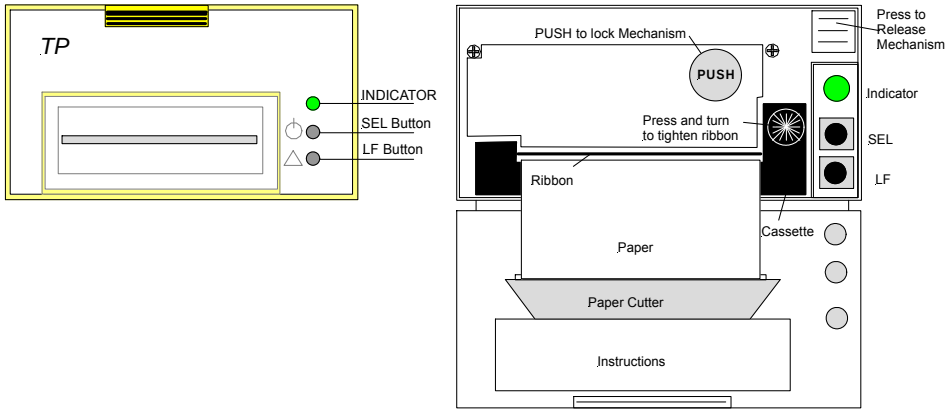


Figure 33: Printer Front Panel Layout (Front Cover Closed / Open)

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.

5.11.2 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.

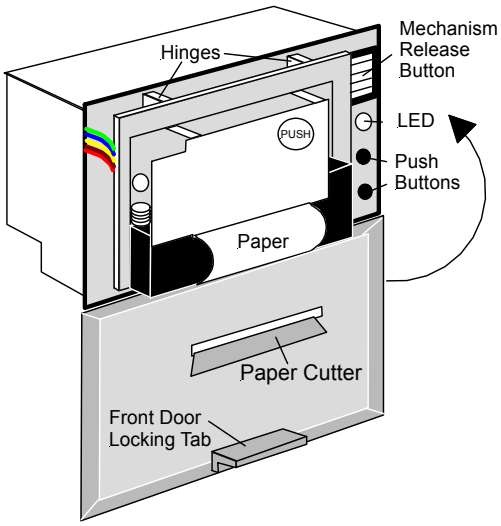


Figure 34: Paper Access

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.

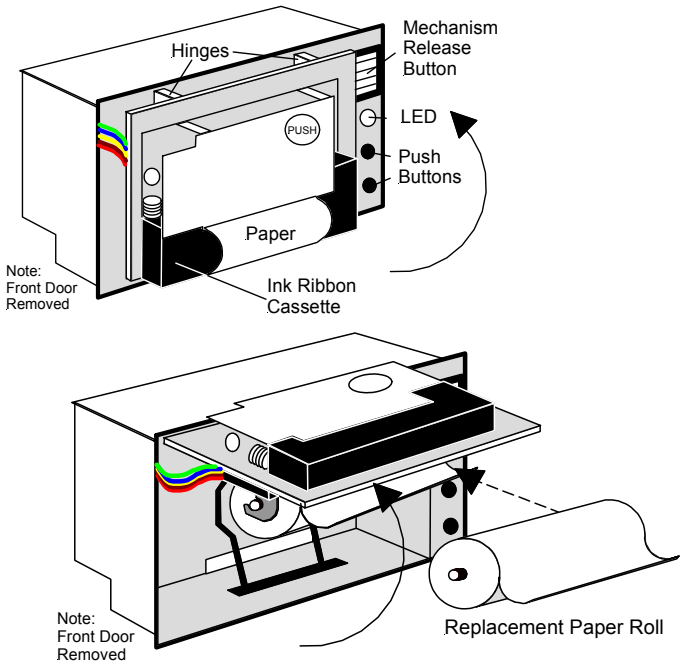


Figure 35: Head Mechanism Rotation and Paper Roll Removal / Insertion

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.*

5.11.3 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 Main Board,
- Jumper links required to set the programmed print modes; and
- Printer 5 volt DC Power Supply.

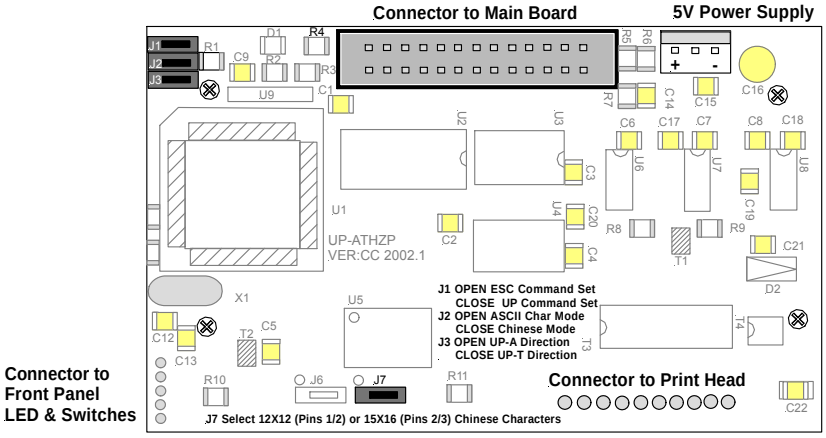


Figure 36: PCB Layout

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 Pins 2 and 3	Selects the 15 X 16 Font

5.11.4 Printer 5 Volt Power Supply (BRD42PVCB1)

27 volts DC is taken from Brigade / PSU Monitor Board and fed to CN1 of the 5volt Printer Power Supply Board. It is this board that drops this voltage from 27volts to 5volts for use by the Printer.

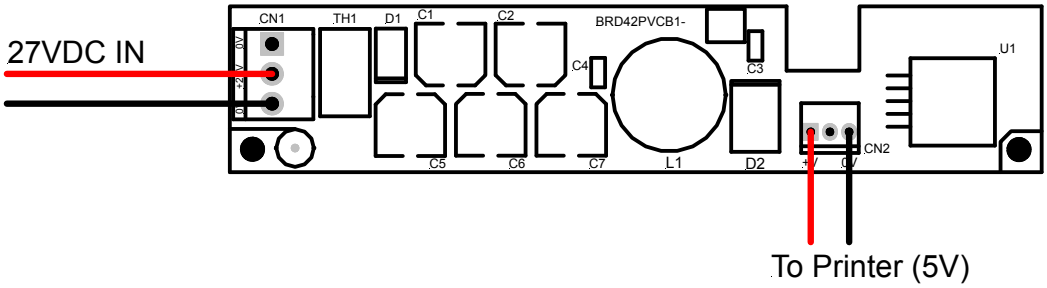


Figure 37: Printer Power Supply Board Layout

6. Compatible Devices

Auto Learn Default	Device Type	Displayed Type (19 chars)	Type Descriptor
	Optical		
✓	XP95 Optical	XP95 PHOTO	PHOTO
	XP95 Optical with base sounder	XP95 PHOTO + SNDR	PHOTO
	XPander Optical	XPANDER PHOTO	PHOTO
✓	Discovery Optical	DISC PHOTO	PHOTO
	Discovery Optical with base sounder	DISC PHOTO + SNDR	PHOTO
	S90 Optical	S90 PHOTO	PHOTO
	Xplorer Optical	XPLORER PHOTO	PHOTO
	Xplorer Optical with base sounder	XPLR PHOTO + SNDR	PHOTO
✓	XP95 Multisensor	XP95 MULTISENSOR	MULTI
	XP95 Multisensor with base sounder	XP95 MULTI + SNDR	MULTI
	XPander Multisensor	XPANDER MULTI	MULTI
✓	Discovery Multisensor	DISC MULTISENSOR	MULTI
	Discovery Multisensor with base sounder	DISC MULTI + SNDR	MULTI
✓	Enhanced Discovery Multisensor	EDSC MULTISENSOR	MULTI
	Enhanced Discovery Multi + base sounder	EDSC MULTI + SNDR	MULTI
	XP95 Beam	XP95 BEAM	PHOTO
✓	XP95 Reflective beam	XP95 REFLECT BEAM	BEAM
✓	XP95 Flame	XP95 FLAME	FLAME
	Heat Detectors		
✓	XP95 Heat	XP95 HEAT	HEAT
	XP95 Heat with base sounder	XP95 HEAT + SNDR	HEAT
	XPander Heat	XPANDER HEAT	HEAT
✓	XP95 Hi temp	XP95 HI HEAT	HHEAT
	XP95 Hi temp with base sounder	XP95 HI HEAT + SNDR	HHEAT
	XPander Hi temp	XPANDER HI HEAT	HHEAT
✓	Discovery Heat	DISC HEAT	HEAT
	Discovery Heat with base sounder	DISC HEAT + SNDR	HEAT
	S90 Heat	S90 HEAT	HEAT
	Xplorer Heat	XPLORER HEAT	HEAT
	Xplorer Heat with base sounder	XPLR HEAT + SNDR	HEAT
	Xplorer Hi temp	XPLORER HI HEAT	HHEAT
	Xplorer Hi temp with base sounder	XPLR HI HEAT + SNDR	HHEAT
	Ionisation		
✓	XP95 Ion	XP95 ION	ION
	XP95 Ion with base sounder	XP95 ION + SNDR	ION
✓	Discovery Ion	DISC ION	ION
	Discovery Ion with base sounder	DISC ION + SNDR	ION
	S90 Ion	S90 ION	ION
✓	Discovery Carbon Monoxide	DISC CO	CO
	Discovery Carbon Monoxide with base sndr	DISC CO + SNDR	CO
	Manual Call Points		
✓	XP95 MCP	XP95 MCP	MCP
	XPander MCP	XPANDER MCP	MCP
	XP95 Mini switch monitor with interrupt	XP95 MINI SW + INT	MCP

✓	Discovery MCP	DISC MCP	MCP
✓	S90 MCP	S90 MCP	MCP
	Xplorer MCP	XPLORER MCP	MCP
	Sounders		
✓	XP95 sounder / sounder control unit	XP95 SOUNDER	SNDR
	XPander sounder	XPANDER SOUNDER	SNDR
	XP95 integrated base sounder	XP95 INTGR BSE SNDR	SNDR
	XP95 Intelligent base sounder	XP95 INTEL BSE SNDR	SNDR
	XP95 sounder beacon base	XP95 SND BEACN BSE	SNDR
	XP95 loop powered beacon	XP95 LOOP PWR BEACN	SNDR
	S90 sounder control unit	S90 SCU	SNDR
✓	Discovery sounder beacon base/open area	DISC SOUNDER BEACN	SNDR
	I/O Units		
✓	XP95 input / output module	XP95 I/O	I/O
	XPander I/O (Relay) Unit	XPANDER I/O	I/O
	XP95 three channel input / output module	XP95 3I/O	I/O
	XP95 output module	XP95 OUTPUT	I/O
	XP95 mains switching input / output module	XP95 MAINS I/O	I/O
	S90 single channel I/O unit	S90 SINGLE I/O	I/O
	S90 3 channel I/O unit	S90 3I/O	I/O
	S90 3 channel analogue I/O unit	S90 3I/O + ANALOGUE	I/O
	S90 switch monitor unit	S90 SWITCH	I/O
	Xplorer output module	XPLORER OUTPUT	I/O
	Zone Monitors		
✓	XP95 zone monitor	XP95 ZONE MONITOR	CONV
	XPander Loop Interface	XPANDER INTERFACE	RADIO
	S90 zone monitor	S90 ZONE MONITOR	CONV
✓	XP95 switch monitor	XP95 SWITCH	SWITCH
	XP95 mini switch monitor	XP95 MINI SWITCH	SWITCH
	XP95 switch monitor plus	XP95 SWITCH PLUS	SWITCH
✓	FastSense XP95 APIC	XP95 FASTSENSE	FSENSE

7. 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) / 24 x 0.8		=	Amps
2.	**Add**	Quiescent Current of the System (Iq)	=	Amps
3.	**Add**	the extra current that is drawn when in alarm (Ia.)	=	_____Amps
4.		Minimum Current Rating of Power Supply is	=	_____Amps

☞ **Note:** *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

Panel Configuration	*Criteria* Iq Calculation No Off	X mA	= Iq	*Example* Iq Calculation No Off	X mA	= Iq
Basic 1 Loop Panel		115		1	115	**115**
Basic 2 Loop Panel		135				
Interface Cards/Boards						
8 Zone Conventional (3K3 EOL)		70				
32 Zone Alarm Mimic Card		3.6				
8 Way Switch & Indicator Card		3.6				
Zone Disable & Indicator Card		3.6				
8 Way Relay Board		2.4				
8 Way Sounder Board		5.6				
Conventional Network		9				
Printer		1000				
SmartTerminal		12.4		1	12.4	**12.4**
Loop Devices (using Loop calc)						
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	= Ah above / 24 x **e**	= 1.054 / 24 x e
	= A	= .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

8. Maintenance and Trouble Shooting Chart

8.1 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.*

8.2 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 Authorised Distributor
Alarms Status	Make sure you have a 10KΩ EOL resistor fitted and a diode (1N4004) in series with any sounders
Battery Cable Fault	Refer section 3.8.2
Charger Low Condition	Refer section 3.8.3

9. 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

10. Address Setting

BINARY ADDRESS SETTING (APOLLO)

SERIES XP95 - ADDRESS DATA

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

DIL switch setting		DIL switch setting		DIL switch setting		DIL switch setting		DIL switch setting	
Address	1234567	Address	1234567	Address	1234567	Address	1234567	Address	1234567
1	1000000	26	0101100	51	1100110	76	0011001	101	1010011
2	0100000	27	1101100	52	0010110	77	1011001	102	0110011
3	1100000	28	0011100	53	1010110	78	0111001	103	1110011
4	0010000	29	1011100	54	0110110	79	1111001	104	0001011
5	1010000	30	0111100	55	1110110	80	0000101	105	1001011
6	0110000	31	1111100	56	0001110	81	1000101	106	0101011
7	1110000	32	0000010	57	1001110	82	0100101	107	1101011
8	0001000	33	1000010	58	0101110	83	1100101	108	0011011
9	1001000	34	0100010	59	1101110	84	0010101	109	1011011
10	0101000	35	1100010	60	0011110	85	1010101	110	0111011
11	1101000	36	0010010	61	1011110	86	0110101	111	1111011
12	0011000	37	1010010	62	0111110	87	1110101	112	0000111
13	1011000	38	0110010	63	1111110	88	0001101	113	1000111
14	0111000	39	1110010	64	0000001	89	1001101	114	0100111
15	1111000	40	0001010	65	1000001	90	0101101	115	1100111
16	0000100	41	1001010	66	0100001	91	1101101	116	0010111
17	1000100	42	0101010	67	1100001	92	0011101	117	1010111
18	0100100	43	1101010	68	0010001	93	1011101	118	0110111
19	1100100	44	0011010	69	1010001	94	0111101	119	1110111
20	0010100	45	1011010	70	0110001	95	1111101	120	0001111
21	1010100	46	0111010	71	1110001	96	0000011	121	1001111
22	0110100	47	1111010	72	0001001	97	1000011	122	0101111
23	1110100	48	0000110	73	1001001	98	0100011	123	1101111
24	0001100	49	1000110	74	0101001	99	1100011	124	0011111
25	1001100	50	0100110	75	1101001	100	0010011	125	1011111
								126	0111111

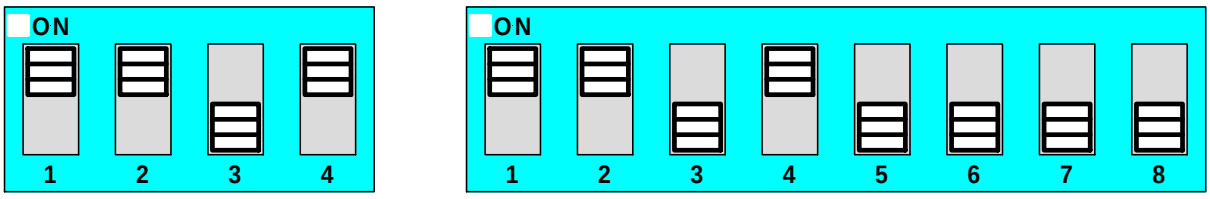


Figure 38: 4 and 8 way Switch addressing set to Address 11

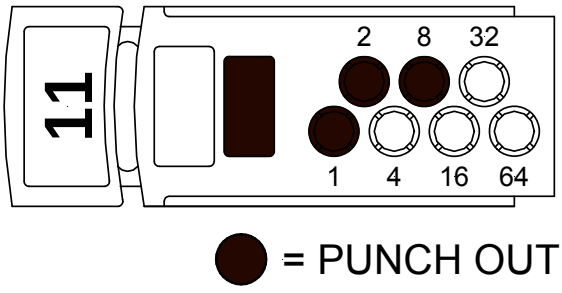


Figure 39: Xpert Card addressing set to Address 11

11. Specifications

	Metal
Standard	
CP10:2005 & EN54-2&4	PSB Approved
Mechanical	
Dimensions Cabinet: (mm)	500 (H) x 450 (W) x 155 (D)
Environmental	
Temperature:	0ºC to + 40ºC
Humidity:	25% to 95%
Mains Input	
Input Voltage:	204 - 264VAC
Protection (Quick Acting Fuse):	2Amp M205
Minimum Cable Requirements:	Not less than 0.75mm²
Power Supply	
Voltage with Mains connected:	25 – 29VDC
Power Supply Ripple Voltage:	<100mV
Power Supply Fault Indication	
Volts High (at room temperature)	28VDC
Volts Low	26.5VDC
Power Supply Output Current:	3Amps
Imax A	3Amps
Protection	Current Limiting
Batteries / Battery Charger	
Charger O/P Voltage (Temp compensated):	26.6-28.1VDC (27.3VDC nom)
Approved LPCB Battery:	Enersys NP18-12R
Battery Type:	2x12V Sealed Lead Acid
Max Battery Capacity:	17AH
Max Charger Current Limited:	600mA
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

NOTES:

UNCONTROLLED DOCUMENT

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