

Premier Elite

FIRE ALARM CONTROL PANEL

Instruction Manual: 4-8 zone F.A.C.P.

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Introduction

The Premier Elite 4 to 8 zone panels have been designed to meet the requirement of an easy to use fully functional fire alarm control panel.

It is available as either a 4 zone panel, 6 zone panel or an 8 zone panel.

Each version has 2 sounder circuits, an alarm relay , and a fault relay.

The sounder circuits can have a programmable delay set.

There is an option to add a zonal output board, which can be used to drive zonal relays, or a hard wired repeater panel.

There is no configuration, simply connect the detectors & sounders and apply power.

The Premier Elite range also includes a low cost 1 & 2 zone version These panels are NOT covered in this manual. They have a separate manual.

Mains & Battery

Connecting the mains.

The Mains supply to the FACP is fixed wiring, using **Fire resisting** 3-core cable (Between 1 mm² and 2.5mm²) or a suitable 3-conductor system, fed from an isolating double pole switch fused spur, fused at 3A. **IT SHOULD NOT BE CONNECTED THROUGH AN RCD.** This should be secure from unauthorised operation and be marked 'FIRE ALARM: DO NOT SWITCH OFF'. The supply must be exclusive to the Fire Panel. **MAKE SURE ANY SPARE ENTRY HOLES ARE COVERED WITH THE GROMMETS PROVIDED**

Connecting the batteries

The Premier Elite requires 2 x 12 V sealed lead acid (SLA) batteries

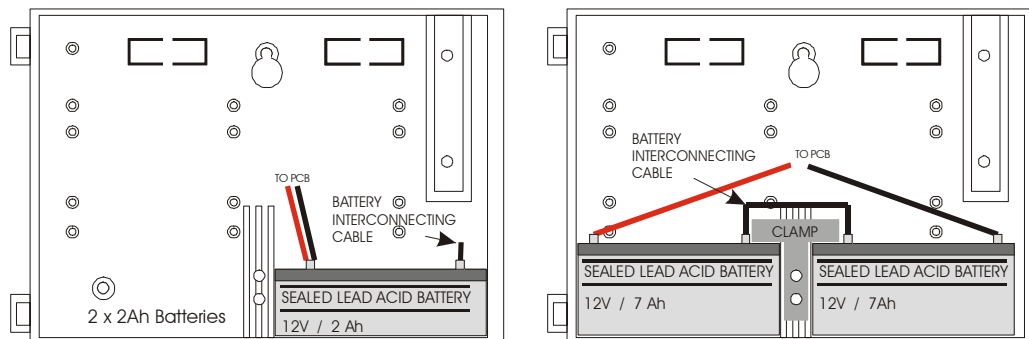
The two batteries are wired in **series**.

The **+ve** of one battery is connected to the **red** battery lead.

The **-ve** of the other battery is connected to the **black** battery lead.

The **-ve** of the first battery is connected to the **+ve** of the second battery using the link wire supplied.

Although there are many sizes of suitable battery, the sizes we usually recommend are 12V 2Ah for standard backup, or 12V 7Ah for extended backup (72 hour or more) , and the enclosure has been designed to hold these two battery sizes.



Charger Short Circuit Protection

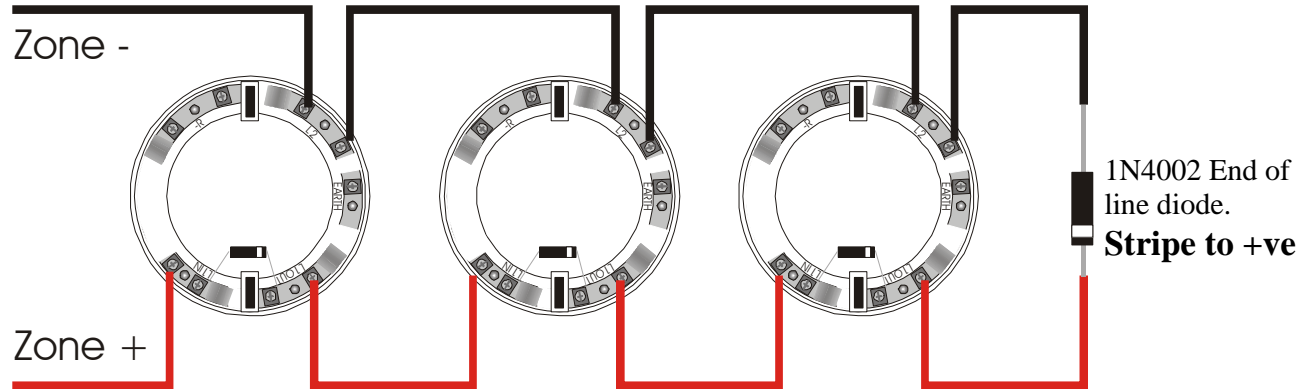
The Premier Elite has an intelligent charger, that senses if too much current is being drawn (for instance in the case of totally discharged batteries, or the charger leads being shorted together). In such an event, the Premier Elite 4-8 zone panel will turn off the power to its charger circuit.

The panel also turns off the charger when the batteries are disconnected.

Detectors & sounders

Wiring the detectors

The Premier Elite has been designed to use a 1N4002 diode end of line on the detector zones.



When common bases are used, call points should be connected to the start of the zone, so that removing a detector head will not remove power from the call points.

Diode Bases

The Premier Elite 4-8 zone can also be used with diode bases. Diode bases allow call points & detectors to be mixed on the same zone without any restrictions. The diode (also known as a continuity diode) passes power to the downline detectors and call points, if a detector head is removed for any reason.

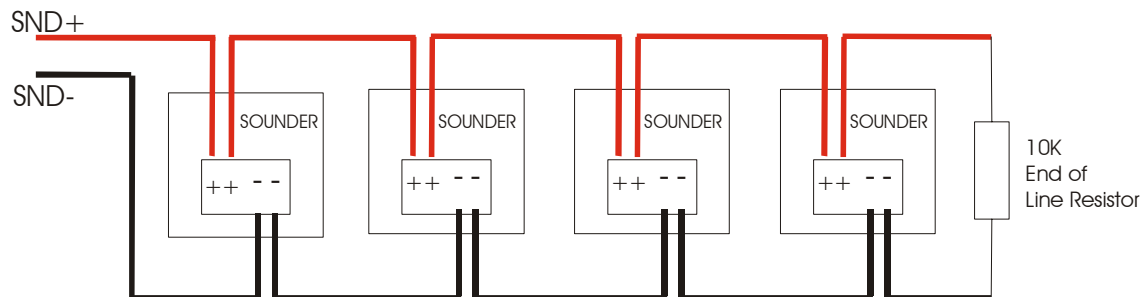
Zone Short Circuit Protection

The Premier Elite 4-8 zone panel has a higher zone output current than the 1-2 zone panels. This is to allow them to drive larger zones, and zone powered beam detectors etc.

In order to protect the panel in the event of an overload, the panel will turn off the zone voltage if the current in that zone exceeds 70mA. The panel will then try to restart the zone during the next "Open circuit monitoring cycle". These occur once every 60 seconds.

Wiring the sounders

The Premier Elite has 2 sounder circuits, each rated at 400mA. Each sounder circuit must be fitted with a 10k end of line resistor

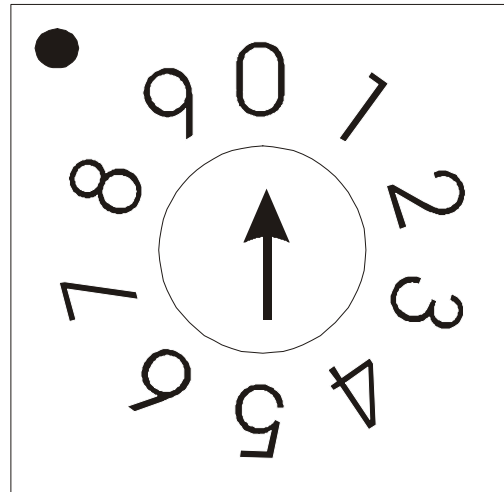


Setting a Sounder Activation Delay

On the Premier Elite there is the option to delay the sounder activation in the event of a fire. This might be useful in schools or clubs where the responsible person might want to verify the alarm, before having a “mass evacuation” of the building. A false alarm can be reset before the sounders operate. If it is a true alarm, the sounders can be started before the timer finishes by pressing the DELAY OVERRIDE BUTTON.

To set a delay open the panel door using Alan Key provided and set switch 7 (SW7) using a terminal screw driver to the delay required

SW7 Setting	External sounder delay in minutes
0	No delay
1	1 minute
2	2 minutes
3	3 minutes
4	4 minutes
5	5 minutes
6	6 minutes
7	7 minutes
8	8 minutes
9	9 minutes



When a delay is set, the panel will show GENERAL DISABLEMENT and DEL (sounder DELay)

Other Connections

The Premier Elite also has the following connections:-

Fire Relay

The Premier Elite has one volt free change over relay that operates on an alarm. It is rated at 1Amp, SELV. The relay remains operated until the panel has been reset.

Fault Relay

The Premier Elite has one volt free change over relay that operates on any fault condition. The Relay is Normally energised, so that it gives a signal in the event of total power failure (Mains & Battery back-up). It is rated at 1Amp, SELV. The relay remains operated until the fault has been cleared.

Class Change Input

The class change input on a Premier Elite 4-8 zone F.A.C.P. will remotely operate the sounder circuits.

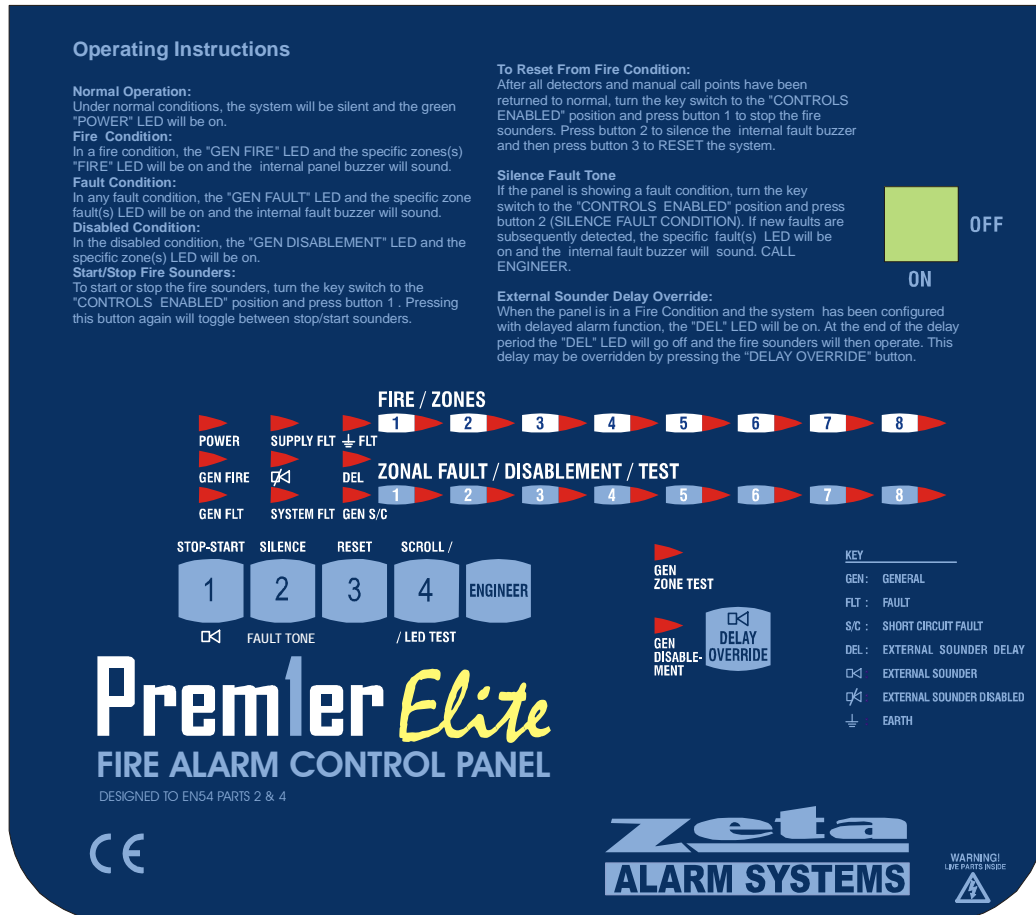
The Class change terminals should be connected to a normally open contact, that closes when the sounders are required to sound.

Historically it was used to ring bells in school momentarily to signal end of lessons, and lunch break.

It can also be used as a simple way of linking 2 control panels. You would link from the fire relay on one panel to the class change on the other, and vice versa.

Display & Controls

Here is the fascia for the Premier Elite.



It should be noted that the Yellow zonal indication LEDs are used to indicate several conditions. They are used for:-

- Zone fault (GEN FLT will also be lit)
- Zone Disablement (GEN DISABLEMENT will also be lit)
- Zone Test (GEN TEST will also be lit)

Display

The Premier Elite has the following LED indicators:-

LEDs LIT	LED CONDITION	PANEL STATUS
POWER	CONSTANT GREEN	The panel is supplied with power, and has no faults / fires (System Normal)
GEN FLT ONLY	CONSTANT YELLOW	Problem with keyswitch connections
GEN FLT & SUPPLY FLT	CONSTANT YELLOW FLASHING YELLOW	There is a problem with either the mains supply or the battery backup
GEN FLT & EARTH FLT	CONSTANT YELLOW FLASHING YELLOW	There is a wiring problem. One of the cables is touching the earth screen.
GEN FLT & ZONAL FLT	CONSTANT YELLOW FLASHING YELLOW	There is an open circuit fault in the wiring of the zone indicated.
GEN FLT & ZONAL FLT GEN S/C	CONSTANT YELLOW FLASHING YELLOW FLASHING YELLOW	There is a short circuit fault in the wiring of the zone indicated.
GEN FLT & SND FLT	CONSTANT YELLOW FLASHING YELLOW	There is an open circuit fault in the wiring of one or both of the sounder circuits
GEN FLT & SND FLT GEN S/C	CONSTANT YELLOW FLASHING YELLOW FLASHING YELLOW	There is a short circuit fault in the wiring of one or both of the sounder circuits
GEN FLT & SYSTEM FLT	CONSTANT YELLOW CONSTANT YELLOW	A processor fault has occurred. To reset, turn keyswitch on then back off. If problem persists, consult your dealer.
GEN FIRE ONLY	CONSTANT RED	A manual evacuation has occurred. The sounders will be active.
GEN FIRE & ZONE FIRE	CONSTANT RED CONSTANT RED	A fire has occurred in the zone indicated. The sounders will be active.
GEN FIRE & ZONE FIRE & GEN DISABLE & DEL	CONSTANT RED CONSTANT RED CONSTANT YELLOW CONSTANT YELLOW	A fire has occurred in the zone indicated. The sounders have a delay set, and will become active after the programmed delay. To override the display, press delay override.
GEN DISABLE	FLASHING YELLOW (FAST–4HZ)	The panel is ready for selecting disable or test mode
GEN DISABLE	FLASHING YELLOW (SLOW–0.5HZ)	The panel is in SELECT DISABLEMENT MODE
GEN DISABLE ZONE DISABLE	FLASHING YELLOW (SLOW–0.5HZ)	The user is scrolling through zones to select which one to disable/or user has just enabled the zone.
GEN DISABLE ZONE DISABLE	CONSTANT YELLOW CONSTANT YELLOW	The indicated zone is disabled.
GEN DISABLE DEL	CONSTANT YELLOW CONSTANT YELLOW	The Sounders are delayed by the amount set on the rotary switch.
GEN TEST ZONE DISABLE	FLASHING YELLOW FLASHING YELLOW (VERY SLOW–0.25HZ)	The indicated zone is in Test Mode.

Controls

The Premier Elite has the following controls:-

BUTTON	LABEL	USE
1	START/STOP	Used to silence the sounders in an alarm, or to manually start the sounders to evacuate building
2	SILENCE FAULT TONE	Used to silence the panel's internal buzzer in a fault or alarm condition.
3	RESET	Used to return the panel to its normal condition after an ALARM condition. (Reset will not clear faults)
4	LED TEST	To check that all indicator LEDs are working. Use as part of the daily / weekly fire alarm inspection.
Engineer	ENGINEER	Used to access Disablement mode or Test Mode.
Delay Override	DELAY OVERRIDE	Used to start sounders immediately in the event of the panel having a delay to the sounders

Note that the controls can only be used after the keyswitch has been turned to the ON position.

Alarm Condition & Resetting an alarm

The Premier Elite signals an alarm by the following:-

Turn on the General Fire LED
Turn on the Zonal Fire Indicator
Turn on internal buzzer
Start any sounders connected to the panel`s sounder circuits
Activate the fire relay

What to do in the event of a fire.

1. Follow the building evacuation procedure, and check that everyone has left the building safely.
2. The building fire officer or responsible person should CAREFULLY enter the building, and locate the area of the alarm from the fire alarm panel.
3. Investigate to determine the cause of the alarm. Look for the detector in the zone in alarm that signalled the fire. The detector that signalled an alarm will have its RED ALARM LED on.
4. If a small fire is found, a suitably trained person could tackle this with a suitable fire extinguisher.
5. If a larger fire is found, leave the building immediately, and contact the fire brigade.
6. If no fire is found, make a note of the detector that signalled fire, and look for anything nearby that could be the cause of the activation, eg cooking, or use of a hot air gun etc.
7. Record findings in the fire alarm log book.

Resetting from an alarm condition

After the relevant action has been taken, the Premier Elite fire alarm panel can be reset by the following:-

- 1 Press Stop/Start sounder button (BUTTON 1). This will silence the external sounders.
- 2 Press Silence Fault Tone button (BUTTON 2). This will silence the panel`s internal buzzer.
- 3 Press the Reset button (BUTTON 3). This will return the panel to it`s normal condition.

If the panel goes straight back into alarm, then the cause of the alarm has not been cleared. This could be a detector still exposed to smoke, or a call point still in the active position. Press Buttons 1 & 2 on the panel, then investigate for a call point, or detector that still has it`s RED ALARM LED on. Reset the call point, or clear the smoke. If the problem persists, contact an engineer.

Fault display & fault-finding

The Premier Elite 4 to 8 zone panels monitor for the following faults:-

Low or failed mains (Including fuses)
Low or failed battery (Including fuse)
Detection Zone open circuit wiring fault
Detection Zone short circuit wiring fault
Detection Zone detector removed.
Sounder circuit open circuit wiring fault
Sounder circuit short circuit wiring fault
Earth Fault
System fault

Most of these faults will need to be checked by an engineer, but the system can be checked for a removed detector by the responsible person.

All faults in the Premier Elite are NON-LATCHING. IE they can not be reset with the reset button. They will clear automatically when the fault has been fixed.

The exception is a SYSTEM FAULT, which means that the processor may have crashed, and may or may not have restarted correctly.

Fault Finding

Supply fault

A power supply fault is indicative of one or more of the following faults: -

Loss of Mains power

- Check that 230V AC is present at the mains terminal block
- Check mains fuse
- Check that there is 30-34V coming from the transformer secondary
- Check charger fuse FS1.

Loss of Battery power

- Check that 2 X 12V batteries are fitted in series to give 24V backup
- Check battery fuse FS2.
- Check that battery connections are secure.
- Check that the batteries are not over 5 years old
- Check that the 2 batteries have a combined voltage of over 21V DC

Zone Fault

A Zone Fault is indicative of one or more of the following faults:-

Open Circuit fault.

- Check that the correct end of line DIODE (1N4002) has been fitted
- Check that there are no breaks in the cable, and that all screw connections are secure.
- Check that no detectors have been removed from the circuit.
- Check that all detectors are correctly fitted to their bases.
- As a cable check, remove zone wire from panel. Temporarily join the + & - cables at the end of line & Check for continuity. (If a break is found, splitting the line in half & fitting EOL will help determine which section of cable has the fault)
- As a panel check, remove cable & fit EOL at the panel. If the fault clears, the panel is working correctly.
- If a panel does not report a fault when an detector is removed, check with your supplier if the detector is compatible with the Premier Elite.

Short Circuit Fault (Gen S/C LED will be lit)

- Check that the correct end of line has been fitted (1N4002 DIODE), and check that it has not been fitted backwards. It should be fitted stripe to +ve.
- Check that no equipment, other than detectors or call points has been fitted to the zone.
- Check for shorts to the cable screen.
- Check that none of the heads have become damaged (remove one at a time).
- As a panel check, remove cable & fit EOL at the panel. If the fault clears, the panel is working correctly.

Sounder Circuit Fault

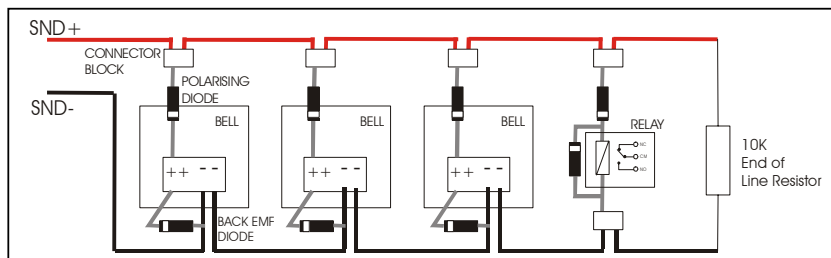
A Sounder Fault is indicative of one or more of the following faults:-

Sounder Open Circuit fault.

- Check that the correct end of line resistor (10K) has been fitted to both circuits
- Check that sounder fuses FS4 & 5 are intact.
- Check that there are no breaks in the cable, and that all screw connections are secure.
- As a panel check, remove both circuits cable & fit both EOLs at the panel. If the fault clears, the panel is working correctly.

Short Circuit Fault (Gen S/C LED will be lit)

- Check that the correct end of line has been fitted to both circuits (10k resistor)
- Check that ALL sounders, Bells etc are POLARISED, and are fitted the correct way round. (see diagram after list)
- Check for shorts to the cable screen.
- As a panel check, remove cable & fit EOL at the panel. If the fault clears, the panel is working correctly.



Note: If non-polarised alarm devices (eg some types of old mechanical bell, or a relay) are used, then a diode will have to be placed in line with the device to enable fault monitoring. They may also need a

back EMF protection diode. (symptoms: Chattering sounder relays that don't turn off).

Earth Fault

An EARTH fault indicates that something is shorting to earth (usually through the cable screen). Disconnect the earth screens one at a time to determine the problem line.

(Note: connecting other equipment , eg an oscilloscope or PC, to the panel can give an earth fault)

The voltage between battery –Ve and earth should be 14-16 volts. If it is not, the voltage should indicate what is shorting to earth.

System Fault

A system fault is an abnormal microprocessor running condition due to various unexpected phenomena.

This will result in the panel attempting to correct itself. Should this fault occur, the System Fault LED, General Fault LED, General Fault relay and fault internal buzzer will be constantly active until the control keyswitch is turned from off position to control enable position. This should cause this fault condition to reset. If not, consult your supplier.

Disablement

The Premier Elite 4-8 zone allows any zone, or the sounder circuit to be disabled to aid commissioning and assist routine maintenance work.

When a zone (or sounder cct) is disabled, the panel will not respond to any fault or fire signals it receives from that zone. This might be used if the system requires routine maintenance, and the customer needs the system to continue running, but doesn't want spurious false alarms.

The panel will respond in the usual manner to any events in any non-disabled zones.

To Programme Zone (Or Sounders) As Disabled

Any number of zones (or the sounders) can be disabled, but it is good practice to only disable one zone at a time.

Insert and turn control key to enabled position;

Press Engineer switch and the GENERAL DISABLEMENT LED will come on (flashing fast);

Press Scroll switch and the GENERAL DISABLEMENT LED will flash slowly. The panel is now in SELECT DISABLEMENT MODE.

Press scroll button again. Zone 1 DISABLEMENT LED will be lit. Continue to press scroll until the desired Zone or sounder is lit. Press the Engineer button. The GENERAL DISABLEMENT LED will be lit constantly indicating that this zone (or sounder) is now disabled.

If more than one zone needs to be disabled, then press scroll again until the required zone is selected.

If the panel needs to be taken out of SELECT DISABLEMENT MODE (eg to silence a fault on another part of the system), turn the keyswitch off, then back on again.

Once all the work has been done the zones need to be enabled again. If the panel is still in SELECT DISABLEMENT MODE, jump to paragraph 8, otherwise, turn the keyswitch to controls enabled, press engineer button (GENERAL DISABLEMENT LED will flash fast). Press scroll and it will return to being on steady. The panel is now in SELECT DISABLEMENT MODE

Press the scroll button until the disabled zone has been selected. Press engineer button. Scroll to any other disabled zone and enable in the same way. When all zones are enabled again, the GENERAL DISABLEMENT LED will flash slowly. Turn the keyswitch to off to return the system to normal.

Test Mode

To aid commissioning and assist routine maintenance check, a non-latching 'one man test' facility is available.

When a detector or manual call point is triggered on any zone in Test, the Alarm sounders operate for approximately seven seconds on and seven seconds off. This cycle continues until the cause of the Alarm is removed (either by the test smoke clearing from the detector or the manual call point being reset), at which point, the detector circuit also automatically resets.

Should an Alarm occur on a zone that is not programmed to test, the Alarm will be processed in the normal way. The testing of the zone in test will temporarily be suspended until the Alarm(s) from the other zones are reset. At this point, zone retesting may resume.

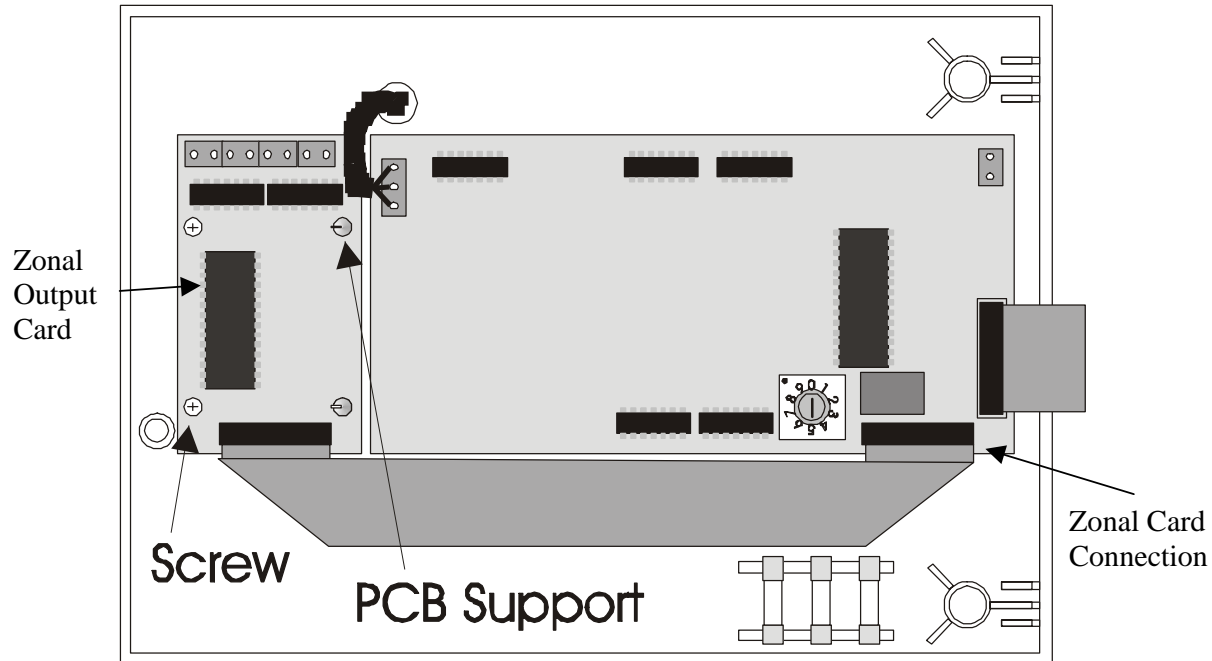
To Programme Zone In Test

NOTE: Only **one zone** can be programmed in test at any one time.

1. Insert and turn control key to enabled position;
2. Press engineer switch until the General Zone test LED is on (flashing fast);
3. Enter Engineer Code 4114 and then the General Zone Test LED is on (flashing slow);
4. Press scroll switch and Zone one fault LED will flash in synchronisation with the General Zone test;
5. Press scroll button to the desired Zone for test. Once the desired Zone LED is flashing, this Zone is now in test mode.
6. Once testing of that zone is completed, press scroll button to move to another Zone or turn the control key switch to off position to exit test mode.

Optional Repeater Driver

The Premier Elite has a connection to fit an optional Zonal Output Card. The card fits next to the display PCB on the fire alarm panel door.



This can either be used in two ways:-

- 1 As a stand alone board that has zonal 29 Volt outputs, suitable for connecting relays etc.
- 2 It can be used to drive a hard wired repeater panel. The panel would need the following connections to the repeater:-

+V – Supply Voltage
0V – Supply ground
GA – General Alarm signal
CF – Common Fault Signal
TN – Buzzer Active Signal (tone)

It will also need 1 connection per zone.

Battery Calculation

Here are the current consumption of the Premier Elite panels in various conditions:-

Control Panel Model	Mains Fail, buzzer sounding	Mains Fail, buzzer silenced	Mains fail, panel in alarm
Premier Elite 4-8 Zone	50mA	31mA	163mA

Sample Calculation

A Premier Elite 4 zone panel has the following items connected:-

Zone 1: 2 x MCP, 8 x Optical, 2 x heat detector
 Zone 2: 1 x MCP, 7 x Optical, 1 x heat detector
 Zone 3: 3 x MCP, 9 x Optical, 1 x heat detector
 Zone 4: 1 x MCP, 10 x Optical, 0 x heat detector
 Sounder CCT 1: 10 x Maxitone sounder
 Sounder CCT 2: 12 x Maxitone sounder

ITEM	QUIESCENT	ALARM
PREMIER ELITE 2	66mA	99mA
MCP	0mA	40mA
OPTICAL	100uA	40mA
HEAT	50uA	40mA
MAXITONE SOUNDER	0mA	25mA

To calculate the required battery backup required, we use the equation:-

$$\text{Battery Size (Standby time in Amp Hours)} = 1.25 \times [(T_{\text{ALM}} \times I_{\text{ALM}}) + (T_{\text{SBY}} \times I_{\text{SBY}})]$$

Where:

T_{ALM} = Maximum time in hours required for the alarm [$\frac{1}{2}$ hour is most common time]

I_{ALM} = Total Alarm Current in amps for all alarm devices connected to the alarm circuits

T_{SBY} = Standby time in hours for the system after mains failure [normally 24, 48 or 72 hr]

I_{SBY} = Quiescent current in amps of control panel in fault condition [because of mains failure] **PLUS** all detection zones.

$$I_{\text{ALM}} = \text{PREMIER ELITE ALM} + 22 \times \text{MAXITONE ALARM} + 1 \times \text{DETECTOR ALM} + 7 \times \text{MCP QU} + 33 \times \text{OPT QU} + 4 \times \text{HT QU}$$

$$\begin{aligned} &= 0.163 + 22 \times 0.025 + 1 \times 0.040 + 7 \times 0 + 33 \times 0.0001 + 4 \times 0.00005 \\ &= 0.163 + 0.55 + 0.04 + 0 + 0.0033 + 0.0002 \\ &= 0.757 \text{ Amps} \end{aligned}$$

$$I_{\text{SBY}} = \text{PREMIER ELITE QU} + 22 \times \text{MAXITONE QU} + 7 \times \text{MCP QU} + 34 \times \text{OPT QU} + 4 \times \text{HT QU}$$

$$\begin{aligned} &= 0.050 + 22 \times 0 + 7 \times 0 + 34 \times 0.0001 + 4 \times 0.00005 \\ &= 0.050 + 0 + 0 + 0.0034 + 0.0002 \\ &= 0.0536 \end{aligned}$$

Therefore:-

$$\begin{aligned} \text{Battery size} &= 1.25 \times ((0.5 \times 0.757) + (24 \times 0.0536)) \\ &= 1.25 \times (0.3785 + 1.2864) \\ &= 1.25 \times 1.6649 \\ &= 2.08 \text{ Ah} \end{aligned}$$

So 2.2 Ah batteries will be suitable for this installation.

It is always best to calculate battery requirements, but our general guideline would be:-

1,2 or 4 zone – use 2 x 12V 2.2Ah
 6 or 8 zone - use 2 x 12V 7.0Ah

Specifications

Electrical Specifications

ELECTRICAL DESCRIPTION	VALUE
MAINS VOLTAGE	230V AC +/- 10% @ 50/60 Hz
BATTERY VOLTAGE	24V DC (2 X 12V SLA BATTERY)
SYSTEM VOLTAGE	24V DC NOMINAL (18 – 32 V)
SYSTEM VOLTAGE RIPPLE	2V PK-PK MAX
CHARGER SIZE	UP TO 7AH in 24 Hours
ZONE VOLTAGE	21V DC NOMINAL (20 - 22.5V)
SOUNDER ALARM OUTPUTS	2 x 400mA @ 24V DC (Nominal)
AUXILIARY FAULT OUTPUT	1 x RELAY SELV (1A MAX)
AUXILIARY FIRE OUTPUT	1 x RELAY SELV (1A MAX)
NUMBER OF ZONES	1/2/4/6/8
MAXIMUM ZONE CAPACITY	32 DEVICES PER ZONE
MAXIMUM ZONE RESISTANCE	70 ohms
REMOTE SOUNDER ACTIVATION	VIA N/O CONTACTS
SOUNDER ACTIVATION DELAY	0-9 MINUTES -IN 1 MIN INCREMENTS
ZONE END OF LINE DEVICE	1N4002 DIODE (CATHODE STRIPE TO +)
SOUNDER END OF LINE DEVICE	10 K RESISTOR
CHARGER VOLTAGE	28.4V @ 25°C (NO BATTERY CONNECTED)
ZONE SHORT CIRCUIT PROTECTION	100mA
CHARGER SHORT CIRCUIT PROTECTION	Batteries less than 21V
TOTAL CHARGER OUTPUT	1.1 Amp

Enclosure Specifications

DESCRIPTION	VALUE
ENCLOSURE SIZE	355 x 275 x 100 mm
TOP CABLE ENTRIES	12 x 19mm DIA GROMMETED ENTRIES
BOTTOM CABLE ENTRIES	2 x 19mm KNOCKOUT ENTRIES
REAR CABLE ENTRIES	2 SNAP OUTS, 60 x 20mm

Fuse Ratings

FUSE NO	DESCRIPTION	RATING
FS1	Charger Fuse	1.6A time delay 5 x 20mm glass
FS2	Battery Fuse	1.6A time delay 5 x 20mm glass
FS3	EN54 SUPPLY (NOT USED)	1.6A time delay 5 x 20mm glass
FS4	Sounder circuit 1	400mA time delay 5 x 20mm glass
FS5	Sounder circuit 2	400mA time delay 5 x 20mm glass
INLET FUSE	Mains Protection Fuse	2A Quick Blow HBC 5 x 20mm ceramic

