

Surveyor Envoy

Fire Alarm Control Equipment

Installation, Commissioning and Operating Manual

VERSION 5.0 and Above

**MASTER
MANUAL**

MENVOY-01 Issue 3.0 May 2003

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SECTION 1 – INTRODUCTION

About This Manual

This manual is intended as a complete guide to the 1 to 4 zone range of conventional Surveyor ENVOY fire alarm control panels. Installation instructions are provided in the first part of the manual with the following sections dealing with commissioning, full technical details and operating procedures. A separate Log Book is also provided.

System Design and Planning


It is assumed that the system, of which this control panel is a part, has been designed by a competent fire alarm system designer in accordance with BS 5839 Part 1: 1988 and with regard to BS EN 54 parts 2 and 4 in the case of control equipment and power supplies. Design drawings should be provided to clearly show the position of any field devices and ancillary equipment.

Panel Types

FCPENV-1 – A single zone, non extendable control panel with an integral 1.0 Amp PSU and space for 2 x 12V S.L.A batteries. Cabinet size: 277mm Wide x 200mm High x 97mm Deep

FCPENV-1EXT – A single zone control panel with the capacity to be extended up to 4 zones via plug in zone cards. Integral 1.0 Amp PSU and space for 2 x 12V S.L.A batteries. Cabinet size: 400mm Wide x 200mm High x 97mm Deep.

General

	<p>This equipment must only be installed and maintained by a suitably skilled and technically competent person.</p> <p>THIS ITEM IS A PIECE OF CLASS 1 EQUIPMENT AND MUST BE EARTHED</p>
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The control panel is a micro-processor controlled, conventional fire alarm control system, comprising of one circuit board, plus add on modular circuit boards, for additional zones (extendable version only). The enclosure consists of back box and hinged, removable lid. Constructed of 1.2mm (18swg) zintec mild steel and powder coated in textured light grey. The enclosure is designed to give protection to IP30 level.

Control panels are available from 1 to 4 zones. They are supplied as a one zone non extendable control panel or a one zone extendable control panel. The panel is extended using either the hy-spec single zone cards, which consist of one zone, one sounder circuit and one aux relay, or a three zone budget zone card which consists of just three zones on a single card plus zone +ve for 3 wire connections.

A 4 zone repeater is available and requires one core per zone plus three additional cores.

These panels are designed to comply with the requirements of BS EN 54 part 2 1998, but include integral facilities to enable connection to older systems, which may not comply with current standards.

General – Continued

The control panels are compatible with a wide range of detection and alarm devices. Refer to technical specification for details. The panel can be, CONVENTIONAL with separate detection and alarm circuits or "TWIN-WIRE", with detectors and sounders on the same circuits. This is selectable internally and can be set differently for each zone if using the hy-spec single zone extension cards. The ENVOY control panel has integral detector removal monitoring and no special active end of line units are required.

ENVOY control panels are simple to install and operate. Control functions are enabled by keyswitch. The panel fascia is retained by a security cam lock. No internal access is required under normal usage.

Equipment guarantee

This equipment is not guaranteed unless the complete system is installed and commissioned in accordance with the laid down national standards by an approved and competent person or organisation.



This product has been manufactured in conformance with the requirements of all applicable EU Council Directives.

SECTION 2 – INSTALLATION

General

- The installation of fire detection and alarm systems should be carried out in accordance with current IEE wiring regulations and in line with B.S.5839 British Standard codes of practice for fire alarm installations. The installation should be carried out by suitably qualified and experienced technicians.
- Care should be taken with regards to avoiding the close proximity of high voltage cables or areas likely to induce electrical interference. Earth links should be maintained on all system cables and grounded in the control panel.
- Any junction boxes used should be clearly labelled FIRE ALARM.
- Any ancillary devices, e.g. door retaining magnets, must be powered from a separate power source.
- Any coils or solenoids used in the system must be suppressed, to avoid damage to the control equipment.

ESD PRECAUTION



Electronic components are vulnerable to damage by Electrostatic Discharges (ESD). An ESD wrist strap, suitably grounded, should be worn at all times when handling pcbs. These wrist straps are designed to prevent the build up of static charges, not only within a persons body, but on many other materials. ESD damage is not always evident immediately, faults can manifest themselves at anytime in the future.

All pcbs should be stored in static shielded bags (silvered) for safe keeping, when not mounted in the control panel. Do not use “black” or “pink” bags and **never** allow pcbs to come in contact with bubble wrap or expanded polystyrene (packing chips).

Static shielded bags and disposable wrist straps are available from the manufacturer.

Cable Types and Limitations

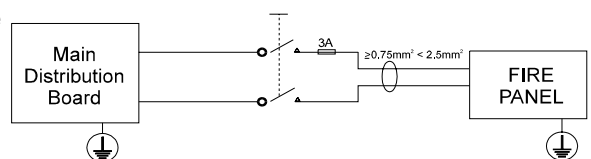
All System wiring should be installed to meet BS 5839: Pt 1: 1988 (from 15th July 2003 this will be BS5839: Pt 1: 2002) and BS 7671(Wiring Regulations). Other national standards of installation should be used where applicable

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 screened cables throughout the installation. Acceptable, commonly available, screened cables, which can be used on both the sounder and detector circuits include FP200™, Firetuff™, Firecel™, MICC (Pyro™) or any other cable complying with BS 6387 categories C, W, Z.

Mains Wiring

The mains supply to the fire alarm panel should be hard wired, using suitable three core cable (no less than 0.75mm^2 and no more than 2.5mm^2) or a suitable three conductor system that meets the appropriate national wiring regulations. The panel should be fed from an isolating switched fused spur, fused at 3A. This should be secure from unauthorised operation and be marked 'FIRE ALARM: DO NOT SWITCH OFF'. The mains supply must be exclusive to the fire panel.

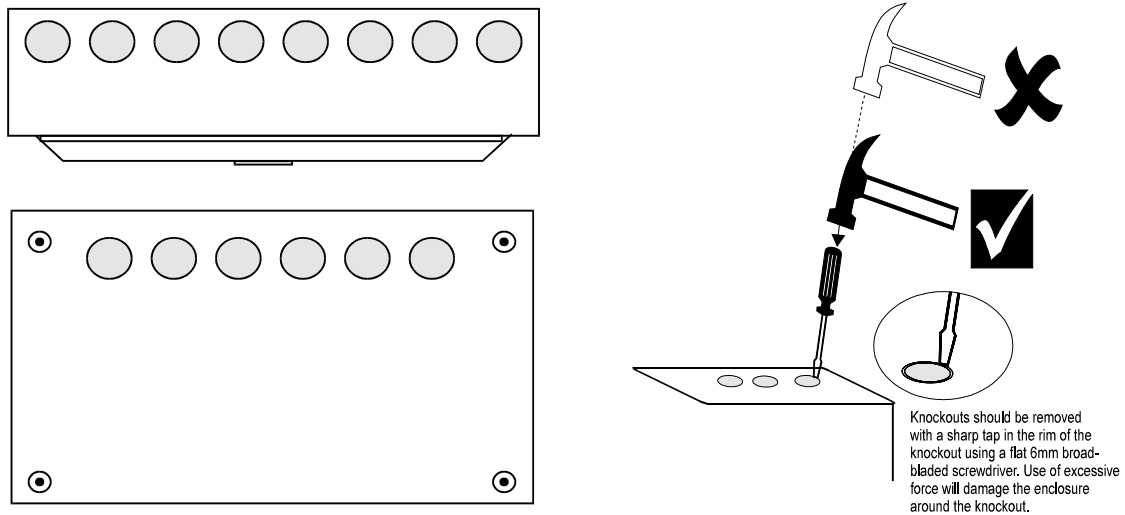
As an alternative to a switched fused spur, a double pole isolating device may be used (see diagram) providing it meets the appropriate national wiring regulations.



Planning the Cable Layout in the Panel

The detector and sounder circuit cabling is classed as extra low voltage and must be segregated away from mains voltages. Careful planning is needed to ensure this, refer to Figure 1 (below) for guidance and important information on how to remove the panel's knockouts. Always ensure that if a knockout is removed, the hole is filled with a good quality cable gland. Any unused knockouts must be securely blanked off.

Figure 1 : Location of knockouts for cable entry and knockout removal details



Fixing the Cabinet

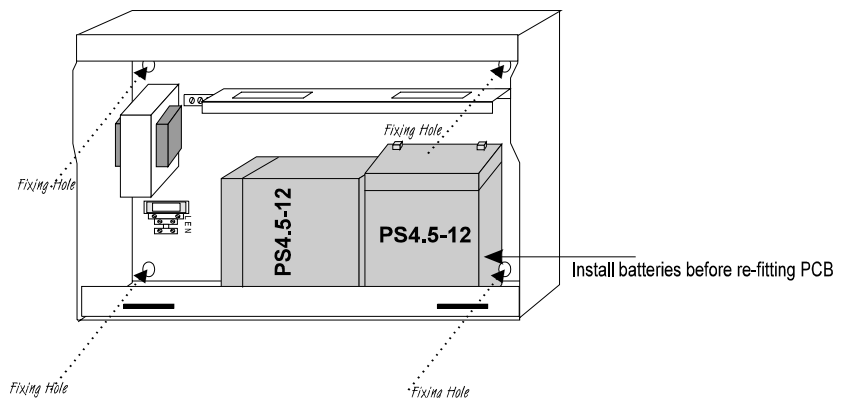
Remove outer cover by unlocking the door, drop down fully, remove Earth connection, slide lid to the right, then pull gently towards you. Disconnect transformer and earth connections at top l/h corner of PCB using small terminal driver. The terminals are marked **ac** (white wires) and **Earth** (green and yellow wires). Remove circuit board from back box by unscrewing 3 in number M4 cross headed screws from the circuit board supports. Place circuit board, lid and fixings in a safe position.

Secure cabinet to the wall using the four indented holes in the back box (see figure 2). Ensure that the box is mounted in a convenient location where it may be easily operated and serviced and where it is away from possible sources of vibration or shock, i.e., on partition wall next to a slamming door. External cables should be glanded via pre-formed knockouts at the top and rear of the box as provided. The enclosure should be cleaned of swarf etc., prior to refitting of printed circuit board.

Disconnect the battery leads from the circuit board by a pull out connector at the top l/h corner of the PCB. Insert batteries and connect the battery leads to the battery terminals before replacing circuit board. Ensuring the white link lead is also connected.

Figure 2 : Fixing the cabinet
(Drawing shows model FCPENV-1 with 2 x 4.5Ah, 12v batteries).

(Model FCPENV-1EXT has space for up to 2 x 7.0Ah, 12v batteries)



Additional Zone Cards

If fitting additional zone cards to the extendable version of the ENVOY control panel, first refit the main circuit board. Slide additional cards into position using the locating pins, see figure.3. ***Particular attention must be made to ensuring that the pins are located correctly in the connector. Misalignment of these pins will result in damage to the zone card when the panel is powered up, see figure.4.***

Fix the card into position using clips and self tapping screws provided. Pre-drilled fixing holes have been made in the mounting rail but they are obscured by a foam strip which is designed to protect tracks on the back of the zone card. It is advisable to locate these fixing holes before attempting to screw down the circuit board.

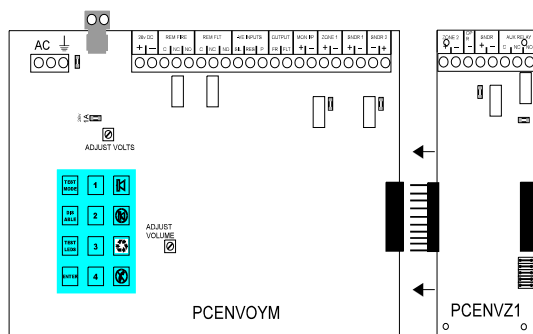


Figure 3

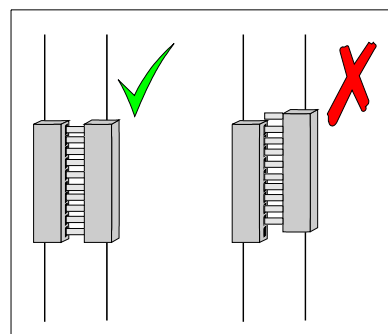



Figure 4

Mains Connections

The general requirements for mains wiring is described on page 6.

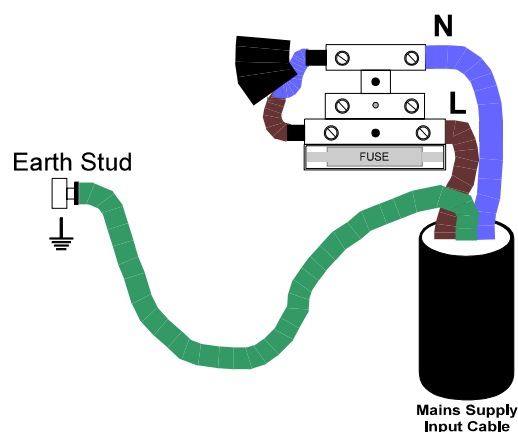
Do not connect the mains supply to the panel until you are fully conversant with the layout and features of the equipment. A rating plate is fitted in the bottom left hand corner of the panel describing the nature of the supply permitted.

The incoming mains supply should be brought into the panel in the bottom left hand corner, via the knockout provided. A suitable cable gland must be used to secure the outer sheath of the cable used.

The earth must first be connected to the primary earth stud (peg) marked with a  symbol using ring crimp provided.

Sufficient earth lead should be left to allow Live and Neutral connections to be accidentally pulled from terminal block, while leaving earth connection intact. Secondary earths may be connected to the brass earthing block.

Figure 5: Mains block and earth stud connections



Circuit Descriptions and Wiring Details

MAIN CONTROL PCB (PCENV-M-5)

SNDR 1 & 2	2 conventional monitored sounder circuits, 28vdc reverse polarity monitored, 4K7 end of line. SNDR 1 can be selected to function as a "TWIN-WIRE" zone via SW5 on DIL switches. Both circuits fused at 500mA. Maximum panel sounder load 1 Amp.
ZONE 1	Conventional 2 wire zone with in built detector removal monitoring. Can be used with zener diode type bases by via SW3 on DIL switches. Maximum detector load 3mA. 4K7 EOL
MON I/P	Evacuate input, monitored for short and open circuit faults. Silenceable, non latching. Requires 470 Ohms to activate. 4K7 EOL
OUTPUT FR / FLT	Switched –ve outputs, common fire and common fault. Maximum load 100mA
-VE INPUTS:-	
SIL	Switched –ve input. When grounded provides remote silence alarms.
RES	Switched –ve input. When grounded provides remote reset.
P	Precinct or class change switched –ve input. When grounded activates sounder circuits. Non latching, non silenceable
REM FLT	Clean c/o contacts, fail safe, unfused, maximum load 1 amp @ 50vdc
REM FIRE	Clean c/o contacts, unfused, maximum load 1 amp @ 50vdc
28v DC OUTPUT	Fused 500mA 28vdc supply output for powering relays etc. Not recommended for door retainer supply.

SINGLE ZONE HY-SPEC CARD (PCENV-1Z-5)

ZONE	Conventional 2 wire zone with in built detector removal monitoring. Can be used with zener diode type bases via SW3 on DIL switches. Maximum detector load 3mA. 4K7 EOL
OPR	Switched –ve zone repeater output. Maximum load 100mA
SNDR	Conventional monitored sounder circuit, 28vdc reverse polarity monitored, 4K7 end of line. Can be selected to function as a "TWIN-WIRE" zone via SW5 on DIL switches. Fused at 500mA. Maximum panel sounder load 1 Amp.
AUX RELAY	Clean c/o contact, fused @ 500mA. Common fire or zonal operation selection via SW4 on DIL switches.

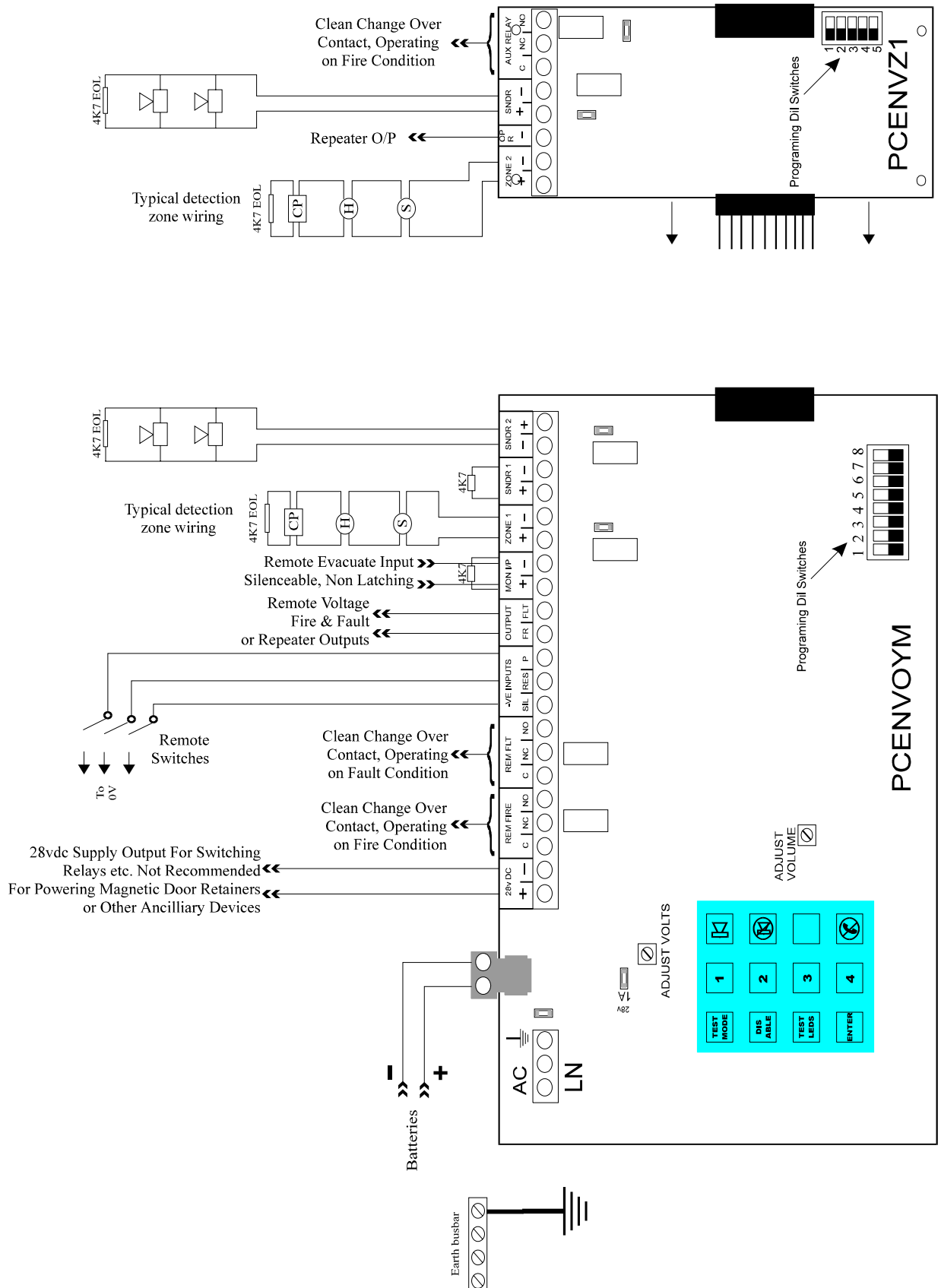
THREE ZONE BUDGET CARD (PCENV-3Z-5)

ZONES 1 – 3	Conventional 2 wire zones with in built detector removal monitoring. Can be used with zener diode type bases via SW3 on DIL switches. Maximum detector load 3mA. 4K7 EOL
OPR	Switched –ve zone repeater output. Maximum load 100mA
ZP+	Common zone +ve for operation of 3 wire circuits. Maximum load 1amp @ 28vdc

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WARNING:- Not all makes of detectors and call points etc are suitable for this panel, see page 24 for recommended equipment

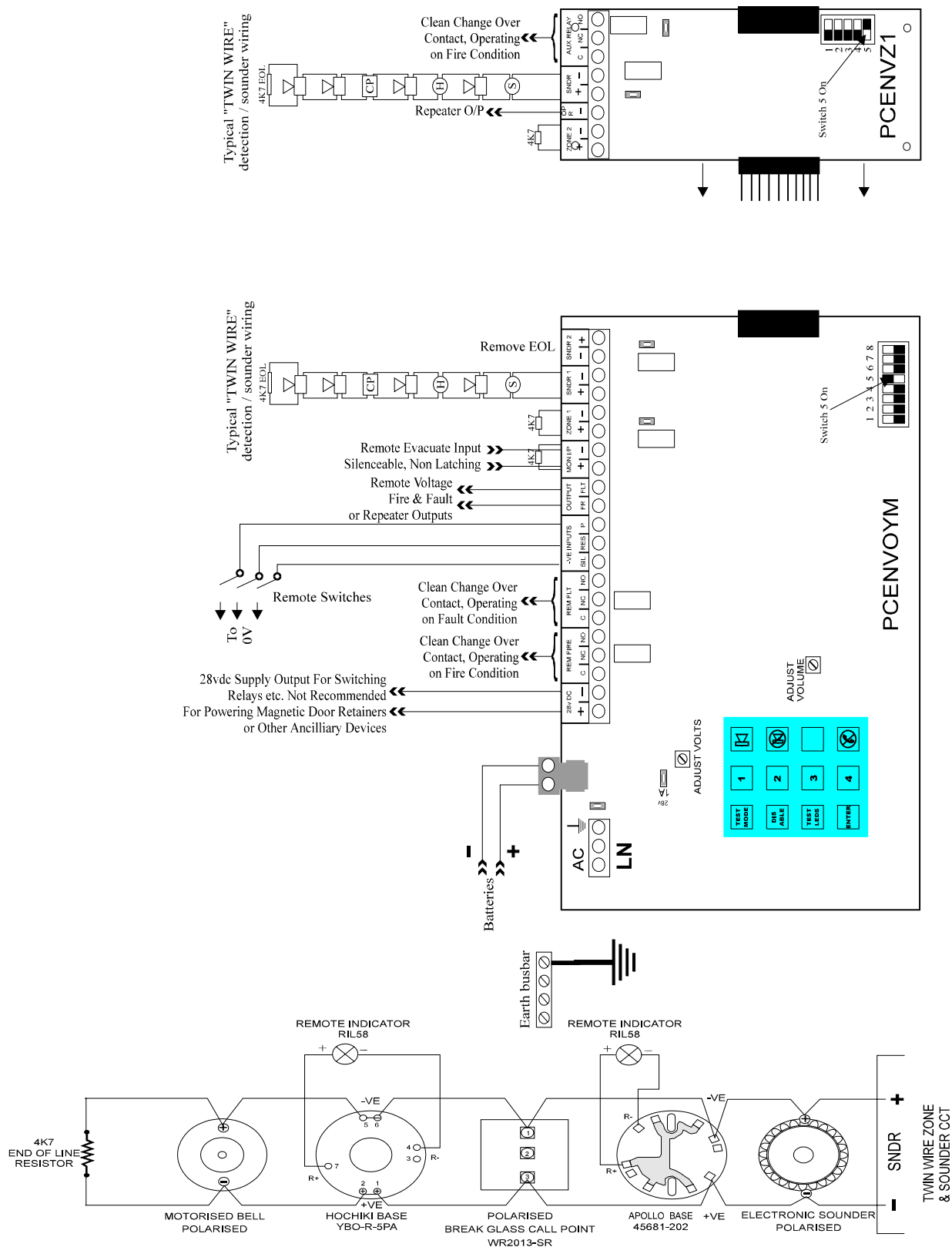
Drawing No. S1597, showing general wiring schematic



Installation, Commissioning & Operating Manual

WARNING:- Specific detectors and call points etc must be used with “TWIN-WIRE” systems, see page 24 for details

Drawing No. S1598, showing wiring schematic for 'TWIN-WIRE' connections

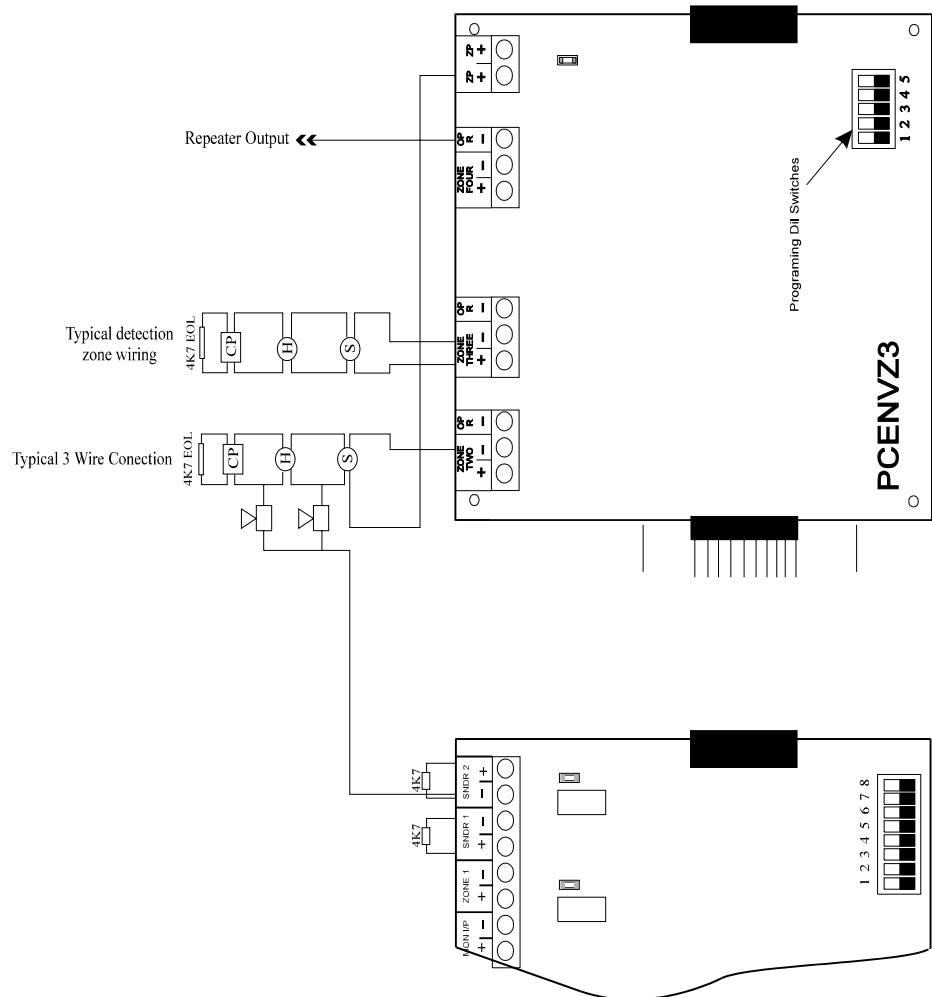


Drawing shows TWIN-WIRE zone and sounder CCT connections when panel is in it's quiescent state (not in alarm). +ve goes to sounder +ve but detector or call point -ve and vice versa..

Installation, Commissioning & Operating Manual

WARNING:- Not all makes of detectors and call points etc are suitable for this panel, see page 24 for recommended equipment

Drawing No. S1599, showing general wiring schematic for PCENV-3Z-5, including 3 wire connection



A typical 3 wire circuit is shown on Dwg No. S1599, connected into zone 2. This method of wiring does not meet current standards for new systems, but may be suitable for upgrading certain existing installations.

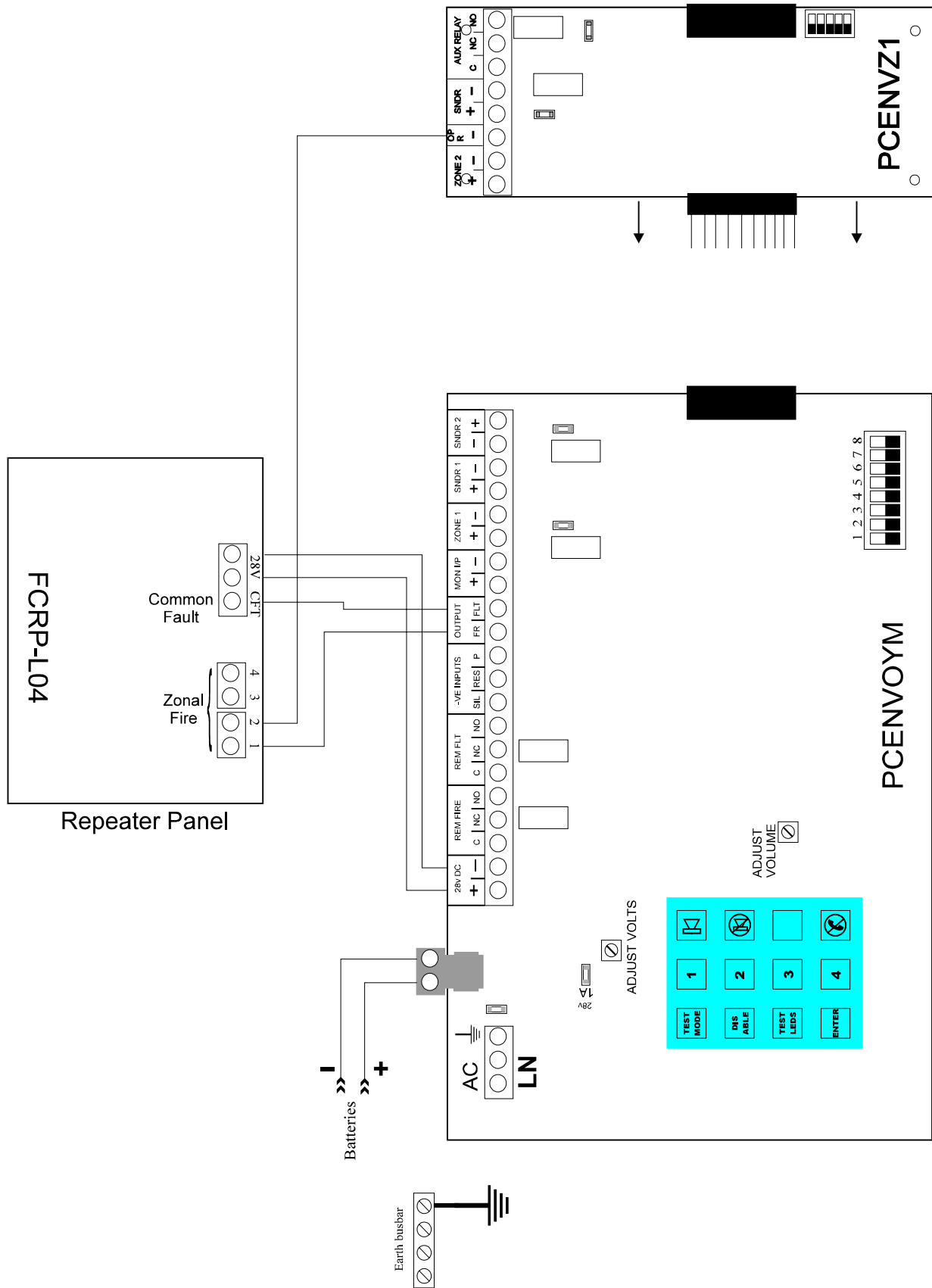
Three wire circuits may contain high current and / or unpolarised sounders or other unsuitable equipment, so care should be taken to upgrade equipment when connecting in these circuits.

CAUTION: Ensure all solenoids, relays and sounders fitted to the circuits are polarised and suppressed with back EMF diodes. It is recommended that old heavy current sounders are changed to light current. Maximum sounder load on the total 3 wire system is 1 Amp.

The following modifications must be made for the circuit to function correctly:

- The detector zone must be configured for **short = fire** and no head removal monitoring by switching SW5 on DIL switches. **Refer to Engineering Options.**
- The sounder circuit is not monitored, therefore a 4K7 resistor must be fitted to the sounder circuit terminals in the panel.

Drawing No. S1600, showing repeater panel connections

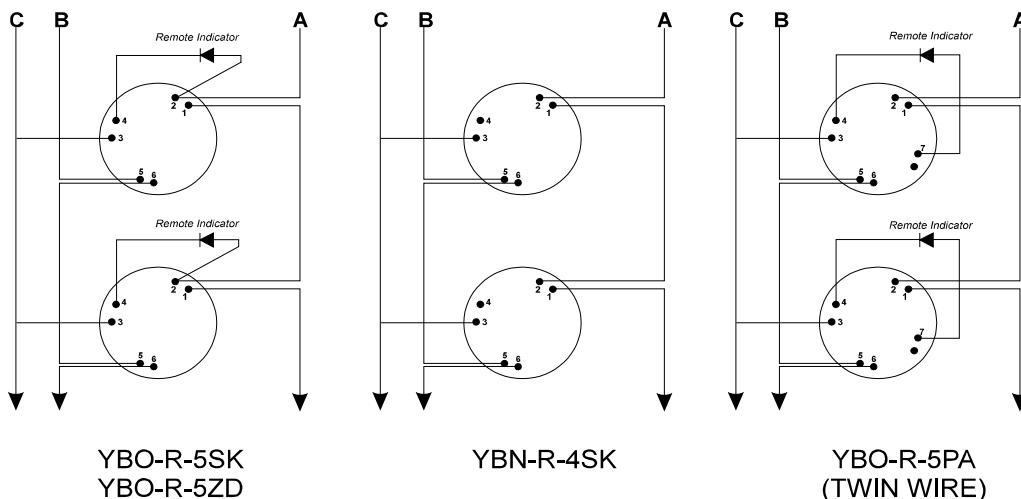


Drawing S1601, showing detector base connections

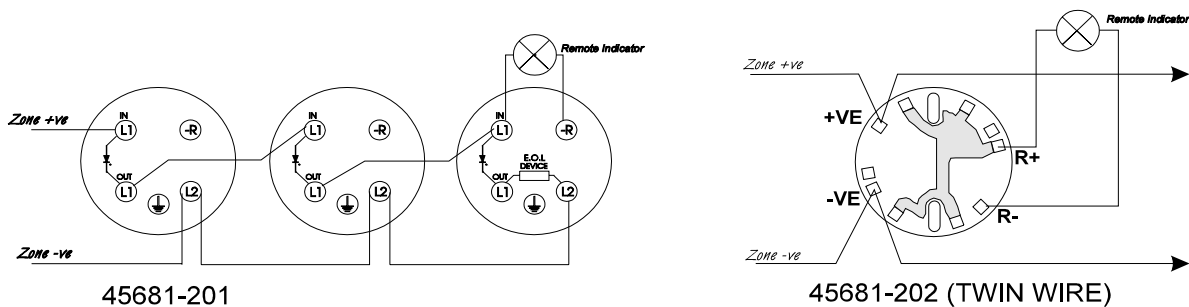


CDX RANGE DETECTORS

A: = Zone +ve B: = Zone -ve C: = Cable Screen

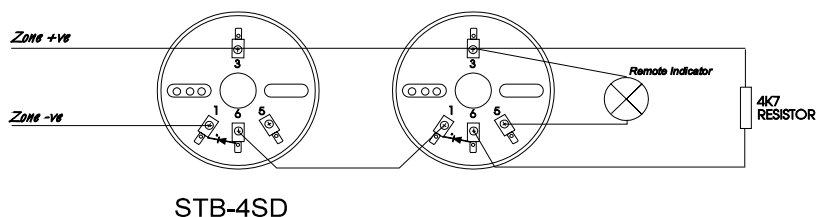


Series 60 DETECTORS



MITTAN (UK) LTD

SENORTEC RANGE DETECTORS

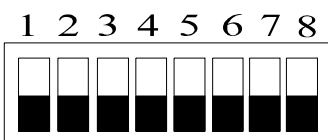


SECTION 3 – ENGINEERING OPTIONS

General

The panel has various options which are programmed by the selection of DIL switches on the PCBs. This section explains which switch relates to which option.

PCENV-M-5 (Master PCB)



Switch	Function when 'off'	Function when 'on'
1	Zone 1 latching	Zone 1 non latching
2	Short circuit = fault, zone 1	Short circuit = fire, zone 1
3	Detector removal, standard Schottky diode base	Zener diode head removal, Hochiki YBO-R-5ZD or Apollo 45681-350
4	Rem.fire relay, is common	Rem fire relay, zone 1 only
5	Conventional operation (2 wire zone, 2 wire sounders)	Twin wire operation SNDR 1 (Two wires share sounders and detectors)
6	Zone 1 operates all sounder circuits	Zone 1 no sounder circuits, panel buzzer only
7	Zone 1 operates all aux relays	Zone 1 does not operate Rem.fire aux, still operates other aux relays
8	Sounder operation common	Zone of origin continuous, other sounder circuits pulsing (PCENV1Z-5 cards only)

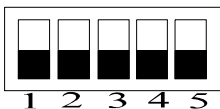
Engineering Options Continued

PCENV-1Z-5 (hy-spec single zone card)



Switch	Function when 'off'	Function when 'on'
1	Zone latching	Zone non latching
2	Short circuit = fault	Short circuit = fire
3	Detector removal, standard Schottky diode base	Zener diode head removal, Hochiki YBO-R-5ZD or Apollo 45681-350
4	Zone operates all aux relays	Zone operates own aux relay only
5	Conventional operation	Twin wire operation, use SNDR CCT

PCENV-3Z-5 (Three zone budget zone card)



Switch	Function when 'off'	Function when 'on'
1	Zone 2 latching	Zone 2 non latching
2	Zone 3 latching	Zone 3 non latching
3	Zone 4 latching	Zone 4 non latching
4	Zones 2-3-4 short circuit = fault	Zones 2-3-4 short circuit = fire
5	Zones 2-3-4 detector removal, standard Schottky diode base	Zones 2-3-4 zener diode head removal, Hochiki YBO-R-5ZD or Apollo 45681-350

SECTION 4 – COMMISSIONING

General

The commissioning procedures should be completed one step at a time as described below to avoid unnecessary problems. By following a logical sequence any faults that may occur can be quickly identified and rectified before moving on to the next step.

Before connecting external circuits to the control panel it is recommended that the panel is powered up and tested, and any faults cleared before proceeding.

Ensure that 4K7 resistors are fitted into zone and sounder circuit terminals (see drg.no. S1597) before applying power.

To clear the battery fault indication when the mains is connected, a battery must be connected to the battery terminals; it is not possible to inhibit the battery fault by the insertion of a resistor.

The system may be operated on the battery supply, i.e. if the mains supply is not available.

Powering the Panel

Remove the fuse from the mains input. Connect the supply wiring to the terminal block. Check that all connections are sound and that 4K7 EOL resistors are fitted to zone and sounder circuits.

Refit the fuse and switch on the mains supply. The panel LEDs are illuminated momentarily, the ARW LED remains lit and a battery fault is indicated. The internal buzzer sounds.

Connecting the Battery

The standby battery comprises two 12V cells of a capacity suitable for the required standby period and total alarm load.

Batteries may be located in the panel or in a separate cabinet depending on the battery size.

Battery leads are provided, including a battery link.

The SUPPLY HEALTHY LED should now be illuminated. The ARW LED should be illuminated and the internal buzzer pulsing.

Turn the CONTROLS keyswitch to ON, and press RESET.

All the LEDs are lit momentarily, the ARW LED should extinguish and the buzzer should be silent. The panel is now operating correctly in the quiescent mode.

Any faults that are indicated at this stage should be investigated and cleared before proceeding. If necessary refer to the fault location chart on page 22 for further information.

If unfamiliar with the Surveyor ENVOY Series equipment, it is advisable to explore the panel operation and become conversant with the controls before proceeding. Faults can be simulated by open and short circuiting zone and sounder circuits, fire alarms can be generated by shorting the zone terminals with a 470R resistor. Refer to the Operation section if required.

Disposal of Batteries



Respect the environment. Batteries must be disposed of responsibly and in accordance with any local regulations.

Initialisation of Zone Cards

For added security, the master card (PCENV-M-5) keeps a log of fitted zone cards and will indicate a system fault, with a warbling tone, if zone cards are removed, or cease to function. To achieve this, zone cards are logged 'on' and 'off' of the panel.

Proceed as follow:

- 1 Ensure panel is completely powered down by disconnecting both mains and battery supplies.
- 2 Insert, or remove, required zone card(s), ensuring pins are securely located.
- 3 Press and hold button No.1 on keypad and at the same time apply either battery or mains power.
- 4 Observe the zone fault illuminating on each zone card, this indicates acknowledgment of 'learning' mode.
- 5 Release button 1 and press Reset to clear fault indications and 'ARW'.

If a panel should start to warble and show system fault, check the following:-

- If a PCENV-NET card is fitted, refer to network instructions.
- If no network is present, check whether zone cards will function i.e. go into fire, or fault.
- If a zone card appears to be faulty, replace it, or remove it.
- If a problem persists, try to re-log the card by following the procedure 1-5 again, as above.
- If 'Disablement' indicator is on, but no zone is illuminated, it is possible that the internal memory is out of synchronisation. This can be corrected by the following procedure:

- 1 Completely power down panel
- 2 Press and hold button No.2 on keypad whilst powering up
- 3 The panel will enter a self diagnosis mode, which resets the memory
- 4 Pressing the 'Enter' button will step through a test routine, which will operate LEDs and outputs in a sequence.

To exit this mode, power down the panel and power up again, as normal.

Twin Wire Operation

The panel can be converted to 'Twin Wire' operation by selecting Dil switch 5 on each zone card (hy-spec zone cards only). Any individual zone, or all zones, can be selected as twin wire. The twin wire is designed to operate with polarised 470R call points, Apollo and Hochiki 'SAV-WIRE' bases only. See page 24 for part No.s. Any standard 24v bell, siren or strobe, that is polarised and suppressed can be used, providing sounder o/p limits are not exceeded. Short circuit as fire and non latching zones cannot function on a twin wire zone. When twin wire operation is selected, the conventional zone circuit is disabled by the software. The sounder CCT terminals should be used for connection of detectors, call points and sounders.

When used as a twin wire system, use sounder 1 on the main card (PCENV-M-5) and remove the 4K7 resistor in sounder 2, to enable correct monitoring, as these circuits work in tandem.

Where a single zone twin wire system is installed (normally non compliant) and two sounder outputs are required the following modification can be employed:

Remove both 4K7 EOL resistors from SNDR 1 and 2 and substitute with 10K ohm resistors (or 2 x 4K7 in series). This enables sounders and / or detectors to be used on both legs to provide 2 monitored circuits on one zone, thus enabling full compliance for twin wire, with only one zone.

Zone Circuits

The default mode of operation assumes that the zone circuit is configured for open and short circuit fault monitoring, and detector removal monitoring, i.e. detector bases are fitted with a diode.

If these conditions do not apply, e.g. when connecting a circuit from an existing system, the operating parameters for each affected zone must be changed. Refer to the Engineering Options section for details.

It is recommended that each zone is connected in turn and its operation proved before moving on to the next zone.

Check that all detectors are fitted into their bases and that a 4K7 Ohm resistor has been fitted to the last device. Remove the 4K7 Ohm resistor from the selected zone terminals and connect the zone pair, observing polarity.

If a zone fault is indicated, investigate and clear before proceeding to the next circuit. If necessary refer to the fault location chart on page 22.

Continue to connect each zone circuit until all are connected and fault free.

It may be preferable to test the operation of zone devices before proceeding with the connection of sounders.

Sounder Circuits

The Master PCB has two sounder circuits and each hy-spec zone card has one sounder circuit that by default operate in "constant sounder" mode on the activation of any zone. "Zone of origin operation" can be achieved by changing the operating parameters. Refer to Engineering Options.

Sounders must be polarised and suppressed and connected in a parallel circuit with no spurs or tees. Ensure that the load of the sounders is within the individual circuit limits, and that the total load does not exceed the panel limits, taking into account any additional load imposed by auxiliary circuits, repeaters, etc.

Remove the 4K7 Ohm resistor from the relevant sounder circuit terminals and connect the circuit pair, observing polarity. Ensure that a 4K7 Ohm resistor is fitted in parallel with the last device on the circuit.

Clear any faults before proceeding – refer to the fault location chart on page 22 if necessary.

Sounders can be tested by operating the SOUND ALARMS push button.

Three-wire Circuits (budget pcb only)

A typical connection for a three-wire circuit is shown in drg. no. S1599; however, the following modifications need to be made for the circuit to function correctly:

- The detector zone must be configured for Short = Fire, unless the circuit is compatible with open and short circuit monitoring, i.e. detectors with an alarm impedance of > 100 Ohm and < 700 Ohm are fitted, and call points are fitted with a 470 Ohm series resistor. Refer to Engineering Options.
- In these circumstances the sounder circuit is not monitored, therefore, a 4K7 Ohm resistor must be fitted at the sounder circuit terminals.

SECTION 5 – FAULT FINDING

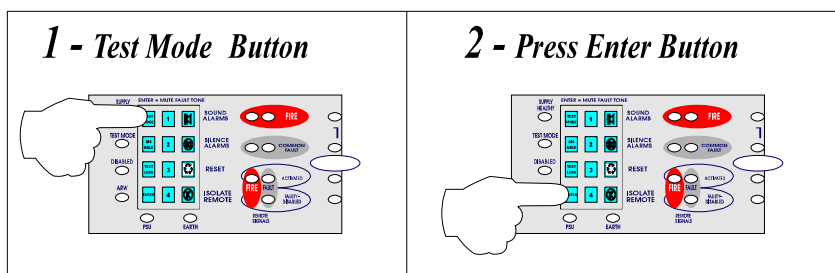
General

A fault is indicated by the illumination of the SYSTEM FAULT LEDs and a buzzer tone. Specific faults are identified by additional fascia indicators, e.g. zone fault. The buzzer tone varies depending on the fault and may, or may not, be silenceable.

Fault Latch

If an intermittent fault exists it is possible to make all fault indications latch to help identify problems. To activate fault latch press the **TEST MODE** button and then the **ENTER** button. The Test Mode LED will be lit but no buzzer sounds. Any faults occurring while this mode is active will be latched until the **RESET** button is pressed. Pressing **RESET** at any time will exit fault latch mode.

Fault Latch Mode



Fault Finding Chart

The following chart identifies the indications that may be displayed, with the possible cause and the recommended action. Fault location should be tackled logically by isolating fault paths until the source is apparent, e.g. disconnecting zone and sounder circuits to prove if the fault is on the circuit or in the panel, etc. Faults on external circuits can be traced by breaking down the circuit, e.g. placing the EOL at the mid point of the circuit and determining which half is affected.

<i>Panel Indication</i>	<i>Possible Cause</i>	<i>Action</i>
System Fault (System Healthy extinguished)	Mains failure/fuse failure Battery disconnected or open circuit. Battery Fuse failed Voltage too high (>30V) or too low (<19V)	Check supply/fuse Check battery/fuse Adjust to 27.6V. Measure voltage using the battery terminals on pcb, with the batteries disconnected.
System Fault	One or more cables in contact with earth	Disconnect ext. cables until fault clears. Investigate circuit and rectify. If fault persists with all circuits disconnected, then fault is on PCB. Replace. Hint: Remove the pcb to earth block earth wire, if the fault disappears then you have an earth fault. If not the fault is on the pcb.
System Fault	Sounder circuit open circuit (LED slow pulse) or short circuit (LED fast pulse)	Check circuit integrity/EOL Sounder not polarised or reverse polarity – correct fault
System Fault + Zone Fault	Zone open circuit (LED slow pulse) Zone short circuit (LED fast pulse)	Confirm fault is on external circuit by disconnecting zone wires and fitting 4K7R in zone terminals. Check EOL and circuit connections
System Fault + Zone Fault + Detector Removed	One or more detectors removed Base(s) wired incorrectly Incompatible detector(s) Panel faulty	Replace detector(s) Check wiring/diodes Consult supplier
Test Mode + Zone Fault or Detector Removed	System in Test Mode	Reset system to exit test mode
ARW	Illuminates when panel is first powered up. Internal microprocessor has auto reset due to spurious power surge/interference	Reset panel. If condition persists, consult supplier
Zone Disabled	Zone isolated	Re-instate zone (refer to programming if necessary)

SECTION 6 – TECHNICAL DATA

- Mains input voltage ; 230Vac, 50-60 Hz (Harmonised) +10% to -15% compliant with BSEN54 Pt4 : 1997 for fire alarm power supplies.
- Nominal system voltage 24V dc.
- Power supply : Current limited 1amp suits SLA batteries only. Charging voltage 27.6 volts +/- 0.2V
- Temperature range: -5 to +40°C. Maximum relative humidity = 95%

GENERAL DATA & CURRENT CONSUMPTION FIGURES

Part No	Description	Qty Convention al Sndr ccts	Qty TWIN WIRE Zone/Sndr ccts	Total Sndr Load (Amps)	Quiescent Current	Panel Only in Alarm
FCPENV-1	Compact non extendable	2	2	1	57mA	100mA
FCPENV-1EXT	Extendable version	2	2	1	57mA	100mA
PCENV-1Z	One zone hy-spec extension zone card	1	1	-	19mA	56mA
PCENV-3Z	Three zone budget extension zone card	-	-	-	28mA	35mA

BATTERY SIZES

The panels have space for the following batteries, based on standard sizes as supplied by the manufacturer.

Part No.	Batteries
FCPENV-1 Cabinet Size: 277W x 200H x 97D mm Weight: 3.36Kg (without batteries)	2 x 1.2Ah 12 Volt SLA 2 x 2.0Ah 12 Volt SLA 2 x 4.5Ah 12 Volt SLA
FCPENV-1EXT Cabinet Size: 400W x 200H x 97D mm Weight: 4.2Kg (without batteries)	2 x 1.2Ah 12 Volt SLA 2 x 2.0Ah 12 Volt SLA 2 x 3.0Ah 12 Volt SLA 2 x 4.5Ah 12 Volt SLA 2 x 7.0Ah 12 Volt SLA

Detector Zones: Voltage 17 – 28V dc. Quiescent current 3.5mA each. End of line value 4K7 Ohm. Schottky diode or zenner clamp detector removal monitoring.

Sounder Circuits: 17 – 28V dc reverse polarity monitored. Sounders must be polarised and suppressed. End of line value 4K7 Ohm. Output current 500mA. Maximum shared sounder load 1.0 amp.

Fuses: Mains: F2AH, 250VAC, 20mm HBC Ceramic. Compliant with IEC (EN 60127 A2)
Battery: 1 amp, nanofuse, fast acting
Supply: 1 amp, nanofuse, fast acting
Sounders: 500mA, nanofuse, fast acting

Technical Data Continued

SUITABILITY (RECOMMENDED EQUIPMENT)

	Conventional:	Twin-Wire:
Smoke / Heat Detectors	Nittan: Sensortec Range STB-4SD schottky base	
	Apollo: Series 60 45681-201 schottky base	Apollo: Series 60 45681-202 base
	Hochiki: CDX Range YBN-R-4SK schottky base YBO-R-5ZD zenner base	Hochiki: CDX Range YBO-R-5PA base
Call Point	KAC: WR2072-SR, 470 OHM Resistor	KAC: WR2013-SR, polarised, 470 OHM
Sounders	Use polarised and suppressed, light current 24vdc electronic sounders or bells (Fulleon, Besson etc.)	Use polarised and suppressed, light current 24vdc electronic sounders or bells (Fulleon, Besson etc.)

SECTION 7 – NETWORKING

A feature of the Envoy is the ability to provide 2 wire (RS 485) communications for repeating and networking capability. All standard panels of version 5.0 and above can be networked.

The PCENV-NET is an 'add-on' card which provides the RS 485 interface and address switches. A PCENV-NET is required for each panel in the network. Up to four panels can be networked. A 'comms' terminal is provided on the master pcb as standard (although this is not shown on the schematic diagrams on the previous pages), but this terminal is not active without the network card fitted.

Network Philosophy

Up to four standard panels can be connected. 1 way or 3 way zone cards can be used in any combination. Ideally on a four zone system, four indicating zones must be available.

Several interesting scenarios can be achieved:

1. A simple panel with up to three repeaters
2. Connect two zones on one panel two on the other and both panels will show all four zones
3. Connect one zone on each of four panels and display all zones on all panels
4. Have zones on one panel and sounders on another

Other permutations are possible.

Limitations

The system is limited to four zones, although sixteen could be connected, only four can show at one panel. For example, when zone 1 is put into fire, it will display as zone 1 on all panels regardless of which panel zone 1 wiring is connected to.

Installing PCENV-NET

1. Turn off power to panel
2. Remove PCENV-M (Master pcb)
3. Locate mounting hole and fit small 3mm threaded spacer (supplied) to PCENV-M. Make sure insulated washer (supplied) is used under screw head.
4. Plug in PCENV-NET to 10 way header, (see drawing 1832M) ensure alignment with small spacer and check all connector pins are aligned correctly.
5. Fit screw through PCENV-NET into spacer and tighten to secure pcb.
6. The communications cable is connected to 'comms' terminals at top of pcb (see drawing 1831M)

Set Up Network

Once all cards are fitted , set Dil switch addresses on PCENV-NET. Designate one panel as the 'master'

Dil switch positions:-

Both off	=	Master
1 off 2 on	=	First repeater / panel
1 on 2 off	=	Second repeater / panel
1 on 2 on	=	Third repeater / panel

Each panel must have a different setting.

For monitoring purposes, the master must be instructed how many panels are in the network. If it changes, the panel will show system fault and will warble.

To enter quantity of panels:

At the master panel (panel with both address switches 'off')

1. Turn off power to panel
2. Press and hold button 4 on keypad whilst powering panel back up. (when powered up the panel will beep continuously)
3. Enter total number of panels in the network, **including the master**, by pressing the relevant keypad number (1-4), followed by the enter button.

When all panels are addressed correctly, the master is set-up and all panels are powered, the TX and RX LEDs will flicker on all panels to confirm communication between panels. In the event of a 'comms' failure the affected panels will warble and show a fault. Note:- panels will function as stand alone in the event of 'comms' failure.

Network Control and Operation

As standard, the network / repeater panels are configured to provide basic operation. If non standard functioning is required, please contact our technical department for advice.

The table below details the functionality of the system.

Local	=	Operates and displays at the local panel level only
Global	=	Operates and displays on all panels simultaneously

Controls

Key switch	=	Local 'panel controls' only
Evacuate	=	Global
Silence	=	Global, silence alarms and fault tone
Reset	=	Global
Test Mode	=	Local zones only
Disable	=	Local zones only
Test LEDs	=	Local
Enter	=	Local fault mute (without key-switch)

Network Control and Operation Cont'd

Indications

Common fire	=	Global fire indication
Common fault	=	Global fault indication
Zones 1 – 4	=	Global zone indication

All other indications work at the local level

Option Switches

As a rule, all option switches function at the local level only, e.g. if on panel A the option switch No. 8 (zonal bells) is selected 'on', this will cause sounders on panel B, C & D to pulse when the fire is on either B, C or D panels.

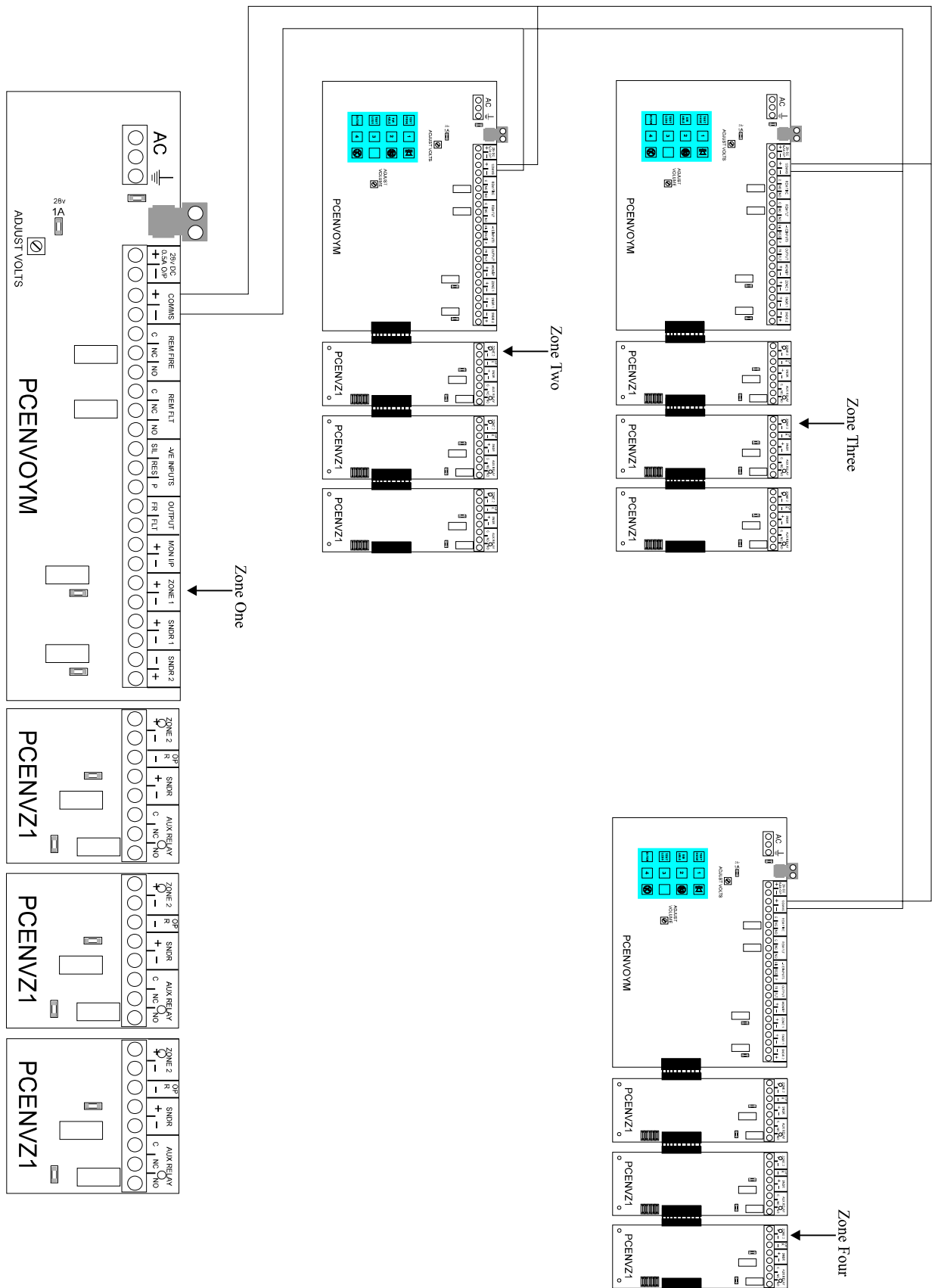
The sounders on panel A will sound continuously only when an alarm is received from one of 'A's' zones.

With due consideration at the design stage, networking could provide useful solutions.

Please contact our technical department for further advice.

IMPORTANT: ENSURE THAT ALL PROGRAMMING IS CORRECT BY CONDUCTING A FUNCTIONAL TEST ON THE COMPLETE FIRE SYSTEM

Drawing No. 1831M, showing typical network, 4 panel connection

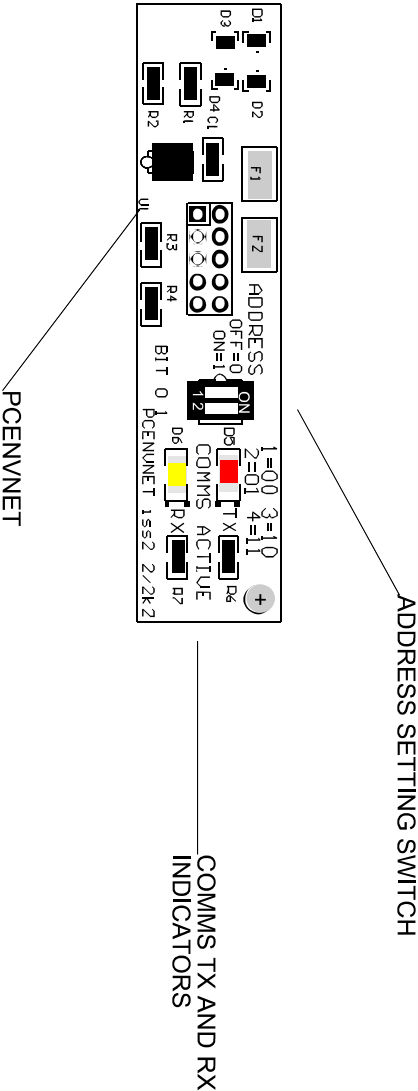
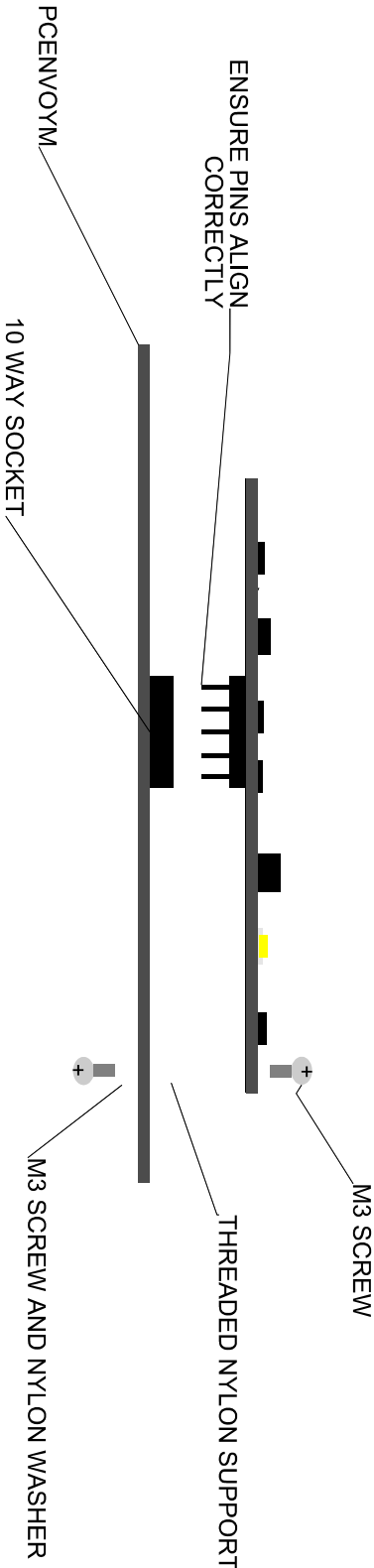


Drawing No. 1832M, showing network card installation

ADDRESS SETTING

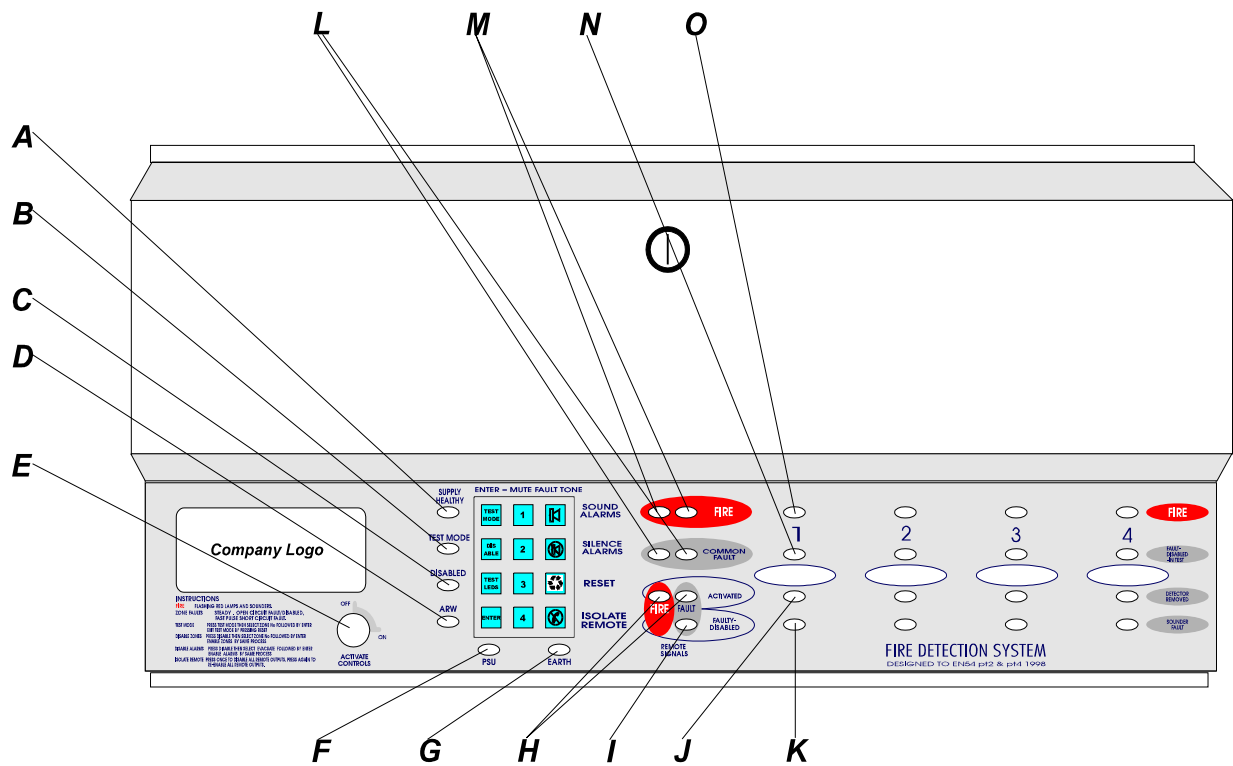
BOTH OFF = MASTER
1 OFF 2 ON = FIRST SLAVE
1 ON 2 OFF = SECOND SLAVE
BOTH ON = THIRD SLAVE

NOTE= NO MORE THAN 4 PANELS
PER NETWORK.



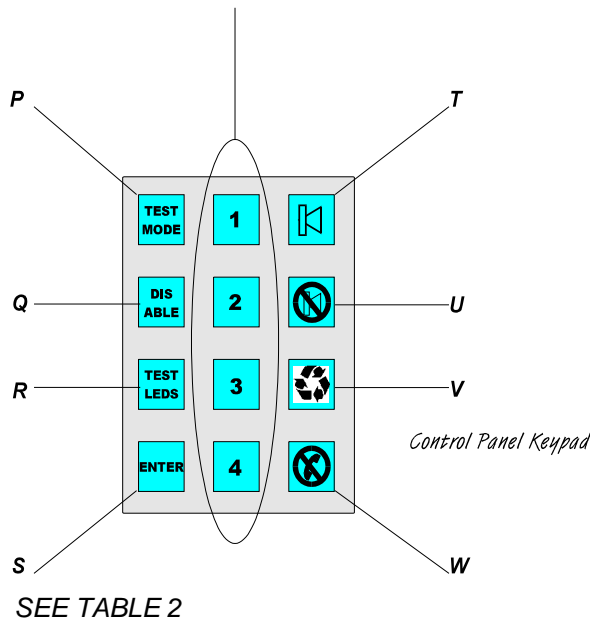
SECTION 8 – OPERATOR INSTRUCTIONS

Controls and Indications



SEE TABLE 1

**BUTTONS 1 - 4 REPRESENT ZONES 1 - 4
WHEN SELECTING TEST MODE OR DISABLE**



Buttons on keypad will not operate unless the Activate Controls key-switch is in the ON position.

SEE TABLE 2

Controls and Indications Continued

TABLE 1

A	SUPPLY HEALTHY	Indicates permanently when panel is correctly powered.
B	TEST MODE	Pulses when the control panel is in engineer's test mode. The individual circuit fault lamp will be on (steady) whilst the circuit is in test mode. It is not possible to test a disabled zone. See page 33 "Test Mode" for more details.
C	DISABLED	Indicates when a zone or sounder circuit has been disabled using the disable button on the keypad. The LED pulses when disablement mode is selected and remains on steady if any disablement is present on any of the circuits. The individual circuit fault lamp will be on (steady) whilst the circuit is disabled. See page 34 "Disable Zones or Sounders" for more details.
D	ARW	Automatic Reset Warning, Indicates if the processor has been rebooted. Will indicate when panel is first powered up. See fault finding section for more details.
E	"ENABLE CONTROLS" KEY-SWITCH	Key-switch to activate the buttons on the keypad. They do not function unless this switch is in the on position
F	POWER SUPPLY FAULT	Indicates a fault with the power supply. A fast pulse = battery fault. A slow pulse = voltage faults. An intermittent blip = mains fault. See fault finding section for more details.
G	EARTH FAULT	Indicates an earth fault on the system. See fault finding section for more details.
H	REMOTE OUTPUTS ACTIVATED	Indicates if the remote fire and fault relays have been activated
I	REMOTE OUTPUTS FAULTY / DISABLED	Indicates if the remote relay outputs are faulty or have been isolated using the isolate remote button on the keypad. This LED also indicates short or open circuit faults on monitored input. Slow pulse = open circuit. Fast pulse = short circuit.
J	DETECTOR REMOVED ON ZONE	Indicates that a detector has been removed on this zone. See fault finding section for more details.
K	SOUNDER CIRCUIT FAULT	Indicates that there is a fault on the individual sounder circuit or that the sounders have been disabled or are in test mode. A fast pulse = short circuit. A slow pulse = open circuit. All zonal sounder circuit fault LEDs are on (steady) for disabled or test mode. Note:- disablement or test mode will have priority. See fault finding section for more details.
L	COMMON FAULT	Dual LEDs Indicate when any fault occurs. Also if Test Mode is activated or if zones or sounders have been disabled. Pulsing when fault buzzer sounding, intermittent pulsing when fault buzzer muted (by pressing the ENTER button) Note:- when a mains failure fault is present the LEDs blip intermittently to conserve the batteries. See fault finding section for more details.
M	COMMON FIRE	Dual LEDs Indicate when any zone is in fire. Pulsing when fire or evacuate is active, will steady when alarms silenced.
N	ZONE FAULT / DISABLED / IN TEST	Indicates that there is a fault on this zone, or that the zone is in test mode, or has been disabled. LED on (steady) in "test mode" or "disabled". A slow pulse = open circuit. A fast pulse = short circuit. Note:- disablement or test mode will have priority. See fault finding section for more details.
O	FIRE ON ZONE	Indicates that there is a fire condition on this zone. Pulses when in fire, will steady when alarms silenced. New zones in fire will pulse until silence alarms is pressed again while the existing silenced zones will remain steady.

Controls and Indications Continued

TABLE 2

P	TEST MODE	"Test mode" button. Puts zones into test mode. See relevant section, page 33.
Q	DISABLE	"Disable" button. To disable or isolate zones or sounder circuits. See relevant section, page 34.
R	TEST LEDs	Pressing this button will cause all LEDs, except remote fire and fault, to illuminate briefly.
S	ENTER	"Enter" button. Used to acknowledge selection of zone or sounder circuits for disablement. Also mutes internal fault buzzer when active.
T	SOUND ALARMS	"Sound alarms" button. To sound all bells and activate remote fire outputs for full evacuation.
U	SILENCE ALARMS	"Silence alarms" button. To silence bells or sounders. The internal buzzer will still sound in the control panel until the system has been reset.
V	RESET	"Reset" button. To reset system. When the panel is in fire condition reset will only function if the "silence alarms" button has been pressed first.
W	ISOLATE REMOTE	Isolates the remote fire and fault relays for system testing purposes. Press again to reinstate them.

Test Mode

ZONE TEST

To put zone(s) into test mode, turn the Activate Controls key-switch to the ON position and press the **TEST MODE** button on the keypad. Now use buttons 1 – 4 to select which zone(s) to put into test mode and press **ENTER** when all selections have been made. The test mode entry will “time out” within 5 seconds if the **ENTER** button is not pressed. It is possible to have any or all zones in test mode at the same time. The Test Mode and Common Fault LEDs will be pulsing. The fault LED of the zone(s) in test mode will be illuminated and the internal buzzer will be sounding. The operation of any smoke detector or call point will now ring all bells or sounders for one second. The panel will automatically reset, providing that the detector is clear of smoke or the call point glass is back in position. The alarms will then sound momentarily to acknowledge that the panel has reset, so you can move on to the next device. Press the **RESET** button on the keypad at any time to exit Test Mode.

The removal of a detector while in test mode will also cause the alarms to sound for one second and then again momentarily when the detector is replaced, thus enabling a Detector Removal Monitoring Walk Test. **N.B the panel may take a few seconds to recognise a detector has been removed due to it's normal monitoring cycle.**

ZONE TEST WITHOUT SOUNDERS

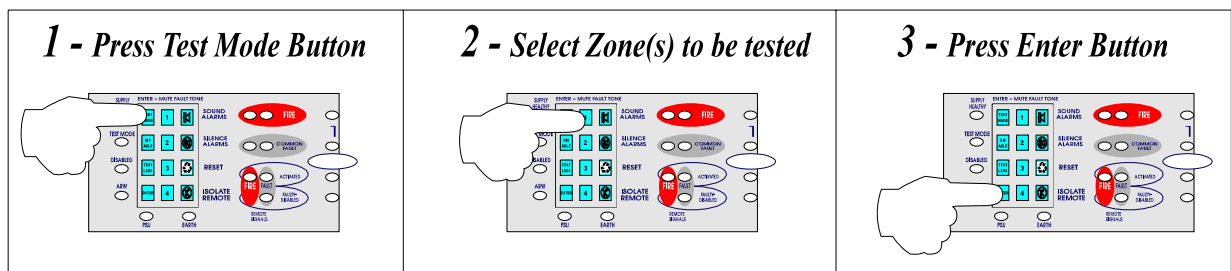
To test zones without the operation of any sounders, i.e. visual indications and panel buzzer only. Press the **TEST MODE** button on the keypad followed by buttons 1 – 4 to select the zone(s) to put into test. Then press the **SILENCE ALARMS** button and then **ENTER**. The sounders will now be disabled during all testing. Should a zone which is not in test go into alarm the sounders will operate as per normal.

SOUNDER WALK TEST

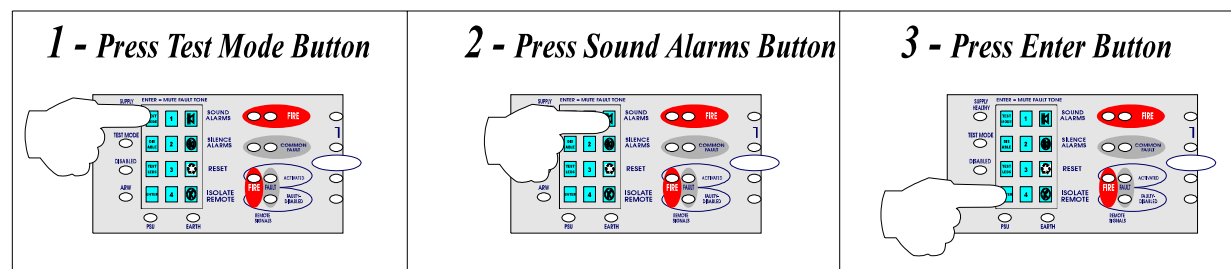
A sounder test can be activated by using the **SOUND ALARMS** button instead of buttons 1 – 4. This will cause the panel to sound all the bells for one second every eight seconds, allowing the user to walk to each sounder to check that it is working correctly.

Remember to push each button slowly and deliberately. There is a half second delay on the buttons to prevent misuse. The panel will bleep to acknowledge each push of the button.

Zone Test



Sounder Test



Disable Zones or Sounders

DISABLE ZONES

To disable / isolate zones , turn the Activate Controls key-switch to the ON position and press the **DISABLE** button on the keypad. Now use buttons 1 – 4 to select which zone(s) to disable and then press **ENTER** when all selections have been made. The disable mode will “time out” within 5 seconds if the **ENTER** button is not pressed. It is possible to select any, or all zones, to be isolated at the same time. The disable LED will be illuminated, the common fault LED's will be pulsing. The fault LED of the zone that is disabled will be illuminated and the internal buzzer will be sounding.

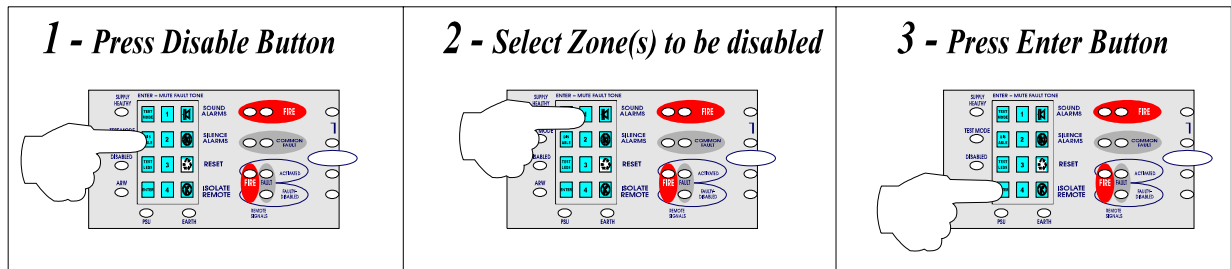
DISABLE SOUNDERS

To disable sounder circuits press the **SOUND ALARMS** button instead of buttons 1 – 4 (see above) and then press **ENTER**. The sounder fault LED will be illuminated. It is not possible to select individual sounder circuits. This routine will disable all sounder circuits.

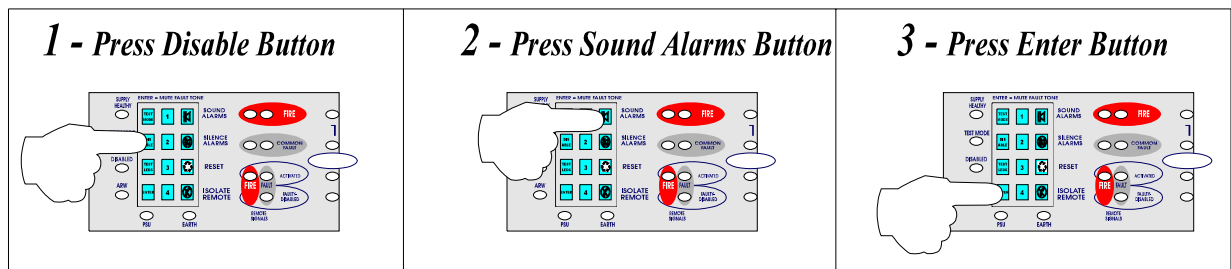
To enable the zones or sounder circuits again simply repeat exactly the same procedure. **WARNING zones and sounder circuits that have been disabled cannot be enabled by the use of the RESET button.**

Remember to push each button slowly and deliberately. There is a half second delay on the buttons to prevent misuse. The panel will bleep to acknowledge each push of the button.

Disable Zones



Disable Sounders



Routine Maintenance and Testing

It is essential that the fire alarm installation is checked regularly by a responsible person for correct operation in accordance with EN54 Part 2 or BS5839 Part 1. or applicable standard.

CLEANING

The exterior of the cabinet may be cleaned when required using a clean, moistened cloth. Do not use solvents or abrasives as these will damage the panel.

ROUTINE TESTING

Routine checks should be carried out as detailed in this section of the manual. It is essential to keep the log, in order to maintain a record of tests, checks, alarms and faults. A log book is provided with this instruction manual. The log book should be kept with the panel and be available for inspection by an authorised person.

DAILY

Check that the green, "SUPPLY HEALTHY", indicator is lit. If the indicator is not lit, record the fact in the log book and call for a qualified electrician to check the power supply.

WEEKLY

Carry out the daily check.

Operate one detector or call point on one zone and check that the panel responds to the alarm and operates the warning devices. Record the results of the test and the zone detector/call point operated, in the log book. A different zone detector/call point should be operated each week, to ensure that all detectors/call points are tested in turn.

Visually inspect the batteries and all connections and ensure that they are in good condition. Visually inspect all call points and detectors and ensure that none is, in any way, obstructed or damaged.

QUARTERLY

Check all previous entries in the log book and ensure that all necessary remedial action has been carried out.

Carry out the daily check.

Carry out the weekly test.

Isolate the mains supply, then test that the battery is capable of operating the warning devices by operating a detector or call point.

Reconnect the mains supply. Record the results of the tests in the log book.

ANNUALLY

Carry out the daily, weekly and quarterly tests. Test all the detectors and call points for correct operation. Visually inspect all cable fittings and equipment to ensure that they are secure, undamaged and adequately protected. Record the results in the log book.

EVERY 5 YEARS

Renew the sealed lead acid batteries and record the fact in the log book.

The installation requires to be tested in accordance with the testing and inspection requirements of the Local or National Standards. Any defect should be recorded in the log book and action should be taken to correct it.

DETECTORS

Renew or return the smoke detectors for cleaning, as directed in the manufacturer's data, to ensure correct operation and freedom from false alarms. Cleaning smoke detectors is a specialised activity. If in doubt consult the supplier. Record the actions in the log book.

NOTE: *Ionisation smoke detectors contain a radioactive source and should only be disposed of in the recommended manner. Contact your Service Company for further advice.*

USER INSTRUCTIONS

Alarm Condition

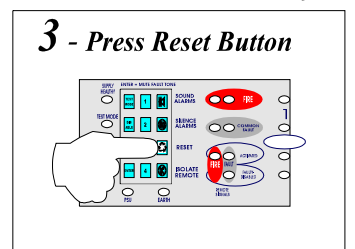
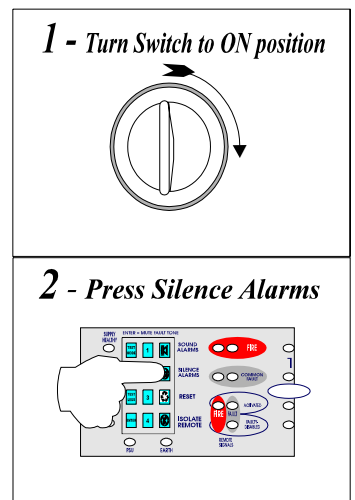
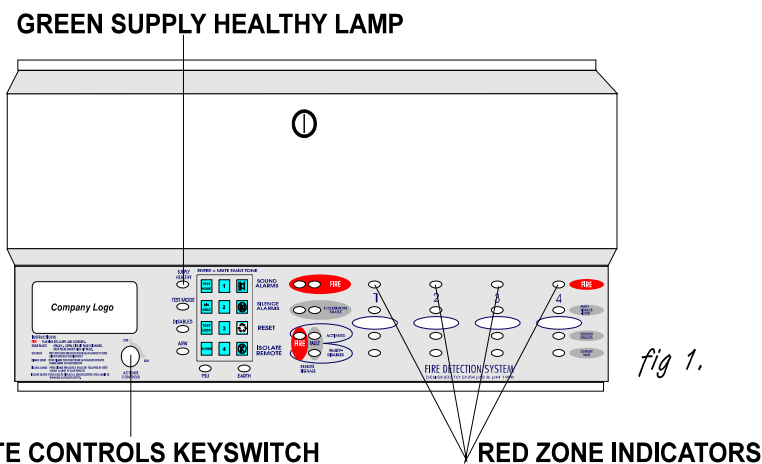
If all the sounders or bells are ringing, the system is in an alarm condition. **YOU MUST EVACUATE THE BUILDING OR FOLLOW YOUR NORMAL FIRE DRILL PROCEDURES.**

A responsible person should then:-

- 1 Check the control panel to see which area or zone has caused the system to go into alarm. The zone in alarm will be indicated by a red light on the front of the control panel, see fig 1.
- 2 Go to the area which has caused the alarm to check if a fire exists.
- 3 Only when it is safe to do so should the alarms be silenced. Turn the "activate controls" keyswitch to the ON position and press the SILENCE ALARMS button, see fig 2. If it was a false alarm look for the device that has caused the alarm. A detector will have a red light lit, or check to see if a call point glass is broken. (If so replace the glass or call an engineeer.)
- 4 When fully satisfied that there is no fire, return to the control panel and press the RESET button, see fig 3. Once the system has been reset the light on the detector should extinguish and only the green SUPPLY HEALTHY lamp should be lit on the control panel.

If the system continues to false alarm, call an engineer.

Tear Here



Fault Condition

If a buzzer is sounding in the control panel but the sounders or bells are not ringing, then there is either a fault on the system or zones / sounders have been disabled. **Call an engineer.**

The internal fault buzzer can be silenced by pressing the ENTER button. **DO NOT RESET THE SYSTEM UNTIL AN ENGINEER HAS INVESTIGATED THE FAULT.**

See relevant section in the installation and operating manual for details of disabling and enabling zones and sounders.