



# **FIRE ALARM CONTROL EQUIPMENT**

**Addendum October 2006  
Instructions for new style  
EN54-4 Power supply unit module**



MXLK-05 Issue 2.0 June 2007

# INSTALLATION

## Safety

Suppliers of articles for use at work are required under section 6 of the Health and Safety at Work Act 1974 to ensure as reasonably as is practical that the article will be safe and without risk to health when properly used. An article is not regarded as properly used if it is used "without regard to any relevant information or advice" relating to its use made available by the supplier.

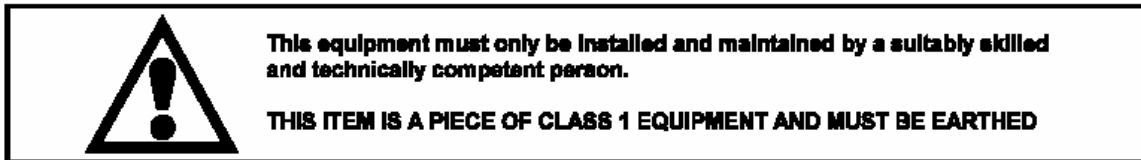
It is assumed that the system, of which this control panel is a part, has been designed by a competent fire alarm system designer in accordance with BS 5839 Part 1: 1988 and with regard to BS EN 54 parts 2 and 4 in the case of control equipment and power supplies. Design drawings should be provided to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

This product should be installed, commissioned and maintained by, or under the supervision of, competent persons according to good engineering practice and,

- (i) IEE regulations for the electrical equipment in buildings
- (ii) Codes of Practice
- (iii) Statutory requirements
- (iv) Any instructions specifically advised by the manufacturer

According to the provisions of the Act you are therefore requested to take such steps as are necessary to ensure that any appropriate information about this product is made available by you to anyone concerned with its use.

This equipment is designed to be operated from 220-240V AC mains supplies and is of Class I construction. As such it must be connected to a protective earthing conductor in the fixed wiring of the installation. Failure to ensure that all conductive accessible parts of this equipment are adequately bonded to the protective earth will render the equipment unsafe.



## General

The control panel is a micro-processor controlled, Conventional fire alarm control system, comprising of one circuit board, plus add on modular circuit boards.

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.

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.

Installation of the panel should only be carried out by qualified personnel. The electronic components within the panel can be damaged by static charge. Suitable precautions must be taken when handling circuit boards. Never insert or remove boards or components, or connect cables, with the mains power on or batteries connected.

## INSTALLATION (Continued)

### 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

### Mounting the cabinet

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.

The site chosen for the location of the panel should be clean and dry, and not subject to shock or vibration. The temperature should be in the range 5 to 35°C, and the humidity should not exceed 95%.

### 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.

**All system wiring should be installed to meet BS5839: Pt 1: 2002, and BS 7671 (Wiring Regulations). Other national standards of installation should be used where applicable.**

# INSTALLATION (Continued)

## Cable types and limitations

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.

## Cabling

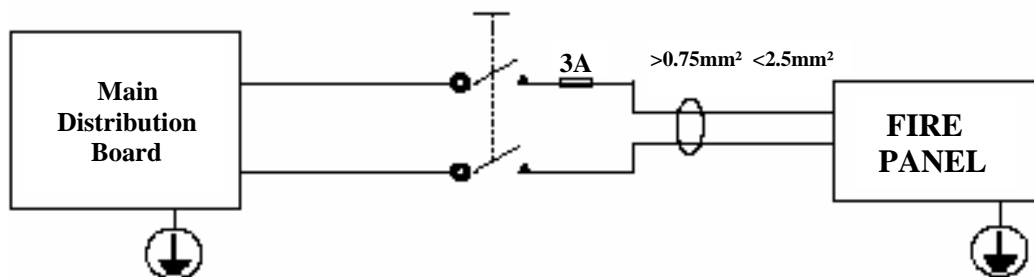
Suitable cables should be brought into the cabinet using the knockouts provided. The screen or drain wire of loop circuits should be bonded to earth at one location only, and should be continuous throughout the circuit. Drain wires should be terminated in the cabinet as near as possible to the entry point.

## Mains wiring

The mains supply to the fire alarm panel should be hard wired, using suitable three core cable (no less than 0.75mm<sup>2</sup> and no more than 2.5mm<sup>2</sup>) or a suitable three conductor system that meets the appropriate national wiring regulations. The panel should be fed from an isolating switched fused spur, supplied directly from the Main Distribution Board, 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.



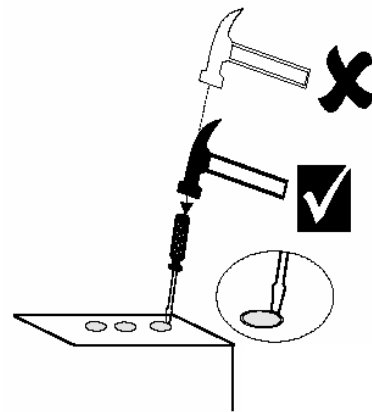
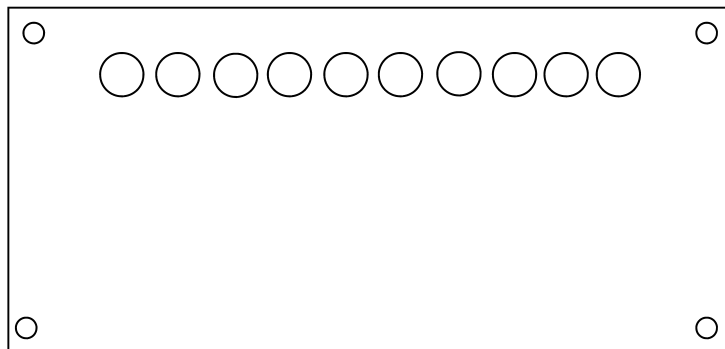
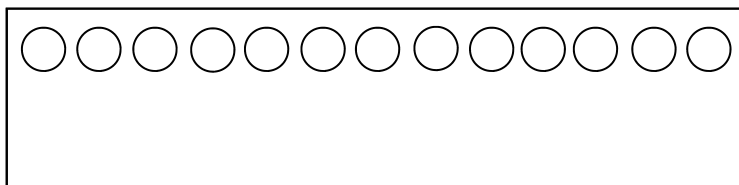
# INSTALLATION (Continued)

## 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.

**NOTE. The Main PCB should be removed before any 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.

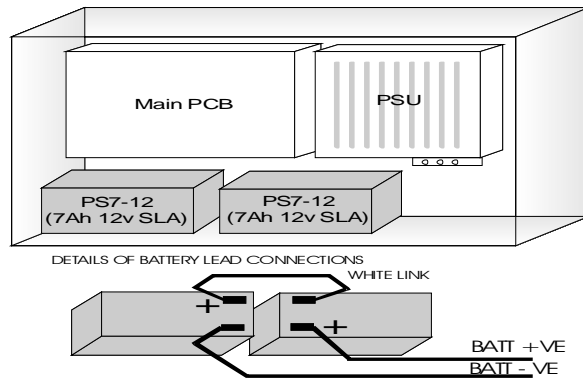


Knockouts should be removed with a sharp tap at the rim of the knock-out using a flat 6mm broad-bladed screwdriver. Use of excessive force will damage the enclosure around the knockout.

## Fixing the cabinet

If the Main PCB hasn't already been removed, then remove the wires from TB4 (Page 9) then remove it from back box by unscrewing 4 in number M4 cross headed screws from the circuit board supports. Place circuit board and screws in a safe position.

Secure cabinet to the wall using the four indented holes in the back box . 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.



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 re-fitting of the printed circuit board.

Replace the four cross head screws in the Main PCB and reconnect the cables in TB4. Locate the white jumper lead and connect to the batteries as per the drawing . Locate the two battery connections from the PSU board and connect to the batteries. Carefully place the batteries as indicated in the drawing above. **Ensuring that the terminals are kept well clear of the PCB support pillars.**


# INSTALLATION (Continued)

## Mains connections.

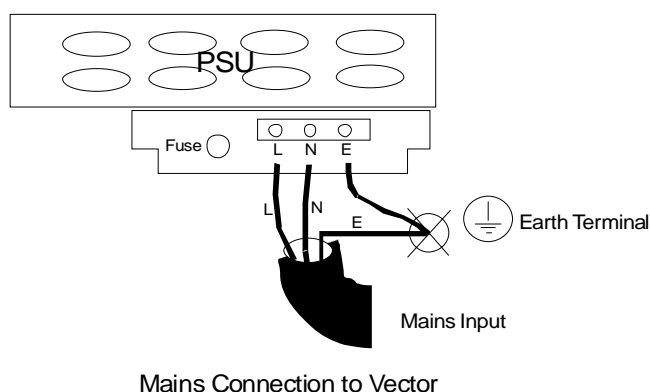
Do not connect the mains supply to the panel until you are fully conversant with the layout and features of the equipment.

A rating plate is fitted in the bottom right 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 right 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 the 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.



## Field devices

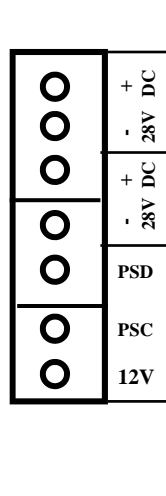
Sensors, call points and input/output devices are supplied with full installation instructions.

### **Warning**

High voltage testing of the wiring must be carried out **before** the control panel and any devices are connected.

## MAIN PCB(continued)

### Terminal Block 4

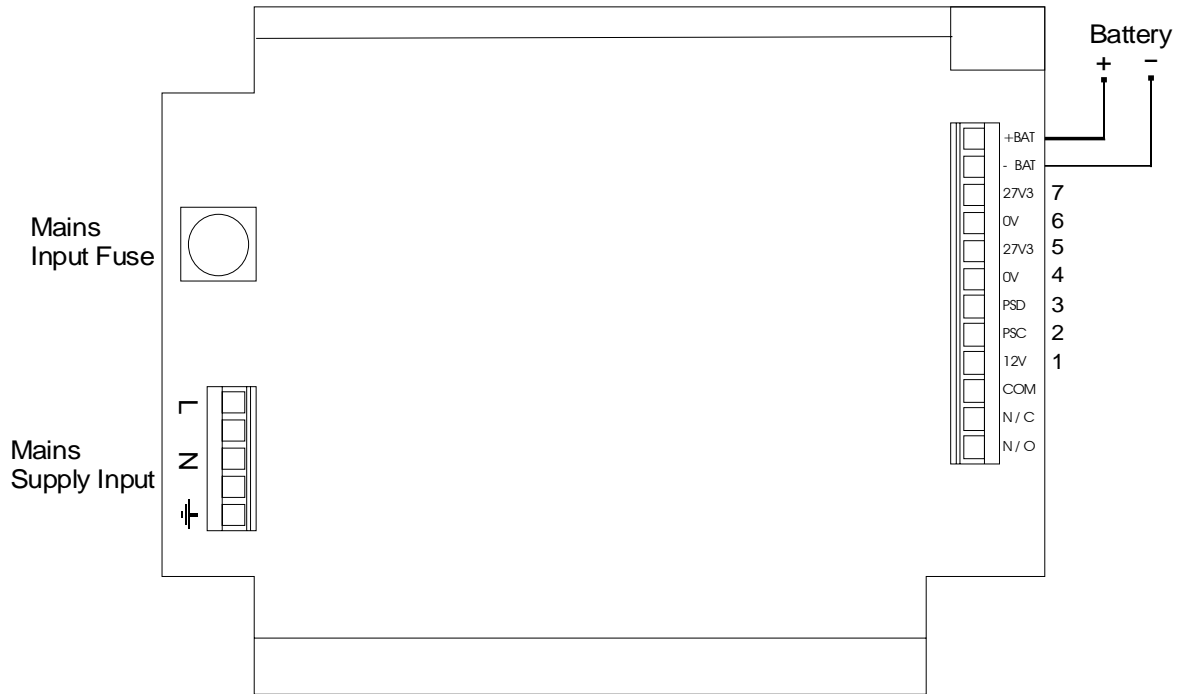


- 12V** Ancillary 12 volt from the power supply unit. Fused on the main pcb at 500mA. Output on TB3 for use on ancillary devices.
- PSC** Clock input from power supply pcb.
- PSD** Data input from power supply pcb.
- 28V DC** 28 volt supply from psu to power load. Separately fused at full output current.
- 28V DC** **NOTE** Fuses of lower value may be fitted to provide extra protection to external equipment.



# POWER SUPPLY MODULE

## PSUXLKEN54-3A



- |                   |                |   |
|-------------------|----------------|---|
| <b>(1)</b>        | <b>12V</b>     | Ancillary 12 volt to the main Pcb unit. Fused on the Main Pcb at 500mA. Output on TB3 (Main) for use on ancillary devices.  |
| <b>(2)</b>        | <b>PSC</b>     | Clock output from power supply Pcb to main Pcb.   |
| <b>(3)</b>        | <b>PSD</b>     | Data output from power supply Pcb to main Pcb.  |
| <b>(4-5)</b>      | <b>27V3 DC</b> | 27 volt supply from PSU to power load. Separately fused at full output current.   |
| <b>(6-7)</b>      | <b>27V3 DC</b> | supply output from PSU to power load  |
| Battery<br>-<br>- |                | 27 volts Battery charging output, WARNING!!! Only for connection of sealed lead Acid batteries only . 2 off nominal 12 volt units wired in series with supplied White Link. To Produce a 24 volt Battery set, Red is Positive, Black is Negative. |
| Com<br>NC<br>NO   |                | Changeover fault contacts, relating to power supply faults only.  |

The Voltage output is factory adjusted to 27.6 volts  $\pm$  0.2 volts. (off load), and with the batteries disconnected. The power supply is temperature compensated in line with battery manufacturers recommendations.

# POWER SUPPLY MODULE

## Testing and maintenance

Disconnect the mains supply. The 'Common Fault LED' and the 'PSU LED' will show and the internal buzzer will sound.

Mute the buzzer by pressing the bottom right hand key on the key pad, 'mute buzzer'. Reconnect the mains, all Fault LEDs will extinguish.

**NOTE** The Battery Charger circuit will disconnect the batteries at 19 volts to protect them from a full discharge after the mains supply has failed. When the mains supply is restored the relay energises and the batteries are reconnected to the charger.

It is recommended that a discharge test be carried out on a regular basis, perhaps by switching the mains supply off and checking that the battery supply will sustain power for the required period. Any further detailed tests should be carried out with the approval of the battery manufacturers.

The power supply / battery charger unit is self contained and requires no regular maintenance.

To verify the function of the power supply the following checks may be carried out;

Using a calibrated volt meter measure voltages across various terminals and check:

### A) With battery connected and mains connected.

- Across 27v3 (7) & 0V (6) voltage between 26.5v and 28.0v
- Across 12v (1) & 0V (6) voltage between 11.2v and 12.7v
- Across +veBatt & -veBatt voltage between 24.0v and 28.0v

### B) With mains disconnected and battery connected (mains fault)

- Across +veBatt & -veBatt voltage above 22 volts.

NOTE:- a battery voltage below 19 volts cannot be re-charged and the battery set must be replaced

### C) Check battery charging current

Place ammeter in series with battery, expect to measure up to 500mA (flat) current to battery when mains is applied. If reading is less than 5mA, allow battery to run system for a short time, then re-check. If no current is drawn and battery fault is showing, the unit may be faulty.

### D) With mains connected and battery disconnected (battery fault)

- Across +veBatt & -veBatt voltage between 10.0v and 12.0v

## Remote power supply

If required, the supply to the control panel can be derived from a remote power supply and battery unit. Input terminals are provided in the control panel on the main pcb for the 28V supply, charger and battery fault conditions. The clock and data lines must be maintained. For connections see the Terminal Block 4 diagram.

# TECHNICAL SPECIFICATION

## General Specification

	Surveyor Excel 2—8 zone
Enclosure	Steel IP 30.
Dimensions. H x W x D mm	310 x 460 x 85.mm
Weight.	6.22 Kg
Temperature	0° to 45°C
Cable Entries. (20mm knockouts)	14 x top, 6 x top rear, 4 x bottom.
Number of Fire Zones	2,4,6 or 8
Open Collector Outputs	6 x 30V Dc, 100mA (max)
Auxiliary Supply Output	2 x 28V DC, 1 Amp.

## Electrical Specification

Mains supply	90 vac - 264 vac 47 - 63Hz	
Mains supply fuse	3.15 Amp (F3.15A H250V)	Replace only with similar type
Power supply rating	3 amps total inc battery charge 28V ± 2V	
Maximum ripple	250 millivolts.	
Battery type	Two 12 volt sealed lead acid (7Ah maximum)	
Battery charge voltage	27.6 vdc nominal.	Temperature compensated
Battery charge current	0.7A max	
Max current drawn from batteries.	3 Amps	With mains power source disconnected.
Dedicated sounder outputs.	24V fused at 500mA. Up To 4 per Panel	1.6 Amp total load over all circuits.
Fault relay contact rating.	30 Vdc 1 Amp maximum for each.	Maximum ratings not to be exceeded.
Remote fire relay contact rating.	30 Vdc 1 Amp maximum for each.	Maximum ratings not to be exceeded.
Terminal capacity	0.5 mm <sup>2</sup> to 2.5 mm <sup>2</sup> solid or stranded wire.	
Number of devices per zone .	20—30	Dependant on type.
Number of sounders per circuit.	Dependant on type and current consumption.	
Sounder circuit end of line.	4K7 5% ¼ Watt resistor.	Supplied in terminals.
Cabling	FP200 or equivalent (maximum capacitance 1µF, maximum inductance 1 millihenry)	Cable glands must be used.