ZITON

ZP3 Fire Control Panel Installation, Commissioning, and Maintenance Manual

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Manufacturer

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Version

This document applies to ZP3 version 3.12

Certification

CE

European Union directives

1999/5/EC (R&TTE directive): Hereby, UTC Fire & Security declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

2002/96/EC (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: www.recyclethis.info.

Contact information

For contact information, see www.utcfireandsecurity.com.

Content

Important information

This manual is intended for use by the personnel who install and commission the ZP3 Fire Control Panel, and has been prepared in accordance with ZP3 operating software version 3.12.

Advisory messages

Advisory messages alert you to conditions or practices that can cause unwanted results. The advisory messages used in this document are shown and described below.

WARNING: Warning messages advise you of hazards that could result in injury or loss of life. They tell you which actions to take or to avoid in order to prevent the injury or loss of life.

Caution: Caution messages advise you of possible equipment damage. They tell you which actions to take or to avoid in order to prevent the damage.

Note: Note messages advise you of the possible loss of time or effort. They describe how to avoid the loss. Notes are also used to point out important information that you should read.

General warnings and precautions

Trained service personnel must carry out procedures in this manual.

The ZP3 panel is powered from a 230 VAC primary supply and from a 24 VDC battery backup supply.

Primary supply

WARNING: The power supply forms part of the main board assembly. This assembly consists of a circuit board (incorporating the power supply), mounted on a metal chassis, with the power supply covered by a metal enclosure. The enclosure must not be opened, and non-authorized persons must never remove the circuit board from the chassis. Very high voltage potentials exist on the circuit board, and disassembling any part of the power supply could be dangerous to field personnel.

Connection to the 230 VAC primary supply (+10%, −15%), must comply with National wiring regulations. The wiring must be permanently connected to the building wiring through a 10 A, 3-core cable, and a double pole 10 A isolation switch.

The primary supply must be wired to the correct terminals as follows:

- Live = Brown
- Neutral = Blue
- Earth = Green/Yellow

Note: The earth wire MUST be connected for each installation.

Cautions

- The incoming mains fuse only breaks the live connection.
- Dangerous potential remains on the incoming terminals even when the fuse is removed.
- Dangerous potentials can also exist at other locations on the PCB even with mains and battery disconnected.

Backup battery supply

WARNINGS

- The backup batteries, although at only 24 VDC, carry enough charge to be dangerous.
- When connecting batteries, or when working in the vicinity of the battery terminals, take care not to accidentally cause a short circuit. In particular metallic tools or metallic watchstraps can also inflict *severe* burns to the user as well as cause a short circuit.

Caution: The backup batteries contain substances that are potentially hazardous to your health and to the environment.

Regulatory information

This product is CPD approved. Certification details are shown in the table below.

CPD certification information

Certification	CE
Certification body	1134
Certificate number	1134-CPD-089
EN 54	EN 54-2: 1997+A1: 2006 EN 54-4: 1997+A1: 2002+A2: 2006
Manufacturer	UTC Fire & Security South Africa (Pty) Ltd., 555 Voortrekker Road, Maitland, Cape Town 7405, PO 181 Maitland, South Africa Authorized EU manufacturing representative: UTC Fire & Security B.V. Kelvinstraat 7, 6003 DH Weert, Netherlands
Year of manufacture	The year and day of manufacture, in the format YYDDD, is included in the first five digits of your product serial number, (located on the product identification label).

European standards for fire control and indicating equipment

These control panels have been designed in accordance with European EN 54-2, and EN 54-4 standards. In addition, they comply with the following EN 54-2 optional requirements, see Table 1 below.

Table 1: EN 54-2 optional requirements

Option	Description
7.8	Output to fire alarm devices (output to C)
7.9.1	Output to fire alarm routing equipment (output to E)
7.11	Delays to outputs
7.12.2	Dependencies on more than one alarm signal (type B)
7.13	Alarm counter
8.3	Fault signals from points
8.4	8.4 Total loss of the power supply
8.9	8.9 Output to fault warning routing equipment (output to J)
9.5	9.5 Disablement of addressable points
10.	Test conditions
10.1	General requirements
10.2	Indication of the test condition
10.3	Indication of zones in the test state
11	Standardized input/output interface

List of abbreviations and acronyms

Table 2 below lists and defines the abbreviations and acronyms used in this manual.

Table 2: Abbreviations and acronyms

Abbreviation	Definition
DC	Direct current
GND	Ground
LCD	Liquid crystal display
LED	Light emitting diode
mA	Milliampere
μF	Microfarads
MICC	Mineral-insulated copper-clad
PC	Personal computer
RX	Receive
SAB	Sounder alarm base
SW	Switch
TX	Transmit
V	Volts

Associated publications and references

Table 3 lists the documents, or parts thereof, that are referenced from this manual:

Table 3: Associated publications and references

Associated publication title	Document number
ZP3 Fire Control Panel User Guide	503-1160ZE-U-12
ZP3 Fire Alarm System Maintenance Logbook	503-1842ZE-1-02
ZP3AB-NET1 Network Board Installation Sheet	501-0485ZE-1-01
ZP3AB-SCB-D Serial Display Unit Interface Installation Sheet	501-0482ZE-1-01
Planner User Guide	503-1436ZE-U-06
European Standard EN 54 (Parts 2 and 4)	
British Standards BS 5839 (Part 1: 1988)	

Chapter 1
Installation overview

Summary

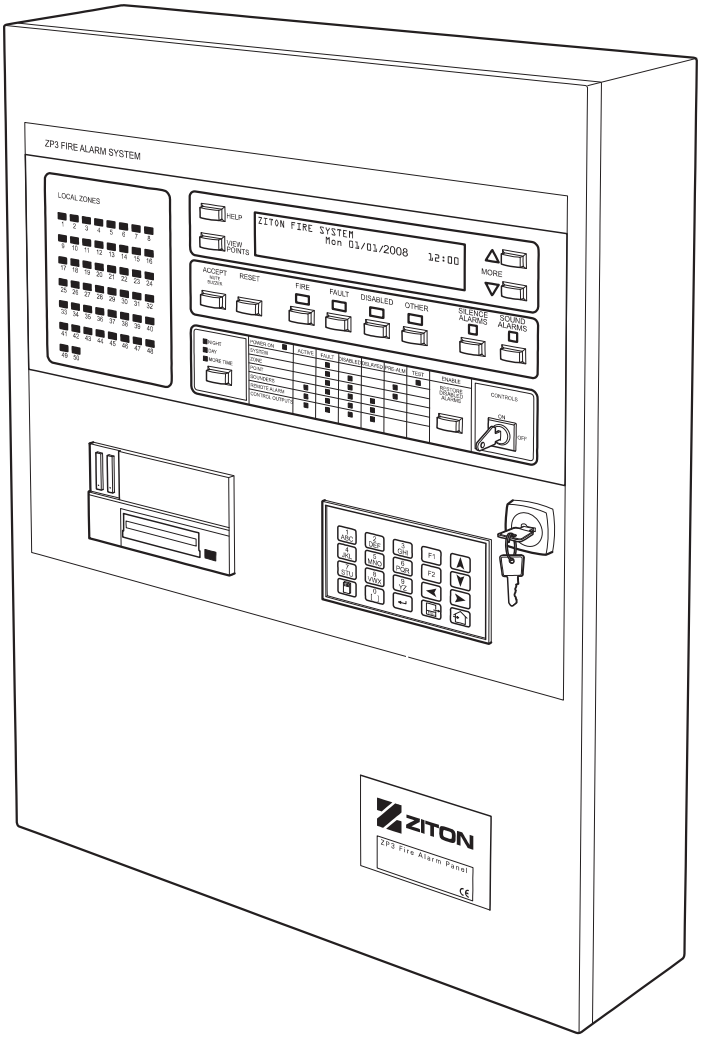
This chapter provides the specifications for your control panel, with an overview of the panel display and controls, construction and other panel information.

Content

Introduction

The ZP3 fire control panel (see Figure 1) is a state-of-the-art analogue addressable panel that complies with EN 54 parts 2 and 4. It is a compact microprocessor controlled unit, of modular design. Hardware and software modules enable you to configure virtually any system requirement. The panel uses nonvolatile flash memory, and can be programmed on site, either directly via the keypad, or by means of a notebook computer.

Figure 1: ZP3 Fire Control Panel



Specifications

Refer to Table 4 below for detailed specifications for the ZP3 Fire Control Panel.

Table 4: ZP3 Fire control panel specification

Compliance		
Fire alarm panel	Complies with European Standard EN 54-2	
Power supply	Complies with European Standard EN 54-4	
Electromagnetic	CE Marked. Complies with European Directive 89/336/EEC. Complies with standards BS EN 50081, BS EN 50082, and IEC 950	
IP rating	IP30: For indoor use only	
Loop		
Loop protocol	ZP addressable loop protocol	
Isolators	Up to 16 per loop (advisable to use 11)	
Capacity		
ZP3 four-loop panel	Devices-508	Loop devices, such as sensors, sounders, interfaces
	Zones-128	128 digital display, 50 built-in zone LEDs
	Outputs-768	Located on the I/O Bus (local and/or remote)
ZP3 two-loop panel	Devices-254	Loop devices, such as sensors, sounders, interfaces
	Zones-128	128 digital display, 50 built-in zone LEDs
	Outputs-768	Located on the I/O Bus (local and/or remote)
ZP3 one-loop panel	Devices-127	Loop devices, such as sensors, sounders, interfaces
	Zones-128	128 digital display, 50 built-in zone LEDs
	Outputs-768	Located on the I/O Bus (local and/or remote)
Power supply		
Mains voltage	230 VAC +10%, −15%	
Mains frequency	50 Hz (±15%)	
Mains current (maximum)	1 A	
Power	130 W	
CIE input voltage	21.0 to 27.6 VDC	

Auxiliary output voltage		
Output voltage (mains on)	24 VDC nominal	See note 1
Output voltage (mains off)	18.0 to 27.6 VDC	See note 1
Battery charging voltage	27.6 VDC	at 20°C temperature compensated
Maximum ripple (at full load)	500 mV peak	
Output current		
Total continuous	2.6 A at 21 VDC	See note 2
Total continuous	3.0 A at 24 VDC	See note 2
Total peak	5.5 A at 24 VDC	See note 2
Panel operation (quiescent)	0.4 A	See note 3
Panel operation (fire)	0.6 A	See note 3
Battery charging (JP6 IN, default)	1.4 A	
Battery charging (JP6 OUT)	1.0 A	
Available to user (continuous non fire alarm)	1.2 A	See note 4
Available to user (continuous in fire alarm)	2.5 A	See note 5
Supply input limits		
High voltage alarm	28.5 VDC	
First battery low-voltage notification: battery low warning local	22.3 VDC	
Second battery low-voltage notification: low/no battery local	21.0 VDC	
Batteries		
Type	12 V (2X)	Sealed lead-acid as per “Power supply and battery calculations” on page 56
Make and model	—	Kung Long WP26-12 BS129N
Battery SLA type	26 A/H	Maximum size that can be fitted into a type-A cabinet
Lithium battery CR2325	6 VDC	Time and date retention
Panel power requirements		
Panel (quiescent at 24 VDC)	450 mA	Load of panel only, excluding any external devices
Panel (alarm at 24 VDC)	500 mA	Load of panel only, excluding any external devices
Per Loop (quiescent at 24 VDC)	150 mA	Fully loaded loop, with 127 ZP devices, not in alarm

Per Loop (alarm at 24 VDC)	300 mA	Maximum available per loop, for driving all devices
Panel total (alarm at 24 VDC)		Dependent upon external devices when in alarm
Power supply (external)		
Primary supply	24 to 28 VDC (amps dependant on system load)	Optional. Supplied from an external charger
Output (mains OFF)	24 VDC	15 to 27.6 VDC depending upon state of battery and load
Total output	Amps	Dependent on external charger capacity
User available output	Amps	Dependent on external charger
Secondary supply/battery	24 VDC	Capacity dependent upon external charger
Software		
Part number	71900	Version 2.0 or higher
Firmware	-	Flash memory
Configuration programming	-	Flash memory
Display		
Liquid crystal text display	160 characters	Backlit 4-line text display
LED indicators	87	High-efficiency LEDs for status indication
Communication ports		
Z-Port 1	Planner (RS-232)	Built-in RS-232 for loading configuration from Planner (without control lines)
Z-Port 2	ZP-Net (RS-485)	Optional RS-485 port for connecting to ZP-NET
Serial control bus	SCB-Bus (RS-485)	Optional port for remote display and control panels
Z-Port 1a	RS-232	Optional port for BMS, pager, or other connection (with modem control lines)
Selectable features		
Common sounders	EN 54-2	Four common sounder circuits
Coincidence alarm	EN 54-2	Coincidence within zone
Remote manned centre (fire)	EN 54-2	For connection to fire alarm RMC routing equipment
Remote manned centre (Fault)	EN 54-2	For connection to fault alarm RMC routing equipment
Zone walk test	EN 54-2	One-man test of a zone, other zones remain working
Control outputs	EN 54-2	Up to 768 programmable control outputs

Output delays	EN 54-2	Delays can be programmed to any output
Alarm counter	EN 54-2	Level 2 access alarm counter records all alarms
Delay on sounder silence		Prevents silencing alarms before they are heard
Alarm verification		Verifies alarms from a sensor before displaying “Fire”
Sensor sensitivity		Four levels of sensitivity per sensor
Input - output configuration		Sophisticated I/O mapping functions
Automatic sensor test		Tests complete operation of sensors
Controls		
Help	Button	Displays operator instructions on-screen
View fire alarm	Button	Displays the Fire Alarms by Zone screen
View fault alarm	Button	Displays the Fault Alarms by Zone screen
View disabled zones/devices	Button	Displays the Disabled Devices by Zone screen
View other	Button	Displays the Other Events by Category screen
View points/devices	Button	Displays alarms by individual device
Accept	Button	Silences the built-in panel buzzer during an alarm
Reset	Button	Resets the system to normal after an alarm
Silence alarms	Button	Silences all field sounders that are active
Sound alarms	Button	Activates all (or selected) field sounders
Restore disabled alarms/RMC	Button	Restores sounders or RMC alarms that are disabled
Scroll events (more)	Button	Manually scrolls the list of alarms on LCD screen
Controls ON/OFF	Key switch	Enables or disables front panel controls
Operator menu/keypad	Keypad	For operator, maintenance, and setup menus

Indicators		
Fire (common)	LED (dual)	Red
Fault (common)	LED (dual)	Yellow
Disabled (common)	LED (dual)	Yellow
Other (common)	LED (dual)	Yellow
Alarms silenced	LED	Yellow
Sound alarms key pressed	LED	Yellow
Night mode (optional)	LED	Green
Day mode (optional)	LED	Yellow
More alarms	LED	Yellow
Sounders active	LED	Red
Remote centre alarm active	LED	Red
Control output active	LED	Red
System fault	LED	Yellow
Zone fault	LED	Yellow
Sounder fault	LED	Yellow
Remote centre alarm fault	LED	Yellow
Control output fault	LED	Yellow
Zone disabled	LED	Yellow
Point disabled	LED	Yellow
Sounders disabled	LED	Yellow
Remote centre alarm disabled	LED	Yellow
Control output disabled	LED	Yellow
Zone prealarm	LED	Yellow
Point prealarm	LED	Yellow
System test mode	LED	Yellow
Power on	LED	Green
Switched outputs (standard)		
Sounder circuits (common/programmable)	2	Monitored sounder circuits, programmable as one o/p “1 + 2”
Sounder circuits (common/programmable)	2	Monitored sounder circuits, programmable as one o/p “3 + 4”
Fire (common)	1	Voltage-free relay contacts, common to all fire alarms
Fault (common)	1	Voltage-free relay contacts, common to fault alarms
Remote manned centre (fire)	1	Monitored voltage output to RMC transmitter for fire
Remote manned centre (fault)	1	Monitored voltage output to RMC transmitter for fault

Switched outputs and inputs (optional)		
Relay outputs	Up to 896	A total of 896 (768 freely programmable) inputs or outputs can be connected to each ZP3 panel. These inputs and outputs can be a mixture of any of the standard device types shown
Transistor open-collector O/P	Up to 896	
Sounder-circuit outputs	Up to 896	
Monitored Inputs	Up to 896	
Optional printer		
24-character panel-mounted	Built-in	Plain-paper printer with menu-selectable programme

[1] This is the output voltage available to provide power to auxiliary boards, such as sounder output boards. It must not be used to power devices not related to the fire system. With the mains on it is regulated at 24 to 29 VDC, and with the mains off it provides battery voltage, which is approximately 3 V lower than the battery voltage when a full load (4 A) is connected. As a safety feature, line device analogue information is ignored by the panel at very low input voltages. Battery voltages from 19 to 21 V (and lower depending on the current being drawn) cause the panel to display the message “Fire detection inactive”.

[2] This is the total power supply capability, used for all panel and user operations. The peak current is only available for short periods of time, not exceeding 30 minutes.

[3] Maximum current used internally by the panel, excluding detectors and external devices.

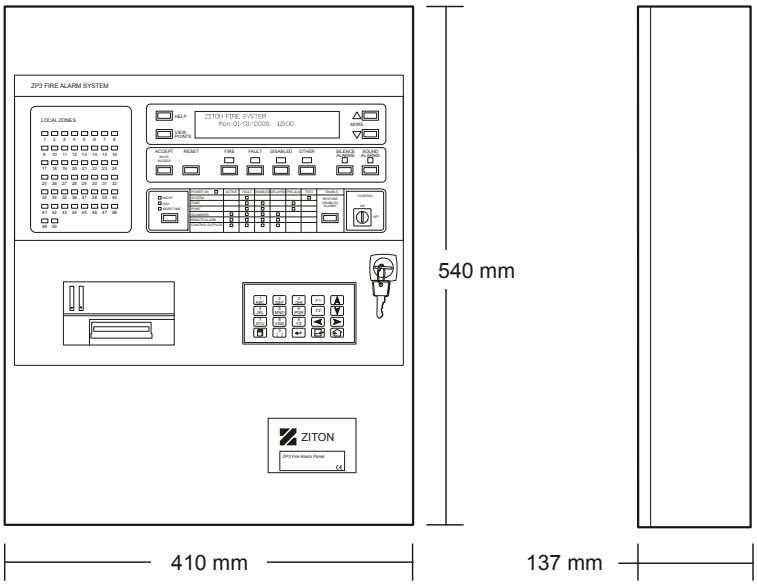
[4] After deducting panel operation and battery charging requirements, the current remaining is available for use by external devices such as detectors, accessory boards and sounders. This is the maximum current available while the system is in a non fire alarm condition.

[5] In a fire alarm condition, the battery charging is disconnected. Therefore, in a fire condition, additional current is available for external fire alarm devices only, such as sounders.

Dimensions

See Figure 2 for the dimensions of the ZP3 fire alarm panel. The basic panel is designed for surface mounting, and flush-mounting kits are available. The dimensions below apply to the basic panel. For details of optional mounting hardware, see the appropriate data sheets.

Figure 2: Panel dimensions



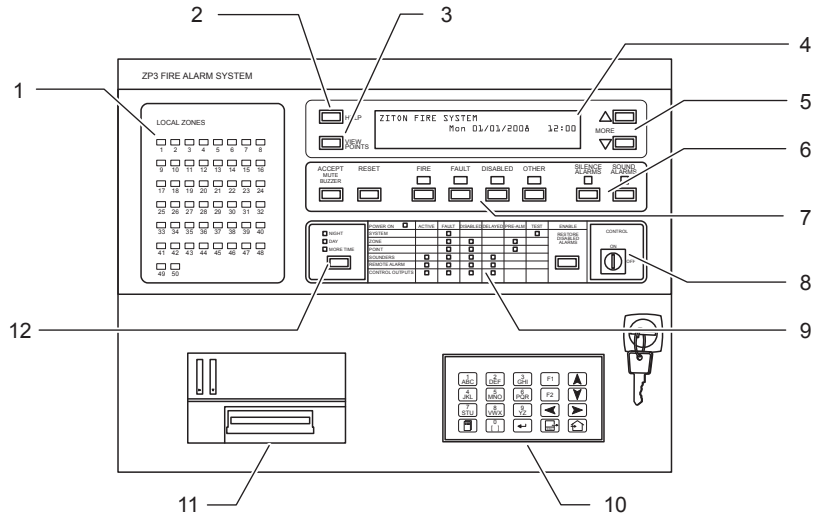
Weight without batteries	10 kg
Weight with batteries	20 kg

Panel overview

Display and controls

The fascia of the ZP3 fire panel has the necessary indicator lamps, text display screen, controls, menu keyboard, and printer to provide the operator with the status of the system at all times. It also has a reporting system for alarms, faults, and other events. Figure 3 shows the main features of the front panel.

Figure 3: Main features of the panel



1. Zone fire indicators
2. Help button
3. Views points button
4. LCD text display
5. Scroll buttons
6. Sounder control keys
7. Alarm view buttons
8. Access control
9. Status indicators
10. Keypad
11. Printer
12. Day/night module

The display of information is designed to comply with the requirements of EN 54-2. In addition to alarms and events being reported on the text screen, they are also indicated on zone lamps where applicable. Operation of controls is structured by access level, with four levels being provided. The printer is an optional item.

Panel construction

Modular format

The ZP3 fire control panel (see Figure 4) is of modular design so that it can be configured for any required application. It consists of a basic panel, which is fully functional, and available in three models, one-loop, two-loop, and four-loop. The basic panel operates as a complete system without any extras.

Figure 4: Modular construction of the panel

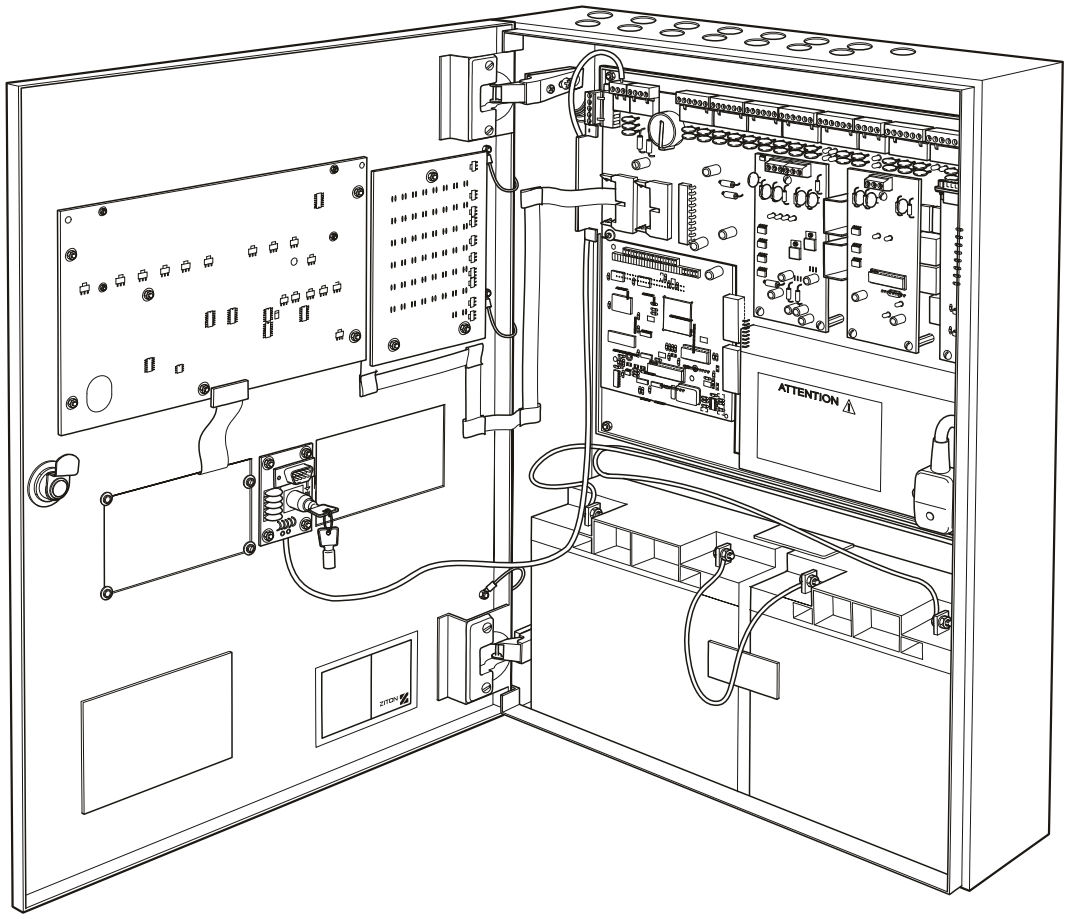
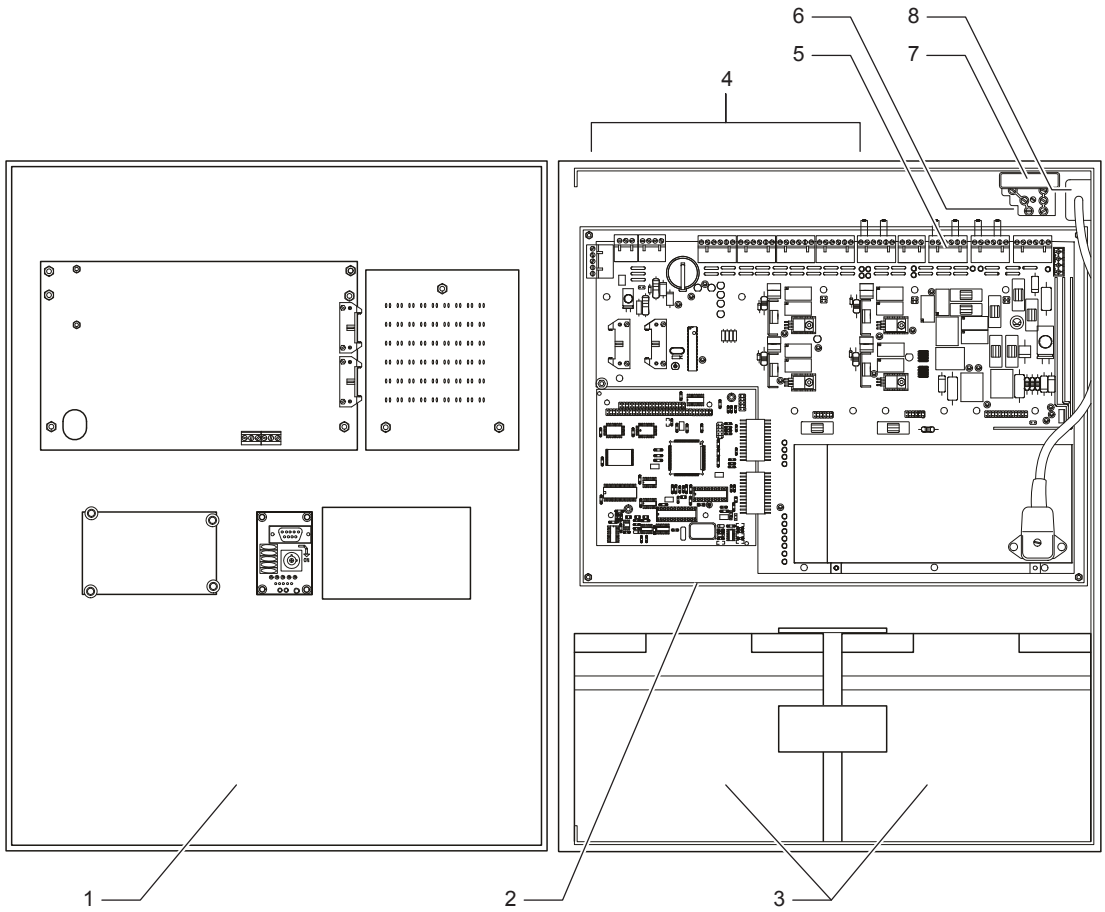


Figure 4 shows the basic fire panel. The elements shown provide all required functions, and form the core of the ZP3 panel. No optional I/O modules or printer are shown in this illustration. Three communication boards are fitted.

Internal features

Figure 5 shows the internal features of the basic ZP3 panel with additional detail. All components are carried on two main modules; the internal chassis holds the main board and processor board, and the door assembly holds the display board, the zone board, the keyboard, and the Zport 1 connection.

Figure 5: Internal features



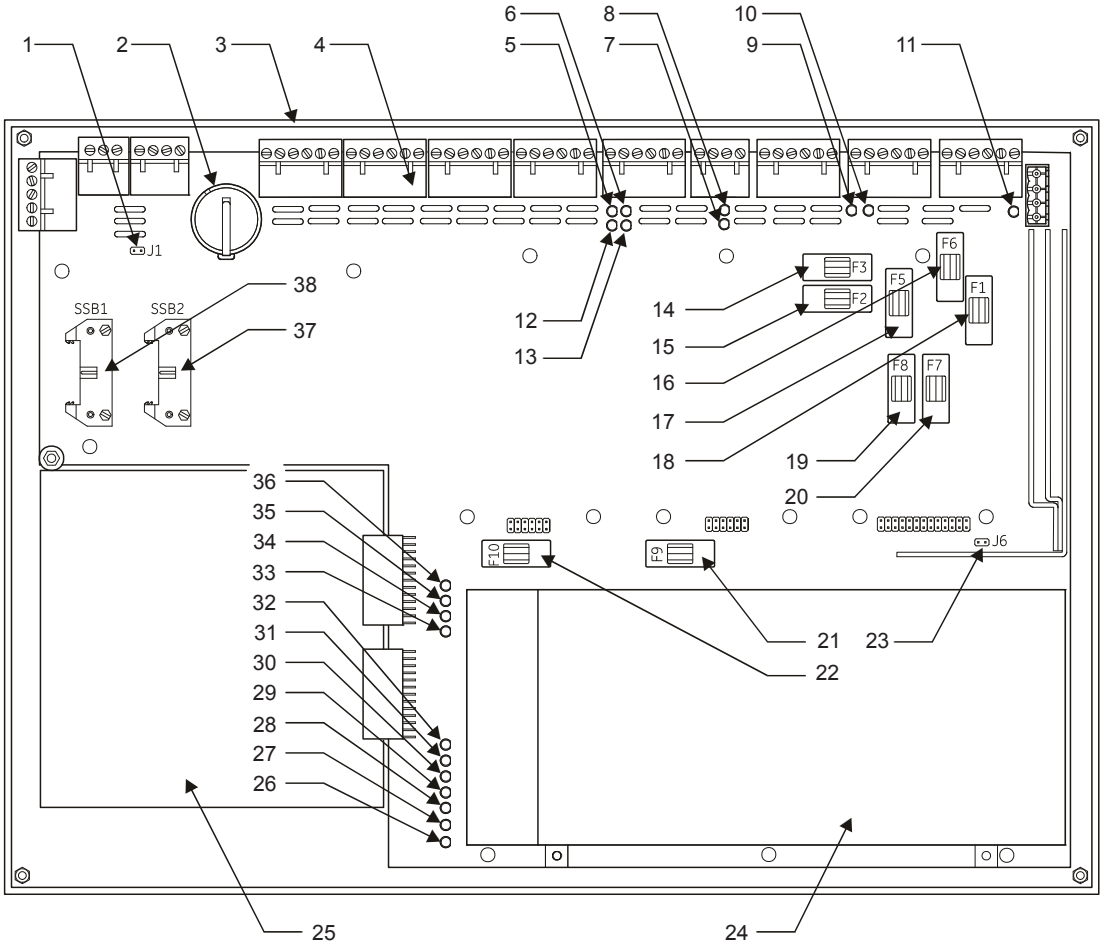
1. Door assembly
2. Main chassis
3. Batteries
4. Field wiring entry
5. Main terminals
6. Mains 230 VAC connections
7. Mains fuse
8. Mains filter

The panel is divided into three main modules, namely the chassis, the door assembly, and the cabinet. The basic electrical installation can be carried out using the cabinet only, which has the required conduit entry points at the top and back. Optional hardware is available for different installation requirements.

Main chassis assembly

Figure 6 shows all the main features of the ZP3 panel main chassis assembly. This unit comprises the line drivers, the I/O circuitry, the control circuits, the power supply, and the plug-in central processing unit (CPU).

Figure 6: Main chassis assembly



1. Earth monitoring enabled
2. Battery for time/date
3. Chassis
4. Field terminals
5. LED 6 RMC alarm activated
6. LED 10 RMC fault activated
7. LED 12 common fire
8. LED 11 common fault
9. LED 13 sounder 1+2 activated
10. LED 36 sounder 3+4 activated
11. LED 1 battery charging
12. LED 5 RMC alarm overload
13. LED 9 RMC fault overload
14. Monitored sounder 4
15. Monitored sounder 3
16. Aux/supply out
17. RMC fault alarm
18. Battery/external 24V
19. Monitored sounder 1
20. Monitored sounder 2
21. Main 24 VDC power 6.3 A
22. 5 VDC power 0.5 A
23. Charge rate selector
24. Power supply unit
25. CPU board
26. LED 4 mains on
27. LED 2 RDU +ve
28. LED 7 RS-232 +ve
29. LED 8 RS-232 −ve
30. LED 14 +5V_S
31. LED 15 +5V
32. LED 37 24V
33. LED 20 sounder fault
34. LED 19 loop fault
35. LED 18 earth fault
36. LED 21 ADC failure
37. To auxiliary boards
38. To display PCB

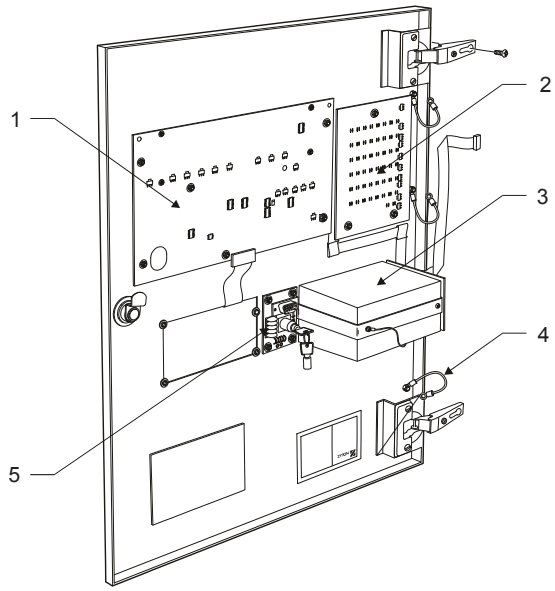
The main chassis is removed from the panel by removing the four securing screws.

WARNING: Once removed, the main chassis should not be dismantled, as very high voltage exists below the circuit board, and can be present even when mains is off, or the unit is removed from power. There are no field-serviceable parts in the assembly.

Door assembly

Figure 7 shows all the main features of the ZP3 panel Door Assembly. This unit comprises the panel display and control electronics as well as the keyboard, a serial connection for data loading, and the printer (if fitted).

Figure 7: Door assembly



1. Display board
2. Zone board
3. Optional printer
4. Earth straps
5. Commissioning board

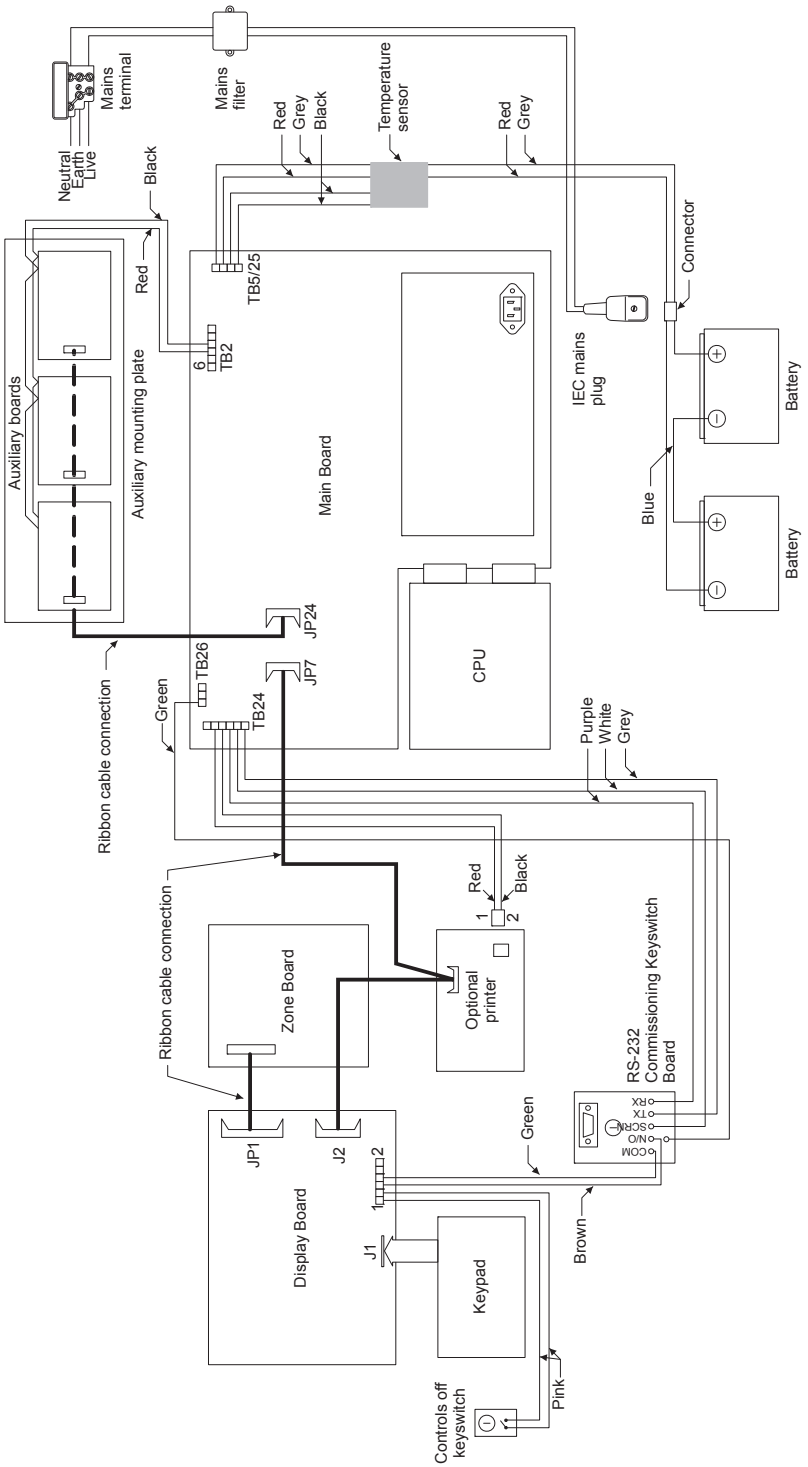
To remove the complete door assembly:

1. Remove the two screws securing the hinges.
2. Remove the four nuts securing the earth straps, which connect from door to box.
3. Carefully unplug cables connecting the door boards to the main chassis.

Note: Do not dismantle the door boards. There are no field-serviceable parts in the assembly.

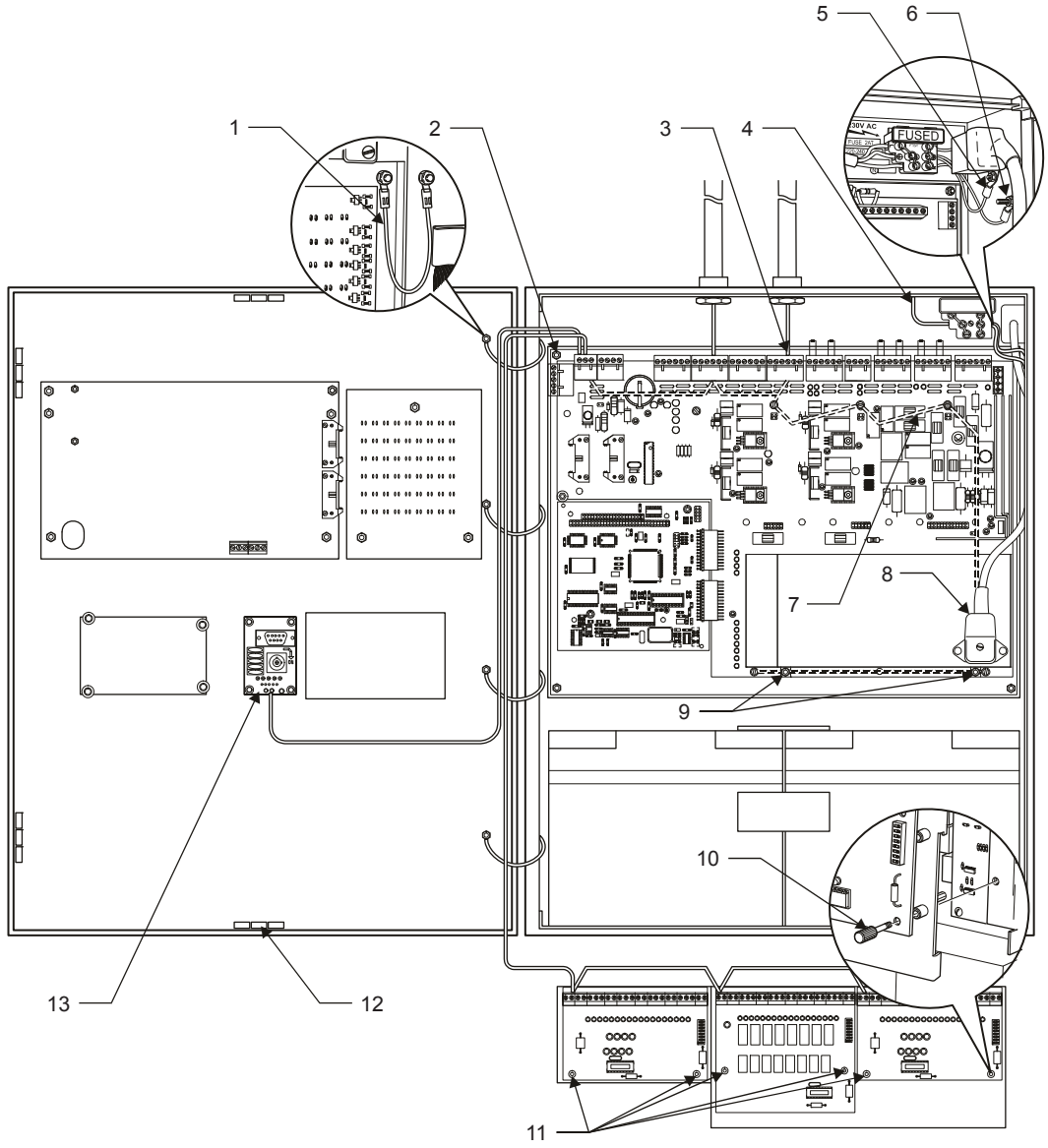
Internal wiring

Figure 8: Internal wiring



Earth bonding

Figure 9: Earth bonding



1. Earth straps
2. Chassis earthing nuts
3. Earth connection to detector loop screens
4. Building earth
5. Filter earth
6. Panel enclosure earthing stud
7. Earth path to chassis
8. Earth in cable to PSU
9. Earth path to power supply cover
10. Accessory plate earthing screw to chassis
11. Earth path to accessory plate
12. Contact clips
13. Commissioning board

Built-in communication port

RS-232 built-in serial port

The built-in RS-232 port is used to connect the ZP3 panel to an external computer for the purpose of uploading or downloading the panel's configuration

program. Configuration programming is normally done on a PC using Planner (the *Planner for Windows* programme) and then loaded into the panel at the site via a portable PC. This port can also be used to upgrade the ZP3 panel software to a new version.

Note: The preferred baud rate settings when using Planner to configure a ZP3 panel are shown in Table 5 below.

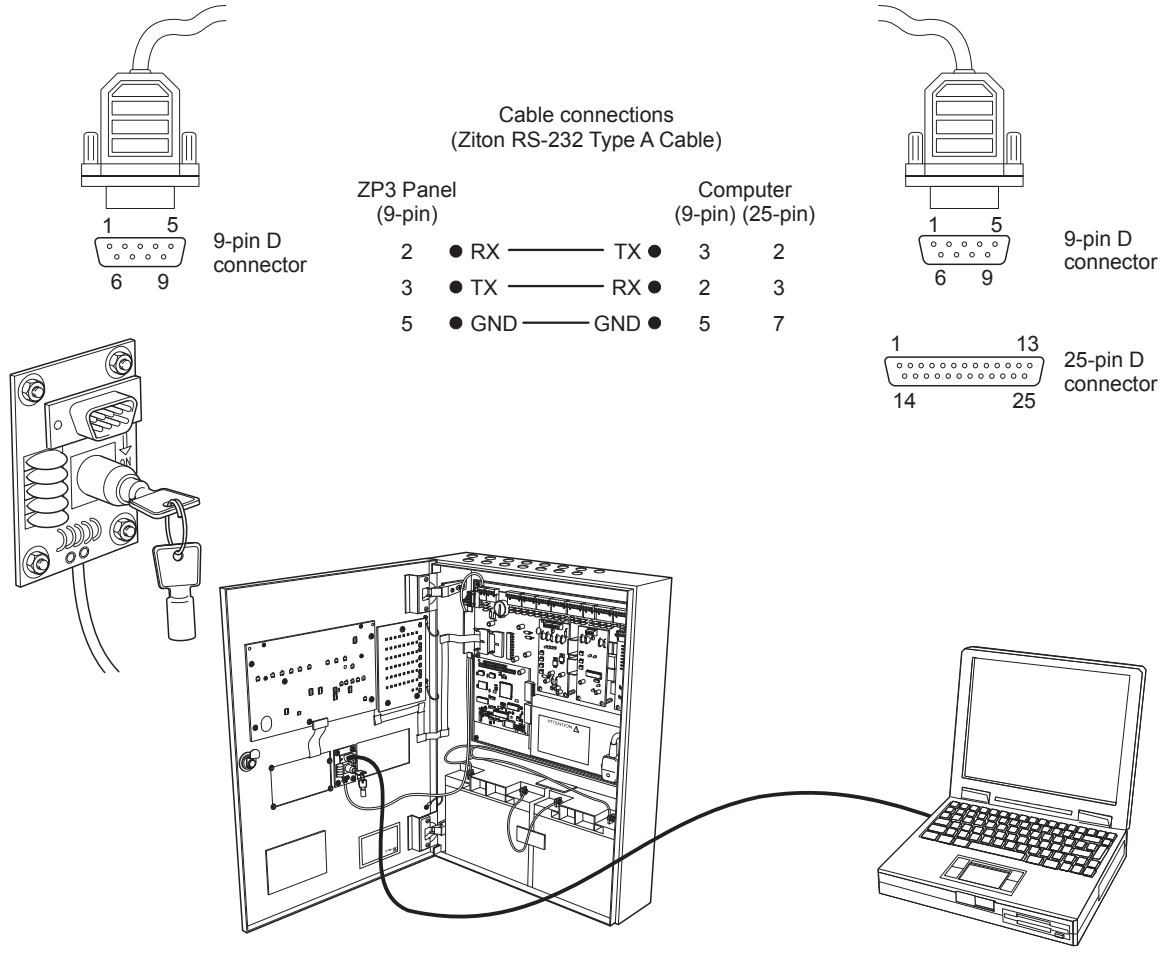
Table 5: Baud rate settings for the ZP3

	Baud rate	Data bits	Parity	Stop bits
Receive	38400	8	Even	1
Send	9600	8	Even	1

Alternatively you can set Z-Port 1 to ZCP3 to allow control directly from Planner.

The protocol is RS-232, with a three-wire connection as shown in Figure 10. This port shares internal lines with Z-Port 1a, and consequently the D-plug connection to the ZP3AB-RS232 board must be physically disconnected before using the built-in port.

Figure 10: RS-232 built-in serial port



RS-232 is officially specified as having a maximum cable length of 10 metres, which is more than adequate for ZP3/PC configuration functions. The connecting cable must be screened, and must be made-up as per Figure 10. Alternatively, a standard null modem cable can be used.

Software setup

The RS-232 built-in serial port (Zport1) must be configured in the software, and must be set to match the communications parameters of the PC and program being used.

Access the communications parameters menu using the following menu path:

Setup > System Configuration > Peripheral Comms > Comms Parameters

The following screen is displayed.

Figure 11: Communications Parameters screen

```
SETUP:SYS CFG: PERIPH. COMMS: COMMS PARMS
Z-PORT  : (1)         (<- -> More Z-PORT)
Protocol: 0 -None
Setup   : 2400/8/e/2          <Enter>-Edit
```

To change a setting, move the bracket to the selected item, and press Enter.

The parameters are dependent on the program used. For Planner, set the parameters as follows.

Table 6: Z-port 1 configuration settings

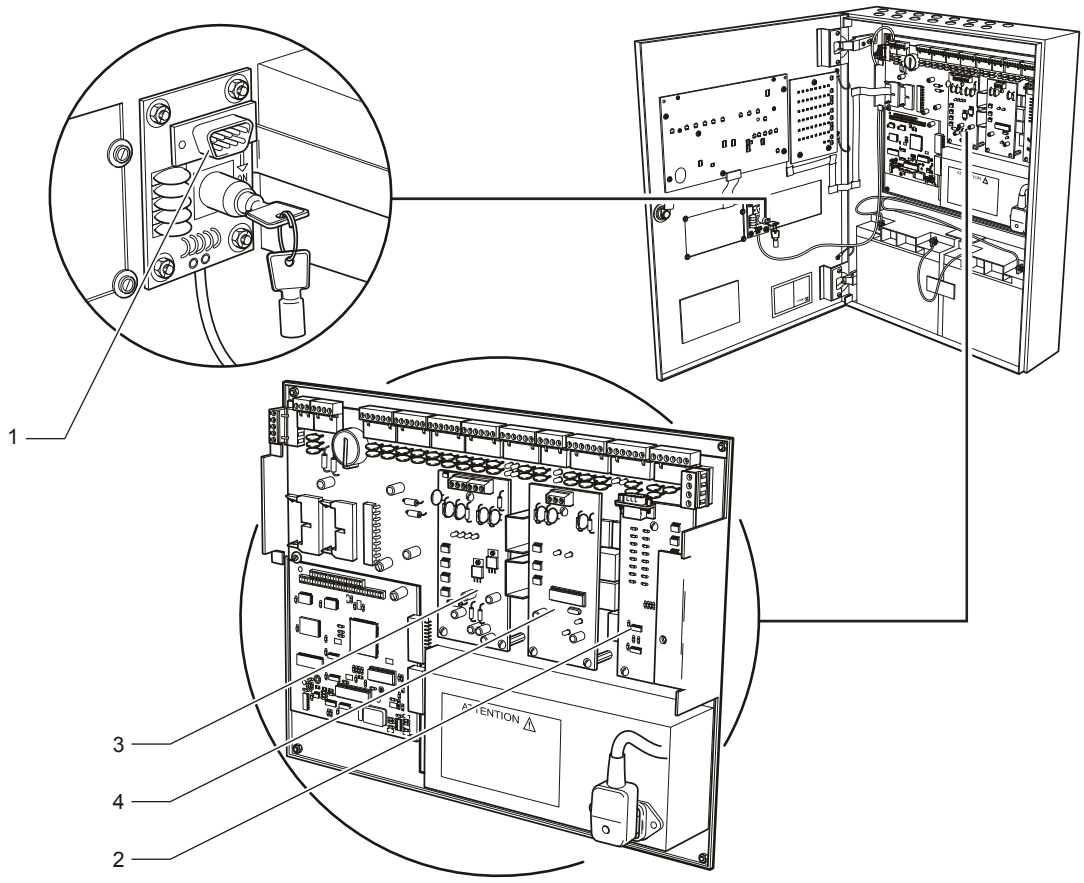
Parameter	Remarks
Z-PORT	Enter Z-port number 1
Protocol	Enter the required protocol as follows: 0 = disable the port 11 = for use with Ziton Planner 18 = ZCP2-3 protocol
Setup	Enter the following setup data: Baud rate = 38400 Data bits = 8 Parity = None Stop bits = 1

Optional modules

Communication boards

The standard ZP3 fire panel has one built-in communication port, Z-Port 1, used for programming. Additional ports are available as options for other functions, such as connecting into a Ziton ZP-NET network, connecting to graphics display computers, as well as to remote display units and remote control units. These ports are installed as shown in Figure 12. Modules are connected to plug-in sockets, and secured to posts with three M4 screws.

Figure 12: Communication boards



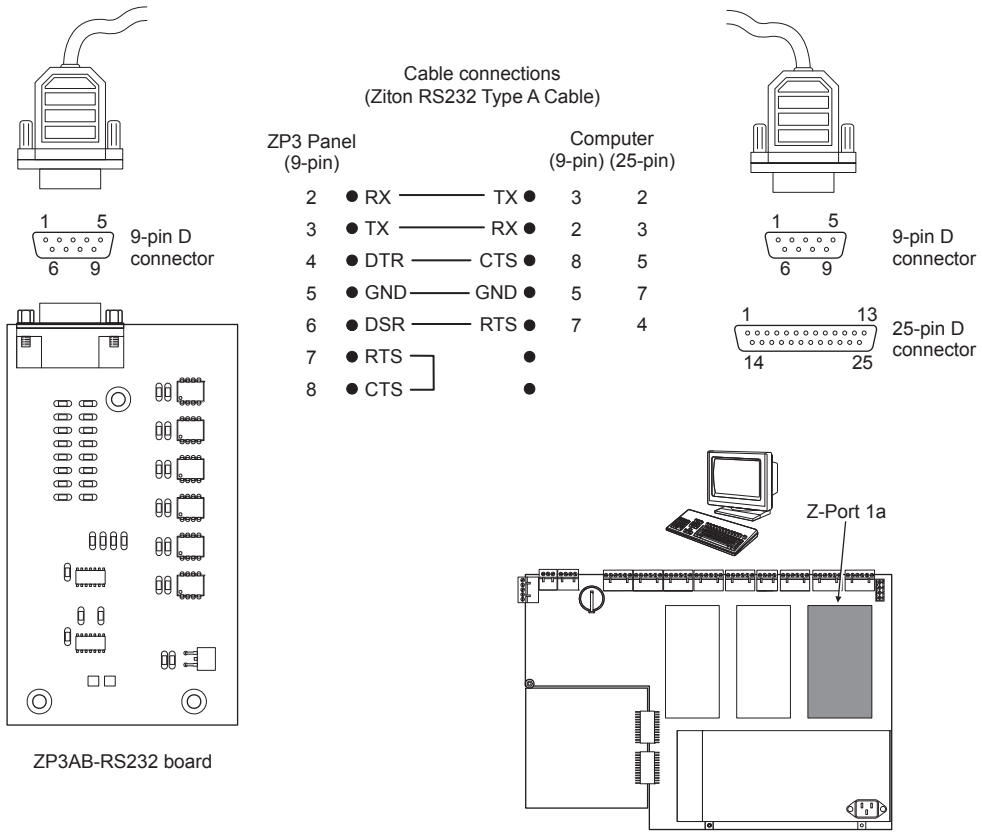
Item	Description	Standard / optional	Remarks
1.	Z-Port 1	Standard	Connects to notebook computer for programming of the ZP3 panel using the Planner configuration program.
2.	Z-Port 1a	Optional	Serial communication board ZP3AB-RS232 for connecting to third party systems, such as building management systems, graphics systems, and automatic pager systems.

Item	Description	Standard / optional	Remarks
3.	Z-Port 2	Optional	Serial board ZP3AB-NET-RS485 for connecting to a Ziton ZP-NET peer-to-peer network comprising several ZP3 panels, Maestro graphics computers, and global display panels.
4.	Serial control board	Optional	Serial board ZP3AB-SCB-D for connecting to one or more remote display panels, remote control panels with inputs and outputs (sounders, control outputs, etc), and remote mimic indicator panels.

ZP3AB-RS232 Serial Communications Board (Z-Port 1a)

The ZP3AB-RS232 Serial Communications Board (see Figure 13) is used to connect a ZP3 panel to an external device, such as a desktop printer, a graphics display system, a building management system, modem, or a paging system. The hardware protocol is a RS-232, being a screened five-wire connection. The RS-232 board is defined in the menus as Port1a, and different software protocols can be selected to match the connected PC application. Communication parameters can be set in the Setup menu.

Figure 13: ZP3AB-RS232 Serial Communications Board (Z-Port 1a)



RS-232 is officially specified as a maximum cable length of 10 metres. However, if slower baud rates are used, then it is possible to operate it at up to 50 metres. Cable must be screened, with at least five conductors, and must be made up as shown in Figure 13.

Software setup

To be functional, the optional RS-232 serial port (Z-port 1a) must be configured in software, and must be set to match the communications parameters of the PC and program being used. Access the communications parameters menu using the following menu path:

Setup > System Configuration > Peripheral Comms > Comms Parameters

The following screen is displayed.

Figure 14: Communications Parameters screen

```
SETUP:SYS CFG: PERIPH. COMMS: COMMS PARMS
Z-PORT  : (1)         (<- -> More Z-PORT)
Protocol: 0 -None
Setup   : 2400/8/e/2          <Enter>-Edit
```

To change a setting, move the bracket to the selected item, and then press Enter.

The parameters are dependent on the programme used. The following options are available.

Table 7: Z-port 1a configuration settings

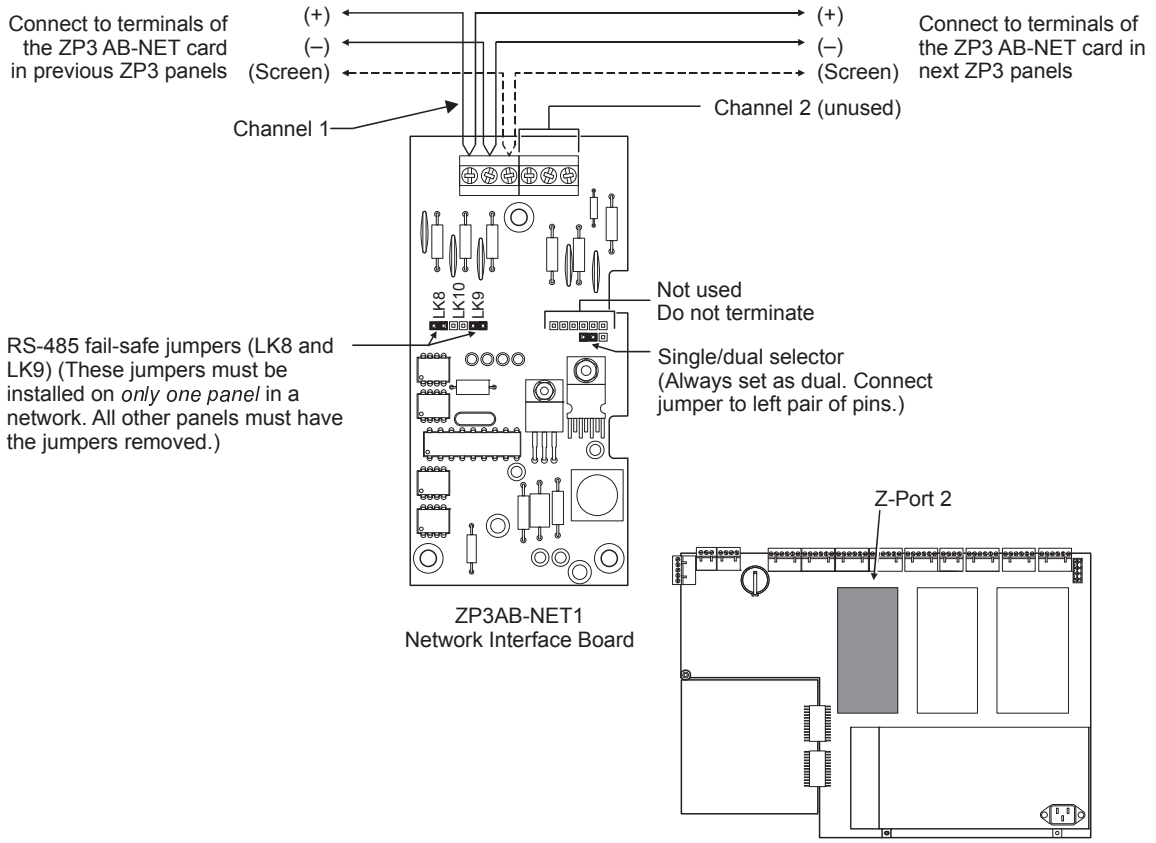
Parameter	Remarks
Z-PORT	Enter Z-port number 1
Protocol	Enter the required protocol as follows: 0 = disable the port 1 = ZCP2 protocol, multiple-telegram, full handshaking 2 = ZCP2 protocol, single telegram, single direction TX only, no handshaking 7 = ZCP2 protocol, single telegram, full handshaking 11 = ZCP3 for use with Ziton Planner 18 = ZCP2-3 protocol, multiple-telegram, full handshaking (configurable). For use with Ziton Planner, Maestro & Building Management systems
Setup	Enter the required setup data from the following options: Baud rate = 57600, 38400, 33600, 28800, 19200, 14400, 9600, 4800, 2400, 1200, 600, 300 Data bits = 5, 6, 7, 8 Parity = Even, Odd, None Stop bits = 1, 2

ZP3AB-NET1 Network Board (Z-Port 2)

The ZP3AB-NET1 Network Board is used to connect a number of ZP3 panels into a peer-to-peer network. The hardware protocol is a multidrop RS-485 screened, two-wire connection. Although the ZP3AB-NET1 board is capable of dual routing operation, ZP3 software does not support this feature, and the board must be used as a single-channel device. In a network of ZP3 panels, one of the

panels must have the fail-safe links connected by connecting the jumpers as shown in Figure 15. All other panels must have their jumpers removed. For long cable runs wiring should be terminated (using LK10) at each end of the cable run, in addition to the LK8 and LK9 jumpers. In any case no more than two terminating links (LK10) must be inserted.

Figure 15: ZP3AB-NET1 Network Board (Z-Port 2)



RS-485 operates through up to 2,000 metres of screened, twisted-pair cable. Wiring can be daisy-chained point-to-point, or can be T-tapped or spurred for short distances i.e. less than 10 m. The total length of cable in the network should not exceed 2,000 metres. If the network distances are greater than 2,000 metres, use RS-485 booster units, or fibre-optic cable. For more information refer to the *ZP3AB-NET1 Network Board Installation Sheet* (P/N 501-0485ZE-1-01).

The cable is specified in detail in Appendix A “ZP wiring guide” on page 117, but as a guideline it should be data quality cable with a conductor size of 0.5 mm².

Software setup

To be functional, the optional ZP3AB-NET1 Network Board (Z-Port 2) must be configured in software. Access the communications parameters menu using the following menu path:

Setup > System Configuration > Peripheral Comms > Comms Parameters

The following screen is displayed.

Figure 16: Communications Parameters screen

```
SETUP:SYS CFG: PERIPH. COMMS: COMMS PARMS
Z-PORT  : (1)         (<- -> More Z-PORT)
Protocol: 0 -None
Setup   : 2400/8/e/2          <Enter>-Edit
```

To change a setting, move the bracket to the selected item, and then press Enter.

The parameters are dependent on the program used. The following options are available.

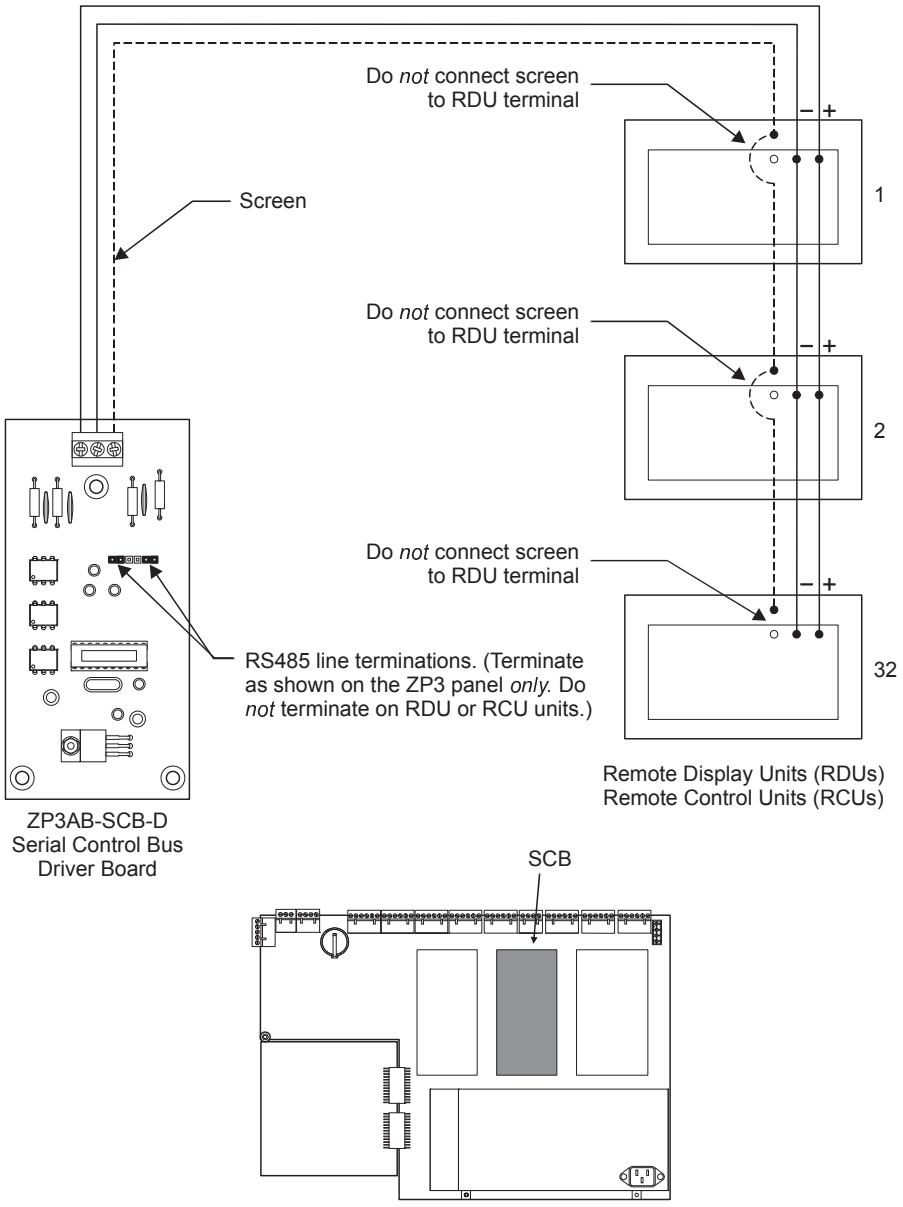
Table 8: Z-port 2 configuration settings

Parameter	Remarks
Z-PORT	Enter Z-port number 2
Protocol	Enter the required protocol as follows: 0 = Used for stand-alone panels (not networked) 9 = Peer-to-Peer networking 10 = Peer-to-Peer V2 17 = Peer-to-Peer V3
Setup	Enter the following setup data: Baud rate = 19200 Data bits = 8 Parity = Even Stop bits = 1

ZP3AB-SCB-D Serial Control Bus Driver Board

The ZP3AB-SCB-D Serial Control Bus Driver Board is used to connect a number of remote display units (RDUs) and remote control units (RCUs) to a ZP3 fire panel. The hardware protocol is a multidrop RS-485 screened, two-wire connection. The wiring is connected from the ZP3AB-SCB-D board in the ZP3 panel to the SCB connections in the RDU and RCU panels. The wiring must be terminated at the ZP3 panel by connecting the jumpers as shown in Figure 17. All other panels must not be terminated, i.e. their jumpers must be removed.

Figure 17: ZP3AB-SCB-D Serial Control Bus Driver Board



Note: The RDU screen must *only* be connected on the ZP3AB-SCB1 Serial Control Bus Driver Board in the ZPR Panel. The screen must *not* be connected at the RDU.

RS-485 operates through up to 2,000 metres of screened, twisted-pair cable. Wiring can be daisy-chained point-to-point, or can be T-tapped or spurred. The total length of cable in the network should not exceed 2,000 metres. If the network distances are greater than 2,000 metres, use RS-485 booster units, or fibre-optic cable. For more information refer to the *ZP3AB-SCB-D Serial Display Unit Interface Installation Sheet* (P/N 501-0482ZE-1-01).

The cable is specified in detail inAppendix A “ZP wiring guide” on page 117, but as a guideline it should be data quality cable with a conductor size of 0.5 mm².

Setup

The ZP3 panel can operate 63 remote display units. The address range for the RDU is 1 to 63, which allows for up to 63 address options. The RDU is wired to the panel via the ZP3AB-SCB1 SCB driver board.

Usage: Fit the ZP3AB-SCB1 board to the ZP3 panel using the interface marked “RDU interface”. Accept devices on the panel. The SCB software stream for the 71910 EN panel is SW72401. Once the SCB driver board has been accepted the user can view the SCB driver software under Operator > Reports to display. Configure the SCB online, this defines the number of RDUs that can be connected to the panel.

Navigate to the following menu:

Setup > System Configuration > Peripheral Comms > RDU/SCBR Online

The address of an RDU may not be higher than the number of RDUs configured to be to online. If this value is set to 32 then RDUs can be connected with addresses ranging from one to 32. This number defines the valid RDU address numbers and not the amount of RDUs connected. All RDUs that have addresses higher than the number entered for RDUs online will not have control abilities.

If this number is set to 63, the address at the RDU can be set to any address from 1 through 63. If this number is set to 1, only address 1 can be set on the RDU unit.

Remote display unit

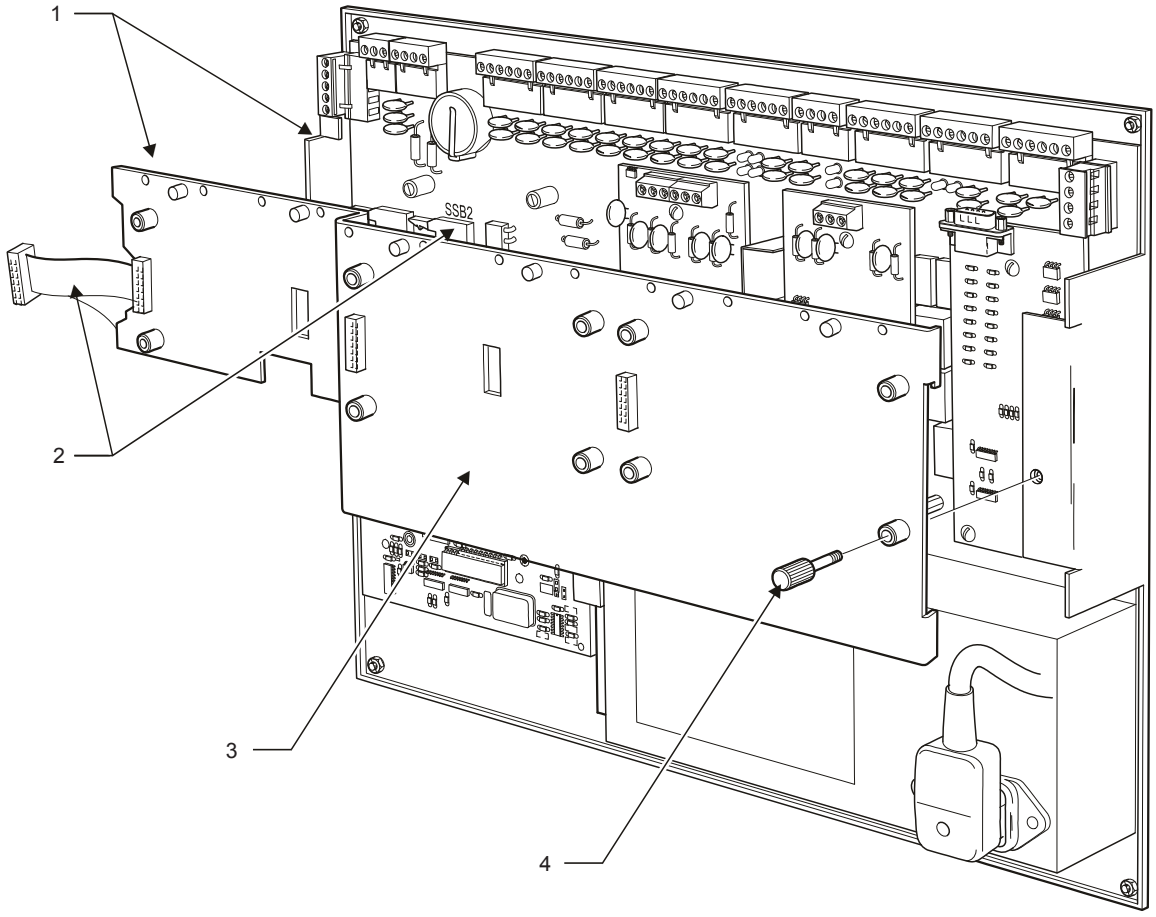
When an RDU is configured as being online, it mimics the panel and also sends control information back to the panel. To disable the RDU control, remove the controls enabled jumper fitted to the RDU board. The RDU software stream for the 71910 EN panel is SW72201. Once the RDU has been accepted the user can view the RDU software under Operator > Reports to Display. If there are ten RDUs accepted then this menu will have ten entries for RDUs.

Usage: The number selected on the address switch depends on the number of RDUs defined online. As stated above, the number entered to define the amount of RDUs online defines the maximum address number. Address switches 1, 2, 3, 4, 5, and 6 set the address in the standard address switch format as used on the detectors, e.g. switches 2, 3, 4, 5, and 6 set to ON represent an RDU address of 62.

Accessory plate

An accessory plate can be installed for the purpose of mounting optional auxiliary boards. The accessory plate mounts onto the main chassis, as shown in Figure 18.

Figure 18: Accessory plate



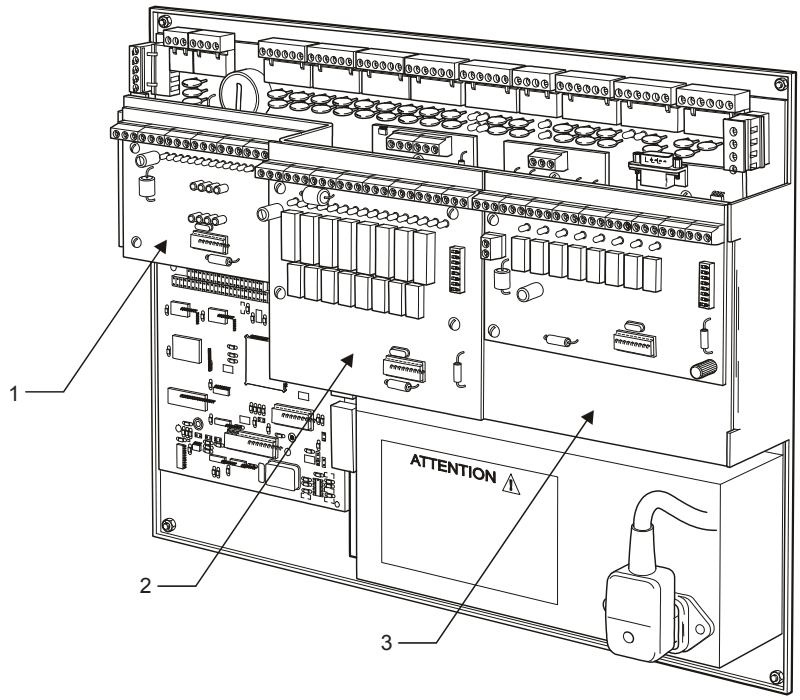
1. Chassis located under clips
2. Connect ribbon cable to SSB2
3. Accessory plate
4. Thumb screw

A ribbon cable is fitted to the accessory plate. Connecting the ribbon cable to the socket as shown in Figure 18 automatically connects all auxiliary boards to the ZP3 main board. The accessory plate enables easy access to the main board after installation.

Mounting auxiliary boards

The basic panel incorporates a standard range of inputs and outputs. If additional inputs or outputs are required, a range of optional modules is available that fit into the panel. The auxiliary I/O boards mount onto the auxiliary chassis as shown in Figure 19.

Figure 19: Mounting auxiliary boards



1. Position A
2. Position B
3. Position C

The maximum number of auxiliary boards that can be fitted into a ZP3 panel is three. This can be all of one type, or a mix of types. This provides from 24 to 72 outputs within the ZP3 cabinet. If additional auxiliary boards are required, these must be mounted in a separate *remote control cabinet.* Various size cabinets are available, and each ZP3 panel can support up to 896 outputs, of which 768 are freely programmable.

Auxiliary boards and modules

The following I/O auxiliary boards are available:

- ZP3AB-MIP8 Input Board (8-way). See “ZP3AB-MIP8 Input Board” on page 66
- ZP3AB-RL8 Relay Board (8-way), See “ZP3AB-RL8 Relay Board” on page 63
- ZP3AB-MA8 Monitored Output Board (8-way). See “ZP3AB-MA8 Monitored Output Board” on page 64
- ZP3AB-OP24 Transistor Output Board (24-way). See “ZP3AB-OP24 Transistor Output Board” on page 65

Modem

Introduction

The Digi One 1A Modem as shown in Figure 20 allows remote dial-in access to the ZP3 panel for diagnostic purposes.

The Modem communicates to the ZP3 panel via the serial port connector JP3 on the ZPAB-RS232 board located on the ZP3 panel. Legacy modems were additionally controlled via a Modem Control Board connected on the panel's SSB (serial synchronous bus). See Table 9 below for modem specifications.

Figure 20: ZP3AB-MD3 Modem

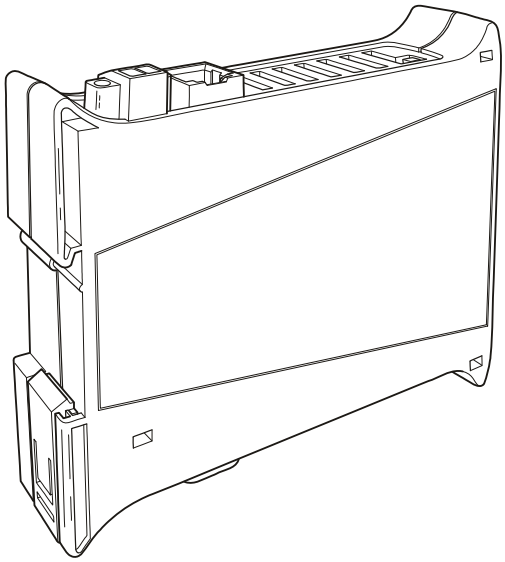


Table 9: Modem specifications

General	
Description	Remote diagnostics modem
Mounting	On the ZP3 accessory plate
Wiring	Via connecting lead to the ZPAB-RS232 board
Power requirements Connector Voltage	 Two-contact barrel connector +9 to +30 VDC
Environmental	
Ambient temperature	0 to 55°C
Relative humidity	5 to 90% noncondensing
Altitude	0 to 3,658 m
EN 60529 rating	IP00
Construction	
Dimensions (W × L × H)	83 × 133 × 19 mm
Weight	227g

Installing the modem

WARNING: To prevent electric shock, do not remove the cover of this module while the unit is powered up. There are no user-serviceable parts inside. Only an approved maintenance authority may perform servicing work.

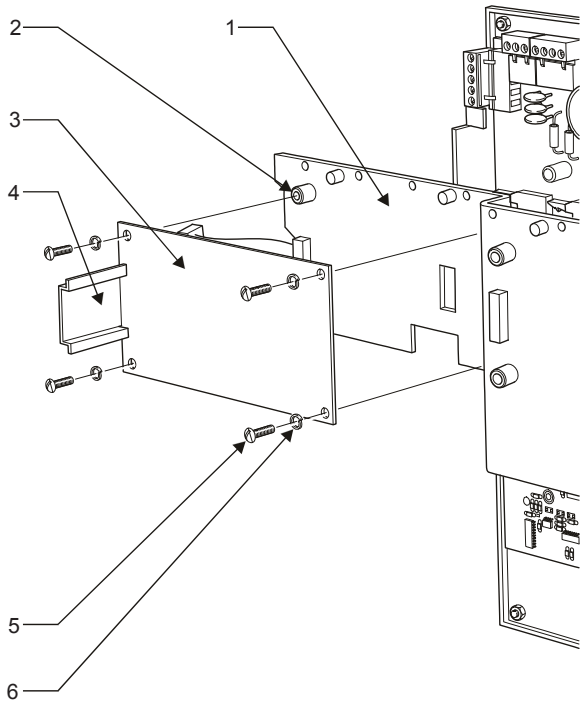
Caution: Do not overtighten the panel clamp screws. Failure to comply will damage the unit.

Note: Make sure the associated washers are positioned directly beneath each screw head.

To install the modem:

1. See Figure 21 on page 30. Fit the Modem mounting bracket (item 3) onto the four accessory plate stand-offs (item 2) and secure using the four M4 screws (item 5) supplied, with associated washers (item 6) positioned directly beneath each screw head.
2. See Figure 22 on page 30. Position the Modem on the mounting bracket so that the Modem catch is positioned in the upper tab of the mounting bracket.
3. Push the lower corner of the Modem in the direction of the arrow so it locks into position on the mounting bracket.
4. See Figure 23 on page 31. Fit the accessory plate (if necessary) to the ZP3 panel.
5. Connect the 9-way RS-232 cable from the modem connector to connector JP3 on the ZPAB-RS232 board located on the ZP3 panel.
6. Connect the telephone line to the RJ11 socket on the modem.
7. Connect +24 VDC supply from the modem power supply connector to the +24V and 0V connections on the Supply Output connector located on the ZP3 panel main board.

Figure 21: Installing the modem mounting bracket



1. Accessory plate
2. Standoffs
3. Modem mounting bracket
4. Bracket channel
5. M4 screws (4X)
6. Washers (4X)

Figure 22: Installing the modem

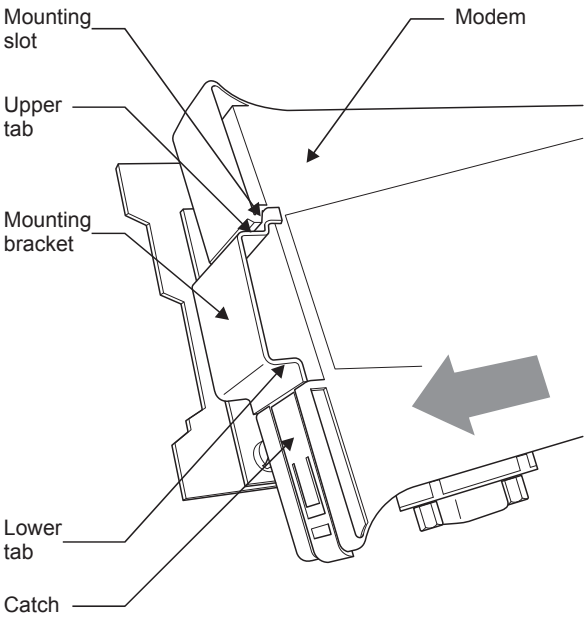
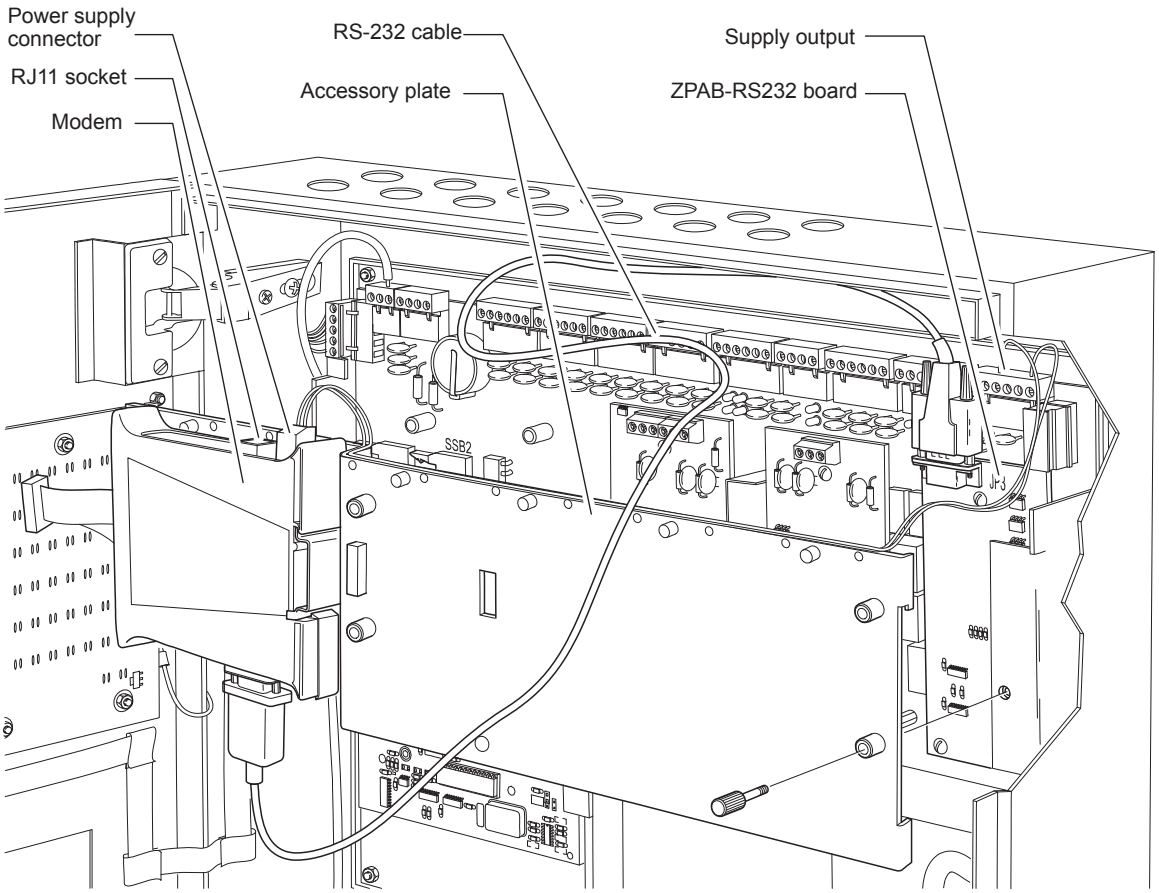


Figure 23: Installing the accessory plate and connecting the RS-232 and power cabling



Printer

An optional ZP3-PR2 dot-matrix printer kit can be fitted to the door of a ZP3 control panel. The printer kit consists of an ABLE printer, a Ziton Printer PCB and the necessary mounting hardware to fit to the ZP3 panel.

The printer (see Figure 24) can be used to give a hard copy of panel alarms, fault events, panel operations, and report requests. The response to alarms, faults, and panel operations can be individually enabled or disabled in the panel software. See Table 10 on page 32 for printer specifications.

Figure 24: ZP3-PR2 Printer

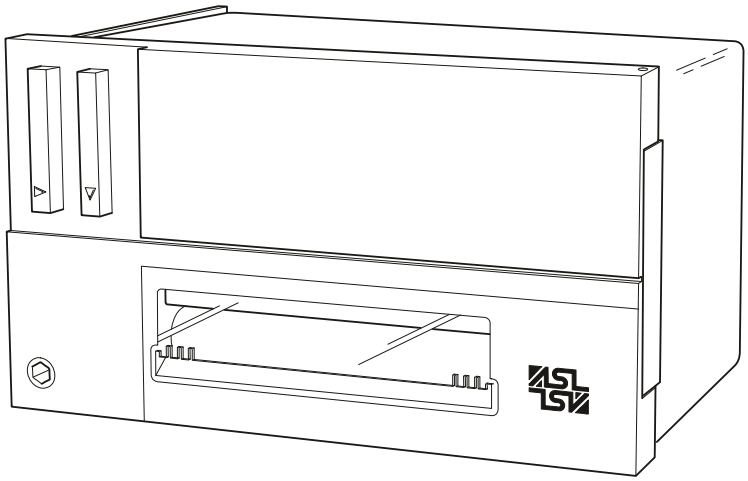


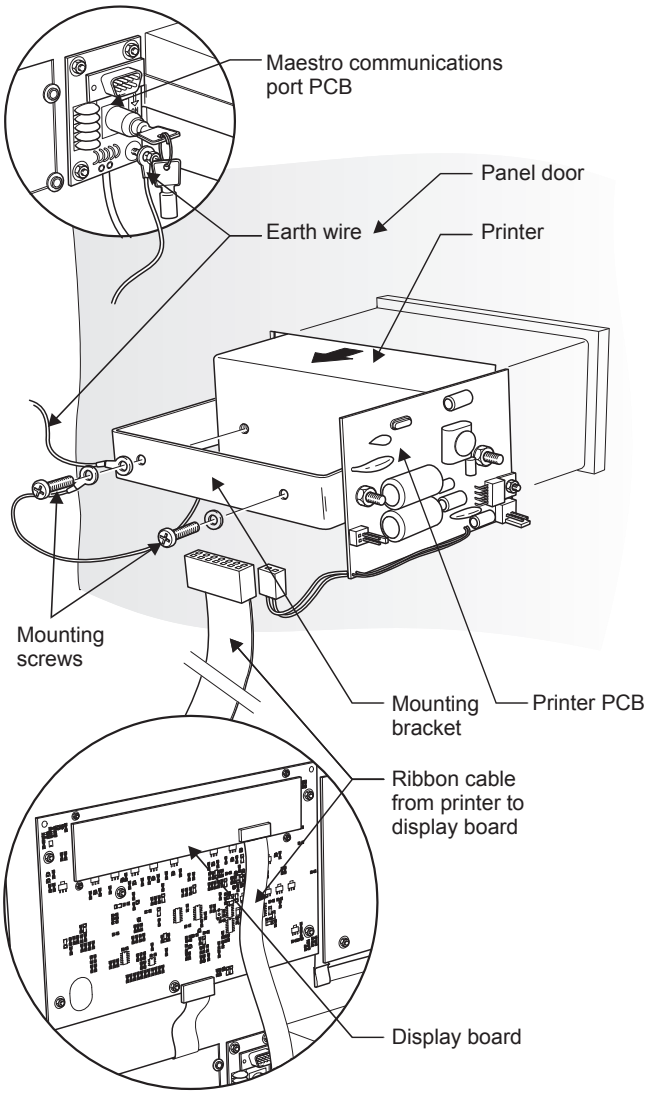
Table 10: Printer specifications

Description	Printer Kit
Model number	ZP3-PR2
Part number	172201
Character set	IBM 224 Character set (ASCII Characters 32 to 255)
Character format	When connected to the panel: ASCII 24 characters
Power supply Voltage Current (standby) Current (printing)	 24 VDC 23 mA 180 mA
Printer consumables Ink ribbon cartridge Paper roll	 ZP-PRC, P/N 24201. Life is 0.5 million characters ZP-PRR, P/N 23701 or equivalent. Width: 57.5 ± 0.5 mm. Thickness: 0.07 mm. Outer diameter < 40 mm
Dimensions (W × H × D)	130 × 66 × 103 mm
Weight	404 g including full-length paper roll
EN 60529 Rating	IP00

Installation instructions

Figure 25 on page 33 illustrates the key installation elements for the printer. Detailed steps for installation follow the figure.

Figure 25: Printer installation



To install the printer:

1. Ensure that the ZP3 panel is powered down.
2. Remove the plastic knockout on the panel door.
3. Ensure that the orange and black cable is disconnected from the printer and separate the printer from its bracket by removing the mounting screws.
4. Fit the printer flush with the panel door.
5. Install the mounting bracket as shown in the illustration. Line up the outer holes on the mounting bracket with the threaded holes on the back of the panel printer.
6. Ensure that the earth connections are made as shown in Figure 25 above.

   Caution: Do not overtighten the panel clamp screws. Failure to comply will damage the unit.
7. Secure the mounting bracket to the panel printer using the screws provided.

8. Connect the external circuit board (attached to the mounting bracket) to the printer using the orange and black cable.
9. Connect the display board and the printer board to the printer using the ribbon cable provided, as shown in Figure 25 on page 33.
10. Connect 24 VDC power to the printer using the black and red ZP3 power lead.
11. Power up the panel and configure the printer on the ZP3 panel.

Once installed the printer must be configured to operate as required. It can be programmed to print or suppress different types of messages (e.g. print fire alarms message, suppress disabled messages, etc.). This programming is done in the ZP3 panel Setup menu. See “System Configuration > Printer” on page 85 for details.

Quick start

Here are a few guidelines to help set up the panel as rapidly as possible.

The panel fascia contains a complete set of status LEDs which give the current status of the ZP3 panel. Under normal operating conditions, all of these LEDs should be off, and the buzzer should be silent. Only the green Power On LED should be illuminated.

When testing a panel, always ensure that the Z-loops are correctly terminated in-to-out as per the wiring drawing, and that all monitored outputs (sounders, monitored inputs, etc,) are terminated with the correct end-of-line resistor.

Make sure that at least one sensor or device is connected when testing a panel otherwise a fault condition occurs.

Always power up with sensors or devices attached to the Z-loops. Remember that the ZP3 panel does not automatically accept sensors or devices added (or removed) afterwards, and a fault condition results. To accept the addition or removal of sensors and devices, go to the menu Setup > Points > Accept Points, and run the accept routine. This causes the panel to accept the sensors and devices currently attached.

The commissioning key switch, which is located on the inside of the front door, has two positions, *normal* and *commission*. The commission position enables you to access the panel setup menus via the keyboard. With the key switch in the commission position, the System Test LED on the fascia flashes.

The internal buzzer operates to announce any events that occur. It provides the required output level to be heard in all situations, with the door closed, and meets EN 54-2 requirements for this.

Chapter 2
Installing the ZP3 fire control panel

Summary

This chapter gives an overview of unpacking or repacking your control panel, presents assembly and storage instructions, covers installation details, and sets forth the established “good practices” that you should follow.

Content

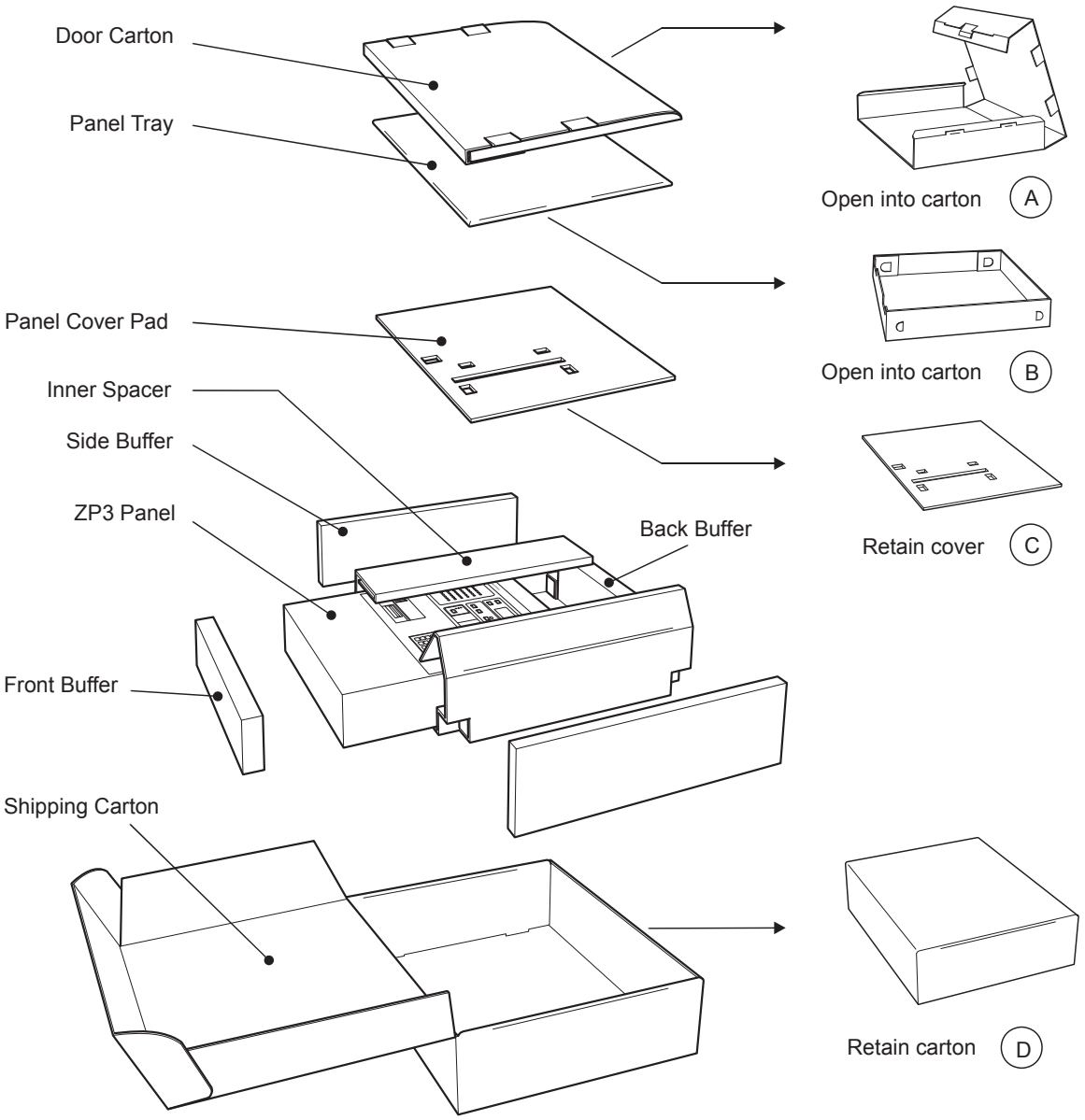
Unpacking or packing

The ZP3 panel is shipped with the panel fully assembled. As only the panel backbox is normally mounted during the installation, the design anticipates that you will remove the door assembly and main chassis before the cabinet is sent to the site for electrical installation.

Extra cartons are included with the original packaging to allow repacking the door assembly and chassis. These can then be stored until they are needed for commissioning.

The panel packaging is shown in Figure 26.

Figure 26: Unpacking the panel



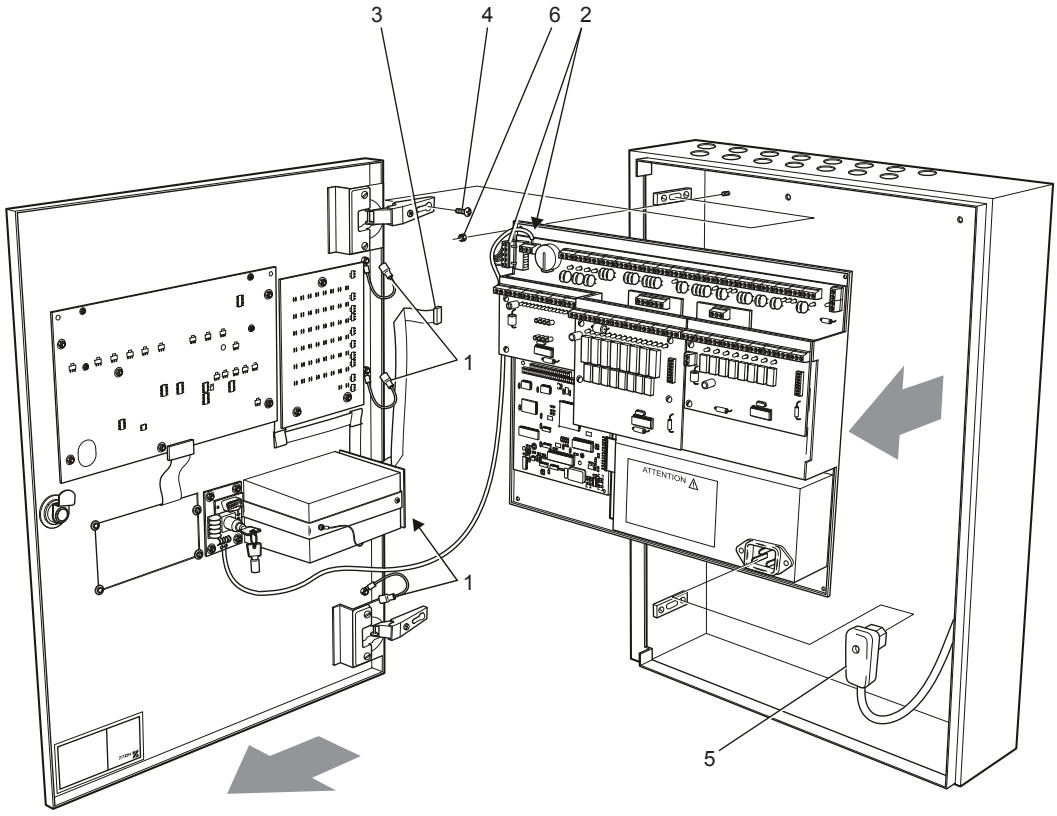
Removing the door and chassis assembly

Refer to Figure 27 below. Once the panel is unpacked, the door and chassis can be removed as described below.

To remove the door and chassis:

1. Disconnect the four earth straps attached to the door (item 1).
2. Disconnect the wire and quick release connector (item 2) from the main board.
3. Cut the cable ties and free the cables.
4. Disconnect the SSB ribbon cable (item 3) from the main board.
5. Remove the two screws (item 4) and remove the door.
6. Disconnect power supply plug (item 5).
7. Remove the four nuts (item 6) and remove the chassis.

Figure 27: Removing the door and chassis assembly

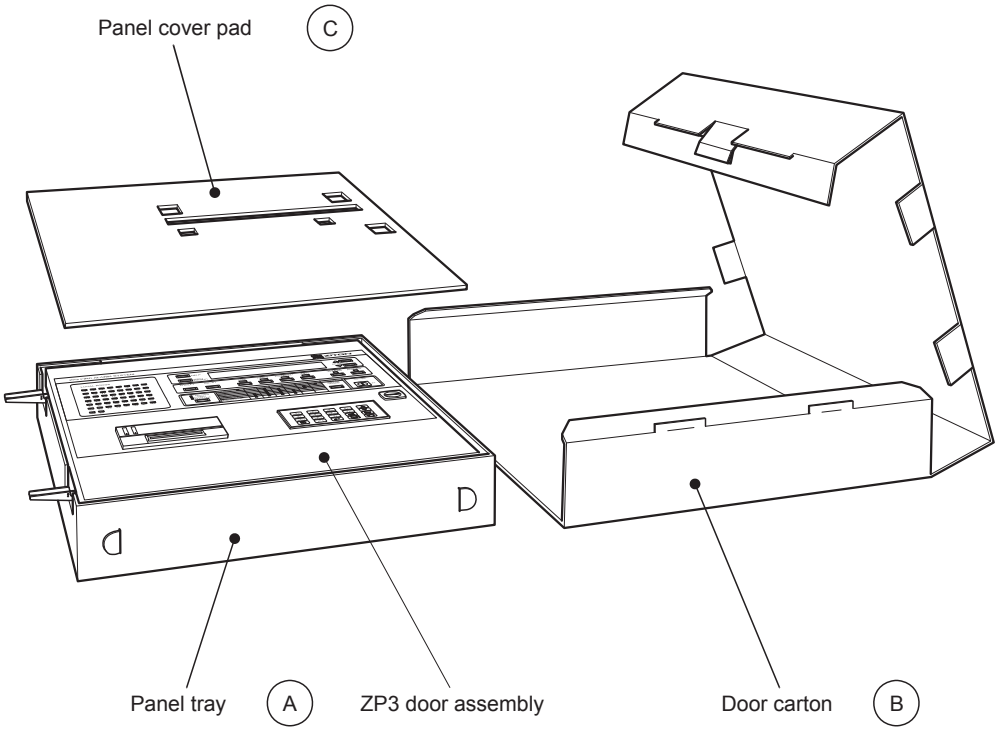


1. Earth strap
2. Wire * quick release connector
3. SSB ribbon cable
4. Securing screw
5. Power supply plug
6. Securing nut

Storing the door assembly

The door assembly can be stored in the packing carton provided until it is required. Repack as shown in Figure 28, making sure that the door hinges are placed in the cut-out provided.

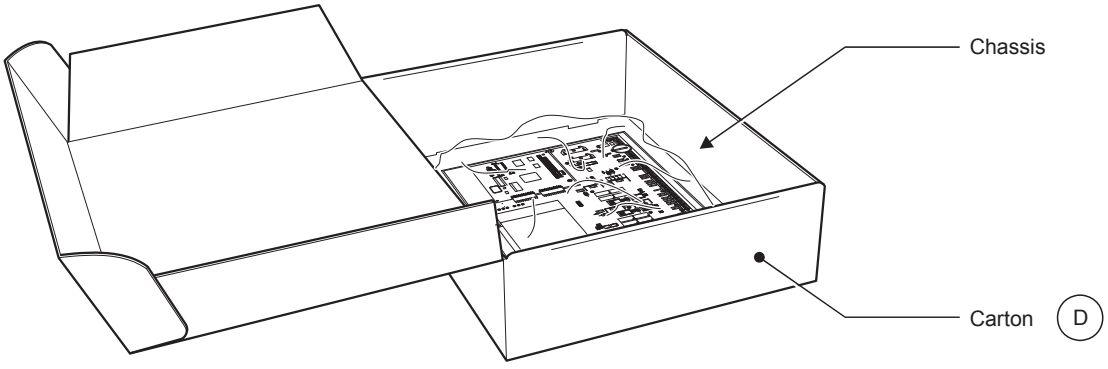
Figure 28: Storing the door assembly



Storing the main chassis

See Figure 29 below. The main chassis assembly can be stored in the packing carton provided until it is required. Repackage the chassis by wrapping it in a protective wrap (such as bubble wrap), and then placing it in the main panel carton.

Figure 29: Storing the main chassis



Overview of installation

Installation of the ZP3 panel must meet the requirements of the authority having jurisdiction. The panel incorporates the system operating controls and displays, and should consequently be located in an accessible position, in close proximity to the persons who are expected to operate the system, and respond to any alarms.

The panel can be surface mounted or flush-recess mounted, with appropriate hardware. Electrical conduit entry is from the top or from behind, and various options are available. The simplest installation is when the panel is used as a 230 VAC model, with built-in batteries. The use of external power supplies or batteries can change the installation criteria.

In some installations, the fascia of the panel is mounted in a security console, usually located in a manned control room. In this case the panel can be located in a plant room, and a remote display unit installed into the console. A full-function remote display unit provides all the display, control, and menu access as the main panel, and is connected by a single twisted-pair, screened cable.

Cautions

The panel must always be installed in its original cabinet, as supplied by Ziton.

Never operate the panel without its door or fascia.

Do not dismantle the chassis and components, and then remount them into another metal enclosure.

Do not change or extend internal ribbon cables, and do not run ribbon cables outside of the ZP3 cabinet.

Failure to comply with the above cautions voids the guarantee and any product approvals. It also makes the panel susceptible to EMC and other electrical noise. The ZP3 panel complies with the requirements of the European CE-Mark for immunity to and emission of electrical interference. This compliance is subject to the panel being operated in its original enclosure, and installed and earthed correctly in accordance with this manual.

The first step when installing a ZP3 panel is to remove the main chassis, and remove the door assembly, leaving the bare backbox for installation. This procedure is described under “Preparatory work” on page 41.

The box can then be prepared for mounting. Knock out the required conduit holes, either on top or at the rear of the cabinet. Drill any additional holes, or larger holes, as required. Note that cable entry can only be brought into the panel into the top section as shown in the drawings later in this topic.

Optional hardware in the form of various mounting kits is available to provide additional space for systems with a large amount of wiring. These are shown in abridged form in this section, and full details can be obtained from the data sheets and application manuals available for these kits.

Note: The ZP3 fire panel is designed for mounting in an indoor location with a temperature range of −5°C to +40°C, a relative humidity of 95% noncondensing, and an environment that is dry and free of condensation. The environmental rating is IP30.

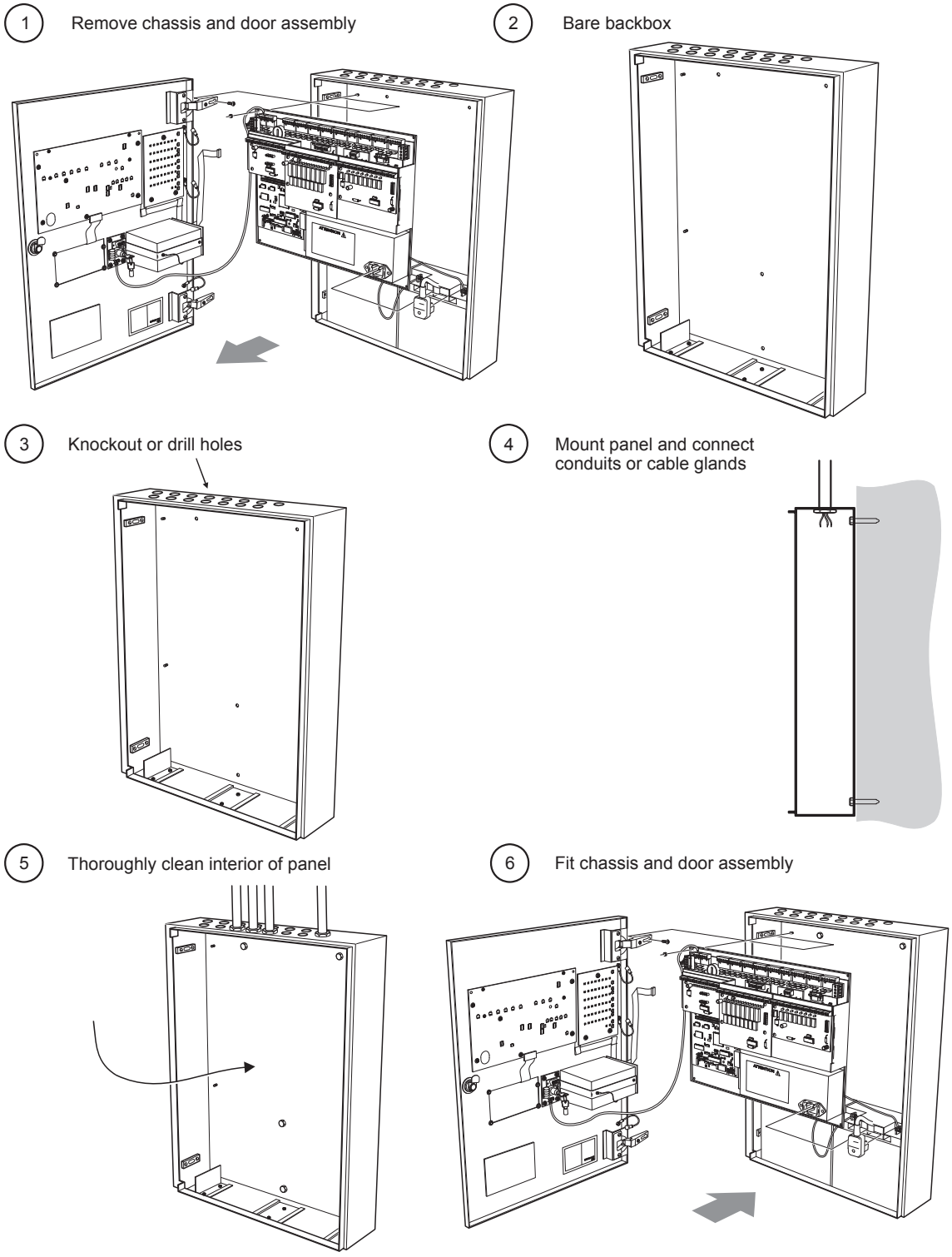
WARNING: The wiring connection to the extinguishant cylinder actuator is a low impedance circuit, which can draw up to 1 A during actuation. Make sure that wiring to the actuator is of sufficient capacity to avoid a voltage loss due to wiring resistance.

Caution: Do not drill, file, or carry out any metalwork on the cabinet with any of the circuit boards installed in the cabinet. Metal filings will enter the circuit and may cause severe damage.

Preparatory work

Figure 30 shows the basic steps to mounting a ZP3 fire panel on the wall.

Figure 30: Mounting the panel on the wall

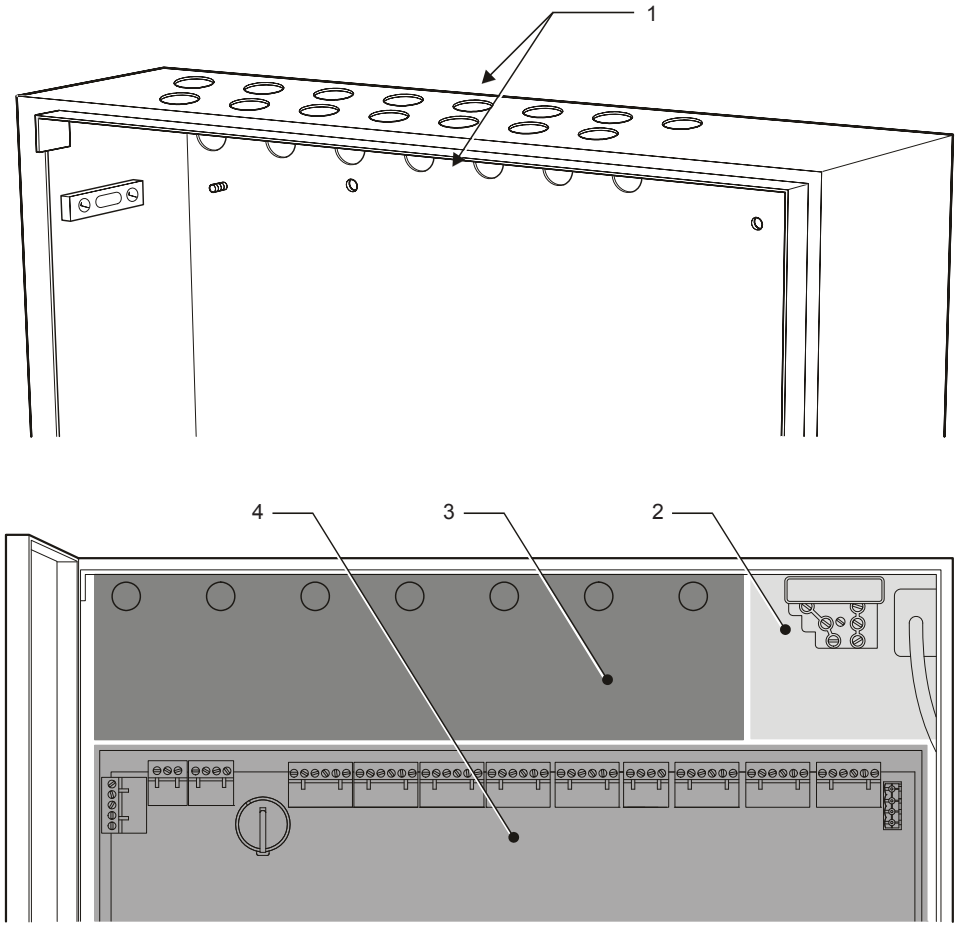


Installation information

Cable entry

Cable entry and wiring locations for the ZP3 panel are restricted to specific areas as shown in Figure 31.

Figure 31: Cable entry to the panel



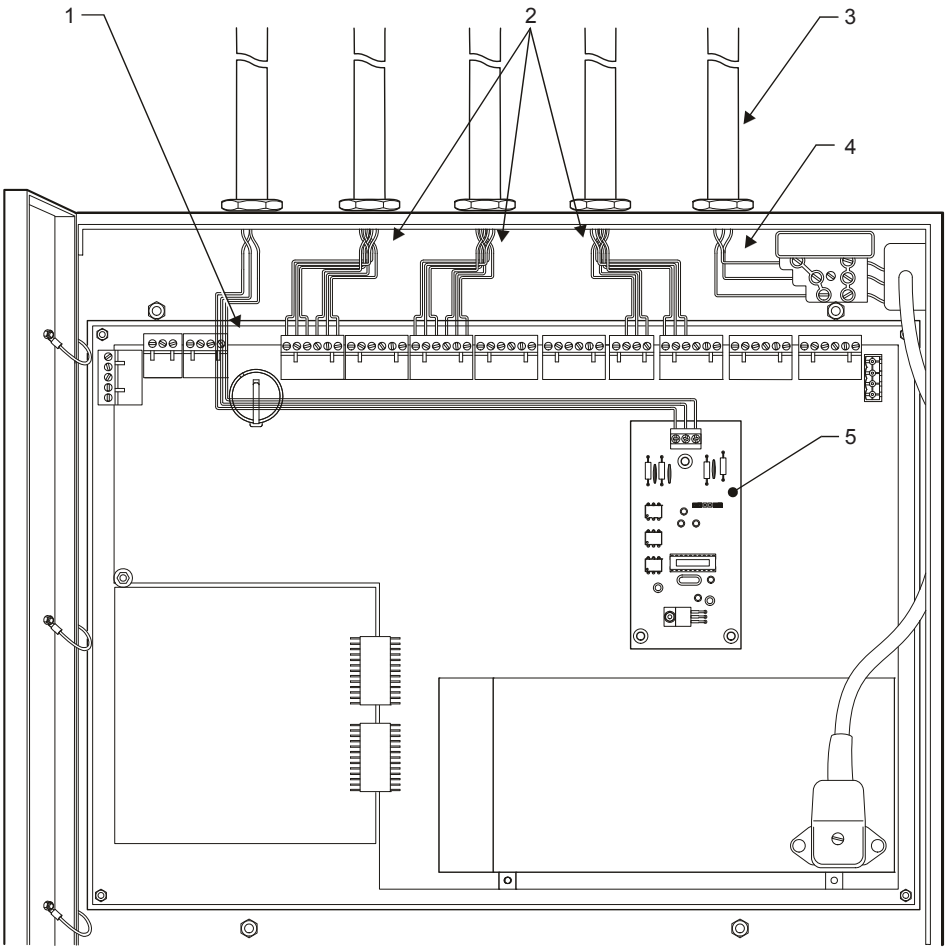
1. Knockout conduits
2. Mains cable area
3. Low voltage cable area
4. Electronics chassis

It is very important to follow the above rules carefully. This ensures that cables are properly separated from the electronic circuit boards. It also prevents physical damage to components and removes noise interference.

Wiring

Refer to Figure 32 below. Wiring must be connected to terminals in a neat and orderly manner. All screens must be connected, and terminals must be adequately tight and secure. The panel must be properly earthed as shown in Figure 32. To prevent cross-cable interference, different types of wiring must be separated as indicated below.

Figure 32: Wiring practices

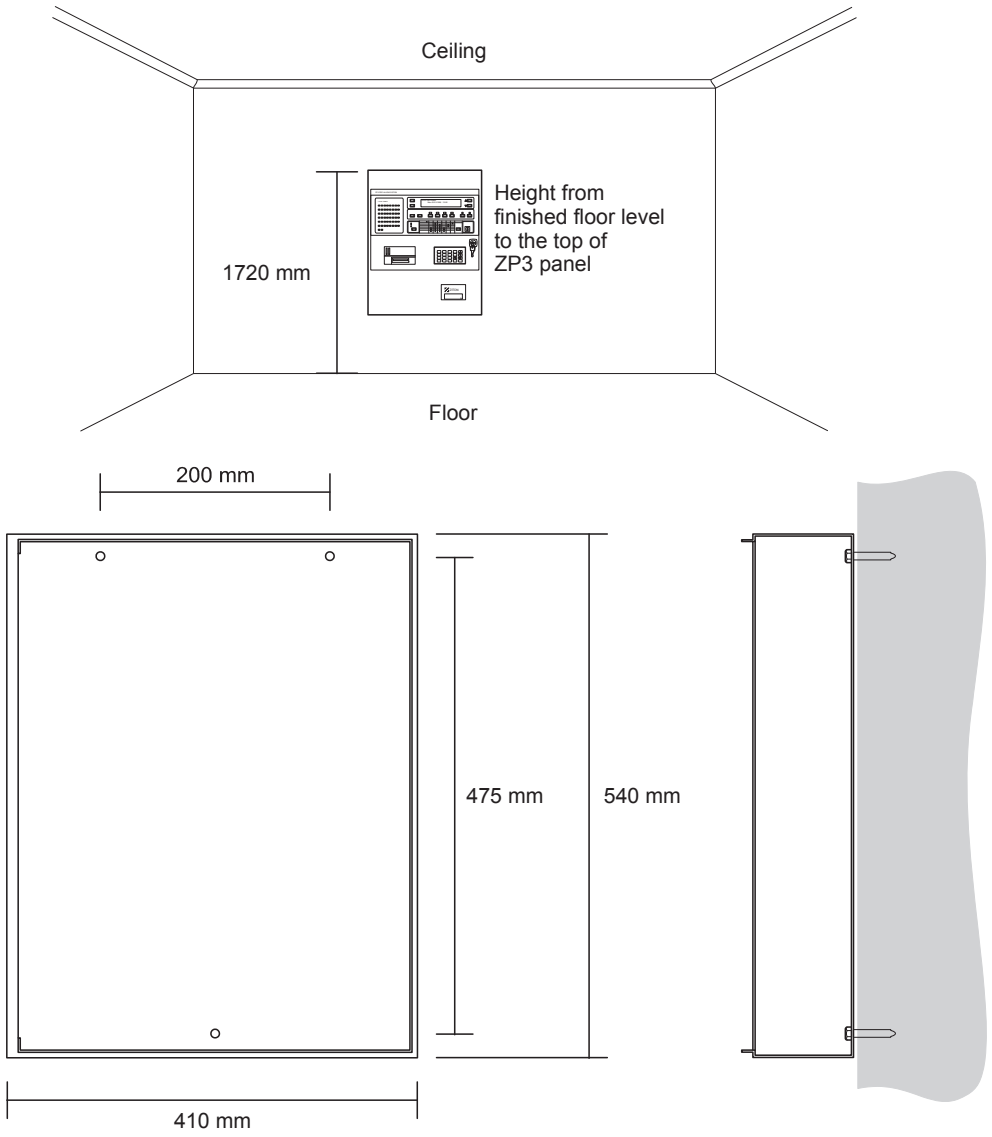


1. Data cabling separated from other cables
2. Z-loops & low voltage control cabling separated from high voltage cables
3. Mains cabling separate from low voltage wiring
4. Earth
5. Serial Control Board (SCB)

Surface mounting

Figure 33 below illustrates the main requirements for surface mounting of the ZP3 panel.

Figure 33: Surface mounting

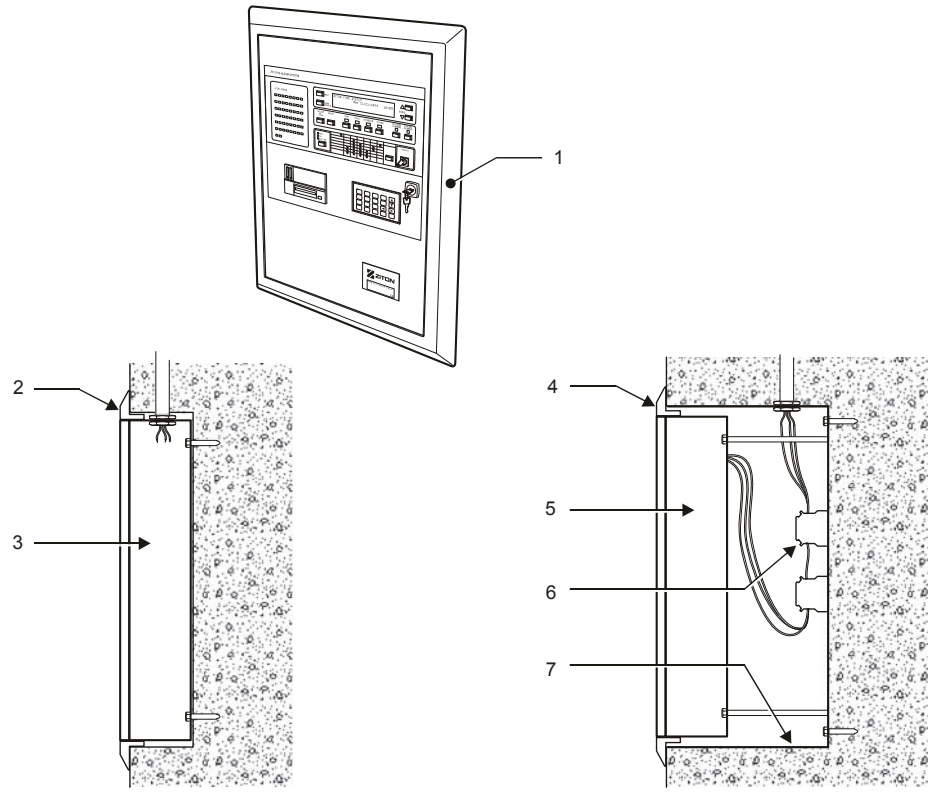


Use appropriate mounting screws such as plastic rawl plugs, expansion anchors, etc., depending on the type of wall. Use M4 screws at least 20 mm long. The mounting system must be able to support a minimum weight of 20 kg, which is the total weight of the panel (with batteries).

Flush mounting

The ZP3 panel protrudes by only 10 mm when flush mounted. Two types of flush mounting kits are available, as shown and described in Figure 34 below. Both use the same collar, and look the same when installed. Flush mounting options are shown in Table 11 below.

Figure 34: Flush mounting



1. Flush mounted ZP3 panel
2. Flush collar
3. ZP3 panel backbox
4. Flush collar
5. ZP3 panel backbox
6. Terminals
7. Flushing box

Table 11: Flush mounting options

Option type	Installation
Flush mounting collar, without backbox	In this variation, the panel backbox is fitted into the wall cavity, with careful alignment. It is then conduited and wired. The flushing collar is then fitted to aesthetically complete the installation.
Flush mounting collar, with backbox	In this variation, a special flushing backbox is fitted into the wall cavity, and all conduit and cables are brought into this box, and terminated on terminals. This box therefore forms both a recessed tray and terminal box. The ZP3 panel and flushing collar are then fitted into the recessed tray. The advantage of this system is that the wall cavity recessed box can be roughly installed, and out of alignment. The system allows the panel and collar to be perfectly aligned after installation.

Backup batteries

To install the backup batteries:

1. Make sure the backup batteries are correct as specified under “Batteries” in Table 4 on page 3.
2. Position a backup battery in the left mounting position in the chassis as shown in Figure 35 below.
3. Locate the battery mounting bracket (packed separately in bubble wrap in the main shipping carton).
4. Hook the curved end of the securing hook on the battery mounting bracket into the hook locator on the hook mounting plate located on the chassis (see Figure 35 below).
5. Taking care that the securing hook is in position, install the second backup battery in the right mounting position in the chassis.
6. Secure the batteries to the chassis with the mounting bracket using the wing nut supplied (see Figure 36 on page 47).
7. Connect the backup batteries as described under “Battery connection” on page 54.

Figure 35: Backup battery mounting position

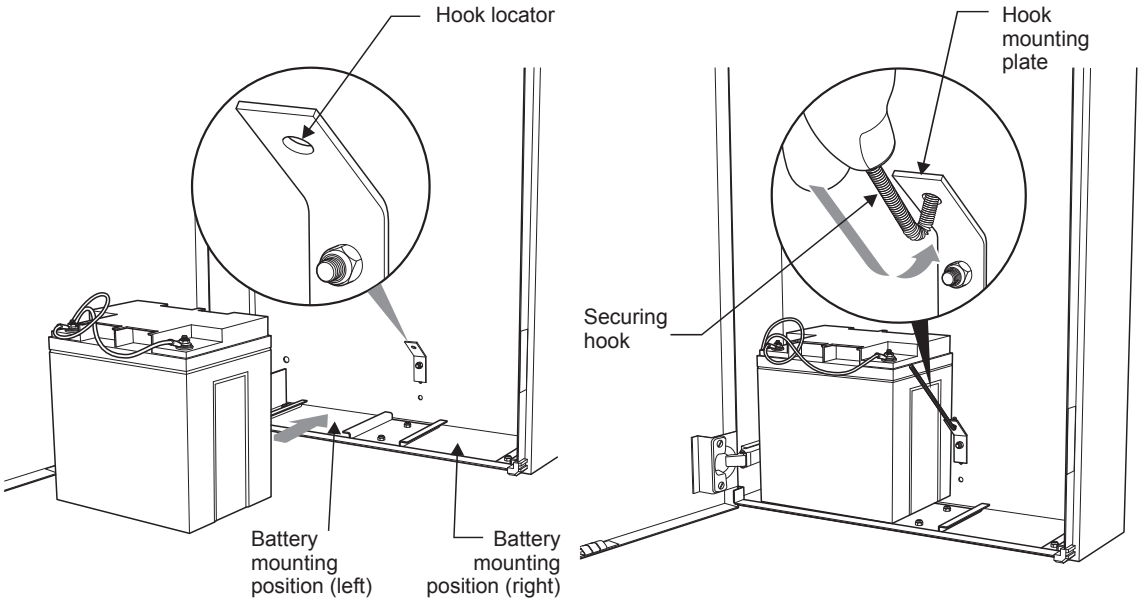
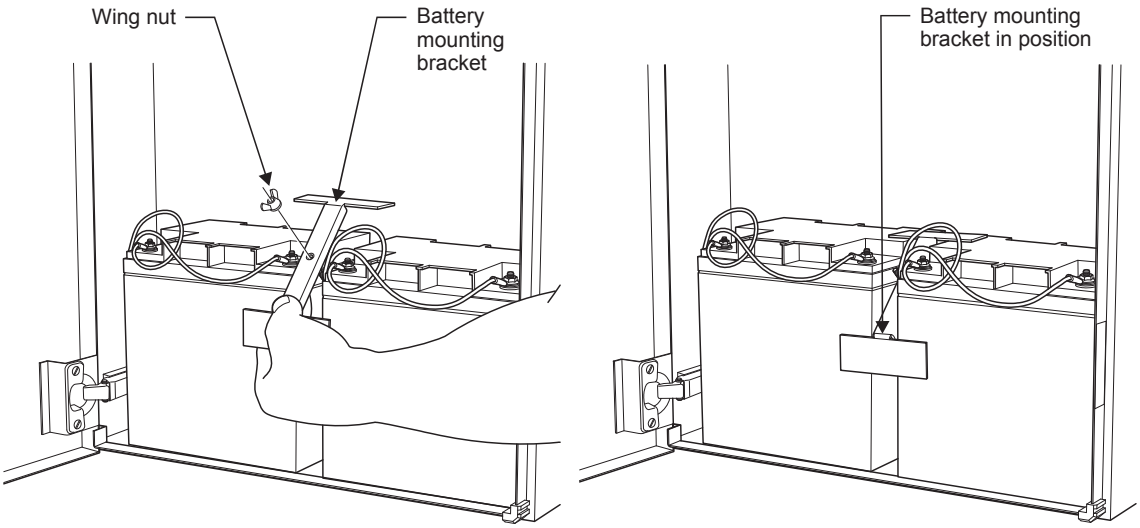


Figure 36: Securing the backup batteries



Good practices

Applying good practices during your installation ensures that the ZP3 system operates reliably and is trouble-free. These are simple actions that assist with commissioning and also provide stable long-term operation.

Earth connections

The panel must be connected to a secure earth point. Door earth straps and internal earth must be connected. Take extra precautions for lightning areas.

Screen connections

All cable screens must be connected to the terminals provided. Do not cut off screen tails or leave screens floating.

Separation of wiring

Inside the panel, physically separate mains wiring, Z-loop wiring, and serial data wiring. The flexible plastic separator that isolates mains from low voltage wiring, must be positioned correctly. Externally, these cable groups should be run in separate conduits. See Appendix A “ZP wiring guide” on page 117 for more details.

Good connections

Make sure that all connections are secure and tight, with a minimum of exposed copper cable to prevent possible shorting to adjacent terminals.

Careful handling of electronics

When removing and replacing the chassis and door assemblies, handle them with extreme care. These are high-precision electronic assemblies, and susceptible to damage if handled roughly.

Cleanliness

Before fitting electronic assemblies, make sure that the cabinet is clean and free from metal filings, oil, or moisture, all of which can damage electronic circuits.

Neatness

Installing the wiring neatly and professionally to make commissioning and maintenance simpler and quicker.

Chapter 3
Field wiring

Summary

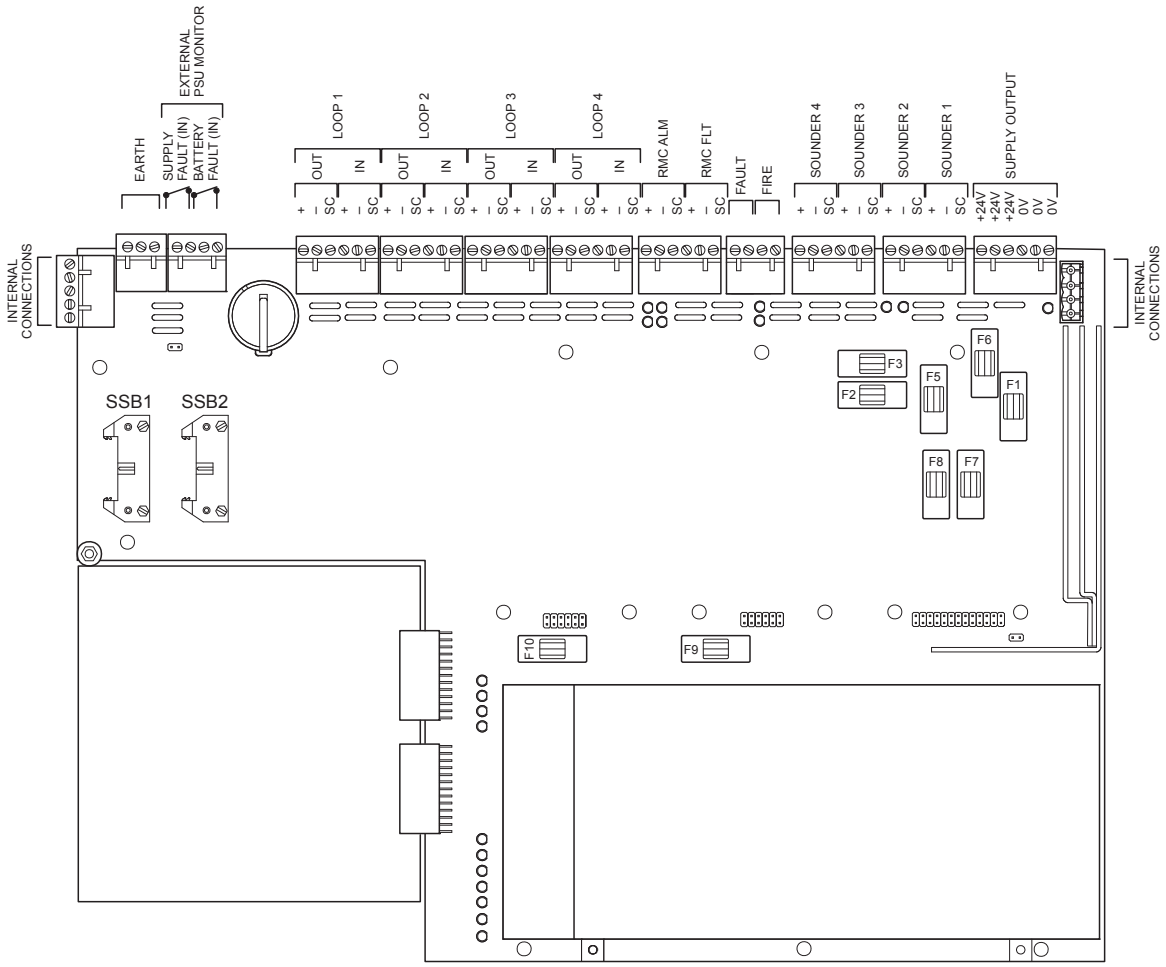
This chapter gives an overview of the terminal layout and provides information on the power supply, battery, wiring, and outputs. It also discusses the compatible auxiliary boards.

Content

Terminal layout

Terminal layout and locations are shown in Figure 37. Detailed connections for each function are shown on the following pages.

Figure 37: Main board terminal layout



Note: All terminals accept wiring sizes from 0.5 mm² to 2.5 mm².

Wiring size and type must be as specified in Appendix A “ZP wiring guide” on page 117.

Power supply

Mains supply

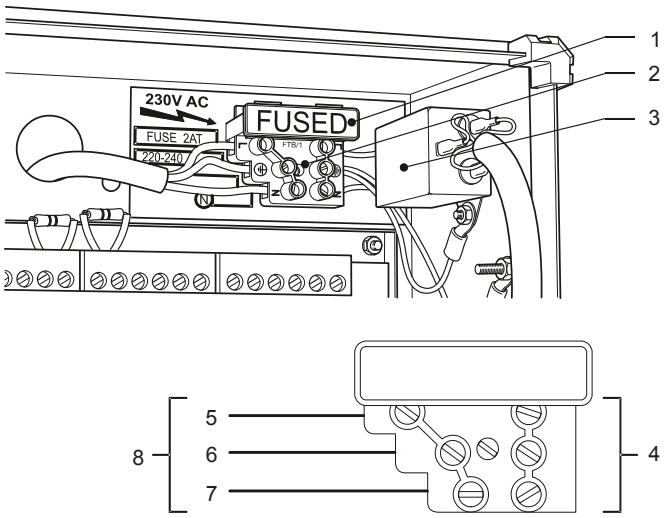
Refer to Figure 38 on page 51. A terminal block (item 2) is located at the top right hand side of the fire panel for connecting the mains supply. The terminal block incorporates a fuse holder (item 1) in the live leg of the supply. A mains filter

(item 3) is located next to the mains terminal block, which in turn is wired to the power supply unit.

The front door of the panel is electrically connected to mains earth via earth straps.

When connecting the mains supply to the panel, make sure that the incoming power is from a clean source that has a solid earth connection. Connecting the panel to a secure earth is very important.

Figure 38: Mains power supply connection



1. Fuse
2. Terminal block
3. Mains filter
4. Internal connections
5. Live
6. Earth
7. Neutral
8. 230 VAC

Make sure that the mains supply wiring is correctly connected. The wiring should be as short as possible within the panel and should be kept away from Z-loop wiring, data cables, and other low voltage wiring.

Connecting the mains power supply

Mains power should be sourced directly from a separate circuit breaker in the building electrical supply distribution board. This circuit should be clearly marked, have a bipolar disconnect device, and only be used for fire detection equipment

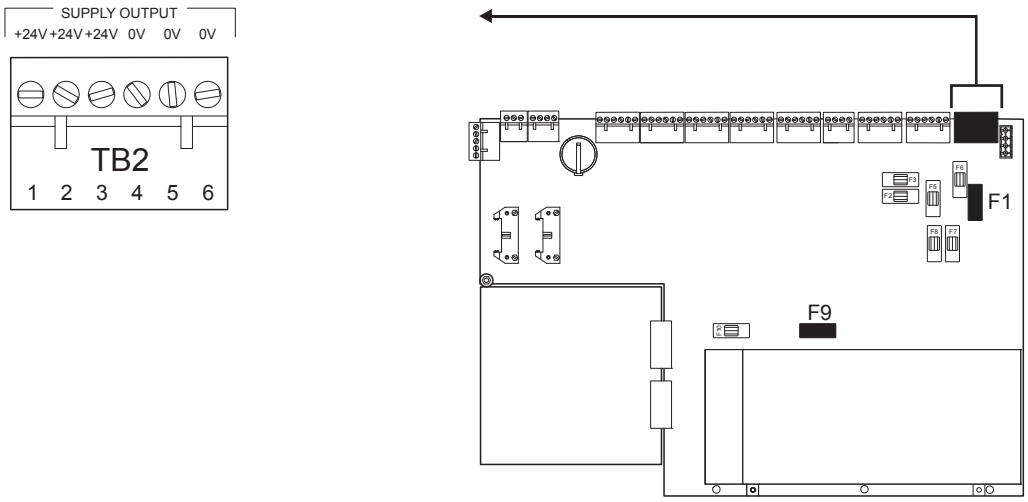
Auxiliary 24 VDC supply

See Figure 39 on page 52. The 24 VDC output (“Supply Output” terminal, TB2 on the main board) is for use by auxiliary equipment, such as programmable relay boards, sounder driver boards, etc. It can also be used to provide power to devices such as remote display units, and similar peripheral devices.

The current drawn from the auxiliary supply is a function of the system engineering. It depends upon the load that has been allocated to the control panel for devices such as loop sounders, common sounders, and control relays.

The output is fused at 5 A (Fuse F1).

Figure 39: Auxiliary 24 VDC supply



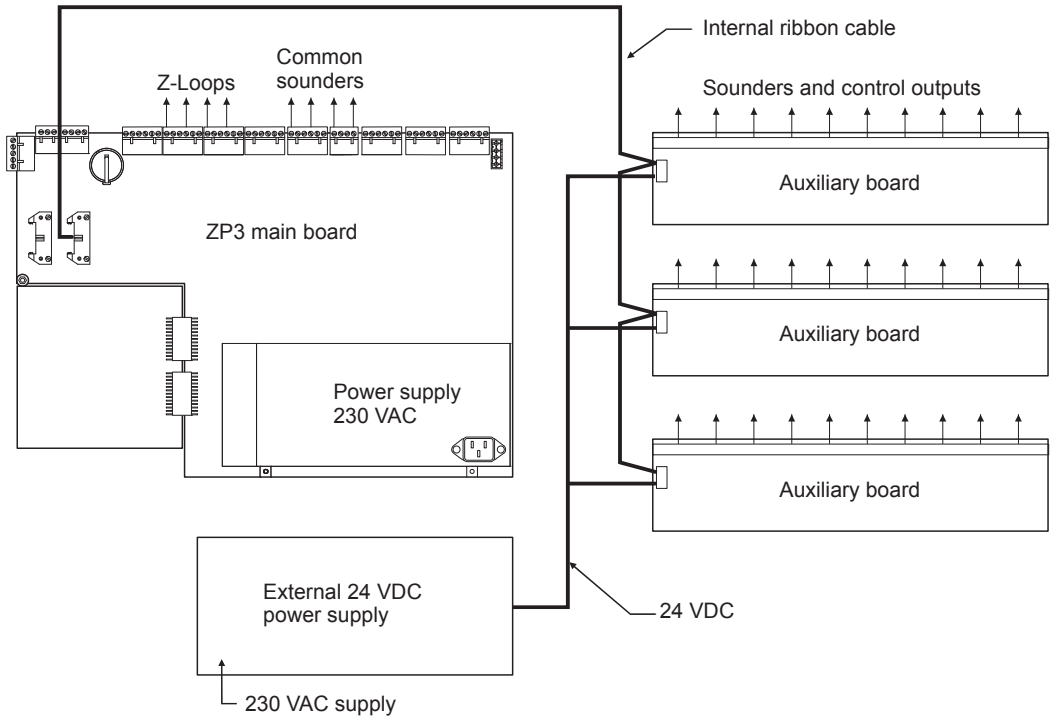
External power for accessory boards

Where the load required for optional accessory boards exceeds the capacity of the ZP3 power supply, it is possible to power these boards from a separate external 24 VDC power supply as shown in Figure 40. This external supply must meet the following criteria:

- Output voltage must be in the range 22 to 28 VDC
- Output ripple must be a maximum of 200 mV (peak-to-peak)
- Output ripple with full load must be a maximum of 500 mV peak
- Supply must comply with the requirements of European Standard EN 54-4
- Output capacity must be adequate for the required load, even with batteries disconnected
- Supply must incorporate standby batteries, sized to provide the required operating period
- Output must be suitably fused
- For reporting faults to the ZP3 fire panel, two voltage-free changeover contacts must be provided, one signalling a mains failure, the other signalling a battery fault

Caution: Do not connect the 0-volts (negative supply) of the external power supply and the 0-volts (negative supply) of the fire panel. The two power supply systems must remain floating with respect to each other.

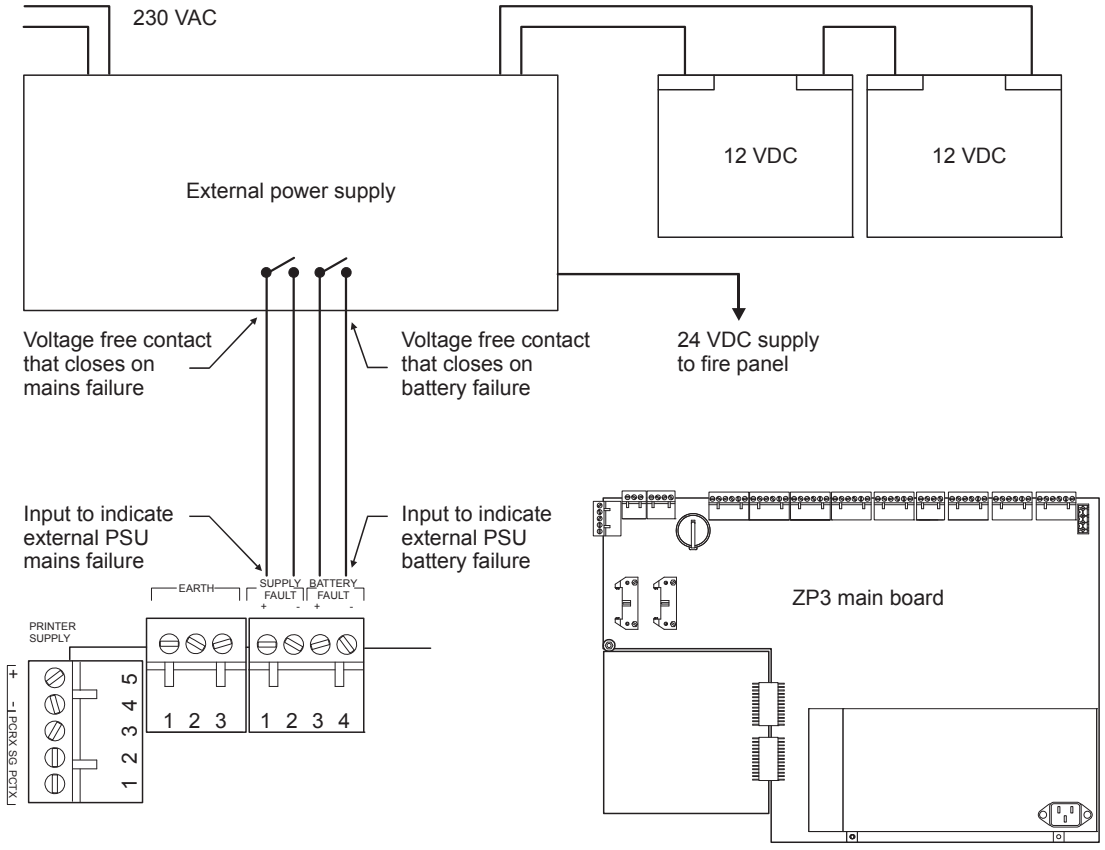
Figure 40: Powering optional accessory boards from a separate external power supply



Monitoring external power

When using an external power supply unit, the failure of the mains supply, or the failure of the batteries, charging system, or fuse, can be reported to the ZP3 fire panel as shown below. The power supply unit must incorporate two sets of voltage-free contacts, one which changes over on mains failure, the other which changes over on battery fault (disconnected battery, low or high voltage, etc.), charger failure, or fuse failure. These contacts must be connected to the ZP3 main board terminals as shown in Figure 41 on page 54. When the contact changes state, the fault is reported to the ZP3 panel, which indicates the appropriate visual and audible alarm, as well as signalling to the remote manned centre.

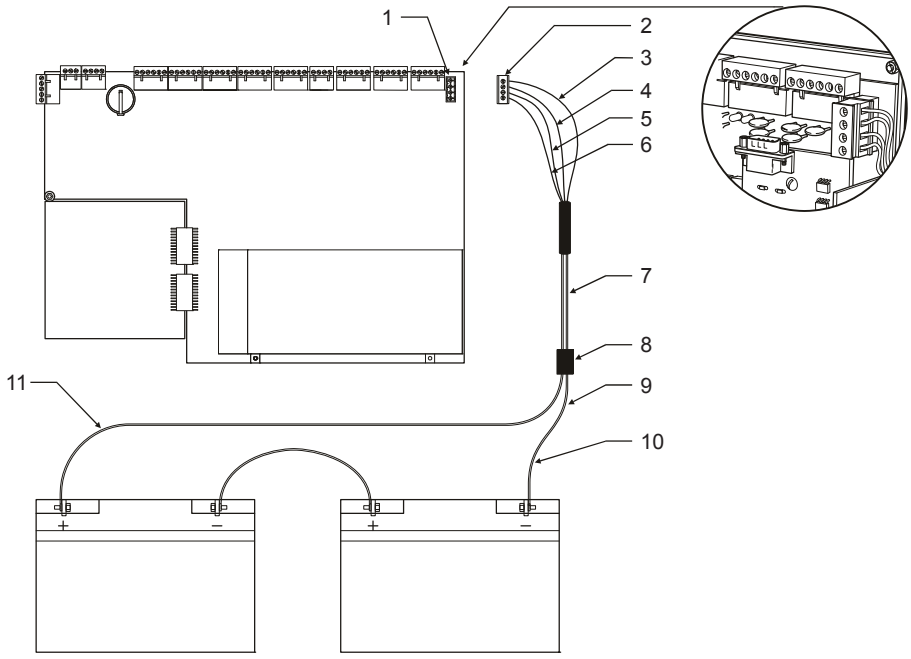
Figure 41: Monitoring external power



Battery connection

This section describes how to connect the batteries to the power supply (see Figure 42). Make sure that you comply with the “General warnings and precautions” on page iii and the recommendations provided under “Good practices” on page 47.

Figure 42: Battery connection



1. Battery connector socket
2. Plug
3. Red
4. Black
5. Grey
6. Grey
7. Battery connector lead
8. Connector
9. Black
10. 230 VAC Types of cables:
    (a) spade lugs
    (b) screw lugs
11. Red

Connection overview

Refer to Figure 42 above.

- The batteries must be housed in their proper place.
- The batteries must be connected using only the leads provided. These leads incorporate a temperature-sensing element, used to provide temperature compensated charging.
- The connector lead connects to the main board with a plug and socket. Battery positive is RED (item 3), battery negative is BLACK (item 4), and the control leads are GREY (items 5 and 6).
- Two final connector leads are provided: one for batteries with plug-in type connectors, the other for batteries with screw connectors. Use the appropriate lead for your batteries.
- The batteries must be connected in series with a jumper as shown in Figure 42.
- Take care not to invert the battery connection polarity. If this happens, replace fuse F1 (6.3 A, slow-blow, 250 V, size 20 mm × 5 mm).

Power supply and battery calculations

Two power supply calculations must be done when designing a ZP3 system:

1. The capacity must be calculated when running on mains power to ensure that it will be able to supply the system load, even when the batteries are disconnected or discharged.
2. Calculate the capacity when running on batteries.

Table 12: ZP3 System load calculation

C1	C2	C3 (A)	C4 (A)	C5	C6 (A)	C7 (A)
	Device	Standby current	Alarm current	Qty	Total standby (C3 × C5)	Total alarm (C4 × C5)
Panel and accessories	ZP3AB-SCB-D Control bus driver	0.0400	0.0400			
	ZP3AB-Net1 Network card	0.0700	0.0700			
	ZP3AB-RS232 Comms card	0.0650	0.0650			
	ZP3AB-PR1 Printer	0.0370	0.1900			
	ZP3AB-RL8 Relay board	0.0350	0.1300			
	ZP3AB-MA8 Sounder board	0.0400	0.2200			
	ZP3AB-OP24 Output board	0.0010	0.0500			
	ZP3AB-MIP8 Input board	0.0400	0.0600			
Line devices	ZP700 sensors (all types)	0.0005	0.0006			
	ZP700 Loop I/O units (all)	0.0005	0.0006			
	ZP700 Call points (all types)	0.0005	0.0006			
	ZP755 Loop sounder	0.0005	0.0025			
	ZP570 Conventional i/f	0.1000	0.1000			
	ZP471 Radio loop interface	0.0400	0.0400			
	ZP472 Radio loop interface	0.0400	0.1000			
	ZP3-ECU Extinguishing control units	0.0800	0.2000			
	Conventional detectors (all types)	0.0001	0.0000			
Alarms	Alarm bells	0.0000	0.0500			
	Electronic sounders	0.0000	0.0250			
Other						
Total system load					**Standby (A)**	**Alarm (A)**

Use the information provided in Table 12 to calculate the power supply and battery load capacities. Record the results as shown in Table 13.

Power supply load calculation

Table 13: Power supply load calculation

Description		Calculated load	PSU capacity	Pass	Fail
Quiescent Amperes	L1		1.2 A		
Fire alarm Amperes	L2		2.5 A		

Insert the calculated quiescent load into L1, and the calculated fire alarm load into L2.

Check Pass if the calculated load is below the PSU capacity, otherwise check Fail.

Should the ZP3 PSU not be able to supply the system load, then either the system design must be modified, or a separate, external power supply must be used for part of the load.

Battery calculation

If the system must operate in the quiescent state for 24 hours and with a full alarm load for half an hour, calculate the battery size as follows (see Table 14 below).

Multiply the quiescent load plus the basic panel load by 1.05 (this adds 5%) to obtain the possible extra load resulting from the panel being in a fault, disabled, or other non-fire condition. Multiply this figure by 24 to obtain the ampere-hours (Ah) needed for 24-hour operation. Insert the result into C1.

Multiply the Fire Alarm Load plus the basic panel load by 0.5, and insert the result into C2.

Add C1 and C2, and insert the result into C3.

Add 25% to C3 to calculate the battery over-rating requirement. This allows for the normal deterioration in battery performance over the batteries' lifetime.

Select the nearest size battery available, rounding upwards. Remember that the largest battery that can be accommodated in the ZP3 enclosure is 30 Ah.

Table 14: Battery calculation

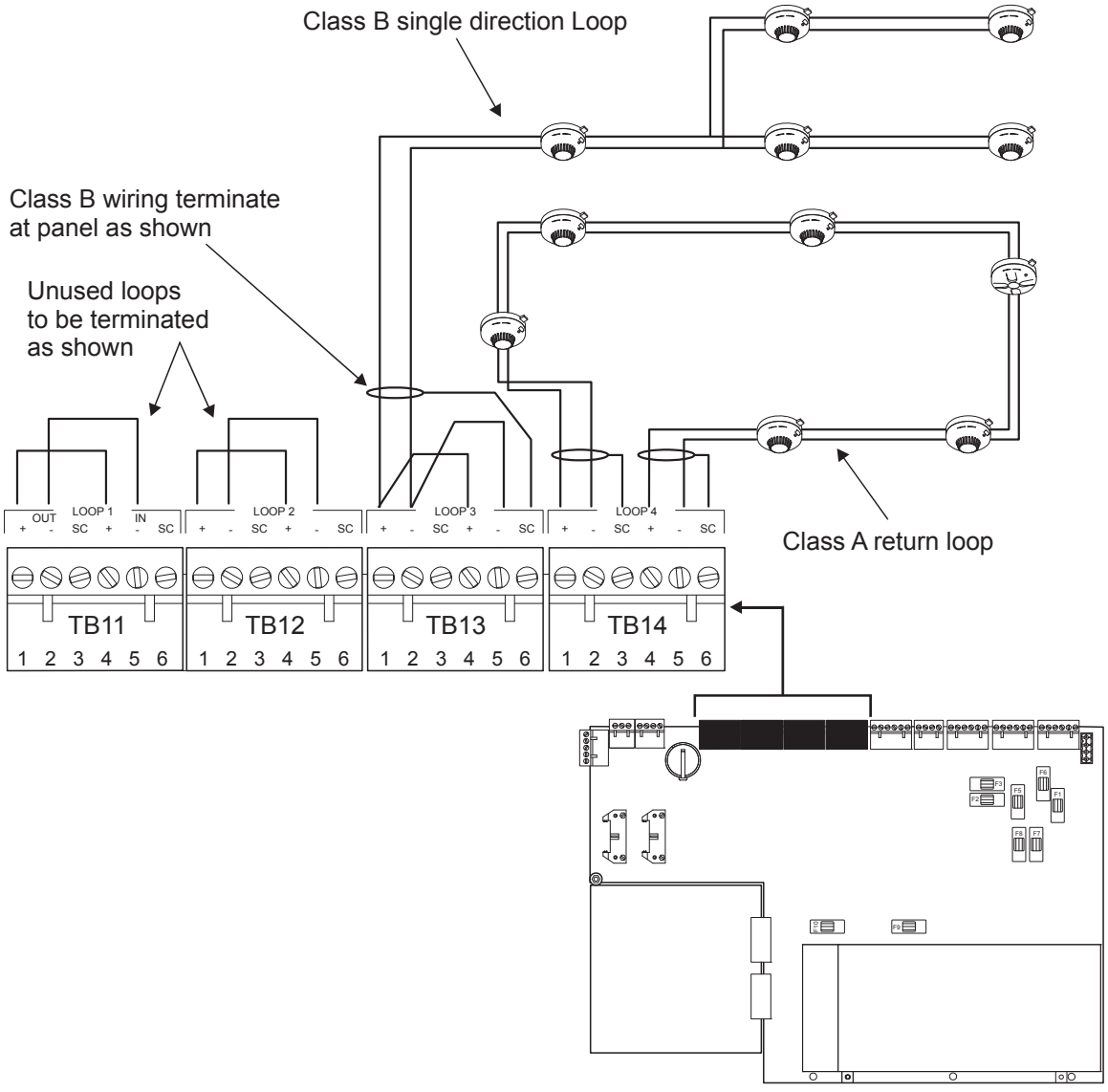
Description	Calculation	Result	No
Standby Ah	(Quiescent load + 0.3 Amps) × 24 × 1.05		C1
Fire alarm Ah	(Fire alarm load + 0.5 Amps) × 0.5		C2
Total Ah	C1 + C2		C3
Battery capacity over-rating (25%)	C3 × 1.25		C4
Nearest size battery			C5

Z-Loop

Z-Loop wiring

See Figure 43 below. The addressable Z-Loop can be wired as a Class A return loop, or as Class B single direction wiring, with spurs. Loop length can be up to 3,000 metres, depending upon the type, quantity and location of devices attached. For more information see “Z-Loop parameters” on page 59.

Figure 43: Z-Loop wiring



When wired in Class B single direction format, then the loop terminals must be connected (+) in to (+) out and (−) in to (−) out.

The loop is monitored for open and short circuit. Unused loops must be terminated (+) in to (+) out and (−) in to (−) out.

Loop isolators

For information on loop isolators, see “Line isolators” on page 123 in Appendix A of this manual.

Z-Loop parameters

The Z-loop connects the ZP analogue addressable devices to the fire control panel. It is a two-wire loop that supplies power to the connected devices, and carries communication between each device and the panel. Loops must be wired in correctly sized cable, and must be continuously screened.

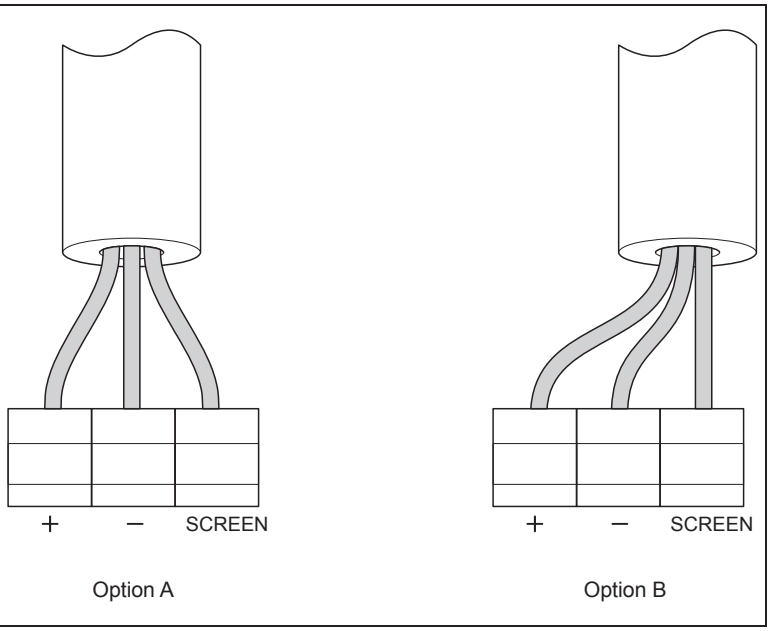
Screening

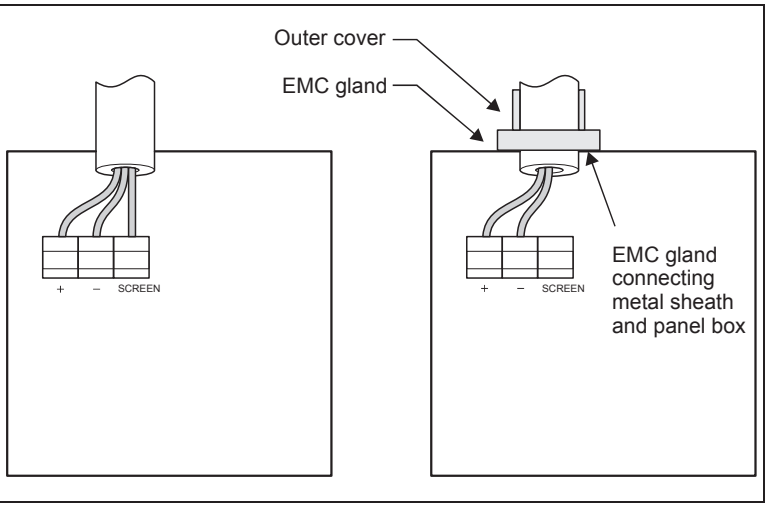
Refer to Table 15 below. Cables must be shielded and shields must be continuous i.e. connected through at each device. For Class A return loop wiring, both ends of the shield must be connected to their earth terminals at the panel. For Class B single-direction wiring, the screen must be connected to its earth terminal at the panel end, and left disconnected at the far end.

Shielded cable may be two-core or multiple-core. If multiple-core cables are used, only Z-loop wiring or the fire system DC wiring must be run inside the same screen. Third-party cabling, for example public address and intercom systems, must not be run inside the same screen.

Z-loops should, where possible, be separated from high-voltage cabling. They must not run adjacent to high-voltage cable for any substantial distance. Separation should be at least 100 mm.

Table 15: Screen connection wiring best practice

The ZP line loop screen connection must be kept as short as possible to ensure the best results for noise immunity, which is a CE requirement. The adjacent illustration shows two screen connections. Option B (the preferred method), has a shorter screen connection even though this results in longer plus and minus terminal wires.	

Alternative screen connection For optimum connection, if thick, mineral-insulated cabling is being used, we recommend using EMC glands as an alternative method for the screen connection. Strip away the outer covering of the cable to expose the metal sheath. Connect the metal sheath directly to the ZP3 panel box via the EMC conductive gland.	

Cable sizing

Cable sizing depends upon the length of the Z-loop, and the number and type of devices connected. Input devices, such as fire sensors, call points, and interface units, use very little current, and allow the maximum loop length. Adding loop-powered output devices (for example, sounders) to the loop requires heavier cable and reduces the allowable loop length. See Appendix A “ZP wiring guide” on page 117 for more details.

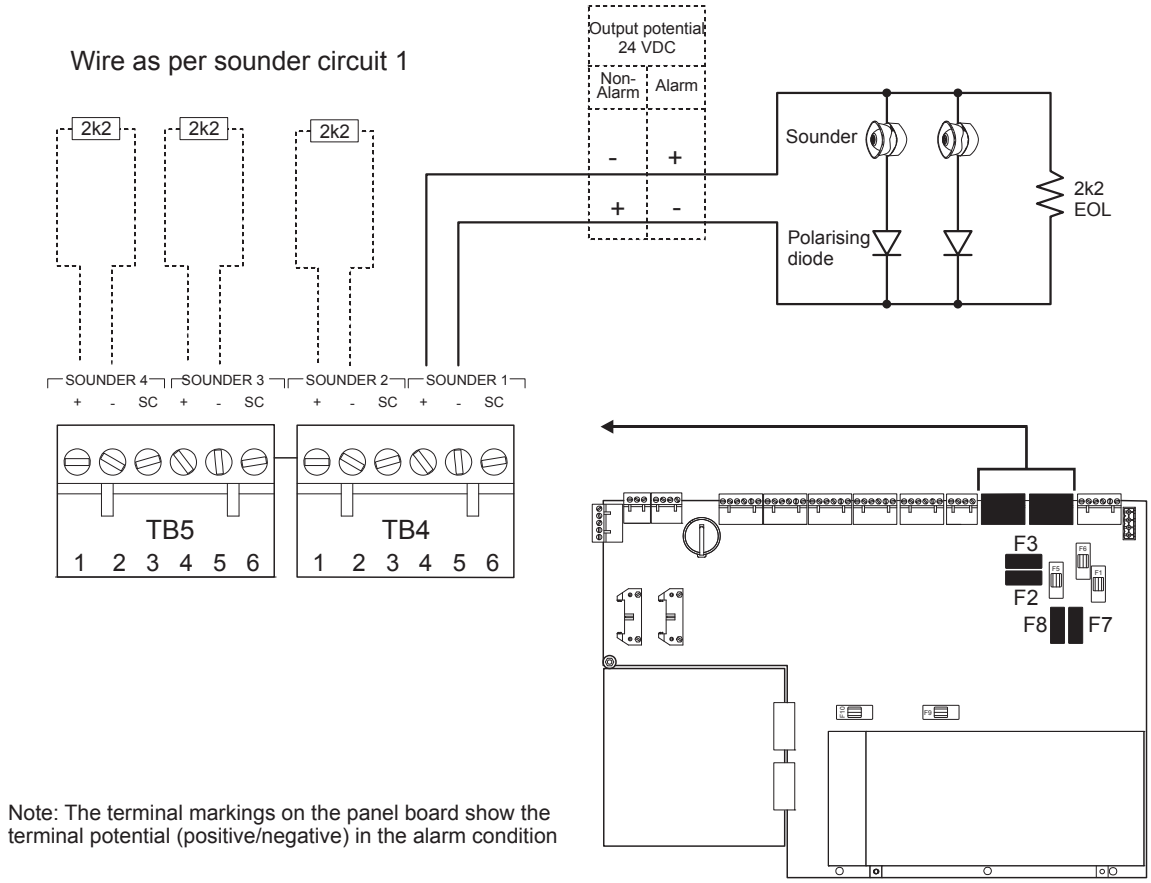
Common outputs

Common sounder outputs

See Figure 44 on page 61. The ZP3 Fire Control Panel has four built-in sounder outputs, arranged in two pairs. These outputs provide 24 VDC for driving sounders. They can be programmed to activate on a fire alarm from any zone or device, or as required.

The outputs are wired in two-wire Class B single direction format. They must be daisy-chained from point-to-point, without T-taps or spurs. They operate on a reverse polarity basis, and are monitored for open circuit and short circuit faults. Circuits must be terminated with a 2.2 kΩ, 1 W end-of-line resistor at the last sounder on the circuit.

Figure 44: Common sounder outputs wiring



Note: The terminal markings on the panel board show the terminal potential (positive/negative) in the alarm condition

Sounders connected to the circuits must be polarized, i.e. fitted with diodes so that they operate with power in one polarity direction, and not in the reverse direction.

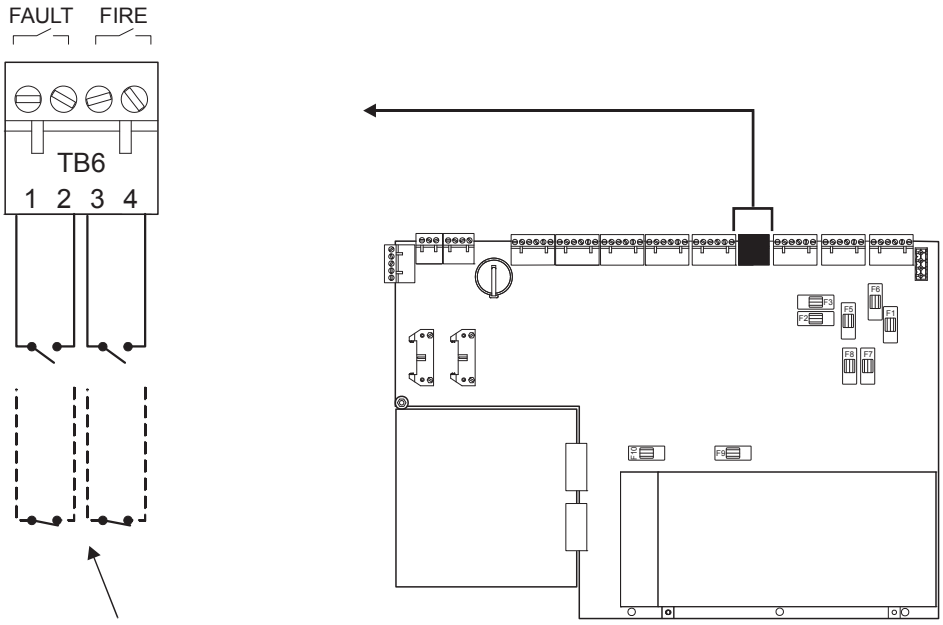
The sounder lines are fused at 1 A each, and sounders 1, 2, 3, and 4 are fused by F8, F7, F3, and F2 respectively.

Common fire / fault outputs

See Figure 45 on page 62. The common fire and common fault relay outputs provide voltage-free contacts, which can be set to be either normally open (NO, closing on alarm), or normally closed (NC, opening on alarm). The NO or NC settings are done in software in the Setup menu.

The common fire relay changes state on any fire alarm, and the common fault relay changes state on any fault alarm. Relays restore when the panel is reset.

Figure 45: Common fire/fault outputs



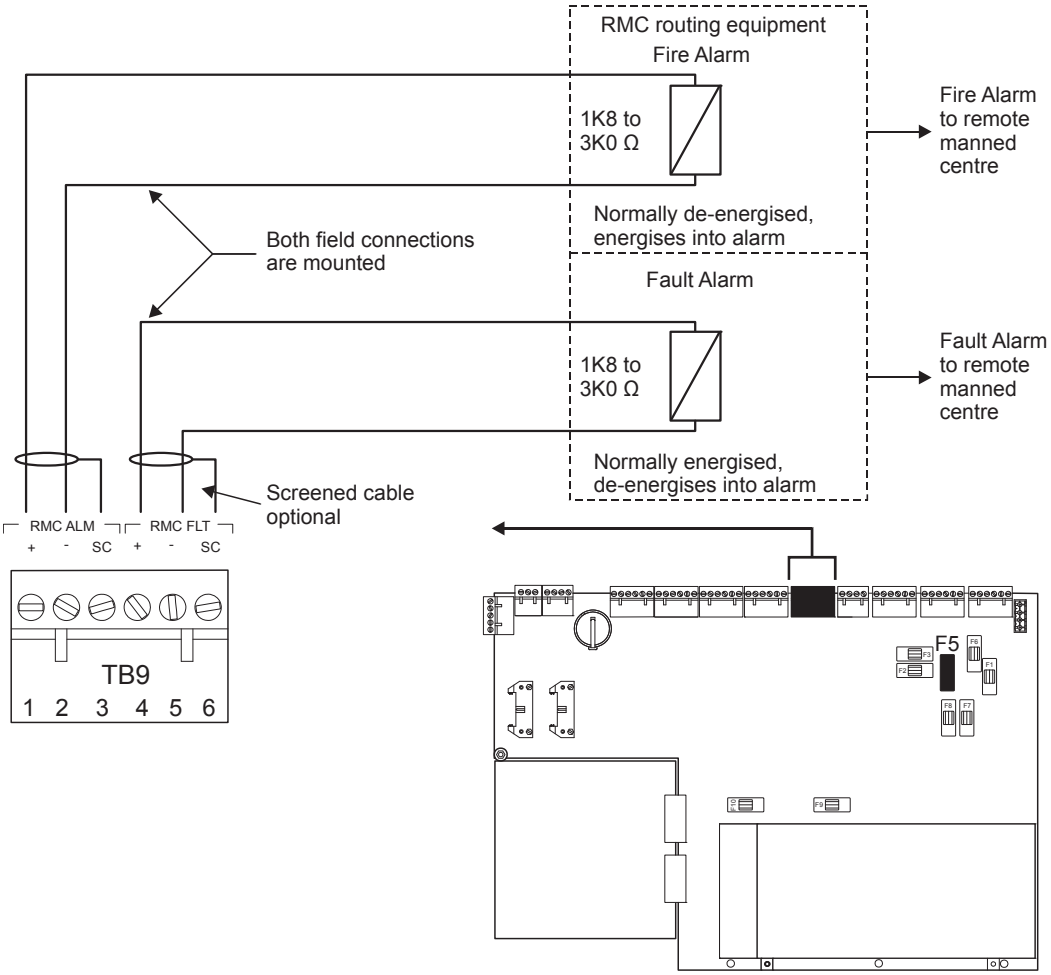
The relay contacts are rated for a maximum current of 1 A, and a maximum voltage of 24 VDC or 100 VAC.

Remote manned centre outputs

See Figure 46 on page 63. The remote manned centre (RMC) alarm output sends a fire alarm signal to RMC-routing equipment upon receipt of any fire alarm. This transmits an alarm to a remote manned centre such as a fire brigade or a manned control room.

The remote manned centre (RMC) fault output sends a fault alarm signal to RMC-routing equipment upon occurrence of any panel or system fault. This transmits a fault signal to a remote manned centre such as a fire brigade, or a manned control room.

Figure 46: Remote manned centre outputs



The RMC outputs are designed to drive relays in the fire alarm routing equipment. These relays must have a coil resistance of 1.8 to 3.0 kΩ.

The fire alarm circuit is monitored for open and short circuit faults at the fire panel. A fire alarm causes the current to increase and activate the routing equipment.

The fault alarm circuit is monitored for open and short circuit faults at the receiving equipment end. The fault alarm output is normally ON, and de-energises upon receipt of a fault signal.

If these outputs are not used they should be terminated with a resistor of 2.2 kΩ.

Auxiliary boards

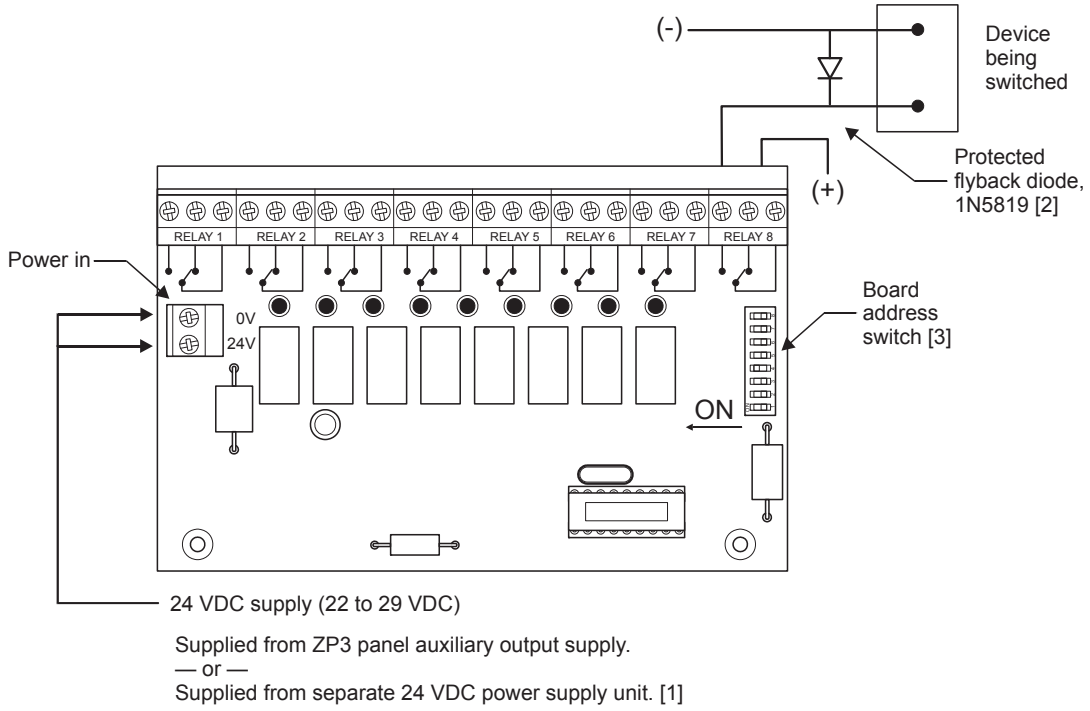
ZP3AB-RL8 Relay Board

See Figure 47 on page 64. The ZP3AB-RL8 Relay Board is a programmable relay board with eight separate relays. Each relay has a single changeover contact which changes state when activated. Relays are each allocated an

address, and programmed to operate from selected inputs using the I/O-mapping function built into the panel.

The ZP3AB-RL8 board connects to the ZP3 panel control bus. If allocated to the User Bus section, up to 768 addresses are available. These outputs are freely programmable. If allocated to the System Bus section, a further 256 addresses are available, which have preprogrammed functions.

Figure 47: ZP3AB-RL8 Relay Board



[1] If externally supplied, do not common the power supplies, i.e. do not connect the 0V of the internal and external power supplies together.

[2] If outputs are used to switch inductive loads, they should be protected with a flyback diode.

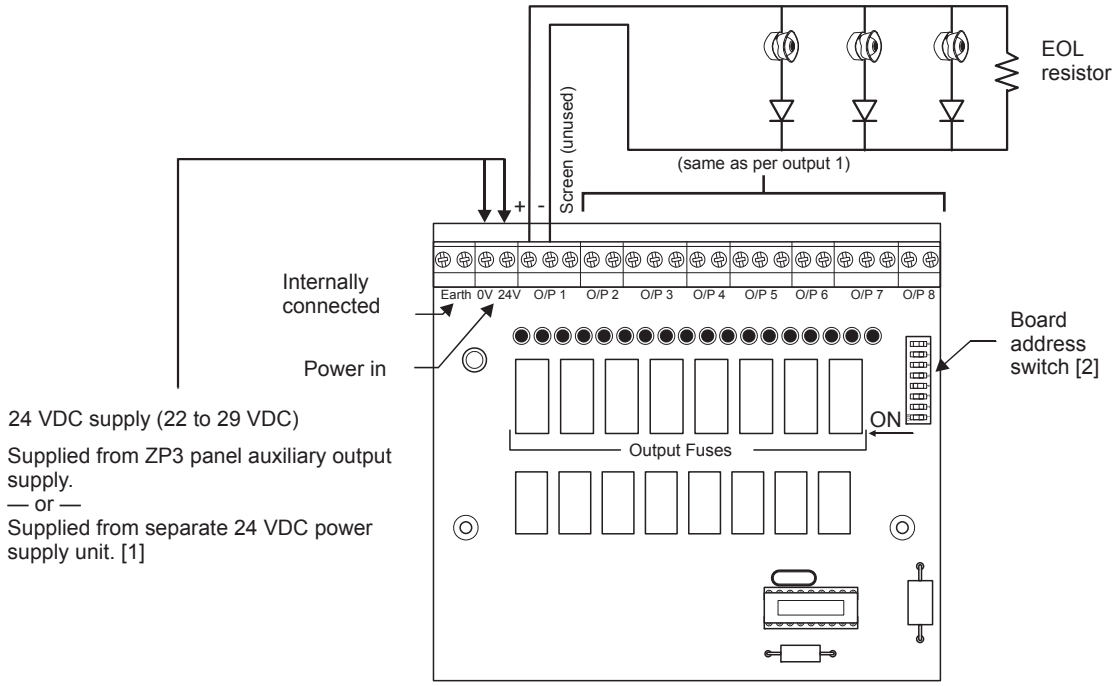
[3] Each board is fitted with an eight-segment DIP switch. This switch is set to an address between 000 and 127. This board address determines the address of each output, and is specified in “System address list” on page 97.

ZP3AB-MA8 Monitored Output Board

See Figure 48 on page 65. The ZP3AB-MA8 Monitored Output Board is a programmable output board with eight separate outputs, designed to drive fire alarm sounder or control outputs. Outputs monitor the circuit field wiring for open circuit and short circuit faults, and report to the panel should a fault occur. The outputs operate on a reverse polarity basis, being set to one polarity for normal and reversing polarity for alarm. Outputs must be polarized with a polarizing diode (these are often internally fitted on sounders). The outputs are wired in two-wire Class B single direction format. They must be daisy-chained from point-to-point, without spurs. Circuits must be terminated with a 2.2 kΩ end-of-line resistor at the last device on the circuit.

Each output is allocated a unique address, and programmed to operate from selected inputs using the I/O-mapping function built into the panel. The ZP3AB-MA8 board connects to the ZP3 panel control bus. If allocated to the User Bus section, up to 768 addresses are available. These outputs are freely programmable. If allocated to the System Bus section, a further 256 addresses are available, which have preprogrammed functions.

Figure 48: ZP3AB-MA8 Monitored Output Board



[1] If externally supplied, do not common the power supplies, i.e. do not connect the 0V of the internal and external power supplies together.

[2] Each board is fitted with a DIP switch, which is set to an address between 000 and 127. This determines the address of each output, as specified in “System address list” on page 97.

Each output provides 24 VDC in alarm, and can drive a maximum circuit load of 1 A. If outputs are used to switch inductive loads, they should be protected with a flyback diode.

The load is provided from the 24 VDC supply connected to the power input terminals. If connected to the ZP3 panel auxiliary power supply terminals, the load is supplied from the built-in ZP3 power supply. If connected to an external 24 VDC power supply, the external supply supplies the load.

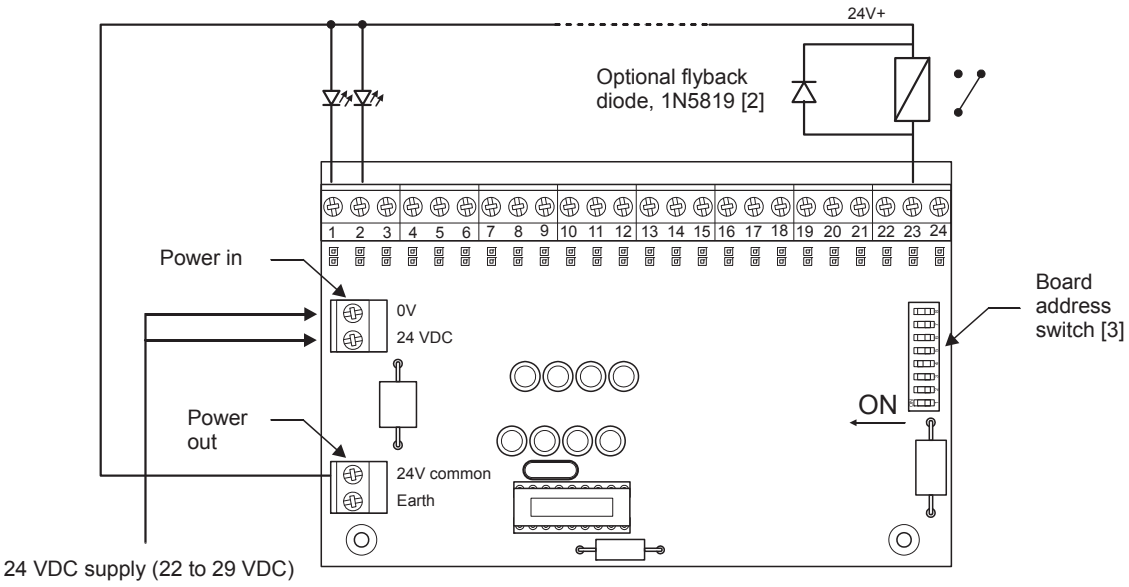
ZP3AB-OP24 Transistor Output Board

See Figure 49 on page 66. The ZP3AB-OP24 Transistor Output Board is a programmable output board with 24 separate outputs, designed to drive low-power functions, such as LEDs or control relays. This board is suitable for driving remote mimic panels. The outputs are open-collector transistor outputs, which switch negative (0 volts) when activated. Connect the opposite side of the output

load (LED, etc.) to a common positive (+24 volts) from the same power supply source as the board.

Each output is allocated a unique address, and programmed to operate from selected inputs using the I/O-mapping function built into the panel. The ZP3AB-OP24 board connects to the ZP3 panel control bus. If allocated to the User Bus section, up to 768 addresses are available. These outputs are freely programmable. If allocated to the System Bus section, a further 256 addresses are available, which have preprogrammed functions.

Figure 49: ZP3AB-OP24 Transistor Output Board



Supplied from ZP3 panel auxiliary output supply.
— or —
Supplied from separate 24 VDC power supply unit. [1]

[1] If externally supplied, do not common the power supplies, i.e. do not connect the 0V of the internal and external power supplies together.

[2] Each output can drive a maximum circuit load of 50 mA. If outputs are used to switch inductive loads, they should be protected with a flyback diode.

[3] Each board is fitted with a DIP switch, which is set to an address between 000 and 127. This determines the address of each output, as specified in “System address list” on page 97.

The load is provided from the 24 VDC supply connected to the power input terminals. If connected to the ZP3 panel auxiliary power supply terminals, the load is supplied from the built-in ZP3 power supply. If connected to an external 24 VDC power supply, the external supply supplies the load.

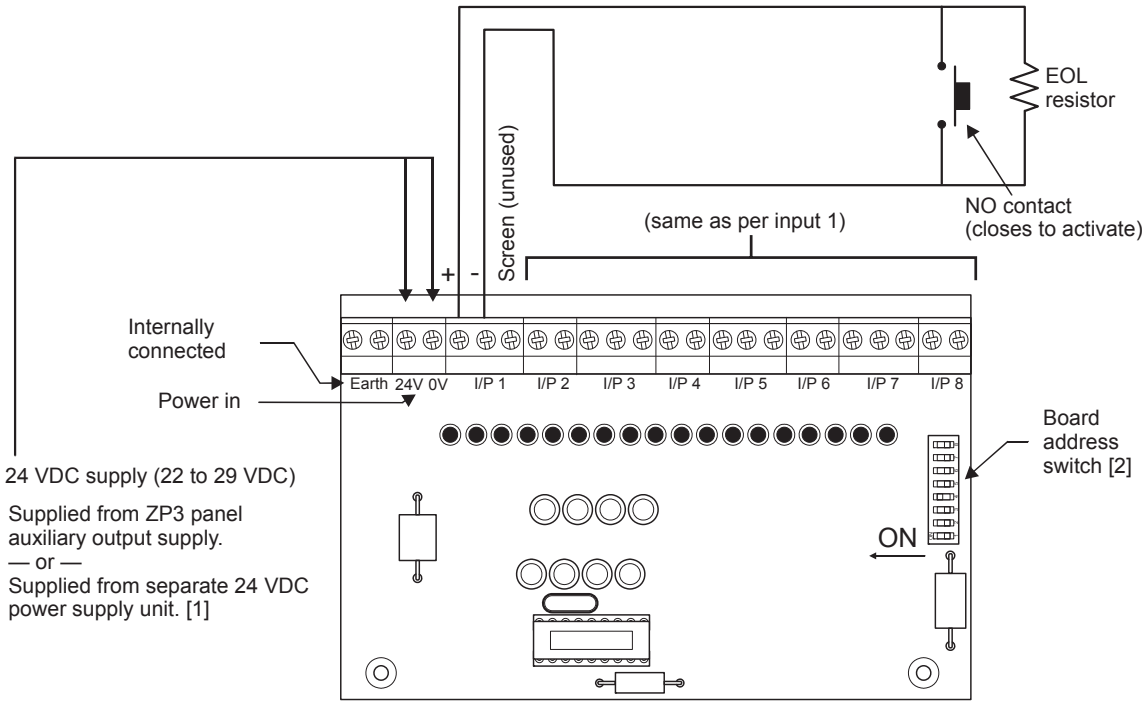
ZP3AB-MIP8 Input Board

See Figure 50 on page 67. The ZP3AB-MIP8 Input Board is a programmable input board with eight separate inputs. It is designed for connection to normally open, voltage-free contacts (key switches, relays, etc), the closing of which provides an input signal to the panel. This signal can be programmed to operate control outputs or sounders, disable zones or devices, change sensor

sensitivities, or carry out other functions. The activation of these inputs is not displayed as an alarm by the panel, but rather treated as a *silent* control function. The input circuit field wiring is monitored for open circuit faults.

Each input is allocated a unique address, and programmed to operate selected outputs or functions using the I/O-mapping function built into the panel. The ZP3AB-MIP8 board connects to the ZP3 panel control bus. If allocated to the User Bus section, up to 768 addresses are available. These outputs are freely programmable. It does not operate on the preprogrammed System Bus section.

Figure 50: ZP3AB-MIP8 Input Board



[1] If externally supplied, do not common the power supplies, i.e. do not connect the 0V of the internal and external power supplies together.

[2] Each board is fitted with a DIP switch, which is set to an address between 32 and 127. This determines the address of each input, as specified in “User bus addresses” on page 100.

The inputs are wired in two-wire Class B single direction format. If connected to more than one contact, they must be daisy-chained from point-to-point, without spurs. Circuits must be terminated with a 2.2 kΩ, 0.5 W end-of-line resistor at the end of the circuit.

The board can be connected to the ZP3 panel auxiliary power supply terminals, or to an external 24 VDC power supply.

Chapter 4
Software programming

Summary

This chapter provides information on programming, including the menu operation, structure, and functionality.

Content

Introduction

The ZP3 fire control panel is a modular system with a powerful software programming capability. The system requirements are built from standard hardware modules, and the functional requirements are software programmed into the panel. The software programming system allows for programming that meets the needs of virtually any required application.

The configuration can be programmed on a PC computer using the Planner programme, and then loaded into the panel. It can also be programmed directly into the panel via the fascia keyboard. Programming on a PC is the recommended method because it also allows you to produce a hardcopy of the system programming for record purposes.

The following key items or features can be programmed into the panel:

- Access control facilities
- Panel identification
- Stand-alone system or ZP-NET multiple panel system
- Fire and non-fire functions
- Sensor allocation to zones
- Individual sensor and device location messages
- Zone identification or location messages
- Input to output mapping
- Device type and address
- Alarm verification feature
- Sensor sensitivity
- Sensor with attached sounder
- Loop sounders
- Panel sounders
- Sensor self-test
- Loop isolators
- Delay on silencing sounders
- Printer and printer options
- Time stamping of event on-screen

Setup menu

Menu operation

The panel programming functions are accessed via the Setup menu, using the panel keypad. Menu functions are displayed on the LCD screen.

The keypad

The keypad is illustrated in Figure 51 and described in Table 16 below.

Figure 51: Keypad

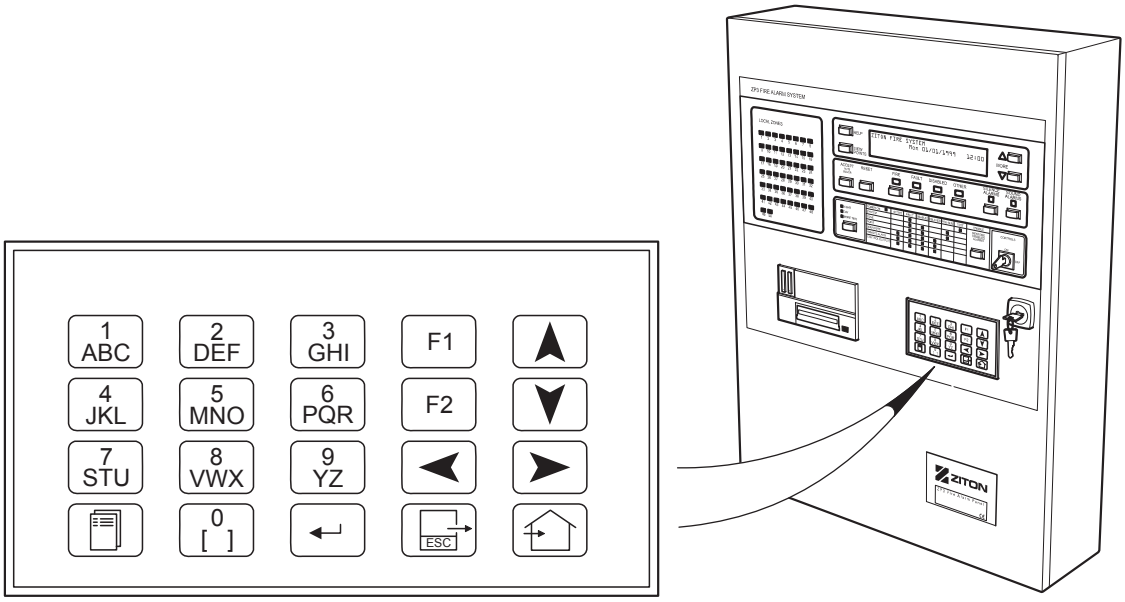


Table 16: Keypad buttons

Button	Name	Description
1 ABC	Numeric buttons	Used to enter number sequences
	Menu	Displays the Main Menu
	Enter	Used to confirm data entry and save data
ESC	Escape or Esc	Exits a function and returns to the previous level
	Home	Exits all menus and returns to the system home screen
F1 F2	Function buttons	Used within certain menus
	Navigation buttons	Used to move up, down, left, or right

Setup menu

The Main Menu is the entry point to all of the user operator accessible software functions, including the Setup menu. The Setup menu holds all the system configuration options.

To access the Main Menu:

1. Press the Menu button on the keypad.

   The Main Menu is displayed, as shown below.

   ```
   MAIN MENU
   1. Operator
   2. Maintenance
   3. Setup menu
   ```

2. Choose Setup Menu to display the Setup menu.

   To do this, press the 3 button on the keypad The system prompts you to enter the access code.

3. Enter the setup (level 3) access code, and then press Enter.

   The Setup menu is displayed, as shown below.

   ```
   SETUP                                MORE^
   1. Zoning          4. Sounders
   2. I/O mapping     5. Title message edit
   3. Points          6. System configuration
   ```

The menu name is displayed on the top line, and the menu items are shown with numbers alongside. Menu items are selected by pressing the numeric keypad button that matches the item number. Selecting a menu item may cause another menu to appear or may carry out a particular function. The operator may be prompted to enter the required information via the keypad.

Any menu can be cancelled and the previous menu presented by pressing the Esc button. Esc is used to cancel or abort the current activity and return to the previous activity.

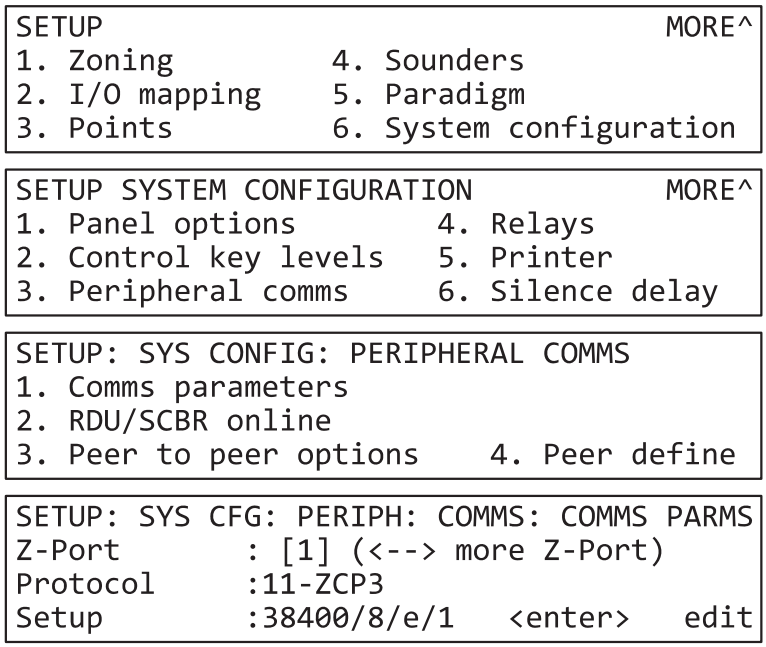
Exit the menu system completely by pressing the Home button. This returns the panel to its normal operation display. To prevent a system from being inadvertently left in a menu, a timeout is built into the menu system. The timeout counter starts from the last button press. In menu selection, the timeout is approximately 45 seconds; if a software function has been started and not completed, then it is 12 minutes.

The normal operation display consists of either the Home screen showing either a title message plus the time and date (if the panel is in quiescent condition) OR an alarm condition.

Programming menus

Some of the menus are used to set up the configuration of devices or functions. Figure 52 shows some example displays, using the communications port setting parameters.

Figure 52: Programming menu examples



To configure communication port settings:

1. Access the following menu: Setup > System Configuration > Peripheral Comms > Comms Parameters.
2. Select the required port to configure as follows:

   Press the Up or Down Arrow button to move the selection brackets to Z-Port.

   Press the Left or Right Arrow button to select the required Z-port (i.e. 1 or 2).
3. Select the required communications protocol as follows:

   Press the Up or Down Arrow button to move the selection brackets to Protocol.

   Press Enter. A list of available protocols is displayed.

   Select the required protocol using the Up or Down Arrows, and then press Enter.
4. Select the required communications protocol parameters as follows:

   Press the Up or Down Arrows to select Setup.

   Press Enter. A list of available parameters is presented.

   Press the Left or Right Arrows to select each parameter, and then press Enter.

   Press the Up or Down Arrows to select the required value, and then press Enter.

   Select Done after setting the required parameters, and then press Enter.
5. When you have finished, press Esc to save the programming.

Menu structure

The following chart shows the menu structure of the Setup menu. A greater-than sign beside an option indicates that there are more submenus or options available than those shown.

- Zoning
  - Viewing
    - Allocation and Messages
    - Fire Coincidence Detection
  - Edit
    - Zone Allocation
    - Zone Messages
    - Fire Coincidence Detection
  - Clear
    - Single Zone
    - All Zones
    - Single Zone Message
    - All Zone Messages
- I/O Mapping
  - I/O Map View
  - I/O Map Edit
  - I/O Map Clear
  - Global Reactivation
- Points
  - Individual Settings
    - View
      - Sensitivity and AVF
        - Sensitivity - Point
        - Sensitivity - Point Range
        - AVF - Point
        - AVF - Point Range
      - Zones
      - Messages
      - Sounder
      - Detector Test
      - Point Type
      - AGV Allocation
    - Edit
      - Sensitivity and AVF
        - Sensitivity - Point
        - AVF (Fire) - Point
      - Messages
        - Edit
        - Display

- Clear Single
- Clear All
- Zones
- Sounder
- Detector Test
- Point Type
- AGV Allocation

- Global Settings
  - View
    - Sensitivity
    - AVF
    - Sounder Alarm Base
    - Detector Test
  - Edit
    - Sensitivity
    - AVF (Fire)
    - AVF (Fault)
    - Sounder Alarm Base
    - Detector Test
- Accept Points

Sounders

- View SAB
- Edit SAB
- View Mapped Sounders
- Edit Mapped Sounders

Paradigm

- View
  - Point Profile
- Edit
  - Point Profile
- Clear
  - Point Profile

System Configuration

- Panel Options
  - Panel Mode >
  - Panel Number
  - Day/Night Times
  - Day Delay Override
  - Panel Standard
- Control Key Levels
  - Sound Alarms
  - Silence Alarms
  - Accept
  - Reset

- Restore Disabled Alarms
- Peripheral Comms
  - Comms Parameters >
  - RDU/SCBR Online
  - Peer To Peer Options
  - Peer Define
- Relays
  - Fire Relay
  - Fault Relay
  - RMC Alarm Relay
  - Sounder Relays
- Printer
  - Printer Type
  - Printer Options
- Silence Delay
- Isolators
- AGV
- Time Update
- Event Time Display
- Flash LED Healthy Det
- Zone LED Link
- Time Set Level
- Control Keyswitch Level

Planner
- Send Map
- Receive Map

Title Message Edit

Watchdog Counters

Level 4 Ops
- Security Codes
  - Clear Codes
  - Edit / View
  - Print
- Panel Hardware
- Erase Program
- Software Upgrade
- Local Programming
- Debug Comms Message
- Clear Alarm Counters
- Language Select

Menu functions

Zoning

Buildings are divided into logical areas known as zones, in order to readily identify each location. The ZP3 fire panel displays fire and fault events by zone. Fire alarm input devices, such as sensors and call points, are assigned to a zone.

The menu path is: Setup > Zoning. The available options are described in Table 17.

Table 17: Zoning options

Option	Description
Viewing	View the devices assigned to a zone, with their type and the zone message. Enter the zone number. The address of the first point in the zone is displayed, together with the total number of devices assigned to the zone. Scroll to view other device addresses. It is also possible to view zones set for fire coincidence detection.
Edit	Assign devices to a zone, and create or edit the zone message. Zone allocation. Enter the zone number, use the numeric keys or the scroll feature to select points to be assigned to the zone. Use the F1 key to remove a point from within a zone. Zone messages. Enter the zone number, and use the keypad to enter the zone message. Fire coincidence detection. Enter the zone number.
Clear	Clear (delete) zone programming. Options are; single zone clearing; all zone clearing; single zone message clear; all zone messages clear. A level 3 code is required before the information is deleted.

Title Message Edit

The Title Message Edit menu lets you set the home screen title message, which is displayed on the LCD screen when the system is in normal mode, i.e. when no alarms are active.

The menu path is: Setup > Title Message.

Watchdog Counters

The ZP3 panel processors are continually monitored. If a processor fails, it is restarted automatically, and a watchdog counter is incremented.

The menu path is: Setup > Watchdog Counters.

The watchdog counters can be viewed in this menu. Use the F1 key to clear counters.

I-O Mapping

Input-output mapping interlinks inputs to outputs creating a *cause and effect* schedule. Up to 1,000 outputs can be controlled, with 2,000 inputs. Inputs and

outputs can be assigned a range of attributes to create the required functions. Each input can be linked to several outputs, with different attributes for each.

The menu path is: Setup > I-O Mapping. The available options are described in Table 18.

Table 18: I-O Mapping options

Option	Description
I/O Map View	View I/O mapping. Enter the output address to view and press Enter. The display shows the output address, its attributes, and its identification message. It also shows the total number of outputs mapped. Using the scroll feature displays the linked inputs and their attributes.
I/O Map Edit	Add new I/O map entries or edit existing entries. Proceed as follows: Enter the output address, and press Enter. The output is shown, with default attributes that can be changed. Use F2 to create (or edit) an output identification message. Choose Done when complete. The display switches to the input screen, and allows inputs to be assigned. Each input address entered is presented with default attributes that can be changed. Select Done when complete, and the next input is presented. Press Esc to select the next output address after all inputs are assigned. Press Home to exit the menu, and save the I/O mapping once complete. Note: The addresses of Control Nodes can be mapped as inputs only. The Control nodes are addressed as group 26; address range 0 to 255.
I/O Map Clear	Clear (delete) all I/O mapping entries. A level 3 code is required before the I/O map can be deleted.
Global Reactivate	This option is used to globally set the reactivation rules for outputs that have been defined as silencing. It also defines their behaviour after they have been silenced, when a second alarm is received. Two options are available: Own I/Ps. This means that if the output is silenced, it only reactivates if a second alarm is received from an input that is mapped to it. Any Fire. This means that if the output is silenced, it reactivates from any second alarm, regardless of the source.

Points > Individual Settings > View

The View menu lets the operator view the configurations of individual points connected to the Z-loops.

The menu path is: Setup > Points > Individual Settings > View. The available options are described in Table 19.

Table 19: Individual point settings view options

Option	Description
Sensitivity/AVF	View the sensitivity to which a sensor is set. The following options are available after accessing this menu. Sensitivity point. Sensitivity settings for an individual point. Enter the point address. The device type, zone, and sensitivity settings are displayed. Use the scroll feature to view the next or previous point. Sensitivity point range. Sensitivity settings viewed on a group basis by zone and device type. Enter the zone range (or all), and the device types (or all) and then use the scroll feature to view. AVF point. Alarm verification settings for an individual point. Enter the point address. The device type, zone, and AVF setting are displayed. Use the scroll feature to view the next or previous point. AVF point range. Alarm verification settings viewed on a group basis by zone and device type. Enter the zone range (or all) and device type (or all) and then use the scroll feature to view.
Zones	View the point addresses of all devices allocated to a zone. Enter the zone number to be viewed. The zone number and first point address in that zone are displayed. Use the scroll feature to view the next or previous address in that zone.
Messages	View the identification message assigned to each point address. Enter the point address. The message is displayed. Use the scroll feature to view the next or previous point address.
Sounder	View which sensors are fitted with sounder bases. The address of the first sensor with sounder base is displayed together with the total number of sensor-sounder base points. Use the scroll feature to view the list.
Detector Test	View which sensors have their self-test feature enabled. Enter the point address for the point to be viewed. Use the scroll feature to view the next or previous point.
Point Type	View the type of device at each address. Enter the point address. The device type is displayed. Use the scroll feature to view the next or previous address.
AGV Allocation	View which sensors are allocated into each alarm group. See the Points > Individual Settings > Edit section for more details on AGV.

Points > Individual Settings > Edit

This Individual Settings > Edit menu lets the operator configure devices connected to the Z-loops.

The menu path is: Points > Individual Settings > Edit. The available menu options are described in Table 20.

Table 20: Individual point settings edit options

Option	Description
Sensitivity/AVF	There are four sensitivity levels for each point. This option lets you set the sensitivity of devices using the following options. Sensitivity point. Enter the point address. The current sensitivity is displayed, and can be changed. Scroll to select the next point address. AVF (Fire) point. With alarm verification enabled, smoke must be present for a period before the sensor gives an alarm. Enter the point address. The setting (AVF on or off) is displayed, which can be changed. Scroll to select the next point address. Note: The AVF setting for a fault condition is global, not individual.
Zones	Allocate Z-loop devices to a zone, or remove devices from a zone. Enter the zone number. The first point address, and the number of devices in the zone are displayed. Scroll to view the other point addresses in the zone. To add a new device to the zone, enter a new point address. To delete an existing device, display its point address and press F1.
Messages	Create or edit identification messages for each point address. In the edit mode, the panel keyboard is used. Messages can be up to 40 characters in length. Options are provided to delete messages.
Sounder	Create a list of sensors that are fitted with sounder bases (SAB). A scrolling, current list is shown. To add a new sensor, enter the point address. To delete a sounder base entry, press F1.
Detector Test	Enable or disable the self-test function of each sensor. Enter the point address. The screen indicates whether the self-test is on or off. To edit a new sensor, enter the address or scroll.
Point Type	Allows the device type at the point address to be defined e.g. heat sensor, optical smoke sensor, call point, etc. This is an optional field as the panel normally learns the device type automatically.
AGV Allocation	This allows the point addresses which physically exist between loop isolators to be defined. This is an optional field as the panel normally learns the addresses automatically.

Points > Global Settings > View

The Global Settings > View menu provides a view of the attributes of point addresses on a zonal basis. Enter a range of zones, for example 1-1, 3-5, or All.

The menu path is: Points > Global Settings > View.

Scroll through the point addresses. The options available for each address are described in Table 21.

Table 21: Point addresses view options

Option	Description
Sensor sensitivity	View sensitivity settings of devices
AVF (Alarm Verification Function)	Enabled or disabled
Sounder base	Present or not
Detector self-test	Enabled or disabled

Points > Global Settings > Editing

The Global Settings > Editing menu provides the ability to simultaneously programme a set of attributes for a group of point addresses as follows.

The menu path is: Points > Global Settings > Editing.

After programming globally with this menu, individual devices that need different attributes can be changed using the Points menu. Scroll through the point addresses. The editing options available for each address are described in Table 22.

Table 22: Point addresses edit options

Option	Description
Sensor sensitivity	High, medium, standard, low
Fire AVF (Alarm Verification Function)	Enabled or disabled
Fault AVF (Alarm Verification Function)	Enabled or disabled (Note: Global only)
Sounder base	Present or not
Detector self-test	Enabled or disabled

Points > Accept Points

Selecting the Accept Points menu instructs the panel to carry out a self-learning process, to accept all current devices attached to the Z-loops, or peripheral boards, as the current system configuration. The panel displays the message “Accepting points” and counts down toward zero. On completion, the panel displays “Calibrating”. If a device was not accepted, it is shown as “unaccepted”.

The menu path is: Setup > Points > Accept Points.

Sounders

The Sounders menu provides the tools for setting up system sounders. Loop devices and panel outputs that operate sounders must be defined as such to the panel to ensure that they behave correctly.

The menu path is: Setup > Sounders or Setup > Pnts > INDN. The available sounder setup options are described in Table 23.

Table 23: Sounder setup options

Option	Description
View SAB	View which Z-loop sensors have been defined as having a sounder base (SAB). The point address of the first sensor is displayed, plus the total number of sounder bases. Scroll to view the list.
Edit SAB	Define which sensors have a sounder base. Add or delete a point address.
View Mapped Sounders	View of all outputs (Z-loop and panel outputs), which have been defined as sounders in the I/O mapping tables. Scroll to view the list.

Option	Description
Edit Mapped Sounders	Define which outputs are sounders. The point address of the first sounder is displayed, plus the total number sounders in the list. Scroll to view the list. Addresses can de added to or deleted from the list.

Paradigm

The Paradigm menu is used to set the properties of Paradigm sensors. These properties define the performance characteristics of each sensor, and are selected according to the location of the sensor and the type of response required from a fire, as well as the sensors resistance to false alarms. See the section on sensor setup options for details on how to choose appropriate settings for each sensor.

The menu path is: Setup > Paradigm. The paradigm sensor setup options are described in Table 24.

Table 24: Paradigm sensor setup options

Option	Description
View > Point Profile	View the profile assigned to each Paradigm sensor. The point address of the first Paradigm sensor is displayed, together with its profile code. Scroll to view the list.
Edit > Point Profile	Allocate a profile to each Paradigm sensor. Enter a point address, and a configuration menu appears. Two different profiles can be assigned to each Paradigm sensor, one for day operation, and one for night operation.
Clear > Point Profile	Restores a Paradigm point address to the default Paradigm profile.

System Configuration > Panel Options

The Panel Options menu path is: Setup > System Configuration > Panel Options. The Panel Options section sets the following global panel functions (see Table 25).

Table 25: Panel configuration options

Option	Description
Panel Mode	Define whether the panel is to operate in standard or day/night mode. In standard mode, all functions remain the same regardless of the time of day. In day/night mode, functions and alarms operate differently during day and night hours.

Option	Description
Panel Number	Each fire panel must be given a unique number 001 to 255 that is embedded in the four-segment, IP-style address AAA-BBB-CCC-DDD, where: A = domain address B = site address C = host address D = panel number The domain address, site address and host address are fixed for a particular site, i.e. for all panels in a Planner project. The menu displays the following information: Enter local panel number: When entering the Panel Number menu the cursor defaults to the local panel number field. The IP address is entered in the same style as the date, with digits added continuously from left to right. Address: The four-segment, IP-style panel address currently allocated is displayed in this field. New: The panel number selected in “Enter local panel number” is displayed. Note: When enter is pressed to save the data, if any of the three-digit fields exceeds 255, an error message is displayed in the bottom right of the menu. The error message is cleared once a value less than or equal to 255 is entered. Press Esc to cancel any changes.
Day/Night Times	Day/Night panels change to night mode each evening at a preset time. This menu sets the changeover times for each day of the week.
D/delay Override	Allows call points to be excluded from the “Day delay” alarm delay period.
Panel Standard	Allows panel to be configured to a specific standard: EN 54, 1997 (Classic/UK) EN 54, 2005 (Sweden etc.) CP10, Singapore

System Configuration > Control Key Levels

The Control Key Levels menu path is: Setup > System Configuration > Control Key Levels. The Control Key Levels menu sets the access levels for the following functions (see Table 26).

Table 26: Function access level options

Option	Description
Sound Alarms	Defines the required access level for the Sound Alarms control key (i.e. the Sound Alarms button).
Silence Alarms	Defines the required access level for the Silence Alarms control key.
Accept	Defines the required access level for the Accept/Silence Buzzer control key.
Reset	Defines the required access level for the Reset control key.

Option	Description
Restore Disabled	Defines the required access level for the Restore Disabled Alarms control key.

Note: Level 1 allows open access, while level 2 or higher enforces restricted access. Restricted access requires a password before the control key operates. The panel's control key switch must be in the ON position in both cases. See also the "Control Key Switch" option in Table 30 on page 86.

System Configuration > Peripheral Comms

The Peripheral Comms menu is used to set the peripheral communications functions of the panel. It allows for the setup of the communications parameters for networked panels, and for the SCB-bus connected to remote display units and remote control units).

The menu path is: Setup > System Configuration > Peripheral Comms. See Table 27 for available options.

Table 27: System configuration, peripheral comms options

Option	Description
Comms	Defines the port number, communication protocol, baud rate, number of bits, parity, and stop bits.
RDU/SCBR Online	Specifies the quantity of RDUs (remote display units) and RCUs (remote control units) connected to the panel via SCB-bus. The maximum is 63.
Comms Hardware	Communication hardware settings for handshake and timeouts. Precise usage of timeouts varies according to the selected protocol. Timeouts should be left at their default settings unless additional interface equipment with special requirements is used. Timeouts for interruption of communications: (a) acknowledgement (b) offline/inter-packet (c) inter-character The range for this setting is 000 to 255. Note: When a level 4 user accesses this menu, the timeouts can be individually edited. If a level 3 user accesses this menu, the user can use the Timeout defaults option, but cannot edit the individual timeout settings. Press F2 to default the selected port's timeouts as follows: • Timeout 1 = 4 seconds (on all Z-ports) • Timeout 2 = 67 minutes (scaled x 4 internally, making 268 seconds) (on all Z-ports) • Timeout 3 = 50 milliseconds (on all Z-ports). Hardware handshaking lines RTS, DSR, CTS, and DTR may be enabled or disabled as a group. The four handshake lines default to "disabled".
Peer Options	In networks, each panel must mark as *online* the address numbers of all the other panels that it must communicate with. Each panel must also define the type of information and control functions to send to the other panels in the network.

Option	Description
Peer Define	Defines the properties of all network panels, e.g. number of loops, zones, and communication ports.

System Configuration > Relays

The Relays menu allows for the setup of the standard built-in relays.

The menu path is: Setup > System Configuration > Relays. The following options are available (see Table 28).

Table 28: System configuration relay setup options

Option	Description
Fire Relay	The common fire relay can be set to normally de-energised (open contact, closing on alarm) or normally energised (closed contact, open on alarm). The latter state is described as “inverted” in the menu.
Fault Relay	The common fault relay can be set to normally energised (open contact, closing on alarm) or normally de-energised (closed contact, open on alarm). The latter state is described as “inverted” in the menu.
RMC Alarm	The remote manned centre output is connected to RMC-routing equipment. It should be set to restore only after a reset.
Sounder Relays	The sounder outputs (four outputs, controlled from two addresses) can be set to operate as common, from any alarm, or as programmable. If they are set to programmable, then they must be linked to activating inputs in the I/O-menu.

System Configuration > Printer

The Printer menu allows for the setup of the optional in-panel printer.

The menu path is: Setup > System Configuration > Printer. The following options are available (see Table 29).

Table 29: System configuration printer setup options

Option	Description
Printer Type	Allows the type of printer to be defined. Current types are: 1. NONE = no printer attached 2. Able-24/25 = panel printer 3. Able-24+IN) = panel printer 4. Serial desktop = external printer, 80 column
Printer Options	Defines the information to be printed, categories are: 1. Fire Alarm 2. Fault 3. Panel Operation 4. O/P Activation

System Configuration > [Option]

The Various System Configuration section describes the options available in the submenus.

The menu path is: Setup > System Configuration > [Option]. The following options are available (see Table 30).

Table 30: Various system configuration setup options

Option	Description
Silence Delay	Allows the SILENCE ALARMS key to be delayed to prevent the alarm sounders from being silenced (turned off) too soon, before being heard. Enter the required silence delay time required in seconds.
Isolators	Define the quantity of isolators installed per Z-loop, range 0 to 16.
AGV (Alarm Group Verification)	Specifies whether the Alarm Group Verification (AGV) function is enabled or disabled. Two modes are provided: Address group check - When enabled, the panel verifies that the correct device addresses exist between loop isolators Partial short check - When enabled, checks for partial short circuits and data corruption, isolating the cause with the loop isolators
Time Update	When this menu is [ENABLED], setting the time and date in a panel, which is part of a network of panels, causes the time and date of all the panels in the network to be updated.
Event Time Disp	Enabling this function causes the time of each alarm to be displayed on the LCD display. This reduces the number of characters visible for the zone message by 6. See also “Zone identification messages” on page 91.
Flash Healthy LED	With this function enabled, the LEDs on sensors and line devices flash once every 20 seconds to indicate that the device is present and healthy. When a device is in alarm, the LED flashes once every 2 seconds. With this function disabled, the LEDs remain off when the device is normal.
Zone LED Link	The zone LEDs can be set to be automatically linked to the system zones, or to be programmed to different zones with I/O-mapping. This menu defines whether the zone LEDs are zone-linked or programmable.
Time Set Level	This function enables either free access to the time setting commands, or limits access to level 2.
Control Key Switch	This function causes the RDUs Controls Enable/Disable key switch to be linked to the level 2 access code, allowing it to be used for level 2 access from RDUs, which do not have keypads with which to enter a passcode. Note: For this to operate, the RDUs Controls key switch must be wired into the required “Reserved terminal” of its display board in place of the “Controls Off” terminal.

Planner

Most of the programming of a ZP3 system is done by means of software. This can be done directly via the panel menus, or it can be done offline on a PC, using the Planner program, and later loaded into the panel by means of a serial data

connection. After being loaded into the panel, minor modifications can be made to the programming, directly via the panel menus. In this case, it is possible to load the programming from the panel back to the PC, for saving to disk, and printed report and record keeping.

The menu path is: Setup > Planner. Menu options available are as follows (see Table 31).

Table 31: Planner setup options

Option	Description
Send Map	This function is used to send the programmed data that exists in a ZP3 panel to an external PC.
Receive Map	This function is used to receive programmed data from a PC.

Note: The preferred baud rate settings when using Planner to configure a ZP3 panel are shown in Table 32 below.

Table 32: Preferred Planner baud rate settings

	Baud rate	Data bits	Parity	Stop bits
Receive	38400	8	Even	1
Send	9600	8	Even	1

Alternatively you can set Z-Port 1 to “ZCP3” to allow control directly from Planner.

Level 4 Operations

These are high level operations for use by a senior administrator of the fire system, to alter options or settings that cannot be changed by installation, maintenance, or operation personnel.

The menu path is: Setup > Level 4 Operations. The following options are available (see Table 33).

Table 33: Level 4 Operations options

Option	Description
Security Codes	Defines panel access codes as follows: 1. Operator 2. Maintenance 3. Setup 4. Level 4 In addition, the access system allows you to enter up to 20 (optional) operator names. Each name can have a different four-digit numeric access code, and can have an access level from 1 through 4. Clear: This menu lets you delete all the access codes. The existing level 4 code is required for deletion and a new level 4 code is required. Edit/View: This menu allows for viewing, adding, and deleting codes. The first operator, code, and access level is displayed. Scroll to display other entries. Displayed entries can be deleted. To add an entry, scroll to the end of the list and enter the required details. Print: This option generates a printed record of all existing operator names, codes, and levels.
Local Programming	Defines the programming method, as follows: Local programming enabled = The panel can be programmed directly from the keypad (with level 3 access), or by loading a project from a PC. Local programming disabled = The panel cannot be programmed via the keypad, it can only be programmed by loading a project created on an external PC.
Erase Program	Deletes all user programming and restores all configuration settings to the factory defaults.
Software Upgrade	Lets you load new operating software into the panel from a PC. Loading new software does not lose or affect configuration programming.
Debug Comms	View data received on Z-Port 1 and 2 or other diagnostic information on other virtual ports.
Panel Hardware	Defines the hardware configuration, i.e. loops, zones, and power options.
Clr Alrm Counters	Resets the alarm counters to zero.
Language	The ZP3 panel has facilities for two languages, English and one extra language. This menu defines the default language that the panel uses. An alternative foreign language can be loaded (for software version 3.02 and higher). This option was not available on version 3.00. Note that the appropriate version language file must be used. Refer also to the ZP3 language loading procedure, which may be found in the *Planner User Guide* (P/N 503-1436ZE-U-05)

Chapter 5
System configuration

Summary

This chapter provides configuration information for your control panel, and includes information on EN 54 requirements.

Content

System specification

To set up the system configuration, it is necessary to prepare a detailed system specification. This specification will also be used in the future maintenance of the system. The specification should contain the information described in this topic.

General information

A system schematic should be prepared, showing all the panels, and auxiliary boards and modules, in the system. The schematic should show the Z-loops, with the devices and loop isolators.

A list of all sensors and devices must be prepared, with device types, location details, and point addresses. Drawings should be available showing loop wiring runs, with the positions and point address of each device, and the positions of each loop isolator. A schedule of loops, with the loop length, wiring size, and number and type of devices on each loop should be produced.

Input-output mapping

Input-output mapping is software defined rules that allow the linking of inputs to outputs creating a *cause and effect* schedule. This is described in more detail in the topic “Cause and effect functions” on page 93.

Panel identification

Each panel must be assigned a unique number between 1 and 255. A title message, which displays on the panel LCD in the normal condition, is optional. If specified, it can be up to 40 characters in length, and defaults to “Fire Alarm System”.

Menu access codes

The panel uses access codes (passwords) to control user access to the menus. There are four access levels, but only three are restricted and require the use of access codes. A four-digit numeric access code must be specified for each of the three restricted access levels:

- Level 2 = Maintenance
- Level 3 = Setup
- Level 4 = Level 4 (or administration)

Level 1, Operator, is not restricted and does not require the user to enter an access code.

Control key access levels

A facility is provided to prevent unauthorised operation of control keys (buttons) on the panel fascia. Each of the four main control keys Accept, Reset, Silence-Alarms, and Sound-Alarms, can be individually assigned an access level. If unassigned, these controls operate at level 1, which is uncontrolled.

Local programming

The panel can be configured to allow or prohibit l*ocal programming* from the fascia keypad. If local programming is not allowed, then the panel can only be programmed by downloading a configuration project created on an external PC. This can provide a higher level of security to prevent unauthorized on-site changes to the configuration.

Networking

Panels must be defined as stand-alone or part of a network.

Zone allocation

All input devices on a loop must be assigned to a zone. This includes sensors, call points, and interface units. Output devices such as sounders and line relays can be zoned optionally, as required. Zones must be specified and numbered, and the point addresses belonging to each zone must be defined.

Zone identification messages

Each zone requires an identification message. The message displayed on the Points screen can be up to 29 characters in length (on networked panels due to the panel numbers field) or 33 on stand-alone panels. If the feature that displays the time of each alarm on-screen is enabled, then the visible space for the zone message is reduced by 6 characters. It is not necessary to include the zone number in the message, as this is displayed automatically. All 40 characters are logged on the printer.

Point information

The address of each point to be used in the system must be defined, together with the type of device at each point address.

Device identification message

Each device in the system has an identification message, which is tagged to the point address of the device. For Z-loop devices this message can be up to 40

characters in length. For panel outputs, the message can be 10 characters in length.

Detector self-test

ZP700 series sensors have a self-test capability that is used by the panel to automatically test them every 24 hours. This test is optional, and can be specified on a device-by-device basis. Certain devices on the loop (for example, conventional detectors connected via interface units), do not have a self-test facility, and would have this function disabled. The default setting is OFF.

Sounder bases

A sensor can be connected to a sounder alarm base (SAB), providing the ability to provide an audible alarm at each sensor. The point address of each sensor fitted with a sounder base must be specified, and whether the sounder is powered from the Z-loop, or powered externally. This is dependent upon the number of base sounders, the required sound output (in decibels), and the size and length of loop cabling. Refer to the relevant base sounder application documentation for more information.

Loop sounders

Sounders can be connected directly to the Z-loop, and assigned their own point address. The point address of each loop device that is a sounder must be specified in order for it to behave correctly. In addition, you must specify whether the sounder is powered from the Z-loop, or powered externally. This is dependent upon the number of sounders, the required sound output (in decibels), and the size and length of loop cabling. Refer to the relevant loop sounder application documentation for more information.

Panel sounders

Panel sounders are attached to the panel in two ways:

- Standard built-in sounder outputs, a quantity of four, paired on two addresses
- Optional sounder outputs, quantity dependent upon the number of boards installed

Sounders can be connected directly to panel outputs, or to remote panel outputs. All sounders can be programmed to operate on a common alarm, or to be individually configurable by means of I/O-mapping. All sounder outputs have their own panel point address. The point address of each panel output connected to a sounder must be specified as a sounder output, in order for it to behave correctly. Panel sounders are usually powered from the panel power supply, but can also be powered by an external power supply. This is dependent upon the number of

sounders, the required sound output (in decibels), and whether the sounders are connected to the panel, or to a remotely located RCU-panel.

Z-loop isolators

The number of Z-loops and the number of loop-isolators on each loop must be specified. In addition the location of each isolator must be shown either on the schematics, or on the layout drawings. Up to 16 loop isolators (limited to 11 to comply with EN 54 specification) can be installed on a loop. The panel includes two built-in isolator relays, giving a total of 12 isolated sections of cable.

Common relays

The normal state for common fire and fault relays must be defined. The defaults are; fire relay (normally de-energised) and fault relay (normally energised).

Printer

Specify whether a panel printer is to be fitted, and specify the type of events that must be printed. Events are categorized into fire alarms, fault alarms, panel operations, and outputs activated.

Alarm time display

Specify whether the time of each alarm must be displayed on-screen or not. This information is always printed on the printout.

Silence delay

A delay can be programmed for the Silence Alarms button in order to prevent the system sounders being silenced (turned off) too soon in the event of a fire alarm. The time can be set between 0 and 600 seconds.

Cause and effect functions

Input-output mapping

Input-output mapping refers to software-defined rules that allow the linking of inputs to outputs creating a *cause and effect* schedule. Up to 2,000 input triggers may be configured to link with up to 896 outputs. This allows multiple input conditions to be defined for each output.

The full details of every input-output map link must be specified. An address must be specified for each output and each input. The options to be configured for a

mapping link are discussed below under the headings “Output parameters” and “Input parameters”.

Output parameters

Output mode

The output mode defines whether the output is silencing, non-silencing, dynamic, or pulsed. Pressing the Silence Alarms button on the panel turns off the silencing outputs. Non-silencing outputs turn off when the panel is reset. If the output mode is set to dynamic then the output ignores the silence or reset keys, and follows the input trigger, i.e. it switches off when the input is deactivated. A pulsed response activates the output for a single programmable period (selectable in seconds up to 2 hours, 11 minutes, and 15 seconds) after activation.

The mode also indicates whether the output is triggered by any one of its inputs (single-knock), or whether it requires two input triggers (double-knock).

Output reactivate mode

Output reactivation mode applies to silencing outputs only. This allows an output that has been silenced (from a previous alarm) to be reactivated by two options; either from any new fire alarm in the system (labelled as “Any”), or only by a new alarm from input devices that are already linked to it in the I/O map (labelled as “Own”).

Output delay

When an output is triggered, it can be given an elapsed time delay of 0 to 600 seconds until it activates. This interval is called the output delay.

Normal output state

Each output can be individually defined to be normally off (de-energised in the non-alarm condition, energising on alarm) or normally on (energised in the non-alarm condition, de-energising on alarm). The default setting is “Normally Off”.

Sounders/control outputs

Each output that is defined to operate sounders should be specified as such. Note that outputs declared as sounders are always configured as silencing, and this setting takes precedence over the I/O-mapping setting. These are intended for extinguishing and ventilation control, etc. Outputs defined to operate as control outputs should be defined as such.

Input parameters

Input mode

The input can be set to operate its linked output at these rates: steady, flash fast, flash slow, or disable. The “disable” value is used when an input address is used to disable one or more outputs; for example, when a key switch is used to disable outputs for routine maintenance. Note that panel outputs can be set to fast or slow intermittent operation, whereas Z-loop devices have only one flash rate. On multi-tone sounders, these correspond to different tones.

Input device type

The device type of the input can be defined as a general device, line device, or a gas control unit. The type setting determines what trigger events are available to activate an output.

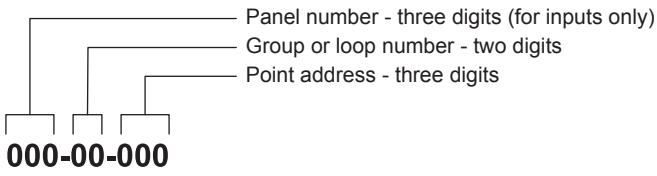
Trigger

Each input can be set to trigger the output on certain types of event, defined by its type. Sensors can activate outputs from fire, fault, prealarm, service, or disabled alarms.

Point address structure

Input-output mapping a software-defined rule that defines a set of input triggers that activate an output. One or more inputs may be linked to an output. Each input and output has an address that must be specified when setting an I/O mapping link. Each address consists of three elements as follows.

Figure 53: Point addressing



The ZP3 panel incorporates one control bus with 1,024 addresses that can be either inputs or outputs. Refer to the “System address list” on page 97 for details. These addresses are divided into two groups, system bus and user bus, as shown in the following table.

Table 34: Address groups

Name	Addresses	Description
System Bus (Group 09)	000 to 255	Controls panel functions, including zones, common LEDs, and control keys. Can be used for external mimic functions. These outputs are preprogrammed.
User Bus (Group 10)	000 to 767	Freely programmable.

The system bus range of addresses is preprogrammed by default to carry out certain functions, for example, to illuminate zone LEDs. Alternatively, addresses 9.001 to 9.128 can be configured to be freely programmable. Where connected outputs are set to addresses in the system bus range, then these outputs automatically mimic the behaviour of the preprogrammed functions. For example, an output board set to the same address as the zone LEDs automatically mimics these LEDs, without any panel programming being required.

The user bus range of addresses is freely programmable. Any output connected to the system with an address in the user bus range must be programmed using the I/O-mapping function before it will operate.

Auxiliary board addresses

The ZP3 auxiliary boards can be set to assume any address in the system bus (group 9) or user bus (group 10) address range. Auxiliary boards have 8, 16, or 24 points, which are addressed sequentially from a base address. The base address is determined by the DIP switch settings on each board. Refer to the information in the topic “System address list” on page 97.

DIP switch settings between 0 and 31 set the addresses within the system bus (group 09) range (Switch 8 = ON).

DIP switch settings between 32 and 127 set the addresses within the user bus (group 10) range (Switch 8 = OFF).

System address list

System bus addresses

The following tables show the system bus (group 09) addresses for each auxiliary board DIP switch setting. These are preprogrammed, and cannot be changed from the specified functions. Outputs can be linked to these addresses to automatically mimic their functions.

Note: Accessory board DIP switch 8 must be set to ON to link to the system bus.

Table 35: System bus addresses for auxiliary boards

DIP switch	Address	Function	DIP switch	Address	Function
000	000	Zone 0 Fire LED	003	024	Zone 24 Fire LED
	001	Zone 1 Fire LED		025	Zone 25 Fire LED
	002	Zone 2 Fire LED		026	Zone 26 Fire LED
	003	Zone 3 Fire LED		027	Zone 27 Fire LED
	004	Zone 4 Fire LED		028	Zone 28 Fire LED
	005	Zone 5 Fire LED		029	Zone 29 Fire LED
	006	Zone 6 Fire LED		030	Zone 30 Fire LED
	007	Zone 7 Fire LED		031	Zone 31 Fire LED
001	008	Zone 8 Fire LED	004	032	Zone 32 Fire LED
	009	Zone 9 Fire LED		033	Zone 33 Fire LED
	010	Zone 10 Fire LED		034	Zone 34 Fire LED
	011	Zone 11 Fire LED		035	Zone 35 Fire LED
	012	Zone 12 Fire LED		036	Zone 36 Fire LED
	013	Zone 13 Fire LED		037	Zone 37 Fire LED
	014	Zone 14 Fire LED		038	Zone 38 Fire LED
	015	Zone 15 Fire LED		039	Zone 39 Fire LED
002	016	Zone 16 Fire LED	005	040	Zone 40 Fire LED
	017	Zone 17 Fire LED		041	Zone 41 Fire LED
	018	Zone 18 Fire LED		042	Zone 42 Fire LED
	019	Zone 19 Fire LED		043	Zone 43 Fire LED
	020	Zone 20 Fire LED		044	Zone 44 Fire LED
	021	Zone 21 Fire LED		045	Zone 45 Fire LED
	022	Zone 22 Fire LED		046	Zone 46 Fire LED
	023	Zone 23 Fire LED		047	Zone 47 Fire LED

DIP switch	Address	Function	DIP switch	Address	Function
006	048	Zone 48 Fire LED	010	080	Zone 80 Fire LED
	049	Zone 49 Fire LED		081	Zone 81 Fire LED
	050	Zone 50 Fire LED		082	Zone 82 Fire LED
	051	Zone 51 Fire LED		083	Zone 83 Fire LED
	052	Zone 52 Fire LED		084	Zone 84 Fire LED
	053	Zone 53 Fire LED		085	Zone 85 Fire LED
	054	Zone 54 Fire LED		086	Zone 86 Fire LED
	055	Zone 55 Fire LED		087	Zone 87 Fire LED
007	056	Zone 56 Fire LED	011	088	Zone 88 Fire LED
	057	Zone 57 Fire LED		089	Zone 89 Fire LED
	058	Zone 58 Fire LED		090	Zone 90 Fire LED
	059	Zone 59 Fire LED		091	Zone 91 Fire LED
	060	Zone 60 Fire LED		092	Zone 92 Fire LED
	061	Zone 61 Fire LED		093	Zone 93 Fire LED
	062	Zone 62 Fire LED		094	Zone 94 Fire LED
	063	Zone 63 Fire LED		095	Zone 95 Fire LED
008	064	Zone 64 Fire LED	012	096	Zone 96 Fire LED
	065	Zone 65 Fire LED		097	Zone 97 Fire LED
	066	Zone 66 Fire LED		098	Zone 98 Fire LED
	067	Zone 67 Fire LED		099	Zone 99 Fire LED
	068	Zone 68 Fire LED		100	Zone 100 Fire LED
	069	Zone 69 Fire LED		101	Zone 101 Fire LED
	070	Zone 70 Fire LED		102	Zone 102 Fire LED
	071	Zone 71 Fire LED		103	Zone 103 Fire LED
009	072	Zone 72 Fire LED	013	104	Zone 104 Fire LED
	073	Zone 73 Fire LED		105	Zone 105 Fire LED
	074	Zone 74 Fire LED		106	Zone 106 Fire LED
	075	Zone 75 Fire LED		107	Zone 107 Fire LED
	076	Zone 76 Fire LED		108	Zone 108 Fire LED
	077	Zone 77 Fire LED		109	Zone 109 Fire LED
	078	Zone 78 Fire LED		110	Zone 110 Fire LED
	079	Zone 79 Fire LED		111	Zone 111 Fire LED

DIP switch	Address	Function	DIP switch	Address	Function
014	112	Zone 112 Fire LED	018	144	Points Disabled LED
	113	Zone 113 Fire LED		145	Info LED
	114	Zone 114 Fire LED		146	Alarms Delayed LED
	115	Zone 115 Fire LED		147	Rem/Alarm Delayed LED
	116	Zone 116 Fire LED		148	GC Function Delayed LED
	117	Zone 117 Fire LED		149	Day Mode LED
	118	Zone 118 Fire LED		150	Test Condition LED
	119	Zone 119 Fire LED		151	Point Alarm LED
015	120	Zone 120 Fire LED	019	152	System On LED
	121	Zone 121 Fire LED		153	LCD Backlight On
	122	Zone 122 Fire LED		154	Reserved-for future use
	123	Zone 123 Fire LED		155	Reserved-for future use
	124	Zone 124 Fire LED		156	Reserved-for future use
	125	Zone 125 Fire LED		157	Reserved-for future use
	126	Zone 126 Fire LED		158	Buzzer Output
	127	Zone 127 Fire LED		159	Info #2 LED
016	128	Zone 128 Fire LED	020	160	Common Disable #2 LED
	129	Common Fire LED		161	Common Fault #2 LED
	130	Common Fire LED #2		162	Night Mode LED
	131	Sounders Active LED		163	Alarm Silenced LED
	132	Remote Alarm Active LED		164	More Up LED
	133	Control O/P Active LED		165	More Down LED
	134	Common Fault LED		166	Zone Prealarm
	135	Alarm(Sounder) Fault LED		167	Zone Fault
017	136	Remote Alarm Fault LED	021	168	More Time
	137	Control O/P Fault LED		169	Points Fault
	138	System Fault LED		170	Double Knock
	139	Common Disable LED		171	Security (door switches?)
	140	Alarm Disable LED		172	Common Fire LEDs
	141	Rem. Alarm Disabled LED		173	Fire Alarm Relays 1+2
	142	Control O/P Disabled LED		174	Silence Alarm Key
	143	Zone Disabled LED		175	Sound Alarm Key

DIP switch	Address	Function	DIP switch	Address	Function
022	176	Reset Panel Key	023	184	Mains supply fault
	177	Sound Alarms LED		185	Disable All Sounders
	178	Fire Alarm Relays 2+3	023	186	Reserved for future use
	179	Accept alarms key	to	to	
	180	More time key	031	255	
	181	Restore disabled alarms key			
	182	Modem power control			
	183	Toggle Day/Night			

User bus addresses

The ZP3 auxiliary boards can assume any address in the user bus (group 10) address range. Each auxiliary board represents a range of point addresses; 8-way, 16-way, or 24-way. The address range is defined by the board address, which is set with a DIP switch on each board. The board address defines the first 8-point addresses on the board. For boards with more than 8-ways, each subsequent group of 8-ways automatically assumes the next board address after the DIP switch setting. Therefore, a 24-way board would use 3 board addresses, the first being set on the DIP switch, the other two board addresses following-on by assumption.

Note: Accessory board DIP switch 8 must be set to OFF to link to the user bus.

Table 36: User buss addresses for auxiliary boards

DIP switch	Bus point	DIP switch	Bus point	DIP switch	Bus point	DIP switch	Bus point
32	000-007	56	192-199	80	384-391	104	576-583
33	008-015	57	200-207	81	392-399	105	584-591
34	016-023	58	208-215	82	400-407	106	592-599
35	024-031	59	216-223	83	408-415	107	600-607
36	032-039	60	224-231	84	416-423	108	608-615
37	040-047	61	232-239	85	424-31	109	616-623
38	048-055	62	240-247	86	432-439	110	624-631
39	056-063	63	248-255	87	440-447	111	632-639
40	064-071	64	256-263	88	448-455	112	640-647
41	072-079	65	264-271	89	456-463	113	648-655
42	080-087	66	272-279	90	464-471	114	656-663
43	088-095	67	280-287	91	472-479	115	664-671
44	096-103	68	288-295	92	480-477	116	672-679

DIP switch	Bus point	DIP switch	Bus point	DIP switch	Bus point	DIP switch	Bus point
45	104-111	69	296-303	93	478-495	117	680-687
46	112-119	70	304-311	94	496-503	118	688-695
47	120-127	71	312-319	95	504-511	119	696-703
48	128-135	72	320-327	96	512-519	120	704-711
49	136-143	73	328-335	97	520-527	121	712-719
50	144-151	74	336-343	98	528-535	122	720-727
51	152-159	75	344-351	99	536-543	123	728-735
52	160-167	76	352-359	100	544-551	124	736-743
53	168-175	77	360-367	101	552-559	125	744-751
54	176-183	78	368-375	102	560-567	126	752-759
55	184-191	79	376-383	103	568-575	127	760-767

EN 54 Setup requirements

Summary

The setup requirements to conform to EN 54 are provided below. All paragraph numbers refer to EN 54 part 2 of 1997 unless otherwise specified.

1. Para 7.1.4 and 8.1.3: AVF shall be switched off for all points.
2. Para 7.3.1: Under menu Setup > System Configuration > Zone LED Link, zone LEDs shall be linked to the appropriate zones.
3. In menu Setup > System Configuration > Control Key Switch Level:

   Para 7.4.1: The Accept key shall be set up to level 1 or 2

   Para 7.6.1: The Reset key shall be set up to level 2

   Para 7.8(a): The Silence Alarms key shall be set up to level 2

   Para 7.8(b): The Sound Alarms key shall be set up to access level 2
4. Para 7.8: If accessory board ZP3AB-MA8 outputs are required to serve the function of “output to fire alarm devices (item C)” then they must be defined as sounder outputs when mapping. Standard outputs and use of non-monitored output boards shall not be used to comply with EN 54 item C requirements.
5. Para 7.10: If accessory board ZP3AB-MA8 outputs are required to serve the function of “control to fire protection equipment” then they must be defined as control outputs when mapping. The programming must not include delays to output when the output is used to serve the function of “control to fire protection equipment”. Standard outputs and use of non-monitored

input/output boards shall not be used to comply with EN 54 item G requirements.

6. Para 7.11(a): Under menu Setup > System Configuration > Relays > Sounder Relays, the sounder relays must be defined as programmable. The relays must then be mapped as outputs (addresses 09-173 and 09-178) using the I/O mapping function. They must defined as sounder outputs, silencing with no delay.

   Note: A suitable input would be the common fire LED at address 09-129.

7. Para 7.11(c): The day delay and more time extension shall be set to a maximum of 10 minutes as it automatically affects the delay to RMC alarm output.
8. Para 7.11(c): The I/O mapping to common sounder outputs (addresses 09-173 and 09-178) shall be set to a maximum delay of 10 minutes (including day delay and more time extension if operating in day mode).
9. Para 7.11(d): Under menu Setup > System Configuration > Panel Options > Day Delay Override set up so that call points do override the day delay.
10. Para 7.12: To meet coincidence detection requirements either:

    (a) Use the coincidence function in the Setup > Zoning menu to inhibit the indication of fire alarm condition (the first alarm in shows as a prealarm)

    — or —

    (b) Facilitate the option to inhibit fire alarm devices and fire protection equipment by mapping each appropriate output as double knock from the zone

11. Para 8.2.4(c): Earth fault monitoring shall be enabled (by inserting link J1 on the main control board).
12. Para 8.2.5/6: The auxiliary 24 V power supply output shall not be used to drive unmonitored equipment i.e. equipment which will not automatically notify a fault to the control panel should loss of power occur. Line units such as ZP752-2 are monitored.
13. Para 12.4.4: All internal components of the panel enclosure shall be left inside the enclosure to ensure EMC compatibility. The panel shall remain locked with key removed during operation.
14. Para 12.5.2 and CEA GEI 1-052 Para 5.2.3: Under menu Setup > System Config > AGV, the AGV should be defined as enabled for partial short circuit check.
15. Para 12.5.2: Loops must be wired in Class A return loop configuration.
16. Para 12.5.2: Isolators should be placed on the loop such that no more than 32 detectors or call points may be isolated in the event of an open or short circuit on the loop. (It is recommended that no more than 32 points are included in a zone).
17. Para 12.6: The controls key switch should be left on.

18. Para 12.10.2: The panel audible sounder shall be operated at full volume and not suppressed.
19. EN 54-2 annexure A: The commissioning key should be off.
20. Heat sensor elements required to conform to EN 54 Part 5 Grade 1 must be set up to sensitivity 2.
21. To meet the requirements of EN 54-2 either as a sounder output (type C) or an output to fire protection equipment (type G) the output must be monitored and hence a monitored output accessory board should be used as opposed to a relay output accessory board or line device.
22. The ZP3 panel approved to EN 54 was tested using the internal power supply. Although option is provided to supply power from an external power supply this should not be used if compliance with EN 54 is essential.
23. The ZP3 panel approved to EN 54 was tested using 11 isolators in a ZP address loop. Although option is provided to software select up to 16 isolators, a maximum of 11 should be used if compliance with EN 54 is essential.
24. The loop wiring must be shielded with the screens being effectively earthed.
25. Para 5.3.1 b): Charge rate jumper JP6 must be linked to meet the requirements of EN 54 if the battery capacity exceeds 17Ah. See “Power supply and battery calculations” on page 56 for more details.

Chapter 6
System commissioning

Summary

This chapter provides commissioning instructions for your control panel.

Content

Introduction

After the ZP3 fire control panel and the other system elements have been installed, the system must be commissioned. The purpose of commissioning is to make sure that the system operates correctly. The following areas must be checked:

- The system has been correctly designed
- All equipment has been properly installed
- The software functions have been correctly programmed
- Sensors are appropriate for their environment
- All sensors function correctly
- All outputs operate correctly
- Cause and effect linkages are correct
- The complete system is functioning correctly

Verification

The following elements must be verified as correct. Some of these items can be checked using the printout from the Ziton Planner programming software. Others items require on-site checking, testing and measurement. The commissioning process must cover the following items.

Verify system design

Verify that the system design satisfies the requirements of the system specification (usually produced by the project consulting engineer, or similar person). Check that that the correct types of sensors are fitted into each area, and that equipment complies with the specification.

Where a system is required to comply with the design criteria of a National Standard (such as BS 5839-1, *Fire detection and fire alarm systems for buildings*), then verify that the installation does comply with these requirements.

Verify equipment installation

Check and verify that all the items of equipment (sensors, call points, fire panels, etc.) are installed in accordance with the manufacturer’s instructions and recommendations.

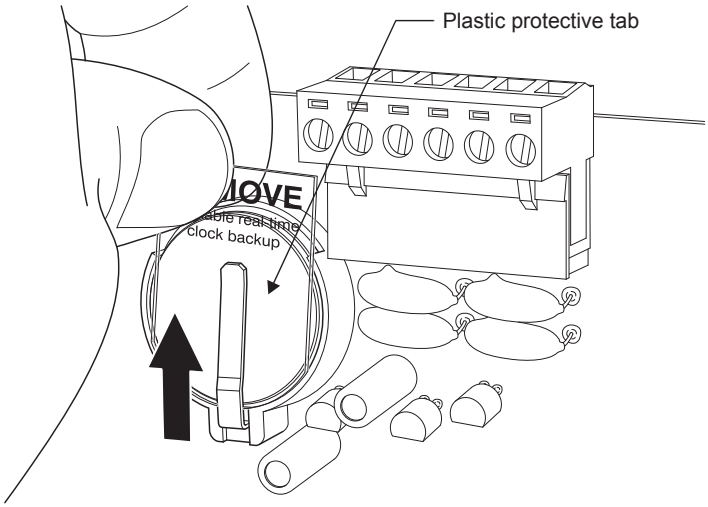
Verify wiring

- Check that the installation of the wiring complies with the requirements of Appendix A “ZP wiring guide” on page 117 and that it has been sized correctly. Particularly check that all Z-loops are screened, and that the screens are continuous, and earthed at the panel.
- Make sure there are no sections of floating screens. Also verify that proper separation has been maintained from high-voltage mains cabling.
- Check that data cabling (RS-232 and RS-485) is screened, continuous, and earthed, and separated from mains and Z-loop wiring.

Remove the clock battery protective tab

Make sure that the plastic protective tab installed between the metal securing clip and the lithium clock batteries on the main board is removed to enable the clock (see Figure 54 below).

Figure 54: Clock battery protective tab



Verify system programming

The software configuration can be verified by checking the system configuration printout from the Planner programme. If the system was not programmed using Planner, then a printout of the zoning and I/O-mapping functions can be obtained from the panel. The following must be checked and verified:

- Access control levels are correctly set
- System configuration (global settings) have been set in the Setup menu
- AGV function has been enabled if this feature is required
- Panel number is correctly set
- Panel has been defined as a stand-alone or ZP-NET panel

- Panel has been defined as standard operation or day/night operation
- Zoning has been correctly allocated to sensors
- If zoning has been unlinked from the fascia LEDs, then zones must be I/O-mapped to LEDs
- Sensor and device location messages are correct
- Zone identification or location messages are correct
- Input-output mapping is correct
- Paradigm sensors have been programmed with the correct profiles
- Standard sensors have been correctly set for sensitivity and AVF
- Sensors with attached sounder are tagged as such
- All sounders in the system are tagged as such
- Control outputs are all tagged as such
- Sensor self-test feature has been programmed
- Correct quantity of loop isolators has been set
- Correct delay on silencing of sounders has been set, if required
- Printer options have been set
- Event on-screen time-stamping has been set, if required

System tests

After confirming that the system has been correctly installed and programmed, perform the following tests to confirm that the equipment is functioning correctly:

Panel check

To check the panel:

1. Disconnect the loops from the panel.
2. Jumper the in and out terminals of each loop, and connect three sensors (or other line devices) to each loop.
3. Address these devices at any desired addresses; do not duplicate addresses.
4. Make sure the addresses are zoned.
5. Carry out the following checks:

   a) Check that the first analogue value (the Reference Value, V1) of each ZP device is within the range 208 to 216 counts in the maintenance/reports to screen/point analogues menu. If any of the devices are out of this range, then

replace the panel main board. For ZX, ZR or EX devices, check for the appropriate levels as shown in Table 37 below.

b) Put one device on each loop into alarm (activate call points, or use smoke or test smoke on a sensor). Make sure the panel reports an alarm and that the zone is reported on the LCD display (and the correct zone and status LEDs turn on).

c) Create a fault on one device on each loop (disconnect a call point, or unplug a sensor base). Make sure the panel reports a fault and that the zone is reported on the LCD display (and the correct status LED turns on).

Table 37: Device reference values

Device model range	Slot 1 level	Slot 1 min. counts	Slot 1 max. counts
ZP (standard analogue)	2	198	227
ZR (wireless)	4	135	163
ZX (paradigm)	4	135	163
EX (intrinsically safe)	6	68	100

Z-loop wiring check

To check Z-loop wiring:

1. Disconnect the loops from the panel.
2. Bridge out any line isolators (if fitted).
3. Measure the resistance of the complete loop (the combined resistance of both the positive and negative legs), using a multimeter, as follows:

   If the system is wired as a Class A return loop, measuring the resistance is a simple matter. At the panel, measure the resistance of the positive leg from [+out] to [+in], and record. Multiply by two to get resistance of the total cable and check that they are within the required parameters as described under “Z-loop wiring parameters” below.

   If the system is wired as a Class B return loop, measure as follows. If the loop has T-taps, identify the longest leg (measured from the panel to the last device). At the last device connect the positive leg to the negative leg. At the panel, measure the resistance from the positive leg [+out] to the negative leg [−out], and record.

Z-loop wiring parameters

These must be as specified in Appendix A “ZP wiring guide” on page 117.

As a guideline only:

- For a loop with sensors, call points, and interface units only, the total loop resistance must not exceed 75 Ω (i.e. 37.5 Ω for the positive leg and 37.5 Ω for the negative leg), and the maximum cable length must not exceed 3,000 m.
- For a loop with loop-powered sounders, wiring parameters depend upon the number of sounders connected. Assuming 100 sounders, the total loop resistance must not exceed 12 Ω, and the maximum cable length must not exceed 1,500 m.

Z-loop functional tests

To test Z-loop function:

1. Connect all the loops to the panel.
2. Power up the panel, and allow the panel to go through the self-diagnostics, device acceptance, and automatic calibration routines.
3. Access the Setup > Points > Accept Points menu, and manually accept all devices online.
4. Carry out the following checks:

   a) Identify the device addresses on each loop that are (1) the closest to the panel, (2) the furthest from the panel (i.e. near the end of the Z-loop), and (3) about halfway along the Z-loop.

   b) In the Maintenance > Reports to Screen > Point Analogues menu, check that the first analogue value (the Reference Value, V1) of each ZP device is within the range 208 to 216 counts, and within 5 counts of each other. For ZX, ZR, or EX devices, check for the appropriate levels as shown in Table 37 on page 109.

   If the Reference Value is substantially reducing between the beginning and the end of the Z-loop, this is an indication that the wiring is out of specification, resulting in signal loss. Incorrectly sized wiring, a loop that is too long, loose connections, or similar faults could cause this. If this is the case, the fault must be found and rectified.

Data wiring RS-485

Check that RS-485 data cabling connecting panels together meets the requirements of Appendix A “ZP wiring guide” on page 117. As a guideline, this must be high-quality, screened data cable, with a maximum of 2,000 metres of cable connected in any one network. The cable terminating jumpers on the communications boards must be set correctly. See the appropriate equipment data sheets.

Chapter 7
Peer-to-peer 3 protocol

Summary

This chapter provides information on the protocol features of your control panel.

Content

Introduction

This chapter covers the new features and enhancements of software 71910 Version 3.04 (EN 54 ZP3 Fire Panel), which was released on 01 August 2003.

New data structure

Panel Software 3.04 makes use of a new data structure. This new structure relates to device messages and zone messages.

Compatibility with Maestro and Planner

Use Planner version 3.0.0.59 or higher to ensure that the structure is correct. Previous Planner projects or saved files are converted automatically to the correct structure when opened with Planner 3.0.0.59 or higher.

Peer-to-peer 3 (P2P3) protocol

Overview

The most notable new feature is the Peer-to-Peer 3 Protocol (P2P3), which allows up to 255 network nodes on a single multidrop RS-485 communication link. Although this capability is apparent, a network of 100 nodes is deemed the maximum, as this is the maximum extent to which the system has been tested.

Compatibility with older versions of panel software

Since version 3.00, the protocol has been reworked to deliver multiple commands and events in a single data packet. This results in larger packets and quicker overall performance when the system gets busy. Version 3.00 and 3.04 panels will therefore not communicate correctly with each other.

During upgrade, we recommend that the version 3.04 panels have their network communications disabled. This can be done either by physically disconnecting them or splitting them into subnetworks of new and old or by using the new Panel Comms Disable feature described on the next page.

Keep the network communications disabled until all the old version 3.00 software has been replaced.

Sound and silence command and status report handling has been improved to minimize an older event from being reported after a newer command.

The status block fetched by Maestro now includes a “panel comms disabled” status (block 15).

Sending empty blocks in place of those that only contain zeros as data has further optimized this status mechanism, so less data is sent when loops, zones, or outputs are normal.

Note that Maestro version 3.0 or higher is required to communicate correctly with the new panel software.

P2P3 New features

- Panel communications enable or disable function
- Interpanel support for remote diagnostics across the network
- Panel standards

Panel Comms Enable/Disable

The Panel Comms Enable/Disable option enables or disables P2P3 communications to panels on the network temporarily, without altering their filters etc. When edited on one panel, it replicates to all panels that are configured to be online via setup, so that they all agree on who is expected to be online.

The option is accessed on the panel using a new menu: Maintenance > More > Panel Comms Enable/Disable, or by Planner, or on Maestro.

This feature can be used when maintenance is being done on a panel, and can replace the need to have large numbers of point disables from that panel being reported on the rest of the system, without needing to edit a large number of communications filter entries.

If any panels are registered as disabled, the Other LED illuminates and the operator can view the list of panels disabled by viewing the other info.

Inter-panel support for remote diagnostics across the network

Planner can be connected directly to one panel via its RS-232 port and then access any other panel indirectly via the network. The operator can perform all functions listed below with the exception of Code Load and Language Load.

Remote diagnostics for Planner (ZCP3 protocol on RS-232 Port)

Direct (ZCP3) or indirect (ZCP3+P2P3)

- Maintenance Flash Load (includes all disables: point, zone, and panel communications)
- Configuration Flash Load (includes all setup options)
- Message Flash Load (includes the custom text for points and zones)
- Analogue View
- Remote Reset/Silence/Accept commands
- Code Load (Direct/Local panel only)
- Event Archives View

- LED status View
- Language Load (Direct/Local panel only)

Note: When the configuration is loaded, the disables must also be loaded, to keep them tracking one another. However the disables may be changed without changing the configuration, as long as the configuration's integrity is ensured.

These new features are only available when using Planner version 3.0 or higher.

Panel filters set, store and send capability

The panels now have a utility that allows the Network filters of all of the panels in the network to be set up and then transferred to any or all of the panels in the network via Maestro.

New network filters

Filter description

Fetch disables control

The "fetch disables control" filter is used to indicate the other nodes in the system to which the Fetch Disables command may be sent. This is used to control the Disables LED on the front of the ZP3 Panel. The LED only illuminates on the local panel if the local panel has any disabled or delayed elements or if any remote panels to which the Fetch Disables command may be sent have any disabled elements. If this filter is off to a remote panel then any disabled elements on that panel are not displayed on the local panel.

Disable events

The "disable events" filter specifies the remote panels to which the event telegrams arising out of a change of disable status on the local panel should be sent. This filter should only be turned on if the remote panel has a specific need to use this information other than for display purposes, for example if a remote I/O-mapped operation has to be triggered by a specific zone or device disablement on the local panel. Display only purposes are provided for with the fetch disables control.

Note: It is not a requirement to send disable events to Maestro (with P2P-3 protocol) since all disablements are sent in the general status message.

General status events

The general status events filter is used to identify the Maestro nodes in a network. Panel nodes do not use the general status block data, but all panel

nodes generate the message. Setting the general status event flag for each Maestro node permits the remote panels to always send the status messages to all of the Maestros at the same time.

Since the disable events no longer need to be sent for display only needs, each panel volunteers the general status message to all the Maestros whenever a change of disable status occurs on the panel. A 20-second delay period from the last change of disable status is used to allow multiple disable changes to be done prior to the status message being sent out.

Note: The delay is cumulative, i.e. a 20-second period of no changes is required before the status job is sent. Sending a status request message from Maestro, which is processed immediately by the target panel, if it is not currently busy with a status job, can shorten this period.

Use of network communications filters

Overview

We recommend that the available communications filters be used to minimize the network communications data traffic of commands as well as events to those that are necessary. This is done to optimize the use of the bandwidth and buffer sizes, which are limited by physical constraints. The panel has a display buffer of a total of 484 events, including points, zones, and system status. On versions prior to R3.11, once this buffer is full, information is no longer passed to Maestro and panel events that are inter-panel I/O-mapped are not sent. However, on later versions this restriction is removed by the use of an additional rotating communications buffer. In the case of viewing disables some of the buffer space may be occupied by other events that occurred since the last reset, including reset status events from remote panels, if they were configured to send them.

In particular the disabled/enabled status of points and zones is now passed to Maestro primarily by general status data blocks (controlled by the general status filter). They no longer depend on the disabled event telegrams, which bypasses the restriction in event buffer size and contents.

The panel automatically sends the general status data block to Maestro 20 seconds after a single change in its disablements, (or once 20 seconds after the last of a series of disablements). Maestro also requests it automatically on startup, after a reset, during a fascia view, or manually on request by the operator by selecting Refresh, or Current Status (from Maestro Comms or Maestro panel controls right-click).

Fetch disables control

Selecting Key 4, in the Keys options, can toggle the fetch disables command filter setting. This filter enables/disables the Fetch Disables command to the individual remote panels when the View Disables button is pressed on the local (receiving) panel. At the same time, it also allows (or disallows) the Common Disable LED to reflect the disables of the same remote panels.

The communications test message is also enabled or disabled using this filter. Panels use this to request the disable status of remote panels at startup. It must be enabled to a Maestro station.

Disable events

The disabled event filter (which existed in earlier versions) may be set separately at the sender panel (as before) to allow or prevent volunteering disabled events to remote panels or Maestro. The disabled events filter should be set *not* to send to Maestro, but only to panels if they require it.

If a panel is undergoing commissioning or configuration changes and has large numbers of disables, either the “disables” commands and disabled events are disallowed, or the whole panel is ignored using the Panel Comms Enable/Disable feature.

General status events

The “general status events” filter setting works similarly by pressing Key 4 in Event options. This should be used for enabling a status data message from a panel to a Maestro, and disabling it to all remote panels, which do not require it.

Language loading

An alternative foreign language may be loaded on version 3.02 (or later) panels. This was not available on version 3.00 panels.

Note: The appropriate version language file must be used.

Refer also to the ZP3 Language Loading procedure, which may be found in the *Planner User Guide* (P/N 503-1436ZE-U-05).

Appendix A
ZP wiring guide

Summary

This chapter includes information on the wiring arrangement of your control panel.

Content

Introduction

General

The ZP system uses an extremely flexible wiring arrangement. It is designed to provide simple, low-cost wiring for new buildings. It can, in many cases, also use existing wiring where a fire detection system is being upgraded. A key feature of ZP the system is the ability to mix looped wiring and spurs on the same circuit. A further advantage is that future extensions or changes to a system are easily carried out, without in any way affecting the existing system or its wiring.

Note: To make sure that systems function correctly, it is important that correct wiring techniques are used. The wiring is an integral part of the complete system, and use of unsuitable cable, or defective installation methods can cause the system to malfunction.

This appendix provides specifications and guidelines for cable selection and installation. Follow these practices to make sure that your ZP fire detection system functions correctly and reliably at all times.

All wiring must be installed in compliance with local codes, and in accordance with the requirements of the local authority having jurisdiction.

Where line powered output devices are used, adequate provision must be allowed for in the system cabling to cater for the increased line current drawn.

In addition to the requirements specified in this appendix, all wiring should be installed in compliance with Section 17 (paragraphs 17.1 - 17.15) and Section 24 (paragraphs 24.1 - 24.5) of British Standards BS 5839: Part 1: 1988.

Panel power supply connections

Effective functioning of the system is dependant on the correct connection of the panel power connections and must be wired as described under “Power supply” on page 50 of this manual.

Caution: The panel must be connected to a source of power that is both clean and reliable. The power source should not be shared by electrical equipment that causes electrical noise or spikes. If the quality of the power feeding the panel is suspect and electrical noise is present, assistance should be sought from Ziton regarding earth and surge protection.

Earth connection

The panels, power supplies, and cables making up the fire detection system should be connected to earth at one point only. This earth point must always be at the panel. The only exception to this is when MICC cable is used. In this case the cable shield may be connected at other points in the building.

The panel is typically located in a building, which allows only limited earth options. The following are the preferred rules that should be followed if possible.

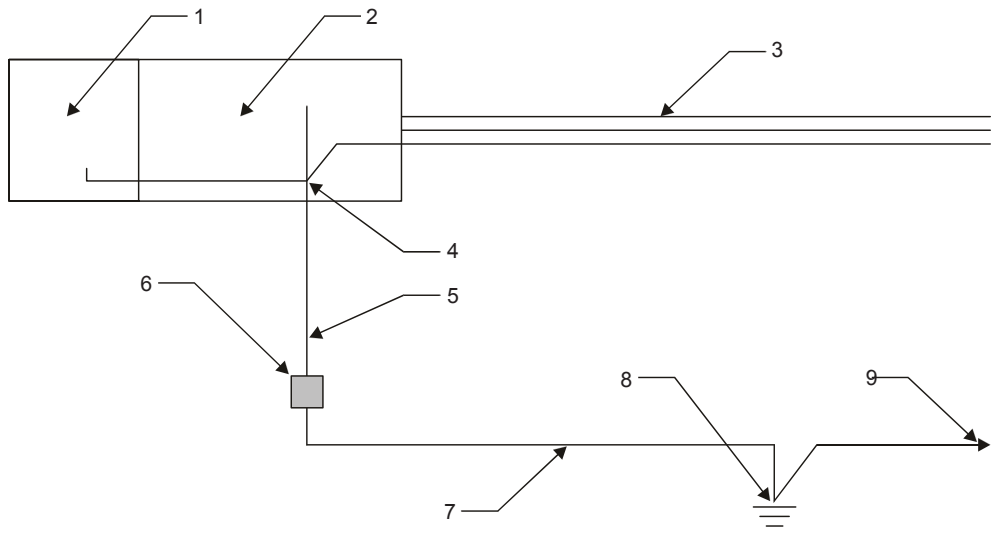
Normally the panel is connected to the nearest external earth point. This external earth point may vary in quality, from a high quality instrumentation earth to the earth used by the electrical network. This external earth point is in turn connected to the main building earth system.

The earth connection should preferably meet the following criteria:

- It should be a clean earth, preferably not shared with other electrical devices. High-energy equipment should be connected to an earth point that is as close as possible to true earth.
- Wiring codes normally require it to be bonded to the main building earth for safety reasons.
- The resistance to true earth should be as low as possible.

See Figure 55 for a typical panel earth connection.

Figure 55: Typical panel earth connection



1. Power supply
2. Panel
3. ZP loop
4. Common earth point at panel
5. Wire from panel to earth point
6. External earth point
7. Existing wire from earth point to main building earth
8. Main building earth
9. High energy equipment

The wire from the panel to the external earth point should be at least 4 mm² cable and be securely connected at both ends to ensure a good mechanical and electrical connection. Use crimped lugs where possible.

Remote equipment earth

If any loop device makes use of separate external power i.e. is not powered from the ZP loop, then the earth connections must follow the guidelines below:

- The ZP loop shield must be connected to panel earth at the panel.

- AC supply earth and panel earth must be connected if not the same.
- If the loop device is powered from an external power supply at the panel, the external power supply negative must be connected to panel earth. For a frequent surge environment, the loop device chassis must be connected to the main building earth. This may require a separate earth wire to be run to the panel.

System cabling

Overview

The ZP system consists of a number of devices that are connected together by cables. Examples of these devices are control panels, repeater panels, fire and smoke sensors, audible sounders, relays, computers, etc. Different circuits control various functions, and these circuits have differing cable requirements. Four different types of circuit are used to interconnect the equipment into a system. These are described below, and illustrated on the next page.

A full description of the wiring requirements for each type is detailed on following pages.

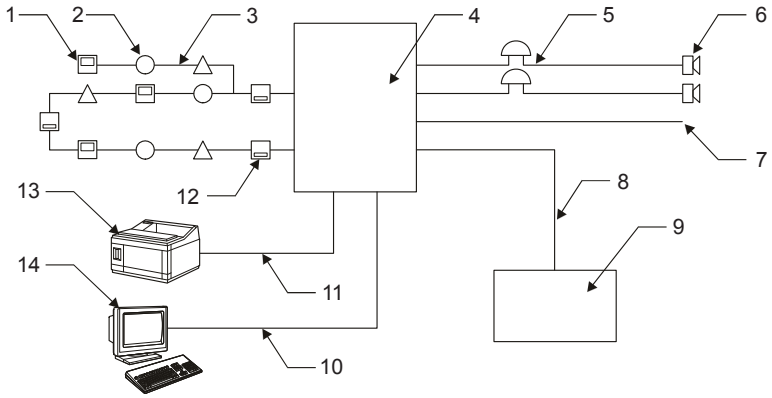
Circuit types

Circuit Type	Remarks	Cross Reference
Z-Address lines	Fire sensors, line relays, isolators, call points, addressable sounders, other line devices	See “Z-Address lines” on page 121
Serial communication lines	Panel-to-panel networks, connections to repeater panels and to computers and building management systems, other devices, e.g. printers	See “Serial communication lines” on page 128
DC control lines	Sounders, control relays, door magnets, etc.	See “DC control lines” on page 130

Circuit schematic

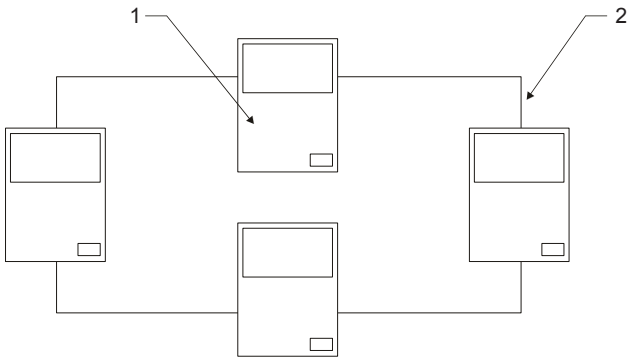
Figure 56 shows a typical single-panel system, and Figure 57 shows a typical multiple-panel networked system.

Figure 56: Typical single-panel system



1. Manual call point
2. Detector
3. Z-address line
4. Control unit
5. DC wiring
6. Sounder
7. Switched output
8. Data wiring-RS-485
9. Repeater panel
10. Data wiring-RS-232
11. Data wiring-serial
12. Isolator
13. Printer
14. Computer

Figure 57: Typical multiple-panel system



1. Control unit
2. Communication wiring, RS-485

Z-Address lines

Function

Z-Address lines connect the Ziton addressable field devices to the panel. Field devices include fire and smoke sensors, line relays, addressable sounders, extinguishing control units, manual call points, interface units, and line isolators.

Each Z-Address line is a two-wire circuit, which provides both power and data communication to the ZP fire and smoke sensors, call points, and addressable input and output interface units.

Some devices, such as the extinguishing control unit, require a separate power supply circuit, whereas others, such as the ZP754 loop sounder, may be either

externally powered or powered from the Z-Address line. Each line connects to 127 ZP addressable line devices.

Features

Key features of the Z-Address Line are:

- Cabling can be installed in any configuration that suits the building. This includes loop circuits, tees, spurs, or combinations of styles.
- Cabling can be shielded, for new buildings, or unshielded for retrofitting systems to existing buildings (see “Rules for using shielded cable” on page 125 and “Rules for using unshielded cable” on page 127 for more details if required.
- Up to 3,000 metres of two-core cable can be used per loop, depending upon cable size and provided that no line-powered output devices are connected. Refer to “Loop length” on page 127 for more details about maximum permissible loop lengths.

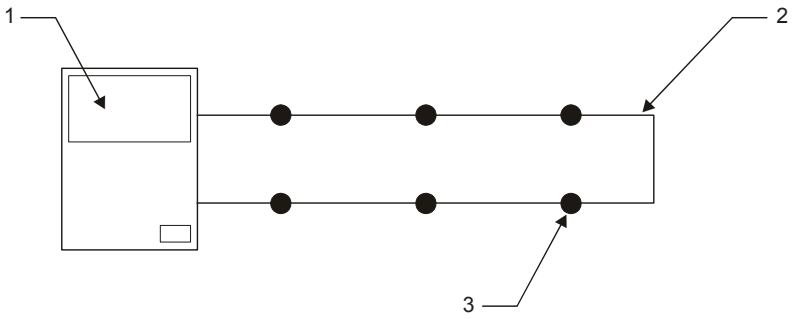
Wiring styles

The ZP system can mix looped wiring and spurs on the same addressable circuit. This provides maximum flexibility and lowest cost during installation. Figure 58, Figure 59, and Figure 60 show examples of different wiring styles, together with an outline of the benefits of each.

Style A

See Figure 58. Return loop wiring provides protection against open circuits, short circuits (using line isolators), and earth leakage.

Figure 58: Style A address line wiring

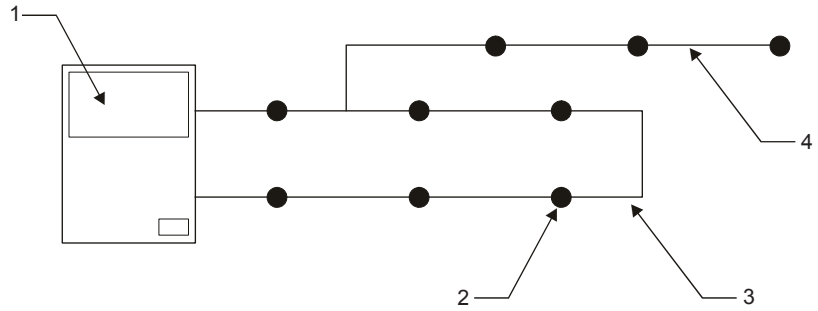


1. Control Unit
2. Loop
3. Detectors

Style B

See Figure 59. Return loop wiring with spurs provides protection against open circuits, short circuits (using line isolators), and earth leakage.

Figure 59: Style B address line wiring

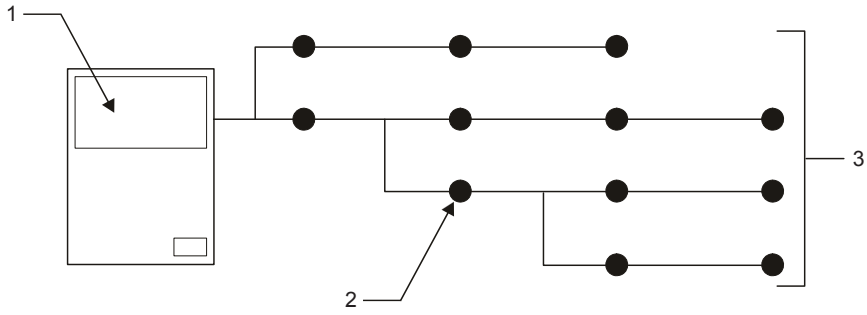


1. Control Unit
2. Detectors
3. Loop
4. Spur

Style C

See Figure 60. Single direction wiring with spurs provides protection against open circuits and earth leakage.

Figure 60: Style C address line wiring



1. Control Unit
2. Detectors
3. Spur

Line isolators

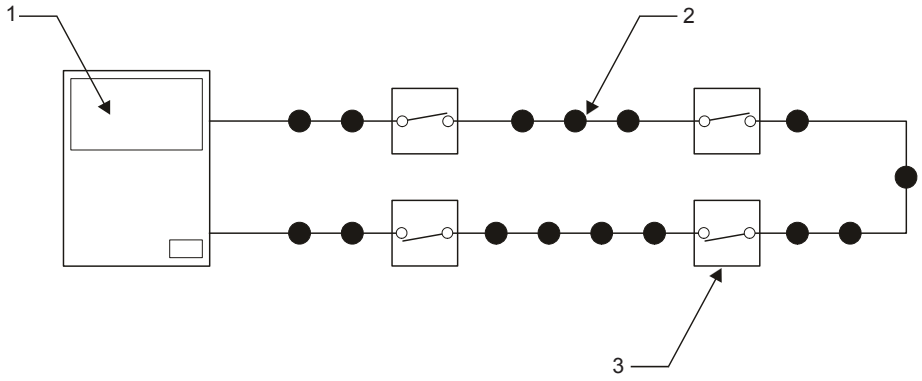
Line isolators are devices installed on the Z-Address line to monitor for short circuits on the field wiring. These devices keep up to 93% of the line operational in the event of a short circuit. Line isolation can only be utilised when Style A wiring is used. They must be installed in accordance with the requirements of BS 5839 Part 1.

Operation

See Figure 61 for a schematic of line isolator usage. Isolators are installed on the loop at intervals. A short circuit on the loop wiring causes the isolators on each side of the short to disconnect the damaged section of cable. This removes the short from the loop, allowing the remainder of the loop to function normally.

Schematic

Figure 61: Line isolator usage schematic



1. Control Unit
2. Detectors
3. Isolators

Rules for using line isolators

1. Isolators should be located on the Z-Address loop either at the beginning and end of each zone, or at regular intervals.
2. To comply with BS 5839 Part 1, no more than 1 zone, or 20 detectors or call points, must be grouped between two isolators. Other standards allow up to 32 devices between isolators.
3. A maximum of 16 isolators can be used on each Z-Address loop.
4. The total loop cable resistance must not exceed 75 Ω (37.5 Ω for each positive and negative leg).
5. The maximum cable resistance between any two isolators, or from the panel to the first isolator, is 18 Ω for both cores (9 Ω for each positive and negative leg).
6. The Z-Address loop is pulsed at nominal 20 Vp-p. When loops are installed in accordance with this wiring guide, then the maximum volt-drop across the loop is 4 V. This ensures that isolators always receive a supply of at least 16 V.

Shielding

Shielded cable provides the greatest protection against external interference, as well as protecting other equipment from interference generated by the fire detection system.

Shielded cable must be used where possible.

Note: Shielded cable must be earthed at the panel at both ends and must never be left with the shield floating.

Rules for using shielded cable

1. Shielding includes cable with copper screens, Mylar covered, or Pyrotenax cable (MICC).
2. Shielded cable may be two-core or multiple-core.
3. Only Z-Address lines may be run inside a screen, in order to qualify as shielded.
4. Where four-core shielded cables are used, two cores can be used for the Z-Address Line, and the other two cores used for either ZP approved sounders, or ZP system DC control circuits.
5. Where multiple-core cable is used, it must only be used for the ZP fire detection system devices, attached to the same control panel. Third party cabling should not be run inside the same shield as the fire detection cable. Examples are public address and intercom systems. Third party cabling includes connections between ZP interface units and relays, etc. of other systems.
6. The shielding must be connected through at each sensor, line device, or connection, and must be continuous through the complete length of cable. The connection must be by means of a terminal.
7. Z-Address line must be separated from high voltage cables by at least 300-mm as per BS 5839 Part 1.
8. Continuity of conduit, Pyrotenax, or shielding must be as per BS specification BS 5839 Part 1 (paragraph 24.5), and the *IEE Wiring Regulations* (BS 7671).
9. Insulated screened cable must be isolated from building earth except for connection at the panel.

For Pyrotenax cable (MICC), which can pick up coincidental earths at junction boxes, the building system must have an effective earth bond between the parts of a building or buildings where the system is to be installed. The building earth bond must be sufficient to prevent the fire system from acting as an earth strap between the different parts of a building or buildings.

Shielding technique

Figure 62 and Figure 63 show the correct methods for using shielded cable.

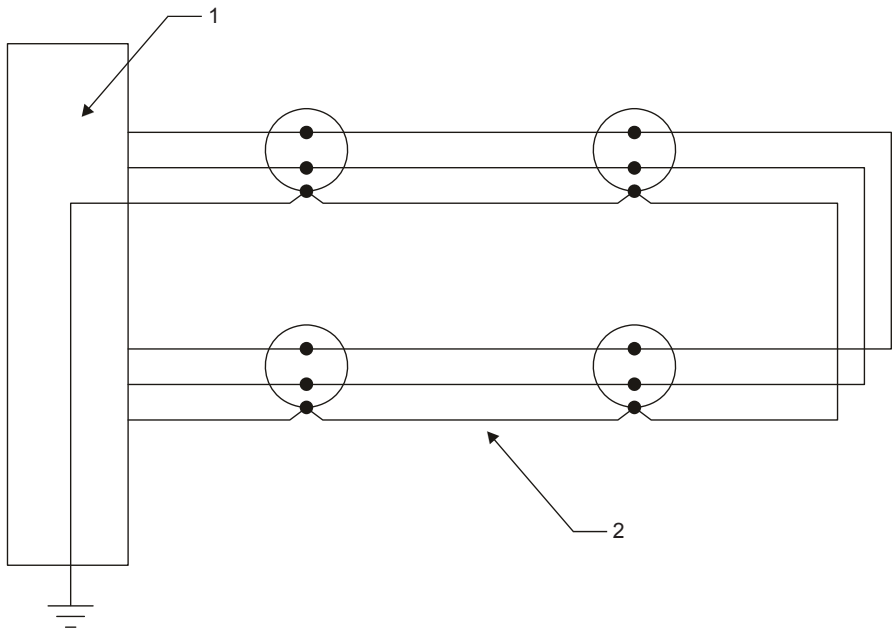
The cable shield must be continuous, and must be connected through at detectors, or devices, or at connections. Some detectors have provision for the shield connection, but in those without, a connector should be used to join the shield.

Notes

- Shields must be connected with a screw connector at each termination.
- Earth continuity must be checked.
- The addressable line outgoing and return loop must both be earthed.

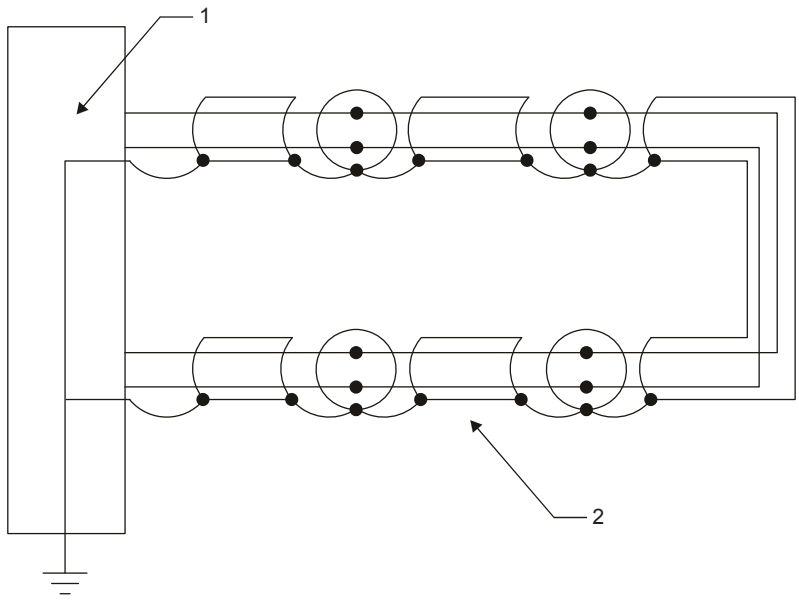
For MICC cable, earth must be continuous at each connection or junction, in accordance with BS specification BS 5839 Part 1 (paragraph 24.5), and the *IEE Wiring Regulations* (BS 7671).

Figure 62: Shielded cable



1. Control Unit
2. Isolators

Figure 63: MICC



1. ZP Panel
2. Shield connected through

Unshielded cable

Unshielded cable should only be used where it is impractical to use shielded cable. An example would be the upgrading of an existing system to a ZP system, where the cabling is already in place.

When the Z-Address line is used with unshielded cable, the panel should be set to AVF mode. In this mode, some of the functional responses are deliberately slowed, in order to maintain data integrity in an electrically noisy environment. Electrical noise, generated by third party pulsing systems, can transfer into Z-Address lines if the third-party cables are adjacent to the fire alarm cables.

In some cases, the use of unshielded cable can cause spurious responses.

Caution: Under no circumstances must an unconnected screen be left floating on a cable. If screened cables are used they must be terminated as described under “Shielding” on page 124.

Rules for using unshielded cable

1. Z-Address lines may be run in steel or plastic conduit or trunking, or fixed to walls or supports without conduit.
2. Third party or mains power cabling may not be run adjacent to the Z-Address line or in the same conduit or trunking.
3. The cores of multiple-core cable may be used for several Z-Address lines from the same panel, as well as ZP approved sounders, and ZP systems DC control lines.
4. Where multiple-core cable is used, it must only be used for the ZP fire detection system devices. Third party cabling should not be run inside the same outer insulation as the fire detection cable. Examples are public address and intercom systems. Third party cabling includes connections between ZP interface units and relays, etc. of other systems.
5. Noise generated by an unshielded Z-Address line may cause interference on third-party systems, such as intercoms.
6. Unshielded Z-Address lines must be separated from high voltage cables by at least 300 mm, as per BS 5839 Part 1.
7. Unshielded Z-Address lines must be separated from all other cables by at least 50 mm.

Loop length

The Z-Address line operates with a two-core loop length of up to 3,000 m when no high-power devices are used on the line. High-powered devices, e.g. loop-powered sounders, draw more current and engineering calculation is required for specific line configurations to make sure that the line resistance through various sections of the line does not cause the line drive voltage at the end of the line to drop from 20 V to below the specified detector minimum of 16 V. For current

draws and minimum line voltages see the applicable datasheets. Refer to Ziton if further assistance is required.

The Z-Address line must meet two criteria; resistance and capacitance. The maximum permissible resistance of a loop is 75 Ω. This is the combined resistance of both conductors. The total capacitance of a line should not exceed 0.7 µF with either leg shorted to earth.

Table 38 below gives the conductor sizes required for different loop lengths, which meet the above criteria when using normal copper screened cable and no loop powered sounders. Lengths for high capacitance cables should be reduced accordingly.

Cable size

Refer to Table 38 below.

Table 38: Maximum loop length vs. wire sizes [1]

Conductor area (mm^2)	Conductor diameter (mm)	Maximum loop length (m) [2]
0.50	0.80	900
0.75	1.00	1350
1.00	1.13	1800
1.50	1.38	2800
2.50	1.79	3000

[1] Values assume no high-power devices
[2] For two-core cabling

Serial communication lines

General

Serial communication lines are data lines used to convey digital communication between control panels and other devices, as well as between control panels in multiple-panel network systems. Other devices include devices such as graphics computers, remote display units, mimic panels, printers, accessory panels, and so on.

Two types of serial communication ports are used on ZP panels, i.e. RS-232 and RS-485.

RS-232 ports

RS-232 ports are used for connection to graphics computers, building management systems and Ziton accessories, and for interfacing to building

management systems. Each port usually connects to only one piece of equipment.

Rules for RS-232 cabling

1. Cable requires nine conductors plus a shield. The cable is terminated at each end to a D connector, either 9-pin or 25-pin depending upon the equipment.
2. The shield must be insulated, and earthed only at the point shown on the system installation drawing.
3. No cables or conductors for other services must be run inside the same shielding.
4. RS-232 cabling is normally specified for a maximum length of 10 m.
5. RS-232 cabling can be used at up to 100 m cable length, at a slower communication baud rate. This does not affect the performance of the system.

RS-485 ports

RS-485 ports are used for connections between ZP panels and ZP equipment. For example, between networking panels in a multiple-panel system, from a panel to a remote display unit, to an intelligent mimic panel, etc. RS-485 is sometimes used to connect to computers.

A single circuit may interconnect several pieces of equipment.

Rules for RS-485 cabling

1. Cable requires two conductors plus a shield. The cable is terminated at each end to a 9-pin D connector, or onto terminals, depending upon the equipment.
2. The shield must be insulated, and connected only at the points shown on the system installation drawing. If the shield is not insulated, and could be earthed, then a three-conductor cable is required. The third wire serves the function of the screen.
3. Only cable specifically manufactured for RS-485 should be used. This is an ultra-low capacitance cable with capacitance of 0.04 µf/1000 m.
4. The conductor size, when using shielded cable with a capacitance of 0.04 µf/1000 metres, should be as follows:

   0.25 mm² - up to 1,000 m
   0.50 mm² - 1,000 to 2,000 m
5. No cables or conductors for other services must be run inside the same shielding.
6. The maximum communication distance for RS-485 cabling is 2,000 m. If greater distances are required, please contact Ziton.
7. Where wiring connects to several panels or devices, it must be daisy-chained from point to point (not connected in a star pattern).

DC control lines

General

ZP systems operate on 24 VDC. The majority of field wiring consists of power supply wiring, for devices that require 24 V, or switched, low voltage DC circuits. These are used for functions such as audible alarm sounders, mimic panels, magnetic door holders, CO2, water mist or Halon extinguishing systems, and control of building systems such as evacuation systems, air conditioning, dampers, and lifts and elevators.

Wiring specifications depend entirely on the current consumption of the devices connected, the number of devices on the same line, and the distance of each device from the control unit.

DC cable type

Any type of cable may be used for DC control circuits. Normally, PVC insulated, single-core or multiple-core cable is used. It is not necessary to shield these cables.

DC cable size

See Table 39. Conductor diameters of 0.5 mm² to 2.5 mm² may be used. Cables should be sized so that a maximum volt drop of 1.0 V occurs at the furthest device when the circuit is operated at maximum power consumption.

Table 39: DC cable size (m) [1]

Cable size (mm²)	Device current consumption				
	50 mA	100 mA	250 mA	500 mA	1 A
0.5	250	125	50	N/A	N/A
0.75	375	180	75	N/A	N/A
1.0	500	250	100	50	N/A
1.5	750	375	150	75	35
2.5	1250	625	250	125	60

[1] Length of two-core cable giving a 1 V drop

Appendix B
ZP3 system maintenance

Summary

This chapter includes information on the fire alarm system and battery maintenance.

Content

Overview

Two types of maintenance are performed on a ZP3 system:

- Routine maintenance
- Corrective maintenance

Routine maintenance must be performed at the prescribed times in order to help the system operate to its optimum effect. The quarterly and annual services are designed to check that the system is functioning to its installation specifications, and must be carried out by an authorized Ziton maintenance company.

The panel operator or the company in-house maintenance staff typically carry out a daily and weekly check. See the *ZP3 Fire Control Panel User Guide* (P/N 503-1160ZE-U-12) if required.

Only trained personnel can perform corrective maintenance in order to bring the system back into service after a particular fault.

Record keeping

A record of all alarms, events, checks, tests, and repairs must be entered in a logbook (see P/N 503-1842ZE-1-02), which is typically maintained by the panel operator.

System specification

Make sure that there is a record available showing how the fire system has been configured. This is a system specification that should describe in detail all aspects of the system. The system specification is essential for the system to be tested and checked during servicing. This document is the blueprint of how the system has been configured and how it should behave. When changes are made to the system, the specification should be updated.

Routine maintenance

Quarterly maintenance

Quarterly maintenance is performed every three months. Refer to Table 40 for the quarterly checks that must be carried out on the ZP3 system.

Table 40: Quarterly checks

Number	Quarterly check	Description
1.	Log book analysis	Prepare for testing by reading through the log book. Any corrective action that has not yet been taken should be noted and carried out during the service.

Number	Quarterly check	Description
2.	Service and preservice check	Use the panel menu to take a print out of all the sensors that are in a service or preservice condition, which indicates that they are contaminated. Exchange these points with replacement units, set to the same address. Dirty sensors can be sent to Ziton for cleaning.
3.	Analogue values check	Use the panel menu to generate printer reports of device analogue values. Compare these values to the permitted values for each point. Replace faulty devices or repair wiring.
4.	Configuration check	Connect Planner to the panel and print out a complete system configuration from the panel software. Compare this to the system specification and verify that the system zoning, input-output mapping, and other settings have not been changed.
5	Disabled devices check	Check if the common Disable LED on the front of the panel is illuminated. If so, use the menu to identify the disabled devices and investigate the reason. Any faults should be rectified, and any disabled devices should then be enabled.
6.	Test the alarms	Test one sensor or call point in each zone. Activate each point in turn, checking that the sounders operate and that the panel reacts correctly. Check that signals to auxiliary systems such as the fire station, air conditioning, building management systems, graphics displays, or remote indicators function correctly.
7.	Fault test	Remove one sensor in the system and check that the panel correctly reports the event. Accept the fault, replace the sensor and reset the panel.
8.	Panel controls test	Check that all control functions and the Accept and Reset buttons are operating correctly.
9.	Printer test	Make sure that the printer (if fitted) is printing all events generated during the service.
10.	Monitor earth leakage	If the earth leakage monitoring feature on the ZP3 system is enabled, test the earth leakage by applying a short between the positive leg of the Z-loop and earth. Make sure that the panel indicates an earth leakage fault. Repeat test using the negative leg of the Z-loop.
11.	Connection checks	Make sure that all terminal screws are tight and cables inside the panel are secure. Check that all printed circuit boards (PCBs) appear to be in good condition, are free of dust and are securely mounted in the panel.
12.	Battery replacement check	Make sure that the backup batteries installed are sufficient to meet the system specifications. If not then replace them with suitable ones as described under “Removing and replacing the backup batteries” on page 152. Check whether the battery replacement date will still be valid before the next service. If not, then replace the batteries as described under “Removing and replacing the backup batteries” on page 152. The age of the battery should be marked on it with a label, or may be recorded in the log book. SLA batteries should be replaced at least every four years, or more frequently in high temperature environments (refer to the manufacturer’s documentation if necessary).

Number	Quarterly check	Description
13.	Battery operation check	Check that the battery is healthy. One method is to conduct an “all sounders on” operational test with the mains off and the system running on batteries. This tests the batteries under a full load. The battery voltage should be monitored during this test and should not fall below 24 V. Remove one battery terminal and verify that the system reports a battery fault. Replace the terminal, ensure that it is tight, and reset the panel. Clean the battery with a damp cloth and lightly lubricate any exposed terminals with petroleum jelly if necessary.
14.	Time and date set	Set the correct time and date on the panel, if necessary.
15.	Completion of service	Restore the system to normal condition, enable any disabled devices, reconnect any disconnected devices, reconnect all external systems that were disconnected for the testing, and make sure that the system is left in 100% working condition. Advise all staff and the remote manned centre that testing is complete, and that any alarm now received must be treated as real.

Annual maintenance

Refer to Table 41 for the annual checks that must be carried out on the ZP3 system.

Table 41: Annual checks

Number	Annual check	Description
1.	Quarterly checks	Make sure the quarterly checks have been performed (see Table 40 on page 132)
2.	Input-output configuration test	Using a fairly large representative sample, verify by testing that the input-output mapping operates as programmed. Activate an input, such as a sensor, call point, or interface unit, and verify that the correct outputs operate. Also check that the outputs function correctly, for example, that they pulse, or operate continuously, that any delays operate correctly, etc.
3.	Building changes check	Visually inspect that the internal structural layout of the building, including inter-office partitioning, has not changed from the system specification to such an extent that it may affect the efficient operation of the fire alarm system.
4.	Clock batteries check	Check whether the lithium clock batteries will still be valid before the next service. If not, then replace the batteries as described under “Removing and replacing the clock batteries” on page 150. The age of the battery should be marked on it with a label, or may be recorded in the log book. SLA batteries should be replaced at least every four years, or more frequently in high temperature environments (refer to manufacturer’s documentation if necessary).

Number	Annual check	Description
5.	Completion of service	Restore the system to normal condition, enable any disabled devices, reconnect any disconnected devices, reconnect all external systems that were disconnected for the testing, and ensure that the system is left in 100% working condition. Advise all staff and the remote manned centre that testing is complete, and that any alarm now received must be treated as real.

Maintenance menu

Introduction

The panel has built-in software functions for providing maintenance diagnostics and support. These functions are accessed via the Maintenance menu, using the panel keypad. Menu functions are displayed on the LCD screen.

Menu access

Access to the menus is via the panel keypad (see Figure 64). Each button on the keypad is described in Table 42 on page 136.

Figure 64: Keypad

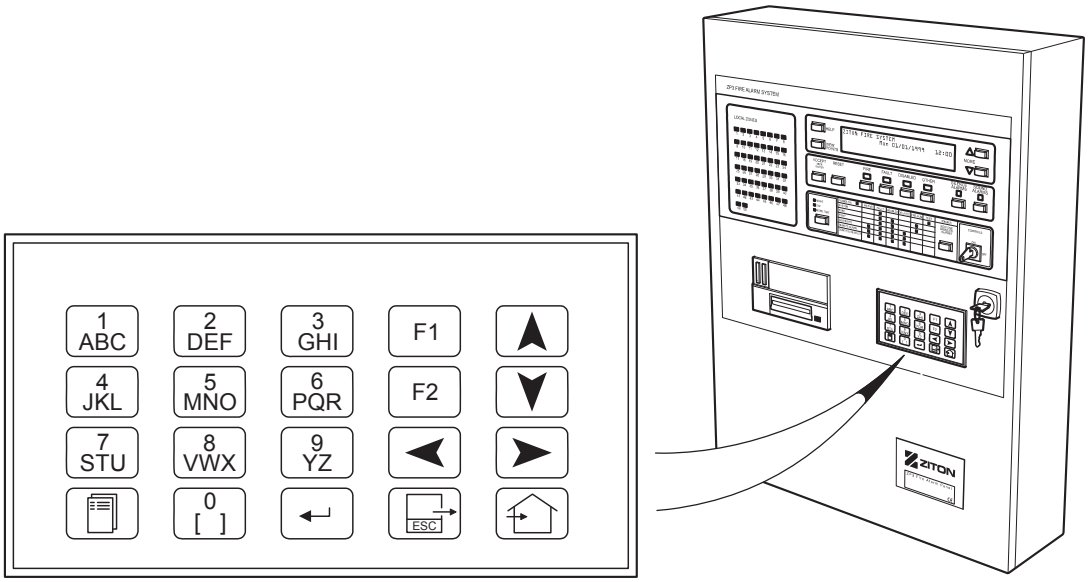


Table 42: Keypad buttons

Button	Name	Description
1 ABC	Numeric buttons	Used to enter number sequences
	Menu	Displays the Main Menu
	Enter	Used to confirm data entry and save data
ESC	Escape or Esc	Exits a function and returns to the previous level
	Home	Exits all menus and returns to the system home screen
F1 F2	Function buttons	Used within certain menus
	Navigation buttons	Used to move up, down, left, or right

Maintenance

The Main Menu is the entry point to all of the maintenance related software functions, including the Maintenance menu.

To access the Main Menu:

1. Press the Menu button on the keypad.

   The Main Menu is displayed as shown below.

```
MAIN MENU
1. Operator
2. Maintenance
3. Setup menu
```

2. Choose the Maintenance option to display the Maintenance menu.

   To do this, press the 2 button on the keypad. The system prompts you to enter the access code.

3. Enter the maintenance (level 2) access code, and then press Enter.

   The Maintenance menu is displayed, as shown below.

```
MAINTENANCE                          MORE^
1. Edit disabled   4. Reports to display
2. View disabled   5. Reports to printer
3. Enable all      6. Calibrate detectors
```

The menu name is displayed on the top line, and the menu items are shown with numbers alongside. Menu items are selected by pressing the numeric keypad button that matches the item number. Selecting a menu item may cause another menu to appear or may carry out a particular function. The operator may be prompted to enter the required information via the keypad.

Any menu can be cancelled and the previous menu presented by pressing the Esc button. Esc is used to cancel or abort the current activity and return to the previous activity.

Exit the menu system completely by pressing the Home button This returns the panel to its normal operation display.

To prevent a system from being inadvertently left in a menu, a timeout is built into the menu system. The timeout counter starts from the last button press. In menu selection, the timeout is approximately 45 seconds. If a software function was started (but was not completed) the timeout is 12 minutes.

Menu structure

The Maintenance menu structure is displayed as a menu tree in the following list.

- Edit Disabled
  - Point
  - Zone
  - Extinguish Systems
  - Sounders
  - Outputs
  - Remote Alarm
- View Disabled
  - Point
  - Zone
  - Extinguish Systems
  - Sounders
  - Outputs
  - Remote Alarm
- Enable All
  - All Points
  - All Outputs
  - All Point and Outputs
- Reports to Display
  - Point Analogues
  - Checksums
  - Zoning
  - I/O Mapping
  - Service Reports
  - Pre-service Reports
- Reports to Printer
  - I/O Map
  - Points Analogues
  - Service Reports
  - Zoning
  - Checksums
  - Stop Printer
- Calibrate
- Test
  - Detector Test
  - Walk Test
  - Flash Faulty Point LED
- Comms Enable/Disable

Menu functions

Table 43: Edit Disabled

Menu path	Maintenance > Edit Disabled
Purpose	This menu groups the functions relating to enabling and disabling points, zones, and outputs.
Point	Enable or disable a point, accept the default point address displayed or enter the address of the point to be edited. The point address and current state are displayed. Use the scroll feature to display the next or previous point to be edited.
Zone	Enable or disable a zone, accept the default zone number displayed or enter the zone number to be edited. The zone number and status is displayed. Where the points in a zone are not all set to any one status, the status is shown as “Various settings”. Use the scroll feature to display the number of points in the zone and the totals of enabled or disabled points within the zone.
Extinguish Sys	Enable or disable extinguishing control units. Only valid ECU addresses are displayed. Use the scroll feature to select the ECU to edit.
Sounders	Enable or disable a sounder output. Only outputs and points declared as sounders are displayed. Use the scroll feature to select the sounder to edit. Note: Compliance with EN 54-2 requires that *all* sounders are enabled or disabled together. From Software version 3.11 onwards, this is achieved by pressing the Restore Disabled Alarms button, which now toggles between Disable All Sounders and Enable All Sounders, as indicated by the Sounders Disabled LED.
Outputs	Enable or disable an I/O-mapped output, accept the default output address displayed or enter the address of the output to be edited. The output address and status are displayed. Use the scroll feature to display the output to be edited.
Remote Alarm	Enable or disable the remote alarm relay (fire brigade) switched outputs. Both the alarm and fault outputs can be edited in this menu.

Table 44: View Disabled

Menu path	Maintenance > View Disabled
Purpose	This menu is used to view points, zones, or outputs that have been disabled. An Extinguish System submenu is also provided to limit the points viewed to extinguishing control units. Once a submenu is chosen, the first disablement in the category is displayed. Use the scroll feature to view the next or previous disablement.
Points	Display all points that are set to disabled.
Zones	Display zones that are set to disabled. The zone number of the first disabled zone and the number of points within the zone are displayed.
Extinguish sys	Display extinguishing control units (ECUs) set to disabled.
Sounders	Display sounders that are set to disabled.
Outputs	Display I/O-mapping outputs set to disabled. The address of the first disabled output is displayed. Use the scroll feature to view the next or previous disabled output.

Remote alarm	Display the enabled/disabled status of the remote alarm relay (fire brigade) switched outputs. Both the alarm and fault outputs can be viewed in this menu.

Table 45: Auto enable (Disable for a period)

Menu path	Maintenance > Edit or View Disabled (Points, Zones)
Purpose	This menu lets you temporarily disable an address in half hour intervals. This allows multiple zones and line input devices to be disabled but not panel or panel bus outputs. After the period expires, the address enables again automatically. The menu allows the user to select Auto Enable, after a disablement period configurable from 30 minutes to 12 hours.
Points	To auto enable any point select Edit Disabled from the Maintenance menu. Select the point to be auto enabled and select Auto, using the arrows to scroll up or down to set the required time period. Use the scroll feature to display the next or previous point to be disabled. Use the Enter key to confirm the selection.
Zones	To auto enable zones select Edit Disabled from the Maintenance menu. Select the zones to be auto enabled and select Auto, using the arrows to scroll up or down to set the required time period. Use the Enter key to confirm the selection.
	Note: The disabled status can be overridden by: • A local enable event from the local panel • A remote enable event from a remote panel via the peer to peer network • A change over from day to night mode may extend the disabled period to coincide with the Disable by Night setting. In the case of dual-sensor detectors, both smoke and heat elements are disabled.

Table 46: Enable All

Menu path	Maintenance > Enable All
Purpose	This menu provides a quick method to enable points and outputs or both. The menu options available are: Enable all…
Points	Enable all system Z-loop devices. This includes sensors, call points, devices, zones, and loop or base sounders.
Outputs	Enable all panel outputs. This includes all extinguishing control units, panel sounder outputs, and the remote manned centre output.
Points and Outputs	Enable all Z-loop devices and panel outputs, i.e. this is the same as selecting both options above.

Table 47: Reports to Display

Menu path	Maintenance > Reports to Display
Purpose	This menu provides a selection of reports to view on the display. Report messages can be manually or automatically scrolled. The reports that can be viewed are listed below with a brief description of each report.

Point Analogues	A real time display is shown per point of analogue values. Point ID, sensitivity, threshold, and condition are also displayed. Use the scroll feature to view the next or previous point analogues.
Checksums	Two numeric values are displayed, a calculated and a stored value. If the values are not equal, data corruption has occurred.
Zoning	Generate a report showing which points are allocated to a zone. The zone number and the first point allocated to the zone is displayed. Use the scroll feature to display the next or previous point allocated to the zone.
I/O Mapping	Display a report of all the programmed outputs with their respective programmed configuration details and associated input triggers. Use the scroll keys to view the next or previous outputs and left or right arrow keys to view associated inputs.
Service	Generate a report of all sensors that require servicing. A service condition indicates that the sensor should be cleaned or replaced as soon as possible. Use the scroll feature to display the next or previous point. The point displayed may be limited to a date range.
Pre-service	Generate a report of all sensors that are in a preservice condition. A sensor in a preservice condition does not need immediate attention. Preservice reports allow forward planning by the installer. Use the scroll feature to display the next or previous point. The points displayed can be limited to a date range.

Table 48: Reports to Printer

Menu path	Maintenance > Reports to Printer
I/O map	Generate a printout of all I/O-mapping entries.
Points analogue	Generate a snapshot of all points analogues at the time of the print report initialisation. Enter an address range of points to print or accept the default value (all).
Service reports	Generate a report of all sensors that require servicing or are in a preservice condition. A service condition indicates that the sensor should be cleaned or replaced as soon as possible. A sensor in a preservice condition does not need immediate attention, but serves as a warning that the sensor will reach a service condition in the future.
Zoning	Generate a printout of which points are allocated to a zone. The printout shows the zone number and the points assigned within it.
Checksums	Two numeric values are printed, a calculated value and a stored value. If the two values are not equal, then code corruption has occurred.
Stop printer	Cancel any print operation in progress.

Table 49: Calibrate Detectors

Menu path	Maintenance > Calibrate Detectors
Purpose	The panel automatically calibrates every sensor every 24 hours, at midnight. This menu lets you manually recalibrate the sensors. When initiated a message “Calibrating…” is displayed on the LCD screen while calibration takes place. This takes about one minute to complete.

Table 50: Test

Menu path	Maintenance > Test
Purpose	This menu allows you to configure automatic and manual test modes to provide simple one-man testing of a complete system.
Detector test	Sensors can be individually or globally configured to self-test every 24 hours. This test is done at midnight, and a report is generated if any sensors fail the test. The self-test routine can be manually initiated from within this menu for an immediate real time test. The display indicates the number of detectors tested and passed. A fault event is generated if failure occurs. If a printer is fitted, a report is automatically printed.
Walk test	The walk test procedure is executed on a zonal basis. A zone is placed in walk test mode, and the sensors/devices within the zone are manually tested. The outputs and alarms for the selected zone are automatically disabled. At the end of the test, the display shows the number of devices in the zone, the number triggered and passed, and the number not triggered and failed. The respective zone LED on the fire panel is lit. A printed report is also produced. If an alarm occurs in a different zone, the panel cancels the test, and initiates a real alarm.
Flash faulty LED	Enabling this function flashes the LED on a point that reports a fault. This assists with visually finding and identification of the device that reports a fault.

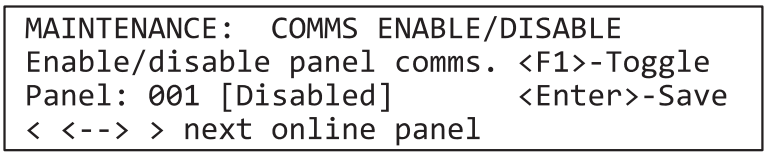
Table 51: Comms Enable/Disable

Menu path	Maintenance > Comms Enable/Disable
Purpose	This menu lets you temporarily enable or disable PP3 communications to panels on the network, without altering their filters etc. When edited on one panel it replicates to all panels that are configured to be online via setup, so that they all agree on who is expected to be online.

Operation

When Comms Enable/Disable is selected, the following menu is displayed (see Figure 65). The panel number, which defaults to 001, can be entered using the panel keypad.

Figure 65: Maintenance > Comms Enable/Disable menu



As the panel number is entered, the panel status changes accordingly. The panel status can either be Enabled, Disabled, Offline, or Invalid. An invalid panel number results in an invalid condition, which is indicated by a blank in the panel status field.

The panel number is entered from right to left. Illegal panel values may occur as the panel number is being entered, which is why an invalid condition is displayed as blank (to prevent confusion).

When the panel number is entered, the menu text changes from “Enter-Save” to “Home-Save” thereby making the Enter button functionality redundant. Pressing the F1 button toggles the panel status of the selected panel.

If the Esc button is pressed, all changes made in this menu will be lost. Pressing the Home button saves all changes.

Interpretation of analogue readings

Introduction

The panel reads six analogue values from each device, each time it polls that device. Each value is a whole number that can range from 0 to 255. These values can be interpreted in order to provide a comprehensive analysis of each device and the system as a whole.

The six readings are listed below in the order in which they are read and conventionally displayed:

- Reading 1 Reference group
- Reading 2 Polling group
- Reading 3 Device type
- Reading 4 Reference (low)
- Reading 5 Device status (analogue reading)
- Reading 6 Device specific

The following sections give the meanings of each analogue reading. Reading 6 is only relevant for certain specialized devices, and is usually zero.

Reference group

The reference group reading identifies the device reference group type. This value is used for the following:

- Decide if a device is online (connected) or offline (disconnected).
- Determine the health of a device and how well the device or the line driver board is calibrated.
- Identify the device as an intrinsically safe (EX), ZR, ZP or ZX device.

The values are interpreted as follows (as for Table 37 on page 109):

- 0–39: A value in this range indicates to the panel that there is no device at the polled address. It is offline.

- 70–100: Values in this range indicate an intrinsically safe (EX) device. The norm for intrinsically safe devices is 84, which indicates best calibration.
- 135–163: The norm for ZR and ZX devices is 152.
- 197–226: Values in this range indicate a healthy non-intrinsically safe device (ZP). The norm for devices is 213, which indicates best calibration. If a device falls outside the range 205 to 218 then it should be recalibrated.

Values falling outside the above ranges indicate a very poorly calibrated or unhealthy device. The panel treats all such devices as invalid. If occurring on multiple devices, a wiring fault may be suspected.

Device type readings

Readings two (polling group) and three (device type) together with reading one (reference group) identify the type of the device. The device types indicated by combinations of the three readings are provided in Table 52 below.

The Code column gives a three-digit identifier for the device, each digit derived from the values of the device type readings. Some intrinsically safe devices may have the same code as standard devices but are distinguished by their reference group reading (reading 1).

Table 52: Device definition table and device type analogues interpretation

Model	Description	Code	Reading 1	Reading 2	Reading 3
ZP710-2	Analogue ionization sensor	212	197-226 (213)	228-255 (245)	197-226 (213)
ZP720-2	Analogue heat sensor	213	197-226 (213)	228-255 (245)	165-194 (180)
ZP720-3	Analogue heat sensor	217	197-226 (213)	228-255 (245)	039-068 (054)
ZP725-2	Analogue heat sensor, with rate of rise element	214	197-226 (213)	228-255 (245)	133-162 (152)
ZP730-2	Analogue optical sensor	215	197-226 (213)	228-255 (245)	102-131 (118)
ZP732-2	Analogue duet sensor (optical/heat)	216	197-226 (213)	228-255 (245)	070-100 (084)
ZP5-IF8-22	Eight-way interface fire call point board	222	197-226 (213)	197-226 (213)	197-226 (213)
ZP5-IF8-23	Eight-way interface fire sprinkler board	223	197-226 (213)	197-226 (213)	165-194 (180)
ZP740-2-23	Analogue interface fire sprinkler	223	197-226 (213)	197-226 (213)	165-194 (180)
ZP5-IF8-24	Eight-way interface fire general purpose board	224	197-226 (213)	197-226 (213)	133-162 (152)
ZP740-2-24	Analogue interface fire general purpose	224	197-226 (213)	197-226 (213)	133-162 (152)
ZP745	Interface unit	224	197-226 (213)	197-226 (213)	133-162 (152)
A45E	Interface unit	224	197-226 (213)	197-226 (213)	133-162 (152)

Model	Description	Code	Reading 1	Reading 2	Reading 3
ZP740ST	Analogue interface for high sensitive smoke detector (stratos)	233	197-226 (213)	165-194 (180)	165-194 (180)
ZLS1APIC	Analogue interface for high sensitive smoke detector (stratos)	233	197-226 (213)	165-194 (180)	165-194 (180)
ZP755	Loop sounder (all variants)	241	197-226 (213)	133-162 (152)	228-255 (245)
ZP750-2	Line relay	242	197-226 (213)	133-162 (152)	197-226 (213)
A50E	Line relay	242	197-226 (213)	133-162 (152)	197-226 (213)
A51E	High voltage line relay	242	197-226 (213)	133-162 (152)	197-226 (213)
ZP752-2	Dual line sounder unit	245	197-226 (213)	133-162 (152)	102-131 (118)
ZP753-2	Addressable LED indicator	246	197-226 (213)	133-162 (152)	070-100 (084)
ZP754*-2	Addressable line sounder	247	197-226 (213)	133-162 (152)	039-068 (054)
ZP755	Loop sounder (ZP754 mode)	247	197-226 (213)	133-162 (152)	039-068 (054)
ZP5-IF8-52	Eight-way interface fire non-fire/auxiliary board	252	197-226 (213)	102-131 (118)	197-226 (213)
ZP740-2-52	Analogue interface non-fire/auxiliary	252	197-226 (213)	102-131 (118)	197-226 (213)
ZP5-IF8-53	Eight-way interface fire non-alarm/control board	253	197-226 (213)	102-131 (118)	165-194 (180)
ZP740-2-53	Analogue interface non-alarm/control	253	197-226 (213)	102-131 (118)	165-194 (180)
ZP5-IF8-54	Eight-way interface fire non-alarm/control board	254	197-226 (213)	102-131 (118)	133-162 (152)
ZP740-2-54	Analogue interface non-alarm/control	254	197-226 (213)	102-131 (118)	133-162 (152)
ZP5-IF8-62	Eight-way interface fire security latching board	262	197-226 (213)	070-100 (084)	197-226 (213)
ZP740-2-62	Analogue interface security latching	262	197-226 (213)	070-100 (084)	197-226 (213)
ZP5-IF8-64	Eight-way interface fire security non-latching board	264	197-226 (213)	070-100 (084)	133-162 (152)
ZP740-2-64	Analogue interface security non-latching	264	197-226 (213)	070-100 (084)	133-162 (152)
ZX832-2	Analogue duet sensor (paradigm) optical/heat	416	133-162 (152)	228-255 (245)	070-100 (084)
ZR420	Radio heat detector	423	133-162 (152)	197-226 (213)	165-194 (180)
ZR485	Radio call-point	424	133-162 (152)	197-226 (213)	133-162 (152)
ZR430	Radio optic detector	425	133-162 (152)	197-226 (213)	102-131 (118)
Radio aux.	Radio auxiliary interface	426	133-162 (152)	197-226 (213)	070-100 (084)

Model	Description	Code	Reading 1	Reading 2	Reading 3
Radio sounder	Radio I/O unit (includes sounders)	427	133-162 (152)	197-226 (213)	039-068 (054)
Radio I/O group	Radio I/O group (including sounder groups)	437	133-162 (152)	165-194 (180)	039-068 (054)
ZP710Ex-1	Intrinsically safe analogue ionization sensor	655	070-100 (084)	102-131 (118)	102-131 (118)
ZP720Ex-1	Intrinsically safe analogue heat sensor (change to ZP720Ex-1) FT	656	070-100 (084)	102-131 (118)	070-100 (084)
ZP785-2	Call point	222	197-226 (213)	197-226 (213)	197-226 (213)
ZP785-3	Call point- 3 second response	222	197-226 (213)	197-226 (213)	197-226 (213)
ZP786Ex-1	Intrinsically safe analogue call point (break-glass)	665	070-100 (084)	070-100 (084)	102-131 (118)
ZP740Ex-1	Intrinsically safe analogue interface unit (fire)	666	070-100 (084)	070-100 (084)	070-100 (084)
ZP740Ex-1	Intrinsically safe analogue interface unit (non-fire)	667	070-100 (084)	070-100 (084)	039-068 (054)
ZP3-ECU	Extinguishing control unit - address 1	244	197-226 (213)	133-162 (152)	133-162 (152)
ZP3-ECU	Extinguishing control unit - address 2	242	197-226 (213)	133-162 (152)	197-226 (213)
ZP5-570-2	Analogue interface for conventional sensor line	232	197-226 (213)	165-194 (180)	197-226 (213)
A70E (emulated)	Analogue interface for conventional sensor line	232	197-226 (213)	165-194 (180)	197-226 (213)
ZP5-574	Four-way conventional interface	235	197-226 (213)	165-194 (180)	102-131 (118)
ZP7BMR	Analogue interface fire general purpose	224	197-226 (213)	192-226 (213)	133-162 (152)
ZP7BM2000	Analogue interface fire general purpose	224	197-226 (213)	192-226 (213)	133-162 (152)

Reference (low)

The reference (low) reading is used to determine that the line on which the device is connected is healthy and is not subject to residual or unwanted signals. For effective operation of the line this value must be below 10. A reading of zero is quite usual.

If the low reference reading ever rises above 38 then the panel treats the device generating the reading as invalid.

Device status reading

The device status reading is sometimes also referred to simply as the analogue reading. It is a precise indicator of how strongly the device is sensing the environmental factors (e.g. heat or smoke) it is designed to detect. For some devices the analogue reading may indicate some other measure such as the status of a switch.

The panel interprets the reading according to the device type. The panel uses sophisticated algorithms based on these readings and their change over time to determine the true conditions in the area covered by the device. Viewing a snapshot of the analogue readings cannot provide information with the same degree of accuracy; nevertheless values can be interpreted, as in the following tables, in order to help assess the status of a device.

Analogue status, idle limits

The resting values of the analogues when devices are in normal conditions are provided in Table 53. The resting value is referred to as the idle value and can take on any values in the ranges given below, usually this is near the midpoint of the range.

Table 53: Analogue status, idle limits

Model	1 High	2 Standard	3 Medium	4 Low
ZP710-2	20–108	20–108	20–108	20–108
ZP720-2	25–123	25–143	25–186	25–186
ZP725-2	25–123	25–151	25–174	25–194
ZP730-2	20–108	20–108	20–108	20–108
ZP732-2 optic	20–108	20–108	20–108	20–108
ZP732-2 heat	25–163	25–163	25–179	25–179
ZP720-3	25–123	25–163	25–179	25–179
ZP740-2	59–137	59–137	59–137	59–137
ZP745	59–137	59–137	59–137	59–137
ZP770-2	59–137	59–137	59–137	59–137
ZP740ST	39–104	39–104	39–104	39–104
ZP755	40–110	40–110	40–110	40–110
ZP750-2	59–140	59–140	59–140	59–140
ZP752-2	40–140	40–140	40–140	40–140
ZP753-2	40–110	40–110	40–110	40–110
ZP754*-2	40–110	40–110	40–110	40–110
ZP5-IF8	59–137	59–137	59–137	59–137
ZX832-2 optic	20–100	20–100	20–100	20–100
ZX832–2 heat	25–164	25–164	25–179	25–179
ZR420	85	85	85	85

Model	1 High	2 Standard	3 Medium	4 Low
ZR430	85	85	85	85
Radio Sounder	85	85	85	85
ZP710Ex-1	10–54	10–54	10–54	10–54
ZP720Ex-1	12–71	12–71	12–93	12–100
ZP785-3	59–137	59–137	59–137	59–137
ZP786Ex-1	29–58	29–58	29–58	29–58
ZP740Ex-1	29–58	29–58	29–58	29–58
ZP5-570-2	59–137	59–137	59–137	59–137
ZP5-574	59–137	59–137	59–137	59–137

Analogue status, alarm values

In Table 54 below, the analogue values that indicate an alarm state are shown for various devices. For some devices other value ranges are used to indicate such conditions as fault, service, preservice and prealarm.

Table 54: Analogue status, alarm values

Device type	Sensitivity level							
	High		Standard		Medium		Low	
	Nom	Max	Nom	Max	Nom	Max	Nom	Max
ZP710-2	N+68	168	N+81	180	N+94	190	N+105	200
ZP720-2	145	N/A	a(144)	N/A	a(187)	N/A	188	N/A
ZP720-3	165	N/A	a(164)	N/A	a(180)	N/A	181	N/A
ZP725-2	125	N/A	153	N/A	176	N/A	196	N/A
ZP730-2	N+77	158	N+90	176	N+102	186	N+110	205
ZP732-2 optic element	N+77	158	N+90	176	N+102	186	N+110	205
ZP732-2 heat element	165	N/A	a(164)	N/A	a(180)	N/A	181	N/A
ZP720-3	165	N/A	a(164)	N/A	a(180)	N/A	181	N/A
ZP5-IF8	138	187	138	187	138	187	138	187
ZP740-2	138	187	138	187	138	187	138	187
ZP745	138	187	138	187	138	187	138	187
ZP770-2	138	187	138	187	138	187	138	187
ZP740ST	150	255	150	255	150	255	150	255
ZP755	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ZP750-2	141	141	141	141	141	141	141	141
ZP752-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ZP753-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ZP754-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ZX832-2 optic element	a(N+49)9	255	a(N+60)	255	a(N+80)	255	a(N+105)	255

Device type	Sensitivity level							
	High		Standard		Medium		Low	
	Nom	Max	Nom	Max	Nom	Max	Nom	Max
ZX832-2 heat element	a(165)	N/A	a(164)	N/A	a(180)	N/A	a(181)	N/A
ZR420	181	181	181	181	181	181	181	181
ZR430	181	181	181	181	181	181	181	181
Radio sounder	181	181	181	181	181	181	181	181
ZP710Ex-1	N+34	255	N+40	255	N+47	255	N+52	255
ZP720Ex-1	73	N/A	73	N/A	95	N/A	102	N/A
ZP785-2	138	187	138	187	138	187	138	187
ZP785-3	138	187	138	187	138	187	138	187
ZP786Ex-1	59	98	59	98	59	98	59	98
ZP740Ex-1	59	98	59	98	59	98	59	98
ZP5-570-2	138	187	138	187	138	187	138	187
ZP5-574	138	187	138	187	138	187	138	187

a = algorithm

Note: When the calculated N+ values fall outside of the minimum/maximum levels, the minimum/maximum levels take precedence. N is the nominal idle value read on a daily basis. N value adjustment is limited to 10 counts maximum, this avoids sensitivity shift in a smouldering fire situation.

Extinguishing control unit

The extinguishing control unit in particular makes extensive use of readings 5 and 6 to indicate status. These analogues are shown in Table 55 for reading 5 and Table 56 for reading 6.

Table 55: Extinguishing control unit, reading 5 (address 1)

Details	Nominal value digital counts
Normal idle value	39–65
Manual when door locked	68–100
Loss of signal	< 39
General panel fault	103–132
Power supply fault	> 163
Relay operated	141–163

Table 56: Extinguishing control unit, reading 6 (address 1)

Details	Nominal value digital counts
Fault, low idle	< 39
Auto released	39–65
Manual released	68–100

Details	Nominal value digital counts
System locked-off (released)	103–132
Auto non-released	141–163
System locked-off (non-released)	166–195
Manual (non-released)	> 198

Corrective maintenance

Removing and replacing the clock batteries

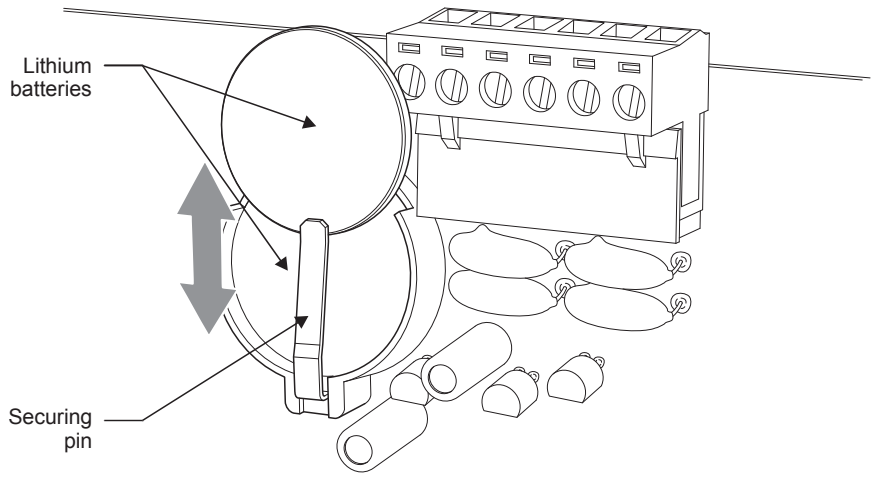
Lithium clock batteries on the main board ensure that the system date and time stay current despite power outages. These must be replaced before they reach their end-of-life date.

Caution: The lithium clock batteries contain substances that are potentially hazardous to your health and to the environment.

To remove the lithium clock batteries:

1. Open the front door of the ZP3 panel.
2. Locate the lithium clock batteries on the main board (see Figure 66).
3. Remove the batteries by sliding them out from under the securing pin.
4. Install two new lithium batteries into the space provided making sure that the positive sides of the batteries are facing towards the front of the panel.
5. Dispose of the old batteries as required by local ordinances or regulations. Do *not* dispose of the batteries in unsorted municipal waste.

Figure 66: Removing the clock batteries

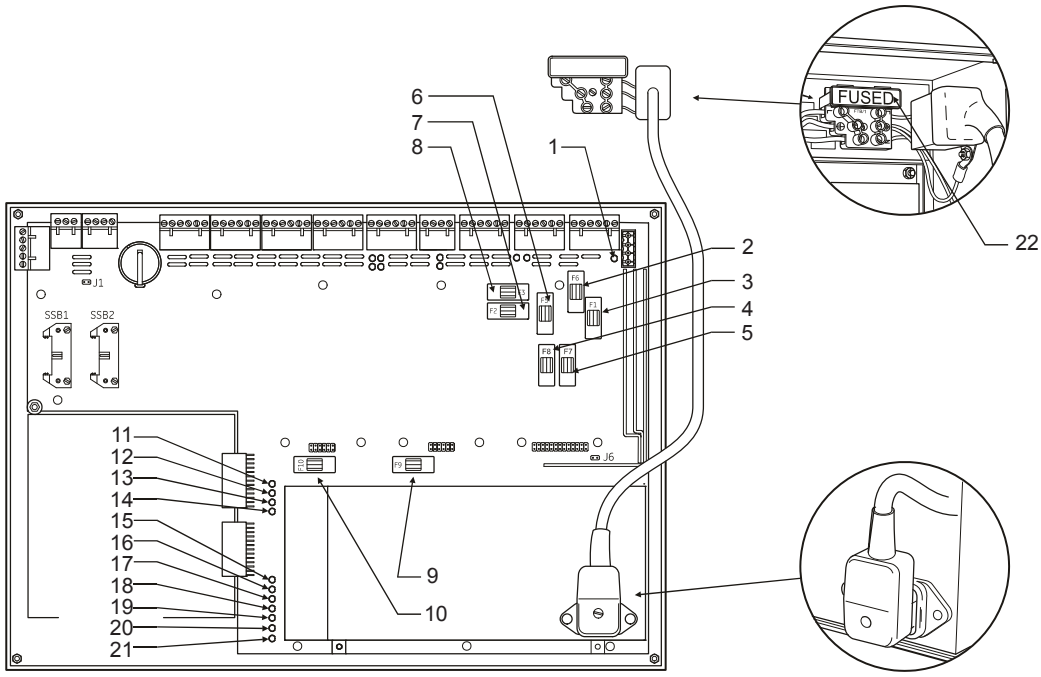


Fuses and indicators

Figure 67 shows the fuses and indicators used primarily for fault finding on the power supply. A list of fuses and indicators is provided in the accompanying legend.

Fuses must only be replaced with the value and type shown. Use of an incorrect fuse can affect safety and reliability.

Figure 67: Fuses and indicators



No.	Name	Description	Rating	Remarks
1.	LED 1	Battery charging	-	25.4 × 6.3 mm
2.	Fuse F6	Auxiliary 24 VDC supply	S2000mAL250V	20 × 5 mm 250V, 2.0A slow-blow
3.	Fuse F1	Battery fuse	S6300mAL250V	20 × 5 mm 250V, 6.3A slow-blow
4.	Fuse F8	Monitor sound	F1AL250V	20 × 5 mm 250V, 1.0A fast-blow
5.	Fuse F7	Monitor sound	F1AL250V	20 × 5 mm 250V, 1.0A fast-blow
6.	Fuse F5	RMC FLT alarm	F1AL250V	20 × 5 mm 250V, 1.0A fast-blow
7.	Fuse F2	Monitor sounders	F1AL250V	20 × 5 mm 250V, 1.0A fast-blow
8.	Fuse F3	Monitor sounders	F1AL250V	20 × 5 mm 250V, 1.0A fast-blow
9.	Fuse F9	PSU 24 VDC supply	S4000mAL250V	20 × 5 mm 250V, 4.0A slow-blow
10.	Fuse F10	PSU 5 VDC logic (internal)	S500mAL250V	20 × 5 mm 250V, 500mA slow-blow
11.	LED 21	Default = Off	-	Green: On = ADC failure
12.	LED 18	Default = Off	-	Green: On = Earth fault
13.	LED 19	Default = Off	-	Green: On = Loop fault
14.	LED 20	Default = Off	-	Green: On = Sounder fault

No.	Name	Description	Rating	Remarks
15.	LED 37	Internal supply 24 VDC	-	Green: On = supply on, Off = supply faulty
16.	LED 15	Internal supply for CPU (5 VDC)	-	Green: On = supply on, Off = supply faulty
17.	LED 14	Internal supply for logic (5 VDC)	-	Green: On = supply on, Off = supply faulty
18.	LED 8	Internal supply for RS-232 (12 VDC −ve)	-	Green: On = supply on, Off = supply faulty
19.	LED 7	Internal supply for RS-232 (12 VDC +ve)	-	Green: On = supply on, Off = supply faulty
20.	LED 2	Internal supply for ZP3AB-SCB-D control bus driver	-	Green: On = supply on, Off = supply faulty
21.	LED 4	Mains 230 VAC supply	-	Green: On = supply on, Off = supply faulty
22.	Fuse FM	Mains fuse	F5AL250VAC	BS1362

Removing and replacing the backup batteries

The backup batteries may need to be replaced for a number of reasons, for example, end-of-life, insufficient capacity, etc.

WARNINGS:

- The backup batteries, although only 24 VDC, carry enough charge to be dangerous.
- When connecting batteries, or when working in the vicinity of the battery terminals, take care not to accidentally cause a short circuit. In particular metallic tools or metallic watchstraps can also inflict *severe* burns to the user as well as cause a short circuit.

Caution: The backup batteries contain substances that are potentially hazardous to your health and to the environment.

To remove the backup batteries:

1. Disconnect the connections from the positive and negative terminals on the backup batteries.
2. Loosen and remove the wing nut from the batteries securing bracket (see Figure 68 on page 153).
3. Remove the bracket securing the backup batteries to the chassis.
4. Remove the backup batteries.
5. Install new backup batteries as described under “Backup batteries” on page 46.

6. Dispose of the battery as required by local ordinances or regulations. Do *not* dispose of the batteries in unsorted municipal waste.

Figure 68: Removing the backup batteries