



Twinflex and Multipoint

**Installation
and
Operating
Instructions**

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Twinflex and Multipoint Installation and Operating Instructions

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Introduction

About the Manual

These Installation and Operating Instructions contain information to enable an engineer to install, commission and operate the Rafiki Twinflex range of control panels and field devices.

The instructions are written on the basis that the installer may be unfamiliar with the equipment, but assumes that they have an engineering background and are generally conversant with the requirements of BS 5839 Part 1, or other standards applicable to the design and installation of fire detection and alarm systems in commercial, industrial and residential premises.

If in doubt about the system configuration, refer to the application guidance within this manual, or the separate Application Guide.

It is recommended that the whole of this manual is read before attempting to install and operate the equipment.

Scope

The manual contains installation and operating instructions for the full range of Twinflex 2, 4 and 8 zone control panels, including Twinflex *plus*, and all of the available field devices. The instructions apply equally to all control panels except where noted in the text.

Limitations

The Twinflex control panels are only compatible with Rafiki field devices; other manufacturers' smoke detectors, call points, etc. cannot be used on the system. Similarly, the Rafiki field devices are not compatible with other manufacturers' control equipment. The following products are covered herein:-

- ◆ Twinflex 2, 4 and 8 Zone Control Panel
- ◆ Twinflex *plus* 4 and 8 Zone Control Panel
- ◆ Multipoint Detector (with and without integral sounder)
- ◆ Twinflex Manual Call Point
- ◆ Twinflex Output Unit
- ◆ Twinflex 'Hatari' Sounder

As a guide, the following is the maximum number of Twinflex field devices that can be installed on a single zone:-

- ◆ Hatari Sounders only **6, or**
- ◆ Multipoint detector with sounder (normal volume) **32, or**
- ◆ Multipoint detector with sounder (low volume) **32, or**
- ◆ Multipoint detector without sounder * **32, or**
- ◆ Twinflex manual call point * **32, or**

* Limited by standards or application only, not loading.

- ◆ Combinations thereof (see example overleaf).

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Example:

The following combination is acceptable for a single zone:-

- ◆ Hatari sounder2
- ◆ Multipoint detector with sounder5
- ◆ Multipoint detector without sounder10
- ◆ Manual call point15

Conventions

When referred to in the text, panel controls and indicators are shown in uppercase in accordance with the legend screened on the panel fascia.

Bold text denotes important information.

Associated Documents

- ◆ Twinflex Application Guide
- ◆ Twinflex User Guide

Twinflex Features

Twinflex is a '2-wire conventional' system, but with enhanced features usually only found on addressable systems. All field devices on a zone are connected to the control panel via a common 2-wire cable, and communicate with the panel using the 2-wire protocol.

The 2-wire panel is able to recognise and separately indicate a detector alarm and a call point alarm. The panel also monitors each zone for detector head removal, device fault, end-of-line fault and open/short circuit fault. No end-of-line (EOL) component is required, as any device can be configured as an EOL unit.

The 2-wire panel provides a single 24V conventional sounder output, a monitored 24V remote fire output, a volt-free common fault output, and a volt-free common fire output. There is also a 'class change' input and outputs to signal to a repeater panel.

The 2-wire panel incorporates an integral power supply unit and can accommodate the following standby batteries to provide up to 72 hour standby (refer to Technical Data).

- ◆ 2/4 Zone Panel 2 x 12V 2.1 Ah
- ◆ 8 Zone Panel 2 x 12V 3.3 Ah or 2 x 7.2 Ah

The Twinflex System Range

2-Wire Conventional Fire Detection

Unlike most conventional fire alarm systems which require separate pairs of cables for detector zones and sounder zones, the Twinflex system requires only one pair (two wires) for each zone to accommodate both detection devices and sounders. Furthermore, sounders are incorporated within the detector to reduce system components and simplify installation.

Twinflex Control Panel

The following capacities are available:

- ◆ 2 Zone
- ◆ 4 Zone
- ◆ 8 Zone

Each panel in the range provides similar functions and facilities and all share a common fascia layout featuring clearly marked controls and status indicators.

Twinflex *plus* Control Panel

The Twinflex *plus* 4 and 8 zone panels are identical in appearance to the Twinflex range, but with an important additional feature, Checkpoint.

Checkpoint provides a special two-stage alarm operation which is designed specifically to cater for the requirements of residential premises, typically hostels, hotels, apartments, and 'HMOs' (houses with multiple occupation).

Indicators and Controls

The panel indicators and controls are described in Figures 17 and 18 at the end of the manual.

The 8 zone panel is fitted with a 'Controls Enable' key-switch to provide level 2 access (see Access Levels).

Internal Controls

A CPU RESET button is located on the PCB within the panel. When the button is operated the CPU is reset.

Note. When the panel has re-started, a system fault is indicated until the panel is reset.

Internal Buzzer

The internal buzzer has three operating modes as follows:

- 1 It sounds continuously when:-
 - a fatal error occurs, i.e. CPU failure

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- a program memory checksum fault is detected
 - a button operation is expected, e.g. the number of a zone to be tested
- 2 It is pulsed quickly (1s on, 1s off) when:-
- a device alarm is detected
 - the SOUND ALARMS control is operated
 - the repeater evacuate input is active
 - the alarm input is active (alarm input mode 2)
- 3 It is pulsed slowly when:-
- a fault is detected
 - a panel function is disabled
 - a zone is in test mode
 - the panel is at access level 3

Access Levels

There are three access levels which inhibit the panel controls and restrict access to unauthorised personnel:

Level 1 At access level 1 the CONTROLS ENABLED LED is unlit and the controls are disabled.

Level 2 At access level 2 the CONTROLS ENABLED LED is lit and the user controls are enabled.

Level 3 At access level 3 the CONTROLS ENABLED LED flashes and the buzzer pulses. The user controls and engineering functions are enabled.

Field Devices

Twinflex Multipoint Detector

The Twinflex Multipoint Detector is a single device providing all the features of normal conventional smoke and heat detectors in a single unit, which can be configured to operate in one of seven modes to suit the environment in which it is located. The device is available with or without an integral sounder, but is otherwise universal in its application. The sounder can be configured for normal volume (90 dB) or low volume (75 dB).

Twinflex Manual Call Point

The manual call point is connected to the two-wire zone circuit and provides the means to manually activate the fire alarm system.

Hatari Electronic Sounder

For locations where a sounder only is required the 'Hatari' electronic sounder can be installed and connected to the two-wire zone cabling.

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A number of standard 24V DC sounders can be connected to the conventional sounder output provided the maximum load is not exceeded (refer to Technical Data).

Twinflex Output Unit

The Twinflex Output Unit operates whenever a fire condition is active on the panel, and provides a volt-free contact to interface with building services or ancillary devices, e.g. plant shut down, door release devices, etc.

Twinflex Repeat Panel

The Twinflex Repeat Panel provides remote indication of the control panel status for applications where the main panel may be hidden from general view, or where there is an alternative entrance to the building. The Repeat Panel can incorporate controls to remotely silence, reset and evacuate the system.

Features

The main features provided by the range are:

- ◆ All field devices connected to one pair of wires per zone - reducing cable and simplifying installation.
- ◆ No special end-of-line device or component required - any field device can be configured as the end of line unit.
- ◆ Differentiates between an active manual call point and a detector.
- ◆ One single detector meets all applications.

Installation

Introduction

This section provides instructions for installing the Twinflex range of control panels and field devices. It does not give specific guidance on the type, number, location and configuration of the equipment for a particular application which, it is assumed, will have been determined by the system planner or project engineer. The installer should be in possession of a drawing or instructions to indicate the position of the control panel and the layout of the field devices.

If the system utilises the Twinflex *plus* control panel (Checkpoint) it is important to arrange the zones such that the required operation can be achieved, i.e. 'communal' and 'dwelling' areas are wired as separate zones (refer to Application Guide for further information).

Cable Installation

The particular specification and installation requirements for the system cabling are outside the scope of this manual. However, the following points should be noted.

- ◆ Each zone requires a separate 2-core cable radial circuit from the control panel to the furthest point of the zone.
- ◆ The cable used must be MICC, FP200 or similar screened cable approved for use in fire alarm systems.
- ◆ There is a limit to the number of devices that can be connected to a zone - separate zones may be required if the number is likely to be exceeded.
- ◆ No special end-of-line (EOL) device or component is required - the last device on the circuit can be configured as the EOL.
- ◆ The 240V AC mains supply should be installed by a qualified electrician in accordance with the current IEE Wiring Regulations (BS 7671), and/or other local codes, and tested with an earth loop impedance tester before being left in an isolated state.
- ◆ Ensure the mains supply 'tails' are long enough to accommodate the ferrite sleeve (see Figure 8).
- ◆ **Earth continuity must be maintained throughout the zone circuit.**

Refer to Figure 1 on page 7 for typical wiring details.

Wiring Schematic

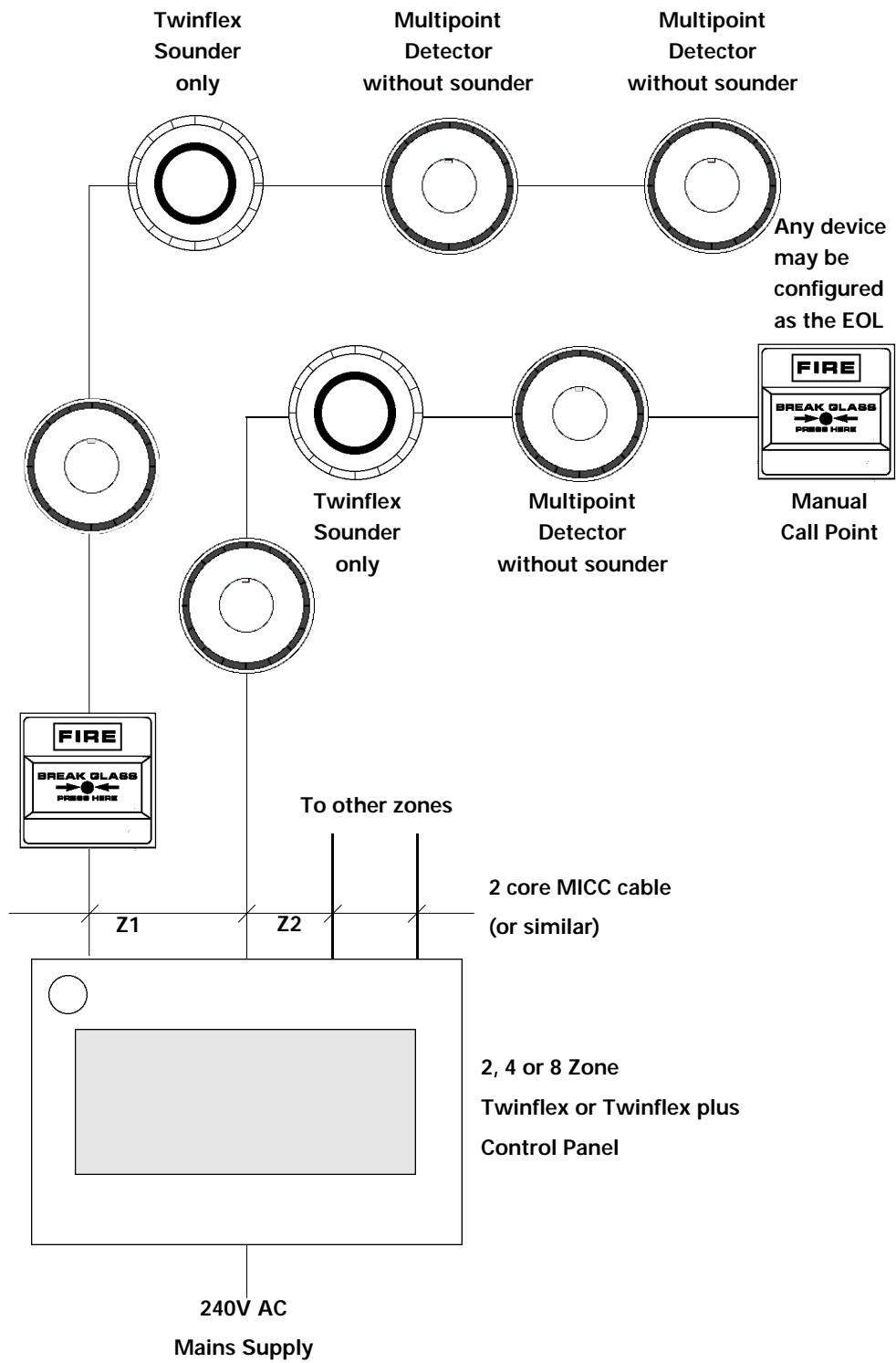


Figure 1 - Typical Wiring Schematic

Unpacking the Equipment

Check that all the equipment has been supplied. Detector and sounder bases may be removed from the packing boxes for installation, but it is recommended that the device and its associated electronics module are left in the box until required for commissioning.

After unpacking the control panel, check its condition and ensure that the PCBs and other components are intact and in position (see Figures 2 and 3). The battery leads, fuses, resistors and User Guide are stored in a polythene bag.

Mounting the Panel

Identify the location of the control panel. Ensure that the panel will be easily accessible, and that account is taken of any subsequent work that may affect access. The panel should be mounted on a flat, vertical wall at a height where the indicators can be seen without difficulty.

Like all electronic equipment, the panel may be affected by extreme environmental conditions. The position selected for its installation should therefore be clean and dry, and not subjected to high levels of vibration or shock. Ambient temperatures should be within the range given in the Technical Data section.

Note. The electronic components of the panel can be damaged by static discharge. Suitable precautions must be taken when working on the panel, e.g. touch a good earth before handling the PCBs. When not installed in the panel PCBs should be stored in an anti-static bag.

In common with all microprocessor-controlled panels, the panel may operate erratically or may be damaged if subjected to lightning-induced transients. Proper earthing will greatly reduce susceptibility to this problem.

Note. Do not over-tighten screw terminals as this may damage the threads.

2 and 4 Zone Panels

Remove both halves of the front cover by unscrewing the four pozidrive screws. (see Figure 2). Note the position of the required terminals (see Figure 9) and select 'knockouts' for cable entry. Do not drill additional holes in the panel, and do not bring cables into the rear of the panel unless cable entries are provided. Note the position of the centre 'keyhole' fixing and mark the wall at the correct height. Drill and plug the wall and part-insert a temporary screw on which to hang the panel. Hang the back box on the keyhole fixing, check that it is level, and mark the position of the four dimple fixing holes. Remove the back box, drill and plug the wall, re-hang the back box and secure using all four fixings.

8 Zone Panel

Unscrew the two pozidrive screws and open the front door (see Figure 3). Note the position of the required terminals (see Figure 10) and select 'knockouts' for cable entry. Do not drill additional holes in the panel. Note the position of the centre 'keyhole' fixing and mark the wall at the correct height. Drill and plug the wall and part-insert a temporary screw on which to hang the panel.

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Hang the back box on the keyhole fixing, check that it is level, and mark the position of the four dimple fixing holes. Remove the back box, drill and plug the wall, re-hang the back box and secure using all four fixings.

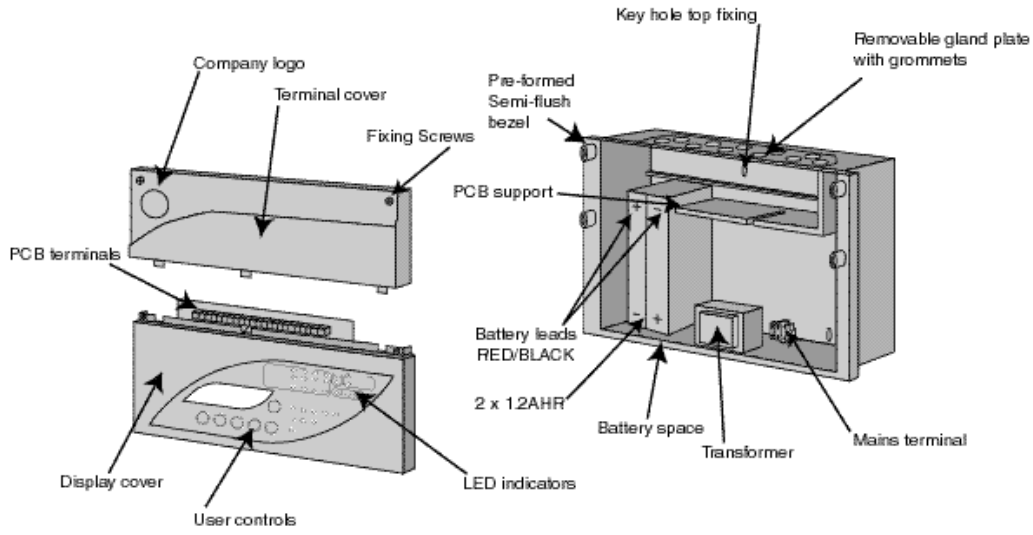


Figure 2 - 2/4 Zone Control Panel General Arrangement

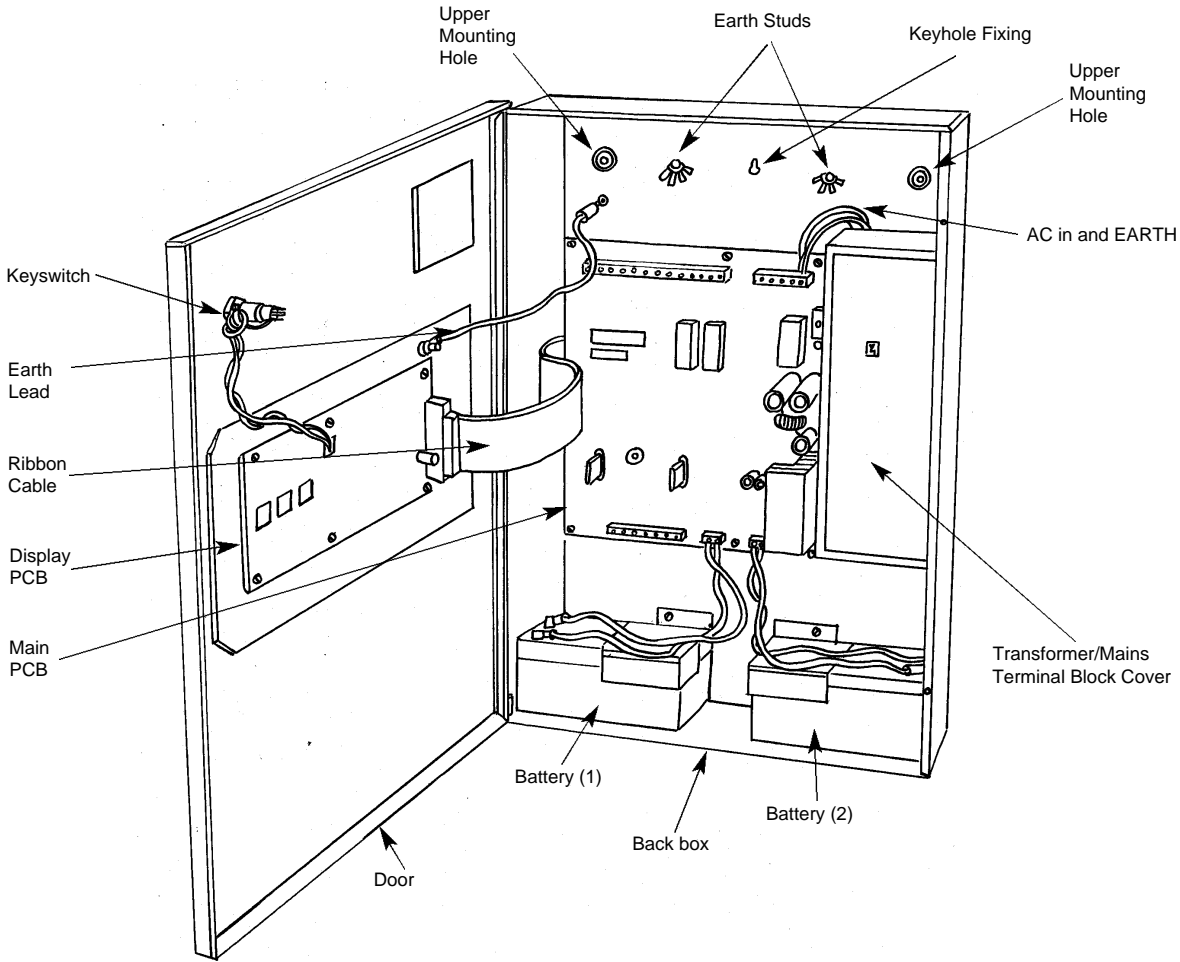


Figure 3 - 8 Zone Control Panel General Arrangement

Multipoint Detector

Unpacking the Detector

Remove the items from the pack and check that the following have been supplied:-

- ◆ Base unit
- ◆ Electronics module
- ◆ Detector head
- ◆ Electronics module removal key
- ◆ 'Heat' label
- ◆ Instructions

With the exception of the base, return the items to the packing box for safe keeping until commissioning.

Mounting the Base

The base has fixing holes to enable it to be mounted to a standard electrical 'BESA' box.

Wiring the Base

Connect the incoming pair of wires to the 0V and + LINE IN terminals. Connect the outgoing pair of wires to the other 0V and + LINE OUT terminals (see Figure 4).

Remote LED

If a remote LED is required connect a pair of wires between the - and + REMOTE LED terminals in the base and the remote LED (see Figure 4).

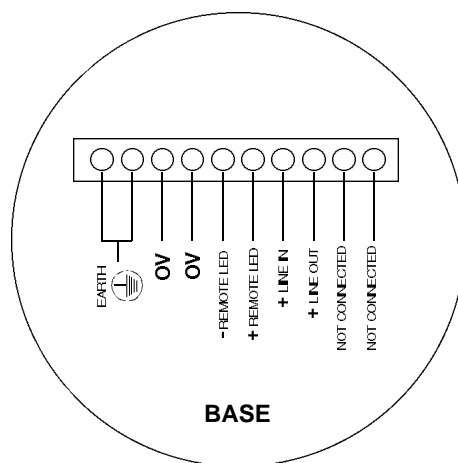


Figure 4 - Base Unit Connection Terminals

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Twinflex Manual Call Point

Unpacking the Call Point

Remove the items from the pack and check that the following have been supplied:-

- ◆ Back box
- ◆ Front cover
- ◆ Front cover mounting screws (2)
- ◆ Test key
- ◆ Instructions

With the exception of the back box, return the items to the packing box for safe keeping until commissioning.

Mounting the Back Box

The back box should be mounted on a flat vertical surface at 1400mm above the finished floor level using at least two of the slotted mounting holes (see Figure 5).

Wiring the Device

Connect the two-wire zone incoming and outgoing cables to the + and - terminals, observing polarity. Connect the earth wires to the EARTH terminal to maintain earth continuity

Note. If the supplied back box is not used, e.g. in flush mounting applications, alternative arrangements will need to be made for connecting the wires from the front of the unit to the incoming and outgoing zone wires.

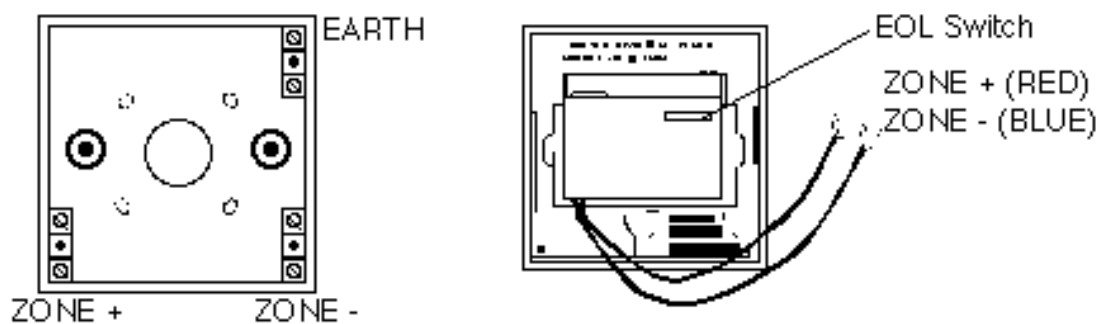


Figure 5 - Manual Call Point Back Box and Front Cover (Rear View)

Twinflex Sounder

Unpacking the Sounder

Remove the items from the pack and check that the following have been supplied:-

- ◆ Base
- ◆ Sounder
- ◆ Sounder removal instructions

Mounting the Base

The base has fixing holes to enable it to be mounted to a standard electrical 'BESA' box.

Wiring the Base

Connect the incoming and outgoing two-wire zone cables to the base terminals, observing polarity.

Fitting the Sounder

Position the sounder over the base so that the locating pins are aligned with the corresponding lugs in the base. Push the sounder home firmly and twist clockwise to lock into position.

To remove the sounder, the Head Removal tool is used (see Figure 12 on page 23). Locate the head removal tool over the sounder; press firmly to release the lock and twist anti-clockwise.

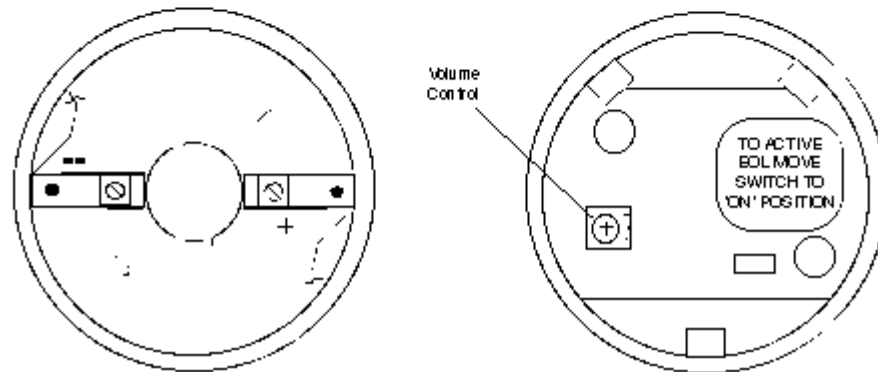


Figure 6 - Sounder Base and Sounder (Rear View)

Twinflex and Multipoint Installation and Operating Instructions

Output Unit

Note. The output unit requires an external 24V supply.

Unpacking the Unit

Remove the items from the pack and check that the following have been supplied:-

- ◆ Back box
- ◆ Front cover
- ◆ Front cover mounting screws (2)
- ◆ Installation instructions

Mounting the Back Box

The back box should be mounted horizontally on a flat surface using at least two of the four slotted mounting holes.

Wiring the Device

Cables should be brought into the unit via one or more of the knockouts in the back box. Connections are made to the terminals on the PCB mounted on the front cover (see Figure 7).

The 'in' and 'out' circuits (if applicable) are connected to the Zone + and - terminals, observing polarity. The earth continuity should be maintained by utilising the Earth E1 and E2 terminals.

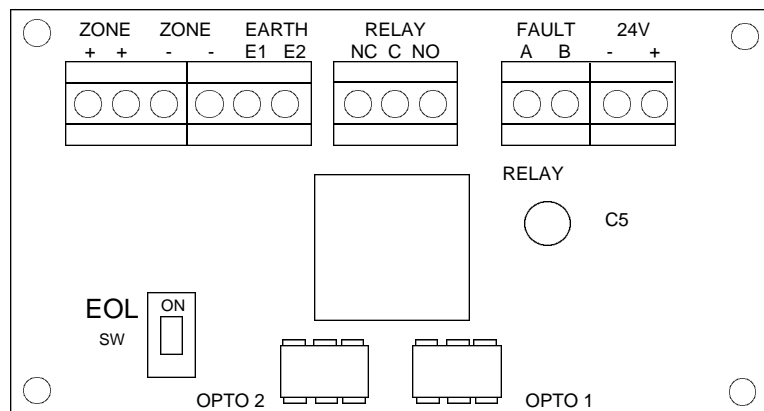


Figure 7 - Output Unit

Control Panel Circuits

Conventional Sounder Circuit

Up to 14 sounders (electronic devices or bells) can be connected to the SOUNDER circuit output, providing the combined current consumption does not exceed the output rating (see Technical Data).

The wiring consists of a two-wire radial circuit which is terminated with a 4K7 end-of-line (EOL) resistor connected in parallel with the circuit at the last device. Suitable fire-rated cable should be used.

Remote Fire Output

The REM FIRE output can be used to signal a fire condition to a remote location, or can provide a general 'fire' output to interface with plant or other systems. A 24V signal is applied to the output when a fire condition is detected, which can be connected directly to compatible equipment, or used to activate a relay.

The wiring consists of a two-wire radial circuit which is terminated with a 4K7 end-of-line (EOL) resistor connected in parallel with the circuit at the equipment or relay. (Refer to Commissioning for connection details).

Common Fire Output

The FIRE output is a volt-free changeover contact that can be used to signal a fire condition to a remote location, or can provide a general 'fire' output to interface with plant or other systems.

Common Fault Output

The Fault output is a volt-free changeover contact that can be used to signal a common fault condition to a remote location.

Auxiliary 24V Output

The auxiliary 24V output provides a permanent 24V supply to ancillary equipment and can be used to power output units, repeaters and other equipment providing the maximum load is not exceeded (refer to Technical Data).

Note. Standing loads applied by permanently energised devices such as door holders and dampers will substantially reduce the battery standby period. Ensure all loads are taken into account or, preferably, use a remote power supply unit.

Reset Output

The 8 zone panel has in addition a 'reset output' which consists of a switched 0V which is applied to the output for a short period when the panel is reset, and can be used, for example, when interfacing with another system.

Power Supply Units

Auxiliary power supply units (PSUs) used to power ancillary equipment, e.g. door holders, dampers, etc., should be installed in accordance with the instructions provided.

Note. The Output Unit has a 'fault' input which can be used to monitor a remote PSU, assuming a suitable fault output is available.

Repeater Panel

Remote fire and fault outputs, and remote control inputs are provided within the control panel to facilitate the connection of a repeater panel. The number of cores between the panel and repeater will depend on the number of zones and whether or not control facilities are utilised. As a guide, the following is required:-

- ◆ One conductor for each zone indicator
- ◆ One conductor for remote 'fault' indication
- ◆ One conductor for each 'control' function
- ◆ One conductor for the 0V supply, **or**
- ◆ Two conductors for + and - 24V supply (optional - see Commissioning)

Control functions are:-

- ◆ Silence Alarms
- ◆ Reset System
- ◆ Evacuate

Commissioning

WARNING: THE PANEL MAY BE DAMAGED BY CONNECTING CABLES WHILE THE PANEL IS POWERED. DO NOT ATTEMPT TO COMMISSION THE PANEL UNTIL THIS SECTION HAS BEEN READ AND UNDERSTOOD.

Introduction

The commissioning procedure involves the following steps:-

- ◆ Powering the panel and checking its basic operation
- ◆ Configuring the panel for the required operation
- ◆ Connecting the field devices and external wiring
- ◆ Testing the system

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

Before connecting the field devices, it is recommended that the panel is powered-up and checked for correct operation.

Powering the Panel

Mains Supply

Ensure that the panel is earthed and that the mains supply is isolated. If necessary remove/undo the front cover to gain access to the terminals.

Locate the mains connection terminals. In the 8 zone panel it is necessary to first remove the transformer cover by loosening the retaining screw, lifting and withdrawing the cover, noting the earth wire that is attached to it.

Pass the mains supply wires through the ferrite sleeve (supplied with the panel) as indicated in figure 8 and connect the live, neutral and earth mains cables to the L, N and E terminals. Do not switch on the supply at this stage. Replace the cover (8 zone panel).

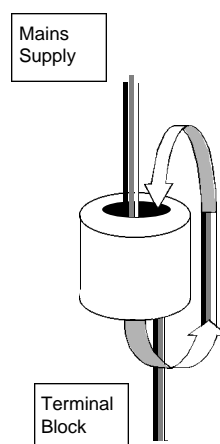


Figure 8 - Ferrite Sleeve Installation

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Battery Supply

The 2/4 panel requires 2 x 12V 2.1 Ah batteries, and the 8 zone panel requires two 2 x 12V 3.3 Ah or 7.2 Ah batteries.

Install the batteries as indicated (refer to Figures 2 and 3 on page 9). Connect the supplied battery leads to the BATT terminals in the panel, observing the correct polarity.

Connect the negative (black) lead from the BATT 1 terminal to the negative (-) terminal of the left hand battery. Connect the positive (red) lead from the BATT 2 terminal to the positive (+) terminal of the right hand battery. Leave the other leads disconnected at this stage.

End-of-Line Resistors

Ensure that a 4K7 resistor is fitted to the Remote Fire and Conventional Sounder terminals in the panel, i.e.:

2/4 zone panel REMOTE FIRE and BELL O/P

8 zone panel REM FIRE and SOUNDER

Refer to figures 9 and 10 for terminal details.

Applying Power

1. Switch on the mains supply.
2. Connect the remaining battery leads to the appropriate battery terminals, observing polarity.

The panel will commence normal operation within 45 seconds.

The POWER LED and the FAULT LED should be lit, and all ZONE FAULT / DISABLE / TEST LEDs should be flashing slowly (1s on, 3s off). All other LEDs should be unlit.

If any other LEDs are lit or abnormal conditions indicated, they should be investigated and rectified before proceeding. Refer to Fault Conditions on page 35.

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PCB Terminals

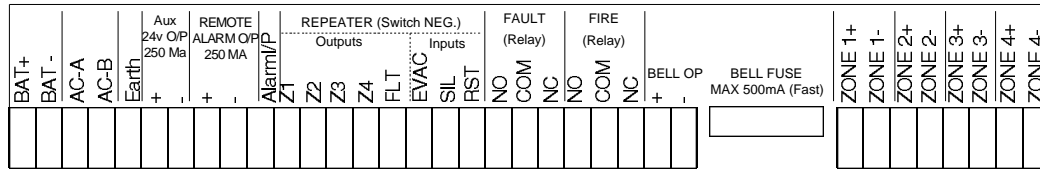


Figure 9 - 2/4 Zone Panel Terminals

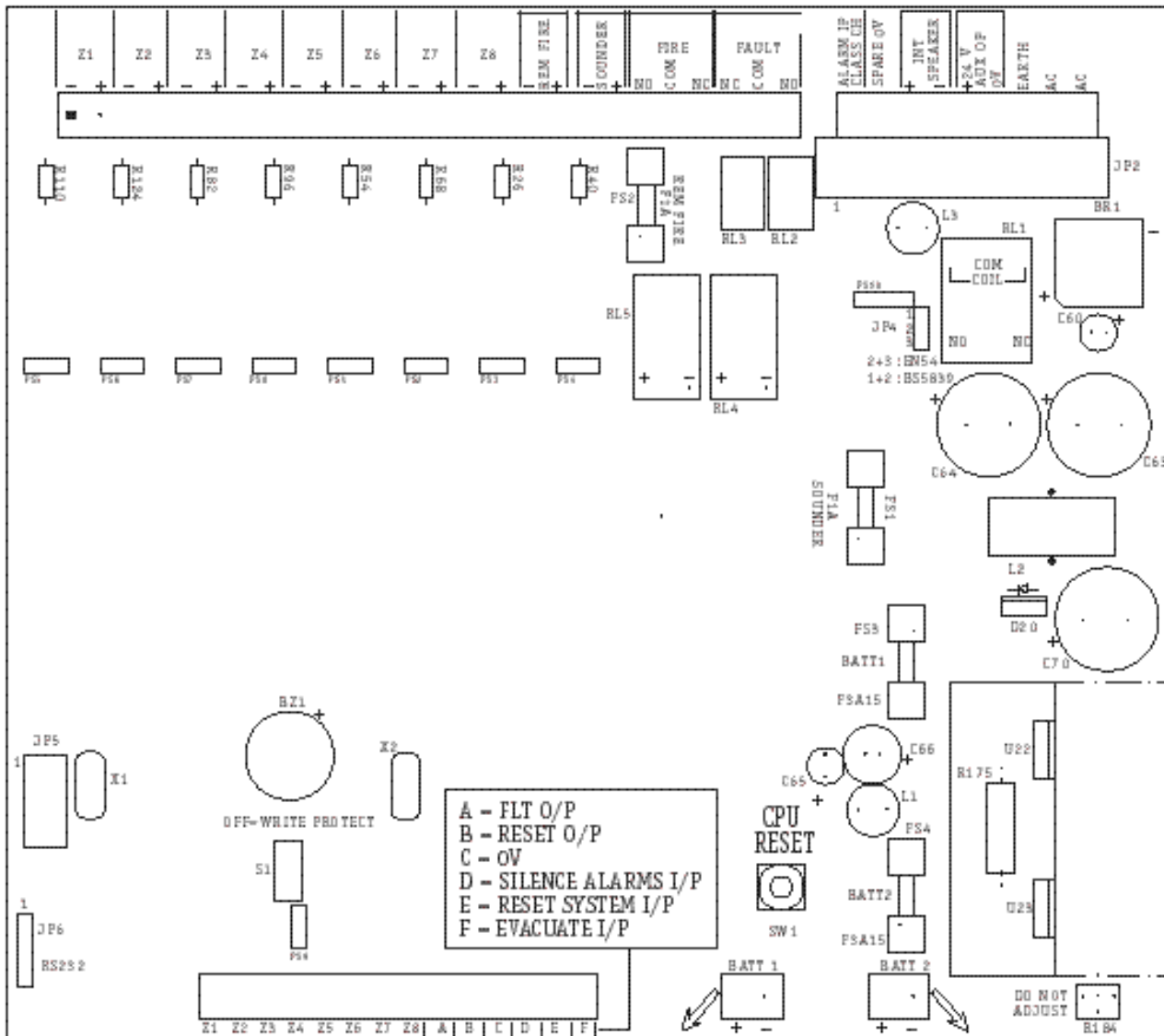


Figure 10 - 8 Zone Panel Terminals

Configuring the Panel

Introduction

The instructions in this section apply to the standard panels and do not include the Checkpoint facilities. Refer to the Checkpoint Configuration section for further information.

There are a number of configuration options available which determine how the panel operates. The following instructions allow these options to be configured as required.



In order to carry out panel configuration it is necessary to enter the Level 3 access code. Refer to Operation for a description of the access levels.

Configure the Number of Active Zones

Active zones are those used in the particular installation. Inactive zones are not powered and therefore not monitored.


Active zone configuration is carried out at access level 3 (see Operation).

2/4 zone panel

- Step 1 Press 
- Step 2 Enter the number of active zones, e.g. for 2 zones press 

Note. A zone fault is indicated if no EOL signal is detected from an active zone.

8 zone panel

- Step 1 Press
- Step 2 Enter the number of active zones, e.g. for 1-7 zones press 

Alarm Configuration

This option enables the alarm mode to be configured to provide either a common alarm or a two-stage alarm, i.e.

- ◆ Mode 1 Common alarm
- ◆ Mode 2 Two-stage alarm

If Mode 1 is selected, all alarm sounders are activated in any alarm condition.

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If Mode 2 is selected, the alarm sounders in the same zone as the activated device operate continuously (evacuate), and alarm sounders in all other zones operate intermittently (alert).

If a remote alarm signal is received, or the alarms are re-sounded after silencing, all sounders operate continuously.

Note. Mode 1 Common Alarm is the default mode. If this is the required mode of operation, no configuration is necessary.

To configure the alarm mode at access level 3:-

Step 1 Press 

Step 2 Enter the required alarm mode by pressing the appropriate number button, i.e.

1	Common alarm
2	Two-stage alarm

Alarm Input Configuration

This option enables the alarm input mode to be configured as 'class change' or 'remote alarm', i.e.

- ◆ Mode 1 Class Change (1)
- ◆ Mode 2 Remote Alarm (1)
- ◆ Mode 3 Class Change (2)
- ◆ Mode 4 Remote Alarm (2)

If Mode 1 is selected, the application of an 0V signal to the ALARM IP, when the panel is not in the fire state, activates all the sounders whilst the input is active. The sounders deactivate when the input is removed, or after 10s if the input is still active.

If Mode 2 is selected, the application of an 0V signal to the ALARM IP, when the panel is not in the fire state, activates all the sounders and lights the REMOTE ALARM LED on the panel fascia. When the input is removed the sounders are silenced and the panel is reset.


If Mode 3 is selected, the operation is as Mode 1 except that the time-out does not occur.

If Mode 4 is selected, the operation is as Mode 2 except that the Remote Fire output is not activated. This option is useful when linking systems, to ensure that they can be successfully reset following an event.

Note. Mode 1 Class Change is the default mode. If this is the required mode of operation, no configuration is necessary.

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To configure the alarm input mode at access level 3:-

Step 1 Press 

Step 2 Enter the required alarm input mode by pressing the appropriate number button, i.e.

1	Class Change	(1)
2	Remote Alarm	(1)
3	Class Change	(2)
4	Remote Alarm	(2)

Repeater Zone Output Configuration

This option enables the zonal repeater output to operate in one of two modes, as follows:

- ◆ Mode 1 Zone output is active in a Fire condition (default)
- ◆ Mode 2 Zone output is active during the checking period of a 'dwelling zone' (see also Checkpoint configuration).

Note. Mode 2 is only applicable to Twinflex *plus* panels and indicates a 'pre-alarm' condition. In this mode a Fire condition is not indicated and therefore it is not suitable for 'normal' repeater applications.

Refer to Checkpoint Configuration for details.

Before Continuing

When the panel is proved to be operating correctly, and the options described above have been configured as required, isolate the mains supply and disconnect the battery before proceeding to the next stage of commissioning.

Configuring the Field Devices

Introduction

Before the external circuits are connected to the panel it is recommended that the connections to all field devices are completed and that devices, e.g. detectors, are configured for the application, i.e. smoke mode, heat mode, etc.

If the default mode (see below) is acceptable, and there are no other special requirements for the installation, proceed to the next section.

The instructions in this section apply to a standard installation. If the Checkpoint facility is provided refer to the Checkpoint Configuration section for supplementary information.

Multipoint Detector

Before fitting the Multipoint 2-wire detector to its base it should be configured for the required application mode according to its position in the installation.

Note. The default detector mode is SMOKE 2.

The application mode information will be contained in instructions provided by the system planner, or indicated on the system drawings. If this information is not available, then the commissioning engineer should select the appropriate mode, referring to the Multipoint Applications chart in this manual if necessary.

Firstly, determine if the detector at a given position requires an integral sounder or not, and select a detector accordingly.

The operating modes are selected by setting the 8-way DIL switch located on the top side of the electronics module, before it is plugged into the base unit. Each switch should be set to either ON (1) or OFF (0) as indicated in Table 1 on page 24.

The module is removed, if necessary, by use of the special key provided (see Figure 11).

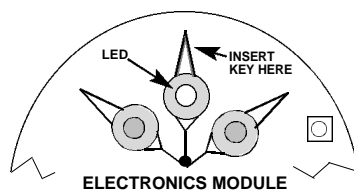
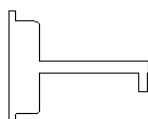


Figure D: Insert key in slot and turn clockwise to position and pull gently.



ELECTRONIC MODULE REMOVAL KEY

Figure 11 - Electronics Module

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The electronics module is factory preset as follows:

- ◆ EOL disabled
- ◆ Smoke 2
- ◆ Sound 2
- ◆ Normal volume

If the detector is the last device on the zone circuit, the EOL signal must be enabled as indicated in the table.

The detector application mode selected should be marked on the label on the electronics module. If a heat mode is selected, the supplied 'HEAT' label should be prominently displayed on the exterior of the base unit.

Once the application mode has been set, the electronics module is plugged into the base via the 4-pin connector located on the underside of the module.

After the electronics module has been plugged into the base, the detector head is fitted to the base assembly by aligning the key notch with the head release catch (see Figure 12).

Note. The head insertion/removal tool (available separately) must be used to release the head from the base assembly.

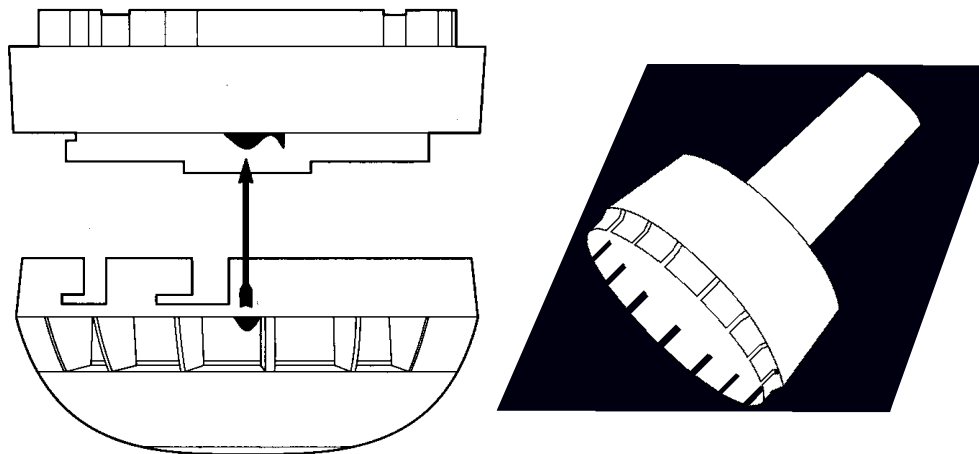


Figure 12 - Detector Mounting and Head Removal Tool

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Multipoint Detector and Sounder Mode Settings

Table 1

		DIL SWITCH SETTING							
		1	2	3	4	5	6	7	8
EOL Signal	Disabled	0							
	Enabled	1							
Detector Mode	Disabled			0	0	0			
	Smoke 1			1	0	0			
	Smoke 2			0	1	0			
	Smoke 3			1	1	0			
	Heat 1			1	0	1			
	Heat 2			0	1	1			
	Heat 3			1	1	1			
	Smoke 2/Heat 2 Combined			0	0	1			
Checkpoint *	Logical link disabled		0						
	Logical link disabled		1						
Sounder Mode	Disabled						0	0	
	Sound 1 (Continuous 970 Hz)						1	0	
	** Sound 2 (Alternate 800/970 Hz)						0	1	
	** Sound 3 (Sweep 800 to 970 Hz)						1	1	
Sounder Volume	Low 75 dB (A)								0
	Normal 90 dB (A)								1

* Refer to Checkpoint Configuration

** The device can alternatively be supplied with Sound 2 as a 'slow whoop' (500 to 1200 Hz), and Sound 3 as a 'DIN Tone' (1200 to 500 Hz).

Manual Call Point

The front part of the call point containing the electronics module connects to terminals in the back box via flying leads (red to Zone + and blue to Zone -).

If the device is the last in the zone circuit, set the EOL switch to ON.

Hatari Twinflex Sounder

The sounder simply plugs into the base. Before fitting, set the EOL switch to ON if the device is the last in the zone circuit.

The sounder volume can be adjusted by turning the control with a small screwdriver. However, it is recommended that no adjustments are made until the system has been fully commissioned and tested, and the ambient noise levels established.

The sounder must be removed by means of the insertion/removal tool (see Figure 12).

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Output Unit

If the device is the last in the zone circuit, set the EOL switch to ON.

Note. This device requires a remote 24V supply in order to function. If a simple switching function is required then the supply may be derived from the control panel auxiliary supply (subject to wiring considerations). If the device is used to control, for example door holders or dampers, then a suitable separate supply should be used.

The output unit provides a volt-free changeover relay contact which can be used to interface with plant, or switch voltage to ancillary items (see Figure 13).

In addition, a fault input is provided. The input monitors a normally closed contact and can be used, for example, to monitor the remote power supply 'power fault' condition.

If the input is not used, then the terminals must be fitted with a wire link.

Note. Do not power the output unit from the zone circuit.

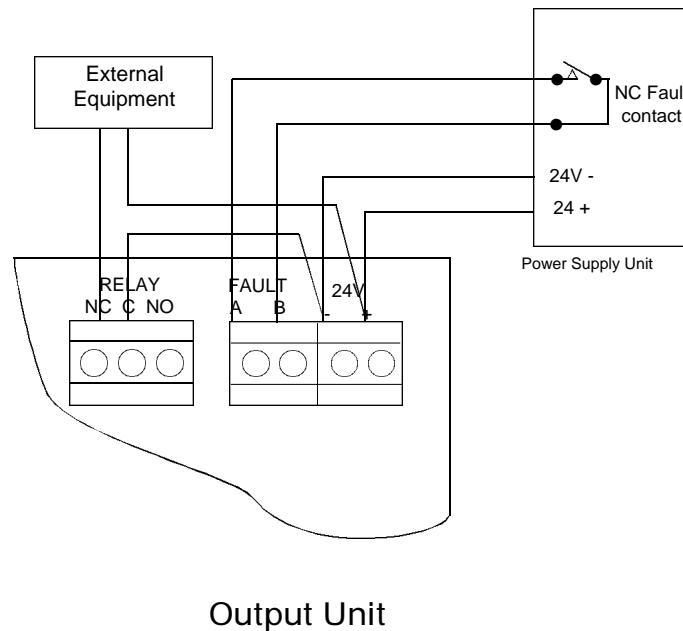


Figure 13 - Typical Output Unit Connection Detail

Connecting the External Circuits

General

Before connecting the external circuits to the panel ensure that the following conditions apply:-

- ◆ There is wiring continuity between the panel and the last device on the zone.
- ◆ Polarity has been observed.
- ◆ The last device on the zone has been configured as the EOL.
- ◆ Detectors have been configured for the required operation.
- ◆ All devices are fitted.
- ◆ Auxiliary power is available where necessary.
- ◆ The panel has been configured for the installation.

Ensure that all circuits are connected before powering up the panel.

Zone Circuits

Connect the zone wiring to the relevant zone terminals, observing the correct polarity.

Conventional Sounder Circuit

Remove the 4K7 EOL resistor from the CONV SOUNDER or SOUNDER terminals and connect the sounder wiring, observing the correct polarity.

Fit the 4K7 EOL resistor in parallel with the circuit at the last device on the zone.

Remote Fire Output

Remove the 4k7 EOL resistor from the REMOTE FIRE terminals and connect the circuit, observing the correct polarity. Fit the 4k7 EOL resistor in parallel with the circuit at the remote equipment.

Alarm/Class Change Input

This input requires a switched 0V to make it active (refer to panel Configuration).

Common Fire Output

The FIRE terminals provide a volt-free changeover contact which operates when the common FIRE LEDs are lit.

Common Fault

The FAULT terminals provide a volt-free changeover contact which operates when the common FAULT LED is lit.

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Repeater

The following inputs and outputs are provided to facilitate the connection of a repeater panel:

Table 2

	2/4 Zone Panel		8 Zone Panel	
	Term	Function	Terms	Function
Zone Outputs	1-4	Switched 0V on device alarm	Z1-8	Switched 0V on device alarm
Fault Output	FAULT	Switched 0V on fault condition	A	Switched 0V on fault condition
Reset Output	-	N/A	B	Switched 0V for 200ms on reset
Silence Input	SIL	Silences the alarms when 0V is applied, in the fire state.	D	Silences the alarms when 0V is applied, in the fire state.
Reset Input	RESET	Resets the panel when 0V is applied, if alarms are silenced	E	Resets the panel when 0V is applied, if alarms are silenced
Evacuate Input	EVAC	Puts panel in fire state when 0V is applied, or - If panel is in fire state with alarms silenced, resounds the alarms	F	Puts panel in fire state when 0V is applied, or - If panel is in fire state with alarms silenced, resounds the alarms

Re-applying Power

1. Switch on the mains supply.
2. Connect the battery leads to the appropriate battery terminals, observing polarity.

The panel will commence normal operation within 45 seconds.

The POWER LED should be lit. All other LEDs should be unlit.

If any faults or abnormal conditions are indicated they should be investigated and rectified before attempting to test the panel. If necessary refer to Fault Conditions on page 35.

Detector Power Up

The detector electronics and software require a one minute settling period before the detector is fully functional. This also applies if the detector head is removed and refitted while the device is powered.

The device LED (and any remote LED) provide the following indications:

- | | |
|--------------------------|------------------------|
| 1. Normal operation | LED flashes every 20s |
| 2. EOL device | LED flashes every 5s |
| 3. Detector head removed | LED flashes every 1.3s |
| 4. Alarm condition | LED steady ON. |

Detector Limitations

Do not power up the electronics module without the detector head fitted.

Do not attempt to change the DIL switch settings without removing the detector head.

After replacing a detector head on a powered zone, wait at least 60s before testing the device.

To change a detector head on a powered zone:

- ◆ Remove the existing detector head
- ◆ Wait until 'detector head removed' is indicated by the device
- ◆ Fit the new detector head
- ◆ Wait at least 30s before testing the device or powering down the zone.

Do not leave a detector head off if the zone is powered. To prevent false alarms during maintenance work or redecoration, disable the detector via the DIL switch, or disable the zone via the control panel, and fit a dust cover to prevent the optical chamber from becoming contaminated with airborne particles.

Testing the External Circuits

The following tests are intended to ensure that the panel is correctly monitoring the external circuits and is able to report faults.

If in doubt about the panel operation, refer to the Operation section that follows.

CAUTION. WHEN SHORTING TERMINALS FOR TEST PURPOSES, IT IS IMPORTANT TO AVOID INTERMITTENT SHORTS AS THIS CAN DEFEAT THE CIRCUIT PROTECTION AND DAMAGE THE ELECTRONICS.

Ensure that the system returns to normal operation between each test, and note that up to 60s can elapse before the simulated condition is reported.

1. To check the zone monitoring, remove a detector head. Within 10s the FAULT LED is lit, the relevant ZONE FAULT/DISABLE/TEST LED flashes slowly (1s on, 3s off), and the internal buzzer pulses.
2. To check the open circuit monitoring of a zone, disconnect one of the circuit conductors from the zone terminals. Within 60s the FAULT LED is lit, the relevant ZONE FAULT/DISABLE/TEST LED flashes slowly (1s on, 3s off), and the internal buzzer pulses.
3. To check the short circuit monitoring of a zone, short the zone + and - terminals. Within 60s the FAULT LED is lit, the relevant ZONE FAULT/DISABLE/TEST LED flashes slowly (1s on, 3s off), and the internal buzzer pulses.
4. To check the open circuit monitoring of the conventional sounder output, disconnect one of the circuit conductors from the terminal. The FAULT and SOUNDER LEDs light, and the internal buzzer pulses.

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5. To check the short circuit monitoring of the conventional sounder output, short the circuit + and - terminals. The FAULT and SOUNDER LEDs light, and the internal buzzer pulses.
6. To check the open circuit monitoring of the remote fire output, disconnect one of the circuit conductors from the terminal. The FAULT and the REMOTE FIRE FAULT/DISABLE LEDs light, and the internal buzzer pulses.
7. To check the short circuit monitoring of the remote fire output, short the circuit + and - terminals. The FAULT and the REMOTE FIRE FAULT/DISABLE LEDs light, and the internal buzzer pulses.
8. To check the battery supply, disconnect the mains supply. Within 10s the FAULT LED lights, the POWER FAULT LED flashes, and the internal buzzer pulses.
9. To check the charger circuit, disconnect the battery. Within 60s the FAULT and POWER FAULT LEDs light, and the internal buzzer pulses.

Note. The common fault output is active whenever the FAULT LED is lit. The fault buzzer can be silenced by operating the BUZZER SILENCE push-button at access level 2.

Testing the Field Devices

Multipoint Detector

To test a detector that has been set to Smoke 1 or Smoke 2 use a 'No Climb' SOLO 300 tester, or equivalent product, in accordance with the manufacturer's instructions.

To test a detector that has been set to Smoke 3 spray the detector with 'No Climb' SURETEST, or an equivalent product, in accordance with the manufacturer's instructions; then immediately fit a dust cover. The detector will go into alarm within 90 seconds.

If a detector that has been set to one of the smoke modes indicates 'Detector Head Removed' when it is tested, wait for the fault to clear and then repeat the test procedure.

Note. This is an anomaly of the test procedure and does not affect the performance of the detector in a real fire.

To test a detector that has been set to a Heat mode, use a 'No Climb' SOLO 400 tester, or an equivalent product, in accordance with the manufacturer's instructions.

Manual Call Point

To test the call point, insert the test key provided with the unit in the slot in the lower edge of the front cover as indicated in Figure 14, and gently push the key in until the glass pane drops.

When the control panel has recognised the device activation, remove the test key and, if necessary, silence the alarms and reset the panel.

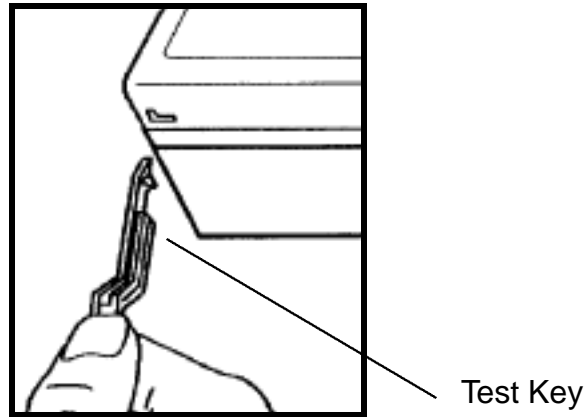


Figure 14 - Manual Call Point Test Key

Output Unit

When the panel enters the fire state, e.g. by the activation of a detector or call point, confirm that the output unit relay operates and the ACTIVE LED is lit.

Reset the panel and confirm that the relay output is de-activated and the ACTIVE LED is cancelled.

Note. Silencing/resounding the alarms does not affect the state of the device.

Open the normally closed fault circuit and confirm that the FAULT LED lights and that the panel indicates a fault condition on the relevant zone.

Isolate the 24V supply to the unit and confirm that the panel indicates a fault condition.

Operation

Introduction

This section describes the operation of the panel in response to fire and fault conditions, operator actions required to process alarms and restore the panel to the normal state, and engineering functions such as testing and system configuration.

The panel controls and indicators are basically the same for the 2/4 and 8 zone panels; however, they are arranged slightly differently (refer to the fascia layout drawings at the end of the manual).

Unless otherwise stated, the functions and operator actions described apply to all panels.

Normal State

In the normal state, i.e. no fire, fault or active conditions existing, the POWER LED is lit (access level 1).

If the panel is at access level 2 the CONTROLS ENABLED LED is lit.

If the panel is at access level 3 the CONTROLS ENABLED LED flashes (1s on, 1s off), and the buzzer is pulsed (1s on, 3s off).

Active State

The panel enters the active state when:-

- ♦ a fault is detected
- ♦ a panel function is disabled
- ♦ a zone is in test mode

Fire State

The panel enters the fire state when:-

- ♦ a device alarm is detected
- ♦ the SOUND ALARMS button is pressed
- ♦ the repeater evacuate input is activated
- ♦ the alarm input is activated (Mode 2)

Fatal Error

The panel enters the fatal error state when the CPU fails or a program memory checksum fault is detected.

Access Levels

There are three access levels on both the 2/4 zone and the 8 zone panel, and the facilities provided each access level are similar; however, the method of gaining access and the level 3 configuration options are different and are described separately.

2/4 zone panel

At access level 1 the operator can:-

- view the indicators and enter the access level 2 PIN.

At access level 2 the operator can:-

- sound the alarms (evacuate)
- silence the alarms
- reset the panel
- silence the buzzer
- disable the remote fire output
- disable the alarms
- disable a zone
- test the LEDs
- enter the access level 3 PIN.

At access level 3 the operator can:-

- configure the number of active zones.

To change to access level 2 from level 1:

Step 1 Press 

Step 2 Enter the access level 2 PIN (XXX).

If an incorrect PIN is entered, press ALT and re-enter the PIN.

At access level 2 the CONTROLS ENABLED LED is lit.

Note. The panel reverts to access level 1 if no button is pressed for 30s.

To change to access level 3 from access level 2:

Step 1 Press 

Step 2 Enter the access level 3 PIN (XXXX).

If an incorrect PIN is entered, press ALT and re-enter the PIN.

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At access level 3 the CONTROLS ENABLED LED pulses 1s on, 1s off.

Note. The panel reverts to access level 1 if no button is pressed for 30s.

8 zone panel

At access level 1 the operator can:-

- view the indicators and change to access level 2 by operating the key-switch on the panel fascia.

At access level 2 the operator can:-

- sound the alarms (evacuate)
- silence the alarms
- reset the panel
- silence the buzzer
- disable the remote fire output
- disable the alarms
- disable a zone
- test the LEDs
- enter the access level 3 PIN.

At access level 3 the operator can:-

- configure the number of active zones.
- configure the alarm mode.
- configure the alarm input mode.

To change to access level 2 from level 1:

Set the key-switch to ON.

At access level 2 the CONTROLS ENABLED LED is lit.

To revert to access level 1 from access level 2 or access level 3, turn the key-switch OFF.

To change to access level 3 from access level 2:

Step 1 Press



Step 2 Enter the access level 3 PIN (XXXX).

If an incorrect PIN is entered, press button **6** to cancel the operation and then repeat the above steps.

At access level 3 the CONTROLS ENABLED LED flashes 1s on, 1s off and the buzzer pulses.

Note. The panel reverts to access level 1 if no button is pressed for 30s.

Fire Alarm

Device Alarm

The following actions occur when the panel enters the fire state on receipt of a signal from a detector or manual call point:

- ◆ The common FIRE LEDs are lit
- ◆ The relevant zone DETECTOR ALARM LED flashes **or** the BREAKGLASS ALARM LED is lit, depending on the activated device
- ◆ The buzzer pulses (1s on, 1s off)
- ◆ Sounders are activated
- ◆ The REMOTE FIRE ACTIVE LED is lit.
- ◆ The remote fire output is activated
- ◆ The FIRE contact operates
- ◆ The relevant repeater output is activated

Remote Alarm

The following actions occur when the panel enters the fire state on receipt of a signal from the remote alarm input in Mode 2 (see Configuring the Panel):

- ◆ The common FIRE LEDs are lit
- ◆ The buzzer pulses (1s on, 1s off)
- ◆ Sounders are activated
- ◆ The REMOTE ALARM LED is lit.
- ◆ The FIRE contact operates

Silence Alarms

To silence the alarms at access level 2:



The alarms are silenced and the ALARMS SILENCED LED is lit. The buzzer continues to pulse.

If a subsequent fire alarm signal is received, or the SOUND ALARMS button is pressed, the alarms are re-energised and the ALARMS SILENCED LED is cancelled.

Reset System

To reset the panel from the fire state at access level 2:



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All detectors are reset and the panel reverts to either the normal state (no faults / disablements / tests), or the active state (one or more faults / disablements / tests).

Note. The panel cannot be reset until the alarms are silenced.

If the fire alarm condition still exists, e.g. broken glass in manual call point or remote input active, the panel reverts to the fire state.

Sound Alarms (Evacuate)

The following actions occur when the SOUND ALARMS button is pressed at access level 2, or the remote evacuate input is active:

- ◆ The common FIRE LEDs are lit
- ◆ The buzzer pulses (1s on, 1s off)
- ◆ Sounders are activated
- ◆ The REMOTE FIRE ACTIVE LED is lit.
- ◆ The remote fire output is activated
- ◆ The FIRE contact operates

To sound the alarms at access level 2:



Silence Buzzer

To silence the buzzer at access level 2:



The buzzer is silenced and the BUZZER SILENCED LED is lit.

If a subsequent fire alarm or abnormal condition occurs, the buzzer is re-energised and the BUZZER SILENCED LED is cancelled.

Fault Conditions

General

When a fault is detected the panel performs the following functions:

- ◆ The common FAULT LED is lit
- ◆ The appropriate fault LED is flashed/lit
- ◆ The buzzer is pulsed slowly (1s on, 3s off)
- ◆ The fault output is activated
- ◆ The repeater fault output is activated

Note. Fault indications reset automatically when the condition clears, except where stated otherwise.

The buzzer can be silenced if required by operating the BUZZER SILENCE button at access level 2.

Zone Fault

When a zone fault is detected the appropriate ZONE FAULT / DISABLE / TEST LED is flashed.

A zone fault is indicated if:

- a detector head or sounder is removed or is incorrectly fitted
- a detector head has reached its contamination limit (this fault occurs over a time interval which depends on the detector's environment)
- no device has been set to EOL on an active zone (*LED flashes at same rate as buzzer*)
- more than one device has been set to EOL on an active zone (*LED flashes quicker than buzzer*)
- an output unit fault input is open circuit and/or there is no 24V supply
- the zone wiring has a short circuit
- the zone wiring has an open circuit

Note. A zone fault caused by the removal of a detector head or sounder clears automatically within 60s of the detector head being replaced.

System Fault

When a system fault is detected, the SYSTEM FAULT LED is lit.

A system fault is indicated if:

- the CPU is reset (SYSTEM FAULT LED flashes)
- a configuration memory checksum fault is detected
- a program memory checksum fault is detected
- the CPU fails

A system fault caused by a CPU reset can be cleared by pressing the RESET SYSTEM button at access level 2.

A system fault caused by a configuration memory checksum fault can be cleared by reconfiguring the number of active zones as described on page 19.

A system fault caused by program memory checksum fault or a CPU failure cannot be cleared and must be reported to the supplier.

Power Fault

When a mains supply fault is detected the POWER FAULT LED is flashed (1s on, 1s off).

When a battery supply or charger fault is detected the POWER FAULT LED is lit.

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Sounder Fault

When a conventional sounder output fault is detected the SOUNDER FAULT LED is lit

A sounder fault is indicated if:

- the sounder wiring has a short circuit
- the sounder wiring has an open circuit
- the 4K7 EOL resistor is not fitted

Remote Fire Fault

When a remote fire output fault is detected the REMOTE FIRE FAULT / DISABLE / TEST LED flashes.

A remote fire output fault is indicated if:

- the sounder wiring has a short circuit
- the sounder wiring has an open circuit
- the 4K7 EOL resistor is not fitted

Earth Fault

When an earth fault is detected the EARTH FAULT LED is lit.

An earth fault is indicated if there is a path to earth from any system wiring.


Panel Functions

Test Mode

The test mode enables devices on a selected zone to be tested without the need to reset the panel after each activation.

To put the panel into test mode at access level 2:

Step 1 Press 

Step 2 Enter the zone number, e.g. for zone 2 press 

When in test mode, the TEST LED and the selected ZONE FAULT / DISABLE / TEST LED are lit and the buzzer pulses slowly.

When a device alarm is detected from a zone in test mode, the FIRE LEDs are lit, the alarms are activated, and the buzzer is pulsed quickly. After 4-5s the alarms are silenced and the ALARMS SILENCED LED is lit. After a further 4s the system is reset.

To cancel the test mode at access level 2 and revert to the normal state, repeat steps 1 and 2.

Note. The following functions require the 'Access' button to be pressed, either on its own or in conjunction with other buttons. The access button is labelled ALT on the 2/4 zone panel and 6 on the 8 zone panel, and for simplicity is referred to as the ACCESS button in the following instructions. Other buttons are referred to by their number.

Lamp Test

To test the panel LEDs at access level 2:

Press and hold the ACCESS button for a minimum of 5s.

All LEDs are lit.

Disable Remote Fire Output

To disable the remote fire output at access level 2:

Step 1 Press and hold the ACCESS button.

Step 2 Press button 1.

The remote fire output is disabled, the DISABLE and the REMOTE FIRE FAULT / DISABLE / TEST LEDs are lit and the buzzer is pulsed slowly.

To enable the remote fire output at access level 2, repeat steps 1 and 2.

Disable Alarms

To disable the alarms at access level 2:

Step 1 Press and hold the ACCESS button.

Step 2 Press button 3.

The alarms are disabled, the DISABLE and ALARMS DISABLED LEDs are lit and the buzzer is pulsed slowly.

Note. If a device enters the fire state, although no alarms sound the SILENCE ALARMS button must be pressed before the system can be reset.

Disable Zone (Access Level 2)

To disable a zone at access level 2:

Step 1 Press and hold the ACCESS button.

Step 2 Press button 5.

Step 3 Release both buttons and press the relevant zone number button, e.g. for zone 2 press 2.

The selected zone is disabled, the DISABLE and the relevant ZONE FAULT / DISABLE / TEST LEDs are lit and the buzzer is pulsed slowly.

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Note. Disabling a zone does not disable the zone sounders or output units.

To enable a zone at access level 2, repeat steps 1 to 3.

Disable Zone (Access Level 3) [8 Zone Panel]

To disable a zone circuit at access level 3:

Step 1 Press and hold the ACCESS button.

Step 2 Press button 5.

Step 3 Release both buttons and press the relevant zone number button, e.g. for zone 2 press 2.

The zone circuit is disabled, the DISABLE LED flashes quickly, the selected ZONE FAULT / DISABLE / TEST LED is lit, and the buzzer is pulsed slowly.

Note. 1. Disabling a zone circuit at access level 3 disables all devices on the zone including sounders and output units.
2. The panel does not monitor a disabled zone for an EOL signal.

To enable a zone circuit at access level 3, repeat steps 1 to 3.

Check Configuration

The current configuration of a panel can be checked at access level 3 as follows:

Number of Active Zones

Press 

The ZONE FAULT / DISABLE / TEST LED for each active zone is lit.

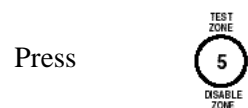
Alarm Configuration

Press 

The ZONE FAULT / DISABLE / TEST LEDs represent the mode, i.e. Zone 1 LED lit = Mode 1, and Zones 1 and 2 LEDs lit = Mode 2

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Alarm Input Configuration



The ZONE FAULT / DISABLE / TEST LEDs represent the mode, i.e.

- ◆ Zone 1 LED lit = Mode 1
- ◆ Zone 1 and 2 LEDs lit = Mode 2
- ◆ Zone 1, 2 and 3 LEDs lit = Mode 3
- ◆ Zone 1 to 4 LEDs lit = Mode 4.

Note. The panel reverts to normal operation (access level 1) if no button is pressed for 5 minutes - or enter access code again to immediately revert to access level 1.

Refer to page 20 for description of Alarm Input modes.

Checkpoint Configuration

Introduction

The instructions in this section apply to the Twinflex *plus* control panel with Checkpoint facility, and are supplementary to the instructions in the previous sections.

The Checkpoint facility enables zones to be separately configured as Communal or Dwelling zones. It is assumed that the zones have been cabled as necessary to provide the required operation and that the commissioning engineer is in possession of the relevant information to enable the system to be configured as required.

If in doubt refer to the Application Guide, or the supplier.

Panel Variants

Twinflex *plus* control panels with Checkpoint facility can be supplied to function in accordance with the requirements of either BS EN 54-2 & 4 : 1997, or BS 5839-6 : 1995.

The following differences apply depending on the variant supplied, in order to comply with the appropriate standard:

Silence Buzzer

The internal buzzer in the BS 5839-6 variant cannot be silenced in the following conditions:

- the alarms have been silenced
- a CPU reset has been detected

Internal Controls

When the 'write protect' switch (S1) of the BS 5839-6 variant is OFF the configuration memory is write-protected; when it is ON the memory is write-enabled.

Power Supply

The POWER LED is normally lit to indicate that the mains supply is present. On the EN 54 variant it is also lit when the panel is operating on battery supply only.

System Fault

The SYSTEM FAULT LED flashes quickly (1s on. 1s off) when a CPU reset is detected. It is lit when one or more of the following faults is detected:

- ◆ Configuration memory write-protect fault (BS 5839-6 variant)
- ◆ Configuration memory checksum fault
- ◆ Configuration memory protection fault (BS 5839-6 variant)
- ◆ Program memory checksum fault
- ◆ Fatal error

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The fault indication is cancelled when the system is reset after all system faults have been cleared.

The following systems faults cannot be cleared by the operator:

- ◆ Configuration memory protection fault (BS 5839-6 variant)
- ◆ Program memory checksum fault
- ◆ Fatal error

Zone Modes

Each zone on the system can be separately configured as a 'communal' zone or a 'dwelling' zone at access level 3.

Communal Zone

Communal zones are those covering general access areas such as entrance hallways, corridors, lounges, etc (see Figure 15).

The activation of a detector or call point in a communal zone generates an immediate alarm and energises the sounders on all zones.

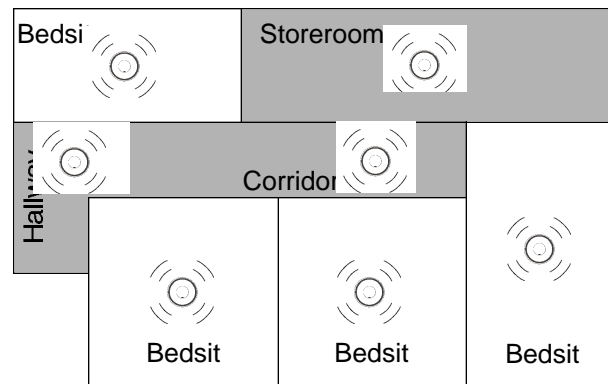


Figure 15 - Communal Zone (shaded) and Dwelling Zone

Dwelling Zone

In a dwelling zone the devices are located within private areas such as bedrooms, bed sitting rooms, apartments, hotel rooms, etc (see Figure 15).

Detectors in a dwelling zone can be configured as:

- single dwelling
- multiple dwelling

The dwelling zone shown in Figure 15 is a typical 'multiple' dwelling where each bedsit is separately occupied. The activation of a detector in a multiple dwelling zone initially activates its integral sounder only whilst the panel carries out confirmation checks.

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Figure 16 shows a typical 'single' dwelling zone where there are several rooms forming one occupancy, i.e. bathroom, bedroom, kitchen and lounge. The activation of one of the devices energises the integral sounder in all the detectors whilst the panel carries out confirmation checks.

The activation of a call point in a dwelling zone causes an immediate general alarm.

Logically Linked Detectors

Detectors in a multiple dwelling zone are logically-linked by setting DIL switch 2 on the electronics module to ON (see Table 1 on page 24).

Note. The 'single dwelling' and 'multiple dwelling' zone options generally apply to a complete zone; however, with the multiple dwelling option, if switch 2 is OFF on a particular detector it will operate in conjunction with the activated detector. This feature may be useful where, for example, there is a warden's flat, or similar.

Confirmation Checks

When a detector on a dwelling zone is activated, the integral sounder, or sounders, are energised for a configurable period. During this period the panel carries out a number of confirmation checks, depending on the configuration, following which it either silences the sounders, if the detector is no longer in the fire state, or generates a full alarm if the detector is still active.

The number of checks carried out by the panel can be in the range 1 to 5, with each check period having a duration of approximately one minute. Therefore the maximum checking period is in the order of 5 minutes during which time the local sounder is energised. If a zone fault is detected during the checking period an alarm will result.

No alarm is indicated at the control panel during the confirmation period.

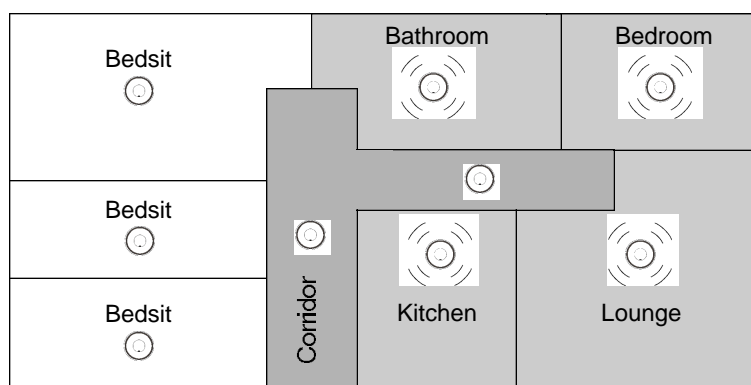


Figure 16 - Typical Dwelling Zone with Single Occupancy




Note. Stand-alone sounders on dwelling zones are not energised until the detector alarm is confirmed.

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Configuration

Zone Mode

To configure the zone mode at access level 3:

- Step 1 Press and hold 
- Step 2 Press 
- Step 3 Release both buttons and enter the zone number, e.g. 

Subsequent operations of the selected zone number button toggle the zone mode between communal and dwelling, i.e.




- ◆ Communal zone ZONE FAULT / DISABLE / TEST LED Off
- ◆ Dwelling zone ZONE FAULT / DISABLE / TEST LED On

Detector DIL Switch Setting

- ◆ Single dwelling DIL switch 2 OFF
- ◆ Multiple dwelling DIL switch 2 ON

Zone Checks

To configure the number of dwelling zone checks at access level 3:

- Step 1 Press and hold 
- Step 2 Press 
- Step 3 Release both buttons and enter the number of checks, e.g. 

Note. The number of dwelling zone checks can be in the range 1 to 5 and is common to all zones configured as dwelling zones.

Repeater Zone Output Configuration

This option enables the zonal repeater output to operate in one of two modes, as follows:

- ◆ Mode 1 Zone output is active in a Fire condition (default)
- ◆ Mode 2 Zone output is active during the checking period of a 'dwelling zone'.

To configure the zone repeater output at access level 3:-

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Step 1 Press and hold the ACCESS button.

Step 2 Press button 2.

Step 3 Release both buttons and press the relevant zone number button, e.g.

1 = Mode 1 (Fire alarm output)

2 = Mode 2 (Pre-alarm output)

Refer to page 21 for a description of the repeater output modes.

Operation

Fire Alarm

The panel enters the fire state when:

- a detector alarm is detected on a communal zone, or a manual call point is activated on a dwelling zone
- a detector alarm on a dwelling zone is confirmed, i.e. the panel has carried out the programmed number of checks and has confirmed that the device is in the fire state
- the SOUND ALARMS button is operated
- the repeater evacuate input is active
- the alarm input is active (mode 2)

Note. If an EOL fault is detected on the zone during the confirmation period, the panel enters the fire state.

Processing an Alarm

All control functions, e.g. silence alarms, reset and evacuate, operate as described previously.

It is not possible to silence the local sounder operation during the confirmation period on a dwelling zone.

Battery Standby Capacity

2/4 Zone Panel

The panel will provide up to 72 hours standby, with sufficient capacity for 30 minutes alarm load at the end of this period, if two 2.1 Ah batteries are fitted. The following equation, based on known parameters, shows how this is achieved.

Panel current consumption in mains failed condition = 12 mA

$$\begin{array}{l} 72 \text{ hour standby} \quad 0.012 \times 72 = 0.864 \text{ A} \\ \text{Battery 2.1 Ah} \quad 2.1 - 0.864 = 1.236 \text{ Ah (remaining capacity)} \end{array}$$

Alarm period 0.5 hours x Alarm current @ 900 mA (maximum panel loading)

$$\text{Remaining capacity } 1.236 - (0.5 \times 0.9) = 0.786 \text{ Ah}$$

8 Zone Panel

The panel will provide up to 36 hours standby, with sufficient capacity for 30 minutes alarm load at the end of this period, if two 3.3 Ah batteries are fitted. The following equation, based on known parameters, shows how this is achieved.

Panel current consumption in mains failed condition = 40 mA + 2.5 mA per zone (60 mA maximum)

$$\begin{array}{l} 36 \text{ hour standby} \quad 0.06 \times 36 = 2.16 \text{ A} \\ \text{Battery 3.3 Ah} \quad 3.3 - 2.16 = 1.14 \text{ Ah} \end{array}$$

Alarm period 0.5 hours x Alarm current @ say 1A

$$\text{Remaining capacity } 1.14 - (0.5 \times 1.0) = 0.64 \text{ Ah}$$

The panel will provide up to 96 hours standby, with sufficient capacity for 30 minutes alarm load at the end of this period, if two 7.2 Ah batteries are fitted. The following equation, based on known parameters, shows how this is achieved.

Panel current consumption in mains failed condition = 40 mA + 2.5 mA per zone (60 mA maximum)

$$\begin{array}{l} 96 \text{ hour standby} \quad 0.06 \times 96 = 5.76 \text{ A} \\ \text{Battery 7.2 Ah} \quad 7.2 - 5.76 = 1.44 \text{ Ah} \end{array}$$

Alarm period 0.5 hours x Alarm current @ say 1A

$$\text{Remaining capacity } 1.44 - (0.5 \times 1.0) = 0.94 \text{ Ah}$$

Fault Finding

General

Fault finding can be difficult and frustrating if not tackled methodically. The art of successful fault finding is elimination, with due regard to the circumstances immediately before the fault occurred.

Faults or abnormal conditions occurring during commissioning or testing can be eliminated or reduced by adopting the step-by-step approach described in the commissioning procedure. If a fault occurs you can be reasonably confident that it is a result of the last action.

It is important to establish that the panel is functioning correctly before connecting external circuits. If a fault is indicated when the circuits are connected, you know it is the circuit and not the panel. The faulty circuit is generally identified so that investigation is limited to a single zone.

To trace a fault on a particular zone, assuming it is not apparent by the operation of the detector LEDs (see chart), split the circuit roughly in half and configure the last device on the half still connected to the panel as the EOL. If the fault clears then you know that the fault is on the disconnected section. By extending the EOL towards the end of the circuit the location of the fault will eventually be revealed. If the fault still exists after splitting the circuit, it is obviously on the section connected to the panel and by moving the EOL towards the panel the fault can be located.

If the system has been commissioned and is operating correctly before a fault occurs, it can be assumed that something has subsequently happened to the panel or the external circuits to cause the fault. A similar step-by-step approach can be adopted to simplify the location process, e.g.

- ◆ If the fault is reported by the user, ask them to note **all** illuminated LEDs, not just the 'fault' indicator, and also ascertain if anything occurred immediately before the fault was reported that could be the cause, e.g. power failure, building works, furniture moving, etc.
- ◆ When attending to a fault, note all illuminated indicators and the buzzer tone before attempting to reset the panel. Carry out a visual examination of the relevant area, taking particular note of the detector LEDs, to determine if there are any obvious causes.
- ◆ Confirm whether the fault is on the panel or an external circuit by disabling the relevant zone (if applicable).
- ◆ Gradually eliminate sections of the system until the fault is located. In the case of an earth fault, for instance, it will necessary to disconnect each circuit in turn until the fault clears. Having established the circuit, it can be broken down as described above to locate the fault.

Fault Finding Chart

Fault Indication	Possible Cause	Corrective Action
ZONE / FAULT / DISABLE	Device or wiring fault on indicated zone - Detector contaminated. Output unit fault or loss of auxiliary 24V supply	Investigate circuit. Note any abnormal operation of detector LEDs. Identify location by breaking circuit down until fault is found. Refer to Zone Fault on p36.
SYSTEM FAULT	Control panel fault - refer to System Fault on p36.	Try resetting panel. If this fails contact supplier.
POWER FAULT	Mains, battery or fuse failure - refer to Power Fault on p36.	Check that the mains supply is healthy - if not wait until mains is restored and check that panel resumes normal operation. If mains supply is healthy and everything appears normal, contact supplier.
SOUNDER FAULT	Conventional sounder circuit wiring open or short circuit	Confirm that circuit is faulty by inserting EOL in panel and checking that fault clears. Break down circuit to locate fault.
REMOTE FIRE FAULT	Remote Fire circuit wiring open or short circuit	Confirm that circuit is faulty by inserting EOL in panel and checking that fault clears. Break down circuit to locate fault.
EARTH FAULT	Conductor in contact with earth, e.g. bad connection, faulty MICC cable termination, etc.	Isolate one circuit at a time from the panel until fault clears. Break down circuit to locate fault.

Technical Data

Specifications

	2/4 Zone Panel	8 Zone Panel
Dimensions (mm)	310W x 243H x 85D	315W x 400H x 90D
Weight (excluding battery)	2.3 kg	6.2 kg
Construction	ABS	Mild Steel
Cable entry	10 x 20 mm knockouts in metal insert	15 x 20 mm k/outs in top 11 x 20 mm k/outs in back
Detection zones	2 or 4	8
Devices per zone	32	32
Device protocol	2-wire	2-wire
Sounder circuits	1	1
Operating standard	BS EN 54-2 & 4	BS EN 54-2 & 4
Operating temperature	5°C TO 33°C	5°C TO 33°C

Ratings

	2/4 Zone Panel	8 Zone Panel
Mains voltage	230V AC +10% -15%	230V AC +10% -15%
PSU output (4 hour cont)	900 mA	3 A
Operating voltage (nominal)	24 V DC	24 V DC
Battery charger output	110 mA	550 mA
Battery voltage	27.6 V @ 20°C	27.6 V @ 20°C
Battery capacity (24h standby)	2 x 2.1 Ah	N/A
Battery capacity (72h standby)	2 x 2.1 Ah	2 x 7.2 Ah
Zone output (max)	250 mA	200 mA
Sounder output load (max)	500 mA fuse	800 mA
Sounder output EOL	4K7	4K7
Remote fire output load	250 mA	800 mA
Remote fire output EOL	4K7	4K7
Auxiliary 24V supply (max)	250 mA	800 mA
Repeater outputs	50 mA sink (do not exceed total of 280 mA)	50 mA sink (do not exceed total of 280 mA)
Fault output	50 mA switched 0V	50 mA switched 0V
Common Fire relay	VFCO contacts 1A @ 24V	VFCO contacts 1A @ 24V
Common Fault relay	VFCO contacts 1A @ 24V	VFCO contacts 1A @ 24V

Fuses

	2/4 Zone Panel	8 Zone Panel
Zone output	300 mA trip polyfuse	250 mA trip polyfuse
Sounder output	500 mA 20mm glass type F	1A 20mm glass type F
Remote fire output	300 mA trip polyfuse	1A 20mm glass type F
Auxiliary 24V supply	300 mA trip polyfuse	900 mA trip polyfuse
Mains	250 mA 20mm glass (SB)	315 mA 20mm glass (SB)
Battery	110 mA current limiter	550 mA current limiter
Battery (reverse polarity)	3.15 A 20mm glass type F	3.15A 20mm glass type F

Note. A poly-fuse is a self-resetting device.

Multipoint Applications

