V1.00

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Multizone 16-48

User & Installation Manual

IMPORTANT
This manual should be left with the panel after installation.

VRC TEROFIRE PRODUCTS

Introduction

The information provided in this manual covers the Multizone 16, 20, 24, 32, 36, 40 and 48 zone fire alarm control panels. The Multizone range is designed to meet the requirements of EN54 Parts 2 & 4.

This product should be installed, commissioned and maintained by suitably qualified service personnel with reference to IEE regulations and any statutory requirements.

Panel Features

- 15 characters of programmable text for system name, all sense zones, all alarm zones and both sets of auxiliary contacts.
- Text can be programmed from the front panel or with a VT100 compatible serial terminal.
- 16 event fire log.
- 16 event fault log.
- 4 alarm zones.
- One man test.
- Remote inputs.
- Two sets of volt free changeover contacts operable on fire.
- One set of volt free changeover contacts operable on fault.
- Head removal via zener clamp base.
- Head removal via diode base with active end of line (not supplied).
- Non-latching facility on all zones.
- Repeater output.
- Class change input to control all alarm zones.
- Class change inputs to control each alarm zone individually.
- 28V 250mA fused auxiliary supply, permanent and/or switched.

Installation Procedure

Before proceeding with the installation, please read the section *Panel Operation.*

 Installation of the panel should be carried out by qualified personnel.

Using the metal box as a template, mark the position of the fixing holes on the wall. Drill and plug the wall, then screw the panel to the wall. Ensure the panel is free from knockout discs, swarf and other debris.

Do not remove any end of line resistors from the panel until after the following test is performed.

With all end of line resistors fitted inside the panel, connect the panel mains supply to an exclusive 240V AC fused supply. Switch the mains supply on. The internal buzzer will sound. Connect two sealed lead acid batteries to the panel - they should be connected in series providing a 24V DC supply.

With both the mains and battery supplies connected, the panel should be silent and in its normal operating mode (power lamp on, alarms & buzzer silent). **If the panel shows CPU Fault, press the watchdog reset button inside the panel. If any other fault is indicated, refer to the fault finding section before proceeding.** Disconnect the batteries and switch off the mains supply. Remove the 3k3 end of line resistor from sense zone 1. Terminate sense zone 1 circuit wiring in the panel observing correct polarity and fit the end of line resistor at the extreme end of the circuit. Check that all the detectors and call points are correctly wired. With sense zone 1 connected and all other end of line resistors fitted inside the panel, connect the mains and battery supplies. **If the panel indicates a fault, refer to the fault finding section before proceeding**. Do not megger cables connected to either the panel or any field devices. If no faults are indicated then power down the panel and follow the same procedure with the additional sense zones and then the alarm zones. Adding the zones one at a time makes fault finding and commissioning much simpler. Make sure that no bare wires come into contact with the panel circuit boards during installation.

Detector Head Removal
The Multizone 16-48 range supports head removal. The basic principle of head removal is to ensure that all call points will function even if a detector head has been removed. Head removal requires either zener clamp bases or schottky diode bases with the appropriate end of line device to be fitted. When a detector head is removed, the panel will show a fault, but the sense zone circuit will remain intact. Consult the table on page 13 for further information.

Panel Operation - Basic

Enabling the front panel buttons.
Before being able to use the front panel buttons, the key switch in the top left of the panel must be turned to the 'On' position.

Silencing the internal buzzer
During a fire or fault condition the internal buzzer will sound. To silence the buzzer, press the Mute button.

Silencing/resounding the alarms.
If a fire is detected, the panel will automatically activate the alarm circuits. To silence the alarms, press the Silence button once. To resound the alarms, press the Silence button again.

Resetting the panel after a fire is detected.
To reset the panel after a fire event, ensure that the alarms have been silenced, then press the Reset button.

Panel Operation - Detailed

The more detailed panel functions are accessed through a system of menus. When the panel is in the normal condition, pressing the ⇧ and ⇩ buttons will scroll through the available menus. To select a particular menu, scroll through to that menu and press the Enter button. In the examples below, all user text will be assumed to be the factory default.

Please note: All menu functions will be automatically reset after approximately 10 minutes of inactivity. This ensures that the panel cannot be inadvertently left in test mode for example.

Test Menu.
Upon entering the Test Menu, the display will show the following:

```
           Zone 01
Tst Zone 01 [--]
```

To put zone 1 into test mode, press the Enter button. The display will change to:

```
        Zone 01
Tst Zone 01 [**]
```

Pressing Enter again will take zone 1 out of test mode.

To select other zones, scroll up/down using the ⇧ and ⇩ buttons.

When a zone is in test mode, a fire detected on that zone will sound the alarms for approximately 3 seconds before automatically resetting. This allows easy one-man testing of zones. If a fire is detected on a zone not in test mode, the panel will go into full fire mode immediately, exiting the Test Menu.

To exit the Test Menu, press the Reset button.

Disable Menu.
Upon entering the Disable Menu, the display will show the following:

```
        Zone 01
Dis Zone 01 [--]
```

To disable zone 1, press the Enter button. The display will change to:

```
        Zone 01
Dis Zone 01 [**]
```

and the Disable and Zone 1 Disable LEDs will be lit.

Pressing Enter again will re-enable zone 1.

To select other zones, scroll up/down using the ⇧ and ⇩ buttons. All sense zones, both sets of auxiliary contacts, and all alarm zones may be selectively disabled.

While a zone is disabled, it is effectively ignored. All inputs from the zone are masked off, and in the case of auxiliary contacts or alarm zones, outputs will not be activated.

To exit the Disable Menu, press the Reset button. If any zones have been disabled, the respective disable leds will remain lit.

Non-Latch Menu.
Upon entering the Non-Latch Menu, the display will show the following:

```
            Zone 01
    N/L Zone 01 [--]
```

To make zone 1 non-latching, press the Enter button. The display will
change to:

```
            Zone 01
    N/L Zone 01 [**]
```

Pressing Enter again will return zone 1 to normal latching mode.

To select other zones, scroll up/down using the ⇧ and ⇩ buttons.

To exit the Non-Latch Menu, press the Reset button.

If a zone is set to non-latching, it will go into fire as normal when triggered.
However, as soon as the triggering device resets, the panel will reset also.

Fault Menu.
The fault leds on the front of the panel give basic fault information. The
Fault Menu provides more detailed information on sense and alarm zone
faults.

Upon entering the Fault Menu, the display will show the following:

```
            Zone 01
    Flt Zone 01 [OK]
```

To view the status of other zones, scroll up/down using the ⇧ and ⇩
buttons.

There are 4 possible codes that describe each zone:

[OK] Zone is not in fault.
[SC] Short Circuit fault. A low resistance path exists across the zone.
[OC] Open Circuit fault. A high resistance path exists across the zone.
[HO] Head Out. A detector head has been removed (zener base only).

To exit the Fault Menu, press the Reset button.

Battery Status.
The Battery Status Menu provides a basic indication of the charge status of the batteries. The display will show the following:

```
Battery Voltage:
             27.20V
```

The voltage reading will be updated every few seconds. This feature is not intended to give a highly accurate measurement, rather a quick check on how the batteries are charging.

To exit the Battery Status Menu, press the Reset button.

Lamp Test.
Upon entering the Lamp Test Menu, the panel will proceed to light all the LEDs in turn.

View/Edit Text.
Upon entering the View/Edit Text Menu, the display will show the following:

```
Zone 01 Text:
     Zone 01
```

The text on the bottom line of the display is the user programmed text for zone 1. To view the text for other zones, use the ⇧ and ⇩ buttons.

To edit the text for a particular zone, zone 1 for example, first scroll to that zone. Press the Enter button, and the display will change to the following:

```
Zone 01 Text:
_    Zone 01
```

A cursor will appear at the left hand side of the bottom line. This is the current character position. To change the character, use the ⇧ and ⇩ buttons to cycle through all the available characters. Once the correct character has been selected, move along the line using the ⇦ and ⇨ buttons. Once the desired text has been entered, press the Enter button to return to view mode.

To exit the View/Edit Text Menu, press the Reset button.

View Fire Log.
The View Fire Log Menu allows the user to access the 16 event fire log. Upon entering this menu, the display will show the most recent fire event. If the most recent fire event had been on zone 15, the display would show:

```
        Zone 15
    Fire Log  [01]
```

To scroll through the log, use the ⇧ and ⇩ buttons. Fire Log [01] is the newest event in the log, while Fire Log [16] is the oldest event.

If a log entry is empty, it will be displayed as:

```
        ————
    Fire Log  [12]
```

Event logging is disabled during power faults to prevent the log from being corrupted if the power fails completely.

To exit the View Fire Log Menu, press the Reset button.

Clear Fire Log.
The Clear Fire Log Menu allows the user to erase all entries in the fire log. Upon entering this menu, the display will show the following:

```
    Clear Fire Log?
    ENTER to confirm
```

To abort without clearing the fire log, press the Reset button, otherwise press the Enter button.

If the Enter button is pressed, the fire log will be cleared and the display will show the following for a few seconds before exiting the Clear Fire Log menu:

```
    Fire Log
    Cleared
```

View Fault Log.
The View Fault Log Menu allows the user to access the 16 event fault log. Upon entering this menu, the display will show the most recent fault event. If the most recent fault event had been on zone 12, the display would show:

> Zone 12
> Fault Log [01]

To scroll through the log, use the ⇧ and ⇩ buttons. Fault Log [01] is the newest event in the log, while Fault Log [16] is the oldest event.

If a log entry is empty, it will be displayed as:

> ————
> Fault Log [09]

Event logging is disabled during power faults to prevent the log from being corrupted if the power fails completely.

To exit the View Fire Log Menu, press the Reset button.

Clear Fault Log.
The Clear Fault Log Menu allows the user to erase all entries in the fault log. Upon entering this menu, the display will show the following:

> Clear Fault Log?
> ENTER to confirm

To abort without clearing the fault log, press the Reset button, otherwise press the Enter button.

If the Enter button is pressed, the fault log will be cleared and the display will show the following for a few seconds before exiting the Clear Fault Log menu:

> Fault Log
> Cleared

Fault Finding

If a fault is detected on the panel, the Fault LED will be lit and the internal buzzer will be sounding. To silence the buzzer, press the Mute button. Specific information about the fault can be obtained from the Fault Menu (see page 6).

Front panel buttons bleeping, but not working.
To activate the front panel buttons, turn the keyswitch in the top left of the panel to the ON position.

Sense zone fault, fault LED lit.
Check the status of the faulty sense zone in the Fault Menu. Depending on the fault code, check the following:

• SC - Short Circuit
Check for short circuits and low resistance paths across the sense zone. Ensure the correct end of line has been fitted.

• OC - Open Circuit
Check for open circuits on the sense zone. Ensure the correct end of line has been fitted. If using standard bases or diode bases with an active end of line, check that no detectors have been removed.

• HO - Head Out
If using zener clamp bases, check that no detectors have been removed.

If all sense zones are in fault, check fuse F15 (VDET FUSE) on the power supply board,

If the fault persists, check all detectors and call points on the sense zone indicated. Check wiring is as in example diagrams and ensure the end of line monitor is a 3k3 resistor or an active end of line device.

Alarm zone fault, alarm fault LED lit, fault LED lit.
Check the status of the faulty zone in the Fault Menu. Depending on the fault code, check the following:

• SC - Short Circuit
Check for short circuits and low resistance paths across the alarm zone. Ensure the correct end of line resistor (10k) has been fitted.

• OC - Open Circuit

Check for open circuits on the alarm zone. Check that the alarm zone fuses are intact and that the fuse clips are secure. If the fuse clips are loose, remove the fuses, pinch the fuse clips together, and refit the fuses. Ensure the correct end of line resistor (10k) has been fitted.

PSU/Mains fault, fault LED lit.

If PSU Fault is lit, and Mains Fault is not lit, there is a fault in the battery circuit. Check that the batteries are in good condition and connected correctly (2 x 12V in series), and that that battery fuse F3 (BATT FUSE) is intact.

If PSU fault and Mains Fault are both lit, there is a fault with the mains supply. Check that mains is present at the mains terminal block inside the panel and that the fuse in the terminal block and fuse F23 (AC IN FUSE) are both intact.

Earth fault, fault LED lit.

The panel has detected an earth fault. The only earth connection to the panel terminals should be to the mains input terminal block. Check that no other earth connections are present.

28V Aux fault, fault LED lit.

Check that fuse F17 (28V) is intact. The 28V Aux Supply fuse also feeds the switched 28V contactor drive output, so drawing excessive current from those terminals can also blow this fuse.

Repeater supply fault, fault LED lit.

Check that fuse F18 (RPTR) is intact.

External fault, fault LED lit.

An external device connected to the panel is signalling fault. Check the external device for faults.

Fault LED and CPU fault LED lit.

Processor fault detected. If no other problems are found then reset the processor. Inside the panel are two push buttons marked CPU RESET and WATCHDOG RESET. Press CPU RESET followed by WATCHDOG RESET.

Panel does not indicate fire when a call point or detector is triggered.
Either a faulty call point/detector or wiring not as shown in diagrams.
Check the firing resistance of the device is 510 ± 200 ohms and ensure
that the correct end of line device is fitted.

Head removal not working.
Check compatible base is being used and is wired correctly. Either a zener
clamp base with a 3k3 end of line resistor, or a schottky diode base with an
active end of line device must be used.

LCD is not very clear.
There is a preset/pot on the back of the display board marked CONTRAST.
Adjust the contrast to give the best display.

Fuse ratings.
Mains fuse .... 2A A/S
Alarm fuses (F6-9, F11-14) ... 500mA A/S
Battery fuse (F3) .... 6.3A A/S
AC in fuse (F23) .... 8A A/S
Vdet fuse (F15) .... 1.6A A/S
28V AUX fuse (F17) .... 250mA A/S
Repeater supply fuse (F18) ... 500mA A/S

Fault output.
The volt free fault contacts operate whenever the panel goes into fault. The
contacts are rated 1A at 30V.

Other faults.
For any other faults, perform a CPU reset. Inside the panel are two push
buttons marked CPU RESET and WATCHDOG RESET. Press CPU
RESET followed by WATCHDOG RESET. This will restart the processor,
but certain configuration information (disable, non-latching) will have to be
re-entered.

Detector Base and Call Point Wiring Information

| Part Number	Terofire STB-4SDR	Hochiki YBK-R/5ZD	Hochiki YBN-R/4	Apollo S60 Diode Base	Apollo S60 Common Base	KAC Call Point	Fulleon Call Point	Resettable Call Point
Positive In	4	L1	2	L1 IN	L1 IN	1	470 Ohms	+ IN
Positive Out	4	L2	1	L1 OUT	L1 OUT	1	470 Ohms	+ OUT
Negative In	1	C5	5	L2	L2	2	COMMON	- IN
Negative Out	6	C6	6	L2	L2	2	COMMON	- OUT
Remote Indicator Positive	4	L1	N/A	L1 IN	L1 IN	N/A	N/A	N/A
Remote Indicator Negative	5	S3	N/A	-R	-R	N/A	N/A	N/A
End of Line Device	Active End of Line	3k3 Resistor	3k3 Resistor	Active End of Line	3k3 Resistor	To Suit Detector Base	To Suit Detector Base	To Suit Detector Base
Head Removal Supported	Yes	Yes	No	Yes	No			

Panel Specifications

	Multi 16	Multi 20
Mains Voltage (V AC)	240	240
System Voltage (V DC)	28	28
Quiescent Current, Unsilenced Fault (mA)	220	270
Quiescent Current, Unsilenced Fault & Fire (mA)	350	400
Minimum Battery Size 2 x 12V Required (Ah) (Derating factor of 1.25)	9	10
Detector Voltage (V DC)	21	21
Number of Sense Zones	16	20
Maximum Number of Detectors per Zone	20	20
Firing Resistance (Ohms)	510 ± 200	510 ± 200
Sense Zone End of Line (Ohms)	3k3	3k3
Alarm Voltage (V DC)	28	28
Number of Alarm Zones	4	4
Maximum Alarm Current per Zone (mA)	500	500
Max Number of Sounders per Zone @ 10mA	50	50
Alarm Zone End of Line (Ohms)	10k	10k
Maximum Auxiliary Supply Current (mA)	250	250
Panel Dimensions (mm)	410 x 380 x 120	556 x 470 x 120

Multi 24	Multi 32	Multi 36	Multi 40	Multi 48
240	240	240	240	240
28	28	28	28	28
310	380	430	470	530
440	510	560	600	660
12	Must be calculated for each installation.			
21	21	21	21	21
24	32	36	40	48
20	20	20	20	20
510 ± 200	510 ± 200	510 ± 200	510 ± 200	510 ± 200
3k3	3k3	3k3	3k3	3k3
28	28	28	28	28
4	4	4	4	4
500	500	500	500	500
50	50	50	50	50
10k	10k	10k	10k	10k
250	250	250	250	250
556 x 470 x 120	556 x 470 x 120	556 x 470 x 120	556 x 470 x 120	556 x 470 x 120

Sense Zone Wiring Diagrams

Find the detector bases you will be using in the table on page 13 and check to see which end of line device is required - either a 3k3 resistor or an active end of line unit. The 3k3 resistor should be used if a zone is comprised entirely of call points.

Sense zone with a 3k3 end of line resistor.
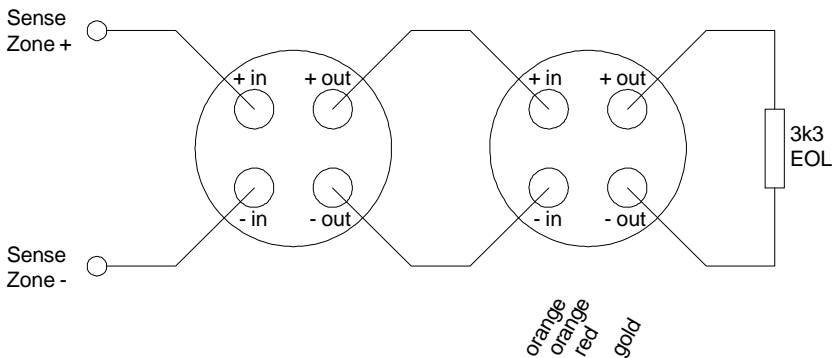
The colour bars on a 3k3 resistor are
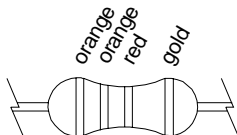
Sense zone with an active end of line.

The panel is supplied with 3k3 end of line resistors as standard. Active end of line units are available separately.

Remote indicator connection details are shown in the table on page 13.

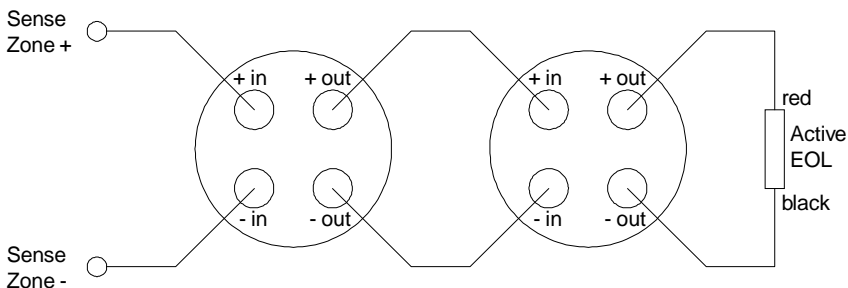## Alarm Zone Wiring Diagram

The alarm zones are wired as in the diagram below. A 10k end of line resistor must be fitted at the end of the circuit. Motorised fire bells may be used, but solenoid bells MUST NOT be connected to the panel.
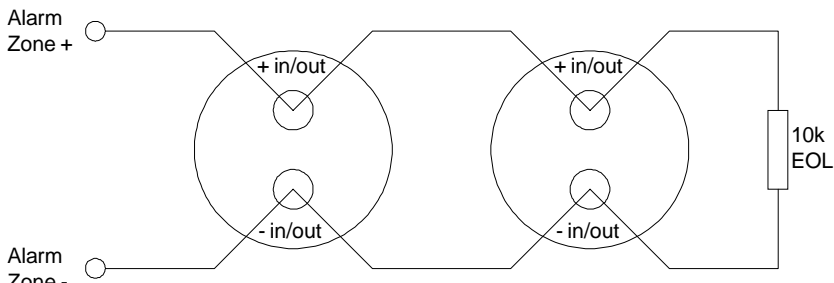
The colour bars on a 10k resistor are

brown black orange gold
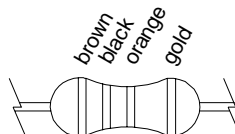
Attaching a relay to an alarm zone.
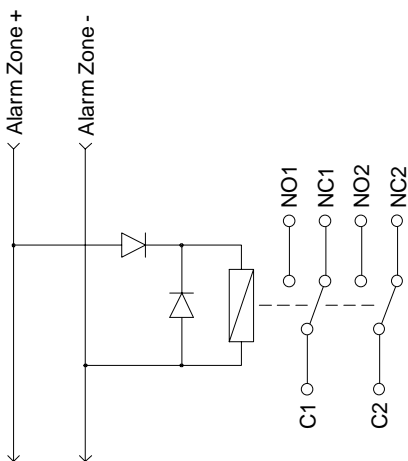
A relay may be connected anywhere on the alarm zone wiring provided that two diodes (1N4001 or equivalent) are fitted as shown in the diagram. The end of line resistor is not shown, but must be connected at the end of the alarm zone wiring.

The relay must have a 24V DC coil.

Additional Wiring Information

Ringing the alarms remotely.
The class change (CC) facility allows a remote source to sound the alarms. When the CC terminal is connected to the 0V terminal, all the alarms will sound. To selectively sound the alarm zones, use the individual class change inputs. Connecting CC1 to 0V will sound alarm zone 1 for example.

Class Change (CC)

Remote C/NO Contacts

0V
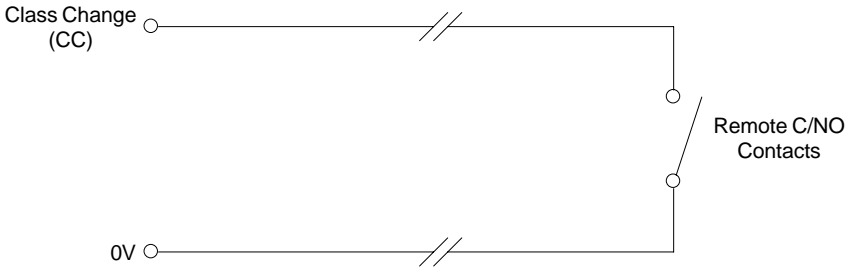
Silencing the panel remotely.
The remote silence facility will only function if the panel is in fire and the keyswitch is turned to the off position. As soon as the front panel buttons are enabled, the remote silence facility is locked out.

Silence (SIL)

Remote Push Switch

0V
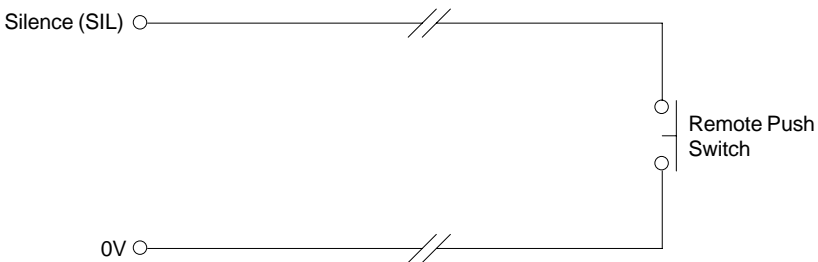
Signalling fire to another panel.

By connecting two panels as shown below, when panel B closes its
auxiliary contacts, panel A will go into fire. If the zone on panel A is set to
non-latching it will automatically reset when panel B opens its auxiliary
contacts. If both panels need to signal fire to each other, simply duplicate
the circuit substituting panel A for panel B and vice versa.
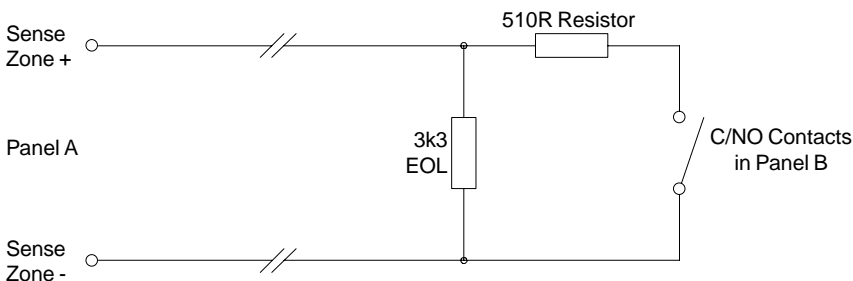
Connecting magnetic door holders.

Low voltage magnetic door holders can be switched using a set of auxiliary
contacts in the panel. When the panel goes into fire, power to the door
holders is removed allowing the doors to close. Care must be taken to
ensure that the auxiliary contacts rating of 30V / 1A is not exceeded.
Mains voltages MUST NOT be switched directly from the auxiliary contacts
- instead, fit a heavy duty relay operated from the auxiliary contacts.
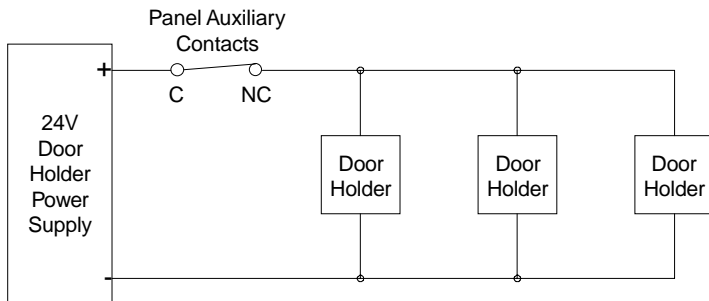
Signalling fault to the panel.
The external fault input allows an external source, such as a door holder power supply, to signal fault to the panel. This will be indicated by the External Fault LED on the front panel.

Remote Fault
Input (FLT)

Remote C/NO
Contacts

0V
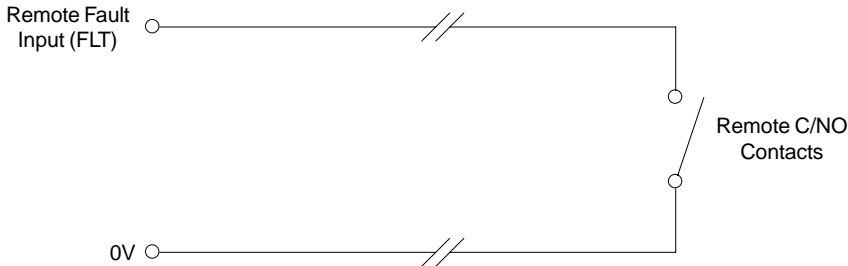
Connecting a relay/contactor to the switched 28V supply.
The switched 28V supply is activated when the panel goes into fire. It is fused via the 28V auxiliary fuse, so the maximum combined current is limited to 250mA. A suitable diode must be fitted across the relay/contactor coil.

Switched 28V
Positive
(SW 28V +)

Switched 28V
Negative
(SW 28V -)
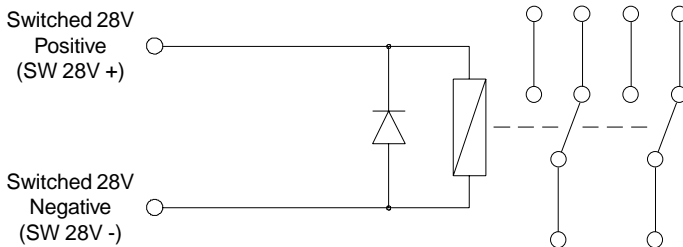
DIP Switch Settings

Zone input board.
Each zone input board has a 6 way DIP switch fitted (see picture).
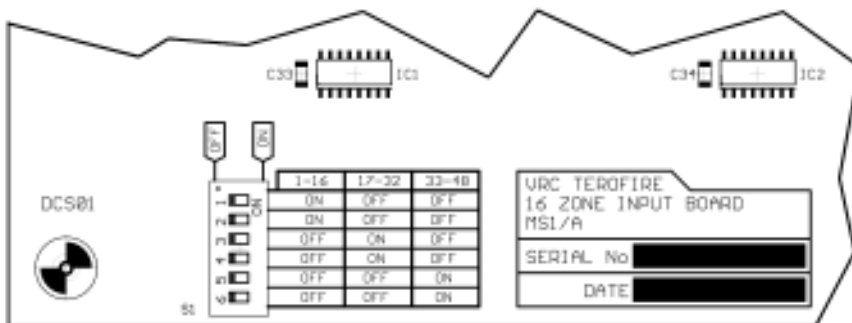
The DIP switch is used to set the address of each zone input board. There are three possible settings dependent on whether the zone input board is being used for zones 1-16, 17-32, or 33-48.

The DIP switches are factory set and should not need to be changed. In the event of a new/replacement board being fitted, set the address according to the table below (also printed adjacent to the DIP switch on the zone input board).

Zones 1-16		
	■	On
	■	On
■		Off
■		Off
■		Off
■		Off

Zones 17-32		
■		Off
■		Off
	■	On
	■	On
■		Off
■		Off

Zones 33-48		
■		Off
■		Off
■		Off
■		Off
	■	On
	■	On

CPU board.
There is a 4 way DIP switch on the back of the CPU board (see drawing below). To enter one of the system menus, set the relevant DIP switch and either power up the panel, or if the panel is already powered up, press CPU RESET followed by WATCHDOG RESET.

Serial programming mode
Calculate Checksum
Clear memory
Configure number of zones
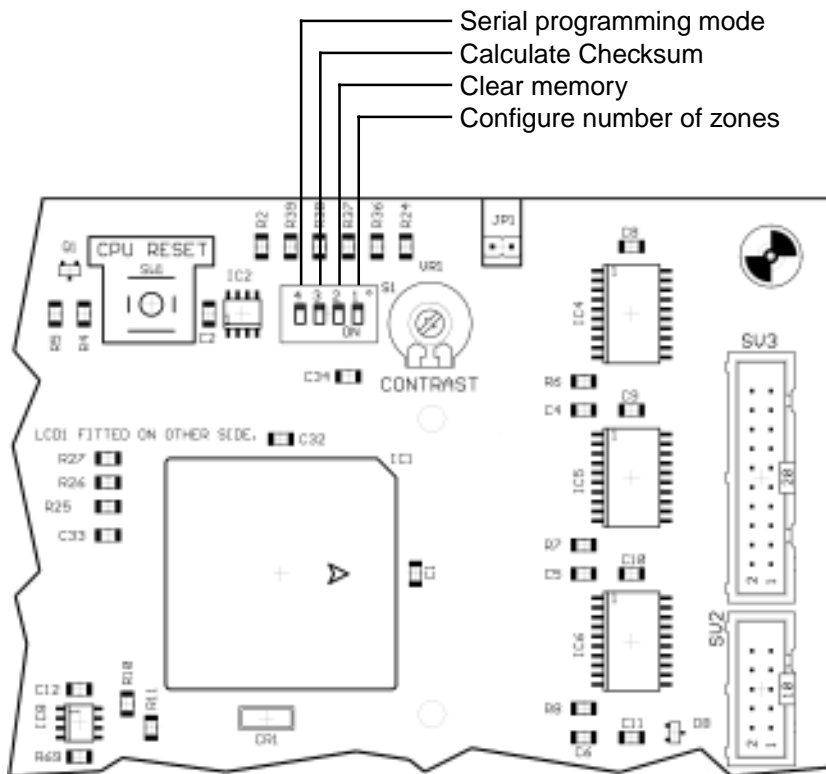
Configure number of zones.
This menu should not normally be required. In the event of fitting a new/ replacement CPU board, it may be necessary to configure the number of sense zones fitted in the panel. Upon entering the menu, the display will show the following:

```
Select number of
zones :-     [16]
```

By pressing the ⇧ and ⇩ buttons, the number of zones can be selected - either 16, 20, 24, 32, 36, 40 or 48. Do not select more zones than are fitted in the panel as damage may result.

To exit the menu, press the Enter button. This will program the number of zones into the panel memory. The internal buzzer will sound and the display will show the following:

```
Reset DIP switch
to continue...
```

Reset the DIP switch and the internal buzzer will silence. The panel will initialise as normal.

Clear memory.
This menu will reset the panel memory to the factory default state, clearing all user programmed text.

Upon entering this menu, the display will show:

```
All data will be
reset to default
```

followed by:

```
ENTER to proceed
RESET to cancel
```

To abort the process, press the Reset button - the memory will not be cleared.

To clear the memory, press the Enter button. The internal buzzer will sound and the display will change to:

```
Reset DIP switch
to continue...
```

Reset the DIP switch and the internal buzzer will silence. The panel will initialise but will show a CPU Fault. To clear the CPU Fault it is necessary to recalculate the checksum, as detailed below.

Calculate checksum.

The panel stores a checksum in non-volatile memory which is used to verify that the program memory is correct and has not been corrupted. If a processor with a different firmware version is fitted, or the data memory is cleared, a new checksum will need to be calculated.

On entering this menu, the display will show the following:

```
Redo Checksum?
ENTER to proceed
```

To abort the process, press the Reset button.

To calculate the checksum, press the Enter button. The internal buzzer will sound and the display will change to:

```
Reset DIP switch
to continue...
```

Reset the DIP switch and the internal buzzer will silence. The panel will initialise as normal.

Serial programming mode.

The panel supports serial programming of user text via a VT100 compatible terminal. This can be a basic serial terminal program running on a laptop or even a suitable organiser.

The wiring details for a suitable serial cable are shown below.

PC End 9W Female	Panel End 9W Male
2	3
3	2
5	5

On entering this menu, the display will show the following:

```
Serial
Programming Mode
```

The following text will be displayed on the serial terminal:

```
Multizone 16-48 Text Entry - Firmware V1.00

* Select a zone using the UP/DOWN cursor keys.

* To edit the text, press ENTER.

* To exit, press Q.


Zone 01 text: "    Zone 01    "
```

Pressing the up/down cursor keys on the serial terminal will cycle through the sense zones, alarm zones, auxiliary contacts, and system text. To change any user text, cycle through to the relevant zone and press Enter on the serial terminal.

```
* Move the cursor using the LEFT/RIGHT cursor keys.

* Edit the text, then press ENTER.

Zone 01 text: "    Zone 01    "
```

The text being edited will then be displayed in reverse video. Move the cursor using the left/right cursor keys on the serial terminal, and type over the existing text using the serial terminal keyboard.

Once the new user text has been entered for the relevant zone, press Enter on the serial terminal. Repeat this process until all necessary changes have been made.

To quit serial programming mode, press 'Q' on the serial terminal. The internal buzzer will sound and both the LCD and the serial terminal will display:

```
Reset DIP switch to continue...
```

Reset the DIP switch and the internal buzzer will silence. The panel will initialise as normal.

Multizone System Log

All events should be properly recorded in this log book. An 'event' should include fire alarms (whether real or false), faults, tests, temporary disconnections and the dates of installing or servicing engineer's visits with a brief note of work carried out and outstanding.

Name and address ....
of installation ....
....
....
....

Person responsible .... Date ....
for log book .... Date ....
.... Date ....
.... Date ....

System installed by ....

and is maintained under contract by ....
Tel. ....

Notes:

Date	Time	Zone	Event	Action Required	Date Completed	Initials

Date	Time	Zone	Event	Action Required	Date Completed	Initials