

# SMARTCONNECT

## MULTI-LOOP PANEL

### Installation Manual



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# Introduction

## **About the Smart Connect Multi-loop Fire Alarm System**

The Smart Connect Multi-loop Control Panel is a powerful intelligent fire alarm control system with a user friendly 4.3 inch touch screen display, which has been designed to provide reliable life safety and property protection, while also being easy to install, commission and operate. The Smart Connect Multi-loop system is totally modular which enables it to satisfy any size building fire alarm needs.

By adding intelligent loop modules, the Smart Connect Multi-loop can be upgraded to support up to 3000 addressable devices spread across a flexible number of loop cards (maximum of twelve loop cards). The system can also be expanded by adding Form C relay output modules, network interface modules, alarm circuit modules, and zone monitor modules for conventional detectors and devices.

The Smart Connect Multi-loop system's touchscreen interface is designed to make status information clear, and system control functions simple to operate. Through the use of function buttons on the systems display the user can easily "SILENCE BUZZER", "STOP SOUNDERS" or "START SOUNDERS", or "RESET" the system. The system status presentation is structured to allow the different types of system events (Alarms, technical alarms, and faults) to be viewed independently. Each system event presents the user with a message describing the location of the alarm report and the type of event (manual alarm, smoke, or heat). If additional details about the nature of the alarm report or its location are required, the user can add a text label to the device or zone.

The 32-bit microcontroller (MCU) at the heart of Smart Connect Multi-loop rapidly processes logical decisions based on the status of the smoke detection and other initiating devices to control the system outputs. The Windows based software 'Smart Configurator' is used to configure the system's operation based on the customer specified operating requirements, and reduce commissioning/installation times.

The Smart Connect Multi-loop system continuously checks all software and hardware for proper operation. It checks all control panel electronic hardware, system memory components, and the system program. A hardware watchdog circuit is provided to ensure that System programs are functioning properly. If a problem develops with the program or processor, the watchdog circuit places the System into a fault condition and resets it.

The Smart Connect Multi-loop system is equipped with a backup microprocessor on its termination board. To ensure reliable operation, if the main panel's CPU stops, the backup CPU will take over and allow the system to still be able to detect and annunciate alarms.

The fire alarm operation is always processed as the highest priority over all other operating modes.

## **Overall Features**

- Modular construction allows a panel to be specified using just the required modules.
- Up to 4, 6 or 12 Loop modules (depending on panel model).
- 4.3" colour touch screen display.
- Capacity for up to 26 intelligent modules (depending on panel model).
- Full system redundancy.
- Extensive Day/Night mode programming.
- Full cause & effect programming via front of panel or the 'Smart Configurator' PC software.
- 250 ZETA addressable MKII devices per loop card.
- 254 available programmable zones.
- Up to 64 panel peer-to-peer network.
- Positive Alarm Sequence.
- Alarm Verification.
- Alarm circuit special application 24V mode.
- 400W power supply.

## EXPLANATION OF ACCESS LEVELS

The Smart Connect System has the following access levels.

ACCESS LEVEL	ACCESSED BY	ACCESS METHOD	FUNCTIONS ACCESSED
1	General public	Default state	View Panel Override delay (if used)
2	Responsible person	Enter user access code (default 0001)  =====	Start sounders stop sounders Silence buzzer Reset panel Access User Menu =====
		Enter user access code (default 0001), and press Menu Access Icon	Enable / disable sections of system Test Mode View Zones / Points View event log Turn off delay
3	Installer / Engineer	Enter Engineer Password (Default 9999), and press Menu Access Icon  =====	Configure loops Assign zones Assign Text to each point Modify Alarm Operation Programming Configure network (if fitted) System Diagnostics (LED blink / loop Autocheck) Change passwords Configure TCP/IP Port =====
		Open Enclosure	Connect wiring during Install Battery check during Maintenance Update Cause & Effect programming via USB
4	Authorised Service Engineer	Open Enclosure & PC S/W	Update Panel Firmware, Add new language

Care should be taken to ensure that the access method for each level is only available to suitably qualified personnel.

## Additional Features

There is PC configuration software, a mobile monitoring application, a repeater panel and a LED Expander PCB available.

PC Configuration Software: Smart Configurator

Repeater Panel: SMART/REP

## Approvals Reference Numbers

Model Number	LPCB REFERENCE	UKCA Certificate Number	CPR Certificate Number
SMART6	330w/01	0832-UKCA-CPR-F1331	2831-CPR-F4514
SMART6/32	330w/02	0832-UKCA-CPR-F1332	2831-CPR-F4515
SMART10/64	330w/03	0832-UKCA-CPR-F1333	2831-CPR-F4516
SMART10/P/64	330w/04	0832-UKCA-CPR-F1334	2831-CPR-F4517
SMART26/64	330w/05	0832-UKCA-CPR-F1335	2831-CPR-F4518
SMART26/P/64	330w/06	0832-UKCA-CPR-F1336	2831-CPR-F4519
SMART/REP	330w/R01	Included as Ancillaries on main cert	Included as Ancillaries on main cert

# Document Conventions

## Circuits and Zones

**Circuit** = this refers to an actual electrical interface, initiating (detection), indicating (signal), or relay.

**Zone** = this is a logical concept for a fire alarm protected area, and will consist of at least one circuit.

The terms zone and circuit are used interchangeably throughout this manual.

On the Smart Connect Multi-loop, circuits can be either conventional or addressable inputs or outputs. Both hardwired conventional inputs and outputs, and addressable inputs and outputs may be grouped together to form logical zones.

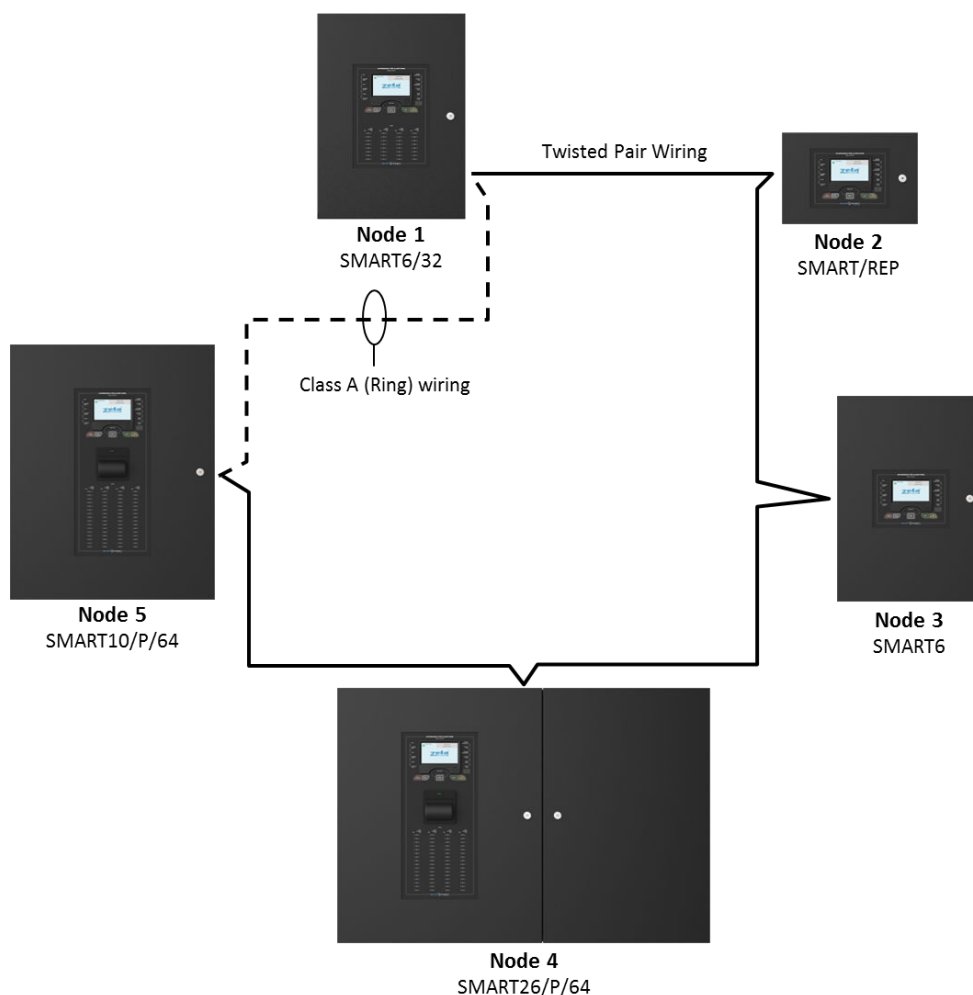
## Wiring Styles

**Loop Circuits** have a redundant pathway (powered from both sides of the circuit) and are able to be wired either in the Class A designation or in the Class X designation (designed to operate past any a single short circuit with the addition of EN54 listed isolators).

**Conventional Zone Circuits** do not have a redundant path. The SCM-ZMM has 6 Class B circuits and simply terminates at the last device.






**Alarm Circuits** do not have a redundant path. The SCM-ACM has 2 Class B circuits and simply terminates at the last device.



Typical SMART Connect Multi-loop Network Fire Alarm Wiring





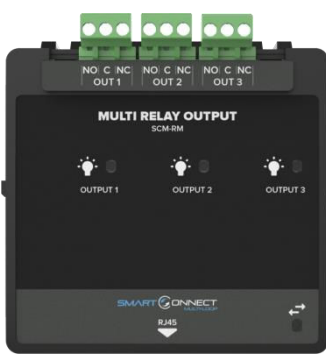
# System Components



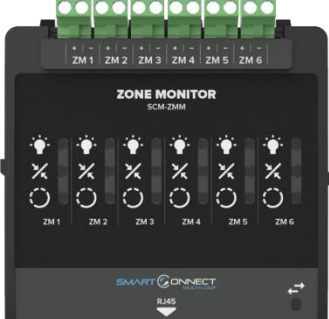

## Panel Types

			Model	Description
			SMART6	<ul style="list-style-type: none"> <li>W:380mm x H:530mm</li> <li>Space for up to 6 small modules</li> <li>Supplied with a 400W 13A PSU</li> <li>Space for 2 x 12Ah batteries.</li> </ul>
			SMART6/32	<ul style="list-style-type: none"> <li>W:380mm x H:530mm</li> <li>Space for up to 6 small modules</li> <li>Equipped with 32 zone LED expansion</li> <li>Supplied with a 400W 13A PSU</li> <li>Space for 2 x 12Ah batteries.</li> </ul>
			SMART10/64	<ul style="list-style-type: none"> <li>W:500mm x H:600mm</li> <li>Space for up to 10 small modules</li> <li>Equipped with 64 zone LED expansion</li> <li>Supplied with a 400W 13A PSU</li> <li>Space for 2 x 38Ah batteries</li> </ul>
			SMART10/P/64	<ul style="list-style-type: none"> <li>W:500mm x H:600mm</li> <li>Space for up to 10 small modules</li> <li>Equipped with panel printer</li> <li>Equipped with 64 zone LED expansion</li> <li>Supplied with a 400W 13A PSU</li> <li>Space for 2 x 38Ah batteries</li> </ul>
			SMART26/64	<ul style="list-style-type: none"> <li>W:1000mm x H:665mm</li> <li>Space for up to 26 small modules</li> <li>Equipped with 64 zone LED expansion</li> <li>Supplied with a 400W 13A PSU</li> <li>Space for 2 x 38Ah batteries</li> </ul>

	SMART26/P/64	<ul style="list-style-type: none"> <li>• W:1000mm x H:665mm</li> <li>• Space for up to 26 small modules</li> <li>• Equipped with panel printer</li> <li>• Equipped with 64 zone LED expansion</li> <li>• Supplied with a 400W 13A PSU</li> <li>• Space for 2 x 38Ah batteries</li> </ul>
	SMART/REP	<ul style="list-style-type: none"> <li>• W:300mm x H:200mm</li> <li>• Smart Connect Repeater</li> <li>• Please refer to GLT-261-7-12 Smart Connect Repeater Manual for further information</li> </ul>

## Panel Modules

Image	Model No.	Description	Technical
	SCM-LCM	<u>Loop Card Module</u> The plug-in loop card module provides power for, and handles communications to the analogue addressable devices. It has 4 fault status LED's for added fault finding assistance.	<u>Loop Voltage:</u> 35V Nominal <u>Maximum Loop Current:</u> 450mA <u>Maximum Loop Capacity:</u> 250 Addresses <u>Maximum Loop Length:</u> 2KM <u>Maximum Loop Resistance:</u> 22Ω + to +, 22Ω - to - <u>Maximum SLC Capacitance:</u> 500nF <u>Maximum SLC Baud Rate:</u> 1024 bits per second <u>Compatible Devices:</u> MKII-AOP, MKII-AOH, MKII-AHR, MKII-AHF, MKII-AHF/CS90, ZAI-MI, ZAIO-MI, ZAZM-MI, ZAIO/230, ZASC-MI, MKII-SSB, MKII-AXT, MKII-AXTB, ZRAP, ZRAPB (EN54 approved)
	SCM-ACM	<u>Alarm Circuit Module</u> The plug-in alarm circuit module provides power for, and handles communications to the non-addressable sounder appliances. It has 2 x Class B circuits and can be programmed to provide two 24v DC auxiliary outputs.	<u>Circuit Voltage:</u> 29VDC Nominal <u>Maximum Circuit Current:</u> 500mA <b>per circuit</b> <u>Maximum Circuit Impedance:</u> 4Ω <u>Maximum Circuit Length:</u> Depends on AWG <u>Special Applications:</u> Auxiliary 24 VDC Output [Power limited & Unsupervised] <u>End of Line Resistor:</u> 4K7Ω <u>Compatible Devices:</u> ZXT, ZXTB, ZRP, ZRPB (EN54 approved)
	SCM-RM	<u>Multi Relay Output</u> A Relay module that is designed to be DIN mounted inside of a SMART Connect Multi-loop panel. It's powered and interfaced to the CIE via a RJ45 connection. Can be configured as a programmable relay or a common alarm, common fault or common tech alarm relay via the panel settings.	<u>Relay Type:</u> Form C x 3 <u>Switching Capacity:</u> 5 A, 30 VDC (resistive) 5 A, 250 VAC (general use) <u>Quiescent Current @ 30V:</u> 39.3mA <u>Relay Operated Current (LEDs ON):</u> 115.26mA

	SCM-NM	<p><b>RS485 Network</b> The SMART Connect Multi-loop system network has the facility to monitor, indicate and control the functions of a fire alarm installation, thus allowing signals to be distributed around a large site. The network will accommodate up to 64 nodes. The network uses RS485 data communication.</p>	<p><u>Communication Protocol:</u> RS485 <u>Maximum Network Size:</u> 64 Nodes <u>Maximum Distance Between Nodes:</u> 1KM (using a screened data cable) or 100M (using a standard fireproof cable) <u>Network Wiring Typologies:</u> Bus or Ring</p> <p><i>NOTE: Only 1 network module allowed per panel. If a second module is fitted, it will be powered down when the panel starts.</i></p>
	SCM-MIM	<p><b>Multi Input Unit</b> An input module that is used to monitor and raise alarm from any ancillary equipment such as sprinkler flow switch, aspiration detectors, secondary fire control panel, beam detectors, external power supplies etc.</p>	<p><u>Input Voltage:</u> 23.7VDC Nominal <u>Wiring Class:</u> 6 x Class B <u>Quiescent Current @ 30V:</u> 39.3mA <u>Input Max Impedance:</u> 10Ω <u>Input End of Line:</u> 4K7Ω <u>Alarm Triggering Resistor:</u> 1KΩ</p>
	SCM-ZMM	<p><b>Zone Monitor</b> A zone monitor that can be typically used for conventional devices and/or for special detectors that are not available in addressable form. It has 6 x Class B input circuits.</p>	<p><u>Zone Voltage:</u> 26VDC Nominal <u>Wiring Class:</u> 6 x Class B [Power limited &amp; Supervised] <u>Zone Maximum Line Impedance:</u> 10Ω <u>End of Line Resistor:</u> 4K7Ω <u>Alarm Triggering Resistor:</u> 1KΩ <u>Compatible Detectors:</u> MKII-OP, MKII-HR, MKII-HF, MKII-HF-CS90, MKII-OH, ZT-CP3 (EN54 approved)</p>
	SCM-PM	<p><b>RS232 Printer</b> The plug-in RS232 module will give a Smart Connect Multi-loop panel the ability to interface to RS232 serial equipment and devices. This is most commonly used to connect the panel to an RS232 panel printer, or a desktop printer for real time event log printing. The module also has a 5V aux output that is used to provide power to the panel's internal printer.</p>	<p><u>Communication Protocol:</u> RS232 <u>Baud Rate:</u> 9600 <u>Data Bits:</u> 8 <u>Parity:</u> None <u>Stop Bits:</u> 1 <u>Compatible Devices:</u> CUSTOM PLUS2 Panel Printer</p>

# Control Panel Installation and Dimensions

## Enclosure Dimensions

See table 1 for full dimensions see table 1.

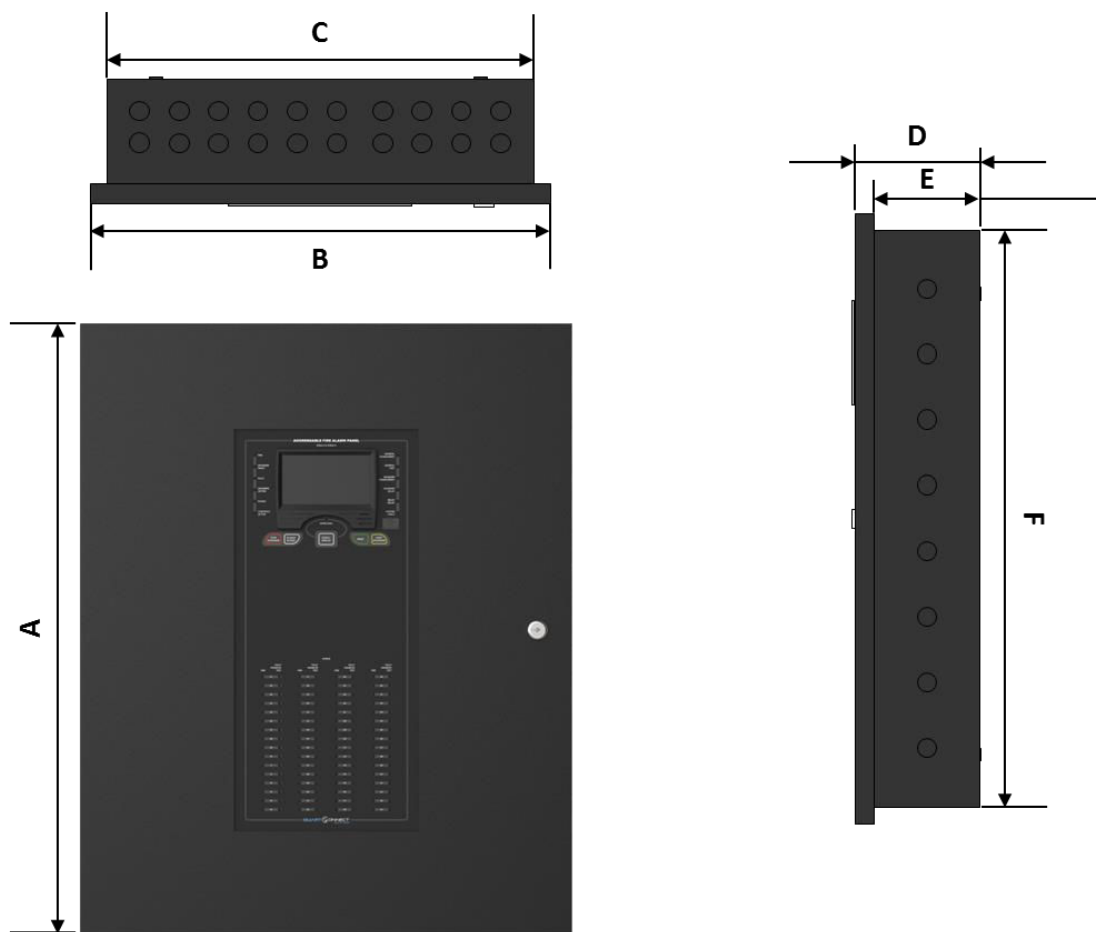


Table 1

Panel	A	B	C	D	E	F	Top Knock outs	Side Knock outs	Bottom Knock outs	Max Battery Size
SMART/6	535mm	385mm	355mm	150mm	120mm	505mm	18	12	4	2 x 12Ah
SMART/10	665mm	535mm	505mm	200mm	170mm	635mm	26	8	4	2 x 38Ah
SMART/26	665mm	975mm	945mm	200mm	170mm	635mm	64	28	20	2 x 38Ah

## Panel Construction Details

All components are manufactured from Zintec.

### Large and Medium Smart Multi-loop Enclosures

Back box and door 1.5 mm

Door plate 0.9 mm

All internal parts are 0.9 mm

### Small Smart Multi-loop Enclosure

All parts are 0.9 mm

### Smart Repeater Enclosure

All parts 0.9 mm.

The paint colour for the main box and door is RAL9005 Black Leatherette (Black version).

The internals are RAL9005 Black Leatherette.

The control cabinet can be semi flushed into a wall or surface mounted.

## Locating the Fire Alarm Control Panel

The control panel should be installed per BS5839-1:2017 recommendations: -

The panel should be close to the main entrance of the building, so that it can be viewed by any fire-fighting personnel entering the building.

- It should be fitted to a sturdy wall that will not flex unnecessarily.
- It should ideally be mounted at eye level, for it to be viewed without need of a ladder.
- It should be installed in a dry, weatherproof place, preferably NOT in direct sunlight.
- It should be easily accessible, so that the responsible person can perform their regular fire alarm checks.

The panel must be in a clean, dry position, which is not subject to excessive shock or vibration and at least 2 meters away from pager systems or any other radio transmitting equipment. The operating temperature range is -5°C (23°F) to 40°C (104°F); maximum humidity is 95%. The panel will withstand vibrations between 5 & 150 Hz.

## Mounting the Enclosure

Fix the enclosure to the wall using all the mounting points provided:

SMART6: 4 x Mounting Points. See Fig 1

SMART10: 4 x Mounting Points See Fig 2

SMART26: 6 x Mounting Points. See Fig 3

Check the build and condition of the wall to decide a suitable screw fixing. The mounting holes are designed for No 8 roundhead or countersunk woodscrews (or similar). Remove any debris from the enclosure. Take care not to damage the FACP during installation.



**ATTENTION:** DO NOT DRILL ANY ENTRY HOLES INTO THE PSU SECTION OF THE ENCLOSURE WHICH IS LOCATED ON THE LEFT-HAND SIDE OF THE CONTROL PANEL CABINET.

## Mounting Hole Dimensions

Fig 1

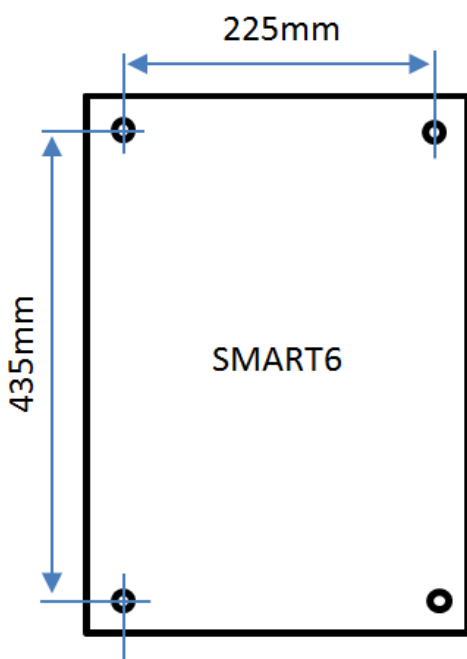


Fig 2

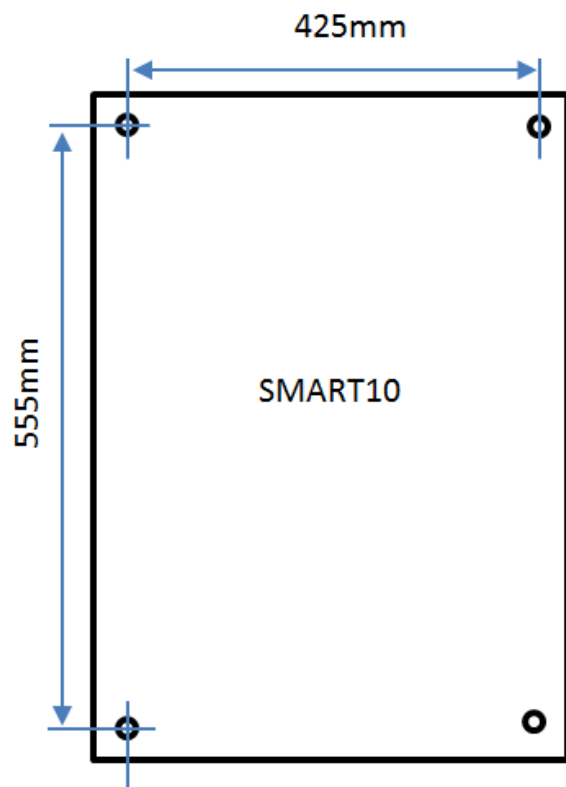
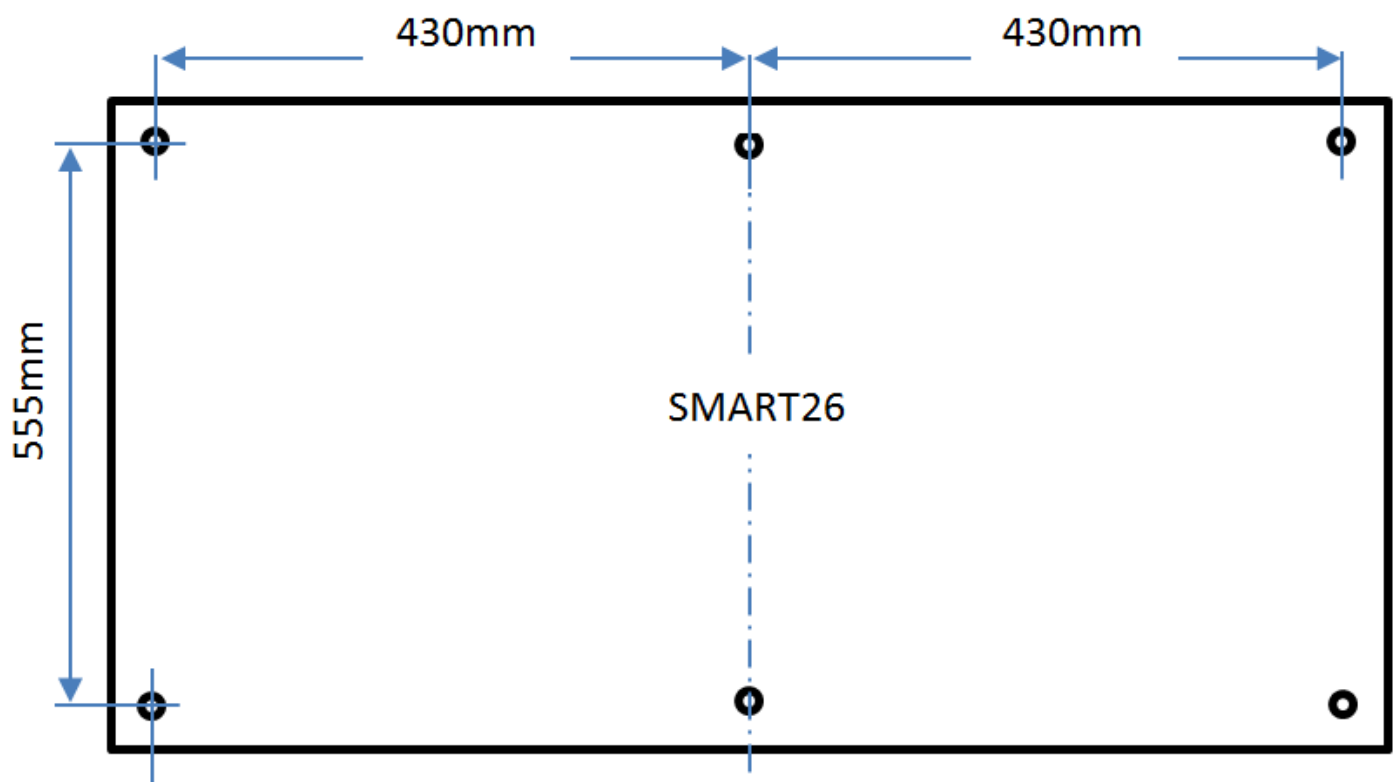


Fig 3



## Planning Cable Entry

The Knock-out cable entries can be easily removed by tapping with a suitable screwdriver or chisel from outside the control panel box. Alternatively, the entry can be drilled out, using a 20mm hole cutter. Care should be taken if using a drill. Consider removing the PCBs to prevent damaging them.

The SMART Connect Multi-loop comes with many cable entry holes. If another entry hole is required, it is strongly recommended that the panel door is removed to avoid accidental damage. Also, the power supply and termination board should be removed and stored in a safe place. This would also help while fixing the back box to the wall.



**ATTENTION:** DO NOT DRILL ANY ENTRY HOLES INTO THE PSU SECTION OF THE ENCLOSURE.

## Cable Grounding

The panel is provided earth bars located along the top of the panel for grounding incoming wiring if needed.

The SMART6 panel has 1 x 12 way Earth bar

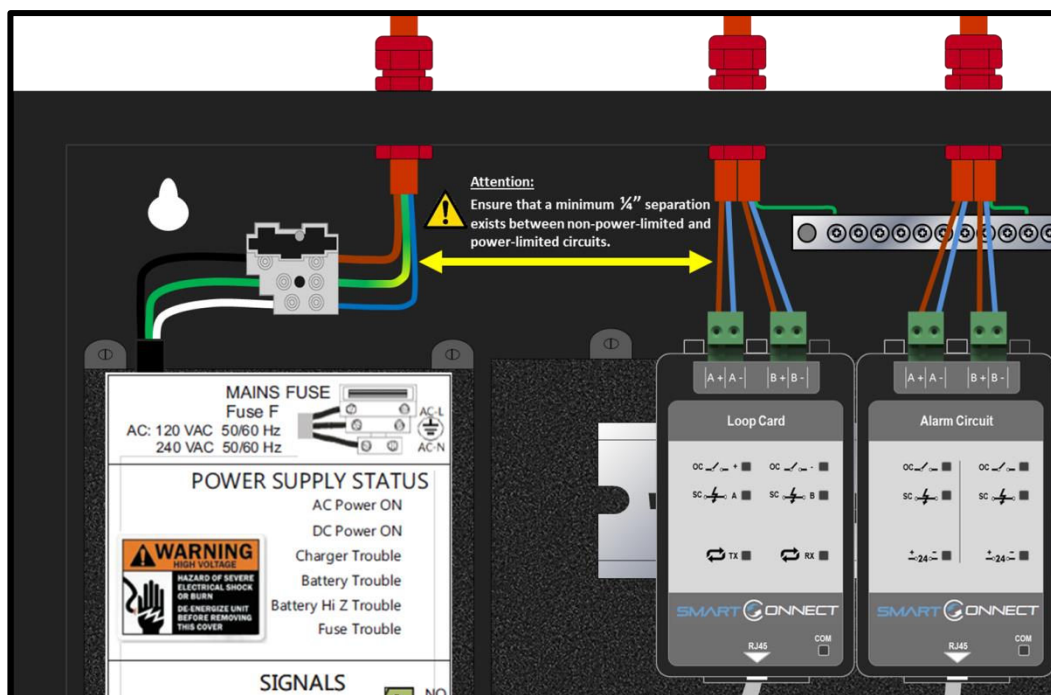
The SMART10 panel has 2 x 12 way Earth bar

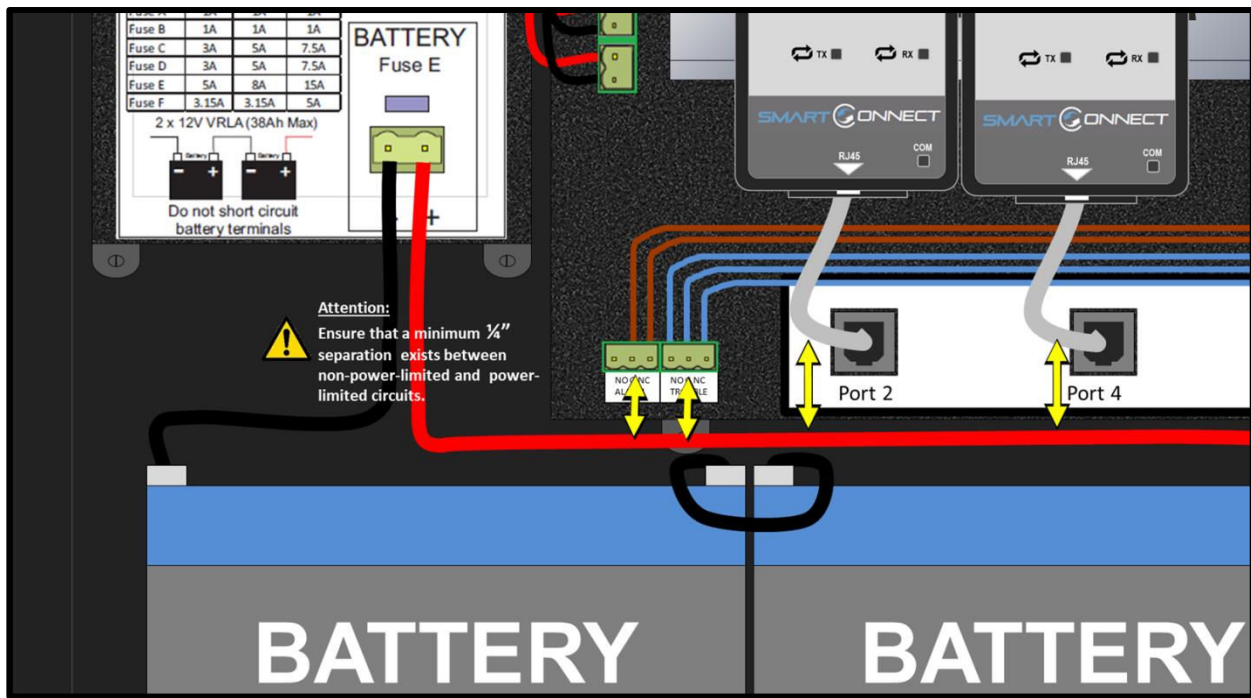
The SMART26 panel has 3 x 12 way Earth bar

## Mains Wiring



**Note:** The AC (mains) input wiring, and the back-up battery connections are non-power-limited. All other connections on the SMART connect multi-loop panel are power limited. Ensure that a minimum ¼" separation exists between non-power-limited and power-limited circuits.





### Recommendations

The Mains supply to the FACP is fixed wiring, using Fire resisting 3-core cable (Between 1 mm<sup>2</sup> and 2.5mm<sup>2</sup>), or equivalent, fed from an isolating double pole switch fused spur, and fused at 5A. This should be secure from unauthorized operation and be marked 'FIRE ALARM: DO NOT SWITCH OFF'. The supply must be exclusive to the Fire Panel.

### Connecting the Mains Power

The AC Live (L), Earth (E) and Neutral (N) connections are marked on the power supply cage. It is essential that the mains Earth cable is connected to the PSU's Earth terminal. The incoming mains cable should be kept separate from the loop card cables to help minimise mains interference.



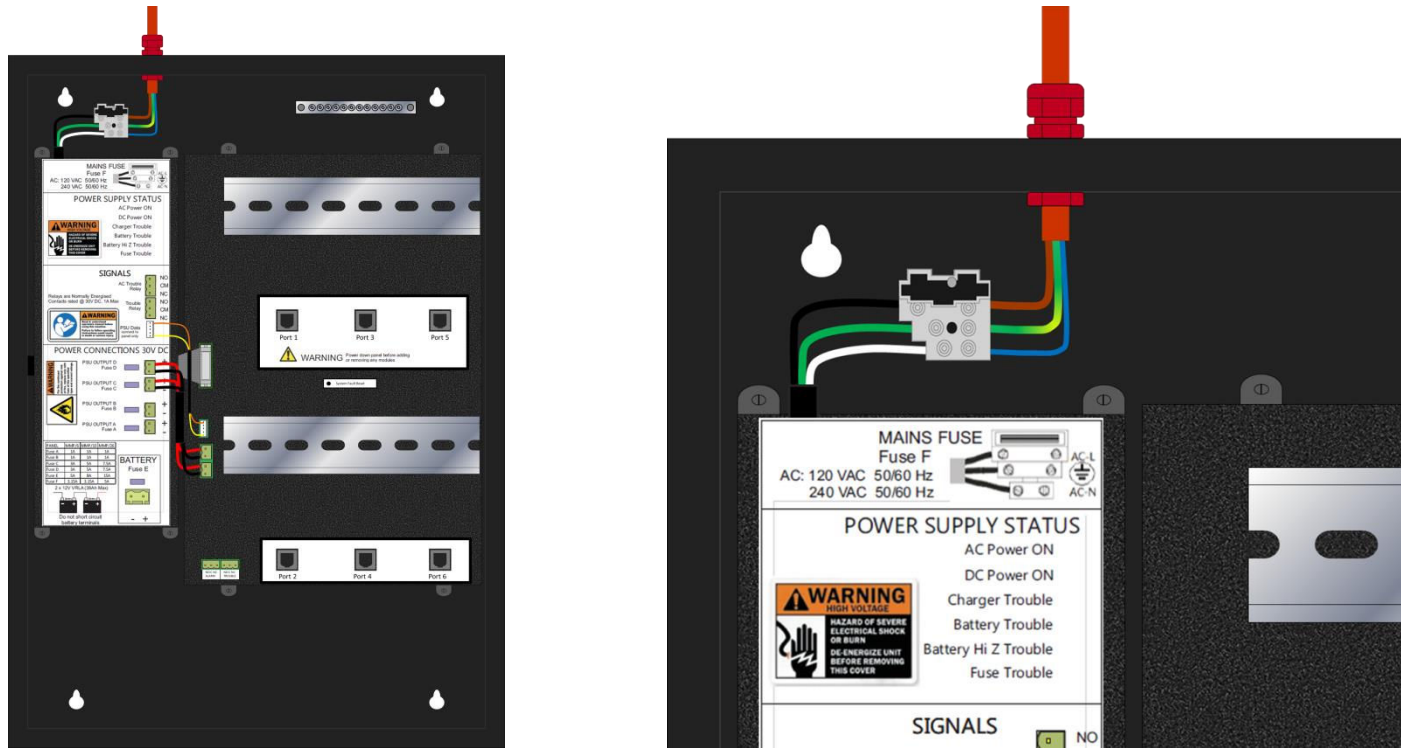
**ATTENTION:** MAKE SURE ANY SPARE ENTRY HOLES THAT HAVE BEEN OPENED, BUT NOT USED ARE COVERED WITH SUITABLE GROMMETS OR BLANKING SCREWS.

It is advisable to apply power to the panel before connecting any devices, to check for correct operation, and to familiarise yourself with the fire alarm panels controls.

If a knockout is removed, fill the hole with a suitable cable gland. If any knockout is removed, but subsequently not used, it should be covered up.

The AC Mains cable must be fed into the enclosure via one of the cable entries at the top left corner of the back box (Refer to Figure 3 below).

Figure 3: Wiring the mains power supply



Panel	Input Voltage	Input Frequency	PSU Cage Size	Max Input Current	Max Surge current	Fuse Installed
SMART6	120-230V AC	47-63 Hz	400W	3.6Amax@120Vac & Full-Load, 2.0Amax@220Vac & Full-Load	65A peak, 1.2ms duration, <0.25A2s@230Vac, Cold Start	3.15A (230 V AC)
SMART10	120-230V AC	47-63 Hz	400W	3.6Amax@120Vac & Full-Load, 2.0Amax@220Vac & Full-Load	65A peak, 1.2ms duration, <0.25A2s@230Vac, Cold Start	3.15A (230 V AC)
SMART26	120-230V AC	47-63 Hz	400W	3.6Amax@120Vac & Full-Load, 2.0Amax@220Vac & Full-Load	65A peak, 1.2ms duration, <0.25A2s@230Vac, Cold Start	3.15A (230 V AC)

## Battery Wiring

The SMART Connect Multi-loop panel uses two 12 Volt batteries, wired in series to give a 24 Volt back-up supply.

The **+ve** of one battery is connected to the **red** battery lead.

The **-ve** of the other battery is connected to the **black** battery lead.

The **-ve** of the first battery is connected to the **+ve** of the second battery using the link wire supplied.

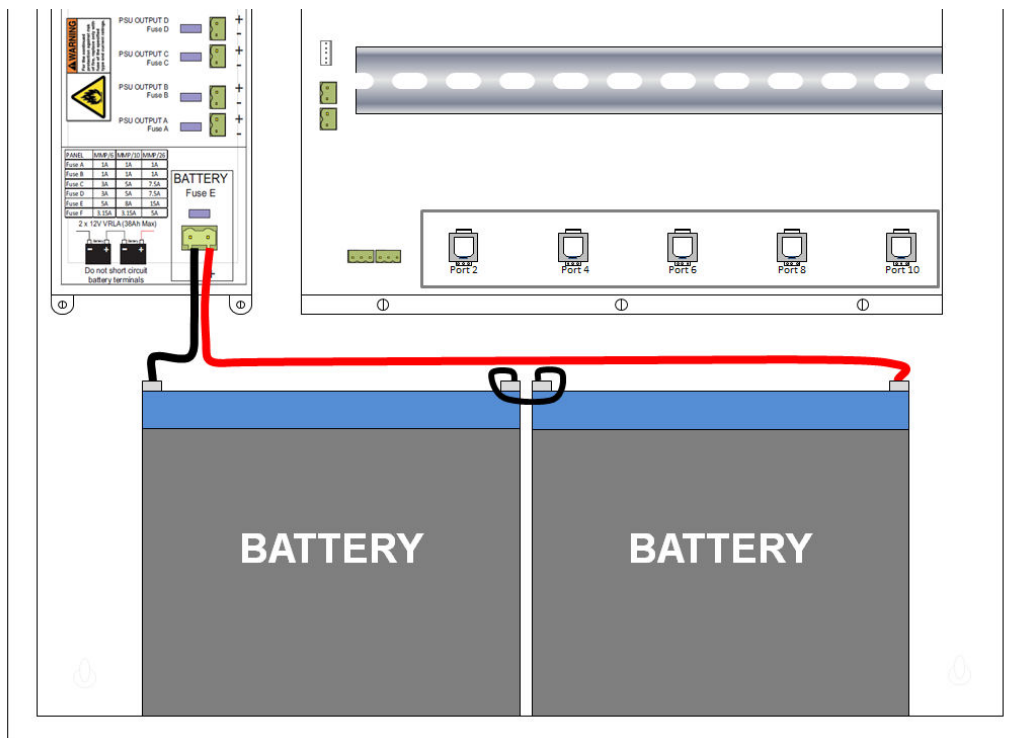
Recommended Battery Types:

Panel	Recommended Battery size
SMART6	2 x Powersonic 12V,12Ah
SMART10	2 x Powersonic 12V,38Ah
SMART26	2 x Powersonic 12V,38Ah

To calculate the required backup battery capacity, use the information in Appendix B

Other makes and sizes of battery may be suitable. Calculate the standby requirements to determine the most suitable size of batteries.

Figure 4: Battery location and connection



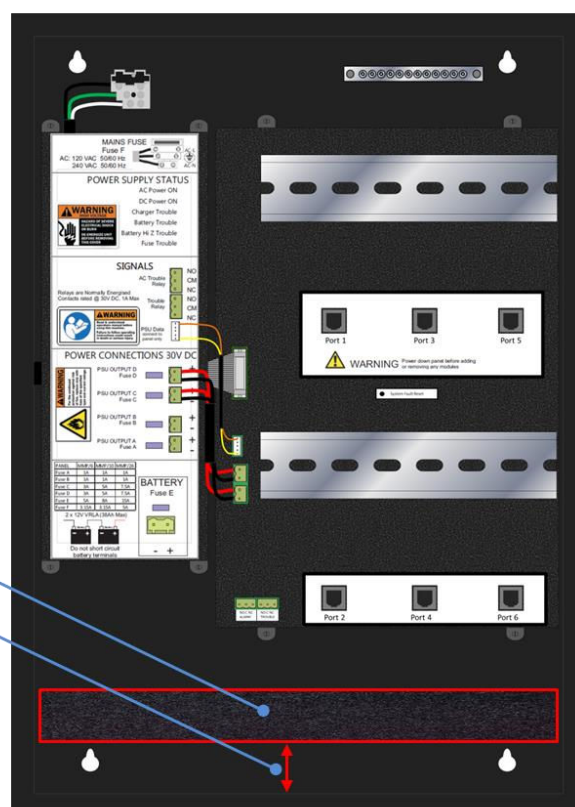
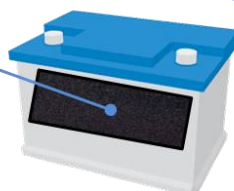
Panel	Charger Boost Voltage	Charger Float Voltage	PSU Cage Size	Max Charger Current	Max Battery Size	Fuse Installed
SMART6	29.5V DC	27.6V DC	400W	1.1A	2 x 12V, 12 Ah	5A
SMART10	29.5V DC	27.6V DC	400W	2.2A	2 x 12V, 38 Ah	8A
SMART26	29.5V DC	27.6V DC	400W	2.2A	2 x 12V, 38 Ah	15A

## Securing the batteries

The SMART Connect Multi-loop has been designed so that the batteries are secured in the panel with Velcro strips.

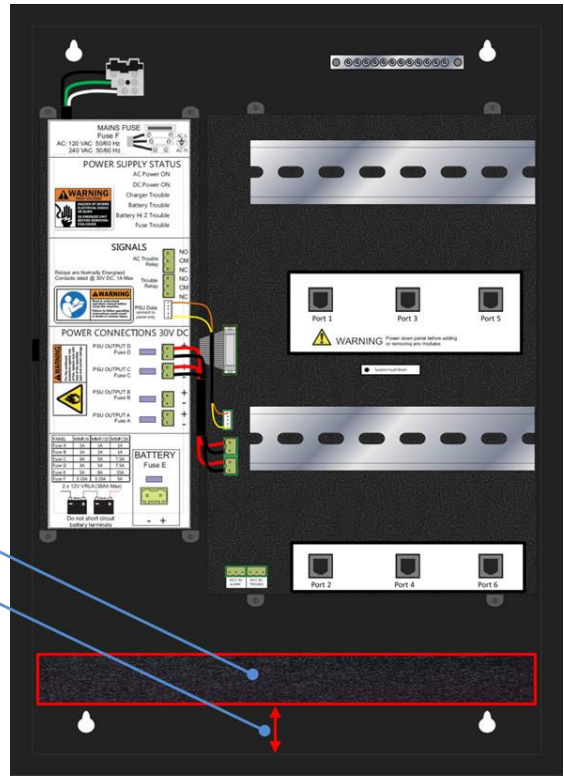
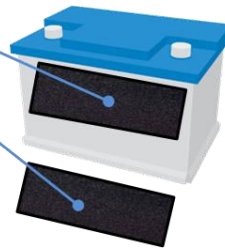
## SMART6 Battery Mounting

- Velcro:
  - Type: Heavy duty
  - (W) 50mm
- Velcro PANEL attachment
  - (L) 330mm
  - (H) 45mm
- Velcro BATTERY attachment
  - Battery: 7 - 14Ah
  - (L) 140mm



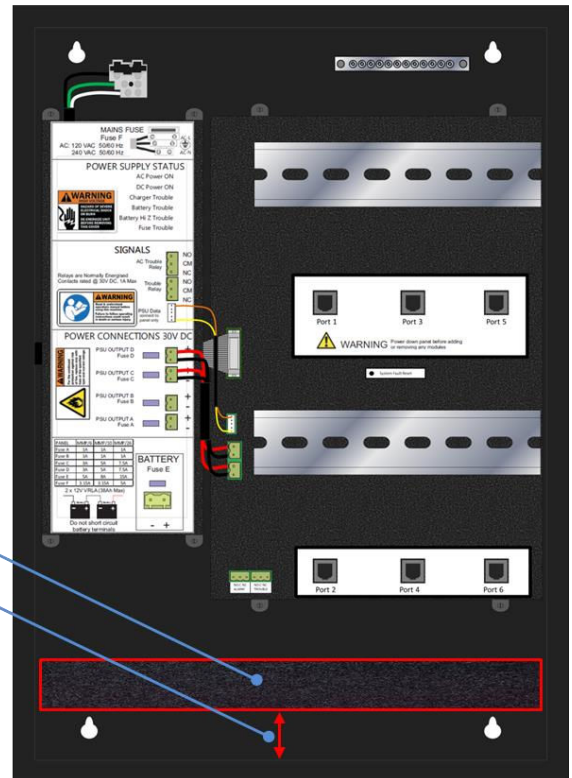
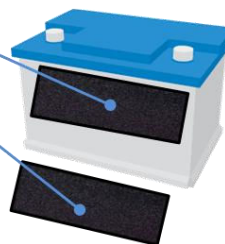
## SMART10 Battery Mounting

- Velcro:
  - Type: Heavy duty
  - (W) 50mm
- Velcro PANEL attachment
  - (L) 480mm
  - (H) 45mm
- Velcro BATTERY attachment
  - (L) back: 180mm
  - (L) bottom: 110mm



## SMART26 Battery Mounting

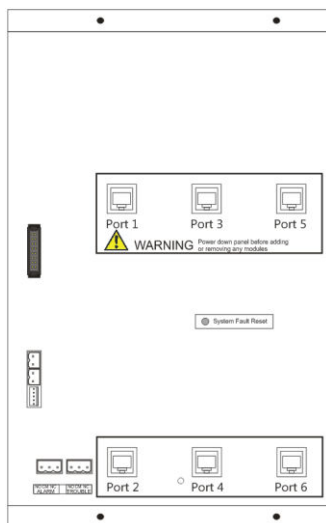
- Velcro:
  - Type: Heavy duty
  - (W) 50mm
- Velcro PANEL attachment
  - (L) 900mm
  - (H) 45mm
- Velcro BATTERY attachment
  - (L) back: 180mm
  - (L) bottom: 110mm



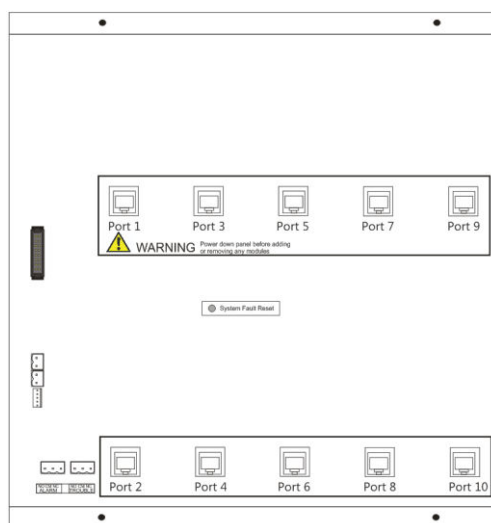
# Assembling the panel

The SMART Connect Multi-loop is a modular panel, designed to be flexible to install. It will normally be supplied as the base panel with a number of expansion modules packed separately. The Modules are Din Rail Mounted, and connect to the panel's motherboard with a small RJ45 cable (supplied with the module). The Base panel is available in 3 sizes:

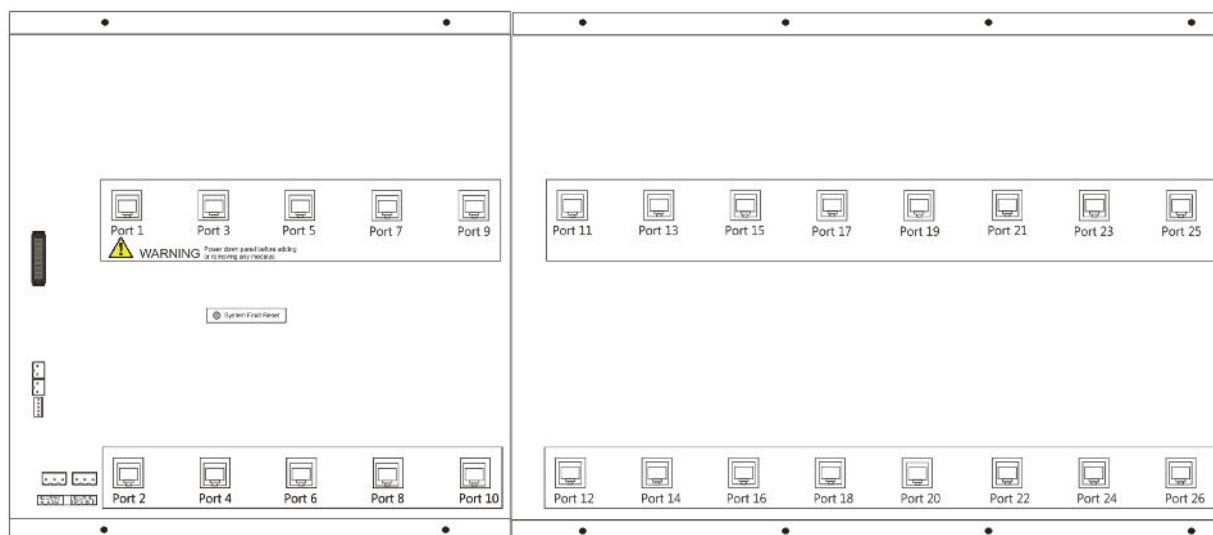
**SMART6**



**SMART10**



**SMART26**



The above diagrams show the port addresses for each panel size

A typical panel set up would include:-

At least one module for Input devices (Either an addressable loop module [SCM-LCM], or a conventional zone module [SCM-ZMM])

At least one module for warning devices (Either a conventional sounder circuit module [SCM-ACM], or an addressable loop module [SCM-LCM])

## Initial Power Up

It is recommended to initially power up the panel with no modules connected to confirm that the base panel is functioning as expected. To do this:-

1. Check that the AC cable is connected correctly and the proper grounding has been made (as per BS5839-1:2017).
2. Close the panel door
3. Turn on the mains power. The following will be observed:-
  - a. Power, Fault and System Fault LEDs will light for around 6 seconds
  - b. Fault and System Fault LEDs will turn off. Power LED will blink a few times
  - c. LCD will show touch for calibration. Press the screen within 3 seconds to perform a screen calibration. (The screen is calibrated at the factory, so this step is not usually required)
  - d. The LCD shows the Zeta logo for a few seconds, while it checks to see what modules are fitted. (Note: the usual "System Healthy" banner is not shown during the module check.)
  - e. If the panel finds no modules, it displays "No Modules" on its LCD



- f. The panel has passed its power on test. It can now be turned off and the modules can be fitted.

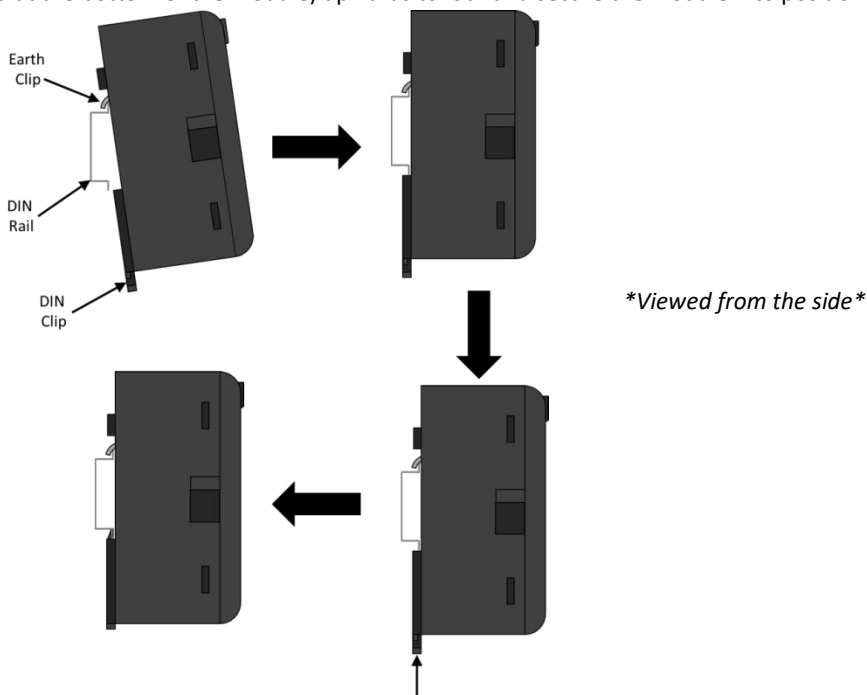
## Module Installation

The Smart Multi-loop panel uses the expansion port number to reference modules. It is recommended that any Loop Card modules are fitted first to the first expansion ports, so that the loop circuit numbers follow a logical sequence (loop 1 in port 1, loop 2 in port 2 etc.)



**ATTENTION:** THE PANEL MUST BE POWERED DOWN, AND DISCONNECTED FROM THE BATTERIES BEFORE INSTALLING OR REMOVING ANY MODULES.

1. Ensure that the installation area is free from any cables or wires that may get caught, and that there is enough space on the DIN rail to mount the module.
2. Place the module onto the DIN rail, hooking the metal earth clip underneath onto the rail first.
3. Once the earth clip is hooked, push the bottom of the module onto the rail so that the module sits flat.
4. Push the plastic DIN clip (located at the bottom of the module) upwards to lock and secure the module into position.



5. Once the module is secured to the DIN rail, simply connect the supplied CAT5E cable to the module's RJ45 port.
6. Connect the other end of CAT5E cable to the nearest unoccupied RJ45 port on the termination PCB.



## TRM RJ45 Port Address Designation

Each RJ45 port on the SMART Connect Multi-loop termination PCB has its own unique port address. This port address is important to keep note of as it is displayed on Alarm/Fault messages and is used when configuring or setting up cause and effects on the panel (See operation manual GLT-261-7-11).

## Securing the modules

The modules are designed to clip together to make them more secure. In addition, the SMART Connect Multi-loop panel is supplied with DIN rail end stoppers. These should be fitted before the first module, and after the last module on each rail.




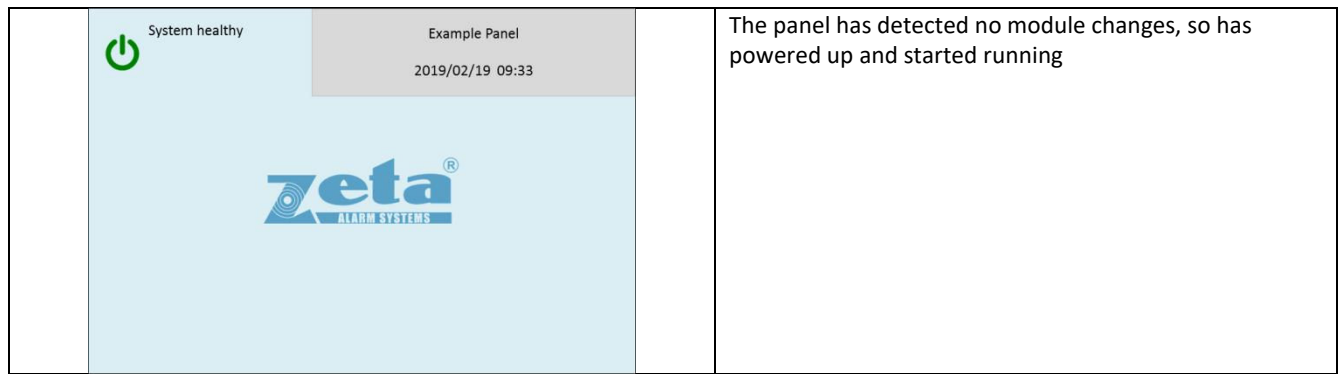
## Before Powering the Panel On

1. To prevent the risk of a spark, do not connect the batteries. Only connect the batteries after powering on the system from its main AC supply.
2. Check that all external field wiring is clear from any open, shorts and ground faults.
3. Check that all the modules have been installed properly, with correct connections and placement
4. Check that all switches and jumper links are at their correct settings.
5. Check that all interconnection cables are plugged in properly, and that they are secure.
6. Check that the AC power wiring is correct.
7. Ensure that the panel chassis has been correctly earth grounded (See BS5839-1:2017 recommendations).
8. Before powering on from the main AC supply, make sure that the front panel door is closed.

## Power on Procedure

1. After the above has been completed, turn the panel on (Via AC Only). The panel will follow the same power up sequence described in initial power up section above
2. The panel will now display one of the following messages

Message	Meaning										
 <p><b>No Modules</b></p>	<p>The Panel has not detected any modules fitted during its power up check.</p> <p>Power down the panel and check that the expected modules are fitted, and that all module cables are correctly inserted.</p> <p>Note that the panel will need at least one module fitted to run.</p>										
<table border="1"> <tr> <td>001</td><td>New module : SOUNDER CLASS B</td></tr> <tr> <td>002</td><td>Empty port</td></tr> <tr> <td>003</td><td>Empty port</td></tr> <tr> <td>004</td><td>Empty port</td></tr> <tr> <td>005</td><td>Empty port</td></tr> </table> <p>✓ ⏴ ⏵</p>	001	New module : SOUNDER CLASS B	002	Empty port	003	Empty port	004	Empty port	005	Empty port	<p>The panel has detected a new module added to a port that was previously empty.</p> <p>This is the usual message seen the first time a panel is configured</p>
001	New module : SOUNDER CLASS B										
002	Empty port										
003	Empty port										
004	Empty port										
005	Empty port										
<table border="1"> <tr> <td>001</td><td>Changed module : SOUNDER CLASS B</td></tr> <tr> <td>002</td><td>Empty port</td></tr> <tr> <td>003</td><td>Empty port</td></tr> <tr> <td>004</td><td>Empty port</td></tr> <tr> <td>005</td><td>Empty port</td></tr> </table> <p>✓ ⏴ ⏵</p>	001	Changed module : SOUNDER CLASS B	002	Empty port	003	Empty port	004	Empty port	005	Empty port	<p>The panel has detected a different type of module fitted to a port that was previously occupied.</p>
001	Changed module : SOUNDER CLASS B										
002	Empty port										
003	Empty port										
004	Empty port										
005	Empty port										
<table border="1"> <tr> <td>001</td><td>Serial Number Changed : LOOP</td></tr> <tr> <td>002</td><td>Empty port</td></tr> <tr> <td>003</td><td>Empty port</td></tr> <tr> <td>004</td><td>Empty port</td></tr> <tr> <td>005</td><td>Empty port</td></tr> </table> <p>✓ ⏴ ⏵</p>	001	Serial Number Changed : LOOP	002	Empty port	003	Empty port	004	Empty port	005	Empty port	<p>The panel has detected a module fitted to a port that is the same type, but it's serial number has changed.</p> <p>This could happen if a loop module was swapped with another one, for example.</p>
001	Serial Number Changed : LOOP										
002	Empty port										
003	Empty port										
004	Empty port										
005	Empty port										
<table border="1"> <tr> <td>001</td><td>Removed Module : LOOP</td></tr> <tr> <td>002</td><td>Empty port</td></tr> <tr> <td>003</td><td>Empty port</td></tr> <tr> <td>004</td><td>Empty port</td></tr> <tr> <td>005</td><td>Empty port</td></tr> </table> <p>✓ ⏴ ⏵</p>	001	Removed Module : LOOP	002	Empty port	003	Empty port	004	Empty port	005	Empty port	<p>The panel has detected no module fitted to a port that was previously occupied.</p>
001	Removed Module : LOOP										
002	Empty port										
003	Empty port										
004	Empty port										
005	Empty port										



1. Check that the module configuration is as expected using the ▲ and ▼ to navigate through the port numbers. Press the ✓ icon to confirm the changes.
2. The new module is now configured into the panel and is ready for use.
3. Since the batteries are not connected, the panel will report them as removed, lighting the yellow “Fault” LED, intermittently sounding the fault buzzer, and displaying battery removed message on the screen.
4. Connect the batteries, ensuring that the polarity is correct (Red wire = +ve) & (Black wire = -ve). Acknowledge the fault event via the display screen, and reset the panel to clear the battery fault.
5. The panel should now remain in the normal condition, and you can configure the panel as normal.

## Field Wiring

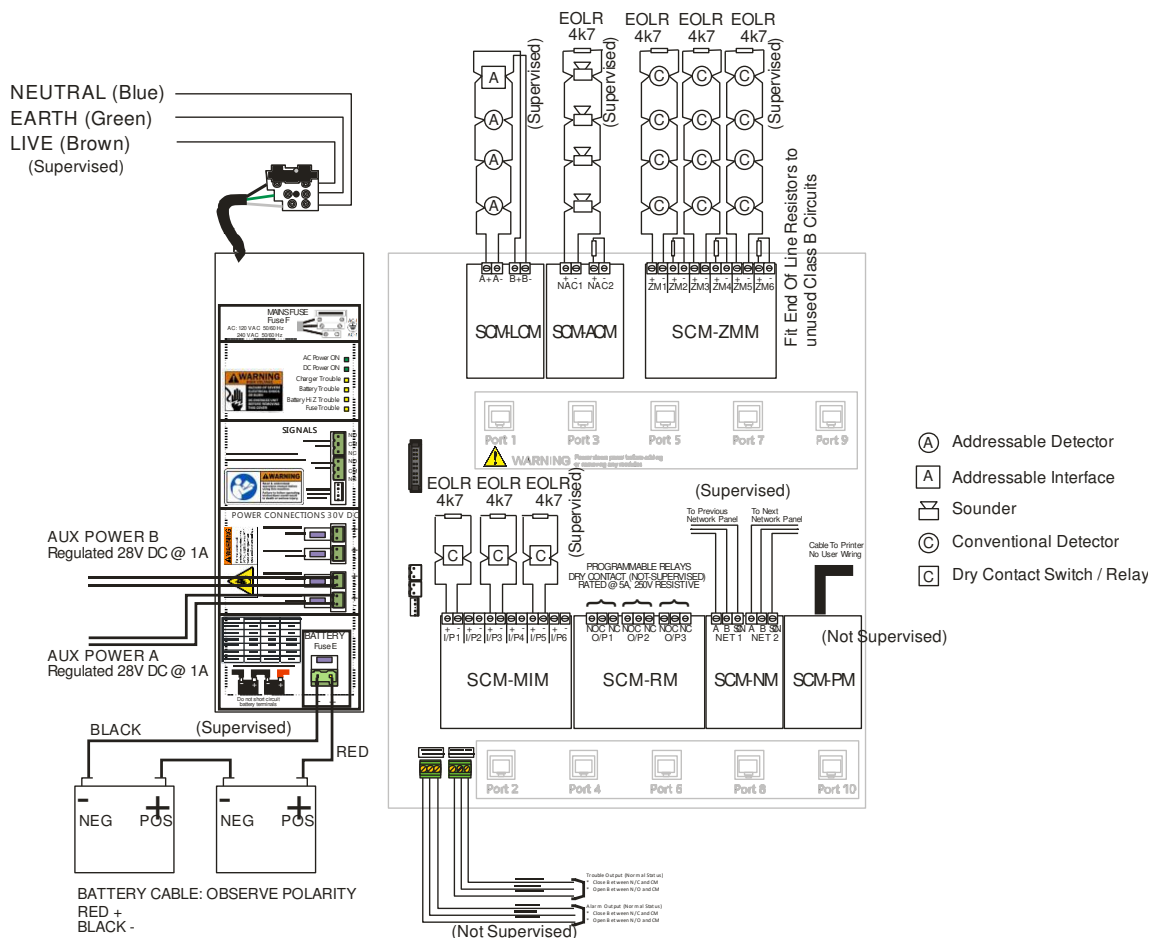


**NOTE:** The terminal blocks are removable to make wiring easier.



**ATTENTION:** DO NOT EXCEED POWER SUPPLY RATINGS, OR MAXIMUM CURRENT RATINGS.

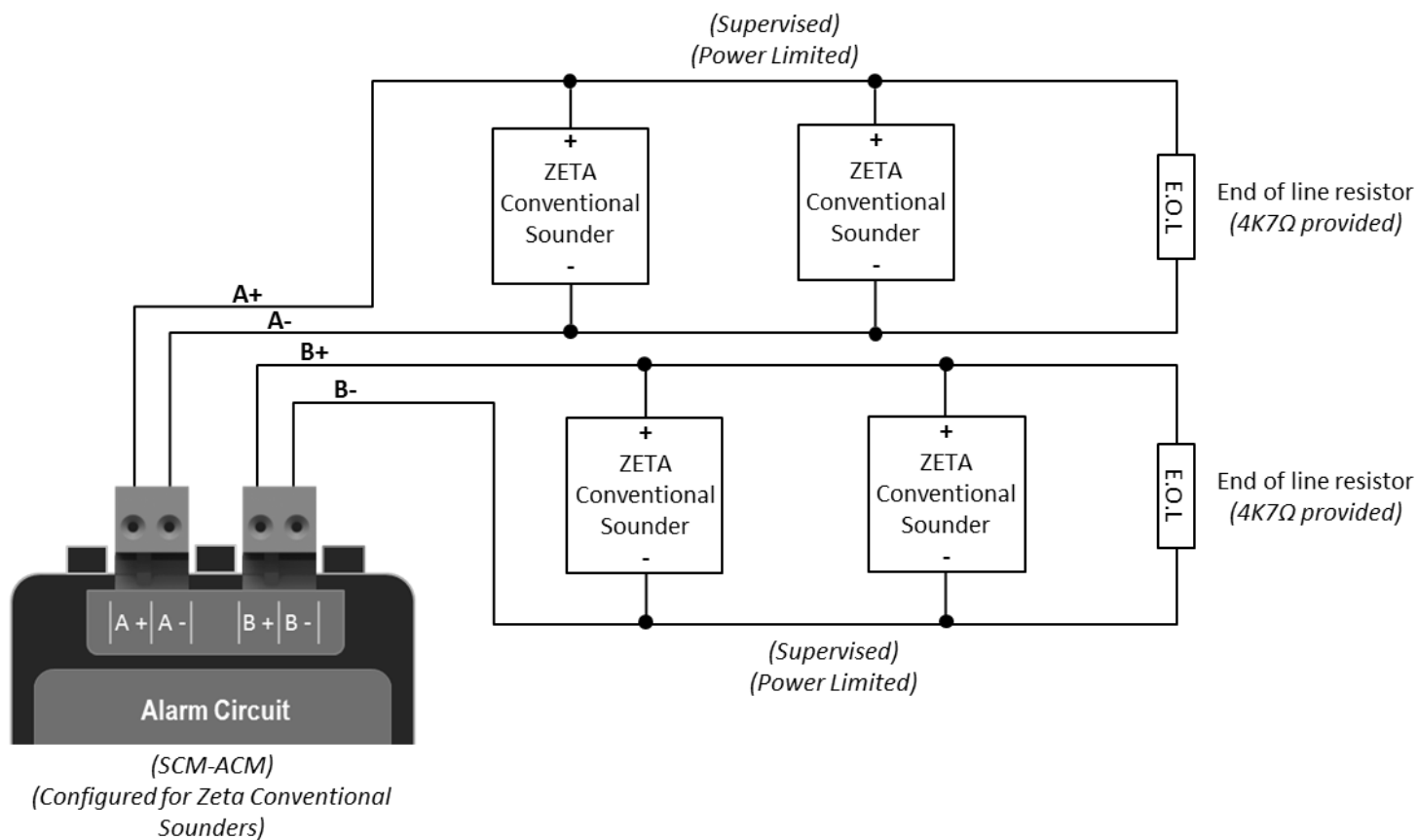
## Wiring Overview



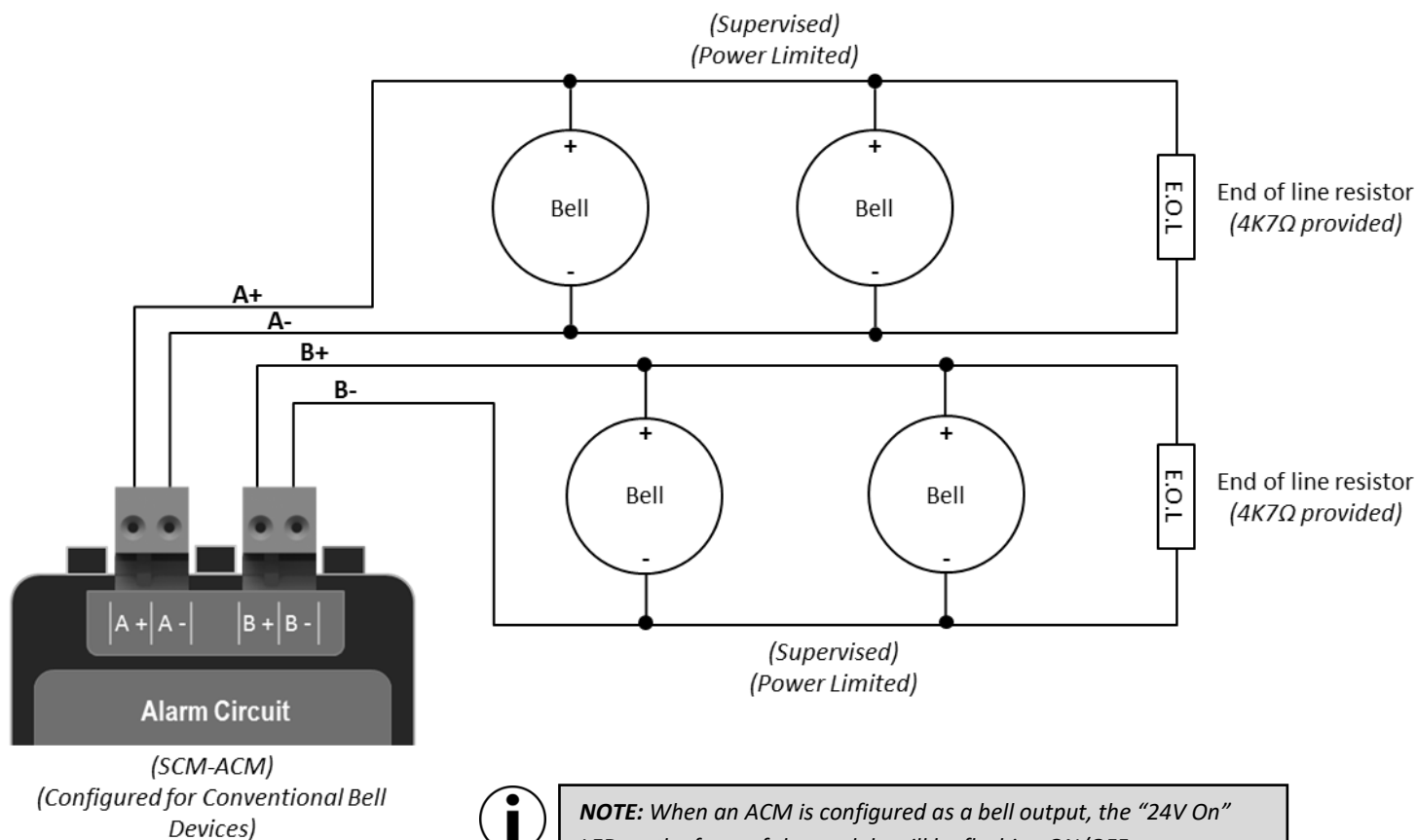
NOTE: The Smart Connect Multi-loop panel is a modular system, where any module can be connected to any expansion port. The above diagram gives an example configuration for illustrative purposes.

## SCM-ACM Field Wiring Connections

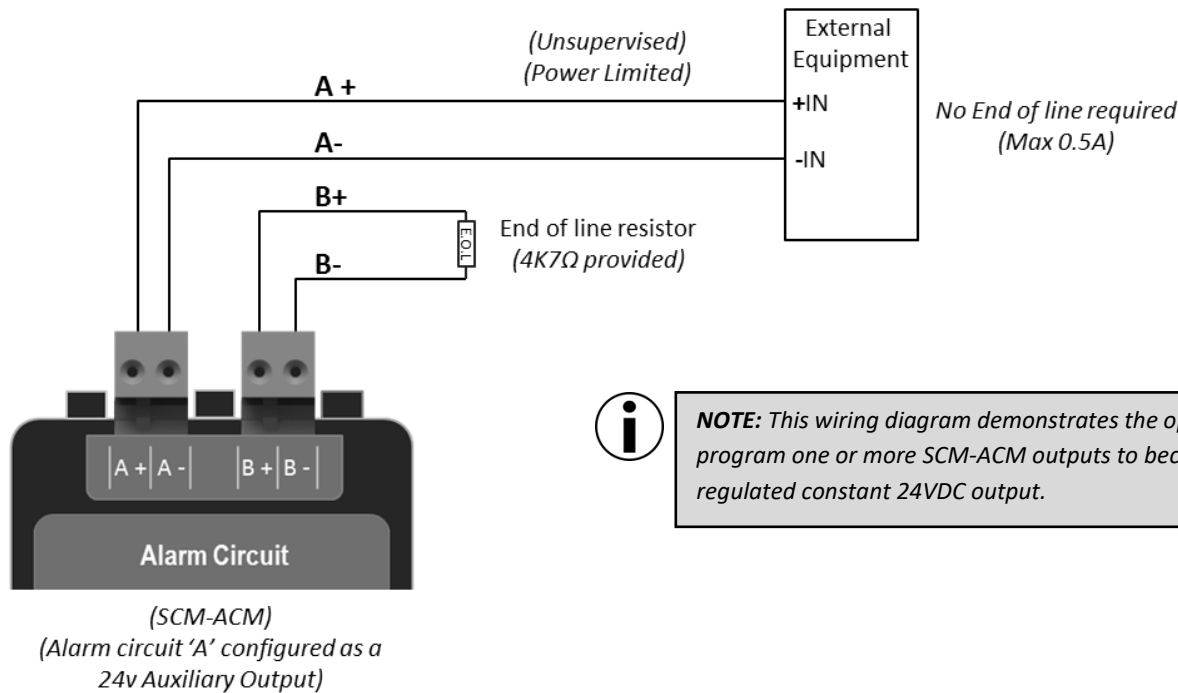
### Typical Wiring Diagram (Class B) – Zeta Conventional Sounders



### Typical Wiring Diagram (Class B) - Bell Devices



## Typical Wiring Diagram (Auxiliary 24VDC)



**NOTE:** This wiring diagram demonstrates the option to program one or more SCM-ACM outputs to become a regulated constant 24VDC output.



**NOTE:** When an alarm circuit is configured as a 24v aux output, the "24V On" LED on the front of the module will be ON.

## Wiring recommendations for Alarm Circuits (SCM-ACM)

The SCM-ACM circuits are rated for 500mA each. The table shows the maximum wire run in metres for different wire gauges and alarm loads.

Wire Gauge	125mA Load	250mA Load	500mA Load
18 AWG	765 m	510 m	340 m
16 AWG	1530 m	1020 m	680 m
14 AWG	1869 m	1246 m	831 m

**RECOMMENDED CABLE:**

Cable should be BS approved FPL, FPLR, FPLP or equivalent.

## SCM-ACM Specifications

Alarm Circuit Module (SCM-ACM)	
Circuit Voltage	29VDC Nominal (19V – 29V)
Circuit Type	Regulated 24V DC. Power limited & Supervised.
Maximum Alarm Circuit Current	2 x 500mA
Maximum Aux 24V Current	2 x 400mA
Maximum RMS current for a single sounder device	350mA
Maximum Line Impedance	3.6Ω total (1.8Ω per core)
Wiring Class	2 x Class B [Power limited & Supervised]
End of Line Resistor	4K7Ω
Recommended cable sizes	18 AWG to 14 AWG (0.8mm <sup>2</sup> to 2.5mm <sup>2</sup> )
Special Applications	24V auxiliary voltage output

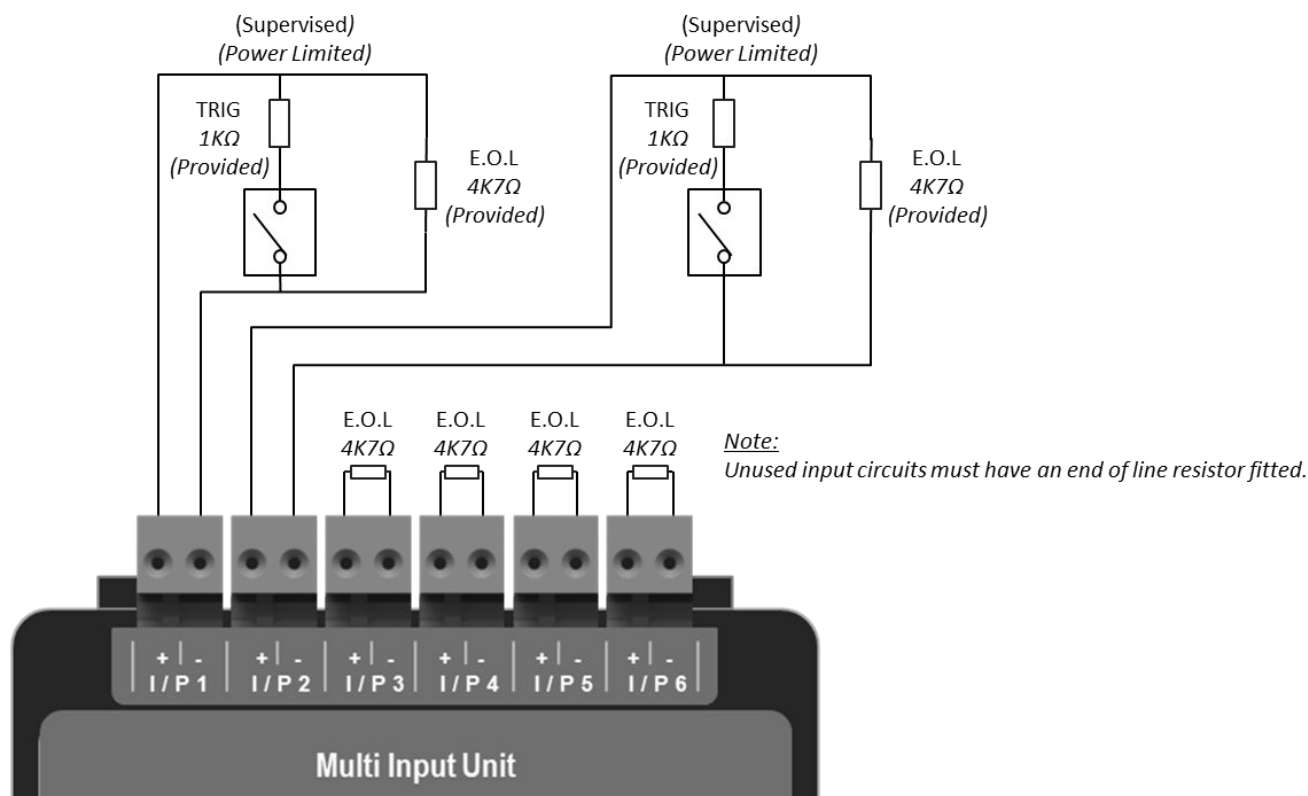
## Compatible Warning Devices

Alarm Circuit Devices	
ZXT	Xtratone Conventional Wall Sounder
ZXTB	Xtratone Conventional Combined Wall Sounder Beacon
ZRP	Conventional Raptor Sounder
ZRPB	Conventional Raptor Sounder Beacon

## Maximum Warning Devices per Circuit

Some of the above warning devices have selectable settings for sound and beacon output. Please refer to the device manuals to calculate the maximum number allowed on each alarm circuit.

## SCM-MIM Field Wiring Connections



## Wiring Recommendations for Input Circuits (*SCM-MIM*)

Wire Gauge (AWG)	Maximum Wiring Run (Metres)
22	910
20	1450
18	2300



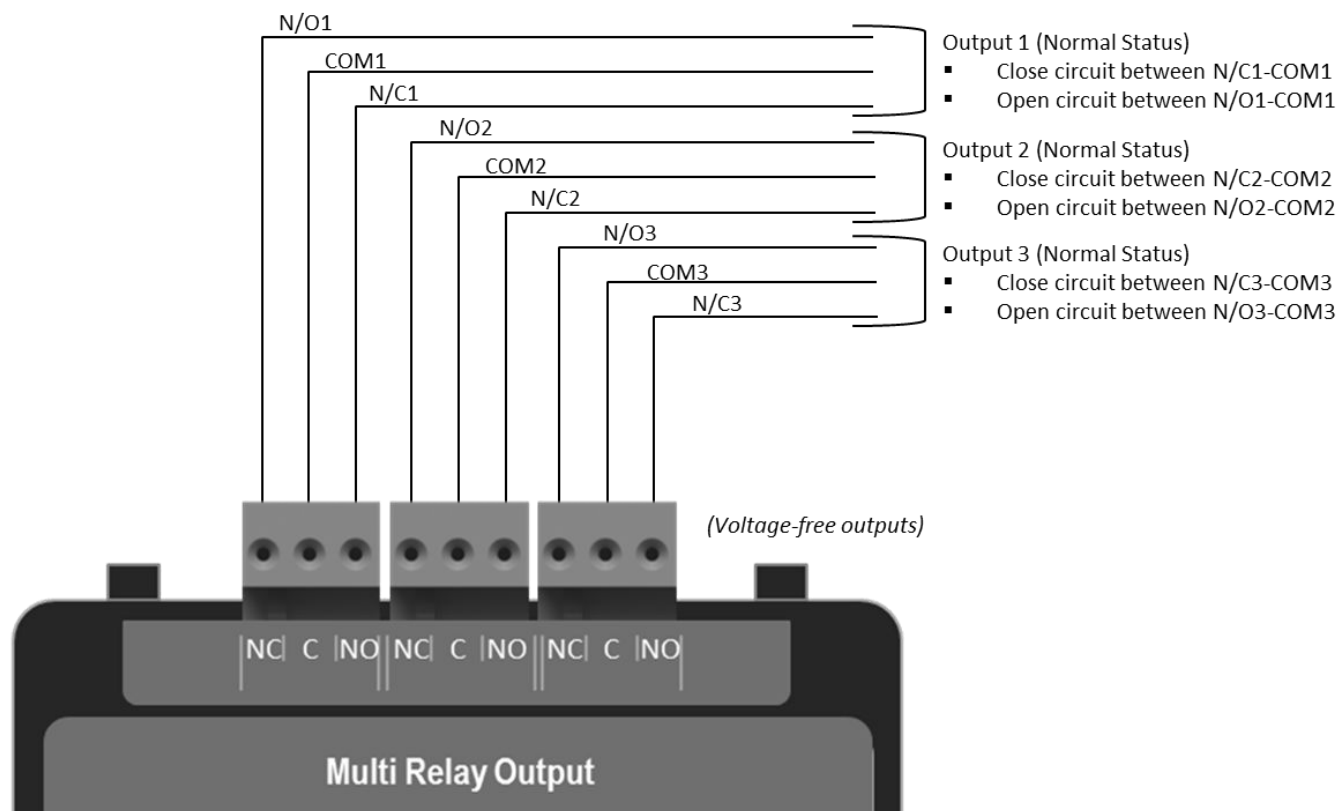
### RECOMMENDED CABLE:

Cable should be BS approved FPL, FPLR, FPLP or equivalent.

## SCM-MIM Specifications

Multi Input Module (SCM-MIM)	
Circuit Voltage	24VDC Nominal (16V – 24.5V with EOL fitted)
Wiring Class	6 x Class B circuits
Input Maximum Line Impedance	10Ω
End of Line Resistor	4K7Ω
Recommended cable sizes	22 AWG to 18 AWG (0.3mm <sup>2</sup> to 0.8mm <sup>2</sup> )
Alarm Trigger Resistor	1KΩ

## SCM-RM Field Wiring Connections

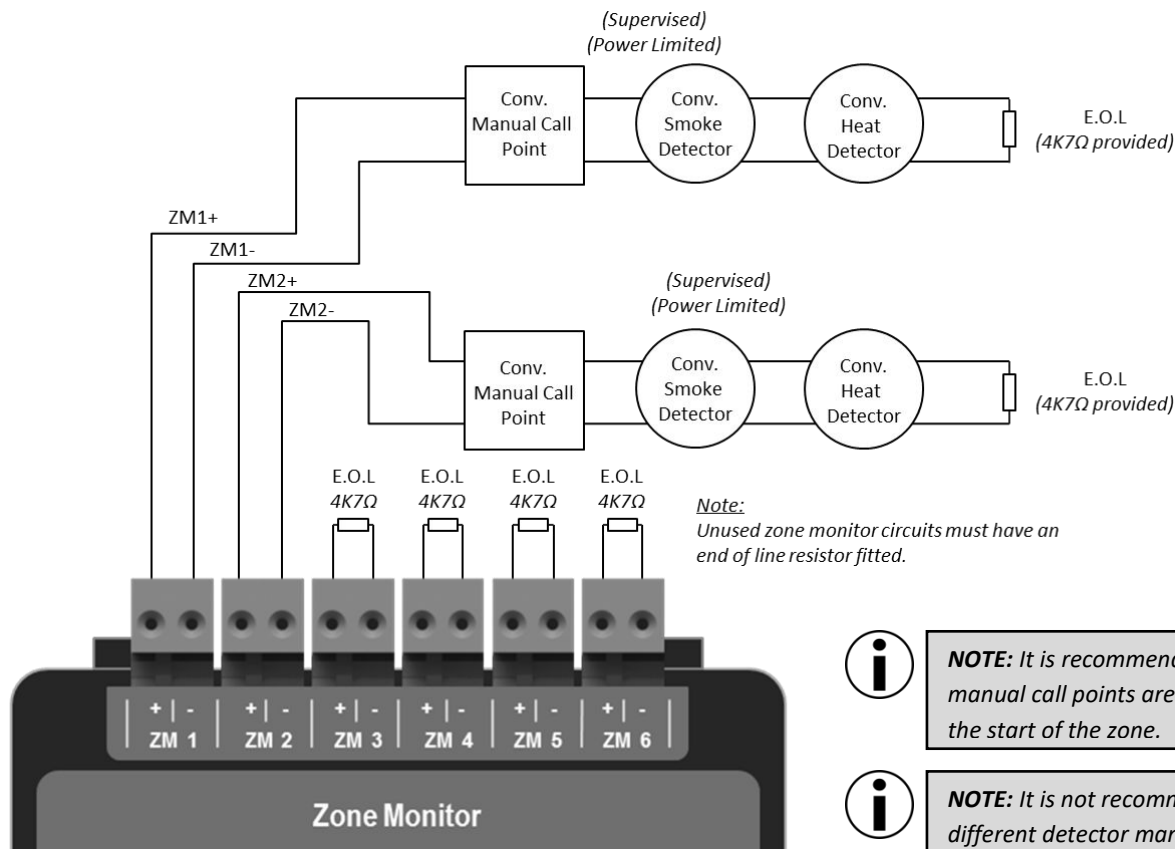


**NOTE:** When an MRM relay is configured as an alarm output, it will act as a common alarm relay, and cannot be controlled by cause and effect.

## SCM-RM Specifications

Multi Relay Modules (SCM-RM)	
Contact Form	3 x Form C
Switching Capacity	5 A, 30VDC (resistive) 5 A, 250VAC (general use)
Circuit Type	Power limited & Not Supervised.
Modes	Common alarm, Common fault, Common tech alarm or Programmable
Recommended cable sizes	18 AWG to 14 AWG (0.8mm <sup>2</sup> to 2.5mm <sup>2</sup> )

## SCM-ZMM Field Wiring Connections



**NOTE:** It is recommended that all manual call points are connected at the start of the zone.



**NOTE:** It is not recommended to mix different detector manufacturers on a zone.

## Wiring Recommendations for Zone Monitor Circuits (SCM-ZMM)

Wire Gauge (AWG)	Maximum Wiring Run (Metres)
22	910
20	1450
18	2300



### RECOMMENDED CABLE:

Cable should be BS approved FPL, FPLR, FPLP or equivalent.

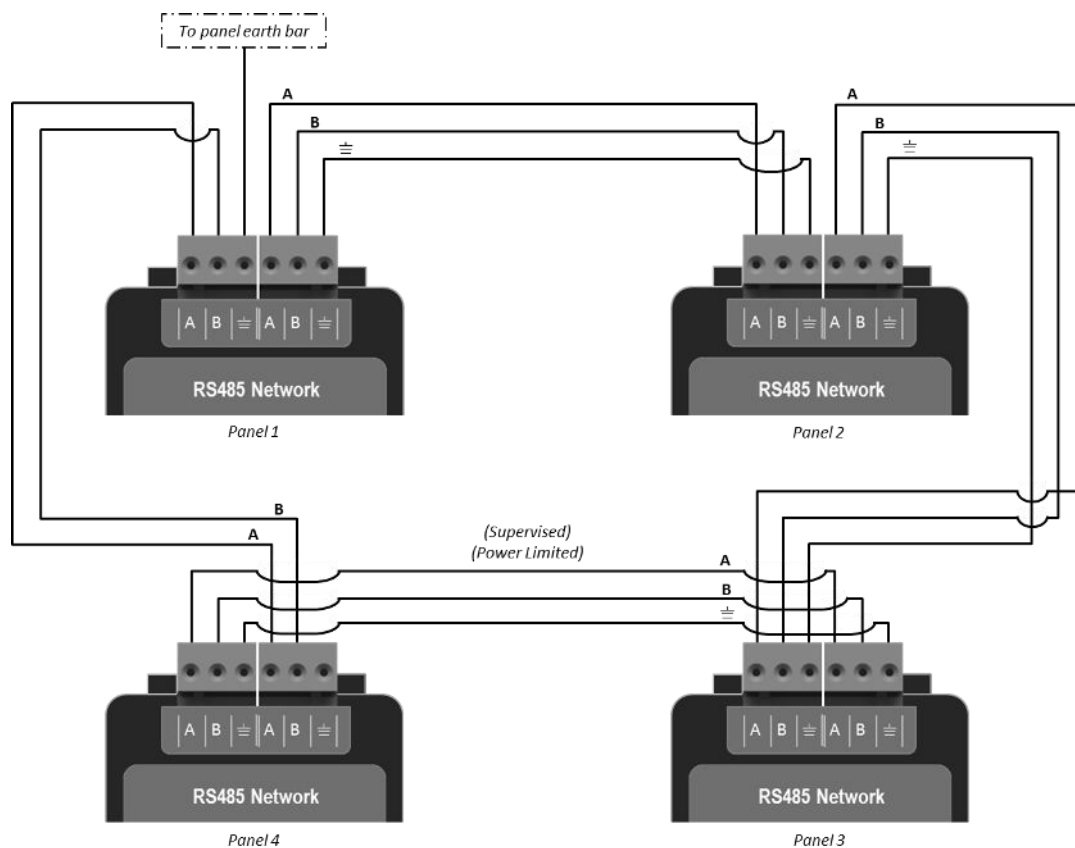
While SMART Connect Multi-loop conventional Zone modules can support cable runs greater than 2000m, it is generally better to plan the system to use more manageable lengths.

## SCM-ZMM Specifications

Zone Monitor Modules (SCM-ZMM)	
Circuit Voltage	26VDC Nominal (17.5V - 26.5V with EOL connected)
Circuit Type	Power limited & Supervised
Wiring Class	Class B
Zone Maximum Line Impedance	10Ω
Zone Maximum Current (under S/C conditions)	56mA
Wiring Class	6 x Class B circuits
Recommended cable sizes	22 AWG to 14 AWG (0.3mm <sup>2</sup> to 2.5mm <sup>2</sup> )
End of Line Resistor	4K7Ω
Alarm Trigger Resistor	1KΩ
Compatible Devices	MKII-OP, MKII-HR, MKII-HF, MKII-HF-CS90, MKII-OH, ZT-CP3 (All are EN54 approved)
Maximum Detectors Per Zone	20

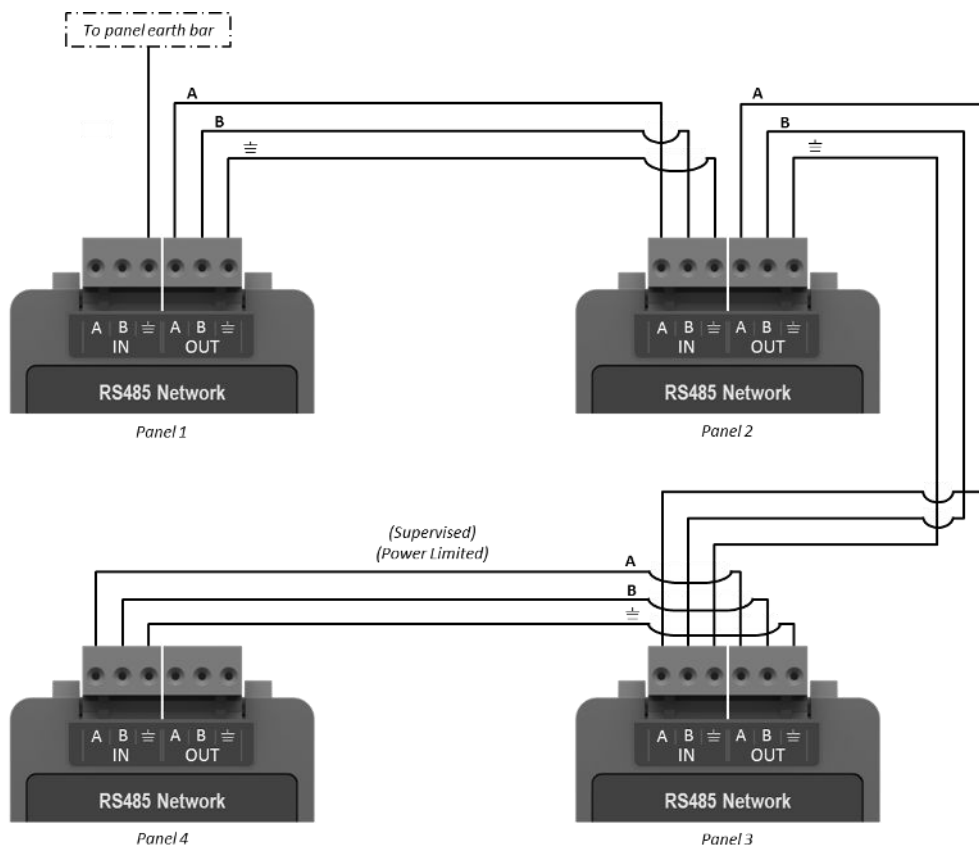
## SCM-NM Field Wiring Connections

### Ring Topology



**NOTE:** It is recommended to install the network in a ring topology for protection against open circuit and short circuit faults.

### Bus Topology



## Wiring Recommendations for Network Wiring (*SCM-NM*)

The SMART Connect Multi-loop network can support up to 64 panels.



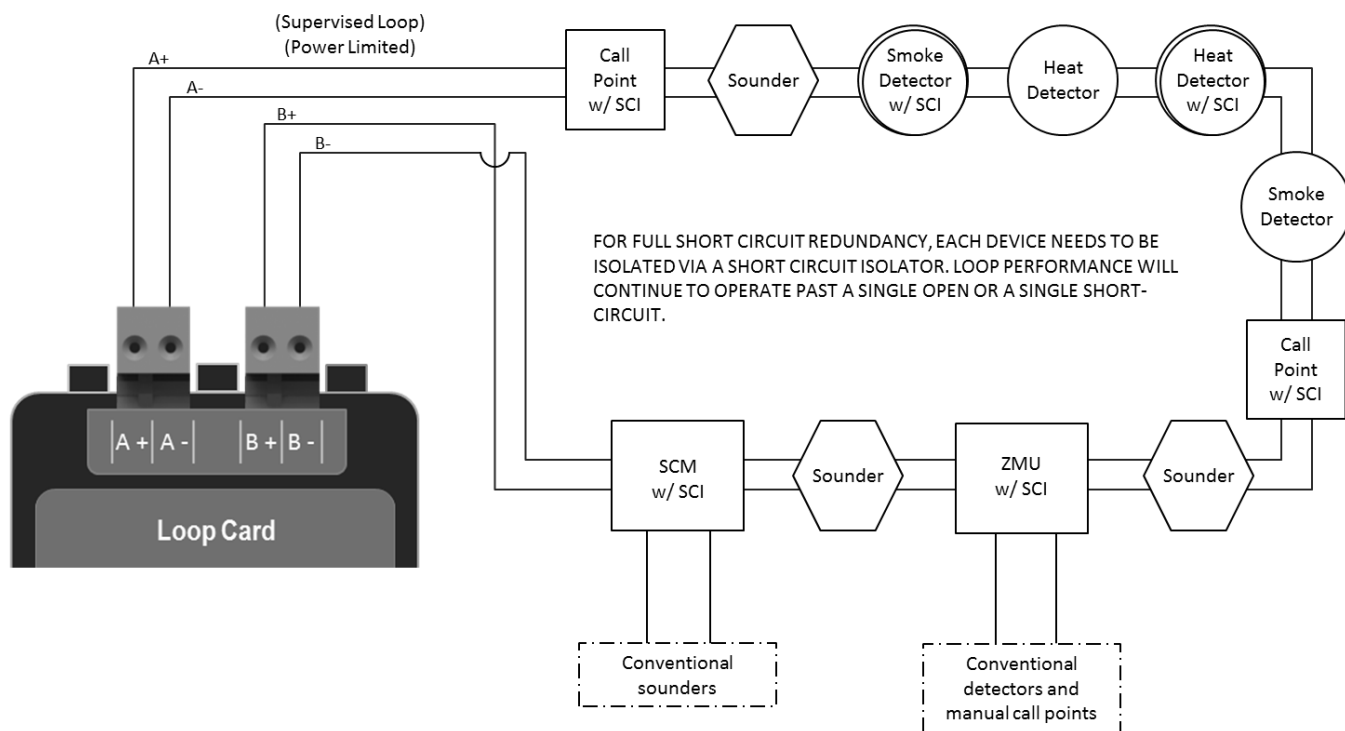
**RECOMMENDED CABLE:** *Belden type*

## SCM-NM Specifications

Network Module (SCM-NM)	
Maximum Network Size	64 Nodes
Maximum Distance Between Nodes	1KM (with screened data cable)
Communication Protocol	RS485
Network Wiring Typologies	Bus or Ring

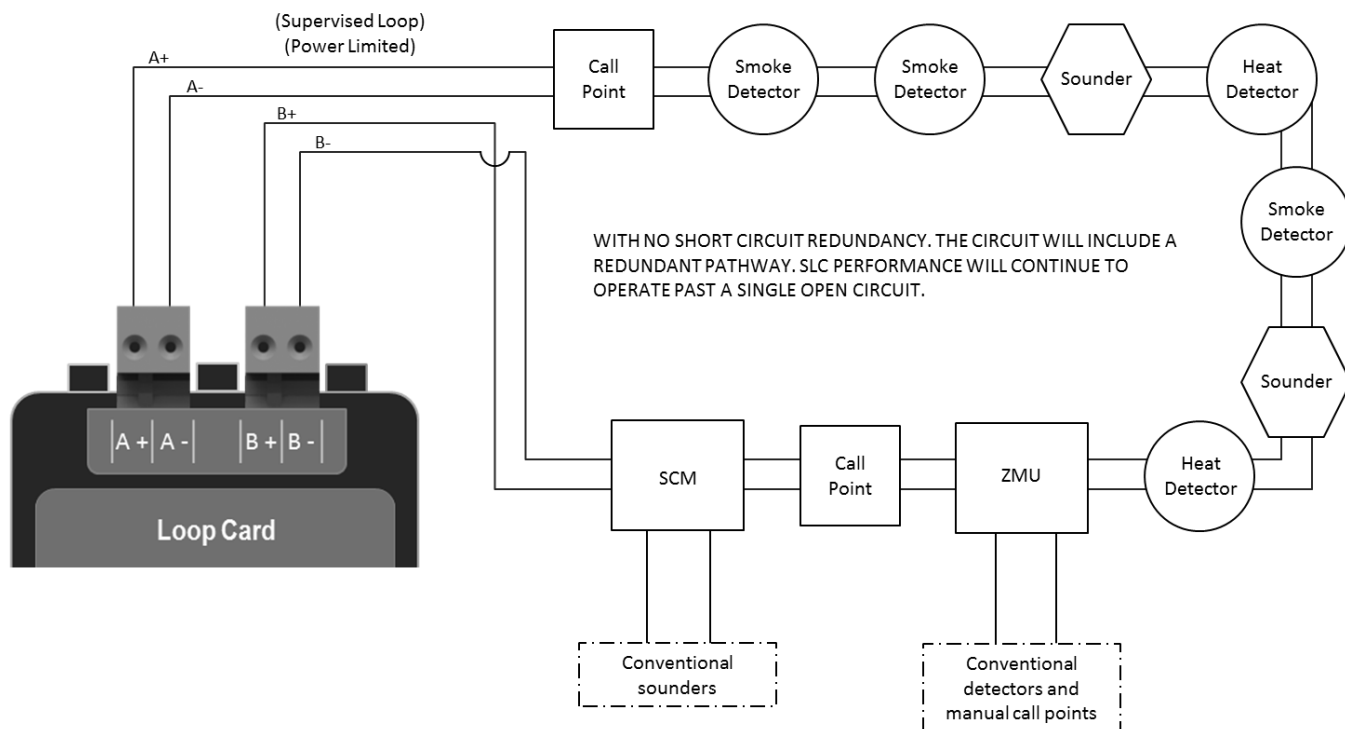
## SCM-LCM Field Wiring Connections

### Class X Wiring



**Note:** Detectors can be fitted to isolator bases, or fitted between isolator modules for Class X wiring. Manual stations should be fitted between isolator modules.

### Class A Wiring



**Note:** If a loop using Class A wiring is used for 2 or more detection zones, short circuit isolators, or devices with built in short circuit isolators (such as interfaces) should be fitted to the zone boundaries to prevent a single short circuit affecting more than one zone.

## Wiring Recommendations for Loop Card Modules (*SCM-LCM*)

The SCM-LCM's are rated for 450mA each, but it is recommended that you leave an allowance ~100mA for any future loop expansion.

MAXIMUM LOOP CURRENT (IN ALARM)	500 mA	400 mA	300 mA	200 mA
1mm <sup>2</sup> CSA cable	500m	625m	830m	1250m
1.5mm <sup>2</sup> CSA cable	750m	930m	1250m	1870m
2.5mm <sup>2</sup> CSA cable	1000m	1250m	1660m	2500m



### NOTE:

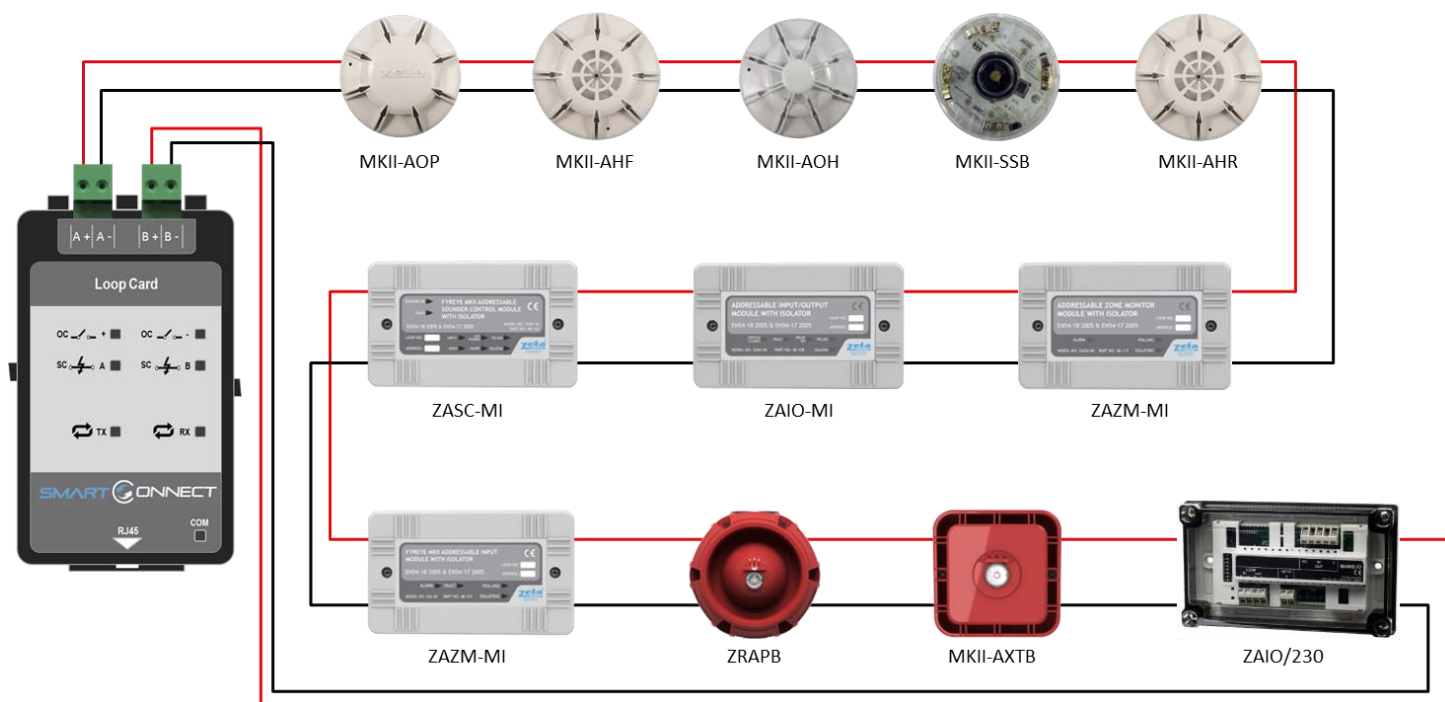
- Line capacitance shall not exceed 0.5µf (500nF)
- Inductance shall not exceed 1mH
- Resistance shall not exceed 50 Ohms.



**RECOMMENDED CABLE:** The general recommendation would be to use a standard fire resistant cable, such as Firetuf™, FP200 or an equivalent, 1.0mm<sup>2</sup> to 2.5mm<sup>2</sup>. These cables are screened, and will provide good EMC shielding when properly grounded at the panel.

## Loop Device Wiring and Device Information

Loop device configuration for addressable devices



### MKII-AOP



**MKII-AOP** - The Fyreye MKII optical smoke detector (MKII-AOP) uses a pulsing IR LED & photodiode to detect IR scatter caused by smoke entering the chamber.

The detector is particularly suitable for detecting optically dense smoke, involving materials such as soft furnishings, PVC, plastic, foam and all similar materials which produce small visible particles (0.5 to 10µm).

### MKII-AHR, MKII-AHF and MKII-AHF/CS90

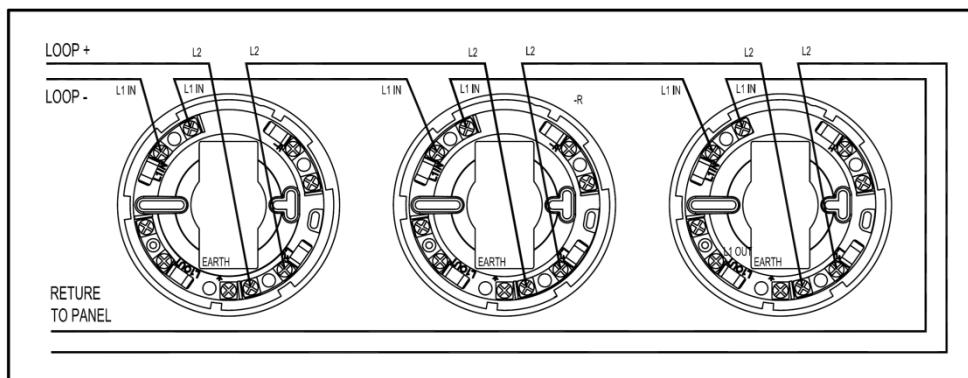


**MKII-AHR, MKII-AHF and MKII-AHF/CS90** - The Fyreye MKII Rate of Rise heat detector (MKII-AHR) uses a thermistor arrangement to sense a quick rise in temperature and also a final threshold temperature of 57°C. The Fyreye fixed heat detector (MKII-AHF) has a single thermistor arrangement that gives an alarm at a temperature of 57°C, where the MKII-AHF/CS90 give an alarm above 86°C.

## MKII-AOH



**MKII-AOH**—The Fyreye MKII optical heat Detector contains both an optical smoke detector and a thermistor temperature sensor for full fire detection. The smoke sensor uses a pulsing IR LED & photodiode to detect IR scatter caused by smoke entering the chamber. The heat sensor has a single thermistor arrangement that gives an alarm at a temperature of 57°C.



Addressable device – Wiring diagram

## MKII-CB



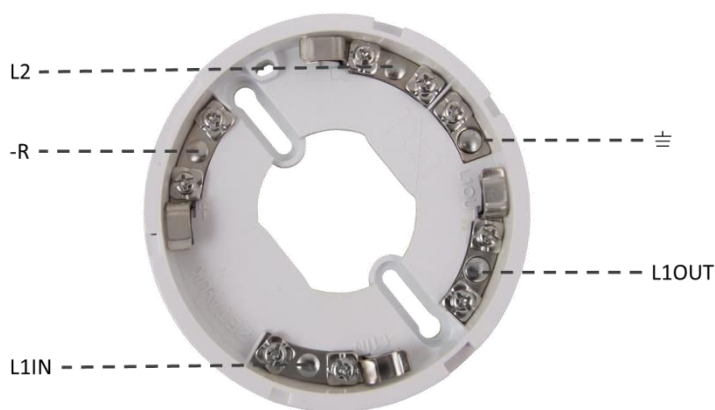
**MKII-CB** series base is detector base which is designed to be used with the model **MKII-AOP**, **MKII-AHF**, **MKII-AHF/CS90**, **MKII-AHR**, and **MKII-AOH** detector series heads. The series includes MKII-CB, which is a 4 inch standard base, and MKII-CB/D, which is 4 inch deep base.

## MKII-CB/D



**MKII-CB & MKII-CB/D** are supplied with 5 terminals as standard. The Terminals of the bases are configured as follows.

- L1IN=Loop Negative
- L1OUT= Not Used
- L2=Loop Positive
- -R=(Used for remote indicators only)
- $\equiv$  = Earth screen

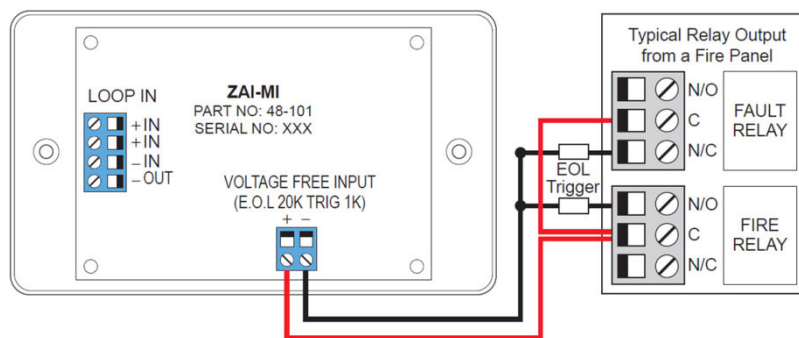


Position of terminals (MKII-CB)

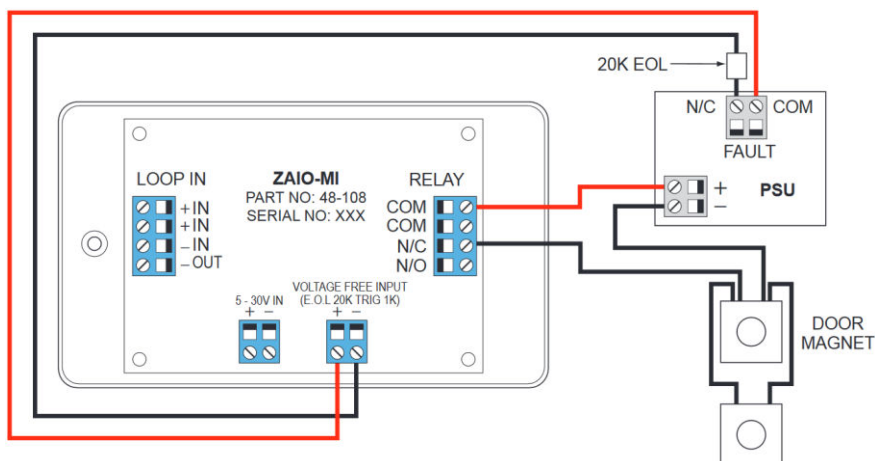
## ZAI-MI



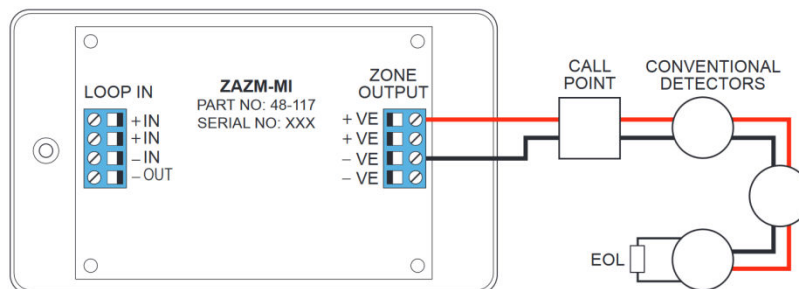
**ZAI-MI** – The ZAI-MI is used to monitor and raise alarm from any ancillary equipment such as sprinkler flow switch, aspiration detectors, secondary fire control panel, beam detectors, external power supplies etc. For more details and connection information consult the installation guide.

**ZAI-MI typical wiring diagram** (E.g. connecting to fire panel / beam detector / UV IR detector):**ZAIO-MI**

**ZAIO-MI** – The ZAIO-MI is used when both an input needs to be monitored and at the same time a local output (relay output) needs to be triggered to switch ancillary equipment on or off during an alarm condition. Typical output triggering includes: controlling lift operation during an alarm, starting fire pump, stopping ventilation fans etc.

**ZAIO-MI typical wiring diagram**(E.g. connecting to a door magnet):**ZAZM-MI**

**ZAZM-MI** – The ZAZM-MI is a conventional zone that can be used for conventional devices and/or for special detectors that are not available in addressable form such as UV detectors, Aspiration detectors etc. For more details and connection information consult the installation guide.

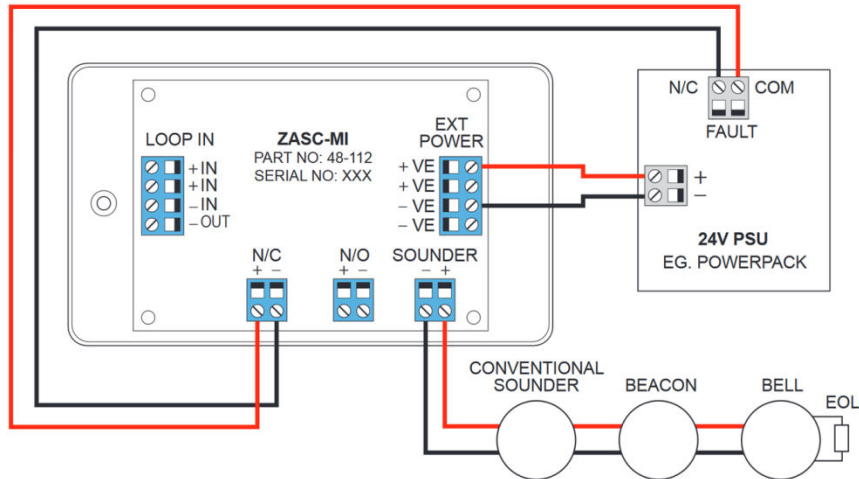
**ZAZM-MI typical wiring diagram**(E.g. connecting to conventional initiating devices):

## ZASC-MI



**ZASC-MI** – The ZASC-MI can be used to supply a monitored 24Vdc to operate external relays and as a conventional sounder circuit to run bells or beacon flashers where the current consumption prohibits the use of addressable loop powered devices. The unit also includes input connections to monitor the external power supply status and report the findings to the addressable control panel.

## ZASC-MI typical wiring diagram (E.g. connecting to conventional sounder devices):



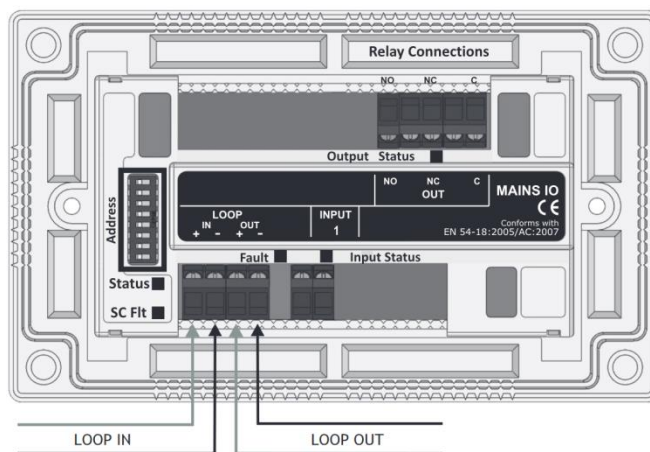
## ZAIO/230



**ZAIO/230** – The interface is used to monitor the contacts of an external system which must be interfaced to the Fire Alarm System, for example a Flow Switch in a sprinkler system to indicate if the sprinklers have been activated or extinguisher level monitoring in Gas Extinguishing systems, etc.

Module is provided with a loop short-circuit isolator and with a voltage free single pole change over mains rated output. The output relay is always powered directly from the detection loop. It is not required to use an external 24V DC power supply. Relay operation is confirmed by an on-board red LED

## ZAIO/230 typical wiring diagram (E.g. Loop wiring):

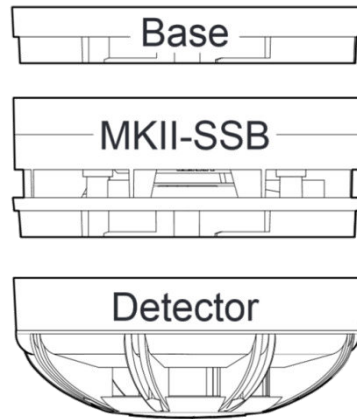


## MKII-SSB



**MKII-SSB** – The Fyreye II Sandwich sounder base is a platform sounder that works with the Zeta Fyreye MKII protocol. The sounder can be triggered from its detectors remote LED output, allowing the sounders to be triggered individually. It can also be triggered using the Protocol's common sounder group command, meaning that it can be triggered even if it's detector has been removed. This sounder has been designed to be sandwiched between a common base and an addressable Fyreye II Detector

## MKII-SSB typical setup:



#### MKII-AXT & MKII-AXTB

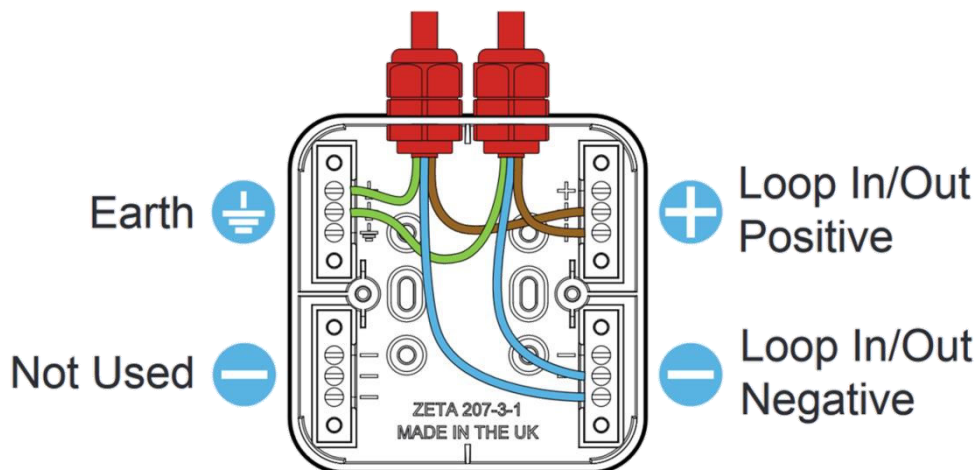


(MKII-AXTB/R pictured)

**MKII-AXT & MKII-AXTB** – The Xtratone addressable sounder beacon is a small, high output device, suitable for indoor wall mounted applications. It is available in red or white and has a selection of 16 alarm tones, selectable at the control panel. Termination of field wiring is made to the back box for a clean first fix.

The AXTB beacon has a coverage pattern of W-3.1-9.1.

#### MKII-AXT & MKII-AXTB typical wiring diagram (E.g. Loop wiring):



#### ZRAP & ZRAPB

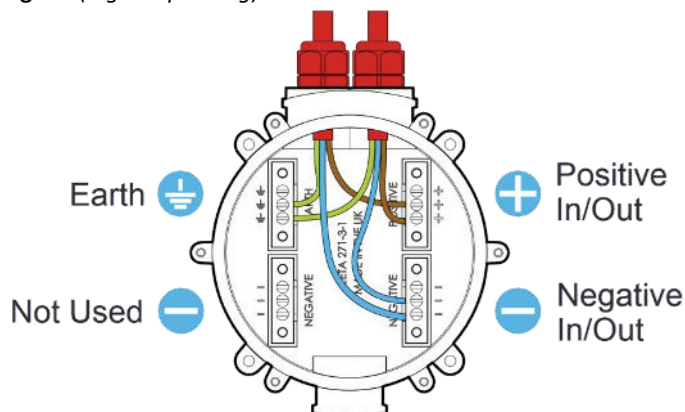


(ZRAPB/R pictured)

**ZRAP & ZRAPB** – The Raptor addressable sounder is a large weatherproof horn sounder suitable for many indoor & outdoor applications. It is available in red or white and has a selection of 16 tones, selectable at the control panel. Termination of field wiring is made to the back box for a clean first fix.

The ZRAPB beacon has a coverage pattern of W-3.0-8.7 and has a flash rate between 0.33Hz and 1.5Hz.

#### ZRAP & ZRAPB typical wiring diagram (E.g. Loop wiring):



## SCM-LCM Specifications

Loop Card Modules (SCM-LCM)	
Circuit Voltage	28V + 9V Data (Nominal)
Protocol Data	Address Phase: Pulse Width Modulation Reply Phase: Synchronous 20mA Current Pulses
Circuit Type	Power limited & Supervised
Recommended cable sizes	1.0mm <sup>2</sup> to 2.5mm <sup>2</sup> (18 AWG to 14 AWG)
Maximum Loop Current	450mA
Maximum Loop Capacity	250 Addresses
Maximum Loop Resistance	25Ω per core @ 200mA / 10Ω per core @ 450mA
Maximum Loop Capacitance	500nF
Maximum Loop Baud Rate	1024 Bits Per Second (typical)

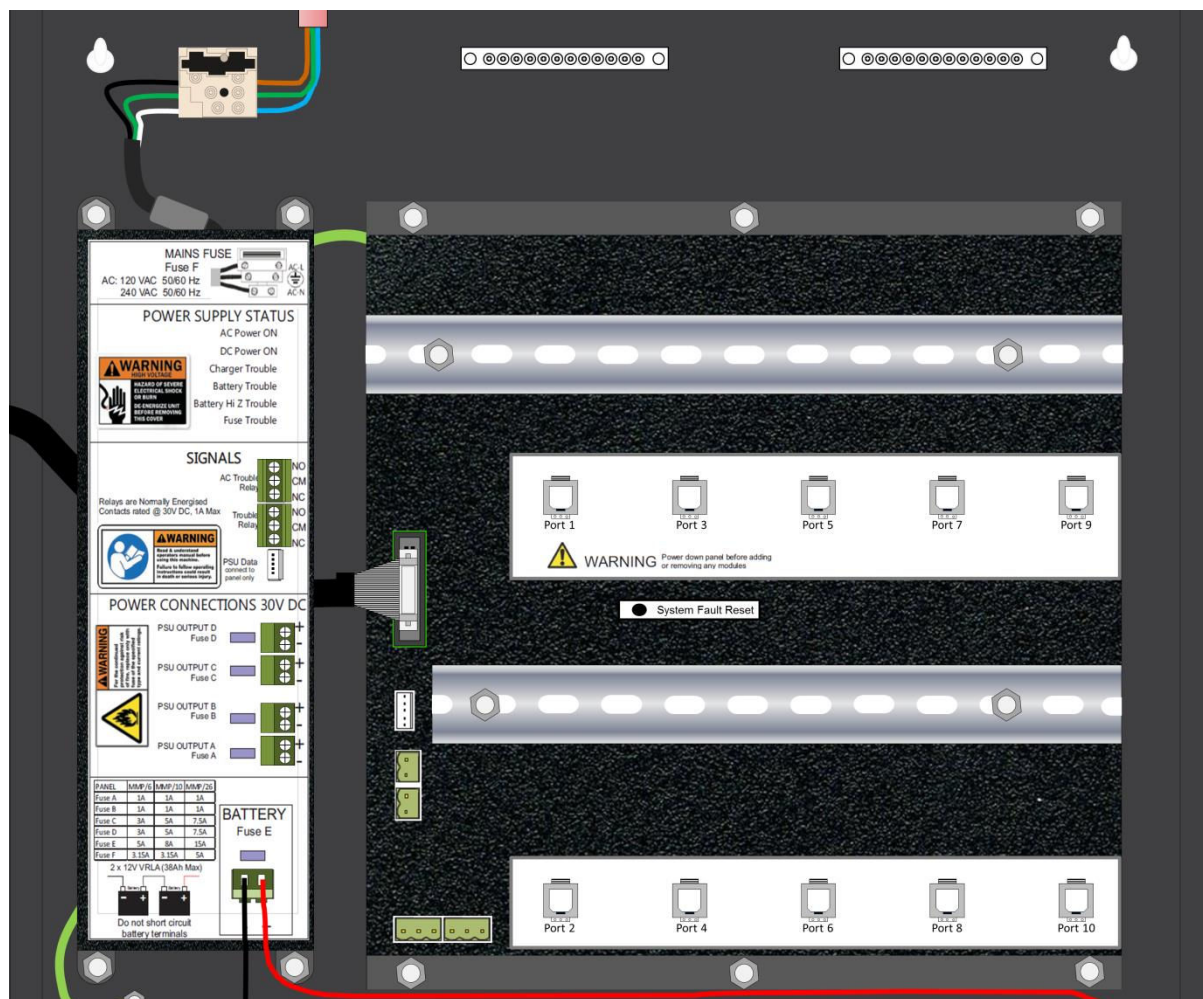
## Compatible Loop Card Devices

Loop Card Devices	
Description	Model No.
MKII Addressable Optical Smoke Detector	MKII-AOP
MKII Addressable Combined Optical Smoke & Heat (A1R) Detector	MKII-AOH
MKII Addressable Fixed Heat Only A2S Detector	MKII-AHF
MKII Addressable Fixed Heat Only CS Detector	MKII-AHF/CS90
MKII Addressable Rate of Rise & Fixed Heat Detector A1R Detector	MKII-AHR
MKII Addressable Optical Smoke Detector With Built-In Isolator	MKII-AOPI
MKII Addressable Combined Optical Smoke & Heat (A1R) Detector With Built-In Isolator	MKII-AOHI
MKII Addressable Fixed Heat Only A2S Detector With Built-In Isolator	MKII-AHFI
MKII Addressable Fixed Heat Only CS Detector With Built-In Isolator	MKII-AHFI/ CS90
MKII Addressable Rate of Rise & Fixed Heat Detector A1R Detector With Built-In Isolator	MKII-AHRI
Addressable Remote LED Indicator	MKII-ARL
Zeta Addressable CP3 Manual Call Point	ZT-CP3/AD
MKII Sandwich Sounder	MKII-SSB
Xtratone Addressable Wall Sounder	MKII-AXT
Xtratone Addressable Combined Sounder Beacon	MKII-AXTB
Raptor Addressable Weatherproof Sounder	ZRAP
Raptor Addressable Weatherproof Sounder Beacon	ZRAPB
MKII Addressable Input Module with S/C Isolator	ZAI-MI
MKII Addressable Input/Output Module with S/C Isolator	ZAIO-MI
MKII Addressable Sounder Circuit Controller with S/C Isolator	ZASC-MI
MKII Addressable Zone Monitoring Unit with S/C Isolator	ZAZM-MI
MKII Addressable Mains switching I/O unit 8A @ 230V AC	ZAIO/230
Special Mini Module (Yellow) - Alarm Devices	SMM/S
Special Mini Module (White) - Beam Detector	SMM/B
Special Mini Module (Red) - Call Point	SMM/C
MKII Shallow Common Base	MKII-CB
MKII Deep Common Base	MKII-CB/D
MKII Isolator Base	MKII-IB
MKII Common Base For Use With Detectors /w Isolator	MKII-CBI

# Power Supply

The SMART Connect Multi-loop Power supply is located on the left hand side of the back box.

There are three different power supply sizes, depending on whether the panel is a 6 ports, 10 ports, or 26 ports version.



## PSU Specifications

	SMART6	SMART10	SMART26
AC Line Voltage	120 – 230 VAC	120 – 230 VAC	120 – 230 VAC
Power Supply Rating	400 Watts	400 Watts	400 Watts
DC Output Voltage	30 VDC	30 VDC	30 VDC
Maximum Output Current	11.1 Amp	11.1 Amp	11.1 Amp
Battery Voltage	27.6VDC	27.6VDC	27.6VDC
Battery Charging Capability	Up to 12.0Ah	Up to 38.0Ah	Up to 38.0Ah
Max Battery Charging Current	1.1 Amp	2.2 Amp	2.2 Amp



### ATTENTION:

- DO NOT EXCEED POWER SUPPLY RATINGS, OR MAXIMUM CURRENT RATINGS.
- TO AVOID SPARKING, CONNECT BATTERIES AFTER THE SYSTEM'S MAIN AC POWER IS TURNED ON.
- COMPLY WITH VOLTAGE MARKINGS AS SPECIFIED ON LABELS.

## PSU Fuses

All fuses are quick blow, rating as shown.

Panel Designation	SMART6	SMART10	SMART26
Fuse A	1A	1A	1A
Fuse B	1A	1A	1A
Fuse C	7.5A	7.5A	7.5A
Fuse D	7.5A	7.5A	7.5A
Fuse E	5A	8A	15A
Fuse F	3.15A	3.15A	3.15A

## Power Supply Status Indications

LED Description	LED Colour	Indication Method	Event
AC Power ON	Green	ON	Mains power present, converter in operating state
		OFF	Mains power off
DC Power ON	Green	ON	No mains power or converter off
		OFF	When mains power present
Charger Fault	Yellow	OFF	Normal
		Flashing	Charger Fault
Battery Fault	Yellow	OFF	Normal
		Flashing	Battery disconnected / Battery fuse blown or removed/ Low Battery
Battery Hi Z	Yellow	OFF	Normal
		Flashing	Battery internal high impedance present
Blown Fuse	Yellow	OFF	Normal
		Flashing	Fuse A, B, C, or D, are blown



1. Switch SW2 on the charger PCB is used to determine if temperature compensation is used or not. Power down panel completely before removing cover to change the setting.
2. Battery circuit resistance measurement is required by BS EN 54-4. The maximum resistance of several tens to hundreds of milliohms varies for different power supplies and depends on their nominal output voltage and power. It can be set on or off by using switch 4 of dip switch SW1 on the charger PCB. Power down panel completely before removing cover to change the setting.

## Power Supply Signals

Description	Details
MAINS FAULT	Continuity between NC & C in normal operating condition. When there is a fault condition on the mains power, continuity is switched to NO & C. Relay is normally energized and “fail-safe” as the relay will change over in the event of total power failure.
FAULT RELAY	Continuity between NC & C in normal operating condition. When there is any fault on the PSU or Charger, continuity is switched to NO & C. Relay is normally energized and “fail-safe” as the relay will change over in the event of total power failure.
PSU DATA	Serial data connection from PSU to termination PCB. TO BE USED TO CONNECT TO PANEL ONLY.

# Panel Printer

(SMART Connect Multi-loop systems with a fitted panel printer only)

## Loading/Replacing the Printer Paper Roll

The SMART Connect Multi-loop uses a CUSTOM PLUS2 RS232 panel printer. This printer will accept printer rolls that meet the following requirements:

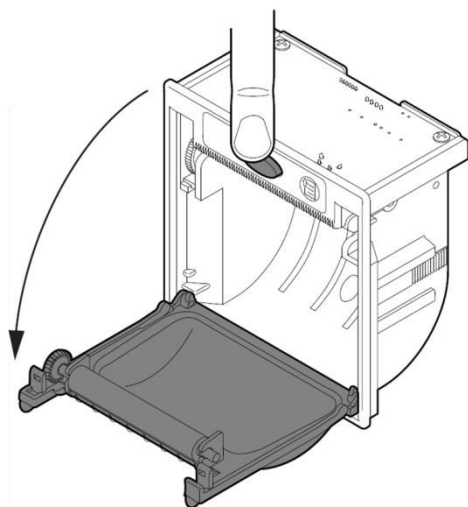
Specification	PLUS2
Paper Type	Thermal Paper Roll
Paper Width	57mm
Roll Diameter	50mm
Roll Length	30m (See note)
Paper Weight	55 to 70gsm



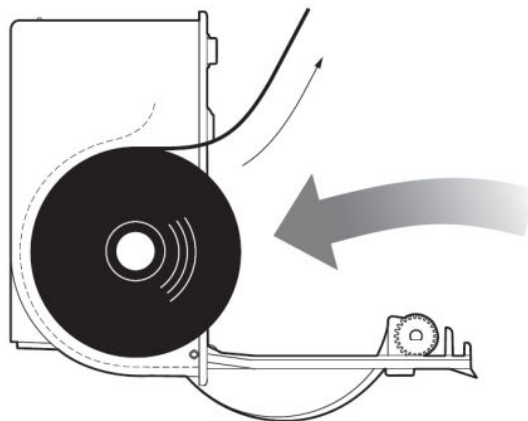
**Note:** Paper roll length is approximate, based upon readily available UK sourced paper with 12.7mm core.

To change the printer roll, proceed as follows. Every time the paper is changed, check inside the device to locate and remove any Scrap pieces of paper.

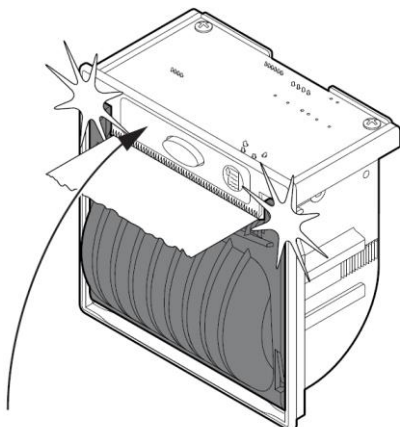
**1.** Open the printer cover.



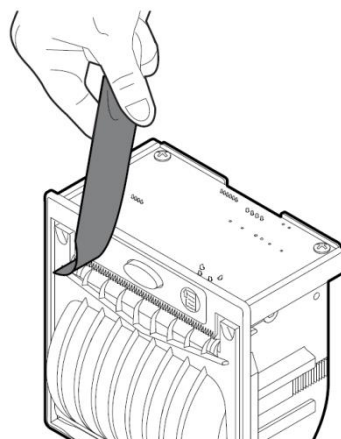
**2.** Place the roll in the paper compartment and pull out a few centimetres of paper.



**3.** Close the printer cover.



**4.** Remove any excess paper.



## Printer Status

See CUSTOM PLUS2 manual for further information on troubleshooting printer issues.

## Printer Maintenance

The regular cleaning of the panel printer will help maintain its print quality and extend its lifetime. The table below shows the recommended maintenance timeline and cleaning operations.

Every Paper Change	
Printer Head	Use Isopropyl Alcohol
Rollers	Use Isopropyl Alcohol
Every 5 Paper Changes	
Paper Path	Use Compressed Air
Sensors	Use Compressed Air
Every 6 Months or as Needed	
Printer Case	Use Compressed Air or a Soft Cloth



**Note:** If the SMART Connect Multi-loop panel is installed in a dusty environment, the times between the cleaning operations should be reduced.

## Fault Finding

See troubleshooting section in SMART Connect Multi-loop Operation Manual (Doc: GLT-261-7-11)

# Appendix A: SPECIFICATIONS

Code			
Description	SMART Connect Multi-loop Fire Alarm Panel		
Standard	EN 54-2 EN 54-4		
Main Supply			
Mains Voltage*	230V AC (+10% / -15%) 120V AC (+10% / -15%)		
Mains Frequency*	47-63 Hz		
Battery Secondary Supply	SMART6	SMART10	SMART26
Battery Voltage	2 x 12V SLA	2 x 12V SLA	2 x 12V SLA
Battery Charge Current	1.1A	2.2A	2.2A
Battery Charge Voltage	27.3V @ 25°C	27.3V @ 25°C	27.3V @ 25°C
Power Supply Ratings			
IMAXA	0.8A	2.3A	2.3A
IMAXB	3.9A	9.4A	9.4A
IMIN	40mA	40mA	40mA
RINT	0.75Ω	0.75Ω	0.75Ω
On-board Relay Outputs			
Fire Relay (Termination PCB)	(C,NO,NC) Contact rating: 125VAC @ 0.5A / 30VDC @ 1A		
Fault Relay (Termination PCB)	Normally Energised (C,NO,NC) Contact rating: 125VAC @ 0.5A / 30VDC @ 1A		
Mains Fault Relay (Charger PCB)	Normally Energised (C,NO,NC) Contact rating: 125VAC @ 0.5A / 30VDC @ 1A		
Fault Relay (Charger PCB)	Normally Energised (C,NO,NC) Contact rating: 125VAC @ 0.5A / 30VDC @ 1A		
Power Supply Outputs	SMART6	SMART10	SMART26
Output D (Control Panel Power)	Nominal 29V @7.5A (20.5V – 31.0V)	Nominal 29V @7.5A (20.5V – 31.0V)	Nominal 29V @7.5A (20.5V – 31.0V)
Output C (Control Panel Power)	Nominal 29V @7.5A (20.5V – 31.0V)	Nominal 29V @7.5A (20.5V – 31.0V)	Nominal 29V @7.5A (20.5V – 31.0V)
Output B (Auxiliary Power)	Nominal 29V @ 1A (20.5V – 31.0V)	Nominal 29V @ 1A (20.5V – 31.0V)	Nominal 29V @ 1A (20.5V – 31.0V)
Output A (Auxiliary Power)	Nominal 29V @ 1A (20.5V – 31.0V)	Nominal 29V @ 1A (20.5V – 31.0V)	Nominal 29V @ 1A (20.5V – 31.0V)
Display			
LCD Display	4.3” Resistive touch screen. 480 x 272 pixel resolution		
LED Indicators	Fire, Sounder Fault, Fault, Sounder Active, Power, Controls Active, General Disablement, General Test, Sounder Disablement, Sounder Delay, Relay Delay, System Fault, More Data 32 zone LED indication (Optional MMP6) 64 zone LED indication (Optional MMP10/26)		
Button Controls	Stop Sounders, Silence Buzzer, Silence Buzzer, Scroll Display, Reset, Start Sounders (All other controls via touchscreen)		
General Panel Information			
Maximum Software Zones	254 Zones		
Maximum Event Log	8032 Events		
Software Programming	Via touchscreen or Windows ‘Smart Configurator’ software		
Enclosure	SMART6	SMART10	SMART26
Dimensions H x W x D (mm)	H: 535mm x W: 385mm x D: 150mm	H: 665mm x W: 535mm x D: 200mm	H: 665mm x W: 975mm x D: 200mm
Weight	8.5 kg	15 kg	27 kg
Cable Entries	Top 18 Sides 12 Base 4	Top 26 Sides 8 Base 4	Top 66 Sides 28 Base 20
Module Capacity	6	10	26
Power Supply	400W	400W	400W
Battery Capacity	12Ah max	38Ah max	38Ah max
Environmental			
Operating Temperature	-5°C (23°F) to 49°C (120°F)		
Relative Humidity	93% Non-condensing		

\*Panel Approval testing performed at 230V / 50 Hz

## **FUNCTIONS REQUIRED BY EUROPEAN STANDARD EN54-2**

The Smart Connect Multi-loop fire alarm control panel provides the following mandatory and optional functions as prescribed by the European standard EN54-2.

(a) Mandatory Functions

The mandatory functions and corresponding indications provided by this panel are:

- Fire alarm condition
- Fault warning condition
- Disabling condition
- Quiescent condition (when the CIE is powered by a power supply conforming to EN 54-4 and no other functional condition is indicated)

(b) Optional Functions (Options with Requirements)

The options with requirements provided by this panel are:

- Clause 7.8 – Output to fire alarm device(s)
- Clause 7.11 – Delays to outputs
- Clause 7.12.2 – Dependencies on more than one alarm signal - Type B
- Clause 7.12.3 – Dependencies on more than one alarm signal - Type C
- Clause 8.3 – Fault signals from points
- Clause 9.5 – Disabling of each address points
- Clause 10 – Test Condition

(c) Other Functions outside EN54

- USB port (For PC configuration and software upgrading)
- RS485 Network / Repeater connection
- TCP/IP (Ethernet) connection (Remote access)
- Programmable Cause / Effect on Outputs (Phased Evacuation)
- Printer Option
- Auxiliary Power Supply Output (via SCM-ACM)
- Auxiliary Relay Outputs

## **FUNCTIONS REQUIRED BY EUROPEAN STANDARD EN54-4**

The Smart Connect Multi-loop fire alarm control panel provides the following mandatory functions as prescribed by the European standard EN54-4.

(a) Mandatory Functions

The mandatory functions and corresponding indications provided by this panel are:

- Clause 5.1 – Power supply from the main power source
- Clause 5.2 – Power supply from the standby power source (battery)
- Clause 5.3 – Charger
- Clause 5.4 – Faults

## Appendix B: STANDBY BATTERY REQUIREMENTS

A spreadsheet is available for calculating the standby battery requirements. The table below is provided for information:

Model Number	Description	Standby Current (mA) (Mains Fail Condition)	Alarm Current (mA)
SMART6	Smart Connect Multi-loop 6 expansion port FACP	110	
SMART10	Smart Connect Multi-loop 10 expansion port FACP	112	
SMART26	Smart Connect Multi-loop 26 expansion port FACP	120	
SCM-LCM	Loop Card Module	58*	58*
SCM-MIM	Multi Input Module	48	73
SCM-ZMM	Zone Monitor Module	62	97
SCM-RM	Multi Relay Module	28	116
SCM-ACM	Alarm Circuit Module	32	32+ alarm load
SCM-NM	Network Module - RS485	15	17
SCM-PM	RS232 Module (Printer Driver)	37	37**
MKII-AOP	MKII Addressable Optical Smoke Detector	0.5	5
MKII-AOH	MKII Addressable Combined Optical Smoke & Heat (A1R) Detector	0.5	5
MKII-AHF	MKII Addressable Fixed Heat Only A2S Detector	0.5	5
MKII-AHF/CS90	MKII Addressable Fixed Heat Only CS Detector	0.5	5
MKII-AHR	MKII Addressable RoR & Fixed Heat Detector A1R Detector	0.5	5
MKII-AOPI	MKII Addressable Optical Smoke Detector With Built-In Isolator	0.5	5
MKII-AOHI	MKII Addressable Combined Optical Smoke & Heat (A1R) Detector With Built-In Isolator	0.5	5
MKII-AHFI	MKII Addressable Fixed Heat Only A2S Detector With Built-In Isolator	0.5	5
MKII-AHFI/CS90	MKII Addressable Fixed Heat Only CS Detector With Built-In Isolator	0.5	5
MKII-AHRI	MKII Addressable Rate of Rise & Fixed Heat Detector A1R Detector With Built-In Isolator	0.5	5
MKII-ARL	MKII Addressable Remote LED Indicator	0.5	5
ZT-CP3/AD	Addressable CP3 Manual Call Point	0.45	2.3
ZAI-MI	MKII Addressable Input Module with S/C Isolator	1	3.6
ZAIO-MI	MKII Addressable Input/Output Module with S/C	1	2
ZASC-MI	MKII Addressable Sounder Circuit Controller with S/C Isolator	0.6	0.8
ZAZM-MI	MKII Addressable Zone Monitoring Unit with S/C Isolator	3.5	13.2
ZAIO/230	MKII Addressable Mains switching Input/Output Module	1.5	4.6
SMM/B	Special Mini Modules (White) - Beam Detector	1.1	12
MKII-SSB	MKII Sandwich Sounder (No Address Required)	0.65	5.5
MKII-AXT	MKII Addressable Xtratone Wall Sounder	1.5	5.4
MKII-AXTB	MKII Addressable Xtratone Combined Sounder Beacon	1.5	19-44***
ZRAP	MKII Addressable Raptor Weatherproof Sounder	1.5	5.4
ZRAPB	MKII Addressable Raptor Weatherproof Sounder Beacon	1.5	19-44***
MKII-OP	MKII Conventional Fyreye Optical Smoke Detector	0.07	35-45****
MKII-HR	MKII Conventional Fyreye ROR Heat Detector	0.07	35-45****
MKII-HF	MKII Conventional Fyreye Fixed Heat Detector	0.07	35-45****
MKII-HF-CS90	MKII Conventional Fyreye Fixed Heat (CS) Detector	0.07	35-45****
MKII-OH	MKII Conventional Fyreye Opto-Heat Detector	0.07	35-45****
MKII-RL	MKII Conventional Remote LED Indicator	0.45	2.1****
ZXT	Xtratone Conventional Wall Sounder	0	10
ZXTB	Xtratone Conventional Combined Wall Sounder Beacon	0	60-70***
ZRP	Conventional Raptor Sounder	0	10
ZRPB	Conventional Raptor Sounder Beacon	0	60-70***

\*Loop device current and alarm current not included. On batteries use 1.6x current to allow for DC-DC step up voltage

\*\*Current for printing out alarm message not included

\*\*\*Depends on flasher intensity setting

\*\*\*\*For use with either SCM-ZMM, or the MKII-ZAZM loop powered module

## Appendix C: LOOP DEVICE ADDRESS SETTING

### Soft Addressing (with handheld programming tool)

The MKII Handheld Programmer is designed to complement all MKII devices and to assist the commissioning engineer on site. The unit will softly address all devices without using the incorporated dip-switch on the field devices.

Smoke and heat detectors can be tested when plugged on the programmer and alarm LED's can be verified prior to installation. The MKII Programmer can also re-program the OPT-HEAT detectors to either heat or smoke detector.

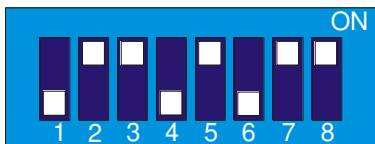
For instructions and further details on how to soft address devices, please refer to the "MKII-TOOL-Manual" (GLT-252-7-1).



### Hard Addressing (with DIP switches)

If the soft address programming tool is not available, the device Address can still be set with a DIP switch on the rear of the device.

If you are not familiar with binary, use the following rule:



The example shown would be: switches 6, 4 & 1 =  $32 + 8 + 1 =$  Address 41

- Switch 8 off = Add 128
- Switch 7 off = Add 64
- Switch 6 off = Add 32
- Switch 5 off = Add 16
- Switch 4 off = Add 8
- Switch 3 off = Add 4
- Switch 2 off = Add 2
- Switch 1 off = Add 1

The Address setting is binary, with the ON position being binary 0, and the OFF position being binary 1.

**DIP Switch Address Settings (Full table)**

ADDRESS		SWITCHES								ADDRESS		SWITCHES								ADDRESS		SWITCHES							
		1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8
0	=	N	O	T		U	S	E	D	43	=	OFF	OFF	ON	OFF	ON	OFF	ON	ON	86	=	ON	OFF	OFF	ON	OFF	ON	OFF	ON
1	=	OFF	ON	ON	ON	ON	ON	ON	ON	44	=	ON	ON	OFF	OFF	ON	OFF	ON	ON	87	=	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
2	=	ON	OFF	ON	ON	ON	ON	ON	ON	45	=	OFF	ON	OFF	OFF	ON	OFF	ON	ON	88	=	ON	ON	ON	OFF	OFF	ON	OFF	ON
3	=	OFF	OFF	ON	ON	ON	ON	ON	ON	46	=	ON	OFF	OFF	OFF	ON	OFF	ON	ON	89	=	OFF	ON	ON	OFF	OFF	ON	OFF	ON
4	=	ON	ON	OFF	ON	ON	ON	ON	ON	47	=	OFF	OFF	OFF	OFF	ON	OFF	ON	ON	90	=	ON	OFF	ON	OFF	OFF	ON	OFF	ON
5	=	OFF	ON	OFF	ON	ON	ON	ON	ON	48	=	ON	ON	ON	ON	OFF	OFF	ON	ON	91	=	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
6	=	ON	OFF	OFF	ON	ON	ON	ON	ON	49	=	OFF	ON	ON	ON	OFF	OFF	ON	ON	92	=	ON	ON	OFF	OFF	OFF	ON	OFF	ON
7	=	OFF	OFF	OFF	ON	ON	ON	ON	ON	50	=	ON	OFF	ON	ON	OFF	OFF	ON	ON	93	=	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
8	=	ON	ON	ON	OFF	ON	ON	ON	ON	51	=	OFF	OFF	ON	ON	OFF	OFF	ON	ON	94	=	ON	OFF	OFF	OFF	OFF	ON	OFF	ON
9	=	OFF	ON	ON	OFF	ON	ON	ON	ON	52	=	ON	ON	OFF	ON	OFF	OFF	ON	ON	95	=	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
10	=	ON	OFF	ON	OFF	ON	ON	ON	ON	53	=	OFF	ON	OFF	ON	OFF	OFF	ON	ON	96	=	ON	ON	ON	ON	ON	OFF	OFF	ON
11	=	OFF	OFF	ON	OFF	ON	ON	ON	ON	54	=	ON	OFF	OFF	ON	OFF	OFF	ON	ON	97	=	OFF	ON	ON	ON	ON	OFF	OFF	ON
12	=	ON	ON	OFF	OFF	ON	ON	ON	ON	55	=	OFF	OFF	OFF	ON	OFF	OFF	ON	ON	98	=	ON	OFF	ON	ON	ON	OFF	OFF	ON
13	=	OFF	ON	OFF	OFF	ON	ON	ON	ON	56	=	ON	ON	ON	OFF	OFF	OFF	ON	ON	99	=	OFF	OFF	ON	ON	ON	OFF	OFF	ON
14	=	ON	OFF	OFF	OFF	ON	ON	ON	ON	57	=	OFF	ON	ON	OFF	OFF	OFF	ON	ON	100	=	ON	ON	OFF	ON	ON	OFF	OFF	ON
15	=	OFF	OFF	OFF	OFF	ON	ON	ON	ON	58	=	ON	OFF	ON	OFF	OFF	OFF	ON	ON	101	=	OFF	ON	OFF	ON	ON	OFF	OFF	ON
16	=	ON	ON	ON	ON	OFF	ON	ON	ON	59	=	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	102	=	ON	OFF	OFF	ON	ON	OFF	OFF	ON
17	=	OFF	ON	ON	ON	OFF	ON	ON	ON	60	=	ON	ON	OFF	OFF	OFF	OFF	ON	ON	103	=	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
18	=	ON	OFF	ON	ON	OFF	ON	ON	ON	61	=	OFF	ON	OFF	OFF	OFF	OFF	ON	ON	104	=	ON	ON	ON	OFF	ON	OFF	OFF	ON
19	=	OFF	OFF	ON	ON	OFF	ON	ON	ON	62	=	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	105	=	OFF	ON	ON	OFF	ON	OFF	OFF	ON
20	=	ON	ON	OFF	ON	OFF	ON	ON	ON	63	=	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	106	=	ON	OFF	ON	OFF	ON	OFF	OFF	ON
21	=	OFF	ON	OFF	ON	OFF	ON	ON	ON	64	=	ON	ON	ON	ON	ON	ON	OFF	ON	107	=	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
22	=	ON	OFF	OFF	ON	OFF	ON	ON	ON	65	=	OFF	ON	ON	ON	ON	ON	OFF	ON	108	=	ON	ON	OFF	OFF	ON	OFF	OFF	ON
23	=	OFF	OFF	OFF	ON	OFF	ON	ON	ON	66	=	ON	OFF	ON	ON	ON	ON	OFF	ON	109	=	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
24	=	ON	ON	ON	OFF	OFF	ON	ON	ON	67	=	OFF	OFF	ON	ON	ON	ON	OFF	ON	110	=	ON	OFF	OFF	OFF	ON	OFF	OFF	ON
25	=	OFF	ON	ON	OFF	OFF	ON	ON	ON	68	=	ON	ON	OFF	ON	ON	ON	OFF	ON	111	=	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
26	=	ON	OFF	ON	OFF	OFF	ON	ON	ON	69	=	OFF	ON	OFF	ON	ON	ON	OFF	ON	112	=	ON	ON	ON	ON	OFF	OFF	OFF	ON
27	=	OFF	OFF	ON	OFF	OFF	ON	ON	ON	70	=	ON	OFF	OFF	ON	ON	ON	OFF	ON	113	=	OFF	ON	ON	ON	OFF	OFF	OFF	ON
28	=	ON	ON	OFF	OFF	OFF	ON	ON	ON	71	=	OFF	OFF	OFF	ON	ON	ON	OFF	ON	114	=	ON	OFF	ON	ON	OFF	OFF	OFF	ON
29	=	OFF	ON	OFF	OFF	OFF	ON	ON	ON	72	=	ON	ON	ON	OFF	ON	ON	OFF	ON	115	=	OFF	OFF	ON	ON	OFF	OFF	OFF	ON
30	=	ON	OFF	OFF	OFF	OFF	ON	ON	ON	73	=	OFF	ON	ON	OFF	ON	ON	OFF	ON	116	=	ON	ON	OFF	ON	OFF	OFF	OFF	ON
31	=	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	74	=	ON	OFF	ON	OFF	ON	ON	OFF	ON	117	=	OFF	ON	OFF	ON	OFF	OFF	OFF	ON
32	=	ON	ON	ON	ON	ON	OFF	ON	ON	75	=	OFF	OFF	ON	OFF	ON	ON	OFF	ON	118	=	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
33	=	OFF	ON	ON	ON	ON	OFF	ON	ON	76	=	ON	ON	OFF	OFF	ON	ON	OFF	ON	119	=	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
34	=	ON	OFF	ON	ON	ON	OFF	ON	ON	77	=	OFF	ON	OFF	OFF	ON	ON	OFF	ON	120	=	ON	ON	ON	OFF	OFF	OFF	OFF	ON
35	=	OFF	OFF	ON	ON	ON	OFF	ON	ON	78	=	ON	OFF	OFF	OFF	ON	ON	OFF	ON	121	=	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
36	=	ON	ON	OFF	ON	ON	OFF	ON	ON	79	=	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	122	=	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
37	=	OFF	ON	OFF	ON	ON	OFF	ON	ON	80	=	ON	ON	ON	ON	OFF	ON	OFF	ON	123	=	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
38	=	ON	OFF	OFF	ON	ON	OFF	ON	ON	81	=	OFF	ON	ON	ON	OFF	ON	OFF	ON	124	=	ON	ON	OFF	OFF	OFF	OFF	OFF	ON
39	=	OFF	OFF	OFF	ON	ON	OFF	ON	ON	82	=	ON	OFF	ON	ON	OFF	ON	OFF	ON	125	=	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
40	=	ON	ON	ON	OFF	ON	OFF	ON	ON	83	=	OFF	OFF	ON	ON	OFF	ON	OFF	ON	126	=	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON
41	=	OFF	ON	ON	OFF	ON	OFF	ON	ON	84	=	ON	ON	OFF	ON	OFF	ON	OFF	ON	127	=	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
42	=	ON	OFF	ON	OFF	ON	OFF	ON	ON	85	=	OFF	ON	OFF	ON	OFF	ON	OFF	ON										

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## Appendix D: PRODUCT CODES

Description	Product Code
<b>Panels</b>	
6 Module Capacity – LCD Only	SMART6
6 Module Capacity – LCD & 32 Zonal LED's	SMART6/32
10 Module Capacity – LCD & 64 Zonal LED's	SMART10/64
10 Module Capacity – LCD & Printer & 64 Zonal LED's	SMART10/P/64
26 Module Capacity – LCD & 64 Zonal LED's	SMART26/64
26 Module Capacity – LCD & Printer & 64 Zonal LED's	SMART26/P/64
Repeater Panel	SMART/REP
<b>Modules</b>	
Loop Card Module	SCM-LCM
Multi Input Module	SCM-MIM
Zone Monitor Module	SCM-ZMM
Multi Relay Module	SCM-RM
Alarm Circuit Module	SCM-ACM
RS485 Network Module	SCM-NM
RS232 Printer Module	SCM-PM

## Appendix E: Ground Fault Impedance values

Below is a table of the impedance values that will cause a ground fault on the SMART Connect Multi-loop under normal operating conditions (running on mains power).

Circuit	Impedance that will signal a Ground Fault
PSU Output +	10kΩ
PSU Output -	10kΩ
Alarm Circuit Module (ACM) +*	10kΩ
Alarm Circuit Module (ACM) - *	10kΩ
Loop Card Module (LCM) +	10kΩ
Loop Card Module (LCM) -	10kΩ
Multi-Input Module (MIM) +	10kΩ
Multi-Input Module (MIM) -	10kΩ
Zone Monitor Module (ZMM) +	10kΩ
Zone Monitor Module (ZMM) -	10kΩ
Network Module (NM) terminal A	N/A (Isolated from system voltage)
Network Module (NM) terminal B	N/A (Isolated from system voltage)
Multi-Relay Module (RM) NO	N/A (Isolated from system voltage)
Multi-Relay Module (RM) CM	N/A (Isolated from system voltage)
Multi-Relay Module (RM) NC	N/A (Isolated from system voltage)

\*In quiescent condition, the ACM has a reverse voltage on its terminals. So that a ground fault to ACM + will cause a negative ground fault, and a ground fault to ACM - will cause a negative ground fault. When active, the impedance levels, and the fault messages reverse.

**Installation Manual Modification History**

Issue	Date	Changes
001	19/03/2020	<ul style="list-style-type: none"> <li>- Added manual modification history table.</li> <li>- Impedance values changed to 10KΩ.</li> <li>- Removed non-LED MMP10 &amp; MMP26 version.</li> <li>- Changed PSU specifications.</li> <li>- Added functions required by European standard section.</li> </ul>
002	23/2/2021	General corrections before panel submission.
003	4/6/2021	Changed Access level table updated IMAXA , IMAXB , IMIN and RINT values Changed Smart 6 batteries from 14Ah to 12 Ah
004	19/8/2021	Added note that Approval testing was at 230V, 50Hz
005	22/10/2021	Added approval reference numbers. Adjusted Mains rating to match PSU label
006	07/12/2021	Added voltage range for power supply outputs in Appendix A
007	8/12/2021	Added missed “Nominal” wording on outputs C and D
008	9/12/2021	Adjusted voltage range in Appendix A from 20. -> 31.3V to 20.5 -> 31.0V. Re-ordered outputs from D to A to match PSU output order
009	5/1/2022	Adjusted Max operating temperature to 49°C to reflect testing on UL version of the panel.