Peripheral Sounder
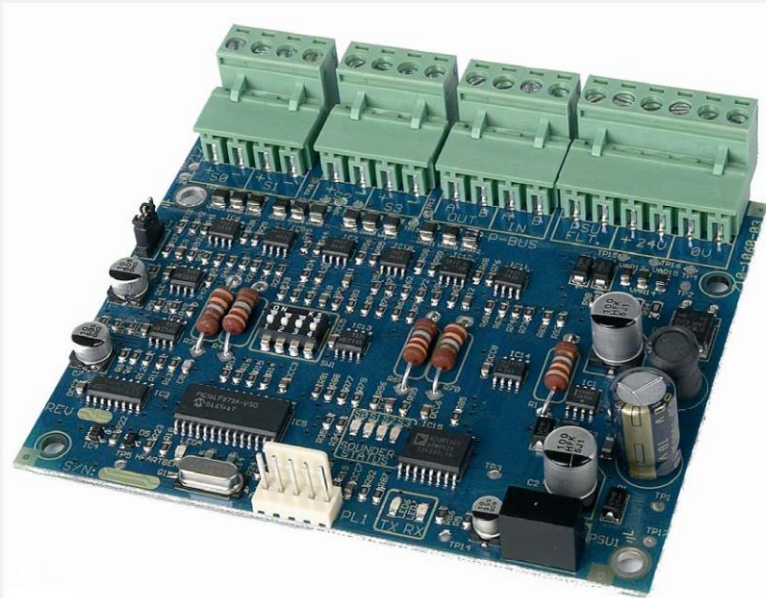

The Programmable 4-Way Sounder Card is an optional peripheral unit that provides four individually programmable and monitored sounder output circuits compliant with BSEN54-2: 1998 Clause 7.8.

Up to 16 Cards can be connected to a multi-loop panel giving a maximum of up to 64 additional local sounder outputs.

Each output is fully programmable using the powerful 'DynamiX' cause and effects rules and all outputs are synchronized.

The unit is available as either a printed circuit card only or as a boxed version with integral 4A power supply.

Features

- Each output is 1A rated, short-circuit protected and provides open and short circuit monitoring.

- Each output is individually programmable with any of the available 'DynamiX' cause and effects rules.

- All outputs can be synchronized in pulsing modes.

- Up to 16 cards can be connected giving a total of 64 additional outputs.

- Supports 'Temporal' pattern output styles.

- Each output may be individually programmed for silence, walk test and investigation delay.

- An Input is provided to monitor the fault output from a power supply.

The operation and functions described in this manual are available from Software Version 020-02 onwards.

Specifications:

Models, Sales Order Parts:
Mxp-034 : 4-Way Programmable Sounder Card **Mxp-034-BXP** : 4-Way Programmable Sounder Card Boxed with 4A PSU

Applications / Limitations:
EN54-2 compliant sounder outputs.

Compatibility:
Can be used with MxPro 4, MxPro 5 and Axis EN Panels. *4200*, *4400* and *4800* control panels programmed with Version 020-02 software (or later) and fitted with base card hardware revision levels 10 (712-1022 Mx-4400) and 09 (712-1022-002 Mx-4200) or later. Compatible with the PC Configuration Tool from version 4.7 or later. Requires installation of the Mxp-031 Peripheral Bus Interface Adaptor card in the panel.

Item	Specification Details
Applicable Standards	BS EN54-2: 1998, BS EN54-4: 1998
Operating Temperature	-5ºC to 40ºC
Relative Humidity	95% non-condensing (maximum)
Enclosure	Steel, IP30, RAL9002, 320 mm high x 345 mm wide x 88 mm deep, 3kg (excluding batteries)
Knockouts 20mm	7x Top, 2x Bottom
AC Supply	230V AC, 50Hz (+10%, -15%) FUSE T3.15H250
Standby Battery	2x12V, 7AH Sealed Lead-Acid Type (Yuasa recommended)
LED Indications (Box)	Power and General PSU Fault – Separate indications of specific PSU fault conditions are available on the PSU.
PCB	110 mm x 86 mm x 18 mm, 75 grams
PCB Supply	24VDC nominal (21-28VDC), 17mA (quiescent) 64mA (all outputs on) + Sounder Load
LED Indications (PCB)	Sounder Circuit ON, Communications TX & RX and Heartbeat
Outputs (x4)	24VDC 1A
EOLR (Sounder)	10kΩ
EOLR (Fault Input)	10kΩ
EOLR (Peripheral Bus)	150Ω
As our policy is one of constant product improvement the right is therefore reserved to modify product specifications without prior notice	

Table of Contents   Page

1   Introduction

Outputs to Fire Alarm Devices – Clause 7.8

The 4-Way Sounder Card provides monitored outputs for connection to Fire Alarm Devices (Item C) in accordance with EN54-2.

Four sounder outputs are provided. These can be independently programmed with different cause and effect rules.

The outputs can be configured to pulse as a simple on-off pattern or can be configured with temporal ringing styles. Outputs programmed with the same, pulsed based / temporal pattern are synchronized with each other. This synchronization occurs across all sounder outputs including other peripheral sounder card circuits, the sounder circuits on the local panel base card and across the network on other panel nodes.

The PC CONFIG tool is used to program the presence and functionality of these outputs.

When Sounders are disabled at the panel, all outputs attached to the panel are disabled. Outputs can also be individually disabled via the user menus or disabled using the group disable function through programming.

The Boxed unit is provided with a power supply capable of providing a full alarm load of 4A. Status indications for Power and Fault are provided.

On-board indicators are provided for each sounder output (illuminated when the sounder is activated), Bus communications Transmit TX and Receive RX and a Heartbeat indicator (flashes at a rate of 1Hz to show normal operation and at a rate of 5Hz to show an internal fault condition).

Earth Fault monitoring on the sounder circuits can be enabled / disabled by jumper.

2   Installation

2.1   Enclosure

The enclosure dimensions, fixing points and general arrangement are shown in FIGURE 1 opposite:

Space is provided in the bottom of the enclosure for 2x 7AH batteries.

Enclosure cover is fixed to the back box with 2x hex M4 screws.

Ensure that the earth lead from the cover is securely connected to the earth tab in back box before refitting.
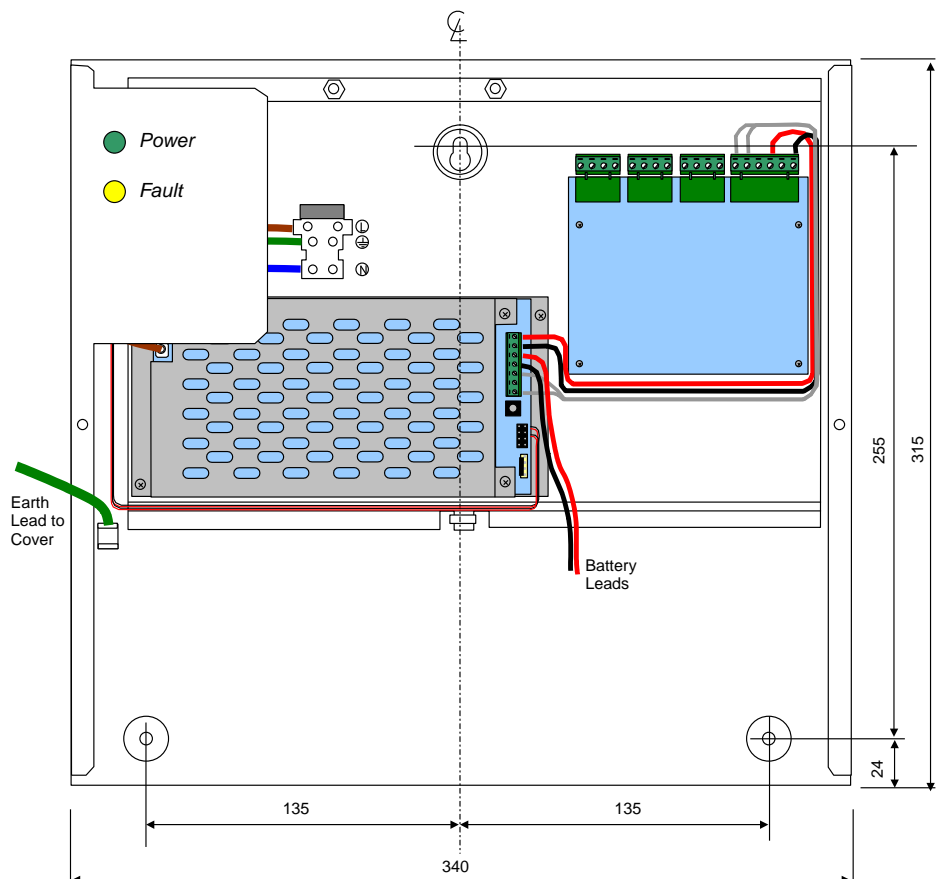
Cover is 345 (w) x 320 (h).

FIGURE1

2.2 PCB Mounting in Separate Enclosure

The printed circuit card shall be fitted to a metal chassis or in a metal enclosure using the M3 spacers, nuts and screws supplied.

The chassis / enclosure must be [Must be earthed] connected to protective earth.

Refer to the diagram opposite for dimensions and fixing positions.

Fixing positions marked * must be securely fixed to provide an earth connection for EMC purposes. Brass spacers are provided for this purpose.

The card is pre-configured to monitor the sounder circuits for earth / ground faults. Moving the Jumper J1 from position A to position B will disable this monitoring.
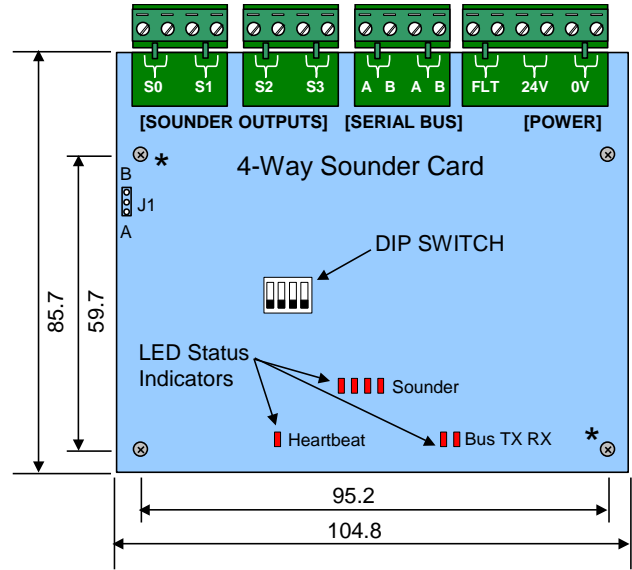

FIGURE 2

2.3 PCB Mounting in a 4200 / 4400 Panel

The card may be fitted to the chassis using 4x M3 screws. Refer to Figure 3 opposite.

Screws marked * must be securely fixed to provide an earth connection for EMC purposes.

Where the unit is used for lightly loaded outputs, the power may be supplied by the AUX 24VDC panel supply output.

In this case, check and ensure that the power supply and battery standby can support the application.
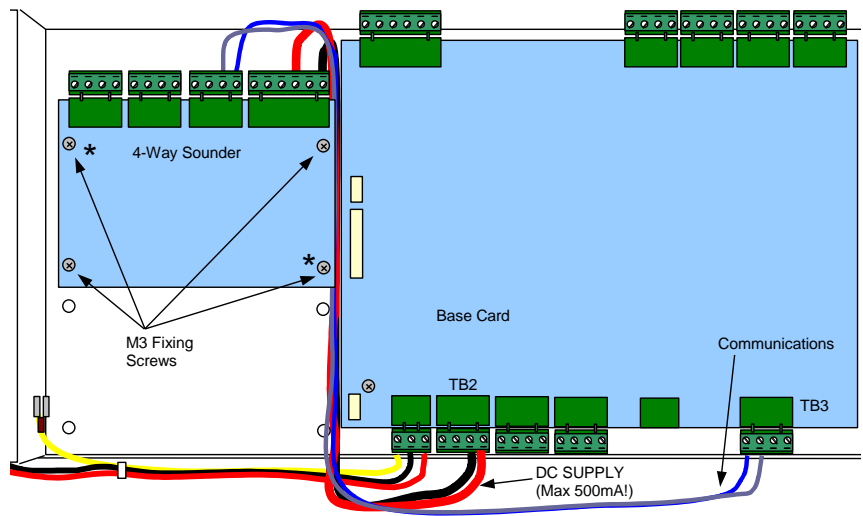

FIGURE 3

Wiring should be in accordance with subsequent sections of this manual.

Refer to FIGURE 3 above for the recommended routing of cables.

NOTE: If using AUX 24V DC power, disable earth fault monitoring (J1 – Set to Position B) – The panel itself will monitor for sounder circuit earth faults.

## 2.4 PCB Mounting in a 5000 Panel

There is provision on the 5000 chassis plate to mount one peripheral bus module (except 5100 small enclosure). Refer to panel manual 680-165 for further information.

2.5   DIP Switch Configuration

Each 4-Way Sounder Card must be given a unique address.

The interfaces are added to the configuration file in the PC CONFIG tool at Peripheral Bus Address 50-65.

The DIP Switch on each unit must be set accordingly to the corresponding address defined. See table opposite.
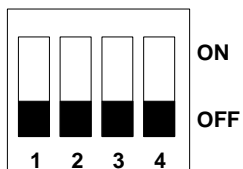
Address	SW1-1	SW1-2	SW1-3	SW1-4
50	OFF	OFF	OFF	OFF
51	ON	OFF	OFF	OFF
52	OFF	ON	OFF	OFF
53	ON	ON	OFF	OFF
54	OFF	OFF	ON	OFF
55	ON	OFF	ON	OFF
56	OFF	ON	ON	OFF
57	ON	ON	ON	OFF
58	OFF	OFF	OFF	ON
59	ON	OFF	OFF	ON
60	OFF	ON	OFF	ON
61	ON	ON	OFF	ON
62	OFF	OFF	ON	ON
63	ON	OFF	ON	ON
64	OFF	ON	ON	ON
65	ON	ON	ON	ON

2.6 Wiring

The unit is designed for easy wiring installation.

"Plug-in" terminal blocks are provided for all connections to the unit.

FIGURE 2 above shows the positions for all connections to the card.

NB: Minimum / Maximum cable size for terminal block connections is limited to 0.35mm² - 2.5mm² (22-14AWG).

All electrical wiring installation work should be carried out in accordance with the code of practice applicable in the country of installation.

To maintain electrical integrity of the SELV wiring on the DC Power, communications lines and sounder outputs all SELV wiring should be segregated from LV mains wiring and be wired using cable with insulation suitable for the application.

To minimise the effects of EMC interference all data wiring circuits should be wired with a twisted pair of conductors with a cross sectional area suitable for the loading conditions.

In areas where cabling may come into contact with high frequency interference, such as portable radio transceivers etc. the data wiring cable should be of a twisted pair construction within a overall screen. Care should be taken to correctly terminate this screen, refer to the information below.

2.6.1 AC Wiring (Boxed Units)

Route the high voltage mains AC wiring into the enclosure at the upper left corner only. Keep the AC wiring away from the circuit boards and all other wiring.

The panels must be connected to the supply earth through the power cable.
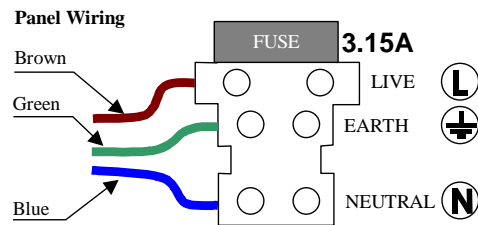
The mains input connector is shown in the diagram opposite. Note the positions of the earth, neutral and live terminal connections. These are clearly marked on the label next to the connector. The connector block contains an integral fuse holder.

Secure the mains input wiring by tie wrap as close to the terminal block as possible.

The fuses are rated at: T 3.15A H 250V

Replace with correct rating and specification only.

FIGURE 4

Connect the Unit to the mains supply via a readily accessible disconnect-device (Isolation Switch) and suitable earth fault protection incorporated in the building installation wiring. The Mains cable should be 0.75mm^2 cable rated at 250V and fused via a 5A anti-surge fuse.

2.6.2 Battery Installation (Boxed Unit)

Two 7AH batteries can be installed in the bottom of the enclosure.
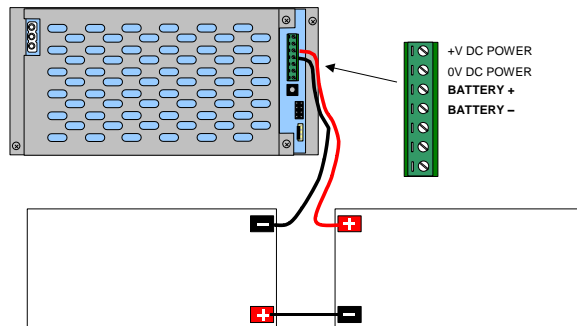Battery Leads are supplied.
Connect as shown in FIGURE 5 opposite.

OBSERVE POLARITY OF CONNECTIONS

FIGURE 5

2.6.3 DC Power and Serial Communications

A 24V DC power supply is required.

Connect the 24V DC supply feed input to the SUPPLY +24V and 0V terminals on the interface card.

Use cables of sufficient size to ensure that the power input voltage is maintained under all supply conditions – refer to specifications section.

Note: The DC power supply used MUST BE designated a Safety Extra Low Voltage (SELV) supply.

For boxed versions, supplied complete with a power supply, DC Power is pre-wired. Refer to details above for the AC Power connections.

The enclosure in which the card is mounted must be earthed and the card fixing points defined in FIGURE 2 must be connected to earth for EMC purposes.

Must be earthed
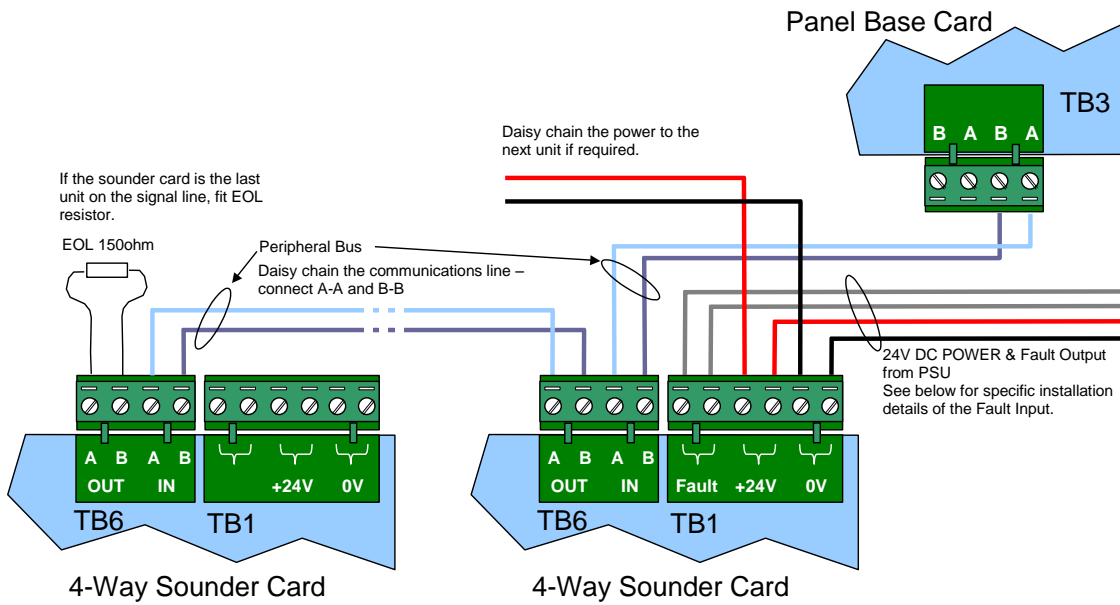
| OBSERVE POLARITY OF CONNECTIONS |

FIGURE 6

!

Critical Signal Path

The serial communications is a 2-wire bus. Communications cable must be twisted-pair type. See FIGURE 6 above for connections. Connect a 150Ω EOL resistor to the OUT connections on the last unit on the bus.

The interfaces and enclosures should be located not greater than 10M from the control panel (and must be within the same room) with the wiring run in rigid metal conduit or using fire rated cables.

2.6.4 Power Supply Fault Input

The "FAULT INPUT" terminals are normally used to monitor the contacts of the fault relay output from the power supply.

A 10KΩ series resistor should be connected to the relay terminals.

If more than one module is powered from the same power supply, it is only necessary to connect the fault output monitoring to one of the modules.

Should no fault relay be available, or if the monitoring of an external fault signal is not required, these two terminals should be shorted together with a 10KΩ resistor across the terminals of the "FLT-INPUT" terminal block.
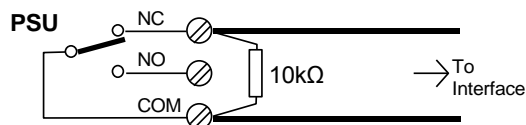

FIGURE 7

2.6.5 Sounder Outputs

Critical Signal Path

The *Mxp-034* is equipped with four supervised sounder circuits. These are denoted as Circuits S0, S1, S2 and S3.

Each Sounder output is rated at a maximum of 1 Ampere.

The terminal connections on the card are shown in the FIGURE 8 opposite.

The sounder outputs are monitored (supervised) for open and short circuit conditions using reverse polarity signals. Sounder must be equipped with an in-built blocking diode that prevents the sounder from taking power when the output is in the supervising condition.

An End-of-Line Resistor (EOLR) of value 10,000Ω, ½ Watt must be fitted to the last sounder / bell.

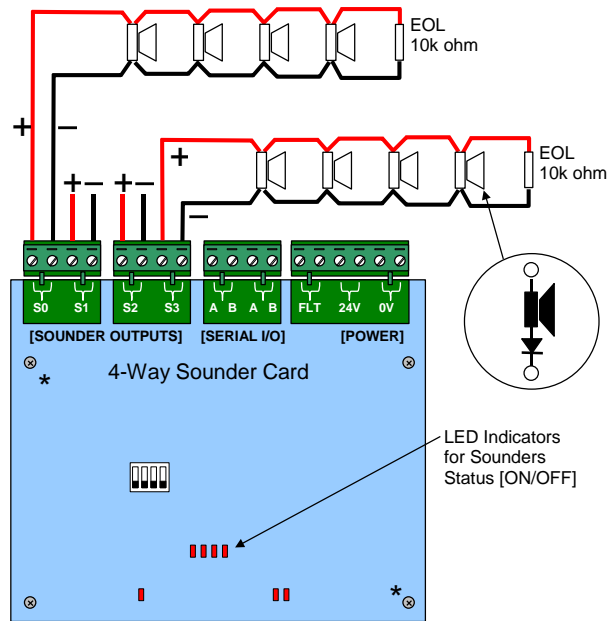Refer to Document 680-088 for information on cable types to be used.

FIGURE 8

2.6.5.1 Sounder Circuit Lengths
The voltage drop on each alarm circuit should be calculated to ensure that the minimum voltage at the end of the circuit exceeds the minimum required by each sounding device at the minimum alarm circuit output voltage.

The voltage at the end of the circuit is given by:

Minimum Alarm Voltage = $V_{OUT(MIN)} - (I_{ALARM} \times R_{CABLE})$

  Minimum Output Voltage ($V_{OUT(MIN)}$) is $V_{BAT(MIN)} - 1.0V = 20.0V$

  Alarm Current (I_{ALARM}) is the sum of the loads presented by the sounding devices in alarm

  Cable Resistance (R_{CABLE}) is the sum of the cable resistance in both cores x cable length.

   Cable Resistance (R_{CABLE}) for 1.0mm^2 is 0.036Ω / metre

   Cable Resistance (R_{CABLE}) for 1.5mm^2 is 0.024Ω / metre

   Cable Resistance (R_{CABLE}) for 2.5mm^2 is 0.015Ω / metre

Insulation Resistance (Core-Core and Core-Screen)	]2M Ω

3   Programming and Configuration

To add a 4-way sounder card in the configuration file firstly expand the panel tree and select the "Peripheral Bus" option. Secondly, highlight the address (50-65) at which the 4-way sounder should be added.

3.1   Adding Devices
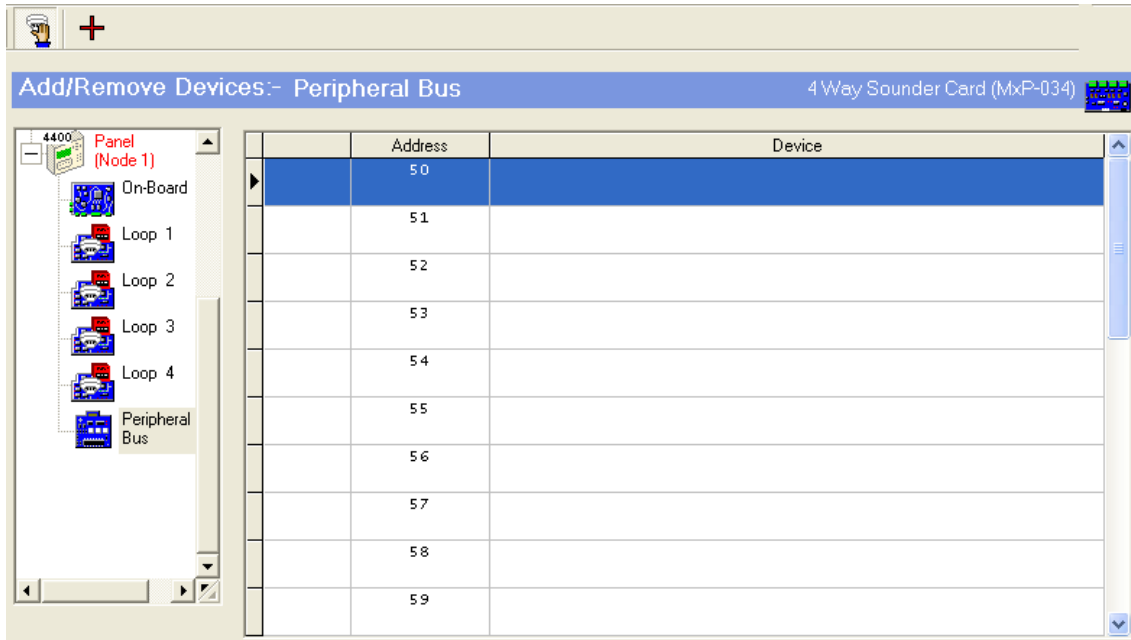
Click ➕ on the toolbar and a device selection pop-up screen will be shown. Expand the tree and click on the Mxp-034 option to highlight and select it.

The zone number is pre-assigned to the zone number of the panel. This can be changed if an alternative zone is required for these circuits.
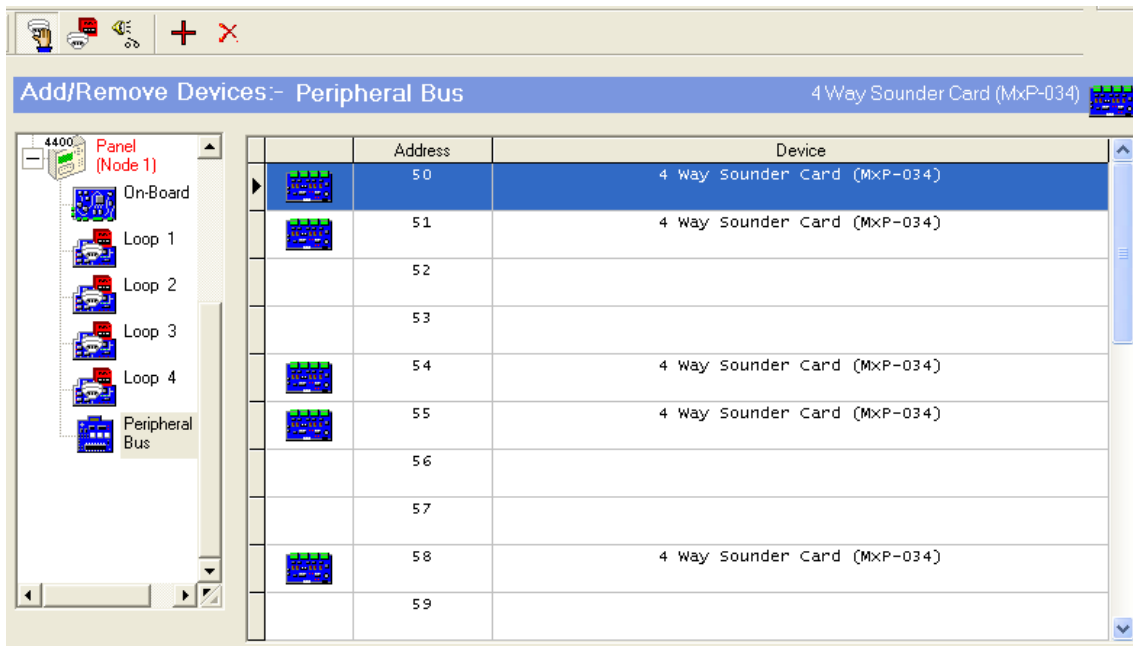
Click OK and the device will be added at the selected address.

Continue and add 4-way sounder cards at additional addresses if required.

Remember that the DIP Switch on the card(s) will need to be set to match the addresses chosen in the configuration file.

An example of a panel with five (5) sounder cards is shown below.
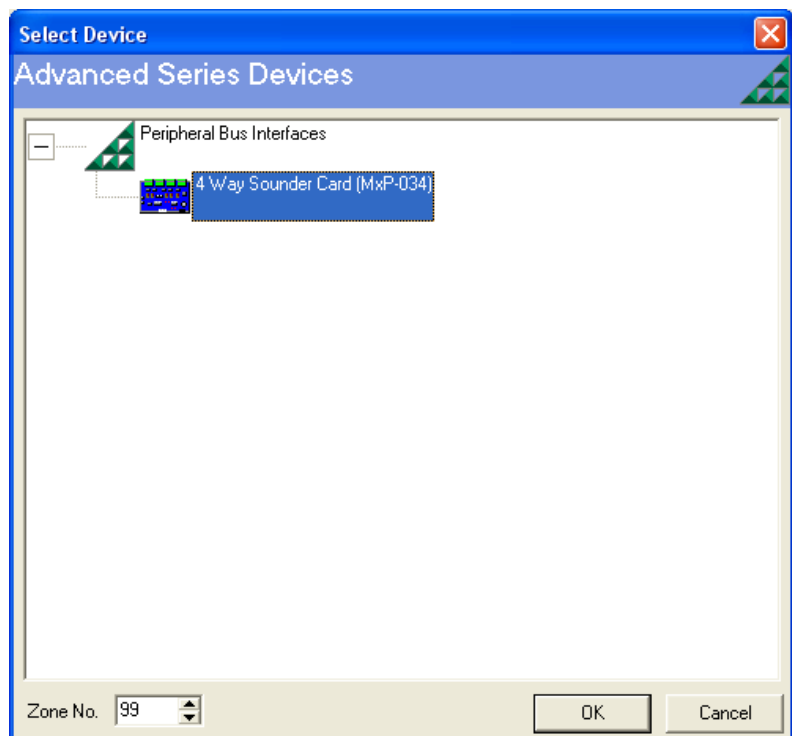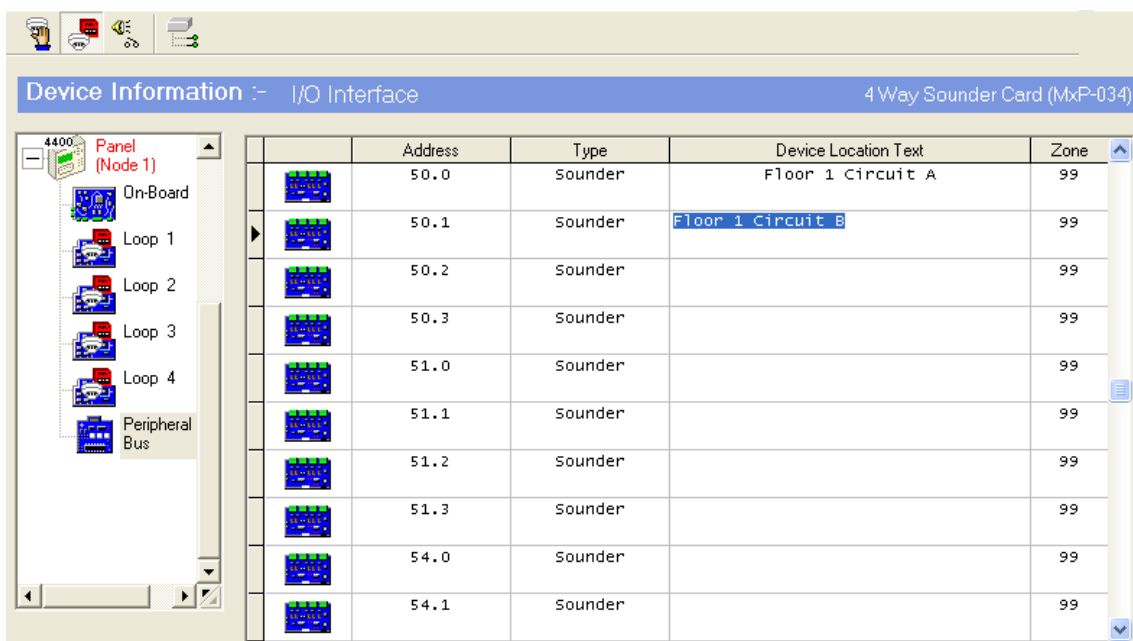
3.2   Removing Devices

To remove a device, click on the [icon] button, select and highlight the address to be removed and then click the [X] button to delete the 4-way sounder card from the address.

3.3   Configuring the Output Circuits

3.3.1   Basic Details

Click the [icon] button to show a list of the addresses and sub-addresses for all of the devices added. An example is shown below:

Each output is a sub-address of the main card address. For example, at address 51, S0 = 51.0, S1 = 51.1, etc.

Enter the Device Location text to describe each sounder circuit. If required, the Zone Number can also be changed.

3.3.2 Detailed Configuration

Click the [button] button to show a detailed output configuration window for the selected address. For example:
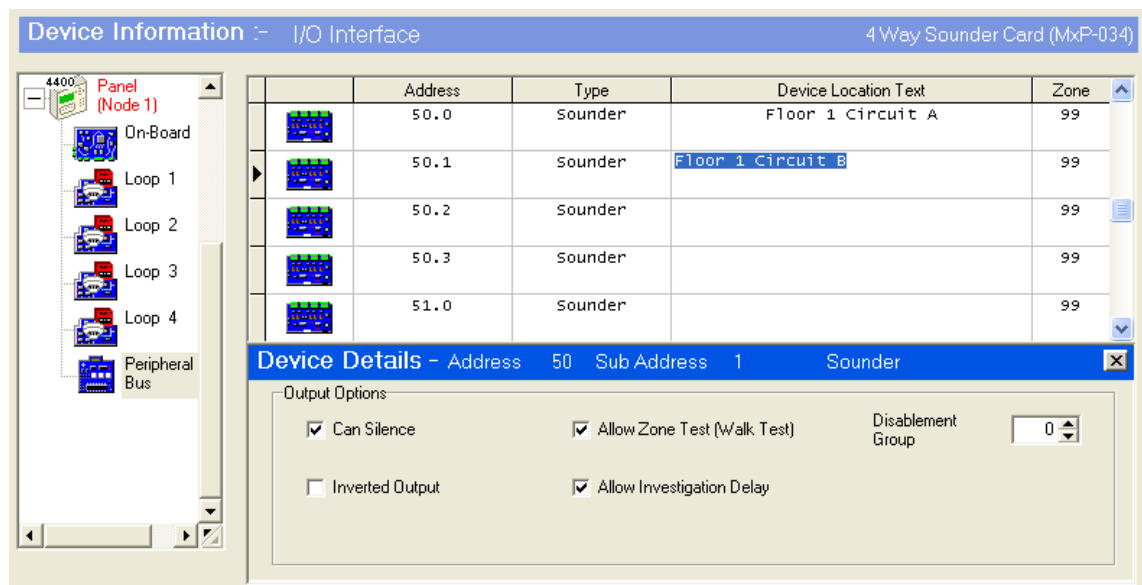
Option	Description	Default
Can Silence	Determines if the output will be silenced when a Sounders Silence command is performed.	Yes
Allow Zone Test (Walk Test)	Determines if the output will respond to "Test" fire alarms.	Yes
Inverted Output	Determines if the output is normally OFF (not inverted and activates on the event) or normally ON (inverted and de-activates on the event)	No
Allow Investigation Delay	Determines if the output will follow any programmed investigation delays or will activate immediately on the event.	Yes
Disablement Group	The output can be assigned to a disablement group. When the group is disabled, the output will not activate on an event. 0 = not assigned to a disablement group.	0

3.3.3 Output Group Cause and Effect Assignment

Click the [icon] button to show the Output Group Assignment screen. For example:
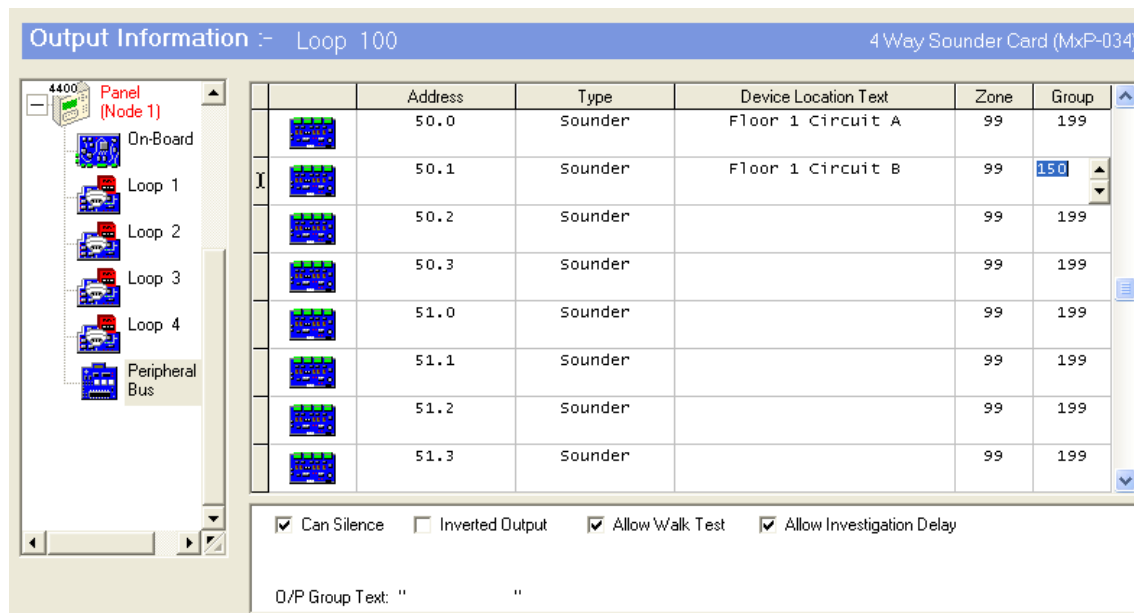
By default, all outputs are pre-assigned to the default general fire alarm output group (199).

Assign the output to an alternative output group depending on the cause and effects required for each output.

If the output group cause and effects rule has not been defined, the output will be highlighted as below:
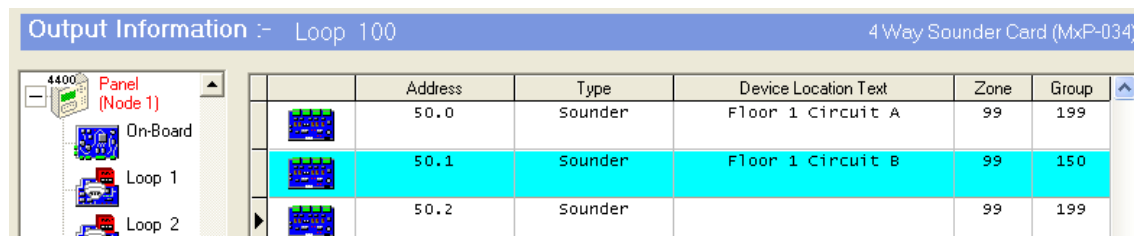
Double click on the device picture to directly open up the screens to create the new cause and effects rule.

The name assigned to the Output Group Rule is shown at the bottom of the screen for easy reference.

3.4 Output Group Programming

3.4.1 Basic Options

Each output can be independently programmed in the same way as other outputs on the panel including delays, zone range, input events and logic.

For further information, refer to the panel manuals and PC Tool manual.

In addition, the outputs can be programmed with simple on/off pulse and pulsing temporal patterns.

3.4.2 Pulse / Temporal Patterns[1]

When the PULSE option is selected within the Ringing Style, up to one of five additional Temporal Patterns can be selected in addition to the standard ON/OFF pulsing pattern.

The Temporal Pattern is a sequence of repeating pulses based on ½ second intervals. The default for all patterns is the ANSI S3.41 Audible Evacuation Signal. These can be changed to create unique signals repeating at intervals up to every 12 seconds.

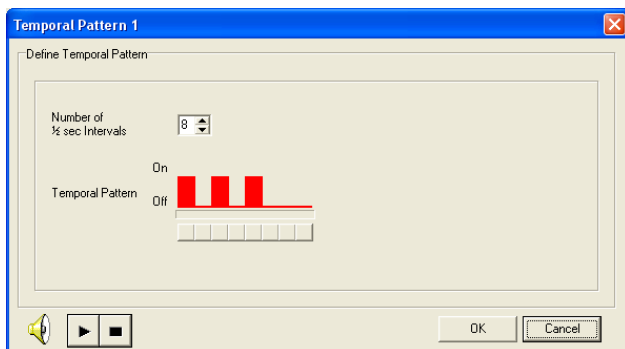Select the required Temporal Pattern or Simple On/Off Pulse as below:
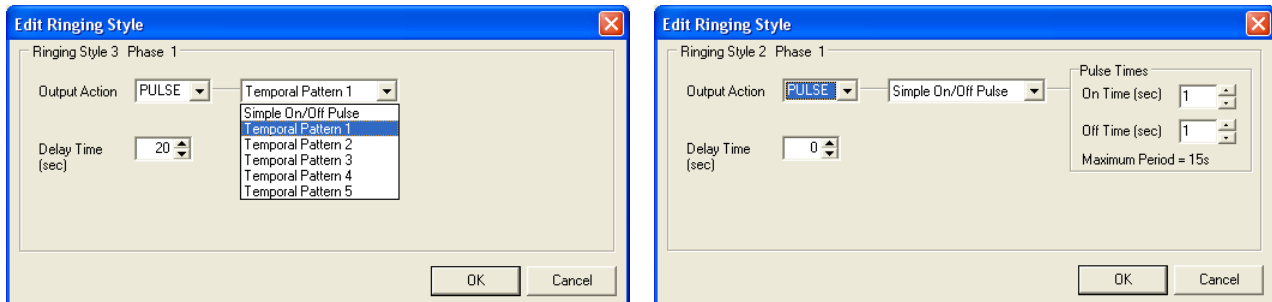
3.4.2.1 Simple On / Off Pulse

Simple On/Off pulse patterns can be configured for variable ON and OFF periods in increments of one second (the maximum total On plus Off time is 12 seconds). For example, 3 seconds On and 9 seconds Off.

3.4.2.2 Temporal Pattern

Click on the "Edit Pattern" button to view the pattern

Adjust the pattern by:

a) Set the required repeat interval (1/2 s steps) up to 12 seconds (24 steps)

b) Click on the boxes below the Temporal Pattern line to turn On/Off the pulsing (Red block = ON).

For example, the following pattern will turn on the sounder for ½ s On, 1s Off, 1s On, 1s Off, 1½s On, 1s Off, 2s On, 4s Off and then repeat.
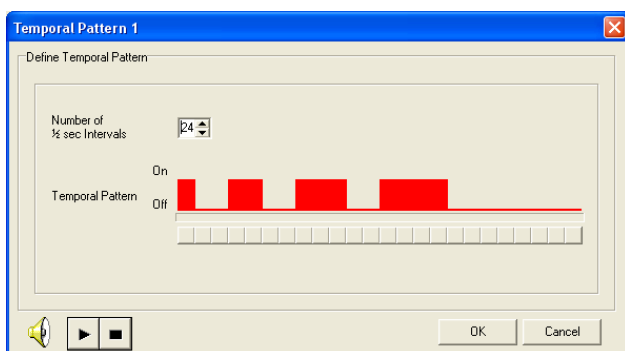
> ! A representation of the pattern can be played via the PC speaker using the play and stop controls at the bottom of the pop-up window.

---

[1] NOTE: Loop based sounders only support Simple On/Off pulse patterns with pulse periods of 1 second On / 1 second Off.

USER NOTES