



Elmdene Products

Technical Guide for Installation and Service Engineers

January 2020

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INTRUDER



CCTV



ACCESS
CONTROL



FIRE

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ACCESS
CONTROL



FIRE

Introduction

This Technical Guide is intended for use by Installation and Service Engineers installing and maintaining Elmdene products listed within the Contents page.

For those occasions when the original instructions are not available this guide will provide the information necessary to carry out connection and testing, providing a single technical resource for many of Elmdene's products.

The aim of this manual is to provide the essential information in a concise form and is intended for the use of experienced Security / Fire Engineers.

The manual includes a glossary to define abbreviations and terminology used within the text. There are also appendices included to provide additional information.

Technical Support is available Monday to Friday 8.30am to 5pm: 02392 696 638 - option 3. You can also email Technical Support: technical.support@elmdene.co.uk.

Elmdene has always welcomed feedback from installers and this has proven beneficial in the development and improvement of our products. We would also welcome your comments on this Technical Manual so that we can expand and improve the content in future issues; please use the Technical Support email address above.

Every effort has been made to ensure the accuracy of this manual, however Elmdene accepts no responsibility for errors or omissions. Specifications are subject to change without notice.

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6 Wire Contacts - Key Points

- Grade 2 and 3 models are available.
- Each Contact contains ONE pair of resistors according to colour code - See Appendix 'A'
- 6 Wire Contacts are available in both Flush and Surface format.
- Suitable for Single or Multiple doors in both FSL and DP mode.
- When multiple Contacts are connected, maximum resistance will be 1 x Shunt resistor + 1 x End of Line resistor, no matter how many contacts are connected to the zone. So for a Scantronic Panel with ten contacts on one zone this would be: $1x 4k7 + 1x 2k2 = 6k9$.
- 'Series' connection of the two end of line resistors is used for most Control Panels with the exception of Guardall Panels, which use a 'Parallel' network for their end of line resistors.
- Elmdene Grade 3 Flush and Surface Contacts have Immunity to interfering magnetic fields and therefore do not produce a Tamper or Alarm signal when subjected to such interference.
- Elmdene Grade 3 Roller Shutter Contacts utilise Immunity and Magnetic Detection, therefore these Contacts will optionally signal a Tamper or Fault on detection of magnetic interference.
- To use a 6 Wire Contact without the resistors, connect Red & Black wires to Alarm and the two White wires to Tamper.
- Elmdene 6 Wire Contacts have white wires with coloured sleeves to inhibit identification of individual cores along the length of the cable.
- Spacers are available for some models of Surface Contact for use when installed on a ferrous metal surface or to compensate for a difference in height between Contact and Magnet.

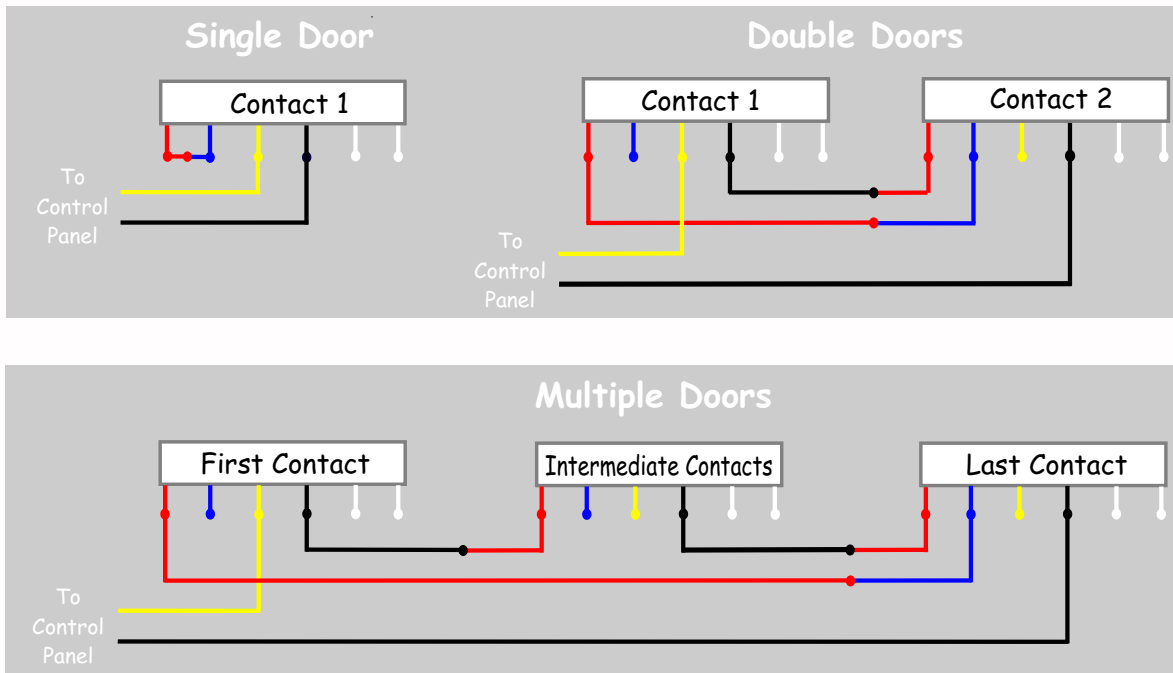
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6 Wire Contacts - Connection

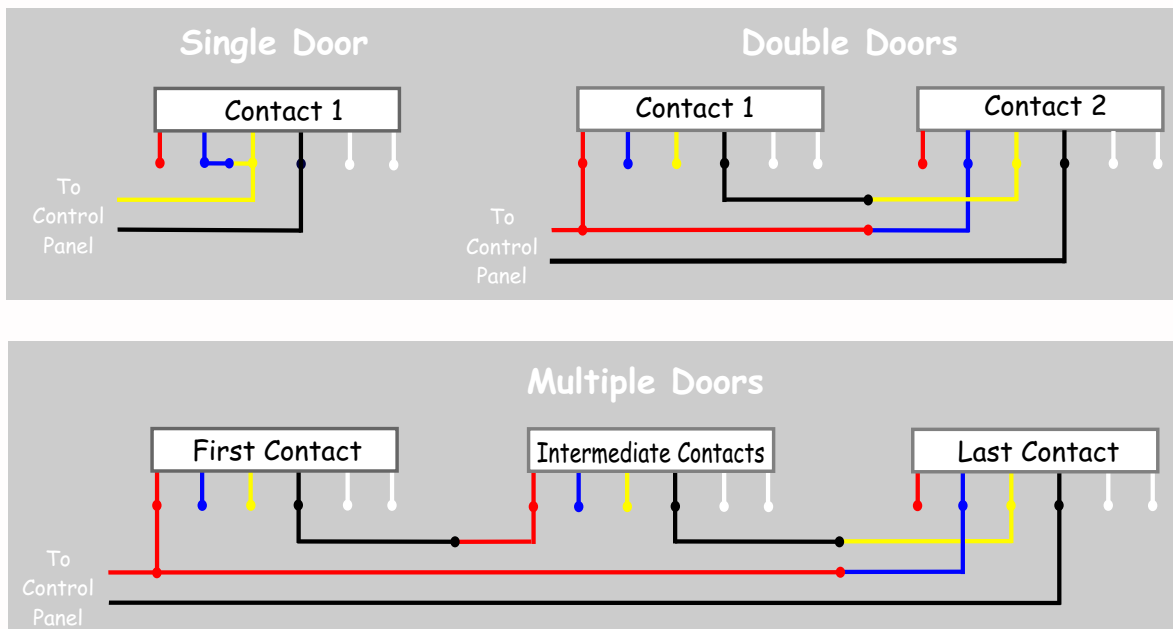
Grade 2 & 3 Standard:

6QFC, 6FM2, 6B, 6M, 6F, 6BP, 6MDP, 6S, 6SL, 6PHD, 6SFU, 6SM, 6HD, 6HD-SO, EN3-QFC, EN3-QSC, EN3-LSC

All Panels except Guardall



Guardall Panels



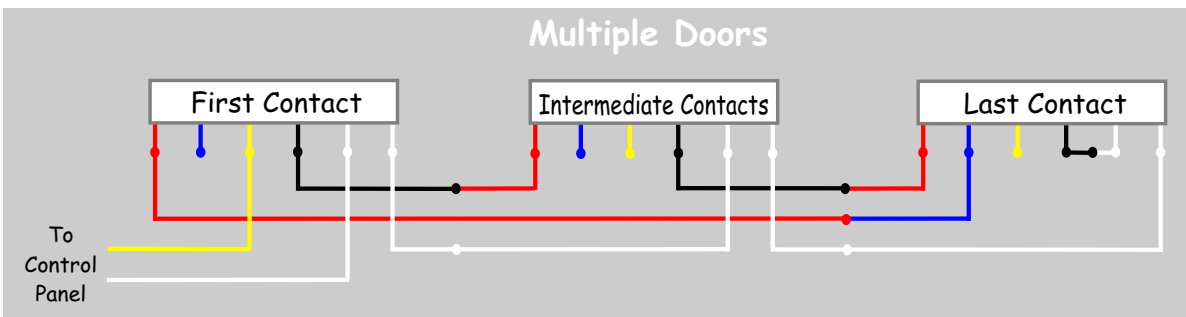
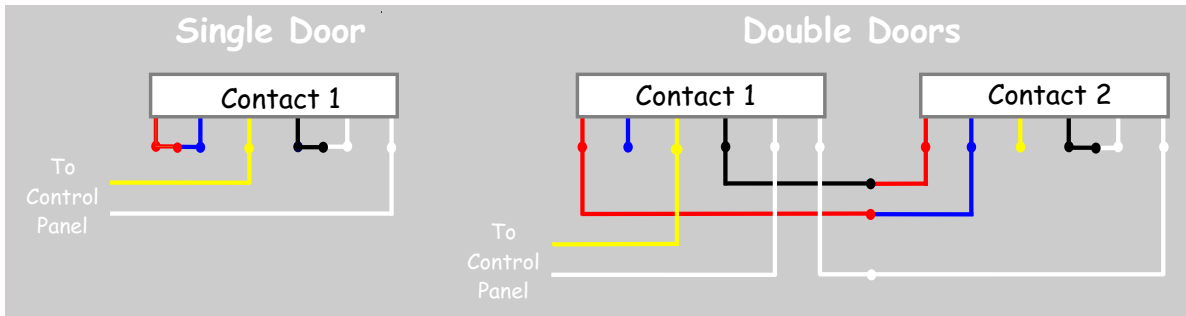
Note: Junction box's have been omitted for clarity. One core returning to Control Panel must connect 'through' junction box Tamper Switch on Grade 3 systems.

6 Wire Contacts - Connection

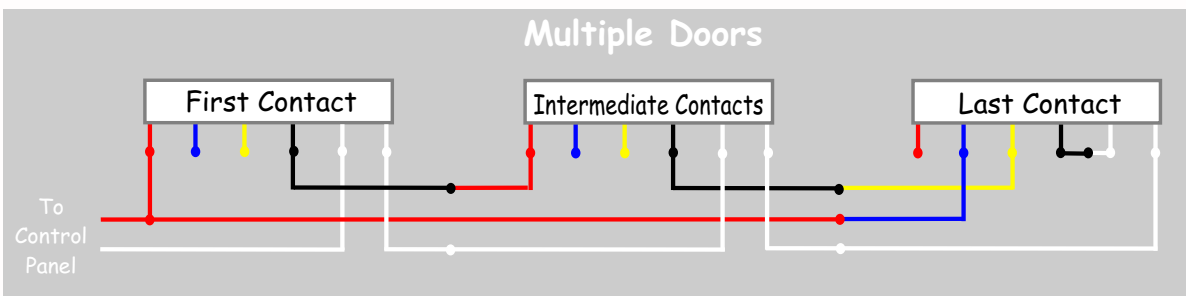
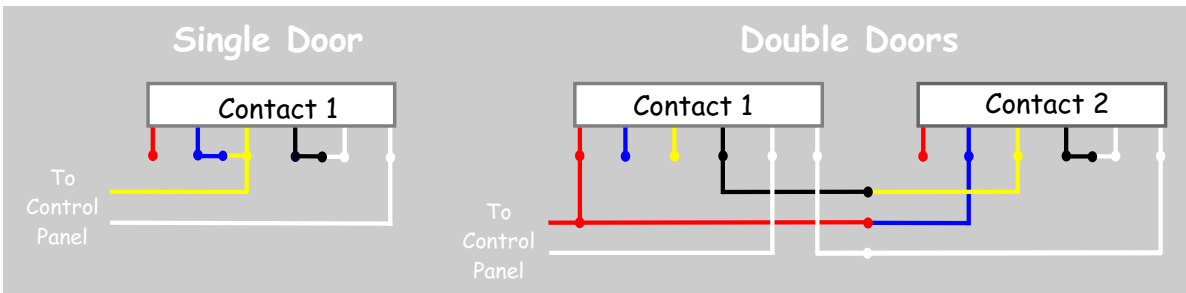
Grade 3 Roller Shutter and all Grade 2 & 3 High Security Range:

EN3-RSA, 6FMBR, 6VS105, 6HSI, 6HDBR, 6HDBR-SO, 6VS222, 6VS302

All Panels except Guardall



Guardall Panels



Note: Junction box's have been omitted for clarity. One core returning to Control Panel must connect 'through' junction box Tamper Switch on Grade 3 systems.

6 Wire Contacts - Identifying Cores

Where the coloured identification markers have been removed or lost on a 6 Wire Contact, use one of the following procedures to identify and re-mark the cores.

Contacts With Same Value Shunt & EOL Resistors.

Range of Resistor Values (ohms):

<u>Shunt Resistor</u>	<u>EOL Resistor</u>	<u>Colour Code</u>
1000 (1k)	1000 (1k)	GN (Green)
2000 (2k)	2000 (2k)	YL (Yellow)
4700 (4k7)	4700 (4k7)	GY (Grey)
5600 (5k6)	5600 (5k6)	OR (Orange)
8200 (8k2)	8200 (8k2)	BL (Blue)

See Appendix 'A' for more information on Contact Colour Code

Prepare 6 pieces of PVC insulating tape marked: R, Y, BL, BK, W, W.

Using a Digital Meter set to measure ohms:

With Magnet Away From Contact

1. Find a pair of wires with approximately 0.5 ohms resistance between them - mark both as White and put to one side.

With Magnet Operating Contact

2. Find a pair of wires with approximately 0.5 ohms resistance between them - mark one of the wires Red and the other wire Black. (Does not matter which).

With Magnet Away From Contact

3. Meter between wire marked Red and two remaining wires to find wire that gives some value of resistance, mark this wire Yellow and make a note of the resistance.
4. Meter between wire marked Black and remaining unmarked wire, you should get the same value of resistance as in step 3. Mark this wire Blue.

If the resistance values do not match in steps 3 & 4 you have a contact with different value Shunt and End of Line resistors; see below to identify the wires for this type of contact.

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6 Wire Contacts - Identifying Cores

Contacts With Different Value Shunt & EOL Resistors.

Range of Resistor Values (ohms):

<u>Shunt Resistor</u>	<u>EOL Resistor</u>	<u>Colour Code</u>
4700 (4k7)	2200 (2k2)	RD (Red)
6800 (6k8)	4700 (4k7)	PU (Purple)

See Appendix 'A' for more information on Contact Colour Code

Prepare 10 pieces of PVC insulating tape marked: R, Y, BL, BK, W, W, 1, 2, A, B.

Using a Digital Meter set to ohms:

With Magnet Away From Contact

1. Find a pair of wires with approximately 0.5 ohms resistance between them - mark both as White and put to one side.

With Magnet Operating Contact

2. Find a pair of wires with approximately 0.5 ohms between them - temporarily mark the wires 1 & 2. (Does not matter which).

With Magnet Away From Contact

3. Meter between wire marked 1 and the two remaining wires; only one of these will give a reading, make a note of the resistance and mark the wire A.
4. Meter between wire marked 2 and the remaining unmarked wire and make a note of the resistance, mark the wire B.
5. Select the pair 1/A or 2/B, whichever has the highest resistance, mark the numbered wire Black and the lettered wire Blue.
6. The remaining pair (lowest value resistance), mark the numbered wire Red and the lettered wire Yellow.

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Terminal Contacts - Key Points

- All Elmdene Terminal Contacts are Grade 2, with the exception of the QF-5, a traditional 5 terminal flush contact which is grade 1.
- Terminal Contacts are available in both Flush and Surface format.
- Dependant on model, Contact may have one, two or multiple pairs of Resistors in accordance with colour code - See Appendix 'A'
- Suitable for Single or Multiple doors in both FSL and DP mode.
- 'Series' connection of the two end of line resistors is used for most Control Panels with the exception of Guardall Panels, which use a 'Parallel' network for their end of line resistors.
- QFT and RFT flush Contacts cannot be connected in a double door configuration, they are suitable for single door connection only.
- Spacers are available for some models of Surface Contact for use when installed on a ferrous metal surface or to compensate for a difference in height between Contact and Magnet.
- To use Terminal Contacts without Integral Resistors i.e. Double Pole mode:

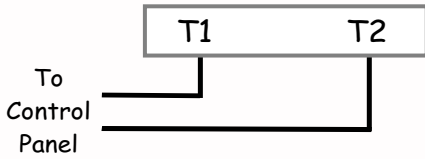
QST - Series:	Cut all links:	Alarm - T1&T4	Tamper - T2&T3
QST - Parallel:	Cut links 2&3:	Alarm - T1&T4	Tamper - T2&T3
LST - Series:	Cut all links:	Alarm - T1&T2	Tamper - T3&T4
LST - Parallel:	Cut links 2&3:	Alarm - T1&T2	Tamper - T3&T4
MST - All:	Remove all links:	Alarm - T4&T5	Tamper - T2&T3

.oOo.

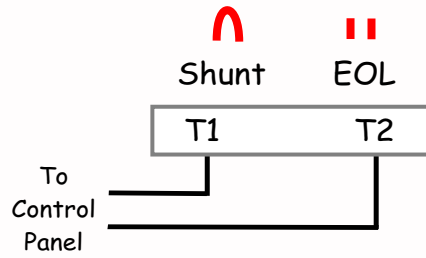
Terminal Contacts - Connection

Grade 2 Flush - All Panels

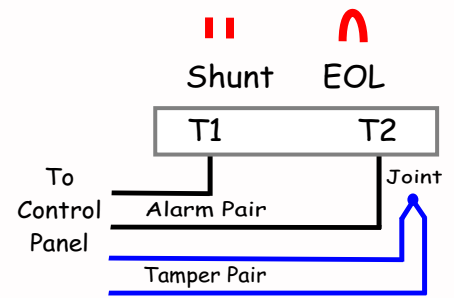
QFT-FSL mode



RFT-FSL mode



RFT-DP mode

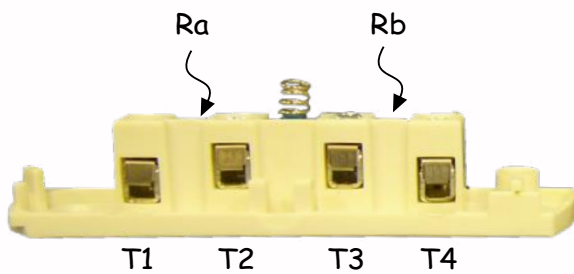


Note: Only the RFT-DP mode can be used on multiple doors

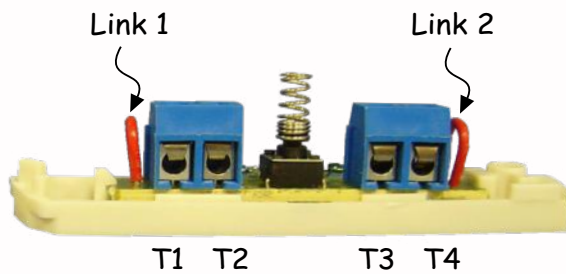
Grade 2 Surface

QST - All Panels except Guardall

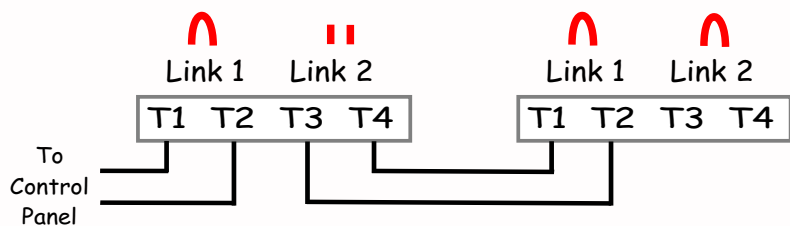
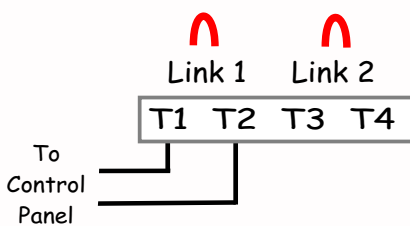
There have been two versions of this Contact, the original on the left and the current model on the right. Terminals and Resistor Links are shown as identified on their respective instruction sheets.



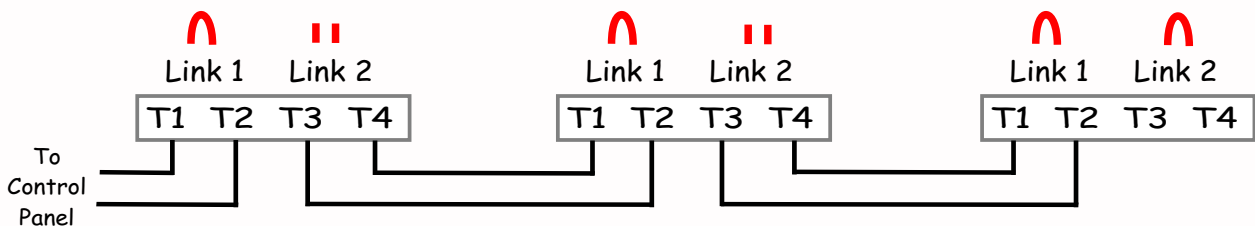
Single Door



Double Doors*



Multiple Doors*



= Link NOT Cut. = Link CUT. Ra = Link 1 = Shunt Rb = Link 2 = EOL.

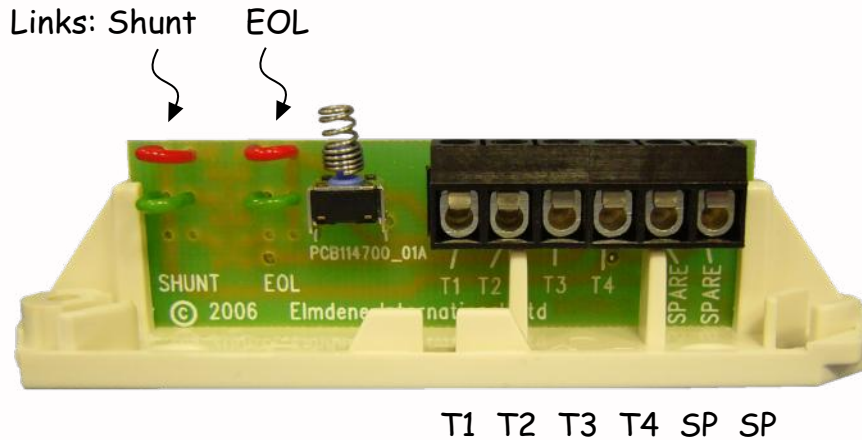
Links all shown Red here but colours normally correspond to Panel/Resistor option for Contact, if Contact has two sets of Links, cut ALL coloured links NOT associated with your Control Panel and cut Links corresponding to your Control Panel as above. See Appendix 'A' for more information on Contact/Panel colour codes.

* See [alternative connection, page 13](#) for Double/Multiple doors in the event of Tamper/Fault when more than one door open.

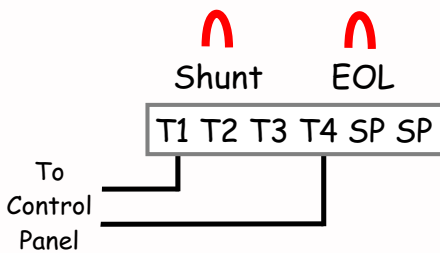
Terminal Contacts - Connection

LST & VHDA - All Panels Except Guardall

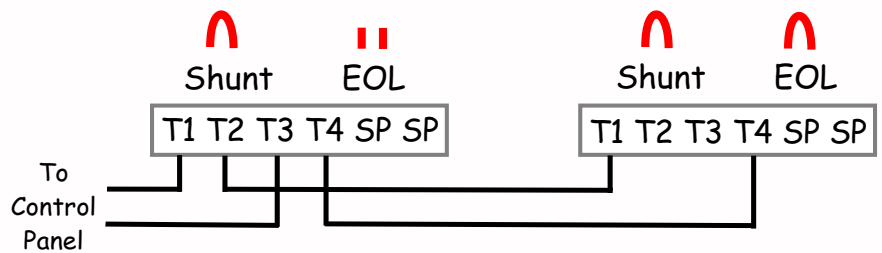
LST



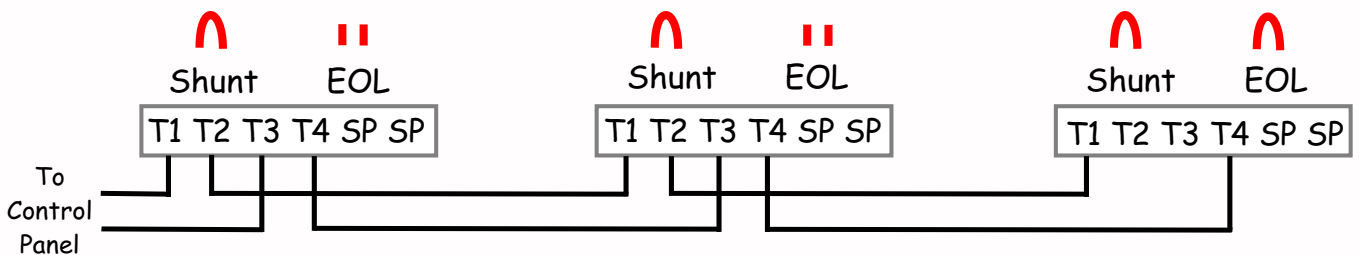
Single Door



Double Doors*



Multiple Doors*



⤴ = Link NOT Cut.

⤵ = Link CUT.

Ra = Link 1 = Shunt

Rb = Link 2 = EOL.

Links all shown Red here but colours normally correspond to Panel/Resistor option for Contact, if Contact has two sets of Links, cut ALL coloured links NOT associated with your Control Panel and cut Links corresponding to your Control Panel as above. See Appendix 'A' for more information on Contact/Panel colour codes.

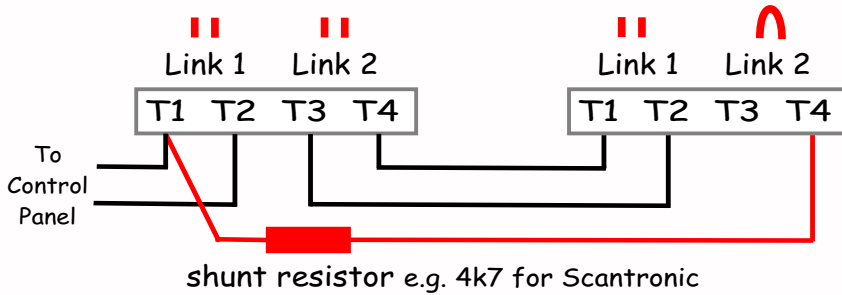
* See [alternative connection, page 13](#) for Double/Multiple doors in the event of Tamper/Fault when more than one door open

Alternative Connection - QST and LST/VHDA Contacts

For Double/Multiple Contacts in the event of Tamper/Fault when more than one door open.

QST - All Panels except Guardall

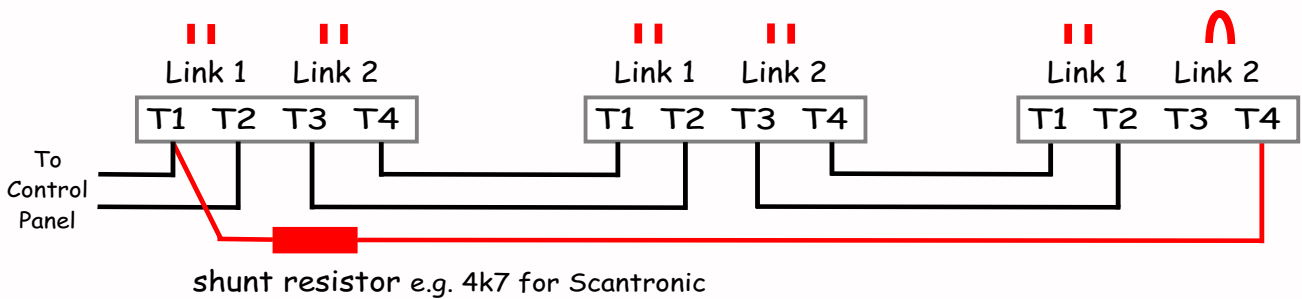
Double Doors



Note: Additional wiring and resistor shown in Red. All Links cut except Link 2 in last contact.

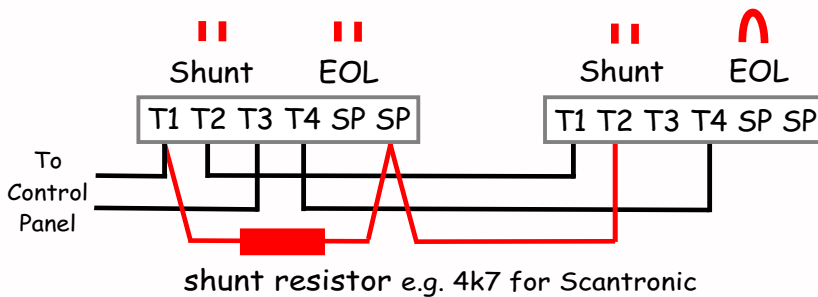
Use Shunt resistor to suit control Panel.

Multiple Doors



LST & VHDA - All Panels except Guardall

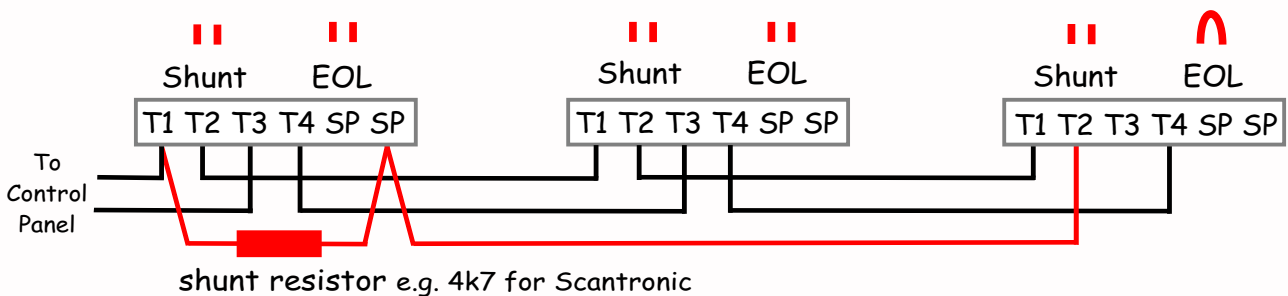
Double Doors



Note: Additional wiring and resistor shown in Red. All Links cut except EOL in last contact.

Use Shunt resistor to suit control Panel.

Multiple Doors



⤴ = Link NOT Cut.

|| = Link CUT.

Ra = Link 1 = Shunt

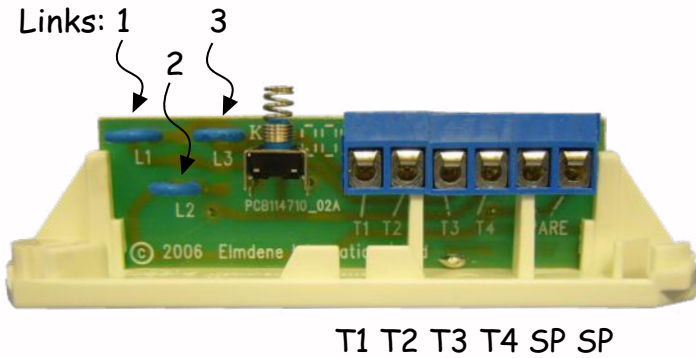
Rb = Link 2 = EOL.

Links all shown Red here but colours normally correspond to Panel/Resistor option for Contact, if Contact has two sets of Links, cut ALL coloured links NOT associated with your Control Panel and cut Links corresponding to your Control Panel as above. See Appendix 'A' for more information on Contact/Panel colour codes.

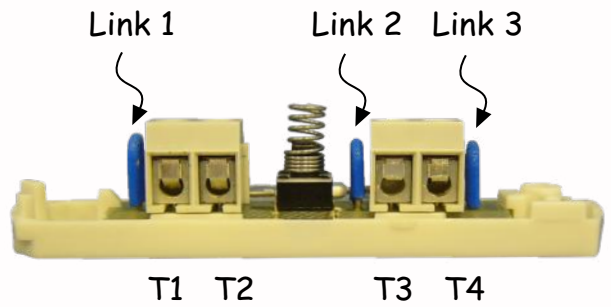
Terminal Contacts - Connection

LST & QST - Guardall Panels

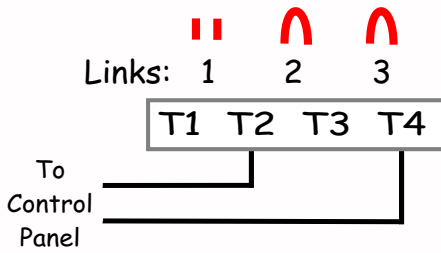
LST



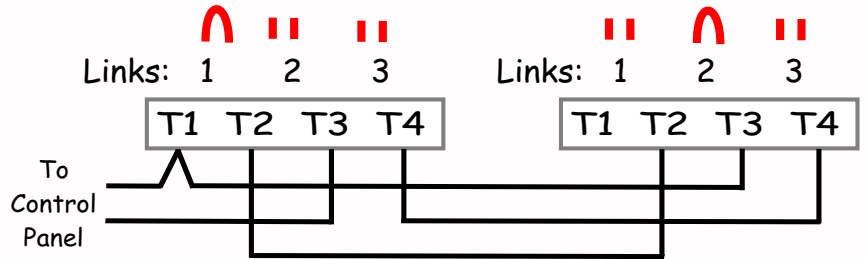
QST



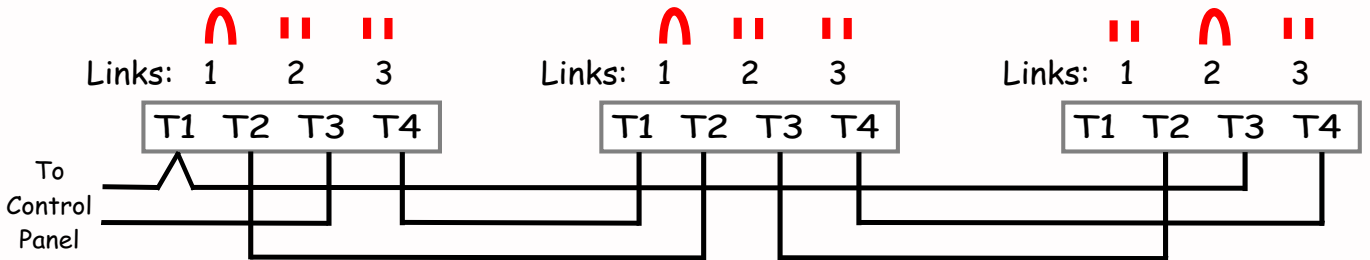
Single Door





Double Doors



Multiple Doors



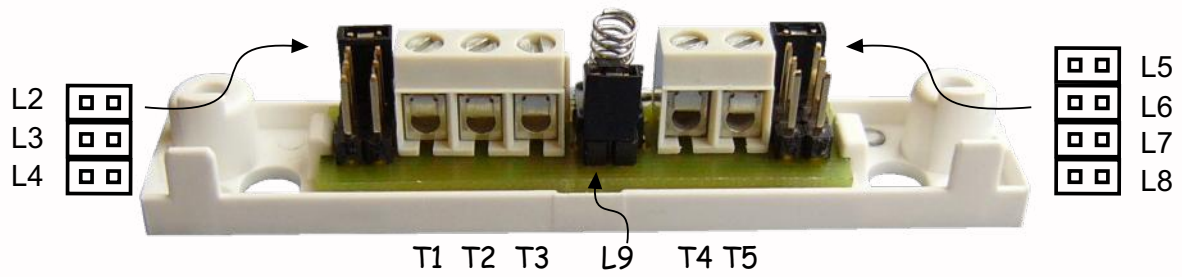
 = Link NOT Cut.  = Link CUT.

Note: only terminals T1 to T4 shown for LST as Spare (SP) terminals not used

Links all shown Red here but colours normally correspond to Panel/Resistor option for Contact. See Appendix 'A' for more information on Contact/Panel colour codes.

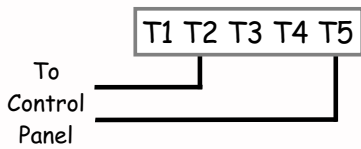
Terminal Contacts - Connection

MST - Multi Resistor Contact

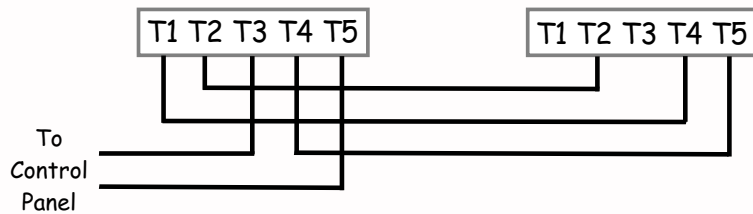


MST - All Panels except Guardall

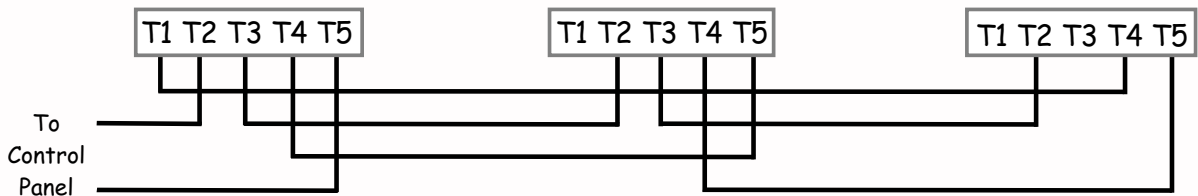
Single Door



Double Doors



Multiple Doors



Connections as diagrams above, fit Links according to table below by selecting Resistor values required and fitting Links for each contact as specified.

Resistors	Single Door	Double Doors		Multiple Doors		
		First	Last	First	Middle	Last
4k7/2k2	L3, L6, L9	L6	L3, L9	L6	none	L3, L9
1k/1k	L4, L8, L9	L8	L4, L9	L8	none	L4, L9
4k7/4k7	L2, L6, L9	L6	L2, L9	L6	none	L2, L9
2k2/2k2	L3, L7, L9	L7	L3, L9	L7	none	L3, L9
6k8/4k7	L2, L5, L9	L5	L2, L9	L5	none	L2, L9

Grade 3 Range of Contacts

It is very important to only install grade 3 contacts in the specified orientation(s):

EN3-QFC

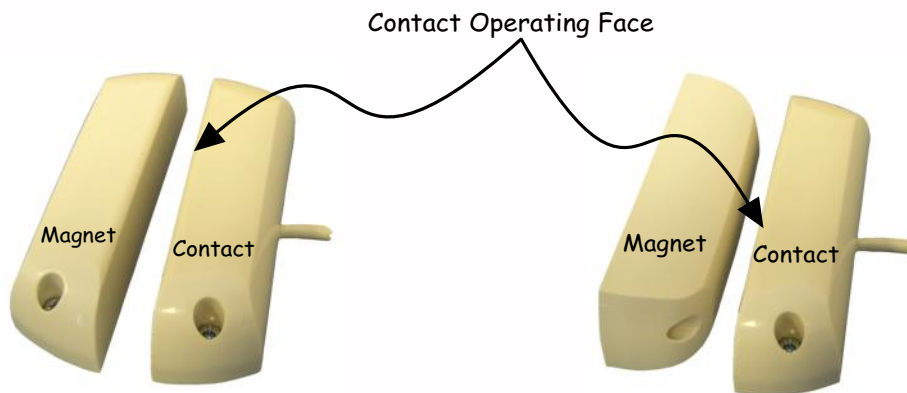
This is the only orientation acceptable for the flush contact.



Aim to have contact and magnet accurately aligned, it will still function with miss-alignment up to 10mm in any direction, however it is recommended to keep this to no more than 5mm.

EN3-QSC, EN3-LSC

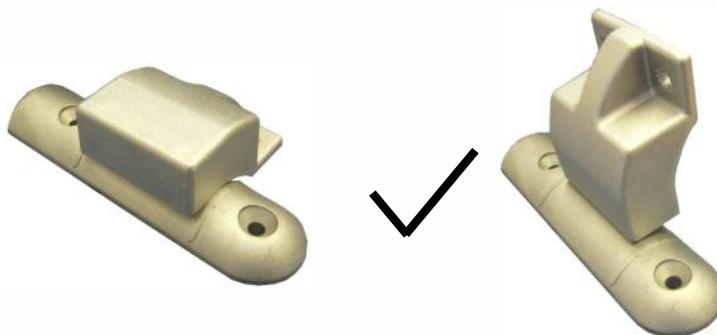
These are the only two orientations acceptable for these contacts. Note the magnet must be adjacent to the operating face of the contact



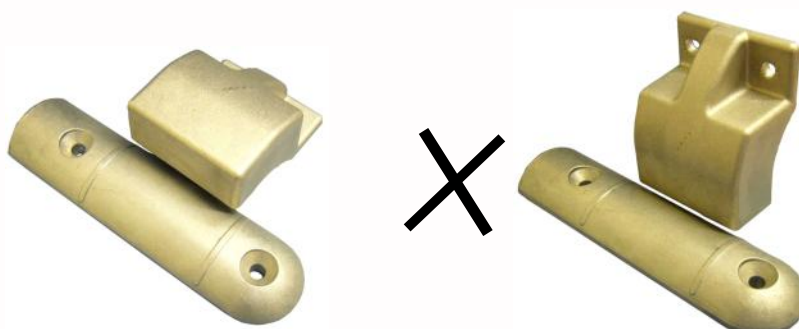
Aim to have contact and magnet accurately aligned, it will still function with up to 10mm lateral or vertical miss-alignment, however it is recommended to keep this to no more than 5mm.

EN3-RSA

The allowed position / orientations for the Roller Shutter contacts are shown below.



Aim to have contact and magnet accurately aligned, it will still function with up to 20mm lateral miss-alignment, however it is recommended to keep this to no more than 10mm.



High Security Range of Contacts

FMBR

The FMBR is a high security flush mounting magnetic contact incorporating an active tamper circuit designed for non ferrous surround applications. The contact and magnet both have a plastic body with a stainless steel flange. Available in 4 wire (double pole) and 6 wire (integral resistors) formats.



Supplied as a matched pair, correct orientation of magnet and contact is required for operation.

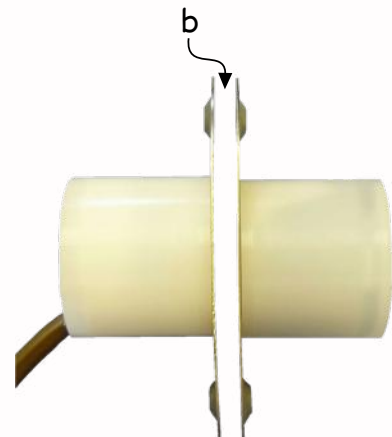
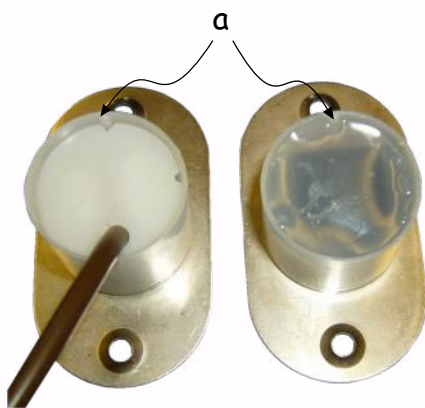
Specification

Grade	2
Environmental Class / IP	III / IP67
Reeds	2
Biased Reeds	1
Tamper	Active
Operating Gap:	Minimum 3mm Maximum 5mm

Key Points

The magnet and switch are polarised and matched together therefore requiring care in installation for optimal operation. The fixing holes in the mounting plates of both the sensor and the magnet should be carefully aligned and the **polarisation mark (a)** on the magnet should correspond to the matching mark on the sensor.

For optimal sensitivity, a gap of **3mm (b)** should exist between the magnet and the sensor when in the 'set' mode. The introduction of any 'illegal' magnetic field in this condition will interrupt either the tamper or the operating circuit.



Connection

4 Wire Model: Two pairs of wires, meter to find N.C. pair when magnet not present, this is the tamper pair.

6 Wire Model: See - 6 Wire Contacts - connection of grade 3 roller shutter and all high security contacts.

High Security Range of Contacts

HDBR

The HDBR is a high security surface mounting magnetic contact with a passive tamper circuit designed for non ferrous applications, however with the use of spacers the unit can also be used on ferrous surfaces. Supplied as a matched pair, correct orientation of magnet and contact is required for operation.



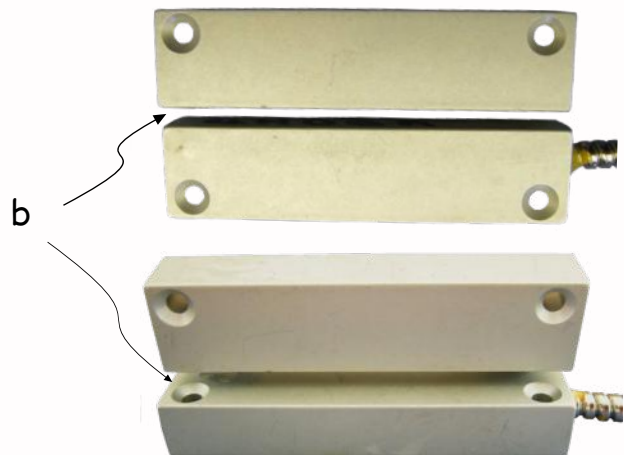
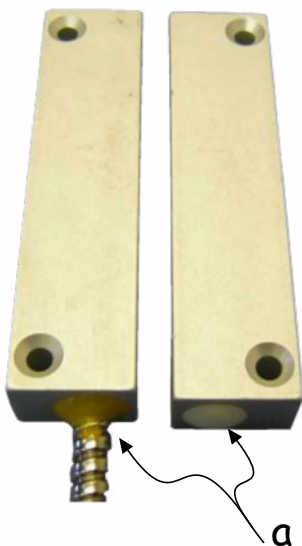
Specification

Grade	2
Environmental Class / IP	III / IP67
Reeds	3
Biased Reeds	1
Tamper	Passive
Operating Gap: Minimum	1mm
Maximum	15mm

Key Points

This contact and magnet are a matched pair. The magnet must be positioned with the plug (a) on the same side as the conduit exit from the contact and with the fixings to the back. If fitted to ferrous metal, the sensitivity may be affected and a spacer should always be fitted under the contact and magnet.

Mount the switch/magnet assembly to have an air gap of minimum 1mm and not greater than 5mm (b). Although it will work with a greater gap, optimum balance is set to be achieved at 5mm. The introduction of any 'illegal' magnetic field will interrupt the operating circuit.



Connection

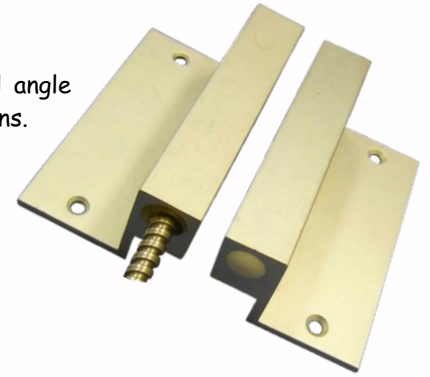
4 Wire Model: Two pairs of wires, meter to find N.C. pair when magnet not present, this is the tamper pair.

6 Wire Model: See - 6 Wire Contacts - connection of grade 3 roller shutter and all high security contacts.

High Security Range of Contacts

HDBR-SO

The HDBR-SO is a high security surface mounting magnetic contact with integral angle brackets and a passive tamper circuit designed for ferrous and non ferrous applications.



Specification

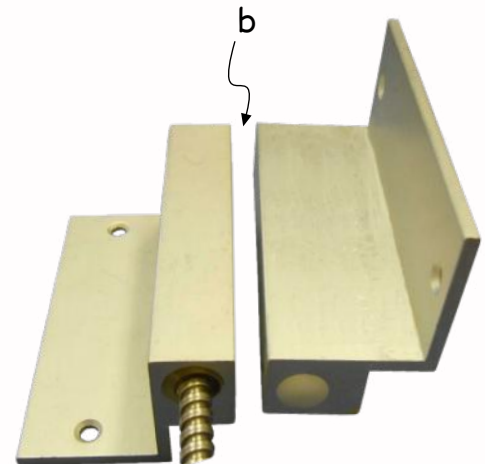
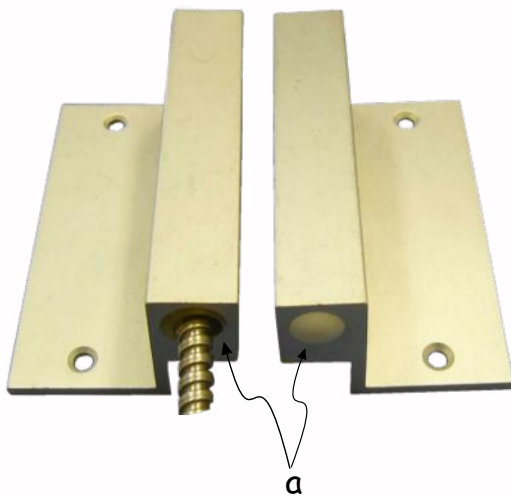
Grade	2
Environmental Class / IP	III / IP67
Reeds	3
Biased Reeds	1
Tamper	Passive
Operating Gap: Minimum	1mm
Maximum	15mm

Key Points

This contact and magnet are supplied as a matched pair. The magnet and contact are 'handed' and will only operate in the two positions shown below with the conduit exit from the contact the same end as the 'plug' (a) on the magnet. A model is available with cable exit on the other side: HDBR-SO-REV.

Mount the switch/magnet assembly to have an air gap of minimum 1mm and not greater than 5mm (b). Although it will work with a greater gap, optimum balance is set to be achieved at 5mm.

The introduction of any 'illegal' magnetic field will interrupt the operating circuit.



Connection

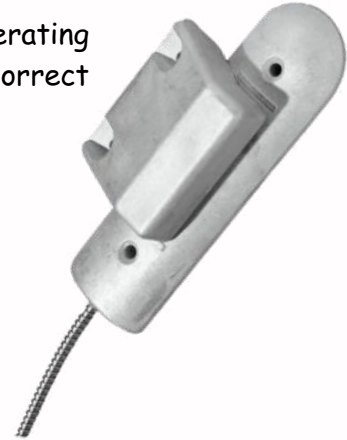
4 Wire Model: Two pairs of wires, meter to find N.C. pair when magnet not present, this is the tamper pair.

6 Wire Model: See - 6 Wire Contacts - connection of grade 3 roller shutter and all high security contacts.

High Security Range of Contacts

VS222

The VS222 is a High Security Roller Shutter Contact with two operating circuits and one active tamper circuit. Supplied as a matched pair, correct orientation of magnet and contact is required for operation.



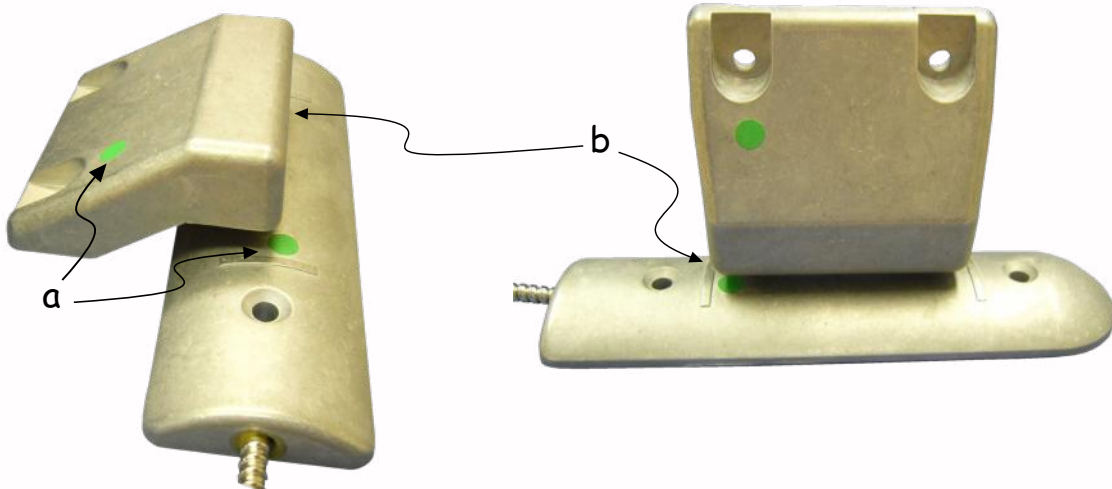
Specification

Grade	2
Environmental Class / IP	III / IP67
Reeds	4
Biased Reeds	2
Tamper	Active
Operating Gap: Minimum	5mm
Maximum	15mm

Key Points

This contact and magnet are supplied as a matched pair. The units are 'handed' and can only be fitted as shown in the two images below. The coloured dot must be on the same side of the magnet and contact (a). It will not work the other way around due to the biasing of the sensor reeds. A 'Reversed' model is available: VS222-REV

Mount the switch & magnet assembly to have an air-gap of around 6 - 10mm (b). Although it will work with a greater gap, the balance is set to be achieved at 10mm and the circuits may reset at less than 5mm separation.



Connection

Standard 6 Wire Model: Meter to find N.C. pair when magnet not present, this is the tamper pair. This contact has two sets of alarm reeds wired independently which accounts for two pairs of wires, these can normally be found with the use of a meter while the magnet is in the closed position. These two alarm circuits are normally wired in series to provide a single alarm output, however they can be used independently if required.

6 Wire Model with Integral Resistors: See - 6 Wire Contacts - connection of grade 3 roller shutter and all high security contacts.

High Security Range of Contacts

VS302

The VS302 is a High Security surface mount magnetic contact with a passive tamper circuit designed for use on ferrous and non ferrous surfaces. Note: the operating gap will be slightly reduced when used on a ferrous surface. Supplied as a matched pair, correct orientation of magnet and contact is required for operation.



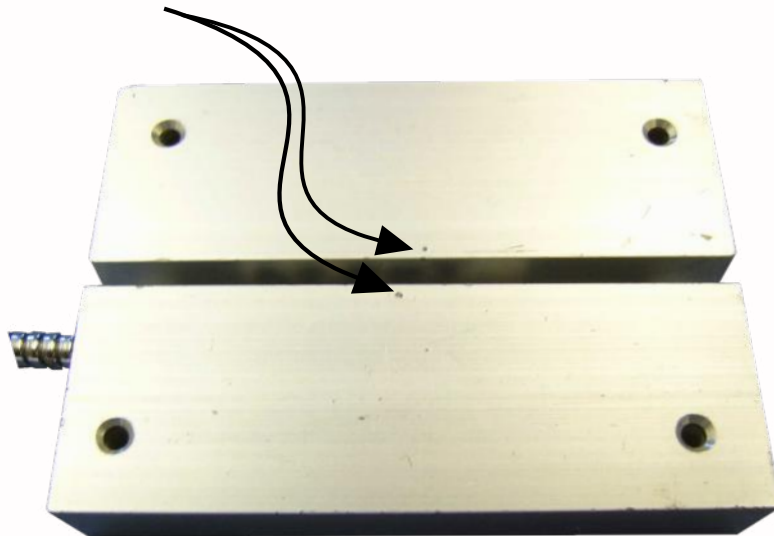
Specification

Grade:	3
Environmental Class / IP	III / IP67
Reeds	3
Biased Reeds	3
Tamper	Passive
Operating Gap: Minimum	0mm
Maximum	10mm

Key Points

This contact and magnet are supplied as a matched pair. Mount the magnet to the opening fixture and ensure the alignment mark is uppermost and adjacent to the contact. Fix the contact such that, when the door is closed, the dots on the contact and magnet are adjacent.

Mount the contact and magnet to have a maximum gap of 5mm when the door is closed. Although it will work with a larger gap the balance is set to be achieved at 5mm



Connection

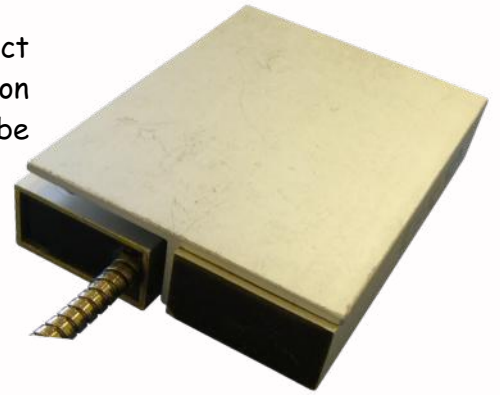
4 Wire Model: Two pairs of wires, meter to find N.C. pair when magnet not present, this is the tamper pair.

6 Wire Model: See - 6 Wire Contacts - connection of grade 3 roller shutter and all high security contacts.

High Security Range of Contacts

VS303

The VS303 is a High Security surface mount magnetic contact with an active tamper circuit and cover plate designed for use on ferrous and non ferrous surfaces. Note: the operating gap may be slightly reduced when used on a ferrous surface.

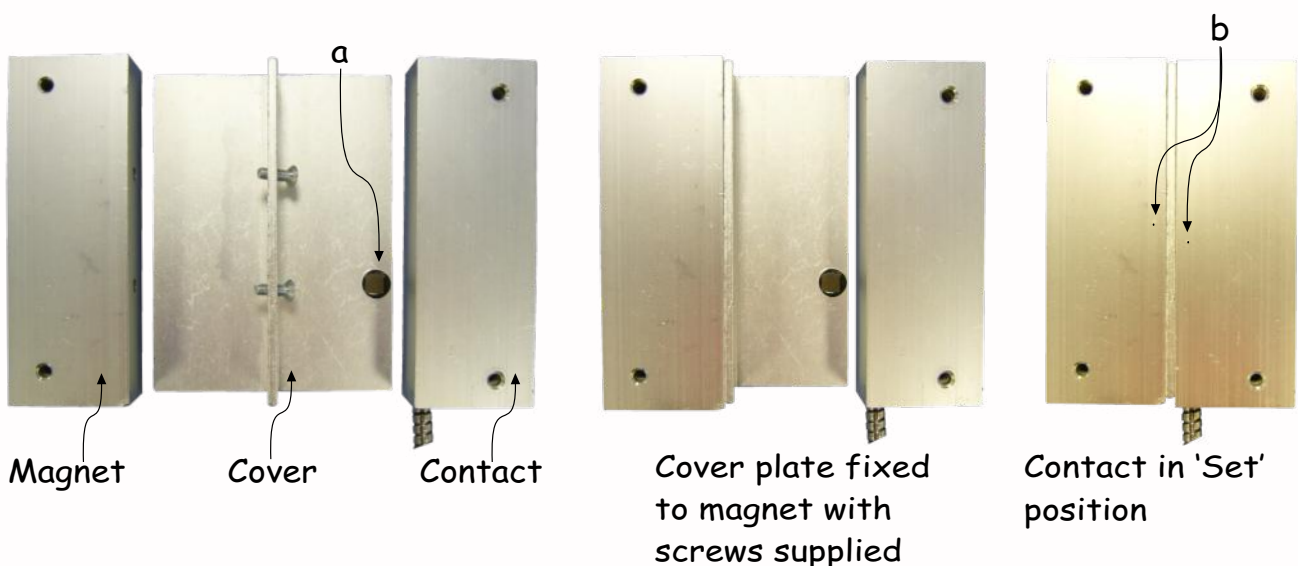


Specification

Grade	3
Environmental Class / IP	III / IP67
Reeds	5
Biased Reeds	3
Tamper	Active
Operating Gap: Minimum	0mm
Maximum	6mm

Key Points

The VS303 contact, magnet and cover are supplied as matching components. Do not attempt to use the contact with any other magnet or cover or you may experience compatibility problems. Mount the magnet to the door and fix the cover with the screws provided such that the magnet fixings are not visible and the cover magnet (a) on the underside of the cover is still visible. Fix the contact such that, when the door is closed, the dots (b) on the magnet and sensor are all aligned. Mount the contact and magnet to have a maximum gap of 5mm when the door is closed.



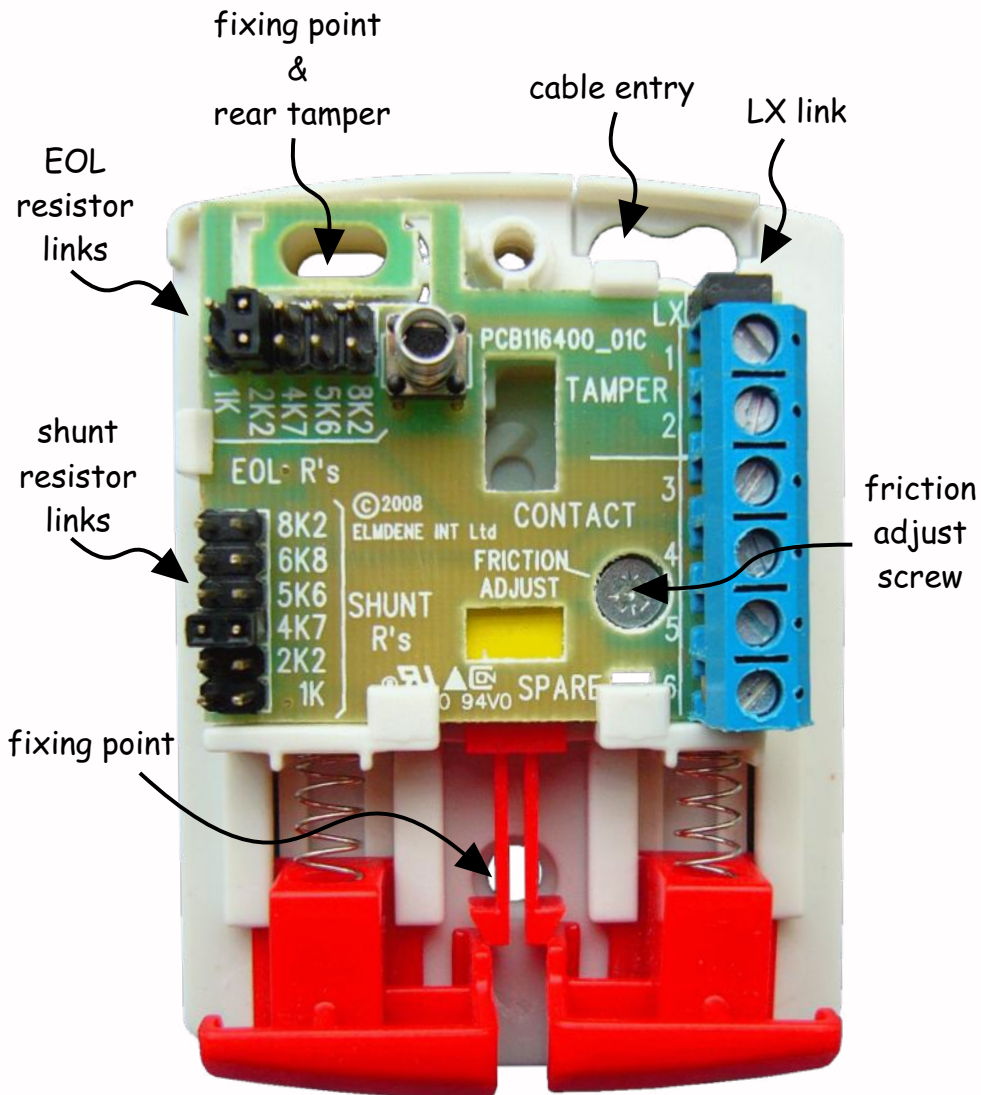
Note: These images are from the rear (i.e. faces fixed to door & frame) to give a clear view of correct assembly and will not be visible when installed.

Connection

4 Wire Model: Two pairs of wires, meter to find N.C. pair when magnet not present, this is the tamper pair.

Panic Buttons - Key Points

- Double Push Grade 3 Panic Buttons, feature multiple resistors to suit most control panels; image below shows 4k7 Shunt and 2k2 EOL resistors selected for Scantronic, Texecom etc.

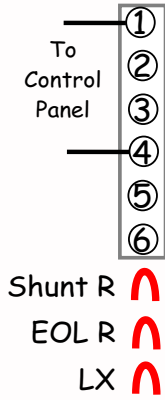


- When connecting, select Resistor Links to suit your control panel and fit as indicated in diagrams below.
- It is crucial Resistor and LX links are fitted correctly to ensure correct operation of all PA Buttons.
- Use screws supplied where possible, take care not to over tighten. If you are fitting alternative screws it is important the Rear Tamper fixing screw is a 'Pan' head, the other fixing screw must be countersunk and not interfere with the operation of the buttons or carriage.

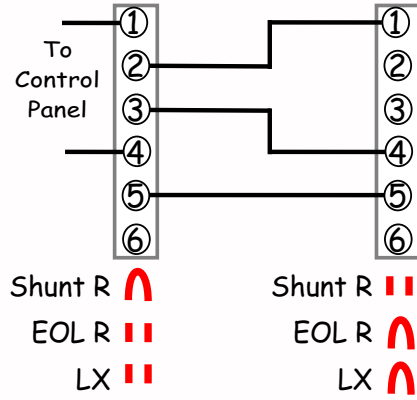
Panic Buttons - Connection

Connections for FSL circuits on this page, Double Pole circuits on next page.

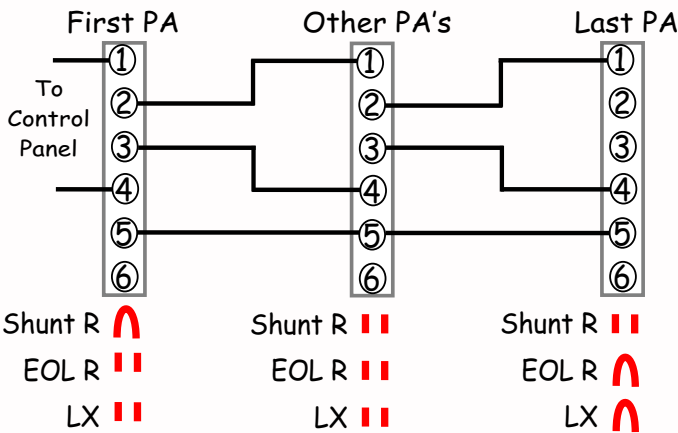
Single PA All Panels



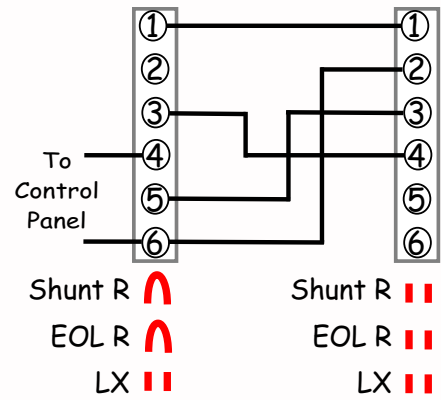
Two PA All Panels except Guardall



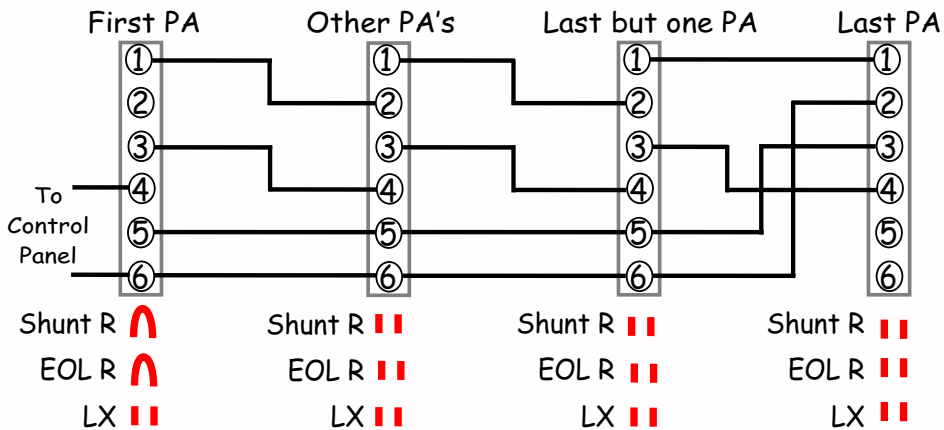
Multiple PA All Panels except Guardall



Two PA Guardall Panels



Multiple PA Guardall Panels



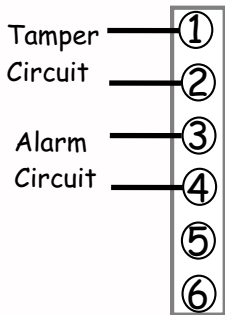
= Link Fitted = Link NOT Fitted

Panic Buttons - Connection

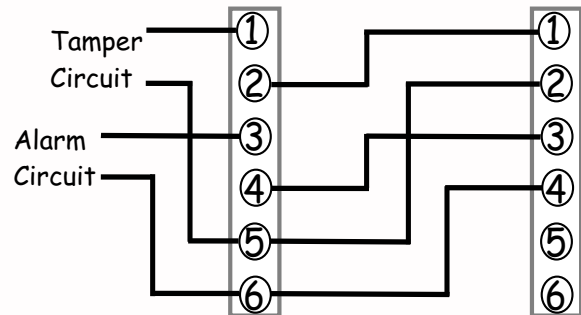
Connections for Double Pole wiring i.e. no end of line resistors.

Remove ALL LINKS for ALL applications

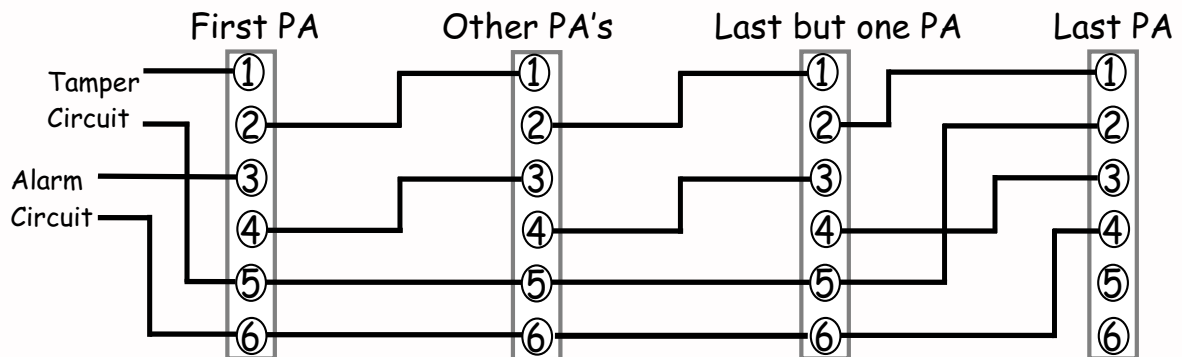
Single PA



Two PA



Multiple PA



Safe Limpets - Key Points

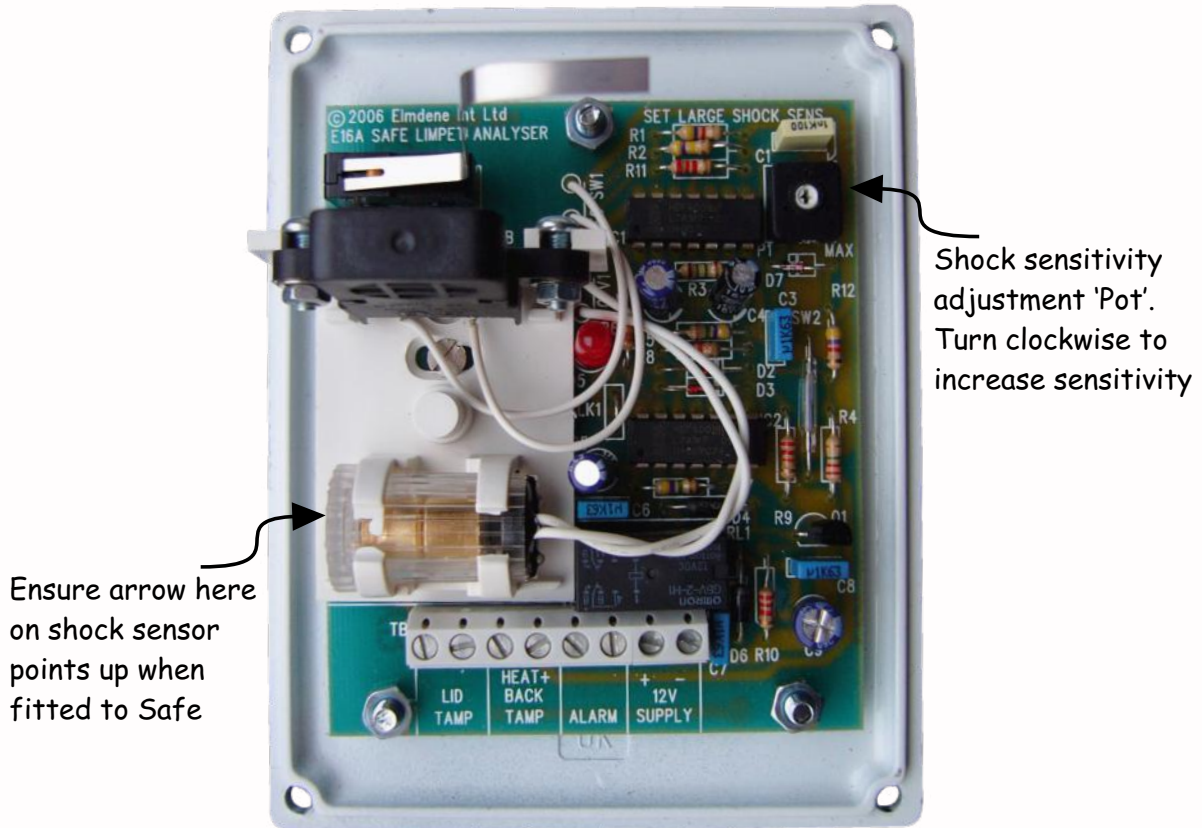
- All Models are Grade 3 Environmental Class II.
- Primarily used for the protection of traditional key locking Safes'.
- Units comprise of Limpet and 'Keep' which is fixed to the Safe door covering the keyhole.
- Three models, E16, E16A and E20 - Providing the following protective features:
 - Proximity** (Reed switch operated by magnet in 'Keep') - All models.
 - Vibration / Shock** - All models. Note E16 requires 3rd Party Analyser.
 - Thermal Sensor** (Operates at approximately +60° C) - All models.
 - Supply Failure** - E16A, E20.
 - Magnetic Interference Detection** (Additional reed switch) - E20.
- E16A and E20 both require 12v supply.
- E16A and E20 have an integral 'Analyser' for the vibration / shock sensor with adjustable sensitivity.
- E16A utilises a traditional 'Inertia' sensor for detecting shock/vibration; the E20 features a Piezo sensor for this function.
- Magnetic feet should not be rotated for any reason as this may upset the magnetic field balance of the unit.
- E20 Reset+ / Reset- terminals can be used if required to remotely reset LED indication. The LED can also be permanently disabled, see connections. If neither Reset is used LED will flash continuously after first activation. Note, Alarm contacts reset automatically and are not affected by the LED reset function.

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Safe Limpets - Connections E16 / E16A

Details for FSL connection, select Shunt & EOL resistors according to Control Panel. e.g. Scantronic: 4k7 Shunt / 2k2 EOL.

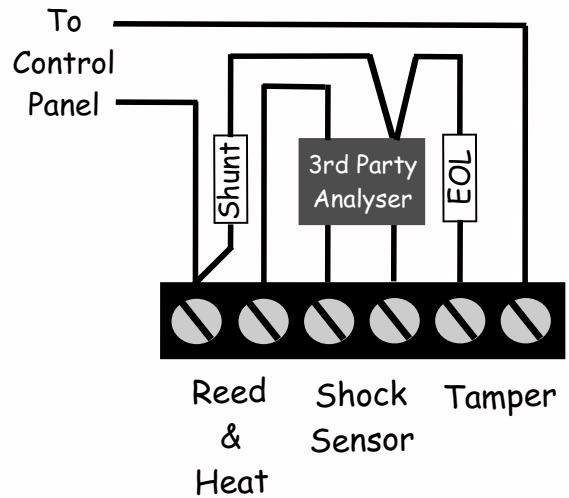
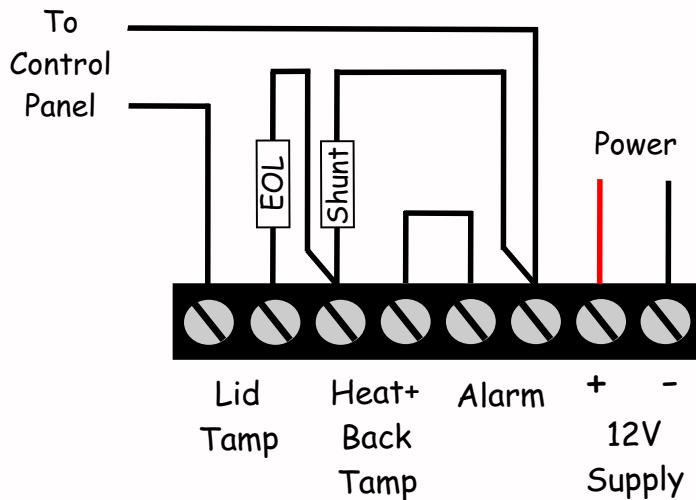
E16A shown



E16A

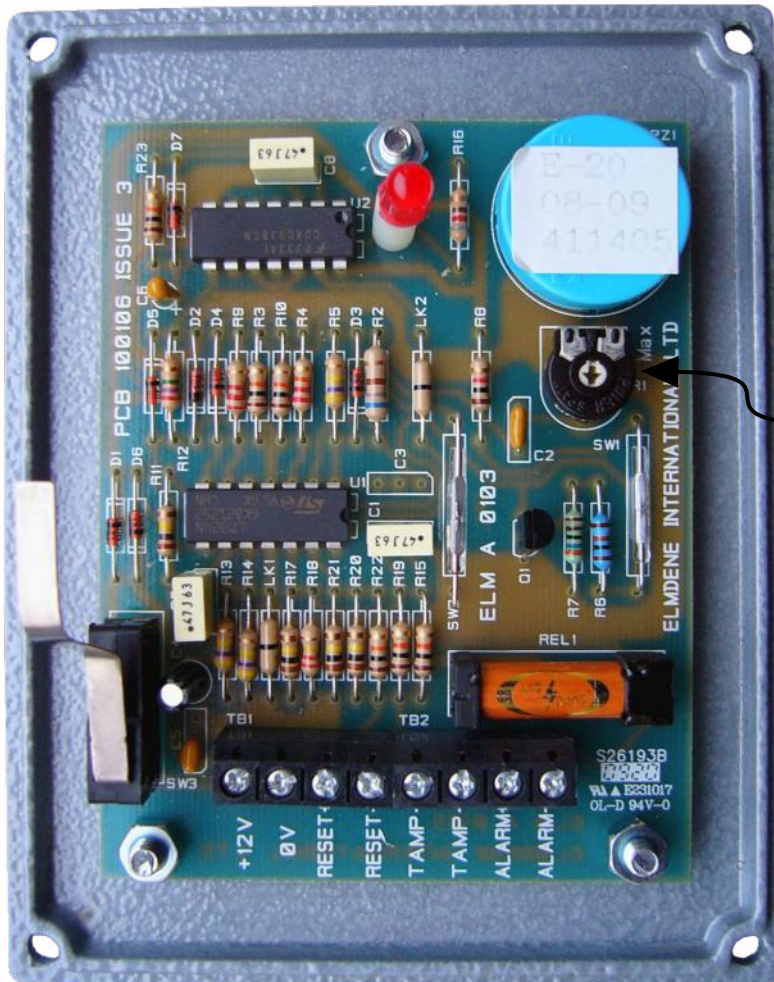
E16

Power to 3rd Party Analyser omitted for clarity

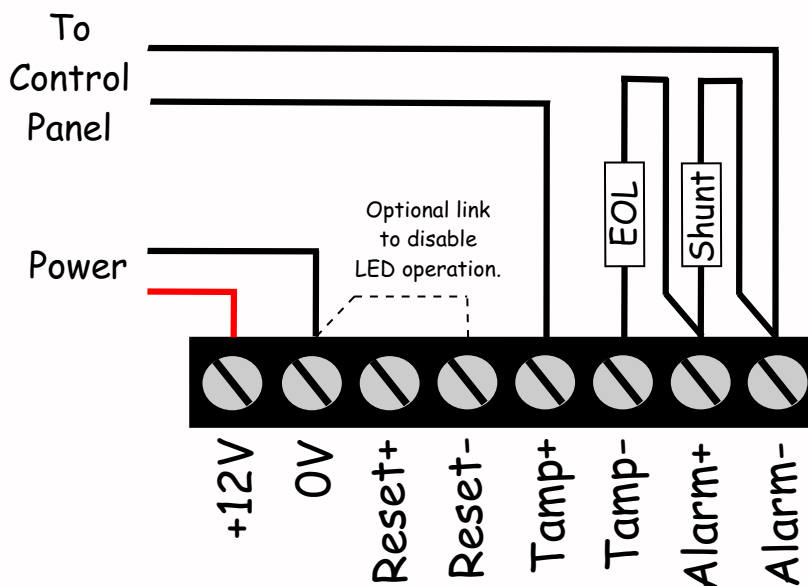


Safe Limpets - Connections E20

Details for FSL connection, select Shunt & EOL resistors according to Control Panel. e.g. Scantronic: 4k7 Shunt / 2k2 EOL. (Alarm and Tamper connections are not polarity conscious as inferred by PCB markings)



Shock sensitivity adjustment 'Pot'.
Turn Anti-clockwise to increase sensitivity



Note: Alarm and Tamper connections are NOT polarity conscious.

External Sounders - Key Points

Connections - understanding the function of individual terminals will enable you to connect an Elmdene Sounder to any Control Panel, the following is a full list of Terminals and their respective function:

Note: There are some minor variations to Terminal designations dependant on Model.

- **H+**
Positive Hold Off: Permanent +12V.
- **H-**
Negative Hold Off: Permanent -0V.
- **TR / RTN**
Tamper Return: Usually -0V when all tampers are healthy and a hold off supply is present. Some Sounders have the option to select this as +12V (rarely used) or one of a pair of volt free contacts when volt free operation of the Tamper is required.
- **TS / RTN SEL**
Tamper Select: Dependant on model, used to select -0V or +12V or Volt Free Tamper operation, or link the Tamper circuit of two sounders wired to one Control Panel.
- **R-**
Ring Negative: -0V trigger input to activate Sounder. Note Grade 3 & 4 units will require this to be pulled to +12V by Control Panel in standby mode. See [Appendix C](#) for more information
- **ST-**
Strobe Negative: -0V trigger input to activate Strobe.
- **M-**
Low Level Sounder Trigger: Used on INT500/600 Internal Sounders
- **ENG**
Engineer: Intended for use during installation/service, applying +12V to this terminal will silence the Sounder. This can be linked directly at the Sounder or wired back to the Control Panel; note while ENG terminal has +12V applied the tamper circuit is opened to ensure this is not inadvertently left connected. On Grade 3: HS, Vertec and Quartz this input doubles as a Remote Test Input (RTST), see below.
- **RTST / REM**
Remote Test Input: Taking this input to +12V initiates a self test of the battery - all Grade 3 & 4 units, and the Piezo(s) - Grade 3/4 Rapier, Grade 3 HS, & Vertec
- **Fault**
Fault Output: Normally closed volt free fault output terminals.
- **BT+**
Battery Positive: Connection of battery positive lead, on some models this is only used when a replacement battery is being fitted.
- **BT- / FL1 / BATT LINK**
Battery Negative: Connection of battery negative lead, some models this is just a link between two terminals.
- **SAB** mode draws power from the Control Panel in alarm to activate the Sounder and in this mode the unit will also activate on loss of hold off supply or if a tamper condition occurs. A tamper signal is sent to the Control Panel in each case.
- **SCB** mode differs by:
 1. Using internal battery to activate Sounder.
 2. Not activating Sounder in the event unit is tampered, however a signal is sent to the Control Panel.

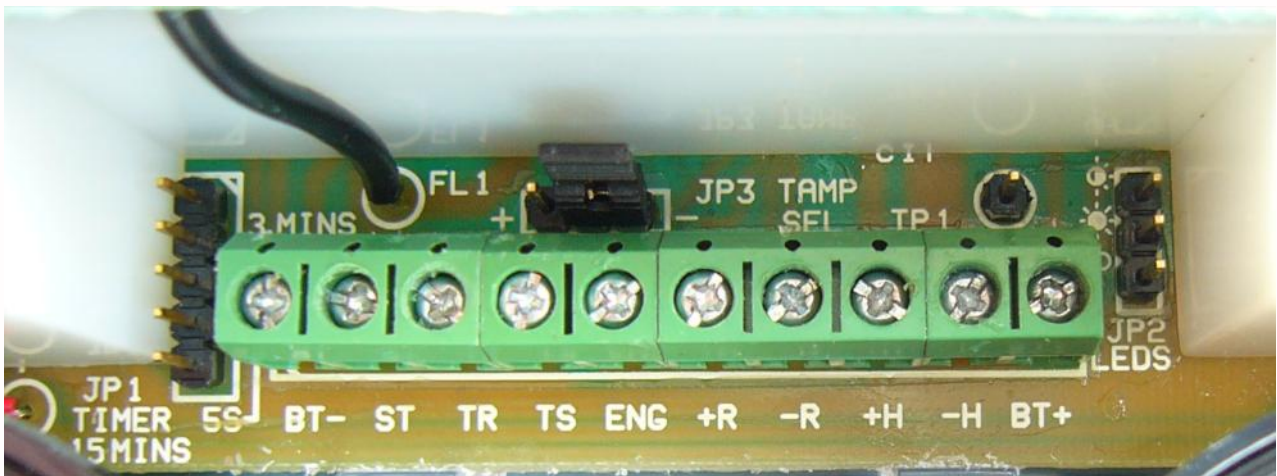
See [Appendix 'B'](#) for details of connecting two External Sounders to a Control Panel.

External Sounders - Connections & Link Options



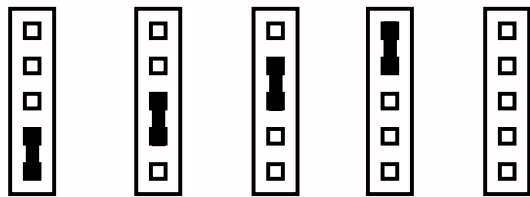
HS500, Maxitec 500, Vertec 3000/5000

Link options selected: JP1-15m Timer / JP2-Flashing LED's / Neg Tamper



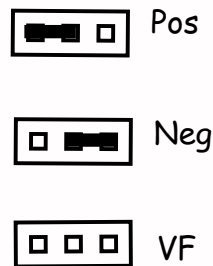
See External Sounders Key Points for Connections

JP1 - Timer



5sec None 10min 3min 15min

JP3 - Tamper

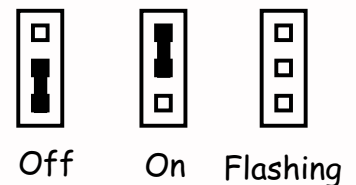


Pos

Neg

VF

JP2 - LED's



Off

On

Flashing

Specification

Voltage: 12Vdc / Current: Standby 40mA, Alarm 200mA, Strobe 100mA

Sounder & Strobe Triggers: -0V Applied / Tamper Return: Pos, Neg, VF / Battery: 6V 300mAh NiMH

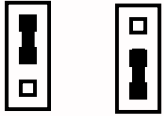
Note: All these models now superseded as of June 2012.

External Sounders - Connections & Link Options

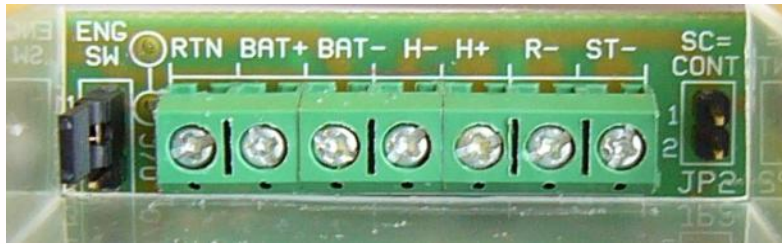
HS500C-G2, HS500C, Maxitec 500C, Vertec-1000-G2, Vertec 1000

Link options selected: JP1-Neg Tamper / JP2-15m Timer

JP1 - Tamper



Neg Open
Collector



JP2 - Timer



15min None

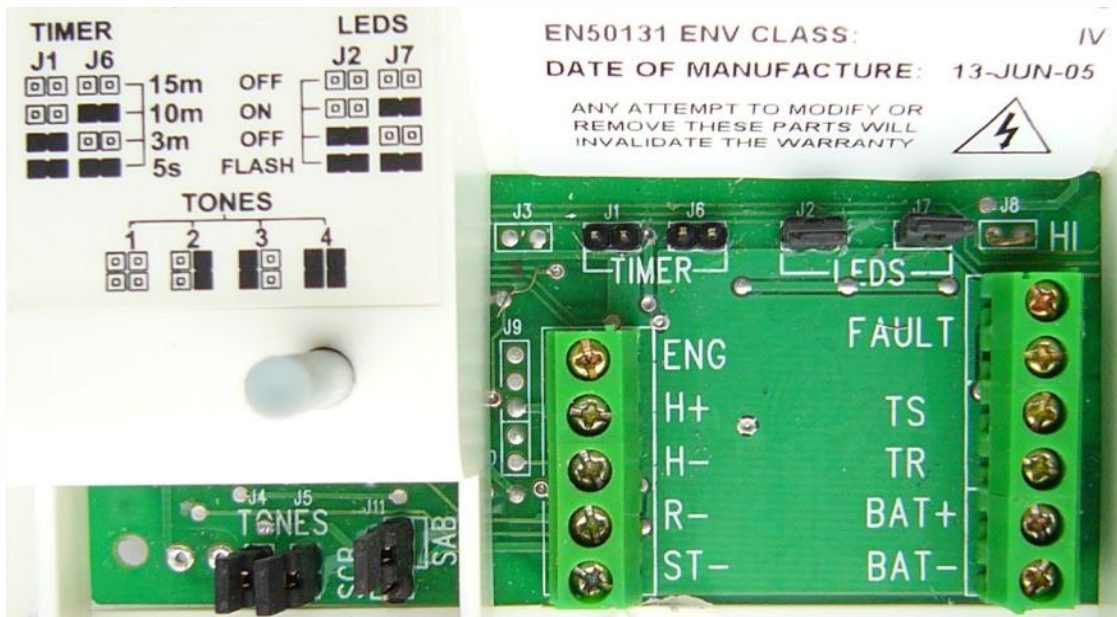
See External Sounders Key Points for Connections

Specification

Voltage: 12Vdc / Current: Standby 40mA, Alarm 200mA, Strobe 100mA
 Sounder & Strobe Triggers: -0V Applied / Tamper Return: Neg / Battery: 6V 170mAh NiCd

HS-500-G3, HS700, Maxitec 700, Vertec-3000-G3, Vertec 7000

Link options selected: J1&J6-15m Timer / J2&J7-Flashing LED's / SAB / Default Tone



Link TS to H- for single unit operation, see External Sounders Key Points for other Connections

Specification

Voltage: 12Vdc / Current: Standby 17mA, Alarm 100mA, Strobe 100mA
 Sounder & Strobe Triggers: -0V Applied / Tamper Return: Neg / Battery: 6V 300mAh NiMH

Note: Only G3 & G4 models have ring line monitoring

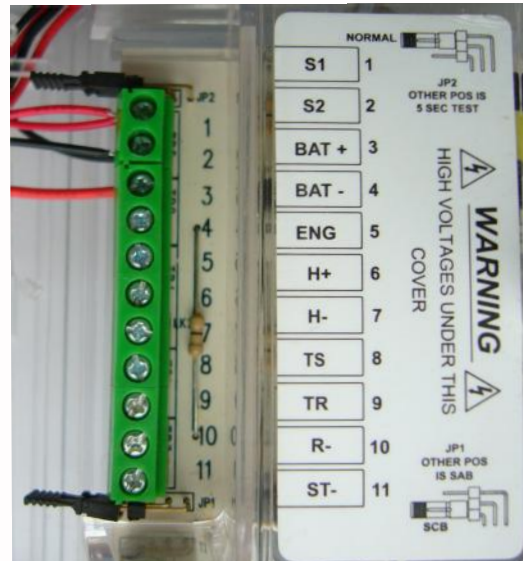
External Sounders - Connections & Link Options

Quartz-1000 & 3000-G2



Link options: Normally top two pins for JP1-SAB and JP2-15m Timer

Link TS to H- for single unit operation, see External Sounders Key Points for other Connections



See External Sounders Key Points for Connections

Specification

Voltage: 12Vdc / Current: Standby 15mA, Alarm 130mA, Strobe 120mA

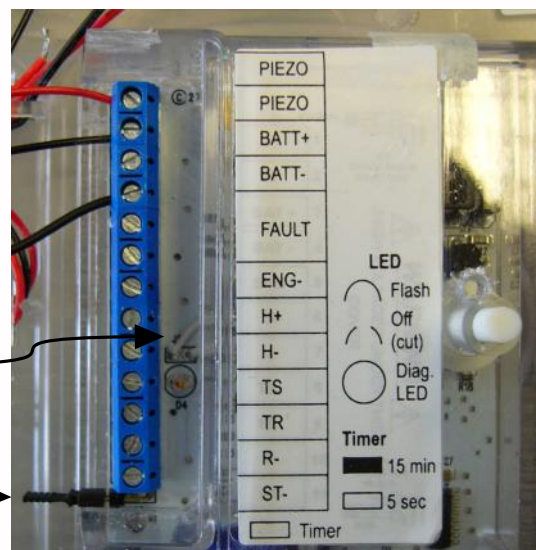
Sounder & Strobe Triggers: -0V Applied / Tamper Return: Neg / Battery: 6V 320mAh NiMH

Quartz-1000-G3 & 3000-G3



Link options: Cut wire loop to disable Comfort LED's.

Timer link MUST be ON for 15m timer; link off = 5s test mode



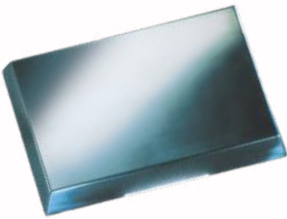
See External Sounders Key Points for Connections

Specification

Voltage: 12Vdc / Current: Standby 16mA, Alarm 160mA(1000), 190mA (3000) Strobe 40mA

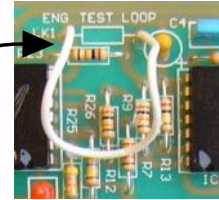
Sounder & Strobe Triggers: -0V Applied / Tamper Return: Neg or VF / Battery: 6V 320mAh NiMH

External Sounders - Connections & Link Options



Rapier 2000, 4000, 6000

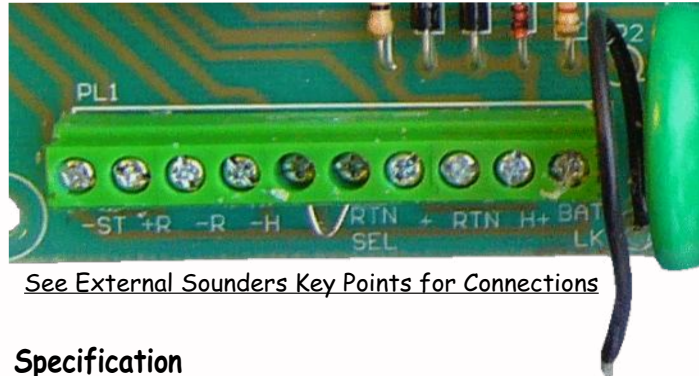
Ensure 'ENG TEST LOOP' on PCB is cut to increase cut off timer from 5s to 15m



See External Sounders Key Points for Connections

Note: 'RTN SEL' and '-' linked at production providing negative tamper return as default; remove link for volt free tamper operation between 'RTN SEL' and 'RTN'.

In some cases, particularly where the Rapier is some distance from the Control Panel, it may be beneficial to use a separate spare core to provide a -OV connection to RTN SEL; when this is done remove Link between RET SEL and -



See External Sounders Key Points for Connections

Specification

Voltage: 12Vdc / Current: Standby 78mA, Alarm 350mA, Strobe 150mA / Sounder & Strobe Triggers: -OV Applied
 Tamper Return: Neg. Pos, VF / Battery: 2 x 6V 300mAh NiMH (Note: 2000 uses 12V 900mAh pack)

Rapier 36S

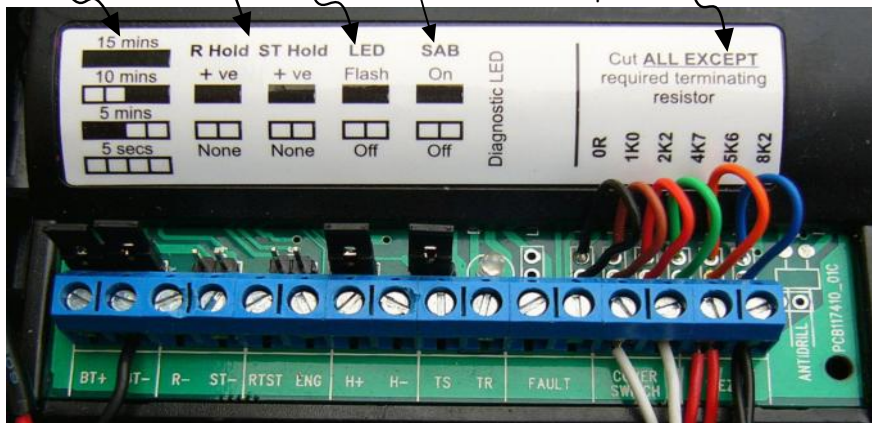
The R Hold & ST Hold feature provides activation of Sounder / Strobe on Positive Removal; these links would not normally be fitted for installations in the UK.

SAB mode ON normally selected. With SAB mode OFF, unit will not sound in response to a Tamper condition; however a Tamper will be signalled to the Panel

Sounder Timer options fit links according to timer requirements. 15 mins selected

Select Comfort LED Mode Flash or OFF

This feature provides for the inclusion of an End Of Line Resistor in the Tamper circuit if required. The unit can be used as supplied with No Links cut if no EOL Resistor is required; otherwise cut ALL links apart from link corresponding to the resistance required



Specification

Voltage: 12Vdc / Current: Standby 10mA, Alarm 180mA, Strobe 40mA
 Battery: 1 x 6V 300mAh NiMH

External Sounders - Commissioning Tones and Diagnostic LED

Some of our external Sounders feature commissioning tones and a diagnostic LED to assist with installation and service, currently this includes: HS500-G3* Quartz 1000/3000-G3, Rapier-G3/4 and Vertec3000-G3*. (*Commissioning tones only).

The commissioning tones will help identify the status of the front and rear tamper, which can be particularly useful for example when you need to confirm the rear tamper is closing effectively. A faulty or disconnected battery will also be indicated. Note the ENG input on the Sounder must be connected to +12V to initiate the commissioning tones, which also has the effect of disabling the siren and opening the tamper circuit while in this mode.

The Diagnostic LED is automatically enabled when the front tamper is open and provides status indication relating to the integral battery and piezo, see table below.

Commissioning Tones - ENG input must be held high (+12V) - (HS500-G3 & Vertec3000-G3)
(also select 5s cut-off timer)

1 click:	Tamper closing, front or rear.
2 clicks:	Tamper opening, front or rear.
Continuous slow clicks:	Rear tamper open when front tamper closed.
Continuous fast clicks:	Battery faulty or not connected when front tamper closed.

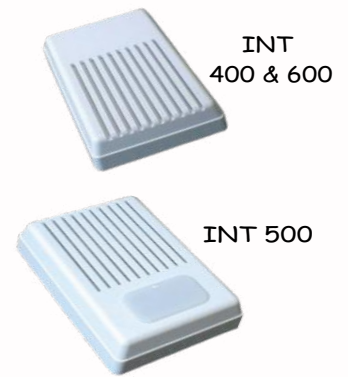
Diagnostic LED - Active when front tamper open

1 flash	Low battery / charging.
2 flashes	Battery failed 24h test.
3 flashes	Piezo(s) failed.
4 flashes	Battery charger failed.

.oOo.

'INT' Range Internal Sounders - Key Points

- Internal Sounders available with or without Integral Battery
- Product codes for models with an integral battery are suffixed with 'S'
- Three models:
 INT400(S) (TS445-402) - High level sounder.
 INT500(S) (TS447-500) - High level and Low level sounder plus Strobe.
 INT600(S) (TS445-600) - High level and Low level sounder.

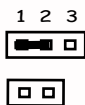
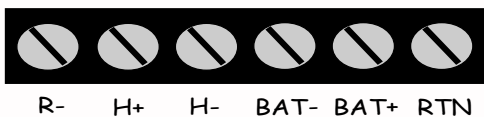


- Units with integral battery - grade 2, without battery - grade 3.
- High level sounder normally used for alarm conditions and low level sounder for entry/exit tone.
- High level sounder, low level sounder and Strobe function are all independently controlled with separate triggers for each.
- Low level sounder has volume control 'Pot' to provide adjustable sound output level.
- High level sounder is not adjustable.

Internal Sounders - Connections & Link Options

INT 400(S)

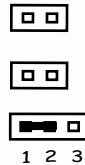
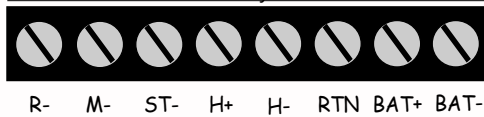
See External Sounders Key Points for Connections



JP1: 1&2 Negative Tamper - default
 2&3 Open Collector
 JP2: On - No Timer
 Off - 15m Timer

INT 500(S) (before November 2014)

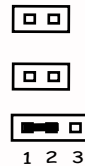
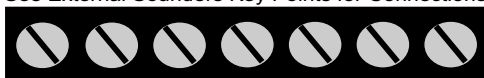
See External Sounders Key Points for Connections



JP3: On - Fast Whoop
 Off - Warble
 JP2: On - No Timer
 Off - 15m Timer
 JP1: 1&2 Negative Tamper - default
 2&3 Open Collector

INT 600(S) (before November 2014)

See External Sounders Key Points for Connections

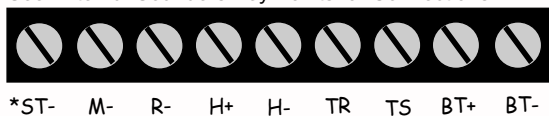


JP3: On - Fast Whoop
 Off - Warble
 JP2: On - No Timer
 Off - 15m Timer
 JP1: 1&2 Negative Tamper - default
 2&3 Open Collector

Technical Specification	
Voltage	12Vdc
Current - Standby	19mA
- H/Level Sounder	260mA
- L/Level Sounder	80mA
- Strobe	50mA
Battery ('S' versions)	6V / 170mAh NiCd
Trigger: All functions	Negative Applied
Tamper Return	0V, O/C or V/F
Cut Off Timer	15m or None

INT 500(S) & 600(S) (after November 2014) Now features V/F Tamper Connection. *Note: ST- not used on INT600(S)

See External Sounders Key Points for Connections



JP1: On - No Timer
 Off - 15m Timer

Sounder - FAQ

What could be the cause of a 'Bell' tamper at the Control Panel?

- 1: No hold-off supply to sounder. [Action:A]
- 2: Front or Rear Tamper switch not closed. [Action:B]
- 3: Some models require TS terminal to be connected to H- [Action:C]
- 4: Trigger wire not connected / pulled up to +12V in standby mode. [Action:D]
- 5: Cable fault. [Action: E]

Why can't I stop the Siren sounding?

- 1: Hold-off supply not present at H+ & H- (battery connected). [Action:A]
- 2: Front or rear tamper not closed. [Action:B]
- 3: Trigger wire not connected / pulled up to +12V in standby mode - G3 models. [Action:D]
- 4: 0V applied to R- by control panel. [Action:F]

Why can't I get the Siren to sound?

- 1: Hold-off supply not present at H+ & H- [Action:A]
- 2: Combination of, 5 second link enabled or not cut (dependant on model), plus front / rear tamper open. [Action:G]
- 3: Trigger wire not pulled up to +12V in standby mode - G3 models. [Action:D]
- 4: Trigger to R- is the wrong polarity. [Action:H]

Action

A: Measure voltage across H+ & H-, this should normally be about 12-14V.

B: Check tamper switches are made, HS, Vertec, Maxitec and Prima 500 models have a magnetic front tamper.

C: For models with a terminal marked 'TS' this may need connecting to H-

D: This action is only relevant to G3 Sounders, post June 2012. Ensure trigger wire connected to R- is pulled up to +12V by control panel in non alarm condition; fit a 1k resistor between trigger output and +12V at control panel if necessary - see Appendix C.

E: Meter cable to ensure continuity of cores.

F: Check polarity of voltage at R- terminal or at control panel output, this should be approximately +12V in a non alarm condition.

G: Check 5 second link and front/back tamper switches are made, HS, Vertec, Maxitec and Prima 500 models have a magnetic front tamper.

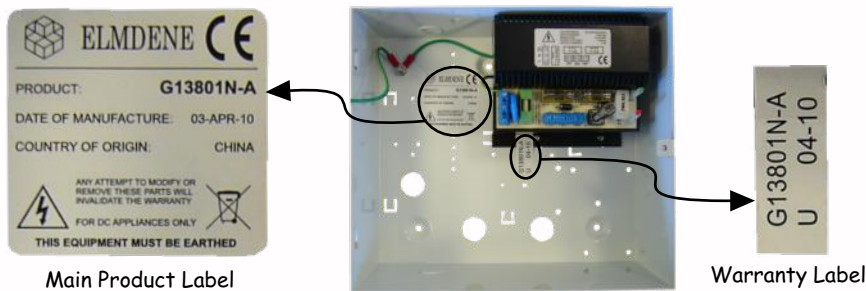
H: Ensure trigger output to R- is -0V.

Power Supplies - Key Points

This section is focussed more on features and function of Power Supplies rather than wiring and connections.

- **Identifying the Power Supply**

When installing a Power Supply you will normally have been provided with a unit of appropriate voltage and current rating; however on a service call you may come across a PSU where its output voltage and current rating are not immediately apparent; here's how to find out.



The Main Product Label and Warranty Label both identify the PSU, in this case a G13801N-A. From this you can determine the Voltage and Current rating of the unit:

Product codes beginning with 138 as in this example are 12V PSU's with an output of 13.8V; after the Voltage is the Current rating, again in the example here it is '01', so this will be a 1A PSU; note there is not always a leading zero. Alternatively the VRS124000 is a 12V PSU with a 12V output and in this example the Current rating is specified in milliamps, so in this case 4A.

24V Power Supplies are coded in a similar way although '24' is always used even though the output in most cases would be 27.6V. An example would be a G2405N-C; this is a 24v PSU with an output of 27.6V and rated at 5A. The 'TR' Range comprising the TR2 & TR4 are an exception to this being 24V with a nominal output of 28V, 2A and 4A respectively; primarily used to power door retainers.

Features - Dependant on Model

Battery Charging

Most Elmdene PSU's feature simple taper charging to recharge the standby batteries, some models, e.g. the BM, EN, GEN, STE and STX ranges have more sophisticated charging regimes to improve recharge times and maximise battery life.

Note: when checking battery charge voltage this should be done with the battery connected to the PSU; this will provide true battery charge voltage as opposed to an open circuit reading of the PSU battery terminals. Additionally PSU's that feature Deep Discharge Protection will not have a charge voltage present unless a healthy battery is connected.

Deep Discharge Protection

In the event mains power is lost standby batteries continue to supply the load. At approximately 10.5V for a 12V system and 21V for a 24V system, the Power Supply disconnects the batteries from the load to save them from further unnecessary discharge and protect them from possible permanent damage. Some of the PSU's with this feature include BM, EN, FS, GEN, STE and STX ranges.

Electronic Short Circuit Protection

Protects the Power Supply from heavy overload and short circuits by shutting down the output; removal of the overload condition restores normal operation of the Power Supply.

Power Supplies - Key Points...continued

- **Fault Outputs**

These are provided on some models to enable remote monitoring of the PSU status; these may include:

APS (Alternative Power Source) - Battery faults

EPS (External Power Source) - Mains failure

Gen Fault or PSU Fault - Dependant on model:

Battery Fault, Load or Battery Fuse Failure

Fault Outputs are usually Volt Free, SPST, being closed when the PSU is healthy and open when a fault occurs. The original linear BM range and the more recent STV range have SPDT (changeover) contacts. Some older models have single terminal Open Collector fault outputs; in every case these are pulled to -0V when the unit is healthy, going high impedance when a fault occurs. So these can be used to provide the -0V supply to a relay which would drop out when a fault occurred. Note: some of these are limited to maximum current of 100mA.

- **Floating Output**

All Elmdene Power Supplies have 'Floating' Outputs i.e. independent of and not referenced to the earth/ground connection.

- **Mains Transient Suppression and Brown-Out Filter**

Protect the PSU from mains surges and short duration dips in the Mains Supply.

- **Output Fuse**

Fast acting fuses are used to protect the PSU from overload; they are required to allow a degree of higher current flow for a short period of time for loads which cause a surge on power up.

- **Switch Mode Operation**

Power Supplies utilising Switch Mode technology provide advantages in energy efficiency, universal mains input voltage and lower operating temperature, a key element in prolonging the life of the PSU and battery.

- **Transformer Thermal Trip**

Enclosed within the transformer, this device will go permanently open circuit in the event of the transformer overheating; this may result from one or more of the following conditions: overload, high ambient temperature, excessive mains voltage.

- **Installation Tips**

Power Supplies must have an external disconnect device as a means of isolation, this is usually a non switched fused spur.

Ideally leave spare capacity with respect to current drawn from the PSU, this will help prolong its life and can provide enough to add that extra door or camera when required.

Install a PSU with 100mm of space around all sides and avoid stacking them one above the other. Avoid hot locations and spaces with little or no ventilation.

Following installation, test the output with no load connected first to confirm all is OK. When fitting a battery ensure it is already in a healthy condition or it may not be 'seen' by the PSU and remain uncharged, see Battery Charging above.

Power Supplies - FAQ

What could cause failure of dc output to the load?

- 1: Failure of output fuse due to overload.
- 2: PSU has shut down due to overload.
- 3: See also - What could cause failure of Transformer secondary output?

Action

Disconnect load, replace fuse if required, check output & load before reconnecting. If failure occurs again check load for faults.

What could cause failure of Transformer secondary output?

- 1: Transformer thermal trip operated due to overload and or high ambient temperature.
- 2: High mains supply voltage.

Action

Replace power supply - reduce load and or relocate to cooler location, check mains supply voltage; also see installation tips above.

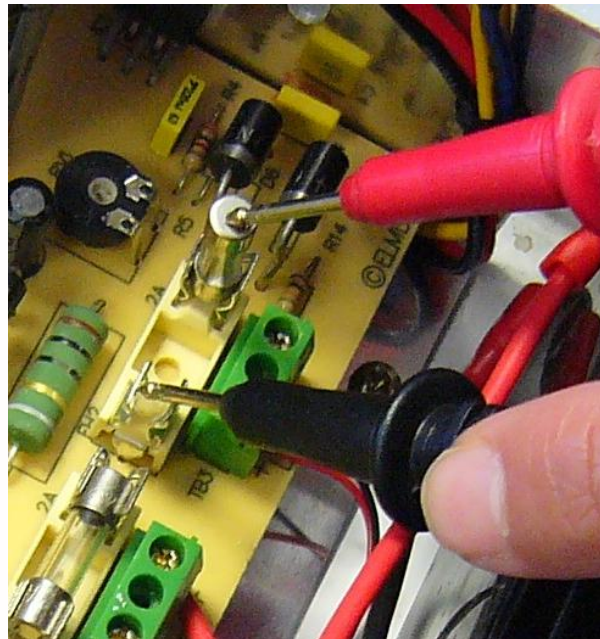
What could cause a low output voltage from the Power Supply?

- 1: Overload condition

Action

Check current being drawn by load with ammeter / disconnect load and check output voltage is correct for power supply.

This picture shows a very simple way to check current drawn from a psu without having to disconnect the load. Lift the Load fuse from one end, then probe onto the open fuse carrier and the exposed fuse end. Battery charge current can also be measured in the same way at the Battery fuse.



I can't detect/measure a battery charge voltage; is the Power Supply faulty?

- 1: This is not usually a fault; where a power supply has Battery Deep Discharge Protection, a charge voltage will not be present until a 'healthy' battery is connected. This would be a battery or batteries with a terminal voltage of approximately 11V for a 12v psu, and 23V for a 24V psu.

Also Note: True battery charge voltage can only be measured with the battery(ies) connected to the power supply.

Power Supplies - Ancillary Devices

FIREFOM

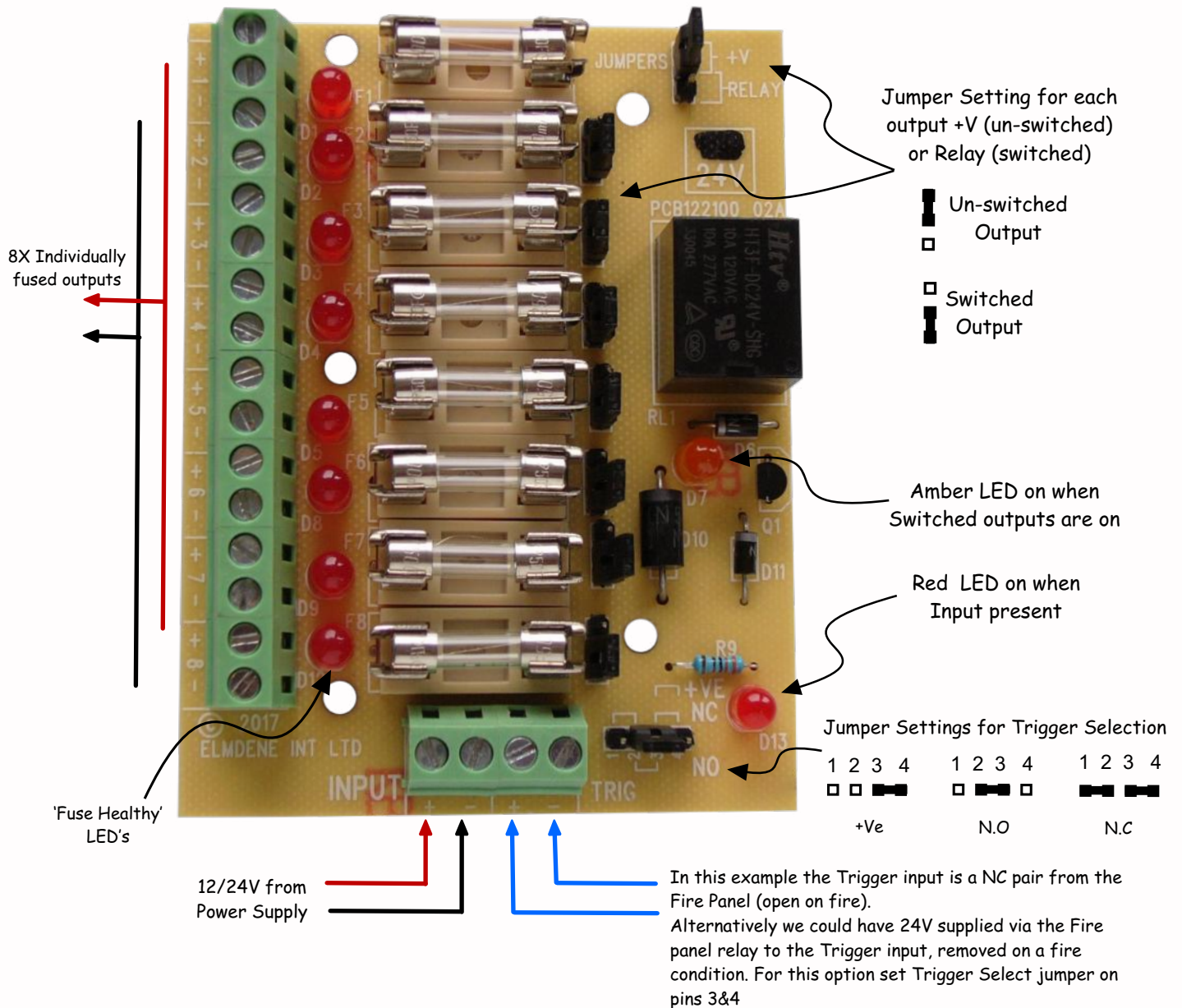
Available in 12V & 24V versions, the FIREFOM provides 4, 8 or 12 individually fused outputs, each output can be selected to be permanently on or switched via a remote signal from a Fire Panel or other control device. The remote signal can be either dry contacts or voltage controlled. Typically used in Access Control applications to remove power from locks while maintaining power to the ACU when the Fire Alarm activates.

Connections

Input 0V/+12-24Vdc from PSU

Output 4/8/12 Fused outputs (permanently on or switched as selected)

TRIG Connection from remote source e.g. Fire Panel to control the outputs selected as 'Switched'; can be either N.O/N.C contacts or Voltage



This table defines the output state of the 'Switched' Outputs with respect to Mode selected and Trigger inputs.

Trigger Mode	Jumpers	Trigger I/P	Switched Outputs
N.O	2&3	Closed	On
N.C	1&2 3&4	Open	On
+VE	3&4	Applied	On

Power Supplies - Ancillary Devices

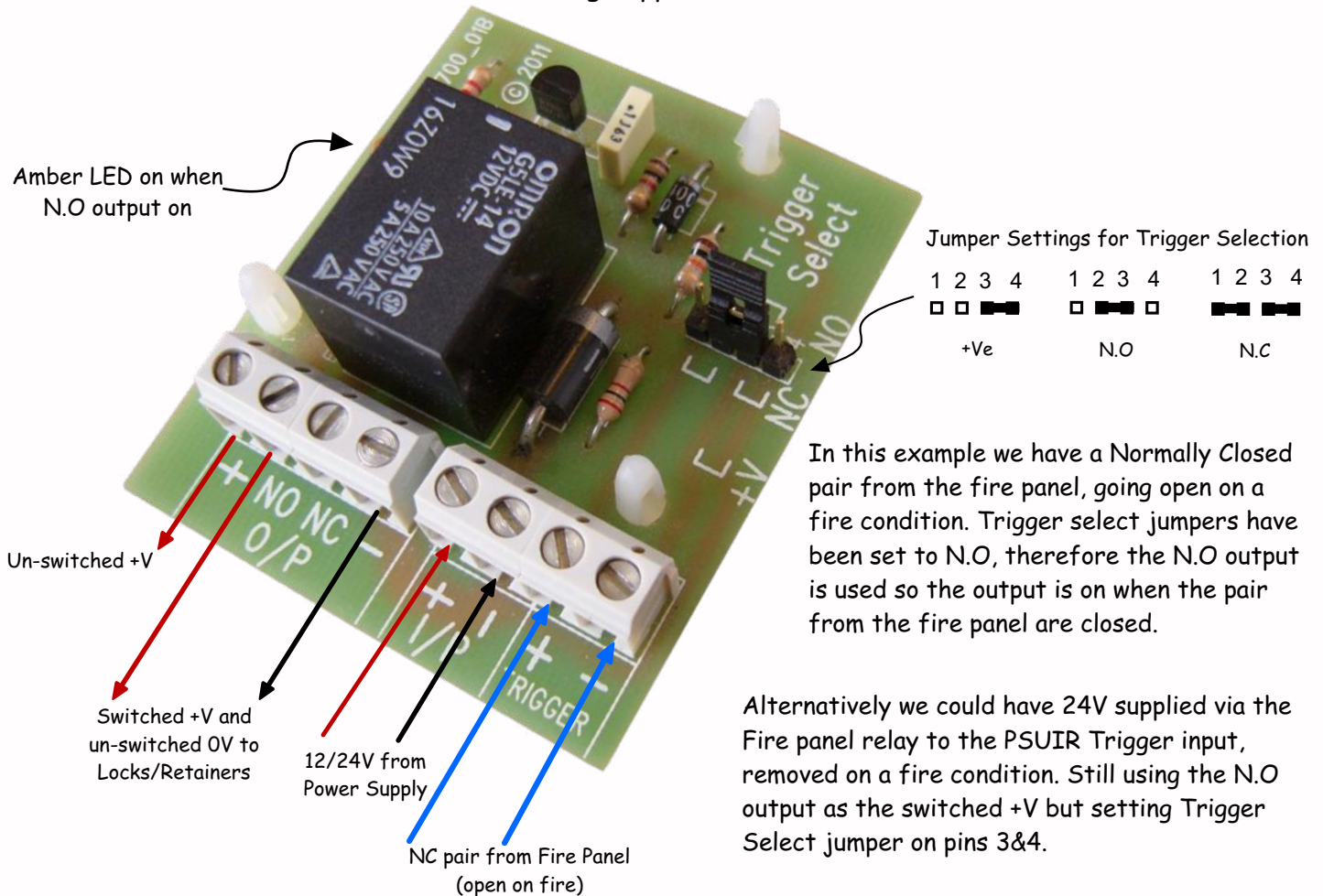
PSU Interface Relay - PSUIR-12 and PSUIR-24

The PSU Interface Relay facilitates control of a PSU output by means of either Volt Free Contacts (normally open or normally closed) or a Low Voltage Signal, and is available in 12V & 24V versions. Typically used in Access Control applications to remove power from a lock or door retainer when the Fire Alarm activates.

Connections

- I/P:**
- + +12Vdc or 24Vdc from PSU
 - 0V from PSU
- O/P**
- + Un-switched +V Auxiliary output
 - Un-switched 0V output to load
 - N.O Normally Open relay output
 - N.C Normally Closed relay output

TRIGGER Connection from remote source e.g. Fire Panel to control the output, can be either N.O/N.C contacts or a Voltage applied, removed on a fire condition.



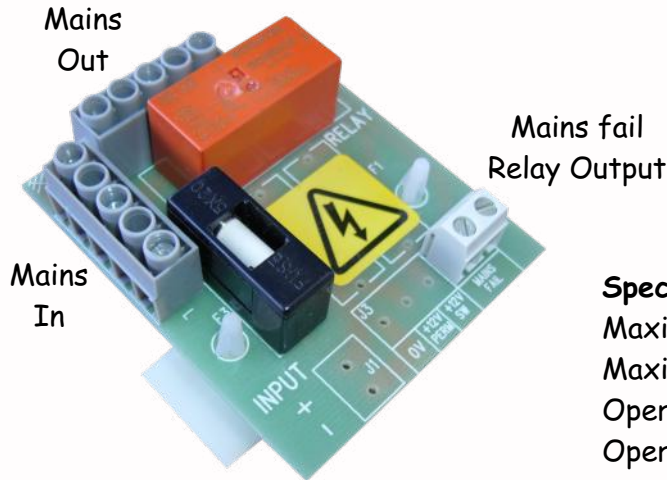
This table defines the output state of the 'NO' Output with respect to Mode selected and Trigger inputs.

Trigger Mode	Jumpers	Trigger I/P	N.O Output
N.O	2&3	Closed	On
N.C	1&2 3&4	Open	On
+VE	3&4	Applied	On

Power Supplies - Ancillary Devices

Mains Fail Relay - MFR-1

The MFR-1 is used to provide *Mains Fail* indication using a volt-free relay contact; the relay is deactivated on loss of mains supply providing mains failure signalling. Under normal conditions when the mains supply is present the device provides normally closed contacts which open on loss of mains. (Fail safe operation).



Specification

Maximum Input Voltage	230Vac (nom) +/- 10%
Maximum Contact Current	8A @ 27.6vdc.
Operating Voltage	<130V
Operating Time	<0.5s
Operating Temperature	-10°C to 50°C

Fused Output Module - FOM-8

8 Way fuse carrier providing up to 8 independently fused outputs from a single fused output Power Supply.

Maximum rating 6A at 50V dc

Supplied with 8 x T500mA fuses as standard.

Any combination of fuses can be used providing maximum rating of PSU or 6A rating of unit is not exceeded.



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Ancillaries - Exit Alarm - X12D



The Exit Alarm or X12D is a very simple device intended for the protection of Fire Exits etc. So ideally suited to doors that are not in normal use and an alarm is required should they be opened.

The units are supplied with a PP9 dry cell battery which will give approximately 6 months standby.

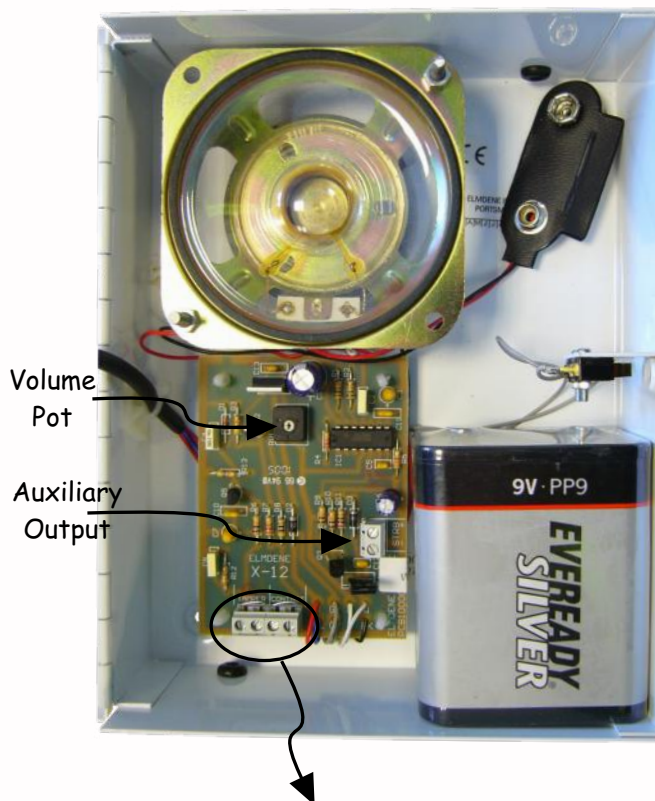
A 12V Power Supply can be used to provide the power if required (G13801N-A); the dry cell battery must then be removed, however a standby battery can be used in the Power Supply.

8M of 2 core cable and a surface door contact are also supplied. The two wires from the door contact should be wired to the terminals marked 'CONTACT'; the factory fitted link should be removed. Leave the factory fitted TAMPER link in place unless you intend to utilise this facility in some way.

When the connections are made and battery/PSU connected, secure the lid with the screw provided. The unit is armed by turning the keyswitch to the 'ON' position.

Pressing the red test button should cause the LED to glow if the battery is healthy.

A volume 'POT' provides adjustment of alarm volume. An auxiliary output is available that can be used to power a strobe or some other device, maximum 500mA



If the protected door is opened and the alarm activated, the door must be closed and the keyswitch turned to the 'OFF' position to silence. Return to the 'ON' position to re-arm.

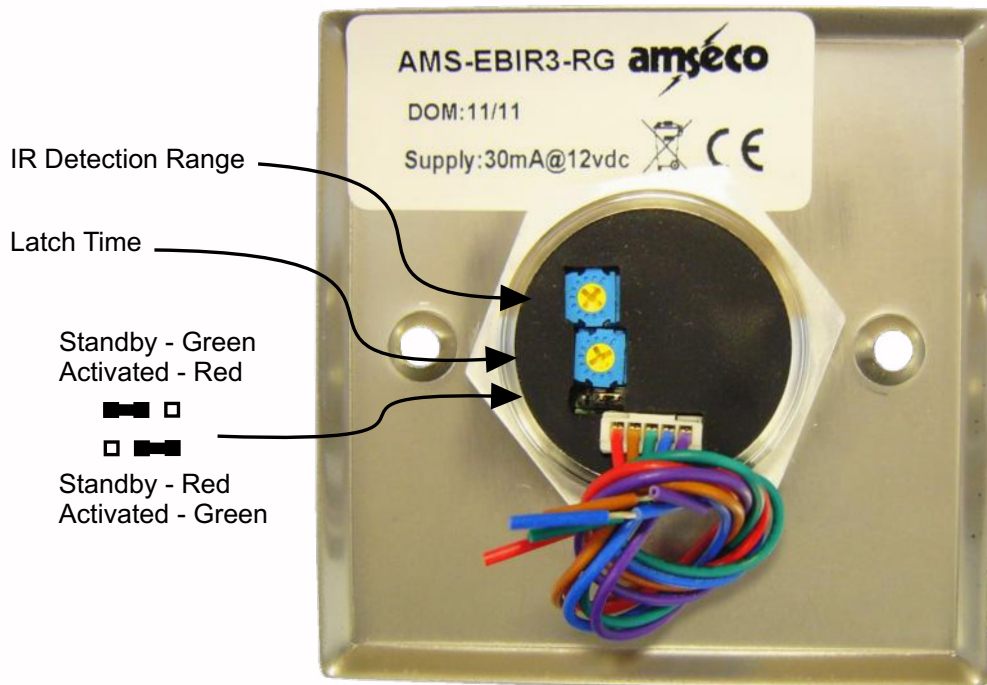
Replacement key barrels with 2 keys are available from RS, Part No: 321-054.

Ancillaries - Exit Button - AMS-EBIR3-RG

The AMS-EBIR3-RG is an Exit Button for use in Access Control systems with the following key features:



- Infra Red operation (non touch)
- Red / Green Bezel indicates Standby / Activated status
- Adjustable IR operating distance:
- Adjustable latch time: 0.5 to 20 seconds
- 12V-20V dc
- Maximum current 30mA
- Common, N.O, N.C contacts available
- Contact Rating: 1A @ 30Vdc



Wire Identification

Red	+12V
Brown	0V
Green	N.C
Blue	Common
Purple	N.O

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Ancillaries - Mains Relay Timer - MRT01



The Mains Relay Timer is intended to facilitate the switching of 230V mains equipment e.g. lighting, using a low voltage trigger from an Intruder Control Panel or similar device. Features both Relay and Timer Modes. The Timer is continuously variable between 2 - 40 minutes (approximately) in Timer Mode.

Maximum switched load: 3A
 Timer / Trigger input: +12V
 Low voltage supply: 12vdc.
 Load fuse: F3A 20mm HRC

TCO Lid Tamper Common
 TNO Lid Tamper Normally Open (Lid removed)
 TNC Lid Tamper Normally Closed (Lid removed)
 R+ +12V Trigger Input
 +12V Permanent +12V Supply
 0V Permanent -0V Supply

JP1 Link = Timer Mode
 No Link = Relay Mode

JP2 Link = Normal Trigger Mode
 (must be fitted for Relay Mode).
 No Link = Pulse Trigger Mode.

Timer Mode - (JP1-ON)

The load output is switched on for the period of time set using the Timer Pot.

Normal Trigger Mode (JP2-ON)

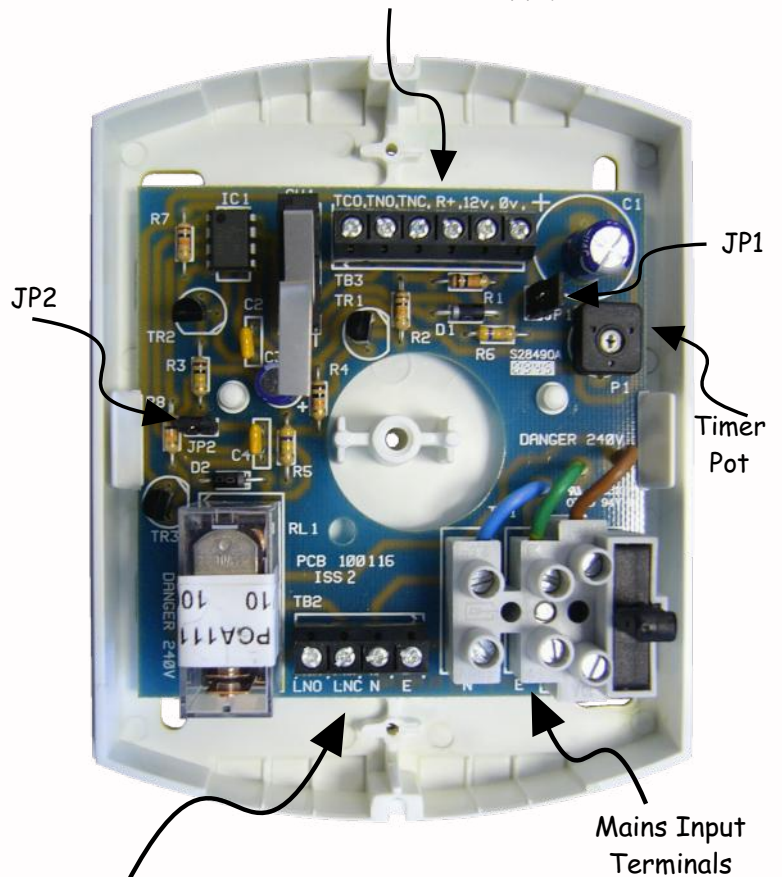
The time period starts when the Trigger input is at +12V. If the Trigger input is removed before the time period ends, the load is switched off and the Timer reset.

Pulse Trigger Mode (JP2-OFF)

The Time period starts when the Trigger input is momentarily taken to +12V. The load will only be switched off at the end of the timed period, set by the Timer.

Relay Mode (JP1-OFF/JP2 ON)

In Relay Mode the output is switched on whilst the Trigger input is at +12V. When the Trigger input is removed, the load will be switched off.



LNO Switched 230V Live - normally open, contact, closed during timed period in Timer Mode or whilst Trigger input is high in relay Mode.

LNC Switched 230V Live - normally closed contact, contact closed when in reset (un-triggered) state in Timer Mode or whilst Trigger input is low in Relay Mode.

N Load Neutral

E Load Earth

Ancillaries - Multi Purpose Relays - MPR001/MPR002

These Multi Purpose Relays have two sets of volt free changeover contacts that can be used to switch up to 1A at 24V from a 12V (MPR001) or 24V (MPR002) source.

Specification - MPR001/MPR002

Maximum switched Load	1A @ 24Vd.c. 0.5A @ 125Va.c. (each contact)
Power Supply	12V d.c. @ 20mA / 24V d.c @13mA maximum
Low current trigger input	12V d.c. @ 1mA / 24V d.c @ 2.5mA maximum

Connections - MPR001/MPR002

+12V	+12V / 24 dc supply (reverse connection protected).
TRIG+	+12V / 24 dc low current trigger.
0V	0V supply.

Two Sets of Changeover Contacts:

Com	Switch contact - common.
N.O	Switched contact - closed when relay triggered.
N.C	Switched contact - open when relay triggered.

Trigger Selection - JP1

Link ON - Normal trigger mode, relay switches when +12v and -0V supply present.

Link OFF - Low current trigger mode, relay switches when +12V applied to TRIG+ (+12v and -0V supply must be present)

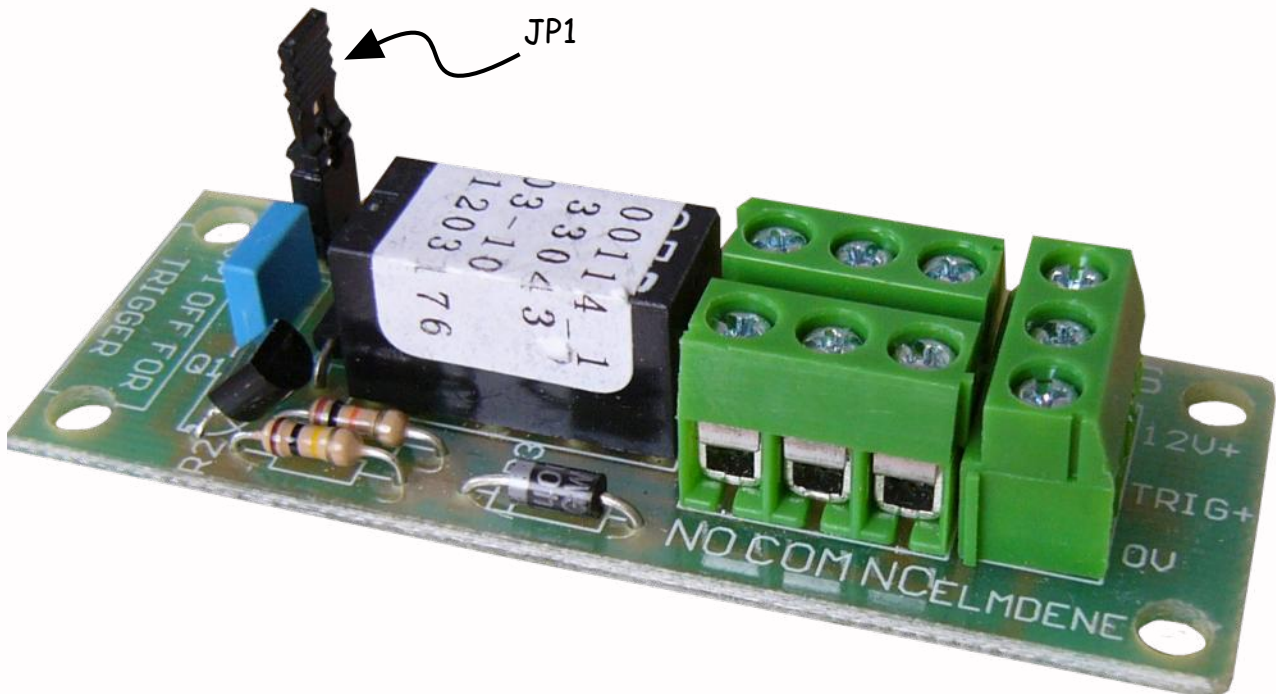


Image shows 12V MPR001

Note: these units are not suitable for switching Mains Voltage; see [Mains Relay Timer](#) for mains switching applications.

Glossary of Terms used in this Manual

DP	Double Pole Independent Alarm and Tamper circuits, one pair of wires for Alarm & one pair for Tamper.
EOL	End Of Line (Resistor) Resistor at the end of the zone, always in circuit unless a tamper condition exists. e.g. 2k2 for a Scantronic Panel.
FSL	Fully Supervised Loop Incorporates End Of Line Resistors to provide continuous monitoring of the zone.
Parallel	Parallel (Resistor Network) Arrangement of resistors in a magnetic contact connected to an FSL system, typically Guardall Panels. Guardall refer to this as Type 1 Network.
Series	Series (Resistor Network) Arrangement of resistors in a magnetic contact connected to an FSL system. Used by the majority of Control Panels with the exception of Guardall, who refer to this as Type 2 Network.
Shunt	Shunt (Resistor) Resistor at the end of a zone which 'shunts' the reed switch in a magnetic contact to provide an alternative circuit path when the reed switch is open. e.g. 4k7 for a Scantronic Panel.
VF	Volt Free Voltage free contacts.

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Appendix A

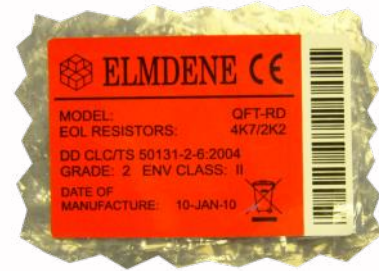
Magnetic Contacts with Integral Resistors - Colour Code

Where Contacts are supplied with integral resistors, a Colour Code is used to make it easy to identify the Resistor values built into the Contact and therefore the Control Panels for which the Contacts are suitable.

The colour coding applies to the label on the original packaging and also a label on the Contact. Note: The Contact Colour Code does NOT refer to the Wire colours.



Example of Green Contact label (GN)
indicating 1k/1k Resistors



Example of Red packaging label (RD)
indicating 4k7/2k2 Resistors

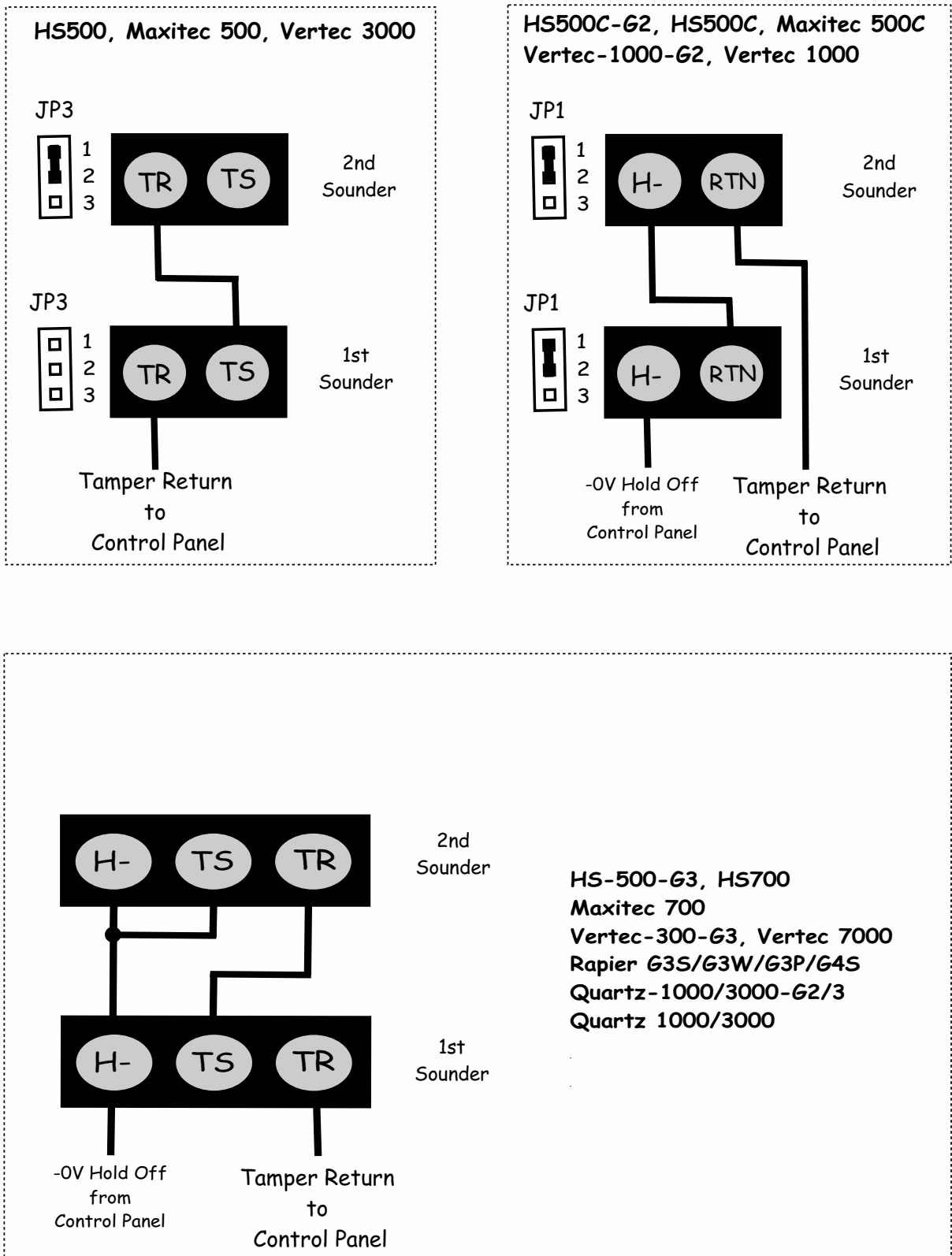
Contact / Resistor Colour Code Table

Resistors	Colour	Code	Control Panel(s)
4k7/2k2	Red	RD	ADE, Bosch, Castle, Dycon, Menvier, Pyronix, Scantronic, Texecom
1k/1k	Green	GN	Honeywell
8k2/8k2	Blue	BL	Guardall
4k7/4k7	Grey	GY	Aritech
6k8/4k7	Purple	PU	GardTec
2k2/2k2	Yellow	YL	Europlex
5k6/5k6	Orange	OR	DSC
22k/10k	Brown	BRN	Texecom Veritas

Appendix B

Connecting Two External Sounders to a Control Panel

When connecting two external sounders to one Control Panel its usually only the Tamper connections that cause confusion. Therefore in the diagrams below only connections and Links directly associated with the Tamper connections are shown. H+, ST-, R- connections are wired in parallel between the two Sounders.



Appendix C

Ring Line Monitoring

Ring Line Monitoring was introduced by EN50131-4:2009 becoming fully effective from June 2012 and relates to grade 3 & 4 Sounders. The purpose of this requirements is to enable the Sounder to monitor its trigger connection back to the Control Panel. If this connection fails or is disconnected the Sounder is alerted and can respond accordingly.

Monitoring of the Ring line is achieved by the Control Panel holding this line at +12V when in a non alarm condition; this is sensed by the Sounder and confirms continuity of the Ring line to the Control Panel. When an alarm condition occurs the Ring line is switched to -0V to activate the Sounder.

There may be occasions when the trigger output is not pulled up to +12V in a non alarm condition because the Control Panel does not provide for this, or if the Sounder is being triggered through Volt Free contacts.

To identify if the trigger output of any given Control Panel is pulled up to +12V in standby mode, check the Trigger output with a digital voltmeter as in figure 1 below. This is probably best done before the Sounder is connected, but can still be done if the Sounder is already connected. You should ideally measure about 12V, in which case this Panel should work with the Sounder just as it is.

If the reading on the meter is less than 10V, you should fit a 'pull up' resistor (1k to 10k), choosing the appropriate option in figure 2.

Note: When a Grade 3 Sounder detects failure of the Ring Line (R-) to the Control Panel it will respond by reporting a tamper and or self activating.

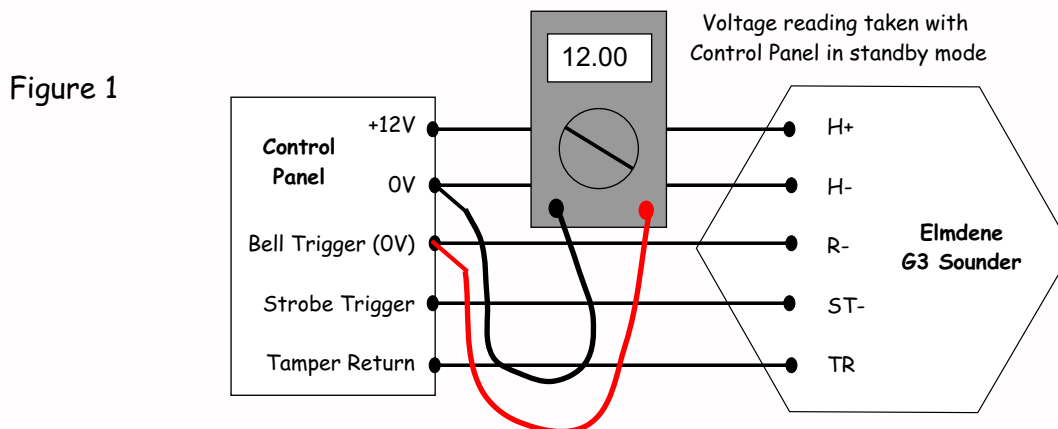
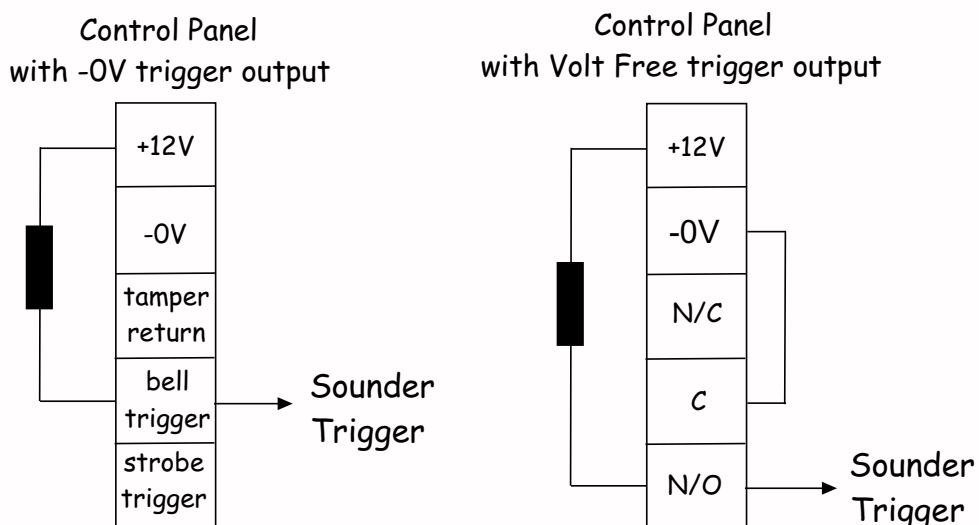


Figure 2

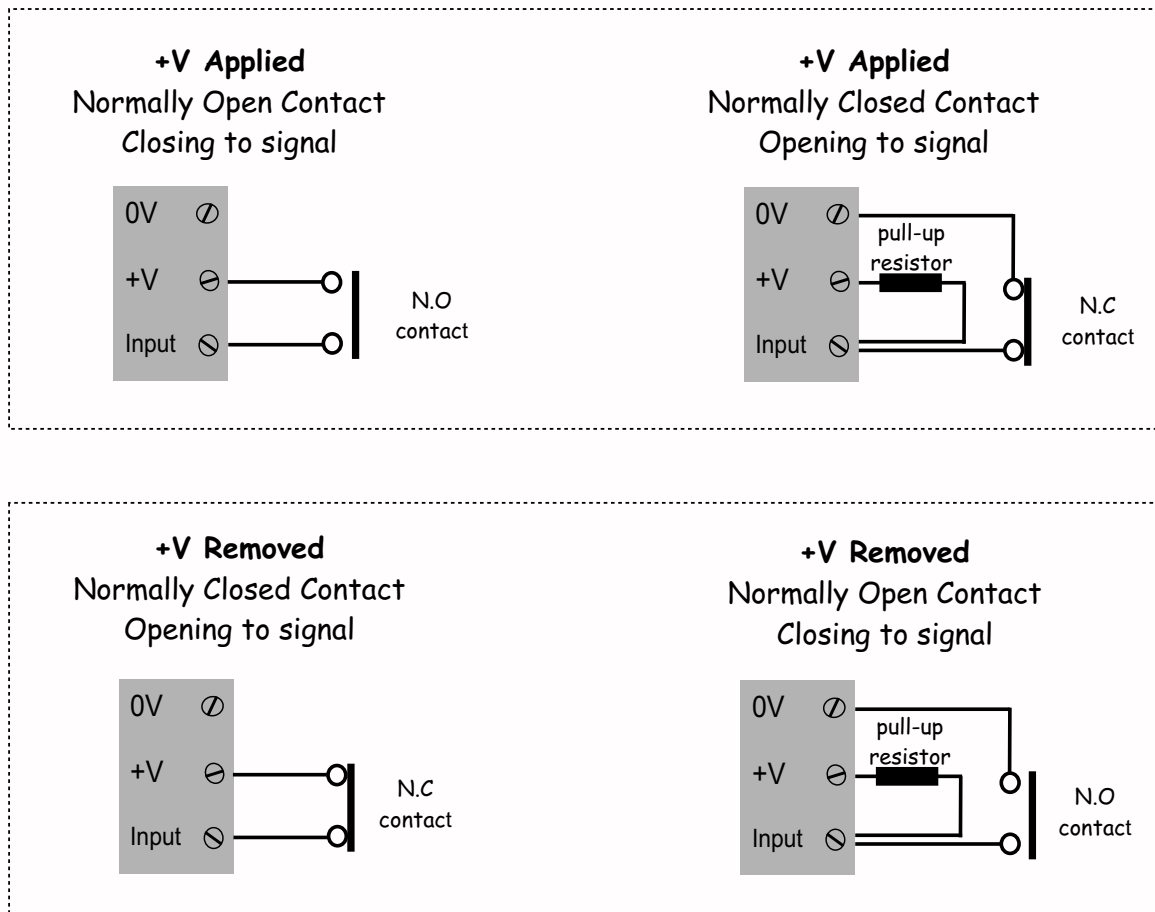


Appendix D

Managing Signal Polarity

This appendix shows how to arrange +Applied or +Removed signalling with a range of outputs, particularly where the signal available is the reverse of the required output. This may sometimes be useful when using the Elmdene Fire Signalling Interface: FSI-01.

The four diagrams below show how +Applied or +Removed signalling can be provided with both Normally Open and Normally Closed volt free contacts. Where a pull-up resistor is used this would typically be between 1k and 10k.



Signalling should always be tested to ensure correct polarity and satisfactory operation. When a signal is not present the 'input' should ideally be held at the opposite polarity; this may be done internally by the communication device, if not a pull up or pull down resistor may need to be fitted.

Where a 'Voltage' signal is provided rather than a relay output, these can be reversed when required by using an Elmdene Multi Purpose Relay - MPR001, which features two sets of volt free changeover contacts. Use the link or see further information on this device.

Elmdene International Limited



3 Keel Close
Interchange Park
Portsmouth PO3 5QD
United Kingdom

Tel: +44 (0)2392 696638

Fax: +44 (0)2392 660483

sales@elmdene.co.uk
technical.support@elmdene.co.uk

www.elmdene.co.uk

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