PERTRONIC INDUSTRIES LTD
INSTALLATION NOTE Pertronic AA Isolator Board - 8 Spur

Overview:

The Pertronic Analogue Addressable Isolator Board – 8 Spur (8SAAIB) provides up to eight isolated spurs from an analogue addressable loop circuit.

This product allows conventional detector zones to be converted to analogue addressable (AA) systems by replacing the conventional detectors and bases with AA detectors and modules connected to the existing cabling.

Features:

- Provides up to eight analogue addressable spurs from one analogue addressable loop circuit
- A short-circuit on any spur will not affect normal operation on other spurs or the rest of the loop circuit
- A short-circuit on either side of the 8SAAIB LOOP IN and LOOP OUT connections will not affect normal operation of the spurs or the other side of the loop circuit.
- A short-circuit fault on any spur, or on either side of the 8SAAIB, is identified by a yellow LED
- Spurs and unused spur connections do not need to be terminated.

Analogue Addressable Isolator Board – 8 Spur (8SAAIB)

Maximum Spur Length from Fire Panel		
Conductor Size	**Max. Length**	**Limit**
2.5 mm²	2500 metres	40Ω
1.5 mm²	1500 metres	40Ω
1.0 mm²	1000 metres	40Ω
For larger conductor sizes, the max spur length should not exceed 2500 metres.		

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Specifications:

Voltage Range	Analogue Addressable (loop) Circuit Voltage
Maximum Input Voltage	45 Vdc
Quiescent Current	1.5 mA ± 10 % @ 24 Vdc
Isolate Current	16.5 mA ± 10% per spur
Isolation threshold	Loop voltage ≤ 4.8 V
Restoration threshold	Loop voltage ≥ 7.5 V
Switch ON resistance	0.42 Ω (loop in to loop out)
Switch OFF resistance	≥ 4 kΩ (loop in to loop out)
Zones	Each spur may cover no more than one zone
Spur Cable Resistance	Up to 40 Ω
AA Devices	Up to 40 analogue addressable devices per spur
LED Indications	10 x yellow (1 per spur, plus LOOP IN and LOOP OUT)
Operating Temperature	-10 ºC to 50 ºC
Maximum Humidity	90 % RH, non-condensing
PCB dimensions	137.5 L x 96.5 W x 27.5 H mm
Mounting holes	4 x 4 mm holes, centred at 127.5 mm x 89 mm
Weight	100 g

Functional description:

When upgrading a fire system from conventional to Pertronic analogue addressable, the system wiring will normally consist of several zones of conventional two-wire devices (Fig. 1 below).

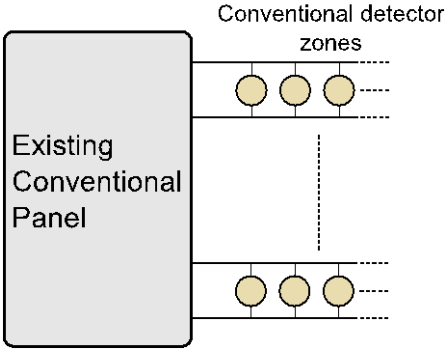

Figure 1: **Existing system being replaced**

If keeping the conventional devices, a Pertronic 8 Way Loop Responder is usually used to interface them to the new Pertronic panel.

However, if the system is to be upgraded to analogue-addressable devices, it may not be convenient or financially viable to provide the ideal loop-circuit return wiring for these devices. In this situation, *spurs* off the actual analogue loops may be used. However, to protect each separate zone (spur) of devices from cable faults occurring on any other zones on the system, each spur must have short circuit isolation. See Figure 2 below for an illustration of the isolation problem.

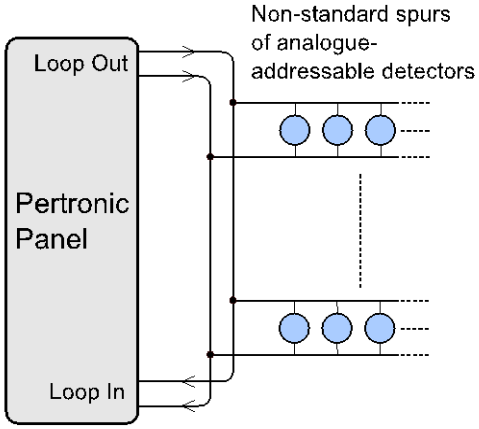

Figure 2: **Non-standard “loop” wiring**

The 8SAAIB solves the isolation problem, despite use of the non-optimal spur wiring style. It does so by automatically isolating a spur if a short circuit fault occurs. Additional isolators at the Loop-In and Loop Out cable termination points allow all the spurs to continue operating if a fault occurs on either side of the analogue loop. See Fig. 3 below.

A common form factor is used so that the circuit board can easily be mounted in Pertronic cabinets.

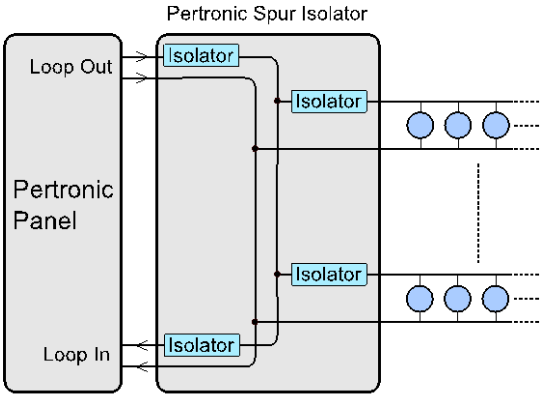

Figure 3: **The Isolated Loop Spur solution**

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Connections:

All terminals are clearly marked on the PCB. The Loop In & Loop Out connectors are positioned on one edge of the circuit board, separate from the isolated spurs.

The spur wiring intentionally imitates the polarity of Loop Responder connections that may have been previously installed. Therefore the upgrade process from Loop Responders to full analogue addressable is made simpler. See Figure 4 below.

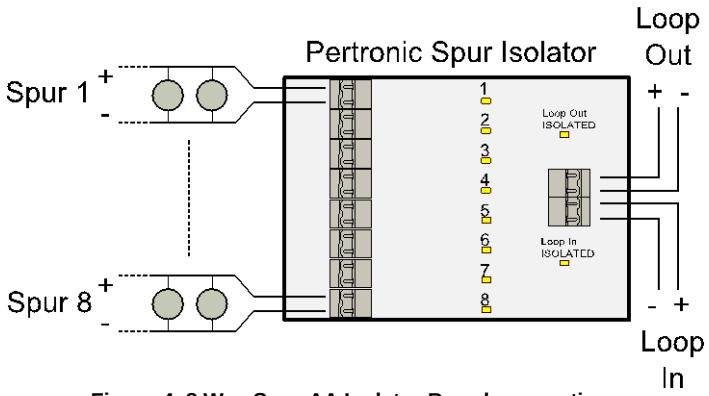

Figure 4: **8 Way Spur AA Isolator Board connections**

Application Guidelines:

If analogue addressable spurs are wired with non-twisted cable (such as existing flat two-core cable):

- The resistance between each conductor and the system earth (ground) should be > 50 kΩ.
- The total AA cable resistance must not be more than 50 ohms (25 Ω per conductor). See table at left for maximum length.
- The number of detectors in each zone, and the number of zones covered by a single AA loop, must meet all regulatory and project requirements.

NOTE 1: Non-twisted cable should not be used in AA detection circuits if the detection cable will run alongside, and close to, other cables that may produce, or be susceptible to, interference.

NOTE 2: A maximum of 40 Analogue Addressable devices can be connected to each spur.

Ordering Information:

Product Code	Description
8SAAIB	AA Isolator Board – 8 Spur

Document Change History:

Issue Number/Date	Description of Changes	Change Note
Issue 2.2, 04.12.2020	Minor update to specifications	CN2901
Issue 2.3, 08.11.2022	Minor update to specifications	CN3267