

EXI800 MX I.S. Loop Interface Module

Introduction



Fig. 1: EXI800 Interface Module

The EXI800 Interface Module, used with a galvanic isolator, provides a path for an MX Panel to transparently communicate to slave devices (800Ex Detectors, IF800Ex Interface Module or CP840Ex Addressable Break Glass Call Point) connected to the Intrinsically Safe loop. The interface reduces the standard MX loop supply voltage and signalling currents to levels that are acceptable for hazardous areas.

The EXI800 includes an integral isolator, which serves as protection against short circuits.

The EXI800 meets the requirements of EN54 Pt 17.

The IS loop output of the EXI800 interfaces with the Pepperl+Fuchs KFD0-CS-Ex1.54 Galvanic Isolator, supplying loop voltage and signalling currents to the Intrinsically Safe loop.

Mechanical construction

As shown in Figure 1, the EXI800 electronics is mounted into a Pepperl+Fuchs DIN rail housing.

The housing is clipped onto a standard DIN rail mounted inside an enclosure located in the safe area.

Refer to document 17A-13-D2, I.S. System 800 Product Application and Design Information, for a selection of appropriate enclosures.

Two triple terminal blocks are used to terminate field wiring. The terminal blocks accommodate a single 12 AWG to 24 AWG (2.97mm to 0.508mm) solid or stranded wire.

The EXI800 terminal connections are as follows:

- MX Loop R + (5) MX Loop R - (2)
- MX Loop L + (6) MX Loop L - (3)
- IS Loop IS + (4) IS Loop IS - (1)

Terminal idents, shown in brackets, are screened on to the top cover of the housing.

Operation

Refer to Fig. 2. The EXI800 behaves like a semi-transparent bi-directional signalling path for the FSK communication signals and for loop supply voltages.

The EXI800 is loop powered, drawing its own low quiescent power from the safe area loop supply.

The EXI800, combined with a galvanic isolator, limits the energy levels entering the hazardous area.

Signalling current pulses are reduced to levels such that a minimum amount of voltage drop is seen across the galvanic isolator, whilst still maintaining effective communication.

Isolator operation

The built in isolator serves as a protection device against short circuits. It operates by isolating the section of line containing the short circuit from devices on the line and from the rest of the circuit.

Optimum operation requires the line in the Safe Area to be wired as a loop, so that a section of line with a short circuit can be isolated between a pair of isolator devices.



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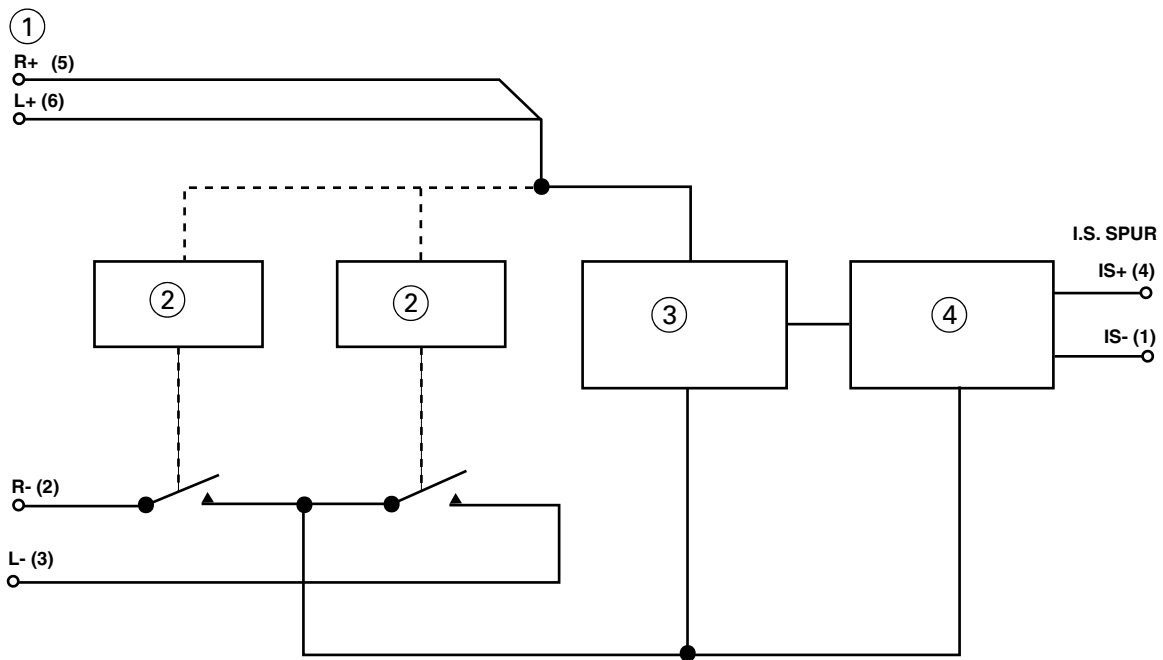


Fig. 2: EXI800 Schematic

- 1– Safe area loop
- 2– S/C monitor
- 3– Voltage level shifter and DC current limiter
- 4– Signalling level shifter and line driver

In order to enable the isolator’s use in a looped circuit, it is capable of passing current in both directions (LOOP IN LEFT to LOOP IN RIGHT or LOOP IN RIGHT to LOOP IN LEFT).

In the event of a line short circuit in the Safe Area, the built-in isolator continues to power the Intrinsically Safe spur, providing that either LOOP IN LEFT or LOOP IN RIGHT remains intact.

A short on the Intrinsically Safe spur will also cause the built-in isolator to open circuit both the Intrinsically Safe spur and Safe Area loop at that point.

The operation of the MX loop driver means that there are effectively 2 operational modes for the built-in isolator.

- When the loop is first powered, if a section of the line appears as a low impedance (with an equivalent resistance of <400 ohms), the isolator will restrict the power to that section of line until the fault is cleared.
- If a short circuit is introduced onto the line when the loop is already powered up, in most instances the controller’s internal protection will switch in before the line isolator. The voltage is then removed from the line by the controller, on restoration, the isolator devices will isolate the low impedance section of the line.

Technical specifications

Mechanical

The overall dimensions are shown in Fig. 3.

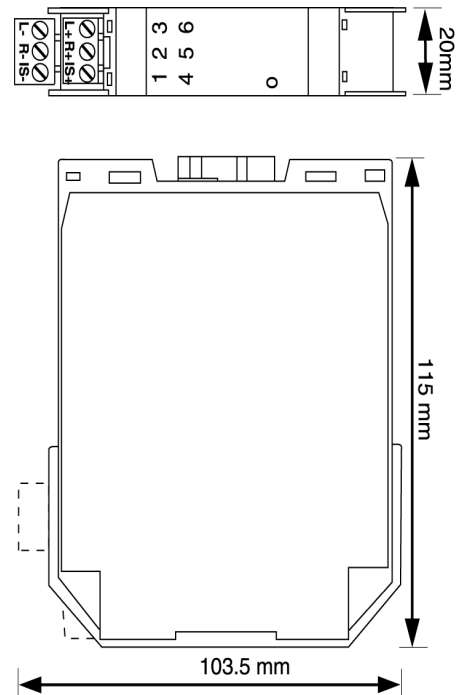


Fig. 3: EXI800 Interface Module



Parameter	Value
Materials	Makrolon
Environmental	
■ Operating Temperature:	-25 ° to + 70 °C
■ Storage Temperature:	-40 °C to + 70 °C
■ Relative Humidity:	up to 95% RH (non-condensing)
Dimensions (HWD)	115 mm x 103.5 mm x 20 mm
Weight	88 g approx.
IP Rating	20

Table 1: Mechanical Specifications

Electrical Characteristics

Parameter	Value
DC input voltage	Maximum 37.5 ± 1.5 V
DC input voltage	Minimum 20.0 V (minimum voltage required to operate a detector or ancillary)
DC output voltage	Maximum 28.0 V
AC input signalling voltage	
Maximum:	4 V ± 0.2 V pp
Minimum:	1 V pp.
AC output signalling voltage	
Maximum:	4 V ± 0.2 Vpp
Minimum:	1 Vpp.
AC input signalling Current:	40 mA max.
Isolator	
Maximum Loop Voltage:	40 Vdc
Minimum Loop Voltage:	19 Vdc
Maximum Rated Continuous Current (Isolator Closed):	2 A
Maximum Rated Switching Current (s/c):	2 A

Table 2: Electrical Characteristics

Parameter	Value
Maximum Leakage Current (Isolator Open):	– 6 mA into zone (10 mA into Isolator)
Maximum Series Impedance (Isolator Closed):	0.25 ohms
Isolator Switching Threshold (Isolator Closed to Open):	19 V or below
Isolator Switching Threshold (Isolator Open to Closed):	3.3 V from s/c

Table 2: Electrical Characteristics

Electromagnetic compatibility

The EXI800 complies with the following:

- Product family standard EN50130-4 in respect of Conducted Disturbances, Radiated Immunity, Electrostatic Discharge, Fast Transients and Slow High Energy
- EN61000-6-3 for Emissions

Cabling

Cables are to be selected in accordance with Publication 05A-02-D1 and the requirements of the current issue of BS5839. Cabling should be connected as shown in Fig 5, ensuring correct polarity.

All EXI800 wiring must be kept in the safe area wiring section of the housing.

Programming 800Ex detectors

The EXI800 is supplied with an Ex dongle adaptor which must be fitted to the 'AUX' port of the 801AP Service Tool to enable the detectors to be programmed.



Notice

On later models of the 801AP Service Tool, the Ex dongle adaptor is not required for programming Intrinsically Safe 800Ex detectors. The applicable models of the 801AP can be identified by the C-tick mark on the product identification label on the underside of the tool. See Fig. 4.



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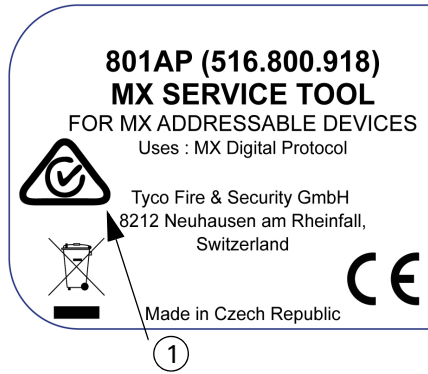


Fig. 4: 801AP MX Service Tool
1–C-Tick mark

CPR Information

Tyco Fire & Security GmbH, Victor von Bruns-Strasse 21, 8212 Neuhausen am Rheinfall, Switzerland 15 DoP-2015-4102
<p>EN54-17: 2005 Short-circuit isolator device for use in fire detection and alarm systems EXI800</p>
<p>Essential Characteristics EN54-17: 2005 Performance under fire conditions: Pass Operational reliability: Pass Durability of operational reliability and response delay; temperature resistance: Pass Durability of operational reliability; vibration resistance: Pass Durability of operational reliability; humidity resistance: Pass Durability of operational reliability; corrosion resistance: Pass Durability of operational reliability; electrical stability: Pass</p>
Fixing Instructions 120.415.578_17A-03-EXI

Ordering information

Item	Order Code
EXI800 Interface Module	514.001.063
801PHEx Optical Smoke & Heat Detector	516.800.530
801CHEx Carbon Monoxide & Heat Detector	516.800.531
801HEx Heat Detector	516.800.532
CP840Ex Break Glass Call Point	514.800.513
IF800Ex Contact Input Monitor	514.001.062
5BEx 5" Universal Base	517.050.023
MUBEx Base for use with Ex Detectors	517.050.610
Pepperl+Fuchs KFD0-CS-Ex1.54 Galvanic Isolator	517.001.259
Spare Service Tool Ex Dongle	557.203.008

Fig. 5: Order codes



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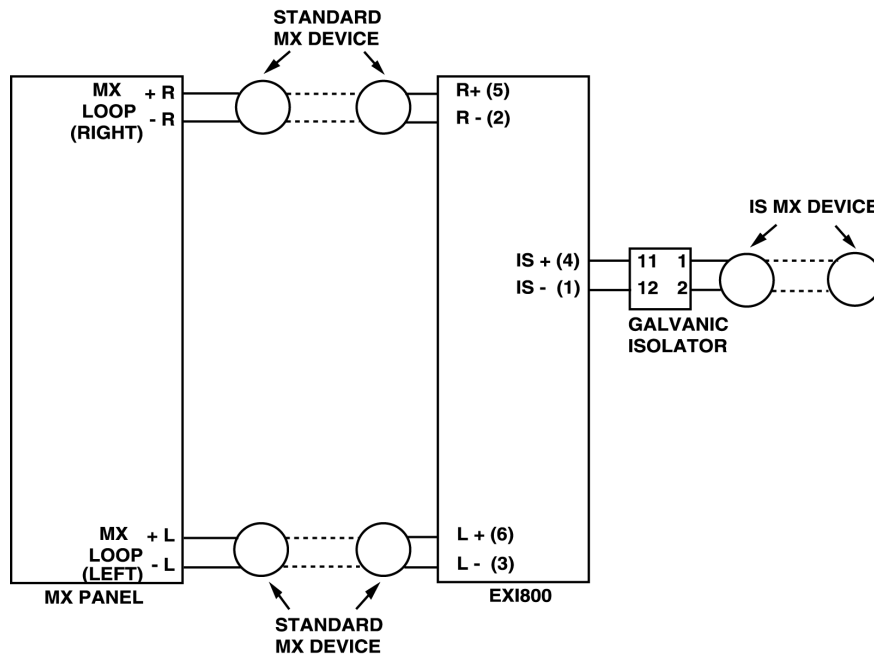


Fig. 6: EXI800 Simplified Wiring Diagram



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