



There is a danger of electric shock due to the presence of high voltage (AC240V). Never touch the terminals while the power is on. Make sure to turn off the high voltage AC power supply before commencing wiring work.

**NOTE:** Please read these instructions carefully and keep for future reference. The information in this document is subject to change without notice. For updates please refer to our website.

**NOTE:** Follow the requirements for the installation of the product in accordance with the Specifications. Otherwise it may cause malfunction

**NOTE:** Do not install the product in any location where oil, dust, iron powder, chemicals, or hydrogen sulphide may occur or affect the product. It may cause malfunction.

**This package contains the following items:**

Main unit: x 1  
 EOL resistor: 10k ohm x 1  
 Alarm Resistor: 680 ohm x 1  
 Jumper: x 1  
 Manual: (this document) x 1

**General Description**

The EV-IO-420 4-20mA Input / Output Module is an addressable module with -ve Line short circuit isolator, consists of two inputs (Input 1 and Input 2) and one dry contact relay output rated at 5A 240Vac. It provides the function that receives a constant current from 4-20mA sensors, and converts it into digital signals to communicate to an addressable fire alarm control panel. For example, the module can monitor the 4-20mA current output from a temperature sensor to drive equipment such as a fan damper or door magnet retainer.

An external power supply shall be connected to provide the power to the 4-20mA sensor. Input 1 is monitored for a constant current input from 4-20mA sensors, such as gas sensors and temperature sensors. The module accepts 2-wire and 3-wire configurations in either current sink or current source mode. Select the mode with the slide switch. Refer to Figure 4 for wiring.



Input 2 (Class B) is monitored for a dry contact input from external devices. This circuit is for general purpose use. These inputs are monitored to detect a normal/input/open/short circuit state.

The Output is monitored to detect the relay state (on/ off/ relay stuck). The relay output is used for the control of equipment such as dampers, extractors for ventilation, or smoke control systems.

**Address Setting**

Use EV-AD2-EXT to set the address of the EV-IO-420. The factory default address of 1 is given to the module. Connect the EV-AD2-EXT to the address setting port with the Micro USB cable for the programmer, and change the address to any of 1-254, with reference to the instruction manual of EV-AD2-EXT programmer. (Note that the number of available addresses can be less depending on a control panel model.) The address can be set regardless of whether power supply from the control panel is turned on or off.

Address setting is possible even after connecting the module to the Loop.

EV-IO-420 – 4-20mA Input / Output Module with Isolator	EN 54-17: 2005 / AC: 2007 – Short Circuit Isolators EN 54-18: 2005 / AC: 2007 – Input / Output Devices
	<p><b>For use with Nittan Evolution Protocol Only.</b></p> <p>Loop Voltage: 20 to 38 Vdc                  Quiescent Current: 630µA                  Alarm Current: 7.8mA                  Loop resistance: &lt; 50 ohm/ km                  Input voltage for 4-20mA operation: 19.2 to 28.8Vdc                  Current supplied to 4-20mA device: 1A max.                  Input line resistance: &lt; 50 ohm/ km                  EOL resistor: 10k ohm                  Input resistance: 470 ohm or 680 ohm                  Input threshold level: ON : &lt; 680 ohm,                  Short : &lt;50 ohm,                  Open : &gt; 20k ohm                  Relay Contact rating: 5A at 240Vac                  Or 5A at 30 Vdc                  Min sw open voltage (Vso min): 11 Vdc                  Max sw open voltage (Vso max): 14 Vdc                  Min sw close voltage (Vsc min): 3 Vdc                  Max sw close voltage (Vsc max): 10 Vdc                  Max line current (Ic max): 500 mA                  Max switching current (Is max): 1500 mA                  Max leakage current (Il max): 15 mA                  Max switch resistance (Zc max): 150 mΩ                  Wire size: 0.75mm<sup>2</sup> (Min) - 2.5mm<sup>2</sup> (Max)                  Operating temperature: -10°C to 55°C                  Storage temperature: -25°C to 65°C                  Max. relative humidity: 95%RH, non-condensing                  Mass EV-IO-420: 450g                  Technical Data Sheet: TD-EV-IO-420</p>
DoP Number: 00641	<p>Nittan Europe Ltd. Tel: +44 (0) 1483 769 555                  Hipley Street, Fax: +44 (0) 1483 756 686                  Old Woking, Email: <a href="mailto:sales@nittan.co.uk">sales@nittan.co.uk</a>                  Surrey, GU22 9LQ Web: <a href="http://www.nittan.co.uk">www.nittan.co.uk</a>                  United Kingdom</p>
	

**RoHS Compliance Statement**

This product complies with the European Union RoHS (Restriction of Hazardous Substances) directive (EU) 2015/863 which restricts the use of the following ten hazardous materials in the manufacture of electronic and electrical equipment.

- Cadmium (Cd): < 100 ppm
- Lead (Pb): < 1000 ppm
- Mercury (Hg): < 1000 ppm
- Hexavalent Chromium (Cr VI): < 1000 ppm
- Polybrominated Biphenyls (PBB): < 1000 ppm
- Polybrominated Diphenyl Ethers (PBDE): < 1000 ppm
- Bis(2-Ethylhexyl) phthalate (DEHP): < 1000 ppm
- Benzyl butyl phthalate (BBP): < 1000 ppm
- Dibutyl phthalate (DBP): < 1000 ppm
- Diisobutyl phthalate (DIBP): < 1000 ppm

## EV-IO-420 Installation instructions

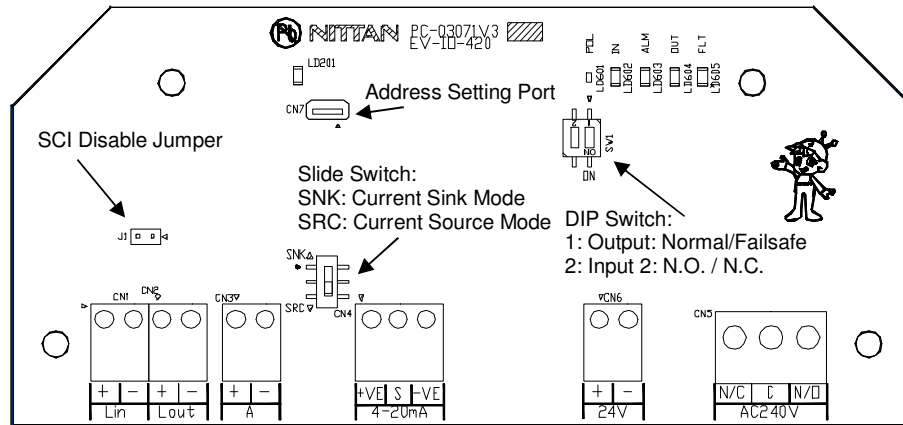


Figure 1

### DIP Switch Operation

The DIP switch 1 can select normal mode or failsafe mode of the Output (refer to Table 1 and Figure 1). If the loop power supply is off, the relay is on in the failsafe mode. Refer to Table 2 for the relay position in each state in the normal/failsafe mode.

With the DIP switch 2, it is possible to select the input method (normally open/ normally closed) of Input 2.

Open the cover of the module enclosure, and it is possible to configure the address setting and change the setting of DIP switch or jumper pin (refer to Figure 1).

DIP switch	Position	Function
1	ON	Relay: Failsafe mode
	OFF	Relay: Normal mode
2	ON	Input 2 : Normally closed
	OFF	Input 2 : Normally open

Table 1

Condition	Relay Normal mode	Relay Failsafe mode
Loop power Off	Off	On
Standby	Off	Off
Alarm	On	On

Table 2

Relay is activated continuously while relay stuck is not detected	Loop wiring is not correct. There is a problem with Relay.
Relay is activated when powering off the module or the system	The module is set to the failsafe mode
SCI operates	There is a short circuit in the loop. Too many devices (over 20mA in total in a standby condition) are connected between the module and the next SCI.

### Dimensions

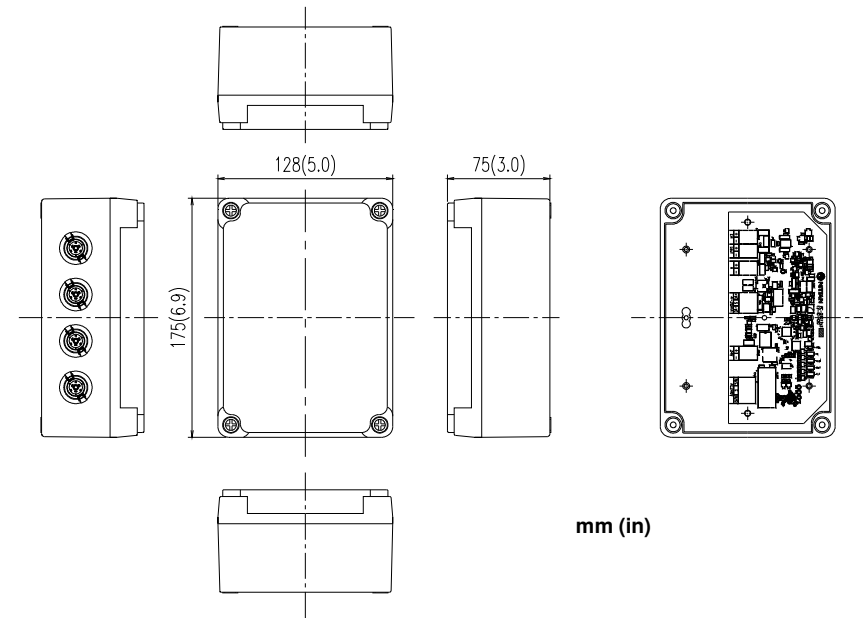
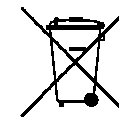


Figure 5

### End of Life Disposal

Like all electronic equipment, at the end of its working life this unit should not be disposed of in a refuse bin. All Nittan products since 2005 have been marked with the WEEE Logo in compliance with European Directive 2012/19/EU and Nittan Europe Limited is a member of a WEEE Compliance Scheme. Contact sales@nittan.co.uk for a copy of our WEEE Compliance Policy.



### Trouble shooting

Problem	Possible cause
No response	The module falls off. Address setting is not correct. Duplicate address. Loop wiring is not correct. An open or short circuit in the loop. Loop voltage is too low.
Communication error	Duplicate address. Loop voltage is too low.
The module information is not found on the panel	Data registered on the control panel is not correct.
PSU voltage drop	Wiring is not correct. The PSU is at fault.
Open circuit is detected in the input circuit	Input wiring is not correct. An open circuit in the input circuit. EOL resistor is removed.
Short circuit is detected in the input circuit	Input wiring is shorted.
Input condition is latched	Insulation in the input circuit is not enough. Input wiring is not correct. EOL resistor is not appropriate.
Input is not detected	Input wiring is not correct. Input resistor is not appropriate.
Short circuit is detected in the input condition	Input wiring is not correct. Input resistor is not connected. The DIP switch N.O/N.C setting is not appropriate (DIP switch is set to N.C)
Input is detected in the open circuit condition	The DIP switch N.O/N.C setting is not appropriate (DIP switch is set to N.C)
Open circuit is detected in the 4-20mA input circuit	The wiring is not correct. An open circuit in the 4-20mA input circuit. 4-20mA sensor device is at fault.
Short circuit is detected in the 4-20mA input circuit	The wiring is not correct. A short circuit in the 4-20mA input circuit. 4-20mA sensor device is at fault.
An alarm is detected in the 4-20mA input	The wiring is not correct. The setting on the panel (alarm thresholds for 4-20mA device) is not correct. 4-20mA sensor device is at fault.
Relay stuck is detected	Relay is at fault. Relay is welded due to exceeding the rating.
Relay fails to operate while relay stuck is not detected	Loop wiring is not correct. Control panel has incorrect cause and effect programming. There is a problem with Relay.

### LED Operation

The module is equipped with 6 LEDs to indicate the state of the module (refer to Figure 2 and Table 3).

Polling LED: flashes green during polling from the control panel.

Input LED: illuminates red to indicate that an input is activated in Input 2.

Alarm LED: illuminates red to indicate that an input is activated in Input 1 (for 4-20mA input) and the module is in an alarm state.

Output LED: illuminates red when the output relay is on.

Fault LED: illuminates yellow when an open or short circuit in Input 1 or 2, relay stuck, or PSU voltage drop is detected.

SCI LED: illuminates yellow when a short circuit is detected in the loop and the short circuit isolator (SCI) is activated.

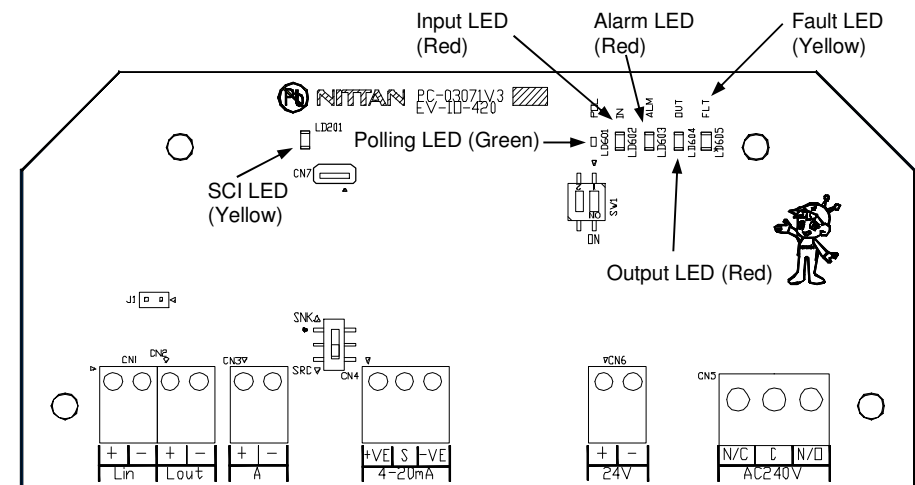


Figure 2

	Colour	Function	State of module	State of LED
<b>Polling LED</b>	Green	Polling	Polling	Flashing
<b>Input LED</b>	Red	Input2	Input	Steady on
<b>Alarm LED</b>	Red	Input1 4-20mA	Input	Steady on
<b>Output LED</b>	Red	Output	Relay on	Steady on
<b>Fault LED</b>	Yellow	Fault	Input 1 & 2 - Open/short Output Relay - Relay stuck External PSU Voltage drop	Steady on
<b>SCI LED</b>	Yellow	Loop	SCI	Steady on

Table 3

### Connections

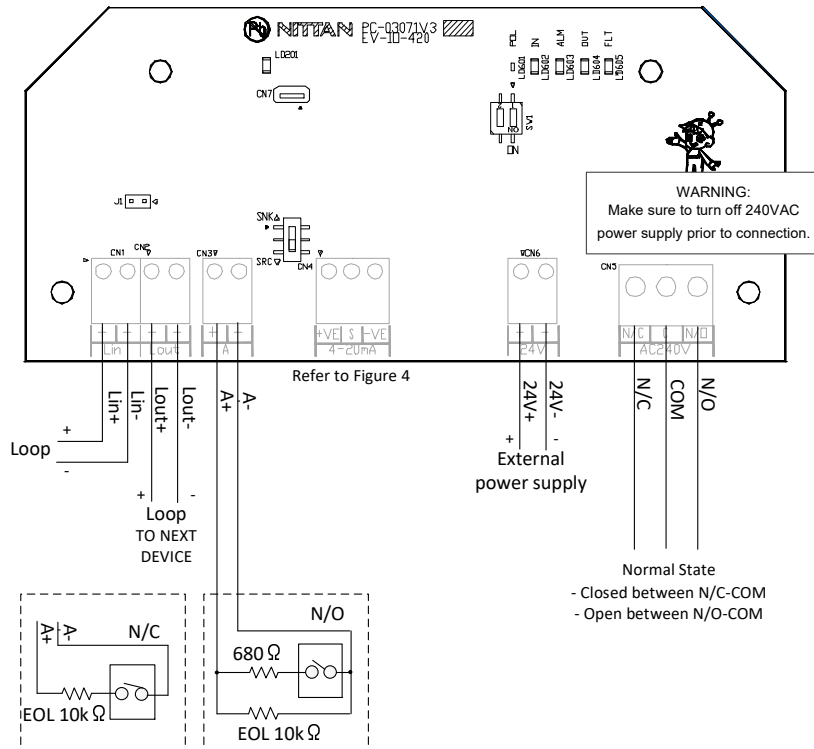


Figure 3



There is a danger of electric shock due to the presence of high voltage (AC240V). Never touch the terminals while the power is on. Make sure to turn off the high voltage AC power supply before commencing wiring work.

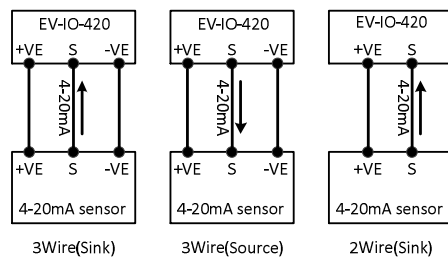


Figure 4 – 4-20mA Connections

### Installation

**NOTE:** Take care when drilling holes to fit additional cable glands. Remove PCB assembly if necessary to avoid damage.

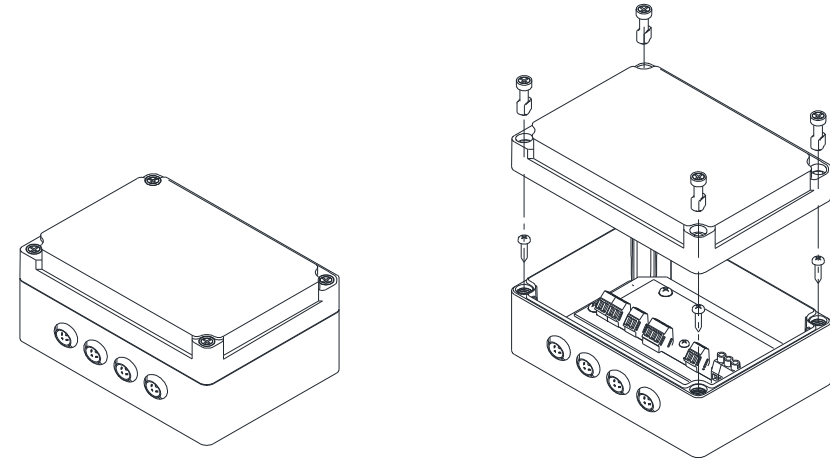


Figure 6

### SCI Function

The EV-IO-420 has a built-in short circuit isolator. The SCI circuit prevents entire loop failure in the event of a short between L+ and L- on the loop. If a short circuit is detected, the section of line containing a short circuit is automatically isolated. If not required the Isolator can be bypassed using the Jumper provided (refer to Figure 1).

**NOTE:** It is not possible to mix -ve and older +ve isolator styles on a system.

**NOTE:** Product Not compatible with Advanced MxPro4 Panel.

### Service and Maintenance

Inspection and tests of the module shall be carried out periodically according to the requirements of BS 5839 Part 1, Fire Detection and Alarm Systems for Buildings: Code of Practice for System Design, Installation and Servicing, or equivalent local codes of practice.

For a routine inspection, ensure the module is secure and undamaged.

When carrying out site testing of the module, set the Fire Alarm Control Panel to test mode and take any necessary precautions, so as to limit the activation of alarm sounders/bells and any fire service summoning device.