

# 9121-IS

## MTL FISCO Power supply IIC

- Intrinsically safe fieldbus trunk and spurs allows full live working in the hazardous area
- 120mA output current: supports 8 x 15mA IS fieldbus devices per power supply
- Fieldbus repeater
- Multidrop isolators on single fieldbus link
- 250V ac input/output/power supply isolation
- Switch selectable terminator on host side
- Fixed terminator on IS side
- Switch selectable power for host side
- Mountable in Zone 2



The MTL 9121-IS is a fieldbus repeater isolator which repeats the fieldbus signal from a safe area, Zone 2 fieldbus to an intrinsically safe fieldbus for connection to devices in Zone 1. The 9121-IS provides up to 120mA, typically powering up to 8 x 15mA field devices in Gas Group IIC.

The 9121-IS is certified to FISCO (Fieldbus Intrinsically Safe Concept) requirements in IEC60079-11: 2011 Equipment protection by intrinsic safety i and IEC 60079-25: 2010 Intrinsically Safe Electrical Systems. This allows the power supplied to the IS fieldbus to exceed the limit set in the original FF-816 IS physical layer profile. This increases the number of devices on an IS fieldbus from typically 4 x 20mA devices with maximum of 80m cable run, to up to 6 x 20mA devices with 400m cable run using the 9121-IS.

**In addition, FISCO reduces the documentation required.**

Intrinsically safe systems have been installed in accordance with IEC 60079-25: 2010 Intrinsically Safe Electrical Systems entity calculations or similar local code of practice. This requires:

- calculation of cable parameters
- comparison of safety descriptions
- creation of descriptive system document

The administrative work involved in carrying this out in accordance with the end users procedures is usually considerable. Simply adding a new field device to an IS segment will require all this documentation to be updated.

Fieldbus intrinsically safe systems can now also be installed in accordance with FISCO requirements in IEC 60079-25: 2010 Intrinsically Safe Electrical Systems.

This:

- eliminates need to calculate cable parameters
- reduces safety documentation to a list of devices
- allows addition of devices without a review of safety documentation
- as proven by test, allows longer cables with higher capacitance

To install a fieldbus system to the FISCO requirements in IEC 60079-25: 2010 Intrinsically Safe Electrical Systems the cable used in the system must comply with the following parameters:

Loop resistance Rc: 15 to 150 ohms/km  
Loop inductance Lc: 0,4 to 1 mH/km  
Capacitance Cc: 80 to 200 nF/km  
Maximum length of each spur cable: 60 m in IIC and IIB  
Maximum length of each trunk cable: 1 km in IIC 5 km in IIB

When cable which complies with this specification is used, no further consideration of cable parameters is necessary. Virtually any instrument cable suitable for a fieldbus signal will comply.

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## MODULE SPECIFICATION

See also Common Specification

### OUTPUT

#### Number of channels

One

#### Voltage

12.4V (min.) at 25°C (see note)

#### Design current

0 to 120mA

#### Current limit

>140mA

#### Output ripple

Complies with clause 22.6.2 of the fieldbus standard†

#### Minimum load

No load

#### Maximum cable length

Determined by IS load, see MTL Application Note AN9026 for details

#### Isolation

Input to output:	250V ac rms
Input and output to power supply:	250V ac rms
Power In	Um 40Vdc
Host Fieldbus	Um 253Vrms

### INPUT

#### Input voltage

19.2 - 30V dc

#### Current consumption:

235mA (typical) 330mA (max.) at 20V  
190mA (typical) 265mA (max.) at 24V  
155mA (typical) 215mA (max.) at 30V

#### Power dissipation with 110mA load:

2.9W (typical) 4.3W (max.)

#### Input protection

Fuse + supply reversal diode

Note: Temperature coefficient 12mV/°C. If the power supply and fieldbus cable are operated at low temperatures, the reduced resistance of the cable more than compensates for the reduction in output voltage.

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† The applicable fieldbus specifications and standards are:

- FOUNDATION™ fieldbus 31.25 kb/s Physical Layer Profile Specification, document FF-816.
- IEC 61158-2:2014
- ISA-S50.02-1992 for 31.25 kb/s fieldbus systems.

### SAFETY

#### Location of module

Safe area, Zone 2, IIC T4 hazardous area.

#### Location of field wiring

Zone 1, IIC T4 hazardous area.

#### Field wiring protection

Intrinsically safe

#### Certification Code

ⓂII(2) GD [Ex ib Gb] IIC  
ⓂII 3 GD Ex nA IIC T4 Gc

#### Safety description

14V, 180mA, 2.52W, 0.20μF\*, 300μH\*

\*When used in accordance with IEC/EN 60079-25:2010, there is no need to take into consideration Co and Lo.

#### Approvals

For the latest certificate information see [www.mtl-inst.com/certificates](http://www.mtl-inst.com/certificates)

#### Certification is compatible with

Fieldbus FOUNDATION FF816-FISCO.  
FISCO requirements in IEC/EN60079-11 and IEC/EN 60079-25.  
ATEX Directive 2014/34/EU

### MECHANICAL

#### Mounting

DIN rail/surface mounting

#### Module width

42mm

#### Weight

360g

### LED INDICATORS

	OFF	ON
Power (green)	Power fail	Power OK
Fault (red)	Normal	Fault
Host Comm (yellow)	Comms failure	Comms OK
IS Comm (yellow)	Comms failure	Comms OK

**COMMON SPECIFICATIONS****MECHANICAL****Mounting method**

Flat panel or DIN - rail

**DIN-rail types**

'Top hat', 35 x 7.5mm to EN 50022 or 35 x 15mm to EN 50022

**ENVIRONMENTAL****Ambient temp****Operating, optimum orientation**

-40°C to +70°C

(except where stated in individual module specifications)

**Operating, non-optimum orientation**

-40°C to +50°C

(except where stated in individual module specifications)

**Storage**

-40°C to +85°C

**Relative Humidity**

5 to 95% RH (non-condensing)

**Vibration - Operating, Storage & Transport**

Sinusoidal Vibration EN 60068-2-6	10-500 Hz. 5 g for surface mounting, 1 g for DIN-rail mounting
Random Vibration BS2011:Part 2.1	20-500 Hz 5 g for surface mounting 1 g for DIN-rail mounting

**Shock - Storage & Transport**

EN 60068-2-32	1 m drop onto flat concrete
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**Shock - Storage & Transport**

EN 60068-2-27	30 g peak acceleration with 11 ms pulse width
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**Shock - Storage & Transport**

EN 60068-2-27	30 g peak acceleration with 11 ms pulse width
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**Ingress Protection**

IP20 to IEC/EN 60529

(Additional protection by means of enclosure).

**Corrosive atmospheres:**

Designed to meet ten year service in Class G3 corrosive environment, as defined by ISA Standard SP71.04

**ELECTRICAL****EMC compliance**

To EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements.

Class A equipment Table 2 - Industrial locations

**Electrical safety**

EN 61010-2-201

**PHYSICAL NETWORK**

IEC61158-2

FOUNDATION Fieldbus H1

Profibus PA

**TERMINALS (PLUGGABLE)****Rising cage clamp screw terminals**

Specify -PS

Conductor size: 0.14 to 2.5mm<sup>2</sup>**Spring clamp terminals**

Specify - PC

Conductor size: 0.14 to 2.5mm<sup>2</sup>**FIELDBUS TERMINATOR****Host side**

Selectable by switch on top of unit

**IS side**

Permanently connected terminator

**HOST SIDE POWER (selectable by switch on top of unit)\*****Voltage**

14V minimum

**Current**

0 to 30mA

**Output ripple**

Complies with clause 22.6.2 of the fieldbus standard

**Minimum load**

No load

**Maximum cable length**

Determined by host side load

**Terminal numbering**

Host side			NI/IS connection	
1	Power Supply No 1 + ve	7	NI/IS fieldbus trunk +ve	
2	Power Supply 0V	8	NI/IS fieldbus trunk shield	
3	Power Supply No 2 +ve	9	NI/IS fieldbus trunk -ve	
4	Fieldbus trunk -ve			
5	Fieldbus trunk shield			
6	Fieldbus trunk +ve			

\* Note: When mounted in Zone 2, switches may only be operated if the equipment is de-energised or the area is known to be gas-free.

**ORDERING INFORMATION**

Host side	Host side
9121-IS-PC	FISCO power supply, IIC, with spring clamp terminals
9121-IS-PS	FISCO power supply, IIC, with screw terminals