

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 R_c : 15 to 150 ohms/km
Loop inductance L_c : 0,4 to 1 mH/km
Capacitance C_c : 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
 Um = 250V rms

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: 2000.
- 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] IIC, ⓂII 3 GD Ex nA IIC T4.

Safety description

14V, 180mA, 2.52W, 0.20μF*, 300μH*

ATEX certificate numbers

MTL02ATEX9121
 BAS02ATEX7276

IECEx certificate number

IECEx BAS 04.0031

Certification is compatible with

Fieldbus FOUNDATION FF816-FISCO.
 FISCO requirements in IEC60079-11:
 2011 Equipment protection by intrinsic safety i and
 IEC 60079-25: 2010 Intrinsically Safe Electrical Systems
 EC Directive 94/9/EC (ATEX 100A)

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

* When used in accordance with IEC/TS 60079-27, there is no need to take into consideration Co and Lo.

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 BS 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 61010-1

PHYSICAL NETWORK

IEC61158-2

FOUNDATION Fieldbus H1

Profibus PA

TERMINALS (PLUGGABLE)

Rising cage clamp screw terminals

Specify -PS

Conductor size: 0.14 to 2.5mm²

Spring clamp terminals

Specify - PC

Conductor size: 0.14 to 2.5mm²

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

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		

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
9321-SC	Spur Connector - Entity (for use with 9121-IS)
9322-SC	Spur Connector - Ex ia
9323-SC	Spur Connector - Entity (for use with 9122-IS or 9121-IS)