

## MTL 9101-22

### 4-segment, redundant, FISCO power supply

- Redundant power supply configuration for high system availability
- 245mA output per segment for IIB Gas Groups
- For Invensys Foxboro I/A<sup>®</sup> series control systems
- Enhancement of field-proven 912x-IS FISCO power supply
- Rugged construction for easy cabinet mounting and resistance to shock and vibration



### System Overview

The 9101 power supply system provides an intrinsically safe field network for FOUNDATION<sup>™</sup> fieldbus systems in hazardous areas. It has host-side connections that allow direct integration into Invensys Foxboro I/A<sup>®</sup> series control systems by means of standard pre-assembled cables. For other DCS types, consult MTL product line for details of the complete 910x-22 power supply range.

The output of the power supply modules complies with the Fieldbus Intrinsically Safe Concept (FISCO) model, in accordance with IEC standard 60079-27. The key advantages of FISCO over earlier 'Entity' model installations to FF-816 are higher available field current and reduced safety documentation, while retaining the ability to conduct maintenance while energised and without 'gas clearance'.

The 9101 system builds on MTL 912x-IS range of power supplies, which have become established as the industry standard solution for FISCO networks. The 9101 system now achieves higher levels of overall system availability by providing redundancy of the power modules.

When used with intrinsically safe versions of MTL Megablock field wiring hubs, the power supply system allows complete FISCO networks to be assembled for even the most demanding process applications.

### Architecture

Each IS fieldbus segment is powered by a redundant pair of pluggable FISCO power supply modules. The modules operate in active/hot standby mode, ensuring that the fieldbus segments are continually powered. In the event of a failure of an active power supply module, the field circuit is automatically transferred to the standby module. The change-over is managed by Supply Arbitration Modules (SAMs), which

monitor the health of the FISCO power supplies while maintaining intrinsic safety requirements during the transition to the standby module. The SAMs are also duplicated and replaceable, meaning that there are no non-redundant system components.

Switch-over is achieved rapidly and in accordance with FOUNDATION<sup>™</sup> fieldbus specifications, and without risk of losing fieldbus devices from the bus. A combination of LED diagnostics and alarm signalling provides failure notification of FISCO power supplies and SAMs, allowing failed hardware to be identified and full redundancy to be restored by module replacement.

### Carrier

The module carrier provides fieldbus power for four fieldbus segments. It supports pluggable power supply and arbitration modules for each segment and all connection facilities. Each carrier has connections for redundant 24V input power, host fieldbus segments and intrinsically safe field trunks. A volt-free failure alarm is also provided for connection to a digital input in the host Control System. There are no active electronic circuits on the carrier, resulting in long calculated Mean Time to Failure (MTTF) and overall high system availability.

The carrier dimensions are designed to provide high packing density in typical 800mm wide equipment cabinets. Survival in high-vibration marine environments is achieved by secure panel-mount fixings.

The FISCO power supply modules are pluggable versions of MTL 9122-IS range, and support the same level of features. LED indicators provide information on system health and assist with fault diagnosis.

## SPECIFICATION

### OUTPUTS

#### Number of segments

Four

#### Voltage

12.9V (min.) at 25°C (see note)

#### Design current

0 to 245mA

#### Current limit

>270mA

#### Output ripple

Complies with clause 12.7.3 of EN61158-02:2004

#### Minimum load

No load

#### Isolation

Host fieldbus to intrinsically safe fieldbus: 250V ac rms

Host/intrinsically safe fieldbus to power supply: 250V ac rms

Um = 253V rms

*Note: Temperature coefficient 12mV/°C maximum. 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.*

### INPUTS

#### Input voltage

19.2 - 30V dc

#### Current consumption per segment (full load):

570 mA (typical) 625 mA (max.) at 24V

#### Power dissipation per segment (200mA load):

9.7W (typical) 10.2W (max.)

#### Power dissipation per segment (full load):

10.3W (typical) 11.5W (max.)

### SAFETY

#### Location of fieldbus power supply carrier

Safe area

#### Location of field wiring

Zone 1, IIB hazardous area

#### Field wiring protection

Intrinsically safe

#### Safety description, each segment

14.8V, 359mA, 5.31W, 0.50µF\*, 550µH\*

\* When used in accordance with IEC60079-27, there is no need to take into consideration Co and Lo.

#### Certification

See 'Approvals' table

Certification is compatible with

- Fieldbus FOUNDATION FF816-FISCO
- IEC 60079-27 FISCO Standard
- EC Directive 94/9/EC

### FIELDBUS TERMINATION

1 x fixed terminator and 1 x switchable terminator per host segment on module carrier

Fixed terminator per field segment inside each 9122-IS module

### CONNECTIONS

#### Host fieldbus

25-pin subminiature D-type connector - compatible with Foxboro system cables from the P0916Dx series. (Select a cable of the appropriate length.)

#### Hazardous area fieldbus

3-way pluggable rising cage-clamp screw terminals per segment

Conductor size: 0.14 to 2.5 mm<sup>2</sup>

#### 24V power - Power A and Power B

3-pin header - compatible with Foxboro power cables from the P0926Kx series. (Select a cable of the appropriate length.)

### Alarm

2-way rising cage-clamp screw terminal

Conductor size: 0.14 to 2.5 mm<sup>2</sup>

### ALARMS

#### Alarm contact rating

Max. 250V, 100mA (solid state)

#### Alarm contact status

Normally closed, open on failure of any FISCO power supply module or Supply Arbitration Module

### MECHANICAL

#### Mounting

Surface mounting

#### Weight

6.0kg approx.

#### Dimensions (refer also to diagram)

255(w) x 354(h) x 154(d) mm

### ENVIRONMENTAL

#### Ambient temperature

-20°C to +60°C (operating)

-40°C to +85°C (storage)

#### Ingress protection

IP20 to BS EN 60529 (Additional protection by means of enclosure)

**LED INDICATORS****Carrier Power Inputs**

|                      | <b>OFF</b> | <b>ON</b> |
|----------------------|------------|-----------|
| <b>Power</b> (green) | Power fail | Power OK  |

**FISCO Power Supply - 9122-IS-CM**

|                           | <b>OFF</b>                   | <b>ON</b> |
|---------------------------|------------------------------|-----------|
| <b>Power</b> (green)      | Power fail or internal fault | Power OK  |
| <b>Fault</b> (red)        | Normal                       | Fault     |
| <b>Host Comm</b> (yellow) | Comms failure                | Comms OK  |
| <b>IS Comm</b> (yellow)   | Comms failure                | Comms OK  |

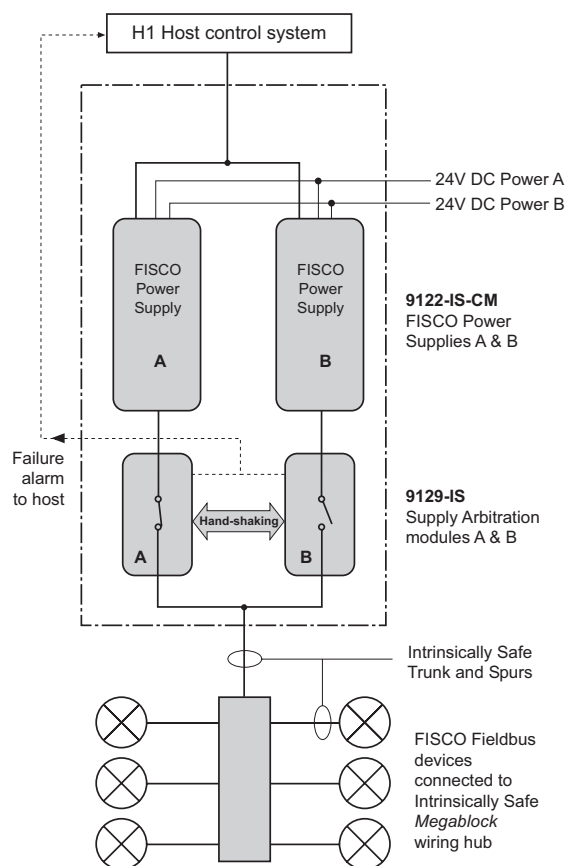
**Supply Arbitration Module (SAM) - 9129-IS**

|                         |                                              |                         |
|-------------------------|----------------------------------------------|-------------------------|
| <b>Active Mode</b>      | <b>Active LED - ON</b>                       | Standby LED - OFF       |
| <b>Standby Mode</b>     | Active LED - OFF                             | <b>Standby LED - ON</b> |
| <b>Fault/Alarm Mode</b> | Active LED or Standby LED - OFF or FLASHING* |                         |

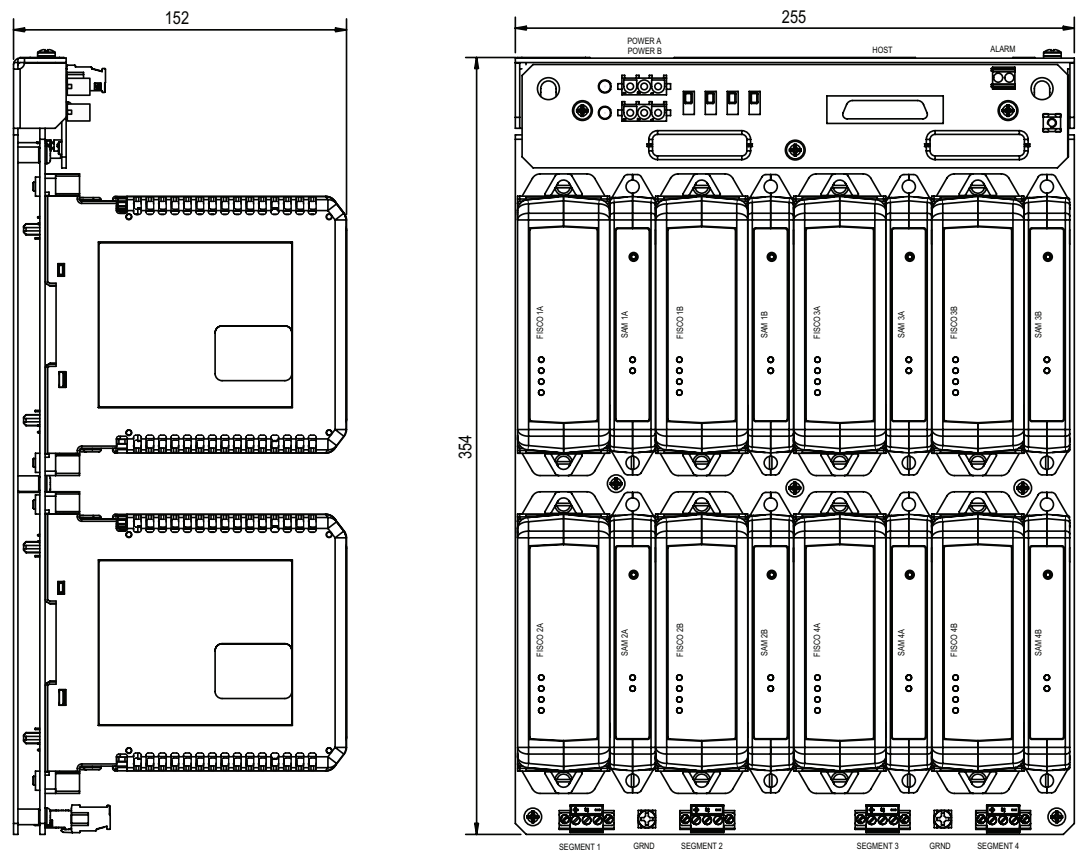
\* Note: During startup, either of the LEDs may flash for up to 10 seconds - this is normal operation.

**ORDERING INFORMATION**

| <b>Description</b>                                                                                                                                                                                     | <b>Part Number</b> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>Redundant FISCO power supply system</b><br>(4 segment, pluggable screw terminals,<br>IIB Gas Group for Invensys Foxboro I/A)<br><b>Comprises:</b><br>8 x 9122-IS-CM, 8 x 9129-IS,<br>1 x 9101-CA-PS | <b>9101-22-PS</b>  |
| <b>FISCO power supply</b><br>(IIB Gas Group, pluggable carrier mount)                                                                                                                                  | <b>9122-IS-CM</b>  |
| <b>Supply arbitration module</b>                                                                                                                                                                       | <b>9129-IS</b>     |
| <b>Alarm blanking module</b><br>(To defeat carrier alarm if power supplies and<br>supply arbitration modules are not fitted. Two<br>required per segment)                                              | <b>9127-BLK</b>    |
| <b>Module carrier</b><br>(4 segment, pluggable screw terminals)                                                                                                                                        | <b>9101-CA-PS</b>  |

**REDUNDANCY BLOCK DIAGRAM  
(one segment shown)**

DIMENSIONS (mm)



APPROVALS

| Authority              | Baseefa                                                                                                          | IECEX                                                                                             |
|------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Standards              | EN 60079-0<br>EN 60079-11<br>EN 60079-27<br>EN 61241-11                                                          | IEC 60079-0<br>IEC 60079-11<br>IEC 60079-27<br>IEC 61241-11                                       |
| Certification markings | E II (2) GD<br>[Ex ib Gb] IIB (-20°C ≤ T <sub>a</sub> ≤ 60°C)<br>[Ex ib Db] IIIC (-20°C ≤ T <sub>a</sub> ≤ 60°C) | [Ex ib Gb] IIB (-20°C ≤ T <sub>a</sub> ≤ 60°C)<br>[Ex ib Db] IIIC (-20°C ≤ T <sub>a</sub> ≤ 60°C) |
| Certification number   | Baseefa09ATEX0127                                                                                                | IECEXBAS 09.0055                                                                                  |