



# Redundant FISCO Power Supplies Introduction

**COOPER** Crouse-Hinds



Highest system  
availability for  
FOUNDATION™  
fieldbus networks  
in hazardous areas



# REDUNDANT POWER SUPPLIES FOR FIELDBUS INTRINSICALLY SAFE CONCEPT

MTL has made a major enhancement to its class-leading range of Fieldbus Intrinsically Safe Concept (FISCO) components for FOUNDATION™ fieldbus networks.

The introduction of power supply redundancy means FISCO can now be specified for the most critical hazardous area applications, while retaining the key benefits of intrinsic safety such as the ability to conduct 'live maintenance' on the entire field network. The redundancy scheme eliminates the risk of network failure in the event of the loss of a single power supply. Such redundancy is routinely specified by end users and engineering companies where failure could result in downtime and lost production.

Redundant FISCO from MTL ...an industry first

- Providing the highest levels of reliability for your critical hazardous area networks
- Bringing safe and secure 'live working', even in the most demanding control environments
- Lowering the total cost of ownership of your asset base
- Protecting your revenue streams, reputation and business continuity





# HIGH AVAILABILITY STARTS HERE . . .

The use of FOUNDATION™ fieldbus in critical process applications demands the highest levels of system availability. Power supply redundancy, combined with highly reliable field wiring components, provides the basis for taking this industry-leading technology into a wider range of hazardous area applications in the process industries. MTL's Redundant FISCO power supplies satisfy the combined requirements of intrinsic safety standards and rigorous Fieldbus Foundation compliance specifications to provide highly available fieldbus power for intrinsically safe networks.

## KEY BENEFITS

### Highest system availability of any intrinsically safe network

- Full power supply redundancy
- Simple, reliable Megablock™ field-wiring hub in field enclosure

### Safest operational safety in hazardous areas

- Safe and secure 'live working' throughout the field network
- No 'mixed protection' techniques requiring special operator training
- Easy maintenance in hazardous areas using established Intrinsic Safety practice

### Simple architecture

- Intrinsically safe network from control room to field
- No complex ancillary apparatus in field circuit

### Designed according to internationally recognised standards

- Fully compliant with IEC 60079-27 FISCO standard

*"In order to achieve the high availability, reliability and key safety functions required, Redundant FISCO is the natural choice for segment power source."*

*"MTL have supplied fieldbus physical layer technology for most of the world's largest fieldbus installations. This, coupled with their experience of intrinsic safety, makes them the supplier of choice."*

*FPSO automation engineer*



# THE SOLUTION YOU HAVE BEEN WAITING FOR ...IS NOW AVAILABLE FROM MTL

Redundant FISCO Power Supplies from MTL, providing a low-risk solution requiring simple design, installation and commissioning skills in the field.

## Redundancy Mechanism

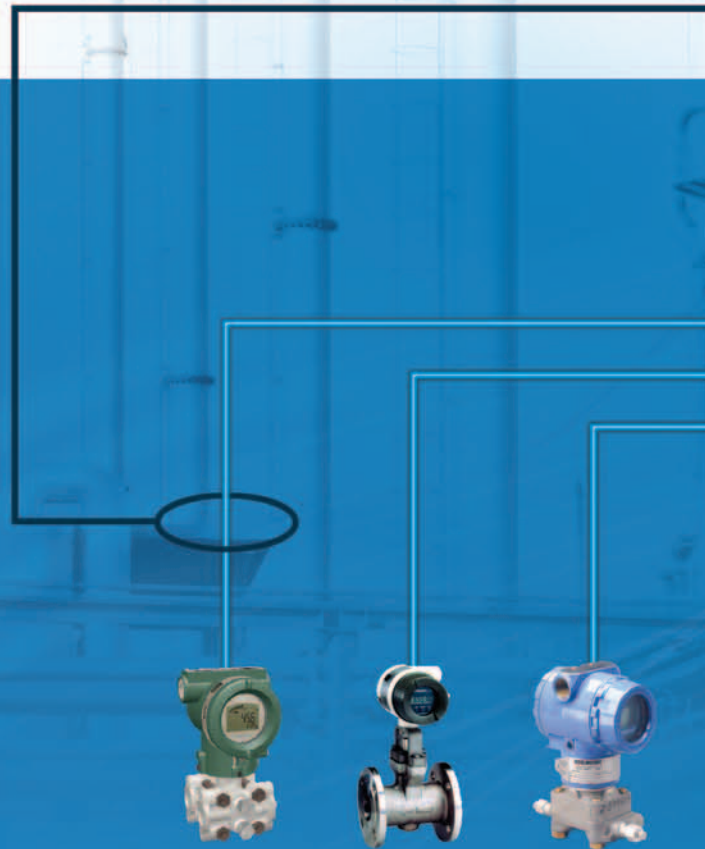


- If loss of output of the active FISCO power module is detected, then the arbitration module (SAM) electronically transfers the field load to the “hot standby” FISCO power module
- Rapid fail-over occurs within the limits of FOUNDATION fieldbus™ specifications, removing the risk of losing fieldbus devices from the bus
- Failure notification (open-circuit alarm) is provided to host control system
- LED indicators identify failed module, to allow replacement under power

## CONTROL ROOM

### HAZARDOUS AREA ZONE 1 / DIVISION 1

**INTRINSICALLY SAFE  
TRUNK & SPURS  
(1 SEGMENT OF 4)**



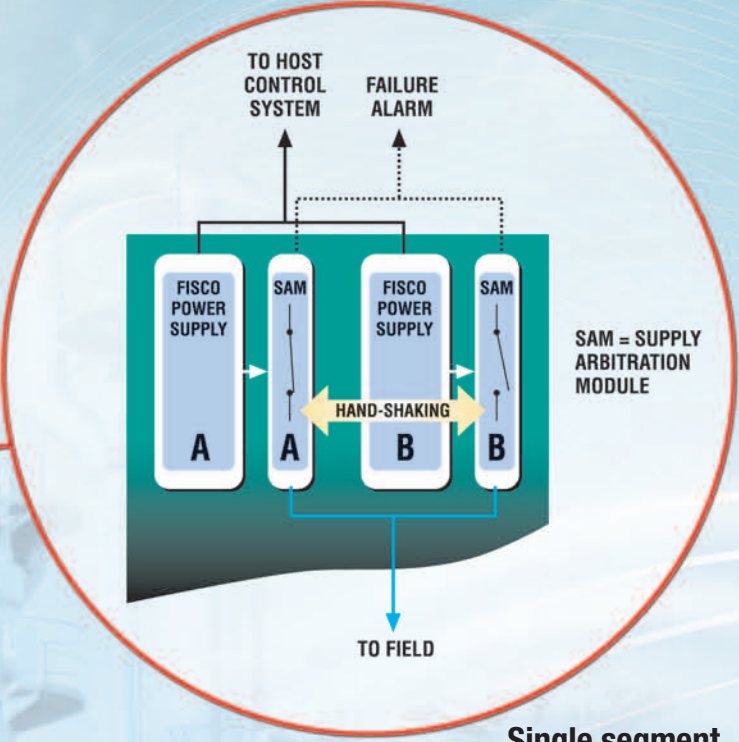


**FOUNDATION fieldbus™ H1  
HOST CONTROL SYSTEM (DCS)**

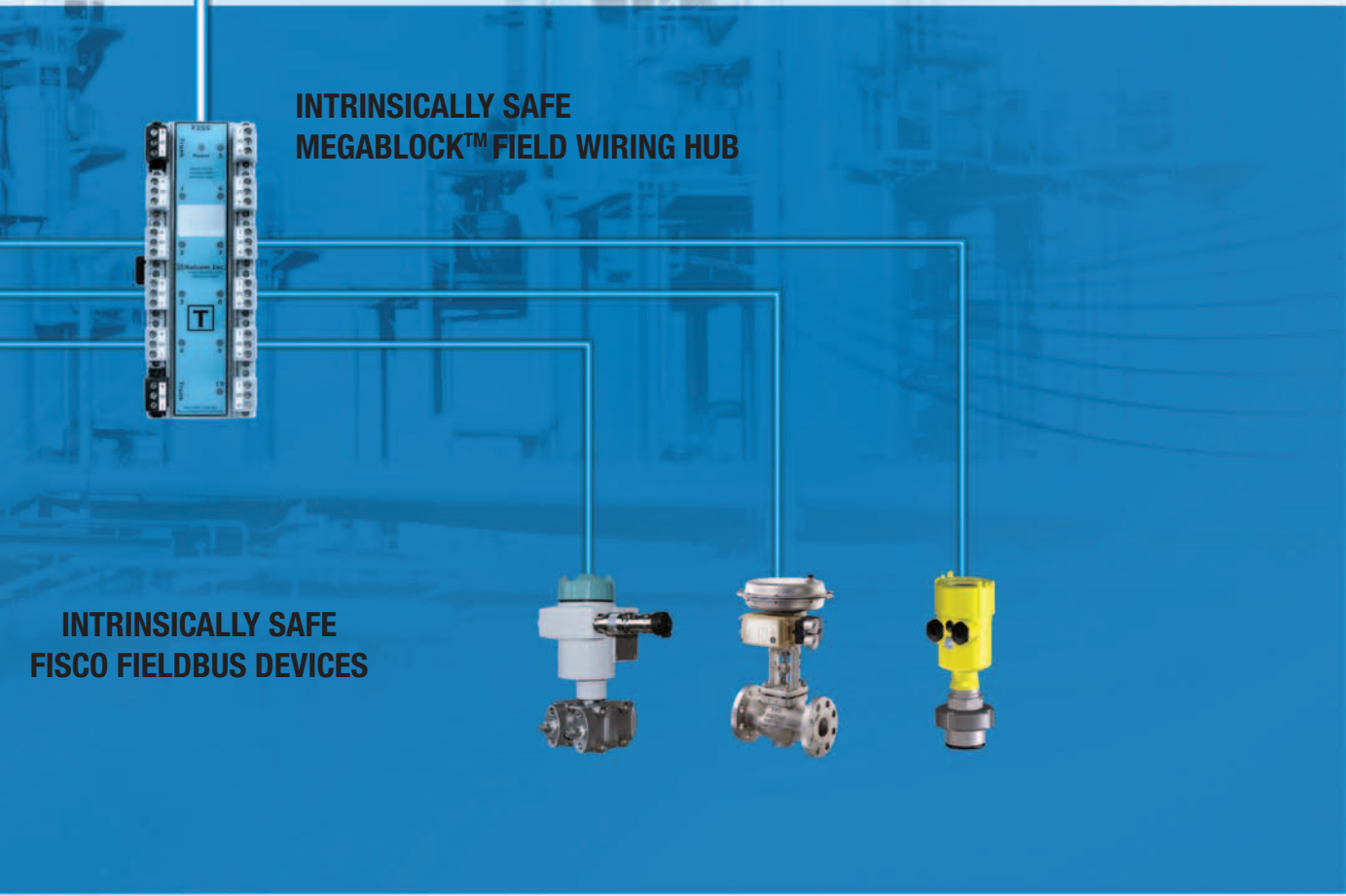


**BULK POWER INPUT  
(REDUNDANT)  
24Vdc**

**4 SEGMENT REDUNDANT FISCO  
POWER SUPPLY SYSTEM**



**Single segment  
block diagram**



**INTRINSICALLY SAFE  
MEGABLOCK™ FIELD WIRING HUB**

**INTRINSICALLY SAFE  
FISCO FIELDBUS DEVICES**

# Redundant FISCO power supplies from MTL...

...bringing higher levels of security to demanding control environments

MTL's clever, patent-pending approach uses two FISCO power supplies - one 'active' and the other in 'hot-standby' mode - together with twin supply arbitration modules (SAMs) that negotiate and manage power supply changeover in the event of a power supply failure. Continuous handshaking between the two SAMs ensures that they can never both be "active" at the same time.

## Features for reliability and ease of use

- Intelligent monitoring of module status ensures output levels always remain within intrinsic safety limits
- Manual fail-over facility allows off-line proof testing of redundancy function
- Innovative mechanical interlock ensures power and communications are maintained during module replacement
- Selection of power supply module types according to the hazardous area Gas Group optimises trunk cable length and number of fieldbus devices supported per segment

## Power supply module carriers

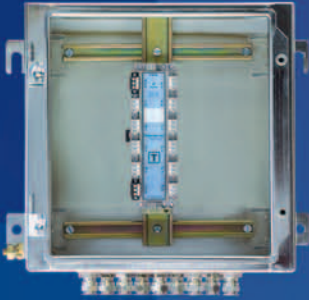
4-segment power supply systems are supported for integration into the major distributed control platforms to reduce cabinet 'footprint' and engineering effort.

- Full redundancy on each of 4 segments
- Versions for DCS integration
- Redundant 24Vdc bulk power inputs
- Alarm output to host control system
- Sized to maximise the number of power supply segments supported in typical floor-standing marshalling cabinets





# FISCO field enclosures reduce capital and life-cycle costs



A key advantage of the fieldbus intrinsically safe concept is simplicity of the field-wiring enclosures. In comparison with other techniques, FISCO junction boxes are smaller, lighter, simpler and easier to maintain. The elimination of complex, non-redundant electronic circuitry from harsh field environments enhances the overall reliability of FISCO networks:

- Simple, high reliability 'Megablock™' wiring hub for up to 12 intrinsically safe spurs
- All circuits inside the enclosure are intrinsically safe
- Compact design without the need for ancillary components to enable live-working
- Optional surge protection for trunk and spurs
- No restrictions on removal of covers in presence of flammable atmospheres
- Compatible with IS hand-held diagnostic tools such as MTL-Relcom FBT-6

## Intrinsic Safety without functional limitations...

Selecting intrinsic safety for your fieldbus networks doesn't mean you have to compromise on cable length or segment loading. With a choice of module types according to the Gas Group, MTL's Redundant FISCO power supplies can support the number of fieldbus instruments required by today's projects - at cable lengths that exceed expectations for intrinsically safe buses. See the table below for a guide to the relationship between maximum trunk length and number of devices in typical applications:

| No. Field devices per segment | Average field device current | Trunk cable cross-section               | Total segment current † | Spur cable length | Gas group | Maximum trunk cable length | Total segment length |
|-------------------------------|------------------------------|---|-------------------------|-------------------|-----------|----------------------------|----------------------|
| 6                             | 17mA                         | 1.5mm <sup>2</sup><br>(24 ohms/km loop) | 130mA                   | 60m               | IIB       | 1050m                      | 1410m                |
| 8                             | 17mA                         | 1.5mm <sup>2</sup><br>(24 ohms/km loop) | 164mA                   | 60m               | IIB       | 831m                       | 1311m                |
| 10                            | 17mA                         | 1.5mm <sup>2</sup><br>(24 ohms/km loop) | 198mA                   | 60m               | IIB       | 690m                       | 1290m                |
| 12                            | 17mA                         | 1.5mm <sup>2</sup><br>(24 ohms/km loop) | 233mA                   | 60m               | IIB       | 585m                       | 1305m                |
| 4                             | 17mA                         | 1.5mm <sup>2</sup><br>(24 ohms/km loop) | 105mA                   | 60m               | IIC       | 760m*                      | 1000m                |

\* Limited by total segment length

† includes one spur in short circuit condition



REDUNDANT FISCO



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