

9387-FB-xx-R

Open-frame, redundant fieldbus barrier



- For FOUNDATION™ fieldbus networks in hazardous areas
- Pre-assembled system components for up to 5 intrinsically safe spur connections
- For assembly into user-specified field enclosure
- Spurs compatible with FISCO and “Entity-certified” fieldbus instruments
- Ergonomic mechanical design
- Pluggable system components without “gas free” constraints
- Optional, integrated surge protection for trunk and spurs



The 9387-FB-R (5-spur) Open-frame redundant fieldbus barrier provides intrinsically safe spur connections from a high-energy trunk, for connection to suitably certified Foundation™ fieldbus H1 instruments. The unit comprises pre-wired and assembled system components on a stainless steel baseplate, for installation into a suitably certified field enclosure. Connection facilities are provided for the trunk and spur wiring, as well as all electronic modules needed to support a fully-working Fieldbus Barrier. In a typical application, an Ex e (increased safety) certified field enclosure will be selected to allow installation in a Zone 1 hazardous area; third-party approval of the enclosure and contents is normally required.

The assembly uses duplicated fieldbus barrier modules in a redundant configuration to achieve significantly higher system availability than equivalent ‘simplex’ units. The 9387-FB-R may therefore be selected for critical process applications where failure of the Fieldbus Barrier would otherwise result in unacceptable downtime or lost production. It is also ideal for use in Fieldbus Safety Instrumented Function (SIF) networks in which nuisance trips cannot be tolerated. Failure annunciation to the host control system is provided by means of an integrated FOUNDATION™ fieldbus device with Digital Input Function Block capability.

In common with conventional fieldbus barriers, each intrinsically safe spur is capable of supporting a FISCO or ‘Entity’ certified fieldbus device located in a Zone 0 or 1 hazardous area. The short-circuit protected spurs are galvanically isolated from the trunk and require no protective ground connection in the field.

The 9387-FB-R redundant fieldbus barrier assembly is based on MTL’s revolutionary 9370-FB range of products, which are supplied as complete, factory-assembled systems that do not require additional wiring or complex ancillary components. The electrical and mechanical aspects of this design have been integrated to provide the industry’s first complete, ergonomic solution for ‘High Energy Trunk’ applications in hazardous areas.

Uniquely, the key modular components of the system (Fieldbus Barrier, Terminator and Surge Protectors) may be ‘hot-plugged’ by design and without gas-clearance procedures or separate isolating switches. This virtually eliminates the risk associated with hazardous area maintenance activities, speeds module replacement and avoids the need for specialist operator training. Further optional features include pluggable surge protection components for the fieldbus trunk and individual spurs.

The 9387-FB-R Fieldbus barrier assembly is bus powered and requires no additional power supply in the field. When used with a fieldbus host control system, power for the trunk may be provided by redundant MTL power supplies.

SPECIFICATION**SPURS****Number of spurs**

5 (6th spur allocated to alarm module)

Number of 9377-FB-R modules

2

Current per spur

0 - 32mA

Total current all spurs (max.)

160mA

Current limit per spur (max.)

45mA

Spur short circuit current (max.)

4.5mA

Spur voltage

≥ 10V @ 40mA

No-load voltage

12V min.

Number of field devices

1 per spur

Maximum spur length

120m (depending on the number of spurs per fieldbus segment)

Galvanic isolation (to EN 60079-11)

Trunk to spurs: 1.5kV (test voltage)

Spur to spur: no isolation

Module to module: 30V

Spur surge protection

Plug-in module (part number FS32) - see separate specification

* See ordering information

TRUNK**Data rate**

31.25kbaud

Data transmission between trunk and spurs

passive, no repeater function

Number of trunk connections

2 (in & out), internally connected

Input voltage (trunk)

16-32V DC

Voltage drop (trunk in to trunk out)

0V

Maximum rated current (trunk in to trunk out)

5A

Low voltage monitoring

Input voltage < 16V, spurs de-energized

Typical DC current consumption for 9387-FB

		@ 16V	@ 24V	@ 32V
No load on each spur	typ.	77.9	62.9	49.6
	max.	80.0	65.0	51.0
1 spur @ 20mA	typ.	102.8	81.1	64.3
	max.	120.0	84.0	80.6
All spurs @ 20mA	typ.	201.7	144.1	114.2
	max.	208.0	149.0	118.0
All spurs @ 20mA 1 short-circuit	typ.	185.0	135.6	106.5
	max.	191.0	140.0	110.0
All spurs @ 32mA	typ.	276.5	191.9	149.4
	max.	288.0	198.0	154.0

Power dissipation (max.)

2.5W (all spurs at 32mA)

Fieldbus terminator

Plug-in module (part number 9378-FT) supplied with each 9387-FB-R or 9388-FB-R assembly.

Provides 100Ω + 1μF according to IEC 61158-2 - see separate specification

Trunk surge protection

Plug-in module (part number 9376-SP) - see separate specification

Reverse polarity protection

Yes

Failure alarm

Failure of either 9377-FB-R barrier module in redundant mode is annunciated over FOUNDATION™ fieldbus via state change of

DI Function Block in 9379-ALM alarm module

ELECTRICAL CONNECTIONS**Trunk wiring terminals**

Type: Ex e

Cable types and capacity	Screw cage clamp - mm ²	Spring cage clamp - mm ²
Rigid cable	0.5 to 4.0	0.5 to 4.0
Flexible cable	0.5 to 2.5	0.5 to 2.5

Spur field wiring terminals

Type: 3-way, pluggable

Cable types and capacity	Screw cage clamp - mm ²	Spring cage clamp - mm ²
Rigid cable	0.2 to 2.5	0.2 to 2.5
Flexible cable	0.25 to 2.5	0.25 to 2.5

Grounding of cable screens (trunk & spurs)

(Configured with wire connections in the Trunk Terminal Assembly)

Options	Trunk	Spurs
1 Single point grounding	Grounded at host	Trunk & spur screens joined
2 Local grounding of spurs	Grounded at host	Grounded at field enclosure

Equipotential earth/ground connection facility

M10 earth/grounding stud on baseplate

BARRIER LED INDICATORS**Trunk Power (PWR)**

	ON	OFF
Green	Supply voltage > 16V, internal supply healthy	Supply voltage < 16V or no supply

Spurs (tri-colour, per spur)

Colour	Steady	Flashing
Green	Channel powering spur - spur OK	Channel powering spur - spur open
Red	Internal fault	N.A.
Yellow	Short to shield	Short circuit, current limit
Off	Supply < 16V or no supply	N.A.

PHYSICAL NETWORKS

IEC61158-2
FOUNDATION™ fieldbus H1

Profile type (according to FF-816)

Type 163 (isolated device coupler) FF-846*

HAZARDOUS AREA APPROVALS

Location of equipment

Zone 1 IIC T4 hazardous area when mounted inside a suitably certified enclosure

Location of connected spur equipment

Zone 0 IIC hazardous area

Certification codes

⊕ II 2(1) G
Ex d e i b mb [ia Ga] IIC T4 Gb (-40°C to +75°C)

Certificate numbers

Baseefa 09 ATEX0184U
IECEX BAS09.0081U

Note: 9387-FB-R is a product ordering code. The certification documents refer to the **937x** components that comprise the 9387-FB-R.

'U' denotes a unit that requires further equipment for use in hazardous areas, i.e. a suitably certified enclosure.

Safety description (spurs)

U_o = 17.5V
I_{o peak} = 249.5mA
I_{o continuous} = 113mA
P_o = 982mW
U_i = 17.5V
C_i = 0
L_i = 0

Spurs in accordance with FISCO standard IEC 60079-11

ENVIRONMENTAL

Ambient temperature (inside selected enclosure)

Operating	Storage
-40°C ... +75°C	-40°C ... +75°C

Relative humidity

< 95%, non-condensing

Electromagnetic compatibility

EN 61326-1 : 2013
NAMUR NE 21

Shock & Vibration

Vibration:

BS EN 60068-2-6: 2008 Test Fc: 1g
BS EN 60068-2-64: 1995 Test Fh: 1g

Shock:

BS EN 60068-2-27: 1993 Test Ea: 15g

MECHANICAL

Mounting position (recommended)

On to a vertical plane

Protection

Intrinsically safe terminals IP20
Non-IS terminals IP30

Weight

4.8kg

(includes two barrier(s) and the trunk terminator but excludes any surge protection items)

ORDERING INFORMATION

Order as:

9387-FB-xx-R 5-spur Redundant Fieldbus Barrier assembly with two 9377-FB-R Fieldbus Barrier modules and one 9379-ALM alarm module installed.

Where **xx** = **PS** = pluggable screw terminal connectors
PC = pluggable spring-clamp connectors

(Note: All assemblies are pre-wired and include a 9378-FT Fieldbus terminator module)

9377-FB-R Fieldbus Barrier module, 6-spur, pluggable
9379-ALM Alarm module

9378-FT Fieldbus terminator, pluggable

9376-SP Trunk surge protection module, pluggable

FS32 Spur surge protection module, pluggable

ASSOCIATED LITERATURE

Instruction Manual

INM9380-RD

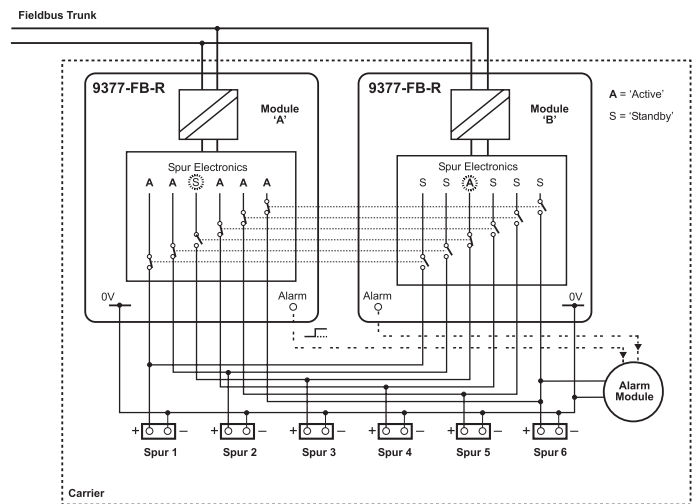


Figure 1 - Illustrating spur redundancy and use of optional Alarm module

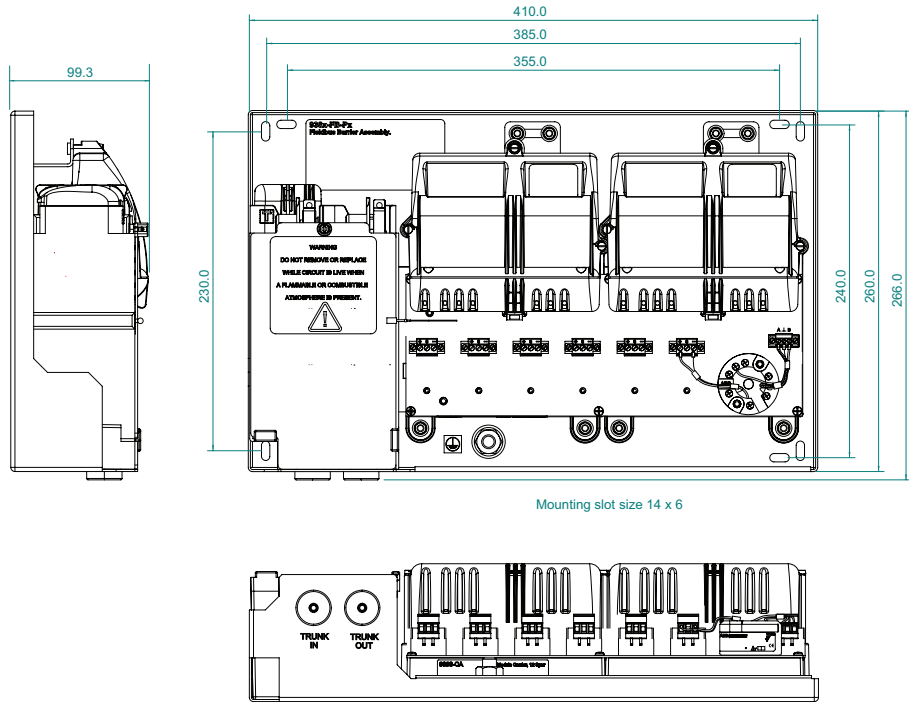
* The FF-846 Isolated Device Coupler registration does not include tests for hardware redundancy. Although operation of the redundancy mechanism has been thoroughly tested by MTL, registration of the redundant capability is not implied by the application of the Foundation's checkmark.

9387-FB-xx-R

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DIMENSIONS (mm)

9387-FB-xx-R
5-spur baseplate assembly



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