MTL Instruments

9370-FB Series Fieldbus Barriers

Field Plus™

COOPER Crouse-Hinds

The Solution for "High Energy Trunk" Fieldbus Applications

HIGH ENERGY TRUNK

MTL Instruments

NEW 9370-FB Series

Serviceability
Size Scalability Safety

A *revolution* in safety, reliability and maintainability for fieldbus networks in hazardous areas

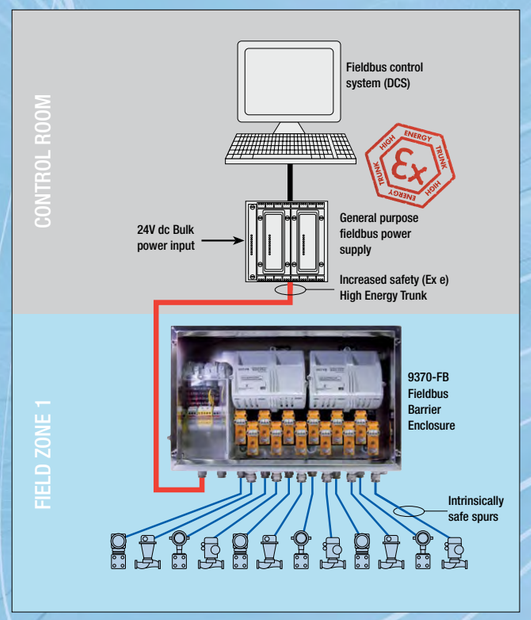
Fieldbus Barriers

Taking FOUNDATION™ fieldbus networks into Zone 1

Fieldbus Barriers are an effective means of connecting field instruments in Zone 1 or Zone 0 hazardous areas to FOUNDATION™ fieldbus host control systems. They provide the field-mounted interface between the fieldbus trunk and intrinsically safe spurs, allowing heavily loaded segments and long cable lengths, irrespective of the Gas/Apparatus Group. The spur connections are compatible with 'IS' certified fieldbus devices complying with 'Entity' or 'FISCO' specifications.

MTL's 9370-FB Series Fieldbus Barriers establish a new benchmark for such networks in hazardous areas. They retain the major benefits of the *High Energy Trunk* technique while removing the drawbacks associated with existing Fieldbus Barrier implementations. The result is lower cost, safer operation and higher reliability throughout the life-cycle of the fieldbus network, with benefits not only for the plant operator but also for all parties involved in the design and installation process.

Segment architecture with 9370-FB Series Fieldbus Barrier



Key Benefits

- **Safer operation and maintenance - all components within main enclosure compartment are 'live workable' in the hazardous area, reducing fire and explosion risks**
- **Earlier production start-up - late specification changes are easily accommodated by system expansion and installation of surge protection at any time**
- **Faster fault diagnosis and replacement - pluggable modules mean maintenance personnel spend less time in the process area**
- **Higher reliability - elimination of internal interconnecting wiring and duplicated components results in fewer interruptions to production**
- **Reduced infrastructure cost - smaller field enclosure can be installed where convenient and safe to work on, not just where it fits**

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FOUNDATION™ fieldbus networks within hazardous areas

Modularity Means Maintainability

Innovative design reduces maintenance time

The time taken to repair failed instrumentation is crucial in many applications. Lost production and interruptions to process visibility must be avoided, and a focus on safety means there is increasing pressure to reduce the time any operator spends in the process area.

A key feature of MTL's 9370-FB is the speed and ease with which it can be reconfigured or repaired. All parts of the system containing complex electronic circuits are housed in "pluggable" modules that can be removed and replaced, even when the apparatus is powered and in service. This is in sharp contrast with conventional 'hard-wired' Fieldbus Barrier implementations, where serviceability is difficult or impossible.

Tracing and fixing faults is also made easier, because rapid substitution can be used to pin-point the source of problems. The table below illustrates how the activity of replacing a Fieldbus Barrier module is not only made much faster, but also avoids the introduction of other errors or safety risks.

How the 9370-FB saves on repair time

Maintenance activity	Conventional Fieldbus Barrier enclosure	9370FB Series Fieldbus Barrier enclosure
• Remove and replace Fieldbus Barrier module	• Remove enclosure cover • Select and operate appropriate isolating switch to de-energise trunk connection • Open trunk terminal cover on barrier module • Remove trunk wiring from terminals and secure • Remove spur wiring from terminals and secure • Remove and replace barrier module • Reinstate trunk and spur wiring and close trunk terminal cover • Operate isolating switch • Replace enclosure cover	• Remove enclosure cover • Loosen module screws • Remove and replace barrier module • Tighten screws • Replace enclosure cover

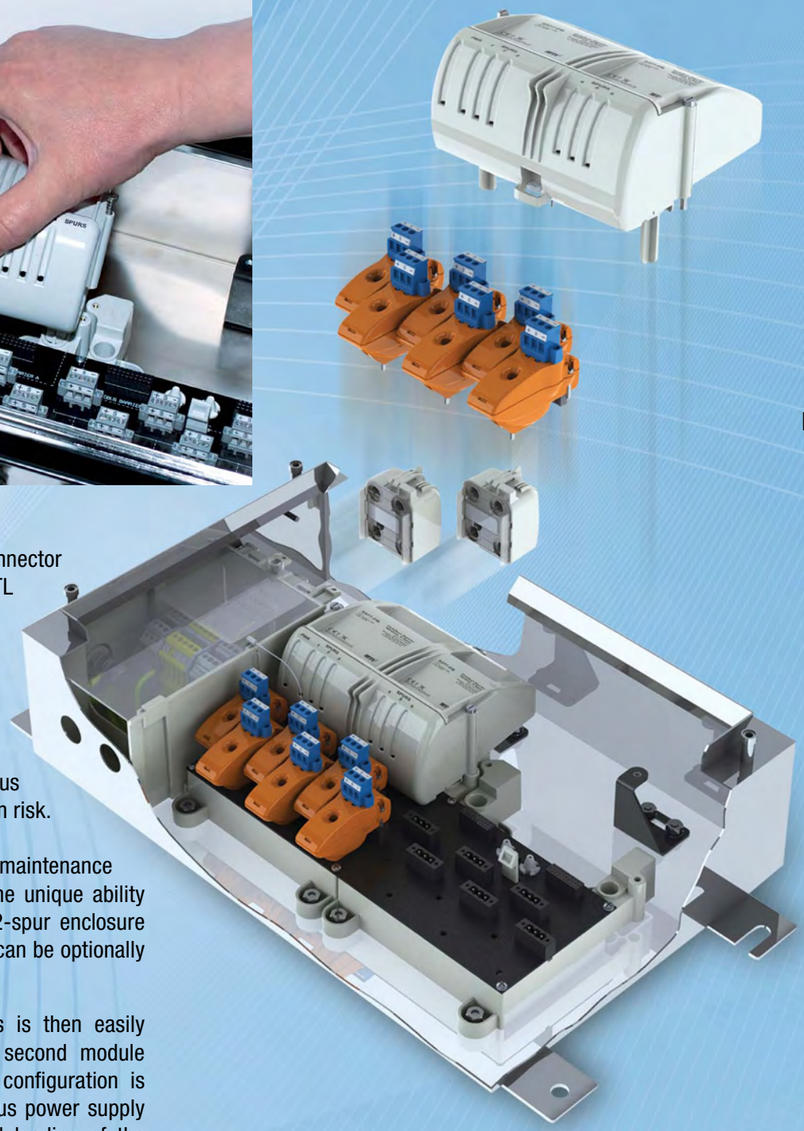
Key Features

Making life easier – throughout the life-cycle

Feature	Existing Fieldbus Barrier modules	New 9370-FB Series
Design supports typical 6-spur and 12-spur applications without "custom" enclosures	X	✔
Integrated ergonomic mechanical and electrical design	X	✔
Fieldbus Barrier modules "hot pluggable" in the hazardous area and without complex isolating circuitry	X	✔
Integrated trunk and spur surge protection as initial build or "retro-fit"	X	✔
All connections within main enclosure compartment are live-workable	X	✔
Screw-secured, pluggable connections for spur wiring	X	✔
Spur terminals compatible with clip-on accessory for FBT-6 hand-held tester	X	✔
Spur-to-shield short-circuit indication	X	✔
Separation of Exe trunk terminals without additional enclosure compartment	X	✔

Expand on demand

Scalable to your needs



The use of innovative connector technology has allowed MTL to provide a Fieldbus Barrier system that has the ultimate flexibility. The barrier modules, terminator and optional surge protection devices are all certified for removal and replacement in the hazardous area without causing an ignition risk.

Not only does this mean safer maintenance activity, but it also provides the unique ability for expansion in service: a 12-spur enclosure fitted with one 6-spur module can be optionally specified and installed.

Expansion to 12 active spurs is then easily accomplished by plugging a second module into the enclosure. No other configuration is necessary, provided the fieldbus power supply is correctly sized and the full loading of the segment has been anticipated.

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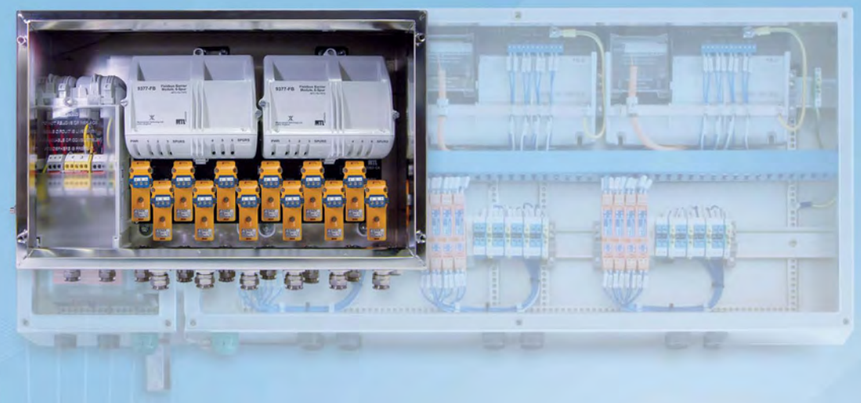
Save space – reduce cost

Why bigger was never better

Reducing the size of field-mounted apparatus such as junction boxes has advantages throughout the life of an installation. Smaller field enclosures are easier to install and maintain, and require less mechanical infrastructure to support them. They can also be located where they are safe and accessible, not just where they fit.

The 9370-FB Series Fieldbus Barrier is as much as 70% smaller than conventional equipment. This is of particular benefit where space and weight are serious considerations, for example in restricted process areas or offshore installations.



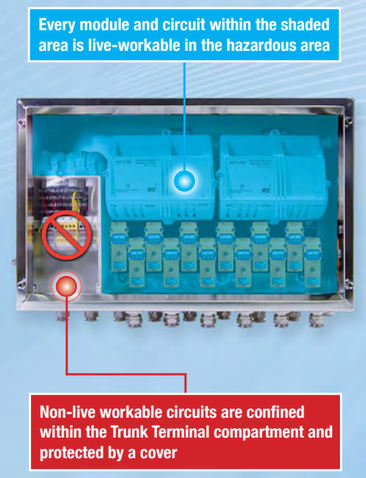
Scaled size comparison illustrating existing 12-spur solution with surge protection and the NEW 9373-FB 12-spur with surge protection.

Live maintenance in hazardous areas

Why leave safety to chance?

Mixing circuits that can be live-disconnected in a hazardous area with those that can't leads to unnecessary risks during field maintenance – which is why the 9370-FB Series has been carefully designed to minimise the possibility of unsafe operator errors. Those parts of the wiring that must not be interrupted while powered - such as the high energy trunk connection - are completely separated within a covered terminal housing. Once this housing has been wired, there are no maintenance activities that require it to be opened - ever.

Meanwhile, all other circuits in the main enclosure compartment are completely live-workable in the hazardous area, and without "gas clearance" procedures. No exposed ignition-capable terminals or interconnecting wiring – only hot-pluggable modules and intrinsically safe spur connections. Even the fieldbus terminator and surge protection devices can be removed and replaced under power in the hazardous area.



Simpler...
safer...
...more reliable

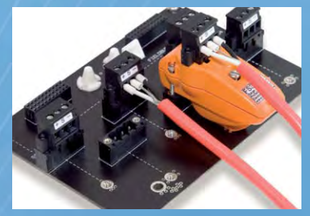
Surge Protection

Install on demand

Surge protection devices are commonly specified for fieldbus networks that are at risk from damage due to transients generated by heavy machinery or lightning. The use of surge protection reduces the risk of catastrophic failure or degradation, and increases the overall system availability.

Optional, integrated surge protection is a key feature of the 9370-FB Series, and includes plug-in devices to protect the barrier modules from transients transmitted along the trunk and spur cables. When used in conjunction with additional protectors located at the fieldbus host and at the field instruments, they allow the user to install and operate fully-protected networks.

Unlike conventional fieldbus barrier solutions, the 9370-FB surge protection modules can be included at the time of installation or retrofitted once the system is in service. This streamlines the selection process, avoids clumsy over-specification and allows protection to be added in response to site experience.



High Energy Trunk goes the distance

A characteristic of Fieldbus Barriers in 'High Energy Trunk' applications is that they can be used in segments with long trunk cable lengths, even when heavily loaded with large numbers of fieldbus devices. The table indicates the maximum trunk cable length according to the number of active devices.

Assumptions:
1. 20mA field device current per spur
2. One spur per segment in short circuit condition
3. 30m spur cable length
4. Segment powered by F802 power supply (28V, 500mA output)
5. 0.8mm² trunk cable cross section with 44Ω resistance per loop km.
6. Cable lengths shown are for guidance only

Number of active spurs	Maximum trunk cable length
4	1,550m
5	1,380m
6	1,230m
7	890m
8	820m
9	770m
10	720m
11	680m
12	650m

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GLOBAL LOCATIONS

AUSTRALIA
MTL Instruments Pty Ltd, 9 /12 Billabong Street,
Stafford, Queensland 4053
Australia

Tel: + 61 1300 308 374 Fax: + 61 1300 308 463
E-mail: enquiries@mtlaus.com.au

CHINA
Cooper Electric (Shanghai) Co. Ltd. Room 2001, China Life Tower,
16 Chao Yang Men Wai Street,
Chao Yang District, Beijing 100020

Tel: + 86 10 5980 0288 Fax: + 86 10 8562 5725
E-mail: bjsales@mtl-inst.cn

FRANCE
MTL Instruments sarl, Les Carrés du Parc
10 rue des Rosiéristes, 69410 Champagne au Mont d'Or

Tel: + 33 (0)4 78 64 98 32 Fax: + 33 (0)4 78 35 79 41
E-mail: info@mtl-inst.fr

GERMANY
MTL Instruments GmbH, An der Gümpgesbrücke 17
D-41564 Kaarst

Tel: + 49 (0)2131 718930 Fax: + 49 (0)2131 7189333
E-mail: info@mtl.de

INDIA
MTL Instruments Pvt Ltd, No.36, Nehru Street
Off Old Mahabalipuram Road
Sholinganallur, Chennai - 600 119

Tel: + 91 (0) 44 24501660 /24501857 Fax: + 91 (0) 44 24501463
E-mail: sales@mtlindia.com

ITALY
MTL Italia srl, Via Cantù 11
I - 20092 Cinisello Balsamo MI

Tel: + 39 02 61802011 Fax: + 39 02 61294560
E-mail: info@mtl-inst.it

JAPAN
MTL Instruments KK,
MT Building
3F 2-7-5 Shiba Daimon, Minato-ku,
Tokyo 105-0012

Tel: + 81 (0)3 6430 3128 Fax: + 81 (0)3 6430 3129
E-mail: sales@mtlkk.co.jp

KOREA
Cooper Crouse-Hinds Korea
12F, Vision Tower
707-2 Yeoksam-Dong Gangnam-Gu,
Seoul 135-080, South Korea.

Tel: + 82 2 538 3281 Fax: + 82 2 538 3505
E-mail: jake.lee@cooperindustries.com

NETHERLANDS
Terheijdenseweg 465, 4825 BK BREDA
The Netherlands

Tel: +31 (0) 76 7505360 Fax: +31 (0) 76 7505370
E-mail: info@mtlbenelux.com

SINGAPORE
MTL Instruments Pte Ltd
No 2 Serangoon North Avenue 5, #06-01 Fu Yu Building
Singapore 554911

Tel: + 65 6 487 7887 Fax: + 65 6 487 7997
E-mail: sales@mtlsing.com.sg

UNITED ARAB EMIRATES
MTL Instruments, Villa No. 4, Sector 2-17
Street 6, PO Box 53234
Abu Dhabi, UAE

Tel: + 971 2 446 6840 Fax: + 971 2 446 6841
E-mail: mtlgulf@mtl-inst.com

UNITED KINGDOM
MTL Instruments, Great Marlings,
Butterfield, Luton
Bedfordshire LU2 8DL

Tel: + 44 (0)1582 723633 Fax: + 44 (0)1582 422283
E-mail: enquiry@mtl-inst.com

AMERICAS
Cooper Crouse-Hinds MTL Inc.
3413 N. Sam Houston Parkway W.
Suite 210, Houston TX 77086

Tel: + 1 281-571-8065 Fax: + 1 281-571-8069
E-mail: csinfo@mtl-inst.com

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