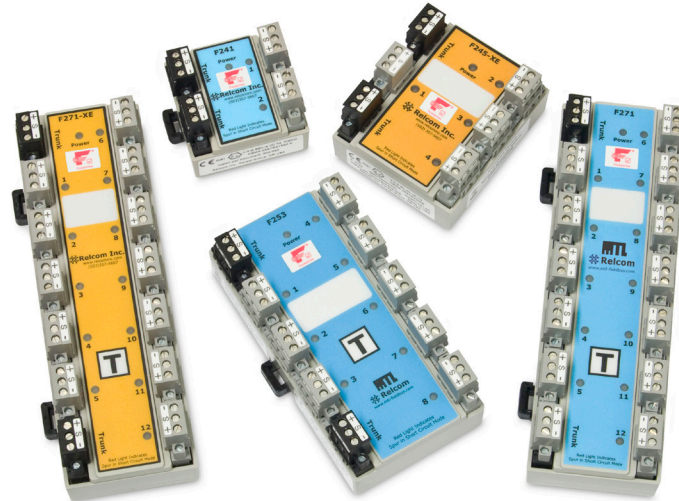




technical datasheet

# F2xx & F2xx-XE Megablock Series

passive hubs for Zone 1 & Division 1 fieldbus networks



**Megablocks are DIN-rail mounted passive hubs** for Foundation™ fieldbus networks. They connect several field devices to the network trunk cable and provide short circuit protection to the segment. Megablocks minimize hand wiring and allow individual devices to be added to and removed from the segment without disrupting network communication.

**A green power LED on each unit** indicates whether at least 9V dc is present. Megablocks are available in two, four, eight, ten and twelve drop versions. Multiple Megablocks are easily wired to one another to allow larger segments to be constructed.

**Megablocks are available with an integral terminator** making them ideal for a star or "chickenfoot" topology where several devices are connected at a single field junction box. Separate Megablock Terminators are also available, which may be wired easily to any Megablock. Megablocks having a built-in terminator are clearly marked ('T') for easy identification by field personnel.

**Connections to the Megablock** are made using pluggable, screw-terminal type connectors. This allows wire terminations to be made to the individual connectors which are then plugged into the Megablock. Devices can then be connected and disconnected easily during commissioning. After commissioning, retaining screws are tightened to secure each connector to the Megablock.

**Trunk connections** for the fieldbus home-run/trunk cable are easily identified by their black connectors. Separate numbered connections are provided for each spur drop.

**SpurGuard™ is a device-port, short circuit protection technique** that minimizes susceptibility to single points of failure. The Megablocks are available with built-in SpurGuard™ protectors that prevent a short circuit in any of the individual transmitters or spur cable runs from bringing the entire fieldbus segment down. A red LED near each spur connection indicates that a spur is shorted and is in "over-current" mode.

**Megablock hazardous area approvals** permit installation in a variety of configurations in Zone 1 or 2 and Division 1 or 2. Within Zone 1 and Division 1 Megablocks are designed for installation in intrinsically safe applications, and are compatible with FISCO or Entity-approved field instruments. An energy-limited or intrinsically safe fieldbus allows live connection/disconnection of the fieldbus without the need for a gas clearance certificate, which assists in commissioning, maintenance and system expansions.

**For applications using flameproof certified devices**, the Megablocks are designed to meet the requirements for increased safety for installation in an Ex e junction box in Zone 1. See FCS-MBx-SG Megablock datasheet for applications in safe areas, Zone 2 and Division 2 hazardous areas.

*To select the Megablock for your application see the Ordering Information section of this document.*

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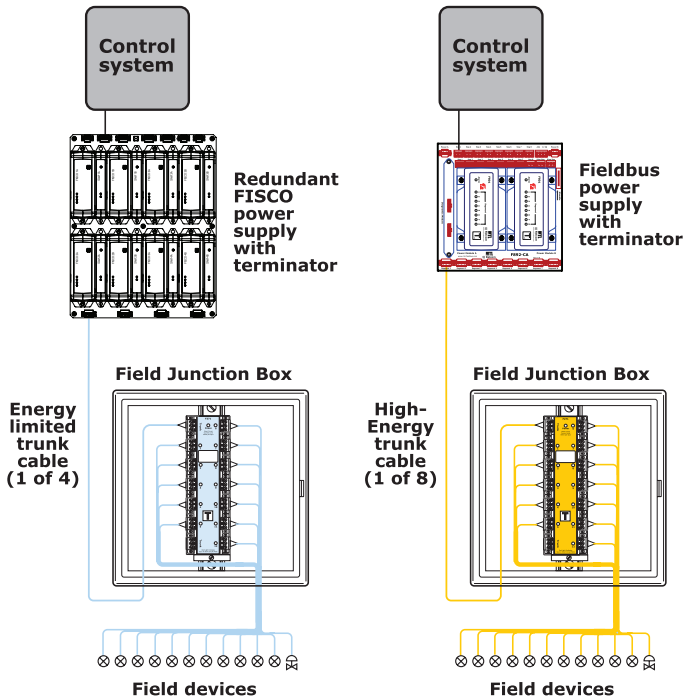
**COOPER** Crouse-Hinds

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## INSTALLATION

Megablocks can be mounted vertically or horizontally using 35 mm DIN rail within a suitable enclosure, such as a field junction box. Megablocks are removed from the DIN rail using a flat blade screwdriver to release the mounting platform. Use of DIN rail end stops is recommended to prevent sliding in vertical installations. The four, eight, ten and twelve port Megablocks have labeling areas so that segments can be easily identified according to plant standards.

MTL have a wide range of standard junction box designs for use with Megablocks. See the data sheet for the range of Process JB's.



Shown above are examples of common Fieldbus segment topologies. Twelve field devices are connected to a twelve-drop Megablock, which is mounted in a field junction box. The trunk connector on the Megablock is wired to the segment trunk cable that leads to the control room or marshalling panel where the power supply and second terminator are located. On the left is an intrinsically safe Megablock connected to an intrinsically safe FISCO power supply and on the right is an increased safety (Ex em) version connected to a general purpose fieldbus power supply.

## GROUNDING

To prevent ground loops, a fieldbus segment should only be grounded at one point. This is usually done by grounding the cable shield at the control room end of the segment. If a permanent segment ground connection in the field is desired, this can be achieved by wiring the shield terminal on one of the Megablock trunk connectors to a suitable earth ground instead of wiring it to the shield terminal on the Megablock Terminator.

Fieldbus Connection System (FCS) wiring blocks are protected by U.S. Patents 6,366,437, 6,369,997 and 6,519,125.

## SPECIFICATIONS

### Mounting requirements

35mm DIN rail

### Wire capacity

0.14 to 2.5mm<sup>2</sup>

### Case material

Lexan polycarbonate

### Temperature range

Operating -45° to +70°C

Storage -50° to +85°C

### Voltage required to activate power LED

9.2V dc minimum

### Minimum input voltage

10.0V (See Note 1 below)

### Maximum input voltage

see certification ratings

### Maximum input current

see certification ratings

### Trunk-to-trunk voltage drop

0.1V maximum

### F245 - F271 Intrinsically Safe Megablock with SpurGuard™

#### Unloaded current consumption

No. of Ports	2	4	8	10	12
mA	1.4	1.7	2.5	2.9	3.2

#### Spur device current

29mA maximum (recommend one device per spur)

#### Spur short-circuit current

40mA maximum

#### Trunk-to-trunk voltage drop

0.1V maximum

#### Trunk-to-spur voltage drop

0.3V maximum

### F245-XE - F271-XE Intrinsically Safe (Ex em) Megablock with SpurGuard™

#### Unloaded current consumption

No. of Ports	4	8	10	12
mA	1.7	2.5	2.9	3.2

#### Spur device current

29mA maximum (recommend one device per spur)

#### Spur short-circuit current

40mA maximum

#### Trunk-to-trunk voltage drop

0.1V maximum

#### Trunk-to-spur voltage drop

0.3V maximum

## PHYSICAL NETWORK

IEC 61158-2

Foundation™ fieldbus H1

Profibus PA

Note 1: The minimum input voltage guarantees that the spur output under full load will be at least 9.3V so that the device will see at least 9.0V.

The given data is only intended as a product description and should not be regarded as a legal warranty of properties or guarantee. In the interest of further technical developments, we reserve the right to make design changes.



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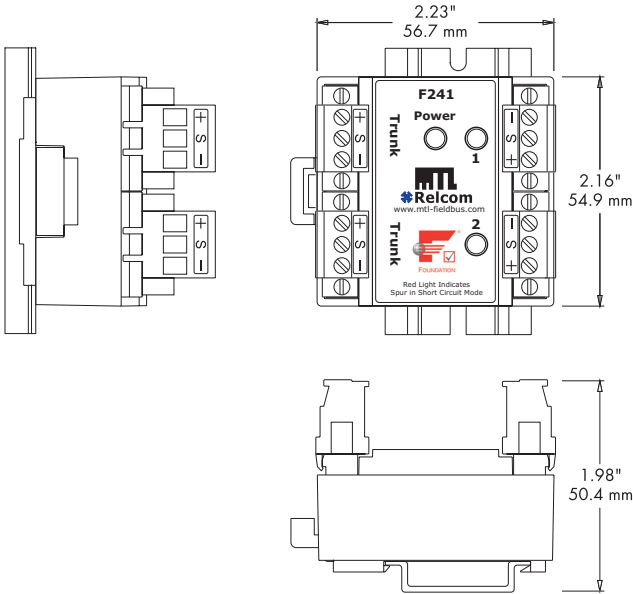
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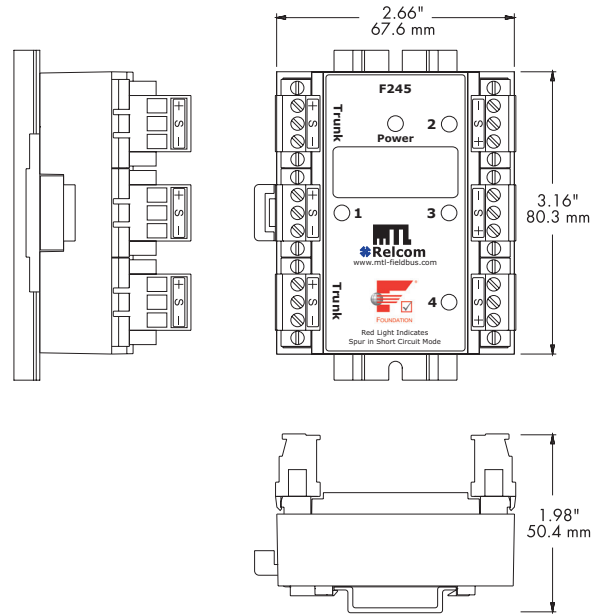
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## CASE DIMENSIONS

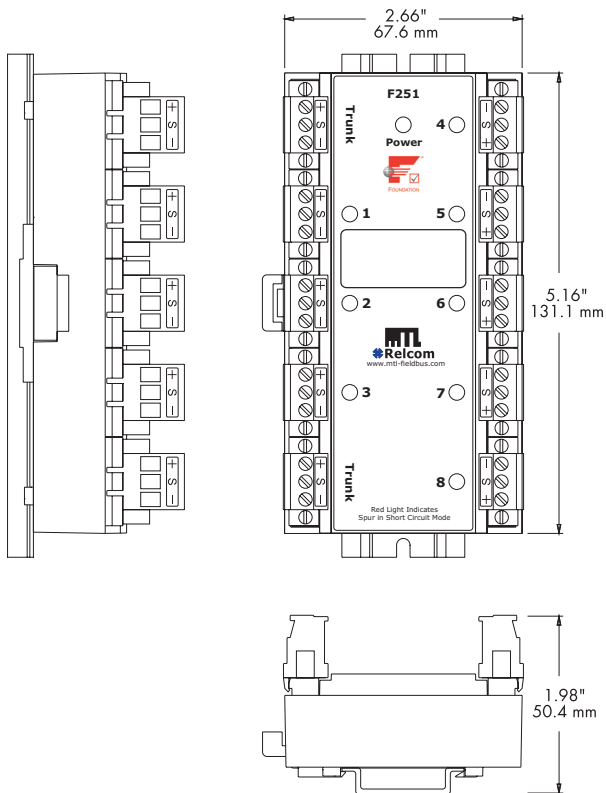
### 2-WAY - F241



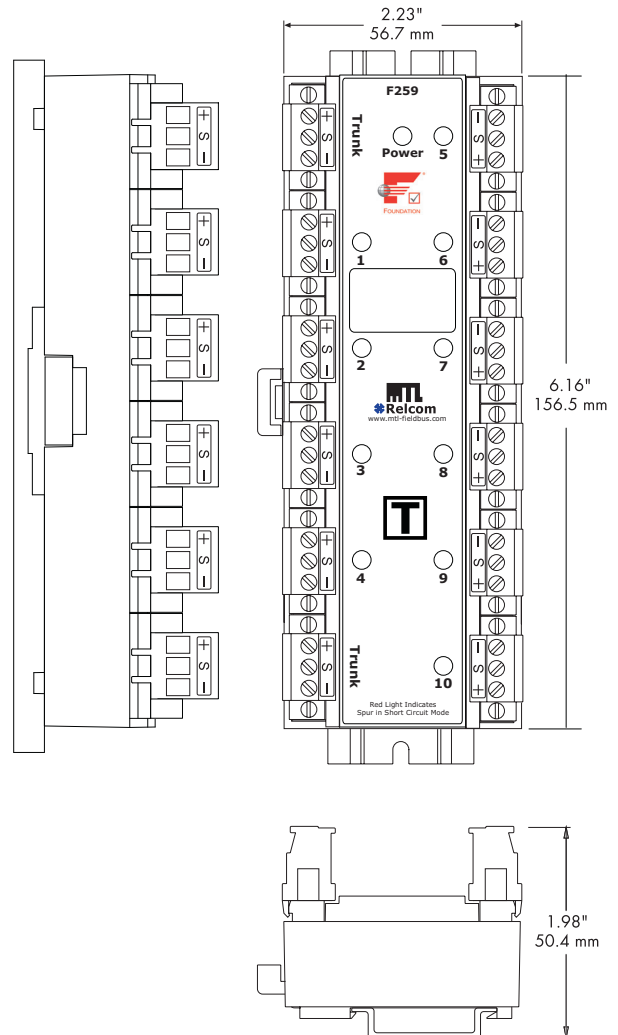
### 4-WAY - F245(-XE), F247(-XE)



### 8-WAY - F251(-XE), F253(-XE)



### 10-WAY - F259(-XE), F261



**Note: Different Megablock versions have minor variations in labelling.**

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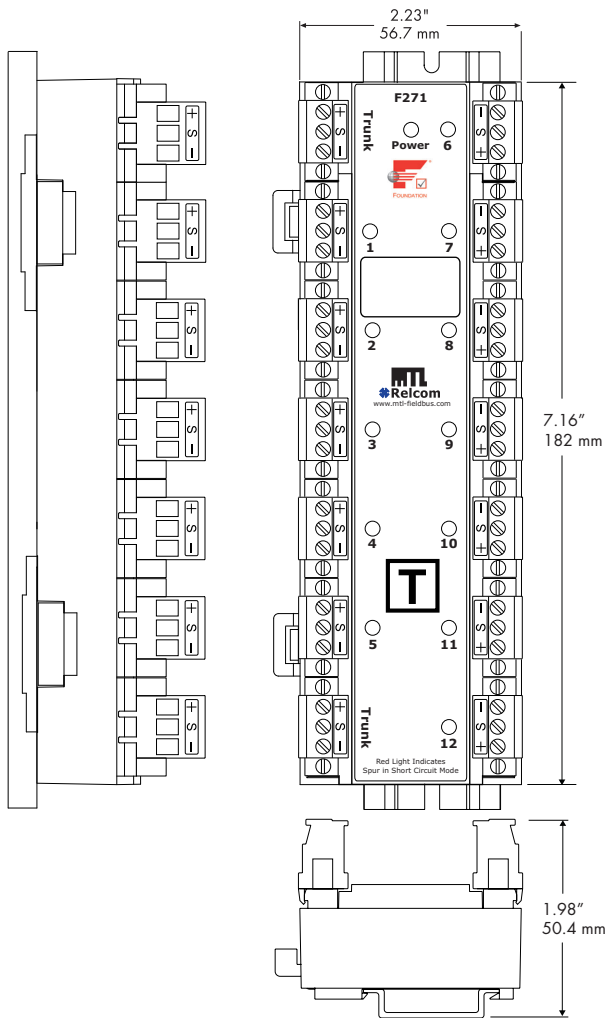
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## CASE DIMENSIONS (cont)

### 12-WAY - F271(-XE)



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**APPROVALS - for full certification information visit [www.mtl-inst.com/support/certificates/](http://www.mtl-inst.com/support/certificates/)**

**MODELS - F241, F245, F247, F251, F253, F259, F261, F271†**

Country	Global	Europe	USA	USA & Canada	International				
Authority	Fieldbus Foundation™	KEMA (ATEX)	FM	CSA	LCI (IECEx)				
Standard	FF-846	EN 60079-0 : 2006* EN 60079-11 : 2007*	3600 1998 3610 2010 3810 1989 inc. Supplement No.1 1995 ANSI/ISA 60079-0 2009 ANSI/ISA 60079-11 2009	C22.2 No. 0 - M1982 CAN/CSA-C22.2 No.1010.1-92 CAN/CSA-C22.2 No.1010.1B-97 T.I.L. No. I-29 C22.2 No. 157-92 CAN/CSA - E79-0-95 CAN/CSA - E79-11-95 FM3600 - November 1998 FM3610 - October 1999	IEC 60079-0 : 2007 IEC 60079-11 : 2006 IEC 60079-27 : 2005				
Approved for	See specification	⊕ II 2G Ex ia IIC T4	IS//1/ABCD/T4 Ta=70°C I/O/AEx ia IIC T4 Ta=70°C	Class I, Division 1 Groups A, B, C and D (Temp Code T4) Ex ia IIC T4	Ex ia IIC T4 Ga				
Certificate no.	DC067300	KEMA03ATEX1555X	3020445	1422741	IECEx LCI 11.0068X				
Apparatus parameters (Trunk)	See specification	ENTITY Intrinsically safe Ui ≤ 24V Ii ≤ 250mA Ci = 0 Li = 0 Pi ≤ 1.2W	FISCO Intrinsically safe Vmax = 24V Imax = 250mA Ci = 0 Li = 0 Pi = 1.2W	ENTITY Intrinsically safe Vmax = 17.5V Imax = 380mA Ci = 0 Li = 0 Pi = 5.32W	FISCO Intrinsically safe Vmax = 17.5V Imax = 380mA Ci = 0 Li = 0 Pi = 5.32W	ENTITY Intrinsically safe Vmax, Ui = 24V Vmax, Ii = 250mA Ci = 0 Li = 0 Pi = 1.2W	FISCO Intrinsically safe Vmax, Ui = 17.5V Vmax, Ii = 380mA Ci = 0 Li = 0 Pi = 5.32W	ENTITY Intrinsically safe Ui = 24V Ii = 250mA Ci = 0 Li = 0 Pi = 1.2W	FISCO Intrinsically safe Ui = 17.5V Ii = 380mA Ci = 0 Li = 0 Pi = 5.32W

\* the original KEMA Certificate used EN 50014:1997 and EN 50020:2002. We have determined that there are no technical differences (affecting the products) between these standards and the currently harmonized EN standards listed above.

† Model F271 currently has only Fieldbus Foundation™, ATEX and IECEx approval to the standards indicated.

**MODELS - F245-XE, F247-XE, F251-XE, F253-XE, F259-XE, F271-XE**

Country	Global	Europe
Authority	Fieldbus Foundation™	KEMA (ATEX)
Standard	FF-846	EN 60079-0 : 2009 ‡ EN 60079-7 : 2007 ‡ EN 60079-18 : 2009 ‡
Approved for	See specification	⊕ II 2 G Ex em IIC T4
Certificate no.	DC067300	KEMA05ATEX2006
Trunk wiring parameters	See specification	Rated voltage 30V DC Rated current 1.5A

‡ The original KEMA Certificate used EN 60079-0:2004, EN60079-7:2001, and EN6007 9-18:2004. We have determined that there are no technological differences (affecting the products) between these standards and the currently harmonized EN standards listed here.

**ORDERING INFORMATION**

	Zone/Division 1 Intrinsically Safe	Zone 1 Ex em
Megablocks		
2 way	F241	-
4 way	F245	F245-XE
4 way with internal Terminator	F247	F247-XE
8 way	F251	F251-XE
8 way with internal Terminator	F253	F253-XE
10 way	-	-
10 way with internal Terminator	F259	F259-XE
10 way with switched Terminator	F261	-
12 way	-	-
12 way with internal terminator	F271	F271-XE
12 way with switched Terminator	-	-

See Fieldbus Terminators datasheet for details of separate, DIN-rail mounted terminators

**ACCESSORIES**

Description	Part Number
Heavy Duty DIN rail end stop	ETL7000
35mm DIN Rail, 1 metre lengthw	THR7000
Process JB stainless steel, painted‡	FCS-75XX
Process JB carbon loaded GRP‡	FCS-85XX
Process JB stainless steel‡	FCS-95XX

‡ See Process JB data sheets for further details

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