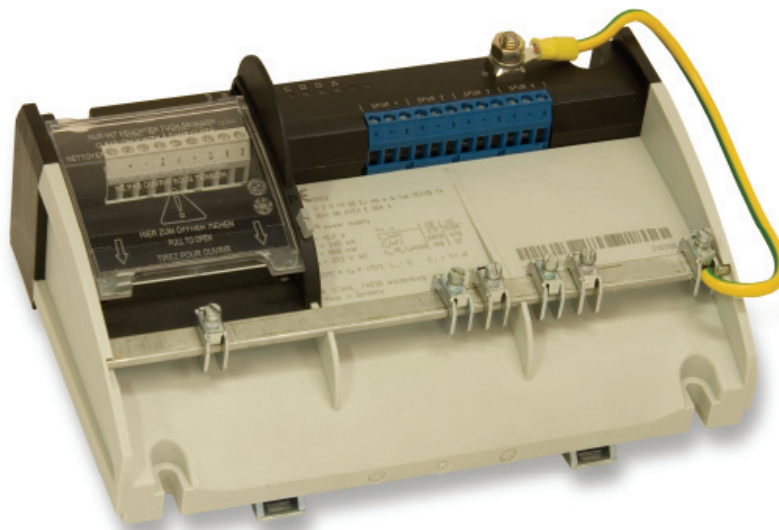


## 4-spur fieldbus barrier for FOUNDATION fieldbus™ H1 and Profibus PA

# 9311-FB

(Ordered as 9411/21-2xx-31 Series)



CE

- ◆ 4 short-circuit protected IS spurs
- ◆ Bus powered
- ◆ Mount in Zone 1/Zone 2 (gas) or Zone 21/Zone 22 (dust)
- ◆ EEx ia IIC spur connections
- ◆ EEx e trunk connections
- ◆ Standard and customer-specific enclosures available
- ◆ FISCO compatible spur wiring
- ◆ Capacitive or direct earthing options
- ◆ Screw terminal or spring clamp terminal options

The **9311-FB** is a field-mounted wiring hub that creates four intrinsically safe spur connections from a non-intrinsically safe trunk, for connection to FOUNDATION fieldbus™ H1 or Profibus-PA fieldbus instruments. The spurs are galvanically isolated from the trunk and require no protective ground connection in the field. Spur short-circuit protection is provided.

It may be installed in a **Zone 1/Zone 2 (gas) or Zone 21/Zone 22 (dust) hazardous area**, with the trunk wiring implemented using suitably protected cable and increased safety (Ex e) connection facilities. Up to four 9311-FB fieldbus barrier modules may be connected together on one hazardous area trunk, allowing up to sixteen intrinsically safe fieldbus devices to be supported on the hazardous area segment. The 9311-FB is ideal for lightly loaded fieldbus segments. For applications requiring more than four intrinsically safe spurs per segment, consider also the 8-spur fieldbus barrier 9312-FB.

The **9311-FB 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 MTL-Relcom FPS-Series or F800 Series power supplies.

The **9311-FB is DIN-rail mountable** for installation in a wide variety of field enclosures. Standard enclosures accommodating single fieldbus barrier modules are available in either glass-reinforced polyester or stainless steel. Additionally, complete enclosure systems, meeting specific environmental requirements, can be provided for single or multiple Fieldbus Barrier modules. Ex-certified isolating switches are also available to permit removal and replacement of Fieldbus Barrier modules while under power in the hazardous area. Consult MTL for further information.



## SPECIFICATION

### TRUNK

#### Data rate

31.25kbaud

#### Data transmission between trunk and spurs

passive, no repeater function

#### Number of trunks

2 connections (in & out)

#### Input voltage (trunk)

16–32V DC

#### Low voltage monitoring

Input voltage < 16V, spurs de-energized

#### Max. DC current

	at 16V	at 24V	at 32V
0mA each spur	28mA	24mA	22mA
20mA each spur	120mA	80mA	65mA
40mA each spur	220mA	140mA	105mA

3 spurs @ 40mA, 1 spur in short-circuit	235mA	150mA	105mA
short-circuit all spurs	< 80mA	< 60mA	< 50mA

#### Max. power dissipation

1.4W

#### Reverse polarity protection

Yes

### SPURS

#### Number of spurs

4

#### Available current per spur

0 - 40mA

#### Spur voltage

≥ 10V @ 40mA per spur

#### No-load voltage

12V min.

#### Max. internal resistance

65Ω

#### Number of field devices

1 per spur

#### Maximum spur length

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

#### Galvanic isolation (to EN 50020)

Trunk to spurs:	1.5kV (test voltage)
Spur to spur:	no isolation

## ELECTRICAL CONNECTIONS

### Bus termination

100Ω + 1ΩF according to IEC 61158-2

Move jumper from 'park' position to terminals marked 'T'.

### Grounding of cable screens (trunk & spurs)

Direct earth - connect to earth bar (not to 'S' terminals)

Capacitive earth - via 4.7nF (connect to 'S' terminals)

**Note:** For enclosure types 9311-FB-xx-SS the earthing stud is internally connected to the enclosure.

## LED INDICATORS

### Spurs 'S1' - 'S4' (yellow, per spur)

Not connected:	off
In range (0–42mA):	on
Short circuit (>42mA):	flashing

### ERR (red)

One or more spurs:	flashing
Fieldbus barrier error:	on

### Power (green)

Trunk voltage > 16V: on

## PHYSICAL NETWORKS

IEC61158-2

FOUNDATION fieldbus™ H1/Profibus PA

## ENVIRONMENTAL

### Ambient temperature

module	standard enclosure	storage
–40°C ... +75°C	–20°C ... +70°C	–40°C ... +75°C

### Relative humidity

< 95%, non-condensing

### Electromagnetic compatibility

EN 61326 (IEC/EN 61000-4-1...6 and 11; EN 55022 class B);

NAMUR NE 21 (IEC/EN 61000-4-1...6, 8 and 11; EN 55022 class B)

## MECHANICAL

### Terminals

3 pole (+, –, screen)

	screw terminals (-ST versions)	spring clamp terminals (-CC versions)	
	trunk & spurs	trunk	spurs
rigid	0.2 – 4mm <sup>2</sup>	0.5 – 2.5mm <sup>2</sup>	0.08 – 2.5mm <sup>2</sup>
flexible	0.25 – 2.5mm <sup>2</sup>	0.5 – 2.5mm <sup>2</sup>	0.08 – 2.5mm <sup>2</sup>

### Cable entries (9311-FB-xx-xx or 9411/21-2x1-31 and 9411/21-2x2-31 enclosures)

Cable glands	4 x M20 blue (Ex i spurs), plastic
	2 x M20 black (Ex e trunk), plastic
	1 x M16 black (earth), plastic
Breathing gland	1 x M25, plastic

### Installation (9311-FB-xx or 9411/21-2x0-31 module)

On DIN rail to EN 50022, or mounting plate

### Mounting position

Horizontal or vertical

### Protection

Intrinsically safe terminals	IP 20
Ex e terminals	IP 30 (enclosure may be opened in hazardous area under power)
Fire protection class	(UL-94) HB
Enclosures (9311-FB-xx-xx)	IP66

## HAZARDOUS AREA APPROVALS

### Location of barrier

Zone 1/Zone 2 (gas) or Zone 21/Zone 22 (dust) hazardous areas

### Location of spur wiring

Zone 0, IIC hazardous area  
(Temperature classification defined by connected apparatus)

### Safety description (each spur)

U<sub>o</sub> < 15.7V, I<sub>o</sub> < 245 mA, P<sub>o</sub> < 960 mW,  
C<sub>i</sub> = 1.1nF, L<sub>i</sub> ~ 0mH  
U<sub>m</sub> = 253V

### Cable parameters (each spur)

IIC	Co = 476nF	Lo = 0.58mH
IIB	Co = 2878nF	Lo = 2.9mH

### Protection category

#### Barrier on DIN rail

⊕ II 2 (1) G D Ex mb e ib [ia] IIC/IIB T4  
Certificate No.: BVS 06 ATEX E 135X (9311-FB-xx-xx)  
BVS 06 ATEX E 003X (9411/21)

T<sub>a</sub> = –40°C ... +75°C

Spurs FISCO according to IEC 60079-27

Suitable enclosure necessary

#### Barrier in enclosure

⊕ II 2 (1) G D Ex mb e ib [ia] IIC/IIB T4

⊕ II 2 D IP 6X T80°C

Certificate No.: BVS 06 ATEX E 135X (9311-FB-xx-xx)  
BVS 06 ATEX E 004X (9411/21-2x1-31  
and 9411/21-2x2-31)

T<sub>a</sub> = –20°C ... +70°C

Spurs FISCO according to IEC 60079-27

### Special Conditions For Safe Use

See certificate



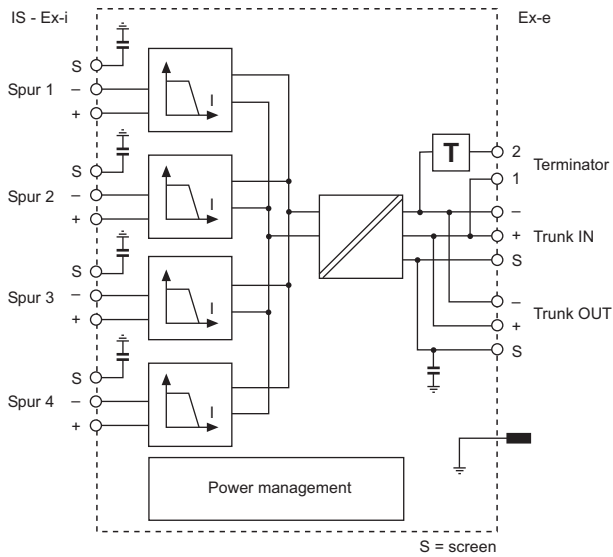
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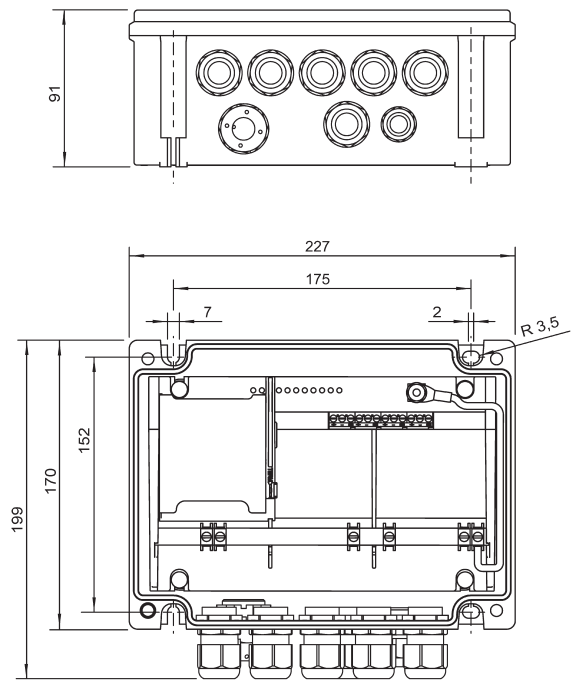
Web site: www.mti-inst.com

### FIELDBUS BARRIER BLOCK DIAGRAM

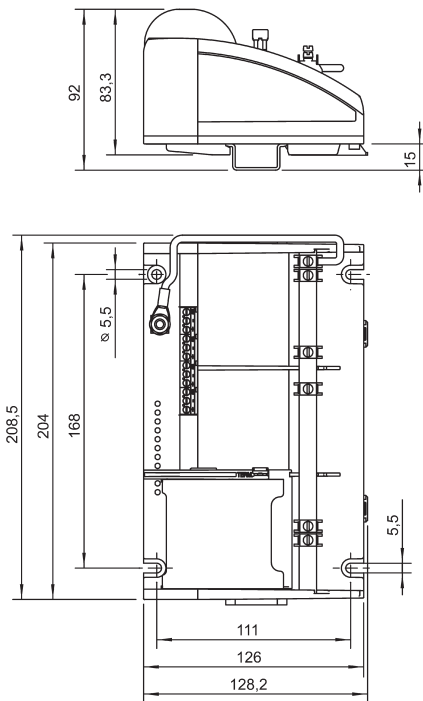


### ENCLOSURES DIMENSIONS

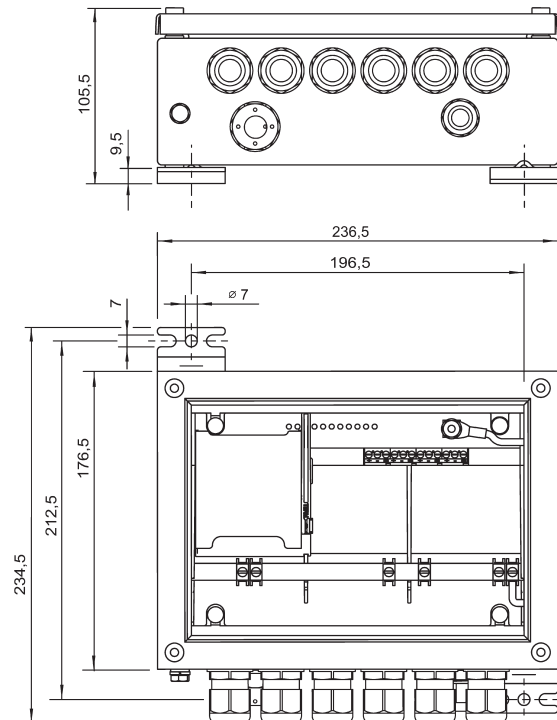
#### 9311-FB-xx-PP and 9411/21-2x1-31 enclosures



### MODULE DIMENSIONS



#### 9311-FB-xx-SS and 9411/21-2x2-31 enclosures



## ORDERING INFORMATION

MTL Model number	Order code	Description
9311-FB-ST	9411/21-210-31	Fieldbus barrier module, screw terminals
9311-FB-ST-PP	9411/21-211-31	Fieldbus barrier module, screw terminals, GRP enclosure
9311-FB-ST-SS	9411/21-212-31	Fieldbus barrier module, screw terminals, stainless steel enclosure
9311-FB-CC	9411/21-220-31	Fieldbus barrier module, spring clamp terminals
9311-FB-CC-PP	9411/21-221-31	Fieldbus barrier module, spring clamp terminals, GRP enclosure
9311-FB-CC-SS	9411/21-222-31	Fieldbus barrier module, spring clamp terminals, stainless steel enclosure



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