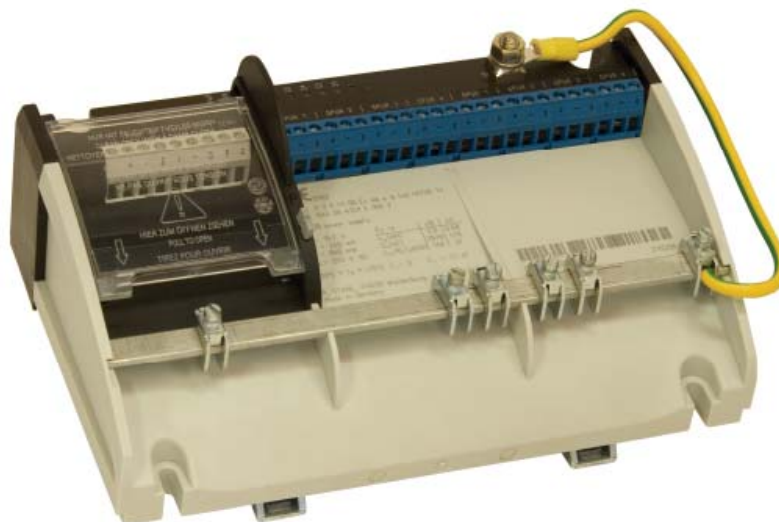


## 8-spur Fieldbus Barrier for FOUNDATION fieldbus™ H1 and Profibus PA



# 9312-FB

(Ordered as 9411/21-2xx-41 Series)



- ◆ 8 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 **9312-FB** is a field-mounted wiring hub that creates eight 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 9312-FB fieldbus barrier modules may be connected together on one hazardous area trunk, allowing large numbers of intrinsically safe fieldbus devices to be supported on the hazardous area segment, limited only by FOUNDATION fieldbus™ rules. The 9312-FB provides a compact and low-cost solution for typical fieldbus segments having between eight and sixteen spurs. For lightly loaded segments, consider the four-spur fieldbus barrier 9311-FB.

The **9312-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 **9312-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), internally connected

#### 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	32mA	26mA	23mA
20mA each spur	223mA	147mA	112mA
7 spurs @ 20mA, 1 spur in short-circuit	265mA	172mA	130mA
short-circuit all spurs	< 90mA	< 70mA	< 60mA

#### Max. power dissipation

1.8W

#### Reverse polarity protection

Yes

### SPURS

#### Number of spurs

8

#### Available current per spur

0 - 40mA

#### Total current available across 8 spurs

160mA max

#### 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 + 1μF 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 9312-FB-xx-SS the earthing stud is internally connected to the enclosure.

### LED INDICATORS

#### Spurs 'S1' - 'S8' (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

#### PWR (green)

Trunk voltage > 16V:	on
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### 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 (9312-FB-xx-xx or 9411/21-2x1-41 and 9411/21-2x2-41 enclosures)

Cable glands	8 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 (9312-FB-xx or 9411/21-2x0-41 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 (9312-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> < 245mA, P<sub>o</sub> < 960mW,

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 (9312-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 (9312-FB-xx-xx)

BVS 06 ATEX E 004X (9411/21-2x1-41

and 9411/21-2x2-41)

T<sub>a</sub> = -40°C ... +70°C

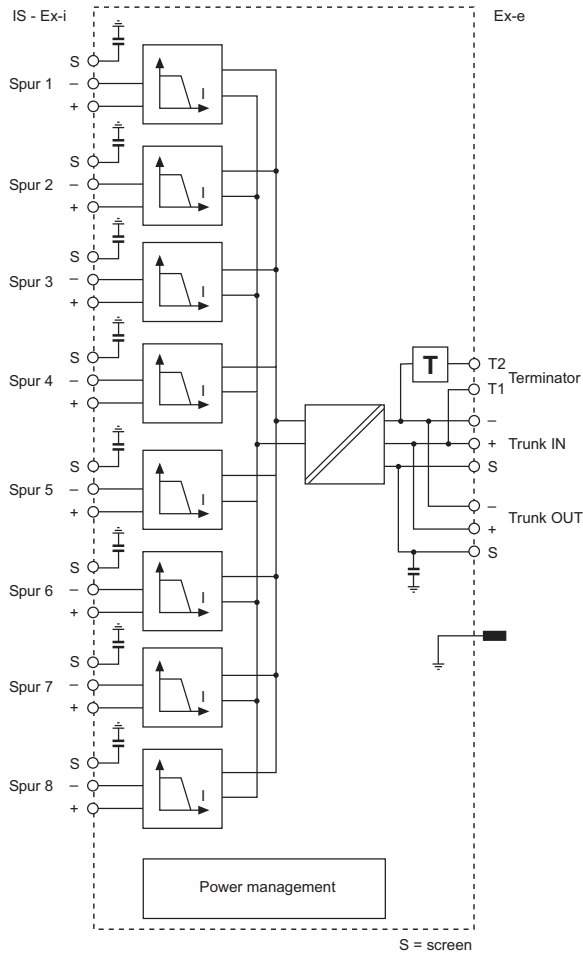
Spurs FISCO according to IEC 60079-27

#### Special Conditions For Safe Use

See certificate

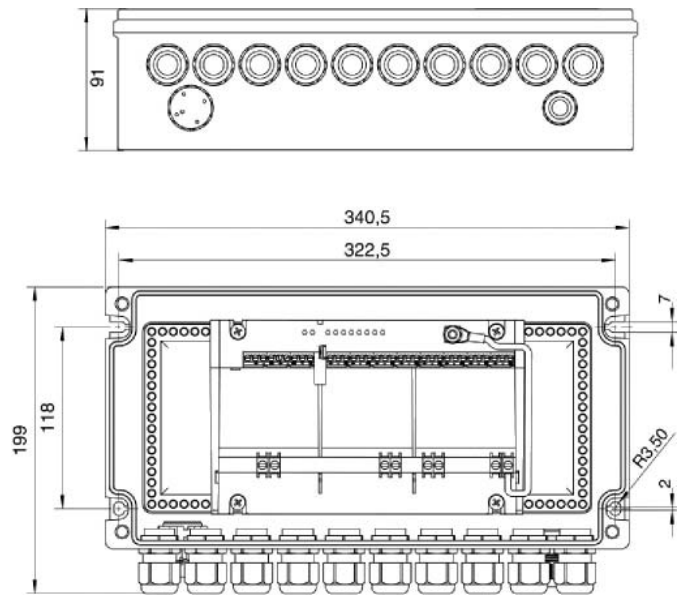


### FIELD BUS BARRIER BLOCK DIAGRAM

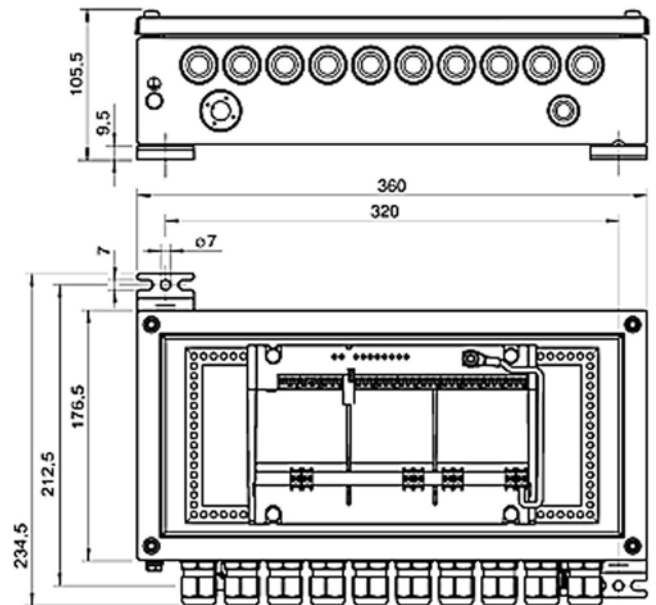


### ENCLOSURES DIMENSIONS

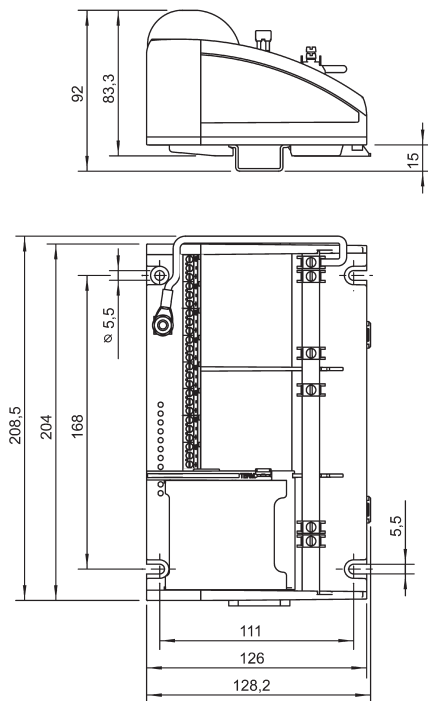
9312-FB-xx-PP and 9411/21-2x1-41 enclosures



9312-FB-xx-SS and 9411/21-2x2-41 enclosures



### MODULE DIMENSIONS



**ORDERING INFORMATION**

<b>MTL Model number</b>	<b>Order code</b>	<b>Description</b>
9312-FB-ST	9411/21-210-41	Fieldbus barrier module, screw terminals
9312-FB-ST-PP	9411/21-211-41	Fieldbus barrier module, screw terminals, GRP enclosure
9312-FB-ST-SS	9411/21-212-41	Fieldbus barrier module, screw terminals, stainless steel enclosure
9312-FB-CC	9411/21-220-41	Fieldbus barrier module, spring clamp terminals
9312-FB-CC-PP	9411/21-221-41	Fieldbus barrier module, spring clamp terminals, GRP enclosure
9312-FB-CC-SS	9411/21-222-41	Fieldbus barrier module, spring clamp terminals, stainless steel enclosure

