Zone 2 Ex i Field Device Coupler 4 Spurs

Series 9411/24

19372E00

- Connection of up to 4 intrinsically safe Entity / FISCO field devices to the high power trunk
- Isolation between intrinsically safe field devices and non-intrinsically safe fieldbus
- Short-circuit protection for each spur
- Reduced starting and low short-circuit current through power management
- LED indication of status and faults on each spur
- Switchable fieldbus-termination on board
- Screw terminals, detachable screw or spring cage terminals (Ex i Spurs)

The Zone 2 Ex i Field Device Couplers are installed in Zone 2 and connect up to 4 intrinsically safe FOUNDATION™ fieldbus H1 or Profibus PA field devices in Zone 1 to a non-intrinsically safe fieldbus (high power trunk). The intrinsically safe spurs comply with Entity / FISCO specifications and are electrically isolated from the trunk. The Field Device Couplers feature a power management to minimize current from the trunk.
The couplers are mounted on DIN rail or directly in enclosures made of glass fibre reinforced polyester or stainless steel. The cable shields can be connected to earth capacitively at the terminals or directly at the cable screen bus bar (optional).

	ATEX / IECEx / GOST					
Zone	0	1	2	20	21	22
Ex interface	x	x	x	x	x	x
Installation in			x		x	x

	NEC 505 Class I			NEC 506		
Zone	0	1	2	20	21	22
Ex interface	x	x	x	x	x	x
Installation in			x		x	x

	NEC 500					
	Class I		Class II		Class III	
Division	1	2	1	2	1	2
Ex interface	x	x	x	x	x	x
Installation in		x		x		x

WebCode 9411E

Zone 2 Ex i Field Device Coupler 4 Spurs
Series 9411/24

Selection Table

Version	Field enclosure	Number of channels (spurs)	Terminals (Spurs)	Order number
Zone 2 Ex i field device coupler	without, DIN rail mount	4	screw terminals	**9411/24-310-31**
			detachable screw terminals	**9411/24-330-31**
			detachable spring cage terminals	**9411/24-340-31**
Note	Field enclosures in polyester or stainless steel: Customer specific solutions on request			

Explosion Protection

Global (IECEx)	
Gas and dust	IECEx BVS 08.0057 X Ex nA [ia Ga] IIC T4 Gc [Ex ia Da] IIIC
Europe (ATEX)	
Gas and dust	BVS 06 ATEX E 004 X Ⓔx II 3 (1)G Ex nA [ia Ga] IIC T4 Gc Ⓔx II (1) D [Ex ia Da] IIIC
USA (NEC)	
Gas	in preparation in preparation
Certificates and approvals	
Certificates	IECEx, ATEX, Canada (CFM), Russia (GOST-R), USA (FM), Belarus (GOST-B)
Further parameters	
Installation	in Zone 2, Zone 22 (dust), Class I, Zone 2, Class I Division 2 and in the safe area Suitable enclosure required e.g. R. STAHL Series 8146 (plastic) or 8125, 8150 (stainless steel)
Safety data (CENELEC) per spur	
	Entity / FISCO (IEC 60079-27)
Max. voltage U_o	15.7 V
Max. current I_o	245 mA
Max. power P_o	960 mW
Max. connectable capacitance C_o for IIC/IIB	476 nF / 2878 nF
Max. connectable inductance L_o for IIC/IIB	0.58 mH / 2.9 mH
Max. internal capacitance C_i	1.1 nF
Max. internal inductance L_i	~ 0 mH
Rated insulation voltage U_m	253 V

Technical Data

Electrical data	
Auxiliary power	not required, the Field Device Coupler is powered from the trunk
Galvanic isolation	
Ex i spurs to trunk	1,5 kV AC
Ex i spur to Ex i spur	No galvanic isolation
Data transmission	
between trunk and spurs	passive, no repeater function
Max. no. of field devices per segment	16 (FF H1), 32 (Profibus PA)
Trunk, not intrinsically safe	
Connections	2 trunk connections (IN, OUT), internally bridged
Voltage range	16 ... 32 V
Undervoltage monitoring	U < 16 V, spurs de-energised
Max. rated input current Trunk IN/OUT	2 A
Max. voltage drop Trunk IN/OUT	60 mV

Technical Data

Electrical data

Trunk, not intrinsically safe						
Max. rated trunk input current		load on spurs:				
	trunk voltage	no load	1 x 20 mA	4 x 20 mA	3 x 20 mA + 1 x short circuit	4 x 41 mA
	16 V	28 mA	54 mA	120 mA	160 mA	220 mA
	32 V	28 mA	46 mA	65 mA	80 mA	115 mA
Max. power dissipation	1.8 W					
Indication	Green LED "PWR" (U ≥ 16 V from trunk)					
Reverse polarity protection	yes					
Max. number of Field Device Couplers	4 per trunk					
Fieldbus terminator	The field device couplers have a built-in, switchable fieldbus terminating resistor 100 Ω + 1 uF (IEC 61158-2). A jumper between the terminals TERM 1 and 2 connects the fieldbus terminating resistance to the trunk. As an alternative, it is also possible to use an external fieldbus terminating resistor Series 9418 at Trunk OUT connection.					
Spurs, intrinsically safe Entity / FISCO Ex i						
Quantity	4					
Max. no. of field devices per spur	1					
Max. cable length	120 m					
Max. steady state DC output current all spurs	41 mA					
Min. output voltage	10 V at 41 mA					
Note	For correct engineering the R. STAHL tool „Fieldbus Wizard“ shall be used (www.stahl.de).					
Min. no-load voltage	12 V					
Max. internal resistance	65 Ω					
Max. short-circuit current	50 mA					
Indication per spur	Yellow LED "S1" ... "S4"					
Earthing of cable shields (trunk and spurs)						
Direct earthing	on the shield bus (option)					
Capacitive earthing spurs	via 4.7 nF at terminal „S“ (grounding bolt M6)					
Capacitive earthing trunk	via 2.35 nF at terminal „S“ (grounding bolt M6)					
Power management	If the trunk voltage exceeds 16 V, the spurs are switched on one after the other to prevent a high start-up current due to the field devices. A short circuit detected on a spur will deactivate the respective spur until the short-circuit is removed. Regardless of how many spurs are short-circuited, the trunk is loaded with max one short-circuit current. This minimises the current consumption of the trunk and the power dissipation under all operating conditions.					
Fault detection						
Spur short-circuit	≥ 42 ... 50 mA					
Indication of short-circuit per spur	Yellow LED "S1" ... "S4", flashes					
Collective error message	Red LED "ERR" flashes					
Error indication on field device coupler	Red LED "ERR"					
Electromagnetic compatibility	Tested to the following standards and regulations: 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)					

Ambient conditions

Ambient temperature	Coupler mounted on DIN rails:	-40 ... +75 °C
Storage temperature	-40 ... +75 °C	
Relative humidity (no condensation)	< 95 %	

Zone 2 Ex i Field Device Coupler 4 Spurs

Series 9411/24

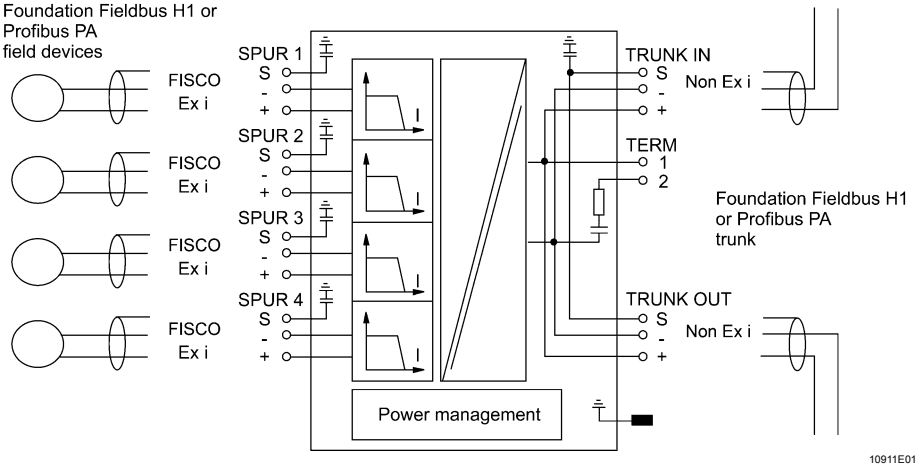
Technical Data

Mechanical data

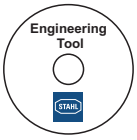
Ingress protection			
Enclosure	IP30		
Ex i terminals	IP20		
Ex e terminals	IP30, cover closed (enclosure may be opened in hazardous area while connected to power)		
Terminals	3pole (+, -, screen)	screw terminals	detachable screw or spring cage terminals
		trunk spurs Ex i	only for spurs Ex i (trunk see “screw terminals“)
	rigid	0.2 ... 4 mm²	0.2 ... 4 mm²
	flexible	0.25 ... 2.5 mm²	0.25 ... 2.5 mm²
	flexible, end covering sleeves	0.25 ... 2.5 mm²	0.25 ... 2.5 mm²
Weight	0.735 kg		
Installation type	on DIN rail, EN 50022 (NS 35/15, NS 35/7.5) or mounting plate		
Installation position	vertical or horizontal		
Fire resistance (UL-94)	HB		

Installation conditions

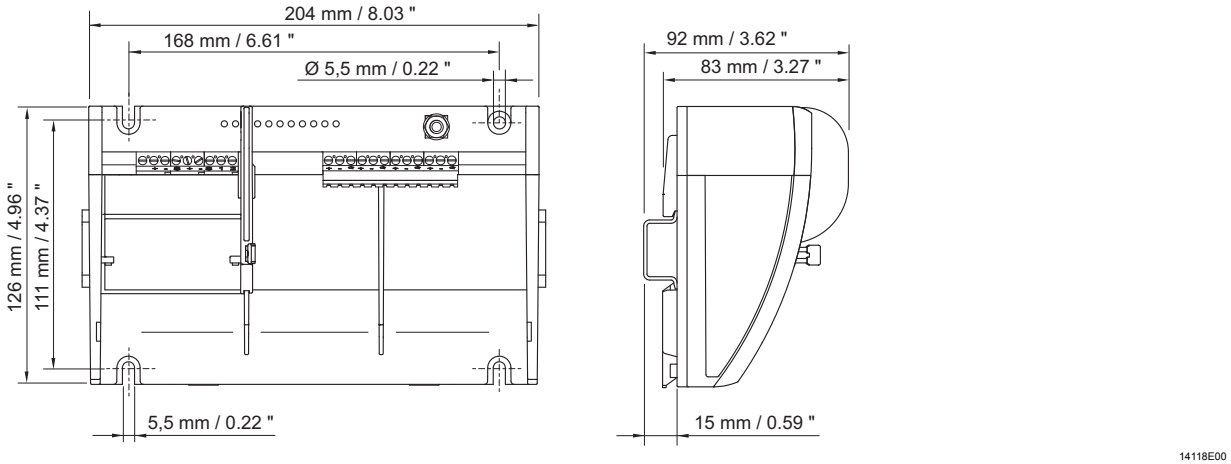
Connection diagram



Accessories and Spare Parts

Designation	Illustration	Description	Order number	Weight kg
Terminating resistor	 06501E00	Fieldbus Terminator "Ex m"	**9418/01-201-10**	0.080
		Fieldbus Terminator "Ex i"	**9418/02-201-10**	0.080
Fieldbus Wizard Engineering Tool	 07376E00	Engineering tool for segment design of fieldbus foundation or Profibus PA fieldbus installations Download under www.fieldbus-solutions.info		
Fieldbus Power Supply	 12783E00	Fieldbus power supply and diagnosis	**9412/00-310-11s**	0.135
	 12809E00	Fieldbus power supply, diagnosis and adjustable warning level	**9412/00-320-11s**	0.135
Earthing bar set 4 K	 01525E00	Earthing bar 9411 spring terminal strap with 6 terminals	**202774**	0.128
		Earthing bar 9411 screw terminals	**161929**	0.080

Dimensional Drawings (All Dimensions in mm / inches) - Subject to Alterations



14118E00

9411/24-3.0-31
Zone 2 Ex i Field Device Coupler without enclosure

We reserve the right to make alterations to the technical data, dimensions, weights, designs and products available without notice. The illustrations cannot be considered binding.