

Zone 1 Ex i Field Device Coupler 8 Spurs

Series 9411/21



www.stahl.de



12195E00

- > Connection of up to 8 intrinsically safe 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 terminals (Ex i Spurs) or spring cage terminals



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The Ex i Field Device Couplers connect up to 8 intrinsically safe FOUNDATION™ fieldbus H1 or Profibus PA field devices to a non-intrinsically safe fieldbus (high power trunk). The intrinsically safe spurs comply with 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. An IP30 cover protects the non-intrinsically safe connections of the trunk so that work can be carried out at any time on the intrinsically safe spurs and field devices.

	ATEX / IECEx / GOST							NEC 505						NEC 506						NEC 500					
	0	1	2	20	21	22		Class I	0	1	2	20	21	22	Division	1	2	1	2	1	2	Class I	Class II	Class III	
Zone	x	x	x	x	x	x	Zone	x	x	x	x	x	x	Division	x	x	x	x	x	x	x	x	x	x	
Ex interface	x	x	x	x	x	x	Ex interface	x	x	x	x	x	x	Ex interface	x	x	x	x	x	x	x	x	x	x	
Installation in	x	x			x	x	Installation in	x	x			x	x	Installation in	x			x			x			x	

WebCode 9411D

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Selection Table

Version	Field enclosure	Number of channels (spurs)	Terminals	Order number
Ex i field device coupler without enclosure	without, DIN rail mount	8	screw terminals	9411/21-210-41
			spring cage terminal	9411/21-220-41
			detachable screw terminals	9411/21-230-41
Ex i field device coupler in the standard enclosure	made of polyester	8	screw terminals	9411/21-211-41
			spring cage terminal	9411/21-221-41
			detachable screw terminals	9411/21-231-41
	made of stainless steel	8	screw terminals	9411/21-212-41
			spring cage terminal	9411/21-222-41
			detachable screw terminals	9411/21-232-41

Explosion Protection

Version	Coupler mounted on DIN rail	Coupler in the standard enclosure
Global (IECEX) Gas and dust	IECEX BVS 08.0057 X Ex mb e ib [ia Ga] IIC T4 Gb [Ex ia Da] IIIC	IECEX BVS 08.0057 X Ex mb e ib [ia Ga] IIC T4 Gb Ex tD A21 IP6X T80°C [ia D]
Europe (ATEX) Gas and dust	BVS 06 ATEX E 004 X ⊕ II 2(1)G Ex mb e ib [ia Ga] IIC T4 Gb ⊕ II (1) D [Ex ia Ga] IIIC	BVS 06 ATEX E 004 X ⊕ II 2(1)G Ex mb e ib [ia Ga] IIC T4 Gb ⊕ II 2(1) D Ex tD A21 IP6X T80°C [ia D]
USA (NEC) Gas	3026646 (FM) see certificate	3026646 (FM) see certificate
Certificates and approvals Certificates	IECEX, ATEX, Brazil (INMETRO), India (PESO), Canada (cFM), Kazakhstan (GOST-K), Russia (GOST-R), Serbia (IZP), USA (FM), Belarus (GOST-B)	IECEX, ATEX, Brazil (INMETRO), India (PESO), Canada (cFM), Kazakhstan (GOST-K), Russia (GOST-R), Serbia (IZP), USA (FM), Belarus (GOST-B)
Further parameters Installation	in Zones 1 and 2, Zones 21 and 22 (dust), Class I, Zones 1 and 2, Class I Division 2 and in the safe area suitable enclosure necessary e.g. R. STAHL Series 8146 (plastic) or 8125, 8150 (stainless steel)	in Zones 1 and 2, Zones 21 and 22 (dust), Class I, Zones 1 and 2, Class I Division 2 and in the safe area
Safety data (CENELEC) per spur		
Max. voltage U_o	FISCO (IEC 60079-27) 15.7 V	FISCO (IEC 60079-27) 15.7 V
Max. current I_o	245 mA	245 mA
Max. power P_o	960 mW	960 mW
Max. connectable capacitance C_o for IIC/IIB	476 nF / 2878 nF	476 nF / 2878 nF
Max. connectable inductance L_o for IIC/IIB	0.58 mH / 2.9 mH	0.58 mH / 2.9 mH
Max. internal capacitance C_i	1.1 nF	1.1 nF
Max. internal inductance L_i	~ 0 mH	~ 0 mH
Rated insulation voltage U_m	253 V	253 V

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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				
Max. rated trunk input current	load on spurs:				
	trunk voltage	no load	1 x 20 mA	8 x 20 mA	7 x 20 mA + 1 x short circuit
	16 V	32 mA	58 mA	225 mA	270 mA
	32 V	32 mA	50 mA	115 mA	135 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 µF (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 FISCO Ex i					
Quantity	8				
Max. no. of field devices per spur	1				
Max. cable length	120 m				
Max. steady state DC output current all spurs	20 mA				
Max. steady state DC current per spur	41 mA (see manual)				
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" ... "S8"				
Earthing of cable shields (trunk and spurs)					
Direct earthing	on grounding bar				
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)				

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Technical Data

Electrical data

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" ... "S8", flashing	
Collective error message	Red LED "ERR" flashes	
Indication of spur causing overload	Yellow LED "S1" ... "S8" flashes quickly	
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
	Coupler built in a standard enclosure:	-20 ... +70 °C
Storage temperature	-40 ... +75 °C	
Relative humidity (no condensation)	< 95 %	

Mechanical data

Ingress protection	IP30				
Enclosure	IP20				
Ex i terminals	IP 30, cover closed				
Ex e terminals	(enclosure may be opened in hazardous area while connected to power)				
Terminals	3 pole (+, -, screen)	screw terminals	spring cage terminals	detachable screw terminals	
		trunk Ex e spurs Ex i	trunk Ex e	spurs Ex i	only for spurs Ex i (trunk Ex e see "screw terminals")
	rigid	0.2 ... 4 mm ²	0.5 ... 2.5 mm ²	0.08 ... 2.5 mm ²	0.2 ... 4 mm ²
	flexible	0.25 ... 2.5 mm ²	0.5 ... 2.5 mm ²	0.08 ... 2.5 mm ²	0.25 ... 2.5 mm ²
	flexible, end covering sleeves	0.25 ... 2.5 mm ²	0.5 ... 1.5 mm ²	0.08 ... 1.5 mm ²	0.25 ... 2.5 mm ²
Weight	9411/21-2.0-41: 0.89 kg 9411/21-2.1-41: 2.35 kg 9411/21-2.2-41: 4.29 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				

Field Device Coupler in a standard enclosure

Version	material	enclosure Series	Field Device Coupler
	polyester	8146/.S71	9411/21-211-41 9411/21-221-41 9411-21-231-41
	stainless steel	8125/.071	9411/21-212-41 9411/21-222-41 9411/21-232-41
Degree of protection	IP66		
Cable glands	cable glands Series 8161	8 x M20 blue (Ex i spurs) 2 x M20 black (Ex e trunk) 1 x M16 black (earth)	
	breathing gland Series 8162	1 x M25	

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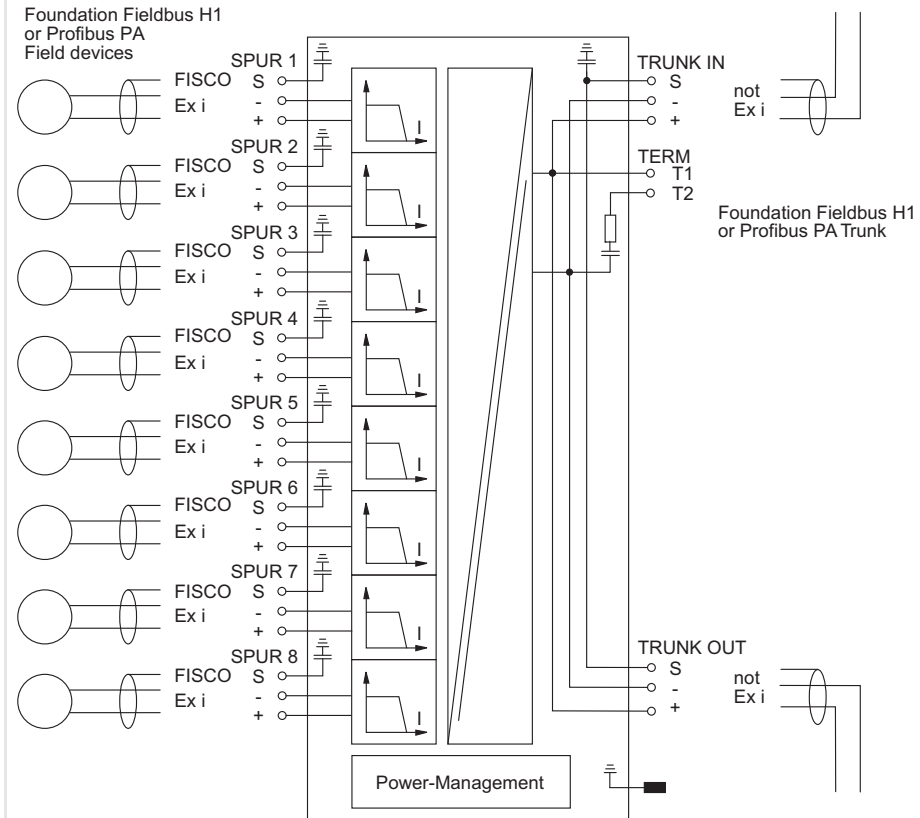
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Technical Data

Installation conditions

Connection diagram



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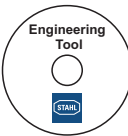




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Accessories and Spare Parts

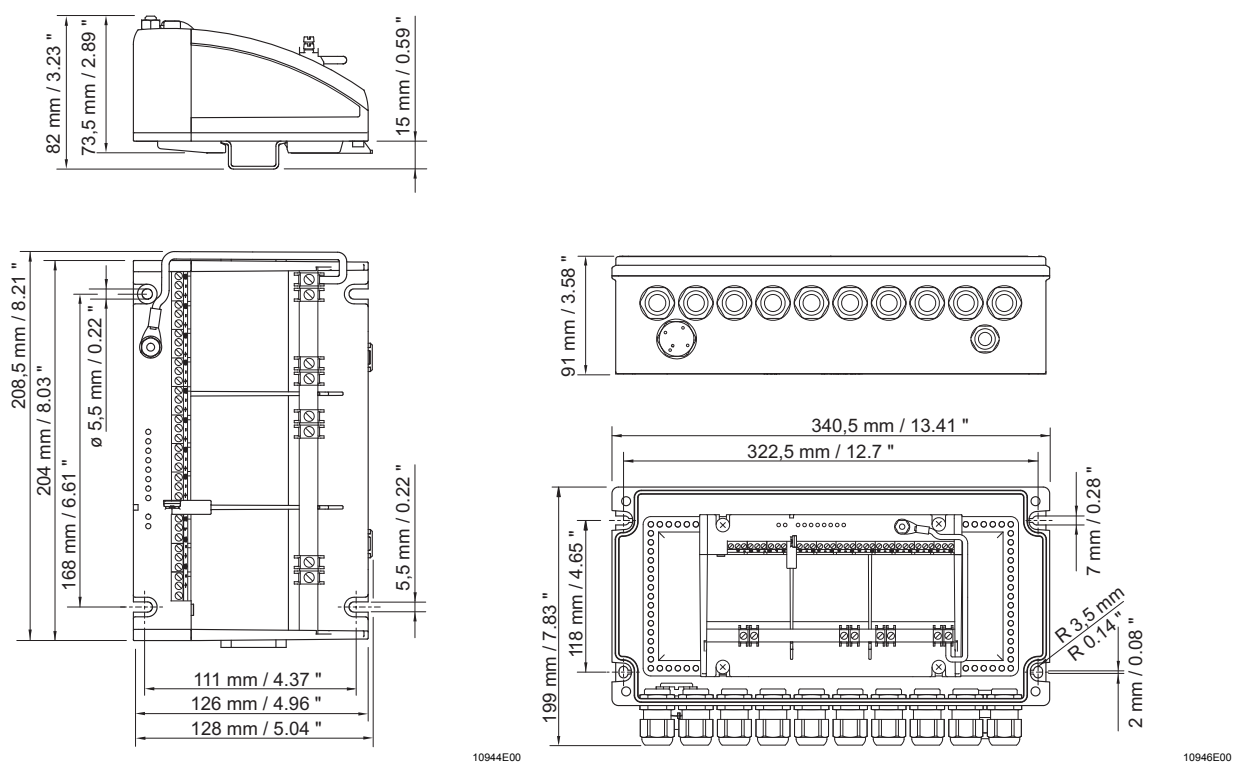
Designation	Illustration	Description	Order number	Weight kg
Terminator	 06501E00	Fieldbus Terminator "Ex m"	9418/01-201-10	0.080
		Fieldbus Terminator "Ex i"	9418/02-201-10	0.080
Fieldbus Wizard Engineering Tool	 07376E00	Engineering tool for segment design of fieldbus foundation or Profibus PA fieldbus 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
Eathing bar set for 4 Spurs	 01525E00	Earthing bar 9411 spring terminal strap with 6 terminals	202774	0.128
Eathing bar set for 8 Spurs	 04079E00	Earthing bar 9411 spring terminal strap with 10 terminals	202775	0.200

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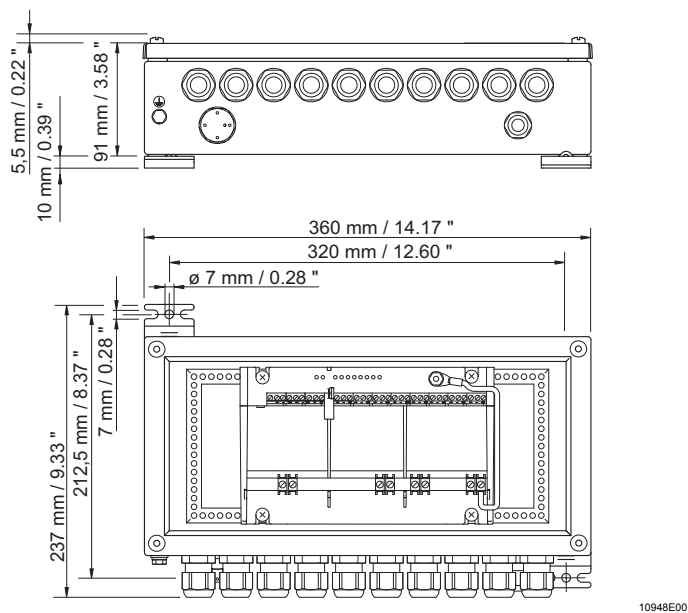


Dimensional Drawings (All Dimensions in mm / inches) - Subject to Alterations



9411/21-2.0-41
Field Device Coupler without enclosure

9411/21-2.1-41
Enclosure 8146/.S71 incl. Field Device Coupler



9411/21-2.2-41
Enclosure 8125/.071 incl. Field Device Coupler

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.

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