

## Zone 1 Ex i Field Device Coupler 4 Spurs Series 9411/21



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11009E00

- > Connection of up to 4 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 4 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 9411C

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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 | 4                          | screw terminals            | 9411/21-210-31 |
|   |                         |                            | spring cage terminal       | 9411/21-220-31 |
|   |                         |                            | detachable screw terminals | 9411/21-230-31 |
| Ex i field device coupler in the standard enclosure | made of polyester       | 4                          | screw terminals            | 9411/21-211-31 |
|   |                         |                            | spring cage terminal       | 9411/21-221-31 |
|   |                         |                            | detachable screw terminals | 9411/21-231-31 |
|   | made of stainless steel | 4                          | screw terminals            | 9411/21-212-31 |
|   |                         |                            | spring cage terminal       | 9411/21-222-31 |
|   |                         |                            | detachable screw terminals | 9411/21-232-31 |

### Explosion Protection

| Version   | Coupler mounted on DIN rail  | Coupler in the standard enclosure   |
|---|--|---|
| <b>Global (IECEX)</b><br>Gas and dust             | IECEX BVS 08.0057 X<br>Ex mb e ib [ia Ga] IIC T4 Gb<br>[Ex ia Da] IIIC   | IECEX BVS 08.0057 X<br>Ex mb e ib [ia Ga] IIC T4 Gb<br>Ex tD A21 IP6X T80°C [ia D]  |
| <b>Europe (ATEX)</b><br>Gas and dust              | BVS 06 ATEX E 004 X<br>⊕ II 2(1)G Ex mb e ib [ia Ga] IIC T4 Gb<br>⊕ II (1) D [Ex ia Ga] IIIC   | BVS 06 ATEX E 004 X<br>⊕ II 2(1)G Ex mb e ib [ia Ga] IIC T4 Gb<br>⊕ II 2(1) D Ex tD A21 IP6X T80°C [ia D]                                 |
| <b>USA (NEC)</b><br>Gas                           | 3026646 (FM)<br>see certificate  | 3026646 (FM)<br>see certificate   |
| <b>Certificates and approvals</b><br>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) |
| <b>Further parameters</b><br>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<br>suitable enclosure necessary<br>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                                 |
| <b>Safety data (CENELEC) per spur</b>             |  |   |
| Max. voltage $U_o$                                | FISCO (IEC 60079-27)<br>15.7 V   | FISCO (IEC 60079-27)<br>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 | 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 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                                      | 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 ( <a href="http://www.stahl.de">www.stahl.de</a> ).  |         |           |           |                               |           |
| 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 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)  |         |           |           |                               |           |
| 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. |         |           |           |                               |           |

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### Technical Data

#### Electrical data

|  |  |
|--|--|
| Fault detection<br>Spur short-circuit<br>Indication of short-circuit per spur<br>Collective error message<br>Error indication on field device coupler<br>Electromagnetic compatibility | ≥ 42 ... 50 mA<br>Yellow LED "S1" ... "S4", flashes<br>Red LED "ERR" flashes<br>Red LED "ERR"<br>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<br>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<br>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 <sup>2</sup>    | 0.5 ... 2.5 mm <sup>2</sup> | 0.08 ... 2.5 mm <sup>2</sup> | 0.2 ... 4 mm <sup>2</sup>                              |
|                         | flexible  | 0.25 ... 2.5 mm <sup>2</sup> | 0.5 ... 2.5 mm <sup>2</sup> | 0.08 ... 2.5 mm <sup>2</sup> | 0.25 ... 2.5 mm <sup>2</sup>                           |
|                         | flexible, end covering sleeves  | 0.25 ... 2.5 mm <sup>2</sup> | 0.5 ... 1.5 mm <sup>2</sup> | 0.08 ... 1.5 mm <sup>2</sup> | 0.25 ... 2.5 mm <sup>2</sup>                           |
| Weight                  | 9411/21-2.0-31: 0.87 kg<br>9411/21-2.1-31: 1.90 kg<br>9411/21-2.2-31: 3.20 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/.061                 | 9411/21-211-31<br>9411/21-221-31<br>9411-21-231-31                               |
| Degree of protection | cable glands Series 8161 | stainless steel 8125/.061 | 9411/21-212-31<br>9411/21-222-31<br>9411/21-232-31                               |
|                      |                          |                           | 4 x M20 blue (Ex i spurs)<br>2 x M20 black (Ex e trunk)<br>1 x M16 black (earth) |
|                      |                          |                           | breathing gland Series 8162  |

# Zone 1 Ex i Field Device Coupler 4 Spurs

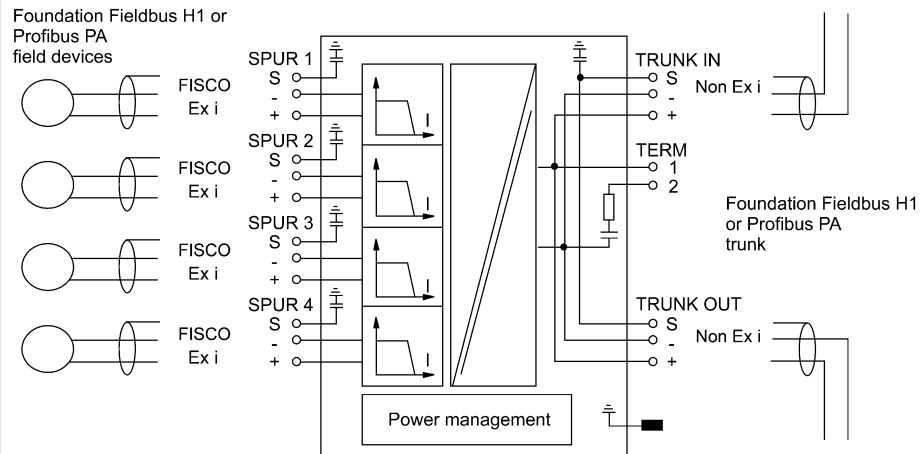
## Series 9411/21




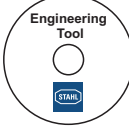




### Technical Data

#### Installation conditions

Connection diagram



#### Accessories and Spare Parts

| Designation                      | Illustration  | Description   | Order number           | Weight<br>kg |
|----------------------------------|---|---|------------------------|--------------|
| Terminator                       | <br>06501E00 | Fieldbus Terminator "Ex m"  | <b>9418/01-201-10</b>  | 0.080        |
|                                  |   | Fieldbus Terminator "Ex i"  | <b>9418/02-201-10</b>  | 0.080        |
| Fieldbus Wizard Engineering Tool | <br>07376E00 | Engineering tool for segment design of fieldbus foundation or Profibus PA fieldbus installations<br>Download under <a href="http://www.fieldbus-solutions.info">www.fieldbus-solutions.info</a> |                        |              |
| Fieldbus Power Supply            | <br>12783E00 | Fieldbus power supply and diagnosis   | <b>9412/00-310-11s</b> | 0.135        |
|                                  | <br>12809E00 | Fieldbus power supply, diagnosis and adjustable warning level   | <b>9412/00-320-11s</b> | 0.135        |
| Earthing bar set for 4 Spurs     | <br>01525E00 | Earthing bar 9411 spring terminal strap with 6 terminals  | <b>202774</b>          | 0.128        |
| Earthing bar set for 8 Spurs     | <br>04079E00 | Earthing bar 9411 spring terminal strap with 10 terminals   | <b>202775</b>          | 0.200        |

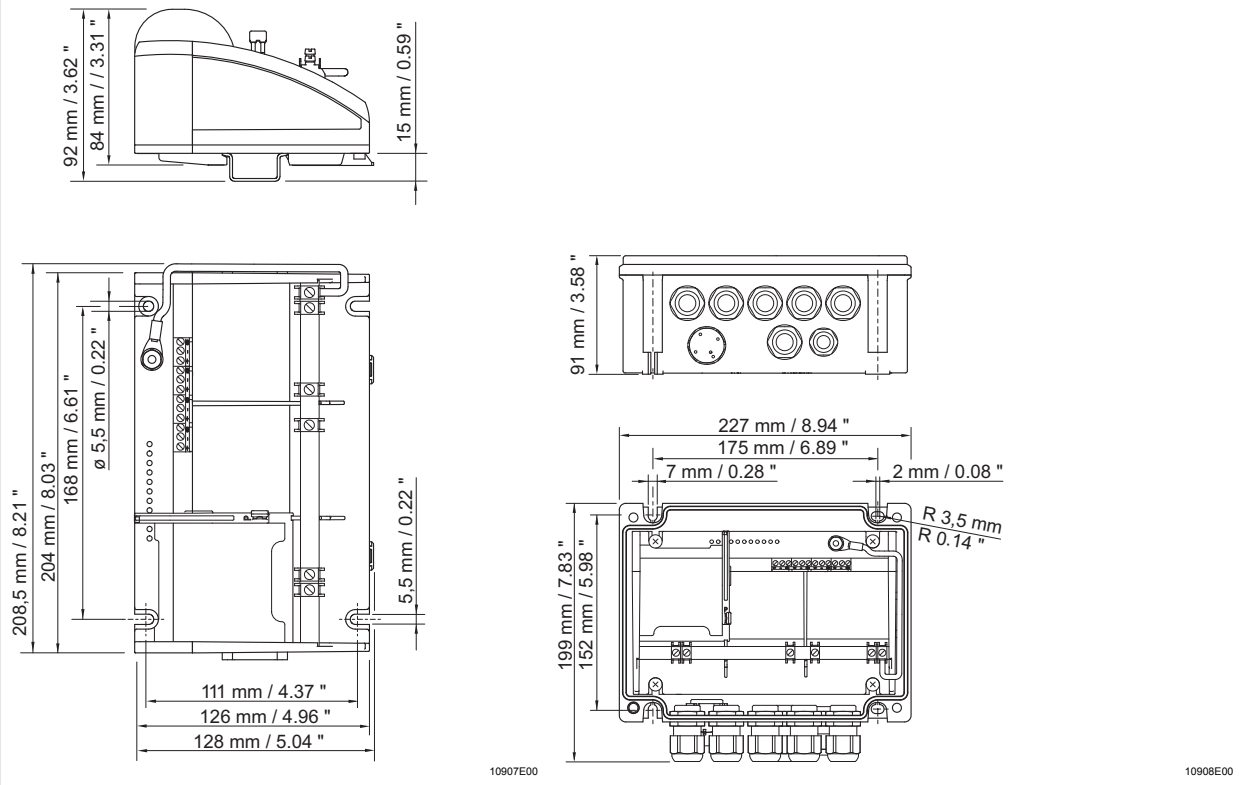
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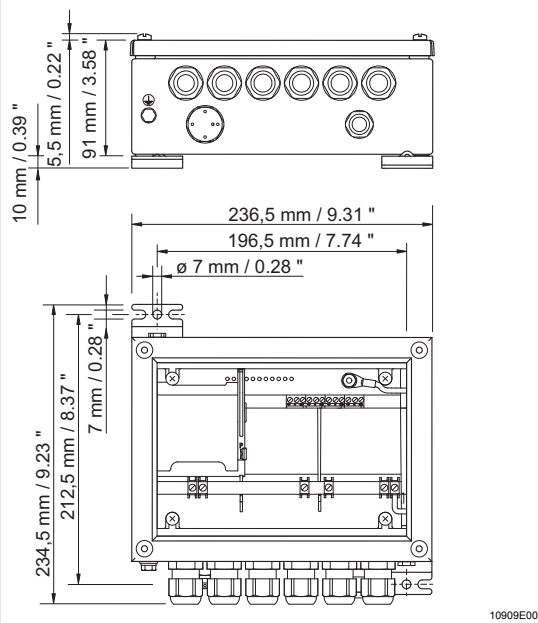


**Dimensional Drawings** (All Dimensions in mm / inches) - Subject to Alterations



**9411/21-2.0-31**  
Field Device Coupler without enclosure

**9411/21-2.1-31**  
Enclosure 8146/.061 incl. Field Device Coupler



**9411/21-2.2-31**  
Enclosure 8125/.061 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.