

Network and Wireless Solutions

ISbus fieldbus technology Field device coupler, 8 spurs

for Zone 1 Ex i

9411/21-230-41 Art. No. 206829



- For connecting eight intrinsically safe (FISCO/Entity) fieldbus devices in Zone 1 and Class I, Div. 1
- Operated using High Power Trunk concept
- Reduced start-up current thanks to power management and short-circuit limiting with disconnection

MY R. STAHL 9411D



9411/21 series Ex i field device couplers for installation in Zone 1 and Class I, Div. 2 with galvanic separation can be used for interference-free connection of eight FF H1 or PROFIBUS PA field devices on the High Power Trunk. The spurs with type of protection "ia" can be used for fieldbus devices in Zone 1 and Class I, Div. 1 (FISCO, Entity) and are protected by a short-circuit limiting function.

The integrated power management minimizes start-up and short-circuit currents.

Available with screw terminals or spring clamp terminals.

Technical Data

Explosion Protection

| | |
|---------------------------------|--|
| Application range (zones) | 1, 2 |
| Ex interface zone | 0, 1, 2, 20, 21, 22 |
| IECEX gas certificate | IECEX BVS 08.0057X |
| IECEX gas explosion protection | Ex mb e ib [ja Ga] IIC T4 Gb |
| IECEX dust certificate | IECEX BVS 08.0057X |
| IECEX dust explosion protection | [Ex ia Da] IIIC |
| ATEX gas certificate | BVS 06 ATEX E 004 X |
| ATEX gas certificate | BVS 06 ATEX E 004 X |
| ATEX gas explosion protection | Ex II 2 (1) G Ex mb e ib [ja Ga] IIC T4 Gb |
| ATEX dust certificate | BVS 06 ATEX E 004 X |
| ATEX dust explosion protection | Ex II (1) D [Ex ia Da] IIIC |
| FMus certificate | 3026646 |
| cFM certificate | 3026646C |
| Marking cFMus | NI, Class I, Div. 2, Groups A,B,C,D; T4, AIS Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G; Class I, Zone 1, AEx/Ex m e [ia] IIC T4 T4 at Ta = 75°C See Doc. 9411 6 031 001 1 |
| Certificates | ATEX (BVS), Brazil (ULB), Canada (FM), IECEX (BVS), India (PESO), International (FF), USA (FM) |

Safety Data

| | |
|---------------------------|--------|
| Max. voltage U_o/V_{oc} | 15.7 V |
| Max. current I_o/I_{sc} | 245 mA |
| Max. power P_o | 960 mW |

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Safety Data

| | |
|--|--------------|
| Max. permissible external capacitance C_j/C_a for IIC | 476 μ F |
| Max. permissible external inductance L_j/L_a for IIC | 0.58 mH |
| Max. permissible external capacitance C_j/C_a for IIB | 2878 μ F |
| Max. permissible external inductance L_j/L_a for IIB | 2.9 mH |
| Internal capacitance | 1.1 nF |
| Internal inductance | ~ 0 mH |
| Safety-related max. voltage | 253 V |

Electrical Data

| | |
|--|--|
| Max. number of field devices per segment | 16 (FF H1) 32 (Profibus PA) |
| Data transmission trunk and spurs | Passive No repeater function |
| Max. number of field device couplers | 4 per trunk |
| Power Management | If the voltage on the trunk exceeds 16 V, the spurs are switched on consecutively in order to avoid a high start-up current through the field devices. If a spur short circuit is detected, the affected spur is disconnected until the short circuit is removed. The trunk is loaded with max. one short-circuit current, regardless of how many spurs are short-circuited. This minimises the current drawn by the trunk and the power dissipation under all operating conditions. |
| Fieldbus termination | The field device couplers have a built-in, connectable terminator 100 Ω + 1 μ F (IEC 61158-2). A jumper between the TERM 1 and 2 terminals connects the terminator to the trunk. As an alternative, it is also possible to use a Series 9418 external terminator at the trunk OUT connection. |

Auxiliary Power

| | |
|------------------------|--|
| Max. power dissipation | 1.8 W |
| Auxiliary power | Not required; the field device coupler is supplied from the trunk. |

Galvanic Isolation

| | |
|---|------------------------|
| Galvanic separation Ex i spur/trunk | 1500 V AC |
| Galvanic separation Ex i spur/Ex i spur | No galvanic separation |

Input

| | |
|--|--|
| Trunk connections | 2 (IN/OUT) Bridged internally |
| Trunk version | High power trunk/Ex e |
| Voltage range | 16 – 32 V |
| Input undervoltage monitoring | < 16 V, spurs de-energised |
| Max. trunk voltage IN/OUT | 2 A |
| Max. trunk voltage drop IN/OUT | 60 mV |
| Trunk polarity reversal protection | Yes |
| Trunk earthing | Direct on shield bus Capacitive over 5.2 nF |
| Max. input current Trunk, voltage 16 V | Without load on spurs: 32 mA Load on spurs 1 x 20 mA: 58 mA Load on spurs 8 x 20 mA: 225 mA Load on spurs 7 x 20 mA + 1 x short circuit: 270 mA |

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Input

| | |
|--|--|
| Max. input current Trunk, voltage 32 V | Without load on spurs: 32 mA Load on spurs 1 x 20 mA: 50 mA Load on spurs 8 x 20 mA: 115 mA Load on spurs 7 x 20 mA + 1 x short circuit: 135 mA |
|--|--|

Output

| | |
|---------------------------------------|--|
| Output voltage | Min. 10 V at 41 mA |
| Max. number of field devices per spur | 1 |
| Max. cable length | 120 m |
| Max. continuous output current DC | 20 mA |
| Output max. short-circuit current | 50 mA |
| Spurs earthing | Direct on shield bus Capacitive over 4.7 nF |

Field Device Interface

| | |
|-----------------------|-------------------------------|
| Spurs version | Intrinsically safe FISCO Ex i |
| Spurs connections | 8 |
| Spurs connection type | Detachable screw terminal |

Device Specific Data

| | |
|--------------------------------|--|
| Trunk LED operating conditions | "RUN" LED, green |
| Spurs operating condition LED | "S1" to "S8" LED, yellow |
| LED error indication | "ERR" LED, red |
| Error detection | Short circuit \geq 42 to 50 mA |
| Short circuit indication | "S1" to "S8" LED Yellow, flashes |
| Note | The R. STAHL "Fieldbus wizard" tool (r-stahl.com) must be used for correct project engineering. |

Diagnostics

| | |
|-----------------|-------------------------|
| LED group error | Red "ERR" LED, flashing |
|-----------------|-------------------------|

Ambient Conditions

| | |
|-------------------------------|---|
| Ambient temperature °C | -40 °C ... 75 °C |
| Ambient temperature °F | -40 °F ... +167 °F |
| Storage temperature °C | -40 °C ... 75 °C |
| Storage temperature °F | -40 °F ... +167 °F |
| Max. operating altitude | < 2000 m |
| Max. operating altitude | 2000 m |
| Max. operating altitude, ft | < 6562 ft |
| Max. relative humidity | 95% (without condensation) |
| Max. relative humidity | 95 % |
| Electromagnetic compatibility | Tested to the following standards and regulations: EN 61326 (IEC/EN 61000-4-1 to 61000-4-6 and 61000-4-11; EN 55022 class B), NAMUR NE21 |

Mechanical Data

| | |
|------------------------------|--|
| Field enclosure | without |
| Trunk connection type | Screw terminals |
| Connection terminals | 3-pole (+, -, shield) |
| Rigid single-wire connection | Trunk 0.2 to 4 mm ² Spurs 0.2 to 4 mm ² |

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Mechanical Data

| | |
|---|---|
| Flexible single-wire connection | Trunk 0.25 to 2.5 mm ² Spurs 0.25 to 2.5 mm ² |
| Flexible single-wire connection with sleeve | Trunk 0.25 to 2.5 mm ² Spurs 0.25 to 2.5 mm ² |
| Degree of protection note | The installation enclosure may be opened during operation in a hazardous area while connected to power. |
| Degree of protection (IP) (IEC 60529) | IP30 enclosure IP20 Ex i terminals |
| Module enclosure | PA 6.6 |
| Fire resistance (UL 94) | HB |
| Pollutant class | Corresponds to G3 |
| Width | 208.5 mm |
| Width, inches | 8.21 in |
| Height | 83.3 mm |
| Depth | 128.2 mm |
| Depth in inches | 5.05 in |
| Mounting depth in inches | 3.28 in |
| LED operating status Spurs des | S1 ... S8 |
| Weight | 1.96 lb |

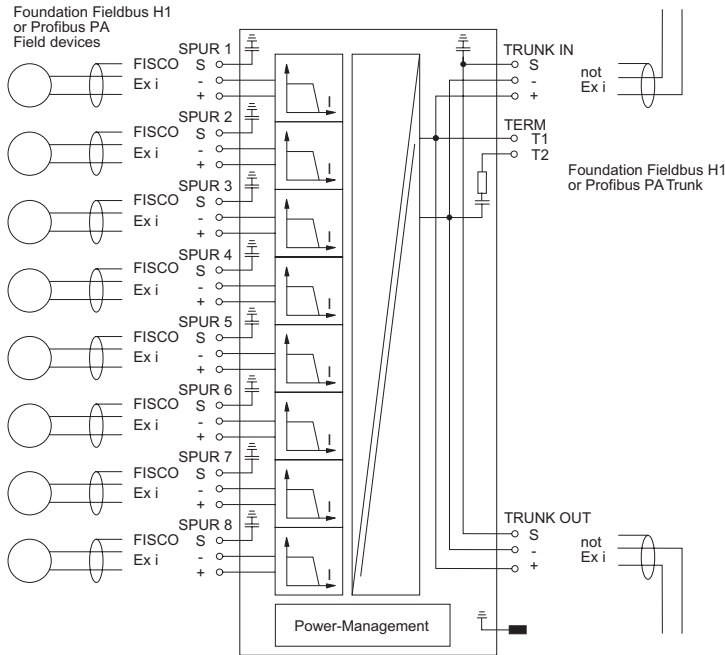
Mounting / Installation

| | |
|----------------------|---|
| Mounting type | on NS 35/15 DIN rail (DIN EN 60715) On mounting plate (4 x M5 screw) |
| Tightening torque | 2.6 Nm |
| Mounting orientation | Horizontal Vertical |

Components

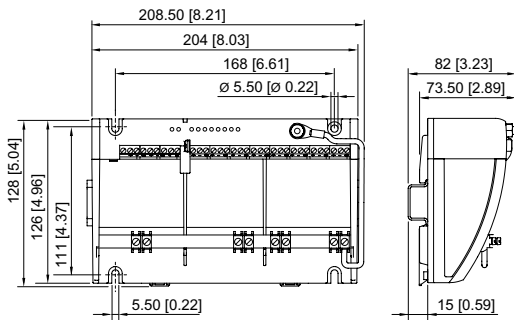
| | |
|--------------------------------|-------|
| LED error indication design. | ERR |
| LED operating status Trunk des | RUN |
| LED error indication colour | red |
| LED operating status Trunk col | green |

Technical Drawings – Subject to Alterations

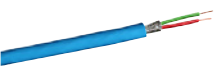




Connection diagram 9411/2.

Dimensional Drawings (All Dimensions in mm [inches]) – Subject to Alterations



Accessories

| Cable for Foundation Fieldbus, PROFIBUS PA | | Art. No. |
|--|---|----------|
|  | Cable type: O2YS(St+Ce)Y-fl Colour (sheath): Blue Application area: Universal use FISCO, UL listed, sunlight-resistant, oil-resistant, flame retardant | 169328 |
| Cable for FOUNDATION Fieldbus, PROFIBUS PA | | Art. No. |
|  | Cable type: O2YS(St+Ce)Y-fl Colour (sheath): Orange Application area: Universal use FISCO, UL listed, sunlight-resistant, oil-resistant, flame retardant | 169329 |
| Grounding bar set for 8 Spurs | | Art. No. |
|  | Grounding bar 9411 spring terminal strap with 10 terminals | 202775 |



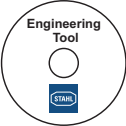
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| | | |
|--|---|-----------------|
|  | Grounding bar 9411 screw terminals | 161930 |
| Fieldbus power supply | | Art. No. |
|  | Fieldbus power supply and diagnostics | 200586 |
| Fieldbus wizard engineering tool | | Art. No. |
|  | Engineering tool for project engineering for Foundation Fieldbus or PROFIBUS PA fieldbus segments Download from r-stahl.com | |

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