

## Remote I/O

### Remote I/O IS1 CPU and power module for Zone 1

9440/22-01-21-C1455 Art. No. 203586



- Suitable for Ex i Profibus DP V0/V1 HART PNO red.
- Supports system redundancy and optical rings
- CPM in Zone 1 can be replaced without having to disconnect the power supply (i.e. hot-swapped)
- Integration in plant asset management systems via Service-Bus and FDT/DTM
- Integrated Ex i power supply for up to 8 I/O modules

#### MY R. STAHL 9440A



Modbus RTU



Series 9440/22 CPU & power modules (CPM) for Zone 1 are used to supply up to 8 IS1+ I/O modules and field circuits with intrinsically safe power. Intrinsically safe RS485-IS with PROFIBUS DP V0/V1 HART PNO red. is used for communicating with the automation system. The CPMs support system redundancy and optical rings and can be replaced during operation (i.e. hot-swapped) in Zone 1/Div. 1. A DTM and process bus or ServiceBus are used for asset management integration.

## Technical Data

### Explosion Protection

|                                |                                                                                                                                                                                                                           |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application range (zones)      | 1, 2                                                                                                                                                                                                                      |
| Ex interface zone              | 0, 1, 2, 21, 22                                                                                                                                                                                                           |
| IECEX gas certificate          | IECEX KEM 08.0038X                                                                                                                                                                                                        |
| IECEX gas explosion protection | Ex d [ia] [ib] IIC T4 Gb                                                                                                                                                                                                  |
| ATEX gas certificate           | KEMA 02 ATEX 1333 X                                                                                                                                                                                                       |
| ATEX gas explosion protection  | II 2 G Ex d [ia] [ib] IIC T4 Gb                                                                                                                                                                                           |
| FMus certificate               | FM17US0332X                                                                                                                                                                                                               |
| cFM certificate                | FM16CA0134X                                                                                                                                                                                                               |
| Marking cFMus                  | XP, Class I, Div. 1, Groups A,B,C,D;<br>Class I, Zone 1, Group IIC<br>AIS Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G;<br>Class I, Zone 1, [AEx ia, ib]/[Ex ia, ib] IIC<br>T4 at Ta = 65 °C<br>See Doc. 9440 6 031 001 1 |
| cCSA certificate               | 1519624                                                                                                                                                                                                                   |
| Marking cCSA                   | Class I, Zone 1, Ex e d ib [ia/ib] IIC T4<br>Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G;<br>T4 at Ta = 65 °C<br>See Doc. 94 006 01 31 2                                                                                 |
| Certificates                   | ATEX (DEK), Brazil (ULB), Canada (FM), China (NEPSI), IECEX (DEK), Korea (KTL), USA (FM)                                                                                                                                  |
| Ship approval                  | ABS, BVIS, EU RO MR (DNV), KR, LR                                                                                                                                                                                         |
| Installation                   | Zone 1/Division 1                                                                                                                                                                                                         |
| Further information            | See relevant certificates and operating instructions                                                                                                                                                                      |

### Safety Data

|                                                     |                                                 |             |                          |
|-----------------------------------------------------|-------------------------------------------------|-------------|--------------------------|
| Max. output voltage U <sub>out</sub>                | 26.2 V for supplying the I/O modules with power |             |                          |
| Connection to intrinsically safe RS-485-IS fieldbus | Global (IECEX)                                  | PTB 11.0027 | Ex ib IIC T4             |
|                                                     | Europe (ATEX)                                   | PTB 04 ATEX | 2089 II 2 G Ex ib IIC T4 |

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#### Safety Data

|                                |              |
|--------------------------------|--------------|
| Max. voltage $U_o$ (RS485-IS)  | 3.7 V        |
| Max. voltage $U_i$ (RS485-IS)  | +/- 4.2 V    |
| Max. current $I_o$ (RS485-IS)  | 134 mA       |
| Max. power $P_o$ (RS485-IS)    | 124 mW       |
| Max. capacitance $C_o$ for IIC | 1000 $\mu$ F |
| Max. inductance $L_o$ for IIC  | 1.9 mH       |

#### Electrical Data

|                                            |                                                                                                       |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Protocols                                  | Profibus DP V0<br>Profibus DP V1<br>Profibus DP V1 HART                                               |
| Redundancy                                 | According to PNO<br>Full redundancy                                                                   |
| Fieldbus RS485 connection                  | Sub-D socket, 9-pole                                                                                  |
| ServiceBus RS485 connection                | Sub-D socket, 9-pole                                                                                  |
| RS485 interface                            | As per PROFIBUS specification<br>RS 485-IS                                                            |
| Transmission speed RS-485                  | 9.6 kbit/s to 1.5 Mbit/s                                                                              |
| RS485 address setting                      | 0 – 127                                                                                               |
| Copper RS485 transmission length/rate      | 1200 m at 9.6 to 93.75 kbit/s<br>1000 m at 187.5 kbit/s<br>400 m at 500 kbit/s<br>200 m at 1.5 Mbit/s |
| Transfer length/rate FO RS485              | Approx. 2000 m at 1.5 Mbit/s                                                                          |
| Transmission length/rate service bus RS485 | 1200 m at 9.6 kbps                                                                                    |
| Line termination                           | Powered resistor (end-of-line resistor in the Sub-D plug, see accessories)                            |
| Transmission distance/rate note            | For further information, see the operating instructions                                               |
| RS485 data transmission                    | Approx. 40 16-bit words/ms<br>(Cycl., net at 1.5 Mbit/s)                                              |
| Internal signal delay max. (8 I/O modules) | 7 ms for digital modules, 10 ms for analogue modules                                                  |

#### Auxiliary Power

|                                           |                                                        |
|-------------------------------------------|--------------------------------------------------------|
| Nominal voltage                           | 120 V / 230 V AC                                       |
| Auxiliary power voltage range             | 90 ... 253 V AC                                        |
| Auxiliary power frequency                 | 45 – 66 Hz                                             |
| Mains frequency                           | 50/60 Hz                                               |
| Polarity reversal protection              | Not applicable                                         |
| Undervoltage monitoring                   | Yes                                                    |
| Current consumption (without I/O modules) | Approx. 25 mA at 230 V AC<br>Approx. 48 mA at 120 V AC |
| Current consumption (8 I/O modules)       | Approx. 0.4 A at 230 V AC<br>Approx. 0.8 A at 120 V AC |
| Power dissipation (without I/O modules)   | 8.4 W                                                  |
| Power dissipation (per I/O module)        | 1 W                                                    |

#### Galvanic Isolation

|                                   |           |
|-----------------------------------|-----------|
| Auxiliary power/system components | 1500 V AC |
| Bus interface/bus interface       | 500 V AC  |

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**Galvanic Isolation**

|                                |          |
|--------------------------------|----------|
| Bus interface/system component | 500 V AC |
|--------------------------------|----------|

**Device Specific Data**

|                                                           |                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Software                                                  | IS1 device DTM<br>IS Wizard                                                                                                                                                                                                                                                                                                                       |
| LED operating conditions                                  | "RUN" LED, green                                                                                                                                                                                                                                                                                                                                  |
| LCD display                                               | 2 x 16 characters                                                                                                                                                                                                                                                                                                                                 |
| LCD Display                                               | 2 x 16 characters                                                                                                                                                                                                                                                                                                                                 |
| Settings on the LCD                                       | Bus address                                                                                                                                                                                                                                                                                                                                       |
| Indications                                               | Bus address, alarms/errors, information (type, version, etc.) for the levels of field station, modules and signals, and values for inputs and outputs                                                                                                                                                                                             |
| Diagnostic/parameterisation functions                     | <ul style="list-style-type: none"> <li>- Load or read back configuration data and parameters in IS1 field stations</li> <li>- Read inputs</li> <li>- Read and write outputs</li> <li>- Transmit diagnostics data (e.g. configuration error, hardware error, signal error)</li> <li>- Transmit HART commands from/to HART field devices</li> </ul> |
| Diagnostic/parameterisation connectable software packages | <ul style="list-style-type: none"> <li>- IS Wizard (via R. STAHL ServiceBus)</li> <li>- R. STAHL DTM</li> <li>- AMS from Emerson Process Management</li> <li>- PDM from Siemens</li> <li>- PRM and Fieldmate from Yokogawa</li> <li>- FieldCare from Endress+Hauser</li> <li>- FDM from Honeywell</li> <li>- etc.</li> </ul>                      |

**Diagnostics**

|                 |                |
|-----------------|----------------|
| LED group error | "ERR" LED, red |
|-----------------|----------------|

**Ambient Conditions**

|                               |                                                                                                                                               |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Ambient temperature           | -20°C ... +65°C                                                                                                                               |
| Ambient temperature           | -4°F ... +149°F                                                                                                                               |
| Storage temperature           | -40°C ... +70°C                                                                                                                               |
| Storage temperature           | -40°C ... +158°C                                                                                                                              |
| Max. operating altitude       | < 2000 m                                                                                                                                      |
| Max. relative humidity        | 95% (without condensation)                                                                                                                    |
| Shock (semi-sinusoidal)       | (IEC EN 60068-2-27)<br>15 g (3 shocks per axis and direction)                                                                                 |
| Vibration (sinusoidal)        | (IEC EN 60068-2-6)<br>Frequency range 2 to 13.2 Hz Amplitude 1 mm (peak value)<br>Frequency range 13.2 to 100 Hz Acceleration amplitude 0.7 g |
| Electromagnetic compatibility | Tested to the following standards and regulations: EN 61326- 1 (1998) IEC 1000-4-1 to 1000-4-1-6, NAMUR NE 21                                 |

**Mechanical Data**

|                                       |                                                                                                                                                             |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection auxiliary power            | 9490/11-12 socket Ex e terminals 4 mm <sup>2</sup><br>9490/13-12 socket Unconnected cable end, 5 m, 1 mm <sup>2</sup> per core<br>9490/12-12 socket Conduit |
| Degree of protection (IP) (IEC 60529) | IP20 connections<br>IP30 modules                                                                                                                            |
| Module enclosure                      | Polyamide 6GF                                                                                                                                               |
| Fire resistance (UL 94)               | HB                                                                                                                                                          |
| Pollutant class                       | Corresponds to G3                                                                                                                                           |
| Width                                 | 96.5 mm                                                                                                                                                     |

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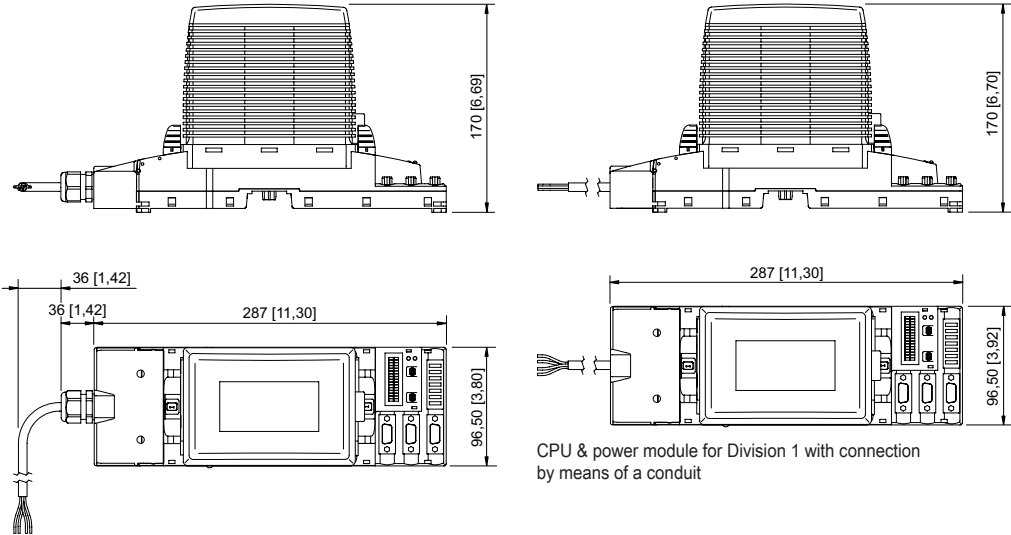
Mechanical Data

|                          |         |
|--------------------------|---------|
| Width, inches            | 3.78 in |
| Depth                    | 170 mm  |
| Length                   | 253 mm  |
| Length in inches         | 9.96 in |
| Mounting depth in inches | 6.69 in |
| Weight                   | 2.96 kg |
| Weight                   | 6.53 lb |

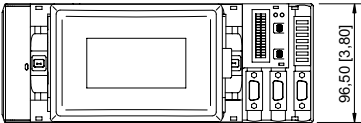
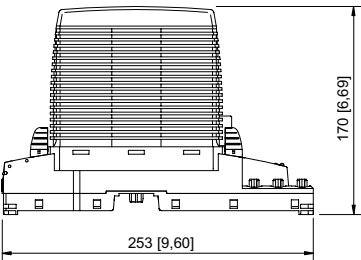
Mounting / Installation

|                      |                                     |
|----------------------|-------------------------------------|
| Mounting type        | on NS 35/15 DIN rail (DIN EN 60715) |
| Mounting orientation | Horizontal<br>Vertical              |

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



CPU & power module for Zone 1 with connection by means of an unconnected cable end



CPU & power module for Zone 1 with connection by means of Ex e terminals

Accessories

RS485 media converter

Art. No.

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|                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|    | <p>Media converter for installation in Zone 1.<br/>For fieldbuses (PROFIBUS DP, Modbus RTU) using optical intrinsically safe "Ex op is" fibre optic in Zone 1.<br/>Compatible with Series 9786 devices.<br/>Point-to-point, linear structure or optical ring.<br/>With diagnostics function including error signalling.<br/>Simple parameterisation using a rotary switch.<br/>Data rates from 9.6 kbit/s to 1.5 Mbit/s possible.<br/>For further information, see the data sheet for the Series 9786 media converter.</p>    | 308562          |
|    | <p>Media converter for installation in Zone 2.<br/>For fieldbuses (PROFIBUS DP, Modbus RTU) using optical intrinsically safe "Ex op is" fibre optic in Zone 1.<br/>Compatible with Series 9786 devices.<br/>Point-to-point, linear structure or optical ring.<br/>With diagnostics function including error signalling.<br/>Simple parameterisation using a rotary switch.<br/>Data rates from 9.6 kbit/s to 1.5 Mbit/s possible.<br/>For further information, see the data sheet for the Series 9786 media converter.</p>    | 308563          |
| <b>Series 9490/11 – socket for CPU &amp; power module</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Art. No.</b> |
|   | <p>Zone 1, connection by means of Ex e terminals,<br/>24 V DC, 120/230 V AC</p>                                                                                                                                                                                                                                                                                                                                                                                                                                               | 162707          |
| <b>Series 9490/13 – socket for CPU &amp; power module</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Art. No.</b> |
|  | <p>Zone 1, connection by means of an unconnected cable end,<br/>24 V DC, 120/230 V AC</p>                                                                                                                                                                                                                                                                                                                                                                                                                                     | 162711          |
| <b>Series 9490/12 – socket for CPU &amp; power module</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Art. No.</b> |
|  | <p>Division 1, connection by means of a conduit,<br/>24 V DC, 120/230 V AC</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                | 162715          |
| <b>Sub-D plug, RS-485 IS, angled</b>                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Art. No.</b> |
|  | <p>9-pin for connecting fieldbus or ServiceBus to CPU &amp; power module Series 9440/22, 9185 fieldbus isolating repeater and 9786/12-11 media converter.<br/>The end-of-line resistor is installed and switchable.<br/>For RS 485 IS (according to Profibus standard).<br/>Ambient temperature: -40 °C to +70 °C</p>                                                                                                                                                                                                         | 162693          |
| <b>Fieldbus isolating repeater Series 9185/11</b>                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Art. No.</b> |
|  | <p>Equipment for installation in safe areas or Zone 2/Div. 2<br/>For fieldbuses with RS485-IS interface – Zone 1/Class I, II, III Division 1 and Class I, II, III<br/>Zone 1<br/>Suitable for PROFIBUS DP, Modbus, R. STAHL ServiceBus<br/>RS 232, RS 422, RS 485 interface with the automation system<br/>Transmission rate automatically set with PROFIBUS DP<br/>Adjustable transmission rate (1.2 kbit/s to 1.5 Mbit/s)<br/>24 V AC/DC auxiliary power<br/>For further information, see the Series 9185/11 data sheet</p> | 227598          |

### DTM IS1+ devices for PROFIBUS DP and Ethernet

Art. No.

|                                                                                  |                                                                                                                                                                                                                                                                                                      |  |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <p>Parameterisation and configuration of the IS1+ system<br/>Communication with HART-capable field devices<br/>Supports all common FDT frame applications (e.g. FieldCare, PactWare™)<br/>Condition monitoring<br/>Scan function for automatic topology generation<br/>Download from r-stahl.com</p> |  |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

### IS1 DTM devices Series 9499/DTM

Art. No.

|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                      |        |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  | <ul style="list-style-type: none"> <li>- Parameterisation and configuration of the IS1+ system</li> <li>- Communication with HART-capable field devices</li> <li>- Supports all common FDT frame applications (e.g. FieldCare, PactWare™)</li> <li>- Condition monitoring</li> <li>- Scan function for automatic topology generation</li> <li>- Download from r-stahl.com</li> </ul> |        |
|                                                                                  | <p>9499/DTM-IS1-02 Com/Device/HART 30<br/>Free-of-charge software licence for up to 30 HART devices</p>                                                                                                                                                                                                                                                                              | 251237 |
|                                                                                  | <p>9499/DTM-IS1-04 Com/Device/HART 300<br/>Software licence for up to 300 HART devices</p>                                                                                                                                                                                                                                                                                           | 251239 |
|                                                                                  | <p>9499/DTM-IS1-06 Com/Device/HART unlted.<br/>Software licence for an unlimited number of HART devices</p>                                                                                                                                                                                                                                                                          | 251240 |

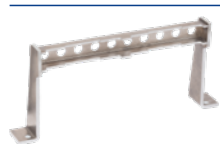
### IS1 PCS7 APL field device library

Art. No.

|                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <p>Simple integration of IS1+ systems in SIEMENS PCS7 (V9 SP2 to V9.1 SP2):<br/>- PROFIBUS DP with CPM 9440 from GSD 3.12; CPU 9442 from GSD 5.14<br/>- PROFINET with CPU 9441 from GSDML-V2.3-Stahl-RIO-20140206; CPU 9442 from GSDML-V2.34-Stahl-RIO9442-20200427<br/>Further information and ordering only available from Siemens: <a href="http://www.siemens.com/mvdi">www.siemens.com/mvdi</a></p> |  |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

### Vibration bracket set

Art. No.

|                                                                                    |                                                                                                                                                                                                                                                                                                                                                                       |        |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  | <p>When installed in environments with extreme vibration (&gt; 0.7 g and max. 4 g), the 9490 vibration brackets may be used as an additional measure and provide mechanical stability for the individual modules.<br/>For mounting: 9440/22 CPM for Zone 1, redundant<br/>Number of brackets in a set: 2<br/>Screws (item no. 275516) must be ordered separately.</p> | 271918 |
|  | <p>When installed in environments with extreme vibration (&gt; 0.7 g and max. 4 g), the 9490 vibration brackets may be used as an additional measure and provide mechanical stability for the individual modules.<br/>For mounting: 9440/22 CPM for Zone 1, single<br/>Number of brackets in a set: 2<br/>Screws (item no. 275516) must be ordered separately.</p>    | 271917 |

### Set of screws

Art. No.

|  |                                                                                                           |        |
|--|-----------------------------------------------------------------------------------------------------------|--------|
|  | <p>Set of M5 x 14 screws (self-tapping) for 9490 vibration brackets<br/>Number of screws in a set: 25</p> | 275516 |
|--|-----------------------------------------------------------------------------------------------------------|--------|

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.