

# Remote I/O

## Remote I/O IS1+ Digital output module

### For Zone 1 Ex i

9475/32-08-62 Art. No. 210656



- Eight channels for Ex i solenoid valves up to 30 mA
- Ex ia outputs with line fault monitoring and LED error and status indication for each channel plus SIL 2 shutdown input
- Modules in Zone 1, Cl. I, II, Div. 1 can be hot swapped

WebCode 9475C



9475/32-08 series digital output modules for Zone 1, Cl. I, II, Div. 1 have eight channels for actuating Ex i solenoid valves or indicator lamps. An additional Ex i control input is suitable for safe shutdown up to SIL 2. All outputs are short-circuit proof, galvanically separated from the system and individually monitored to check for wire breakage/short-circuiting.

## Technical Data

### Explosion Protection

|                                 |  |
|---------------------------------|--|
| Application range (Zones)       | 1<br>2   |
| Ex interface zone               | 0<br>1<br>2<br>20<br>21<br>22  |
| IECEX gas certificate           | IECEX DEK 12.0070X   |
| IECEX gas explosion protection  | Ex ia [ia Ga] IIC T4 Gb  |
| IECEX dust certificate          | IECEX DEK 12.0070X   |
| IECEX dust explosion protection | [Ex ia Da] IIIC  |
| ATEX gas certificate            | DEKRA 12 ATEX0232X   |
| ATEX gas explosion protection   | ⊕ II 2 (1) G Ex ia [ia Ga] IIC T4 Gb   |
| ATEX dust certificate           | DEKRA 12 ATEX0232X   |
| ATEX dust explosion protection  | ⊕ II (1) D [Ex ia Da] IIIC   |
| Certificate FMus                | FM17US0332X  |
| Certificate cFM                 | FM16CA0134X  |
| Marking cFMus                   | IS, Class I, Div. 1, Groups A,B,C,D;<br>Class I, Zone 1, AEx/Ex ia [ia] IIC<br>AIS Class I,II,III, Div. 1, Groups A,B,C,D,E,F,G;<br>T4 at Ta = 75°C<br>See Doc. 9475 6 031 002 1 |
| EAC certificate                 | TS RU S-DE.GB04.B.00448  |
| EAC gas explosion protection    | ⊕ 1 Ex ia [ia Ga] IIC T4 Gb X  |
| EAC dust explosion protection   | ⊕ [Ex ia Da] IIIC  |
| Certificates                    | ATEX (DEK), Brazil (ULB), Canada (FM), EAC (ENDCE), IECEX (DEK), India (PESO), Korea (KTL), SIL (exida), USA (FM)  |

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#### Explosion Protection

|                     |   |
|---------------------|---|
| Ship approval       | EU RO MR  |
| Notes               | CCC certificate available from 2021 onward            |
| Installation        | Zone 1, Zone 2, Cl. I, Div. 1, 2 and in the safe area |
| Further information | see respective certificate and operating instructions |

#### Safety Data

|                              |   |
|------------------------------|---|
| Max. voltage $U_o/V_{oc}$    | 25.7 V  |
| Max. current $I_o$ (Ex ia)   | 107 mA  |
| Max. power $P_o$ (Ex ia)     | 688 mW  |
| Max. current $I_o$ (Ex ib)   | 26.3 mA   |
| Max. power $P_o$ (Ex ib)     | 468 mW  |
| Internal inductance $L_i$    | Negligible  |
| Max. internal capacity $C_i$ | 5,2 nF (in the above tables, $C_i$ is subtracted from $C_o$ ) |

|  |            |      |     |     |     |     |     |      |
|--|------------|------|-----|-----|-----|-----|-----|------|
| Max. connectable inductance $L_o$ / capacity $C_o$ |            |      |     |     |     |     |     |      |
| Output ia  |            |      |     |     |     |     |     |      |
| IIC  | $L_o$ [mH] | 1.57 | 1.1 | 1.0 | 0.9 | 0.5 | 0.2 | 0.1  |
|  | $C_o$ [nF] | --   | 49  | 52  | 54  | 69  | 95  | 97   |
| IIB/IIIC   | $L_o$ [mH] | 11   | 5.0 | 1.0 | 0.5 | 0.2 | 0.1 | 0.05 |
|  | $C_o$ [nF] | 335  | 335 | 395 | 485 | 635 | 785 | 785  |
| Output ib  |            |      |     |     |     |     |     |      |
| IIC  | $L_o$ [mH] | 7.0  | 5.0 | 2.0 | 1.0 | 0.5 | 0.2 | 0.05 |
|  | $C_o$ [nF] | 32   | 36  | 49  | 64  | 81  | 97  | 97   |
| IIB/IIIC   | $L_o$ [mH] | 100  | 50  | 1.0 | 0.5 | 0.2 | 0.1 | 0.05 |
|  | $C_o$ [nF] | 245  | 365 | 425 | 505 | 655 | 785 | 785  |

|  |            |   |        |        |        |        |   |    |
|--|------------|---|--------|--------|--------|--------|---|----|
| Ex i control input "Pant STOP"                     |            |   |        |        |        |        |   |    |
| Connection terminals                               |            | X3 1, 2<br>(without galvanic separation,<br>9475/22 compatible) |        |        |        |        | X3 3, 4<br>(with galvanic<br>separation,<br>switchable in parallel) |    |
| Type of protection                                 |            | Ex ia   |        |        |        |        | Ex ia   |    |
| Max. voltage $U_o$                                 |            | 5.1 V   |        |        |        |        | --  |    |
| Max. current $I_o$                                 |            | 0.44 mA   |        |        |        |        | --  |    |
| Max. power $P_o$                                   |            | 0.5 mW  |        |        |        |        | --  |    |
| Max. connectable inductance $L_o$ / capacity $C_o$ |            |   |        |        |        |        |   |    |
| IIC  | $L_o$ [mH] | 100   | 10     | 2      | 1      | 0.2    | 0.01  | -- |
|  | $C_o$ [nF] | 2.195   | 2.595  | 3.295  | 3.695  | 5.495  | 15.995  | -- |
| IIB/IIIC   | $L_o$ [mH] | 100   | 10     | 2      | 1      | 0.2    | 0.01  | -- |
|  | $C_o$ [nF] | 9.995   | 12.995 | 16.995 | 19.995 | 31.995 |   | -- |
| Max. voltage $U_i$                                 |            | --  |        |        |        |        | 30 V  |    |
| Max. internal resistance $R_i$                     |            | --  |        |        |        |        | 4940 $\Omega$   |    |

#### Electrical Data

|                    |                |
|--------------------|----------------|
| Number of channels | 8 Ex i outputs |
|--------------------|----------------|

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#### Electrical Data

|   |  |  |   |
|---|--|--|---|
| Connection Ex i field signals                                     | Pluggable, blue terminals, 16-pin, 2.5 mm <sup>2</sup> , screw or cage clamp version with lock |  |   |
| Connection Ex i Steuereingang                                     | Pluggable, blue terminals, 2-pin, 2.5 mm <sup>2</sup> , screw type version with lock           |  |   |
| Ex i control input X3<br>Connection terminals                     |  | X3 1, 2<br>(without galvanic separation, 9475/22 compatible) | X3 3, 4<br>(with galvanic separation, switchable in parallel) |
| Supply voltage  |  | 3.3 V  | --  |
| Internal resistance   |  | 20.5 kΩ  | --  |
| Control voltage for all outputs<br>"OFF" ("Plant STOP" activated) |  | > 2.2 V  | < 1 V   |
| "Normal operation"<br>("Plant STOP" deactivated)                  |  | < 0.7 V  | > 6 V   |

#### Auxiliary Power

|  |                                      |
|--|--------------------------------------|
| Power supply connection                | BusRail types 9494                   |
| Auxiliary power version                | Intrinsically safe Ex ia via BusRail |
| Behaviour during undervoltage          | All outputs "OFF"                    |
| Current consumption                    | 240 mA                               |
| Max. power consumption                 | 5.8 W                                |
| Max. power dissipation outputs         | 4 W                                  |
| Max. power dissipation rated operation | 0 W                                  |

#### Galvanic Isolation

|                                     |                                   |
|-------------------------------------|-----------------------------------|
| Test voltage for galvanic isolation | According to standard EN 60079-11 |
| Auxiliary power/system components   | ≥ 1500 V AC                       |
| I/O module / I/O module             | ≥ 500 V AC                        |
| I/O channels/system components      | ≥ 500 V AC                        |
| I/O channels / ground (PA)          | ≥ 500 V AC                        |
| I/O channels/plant STOP X3 3.4      | ≥ 500 V AC                        |
| Plant STOP X3 3.4 / earth (PA)      | ≥ 500 V AC                        |

#### Input

|                           |   |
|---------------------------|---|
| Control input             | Ex i control input X3                         |
| Control input suitability | Switch-off up to SIL 2, low demand (IEC61508) |
| Control input function    | "Plant STOP" to switch off all outputs        |

#### Output

|                                     |   |
|-------------------------------------|---|
| Ex i output rated operation         | 17.5 V/20 mA  |
| Internal resistance of outputs      | 315 Ω   |
| Open-circuit voltage U <sub>a</sub> | 23.5 V  |
| Output characteristic 9475/33-08-60 | <p>The graph plots output voltage U<sub>a</sub> (V) on the y-axis (0 to 25) against current I (mA) on the x-axis (0 to 35). The curve shows a linear decrease from 23.5 V at 0 mA to about 17.5 V at 30 mA, followed by a vertical drop to 0 V.</p> |

#### Device Specific Data

|                            |           |
|----------------------------|-----------|
| Diagnostics message module | OFF<br>ON |
|----------------------------|-----------|

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#### Device Specific Data

|                                   |  |
|-----------------------------------|--|
| Line fault monitoring             | ON without test current<br>OFF<br>ON   |
| Test current signal               | 0,2 ... 0,28 mA  |
| Output behaviour in case of error | Keep last value<br>ON<br>OFF   |
| LED module requires maintenance   | "M/S" LED, blue  |
| LED operating conditions          | "RUN" LED, green   |
| LED group error                   | "ERR" LED, red   |
| LED channel error                 | LED for each channel, red  |
| LED channel status                | LED per channel, yellow  |
| "Plant STOP" LED                  | (all outputs are high-impedance)<br>"Plant STOP" LED, yellow   |
| Retrievable parameters            | Hardware revision<br>Manufacturer<br>Serial number<br>Software revision<br>Type                        |
| Signal status bit                 | "1" = Output supplied with power<br>"0" = High-impedance output  |
| Wire breakage output              | > 12 k $\Omega$ (with deactivated test current can be detected only if the output is switched on)      |
| Short circuit output              | < 30 $\Omega$ (response range 30 ... 60 $\Omega$ ) (can be detected only if the output is switched on) |

#### Ambient Conditions

|                               |   |
|-------------------------------|---|
| Ambient temperature °C        | -40°C ... +75°C   |
| Ambient temperature °F        | -40°F ... +167°F  |
| Storage temperature °C        | -40°C ... +80°C   |
| Storage temperature °F        | -40°F ... +176°F  |
| 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 ... 13.2 Hz    Amplitude 1 mm (peak value)<br>Frequency range 13.2 ... 100 Hz    Acceleration amplitude 0.7 g |
| Electromagnetic compatibility | Tested to the following standards and regulations: EN 61326-1 (2006) IEC 61000-4-1 to 61000-4-6, NAMUR NE 21  |
| Note                          | (observe operating instructions)  |

#### Mechanical Data

|                                     |                   |
|-------------------------------------|-------------------|
| Degree of protection IP (IEC 60529) | IP20              |
| Module enclosure                    | Polyamide 6GF     |
| Fire resistance (UL 94)             | V2                |
| Pollutant class                     | Corresponds to G3 |
| Width                               | 96.5 mm           |
| Width inches                        | 3.8 in            |
| Height                              | 67 mm             |
| Length                              | 128 mm            |

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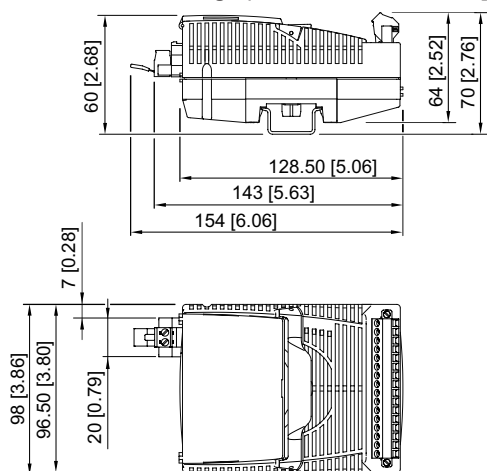
#### Mechanical Data

|                       |          |
|-----------------------|----------|
| Length inches         | 5.04 in  |
| Mounting depth inches | 2.64 in  |
| Weight                | 0.275 kg |
| Weight                | 0.61 lb  |

#### Mounting / Installation

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

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



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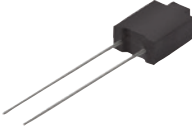
## Accessories

| Pluggable terminal   |   | Art. No. |
|--|---|----------|
|  | 2.5 mm <sup>2</sup> with lock, 16-pole, screw connector, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits<br>Labelling: 1 ... 16<br>Attention: An additional terminal is necessary for I/O module Series 9470 and 9482.<br>Labelling: 17 ... 32                           | 162702   |
|  | 2.5 mm <sup>2</sup> with lock, 16-pole, spring clamp connection, blue, for connecting the field signals to I/O modules, for intrinsically safe field circuits, incl. test jacks<br>Labelling: 1 ... 16<br>Attention: An additional terminal is necessary for I/O module Series 9470 and 9482.<br>Labelling: 17 ... 32 | 162695   |


| Electronic relay  |  | Art. No. |
|---|--|----------|
|   | The electronic relay module 9174 is used to switch Ex e loads by using intrinsically safe control signals.<br>Input: Ex i<br>Output: 48 V / 2 A DC, Ex e   | 212340   |
|  | The electronic relay modules are used to switch from Ex e loads via intrinsically safe (Ex i) or non-intrinsically safe (Ex e) control.<br>Coil circuit: Ex i or non-Ex i (Ex e)*<br>Contact circuit: Non-Ex i (Ex e)<br>*You can switch between Ex i and non-Ex i circuits, or vice-versa, at any time without restriction. | 282457   |

| Ex i/Ex e relay module for Zone 1  |  | Art. No. |
|--|--|----------|
|  | The Ex i/Ex e relay modules are used for the galvanically isolated switching of intrinsically safe circuits (Ex i) and non-Ex i (Ex e) electrical circuits.<br>Coil circuit: Ex i or non-Ex i (Ex e)*<br>Contact circuit: Ex i or non-Ex i (Ex e)*<br>*You can switch between Ex i and non-Ex i circuits, or vice-versa, at any time without restriction | 273000   |

| Partition  |  | Art. No. |
|--|--|----------|
|  | For mounting between intrinsically safe and non-intrinsically safe connections of the I/O modules, in order to adhere to the required 50 mm distance | 220101   |

| Resistor error message suppression   |  | Art. No. |
|--|--|----------|
|  | The resistors are used to suppress error messages for unused I/O channels<br>Resistance value: 5K6 / 0.5 W<br>Suitable for: AIM 9468; UMH 9469; DIOM 9470; DIOM 9471; DIOM 9472; DOM 9475<br>For intrinsically safe circuits (simple apparatus according to EN 60079-11) | 244911   |

## Spare Parts

| Warning sign   |   | Art. No. |
|--|---|----------|
|  | "Clean modules only with a damp cloth." | 162796   |

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### LED Indicator lamp Ex i

Art. No.

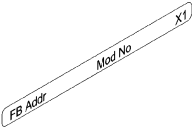


LED indicator lamp for intrinsically safe circuits 8010/3-02, Ex i

237972

### Labelling strips

Art. No.



"FB Addr ... Mod No ..." for pluggable terminal, 26 pieces on the sheet

162788

### DIN A4 sheet

Art. No.



For the label plate on I/O modules, 6 labels per sheet  
Print IS Wizard, packaging unit = 20 sheets

162832

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