# Remote I/O


07374E00

**Digital Input Module NAMUR Ex nL / NI Inputs, 16 Channels Series 9470/25**

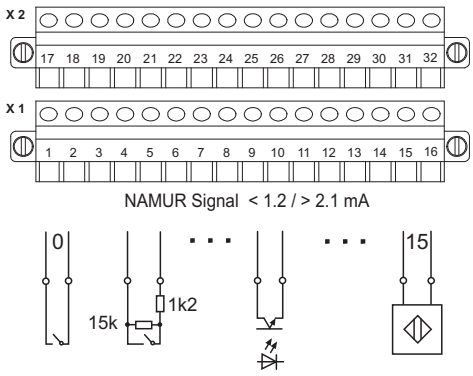
- 16 channels for contacts and NAMUR proximity switches (EN 60947-5-6)
- Zone 2 / Division 2 version for connection of circuits acc. to Ex nL, Ex nA, Nonincendive and Non-Ex
- Galvanic isolation between inputs and system
- Open-circuit and short-circuit monitoring for each field circuit
- Two channels can be used as frequency inputs or counters up to 20 kHz
- Module can be replaced in operation (hot swap)

| Zone | 0 | 1 | 2 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|
| Class | I | | | II / III | | |
| Zone | 0 | 1 | 2 | 20 | 21 | 22 |
| Ex interface | | | X | | | X |
| Installation in | | | X | | | X*) |

| Class | I | | II / III | |
|---|---|---|---|---|
| Division | 1 | 2 | 1 | 2 |
| Ex interface | | X | | X |
| Installation in | | X | | X*) |

*) suitable enclosure necessary

The Digital Input Module is used for the connection and supply of up to 16 volt-free contacts or proximity switches acc. to EN 60947-5-6 (NAMUR). All inputs are short-circuit proof and individually monitored for open-circuit and short-circuit.
Channels 14 and 15 can also be used for frequency measurement or as pulse counters up to 20kHz.
The interface of the Digital Input Module with the internal data bus of the BusRail is designed with redundancy.

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## Selection Table

| Version | Description | Order number | Weight kg / lbs |
|---|---|---|---|
| Digital Input Module NAMUR | 16 channels for contacts and NAMUR proximity switches (EN 60947-5-6) | **9470/25-16-12** | 0.319 / 0.703 |

## Explosion Protection

| | | |
|---|---|---|
| Certificates | | |
| Europe (ATEX) | KEMA 06 ATEX 0291 X | |
| USA (NEC) | 3007532 (FM) | |
| Marking | | |
| Europe (ATEX) | ⟨Ex⟩ II 3 (2) GD Ex nA [nL] [ib] IIC T4 | |
| USA (NEC) | NI/I/2/ABCD/T4 Ta = 65 °C, I/2/IIC/T4 Ta = 65 °C | |
| Other certificates | Marine (DNV) | |
| Safety data | | |
| Maximum values | | per channel |
| | max. voltage $U_o$ / $V_{oc}$ | 12.6 V |
| | max. voltage $U_i$ / $V_{max}$ | 12.6 V |
| | max. current $I_o$ / $I_{sc}$ | 15 mA |
| | max. current $I_i$ / $I_{max}$ | any |
| | max. power $P_o$ | 48 mW |
| | max. power $P_i$ | any |
| Cable parameters (ATEX) | | per channel |
| | max. capacitance $C_o$ / $C_a$ for IIC | 1.2 µF |
| | max. capacitance $C_i$ for IIC | 2.6 nF |
| | max. inductance $L_o$ / $L_a$ for IIC | 1 mH |
| | max. inductance $L_i$ for IIC | 0 mH |
| Further information | see respective certificate | |

## Technical Data

| | | | |
|---|---|---|---|
| Digital inputs | | | |
| Number of channels | 16 | | |
| Signal | EN 60947-5-6 (NAMUR) | | |
| Minimum current for ON | 2.1 mA | | |
| Maximum current for OFF | 1.2 mA | | |
| Switching threshold | 1.65 mA | | |
| Supply voltage | 7.8 V | | |
| Internal resistance | 1 kΩ | | |
| Minimum pulse width of the input signal | | without OC/SC detection | with OC/SC detection |
| | Channels 0-15 as digital inputs | approx. 1 ms | approx. 2 ms |
| | Channels 14 or 15 as frequency input or counter | approx. 2 ms | approx. 4 ms |

# Digital Input Module NAMUR
# Ex nL / NI Inputs, 16 Channels
# Series 9470/25

## Technical Data

| | | | | |
|---|---|---|---|---|
| Digital inputs | | | | |
| Maximum signal delay | | | without OC/SC detection | with OC/SC detection |
| | from digital inputs to internal bus | channels 0-15 as digital inputs | approx. 1 ms | approx. 2 ms |
| | | channels 14 or 15 as frequency input or counter | approx. 2 ms | approx. 4 ms |
| | from frequency inputs to internal bus | measuring range 1 Hz ... 1 kHz (measurement frequency f = 1 ... 35 Hz) | 2 ms + 1/f | 4 ms + 1/f |
| | | measuring range 1 Hz ... 1 kHz (measurement frequency f = 35 Hz ... 1 kHz) | 34 ms + 1/f | 36 ms + 1/f |
| | | measuring range 1 Hz ... 20 kHz gate time | | |
| | | 50 ms | approx. 50 ms | approx. 50 ms |
| | | 200 ms | approx. 200 ms | approx. 200 ms |
| | | 1 s | approx. 1 s | approx. 1 s |
| | from counter inputs to internal bus | | approx. 2 ms | approx. 4 ms |
| Galvanic isolation | | | | |
| between power supply and system components | 1500 V AC | | | |
| between two input / output modules | 1500 V AC | | | |
| between inputs and system components | 1500 V AC | | | |
| | The inputs of an I/O module have a common negative conductor | | | |
| Channels 14 and 15 as frequency input or counter | | | | |
| Maximum switching frequency | 20 kHz (the line length must be reduced for frequencies > 1 kHz, e.g. at 5 kHz to approx. 75 m / 246 ft) | | | |
| Minimum pulse width | 25 µs | | | |

Frequency input

| | Measuring range | |
|---|---|---|
| | 1 Hz ... 1 kHz | 1 Hz ... 20 kHz |
| Resolution | 0.05 Hz | 1 Hz |
| Accuracy | 0.02 % | 0.02 % |

adjustable parameters for each channel

| | |
|---|---|
| Counter input | |
| Control signal for counter | Start, Stop, Reset |
| Counter range | 0 ...65535 |
| MTBF acc. to MIL | 46.9 years (at 40 °C / 104 °F) |

| Technical Data | |
|---|---|
| Settings | |
| Open-circuit and short-circuit monitoring | ON, OFF (for each channel) |
| Value to fieldbus during open circuit, short circuit | ON, OFF, hold last value (all channels) |
| Invert input value | ON, OFF (all channels) |
| Adjustable pulse width | 0 s, 0.6 s, 1.2 s, 2.4 s (for channel groups) |
| Gate time for frequency measuring range 1 Hz ... 20 kHz | 50 ms, 200 ms, 1 s |
| Active edge for counter (channels 14 and 15) | positive (voltage ↑)<br>negative (voltage ↓) |
| Diagnostics | |
| Retrievable parameters | Manufacturer, type, version, serial number |
| Characteristic values for open circuit and short-circuit detection | |
| Open-circuit detection | < 0.05 mA |
| Short-circuit detection | < 100 Ω |
| | Note: If open-circuit / short-circuit detection is required, then contacts require resistors with 1.2 kΩ wiring in series and 15 kΩ in parallel. |
| Module faults | • Internal primary bus faults<br>• Internal redundant bus faults<br>• No response<br>• Module does not correspond to configuration<br>• Hardware fault |
| Power supply | |
| Maximum power consumption | 3 W |
| Maximum power dissipation | 3 W |
| Mechanical data | |
| Module enclosure | Polyamide 6GF |
| Fire protection class (UL 94) | V2 |
| Degree of protection (IEC 60529) | |
| Modules | IP30 |
| Connections | IP20 |
| Electrical connection | |
| Ex n / NI field signals | Plug-in terminals 16-pole with catch, 2.5 $mm^2$ / up to 14 AWG, screw or spring type |
| Operator interface | |
| Operation | LED green "RUN" |
| Fault | LED red "ERR" |
| Installation conditions | |
| Mounting type | on 35 mm DIN rail NS 35/15 |
| Installation position | horizontal and vertical |

# Digital Input Module NAMUR
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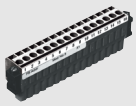
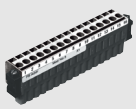
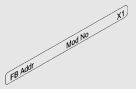
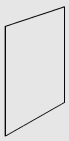
# Series 9470/25

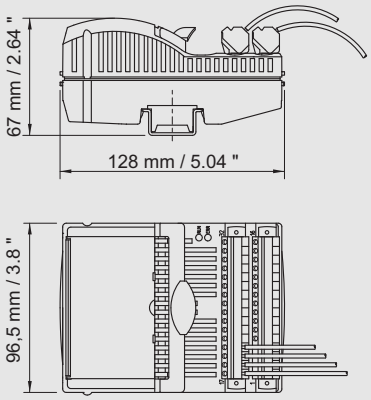
## Technical Data

| | |
|---|---|
| Ambient conditions | |
| Ambient temperature | - 20 ... + 65 °C / - 4 ... + 149 °F |
| Storage temperature | - 40 ... + 70 °C / - 40 ... + 158 °F |
| Maximum relative humidity | 95 % (no condensation) |
| Vibration, sinusoidal (IEC EN 60068-2-6) | 1 g in frequency range between 10 ... 500 Hz<br>2 g in frequency range 45 ... 100 Hz |
| Shock, semi-sinusoidal (IEC EN 60068-2-27) | 15 g (3 shocks per axis and direction) |
| Electromagnetic compatibility | Tested according to the following standards and regulations:<br>EN 61326-1 (1998) IEC 1000-4-1...6, NAMUR NE 21 |
| Engineering notes | • Versions 9470/.5 are only for installation in Zone 2 / Division 2 or in safe area.<br>• Mixing of Zone 1 / Division 1 modules (9470/.2) and Zone 2 / Division 2 modules (9470/.5) on same BusRail is allowed.<br>• For separation between intrinsically safe and non-intrinsically safe circuits (≥ 50 mm / 2 in), a partition (162740) is required. |

## Accessories and Spare Parts

| Designation | Illustration | Description | Order number |
|---|---|---|---|
| Plug-in terminal |  09898E00 | Screw connection, 2.5 mm² / 14 AWG with catch, 16-pole, black, for connecting Ex nL/Ex nA field signals<br>Labelling: 1 ... 16 | **162708** |
| |  09898E00 | Screw connection, 2.5 mm² / 14 AWG with catch, 16-pole, black, for connecting Ex nL/Ex nA field signals<br>Labelling: 17 ... 32 | **162719** |
| |  09899E00 | Spring connection, 2.5 mm² / 14 AWG with catch and test jacks, 16-pole, black, for connecting Ex nL/Ex nA field signals<br>Labelling: 1 ... 16 | **162710** |
| |  09899E00 | Spring connection, 2.5 mm² / 14 AWG with catch and test jacks, 16-pole, black, for connecting Ex nL/Ex nA field signals<br>Labelling: 17 ... 32 | **162720** |
| Labelling strips |  05869E00 | „FB No ... Mod No ...“ for plug-in terminals, sheet with 26 labels | **162788** |
| Warning sign |  05872E00 | „Only clean modules with damp cloths“ | **162796** |
| DIN A4 sheet |  09900E00 | For I/O module labels; 6 labels each sheet; print out with IS Wizard software; packaging unit = 20 sheets | **162832** |
| Partition |  02078E00 | For assembly between intrinsically safe and non-intrinsically safe connectors of the I/O modules, in order to adhere to the required 50 mm / 2 in distance | **162740** |

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

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