RDIO400
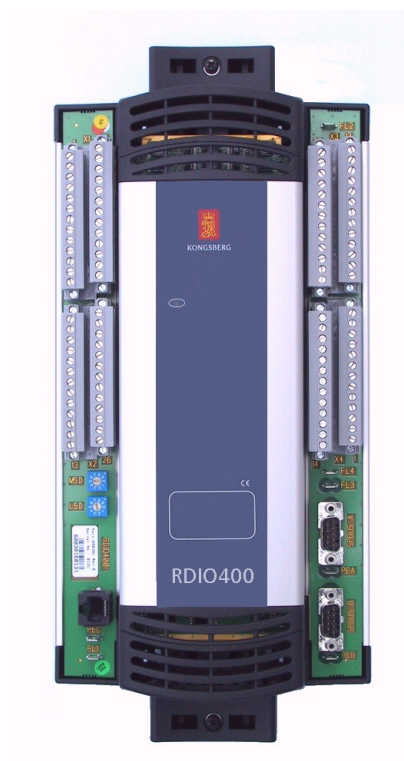
Remote Digital Input and Output

The RDIO400 is an interface module between the Serial Process Bus and digital input or output signals.

Features

- Up to 32 individually defined digital inputs or outputs
- Dual Serial Process Bus (SPBus) interfaces to allow optional redundancy
- Each SPBus interface ensures electrical isolation from the control system
- Easy installation and replacement:
  - DIN standard rail-mounting
  - plug-in connections
- Status LED for normal operation or error condition
- Loop-check and debugging from operator station and local data terminal
- Short-circuit proof loop current driver
- Fail-safe activation of outputs upon loss of communication
- Built-in test for self diagnostics and fault identification
- SIL 1 compliant
- Line Fault Detection (LFD)
- Earth Fault Detection (EFD)
- Dual watch-dogs

Description

The Kongsberg Maritime Remote Input and Output system (RIO400) uses a Serial Process Bus (SPBus) between a controller computer in the process network and the input and output (I/O) signals to remote devices such as valves, relays and temperature sensors.

The RDIO400 is an interface module between the SPBus and digital inputs or outputs to and from field devices.

The RIO400 system provides a cost-effective solution for connecting any number of inputs and outputs to a Kongsberg Maritime automation system, independent of the distance between the remote equipment and the controller computer.

Input and Output

Number of I/O channels: 32
I/O configuration: Individually defined as input or output

Digital Input

Loop voltage: 24 VDC +/- 20%
Input loop current: maximum 4 mA at 24 VDC loop voltage
Channel "off" current: <0.5 mA
Channel "on" current: >3 mA
Maximum input voltage: loop voltage
Maximum input
signal frequency: 10 ms pulse
Connectors: screw terminals, 2.5 mm^2

Digital Output

Loop voltage: 24 VDC +/- 20%
Loop driver: 1 A, short-circuit proof "High -Side" driver (HSD)
Loop driver trip current: approximately 1.4 A (reset by command)
Loop driver
OFF leakage: maximum 2 mA at 24 VDC loop voltage
Connectors: screw terminals, 2.5 mm^2

SPBus Interface

SPBus interfaces: 2
Power supply voltage
from SPBus: 10 to 28.8 VDC
SPBus connector: 9-pin male DSUB
SPBus isolation: 500 V (optocoupler)
SPBus type: RS-485 (multidrop)
SPBus frequency: maximum 2 MHz
SPBus signal code: Manchester encoded (self-clocked)

Dimensions

Height: 355 mm
Width: 158 mm
Depth: 87 mm
Weight: 1.35 kg

Electrical

Input voltage: 24 VDC +/- 20%
Power consumption: maximum 6 W for 32 inputs
or maximum 768 W for 32 outputs
Connectors: screw terminals, 2.5 mm^2

Environmental Specifications

Ambient temperatures
operational: 0° C to 70° C
storage: -25° C to 70° C
Ambient humidity
operational: up to 100% relative humidity
storage: up to 100% relative humidity
Heat dissipation: maximum 10 W
Protection standard: IP20
EMC according to: EN50081-2, EN50082-2, EN60945 and EN61135-2

Article Number

RDIO400: 600301

Standards Applied

The equipment is designed to conform to the following standards:

IEC 61131-2, IEC 60945 and IACS E10

CE Marking

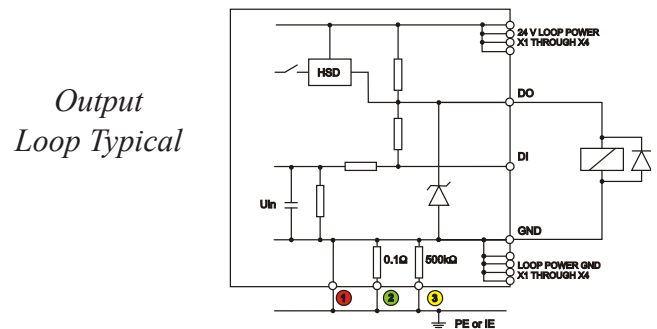All equipment satisfies the relevant EU directives.

Approvals

The RDIO400 is approved by Det Norske Veritas (DNV) for ships and Mobile Offshore Units, the American Bureau of Shipping (ABS) for Mobile Offshore Drilling Units and ships and by TÜV in SIL3 functions as dual I/O and SIL2 with single I/O in accordance with IEC 61508.
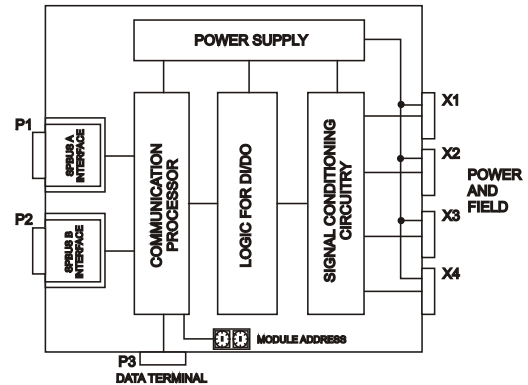
Block Diagram
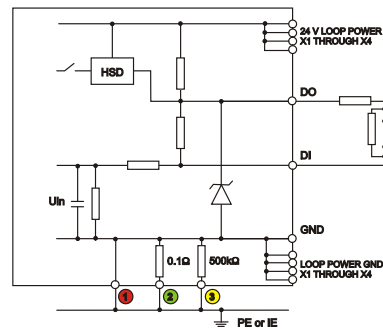
*Input
Loop Typical*

*Output
Loop Typical*

1. Fully earthed to PE or IE
2. Monitored earth across a 0.1 ohm resistor
3. Insulated by 500 kohm and monitored leakage to earth

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