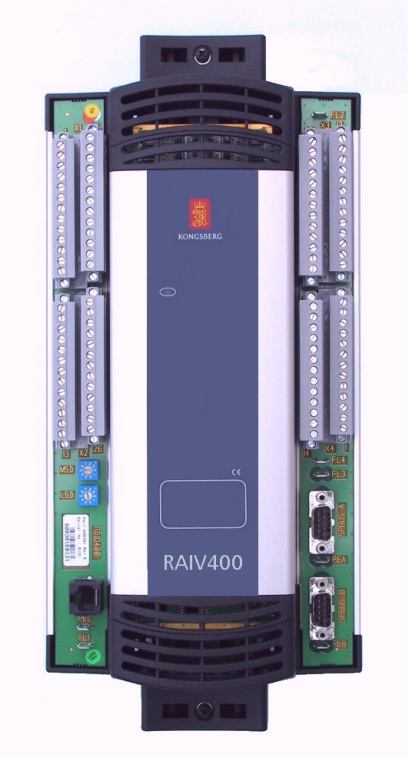
RAIV400

KONGSBERG

Remote Analogue Input, Voltage



The RAIV400 is an interface module between the Serial Process Bus and analogue input signals.
Typical applications are:
- **Vessel Control Systems**
- **Process Control Systems**
- **Safety Systems**

Features

- Up to 32 analogue voltage inputs
- 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
- Dual watch-dogs
- Fail-safe settings activated by watchdog
- Built-in test (BIT) for self diagnostics and fault identification
- Dual units are SIL 3 compliant
- Single units are SIL 1 and SIL 2 compliant
- Line Fault Detection (LFD)
- Earth Fault Detection (EFD), node level

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 RAIV400 is an interface module between the SPBus and analogue inputs from field instruments and is primarily intended for use in dual I/O systems.
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.

Technical Specifications

Standards Applied
The module is designed to conform to the following standards:
IEC 61131-2, IEC 60945, IEC 61508 and IACS E10.

CE Marking
The module conforms to the relevant EU directives.

Type Approval
The RAIV400 is type 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
- TÜV in SIL3 functions as dual I/O and SIL2 with single I/O in accordance with IEC 61508.

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

Electrical
Input voltage:	24 VDC ±20%
Power consumption:	maximum 21.6 W
Connectors:	screw terminals, 2.5 mm²

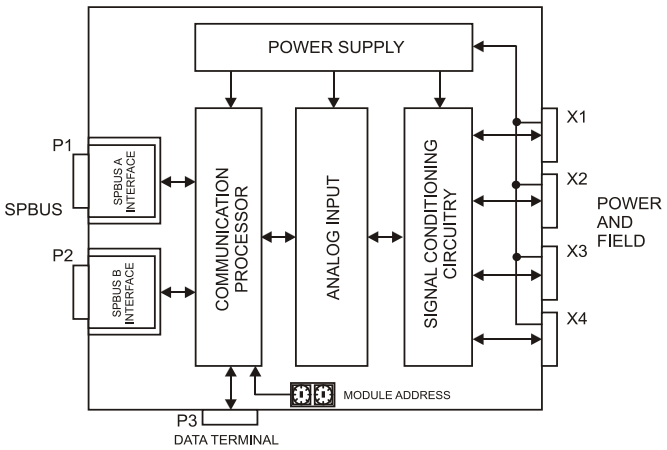
Environmental Specifications
Ambient temperatures	
operational:	0° C to 70° C
storage:	-25° C to 70° C
Ambient humidity	
operational:	up to 100% relative humidity
storage:	up to 100% relative humidity
Heat dissipation:	maximum 10 W
Protection standard:	IP20
EMC according to:	EN 50081-1, EN 60945 and EN 61000-4-3

Analogue Input
Number of channels:	32 voltage inputs
Voltage input:	±10 VDC
Voltage input impedance:	3.3 Mohm
Voltage accuracy:	better than ±0.1% of full scale (typically ±0.05%)
Digital resolution:	12 bits
Connectors:	screw terminals, 2.5 mm²

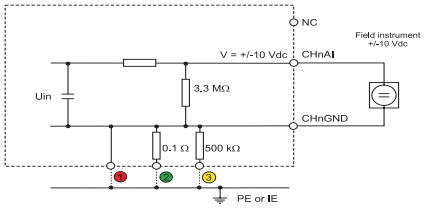
Loop Current Driver
Loop driver:	500 mA, short-circuit proof "High -Side" driver (HSD)
Loop driver trip current:	approximately 1.4 A (reset by command)
Loop driver OFF leakage:	maximum 2 mA at 24 VDC loop voltage

Article Number
RAIV400:	600370

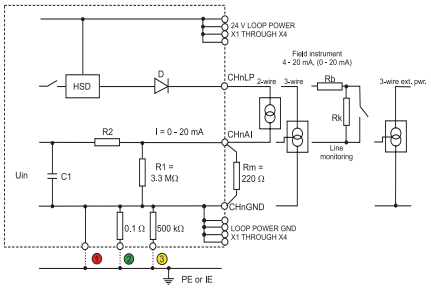
SPBus Interface
SPBus interfaces:	2
Power supply voltage from SPBus:	10 to 28.8 VDC
SPBus connector:	9-pin male DSUB
SPBus isolation:	500 V (optocoupler)
SPBus type:	RS-485 (multidrop)
SPBus frequency:	maximum 2 MHz
SPBus signal code:	Manchester encoded (self-clocked)



Block Diagram



Analogue voltage input loop typical



Analogue current input 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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