



KONGSBERG

RAOC400

Remote Analogue Input and Output

The RAOC400 is an interface module between the Serial Process Bus and analogue input or output signals.

Features

- Up to 24 analogue inputs (16 current and 8 voltage) and 8 analogue outputs, individually defined as current or voltage
- 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 run and error
- Loop-check and debugging from operator station and local data terminal
- Short-circuit proof analogue input loop current driver
- Fail-safe activation of outputs by watch-dog upon loss of communications
- Built-in test for self diagnostics and fault identification
- Earth Fault Detection (EFD)
- Line Fault Detection (LFD)
- 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 RAOC400 is an interface module between the SPBus and analogue 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.

Technical Specifications

Analogue Input

Number of channels:	16 current and 8 voltage inputs
Current input:	0 to 20 mA (input resistor 220 ohm)
Current accuracy:	+/- 0.2% of full scale
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 mm ²

Loop Current Driver

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

Analogue Output

Number of channels:	8 current or voltage
Current output:	0 to 20 mA (loop power maximum 30 WDC)
Voltage output:	0 to 10 V
Current accuracies at 300 ohm load and 24 VDC loop voltage	
Linearity:	+/- 0.1% of full scale
Offset:	+/- 0.2% of full scale
Gain:	+/- 0.2% of full scale
Temperature drift:	60 ppm/°C
Voltage output:	0 to 10 VDC
Digital resolution:	12 bits
Output resistance:	70 ohm
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 21.6 W
Connectors:	screw terminals, 2.5 mm ²

Article Number

RAOC400: 600303

KONGSBERG MARITIME AS

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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

Standards Applied

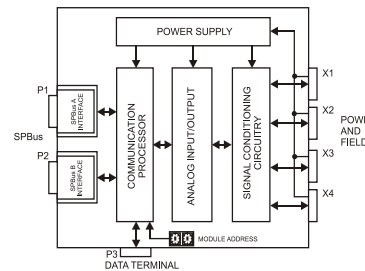
The equipment is designed to conform to IEC 61131-2, IEC 60945 and IACS E10.

CE Marking

The module satisfies the relevant EU directives.

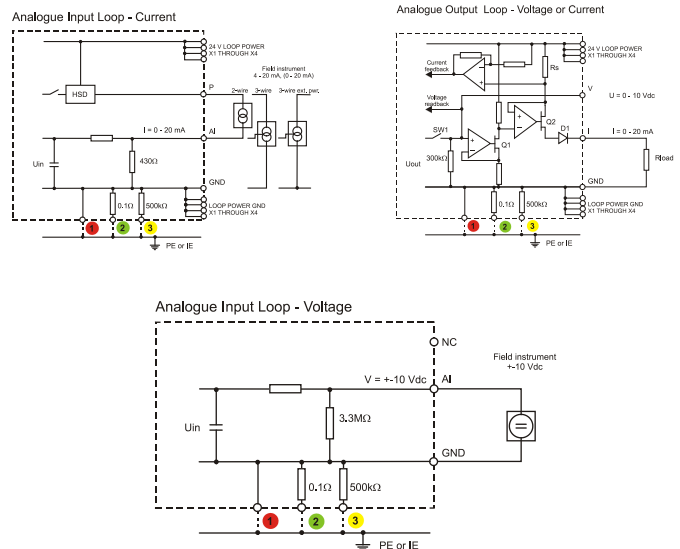
Approvals

The RAOC400 is approved by Det Norske Veritas (DNV) for ships and Mobile Offshore Units and by the American Bureau of Shipping (ABS) for Mobile Offshore Drilling Units and ships.



Block Diagram

Examples of Loop Typicals



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



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