

RCU 501

Remote Controller Unit



KONGSBERG

RCU501 is a high performance, general purpose, real-time process control computer for use in a wide variety of system applications in both on- and offshore installations. The processor core is an embedded Power PC™ architecture and the module is approved for Ex Zone 2 applications.

Application types

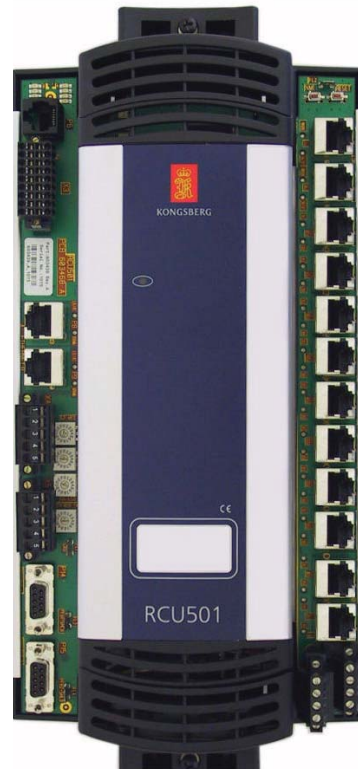
- Dynamic Positioning Systems
- Thruster Control / Steering Systems
- Navigation Sensor Integrator
- Integrated Process Control Systems
- Alarm and monitoring Systems
- Safety Systems

Function

- Dual ethernet LAN process networks
- Dual RedundancyNet interface for redundant RCU configuration
- Dual Remote IO process BUS (RBUS)
- 4 general purpose Digital Input channels
- 4 general purpose Digital Output channels
- 32 serial lines for 3rd party interface
- 2 PROFIBUS channels for 3rd party interface
- 2 CANBUS channels for 3rd party interface

Feature

- Single unit topology: SIL 1 compliant
- Dual unit topology: SIL 2 and SIL 3 compliant
- Triple unit topology
- Ex Zone 2 approved
- Compliant to the following protocols:
 1. Modbus (Serial and TCP)
 2. NMEA 0183
 3. PROFIBUS/PROFIsafe
 4. CAN/DeviceNet
- 3rd party vendor specific protocols are available upon request
- Power:
 1. Redundant power input with power alarm monitoring
 2. Inrush current and over-voltage protection
- Enhanced watchdog with fail-safe function and system status output



Benefits

- The following built-in functions minimize system downtime:
- Extended Built-in Self- Test (BIST) for computer diagnostics and fault identification during start-up and runtime
 - Prepared for online remote diagnostics
 - Prepared for online firmware upgrade
 - Bootable from file server or local flash memory
 - Easy installation and replacement
 1. DIN Rail mounting
 2. All connections are pluggable
 3. 3 digit address switches
 - Hot swap in redundant applications, dual and triple Hot-Standby redundancy, 1oo2 redundancy
 - Status LED indication (Normal/Error)
 - RoHS compliant

Computer performance

- RCU501 performance is application dependant and governed by process complexity, updating frequency and number of interfaced I/O. Maximum updating frequency is 50 Hz.
- Configuration guidelines:
 1. ESD/PSD: max. 800 I/O, F&G: max. 700 I/O both at scan rate: 1 Hz
 2. Process/ Automation: max. 2000 I/O, design advice: 1280 I/O both at scan rate: 1 Hz
 3. Anti-surge: 3 loops, Scan rate: 50 Hz
 4. Dynamic Positioning: Triple redundant DP system combined with Position Mooring. (Scan rate is adapted to signal processing and varies from 1 to 10 Hz).



KM article number

RCU501: 603439

Standards

RCU501 complies with the following:

- IACS E10
- IEC 60533
- IEC 60945
- IEC 61508
- IEC 62061

Type approval

RCU501 is type approved by:

- Det Norske Veritas (DNV)
- The American Bureau of Shipping (ABS)
- TÜV Rheinland
- Wurldtech™; Achilles level 1 certified

CE marking

CE mark compliant, confirm to:

- 2004/108/EC (EMC directive)
- 94/9/EC (Atex directive)

Ex certification

Ex nA II T4 (Zone 2)

Environmental specifications

Ambient temperatures and humidity:

- Temp. Operation: -15°C to 70°C
- Temp. Storage: -25°C to 70°C
- Humidity Operation: Up to 98% RH
- Humidity Storage: Up to 98% RH

Protection Standards: IP 20

Dimensions

Height: 355 mm

Width: 158 mm

Depth: 87 mm

Weight: 1.35 kg

Cross point screw lock on DIN Rail T35 7.5/15 according to EN 50022

Electrical

Input supply voltage: 24 VDC (+30%, -25%)

Nominal current consumption: ≈ 0.8 A

Start-up current: Max. 2.7 A

Power consumption: Max. 20 W

Heat dissipation: Max. 20 W

Power connectors:

- Screw terminals (slotted)
- Cable cross section: 2.5 mm²

Processor and memory

Processor:

- Type: Power PC™ host processor MPC8245
- Clock frequency: 400 MHz

Memory:

- RAM size and speed: 64 MB @ 133 MHz
- PROM: 16 MB application flash-file

Serial line

Channels: 32 insulated serial lines, distributed on 8 RJ45 connectors

Physical layer: RS232, RS422 and RS485 Multidrop via RSER200

Bit rate: Max. 115 kb/s

General purpose I/O channels

Digital Output (DO):

- 4 x opto-isolated outputs
- 1 x opto-isolated watchdog (for external interface)

Digital Input (DI): 4 x opto-isolated inputs

I/O connectors:

- Cage clamps
- Cable cross section: 1 mm²

LAN interface

Process network & RedundancyNet:

2 x RJ45 Ethernet IEEE 802.3 type 10BASE-T/100BASE-TX

RBUS interface

Connector: 2 x RJ45

Bit-rate: 2 Mb/s

Signal code: Manchester encoded (Self-clocked)

Copper wire topology:

- Insulation: 500 V (Optocoupler)
- Physical layer: RS485 Multidrop
- Cable attenuation: < 6.5 db/100m @ 10 MHz (CAT 5)
- Cable length: Max. 200 m between repeaters. Max. 3 repeaters

Fibre optical topology (w/ additional fibre media converter):

- Fibre cable: 62.5/125 μ m. Multimodus
- Connector: ST
- Cable length: Max. 1000 m (point to point). 500 m if used in patch-panel topology

Field interface

CAN interface:

- 2 x CANopen/DeviceNet @ 5 pole cage clamp terminals. 2.5 mm² cable
- Bit rate: Max. 1 Mb/s. (DeviceNet not defined above 500 kb/s)

PROFIBUS interface:

- 2 x opto-isolated 9 Pin female D-Sub connectors
- Bit rate: Max. 12 Mb/s

Life cycle prediction

Predicted failure rate @ GB 25°C (60% confident, based on chip suppliers data): 24.2 Years

Predicted failure rate @ NS 35°C (Environmental de-rating based on Rome Laboratory toolkit): 6.5 Years

* KM reserves the right to make changes to the material or product described, at any time without notice.

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