




16 K-Chief 700  
16.23.04 RCU502

**Ref:**  
**Document name:** RCU502 Hardware Module Description  
**Document nr:** 358190

**DMS no:**

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## Learning outcome


The participants shall be able to

- describe the RCU502 layout and features.
- explain the mode and address setting for RCU502.
- be familiar with the description to the different connectors belonging to RCU502.
- explain how to restart a RCU502 unit.
- be familiar with LED status for start-up sequence for RCU502.
- gather information about RCU502 in Reference Manual.
- to utilize the reference Manual in carrying out maintenance onboard.
- take responsibility when do maintenance to RCU502.

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## Process Station (PS)





Remote Controller Unit (RCU) is a real-time single board computer and remote IO bus driver.

RCU 502 is based on PowerPC Host Processor MPC 8245 running at 400MHz.

64 MB RAM  
32 MB Flash memory.

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## RCU502 Layout



Status LEDs →

Console Connection P6

Onboard IO (DI,DO,WD) X3

Net A/B- Ethernet P8  
P9

CANBUS 1,2 X4  
X5

PROFIBUS 1,2 P14  
P15



Run/ Error LED

Address Wheels

Mode Switch

NMI / Reset

P11 RedNet  
P10

P31 FieldNet  
P30

P26 Serial Link Connections


P21

P20 RBUS B  
P19 RBUS A

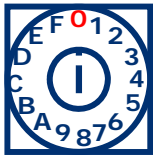
X2 Power 24VDC

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### RCU502 Mode Setting








**MODE**



The hexadecimal MODE switch set SW-mode and is used only for advanced servicing and debugging purposes.


The switch **has to be set to 0** (Zero) for normal operation



 **S7: MAC1**  
 **S6: MAC2**  
 **S5: MAC3**  
 **S4: MODE**

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### RCU502 Address Setting




**MAC1**





**MAC2**

**MAC3**



Set correct PS address using the three address wheels



 **S7: MAC1**  
 **S6: MAC2**  
 **S5: MAC3**  
 **S4: MODE**

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### RCU502 Address Setting

MAC1

MAC2

MAC3

MSD

LSD

Network A and B IP addresses  
(SW address)

Example of IP address of PS41:  
172.21.1.41 net A  
172.22.1.41 net B

Network A and B MAC addresses  
(HW address)

Example of MAC address PS41:  
02:41:4c:42:12:29 for net A  
02:41:4c:42:22:29 for net B

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### RCU502 Connectors (P6, P8, P9)

RS232 serial line for console connection

Dual female RJ45 8 pin socket for 10Base-T/100Base-TX

Net A

Net B


P6

P8

P9

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### RCU502 Connectors (X1, X2 and X3)




9 Onboard isolated digital IO

- 4 DI opto-isolated
- 4 DO opto-isolated
- Watchdog

X3 →


X1 → Fan connection

X2 ← Redundant power



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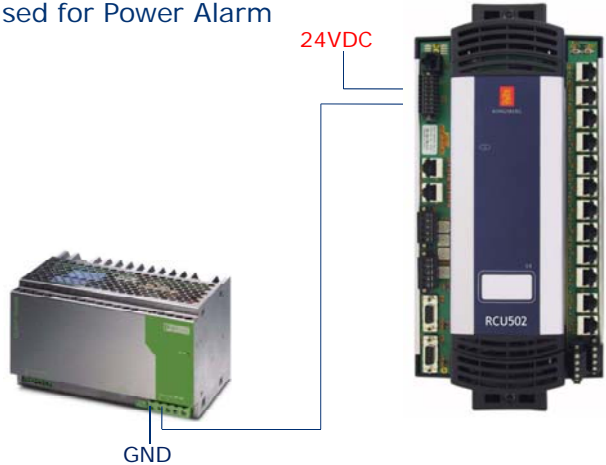
### Onboard IO – an Example



Used for Power Alarm



24VDC




GND



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### RCU502 Connectors (P14 and P15 Profibus)

Isolator
CPM
Remote IS units

Stahl I.S.1 cabinet

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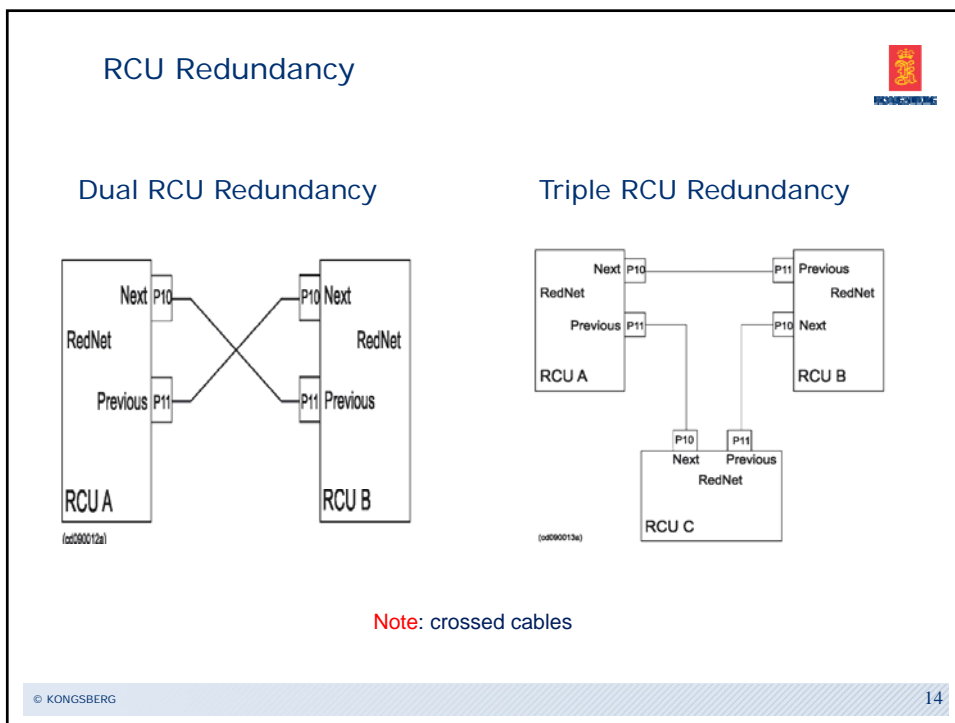
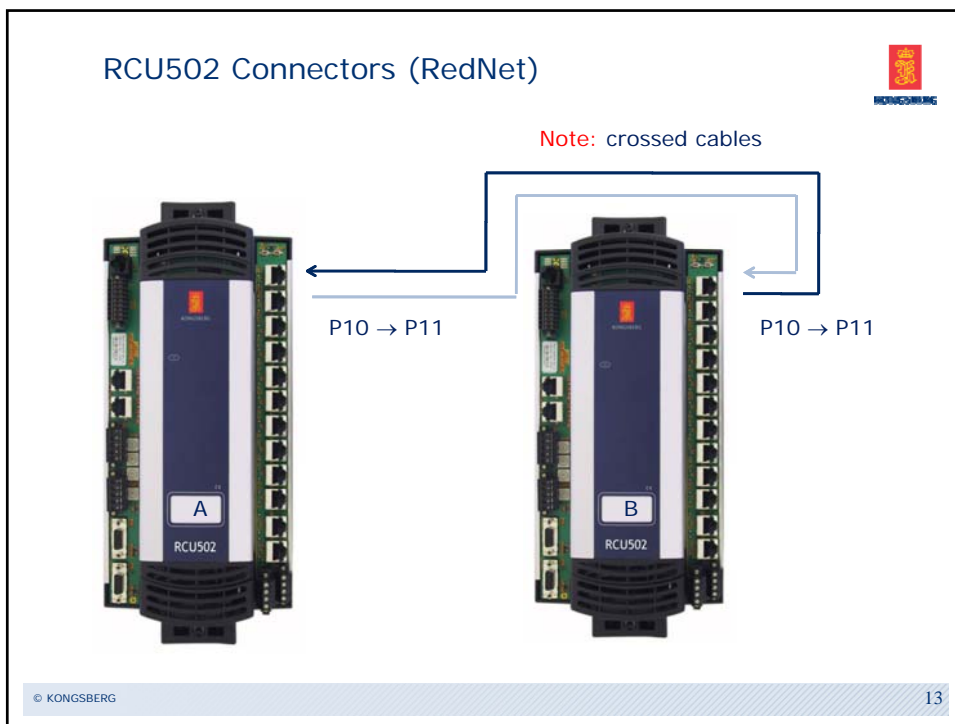
### NMI/Reset Buttons






- NMI
  - Non-Maskable Interrupt
- Reset
  - Restart the controller

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### RCU502 Connectors (FieldNet:P30 and P31)

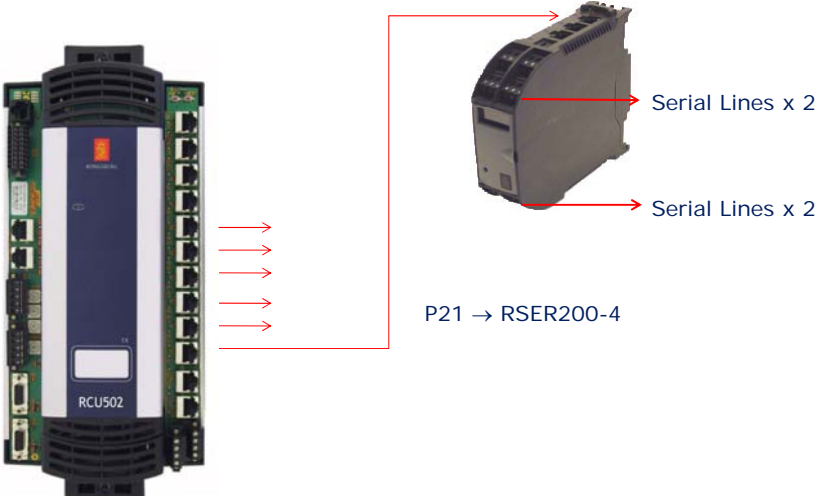


P31 → Ethernet communication to dedicated field devices.  
P30 → For future use.

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Detailed description: This slide shows a front view of the RCU502 device. On the right side, there are two rows of connectors. The top row is labeled 'P31' and the bottom row is labeled 'P30'. Red arrows point from these labels to the respective connector rows. The text explains that P31 is for Ethernet communication to dedicated field devices, while P30 is reserved for future use. The Kongsberg logo is in the top right corner, and the slide number '15' is in the bottom right corner.

### Serial Link Connectors P21 to P26



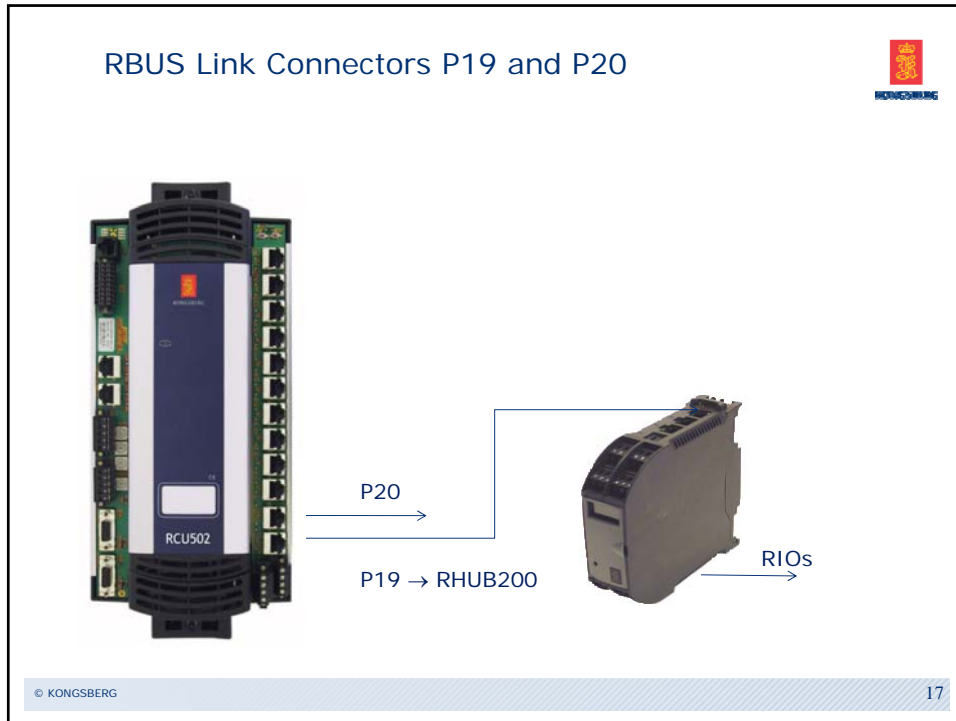
Serial Lines x 2  
Serial Lines x 2

P21 → RSER200-4

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Detailed description: This slide shows the RCU502 device on the left. On the right, a separate module labeled 'RSER200-4' is shown. Red arrows connect the P21 connector on the RCU502 to the RSER200-4 module. Two arrows point to the top of the module, labeled 'Serial Lines x 2', and two arrows point to the bottom, also labeled 'Serial Lines x 2'. The text 'P21 → RSER200-4' is positioned below the connection line. The Kongsberg logo is in the top right corner, and the slide number '16' is in the bottom right corner.





### RCU502 Start-up Sequence


ST0  
 ST1  
 ST2  
 ST3

Status LEDs


Phase	ST3-ST0	Task running
HW Testing	0001	Test of bootPROM checksum
	0010	Test of RAM
	0011	PCI Test
	0100	Test of FLASH
	0101	FPGA Test
	0110	Serial Test
	0111	Timer Test
	SW Booting	1000
1001		Getting bootp on net A
1001 flashing		Booting on net A
1010		Getting bootp on net B
1010 flashing		Booting on net B
1011 flashing		Started initializing the basic SW
Application running	0000	Calling init Application and starting the application code

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## RCU502 Start-up Sequence



Step	Description	Status LED ST3-ST0	Status LED In front	System Status (OS)
1	HW Selftest	0001   0111	Red	Not Communicating
2	Loading Systemfiles	1000   1011	Red  Green	Not Communicating  Not Communicating
3	Loading "workingfiles"	ST4 Lit (Master)	Green  Green	Booting  Operational



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## Exercise: RCU502

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## Summary



- RCU – Remote Controller Unit
- Hardware module description MAN: 300991A
- Connections
  - Power
  - Ethernet
  - RedNet
  - FieldNet
  - RBUS Link connection
  - Serial Link connection
- NMI/Reset
- Address and mode settings