16 K-Chief 700

16.25.05 RPC420

Ref:

Document name: RPC420 Hardware Module Description

Document nr: 325654A

DMS no:

Objectives

- Be familiar with the K-Thrust system
- Know how the K-Thrust is connected in an integrated “K” system
- Know what kind of signals/equipment that can be connected to the RPC420, the RIO module for the lever panels.
- Know where, and how to set up a RPC420 card.

The Propulsion and Thruster Control System

- The Propulsion and Thruster control System, K-Thrust, offers manual remote control of propulsion units, i.e.:
  - Tunnel thrusters
  - Azimuth thrusters
  - Main propellers
  - Rudders
- The K-Thrust system can integrate with:
  - K-Pos system
  - K-Chief 700 system

K-Thrust Main Functions

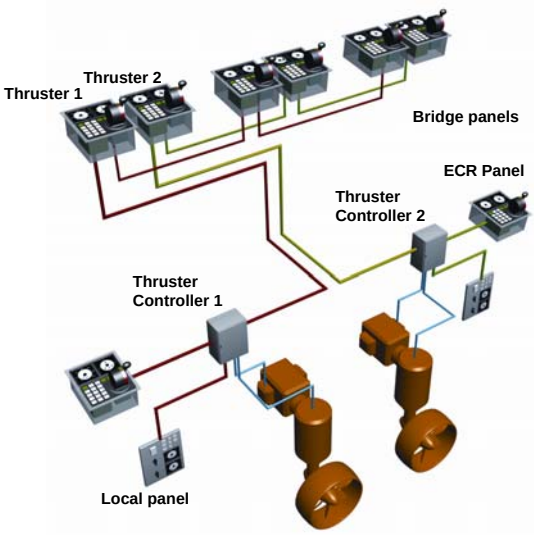
- In combination with the K-Pos system, the K-Thrust becomes a manoeuvring system with a complete range of ship handling functions:
  - Manual control from levers
  - Autopilot
  - Joystick control with automatic heading option
  - Automatic station keeping
- The K-Thrust complies with the relevant main class rules (DNV, ABS and LR)

K-Thrust System Configuration

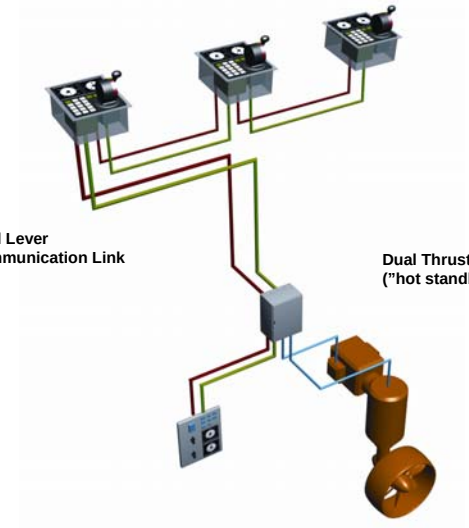
Each thruster has its own Thruster Controller – TC;
similar to a Field Station.

Lever Panels – in several positions

Lever Communication Link (LCL)



K-Thrust Dual System (redundancy)

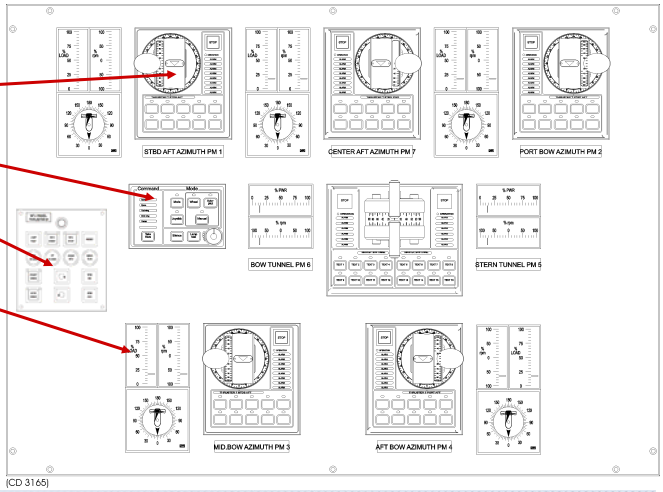


K-Thrust Control Positions

Located on the bridge - optional in engine control room (ECR)

Comprises:

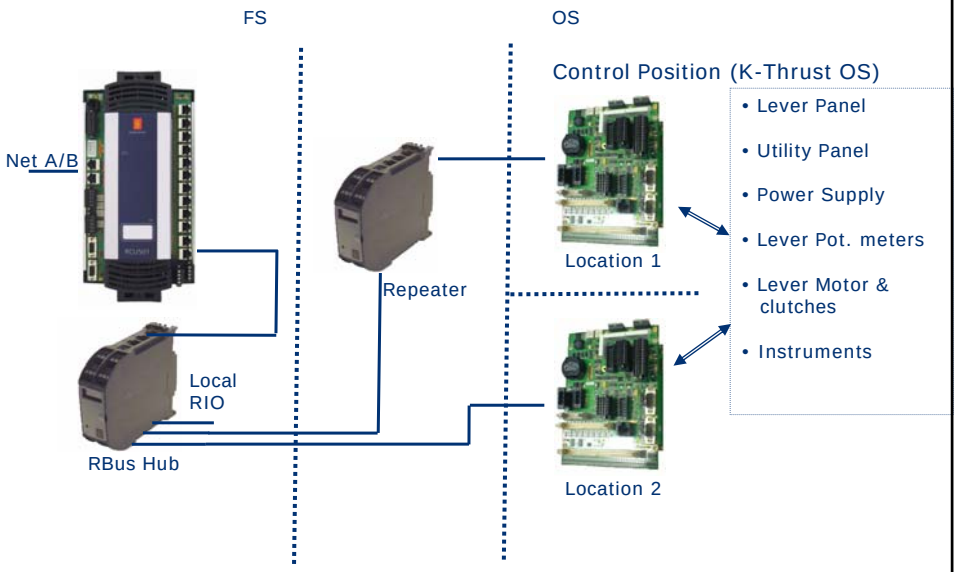
- Manual lever panel
- Utility panel
- Non follow up panel (optional)
- Meter indications



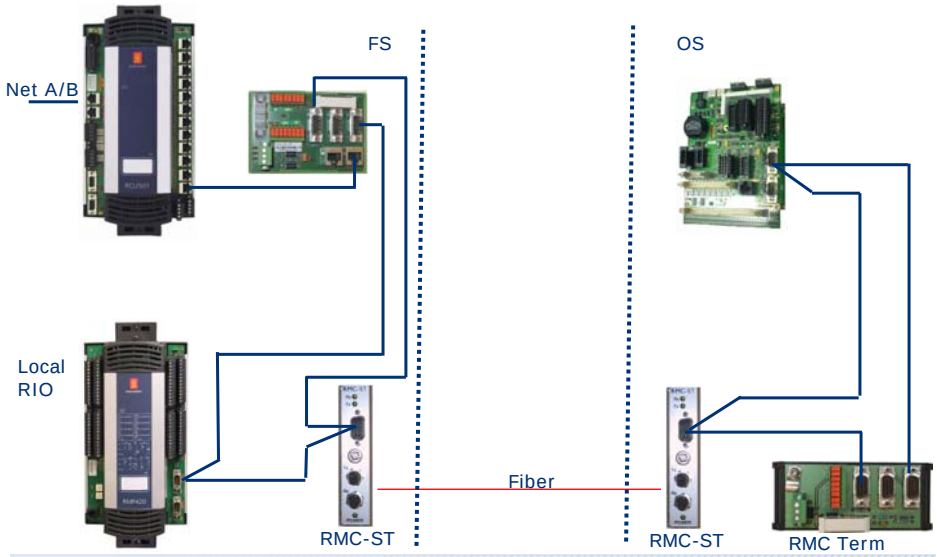
K-Thrust Control Position

- K-Thrust and K-POS in combination

K-Thrust Communication Link: RBus



K-Thrust Communication Link: RBus over Fiber



RPC 420 Function and Layout

Address / Slot no. switch
Unique identification on RBus

LED Status indicator
GRENN=Running OK/ RED=ERROR

Interface module between Thruster Lever Panel signals

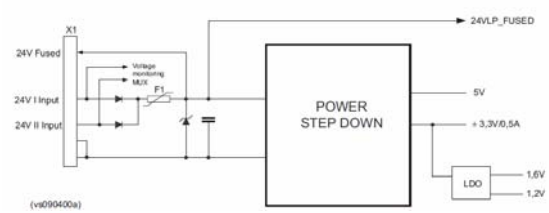
and

Thruster Controller (RCU in TC)

Main interface functions:
- Power Supply
- RBus interface
- Communication processor
- I/O with signal conditioning circuirity
- Self diagnostic

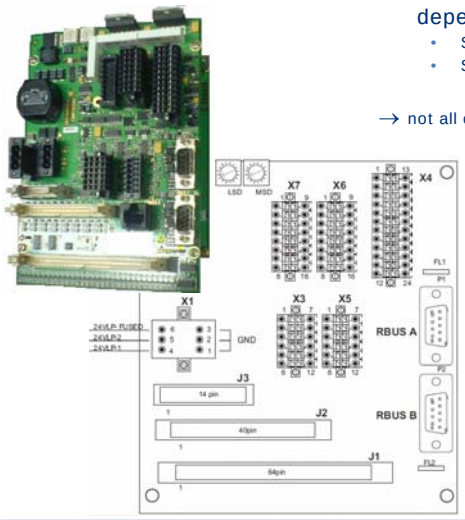
RPC 420 Power Supply and Loop Power

2 Power Supply for redundancy
Isolated by diodes



Automatic fuse F1

Connector Overview



- Note that connectors used depends on system set up
  - System complexity
  - System functionality

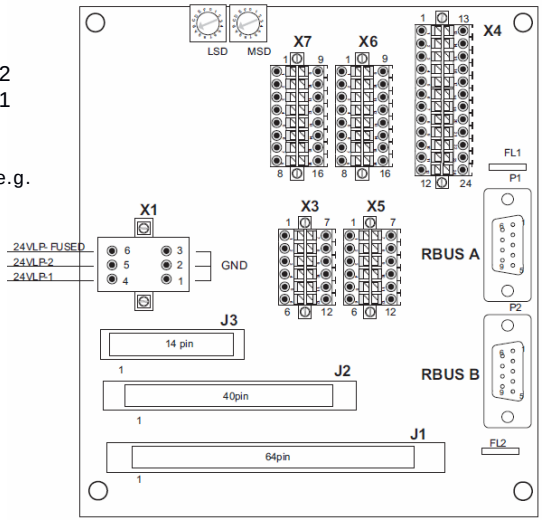
→ not all connectors are necessarily in use

Power connector, X1

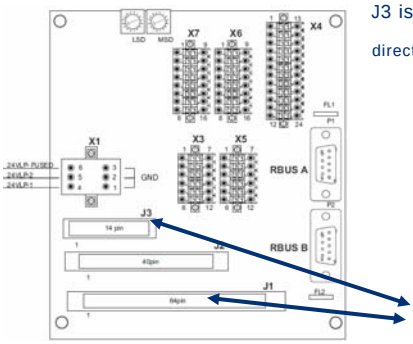
X1:

6:24V 3:GND Ext.Pwr*
5:24V 2:GND PwrSupp2
4:24V 1:GND PwrSupp1

* Power to external load, e.g. lever panel



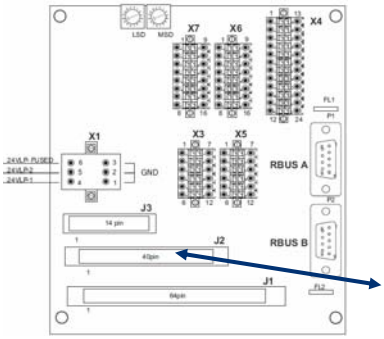
Lever Panel: J1, J3



J1 is a 64 pin flat-cable connector and
J3 is a 14 pin flat cable connector;

direct connection to Lever panel button & LED matrix

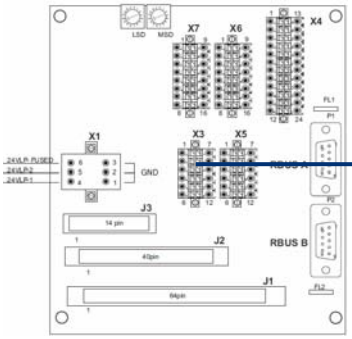
Utility panel: J2

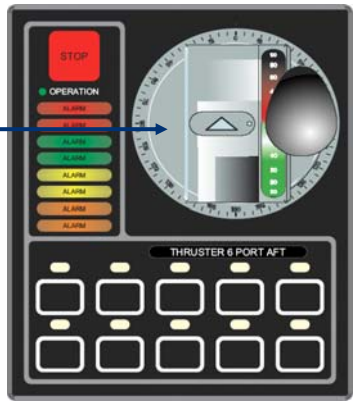


J2 is a 40 pin flat-cable connector;
direct connection to Utility panel button & LED matrix

Lever Potentiometers: X3

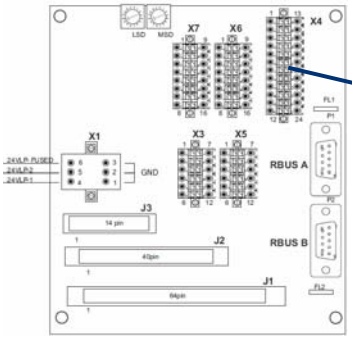
X3 is a 12 pin terminal block connector;
dedicated for connection to different lever potentiometers

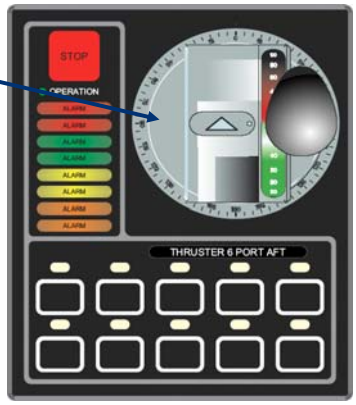




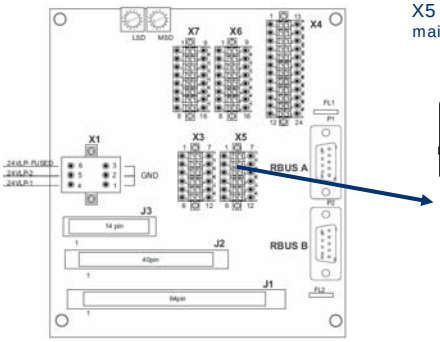
Lever Motors & Clutches: X4

X4 is a 24 pin terminal block connector;
dedicated for connection to lever motors and clutches

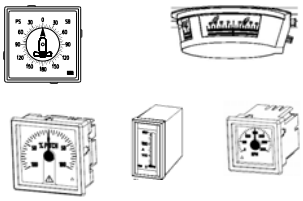




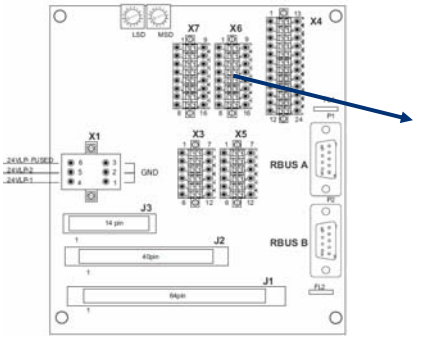
Instruments: X5



X5 is a 12 pin terminal block connector;
mainly for connection to current-loop driven meters

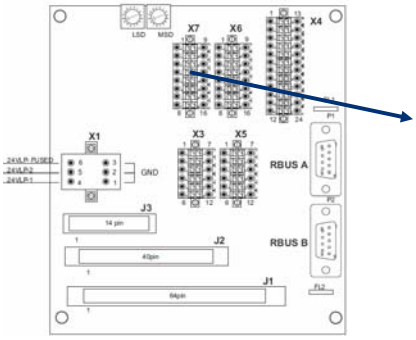


Panel Controls: X6



X6 is a 16 pin Terminal Block

-For connection to a Control Panel
- -Alarm Buzzer and Silence
- -Dimmer
- -Lamp Test

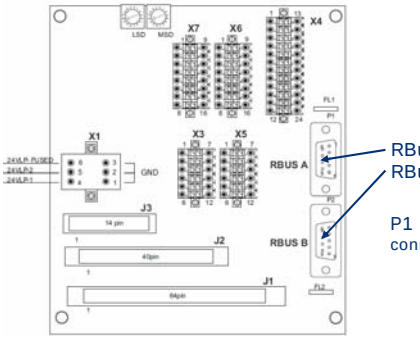


X7 is a 16 pin Terminal Block

- Multipurpose (reconfigurable IO Points)
- Relays (DO Relays)

Used when needed

RCU RBus A/B: P1/P2

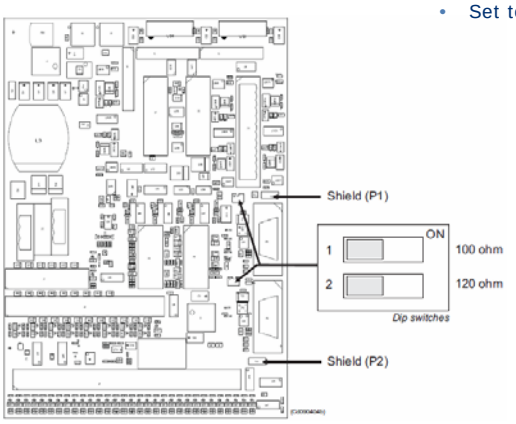


RBus A connects to P1
RBus B connects to P2

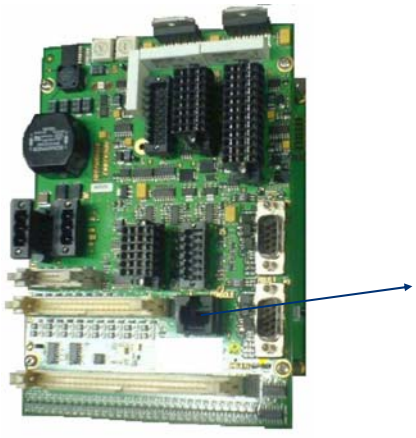
P1 and P2 are 9 pin female DSUB connectors;
connection to TC / RCU by the multi-drop serial bus

Terminating the RBUS on RPC420

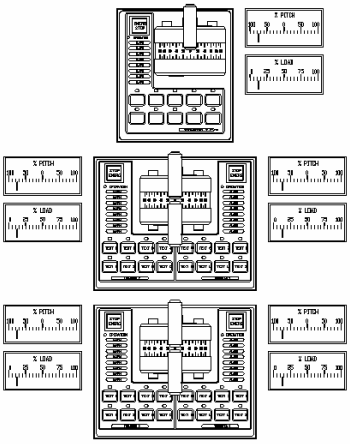
- End Termination is normally taken care of by RBus Term Card
  - Set to OFF on RPC420

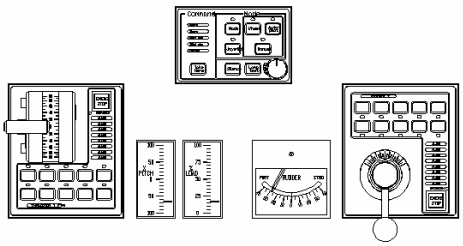


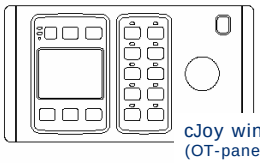
Console Connection: P3



Example: K-Thrust Bridge panel

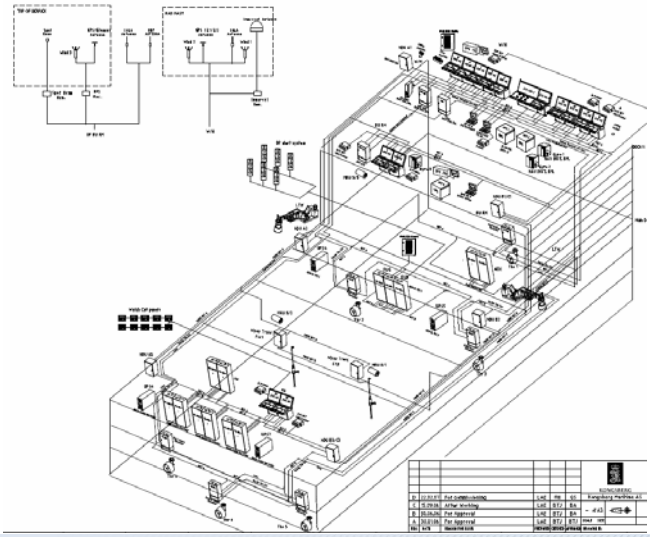






cJoy wing Panel; (OT-panel)

Example: System topology K-Pos/K-Chief 700/K-Thrust



Exercise

- RPC420

Summary

- K-Thrust Main functions
- K-Thrust System configuration
  - TC/FC
  - Lever Panels
  - Lever Communication Link (LCL)
- RPC420 Function and layout
- RPC420 connections