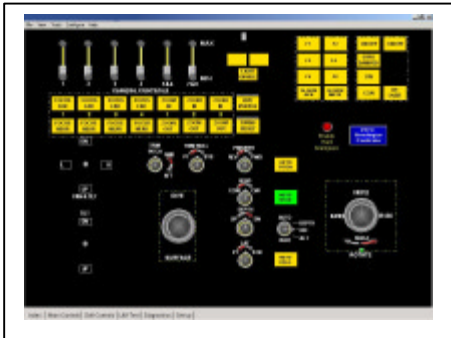
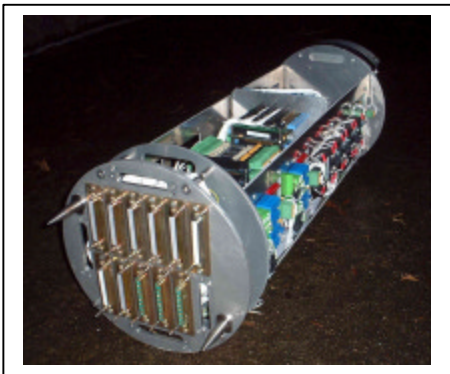


PRODUCT SPECIFICATION
Large Generic Control system
ROCS SCS03



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PRODUCT SPECIFICATION

Large Generic Control system

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PRODUCT DESCRIPTION

The ROCS SCS03 large control system is an example of one of ROV Networks bigger control solutions. The design contains a number of different boards based on Commercial off the shelf (COTS) products as well as electronics from the ROCS control system range.

This design is targeted at ROV's, trenchers, ploughs, templates and any large tooling systems requiring over 100 isolated input/output channels. One of the critical things with all our designs is making sure the potential for future expansion is built into the system. The system shown here is only an example of what can be provided. Any combination of boards may be used from the wide range available from the ROCS designs and the system is fully scaleable to increase the I/O capability at anytime.

The system consists of a master control electronics unit connected via a serial line to the Slave electronics unit. This carefully designed system has enough isolated digital and analogue I/O to operate any modern ROV or tooling system. A separate graphics computer provides the operators with a powerful tool for visualising the slave system as well as controlling it via on-screen buttons and sliders.

ROCS0002 UNDERWATER CONTROL SYSTEM (SLAVE)

The ROCS0002 Slave system consists of one or more modular control pods. This system is designed for underwater use and is thus meant to be mounted inside a deep water pod housing. The cards fitted in this SCS03 system include :-

1. 1 off Stack Power supply
2. 1 off CPU with 2 serial ports,
3. 1 off 4 port isolated comms card 232/485
4. 1 off 16 channel Analogue output card (24 DIO)
5. 1 off 32 channel Analogue input card (4 Anal out+24 DIO)
6. 1 off 48 channel Digital I/O card
7. 1 off 8 channel servo drive card
8. 3 off 8 channel analogue isolation card
9. 3 off 24 channel solenoid driver card (Bi-polar or Uni-polar)
10. 3 off 12 channel relay card
11. 1 off GFD volts monitoring board
12. 1 off Lights Fault Monitoring system



Figure 1
ROCS0002 Slave
Attached to customers endcap

A fibre optic multiplexer board may be optionally fitted to the system allowing all data and video to be transmitted via a single or multimode fibre to the master station. (*Price on application*). The board set above is mounted on a Tri-stack Backplane (*3 stacks of up to 9 boards per stack*) and provides the following capabilities.

- | | |
|--|---------------------------|
| - 6 serial ports, (4 isolated) 1 used for master comms | 2 off RS485 optional |
| - 32 Bipolar Analogue input all Isolated | 16 Bit +-5V, +-10V +-20mA |
| - 20 Bipolar Analogue output, isolated for servo/prop drives | 12 Bit +- 40mA /chan |
| - 16 Digital inputs available for sensors | 24Vdc or 5Vdc input |
| - 116 Isolated digital outputs (see details below) | Various output types |
| - 36 Bipolar (64 Unipolar) isolated FET drives for solenoids etc | 1 Amp per channel 24Vdc |
| - 36 double pole isolated switching power relays | 1.5 A per contact 24Vdc |
| - 16 Double pole (DPDT) Power relays | 5A per contact 24/110V |
| - 3 off fast counter timers | 100khz-10MHz |
| - CPU | Pentium 300MHz |
| - Flash Disk with all system software | 32 Mb to 512 Mb |

We would like to point out that this is a suggested I/O list based on a standard ROV requirement. With the range of cards available from ROV Network, you can build exactly the system you need. The pod has room on the stacks for up to 8 more boards without extending into the customer expansion space. This free space is designed to hold customer specific electronics such as power supplies or sonar equipment. Alternatively it may be filled with extensions to the standard I/O. Another expansion route is

to extend the system using our intelligent valve pack boards mounted inside solenoid, servo or proportional valve packs using a mixture of direct and distributed control techniques.

Onboard power supplies inside the pod provide power for sensors and some components +-12 Vdc, +-15Vdc +5Vdc, +24Vdc. (This excludes the large power supplies for aux equipment and valve packs)
Input power, 24Vdc nominal. 3.0A – 6.0A

Isolated Analogue inputs can be voltage (up to +-10V) or current (up to +- 20mA), also resistance for Temp sensors and direct connection to 4-20mA sensors.

The system can directly drive servo valves, solenoid valves, up to 8 lamps (2000W) (via 4 off over current protected dimmer circuits), Up to 6 Cameras, 6 focus/zoom controls and any ancillary equipment such as Sonars or survey systems.

The electronics can directly read water alarms, pressure and temperature sensors, flow meters and Intelligent sensors (Digiquartz and altimeters). With extensive spare capacity, the system can operate other tools or read additional sensors including quadrature sensors, LVDT's etc.

Drivers can be provided for almost any serial sensor or control module including other items from the ROV Network product range such as intelligent servo and solenoid valve packs. The system is also fully compatible with our smaller control packages allowing direct control and communications from both surface and sub sea modules.

Programming of the control system is by ladder logic or "C" code. Onboard ROMDOS allows easy access to standard bios functions. The standard control system is provided fully programmed for your project based on your stated requirements. It also comes with a library of functions that can be easily incorporated into your system well into the future. There is a full technical support package ensuring the right product spec is used for your system and a complete programming service with 24 Hour help line available, please contact us for details.

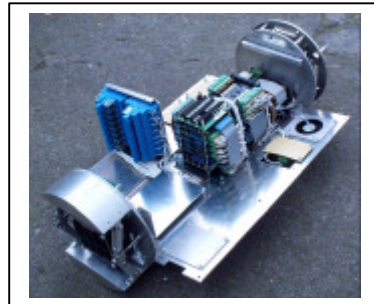


Figure 2
Easy access compact chassis.

ROCS0001 SURFACE CONTROL SYSTEM (MASTER)



Figure 3 Typical control panel

The Surface Master control station consists of a stack of PC104 cards and a Graphics computer providing the operator MMI. The PC104 stack connects to any existing or new build manual control panel containing joysticks, potentiometers, sliders and switches. Your control panel may also hold LED's and an acoustic alarm for feedback purposes.

The PC104 controller is standard supply although on certain specialist applications, it may not be

required. The Graphics computer can be fitted with a touch-screen monitor that can be used on it's own as the master controller but experience suggests most users prefer physical controls using the touch screen interface graphics and seldom used control functions.

The high quality graphics and large internal storage allow any number of screens to be created displaying the

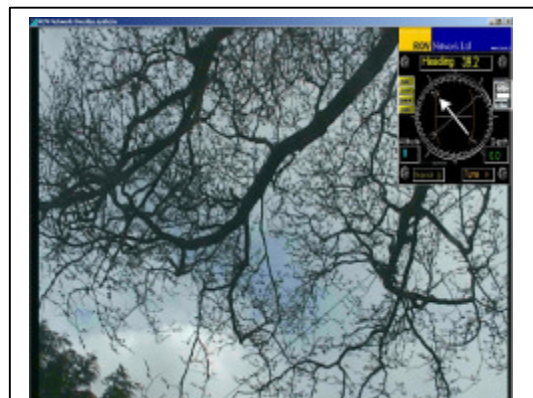


Figure 4 ROCS1000 video overlay option

incoming data and allowing control over any of the system functions. Additional screens can be provided to provide secondary control stations. Other options include wide ranging networking capability and a video input allowing cameras pictures to be displayed on the computer overlaid with system graphics.

ROCS 0001 PC104 CONTROLLER (MASTER)

The Slave pods and Graphics computer connect by serial lead to the PC104 stack consisting of.

1. 1 off Stack Power supply
2. 1 off CPU.
3. 1 off Diamond 32 channel analogue input card with 24 DIO + 4 Anal out
4. 2 off Garnet 48 channel digital input card
5. 1 off 4 port isolated comms board (optional)

This board set provides the following capability:-

- 32 analogue inputs
- 120 Digital inputs
- 4 analogue outputs
- 5 Digital outputs
- ZFx86 300 MHz CPU
- 32 MB RAM
- IDE and Floppy disk Connectors for logging and data storage
- 6 Serial, 1 Parallel

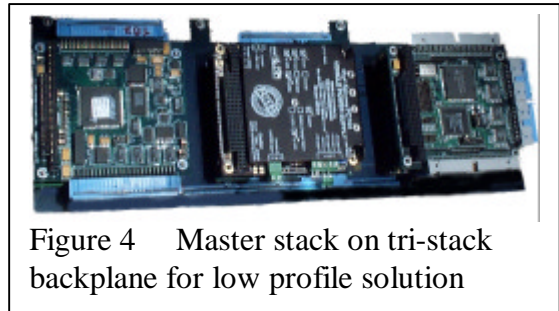


Figure 4 Master stack on tri-stack backplane for low profile solution

This I/O capability can be easily expanded using any of our standard PC104 cards. The system can output serial data to interface with legacy control systems or survey equipment. The system can also receive data from other serial devices if the comms card option is fitted.

The stack is not supplied with an enclosure as the customer will be expected to create their own control panel for use with the system. (*Panels can be provided at customer request.*)

SCADA GRAPHICS COMPUTER (MASTER MMI)

Housed in a 4U 19" rackmount PC case, The Graphics PC contains a modern PC motherboard running Windows 2000 or XP if preferred. The PC is fitted with 512MB of ram, a 40GB Hard Disk, a high-end VIVO video card and a CD writer. There is an option for a 4 port comms card to communicate with survey systems.

The Video card allows two monitors to be driven from the same computer with different SCADA screens displayed on each one. The VIVO card also allows any video signal to be displayed on the computer screen with the SCADA control graphics overlaid on top. The same image can then be recorded to hard disk or output as a video signal to VCR's or monitors.

The Computer is loaded with a modern OPC communications suite to handle all communications to slave stations. This allows any computer on the network to control or access data directly from the slave systems. This applies to local computers or systems over a WAN or the internet.

Any OPC or DDE Client can be used to read and write data through the server. Possible Clients include all modern SCADA packages as well as all Microsoft Office compatible packages such as Excel and Access. Live data from the system can be displayed in a spreadsheet or stored in a database.

The client we provide is one of the most advanced SCADA software packages available. It's capabilities over and above the graphics include options for data logging, multimedia alarm functions, data routing

for fault recovery and a trending package allowing complex graphing and charting routines. The system is VBA compatible and can be interfaced to third party software using simple scripts as well.

We create high quality dedicated graphics pages displaying every aspect of the system for both control and diagnostics using the SCADA software. The system can also convert these pages to HTML should a user wish to access the system over the internet. Although the screens are designed to make the system easy and intuitive to operate, the advanced design ensures the system is future proof. We already have the ability to display the screens on PDA devices for remote operation or fault finding and link to the system through wireless connections. Whatever happens with technology, our customers can be assured that their system will be compatible with technologies well into the future.

The standard package comes with over 20 pre-programmed pages designed around the customers hardware. These include:-

- 4 off Master control pages
- 2 off Video control pages (Power, Pan and tilts, zoom/focus)
- 8 off Calibration pages
- 8 off Diagnostics pages

These demo screens will give full access to all the onboard functions. A programming package is supplied with a detailed manual on editing the existing screens and creating additional graphics pages.

PRICE LIST

Please contact Chris or Andy at ROV Network LTD +44 1224 311113 for up to date prices

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