# SeaKing System

# Operator & Installation Manual

*For SONV3 systems operating*
*with the SeaNet SCU*

Supplied by

# COPYRIGHT

F063.1

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# Handling of Electrostatic-Sensitive Devices



## Attention

### Observe Precautions for handling Electrostatic Devices

## Caution

## Handling of Electrostatic-Sensitive Devices

**Certain semiconductor devices used in the equipment are liable to damage due to static voltages.**

Observe the following precautions when handling these devices in their unterminated state, or sub-units containing these devices:

- Persons removing sub-units from any equipment using electrostatic sensitive devices must be earthed by a wrist strap via a 1MΩ resistor to a suitable discharge reference point within the equipment.

- Soldering irons used during any repairs must be low voltage types with earthed tips and isolated from the Mains voltage by a double insulated transformer. Care should be taken soldering any point that may have a charge stored.

- Outer clothing worn must be unable to generate static charges.

- Printed Circuit Boards (PCBs) fitted with electrostatic sensitive devices must be stored and transported in appropriate anti-static bags/containers.

F110.0

# Warranty Statement

**Tritech International Limited** herein after referred to as **TIL**

TIL warrants that at the time of shipment all products shall be free from defects in material and workmanship and suitable for the purpose specified in the product literature.

The unit/system warranty commences immediately from the date of customer acceptance and runs for a period of 365 days. Customer acceptance will always be deemed to have occurred within 72 hours of delivery.

**Note:** Any customer acceptance testing (if applicable) must be performed at either TIL premises or at one of their approved distributors unless mutually agreed in writing prior to despatch.

**Conditions:**

**These include, but are not limited to, the following:**

1        The warranty is only deemed to be valid if the equipment was sold through TIL or one of its approved distributors.

2        The equipment must have been installed and commissioned in strict accordance with approved technical standards and specifications and for the purpose that the system was designed.

3        The warranty is not transferable, except or as applies to Purchaser first then to client.

4        TIL must be notified immediately (in writing) of any suspected defect and if advised by TIL, the equipment subject to the defect shall be returned by the customer to TIL, via a suitable mode of transportation and shall be freight paid.

5        The warranty does not apply to defects that have been caused by failure to follow the recommended installation or maintenance procedures. Or defects resulting from normal wear & tear, incorrect operation, fire, water ingress, lightning damage or fluctuations in vehicles supply voltages, or from any other circumstances that may arise after delivery that is outwith the control of TIL.
         (**Note:** The warranty does not apply in the event where a defect has been caused by isolation incompatibilities.)

6        The warranty does not cover the transportation of personnel and per diem allowances relating to any repair or replacement.

7        The warranty does not cover any direct, indirect, punitive, special consequential damages or any damages whatsoever arising out of or connected with misuse of this product.

8        Any equipment or parts returned under warranty provisions will be returned to the customer freight prepaid by TIL

9        The warranty shall become invalid if the customer attempts to repair or modify the equipment without appropriate written authority being first received from TIL.

10       TIL retains the sole right to accept or reject any warranty claim.

11       Each product is carefully examined and checked before it is shipped. It should therefore be visually and operationally checked as soon as it is received. If it is damaged in anyway, a claim should be filed with the courier and TIL notified of the damage.

**Note: TIL reserve the right to change specifications at any time without notice and without any obligation to incorporate new features in instruments previously sold.**

**Note: If the instrument is not covered by warranty, or if it is determined that the fault is caused by misuse, repair will be billed to the customer, and an estimate submitted for customer approval before the commencement of repairs.**

F167.1

## Safety Statements

| ⚠️ Caution ! | Throughout the manual certain safety or operational related comments and requirements will be highlighted to the operator by indications identified by the adjacent symbol and text. |
|---|---|

## Technical Support & Software Upgrade

**Contact your local agent or Tritech International Ltd**

| | | |
|---|---|---|
| ✉ | Mail | **Tritech International Ltd.**<br>Peregrine Road,<br>Westhill Business Park,<br>Westhill, Aberdeen,<br>AB32 6JL, UK |
| ☎ | Telephone | ++44 (0)1224 744111 |
| | Fax | ++44 (0)1224 741771 |
| 💻 | Email | support@tritech.co.uk |
| | Web | www.tritech.co.uk |

**An out-of-hours emergency number is available by
calling the above telephone number**

If you have cause to use our Technical Support service, please ensure that you have the following details at hand **prior** to calling:

- System Serial Number (if applicable)
- Serial Numbers of SEANET SCU and all scanning / profiling heads
- Software Revision Number
- Fault Description
- Any remedial action implemented

Due to the expansion capabilities of SEANET SCU and the fact that new sub-modules are continually being introduced, this manual cannot detail every aspect of its operation.

**The name of the organisation which purchased this system is held on record at *Tritech International Ltd*. Details of new software and hardware packages will be announced at regular intervals. Depending on the module, free upgrades will be offered in keeping with our policy of maintaining the highest levels of customer support.**

***Tritech International Ltd can* only undertake to provide software support for systems loaded with Operating System and Tritech SONV3 software in accordance with the instructions given in the System Re-installation section of this manual. It is the customers responsibility to ensure the compatibility of any other package that they may choose to load unless with the prior consent of *TIL*.**

# COMPLIANCE WITH ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 89/336/EEC



Tritech hereby confirms that the following listed equipment conforms to the requirements outlined in the above mentioned European Community Directive concerning Electro Magnetic Compatibility:

| Part No. | Description |
|---|---|
| S4430 | SeaNet SCU Acoustic processor |
| S1214, S1215, S1216, S1217, S1257, S1273, S1422, S1423, S1424 S1546, S2019, S2035, S2036, S2099, S2146 S2154, S2189,S2202, S2275, S2298, S2879, S2899, S2907, S3133, S3171, S3315, S3404, S3715, S3817, S3891, S4010, S4094, S4127, S4366, S4367, S4431, S4855, S4856, S4858 | SeaKing Sonar / Profiler heads |
| S847, S853, S962, S966, S968, S999, S1058, S1152, S2122, S2123, S2125, S2127, S2128, S2130, S2131, S2132, S2135, S2248, S2300, S2346, S2466, S2711, S3168, S3447, S3677, S4065, S4125, S4502, S4519, S4677, S4806 | Precision Echo Sounder altimeters |
| S1042, S1043, S1044, S1045, S1046, S1062, S1173, S1174, S1196, S1198, S1218, S1288, S1289, S1290, S1291, S1292, S1293, S1294, S1295, S1296, S1411, S1412, S1549, S1551, S1566, S1567, S1574, S1575, S2297, S2396, S3690 | Bathymetric / Oceanographic sensors |

The EMC standards which have been applied to this equipment are :
EN50081 Part 1
EN50082 Part 1

This list is continually under review. If your device is not listed then please contact Tritech for confirmation of compliance. Or, if you have any questions pertaining to the Compliance to EMC Standards of any Tritech equipment then please contact the Technical Director at Tritech.

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permission of Tritech International.

# INTRODUCTION

The SEANET SCU was introduced on the market in January 2002 as a direct replacement for the SeaKing SCU which is now a discontinued product. The SEANET SCU has all the features of the SeaKing SCU with added options and capabilities for future expansion.

The system uses modern PC technology housed in a semi-rugged anodised Aluminium housing and incorporates a sophisticated front panel Remote Access Terminal (RAT) which enables all functions to be controlled by a combination of trackball and function button operations.

The SEANET Surface Control Unit (SCU) is designed to control and display the complete range of SeaKing subsea sensors and incorporates a number of very important features.

- **Versatility**

The SEANET SCU can simultaneously run combinations of Imaging Sonar, Profiling Sonar, Bathymetric & Oceanographic package and Sidescan together.

- **High speed communication**

The SEANET SCU uses a very fast ArcNet communications to the subsea devices allowing a standard data rate of 156kBaud (max cable length 1200m) with options for fibre-optic interfaces and other Baud rates available for longer cable lengths.

- **Display resolution**

The SEANET SCU is able to run on a SVGA monitor at up to 1280 x 1024* screen resolution. This is a marked improvement on the VGA monitor at 640 x 480 screen resolution. Assuming the screen area used to plot data is fairly similar, the SeaKing therefore has the ability to display a significant 50% more sonar data than previously obtained.

**\*** *For clarity, a resolution of 800 x 600 is recommended.*

- **Digital recording of data**

The SEANET SCU is installed with a high capacity ZIP$^®$ drive that can be used to record and replay back all data from subsea sensors such as SeaKing DFS Sonar, DFP Profiler and Bathy. The floppy drive is also available for recording shorter log files. As well as sonar data, other data including NMEA 1083 may be recorded.

- **Solid State Boot Drive**

All Operating System and Sensor Control software are installed on a solid state Flash card which is faster and more shock-resistant than mechanical platter disks. Full re-installation in just minutes from a bootable 'Emergency Backup' ZIP$^®$ disk.

- **RS-232 Interfaces for survey data**

All data collected by the subsea devices can be made available on one or more RS-232 ports for survey purposes. The SEANET SCU has 2 available COM ports built in for this purpose with option for a further 2 through installation of an internal Auxiliary I/O card - this option is available from Tritech.

- **Downloading software to subsea sensors**

All SeaKing subsea sensor software is stored in Flash RAM that enables the head to have its software upgraded without dismantling the unit and replacing EPROM's etc.

- **19" Rack Mount**

The SEANET SCU is designed to be rack-mountable in Racks of depth 330mm or greater.

## SEANET SCU FRONT PANEL LAYOUT
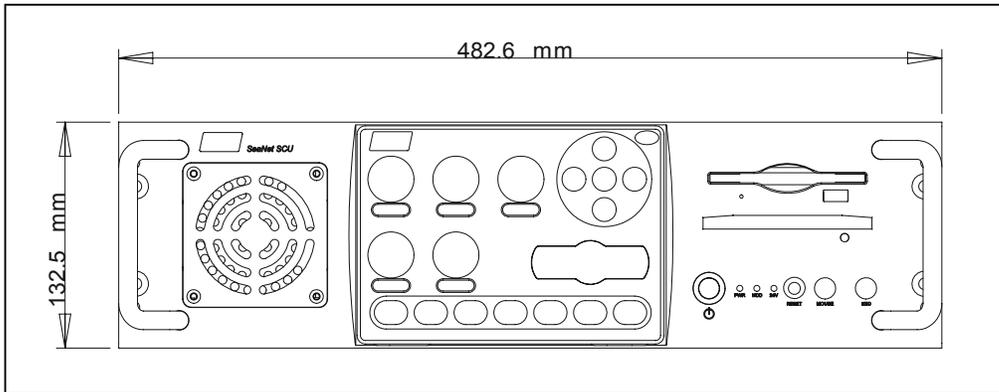


*Fig. 1.1 SEANET SCU Front Panel Layout (complete with Rev.2 RAT as shown)*

The particular RAT controls depend on the particular subsea sensors fitted, and the user should refer to the appropriate section of the manual for full details of operation.

# USING THE SYSTEM

Once a system has been installed in conjunction with the relevant sections of this manual and the sensor manuals, it can be tested in air by powering up the system and observing that communications with the subsea device(s) is established.

The following sections of this manual will describe the general software controls in addition to installation and connection instructions. Further, separate manual sections will describe operation of each of the subsea Sensors and their connection details.

## SEAKING SYSTEM DISPLAY
## Typical Display (SeaKing scanning sonar application)

1)  Screen Display and Controls
The Main Areas of the Sonar Display are identified below:

Tools Menu

Device Toolbar

Main Sonar Controls

Menu Options

Device Pause

Operating Frequency

Display Header

Log Options

Range Scale

Cursor Co-ordinates

Screen Freeze

Resolution

System Status Bar

Sensor Display Area

Sonar Zoom window

F1 - F6 Function keys. Emulate 'Green' RAT buttons

'Max' Button. Clicking this control will toggle between normal screen view (as shown above) and a full screen view of the Sensor Display Area.

## DESCRIPTION OF SCREEN DISPLAY AND CONTROL AREAS.

**Display Header**
This part of the screen is used for system identification.

**Menu  Options.**
This button is used for accessing system set-up functions. Printer Setup, Application selection and Colour Scheme setup are features which can be accessed through clicking on the 'Menu' button.

**Log Options.**
This button is used to access the Setup, Recording and Playback of log data files.

**Screen Freeze**
Freezes the entire screen display and pauses all SeaKing devices that are active on the network.

**FUNCTION KEYS (F1 - F6)**

**F1-Cycle:** Use this function key or it's associated RAT Function button to select and highlight a device window. When highlighted, the 'Range' box will change to a red background display and the associated RAT control settings will be displayed. When running multiple devices such as an Imaging Sonar and a Profiler, only one device can have its RAT control settings displayed and adjusted at the one time. The specific device window must be highlighted before its control settings can be displayed and adjusted.

When a window has been expanded (F2 Function key), pressing F1-Cycle will cycle through application windows in their expanded state. For instance, running a multi-device Application with Profiler, Sonar and Video windows, press the 'F2-Expand' button to expand the highlighted device window to a full screen display area. Pressing 'F1-Cycle' repeatedly will cycle through each active device window in full screen (expanded) mode.

**F2-Expand:** Use this function key to expand a highlighted device window to full screen mode - only active with a multiple device application.

**F3-Zoom:** Operational with Imaging Sonar Only. This function can be used to zoom in on objects of particular interest. The Zoom window is situated in the bottom right of the screen area and, when active, will overlay the 8 User boxes. De-activating the Zoom function will recall all previous User box entries. Two types of Zoom function are included; a true Acoustic Zoom and an Image (Pixel) Zoom.

**F4-Resolution:** This control is associated with Imaging and Profiling Sonars. 4 resolutions are included; Low, Medium, High and Ultimate. For profiler operation, Resolution changes will affect the physical step size and correspondingly the number of points that will be plotted for each scanline. For Sonar operation this control will adjust the number of Bins, or samples taken for each ping. The Bin number can be viewed in the Tools menu (Spanner Icon) under the Sonar Toolbar.

**F5-Operating Frequency:** This function allows for real-time switching between Low and High frequency operation for all Sonar devices which have this capability.

**F6-Reverse:**  Toggling this control will switch the Imaging Sonar scan between a CW (Clockwise) and CCW (Counter Clockwise) direction.

**System Status Bar**
This part of the screen is used to display system status information, typically the AIF interface status, Logging status and progress information and Job specific information

**Sensor Display Area**
This part of the screen is where the main sensor data is displayed.  Other pertinent data such as Range Scale, Cursor and Sonar communications and status boxes pertaining to the sonar may also be displayed within this area.

**Main RAT Controls**

<u>**Sonar RAT Controls**</u>         <u>**Profiler RAT Controls**</u>
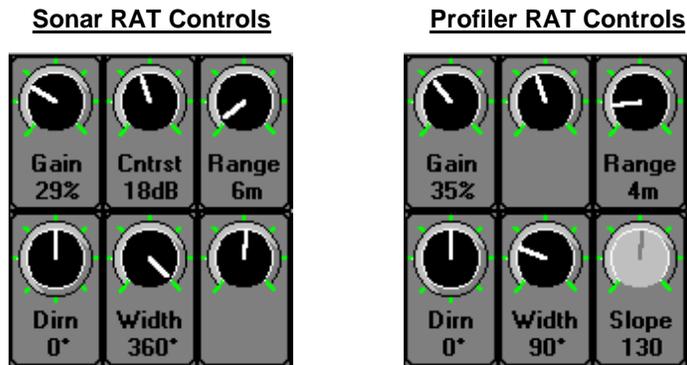
The Main RAT control area comprises six separate controls; the black controls represent the Gain, Contrast, Range, Scan Direction, Scan Width controls on the RAT (C1 - C5 respectively) and a sixth grey control is also available for trackball use only. The functionality of RAT controls C1, C2, C3, C4 & C5 is application dependent. For instance, C2 is the Contrast control for the Sonar application and is unused in the Profiler application. For sidescan sonar controls, refer to the Sidescan Sonar manual.

All Main Controls can be adjusted by using the Trackball or Mouse. Controls with black dials can also be adjusted by rotating the corresponding RAT control. There are two ways to adjust controls using the trackball.

The first way is to position the cursor on the control, either to the Left or Right of its vertical centre and click the Left Trackball button to incrementally change its value. Left of Centre clicks will 'turn down' the control counter clockwise, Right of Centre clicks will 'turn up' the control clockwise. This method is used to trim controls by small amounts.

The second way to adjust the control is to position the cursor to the Left or Right of centre to choose control direction and then, whilst holding down the Right Trackball button, gently moving the cursor around within the control area will cause rapid increase or decreases of the control value.

## MENU OPTIONS

The 'Menu' options menu provides control over several sonar features and various menu items.

Clicking on the 'MENU' button allows the user to access the following features:

- Printing and Printer setup
- Application setup
- Colour maps
- Icon setup
- System (Manual entered) Velocity of Sound ('VOS')
- Exit the sonar program
- Information concerning sonar versions and other hardware details

## PRINTING AND PRINTER SETUP

The Print functions of the SeaKing operating system allow the user to produce colour or black and white hard copies of the sonar data - or any other devices connected to the SEANET SCU and enabled - by printing to a printer connected to the printer port of the SEANET SCU.
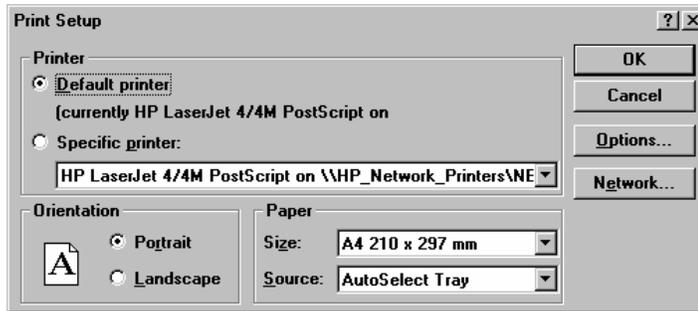


The operator may choose between the default printer as defined in Windows Control Panel or, alternatively, may choose any other printer connected to the SEANET SCU assuming that the correct printer drivers for that printer have been loaded through the Windows Control Panel.

For further information refer to the accompanying Windows manual. The resultant printout may be in portrait or landscape mode. Other modes may be available depending on the printer connected. The user may also select the paper size and other options that are generally printer specific.

The **Page Setup** command allows the user to choose between allowing the software to automatically decide on the best size image to fit the paper in the printer or, alternatively, to distort the image such that it is stretched to cover the entire printable area of the paper.



Once the user is satisfied with all the printer settings, the **Print** button may then be selected and a printout will be generated. A message box shows the progress of the software whilst it turns the captured sonar image into a printable format.

**CAUTION**
**Printing may take a few moments during which sonar updates are suspended. It is therefore not advisable to make print-outs during actual underwater operations unless it is safe to do so. Experiment BEFORE going operational!**

## APPLICATION SETUP

Application Setup is designed to allow multiple subsea sensors to be attached to a single SEANET SCU processor including;

- Imaging Sonars
- Sidescan sonars
- Profiling sonars
- Bathymetric & oceanographic packages
- Attitude Sensor

Application Title and associated device list.

Pull-down list of available applications, e.g. SVP=Sonar, Video-In & Profiler.
S=Sonar, P=Dual Profiler, V=Video, B=Bathy, PQ=Quad Profiler, A=Attitude

Information on current Application including Slot no., Node no., Device type Panel Position on display and Menu bar 'RAT' Item name.

Screen Setup - Factory use only !!

## SETTING UP THE SONAR COLOURS

The Sonar Colour Setup allows user selection of displayed sonar colours. The operator has the choice of running the sonar in either 4-bit data mode or 8-bit data mode [this is selected from the **Sonar Setup** menu]. When operating in 4-bit mode, the sonar head converts the acoustic data into a 4-bit number which is mapped as one of 16 colour values. If 8-bit mode is selected, the sonar head takes 8-bit data allowing a theoretical 256-colour display. However, due to the way in which Windows manages the colours it lets the user have access to, the actual number of colours available are 64.

The same Setup menu is used for both 4-bit and 8-bit colour with the only difference being that in 8-bit mode the actual sonar display interpolates between two adjacent colours to create four new colour values. The end result is therefore 16 x 4 colours - a total of 64. In later versions of software the sonar is set in 8-bit mode and the 4-bit option is not available.

To Setup the Sonar Colours, from the '**MENU**' Options menu, select **Colours.** The following selection form will appear.



These buttons allow the Sonar Display Background, Bearing Marker, Range Ring, Zoom Rectangle and Overlay colours to be selected for adjustment using the RGB sliders. Similarly, Altimeter & Profiler colours can be adjusted.

Saved Colour scheme menu. There are 5 preset colour schemes; 4 default and 1 for mono printing. Unlimited user-saved configurations can be stored. File names are entered via keyboard or in-built keypad (see below).

When you have finished with the colour palette, this button stores the current settings and saves any changes. If no filename has been entered, 'new' is used as default.

The Create button enables the R, G & B slider bars for colour scheme editing. The default filename 'new' is created which can be changed by the user.

The Blend button simplifies colour scale creation by interpolating colours 1-14 from the current values of colours 0 and 15.

If you do not wish to save any changes made, the 'Cancel' button will leave the current settings unchanged.

The Delete button is used to erase any unwanted user schemes. Default schemes are non-erasable.

The left column of boxes indicate the 4 bit mode display colours, 15 represents the strongest received echoes. The currently selected colours are shown. To adjust individual colours, Left-click the appropriate button (Colour '0' is selected). The Red, Green and Blue levels of individual colours may be adjusted with the RGB slider bars. Whilst all 4 colour sets can be adjusted, only colour set 4 can be stored.

## KEYPAD

Double-clicking, using the left trackball/mouse button, on certain areas of the SONV3 display will enable a keypad for use in that particular area. This feature can be used when double clicking on the 8 user boxes and is also featured with the Save Colour Scheme menu to enable filename input. Where system values require to be entered, for instance V.O.S. and Bathy/Altimeter position offsets, double clicking on the text box will call out the keypad.

For example, when entering filenames during Colour Scheme setup:

double-click here to call up the keypad.

The full character set can be used in the filename. The inputted filename is referenced to a catalogue file that uses a standard Dos filename convention.

## EXIT

When the **Exit** control is selected the SeaKing program terminates. Note that any data being logged or replayed must be stopped before exiting the program. Alternatively double click the 'X' Windows control box on the top right of the screen.

## ABOUT

The **About** box contains information about the SeaKing program, including;

- Software version
- Date the software version was created
- Owner of the program
- Hardware information

If the user ever has reason to contact Tritech for technical support it is advisable that the details contained in the **About** box are noted as this will assist the technical support team.

## LOGGING AND REPLAYING OF DATA

The SeaKing program allows the operator to log data to and replay data from the internal hard or floppy disk drives of the SEANET SCU processor. This is very useful for creating records of sonar and other data that may then be replayed post-mission for verification of targets etc. Logging and replaying is invoked by using the **Log** command. The **Log** menu is shown alongside.
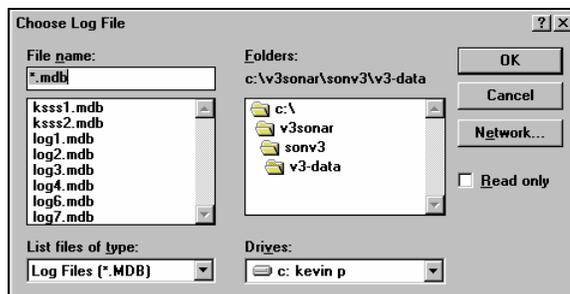
### Replaying data

When the **Play** button is pressed the menu as shown alongside appears. A list of available log files i.e. those previously recorded, appears. The user can select a file by moving the cursor over the file, clicking upon the filename and then choosing the **OK** button.

The following menu will appear;

The 'Log Replay' panel indicates the date of the log file data, and its start and stop times. The time under the progress slider bar indicates the 'current' replay data time, to its right a number indicates the log file record number of the last plotted scanline. The 'Srce' field indicates that the replay data is from a Sonar device, the 'Slot' field indicates the number of the Sonar device in the system.

**Log Replay**

| Date | 17-April-1996 |
| Srce | 2 |
| Slot | 1 |
| Bytes | 784 |

12:20:34    13:18:00

12:22:05    929    0

Click 'Hide' Button if you want to see controls during replay. Menu Select Log Replay (again) to Unhide Replay.

Check the "Cn" box with an 'x' for a Looped, Continuous Replay

Replay Speed Control.

EXIT Replay Button.

Clear and Refresh Screen Button.

PAUSE Replay Button.

On Replay and after the LogFile has been selected, the Log Replay Menu is displayed. Press the ► button to start replay. You can move the slider bar at any time to get to different parts of the LogFile.

## Logging data

Logging data is achieved by choosing the **Record** button. The menu as shown below will appear. If the operator has a keyboard connected to the SEANET SCU then a name for the data file may be entered. If no keyboard is attached, the SEANET SCU automatically generates a file name for the logged data. Note that the file extension of **.mdb** must always be used. If not, it will not be possible to replay the data.

**Create Log File**

File name:
l1028-05.mdb

ksss1.mdb
ksss2.mdb
log1.mdb
log2.mdb
log3.mdb
log4.mdb
log6.mdb
log7.mdb

List files of type:
Log Files (*.MDB)

Folders:
c:\v3sonar\sonv3\v3-data

📁 c:\
📁 v3sonar
📁 sonv3
📁 v3-data

☐ Read only

OK
Cancel
Network...

Drives:
💾 c: kevin p
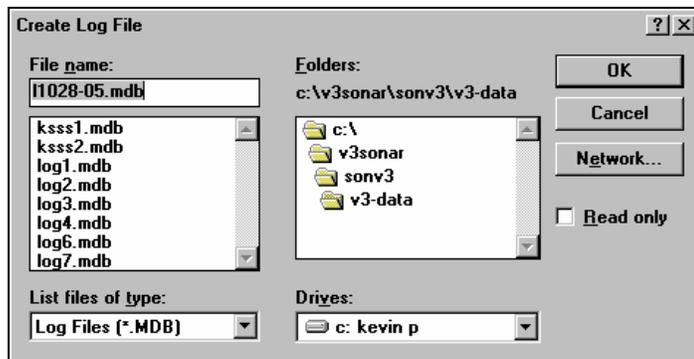
## Log File Format

The Log files created are Microsoft™ Access Database files, and can be manipulated using standard software tools. The sonar data within the Database is stored as a binary object, which can be accessed and manipulated using Microsoft™ VisualBasic tools.

## REMOTE COMMUNICATIONS BAR

If active, this bar is situated in the Right Panel of the Screen display. 'Remote' Communications Setup provides configuration of all serial links to provide control and logging facilities on a Remote Terminal. The 'Remote' Communications bar has 5 indicators (Channel 1,2,3 used for serial data Input/Output through assigned COM port(s); DDE and SOCKET for specialist applications). For the purposes of serial data transfers using a COM port, when a channel has been selected and it's COM port is enabled, the indicator changes to blue. If the COM port is bad or in use by another peripheral device, the indicator will change colour to red. When communications is taking place the indicator flashes green when transmitting and red when a message or command is received on the channel.

Depressing the Spanner icon button in the 'Remote' Communications bar will call out the 'Remote V4 Setup' menu, the full features of which are described in the SeaKing Remote Comms Manual.

## USER BOXES

On the right panel of the display there are 8 boxes which provide the facility for displaying user text. Double clicking on any box will call up a keypad that can be used for entering and editing text.

**Note:** When the zoom facility is in use, the user box panel is disabled and the Zoom window appears in its place.

# SEANET SCU INSTALLATION

The SEANET SCU should be carefully removed from its transit case and checked to see that the control unit is undamaged. The unit may be inverted to check for any parts that may have been loosened during transit. If so, remove the unit cover and investigate further. The unit should be firmly mounted in a clean dry installation such as a rack system.
If fitted in a confined space such as a rack, then an adequate supply of cool air should be available to keep the unit from overheating. The SEANET SCU has an internal cooling fan for sourcing and filtering the air at the front of the unit. The back of the unit must have a clear space around it, for air venting, cooling and cable access. If the unit is mounted on a desk or bench, then it should be secured against movement when powered on. Again leave access for air circulation and cable access.

The SEANET SCU is supplied to the customer with the screen display and output and communications already configured to suit their system. The user should not have to change the screen display layout or comms set-up unless it is not suited to their use. Contact Tritech for details.

The SEANET SCU mains input (J1) should be connected to a fused (rated 5A) 110/230V 50/60Hz power supply. The mains supply to the SEANET SCU must be 'clean', free of transient noise spikes and interference, as suitable for computers and electrical instruments. If the mains supply is of a 'dirty' nature then a suitable filter or uninterruptible power supply (UPS) must be fitted. There is an On/Off Isolator switch at the rear of the unit and momentary On/Off 'soft power' switch at the front. The On/Off Isolator switch must be ON before operating the momentary soft power switch at the front.

For the full connection details of the SEANET SCU to other parts of the system please refer to the Connection Pin out data **and take particular note of (data comm's) cable termination requirements**. Connect the ArcNet communication lead, for connection to the subsea device(s), to the AIF Card (J2.1).

Connect the VGA output display to a suitable VGA monitor (J3.1). If Video OUT option is active then the Video Jumper lead should be connected to the Video Out port (J3.2). If the Video OUT option is used for recording or viewing, the S-VHS format provides a much better picture quality than the normal composite PAL / NTSC.

If the RAT is used remotely, use the extension lead supplied to connect it to either the front of the SEANET SCU, or the back at the AIF card (J2.2). Mount the RAT in a secure safe place if not fitted to the SEANET SCU.

PS/2 connections are available for Keyboard and Mouse options. If a keyboard is to be used, then this connects on to the front or rear panels. Similarly a PS/2 mouse could be used, as a backup, to replace the RAT controller if this is ever necessary. A PS/2 mouse will connect on the front or rear panels and by simply re-powering the SCU this will force it to be detected and loaded by Windows.

For Remote Profiler operations the SEANET SCU will have to be linked to another computer, use the RS-232C I/O connections for this on the rear (COM1, COM2). These I/O ports are surge protected through opto-isolators installed on an internal circuit board at the rear of the unit.

Before switching the SEANET SCU on check that the subsea heads are correctly connected, check the data communication lines for shorts to other wires, and check the termination resistance is correct at both ends. See SeaKing Communication Wiring Diagram and installation notes for details.

An Isolated DC Power Supply is available at the rear of the unit. This will be installed as 24VDC, 1A as default although 12VDC and 36VDC Power options can be fitted on request. For protection, an auto-re-setable fuse is fitted with maximum current rating of 1.2A.

## SEANET SCU REAR PANEL LAYOUT

The connection details shown in these drawings are listed in Table1.1 - 1.5.
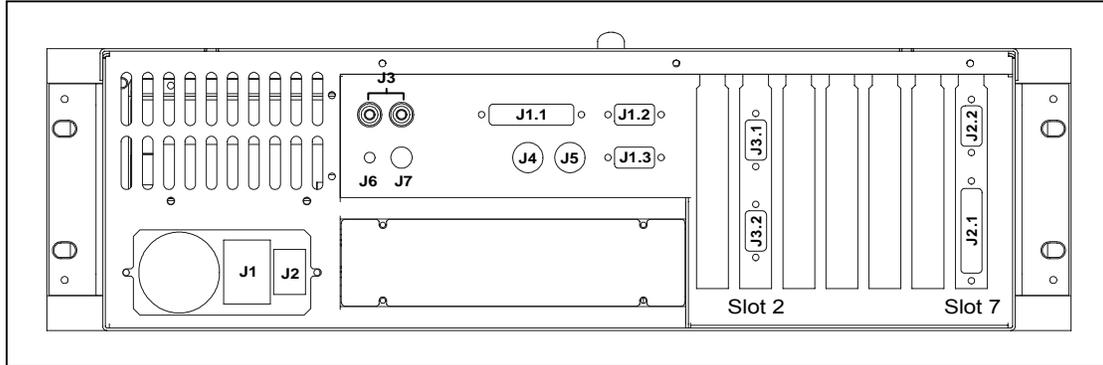


*Fig. 2.1 SEANET SCU Back Panel Layout*

## SEANET SCU CONNECTION PINOUT DETAILS

*Table 1.1 Panel connections and Slot Allocation*

| REF. | DESCRIPTION | TYPE |
|---|---|---|
| J1 | Mains Input 240/120V AC 1Ø | IEC |
| J2 | Mains On/Off Isolator Switch | On-off Rocker Switch |
| J3 | DC Supply Output (0V, +24V/12 VDC) | 4mm Banana Socket |
| J4 | Mouse | PS/2 |
| J5 | Keyboard | PS/2 |
| J6 | Earth/Ground Point | External Tab / stud |
| J7 | Barometric Input (option) | |
| | | |
| J1.1 | LPT1 Printer port | 25-way D female |
| J1.2 | PORT 1 (COM1) Data logging port | 9-way D male |
| J1.3 | PORT 2 (COM2) Data logging port | 9-way D male |
| | | |
| SLOT 2 | VGA / VIDEO card | |
| J3.1 | VGA monitor 1 connector | 15-way HDD female |
| J3.2 | PAL/NTSC monitor 2 connector (for interface cable) | 15-way HDD female |
| | | |
| SLOT 7 | Sonar AIF Card | |
| J2.1 | Subsea Sensor Comms | 15 way D female |
| J2.2 | Aux. RAT connector | 9-way D female |

## SEANET SCU COMMUNICATION CONFIGURATION

## AIF Card

The AIF interface PCB is located in slot 7 of the SCU. Full details of all the connections are contained in Appendix 1. Normal communications with the subsea devices is via a customised version of the ARCNET network system and requires a good quality balanced twisted pair cable. An optional RS-232 interface can be provided to allow telemetry connection through a fibre optic system capable of 115kBaud transmission. The RS-232 interface is available in the guise of an RS-232 to ARCNET 'converter' PCB that is installed in a dry pod on the vehicle. Alternatively, an intelligent 4000m pressure rated Junction Box will provide the RS-232 interface to the network of SeaKing ARCNET devices. *Note: there is a single-head RS-232 option built into SeaKing heads but this is not multi-drop.*

## SUBSEA SENSOR ELECTRICAL INSTALLATION

The SeaKing range of Subsea Sensors is designed to work from a smoothed DC power supply of 18v-36v DC (Absolute Maximum 36v DC).

If using a rectified transformer PSU, the output of the PSU must have a filter capacitor of not less than 470$\mu$F, for each head being powered. If an unregulated PSU is used, then make sure that the voltage value measured at the head is in the range 18-36v DC, in power on/off and running conditions. If powering the head(s) down a long lead or umbilical, the maximum recommended loop resistance of the power line must not exceed 10$\Omega$ for one head, 5$\Omega$ for two heads, and 3$\Omega$ for three heads. If the supplied voltage is less than 18v dc the head may not operate correctly.

| | |
|---|---|
| ⚠️ **Caution !** | **Never try to make SeaKing DFS system heads work down a long cable by increasing the PSU output voltage above 36v DC.**<br>**Always pay particular attention to the termination of the data lines as below. If using cables in excess of 1,200m it may prove necessary to reduce the Baud rate - if in doubt contact Tritech for details.** |

## ST HEAD SUBSEA INTERCONNECT CABLING

The Standard Underwater Connector supplied is Tritech 6 way. Default telemetry is ARCNET and the wiring code for this is shown below.
*Note:* *If another telemetry option such as single node RS-232 is used, wiring details will be found in another section of the manual.*

| ⚠️ Caution ! | The numbers shown relate to all schematic diagrams, (not a DIN style format). The sidescan cable maintains the same pin configuration but may have different colour codes, (see sidescan manual) |
| --- | --- |



| Pin | Signal | (RS-232) | Colour |
| --- | --- | --- | --- |
| 1 | ARCNET-A | *(RS-232 Tx)* | Yellow |
| 2 | ARCNET-B | *(RS-232 Rx)* | Blue |
| 3 | +24v DC | *(+24v DC)* | Red |
| 4 | 0v DC | *(0v DC)* | Black |
| 5 | | *(RS-232 Gnd)* | Green |
| 6 | HEAD CHASSIS | | Screen |

Connector Face View
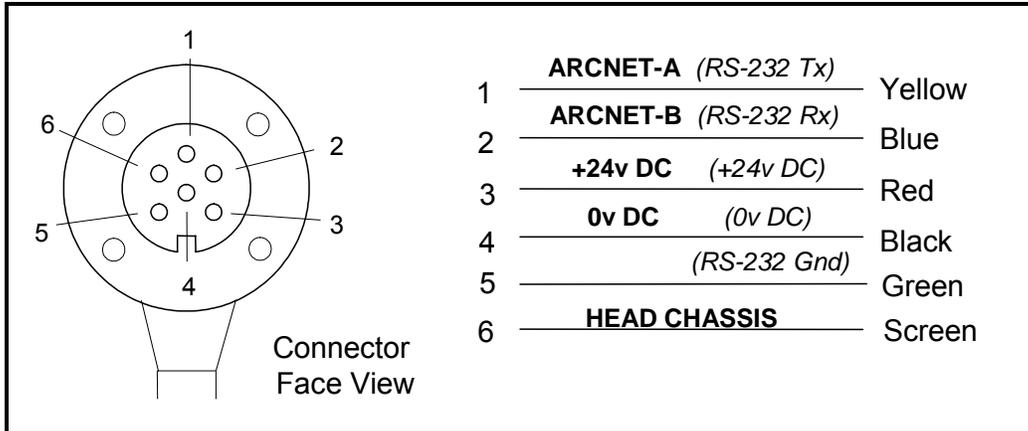
*Tritech 6-Way Underwater Connector - Wiring Configuration*

*Pin-outs for optional single-node RS-232 communications are shown in italics.*

See the "Seanet Pro Sensor Communication Manual" for more information on RS232 configuration and baud setup.

**ARCNET CONNECTION**



**SeaKing Sonar ARCNET - typical communications connections**

*SeaKing Communication ARCNET Wiring Diagram*

*** Appendix 1 of the 'SYSTEM' section of the manual contains the Sensor head and AIF Card switch settings for both the Normal and 1/2 Baud operations. The default factory setting is Normal Baud operation.**

**Note on Subsea Termination Resistor:**
*(As shown in diagram above)*

This will normally be installed in the Junction point on the vehicle where the communications pair splits off to each SeaKing device that is connected; i.e. this junction point would normally be inside the vehicle Junction box/pod.

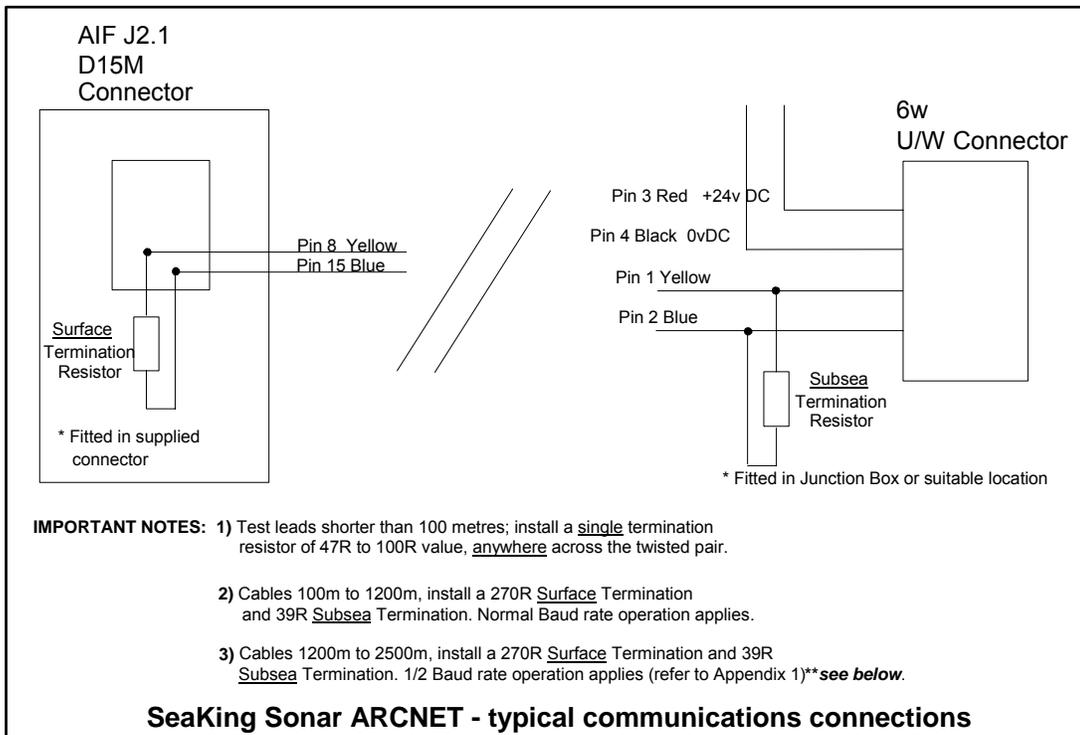There are circumstances where it is not possible to install a permanent subsea termination resistor for the SeaKing communications; i.e. when operating over a single run of cable.

In these cases, a Yellow Waterblock Adapter (Part No. 2648) is available which has a 39 ohm termination resistor installed internally.
These Yellow adapters are now supplied with each SeaKing system (SCU surface unit or PC Install kit) as supplied from mid-2000 onwards. For systems purchased before this date and which do not therefore include this Yellow adapter, they can be obtained from Tritech or through a local agent.
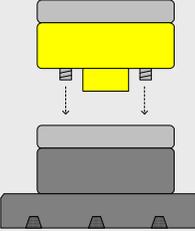
The Yellow terminated waterblock should be installed directly onto the 'Main' connector port on one of the SeaKing heads attached to the Network *(as indicated left)*.

**Important:**
**(1)** *Only one yellow 39$\Omega$ terminated waterblock to be used per system*
**(2)** *Check that there are no other termination resistors present – other than 270$\Omega$ at surface – prior to installation.*

When the SEANET SCU and subsea heads are switched on, the system display will appear on the monitor after a few seconds delay. Until the SEANET SCU, AIF Card, Remote Access Terminal (RAT), and subsea elements are communicating correctly a 'NO COMMS' signal will be shown in their respective windows. These messages will disappear as each element checks out OK.

If the RAT, or subsea elements are not powered up, not present, or have a fault somewhere, then error messages will be shown in the status boxes. If error messages appear check that all the system parts are connected and that all leads are correctly installed. When error messages continue to appear, then there is a fault and the Trouble-Shooting section should be referred to.

 **Caution !** | *Information concerning other telemetry options - apart from ARCNET - can be found in separate manual sections. Single node RS-232 and other configurations such as RS-422 and TTL, to be used through Fibre optic interfaces, are available.*

*\*\*\*\* The section below is for information and is not the full manual for TTL modem interfacing \*\*\*\**

## TTL OUTPUT ON AIF CARD

The TTL configuration is a special option used with RS422 and TTL Fibre interfaces.
TTL makes use of the ARCNET channel but bypasses the ARCNET line driver.
When using TTL an AIF jumper position is changed **this disables the ARCNET output on the pins 8 and 15.**

If no ARCNET Comms are achieved when the instructions above are followed it may be that the ARCNET output is disabled. Please check the jumpers below to confirm that the card is not set for TTL.  The jumper names are identified on the PCB artwork.
The photographs should also enable you to identify which card you have in your system
**V3 AIF Card**
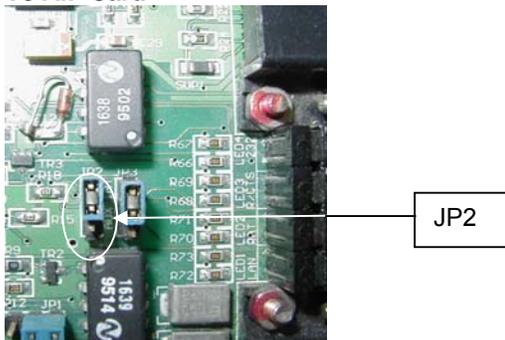


For ARCNET Comms jumper JP2 must be shorted pins 2 to 3 as shown in above photograph.

**V4 AIF card**
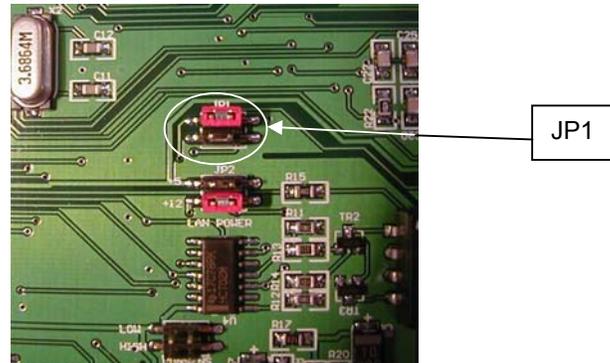


For ARCNET Comms Jumper JP1 must be shorted pins 1 to 2 as shown in above photograph.
*If you require the full TTL manual please visit the Tritech website*

## V3SETUP UTILITY

### INTRODUCTION

This utility allows the user to re-program the subsea network hardware. It therefore allows software upgrades to be performed 'in the field', without hardware modification and without return of any system components to the manufacturer. The utility also includes a spectrum analyser facility for use as a diagnostic tool.

| | |
|---|---|
| ⚠️ **Caution !** | *WARNING: It is important that the following sections be read and understood prior to running the utility. Incorrect use can cause permanent damage to sonar heads and sensors and to the SEANET SCU system itself. If in doubt consult Tritech support before making any changes.* |

Each SEAKING DFS sonar and profiler head has software for its operation fitted in the head, in the form of a non-volatile memory. This software may be upgraded occasionally as more features of operation are developed. SEAKING DFS sonar and profiler heads can be re-programmed by the SCU when any new system software is issued. In a commissioned system, all programming is done via the communications link, and there is no requirement to open up the pressure housing to change any EPROM's.

In some multi-head installations it may be necessary to re-program the head network node address to avoid address conflicts, for example, when a spare head has a node address that is already allocated to another head. In this instance, the node address can be changed by using the V3SETUP utility program supplied on the SEANET SCU.

## Opening V3SETUP

Double click the V3SETUP Icon in the Sonar Group. On opening, the screen shown over-page is displayed. Included are a table of network nodes, a CPU ID dialog box, Refresh and rebuild buttons, A Reset Cnt Button and its adjacent counter panel and a set of drop-down menus. Node numbers are listed down the left-hand column of the node table. To initialise the display, click on a blank row in the table, and then click on one of the occupied rows of the node table. A blue highlight band appears on that row, and the current settings appear in the CPU ID Dialog box.

Spectrum Menu

Current Node, ID and Checksum settings columns

Status Bar

Refresh / Rebuild / ReBoot All Buttons

Program Column

New Node, ID & Checksum settings

Blue Cursor Highlight

Network Node Table

CPU ID Dialog Box
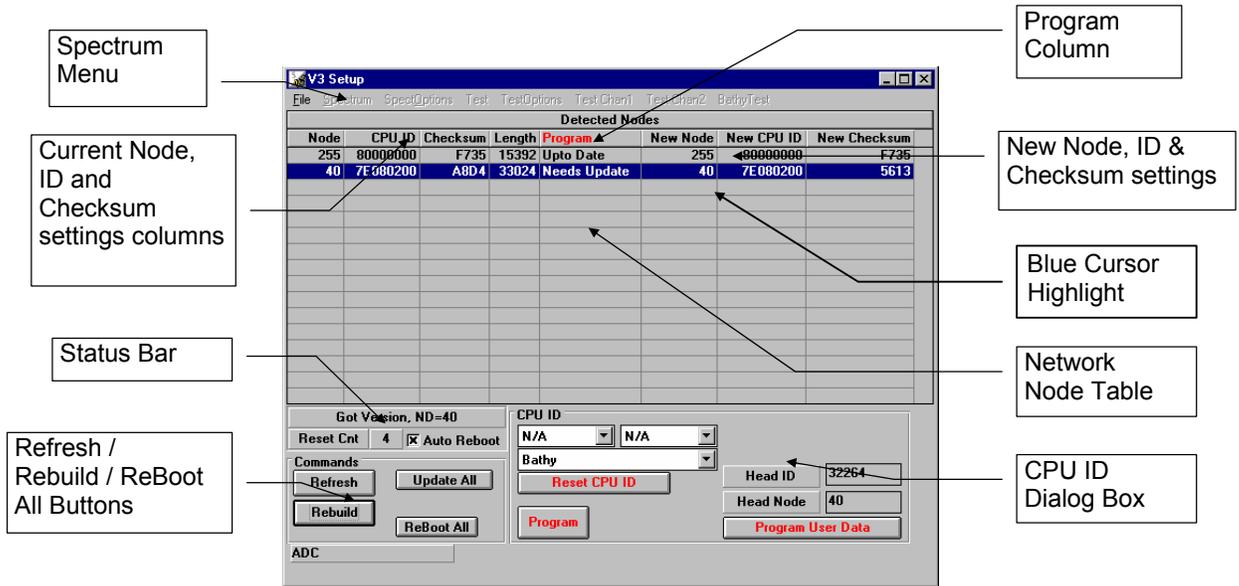
## Node Table

A central node table shows a list of all connected network nodes, and the parameters associated with them. A node is defined as any device connected to the SEANET SCU system and includes the internal AIF card and all external sonar heads and sensors, but not the Remote Access Terminal (RAT). The table columns show the parameters set for each node. The values shown in the node table may not be changed directly. Alterations are made via the CPU ID Dialog box described below.

### Node Number

Column one displays the Node Number for each node. This is a unique identifier for each node on the network and can take a value from 1 to 255. Heads and AIF cards are supplied with a preset node number. Sonar heads and sensors take numbers from 1 to 254. AIF cards are always assigned node number 255.

The numbers are detected and displayed automatically during the power up of each node and can be changed by the user as long as they remain unique. If two nodes are connected with the same node number, or the user changes one of the node numbers to be the same as another node already connected, then a serious malfunction will occur. (See connecting new nodes below). When connecting new nodes to an existing network, always ensure that the new nodes do not have a node number that is the same as one of the existing nodes.

**CPU ID**

CPU-ID is a value stored in the node memory, and is read by the SEANET SCU during power up of the node. It is a coded representation of the parameters needed by the node processor to operate its hardware properly, and by the SEANET SCU to display its received data properly. When parameters are adjusted within V3SETUP using the CPU ID Dialog box, the CPU-ID number will change to reflect the adjustment. The new number is stored on the node hardware to be read by the SEANET SCU when next required. As the CPU ID number is really a description of the nodes own hardware, it is not normally necessary to adjust this number unless some parts in the node have been replaced or modified.

**Check Sum and Length**

Checksum and Length are numbers stored in the node memory. They are effectively a revision number of the software stored on the node, and as such are compared with the software held on the SEANET SCU, to check if a download of new software is required. After a SEANET SCU software upgrade, the software held on any or all of the nodes on the connected network may become obsolete and require updating.

**Program**

The Program column indicates action required of the operator.

| Program field display | Cause | Action required |
|---|---|---|
| Upto Date | Check Sums and Length match and no parameters have been entered in the CPU ID Dialog box for update | No Action |
| Unknown | A network node number has been detected which is not recognised | Wait for node re-booting sequence to complete. If there is no change after a few seconds then press Rebuild button on the CPU ID Dialog box. |
| Needs Update | One of the parameters in the CPU ID Dialog box has been adjusted for this node OR A new software revision has been installed on the SEAKING SCU that contains new software for this node. | Press Reset to cancel any changes made in the CPU ID Dialog box, OR Press program button in CPU-ID Dialog box and wait for new data to be downloaded. Note: Do not power down any system component during this later procedure or permanent damage will occur. |

**New Node, New CPU ID and New Checksum.**

The other three columns represent the new values for node number, CPU ID and checksum. The new Node and New CPU ID are set in the CPU ID Dialog box. The New Checksum is determined from the software installed on the SEANET SCU which relates to the current node, and is compared to the checksum in column 3 to decide if an update is required (see above). After an update operation (instigated by pressing the Program button), the values in these columns become the current node parameter values and will be displayed in columns 1, 2 and 3.

**Status Bar**

The status bar at the bottom of the node table shows the current status of any downloading operation to the current node. During such a download, it is important to ensure that power is not lost to the nodes. When the operation is finished as shown in the status bar, the system may be powered down normally if required.

**ResetCnt Value**

This value can be used as a simple diagnostic tool. The number will increment upwards each time the network is interrupted. This happens normally when a new node is powered up or connected, and in this case is no cause for concern. However, if there is a loose network connection, then the ResetCnt value will intermittently increment upwards as the network repeatedly breaks down and then re-establishes itself. In this case, check all sonar cabling for loose connections.

The number is reset to zero by pressing the table Rebuild button.

## CPU ID Dialog Box

The CPU ID Dialog box is used to adjust the parameters displayed in the new node number and the new CPU ID columns of the node table, and subsequently to download the settings and /or the new software to the appropriate node.

When the cursor is clicked on one of the node setting rows of the node table, the values shown in the CPU ID Dialog box reflect the values of that node, which will now be shown highlighted by a blue cursor. The values applying to that node can now be freely adjusted using the controls described below, but will not actually be sent to the node until the Program button is pressed.

**Caution !** *Immediately after operation of the **Program** button, data will be downloaded to the current node. Do not power down the system during this process, or **permanent malfunction** will occur, necessitating the return of the system to Tritech.*
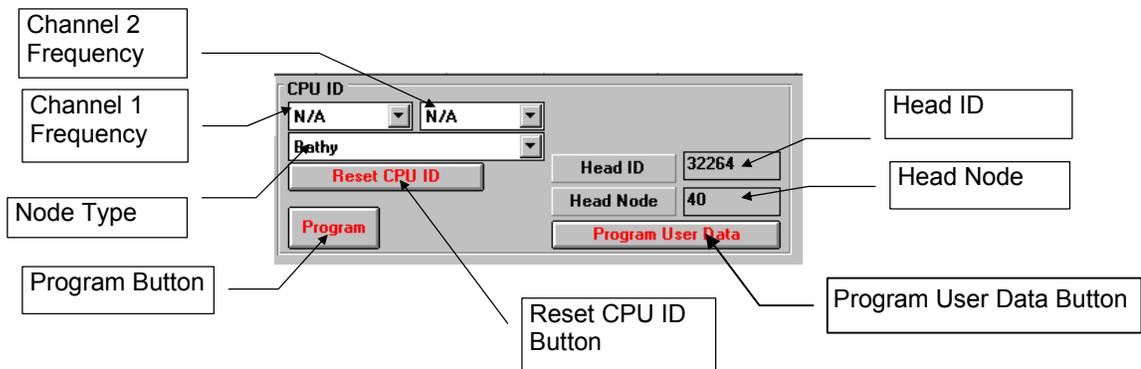


**Reset CPU ID and Program Buttons.**

The **Program User Data** Button should only be used when a hardware modification or upgrade has necessitated the need for a head (Node) software update. Instructions of any requirement to program the user data with new configuration data will be supplied by Tritech.

**Caution !** *Operation of this facility will change the factory setup of the head and unless there are specific instructions to make changes, the Program User Data button should not be pressed.*

Operating the **Reset CPU ID** button causes values for the currently highlighted node to revert from those shown in the new node and the new CPU ID columns of the node table to those shown in the first two columns. The Reset button therefore aborts any adjustments made in the CPU ID Dialog box since the last update (i.e. since the last press of the Program button or the last system power up).

The **Program** button becomes active only if any of the values in the new node or the new CPU ID columns of the node table have been altered using the CPU ID Dialog box, or if there is checksum and length mismatch between the software held in the node memory, and that held on the SEANET SCU indicating that new software has been installed.

In either case 'Needs Update' will now appear in the Program field of the node table. Pressing the Program button causes the new parameters and the current software version held on the SEANET SCU to be downloaded to the highlighted node. Progress of the updating sequence can be monitored in the Status bar at the bottom of the node table and will take several moments. Do not power down the system during this process or permanent damage will occur, necessitating the return of the system to Tritech. After successful completion of the Programming, The Program field for the current node will show 'Upto Date'.

The effects of adjusting each of the controls on the CPU ID Dialog box are described below. None of the changes become effective until a programming sequence is completed as described above. The changes can be aborted by pressing the Reset CPU ID button as described above.

**Adjusting Frequency**

The Channel 1 and Channel 2 Frequency controls apply only to sonar heads connected to the system. Adjusting these controls for other nodes such as an AIF card or Bathymetric sensor will have no effect.

! **Caution !** | *Adjustment of these controls is not normally necessary, and may severely reduce sonar performance.*

The SeaKing sonar heads are software frequency selectable. Frequency can be changed by selecting a value from the drop down lists in the CPU ID Dialog box. Note however that the heads are supplied with their sonar electronics tuned to operate at particular frequencies for channels 1 and 2. This setting is factory set in the CPU ID value detected by the SEANET SCU during node power up. Although changing the frequency values in V3SETUP will cause the sonar to operate at the new frequencies, operation will be severely impaired unless the electronics within the head are replaced with electronics that work at the new settings. A software frequency change **must** be accompanied by a head electronics hardware change. It is strongly recommended that the Tritech service department be contacted before any replacement of sonar head electronics with sets from other heads, or spare parts.

**Node Type**

A node can be of type Sonar, Bathymetric or Unknown. The setting is decoded by the SEANET SCU from the CPU ID value detected during node power up. With the system AIF card node highlighted in the node table, Unknown will show in this box. Do not reprogram a node with a setting other than that detected at power up in this field.

**Motor / Compass Check Boxes**

These values are encoded in the CPU ID value, detected by the SEANET SCU during power up. As with Frequency selection above, it will never be necessary to change the checkboxes from their factory set values unless a hardware replacement has occurred within the node.

**Head ID**

Head ID is coded into the first digits of the CPU ID. It is provided to allow the user to allocate numbers to each sonar head or sensor on a network, and may be freely adjusted and downloaded to the node. Unlike the node number which must always be unique, it is not necessary to give each node a unique Head ID number.

**Head Node**
The Head Node box contains the unique node identifier for each node on the network.

⚠️ **Caution !**

*If a head is connected with a node number that is already present on the network, an operational malfunction will occur. Consult Tritech for the correct procedure for expanding the system by adding a new head or sensor, or for exchanging heads or sensors with similar node numbers between two systems.*

**Refresh, Rebuild & ReBoot All Buttons**
These controls are used to refresh the table of nodes. They differ however in their exact function.

Pressing Refresh causes every node connected to re-send its CPU ID number, Node Number, Checksum and Length parameters to the SEANET SCU. Refreshing occurs automatically whenever the V3SETUP utility is first opened, or when a new node is powered up on the network. Refreshing only updates the information already shown on the node table. If a node does not respond, then there will be no change in the data shown.

Rebuild completely clears the node table before refreshing, and so gives a more accurate representation of the nodes that are actually connected.

ReBoot All will initialise the startup routine and re-boot each node on the network. This follows the same procedure as when the V3SETUP is first executed. Certain levels of re-programming will require the user to activate the ReBoot All routine.

## USING THE SPECTRUM ANALYSER

A spectrum analyser is provided in the V3SETUP utility to allow diagnostics of problems caused by acoustic and electrical noise interfering with the sonar data. In this mode, the sonar **passively** scans the selected frequency band, and can be interpreted to reveal individual sources of noise by an experienced engineer. The Spectrum feature is invoked by selecting the Spectrum drop down menu at the top of the V3SETUP utility window.
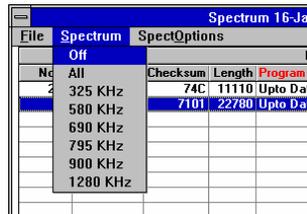


Spectrum drop down menu

A list of options is displayed relating to the band of frequencies that will be plotted by the spectrum analyser. Select All to scan the full range of frequencies from 0 to 2 MHz. Select either of the other frequency options to scan a narrow band centred about that frequency. The Spectrum analyser screen will open, and scanning of the selected band will commence.

**Channel2 select checkbox**

**Signal Level Scale**

**Refresh Button**

**Centre Frequency**

**Frequency Scale**
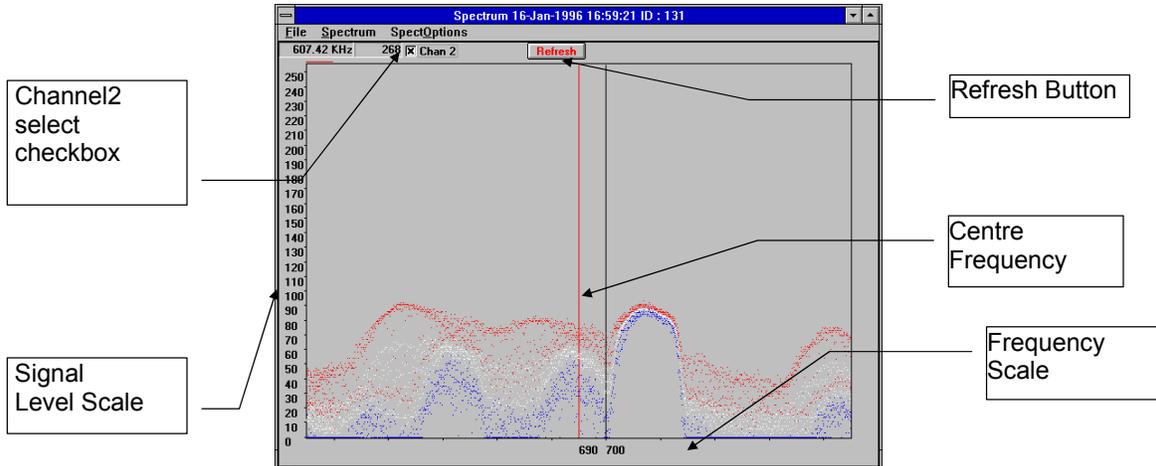
Plotted is a scatter graph of Signal level against frequency. Red points indicate the maximum level detected in a sample period. White represents the average, and blue represents the minimum. Any or all of these can be turned off using the SpectOptions drop down menu. The Signal level ranges from 0 to 255 and is equivalent to a range of 0 to 80dB. In the event of a problem, Interpretation of this display is part of a trouble-shooting process that should be carried out by referral to the appropriate Tritech documentation or to Tritech technical support.

By default, the channel 1 transducer spectrum is displayed. To scan channel 2, check the box marked channel 2 at the top of the window. The value shown at the top left of the display is the current frequency at the cursor position, and can be used to accurately determine the frequency of features on the spectrum.

# MAINTENANCE AND TROUBLESHOOTING

There are few user-serviceable parts inside the SEANET SCU that can be checked and/or replaced.

Firstly, it is recommended that the unit be used in a clean, well ventilated and dust-free environment. Also, operating in extreme temperature and humidity should be avoided if possible. The environmental temperature should be between 0 to +40 degrees C.

## ESD / Transient Protection (COM Ports 1 & 2)

Both of the RS-232 COM Ports are installed with electrical surge protection. These elements are fitted on the SCU4IO PCB (P/N 5126) which is located inside the SCU at the rear. If any of the COM Ports are subjected to very high electrostatic noise or transients, the protective elements on this PCB would blow / open-circuit and therefore protect the serial UART that is installed on the main motherboard.
If in the unlikely event the protection does blow on the PCB then the user has a number of options open to them;

**a)** Replace the SCU4IO PCB with a spare if carried. Contact Tritech or a local agent who will supply this PCB.
**b)** Replace the blown protective elements / components on the PCB. This would obviously require some diagnosing and know-how on the part of the user.
**c)** As an emergency option, by-pass the PCB and connect straight through to COM1 and COM2 ports on the motherboard.
**This is only recommended in emergencies as the UART is now unprotected and any further surges or voltage spikes may render the main motherboard inoperable.**
To bypass the SCU4IO PCB, remove the bottom panel on the rear of the SCU, situated under the recess where COM Port connections …etc are located. This panel is held on with 4 x screws. If COM1 is faulty, remove the ribbon cable that connects to the left 9-pin male 'D' header on the main motherboard, this is UART1 (COM1). Connect your cable directly to the 'D' header on the motherboard.
If COM2 is faulty, remove the ribbon cable from the right 9-pin male 'D' header, which is UART2 (COM2). Connect your serial cable directly to the 'D' header on the motherboard.
**It is strongly advised that bypassing the protection only be used for a temporary period and that the blown protection element(s) be replaced as soon as possible.**

## Front Air Inlet Filter

It is recommended that this filter be replaced annually although a replacement may be required sooner if operating the unit in a particularly dirty environment.

The Tritech Part number of the air filter is 5023.

# TROUBLE SHOOTING

Symptoms:

*1. Failure to boot-up.*
Check that all internal boards and connectors are correctly in place and firmly secured.
Particularly if the system has been recently moved or subjected to any shock loads.

*2. Continuous Status "No Comms" message.*
This indicates that there is no communication with the device flagged.
Check the power and communications links to the sonar head for continuity and for correct polarity, voltage and ensure that the power supply can provide sufficient current to power all devices. If necessary refer to the service section to check that the head internal fuses have not blown. If this occurs on first installation pay particular attention to cable terminations and check that you are not exceeding the recommended cable length (1200m using the standard Baud rate).

If a cable flood is suspected, then the conductors will need to be insulation tested; the subsea units and SEANET SCU must be disconnected. ***This is especially critical if a cable insulation tester is used to check resistance between conductors, as serious damage to the Scanning/Profiling heads and SEANET SCU will occur if the correct procedure is not followed.***

*3. Other Status Messages.*
Refer to the SEANET SCU Head Status Codes

## SeaKing Head Status Codes

| Code | Possible Reason or Fault giving Error Code |
|---|---|
| 'No reply' | Device not powered up, or comms fault. |
| 'Busy' | Device is not completing initialisation. |
| 'Centre' | The transducer is not passing through the Ahead position at the correct sequence point. Physical damage internal to the Boot is the most likely cause of this. |
| 'Ping Sync' | This is pertinent to Dual Profiler operation and usually points to a fault with the dedicated wire link that should be present between Pin 5 on the Master and Slave Profiler heads. |

## SYSTEM SOFTWARE & CONFIGURATION NOTES

Your system will be delivered with DOS, Windows™ and SONV3 System Software pre-installed.

A set of Installation Disks will accompany your system, which, in the event of loss of system files, can be used to re-build your system.

An Emergency Backup Zip Disk is provided with the system which will restore the software to it's factory loaded state. Use of this disk will erase all files currently stored on the Flash disk and replace with factory state backup. The following instructions should be followed when performing a system installation / re-installation.

## SeaKing System Re-Installation

The SEANET SCU has the following Drive Letters;

**Drive C:\\**     *[Primary, Flash Memory boot drive where system files and SeaKing software are installed. This drive should NOT be used for storing any log files].*
**Drive D:\\**     *[The ZIP® Drive where all Log Files should be recorded. This drive is also where the Full System Restore from the 'Emergency Backup' Zip® Disk is performed.*


1. **Full Software Re-Installation from 'Emergency Backup' ZIP® Disk**

If any part of Windows 98 becomes corrupt and requires re-installing, the original factory configuration can be restored from a Zip Disk in a matter of minutes. Refer to the following steps for guidance...

**a)** **Power up** SeaNet SCU.

**b)** Insert **Emergency Backup Zip® Disk** into Zip® Drive, then press **Reset** button on front of SCU.

**c)** The SCU should re-boot from the software on the Zip® Disk and start the Image Restore program.
**Note:** *If this is not the case and the SCU re-boots directly into Windows, then remove the Zip® Disk and restart the SCU. Enter the BIOS on restart, by pressing 'Delete', and in the 'Advanced BIOS Features' ensure the 'First Boot Device' is set to 'ZIP100'. Remember to save any changes before exiting the BIOS and then refer back from **a)** above.*

**d)** The '**Microsoft Windows 98 Startup Menu**' will appear. In this menu, select…

       **'1. Restore Hard Disk to factory defaults'**

**e)** The Restore should take around 3 minutes, after which time the prompt to "**remove Zip Disk and Restart computer**" will appear. Press the '**Reset**' button on the front of the SeaNet SCU to Restart.

**f)** Accept the **Windows License agreement.** A Windows license has been supplied with the system and the **Windows Product Key** for this will be included with the system documentation and also displayed on a label at the rear of the SCU.
**Note:** *The Product Key will also be displayed inside the SeaNet SCU in the event that these numbers cannot be read nor found.*

**g)** Enter the **Windows Product Key** to complete the Restore.

If Windows becomes unstable and a re-installation (following the above steps) does not fix the problem, the C:\\ Drive *(N.B. solid-state Flash Disk)* should be scanned for errors and a further re-installation attempted...

**h)** To scan the disk for errors use the ScanDisk utility, found in the following location;
**Start Menu** -> **Programs** -> **Accessories** -> **System Tools** -> **ScanDisk** *(select **Thorough** test.)*

**2. SONV3 Software Upgrade or Re-Installation**

The system will be supplied with the latest SONV3 program installed and this version will also be restored from the 'Emergency Backup' Zip® Disk. SONV3 software upgrades may later be provided by Tritech for system upgrade and/or to provide new features. Alternatively, the latest software can be downloaded from the Tritech web-site ([www.tritech.co.uk](www.tritech.co.uk)). Any such upgrade would need to be re-installed after Restoring from the 'Emergency Backup' Zip® Disk.

**a)**   After re-installation from Emergency Backup, insert the **SEAKING Installation disk** into the floppy drive, first reading the installation instructions printed on the label; In Windows, run **a:\v3soft** from File Manager.

**b)**   Follow on-screen prompts.

**c)**   Remove disk from floppy after installation is complete.

**d)**   Insert the **SEAKING VBDLLS Installation disk (#1)** into the floppy drive.

**e)**   Run **a:\v3dlls.exe** from File Manager and follow on-screen instructions.

**f)**   Remove disk from floppy drive.

The following Directories will be created on the system hard disk (Key files are noted);

| | |
|---|---|
| C:\WINDOWS\.. | *SONV3SO.INI* |
| C:\WINDOWS\SYSTEM\.. | *SONV3.VBX* |
| C:\V3SONAR\AIFV4\.. | *USERAV4.BIN, USERSV4.BIN* |
| C:\V3SONAR\HEADV4\.. | *USERHV4.BIN* |
| C:\V3SONAR\V3UTILS\.. | *TSTAIF.EXE* |
| C:\V3SONAR\SONV3\.. | *SONV3.EXE, AIFV4.VXD, SONV.CFG* |

*SONV3SO.INI* and SONV3.CFG are the main runtime configuration files. *SONV3SO.INI* is a text file that contains the configuration operating parameters for the sonar system.

You may be issued with software upgrades and should follow part 2 of the above installation guide.

*(**NOTE**: It is not necessary to Restore from Emergency Backup in order to upgrade the SONV3 software. A SONV3 software upgrade will install over the top of the existing SONV3 installation.)*

Before doing so there is a software uninstaller loaded across with the SeaKing software which you may be advised to first run (**C:\V3SONAR\UNSTALL.EXE**). Note that the VBDLLs Installation disk(s) will only copy across files that are more up to date or not presently installed on the destination drive. Installation of the VBDLLs may therefore be instantaneous and if there is a 2nd disk of the install set this may not be requested.

You will probably be prompted to run V3SETUP to reprogram the heads, as described earlier in this manual.

## Upgrading SONV3 Software

Software upgrades are supplied on floppy disks and are then installed on the SEANET SCU itself. If the software upgrade contains new software for the subsea nodes, then program files on the SEANET SCU must be downloaded into these using the V3SETUP utility. If this is the case, then an automatic checksum and program length check performed by the V3SETUP utility will reveal that new software is available for downloading by showing the message "Needs Updating" in the 'Program' field of the node table.

The procedure therefore for a software upgrade is to first install the new software on the SEANET SCU as detailed in the upgrade documentation. Open the V3SETUP utility and check to see if any of the nodes show the message "Needs Update" in their 'Program' field. If any show this message then highlight and then program each in turn until all show the message "UpTo Date".

The V3SETUP utility can now be closed and the sonar system operated normally under control of the SONV3 run-time software application.

### 3. Installing the 'Quatech' Auxiliary Comm's Card

If the Auxiliary Comm's Card is installed, it will be necessary to exit SONV3 and run Windows 'Control Panel' -> 'Ports' -> 'Settings' -> 'Advanced' in order to set the correct interrupts for COM3 and COM4. These should be…

<div align="center">

COM3    Interrupt 5
COM4    Interrupt 11

</div>

- Insert the Quatech DS-100 serial adapter card into a spare ISA slot on the motherboard and start-up the SCU.
- Ensure that Interrupts 5 and 11 are allocated for ISA bus use in BIOS *(**NB**: Non Plug and Play / PCI).*

**Installation:**

1. **Start** => **Settings** => **Control Panel**.

2. Double click on **Add New Hardware** => Click on **Next** => Click on **Next**.

3. When asked if you would like Windows to search for your new hardware, select:
   => **No, select from hardware list** => Click on **Next**.

4. Highlight **Ports (COM & LPT)** => Click on **Next**.

5. Highlight **(Standard port types)** under *Manufacturers* list and highlight **Communications Port** under *Models* list  => Click on **Next**.

6. A list with a default Interrupt value and base address will be shown  => Click on **Next**.

7. When prompted to restart the SCU, click on **NO**.

8. **Start** => **Settings** => **Control Panel**.

9. Double click on **System**.

10. Select the **Device Manager** tab.

11. Double click on **Ports (COM & LPT)**.

12. Highlight **Communications Port (COM3)** => Click on **Properties**.

13. Click on the **Resources** tab.

14. Highlight **Input/Output Range** => Click on **Change Setting**.
    *NB: If you are told that the resource setting cannot be modified change the Basic Configuration setting in the drop down list above and repeat step 14.*

15. Change *Value* to **03E8 – 03EF** => Click on **OK**.

16. Highlight **Interrupt Request** => Click on **Change Setting**.

17. Change *Value* to **05** => Click on **OK** and then **OK** again.

18. When prompted, shut down and restart the SCU.

19. Repeat steps 1 to 11.

20. Highlight **Communications Port (COM4)** => Click on **Properties**.

**21.** Click on the **Resources** tab.

**22.** Highlight **Input/Output Range** => Click on **Change Setting**.
*NB: If you are told that the resource setting cannot be modified change the Basic Configuration setting in the drop down list above and repeat step 23.*

**23.** Change *Value* to **02E8 – 02EF** => Click on **OK**.

**24.** Highlight **Interrupt Request** => Click on **Change Setting**.

**25.** Change *Value* to **11** => Click on **OK** and then **OK** again.

**26.** When prompted, shut down and restart the SCU.

## Configuring Video Output

The SEANET SCU display can be either to an SVGA or PAL/NTSC monitor. It is possible to have 2 monitor connections operating simultaneously; SVGA + PAL **or** SVGA + NTSC. These features will be configured within Windows for whatever particular video card is installed, as now described…

**1.    Matrox Millennium G450 DualHead LX**

This is a combined SVGA + PAL/NTSC Video card. There are 2 x 15-pin High Density 'D' output connectors on the rear, the top connector is for SVGA output, whilst the bottom provides PAL/NTSC. If a PAL/NTSC output is configured, this will require the supplied interface cable to be connected. The interface cable connects to the bottom 'D' connector and splits off to both Composite and S-VHS plugs.

**SVGA + PAL/NTSC Output Connections**
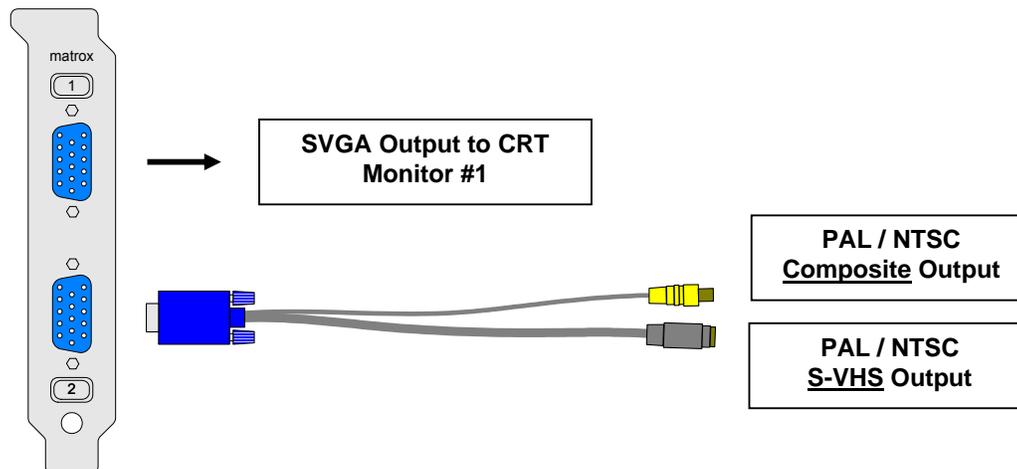
***To configure the PAL/NTSC Video Output option, in Windows…***

1. *Click on the Start Menu -> Settings -> Control Panel -> Display.*
2. *Select 'Settings' tab page and then click on 'Advanced'.*
3. *To enable the PAL/NTSC Video Output, select 'DualHead' tab page and then click on 'DualHead Clone, DVDMax or Zoom' radio button to enable.*
4. *Then, click on the 'Use DualHead Clone' button to enable.*
5. *Select either NTSC or PAL options near bottom of box.*
6. *Click on 'Apply' button to enforce all above changes and re-start the computer when prompted.*
7. *Connect the video interface cable, as shown above, between card and monitor cable.*
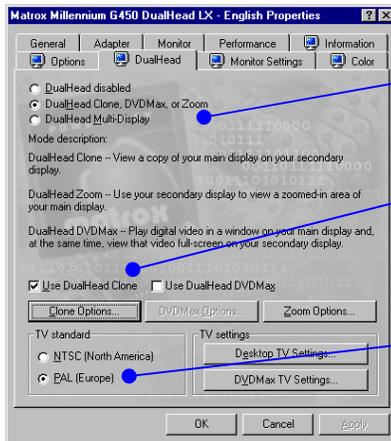
Select **DualHead Clone, DVDMax, or Zoom**

**\* NOTE**: *SONV3 does not support 'DualHead Multi-display' (i.e. 2 x SVGA dual monitor display)*

Click on **Use DualHead Clone**

Select **NTSC** or **PAL** output

# APPENDIX 1

## AIF Sonar System Card - AT Bus Interface Module

There are 3 revisions of SeaKing AIF card;

**AIFBV3** – the first revision, installed in earlier SEAKING SCUs.
**AIFV4** – the second revision, installed in SEANET SCUs *(see Fig 4.2)*.
**AIFV4 (PC104 Layout) –** Specialist revision for PC104 application.

The three types of AIF card have the same functionality and communicate using ARCNET networked communications. ARCNET communications requires a screened twisted pair.
The AIF card's default comm's and Head comm's configuration is ARCNET. SEAKING Heads can communicate by ARCNET or optional serial interfaces can be provided to allow interface to fibre optic systems that are capable of 156kBaud transmission. RS-232 and RS-422 are available serial options. Please contact Tritech for more information on these options.

**Important (1):** This manual will only describe the AIFV4 as this is the factory-installed card within the SEANET SCU. If for any reason an earlier revision card has been installed, the SEAKING SCU System manual ('sksys.xxx') must be referred to.
Details for the PC104 card can be obtained by contacting Tritech International Ltd or their agent.

**Important (2):** The AIFV4 card will not be recognised in surface software versions earlier than V1.39.
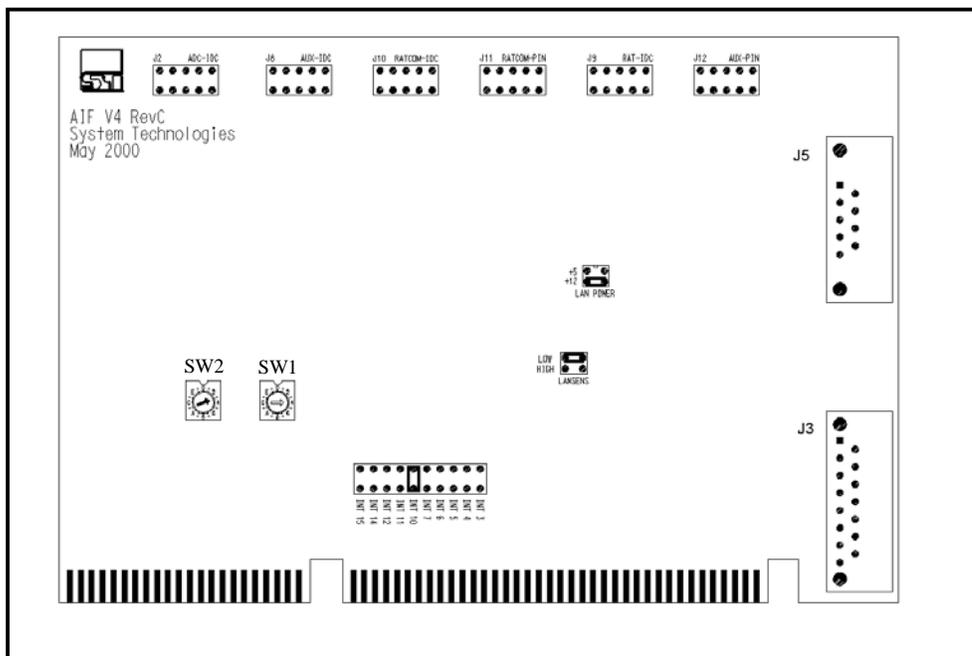


**Fig. 4.2 AIFV4 Rev.C PCB Card Layout.** *Note: J5 = J2.2, J3 = J2.1 on SCU rear panel*
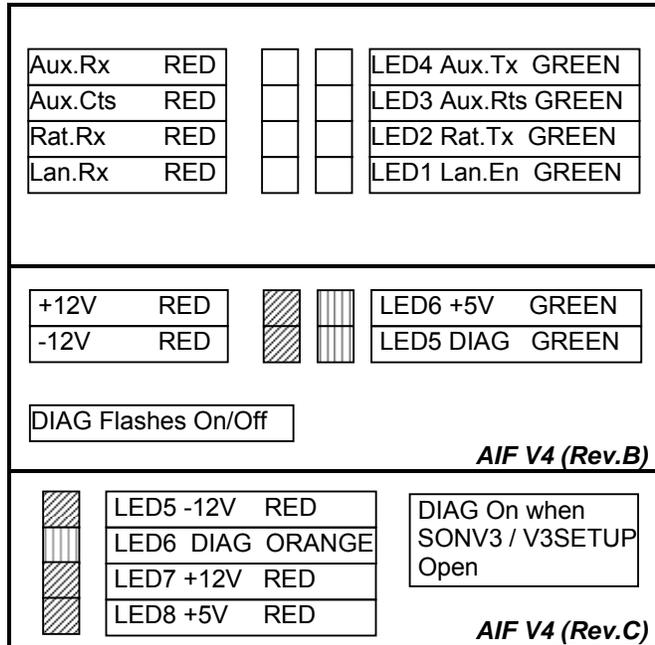
## AIF Diagnostic Led's

### LED 1-4

The AIF Card has a column of diagnostic LED's situated on the back of the module between the back panel connections. These are used to check on the status of the communications channels to the systems devices. They are useful for setting up the communications lines, and when fault finding the system.

### LED 5, 6 (…& 7, 8 - Rev.C)

The AIF Card also has four LED's mounted at the upper rear edge of the PCB Module. These LEDs indicate the presence of +5v, +12v and -12v power rails to the card. The fourth LED is a diagnostic LED to indicate AIF CPU activity

| Aux.Rx | RED | | | LED4 Aux.Tx | GREEN |
| Aux.Cts | RED | | | LED3 Aux.Rts | GREEN |
| Rat.Rx | RED | | | LED2 Rat.Tx | GREEN |
| Lan.Rx | RED | | | LED1 Lan.En | GREEN |

| +12V | RED | | | LED6 +5V | GREEN |
| -12V | RED | | | LED5 DIAG | GREEN |

DIAG Flashes On/Off

*AIF V4 (Rev.B)*

| LED5 -12V | RED |
| LED6 DIAG | ORANGE |
| LED7 +12V | RED |
| LED8 +5V | RED |

DIAG On when SONV3 / V3SETUP Open

*AIF V4 (Rev.C)*

## AIF Interrupt and I/O Base Card Address

The AIFV4 (and AIFBV3) card has the Interrupt default set to INT10, this can be changed by moving the jumper to the required setting.

The I/O Base Card Address is default set to 3300 for AIFBV3 and 3400 for AIFV4, this can be changed by setting the four (only two used in later revisions) rotary dials to the new required setting.

Neither of the above should need to be changed, but in a circumstance where these is a conflict with another 3rd party card / device, then the new settings have to be edited in 'System' section of the SONV3SO.INI file. If these lines do not exits in the SONV3SO.INI file – as is the case with earlier software versions – then they can be added to the 'System' section. See below for example.

*[SYSTEM]*

*AIFPORT=816*                                : In decimal. Matches the I/O Base Address setting on the card* (i.e. 816 decimal = 330 Hex). N.B. will also check for card at (+10 Hex) 340 Hex automatically to locate the AIFV4 type cards.

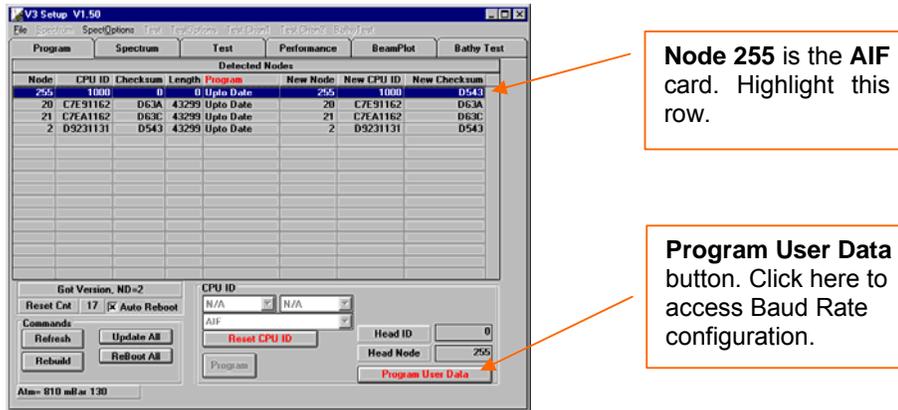*AIFINTNO=10*                                : Matches the interrupt jumper setting on the card (i.e. INT10).

*\* default 330 on AIFBV3, 340 on AIFV4 Card*

## Changing System Baud Rates

### 1.  Changing AIFV4 Surface Card

This is handled by a software flag in the V3SETUP surface utility program;

**Step 1:** Open the V3SETUP utility program *(shown below)*, ensure that the SONV3 program is closed beforehand.



**Node 255** is the **AIF** card. Highlight this row.

**Program User Data** button. Click here to access Baud Rate configuration.

**Step 2:** Highlight the **Node 255** row *(as shown above)* and then click on the **Program User Data** button.

**Step 3:** Accept the warning message that appears, after which the **AIF Setup** menu box shown below will appear…
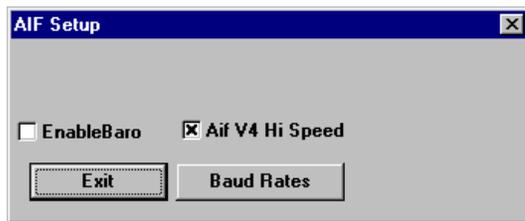


**Step 4:** The Aif V4 Hi Speed check-box selects either the Normal or Half Baud rate, in the same way as the Hardware switches do for AIFBV3 Card (switch 'SW5') and Heads (switch 'SW1').

1) **Cross** the **Aif V4 Hi Speed** check-box *(as shown above)* to select the **Normal Baud**[#] Rate

2) **Un-cross** the **AIF V4 Hi Speed** check-box to select **Half Baud**[#] Rate.

> [#] Factory Settings for ARCNET are:
> **Normal Baud** = **156.2** (kBaud)
> **Half Baud** = **78.1** (kBaud)

## 2. Changing SeaKing Heads (Sonar, Bathy, Profiler, Sidescan)

This is handled via hardware switch SW1 located on the internal 'CPUCV3' PCB;

### SeaKing Head CPU Switch - SW1
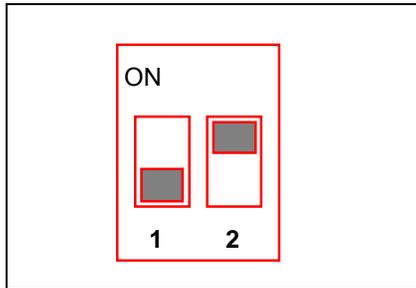
The switch settings are as follows:

Switch **1**[#]     **Off**=Normal Baud     **On**=1/2 Baud

Switch **2**     **On**=Normal*          **Off**=Boot

 * Factory Setting - Do not touch.

[#] Factory Settings for ARCNET are:
    **Normal Baud   =   156.2** (kBaud)
    **Half Baud      =   78.1**  (kBaud)

## AIF Connector Details

'J3' is used for connections to SEAKING system Devices and Networks

| J3 - Communications D15F Rear Panel Socket | | |
|---|---|---|
| Pin | Signal Name | |
| 1 | Supply -12V F0.3A | For Options |
| 2 | Ground | Signal Ground |
| 3 | SparePort | For Options |
| 4 | Lan.RxInB | For Lan Modem |
| 5 | Aux.CTS | Aux RS232 Comms |
| 6 | Aux.TX | Aux RS232 Comms |
| 7 | Lan.Pulse2 | For Lan Modem |
| 8 | Lan.A | To Sonar Pin 1 |
| 9 | Supply +12V F0.3A | For Options |
| 10 | Supply +5V F0.3A | For Options |
| 11 | Lan.Enable | For Lan Modem |
| 12 | Aux.RTS | Aux RS232 Comms |
| 13 | Aux.RX | Aux RS232 Comms |
| 14 | Lan.Pulse1 | For Lan Modem |
| 15 | Lan.B | To Sonar Pin 2 |

'J5' is used for External connection to the RAT control device

| J5 - Rat Communications D9M Rear Panel Socket | | |
|---|---|---|
| Pin | Signal name | RAT Interface |
| 1 | Ground | |
| 2 | RAT.RS-232.RTS | |
| 3 | RAT.RS-485.B | |
| 4 | RAT.RS-485.A | |
| 5 | Supply +5V RAT | |
| 6 | Supply -12v F0.3A | |
| 7 | RAT.RS-232.OUT | |
| 8 | RAT.RS-232.IN | |

'J9' is used for internal connection to the RAT control device

| J9 - Rat Communications IDC-10 PCB Header | | |
|---|---|---|
| | | |
| Pin | | To SCU Front Panel |
| 1 | Supply +5V RAT | |
| 2 | Supply +12v F0.3A | |
| 3 | RAT.RS485.A | |
| 4 | RAT.RS232.IN | |
| 5 | RAT.RS485.B | |
| 6 | RAT.RS232.OUT | |
| 7 | RAT.RS232.RTS | |
| 8 | Supply -12v F0.3A | |
| 9 | Ground | |
| 10 | N/C | |

'J8' / 'J12' are the AUX RS-232 Interface is for external communications options. The two formats of pin-out are provided to ease connection to D9 type connector cables (IDC or PIN layout).

| J8 - Aux-IDC Communications IDC-10 PCB Header | | |
|---|---|---|
| | | |
| Pin | | |
| 1 | DCD * | Tied to * |
| 2 | DSR * | Tied to * |
| 3 | Aux.RX | Aux Comms |
| 4 | Aux.RTS | Aux Comms |
| 5 | Aux.TX | Aux Comms |
| 6 | Aux.CTS | Aux Comms |
| 7 | DTR * | Tied to * |
| 8 | RI * | Tied to * |
| 9 | Ground | Signal Ground |
| 10 | N/C | |

| J12 - Aux-PIN Communications IDC-10 PCB Header | | |
|---|---|---|
| | | |
| Pin | | |
| 1 | DCD * | Tied to * |
| 2 | Aux.RX | Aux Comms |
| 3 | Aux.TX | Aux Comms |
| 4 | DTR * | Tied to * |
| 5 | Ground | Signal Ground |
| 6 | DSR * | Tied to * |
| 7 | Aux.RTS | Aux Comms |
| 8 | Aux.CTS | Aux Comms |
| 9 | RI * | Tied to * |
| 10 | N/C | |

'J10' / 'J11' are the RATCOM RS-232 Interface for interfacing RAT Trackball signals to system COMx: ports as a pointer device. The two formats of pinout are provided to ease connection to D9 type connector cables ( IDC or PIN layout )

**J10 - RATCOM-IDC Communications IDC-10 PCB Header**

| Pin | | | |
|-----|------|------|------|
| 1 | DCD * | Tied to * | |
| 2 | DSR * | Tied to * | |
| 3 | Rat.RX | Rat TrackerBall | |
| 4 | Rat.RTS | Rat TrackerBall | |
| 5 | Rat.TX | Rat TrackerBall | |
| 6 | Rat.CTS | Rat TrackerBall | |
| 7 | DTR * | Tied to * | |
| 8 | RI * | Tied to * | |
| 9 | Ground | Signal Ground | |
| 10 | N/C | | |

**J11 - RATCOM-PIN Communications IDC-10 PCB Header**

| Pin | | | |
|-----|------|------|------|
| 1 | DCD * | Tied to * | |
| 2 | Rat.RX | Rat TrackerBall | |
| 3 | Rat.TX | Rat TrackerBall | |
| 4 | DTR * | Tied to * | |
| 5 | Ground | Signal Ground | |
| 6 | DSR * | Tied to * | |
| 7 | Rat.RTS | Rat TrackerBall | |
| 8 | Rat.CTS | Rat TrackerBall | |
| 9 | RI * | Tied to * | |
| 10 | N/C | | |