



**Tritech
International
Limited**

SeaKing SPLIT AIF Card Fibre Optic Interface

Operator & Installation Manual (Seanet Software)

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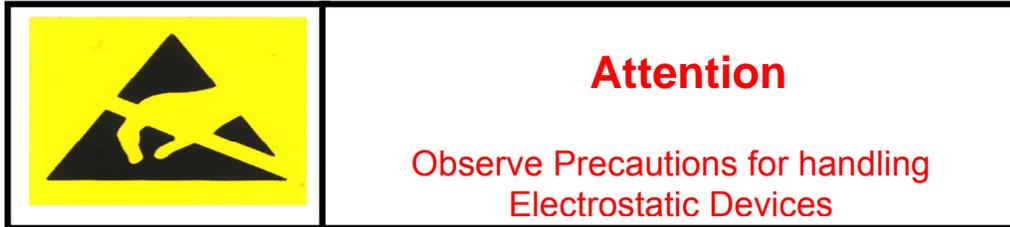
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Handling of Electrostatic-Sensitive Devices



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 1M Ω 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 out with 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

Contact your local agent or Tritech International Ltd

	Mail	<i>Tritech International Ltd.</i> Peregrine Road, Westhill Business Park, Westhill, Aberdeen, 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:

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

Due to the expansion of equipment capabilities and the fact that new sub-modules are continually being introduced, this manual cannot detail every aspect of the 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 Seanet 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 *Tritech*.

1.1 GENERAL OVERVIEW

The Split AIF system is required when it is necessary to use a fibre optic system for communications between the control unit and the subsea sensors.

This may be because a twisted pair is not available or if the cable length is too long to support the high speed data link over conventional conductors (typically in excess of 1.5km)

This manual must be used in conjunction with other system manuals supplied with the system.

The Split AIF Fibre Optic interface consists of two boards one inside the SCU (AIFV4) and one board on the subsea end of the fibre optic system (SA AIF).

Definitions:

- SA AIF Stand Alone Acoustic Interface – Locates in the dry pod subsea.
- AIFV4 Acoustic Interface Version 4 – Locates inside the Surface Control Unit.

1.1.1 Operational Overview

The Split AIF Interface can be utilised in two ways.

1. By making use of both AIFV4 and SA AIF cards, the system can be configured for RS-232 communications between cards (for interface to an RS-232 fibre optic MUX) and then ARCNET between the subsea card and multiple heads.

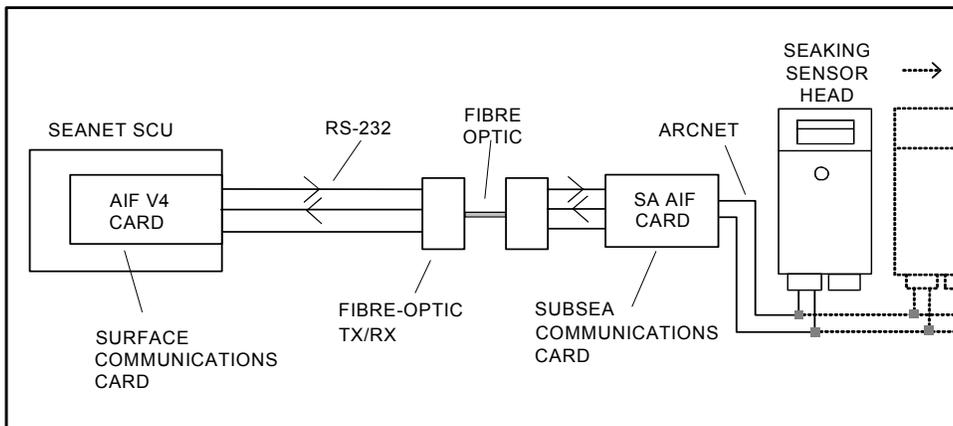


Diagram 1.01: General Layout for RS-232 operation.

2. Using only the surface AIFV4 card, the system can be configured for ARCNET and will run multiple heads through a single copper twisted pair of up to 2500 metres in length.

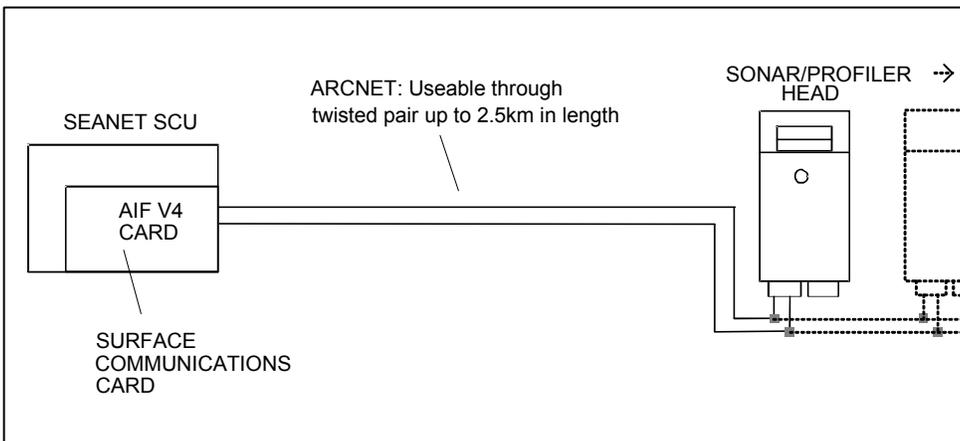


Diagram 1.02: General Layout for ARCNET operation (Using AIFV4 only)

1.2 INSTALLATION

1.2.1 Bench Test Setup for Split AIF Card



Caution!

In order to set up the Split AIF RS-232 communications it is important that the following procedure is followed closely as failure to do so may result in **permanent communication loss to the SA AIF.**

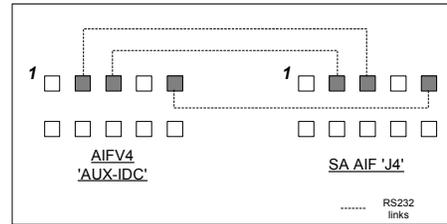
To initially configure and test the Split AIF system it is advisable to first set the system up on a bench, connecting the SA AIF PCB directly to the AIFV4 card.

1. For powering the SA AIF PCB, a power supply cable has been included and this will connect to the +24 VDC supply output (banana plug sockets) situated on the rear of the SCU.
2. RS-232 I/O on both the AIFV4 and SA AIF cards is on their respective AUX-IDC ports. For interconnection, wire a short NULL modem RS-232 cable, as follows:

**AIFV4 – AUX-IDC
(9-way M 'D')**



**SA AIF – AUX-IDC
(9-way M 'D')**



• IDC wiring pin-outs

The full bench wired configuration is as follows;

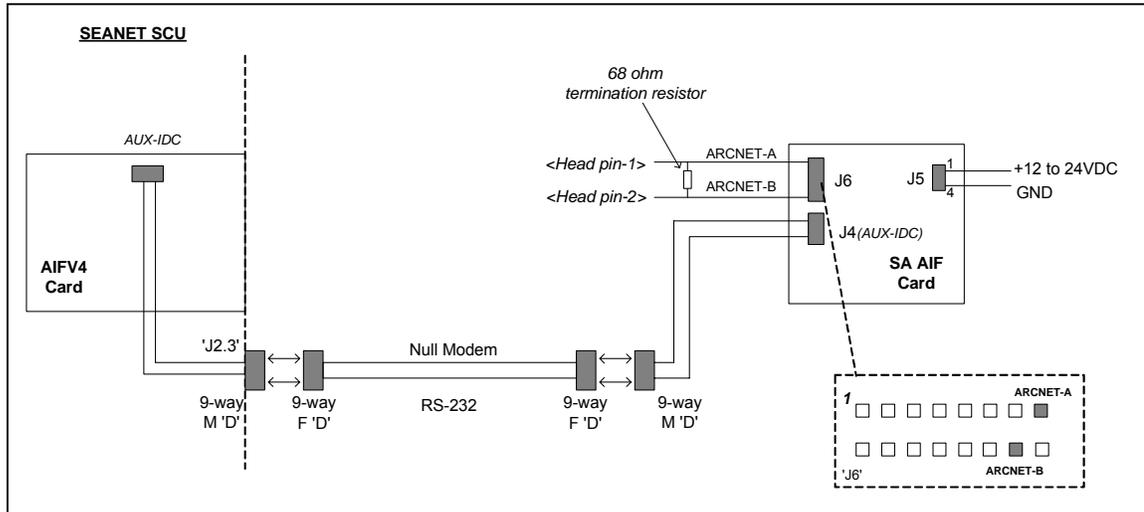


Diagram 1.03: Bench Wiring

Refer to later sections of this manual for software configuration, including selection of RS-232 Baud rates.

1.2.2 Installing Split AIF for RS-232 Communications

1.2.2.1 SURFACE HARDWARE INSTALLATION

The surface AIFV4 card is fitted inside the Seanet SCU (Surface Control Unit) or PC in the case of a PC Kit. Inside the SCU, the ribbon cable from the RAT connects to 'RAT-IDC' on the AIFV4 card. When fitting to a PC there will be a ribbon cable from the COM2 port on the motherboard which connects to 'RATCOM-IDC' (or 'RATCOM-PIN' in unique cases). For PC installations, the 'RAT-IDC' header is not used.

Using the RAT Extension lead supplied with the SCU, the RAT can also connect to J2.2 which is the 9-way 'D' type port on the backplane of the card.

A SCU backplane plate with 9-way 'D' male and ribbon connector is supplied with the system. This fits inside the SCU in an adjacent slot to the AIFV4 card and is J2.3 on the SCU. The ribbon cable from this plate plugs into 'AUX-IDC' on the AIFV4 card.

RS-232 communications to the Fibre Optic MUX is now made through J2.3.(see diagram 1.04).

Pin-outs are as below:

J2.3 – 9D Male pin allocations

2	-----	RS-232 Uplink data. (Yellow)
3	-----	RS-232 Downlink data. (Blue)
5	-----	RS-232 Ground. (Screen)

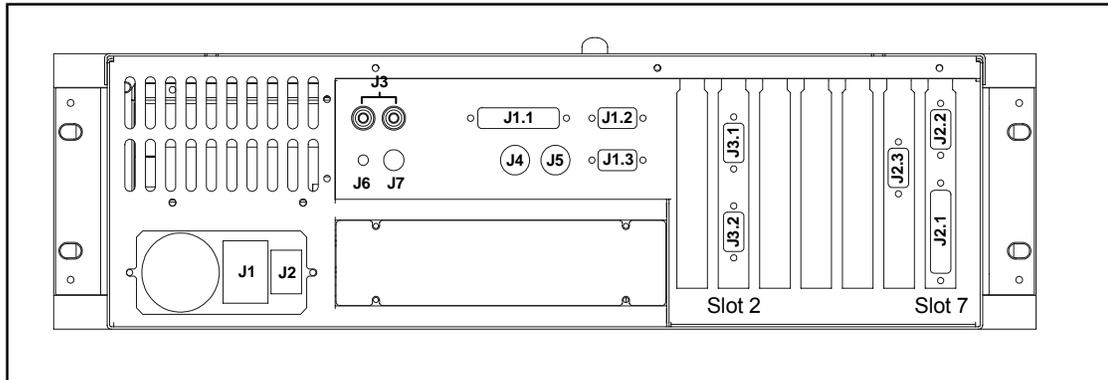


Diagram 1.04: Rear view of SCU with AIFV4 Fitted

1.2.2.2 SUBSEA HARDWARE INSTALLATION

The subsea SA AIF PCB should be fitted as near as possible to the subsea FO MUX.

This card has one power connector; **J5**.

A mating connector is supplied and **+12 to +24 Volts DC (max)** must be applied.

There are three data connectors; **J3, J4, J6** (J3 is unused).

Two ribbon connectors are supplied, one 9-way D male and one 15-D female.

The 9-way ribbon connects to **J4** (AUX IDC) this is used for RS-232 communications to the Fibre Optic MUX. *See diagrams 1.03 & 1.11 for exact pin-outs.*

The 15-way ribbon connects to **J6** (LAN-IDC) this is used for ARCNET communications to the SeaKing sensors. *See diagram 1.11.*

The 15-way 'D' pin-outs are exactly the same as for J2.1 on the AIFV4 card (see the main Seanet System manual).



Caution!

ONLY pins 8 and 15 (ARCNET) on the 15-way 'D' should be connected on the SA AIF output.

A termination resistor is required and should be a single **68 ohms** when the ARCNET circuit is less than 100metres in length.

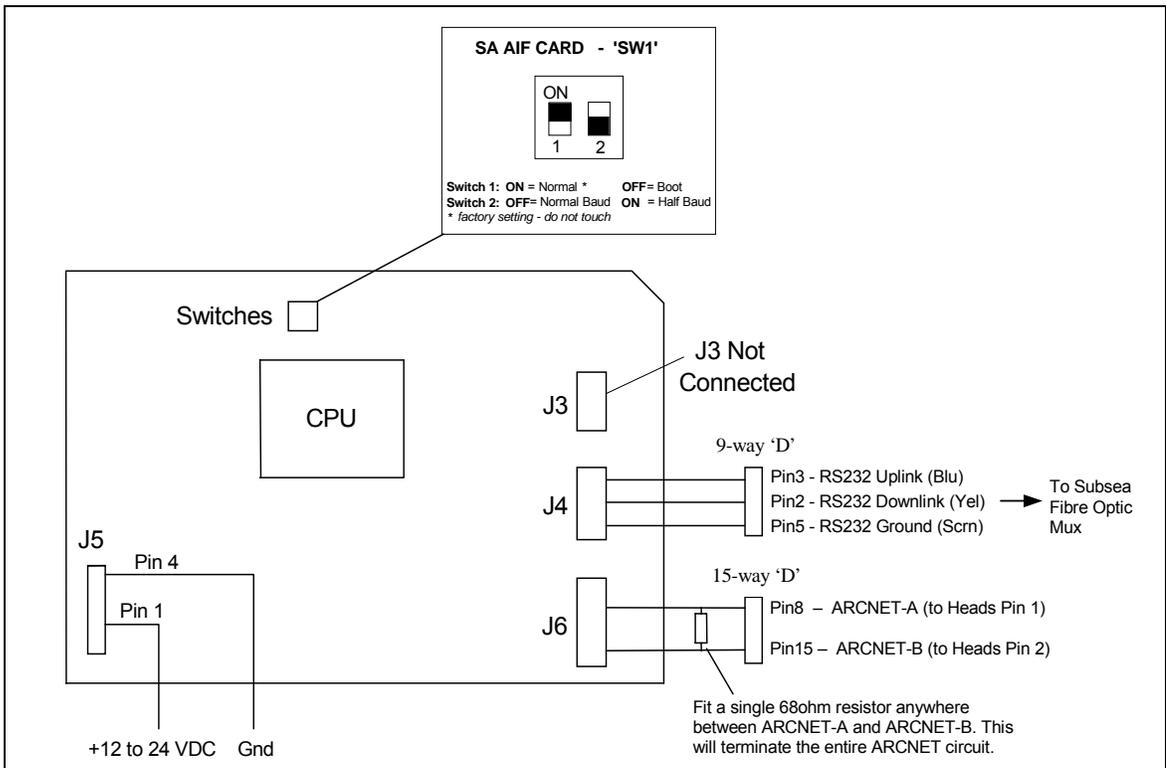


Diagram 1.11: "Split AIF" subsea card (SA AIF) power and data connections

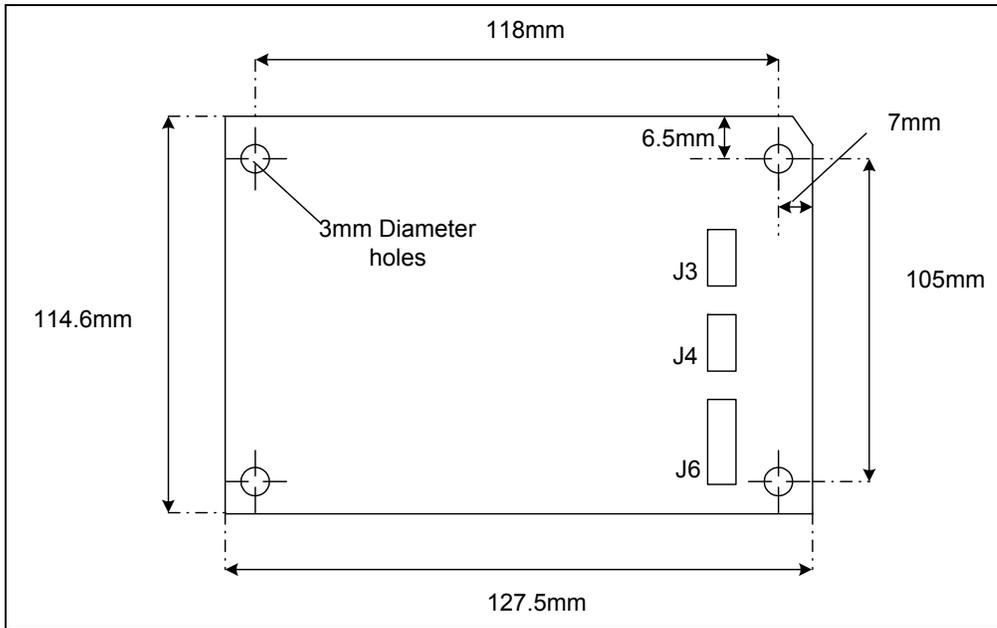


Diagram 1.12: "Split AIF" subsea card (SA AIF) dimensions.

1.2.2.3 Software Setup for RS-232 Operation (AIFV4 to SA AIF)

Use **Bench Test Setup for Split AIF Card** described previously.

Switch on the power to the SCU. For bench testing, this will also supply +24 VDC to the SA AIF card via 'J3' on the rear of the SCU. Close the main Seanet software program and run the 'Seanet Setup' utility program by clicking on its Windows Program Icon. The following Table will appear...

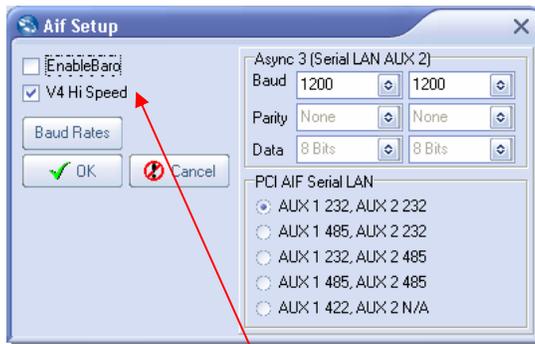


Node 255 = AIFV4 Card.
Node 254 = Subsea SA AIF Card.

IF NODE 254 DOES NOT APPEAR, See Section 1.2.2.4 below...

1.2.2.4 Establish Communications Using (Recovery) 9600 Baud Speed

1. Click on the Action drop-down box for Node 255 and select Setup. The 'Aif Setup' panel appears as below:



2. Un-tick the V4 Hi Speed check box.
3. Click on OK and the new speed setting will be set for the AIFV4 card. This will be 9600 Baud as default which is the RS-232 speed the AIFV4 card will use to communicate with the SA AIF card.
4. Close Seaneet Setup and ensure power to the SA AIF card is switched OFF.
5. On the SA AIF card, set 'SW1' Switch-2 to the ON position.
6. Switch power to the SA AIF back on and Restart Seaneet Setup.
7. Press Rebuild and the SA AIF card should now appear as NODE 254 using the (recovery) RS-232 communications rate of 9600 baud.

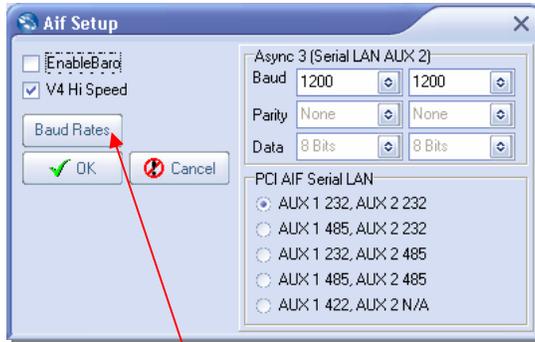
1.2.2.5 Setting the RS-232 Communications Rate

Once there is established RS-232 communications between the AIFV4 card and the SA AIF card (i.e. Node 255 & 254 appear in table), then the RS-232 Baud rate may be changed. This may be necessary to suit the speed of the fibre link when the cards are installed to the system.

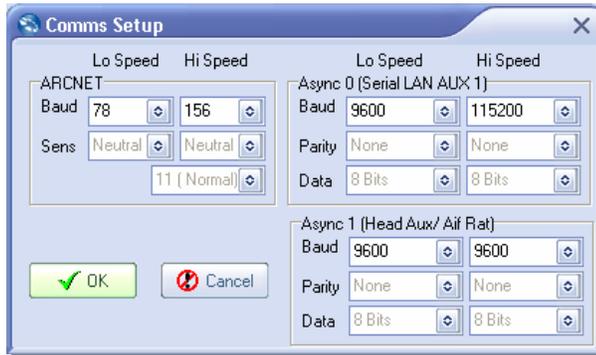
1.2.2.6 Setting Fibre Link Speed

Step 1: Subsea Interface – SA AIF Card

1. Click on the Action drop-down box for Node 254 and select Setup. The 'Aif Setup' panel appears as below...



2. Click on Baud Rates and the following panel appears...



3. Locate the settings for 'Async 0' channel and set the right-hand baud rate to the desired Fibre link speed (default speed is 115.2 kBaud*).

** speeds less than 38.4k are unadvisable for Imaging Sonar applications*

4. Click on OK and the update will be sent to the SA AIF card.

Step 2: Surface Interface – AIFV4 Card

5. Click on the Action drop-down box for Node 255 and select Setup. The 'Aif Setup' panel appears (as shown in Step 1). Ensure V4 Hi Speed box is ticked.
6. As in Step 1, Click on Baud Rates.
7. Locate the settings for 'Async 0' channel and set right-hand baud rate to desired Fibre link speed. This should match the SA AIF link speed setting, as set in Step 1.

8. Click on OK to confirm the new AIFV4 link speed.
9. Ensure SA AIF card 'SW1' Switch-2 is set to OFF. If not then change the switch setting with the card powered down.
10. In Seagnet Setup, Press Rebuild and confirm Nodes 255 & 254 appear.



Caution!

The RS-232 link is now running at the Async 0 right-hand Baud speed (as shown in the above panel) and the Split AIF system is now ready to be integrated with the Fibre Optic system as per the Hardware Installation described previously.

1.2.3 Using AIFV4 Card for ARCNET Operation

1.2.3.1 Hardware Installation

The standard telemetry used in SeaKing systems is ArcNet. The ArcNet SeaKing heads connect to the AIFV4 card directly over the 2-wire ArcNet LAN. Connection wiring, terminations and full details can be found in the main Seanet System manual.

The ARCNET output is from pins 8 and 15 on the AIFV4 card's J2.1 connector (See diagram 1.21 & 1.22)

ARCNET impedance termination is 270 ohms at the surface and 39 ohms subsea (i.e. Standard SeaKing ARCNET resistor values)

WARNING: The AIF mating connector may be supplied fitted with a lower value resistor intended for use with the Split AIF RS-232 configuration, this must be checked and changed if incorrect.

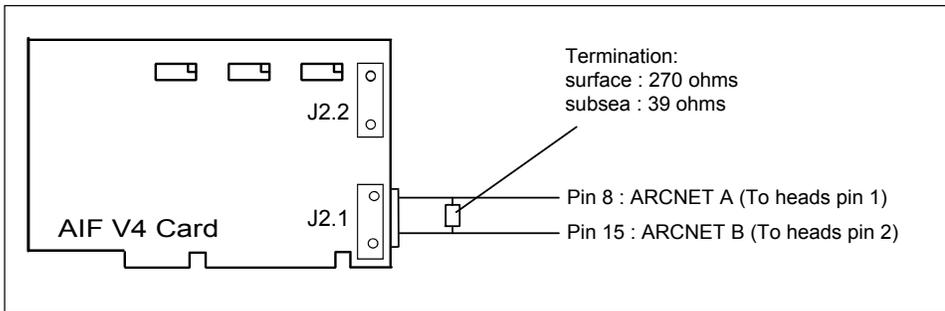


Diagram 1.21: AIFV4 ARCNET Connections.

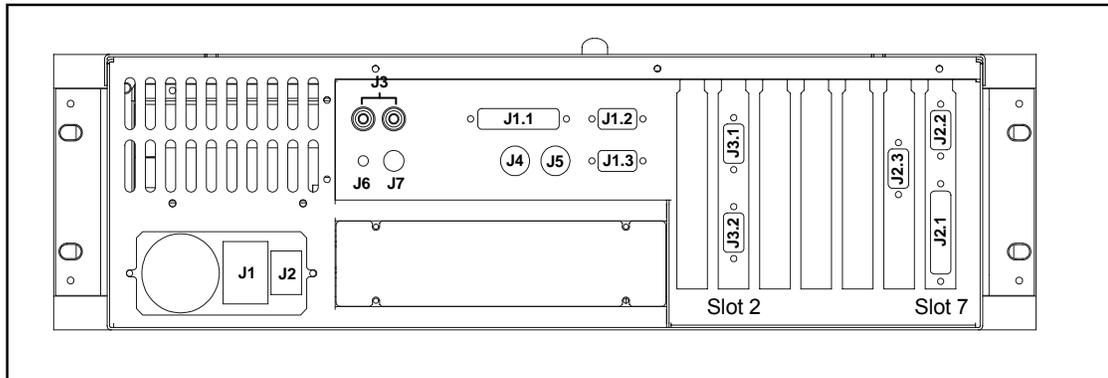


Diagram 1.22: Rear view of SCU showing AIFV4 ARCNET connection J2.1

1.2.3.2 Software Setup for ARCNET Operation

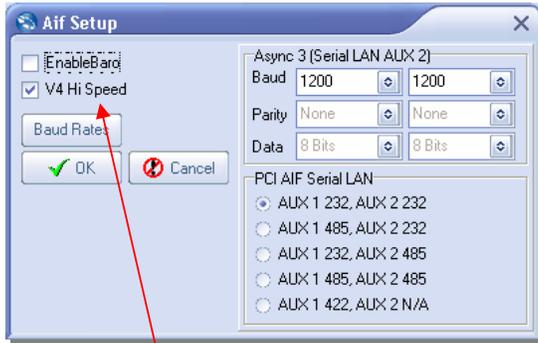
The AIFV4 card is capable of SIMULTANEOUSLY communicating through J2.3 to the SA AIF card AND through J2.1 directly to the ArcNet SeaKing heads.

Therefore there is no further software settings required to operate a network directly through twisted pair.

1.2.3.3 ARCNET Baud Rate Changes on AIFV4 Card

Unlike the earlier AIFV3 card, for the AIFV4 card there is a software switch that is used to select between Half Baud (78kB) and Full Baud (156kB). This is done as follows...

1. Run Seagnet Setup.
2. Click on the Action drop-down box for Node 255 and select Setup. The 'Aif Setup' panel appears as below...



3. The V4 Hi Speed check box is used to select the ARCNET Baud Rate....

With the box **checked/ticked** the system will run at **156** kbit/s.
 With the box **un-checked/un-ticked** the comms will be **78** kbit/s.