Sperry Marine

NORTHROP GRUMMAN

VISIONMASTER FT®

Ship's Manual
Volume 2

(Configuration & Commissioning)

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PREAMBLE

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NOTICE

Northrop Grumman Sperry Marine B.V. have a policy of continuous development. This may lead to the equipment described in this manual being at variance with equipment manufactured after its publication.

Warnings and Cautions

	CAUTION! – ANTI-VIRUS PROTECTION
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Revision Record

Table 1: Revision Record

Revision No	Issue Date	Date Incorporated	Incorporated By
Issue 1	November 2006		
Issue 2	December 2006		
Issue 3	April 2008		
Issue 4	July 2008		
Issue 5	October 2008		
Issue 6	June 2009		
Issue 7	September 2009		
Issue 8	November 2010		
Issue 9	June 2011		
Issue 10	March 2012		
Issue 11	February 2013		

Preface

HOW TO USE THIS MANUAL

The VisionMaster Ship’s Manual is divided into two volumes.

Volume 1 is intended for use by installation and service engineers.

Volume 2 (this manual) covers all configuration, service and commissioning functions carried out at the VisionMaster display. It also includes configuring a Conning Information Display (CID) and setting up the Total Tide application.

The structure and design of the manual should help you to quickly find the information that you need. Consistent presentation techniques are used throughout the manual.

Volume 2 is divided into the following chapters:

- **Chapter 1 - Configuration**. Details the configuration procedures for the VisionMaster FT system using the configuration tool. The following appendices are included in this chapter:
    - **Appendix A - Configuring a Multinode System**. Describes specific steps required when configuring a Multi-node system.
    - **Appendix B - Configuring a System for Client/Server Radar**. Describes specific steps required when configuring a system for Client/Server Radar (CSR), also instructions on installing and operating the TightVNC application for Clients and Servers.
    - **Appendix C - Configuring Peripheral Devices**. Includes information on the following peripheral devices:
        - Extra serial ports (external serial port and an internal PCI serial card).
        - Reconfiguring pre-existing SixNet ring switches to be used with later versions of VisionMaster software.
        - How to install and configure the PC NAVTEX Client/Server application.
        - How to fix a potential fault if a printer connected to the node PC does not print.
- **Chapter 2 - Diagnostics, Commissioning & Service Mode**. Describes the diagnostics and commissioning functions in the VisionMaster System menu, and how to access the Service desktop.
    - **Appendix A - Registering and Replacing a C-MAP eToken**. Describes how to register a C-MAP eToken and how to replace an eToken with a different version.
- **Chapter 3 - Configuring a Conning Information Display**. Describes how to use the CID designer in the configuration tool. The following appendix is included:
    - **Appendix A - Configuring a Second Monitor**. Describes how to configure a second monitor for CID pages using either the ATI Catalyst Control Center or Microsoft display properties.

- **Chapter 4 - TotalTide Setup**. Describes how to set up the TotalTide application from the Service desktop.
- **Chapter 5 - NSI Service Manual** - includes a pdf of the Network Serial Interface (NSI) User, Installation and Service Manual.

Related Documents

Other publications in the VisionMaster FT series are listed in Table 2 below:

Table 2: Related Documents

Document Title	Document Number
VisionMaster Ship's Manual - Volume 1	65900011V1
ECDIS Bridge Card	65900008
Radar/Chart Radar Bridge Card	65900009
Radar/Chart Radar User's Guide	65900010
ECDIS User's Guide	65900012
Supplementary Features User Guide	65900014

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Chapter 1

Configuration

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APPENDICES

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1 Introduction

The Configuration program provides the service engineer with the tool to commission and service the VisionMaster system.

In general, the order of configurable sections as presented by the Configuration tool is designed to be the order in which the engineer should progress through the system configuration.

As features and values are configured the Configuration tool gives a graphical indication of each item's configuration status by means of coloured status buttons in the navigation column, see See "Status Buttons" on page 17.

The Validation window also gives a summary of any validation errors in the configuration, see Section 4.3 *Validation Errors*'. You can check the validation status of your configuration at any time by accessing **Validate** from the **File** menu. See "Validating and Exporting a Configuration" on page 259. Or, by right clicking on a specific unvalidated status button, see Section 4.2 *Right Click Options on Configuration Topics*'.

The configuration tool includes a Quick Setup menu. This includes key summary pages that enable a service engineer to simplify and speed up the task of commissioning a basic VMFT configuration without necessarily referencing the more detailed Resources and Applications menus.

Note: *There are particular factors to consider when configuring a multi-node system, or when changing the existing configuration of a multi-node system. For details please refer to 'Appendix A Configuring A Multi-Node System' at the end of this chapter.*

2 Accessing the Configuration Tool

To access the VisionMaster configuration tool do the following:

1. In VisionMaster FT log in as a service engineer, for details refer to Section 3.1 *Login*' in Chapter 2 '*Diagnostics, Commissioning & Service Mode*'.
2. Navigate to **Shutdown** in the System menu and click on the **Service Mode** button. The VisionMaster system shuts down and the Windows desktop is displayed.
3. Double click on the **Configure VMFT** icon on the desktop. The VisionMaster Config Tool Start Up window appears. This window shows the current system version number, copyright information and a status bar displaying the configuration loading status.

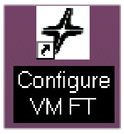


Figure 1.1 Config Tool Start Up Window

When opened, the Configuration window comprises an active title line, and a toolbar which includes File, View and On-Screen Keyboard drop down menus. The main area of the window is divided into two size-editable columns; the left column contains the configuration navigation tree, and the right column is the main content area.

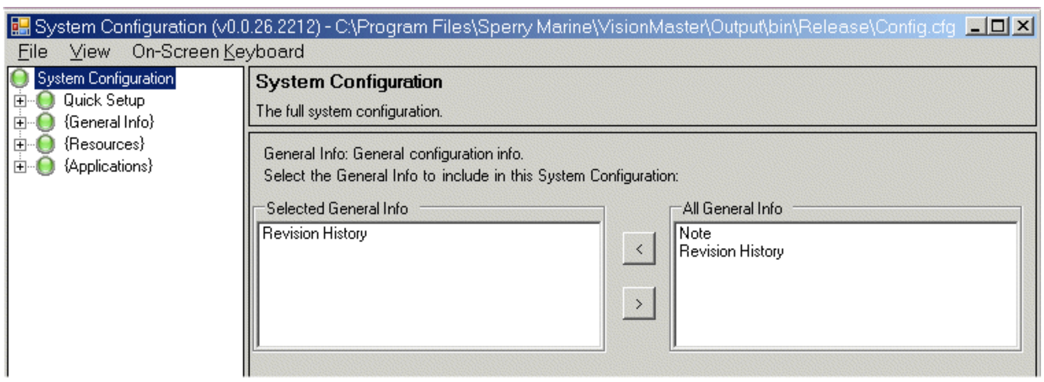


Figure 1.2 Configuration Tool Window

2.1 Changing the Login Status

When you access the configuration tool the system automatically opens the application in Service mode. To change the current login status (for example, from 'service' to 'developer'):

1. Click on the **File** drop down menu and select **Log In**. The Configuration Log In window appears.

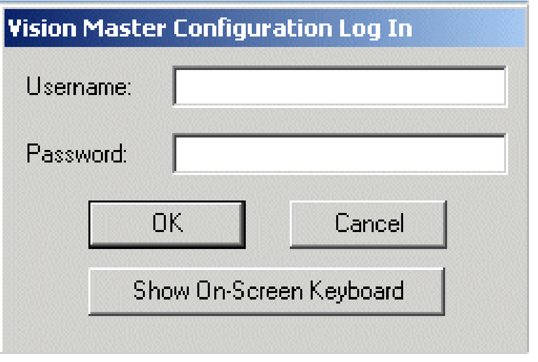


Figure 1.3 Login Window

2. Enter a valid user name and password in the respective fields and click the **OK** button. The system authenticates the data against a database of known users and provides user authentication, independently on each node of the system.
3. If the data entered is authenticated the configuration options listed in the navigation tree may change dependant on the logged in operator's access level.

2.2 Accessing the On-Screen Keyboard

If you require access to a screen keyboard in order to enter data click on the **On-Screen Keyboard** drop down menu and select **Show**. A keyboard appears below the Configuration window.

Figure 1.4 On -screen Keyboard

3 Opening and Saving Config Files

When the VisionMaster FT configuration tool is first opened after having run the installer the system loads a baseline configuration file with settings suitable for Production Test.

The system will also include configuration files for specific types of products, e.g. Total Watch or Standalone ECDIS.

When you first access VisionMaster FT Configuration you must open the configuration file which matches the product type you are using. After opening the file, save the file as the default config file (named 'config.cfg') which will automatically be used by the VisionMaster FT system.

3.1 Opening a Product Configuration

1. To open a product configuration click on the **File** drop down menu and select **Open**.
2. A navigation window appears superimposed over the Configuration window from where you can select from the list of configuration files.

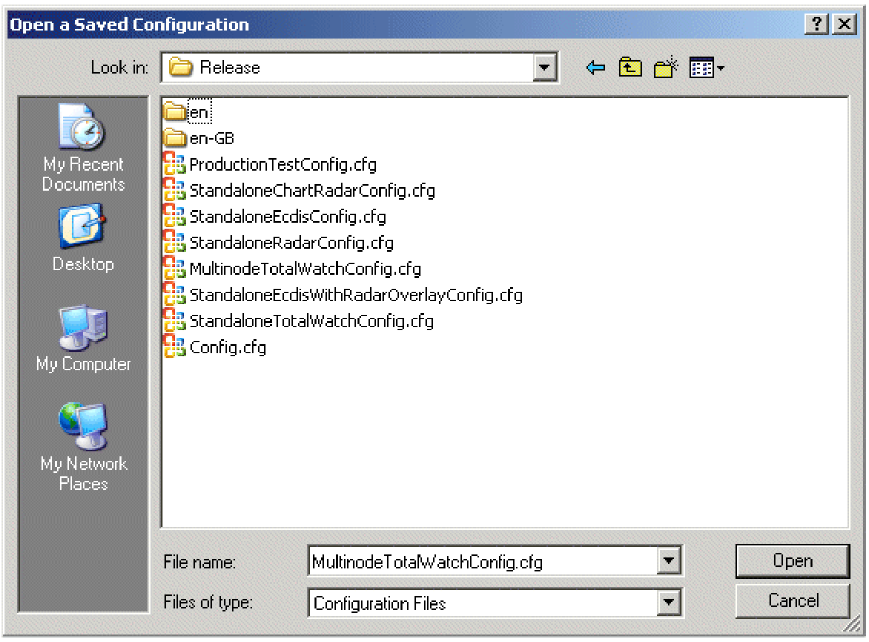


Figure 1.5 Accessing the Configuration files.

3. Highlight the file that matches the product on your node and click on the **Open** button. The navigation window disappears and the product file selected is shown in the active title line at the top of the System Configuration screen.

3.2 Saving an Opened Product Configuration

After a product configuration has been opened, any changes made to the configuration file must always be saved as config.cfg. It is from this file that the VisionMaster application will subsequently read the configuration.

To save and rename a product configuration click on the **File** drop down menu and select **Save As (to All Nodes)**. In the Save Configuration navigation window select **'config.cfg'** from the list and click the **Save** button.

Whenever a configuration is saved a Validation Errors popup warning appears prompting to enter information about the installation, see Figure 1.6.

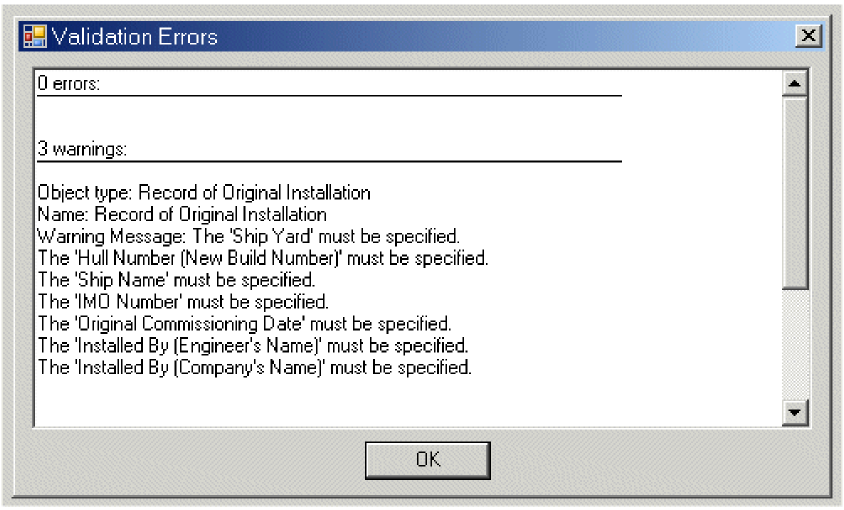


Figure 1.6 Validation Errors for Installation

Information about the installation may be entered as described in Section 5.1 *Record of Original Installation*'. If no information is entered the warning window can be closed by clicking the **OK** button. The VMFT application will open as normal but the warning error will remain when the configuration is re-opened.

3.2.1 Saving a Configuration to an External Device

After saving the configuration, it is advisable to also save the file to an external device such as a memory stick. This will enable you to transfer the system parameters in the configuration file to new equipment in the event of hardware modules requiring replacement.

3.3 Synchronize Files

The Synchronize Files option is used in a multi-node system to compare the currently loaded configuration file to the corresponding files on each node. For details refer to Section 8 *Changing the Current Configuration*' in '*Appendix A Configuring A Multi-Node System*'.

4 Viewing Options

When a valid configuration file has been opened the navigation tree displays the following main menu items:

- Quick Setup
- General Info
- Resources
- Applications

To access their sub-menu functions either click on the **+** button to the left of the menu items, or click on the **View** drop down menu and select **Expand All**, all the topics relevant to the configuration file are displayed in the navigation tree.

To return to displaying the main menu items only, select **Collapse Al**l from the View drop down menu.

4.1 Status Buttons

Each configuration topic in the navigation tree has an accompanying status button to the left of the function. When a topic's configuration status is valid the button colour is displayed as green. If a configuration setting is invalid, either because the topic has not been correctly configured, or the configuration setting made is not available, then the topic's status button is displayed as red and all it's hierarchical sub-menu functions up to System Configuration are displayed as orange.

Figure 1.6 below shows an example where **Own Ship Characteristics** has not been correctly configured.

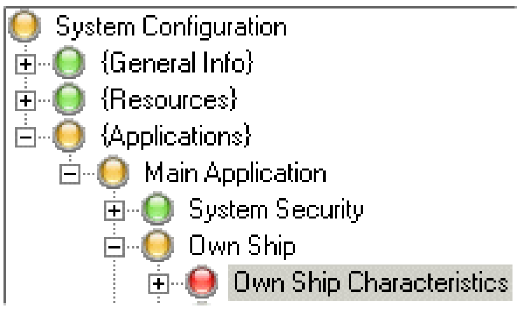
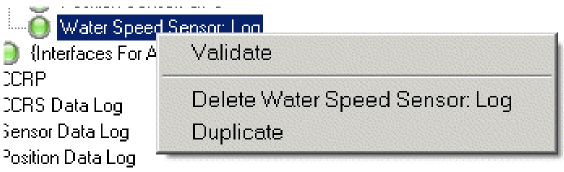


Figure 1.6 Status Buttons

If a configuration has warning errors present (see Section 4.3.1 *Warning Messages*') the topic's status button will be displayed in orange with it's hierarchical sub-menu functions also displayed as orange.

4.2 Right Click Options on Configuration Topics

The following options may available when you right click on configuration topics (depending on the selected topic).



- Validate
- Delete
- Duplicate

If a topic forms part a standard default configuration then only the **Validate** will be available. Using this option enables an individual topic to be validated, in addition to validating the whole configuration, see Section 9.1 *Validating a Configuration*'.

Topics that have been added to a configuration may be deleted or duplicated, in addition to being validated.

Selecting Delete removes the selected topic from the configuration file. Duplicate creates a topic identical to the selected topic and is used where a similar topic to the existing one is required.

4.3 Validation Errors

The configuration tool generates two types of validation error message; Errors and Warnings.

4.3.1 Warning Messages

Warning messages are generated where a configuration setting varies from the actual setting recommended by Sperry Marine. For example, in Announcements, operator messages may be selected to bypass mute settings, but the recommendation is that operator messages obey the mute settings rule.

When a warning is generated, the topic's status button is displayed in orange. To access the error message, either select **Validate** from the File drop down menu, or right click on the topic and select **Validate**. A Validation Errors window appears listing the reasons for the warning message and recommendations to rectify it.

Note that, unlike an error message, a warning error does not generate an invalid (red) setting. Therefore a configuration containing warning errors may be saved and the VisionMaster application will open as normal, but any warning errors will remain when the configuration is re-opened.

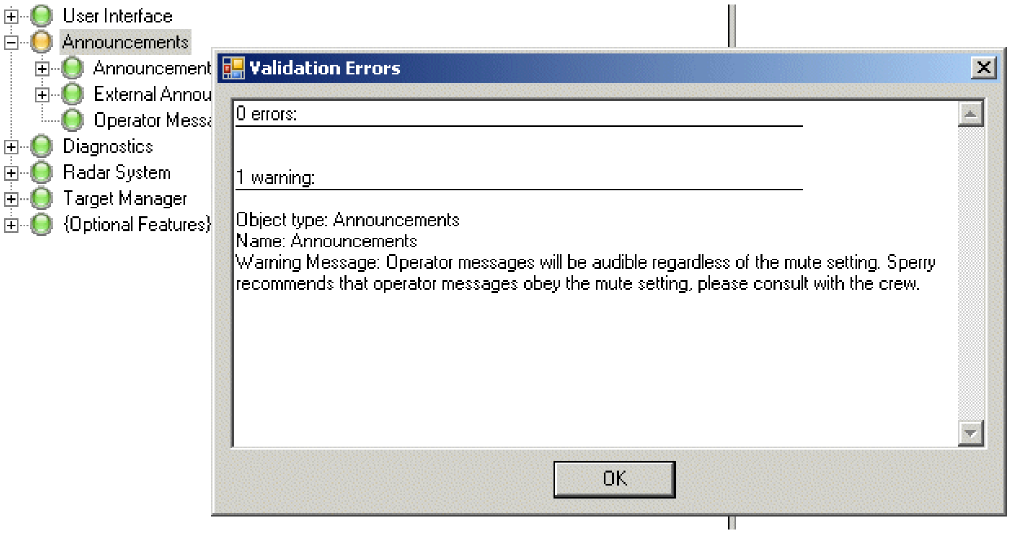


Figure 1.7 Typical Warning Message

4.3.2 Error Messages

Error messages are generated when a selected object type has not been configured, or an incorrect setting has been entered in an object's configuration window.

When an error message is generated the status button of the unconfigured object appears red and the Validation Errors window details the reasons for the error message.

Note: *If your configuration includes one or more error messages when the Config tool is closed, the VisionMaster application will not run when the system is re-started.*

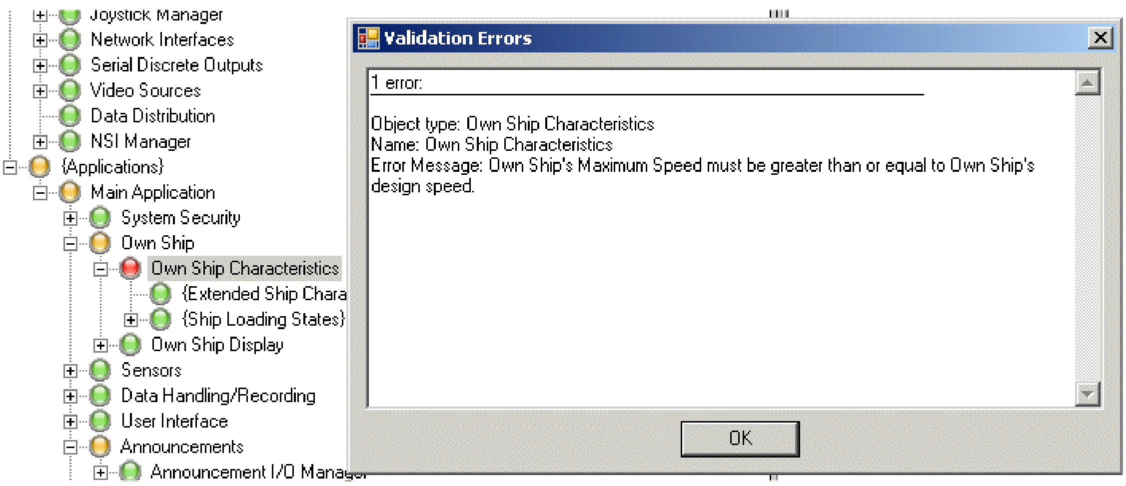


Figure 1.8 Typical Error Message

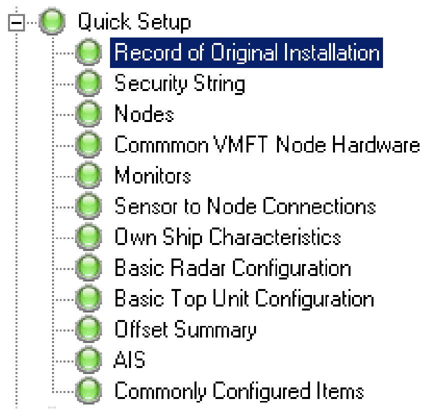
5 Quick Setup

The Quick Setup includes key summary pages that enable a service engineer to simplify the task of commissioning a basic VMFT configuration.

The pages included in Quick Setup are either summaries based on more detailed configuration pages found in the Resources or Applications menus, or in certain cases (for example, Monitors) a replication of the same page in the advanced configuration tool.

The following configuration pages are included in the Quick Setup and are described in the subsequent sub sections:

- Record of Original Installation
- Security String
- Nodes
- Common VMFT Node Hardware
- Monitors
- Sensor to Node Connections
- Own Ship Characteristics
- Basic Radar Configuration
- Basic Top Unit Configuration
- Offset Summary
- AIS
- Commonly Configured Items



5.1 Record of Original Installation

The Record of Original Installation page includes a list of miscellaneous information that can be entered about the ship installation, see Figure 1.9.

If information is not entered, or only partly entered, a warning message is generated. The configuration can be saved, and the VMFT application opened but the warning error will remain when the configuration is re-opened.

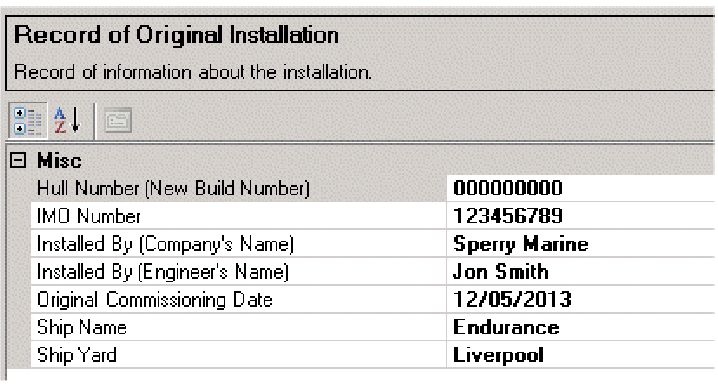


Figure 1.9 Record of Original Installation

5.2 Security String

A security string is required for each node on a multi-node system and defines the system level authorisation parameters available for that node and a list of any optional features that have been purchased by the customer.

Note: *If optional features that require purchasing are not defined in the security string then they will not appear in the VisionMaster application, even if the features have been successfully configured.*

The Security String window is replicated in the Main Application area of the configuration under 'System Security'.

A security string is provided by your VMFT supplier and will, in most circumstances, be automatically entered when the system is commissioned.

If a security string is required to be entered by a service engineer:

1. Insert the security device provided (sometimes known as a dongle) into a USB port on the PC and open **Security String** from the Quick Setup list. From the toolbar access the **On-Screen Keyboard**, enter the security code in the **Security String** field, and click the **Ent** key on the on-screen keypad.
2. When a valid alpha/numeric code has been entered the window displays auto-generated information derived from the code, including a five digit PIN, the number of nodes in the system with each product type, and purchased features information (if applicable).

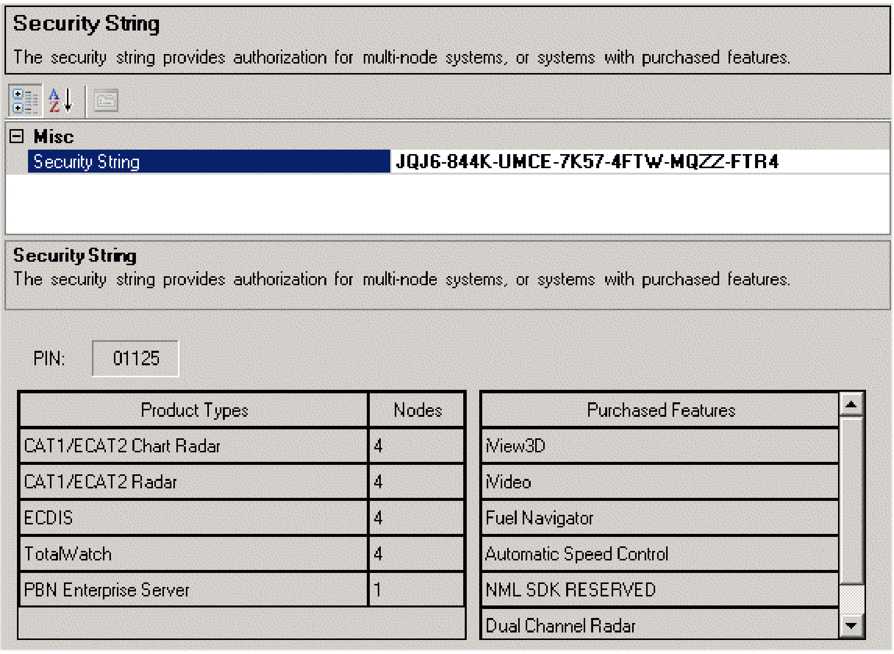


Figure 1.10 Security String window

When a security string has been validated each node on a multi-node system can be separately configured, see Section 5.3 *Nodes*'.

5.3 Nodes

The Nodes window lists all nodes assigned to a multi-node system, the Windows network host name, product type and processing participation.

The Nodes window is replicated in the Resources area of the configuration.

The following configuration settings can be made from the Nodes window:

- Specify the number of nodes on the system. If the system is a standalone this will be set to 1.
- Change the base node name from the default.
- Change the network host name from the default.
- Select the product type (e.g. Total Watch, Cat 1 Chart Radar, ECDIS etc.).
- Change the processing participation from the default of Normal.

The up/down buttons and delete button to the right of the Display Name may be used when configuring a multi-node system.

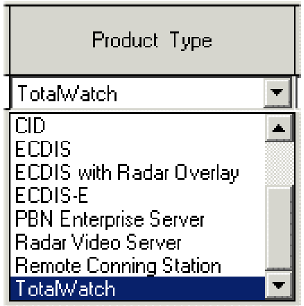
5.3.1 Setting up Nodes

1. Open the **Nodes** topic from the Quick Setup list.
2. To specify the number of nodes on your system, click on the **Number of Nodes** drop down arrow and from the list select the total number of nodes (maximum 32). Nodes are added or subtracted to the **Display Name** list with the base node name and number auto generated.

Note: *Each node must have a Security Device attached to the PC. The system will compare the allowed number of nodes to the actual number of nodes in the system. If the number of nodes exceeds the limit set in the Security String an Authorization Failure alarm is given. For a list security devices that can be used on VMFT nodes refer to Section 5.3.2 Security Devices'.*

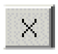
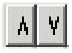
3. To change the node name from the default click in the **Base Node Name**: field, delete the default name, enter a new name and click on the **Auto-Generate Names** button. All the node display names on the system are changed accordingly.
4. Enter the windows network host name assigned to each PC on the system (this is the Computer Name shown in the Control Panel/System Properties). Note that the windows host names entered must be no more than 15 characters.

5. Click on the **Product Type** drop down arrow and select from the products list. Repeat the process for each node.



Note: *The Product Types selected must match the number of product types authorised by the Security String. If the product types do not match a Validation Error window will appear listing the reasons for the error.*

The window includes the option of deleting a line, or moving a node up or down the list.

6. To delete a node from the list click on the delete button.  The line is initially shown blank, after a few seconds the screen refreshes to display the list with the line removed and the Number of Nodes reduced accordingly.
7. To move a node line up or down the list, click on the up or down button to the right of the table.  The screen refreshes and the node line is moved up or down the list, depending on the button pressed.
8. The Processing Participation column enables the availability of each node for general system wide processing to be configured. The setting defaults to **Normal**, which means nodes are available for any general processing. The selections available from the Processing Participation drop down arrow are as follows:
   - **When Necessary -** this option may be selected for server nodes when the system is a client/server network configuration. It should not be selected for a general multi-node system.
   - **Unavailable -** never available for general processing. This would include nodes that are often turned off or disconnected from the system, such as laptops, or Remote Conning Station nodes in the captain's cabin where processing participation is always selected as Unavailable.

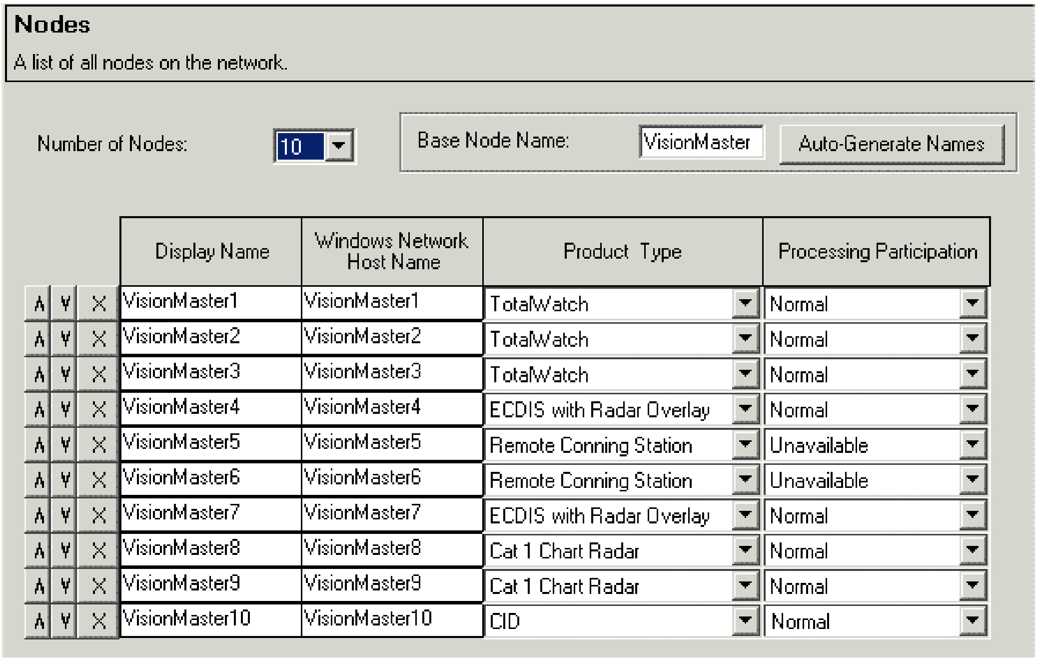


Figure 1.11 Nodes Window for a Multi-Node System

5.3.2 Security Devices

The types of security device (product type identifier) are as follows:

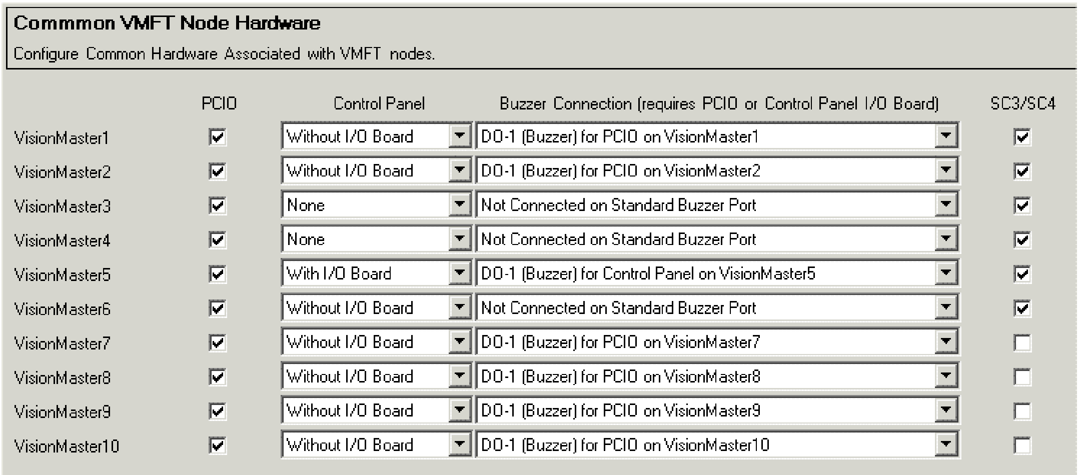
- 32SDV001 for CAT 1 Radar (also Enhanced CAT 2 Radar)
- 32SDV002 for CAT 1 Chart Radar (also Enhanced CAT 2 Chart Radar)
- 32SDV003 for ECDIS
- 32SDV004 for ECDIS with Radar Overlay
- 32SDV005 for Multi-node workstation (also used for all nodes on a Client/ Server Radar system)
- 32SDV006 for Total Watch (CAT 1 Chart Radar and ECDIS)
- 32SDV008 for CAT 2 Radar

These security devices are for individual workstations, with the configured product type for each workstation matching the security device fitted. The exception being 32SDV005 (multi-node workstation) where the product type selected in the configuration determines the mode of operation.

5.4 Common VMFT Node Hardware

The following common hardware items that may be associated with VMFT nodes are shown in a table that also lists all the nodes on the system:

- PCIO
- Control Panel
- Buzzer Connection
- Scan Converter board (SC3 or SC4)



Commmon VMFT Node Hardware
Configure Common Hardware Associated with VMFT nodes.

	PCIO	Control Panel	Buzzer Connection (requires PCIO or Control Panel I/O Board)	SC3/SC4
VisionMaster1	☑	Without I/O Board	DO-1 (Buzzer) for PCIO on VisionMaster1	☑
VisionMaster2	☑	Without I/O Board	DO-1 (Buzzer) for PCIO on VisionMaster2	☑
VisionMaster3	☑	None	Not Connected on Standard Buzzer Port	☑
VisionMaster4	☑	None	Not Connected on Standard Buzzer Port	☑
VisionMaster5	☑	With I/O Board	DO-1 (Buzzer) for Control Panel on VisionMaster5	☑
VisionMaster6	☑	Without I/O Board	Not Connected on Standard Buzzer Port	☑
VisionMaster7	☑	Without I/O Board	DO-1 (Buzzer) for PCIO on VisionMaster7	☐
VisionMaster8	☑	Without I/O Board	DO-1 (Buzzer) for PCIO on VisionMaster8	☐
VisionMaster9	☑	Without I/O Board	DO-1 (Buzzer) for PCIO on VisionMaster9	☐
VisionMaster10	☑	Without I/O Board	DO-1 (Buzzer) for PCIO on VisionMaster10	☐

Figure 1.12 Common VMFT Node Hardware

5.4.1 Configuring Node Hardware

1. Tick the **PCIO** check box if the node has a PCIO board connected. For details on a PCIO see Section 7.1 *PCIO Board Manager*'.
2. A control panel attached to a node will be available as one of the following variants:
   - **Without I/O Board -** a basic control panel without an I/O board. When selected a serial control port for the control panel is automatically added to the I/O Port Manager list, see Section 7.9.4 *Control Panel Serial Control Port*'.
   - **With I/O Board -** a control panel that includes an I/O board, usually intended for nodes that do not include a PCIO board. When selected a serial port for the control panel is automatically added to the I/O Port Manager list, see Section 7.9.5 *Control Panel Serial Port*'.
3. Select the required option for each node from the drop down list. If the node does not include a control panel select **None**. For more information on configuring a control panel see Section 7.2 *Control Panel Manager*'.

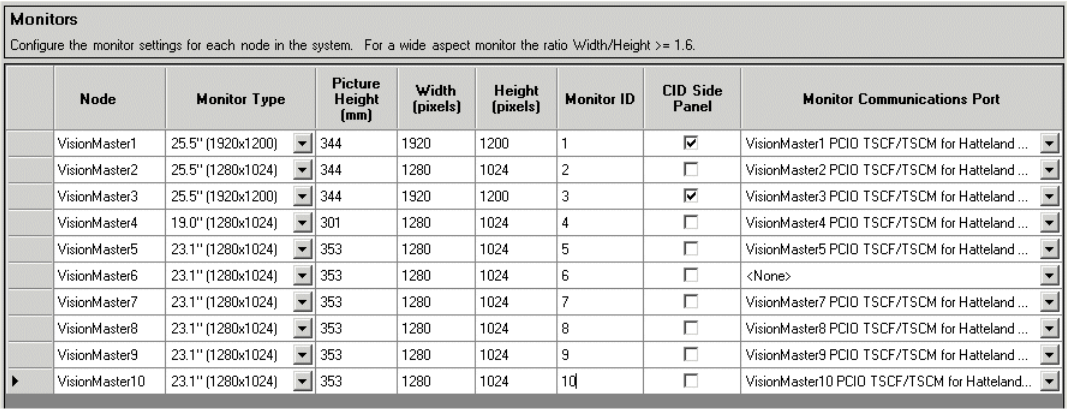
4. The selections made for buzzer connection are based on the following criteria:
    - Nodes that are connected to a PCIO will have a discrete output selected (digital or relay) on the PCIO for the buzzer. In this case **DO-1 [Buzzer] for PCIO** must be selected from the Buzzer Connection drop down list.
    - Nodes that are connected to a control panel with I/O board will have a discrete output for the buzzer on the I/O board. In this case **DO-1 [Buzzer] for Control Panel** must be selected from the Buzzer Connection drop down list.
    - Certain nodes (for example, a CID) may not require a buzzer. In this case **Not Connected on Standard Buzzer Port** must be selected.
5. Nodes that are connected to a PCIO and include radar functionality will include an interface between the PCIO and the PC. The interface is a scan converter (SC) board, which is housed in the PC. Tick the **SC3/SC4** check box for all the nodes that include an SC board. For further information on SC boards, see Section 8.8.2 *Board Manager*'.

5.5 Monitors

The Monitors window enables the monitor settings for each node to be configured.

The following node specific settings can be made from the Monitors window:

- **Monitor Type -** select the size of your monitor (shown in inches with width/height millimetres in brackets). When the monitor type has been selected the picture height and pixel width/height are automatically selected.
- If the monitor type is wide screen format (1920x1200 and above) the **CID Side Panel** check box is automatically ticked. Note that the CID side panel check box cannot be selected for non-wide screen format monitors.
- If **Custom** or **Other Type** has been selected from Monitor Type then the picture height in millimetres and pixel width/height may be changed.
- **Monitor ID -** select the numeric ID for each monitor. On a multi-node system all monitor IDs default to 1.
- **Monitor Communications Port -** select the communications port for the monitor. Each node requires a specific port, this is usually the pre-defined IO setting for monitors (Hatteland/Melford Monitor), see Section 7.9.2.2 *Selecting Pre-Defined IO Settings*'.



Monitors
Configure the monitor settings for each node in the system. For a wide aspect monitor the ratio Width/Height >= 1.6.

	Node	Monitor Type	Picture Height (mm)	Width (pixels)	Height (pixels)	Monitor ID	CID Side Panel	Monitor Communications Port
	VisionMaster1	25.5" (1920x1200)	344	1920	1200	1	☑	VisionMaster1 PCIO TSCF/TSCM for Hatteland ...
	VisionMaster2	25.5" (1280x1024)	344	1280	1024	2	☐	VisionMaster2 PCIO TSCF/TSCM for Hatteland ...
	VisionMaster3	25.5" (1920x1200)	344	1920	1200	3	☑	VisionMaster3 PCIO TSCF/TSCM for Hatteland ...
	VisionMaster4	19.0" (1280x1024)	301	1280	1024	4	☐	VisionMaster4 PCIO TSCF/TSCM for Hatteland ...
	VisionMaster5	23.1" (1280x1024)	353	1280	1024	5	☐	VisionMaster5 PCIO TSCF/TSCM for Hatteland ...
	VisionMaster6	23.1" (1280x1024)	353	1280	1024	6	☐	<None>
	VisionMaster7	23.1" (1280x1024)	353	1280	1024	7	☐	VisionMaster7 PCIO TSCF/TSCM for Hatteland ...
	VisionMaster8	23.1" (1280x1024)	353	1280	1024	8	☐	VisionMaster8 PCIO TSCF/TSCM for Hatteland ...
	VisionMaster9	23.1" (1280x1024)	353	1280	1024	9	☐	VisionMaster9 PCIO TSCF/TSCM for Hatteland ...
▸	VisionMaster10	23.1" (1280x1024)	353	1280	1024	10	☐	VisionMaster10 PCIO TSCF/TSCM for Hatteland...

Figure 1.13 Monitors

5.5.1 Changing Monitor Settings

1. To change the monitor type click on the drop down arrow and select from a list of pre-defined sizes, Custom or Other Size. For example, if your monitor is a standard 340 mm console, select 23.1"; or if your monitor is a widescreen version, select a defined size (i.e. 25.5" or 27.0").
2. If a widescreen monitor is selected which is required to interface to a VDR that cannot support wide screen modes the widescreen monitor type must be set to 23.1" (1280 x 1024) format.
3. If you have received a 25.5" monitor as a replacement for a 23.1" the monitor type should remain at 23.1". When a widescreen system is running on this setting the screen will show blank side bands (approximately 2.5") either side of the display.

Note: *When a widescreen monitor type (1920 x 1200) is selected. The screen resolution setting must also be applied at the Display Properties window, see Section A.1.2 Using the Microsoft Display Properties' in Chapter 3 'Appendix A Configuring a Second Monitor'*

4. Select **Custom** if your monitor does not have a serial communications port, the monitor comms port selection is then disabled.
5. Select **Other Size** if your monitor has a serial communications port but the monitor size is not included in the Monitor Type drop down list.
6. When Other Size or Custom monitor type are selected specify the **Picture Height**, and if required the **Width** and **Height (pixels)**, by clicking on the top and bottom arrows to the right of the current values.

7. If a pre-defined size or **Other Size** have been selected click on the drop down arrow of the Monitor Communications Port and select the Monitor serial port from the list of ports previously configured for the monitor, see Section 7.9.2 *Configuring a PCIO Serial Port*'.

Note: *If the monitor is configured to operate at a screen resolution different from the monitor type selected here, an 'Incompatible Resolution' window opens when the VisionMaster application starts up. The system will restart when the message is acknowledged. This will allow appropriate correction (either to the configuration or the windows display settings) to resolve the mismatch.*

5.6 Sensor to Node Connections

The Sensor to Node Connections function enables the user to define common navigation connections between sensors and VMFT nodes over the PCIO.

The window displays a grid listing all the configured sensors in the left column and all the VMFT nodes along the top row. Connections between sensors and each node are shown as physical port labels, which correlate to labels on the PCIO.

5.6.1 Configuring Sensor to Node Connections

1. To change the configuration of a sensor click on the sensor box in the grid. The configuration window for that sensor appears as a secondary sizable window. Figure 1.14 shows a typical heading sensor configuration window. For information on changing any sensor settings refer to Section 8.4.1.1 *Sensors*'.
2. To close the configuration window click the **Close** button.

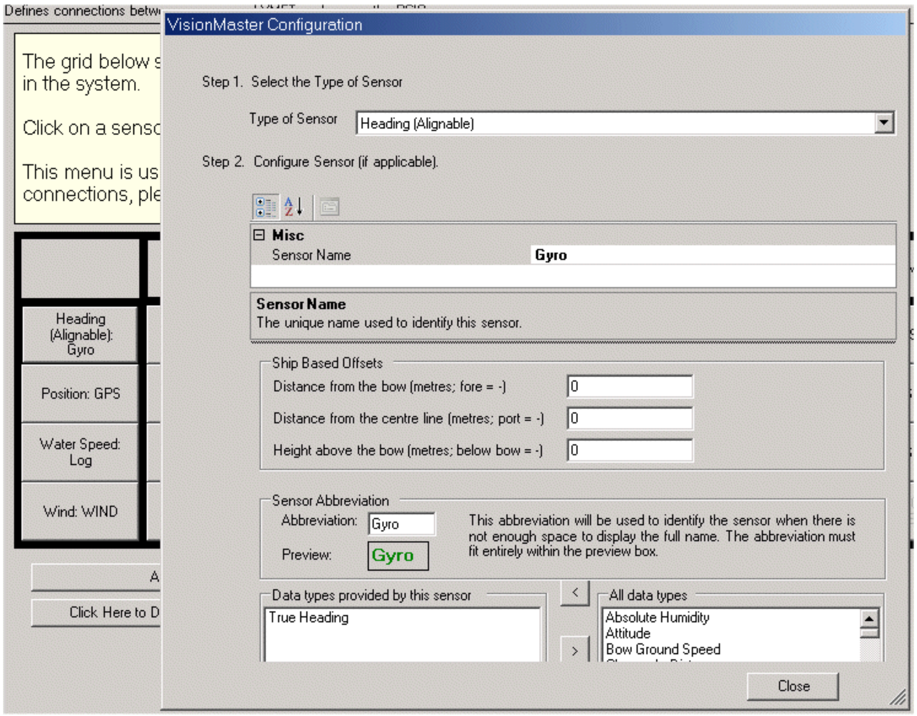


Figure 1.14 Configuration Window for Heading Sensor

3. To configure the connection between a sensor and the PCIO port click on the port label box. Figure 1.15 shows the PCIO port label TSC (Analog Heading Input) for the heading sensor.

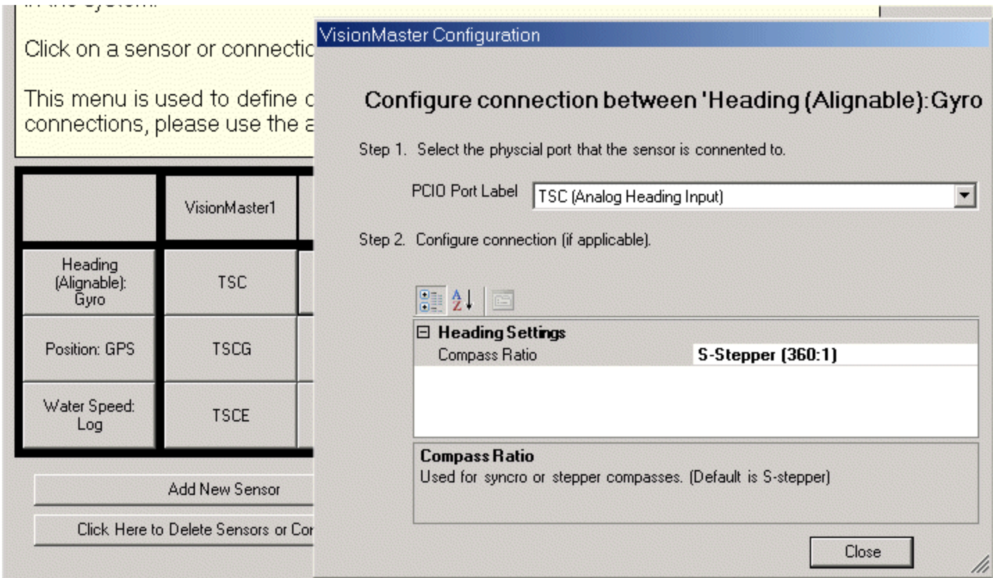


Figure 1.15 Configuration Window for Sensor Connection

5.6.2 Adding New Sensors

New sensors can be added to the Sensor to Node Connections grid by doing the following:

1. Click on the **Add New Sensor** button. A popup window appears prompting to select the type of sensor to be configured.
2. Click on the drop down arrow and select from the list. Note that the list only includes Heading, Position Water Speed and Wind. For information on configuring more types of sensors refer to Section 8.4.1.1 *Sensors*'. The sensor is added to the grid.
3. To configure the new sensor click on the sensor box. The configuration window for that sensor appears as a secondary sizable window. Figure 1.16 shows a typical wind sensor configuration. For information on configuring a wind sensor refer to '*Configuring a Wind Sensor*' on page 116.

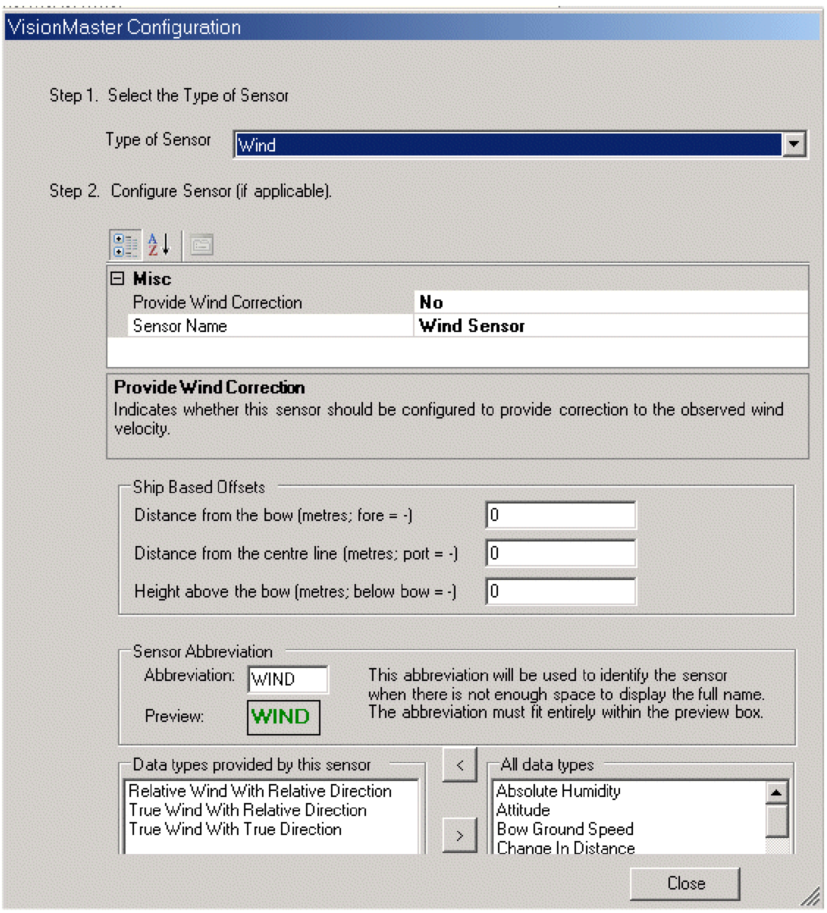


Figure 1.16 Wind Sensor Configuration Window

4. When a new sensor has been added to the grid the PCIO port labels show **[NOT CONNECTED]** for each node. To connect the sensor to a port click on the **[NOT CONNECTED]** box and select the connector on the PCIO by clicking on the PCIO Port Label drop down list in the popup window.
5. When a PCIO port label has been selected for the new sensor the popup window may then list a number of basic and advanced settings, see Figure 1.17. For information on configuring these PCIO port settings refer to Section 7.9.2 *Configuring a PCIO Serial Port*’.

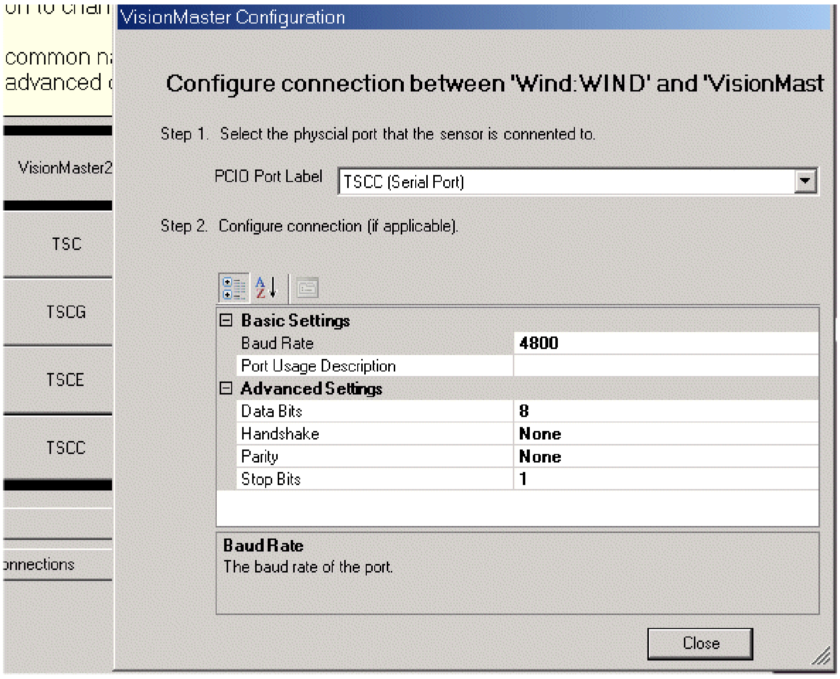


Figure 1.17 Select PCIO Port Label

5.6.3 Deleting Sensors or Connections

1. To delete a sensor or sensor connection from the grid click the **Click Here to Delete Sensors or Connections** button. All boxes in the grid display a small square in the top left corner with a red cross. The delete button changes to display **Click Here to Cancel Delete Mode** in red, see Figure 1.18.

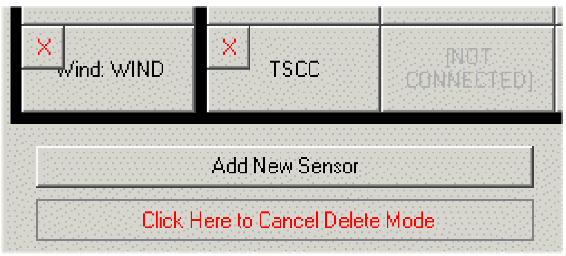


Figure 1.18 Cancel Delete Mode

2. To cancel the delete operation click the delete button again. The grid and button revert to their normal mode.
3. To delete a sensor or sensor connector click on its red cross. The sensor or connector is removed from the grid. Repeat the process for each item.
4. After the deletion process is complete the delete button must be clicked again in order to exit delete mode.

5.7 Own Ship Characteristics

Ownship Characteristics displays the following settings related to own ship:

- Alternate Bow distances and menu setting
- Dimensions, speed settings and turn rates
- Custom outline configuration

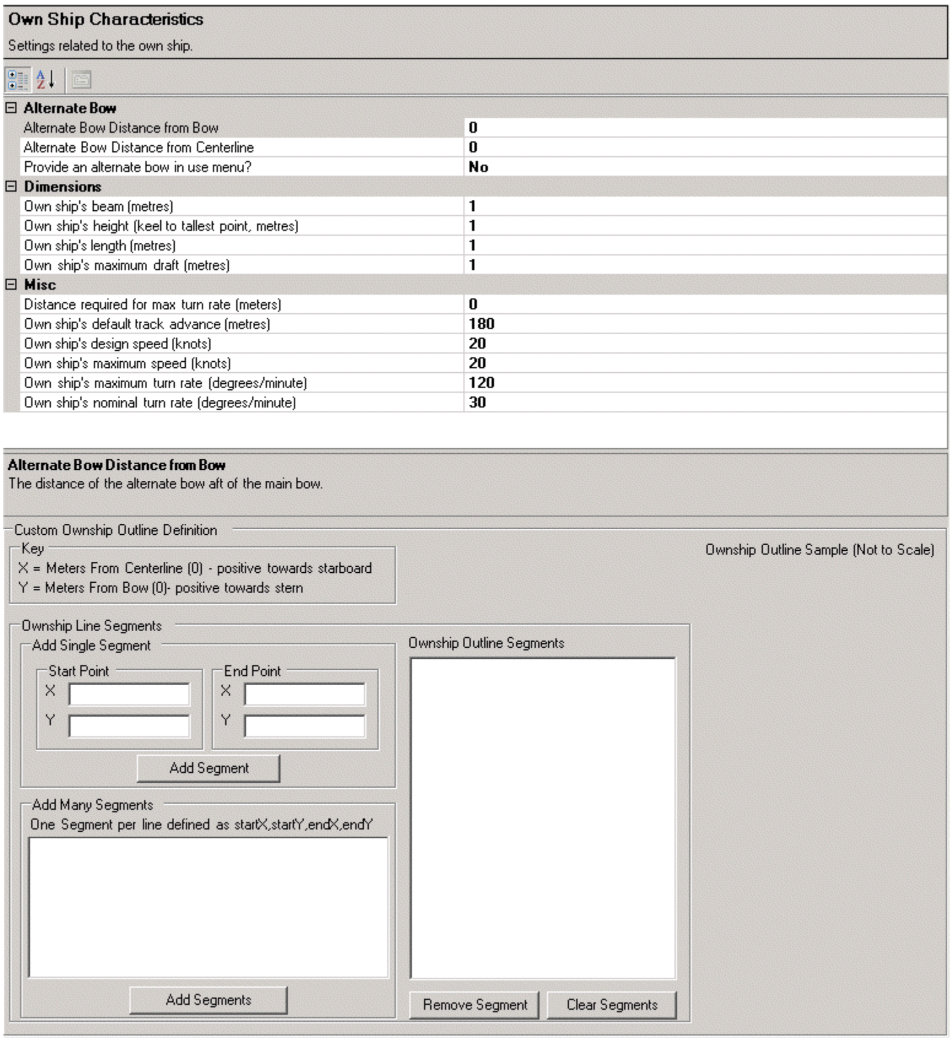


Figure 1.19 Own Ship Characteristics

The following sub sections describe how to set up alternate bow distances, own ship's dimensions, miscellaneous settings related to own ship and how to define a custom outline for own ship. The more detailed configuration page in the Applications menu includes information on configuring ship loading states and alternate bow in use inputs, see Section 8.3.1 *Own Ship Characteristics*'.

5.7.1 Alternate Bow Distances and Menu

When a discrete input has been selected the following Alternate Bow settings should be made in the Own Ship Characteristics window:

- **Alternate Bow Distance from Bow -** the distance of the alternative bow aft of the main bow.
- **Alternate Bow Distance from Centreline -** the distance of the alternative bow starboard of the centreline.
- **Provide an alternate bow in use menu? -** In the event that no external discrete input can be configured then this setting should be enabled by clicking on the drop down arrow and selecting **Yes**. A check box is then enabled on the Characteristics tab of the System Commissioning menu, allowing the operator to switch from main bow to alternative bow.

When an alternative bow is in use menu is selected, the system uses an alternate bow position as the reference point for all data relative to ownship. This includes, for example, the cursor readout and all position readouts.

The alternate bow position is configured at the CCRP window, see Section 8.4.3 *CCRP*'.

5.7.2 Dimensions

The dimensions settings include own ship's beam, height, length and maximum draft. On start up all dimensions default to an invalid value of 0.

The following own ship dimensions must be entered to validate the configuration:

- Beam represents the width of the vessel's beam (range from 1 metre to 999 metres maximum).
- Height represents the distance from the keel to the tallest point on the ship (range from 1 metre to 999 metres maximum).
- Length represents the length of the vessel, measured from the bow to the stern (range from 1 metre to 9999 metres maximum).
- Draft represents the maximum depth of ship's keel under water, measured from the waterline to the bottom of the keel (range from 1 metre to 999 metres maximum).

5.7.3 Miscellaneous

Miscellaneous includes the following settings:

- The distance required for own ship to reach its maximum turn rate in metres, regardless of ship's speed. It is not necessary to enter a maximum turn rate value in order to validate Own Ship characteristics.
- The default track advance of own ship in metres, default 180 metres (range from 1 metre to 99999 metres maximum).
- the design speed of own ship in knots, default 20 knots (range from 1 knot to 199 knots maximum).
- the maximum speed of own ship in knots (range from 1 knot to 199 knots maximum).
- the maximum turn rate of own ship in degrees per minute, default 30 degrees per minute (range from 1 degree to 12000 degrees per minute).
- the nominal turn rate of own ship in degrees per minute, default 30 degrees per minute (range from 1 degree to 12000 degrees per minute).

To change the default values click in the field and enter the required value.

5.7.4 Custom Ownship Outline

A custom outline for ownship may be configured by entering line segments which are defined as x, y coordinates for the start and end point of each segment. These coordinates are measured in metres from the bow and centre line of the ship.

A validated line segment consists of an x and y value for the start point and an x and y value for the end point. An custom outline example is as follows:

0,0,10,10

10,10,10,100,

10,100,-10,100

-10,100,-10,10

-10,10,0,0

To enter the above values click in the Start Point X field and enter **0**, tab to the End Point X field and enter **0**, tab to the End Point Y field and enter **10**, and tab to the End Point Y field and enter **10**. Repeat for the other lines.

The resulting symbol is a ship outline as shown in Figure 1.20 The X axis is positive from the centre point toward the starboard side of the ship. The Y axis is positive from the bow towards the stern.

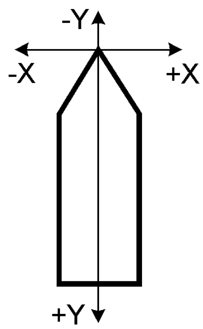


Figure 1.20 Custom Outline of Ownship

The maximum number of line segments for ownship's outline is 100.

A line segment string may be pasted from any text source into the **Add Many Segments** field.

A validation warning is given if the calculated dimension are more than one metre larger or smaller than the defined dimensions of the ship.

5.8 Basic Radar Configuration

The basic radar configuration page enables the following radar connections to be configured:

- The interswitch type used (if any) and the PCIO port the interswitch connects to.
- the channel connections for each node not connected to an interswitch, including Master/Slave status and top unit aliases.

If the system does not include an interswitch select **None** from the Step 1 drop down list and configure the node connections to the top units via the Channel Connections tab, see instructions and figure on page 36.

5.8.1 Interswitch

The Interswitch is a radar video/data matrix switch that allows multiple nodes to view and/or control multiple turning units.

The Interswitch is connected to serial ports on one or more PCIO units and interfaced to the Processor via a USB connection.

1. To select the type of Interswitch used on the system click on the Step 1 drop down arrow and select the model type (2-way or 6-way).
2. On the Interswitch Connections tab select the nodes that are connected to a PCIO. The number of nodes shown is dictated by the Interswitch model selected; a maximum of 4 nodes for a 2-way interswitch and 6 nodes for a 6-way interswitch. Figure 1.21 shows four nodes connected to a 2-way interswitch.

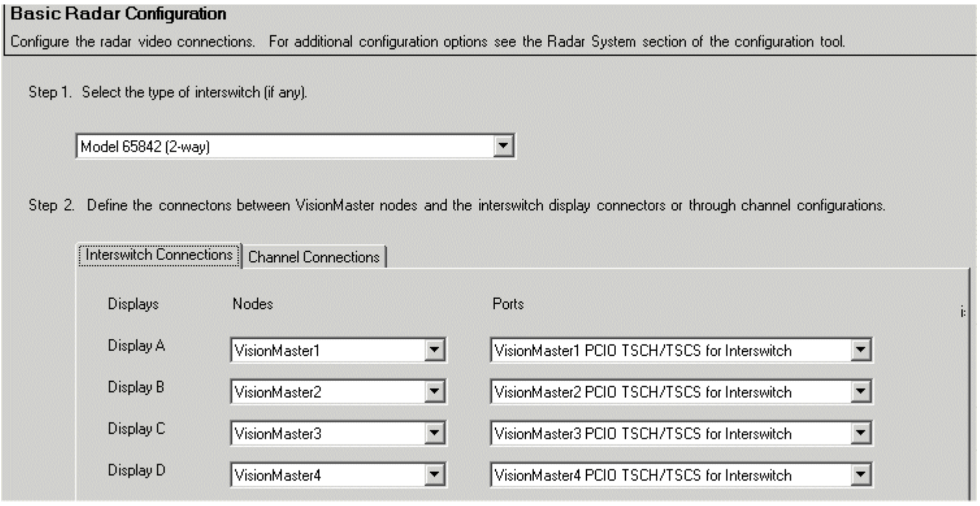


Figure 1.21 2-Way Interswitch Configuration Window

3. For each node select the PCIO port that the interswitch is connected to by clicking on the Ports drop down arrow and selecting from the list. The port should be one that has been previously configured to use Interswitch settings, see Section 7.9.2.2 *Selecting Pre-Defined IO Settings*' in the I/O Port Manager section.

The channel connections tab enables configuration of other nodes on the system that include a radar interface but are not connected to an interswitch*

1. Select the Master/Slave status of the node. For information on master and slave nodes refer to Section 8.8 *Radar System*'.
2. Select the Top Unit alias the nodes are connected to. The top unit aliases are listed alphabetically with the actual number of top units defined in Section 5.9 *Basic Top Unit Configuration*'.

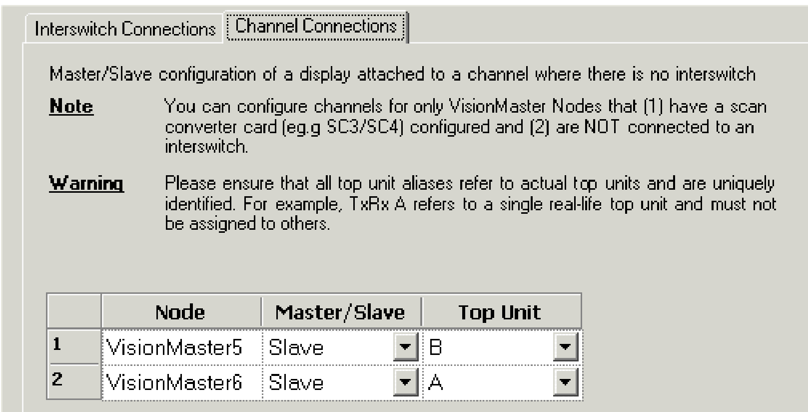


Figure 1.22 Basic Radar Configuration - Channel Connections

* The number of nodes shown in this tab is defined by the number of radar interfaces on the system (see Section 8.8.2 *Board Manager*'). For example, if there are six radar interfaces and four nodes connected to a 2-way interswitch then the Channel Connections tab will enable configuration of the remaining two nodes.

5.9 Basic Top Unit Configuration

The Top Units sub menu lists a maximum of six top units available for configuration. For a single radar the number of top units available is dependent on the Interswitch model selected. If the 2-way has been selected then units A to D are configurable; if the 6-way has been selected then units A to F are configurable. For a single dual radar without interswitch, tops units A and B are available.

To remove a top unit from a configuration untick the top unit’s check box, when a check box is unticked the **Configure** button for that top unit is removed, see Figure 1.23.

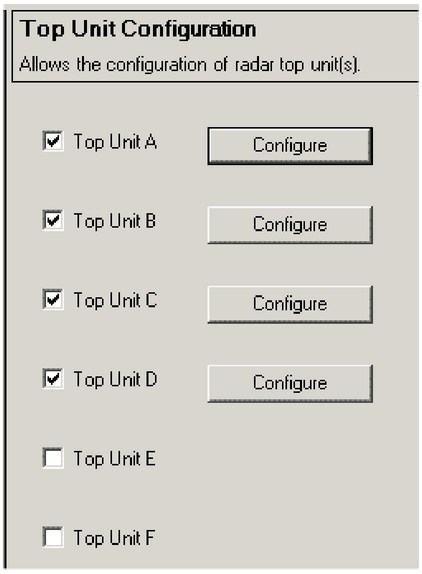


Figure 1.23 Top Unit Configuration

To change a top unit’s settings click the unit’s **Configure** button, a secondary window opens enabling settings for that top unit to be made from the following three tab folders:

- Transceiver
- Turning Unit
- Sector Blanking

5.9.1 Transceiver

The Transceiver fields display the following data and values:

- RF Feeder Length - enter the distance, in metres, from the transceiver to the turning unit.

Note: *Changing this setting from a default of 0 is only applicable if the transceiver location is a bulkhead. The maximum feeder length for a bulkhead transceiver is 99 metres.*

- Transceiver Location - select either Bulkhead or Aloft (masthead mounting).
- Transceiver Name - enables entry of an optional user name for the transceiver.
- Transceiver State - the slave only state of the transceiver (for interswitched systems only) select from **Standard** (default) and **Slave Only**.

To set a transceiver to Slave Only the Dil switches on the Interswitch need to be temporarily changed to accept global messages, this is done by setting the Dil switch from Local mode to Global mode (Link 1). The Dil switch should be set back to Local after the VMFT has tuned in and communicated with the Interswitch. The Interswitch will remember the setting.

For information on changing the settings of the Interswitch Dil switch refer to section 4.2.1 '*Dil Switches*' in Chapter 7 '*Interswitch Units*' in Volume 1 of the VMFT Ships Manual.

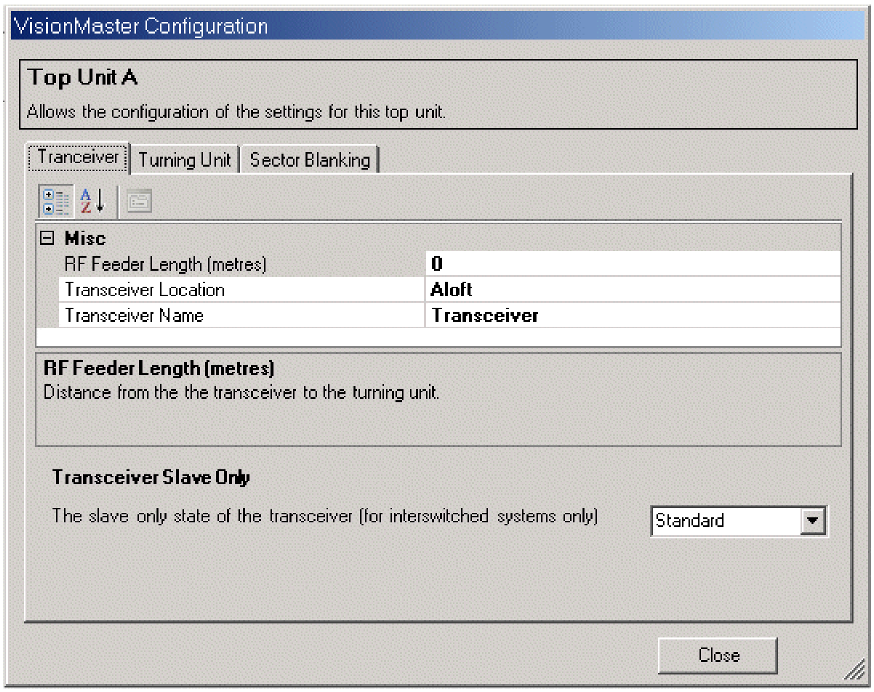


Figure 1.24 Top Unit - Transceiver

5.9.2 Turning Unit

The Turning Unit tab folder includes the selection of the beam width for the turning unit antenna and configuration of turning unit offsets.

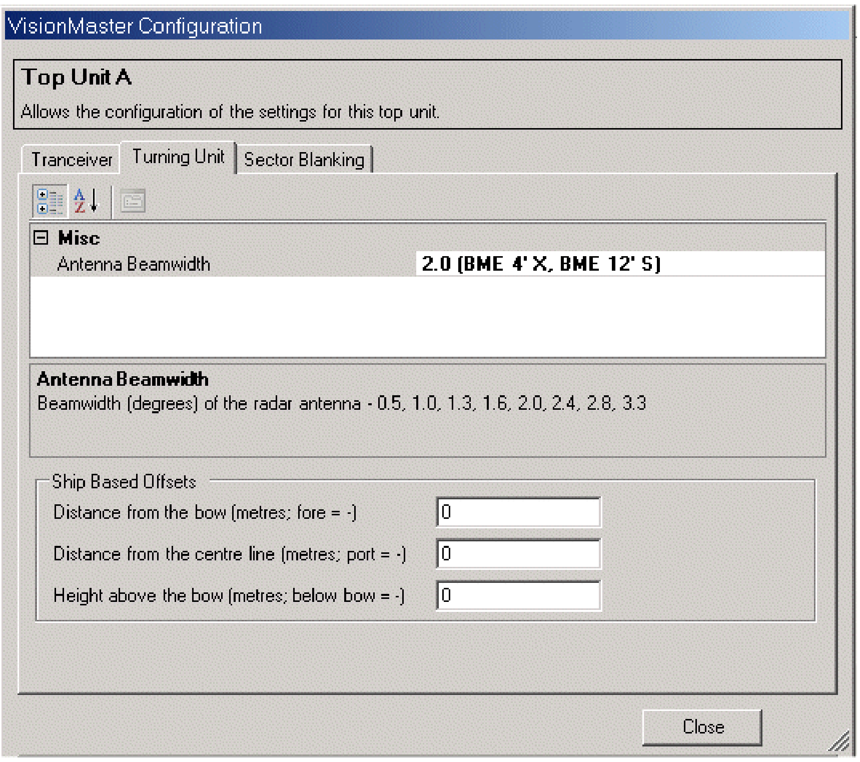


Figure 1.25 Top Unit - Turning Unit

The Antenna Beamwidth is the beamwidth, in degrees, of the radar antenna. The default value is **2.0**. To change, click on the drop down arrow and select the beamwidth currently installed on the system.

The Ship Based Turning Unit Offsets enable offsets relative to ship's bow to be configured. The maximum value for all position settings is +/- 999 metres:

- Distance from the bow (metres) - the position of the turning unit, measured from the bow towards the stern.
- Distance from the centre line (metres; port = -) - the position of the turning unit, measured from the centre line.
- Height above the bow (metres; below bow = -) - the vertical position of the turning unit, measured upward from the level of the bow.

On a dual radar, a different set of offsets may be applied to each turning unit.

5.9.3 Sector Blanking

The Sector Blanking window enables the configuration of two blanking sectors for the selected top unit. A transceiver will not transmit in any active blanked sector defined for it and the video in that sector is blanked.

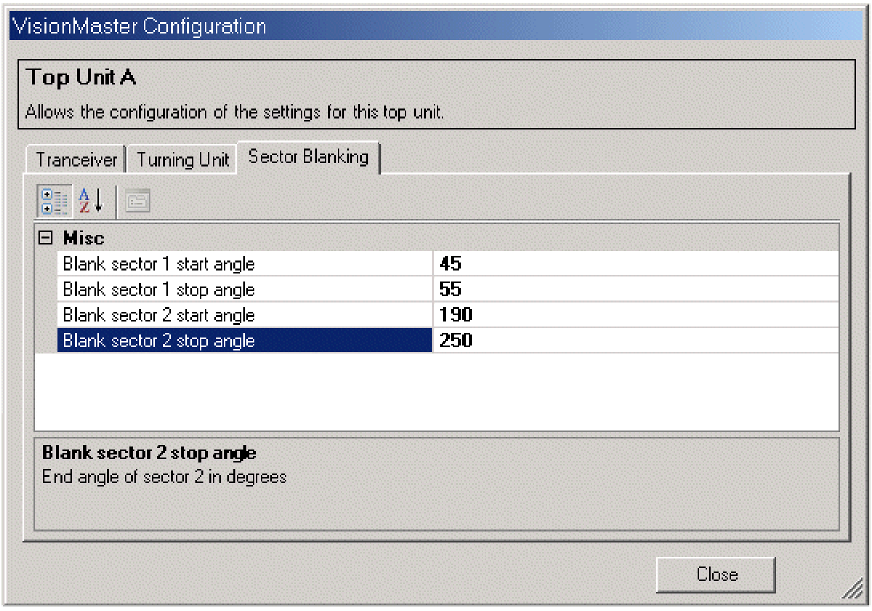


Figure 1.26 Top Unit - Sector Blanking

The sectors are set up so they do not overlap and do not blank more than 340 degrees of the radar picture. For example, blank sector 2 start angle cannot start before blank sector 1 stop angle finishes. If both the start and the stop angle are identical, the sector will not be active.

By system default, neither sector is active. The default start and stop angles are set at 0 degrees for blank sector 1 and 180 degrees for blank sector 2.

If a transceiver has blank sectors active, i.e. the start and end angles are not the same, an arc line is drawn at the relevant angles around the video circle bearing scale, indicating the arc that is being blanked. Figure 1.27 shows a graphic representation of blank sectors 1 and 2 with the angle values shown in Figure 1.26.

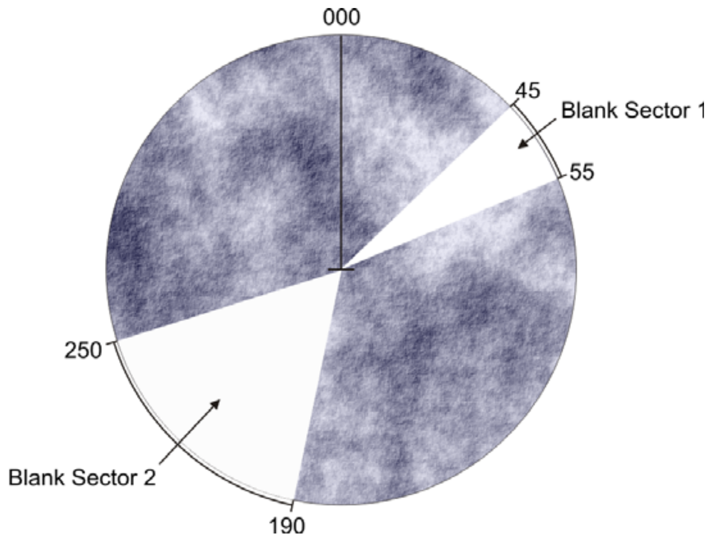


Figure 1.27 Blanking Sectors

Note: *Blanking sectors should not be placed in an arc that blocks the radar transmission to the horizon from 247.5 degrees to 112.5 degrees relative to own ship, or the right ahead direction (relative bearing 000 degrees).*

Sector Blanking for Dual Radar

On a dual radar configuration both top units may have different blanking sectors active. Sector blanking for Channel 1 top unit may have the same start and stop angles as Channel 2 top unit, or a different set of start/stop angles.

When sector blanking is active on dual radar and both top units have the same start and stop angles, a double arc line is drawn for each sector. The outer arc line defines the channel 2 blanking sector, and the inner line defines channel 1 blanking sector.

If the blanking sectors for Channel 1 and Channel 2 do not overlap the angles will be drawn relative to the radar channel's video origin, with the outer/inner arc line positions retained.

5.10 Offset Summary

The offset summary page enables distance units measured from own ship's CCRP to be entered. Distance units apply to three sensors (Gyro, GPS and Log) and turning units. The exact location of the CCRP can also be configured.

The offsets include distance from bow, distance from centre line and height above the bow.

If precise distances values for the three sensors types, CCRP and turning units are available, enter the position data in the relevant fields see Figure 1.28.

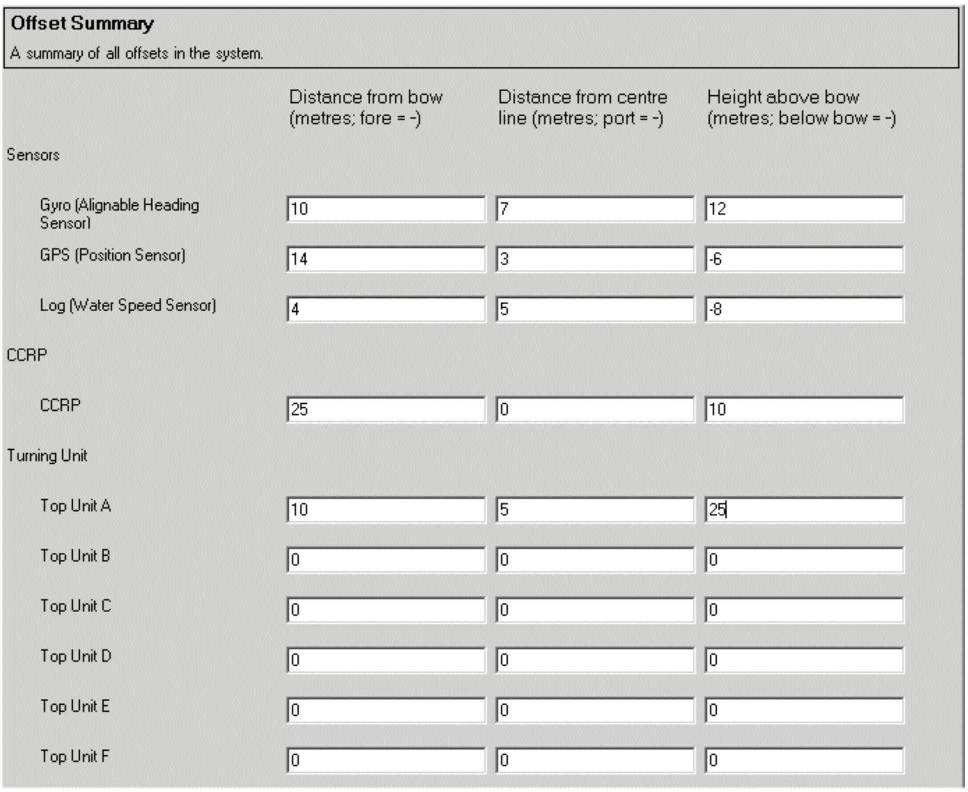


Figure 1.28 Offset Summary

5.11 AIS

The AIS window includes the following miscellaneous settings:

1. Enable AIS MKD Control - If enabled the operator can set various AIS Ownship features such as Draught, Destination, ETA, Vessel, Type of ship etc. The default setting is **No** (disabled). To enable the operator to set AIS ownship features click the drop down arrow and select **Yes**.
2. MMSI - Enter the 9 digit MMSI number which is taken from the AIS transceiver. If an MMSI number is not entered a warning is generated on the AIS topic.
3. MMSI Group Site - This setting is set to No (disabled) for ships. For group sites (such as ship groups or coastal stations) where the MMSI starts at 0 enable the setting by selecting **Yes**.
4. The system defaults to displaying AIS targets irrespective of the datum used for positioning. To remove AIS targets from the display when the position data is not WGS84 click on the drop down arrow and select **Yes**.
5. The amount of seconds before the system starts calculating an AIS target position by dead reckoning if no position information is received from the AIS. The default is 5 seconds. Values above 60 will cause the timestamp not to be taken under consideration.

A primary and secondary network port may be selected. Note that these ports will only require configuration if network ports are available.

The AIS window displays all the nodes on the system with the option of selecting the availability of AIS for specific nodes and a communications port from a list of PCIO ports, see Section 7.9.2 *Configuring a PCIO Serial Port*'.

Select the I/O port for each node that requires AIS by clicking on the Communications Port drop down arrow and selecting from list. For nodes that do not require AIS (for example, a dedicated CID node) select **No** from the **Available** column.

Note: *On the VisionMaster system the serial port for AIS communications must have a baud rate of 38400 (usually COM 5), see Table 1 on page 71 for details.*

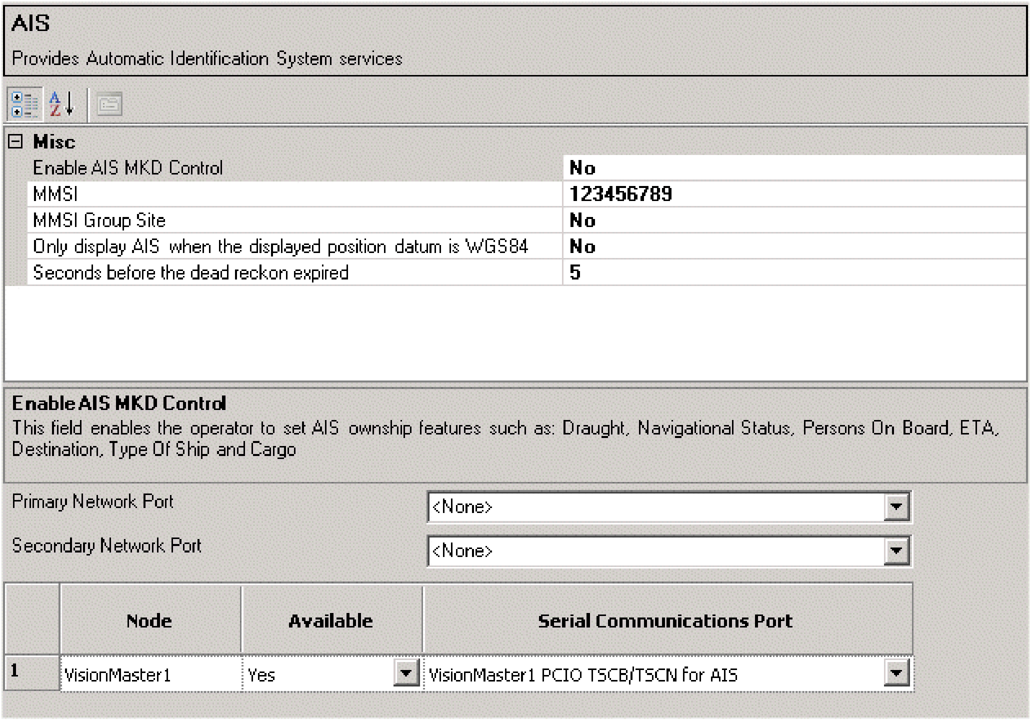
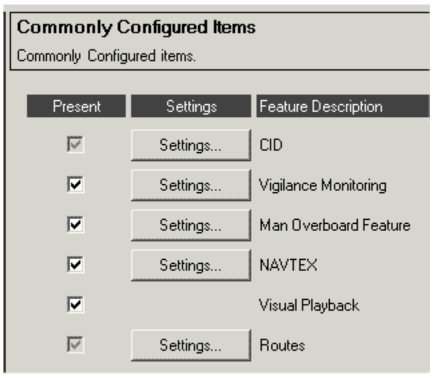


Figure 1.29 AIS Communications

5.12 Commonly Configured Items

The commonly configured items window allows the following features to be selected and configured (if required):

- CID
- Vigilance Monitoring
- Man Overboard
- NAVTEX
- Visual Playback
- Routes



To select a feature tick the feature's check box in the **Present** column. When a feature is selected a **Settings..** button for that feature appears. This applies to all features with the exception of Visual Playback, which does not require any configuration settings to be made.

If a feature is selected that requires configuration the **Settings..** button is displayed with a red background.

Opening the configuration window for that feature will also display **Validation Errors** in a red box, next to the **Close** button.

The following sub sections describe the configuration of common items listed.

5.12.1 CID

The CID (Conning Information Display) topic enables the selection of the default opening CID page for each node to be made.

The CID page is also available from the User Interface menu, see Section 8.6 *User Interface*'.

Figure 1.30 below shows the selection of default CID pages for a multi-node system.

If you have configured a second dedicated monitor to run CID pages select **Yes** from the **Select Secondary Monitor CID Pages** drop down arrow. For details, see Chapter 3 '*Appendix A Configuring a Second Monitor*'.

Note that if certain nodes are widescreen and the monitor has been configured as such (i.e. a monitor with a width/height of 1920x1200 or greater has been selected, see Section 5.5 *Monitors*'), then the option to select a default Side Page is also available.

The layout and mix of readouts for each CID page may be customised for a specific ship. Customisation is made via the CID Designer application, which is accessed by clicking on the **Launch Xml Designer** button.

For a description of how to configure CID pages using the CID Designer, see *Chapter 3 'Configuring a Conning Information Display*'.

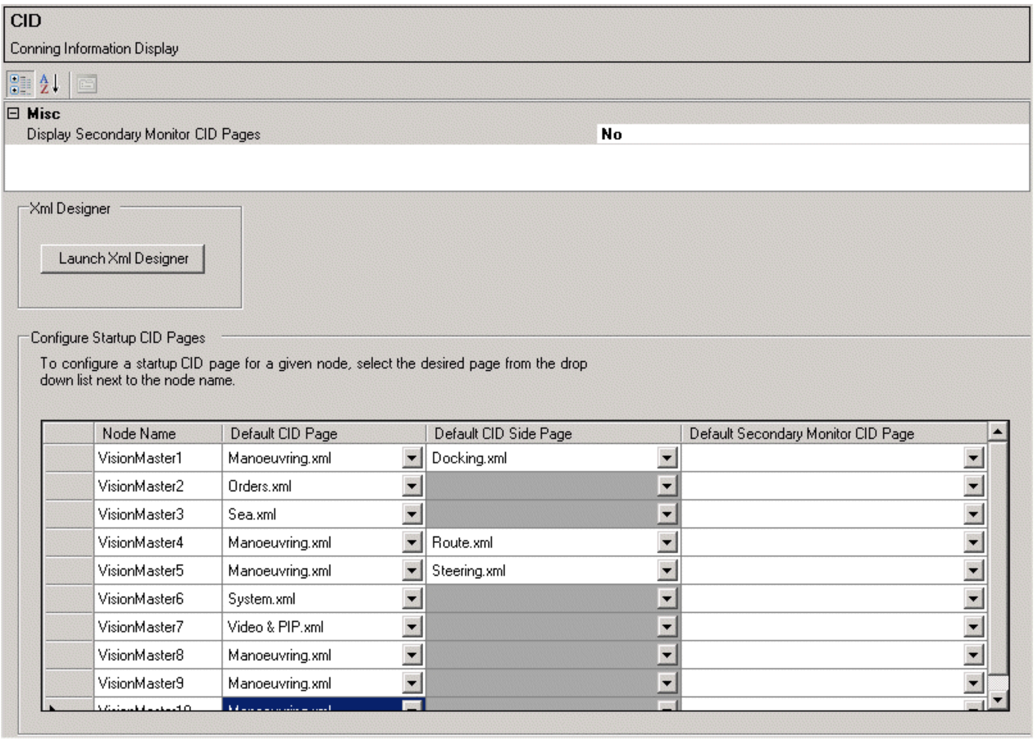


Figure 1.30 CID

5.12.2 Vigilance Monitoring

The Vigilance Monitoring topic enables the system to monitor operator activity or response by monitoring the use of the control panel.

For Vigilance Monitoring to operate the system must be connected to an external watch alarm generator. The watch alarm generator will be set to a 3, 6, 9, or 12 minute time interval. A reset line resets the timer on the generator when any contact closure is received.

Vigilance monitoring comes in three variants: level 1, level 2, and level 3.

Level 1 issues Vigilance Relay Pulses every minute as long as there is operator activity on any node configured to monitor activity. If there has been no operator activity after a full minute from the last pulse then level 1 stops pulsing the vigilance relay.

Note: *If there is activity after a pulse, another pulse will be produced. This can extend the time at which the watch alarm system initiates its alarm may be up to 1 full minute later.*

Level 2 will generate an alarm within VisionMaster prior to refraining from issuing Vigilance Relay Pulses, giving the operator some advanced notification prior to the backup navigated alarm sounding.

In addition to monitoring operator activity, level 3 also asks the operator multiple choice questions to determine whether the operator is alert and active.

5.12.2.1 Vigilance Monitoring Configuration

To configure the Vigilance Monitor:

1. Select the Discrete Output to be used by the Vigilance Monitor for vigilance relay pulses by clicking on the drop down arrow and selecting from the list of previously configured discrete outputs, see Section 7.1 *PCIO Board Manager*'.

Note: *For a group of nodes communicating via a network, at least one node configured with the vigilance monitoring may be connected to a single reset line. Operator activity on a node that is not directly connected to the reset line can still result in a Vigilance Relay Pulse indirectly through the connected node.*

2. To configure the output click on the **Configure** button. The configuration window for the relay output appears.

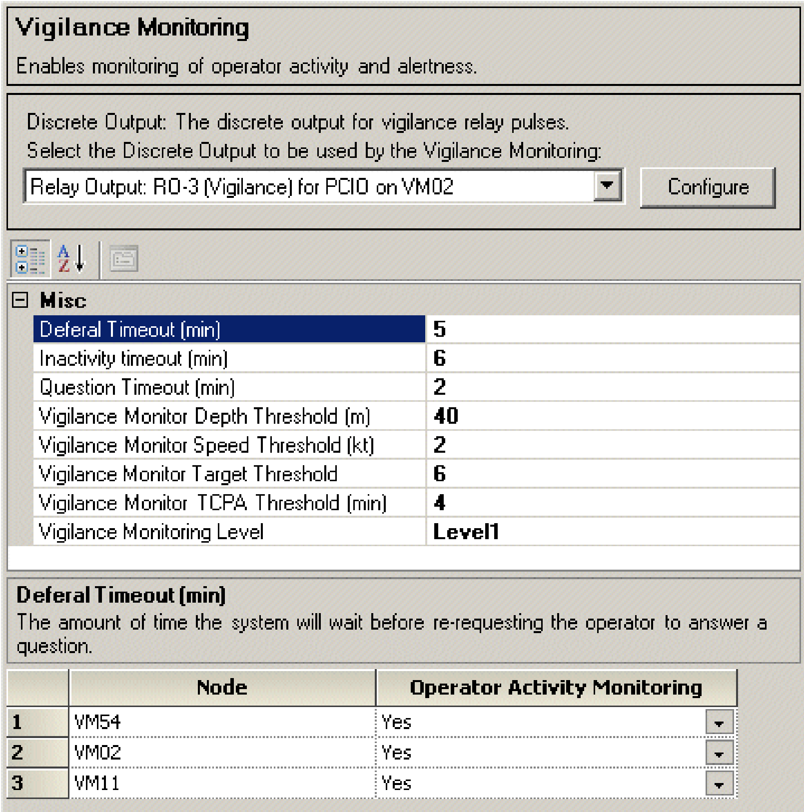


Figure 1.31 Vigilance Monitoring

The window shows the following miscellaneous parameters.

- **Deferral Timeout -** the amount of time the system will wait before re-requesting the operator to answer a question after a question has been deferred. The default time is 5 minutes.
- **Inactivity Timeout -** the amount of time (default 6 minutes) when there is no operator activity to:
  - Level 2: activating the vigilance alarm;
  - Level 3: asking the first vigilance question.

Note: *Level 1 vigilance monitoring will not use the inactivity timeout as used on Level 2.*

- **Question Timeout -** the amount of time the operator has to answer a question before a vigilance alarm is raised. The default time is 2 minutes.
- **Vigilance Monitor Depth Threshold (m) -** when own ship depth is less than this value (default of 40 metres) the system refrains from asking vigilance questions. Applies to Level 3 only.
- **Vigilance Monitor Speed Threshold (kt) -** when own ship depth is less than this value (default of 2 knots) the system refrains from asking vigilance questions or activating the vigilance alarm.

- **Vigilance Monitor Target Threshold -** when the number of processed targets (AIS or tracked) is greater than this value (default of 6) the system refrains from asking vigilance questions. Applies to Level 3 only.
- **Vigilance Monitor TCPA Threshold (min) -** when one or more targets have a TCPA less than this value (default of 4) the system refrains from asking vigilance questions. Applies to Level 3 only.
- **Vigilance Monitoring Level -** click in the field and click on drop down arrow to select from level 1, level 2 and level 3.

The lower part of the window displays all the system nodes, with Operator Activity Monitoring defaulting to **Yes** on each node. To disable monitoring activity on a node click on the node's drop down button and select **No**.

5.12.3 Man Overboard

The Man Overboard (MOB) feature enables selection of a MOB discrete input and configuration of the relay state indicating the Man Overboard condition.

Note: *It is recommended that an external device such as a Labjack or Opto 22 is used as the discrete input for the MOB. See Section 7.5 Labjack Manager' or Section 7.11 Joystick Manager'.*

1. From the Man Overboard Feature window click on the drop down arrow in Step 1 and select the Discrete Input (if any) used to indicate a Man Overboard condition from the drop down list.
2. By default an energized relay is interpreted as a Man Overboard active event. To change the activate mode to Relay De-energized, click on the drop down arrow in Step 2 and select the option from the list.

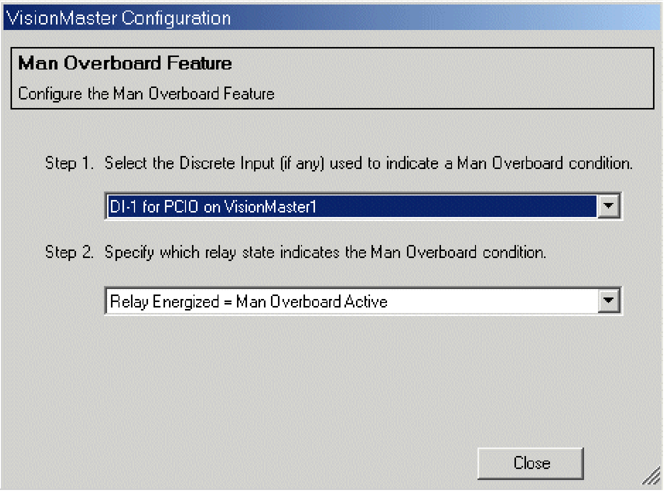


Figure 1.32 Man Overboard

5.12.4 NAVTEX

NAVTEX transmitting stations are used to routinely broadcast urgent coastal marine safety information to ships with a NAVTEX receiver. VisionMaster is able to access this information from the receiver by using a client/server application called PC NAVTEX.

Information on installing the PC NAVTEX software for Server and Clients is given in Chapter 1 '*Appendix C Configuring Peripheral Devices*'.

The NAVTEX configuration window enables the NAVTEX Server node to be selected, miscellaneous features to be configured and NAVTEX client paths to be selected for participating nodes.

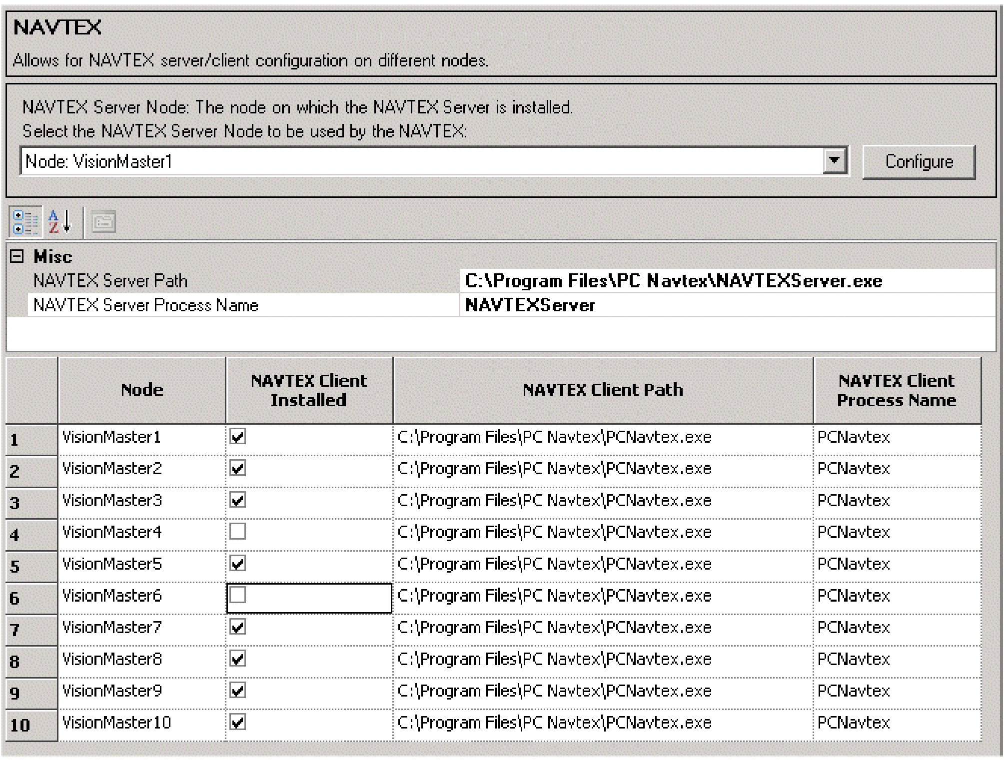


Figure 1.33 NAVTEX - not configured

1. Select the node to be used as the NAVTEX Server by clicking the drop down arrow and selecting from the list. Only one node is configured as a Server in a multi-node system.
2. The NAVTEX Server Path and NAVTEX Server Process Name have pre-defined paths and names. These names should not be changed.
3. The client application defaults to installed on all nodes. To delete the client application on specific nodes untick the NAVTEX Client Installed check boxes.

Note: *Do NOT deselect the node that hosts the NAVTEX server. That node will run both the NAVTEX Client and Server.*

5.12.5 Routes

The Routes configuration page enables the following miscellaneous route values to be changed:

- Off Track Limit - defaults to 100 metres (maximum 9999 metres)
- Route Speed - defaults to 10 knots (maximum 99 knots)
- Turn Radius - defaults to 1 NM (maximum 10 NM).

To change the miscellaneous default values click in the respective field and enter the required value.

For all other route configuration options refer to Section 8.10.5 *Routes*'.

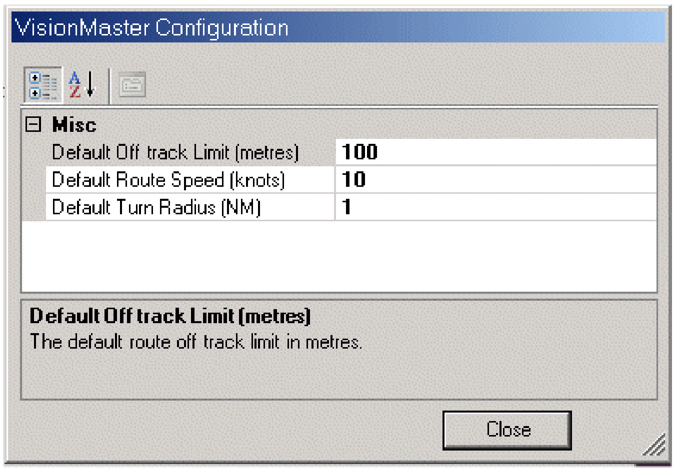


Figure 1.34 Route Miscellaneous Settings

6 General Info

The General Info menu includes as default a Revision History topic, which enables details of revisions made to the opened configuration file to be viewed.

From the General Info window a Note topic may also be added.

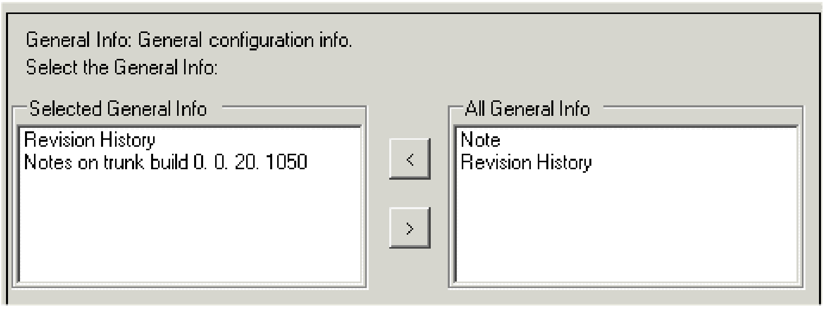


Figure 1.35 General Info

6.1 Revision History

Every time a configuration file is changed and saved the system logs the revision. A list of all the revisions relevant to the opened configuration appear in the Revisions column.

The read-only revision list includes date and time, configuration file name, operator's user name and the software version reference.

Below the revision list, details of a particular revision may be entered in the Notes column.

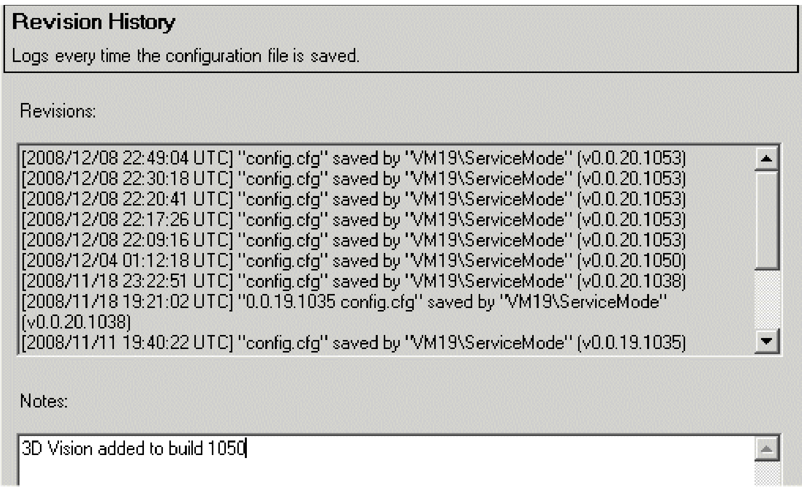
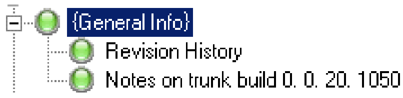


Figure 1.36 Revision History

6.2 Notes

To include a note topic, highlight **Note** in All General Info column and move to the **Selected General Info** column.

The Note topic may be used by the operator to make general notes on the configuration. When a name is entered in the **Title:** field the name is retained and displayed on the navigation tree.



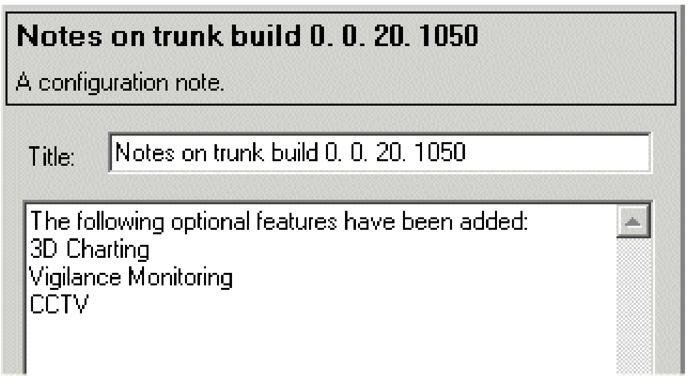
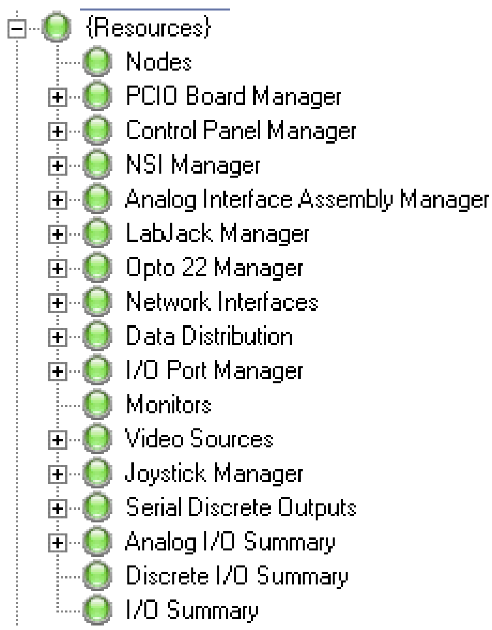


Figure 1.37 Notes

7 Resources



The Resources menu allows the configuration of general-purpose components in the system that are not necessarily associated with any specific feature. These are typically hardware components that may have different uses on different systems. For example, an I/O port is a resource which may be used to support any number of different functions (sensor data acquisition, track table output, etc.) or nodes, if the configuration is for a multi-node system.

The Resources menu includes the following default sub-menu functions:

- Nodes - configures the system node by specifying a identity name, a network host name and product type of the node. The Nodes function is replicated in the Quick Setup section of the configuration and is described in Section 5.3 *Nodes*’.
- PCIO Board Manager - configures the PCIO boards that are connected to the system, see Section 7.1 *PCIO Board Manager*’.
- Control Panel Manager - enables control panels that are connected to nodes on the system to be configured, see Section 7.2 *Control Panel Manager*’
- NSI Manager - enables Network Serial Interface devices to be configured. NSI devices allow NMEA 0183 serial data messages from a serial device to be transmitted over the Local Area Network (LAN), see Section 7.3 *NSI Manager*’.
- Analog Interface Assembly Manager - enables analog interface assemblies such as track control or propulsion control boxes connected to the system to be configured, see Section 7.4 *Analog Interface Assembly Manager*’
- Labjack Manager - For information on configuring a Labjack, see Section 7.5 *Labjack Manager*’.
- Opto 22 Manager - For information on configuring an Opto 22 serial port, see Section 7.6 *Opto 22 Manager*’.
- Network Interfaces - Enables configuration of any network interfaces into the system, see Section 7.7 *Network Interfaces*’.
- Data Distribution - manages connection status between system nodes, including selecting nodes on a multi-node system to operate in Safe Mode, see Section 7.8 *Data Distribution*’.
- I/O Port Manager - configures all the input and output ports on the system, see Section 7.9 *I/O Port Manager*’.

- Monitors - configures all the monitors of a system and their communications ports. The Monitors function is replicated in the Quick Setup section of the configuration and is described in Section 5.5 *Monitors*'.
- Video Sources - enables a video source for CCTV to be configured. The video source may be either generated over a network connection, or connected directly to the monitor, see Section 7.10 *Video Sources*'.
- Joystick Manager - For information on configuring a Joystick device, see Section 7.11 *Joystick Manager*'.
- Serial Discrete Outputs - enables configured serial ports to be used as discrete ports, see Section 7.12 *Serial Discrete Outputs*'.
- Analog I/O Summary - For information on the Analog I/O Summary, see Section 7.13 *Analog I/O Summary*'.
- Discrete I/O Summary - provides an overview of discrete I/O outputs and inputs provided by various components configured into the system (e.g. PCIO boards), and of the functions and nodes in the system that use these, see Section 7.14 *Discrete I/O Summary*'.
- I/O Summary - provides an overview of all I/O channels that are configured in the system, see Section 7.15 *I/O Summary*'.

7.1 PCIO Board Manager

The PCIO Board Manager enables PCIO boards, connected to the system, to be configured.

The I/O Board Manager content area includes a left and right hand window (Selected PCIO Boards and All PCIO Boards), see Figure 1.38 below.

The Selected I/O PCIO Boards window lists the PCIO boards that the user has configured in the system. A standalone system will include one board only; for a multi-node system each PCIO board in the system must be configured.

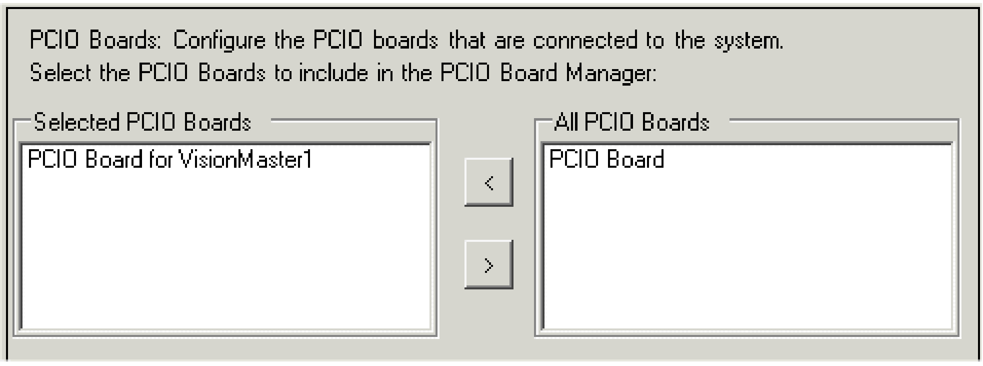


Figure 1.38 PCIO Board Manager

To configure a PCIO board, highlight **PCIO Board** in the **All PCIO Boards** window and click the **<** button. An unconfigured PCIO board is moved into the **Selected PCIO Boards** window and the system adds an unconfigured topic for the board in the navigation tree with a list of discrete outputs and inputs, duplicated from the previously configured PCIO board, with their possible identity and usage. The name of the discrete output may be changed from its default, refer to Section 8.7.1 *Buzzer Configuration*' for details.

A list of serial ports are also created for the board in the I/O Port Manager, see Section 7.9 *I/O Port Manager*'.

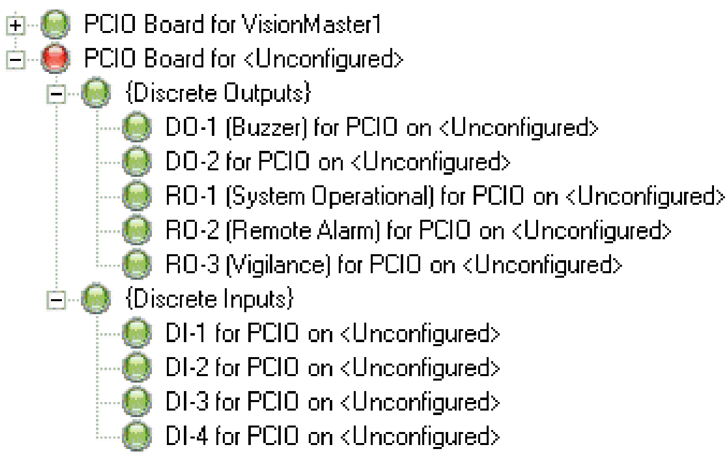


Figure 1.39 Unconfigured PCIO Board - navigation tree

7.1.1 PCIO Board for Node

To view details of the PCIO board click on the **PCIO Board for VisionMaster1** (where ‘VisionMaster1’ is the display name in the Nodes window).

The subsequent window allows the following settings for the PCIO board to be configured:

- Node
- Serial Port
- PCIO Sensor Interface
- Transmission Retries

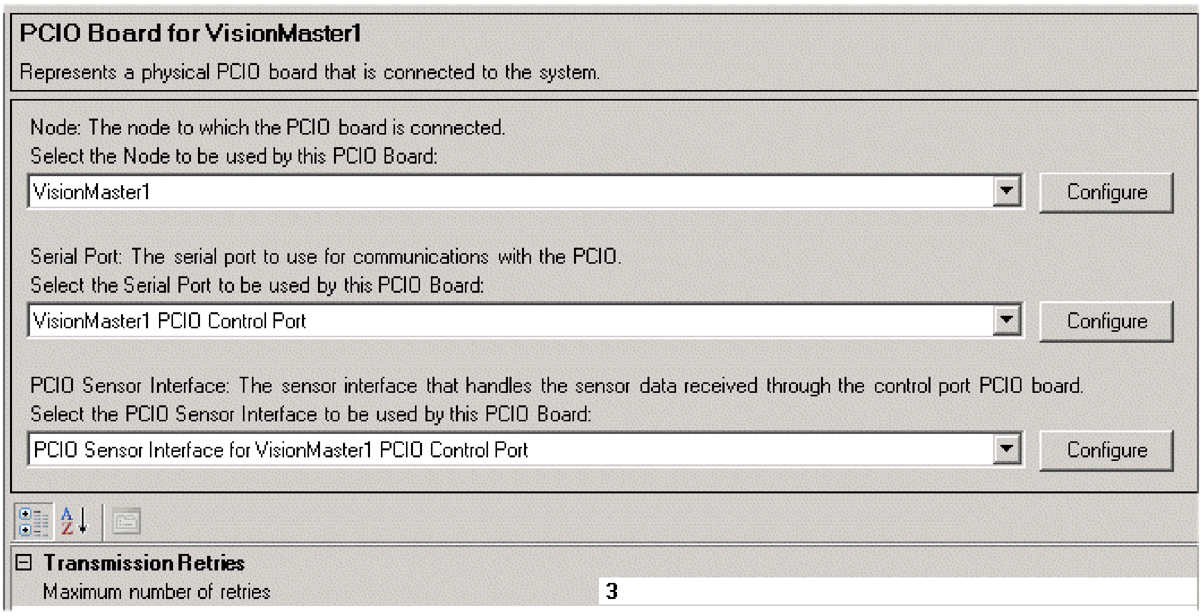


Figure 1.40 PCIO Board for Configured Node

7.1.1.1 Node

The Node field shows the name of the node to which the PCIO board is connected. If the system is a standalone this will be the only node selectable; if the system is multi-node then all other configured nodes will be available for selection by clicking on the Node drop down arrow to the right of the field and selecting the required node from the list.

To configure the selected node click on the **Configure** button, the Nodes window appears, see Section 5.3 *Nodes*’.

Note that when the node that the PCIO board is connected to is selected a series of I/O Ports, including the PCIO Control Port, are automatically generated for the PCIO board in the {I/O Ports} list, see Section 7.9 *I/O Port Manager*’.

7.1.1.2 Serial Port

The Serial Port serves as the control port for the PCIO board. If the PCIO Board is unconfigured the system will automatically assign a Serial Control Port to be configured.

To configure the serial port click on the **Configure** button, the PCIO Serial Control Port window appears, see Section 7.9.3 *PCIO Control Port*'.

7.1.1.3 PCIO Sensor Interface

The PCIO Sensor Interface field enables a link to the sensor interface that handles the sensor data received from the control port PCIO board.

To configure the sensor interface data click on the **Configure** button, the Sensor Interface for the PCIO Control Port window appears, see Section 8.4.1.2 *Interfaces for Acquisition*'.

7.1.1.4 Transmission Retries

The transmission retries specifies the maximum number of times a message will continue to be sent to the PCIO if no acknowledgment is received. The default is **3**.

To change the default click in the Maximum number of retries field and enter the required number. There are no minimum or maximum values for Transmission retries.

7.2 Control Panel Manager

The Control Panel Manager allows control panel variants for each system node and brilliance adjustments to be configured.

If the control panel does not include an optional I/O board a dedicated serial control port must first be configured from the I/O Port Manager. For details, refer to Section 7.9.4 *Control Panel Serial Control Port*'.

On a multi-node system the default setting in the Control Panel Manager is for all nodes to be connected to a basic control panel. To remove the nodes that are not connected to control panels select the node from the Selected Control Panels list and click the **>** button. The window and navigation tree should display only the VM nodes connected to control panels, see Figure 1.41.

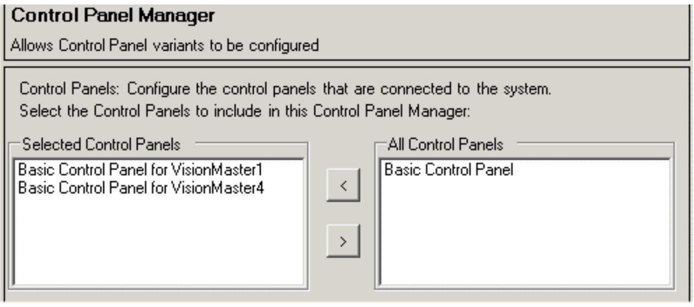


Figure 1.41 Control Panel Manager

To change the default settings for a control panel open the **Basic Control Panel for VisionMaster #** in the navigation tree, see Figure 1.42.

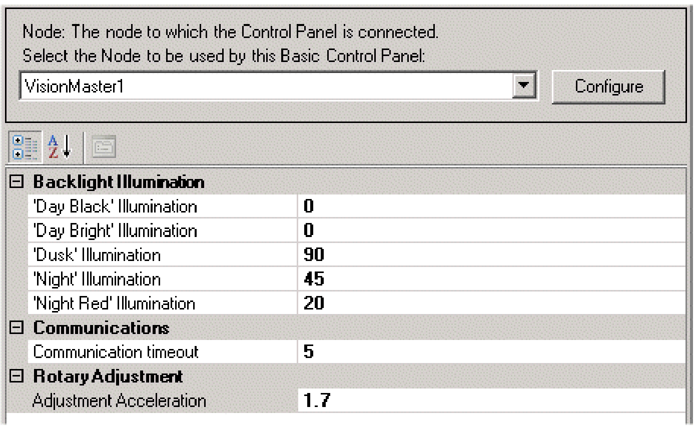


Figure 1.42 Basic Control Panel Configuration

The following configuration settings can be made from the Basic Control Panel configuration window:

1. Node selection - the node to which the control panel is connected.
2. Backlight Illumination - enables illumination settings of the control panel's backlight to be increased or decreased from their defaults. Any adjustments are made relative to the current Day/Night mode and are maintained as the brilliance mode is changed.

3. Communications Timeout - the timeout, in seconds, after which the watchdog declares a communication failure if status messages are not received. The default timeout is five seconds. Valid values are any number equal or greater than 2 seconds.
4. Rotary Adjustment - When manual anti-clutter mode is used rotary control adjusts the anti-clutter sea setting. Larger values cause bigger adjustment as the control is rotated faster. The default value is 1.7. Valid values are equal or greater than 1.1.

7.2.1 Configuring a Control Panel I/O Board

A control panel may include an optional I/O board. The I/O Board is intended to support systems that are not deployed with a PCIO board by providing a limited number of ports. This includes one discrete output for the buzzer, one relay output, and one RS422 serial port capable of up to 38400 baud rate.

The navigation tree assigns an {I/O Board} sub menu to each control panel. To configure a new I/O board for the control panel right click on the sub menu and select I/O board from the flyout.

The navigation tree generates the following sub menu items, see Figure 1.43.

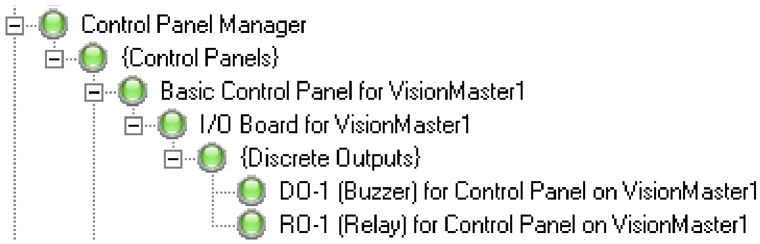


Figure 1.43 Control Panel Navigation Tree

Note that when an I/O board is added to a control panel the system automatically generates a serial port for the control panel in the {I/O Ports} list, see Section 7.9 *I/O Port Manager*'.

The **I/O Board for VisionMaster#** window enables the I/O board relay output to be used to indicate the 'System Operational' status of the node. When set to **Yes** (default) the relay is activated in the event of watchdog failure, or when the node is not running VisionMaster. If the I/O relay is set to **No** it can be used for other purposes, such as announcement outputs.

The discrete output is used to control the buzzer, the settings assigned to this window should not be changed.

If the relay output is to be used for a particular purpose, such as announcement outputs, then a suitable name should be assigned, otherwise the settings assigned to this window should not be changed.

The serial port may be used for LCD monitor communication in order to control the backlight. It is a pass through port that has no interaction with the control panel I/O board.

7.3 NSI Manager

An NSI device includes on the front panel, configuration switches, a reset switch and an Ethernet port. The rear of the device includes five ports for serial data and power connection.

An NSI device will have a default IP address of 192.168.x.yz, with x, y and z being defined by the three configuration switches.

The settings made at the configuration switches determine the mode of operation; Simple or Extended mode. For Simple mode the configuration switch settings are in the range 100 to 999, with the configuration embodied in the device's firmware. In Extended mode the configuration switch settings are in the range 1 to 99. For example, switch 1 is set to 0, with switch 2 and 3 set to '9', giving an IP address of 192.168.0.99.

To access the web pages for NSI devices in order to check the device's status and settings, and for all other information on installing and using an NSI device refer to Chapter 5 '*NSI Service Manual*'.

7.3.1 Configuring an NSI Device

1. Click on the NSI Manager topic and select **NSI** from All NSI Devices column. An NSI device with a default ID of 001 is created and I/O ports 1 to 5 are automatically added to the I/O Port Manager list.
2. To change the configuration settings of the NSI open the NSI 001 on LAN 1 topic.
3. The LAN number defines the IP address of the device. Click on the **Configure** button to the right of the field to open the Network Interface LAN topic, see Section 7.7.1 *LAN Configuration*'.
4. Enter the IP address of the NSI device (for example 192.168.0.99), the last three digits of the IP address being the settings made at the configuration switches. The IP address entered is displayed in the title of the LAN topic and appears in the LAN Number of the NSI configuration window.
5. Enter the ID of the device in the NSI ID field. This is also the three digit configuration code selected at the configuration switches. The ID number entered becomes part of the NSI topic title, see Figure 1.44.

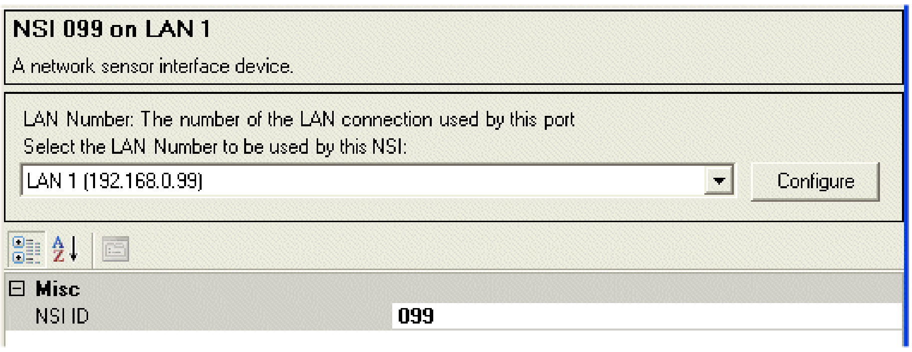


Figure 1.44 NSI Device Configuration Window

7.3.2 Configuring NSI Serial Data Ports

1. Click on the {I/O Ports} sub menu in I/O Port Manager to display the list of I/O ports, including the five serial ports automatically added when an NSI device has been configured, see Figure 1.45.

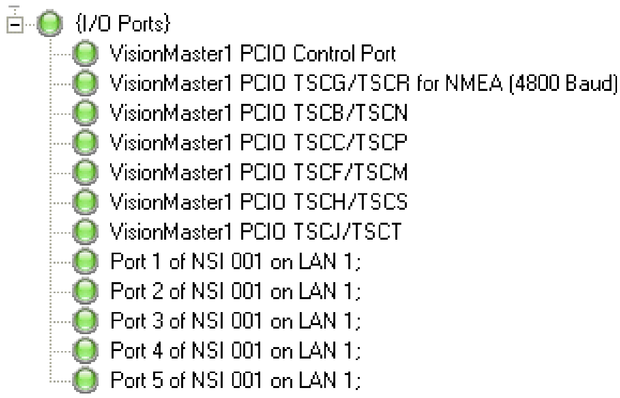


Figure 1.45 I/O Ports List with NSI Ports added

2. Click on an NSI port topic in the navigation tree to open the configuration window for that NSI UDP port.

The LAN number at the top of the window displays the IP address of the NSI, as entered in the Network Interfaces window, Figure 1.54.

The following settings are available for configuration:

1. **General**
   - Port Usage Description - enables a brief summary of the port usage to be entered. This field is initially blank.
2. **Input**
   - Input Enabled? - Defaults to **Yes**. If No is selected then the port can only be used for output.
   - Group Address - The multicast group IP address over which the data will be received. The default group IP address for Input and Output is 225.0.0.0.

- UDP Port Number - The port number over which the data will be received. This is a five digit number with the last number representing the UDP serial port.

3. **Output**

- Output Enabled? - Defaults to **Yes**. If No is selected then the port can only be used for input.
- Group Address - The multicast group IP address over which the data will be sent.
- Maximum Output Rate - This is the maximum rate at which data will be written, the default rate is 38400 Baud. This value MUST be set to the same the baud rate that the NSI device is using, as defined in the Serial Settings web page of the device (Extended mode only). To change the baud rate click on the drop down arrow and select from the options (4800 Baud being the lowest, up to Unlimited).
- UDP Port Number - The port number over which data will be sent to.

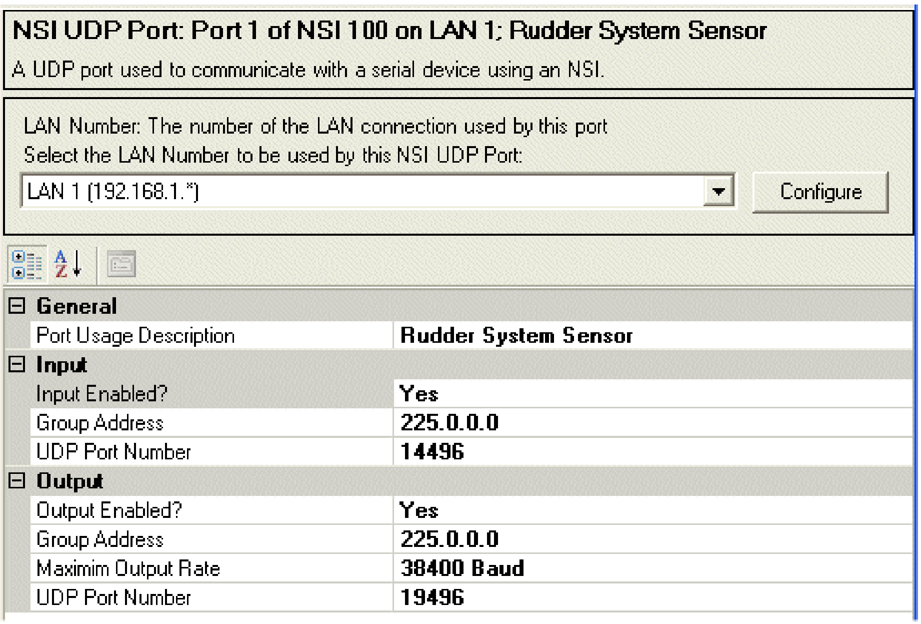


Figure 1.46 NSI UDP Port Configuration Window

7.4 Analog Interface Assembly Manager

One or more analog interface assembly boxes, usually for use with propulsion control or track control systems, may be configured.

To select a analog interface click on **Analog interface Assembly Manager**, select **Analog Interface Assembly Box** from the **All..** list and click the **<** button to move to the **Selected..** list. The navigation tree creates an unconfigured **Analog Interface Assembly Box Labjack1** topic. A similar unconfigured Analog Interface Assembly Box topic is also created in the Labjack Manager sub menu, see Section 7.5 *Labjack Manager*'.

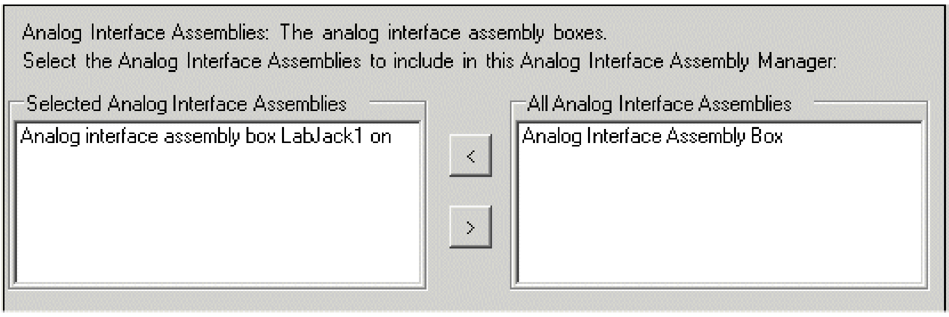


Figure 1.47 Analog Interface Assembly Manager

7.4.1 Configuring an Analog Interface Assembly Box

1. Click on the **Analog Interface Assembly Box Labjack1** topic to open the configuration window.
2. From the Box Type drop down list select the type of system the analog box interface to, see Figure 1.48. This may be a propulsion system such as a Kamewa or Emri, a track control assembly, or a custom assembly.

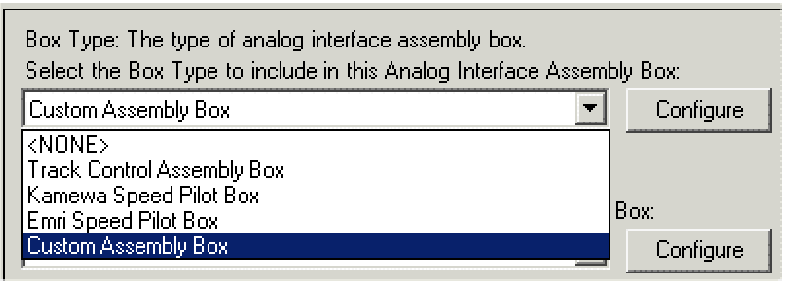


Figure 1.48 Analog Interface Assembly - Select Box Type

3. Select the node that the interface box is connected to. When a node has been selected the topics in the Analog Interface Assembly Manager and Labjack Manager are both displayed as configured.
4. The Labjack ID number defaults to 1. For information on selecting the correct Labjack number refer to Section 7.5.1 *Configuring a Labjack Device*'.

7.5 Labjack Manager

Labjack devices for analog and digital input and output data may be interfaced to the VisionMaster system.

The Labjack Manager window lists all the labjack devices that are connected to the system in the **All Labjack U12 Devices** column this may include analog interfaces previously configured in Section 7.4 *Analog Interface Assembly Manager*’, see Figure 1.49 below.

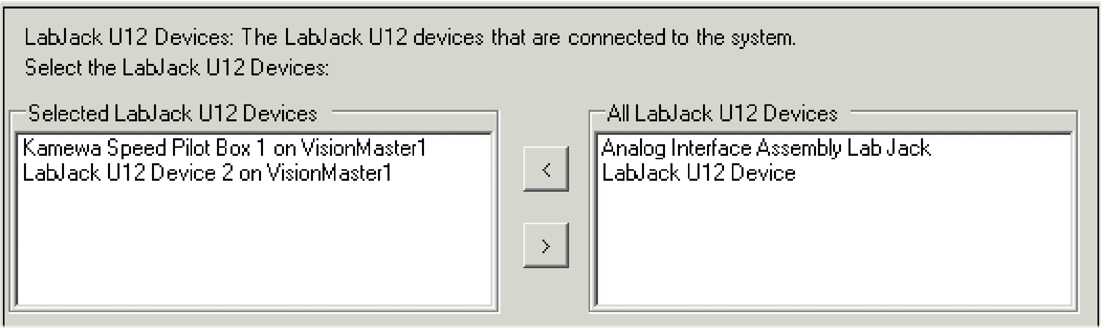


Figure 1.49 Labjack Manager

Select the device to include in the Labjack Manager and click on the **<** button. The selected device is moved to the **Selected Labjack U12 Devices** column and a configuration topic for the selected device appears.

7.5.1 Configuring a Labjack Device

The Labjack configuration window (see Figure 1.50 below) enables you to configure the selected labjack device. The same configuration settings apply for a Labjack U12 device or an analog interface box.

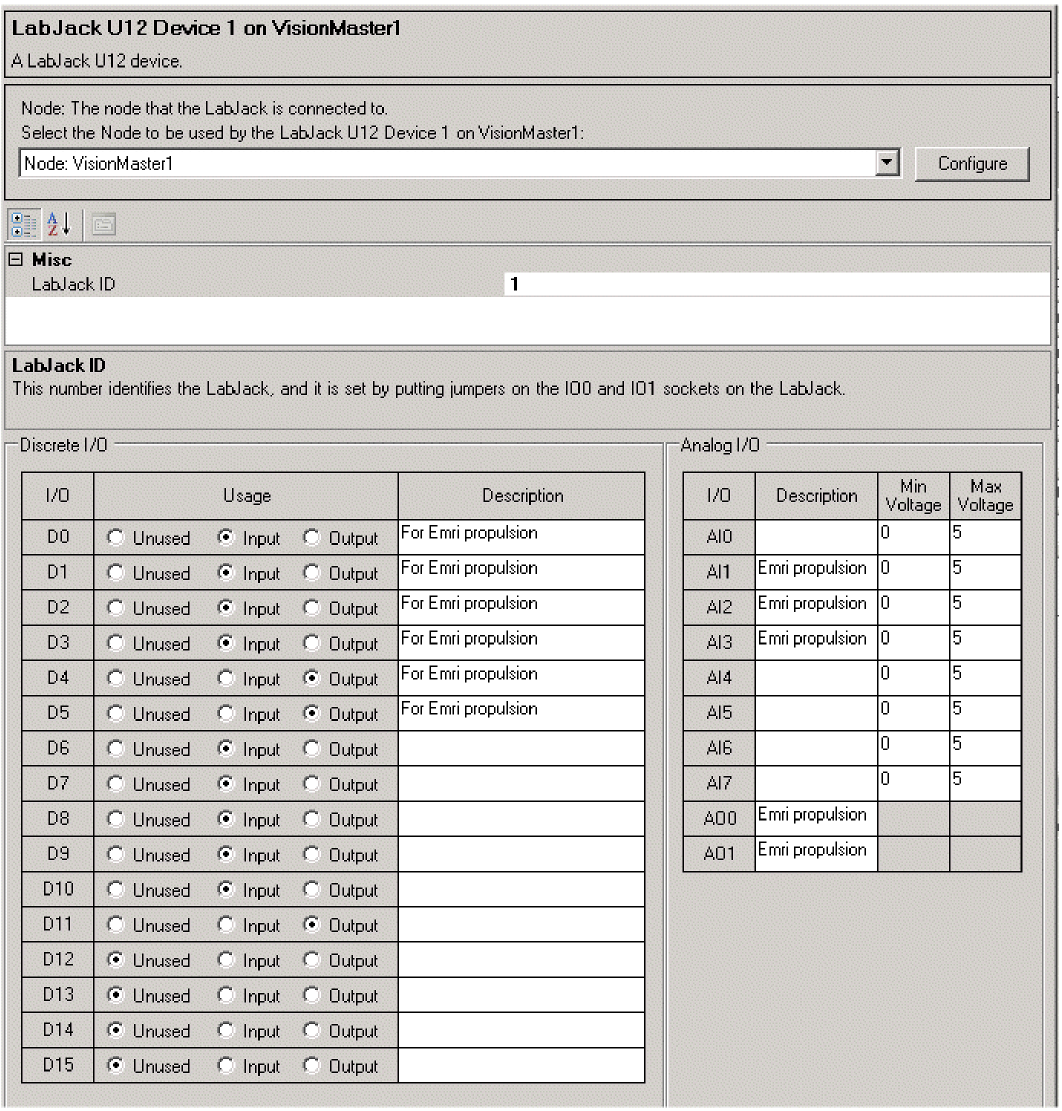


Figure 1.50 Labjack U12 Device Configuration Window

Node Selection

To select the node to which the Labjack device is connected, click on the **Node** drop down arrow to the right of the field and select from the list of configured nodes.

Miscellaneous

The Labjack ID number identifies the Labjack and defaults to 1. The number is set by putting jumpers on the IO0 and IO1 sockets on the device. To change the number click inside the field and click on the drop down arrow to the right of the field. Select the number (1 to 4) by clicking on the drop down arrow and selecting from the list. Note that different Labjack devices cannot have the same ID number.

Labjack ID

The Labjack configuration window includes a list of Discrete I/O connectors and Analogue I/O connectors. All discrete I/O connectors are initially set to **Unused**.

For discrete I/O tick the relevant **Input** and **Output** radio buttons corresponding to the connectors being used by the Labjack. If required, enter a text description in the **Description** field. Figure 1.50 shows a labjack which is used to interface with an Emri Propulsion system, see Section 8.10.19 *Propulsion Control Interface*'.

For analog inputs the minimum and maximum voltage thresholds are set to default values of 0 and 5 volts respectively. You can change the voltage thresholds, up to a maximum of 10 volts. Note that the maximum voltage must be less than the minimum voltage.

7.6 Opto 22 Manager

Opto 22 devices for analog and digital input and output data may be interfaced to the VisionMaster system.

The Opto 22 Manager window provides for the configuration of one or more Opto 22 racks. To select racks to include in the Opto 22 Manager highlight **Opto 22 Rack** in the **All** column and click on the **<** button. An Opto 22 rack is entered in the **Selected** column with a default rack number of **0**.

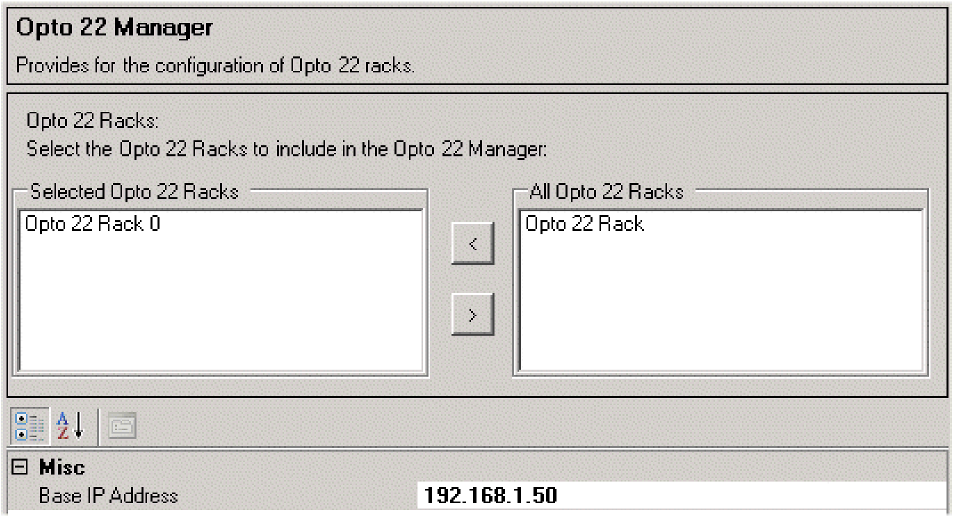


Figure 1.51 Opto 22 Manager

Repeat the above process if further Opto 22 racks are required. Each rack added to the **Selected** column is given the default number of **0** and a unconfigured topic is added to the Opto 22 Racks sub menu.

The Opto 22 Manager includes a base IP address, this IP address is used for rack 0. The rack number determines the IP address of the rack, for Rack 0 the IP address is 192.168.1.50; for Rack 1 its 192.168.1.51 etc.

If necessary, the base IP address may be changed by clicking in the field and entering the correct numerical identification.

7.6.1 Opto 22 Racks

The Opto 22 Racks sub-menu enables the selection of modules that are connected to the rack to be made and the rack number, which identifies the rack, to be changed.

Click in the **Rack Number** field and enter the required number for all racks after Rack 0. When rack numbers have been entered, each topic's configuration status becomes valid (green).

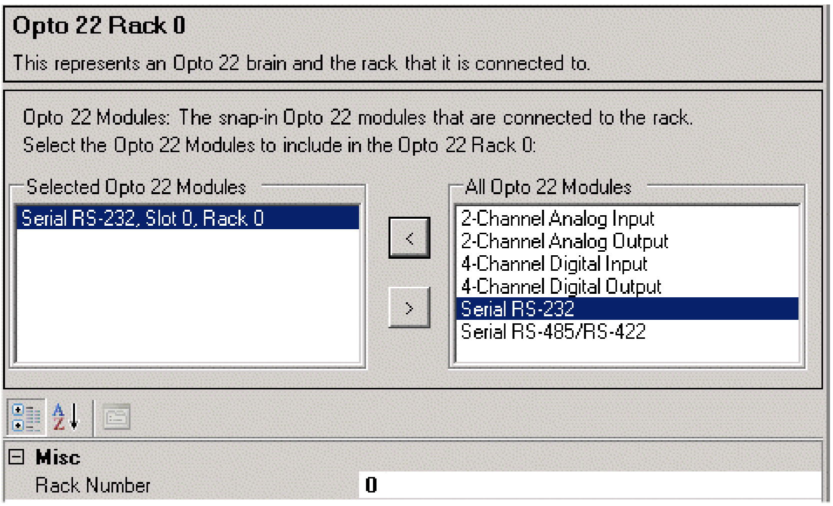


Figure 1.52 Opto 22 Racks

7.6.1.1 Configuring Opto 22 Modules

Each Opto 22 Rack window enables the configuration of the following input/output modules:

- 2-Channel Analog Input/Output
- 4-Channel Digital Input/Output
- Serial RS-232
- Serial RS-485/RS-422

To configure a module highlight the line in the **All Opto 22 Modules** column and click on the **<** button to move the module to the **Selected** column. A module description window, including Slot number, appears in the navigation tree, see Figure 1.53.

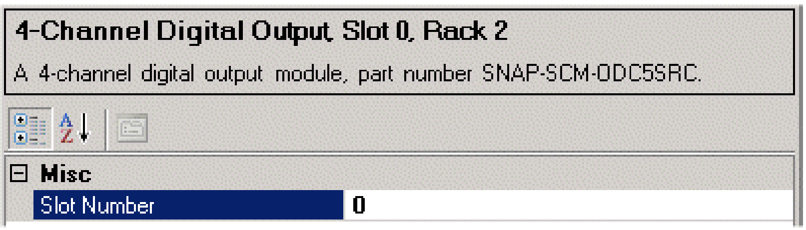


Figure 1.53 Opto 22 Module Window

If Analog or Digital I/Os are selected the system creates {Inputs} and {Outputs} sub-directories in the navigation tree, with each channel listed as a separate topic, from where usage descriptions may be entered. When two or four channel modules are selected each Input and Output module window requires a different slot number to be entered.

7.7 Network Interfaces

The Network Interfaces function is used to configure multiple LANs for systems using network serial interface (NSI) devices.

7.7.1 LAN Configuration

The LAN topic enables LAN details to be entered, including the IP address of the NSI and a unique number associated with the network.

The address defaults to (*.*.*.*), with each * representing the four octets.

Enter the IP address in the field. You can use * in an IP address octet to indicate a wildcard. For example, 192.168.1.*, 192.168.2.1. For details on entering an IP address for an NSI device refer to Section 7.3 *NSI Manager*'.

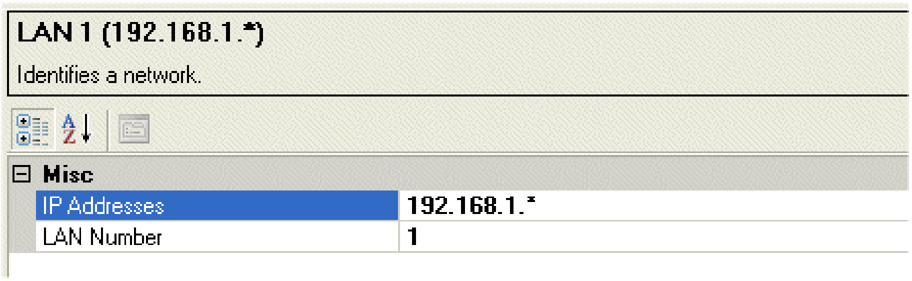


Figure 1.54 LAN Configuration

When an IP address has been entered, the address appears in the LAN window title and the configuration window of the NSI device, see Figure 1.44.

7.8 Data Distribution

Establishes and manages connection between system nodes, including enabling the broadcast time to live to be changed from the default and selecting nodes to operate in 'Safe Mode', where a node will automatically disconnect from the network if conditions on the network prevent the node from being usable.

For information on this facility, refer to Section 5.2.2 *Selecting Nodes for Safe Mode*' in Appendix A '*Configuring a Multi-Node System'*.

7.9 I/O Port Manager

The I/O Port Manager content area includes a left and right hand window (Selected I/O Ports and All I/O Ports), see Figure 1.55 below.

The Selected I/O Ports window lists all of the ports that the user has configured in the system, it also includes ports that have been automatically added as a result of a PCIO Board configuration, see Section 7.1 *PCIO Board Manager*'. This includes ports associated with any node in the system (such as a PCIO serial port) as well as ports that have no association with a particular node (such as a UDP multicast I/O port that is accessible from any node).

All the selected I/O ports are listed below the Ports heading as hyperlinks to the respective Serial Port window. Note that Figure 1.55 shows the I/O Port Manager for a standalone system, on a multi-node system the number of I/O ports configured is dependant on the number of PCIO boards in the system.

The Users list includes hyperlinks to hardware and functions connected to the serial ports, such as monitor, interswitch and AIS communications, which have been previously configured in Applications. Note that when ports are first configured the Users column will be empty.

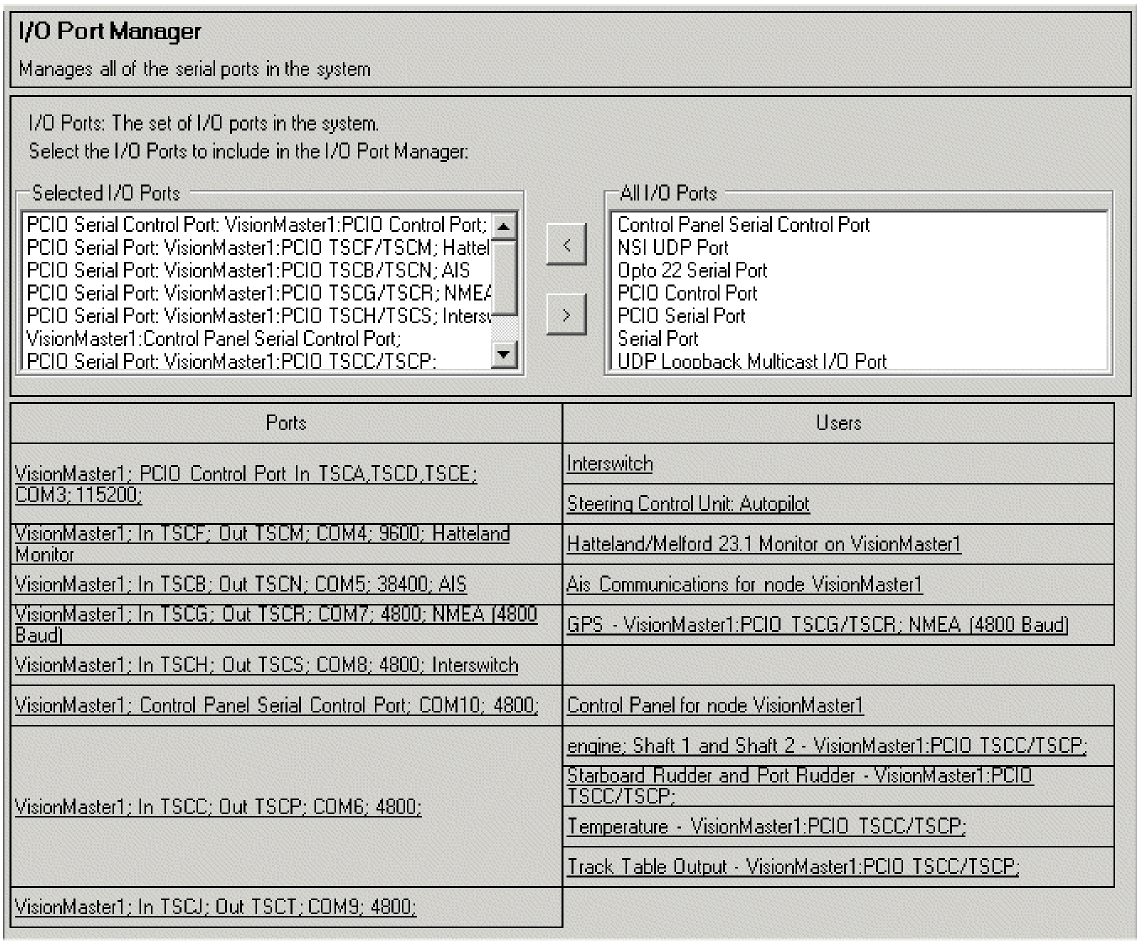


Figure 1.55 I/O Port Manager

To configure a selected I/O Port click on the hyperlink. The I/O Port window for the selected option appears, see Figure 1.56, page 72.

7.9.1 I/O Ports

The topics listed under the {I/O Ports} sub-directory enable each port to be configured. Table 1 below shows the standard input /output configuration for the VisionMaster FT system.

In addition to the serial ports the I/O port manager also manages serial control ports and a UDP multicast input port to the PC. If a NSI device has been configured the I/O Ports list will also include additional serial ports 1 to 5 that may be configured for the NSI, see Section 7.3.2 *Configuring NSI Serial Data Ports*'.

For each PCIO board in the system, the service engineer should configure:

- One PCIO Serial Control Port - this automatically supports input through TSCA, TSCD, and TSCE.
- A PCIO Serial Port for each serial port provided by the PCIO board that is expected to be used by the system, other than TSCA, TSCD, or TSCE.

Note: *Messages that pass through the serial inputs TSCA, TSCD and TSCE must comply with the requirements IEC 61162-1, i.e. the message must have a valid checksum and be no more than 82 characters.*

Table 1: Standard Input/Output Configuration

			Input		Output	
Serial I/O*	**COM Port**	**Baud Rate†**	**Connector**	**Device**	**Connector**	**Device**
1	COM 3	38400	TSCA	Serial Compass (HDT)	Not available	
2	COM 3		TSCD			
3	COM 3	4800	TSCE	Dual axis log (VBW)		
4	COM 4	9600	TSCF	Monitor control	TSCM	Monitor control
5	COM 5	38400	TSCB	AIS (VDO, VDM)	TSCN	
6	COM 6		TSCC		TSCP	
7	COM 7	4800	TSCG	GPS	TSCR	Track table output
8	COM 8	4800	TSCH	Interswitch	TSCS	Interswitch
9	COM 9		TSCJ		TSCT	

*. All serial inputs can work at 4800 baud; serial inputs 1, 5, and 6 can additionally work at 38400 baud.
†. The baud rate of the input/output must be the same.

7.9.2 Configuring a PCIO Serial Port

To configure a PCIO serial port from the I/O Port Manager window:

1. Highlight the port in the All I/O Ports list and click on the **<** arrow. The port is moved to the Selected I/O Ports list as an unconfigured port with an unconfigured (red) status button, a hyperlink for the unconfigured port also appears in the Ports column below.
2. To remove a port from the I/O Port Manager highlight the port in the Selected I/O/ Ports list and click on the **>** arrow, the port is de-selected and moved back to the All I/O Ports list and the hyperlink is removed.
3. The configuration window for the port can be accessed in one of three ways:

   a. double click on the port in the Selected I/O Ports list;

   b. click on the hyperlink in the Ports list; or

   c. double click on the port status line in the navigation tree.

When the configuration window is accessed, the following typical PCIO Serial port configuration window is displayed, see Figure 1.56 below.

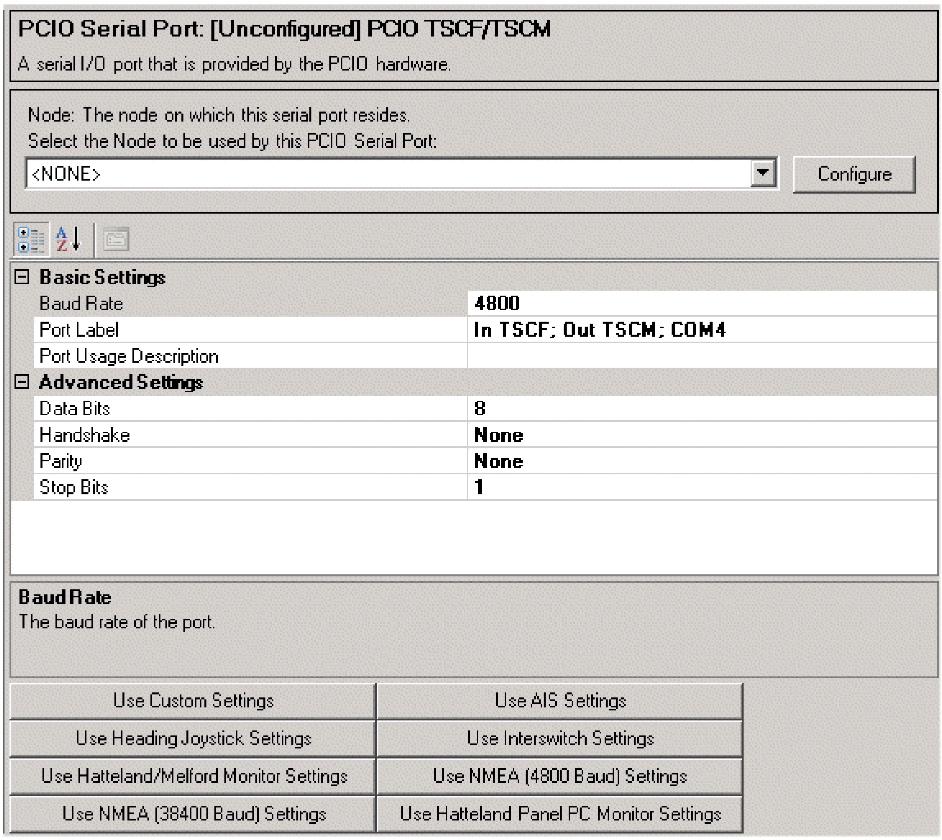


Figure 1.56 I/O Serial Port Configuration Window

The window displays certain default settings for a PCIO serial port including the baud rate (4800), the input/output labels (TSCF/TSCM) and the COM port (4). All default settings are configurable.

7.9.2.1 Selecting the Port Node

To select the node on which the serial port resides click on the Node drop down arrow to the right of the field and select the required node from the list.

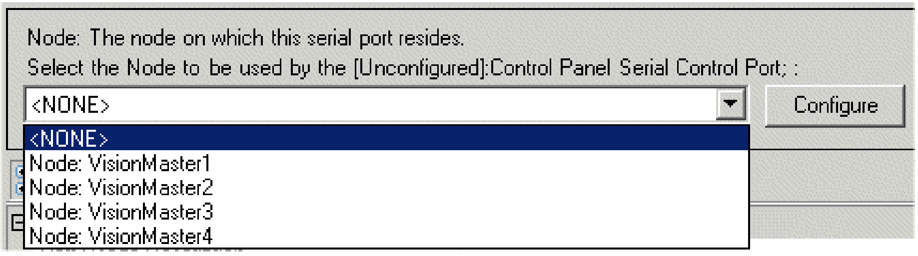


Figure 1.57 Select Node

If the system is single node, only one selection can be made, which is the Display Name in Nodes window. If the system is multi-node you can select or change the node on which the selected port resides.

Note: *On a multi-node system the serial ports for each node must be separately configured.*

To change the node configuration click on the **Configure** button, the Nodes content area appears, see Section 5.3 *Nodes*'

7.9.2.2 Selecting Pre-Defined IO Settings

The I/O Port configuration window includes a number of pre-defined IO settings arranged in a series of buttons at the bottom of the window. These settings enable you to quickly configure the selected port for a defined purpose.

For example, to configure the port connected to the monitor then click the **Use Hatteland/Melford Monitor Settings** button.

The basic and advanced settings of the port automatically change, dependant on the IO setting selected.

The port usage also appears in the PCIO serial port heading and the topic line in the navigation tree.

Figure 1.58 I/O Settings Buttons

7.9.2.3 Changing Basic Settings

The basic settings include the following:

- Baud rate
- Port name or label
- Port usage description

Baud Rate

All serial ports can work to a minimum of 4800 baud, which is the default setting. To check if the serial port baud rate can be increased, refer to Table 1.

Note: *For PCIO Serial ports the configuration will not validate if an invalid baud rate is selected.*

To change the baud rate click inside the rate field and click on the drop down arrow to the right of the field. Select the required baud rate from the drop down list.

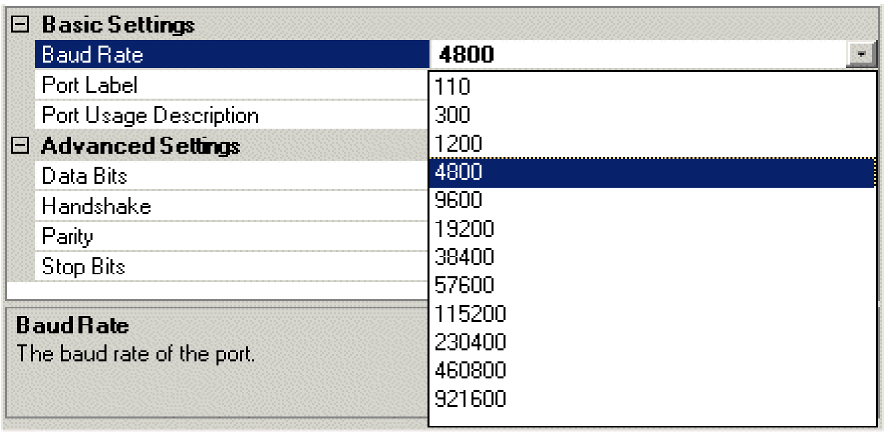


Figure 1.59 Baud Rates

Port Name/Label

The port label lists the physical input and output connections on the PCIO board that the port represents. The port name is the name of the selected port, i.e COM1, COM2 etc.

To change the port connections and name click on the drop down arrow to the right of the field. Select the required settings from the drop down list, Figure 1.60 below shows the list of port connections and names.

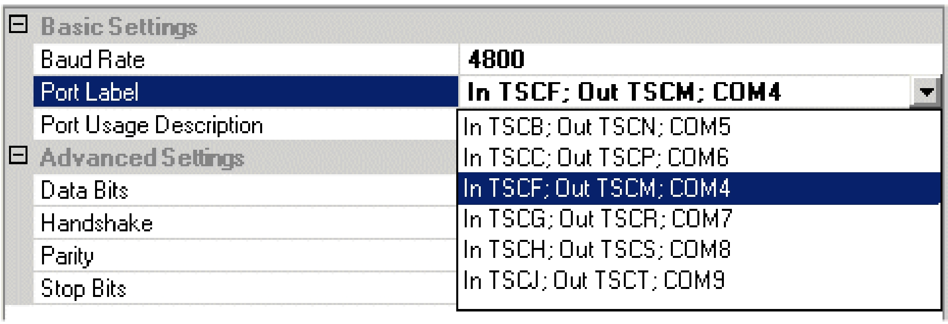


Figure 1.60 Port Label

Port Usage Description

The port usage description includes a summary of the port usage, i.e. the hardware or function connected to the PCIO serial port and listed in the Users column in I/O Port Manager.

7.9.2.4 Changing Advanced Settings

The advance settings include the following communications parameters:

- Data bits
- Handshake
- Parity
- Stop bits

Data Bits

The number of data bits is usually set to eight. To change the number of data bits delete the current number in the field and enter the required number.

Handshake

Handshake represents the handshaking protocol for serial port transmission of data. To change the value click on the drop down arrow to the right of the field and select the required value from the drop down list.

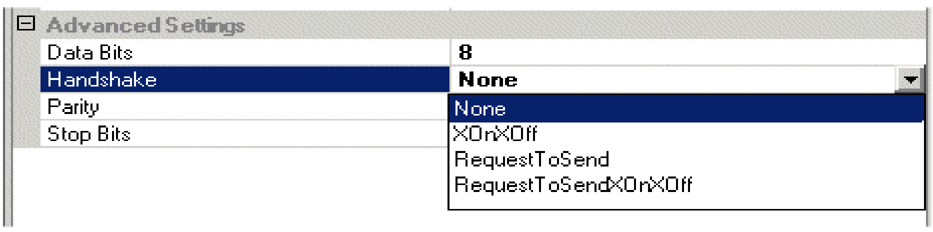


Figure 1.61 Handshake

Parity

The Parity value defaults to **None**, except where Interswitch Settings are selected for Port Usage when the value changes to **Even**. To change the parity of the port click on the drop down arrow to the right of the field and select the required value from the drop down list.

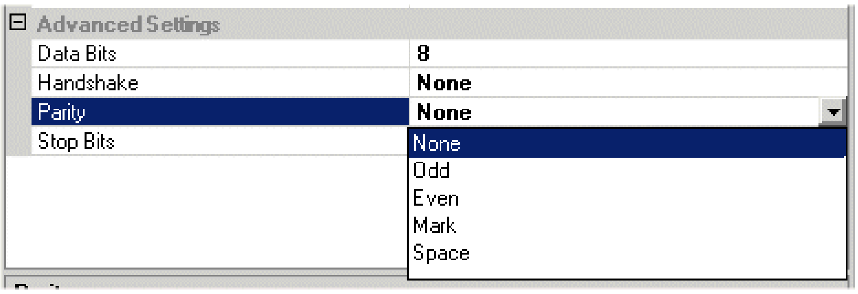


Figure 1.62 Parity

Stop Bits

The number of stop bits defaults to 1, the other values are 1.5 and 2. To change the value click on the drop down arrow to the right of the field and select the required value from the drop down list.

7.9.3 PCIO Control Port

On a multi-node system using a series of PCIOs, each node requires a PCIO Control Port. A configured PCIO Control Port is automatically added to the {I/O Ports} list when a PCIO board has been selected in Section 7.1 *PCIO Board Manager*'.

Figure 1.63 below shows the default settings for a PCIO Control port configuration window.

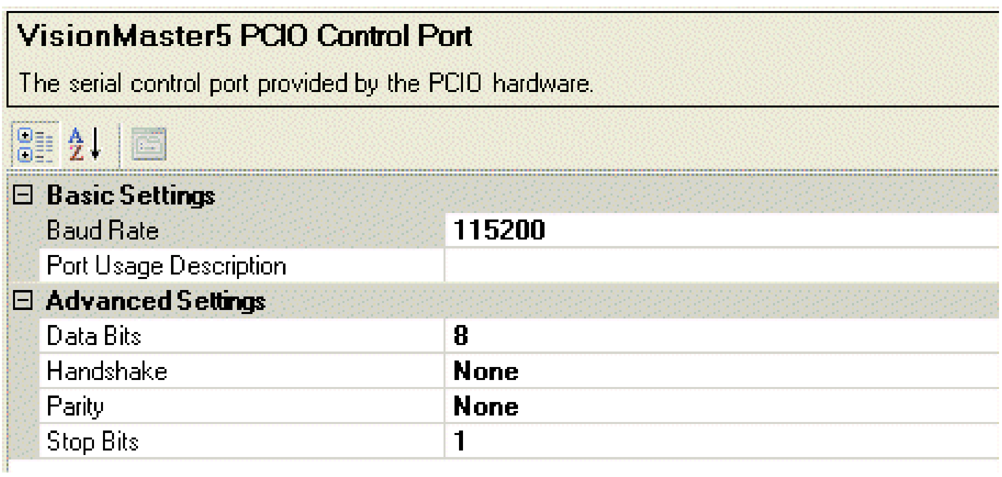


Figure 1.63 IPCIO Control Port Configuration Window

The PCIO Control Port is the channel used for receiving and transmitting data between the PCIO and the Processor (PC). The baud rate for a PCIO control port is always set to a default rate of 115200.

The Control Port window does not require a port usage. Consequently there are no I/O setting buttons at the bottom of the window, although a description of the control port can be entered in the Port Usage Description field.

The configuration of the Basic Settings and Advanced Settings are the same as described previously in Section 7.9.2 *Configuring a PCIO Serial Port*'.

7.9.4 Control Panel Serial Control Port

A Control Panel serial control port is automatically configured and added to the {I/O Ports} list when a control panel has been selected for a node (see Section 7.2 *Control Panel Manager*'). On a multi-node system each node that is connected to a control panel will have a serial control port assigned.

Figure 1.63 below shows the default settings for a Control Panel serial control port configuration window.

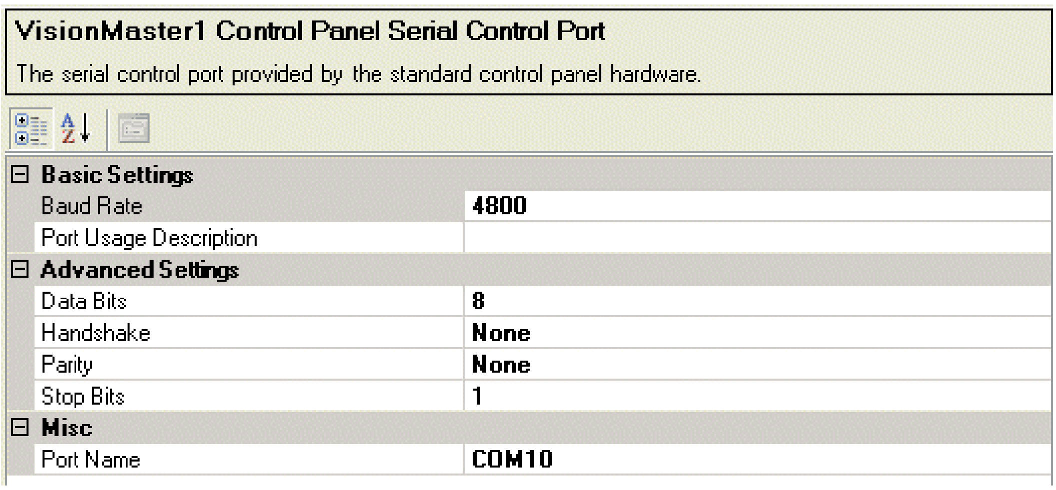


Figure 1.64 Control Panel Serial Control Port Configuration Window

The baud rate is always set to a default rate of 4800.

A port usage is not required to be entered, although a description of the control port (e.g. basic control panel) can be entered in the Port Usage Description field.

The Advanced Settings are the same as described previously in Section 7.9.2 *Configuring a PCIO Serial Port*'.

The control panel Port Name is the COM port assigned to the control panel (the default is COM10).

7.9.5 Control Panel Serial Port

A Control Panel serial port is automatically configured and added to the {I/O Ports} list when an optional I/O board has been configured for the control panel, see Section 7.2.1 *Configuring a Control Panel I/O Board*'.

Figure 1.65 below shows the default settings for a Control Panel serial port configuration window.

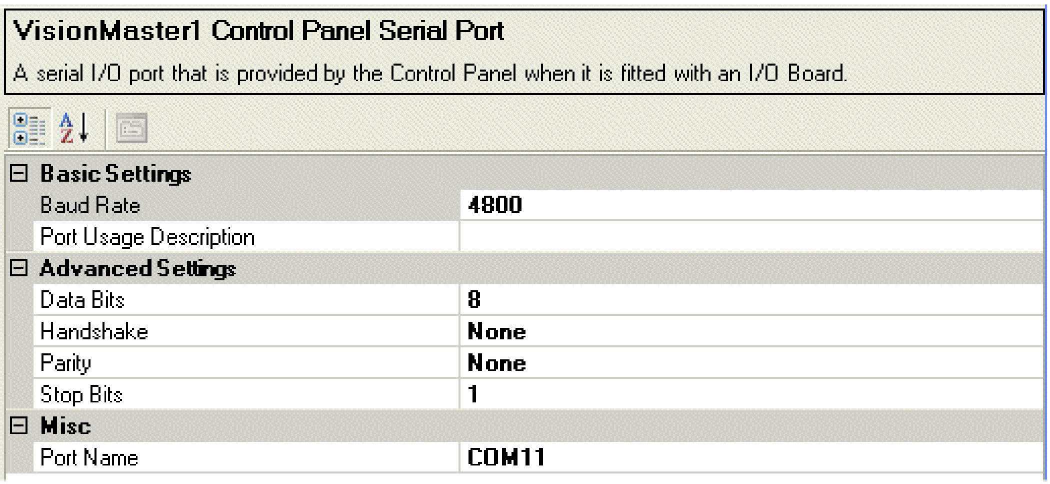


Figure 1.65 Control Panel Serial Port Configuration Window

The baud rate is always set to a default rate of 4800.

A port usage is not required to be entered, although a description of the control port (e.g. control panel IO board) can be entered in the Port Usage Description field.

The Advanced Settings are the same as described previously in Section 7.9.2 *Configuring a PCIO Serial Port*'.

The control panel Port Name is the COM port assigned to the control panel (the default is COM11).

7.9.6 Network I/O Port to PC

The I/O Port Manager enables you to configure UDP multicast network I/O ports from the Processor. UDP multicast I/O ports are used when communicating via a Sperry NSI box connected to the network, or other equipment that uses UDP multicast protocols.

The default setting is input and output enabled but the port may be configured to be either input only or output only.

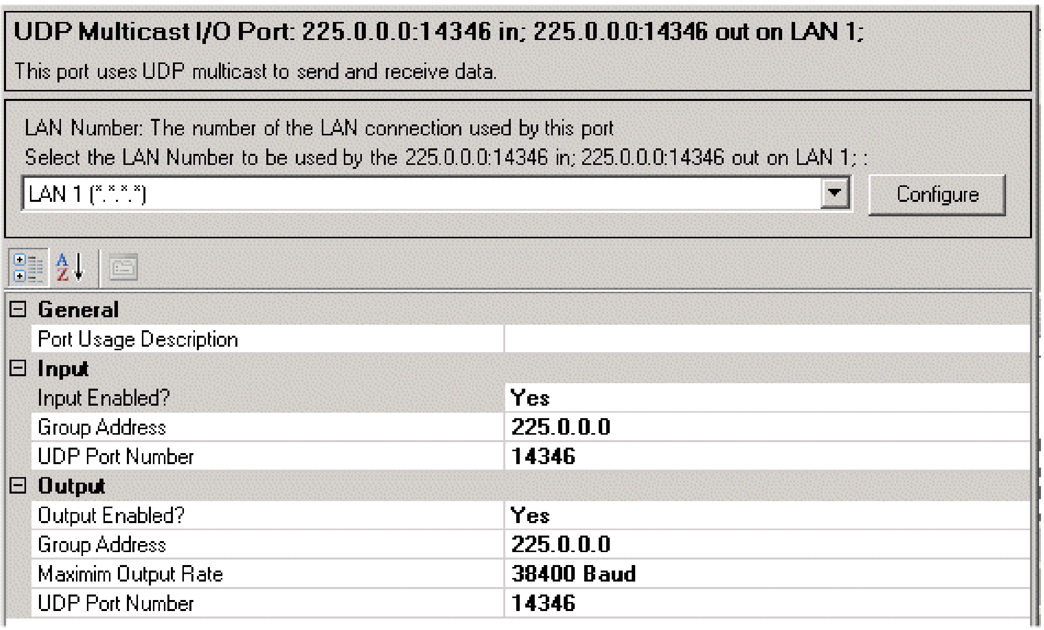


Figure 1.66 UDP Multicast I/O Port

7.9.6.1 LAN Number

The LAN Number is the number of the LAN connection used by this port, if the system only has one network card then this number remains at 1. The (*.*.*.*) indicates a wildcard setting for the IP address associated with the network.

To configure a specific IP Address click the Configure button, the LAN (*.*.*.*) window opens, see Section 7.7.1 *LAN Configuration*'.

7.9.6.2 Changing General Settings

The following general settings can be configured:

- **Port Usage Description -** a description of what the port is to be used for (e.g. Nav Lines) can be entered.

7.9.6.3 Changing Input Port Settings

The following Input settings can be configured:

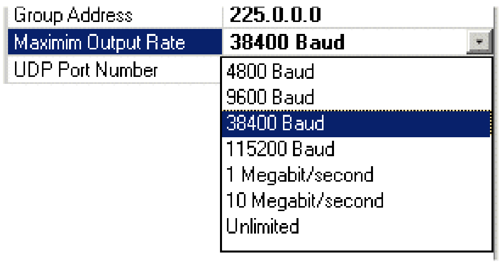
- **Input Enabled** - the enablement setting defaults to Yes, to disable input click on the drop down arrow to the right of the field and select **No**.
- **Group Address** - the Group Address is the multicast IP address over which data will be received. If the address requires changing click in the field and enter the required values.
- **UDP Port Number** - the UDP port number over which the data will be received. If the port number requires changing click in the field and enter the required values.

7.9.6.4 Changing Output Port Settings

The output settings include the same settings as described for Input, but with the addition of Maximum Output Rate, which defaults to 38400 Baud.

Setting the maximum output rate is important when communicating with an external device that cannot continually process the data faster than the rate set for the serial port. For example, track table output send over a UDP multicast port to an NSI box, which is connected via a serial port to the device receiving the target data. If the serial port is operating at 4800 baud, then the UDP port also needs to be limited to 4800 baud.

To change the maximum output rate click on the drop down arrow and select the required value from the list, which ranges from 4800 Baud to Unlimited.



7.9.7 Configuring a UDP Port using a Loopback Adapter

A loopback adapter is a testing tool for a virtual network environment where network access is not available. In VisionMaster it is also used as the UDP port for the CCTV Vic Manager if a LAN Video Display Provider is being configured, see Section 8.10.13.1 *LAN Video Display Providers*'.

The General and Input/Output configuration settings for a UDP Multicast I/O Port are the same as described previously for the UDP Multicast I/O Port, the exception being that no LAN number is required.

7.9.8 Configuring a Opto 22 Serial Port

Before an Opto 22 serial port can be configured the module that houses this serial port must first be selected from the Opto 22 Manager sub-menu. This can be either an RS-232 or RS-485/RS-422 serial I/O. For details see Section 7.6.1 *Opto 22 Racks*'.

To configure a Opto 22 serial port from the I/O Port Manager window, move the serial port into the Selected I/O Ports list in I/O Port Manager and access its configuration window as described previously.

To select the Opto 22 module to be used by the serial port click on the Module drop down arrow to the right of the field and select from the list, see Figure 1.67 below. There may be more than one opto 22 module configured in the Opto 22 Manager.

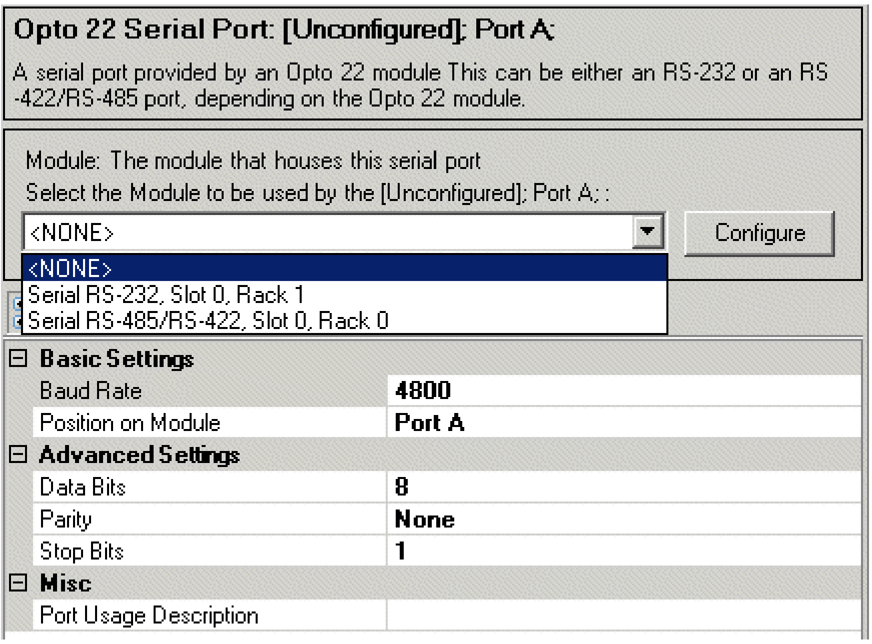


Figure 1.67 Opto 22 Serial Port Configuration Window

To change the baud rate from the default 4800 click inside the rate field and click on the drop down arrow to the right of the field. Select the required baud rate from the drop down list.

Position on Module

If the serial module allows two ports, then select the serial port position by clicking inside the field and clicking on the drop down arrow to the right of the field. Select the port (A or B) from the drop down list.

Advanced Settings

The advanced settings show the same default values as an I/O serial port. To change the Advanced Settings, see Section 7.9.2 *Configuring a PCIO Serial Port*'.

Port Usage Description

Enter an optional description of the usage of the port in the Port Usage Description field.

7.9.9 Configuring a Serial Port on the PC, an external Serial Port or an internal Serial Card

If the product type you are using does not require radar input, (i.e. an ECDIS without radar overlay or a Conning Information Display) then a PCIO unit may not be fitted to the node.

In this case a serial output may be configured in one of three ways:

1. By configuring a serial port on the PC, see Section 7.9.9.1 below.
2. As an External Serial Port (ESP) unit, connected to the PC via a USB port, with COM ports 12 and above assigned to the ESP.
3. As a PCI serial card, which is installed inside the PC.

If an ESP is to be connected to the PC, or a PCI serial card is to be installed in the PC, follow the instructions in Chapter 1 '*Appendix C Configuring Peripheral Devices*'.

7.9.9.1 Configuring a Serial Port on the PC

To configure a serial port on the PC to enable audio output for the buzzer:

1. From the I/O/ Ports window select **Serial Port** from the list of All I/O Ports, see Figure 1.55. The system will automatically assign a port name (COM 1) and a baud rate of 4800.
2. Select the node on which the serial port resides, and if required, change basic and advanced settings.

This serial port may now be used to configure a serial discrete output for the buzzer, see Section 7.12.1 *Configuring a Serial Discrete Output*'.

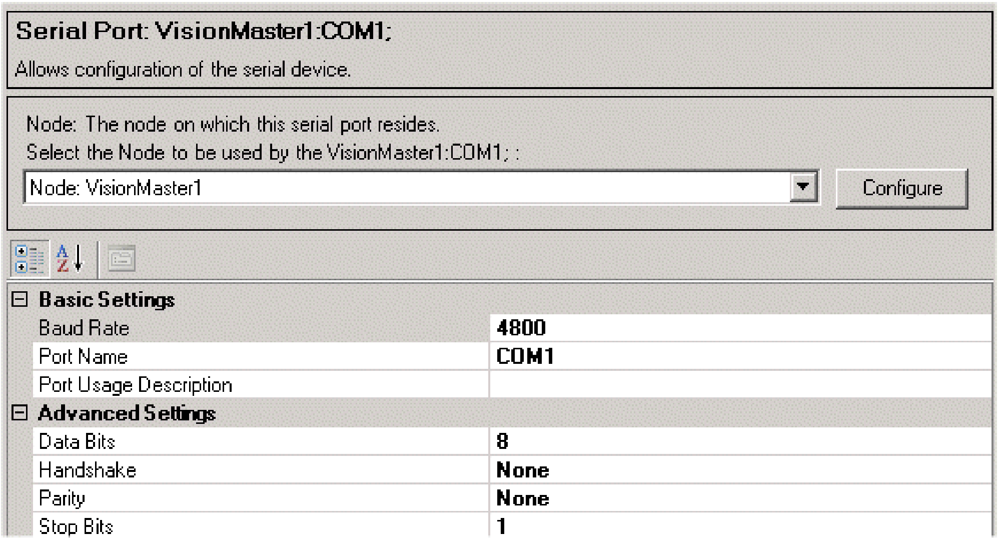


Figure 1.68 Serial Port (COM 1)

7.9.10 Configuring an NSI UDP Port

An NSI UPD serial port may be selected for configuration. If you have configured a NSI device from the NSI Manager menu the I/O Ports list will automatically generate serial ports 1 to 5 for the NSI, see Section 7.3 *NSI Manager*'.

When an NSI UDP Ports is selected from the All I/O POrts list the I/O Ports topic the port number defaults to 0.

For details on configuring an NSI UDP port refer to Section 7.3.2 *Configuring NSI Serial Data Ports*'.

7.10 Video Sources

The Video Sources function enables real time streaming video to be viewed as CCTV on the display. The video source may be generated either over a local area network (LAN) connection, or connected directly to a monitor using the Picture in Picture (PiP) feature of the monitor.

Note: *A Video Display Provider (either LAN or PiP, depending on the video source selected) must also be configured, in conjunction with the configuration of the video source. Refer to Section 8.10 Optional Features' for details on configuring the video display providers.*

To select a video source, select **Video Source Group** in the All Groups column of the Video Sources window and click the < button. An unconfigured video source group is created.

When a Video Source Group has been selected an unconfigured topic is created in the navigation tree with {Video Sources} and {Child Groups} as sub menu items.

Multiple video groups may be created for both Vlc (VideoLAN connection) and PiP video. Each group may have one or more video sources and child groups configured. Figure 1.69 shows two LAN (named Network 1 and 2) and one Pip video source groups configured.

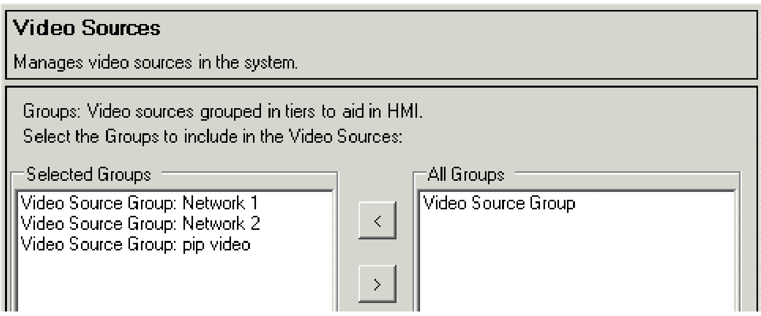


Figure 1.69 Video Sources

7.10.1 LAN VIdeo Source Group

A LAN video source enables up to four MPEG-4 video feeds received over a network to be displayed.

To configure a LAN video source group:

1. Click on the unconfigured **Video Source Group:** topic in the navigation tree. The configuration window for the group of video sources opens.
2. From the All Video Sources column, select **Vlc Client Source** and click the < button. A Vlc Client Source topic is created below the **{Video Sources}** sub menu.
3. To select child groups to include in the video source group select **Video Source Groups** from the All Child Groups and click the < button. A **Child Group** sub menu topic is created.

4. Enter a name for the video source group in the **Name** field. Each name must be unique if more than one group has been created. Figure 1.70 shows a typical example of a configured Video Source Group window.

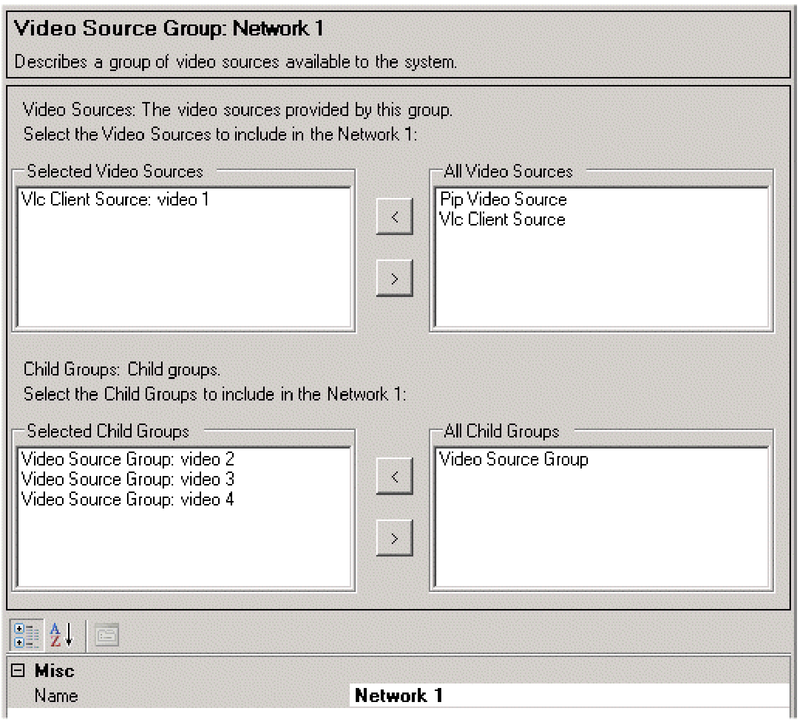
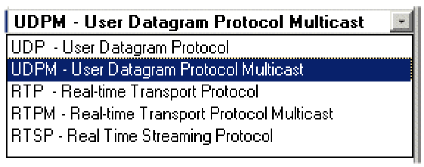


Figure 1.70 Video Source Group Configured

To configure a Vlc Client Source:

1. From the navigation tree, click on the Vlc Client Source: topic. The Vlc Client Source window displays the following auto generated data:
   - IP Address or RTSP URL - the IP address on which the video data is streamed, or the URL of the video stream data if protocol is used. The field should be blank when RTP or UDP is selected from the Protocol Used field.
   - Port Number - the port number on which the video data is streamed. This field is ignored if protocol is RTSP.
   - Protocol Used- the protocol used to stream the video data. The default is UDPM, to change the protocol click on the drop down arrow and select from the list of protocols.



2. Enter a unique name for this video source in the **Name** field. The name is assigned to the Client Source window and the topic in the navigation tree. The names entered for each streaming feed are displayed on the CCTV window when the VisionMaster system is running video.

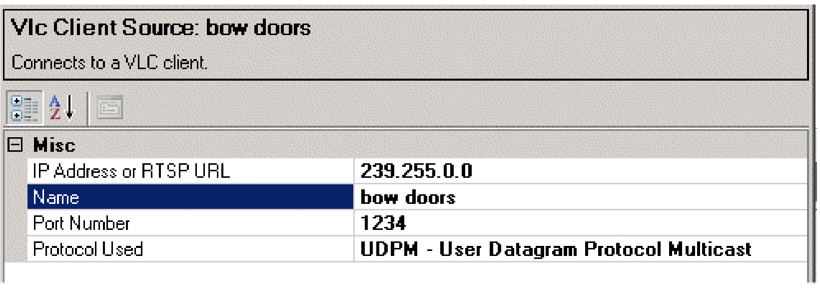


Figure 1.71 Vlc Client Source Configured

If Child Groups have been created for the video source, each group must have their Vlc Client Source configured, as described above.

The video sources are not fully configured until a video display provider has been selected from the Main Application, Optional Features list.

Note: *Each video display window should have a unique video source configured. If more than one video display selects the same source a popup message 'hostform has encountered an error' is displayed.*

Figure 1.72 shows a typical hierarchical sub menu for Video Sources when two LAN video source groups have been created and a video provider selected from Optional Features.

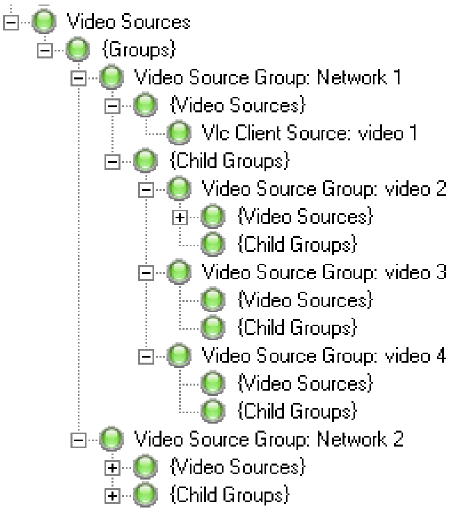


Figure 1.72 Resources sub menu for Video Sources

7.10.2 PIP Video Source Group

When using PiP as a video source, the composite video input on the selected monitor is used as the source of the PiP video.

The CCTV generated through PiP is displayed only on a full screen CID page, or the left side CID panel of a widescreen monitor.

Note: *Currently the PiP video feature is only available when using Hatteland monitors.*

A pre configured element, generated in the CID Designer, is used as a placeholder over which the monitor's PIP video is displayed. For information on configuring a PiP placeholder, see Chapter 3 '*Configuring a Conning Information Display*'.

The configured size and aspect ratio of the placeholder element in the CID Designer matches the aspect ratio and location of the PiP video. For this reason, CCTV windows displaying PiP video cannot be moved or sized by the operator.

The system uses the serial interface of the backlight control to adjust the brightness of the composite PIP video.

To configure a PiP video source group:

1. Select **Pip Video Source** from the All Video Sources column in the Video Source Group window, see Figure 1.70.
2. Select Child Groups as required and name the video source group as described previously. A PiP Video Source topic is created below the **{Video Sources}** sub menu.
3. Click on **PiP Video Source:** in the navigation tree, the window enables the video to be named and the source to be selected.
4. The video source defaults to **Auto (Old).** To change the source click on the drop down arrow and select from the list.

5. Enter a unique name for this video source in the **Name** field. The name is assigned to the Pip Video Source window and the topic in the navigation tree.

7.11 Joystick Manager

One or more joystick devices, for use in performing heading control and entering temporary route plans, may be interfaced to the VisionMaster system

To select a Joystick device click on Joystick Manager, select **Heading Joystick** from the **All Joystick Devices** column and click the **<** button. The Heading Joystick is moved to the Selected Joystick Devices column and the navigation tree displays an unconfigured Heading Joystick topic with sub menu topics.

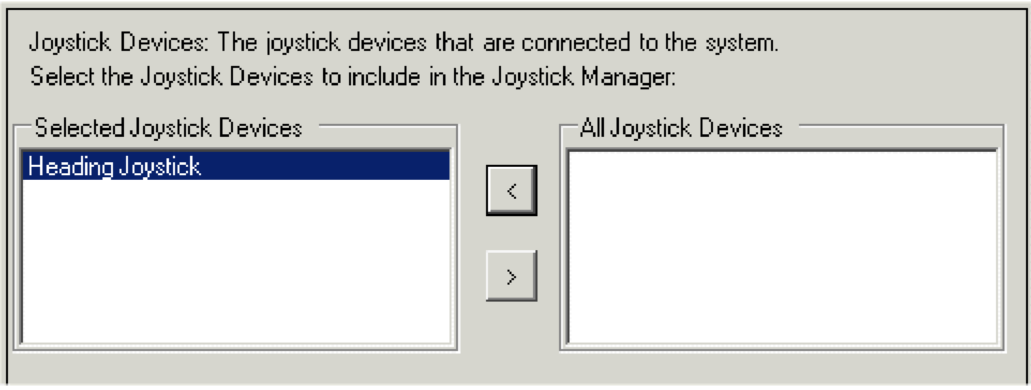


Figure 1.73 Joystick Manager

7.11.1 Configuring a Joystick Device

When a heading joystick has been selected, the communications with the device must be configured.

1. Click on the Heading Joystick topic in the navigation tree, highlight **Heading Joystick Communicator** and click the **<** button. The Communicator is moved to the Selected Heading Joysticks column and the navigation tree creates an unconfigured Heading Joystick Controller topic.
2. Select the **Heading Joystick Communicator** from the navigation tree. If the system is a multi-node then all nodes are listed in the Display Nodes column. From this column select the nodes that the joystick(s) is connected to. If a joystick is connected to more than one node, a communicator for each node must be configured.
3. Select the port to be used to communicate with the joystick, this needs to be an RS422 serial port.
4. Enter a name for the joystick device in the Joystick Name field.

When valid data has been entered in the Heading Joystick Communicator window the joystick device is configured, see Figure 1.74.

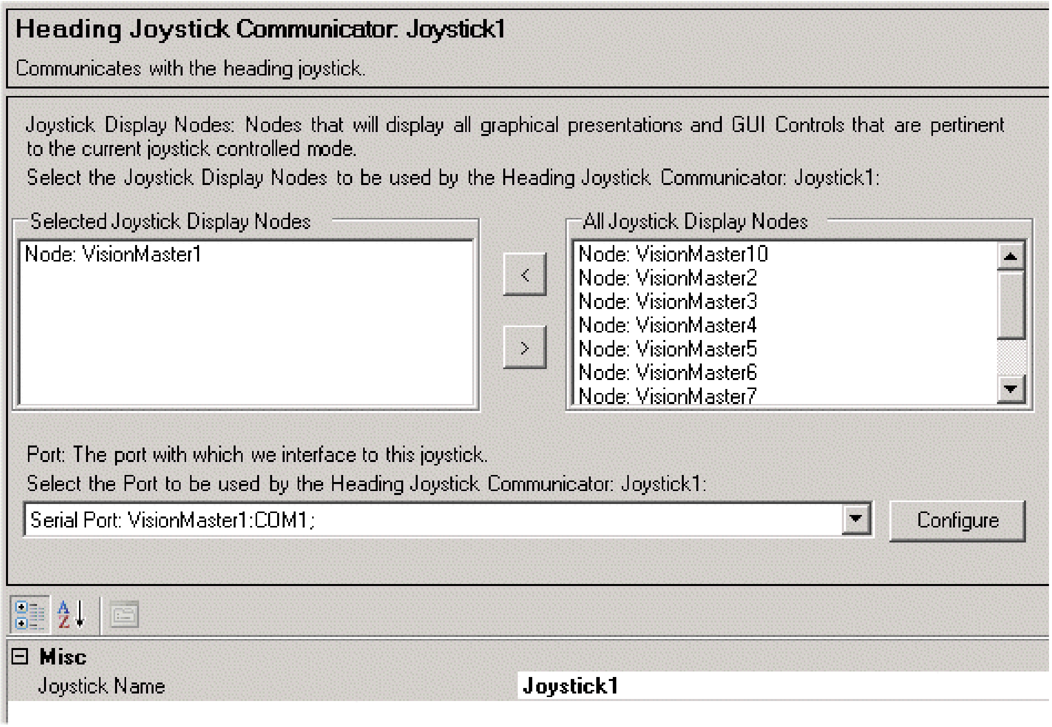


Figure 1.74 Heading Joystick Communicator

The Joystick control and parameters are set to default values, which are not required to be configured. These values are described in the two sub-sections below.

7.11.2 Heading Joystick Controller

The heading joystick controller defines the maximum distribution rate of the joystick button press and position in seconds. The default is 0.1 seconds.

To change the rate, click in the Distribution Rate (s) field and enter a value.

7.11.3 Heading Joystick Parameters

The heading joystick parameters window enable the values, which are used to process the movements of the joystick to be changed. The default values are shown in Figure 1.75 below.

Unless there are valid reasons for changing these values, the Heading Joystick Parameters should remain at default.

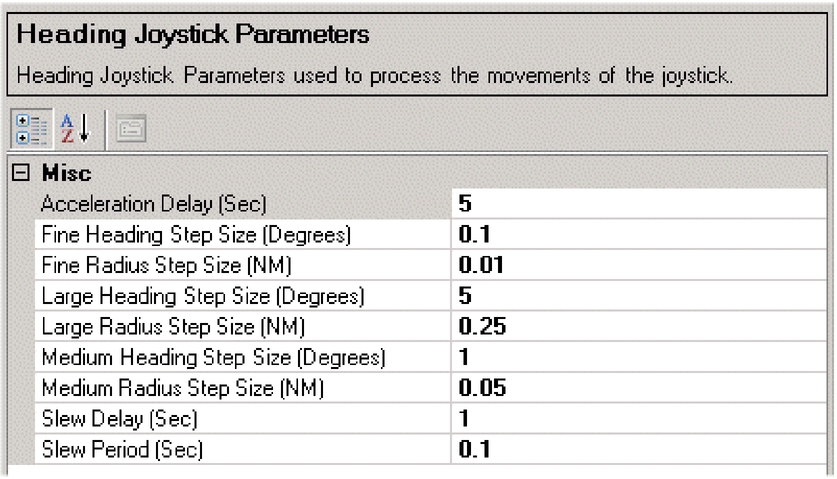


Figure 1.75 Heading Joystick Parameters

7.12 Serial Discrete Outputs

This function is provided in order to configure one or more serial ports to be used as an audio output for the buzzer. A discrete output is required to be configured when the system does not have a PCIO. This output may be via a control panel, monitor, labjack, or a serial discrete output on the PC.

If your system includes a monitor that provides discrete serial output on the buzzer connectors of the monitor's serial port (for example, a Hatteland Panel/ PC Monitor) then the option of selecting Monitor Discrete Output is available.

7.12.1 Configuring a Serial Discrete Output

1. From the Serial Discrete Outputs window select either **Serial Discrete Output** (or, if using a serial port monitor select **Monitor Discrete Output**) and click the **<** button to move to the Selected Serial Outputs column. An unconfigured **Serial Discrete Output: Buzzer** topic is included.

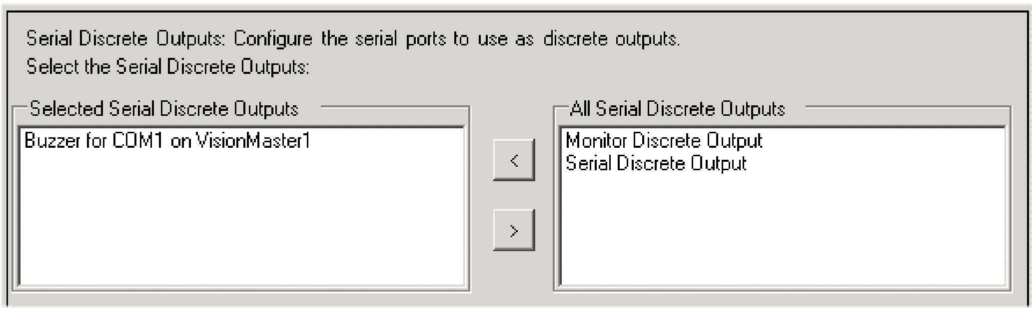


Figure 1.76 Selecting a Serial Discrete Output

2. Click on the unconfigured topic in the navigation tree to open the serial discrete output configuration window. The discrete output is automatically named Buzzer.
3. Select the serial port to be used by the buzzer, this will be a serial port on the VisionMaster PC. If no PC serial port has been configured, refer to Section 7.9.9.1 *Configuring a Serial Port on the PC*'.
4. If required, change the name of the discrete output.

Note that each configured serial discrete output must have a separate serial port selected. Two outputs cannot operate through the same COM port.

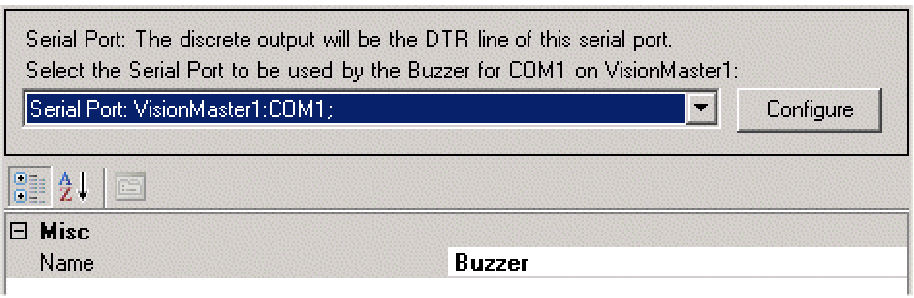


Figure 1.77 Configuring a Serial Discrete Output

7.13 Analog I/O Summary

The Analog I/O summary window provides an overview on how the analog inputs and outputs (configured for Labjack or Opto 22 racks) will be used in the system.

If a Labjack is connected to the system, and has been configured from the Labjack Manager, the Analog I/O summary lists all the analog I/O connectors on the device, see Figure 1.50 '*Labjack U12 Device Configuration Window*'.

If analog Input/Output modules have been configured for an Opto 22 rack the analog connector number (A1, A2 etc.) together with the slot number are listed.

The window is divided into Analog I/O Signals and Users, with all listed data displayed as hyperlinks. To view and/or configure an I/O signal or user click once on the hyperlink, the relevant window for the selected line topic is displayed.

If an analog I/O has not been configured the window is blank.

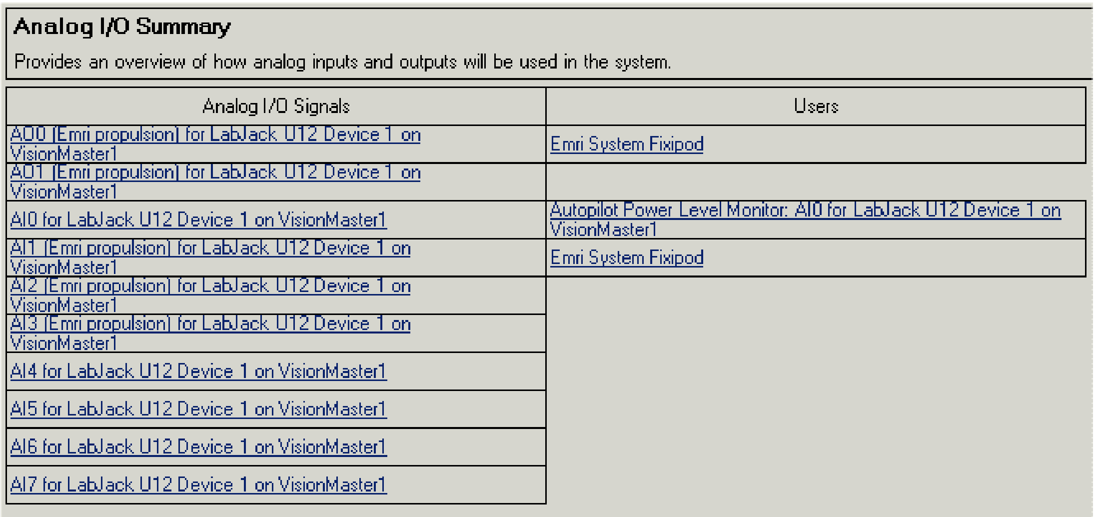


Figure 1.78 Analog I/O Summary window

7.14 Discrete I/O Summary

The Discrete I/O summary window provides an overview on how the discrete inputs and outputs will be used in the system.

Where a PCIO board has been selected from PCIO Board Manager the discrete I/O summary window lists all the discrete inputs and outputs automatically generated by the system and shown as sub-menu items in the PCIO board navigation tree, see Figure 1.39.

Discrete I/O Summary

Provides an overview of how discrete inputs and outputs will be used in the system.

Discrete I/O Signals	Users
DO-1 (Buzzer) for PCIO on VisionMaster1	Announcements
DO-2 for PCIO on VisionMaster1	Announcement I/O Manager
RO-1 (System Operational) for PCIO on VisionMaster1	
RO-2 (Remote Alarm) for PCIO on VisionMaster1	
RO-3 (Vigilance) for PCIO on VisionMaster1	Vigilance Monitoring
D11 for LabJack U12 Device 1 on VisionMaster1	
D4 (For Emri propulsion) for LabJack U12 Device 1 on VisionMaster1	Emri Propulsion System
D5 (For Emri propulsion) for LabJack U12 Device 1 on VisionMaster1	Emri Propulsion System
DI-1 for PCIO on VisionMaster1	
DI-2 for PCIO on VisionMaster1	
DI-3 for PCIO on VisionMaster1	
DI-4 for PCIO on VisionMaster1	
D0 (For Emri propulsion) for LabJack U12 Device 1 on VisionMaster1	Emri Propulsion System
D2 (For Emri propulsion) for LabJack U12 Device 1 on VisionMaster1	
D10 for LabJack U12 Device 1 on VisionMaster1	
D1 (For Emri propulsion) for LabJack U12 Device 1 on VisionMaster1	
D6 for LabJack U12 Device 1 on VisionMaster1	
D7 for LabJack U12 Device 1 on VisionMaster1	
D8 for LabJack U12 Device 1 on VisionMaster1	
D9 for LabJack U12 Device 1 on VisionMaster1	
D3 (For Emri propulsion) for LabJack U12 Device 1 on VisionMaster1	Emri System Fixipod

Figure 1.79 Discrete I/O Summary window

The window is divided into Discrete I/O Signals and Users, with all listed data displayed as hyperlinks. No entries appear in the Users column until after the various features that use discrete inputs and outputs have been configured.

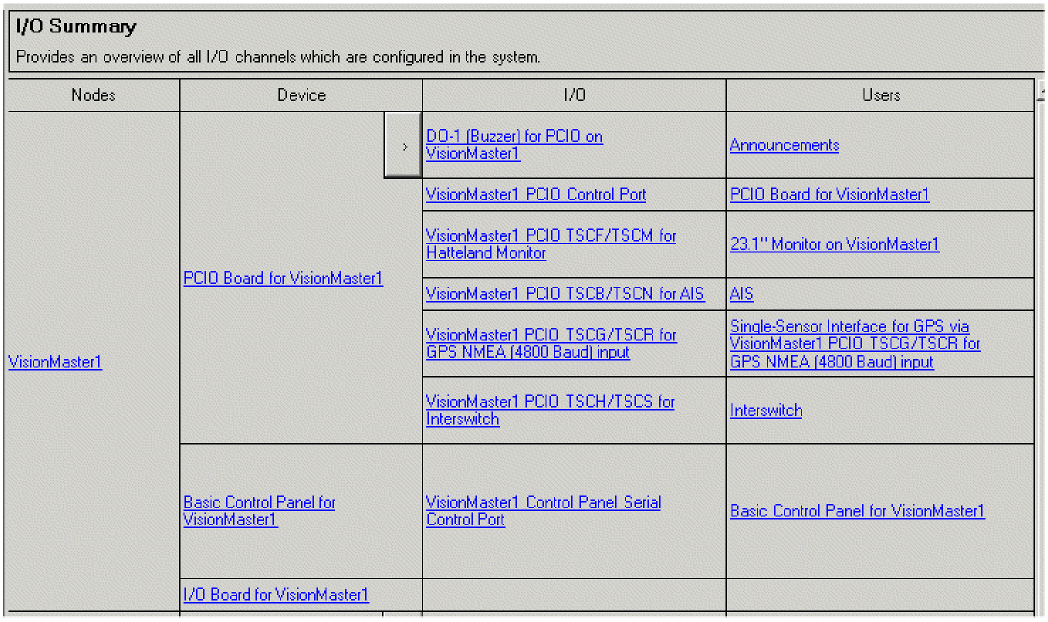
To view and/or configure an I/O signal or user click once on the hyperlink, the relevant window for the selected line topic is displayed.

7.15 I/O Summary

The I/O summary window provides an overview of all the I/O channels configured in the system.

The window is divided into four columns: Nodes, Device, I/O and Users. Each column including hyperlinks to all the nodes, I/O channels and users on the system.

Devices such as PCIO boards include a drop down arrow which when clicked provides links to the I/O ports connected to the PCIO board. The Users column will then list all the devices and services linked to the I/O ports.


I/O Summary

Provides an overview of all I/O channels which are configured in the system.

Nodes	Device	I/O	Users
VisionMaster1	PCIO Board for VisionMaster1	DO-1 (Buzzer) for PCIO on VisionMaster1	Announcements
		VisionMaster1 PCIO Control Port	PCIO Board for VisionMaster1
		VisionMaster1 PCIO TSCF/TSCM for Hatteland Monitor	23.1" Monitor on VisionMaster1
		VisionMaster1 PCIO TSCB/TSCN for AIS	AIS
		VisionMaster1 PCIO TSCG/TSCR for GPS NMEA (4800 Baud) input	Single-Sensor Interface for GPS via VisionMaster1 PCIO TSCG/TSCR for GPS NMEA (4800 Baud) input
		VisionMaster1 PCIO TSCH/TSCS for Interswitch	Interswitch
	Basic Control Panel for VisionMaster1	VisionMaster1 Control Panel Serial Control Port	Basic Control Panel for VisionMaster1
	I/O Board for VisionMaster1		

Figure 1.80 I/O Summary

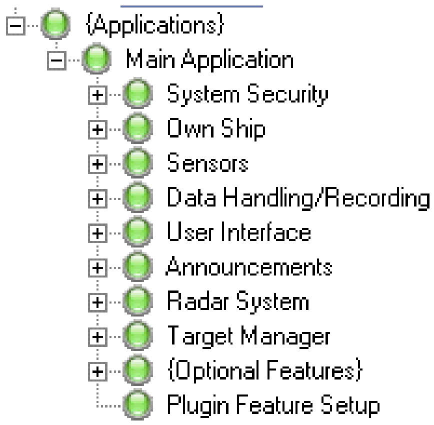
I/O channels not used in the system can be displayed by ticking the **Show unused I/Os** check box.

An I/O summary can be exported to an external device, such as a USB memory stick. The file is exported as a.csv file. To export the file click on the **Export to.CSV** file box and navigate to the device drive.

8 Applications

The Application menu specifies functions, and defines which functions use which resources.

The Main Application menu includes the following sub-menus and functions:



- System Security
- Own Ship
- Sensors
- Data Handling/Recording
- User Interface
- Announcements
- Radar System
- Target Manager
- Optional Features
- Plugin Feature Setup

Apart from Plugin Feature Setup, all sub-menus include a number of functions, for information refer to the relevant section.

8.1 Main Application

The Main Application window enables you to select the Radar System and Target Manager for the application and navigate to their configuration settings.

Optional features for the configuration can be selected from the All Optional Features list.

The window also enables an alternative product logo (or no logo) and a different product name to be configured.

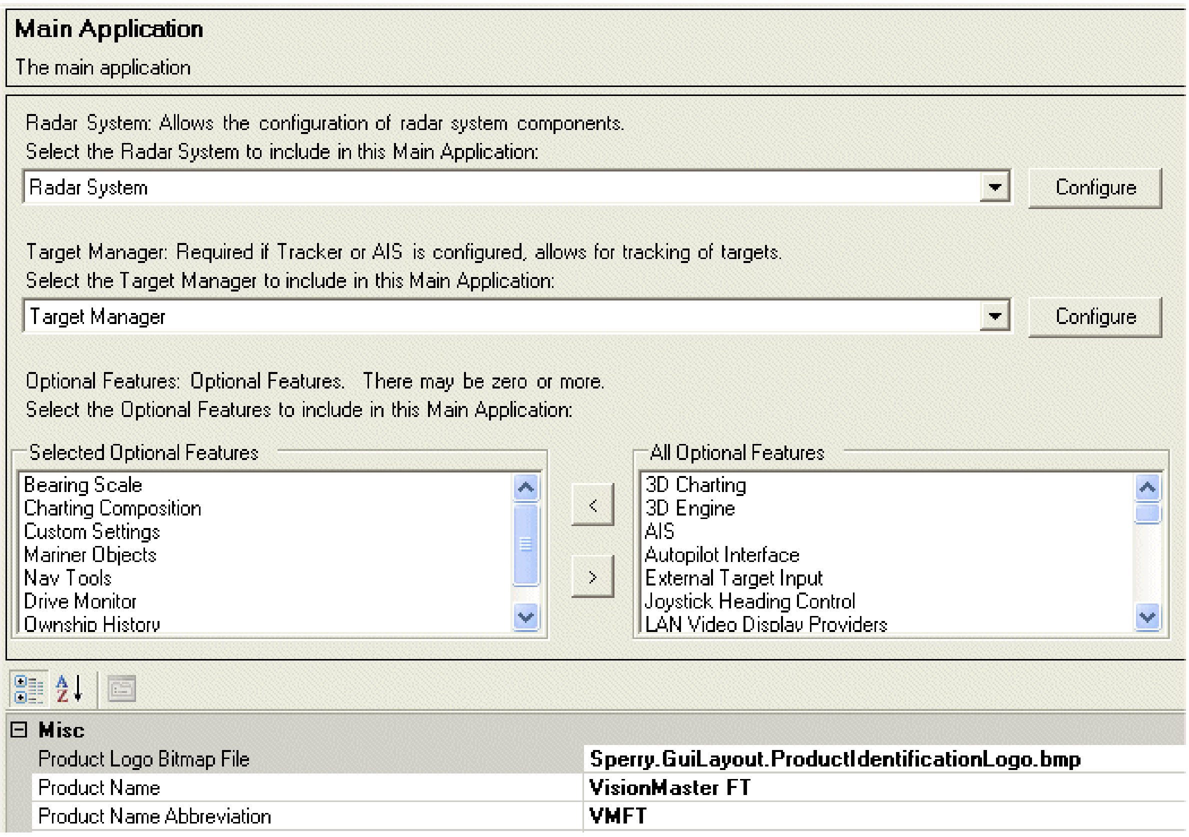


Figure 1.81 Main Application Window

8.1.1 Configuring the Main Application

1. To configure for Radar select **Radar System** from the drop down list and click on the **Configure** button. The Radar System configuration window appears, for details on this configuration, see Section 8.8 *Radar System*', *page 183*.
2. To configure the Targets select **Target Manager** from the drop down list and click on the **Configure** button. The Target Manager window appears, for details on target settings, see Section 8.9 *Target Manager*', *page 192.*

3. To select optional features highlight the feature in the **All Optional Features** list and click the **<** button, the feature is moved to the **Selected Optional Features** list. Certain selected features appear in the navigation tree and may required configuration (e.g. AIS). Removing selected features from the application is the reverse of this procedure.

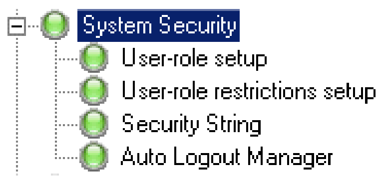
8.1.2 Configuring the Product Logo and Name

The Miscellaneous area includes the option of specifying an alternative brand to VisionMaster, including a product logo bitmap file, product name and product name abbreviation. The maximum number of characters for the product name is 20. The maximum number of characters for the abbreviation is 4.

This data should only be changed in the event that an OEM reseller * has purchased a system and requires a different brand name.

8.2 System Security

System Security includes the following sub menus:



- User-role setup
- User-role restrictions setup
- Security String
- Auto Logout Manager

A security string is required when the VisionMaster system is multi-node. The security string also defines any optional features (such as 3D Vision or CCTV) that have been purchased by the customer.

For Security String information, refer to Section A.4 ‘*Entering a Security String*’ in ‘*Appendix A Configuring A Multi-Node System*’.

8.2.1 User-Role Setup

The User-role setup window manages custom user roles. Each custom user-role maps to an inherited system role (e.g. Seaman, Ship Administrator, etc.) which determines the role level, as shown on the Security tab in Commissioning (see Chapter 2 ‘*Diagnostics, Commissioning and Service Mode*’). The user-role's level gives access to features that may be restricted to other role-levels.

The setup tab enables custom user roles to be created and system access defined:

* An OEM reseller is a term given to a company that purchases a product from another source, and implements it into their own design.

1. If custom user roles have been previously created click the User roles drop down arrow and select from the list. The inherited user roles in the Setup tab will list all the pre-defined roles and custom user roles with the exception of the user role that has been selected, see Figure 1.82.

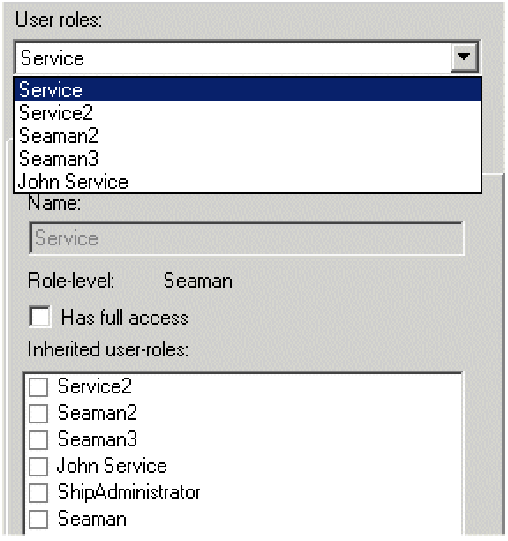


Figure 1.82 Select User Role

1. To create a new user role click the **New** button. The User roles and Name fields display **New Role 1**.
2. Click in the Name: field and enter a name for the user. The name entered here can be personalized to the specific user, e.g. **John Service**.
3. Click the **Update** button. The user name is saved and listed in the custom User roles drop down list.

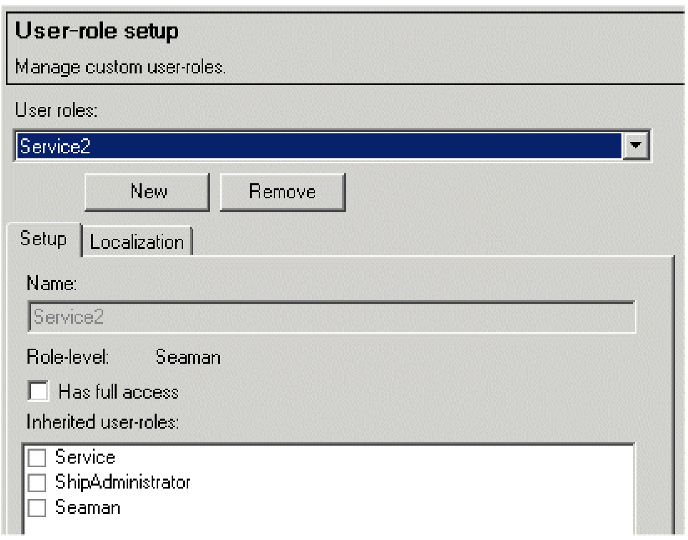


Figure 1.83 User Roles Setup

4. To allow a custom user to have full access to all system functions tick the **Has full access** check box.
5. To define the custom user role, select which inherited user roles should be inherited by ticking the **Inherited user roles** check boxes (inherited user roles will include system default roles such as Seaman, Ship Admin and Field Engineer). The role level selected is shown on the Setup tab.
6. To remove a custom user select from the drop down list, click the **Remove** button then click the **Update** button.

The Localization tab enables descriptions and localized role names to be assigned to custom user roles.

1. Click the User roles drop down list and select from the list of custom users. The localized description of the user shows **ENG New Role 1** in bold (ENG is an abbreviation of English and therefore should not be changed).
2. Select the localized description. The locale (ENG) and localized role name (New Role 1) appear in their respective fields.
3. Enter a name in the localized role name field (this is the name that will appear listed in the Permissions field of the Restrictions Setup window, and in the Security tab of the Commissioning menu). Click the **Update** button. The localized description is changed to the entered name, see Figure 1.84.
4. To delete a localized role name, select from the Localized descriptions list, click the **Remove** button then click the **Update** button.

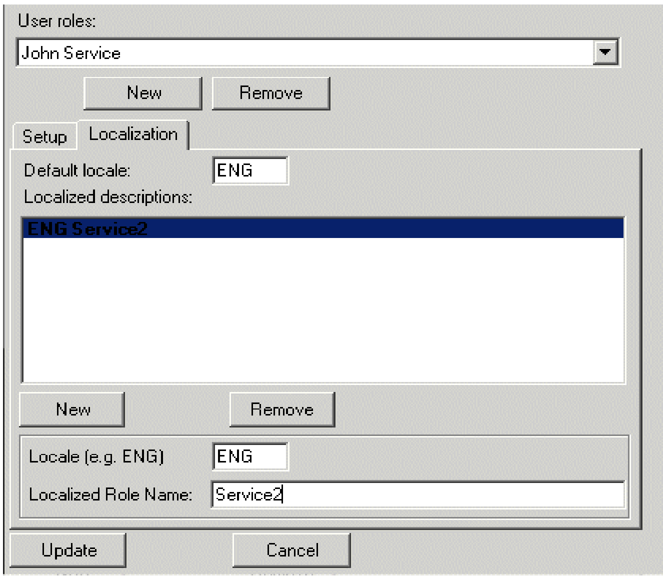


Figure 1.84 User Roles Localization

8.2.2 User-role Restrictions Setup

The user-role restrictions setup window manages restrictions and permissions to the localized and inherited user roles.

The window includes three lists: Protected items, Explicit Permissions and Resulting Permissions.

Protected Items includes **PCIO** and **Utility** menu items. These protected items can be assigned restrictions on a per user-role basis, or if no explicit restrictions are set then will inherit restrictions from inherited user-roles.

Click on the **+** buttons to view the useable controls for each menu item.

Explicit Permissions lists default user roles (Field Engineer, Ship Admin and Seaman) and custom user roles. The custom role names are the ones created in the Localized Setup tab.

Resulting Permissions is a hierarchical tree menu of localized and inherited user roles. The user role restricted setup window includes a key below the field describing the access rights icons.

To change user role restrictions for specific controls:

1. Navigate to the control in the Protected Items field and click the **Useable** item below the control. The control's default permission status is shown as a tick (allowed) or a cross (restricted) in the box below. If the default permission is restricted and no explicit permissions have been given, the only user with service access to the control is a Field Engineer.
2. To change the default permission click the **Item's default permission** check box.
3. Permission may be given for a control for selected users, even when the control's default is restricted. To allow permissions on a control for specific user roles tick the user role check box in the Explicit Permissions field. The check box is displayed with a tick and the user role in the Resulting Permissions field is also ticked.
   When assigning explicit permissions to a user role, any other roles that inherit that user-role may also inherit explicit permissions for that item.
4. To restrict permissions on the selected control click the user role's check box, the tick changes to a cross.
5. To remove the explicit settings given to all user roles for the protected item selected, click the **Remove Item explicit settings** box.

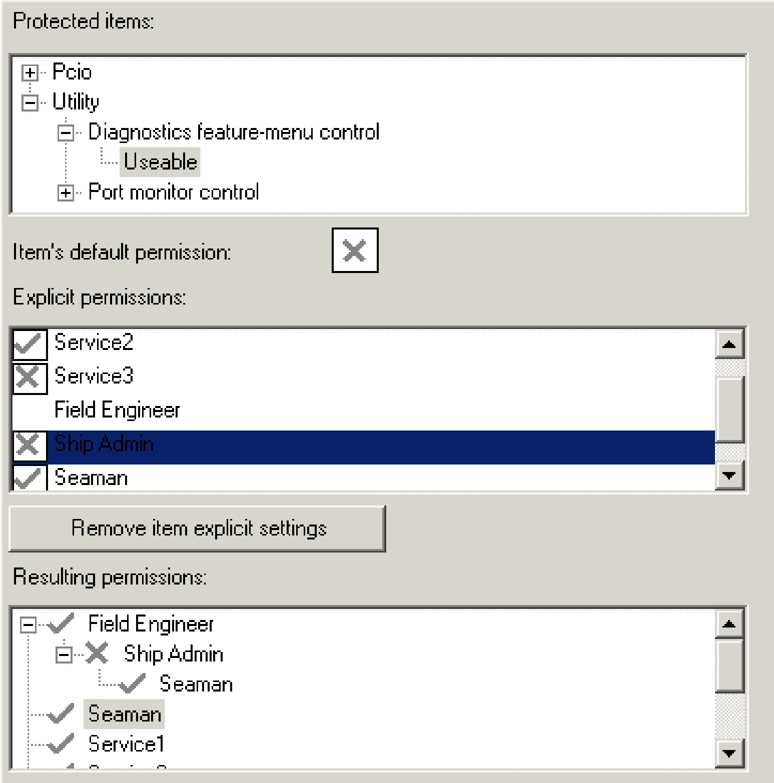


Figure 1.85 User Role Restrictions Setup

8.2.3 Auto Logout Manager

The Auto Logout Manager enables the time an inactive user is allowed to be logged in to be set, after which the system automatically logs out the user, requiring their password to be re-entered.

The default auto logout timeout period is fifteen minutes. To change this value click on **Auto Logout Manager** and enter the required time out period between 1 minute (minimum) and 30 minutes (maximum).

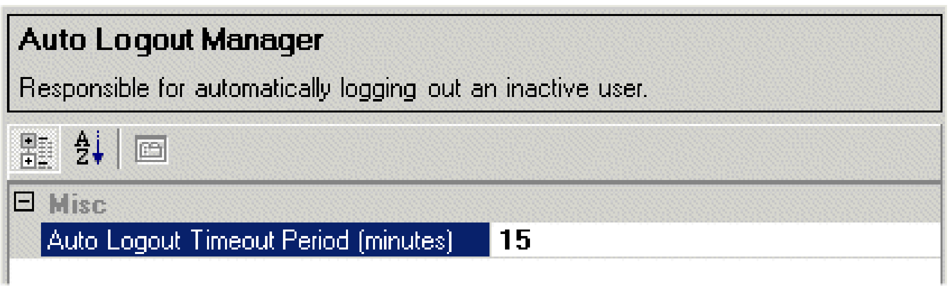


Figure 1.86 Auto Logout Manager

8.3 Own Ship

The Own Ship facility allows you to define a set of own ship characteristics (loading states, alternate bow, and custom outline) and own ship display settings (predicted vector and next turn EBL).

8.3.1 Own Ship Characteristics

The Own Ship Characteristics window shows the following settings:

- Ship loading states
- Alternate Bow in Use inputs
- Dimensions, speed settings and turn rates
- Custom outline configuration

Alternate bow distances, own ship dimensions, miscellaneous settings and custom outline configuration are described in the Quick Setup section, see Section 5.7 *Own Ship Characteristics*'.

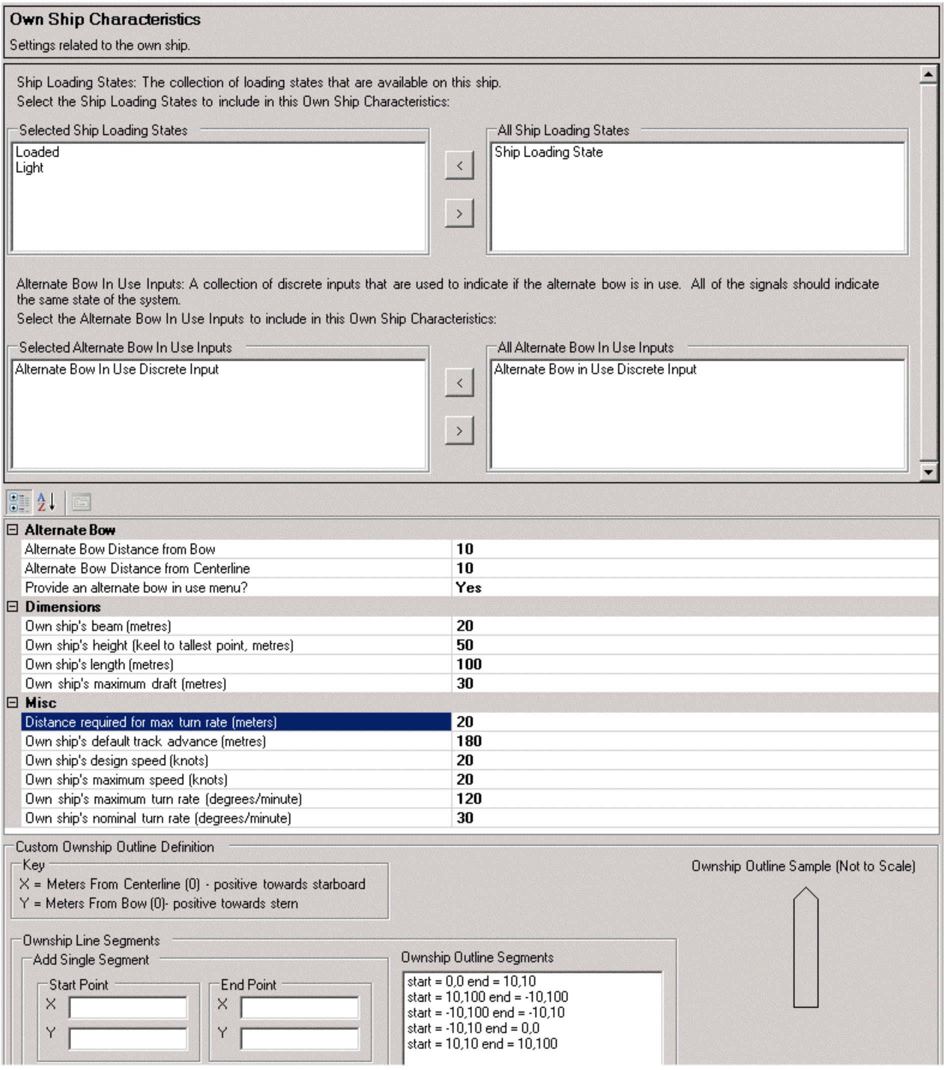


Figure 1.87 Own Ship Characteristics

8.3.1.1 Ship Loading State

A collection of ship loading states may be created.

Note: *Individual ship loading states should only be configured if the VM system includes the optional feature of a propulsion control interface, see Section 8.10.19 Propulsion Control Interface'.*

To define a loading state, highlight **Ship Loading State** in the All Ships Loading States column and click the **<** button. An unconfigured line is added to the {Ship Loading States} in the navigation tree.

To configure the loading state, click on the topic and from the subsequent window enter a unique name based on the current ship's load in the **Loading State Name** field. The ship loading state is configured.

8.3.1.2 Alternate Bow in Use Inputs

An alternate bow relative to the main bow may be used. Signals are provided by discrete inputs that indicate when the alternate bow is in use. All input signals should reflect the same system state.

When the alternate bow is in use the heading marker offset for all top units is automatically adjusted by 180°. When the bow in use changes, the radar remain in transmit without adverse effects, excluding re-building trails and re-acquiring targets.

Note: *The Alternative Bow in Use feature is not permitted if there is a Cat 2 Radar product type node configured, see Section 5.3 Nodes'.*

To configure an Alternate Bow:

1. Select **Alternate Bow in Use Discrete Input** by clicking the **<** button. An unconfigured line appears below the Alternate Bow in Use Inputs sub menu.
2. Open the unconfigured topic and select the discrete input to be used by the alternate bow in use, see Figure 1.88.

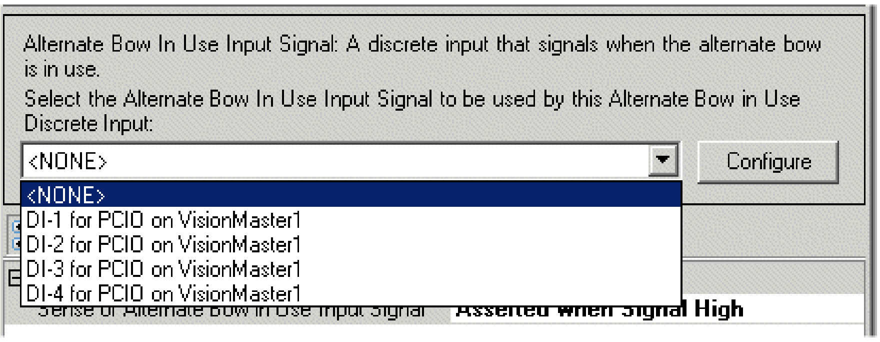


Figure 1.88 Alternate Bow in Use Discrete Input

3. The input signal defaults to sensing when the signal is high, this may be changed to asserting when the signal is low. Normally this setting should not be changed.

8.3.2 Own Ship Display

The Own Ship Display sub menu includes configuration of the following settings:

- Ownship Presentation Settings
- Predicted Vector and Next Turn EBL Output

8.3.2.1 Ownship Presentation Settings

This setting enables ownship ground velocity vector and predicted vector to be displayed simultaneously on the VisionMaster display.

The recommended setting is **No.**

To enable both presentation settings to be displayed select **Yes**.

> **CAUTION!**
>
> When Yes is selected a Warning message is generated informing that the simultaneous display of both vectors is not in accordance with IEC 62388. See Section 4.3.1 *Warning Messages*'.

8.3.2.2 Predicted Vector and Next Turn EBL Output

This setting enables predicted vector and next turn EBL output to be enabled.

In order to be backward compatible, VisionMaster is required to output a VMS Graphics (VMSG) sentence. The VMSG sentence provides Predicted Vector and Next Turn EBL data so that a receiving workstation can generate a graphic representation of the data as similar as possible to the graphics displayed at the sending workstation. This is used when a VisionMaster workstation is connected to a legacy system that is incapable of generating Predicated Vector or Next Turn EBL data.

Predicted Data and Next Turn EBL output are nominally configured for multi-node systems.

If the Predicted Vector display is on at the configured node, then the system transmits the VMSG sentence with correct data for the Predicted Vector data fields, with the data fields reflecting the Predicted Vector display on that node. If the Predicted Vector display is off at the configured node, then the system transmits the data fields as null.

If course mode is active, the system transmits correct data for the Next Turn EBL data fields. If course mode is inactive, then the system transmits the Next Turn EBL data fields as null.

To configure one or more Predicted Vector and Next Turn EBL output items:

1. From the Own Ship Display select Predicted Vector and Next Turn EBL output from the **All** field and click on the **<** button to move the item to the **Selected** field. An unconfigured line for the item appears in the navigation tree.

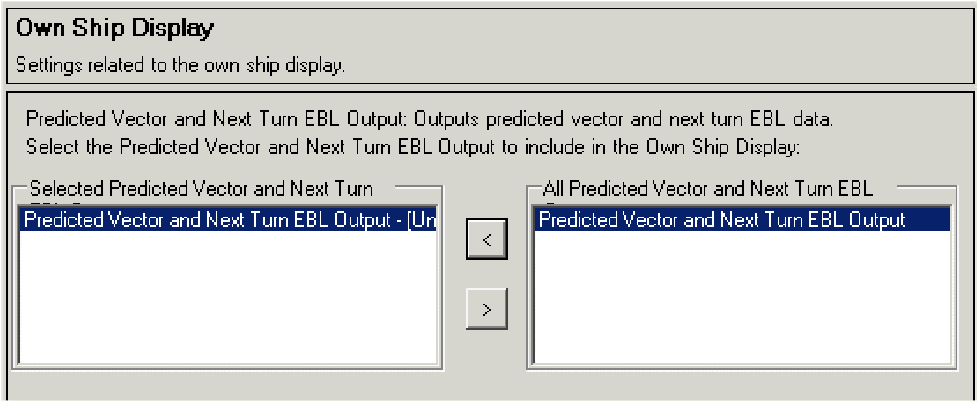


Figure 1.89 Own Ship Display

2. Click on the Predicted Vector and Next Turn EBL output line in the navigation tree. The configuration window for the item appears.
3. Click on the drop down arrow on the Port field to select the output port to be used for the item. The field displays a list of the currently configured ports. Select the port to be used from the list.
4. When a port is selected for use the item's status button colour in the navigation tree changes from red to green (valid).

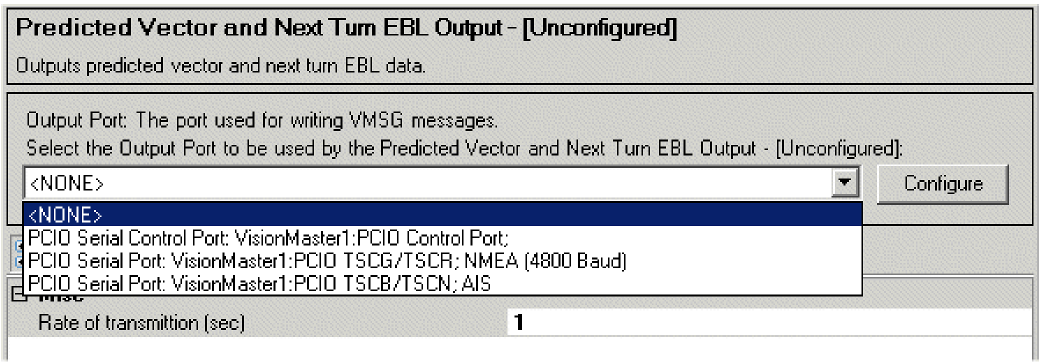


Figure 1.90 Predicted Vector and Next Turn EBL output configuration

5. To change the configuration of the port click the **Configure** button. The configuration window for the selected port appears, see Figure 1.56.
6. To change the rate that the VMSG sentence is sent from the default of 1 second to a value of up to 59 seconds click in the field and enter the required value using the keypad.
7. If required, additional Predicted Vector and Next Turn EBL output items may be configured using the steps listed above.

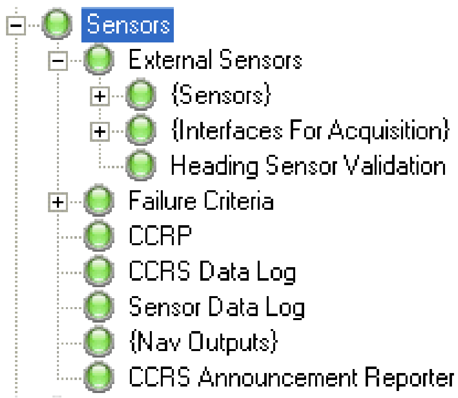
8.4 Sensors

The Sensors menu details the configuration of all sensor data acquisition and usage.

The menu also includes the configuration of the CCRP (consistent common reference point) with regards to own ship, the configuration of the CCRS* and Sensor data logs and the selection of a nav output for configuration.

The Sensors menu is divided into the following functions:

- External Sensors, including the following sub menu functions:
  - Sensors
  - Interfaces for Acquisition
  - Heading Sensor Validation
- Failure Criteria
- CCRP
- CCRS Data Log
- Sensor Data Log
- Nav Outputs
- CCRS Announcement Reporter



* Consistent Common Reference System (CCRS) data includes the various types of data that describe the state of the ship, and which are usually received via sensors. Many of these types describe a characteristic of the ship itself (for example, the ship's heading, or the geodetic position of the ship, etc.), while others describe a characteristic of something associated with the ship, such as `Rudder Angle' or `Propeller Rpm and Pitch'.

The Sensors window enables you to select a Nav output port, provide sensor selection for attitude and heave data and select the types of wind data that will be displayed in the wind selection menu.

A Nav Output port can be selected from either the Sensors window, or from the Nav Outputs window. For information on configuring a Nav Output see Section 8.4.6 *Nav Outputs*'.

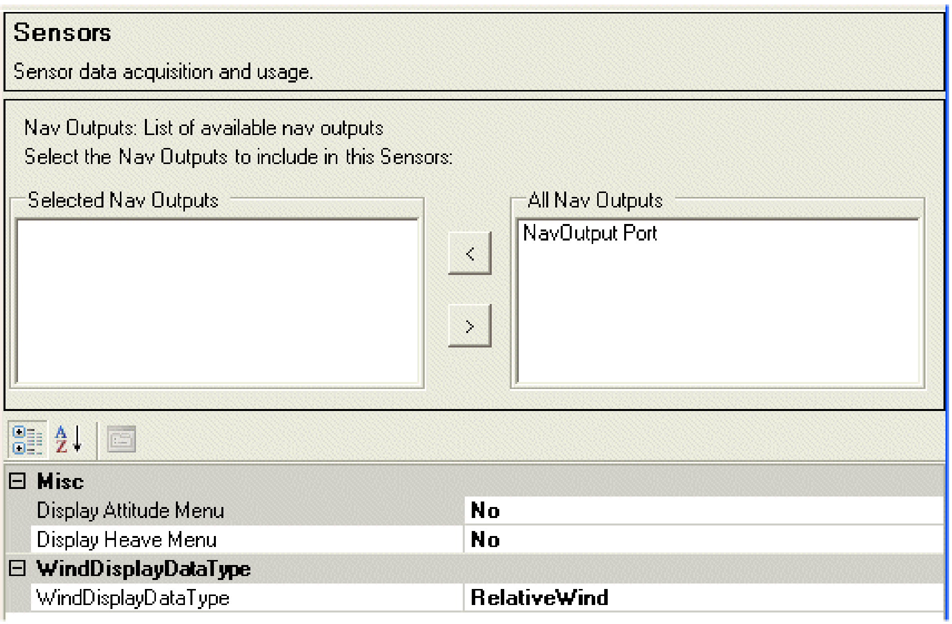


Figure 1.91 Sensors Window

8.4.1 External Sensors

The External Sensors sub menu lists in the right hand columns all types of sensors and interfaces for acquisition that may be connected to the system. The user may select any number of these items to be included in the configuration by selecting the item in the **All..** columns and clicking on the **<** button to move the item into the **Selected..** columns. Figure 1.92 shows the default settings for external sensors.

Note: *Fugro Trim Sensor and Rolls Royce Propulsion System Sensor may be included in the Selected Sensors list for Conning Info Display (CID) configuration. For details refer to "Configuring a Fugro Trim Sensor" on page 1-121 and "Configuring a Rolls Royce Propulsion System Sensor" on page 1-123.*

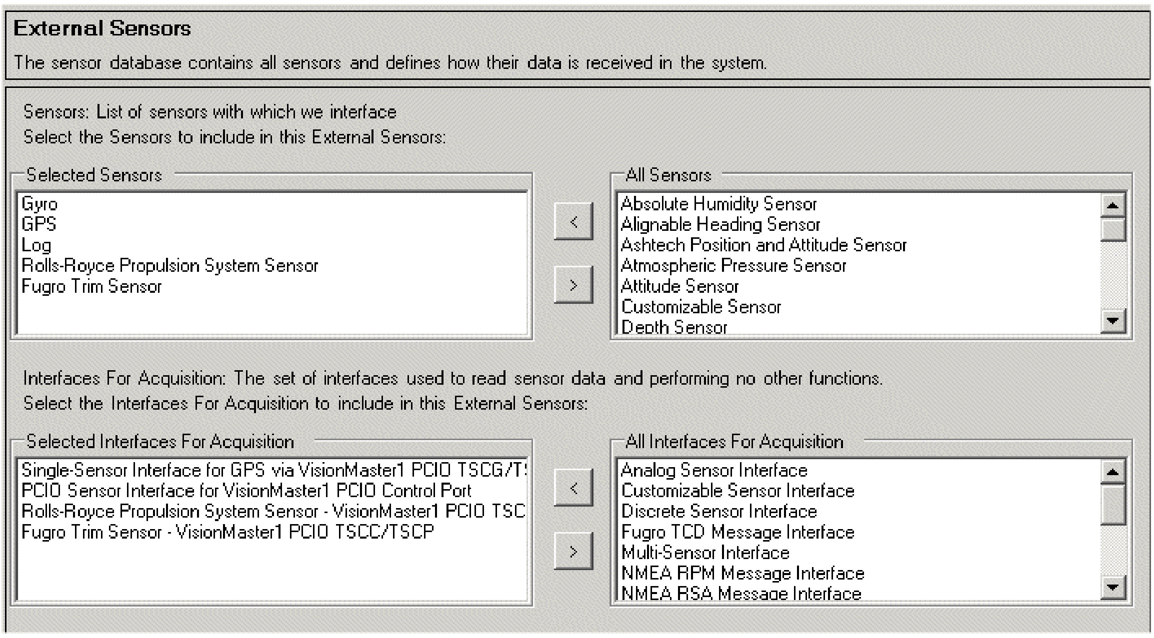


Figure 1.92 External Sensors

External Sensors is divided into the following two areas:

- Sensors
- Interfaces for Acquisition

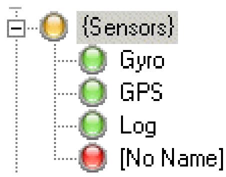
Note: *Not all the sensors and interfaces listed in the right hand columns are detailed in this section. Only the sensors and interfaces that are required to run a standard VisionMaster system, plus the interfaces that you may require (such as multi-sensor interface, and customizable sensor interface) are described.*

8.4.1.1 Sensors

The Sensors area of the window enables you to select the sensors which the system will interface to.

There are a minimum of three sensors that are required to interface with the VisionMaster system and are enabled at commissioning. These are shown in the Sensors list as follows:

- Gyro (Alignable Heading Sensor)
- GPS (Position Sensor)
- Log (Water Speed Sensor)



To add more sensors from the All Sensors list highlight the sensor name and click on the **<** button. The highlighted sensor is moved to the Selected Sensors field and the navigation tree lists the selected sensor as an unconfigured **[No Name]** topic in the Sensors sub-menu with the sensor's status button displayed in red.

The following sub sections give information on configuring the default sensors listed above.

Configuration of the following additional sensor types is also described.

- Wind
- Generic Data
- Rudder System

Configuring an Analog Heading Sensor: Gyro

Figure 1.93 below shows default settings for a Gyro Alignable Heading Sensor.

A Gyro sensor is configured where an analog heading sensor is connected to the system with data acquired via a syncro or stepper interface, see Section 8.4.1.2 *Interfaces for Acquisition*', '*PCIO Sensor Interface*'.

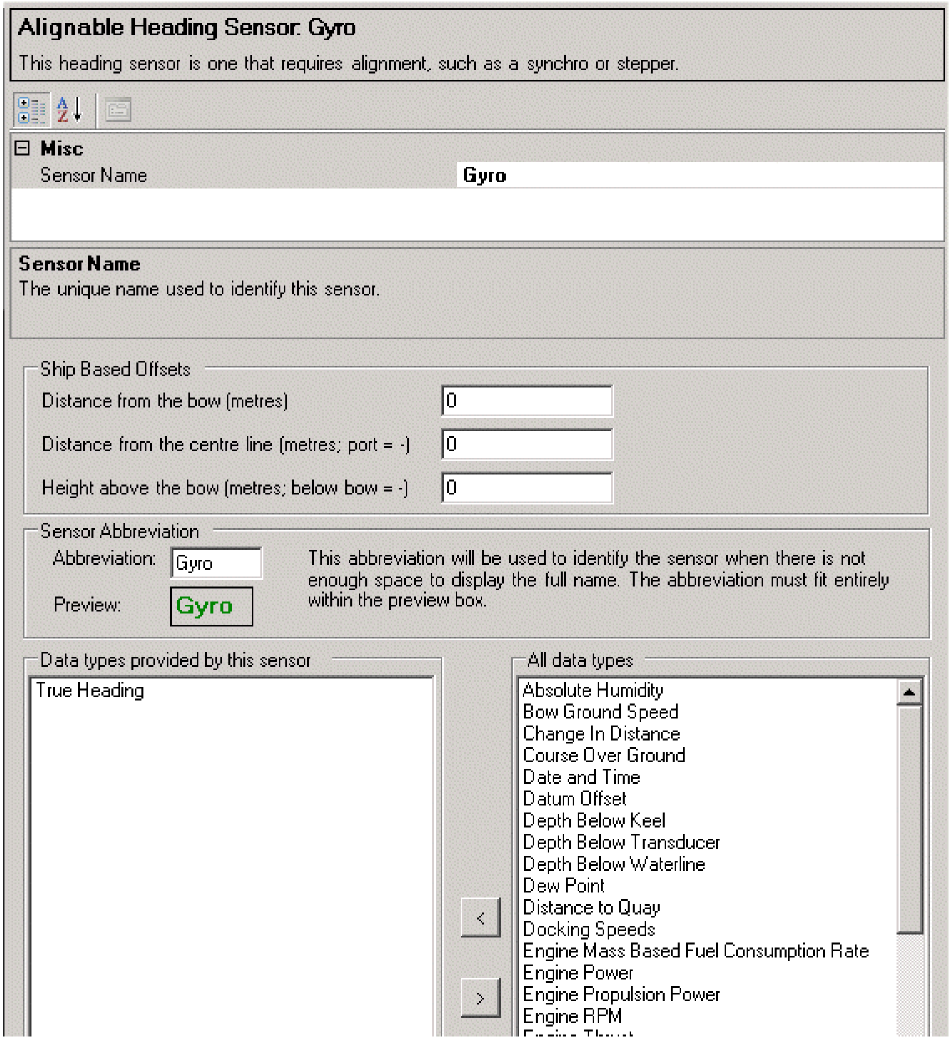


Figure 1.93 Configuration Window for Alignable Heading Sensor

Configurable data includes sensor name, sensor position (ship based offsets), abbreviation and selection of data types provided by the sensor.

To change the Gyro Sensor settings do the following:

1. To change the default name of 'Gyro' enter a name in the **Sensor Name** field. This is usually the descriptive name of the sensor hardware. On a multi-node system it is important that all heading sensors are assigned the same name. See 'Important Note' at the end of this section.

2. If precise distances and height position values of the sensor to the vessel are available, enter the position data of the sensor in the relevant fields of the Ship Based Offsets area.
3. The abbreviation is used to identify the sensor when there is not enough space to display the full name (for an alignable heading Gyro the abbreviation 'Gyro' should be used). When an abbreviation is entered the name appears in the preview box as green characters, if too many characters are entered, the text colour changes to red.
4. The type of data provided by the Gyro sensor defaults to **True Heading**. To select other data types for this sensor highlight from the All Data Types list and click the **<** button. The selected data types are moved to the left column.

Important Note: *In a multi-node system each PCIO must be physically connected to the same set of heading sensors. For information on configuring a set of sensors for a multi-node system, refer to Section 5 Configuring Resources' in 'Appendix A Configuring A Multi-Node System'.*

Configuring a Serial Heading Sensor

If a non-alignable serial compass sensor is connected to the system the data is acquired via the 38400 baud TSCA input on the PCIO Control Port. For a serial compass sensor a serial heading sensor must be configured.

The data types provided by a serial heading sensor may be True Heading, or Magnetic Heading. If a magnetic heading sensor is configured the system can calculate true heading by applying magnetic variation and deviation offsets to the magnetic compass heading, or deviation values may be manually entered.

A configured serial heading sensor is required to be selected at the PCIO Sensor interface configuration window, under **High Speed Serial Compass Sensor**, see Figure 1.115.

Note: *Only one type of heading sensor (analog heading or serial heading) can be configured for the system. Each node in a multi-node system must have the same heading sensor defined.*

Serial Heading Sensor - True Heading

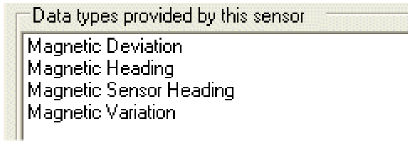
To configure a serial heading sensor as true heading, select **True Heading Sensor** from the All Sensors column. Configure the sensor as described previously for an Analog Sensor.

Note that the True Heading configuration window includes selection of the IO Port interface that will be used to obtain the sensor data. When true heading sensor is selected for the high speed serial compass at the PCIO Sensor Interface window the PCIO Control Port is automatically selected as the IO port interface.

Serial Heading Sensor - Magnetic Heading

To configure a serial heading sensor as magnetic heading, select **Magnetic Heading Sensor** from the All Sensors column.

The data types provided when a magnetic heading sensor is selected include magnetic deviation, heading, sensor heading and variation as default.



A Magnetic Heading Sensor configuration window also includes the option of configuring deviation values. If set to **No** (default) then the magnetic compass must provide the deviation values to the sensor. To manually enter deviation values click on the **Configure Deviation Values?** drop down arrow and select **Yes**. A three-column table appears where Magnetic Sensor Heading, Deviation (Degauss On) and Deviation (Degauss Off) values may be entered, see Figure 1.94. When a deviation value has been entered the table auto-generates an additional row. To delete a row click its **X** button.

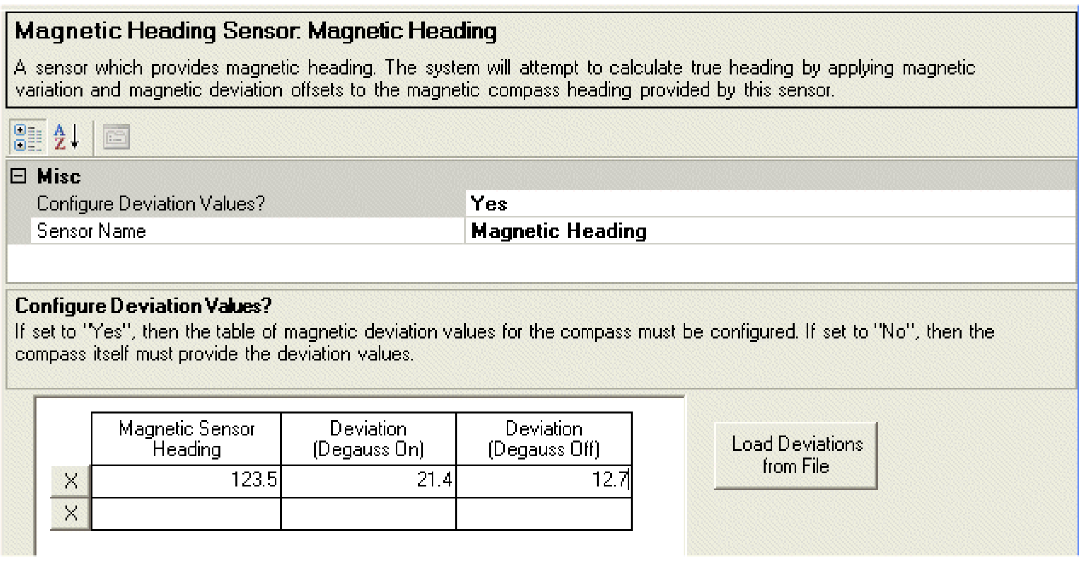


Figure 1.94 Magnetic Heading Sensor with Deviation Values

To load a set of deviation values from a file or external device click the **Load Deviations from File** button. A popup window enables you to navigate to deviation files (INI files).

Other configuration settings, such as Sensor name, Abbreviation and selection of additional Data Types are made as described previously for an Analog Heading Sensor.

Configuring a Position Sensor: GPS

Figure 1.95 below shows default settings for a GPS Position Sensor.

A GPS sensor is configured where position data is being received from a GPS or GLONASS receiver.

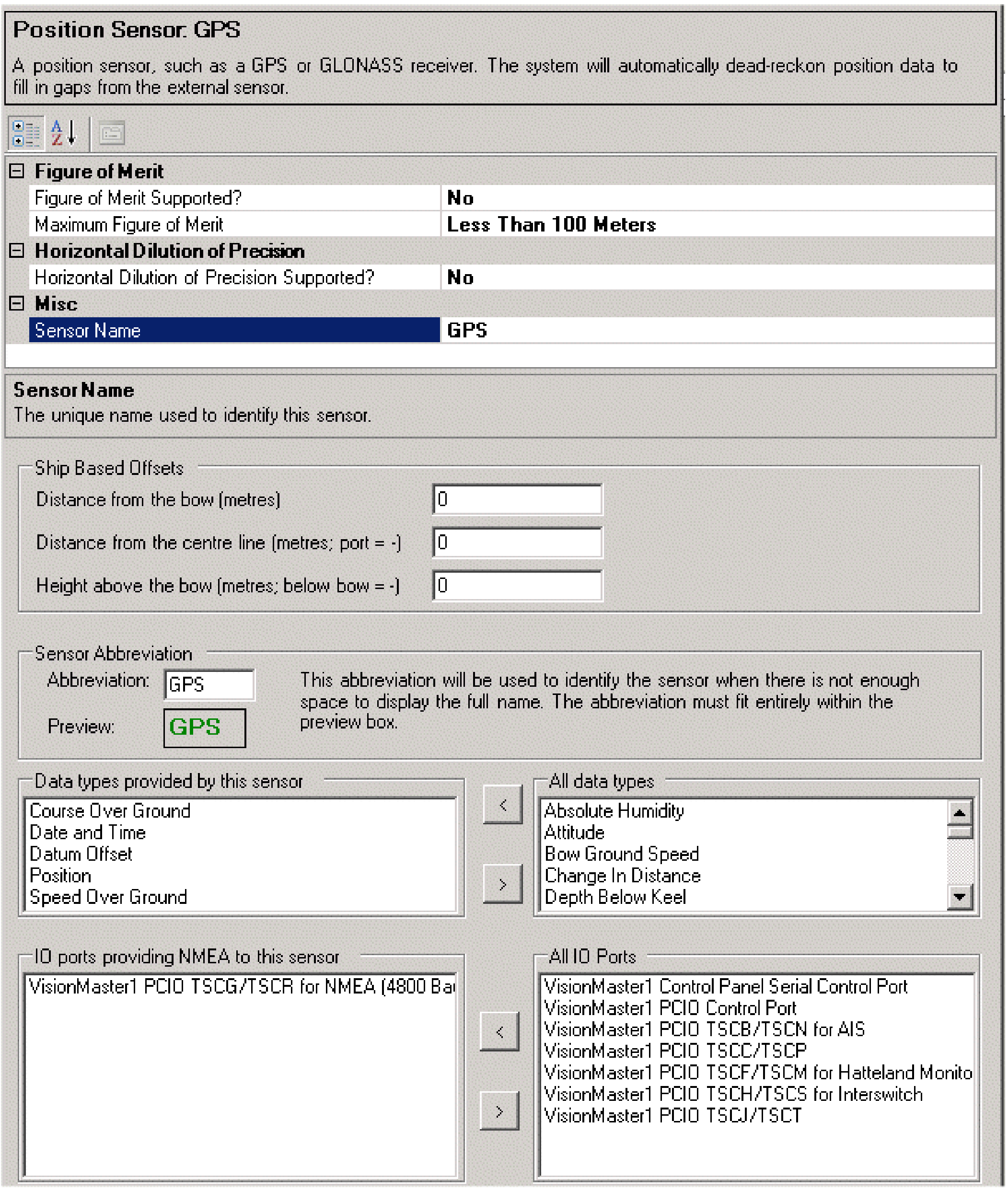


Figure 1.95 Configuration Window for a Position Sensor

In addition to the configurable options of sensor name, sensor position, abbreviation and selection of data types previously described in the Gyro Sensor, the Position Sensor configuration window includes the following additional settings:

- Figure of Merit information - the **Figure of Merit Supported?** setting should always be set to No.
- Horizontal Dilution of Precision - whether to use supplied horizontal dilution of precision information for this sensor. Normally set to No.
- Data Types - the position sensor configuration window automatically selects the data types provided for this sensor, in addition to Position. These data types may be configured where necessary. For example, if your GPS unit does not provide datum offset information (DTM NMEA messages), remove the **Datum Offset** from the All Data Types column. Or, if you have a GPS-Gyro that provides position and heading, add True Heading to the list of data types provided by the GPS.
- IO Ports - this is the interface that will be used to obtain the sensor data, see Section 8.4.1.2 *Interfaces for Acquisition*'. The All IO Ports column lists all the I/O ports on the system, as defined in Section 7.9 *I/O Port Manager*'. A different I/O port for the GPS sensor may be configured where necessary and then selected from the All IO Ports column.

The display and selection of the IO Port on a sensor configuration window is limited to the following sensor types:

- Position
- Depth
- Ground Speed
- Water Speed
- True Heading
- Wind

Configuring a Water Speed Sensor: Log

Figure 1.96 below shows default settings for the sensor that measures the water speed.

The water speed is generated either via a pulse log interface on the PCIO Control Port, or another PCIO serial interface (TSCD, or TSCE for dual axis log) see Figure 1.115 '*PCIO Sensor Interface - configuration*'.

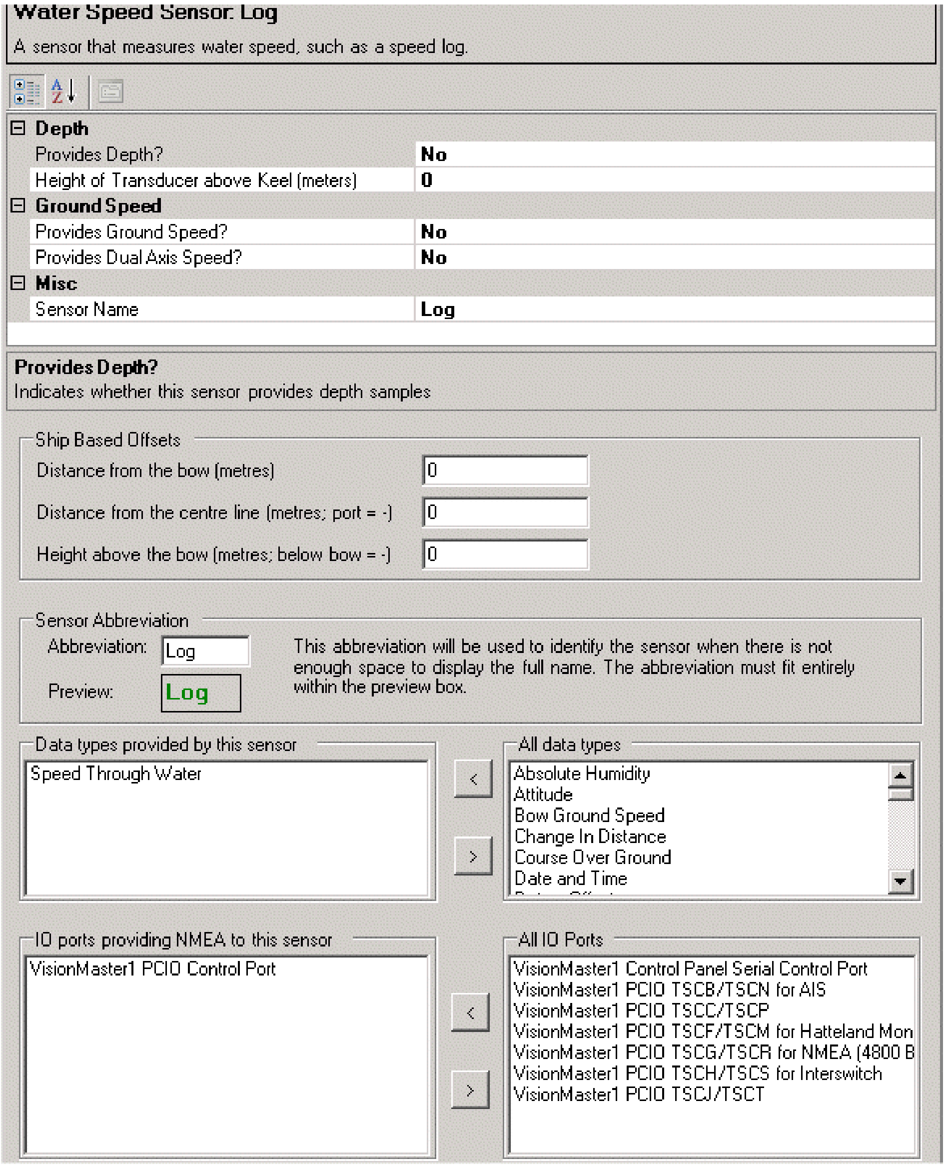


Figure 1.96 Configuration Window for a Water Speed Sensor

In addition to the configurable options of sensor name, sensor position, abbreviation and selection of data types previously described, the Water Speed Sensor configuration window includes the following additional settings:

- **Depth -** indicates whether this sensor provides depth samples. To enable depth samples to be made click on the drop down arrow and select Yes.
- **Height of Transducer above Keel -** if the sensor has been enabled to provide depth samples the height of the transducer above the keel must be entered to provide an offset to the depth below keel measurements.
- **Ground Speed -** indicates whether this sensor provides ground speed samples. To enable samples to be made click on the drop down arrow and select Yes.
- **Dual Axis Speed -** indicates whether this sensor provides ground speed samples. To enable samples to be made click on the drop down arrow and select Yes.

Configuring a Wind Sensor

When a wind sensor is selected the system creates the sub menus 'Relative Wind Directional Offset Translation Table' and 'Relative Wind Speed Scale Factor Translation Table' in the navigation tree.

Wind data may be received in the following three forms:

- Relative Wind with Relative Direction
- True Wind with True Direction
- True Wind with Relative Direction

A wind sensor may provide data in any subset of these three forms, which are automatically selected in the data types column. Whenever any one of these forms is not included, the system computes the values for the missing forms. The system treats the computed data in the same way it would if this data had been received directly from the sensor.

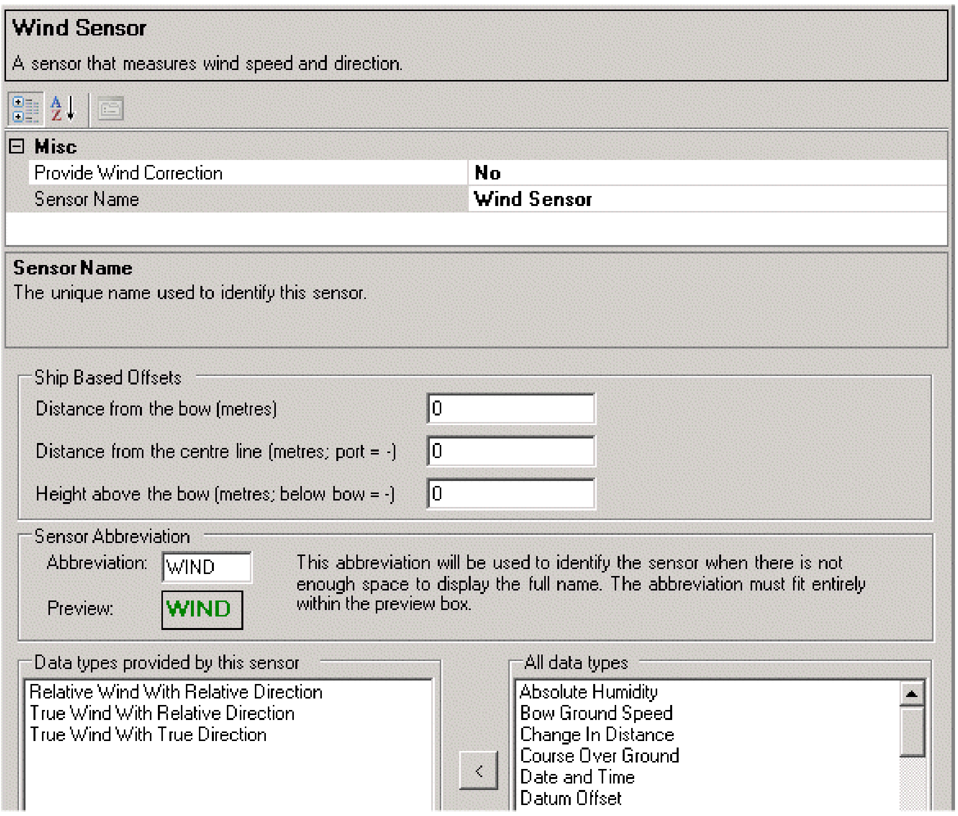


Figure 1.97 Wind Sensor

Wind sensors can be configured with a set of correction factors that apply at various wind directions. These correction factors must be configured if the **Provide Wind Correction** field is set to **Yes**.

When Yes is selected the Relative Wind Directional Offset and Relative Wind Speed Scale Factor translation table status buttons become unconfigured. The translation tables are not enabled if Wind Correction is set to No.

Configuring Wind Correction Translation Tables

The wind correction option allows wind sensors to be configured with a set of correction factors that are automatically applied to the sensed wind data at various wind directions.

When enabled, the translation tables provide a means of entering a set of adjustments to the relative wind speed and relative wind direction. The system then applies the correction factors to generate corrected versions of all three types of wind data and only uses the corrected values wherever the particular wind sensor's data is used or displayed.

Adjustment parameters are entered as directional offsets and/or speed scale factors. Up to 36 adjustment parameters may be entered for each translation table.

Directional Offset

To enter directional offset parameters click on the **Relative Wind Directional Offset Translation Table** topic in the navigation tree.

In the table columns enter observed relative wind directions and the required directional offset values in degrees.

When two or more rows of data are entered the system translates the offset values entered for the relative wind direction and draws a translation curve, based on the given data.

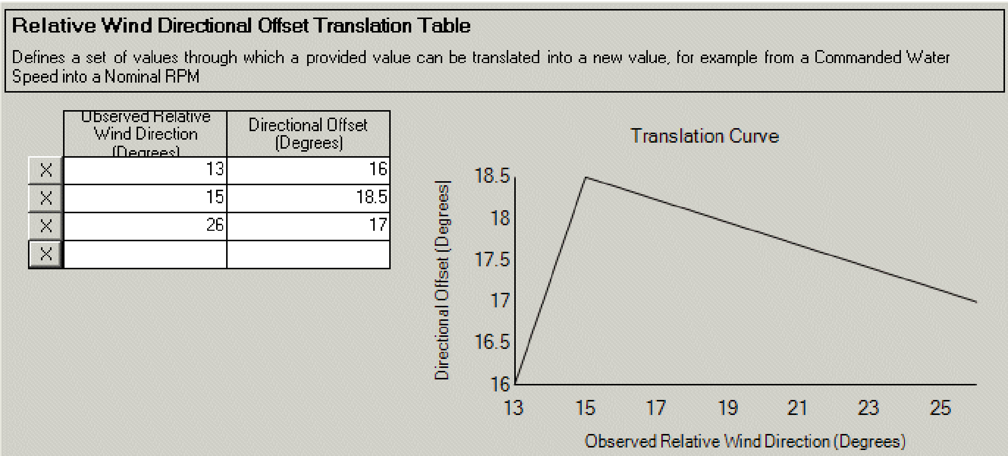


Figure 1.98 Relative Wind Directional Offset Translation Table

Speed Scale Factor

To enter speed scale factors click on the **Relative Wind Speed Scale Factor Translation Table** topic in the navigation tree.

In the table columns enter observed relative wind directions and the required speed scale factor values in knots.

When two or more rows of data are entered the system translates the speed scale factors entered for the relative wind direction and draws a translation curve, based on the given data.

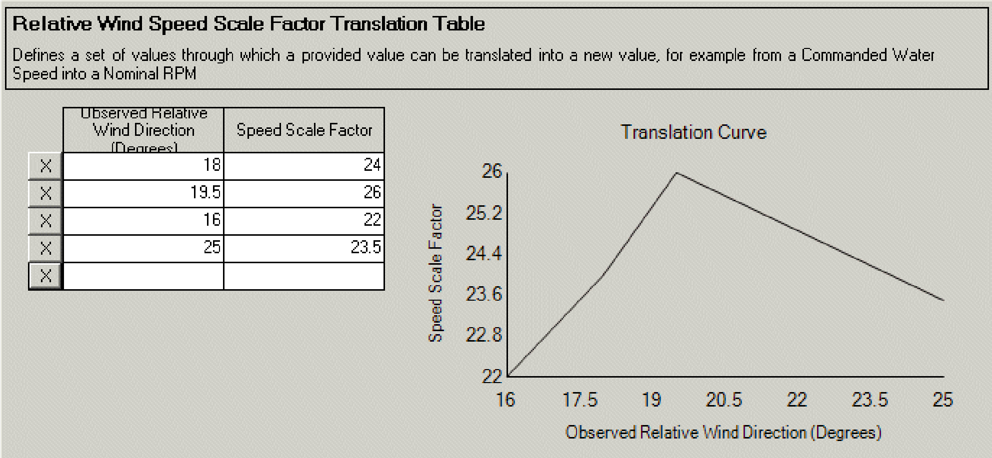


Figure 1.99 Relative Wind Speed Scale Factor Translation Table

Configuring a Generic Data Sensor

A generic data sensor is used to provide non-navigation related data, which may be received from an analog interface or an NMEA XDR message interface.

Generic data, received over a particular interface, is usually displayed on a Conning Information Display (CID) element and is defined by the data type selected from the Type of Data drop down list, see Figure 1.100.

For information on creating CID elements, see Chapter 3 '*Configuring a Conning Information Display*'.

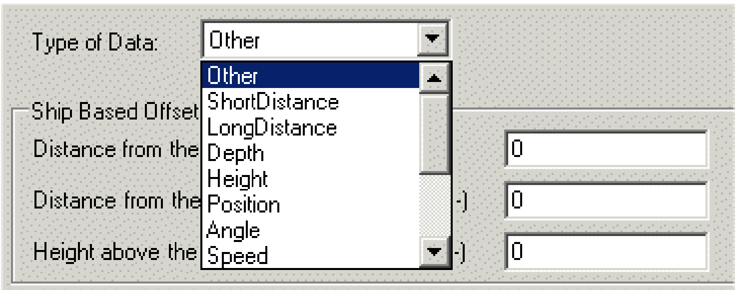


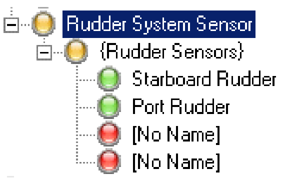
Figure 1.100 Generic Data Sensor- Select Type of Data

Configuring a Rudder System Sensor

This sensor represents the entire rudder system of the ship, which will consist of multiple distinct rudder sensors.

When selected, the rudder system sensor generates two rudders; Port and Starboard.

If the ship has more than two rudders, select the number from the Rudder System Sensor drop down list. The navigation tree will list the extra rudders as unconfigured **[No Name]** topics.



To configure a rudder sensor:

1. Enter a name for the sensor, usually a descriptive name for the rudder location. The given name appears in the navigation tree.
2. Enter the position data of the sensor in the relevant fields of the Ship Based Offsets area.
3. Enter an abbreviation used to identify the sensor.

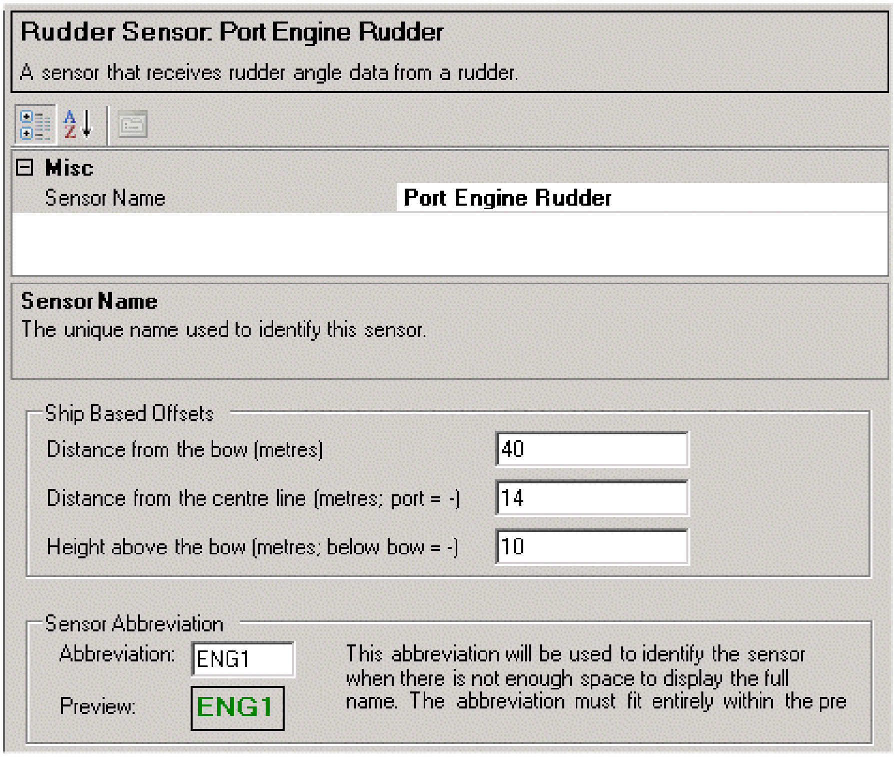


Figure 1.101 Configuration Window for a Rudder Sensor

Configuring a Fugro Trim Sensor

This sensor is required when a Fugro Marinestar system is being used. To configure a Fugro trim sensor:

1. From the External Sensors window select **Fugro Marinestar Dynamic Trim Sensor** from the list of all sensors. An unconfigured sensor is added to the list of sensors in the navigation tree, see Figure 1.102.

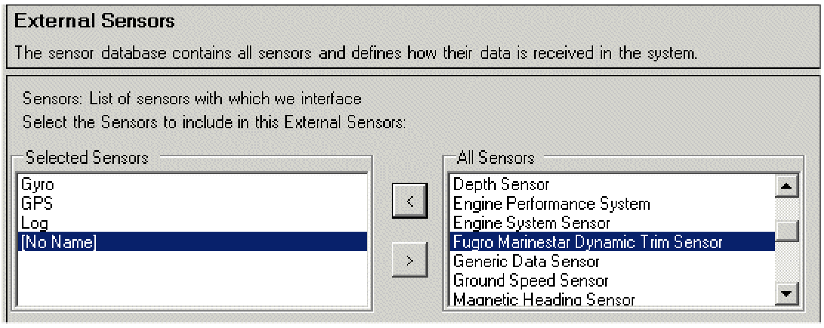


Figure 1.102 Fugro Trim Sensor Selection

2. Open the sensor page by clicking on [**No Name**] in the navigation tree.
3. Enter a name used to identify the sensor in the Sensor Name field. The given name appears in the navigation tree.
4. Enter the position data of the sensor in the relevant fields of the Ship Based Offsets area.
5. Enter an abbreviated name in the Sensor Abbreviation field.

Note that after entering a name and abbreviation, the sensor will remain unconfigured until a suitable interface has been selected and configured.

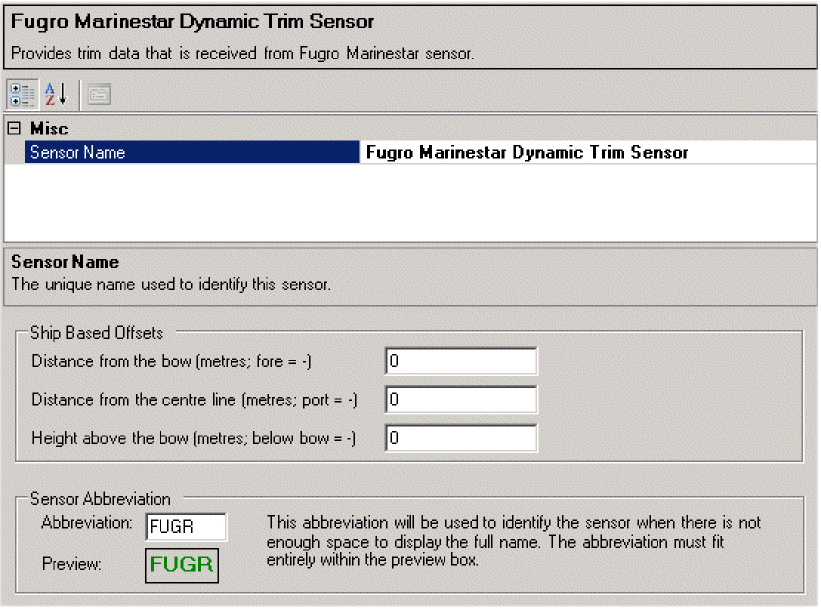


Figure 1.103 Fugro Trim Sensor Window

To configure an interface for the Fugro trim sensor:

1. From the Interfaces For Acquisition area of the External Sensors window select **Fugro TCD Message Interface** from the list of All Interfaces. An unconfigured topic is added to the Interfaces For Acquisition list in the navigation tree, see Figure 1.104.

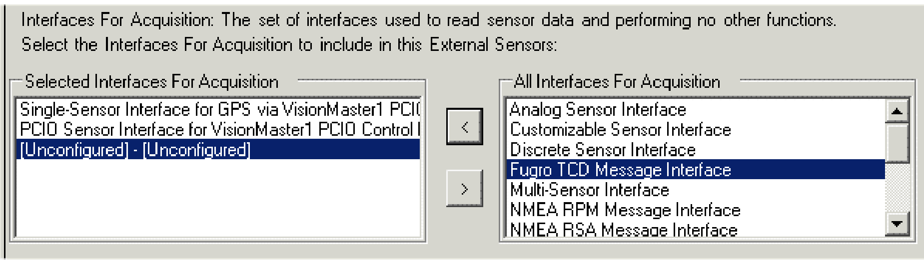


Figure 1.104 External Sensors Fugro Interface Selection

2. Open the topic and select the name of the Fugro Trim sensor as entered in the Sensor Name.
3. Select the port that this interface receives data over by clicking on the Port drop down arrow and selecting from the configured ports list.

When an interface has been configured the external sensor topic status becomes valid.

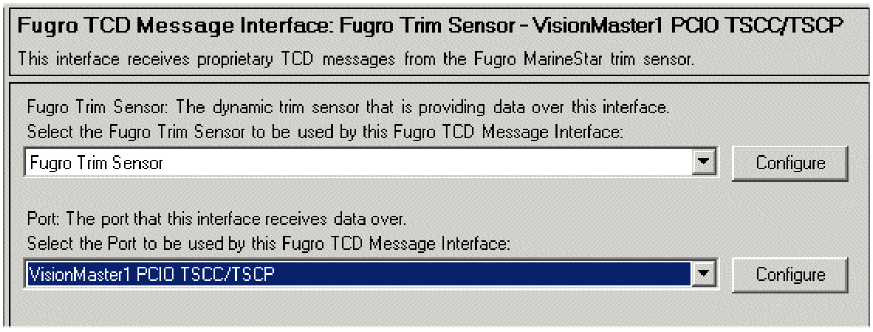


Figure 1.105 External Sensors Fugro Interface Configured

In addition to the configuration of a Fugro trim sensor described above a Conning Information Display (CID) page is also required to be configured from the CID Designer. For information on this refer to Section 2.4.3 *Creating a Page for Fugro Trim Sensor*' in Chapter 3 '*Configuring a Conning Information Display*'.

Configuring a Rolls Royce Propulsion System Sensor

This sensor is required when a Rolls Royce propulsion system is being used.

To configure a Rolls Royce Propulsion system sensor:

1. From the External Sensors window select **Rolls Royce Propulsion System Sensor** from the list of all sensors. The sensor name is automatically added to the list of sensors and the navigation tree creates a hierarchical sub menu for sensor message identifiers.

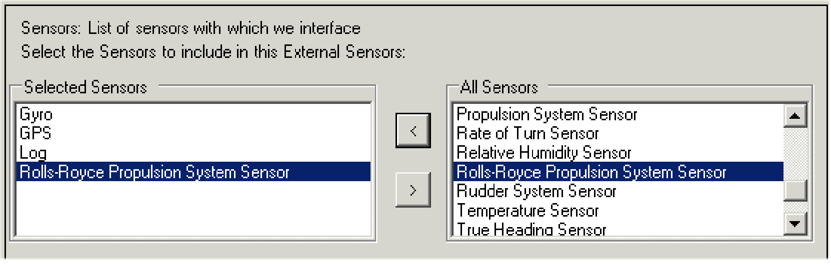


Figure 1.106 Rolls Royce Propulsion System Sensor Selection

2. From the navigation tree open the Rolls Royce Propulsion System sensor page and select the number of unique PRRP message identifiers for the system from a drop down list.

Note: *A Rolls Royce propulsion sensor will only work with a proprietary NMEA $PRRP message. The PRRP message defines the second field to be 'uutn', where ‘uu’ is the unit number and ‘n’ is the message number (‘t’ is ignored by VMFT). Select the number of unique combinations of uu and n. The navigation tree creates unconfigured topics for each number of message identifiers.*

3. For each Rolls Royce Propulsion System sensor message topic a message number and unit number must be entered, see Figure 1.107.

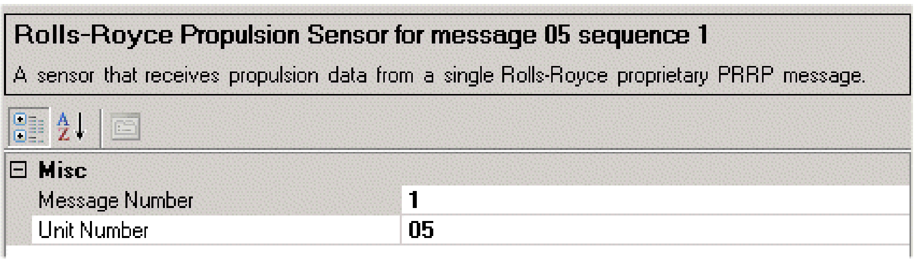


Figure 1.107 Rolls Royce Propulsion System Message Topic

4. Enter a one digit message number. This is the last character of the first field of the PRRP message, for example if the 4 digit message ID is ‘0501’ then **1** should be entered.

5. Enter a two digit unit number. This is the first 2 characters of the first field of the PRRP message, for example if the 4 digit message ID is '0501' then **05** should be entered.

Note that the Rolls Royce Propulsion sensor will remain unconfigured until a suitable interface has been selected and configured.

To configure an interface for the Rolls Royce Propulsion system sensor:

1. From the Interfaces For Acquisition area of the External Sensors window select **Rolls Royce PRRP Message Interface** from the list of All Interfaces. An unconfigured topic is added to the Interfaces For Acquisition list in the navigation tree, see Figure 1.108.

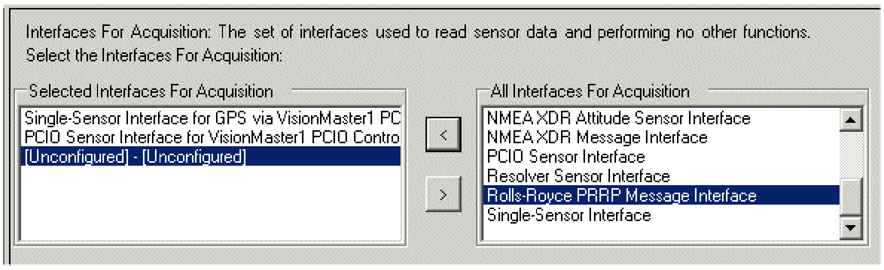


Figure 1.108 Rolls Royce PRRP Message Interface Selection

2. Open the topic and select the assigned name of the sensor (i.e. **Rolls Royce Propulsion System Sensor**).
3. Select the port that this interface receives data over by clicking on the Port drop down arrow and selecting from the configured ports list.

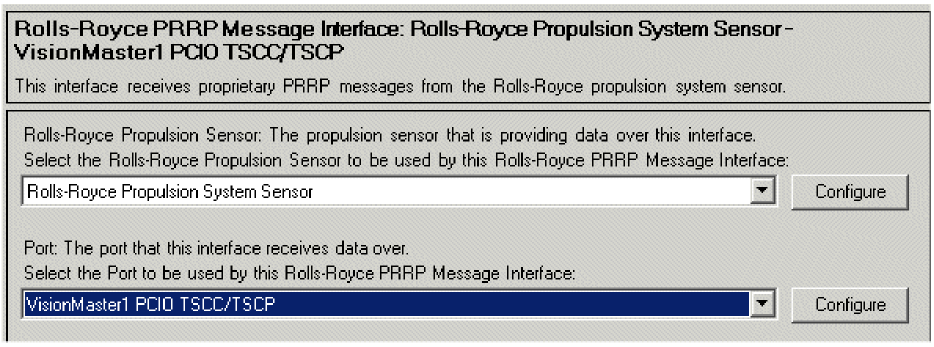


Figure 1.109 Rolls Royce PRRP Message Interface Configured

When an interface has been configured the external sensor topic status becomes valid.

In addition to the configuration of a Rolls Royce Propulsion system sensor described above a Conning Information Display (CID) page is also required to be configured from the CID Designer. For information on this refer to Section 2.4.4 *Creating a Page for Rolls Royce Propulsion System Sensor*' in Chapter 3 '*Configuring a Conning Information Display*'.

8.4.1.2 Interfaces for Acquisition

The VisionMaster system supports the acquisition of received sensor data via serial interfaces on the PCIO board. The serial interfaces comply with IEC 61162-1 and IEC 61162-2 (i.e. serial interfaces operating at 4800 and 38400 baud respectively).

VisionMaster also supports receiving sensor data over other types of I/O ports, such as UDP Multicast I/O ports, which may be used where sensors' serial outputs are connected to an NSI box. This allows the sensor data to be directly available at any node of the system without relying on direct serial wiring to each node.

To access the sensor interfaces click on the **Interfaces For Acquisition** topic in the Navigation tree. The window shows a list of all types of interfaces that can be used to acquire sensor data, and allows the user to include any number of any of these types.

There are five types of sensor interface that can receive digital messages containing the sensor data:

1. Single-Sensor Interface or Multi-Sensor Interface:
   - Single Interface allows reception of data from a single sensor over any type of I/O port providing messages compliant with IEC 61162-1.
   - Multi-Sensor Interface allows reception of data from multiple sensors over a single I/O port of any type, where all sensors are providing messages compliant with IEC 61162-1, and no two sensors are providing the same type of data.
2. PCIO Sensor Interface: Lists the PCIO boards that are to be used for acquiring sensor data, as configured in the PCIO Board Manager.
3. Customizable Sensor Interface: Allows reception of data from multiple sensors over a single I/O port of any type, where all sensors are providing messages compliant with IEC 61162-1, and multiple sensors may provide the same type of data, as long as such sensors can be distinguished by the sentence types or talker ids they use.
4. NMEA Message Interfaces: These are sensor interfaces that handle reception of IEC 61162-1 compliant NMEA sentences of the following types: RPM (for engine RPM or for shaft RPM and pitch data); RSA (for rudder angle data); XDR (for transducer data that may represent pressures, angles, temperatures, or other generic data).
5. Discrete Sensor Interface: If a Labjack device or Opto 22 rack is connected to the system and the source of sensor data from the device is digital input/output data then this interface is selected.

An analog sensor interface should be configured when the source of sensor data from a Labjack or Opto 22 rack is in analog format, or an analog interface on the PCIO board.

A Resolver sensor interface should be configured to receive analog input when a Rudder System Sensor has been configured.

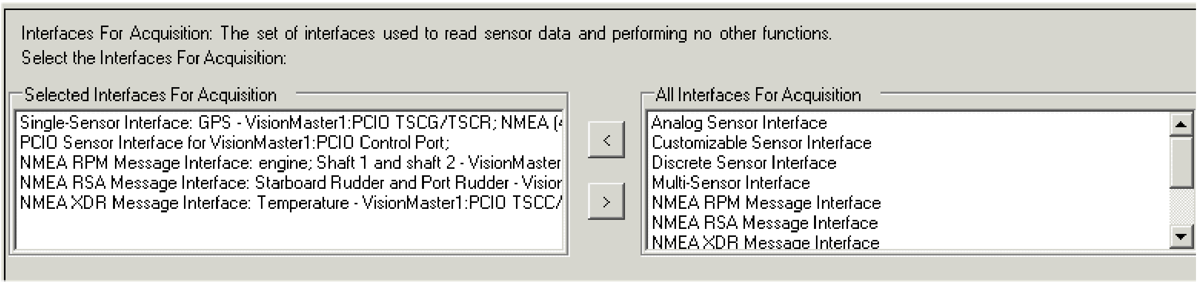


Figure 1.110 Interfaces for Acquisition

For all interface types that use a NMEA parser the sentences listed in Table 2 are used to obtain the data listed in the table.

Table 2: Supported Sentences and Data

Sentence	Data
ACK, ALR	Alarms
DBT, DPT	Depth
DTM	Datum Offset
GGA, GLL, GNS	Geodetic Position
HDG	Magnetic Sensor Heading, Deviation and Variation
HDT	True Heading
MWV	Wind Speed and Angle
RMC	Position, Ground Speed, Course over Ground
ROT	Rate of Turn
RTE	Routes
THS	True Heading and Status
TLB	Target Label
VBW	Ground Speed and Water Speed
VDM, VDO	AIS
VHW	Water Speed
VTG	Ground Speed and Course Over Ground
WPL	Waypoints for Routes
ZDA	Date and Time, Local Time Offset

The following table shows the support for sensor acquisition via specific external interfaces on the PCIO board.

Table 3: PCIO Serial Input Connections

Connector Name	COM Port	Messages received	Caveats
Serial Input 1/TSCA	3 (control port)	HDG/HDT ROT	Cannot be used if any heading is configured for Serial Input 2
Serial Input 2/TSCD	3 (control port)	Any NMEA sensor sentences*	The same Talker/Sentence ID must not also be configured on Serial Input 1 or 3. Can be used for low speed heading input only if serial input 1 is unused
Serial Input 3 / TSCE	3 (control port)	Any NMEA sensor sentences *	The same Talker/Sentence ID must not also be configured on Serial Inputs 1 or 2
Serial Input 4 / TSCF	4	Any	
Serial Input 5 / TSCB	5	Any	
Serial Input 6 / TSCC	6	Any	
Serial Input 7 / TSCG	7	Any	
Serial Input 8 / TSCH	8	Any	
Serial Input 9 / TSCJ	9	Any	

*. TSCD or TSCE can be configured to receive messages from a speed log (providing IIVBW sentences) as long as it is not the same water speed sensor that is connected to the pulse log input of the PCIO board.

Table 4 below lists the commissionable baud rates for serial inputs 3 to 9.

Table 4: PCIO Serial Port Baud Rates

Port Name	Commissionable Baud Rates
Serial Input 2 and 3	4800
Serial Input 4	110, 300, 1200, 4800 and 9600
Serial Input 5	110, 300, 1200, 4800, 9600, 19200, 38400 and 57600
Serial Input 6	110, 300, 1200, 4800, 9600, 19200, 38400 and 57600
Serial Input 7	110, 300, 1200, 4800 and 9600
Serial Input 8	110, 300, 1200, 4800 and 9600
Serial Input 9	110, 300, 1200, 4800 and 9600

Note: *The serial port number 3 cannot be used as a heading source on a PCIO board fitted to a node that is also fitted with an SC2 or SC3 board. For a radar system the heading source should always be received via the PCIO board. If the system does not have radar, (e.g. ECDIS without radar overlay,) then the heading data may be configured via a single sensor or multi-sensor serial interface.*

When an interface has been selected the interface type is listed in the navigation field under the {Interfaces for Acquisition} sub-menu. When first selected the interface shows [Unconfigured] and its status button is displayed as red.

Configuring a Single or Multi-Sensor Interface

1. Click on the Single or Multi-Sensor Interface topic in the navigation area, the configuration window for the interface appears.
2. Select the port that the interface will receive data over by clicking the drop down arrow on the Port field. The field shows a list of ports previously configured in I/O Port Manager, see Figure 1.111 below. If no ports have been configured the field will display <NONE>.

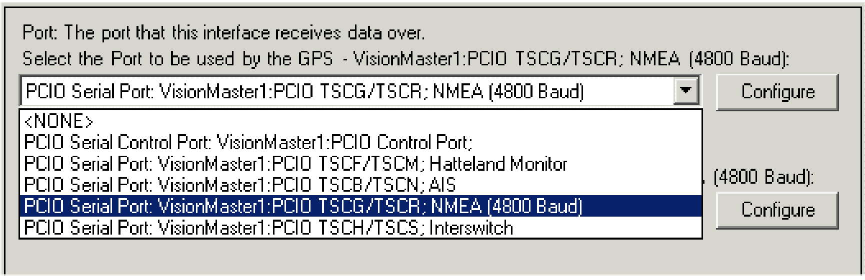


Figure 1.111 Single-Sensor Interface Ports available

3. To change the port settings click the **Configure** button, the port configuration window for the selected port is displayed, see Figure 1.56, page 72.
4. For a Single-Sensor Interface select the sensor that will provide data via the interface by clicking the drop down arrow on the Sensor field. The field shows a list of external sensors previously configured in Sensors, see Figure 1.112 below.

Note: *Heading sensors cannot be configured for a single or multi-sensor interface.*

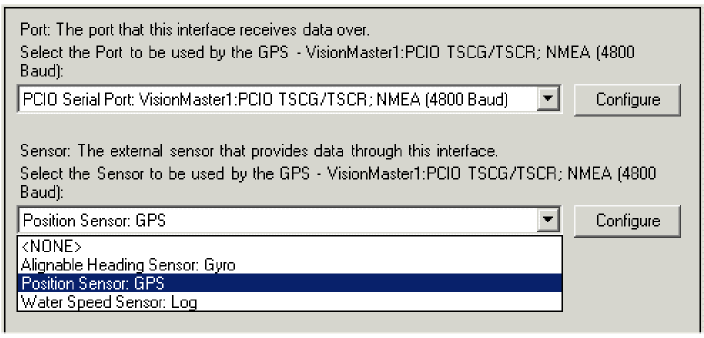


Figure 1.112 Single-Sensor Interface Sensors available

5. Should it be necessary to change the sensor configuration settings, click the **Configure** button, the configuration window for the selected sensor is displayed, see Figure 1.93, page 110.
6. For a Multi-Sensor Interface select the sensors that will provide data via the interface by highlighting each one from the list of previously configured sensors in the **All Sensors** list, and pressing the **<** button.

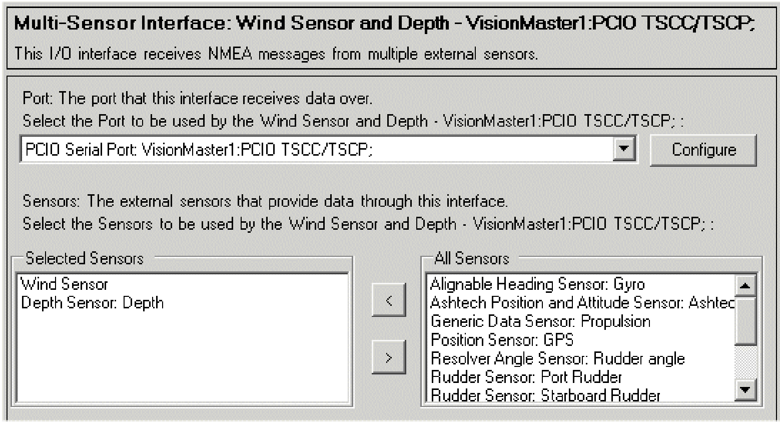


Figure 1.113 Multi-Sensor Interface Sensors available

Parsers

When a single or multi sensor interface is configured a NMEA 0183 Parser is added as a sub menu item to the interface.

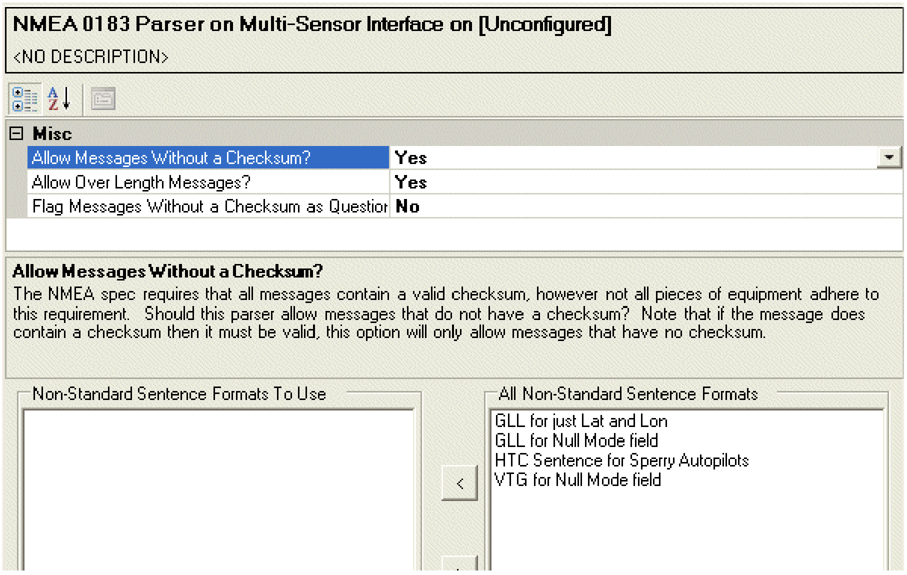


Figure 1.114 NMEA 0183 Parser

The NMEA 0183 Parser window includes a list of alternate sentence parsers that can be included to support non-standard equipment.

The Miscellaneous section includes the following settings:

- **Allow Messages Without a Checksum** - All NMEA messages are required to contain a valid checksum, although not all pieces of equipment adhere to this requirement. The default setting is to allow the parser to receive messages with or without a checksum, although if a message contains a checksum it must be valid. To only allow messages with a valid checksum click in the field and select **No**.

- **Allow Overlength Messages -** All NMEA messages are required to be less than or equal to 82 characters. The default setting is to allow the parser to receive over length messages. To restrict to messages of less than or equal to 82 characters click in the field and select **No**.
- **Flag Messages without a Checksum as Questionable -** If messages without a checksum are allowed should the resulting data be flagged as questionable? Select Yes to flag checksum messages.

Select the following non-standard sentence format to be used by the Sensor Interface:

- GLL for just LAT/LON or Null Mode field
- Sentence for Sperry Autopilots
- VTG for Null Mode field

PCIO Sensor Interface

The PCIO Sensor Interface window enables the configuration of sensor data from a PCIO board to be made.

The PCIO board will have been previously selected and configured from the Resources menu (see Section 7.1 *PCIO Board Manager*' and Section 7.9 *I/O Port Manager*').

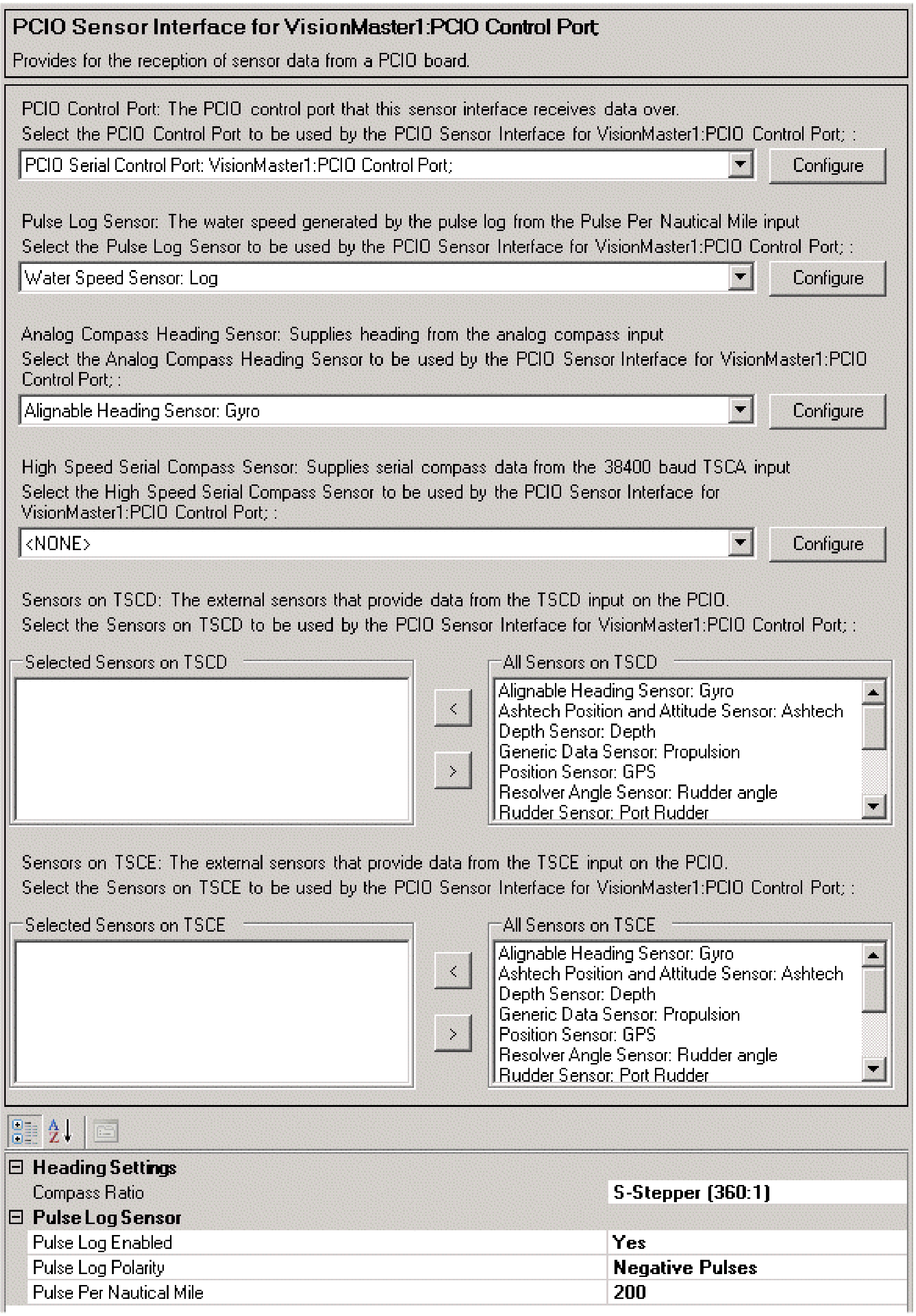


Figure 1.115 PCIO Sensor Interface - configuration

The configuration window for the PCIO unit includes the following selection options:

- PCIO Control Port - the control port that this sensor interface receives data over. The I/O Port Manager will have automatically created a serial control port for the configured PCIO board.
- Pulse Log Sensor - the water speed generated by the pulse log from the Pulse per Nautical Mile input on the PCIO board. Defaults to Log
- Analog Compass Heading Sensor - from the list provided, select the heading sensor whose data is provided via the stepper or synchro interface to the PCIO board. Defaults to Gyro.
- High Speed Serial Compass Sensor - if you are not using an analog compass heading, select the heading sensor whose data is provided via the 38400 baud TSCA input.
- Sensors on TSCD - from the list on the right, select each sensor whose data is provided via serial input TSCD. Note that heading sensors are not permitted here if a heading sensor is selected for the High Speed Serial Compass Sensor.
- Sensors on TSCE - from the list on the right, select each sensor whose data is provided via serial input TSCE. Note that heading sensors are not permitted here.

To change the current settings for the serial port and sensors click on the drop down arrows at the end of each data field and select from the previously configured I/O port and sensor lists.

Select the sensors for TSCD and TSCE to be used by the PCIO board by highlighting the sensors in the All Sensors lists and clicking on the **<** button.

Heading Settings

The heading settings enables the selection of compass ratio settings. applicable where an analog heading sensor is connected to the system. Heading data is acquired via a syncro interface or stepper motor interface connected to the PCIO board, the default is **S-stepper [360:1]**.

To select a different compass ratio click on the drop down arrow and select from the list.

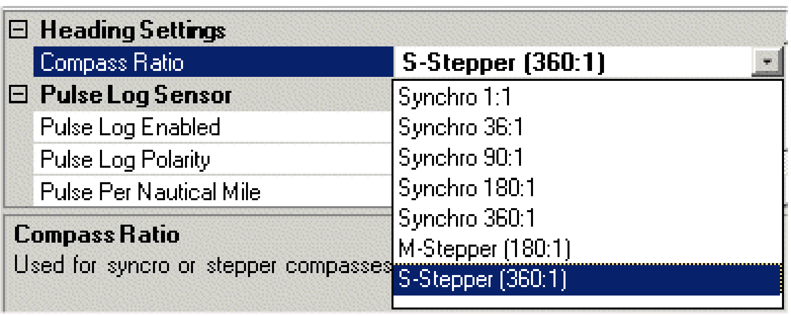


Figure 1.116 Compass Ratio Settings

The ratio settings that apply to a syncro interface are: 1:1, 36:1, 90:1, 180:1, or 360:1.

The ratio setting for the S-Stepper is 360:1. The ratio setting for the M-Stepper is 180:1.

Pulse Log Settings

The acquisition of single axis water speed data is made via a pulse log interface connected to the PCIO board. The following pulse log configuration settings are available, applicable where a pulse log sensor is connected to the system:

- Pulse Log Enabled - denotes whether or not a pulse log is connected to the system, defaults to **Yes**. To disable the pulse log click on the drop down arrow and select **No**.
- Pulse Log Polarity - defaults to Negative pulses, to change settings click on the drop down arrow and select **Positive Pulses**.
- Pulse per Nautical Mile - the pulse log rate, defaults to 200, a rate between 100 and 2560 pulses per nautical mile can be entered.

Customizable Sensor Interface

It should not normally be necessary for a customizable sensor interface to be configured. There are two general situations that may require such an interface:

1. Where VisionMaster receives IEC 61162-1-compliant (NMEA 0183) messages from more than one sensor over a single I/O port, and more than one of the sensors is providing data of the same type. For example, if two GPS sensors (e.g. GPS1 and GPS2) both provide their position data via the same serial port. In such a case, VisionMaster would need to distinguish data received from the two GPS sensors. The customizable sensor interface can be configured to tell VisionMaster, for example, that GPS1 provides GLL sentences, while GPS2 provides GGA sentences.
2. In situations where sensor data is received over a digital interface with a message format other than that specified by IEC 61162-1. Currently, VisionMaster does not support any other message formats.

Important Note: *In the event of a customizable interface requiring configuration, this procedure should only be attempted with phone support from Sperry Marine Engineering.*

The following section describes in general terms the configuration of a customizable sensor interface.

Configuring a Customizable Sensor Interface

When a Customizable Sensor Interface has been selected in the Interfaces for Acquisition window the system adds Message Parser and Message Usage Map as sub-menu items in the Navigation tree.

If a customizable sensor interface is selected in addition to a Single Sensor Interface, the system assigns the same serial port as previously configured for the Single Sensor. The customizable sensor interface configuration window enables the message parser, message usage map and serial IO port to be configured.

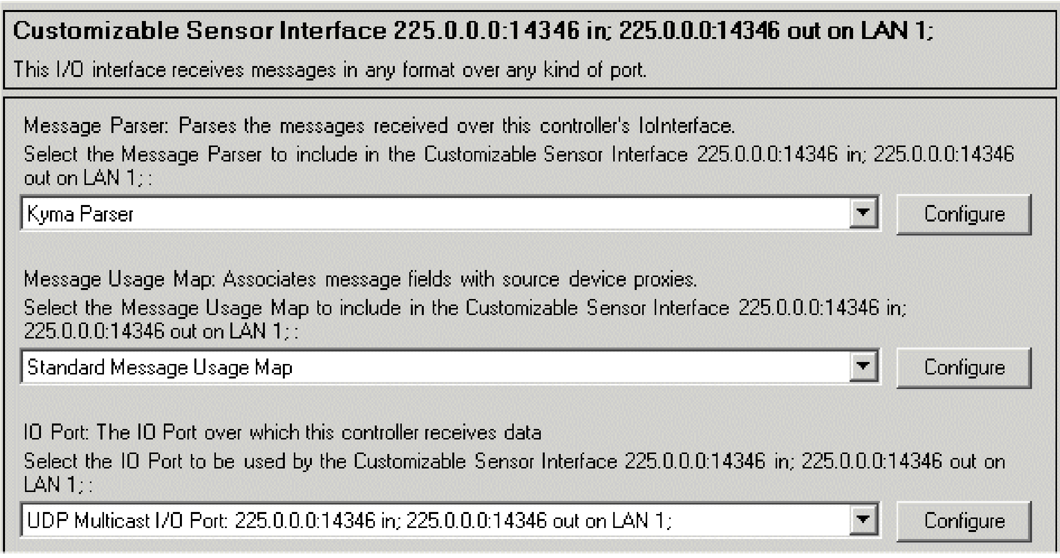


Figure 1.117 Customizable Sensor Interface

Message Parser

The Message Parser parses the messages the sensor interface receives from the PCIO. The message parser field enables you to select the type of parser from a drop down list (including the default NMEA 0183 Parser) and to configure the selected message parser for the I/O interface.

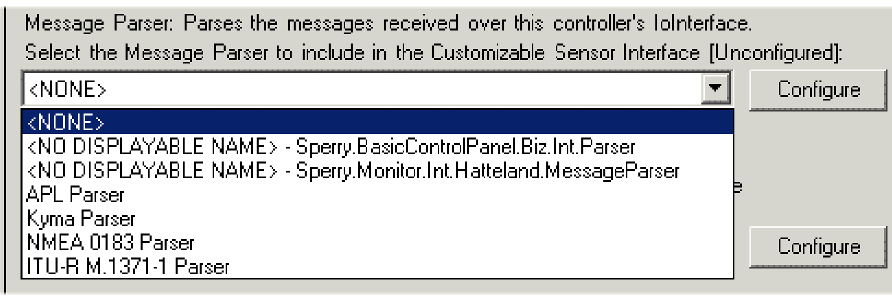


Figure 1.118 Message Parser for Customizable Interface

If the NMEA 0183 Parser is selected you can select alternate sentence parsers to support non-standard sentences. To do this click on the **Configure** button and select from the list of alternate sentence parsers to be included, see Figure 1.114 on page 129.

Message Usage Map

The message usage map provides mapping between the received data samples and the set of previously configured external sensors.

The message usage map defaults to **Standard**. This default should only be changed to **Field-Based** if you require to select specific sentence elements to be included in the message parser.

To select the sensor source devices to be used by the Standard Message Usage Map click on the **Configure** button. The subsequent window enables you to select the source devices that provide data through this interface.

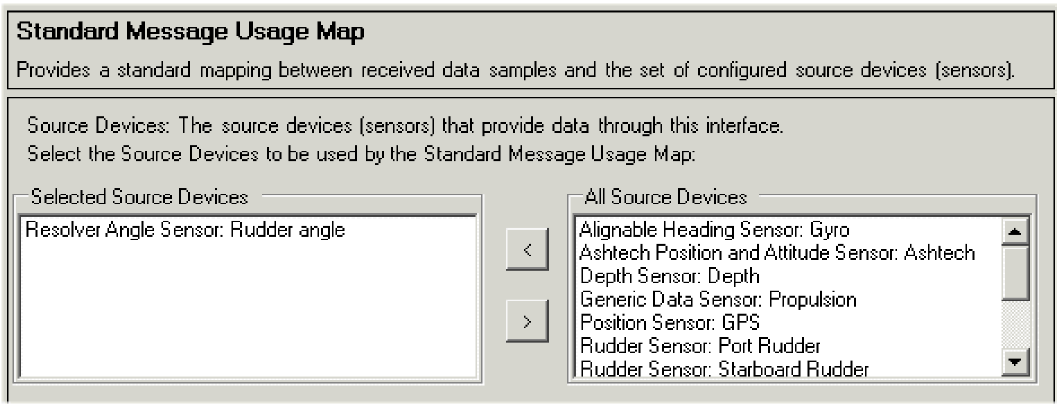


Figure 1.119 Standard Message Usage Map

To change the message usage map from **Standard** click on the drop down arrow to the right of the field and select **Field-Based**.

When Field-Based is selected for the message usage map the subsequent configuration window enables you to select the set of sensor source devices that provide data and the message field that will contain the supplied data.

To add Source Devices and Message Fields:

1. Click on the **Add Mapping** button. A line is created below the columns.
2. Click on the drop down button to the right of the Source Device and select from the list of configured external sensor devices.
3. Click on the drop down button to the right of the Message Field and select from the list.

Note: *You may first need to configure the set of expected message fields.*

4. To add further lines click the Add Mapping button again, or to delete a line highlight it and click the **Delete Mapping** button.

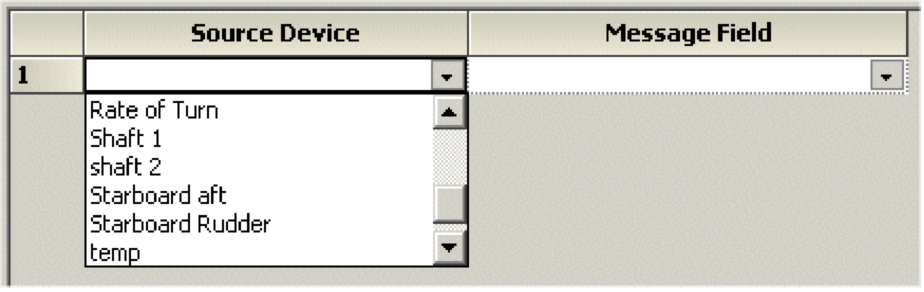


Figure 1.120 Field-Based Message Usage Map

If the NMEA 0183 Parser has been selected as the message parser and Field-Based is selected as the message usage map the NMEA 0183 Parser window includes, in addition to the selection of alternate sentence parsers, the option of configuring specific data elements of a sentence, including columns for Talker ID, Sentence ID, Physical Property and Message Field Name.

To configure data elements:

1. Click on the **Add Field** button. A line is created below the columns.
2. Click on the drop down buttons to the right of each column and select the specific data elements required to be parsed, see Figure 1.121 below.
3. To create further lines click the Add Field button again, or to delete a line highlight it and click the **Delete Field** button.

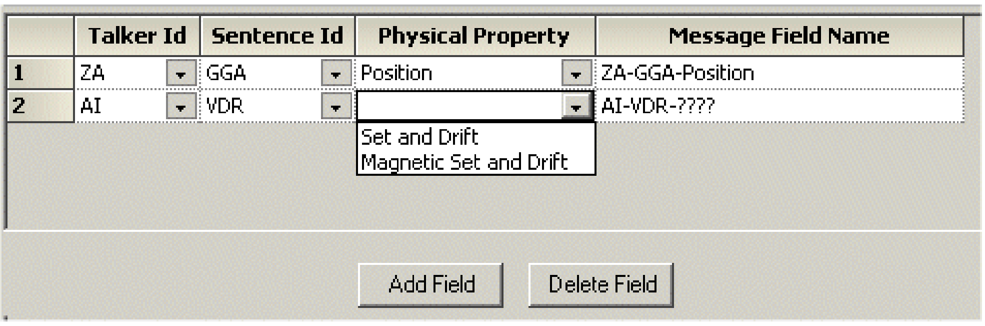


Figure 1.121 NMEA 0183 Parser - Add and Delete Fields

IO Port

To change the port settings for the customizable sensor interface from the default selection click on the IO Port **Configure** button.

The Serial Port in I/O Port Manager appears for the current port.

To select a new port for the sensor interface click on the I/O Port Manager in the navigation tree and configure a port from the **All I/O Ports** list. See Section 7.9 *I/O Port Manager*' on page 70.

NMEA Message Interfaces

There are three NMEA interface types that may be configured to receive the following NMEA messages:

- RPM messages
- RSA messages
- XDR messages

NMEA message interfaces are generally used to receive data that does NOT represent navigation data associated with own ship. Such data is usually only used for display on a CID.

Before configuring any of the three NMEA message interfaces, one or more sensors corresponding to the NMEA message interfaces must first be selected and configured from the list of sensors.

1. NMEA RPM Message Interfaces require sensor data in RPM, such as engine system and/or propulsion system sensors.
2. NMEA RSA [*] Message Interfaces require rudder system sensors.
3. NMEA XDR[†] Message Interfaces can be used with a wide variety of sensor types that provide data in the form of angles, RPMs, temperatures, pressures, and generic values.

Configuring an RPM Message Interface

The RPM message interface should be used when the system receives NMEA RPM sentences to obtain one of the following:

- RPM data associated with one or more of the ship's engines.
- RPM data associated with one or more of the ship's propeller shafts or propulsion units (e.g. azipods or fixipods).
- RPM and pitch data associated with one or more of the ship's propeller shafts or propulsion units.

To configure an NMEA RPM Message Interface:

1. Select **NMEA RPM Message Interface** from the Interfaces for Acquisition window, see Figure 1.110. The NMEA RPM Message Interface topic creates two sub menu topics; one for Single Engine RPM Interfaces, and another for Single Shaft RPM and Pitch Interfaces.
2. Click on the NMEA RPM Message Interface topic, the screen prompts to select either a Single Engine RPM Interface, or single shaft RPM and Pitch interface. Selections are made based on whether this interface is being used to get data for engine RPMs or for propulsion shaft RPM and (optionally) pitch.

* Rudder Sensor Angle
† Transducer measurements

3. If this interface is to be used to obtain engine RPM data, select the Single Engine RPM Interface. A new Single Engine RPM Interface topic appears below the Single Engine RPM Interfaces sub menu. Repeat this step for each engine whose RPM data is provided via NMEA RPM sentences over this interface.
4. Click on each of the new Single Engine RPM Interface topics added in the previous step, and select the engine sensor that represents the source of this data.
5. Select the engine ID that will be in the second field of the RPM sentence for data associated with this sensor. For example, if the ship has two engines (with ID=0 for the port engine and ID=1 for the starboard engine), then two Single Engine RPM Interfaces must be configured with each topic corresponding with the port and starboard Engine Sensors, which should have already been configured under 'Engine System Sensor' (see Section 8.4.1.1 *Sensors*').

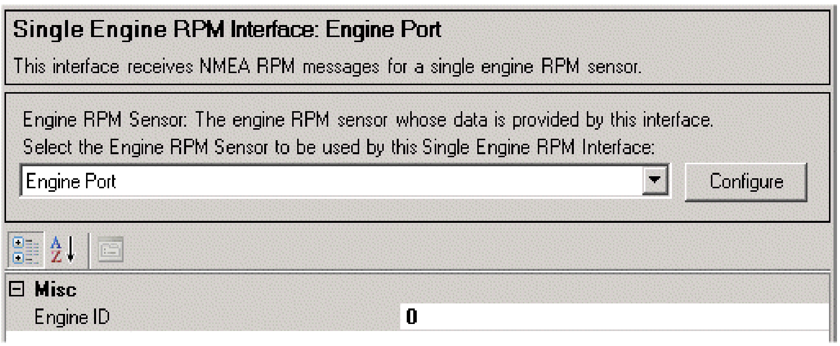


Figure 1.122 Single Engine RPM Interface

6. If a single shaft and pitch sensor, such as a Propulsion System Sensor has been configured, select the Single Shaft RPM and Pitch Interface. A new Single Shaft RPM and Pitch Interface topic appears below the Interfaces sub menu. Repeat this step for each RPM and Pitch interface.
7. Click on each of the new Single Shaft RPM and Pitch Interface topics added in the previous step, and select the shaft RPM and pitch sensor for the interface.

Note: *If there is more than one propulsion shaft on the ship, the data from each shaft may be received from either an independent I/O port, or over the same port. In the former case, an independent NMEA RPM Message Interface must be configured for each shaft, and each of these Interfaces would have a Single Engine RPM Interface. In the latter case, a single NMEA RPM Message Interface would have one Single Engine RPM Interface configured for each shaft.*

8. Enter an ID for each shaft. If there is only one shaft on the centre line of ship then ID is 0 (default). Odd numbers indicate starboard shafts, even numbers indicate port shafts. This ID must match the second field of the RPM sentence.

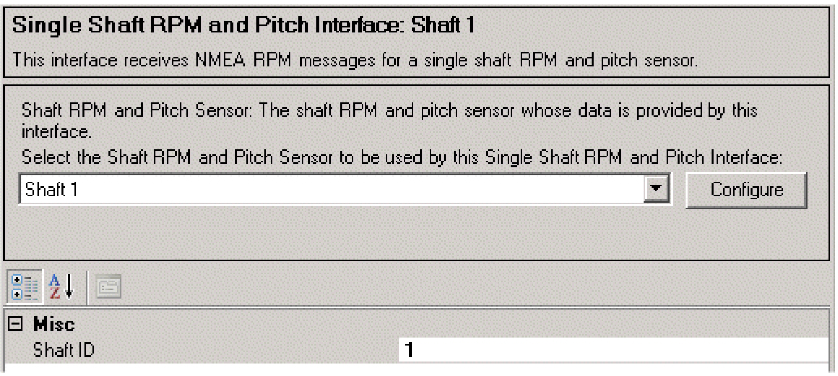


Figure 1.123 Single Shaft RPM and Pitch Interface

9. When the RPM sensor interfaces have been configured, select the port that the interfaces will receive data over by clicking on the port drop down arrow and selecting from the configured ports list. See Figure 1.124 for a typical configured RPM message interface.

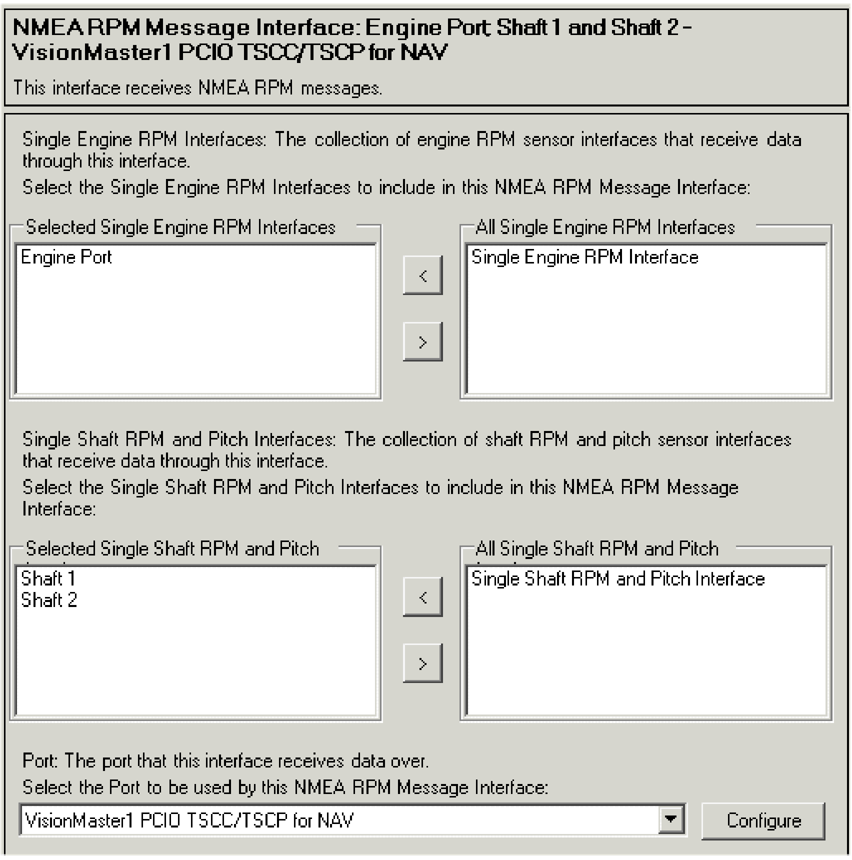


Figure 1.124 Configured NMEA RPM Message Interface

Configuring an RSA Message Interface

The RSA message interface should be used when the system receives NMEA RSA sentences to obtain rudder angle data from the ship's rudder system. This system will include port and starboard rudder sensors as default.

To configure an NMEA RSA Message Interface:

1. Select **NMEA RSA Message Interface** from the Interfaces for Acquisition window, see Figure 1.110. A new NMEA RSA Message Interface topic is created.
2. Click on the NMEA RSA Message Interface topic, the screen prompts to select the first and second rudder sensors to provide rudder angles to the RSA sentence.
3. Click on the drop down arrows and select the required sensors from the list of configured rudder system sensors.
4. Select the port that the interfaces will receive data over by clicking on the port drop down arrow and selecting from the configured ports list. See Figure 1.125 for a typical configured RPM message interface.

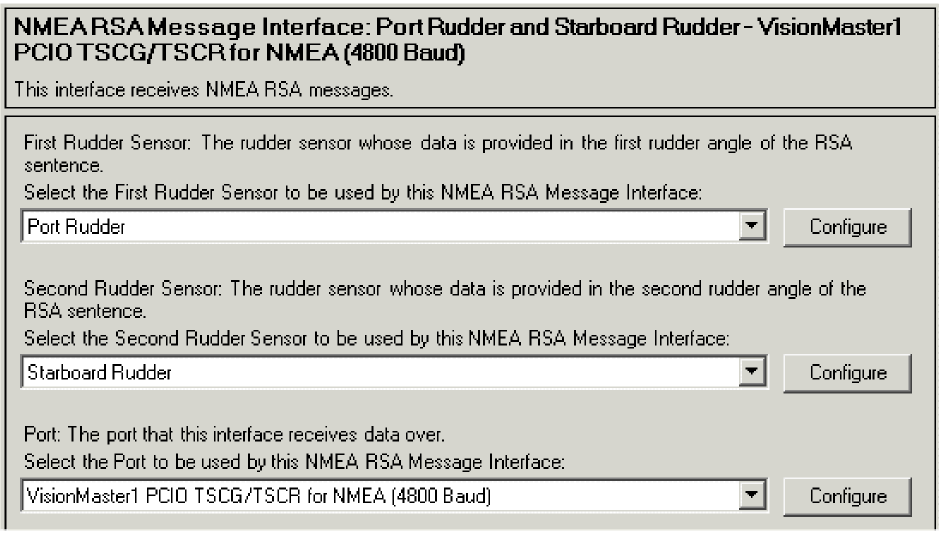


Figure 1.125 Configured NMEA RSA Message Interface

Configuring an XDR Message Interface

The XDR message interface should be used when the system receives NMEA XDR sentences to obtain data from a variety of types, including angles, RPMs, temperatures, and generic values (as defined for the XDR sentence by IEC 61162-1). XDR sentences can deliver data associated with many sensor types, although generally ones that do NOT provide own ship navigation data.

Note that some of these sensor types may provide data either by XDR sentences or by RPM sentence or RSA sentence. This data may include temperature sensors, generic data sensors, rudder sensors, engine RPM sensors, and propulsion system shaft sensors.

Important Note: *XDR sentences should NOT be connected to any of the ports that make up the PCIO control port (TSCA, TSCD and TSCE). This is because XDR data may interfere with communications between the PC and the PCIO over the control port.*

When XDR sentences are received over a single I/O port, the system can handle any number of distinct XDR sentences, each with any number of independent transducer values. However, each independent sensor's value must be identified with a transducer ID (as defined for the XDR sentence by IEC 61162-1) that is unique on the applicable I/O port. This is because, in such a case, the transducer ID is the only means the system has to identify which sensor is providing a given piece of data.

To configure an NMEA XDR Message Interface:

1. Select **NMEA XDR Message Interface** from the Interfaces for Acquisition window, see Figure 1.110. The NMEA XDR Message Interface topic automatically creates a Single Transducer Interfaces sub menu topic.
2. Click on the **{Single Transducer Interfaces}** topic and select a Single Transducer Interface for each sensor whose data is to be received in any XDR sentence over this port. For each selection, a new Single Transducer Interface sub-topic is created.

For each Single Transducer Interface topic created above, perform the following steps:

1. Select a previously configured sensor that is expected to supply one of the pieces of data received via XDR sentences on this interface. The system will automatically limit the selection to the types of sensors that can handle the data types supported by XDR sentences, see Figure 1.126 below.

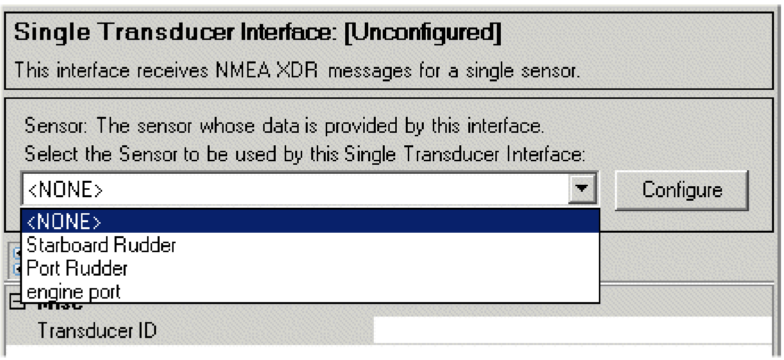


Figure 1.126 Single Transducer Interface - Sensor Selection

2. Enter the transducer ID, which will be in the last field in a group of four of the XDR sentence that provides the selected sensor's data.
3. From the **Data Units** field click on the drop down arrow and select the type of data units in which this data will be received. The system will limit this list to units that apply to the data type handled by the selected sensor. If the received data is not in any of the provided units, then select a unit that allows for easy conversion from the actual units, and untick **The received data is in these units** check box.
4. Enter the conversion logic needed to convert the value in the XDR sentence into the specified units. For example, if you are receiving temperature in the Rankine scale, select **Kelvin** data units, and for the conversion logic, enter 0.55556 in the **First, multiply by:** field and enter 0 in the **Second, add:** field, see Figure 1.127.

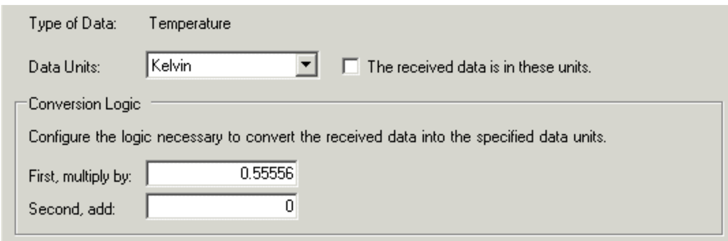


Figure 1.127 Single Transducer Interface - conversion logic

Analog Sensor Interface

An analog sensor interface is configured when analog data is received from a single external sensor. Analog data may come from a propulsion interface connected to the VisionMaster system.

The analog input line can be either from a Labjack device or an Opto 22 rack.

To configure an analog sensor interface:

1. Select **Analog Sensor Interface** from the Interfaces for Acquisition window, see Figure 1.110. An unconfigured topic is created.
2. Open the Analog Sensor Interface topic. From the Analog Input drop down list, select the analog input line to be used for receiving the sensor data.
3. From the Sensor Input drop down list, select the sensor and the device which corresponds to the source of the analog data. For example, **Starboard Rudder**. The type of data and data units will automatically change, based on the sensor type (e.g. for a rudder sensor, the type of data is Angle and the data units default to Degree).
4. The Polling Interval defaults to 1 second. The interval can be changed by entering a value in the field (minimum value 0.2 seconds).

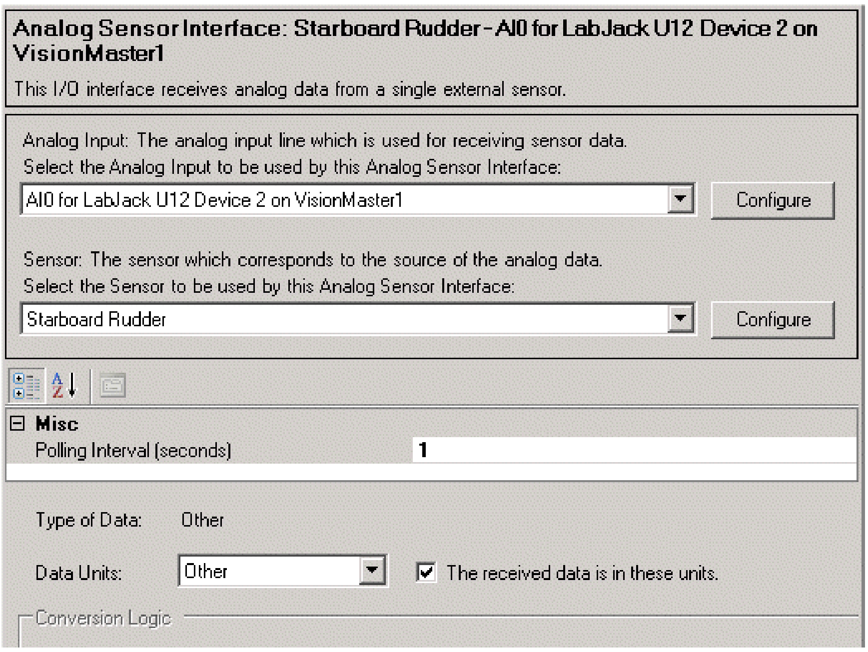


Figure 1.128 Analog Sensor Interface

5. Depending on the type of data, there may be different options of data units. To change the type of data units, or to enter a conversion logic, refer to steps 3 and 4 and Figure 1.127 on page 142.

Discrete Sensor Interface

A discrete sensor interface is configured when digital data is received from a digital input line, usually via a Labjack or an Opto 22 rack.

To configure an discrete sensor interface:

1. Select **Discrete Sensor Interface** from the Interfaces for Acquisition window, see Figure 1.110. An unconfigured topic is created.
2. Open the Discrete Sensor Interface topic. From the Discrete Input drop down list, select the discrete input line to be used for receiving the sensor data.
3. From the Sensor Input drop down list, select the sensor and the device which corresponds to the source of the analog data. For example, **Rudder Sensor: Starboard Rudder**.
4. An active discrete input value is interpreted as **1**, and an inactive discrete value is interpreted as **0**. To invert these input values from the default, click in the **Invert Value?** drop down arrow and select **Yes**.

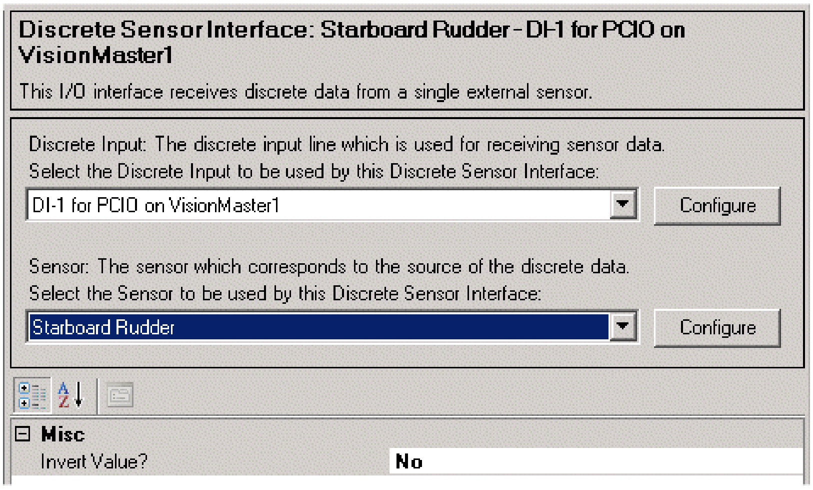


Figure 1.129 Discrete Sensor Interface

Resolver Sensor Interface

A resolver sensor interface is configured when a sensor used to receive angle data, usually from rudder or azipod angles, has been selected in Sensors. The interface identifies the analog input from the sensor used to receive the sin and cos of angle data.

1. Click on the first drop down arrow and select the Analog Input used for receiving the sin of the angle specified in the resolver angle sensor.
2. Click on the second drop down arrow and select the Analog Input used for receiving the cosine of the angle specified in the resolver angle sensor.
3. Select the sensor that corresponds to the source of the resolver angle data. This will be the resolver angle sensor previously configured in Sensors.

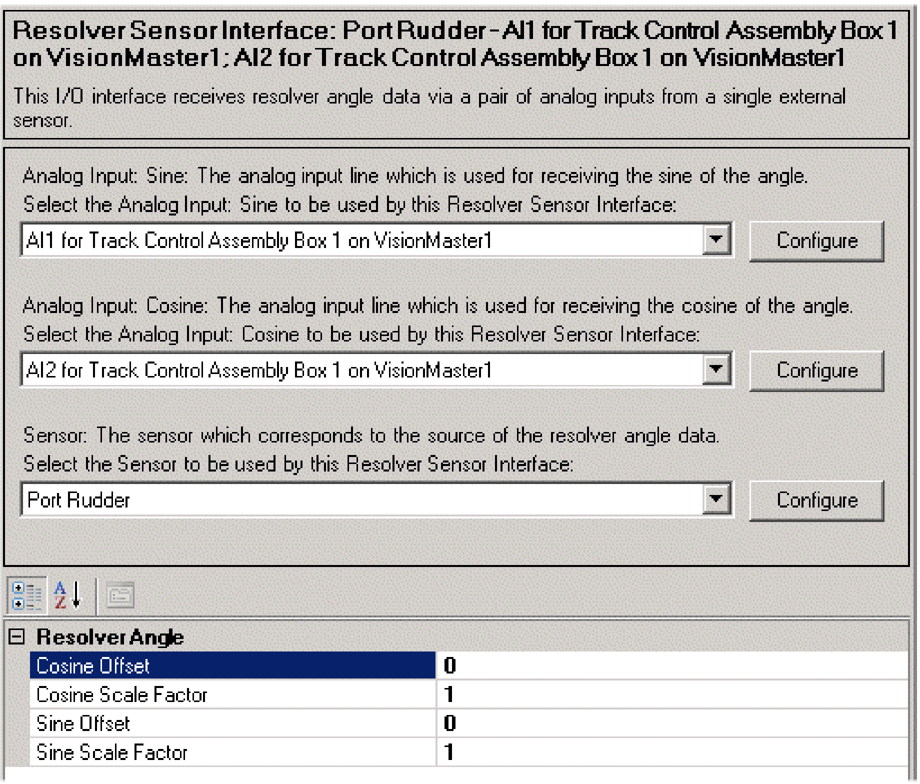


Figure 1.130 Resolver Sensor Interface

8.4.2 Failure Criteria - Plausibility

The Plausibility window enables the minimum ground speed required to perform plausibility assessment on course over ground to be set.

The default minimum value is 0.5 knots. Normally this value should not be changed.

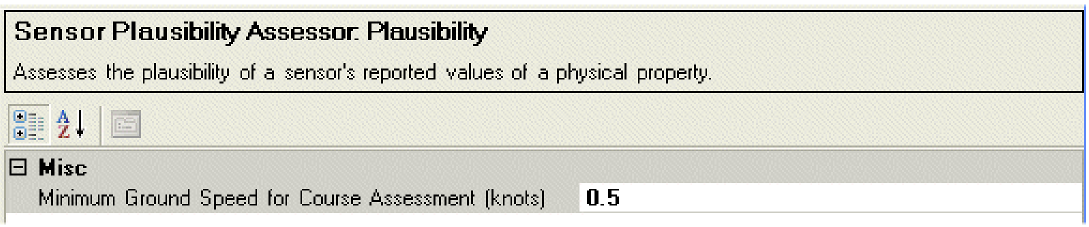


Figure 1.131 Failure Criteria - Plausibility

8.4.3 CCRP

The CCRP (consistent common reference point) is the location on own ship to which all data is referenced. The CCRP is typically the ship's antenna position.

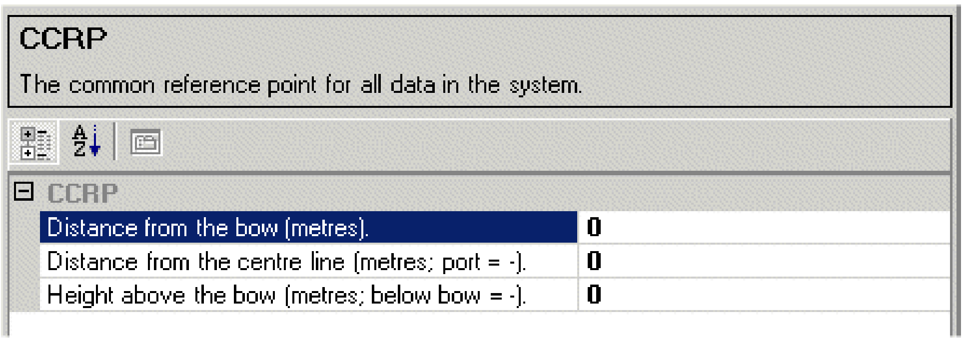


Figure 1.132 CCRP configuration

The exact location of the CCRP can be configured from the specific values listed below.

- Distance from the bow [metres] - the position of the CCRP, measured from the bow to the stern.
- Distance from the centre line [metres; port = -] - the position of the CCRP from the centre line.
- Height above bow [metres; below bow = -] - the vertical position of the CCRP, measured from the level of the bow.

All distance values default to zero, to change one or more values delete the 0 and enter the required value.

8.4.3.1 Alternate CCRP

If an alternate bow menu has been selected from Own Ship Characteristics window (see Figure 1.87 ‘*Own Ship Characteristics*’) the CCRP window will include the same set of configurable values defined for CCRP, see Figure 1.133.

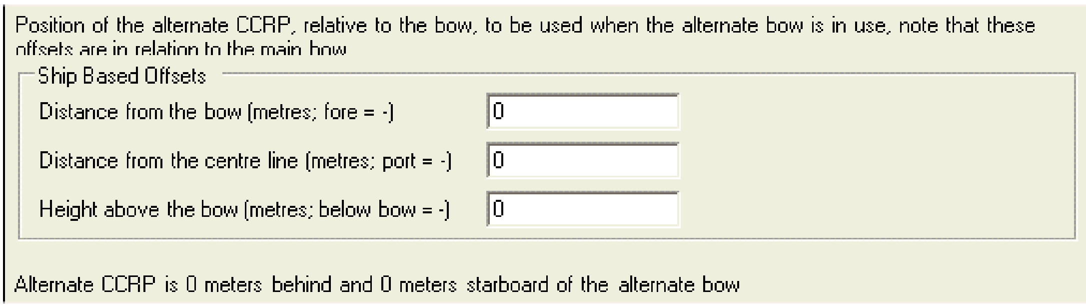


Figure 1.133 Alternate CCRP configuration

8.4.4 CCRS Data Log

The CCRS (consistent common reference source) data log enables configuration of the way CCRS data is logged.

In addition to the periodic logging, the system logs CCRS information whenever a sensor is selected.

The CCRS information logged by the system includes the following for each currently selected Sensor:

- Sensor Name
- Interface Name (see “Interfaces for Acquisition” on page 1-125)
- Data Type
- Data Value
- Data Validity
- Data plausibility
- Data origin (Manual vs. Real)
- Data source (Simulated vs. Real)
- Data Timestamp
- Time of Sensor Selection (if sensor selection event)

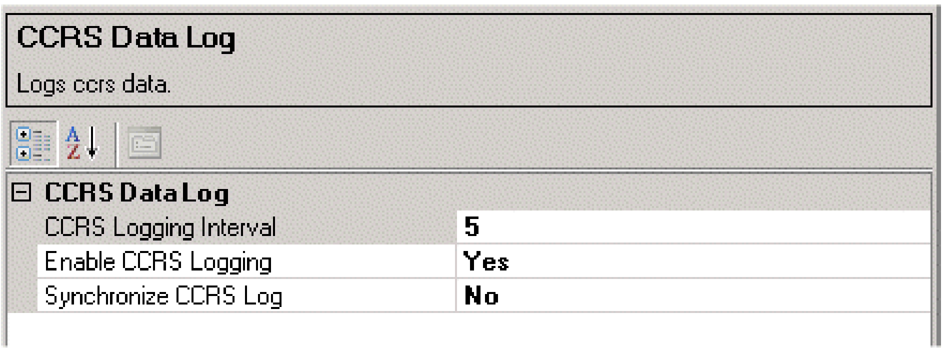


Figure 1.134 CCRS Data Log

The CCRS Data Log window enables the following settings to be configured:

- **CCRS Logging Interval -** the time increment, in seconds, in which CCRS data is logged. The default time is 5 seconds. To change the logging interval click in the field, delete the current value and enter a value between 1 second (minimum) and 60 seconds (maximum).
- **Enable CCRS Logging -** the system automatically enables the logging of CCRS data. To suppress data logging click on the drop down arrow to the right of the field and select **No**.
- **Synchronize CCRS Log -** enables CCRS data logging to be synchronized across nodes, the default is No. To enable click on the drop down arrow to the right of the field and select **Yes.**

8.4.5 Sensor Data Log

The Sensor data log enables configuration of the way Sensor data is logged.

The sensor information logged by the system for each configured sensor includes:

- Sensor Name
- Interface Name (see "Interfaces for Acquisition" on page 1-125)
- Data type (heading, position, etc.)
- Data value
- Data validity
- Data plausibility
- Data origin (Manual vs. Real)
- Data source (Simulated vs. Real)
- Data timestamp

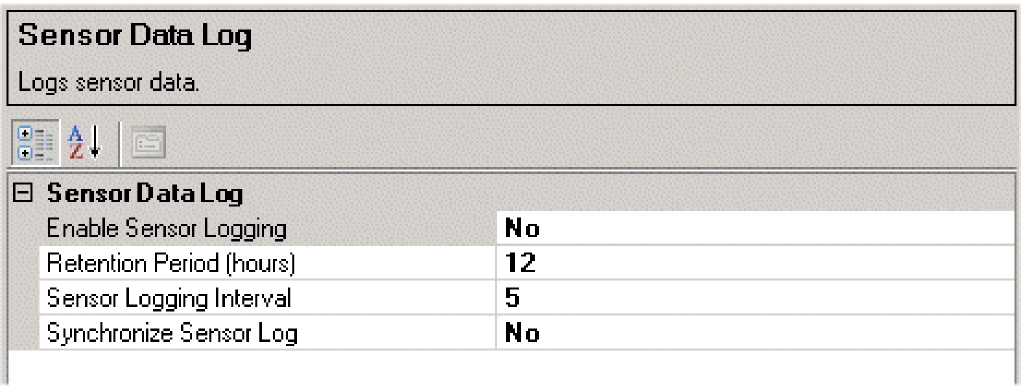


Figure 1.135 Sensor Data Log

The Sensor Data Log window enables the following settings to be configured:

- **Enable Sensor Logging -** the system automatically suppresses the logging of Sensor data. To enable sensor data logging click on the drop down arrow to the right of the field and select **Yes**.
- **Retention Period -** the length of time, in hours, that the system retains log files. The default time is 12 hours. To change the period click in the field, delete the current value and enter a value over 12 (there is no maximum time period for data retention).
- **Sensor Logging Interval -** the time increment, in seconds, in which sensor data is logged. The default time is 5 seconds. To change the logging interval click in the field, delete the current value and enter a value between 1 second (minimum) and 60 seconds (maximum).
- **Synchronize Sensor Log -** enables sensor data logging to be synchronized across nodes, the default is No. To enable click on the drop down arrow to the right of the field and select **Yes**.

8.4.6 Nav Outputs

The Nav Output option is mainly intended to be used when a VisionMaster ECDIS is connected to a radar scanner unit (for example, a BridgeMaster E [BME]). When enabled, the VisionMaster Nav Output should be connected to a Nav Input.

When a Nav Output is configured the following sentences defined in IEC 61162-1 (i.e. serial interfaces operating at 4800 baud) are selected as default:

- GGA (position data from the GPS Quality Indicator)
- ZDA (current system date and time)
- VTG (ground velocity)
- VBW (water velocity)

Additional Nav Output sentences can be selected from the **Navigation Data** column in the Nav Output Configuration screen, see Figure 1.137.

The data within the sentences is populated by the currently selected sensor information from the CCRS (with the exception of ZDA), not directly from sensor inputs.

Further sentences may be added by clicking on the sentence's check box in the Navigation Data area of the configuration window.

8.4.6.1 Configuring Nav Output

To configure one or more Nav Output items:

1. From the Nav Output window select Nav Output Port from the **All Nav Outputs** field and click on the **<** button to move the item to the **Selected** field. An unconfigured Nav Output Port appears in the navigation tree and Selected field. The system also creates a NMEA 0183 Formatter sub menu topic for each Nav Output Port. Figure 1.136 shows a configured and unconfigured Nav Output Port in the Selected Nav Outputs column.

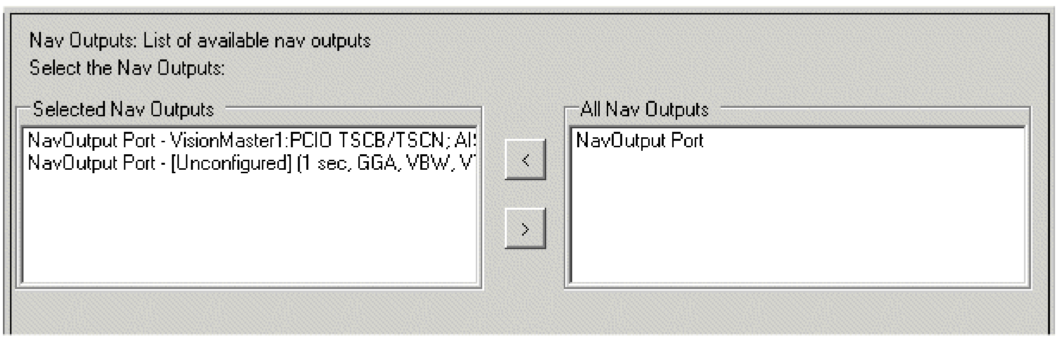


Figure 1.136 Nav Output Port

2. Click on the Nav Output Port line in the navigation tree. The configuration window for the item appears, see Figure 1.137.

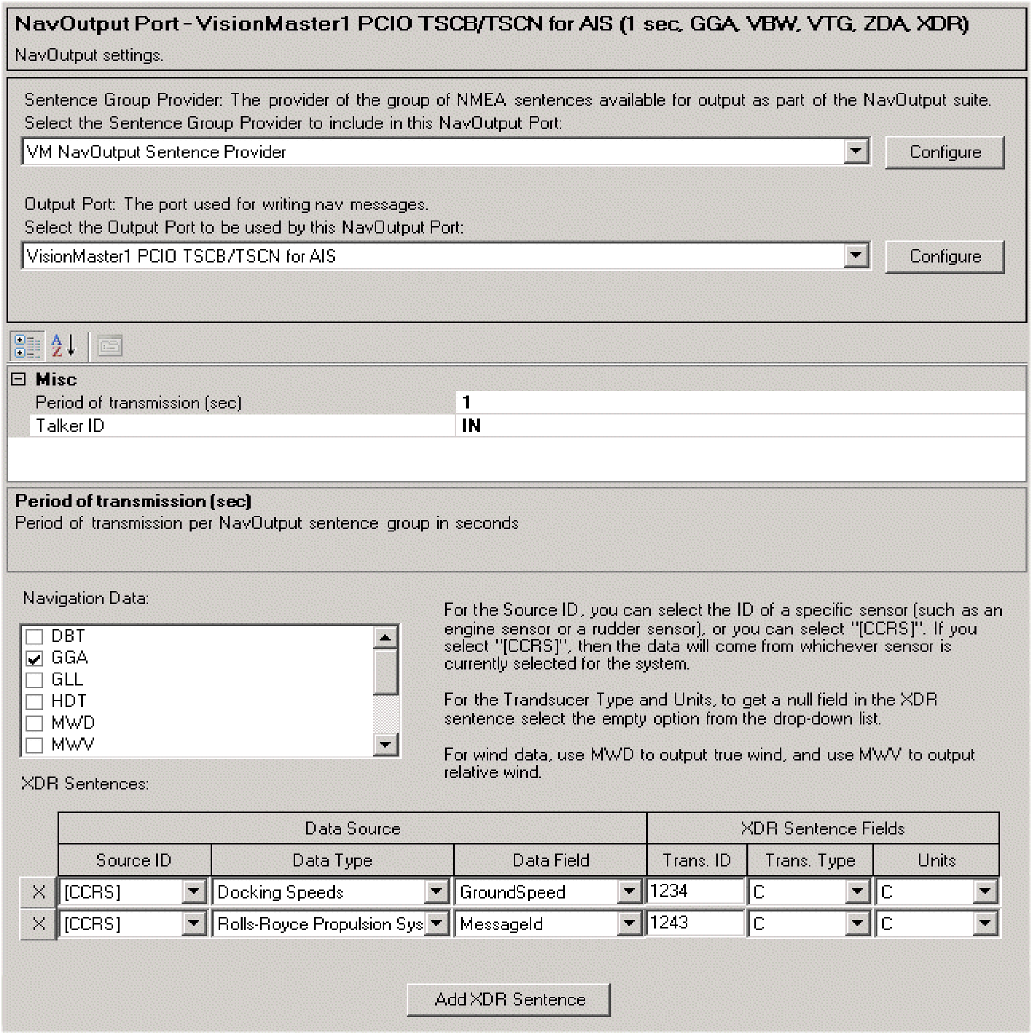


Figure 1.137 Nav Output Configuration

When a Nav Output Port has been selected the **VM Nav Output Sentence Provider** is automatically selected as the sentence group provider.

3. Click on the drop down arrow on the **Output Port** field to select the output port to be used for the item. The field displays a list of the currently configured ports. Select the port to be used from the list.
4. When a port is selected for use the item's status button colour in the navigation tree changes from red to green (valid).
5. To change the configuration of the port click the **Configure** button. The configuration window for the selected port appears, see Figure 1.56.
6. To change the transmission rate that the Output sentence group is sent, from the default of 1 second to a value of up to 59 seconds, click in the field and enter the required value using the keypad.

Talker IDs

The NMEA Talker ID for NMEA sentences output by VisionMaster are official NMEA Talker IDs as specified in IEC 61162-1 Ed2. In addition, the system uses a NMEA Talker ID based upon the standalone and multi-node product types. For a list of NMEA Talker IDs see Table 5.

Table 5: NMEA Talker IDs

Stand-Alone Product Types	NMEA Talker IDs
Radar	RA
Chart Radar	RA
ECDIS	EI
Total Watch	IN
Multi-node Product Types	**NMEA Talker IDs**
All Radar nodes	RA
All Chart Radar nodes	RA
Mix of Radar and Chart Radar nodes	RA
All ECDIS nodes	EI
Any other mix of node product types	IN

The talker ID for NavOutput may be changed from the default IDs listed above to any two digit letters required to be identified by external equipment.

The data listed in Table 5 also defines the talker IDs for Track Table Output, see page 192. Unlike NavOutput, the talker IDs for Track Table Output are not configurable.

Navigation Data

In addition to the sentences listed in Section 8.4.6, the user may select other sentences by ticking their relevant check boxes. An NMEA sentence is defined to have a set of associated data types (e.g. heading, water speed, etc.). For any sentence, some subsets of the associated data types are required, and the remainders are optional. Additionally, NMEA sentences may or may not have the ability to indicate whether a field representing a particular data type is valid.

For a list of supported NMEA sentence types that the sentence is capable of reading, see Table 2, "Supported Sentences and Data," on page 126.

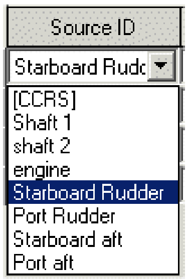
XDR Sentences

The table of XDR sentences allows the user to define any number of XDR sentences to be sent by the system, where each sentence can contain any single value that is available from a specified sensor, or from the CCRS.

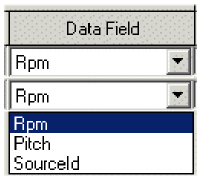
The XDR sentence fields require the following data:

- Transducer ID - this is a four digit number
- Transducer type - this is an alpa character such as **C** for temperature, **A** for angular displacement, **T** for tachometer (as in RPM), etc.
- Data Value - this is an alpa character such as **C** for Celsius, **D** for degrees, **R** for revolutions per minute, etc.

To configure a XDR Sentence table:



1. To add a row, click the **Add XDR Sentence** button. The system creates a default line with **[CCRS]** as the source ID. CCRS is used to collect data from whatever sensor is currently selected for the particular data type (e.g. position data from the selected position sensor). Otherwise, click on the drop down arrow and select from the list of previously configured NMEA sensor interfaces.
2. If CCRS is the source ID select the required data type. When a specific sensor source ID is selected, the Data Type and Data Field are automatically populated with the data type and value provided by this sensor, for example, 'Engine RPM' for Engine Sensor or 'Rudder Angle' for Port/Starboard Rudder.
3. The Data Field normally defaults to **Value**, although certain NMEA sensor interfaces, such as Propulsion System sensors enable the selection of more than one data field.



4. The XDR Sentence Fields define the content of the transducer ID, the transducer type, and the units of measure fields, as described above (where the XDR sentence format was defined). Any values may be used for the transducer ID. Only legally defined values may be selected for the transducer type and the units.
5. To delete a line from the table, click on the X button to the left of the Source ID field.

NMEA 0183 Formatter

The NMEA 0183 Formatter window includes the following miscellaneous setting:

Use Null Fields for Invalid or Missing Data, with the default setting as **No.**

When set to **No**, then if any data types for a given message are not invalid or unavailable, the system will NOT transmit the sentence unless it has a validity indicator* with which the system can indicate that the particular unusable piece of data is indeed invalid.

When set to **Yes** the system will always generate NMEA messages, even if the necessary data to fill those sentences is invalid or unavailable, but it will leave the field in the NMEA sentence null (i.e. there will be no characters in the message between the two commas that would normally delimit the applicable field). Note that if NMEA messages are sent in this way then the message will no longer adhere to the NMEA specification.

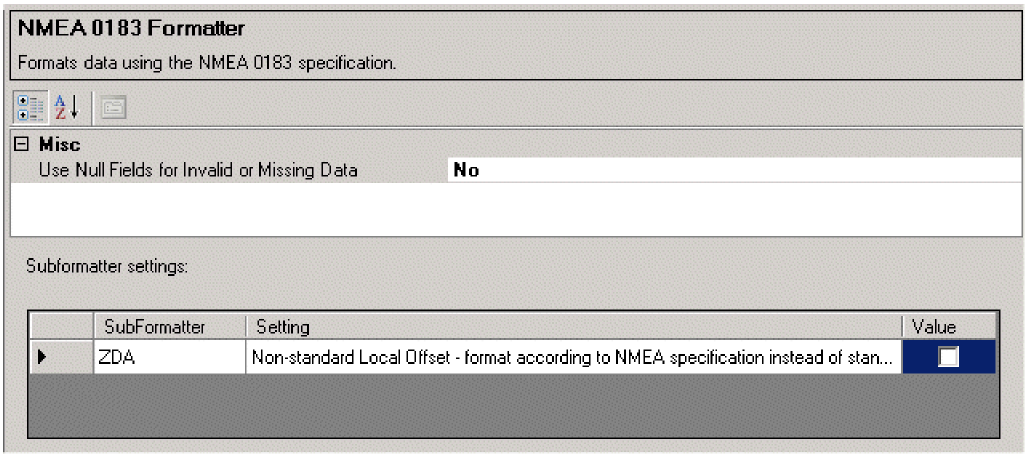


Figure 1.138 NMEA 0183 Formatter

The NMEA 0183 Formatter window also includes the option of inverting the local offset time of a transmitted ZDA message to ensure that the equipment receiving the message is able to display the correct local time.

The VisionMaster time offset (as defined in Time Management on the VMFT application) enables input of a local time offset from UTC in either an East direction or a West direction, where the offset is defined such that Local Time = UTC + Offset. The offset format within the ZDA message according to the NMEA specification defines the offset such that Local Time = UTC - Offset.

To invert the local offset time to comply with the NMEA specification instead of the VMFT standard practice tick the **Value** check box.

* A validity indicator is a flag or status field included in the NMEA sentence that can indicate the validity of some or all of the data the sentence contains.

8.4.7 CCRS Announcement Reporter

The CCRS Announcement Reporter enables CCRS data types that, when selected for primary navigation, will always generate alarms if the data is degraded or unavailable.

CCRS data types that have been configured, but not selected for primary navigation, will only generate cautions if their data is degraded or unavailable.

The default list of data types used for primary navigation are as follows:

- Course Over Ground
- Speed Over Ground
- Position
- Speed Through Water
- True Heading

If Course Over Ground or Speed Over Ground are de-selected from the Primary Navigation column a Validation warning is generated, see Section 4.3.1 *Warning Messages*’.

Position, Speed Through Water and True Heading data types will generate validation errors, and therefore cannot be de-selected from the primary navigation column.

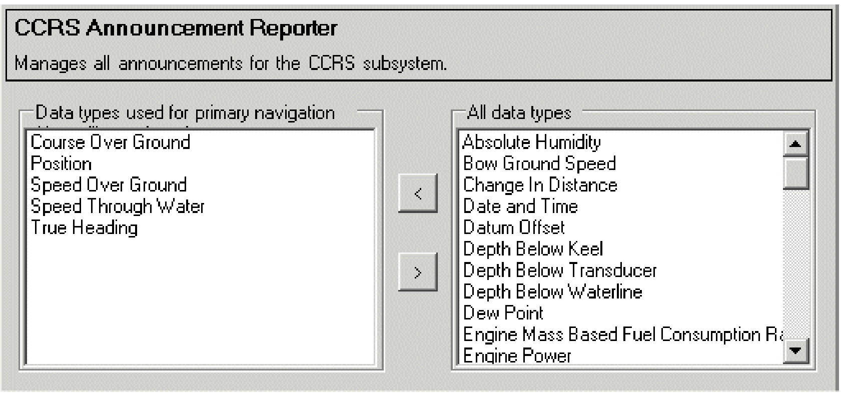


Figure 1.139 CCRS Announcement Reporter

To select other CCRS data types for primary navigation highlight from the list of All data types and click the < button.

8.5 Data Handling/Recording

Data Handling/Recording includes the following sub menus:

- Data Access
- Data Log
- Persistence Subsystem

8.5.1 Data Access

If a database server is installed, Data Access enables configuration of a database server name. The database server name must be the same across all nodes.

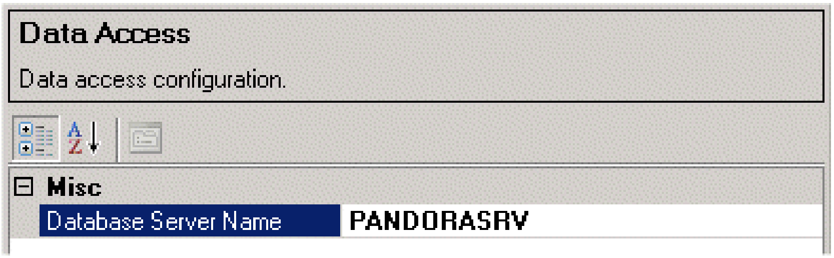


Figure 1.140 Data Access

8.5.2 Data Log

Data Log enables the archive drive where the data resides to be configured. Node Data Log enables you to configure the periodic rate at which the system logs data and the node state information to be suppressed.

The Data Log sub menu comprises Data Log and Node Data Log.

8.5.2.1 Data Log

To access the Data Log click on the **+** button of the Data Log sub menu and click the Data Log topic.

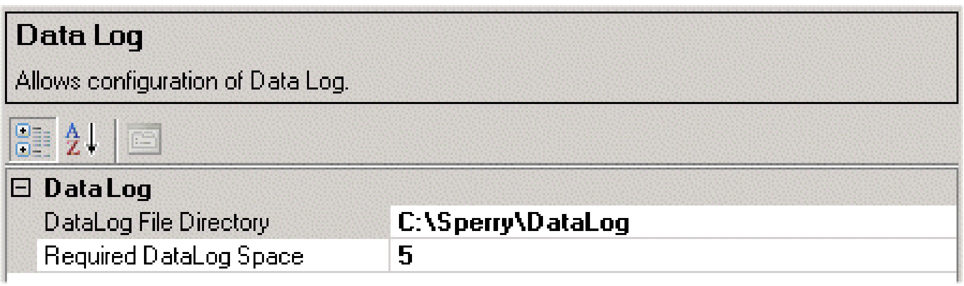


Figure 1.141 Data Log

The Data Log fields display the following data and values:

- **DataLog Drive -** the drive used for datalog archive files, defaults to **C:\Sperry\DataLog**. If the archive drive is changed to a network it must be valid for all nodes.
- **Required DataLog Space -** the disk space, in gigabytes, required for datalog archive files. The default is 5 gigabytes. The archive space range is between 1 and 10 gigabytes.

8.5.2.2 Node Data Log

To access the Node Data Log click on the **+** button of the Data Log sub menu and click the Node Data Log topic.

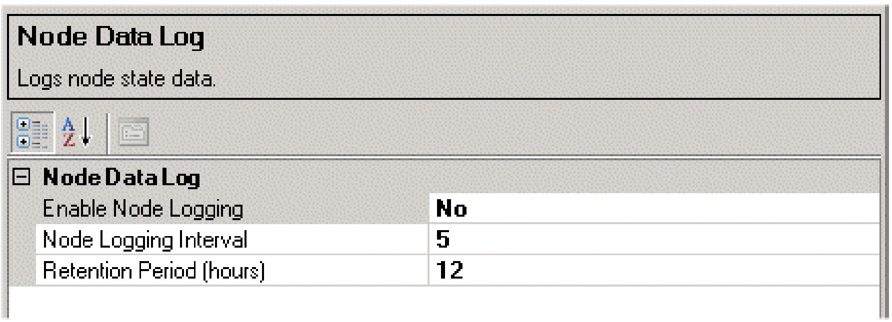


Figure 1.142 Node Data Log

The Node Data Log fields display the following settings and values:

- **Enable Node Logging -** the system automatically suppresses the logging of media data, to enable click on the drop down button to the right of the field and select **Yes**.
- **Node Logging Interval -** the time interval, in seconds, in which node state data is logged. The default is 5 seconds. To change the time interval click in the field, delete the current value and enter a value between 1 second (minimum) and 60 seconds (maximum).
- **Retention Period (hours) -** the number of hours that logging data is retained. The default is 12 hours. To change the retention period click in the field, delete the current value and enter the required value (there are no minimum or maximum values).

8.5.3 Persistence Subsystem

The persistence subsystem window displays the directory where the files containing persistent data will be stored. The directory defaults to **C:\Sperry\PersistedData.**

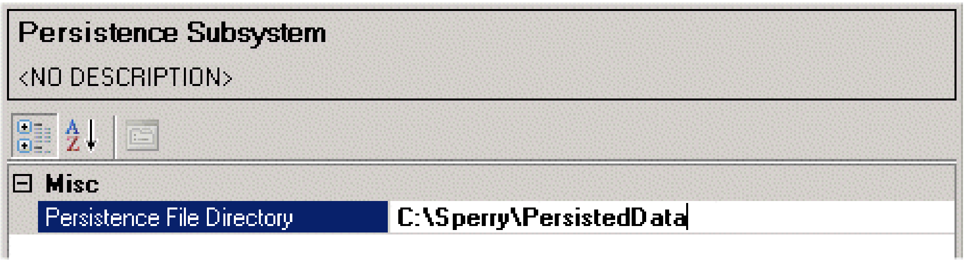


Figure 1.143 Persistence Subsystem

8.5.4 Data Location

Data created and archived by the system (SQL database feature content, XML files, etc.) is saved in subfolders on the system PC.

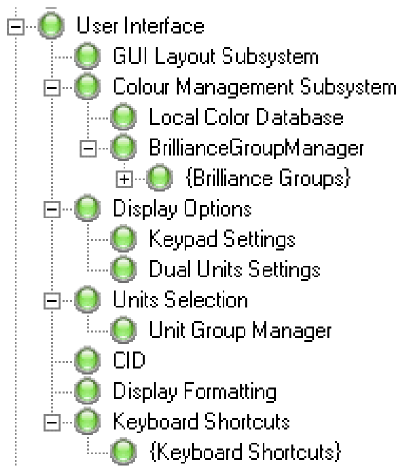
The root path C:\Sperry\ include the following sub folders:

- Chart Handler
- Charts
- Datalog
- Datalog Archive
- Persisted Data

The root path C:\Sperry\DataLog\ include the following sub folders:

- Announcement
- CCRS
- Chart
- Position Sensor
- Prompt

8.6 User Interface



The User Interface sub menu allows the following configuration settings to be made:

- GUI Layout Sub System
- Colour Management Subsystem, including:
  - Local Color Database;
  - Brilliance Groups Manager.
- Display Options, including:
  - Keypad Settings;
  - Dual Unit Settings
- Units Selection
- CID
- Display Formatting
- Keyboard Shortcuts

For information on selecting a CID page refer to Section 5.12.1 *CID*' in the Quick Setup menu.

8.6.1 GUI Layout Sub System

The GUI Layout Subsystem topic allows the display of the Print Screen control to be enabled or disabled on the VisionMaster screen. The default setting is **No** (disabled).

If the VisionMaster node has a printer installed click on the drop down arrow and select **Yes** to enable the Print Screen control.

Not that this control will only available on ECDIS watch mode.

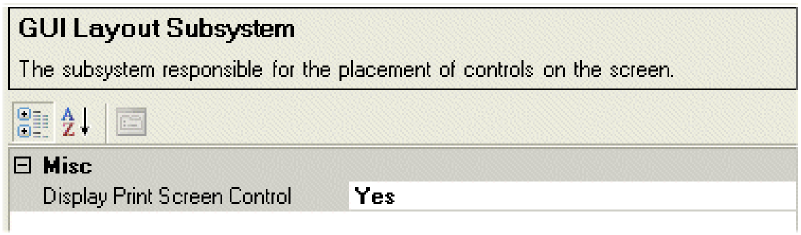


Figure 1.144 GUI Layout Subsystem

Note: *If the printer connected to the node fails to print, refer to Section 4 Enabling the VisionMaster Printer' in 'Appendix C Configuring Peripheral Devices' for a possible solution on how to fix the fault*

8.6.2 Colour Management Subsystem

8.6.2.1 Local Color Database

The Colour Management database enables changes in day/night mode on a selected workstation of a multi-node system to be sent to other nodes on the system.

The Local Colour Database window displays the number of configured nodes on the system, and is divided into **System-Wide Provider** and **System-Wide Responder** columns. The default setting is for all the node's check boxes to be ticked for both columns.

To enable a workstation to be a system wide provider, with other workstations on the network affected by the provider's day/night mode changes, untick the other node's check boxes in the Provider column and untick the provider workstation's Responder check box.

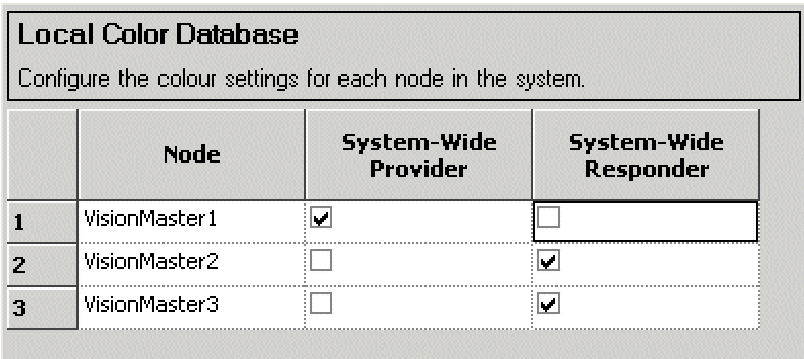


Figure 1.145 Local Colour Database

8.6.2.2 Brilliance Groups Manager

The Brilliance Groups manager enables the pre-defined list of brilliance groups to be edited, or a new brilliance group to be created from available colours to combine different features into a single group.

The Color Management facility prevents a single feature from being associated with more than one brilliance group.

The default values applied to each brilliance group result in colours that do not alter the IEC-required, or otherwise pre-defined, colour values for the selected colour set (e.g. Day Mode, Night Mode, etc.).

The brilliance adjustable functions are pre-defined to the following groups:

- Control Panel
- EBL / VRM
- Own Ship
- Range Rings
- Tools (includes PI lines, rotating cursor, constant turn radius, etc.)
- ARPA / AIS data (to extinction)

- Routes
- Alarms/Warnings
- Mariner Objects
- Chart Symbols

The VisionMaster operator may independently adjust the brilliance of each of these groups via **Groups** in the **Brilliance** menu. See the VisionMaster User Guides (Chart Radar or ECDIS) for further information.

Viewing and Configuring Existing Brilliance Groups

Note: *It should not normally be necessary for a brilliance group to be deleted or re-configured.*

To view details on each brilliance group, click on its status button in the navigation tree. The configuration window for the selected brilliance group appears showing the list of colours assigned to the group, Figure 1.146 below shows the brilliance group configuration window for own ship.

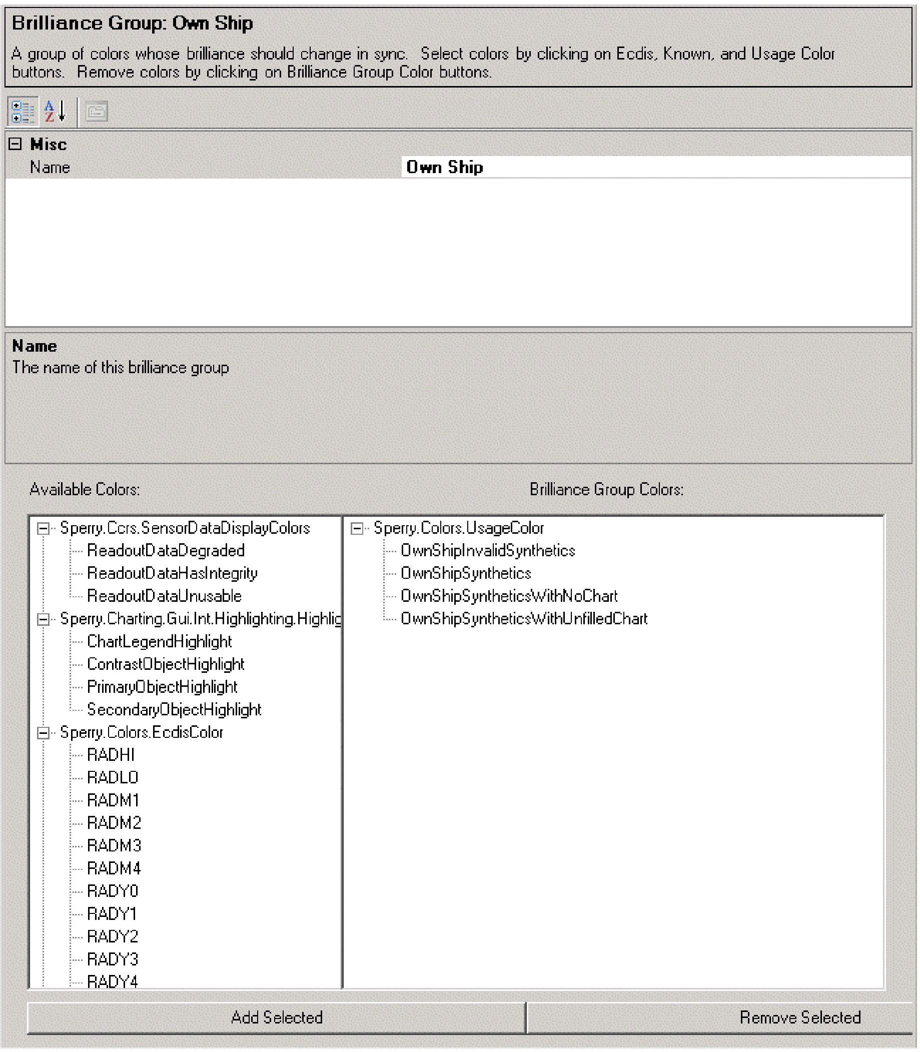


Figure 1.146 Brilliance Group: Own Ship

Creating a new Brilliance Group

To create a new brilliance group:

1. Click on the Brilliance Group Manager status button, the current brilliance groups list appears, see Figure 1.147 below.

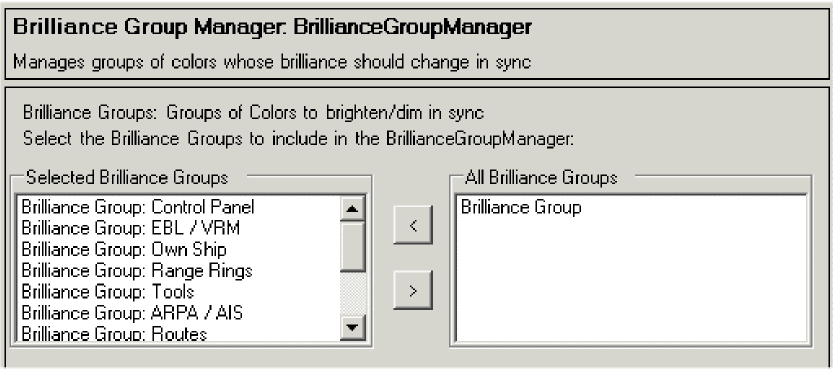


Figure 1.147 Brilliance Group Manager

2. Highlight **Brilliance Groups** from the All Brilliance Groups list and click on the **<** arrow. A new group is added to the selected brilliance group list.
3. Click on the **<Configure Me>** status button in the navigation tree. A blank configuration window for the brilliance group appears.
4. Select individual colours from the list of available colours and click on the **Add Selected** button at the bottom of the window. The selected colour and its parent directory are moved to the Brilliance Group Colors column.
5. To remove a colour highlight it in the Brilliance Group Colors column and click the **Remove Selected** button. The item and its directory are removed from the list.
6. With the required colours selected enter a name for the group in the **Misc: Name** field. The name should be applicable to the colours, or groups of colours selected. The example in Figure 1.148 shows a brilliance group named and created for critical points.
7. When a new brilliance group has been created it will appear in the Brilliance Group Manager and will also be available for the VisionMaster operator to independently adjust via **Groups** in the **Brilliance** menu.

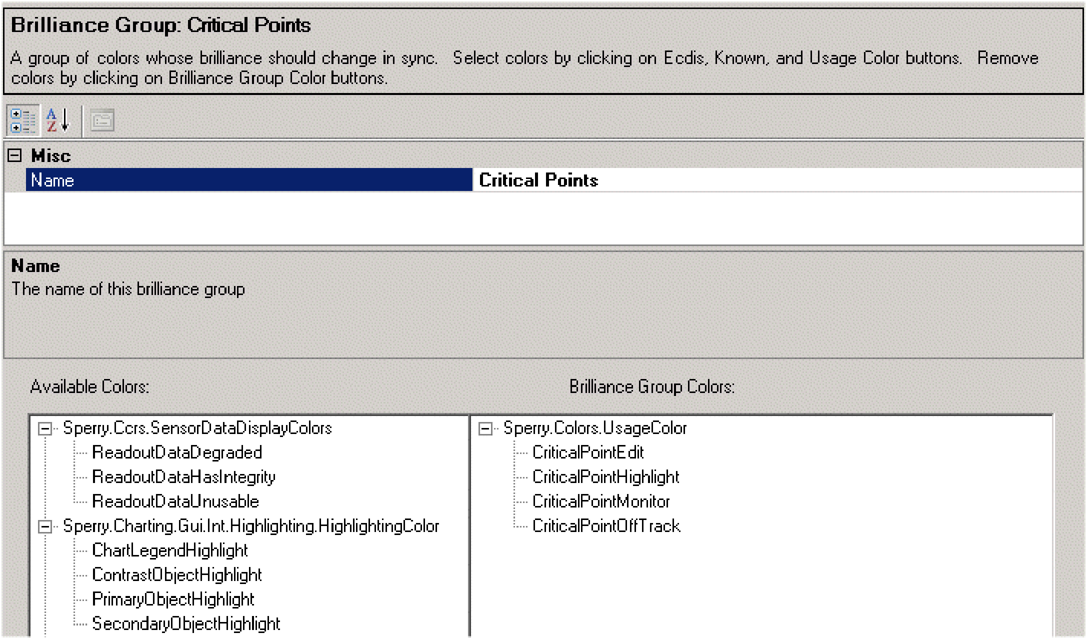


Figure 1.148 New Brilliance Group: Critical Points

8.6.3 Display Options

Display Options enables keypad settings and dual unit settings to be altered.

8.6.3.1 Keypad Settings

The Keypad Settings window enables the time before the screen keypad is removed from the screen, when no keys have been pressed, to be configured. The default timeout value is 30 seconds.

To change the timeout click in the field, delete the current value and enter the required value (there are no minimum or maximum timeout values).

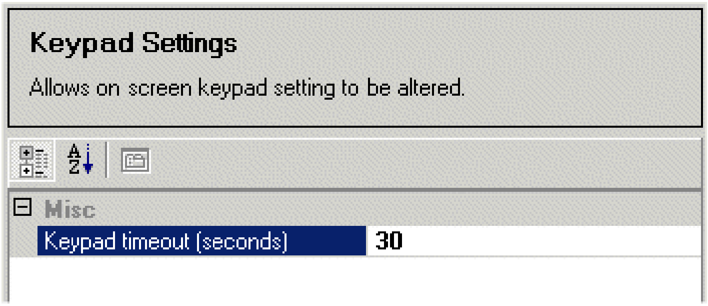


Figure 1.149 Keypad Settings

8.6.3.2 Dual Units Settings

Dual Unit settings show the threshold maximum and minimum distances in metres when the system swaps between displaying short distance units or long distance units. For example, the distance between own ship's CCRP and the current cursor position on the Cursor readout will swap between metres and NM (if configured, see Section 8.6.4 *Units Selection*') when the thresholds are reached.

The default auto short/long maximum changeover distance is 600 metres. The default auto short/long minimum changeover distance is 500 metres.

To change the maximum and minimum changeover values click in the respective fields and enter the required value, maximum value is 3700 metres; minimum value is 10 metres.

To disable the auto short/long unit changeover click on the drop down arrow to the right of the field and select **No.**

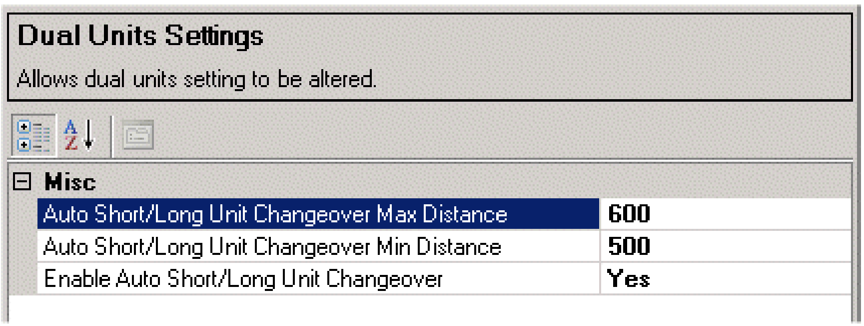


Figure 1.150 Dual Unit Settings

8.6.4 Units Selection

The Units selection window controls the abiliity of the operator to select displayed units while the VMFT application is running. The default setting is disabled (i.e. not to allow units selection by the operator).

To allow the operator to select display units click the drop down arrow and select **Yes**.

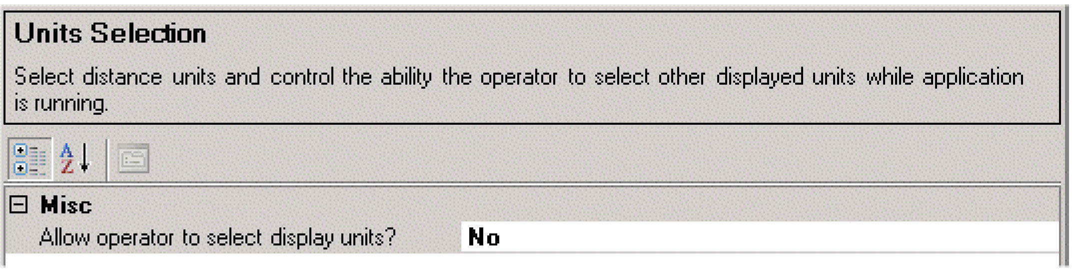


Figure 1.151 Units Selection

8.6.4.1 Unit Group Manager

The Unit Group Manager enables the operator to select the desired units to be displayed within a unit group.

Display Units are listed in the following unit groups:

Group	Default
• Short Distance	Metre
• Depth	Metre
• Height	Metre
• Position	DD°MM.MMM
• Speed (and Windspeed)	Knots
• Temperature	Degrees Celsius
• Pressure	Pascal

The Long Distance Units group only allows for the selection of one unit, the default is Nautical Miles (NM). The following units have only one selection available:

- Angle (degrees)
- Angular Velocity (degrees per minute)
- Humidity (percent)
- Coordinate System (Geographic)
- Fuel Usage (Kilogram)

To change the availability of a unit selection tick the relevant check box.

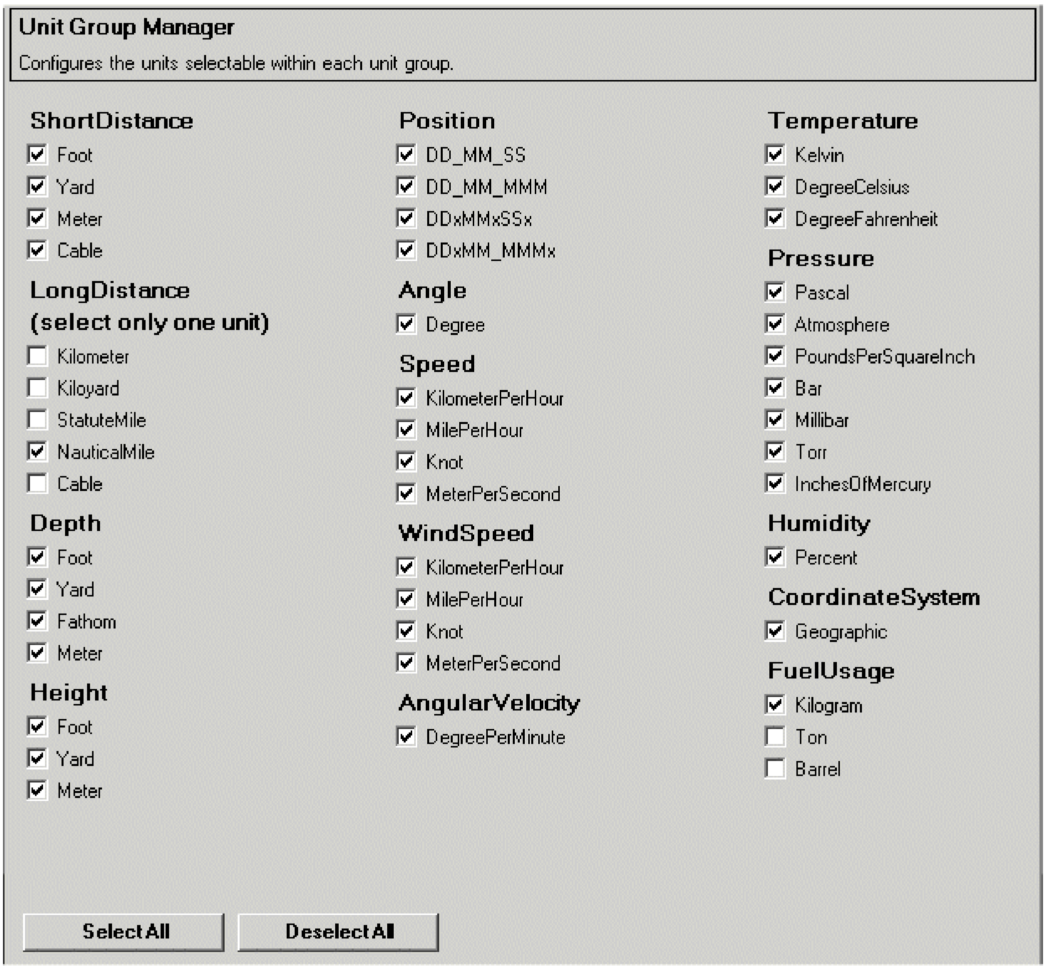


Figure 1.152 Unit Group Manager

Note: *The settings made on this screen do NOT effect the unit default settings, only the selection availability of that unit.*

To discard any changes made in the Units Group Manager and restore the default unit selection click the **Select All** button. All units are selected, with the exception of the Long Distance Unit (Nautical Miles), which must be manually selected.

To untick all units click the **Deselect All** button.

8.6.5 Display Formatting

The display formatting topic allows the Pitch & Roll properties shown on CID screens to be changed.

The following miscellaneous display defaults are applied to a CID screen displaying Pitch & Roll angles:

- Pitch positive when Bow is down
- Roll positive when Starboard is up
- Use default sign convention

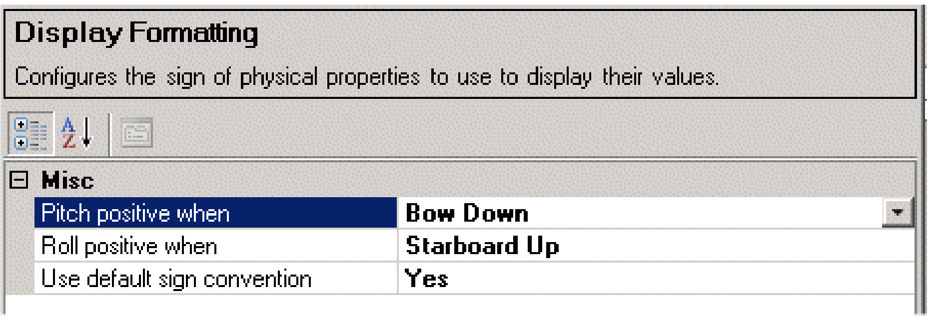


Figure 1.153 Display Formatting

To change the pitch positive to **Bow Up**, or Roll positive to **Port Up** click on the drop down arrows. A negative value is applied to the Pitch & Roll angles when the bow is up or the port is down. For a graphic representation of Pitch & Roll refer to '*Steering Page*' in Chapter 2 Conning Information Display of the Supplementary Features User Guide (65900014).

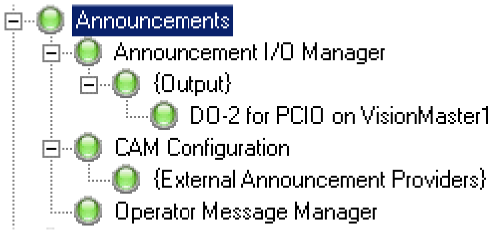
The sign convention for CID screens defaults to **Yes**. To switch off default signage select **No**.

8.6.6 Keyboard Shortcuts

Keyboard Shortcuts enables the operator to execute actions on the VMFT application with single key presses.

Note: *For commercial VMFT this feature should not be enabled (i.e. do not change the setting from <NONE>).*

8.7 Announcements



The Announcements subsystem enables the following configurations and selections to be made:

- configuration of all announcements, including Alarms, Warnings, Cautions and Prompts;
- selection of the audio playback output to be used by the announcements;
- selection of the alarm input/output through configured ports or relays;
- configuration of Central Alarm Manager (CAM);
- display of announcements to be limited to a single node or shown on all nodes.
- configuration of audible operator messages.

The Announcements window divides into the following two areas:

- Buzzer output selection for each node on the system.
- Distribution - enables CAM local announcements to be displayed on all nodes (default) or local nodes only.
- Miscellaneous, including allowing nodes to be configured without buzzers, timeout enablement and prompt display time configuration settings.

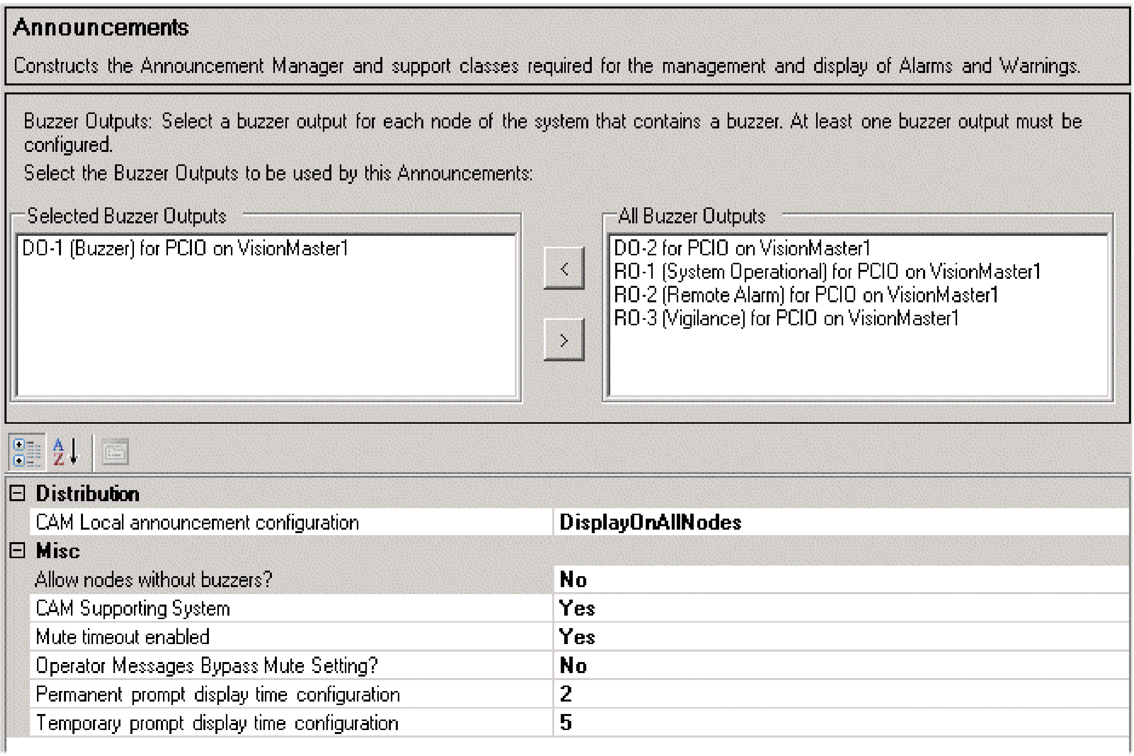


Figure 1.154 Announcements

8.7.1 Buzzer Configuration

Enables selection of a discrete output (digital or relay) on the PCIO board for the buzzer.

Note: *In order for a buzzer output to be selected here, a set of digital and relay outputs for the PCIO board must have been previously configured, see Section 7.1 PCIO Board Manager’.*

1. To select the required PCIO digital or relay output for each node highlight the outputs in the **All Buzzer Outputs** list and click **<** arrow. The output is moved to the **Selected Buzzer Outputs** field.
2. To view or configure the output settings double click on the selected output. The window for the selected buzzer output appears and the navigation tree highlights the output in the **{Discrete Outputs}** sub-directory of the PCIO board.

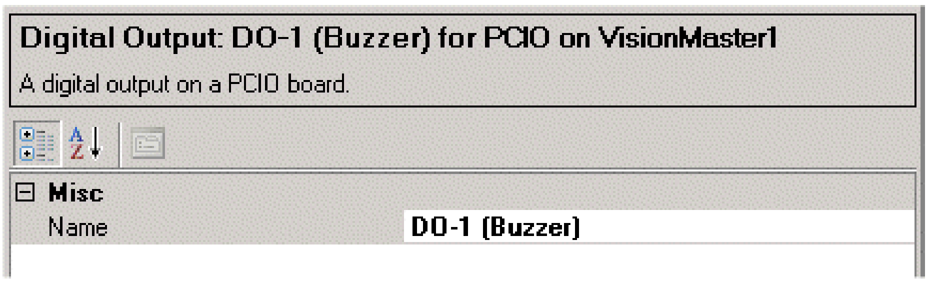


Figure 1.155 Digital Output for Buzzer

3. The name of the output may be changed. To change the output name click in the **Name** field, delete the current name and enter a new one.

8.7.2 CAM Distribution

The Distribution field enables the selection of CAM local announcements to be distributed to all nodes (default setting), or only to the node which generated the announcement.

To change from the default setting (**DisplayOnAllNodes**) click on the drop down arrow and select **LocalNodeOnly.**

8.7.3 Miscellaneous Settings

The Miscellaneous area enables the following settings to be changed:

- **Allow nodes without buzzer? -** by default all nodes are set to receive buzzer output. To allow certain nodes on a multi-node system to be configured without buzzers click in field and select **Yes**.
- **CAM Supported System -** indicates whether the system supports CAM (defaults to **Yes**). If configured as CAM supporting, an alarm is raised when none of the nodes on a multi-node system are in CAM watch mode. If **No** is selected, no alarm is raised if none of the nodes are in CAM watch mode.

- **Mute Timeout Enabled -** defines whether the mute should timeout so that alarms will eventually sound. The default is **Yes**. The length of the mute timeout can be adjusted from the System Commissioning menu, Chapter 2 '*Diagnostics, Commissioning & Service Mode*'.

WARNING!

SELECTING NO ALLOWS THE ALARM TO BE PERMANENTLY MUTED. THIS OPTION SHOULD NOT BE SELECTED FOR OPERATIONAL SYSTEMS.

- **Operator Messages Bypass Mute Setting? -** defines whether operator messages should be audible even when the system is muted. The default is No.
- **Permanent Prompt Display Time -** the length of time, in seconds, that each permanent prompt will be displayed. The default time is 2 seconds. The time range that can be entered is a figure greater than 0 and less than 10 seconds.
- **Temporary Prompt Display Time -** the length of time, in seconds, that each temporary prompt will be displayed. The default time is 5 seconds. The time range that can be entered is a figure greater than 0 and less than 30 seconds.

To change the default values click in the field and enter the required value.

8.7.4 Announcement IO Manager

The announcement IO manager window enables the selection of a announcement I/O port to be made. The output options include DIscrete I/O (digital/relay) and Port I/O (serial) The process for configuring a discrete I/O port and/or a serial I/O port is described in the following sections.

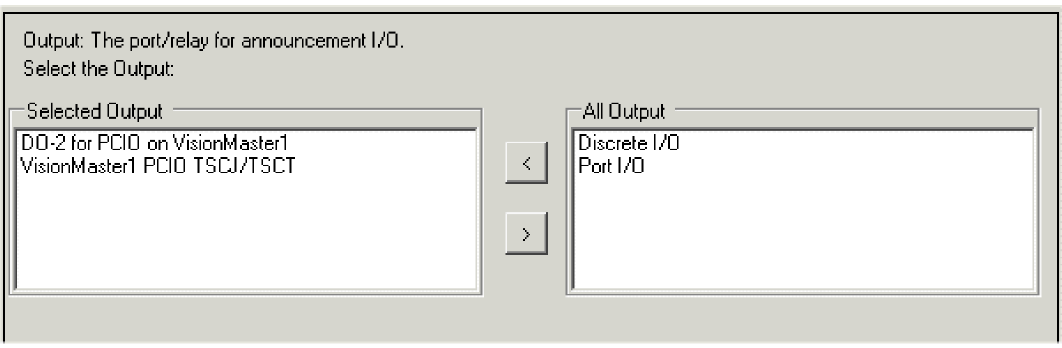


Figure 1.156 Announcement IO Manager

1. Select the output to use for the announcements by highlighting the option in the **All Output** field (Discrete I/O or Port I/O) and clicking on the **<** button. The output is moved to the **Selected Output** field and an unconfigured output line is added to Announcement IO manager in the navigation tree.

2. To configure the output either double click on the selected output or click on the line topic in the navigation tree. A configuration window for the selected output appears.

8.7.4.1 Configuring a Discrete Announcement I/O Port

1. Select the relay to be used for the announcement output by clicking on the drop down arrow and selecting from the list of digital/relay outputs. The list shows the configured discrete outputs on the PCIO board in Section 7.1 *PCIO Board Manager*'.

Note: *You cannot select the same discrete output for the Announcement IO as the output previously selected at the Announcements subsystem.*

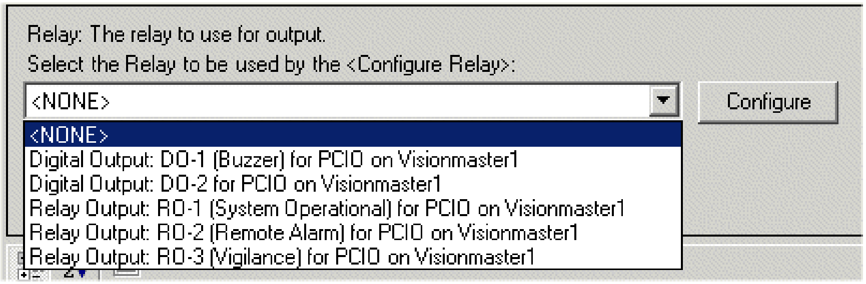


Figure 1.157 List of Discrete I/O Digital/Relay Outputs

2. If the output requires configuration click on the **Configure** button. The digital/relay output configuration window for the selected relay appears, see Figure 1.158.

Note: *Where a discrete output has been selected only the output name can be changed.*

Changing the Miscellaneous Settings

The following Miscellaneous settings may be changed:

- **Clear On Acknowledgement -** by default the relay state changes to its inactive form when the alarm is acknowledged, or the alarm condition clears. To change the relay state so that it does not change to an inactive form after the alarm condition clears, or after any acknowledgement click in the field and select **No**.
- **Delay Length (Seconds) -** denotes the amount of time between when the alarm is made active and when the signal is sent to the external device. The default is 20 seconds
- **Relay State** - by default an active relay is interpreted as an active alarm and the alarm state will display **Relay Energized = Alarm Active**. If you need to deactivate the relay, but keep the alarm active, click on the drop down arrow to the right of the field and select **Relay De-energized = Alarm Active**.

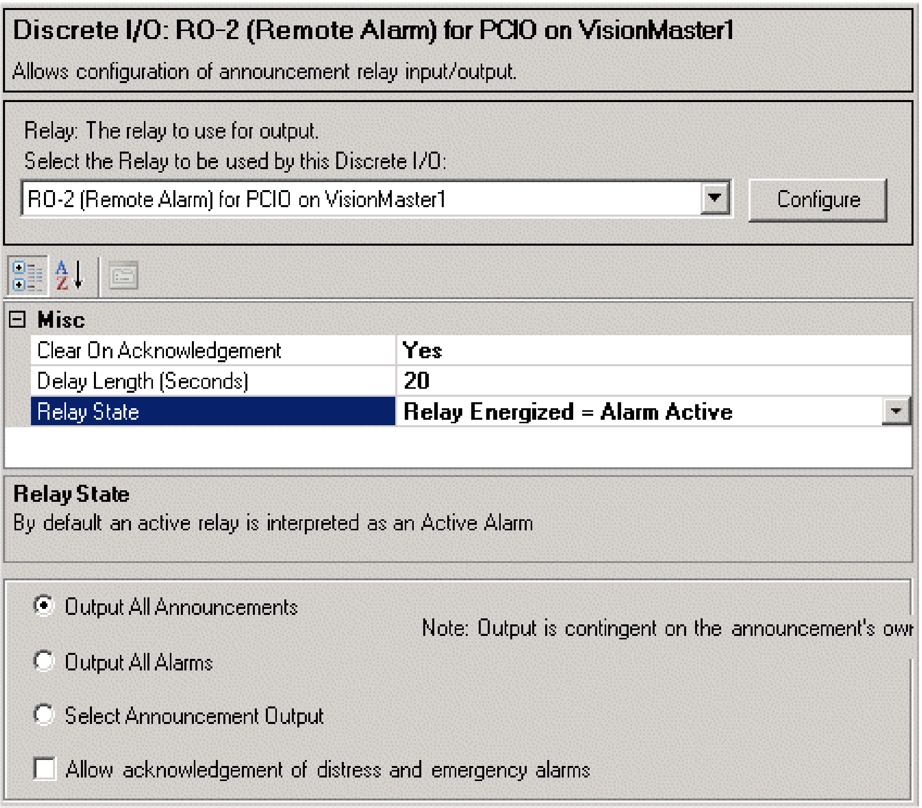


Figure 1.158 Announcement I/O Configuration

The digital/relay output window allows you to select all announcements to output, output Alarms only, or select specific announcements, or groups of announcements from all the announcements list. For details see Section 8.7.4.3 *Configuring the Announcement Output*'.

The window also includes the option of allowing the operator to acknowledge distress and emergency alarms from the configured I/O ports or relays. This option defaults to not selected.

The **Allow acknowledgement of distress and emergency alarms** check box defaults to unticked. If the check box is ticked, the config tool generates a Warning Message informing the user that the acknowledgement of critical alarms from an external system is not in accordance with IEC 62388, with the selected port/relay's status button displayed in orange.

Critical Alarms

There are two alarms in the system that are considered critical:

- Backup Navigator Alarm (marked as Emergency)
- CPA/TCPA Limit (marked as Distress)

A full list of alarms that can be raised by the system, together with a description and their priority status is given in Chapter 7 '*Alarms*' of the Radar/Chart Radar and ECDIS User Guides (65900010 and 65900012).

8.7.4.2 Configuring a Serial I/O Port

When a Port I/O has been selected at the Announcement IO Manager:

1. Click on the **Port I/O: <Configure Port>** line in the navigation tree. The Port I/O configuration window appears.
2. Select the port to be used for the output by clicking on the drop down arrow and selecting from the list of outputs. The list shows all the previously configured I/O serial outputs in the I/O Port Manager.

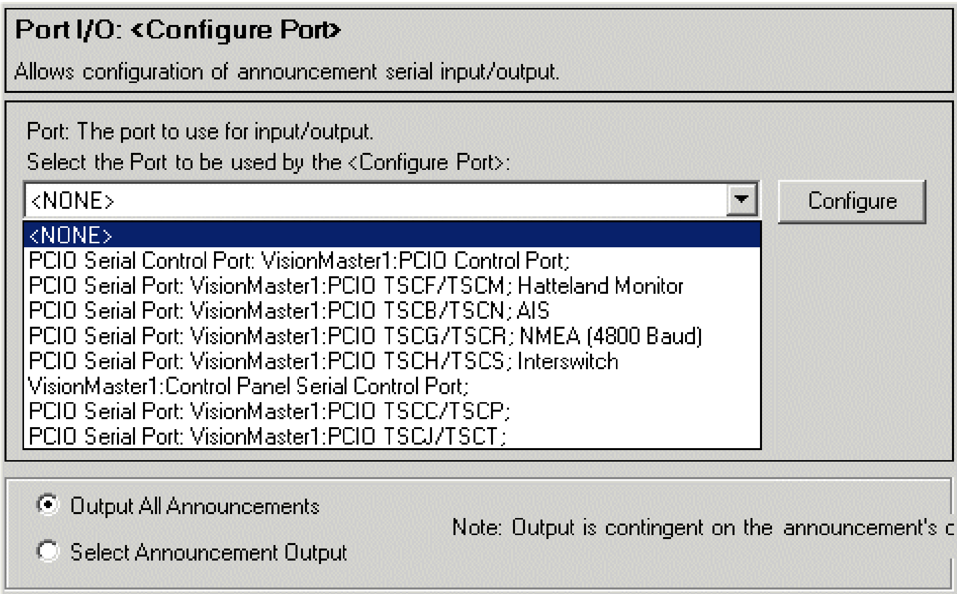


Figure 1.159 List of I/O Serial Outputs

3. If the output requires configuration click on the **Configure** button. The port window for the selected port appears, see Figure 1.56, page 72.

8.7.4.3 Configuring the Announcement Output

The output on all digital or relay output options defaults to **Output All Announcements.** To select specific announcements, or groups of announcements, click the **Select Announcement Output** button, the subsequent screen lists all the Alarm and Warning announcements on the system, arranged by group and priority, see Figure 1.160.

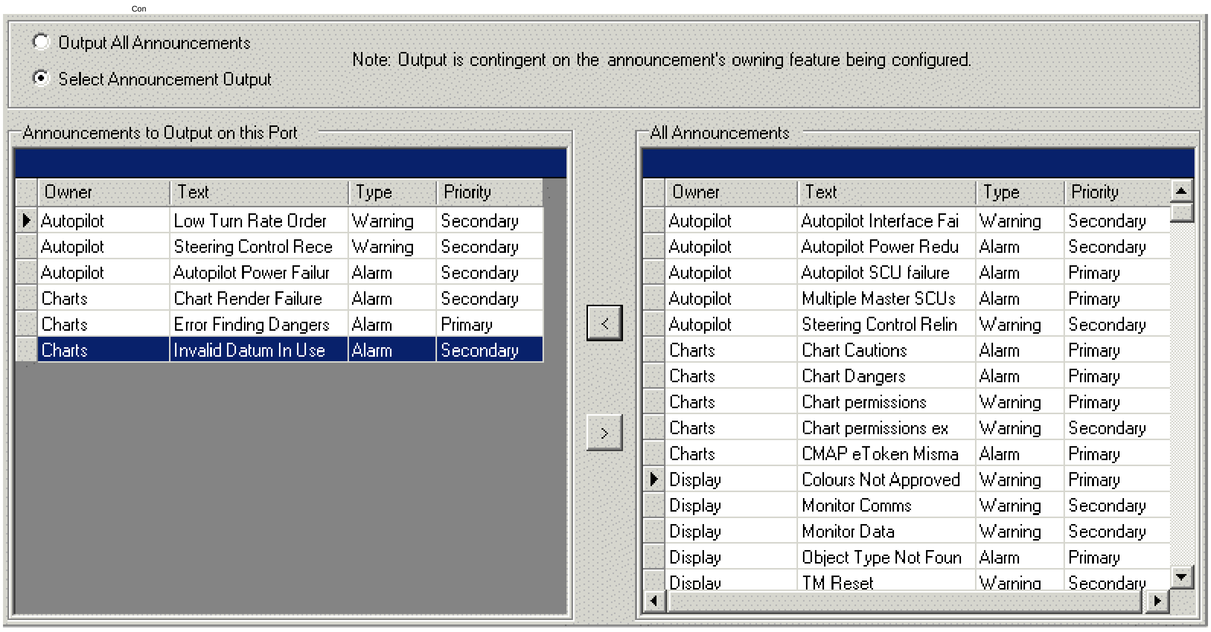


Figure 1.160 I/O Configuration - select announcement output

1. To select an announcement from the **All Announcements** list click on the shaded button to the left of the announcement line, the line is highlighted and an arrow appears in the button.

2. With the required announcement highlighted click the < button. The selected item is moved to **Announcements to Output on this Port** field.
3. To remove items from the Announcements to Output on this Port field highlight the items and click on the > button. The selected items are moved back to the All Announcements field.

8.7.5 CAM Configuration

The CAM Configuration window enables the VisionMaster workstation to act as a Central Alarm Manager (CAM) and receive alarms from external devices.

The external announcement providers selected can be either a discrete alarm device (digital input relay) or NMEA (National Marine Electronics Association) alarm device (IO port).

The Miscellaneous field includes the option of suppressing the display of inactive external annoucements. This setting must be selected on vessels required to conform with Russian regulatory requirements. On all other vessels this setting should remain at **No**.

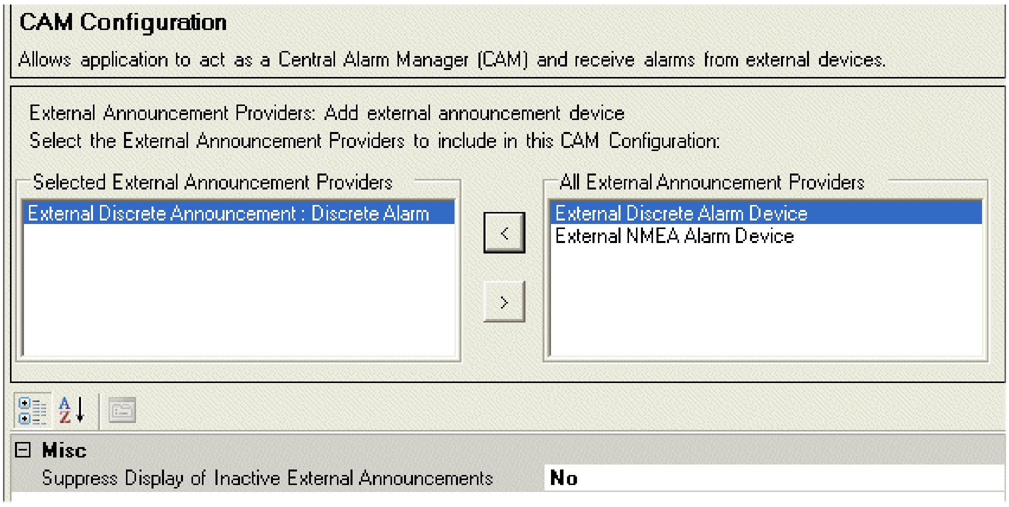


Figure 1.161 CAM Configuration

8.7.5.1 Configuring a Discrete Alarm Device

To select a discrete alarm device as the external announcement provider:

1. Highlight **External Discrete Alarm Device** from the All External Announcement Providers list and click on the **<** button. The device is moved to the Selected Providers list and an unconfigured topic is added to the Navigation tree.
2. To configure the device click on the topic in the navigation tree. The external discrete alarm device configuration window appears.

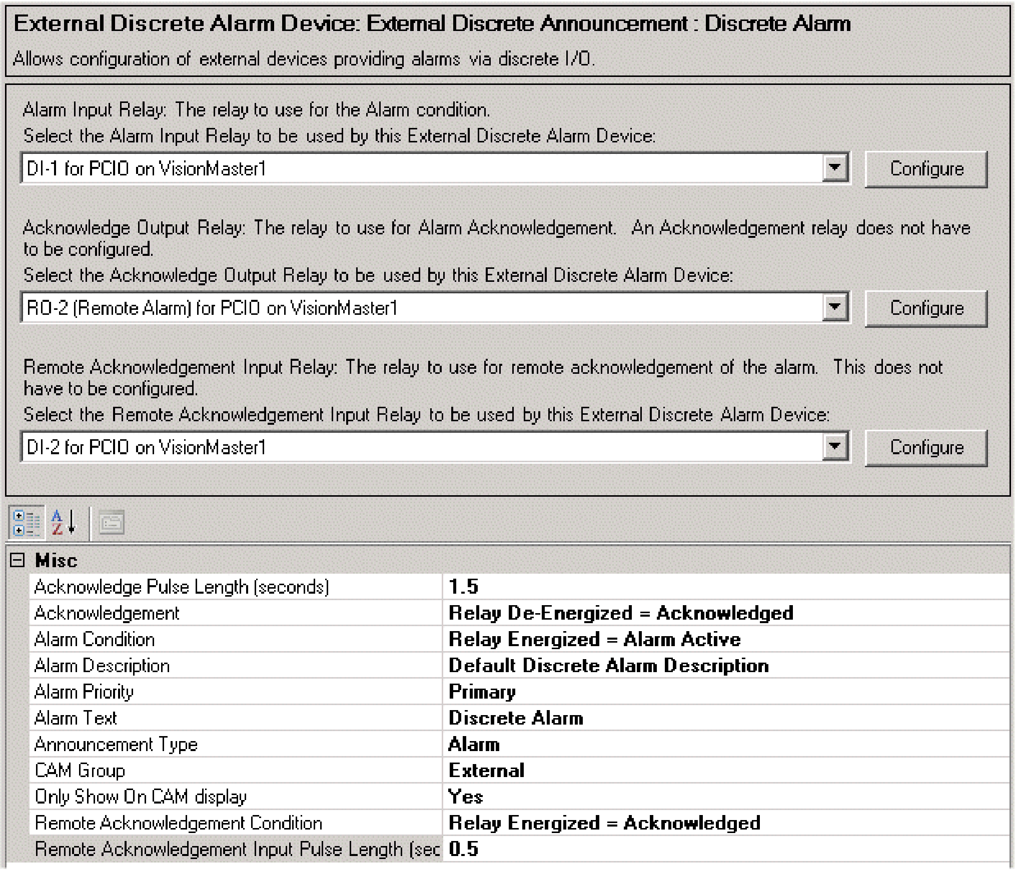


Figure 1.162 External Discrete Alarm Device Configuration

The discrete device configuration window is divided into the following areas:

- the selection of Input/Output relays and remote acknowledgement input relay to be used for the Alarm condition; and
- miscellaneous Alarm conditions.

Selecting Input/Output Relays

To select the Alarm Input relay and Acknowledge Output relay to be used for the external alarm device:

1. Click on the Alarm Input Relay drop down arrow. A list of the discrete inputs on the PCIO board is displayed.
2. Select the Input Relay to be used for the external announcement device.

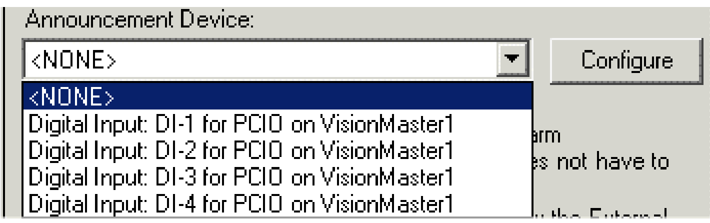


Figure 1.163 Discrete Inputs on PCIO

3. To select an output relay click on the output relay drop down arrow and select from the list of discrete outputs on the PCIO board.

Note: *The Discrete Alarm Device provider can be configured without the requirement of selecting a output relay.*

Selecting Remote Acknowledgement Input Relay

This function should be configured if the VisionMaster is acting as a CAM and is required to accept discrete input signals from remote equipment indicating that the remote equipment has acknowledged an alarm.

From the Remote Acknowledgement Input Relay click on the Remote Acknowledgement Input Relay dropdown button and select the required input relay from the list of input discretes on the PCIO.

Changing Miscellaneous Alarm Settings

The following Alarm settings are listed under Miscellaneous with their default values:

Setting	Default
• Acknowledgement Pulse Length (seconds)	• 1.5
• Acknowledgement	• Relay De-Energized = Acknowledged
• Alarm Condition	• Relay Energized = Alarm Active
• Alarm Description	• Default Discrete Alarm Description
• Alarm Priority	• Primary
• Alarm Text	• Discrete Alarm
• Announcement Type	• Alarm
• CAM Group	• External
• Only Show on CAM Display	• Yes
• Remote Acknowledgement Condition	• Relay Energized = Acknowledged
• Remote Acknowledgement Input Pulse Length (seconds)	• 0.5

Acknowledgement Pulse Length

Defines the length of time that the acknowledgement signal should pulse for in seconds. A value of zero will hold the signal for as long as the alarm is acknowledged.

Acknowledgement

By default an inactive relay is interpreted as an acknowledged alarm. To change the setting to an active relay click on the drop down arrow to the right of the field and select **Relay Energized = Acknowledged**.

Alarm Condition

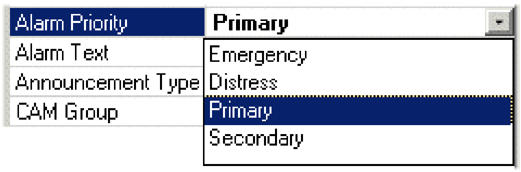
By default an energized relay is interpreted as an active alarm. To change the setting to an inactive relay click on the drop down arrow to the right of the field and select **Relay De-energized = Alarm Active**.

Alarm Description

The description used is what appears in the Alarm Features menu. To change, delete the default entry and enter the required description.

Alarm Priority

The default priority for this alarm is Primary. To change the default click on the drop down arrow to the right of the field and select from the list.



Alarm Text

The Alarm Text is what appears in the Alarms button on the VisionMaster display. To change, delete the default entry and enter the required description.

Announcement Type

The default announcement type from this device is set to **Alarm**. To change to **Warning** or **Caution** click on the drop down arrow to the right of the field and select from the list.

CAM Group

The default name used for the group that the alarms from this device belongs to is **External**. To change, delete the default entry and enter the required description.

Only Show on CAM Display

When set to **Yes** the discrete alarm will only be shown on CAM displays. When set to **No** the alarm is shown on CAM displays, and other displays, such as the Alarms Features menu on VisionMaster.

Remote Acknowledgement Condition

By default an energized relay is interpreted as a remote acknowledgement. To select a de-energized relay as indicating a remote acknowledgement click the dropdown button and select from the list.

Remote Acknowledgement Input Pulse Length (seconds)

The length of time that the remote acknowledgement signal must remain pulsed in seconds before the system will acknowledge the alarm.

8.7.5.2 Configuring an External NMEA Alarm Device

To select an NMEA alarm device as the external announcement provider:

1. Highlight **External NMEA Alarm Device** from the All External Announcement Providers list and click on the **<** button. The device is moved to the Selected Providers list and an unconfigured topic is added to the Navigation tree.
2. To configure the device click on the topic in the navigation tree. The external NMEA alarm device configuration window appears.

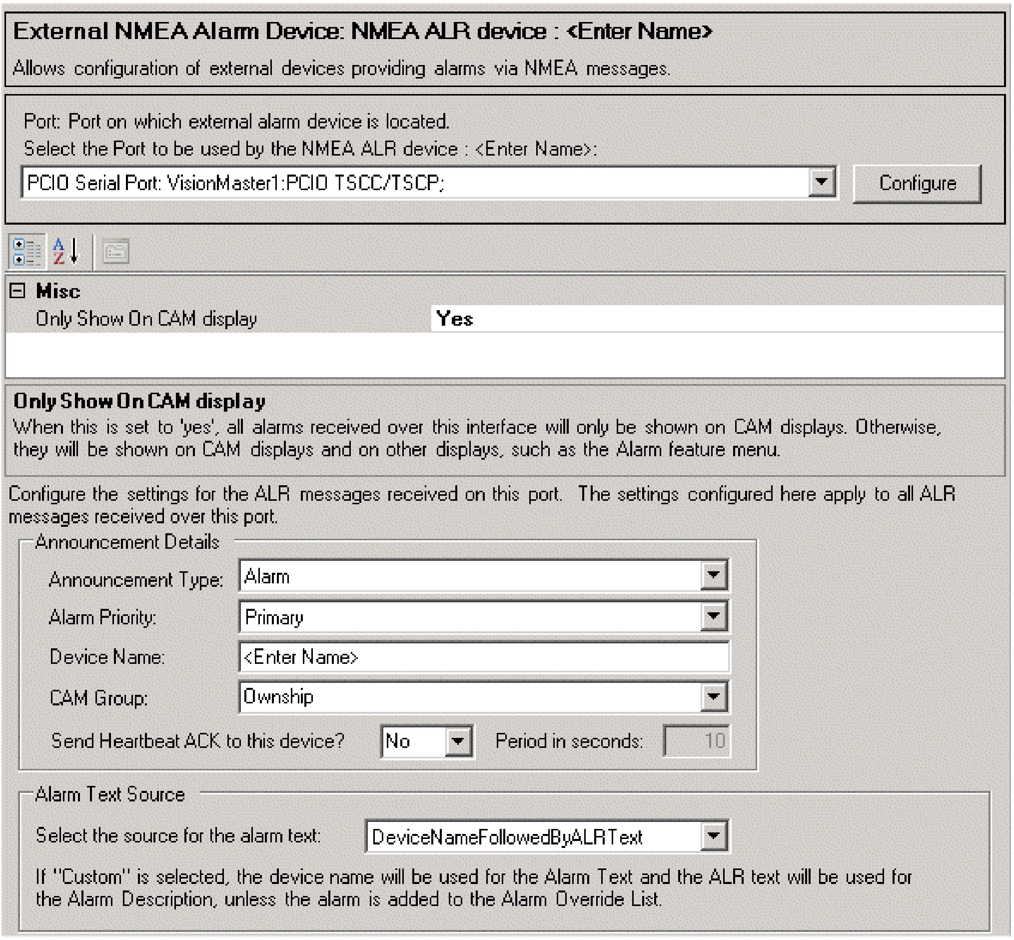


Figure 1.164 External NMEA Alarm Device Configuration Window

Selecting the Port

To select the port to be used for the external NMEA alarm device:

1. Click on the Port drop down arrow. A list of the configured I/O ports in the I/O Port Manager is displayed.
2. Select the port that has been configured to receive NMEA data over in the Interfaces for Acquisition sub menu, see Figure 1.124 '*Configured NMEA RPM Message Interface*'. If necessary, configure the port by clicking on the **Configure** button.

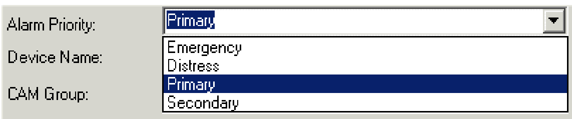
Only Show on CAM Display

When set to **Yes** all alarms displayed over this interface will only be shown on CAM displays. When set to **No** the alarms are shown on CAM displays, and on other displays, such as the Alarms Features menu on VisionMaster.

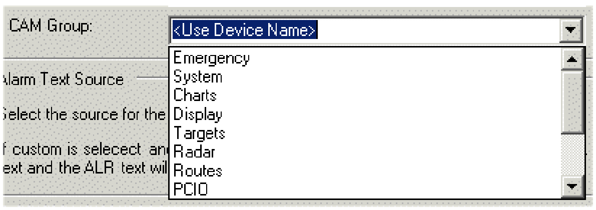
Configuring the Announcement Details

The settings selected in the Announcement Details area apply to all alarm messages received over this port. To configure the settings:

1. The Announcement Type defaults to **Alarm**. To change to **Warning** or **Caution** click on the drop down arrow to the right of the field and select from the list.
2. The default priority for this alarm is **Primary**. To change the default click on the drop down arrow to the right of the field and select from the list.

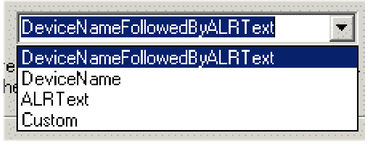


3. A device name is required for the external NMEA device. To enter a name click in the field, delete **<Enter Name>** and enter the desired device name. For example, if the port is to be used for NAVTEX messages, enter NAVTEX in the Device Name.
4. The default name for the CAM Group is to use the device name entered. If desired you can select another CAM group name from a drop down list.



5. The acknowledgement of announcements to external devices defaults to **No**, to change the setting click on the drop down arrow and select **Yes**. The Heartbeat acknowledgement period defaults to 10 seconds, to change, enter a value in the **Period in seconds** field (there are no minimum or maximum values).

Selecting the Alarm Text Source



The source for the Alarm text defaults to **DeviceNameFollowedByALRText.** To change the source click on the drop down arrow and select from the list.

If **Custom** is selected the external NMEA Alarm device configuration screen displays an additional area: **ALR Override Configuration**

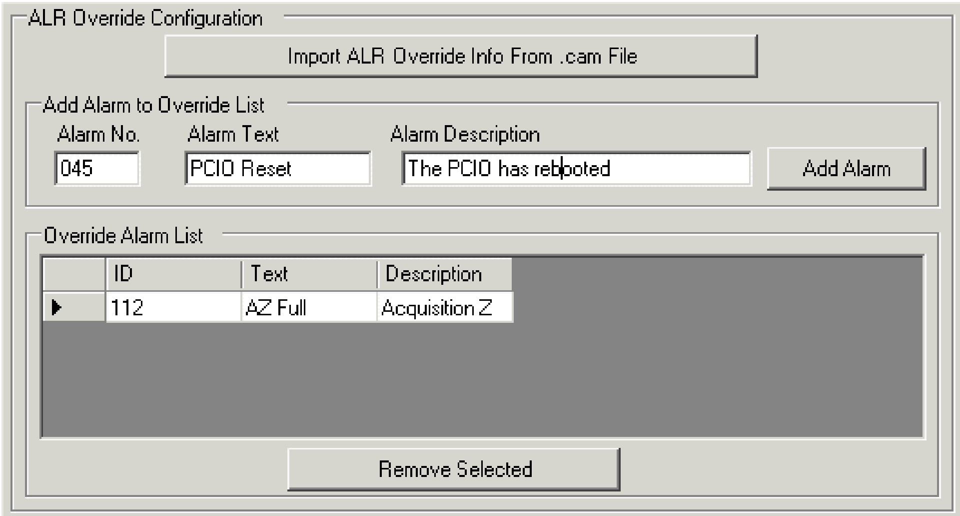


Figure 1.165 ALR Override Configuration

Note: *If Custom is selected and an alarm is received from the NMEA device that is not overridden, the device name will be used for the alarm text and the ALR text will be used for the description.*

The ALR Override Configuration area enables you to import override information as a.cam file.To import a file click on the **Import ALR Override Info From.cam File** button. A navigation window appears from where you can navigate to the required file.

To manually create an override alarm list enter the Alarm number, text and description and click the **Add Alarm** button. The alarm is added to an Alarm override list below. To remove an alarm from the Override list click on the  button to highlight the line and click the **Remove Selected** button.

8.7.6 Operator Message Manager

Operator messages are used to convey information that requires attention from the operator. While the operator message is active an audible indicator is periodically sounded. The operator message manager enables audio delay periods to be changed from their default values.

The following miscellaneous values may be changed:

- To change the period of time before raising the audio indicator for messages that are always audible click in the field. The range is between 1 and 5 seconds (default at 3 seconds).
- To change the period of time before raising the audio indicator for messages that are not always audible click in the field. The range is between 1 and 30 seconds (default at 15 seconds).

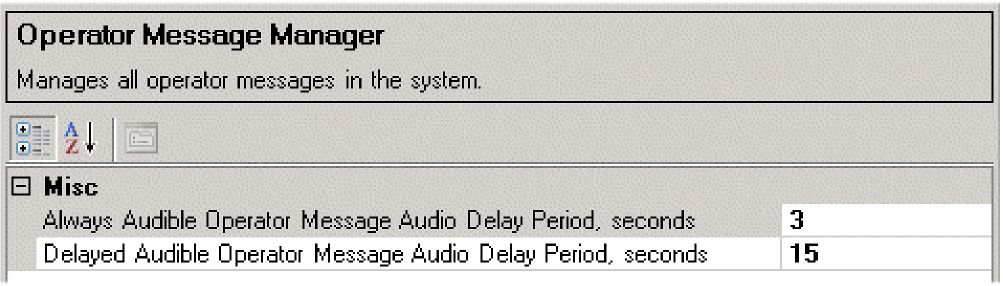


Figure 1.166 Operator Message Manager

8.8 Radar System

The Radar System facility enables you to configure the following radar system components:

- Interswitch
- Board Manager
- Top Units
- Target Tracker
- Test Targets

8.8.1 Interswitch

This section describes the configuration of a 2-way interswitch for a standalone system. For a description of a six-way interswitch for a multi-node system, and the selection of Slave nodes which are not directly connected to the interswitch, refer to *'Appendix A Configuring A Multi-Node System*'.

The Interswitch is a radar video/data matrix switch that allows multiple nodes to view and/or control multiple turning units.

The Interswitch is connected to a serial port on the PCIO unit and interfaced to the Processor unit via a USB connection.

8.8.1.1 Configuring an Interswitch for a Standalone System

1. Access the Interswitch configuration window, either by clicking on the Interswitch topic in the navigation tree, or by clicking the **Configure** button in the Radar System window.

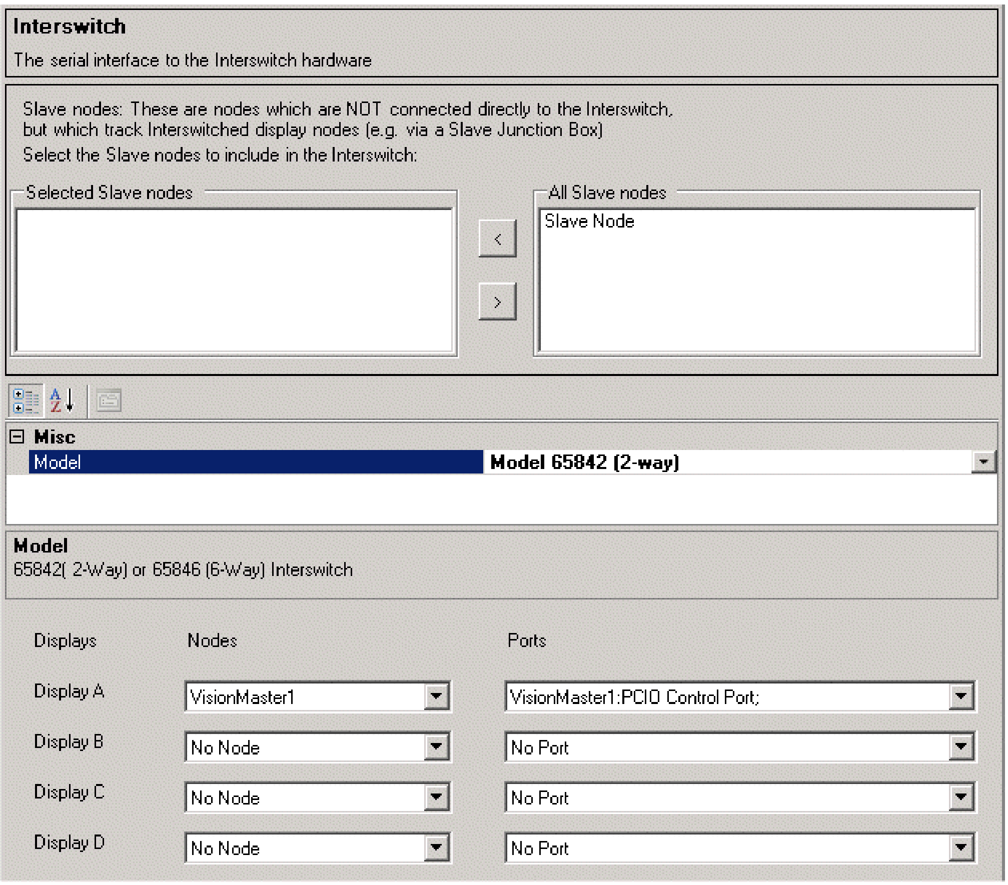


Figure 1.167 2-Way Interswitch Configuration Window

The Interswitch configuration window enables selection of the Interswitch model type (2-way or 6-way) and the selection of nodes and ports for each display. The displays are listed alphabetically, the number of displays shown is dictated by the Interswitch model selected; A to D for a 2-way interswitch and A to F for a 6-way interswitch.

The nodes field shows the display name given to the node, see Section 5.3 *Nodes*'. For a standalone system, only one node (e.g. VisionMaster1) is available.

2. To select a port for the display click on the Ports drop down arrow and select from the list. The port selected should be a port that has been previously configured to use Interswitch settings, see Section 7.9.2.2 *Selecting Pre-Defined IO Settings*' in the I/O Port Manager section.

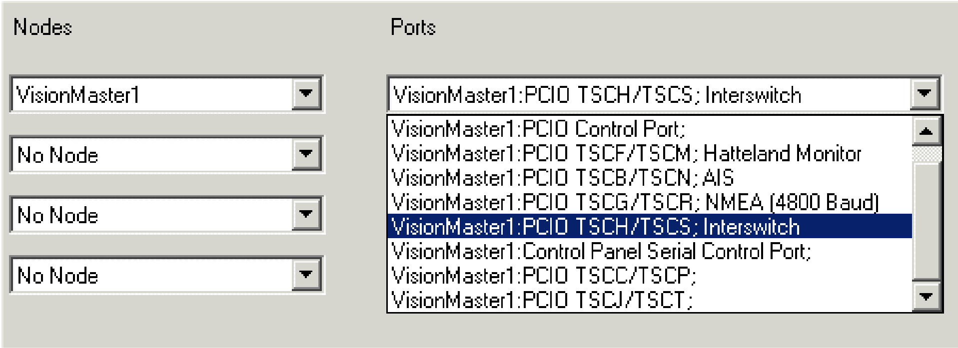


Figure 1.168 Selecting a Port for the Interswitch

When an Interswitch has been configured the system creates **{Slave Nodes}** and **{Slave Display}** sub menu topics below on the navigation tree.

8.8.1.2 Slave Nodes

If you have Slave nodes that track Interswitched Display nodes (for example, via a Slave Junction Box) then **Slave Node** should be selected from the All Slave Nodes field. An unconfigured Slave node is generated.

From the Slave Node topic select the display which will track an Interswitched display. This will be a display with no Interswitch port connected to it.

Select the display which the Slave node will track. This will be from the list of displays with Interswitch ports. The name of the slave display will be included in the Slave Node topic title.

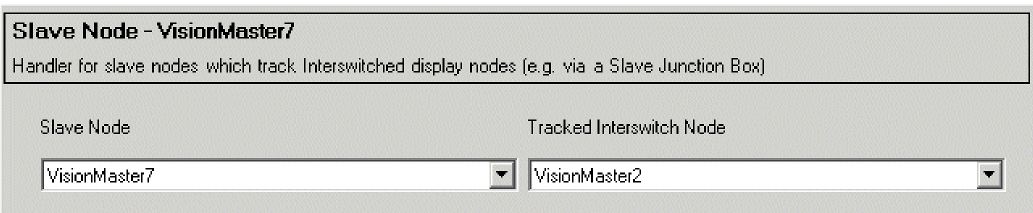


Figure 1.169 Slave Node

8.8.1.3 Slave Display

This window enables you to select slave only displays (i.e. the displays without an interswitch control connection) and which transceiver the displays are to be connected to.

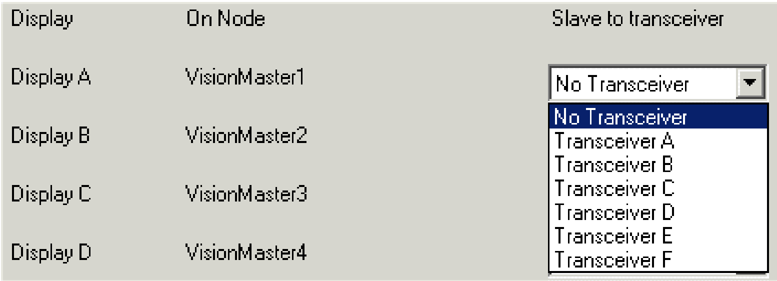


Figure 1.170 Slave Displays and Node Association

To select a transceiver for a display click on the Slave to Transceiver drop down arrow and select from the list.

In order to avoid a Slave only Tx conflict warning being generated on the Slave Display the LK1 Dil switch setting on the Interswitch must be set to Global (link setting 2-3) with VisionMaster running and then back to Local (link setting 1-2) to save the setting.

For more information on changing the Dil switches on an interswitch, refer to Chapter 7 '*Interswitch Units*', Section 4. 'Installation and Commissioning' in Volume 1 of the VisionMaster Ship Manual.

8.8.2 Board Manager

The radar interface between the PCIO Unit and the PC is via a unidirectional scan converter (SC) connection to an SC board, which is housed in the PC.

For a single radar, there will be an interface to one SC board, see Section 8.8.2.1 *Configuring a Radar Interface for Single Radar system*'.

If your system is a dual radar, you will be able to configure two radar interfaces to two SC boards, see Section 8.8.2.2 *Radar Interface for dual radar system*'.

The security string, which is provided by your VisionMaster supplier and usually entered when the system is commissioned, defines whether the system is a dual radar.

Important Note: *The selection of the radar interface is set at commissioning and should NOT be changed. The SC3/SC4 board is compliant with IEC 62388; the SC2 board is applicable for older systems and is compliant with IEC 60936. The Client Server Radar interface board is selected when your system is Client/Server based. For information on configuring a Client/Server system, see Appendix B 'Configuring a System for Client/Server Radar'.*

Note: *A radar interface board is not required if your product type, selected at Nodes is a standalone non-radar product, e.g. a CAM or ECDIS (without Radar Overlay).*

The following procedures should be done if your radar interface has been upgraded from SC2 to SC3/SC4, or if instructed to do so by Sperry Marine Engineering.

If required, the radar interface may be selected from either the Board Manager or {Radar Interface} sub menu.

8.8.2.1 Configuring a Radar Interface for Single Radar system

1. Click on Board Manager, select the SC board from the Radar Interface list and click the **<** button. The board is moved to the Selected Radar Interface list and an unconfigured topic is added below Radar Interface in the navigation tree.
2. Click on the unconfigured topic and select the node to be used by the board by clicking on the drop down arrow to the right of the field and selecting from the configured nodes.
3. The name of the node appears alongside the radar interface board in both the Selected Radar Interface list and topic line below the {Radar Interface} navigation tree.

When an SC board is configured the Board Manager is displayed as follows.

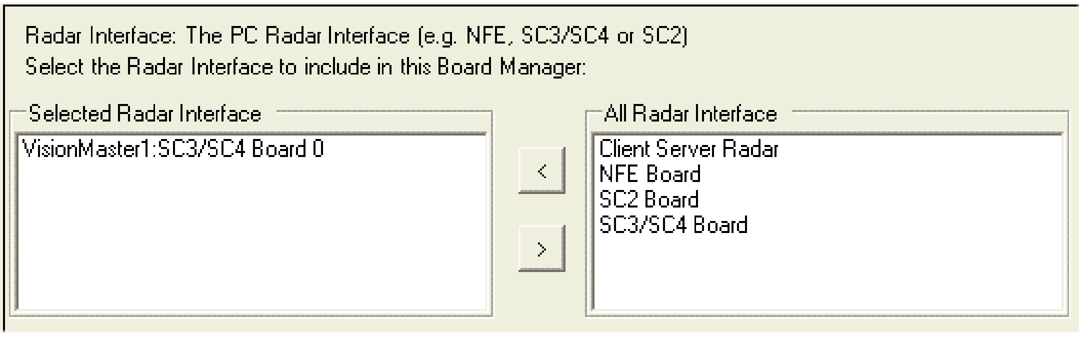


Figure 1.171 Board Manager for Single Radar

A multi-node system using more than one PCIO board will have radar interface boards configured for each PCIO board.

8.8.2.2 Radar Interface for dual radar system

A dual radar system consists of two radar channels; Channel 1 and Channel 2, and an auxiliary PCIO. For each radar channel a separate SC board must be selected and configured.

On a dual radar the two SC boards are defined as Board 0, which is assigned to Channel 1, and Board 1, which is assigned to Channel 2.

1. Select and configure the two SC boards as described previously for single radar systems. When two SC boards are configured the Board Manager appears similar to Figure 1.172 below. Board 0 and Board 1 will also appear as topics under the {Radar Interface} sub menu.

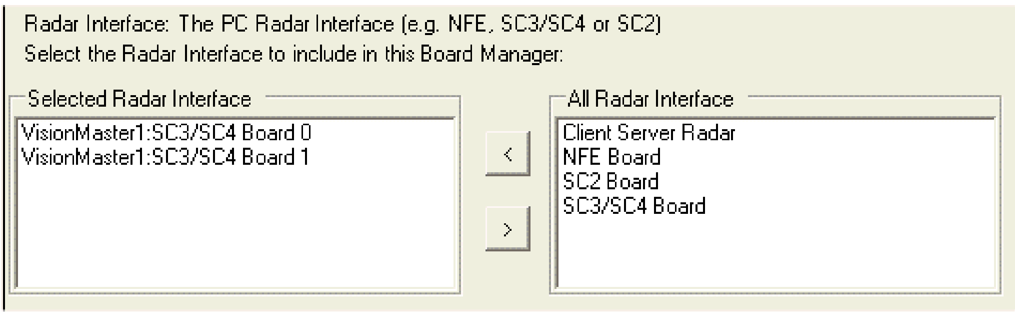


Figure 1.172 Board Manager for Dual Radar

8.8.3 Top Unit Configuration

The Top Unit sub-menu enables you to configure all the connected top units and define the master/slave state of a display in a non-interswitched system via the Channel Manager sub menu.

Each top unit must be separately configured for each Display. For information on configuring top units refer to Section 5.9 *Basic Top Unit Configuration*' in Section 5 *Quick Setup*'.

8.8.3.1 Channel Manager - Single Radar

For a single radar system the Channel Manager will comprise Channel 0 only. No other radar channels can be added to this configuration.

8.8.3.2 Channel Manager - Dual Channel Radar

For a dual radar system the Channel Manager will comprise two channels, Channel 1 and Channel 2. A description of Channel 1 and Channel 2 configuration is described in Section 8.8.3.4 *Configuring Channels for Dual Radar*'.

8.8.3.3 Configuring the Channel for Single Radar

The Channel function enables configuration of the channel through which data is transferred from the top unit to the display.

Note: *The configuration of a channel is only available if there is no Interswitch fitted.*

The Channel enables you to select the display node, the master/slave status of the display attached to the channel and the top unit alias (A to F).

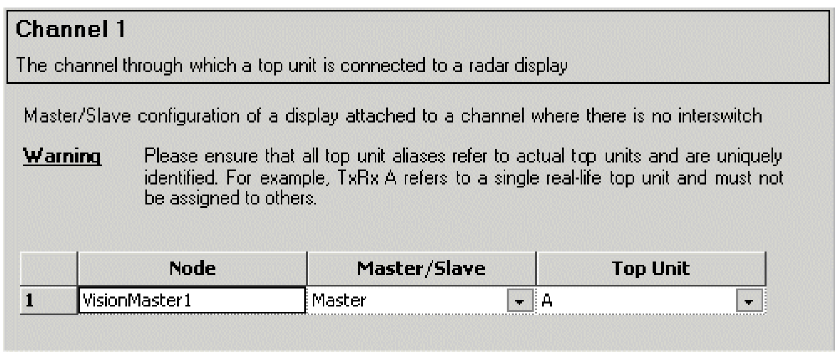
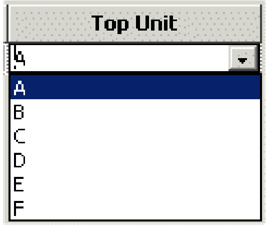


Figure 1.173 Channel Configuration

1. On a multi-node system the channel node defaults to the first display name on the nodes list. To change the node click in the **Node** field and enter the required node name.
2. The Master/Slave status of the channel defaults to **Master**. To change the status to permanent slave click on the drop down arrow and select **Slave**.

3. To select the top unit alias (A to F) for the channel click on the drop down arrow and select from the list of alpha aliases.



Important Note: *Ensure that the top unit alias selected refers to actual top units and is uniquely identified. For example TxRx A refers to a single real-life top unit, the alias must not be assigned to others.*

8.8.3.4 Configuring Channels for Dual Radar

On a dual radar system, Channel 1 is defined as the primary channel. Although both channels may have the same node and Master/Slave status, different top units must be selected for each channel. For example, Channel 1 could have Top Unit A, and Channel 2 could be assigned Top Unit B.

8.8.4 Target Tracker

The Target Tracker window enables the configuration of the software port number used to communicate with the Target Tracker.

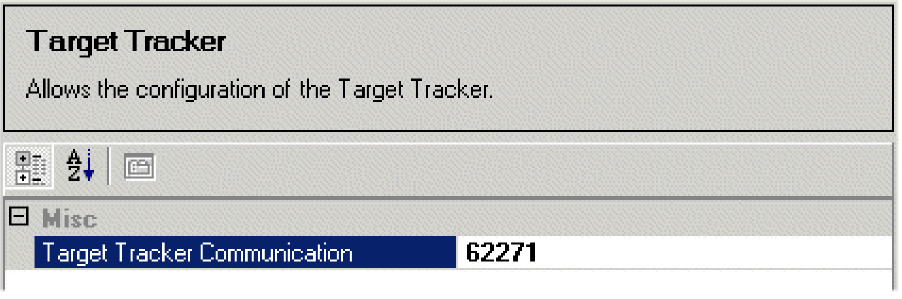


Figure 1.174 Target Tracker

It should not normally be necessary to change the software port number default value.

8.8.5 Test Targets

The Test Targets window displays a table which enables you to define target extents and video amplitude parameters for moveable test targets.

Test Targets

Settings for the realization of test targets.

	Node	Board Id	Target Extent Width	Target Extent Depth	Video Amplitude
1	VisionMaster1	0	3	0.04	Medium

Figure 1.175 Test Targets

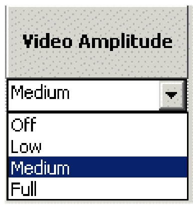
On a single node system the table lists one line for the node. The Node name is defined in Resources, Nodes (see Section 5.3 *Nodes*') and the Board Id relates to the SC board, which for a single radar is always set to 0.

The Target Extent Width defines the width extents in degrees for moveable test targets. The range is from 0.08 degrees to 22.5 degrees, the default is 3 degrees.

The Target Extent Depth defines the depth extents in nautical miles (NM) for moveable test targets. The range is from 0.002 NM to 0.4 NM, the default is 0.04 NM.

To change the values click in the field and move the trackball left to decrease, or right to increase.

The video amplitude defaults to medium. To change the amplitude click on the drop down button and select from the list.



8.8.5.1 Test Targets on Dual Radar

The Test Targets window for a dual radar will include two rows, one for each SC board. The test target configuration parameters for Board 0 and Board 1 may have different values applied.

	Node	Board Id	Target Extent Width	Target Extent Depth	Video Amplitude
1	vm9651	0	4	0.04	Medium
2	vm9651	1	3	0.04	Medium

Figure 1.176 Test Targets - dual radar

8.9 Target Manager

Target Manager enables the configuration of track table output and target rename input.

The track table is a list of all targets in the system, along with the data associated of each. This data includes course, speed, position, type (e.g. tracked, AIS etc.) and source of target (e.g. tracker).

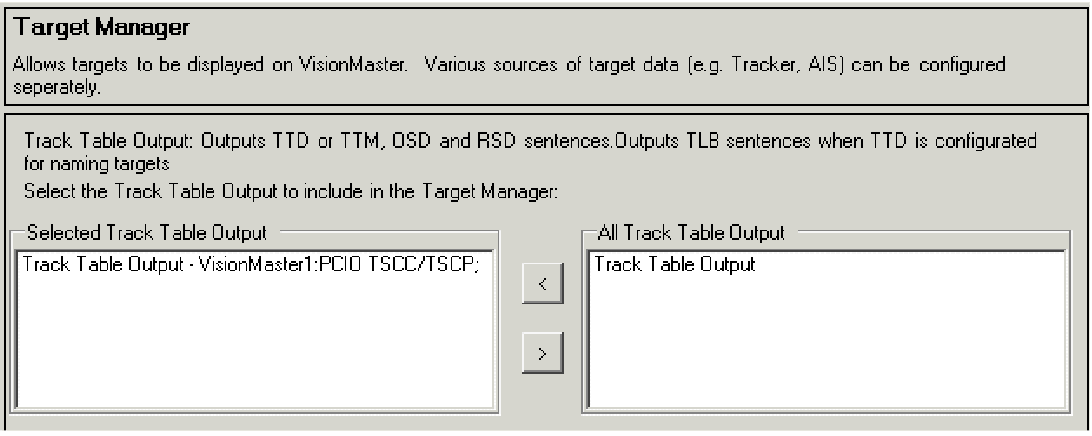


Figure 1.177 Target Manager

The following sub-menu functions are available from the Target Manager menu:

- Track Table Output
- Target Rename Input: TLB Communications

8.9.1 Track Table Output

To generate a track table output:

1. Select **Track Table Output** from the All Track Table Output column in Target Manager and click on the **<** button. An unconfigured Track Table output line is added to the Target Manager menu.
2. Click on the Track Table output line in the navigation tree. A configuration window for the output appears.
3. All the automatic message providers (OSD, RSD and TLB) are selected by default. To de-select a message provider highlight the item in the Selected field and click the **>** button.
4. Select the port to be used for track table output by clicking on the I/O Port down arrow and selecting from the list of previously configured I/O ports from the drop down list, see Figure 1.178.
5. To configure the selected port click on the **Configure** button, the Serial IO Port configuration window appears, see Figure 1.56, page 72.

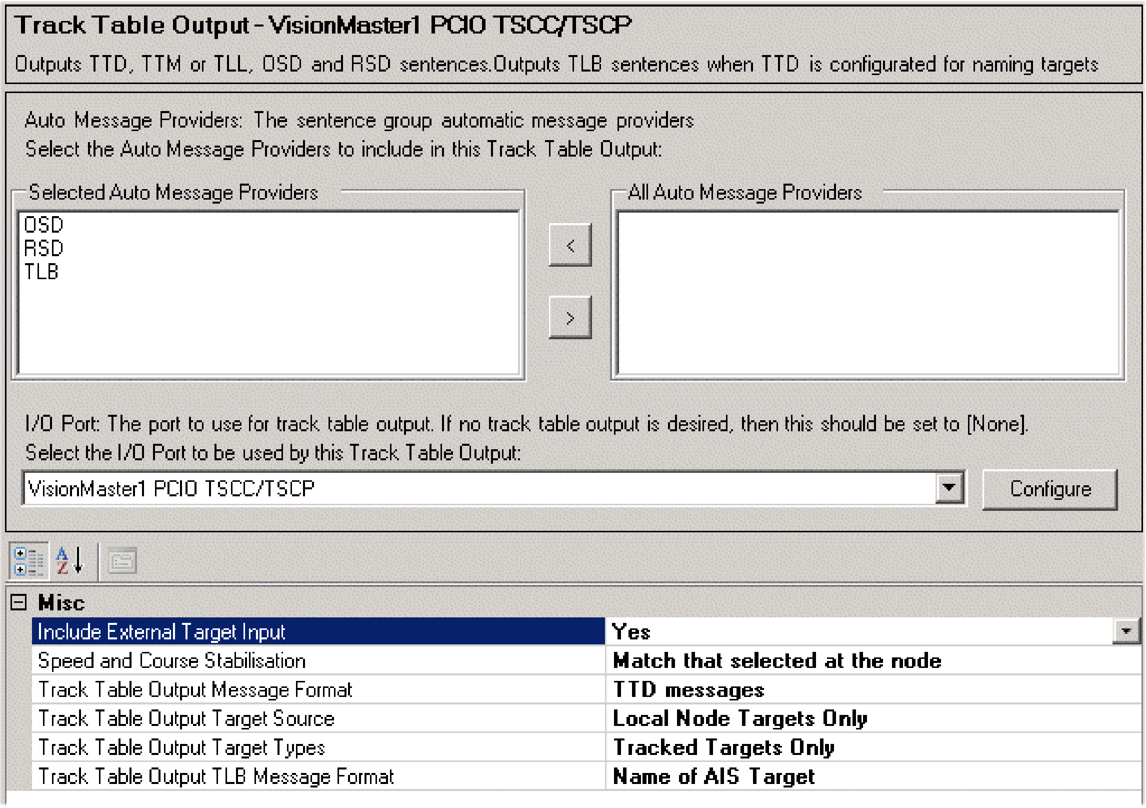


Figure 1.178 Track Table Output

8.9.1.1 Track Table Output- Target Source & Types

The Tracked Table Output Miscellaneous area specifies the following:

- Include External Target input
- Speed and Course Stabilisation
- Track Table Output Message Format
- Track Table Output Target Source
- Track Table Output Target Types
- Track Table Output TLB Message Format

Include External Target input

Specifies if external targets will be output. Defaults to Yes.

Speed and Course Stabilisation

Specifies the stabilisation of the speed and course. The default is to match either the ground or water stabilised mode selected at the node. To restrict the track table output to ground or water stabilised click on the drop down arrow and select from the list.

Message Format

The message format defaults to **TTD** (tracked target data) messages. Data on up to four targets is encapsulated within each TTD sentence.

To change the message format click on the drop down arrow and select from **TTM** (tracked target message) or TLL (target Lat/Long).

TTD and TTM format are sent as range and bearing target messages. TLL messages are sent as latitude/longitude format.

Target Source

The target source output defaults to **All Node Targets.** To change the output of targets from a local node only (for a multi-node system) select **Local Node Targets Only** from the drop down list.

Target Types

The Tracked Table Output Target Types specifies which type of targets will be output, the default is **Tracked and AIS Targets.** To change click on the drop down arrow and select **Tracked Targets Only** from the list.

TLB Message Format

Specifies the message content for TLB (target label). The default is **Name of AIS Target.** To change to **MMSI*** **of AIS Target** click on the drop down arrow and select.

TLB messages are output only when TTD messages have been selected in Message Format.

The selection of TLB message format is mainly intended to be used when VisionMaster is connected to a legacy radar system, see Section 8.9.2 below.

* Maritime Mobile Service Identity

8.9.2 Target Rename Input: TLB Communications

The target rename input window enables selection of the PCIO port used for TLB communications of tracked target data from a radar scanner unit (for example, a BridgeMaster E (BME) or other legacy radar hardware) to a VisionMaster (VM) ECDIS. For information on external target input to a VM, refer to Section 8.10.11 *External Targets*’.

Target data supplied by the radar scanner from a TTM input is re-named by the target manager and transmitted back to the radar scanner via TLB sentences. The system also renames each target supplied by the radar scanner that correlates with a current tracked VM target by selecting the new name to be the numerical identifier of the current tracked target.

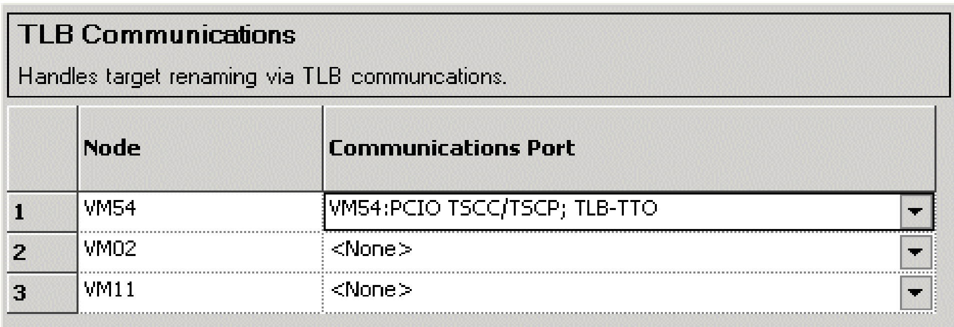


Figure 1.179 TLB Communications

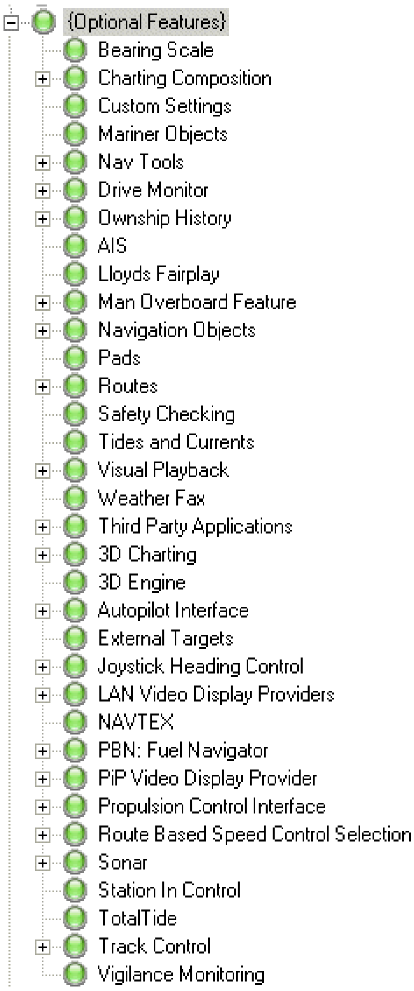
On a multi-node system, the TLB communications window displays all nodes and allows different PCIO ports to be selected for each node (see Figure 1.179 above).

All system nodes displaying tracked target data use a common set of labels.

To select the PCIO port for TLB communications:

1. Click on the port drop down arrow, a list of PCIO ports previously configured in I/O Port Manager appears.
2. Select the port to be used from the drop down list. The standard I/O port defined for TLB communications is COM 7 (TSCG input, TSCR output), see Table 1 on page 71.
3. To configure the selected serial port click on the **Configure** button, the Serial I/O Port configuration window appears, see Figure 1.56, page 72.

8.10 Optional Features



The Optional Features menu enables you to select relevant features for your configuration from a list of features.

The Optional Features window displays in the right field a list of all optional features available and in the left field a list of features currently selected.

To select a feature highlight the line in the **All Optional Features** list and click the **<** button.

The option appears in the **Selected Optional Features** list. If the number of options selected exceeds the limits of the window, page down the list by clicking on the down arrow.

The list below includes all available optional features that require configuration.

- Charting Composition - Chart Engines assigned
- Nav Tools
- Drive Monitor
- AIS - AIS communications
- Navigation Objects
- Man Overboard
- Routes - external route plan configuration
- Visual Playback
- Weather Fax
- Third Party Applications
- 3D Charting
- Autopilot Interface - NMEA Autopilot controller
- External Targets
- Joystick Heading Control
- PiP (or LAN) Video Display Providers
- NAVTEX
- PBN: Fuel Navigator
- Route Based Speed Control Selection
- Propulsion Control Interface - Kamewa or Emri propulsion systems
- Station In Control
- TotalTide
- Sonar
- Track Control

- Vigilance Monitoring
- Static Site

Note that a typical configuration would NOT include all the features listed above. For example, a node configured as a Static Site cannot also include Nav Tools, Man Overboard, Safety Checking, 3D Engine, Autopilot, Propulsion or Sonar.

The following optional features are included in Section 5 *Quick Setup*' and are described in Section 5.12 *Commonly Configured Items*'.

- AIS - AIS communications
- Man Overboard
- NAVTEX
- Vigilance Monitoring
- Routes (miscellaneous settings only)

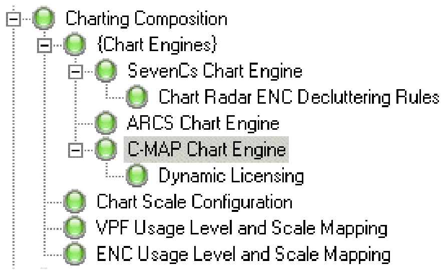
With the exception of Station In Control, all other optional features are described in the following sub sections. For information on configuring Station In Control, refer to Appendix A '*Configuring a Multi-Node System*'.

The list below lists optional features that do not require configuration and are therefore not described in this section:

- Bearing Scale
- Custom Settings
- Mariner Objects
- Ownship History
- Lloyds Fairplay
- Pads
- Tides and Currents
- Safety Checking
- 3D Engine
- Russian River Register Selector

8.10.1 Charting

The Charting facility allows for the selection and configuration of available chart engines. Chart Engines can be configured by accessing the charts installation directory.



The Charting window lists the currently selected chart engine and all available chart engines.

To select a chart engine highlight the file in the **All Chart Engines** field and click on the **<** button. The file is moved into the **Selected Chart Engines** field and is listed and available for configuration in the Chart Engines navigation tree. De-selection of chart engines is a reversal of this procedure.

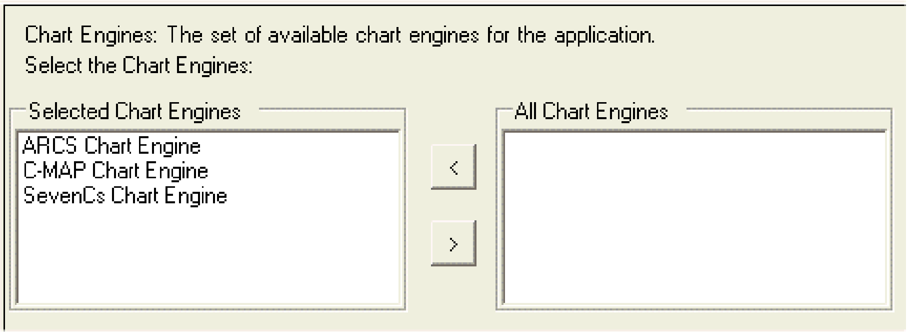


Figure 1.180 Charting

8.10.1.1 Supported Chart Engines

The VisionMaster system supports CMAP, SevenCs and ARCS (Admiralty Raster Chart Service) chart engines.

Note: *ARCS[*] are raster navigational charts (RNCs), supported by the SevenCs chart engine and can only be run on an ECDIS product.*

The CMAP chart engine supports the following chart formats:

- Professional (CD version)[†]
- ENC[‡]
- Professional+ (Upgraded DVD)
- JeppesenPrimar[**]

The SevenCs chart engine supports the following chart formats:

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* The ARCS charts are raster charts, which show a scanned version of a traditional paper chart, with the chart images stored as graphic files.
† CMAP's proprietary and unofficial chart format.
‡ Official S-57 encrypted charts converted to CMAP's proprietary chart database format.
** Consists of official ENC data from Primar and unofficial C-MAP chart data where official data is not present.

- S63 (encrypted S-57)[*]
- S-57[†]
- Digital Nautical Charts (VPF)
- ARCS
- World Map (ENC)[‡]

If the chart type supports network installation, chart installation can be initialised from any node in the system.

Information on installing SevenCs charts is given in the ‘Charts’ chapter of the User Guides (Chapter 4 in the ECDIS User Guide [65900012], Chapter 12 in the Chart Radar User Guide, [65900010]).

Installing C-MAP charts requires shutting down VisionMaster. Information on this installation process is given in Chapter 1 of the Supplementary Features User Guide, 65900014.

When SevenCs or CMAP chart engines are selected the Charting navigation tree creates a topic for the file under the Chart Engines sub directory.

To configure the selected chart engine click on this file in the navigation tree.

8.10.1.2 SevenCs Chart Engine

The SevenCs Chart Engine window enables you to configure the paths on the PC where SevenCs chart data are installed and specify whether a particular chart format is installed.

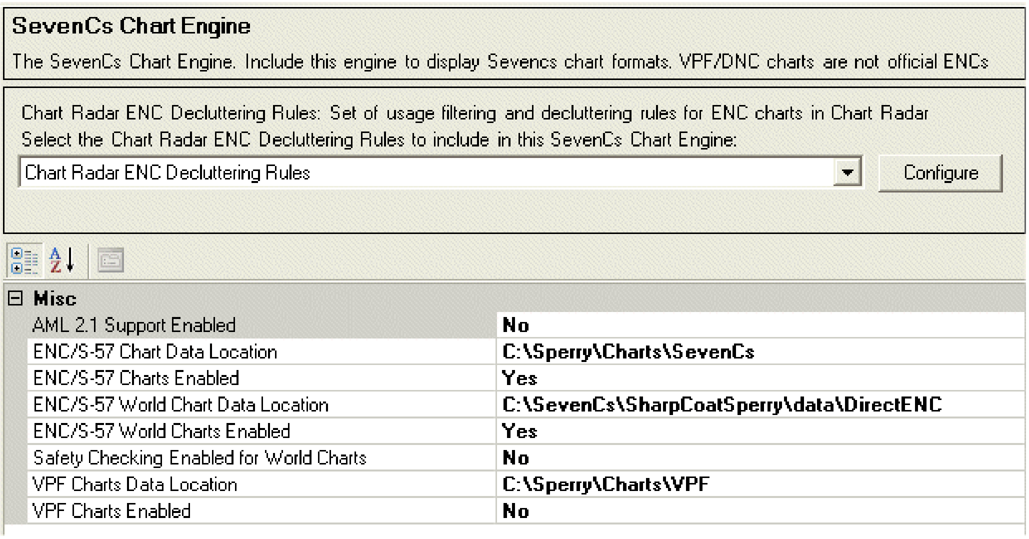

Figure 1.181 SevenCs Chart Engine

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* Encrypted official chart format, implementation based on IMO S63 standard.
† Unencrypted official chart format, implementation based on IMO S63 standard
‡ The World Map database is delivered with the SevenCs Chart Engine and is based on the NGA World Vector Shoreline 1:250,000 charts. The structure of the data is defined by the IHO S-57 specification.

The chart data locations for SevenCs charts default to the paths shown in Figure 1.181. To change these locations, click in the field and then click on the browse button to the right of the chart format file.

The SevenCs Chart Engine window also includes chart format enable/ disable controls. Generally, the chart format controls shown in Figure 1.79 should remain at their default settings.

When the Browse button is accessed a Browse For Folder window appears from where the selected chart installation directory can be configured, *see Figure 1.182.*

The installation directory selected at this window is the read-only chart destination directory that appears in the Sperry Chart Installer facility.

Note: *The default chart installation directories reside on the C: drive. Unless there are valid reasons for changing this directory, the C drive default should remain.*

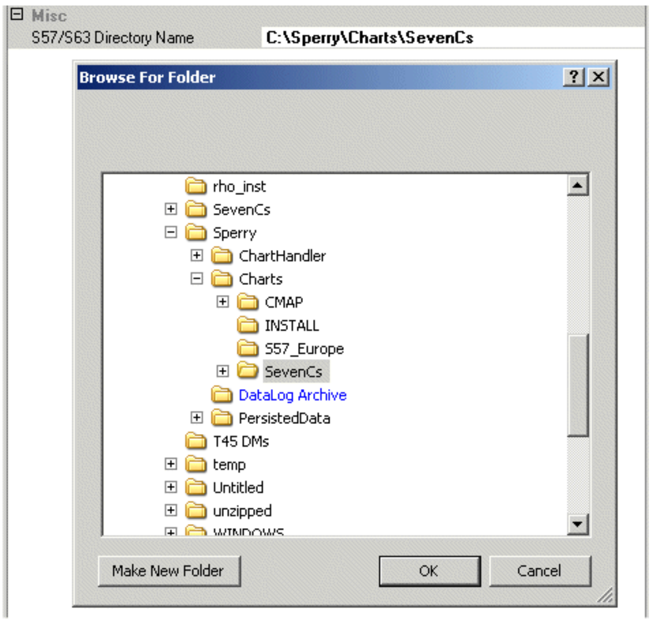


Figure 1.182 Browse For Folder Chart Engine

To move the chart engine directories to a different drive:

1. Either copy or move the chart directory and files from their existing location by right clicking on the main directory and selecting the required option.
2. Navigate to the drive where you want the chart directory to reside and paste the contents.
3. Click the **OK** button in the Browse for Folder window. The window is removed and the chart directory name shows the new directory path.

To move the chart engine directories to a new directory folder:

1. Navigate within the Browse for Folder window where you want the chart files to reside and click on the **Make New Folder** button. A blank folder is created.
2. Name the blank folder then cut and paste the chart files to the folder.
3. Click the **OK** button in the Browse for Folder window. The window is removed and the chart directory name shows the new directory path.

All chart formats default to Enabled. If a particular chart format is not required to be enabled (for example, VPF charts) click on the drop down arrow and select **No**.

Chart Radar ENC Decluttering Rules

The Chart Radar ENC cluttering rules are a set of usage filtering and decluttering values applied to ENC charts in Chart Radar.

To access the window, either click on the **Configure** button in SevenCs Chart Engine, or click on the sub-menu topic in the navigation tree.

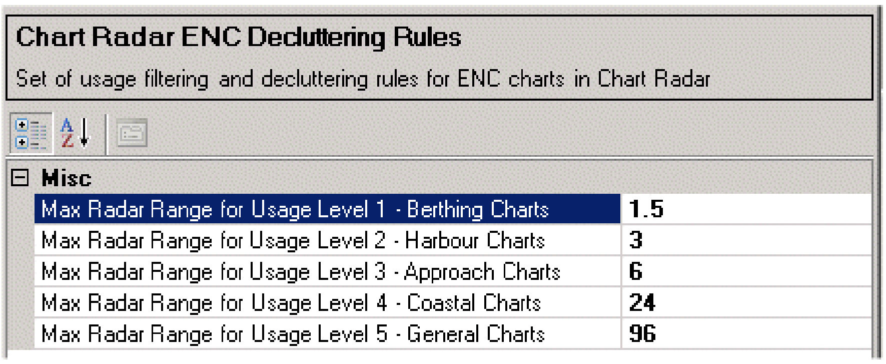


Figure 1.183 Chart Radar ENC Decluttering Rules

The values define the maximum radar range scale in NM at which ENC charts will be displayed for the following usage levels:

Table 6: Range Scale for Chart Usage Levels

Level	Range Scale (NM)	
	Default	Range
Level 1 - Berthing	1.5	Less than or equal to max. harbour range
Level 2 - Harbour	3	Less than or equal to max. approach range
Level 3 - Approach	6	Less than or equal to max. coastal range
Level 4 - Coastal	24	Less than or equal to max. general range
Level 5 - General	96	Must be more than the max. coastal range

8.10.1.3 ARCS Chart Engine

The ARCS Chart Engine window enables you to configure the path on the PC where the ARCS chart data is installed.

ARCS defines separate directories for each ARCS chart format.

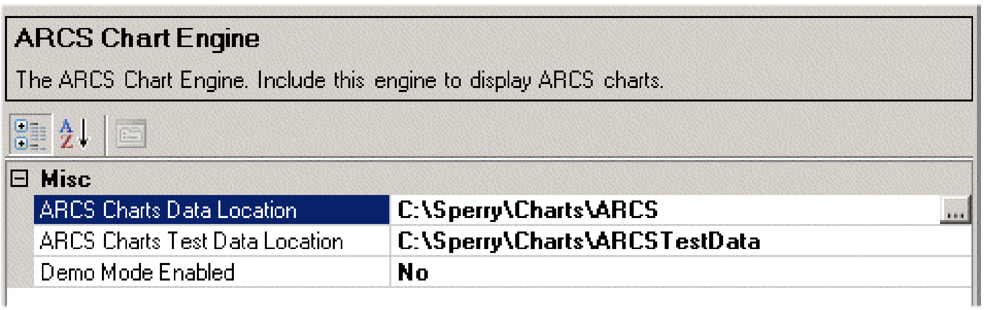


Figure 1.184 ARCS Chart Engine

The ARCS chart data and test data directories default to the paths shown in Figure 1.185. To display ARCS test data the demo mode must be displayed. To change the directory paths, click on the browse button to the right of the chart format files and follow the instructions as described previously for the SevenCs chart engine. To enable demo mode click in the field and select **Yes**.

8.10.1.4 C-MAP Chart Engine

The CMAP Chart Engine window enables you to configure the path on the VMFT PC where the CMAP chart data is installed.

A signature check on the C-MAP database may be set prior to chart installation by selecting Yes. The default for this setting is no signature check.

The C-MAP Chart Engine also enables C-MAP products with background charts to be entered or deleted.

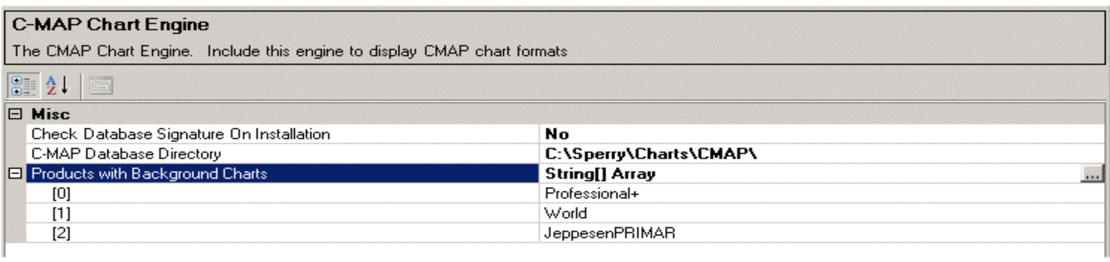


Figure 1.185 CMAP Chart Engine

The CMAP chart directories default to the paths shown in Figure 1.185. To change the directory paths, click on the browse button to the right of the chart format files and follow the instructions as described previously for the SevenCs chart engine.

To edit the C-MAP chart formats with background charts click on the Browse button at the end of the String Array row, a String Collection Editor popup window appears, see Figure 1.186.

The list includes all C-MAP chart formats by default, edit the list using the keyboard and click the **OK** button. The list is automatically re-numbered in **Products with Background Charts** if chart formats are deleted or added.

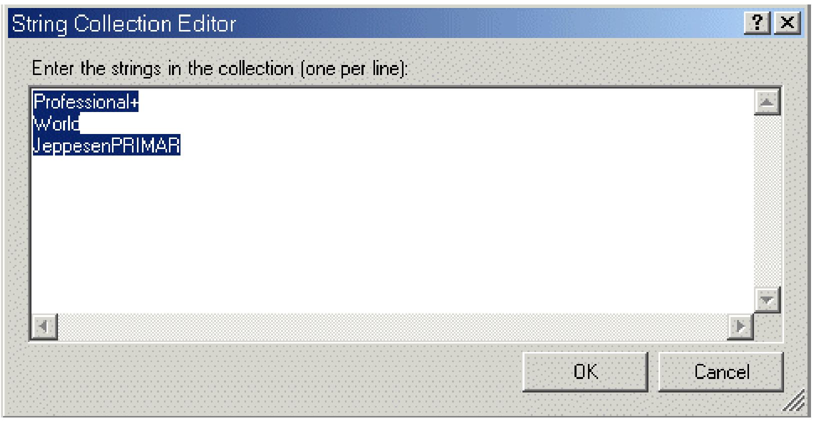


Figure 1.186 String Collection Editor

8.10.1.5 Chart Scale Configuration

The Chart Scale Configuration page enables chart scales for ARCS charts to be edited. These are the chart scales that appear in the VMFT application scale ratio drop down list when ARCS charts are being used.

The window includes a list of pre-defined RNC (raster nautical chart) scales, the default list ranges from 0.125 to 2.0, see Figure 1.187.

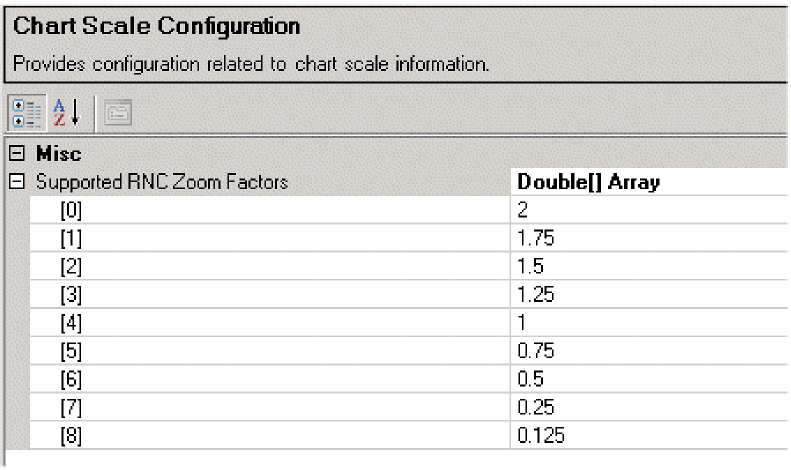


Figure 1.187 Chart Scale Configuration

1. To edit the list of chart scales click the Browse button at the end of the **Double [] Array** row, a **Double Collection Editor** popup window appears.

2. To create an additional chart scale click the **Add** button, a **0** value is added to the **Members:** list and assigned a number.
3. With the **0** highlighted enter the required chart scale in the **Value** field and click the **Add** button, the entered value is added to the chart scale list and another **0** value is added, see Figure 1.188.

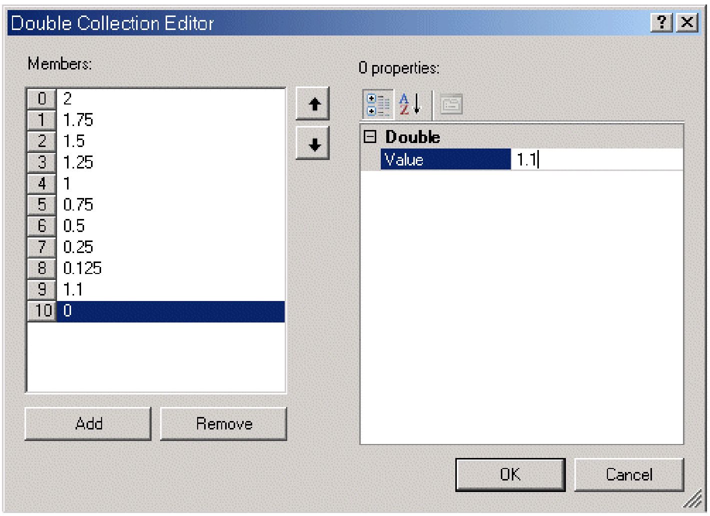


Figure 1.188 Double Collection Editor

4. Chart scales must be listed in ascending order for the Chart Scale Configuration topic to be validated. Therefore, to move the chart scale factor to its correct position in the list highlight the value and click the Up  button. Or, to move a value down the list click the Down button.
5. To remove a chart scale highlight the value and click the **Remove** button, the chart scale list is automatically re-numbered.

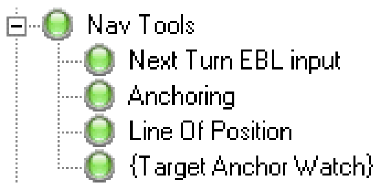
8.10.1.6 Usage Level and Scale Mapping

The VPF and ENC usage level and scale mapping topics list the minimum scales the system will use for various chart usage levels (e.g. Harbour, Approach, General etc). When the VMFT application is running the minimum scale and usage level for each chart is shown in the ‘Chart Index’ window, accessed from the Chart tools menu.

It is advisable that the scale mapping for each usage level is not changed from their default settings.

8.10.2 Nav Tools

Nav Tools sub menu includes the following features as standard:



- Next Turn EBL Output
- Anchoring
- Line Of Position
- Target Anchor Watch

8.10.2.1 Next Turn EBL Input

Next Turn EBL Input enables the selection and configuration of the I/O port used for next turn EBL communications to be made for each node on the system.

1. Click on the **Next Turn EBL** topic in the navigation tree and click on the communications port drop down arrow.

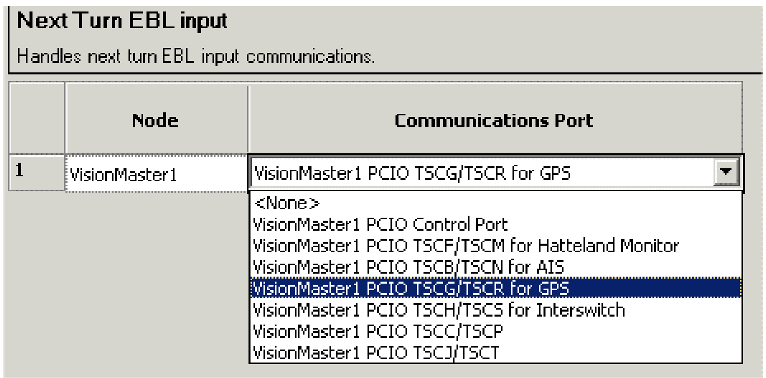


Figure 1.189 EBL Communications

2. Select the I/O port for each node that requires EBL communications by clicking on the Communications Port drop down arrow and selecting from a list of configured PCIO ports, see Section 7.9.2 *Configuring a PCIO Serial Port*'.

8.10.2.2 Anchoring

Anchoring provides configuration of the Anchoring feature. The following values may be entered or changed:

- Alarm triggered when the Hawsepipe's position moves.
- HawsePipe position
- Maximum chain length allowed before a warning is generated.

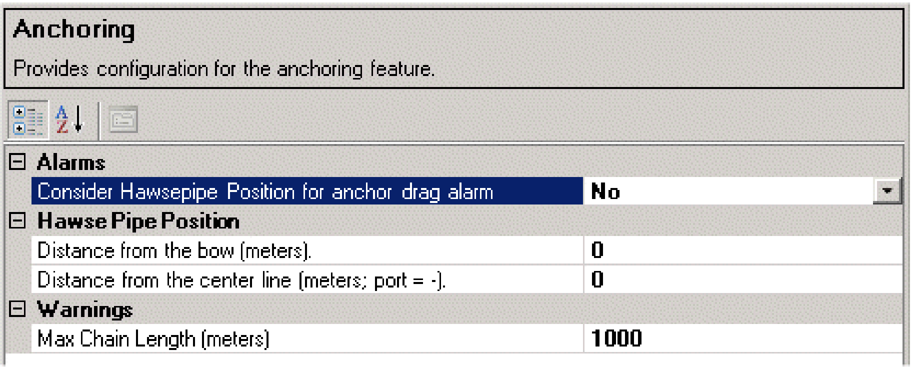


Figure 1.190 Anchoring

Denotes whether the anchor drag alarm should be triggered when the hawsepipe's location moves farther from the anchor position than expected, based on the length of the chain and depth. Defaults to **No**. When set to **Yes** this is applied as an additional criterion in determining the alarm's state. The normal criteria (CCRP moving outside of the drag circle) is ALWAYS applied.

The hawsepipe position relative to own ship's bow and own ship's centre line defaults to 0. To change the values:

1. Enter the actual distance in metres of the hawsepipe from the bow. The distance entered must be less than the configured length of the ship, see Section 8.3.1 *Own Ship Characteristics*'.
2. Enter the distance of the hawsepipe from the centre line (from the port side). The distance entered must be less than the configured beam of the ship, see Section 8.3.1 *Own Ship Characteristics*'.

The maximum anchor chain length allowed before a warning is generated defaults to 1000 metres (maximum value).

3. Enter a maximum chain length value of between 1 metre to 1000 metres.

8.10.2.3 Line Of Position

The Line Of Position (LOP) feature defines the following:

- LOG data retention period
- Length of time, in seconds, after which a LOP permanent fix will expire
- Time that the LOP sensor will be considered usable after a fix.

The log data retention period is the amount of time in days after which LOP log data is automatically deleted. The default is 90 days. The maximum log retention period is 180 days.

The LOP sensor will dead reckon between each fix. If the useable time is less than the condition assessor's dead reckoning tolerance (plus a small amount of time for the data to go degraded) then the Dead Reckoning Tolerance time will be used instead.

The usable time must be between 30 and 3600 seconds. The permanent fix expiration time must be the same or greater than the time the LOP sensor is usable.

The default for both settings is 300 seconds.

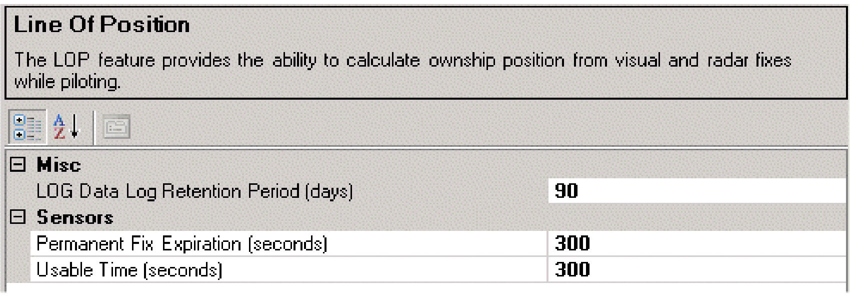


Figure 1.191 Line Of Position

8.10.2.4 Target Anchor Watch

Target Anchor Watch is used to allow the operator to verify that vessels at anchor are not drifting.

Target Anchor Watch is usually part of a static site facility. A static site is normally a stationary installation, such as an oil rig, or land based system.

Note: *On the VisionMaster display, target anchor watch is only available on a Radar or Chart Radar watch mode.*

There are no service configuration settings to be made to target anchor watch. For information on using this feature, refer to Radar/Chart Radar User Guide, 65900010.

8.10.3 Drive Monitor

The Drive Monitor sub menu defines the hard drive setting for the VisionMaster PC. The following miscellaneous settings are listed in the Hard Drive Monitor topic:

- Drive to Monitor - defaults to C
- Monitoring period in seconds (60 to 6000) - defaults to 600
- Required free space (percentage 0 to 50) - defaults to 10 (the minimum free space as a percentage of the drive capacity).

Normally these settings should not be changed.

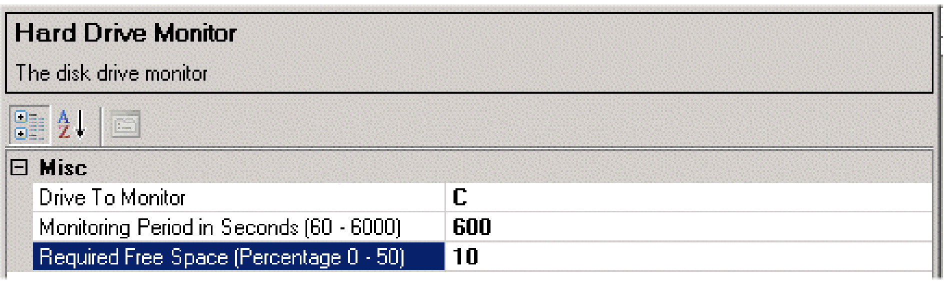


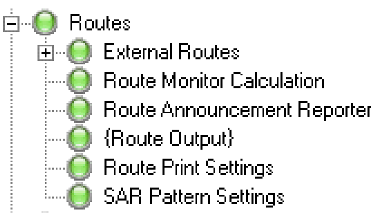
Figure 1.192 Hard Drive Monitor

8.10.4 Navigation Objects

Navigation Objects includes the Clearing Lines feature, which is automatically enabled when Navigation Objects is selected as an optional feature. No other configuration is required.

8.10.5 Routes

The Routes enables the following route options to be configured:



- External Route (input source)
- Route Monitor Calculation
- Route Announcement Reporter
- Route Output port
- Route Print Settings
- SAR Pattern Settings

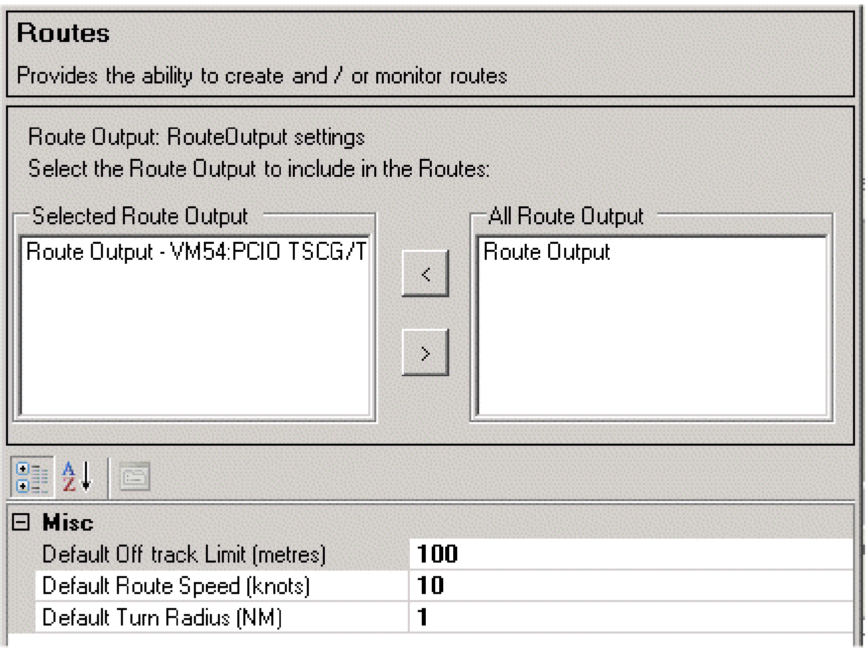


Figure 1.193 Routes Window

The Routes window enables the selection of a route output to be made and the following miscellaneous route values to be changed:

- Off Track Limit - defaults to 100 metres (maximum 9999 metres)
- Route Speed - defaults to 10 knots (maximum 99 knots)
- Turn Radius - defaults to 1 NM (maximum 10 NM).

To change the miscellaneous default values click in the respective field and enter the required value.

The miscellaneous settings for routes are also replicated in the Quick Setup menu, see Section 5.12.5 *Routes*’.

8.10.5.1 Configuring a Route Output Port

A route output port is usually selected when a VisionMaster (VM) ECDIS is connected to a BridgeMaster E (BME) radar. In order to operate correctly the VM Route Output port must be connected to a BME Nav Input port.

When a route output port is configured, the system transmits the following sentences defined in IEC 61162-1:

- RTE (route)
- WPL (waypoint position)
- ZTG (time to next waypoint)

1. To select a route output select the **Route Output** line in the All Route Output column and click on the **<** button. An unconfigured Route Output topic is added to the **{Route Output}** sub menu.
2. RTE and WPL output route messages are auto-selected. To select ZTG highlight and click the **<** button. The ZTG NMEA message provider is added to the list of output messages.
3. Click on the drop down arrow and select the port to be used to write route output messages. The port usage is usually an NMEA (4800 baud) serial port, see Section 7.9.2 *Configuring a PCIO Serial Port*’.

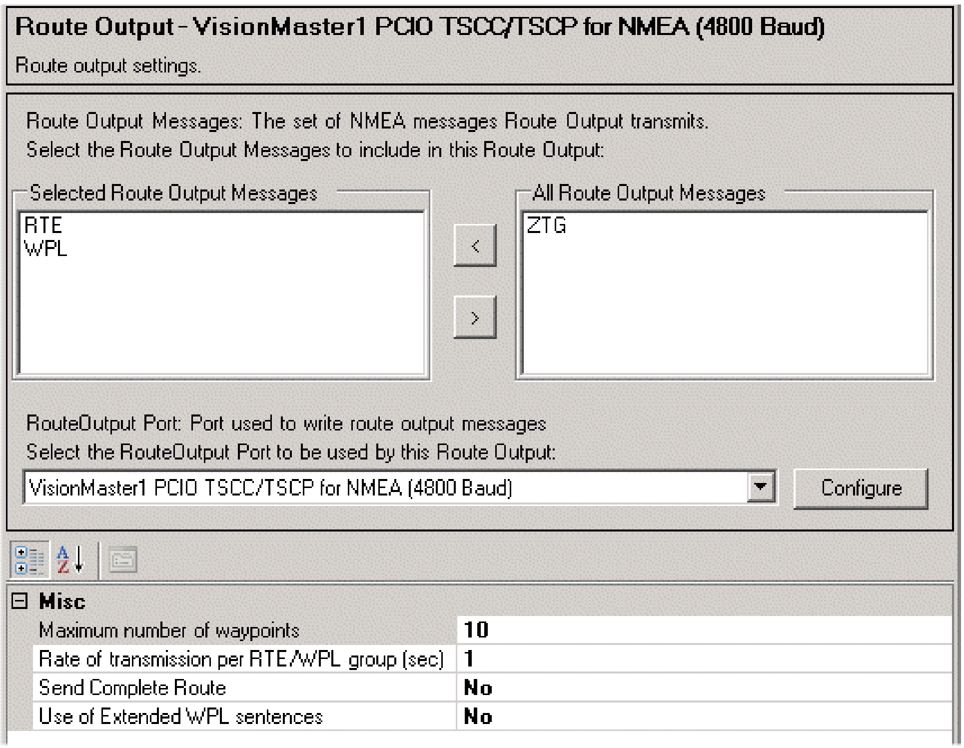


Figure 1.194 Route Output

The following miscellaneous route output values may be changed:

- Maximum number of waypoints - the maximum number of WPL sentences that can be sent after an RTE sentence. The default is 10 (the range is between 1 and 200).
- Rate of transmission per RTE/WPL group - how often a RTE/WPL sentence group should be transmitted in seconds. The default is 1 (the range is between 1 and 59 seconds).
- Send Complete Route - this is set to No if the route is to be sent to a BridgeMaster E or standalone VisionMaster radar. The data sent represents a sliding window of the maximum number of waypoints specified. If Yes is selected the complete monitored route is sent.
- Use of Extended WPL Sentences - the extended WPL sentence is used to transmit route data, including turn radius and approaching leg speed for each waypoint, to a peripheral positioning system. The default is **No**.

To change the miscellaneous default values either click in the respective field and enter the required value, or click on the drop down arrow field and select **Yes**.

8.10.5.2 External Routes

The External Routes sub-menu allows the monitoring of routes from an external input.

External Routes are routes that were created and stored on a GPS unit, a legacy VMS unit, or some other device external to the VisionMaster system. External routes can be displayed on VisionMaster if they are sent using NMEA 0183 (also known as IEC 61162-1) RTE and WPL sentences over a serial connection.

Note: *The external device may also need to be configured to enable its route data to be transferred to the VisionMaster system.*

Note: *In some cases transferring additional route details such as waypoint names from certain GPS units may cause problems when the route is transferred to the system. If transfer problems occur try disabling some of the optional route details. Refer to the device documentation for detailed information regarding the configuration of RTE and WPL messages.*

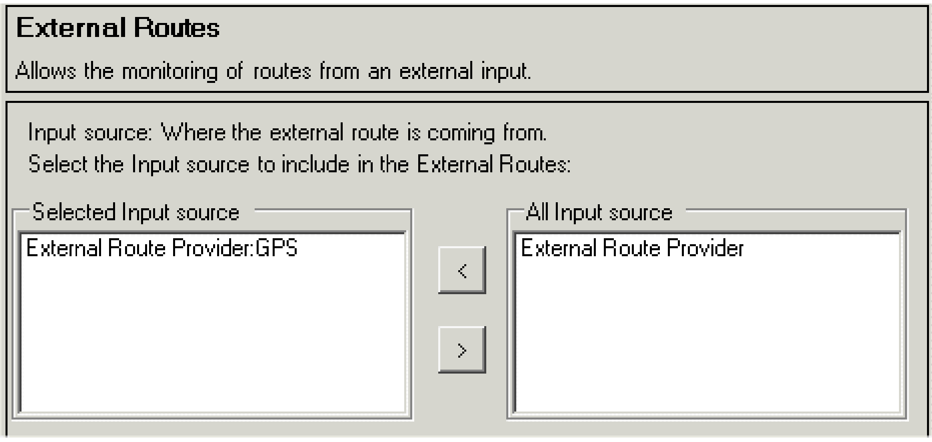


Figure 1.195 External Route Input

To configure an External Route input:

1. Click on the **External Routes** topic in the navigation tree.
2. Highlight **External Route Provider** in the All Input Source field and click the **<** button. An unconfigured External Route Provider topic is added to {Input Source} sub menu.
3. Click on the **External Route Provider** topic in the navigation tree. The configuration window for the external route is displayed.
4. Select the port to be used for the external route provider by clicking on the drop down arrow and selecting from the list of configured I/O ports.
5. If the port requires configuration click on the **Configure** button. The configuration window for the selected I/O port appears, see Section 7.9.2 *Configuring a PCIO Serial Port*'.

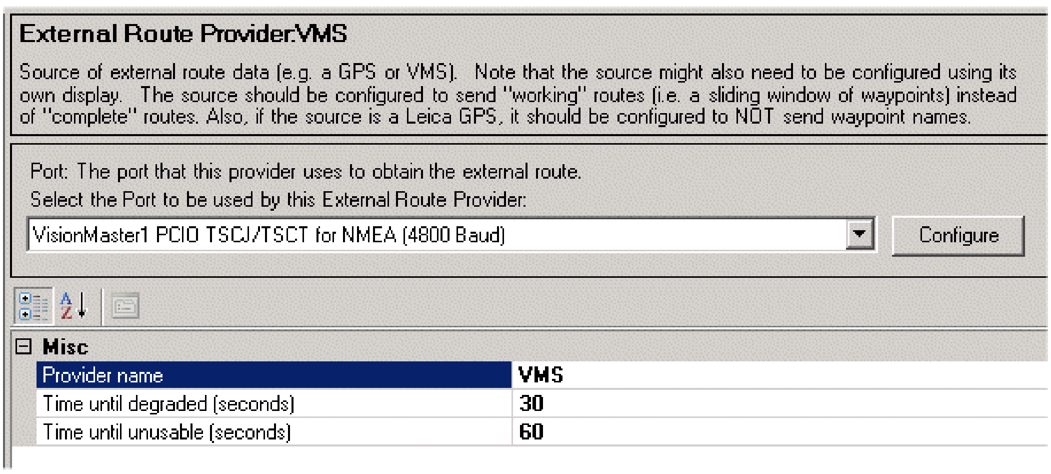


Figure 1.196 External Route Provider

6. In the **Provider Name** field enter a name to use for the external route input. When a name is entered the External Route Provider input is validated, i.e. its configuration status button colour changes to green and the Provider name is shown in the title and navigation topic.

The remaining Miscellaneous values are:

- Time until degraded (seconds) - denotes how long an external route plan data may be displayed in the ungraded color without any updates from the input source. Default value is 30 seconds.
- Time until unusable (seconds) - denotes how long an external route plan may be used without any updates from the input source. Default value is 60 seconds.

To change the default values click in the respective field and enter the required value. There are no minimum and maximum values for this miscellaneous route data.

8.10.5.3 Route Monitor Calculation

The Route Monitor Calculations sub-menu allows you to enter ship-based offsets being the point where the cross-track distance should be calculated from.

For most installations this should be the bow and should only be changed if the system is configured to support an alternate bow (see Section 8.3.1.2 *Alternate Bow in Use Inputs*’), which would require an alternate point to calculate cross track distance from.

8.10.5.4 Route Announcement Reporter

The route announcement reporter enables the selection of a back-up navigator alarm to be raised in the event of the operator not acknowledging an early course change message within a reasonable period of time.

The default selection is **No**, i.e. a back-up navigator alarm is not raised. To enable a back-up navigator alarm to be raised click on the drop down arrow and select **Yes**.

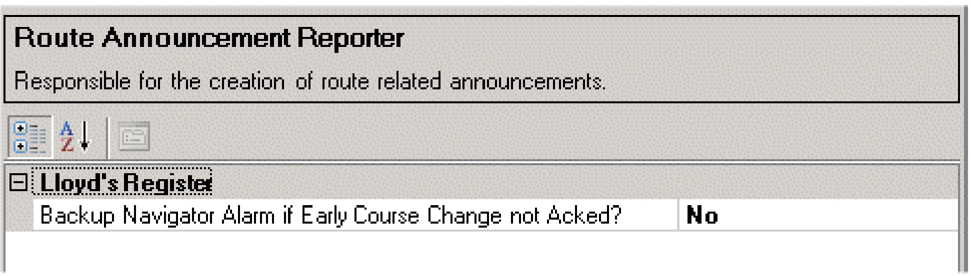


Figure 1.197 Route Announcement Reporter

8.10.5.5 Route Print Settings

The route print settings window enables you to configure the name and size of the font used when a route is output to a local or networked printer.

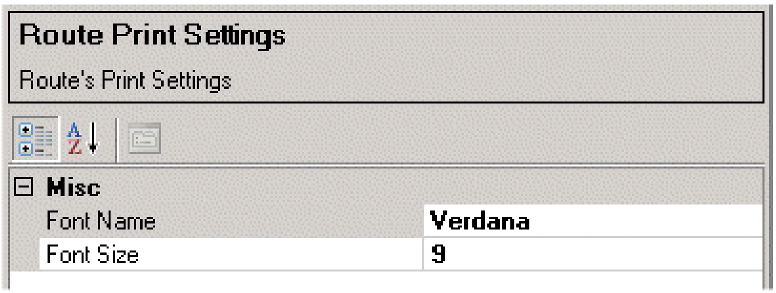


Figure 1.198 Route Print Settings

To change the font name from the default (Verdana) and the font size from the default (9pt) click in the respective fields and enter the required value.

8.10.5.6 SAR Pattern Settings

Provides a list of default settings for all the Search and Rescue (SAR) patterns. Included are settings for Creeping Line, Expanding Box, Parallel Line, Sector width and maximum number of SAR waypoints.

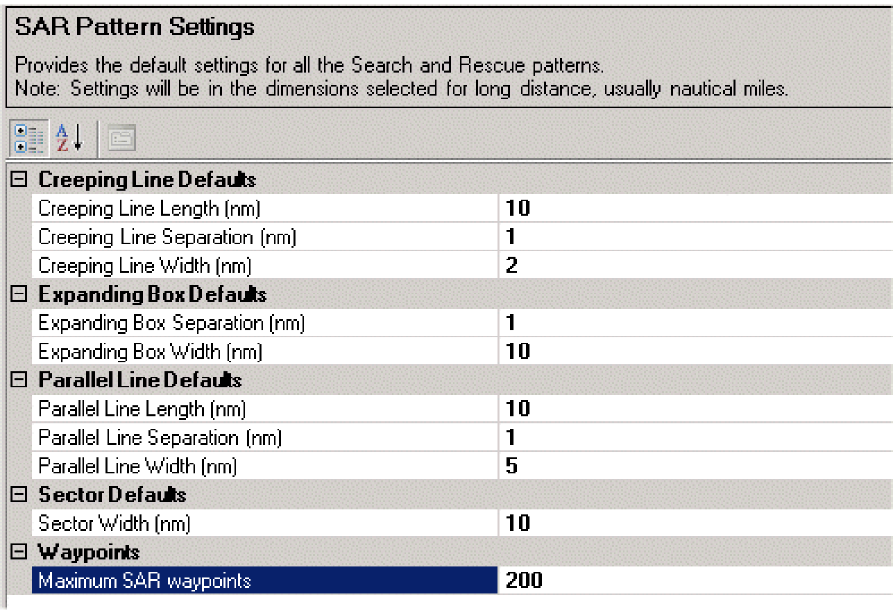


Figure 1.199 SAR Pattern Settings

8.10.6 Visual Playback

Visual Playback is an optional feature that is selected when Playback watch mode is required for a node configured as Total Watch product type.

When Visual Playback is selected the navigation tree adds a Playback Manager sub menu topic.

The Playback Manager includes the following miscellaneous settings:

- Keyframe Frequency[*] - the time between each keyframe in milli-seconds (default 20000, i.e. 20 seconds).
- Max Folder Size - the maximum size of captured data to retain (default 2000 MB).
- Min Folder Size - once the maximum size of captured data is reached the folder will be reduced to this size (default 1500 MB).
- Path to store data - the location of the recorded data on the node (default **c:/playback/**)

The size of retained Playback data is allowed to reach its maximum folder size, at which point the oldest data (i.e. the difference between the maximum folder size and minimum folder size) is automatically deleted until the amount of Playback data is reduced to its minimum folder size.

This renewal and deletion of playback data is a continuous process.

The miscellaneous values in Visual Playback Manager are set at commissioning. It is therefore advisable that these values should only be changed after prior notification or guidance from NGSM service support.

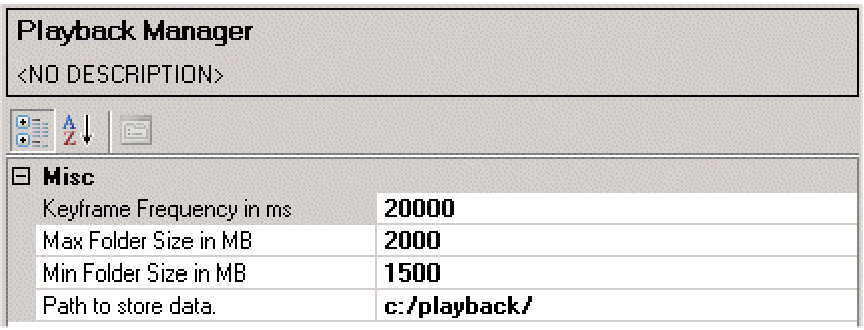


Figure 1.200 Playback Manager

* Within each Keyframe there are minor frame screen captures every 2 seconds. The minor frame frequency is not affected by changes to the Keyframe frequency.

8.10.7 Weather Fax

The Furuno Weather Fax (FAX30) is a device that receives weather images and navigational information from a built in radio receiver and displays the information on a web page using an internet browser installed on the VisionMaster PC.

The Weather Fax topic enables the selection of which nodes in a multi-node system will have the Weather Fax feature and entry of the FAX30 URL. Nodes enabled for weather fax interface with the FAX30 through a network connection.

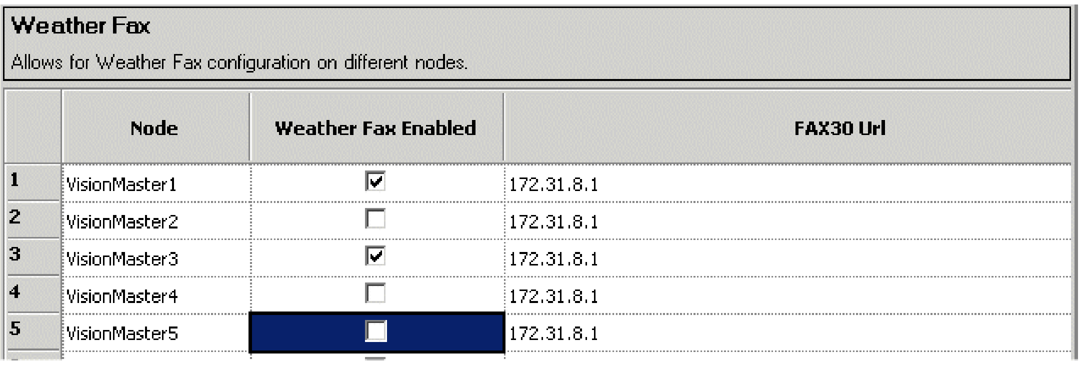


Figure 1.201 Weather Fax

8.10.8 Third Party Applications

Note: *Third party applications require evaluation by Sperry Marine prior to deployment on VisionMaster FT to ensure that their use is regulatory compliant and safe. As a result recommendations for third party applications are provided to all application providers outlining the constraints that third party applications should adhere to.*

There are two methods of configuring third party applications that can be opened from the VisionMaster display:

- as a popup windows application
- as an integrated watch mode

8.10.8.1 Configuring Third Party Window Applications

To configure third party windows applications:

1. Select **Third Party Application** from the All Third Party Window Application field by clicking the **<** button. An unconfigured Third Party Application topic is added to the **Third Party Windows Application** sub menu, see Figure 1.202.

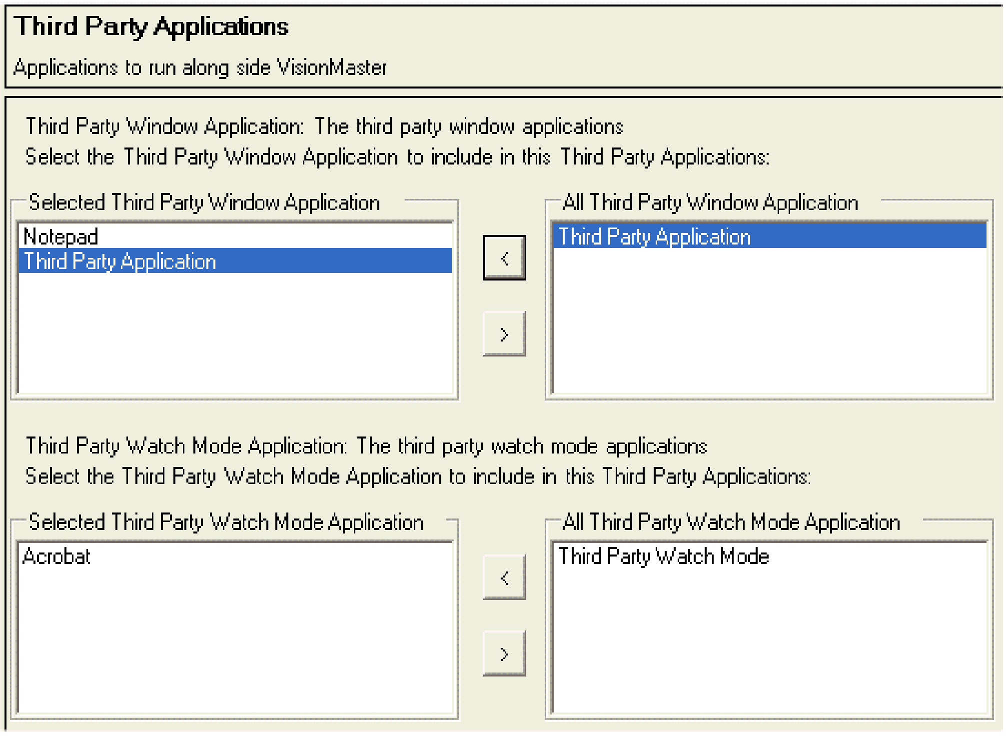


Figure 1.202 Third Party Applications

2. Open the Third Party Application topic.

Note: *Note that the Miscellaneous settings available from the Third Party Application configuration screen are dependent on the Third Party Application selected. Figure 1.203 shows a configuration window for an Acrobat Reader. All Third Party Application screens will include the settings described below, but may also include additional settings, not described in this section.*

3. The **Night Colour Warning**, which enables a prompt to be displayed with a warning that the application colour may not change when night settings are selected, defaults to **No**. All other miscellaneous settings are blank.
4. Enter the **Third Party Application Path.** This is the folder name of the application on the C: drive, along with the filename and extension (usually **.exe**).
5. Enter the **Third Party Application Name**. This is the filename of the application without the.exe extension.
6. Enter the **Third Party Custom Name**. This is the name of the application as it appears in the navigation tree of the configuration and on the list of Third Party Applications in VisionMaster.
7. Repeat the above procedure to configure additional third party windows applications. The applications will be available from the System menu of VisionMaster.

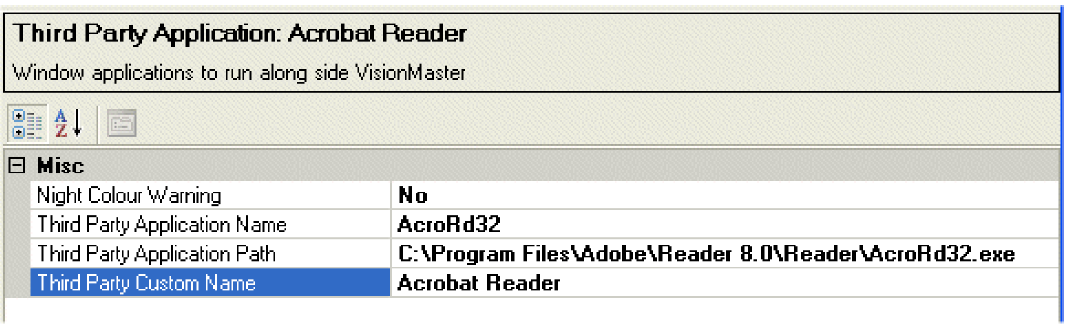


Figure 1.203 Third Party Application Configuration for Acrobat Reader

8.10.8.2 Configuring Third Party Watch Mode Applications

To configure third party watch mode applications:

1. Select **Third Party Watch Mode** from the All Third Party Watch Mode Application field by clicking the **<** button. An unconfigured Third Party Watch Mode topic is added to the **Third Party Watch Mode Application** sub menu.
2. The Third Party Watch Mode Application is configured in the same way as described previously for third party windows applications. The Third Party Custom name is the name that will appear on the Watch Mode list.

8.10.9 3D Charting and 3D Engine

3D Charting and 3D Engine are part of the 3D Vision facility. In order for the 3D Vision to operate successfully both optional features are required to be selected.

The 3D Vision is a feature which shows a 3D visualisation of ownship, chart depth information, and sonar data (if enabled).

To enable 3D Vision, move 3D Charting and 3D Engine to the list of Selected Optional Features. 3D Charting and a 3D Charting Configuration sub menu are created in the navigation tree.

8.10.9.1 3D Charting Configuration

The 3D Charting configuration window enables the following mesh display values to be configured:

- **Chart Altitude -** represents the altitude of the chart in metres, range from 0 metres to 100 metres (the default is 0).
- **Chart Opacity -** represents the opacity of the chart displayed on the water plane, range from 0% to 100% (the default is 0).
- **Mesh Opacity -** represents the opacity of the main mesh displayed, range from 0% to 100% (the default is 100).

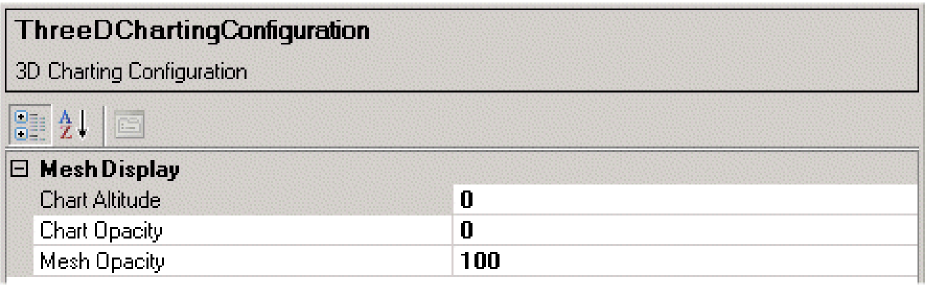


Figure 1.204 3D Charting Configuration

8.10.10 Autopilot Interface

Autopilot Interface enables the VisionMaster system to interface with an autopilot. The facility enables the selection and configuration of a steering control unit which is used to communicate with the autopilot.

1. To select the autopilot click on **Autopilot Interface** in the navigation tree. The default controller shown is a Standard NMEA Autopilot Controller.

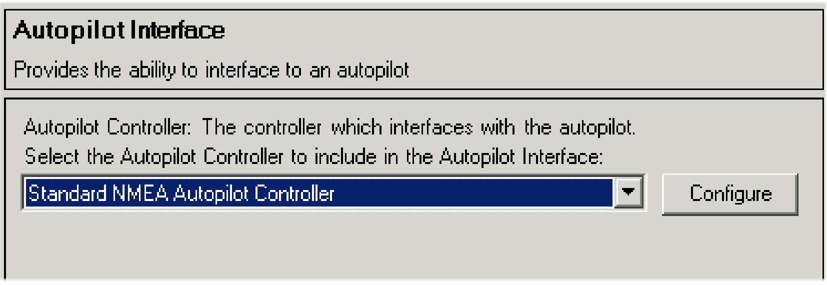


Figure 1.205 Autopilot Interface

2. To configure the autopilot controller click on the **Configure** button, the Standard NMEA Autopilot Controller configuration screen is displayed.

The Autopilot Controller configuration screen enables selection of the Autopilot type and the Steering Control Unit to be used by the Autopilot Controller.

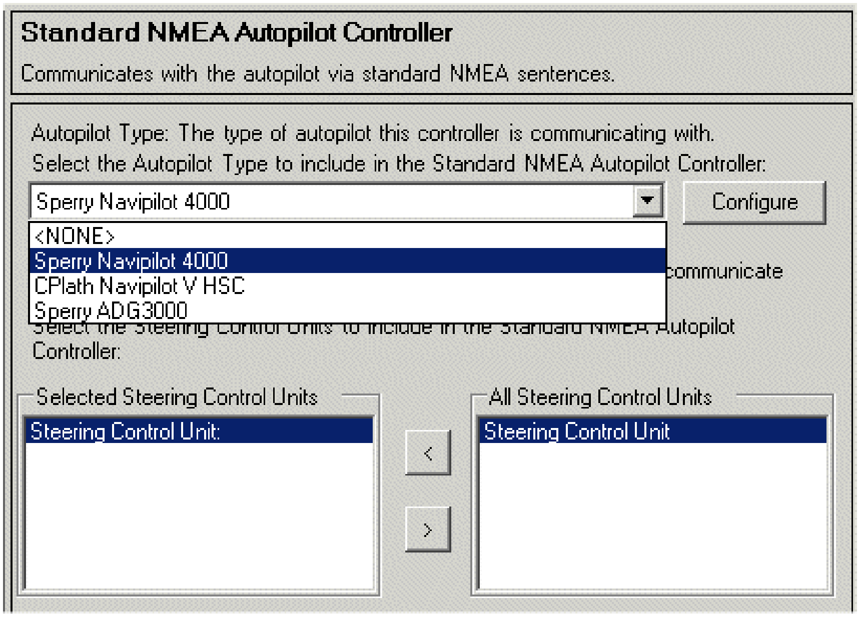


Figure 1.206 Autopilot Controller

1. The autopilot type defaults to **Sperry Navpilot 4000**. To change the type of autopilot the controller is communicating with click on the **Autopilot Type** drop down arrow and select from the list. In addition to the Navipilot 4000, the Autopilot types supported are **C Path Navipilot V HSC** and **Sperry ADG 3000**.
2. Highlight **Steering Control Unit** in the All Steering Control Units column and click on the **<** button. The unit is moved to the **Selected Steering Control Units** column and an unconfigured Steering Control Unit sub menu topic is created.

8.10.10.1 Changing Autopilot Miscellaneous Settings

To change the miscellaneous settings of the selected Autopilot click on the **Autopilot Type:** sub menu topic (the same settings apply to all the available Autopilot types).

1. The Communications Period defines the period, in seconds, that the controller will send commands to the autopilot. The default period is one second. To change click in the field and enter the required period.
2. The Interface Timeout Period defines the amount of time, in seconds, that the controller must receive a message from the autopilot before raising an alarm. The default period is 15 seconds. To change click in the field and enter the required period.

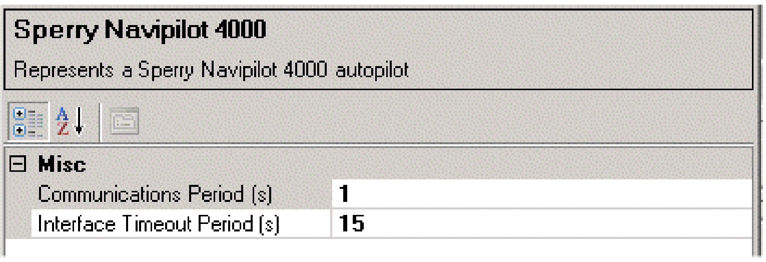


Figure 1.207 Autopilot Miscellaneous Settings

8.10.10.2 Steering Control Unit Configuration

To configure a Steering Control Unit (SCU):

1. Click on the **Steering Control Unit:** topic in the navigation tree, the configuration window for the unit is displayed.
2. Click on the drop down arrow and select the Autopilot Power Level Monitor to be included with the SCU. An unconfigured topic appears below the Steering Control Unit sub menu in the navigation tree.
3. Select the **Autopilot Power Level Monitor** topic from the navigation tree.
4. Click on the drop down arrow of the Power Level Analog Input field and select the Analog Input to be used for the monitor from a list of previously configured analog input devices. Figure 1.208 below shows a Labjack device selected for input.

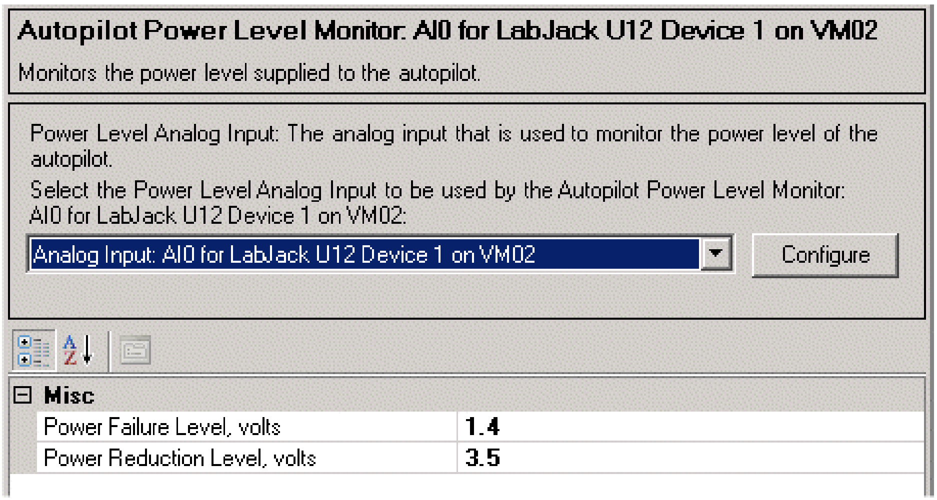


Figure 1.208 Autopilot Power Level Monitor

The window shows the following miscellaneous parameters for the mode.

- **Power Failure Level -** a power level less than this value will be considered a power failure. The default voltage is 1.4 (range between 3.5 and -10 volts).
- **Power Reduction Level -** a power level less than this value will be considered a reduction in power. The default voltage is 3.5 (range between 10 and 1.5 volts).

5. From the Steering Control Unit window select the port (or ports) that will interface with the SCU from a list of previously configured PCIO ports in the **All Ports** column and click the **<** button. The ports are moved to the **Selected Ports** column.
6. Enter a unique name for the SCU in the **SCU Name** field.
7. The switched communication lines default to **Transmit and Receive**. To change to transmit only click on the drop down arrow and select **Transmit**.

When Power Level Monitor, Port and an SCU name have been entered the SCU topic is validated, see Figure 1.209 below.

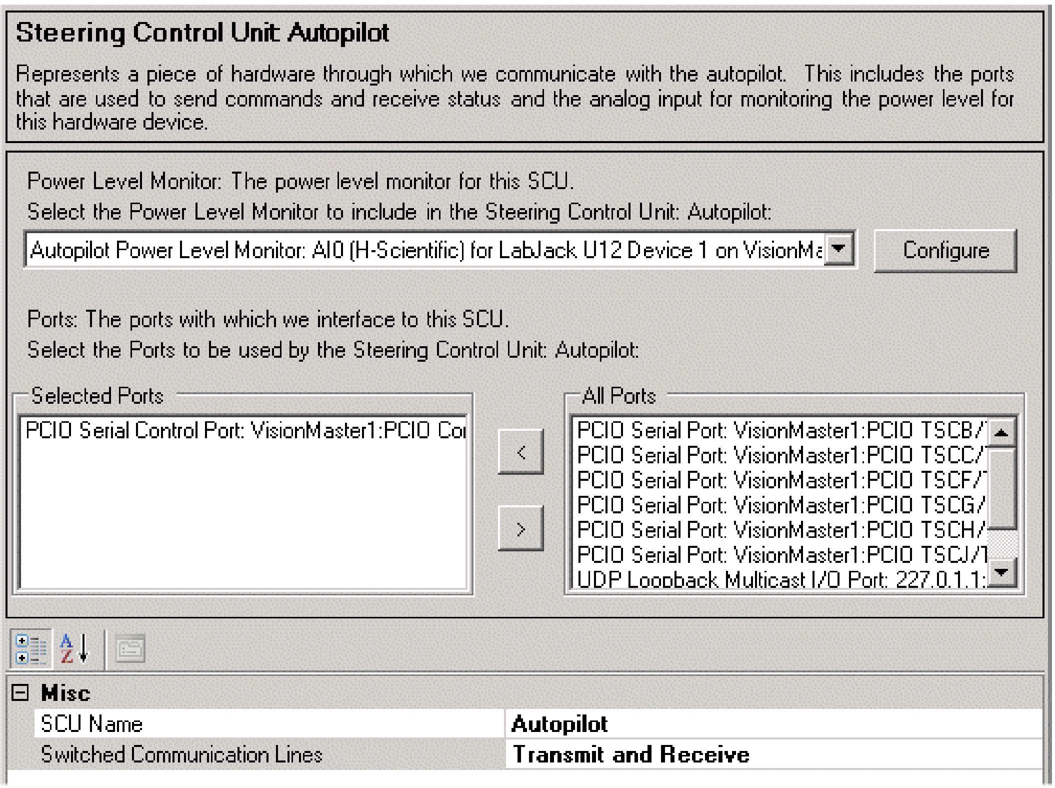


Figure 1.209 Steering Control Unit configured

To configure more SCUs for the Track Control System, repeat the above process.

8.10.11 External Targets

Target transfer from a radar scanner top unit (for example. a BridgeMaster E [BME]) to a VisionMaster (VM) ECDIS is achieved via TTM (tracked target messages), which allow the VM to display targets being tracked by the radar scanner. Each target input from the radar scanner has its own set of targets, each with a local label assigned. Each of these local targets require correlation with other targets in the VM system.

The target system identifier assigned to the target by VM is output in a TLB message to the relevant scanner unit, see Section 8.9.2 *Target Rename Input: TLB Communications*'. The target name is prefixed with the contents of the TLB message's label in parentheses, with a space between this TLB name and the target name assigned.

To configure an External Target input:

1. Click on the **External Targets** topic in the Option Features menu. When External Target Input is opened the window displays the following miscellaneous settings:
   a. Maximum Allowed Targets - the maximum number of external targets allowed in the system. The default is 100, the range is between 0 and 500.
   b. Maximum Target Number - the maximum value of the target number can be set to a value between 0 and 9999 (default).
   c. Maximum Target Range - the maximum range for external targets can be set to a value between 0 and 96 NM (default).
2. Select the port to be used for the target input by clicking on the **Communication Port** drop down arrow and selecting from the list of configured PCIO ports and Control Panel ports. On a multi-node system the PCIO and Control Panel ports for each node are listed.

Note: *When a communication port is selected, a new configuration line is automatically generated below the current line.*

3. Enter a name for the external target provider in the Provider Name column, e.g. BME1.
4. To enable the TLB output message to be renamed click on the drop down arrow in the **Rename Output** column and select **Yes**.
5. On a multi-node system, repeat the process to configure other nodes for external target input.
6. To delete an external target input click on the line's **Delete** button. The line is removed from the window.

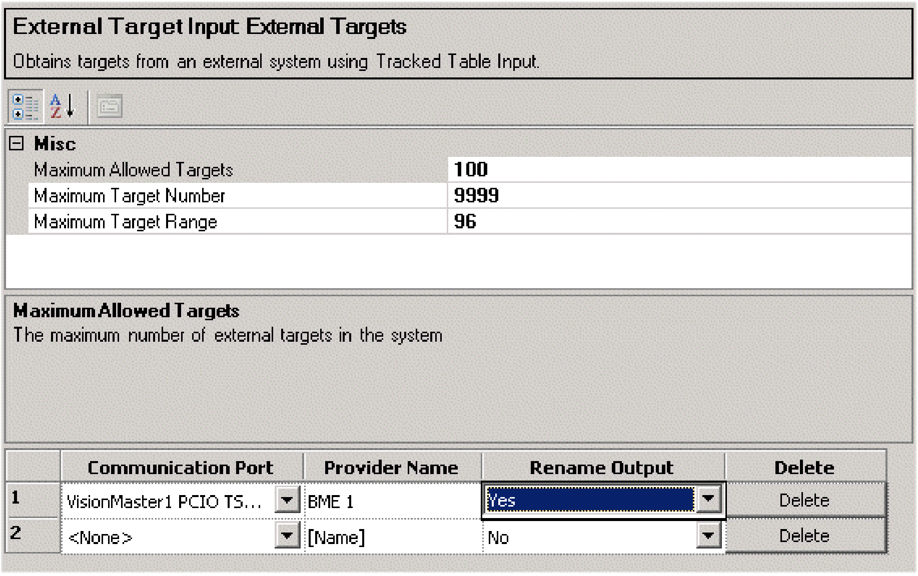


Figure 1.210 External Target Input: External Targets

8.10.12 Joystick Heading Control

The joystick heading control mode enables two configuration settings to be made to a connected heading joystick, which is generally mounted in the armrest of chairs on the bridge.

With Joystick Heading Control in the selected Optional Features list, click on the **Joystick Heading Control Mode** sub menu topic. The following window is displayed.

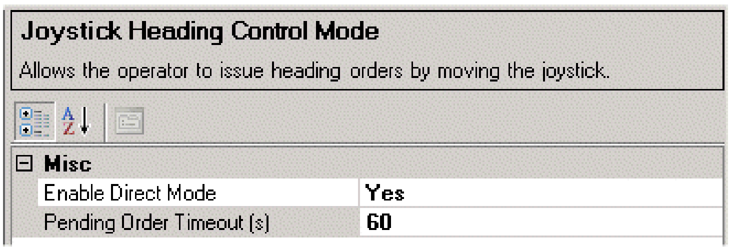


Figure 1.211 Joystick Heading Control Mode

Enable Direct Mode defines whether heading orders are entered with or without operator confirmation. The default is **Yes** (without confirmation). To order the system to generate a confirmation before heading orders from a joystick are implemented, click in the field and select **No**.

The Pending Order Timeout defines a timeout period with a default of 60 seconds. If there is no operator activity after this period then a pending order will be cancelled. If there is an active order then the pending order will revert to the active order, if there is no active order then the joystick mode will be exited. To change the period click in the field and enter a time period from 1 second upwards.

8.10.13 Video Display Providers

The following video display providers may be configured:

- LAN - for video generated over a local area network (LAN).
- PiP - where the video is generated using the Picture in Picture (PiP) feature of the monitor.

The type of video provider selected is dependant on the type of video source configured in Resources, see Section 7.10 *Video Sources*’.

8.10.13.1 LAN Video Display Providers

The LAN video display providers window enable the video source groups configured in Video Sources to be selected for up to four displays.

To configure a LAN Video Display Provider:

1. Select **LAN Video Display Providers** from the Optional Features list.
2. From the LAN Video Display Providers window, select **Vlc Client Control Provider** from All LAN Video Display Providers column and click the < button to move to Selected Providers column. The navigation tree generates unconfigured Vlc Client Control Provider and CCTV Vlc Manager topics.
3. Click the **Default video source for Video DisplayA:** drop down arrow and select from the list of names assigned to the video sources.
4. Repeat step 3 in the other Video Display fields for all the other configured Vlc client sources.
5. To configure the video sources click the **Configure** button to the right of the fields. The Vlc Client Source window for the selected source appears, see Figure 1.71.

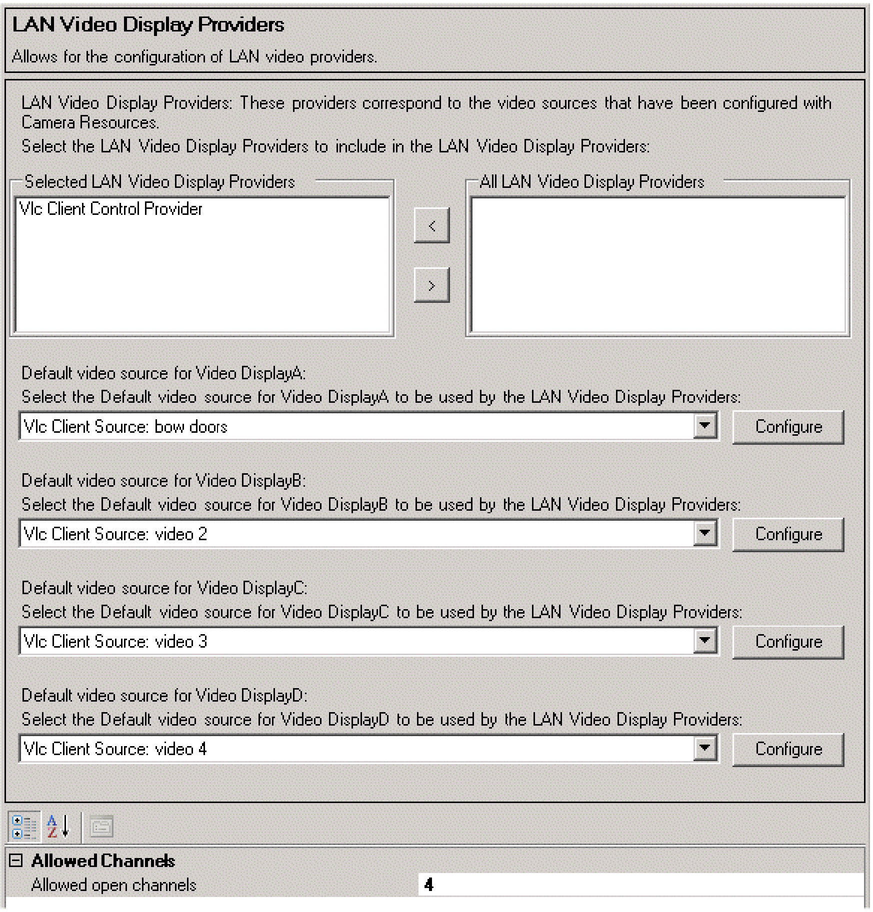


Figure 1.212 LAN Video Display Providers

The Vlc Client Control Provider includes a sub menu, CCTV Vlc Manager, which is automatically selected for the provider.

CCTV Vlc Manager

The CCTV Vlc Manager uses a UDP Loopback Multicast I/O port to send and receive messages. This port is used to communicate with an external process called 'VicVideoHost', which receives and displays streaming video from the video sources.

Click on the drop down arrow and select the previously configured UDP Loopback port from the list of available ports, see Section 7.9.7 *Configuring a UDP Port using a Loopback Adapter*'

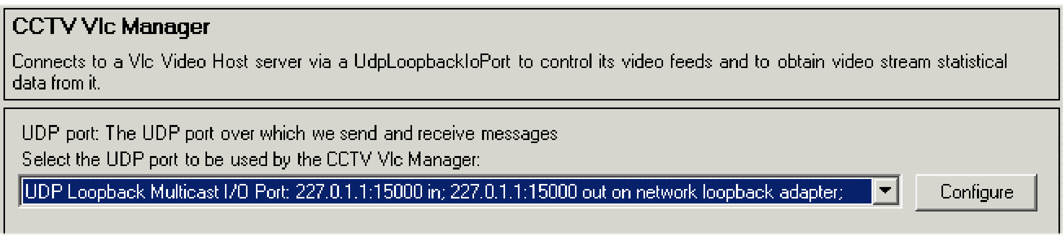


Figure 1.213 CCTV Vlc Manager

8.10.13.2 PiP Video Display Provider

The PiP video display provider window enables the source for PiP video, previously configured in Section 7.10.2 *PIP Video Source Group*', to be selected.

To configure a PiP Video Display Provider:

1. Select **PiP Video Display Provider** from the Optional Features list. The window displays **Pip** as the default video display provider.
2. To select the default source for the PiP video to be used by the display provider, click on the drop down arrow. The unique name for this video source will be the name assigned in the video source window, see Section 7.10.2 *PIP Video Source Group*'.

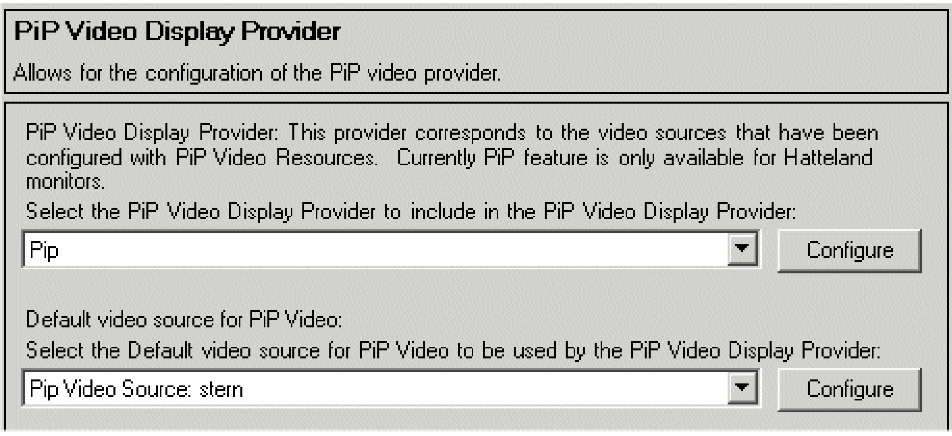
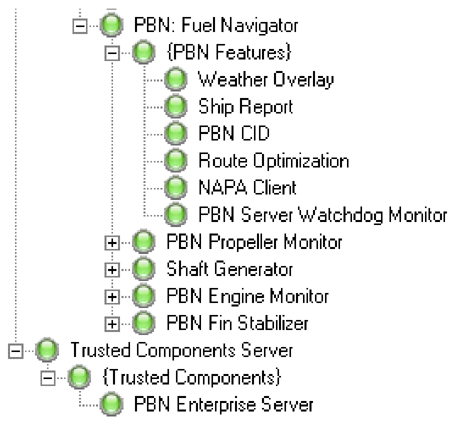


Figure 1.214 PiP Video Display Provider

8.10.14 PBN: Fuel Navigator



The PBN Fuel Navigator is a feature that allows for route optimisation, weather overlay location, and ship reporting data to be displayed.

For route optimisations route data and configured ship characteristics are sent to the PBN system where it is used to create fuel optimised routes. The optimised routes are then sent back to the PBN Fuel Navigator for display.

For weather overlay location, type of overlay, and forecast time data is sent to the PBN system where it is used to generate an image. The image is then passed back to the PBN Fuel Navigator where it is overlaid on the chart.

For ship reporting from other VisionMaster subsystems data is retrieved to populate ship reports. The PBN Fuel Navigator sends the XML based ship reports to the PBN Enterprise Server where they are transferred to the shore based reporting system via the ship's on board satellite communication system.

Note: *The PBN Fuel Navigator can only be run on an ECDIS watch mode, as part of a multi-node system.*

8.10.14.1 Configuring PBN Features

1. Select **PBN: Fuel Navigator** from the Optional Features list. The system automatically selects all the PBN features and the following additional topics are generated in the navigation tree:
   - **PBN Ship Characteristics** in the Own Ship menu (unconfigured topic).
   - **Trusted Components Server** sub menu on the same root level as the Main Application.

   Note that the Node status button displays a validation error. This will be corrected when **PBN Enterprise Server** has been selected as the Product Type on the node to be configured for PBN.

After PBN: Fuel Navigator is selected the only PBN feature that will generate a validation error is Route Optimization, which will require a set of engine modes to be entered. Sets of engine modes for each ship are supplied together with the NAPA ship model. To enter engine modes:

2. Open the Route Optimization window and page down to the **Optimization** list.
3. Click on the **Engine Modes Available** lines (Port and Starboard) and then click the navigation button to the right of the line, a String Collection Editor popup window appears.
4. Enter the supplied engine modes text strings into the editor, see Figure 1.215.

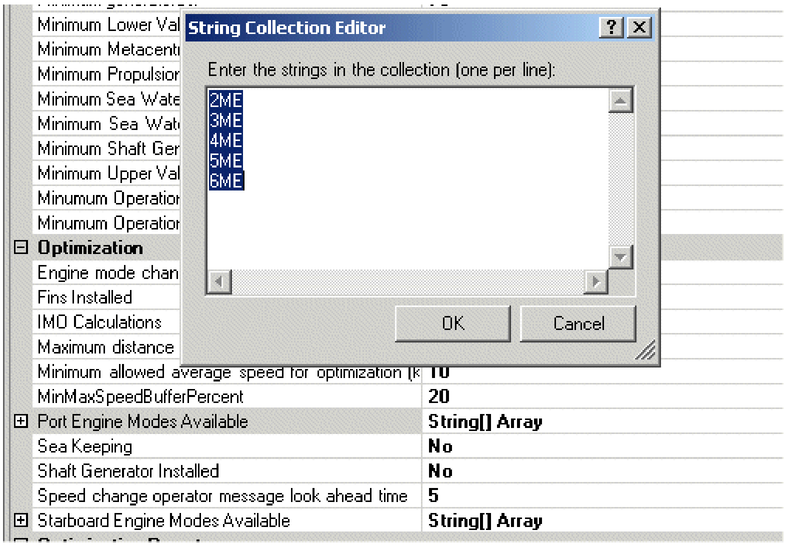


Figure 1.215 Route Optimization - Enter Engine Modes

The following sub-sections describe settings and parameters automatically assigned to PBN Features. Normally this data should not be changed.

Weather Overlay

The PBN Enterprise Server is a designated VisionMaster node (see Section 8.10.14.3) that imports weather data and sea current data files when they are received from the ship's weather service provider.

A request feature provides for filtering of weather and current data sent to the ship, based on an operator designated region, a selected route or own ship position.

The Weather Overlay window defines the following parameters:

- Weather Import - the directory path on the hard disk where the imported weather and sea current files are saved to.
- Weather Request - the location where weather request files to be sent to the PBN Enterprise Server are stored.
- Weather Requests- whether or not weather requests can be made.

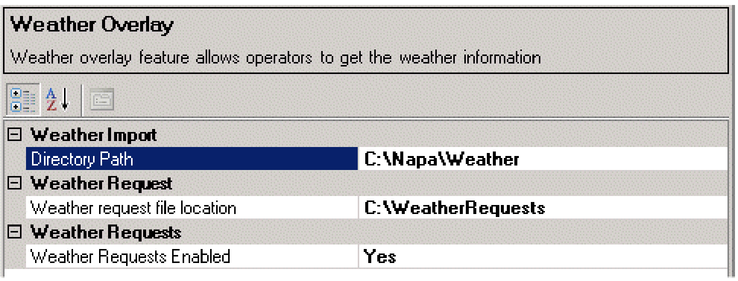


Figure 1.216 Weather Overlay

Ship Report

The PBN system generates reports that can be used by the shore side reporting tool (BridgeLink). Reports include ship data, route data, and navigation data.

There are three types of report: Load Report, Ship Report and End Report.

1. A load report is generated each time a route is loaded. The original cost value in the load report comes from the initial cost calculation of the route selected for optimization. The optimised cost value in the load report comes from the selected optimised route after optimization.
2. A ship report is generated at each route leg change, and at a configurable periodic time.
3. An end report is generated when any of the following criteria are met:
    - The ship reaches the end of the monitored route.
    - A route is loaded with a new route ID.
    - When the speed of the ship is less than 1 knot for more than 1 minute within a percentage offset distance from the planned end of the route.
    - When a temp route is loaded within a distance from the planned end of the route.

The Ship Report window defines the following parameters:

- BridgeLink Lite - the IP address of the BridgeLink Lite web application.
- End of Route Offset - the end of route offset in percent, the default is 2.5.
- Ship Report Creation- the interval in minutes to generate ship report data, the default is 60 minutes.
- Ship Report at PBN Enterprise Server - the location of the destination folder where ship reports are stored.

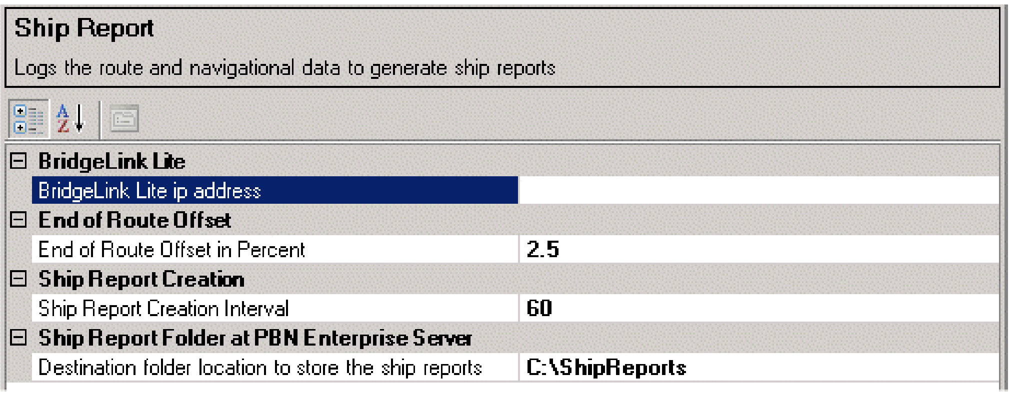


Figure 1.217 Ship Report

Route Optimization

Based on a previously saved route plan, the PBN system can perform a cost analysis which accounts for weather conditions and other factors. After analysing the existing route, the Fuel Navigator can be used to create an optimised route based on operator selected factors.

An optimised route will change leg speeds and waypoint positions to suggest the most efficient route possible that meets the route ETA.

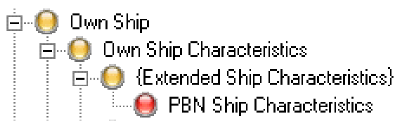
The Route Optimization window allows settings to be adjusted for the following areas:

- Default Values
- Engines
- Environment Values
- Exclusion Zones
- Maximum Values
- Minimum Values
- Optimization
- Optimization Report
- Optimized Route Clean up
- Security
- Ship Type
- Weather and Sea Current Data

The only settings that require configuration in order to validate the feature are the engine modes in the Optimization area, see Figure 1.215.

8.10.14.2 Configuring PBN Ship Characteristics

When PBN: Fuel Navigator is selected an unconfigured PBN Ships Characteristics topic is added to the {Extended Ships Characteristics} sub menu.



The PBN Ships Characteristics window enables required information on the ship to be entered. Note that all fields must have data entered before the topic can be validated.

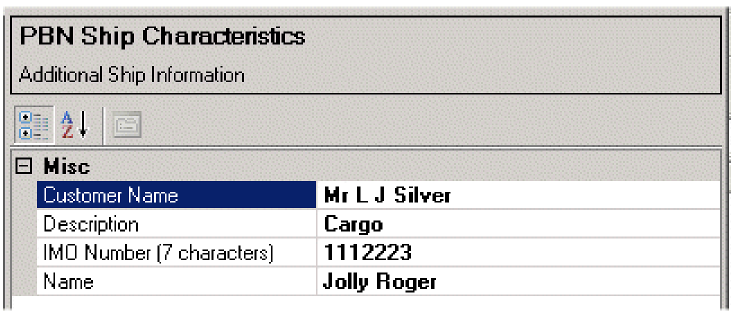


Figure 1.218 PBN Ships Characteristics

8.10.14.3 Configuring a PBN Enterprise Server

One or more nodes are required to be selected as PBN Enterprise Server product types. The server node is used to accept requests from the PBN system and perform weather overlays and route optimisations.

1. To configure a node as the server go to Nodes in either the 'Quick Setup' or 'Resources' menu (see Section 5.3 *Nodes*'), click on the **Product Type** for the selected node and select **PBN Enterprise Server** from the drop down list.
2. From the Trusted Components Server window select **PBN Enterprise Server** from the **All Trusted Components** field. A validated PBN Enterprise Server topic is created below the **{Trusted Components}** sub menu.
3. Double click on the topic to change the default licensing information and directory path for the import of weather data.

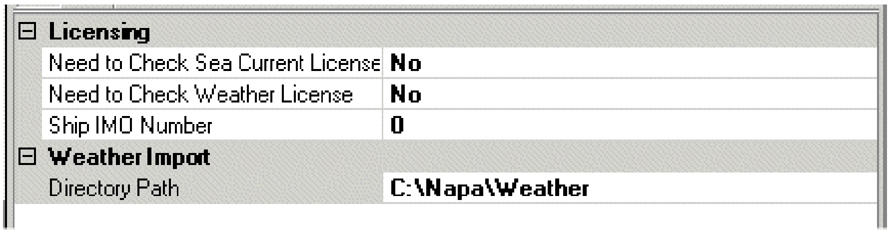


Figure 1.219 PBN Enterprise Server

4. To check whether sea data licenses and weather data licenses have expired select **Yes** from the drop down lists.
   When Yes is selected a weather and sea license expiring warning is displayed with the number of valid license days remaining, starting when the data is within 30 days of expiring. A weather and sea data expired warning is displayed when the data license has expired.
5. if license checking is enabled enter the ship IMO number.
6. The weather Import is the directory path on the hard disk where the imported weather and sea current files are saved to. This must be the same as the path given in the Weather Overlay window.

8.10.14.4 Configuring Fuel Navigator Monitoring Systems

The Fuel Navigator window allows the monitoring of various propulsion sub-systems on the ship, via their sensors, to be selected. The following sub-systems are available for selection and configuration:

- Propeller
- Shaft Generator
- Engine
- Stabilizer Fin

In order to monitor the sub-systems listed above, a set of external sensors connected to the system modules must be configured.

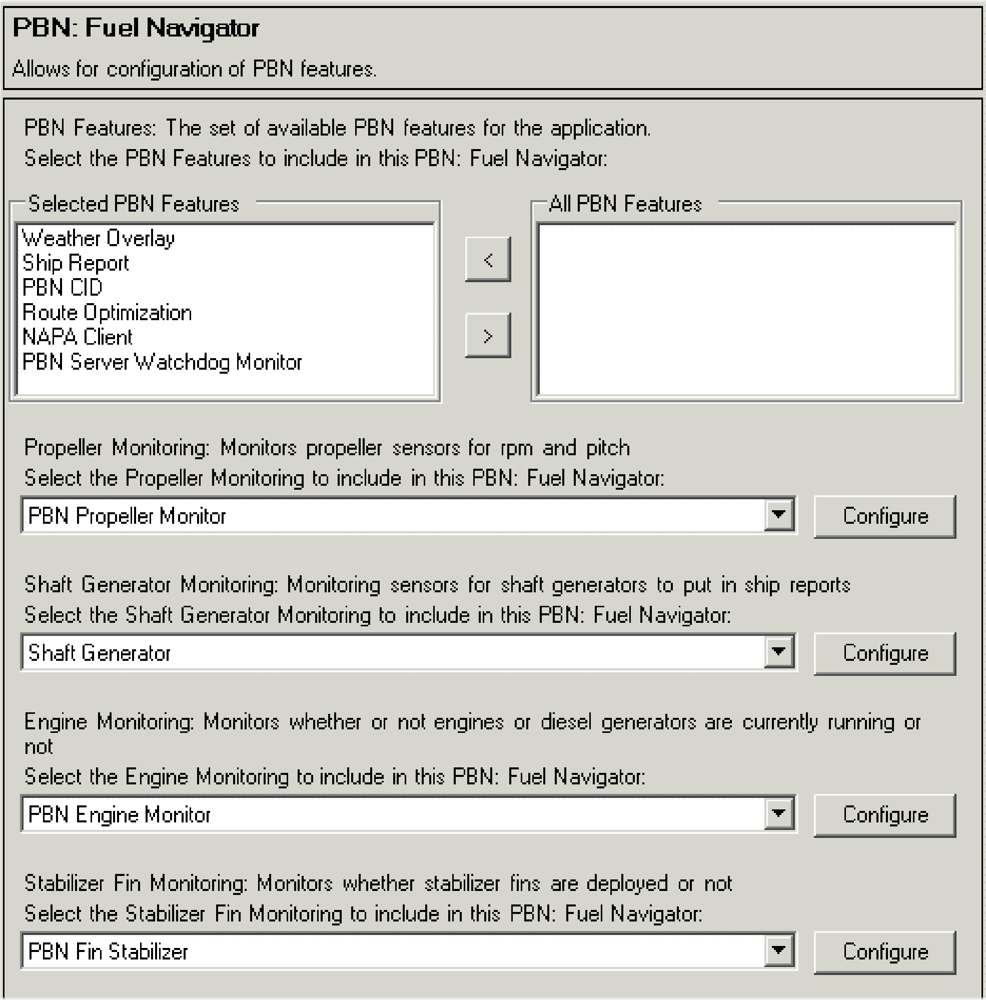


Figure 1.220 PBN: Fuel Navigator

A selected set of sensors that monitor the entire ship's engine system should be configured for Fuel Navigator, see Figure 1.221.

1. From the Sensors sub menu (see Section 8.4.1.1 *Sensors*'), select **Engine Performance System** from the All Sensors list. The navigation tree creates a {Sensors} sub menu with an unconfigured Engine Performance Sensors topic.
2. Open the Engine Performance Sensors topic and select the sensor types available by ticking their check boxes. The sensors appear in the **Selected Engine Sensors** column and unconfigured topics are included under the {Engine Sensors} sub menu in the navigation tree.
3. In the Miscellaneous area enter the engine identifier. The fuel consumption type defaults to **None**, click on the drop down arrow to select from **Mass, Volume** or **Power**. The sensor name defaults to **Engine Performance Sensors**, if required enter a different name.

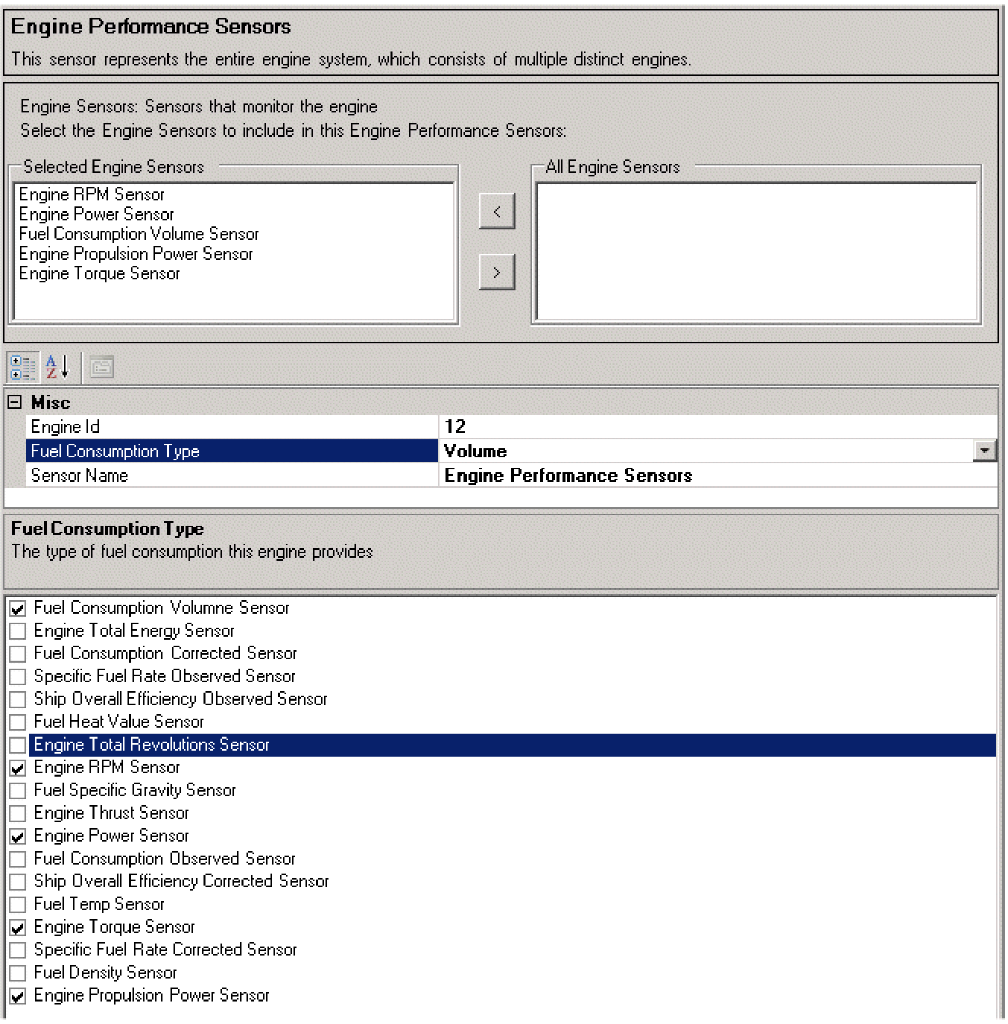


Figure 1.221 Engine Performance Sensors

Most sensors only require a set of ship based offsets and a sensor abbreviation to be configured. The sensor name will be the identifier given in the Engine Performance Sensors list, see Figure 1.222.

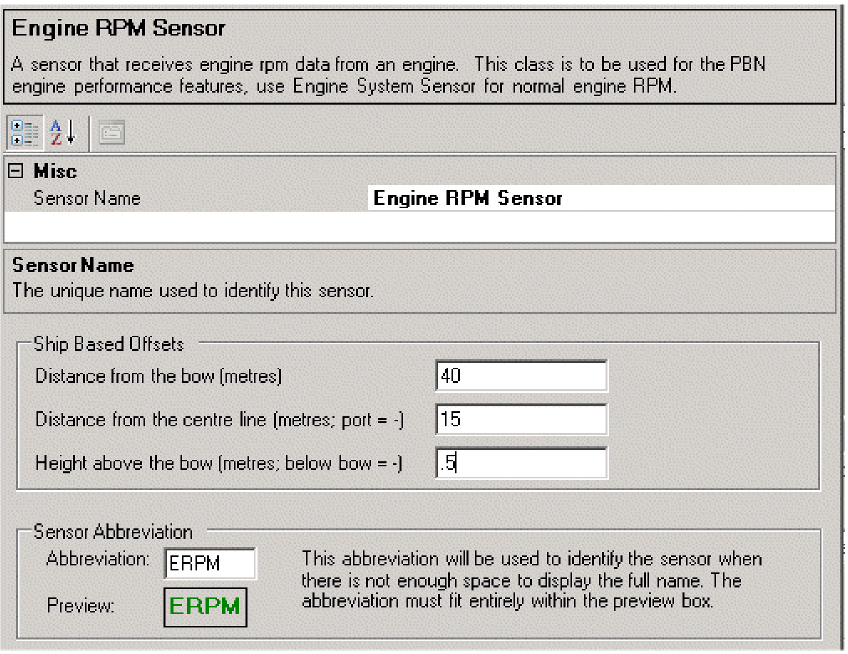


Figure 1.222 Engine RPM Sensor

4. From the PBN; Fuel Navigator menu in the navigation tree open the Monitor sub menus.
5. Select one or more sensors that monitor the selected sub system. If required, enter miscellaneous data (Figure 1.223 shows a configured PBN Engine Monitor).

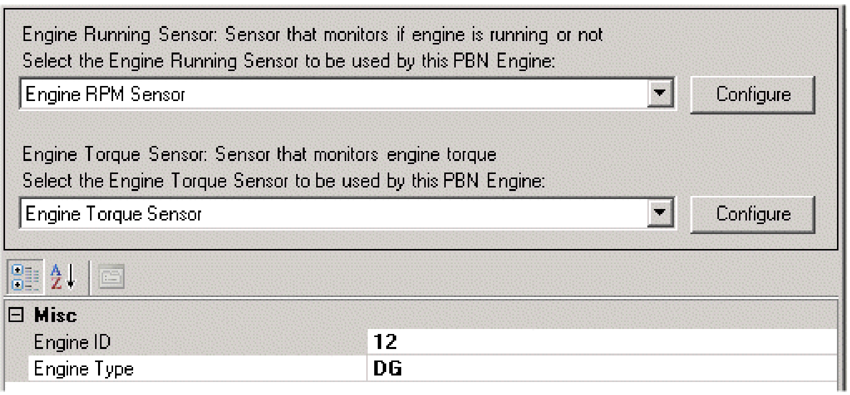


Figure 1.223 PBN Engine Monitor

8.10.15 Route Based Speed Control Selection

The Route Based Speed Control Selection enables the system to implement a route based speed control and configuration of the speed control functionality.

Note: *Route based speed control is a propulsion control mode and is only enabled when VisionMaster is interfaced to the ship's propulsion system, see Section 8.10.19 Propulsion Control Interface'.*

1. From the Route Based Speed Control Selection topic click on the drop down arrow and select **Route Based Speed Control**.
2. To configure the speed control functionality either click on the **Configure** button, or click on the **Route Based Speed Control** sub menu in the navigation tree. The general settings are displayed, see Figure 1.224.

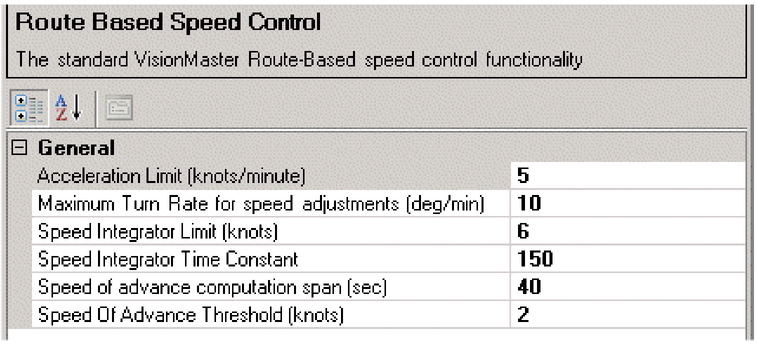


Figure 1.224 Route Based Speed Control

The following general settings may be changed:

Setting	Default
• **Acceleration Limit (knots/minute)**	5 (0.5 min, 40 maximum)

The maximum rate at which speed commands to the propulsion system are allowed to change

Setting	Default
• **Maximum Turn Rate for speed adjustments (deg/min)**	10

The maximum turn rate at which speed command adjustments will be recalculated based on the speed achieved from the current speed commands.

Setting	Default
• **Speed Integrator Limit (knots)**	6

The maximum adjustment that will be made to commanded speed, based on differences between commanded speed and the speed actually achieved.

Setting	Default
• **Speed Integrator Time Constant**	150 (adjustable up to 240)

The time constant that determines how rapidly the system adjusts its speed commands to compensate for the difference between commanded speed and the speed achieved.

Setting	Default
• **Speed of advance computation span (sec)**	40 (adjustable up to 240)

The time span over which the speed of advance is to be measured.

Setting	Default
• **Speed of advance threshold (knots)**	2 (no min or max)

The threshold of the difference between the commanded speed of advance and the measured speed of advance.

8.10.16 TotalTide

The TotalTide feature is available to ECDIS nodes, or a Total Watch system that includes ECDIS. The TotalTide feature cannot be run on Radar/Chart Radar nodes.

If your system is multi-node the TotalTide window lists all the nodes on the system. Tick the check boxes of the nodes which will run the TotalTide application.

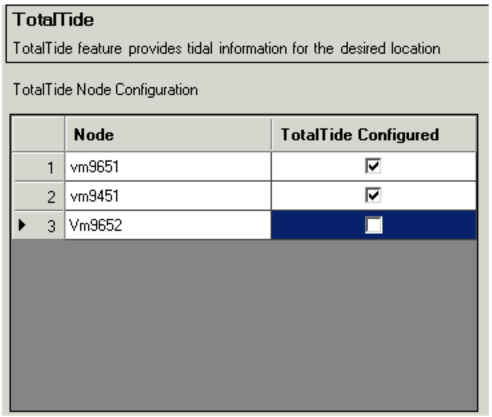


Figure 1.225 TotalTide

8.10.17 Sonar

The Sonar feature enables the configuration of a FarSounder Sonar (FSS) device.

The Sonar window enables the selection of which nodes (on a multi-node system) support communications with the FSS. If a node is not configured to communicate with the FSS, then sonar data and menus for displaying the sonar are not displayed on that node.

The FSS is typically mounted at the front of the ship, at a position relative to the bow. The Sonar configuration window enables the positioning of the sonar device to be made to an accuracy of up to a tenth of a metre. An entry of the Sonar's host IP address must be made in order to communicate between VisionMaster and the FSS software.

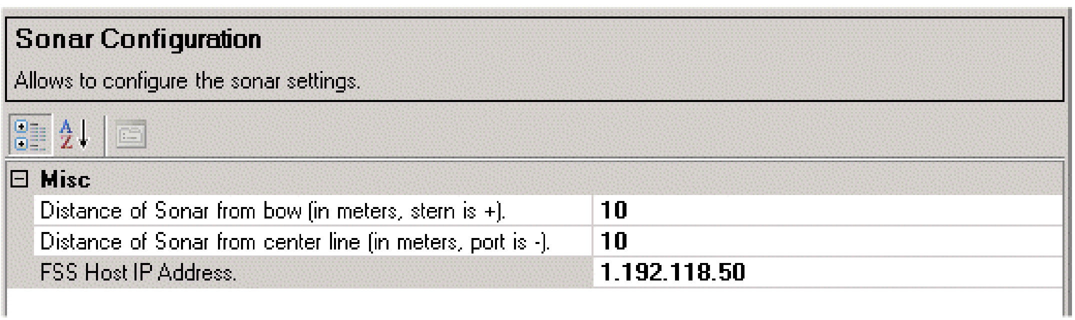
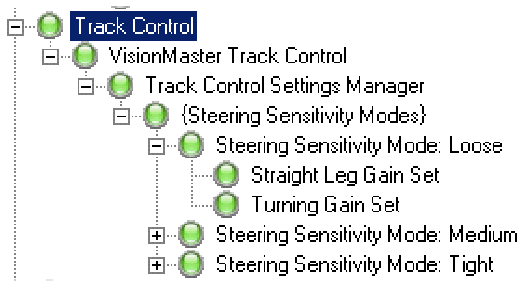


Figure 1.226 Sonar Configuration

1. Distance from Sonar to bow is the distance, in metres, of the FSS to the bow. If the distance is measured from the stern insert + before the value.
2. Distance of Sonar to centre line is the distance, in metres of the FSS to the ship's centre line. If the distance is measured from the port side insert - before the value.
3. Enter the IP address of the sonar in the FSS Host IP Address field.

8.10.18 Track Control



Track Control systems enable own ship to steer automatically along a monitored route, or to maintain a designated heading under various conditions and within the limits related to the ship's manoeuvrability.

A Track Control System consists of one or more VisionMaster nodes and may also include a separate heading control, known as an Autopilot, see *Section 8.10.10 Autopilot Interface*'.

This section also includes instructions on configuring VisionMaster track control settings to correspond to existing track control settings from a legacy VMS (Voyage Management System). See Section 8.10.18.2 *Configuring VMFT Track Control Settings from VMS*'.

8.10.18.1 Track Control Settings Manager

The track control settings manager handles all operator adjustable track control settings. The window is available as a sub menu topic under the VisionMaster Track Control menu.

The Track Control Settings Manager enables steering sensitivity modes to be selected and configured.

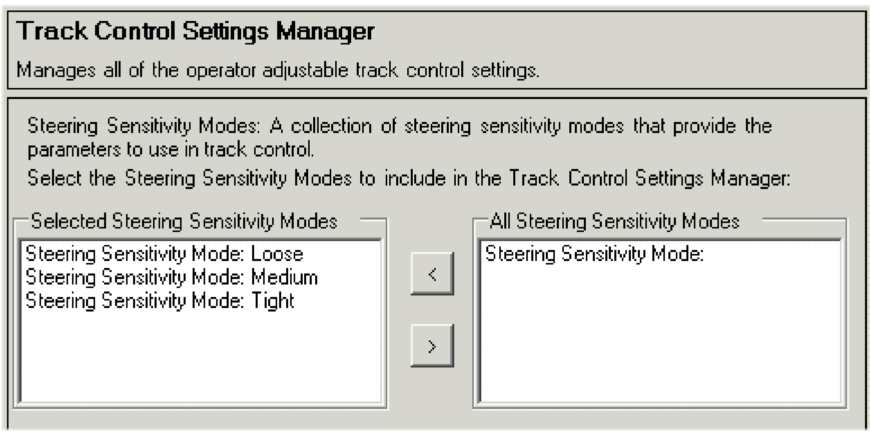


Figure 1.227 Track Control Settings Manager

The default selected steering sensitivity modes are Loose, Medium and Tight. Each mode includes a set of system defined parameters.

Steering Sensitivity Modes

The steering sensitivity modes determine the magnitude of track control adjustment for a given XTE (cross track error). These modes are selectable by the operator from the VisionMaster application.

The three default modes (Loose, Medium and Tight) define a particular set of parameters.

To configure the modes open the **{Steering Sensitivity Modes}** sub menu in the navigation tree and select the required mode, *Figure 1.228* below shows the window for **Loose** mode.

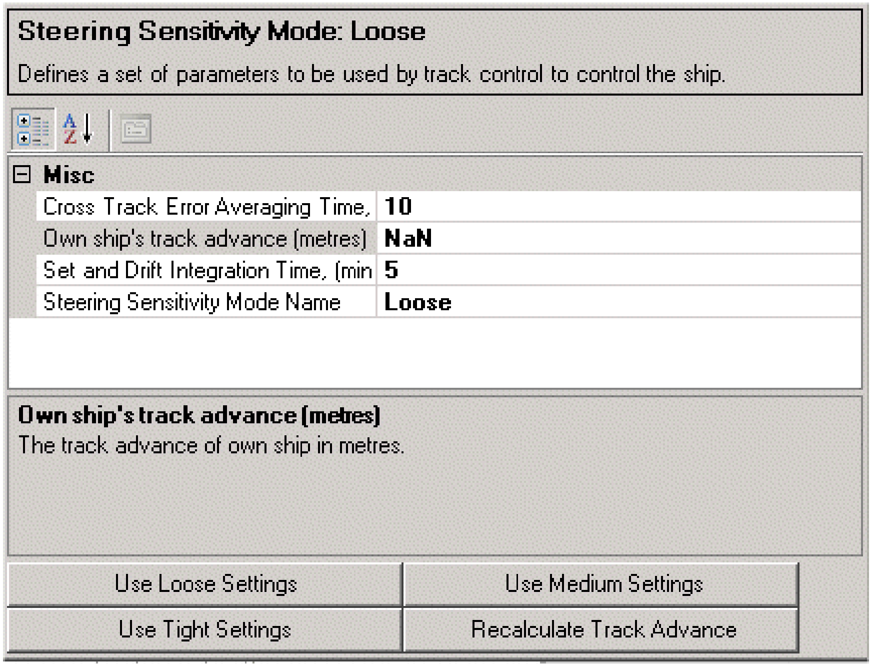


Figure 1.228 Steering Sensitivity Mode

The window shows the following miscellaneous parameters for the mode.

- **Cross Track Error Averaging Time -** the cross track averaging time in seconds to be applied. The default time is 10 seconds (range between 0 and 100).
- **Own ship's track advance -** the track advance of own ship in metres. The default (**NaN**[*]) requires a value to be entered in order to configure the mode. There are no minimum and maximum values for track advance.

---

* NaN (Not a Number) is a global property (variable) with a constant value. Comparison of any object to this property will return true if the object is a number and false if it is not.

- **Set and Drift Integration Time -** the amount of sensor history, in minutes, that the system shall take into account when computing the set and drift to use for track control. There are no minimum and maximum values for this time. The following default values apply for each mode:
  - Loose mode: 5 minutes
  - Medium mode: 3 minutes
  - Tight mode: 1 minute
- **Steering Sensitivity Mode Name -** the name of the mode.

Note: *The cross track error averaging time and own ship track advance distance are the same default values on all modes.*

If the Set and Drift Integration time is changed for a given mode the default values listed above may be re-applied by clicking on the mode settings button at the bottom of the window, i.e. If the Set and Drift Integration time has been changed on Loose mode click the **Use Loose Settings** button to re-apply the default.

To recalculate own ship’s track advance for the given mode, click the Recalculate Track Advance button

Straight Leg and Turning Gain Sets

Each Steering Sensitivity Mode topic includes Straight Leg Gain Set and a Turning Gain Set sub topics.

Each gain set includes computed gain corrections applied to the adjustment of the ship's heading.These corrections are in three parts.

1. The proportional gain reacts to the distance that the ship is off track.
2. The integral gain reacts to the length of time that the ship has been off track. The initial value is **NaN**.
3. The differential gain reacts to the rate at which the ship is moving toward or away from the track. The initial value is **NaN**.

Any adjustments to the computed corrections must be based on specific ship characteristics and operational requirements.

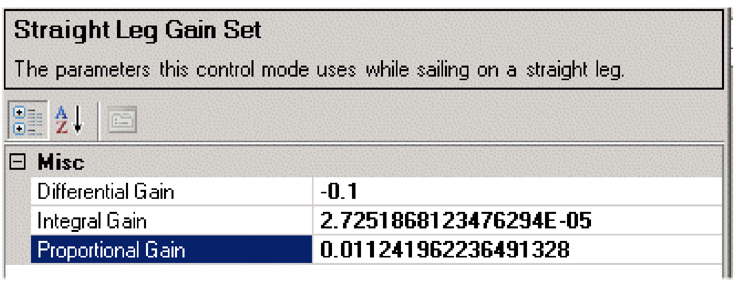


Figure 1.229 Straight Leg Gain Set

Creating a new Steering Sensitivity Mode

To create another mode select **Steering Sensitivity Mode:** in the All Steering Sensitivity Modes column of the Track Control Settings Manager and click on the **<** button. An unconfigured topic is added to the {Steering Sensitivity Modes} sub menu.

Open the unconfigured topic and apply a set of default mode settings to the new topic by clicking on one of the Use Settings buttons.

Configure the new mode settings as required. Note that the mode name must be unique, i.e. two modes cannot both be named 'Loose'.

When a new steering sensitivity mode has been created it appears in the Track Control Settings Manager list and is also selectable by the operator on the VisionMaster Track Control menu.

8.10.18.2 Configuring VMFT Track Control Settings from VMS

If you are upgrading systems from legacy VMS to VisionMaster you need to ensure that the configurable track control settings for VMFT are identical to the corresponding settings that existed in VMS.

In legacy VMS up to six gain sets could be configured, these sets would usually include a 'high gain', 'nominal' and 'low gain'. Each of the gain sets has a 'differential GPS' and a 'non-differential GPS' set of PID (Proportional, Integral and Differential) gains.

If the VMS had three gain sets (high, nominal and low), then the VMFT sensitivity modes should be configured with the 'tight' and 'medium' settings corresponding to the 'differential GPS' gain sets for the 'high gain' and 'nominal' cases, respectively. The 'loose' sensitivity mode would then be configured such that it matches the 'non-differential GPS' gain set for the 'low gain' case.

The following VisionMaster settings must correspond to VMS settings:

- Own ship's track advance value for each sensitivity mode should be taken from the corresponding gain set's track advance setting in VMS.
- Cross Track Error Averaging Time setting for each sensitivity mode should be taken from the corresponding gain set's 'XTE TC' setting in VMS.

If the VMS was configured with more than the standard three gain sets, then corresponding steering sensitivity modes for each gain set must be configured. Always use the 'differential GPS' values for the PID gains, except possibly in the case of the 'loosest' gain set, where the non-differential GPS values should be used.

8.10.19 Propulsion Control Interface

The Propulsion Control Interface enables VisionMaster to control the speed of the ship by interfacing to the ship’s propulsion system through speed or other propulsion commands, such as RPM orders.

VisionMaster may interface with the following types of external propulsion systems:

- Kamewa
- Emri

The following simulator propulsion systems are also available for selection:

- H-Scientific ShipSim
- SimVt

8.10.19.1 Configuring a Kamewa Propulsion System

If a Kamewa is selected, the following configuration procedure is followed:

1. From the Propulsion Control Interface topic click on the drop down arrow and select **Kamewa Propulsion System Composition**. The navigation tree creates a **Kamewa Propulsion System** sub menu topic.

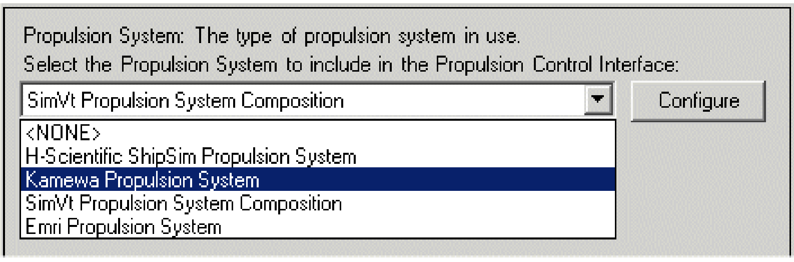


Figure 1.230 Selecting Kamewa Propulsion Control

2. Click on this topic to configure the propulsion control interface. The Kamewa configuration window will include the following discrete signals used for interfacing with the Kamewa:
   - External Control Available Input - the input port used by Kamewa to indicate that external control is available.
   - Request for Control Output - the output port that is used to send the request for control to the Kamewa.
   - External Control Granted Input - the input port used by Kamewa to indicate that external control has been given.

   Usually, a LabJack device (or another device providing discrete signals directly to VisionMaster) will be used for all of these signals. To configure a Labjack, refer to Section 7.5 *Labjack Manager*’ in Section 5 ‘*Resources*’.

3. Select the discrete input and output ports. In a typical Kamewa installation, the discrete I/Os of the Labjack are used:

- Discrete Input D1: Used for External Control Available Input
- Discrete Output D2: Used for External Control Granted Input
- Discrete Input D3: Used for Request for Control Output

To support this, make sure that, under the LabJack U12 Device configuration, that D1 and D2 have their Usage configured as **Input**, and D3 has its Usage configured as **Output**, see Figure 1.50.

4. Select the analog output and input ports. The Kamewa configuration window will include the following analog control signals:
   - Water Speed Order Output - the output signal is used to order the propulsion system to achieve a desired speed through the water.
   - Throttle Position Input - an analog input signal is used by VisionMaster to indicate the current throttle position on the Kamewa system.
5. Select the analog output and input ports. In a typical Kamewa installation, the following Labjack signals are used:
   - Analog Output AO0: Used for Water Speed Order Output
   - Analog Input AI0: Used for Throttle Position Input

Configuring the Miscellaneous Settings

The Miscellaneous section includes the following settings:

- **Control Requested Response Timeout -** a value, in seconds, indicating how long VisionMaster should wait for the Kamewa system to grant control to VisionMaster once control has been requested. The default is 15 seconds. The Kamewa system is designed to automatically respond to such a request, and in most circumstances there should be no need for the default value to be changed.
- **Sense of External Control Available Input Signal and Granted Input Signal -** defines whether the 'asserted' state is indicated when the input signal is high or low. This setting represents the signal level at the connection to the LabJack U12 device. For example, if a 5V signal on a particular LabJack pin indicates that external control is available, then **Asserted When Signal High** should be selected.
- **Sense of Request for Control Output Signal -** if the relay is wired such that it is normally open, and energizing it closes the contacts, then **Asserted when Relay Energized or Signal High (1)** should be selected.

Note: *The discrete I/O signals from VisionMaster (VM) to the propulsion system should be wired such that when VM is in the process of starting or is powered off, the signals will not be seen by the propulsion system as indicating that VM is requesting or taking control. For example, on a Labjack, a Signal Low state from the labjack board should result in an open contact, if a closed contact to the propulsion system represents a request for control.*

- **Speed Order Acceleration Limit -** the acceleration of the speed order limit in knots per second. The default value is 1 knot per second. In most circumstances there should be no need for this default value to be changed.

When a Kamewa Propulsion System has been correctly configured the configuration screen will appear as shown in Figure 1.231 below.

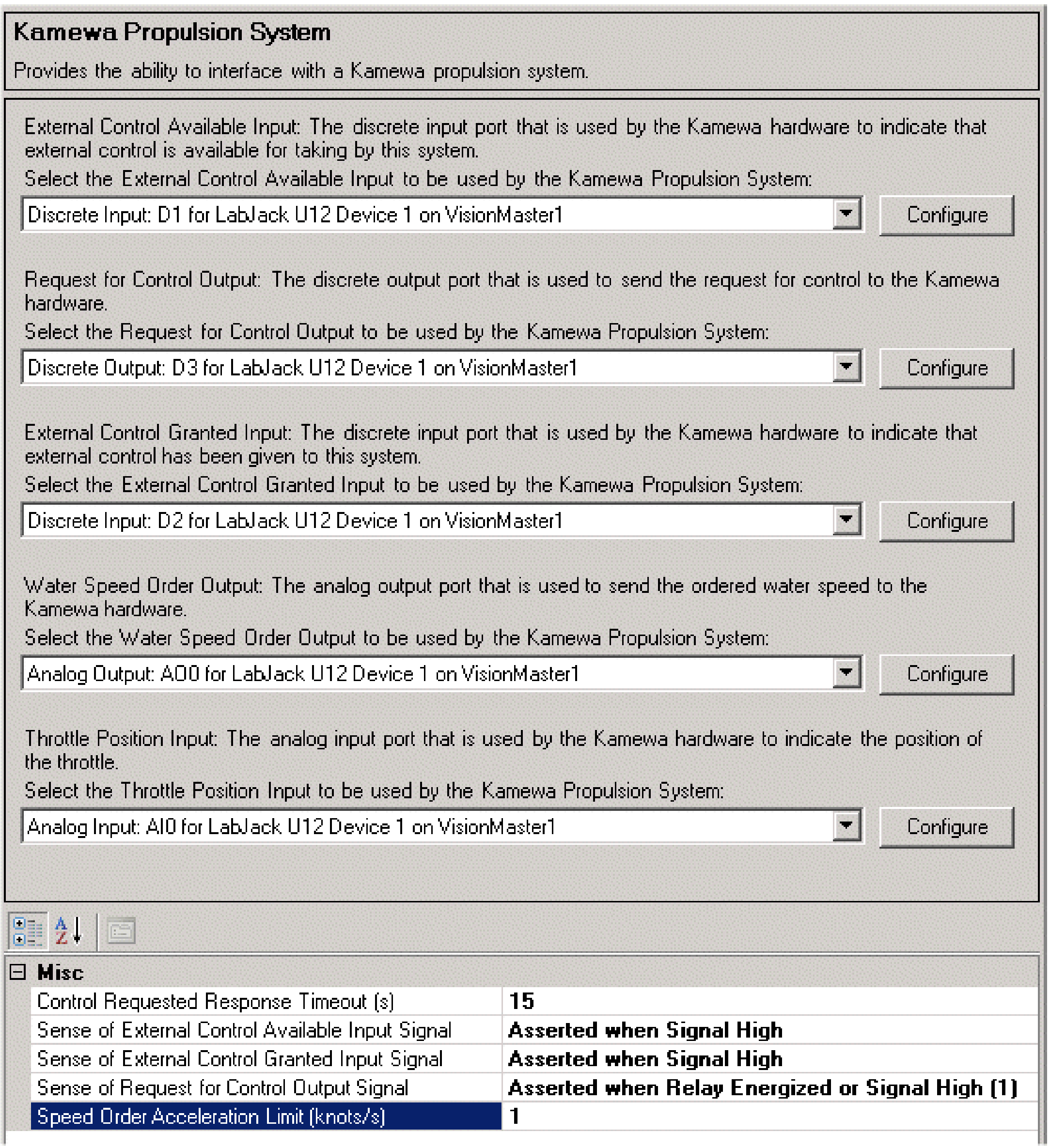


Figure 1.231 Kamewa Propulsion System Configuration

Translation Tables for Ship Loading States

The Kamewa propulsion system sub menu creates load specific translation tables for each loading state defined for the ship.

The translation tables can include a unique mapping from a water speed order voltage to a resulting water speed. For example, when the ship is in a light loading state, a water speed order signal of 3V may result in 20 knots, while in a loaded state the same signal may result in 15 knots.

Once a set of loading states have been defined (see Section 8.3 *Own Ship*'), a set of corresponding Load Specific Voltage to Throttle Position and Water Speed to Load Specific Voltage Translation Tables will appear in the navigation tree. For each loading state, these translation tables allow the user to specify any mapping of voltage to ordered water speed.

To configure a translation table:

1. Click on the **Voltage to Throttle Position Translation Table**, a one line table appears with **Voltage** and **Throttle Position (knots)** columns.
2. Enter the required number of voltages in the Voltage column, and a corresponding knots value in the Throttle Position column. As a value is entered a further table line is created. When two or more values have been entered the config tool will draw a Translation Curve graph showing the relationship between the voltage level of the order signal and the expected water speed that would result from this order, Figure 1.232 shows a graph where two rows of values have been entered.

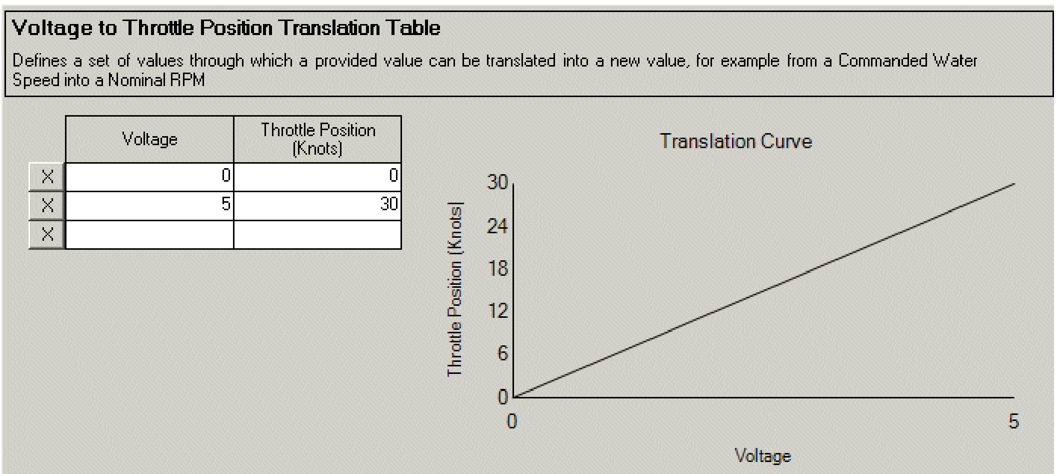
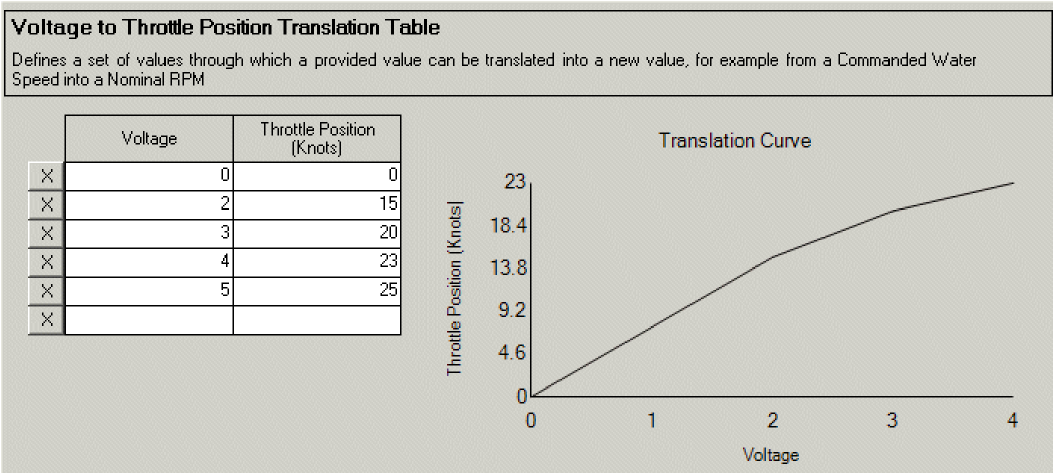


Figure 1.232 Voltage to Throttle Position Translation Table - with two rows

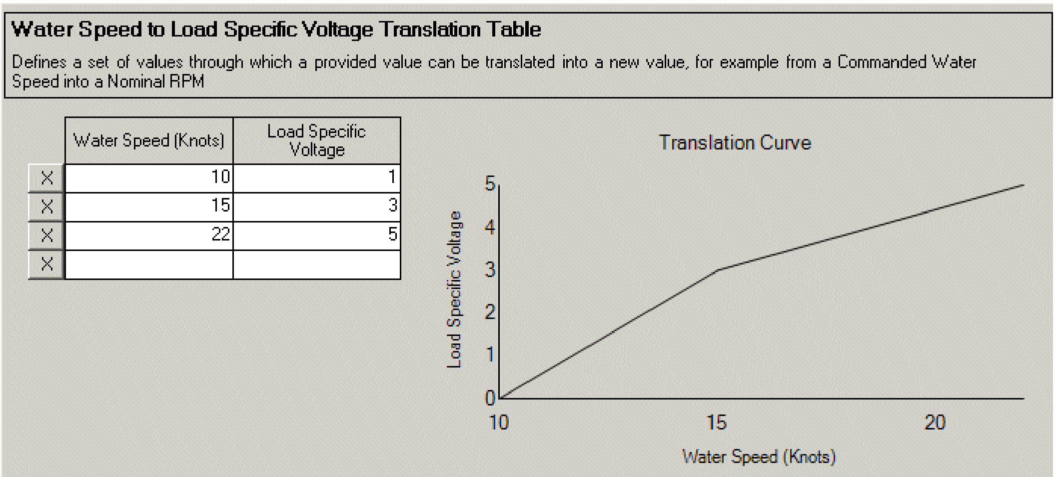
3. If the relationship between voltage and speed is not linear, the user can represent this with more than two rows, as shown below



Voltage	Throttle Position (Knots)
0	0
2	15
3	20
4	23
5	25

Figure 1.233 Voltage to Throttle Position Translation Table - with five rows

4. Click on the **Water Speed to Load Specific Voltage Translation Table**, a one line table appears with **Water Speed (Knots)** and **Load Specific Voltage** columns.
5. Repeat the process described above, see Figure 1.234 below.



Water Speed (Knots)	Load Specific Voltage
10	1
15	3
22	5

Figure 1.234 Water Speed to Load Specific Voltage Translation Table

8.10.19.2 Configuring a Emri Propulsion System

If a Emri system is selected, the following configuration procedure is followed:

1. From the Propulsion Control Interface topic click on the drop down arrow and select **Emri Propulsion System Composition**. The navigation tree creates a **Emri Propulsion System** sub menu topic.

   The Emri propulsion system window differs from the Kamewa in that a set of propulsion units to include in the Emri propulsion system must be configured. The propulsion units include:

   - Fixipod
   - Port Azipod
   - Starboard Azipod

2. Select the propulsion units that are present on the ship from the **All Propulsion Units** column. Typically, there will be one fixipod and one of each azipod. A set of unconfigured sub menu topics for the propulsion units will appear in the navigation tree with each propulsion unit including 'Commanded RPM to Voltage' and 'Voltage to Actual RPM' translation tables.

When connecting to an EMRI system, VisionMaster provides a voltage, representing a commanded RPM, to each of the fixipods/azipods, and receives actual RPM values back from the EMRI. The RPM voltage signal is translated from a desired water speed by Visionmaster, which also interprets the 'actual RPM' voltages received from each fixipod/azipod.

All the discrete and analog signals associated with the EMRI system are usually handled by using two LabJack U12 devices, with each device connected to a separate node of VisionMaster.

A typical connection of EMRI system signals to the two LabJacks (node 1 and node 2) is as shown in Table 7, Table 8 and Table 9.

Table 7: Discrete signals on LabJack U12 device on Node 2

Discrete I/O	I/O from VM	Signal Name
D0	In	External Control Available
D1	In	Starboard Azipod Available
D2	In	Port Azipod Available
D3	In	Fixipod Available
D4	Out	Take Control
D5	Out	Request for Control

Table 8: Analog signals on LabJack U12 device on Node 1*

Analog I/O	Input Voltage (for Labjack)	Input Range	Signal Name
AI1	0-5V	-1 to 1	Starboard Azipod angle (sin value)
AI2	0-5V	-1 to 1	Starboard Azipod angle (cos value)
AI3	0-5V	-100 to 100%	Bow Thruster 1 power
AI4	0-5V	-100 to 100%	Bow Thruster 2 power
AI5	0-5V	-100 to 100%	Bow Thruster 3 power
AI6	0-5V	-100 to 100%	Bow Thruster 4 power
AO0	N/A	Determined by translation tables	Starboard Azipod Ordered RPM

*. Signal rows shown in grey do not relate to configuration of the EMRI; they are included because they would typically share the same LabJack.

Table 9: Analog signals on LabJack U12 device on Node 2*

Analog I/O	Input Voltage (for Labjack)	Input Range	Signal Name
AI1	0-5V	-150 to 150 RPM	Fixipod Actual RPM
AI2	0-5V	-150 to 150 RPM	Starboard Azipod Actual RPM
AI3	0-5V	-150 to 150 RPM	Port Azipod Actual RPM
AI6	0-5V	-1 to 1	Port Azipod angle (sin value)
AI7	0-5V	-1 to 1	Port Azipod angle (cos value)
AO0	N/A	Determined by translation tables	Fixipod Ordered RPM
AO1	N/A	Determined by translation tables	Port Azipod Ordered RPM

*. Signal rows shown in grey do not relate to configuration of the EMRI; they are included because they would typically share the same LabJack.

3. From the Emri Propulsion System window click on the **External Control Available Input** drop down arrow and select Discrete Input: D0 for Labjack device on node 2.
4. Click on the **Request for Control Output** drop down arrow and select Discrete Output: D5 for Labjack device on node 2.
5. Click on the **Take Control Output** drop down arrow and select Discrete Output: D4 for Labjack device on node 2

The Miscellaneous section is similar to the settings previously described for configuring a Kamewa propulsion system, but with the additional setting of Propeller Order Acceleration Limit. The default value is 2 RPM per second. In most circumstances there should be no need for this default value to be changed.

When an Emri Propulsion System has been correctly configured the window will appear as shown in Figure 1.235 below.

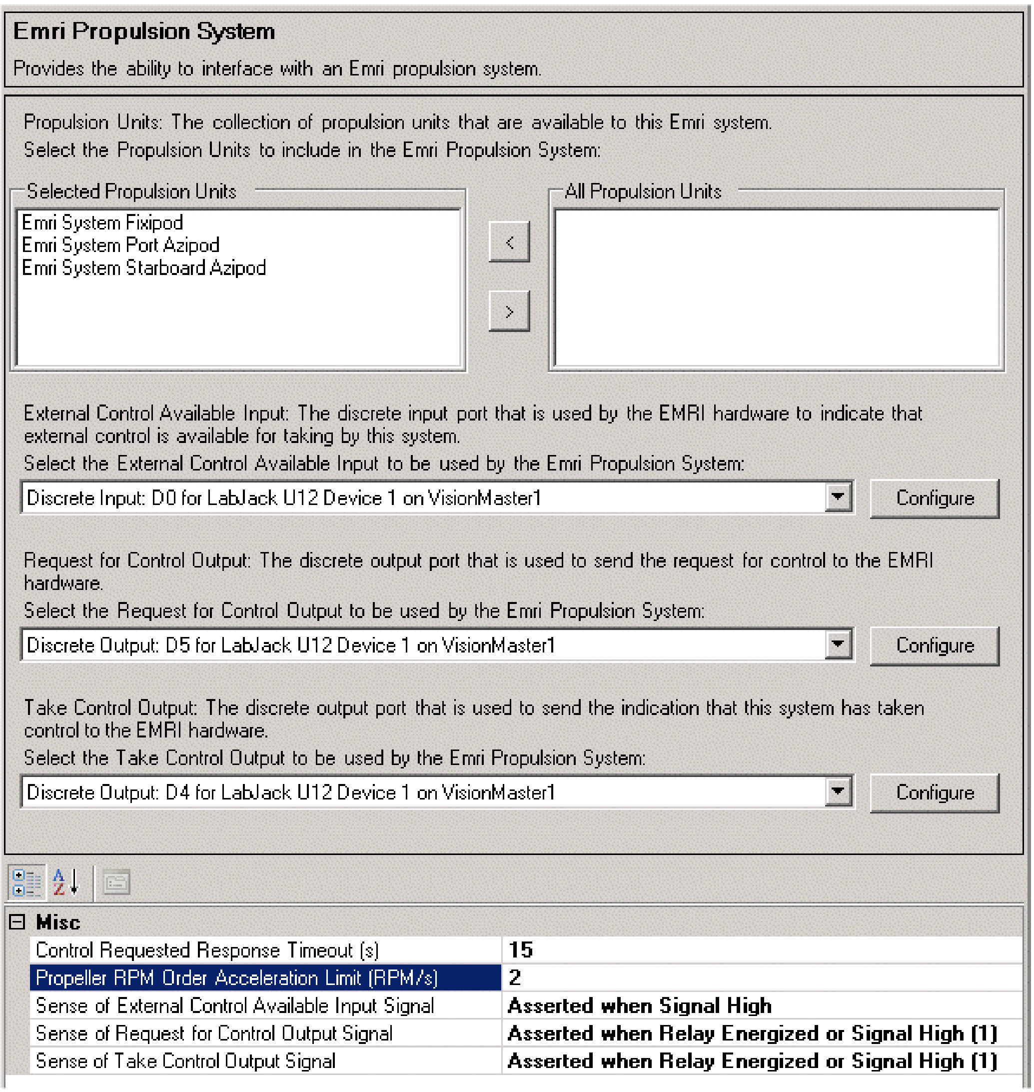


Figure 1.235 Emri Propulsion System Configuration

Configuring the Propulsion Units

The configuration of the Propulsion Units requires the following set of ports and shaft sensor to be selected:

- **Available Discrete Input -** defines what discrete input port is used for handshaking control with the Emri system
- **Actual RPM Analog Input -** defines the analog input port that is used to interpret the voltage levels in the actual RPM signals received from each fixipod/azipod.
- **Ordered RPM Analog Output -** defines the analog output port that is used to interpret the ordered RPM signals sent from each fixipod/azipod.

- **Shaft Sensor -** select the shaft sensor (previously configured under ‘Propulsion System Sensor’, see Section 8.4.1 *External Sensors*’) that is associated with each fixipod/azipod actual RPM signal (this allows the RPM signals to be mapped to CIDs, if desired).

To configure the propulsion units (fixipod, port & starboard azipod):

1. Click on the **Available Discrete Input** drop down arrow and select the required Discrete Input (D1, D2 or D3), depending on which propulsion unit is being configured, see Table 7.
2. Click on the **Actual RPM Analog Input** drop down arrow and select the required Analog Input (AI1, AI2 or AI3), depending on which propulsion unit is being configured, see Table 9.
3. Click on the **Ordered RPM Analog Output** drop down arrow and select the required Analog Output (AO0 or AO1), depending on which propulsion unit is being configured, see Table 8 and Table 9.
4. Click on the **Shaft Sensor** drop down arrow and select the Shaft Sensor (from 1 to 3) to be associated with the data received via the Actual RPM Analog Input signal. This setting allows the RPM data to be selected for display in a CID widget by picking the configured sensor within the CID designer.

Note: *A Propulsion System Sensor, including the number of shafts in the propulsion system and the shaft sensor names, should have been configured in Main Application, Sensors. For details refer to Section 8.4.1 External Sensors’.*

Configuring the Propulsion Units Miscellaneous Setting

The Miscellaneous section includes the following setting:

Sense of Available Discrete Input Signal - defines whether the ‘asserted’ state is indicated when the input signal is high or low. This setting represents the signal level at the connection to the LabJack U12 device. For example, if a 5V signal on a particular LabJack pin indicates that external control is available, then **Asserted When Signal High** should be selected.

Note: *The discrete I/O signals from VisionMaster (VM) to the propulsion system should be wired such that when VM is in the process of starting or is powered off, the signals will not be seen by the propulsion system as indicating that VM is requesting or taking control. For example, on a Labjack, a Signal Low state from the labjack board should result in an open contact, if a closed contact to the propulsion system represents a request for control.*

When an Emri Propulsion Unit has been correctly configured the window will appear as shown below. Figure 1.236 shows a configuration for a propulsion unit Fixipod.

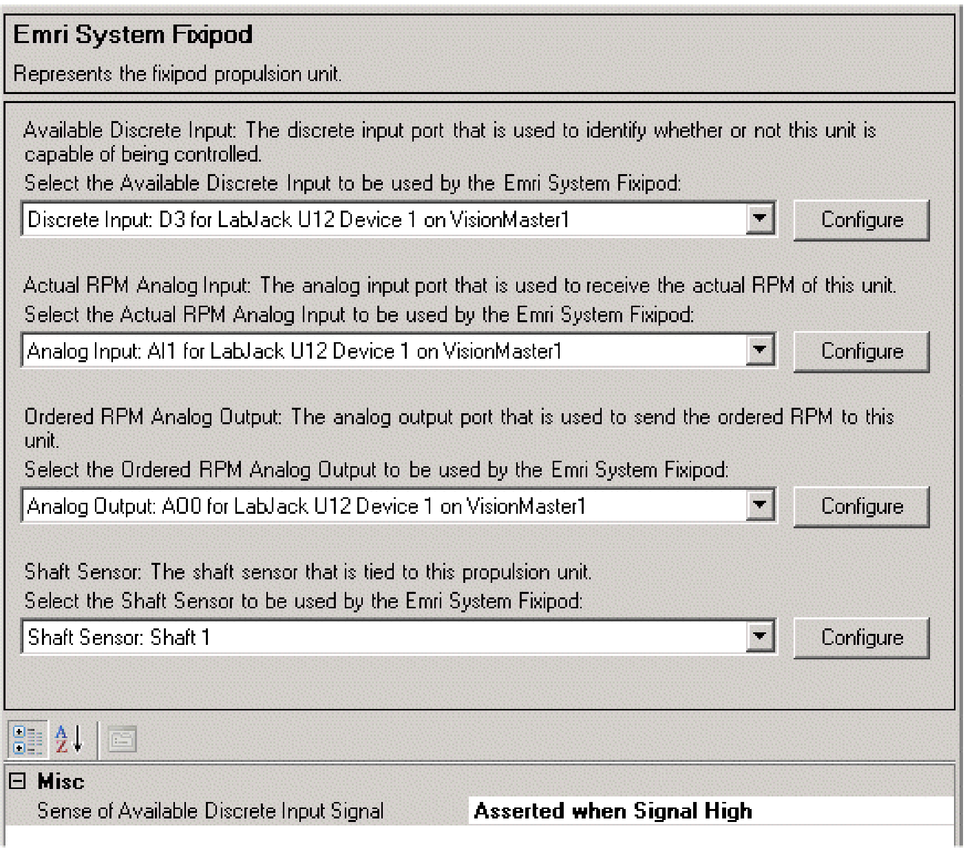


Figure 1.236 Emri Propulsion Unit Configuration

Translation Tables for Emri Propulsion Units

For each Emri propulsion unit the system creates translation tables for commanded RPM to voltage and voltage to actual RPM. The user selects the signals used as the Actual RPM analog input and the ordered RPM analog output.

Tuning of Ordered RPM Output Signals

When VisionMaster needs to order the EMRI system to achieve a particular speed, it generates Ordered RPM analog output signals by applying three translation tables.

The translation tables should be configured in the following order:

1. **Water Speed to Nominal RPM -** the desired water speed is translated to a ‘nominal RPM’ value. The nominal RPM is usually defined to be the correct RPM for the ship’s loading state. Figure 1.237 shows an example of a translation table for a ship full loaded state.

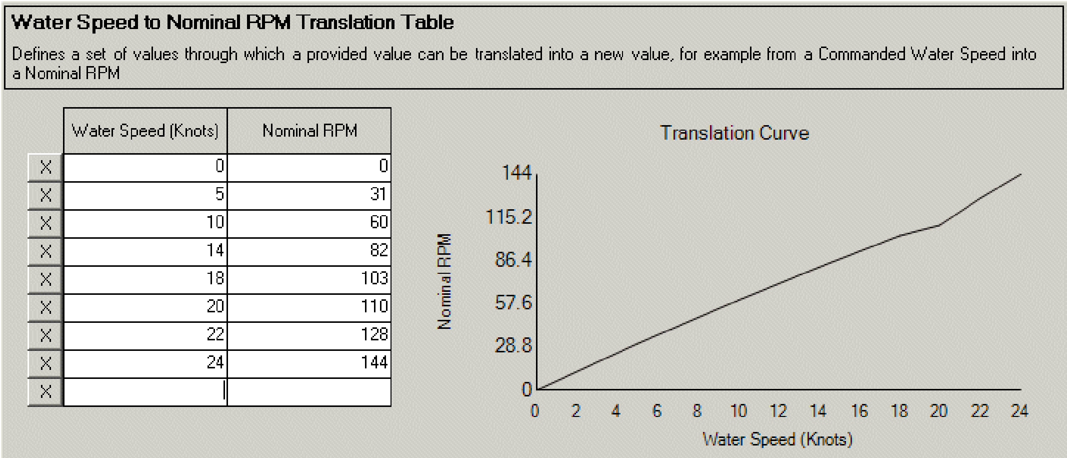


Figure 1.237 Water Speed to Nominal RPM for 'Full' load Translation Table

2. **Nominal RPM to Load Specific RPM -** while VisionMaster is controlling the speed, it will use this translation table for the current loading state of the ship. The result will be the actual RPM that should be generated to achieve the desired water speed. Figure 1.238 below shows a translation table for a full load. Note that the same RPM will be ordered for each propulsion unit.

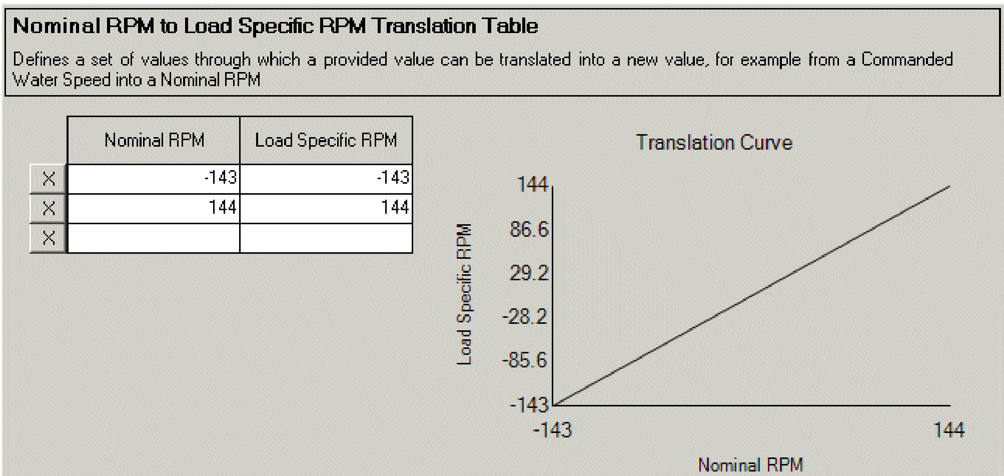


Figure 1.238 Nominal RPM to Load Specific RPM Translation Table

3. **Commanded RPM to Voltage -** this table must be configured independently for each propulsion unit, because, although the RPMs desired on each unit is the same, the voltage to achieve that for each unit could be different.

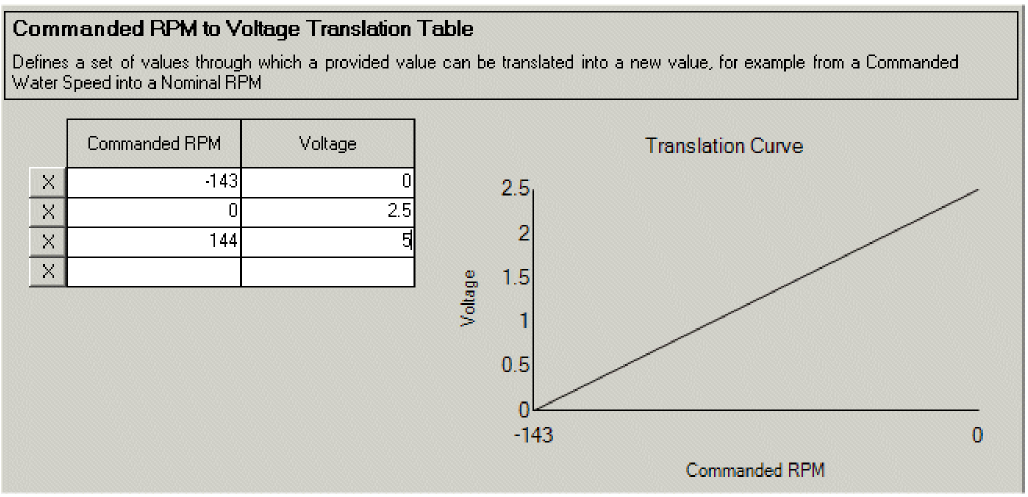


Figure 1.239 Commanded RPM to Voltage Translation Table

Tuning of Actual RPM Input Signals

Each propulsion unit includes a **Voltage to Actual RPM Translation Table**. This table is used to map the range of voltages (generally 0 to 5V) to a range of RPM values.

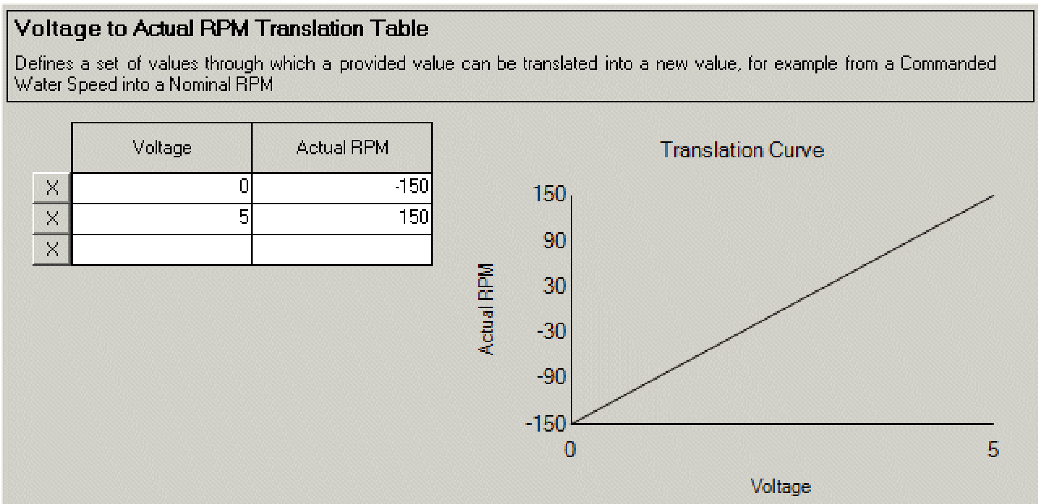


Figure 1.240 Voltage to Actual RPM Translation Table

8.10.19.3 Configuring a H-Scientific ShipSim Propulsion System

CAUTION!

A H-Scientific ShipSim propulsion system should only be configured for testing with the ShipSim simulator. This propulsion system must not be selected for use on a real vessel.

The H-Scientific ShipSim Propulsion System should be connected to a Labjack. If this propulsion system is selected, the following configuration procedure is followed:

From the Labjack device configuration window (see Figure 1.50 '*Labjack U12 Device Configuration Window*'):

1. Set the Analog I/O **AI0** description to **H-Scientific** (or something equally descriptive).
2. Set the the Analog I/O **AO0** description to **RPM order to H-Scientific** (or something equally descriptive).

From the H-Scientific ShipSim Propulsion System topic:

1. Click on the RPM Order Output: drop down arrow and select **Analog Output AO0 (RPM order to H-Scientific)..**
2. Click on the Actual RPM Input: drop down arrow and select **Analog Input AI0 (H-Scientific).**

The **Speed Order Acceleration Limit** is the acceleration of the speed order limit in knots per second. The default value is 1 knot per second. In most circumstances there should be no need for this value to be changed.

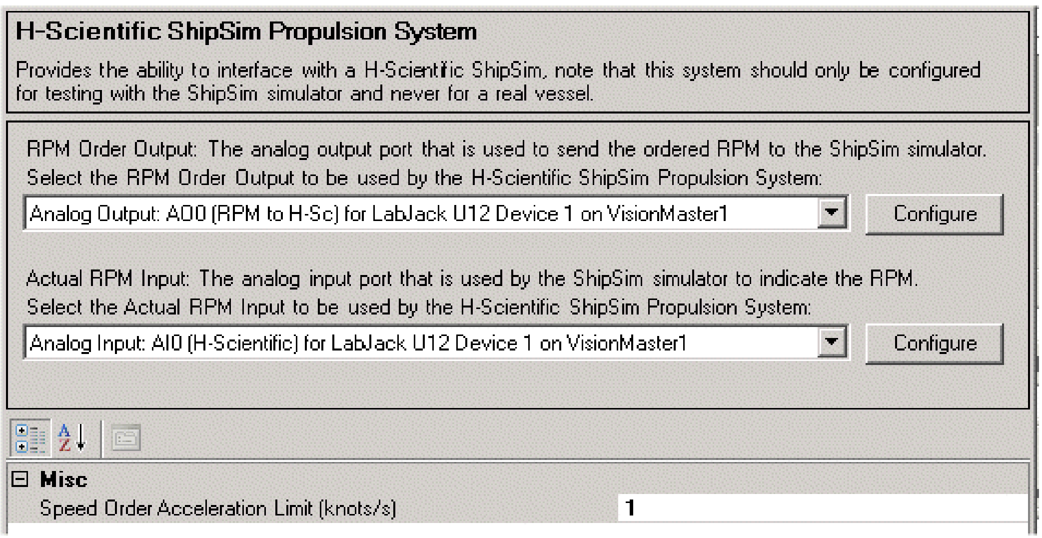


Figure 1.241 H-Scientific ShipSim Propulsion System

Tuning of Ordered RPM Output Signals

When VisionMaster needs to order the H-Scientific system to achieve a particular speed, it generates Ordered RPM analog output signals by applying three translation tables.

The translation tables should be configured in the following order:

1. **Water Speed to RPM -** the desired water speed is translated to a 'nominal RPM' value. The nominal RPM is usually defined to be the correct RPM for the ship's loading state.
    - On the first line of the translation table set both Water Speed (knots) and RPM to **0**.
    - On the second line of the translation table set the maximum ship speed (Water Speed of **25** knots and **100** RPM).
2. **Commanded RPM to Voltage -** this table must be configured independently for each propulsion unit, because, although the RPMs desired on each unit is the same, the voltage to achieve that for each unit could be different.
    - On the first line of the translation table set both Commanded RPM and Voltage to **0**.
    - On the second line of the translation table set the Commanded RPM to **100** and the Voltage to **5**.
3. **Voltage to Actual RPM -** the voltage is translated to a 'actual RPM' value. The actual RPM is usually defined to be the correct RPM for the ship's loading state.
    - On the first line of the translation table set both Voltage and Commanded RPM to **0**.
    - On the second line of the translation table set the Voltage to **2. 5** and the Commanded RPM to **100**.

8.10.19.4 Configuring a SimVt Propulsion System

CAUTION!

A SimVt propulsion system should only be configured for testing with the ShipSim simulator. This propulsion system must not be selected for use on a real vessel.

1. From the SimVt Propulsion system topic select the Water Speed Order Output port to be used. This is usually a serial port on the PCIO used to send the ordered water speed to the SimVt simulator.

The **Speed Order Acceleration Limit** is the acceleration of the speed order limit in knots per second. The default value is 100 knots per second. In most circumstances there should be no need for this value to be changed.

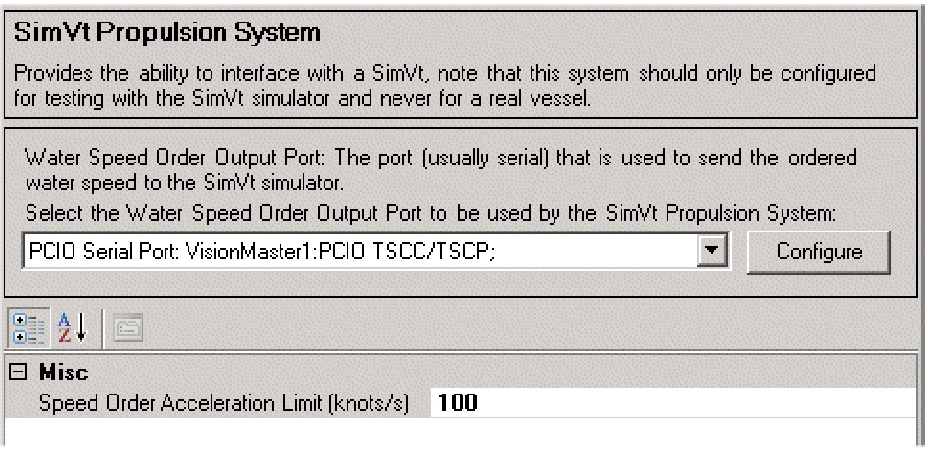


Figure 1.242 SimVt Propulsion System

8.10.20 Static Site

Static Site is an optional facility that allows for a stationary installation. This is intended for small single node installations (for example, an oil rig) and larger multi-node, land based Vessel Traffic Services (VTS) installations.

When configured, a Static Site system will apply to all nodes in a multi-node system.

The following optional features are incompatible when Static Site is selected:

- The following Nav Tools:
  - Next Turn EBL
  - Anchoring
  - Line Of Position
- Route planning, monitoring and ETA Calculator
- Man Overboard
- Safety Checking
- Autopilot
- Propulsion Control Interface
- Joystick Heading Control
- 3D Charting
- Sonar
- Conning Info Display

If these features have been previously selected their status buttons will be shown as red.

No configuration is required for a Static Site.

For a description of Static Site features, refer to Appendix A '*Static Site*' in the Radar/Chart Radar User Guide, document number 65900010.

8.11 Plugin Feature Setup

The Plugin Feature Setup defines how plugin feature applications used with VMFT are handled.

The recommended option for this setting is **Force configuration of all recommended options**.

9 Validating and Exporting a Configuration

9.1 Validating a Configuration

The Validate function on the File menu provides a method of checking the reason for any invalid settings made to the whole configuration. This can be used in addition to checking the validation of individual topics by right clicking on them, see Section 4.2 *Right Click Options on Configuration Topics*'.

You can access the function at any time by clicking on the File drop down menu and selecting **Validate**. When a configuration setting is invalid the Validate window provides a brief description of all current validation errors, if more than one error exists then these are listed.

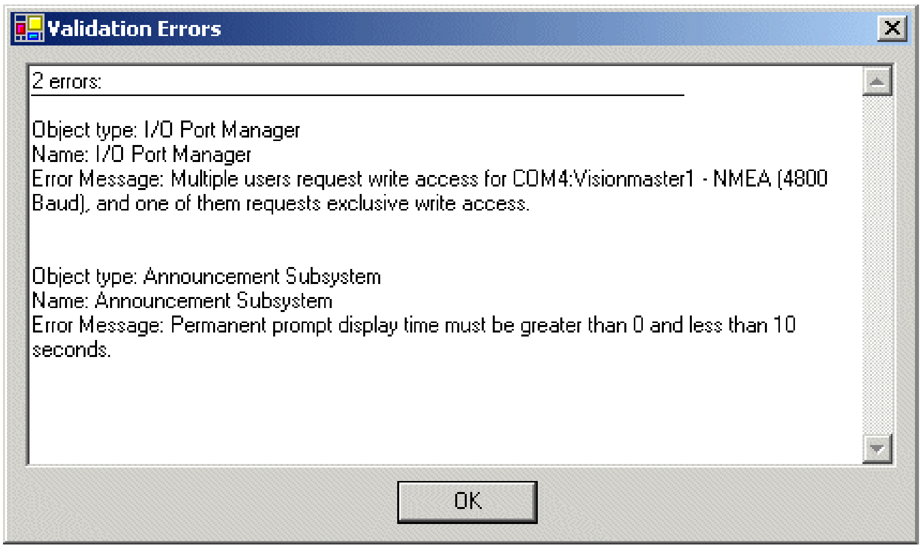


Figure 1.243 Validation Errors

To resolve validation errors check the colour of the status buttons in the navigation tree, the invalid configuration will be the item topic with the red status button.

Where there are no validation errors in the configuration file all status buttons show as green and the Validate window confirms no errors.

9.2 Exporting a Configuration

This function enables a saved configuration file to be saved as a readable.txt file to a external port (usually a USB memory stick).

To export a configuration file:

1. Click on the File drop down menu and select **Export Summary**. a browse window appears enabling you to navigate to the required external port.

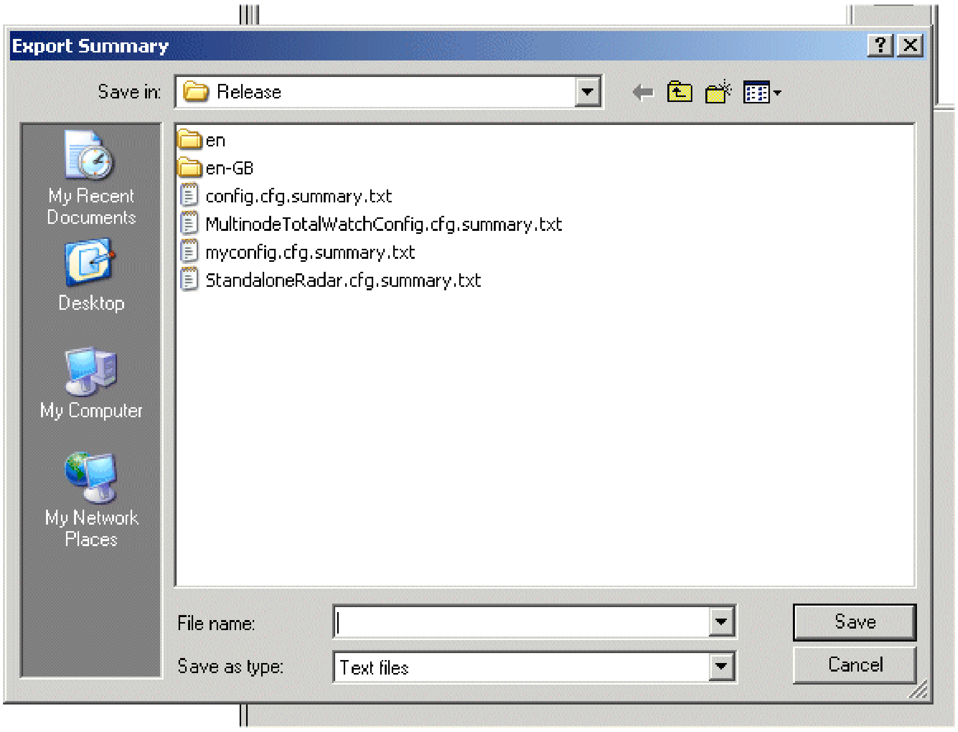


Figure 1.244 Export Summary

2. With the external drive displayed name the file in the **File name:** field and click the **Save** button. The file is saved as a.txt file and can be opened in a basic text editor program.

10 Clear All Persisted Data

The Clear All Persisted Data[*] option clears all persisted data that is stored on the system. The option is selected when, for example, persisted data residing on the system has become corrupted.

CAUTION!

The Clear All Persisted Data option should only be selected when requested to do so by a Sperry Service engineer. Always make a back up a copy of the configuration file prior to clearing persisted data.

After this option has been selected the configuration file reverts to its original commissioned production status.

* Data that is stored by the system during operation and retrieved by the system on any subsequent restarts. Examples of persisted data include route plans, mariner objects, data logs, commissioning settings.

11 Restart and Shutdown System

The **Restart System** command is selected if any errors or faults occur during the running of the system. This option will cause the System Configuration tool, and all other currently opened programs to close, the Windows system will power down and then restart.

The **Shutdown System** command is selected when the operator requires to shut down the system for a prolonged period of time. This option will cause the System Configuration tool, and all other currently opened programs to close and the Windows system to power down.

Appendix A

Configuring a Multi-Node System

CONTENTS

LIST OF FIGURES

LIST OF TABLES

A.1 Introduction

The instructions given in this Appendix A detail specific steps a Service engineer must take to configure a VisionMaster multi-node system.

The Appendix includes instructions on setting up a new multi-node system, and steps to take when making changes to an existing multi-node configuration.

A multi-node system may be configured from one node. Before configuration it is important to ensure that the VisionMaster application is shut down on all nodes and that each node is in Service mode.

For all other instructions on configuring a VisionMaster system, refer to Chapter 1 '*Configuration*'.

A.2 Setting the IP Addresses for Nodes and Product Types

When configuring a VisionMaster FT multi-node system, each node must be assigned a separate IP address. The IP address given is dependant on the product type assigned to the nodes.

Note: *The instructions given below for assigning IP addresses and subnet mask will only apply when all the nodes on the system are VisionMaster. If the VisionMaster nodes are to join an existing network, either as part of the existing subnet, or with a dedicated subnet other than the most common, then different IP addresses than the ones listed in Section 2.2 IP Address List' will be required.*

A.2.1 Accessing the IP Address Properties Window

1. Click on the **Start** button at the bottom left corner of the desktop and from the window select **Control Panel**, see Figure A.1.

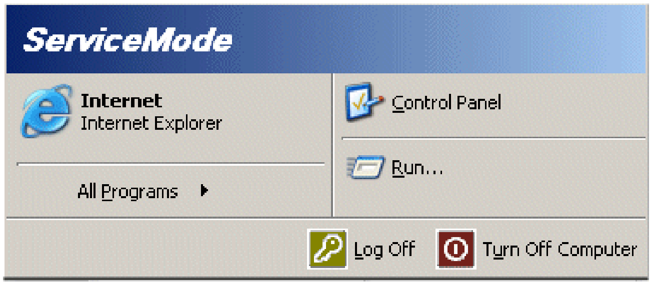


Figure A.1 Control Panel

2. From the Control Panel window double click on the **Network Connections** icon.
3. From the Network Connections window double click on **Local Area Connections.**
4. From the Local Area Connection Status window click the **Properties** button. The Local Area Connection Properties window appears, see Figure A.2.

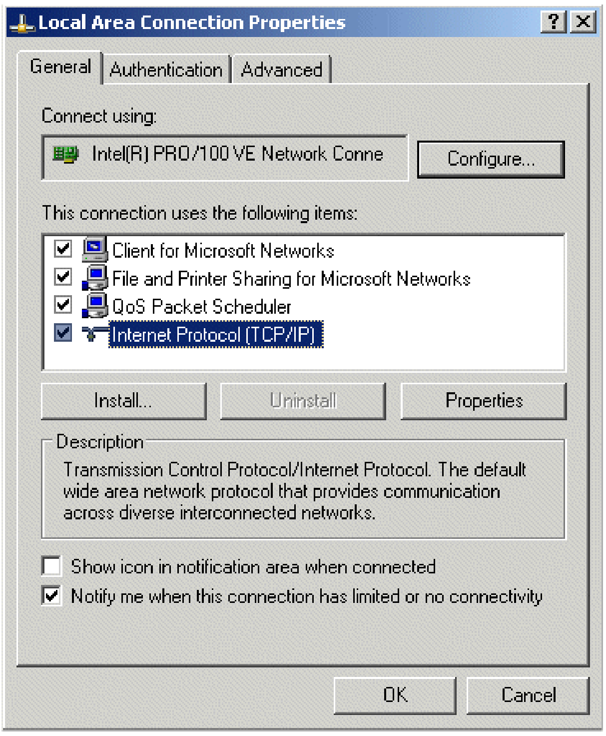


Figure A.2 Local Area Connection Properties

5. Select Internet Protocol (TCP/IP) and click the **Properties** button, the Internet Protocol (TCP/IP) Properties window appears, see Figure A.3.

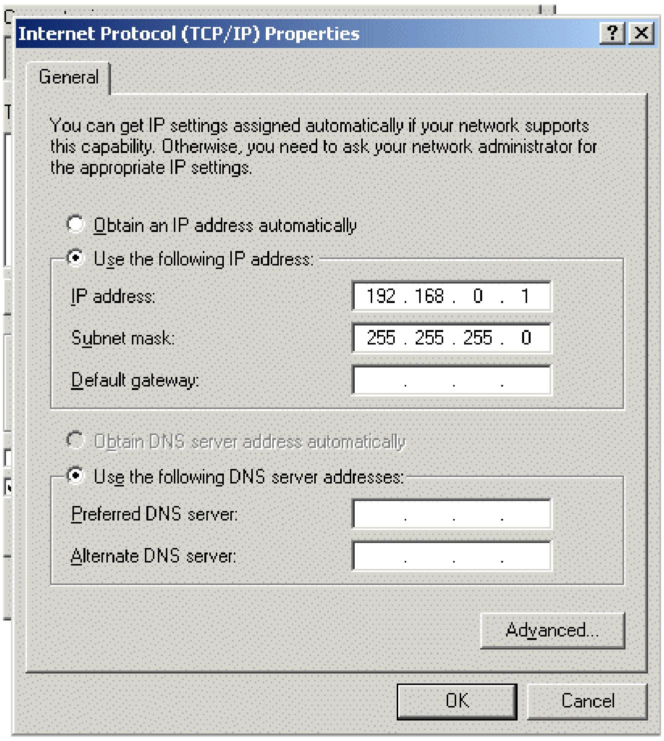


Figure A.3 Internet Protocol (TCP/IP) Properties

6. Tick the **Use the following IP Address**: radio button, the IP Address area becomes active.
7. Enter the designated IP address for the node and product type (see Figure A.3), as listed in Section 2.2 *IP Address List*' below.
8. Enter the subnet mask, which for all IP addresses should be 255.255.255.0. Other fields in the window should be left blank.
9. Click the **OK** button.
10. Repeat the process for each node on the system.

A.2.2 IP Address List

An example of a multi-node system (15 workstations) is listed below:

- Three CAT1/ECAT2 Chart Radar
- Two CAT1/ECAT2 Radar
- Two ECDIS
- Four Total Watch
- Two ECDIS with Radar Overlay
- One CAM
- One CID

The recommended procedure for assigning IP addresses and workstation (node) names is to group them by product type.

For example, typical node names and IP addresses that would be assigned to the three Chart Radar workstations listed above are shown in the table below.

Table 1: Typical IP Address Assignment for Chart Radar Workstations

Node Name	IP Address
VM1	192.168.0.1
VM2	192.168.0.2
VM3	192.168.0.3

Further node names and IP addresses will follow the same format; i.e. the two Radar workstations would be VM4, 192.168.0.4 and VM5, 192.168.0.5, and so on.

A.2.2.1 Adding IP Address Nodes to the System

If one or more nodes are added to the system at a later date, they would occupy the next available node names and IP addresses in order of their functionality.

For example, if a new Total Watch workstation was added to the multi-node example shown above this would be assigned node name VM16 and IP address 192.168.0.16.

A.3 Opening the Product Configuration File

When all IP addresses have been correctly entered, access the VisionMaster Configuration tool and open the required product configuration file (i.e. **Multinode TotalWatchConfig.cfg**) as described in Section 2 '*Accessing the Configuration Tool*' and Section 3 '*Opening and Saving Config Files*' of Chapter 1 '*Configuration*'.

To configure your multi-node system from the standard multi node configuration file refer to the following sections.

A.4 Entering a Security String

The security string defines the system level authorisation parameters available for that node, plus a list of any optional features that have been purchased by the customer.

The Security String topic is replicated in the Quick Setup section of the configuration For information on this function refer to Section 5.2 *Security String*' in Chapter 1 '*Configuration*'.

A.5 Configuring Resources

The following sub-sections covering general purpose components for a multi-node system are included where the configuration process differs from the instructions given in Chapter 1 '*Configuration*', Section 7 '*Resources*'.

For instructions on configuring all other system resources refer to the relevant sections in Chapter 1 '*Configuration*'.

A.5.1 Configuring PCIO Boards

A multi-node system may include more than one PCIO board. To configure a number of PCIO boards:

1. From the Resources menu of the navigation tree open the PCIO Board Manager window. The PCIO Boards includes a **Selected PCIO Boards** column with the currently configured PCIO boards and an **All PCIO Boards** column.
2. Highlight **PCIO Board** in the All PCIO Boards column and click the **<** button. An unconfigured PCIO board is moved into the **Selected PCIO Boards** column and the system adds an unconfigured topic for the board in the navigation tree with a list of discrete outputs and inputs. A list of serial ports are also created for the board in the I/O Port Manager.

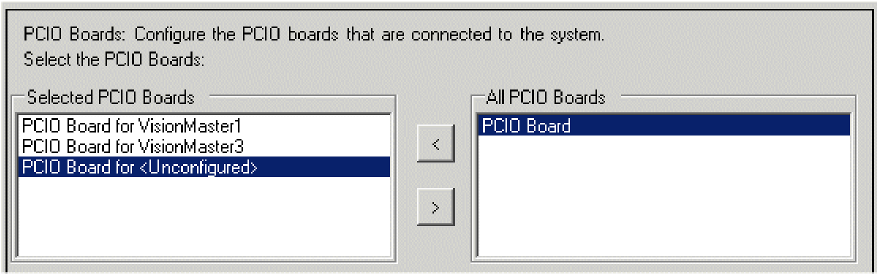
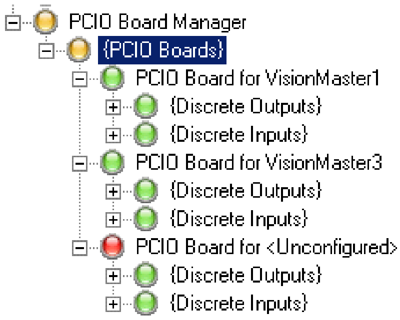


Figure A.4 PCIO Board Manager

3. Click on the unconfigured topic in the navigation tree and from the PCIO Board configuration window select the node to which the PCIO board is connected, see Figure A.5.



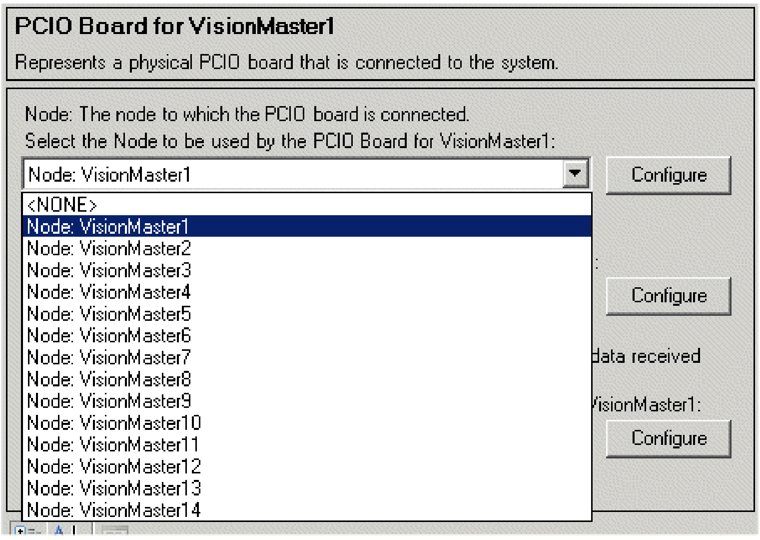


Figure A.5 Selecting Node for PCIO Board

A.5.1.1 Considerations when configuring PCIO Boards

In a multi-node system it is important that each PCIO is physically connected to and configured to the same set of heading sensors. One analog and one high speed serial compass interface is supported by the PCIO for selection.

All nodes which have a PCIO must have the same set of heading sensors configured. The heading sensors on each node must therefore have the same name assigned, e.g. 'Gyro'.

For information on configuring sensors via the interfaces on the PCIO boards, refer to Section 8.4.1.2 '*Interfaces for Acquisition*' in Chapter 1 '*Configuration*'.

A.5.2 Changing Data Distribution Settings

Data Distribution enables the broadcast TTL (Time To Live) to be changed from the default setting and selected nodes that will operate in 'Safe Mode' in the event of a network fault.

A.5.2.1 Node Connection Manager

The Broadcast TTL is the time, in seconds, used to allow for multi-network broadcast discovery.

The default value is five seconds. To change the time click in the **Broadcast TTL** field and enter the required value.

A.5.2.2 Selecting Nodes for Safe Mode

A multi-node system can be configured such that individual nodes are selected for 'Safe Mode'. These nodes will automatically disconnect from the network if they detect conditions on the network that may prevent them from operating reliably.

Typically, on a large system of 12 nodes or more, it is advisable that at least one Radar node and one ECDIS node are selected for safe mode.

A node operating in Safe Mode will function as a standalone node, with direct access to all primary sensor data types.

To select nodes to operate in Safe Mode:

1. From the navigation tree click on the **Safe Mode Indicator** button, the window opens with all system nodes listed in the **All Safe Nodes** column.
2. Select the nodes required for Safe Mode and click the < button. The nodes are moved to the **Selected Safe Nodes** column.

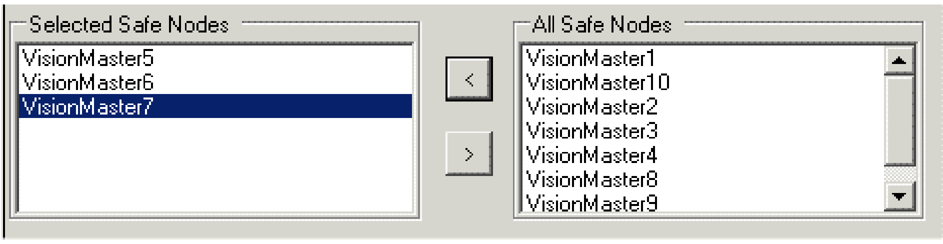


Figure A.6 Safe Mode Indicator

Nodes selected for Safe Mode will automatically disconnect when network conditions dictate. On a selected node, the operator may also manually enter or exit Safe Mode from the VisionMaster display. For operator information refer to the 'System' chapters in the Chart Radar or ECDIS User Guides.

A.6 Configuring Applications

The following sub-sections covering application functions (including Section 4 *Entering a Security String*') are included where the configuration process differs from the instructions given in this section.

For instructions on configuring all other applications refer to the specific section in Chapter 1 '*Configuration*'.

A.6.1 Radar System

A.6.1.1 Interswitch

The Interswitch is connected to a serial port on each PCIO unit of the system and interfaced to the Processors unit via USB connections.

1. To access the Interswitch window select **Interswitch**, either from the Interswitch drop down arrow in the Radar System window, or from the Interswitch topic in the navigation tree. Figure A.7 below shows a configured Interswitch window.

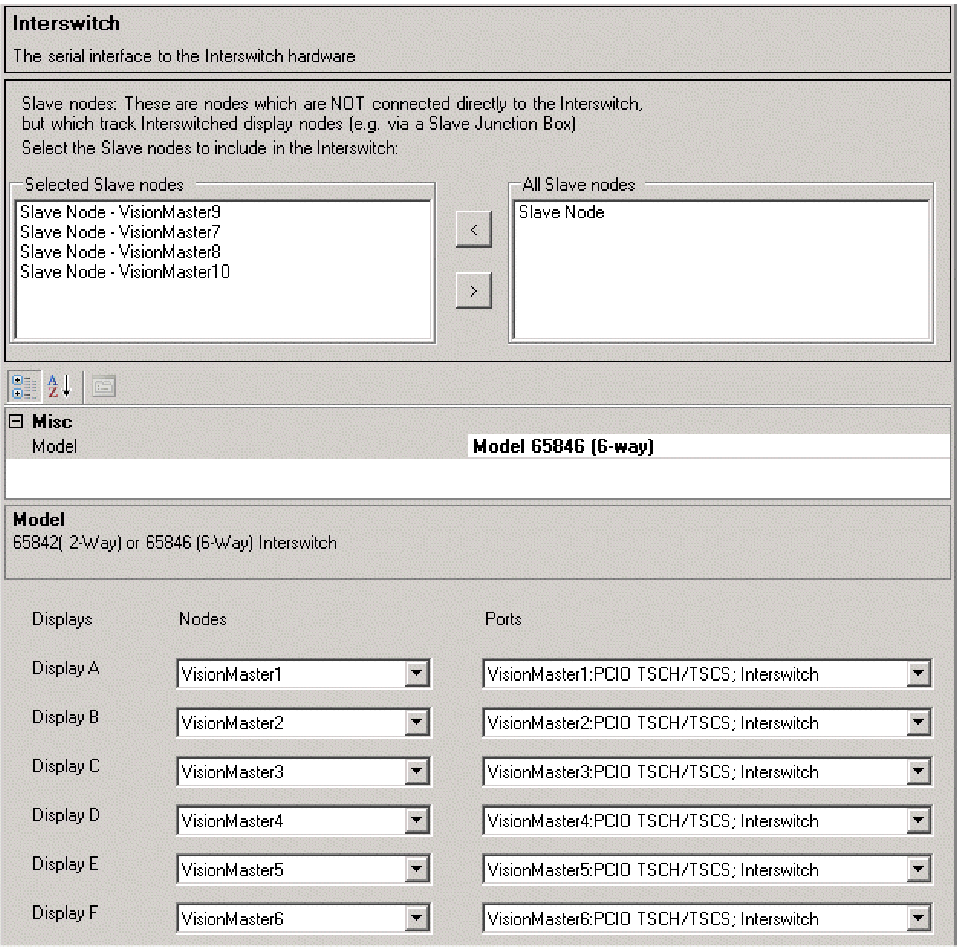


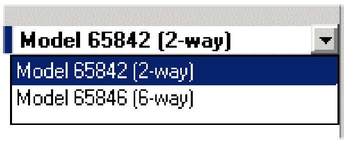
Figure A.7 Interswitch Configuration Window

The Interswitch configuration window enables the following settings to be made:

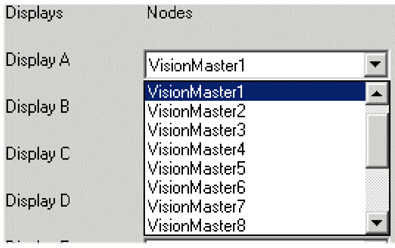
- **Slave Nodes -** the selection of slave nodes which are not connected directly to the interswitch.
- **Model -** the selection of the interswitch model type; 2-way or 6-way.
- **Nodes and Ports -** the selection of the nodes and ports for each display connected to the Interswitch.

The displays are listed alphabetically, the number of displays shown is dictated by the Interswitch model selected; A to D for a 2-way interswitch and A to F for a 6-way interswitch.

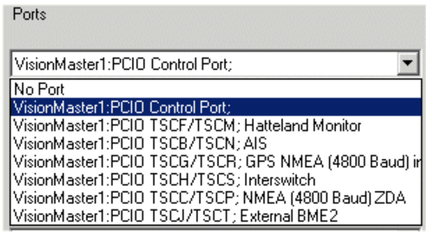
2. The system supports both 65842 (2-way) and 65846 (6-way) interswitches. To change the model from the default (2-way) click the drop down arrow and select 6-way from the list.



3. To select a node for each display click on the Nodes drop down arrow and select from the list previously configured in Nodes.



4. To select a port for the display click on the Ports drop down arrow and select from the list. The port selected should be a port that has been previously configured to use Interswitch settings.



Configuring Slave Nodes

If there are nodes on the system that are not connected directly to the Interswitch but which track interswitched display nodes, for example via a Slave Junction Box[*], these slave nodes are required to be configured to their tracked node.

To configure one or more slave nodes:

1. Select **Slave Node** from the **All Slave Nodes** column and click on the button to move to the **Selected Slave Nodes** column. An unconfigured topic is added to the {Slave Nodes} sub menu list. Repeat the process for each slave node required.
2. Click on the unconfigured topic to open the Slave Node window.

*. A Slave Junction Box only allows up to three Slave displays to be attached.

3. Select the slave node from the drop down list. For example, if six nodes are directly connected to the interswitch on a 10-node system then the remaining four nodes will be available for selection.
4. Select the node to which the slave node will track. These will be the nodes selected on the Interswitch window, see Figure A.8.

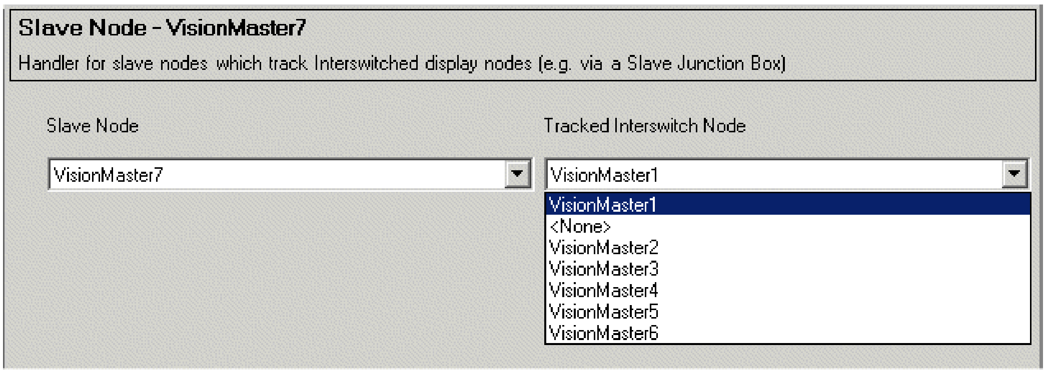
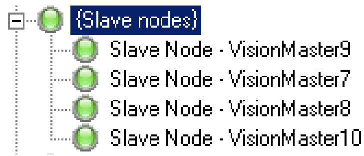


Figure A.8 Slave Nodes Configuration

5. The configured slave nodes will be shown listed in the navigation tree.



A.6.1.2 Displays: Slave Display

When an Interswitch has been configured the system automatically creates a **Displays: Slave Display** topic below the Interswitch on the navigation tree.

This window enables you to select slave only displays (i.e. the displays without an interswitch control connection) and which transceiver the displays are to be connected to.

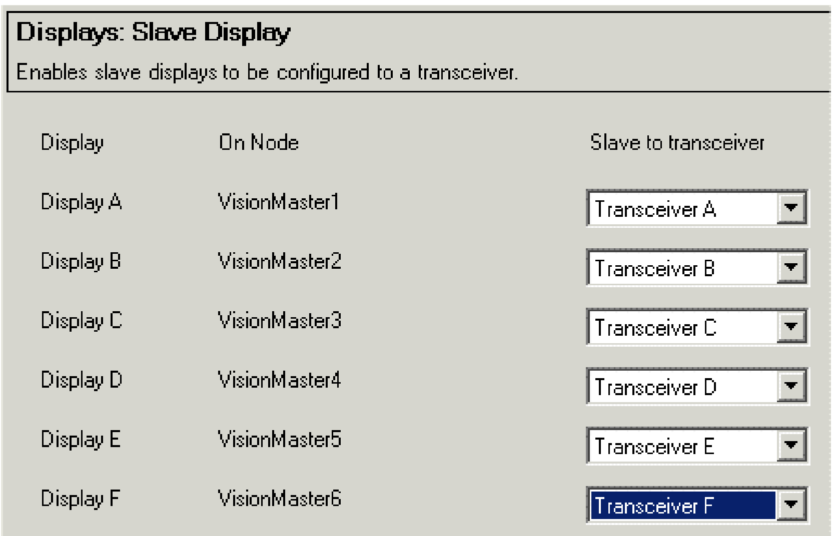
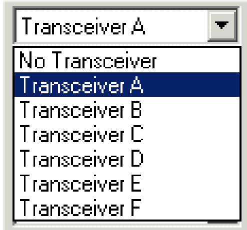


Figure A.9 Displays: Slave Only and Node Association

The displays and nodes are listed as previously configured on the Interswitch Configuration window.

To select a transceiver for a display click on the Slave Transceiver drop down arrow and select from the list.



The transceivers are listed alphabetically, with the number of transceivers dictated by the interswitch model previously selected; A and B for a 2-way interswitch and A to F for a 6-way interswitch.

A.6.2 Announcements

By default all system nodes are selected to receive discrete outputs for a buzzer. If certain nodes do not include a PCIO the option to allow nodes to be configured without buzzers may be selected. For details refer to Section 8.7.3 *Miscellaneous Settings*' in Chapter 1 '*Configuration*'.

A.7 Configuring Optional Features

A.7.1 Station In Control

The Station In Control (SIC) feature is selected where a more secure system of control is required on a multi-node system. The feature enables critical system functions to be controlled only from one or more nodes that have been designated as a station control.

A SIC node may take control over any of the following SIC functions, defined as follows:

- Acknowledge alarms.
- Turn on/off the track control feature or make changes to track control parameters.
- Change the look ahead range, safety depth, and safety height.
- Control whether safety checking Cautions can raise an alarm.
- Change manual sensor values.
- Change the sensor source for any sensor.
- Turn on/off the speed control or make changes to speed control parameters.
- Start or stop the execution of all types of route plans.
- Change the current active chart database.
- Change the active Mariner Object layer, or modify the Mariner Objects that are tied only to geographic locations.

The SIC window is divided into Miscellaneous parameter settings and a Station In Control Group Assignments table, see Figure A.10.

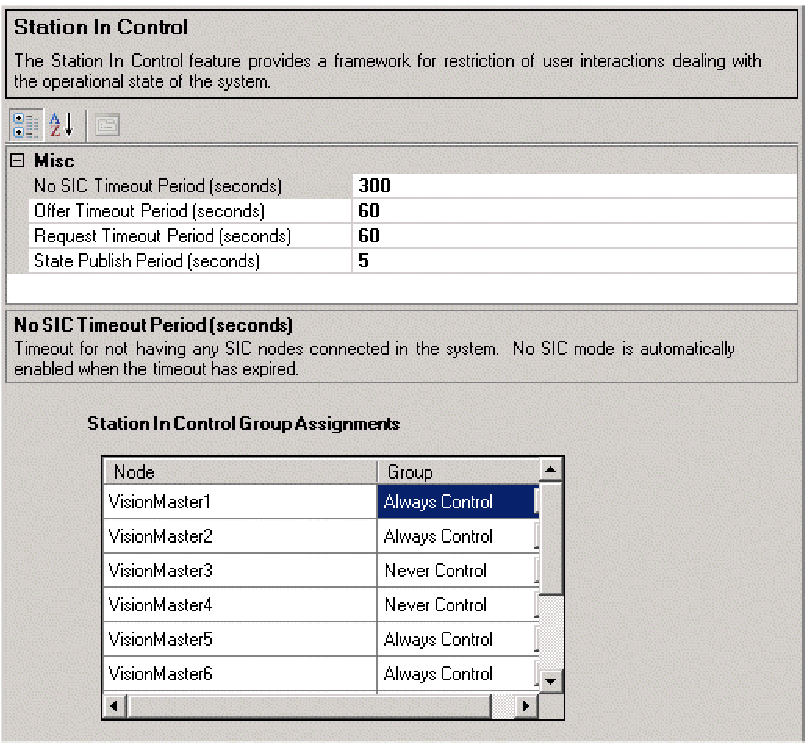


Figure A.10 Station In Control

A.7.1.1 Miscellaneous parameters

The following miscellaneous settings may be changed. All settings are displayed in seconds:

Setting **Default**

- No SIC Timeout Period • 300

  Timeout for not having any SIC nodes connected to the system. No SIC mode is automatically enabled when the timeout has expired.

- Offer Timeout Period • 60

  Timeout for a SIC offer which is not accepted at any non SIC group node.

- Request Timeout Period • 60

  Timeout for a SIC offer which is not accepted or rejected by the SIC station.

- State Publish Period • 5

  Period of time to publish the state of the system to all nodes.

A.7.1.2 SIC Group Assignments

The SIC Group Assignments table defines the control status of all nodes on a multi-node system. The default state is for all nodes to be 'Always in Control'.

To change the control status of a specific node click on the Group drop down arrow and select from **Always Control** or **Never Control** (Figure A.10 shows nodes 3 and 4 as Never Control).

Nodes that are selected in the Never Control group will never be in control of the functions listed in page 13, unless every node from the other groups is unavailable.

A.8 Changing the Current Configuration

The following procedures must be followed when changing the current configuration on a multi-node system:

1. From the VisionMaster (VM) FT application log in all nodes as Service mode, see Chapter 2 '*Diagnostics, Commissioning & Service Mode*' for details.
2. After login, go to Shutdown and click on the **Service Mode** button. The VisionMaster application on all nodes is shut down and the service desktop appears.
3. From one of the nodes open the Configure VM FT application and make the required changes to the configuration.

CAUTION!

If a node, configured as a database server, is detached from the multi-node system and database updates are made, the following warning is raised.

Database server not found: changes made to local database may be lost when reconnecting. Export a backup of changes recommended.

It is advisable to either re-connect the database server before updates are made, or export database changes to an external memory stick

4. When the required changes have been made, save the configuration and test the config file on the same node by opening the VM FT application. Ensure the config file is valid and works as expected with the application opened.

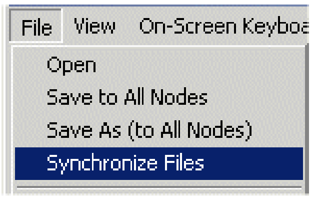
Note: *Alarms for missing interfaces will be raised on the node before the other nodes have been restarted.*

5. With the config file working correctly, restart all other nodes on the system.

A.9 Synchronizing a Configuration File

The Synchronize Files option compares the currently loaded config file and CID related files to the corresponding files on each node of the system.

To synchronize config files click on the File drop down menu in the top left of the screen and select **Synchronize Files**.



The following typical Synchronize Files window appears with a list of the nodes and any differences between the files on each node highlighted in a table, see Figure A.11.

If the config files are correctly synchronized the Info column of the table shows the message **Synchronized** over a green background against each node.

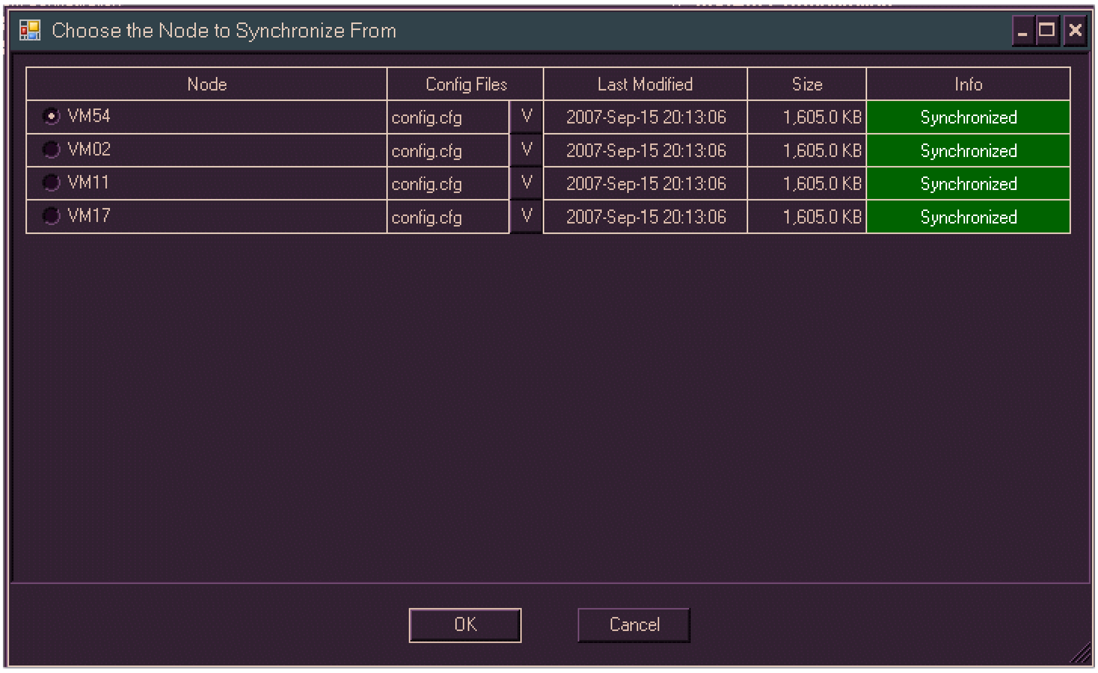


Figure A.11 Synchronise Files

To ensure each node has an identical set of loaded configuration files select the node to synchronize from by clicking the **Node** radio button and then click the **OK** button. All of the files from the selected node are copied to all other nodes in the system.

Appendix B

Configuring a System for Client/ Server Radar

Contents

List of Figures

1 Introduction

The following instructions given in this Appendix B detail specific steps a Service engineer may need to take in order to configure a VisionMaster system for Client/Server Radar (CSR).

Section 2 '*Setting Up a CSR Configuration*' includes specific instructions on setting up or making changes to a CSR configuration.

For all other instructions on configuring VisionMaster, refer to Chapter 1 '*Configuration*'.

Prior to configuration each node on the CSR system must be assigned a unique IP address. For information on setting up IP addresses, refer to Section 2 '*Setting the IP Addresses for Nodes and Product Types*' in Chapter 1 '*Appendix A Configuring A Multi-Node System*'.

A CSR system may be configured from any one node. Before configuration it is important to ensure that the VisionMaster application is shut down on all nodes and that each node is in Service mode.

A CSR system will include Server nodes, providing radar video for display at Client nodes, configured to receive radar video. A Client product type may be a CAT 1 Radar, Total Watch or ECDIS with radar overlay etc.

A CSR system may also include nodes that do not require radar video such as ECDIS, Conning Information Display (CID) or Central Alarm Management (CAM).

This Appendix also includes instructions on installing and operating the TightVNC application, which allows remote access to perform control and administration tasks on Servers from a Client desktop, see Section 3 '*TightVNC*'.

2 Setting Up a CSR Configuration

2.1 Configuring Resources

The following sub-sections covering Resource components for a Client/Server Radar (CSR) system and are included where the configuration process differs from the instructions given in Chapter 1 '*Configuration*', Section 7 '*Resources*'.

2.1.1 Setting up Nodes

On a typical CSR system the number of nodes, the type of node (e.g. Client or Server) and the product type is authorised and defined by a Security String, which is provided by your VisionMaster supplier and will, in most circumstances, be automatically entered when the system is commissioned.

Each node on the CSR system must also have a security device (sometimes known as a dongle) attached to the USB port of the PC.

The following procedure describes specific configuration steps that may be implemented when setting up nodes.

1. From the navigation tree click on the **Nodes** topic in the Resources menu.
2. To specify the total number of nodes on your system, click on the **Number of Nodes** drop down arrow and from the list select the number of nodes on the system*. Nodes are added to the **Display Name** list with their base node name and number auto generated.
3. To change the node display name click in the **Base Node Name**: field, delete the default name, enter a new name and click on the **Auto-Generate Names** button, see Figure B.1. For example, if a large number of Client nodes are to be generated then **Client** should be entered.
4. For Server nodes and nodes not receiving radar video such as ECDIS or CID nodes, enter the name of the node in the Display Name field.
5. Enter the windows network host name assigned to each PC on the system (this is the Computer Name shown in Control Panel/System Properties). Note that the windows host names entered must be no more than 15 characters.
6. For Server nodes click on the Product Type drop down list and select **Radar Video Server**.
7. For all other nodes select the relevant product type for that node from the drop down list (see note below). Repeat the process for each node, see Figure B.1.

*. The maximum number of nodes is 4 Servers and 32 Client connections, however only 20 Clients may be supported by the network infrastructure.

Note: *All Client nodes that are listed as ‘CSR Clients’ on the Client Server Radar sub menu topic require a radar video capable product type to be selected. To configure nodes for non radar video product types see Section 2.1.2 ‘Setting up Non-Radar Video Product Types’*

The Processing Participation column enables the availability of each node for general system wide processing to be configured. The setting defaults to **Normal**, which means nodes are available for any general processing.

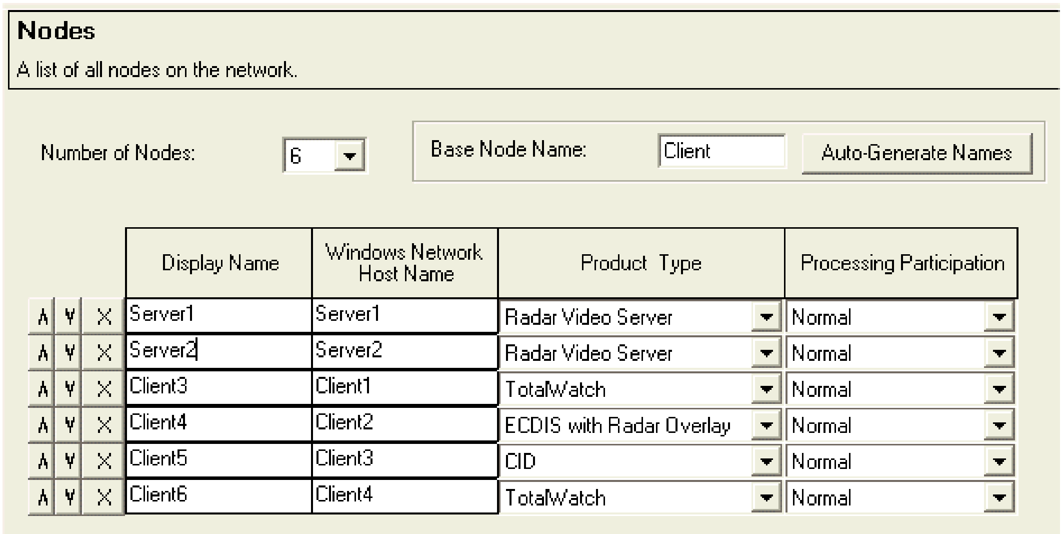


Figure B.1 Nodes Window

2.1.2 Setting up Non-Radar Video Product Types

The following procedure describes how to configure existing Client nodes on the system that do not require radar video, such as ECDIS, CID or CAM product types.

1. Select the product type for the non-radar video node.
2. When a non-radar video product type is selected on an existing CSR Client node a validation error is generated on the Client Server Radar (Radar System) sub menu topic, see Figure B.2.

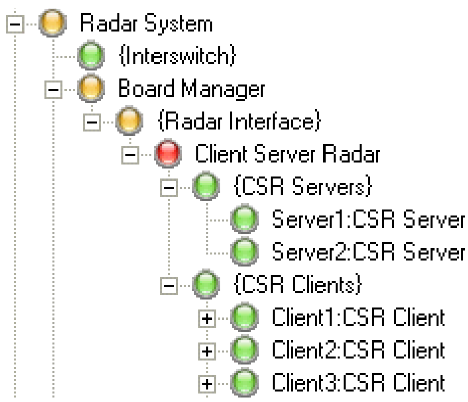
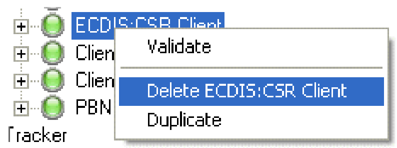


Figure B.2 Client Server Radar Validation Error

3. Right click on the Client Server Radar topic. The validation error window gives the display name or client number of the node that cannot be configured.
4. Remove the node from the {CSR Clients} sub menu by right clicking on the topic and selecting Delete.



5. When all non-radar video Client nodes have been removed from the {CSR Clients} sub menu the Client Server Radar sub menu topic is validated.

2.1.3 PCIO Board Manager

Each Server on the CSR network includes an integral PCIO board, therefore a PCIO board must be seleted for all nodes configured as Servers.

1. Highlight **PCIO Board** in the All PCIO Boards column and click the **<** button. An unconfigured PCIO board is moved into the **Selected PCIO Boards** column and the system adds an unconfigured topic for the board in the navigation tree with a list of discrete outputs and inputs. A list of serial ports are also created for the board in the I/O Port Manager.
2. Click on the unconfigured PCIO Board topic in the navigation tree, from the PCIO Board configuration window select the Server node from the Node drop down list to which the PCIO board is connected, see Figure B.3. The PCIO board is validated when a Server node is selected.

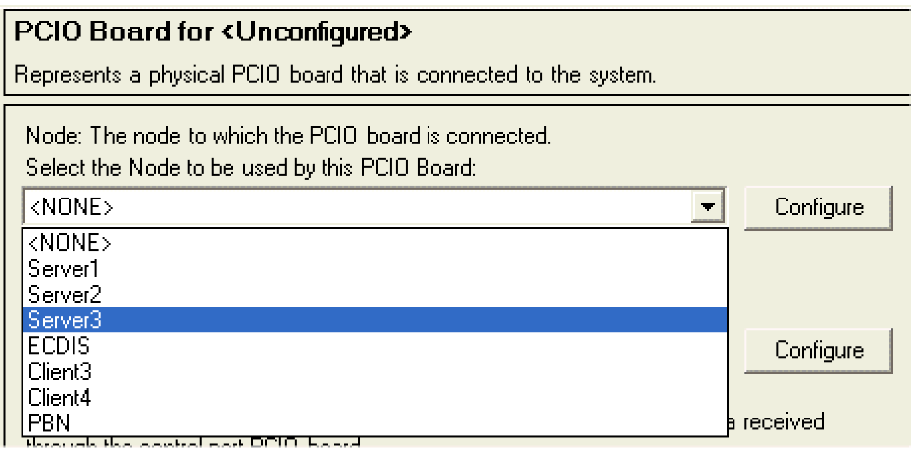


Figure B.3 Selecting Node for PCIO Board

3. When a new Server node has been configured in the PCIO Board Manager an additional server must also be added to the Client Server Radar {CRS Servers} sub menu, see Section 2.2.2 ‘*Configuring a CSR Server*’

2.2 Configuring Applications

The following sub-sections covering Applications components for a Client/ Server Radar (CSR) network are included where the configuration process differs from the instructions given in Chapter 1 '*Configuration*', Section 8 '*Applications*'.

2.2.1 Radar Interface

The {Radar Interface} sub menu forms part of a hierarchical Radar System/ Board Manager menu. Below the Radar Interface is the Client Server Radar sub menu, which includes the Server and Client configuration windows. All the nodes configured in the Nodes window that receive radar video must be included in this section.

The Client Server Radar sub menu includes {CSR Servers} and {CSR Clients} sub menus for each CSR Server and CSR Client, see Figure B.4.

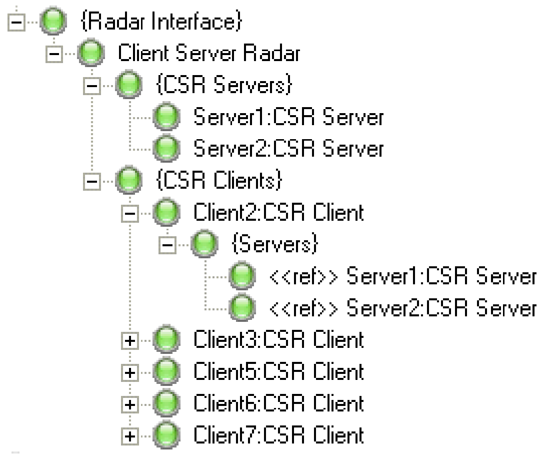


Figure B.4 Radar Interface Navigation Tree

2.2.2 Configuring a CSR Server

Before proceeding with the configuration of one or more additional Server nodes on a network, ensure the Server to be configured in the Client Server Radar sub menu has been previously configured at the Nodes and PCIO Board Manager windows.

1. Open the Client Server Radar topic, highlight **CSR Servers** in the All CSR Servers column and click the **<** button. An unconfigured CSR Server is moved into the Selected Servers column and the system adds an unconfigured topic in the {CSR Servers} navigation tree.

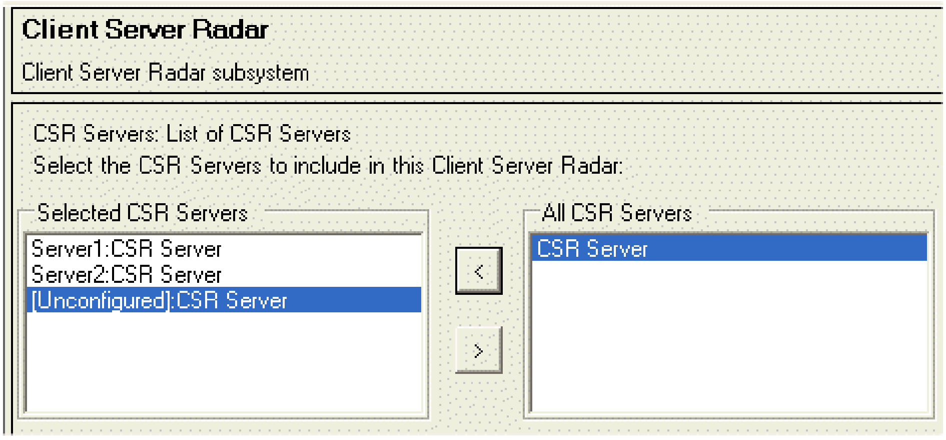


Figure B.5 Client Server Radar - Unconfigured CSR Server

2. Open the configuration window for the CSR Server by clicking on the unconfigured topic in the navigation tree.
3. Click on the CSR Server Node drop down arrow and select the node on which this CSR Server resides. When a Server node has been selected the Server topic is validated.

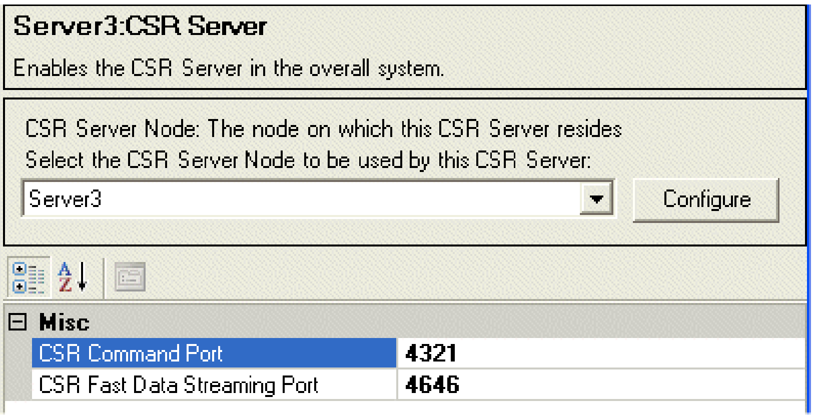


Figure B.6 CSR Server Window

4. The CSR Server window includes the following miscellaneous settings:
   - CSR Command Port - the port number at which the CSR Server send and receives data to and from the CSR Clients.
   - CSR Fast Streaming Data Port - the port number used for fast data streaming.

Normally these settings should not be changed from their default values.

2.2.3 Configuring a CSR Client

Before proceeding with the configuration of one or more additional CSR Client nodes, ensure the Clients to be configured in the Client Server Radar sub menu have been previously configured at the Nodes window.

1. Open the Client Server Radar topic, highlight **CSR Clients** in the All CSR Clients column and click the **<** button. An unconfigured CSR Client is moved into the Selected CSR Clients column and the system adds an unconfigured topic in the {CSR Clients} navigation tree.

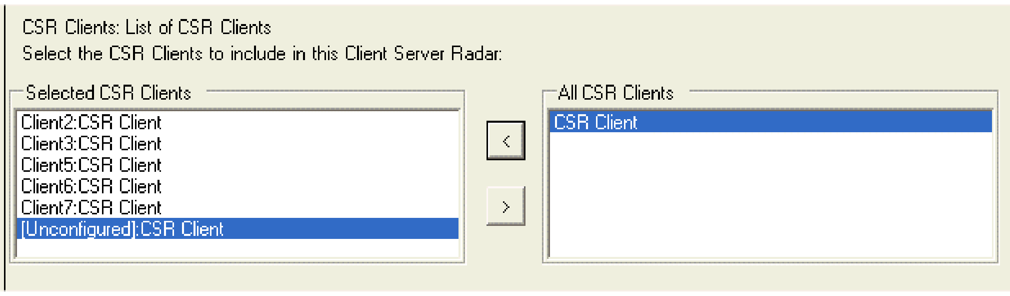


Figure B.7 Client Server Radar - Unconfigured CSR Client

2. Open the configuration window for the CSR Client by clicking on the unconfigured topic in the navigation tree.
3. Click on the CSR Client Node drop down arrow and select the node on which this CSR Client resides.
4. Select the Servers to which the Client will connect from the All Servers column. For every Server selected for the Client a topic is created under a {Servers} sub menu.

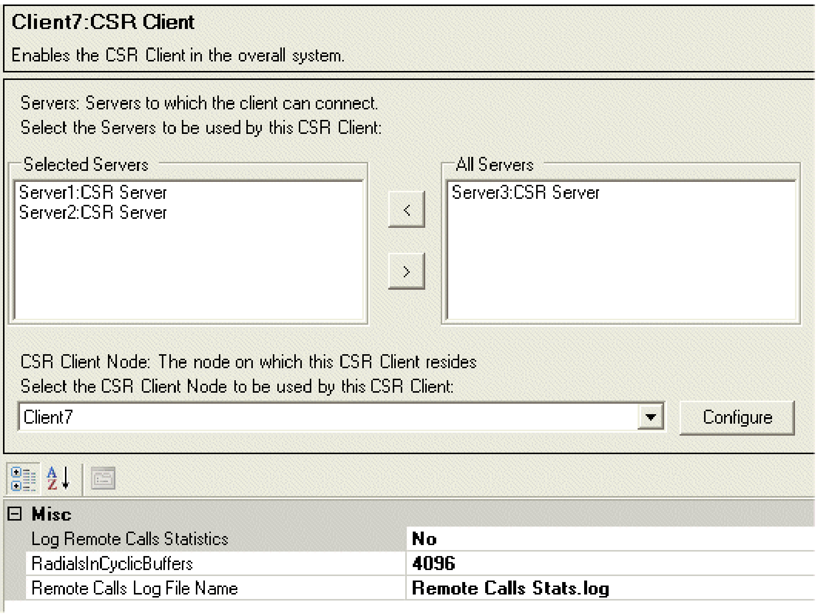


Figure B.8 CSR Client Window

5. The CSR Client window includes the following miscellaneous settings:
   - Log Remote Calls Statistics - enables the tracking of remote calls to the Server to be logged. Defaults to No.
   - RadialsInCyclicBuffers - the number of radials that the cyclic buffers can contain.

Normally these settings should not be changed from their default values.

The Server nodes to which the Clients are connected include the Server configuration windows, as shown in Figure B.6 under the {Servers} sub menu as references. Any changes to the miscellaneous settings made at these referenced topics will be reflected in the same configuration windows of the Server sub menus.

2.2.4 Channel Manager

Each Server communicates with and receives radar/video data from a top unit. The Channel Manager sub menu (part of the Top Unit Configuration) enables configuration of the channel through which the data is transferred from the top units to the Servers.

Note: *A CSR system does not include a physical Interswitch.*

The Channel topic enables you to select the configured Server node, the Server's master/slave status and the top unit alias (A to F).

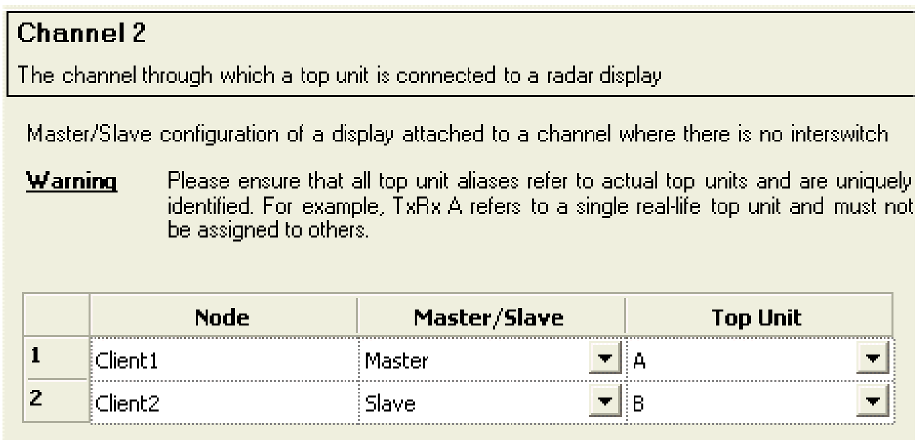


Figure B.9 Channel Configuration

A Server may be selected as the Master or Slave of a particular top unit with each top unit assigned to one Server. For example, a CSR system with two Server nodes must have each node assigned to the specific top unit it is connected to.

3 TightVNC

TightVNC (Virtual Network Computing) is an application which allows the service engineer remote access to perform control and administration tasks on Servers from a Client desktop.

The application includes two components: the TightVNC Server, which makes the Server PC accessible for remote viewing and is installed on the Server; and the TightVNC Viewer, which is used to view and control the Server remotely and is installed on a nominated Client.

3.1 Setting Up TightVNC

The TightVNC software is automatically installed on the C: drive of all VisionMaster nodes.

To setup the TightVNC software:

1. Double click on the TightVNC icon on the Service desktop. The TightVNC Setup Wizard opens. Click the **Next** button to continue.
2. Click the **I Agree** button on the Licence Agreement page. The following page prompts to choose which features you want to install, see Figure B.10.

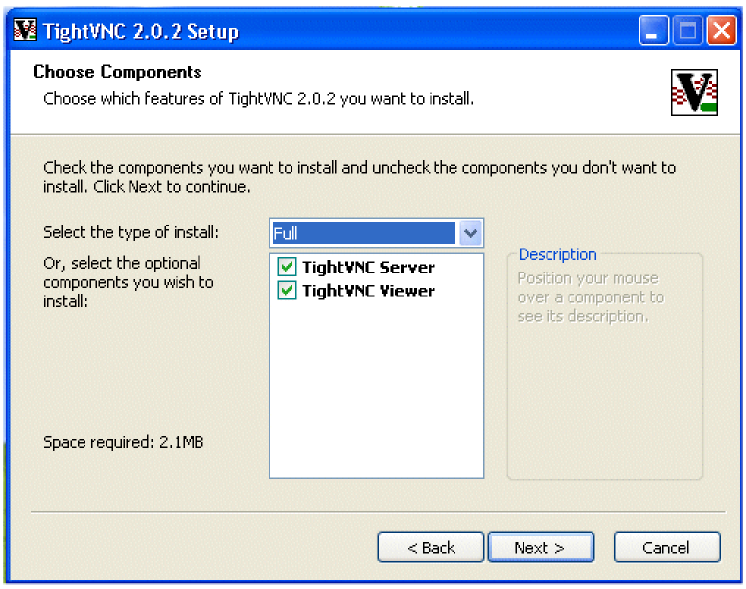


Figure B.10 TightVNC Setup - Choose Components

3. If you are installing the application on a Server untick the **TightVNC Viewer** check box, the type of install changes to **Custom**. Or, if you are installing the application on a Client untick the **TightVNC Server** check box, the type of install changes to **Viewer Only**. Click the **Next** button to continue.

4. The next two pages prompt to choose the folder where the application will be stored and the Start Menu where the program's short-cut will be created. These settings should remain as default.
5. The next page prompts to select additional tasks:
   a. If you are installing the TightVNC Viewer on a Client the tasks include associating.vnc files with the Viewer and Windows Firewall Configuration.
   b. If you are installing the TightVNC Server the tasks include registering the server as a system service and setting up passwords, in addition to Windows Firewall Configuration.
6. If you have selected password configuration on the Server node the subsequent page prompts to enter a user password and an administrative password (optional). The standard service engineer's password as used on the VisionMaster system should be entered.
7. To set the passwords after installation tick the **Skip this step** check box. The Password field are disabled.

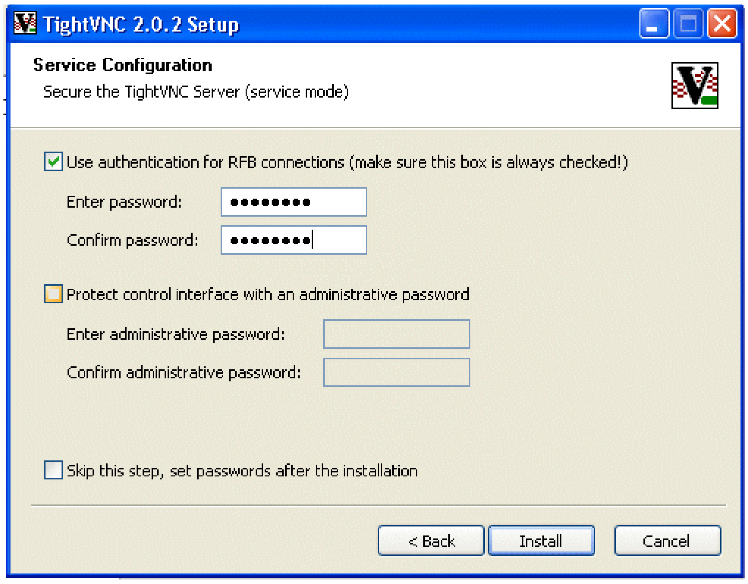


Figure B.11 TightVNC Setup - Enter Passwords

8. When a password has been entered, or the **Skip this step** check box ticked, click the **Install** button. The application is installed onto the PC.
9. When complete click the **Next** button and then click the **Finish** button to close the Setup wizard. After the setup program is finished, the TightVNC application can be accessed from the Start/Programs menu.

3.2 Using TightVNC

After the TightVNC setup program has finished open the VisionMaster application on the Server where the TightVNC Server component resides, and on the Client, where the TightVNC Viewer component resides.

3.2.1 Running the Server

On startup, TightVNC adds an icon to the system task bar on the Server node. The appearance of the icon will change depending on the program's operational status.

1. When no viewers are connected the icon is shown with a white background (moving the cursor over the icon will show the Server IP address).

2. When viewers are connected the icon is shown in inverted colours.

3. When Client connections are disabled the icon is shown with a red border (moving the cursor over the icon will show the reason for the disabled connection, e.g. no valid passwords set).

Right clicking on the icon will display a popup menu where the following commands can be selected:

- **Properties -** enables the user to change various parameters of the TightVNC Server.
- **Add New Client -** allows outgoing connections to be made from the Server to a Client viewer. The name of the target viewer and optional display number can be entered in the dialogue.
- **Kill All Clients -** this will disconnect all currently connected Clients from the Server.
- **Disable New Clients -** this will temporarily disable a new Client connection to the Server. Choose the same menu item to re-enable new Client connections. Note that this mode is not restored on restarting the Server.
- **About... -** shows information about the TightVNC software.
- **Close TightVNC Server -** quits the application.

3.2.2 Running the Viewer

To view and control a remote desktop from a Client node when a TightVNC Server is running, do the following:

1. At the Client where the TightVNC Viewer component resides logon as Service mode from the System/Commissioning menu, see Section 3.1 '*Login*' in Chapter 2 '*Diagnostics, Commissioning & Service Mode*'.
2. Open the TightVNC Viewer by clicking the **Start** button and selecting **All Programs/TightVNC/TightVNC Viewer**, see Figure B.12.

Figure B.12 Opening TightVNC Viewer

3. The TightVNC Connection window opens on the Client desktop. Enter the Windows host name of the Server or its IP address in the **TightVNC Server** field, or navigate to the Server on the network by clicking the Browse.. button, see Figure B.13.

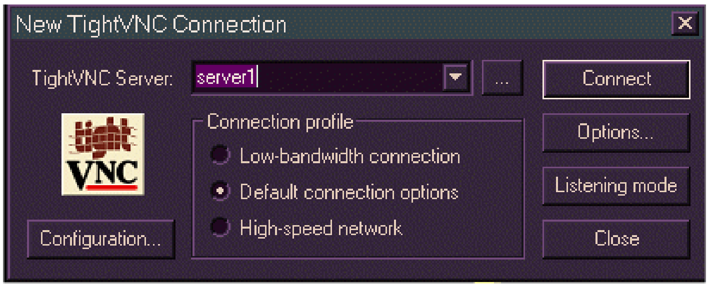


Figure B.13 TightVNC Connection

4. Click the **Connect** button. When the viewer is connecting to the server a connection status popup window appears in the top left of the VisionMaster display.
   The viewer may also be started in 'Listening mode' by clicking on the button in the TightVNC Connection popup window. In this mode, the viewer's icon will appear in the system tray, and reverse connections are accepted from TightVNC Servers (see 'Add New Client' in Section 3.2.1 '*Running the Server*').
5. On successful connection, a popup window prompts to enter your password. Enter the password defined in the Setup Wizard.
6. After the password has been entered the remote Server desktop appears with TightVNC controls at the top of the screen. Server menus may then be accessed from the Client node.
7. To close the TightVNC Viewer and return to VisionMaster on the Client node click the **X** button at the top right of the screen.

Appendix C

Configuring Peripheral Devices

Introduction

This Appendix includes information on the following peripheral devices:

1. External Serial Port (ESP) Unit - how to install an ESP and configure a PCI Serial Card.
2. SixNet Ring Switches - how to reconfigure a pre-existing SixNet Ring Switch using the Ethernet Switch Tools facility.
3. PC NAVTEX - how to install and configure the PC NAVTEX Client/Server application using the VisionMaster configuration tool and the PC NAVTEX application.
4. VisionMaster Printer - how to fix a potential fault if the printer connected to the node PC does not print.

CONTENTS

LIST OF FIGURES

1 Configuring an External Serial Port (ESP) Unit

1.1 Entering Service Mode

1. In the VisionMaster FT system log in as a service engineer, for details refer to Section 3.1'*Login'* in *Chapter 2 'Diagnostics, Commissioning and Service Mode'*.
2. Navigate to **Shutdown** in the System menu and click on the **Service Mode** button. The VisionMaster system shuts down and the service desktop is displayed.

1.2 Installing the ESP

1. If there two USB cables in the ESP, plug the upper USB port cable into any spare USB port on the PC. Otherwise, plug in the single USB cable into a spare USB port. The following 'Welcome New Hardware Wizard' screen appears.

Figure C:1 Welcome to the Found New Hardware Wizard

2. , From this screen select **No, not this time** and then click the **Next >** button:
3. When the following screen appears, select **Install from a list or specific location (Advanced)** and then click the **Next >** button.

Figure C:2 Install Software

4. When the following screen appears, untick **Search removable media (floppy, CD-ROM…)**; and select **Include this location in the search.** Click on the **Browse** button and select the following file: 'C:\Program Files\Sperry Marine\Drivers\Digi International Edgeport'. Then click the **Next >** button.

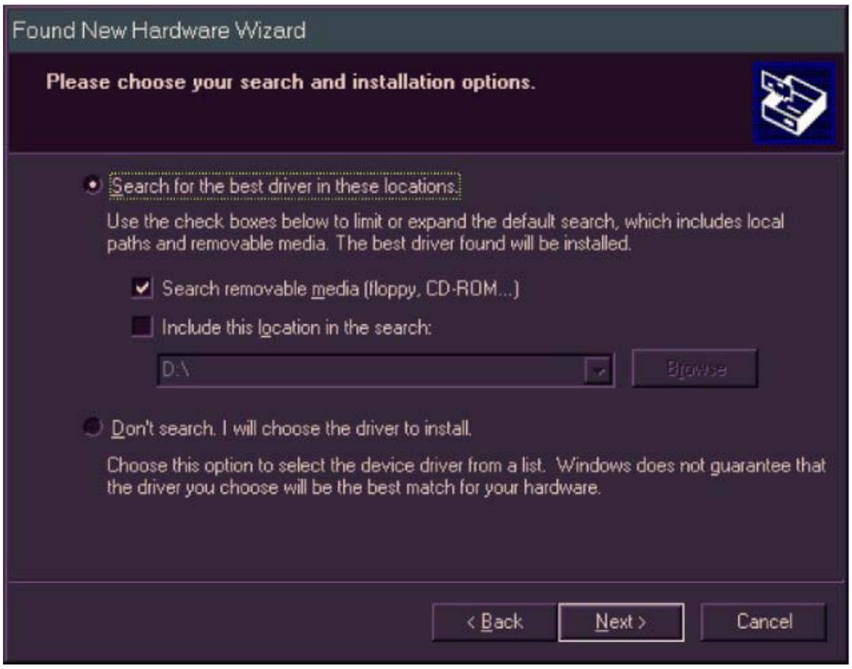


Figure C:3 Search and Installation Options

5. When the following screen appears select **Finish**.

Figure C:4 Finish New Hardware Wizard

6. If there is a second USB cable, plug it into the lower USB port (although this can actually be inserted into any spare USB port). The additional drivers will install automatically with no prompts.

1.2.1 Edgeport Configuration Utility

1. Click on the **Start** button at the bottom left of the screen and select '**All Programs / Digi USB / Edgeport Configuration Utility**'. You should see a window similar to Figure 5, except with different Edgeport serial numbers.

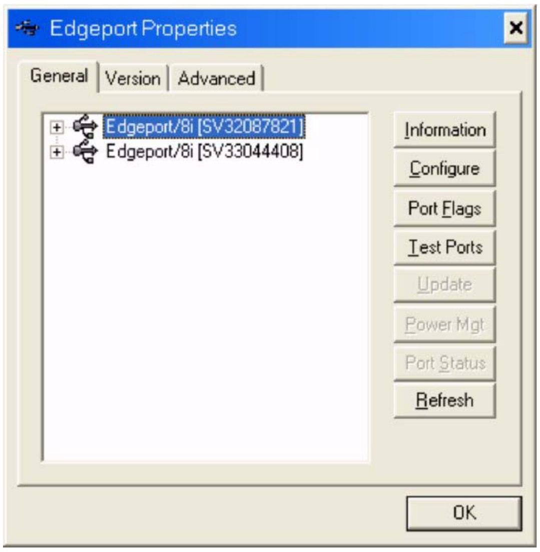


Figure C:5 Edgeport Properties

2. If there are two Edgeports displayed, select the **second** one and click on the **Configure** button.
3. Set up the COM ports as shown in Figure 6 below and then select **OK**.

Note: *The Device Name will be different to that displayed below.*

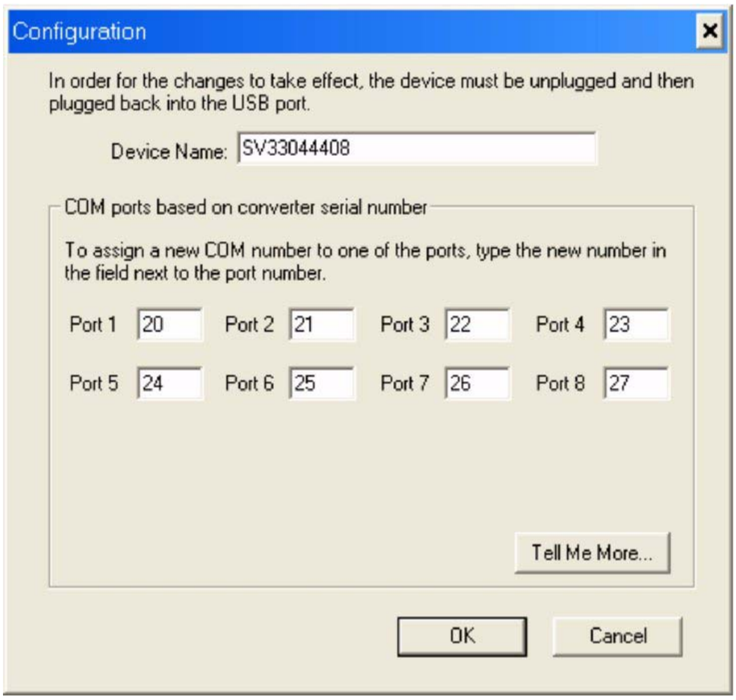


Figure C:6 Edgeport Configuration for second Edgeport device

4. The following COM Port Assignment warning appears. Select **OK**.

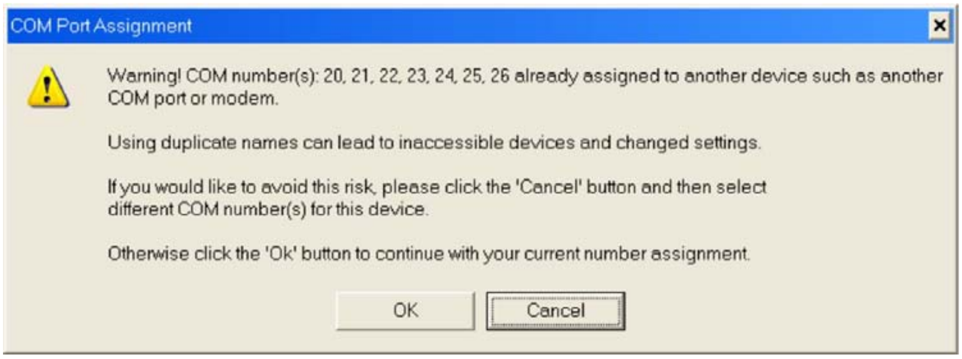


Figure C:7 COM Port Assignment Warning

5. The Edgeport Properties window re-appears. Select the first (or only) Edgeport and click the Configure button.
6. Set up the port numbers as shown in Figure 6 below and then select **OK**.

Note: *The Device Name will be different to that displayed below.*

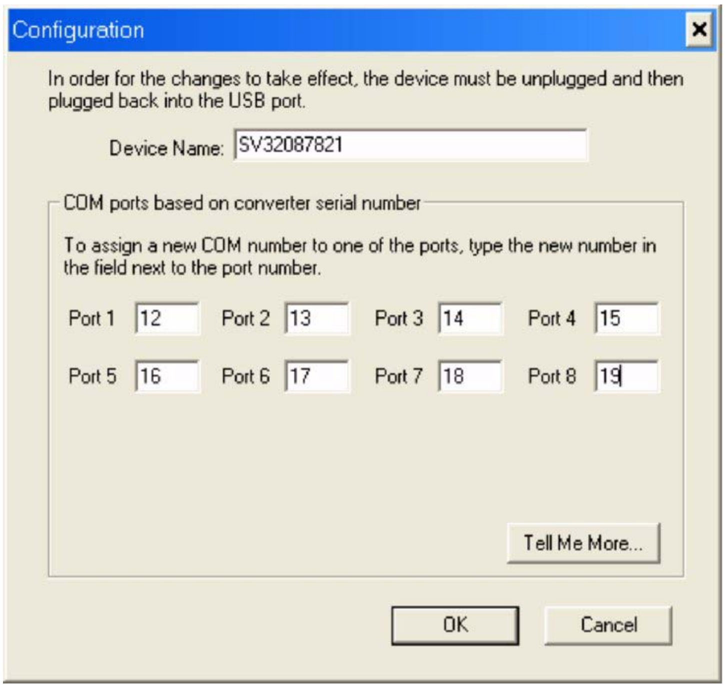


Figure C:8 Edgeport Configuration for first Edgeport device

7. Select **OK**. When the warning dialog appears select **OK**.
8. Select **OK** to exit the Edgeport Configuration Utility.
9. Click on the **Start** button select **Turn off Computer** and click on the **Restart** button to reboot the PC. This will reboot into Operator Mode.
10. To complete the configuration of the system re-enter Service Mode.

1.3 Configuring a PCI Serial Card

For information on the installation of a PCI serial card, refer to VisionMaster Ship's Manual - Volume 1, Chapter 4 '*Appendix B RS422/485 PCI Serial Card Installation*'.

Windows will automatically detect the presence of a newly installed card and may, or may not, prompt to install the software driver when the system is run up after installation. In either case before configuration the Serial Card driver CD must be installed in the CD drive of the PC.

1.3.1 Installing the Device Drivers

1. Click on the **Start** button at the bottom left of the screen and select **Settings** and then **Control Panel**. From the Control Panel window select **Administrative Tools** and from the subsequent window select **Computer Management.** From the left column of the Computer Mangement window select **Device Manager**.

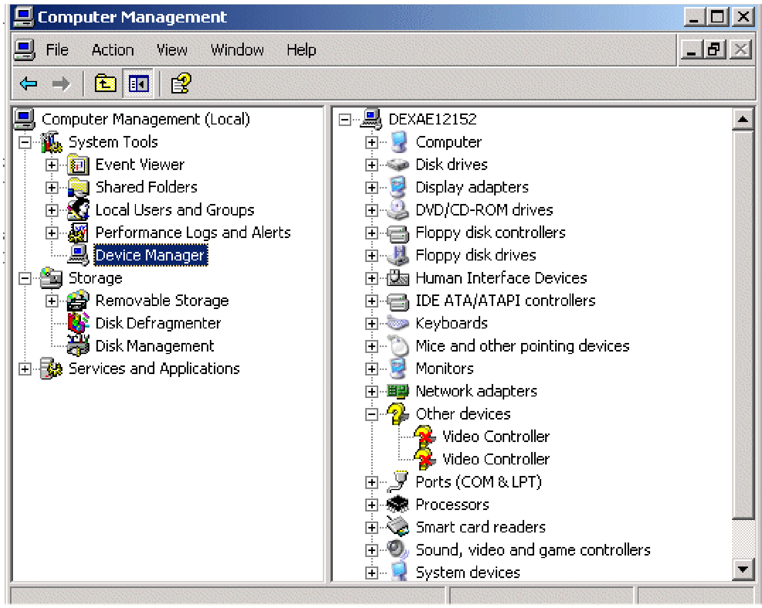


Figure C:9 Computer Mangement window

2. In the right column, right click on the **PCI Serial Port** topic under 'Other Devices' and select **Properties**.
3. From the PCI Serial Port Properties window click on the **Reinstall Driver ..** button.
4. The Upgrade Device Driver Wizard window appears, click on the **Next >** button. The subsequent window prompts to install the hardware device drivers for the PCI Serial Port.
5. Click the **Search for suitable driver...** radio button and then click the **Next >** button.

6. The subsequent window prompts to locate the serial port driver files. Tick the **CD-ROM drives** check box and untick the **Specify a location** check box.
7. The Device Driver Wizard searches for the driver file on the CD-ROM. When the file is located the subsequent window shows the location on the CD and prompts to click **Next**.
8. The Device Driver Wizard starts to install the drivers for the PCI Serial Card. A **Digital Signature Not Found** popup window will appear with a prompt to continue with the installation. To continue click the **Yes** button.
9. Click the **Next >** button at the Found New Hardware Wizard window.
10. At the following window click the **Next >** button again.
11. The following window prompts to search for driver files for the MOXA communications port. Tick the **CD-ROM drives** check box and untick the **Specify a location** check box.
12. The Found New Hardware Wizard searches for the driver file on the CD-ROM. When the file is located the subsequent window shows the location on the CD and prompts to click **Next**.
13. A window confirming the completion of the Found New Hardware Wizard appears. To close the wizard, click **Finish**.
14. The next window confirms the completion of the Upgrade Device Driver Wizard. To close the wizard, click **Finish**.
15. The subsequent window displays the properties of the installed MOXA serial card. Cilck the **Close** button.

1.4 Serial Port Numbering

1. Navigate to the Computer Management window, as described previously in step 1 of Section 1.3.1 ‘*Installing the Device Drivers*’.
2. From the Device Manager, Multi-port serial adaptors sub menu right click on **MOXA CP-132 Series (PCI Bus)** and select **Properties**.
3. From the MOXA Series (PCI Bus) Properties window click the **Ports Configuration** tab. The window shows the current port settings for the board.
4. To change the ports, click the **Port Setting** button, a Port popup window appears. Select a port that is not in use, tick the **Auto-Enumerate** check box and then click **OK**.
5. The ports selected from the Port popup window appear in the list of ports in the Port Configuration tab.
6. Verify that the port settings are correct and click the **OK** button. Close all open windows to finish.

2 Reconfiguring SixNet Ring Switches

This section describes the procedure for reconfiguring pre-existing SixNet ring switches.

SixNet ring switches delivered with Visionmaster FT software version 3.3 or later will be pre-configured by the switch vendor, and will therefore not require reconfiguration as described in this section. However, if your system is using pre-existing SixNet ring switches with version 3.3 or later then these switches are required to be re-configured.

Before reconfiguring SixNet Ring Switches, determine the number of switches to be re-configured (5-port or 9-port) and ensure that the switches are on and attached to the same PC as your VisionMaster.

2.1 Installing SixNet Ring Switch Config Tool

1. From the System menu login as Service and from the Shutdown sub menu click on **Service Mode** (or **Service Mode All** for a multi node system). The VisionMaster FT desktop appears.
2. When running version 3.3 or later the desktop includes an **Install SixNet Ring Switch Config Tool** icon. Double click on this icon to run the Ethernet Switch Tools Setup wizard.

3. The Ehernet Switch Tools Setup copies program files into defined directories. When the Setup is complete the desktop includes the following additional icons: **Ethernet Switch Tools** and **Ring Switch Status**.

2.2 Running Ethernet Switch Tools Application

1. Double click on the **Ethernet Switch Tools** icon. The application opens and displays the following blank window.

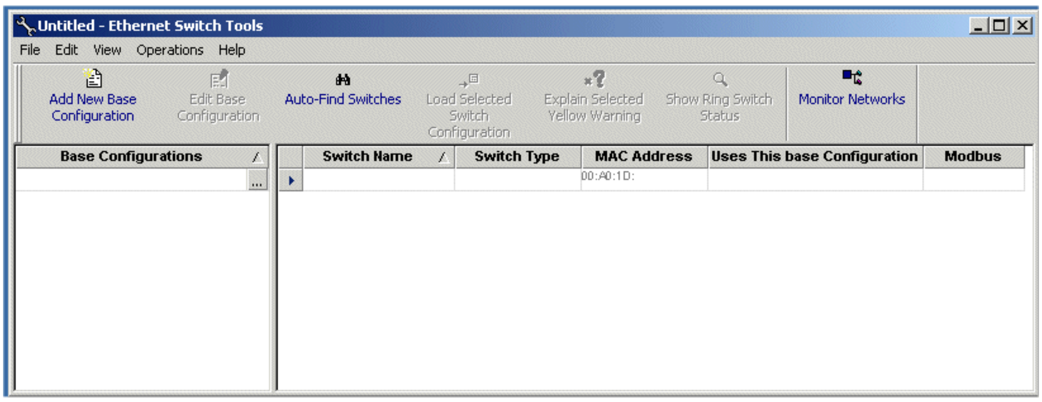


Figure C:10 Ethernet Switch Tools Untitled window

2. Click on the **File** menu, select **Open**, navigate to **C:\SixNet_Ring_Switch** folder and open the **SperrySixNetRingSwitchSettings.6sw** file. Two items appear in the Base Configuration column; one contains the default configuration settings for 5-port ring switches, the other contains the default configuration settings for 9-port ring switches.

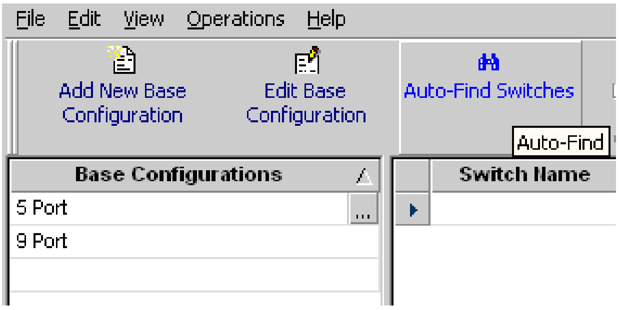


Figure C:11 Ethernet Switch Tools - Switches loaded

3. From the Base Configuration column select the switch type to be reconfigured and click on the **Auto-Find Switches** button. A secondary window appears from where the application searches for switches.
4. When the search is complete, the following window is displayed with all discovered switches. If not all switches are shown, click the **Search Again** button. Or, select all switches by using CTRL click and then click on the **Add Selected to Project** button on the right.

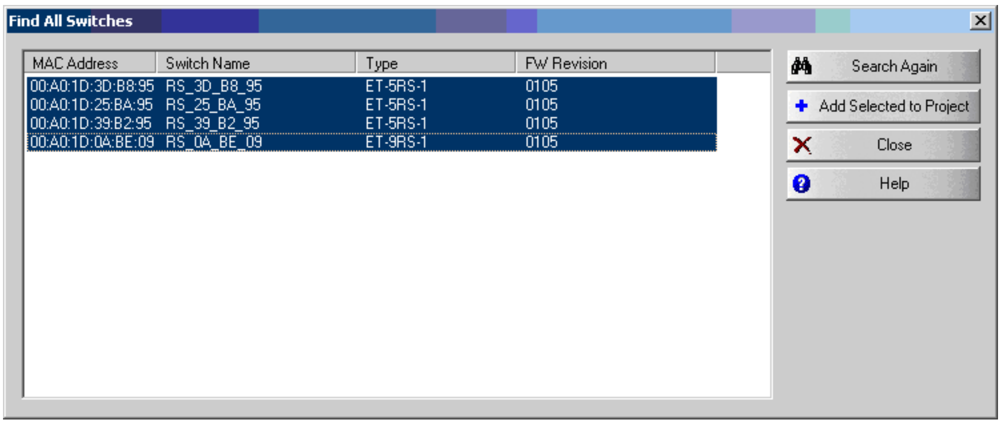


Figure C:12 Find All Switches

5. Move the **Find All Switches** window away from the main window and verify that the selected switches have been added to the right pane of the Ethernet Switch Utility window. Verify that the number of switches matches the total number of switches attached to the LAN.
6. Click on the **Close** button on the **Find All Switches** window.
7. For each switch in the list, determine its type from the **Switch Type** column and then assign the appropriate base configuration to the switch from the drop down list in the **Uses This base Configuration** column, see Figure 13.

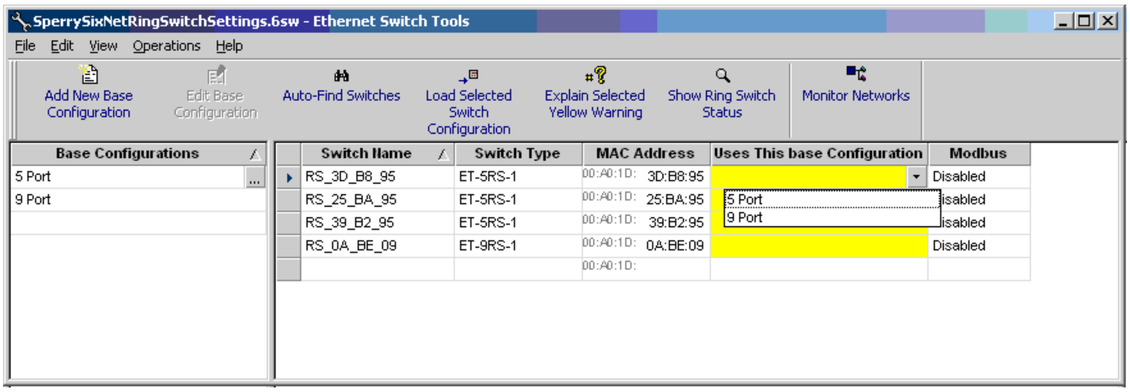


Figure C:13 Switches in Ethernet Switch Utility window

8. When the base configurations have been properly assigned the Ethernet Switch Utility window window will look as shown in Figure 14.

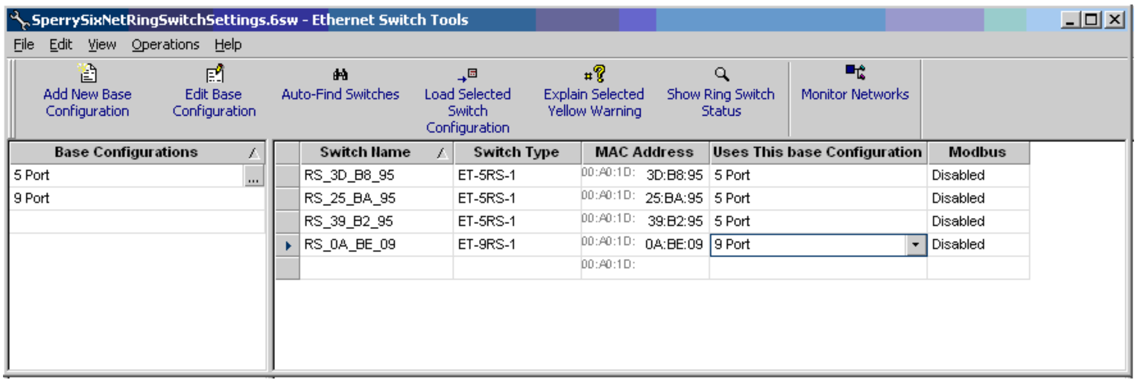


Figure C:14 Switches with Base Configuration Assigned

9. Select each switch in the **Switch Name** column and then click the **Load Selected Switch Configuration** button. This will cause the switch to be configured to its selected base configuration. Note that this process must be done for each switch. After each switch configuration a **Load Complete** popup window appears, click **OK** to confirm.
10. When all switches have been configured exit the application by clciking on the File drop down menu and selecting Exit.The following **setswitch** popup window appears prompting to save changes to **SperrySixNetRingSwitchSettings.6sw**.
11. Select **No** from the window. As this is a one-time reconfiguration changes made when the existing VisionMaster nodes are upgraded to rev 3.3 or later do not need to be saved to the .6sw file.

2.3 5-Port Base Ring Switch Configuration Setting

From the Base Configuration column of the Ethernet Switch Utility window either click on the button to the right of the 5-Port switch row, or highlight the port and click the **Edit Base Configuration** button. The 5-Port Switch Configuration window appears as a second window.

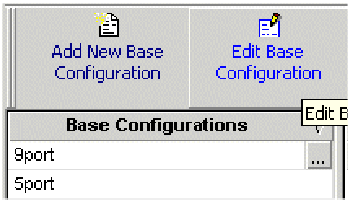


Figure 15 to Figure 22 show the 5 -Port switch defaut data for each tab in the Switch Configuration window.

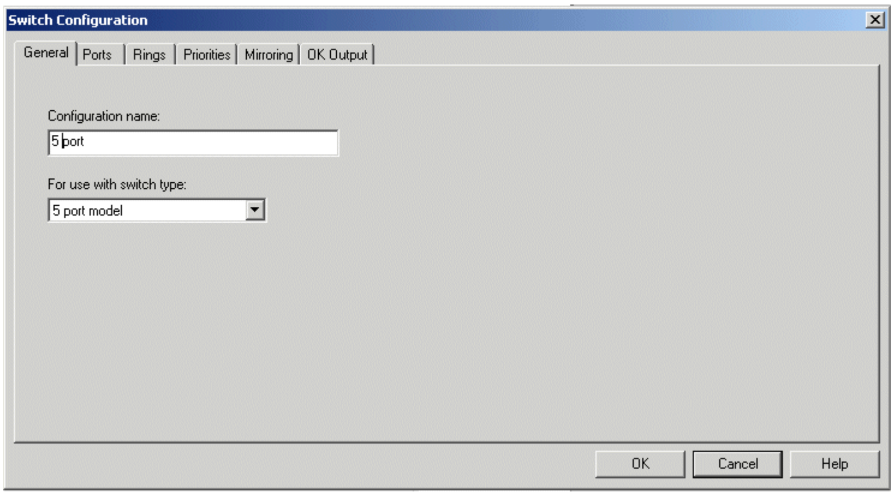


Figure C:15 5-Port Switch Configuration - General

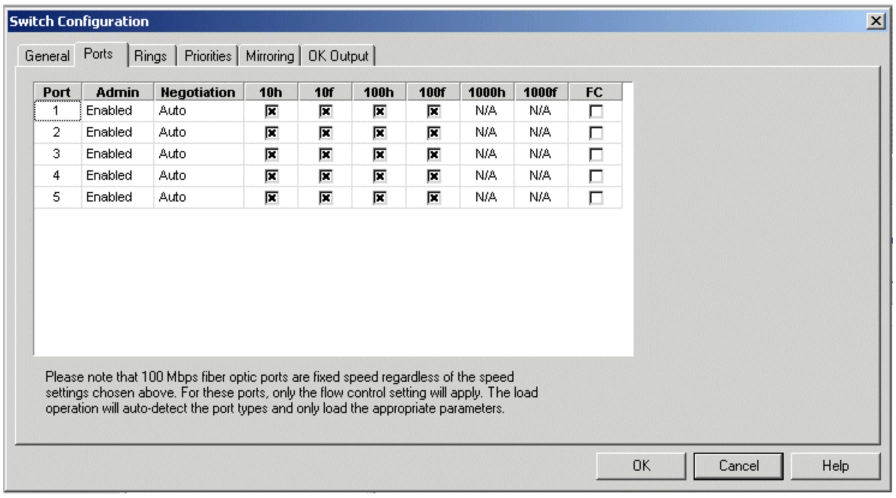


Figure C:16 5-Port Switch Configuration - Ports

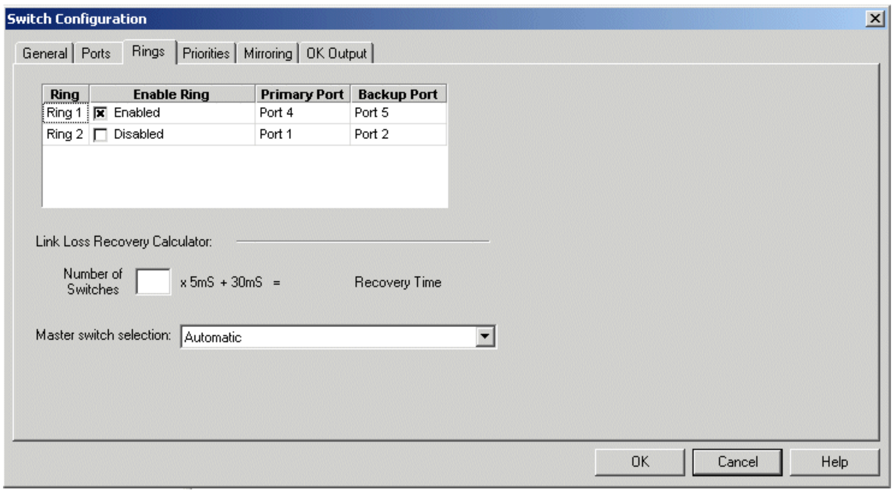


Figure C:17 5-Port Switch Configuration - Rings

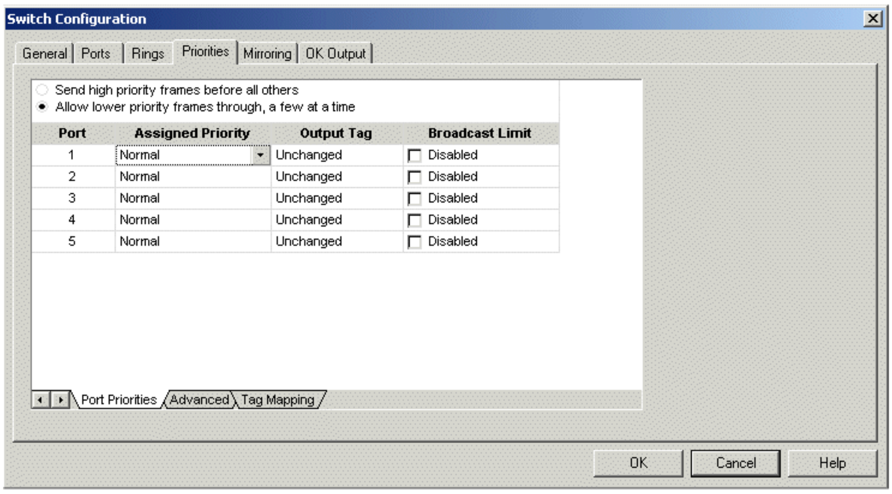


Figure C:18 5-Port Switch Configuration - Priorities - Port

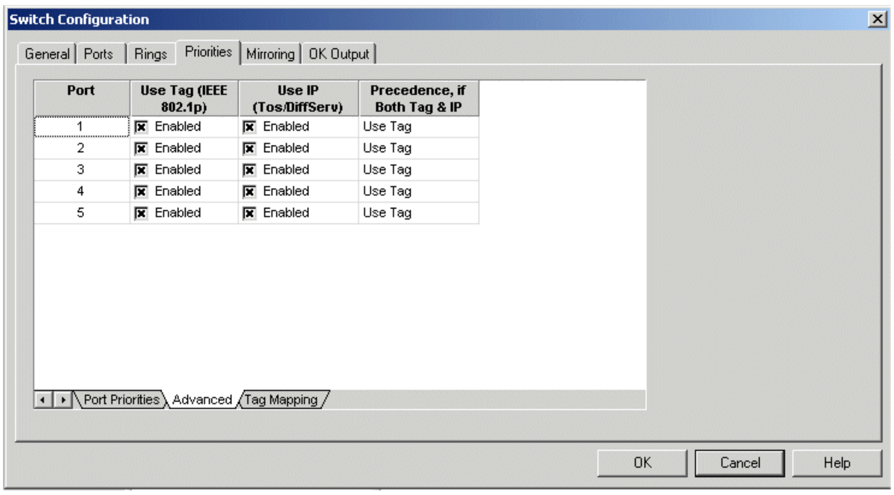


Figure C:19 5-Port Switch Configuration - Priorities - Advanced

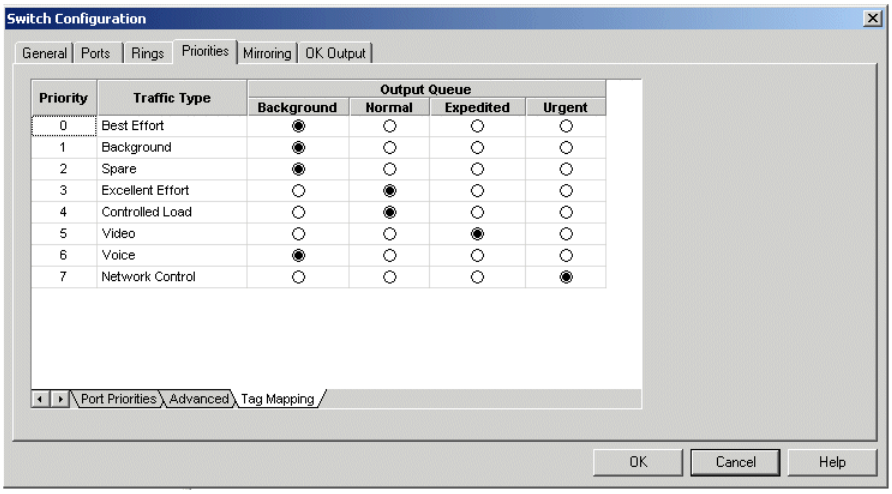


Figure C:20 5-Port Switch Configuration - Priorities - Tag Mapping

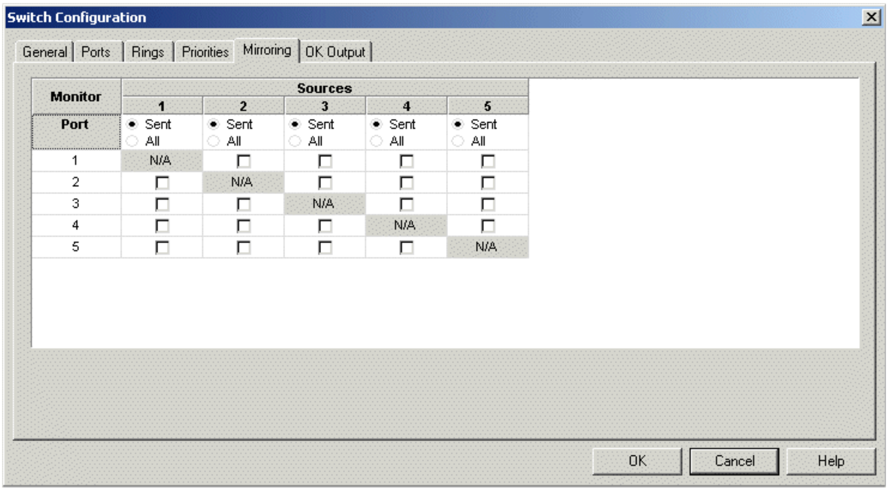


Figure C:21 5-Port Switch Configuration - Mirroring

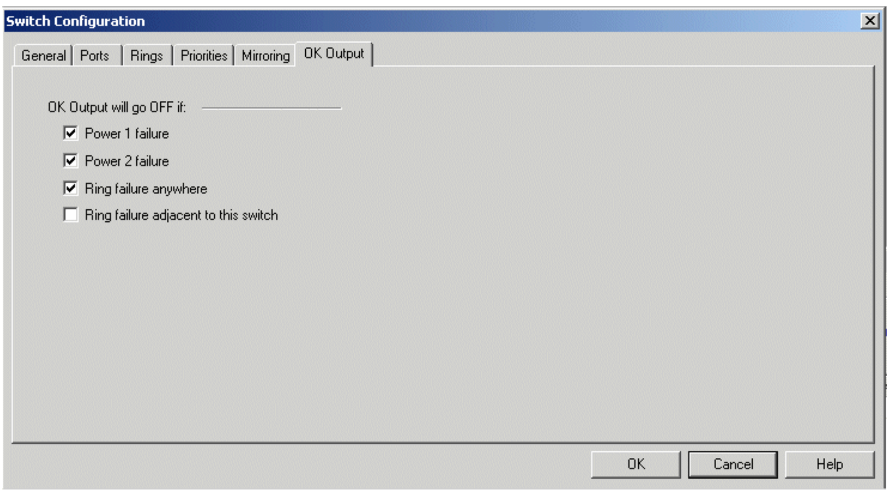


Figure C:22 5-Port Switch Configuration - OK Output

2.4 9-Port Base Ring Switch Configuration Setting

From the Base Configuration column of the Ethernet Switch Utility window either click on the button to the right of the 9-Port switch row, or highlight the port and click the **Edit Base Configuration** button. The 9-Port Switch Configuration window appears as a second window.

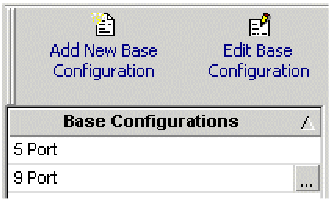


Figure 23 to Figure 30 show the 9-Port switch defaut data for each tab in the Switch Configuration window.

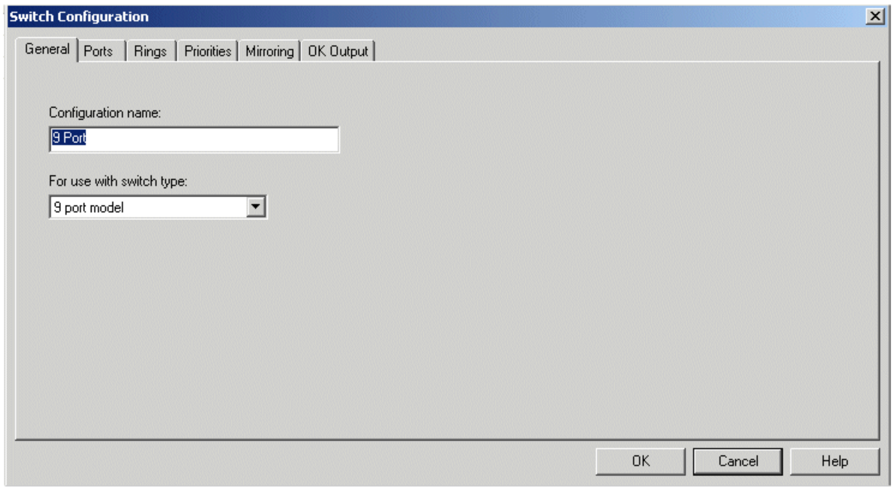


Figure C:23 9-Port Switch Configuration - General

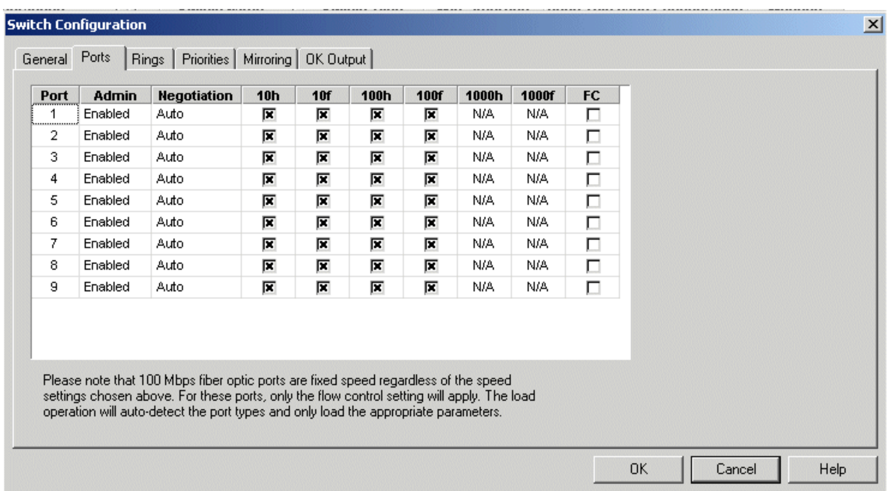


Figure C:24 9-Port Switch Configuration - Ports

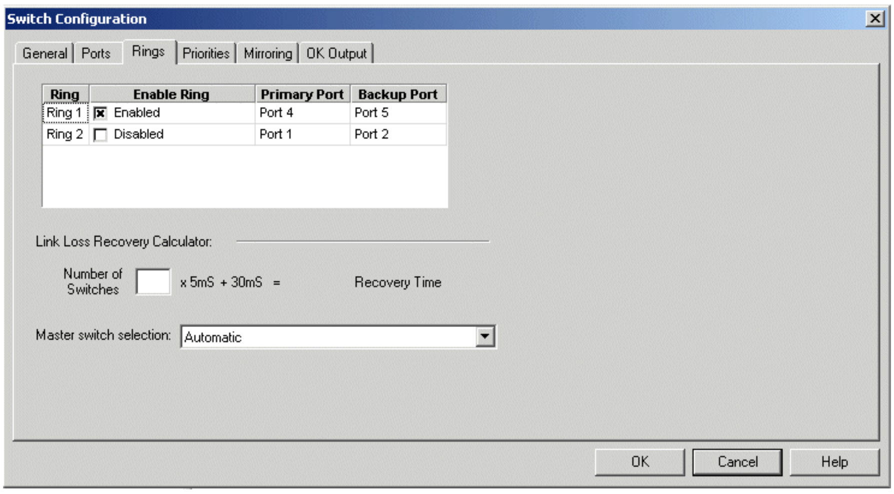


Figure C:25 9-Port Switch Configuration - Rings

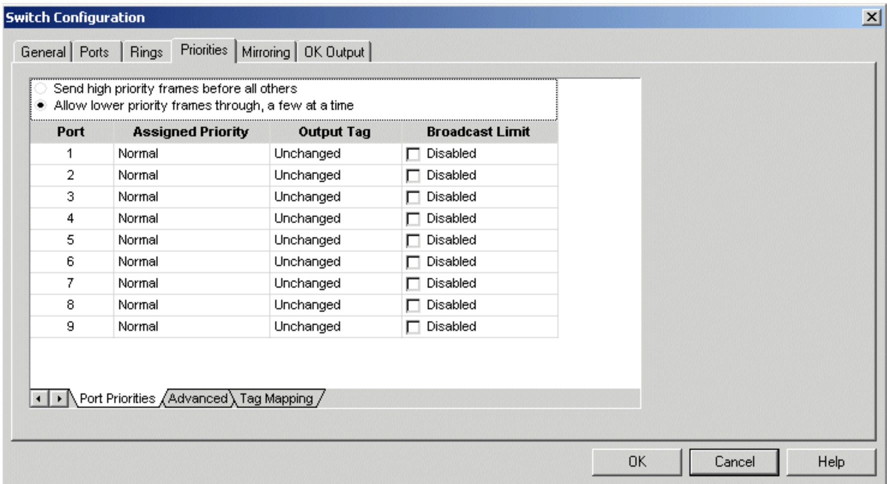


Figure C:26 9-Port Switch Configuration - Priorities - Port

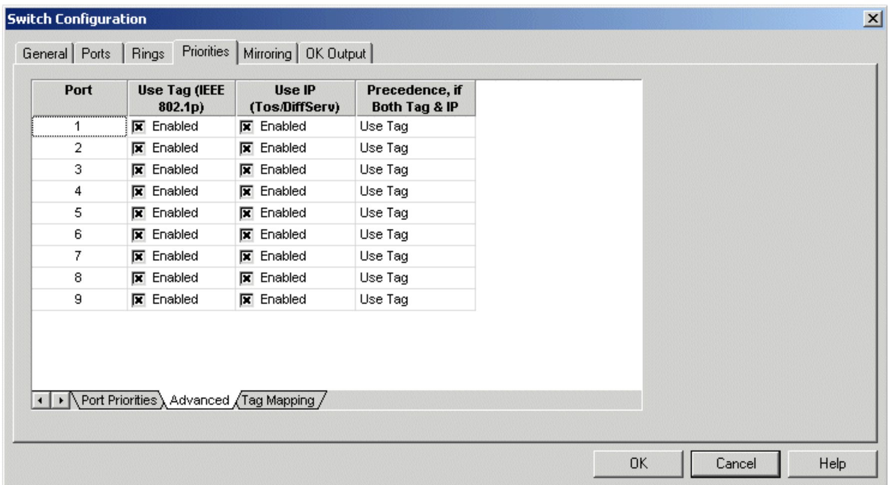


Figure C:27 9-Port Switch Configuration - Priorities - Advanced

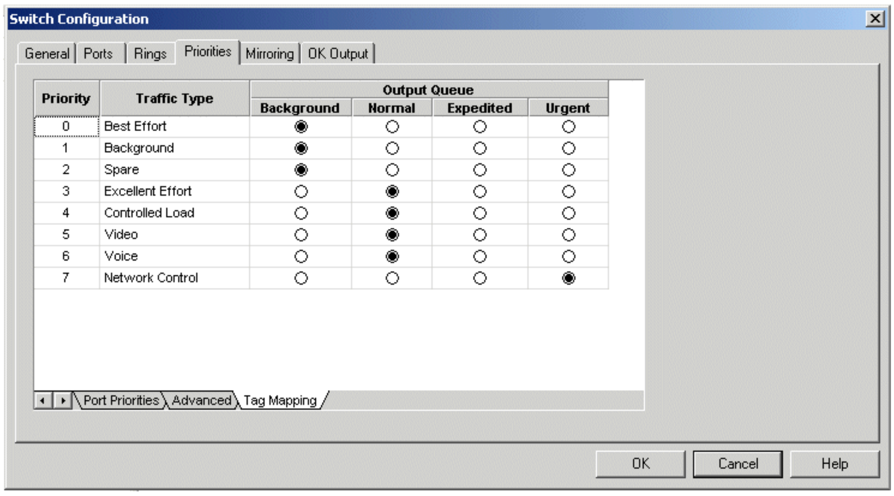


Figure C:28 9-Port Switch Configuration - Priorities - Tag Mapping

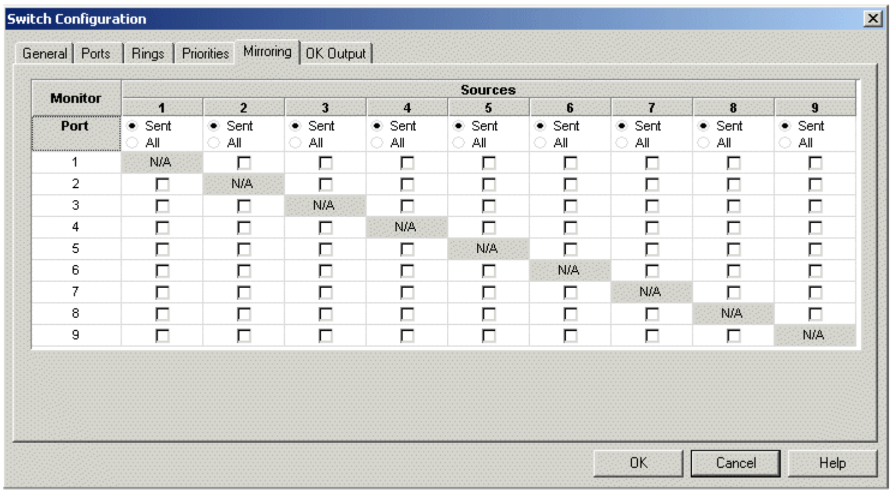


Figure C:29 9-Port Switch Configuration - Mirroring

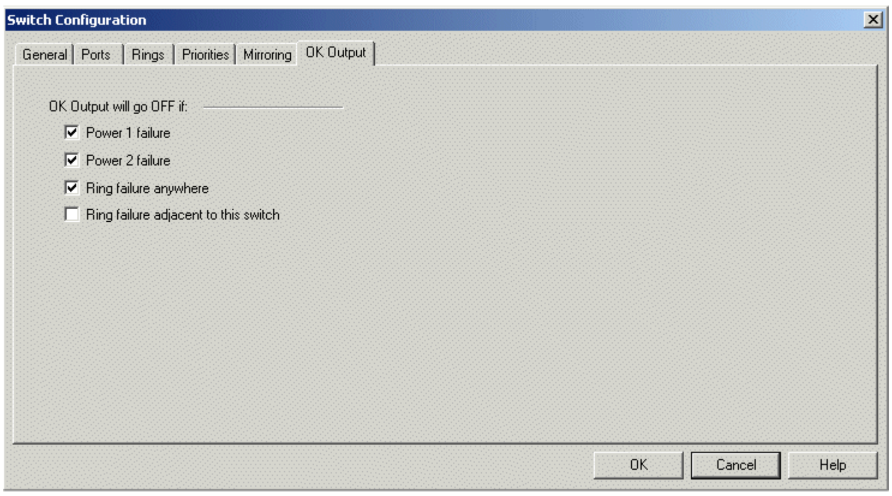


Figure C:30 9-Port Switch Configuration - OK Output

3 Installing and Configuring PC NAVTEX Software

This section describes the following installation and configuration functions that are required to run the PC NAVTEX Client/Server application.

- Installing PC NAVTEX software from the VisionMaster Service desktop.
- Configuring NAVTEX from the VisionMaster Configuration tool.
- Configuring the PC NAVTEX Client/Server from the NAVTEX application.

PC NAVTEX includes two applications:

- Server - communicates with the NAVTEX receiver through a serial connection and stores the messages in a database on the server node.
- Client - provides the user interface that presents NAVTEX messages in a display window on the VisionMaster screen.

PC NAVTEX runs externally to the VisionMaster application.

Note: *NAVTEX messages received are displayed as warnings by the Central Alarm Management (CAM) watch mode.*

3.1 Installing the PC NAVTEX Software

1. From the VisionMaster service desktop double click on the **Install PC Navtex** icon to launch the NAVTEX installation process.
2. The PC NAVTEX Setup wizard, which guides you through the installation process appears, see Figure 31. Click **Next** to continue with the process.

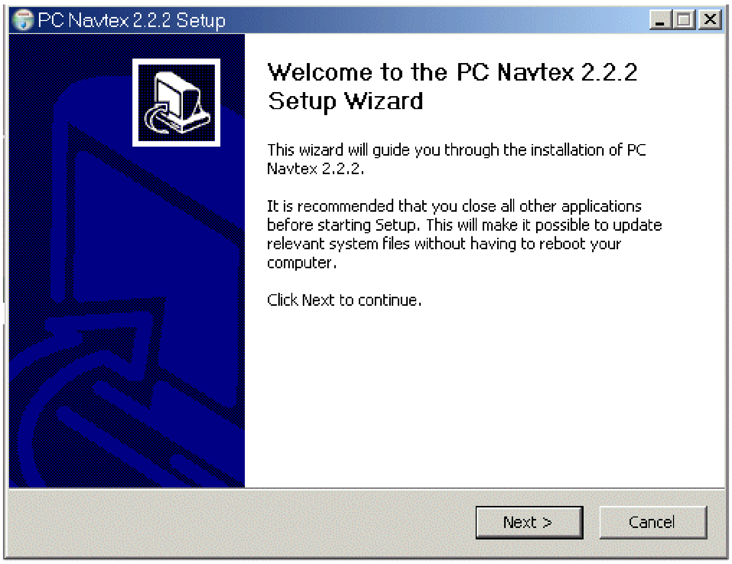


Figure C:31 PC Navtex Setup Screen

3. Select the language of the installation (English) and click **OK**.

4. The next screen prompts to select the Full product or Demo version. If you have purchased the software and have a registration number select **Full version**. If you have not yet purchased the software select **Demo version.** This will give you a 30 demo of the software
5. The next screen prompts how to interface to the GPS using the NMEA Server tool, see Figure 32. Select **No Interface**.

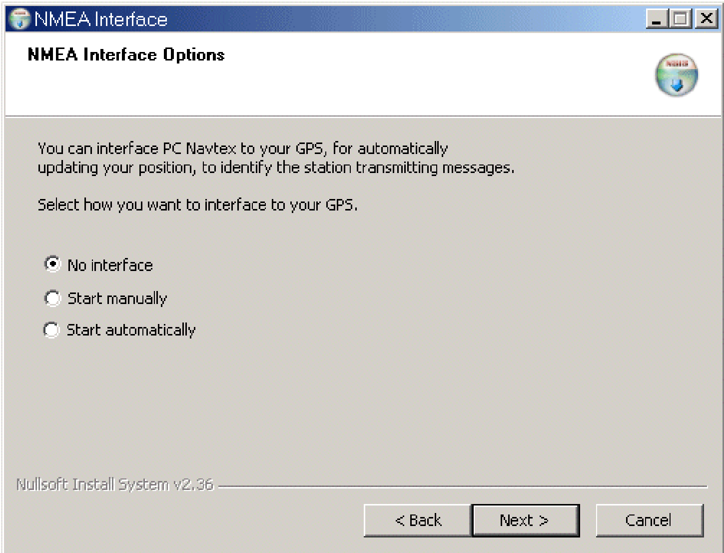


Figure C:32 NMEA Interface Options

6. On the 'Choose Install Location' screen keep the destination as shown in the Destination Folder (**C:\Program Files\PC Navtex**) and click the **Next** button.
7. On the Choose Start Menu Folder screen click the **Install** button. The setup wizard extracts the files for installation.
8. When installation is complete you will be given the choice of re-booting now or later. Select **Reboot Now** to reboot the system.
9. After the reboot, if the system indicates that the NAVTEXServer.exe can not be found, close the dialog box. The **PC Navtex** short cut icon is on the desktop, but the program is not yet available.

3.2 Configuring PC NAVTEX in the VM FT Config Tool

3.2.1 Configuring NAVTEX

The configuration of NAVTEX is included in the Quick Setup menu of the configuration tool and is therefore described in Section 5.12.4 '*NAVTEX*' in Chapter 1 '*Configuration*'.

3.2.2 Configuring the External Announcement Provider

1. From the Announcements menu click on the **External Announcement Manager** topic.
2. In the CAM Configuration window select **External NMEA Alarm Device** from the list of External Announcement Providers, see Figure 33.

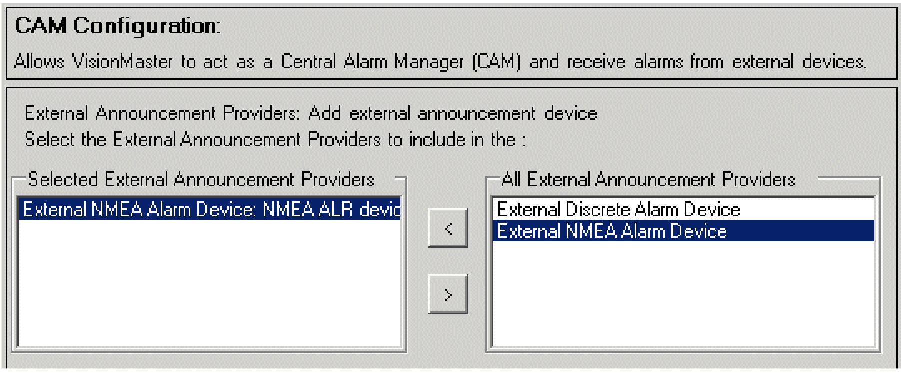


Figure C:33 External Announcement Provider

3. Open the unconfigured topic **External NMEA Alarm Device**.
4. Select the port from which the NAVTEX message will be received. This could be a serial port configured for NMEA [4800 Baud] settings, see Section 6.6 '*I/O Port Manager*' in the Configuration chapter.

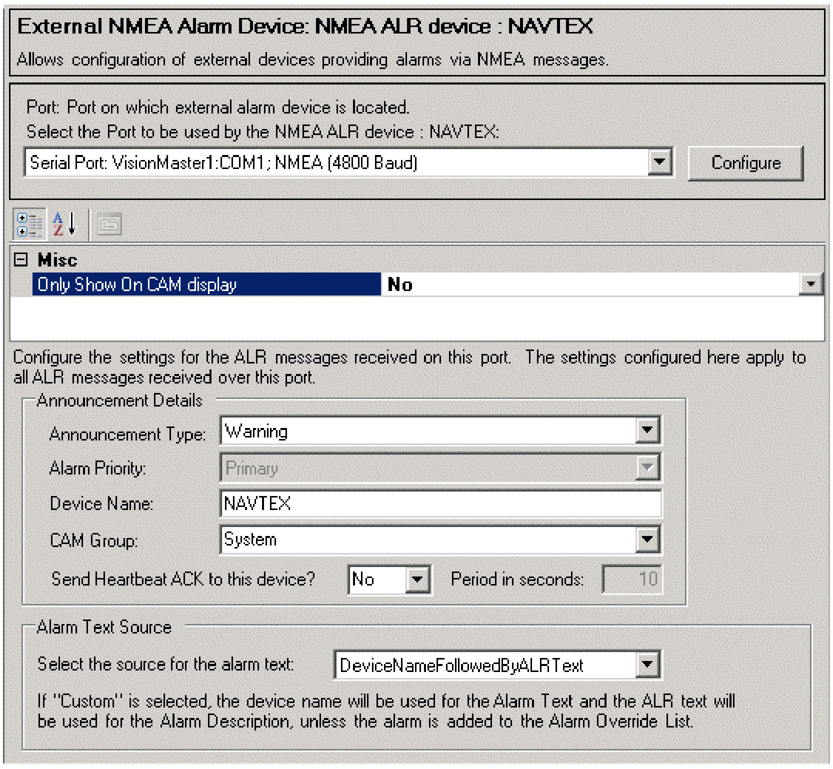


Figure C:34 External NMEA Alarm Device

5. Make the following settings to the External NMEA Alarm Device configuration window (see Figure 34):
   a. Select Yes or No for **Only Show On CAM Display** (No is recommended)
   b. Change the Alarm Type to **Warning**.
   c. Enter a name in the Device Name edit box, e.g. NAVTEX.
   d. Select a CAM Group in the CAM Group edit box.

For more information on configuring an External NMEA Alarm device, see *Chapter 1 'Configuration'* Section 8.7.5.2 '*Configuring an External NMEA Alarm Device*'.

3.3 PC NAVTEX Server Software Configuration

Important Note: *Always configure the NAVTEX Server node (i.e. the node connected to the receiver) before configuring the client nodes. The NAVTEX server is configured to run on only ONE computer.*

All nodes selected as NAVTEX clients must have access to the server database through a mapped network drive to the data path 'C:\Program Files\PC Navtex'. The mapped drive will be either to this folder, or to one of its parents, and set to reconnect at Login.

Manual mapping for each node is not necessary. VisionMaster will automatically map the network drive to N: on all nodes when the system restarts.

3.3.1 Configuring NAVTEX Server from VisionMaster Application

1. Start VisionMaster on the NAVTEX server node.
2. When VisionMaster is running click on the **System** menu button and then click on the **NAVTEX** button. The NAVTEX feature menu is displayed.

3. Click on the **Start NAVTEX Client** button. If you have not yet registered the Registration window appears, see Figure 35. Either enter an unlock code provided by the NAVTEX supplier, or click the **Continue evaluation and register later** button and then click the **Continue** button. For information on registration, see the following Note.

Note: *Each copy of PC NAVTEX must have an unlock code. For 30 days after installation it may be run in 'evaluation' mode. Until the unlock code is entered a blue Registration window will appear when the client or server is started. If you have the unlock code enter it and click* **Continue**. *If you do not have the unlock code, click the* **Continue evaluation and register later** *button and then click* **Continue**. *The unlock code may be obtained by contacting the PC NAVTEX supplier as indicated on the Registration window. The serial number shown at the top right of the window will be required to obtain the code. The unlock code will apply to only one computer.*

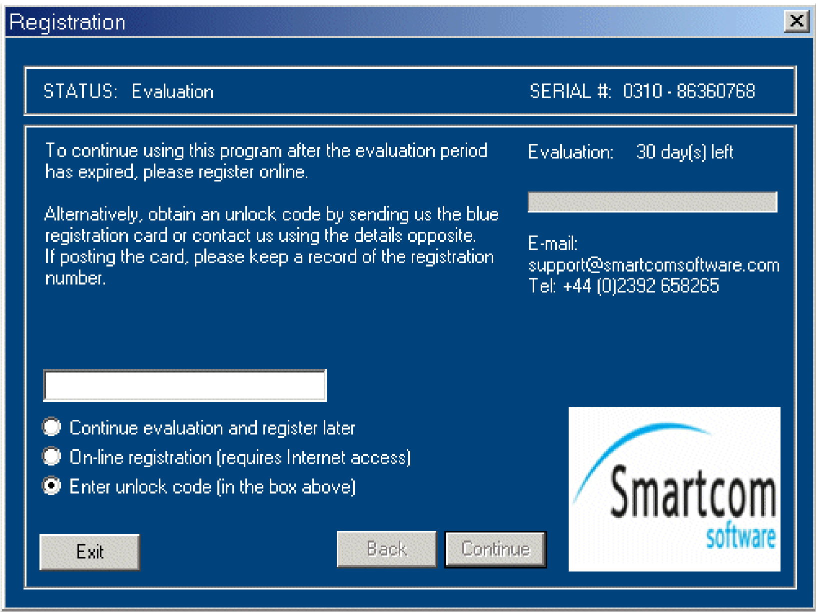


Figure C:35 Registration Window

4. After you have either entered an unlock code or selected the evaluation option from the Registration window the NAVTEX Client/Server display window opens.

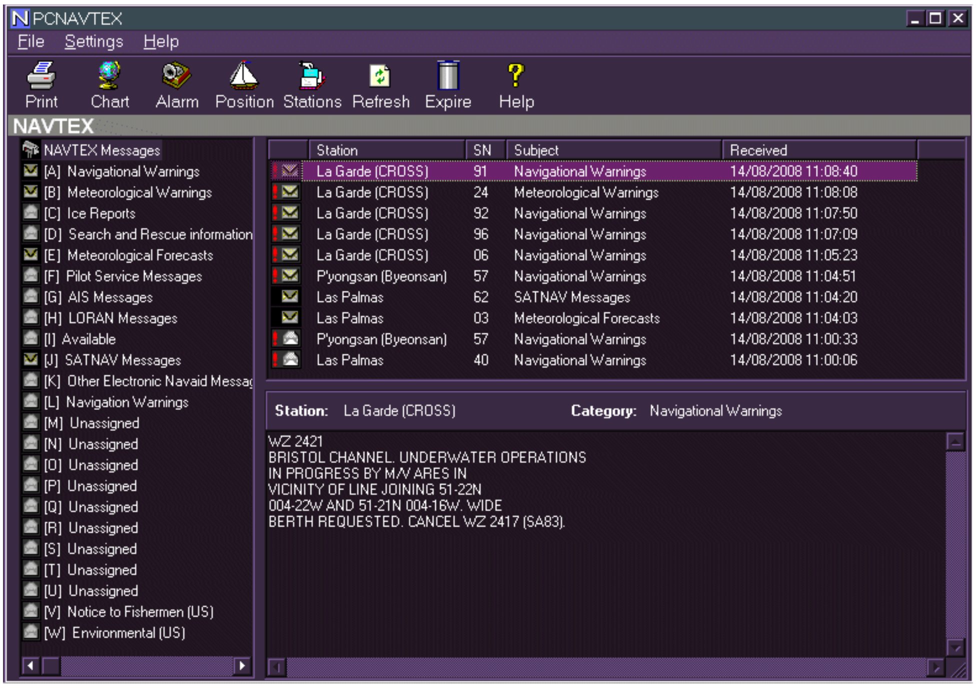


Figure C:36 PC NAVTEX Window

5. Locate the **N:** drive in the left column. Click on the N and the NAVTEX Server interface will display.

Note: *If you are in Operator Mode the N: drive may not be visible. Select* **Show NAVTEX Server** *on the NAVTEX feature menu to display the NAVTEX Server interface, see Figure 37 below.*

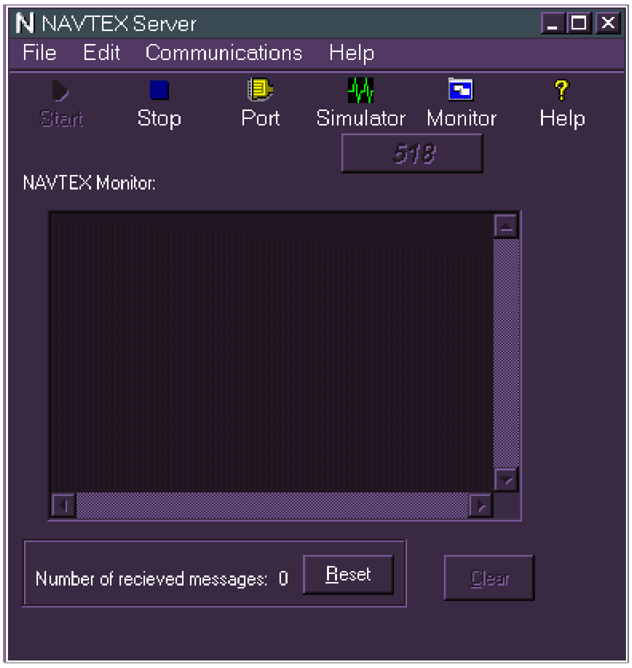


Figure C:37 NAVTEX Server Interface

6. From the NAVTEX Server top menu click **Communications** then select **Serial Port.** The **Serial Port Settings** popup window appears.

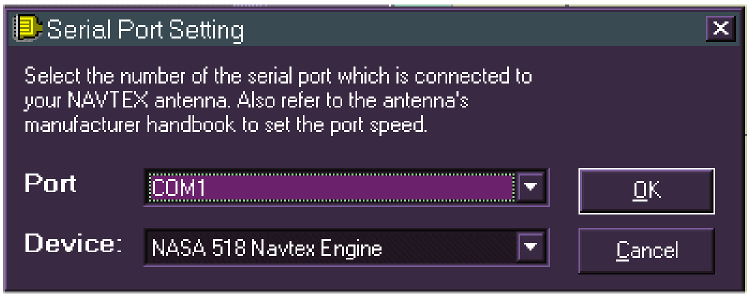


Figure C:38 Serial Port Settings

7. From the **Port** drop down list select the serial port that will be connected to the NAVTEX receiver.
8. From the **Device** drop down list select the receiver type and click the **OK** button.
9. Click **Communications** again and select **Server Settings**. All of the defaults should be correct except that the local IP Address must be 192.168.1.2 (server node), see Figure 39.

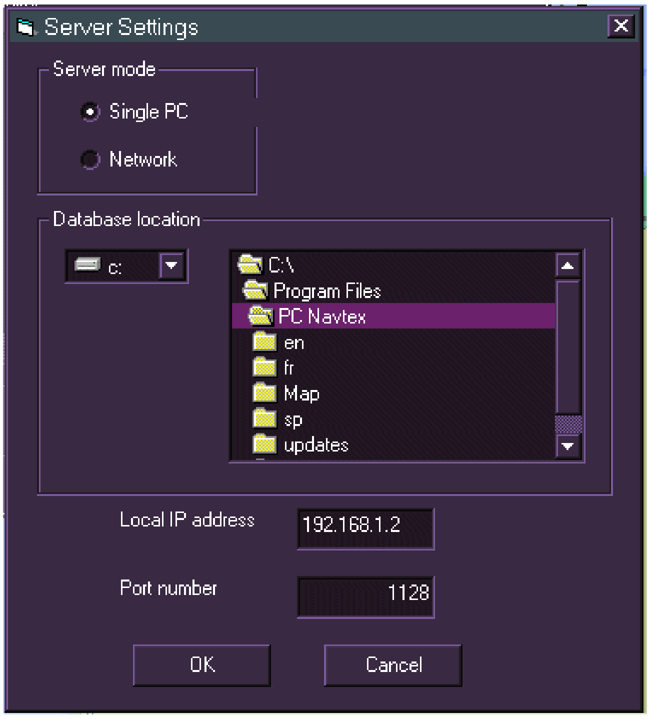


Figure C:39 Server Settings

10. When the Server Settings are correct click the **OK** button.
11. Close the NAVTEX Server/Client window by either selecting **Exit** from the File menu, or clicking the **X** at the top right corner of the window.
12. Restart the Server/Client by clicking on the **Start NAVTEX Client** button in the NAVTEX menu.

3.3.2 NAVTEX Client Software Configuration on Server Node

Important Note: *PC NAVTEX maintains separate configurations for every user. It is essential that NAVTEX is configured at each node in Operator Mode. If you configure from Service Mode the application will not work when the system is in Operator mode.*

1. On the Server open VisionMaster and from the NAVTEX menu click on **Start NAVTEX Client**. The NAVTEX Client display window opens.
2. From the Settings drop down menu select NAVTEX NMEA. The NAVTEX NMEA Port window opens, see Figure 40.

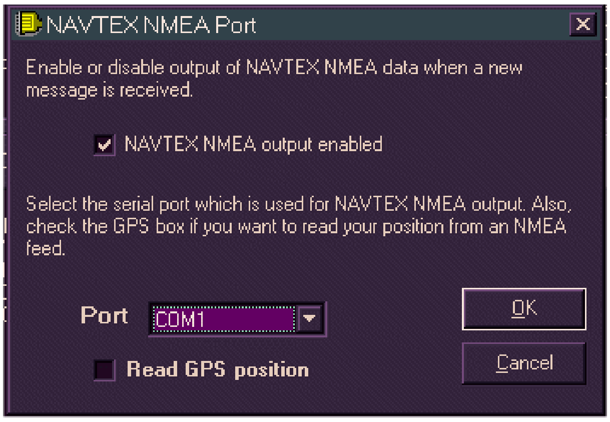


Figure C:40 NAVTEX NMEA Port

3. Untick the **NAVTEX NMEA output enabled** check box.
4. Click the **OK** button to close the window. The Client/Server configuration on the Server node is now complete.

3.4 NAVTEX Software Configuration on Client Nodes

On all nodes other than the server:

1. Open VisionMaster and from the NAVTEX menu click on **Start NAVTEX Client**. If you have not yet registered for this node the Registration window opens, click the **Continue evaluation and register later** button and then click **Continue**.
2. From the NAVTEX Client display window click on the Settings drop down menu and select **NAVTEX Server**. The Server Connection window opens showing the connection settings for a single PC Client.

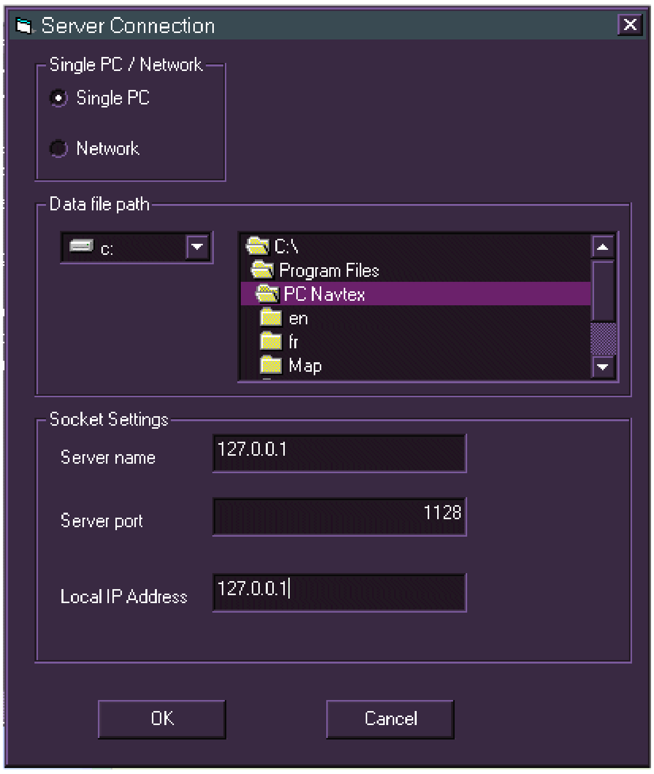


Figure C:41 Server Connection - Single PC

3. As the client will be receiving data from the remote server select **Network**.
4. Change the Data file path to **N:**.
5. Change the Server Name to the IP Address of the Server node, see **Local IP Address** (192.168.1.2) in Figure 39. If the server is on VMFT-2 the Server Connection window will look like Figure 42 below.

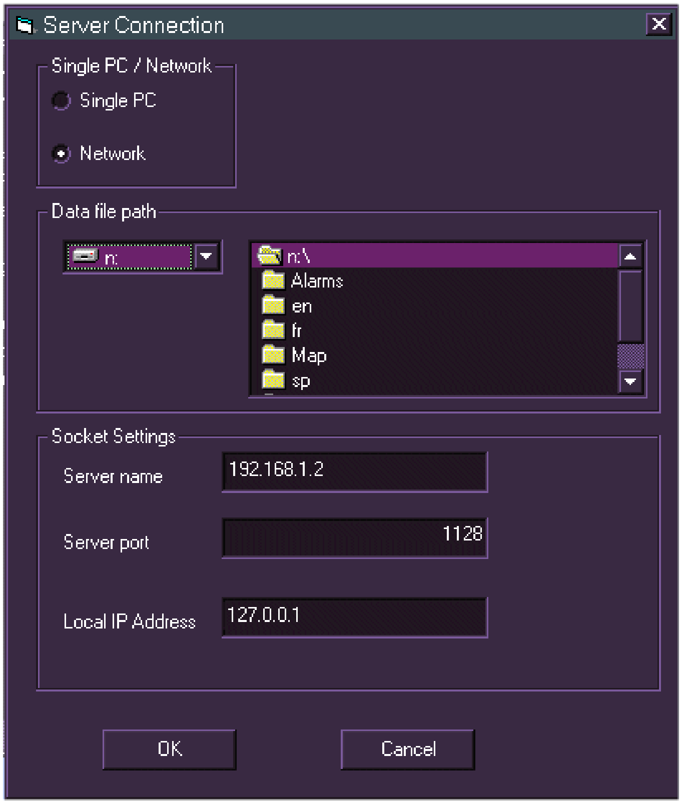


Figure C:42 Server Connection - Network

6. Click the **OK** button.
7. From the PC NAVTEX window (Figure 36) navigate to NAVTEX NMEA window (see Figure 40), untick the **NAVTEX NMEA output enabled** check box and click the **OK** button.
8. Close the NAVTEX Client window by either selecting **Exit** from the File menu, or clicking the **X** at the top right corner of the window.
9. Restart the Client by clicking on the **Start NAVTEX Client** button in the NAVTEX menu. The Client should connect to the Server and display sample messages.
10. From the NAVTEX menu click on **Show NAVTEX Server**. Stop and close the server either by selecting **Exit** from the File menu, or clicking the **X** at the top right corner of the window.
11. Repeat the process on all Client nodes in the Multi-node system.

CAUTION!

Never close the Client or Server user interface by clicking on the X at the upper right of the window. The Server must run at all times for messages to be received and the Client must be running to generate alarms. If the Client window is displayed and you want to return to VisionMaster, either click anywhere on the VMFT screen or click the minimize (_) button on the Client window.

After the clients are all installed and appear to be operating you can test the entire system as follows:

1. Start the NAVTEX client on all nodes.
2. On any client node, click one of the categories (e.g. SatNav Messages) then highlight and delete all of the messages in that category.
3. Select the same category on all other client nodes and see that the messages have been deleted. It may take up to 45 seconds for all of the messages to disappear.
4. Repeat the procedure for all categories that have messages until all of the test messages have been deleted.

3.5 Selecting a Node for NAVTEX Messages

After the Server and a number of Clients have been installed and configured, one node must be selected to provide NAVTEX messages to VisionMaster FT (VMFT). This is done by configuring a port on a NAVTEX Client to send CAM announcements via a serial port.

One node may be used to both generate NAVTEX messages from the Client and accept messages by VMFT. Or one node may be selected to generate messages and another node selected to accept them. The preferred method is to select one node for generation and acceptance, in this case two COM ports must be connected together on the same node.

All NAVTEX Messages are displayed by VMFT as Warnings (as defined in the VMFT Config tool, see Figure 34 '*External NMEA Alarm Device*').

The following options are available for messages generated from NAVTEX:

1. Audio alerts when NAVTEX messages arrive (requires speakers connected to the sound card).
2. VMFT alarms when NAVTEX messages arrive.
3. No alarms when NAVTEX messages arrive.
4. Both audio alerts and Visionmaster alarms.

Selection (1) will allow different sounds (or nor sound) for each of the 26 NAVTEX categories.

For options 1, 2 and 4 an external NMEA Alarm device must be configured, see Section 3.2.2 '*Configuring the External Announcement Provider*'.

If option 2 or 4 is selected you must enable the NAVTEX NMEA output and select a serial port to be used to send the alarms. To do this navigate to the NAVTEX NMEA popup window from the PC NAVTEX window, see Section 3.3.2 '*NAVTEX Client Software Configuration on Server Node*'. Tick the **NAVTEX NMEA output enabled** check box and select the required COM port from the **Port** drop down list.

Option 2 will generate one VMFT alarm for each NAVTEX category that has unacknowledged messages. If the operator acknowledges the alarm on VMFT the audio alert (if enabled) is silenced and the alarm moved to the acknowledged alarms list. When all of the messages in that category have been acknowledged the alarm will be removed from the list. NAVTEX messages can be acknowledged at any one node and will indicate acknowledged at every node.

CAUTION!

It is not necessary to have the NAVTEX Client running on any node for messages to be received and placed in the alarms database. However, if the Client node that is generating the messages to VMFT is <u>not</u> running then no NAVTEX alarms will be presented on any VMFT node.

If options 2 or 4 are to be used, you will need to configure the sound files (.wav) for Navtex message alarms. To do this click on the **Alarm** icon in the PC NAVTEX window. The following popup window **Message Categories and Audio Alarms** appears from where you can associate a sound file with each type of alarm generated from NAVTEX. For more information on audio alarm configuration refer to Navtex help.

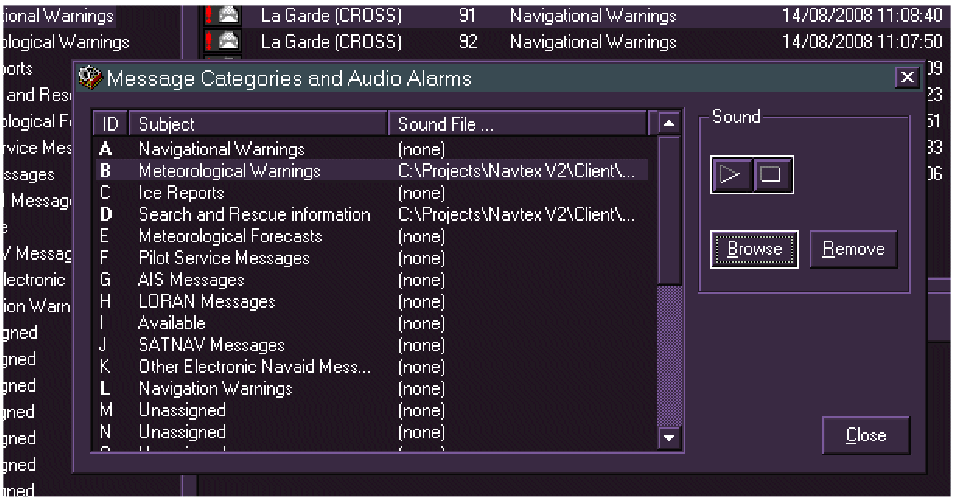


Figure C:43 Message Categories and Audio Alarms

If option 3 is to be used no external announcement provider will need to be configured. However, it is possible to enable external announcements, as described in Section 3.2.2, and just uncheck the **NAVTEX NMEA output enabled** tick box, which will result in no NAVTEX alarms on VMFT.

3.6 Configuring the NAVTEX Server for the Receiver

After the NAVTEX server has been installed and opened at the server node (either automatically after a reboot, or by clicking the **Start NAVTEX Client** button) the NAVTEX server must then be configured to use a serial port to communicate with the NAVTEX receiver.

To configure the server to communicate with the receiver:

1. Right click on the icon letter **N** in the Windows task bar. If the icon N is not visible in Operator Mode, click on **Show NAVTEX Server** button on the NAVTEX feature menu to bring up the NAVTEX Server interface, see Figure 37 on page 27.
2. Click the **Port** icon, the Serail Port Settings popup window appears, see Figure 38 on page 27.
3. From the Port drop down list select the RS422 or RS232 port that will be connected to the receiver. Select the receiver type from the **Device** drop down list.
4. Click the **Monitor** icon to view the data from the receiver.
5. If there are currently no messages being received from the Receiver click the **Simulator** icon and the server will generate messages that can be used to demonstrate or test the clients and client/server connection. Messages are displayed in the NAVTEX Server window.

Note: *If you start the Simulator you must set the receiver type to Furuno FX300. Always make sure you reset the Receiver back to the correct type after you have tested the system from the Simulator.*

6. If the server stops for whatever reason click the **Start** icon to restart it.

The node hosting the Server must always be started and the NAVTEX application opened before the Client nodes. If a Client node is started before the Server a message appears informing the operator that the connection has been forcibly rejected.

If the Server node is not running at all then each Client node will display a message indicating that it could not resolve the host computer. The Client will work correctly when the Server node is started and the NAVTEX application opened. In this case the Client software should NOT be closed, you can either minimise the NAVTEX window by clicking the _ button at the top right of the window, or click anywhere on the VisionMaster screen to automatically minimise the window.

The NAVTEX window will continue to run and will be displayed again if the **Start NAVTEX Client** button is clicked.

4 Enabling the VisionMaster Printer

The following section details steps that can be taken when a local or network printer, connected to a node PC and enabled in the Configuration tool (see Section 8.6.1 '*GUI Layout Sub System*' in Chapter 1 '*Configuration*') does not print when the **Print** button is accessed from the ECDIS lower toolbar.

1. From the Service desktop click on the **Start** button in the lower left corner and select **Control Panel**.
2. From the Control Panel window click on the **Printers and Faxes**, the printers installed on the node are listed.

The printers listed should include the installed printer (e.g. HP Officejet) and the Microsoft XPS Document Writer. The printer fault is likely to be that the XPS Document Writer is opened when the Print command is accessed. To rectify this fault:

3. Right click on **Microsoft XPS Document Writer** and select **Delete** from the popup window, see Figure 44 below.

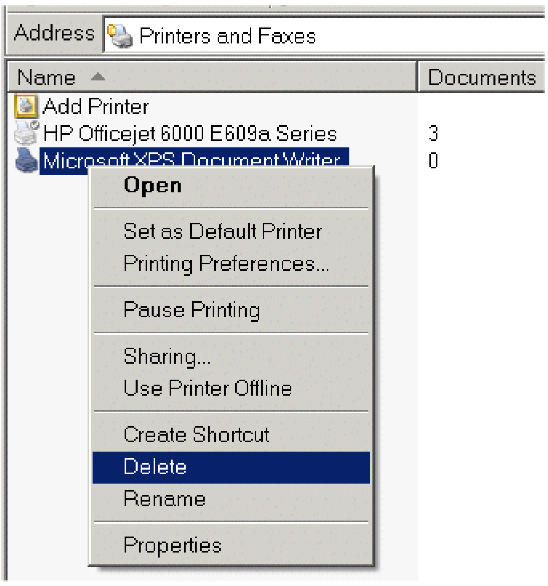


Figure C:44 Delete Microsoft XPS Document Writer

4. A prompt window appears requesting confirmation of the printer deletion. Click the **Yes** button to confirm.
5. Restart the VisionMaster application and check the printer functionality from the ECDIS main display.

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CHAPTER 2

DIAGNOSTICS, COMMISSIONING & SERVICE MODE

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 Introduction

This chapter describes the Diagnostic and Commissioning facilities in the System menu which contain system data and values, some of which may be edited by an operator who has logged on in Service mode.

It also describes the VisionMaster Service desktop, which appears when a user has entered Service Mode from the Shutdown menu.

Appendix A '*Registering and Replacing a C-MAP eToken*' describes how to register a C-MAP eToken from the Service desktop. It also describes how to replace a 32k eToken with a 72k eToken.

Note: *This chapter describes the functions available to a logged on user up to Service only. A user logged on as a Developer will have access to additional features not covered in this chapter.*

2 Diagnostics

The Diagnostics menu includes the following diagnostic sub-menu functions as a series of tab folders:

- Report
- Buzzer
- Performance Monitor (PM)
- DataLog
- Sensor Status
- Connection Status
- Time (read-only data)
- Version (read-only data)
- Tx/Rx Config (read-only data)
- Tx/Rx Data (read-only data)
- Tx/Rx BITE (read-only data)
- S/W (read-only data)

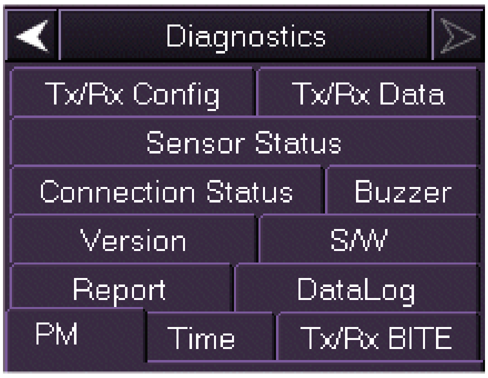


Figure 2.1 Diagnostics Menu

All the diagnostic sub-menus listed above, with the exception of **S/W,** are available to a non-logged in user.

The following sub-menus have functionality for a non-logged in user and are therefore described in the 'System' chapter of the Chart Radar User Guide and ECDIS User Guide:

- Performance Monitor (for Operator Mode only)
- Report
- Datalog
- Buzzer
- Sensor Status
- Connection Status

2.1 Time

The Time folder displays transmission time for all available transceivers and total persisted runtime data for the specific node.

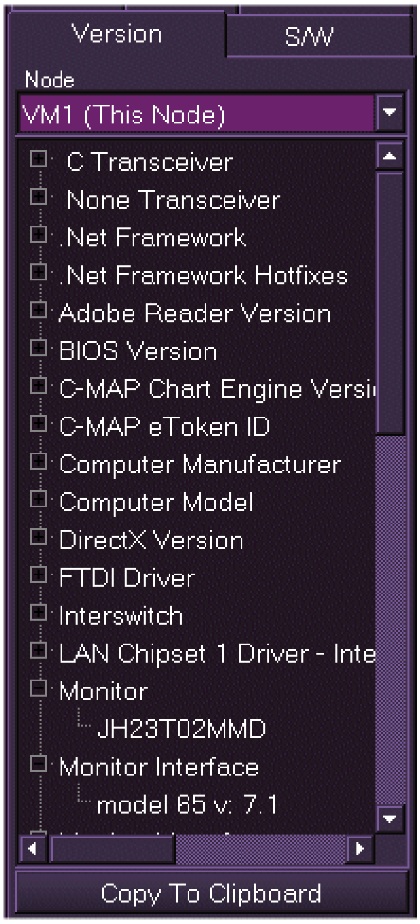
The information listed in the Time window is divided between **Time in Transmit as Master** (for transceivers) and **Total Run Time** (for nodes).

Time in Transmit as Master displays the transmission time in hours on all the available transceivers as listed in 'Interswitch Control' in the Radar menu. The transmission time will increment while the transceiver is transmitting as Master. When the transceiver is put into Standby, or its status changes to Slave, then the run time stops.

On a Client/Server Radar system the transceiver transmission times are collated by the server for Client node access.

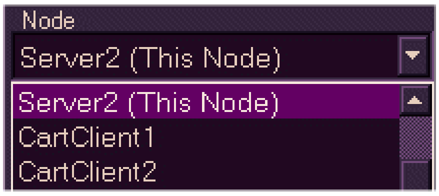
Total Run Time displays the total operational time in hours of the Workstation.

2.2 Version



The Version folder includes information on the components used by the particular node.

If your system is a Multi-Node or Client/ Server Radar then data on other nodes may be accessed. To view version information on other nodes in the system click on the node drop down arrow and select the required node from the list.



To view component details, expand the navigation tree by ticking the required component's check box.

- A Transceiver
  - S/W version of transceiver for selected node
- B Transceiver*
  - S/W version of transceiver
- Net Framework
  - Net runtime service packs
- Net Framework Hot Fixes
  - If applicable, otherwise None.
- Adobe Reader Version
  - version number
- BIOS Version
  - ROM BIOS version
- C-MAP Chart Engine Version†
  - chart engine version number
- C-MAP eToken ID*
  - Sperry Marine eToken ID number
- Computer Manufacturer
  - name of PC manufacturer

* Applies when running Dual Radar
† Appear if C-MAP files are configured.

- Computer Model
  - name and number of PC model
- Direct X Version
  - version number
- FTDI Driver
  - driver number
- IMO Number
  - 8-digit reference number
- Interswitch
  - version number
- LAN ChipSet 1 Driver
  - version number
- Motherboard drivers
  - version number
- Motherboard Memory
  - amount of memory in MB
- Motherboard Processor (and Motherboard Processor 2*)
  - type and power of CPU
- Own Ship Name
  - name assigned to own ship
- PCIO compass board
  - standard or special
- PCIO firmware
  - version number
- SC Hardware Type
  - type of scan converter (SC) card, e.g. 0.SC3
- SC3/SC4 driver/firmware
  - driver and firmware version of SC card.
- Security Block Provider
  - Aladdin eToken
- Security Block Serial #
  - serial number
- Security Block Version
  - version number
- SevenC's ChartHandler version
  - version number of ChartHandler

* Applies when running Dual Radar.

- SevenC's GeoSym Presentation Library Version
  - GeoSym version number and date
- SevenC's Kernel Version*
  - Kernel version number
- SevenC's S-52 Presentation Library
  - SevenCs presentation library version number
- SevenC's ShartCoat Version
  - ShartCoat version number
- SQL Server Version
  - Microsoft SQL Server version
- TotalTide
  - TotalTide application version number
- Video Card
  - type and version of video card
- Video Driver/Version
  - type and version of video driver
- VisionMaster FT Version
  - system software version
- VLC version
  - software version number of VLC
- Windows Service Pack
  - service pack number
- Windows Version
  - Microsoft Windows version

You can copy all the Version data by clicking on the **Copy To Clipboard** button at the bottom of the folder. The information is saved to the Windows clipboard and from there can be pasted to an external program or device.

* If SevenCs files are configured, shows the SevenCs kernel version

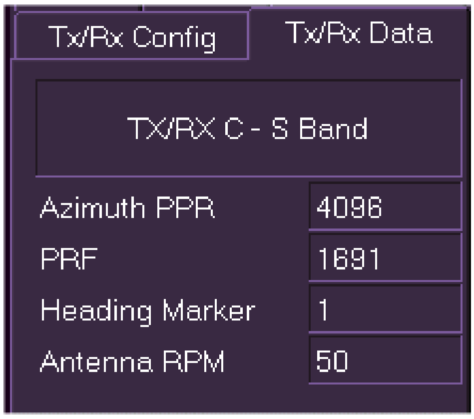
2.3 TX/RX Configuration

The following data received periodically from the currently selected transceiver (transmitter/receiver) is displayed for information in the Configuration folder:

- **Transceiver Type** BridgeMaster (BM) E, BM generation or Unknown.
- **Transceiver Band** X band (3 cm), S band (10 cm) or Unknown.
- **Transmitter Power**
  X band is10 kW, 25 kW or Unknown.
  S band is 30 kW or Unknown.
- **PM** (Performance Monitor) Fitted or Not Fitted.
- **Slave Only** Yes if the transceiver is configured as Slave only, otherwise No.

For other manufacturers' transceivers all data shown, apart from the Transceiver Type, is displayed as Not Available.

2.4 TX/RX Data

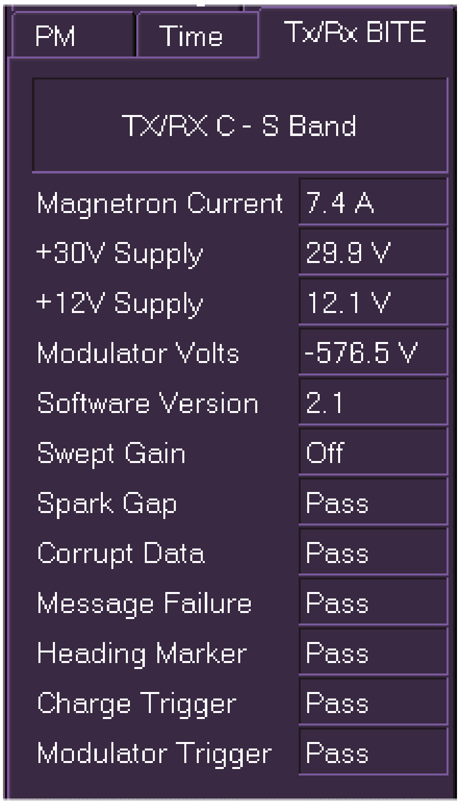


The following data for the currently selected transceiver (transmitter/ receiver) is displayed in the Tx/Rx Data folder when the system is in Transmit.

- Azimuth Pulse Count (between heading markers)
- Pulse Repetition Frequency (PRF)
- Current Heading Marker (1 or 0)
- Antenna revs per minute (RPM)

2.5 TX/RX BITE

When connected to a BridgeMaster (BM) E or BM II transceiver the following test results, except where indicated, are displayed on the transceiver's Built In Test Equipment (BITE) folder.



- Instantaneous magnetron current.
- Instantaneous +30V supply line voltage.
- Instantaneous +12V supply line voltage.
- Instantaneous modulator volts - BME transceivers only.
- Software Version
- Swept gain setting (on/off) - BME transceivers only.

If the connected transceiver is not a BME or a BM II all the BITE data is displayed as being unavailable. The BITE data is available for display irrespective of the display's Master/Slave or standby/transmit state.

The state of the following parameters for the currently selected transceiver is periodically monitored in both standby and transmit. If any of the available parameters indicate a failure, a BITE alarm is raised.

- Spark gap
- Corrupt data
- Message failure
- Heading marker
- Charge trigger - BME transceivers only.
- Modulator trigger - BME transceiver only.

2.6 Performance Monitor

The Performance Monitor (PM) facility allows the operator to detect degradation in the performance of the transceiver.

The PM facility is available when:

- the display is a Master display and is in Transmit mode.
- the connected transceiver is fitted with performance monitoring equipment.

The PM has two modes of operation:

- System Mode (default) which monitors the performance of the overall system.
- Receiver Mode which monitors the receiver path for incoming signals, including the receiver located in the Transceiver unit.

The following table summarises which values are adjustable in each mode:

Table 1: Performance Monitor - modes of operation

PM Mode		System PM tune level	Receiver PM tune level	XR adjust	XT adjust
Normal operation	System monitoring	Yes	No	No	No
	Receiver monitoring	No	Yes	No	No
Commissioning	System monitoring	Yes	No	Yes	No
	Receiver monitoring	No	Yes	No	Yes

While the PM is On any configured Sector Blanking is suppressed with an appropriate warning. If Video Build-Up is On it is automatically turned off.

2.6.1 Performance Monitor Operation

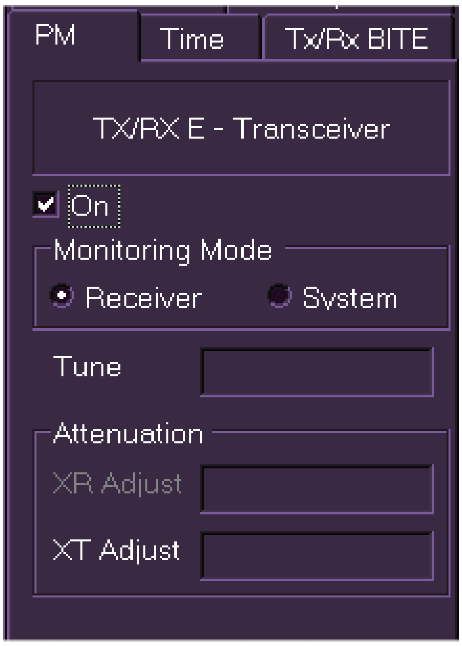
The PM folder displays the current operational Transceiver (Tx/Rx), selected from the Radar menu, see *'Interswitch Control'* in the VisionMaster FT User Guide.

With reference to the User Guide, select the following operating parameters:

- Master Display (Interswitch systems)
- Transmit mode
- Range scale of 12 NM
- Long Pulse (LP) transmission pulse rate
- Manual clutter selection with A/C Rain and A/C Sea set to minimum
- Radar tuning mode to AFC on
- Gain setting at optimum level (if the setting is too low or too high the four tuning arcs may not be visible).

2.6.1.1 Adjusting the PM in Service Mode

To turn on the PM tick the check box next to On.



Note: *If sector blanking is active the system displays a warning prompt informing the operator that sector blanking is inhibited while the PM is switched on.*

When the PM is accessed in Service mode the Monitoring Mode (Receiver or System) and Attenuation (XR or XT) tune levels can be adjusted. The default for the tune values is the lowest value of the performance monitor tune range.

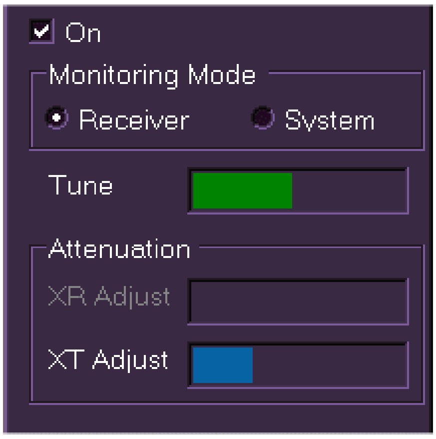
The monitoring mode selected will determine the attenuation adjustment available. Receiver mode enables XT to be adjusted; System mode enables XR to be adjusted.

Note: *When the PM is operational and the monitoring mode tuning level is being adjusted, four arcs are shown on the video circle. These arcs are approximately 0.3NM apart and start at a range scale of between 6NM to 10NM. The arcs extend from 290° to 320° (S Band), or from 155° to 185° (X Band), with respect to the heading line. The precise bearing value will alter depending on the Heading/ Stern line offset value.*

CAUTION!

The adjustment of the attenuation (XR or XT) tune levels should only be done when a major component such as the magnetron or receiver is changed.

To adjust the Performance Monitor, do the following:



1. Select Receiver monitoring mode by clicking the Receiver radio button, the XT Adjust in the Attenuation area becomes active.
2. Left click in the XT Adjust bar to activate the control, the bar will appear blue.
3. Move the trackball to the left to set the XT Adjust to minimum.
4. Left click in the **Tune** bar to activate the control. The current tuning level is shown as a green bar.
5. Move the trackball to the left to set the tune bar to minimum, while adjustment is in progress the tuning bar colour changes to blue.
6. Slowly move the trackball to the right to display maximum presentation of the four PM arcs that should be visible in the following video sectors: 290^{o} to 320^{o} for S -band and 155^{o} to 185^{o} for X-band.
7. Left click in the XT Adjust bar again and slowly move the trackball to the right to increase the XT bar until the outermost arc is just visible in the noise background.
8. Repeat steps 4 to 6, moving the trackball to left and right to achieve maximum visibility of the four arcs.
9. If necessary repeat step 7 so that the outermost arc is just visible in the noise background.
10. Select System monitoring mode and repeat the steps listed above but adjusting the XR attenuation rather than the XT.

If any value is adjusted the new value is stored and restored both upon power up and when interswitching as Master to a transceiver. A different set of tune values are maintained for each transceiver.

2.6.1.2 Adjusting the PM in Operator Mode

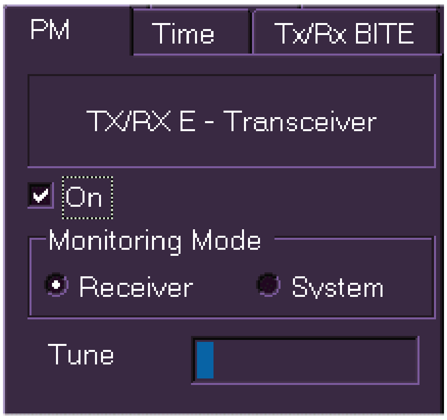
A non-logged on user can operate the PM and adjust the monitor mode (Receiver or System) tune levels to determine if there has been a drop in performance.

The ability to adjust the attenuation (XR or XT) tune levels is not available in operator (non-logged on) mode.

Note: *In Operator mode the PM switches off automatically after 10 seconds.*

To adjust the PM in Operator mode, do the following:

1. With the Monitoring Mode check box On select Receiver by clicking the **Receiver** radio button. The current tuning level is shown as a green bar.
2. Left click in the **Tune** bar to activate the control and move the trackball to the left to set the tune bar to minimum. While adjustment is in progress the tuning bar colour changes to blue.



3. Slowly move the trackball to the right to display maximum presentation of the four PM arcs that should be visible in the following video sectors: 290^{o} to 320^{o} for S -band and 155^{o} to 185^{o} for X-band. The number of arcs displayed shows the current performance.
4. Select System monitoring mode and repeat steps 1 to 3.

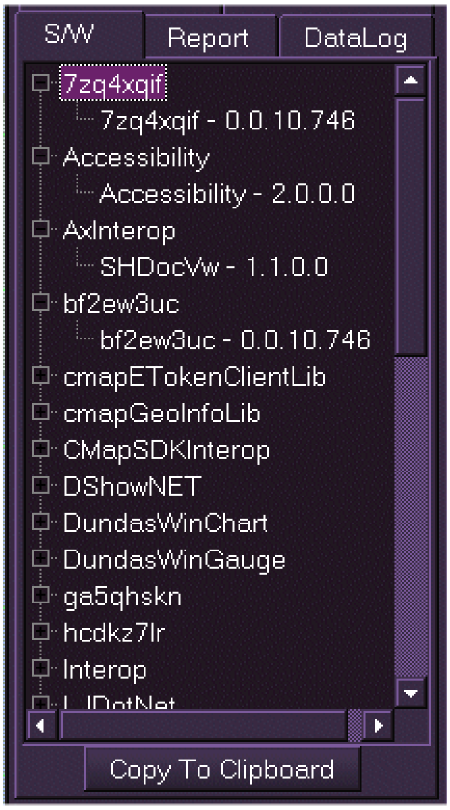
Note: *The arcs are spaced at 5dB intervals. If during operation performance decreases below the second arc, it shows a 10dB drop in performance.*

2.7 (S/W) Software

The S/W (Software) folder includes version information of all the operational software included on the system, including charting (CMAP and/or SevenCs) data. To view software component details, expand the navigation tree by ticking the required component's check box.

Data used during operation and stored in the Software folder is protected in such a way, that necessary modifications and amendments by the user cannot endanger its integrity and correctness.

You can copy all the Software data by clicking on the **Copy To Clipboard** button at the bottom of the folder. The information is saved to the Windows clipboard and from there can be pasted to an external program or device.



3 Commissioning

The Commissioning menu includes the following commissioning sub-menu functions as a series of tab folders:

- Login
- Video
- Tx/Rx
- Authorization
- Config Update
- Service
- Characteristics

A non-logged on user may access data, or enter data in the following folders:

- Login - enter a user name and password
- Authorisation - enter and submit a temporary password
- Config Update - enables the configuration to be exported to a external device, and a modified configuration imported back to the system.
- Characteristics- select ship loading state and alternate bow (if configured).
- Service - display Port Monitor, Port Logging and PCIO Diagnostic forms.

For a description of Authorisation, Config Update, Characteristics and the Service functions available to a non-logged on user, refer to the relevant sections in the System chapter of the VisionMaster User Guides.

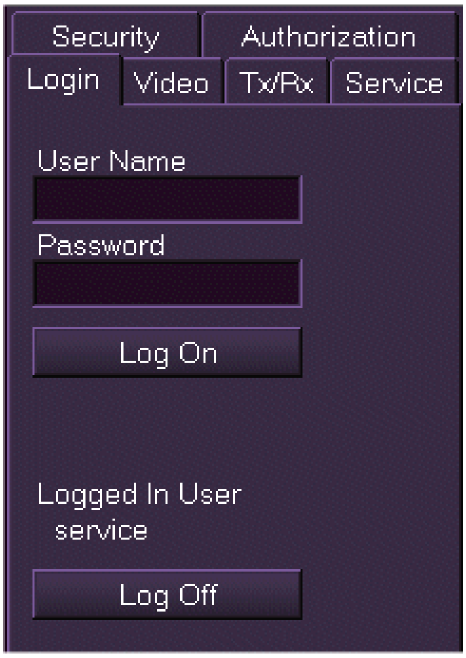
All other Commissioning functions will be displayed as read-only information to a non-logged on user. Editing these functions can only be made when a user is logged on in Service mode.

When the user is logged on in Service mode the Commissioning menu shows the following additional sub menu functions:

- Security
- Logging Control

Figure 2.2 Commissioning Menu in Service Mode

3.1 Login



This function enables a suitably qualified user to access locked system processes by entering a user name and password.

When the Login tab folder is accessed the window confirms the current login functionality. If no user has logged on the authenticated user is shown as `None'. When a user has successfully logged on the window confirms the login status, e.g. **Logged In User service**.

The system defines the following set of user groups (see Section 3.5 '*Security*'):

- Developer
- Field Engineer
- Ship Administrator
- Seaman

With the exception of `Seaman' which usually refers to a user of the system with no Login rights, each user group includes access to system processes that may not be available to the user group lower in the list.

Note: *A user logged on in Service mode has access to system processes up to a Field Engineer user group.*

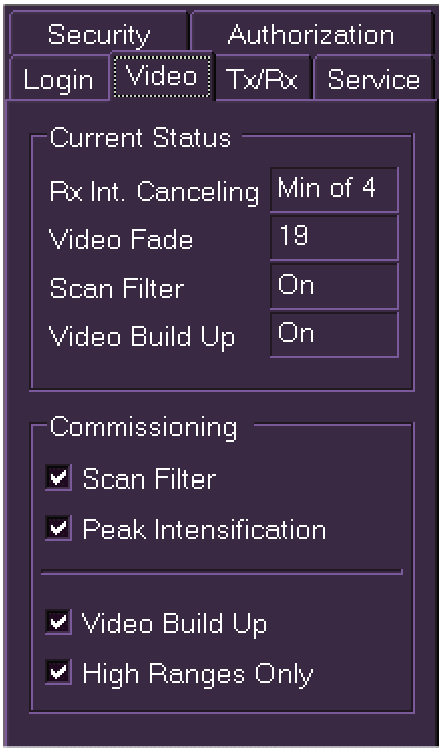
To log onto the system do the following:

1. Left click in the **User Name** field, the alphanumeric keypad appears.
2. Enter a user name using the keypad, e.g. **service**.
3. Move the cursor to the **Password** field and enter a password which should be supplied by your administrator.
4. With the username and password entered click on the **Log On** button. The system authenticates the data entered against a database of known users. Where the Login data is authenticated the system displays additional system processes.

On a multi-node system user authentication is provided independently on each node.

When a user is logged on in Service, the Service Mode desktop can be accessed from the Shutdown menu, see Section 4 '*Service Mode*'.

3.2 Video



The Video tab folder shows the video enablement settings and read-only data transmitted from the Transceiver. The information is divided into the following two areas:

1. Current Status
2. Commissioning

The Commissioning area comprises four tick boxes which control the Scan Filter and Video Build Up enablement in the Current Status area.

Note: *The Commissioning settings can only be made by a user logged on in service mode. If the user has not logged on, or has no Login rights, these settings are greyed out.*

The Current Status area displays the following:

- **Receiver Int. Canceling** - the receiver interference-canceling value is selected automatically and is read only.
- **Video Fade** - shows the decrement readout being applied to fade the video. The readout updates in real time.
- **Scan Filter** - Scan Filter can be turned On or Off by ticking the **Scan Filter** check box in the Commissioning area. If Scan Filter is **On** then **Peak Intensification** can be enabled by ticking its check box. If Scan Filter is **Off** then this setting is not available.

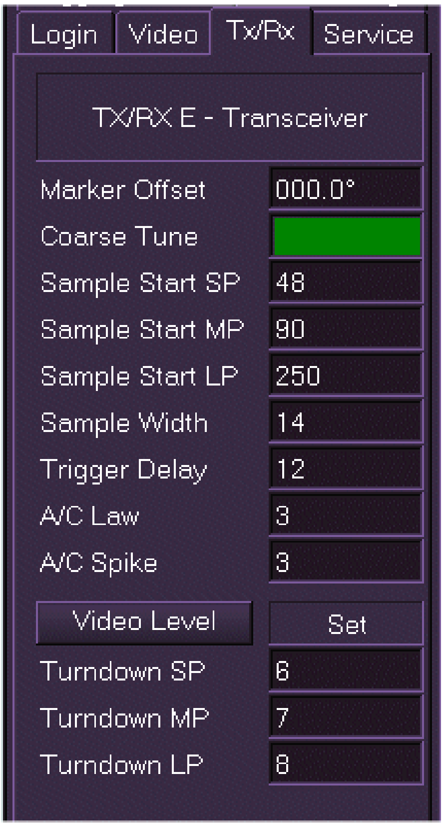
  The system default is for Scan Filter to be enabled with peak intensification selected. Scan Filter is available on range scales of 0.75NM or greater. If the range scale is less than 0.75NM then **Scan Filter** is automatically turned Off.

- **Video Build Up** - Video build up can be turned On or Off by ticking the **Video Build Up** check box in the Commissioning area. If Video Build Up is **On** then **High Ranges Only** can be enabled by ticking its check box. If **Video Build Up** is **Off** then this setting is not available.

  The system default is for video build up to be enabled only on range scales of 3 NM or greater (or a scale ratio of 1:40,000 or greater on an ECDIS). If the range scale is less than these values then video build up is automatically turned Off.

3.3 Tx/Rx Settings

A group of settings are stored in each display for all the Transceivers with which the display can operate.



3.3.1 Selecting the Required Transceiver

If a six way Interswitch is fitted, settings can be entered for up to six transceivers, which are identified by letter ranging from A to F. If a two way Interswitch is fitted then only Transceivers A and B may be selected.

To select the required Transceiver:

1. Navigate to **Interswitch** in the Radar menu. The Interswitch window lists all available Transceivers.
2. To select the transceiver left click in the Transceiver radio button.

3.3.2 Setting the Tx/Rx Parameters

The following transceiver parameters require the display to be in Transmit mode for visual feedback of the video. If the display is part of an interswitched system it must be connected to the appropriate transceiver if the parameters are to be reset. All the data is stored in real time when altered and restored at power on.

Note: *On a multi-node system, the settings for each Transceiver must be the same on all nodes.*

The procedure for adjusting all of the parameters in the Tx/Rx menu, except the Video Level and Coarse Tune settings, is as follows.

1. Position the screen cursor over the setting to be changed and left click. the text changes to green (editable).
2. Move the trackball left or right to change the setting to that required and left click to exit edit mode.

Alternatively, a right click will reveal a drop down numeric keypad from which a setting can be entered.

Information on the individual parameters of the Tx/Rx settings is given below.

3.3.2.1 Marker Offset

The marker offset is the value of the heading marker, offset in degrees, and is the angular amount required to align the heading marker with the compass of the ship. This adjustment is present to allow compensation for the combined errors in physical positioning of the scanner unit and the 'squint angle' of the antenna.

The marker offset values are: minimum = 0°, maximum = 359.9°, system default = 10°.

If more than one turning unit is connected to the display the marker offset is retained and automatically applied when the transceiver for each turning unit is selected.

3.3.2.2 Coarse Tune

The coarse tune level allows the centre tune frequency to be set up for the transceiver, the system default is set to the center value of the AFC tune range. A different level can be stored for each transceiver and restored both at power on and when the transceiver is selected.

The current level of coarse tuning is indicated by the green shaded bar adjacent to the **Coarse Tune** caption. This bar indicates the tune level with the minimum to the left, and maximum to the right.

It will only be possible to set the coarse tuning if the Display is a master to the transceiver and the user is logged on as a service engineer.

Before coarse tune adjustment can be made, do the following:

1. Select Transmit mode and select LP (long pulse) for the transmission pulse length.
2. Select a range scale of 12 NM or above.
3. Set the transceiver tuning indicator to **Man** (Manual) tuning (i.e. AFC off).

To adjust the coarse tuning:

1. Left click on the coarse tune bar to make the bar active. The bar colour changes from green to blue.
2. Move the trackball left to reduce the coarse tuning bar to minimum, then slowly move the trackball to the right to increase the tuning bar percentage.
3. Adjust the coarse tuning bar so that the fine tuning bar at the bottom left of screen is at maximum after its first minimum point has been reached.
4. Left click to set the level and de-activate the coarse tuning bar. The bar will return to its green shaded state.
5. If radar returns are available, select AFC, and confirm that the radar returns are not seriously degraded. If they are, repeat the adjustment and ensure that the first tuning maximum is selected.

3.3.2.3 Video Level

The signal level of the video received from the transceiver is monitored at regular intervals when the display is in transmit.

If the level falls below a low video level threshold a video alarm is raised. The video alarm is automatically cleared If the monitored video level is greater than the low video level threshold, or the transceiver is in standby.

The Video Level indicates whether the radar video input level to the display processor has been set up.

Note: *It is essential that the Coarse Tune level is set before setting the Video I/P level.*

Note: *The video level must be set up for each transceiver at each display.*

The Video Level should ONLY be set when the Master is transmitting in LP (long pulse). The default is **Unset**, but after the set up procedure has been initiated, it will show **Set**, **Low** or **High** as appropriate.

When video is set too low, or there is no video input **Low** is displayed, where video input is present **Set** or **High** are displayed. If the set-up procedure is unable to set the video level **Unset** is displayed.

1. Click on the **Video Level** button to initiate the set up procedure. The button changes to **Setting** and the procedure begins.
2. When the procedure is complete the button changes back to **Video Level**. The result of the set up procedure is shown after a period in the field adjacent to the button.

3.3.2.4 Sample Start

Displays the sample pulse start for all pulse lengths (SP, MP and LP) in units of metres. Minimum for all pulse lengths = 6, maximum for all pulse lengths = 350. The system default values are: 48 (SP), 90 (MP) and 250 (LP).

The following table summarises which values should be input, according to the height of the antenna above sea level.

Table 2: Sample Start Parameters

Antenna Height (metres)	Short Pulse (SP)	Sample Start Medium Pulse (MP)	Long Pulse (LP)
0-10	48	90	250
11-20	75	150	250
21-30	100	150	250
31-40	130	180	250
41-50	160	200	260
51-60	180	200	280

3.3.2.5 Sample Width

Displays the sample pulse width in units of metres (minimum = 6, maximum = 70, system default = 14).

It should not normally be necessary to change these settings from their default values.

3.3.2.6 Turndown

Displays the video turndown for all pulse lengths (SP, MP and LP) in dimensionless units.

Minimum video turndown for all pulse lengths = 0, maximum video turndown for all pulse lengths = 15. The system default values are: 6 (SP), 7 (MP) and 8 (LP).

It should not normally be necessary to change these settings from their default values.

3.3.2.7 Trigger Delay

Displays the trigger delay in units of metres. (minimum = 6, maximum = 350, system default = 12).

Note: *Default is adjusted by RF feeder length in initialisation if Bulkhead Transceiver is fitted.*

For this setting, the radar must be set to the shortest practicable range, and the value adjusted to display known features at the correct range. Echoes from quaysides should appear straight with no 'pushing' or 'pulling' near the centre of the picture.

3.3.2.8 A/C Law

Displays the Anti-Clutter (A/C) law in dimensionless units. (minimum = 0, maximum = 7, system default = 3).

Refer to the table below for the required setting for the A/C Law.according to the height of the antenna above sea level.

Table 3: A/C Law Settings

Antenna Height above sea level (m)	A/C Law Setting
32 and above	7
28 - 31	6
24 - 27	5
20 - 23	4
16 - 19	3
12 - 15	2
4 - 11	1
3 and below	0

3.3.2.9 A/C Spike

Displays the A/C spike in dimensionless units. (minimum = 0, maximum = 3, system default = 3).

It should not normally be necessary to change this setting from its default value.

3.3.3 Selecting and Setting other Transceivers in Interswitched Systems

1. Use the procedure given in Section 3.3.1 to select the next transceiver.
2. Use the procedures given in Section 3.3.2 to set the TX parameters for the selected transceiver.

Repeat steps 1 and 2 above until all system transceivers have been set up.

3.3.4 Transceiver Alarms

A transceiver communications alarm is raised if a valid message has not been received from the transceiver for more than 3 seconds. The alarm is raised regardless of the display's standby/transmit status.

A trigger error alarm is raised when the transceiver is in transmit and there are fewer valid triggers than expected.

An azimuth error alarm is raised when the transceiver is in transmit and either:

- the number of azimuth pulses between heading markers is greater or less than a margin of error of 5 pulses centered on a nominal value of 4096 pulses; or
- the number of pulses per revolution is within the margin of error, but a small error persists for a period of time (e.g. 4095 pulses per rev are received continually).

The azimuth error alarm are cleared when:

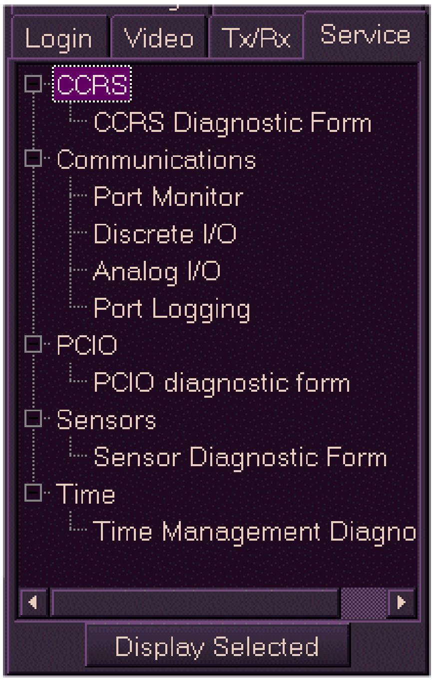
- Neither of the alarm conditions is satisfied; or
- The transceiver is switched to standby.

When the transceiver is in transmit a heading marker error alarm is raised if a heading marker has not been received for more than 10 seconds. If a heading marker has not been received for more than 30 seconds the Master Display automatically switches the connected transceiver to standby.

The heading marker error alarm is cleared when:

- A heading marker is received; or
- The transceiver is switched to standby.

3.4 Service



The Service tab folder displays the following navigation tree items:

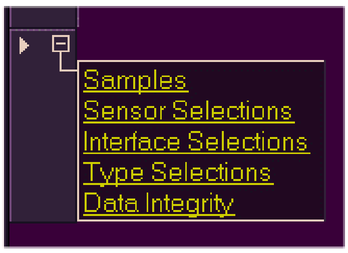
- CCRS
  - CCRS Diagnostic Form
- Communications
  - Port Monitor
  - Discrete I/O
  - Analog I/O
  - Port Logging
- PCIO
  - PCIO diagnostic form
- Sensors
  - Sensors Diagnostic Form
- Time
  - Time Management Diagnostic Form

The Port Monitor and Port Logging Communications functions, and the PCIO diagnostic form are available to a non-logged on user and are therefore described in the VisionMaster User Guides.

3.4.1 CCRS

The Consistent Common Reference System (CCRS) Diagnostic Form provides for the viewing of various types of data that describe the state of the ship, and which are usually received via sensors, or in some cases computed from one or more sensors' data, or entered manually.

To view CCRS Diagnostic Form click on the CCRS **+** button, highlight the item in the tree menu and click the **Display Selected** button at the bottom of the tab folder. From the CCRS Diagnostic Form window click on the **+** box to the left of the window. The following different types of CCRS forms are listed as hyperlinks in a flyout window:



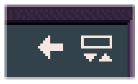
- Samples
- Sensor Selections
- Interface Selections
- Type Selections
- Data Integrity

All CCRS diagnostic forms include a number of information filtering options in the form of radio buttons, including the following:

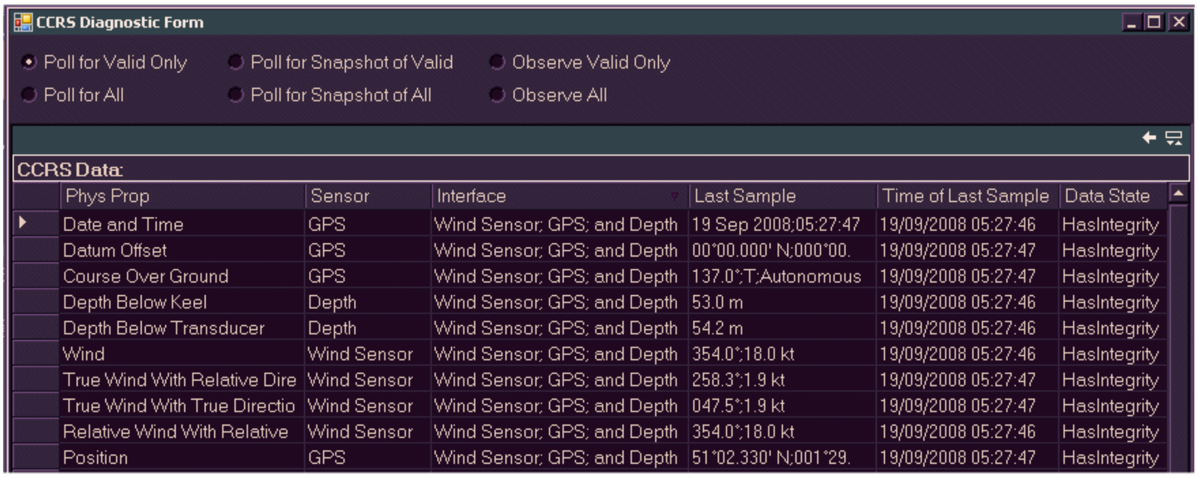
- Poll for All/Poll for Valid Only
- Poll for Snapshot of All/Snapshot for Valid

- Observe All/Observe Valid Only

To return to the list of hyperlinks after a CCRS Diagnostic form has been opened, click on the white arrow graphic at the top right of the list.



The information in the columns may be re-arranged by clicking on the column title. For example, to list the physical properties in alphabetical order click on the **Phy Prop** column title. Or, to list the configured sensor data starting from the top of the form, click the **Sensor** or **Interface** column titles, see Figure 2.3 below.



Phys Prop	Sensor	Interface	Last Sample	Time of Last Sample	Data State
Date and Time	GPS	Wind Sensor; GPS; and Depth	19 Sep 2008;05:27:47	19/09/2008 05:27:46	HasIntegrity
Datum Offset	GPS	Wind Sensor; GPS; and Depth	00°00.000' N;000°00.	19/09/2008 05:27:47	HasIntegrity
Course Over Ground	GPS	Wind Sensor; GPS; and Depth	137.0°;T;Autonomous	19/09/2008 05:27:47	HasIntegrity
Depth Below Keel	Depth	Wind Sensor; GPS; and Depth	53.0 m	19/09/2008 05:27:46	HasIntegrity
Depth Below Transducer	Depth	Wind Sensor; GPS; and Depth	54.2 m	19/09/2008 05:27:46	HasIntegrity
Wind	Wind Sensor	Wind Sensor; GPS; and Depth	354.0°;18.0 kt	19/09/2008 05:27:46	HasIntegrity
True Wind With Relative Dire	Wind Sensor	Wind Sensor; GPS; and Depth	258.3°;1.9 kt	19/09/2008 05:27:47	HasIntegrity
True Wind With True Directio	Wind Sensor	Wind Sensor; GPS; and Depth	047.5°;1.9 kt	19/09/2008 05:27:47	HasIntegrity
Relative Wind With Relative	Wind Sensor	Wind Sensor; GPS; and Depth	354.0°;18.0 kt	19/09/2008 05:27:46	HasIntegrity
Position	GPS	Wind Sensor; GPS; and Depth	51°02.330' N;001°29.	19/09/2008 05:27:47	HasIntegrity

Figure 2.3 CCRS Data: Samples Form

3.4.1.1 Samples

The CCRS Data: Samples form lists all the sensor data types available on the system as physical properties. If the physical property has not been configured to provide sensor data then the row will display **(null)** in all subsequent columns. The Samples form includes the following columns:

- **Physical Properties** - a list of all available data types (e.g. Date and Time, Temperature etc).
- **Sensor** - the sensor which provides data for this physical property (e.g. GPS, Gyro etc.)
- **Interface** - the interfaces which acquire the received sensor data (e.g. PCIO Control port, PCI Serial Ports or Computed Data).
- **Last Sample** - the data value last sampled from this sensor (e.g. kt, metres, bearing etc.)
- **Time of Last Sample** - the date and time (in hours, minutes and seconds) of the last sample.
- **Data State** - the integrity of the data, i.e. 'Has Integrity', 'Plausable' or 'Usable'.

3.4.1.2 Sensor Selections

The CCRS Data: Sensor Selections form includes the data displayed in the first two columns of the Samples form, i.e. Physical Properties and Sensor.

3.4.1.3 Interface Selections

The CCRS Data: Interface Selections form includes the data displayed in the Sensors and Interfaces columns of the Samples form. Note that only configured sensors and interfaces are displayed on this form.

3.4.1.4 Type Selections

The CCRS Data: Type Selections form includes specific types of data in the Physical Properties column, i.e. Vessel Direction, Heading, Speed and Wind, and the sensor types that provide this data. For example, Speed data can be provided from a GPS, Log or echo reference sensor.

3.4.1.5 Data Integrity

The CCRS Data: Data Integrity form list the type of sensor which <u>may</u> provide data for the configured physical properties, and the integrity of that data provided. For example, Position data may be provided by GPS, DR (dead reckoning) or Manual Positioning; GPS and DR data 'Has Integrity', whereas data provided by manual positioning has only a data state of 'Usable'.

3.4.2 Communications

The Communications sub menu enables the following data to be viewed:

- Port Monitor - view data received from a selected port and data sent from the display to the port. Available for display to a non-logged on user.
- Discrete I/O - displays data on discrete outputs and discrete inputs configured for the system.
- Analog I/O - displays data on analog outputs and analog inputs configured for the system.
- Port Logging - enables data sent and received from a specified port to be captured and timestamped. Logged data can then be saved to an external device. Available for display to a non-logged on user.

The following sub-sections describe the Discrete I/O and Analog I/O diagnostics.

3.4.2.1 Discrete I/O

The Discrete I/O window lists the configured discrete outputs and inputs on the node. If no discrete I/Os have been configured, the window is blank.

Note that the settings in the State and Pattern columns are greyed out; these settings are developer configurable only.

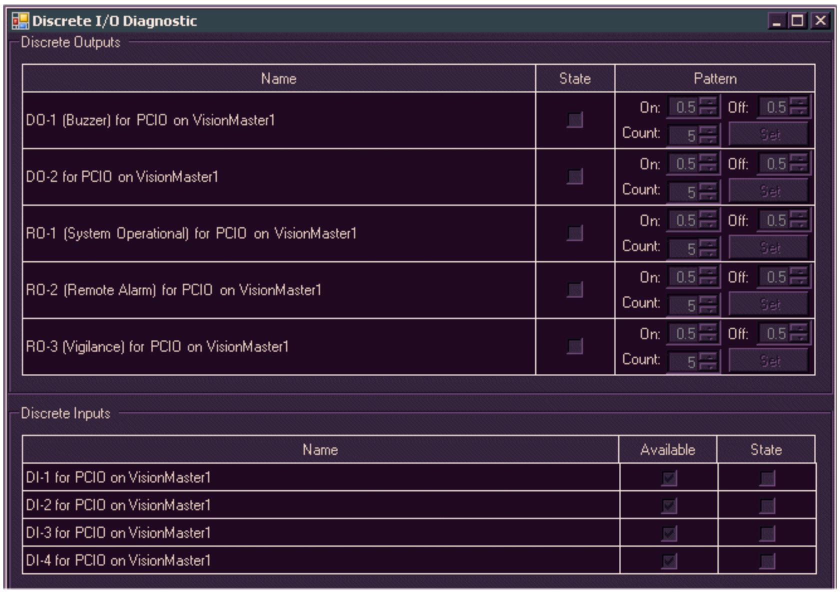


Figure 2.4 Discrete I/O Diagnostic

3.4.2.2 Analog I/O

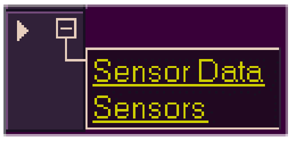
The Analog I/O window lists the configured analog outputs and inputs on the node. The window includes the names of the Outputs and Inputs and the minimum & maximum voltages. If no analog I/Os have been configured, the window is blank.

Figure 2.5 Analog I/O Diagnostic

3.4.3 Sensors

The Sensors Diagnostic form provides for viewing of information on all configured sensors listed in the Sensors Database.

From the Sensors Diagnostic Form window click on the **+** box to the left of the window. The following two types of Sensor forms are listed as hyperlinks in a flyout window:



- Sensor Data
- Sensors

Each Sensor form includes two information filtering options in the form of radio buttons:

- Poll Sensors
- Observe Sensors

To return to the hyperlinks after a Sensors Diagnostic form has been opened, click on the white arrow graphic at the top right of the list.

The Sensors Data diagnostic form includes detailed data on all configured sensors.

The Sensors diagnostic form list each sensor, its interface, physical properties and location (if configured).

The information in the columns may be re-arranged in alphabetical order by clicking on the column title.

3.4.4 Time

The Time Management diagnostic form lists read-only data in the form of date and time values (hours, minutes and seconds).

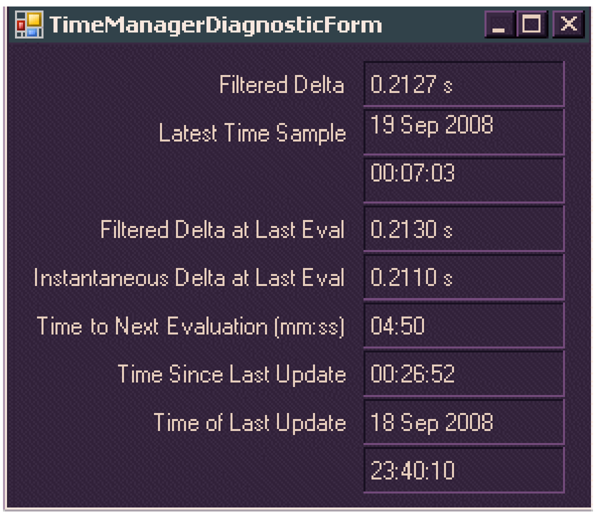


Figure 2.6 Time Manager Diagnostic Form

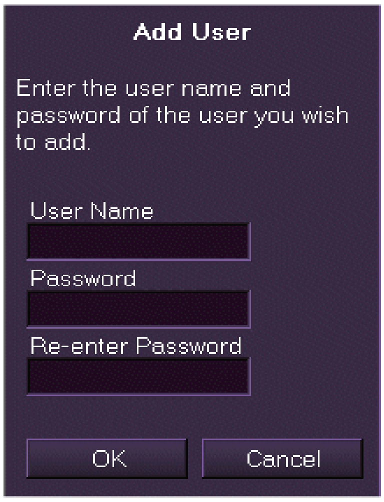
3.5 Security

The Security management folder enables a logged on user to create a group of members for a selected group. The members of a group will be in roles lower than the currently logged on user. For example, a field engineer may assign ship administrators and seamen to a group, whereas a ship administrator can only assign seamen to their group.

The Group list is populated with role names that have been assigned in the Localization tab of the User Role Setup configuration, see Section 8.2 '*System Security*' in Chapter 1 '*Configuration*'.

To create and edit a security group:

1. Click on the Security tab and select the user role from the **Group** drop down list.
2. To add group members click on the **Add..** button. The Add User window appears prompting to enter a user name and a password of the user you wish to add to the group.



3. Enter the name and password, re-enter the password and click the **OK** button. The user's name appears in the Members list and a **User Added** prompt is temporarily displayed.
4. To remove a member from the group highlight the user to be removed from the Members list and click on the **Remove..** button. The screen prompts for confirmation of the action.
5. To confirm click the **Yes** button. The user is removed from the group and the Security window re-appears with the member's name removed from the list.

6. To change the password of a group member highlight the name in the list and click on the **Change Password..** button. The screen prompts to enter the old and new password for the member.
7. Enter the user's old password, then enter the new password, re-enter and confirm by clicking the **OK** button. The new password details are logged in the system and the Security window re-appears.
8. When members have been added to a group the given names appear in the Members field.

3.6 Logging Control

The Logging Control enables an operator logged on as a field engineer to enable or disable data logs.

The Logging Control window displays a list of different types of log data, with certain data enabled as default (Figure 2.7 shows the logging control window on an ECDIS). The default enablements are made at commissioning when the developer has set the logging level to Normal.

In the event of diagnosis of particular problems with the system the field engineer may enable certain log data. The decision of which log data to enable or disable should only be made with guidance from a system developer.

Any changes made to the default settings are not persisted. If the system is re-started the Logging Control reverts to the normal settings.

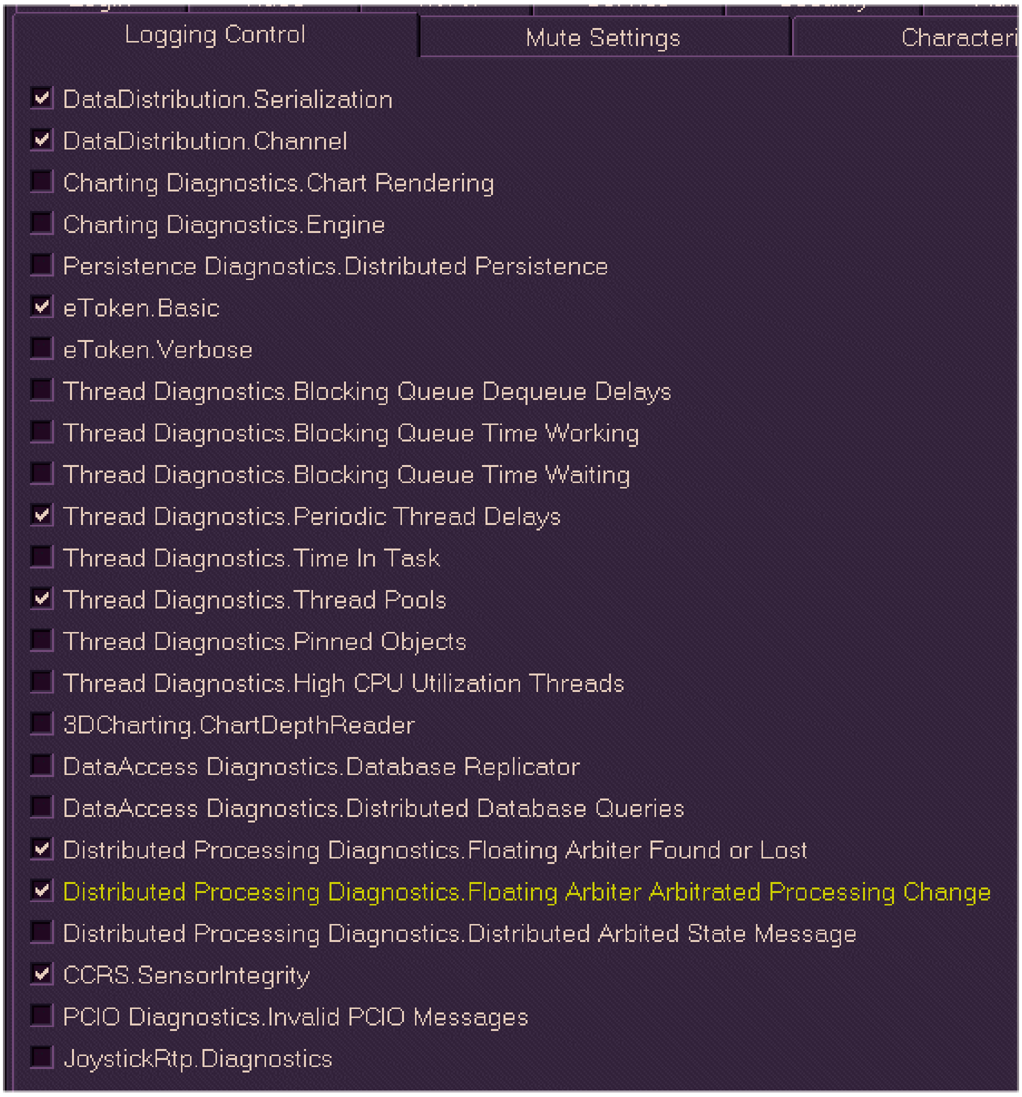


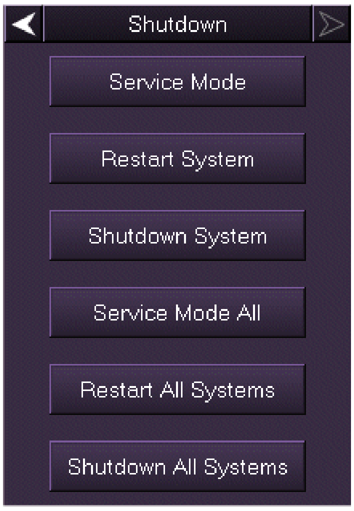
Figure 2.7 Logging Control Window

4 Service Mode

CAUTION!

Switching the system to Service Mode causes VisionMaster and Windows to shut down. Windows will restart with the service desktop displayed.

When a user has logged on in Service mode, as described in Section 3.1 '*Login*', the Service desktop can be accessed.



To access the desktop go to **Shutdown** in the System Menu. The **Service Mode** and **Service Mode All** buttons are now available for selection.

To shut down a single system click the **Service Mode** button, or to shut down all nodes on a multi-node system click the **Service Mode All** button.

An 'Action Required' message appears requesting operator confirmation. Click the **Yes** button to confirm. VisionMaster closes and the Windows operating system shuts down and then restarts with the VisionMaster FT service desktop displayed, see Figure 2.8 below.

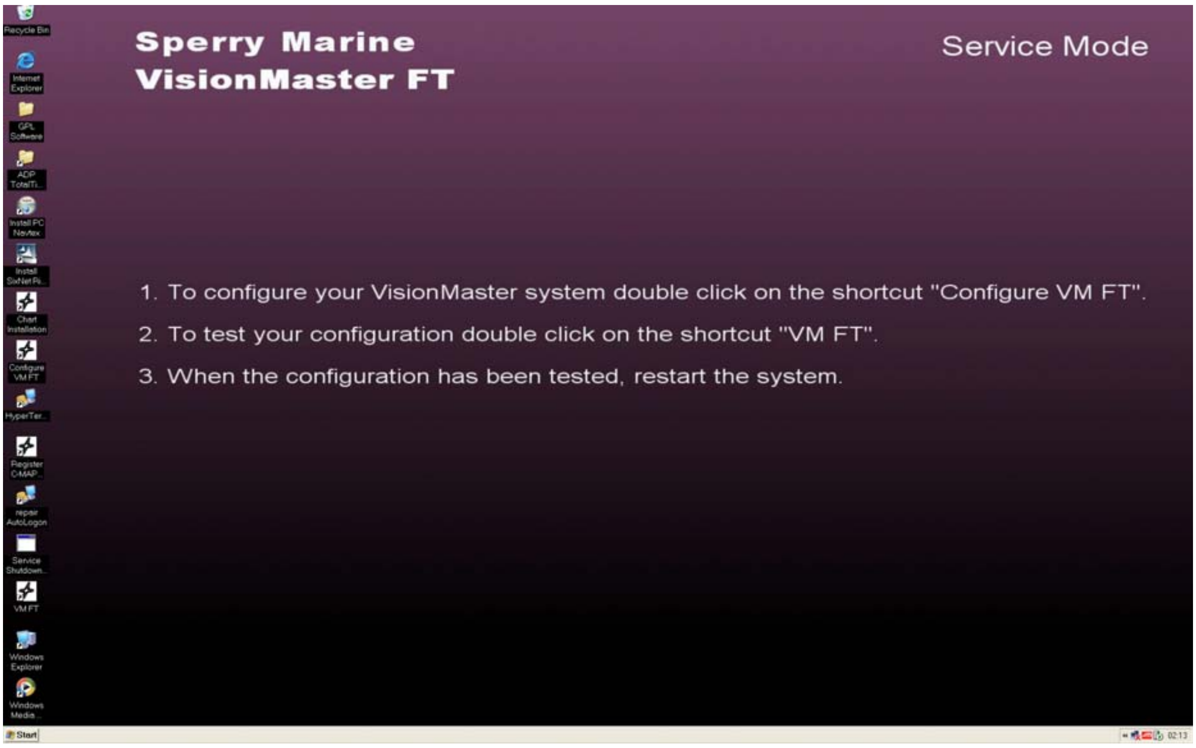


Figure 2.8 Service Desktop

The Service desktop includes a number of icons, most of which have been created as shortcuts.

The following VisionMaster applications and programs may be accessed from the desktop by double clicking on the icon:

- **Configure VM FT -** to open the configuration tool.
- **Chart Installation -** to open the C-MAP Sperry Chart Installer
- **Register C-MAP -** to register the C-MAP eToken
- **VM FT -** to open the VisionMaster application

When VisionMaster is opened from the service desktop the application runs in Service Mode and an active prompt is displayed informing the operator of this.

If VisionMaster is restarted from the System menu, by clicking the **Restart System** button, the application opens in operator mode.

4.1 Repairing AutoLogin to Operator Mode

In normal circumstances when the system is restarted it will automatically run the VisionMaster application in operator mode. In this mode the user will have no access to the service desktop, unless a valid user name and password is entered.

If the system does not automatically open in operator mode a windows logon screen will be displayed where the user will be required to enter a service password to launch the system.

If this fault arises double click on the **repair AutoLogin** icon on the Service desktop. The VisionMaster system will now restart correctly in operator mode.

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Appendix A

Registering and Replacing a C-MAP eToken

Contents

List of Figures

A.1 Registering the C-MAP eToken

If C-MAP charts have been ordered the C-MAP eToken is supplied with all Chart Radar and ECDIS products. The eToken is registered in the system from an eToken USB dongle, which is pre-assigned with a unique user ID. The registration process is done from the Service desktop.

To access the service desktop a suitably qualified user logs on as a service engineer via the VisionMaster Login window, see Section 3.1 '*Login*' in Chapter 2 '*Diagnostics, Commissioning & Service Mode*'. After a successful login the user status is shown on the login screen, e.g. '**Logged In User service'**.

A.1.1 Accessing the Service Desktop

1. In VisionMaster, navigate to the System menu and select **Shutdown**. When logged on in Service the Service Mode button in the Shutdown menu is enabled, see Section 4 '*Service Mode*' in Chapter 2 '*Diagnostics, Commissioning & Service Mode*'.
2. Left click on the **Service Mode** button. The screen prompts to confirm that you want to switch to service mode. Click the **Yes** button to confirm, or click the **No** button to cancel and return to VisionMaster.
3. When switch to service mode is confirmed the VisionMaster system and any other open applications power down and the windows desktop displays two icons; Service Mode and Operator Mode.
4. Click on the Service Mode icon, the service mode desktop appears.

A.1.2 Running eToken Registration

1. To run the eToken registration click on the **Register C-MAP eToken** icon on the Service desktop. The following window appears prompting to install the C-MAP eToken.

Figure A.1 Install eToken

2. .Insert the C-MAP eToken dongle into one of the available USB sockets at the rear of the PC and click the **Yes** button.

3. If the system detects that you are using a new eToken, you will need to reinitialise your C-MAP User ID and obtain new licences from C-MAP. To reinitialise click **Yes**, or to retain the previous state click **No**.

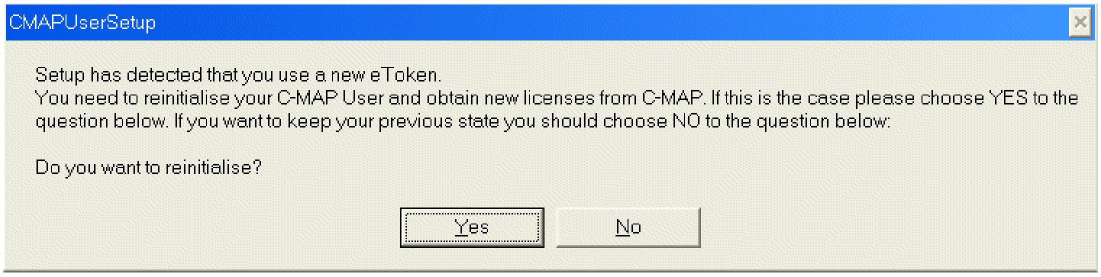

Figure A.2 Reinitialise C-MAP User

4. If **Yes** is selected the following confirmation prompt appears.

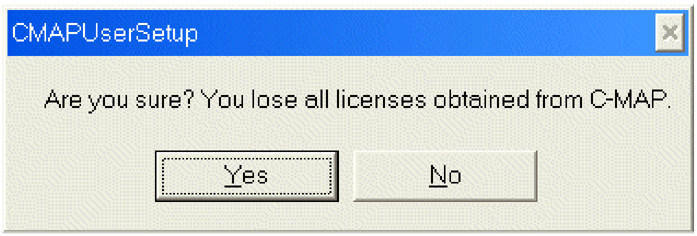

Figure A.3 Reinitialise Confirmation Prompt

5. To confirm click **Yes**. The registration process takes approximately 10 to 15 seconds. When the process is complete a window appears confirming **User Setup has successfully completed.** Click **OK** to confirm completion.

A.2 Replacing a 32k eToken with a 72k eToken

There are two versions of C-MAP eToken; a 32k and a 72k version.

The two versions of eToken are recognised by the identification on the eToken label: 'eT' on a 32k version and 'JeT' on a 72k version.

If your VisionMaster FT system has been recently installed, or your system has been upgraded at commissioning, you will be supplied with the correct eToken for the existing software environment.

However, if there are circumstances where you need to replace an existing C-MAP 32k eToken with a new C-MAP 72k eToken, without upgrading your system (for example, if the eToken is damaged) the following tasks must be performed via the C-MAP short-cuts on the Service Mode Desktop.

1. Uninstall the existing eToken 32k environment
2. Install software environment for eToken 72k
3. Reconfigure C-MAP in order to use the 72k environment

Before uninstalling

To uninstall the existing eToken 32k software environment:

1. Remove both the existing C-MAP eToken and VisionMaster security block from the Processor unit.
2. Click on the **Uninstall eToken 32k** short-cut icon on the Service desktop. The application will proceed to uninstall the software, and when complete, perform a Service Shutdown on the node.

To install the new eToken 72k software environment:

1. Start up the node in Service mode.
2. Click on the **Install C-MAP 72k** short-cut icon on the Service desktop. The application will proceed to install the software, and when complete, perform a Service Shutdown on the node.

3. Re-insert the VisionMaster security block and the new 72k C-MAP eToken into the Processor unit.
4. Start up the node again in Service mode.

Note: *When installing the C-MAP 72k the system may occasionally prompt to restart again after a Service Shutdown. If the Restart prompt appears, click **OK** and then click **Cancel** to cancel the service shutdown. The Install 72k process must then be re-run.*

When the new software environment for the 72k eToken has been installed the C-MAP license file must be installed. The license file is provided by C-MAP and relates to a specific eToken reference number, located on the C-MAP dongle label.

For details on installing the license file refer to '*C-MAP License Files*' in the VMFT Supplementary Features User Guide, document number 65900014.

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Chapter 3

Configuring a Conning Information Display

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Appendix A Configuring a Second Monitor

1 Configuring CID Pages

Each node on a multi-node system may be configured with a different CID page as default. For monitors on the system that have a wide aspect ratio (see Section 5.5 '*Monitors*' in Chapter 1 '*Configuration*') then default side pages may also be configured. If a second dedicated monitor is connected to a node and has been configured (see Appendix A '*Configuring a Second Monitor*') a default CID page for the second monitor may also be selected, see Figure 3.1.

To select a default start-up page for each node:

1. Navigate to the CID topic in the User Interface folder of the configuration file (see Section 8.6 '*User Interface*' in Chapter 1 '*Configuration*'). The **Configure Start-up CID Pages** area lists the node names (if the system is multi-node) and includes a default CID page column and default side page columns. Note that these default side pages are only available if the associated node includes a wide screen monitor, otherwise the cells are greyed out.
2. Click on the drop down arrow to the right of the Default CID Page cell to display the list of pages and select the default page for each node.

   The list of default CID pages available for selection is as follows:

   - Berthing
   - Manoeuvring
   - Orders
   - Routes
   - Sea
   - Steering Mode & Route Info
   - Steering
   - System
   - Video & PIP
   - Video

   Note: *If a commissioning engineer has previously created any custom pages, these will also be listed and available for selection.*
3. On a wide screen display click on the drop down arrow to the right of the Default CID Side Page cell to display the list of pages. If your monitor is standard size no side page selection is available.

   The following default side pages may be selected:

   - Default
   - Docking
   - Environment
   - Route
   - Sea & PIP
   - Sea
   - Steering

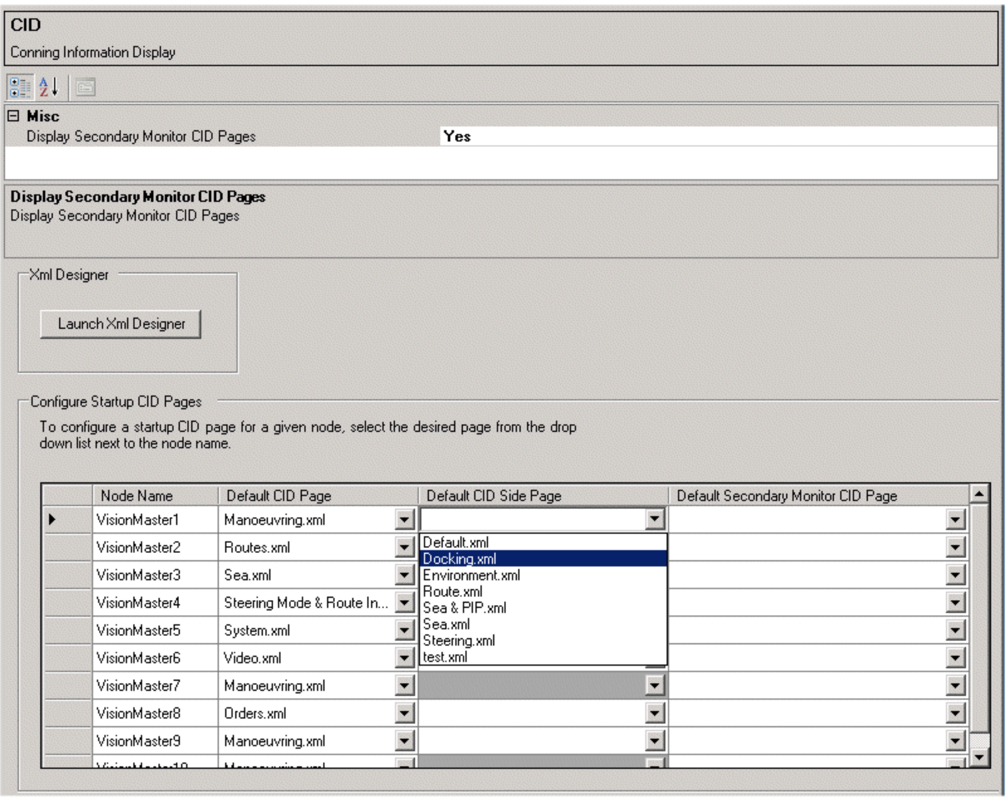


Figure 3.1 Selecting Default CID Pages

4. If you have a secondary monitor connected, select **Yes** from the **Display Secondary Monitor CID Pages** drop down arrow and click on the drop down arrow to the right of the **Default Secondary Monitor CID Page** field to display the list of pages. CID pages will only be available for selection if a secondary monitor has been configured.

2 CID Designer

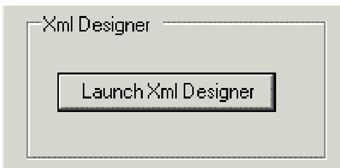
The CID designer enables the following file types to be created:

- 5x4 Full screen pages
- 16x10 Full screen pages
- Side pages
- Pop-Up pages
- HUD widgets
- Elements and Element Groups

When CID pages, HUDs, elements or element groups have been created, the following operations may be performed:

- Delete an existing page
- Modify an existing page
- Add CID elements to a page
- Delete CID elements from a page
- Resize and move CID elements on a page
- Modify properties of CID elements

2.1 Opening the CID Designer



To open the CID designer navigate to the CID topic in the User Interface folder of the configuration file (see Section 8.6 '*User Interface*' in Chapter 1 '*Configuration*') and click on the **Launch Xml Designer** button.

The CID Designer application opens as a secondary window, over the Configuration application.

The CID Designer window comprises a drop down menu bar, toolbar icons and design area, see Figure 3.2.

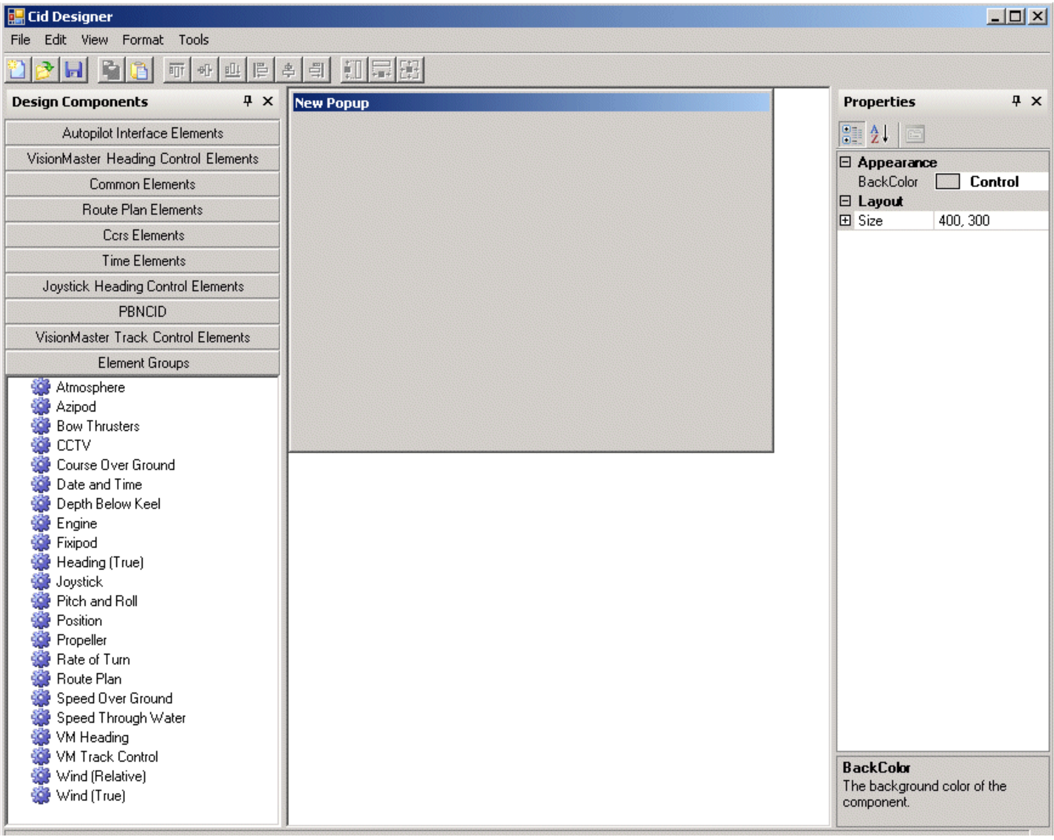


Figure 3.2 CID Designer Default Page

The design area opens with **Design Components** and **Properties** columns on either side of the main area and New Popup window in the page area. To minimise or close the columns click on the minimise and close icons.

2.2 Selecting a File Type

To access the CID Designer file types click on the **File** drop down menu and select **Open**. The following window prompts to select a file type to open.

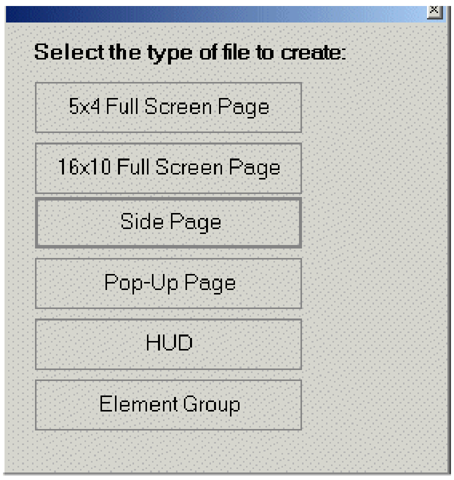


Figure 3.3 Select File Type to Open

The selection of the type of full screen CID page is governed by your monitor type. If your monitor is a standard aspect ratio, i.e. 19.0" or 23.1", the 5x4 Full Screen Page is selected. If your monitor is a wide screen aspect ratio, i.e. 25.5" or 27.0", the 16x10 Full Screen Page is selected.

Side pages should be selected and configured for both ECDIS and Chart Radar nodes if the monitor is a wide screen version.

Popup pages are only available to be viewed on ECDIS nodes.

HUD (Head Up Display) are widgets that may be viewed in the primary chart area of ECDIS nodes. All HUD widgets are displayed as semi-transparent objects. For information, see '*HUD Widgets*' in Chapter 15 Conning Information Display of the ECDIS User Guide, 65900012.

All the page files, HUDs and Element Groups are a series of xml files which reside on the system hard disk.

2.2.1 Full Screen Pages

When 5x4 Full Screen Page is selected, Windows Explorer opens the 5x4 Aspect sub directory with a list of the default xml files, as listed in Section 1 '*Configuring CID Pages*', page 4-5.

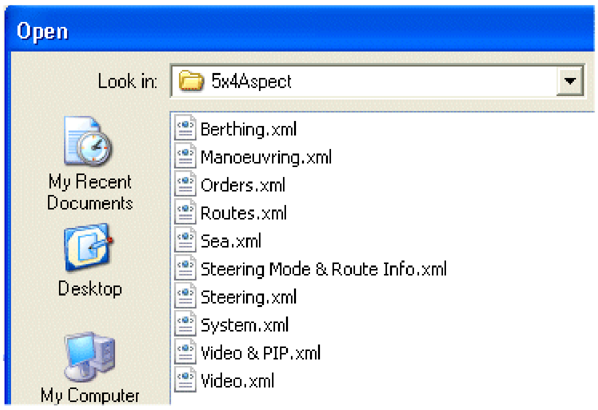


Figure 3.4 5x4 Aspect Full Screen Page xml files

When 16x10 Full Screen Page is selected, Windows Explorer opens the 16x10 Aspect sub directory. All the xml files listed in the 5x4 Aspect Full Screen directory are available for 16x10 aspect, with the exception of Video & PIP.xml.

2.2.2 Side Pages

When Side Page is selected, Windows Explorer opens the Sides sub directory with a list of the default xml files, as listed in Section 1 '*Configuring CID Pages*' on page 4-6.

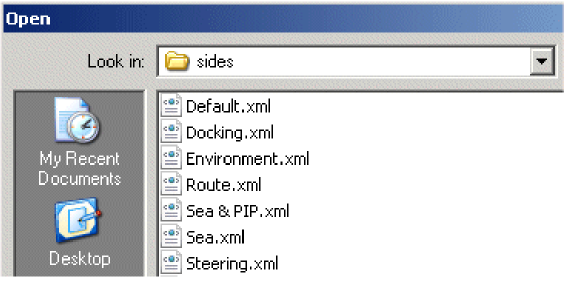


Figure 3.5 Open Side Page xml files

2.2.3 Popup Page

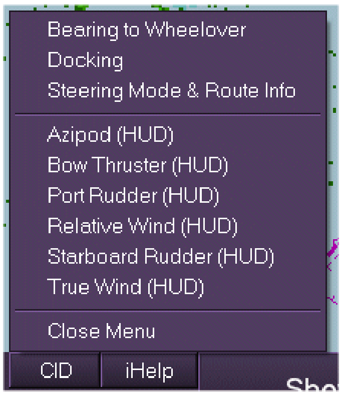
When Popup Page is selected, Windows Explorer opens the Popups sub directory. The default list of popup pages includes the following xml files:

- Bearing to Wheelover
- Docking
- Steering Mode & Route Info

Figure 3.6 Open Popups xml files

Popup page files are available for display on an ECDIS from the CID button in the lower popup toolbar.

HUD widgets are also listed and are available for selection from the CID button.



2.2.4 HUD

When HUD is selected, Windows Explorer opens the Hud sub directory. The default list of HUD widgets includes the following xml files:

- Azipod
- Bow Thruster
- Port Rudder
- Relative Wind
- Starboard Rudder
- True Wind

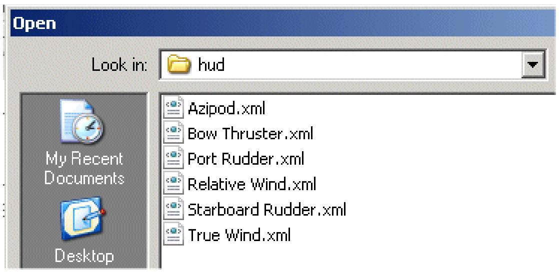


Figure 3.7 Open HUD xml files

CAUTION!

Only the HUD xml files listed above should be selected from the ECDIS. Other CID element groups which are saved as HUDs will be listed in the Huds xml files directory, but if selected from the CID button, will cause the VisionMaster system to shut down.

2.2.5 Element Group

An Element Group comprises a number of CID elements which have been compiled to display data for a particular function. For example, the Date and Time element group comprises date readout, time readout and time zone offset readout CID elements.

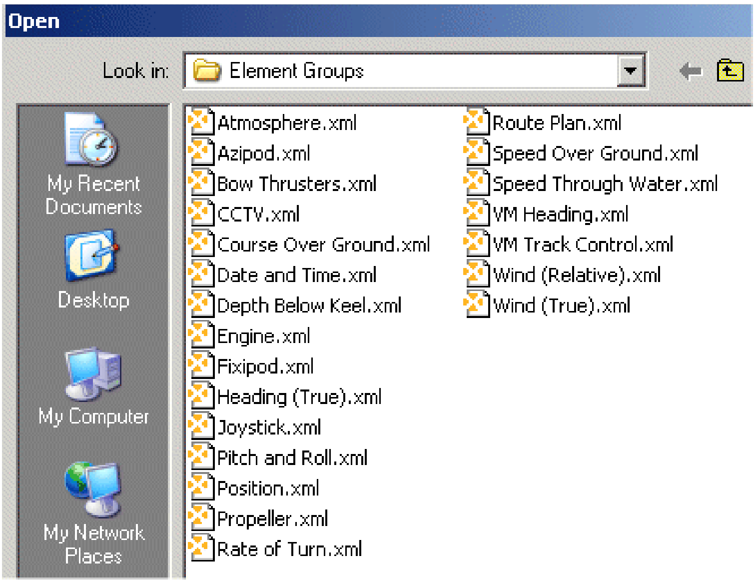


Figure 3.8 List of Element Groups

2.2.5.1 CID Elements

A CID element represents one or more physical components of an xml page. These components are typically graphical or numeric readouts, but may also provide more complex functionality, such as graphs, chart displays, or CCTV displays.

All CID elements are compiled in appropriate groups with the following default groups of elements listed in the **Design Components** column.

- Autopilot Interface
- VisionMaster Heading Control
- CCRS
- Time
- Route Plan
- Common
- Joystick Heading Control
- PBNCID
- VisionMaster Track Control

2.3 Customising CID Pages

The default CID pages listed for full screen, side page, popup pages and element groups may be deleted, copied, or modified.

2.3.1 Deleting CID Pages

To delete an existing CID page:

1. Navigate to the page to be deleted as described in Section 2.2 '*Selecting a File Type*'. The Open window lists the available CID pages.
2. Select the page to be deleted, right click and from the drop down list select **Delete**. A confirm file delete popup window appears.
3. To confirm, click the **Yes** button, the page file is removed from the list and sent to the Recycle Bin. Or to cancel the deletion click the **No** button.

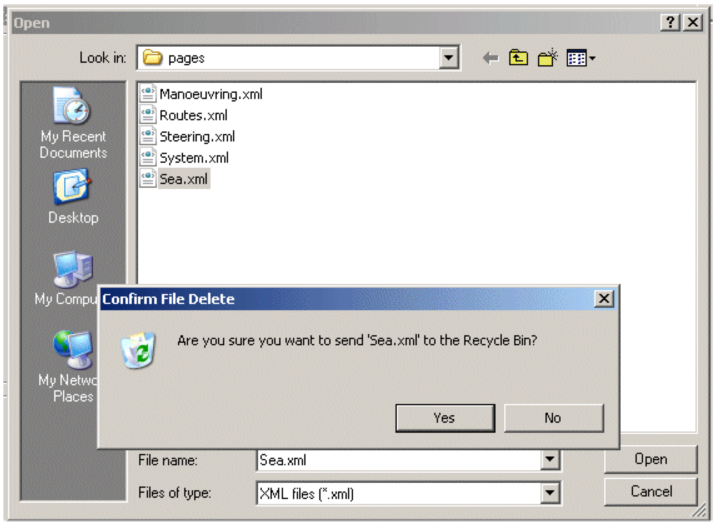


Figure 3.9 Delete Full Screen CID Page

2.3.2 Copying CID Pages

To copy an existing CID page:

1. Navigate to the page to be copied as described above.
2. Select the page from the list and click the **Open** button. The page appears in the CID Designer display area.
3. To copy the page click on the **File** menu and select **Save As (to All Nodes)** from the drop down list. The **Save As** popup screen appears.
4. Name the xml file in the **File Name** field and click the **Save** button. The copy of the page is listed with the existing full screen pages.

Note: *CID pages may be saved as different formats, or to different directories. For example, a full screen page or side page may be saved as a popup page and vice-versa, or an existing CID page may be copied and saved to an Additional Pages folder.*

2.3.3 Modifying CID Pages

To modify a CID page:

1. Navigate to the page to be modified as described above.
2. Select the page to be modified from the list and click the **Open** button. The full screen page appears in CID Designer display area, see Figure 3.10.

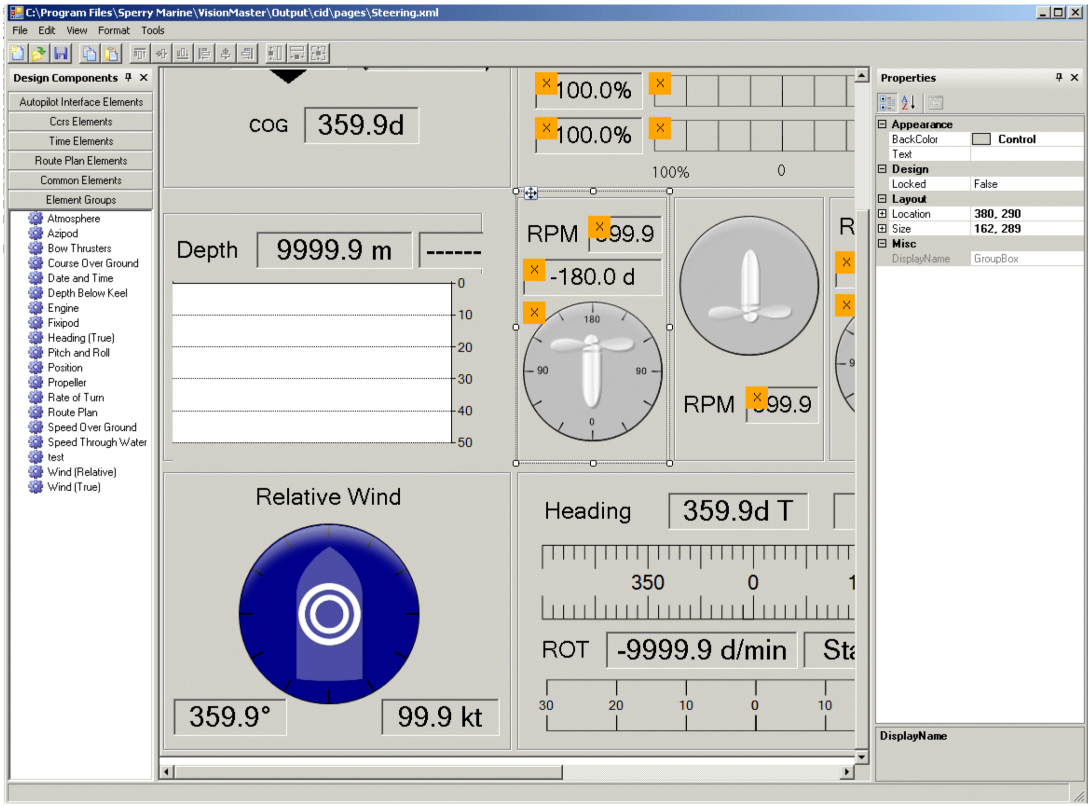


Figure 3.10 Modifying a CID Full Screen Page

Each CID element may be selected, or the element group to which the element belongs may be selected. CID elements and element groups once selected may be copied, moved, cut and pasted, re-sized or deleted.

3. To select an element group click on the edge of the group box, to select a single element click inside the box or icon. When a group or element is selected its box outline is shown with eight square editing points and the **Properties** column lists the element or group characteristics.
4. To copy, cut & paste or delete the element or group go to the **Edit** drop down menu and select the required action from the drop down list.

Elements or element groups may be re-sized and moved, either directly on the display, or by changing the element's Layout values in the **Properties** column.

If an element displays a icon in the top left corner of its box, then the data source for this element is not configured. The icon disappears from the element box when the data source is configured.

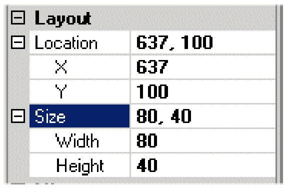
For instructions on adding new CID elements or element groups to an Full Screen page see Section 2.4 '*Creating New Pages*'.

2.3.3.1 Re-sizing Elements or Groups

To re-size an element or group directly on the display:

1. Move the cursor to one of the editing points. The cursor changes to a vertical, horizontal or diagonal arrow dependant on which editing point is selected.
2. Hold down the left key and move the trackball left or right to re-size. With the required size displayed, exit re-sizing mode by releasing the left key and clicking in the element box.

To re-size an element or group from the **Properties** column:



1. Click on the **+ Size** button to display the element's current width and height in pixels.
2. Click in the Width and Height fields and enter the required values. The element or group is re-sized to the entered values.

2.3.3.2 Moving Elements or Groups

To move an element or group directly on the display:

1. Select the group or element box, and move the cursor to the control icon at the upper left of the box.
2. Hold down the left key and move the box to the required location by moving the trackball. As the box is moved horizontal and vertical guide lines appear to enable the box to be aligned with other element or group boxes.
3. When the box is in the required location release the left key.

To move an element or group from the **Properties** column:

1. Click on the **+ Location** button to display the element's X and Y coordinates. The values shown are the height and width from the upper left corner of the element to the upper left corner of its container.
2. Click in the X and Y coordinate fields and enter the required values. The element or group is re-located to the entered values.

2.3.3.3 Customising Element Properties

Certain CID elements, such as data fields, include properties which may be customised. The type of properties and selections available change dependant on the element type selected.

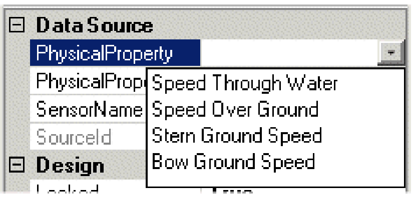
The following lists the editable properties on a typical data element.

Data Source

The Data Source properties are available on certain data readout elements and include the following:

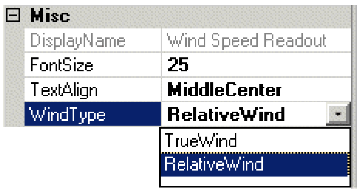
- Physical Property
- Physical Property Field
- Sensor Name
- Source ID

The physical properties of certain elements may be customised, based on the restrictions of the selected element. For example, the physical properties of a ground or water speed readout element will be restricted to those configured in External Sensors, see Chapter 1, 'Configuration'.



If an element has no data source configured the physical properties will show 'Generic Data' and the drop down list will include all data types.

Other elements do not have editable data properties. For example, a wind speed readout is restricted to displaying wind speed in knots, with only the Wind Type (Relative or True) selectable.



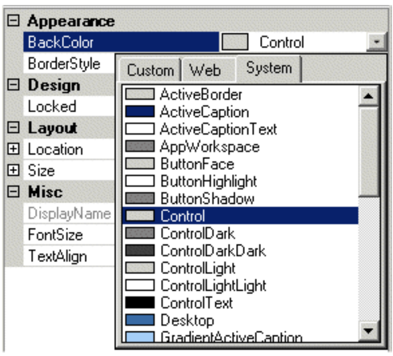
To change data source properties either click on the drop down arrow and select from the list, or enter values in the appropriate fields.

Appearance

Certain readout elements such as Time or Route Plan elements will include Appearance properties, which comprise Back Color and Border Style.

The Back Color is the background color of the element and defaults to the Control color. To change the color click on the drop down arrow and select from the list, the element color changes to the color selected.

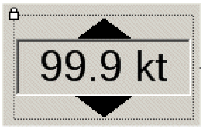
The border style of the element box defaults to **Fixed3D.** To change the border style click on the drop down arrow and select from the list (**FixedSingle** or **None**).



Design

The design property enables an element to be locked in its position on the page. The default is for the element to be unlocked (**False**). To lock an element in position click on the drop down arrow and select **True**.

When an element is locked a lock icon appears at the top left corner of the element box.



Miscellaneous

The miscellaneous properties include the following:

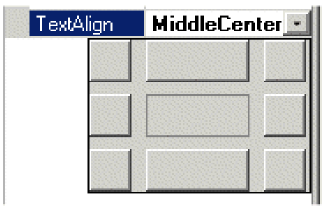
- Display Name
- Font Size
- Text Align
- History Time (Depth below Keel)

Note: *There may be more miscellaneous properties available dependant on the CID element selected.*

The display name is the name of the element that appears in the Design Components list. This value is read-only.

To change the font size click on the drop down arrow and select from the list (the font size ranges from 14pt to 500pt). Changing the font size does not re-size the element box.

Text Align denotes the position of the text within the element box, the default value is **Middle Center**. To change the text alignment click on the drop down arrow and select the desired position from the graphic.



The Depth Below Keel (DBK) history time is the amount of history in minutes displayed on the depth graphic element.

To change the default time from three minutes up to a maximum of 30 minutes click in the **History Time** field and enter the required value.

2.3.3.4 Replacing Obsolete Elements

If an element is obsolete the element box will be displayed with a yellow background and a message advising to use an alternative element. Navigate to the element type and replace the obsolete element, see below.

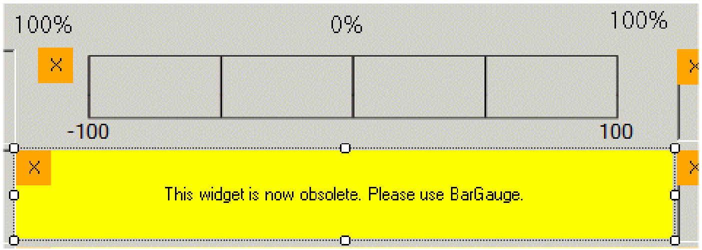


Figure 3.11 Obsolete Element

2.3.3.5 Reversing Azipod Gauge Elements

The azipod gauge element defaults to 180 degrees at the top of the gauge circle, with the propeller pointing north.

To create an aft facing Azipod gauge reverse the element by entering **180** in the **Direction Representing Zero Degrees** field. 180 degrees is shown at the bottom of the circle and the propeller is reversed to point south, see Figure 3.12.

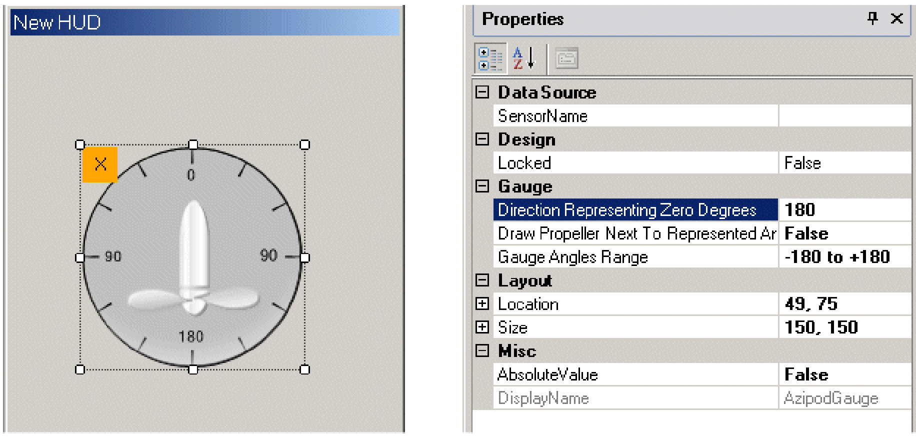


Figure 3.12 Azipod Gauge Reversed for Aft Facing Display

To reverse the gauge but retain the propeller facing north select **True** in the **Draw Propeller Next to Represented Angle** field. The propeller is re-drawn pointing north towards the 0 degree angle.

Note: *Aft facing gauge elements should ONLY be configured for vessels that have displays facing aft on a permanent basis. It should NOT be used for vessels that have been configured for Alternate Bow in Use, see Section 8.3.1 'Own Ship Characteristics' in Chapter 1 'Configuration'.*

2.4 Creating New Pages

New pages may be created and populated with element groups or CID elements.

To add a new page click on the **File** drop down menu and select **New.** The **Select Type** window appears prompting to select the type of file to create.

Select from the options as shown in Figure 3.3. A blank page appears with the title dependant on the page option selected.

2.4.1 Adding Components to a Page

To add design components (elements or groups) to a blank page:

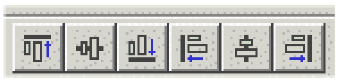
1. Navigate to the component to be added by clicking on its Elements group button in the Design Components column.
2. Left click on a component in the element list. Move the cursor to the area on the page where you want the component added and left click. The component is drawn on the page and its values appear in the Properties column. Repeat the process for each component.

When a component is drawn on the page the Format commands become enabled.

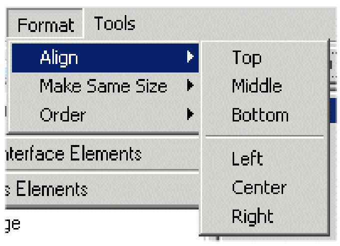
Component boxes can be aligned with each other along the top, middle or bottom face or to the left, center or right faces.

The align commands are accessed in one of the following ways:

1. either from the toolbar icons; or



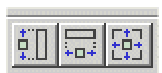
2. by clicking on the **Format** drop down menu and selecting **Align**.



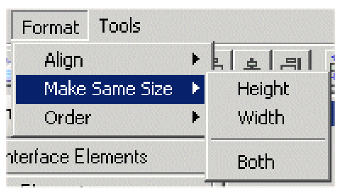
Component boxes can be made the same height, width or made the same size.

The Size commands are accessed in one of the following ways:

1. either from the toolbar icons; or



2. by clicking on the **Format** drop down menu and selecting **Make Same Size**.



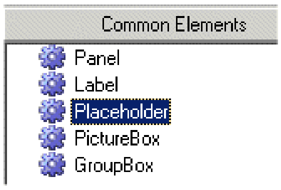
2.4.2 Creating a Placeholder Window for PiP Video

When a PiP video source and PiP display provider have been configured in the Config tool (see Chapter 1 ‘*Configuration*’) a placeholder must be created in the CID Designer in which the monitor's PIP video is displayed. The PIP video is displayed within the boundaries of the placeholder.

PiP video is only available on a full screen CID page, or the left side CID panel of a widescreen monitor (16 x 10 Full Screen Page).

To create a placeholder window for the PiP video:

1. Select Common Elements in the Design Components column. From the list of elements click on **Placeholder** and click in the area of the page where you want the element added. A Placeholder is created with a default size of 150mm x 150mm.



2. To change the placeholder location, enter the X Y coordinates in the Properties, Layout column.
3. With reference to Section 2.4.2.1 ‘*Minimum Sizes for Placeholders*’ resize the placeholder to the required size, either directly on the display, or by entering the width and height in the Layout fields. For instructions, refer to Section 2.3.3.1 ‘*Re-sizing Elements or Groups*’.
4. In the Miscellaneous section, enter **PiP** in the PlaceholderControlId field and enter **PipVideo** in the PlaceholderFactoryName field.

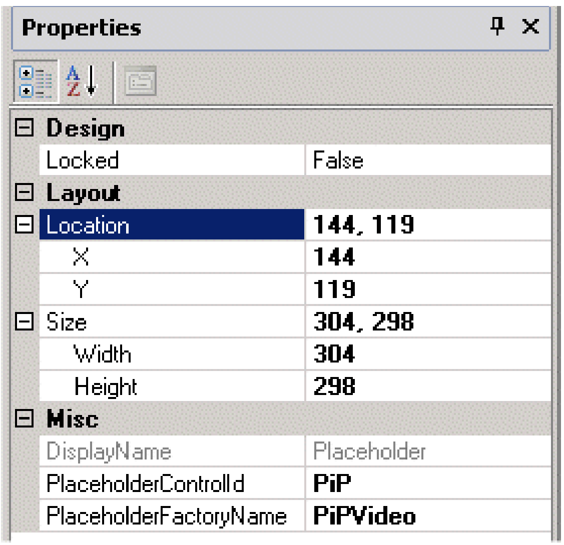


Figure 3.13 Placeholder Properties

2.4.2.1 Minimum Sizes for Placeholders

The placeholder window for Pip Video must be set to a size above the minimum specified for the monitor types listed in Table 1 and Table 2. If the placeholder window is below the minimum size for the monitor the video will not display correctly.

Table 1: Minimum Size of Placeholder in New Hatteland Monitors*

Monitor Size	Display Resolution	Min. Size of Placeholder
27 "	1920 x 1200	250 (Width) x 190 (Height)
27 "	1280 x 1024	250 (Width) x 190 (Height)
23.1 "	1280 x 1024	245 (Width) x 215 (Height)
19 "	1280 x 1024	310 (Width) x 270 (Height)
19" + 23.1" †	1280 x 1024	310 (Width) x 270 (Height)
19" + 23.1" + 27" †	1280 x 1024	310 (Width) x 270 (Height)
23.1" + 27" †	1280 x 1024	250 (Width) x 215 (Height)

* Monitors with tactile push button keypad and status LED ring.

† This information is for multi-node systems with a combination of 19", 23.1" and 27" monitors with display resolutions of 1280 x 1024. As the same 5 x 4 aspect CID page is used for all monitor sizes with this resolution the largest of the width and height specified for individual monitors should be used.

Table 2: Minimum Size of Placeholder in Older Version Hatteland Monitor*

Monitor Size	Display Resolution	Min. Size of Placeholder
23.1 "	1280 x 1024	160 (Width) x 150 (Height)

* Monitors with separate On/Off button and OSD controls.

2.4.3 Creating a Page for Fugro Trim Sensor

This section describes how to set up a CID page to display data from a Fugro Trim sensor when a Fugro Marinestar device is being used by the VMFT system.

A Fugro Trim Sensor and message interface for the sensor must be configured before creating the CID page. For information on the configuration of a Fugro Trim Sensor see "Configuring a Fugro Trim Sensor" on page 121 of Chapter 1 '*Configuration*'.

To create a CID page for a Fugro Trim Sensor:

1. Either open an existing CID page or create a new page as described in Section 2.4 '*Creating New Pages*'.
2. Select **Ccrs Elements** in the Design Components column. From the list of elements select on **LineGraph** and click in the area of the page where you want the element added. A default line graph table is created.
3. In the Properties column click in the Graph Title field and enter an appropriate title. The entered title appears above the graph table.
4. If required change the time span along the Horizontal Axis (defaults to 15 minutes), change the default values on the Vertical Axis (max 100, min -100) to more appropriate values for trim. The graph will update as values are changed.

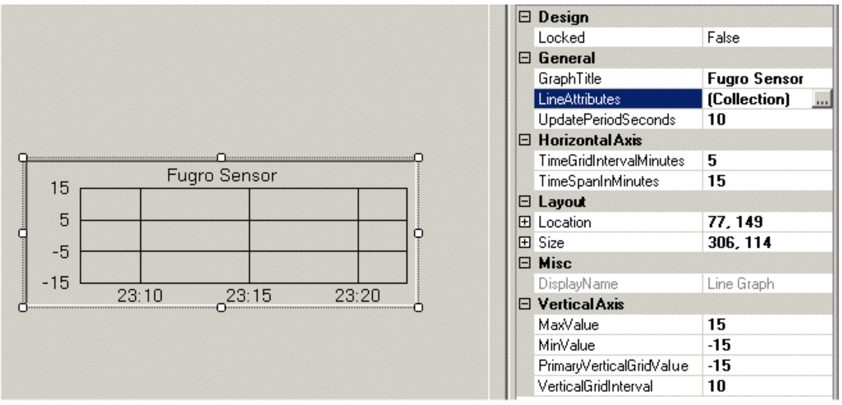


Figure 3.14 Fugro Trim Sensor Line Graph

5. To configure the data that will be displayed on the graph, click in the **(Collection)** field in **LineAttributes** and then click on the **...** button. A Line Attribute Configuration popup window opens, see Figure 3.15.

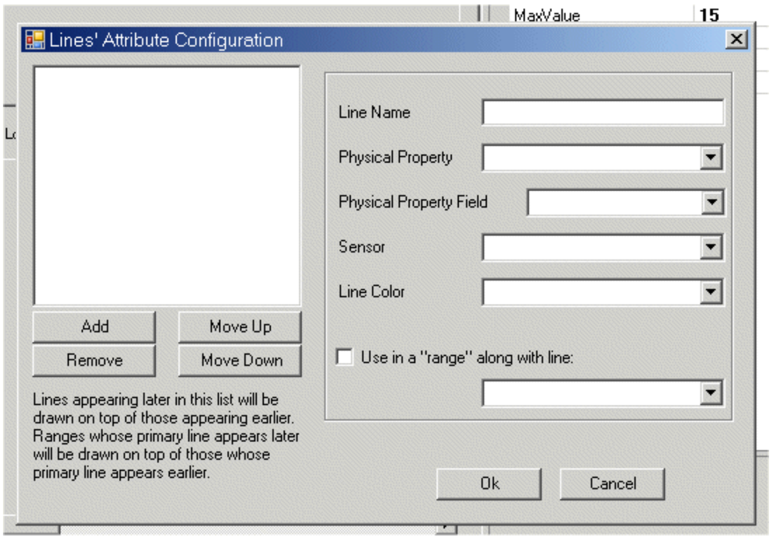


Figure 3.15 Line Attribute Configuration - Blank

6. Click the **Add** button seven times, twice for each colour band and once for the trim itself. Note that the trim sensor is actually four sensors in one; the trim sensor and three trim band sensors: green, yellow, and red. Seven new lines are created in the field above the Add button.
7. Select the first **<new line>**.
   a. Enter the Line Name **Red Band Lower**
   b. Select the physical property **Trim Band** from the drop down list.
   c. Select **LowerValue** from the PhysicalPropertyField.
   d. Enter **'Red band for <configured trim sensor name>**'.
   e. Select red from the Line Color drop down list.
8. Select the second **<new line>.**
   a. Enter the Line Name **Red Band Upper**
   b. Select the physical property **Trim Band** from the drop down list.
   c. Select **Upper Value** from the PhysicalPropertyField.
   d. Enter **'Red band for <configured trim sensor name>**'.
   e. Select red from the Line Color drop down list.
   f. Tick the **Use in a range along with line:** check box and select **Red Band Lower** from the drop down list.
9. Repeat steps 8 and 9 for Yellow and Green bands.
10. For the last line in the list enter the following:
    a. Enter the Line Name **Trim**
    b. Select the physical property **Trim** from the drop down list.
    c. Select **Trim** from the PhysicalPropertyField.

d. Enter sensor name, e.g. **Fugro Trim Sensor**.

e. Select a line color that is not red, yellow or green from the Line Color drop down list.

11. Figure 3.16 shows a completed Line Attribute Configuration window.

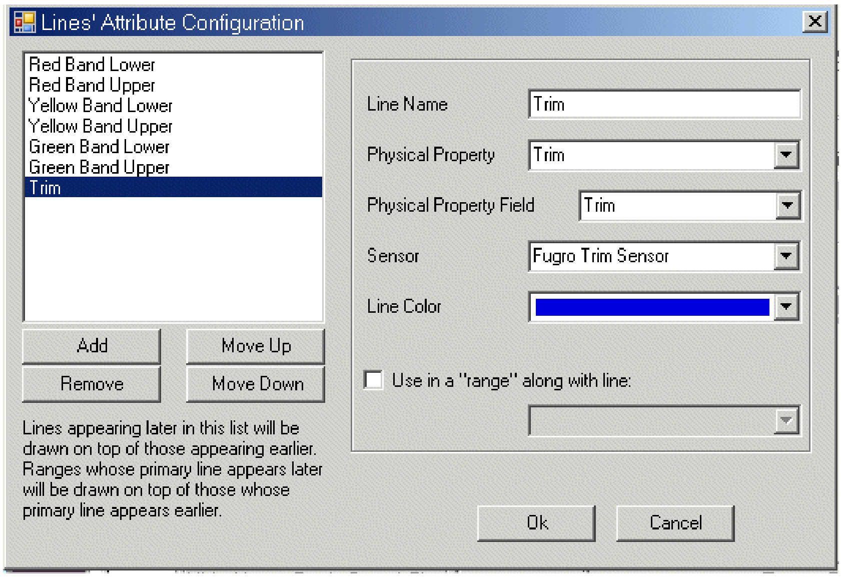


Figure 3.16 Line Attribute Configuration - Complete

Note that the order the fields appear in the list is important, the graph will render the topmost fields first so if you place the Red Band at the bottom of the list the only data that will be visible will be the red band.

12. Click the **OK** button and save the CID page.

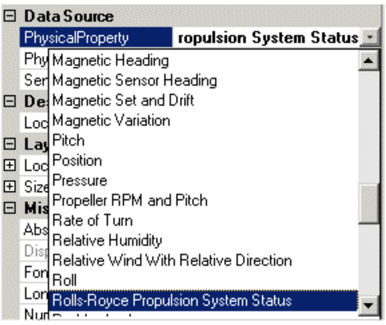
2.4.4 Creating a Page for Rolls Royce Propulsion System Sensor

This section describes how to set up a CID page to display data from a Rolls Royce Propulsion sensor when a Rolls Royce Propulsion sub-system is being used by the VMFT system.

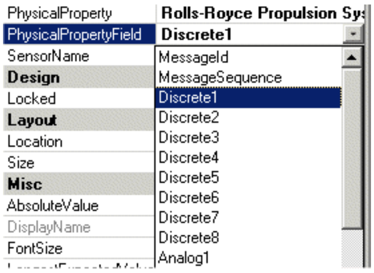
A Rolls Royce Propulsion System Sensor and message interface for the sensor must be configured before creating the CID page. For information on the configuration of this sensor see "Configuring a Rolls Royce Propulsion System Sensor" on page 123 of Chapter 1 '*Configuration*'.

To create a CID page for a Rolls Royce Propulsion Sensor:

1. Either open an existing CID page or create a new page as described in Section 2.4 '*Creating New Pages*'.
2. Select **Ccrs Elements** in the Design Components column. From the list of elements select **PhysicalPropertyReadout** and click in the area of the page where you want the element added. A readout widget is created.
3. In the Properties column click in the **PhysicalProperty** field and select **Rolls Royce Propulsion System Status** from the drop down list.



4. Click the **PhysicalPropertyField** drop down list and select the discrete or analog field you wish to display.



5. Click on the **SensorName** drop down list and select the sensor that corresponds to the message ID you wish to use. For example, if you need to display the 3rd analog value from the message identified as 0500 select **Analog3** as the physical property field and **Rolls-Royce Propulsion Sensor for message 05 sequence 0** as the sensor.
6. If necessary provide a suffix and a label widget to display the source of the data.

2.4.5 Saving a Page

When the required design components have been added and modified the page may be saved to the system.

1. To save the page, click on the **File** drop down menu and select **Save As (to All Nodes)**.
2. The subsequent window shows the list of current pages for the type of new page selected (Figure 3.17 below shows the popup window when an Element Group page has been selected).

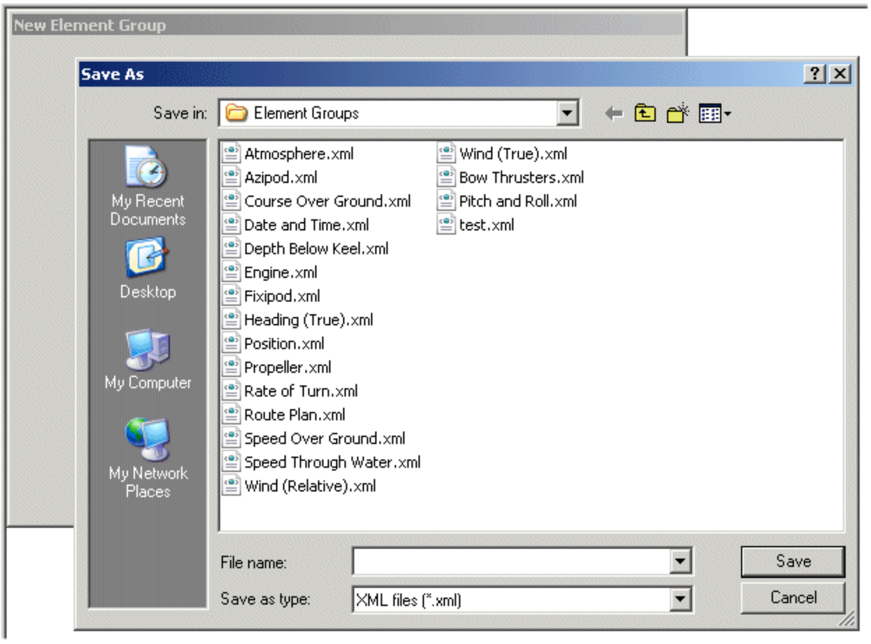


Figure 3.17 Saving a Page

3. To save the page as another type click on the **Save In** drop down arrow and navigate to the required sub-directory.
4. Enter the name in the **File name:** field and click the **Save** button. The page is saved in the sub-directory as an additional xml file.

If the page is saved as a Full Screen page it will appear as an additional tab when the CID is opened, see "Configuring CID Pages" on page 4

If the page is saved as a Side page it will appear as an additional tab when Radar or ECDIS is opened on a wide screen.

If the page is saved as a popup it will appear as a selectable display page from the **CID** button, see "Popup Page" on page 9

2.4.6 Exiting CID Designer

To exit the CID Designer click on the **File** drop down menu and select **Exit.** The program closes and the CID topic in the Configuration tool re-appears.

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Appendix A

Configuring a Second Monitor

CONTENTS

LIST OF FIGURES

A.1 Configuring a Second Monitor

There are two methods of configuring a VisionMaster node to run a second dedicated monitor, which may be required in order to display a product type other than the main display, such as CID pages. The two methods are:

- Using the installed ATI Catalyst Control Center software;

Or:

- from the Microsoft Display Properties

The approved method of configuring a second monitor is by using the ATI Catalyst Control Center (CCC) software.

A.1.1 ATI Catalyst Control Center

The ATI Catalyst Control Center (CCC) software is automatically installed on the C: drive of all VisionMaster nodes.

Running the ATI CCC software is required if the video needs to be cloned when on the DVI port of the graphics card; or when a second monitor is connected to the processor unit.

A.1.1.1 Setting up the ATI CCC Software

To setup the ATI Catalyst Control Center (CCC) software:

1. With the system switched off, connect the second monitor into the other monitor port on the graphics card. For certain monitors and processors you may need a DVI to VGA converter. Do NOT use the on board graphics port.
2. With the second monitor connected, power up the system.
3. Navigate to the desktop by logging in as a service engineer from the VisionMaster application (see Section 3.1 '*Login*' in Chapter 2 '*Diagnostics, Commissioning & Service Mode*').
4. Click on the **Start** button in the left corner of the screen and select **Windows Explorer**.
5. From the Folders list select **My Computer** and then **Local Disk (C:)**.
6. Navigate to the Drivers/ATI CCC folder, scroll down the file column and double click on **setup.exe**, see Figure A.1 below.

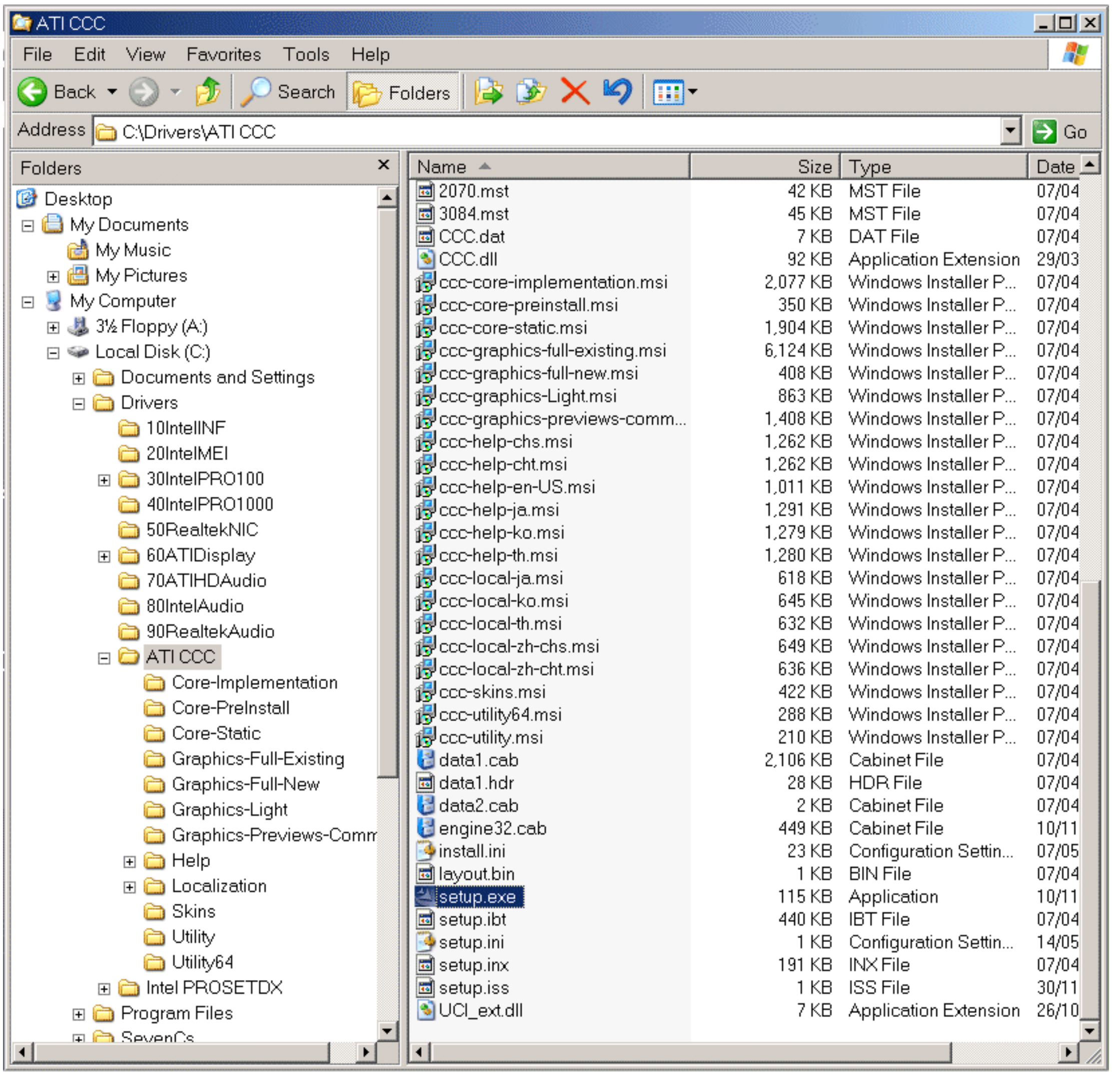


Figure A.1 Navigating to ATI CCC Setup exe

7. When setup is completed click **Finish** on the completion window. The system powers down and restarts.

A.1.1.2 Running the ATI CCC

When the system has restarted the CCC application can be quickly accessed from the Start button.

1. Click on **Start**, highlight **All Programs** and **Catalyst Control Center**. The flyout window shows the CCC selection options, see Figure A.2 below.

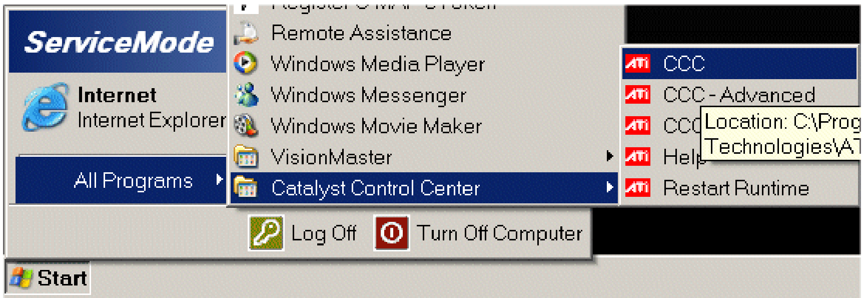


Figure A.2 Locating the CCC Program

2. Select **CCC-Advanced**. The program opens as a window on the desktop. Figure A.3 below shows a typical example.

Figure A.3 CCC Default Display

The Catalyst Control Center window opens with Displays Manager shown as default.

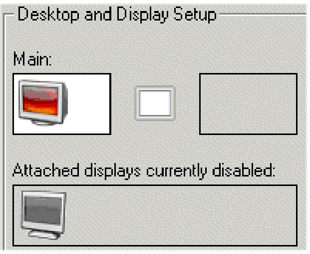
The Graphic Setting window lists a number of display options. The options relevant to this Appendix are briefly described below:

- Information Center - includes information on the installed graphics card.
- Displays Manager - used to change the display setup and arrange the desktop in a multi-monitor environment.
- Display Options - enables additional display control options.
- Monitor Properties - used to view information or configure data on the connected VisionMaster monitor.
- Display Panel (DVI) - displayed if a connected monitor is a flat panel display (FPD). Use this window to configure the FPD settings.

The Desktop and Display Setup area defaults to showing the connected monitors as'Main' and 'Clone' display. The Clone display will show the same screens and operator activity as the Main display.

Note: *The cloned monitor must be the same native resolution as the main monitor, i.e. both monitors at 19" or 23" etc.*

If the secondary attached display is currently disabled the display icon is shown in a box below the main display. To enable this display, right click on the display icon and select the desired option from the popup window. For example, **Clone Main with digital panel** will move the re-enabled display into a Clone box, to the right of the Main box.



A.1.1.2.1 Selecting the Secondary Monitor for CID Pages

If the secondary monitor is to be used to display CID pages (where the main monitor displays Radar/Chart Radar or ECDIS), and/or the second monitor is a different aspect ratio, set up the displays as follows:

1. Right click on the Clone icon and select **Extend Main onto digital panel** from the popup window, see Figure A.4. When this option is selected the **Main:** and **Clone:** boxes change to **Desktop 1:** and **Desktop 2:**

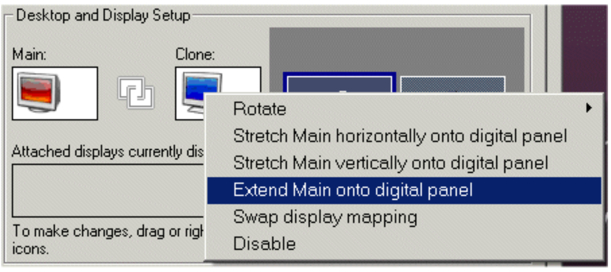


Figure A.4 Extend Main onto digital panel

2. The Display Manager will show the settings for the selected display. To change these settings click on the respective drop down arrow. For example, if the resolution of the second monitor is 23.1" select 1280 x 1024 from the **Desktop Area** drop down list.

3. When the CCC setup is complete, click the **OK** button. The program closes.

A.1.1.2.2 Setting up a CID page for Secondary Monitor

The following procedure describes how to generate a CID page, which will be displayed on the secondary monitor that has been previously set up as Desktop 2.

1. Open the Configuration tool and navigate to **CID** in the User Interface sub-menu.
2. On the CID page open the CID Designer by clicking on the **Launch Xml Designer** button. For details on the CID Designer, refer to Section 2 '*CID Designer*' in Chapter 3 '*Configuring a Conning Information Display*'.
3. Create the required CID page for the secondary display, as described in Chapter 3, Section 2.4 '*Creating New Pages*'. Ensure the CID page size matches the second monitor screen resolution, for a standard monitor this will be 5 x 4 Aspect (1280 x 1024).
4. Save the page to the following directory: 'C:\Program Files\Sperry Marine\VisionMaster\Output\cid\SecondaryMonitorPages'. The Secondary Monitor CID page may be saved under any suitable name.

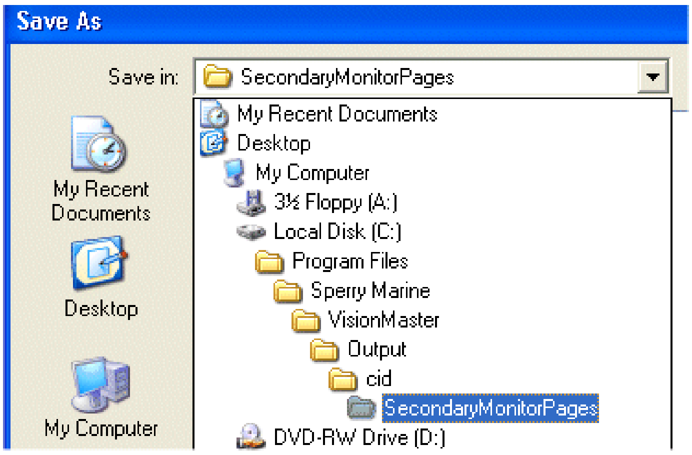


Figure A.5 Saving a CID page in CID Designer

5. Close the CID Designer, re-open the Configuration tool and navigate to the CID page. The page(s) saved in the SecondaryMonitorPages folder will be available for selection from the **Default Secondary Monitor CID Pages** drop down list.

When VisionMaster is opened again any node with a second monitor attached will show the default secondary monitor CID page selected.

A.1.2 Using the Microsoft Display Properties

1. Power down the system and connect the monitor as described previously in step 1 of Section A.1.1.1 '*Setting up the ATI CCC Software*'.
2. Power up the system and navigate to the desktop by logging in as a service engineer from the VisionMaster application (see Section 3.1 '*Login*' in Chapter 2 '*Diagnostics, Commissioning & Service Mode*').
3. On the Service Mode desktop right click and select **Properties**. From the Properties window select the **Settings** tab, see Figure A.6.
4. Configure the monitor that is to show CID pages, this is Display **2** (to the right of the main monitor)   For example, if the screen resolution of the second monitor is a 19" or 23.1" select 1280 x 1024. If the screen resolution is 25.5" or 27" (widescreen) select 1920 x 1200.
5. Tick the **Extend my Windows desktop onto this monitor** check box. This will enable you to move the screen cursor to the second monitor.
6. Click **OK** to save the settings.
7. Generate the CID page as described previously in Section A.1.1.2.2.

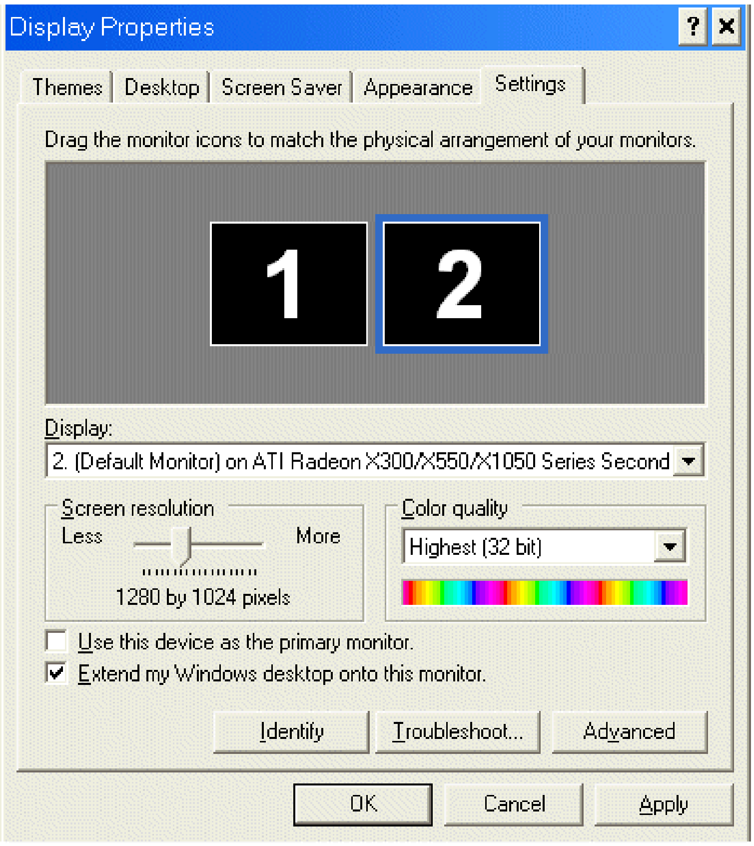


Figure A.6 Display Properties Settings

Chapter 4

TotalTide Setup

CONTENTS

LIST OF FIGURES

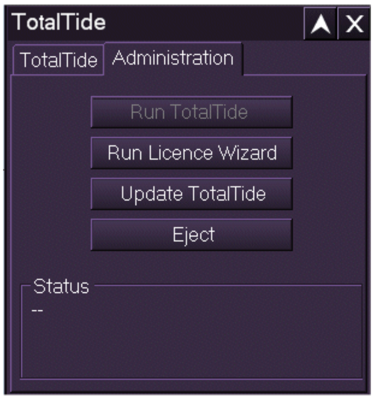
1 Introduction

TotalTide is an optional feature which, when purchased and selected in the Configuration tool, is automatically installed as part of the VisionMaster installer.

After the version of VisionMaster that includes TotalTide is installed, an ADP TotalTide Setup folder is displayed on the Service desktop.

1.1 RunningTotalTide Setup

1. From the VisionMaster Service desktop open the ADP Total Tides Setup folder.
2. From the folder double click on the ADP TotalTide.exe. The exe file extracts a number files and folders to the directory.
3. When the ADP TotalTide.exe has completed, double click on the Setup.exe. The Admiralty Digital Publications Setup wizard appears. Navigate through the Setup wizard, when complete a number of ADP icons are created on the desktop.
4. Open the VisionMaster application in ECDIS watch mode, and from the Charts menu click on TotalTide sub menu. The TotalTide window appears with the Administration tab folder open and **Run TotalTide** button disabled.



To run the TotalTide application for up to one year, a start-up key and activation key must be entered, for details, see Section 1.2 '*Running Licence Key Wizard*'.

1.2 Running Licence Key Wizard

1. To obtain the required license files, click the **Run License Wizard** button. The Licence Key Wizard application opens prompting to enter the start up key that was supplied with the purchase of the ADP TotalTide application.

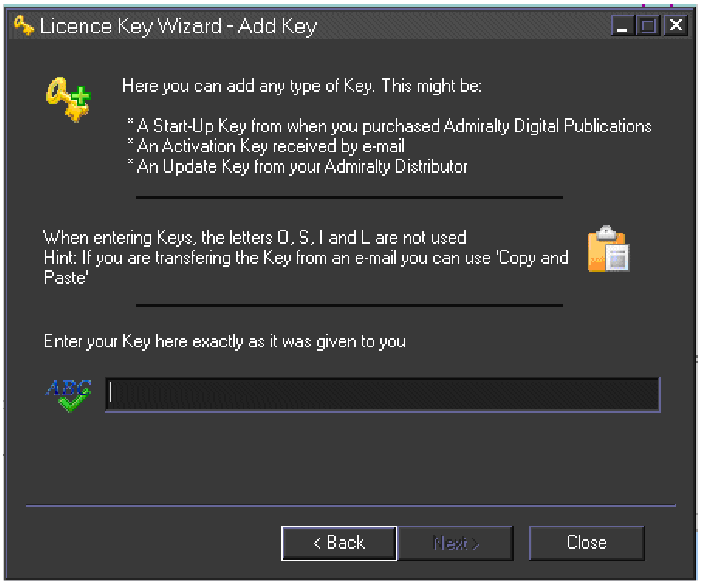


Figure 4.1 Licence Key Wizard - Add Key

2. Enter the key code in the field and click the **Next** button. If the key is validated the next screen confirms that the start up key has been installed, giving temporary 30 day access. To obtain an Activation key, which enables all licensed features, select **Request an Activation Key** and click the **Next >** button.

Figure 4.2 Licence Key Wizard - Request an Activation Key

3. The next screen prompts to obtain the activation key by email. You can send the request directly via email (if your VisionMaster system is linked directly to an email application), send the request to a printer (if no printer is connected, this icon is greyed out), or save the request as a text file.

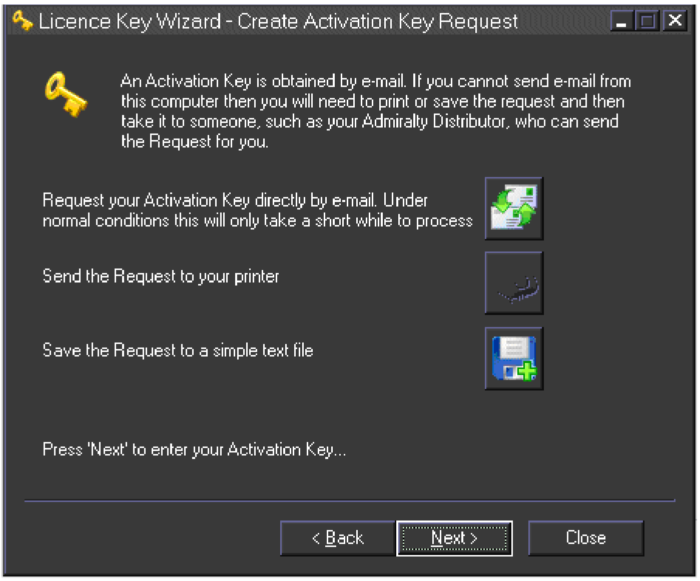


Figure 4.3 Licence Key Wizard - Create Activation Key Request

a. To send your request directly via email click the email icon. A secondary Internet Connection Wizard window opens prompting to enter your email address in the Display Name field.

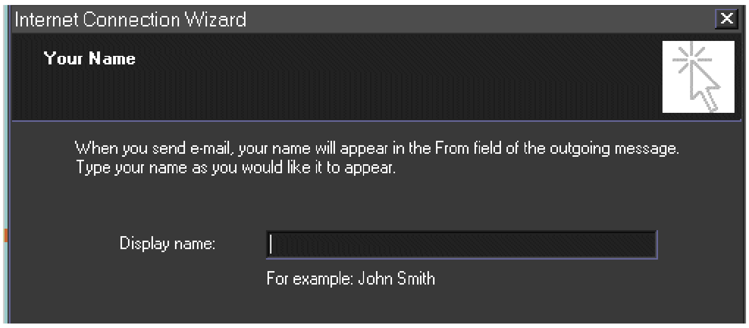


Figure 4.4 Internet Connection Wizard

b. Enter an email address and click the **Next>** button, the following screen prompts to enter your POP3 and SMTP addresses.

c. If VisionMaster is not directly linked to an email application such as Microsoft Outlook, save the request as a text file, which is generated by clicking on the floppy disk icon. The text file can be saved either to the Outlook Express folder in the VisionMaster C:\Program Files directory (default path), or to an external device (for example, a USB memory stick). A **Save As** window opens with the file name **Activation Key Request.txt** shown as default. Save the file to the C: drive, or navigate to the external device and click the **Save** button.

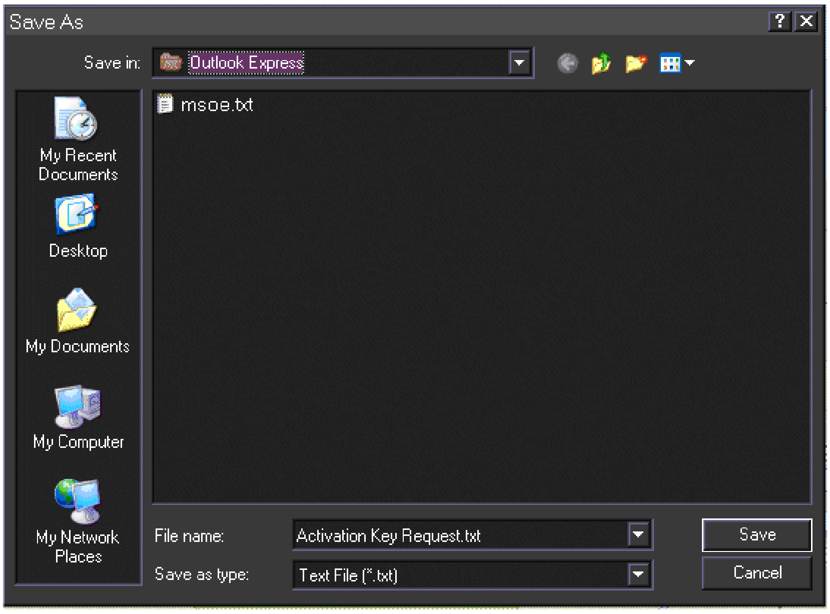


Figure 4.5 Save As window

d. Open the Activation Key Request text file. The file instructs an email message to be sent to *bundled.licences@ukho.gov.uk* with the Activation key in the text message entered in the Subject line of the email.

e. Send the email to the ukho email address. A return email should arrive shortly after with an Activation key code. The email will also list the areas of the world the activation key covers.

4. From the Licence Key Wizard Start Up Key window select **Add an Activation Key** and click the **Next>** button. The Add Key screen shown in Figure 4.1 appears.

Figure 4.6 Licence Key Wizard - Add an Activation Key

5. Enter the activation key as shown on the email in the field and click the **Next>** button. The system reads the key and when validated confirms that the licence will grant the use of the TotalTide application for one year. At the end of the licence period you should re-licence the TotalTide areas you wish to retain access to.
6. Click the **Close** button to exit the Licence Key Wizard.
7. If the VisionMaster application is running, close the application and restart in order to enable the TotalTide application to run on ECDIS.

When a start-up key and activation key have been entered in the Licence Key Wizard, and the system re-started, the TotalTide Administration tab folder shows all features, including **Run TotalTide**, enabled.

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CHAPTER 5

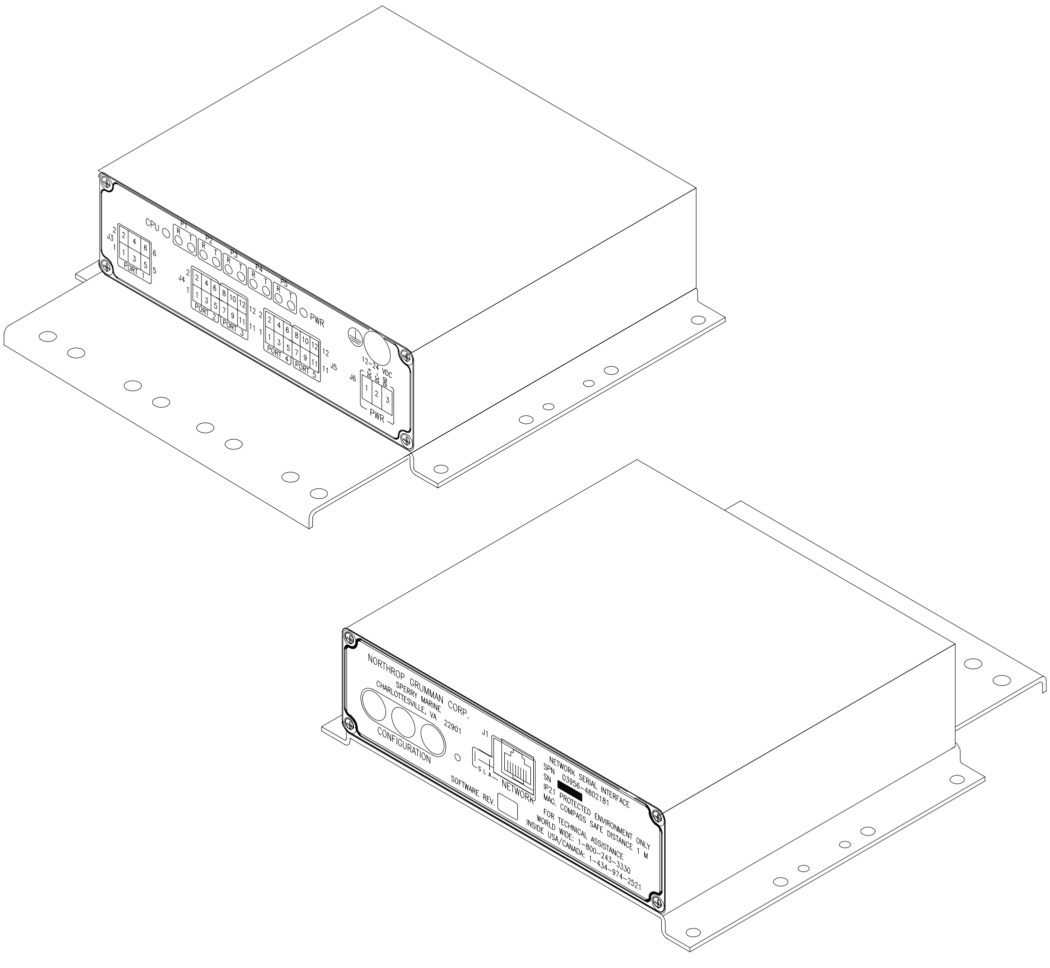
NSI SERVICE MANUAL

Introduction

The following pages include a pdf of the Network Serial Interface (NSI) User, Installation and Service Manual produced by Northrop Grumman Systems Corporation (Sperry Marine), document number JA26-8756C.

For information on configuring an NSI from the VisionMaster configuration tool refer to Section 7.3 '*NSI Manager*' in Chapter 1 '*Configuration*'.

NETWORK SERIAL INTERFACE (NSI)
User, Installation and Service Manual



NORTHROP GRUMMAN

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http://www.sperry-marine.com

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Printed in U.S.A.

REVISION C JUNE 2007

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Safety Precautions

The following safety notice conventions are followed throughout this manual:

A **WARNING** contains an operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in injury or death of personnel.

A **CAUTION** contains an operating or maintenance procedure, practice, condition, statement, etc., which, if not strictly observed, could result in damage to, or destruction of, equipment.

A **NOTE** contains an essential operating or maintenance procedure, condition or statement that is considered important enough to be highlighted.

CAUTION

Do not attempt to open the unit or make any internal repairs yourself. Only Trained Service Technicians may make repairs to your unit.
Breaking a seal will void warranty!

WARNING:

Careless OR improper use of this system may result in vessel damage and/or SERIOUS INJURY OR DEATH.

BEFORE using this system, operators MUST be appropriately trained AND familiar with the warnings, safety instructions and information contained in this manual AND on system components.

ALWAYS keep system manuals in a well-known, readily available location.

CAUTION:

NEVER attempt to open ANY system components OR make ANY internal repairs yourself.

NEVER exceed specified system power OR environmental limits.

NEVER install unauthorized additional cards OR devices into this system.

ONLY Trained Service Technicians are to provide service OR make repairs to this system.

NEVER perform unauthorized service on this system.

NEVER provide unauthorized modifications to this system.

CHAPTER 1
INTRODUCTION

1-1 GENERAL DESCRIPTION

The Network Serial Interface (NSI) helps reduce the amount of shipboard cabling and thereby reduce installation cost by allowing bi-directional transmission of NMEA data through the network infrastructure. The Network Serial Interface (NSI) allows NMEA 0183 (IEC61162-1) serial data messages from a serial device to be transmitted over the Local Area Network (LAN).

The NSI does not interpret the serial messages. The NSI encodes (TX) and decodes (RX) all messages that start with a valid beginning delimiter ($ or !) and is terminated with <CR><LF>. All messages that conform to this format will be passed. The maximum length of the NMEA sentence is 82 characters.

The Network Serial Interface (NSI) can be installed using two different configurations:

a. Simple Mode: The NSI is configured at the factory. The end user supplies the factory with the following information:

1. An IP address that will not conflict with any devices on the network.
2. A list of the NMEA 0183 devices that will be connected to the input and output ports of the NSI.

A unique configuration switch value is assigned to the NSI. The input and output devices are assigned to each input and output port and the configuration information is written to firmware in a configuration file that cannot be modified in the field.

b. Extended Mode: The NSI is configured in the field. Each NSI is assigned a unique configuration switch value on the NSI. A user interface is provided which allows the installer to configure the NSI IP address and input and output ports to transmit NMEA 0183 serial data over the Local Area Network.

The NSI has the capability to be configured to designate a primary and secondary (backup) network source for providing serial data to the configured output ports in the extended mode (see Chapter 4). When the NSI is used in the extended mode, if the primary and secondary ports are receiving data at the same interval and the primary port stops receiving data for 1000ms, the NSI will switch to the secondary port (backup channel) to provide data to the configured output ports.

1-2 MANUAL CONTENTS

Chapter 1: Introduction
This chapter describes the Network Serial Interface usage.

Chapter 2: Equipment Layout
This chapter describes the front and rear panel switches, indicators, and connection ports.

Chapter 3: Using the Network Serial Interface in Simple Mode
This chapter describes the configuration settings and default parameters used when operating the Network Serial Interface in Simple Mode.

Chapter 4: Using the Network Serial Interface in Extended Mode
This chapter describes the configuration settings and default parameters used when operating the Network Serial Interface in Extended Mode.

Appendix A: NSI Mounting Dimensions

This chapter provides outline dimensions and mounting requirements for installing the Network Serial Interface.

Appendix B: NSI Configuration Defaults
This chapter describes the configuration settings and default parameters used when operating the Network Serial Interface.

Appendix C: NSI Configuration Worksheet
This appendix is used to record switch settings for the NSI, the label which is used to identify the NSI, the IP address, Subnet Mask, Default Gateway, Multicast Group Address, Discovery IP Port Number, and the Serial Ports baud rate.

Appendix D: NSI Wizard Worksheet
This appendix is used to enter input and output ports when configuring a NSI in Extended Mode.

Appendix E: Sample NSI Connection Block Diagram
This appendix contains a block diagram which illustrates how the input to a NSI can be configured using the NSI Wizard Add Page to supply an output to equipment connected to another NSI over the network.

1-3 ENVIRONMENTAL SPECIFICATIONS

ENVIRONIMENTAL SPECIFICATIONS		NSI ASSEMBLY PN 4802181
OPERATING TEMPERATURE	MEETS OR EXCEEDS	-15ºC TO +55ºC
STORAGE TEMPERATURE	MEETS OR EXCEEDS	-15ºC TO +55ºC
HUMIDITY	MEETS OR EXCEEDS	IEC 60945, PROTECTED CATEGORY
VIBRATION	MEETS OR EXCEEDS	IEC 60945, PROTECTED CATEGORY
EMI/RFI	MEETS OR EXCEEDS	IEC 60945, PROTECTED CATEGORY
DEGREE OF PROTECTION	MEETS OR EXCEEDS	IEC 529, IP21
COMPASS SAFE DISTANCE	METERS	1
HEAT DISSIPATION	MAX	4 WATTS
SUPPLY VOLTAGE		12 VDC OR 24 VDC +/- 10%
COLOR		YELLOW/BLACK
WEIGHT	MAX	1 KG

CHAPTER 2
EQUIPMENT LAYOUT

2-1 FRONT PANEL

The Network Serial Interface (NSI) front panel contains the configuration switches that are used to enter the three digit IP address for the NSI, the reset switch that is used to reset the NSI IP address and ports to the factory default settings, and the ethernet port that is used to connect the NSI to the Local Area Network.

CONFIGURATION SWITCHES	3 Digit configuration code set to identify the NSI.
RESET SWITCH	Momentary Switch: Used to restart the NSI.
ETHERNET PORT	RJ-45 connector used to connect the NSI to the Network (10/100 Mbs)

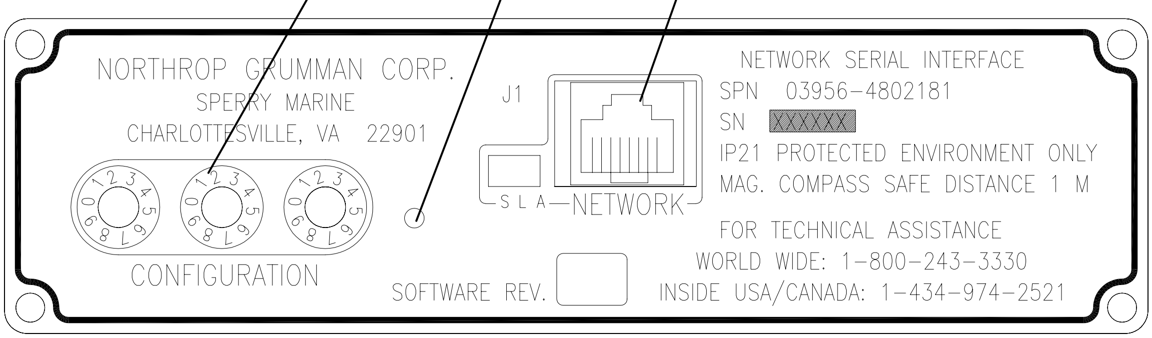


Figure 2-1. Network Serial Interface Front Panel

2-2 REAR PANEL

The Network Serial Interface rear panel is where the ship's ground, the ship's power, and the serial data cables are connected. Also included on the rear panel is a power (PWR) LED which lights when power is supplied to the NSI, a CPU LED which flashes when the NSI is functioning properly, and a receive (R) and transmit (T) LED which flashes when data is being transferred via the NSI.

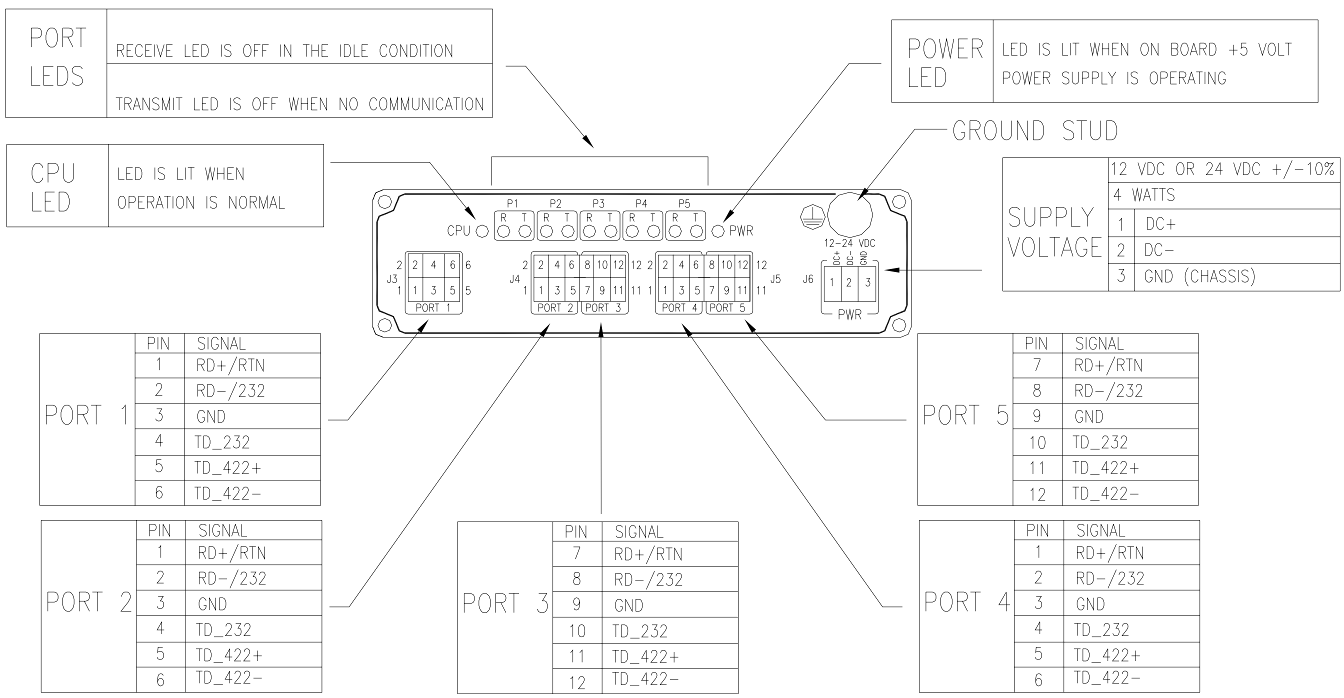


Figure 2-2. Network Serial Interface Rear Panel

CHAPTER 3
USING THE NSI IN SIMPLE MODE

3-1 NSI SIMPLE MODE OVERVIEW

The Network Serial Interface (NSI) front panel contains the configuration switches that are used to enter the three-digit identity of the NSI, the reset switch that is used to reset the NSI IP address and ports to the factory default settings, and the ethernet port that is used to connect the NSI to the Local Area Network.

The setting of the Configuration Switch determines one of two operating modes, Simple or Extended. For Simple Mode, the configuration switch settings are in the range 100 to 999.

In **Simple Mode** the configuration for a project is programmed into the Network Serial Interface firmware by Sperry Marine. Simple Mode has two differentiating features:

a. Configuration is quick and simple using the three digit Configuration Switch. No computer or special expertise is required.

b. The configuration is embodied in the firmware; it cannot be changed in the field.

Figure 3-1 shows and lists the configuration switches for the NSI to operate in Simple Mode.

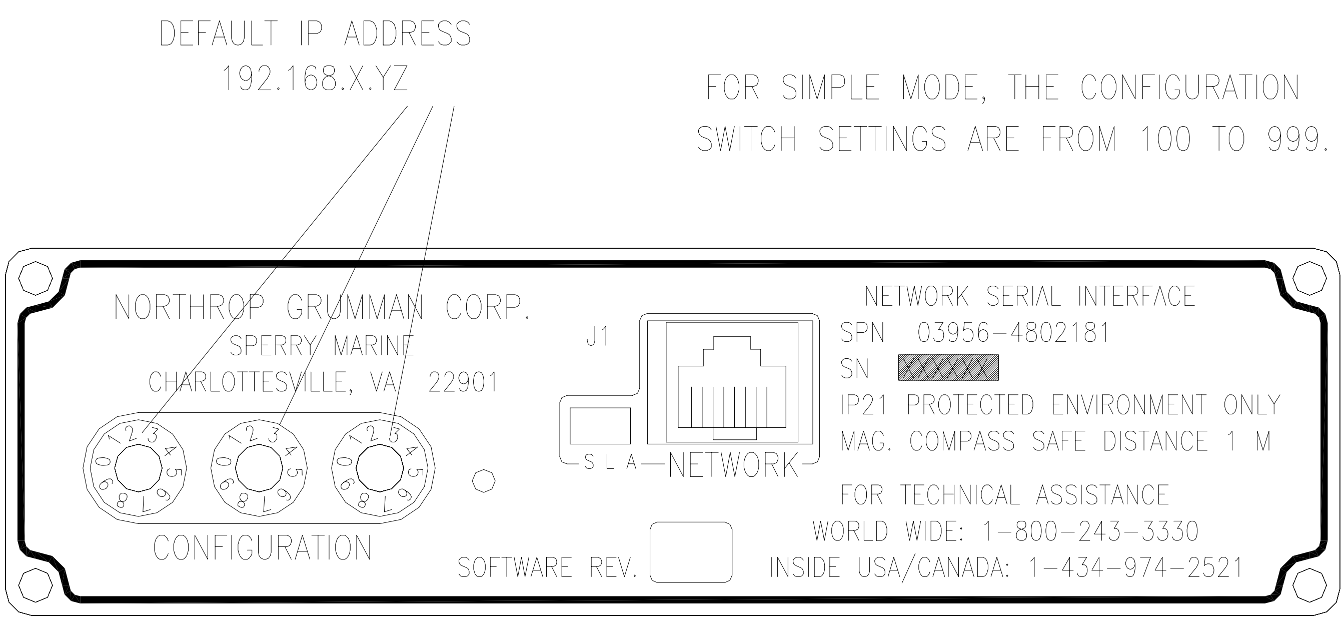


Figure 3-1. Configuration Switch Settings for Operating the NSI in Simple Mode

3-2 CONNECTING A COMPUTER TO ACCESS THE NSI IN SIMPLE MODE

There are two methods to connect a computer to check the status of a NSI in Simple Mode.

The first method is to connect a crossover cable directly from the Ethernet port on the computer to the network connection on the NSI. This method is useful when checking the status of the NSI at your desk.

The second method is to connect the computer directly to the network. The method is useful since the computer can communicate with all of the NSI units connected on the Local Area Network segment. The Cat5 cable works with the NSI when the NSI is connected to a network hub or router.

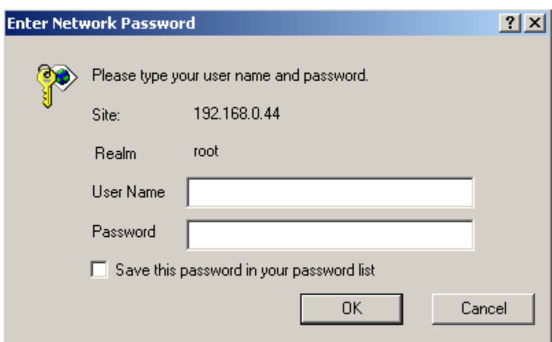
The following procedure is used to connect a computer to the network to access the NSI status web pages used in Simple Mode.

a. Set each NSI's switch to a unique number in the range from 100 to 999 (see figure 3-1). The resulting default IP address will be 192.168.1.00 to 192.168.9.99 with a default subnet mask of 255.255.0.0 (Simple Mode). If you cannot use these IP addresses because of a conflict, a crossover cable will be required to connect the computer directly to the NSI to change its IP address and subnet mask before attaching the NSI to the network.

b. Make sure that power is connected to the NSI(s).

c. Attach the computer to the network. **The computer must be on the same LAN segment as the NSI. Web page access is not supported through a router.**

d. Start the Internet browser. If using the default IP addresses, enter the URL **http://192.168.X.YZ** where 'XYZ' is the three digits (100 to 999 for simple mode) of the switch setting of the NSI that you will be communicating with. The following login box will appear. Login as '**user**' with password '**user**'.

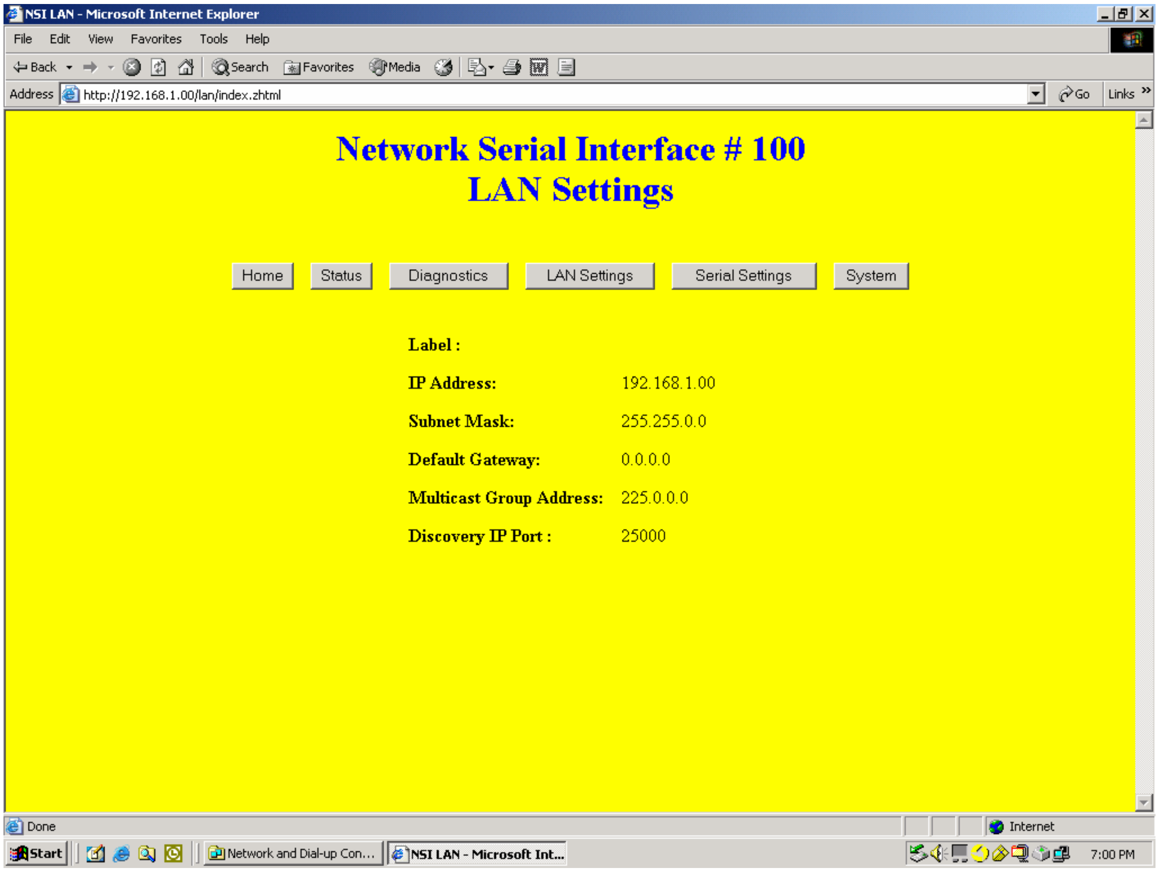


e. You will see the NSI's home page. If you have trouble accessing the NSI, check your computer's IP address and subnet mask.

NOTE

When using the Internet browser always disable page caching. Otherwise, you may see old values on the screen when navigating between pages. In Internet Explorer, you can go to Tools->Internet Options->General->Settings and under "Check for newer versions of stored pages" click on "Every visit to the page".

Figures 3-2 through 3-7 shows the status menus associated with the NSI operating in Simple Mode.



THIS MENU PROVIDES THE STATUS OF THE LAN SETTINGS USED WITH THE NSI.

Figure 3-2. NSI Home Page in Simple Mode

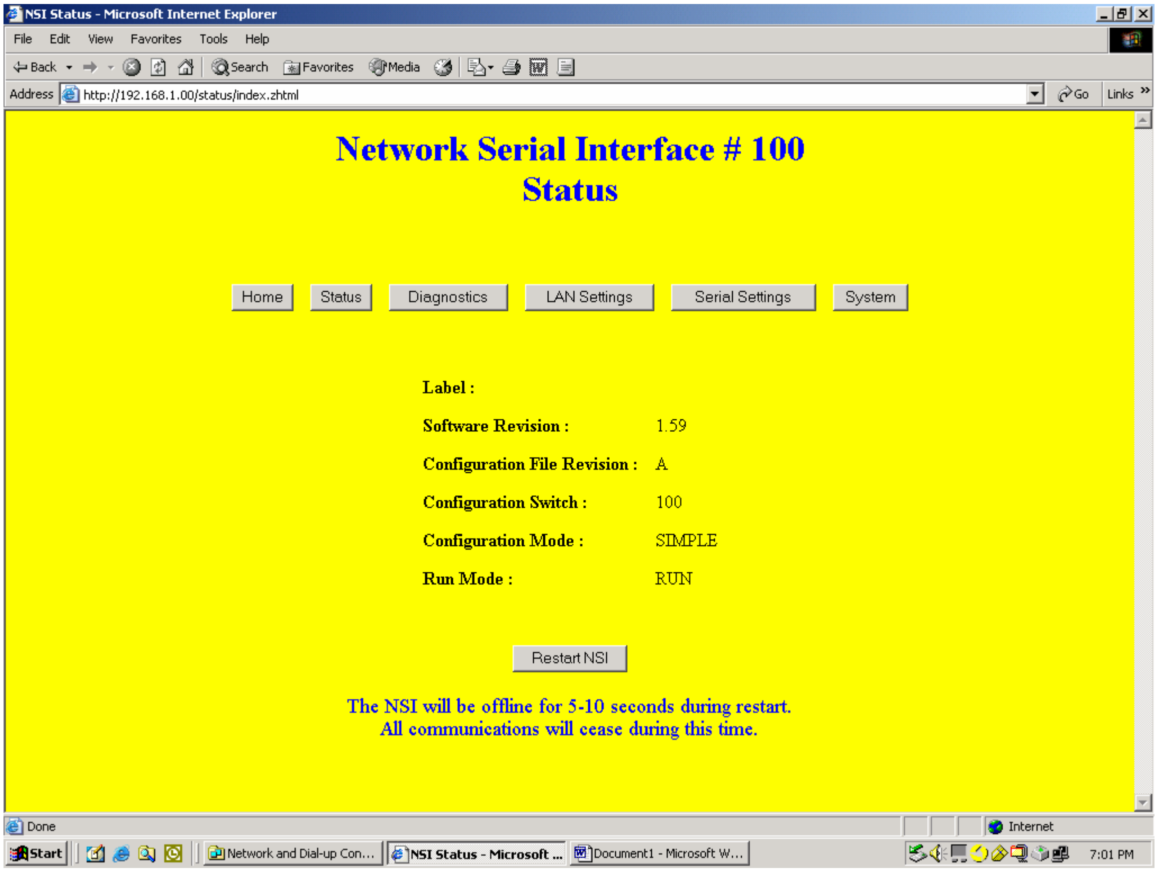


Figure 3-3. NSI Status Page in Simple Mode

Table 3-1. NSI Status Page in Simple Mode

Item		Description
1	Label	Enter a descriptive label for the NSI.
2	Software Revision	NSI firmware revision.
3	Configuration File Revision	This is the revision of the current configuration file. The revision will be the firmware revision (X.XX).
4	Configuration Switch	The setting of the three-digit switch 0-999.
5	Configuration Mode	SIMPLE, (switch setting 100-999), EXTENDED or EXTENDED DEFAULTS (switch setting 1-99), NO CONFIG, IDLE MODE (switch setting 0, shipping configuration)
6	Run Mode	Run, Error, Factory Test
7	Restart NSI	This button initiates an NSI restart.

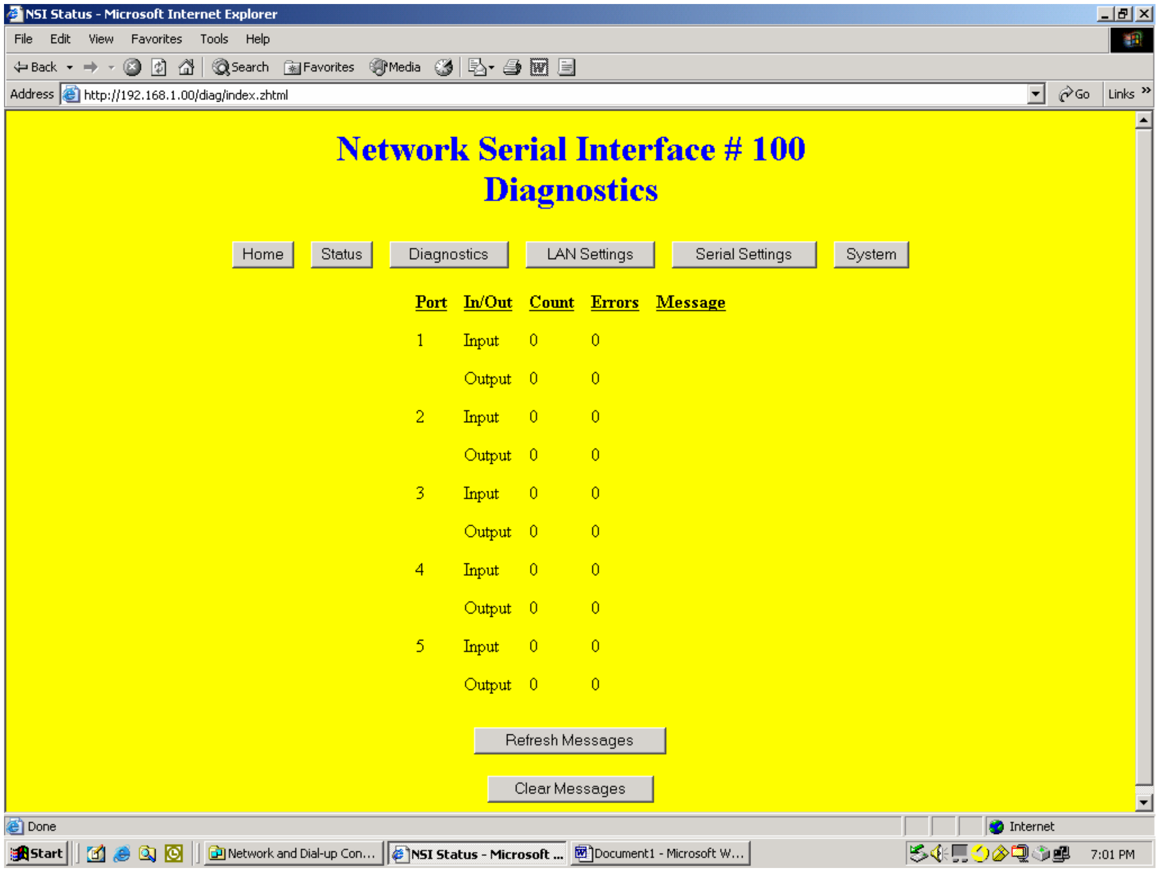


Figure 3-4. NSI Diagnostic Page in Simple Mode

Table 3-2. NSI Diagnostic Page in Simple Mode

Item		Description
1	Count	The number of valid NMEA messages received. This counter is reset at startup and rolls over after 65535.
2	Error	For inputs, an error is logged for an invalid NMEA message or if a timeout occurs. For outputs, an error indicates that a buffer overflow occurred, most often caused by a lower baud rate on the output than the on the input from which it is receiving data.
3	Message	The most recent message received or transmitted. If no messages have been received since startup, this field will be blank.
4	Refresh Messages	Use this button instead of the browser Refresh button.
5	Clear Messages	All message buffers and message counters will be cleared.

INFORMATION PAGE ONLY. THIS PAGE PROVIDES THE STATUS OF THE LAN SETTINGS.

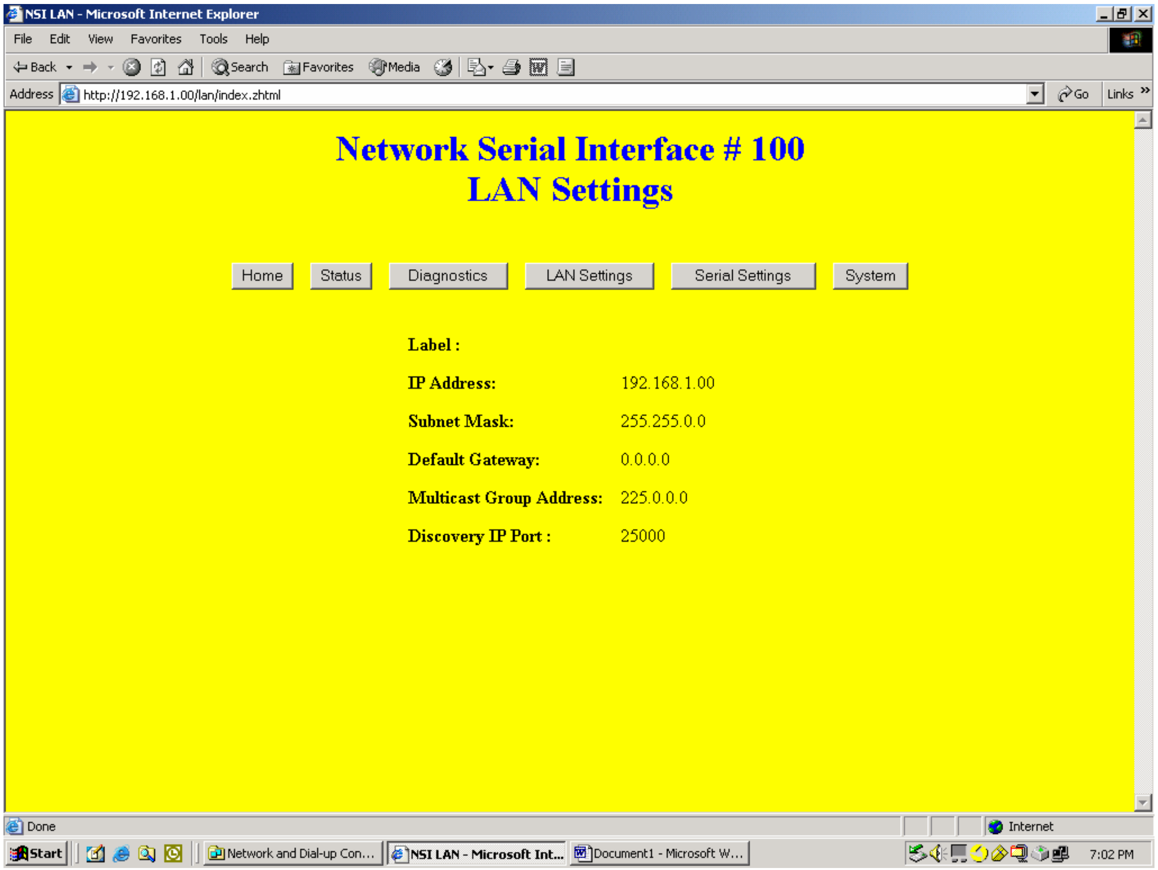
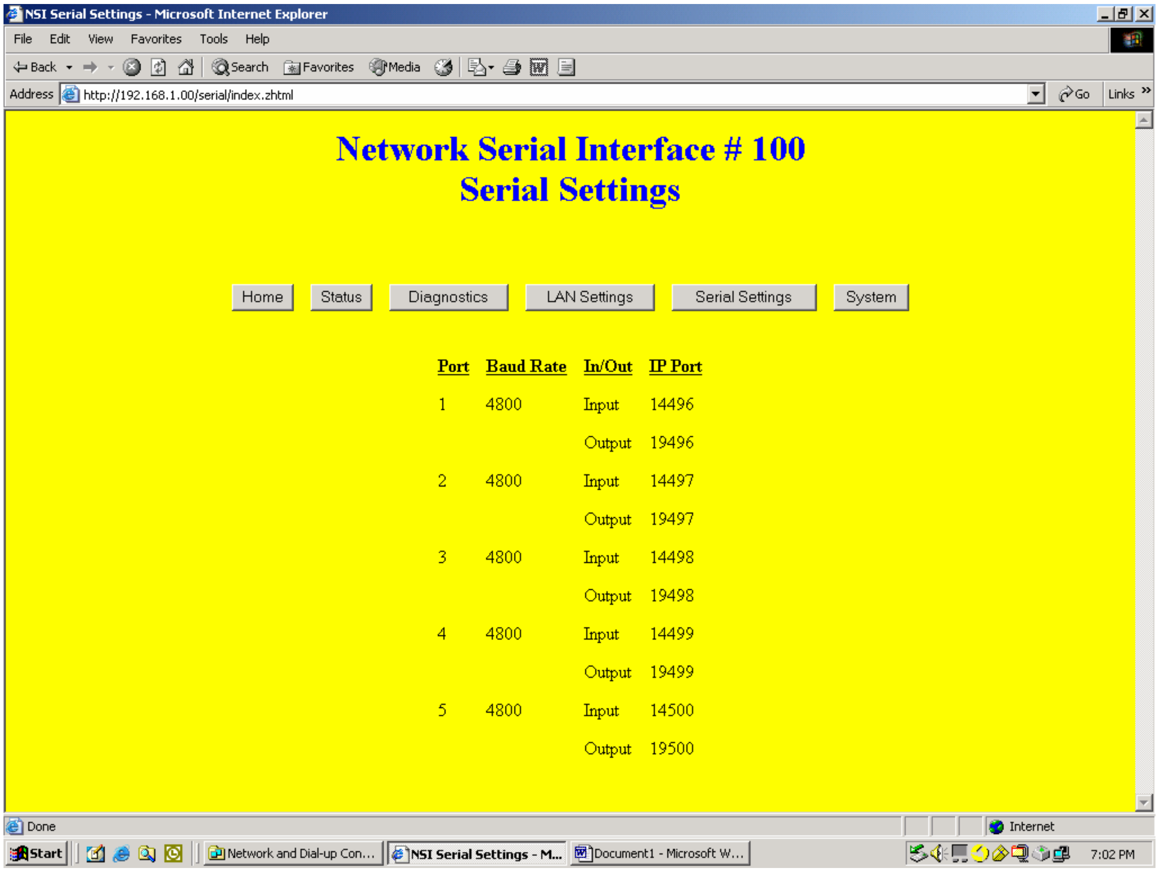


Figure 3-5. LAN Setting Page in Simple Mode



INFORMATION PAGE ONLY. THIS PAGE PROVIDES THE STATUS OF THE NSI SERIAL SETTINGS.

Figure 3-6. Serial Setting Page in Simple Mode

INFORMATION PAGE ONLY. THIS PAGE PROVIDES THE STATUS OF THE NSIs COMMECTED VIA THE NETWORK.

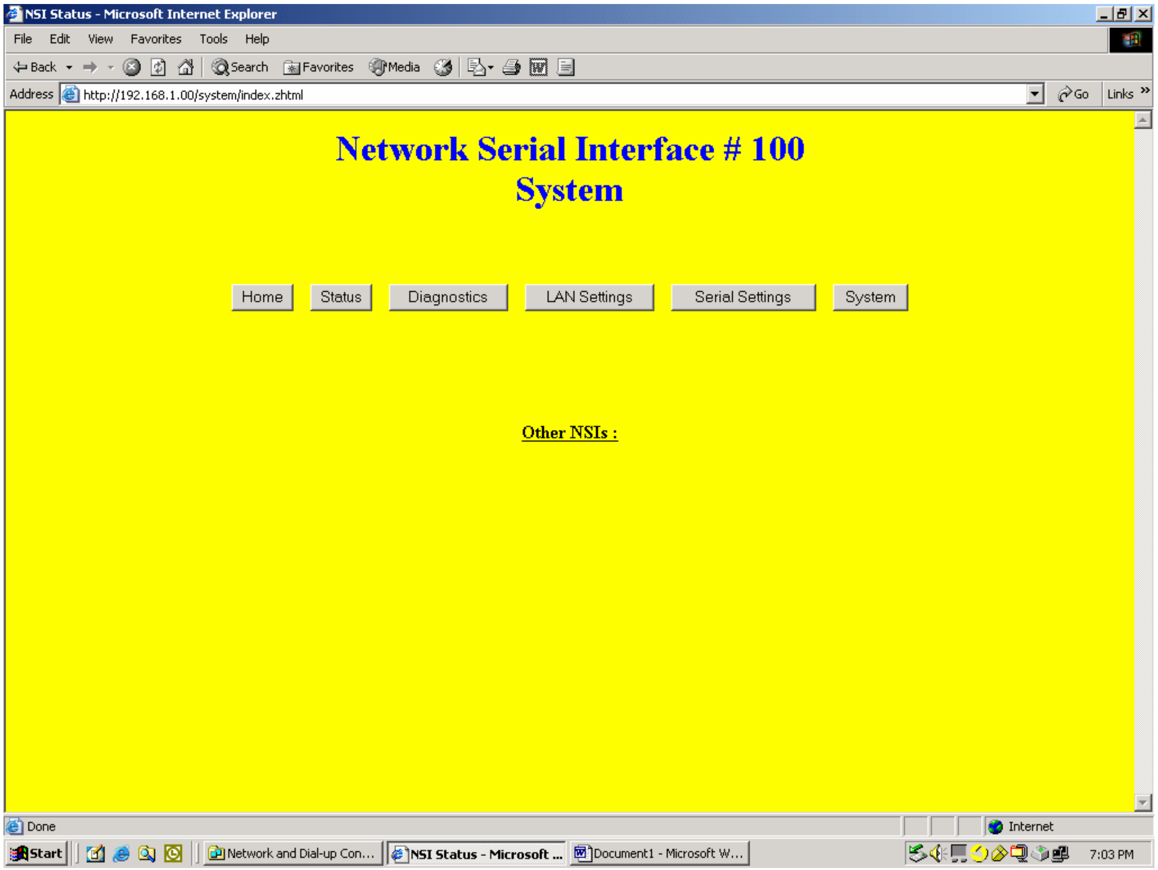


Figure 3-7. System Page in Simple Mode

3-3 COMMUNICATIONS WITH AN EXTERNAL COMPUTER

Some external computers such as a Voyage Management System will have the capability to directly communicate to NSI inputs and outputs over the LAN. Configuring these devices is beyond the scope of this document.

The information needed to configure an external computer will be found on the 'Serial Settings' page (IP Port) and the 'LAN Settings' page (Multicast Group Address).

Reset Button

The Reset button is recessed behind the NSI front panel, next to the Configuration switches. Operation is as follows:

Reset button activated	NSI restarts	Switch definition file defaulted
< 5 secs	Yes	No
> 5 secs	Yes	No
At power up	N/A	Yes

CPU Run LED

Approximately five seconds after startup, the CPU Run LED will start blinking once per second under normal conditions. If the LED blinks at a fast rate, an error such as a corrupted configuration file has been detected at startup. If this occurs, the configuration file can be reset to its defaults by depressing the Reset button at startup.

Performance

Two NSIs will delay the transmission of a NMEA message beyond that experienced with a traditional serial cable connection. The total delay comprises the sum of the following three elements:

- one message length
- 5-10 milliseconds for message processing
- any LAN traffic delays

Activation of the browser Refresh button, the Refresh Messages button or the Clear Messages button can temporarily increase the NSI's message processing from 5 milliseconds to as much as 200 milliseconds. Messages will be delayed during this period, but not lost since the NSI employs message buffering.

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CHAPTER 4
USING THE NSI IN EXTENDED MODE

4-1 EXTENDED MODE OVERVIEW

When the Network Serial Interface (NSI) is used in Extended Mode, all of the configuration parameters (see Appendix B) can be changed in the field using a computer connected to the network. The settings of the configuration switches for Extended Mode are from 1 to 99 (see figure 4-1).

The following features have been incorporated to simplify the process for configuring the NSI in the Extended Mode:

- The defaults have been selected to minimize the amount of change required for most applications.
- The Wizard configures all of the NSIs as a system, by connecting a computer to just one NSI.
- ‘Discovery’ provides web page links to all of the NSIs currently online. Clicking on a link takes you directly to that NSI’s home page.
- ‘Recovery’ will automatically configure a replacement NSI without human intervention.

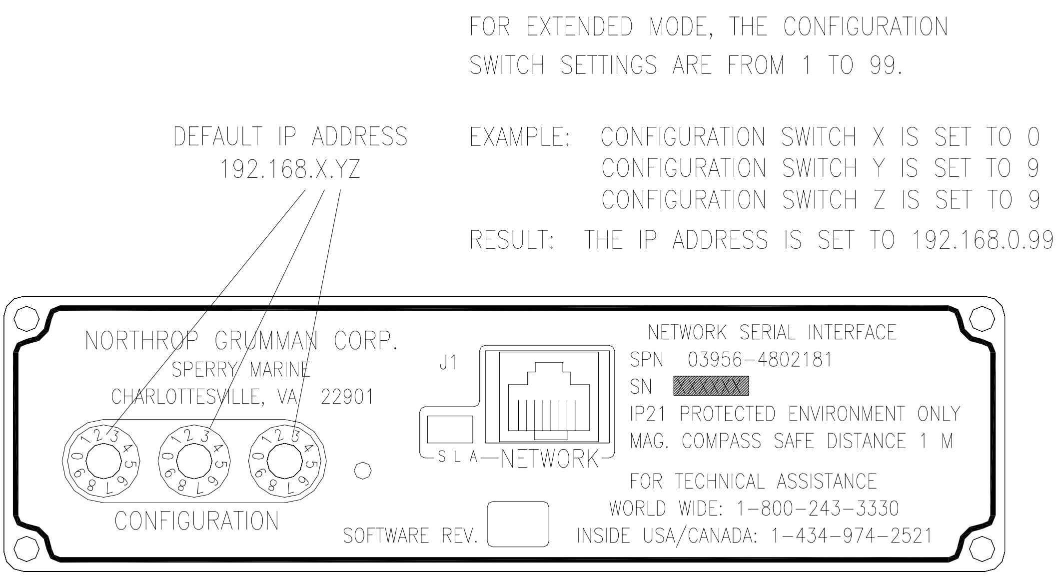


Figure 4-1. Configuration Switch Settings for Operating the NSI in Extended Mode

4-2 CONNECTING A COMPUTER TO ACCESS THE NSI

There are two methods to connect a computer to configure a NSI in Extended Mode.

The first method is to connect a crossover cable directly from the Ethernet port on the computer to the network connection on the NSI. This method is useful when configuring a single NSI.

The second method is to connect the computer directly to the network. The method is useful since the computer can communicate with all of the NSI units connected on the segment when configuring the input and output ports for the NSI.

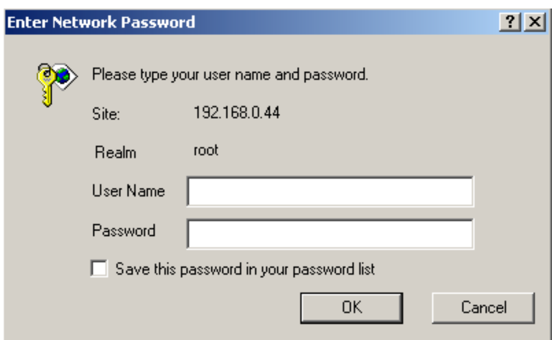
The following procedure is used to connect a computer to the network to access the NSI configuration and status web pages.

a. Set each NSI's switch to a unique number in the range 1 to 99 (see figure 4-1). The resulting default IP address will be 192.168.0.1 to 192.168.0.99 with a default subnet mask of 255.255.255.0 (Extended Mode). If you cannot use these IP addresses because of a conflict, a crossover cable will be required to connect the computer directly to the NSI to change its IP address and subnet mask before attaching the NSI to the network.

b. Make sure that power is connected to the NSI(s).

c. Attach the computer to the network. **The computer must be on the same LAN segment as the NSI. Web page access is not supported through a router.**

d. Start the Internet browser. If using the default IP addresses, enter the URL **http://192.168.X.YZ** where 'XYZ' is the three digits (001-099) of the switch setting of the NSI that you will be communicating with. The following login box will appear. Login as '**user**' with password '**user**'.



e. You will see the NSI's home page. If you have trouble accessing the NSI, check your computer's IP address and subnet mask. If the IP address of the NSI is in question, you can default it by pressing the Reset button for five seconds.

NOTE

When using the Internet browser always disable page caching. Otherwise, you may see old values on the screen when navigating between pages. In Internet Explorer, you can go to Tools->Internet Options->General->Settings and under "Check for newer versions of stored pages" click on "Every visit to the page".

4-3 USING THE WIZARD IN EXTENDED MODE

After the NSI(s) and computer have been connected to the network and the NSI configuration web page has been accessed, the Wizard can be used to configure the input and output ports in the Extended Mode. The Wizard assumes that:

- The baud rate of the input and output (of a pair) is the same.
- The default IP port assignments of the inputs have not been changed
- The 'Multicast Group Address' and 'Discovery IP port number' of all NSIs is the same

To use the wizard follow these steps:

a. Turn on all of the NSIs.

b. Access the first NSI's home page using the procedure described in paragraph 4-2. The Network Serial Interface Home Page should appear (see figure 4-2).

c. Select the "Run the Wizard" button to begin the process. The Wizard Add Page (figure 4-3) will appear. Use the NSI Wizard Worksheet (Appendix D) as a reference to record the configuration data during this process.

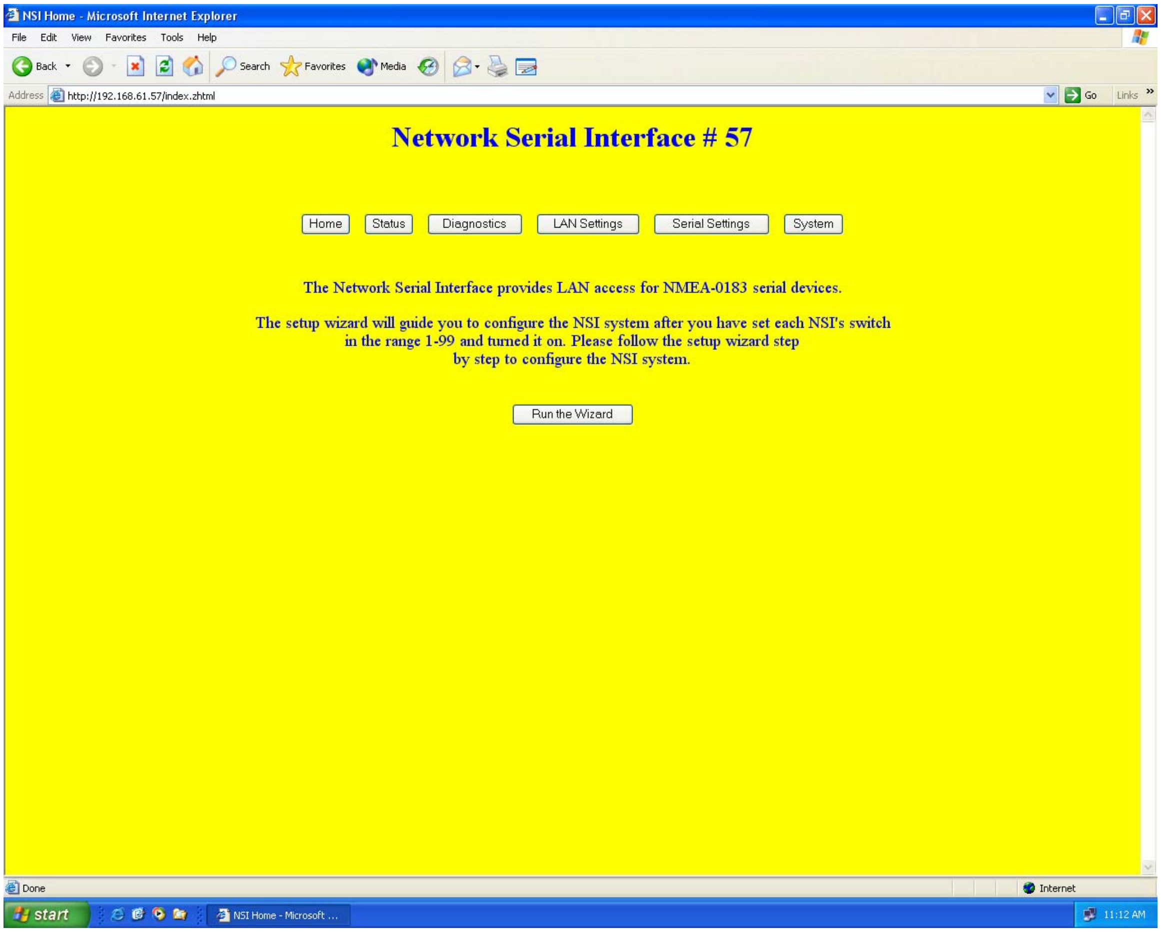


Figure 4-2. NSI Home Page in Extended Mode

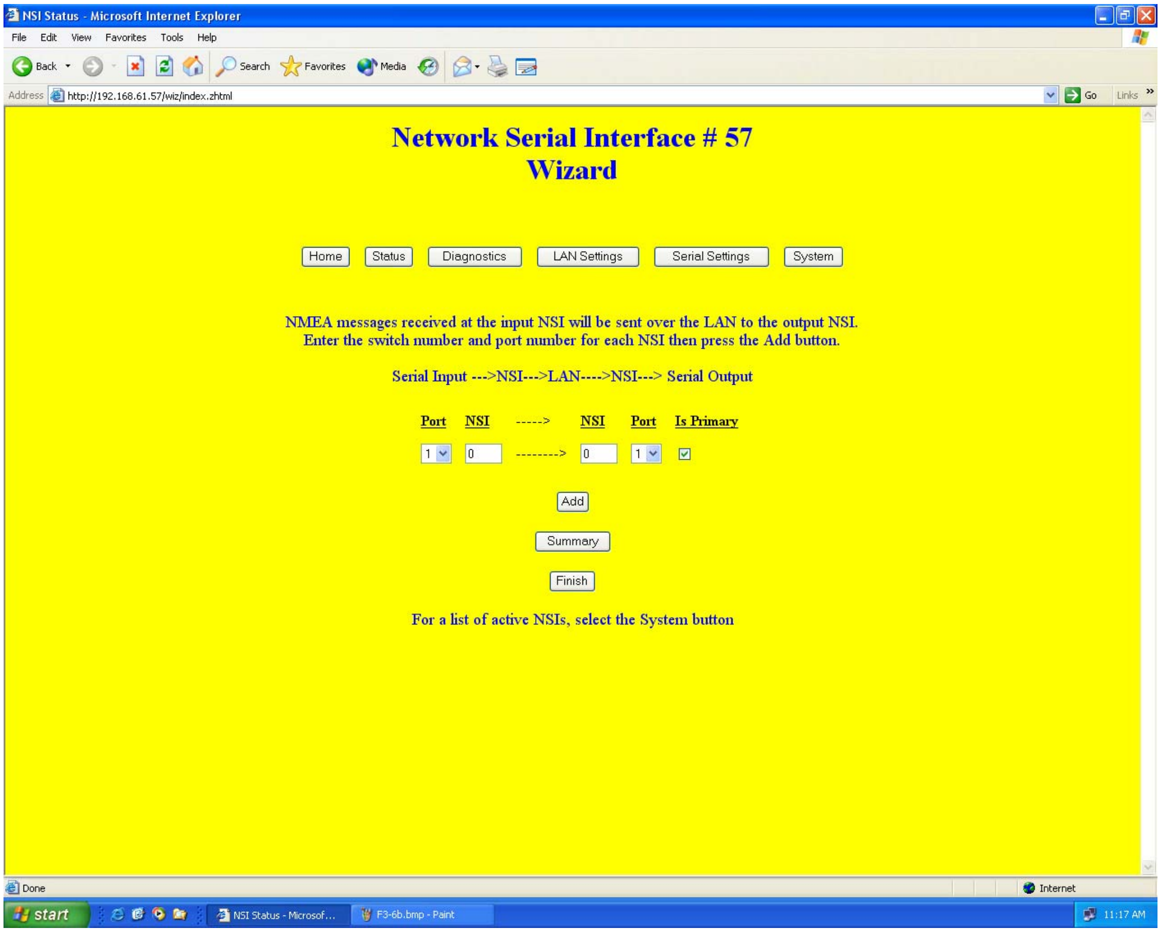


Figure 4-3. NSI Wizard Add Page

d. The Wizard will configure the system such that any NMEA messages received at the input NSI port (left) will be sent over the LAN to the output NSI port (right) (see figure 4-3). The Is Primary checkbox is used to determine if the input is a primary input from the LAN (checkbox is selected) or if it is a secondary input from the LAN (checkbox is not selected). Enter the NSI number and port number for each NSI then press the Add button. Valid NSI numbers for the input port on the left are from 1 to 99 and valid output port numbers for the NSI on the right are from 1 to 99. An input port can supply data to output(s) on the same NSI or other NSI(s). If an input port is supplying data to multiple outputs, enter each input-output combination separately.

e. Continue entering input-output pairs until the system is configured then select Finish.

NOTE

The Wizard only configures online NSIs. To check which NSI(s) is online, use the System button. To see the current configuration at any time, select the Summary button.

f. Select the Summary button to see the Wizard Summary page (figure 4-4). Additions may take several refreshes to appear in the list. Use the refresh button if a new addition does not appear immediately.

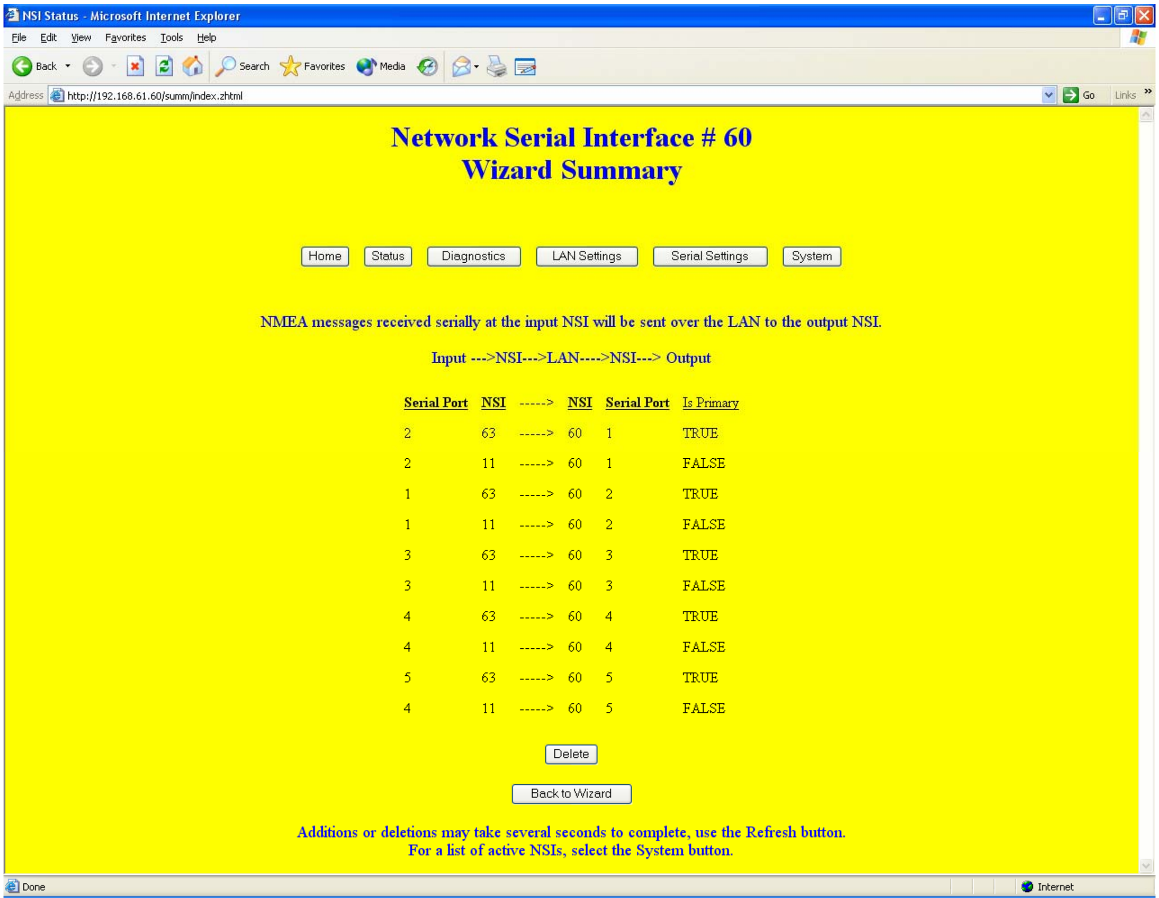


Figure 4-4. NSI Wizard Summary Page

g. To continue to add input-output pairs, select the ‘Back to Wizard’ button. To delete an entry, select the Delete button.

h. Figure 4-5 shows the Wizard ‘deletion’ page. To delete an entry, enter the output NSI and output port number then press the Delete button. To change an entry, first delete it then add the new one.

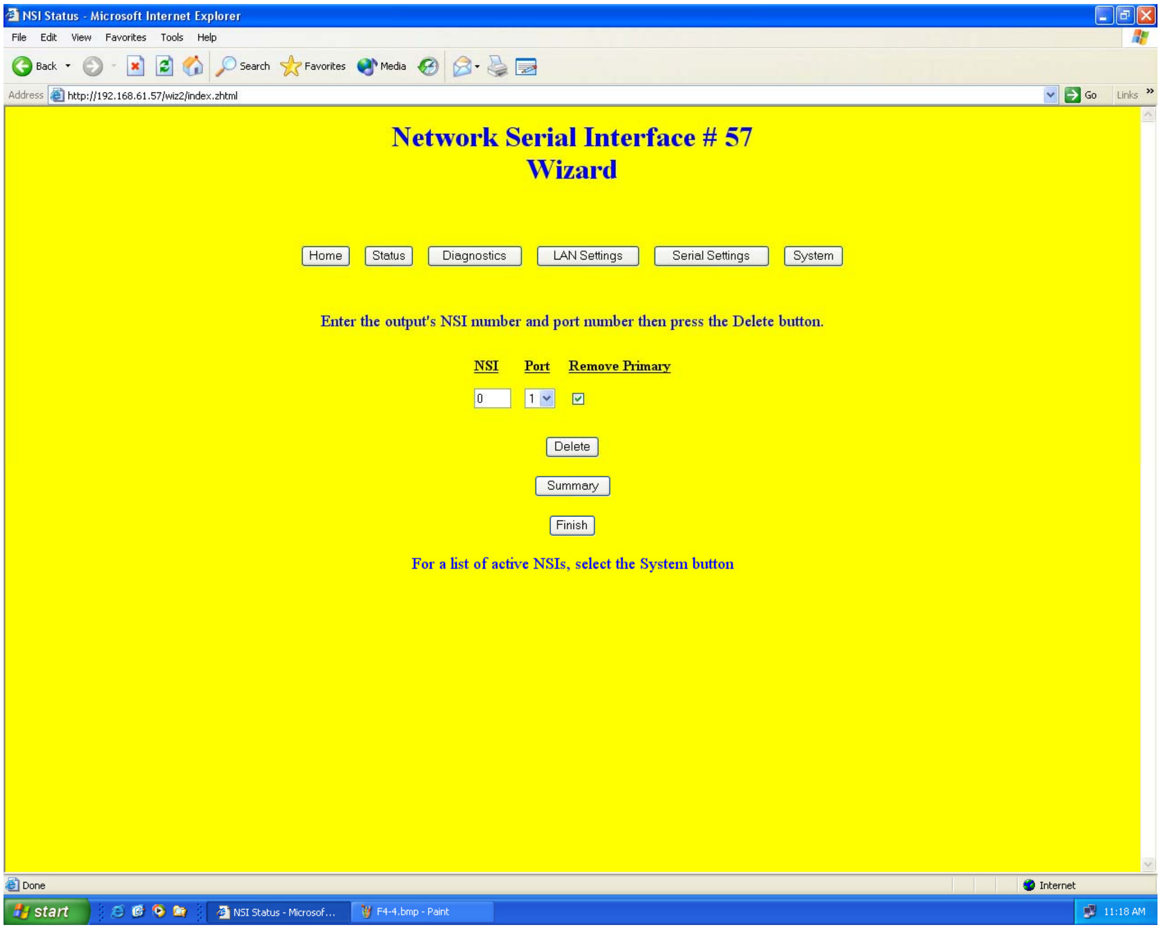


Figure 4-5. NSI Wizard Delete Page

4-4 CHANGING THE DEFAULTS

This section explains how to use the built-in menus to change the configuration defaults of a NSI in Extended Mode. **You may want to disable the Configuration Recovery feature before proceeding** (see paragraph 4-5 - Configuration Recovery).

Do not change the IP port assignments because the Wizard will perform this step for you automatically. Use the Configuration Worksheet in Appendix C to record the changes.

a. Access the NSI's home page (figure 4-6).

b. Select the "LAN Settings" or "Serial Settings" buttons to configure the NSI. See the 'LAN Settings' (figure 4-8 and table 4-3) or 'Serial Settings' (figure 4-9 and table 4-4) for descriptions and instructions on changing the defaults.

c. Once the NSI has been configured, use the System button to navigate to the next NSI if it is on the same LAN segment as your computer (see figure 4-7 and table 4-2).

d. Repeat steps a through c until all NSIs are configured.

NOTE

When using the Internet Explorer Browser, always disable page caching, otherwise you may see old values when selecting a new page. In Internet Explorer, you can go to Tools->Internet Options->General->Settings and under "Check for newer versions of stored pages" click on "Every visit to the page".

4-4.1 NSI Home Page (Extended Mode)

Figure 4-6 and table 4-1 illustrate and describe the buttons associated with the NSI Home page.

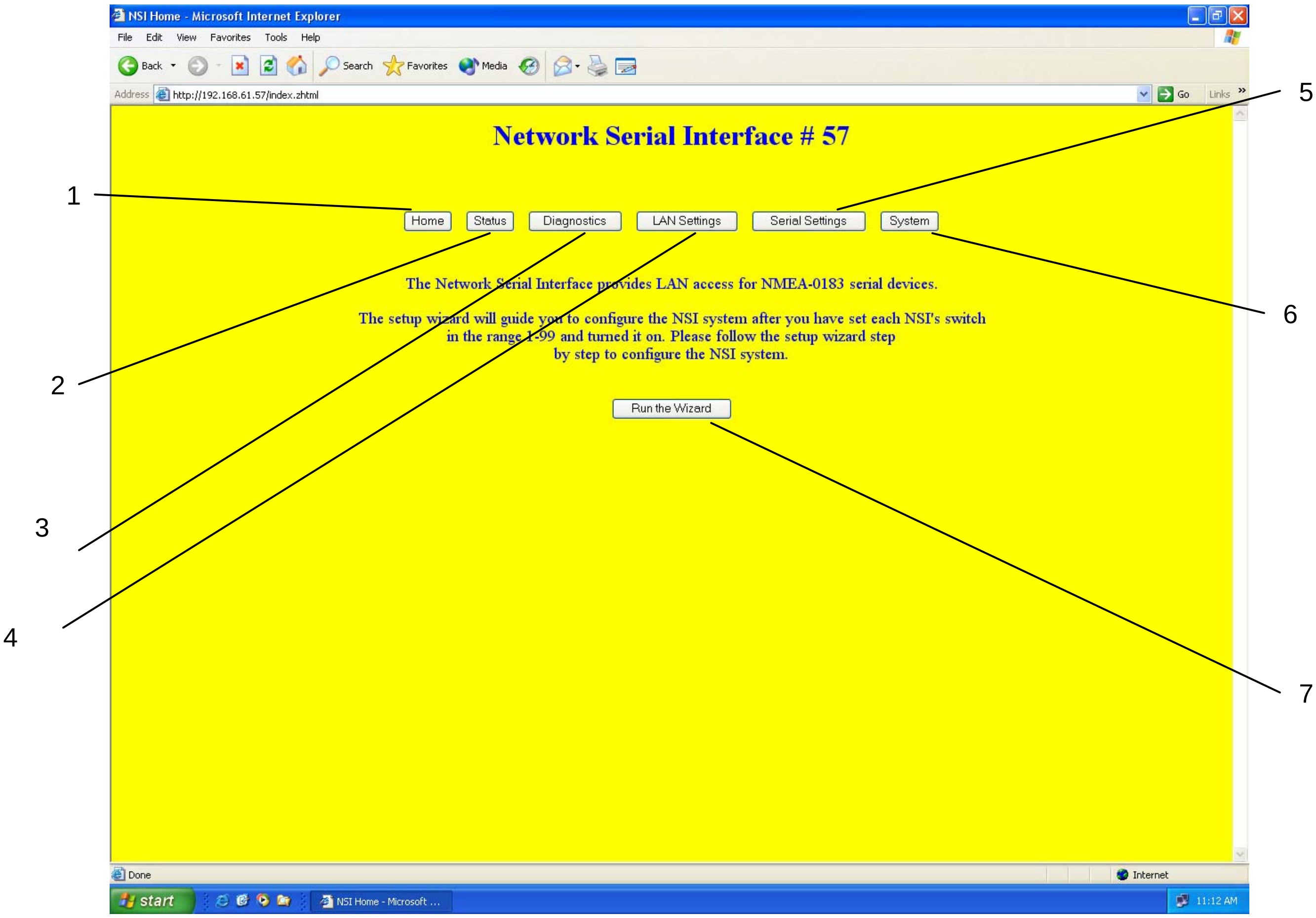


Figure 4-6. NSI Home Page Button Layout

Table 4-1. NSI Home Page Button Layout

Item	Button	Description
1	Home	Home page. The configuration wizard is initiated here.
2	Status	Status page. NSI label, Configuration Mode and Run Mode.
3	Diagnostics	Diagnostics page. Message counts, error counts and most recent message for each input and output. NSI Reset button.
4	LAN Settings	LAN Settings page. IP address, mask, default gateway, multicast group address, discovery IP port number and Configuration Recovery Enable.
5	Serial Settings	Serial Settings page. Baud rate, IP port numbers for inputs and outputs.
6	System	Displays a link to each NSI in the system.
7	Run the Wizard	Steps you through configuration of the inputs and outputs.

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Sperry Marine

4-4.2 NSI System Page

Figure 4-7 and table 4-2 illustrate and describe the check boxes and NSI information presented on the NSI System page.

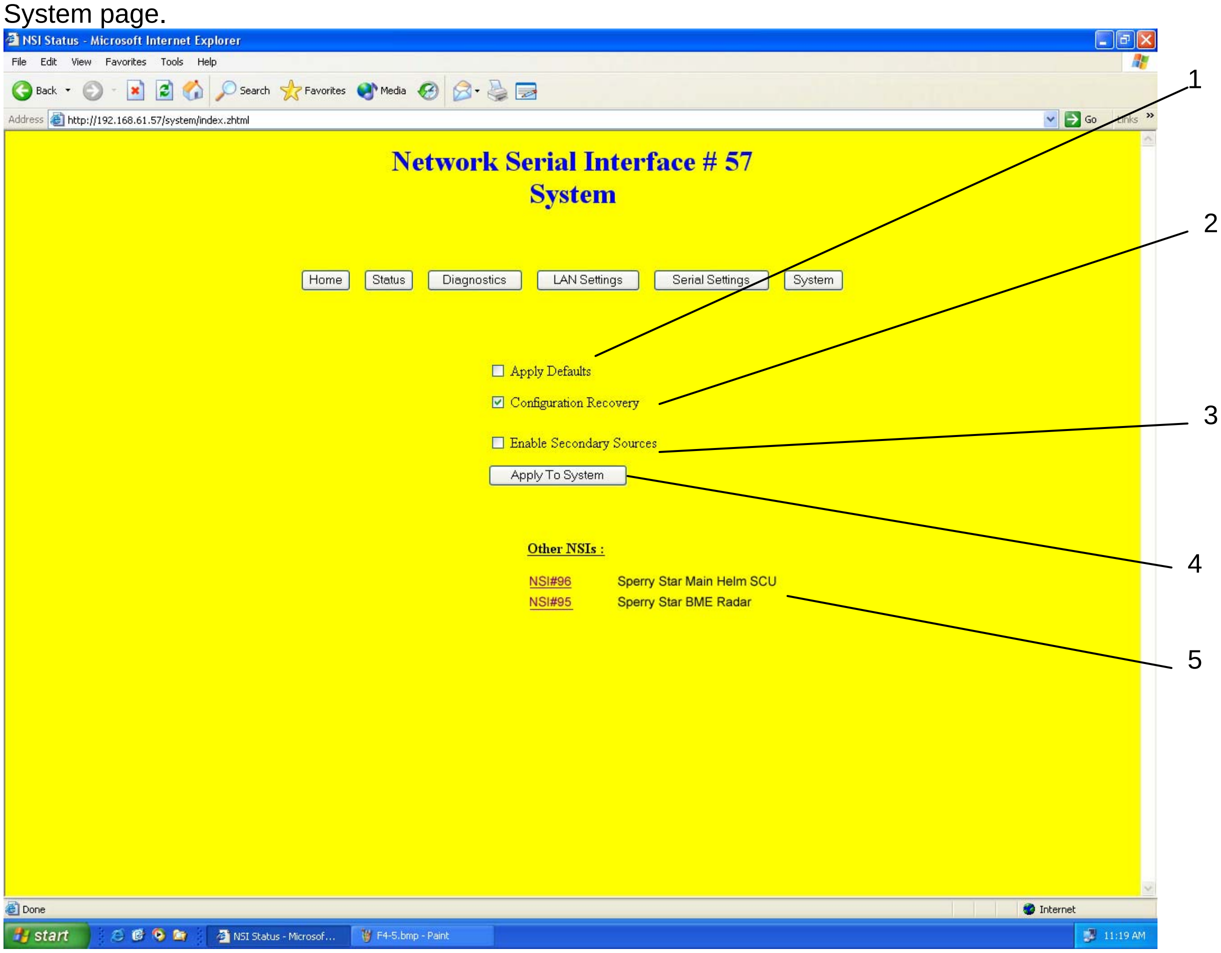


Figure 4-7. NSI System Page

Table 4-2. NSI System Page

Item	Button	Description
1	Apply Defaults	If this checkbox is selected, the configuration is forced to default values when the 'Apply To System' button is activated. All parameters are defaulted except the Configuration Recovery feature.
2	Configuration Recovery	Check this box to enable the configuration recovery feature. The default setting is Enabled. Refer to paragraph 4-5 for a description of the Configuration Recovery feature.
3	Enable Secondary Sources	Check this box to enable a secondary network input port for each serial output port.
4	Apply To System	Select this button after the two previous parameters have been changed and you are ready to submit the new values to the NSI. After this button is selected, all of the NSIs automatically restart.
5	Other NSIs	This is a list of all other NSIs discovered in the system. In order to be discovered, all NSIs should have the same Multicast Group Address and Discovery IP Port assignment. To go to the home page of any NSI in the list, just click on its link.

4-4.3 The LAN Settings Page (Extended Mode)

Figure 4-8 and table 4-3 illustrate and describe the settings associated with the LAN Settings page. These settings can be changed only in Extended Mode (switch number = 1-99).

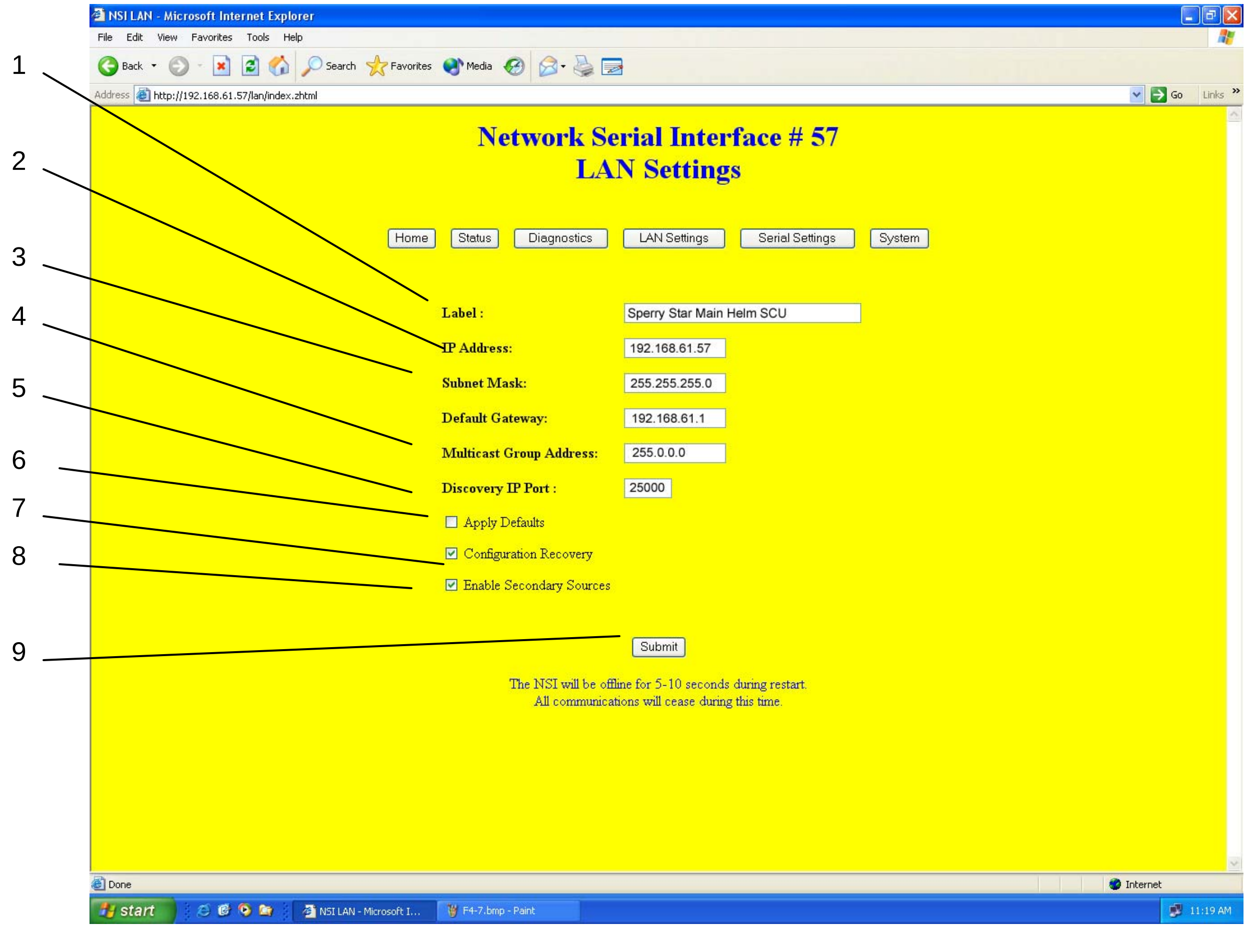


Figure 4-8. NSI LAN Settings Page

Table 4-3. NSI LAN Settings Page

Item		Description
1	Label	Enter a label for each NSI. Each NSI listed on the System page displays the NSI switch number, and this label.
2	IP Address	Enter an IP address. This is used for web browser and FTP access only. The default address is 192.168.0.1 - 192.168.0.99 corresponding to the three digit switch setting (1-99) of each NSI. Be aware that the default IP address for a particular NSI will track its switch number, ie if the switch number is changed, the default IP address will change as well.
3	Subnet Mask	Enter the subnet mask. The default is 255.255.255.0.

Table 4-3. NSI LAN Settings Page

Item		Description
4	Multicast Group Address **	Enter the four octet address. The default is 225.0.0.0. The same Multicast Group Address should be used on all NSIs on the network. NSI inputs and outputs with the same Multicast Group Address and IP Port Number will communicate. The lower 23 bits of the multicast group address must be unique in order to avoid address conflicts. The 23 bits are part of the last three octets, ie in 225.0.0.0 the lower 23 bits are all zeroes.
5	Discovery IP Port Number	Enter an IP Port number from 0-65535 that will be used to discover all of the NSIs in the system. The default setting is 25000 which reserves 25000-25002.
6	Apply Defaults	If this checkbox is selected, defaults are applied when the Submit button is pressed. All parameters are defaulted except the Configuration Recovery feature.
7	Configuration Recovery	Check this box to enable the configuration recovery feature. The default setting is Enabled. Refer to paragraph 4-5 for the description of the Configuration Recovery feature.
8	Enable Secondary Sources	Check this box to enable a secondary network input port for each serial output port.
9	Submit button	Select this button after all parameters have been changed and you are ready to submit the new values to the NSI. After this button is activated, the NSI automatically restarts.

** Most applications should use normal Class D multicast addresses 224.0.0.0-239.255.255.255. However, any valid dotted octet 0.0.0.0-255.255.255.255 will be accepted so as not to eliminate the option of UDP unicast or broadcast.

4-4.4 Serial Settings Page

Figure 4-9 and table 4-4 illustrate and describe the Serial Settings page. These settings can be changed only in Extended Mode.

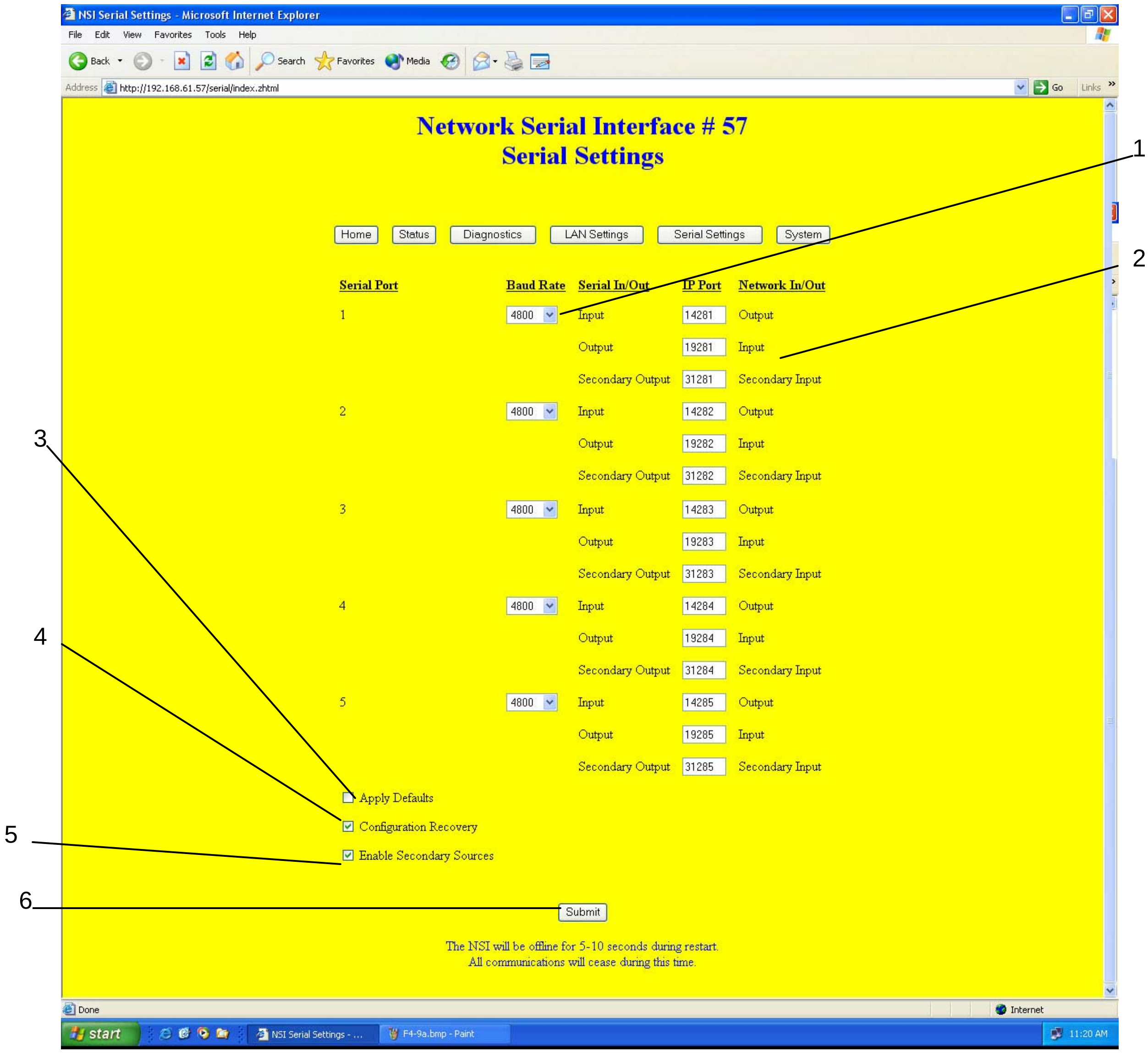


Figure 4-9. NSI Serial Settings Page

Table 4-4. NSI Serial Settings Page

Item		Description
1	Baud Rate	Select 1200, 2400, 4800, 9600, 19200, or 38400 baud.

Table 4-4. NSI Serial Settings Page

Item		Description
2	IP Port number (do not change)	NSI inputs and outputs with the same IP Port Number and Multicast Group Address will communicate. Default IP Port Numbers 14001-14495 correspond to the inputs of NSIs with switch numbers 1-99. Default IP Port Numbers 19001-19495 correspond to the outputs of NSIs with switch numbers 1-99. Be aware that the default IP port numbers for a particular NSI will track its switch number, ie if the switch number is changed, the default IP port numbers will change as well.
3	Apply Defaults	If this checkbox is selected, the configuration is forced to default values when the Submit button is activated. All parameters are defaulted except the Configuration Recovery feature.
4	Configuration Recovery	Check this box to enable the configuration recovery feature. The default setting is enabled. This feature is described in paragraph 4-5.
5	Enable Secondary Sources	Check this box to enable a secondary network input port for each serial output port.
	Submit button	Select this button after all parameters have been changed and you are ready to submit the new values to the NSI. After this button is selected, the NSI automatically restarts.

4-5 CONFIGURATION RECOVERY

The Configuration Recovery feature will automatically sense and configure a new NSI in Extended Mode (switch setting 1-99) that is connected to the network. The new NSI must have the same switch number as the NSI that it is replacing. The new NSI will automatically be configured from a copy of the old NSI's configuration, supplied by one of the other NSIs on the LAN.

The new NSI must have a default configuration and its Configuration Recovery feature must be enabled. This will be the case for any NSI received from the factory. To insure that an NSI is in this state, press its Reset button for at least five seconds before connecting it to the LAN, or hold down its Reset button at power up.

Once an NSI is communicating on the LAN, it will save the configuration of all of the other NSIs in its system configuration file in flash memory. **Before an NSI is re-connected to a LAN after a period of absence, its Reset button should be initially depressed for five seconds or more to clear out any old system configuration data in its flash memory**. Alternatively, the Reset button can be held down at power up.

When configuring a system, the Recovery feature should first be disabled on all NSIs. Otherwise, you will not be able to default an NSI's configuration because it will be automatically restored from another NSI on the LAN. To disable the Recovery feature, de-select the 'Configuration Recovery' checkbox on the LAN Settings page or on the System web page. Do not use the Reset button to default configuration since this enables Configuration Recovery. Instead, use the "Apply Defaults" button on the "LAN Settings" page. The "Apply Defaults" button defaults all parameters *except Configuration Recovery*.

The Configuration Recovery feature will automatically restore all configuration parameters *except the Configuration Recovery setting*.

4-6 NSI STATUS AND DIAGNOSTICS

Figure 4-10 and table 4-5 illustrate and describe the information associated with the NSI Status page. Figure 4-11 and table 4-6 illustrate and describe the information associated with the NSI Diagnostic page.

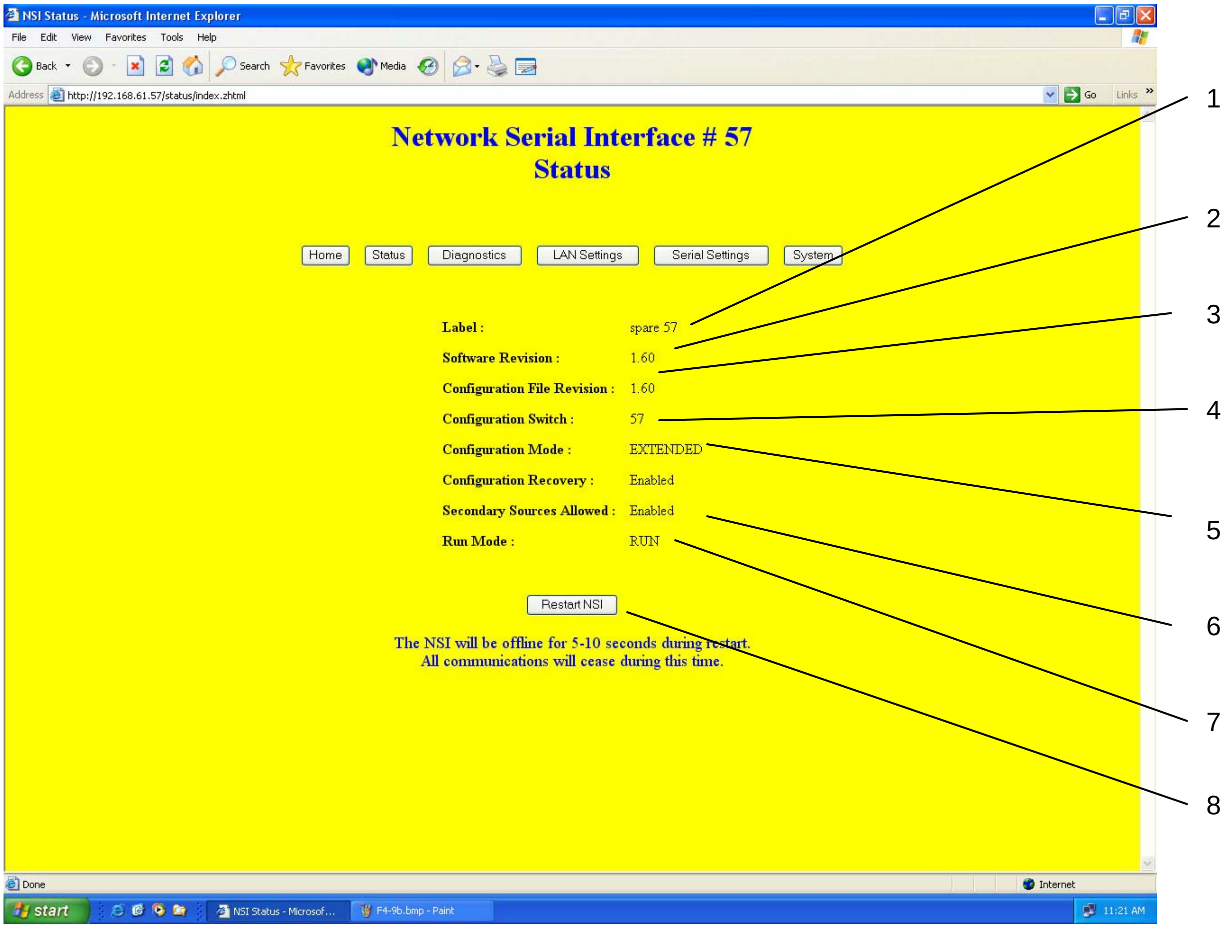


Figure 4-10. NSI Status Page

Table 4-5. NSI Status Page

Item		Description
1	Label	Enter a descriptive label for the NSI.
2	Software Revision	NSI firmware revision.
3	Configuration File Revision	This is the revision of the current configuration file. The revision will be the firmware revision (X.YY) under which the configuration was last changed.
4	Configuration Switch	The setting of the three-digit switch 0-999.
5	Configuration Mode	SIMPLE, (switch setting 100-999), EXTENDED or EXTENDED DEFAULTS (switch setting 1-99), NO CONFIG, IDLE MODE (switch setting 0, shipping configuration)
6	Secondary Sources Allowed	Indicates whether secondary sources have been enabled or not.
7	Run Mode	Run, Error, Factory Test
8	Restart NSI	This button initiates an NSI restart.

NOTE

To update the values on the NSI Diagnostic page, select the Internet browser Refresh button.

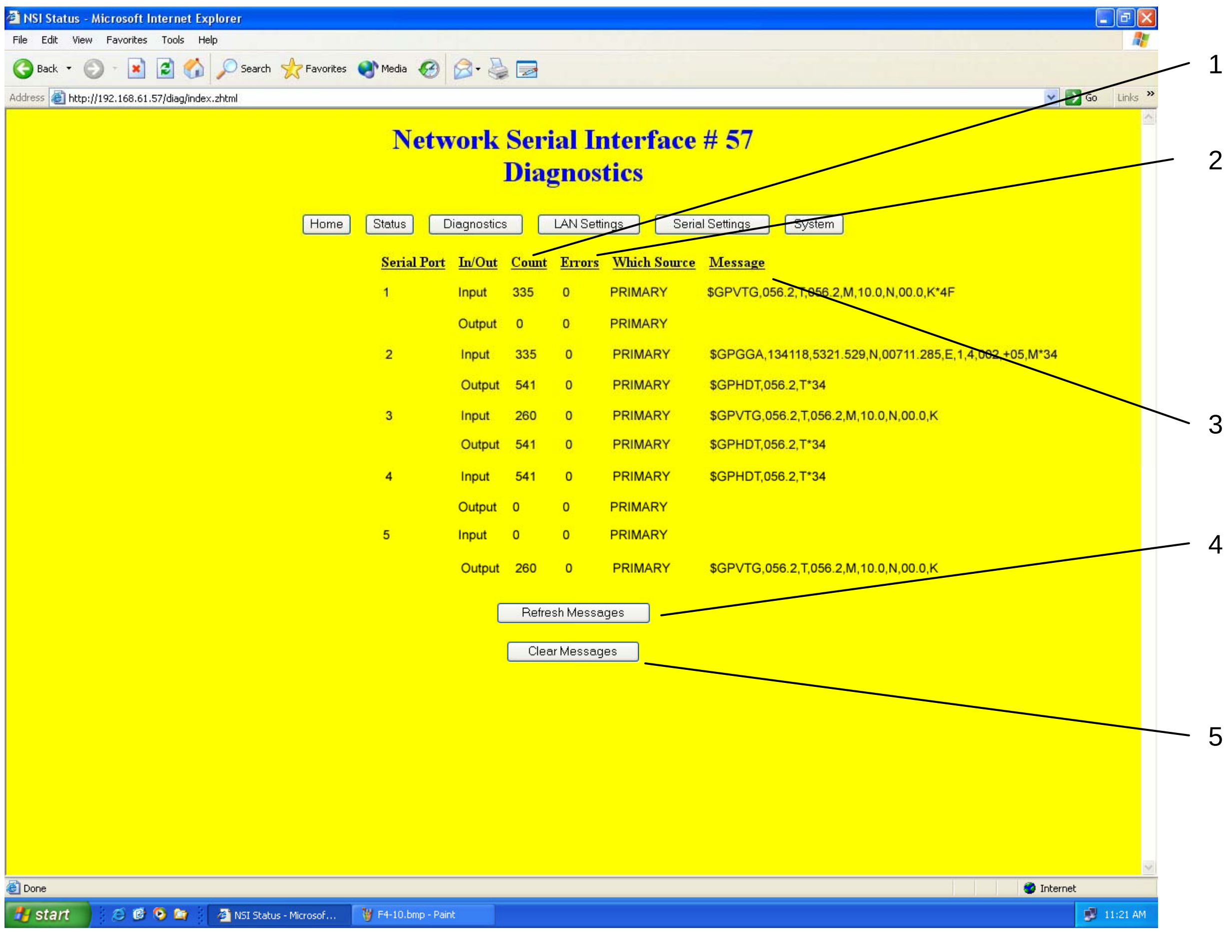


Figure 4-11. NSI Diagnostic Page

Table 4-6. NSI Diagnostic Page

Item		Description
1	Count	The number of valid NMEA messages received or transmitted per serial port. This counter is reset at startup and rolls over after 65535.
2	Error	For inputs, an error is logged for an invalid NMEA message or if a timeout occurs. For outputs, an error indicates that a buffer overflow occurred, most often caused by a lower baud rate on the output than the on the input from which it is receiving data.
3	Message	The most recent message received or transmitted. If no messages have been received since startup, this field will be blank.
4	Refresh Messages	Use this button instead of the browser Refresh button.
5	Clear Messages	All message buffers and message counters will be cleared.

4-7 COMMUNICATIONS WITH AN EXTERNAL COMPUTER

Some external computers such as a Voyage Management System have the capability to directly communicate to the NSI inputs and outputs over the LAN. Configuring these devices is beyond the scope of this document.

The information needed to configure an external computer will be found on the 'Serial Settings' page (IP Port) and the 'LAN Settings' page (Multicast Group Address).

The Configuration Switch

After an NSI has been configured, changing its Configuration Switch setting may disrupt communications to other NSIs and external computers such as a Voyage Management System. This is because the default IP port numbers will change since they are derived from the Configuration Switch setting (see the Configuration Defaults in Appendix B).

Configuration files

The NSI maintains three configuration files in its flash memory:

File	Flash file name	Description
Configuration	file1	Extended Mode configuration
Switch definitions	file2	Simple Mode configuration
System configuration	file3	used during Configuration Recovery

Reset Button

The Reset button is recessed behind the NSI front panel, next to the Configuration switches. Operation is as follows:

Reset button activated	NSI restarts	Config file defaulted	System config file defaulted	Switch definition file defaulted
< 5 secs	Yes	No	No	No
> 5 secs	Yes	Yes	Yes	No
At power up	N/A	Yes	Yes	Yes

The configuration file can be downloaded or uploaded as discussed in the FTP section below.

CPU Run LED

Approximately five seconds after startup, the CPU Run LED will start blinking once per second under normal conditions. If the LED blinks at a fast rate, an error such as a corrupted configuration file has been detected at startup. If this occurs, the configuration file can be reset to its defaults by depressing the Reset button at startup.

FTP

The NSI supports an FTP (File Transfer Protocol) server for file upload and download. This can be used to archive the configuration file to a computer and to later restore it to an NSI. An FTP client such as 'WS FTP Pro' (Ipswitch Software) is recommended. When using FTP, the login is "**user**" and the password "**user**". This login provides both download and upload privileges for the configuration file. The configuration file ("**file1**") can be found under the "**/fs2"** subdirectory.

After downloading a new configuration file, the new configuration will not take effect until the NSI is power cycled with the Reset button held down at startup for 10 seconds.

In the **/fs2** directory you will see other files ("**file2**", "**file3**"). These are not intended for user access.

Performance

Two NSIs will delay the transmission of a NMEA message beyond that experienced with a traditional serial cable connection. The total delay comprises the sum of the following three elements:

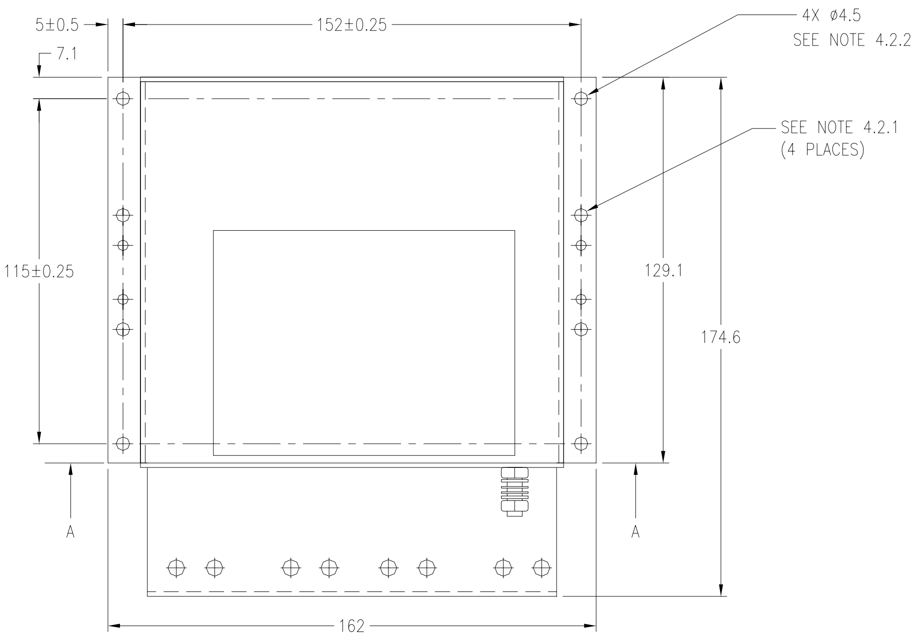
- one message length
- 5-10 milliseconds for message processing
- any LAN traffic delays

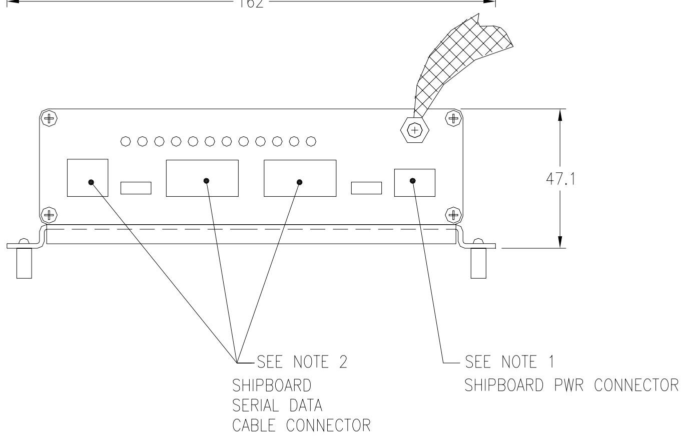
Activation of the browser Refresh button, the Refresh Messages button or the Clear Messages button can temporarily increase the NSI's message processing from 5 milliseconds to as much as 200 milliseconds. Messages will be delayed during this period, but not lost since the NSI employs message buffering.

APPENDIX A
NETWORK SERIAL INTERFACE MOUNTING DIMENSIONS

A-1 INTRODUCTION

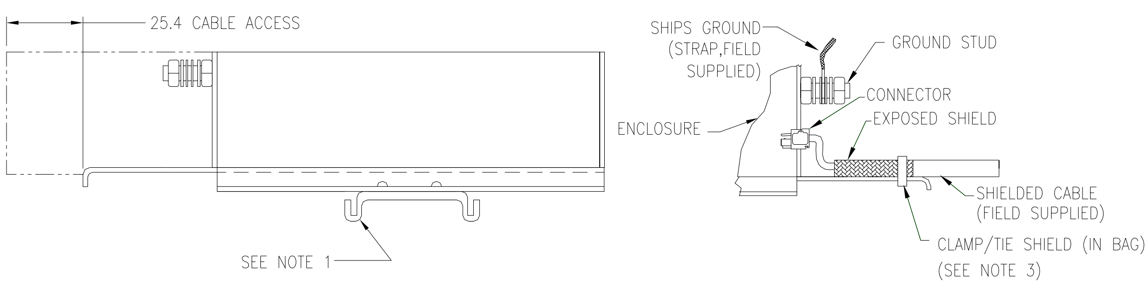
Figure A-1 shows the outline dimensions and mounting requirements for the Network Serial Interface (NSI). Make sure that the ship's ground is connected the ground stud on the NSI after the unit has been mounted.





NOTE

A GROUND STRAP (CUSTOMER SUPPLIED) MUST BE USED WHEN THE NETWORK SERIAL INTERFACE IS DIN RAIL MOUNTED.



CABLE CONNECTIONS TO BOX

NOTES:

1. WHEN CONNECTING TO UNIT USE SHIELDED CABLE WITH 1.5–2.5mm^2 CONDUCTORS (16–14 AWG) ON ORANGE CONNECTOR.
2. WHEN CONNECTING TO UNIT USE SHIELDED CABLE WITH 1.0mm^2 CONDUCTORS (18 AWG) ON BLACK CONNECTORS.
3. GROUND SHIELDS TO BOX AS SHOWN.
4. MOUNTING OPTIONS:
   - 4.1 DINRAIL MOUNTING.
   - 4.2 SCREW MOUNTING.
     - 4.2.1 REMOVE DIN RAIL MOUNTING FEET USING A SMALL STRAIGHT BLADE SCREWDRIVER.
     - 4.2.2 HARD MOUNT USING (QTY 4) M4 OR #8–32 UNC–2A HARDWARE. REQUIRES REMOVAL OF DIN RAIL MOUNTING FEET (SEE NOTE 4.2.1)

Figure A-1. Network Serial Interface Mounting Dimensions

APPENDIX B
CONFIGURATION DEFAULTS

B-1 NSI CONFIGURATION DEFAULTS

Table B-1 lists the configuration defaults for the Network Serial Interface (NSI). The NSI is reset to these values whenever the reset switch is activated on the unit for more than five seconds or at startup. Default changes should be made on all NSIs at this stage, ***before*** using the Wizard in the Extended Mode. You can use the planning sheet in Appendix C as a reference during this process.

Table B-1. NSI Configuration Defaults

Parameter	Default setting
IP address	192.168.0.1 -192.168.9.99 corresponding to the 1-999 switch setting of the NSI
Subnet mask	255.255.255.0 (Extended Mode) 255.255.0.0 (Simple Mode)
Default gateway	0.0.0.0
Multicast Group Address	225.0.0.0
Discovery IP port number	25000 (also assigns 25001, 25002)
Baud rate	4800
IP port number of serial inputs and outputs (do not change these)	IP port numbers 14001-18995 are mapped to inputs of NSIs having switch numbers 1-999. IP Port Numbers 19001-23995 are mapped to outputs of NSIs having switch numbers 1-999. IP port numbers 31001-31495 are mapped to secondary input sources having switch numbers 1-99.

The default IP port assignments of the serial inputs and outputs listed in the above table should only be modified through the Wizard.

Here are some situations that may require a change from the defaults:

- If your network is segmented into subnets using routers, or the default IP address conflicts with other devices on your network. In either case the IP address and/or subnet mask must be changed from the defaults. The computer must be connected locally at the NSI to perform this operation.
- If the Multicast Group Address of the NSI conflicts with other devices on your network. **If the default IP port numbers are in conflict, do not change them. The Multicast Group Address must be changed instead of the IP port numbers.**
- If you have a device that must communicate at a different baud rate than the default setting
- If you want to enter a Label for each NSI in the Extended Mode. The Label makes it easier to identify an NSI on the System web page.

The configuration defaults can only be changed in the Extended Mode.

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APPENDIX C
NSI CONFIGURATION WORKSHEET

C-1 NSI CONFIGURATION WORKSHEET

Table C-1 is the configuration worksheet for the Network Serial Interface (NSI). This worksheet is helpful when configuring the NSI in the Extended Mode. This worksheet should be filled out to record switch setting for the NSI, the label which is used to identify the NSI, the IP address, Subnet Mask, Default Gateway, Multicast Group Address, Discovery IP Port Number, and the Serial Ports used.

After planning how the NSI will be used, the NSI is configured using the configuration wizard.

The serial port section of the worksheet is helpful when planning how the input and output ports of the NSI are mapped to supply serial data.

Table C-1. NSI Configuration Worksheet

Switch Setting	
Label	
IP Address	
Subnet Mask	
Default Gateway	
Multicast Group Address	
Discovery IP Port Number	

SERIAL PORT	BAUD RATE	IN/OUT	COMMENT
1		IN	
		OUT	
2		IN	
		OUT	
3		IN	
		OUT	
4		IN	
		OUT	
5		IN	
		OUT	

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APPENDIX D

NSI WIZARD WORKSHEET

D-1 NSI INPUT PORT AND OUTPUT PORT ASSIGNMENTS

Table D-1 is used to record and describe all of the system's inputs and outputs when configuring the Network Serial Interface (NSI) in the Extended Mode. Enter an input on the left, then enter an output to its right that will receive its data. For each input or output enter its NSI number (1-99) and port number (1-5).

Table D-1. NSI Input and Output Port Assignments

INPUT NSI #	INPUT PORT	INPUT DESCRIPTION	OUTPUT NSI #	OUTPUT PORT	OUTPUT DESCRIPTION

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APPENDIX E
SAMPLE NSI CONNECTION BLOCK DIAGRAM

E-1 SAMPLE CONNECTION BLOCK DIAGRAM

Figure E-1 is a block diagram which shows how the input to a Network Serial Interface (NSI) can be configured using the NSI Wizard Add Page to supply an output to equipment connected to another NSI over the network. Figure E-2 shows the electrical connections used when connecting RS232 and RS422 devices to NSI ports 1 through 5.

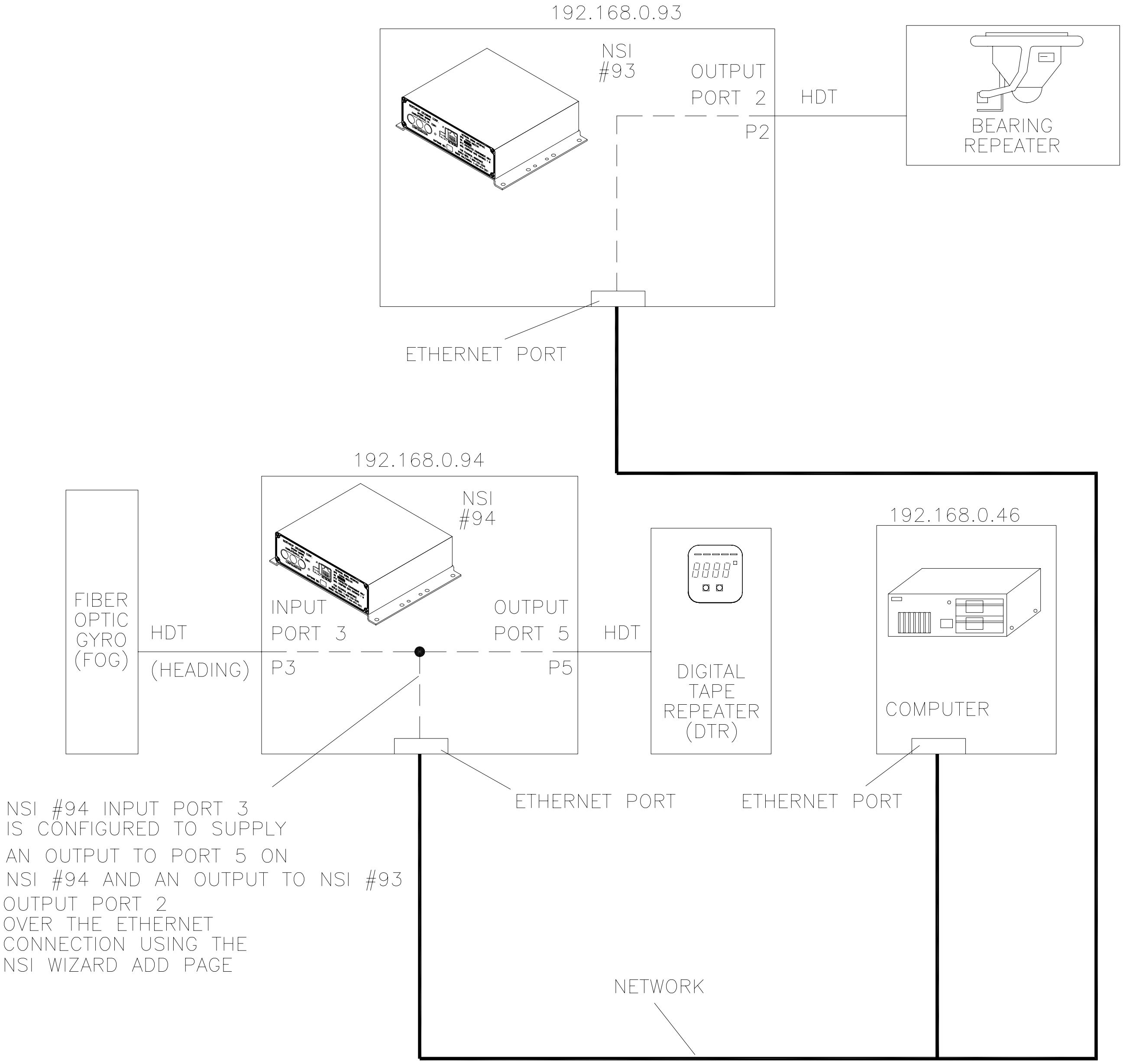


Figure E-1. Sample Network Serial Interface Connection Block Diagram (Sheet 1 of 2)

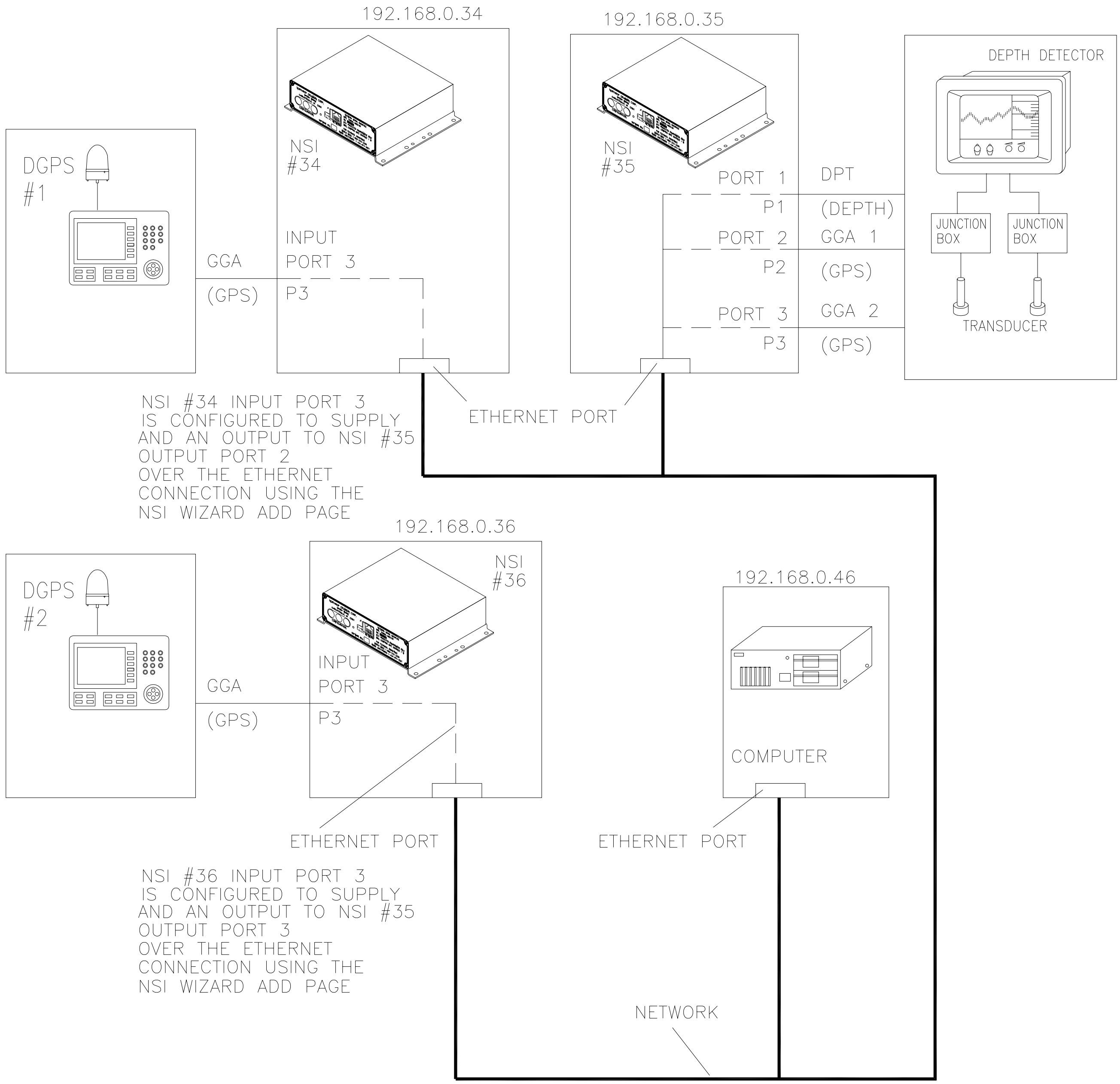
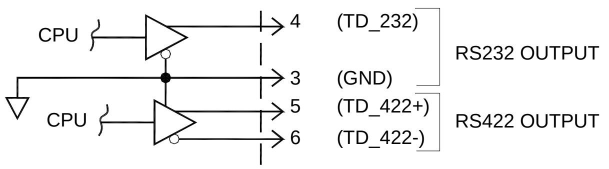
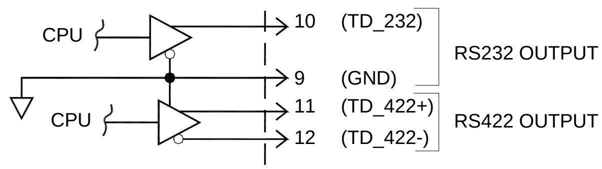


Figure E-1. Sample Network Serial Interface Connection Block Diagram (Sheet 2 of 2)

NMEA OUTPUT PORTS 1, 2, AND 4



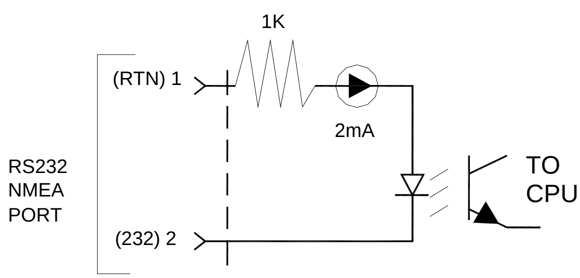
NMEA OUTPUT PORTS 3 AND 5



THE RS422 OUTPUTS MEET OR EXCEED T1A/RS422B AND ITU RECOMMENDATION V.11. THE OUTPUT HIGH VOLTAGE IS 2.4V MINIMUM AND 3.4V TYPICAL AT 20MA LOAD. DIFFERENTIAL OUTPUT IS 2.0V MINIMUM OR 3.1V TYPICAL WITH A 100 OHM LOAD.

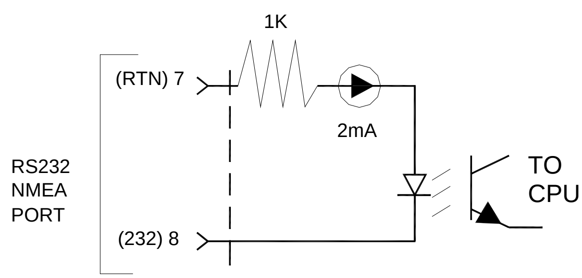
THE RS232 OUTPUT MEETS EIA/T1A-232E AND CCITT V.28 SPECIFICATION AT A DATA RATE OF 20KBPS. THE DRIVERS MAINTAIN THE ±5V EIA/T1A-232E SIGNAL LEVELS AT DATA RATES IN EXCESS OF 120 KBPS WHEN LOADED IN ACCORDANCE WITH EIA/T1A-232E SPECIFICATION.

NMEA INPUTS, RS232 PORTS 1, 2, AND 4



INPUT IMPEDANCE > 1K OHM

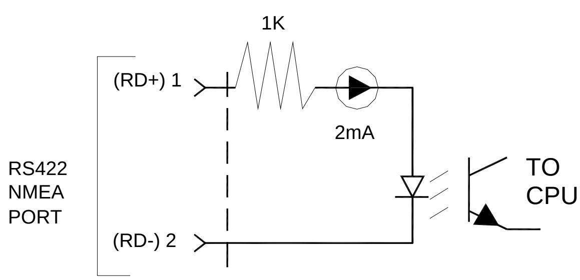
NMEA INPUTS, RS232 PORTS 3 AND 5



INPUT IMPEDANCE > 1K OHM

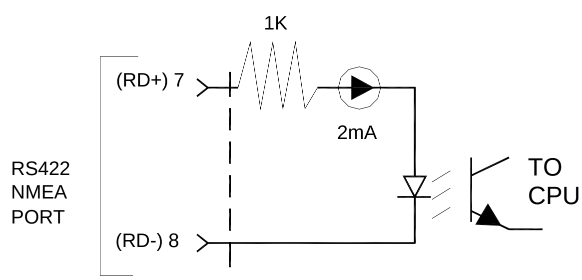
CONNECT RETURN LINE AS SHOWN FOR RS232 INPUT.

NMEA INPUTS, RS422 PORTS 1, 2, AND 4



INPUT IMPEDANCE > 1K OHM

NMEA INPUTS, RS422 PORTS 3 AND 5



INPUT IMPEDANCE > 1K OHM

NO GROUND CONNECTION USED FOR RS422 INPUT.

Figure E-2. Electrical Connections Used When Connecting RS232 and RS422 Devices

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GLOSSARY

Glossary of Terms

A

Acquisition Zone	An area on the video circle that has been defined by the operator. Any target that enters this zone is automatically acquired and tracked.
Activated Target	A symbol representing the automatic or manual activation of a sleeping target for the display of additional graphically presented information including: a vector (speed and course over ground); the heading; and ROT or direction of turn indication (if available) to display actually initiated course changes.
Automatic Identification System (AIS)	A system capability which enables ships and shore stations to obtain identifying and navigation information about other ships at sea, using an automated transponder.
Antenna	Slotted waveguide array for transmitting and receiving microwave signals. 10cm S-band (9 or 12ft aperture) or 3cm X-band (4, 6 or 8 ft aperture)
Anti-clutter	Removal of unwanted reflections on the radar screen caused by rain, sleet etc. (*see* Clutter).
Azimuth	The number of degrees from North (or other reference direction) that a line runs, measured clockwise.
ARCS	Admiralty Raster Chart Service. A service of British Admiralty, suppliers of electronic charts with world coverage, in the HCRF data format.
Azimuth Pulse	Azimuth (AZ): The number of degrees from North (or other reference direction) that a line runs, measured clockwise.

B

Backup Navigator Alarm	The Backup Navigator Alarm is affected by activating a commissioned PCIO relay output by way of an active alarm
BSB Electronic Charts	A supplier of raster-format electronic charts. Electronic charts based on the paper charts supplied by NOAA or CHS are available in the data format established by BSB.
Bulkhead Transceiver	Transmitter/Receiver mounted below decks with microwave or co-axial connection to the Turning Unit.

C

Chart Database	Structured collection of chart data sufficient for safe and efficient navigation on an ECDIS or Chart Radar system
Chart Format	The industry standard the defines the structure of a chart database (e.g. the ENC chart database uses the S-57 format)
C-MAP	C-Map Cartographic Service. Commercial supplier of vector-format navigational charts, which are not fully compliant with ECDIS standards as defined by IMO.

Consistent Common Reference Point (CCRP)	The CCRP is a location on own ship, to which all horizontal measurements such as target range, bearing, relative course, relative speed, closest point of approach (CPA) or time to closest point of approach (TCPA) are referenced, typically the conning position of the bridge.
Checksum	A numeric value used to verify the integrity of a block of data. When data is transmitted from point to point in a packet, the sending computer counts the bytes and adds a check digit at the end of the packet. The receiving computer calculates the bytes received and compares the sender's count with the receiver's count to determine if there is any change that might indicate tampering with the information.
Clearing Lines	Clearing lines are bearing lines or range lines used to approximate a position where a danger to own ship lies.
Clutter	Unwanted reflections on a radar screen, commonly from rain, snow or sleet.
CM93v3	CMAP's proprietary and unofficial chart format.
Conning Info Display	A Conning Info Display (CID) page is a collection of numeric and graphical readouts (also known as CID elements) that display various types of information useful during navigation.
Cross-Track Error	The distance by which the ship's actual position deviates left or right from the Route Plan track.
Course-up	Stabilised display – the ship’s bearing is shown at the top of the video circle with 000° elsewhere on the circle (representing True North).

D

Datum	Any point, line, or surface used as a reference for a measurement of another quantity.
Dead Reckoning	A method of estimating the position of a ship without astronomical observations, as by applying to a previously determined position the course and distance traveled since.
Denso Paste	Soft brown petrolatum primer containing moisture-displacing corrosion-inhibiting compounds. Apply using a stiff brush or gloved hand.
DGPS	Differential GPS (see also GPS). Position sensor intended for precise commercial navigation in coastal waters. The DGPS employs an additional receiver for the reception of correction signals from a land-based transmitter to be applied to the satellite-based GPS position information.
Digitized Chart	A data format for electronic charts that are made using a digitizer device with paper navigational charts. On ships equipped to make digitized charts, these charts can be used for operating in areas for which electronic charts from official or commercial sources are not available. Digitized charts do not conform to any standards for chart display.

Distance To Go (DTG)	Distance to next action, such as a turn, while running a Voyage Plan.
DnV	Det norske Veritas. Independent maritime organization performing classification, certification, quality-assurance and in-service inspection of ships and mobile offshore units with the objective of safeguarding life, property and the environment.
Dongle	A small hardware device that, when plugged into a computer, enables a specific program to run on that computer. The program is disabled, or operates in a degraded mode if the device is not present.
Dynamic Brake	Braking is accomplished by electrically switching motors to act as generators that convert motion into electricity instead of electricity into motion.

E

Electronic Bearing Line	An EBL control is used to show the relative or true bearing of a target on the display. The EBL is moved with the cursor, and the bearing is read of the screen in degrees. One end is always anchored, either at the center of the screen or at a operator-defined point on the video circle.
ECDIS	Electronic Chart Display and Information System. A standard of the International Maritime Organization (IMO), governing electronic navigational systems.
ENC	Electronic Nautical Chart. Chart data conforming to specification published in IHO Special Publication No. 57 (S57). Charts complying with this specification are available from various suppliers.
ENC (C-MAP)	Official S-57 encrypted charts converted to CMAP's proprietary chart database format.

F

Flyback Converter	Power supply switching circuit. During the first half of the switching period, the transistor is on and energy is stored in a transformer primary. During the second half period, this energy is transferred to the transformer secondary and the load.

G

Gain	The ratio of the signal output of a system to the signal input of the system expressed in dB. A gain of 10 would imply that the signal power had increased by a factor of 10. There are two general usages of the term in radar: (a) antenna gain (or gain factor) is the ratio of the power transmitted along the beam axis to that of an isotropic radiator transmitting the same total power; and (b) receiver gain (or video gain) is the amplification given a signal by the receiver.

GGA	NMEA sentence which provides the GPS current fix data.
Greenwich Mean Time (GMT)	The international time standard, based on local standard time at longitude 0º 0' 0" (in Greenwich, England). Also called Coordinated Universal Time (UTC).
Global Positioning System (GPS)	A system by which receivers anywhere on earth can obtain accurate position data. The term "GPS" is also used to refer to the receiver device.
Great Circle	A circle drawn around the Earth such that the center of the circle is at the center of the Earth. Following such a circle plots the shortest distance between any two points on the surface of the Earth.
Guard Zone	An adjustable zone around the vessel. Once a guard zone is set, any target that enters the guard zone will trigger an alarm.

H

Head-up (H UP)	Unstabilised display – the ship's heading marker is always shown vertically upwards indicating straight ahead movement.
HCRF	Hydrographic Chart Raster Format. Electronic format used for BA-ARCS charts.
Heading Line	Line that projects forward showing where own ship is headed relative to the targets seen on the video circle.
Heading Marker	A heading marker on the display provides an important reference to direction. When the antenna is pointing ahead, it sends a pulse to the radar display that causes a line to show on the screen that represents the vessel's head. You can refer echoes displayed on the screen to your vessel's head and get the relative bearing of the echo. If the heading marker is not pointing exactly ahead, relative bearings will be wrong. You can quickly check for any such mistake by heading toward a small prominent visible object and see if the radar echo appears under the heading marker.
Heatsink	Device used to conduct away and disperse the heat generated by electronic components.
HSC	Heading-to-Steer Command. Heading order sent to an autopilot from an external electronic navigation aid, such as the ECDIS.

I

International Hydrographic Office (IHO)	The IHO has developed an ENC product specification as the standard for ECDIS data, and has published this specification in its Special Publication No. 57 (S-57).
International Maritime Organization (IMO)	An agency of the United Nations, responsible for improving maritime safety and preventing pollution from ships. The governing body responsible for SOLAS regulations and ECDIS specifications.
Integral Transceiver	Transmitter/Receiver housed in the Turning Unit.

Interswitch Unit	Enables radar systems to be connected together so that any Display Unit may be connected to any Scanner Unit.
I/O Interface	The collection of components that define the hardware, protocols, and formats used to communicate with an interfaced device. This will include a set of I/O Ports (in most cases, this will be a set of one).
I/O Port	A logical channel through which data is transferred, which may handle protocols needed to pass the data, but functions with no cognizance of the meaning of the data involved. A common example is a serial (RS-232) communications port.
L	
Local Time Offset	Offset between local time and UTC.
Lock-o-seal	Two piece seal element (rubber 'O'-ring with a metal backup ring) designed specially for bolts, studs and other fasteners.
Lost Target	A target representing the last valid position of a target before its data was lost. The target is displayed by a "lost target" symbol.
M	
Magnetron	Device that is comprised of an electric circuit inside a strong but variable magnetic field, designed to generate coherent microwaves.
Master Display	A Master Display has complete control over a Transceiver. A Transceiver can only have one Master Display. A Master Display can only have one Transceiver.
Modulator	A modulator is a circuit or device that combines two different signals in such a way that they can be pulled apart later.
Monitor	The viewing unit, a Flat Panel Monitor (also known as FPD or LCD).
Multi-Function Workstation	A workstation that has been configured to be displayed in a number of presentation options (i.e. Chart Radar, ECDIS or CID).
Multi-Node system	A number of workstations, linked by a LAN, which have been configured as specific product types.
Multi-target Tote	A display panel showing details of multiple acquired targets.
N	
NAVTEX	Enables access to coastal marine safety information transmitted from NAVTEX stations to ships with a NAVTEX receiver.
NIMA	National Imagery and Mapping Agency. An agency of the United States government, supplying navigational charts to the United States Navy.
Nautical mile (NM)	The nautical mile is closely related to the geographical mile which is defined as the length of one minute of arc on the earth's equator. By international agreement, the nautical mile is now defined as 1852 meters (1.15 standard miles).

National Marine Electronics Association (NMEA)	An association of manufacturers that has published widely used standards for navigation and other marine sensor communication. Their published standards include NMEA 0183, Standard for Interfacing Marine Electronic Navigational Devices, Version 1.5, December 1987, and Version 2.0, January 1992. This standard is commonly referred to as simply "NMEA 0183." The ECDIS is designed to use messages from any navigation, weather, or machinery sensor that conforms to this standard.
NOAA	National Oceanic and Atmospheric Administration. Agency of the US government, supplying navigational charts. NOAA charts are available in the BSB electronic format.
North-up (N UP)	Stabilised display – the bearing scale shows 000° at the top of the video circle (assumed to be True North). The ship's heading marker is shown at the appropriate bearing.

O

Opto-coupler	A component capable of optically transferring an electrical signal between two circuits and, at the same time, electrically isolating these circuits from each other. It consists of an infrared LED emitting section at its input, and a silicon photodetector, at its output, with other circuitry sometimes included as part of the device.

P

Parallel Index Lines	A set of parallel lines placed on the video circle to aid navigation.
Parity	An error-checking procedure in which the number of 1s must always be the same – either even or odd – for each group of bits transmitted without error.
Past Position Dots	Equally time-spaced past position marks of a tracked or reported target and own ship. The co-ordinates used to display past positions may be either relative or true.
PBN: Fuel Navigator	An optional feature that allows route optimisation, weather overlay location, and ship reporting data to be displayed on an ECDIS
Performance Monitor	A unit, which warns the operator of reduced radar performance. May be integral with the Turning Unit (X-band) or separate (S-band).
Product types	A small set of defined products, any one of which the VisionMaster application can function as. Product types apply to individual nodes.
Pulse Repetition Frequency	The number of radar pulses transmitted each second. The pulse transmission rate is automatically lengthened for longer ranges.

R

Random Access Memory	Memory used in computer systems. RAM is volatile memory, which does not hold data when the power is turned off
Range Rings	A set of concentric circles labeled by distance from the central point, useful for judging distance (especially from own ship).

Relative Motion – Relative Trails	Own ship is shown at a fixed point in the video circle (normally the centre). All target trails are shown relative to own ship's movement. This means stationary targets will have trails if own ship is moving.
Relative Motion – True Trails	Own ship is shown at a fixed point in the video circle (usually the centre). Target trails show their direction. Staionary targets do not produce trails.
Resolver	A type of rotary electrical transformer that is used for measuring the angle of a rotating machine such as an antenna platform. The primary winding of the transformer, fixed to the rotor, is excited by a sinusoidal electric current, which by electromagnetic induction causes currents to flow in two secondary windings fixed at right angles to each other on the stator. The relative magnitudes of the two secondary currents are measured and used to determine the angle of the rotor relative to the stator.
Rhumb Line	A line on a sphere that cuts all meridians at the same angle; the path taken by a ship or plane that maintains a constant compass direction.
Route	A set of waypoints that define the intended path of travel.
S	
S-band	The S-band, or 10 cm radar short-band, is the part of the microwave band of the electromagnetic spectrum ranging roughly from 1.55 to 5.2 GHz.
S57	Internationally accepted standard for electronic charts in the ENC vector-format. ENC data is standardized according to ECDIS specifications published in IHO Special Publication No. 57. Charts complying with this specification are available from various suppliers.
S57 PIN	Is used to generate a 16-character string which represents the encrypted hardware ID portion of the S-57 User Permit.
S63 Chart permit file	A file generated by the data manufacturer that is used, in conjunction with an S63 permit code to decrypt chart data for a particular set of ARCS charts or S57 cells.
S63 permit code	A code that identifies a license for using S57 charts. This is sometimes referred to as the S57 User Permit.
Scanner Unit	Comprises the Antenna and Turning Unit.
Scanner Control Unit	A unit which switches power to the S-band Turning Unit, under the control of the Display.
System Electronic Navigational Chart (SENC)	SENC is a database resulting from the transformation of the ENC by ECDIS, updates to the ENC by appropriate means, and other data added by the mariner. It is this database that is accessed by ECDIS for the display generation and other navigational functions, and is the equivalent to an up-to-date paper chart. The SENC may also contain information from other sources.
Sentence	A self contained line of data

SevenCs	A chart engine format
Slave Display	Display that is used to observe a radar image. It has limited functionality.
Sleeping Target	A target symbol indicating the presence and orientation of a vessel equipped with AIS in a certain location. No additional information is presented until activated thus avoiding information overload.
SOLAS	Safety of Life At Sea. A set of conventions adopted by the IMO and all of its signatory countries in 1974. These conventions regulate many of the features of ships used in international trade, including navigation equipment and its functionality
Sperry security block	A dongle used to identify a VM system (through a PIN), and identify permits for charts that are licensed on a system-by-system basis.
Standard Display (STD)	The standard set of chart objects (buoy information, conspicuous landmarks, etc.) specified for ECDIS display, in compliance with IMO standards.
Stern Line (SL)	A line, drawn across the video circle, showing the stern's direction. A stern line can be useful when ownship is backing into port or harbour.
Synchro	A motorlike device containing a rotor and a stator and capable of converting an angular position into an electrical signal, or an electrical signal into an angular position.
System PIN	Personal Identification Number that uniquely identifies a system.
T	
TotalTide	Enables VisionMaster to obtain tidal data from the UKHO TotalTide application, including the ability to view tide heights and tidal currents from tidal stations around the world.
Target	Object of interest on a radar display. Targets can be labelled (acquired) and tracked.
Trial Manoeuvre	Facility used to assist the operator to perform a proposed manoeuvre for navigation and collision avoidance purposes, by displaying the predicted future status of all tracked and AIS targets as a result of own ship's simulated manoeuvres.
Trigger PCB	A control board housed in the Transceiver. It controls the Modulator, Magnetron and sends signals to the Display to indicate when the magnetron has fired a pulse.
True Motion	Own ship moves across the video circle. Stationary targets do not produce trails.
TTMG	Track To Make Good. In the context of the ECDIS, TTMG denotes a temporary plan which may be activated at any time, and which by default consists of a 500 nm track line on present heading.
Turning Unit	Contains the Antenna rotation motor, the microwave rotary joint, and may contain an integral Transceiver.

U

Universal Time Coordinated (UTC)	The international standard of time, kept by atomic clocks around the world. Formerly known as Greenwich Mean Time (GMT), local time at zero degrees longitude at the Greenwich Observatory, England. UTC uses a 24-hour clock.

V

Variable Range Marker	An adjustable range ring used to measure the distance to a target. When the VRM is adjusted over the leading edge of a return with the cursor control, the distance to the object is shown on the screen.
Vector	Direct connection between two points, either given as two sets of coordinates (points), by direction and distance from one given set of coordinates (True Vector), or a point in a vector space defined by one set of coordinates relative to the origin of a coordinate system (Relative Vector).
Video Circle	The area on the Display that shows the radar image.
Vigilance Alarm	A system alarm generated when the operator fails to give evidence of fitness.

W

Watch Alarm	The purpose of a watch alarm system is to monitor bridge activity and detect operator disability which could lead to marine accidents. The system monitors the awareness of the Officer of the Watch (OOW) and automatically alerts the Master or another qualified OOW if for any reason the OOW becomes incapable of performing theOOW's duties. This purpose is achieved by a series of indications and alarms to alert first the OOW and, if he is not responding, then to alert the Master or another qualified OOW. Additionally, the watch alarm may provide the OOW with a means of calling for immediate assistance if required. The watch alarm should be operational whenever the ship's heading or track control system is engaged, unless inhibited by the Master.
Waveguide	Hollow rectangular, oval or round tube used to convey microwave RF energy from one point to another in a radar transmitter or receiver.
Waypoint	A geographical location (for example, latitude and longitude) on a route indicating a significant event on a vessel's planned route (for example, course alteration point, calling in point, etc.).
WGS-84	World Geodetic System 1984. Chart datum specified in accordance with the IMO ECDIS standard.
Wheel-over	The geographic location, represented by a line where rudder movement should be activated to accomplish a planned turn. The wheel-over line may be displayed perpendicular to the approaching track or parallel to the departing track of each turn.

Wobbulation	Low frequency modulation of the Pulse Repition Frequency (PRF) to help suppress interference.

X

X-band	The X-band (3 cm radar spot-band) of the microwave band of the electromagnetic spectrum roughly ranges from 5.2–10.9 GHz. The relative short wavelength at X-band frequencies makes possible high-resolution imaging radars for target identification and target discrimination.

Glossary of Abbreviations

Symbols

µA	Microamp (0.000001 amps)
µs	Microsecond (0.000001 seconds)
Ω	Ohms
ϕ	Phase

A

A	Ampere
AC	Alternating Current
ADC	Analog to Digital Converter
AFC	Automatic Frequency Control (fine tuning)
AIS	Automatic Identification System
ARPA	Automatic Radar Plotting Aid – a system wherein radar targets are automatically acquired and tracked and collision situations computer assessed and warnings given.
AZ	Acquisition Zone

B

BA	British Admiralty.
BCR	Bow Crossing Range
BCT	Bow Crossing Time
BIST	Built-In Self-Test
BITE	Built-In Test Equipment
BSH	German Federal Maritime and Hydrographic Agency (BSH) that provide type approval to EC Council Directives

C

CAM	Central Alarm Manager
CD ROM	Compact Disk Read-Only Memory
CDX	Control differential transmitter
CHS	Canadian Hydrographic Service
COG	Course Over Ground
CPA	Closest Point of Approach [to own ship]
C UP	Course-up
CRT	Constant Radius Turn

CSE	CourSE [through water]
CX	Control transmitter
D	
dB	Decibel.
DC	Direct Current
E	
EBL	Electronic Bearing Line
EMC	Electromagnetic Compatibility
EPA	Electronic Plotting Aid
ERBL	Electronic Range and Bearing Line
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
F	
ft	Foot or feet
FPD	Flat Panel Display
G	
GMT	Greenwich Mean Time
GPS	Global Positioning System
GZ	Guard Zone
H	
HDG	Heading
HL	Heading Line
HO	Hydrographic Office.
H UP	Head-up
Hz	Hertz (unit of Frequency)
HT	High tension (meaning high voltage)
I	
IHO	International Hydrographic Organisation
in	Inch
I/O	Input/Output
K	
Km	Kilometre

kt	Knot (one nautical mile per hour – 1.15 mph)
kV	Kilovolt (1000 Volts)
kW	Kilowatt (1000 Watts)
L	
LAN	Local-Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LNFE	Low Noise Front End
LP	Long Pulse (available from 3 NM and upwards)
M	
m	Metre
mA	Milliamp (0.001 Amps)
MHz	Megahertz (1000000 Hertz)
MIS TRIG OUT	Mutual Interference Suppression Trigger Out – trigger used to suppress the video for 12µs to inhibit interference from other radars.
MMSI	Maritime Mobile Service Identity
MOB	Man overboard
Mod Trigger	Modulator Trigger
MP	Medium Pulse (available in the 0.5 NM to 24 NM range)
N	
nm	Nautical mile.
NDI	Nautical Data International. Licensed distributor of CHS charts in the BSB electronic format.
NM	Newton Metre
NMEA	National Marine Electronic Association
NNF	Not Normally Fitted
ns	nanosecond (0.000000001 seconds)
N UP	North-up
P	
PCB	Printed Circuit Board
PCIO	PC Imput/Output
PEU	Processor Electronics Unit

PFC	Power Factor Correction
PFN	Pulse Forming Network
PIP	Picture In Picture (Video mode)
PM	Performance Monitor
PPI	Plan Position Indicator
PRF	Pulse Repetition Frequency
PRI	Pulse Repetition Interval
PSU	Power Supply Unit
R	
RAIM	Receiver Autonomous Integrity Monitoring
RAM	Random Access Memory
RF	Radio Frequency
RFI	Radio Frequency Interference
RM(R)	Relative Motion – Relative Trails
rms	Root mean square (AC voltage that equals DC voltage that will do the same amount of work)
RM(T)	Relative Motion – True Trails
RNS	Raster Navigational Chart
ROT	Rate of Turn
rpm	Revolutions per minute
RR	Range Rings
RVAP	Radio Video Adaptive Processor
S	
SART	Search and Rescue Transponder
SCU	Scanner Control Unit
SIC	Station In Control
SL	Stern Line
sm	Statute mile – A mile as measured on land, 5,280 feet or 1.6 kilometers. Distances at sea are measured in nautical miles.
SOG	Speed Over the Ground
SP	Short Pulse (available below 3 NM)
STW	Speed Through Water

T

T BRG	Target Bearing/True Bearing
TCPA	Time to Closest Point of Approach [to own ship]
TLB	Target Label
TM	True Motion
TRP	Temporary Route Plan
TTD	Tracked Target Data
TTG	Time To Go. Time to next action, such as a turn, while running a Route Plan.
TTM	Tracked Target Message
Tx/Rx	Transmitter/Receiver (Transceiver)
TX BIST	Transceiver Built-In Self Test
TX COMMS	Transceiver Communications

U

UTC	Universal Time Coordinated

V

V	Volt
VA	Volt amperes
VMS	Voyage Management System
VRM	Variable Range Marker

W

W	Watts

X

XTE	Cross-Track Error

Numerics

A

B

C

D

E

F

H

I

L

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