

UM-8098

User Manual for the Type 8098 Navigation Sensor Hub

Issue B Rev 2

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Amendment History

The amendment history records all amendments and additions made to this manual.

Issue	Revision	Date	Comments	Section	Page
A	0	13/07/2009	Initial Issue.	All	All
A	1	29/07/2009	Approved Copy.	All	All
A	2	05/06/2013	ECN12202 – Technical Specification Operating Temperature incorrect. Temperature changed to -5° to 55°C (23° to 131°F).	7	1
			Addition of Cable Drawing CPN 820-6490.	App D	D-6
B	0	01/11/2013	ECN12248 – RS485 and Responder cable drawing replaced. Sensor hub front panel updated to show power/reset button. Lodestar module card added to I/F expansion cards table. Lodestar cable diagram added. Manual fully rebranded to bring in line with new format. References added to type 8098-000-02.	All	All
B	1	24/04/2015	ECN12723: Updated cable CPN 820-6459, DWG 8020-061.	9.12	32
			Deleted cable CPN 280-4721, DWG 8020-079.	9.12	27
			Added installation details for rack mounted rear bracket.	4.2.1	11
			Operating and storage temperatures updated.	9.1	24
			Renumbered sections and general update.	All	All
B	2	18/01/2016	OB10726: Rear card slot details updated.	2.2.2	5
			OB11578: Added NSH Firmware Updater Tool description.	7.1	19-20
			Appendix B – Open Source Licence Notice added.	Appendix B	All

Section 1 – Introduction

1.1 Scope of this Manual

This user manual describes the safe installation, operation and maintenance of the Type 8098 Navigation Sensor Hub (NSH). The information and procedures within this manual are based on Sonardyne's experience and knowledge.

1.2 Purpose of this Manual

This user manual is for personnel involved in Sonardyne system operations who operate the Type 8098 NSH.

To make sure the safety of the installer and operator is maintained it is important that all warnings and cautions in *Section 2 – Safety* of this manual and in any additional manuals are read and fully understood.

1.3 Related Publications

To make sure the equipment is operated safely, a *Sonardyne Safety Manual* is supplied with this user manual. It is important that the *Sonardyne Safety Manual* is read and fully understood before proceeding with any activity on the equipment.

Table 1-1 Related Publications

Publication	Title
<i>Sonardyne Safety Manual</i>	<i>Operational and Safety Precautions</i>
<i>UM-8026</i>	<i>User Manual for i7 Navigation Computer</i>

1.4 Conventions

Format	Convention
Boldface Type	User Input, Menu Options, Keys, e.g. Click OK
Arrow (>)	Selection of an additional menu item e.g. File>Save
<i>Italic Type</i>	References to Figures, Tables, Sections and internal/external source

Section 2 – Safety

2.1 Introduction

Before any activity is carried out on the equipment, it is recommended that the included *Sonardyne Safety Manual* and all warnings and cautions in this manual are read and fully understood.

It is recommended the operator complies with the Health and Safety Regulations applicable to the vessel and the region before operating this equipment.

Operators and service personnel must be familiar with the normal operating and safety procedures for subsea equipment.

Documentation must be consulted whenever a  or  warning symbol is found on the equipment, in order to determine the nature of the potential hazard and any actions which must be taken.

If any additional equipment is used, any warnings and cautions in the equipment user manual must be read and fully understood.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

The safety of any system incorporating this equipment is the responsibility of the assembler of the system.

2.2 Procedures

Before carrying out any procedure on the equipment, make sure that all of the following warnings and cautions are read and fully understood.

2.2.1 Warnings



Risk of fire. Make sure the power rating of any cables used is not exceeded.



Risk of electric shock. Do not push metal objects into the NSH openings and keep metal objects away from connectors as this may result in short circuits, fire or electric shock.



Risk of electric shock. Do not attempt to remove any panels from the NSH to gain access to internal components.

2.2.2 Cautions



Risk of equipment damage. All instruments must be maintained according to their individual operating manuals. Failure to follow recommended procedures could result in instrument failure, and loss of system integrity.



Risk of equipment damage. Make sure that the Navigation Computer chassis and the Navigation Sensor Hub chassis are correctly installed in a rack or a console, and are provided with adequate fixings and support to avoid damage from vibration.



Risk of equipment damage. Make sure the Navigation Computer chassis and the Navigation Sensor Hub chassis receive an adequate cool air supply to avoid damage caused by overheating.



Risk of equipment damage. There are no user-serviceable parts inside the NSH.

-
-  Risk of short-circuit. Do not operate the NSH with any of the covers or expansion slot backing plates removed.
 -  Risk of short-circuit. Make sure the NSH has an earth lead connected to the chassis earth at the rear when rack mounted.
 -  Risk of overheating. Do not operate the NSH with any of the ventilation openings blocked or covered.
 -  Risk of overheating. Make sure the NSH is kept away from heat sources.
 -  EMC risk. High quality cables should always be used for connection to external equipment. It is the responsibility of the system integrator to check there is no practical EMC interference to, or by, the Sonardyne equipment caused by connection to external equipment.
 -  It is recommended that hardware installations are located at least 20 metres from any VHF radio antennae operating in the 156-165 MHz band.
 -  Risk of damaging connectors. Once installed, do not move the NSH with cables connected.
 -  It is advisable to use a power outlet with a surge protector fitted. Preferably the NSH should be supplied with power from an Uninterruptible Power Supply (UPS) to prevent vessel power interruptions affecting the operation.
 -  Equipment damage. Only use fuses of the correct rating. The use of incorrect fuses could result in failure to protect the internal electronic components.
 -  If the configuration of the rack prevents easy access to the rear panel of the NSH, the rack ac power should be controlled by an isolation switch located in a position within easy reach of the operator. In the event of a fire or serious electrical malfunction within the rack, this will allow the operator to isolate the electrical supply quickly.
 -  Network connection failure. Connection of the NSH to anything other than a closed private network of approved Sonardyne devices, i.e. direct connection to a Navigation Computer or additional NSH, is at the risk of the operator. Sonardyne International Limited accepts no responsibility for network connections and configurations.
 -  Equipment damage. Only use fuses of the correct rating. The use of incorrect fuses could result in failure to protect the internal electronic components.
 -  ESD risk. Electrostatic discharge can damage computer components. Use an anti-static wrist strap or an anti-static mat when handling electronic components.
 -  ESD risk. Do not remove electronic components from their anti-static bags until required.
 -  ESD risk. Make sure the equipment is correctly earthed to avoid the risk of damage due to electrostatic discharge.
-

Section 3 – Technical Description

3.1 Introduction

The Type 8098 NSH is a powerful, purpose-built controller which provides the interface between acoustic instruments, sensors and a Type 8026 Navigation Computer running Sonardyne navigation and positioning software applications.

Type 8098-000-02 was introduced in 2013 with the front panel reset button having the additional function of powering the NSH on and off.

3.2 Description

The NSH provides power and communications for acoustic transceivers in addition to the precision time stamping of incoming data from external devices such as a Global Navigation Satellite System (GNSS).

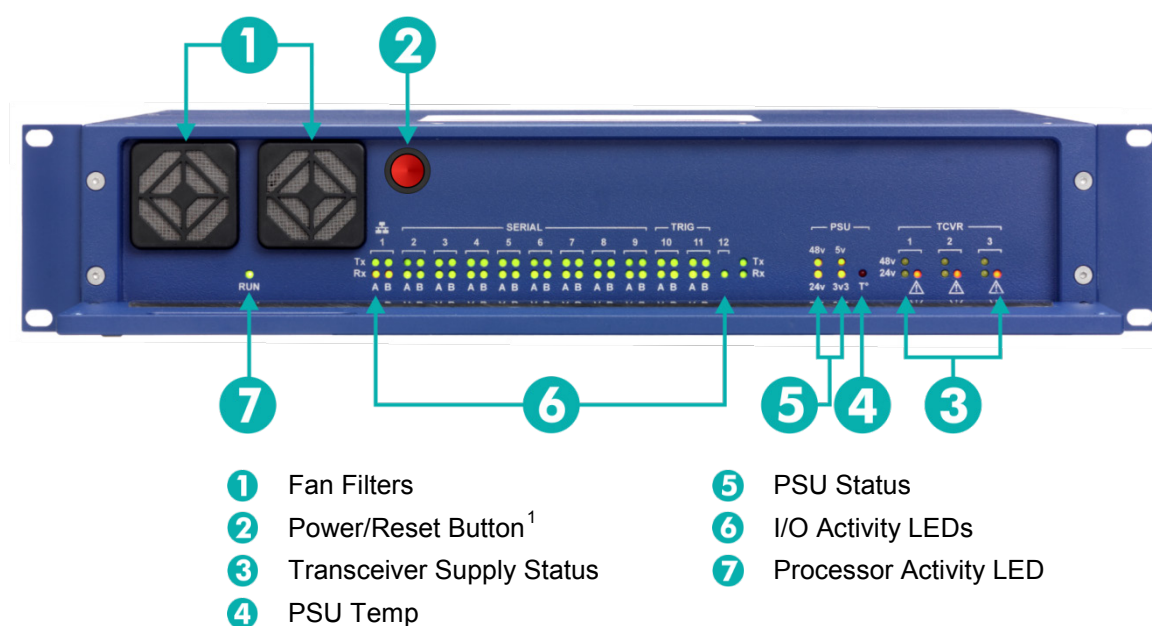
A range of hardware interface cards are available for interfacing Sonardyne transceivers and external sensors. By plugging these cards into the rear of the unit, the NSH can be changed from supporting simple to complex acoustic operations.

The NSH has the following features:

- Interfaces with Sonardyne transceivers and external sensors.
- Provides an IEEE-1588 (PTP) time source, synchronised to GNSS UTC.
- Provides precision time stamping of incoming data for more accurate tracking.
- Provides power and communications to Sonardyne acoustic transceivers.
- Is available in 19" rack mounted configuration.

3.2.1 Front Features

Figure 3-1 Navigation Sensor Hub Front View



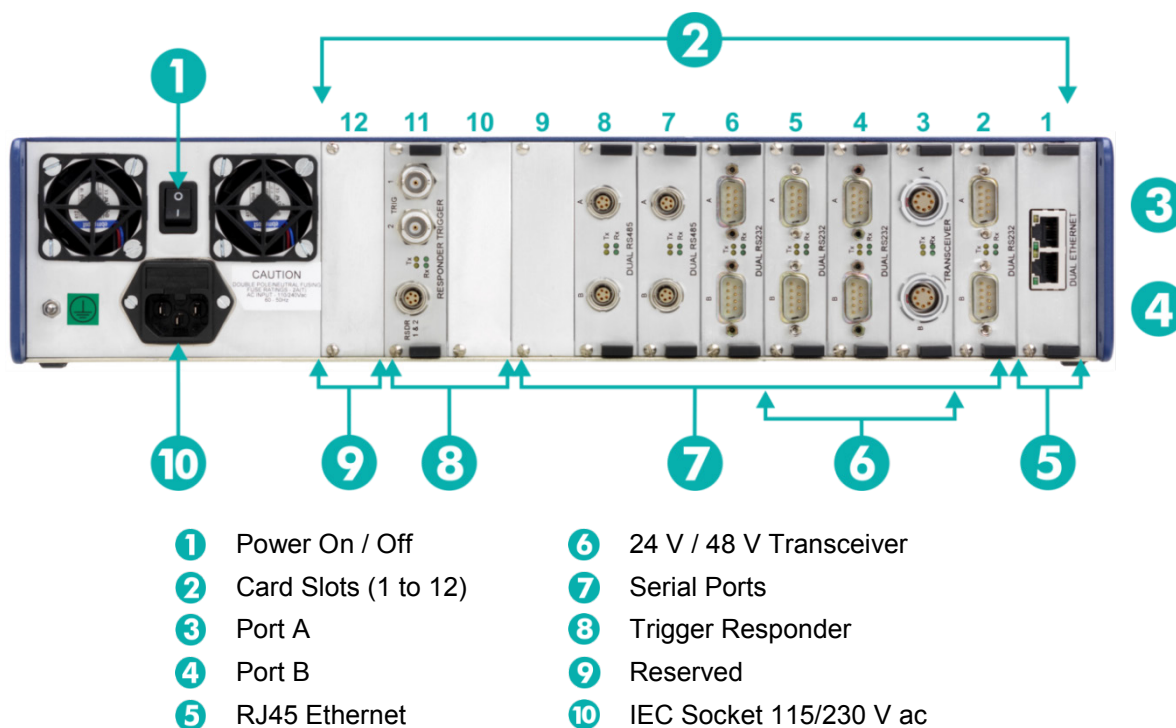
¹ Type 8098-000-01: Reset function only

The front features of the NSH are:

- Controller chassis fans
- Power/reset button²
- Transceiver supply status
- PSU over temperature
- PSU status 48 V, 3.3 V, 5 V, PSU
- Tx / Rx rear card LEDs to monitor all I/O activity through the rear mounted interface cards
- Processor activity LED

3.2.2 Rear Features

Figure 3-2 Navigation Sensor Hub Rear View



The rear features of the NSH are:

- Power on/off switch
- Card slot 1: dual RJ-45 connector for 10/100 BASE-T Ethernet
- Card slot 2A is normally reserved for NSH management
- Card slots 3–9: dual serial (dual RS232, dual RS485). Note: slots 3–5: transceiver power out ports (or dual serial)
- Card slots 10 & 11: trigger/responder cards only
- Card slot 12: reserved
- IEC socket 115/230 V ac, 4/2 A, 60/50 Hz

² Reset function only on Type 8098-000-01

3.2.3 Interface Expansion Card Options

Different interface expansion card options are available depending on the proposed use of the controller.

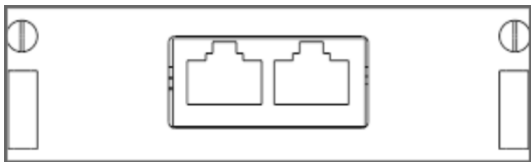
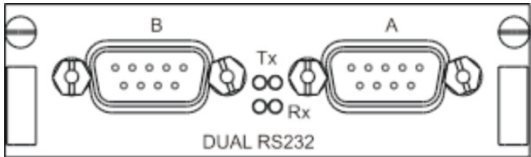
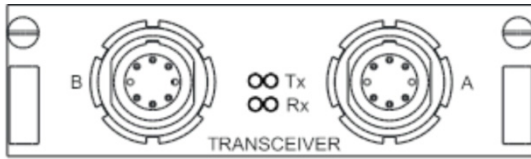
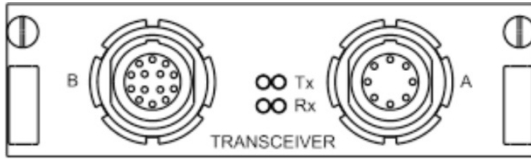
Note

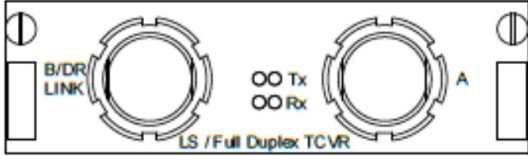
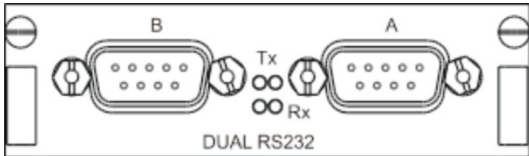
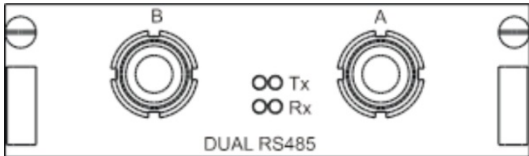
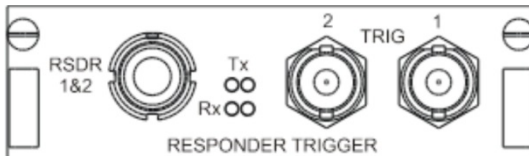


Interface card connectors are keyed to only allow them to be fitted to the correct expansion slots.

The following table shows cards and expansion slot configuration.

Table 3-1 NSH Interface Expansion Cards

Slot No	Notes	Interface Card
1.	Dual Ethernet Module. RJ-45 Ethernet Link to Computer	CPN 631-7691 DWG 8098-050-01 
2.	RS232 communications. Management Module	CPN 631-8074/DWG 8098-053-01 
3, 4 & 5	Transceiver Module RS485 comms and 48 V & 24 V for the following transceivers 48 V DC Transceiver 24 V DC Transceiver USBL LPT ROVNAV 5/6	CPN 631-8165/DWG 8098-051-01 
3, 4 & 5	Dual Redundant Transceiver Module RS485 comms and 48 V & 24 V for the following transceivers 48 V DC Transceiver 24 V DC Transceiver USBL LPT ROVNAV 5/6	CPN 631-7624/DWG 8098-052-01 

Slot No	Notes	Interface Card
3, 4 & 5	Lodestar Module RS485 comms and 48 V for a Lodestar	CPN 631-7977/DWG 8098-067 
3 - 9	RS232 communications. ROVNAV DVL Serial Gyro GNSS Serial VRU	CPN 631-8074/DWG 8098-053-01 
3 - 9	RS485 Communications	CPN 631-7661/DWG 8098-057 
10 & 11	Two responder outputs and two inputs for external triggers such as 1PPS	CPN 631-7623/DWG 8098-059 

Pin-outs, wiring and connector specifications for cable connections to each card are detailed in *Section 9 – Technical Specifications*.

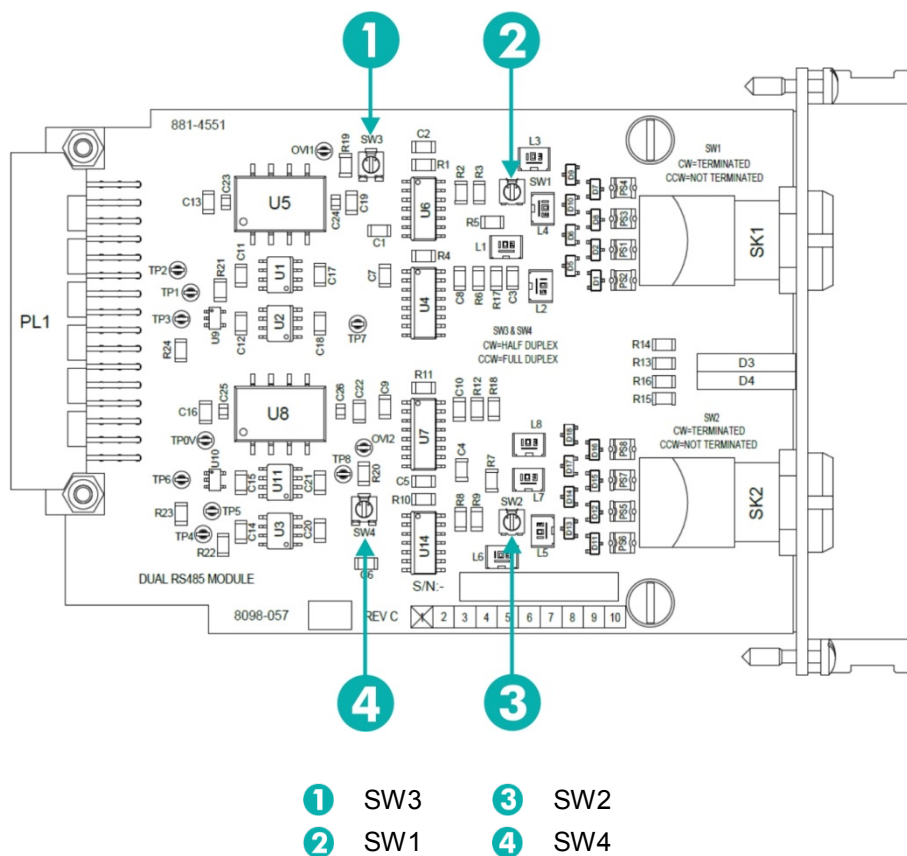
3.2.3.1 Dual RS485 Card

Refer to *Figure 3-3*. Switch positions are shown below:

SW1 & SW2 RS485 Termination resistor CW = Terminated, CCW = Not Terminated.

SW3 & SW4 select full or half duplex CW = Half Duplex, CCW = Full Duplex.

Figure 3-3 Dual RS485 Card



3.2.3.2 Responder Trigger Card

Refer to *Figure 3-4*. Links **LK1** and **LK3** are set for the Responder Trigger Pulse output voltage.

LK1 is for responder 1 and **LK3** is for responder 2.

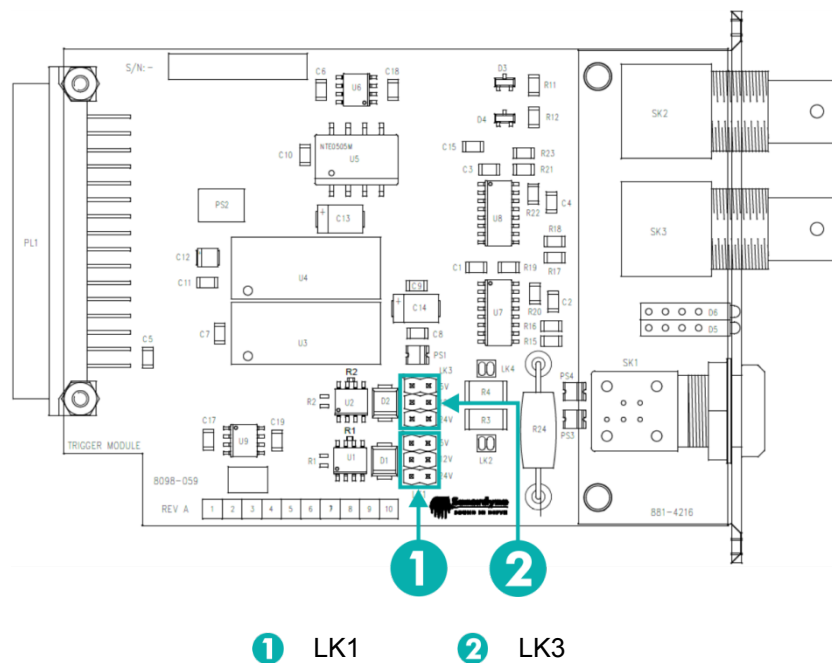
Link pins: 1 & 2 for 5 V
 3 & 4 for 12 V
 5 & 6 for 24 V

Note



Do not fit more than one jumper per link.

Figure 3-4 Responder Trigger Card



Section 4 – Installation

4.1 Introduction

Before installing the NSH, make sure *Section 2 – Safety* is read and fully understood.

The NSH can either be installed in a rack or used on a desk top.

4.2 Rack Mounting

The NSH is designed to be installed in a 19" width rack and must be supported by the two front side panels and either by a shelf or rear brackets.

Notes



Front and rear/shelf support is essential to protect against shock and meet the vibration specifications detailed in *Section 9 – Technical Specifications*.



If installing in a rack with a 480 mm depth, Sonardyne can supply rear brackets on request (part number 875-2476).

4.2.1 Rack Installation

Before installation, inspect the rack to make sure ventilation openings on the rear of the NSH will not become blocked.

To secure the NSH into the rack, proceed as follows:

1. Make sure the ac power supply is turned off.
2. Connect the power lead to the 115/230 V ac IEC input connection on the rear of the NSH.
3. Connect any peripheral cables to the rear of the NSH.
4. Carefully slide the NSH fully into the rack. Secure the front side panels to the front of the rack using the four fixing bolts and washers.
5. Secure the NSH to the rack shelf, or if rear fixing, refer to *Section 4.2.2*.

4.2.2 Rear Fixing

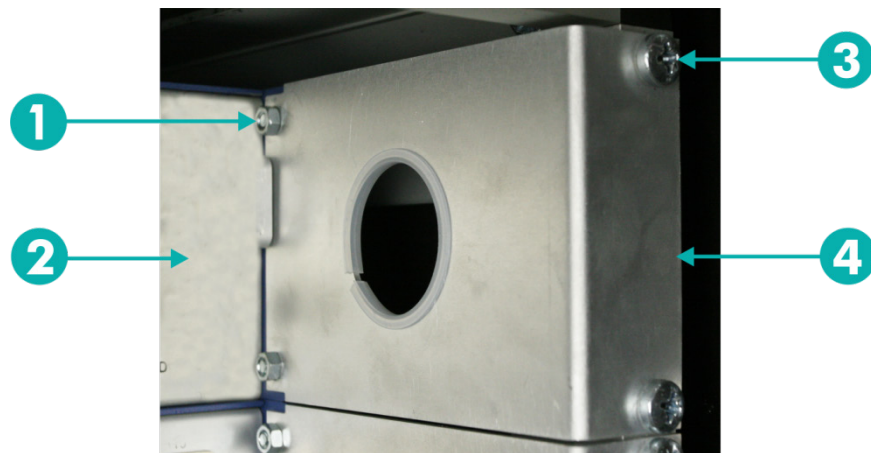
Secure the rear of the NSH to the rack using two Sonardyne rear mounting brackets and fixing nuts and bolts; refer to *Figure 4-1*.

Note



The Sonardyne rear mounting brackets are designed to be used in a 480 mm depth rack.

Figure 4-1 Rear Mounting Bracket



- | | |
|---|---|
| ❶ M6 Fixing Nut and Bolt x 2:
Bracket to Rear of NSH | ❸ M6 Fixing Bolt x 2:
Bracket to Rack (cage nut) |
| ❷ Rear of NSH | ❹ Rear Mounting Bracket (875-2476) x 2 |

4.3 Desk Top Installation

With a desk top installation it is recommended to site the NSH underneath the Navigation Computer. To reduce the risk of injury from sharp edges it is recommended the rack mounting panels are removed; refer to *Section 4.3.1*.

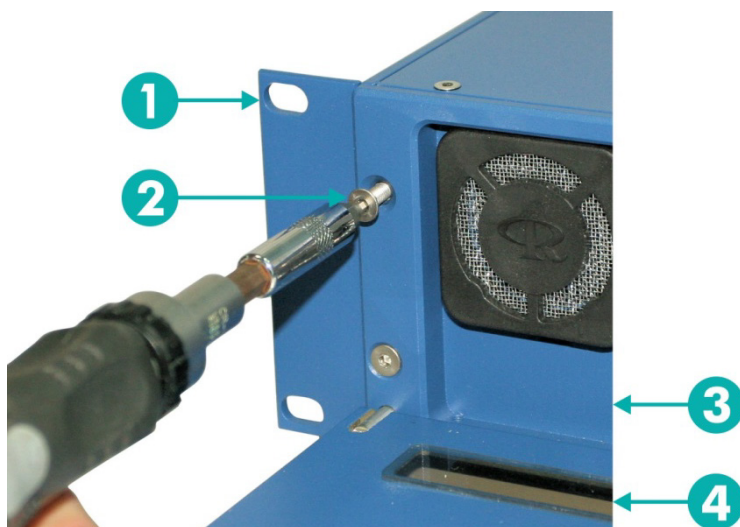
1. Make sure the ac power supply is turned off.
2. Connect the power lead to the 115/230 V ac IEC Input connection on the rear of the NSH.
3. Connect any peripheral cables to the rear of the NSH.

4.3.1 Removing the Rack Mounting Panels

To remove the rack mounting panels proceed as follows:

1. Open the front bottom hinged panel to reveal the rack mounting panels retaining screws.
2. Refer to *Figure 4-2*. Using a 2.5 mm hex-head screwdriver remove the 2 x M4x6 Countersunk Socket Screws **2** retaining each rack mounting panel **1**.

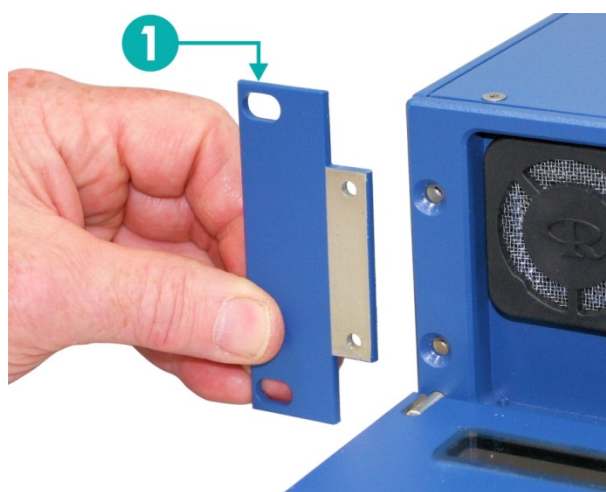
Figure 4-2 Unscrew Rack Mounting Panel Securing Screws



- | | |
|---|-----------------------------|
| 1 Rack Mounting Panel | 3 NSH |
| 2 M4x6 Countersunk Socket Screws | 4 Front hinged Panel |

3. Refer to *Figure 4-3*. Pull the rack mounting panel **1** from the side of the housing.

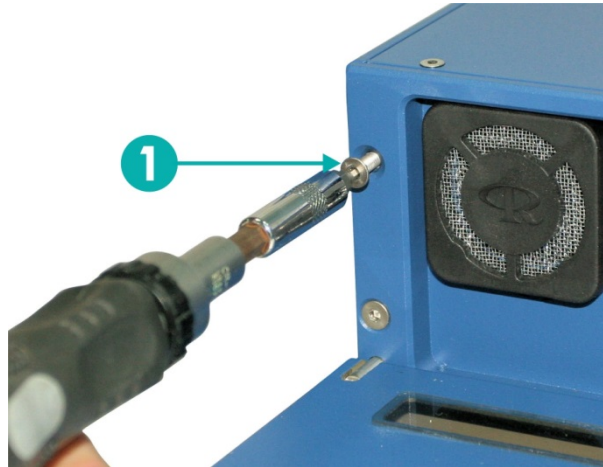
Figure 4-3 Remove the Rack Mounting Panel



- 1** Rack Mounting Panel

4. Refer to *Figure 4-4*. Refit the M4 x6 Countersunk Socket Screws into the NSH.

Figure 4-4 Refit Rack Mounting Panel Screws



1 Rack Mounting Panel screws

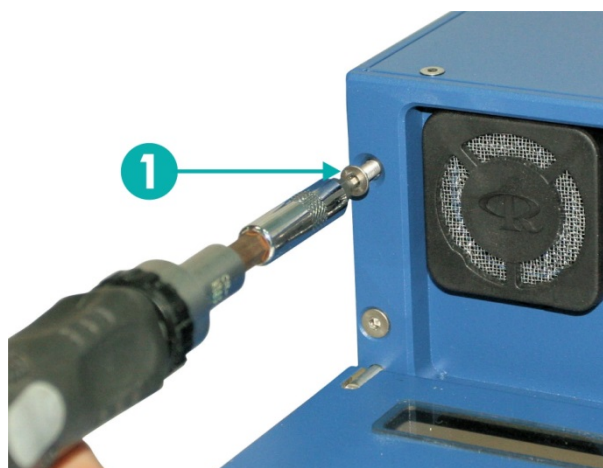
5. Retain the rack mounting panels in a safe place.

4.3.2 Refitting the Rack Mounting Panels

If the NSH is to be used rack mounted it is recommended the rack mounting panels are fitted so the NSH can be secured in position. Fitment of the panels is the reverse of the removal.

1. Open the hinged front panel to reveal the 2 x M4 x6 Countersunk Socket Screws each end of the NSH.
2. Refer to *Figure 4-5*. Remove the 2 x M4 x6 Countersunk Socket Screws.

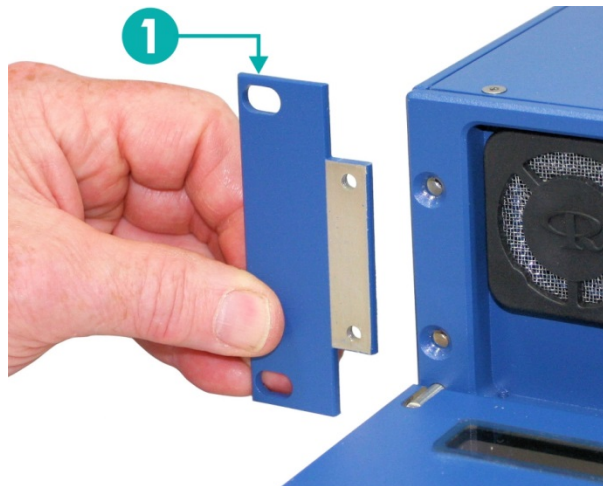
Figure 4-5 Remove the Rack Mounting Panel Screws



1 Rack Mounting Panel screws

3. Refer to *Figure 4-6*. Insert the rack mounting panel and align the holes in the panel with the screw holes.

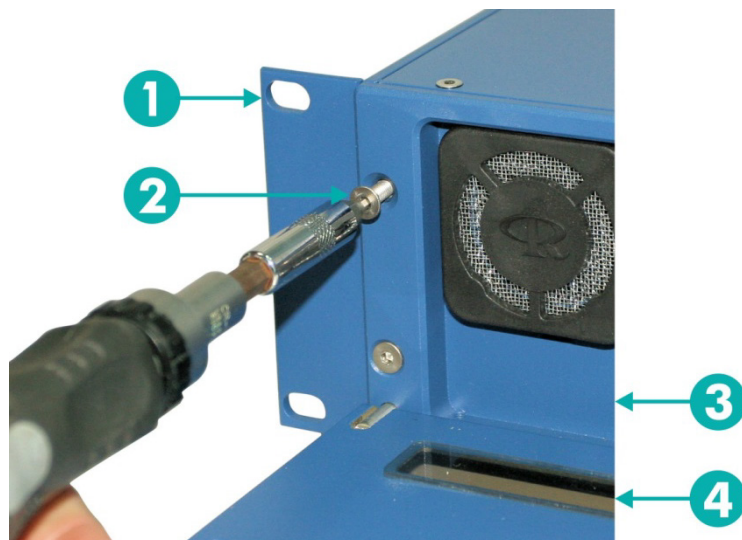
Figure 4-6 Refit the Rack Mounting Panel



1 Rack Mounting Panel

4. Refer to *Figure 4-7*. Refit the 2 x M4 x6 Countersunk Socket Screws and tighten.

Figure 4-7 Refit the Rack Mounting Panel Securing Screws



1 Rack Mounting Panel

2 M4x6 Countersunk Socket Screws

3 NSH

4 Front hinged Panel

Section 5 – Operation

5.1 Introduction

Before proceeding with any operation of the NSH, make sure *Section 2 – Safety* is read and fully understood.

5.2 Starting the NSH

Before attempting to start the NSH make sure all covers are in place and the ventilation openings at the front and rear are clear of blockages. Make sure none of the interface expansion slot backing plates are removed.

1. Make sure the power switch at the rear of the NSH is set to position **0** (off).
2. Connect the power lead to the 115/230 V ac IEC input on the rear of the NSH.
3. Connect the other end of the power lead to the power outlet.
4. Turn on the system power by pressing the power switch at the rear of the NSH to position **1**.

Note

 **Type 8098-000-02 has the additional function of powering the NSH on and off using the power/reset button on the front panel (Type 8098-000-01 is reset only). Once the NSH has been started as described in step 4, it can be turned off by pressing and holding down the red power/reset button on the front panel for 4 seconds and restarted by pressing the power/reset button.**

5. With power switched on, make sure the four green power supply LEDs on the front of the panel illuminate indicating the 48, 24, 3.3 and 5 Volt supplies are available for use.

Notes

 **The Serial Activity LEDs cycle and flash to indicate the start-up test sequence has completed.**

 **The TCVR status light illuminates when 48 or 24 Volts output has been selected for the TCVR Module.**

 **The red LED illuminates when a fault condition has been detected and the TCVR output has been automatically shut down.**

5.3 Turning Off the NSH

Type 8098-000-01: Press the power switch at the rear of the NSH to position **0**.

Type 8098-000-02: Press and hold down the red power/reset button on the front panel for 4 seconds (pressing the power/reset button briefly reboots the NSH) or to isolate power to the NSH, press the power switch at the rear of the NSH to position **0**.

5.4 Network Configuration

Note



Take care not to enter the incorrect Ethernet address. Entering the wrong address may cause other devices on the network to stop working or operate incorrectly.

5.4.1 Configuring the Ethernet Interface

When the NSH is started for the first time, or if the non-volatile memory is restored to the factory settings for any reason, the NSH may need configuring to re-enable the Ethernet interface.

To configure the Ethernet interface:

1. Connect to the NSH via a serial connection to the serial management port (port 2A on the rear).
2. Start-up HyperTerminal configured to run at 115,200 baud, no parity, 1 stop bit and no handshaking.
3. On power up the NSH should display a start-up banner followed by a command prompt:

NSH>

4. To set the TCP/IP address enter the operator IP address – as appropriate:

Net ip1 192.168.179.1

5. To set the netmask enter:

Net netmask1 255.255.255.0

6. To commit the settings to the non-volatile memory, enter the command:

Flash

7. To check the current settings enter the command:

Net

8. The NSH should respond with similar to the following:

```
nsh ip address 1 192.168.179.1
nsh ip address 2 192.168.0.11
nsh network mask 1 255.255.255.0
nsh network mask 2 255.255.255.0
status udp ip address 0.0.0.0
status port 4000
status task disabled
status repeat time 200
Ethernet1 Mac address 00:50:c2:2b:10:80
Ethernet2 Mac address 00:50:c2:2b:10:81
```

Section 6 – Maintenance and Monitoring

6.1 Introduction

Before proceeding with any maintenance of the NSH, make sure *Section 2 – Safety* is read and fully understood.

6.2 Replacing the Fuses

To protect the NSH from fluctuations or spikes in the ac power supply, two anti-surge 5 A fuses are installed (part number 327-1190). To replace these fuses proceed as follows:

1. Make sure the NSH is switched off with the green LED extinguished.
2. Turn off the ac power supply to the NSH.
3. If the NSH has been rack mounted, remove the securing screws retaining the unit to the rack.
4. Pull the NSH forward sufficiently to gain access to the power lead to the rear IEC Socket and disconnect the power lead.
5. Disconnect any additional cables connected to the rear of the NSH.
6. Place the NSH on a clean dry desk.
7. Depending on the NSH type, the fuses are accessed as follows:
 - a. **Type 8098-01:** Using a flat blade screwdriver to assist, lever the fuse holder from the socket. The fuses are contained inside the holder, as shown below.



- b. **Type 8098-02:** Using a flat blade screwdriver, unscrew the fuse holders from the socket. The fuses are contained separately inside the holders, as shown below.



8. Replace with the same rated fuse (refer to *Section 8 – Spares*).
9. Refit the fuse holder(s) back into the NSH.

6.3 Removing and Installing Interface Cards

The NSH is fitted with interface cards that can be replaced and changed where necessary.

6.3.1 Removing an Interface Card

To remove an interface card proceed as follows:

1. Unscrew the securing screws that retain the interface card in the slot.
2. Handle the interface card only by its edges when removing from the slot. Carefully unplug the card from its connector on the connector board.
3. Store the card in an anti-static protective bag.

6.3.2 Installing an Interface Card

Note



The expansion slot connectors are keyed so cards will only fit in specific slots. Refer to *Table 3-1 NSH Interface Expansion Cards* options for details on which cards can be fitted to individual slots.

1. Locate the appropriate empty interface card expansion slot.
2. Unscrew the expansion slot backing plate securing screws for the selected slot and then remove the backing plate from the slot.
3. Handle the interface card only by its edges when removing from the anti-static protective packaging.
4. Position the interface card connector into the expansion slot connector and push the card firmly but gently into place.
5. Secure the interface card in the slot using the securing screws from the backing plate.

Note



Each interface card type has a unique identity which is recognised by the system when it is added to an expansion slot.

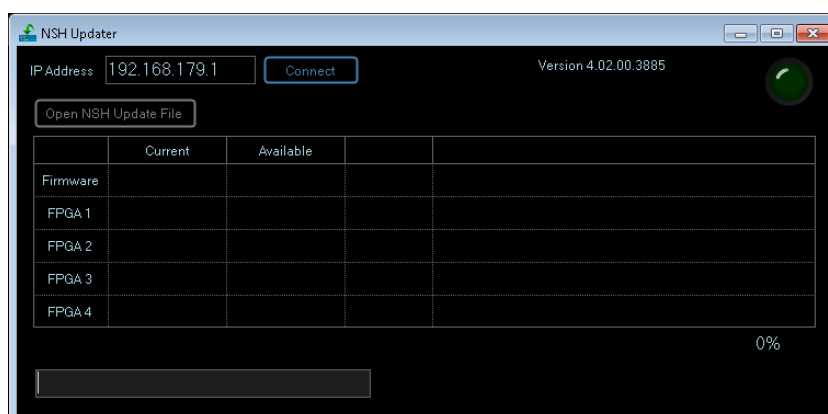
Section 7 – Firmware Update

The NSH firmware can be updated using either the NSH Updater Tool (recommended) or a terminal package such as HyperTerminal. The NSH Updater Tool is included with appropriate Sonardyne navigation software.

The two procedures are described below.

7.1 Updating the Firmware using NSH Updater Tool

1. Click **Start > Programs > Sonardyne / NSH Updater**

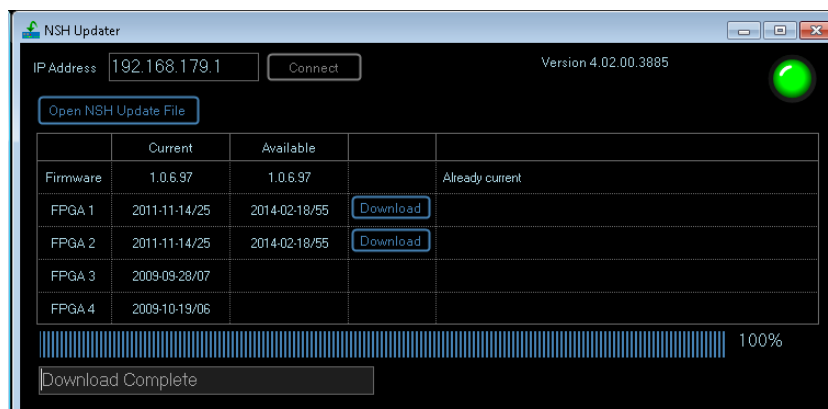


2. Ensure the correct IP address for the NSH is entered (the default of **192.168.179.1** should be correct for most systems) and then click **Connect**.
3. The green indicator in the top right corner will illuminate if connection is successful, and the current firmware version will be displayed.
4. Click **Open NSH Update File** and browse to and select the new.nsh firmware file.



5. The **Current** and **Available** firmware file versions will be displayed.
6. Confirm that the Available firmware version is newer than the Current firmware version and then click **Download**.

7. A progress bar indicates the status of the firmware download and **Download Complete** is displayed after the installation has completed.



7.2 Updating the Firmware using a Terminal Package

To update the NSH firmware using a Terminal package:

1. Connect the TCP/IP management port using a terminal package such as HyperTerminal. The management port is normally configured as port 4000.
2. The NSH should produce the following prompt:

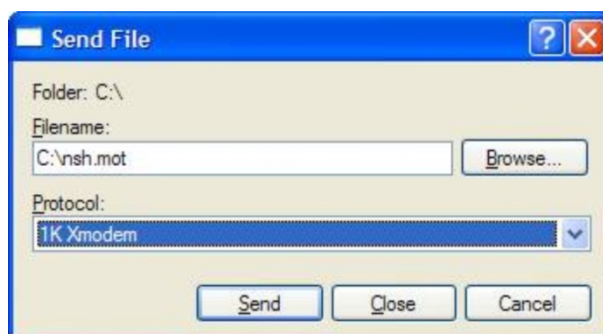
NSH>

3. At the command prompt enter the command:

Software load

4. On the **Transfer** menu select **Send file**.

Figure 7-1 Send File



5. Click **Browse** to navigate to the location of the **.mot** file to be downloaded.

Note

The loader may time-out if too much time is taken to locate the file to download. If this happens, restart the process and Hyperterminal will start in the correct folder.

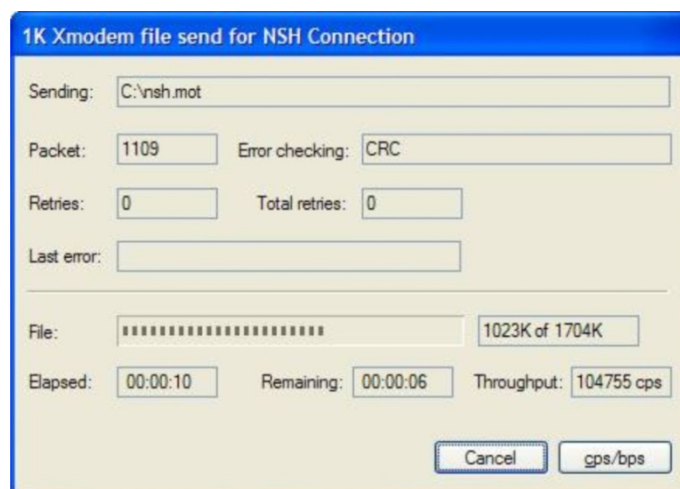
6. Select **1K Xmodem** from the **Protocol** drop-down list and then click **Send**.

Note

 The NSH may send out a series of “C” characters. This is expected as part of the transfer protocol indicating the NSH is ready for data.

7. The application should begin downloading to the NSH (this takes approximately 20 seconds) as shown in *Figure 7-2*.

Figure 7-2 1K XModem



8. Once the download is complete, restart the instrument by typing the command:
Boot HARD
9. Click the disconnect button on the Hyperterminal. The new application should start in approximately 10 seconds.

7.2.1 Viewing Stored Applications

To view the stored applications follow the procedure below:

1. Type the command
Software status
2. The NSH will respond with the current software setup:
***+ NSH Mar 4 2014 1.0.6.97..... CRC = ok**
NSH Oct 26 2012 1.0.5.87..... CRC = ok
3. The two lines detail the firmware currently loaded into the instrument.

Note

 The line with the “*” at the beginning indicates this is the firmware running at present. The line with the “+” in it indicates the default application to be loaded on start up.

7.2.2 Swapping an Application

It may be necessary to return to a previous version of firmware. To return to a previous firmware version proceed as follows:

1. Type the command:

Software switch

2. After a short delay the default application will switch.
3. To check the software status type the command:

Software Status

4. The NSH will respond with the current software information:

* NSH Oct 26 2012 1.0.5.87..... CRC = ok

+ NSH Oct 26 2012 1.0.5.87..... CRC = ok

Note



The '+' symbol will move to the other line.

5. Restart the instrument by typing the command:

Boot HARD

6. Disconnect, wait 10 seconds then reconnect. The other firmware version will now be running.

Section 8 – Spares

8.1 Introduction

When ordering spare parts, you must provide:

- a) The part number
- b) The drawing number (if known)
- c) A description

Enquiries about, or orders for spare parts should be directed to your local Sonardyne office or agent. Sonardyne office addresses are shown on the back of this manual.

8.2 Recommended Spares

Part Number	Description	Qty
327-1190	Fuse Anti-surge Glass 20 mm 5 A, 250 V	2
875-2476	Rear support mounting bracket	2

Section 9 – Technical Specifications

9.1 Specifications

Item	Specification	
Processor	Freescale MPC8360 PowerQUICC™ Integrated Communication Processor	
Memory	One Double Data Rate (DDR) SODIMM Socket fitted with 512 MB SDRAM. Synchronous Dynamic Random Access Mem	
Motherboard	Sonardyne Type 8098-046 motherboard	
Power Supply	The Power Supply automatically senses the ac input voltage 115/230 V, 60/50 Hz. Maximum current 2 A @ 230 V, 4 A @ 115 V	
Weight	9 kg (with all cards fitted).	
Environmental	Operating Temperature	-5° to 40°C (23° to 104°F)
	Storage Temperature	-20° to 55°C (-4° to 131°F)
	Relative Humidity	20 to 80% (non-condensing)
	Shock	10 g acceleration peak to peak 5–17 Hz, 0.1" double amplitude displacement 17–640 Hz, 1.5 G acceleration peak to peak

9.2 Ports and Connectors

Qty	Description
1	IEC socket 115/230 V ac, 4/2 A, 60/50 Hz
12	Interface card connectors

9.3 Interface Expansion Cards

A combination of the interface expansion cards may be fitted to the processor. The cards fitted will depend on the application.

9.4 Safety

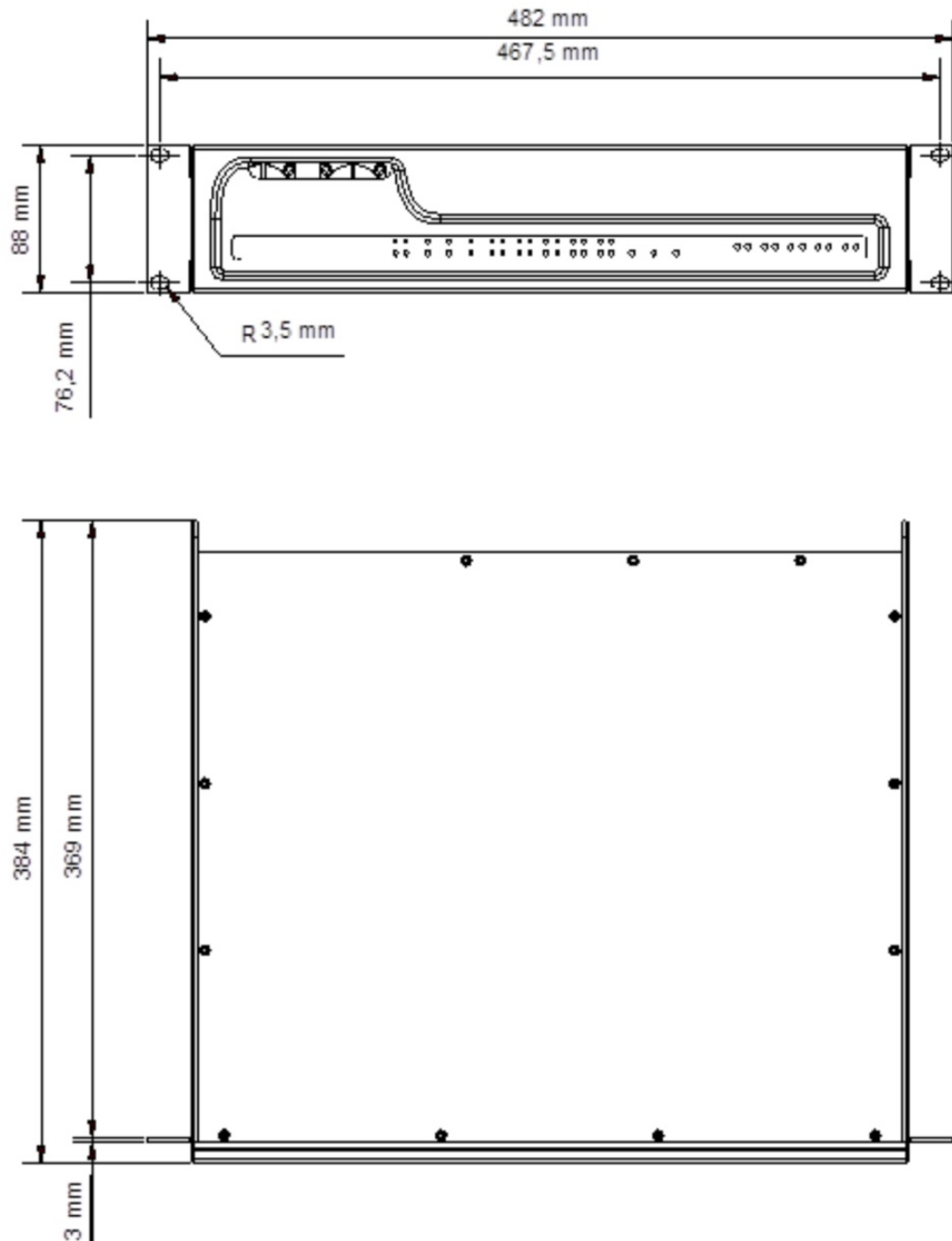
Complies with the requirements of EN61010-1.

9.5 EMC

Designed to comply with the Immunity & Emission requirements of EN60945.

9.6 Outline Drawing

Figure 9-1 Overall Dimension



9.7 Cable Diagrams

Figure 9-2 Transceiver Card to 24 V ROVNav 5 – CPN 820-6475/DWG 8020-068

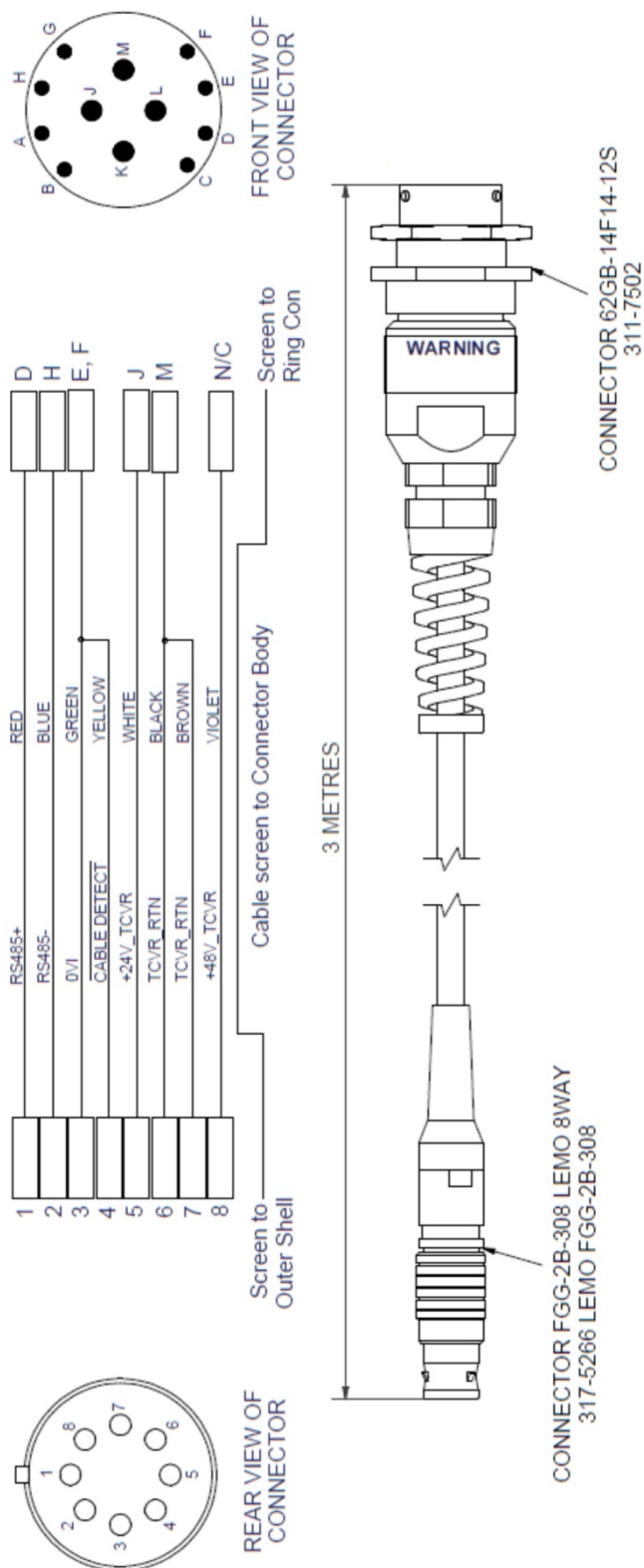


Figure 9-3 8 Pin Lemo to 48 V USBL Transceiver – CPN 820-6484/DWG 8020-069

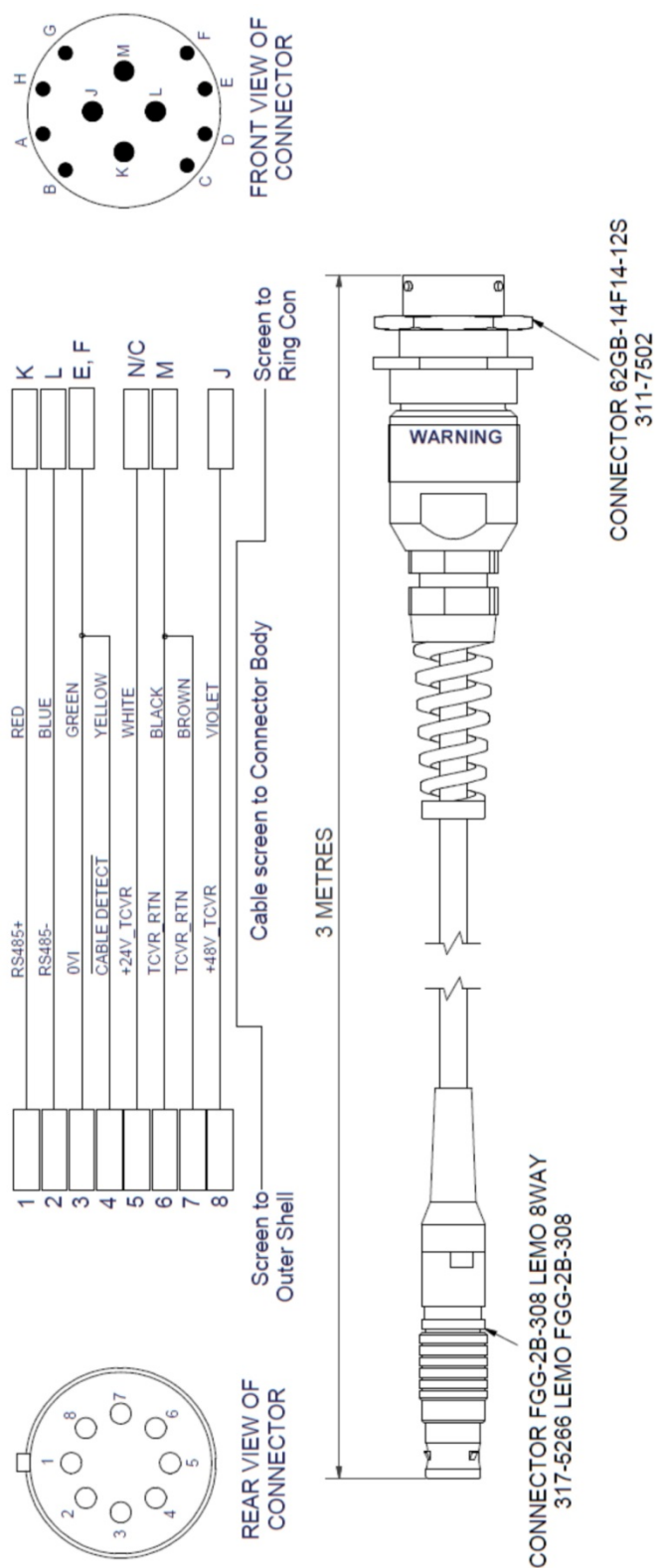


Figure 9-4 Dual Port to Amp to Lemo – CPN 820-6490/DWG 8020-084-01

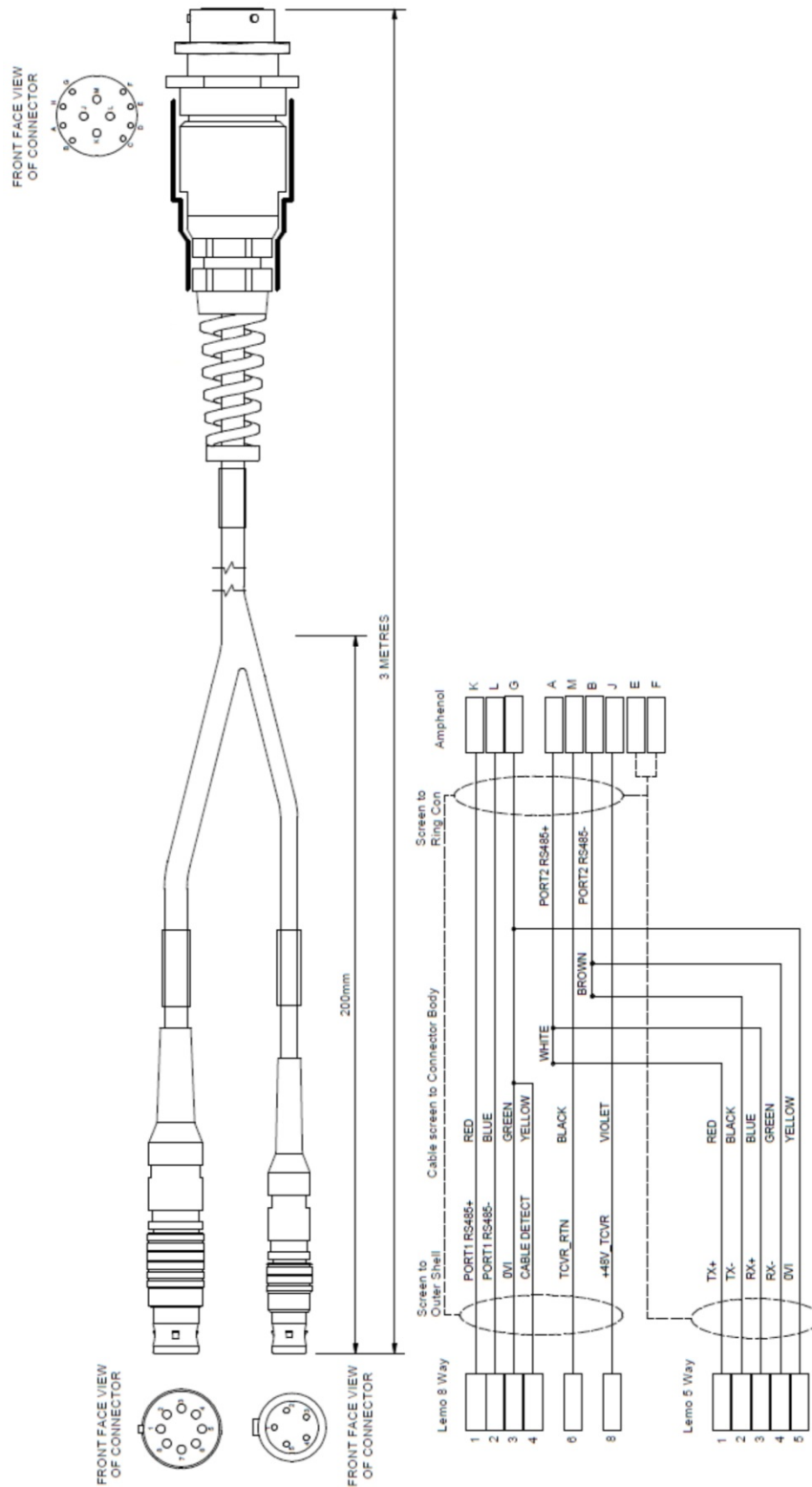


Figure 9-5 Transceiver Card Flylead – CPN 820-6459/DWG 8020-061

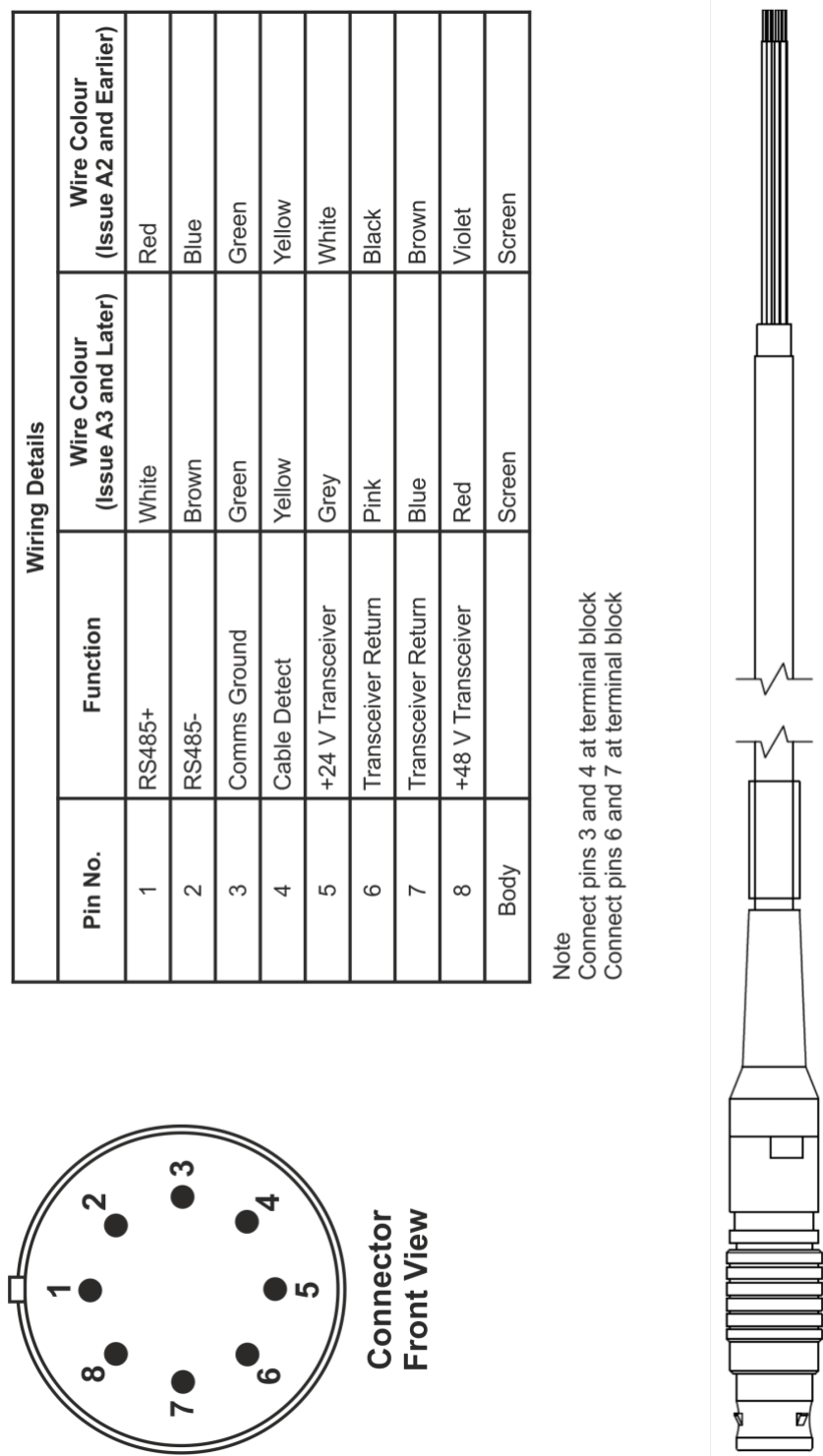


Figure 9-6 USBL Test Lead – CPN 820-6782/DWG 8020-070

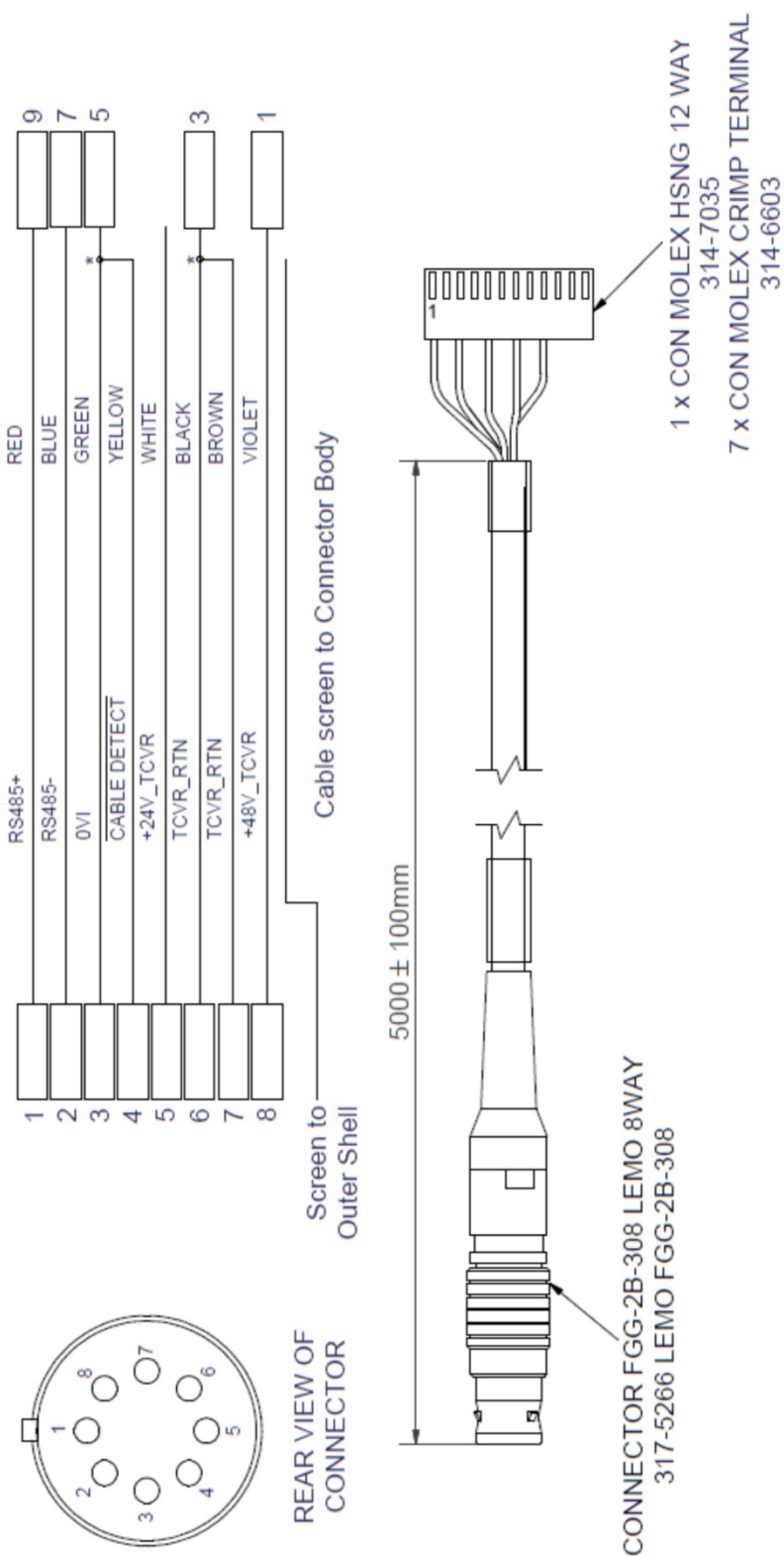


Figure 9-7 Serial Data Cable to Flylead – CPN 820-6608/DWG 8020-060

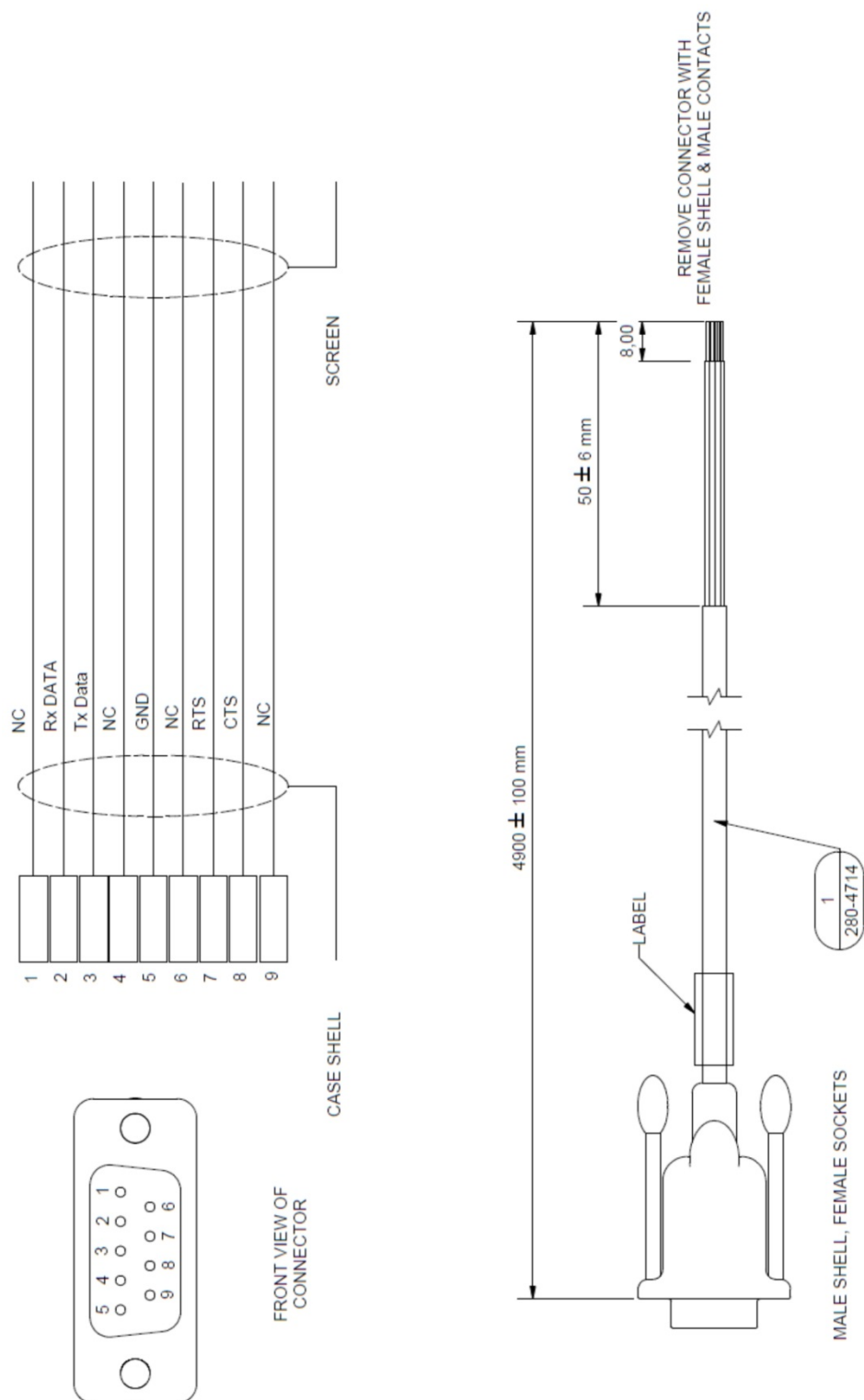


Figure 9-8 Serial Data Cable – CPN 280-4714

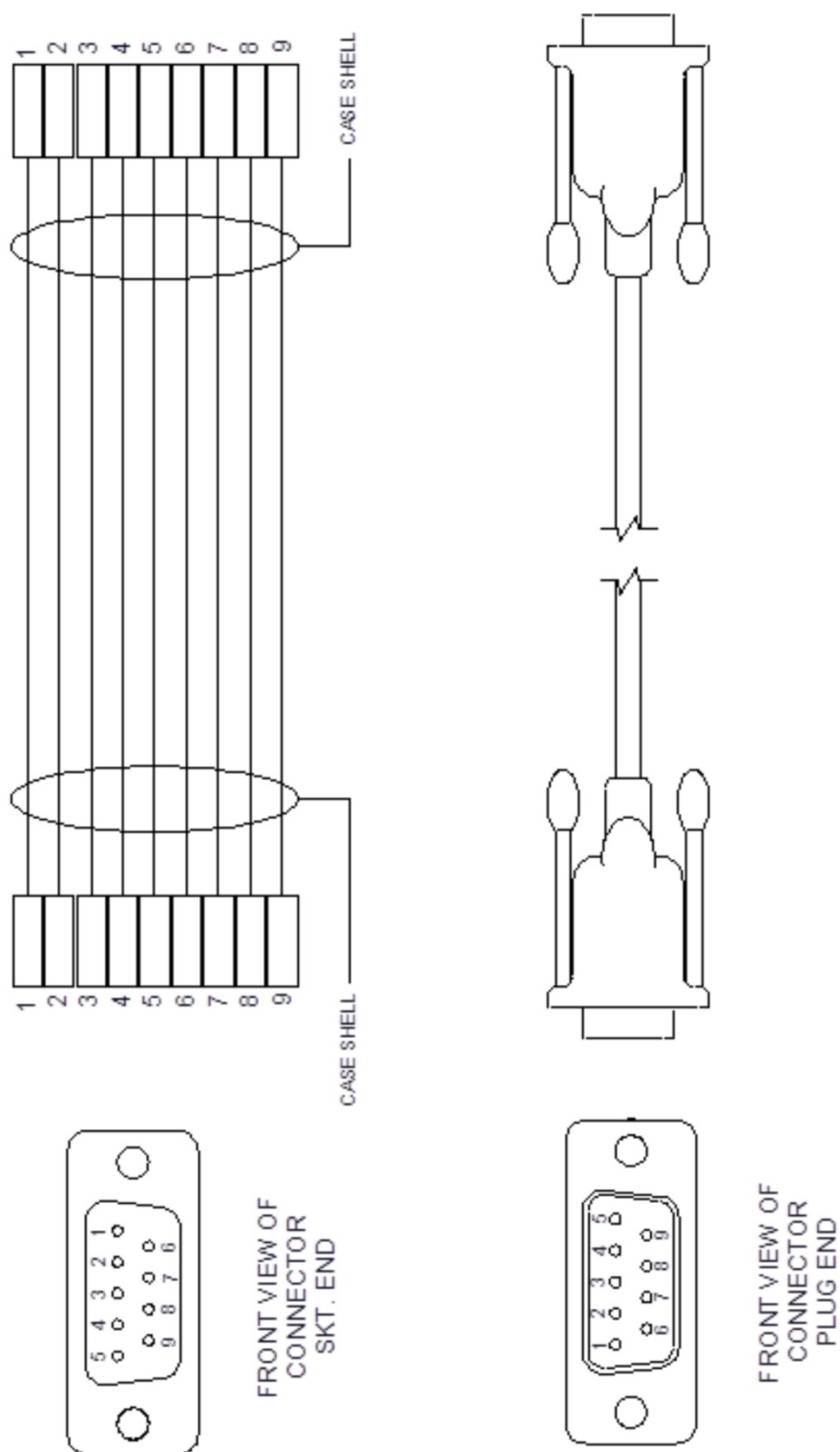
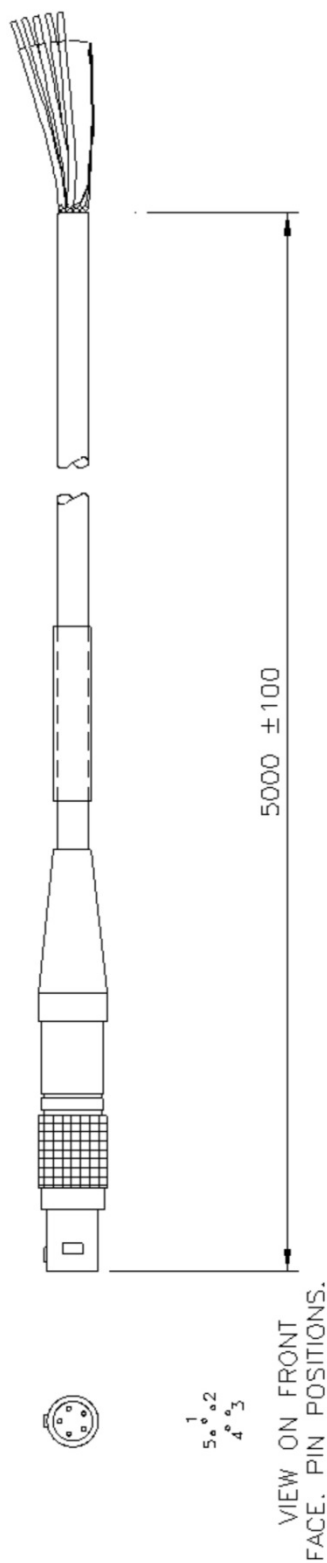


Figure 9-9 RS485/422 Cable – CPN 820-3650/DWG 7784-159



ITEM 1 PIN POSN.	WIRE COLOUR ISSUE B3 & EARLIER	WIRE COLOUR ISSUE B4 & LATER	Serial I/O RS422 SIGNAL
1	RED	WHITE	TX+
2	BLACK	BROWN	TX-
3	BLUE	GREEN	RX+
4	GREEN	YELLOW	RX-
5	YELLOW	GREY	OV1
BODY	SCREEN	SCREEN	SCREEN

CUT BACK WHITE CORE TO END OF OUTER SHEATH TO ISOLATE BOTH ENDS.

NOTE! FOR HALF-DUPLEX OPERATIONS, TX+ AND RX+ MUST BE CONNECTED TOGETHER
AND TX- AND RX- MUST BE CONNECTED TOGETHER.
ALSO THE CONFIG SWITCH SET APPROPRIATELY ON THE INTERFACE CARD.

Figure 9-10 Responder Cable – CPN 820-3349/DWG 7784-049-02

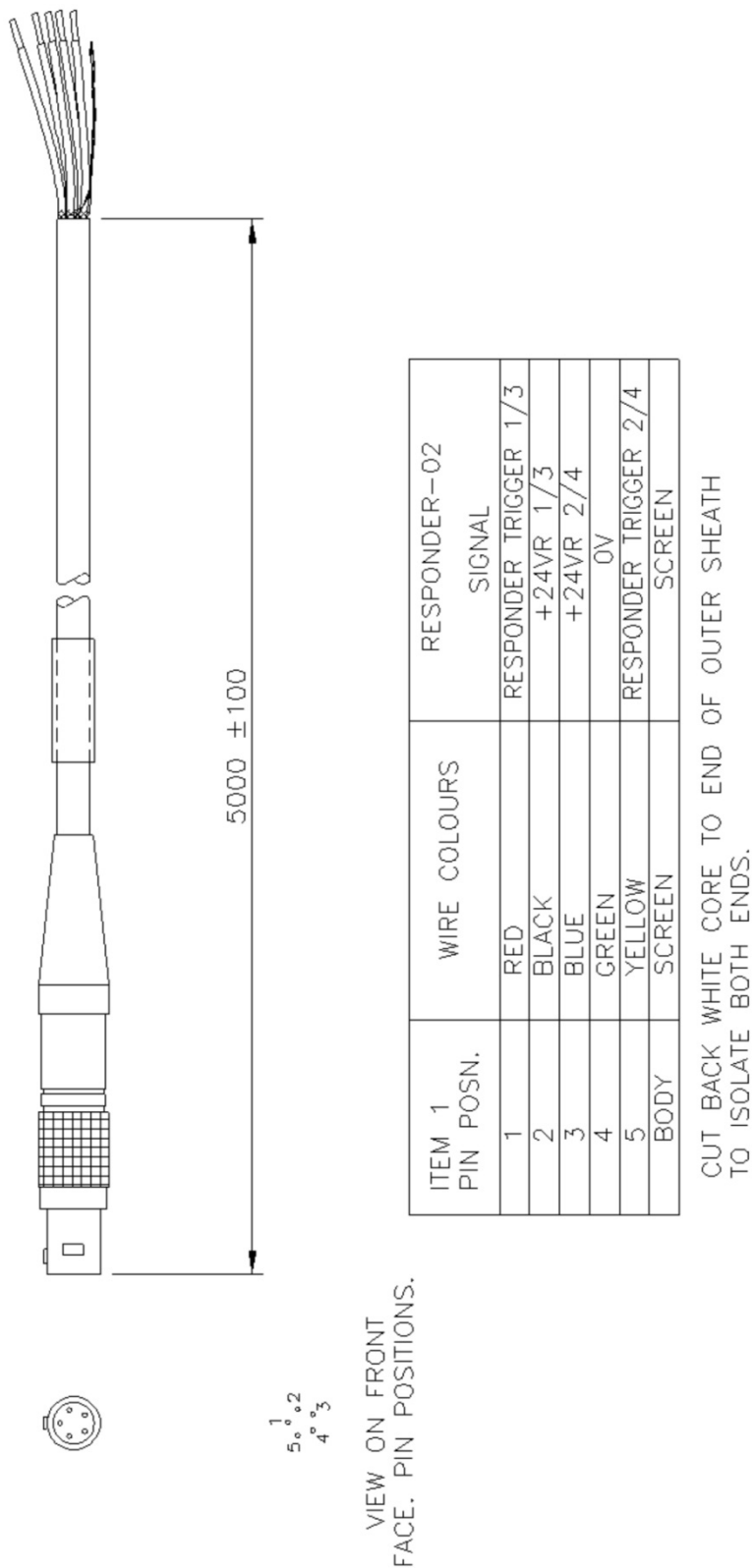
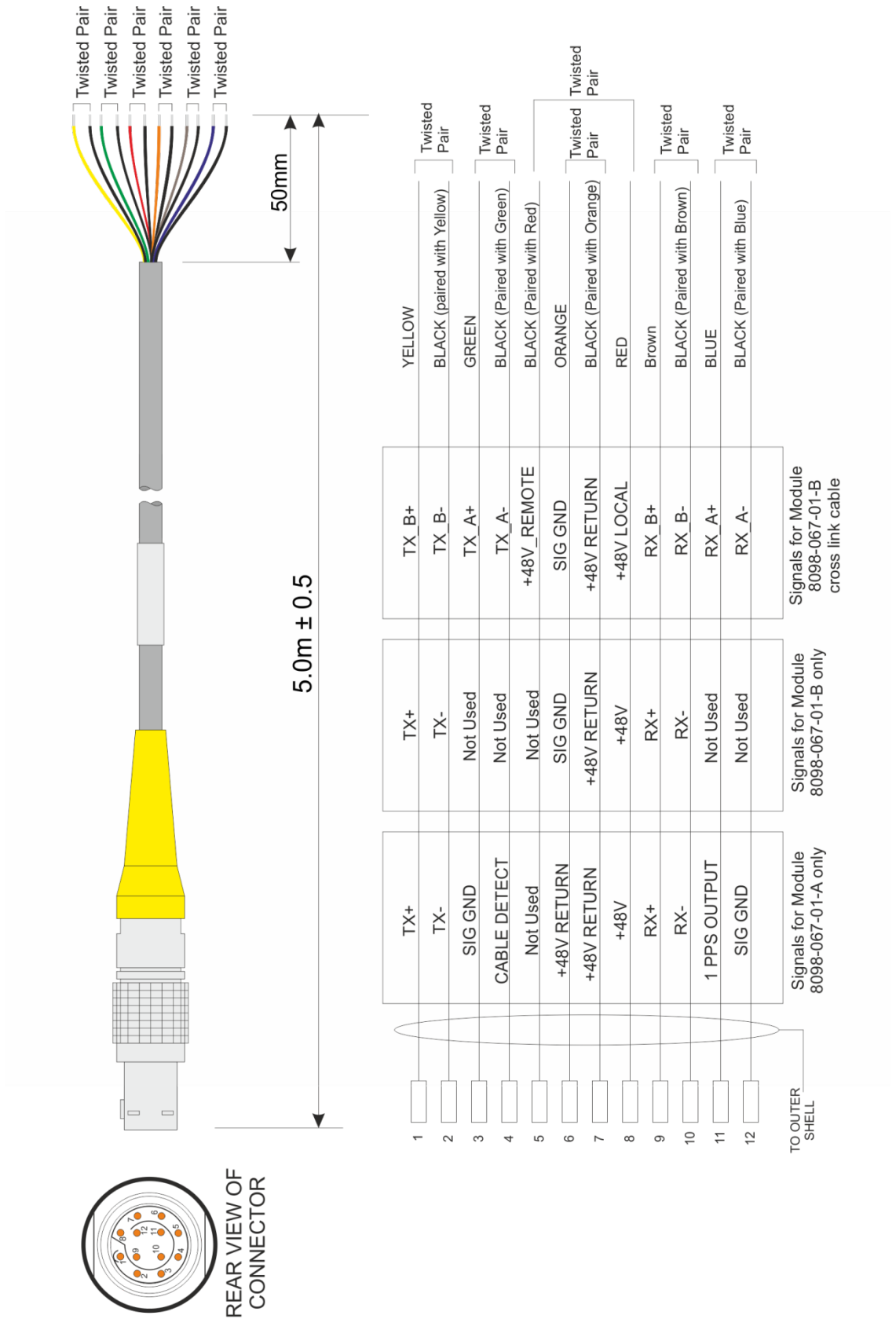


Figure 9-11 Lodestar Cable – CPN 820-0147/DWG 8098-090-01



Appendix A – NSH Interface Card Identification

Table A–1 NSH Interface Card Identification

From NSH interface card	To	Cable Description	Stock Code	Drawing No.	Comments
Transceiver	ROVNav 5	8 pin lemo to 62GB-14F14 - 12S 24 V ROVNav 5	820-6475	8020-068	
	GDT USBL	8 pin lemo to 62 GB-14F14-12S 48 V USBL transceiver	820-6484	8020-069	
	HPT Nav Controller Cable	Dual Port Amp to Lemo	820-6490	8020-084-01	
	Junction Box	8 pin lemo to flylead	820-6459	8020-061	
	GDT USBL Internal 12 way Molex	USBL test lead	820-6782	8020-070	
Lodestar	Junction Box	12 pin lemo to flylead	820-0147	8098-090	
Dual RS232	Junction Box	Serial data cable to flylead	820-6608	8020-060	External device supporting standard RS232 comms
	Male 9 way 'D'	RS232 5 m data cable M/F	280-4714	N/A	Manufacturers part No.31525 External device supporting standard RS232 comms
Dual RS485	Junction Box	5 pin lemo to RS485 flylead	820-3650	7784-159	
Responder Trigger	Junction Box	Responder Trigger flylead	820-3349	7784-049-02	

Appendix B – Open Source Software Licence Notices and Terms

B.1 Open Source Software

PTPd V1.0

This application makes use of PTPd software.

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Definitions

Term	Definition
CPN	Component Part Number
DWG	Drawing
GNSS	Global Navigation Satellite System
HPR	Hydro-acoustic Position Reference
Inertial Navigation System (INS)	A navigation aid that uses a computer, motion sensors and rotation sensors to continuously calculate the position, orientation and velocity of a moving object without the need for external references.
Long Base Line Positioning System (LBL)	A system where two or more transponders are on the seabed. The positions of the transponders are established by a calibration process in a seabed frame. The distances from a transducer to each transponder are measured using a transceiver. The position of the transducer can be computed in the seabed frame. The name comes from the “baselines” joining each transponder.
LUSBL	Long and Ultra Short Baseline
NSH	Navigation Sensor Hub
PSU	Power Supply Unit
ROV	Remotely Operated Vehicle
Sonardyne	Sonardyne International Limited and its affiliates
USBL	Ultra Short Baseline

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