

# Nav6hub User Guide

MAN 3029.00

Issue 1.0

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## Important Information

**This equipment is not approved for use by SOLAS convention vessels within the Global Maritime Distress and Safety System (GMDSS)**

**It is intended for use by leisure craft and other non-SOLAS vessels wishing to participate within GMDSS**

## Safety Warnings

**This instrument is for use as an aid to sailors and should not lead to a reduction in the level of good seamanship required at all times**

**Reception of messages cannot always be guaranteed as this depends on local radio propagation**

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Congratulations on purchasing this superb **ICS Electronics Ltd** product. We hope that it gives you many years of reliable and trustworthy service. Please take the time to read this manual carefully as it contains some essential information regarding the operation and maintenance of the product and a useful background to the NAVTEX system.

We recommend that you regularly visit the ICS website [www.icselectronics.co.uk](http://www.icselectronics.co.uk) for information on updates, the availability of software enhancements, further options and support. The support pages contain frequently asked questions about the Nav6 that you may find useful. There is also a NAVTEX database providing a list of operational NAVTEX stations and their details.

The IMO and various national coastguards also operate informative websites that you may wish to visit; check out our links at [www.icselectronics.co.uk](http://www.icselectronics.co.uk)

## QUICK START

You will find this product easy to install & operate

- Follow the installation guidelines
- Re-check the cable connections
- Apply power
- Set up the Nav6 displays so that the one connected to the DISPLAY1' connector is 'master' and any other displays are 'slave'
- You can now share Nav6 Navtex and/or NMEA data between displays
- If you have the NMEA Data Combiner option fitted then you will also have a combined source of NMEA data available to other systems on your vessel

## INTRODUCTION

It is possible to connect multiple Nav6 displays and sensors together to form an extended system. This may be necessary when more than one sensor is required or multiple displays are needed at several locations on the boat.

*All systems consisting of more than a single display and sensor require a Nav6hub to facilitate the interconnection.*

### **Why Do I Need a Nav6hub ?**

The Nav6 communicates between the display and the sensor using RS485, which is a 2 wire serial interconnection system widely used in electrically noisy environments.

Good performance relies upon using 'best-practice' wiring layout for the entire installation. Ideally, the installation should consist of a single twisted-pair wire 'daisy chained' from one unit (display or sensor) to the next with no 'stubs' or 'loops'. In addition each end of this single wiring run must be terminated with a termination resistor. Obviously these requirements are very difficult, if not impossible, to achieve on a boat. In particular, adding further units to a system that has been installed with 'best practice' will be very difficult indeed. Consequently ICS have developed a Nav6hub product in order to ease the installation issues whilst still maintaining best-practice wiring.

### ***The Nav6hub : a Description***

The Nav6hub provides two RS485 ports (Port1 consisting of the DISPLAY1 & SENSOR1 connectors and Port2 consisting of the DISPLAY2 & SENSOR2 connectors). Each port can be used to connect to two Nav6 units (any combination of display, sensor or other Nav6hub).

The correct termination for RS485 is built into each Nav6 sensor & display, thus the installer only has to set a few links on the Nav6hub.

Each Nav6 sensor & display should be wired *directly* back to a Nav6hub using ICS Nav6 sensor and display cable extensions if required (see the options list at the end of this User Guide).

- All Nav6 unit connections must be made at a Nav6hub
- All connections to the Nav6hub and to any Nav6 product should be made with cable supplied or specified by ICS
- The cable screen drain wire must always be connected as indicated

The Nav6hub is the basic interconnect product. If more than one source of NMEA data is present on your vessel, then you may wish to add the NMEA Data Combiner module which fits inside the Nav6hub.

### ***The Nav6hub***

In a Nav6 or Nav6plus Navtex system the Nav6hub can be used to share Navtex messages between several displays, as they are received.

The Nav6hub also allows more than one sensor to be connected to the display(s).

The Nav6hub can also be used to share a single source of NMEA data between several displays.

### ***The Nav6hub plus NMEA Data Combiner***

In addition to the standard Nav6hub features :

The Nav6hub plus NMEA Data Combiner can also be used to share up to four sources of NMEA data between several displays. This combined NMEA data stream is also available to other external systems.

**Please read the installation section of this user guide thoroughly before attempting installation of the NAV6hub.**

## HOW TO OPERATE YOUR NAV6HUB

The Nav6hub requires no additional control or set-up once it has been configured correctly. The Nav6hub acts as passive interface between other Nav6 products (and between NMEA sources if the NMEA Data Combiner option is fitted).

## NAV6HUB SETUP

### *Configuring the Nav6hub*

The Nav6hub contains 5 linker groups which must be set correctly for reliable operation of the Nav6hub (the Nav6hub *may* work with different linker settings to those indicated, but it is strongly recommended that the published settings are adhered to).

<b><i>Linker group</i></b>	<b><i>Name</i></b>	<b><i>Function</i></b>
LK1	PORT1 COMMS	Controls termination of Port1 RS485
LK2	PORT2 COMMS	Controls termination of Port2 RS485
LK3	SERIAL	Sets Printer or PC Serial operation
LK4	NMEA	Enables use of the NMEA Data Combiner
LK5	PROG	Allows programming of master display

### ***LK1 & LK2 : COMMS Settings***

LK1 & LK2 allow different combinations of displays and sensors to be connected to the two ports. These linkers apply the correct termination resistors for different combinations of displays and sensors.

The linkers should be set as tabulated below :

<b>Configuration</b>	<b>Connector</b>	<b>LK1 linkers</b>	<b>LK2 linkers</b>
----------------------	------------------	--------------------	--------------------

Example Configuration 1

<b>Sensor</b>	Sensor 1	LK1A no fit	LK2A fit
<b>Master Display</b>	Display 1	LK1B no fit	LK2B fit
-	-	LK1C no fit	LK2C fit
-	-		

Example Configuration 2

<b>Sensor</b>	Sensor 1	LK1A no fit	LK2A fit
<b>Master Display</b>	Display 1	LK1B no fit	LK2B no fit
<b>Display</b>	Display 2	LK1C no fit	LK2C fit
-	-		

Example Configuration 3

<b>Sensor</b>	Sensor 1	LK1A fit	LK2A no fit
-	-	LK1B fit	LK2B no fit
<b>Master Display</b>	Display 2	LK1C fit	LK2C no fit
<b>Display</b>	Sensor 2		

Example Configuration 4

<b>Sensor</b>	Sensor 1	LK1A no fit	LK2A no fit
<b>Master Display</b>	Display 1	LK1B no fit	LK2B no fit
<b>Display</b>	Display 2	LK1C no fit	LK2C no fit
<b>Display</b>	Sensor 2		

Example Configuration 5

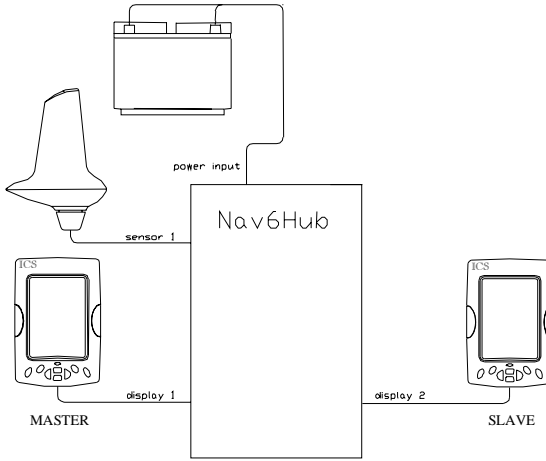
<b>Sensor</b>	Sensor 1	LK1A no fit	LK2A no fit
<b>Master Display</b>	Display 1	LK1B no fit	LK2B no fit
<b>Display</b>	Display 2	LK1C no fit	LK2C no fit
<b>Sensor</b>	Sensor 2		

Example Configuration 6

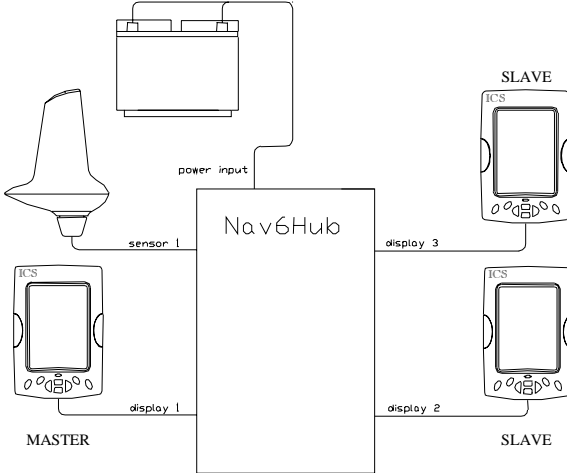
<b>Sensor</b>	Sensor 1	LK1A no fit	LK2A no fit
<b>Master Display</b>	Display 1	LK1B no fit	LK2B no fit
<b>Display</b>	Display 2	LK1C no fit	LK2C no fit
<b>Display</b>	Sensor 2		

\* Example Configuration 5 assumes 2 switchable sensors, all other configurations assume 1 dual sensor

### Example Configurations



Configuration 2



Configuration 4

For the linker settings corresponding to these example configurations – see the previous table.



**LK3 : SERIAL Settings**

<b>LK3</b>	<b>Selection</b>
A	Selects RS232 communications for PC Interface
B	Selects RS232 communications for Nav6 Printer Interface

**LK4 : NMEA Settings**

<b>LK4</b>	<b>Selection</b>
A	Enables NMEA Data Combiner operation
B	Single NMEA input on NMEA.1 connections

**LK5 : PROG Settings**

<b>LK5</b>	<b>Selection</b>
Fit	For programming master Nav6 display only
No fit	Normal operation of master Nav6 display

The PROG linker should only be fitted whilst the display connected to DISPLAY1 connector is being reprogrammed with a new station database, a new language option or new firmware. This linker should NOT normally be fitted.

**Connecting a Single Source of NMEA Data****Important Information**

***If there is only one source of NMEA data – you must use the “NMEA.1” input connector***

The Nav6plus display can be connected to a source of NMEA 0183 compatible data. A typical source of NMEA data is a GPS unit.

The Nav6hub is conveniently configured so that in an installation with multiple displays, the NMEA data is routed to two displays plus an NMEA output port, and only puts a single electrical load on the NMEA source. The NMEA output is a buffered version of the NMEA input.

Displays connected to the 'display 1' and 'display 2' ports automatically have NMEA fed to them. A display connected to 'sensor 1' or 'sensor 2' ports does not, and the following additional connections need to be made :

<b>Nav6hub NMEA OUT Connector</b>	<b>Display Cable Twisted Pair</b>	<b>Core Colour</b>	<b>Nav6 Display Signal Description</b>
+VE (A)	BLUE twisted with BLACK	BLUE	NMEA IN +ve (A)
-VE (B)		BLACK	NMEA IN -ve (B)

To use the NMEA.1 input as the single NMEA input, LK4 must be in the 'B' position.

### **Connecting to More than one Source of NMEA Data**

It is not uncommon to have more than one source of NMEA data. For instance a GPS may be transmitting position-related data on one NMEA source and an instrument system may be outputting the boat's instrument data on another NMEA source. NMEA outputs cannot be connected together and a suitable 'NMEA combiner' must be purchased. ICS recommend that you purchase the Nav6hub NMEA Data Combiner option for installation within the Nav6hub.

There are four pairs of NMEA input connections on the Nav6hub pcb. These are prioritised with NMEA.1 the highest priority. This means that if an NMEA sentence (say RMC) is presented on NMEA.1 & NMEA.2 connectors then the RMC sentence from NMEA.1 will be used & the sentence from NMEA.2 will be discarded.

<b>Nav6hub NMEA IN Connectors</b>	<b>Priority</b>	<b>Suggested Use</b>
NMEA.1	Highest	Master GPS
NMEA.2	Second	Back-up GPS
NMEA.3	Third	Plotter, Radar etc
NMEA.4	Lowest	Instruments (Echosounder, Log etc)

To use the NMEA Data Combiner, LK4 must be in the 'A' position.

### **Connecting to a Serial Printer**

The Nav6 display can be connected to a serial printer (see the Nav6/Nav6plus User Guide for more information). The Nav6hub preserves this capability but only allows the master display (connected to the 'DISPLAY 1' port) to connect to the printer. This means that the Nav6 printer function is controlled only from the master display.

If you require a printer then we recommend that you purchase the ICS Nav6 Printer (order number 918.00). The Nav6hub provides power as well as communication to this printer.

Connections to a Nav6 Printer are as follows :

<b>Nav6hub SERIAL/PRINTER Connector</b>	<b>Nav6 Printer Cable Twisted Pair</b>	<b>Core Colour</b>	<b>Signal Description</b>
12V OUT	RED twisted with BLACK	RED	12V output
0V OUT		BLACK	0V output
SERIAL A	BROWN twisted with WHITE	BROWN	TX from Nav6
SERIAL B		WHITE	0V
SCREEN	Screen	Silver	Nominally 0V

To use the Nav6 Printer, LK3 must be in the 'B' position.

**Connecting to a Personal Computer**

The Nav6 display can be connected to a PC (see the Nav6/Nav6plus User Guide for more information). The Nav6hub preserves this capability but only allows the master display (connected to the 'display 1' port) to connect to the PC.

If you require to connect to a PC we recommend that you purchase the ICS PC Interface Cable (order number 6020.09).

Connections to a PC are as follows :

<b>Nav6hub SERIAL/PRINTER Connector</b>	<b>PC Connections 9 way D-type</b>	<b>Core Colour</b>	<b>Signal Description</b>
12V OUT	-	-	No connection
0V OUT	Pin 5	BLACK	0V output
SERIAL A	Pin 3	BROWN	TX from Nav6
SERIAL B	Pin 2	WHITE	RX to Nav6
SCREEN	Screen	Silver	Nominally 0V

To use the Nav6 PC Interface, LK3 must be in the 'A' position.

### ***Using the Nav6hub for Programming Displays***

The Nav6hub can be used as the method of connecting a Nav6 display to a PC for reprogramming, loading a new station database or new language option *in situ*. You do not need the Nav6 programming lead to do this, but you will require the Nav6 Flash Upgrade CDrom that is supplied with the programming lead (order number 6030.00).

1. To perform any of the above operations first switch off power to the Nav6hub
2. Connect the display to be updated to the DISPLAY1 connector
3. Place a jumper across the PROG link (LK5)
4. Place a jumper across the SERIAL link (LK3) in position 'A' (to enable the PC Interface)
5. Connect the PC to the SERIAL / PRINTER connector (you need to connect RS232 TX to the PC's RX pin & RS232 RX to the PC's TX pin and 0V to the PC's 0V)
6. Now switch on the power to the Nav6hub – the red LED next to the PROG link should illuminate
7. Follow the instructions in the Nav6 programming application program

### **NAV6 / NAV6PLUS / NAV6 REPEATER SETUP**

You will need to set up your Nav6 displays to enable correct & reliable operation of the Nav6hub.

- All displays, apart from the master display, should be set to SLAVE
- The master display connected to port 1 should be set to MASTER (see Nav6 / Nav6plus user manual for details)

## INSTALLATION

### *Designing a Nav6 System Installation*

Follow these simple steps :

- First decide how many Nav6hubs are required
- Next select the best position for the Nav6hub
- Now select the position for each Nav6 display and sensor
- Complete the wiring by following the instructions given in this manual
- Configure the Nav6hub linkers
- Check the wiring & configuration
- Apply power & test the system

### *How Many Nav6hubs Do I need ?*

You will usually only require one Nav6hub (for systems with 4 or less units eg. 3 displays and 1 sensor). If you think that you need more than one Nav6hub then please contact the ICS Electronics Technical Helpline for further advice.

**Telephone +44 (0)1903 738706**

**Facsimile +44 (0)1903 738747**

**Email: [support@icselectronics.co.uk](mailto:support@icselectronics.co.uk)**

### ***Mechanical Installation of the Nav6hub***

Installation of the Nav6hub is straightforward and can be carried out with just a drill and screwdriver.

Select the best position for the Nav6hub, this should be a dry location and at least 0.5metre from any receiving/transmitting equipment or flux gate compass.

Ensure that there is sufficient room to route the various cables into the Nav6hub.

- Remove the cover from the Nav6hub
- Position the Nav6hub on a vertical, flat bulkhead or other suitable surface, allowing the cables to exit out of the slot at the base of the unit
- Mark through the centre two fixing holes
- Drill two 2.5mm holes into your bulkhead
- Attach the Nav6hub with the screws provided
- Complete the wiring following the instructions in this user guide
- Use the cable ties to restrain the wiring from any vibration that might weaken it over a prolonged period
- The connecting cables should be restrained from movement by securing them to the bulkhead or to adjacent woodwork
- The cover should be replaced when the wiring is complete, the configuration established & the installation tested

**IMPORTANT**

The Nav6hub should not be mounted in a position where spray can reach it in a rough sea, or where it is exposed to direct sunlight.

## ***Installation of Displays & Sensors***

The Nav6 displays and sensors should be located following the guidelines in the Nav6/Nav6plus/Nav6aplus User Guides. Cable runs should be kept away from sensitive equipment, extreme heat, standing water and solvents. It may be necessary to purchase cable extensions to complete the runs back to the Nav6hub.

## ***Electrical Installation of the Nav6hub***

*It does not matter which unit is connected to which RS485 port on the Nav6hub – but 2 of the connectors are pre-selected as ‘display’ ports and have all 12 connections marked up on the terminal blocks. One is marked “MASTER” and it is recommended that this be used to connect to the master display. The other two ports are ‘sensor’ ports and only have 5 connections on the terminal block.*

*If more than 2 displays are to be connected then the sensor ports can be used to connect to the power & RS485 connections of the display. See later sections for further details.*

Decide which is to be the ‘master’ display – connect this to ‘display 1’ on the Nav6hub.

- Only the master display can be connected to the optional Nav6 printer or to a PC
- Only the master display can be re-programmed in-situ

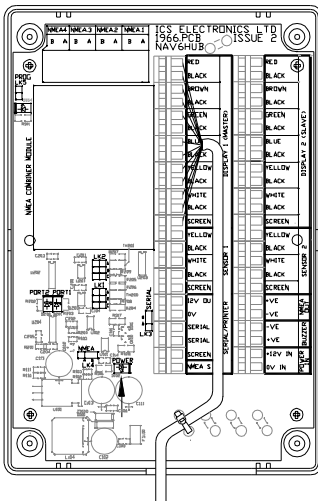
Note that the master display must be set to ‘master’ on the Navtex Set-up page, all other displays must be set to ‘slave’.



## Connecting Displays to the Nav6hub

The first 2 displays should be connected to 'DISPLAY1' and 'DISPLAY2' following the printed colour codes on the Nav6hub pcb. Connect all of the wires – except the BLACK paired with GREEN, which is not used.

Nav6hub DISPLAY Connector	Nav6 Display Cable Twisted Pair	Display Cable Core Colour	Signal Description
RED	RED paired with BLACK	RED	12V OUT
BLACK		BLACK	0V OUT
BROWN	BROWN paired with BLACK	BROWN	SERIAL A
BLACK		BLACK	SERIAL B
GREEN	GREEN (BLACK pair not used)	GREEN	PROG
BLACK		(NOT USED)	(NOT USED)
BLUE	BLUE paired with BLACK	BLUE	NMEA IN +
BLACK		BLACK	NMEA IN -
YELLOW	YELLOW paired with BLACK	YELLOW	(NOT USED)
BLACK		BLACK	<b>(NOT USED)</b>
WHITE	WHITE paired with BLACK	WHITE	RS485_A
BLACK		BLACK	RS485_B
SCREEN	Screen	SILVER	Nominally 0V



The diagram to the left shows a display connected to the DISPLAY1 (MASTER) connector.

### ***Connecting a Third Display to the Nav6hub***

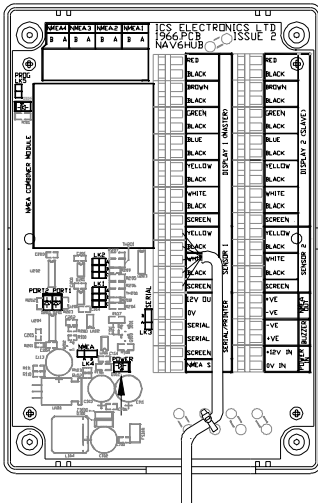
A third display can be connected to 'sensor 2' if required. When a display is connected to a 'SENSOR' connector, the connections should be as shown in the following table:

<b><i>Nav6hub SENSOR Connector</i></b>	<b><i>Nav6 Display Cable Twisted Pair</i></b>	<b><i>Display Cable Core Colour</i></b>	<b><i>Signal Description</i></b>
YELLOW BLACK	RED paired with BLACK	RED BLACK	12V OUT 0V OUT
WHITE BLACK	WHITE paired with BLACK	WHITE BLACK	RS485_A RS485_B
SCREEN	Screen	SILVER	Nominally 0V

### ***Connecting Sensors to the Nav6hub***

The first 2 sensors should be connected to 'SENSOR1' and 'SENSOR2' respectively, following the printed colour codes on the Nav6hub pcb.

<b><i>Nav6hub SENSOR Connector</i></b>	<b><i>Nav6 Sensor Cable Twisted Pair</i></b>	<b><i>Sensor Cable Core Colour</i></b>	<b><i>Signal Description</i></b>
YELLOW BLACK	YELLOW paired with BLACK	YELLOW (black stripe) BLACK (yellow stripe)	12V OUT 0V OUT
WHITE BLACK	WHITE paired with BLACK	WHITE (black stripe) BLACK (white stripe)	RS485_A RS485_B
SCREEN	Screen	SILVER	Nominally 0V



The diagram to the left shows a sensor connected to the SENSOR1 connector.

## Connecting to Another Nav6hub

A second Nav6hub can be connected by using a sensor extension cable as follows :

<b>Nav6hub SENSOR Connector</b>	<b>Nav6 Sensor Extension Cable Twisted Pair</b>	<b>Sensor Cable Core Colour</b>	<b>Signal Description</b>
YELLOW	YELLOW paired with BLACK	YELLOW (black stripe)	Do not connect
BLACK		BLACK (yellow stripe)	Do not connect
WHITE	WHITE paired with BLACK	WHITE (black stripe)	RS485_A
BLACK		BLACK (white stripe)	RS485_B
SCREEN	Screen	SILVER	Nominally 0V

Note that the connections are identical at both ends of the cable.

- The second Nav6hub should only have ‘slave’ displays connected to it
- There should always be only one ‘master’ display in the system
- Use a separate switched & fused power feed from the vessel’s 12V supply to provide power to the second Nav6hub

## CONNECTING TO A POWER SUPPLY

### ***Protection Devices & Wiring - Power Requirements***

It is necessary to calculate the total power consumption of the Nav6 system in order to specify the protection devices and power feed cable.

The internal power requirement for the Nav6hub is approx 20 mA

To calculate the total power consumption for your system and hence the requirement for the external fuse/cct breaker and the loading on your power supply :

Each sensor requires 70mA

Each display requires 300mA

Don't forget to include the consumption of the printer, if fitted

<b><i>Unit</i></b>	<b><i>Current consumption /mA</i></b>	<b><i>Number fitted</i></b>	<b><i>Total current consumption /mA</i></b>
Nav6hub	20	1	20
NMEA Data Combiner	60		
Display	300		
Sensor	70		
Printer	200		
TOTAL			

### ***Fuse / circuit breaker requirement***

An appropriately rated fuse and/or circuit breaker should be used to protect the Nav6 system. The rating should be 1.5 times the total current required by the system.

### ***Power Supply Wiring***

The main 12V feed wiring (+12V and 0V connections to the Nav6hub) should be rated appropriately. The rating should be at least twice the total current required by the system. ICS do not provide the wire for this connection. The installer should source appropriate marine grade wiring.

Note that the fuse / circuit breaker rating should always be lower than the cable rating so that the cable is adequately protected.

The Nav6hub should be powered from a nominal 12Vdc switched supply, capable of providing the total current as calculated above.

- To allow the unit to be isolated for service, a circuit breaker (or a fuse and switch) should switch the power supply to the Nav6hub
- The connection to the boat's power supply should be made with a suitably rated cable
- Carefully check all connections before applying power
- Note that vessels that require isolation may need to install a DC to DC converter – if in doubt ask your dealer
- 24V vessels should install the 24V / 12V DC to DC converter (see options list)

### ***Testing The Nav6 After Installation***

- Switch on the Nav6hub by applying 12V to its power connections
- The red “POWER” LED will illuminate
- The various Nav6 displays and sensors will complete their power-up sequence and then start communicating to each other within a few seconds. The two red LEDs marked PORT1 & PORT2 will start to flash
- The Nav6hub is now operational

Test the interfaces between the Nav6hub and the various display and sensors as follows :

- Check that all of the Nav6 displays are powered up
- Check that none of the Nav6 displays shows “ERR” on the status bar at the top of the LCD
- If a GPS is fitted then check that the “GPS” icon is displayed on the status bar at the top of the LCD on all displays
- If a GPS is not fitted, but there is another source of NMEA data, then check that the Navigate pages display the correct data on all Nav6 displays. (If latitude & longitude are not available on the NMEA bus then the “GPS” icon will not be present)

If any of these checks reveal a problem then follow the fault finding guide at the end of this manual.

#### **Safety Warning**

The ICS Nav6hub has been designed and manufactured to be completely safe when installed in accordance with these installation instructions. It is essential that a fuse or circuit breaker be installed in the supply cable.

## MAINTENANCE AND TROUBLE SHOOTING

### *Cleaning*

The Nav6hub may be cleaned when necessary by wiping with a cloth dampened with fresh water. Do not use solvents.

## SYSTEM FAULT FINDING

The Nav6hub is provided with 3 status LEDs.

The one marked 'POWER' on the pcb should always be lit when power is applied to the Nav6hub.

The other 2 LEDs indicate the status of communications on the 2 RS485 ports. Each LED is only ON when a unit (display or sensor) is talking. The only units that talk are sensors and the 'master' display. The units talk 4 times per second for a very short period each time. Thus the LEDs appear to flash ON for a short time.

<b>LED Status</b>	<b>Indicates</b>	<b>Possible Causes</b>
POWER LED off	No 12V to Nav6hub	<ul style="list-style-type: none"> <li>No 12V to Nav6hub</li> <li>Fuse tripped</li> </ul>
PORT1 LED not flashing	No communications on Port1	<ul style="list-style-type: none"> <li>No talking units connected to Port1</li> <li>Check connections to Port1</li> <li>Set one display to 'master'</li> </ul>
PORT2 LED not flashing	No display set to 'master'	<ul style="list-style-type: none"> <li>No talking units connected to Port2</li> <li>Check connections to Port1</li> <li>Set one display to 'master'</li> </ul>

<b><i>Fault</i></b>	<b><i>Possible Causes</i></b>
'ERR' on the top line of all displays	No sensor connected All displays have been set to 'slave' – one sensor must be set to 'master' More than one display has been set to 'master' RS485_A & RS485_B have been reversed
Navtex messages appear to have blocks of 4 or 5 characters missing	The termination has not been set correctly – see section 2.1.4 above More than one display has been set to 'master'
'ERR' on one display but not on all	Connections to that display are incorrect

If an error condition persists, turn the Nav6 system off and on again and repeat the checks. If any item on the self check list fail a second time, contact your supplier for advice or contact the ICS Electronics Technical Helpline for assistance.

**Telephone +44 (0)1903 738706**

**Facsimile +44 (0)1903 738747**

**Email: [support@icselectronics.co.uk](mailto:support@icselectronics.co.uk)**



## NMEA DATA COMBINER OPERATION

If you wish to understand how the NMEA Data Combiner operates in order to merge several NMEA data streams, then please read this section.

*What happens if the same sentence appears on more than one NMEA input ? For example, I have 2 gps receivers – won't the Nav6 get confused ?*

No. The NMEA Data Combiner may be used to merge up to 4 NMEA data streams. These are prioritised so that when a particular sentence identifier is detected on two or more inputs, the one from the highest priority channel is used. The other sentences from the lower priority channels are ignored. Your two gps receivers will be connected to two different NMEA inputs. Select one as the master and make sure that it is connected to the highest priority channel ( lowest of the two channel numbers).

*What happens when there is more NMEA traffic on the inputs than can possibly be supported on a single output ?*

NMEA 0183 operates at 4800 baud and with a 10 bit data word. Therefore only 480 characters can be sent to the NMEA output per second. In theory this capacity can be exceeded and some valid data lost.. In practice this is unlikely. Care should be taken in selecting which data stream is to be connected to which input. Also ensure that the data repeat-rate from NMEA sources is not set higher than it needs to be (this may be an option on some GPSs and compasses).

*If an NMEA source becomes disconnected or fails, how quickly will this be detected by the NMEA Data Combiner ?*

The NMEA Data Combiner detects the loss of one of its inputs in 10 seconds. At this time, if any of the sentences that were present in the lost channel are also present in another lower priority channel then that version will now be transmitted instead. If the input recovers or is re-connected then the NMEA Data Combiner reverts to transmitting the higher priority version of the sentence.

## WARRANTY

ICS Electronics Ltd warrants to the original end-user that this product will be free from defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with the same or a similar model, which may be a refurbished model) at ICS Electronics' option, without charge for either parts or labour. For warranty repair, the unit must be returned, carriage pre-paid, to the ICS Electronics Ltd. dealer from whom it was first purchased. This limited warranty shall not apply if the product is modified, tampered with, misused, subjected to abnormal working conditions (including, but not limited to lightning and immersion in water) and use with power supplies and other options not specifically recommended by ICS Electronics Ltd.

Please contact us for further details of our warranty repair procedure.

## PACKING LIST AND OPTIONS

### *Packing List*

For the Nav6hub contents – please see the packing list enclosed.

### *Options*

The following Nav6hub options are available:

<b>Option</b>	<b>ICS Part Number</b>
10 metre sensor cable extension	6020.19
30 metre sensor cable extension	6020.18
10 metre display cable extension	6020.22
30 metre display cable extension	6020.23
NMEA Data Combiner Module	050.07
Nav6 Computer Interconnect Cable	6020.09
Nav6 Programming Kit	6030.00
Nav6 Repeater	920.00
Nav6 Printer	918.00
24V to 12V dc-dc converter	tba

## SPECIFICATIONS

### Power Consumption

20 mA @12V – note that total power consumption depends upon how many other units are connected to the Nav6hub

### Physical

Height 180mm Width 122mm Depth 36mm

Weight 300g

### Mounting

Bulkhead mounting via two self tapping screws (supplied)

Cable exits from slot in base of unit

### Connection

All connections made by screw terminal (cable size 26 to 14 awg)

Connect to displays and sensors by the cable supplied with those items

Connect to ancillary equipment by the cable supplied with that equipment

### Environmental

Not for outside use

Unit must be mounted below decks in a suitable dry location

### Inputs & Outputs

Connector	Type	Direction	Product
SENSOR1,2	RS485	Bi-directional	Nav6hub
DISPLAY1,2	RS485	Bi-directional	Nav6hub
SERIAL / PRINTER	RS232	Bi-directional	Nav6hub
NMEA.1	NMEA 0183	Input	Nav6hub
NMEA.2,3,4	NMEA 0183	Input	Only Available When NMEA Data Combiner Option Fitted
NMEA OUT	NMEA 0183	Output	Nav6hub

# NAV6HUB PCB OUTLINE

