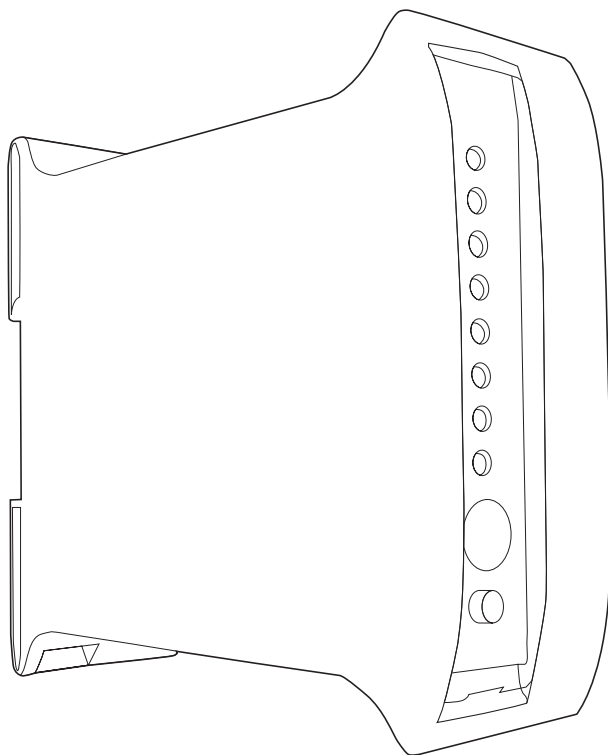


**NMEA2000® CABIN TEMPERATURE  
& HUMIDITY MODULE  
Part Number: 4530  
USER MANUAL**



**Revision 1.00**

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# 1

## INTRODUCTION

The Oceanic Systems Cabin Temperature & Humidity Module (Part No 4530) allows up to 16 Cabin Temperature & Humidity Sensors (Part No 4531) to be connected to the module and report the temperature & humidity values over the NMEA2000® network.

The module is compatible with either 12 or 24 Volt systems and requires NO user setup menus, but the simple setting of a small rotary address switch and a push button, so up to 16 multiple 4530 Modules can exist on the same network.

This unit is designed to operate in a protected marine environment such as an engine room or below decks. It is very important that it is installed and set up correctly according to this manual. Please read and follow the installation and setup instructions carefully to achieve the best results.

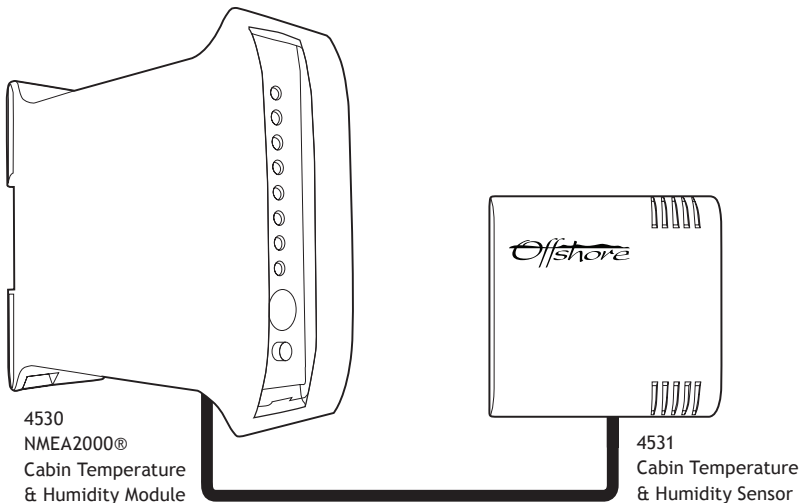
### 1.1 Firmware Revision

The information in this manual corresponds to firmware revision v1.0.0.

### 1.2 Product Features

The 4530 Cabin Temperature & Humidity Module has the following features:

- NMEA2000® Interface
- RS485 Modbus Interface RTU protocol for sensor communications
- DIN Rail mount enclosure
- Supplying power for 4531 Cabin Temperature & Humidity Sensors
- Passes MODBUS messages from 4531 Sensors to the NMEA Interface
- Status and Warning lights for all data transfers
- Allows monitoring of up to 16 sensors



**SAFETY WARNING** This instrument should only be installed by a person competent and experienced in working on electrical systems on boats. **BEFORE BEGINNING WORK THE BATTERY SHOULD BE DISCONNECTED TO AVOID THE RISK OF A SHORT CIRCUIT, A FIRE OR AN EXPLOSION.**

### 2.1 UNPACKING THE BOX

You should find the following items in the 4530 shipping box:

- 1 x 4530 Cabin Temperature & Humidity Module
- 1 x 4530 User Manual (This document)
- 1 x Line termination resistor

### 2.2 CHOOSING THE MOUNTING LOCATION

1. The unit is designed to be mounted on a DIN rail in an electrical cabinet with free air circulation in a dry location below decks.
2. The cabinet may be located in an engine room providing the ambient temperature does not exceed 50°C (125°F).
3. The location needs to allow for connection to the NMEA2000® interface cable and the RS485 Modbus cable.

### 2.3 MOUNTING THE UNIT

1. The unit should be hooked over the top of the DIN rail and then pushed back into location until the red tab at the bottom of the rear of the unit snaps behind the lower edge of the DIN rail. (Figure 1)
2. The unit can be dismantled from the DIN rail by using a screwdriver to release the red tab whilst lifting the unit upwards from the mounting rail. (Figure 2)

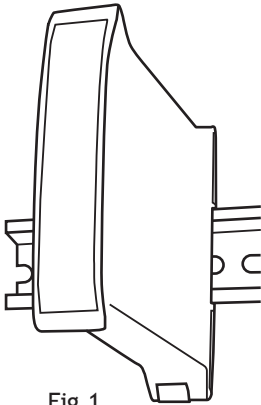


Fig.1

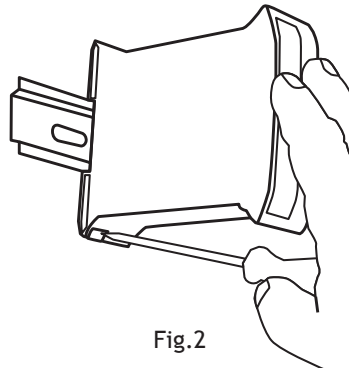
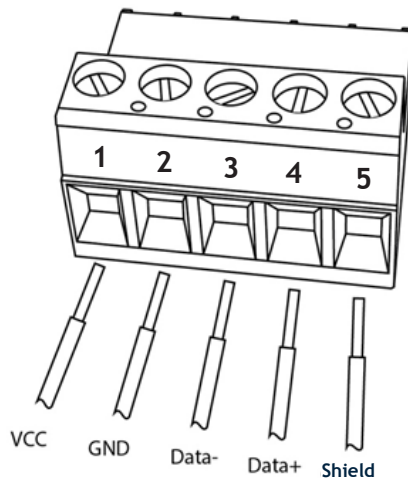


Fig.2

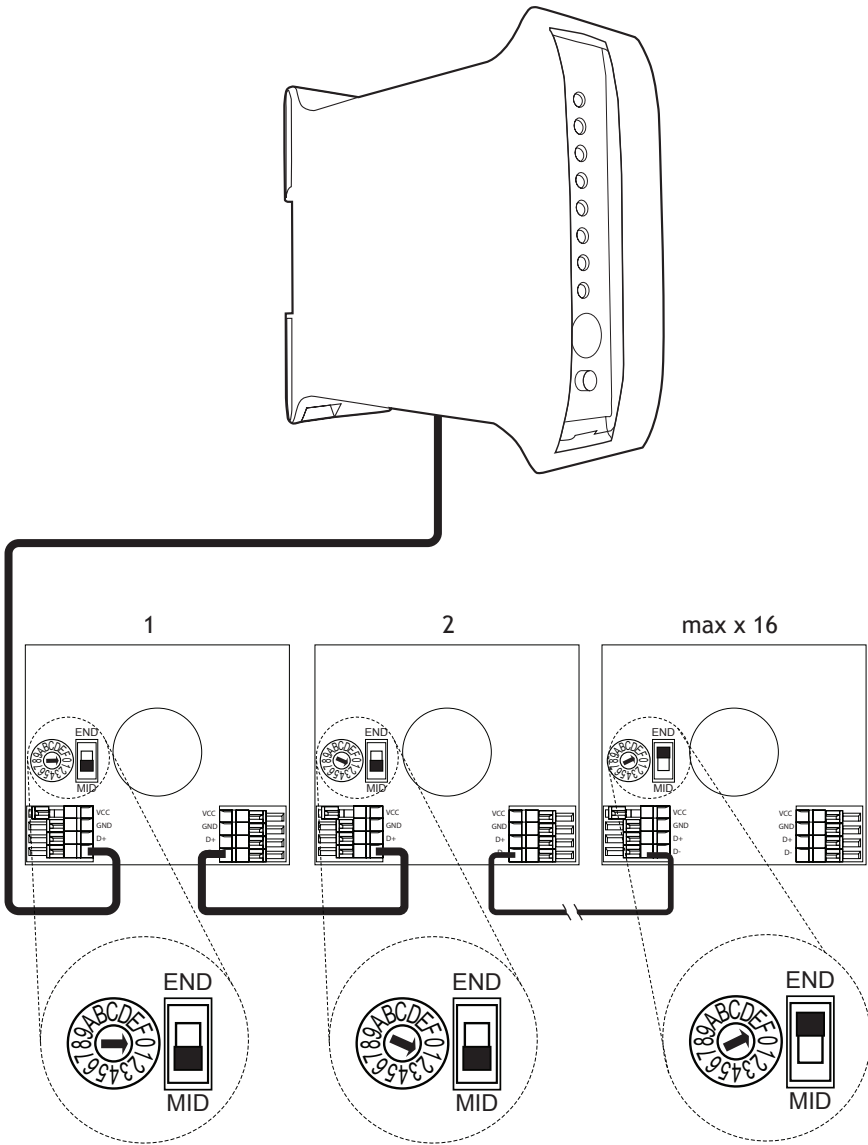
## 2.4 CONNECTING THE RS485 MODBUS INTERFACE

1. The Temperature & Humidity sensors are connected in series using RS485 wiring. The cable should be screened with 2 twisted pairs, with the following wire sizes being suitable: Solid/Stranded wire AWG 24 - 20  
The wires should be stripped for 8mm then simply inserted into connection slot and fixed by tightening screw using a small screwdriver. It is recommended to use bootlace ferrules to reduce the risk of strayed wire strands.
2. A RS485 termination resistor **MUST** be fitted between pins 3 & 4, this is included.



Description	4530	Cable	4531
Sensors Supply Voltage	VCC	Pair 1	VCC
Sensors Supply Ground	GND	Pair 1	GND
Transceiver Terminal 1, V1 Voltage	Data+	Pair 2	Data+
Transceiver Terminal 0, V0 Voltage	Data-	Pair 2	Data-
Cable Shield	Shield	Shield	N/C*

\*Connect the shield drain wires to together inside each 4531 to maintain shielding.



## 2.5 CONNECTING THE NMEA2000® INTERFACE

1. The NMEA2000® interface cable on the unit should be connected to a nearby NMEA2000® Tee connector (part number 3802).
2. The male end of the cable should be inserted into the female Tee connection noting the position of the keyway in the plug and the socket.
3. The unit can be connected with power on or off without any damage.
4. Ensure that the locking ring is securely tightened so that the connection remains sound.

# 3

## CONFIGURATION

### 3.1 MODBUS SLAVE ADDRESS

- A single Modbus network may have a number of slave units attached and these units **MUST** have each a unique slave address.
- The 4530 Cabin Temperature & Humidity Module can accept Slave Addresses from 1 decimal to 16 decimal.
- The Slave Address can be set by using the small rotary switch of the 4531 Cabin Temperature & Humidity Sensors as per the following table

<b>Instance</b>	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
<b>Slave</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>SW</b>	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	E

### 3.2 NMEA DEVICE INSTANCE

NMEA2000® requires a unique Device Instance for each 4530 Cabin Temperature & Humidity Module on a single network. This is settable from device instance 0 to Device Instance 15 using the small rotary switch on the lower edge of the front panel, labelled “Addr”. This can be set at any time regardless if power is on or off. The switch counts from 0 - 9 then A - F being equivalent to Device Instance 10 - 15

### 3.3 THE DEVICE SETUP PROCESS

Once the sensors have all been fitted and connected the 4530 Cabin Temperature & Humidity module needs to discover connected sensors. To connect the sensors please follow the procedure below:

1. Push and hold the setup button for at least 5 seconds, until the setup LED7 starts to flash once per second.
2. Once the button has been held for 5 seconds, the LED7 will remain lit until the release of the button.
3. After release of the button the device enters a “discovery mode” which means that the device starts to look for active sensors (The setup LED7 flashing quicker, about 2 times in a second, until the finish of the discovery). You may see LED 3 & 4 flashing rapidly during the “discovery mode”.
4. When the setup is done the setup LED7 illuminates for approximately 2 seconds, after this the setup is complete.

If the sensor configuration changes, this procedure must be repeated.

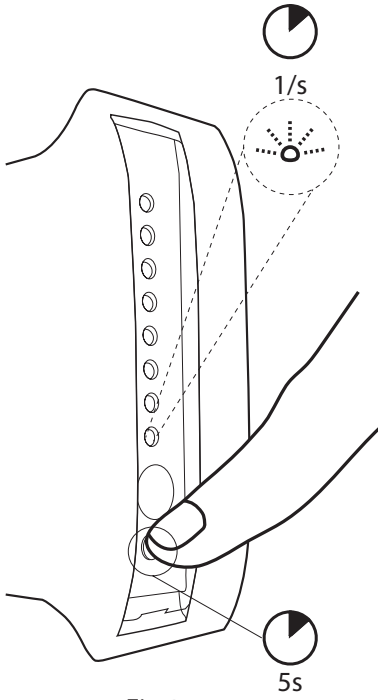


Fig 1

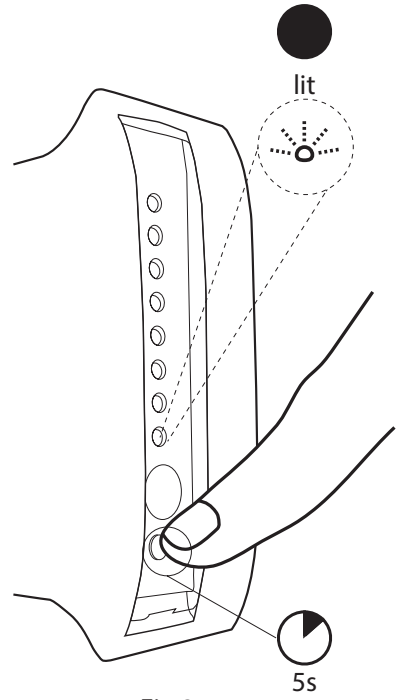


Fig 2

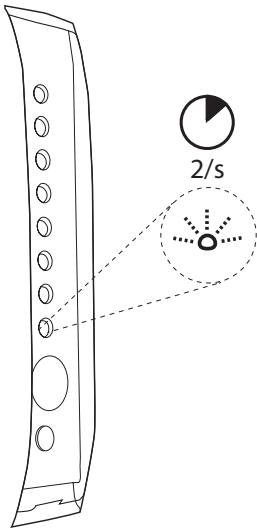


Fig 3

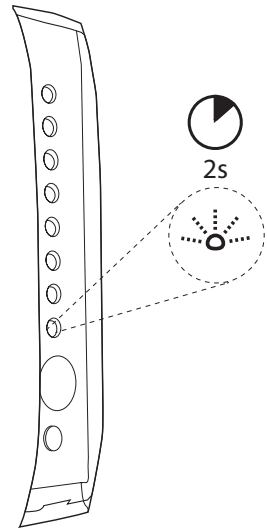


Fig 4



The front panel has the following LEDs:

LED Name	Description
NMRx	Receiving an NMEA2000® message
NMTx	Transmitting an NMEA2000® message
MoRx	Receiving a Modbus message
MoTx	Transmitting a Modbus message
MoFlt	Modbus receiving error
CmFlt	Modbus transmitting error
DefCm	Setup in progress

The front panel indicators should be used to assist in fault finding as follows:

### 5.1 COMMUNICATIONS ERROR LEDs

If the MoFlt (Modbus receiving error) LED is lit this means that the unit detected an error during the read on the Modbus interface. If the ComFlt (Modbus transmitting error) LED is lit this means that the unit detected an error during the write on the Modbus interface. In both cases please check the Modbus line.

- Clean the unit with a soft cloth.
- Do not use chemical cleaners as they may remove paint or markings or may corrode the enclosure or seals.
- Ensure that the unit is mounted securely and cannot be moved relative to the mounting surface. If the unit is loose, tighten the mounting screws.
- Check the security of the cables, connected to the NMEA 2000® connector and the RS485 connector, and tighten if necessary.

As Oceanic Systems are constantly improving their products ass specifications are subject to change without notice. Oceanic Systems products are designed to be accurate and reliable however they should only be used as aids to navigation and not as a replacement for traditional navigation aids and techniques.

### Design Standard

Parameters	Comment
NMEA2000®	Level B+

### NMEA2000® Parameter Group Numbers (PGNs)

Parameters	PGN No.	PGN Name
Monitor	130313	Humidity
	130316	Temperature, Extended Range
Protocol	126464	Tx/Rx PGN List
	456996	Product Information
	059392	Product Information
	059904	ISO Request
	060928	ISO Address Claim
	126208	Command/Request Group

### Electrical and Mechanical

Parameters	Value	Comment
Operating Voltage	12 to 24 Volts	DC Voltage
Power Consumption	75mA + (16mA x sensor)	Max. 331mA
Load Equivalence Number	2 - 7	LEN
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	SAE J1113
Size	120x100x35mm	
Weight	195gm	

## Environmental

<b>Parameter</b>	<b>Value</b>
IEC 60954 Classification	Protected
Degree of Protection	IP40
Operating Temperature	-20°C to 55°C
Storage Temperature	-40°C to 70°C
Relative Humidity	93%RH @40° per IEC60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s <sup>2</sup> per IEC 60945-8.7
Electromagnetic Emission	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12

Oceanic Systems warrants this product to be free from defects in materials and workmanship for one year from the date of original purchase. If within the applicable period any such products shall be proved to Oceanic Systems satisfaction to fail to meet the above limited warranty, such products shall be repaired or replaced at Oceanic Systems option. Purchaser's exclusive remedy and Oceanic Systems sole obligation hereunder, provided product is returned pursuant to the return requirements below, shall be limited to the repair or replacement, at Oceanic Systems option, of any product not meeting the above limited warranty and which is returned to Oceanic Systems; or if Oceanic Systems is unable to deliver a replacement that is free from defects in materials or workmanship, Purchaser's payment for such product will be refunded. Oceanic Systems assumes no liability whatsoever for expenses of removing any defective product or part, or for installing the repaired product or part or a replacement therefore or for any loss or damage to equipment in connection with which Oceanic Systems products or parts shall be used. The foregoing warranties shall not apply with respect to products subjected to negligence, misuse, misapplication, accident, damages by circumstances beyond Oceanic Systems control, to improper installation, operation, maintenance, or storage, or to other than normal use or service.

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### **WARRANTY RETURN PROCEDURE**

To apply for warranty claims, contact Oceanic Systems or one of its dealers to describe the problem and determine the appropriate course of action. If a return is necessary, place the product in its original packaging together with proof of purchase and send to an Authorized Oceanic Systems Service Location. You are responsible for all shipping and insurance charges. Oceanic Systems will return the replaced or repaired product with all shipping and handling prepaid except for requests requiring expedited shipping (i.e. overnight shipments). Failure to follow this warranty return procedure could result in the product's warranty becoming null and void.

Oceanic Systems reserves the right to modify or replace, at its sole discretion, without prior notification, the warranty listed above.

If you require technical support for any Oceanic Systems products you can reach us using any of the following ways:

- Tel (UK): +44(0)1425 610022
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- Fax: +44(0)1425 614794
- Email: [support@osukl.com](mailto:support@osukl.com)
- Web: [www.osukl.com](http://www.osukl.com)
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