Actisense®

Connect without limits

Professional Type Approved NMEA® 0183 Multiplexer Configuration Manual

Important Notices

The device to which this manual relates complies with the Electromagnetic Compatibility requirements according to IEC 60945:2002-08, DNVGL-CG-0339:2019 & IACS UR E10 Rev7. The unit should always be used in conjunction with appropriately approved, shielded cable and connectors as per NMEA 0400 to ensure compliance. A declaration of conformity is available for download at www.actisense.com.

If the device to which this manual relates is to be installed within five metres of a compass, please refer to the 'Compass Safe Distance' section in the 'Technical Specifications' table.

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Please register your product via the online form at https://actisense.com/product-registration

Your product package includes a unit serial number. The serial number is six digits long and can be found below the barcode on the label. Your registration will assist Actisense Support to link your product to your details, simplifying any future assistance you may require.

Product Guarantee

All Actisense products are provided with a 5 year guarantee upon registration. To register your product, visit https://actisense.com/product-registration.

If you suspect that the unit is faulty please refer to the Troubleshooting Section of the User Manual before
contacting support.

It is a requirement of the guarantee that all installations of electronic equipment follow the NMEA 0400 specification. Any connection to a battery or power supply must meet the mandatory essential safety requirements that may be imposed by local regulatory agencies.
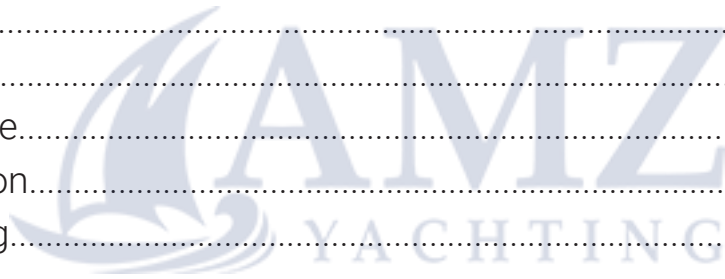
Actisense products are intended for use in a marine environment, primarily for below deck use. If a product is to be used in a more severe environment, such use may be considered misuse under the Active Research Ltd guarantee.

Product Disposal

Please dispose of this product in accordance with the WEEE Directive. The product should be taken to a registered establishment for the disposal of electronic equipment.

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Contents Page

Introduction

The PRO-MUX-2 is a powerful NMEA 0183 multiplexer/router, capable of advanced filtering, allowing the user to forward any NMEA0183 data from their installed 'talkers' to any other connected 'listener' that requires it.

Being a multiplexer, the PRO-MUX-2 allows these incoming data streams from 'talkers' to be combined into a single output stream and fed to a listening device that requires data from multiple sources at the same time. The baud-rate of reception & transmission is also adjustable making the device even more flexible.

The PRO-MUX-2 allows for two separate methods for configuration.

- Mode pin set-up. This method is covered in the install/user manual.
- In-built configuration tool (the web-based method for configuring your PRO-MUX-2).

This manual cover details of the web-based method for configuring your PRO-MUX-2.
The configuration tool is compatible across all popular Operating Systems.
The PRO-MUX-2 also supports a direct Ethernet connection to a PC without the need for a specialised ethernet crossover cable.

Please read through this manual carefully to realise the full potential of the PRO-MUX-2.
This manual should be read in conjunction with the user/install manual, available from the Actisense website using the following link:

https://actisense.com/wp-content/uploads/2020/01/PRO-MUX-1-User-Manual-issue-1.00.pdf

PRO-MUX-2 Overview
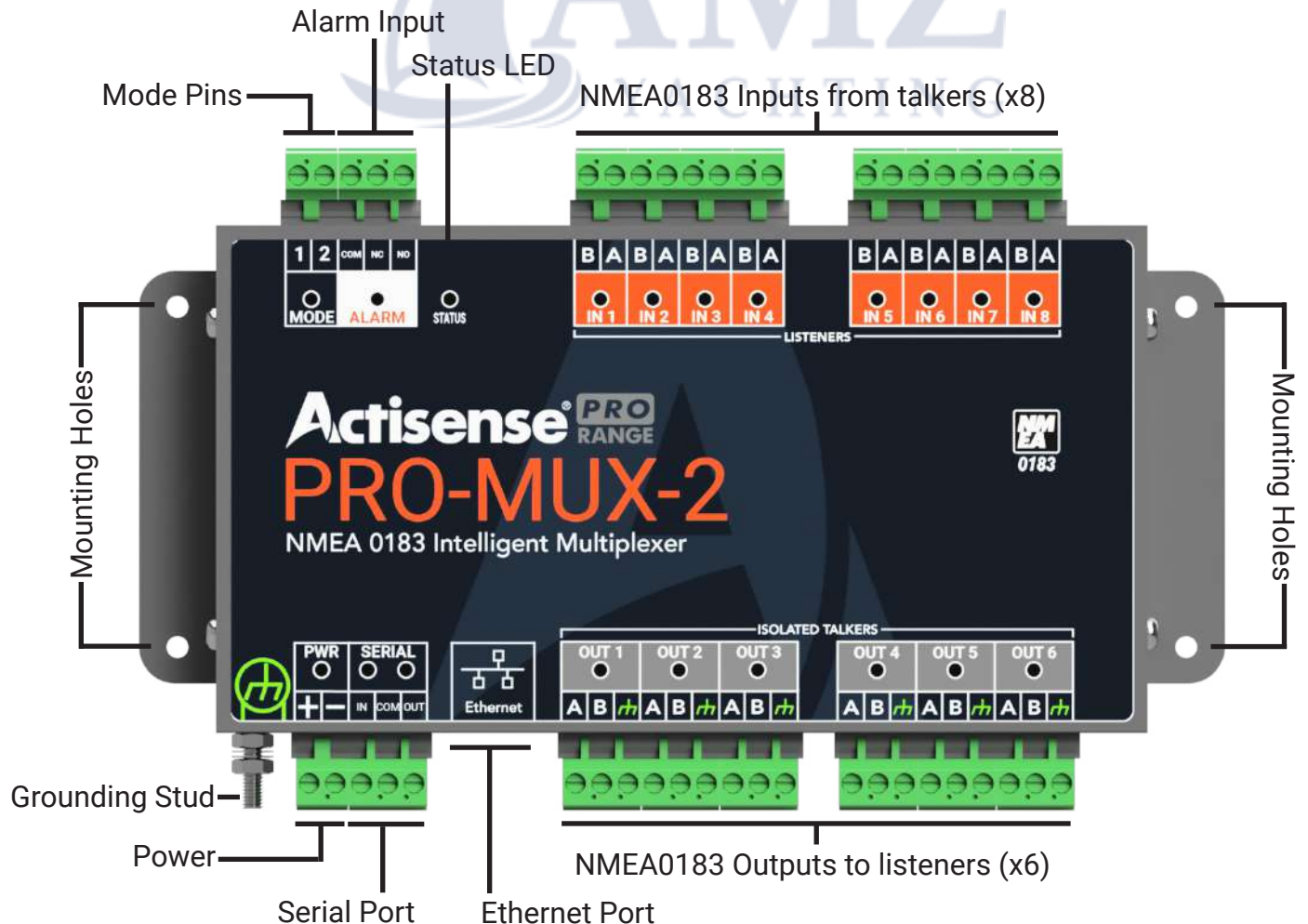
Accessing the PRO-MUX-2 via the network

The PRO-MUX-2 can be connected to your network in one of two ways.

1: Standard Ethernet Networks

- If the PRO-MUX-2 is connected to an ethernet network containing both DHCP and DNS servers, launch any of the popular web browsers.
- Replacing 'xxxxxx' with the serial number of your PRO-MUX-2, type the following command into the address bar.
- http://promux-xxxxxx

The home-page for the PRO-MUX-2 will be shown as below.

2: Direct connection or basic ethernet networks

- If the PRO-MUX-2 is connected directly to a PC, or the ethernet network does not have a DHCP server, the PRO-MUX-2 will communicate using the auto-IP by default.
- The auto-IP process can take up to 60 seconds to complete.
- The PC's 'Local Area Connection' must also be set-up to use auto-IP in order to communicate on this network. Most PC's are set-up to do this by default. If needed, instructions on how to do this using Windows 10 are given in the user/install manual (other Windows operating systems will be similar).
https://actisense.com/wp-content/uploads/2020/01/PRO-MUX-1-User-Manual-issue-1.00.pdf

- **NOTE: Administrator privileges are required to carry out these modifications.**
- Once the PC and PRO-MUX-2 are using the same IP address range, launch any popular web browser.
- Replacing 'xxxxxx' below with the serial number of your PRO-MUX-2, type in the following command into the address bar.
- http://promux-xxxxxx

The home-page for the PRO-MUX-2 will be as shown below.
NOTE: Clicking on any of the icons at this point will allow you to view the current settings of your PRO_MUX-2, but alterations are not possible until a user 'Login' is performed.
When prompted, please use **Username: admin** & **Password: admin**. The password can be altered later. The username 'admin' is static and cannot be altered.
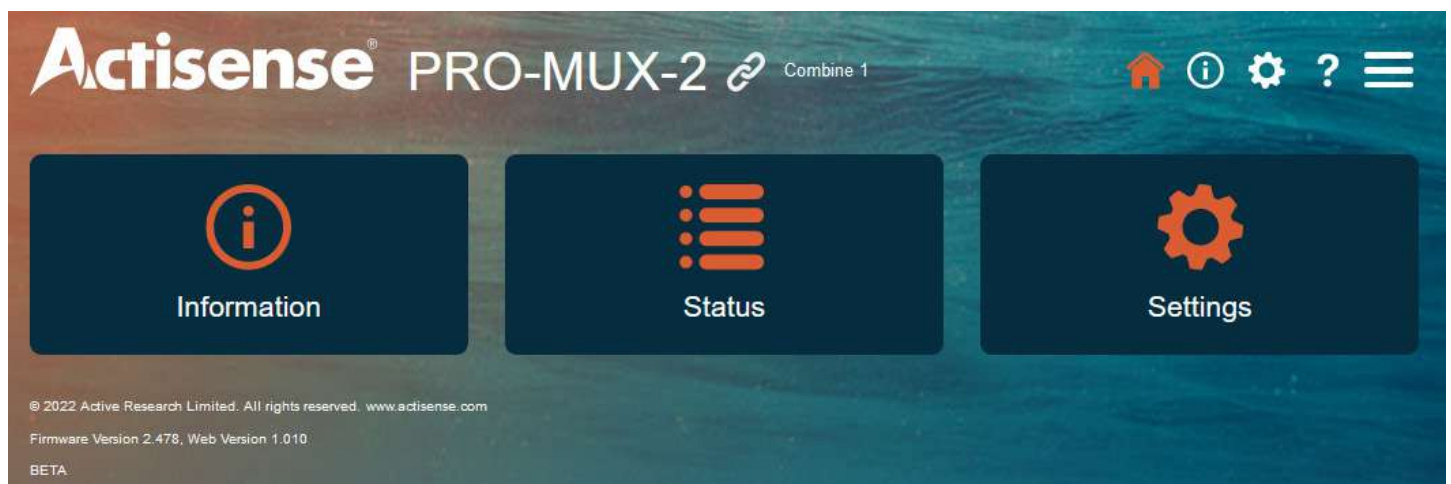
Navigating the PRO-MUX-2 home-page
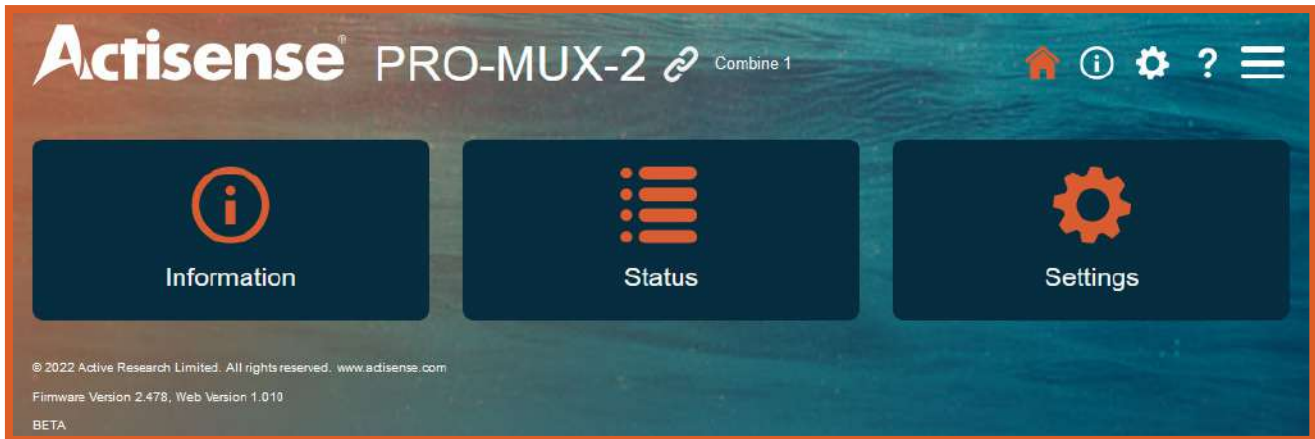
Information Icon

- This icon will display all the relevant technical information relating to the device itself.
- This information is important if you need to troubleshoot your device or require technical assistance at a future date.

Information

Status

Operating Mode:
Combine 1

Battery Voltage:
11.86

Log:
Disabled

Uptime:
0:04:15:25

Device

Model ID:
PRO-MUX-2

Serial Number:
718

Date & Time of manufacture:
05/05/2022, 10:37:42

Hardware ID:
080104

Firmware version:
2.434

Date & Time of Firmware:
01/09/2022, 06:45:44

Firmware CRC:
0xED315DCB

Bootloader version:
1.080

Bootloader CRC:
0x12345678

Web UI version:
0.246

Ethernet Status

MAC Address:
70-B3-D5-6A-0D-8D

Address:
192.168.0.92

Subnet:
255.255.255.0

Gateway:
192.168.0.254

Host Name:
promux-718

HTTP Port:
80

DHCP:
Enabled

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Status Icon

- This icon displays the current status of all the various user controlled settings:
- **Data Servers:** **Displays the following information relating to the data server if enabled.**

Data Servers	Serial

Data Server 1

Enabled: Yes

Status: Open

Port: 60001

Protocol: TCP

Data Format: NMEA0183

Rx Avg Bytes/s: 0

Total Rx Bytes: 0

Rx Dropped Bytes/s: 0

Rx Total Dropped: 0

Tx Bytes Total: 0

TCP Client Connections: 0

Disconnect Count: 0

- **Serial:** **Displays the current status of all the serial ports, including their baud rate, alias name if applied, port direction and the current data load on each port.**

Interface	Name	Mode ⓘ	Speed	Direction ⓘ	Load	
SERIAL			115200	➡⬅	0% / 0%	
IN1		Manual	4800	⬅	0%	
IN2		Manual	4800	⬅	0%	
IN3		Manual	4800	⬅	0%	
IN4		Manual	4800	⬅	0%	
IN5			4800	⬅	0%	
IN6			4800	⬅	0%	
IN7			4800	⬅	0%	
IN8			4800	⬅	0%	
OUT1	⟩		38400	➡	0%	
OUT2	⟩		4800	➡	0%	
OUT3	⟩		4800	➡	0%	
OUT4	⟩		4800	➡	0%	
OUT5	⟩		4800	➡	0%	
OUT6	⟩		4800	➡	0%	
DS1				➡⬅	0% / 0%	

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- **Detailed Stats:** Once the PRO-MUX-2 is operational, this page will show the number of individual sentences being received or transmitted over a 10 second period. The picture below shows a simple case of GPS sentences being sent and received. Once the PRO-MUX-2 has more inputs and outputs enabled this will contain all the sentences being routed through the device.

- **Messages being received from talkers**

Data Servers	Serial	Detailed Stats	Routing	Alarms

Time Period: 10 secs   Receive 〇 Transmit

	IN1-GPS	IN2	IN3
GPDTM	10		
GPGGA	10		
GPGLL	10		
GPGSA	10		
GPGSV	10		
GPRMC	9		
GPVTG	10		
GPZDA	0		

- **Messages being transmitted to listeners**

Data Servers	Serial	Detailed Stats	Routing	Alarms

Time Period: 10 secs   Receive 〇 Transmit

	SERIAL	OUT1-GPS
MXTXT	0	
GPGLL		10
GPRMC		10
GPVTG		10
GPZDA		0
GPGGA		10
GPGSA		10
GPGSV		10
GPDTM		10

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- **Routing:** Matrix showing data flow between inputs and outputs

Routing Settings

ASW1 [ ] Add
ASW2 [ ] Add

Input	SERIAL ✓ ✕	OUT1 ✓ ✕	OUT2 ✓ ✕	OUT3 ✓ ✕	OUT4 ✓ ✕	OUT5 ✓ ✕	OUT6 ✓ ✕	DS1 IP ✓ ✕	Advanced
SERIAL	✕	✕	✕	✕	✕	✕	✕	✕	➕
IN1	✕	✕	✕	✕	✕	✕	✕	✕	➕
IN2	✕	✕	✕	✕	✕	✕	✕	✕	➕
IN3	✕	✕	✕	✕	✕	✕	✕	✕	➕
IN4	✕	✕	✕	✕	✕	✕	✕	✕	➕
IN5	✕	✕	✕	✕	✕	✕	✕	✕	➕
IN6	✕	✕	✕	✕	✕	✕	✕	✕	➕
IN7	✕	✕	✕	✕	✕	✕	✕	✕	➕
IN8	✕	✕	✕	✕	✕	✕	✕	✕	➕
DS1 IP	✕	✕	✕	✕	✕	✕	✕	✕	➕
ASW1	✕	✕	✕	✕	✕	✕	✕	✕	➕
ASW2	✕	✕	✕	✕	✕	✕	✕	✕	➕

- **Alarms:** Shows the status of any alarms which are currently set

Data Servers	Serial	Detailed Stats	Routing	Alarms			

Event	Re-Arm	Action			ℹ State	
Autoswitch	1min	NMEA0183 Message	Repeat	60s	🚩	➕
		Set Relay			🚩	➕
Data Overload	1min	NMEA0183 Message	Repeat	60s	🚩	➕
		Set Relay			🚩	➕
Low Voltage	12V 1min	NMEA0183 Message	Repeat	60s	🚩	➕
		Set Relay			🚩	➕

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Settings Icon

- Provides access to the device for configuration.
- Using any of these setting requires that the user 'Login' to the device (see page 5).
- The settings page provides the following functionality:
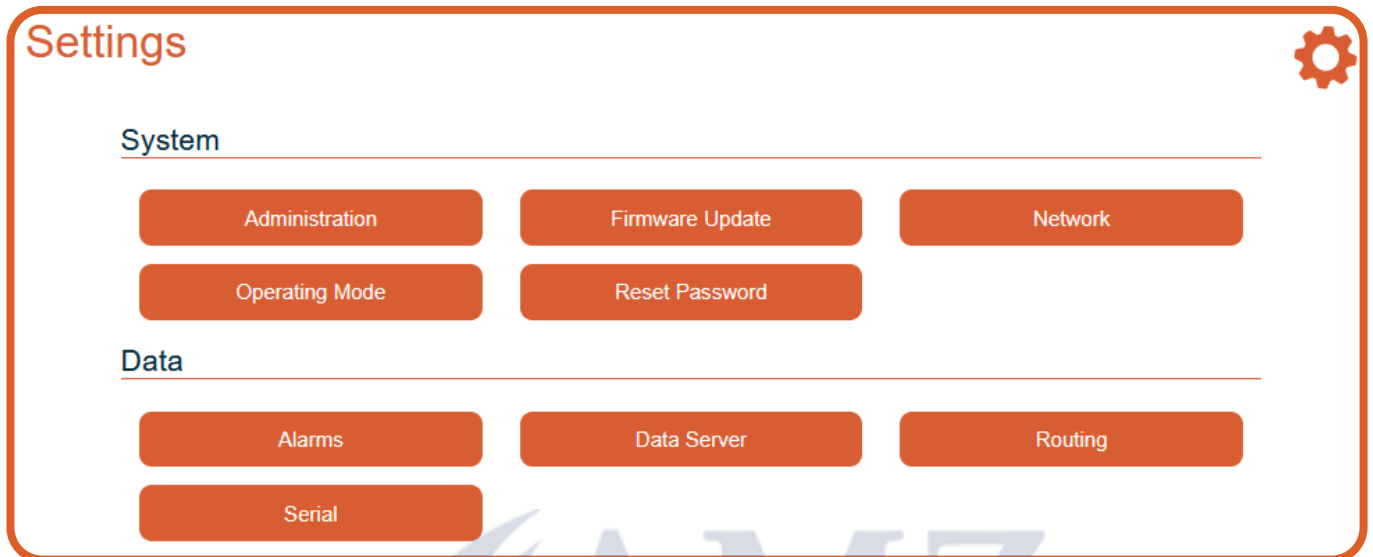
Administration:
Facility to change password only (Username is always 'admin')
Facility to re-start device.

Firmware Update:
Details current firmware version and provides the facility to update.

Network:
Allows the network to be configured correctly depending upon your particular set-up.

Operating mode:
Allows any pre-configured modes to be selected.

Reset Password:
Password can be reset to factory default

Alarms:
Allows the user to set up any required alarms.

Data Server:
Provides facility to turn server on/off as well as specifying data format output, direction and output protocol.

Routing:
Main configuration table to allow precise routing of data between inputs an outputs.
Access to 'autoswitch' operation and set-up.

Serial:
Allows full configuration for each port including baud rate setting, data direction, an 'alias' naming facility and also shows the current data load on each port.

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Planning your NMEA0183 network

- Your PRO-MUX-2 allows you to input data from a maximum of 8 'talkers' and direct these signals either individually, or in combination with other signals, to the various output ports which the PRO-MUX-2 provides (Output ports(x6)/Data server(x1)/Serial Port(x1)).
- In order for this to work correctly, the PRO-MUX-2 must know at what baud rate the connected device is running. It is helpful to be able to name each device separately, so a facility to do this is provided.

Configuring Input from 'Talkers'

- Please read this section in conjunction with the install/user manual if unsure of the required steps
- Adding a 'talker' device is a straight forward process.
- Connect your NMEA 0183 'talker' to one of the 'Listener' ports on the PRO-MUX-2 (see Page 4).
- Pay attention to the wire-colours if your device follows the NMEA 0183 standard.
- Connect the **'talker'** pair of wires from your device to your PRO-MUX-2.
- Configure the device from within 'Serial Settings' of the configuration tool.
- Give the device a useful/meaningful name for future reference by filling in the blank 'Name' box next to its input.

As an example below, we have installed an AIS unit/two GPS units and a Speed sensor to the first four inputs of the PRO-MUX-2.
We have set the baud rate (speed) of the AIS unit to 38400, which is the usual rate for an AIS unit. The remaining three devices have all been set to 4800 baud.

NOTE: The first four inputs of the PRO-MUX-2 can be set to 'auto-baud' between 4800 & 38400 if required. Auto-baud allows the PRO-MUX-2 to follow the baud rate of the connected talker, without the need to specify it. This is helpful if you are unsure of the 'talker' baud rate, or it can change during its normal operation. Inputs 5-8 are pre-set to 4800 baud <u>only</u>.

Manual / Autobaud

Serial Settings

Interface	Name	Mode ⓘ	Speed	Direction ⓘ
SERIAL			115200 ▾	➡ ⬅
IN1	AIS	Manual	38400 ▾	⬅
IN2	GPS #1	Manual	4800 ▾	⬅
IN3	GPS #2	Manual	4800 ▾	⬅
IN4	Speed	Manual	4800 ▾	⬅

Configuring Output to 'Listeners'

- Configuring outputs from the PRO-MUX-2 is performed in a similar way to configuring inputs.
- Connect the NMEA 0183 'listener' to one of the 'talker' ports on the PRO-MUX-2. (see page 4)
- Pay attention to the wire-colours if your device follows the NMEA 0183 standard.
- Connect the **'listener'** pair of wires from your device to your PRO-MUX-2
- Configure the device from within the 'Serial Settings' of the configuration tool.
- Give the output stream a useful/meaningful name for future reference as shown previously.

As an example below, we have installed an NGW-1-ISO, a Radar and an Autopilot to the first three outputs of the PRO-MUX-2.

We have set the baud rate (speed) of the NGW-1-ISO unit to 38400 baud. The remaining devices have been set to 4800.

Consult the manuals and datasheets for your individual devices to find the correct settings.

To confirm any changes made to the INPUTS and OUTPUTS on the PRO-MUX-2, click on the Serial tab of the 'Status' page.
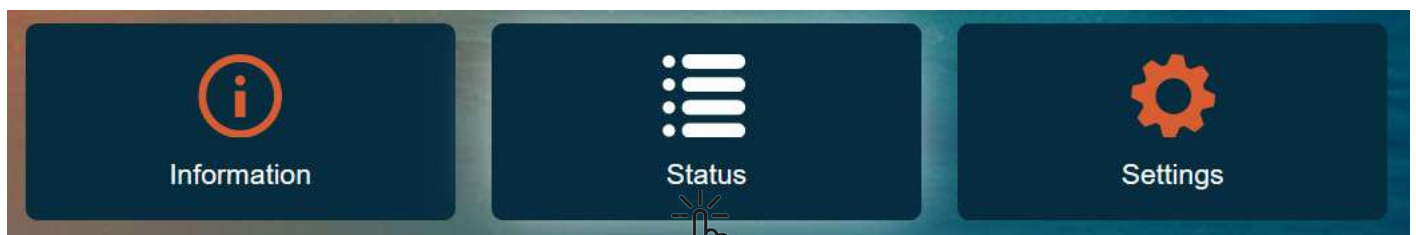
The setting made above will result in the following page being displayed (p.13)

Serial 'Status' confirmation

- Below is the current state of INPUTS and OUTPUTS based on the previous examples.
- With real devices connected and 'talking' to the network, there would be an indication of 'Load' displayed as well.

Interface	Name	Mode ⓘ	Speed	Direction ⓘ	Load	
SERIAL			115200	→ ←	0% 0%	⊕
IN1	AIS	Manual	4800	←	0%	⊕
IN2	GPS #1	Manual	4800	←	0%	⊕
IN3	GPS #2	Manual	4800	←	0%	⊕
IN4	Speed	Manual	4800	←	0%	⊕
IN5			4800	←	0%	⊕
IN6			4800	←	0%	⊕
IN7			4800	←	0%	⊕
IN8			4800	←	0%	⊕
OUT1	NGW-1-ISO	›	38400	→	0%	⊕
OUT2	Radar	›	4800	→	0%	⊕
OUT3	Autopilot	›	4800	→	0%	⊕
OUT4		›	4800	→	0%	⊕
OUT5		›	4800	→	0%	⊕
OUT6		›	4800	→	0%	⊕
DS1				→ ←	0% 0%	⊕

Load Indicator

- Once the PRO-MUX-2 is operational and combining data, each port in use will give an indiction of its current 'load' and sentences being passed as shown below.
- **Please refer to the 'trouble-shooting guide' on page 19 for details of the 'STATUS' light indicator which will alter colour if sentences are being dropped / lost due to 'overload' conditions being reached.**

Serial Settings

Interface ⓘ	Name	Mode ⓘ	Speed	Direction ⓘ	Load	
SERIAL			115200 ▾	← →	0% 0%	⊕
IN1	GPS	◯ Auto	4800	←	62%	⊖

← GPDTM(0) GPGGA(10) GPGLL(10) GPGSA(10) GPGSV(0) GPRMC(9) GPVTG(10) GPZDA(0)

Routing of INPUTS to OUTPUTS

- Once the required 'talkers and 'listeners' are connected to the PRO-MUX-2, you need to decide how you wish the various input signals to be routed and/or combined to the required outputs.
- When implementing this routing plan, there are baud rate issues that need to be considered.

- An input signal being received at 4800 baud will not be output 4x faster if the **output** baud rate is set to 38400 baud. The PRO-MUX-2 cannot replicate the messages it receives. The input signal of 4800 baud **can** be output at 38400 baud, but not repeated any faster than the original 4800 input baud rate frequency.

- An input signal being received at 38400 baud will result in a loss of data if it is tied to an output baud rate rate lower than the input. If the rate of messages being received is faster than the output port can transmit them, this will lead to signal loss, and sentences being dropped. This is quite a common scenario and is not necessarily an issue if its implications are understood.

The Routing Matrix

Shown below is the routing matrix for the PRO-MUX-2.

- The inputs for the PRO-MUX-2 are located on the LHS of the matrix table.
- The outputs from the PRO-MUX-2 are shown on the horizontal orange bar.
- DS1(IP) input/output relates to the Ethernet port.
- ASW1 & ASW-2 provide access to the auto-switching functionality. These are inactive when auto-switching is not being used.

Routing Settings

ASW1 ⬤ [Add]
ASW2 ⬤ [Add]

Input	SERIAL ✓ ✗	OUT1 ✓ ✗	OUT2 ✓ ✗	OUT3 ✓ ✗	OUT4 ✓ ✗	OUT5 ✓ ✗	OUT6 ✓ ✗	DS1 IP ✓ ✗	Advanced
SERIAL	✗	✗	✗	✗	✗	✗	✗	✗	➕
IN1	✗	✗	✗	✗	✗	✗	✗	✗	➕
IN2	✗	✗	✗	✗	✗	✗	✗	✗	➕
IN3	✗	✗	✗	✗	✗	✗	✗	✗	➕
IN4	✗	✗	✗	✗	✗	✗	✗	✗	➕
IN5	✗	✗	✗	✗	✗	✗	✗	✗	➕
IN6	✗	✗	✗	✗	✗	✗	✗	✗	➕
IN7	✗	✗	✗	✗	✗	✗	✗	✗	➕
IN8	✗	✗	✗	✗	✗	✗	✗	✗	➕
DS1 IP	✗	✗	✗	✗	✗	✗	✗	✗	➕
ASW1	✗	✗	✗	✗	✗	✗	✗	✗	➕
ASW2	✗	✗	✗	✗	✗	✗	✗	✗	➕

Basic Routing

- The basic routing of signals is a straight forward process of connecting inputs and outputs in the matrix table.
- Inputs and outputs are connected by setting or clearing the point where they cross in the table.
- As an example setting (shown below) the following routing connections have been made.
- OUT-6 - Taking a feed from IN-2 and IN-7
- OUT-5 - Taking a feed from IN-2 and IN-7
- OUT-4 - Taking a feed from IN-1 and IN-7
- OUT-3 - Taking a feed from IN-5 only
- OUT-2 - Taking a feed from IN-3 and IN-5
- OUT-1 - taking a feed from IN-3 only

From your browser window, simply click the **X** at the point where the required routing is required. This will change it to a tick as shown, indicating that data will be passed between this Input and Output.

Note: Pressing the "tick" or X on the orange bar will quickly toggle all connections ON or OFF.

Auto-switching

- For marine systems that have multiple NMEA devices of an identical type (e.g. two GPS's or two depth sounders), automatic selection of the highest priority device with valid data is very important. However, the NMEA 0183 standard has no method of automatically switching between different devices, so this requirement is usually fulfilled with a manual changeover switch.
- The PRO-MUX-2 has the provision for auto-switching on two devices, where the incoming signal can be prioritised in case of signal loss on one of the channels.
- In practise, this means that should the signal on your GPS(1) be interrupted due to a malfunction of the GPS unit, the auto-switching facility will detect this and the signal from GPS(2) will automatically replace it, giving you a seamless continuation of your data.
- The PRO-MUX-2 allows for auto-switching of two devices (eg. GPS's(x2) & Depth sounders(x2)).
- Any NMEA 0183 device can be auto-switched if required.

Auto-switch routing

- The auto-switch is configured in software to act as in INPUT even though it does not have a physical direct input of its own. It is often described as a "virtual input."
- To configure the ASW mode, you need to decide which two physical inputs require to be auto-switched. It is very common to auto-switch a GPS signal, so the following description will assume that a GPS unit is attached to IN-1 and IN-2 as an example.
- From within the routing matrix, enable ASW1 with the slider at the top of the window. This will change the ASW1 output row at the bottom of the screen to be active.
- Press "Add" and select which of the physical inputs you would like to be the primary GPS source.
- Repeat the above step, and add which GPS input will be the secondary source, auto-switching should the primary GPS fail.
- On the active ASW-1 row at the bottom, select which output you require the auto-switched signal to be fed to (in this example OUT-1 is used). The ASW-1 will now feed IN-1 to OUT-1, and in the event of IN-1 failing, will autoswitch to feeding IN-2 to OUT-1.
- NOTE: In the main matrix, <u>DO NOT</u> also feed IN-1 & IN-2 to OUT-1. This will by-pass the auto-switch functionality. Leave these as X. IN-1 & IN-2 can however still be used to feed other outputs.

Advanced Routing

- Advanced routing is a feature which allows the user to select which messages within an 0183 data stream are allowed to pass to the output and which sentences are not transmitted.
- It is an ideal feature if you only require certain sentences passed to increase the message bandwidth.
- As an example of how this feature works, we have set up a feed from IN-1 to OUT-1 with a data stream containing 5 different 0183 sentences.
- These sentences contain GPGGA, GPGSA, GPGSV, PGVTG & GPZDA.
- On feeding this data into IN-1 and out from OUT-1 the following message stream would be available.

```
$GPVTG,,T,,M,0.05,N,0.09,K,H*2F
$GPGSA,A,3,11,14,19,20,23,28,31,32,,,,,1.6,1.0,1.2*30
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,2,09,20,55,254,48,23,16,188,44,28,15,270,27,31,07,095,40*78
$GPGSV,3,2,09,20,55,254,48,23,16,188,44,28,15,270,27,31,07,095,40*78
$GPGSV,3,3,09,32,84,338,50,,,,,,,,,,,,*40
$GPGSV,3,3,09,32,84,338,50,,,,,2,00,,,,,,*40
$GPZDA,080453.00,08,04,2010,-2,00*7C
$GPGGA,080453.31,4329.771,N,00521.115,E,1,08,1.0,115.29,M,49.16,M,,*67
$GPVTG,,T,,M,0.04,N,0.08,K,A*2F
$GPGSA,A,3,11,14,19,20,23,28,31,32,,,,,1.6,1.0,1.2*30
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
$GPGSV,3,1,09,11,87,300,48,14,22,042,43,17,21,316,00,19,26,163,46*7D
```

- On viewing the Routing Settings page, shown below, clicking on the '+' sign at the RHS in the "'Advanced" column will display all of the message headers that this stream contains.

Routing Settings

Input	SERIAL		OUT1		OUT2		OUT3		OUT4		OUT5		OUT6		DS1 IP		Advanced
SERIAL	✗		✗		✗		✗		✗		✗		✗		✗		➕
IN1-GPS	✗		✓		✗		✗		✗		✗		✗		✗		➖
GPGGA	✗		✗		✗		✗		✗		✗		✗		✗		⬜
GPGSA	✗		✓		✗		✗		✗		✗		✗		✗		⬜
GPGSV	✗		✓		✗		✗		✗		✗		✗		✗		⬜
GPVTG	✗		✓		✗		✗		✗		✗		✗		✗		⬜
GPZDA	✗		✓		✗		✗		✗		✗		✗		✗		⬜

ASW1 — Add
ASW2 — Add

Advanced Routing(cont'd)

- If you wish, for example, to only allow sentence GPGGA to pass through to OUT-1, you need to perform the following three steps:

1: Enable the required message with the slider on the RHS (in this case GPGGA).

2: **Disable the IN-1 to OUT-1 FULL data stream. This stops the entire stream being transmitted.**

3: Enable the required message stream from within the header window. (Tick beside GPGGA only).

- The setting shown above will automatically transmit GPGGA, and reject all other sentences from this data stream (as shown below). There is a small delay as buffers are emptied.

- You are free to select other sentences for transmission, or by selecting all but one sentence, you can reject an individual sentence if required.

- Only GPGGA now transmitted.

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Troubleshooting Guide

First level PRO-MUX-2 diagnostics / fault finding can be performed by observing the LED behaviour. The normal behaviour of the PRO-MUX-2 LEDs is described on the next page. If the LEDs are not behaving as expected, this will indicate a fault in either the device connected to the PRO-MUX-2, the wiring/connections, or the PRO-MUX-2 itself.
Some common checks to perform on all terminals of the PRO-MUX-2 if the correct LED behaviour is not displayed:

• Connectors are fully inserted
• All pins of the connector are in the correct location (not overlapping into another port position)
• Wires are terminated firmly and correctly (check polarity)

| LED	Colour	State	Description	User action
PWR	Blue	Pulsing	Indicates presence of power	None required
IN (INCLUDING 'SERIAL IN')	Green	Flashing	Data available on input indicated by LED.	No action required
	-	Off	No data available on this input or autobaud detection in progress (up to 20 seconds)	Check if connected Talker is sending data. If it is, review configuration.
OUT (INCLUDING 'SERIAL OUT')	Orange	Flashing/ solid	Flashes at a rate determined by baud rate and data length. If available bandwidth is nearly full, LED may appear solid instead of flashing	None required
STATUS	Red	Flashing / solid	Buffer Full – Overload condition, sentences are being dropped.	Use a web browser to review configuration and correct overload condition.
	Yellow	Flashing / solid	Warning, buffer is filling. Duplicate deletion is managing to maintain output capacity by deleting older copies of sentences	Review configuration to understand the required rates of sentences which is acceptable to any connected device
	Green	Flashing / solid	Normal operation. No data issues.	No action required
	-	Off	No data passing through outputs. Either no input data, or if IN LED is active it means all data is blocked.	Check if the connected Talker is sending data. If it is, review configuration.
Ethernet	Green	Flashing	Data activity on the Ethernet port	No action required
	Yellow	On	Indicates line speed at 100Mbps	No action required
		Off	Indicates line speed at 10Mbps	
	-	Off	No data available	Check that the Ethernet network is operational.
ALARM	Red	On	Indicates alarm conditions have been met.	Review status page in browser to understand alarm source.
MODE	Green	Pulsing / Flashing	**Pulsing** - User defined mode selected, **Flashing** - Pre-defined operating mode selected according to mode pins. Number of flashes = operating mode number	No action required
PWR and STATUS (Combined)	Power = blue Status = red	Power = on (solid) Status = on (solid)	Critical HW Error Both Power & Status LEDs are solid	Return to manufacturer if this persists after a power reset

Actisense®

Technical Specification

Power Supply	
Input Supply Voltage	10 to 35 V DC
Input Supply Current	220mA max @ 12V DC (all outputs @ full drive into 100 ohm loads)
Input Protection	Continuous reverse polarity, transient overvoltage and ESD protection
Power Indicator	LED, Blue - indicates unit is functioning correctly
Input Supply Connector	Pluggable 2-way screw terminal, 5.08mm pitch (12 to 30 AWG)

NMEA 0183 Port - Listener & Talker	
Number of Listener / Input Ports	8 isolated NMEA 0183 Listeners
Number of Talker / Output Ports	6 isolated NMEA 0183 Talkers
Compatibility	Fully NMEA 0183, RS422 & RS232 compatible. RS485 Listener compatible
Speed / baud rate	4800 to 38400 bps
Talker Output Voltage Drive	>= 2.2V (differential) into 100 ohm
Talker Output Current Drive	20 mA maximum per output
Talker Output Protection	Short circuit and ESD
Talker Data Indicator	LED, Orange (Flashes at data rate)
Listener Input Voltage Tolerance	-15 V to +15 V continuous, -35 V to +35 V short term (< 1 second)
Listener Input Protection	Current limited, overdrive protection to 40 VDC and ESD protection
Listener Data Indicator	LED, Green (Flashes to indicate valid input)
Connectors	Pluggable 2/3-way screw terminals, 5.08mm pitch (12 to 30 AWG)

Serial Port	
Compatibility	RS422 & RS232 compatible. RS485 Listener compatible
Speed / baud rate	4800 to 115200 bps
Output Voltage Drive	>= 2.1V (differential) into 100 ohm
Output Current Drive	20 mA max.
Output Protection	Short circuit and ESD
Input Voltage Tolerance	-15 V to +15 V continuous, -35 V to +35 V short term (< 1 second)
Input Protection	Current limited, overdrive protection to 40 VDC and ESD protection
Data Indicators	LED's: Green = Receive, Orange = Transmit
Connectors	Pluggable 3-way screw terminals, 5.08mm pitch (12 to 30 AWG)

Ethernet Port	
Host Interface	10/100BaseT, automatic polarity detection
	TCP/IP for configuration and firmware updating
Supported Protocols	TCP/IP and UDP for NMEA 0183 comms
Indicators	Green = Link/Activity, Yellow = 100 Mbps
Connector	RJ45

Isolation	
NMEA 0183 Listener	OPTO-Isolated, Hi-Pot tested to 1000V
NMEA 0183 Talker	Uses IsoDrive™, Hi-Pot tested to 1000V
Serial Port	Uses IsoDrive™, Hi-Pot tested to 1000V
Alarm Relay	Hi-Pot tested to 1000V
Ethernet Port	2kV for 60s

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Mode Inputs	
Input Voltage Range	0 to 35V DC
Protection	Transient overvoltage and ESD protection
Connectors	Pluggable 2-way screw terminals, 5.08mm pitch (12 to 30 AWG)
Alarm Output	
Contacts	Common, Normally Open and Normally Closed
Alarm Indicator	LED, Red indicates a valid alarm condition
Contact Ratings	35VAC / 50VDC
Connectors	Pluggable 3-way screw terminals, 5.08mm pitch (12 to 30 AWG)
Mechanical	
Housing Material	316 Stainless Steel
Dimensions	210mm (W) x 128mm (H) x 27mm (D)
Weight	540g
Mounting	Bulkhead mount or DIN rail mount (DIN kit 1)
Approvals and Certifications	
EMC	IEC 60945:2002-08, DNVGL-CG-0339:2019 & IACS UR E10 Rev7
Compass Safe Distance	175mm
Type Approval Certificate	RINA
Operating Temperature	-25 to +70°C
Storage Temperature	-40 to +85°C
Relative Humidity (RH)	95% @ 55°C
Environmental Protection	IP40
Guarantee	3 years (5 Years if registered)

PRO-MUX-2 Dimensions

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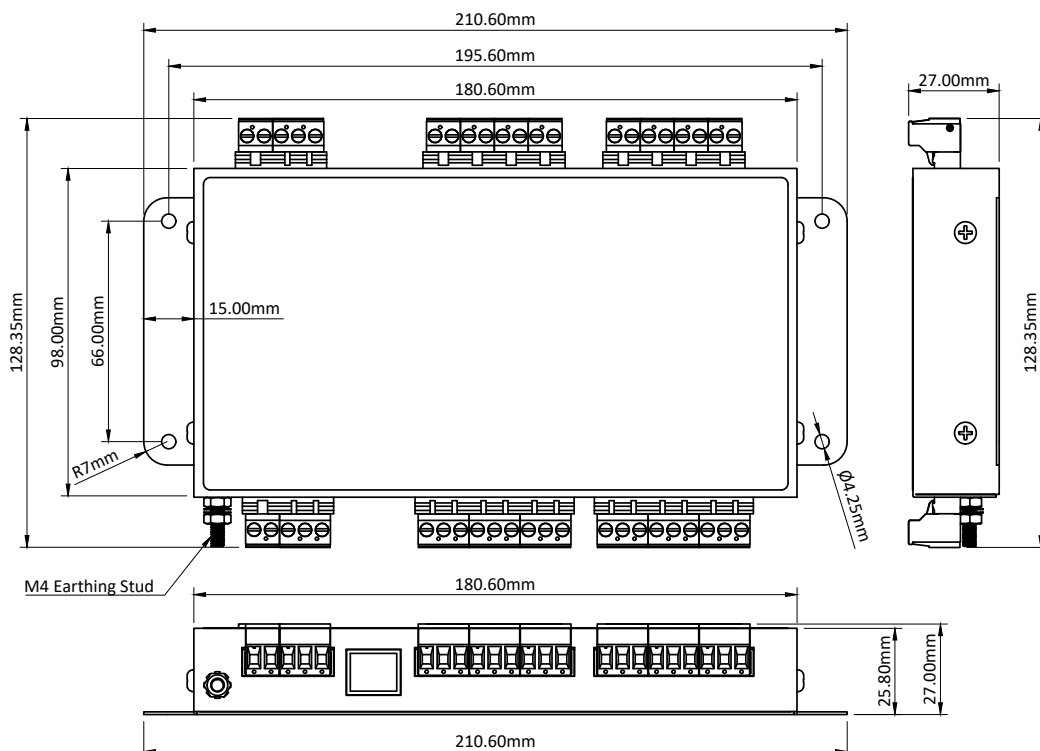
USER NOTES

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