

# **Overcoming Challenges in Commercial Marine with NMEA Solutions**

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Advancement of Marine Electronics

*The widespread growth in the commercial marine industry highlights the demand for advancements in marine electronics - from workboats to fishing vessels.*

And as the marine world becomes more reliant on digitisation, it increases the need for more devices to carry out a range of functions on vessels. For example, as worldwide trading increases, so does the need for advanced electronic navigation and radar systems.

**Safety and functionality**

For any type of vessel, safety and functionality are critical at sea. For example, autopilots are capable of functioning in poor conditions, but when the conditions are too rough or strong, the autopilot may not be able to adjust the vessel in time.

**Seamless navigation**

Conditions at sea can be difficult to predict and can quickly change. Therefore, it is vital that onboard systems are equipped with the efficient technology to detect incoming weather alerts and to maintain awareness of the surrounding waters.

**Marine electronics in commercial marine**

These factors mean that electronics manufactured for the commercial marine industry, where equipment and devices are relied on for safety and reliability, should be designed to meet these requirements.

**Robust and reliable solutions**

Our PRO Range of products have been built to withstand the tough and harsh conditions in the commercial marine environment.

Larger vessels that require added functionality and flexibility will benefit from our industry-leading buffers and multiplexers.

Multiplexers are typically used to combine multiple instruments' data output into a smaller number of outputs. Since two talkers cannot be connected to one listener directly, a multiplexer allows for the data to be output through one talker connection.

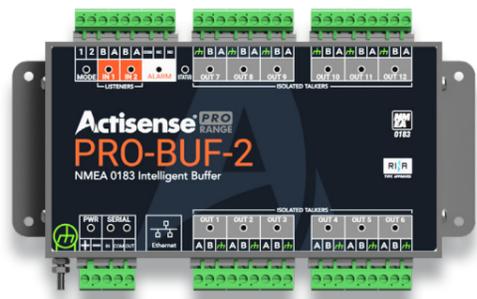
Buffers are typically used to distribute an instruments data into multiple connected listeners. Connecting multiple listeners directly to a talker can be problematic, including current drive issues and wiring issues. Using a buffer removes these issues, and allows for safe, strong distribution of data.

These powerful products are the answer to the challenges in the commercial marine sector.



# NMEA 0183

## PRO Range Type Approved Buffers



### PRO-BUF-2 NMEA 0183 Intelligent Buffer

Two OPTO-isolated inputs and twelve ISO-Drive™ isolated outputs. Offering device protection and excellent flexibility,

The PRO-BUF-2 is a great solution for larger leisure vessels, commercial shipping and is a great addition for systems that require Type Approved devices.

This device would benefit a commercial vessel with one GPS and multiple NMEA 0183 displays or 4 display ECDIS, for example. To get all of these displays to receive the GPS data, a buffer can be used to output to each display, whilst being fully isolated.

With the PRO-BUF-2, the data can be filtered, passed or blocked and monitored, giving greater flexibility and control over all instrument data.

### PRO-NBF-1 NMEA 0183 Buffer

Safely connect one Talker to six Listeners with full isolation.

An example of this could be on a commercial vessel with one GPS and multiple NMEA 0183 displays or 4 display ECDIS. To get all of these displays to receive your GPS data, you can use a buffer to output to each display, whilst being fully isolated.

With the PRO-NBF-1, the data is not checked for validity as the device has no intelligence, so whatever is input is also output. For scenarios where 'invalid' or incomplete data needs to be sent, this product is ideal. Proprietary messages also using certain formats and identifiers can be sent using this device.

### DISCOVER MORE

Learn more about the PRO-BUF-2 and the PRO-NBF-1 on our website.

Our PRO Range provides adaptable, robust and reliable solutions suited to larger leisure vessels and commercial shipping.



# CASE STUDY:

## Using the PRO-NBF-1 on commercial vessels



*The Actisense PRO-NBF-1 was chosen due to their "reputation of quality in the marine industry."*  
Eastern Pacific Shipping



With over 60 years of excellence in the shipping industry, Eastern Pacific Shipping (EPS) stands as a leader with a fleet of more than 290 vessels.

When embarking on a large-scale upgrade project across their fleet, EPS sought a reliable and industry-approved NMEA buffer for each vessel. Their choice: the Actisense PRO-NBF-1, reflecting EPS's commitment to quality and innovation in shipping.

EPS has successfully integrated the PRO-NBF-1 to distribute critical data such as gyro, speed log, and autopilot information to external systems for monitoring.

The device's flexibility and robustness allow it to meet various data requirements, tailored to the specific needs of each project, further enhancing EPS's operational efficiency.

[Visit Eastern Pacific Shipping here.](#)



# NMEA 0183

## PRO Range Type Approved Multiplexers



### PRO-MUX-2 NMEA 0183 Intelligent Multiplexer

Eight OPTO-isolated inputs and six ISO-Drive™ isolated outputs. Offering device protection and excellent flexibility.

An example of this could be on a commercial vessel with multiple NMEA 0183 GPS, wind, AIS and depth instruments. To get all of this data combined and sent to a display or converted via an NGX to NMEA 2000, a PRO-MUX-2 can be used.

With the PRO-MUX-2, the data can be filtered, passed or blocked and monitored, giving greater flexibility and control over all instrument data.

The PRO-MUX-2 has been integrated into systems from companies such as Raymarine and Sea-Kit.

#### DISCOVER MORE

Learn more about the PRO-MUX-2 and the PRO-NDC-1E on our website.

Our PRO Range provides adaptable, robust and reliable solutions suited to larger leisure vessels and commercial shipping.



### PRO-NDC-1E NMEA 0183 Intelligent Multiplexer

Powerful, advanced features enable baud rate adjustments, auto-switching and sentence level filtering.

On a commercial vessel, a likely scenario is a network with multiple NMEA 0183 GPS, wind, AIS and depth instruments. To get all of this data combined and sent to a display or converted via an NGX to NMEA 2000, a PRO-NDC-1E is a great solution.

With the PRO-NDC-1E, the data can be filtered, passed or blocked and monitored, giving greater flexibility and control over all instrument data.

The device also carries the ability to stream NMEA 0183 data over Ethernet, meaning it can connect to other existing Ethernet Systems and share the 0183 data to various connected applications or devices.

# CASE STUDY:

## Raymarine use Actisense PRO-MUX-2 for Pathfinder system



In 2024, Actisense collaborated with Raymarine, world leaders in marine electronics, working to maximise NMEA data efficiency with their ground-breaking Pathfinder system. Raymarine have adopted a custom PRO-MUX intelligent multiplexer to support their rollout into the commercial marine and SOLAS environment.

The Actisense PRO-MUX-2 was selected as the baseline infrastructure for Pathfinder's Data Collection Unit, with eight NMEA 0183 inputs and six NMEA 0183 outputs along with a high-speed ethernet connection. Custom work was done to add functionality including alarm relays to ensure every element of Raymarine's requirement was met.

Director of Navigational Solutions for Raymarine, Andy Murray, commented:

"The Pathfinder Radar launch is helping us disrupt the commercial marine market, with an IMO compliant, intuitive-to-operate system.

Having worked with Actisense successfully on previous projects, we selected their PRO-MUX as the core of our data interfacing solution the Pathfinder DCU. The work we have completed with Actisense ensures we have an extremely flexible interfacing solution at the core of our Pathfinder Radar ensuring that our system is easy to install for both retrofits and newbuild vessels."

Actisense CEO, Phil Whitehurst, added:

"We were delighted to be contracted by Raymarine to help create the Data

Collection Unit for their Pathfinder system. We saw the system on display at Workboat in New Orleans last year, and we were immensely impressed with its capabilities. No doubt, this will solve a number of specific challenges facing commercial vessels. We're proud to have been selected to work with this global electronics giant."

*"...we selected their PRO-MUX as the core of our data interfacing solution the Pathfinder DCU."*  
Andy Murray, Director Navigation Solutions, Raymarine



Find out more on Raymarine's Pathfinder System here.

# BENEFITS

## For Commercial Marine Industry

Across all areas of commercial marine, staying connected and informed is essential for safety and navigation. As well as developing products that solve connectivity headaches, Actisense products are equipped with powerful features to achieve this.

### NMEA Data streaming over Ethernet

Ethernet technology has found its way into the maritime world. It allows users to seamlessly transfer crucial data between various onboard devices and systems, enhancing navigation, communication, and convenience.

#### Benefits of Ethernet:

- Faster data transfer rates
- Improved reliability
- Scalable to connect multiple devices
- Allow seamless integration of various onboard systems

### Type Approved devices

There is a requirement for Type Approval on certain products and scopes to ensure a particular standard is met. All of the Actisense PRO Range products are Type Approved by RINA so you can install with confidence.



## FURUNO TESTIMONIAL

*"I am a big fan of Actisense brand and the solutions they provide for data interfacing within the marine electronics industry."*

*The Actisense PRO Range provides a robust solution for bridging the gap between marine electronic products and PC based navigation software.*

*The PRO-NDC-1E has been our "go to device" for allowing NMEA0183 data to be converted/multiplexed and then transmitted via UDP/TCP over Ethernet. This is a tried and tested solution we have used for connecting Furuno Navigation Products with TimeZero Navigation Software.*

*The NMEA Reader / Toolkit software, when combined with the NGT-1 (NMEA2000 to USB) provides an easy to use / easy to understand diagnostic solution that has been invaluable when diagnosing those tricky NMEA2000 network issues.*

**Ian Upham, Product Support and Training Manager, [Furuno UK](#)**



# CASE STUDY:

## Sea-Kit use Actisense for NMEA connectivity on uncrewed surface vessels

*Working with the talented team at Sea-Kit has been illuminating to help understand the data connectivity challenges faced by uncrewed vessels.*

Sea-Kit are an uncrewed surface vessel manufacturer and operator who require equipment onboard to outperform rough and challenging sea conditions. These vessels don't have human crew to step in and solve problems, so having reliable systems and navigational data is crucial. They also often require Type Approved devices that are in a small form-factor, and which are capable of performing several tasks at once, rather than the need for several devices performing singular tasks. It is for these reasons that they turned to Actisense and our PRO Range of equipment.

Peter Walker, Design and Development Manager at Sea-Kit, explains their particular challenges:

*"...we need data from multiple types of devices, serial, ethernet, CAN-bus and analogue signals to interface into the new digital systems out there. For us, this needs to be reliable and easy to problem-solve when there is an issue on one of the many systems it interfaces into, and there is nothing better to do this job other than Actisense."*

*Peter Walker, Sea-Kit*

"We understand the limitations of the systems and equipment that we use on the boat. To ensure that we have reliable and constant communication to the boat without any compromise on performance or operations, we use multiple redundancy methods to ensure the vessel can always communicate data back to the control centre. This is why products like the PRO-MUX-2 becomes an incredible tool to us, because it not only can take multiple individual forms of serial data, but it can combine them and route them to multiple listening devices around the vessel individually. For a USV, this is incredibly

valuable because we don't want to waste sending high bandwidth data to devices that doesn't require it – so we only send what we need to the devices that need them.

We also use the built in webserver to route more data to other devices around the vessel through an ethernet connection, doubling up on the redundancy in case of cable failure. Having an ethernet connection on all the Actisense PRO Range is certainly one of its

greatest features in my mind as it means we can use it all over the vessel."

To help create these interconnected systems, Sea-Kit specifically chose the PRO-MUX-2 Type Approved NMEA multiplexer to connect multiple GNSS devices for both heading and positioning data,

additionally making use of our PRO-NBF-1 Type Approved NMEA buffers for splitting to redundancy PRO-MUX's. Also connected to the system were elements such as AIS, weatherstation & environmental, and an NMEA 2000 electric compass (which they convert back to NMEA 0183 using our NGW-1 gateway).

Data is output (in RS422) to multiple VHF radios, DSC radio, AIS, chartplotter (TimeZero) and their Sea-Kit autopilot system.

[Discover Sea-Kit's USV's.](#)



WITH NMEA 2000 CONNECTIVITY

With more commercial vessels adopting NMEA 2000, we're pleased to introduce our next generation...

PRO Range Type Approved Multiplexer



PRO-NDC-1E2K NMEA 0183 Multiplexer / NMEA 2000 Gateway

Rugged, robust, Type Approved Multiplexer with built-in NMEA 2000 connectivity, high-speed Ethernet streaming of data, flexible configuration, auto-switching and sentence level filtering.

A typical scenario with the PRO-NDC-1E2K is having multiple NMEA 0183 legacy instruments such as GPS, Heading, Depth and an existing N2K network with an MFD. The requirement is to get the NMEA 0183 data combined and converted to NMEA 2000 for the MFD to display.



This is easy to do using the 1E2K thanks to it's highly flexible configuration options, and the built in NMEA 0183 <-> 2000 converter, the same as what is found in the NGX. The 0183 instrument data can be fed into the Multiplexer, combined and filtered correctly, and then output via the NMEA 2000 Port onto the N2K network, for every connected device to then see.

The ability to combine, filter, convert and Ethernet stream data all through one device is now possible via the PRO-NDC-1E2K.

DISCOVER MORE

Learn more about the PRO-NDC-1E2K on our website.

Our PRO Range provides adaptable, robust and reliable solutions suited to larger leisure vessels and commercial shipping.



For more on NMEA 2000 networks, download the free guide here.

For more on NMEA 0183 networking, download the free guide here.

Email: sales@actisense.com

Call: +44 (0)1202 746682

