

MEJ

MARINE ELECTRONICS
JOURNAL

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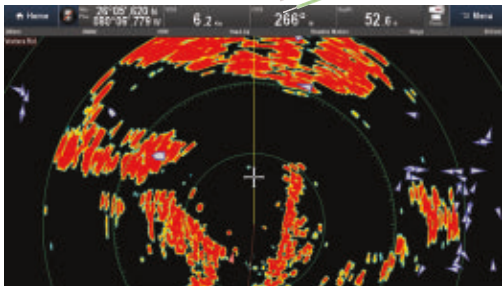
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Courtesy of OceanLED

Member Profile

Actisense

Data conversions and connections are just the start



Actisense has been providing intelligent NMEA solutions since 2001. Their products are no stranger to dealers and technical installers around the world, and in 2023, they were awarded NMEA Manufacturer of the Year for the second year in a row. A company steeped in innovation, their team advocates for the ongoing development of NMEA standards and supports the market with education, not just about their own products but around the extensive marine electronics ecosystem. Here's the rest of the story:

The NMEA 0183 interface standard was developed back in the early 1980s, a time when the idea of navigating your leisure yacht or small workboat from A to B using anything other than a paper chart and parallel rule was still in its infancy. A decade or so after NMEA 0183 was conceived, its true importance became clear due to a surge in the development of marine GPS receivers, chartplotters, radars, logs, depth sounders, autopilots, fluxgate compasses and the like for smaller craft.

Chartered electronics engineer and sailor Phil Whitehurst spotted the opportunity to improve the way much of this equipment worked together and formed Active Research, based in Poole, on the UK south coast. In the early days, he worked out of his house, collaborating on several projects. His first customers included major US transducer manufacturer Airmar.

"In 2001, the company launched the Actisense brand with a small portfolio of marine interconnection devices," says Whitehurst. "We concentrated mainly on areas not well served by the major marine electronics companies, such as creating products that solve problems with installation and interconnection of different manufacturers' equipment. For example, the Actisense NMEA 0183 multiplexers and buffers enabled devices to talk to each other and share valuable data about a boat's situation. Without these, it would not have been possible to see all the data on many of the multipurpose display screens used in that era's onboard systems."

Evolution of protocols

In 2001, the brand name Actisense was registered, the start of a process that saw the company move from being largely consultative to an equipment manufacturer. The niche that had been spotted was the communications gap that often existed between items of equipment, particularly those from different manufacturers.

The simple NMEA 0183 serial communication protocol was fine if you only wanted one "talker" speaking to one or more "listeners" and if the equipment executed the language correctly, at a mutually compatible speed. Often, though, there were problems and the issues typically got trickier as the complexity of onboard systems grew.

Actisense identified the need to create buffers, multiplexers and interfaces that would sit at the hub to connect marine electronics systems. By developing a strong understanding of NMEA 0183, the company could offer solutions to boatbuilders and installers to alleviate inter-connectivity headaches.

Company Chief Engineer Andy Campbell has for several years served as Chair of the NMEA 2000 Technical Steering Committee and has been a key driver of the standard along with industry colleagues.

"The emergence of NMEA 2000, a richer and more capable system based on Controller Area Network (CAN) technology originally developed for the vehicle industry, was another important development in our sector," he says. "This was designed to ultimately replace



NMEA 0183, but both standards co-exist alongside each other now and will continue to do so for many years to come, particularly in more conservative applications like commercial marine where the simplicity of NMEA 0183 is still valued. NMEA 2000 is, however, now commonplace on most leisure craft, and as a business we have aimed to steer this adoption.”

As NMEA OneNet is expected to become the future standard for NMEA, Actisense has been actively participating in this field, conducting webinars and publishing articles to educate the market. They are also evaluating how their technology can be best utilized within this new standard.

Tech milestones

One of the company’s early cornerstone innovations was ISO-Drive. To solve the complicated headaches around ground loops, Actisense created this fully isolated system to protect both inputs and outputs. With many marine electronic products not having their own isolation on the data inputs and outputs, this could cause loss or corruption of data, in bad cases permanently damaging the marine equipment.

With the advent of NMEA 2000, Actisense became a go-to provider for bi-directional data conversion to and from NMEA 0183 devices. The NGW-1 to date has the industry’s most comprehensive library of Sentence-to-PGN conversions. This was recently upgraded with the launch of the NGX-1, the industry’s first dual NMEA 2000 gateway, incorporating the company’s PC interfacing technology.

In 2011, the company launched a range of NMEA 2000 cables and connectors. This was the first foray into “infrastructure” products, and the popularity of these has continued to grow over the years. Installers particularly liked how robust and malleable the cables were, and that the metal-capped ends had been specially coated to combat corrosion in marine environments. 2013 saw the launch of their EMU-1 Engine Monitoring Unit for NMEA 2000 networks. This product has fast become one of the most recommended in its class, and recent upgrades have included compatibility for tilt & trim tab support for outboard engines.

Amy Miles is Head of Operations at Actisense. “One of the main reasons installers trust our products is because of their quality. Our team builds them at our base in Poole, UK, and we have strict quality processes to ensure our products are built to last—even beyond their extensive five-year guarantee period. The result is a near-zero percent returns rate, something we are immensely proud of.”

The company spends significant resources on R&D, with extensive in-house hardware and software development teams. With the ability to rapidly prototype new concepts, Actisense has been able to satisfy the demands of some of the industry’s biggest players, such as TIMEZERO, Airmar, and Raymarine, often creating custom solutions for specific use cases.

With a portfolio of over 30 products, Actisense now simplifies its offering into three core areas: Convert (protocol-to-protocol data conversion); Digitize (analog to digital conversion); and Share (sending data around the vessel and extracting it onto wired and wireless computers).

Global involvement

An early breakthrough came when Airmar decided to launch its own US distribution company. Gemeco has since grown to a network of thousands of dealers across America, and Actisense has been distributed in the USA by them ever since, as well as keeping a strong ongoing relationship with Airmar.

Head of Commercial for Actisense, Justin Cohen, leads the company’s sales and marketing teams. “We’re really proud of the relationships we have built with our distribution network,” he says. “They are our trusted

Beyond the marine environment

In 2009, Actisense broke new ground when the company was chosen to provide a solution for buffering GPS signals on a fleet of buses in New South Wales, Australia. The State Transit Authority wanted a solution that would enable them to know the location of their vehicles at any time. With the Actisense NBF-2 NMEA Buffer already a first choice for installers within the marine industry, the device offered a perfect solution for amplifying the GPS data onboard buses.

Similarly, in 2015, Actisense entered the Agritech arena, when The Climate Corporation in the USA selected the NGW-1 NMEA 2000 Gateway as the solution to bring an NMEA 0183 GPS feed onto their CANbus digital displays.

Actisense remains committed to exploring new markets where its technology can be deployed to solve similar challenges to those faced in the marine environment.

Company founder Phil Whitehurst says initially they concentrated on areas that were not well served by major marine electronics manufacturers. These included products that “solve problems with installation and interconnection of different manufacturers’ equipment.” Today, Actisense offers more than 30 products which are organized in three main categories: Convert (protocol-to-protocol data conversion); Digitize (analog to digital conversion); and Share (sending data around the vessel and extracting it onto wired and wireless computers).

eyes and ears in each of their respected markets, delivering fantastic after-sales service and support. We have a really strong, longstanding partnership with Gemeco in the US market. Outside of the USA, Actisense is distributed in over 50 countries globally by a network of dedicated distribution partners and an army of ‘Acti-fans,’ installers who advocate enthusiastically about the solutions provided by Actisense.”

Key markets include mainland Europe, United Kingdom, South Africa, Australia, Canada and both the Middle East and Far East.

Awards & accolades

Over the past two years, Actisense has been voted NMEA Manufacturer of the Year (Level 1 & 2). These awards are particularly important to the company because they are voted for by installers in the field, the people for whom the technology was created.

Additionally, several products have been winners at both the NMEA and BMEA (Britain) Product Awards, including the NGW-1 NMEA 2000 Gateway, the NGT-1 NMEA 2000 PC Interface, and the EMU-1 Engine Monitoring Unit.

Actisense has won several accolades from the UK's national chambers of commerce, the MAKE UK Manufacturing Awards and the Maritime UK Awards. Through their long-standing partnership with US distributor Gemeco, they are previous winners of the Marine Marketers of America's Neptune Award.

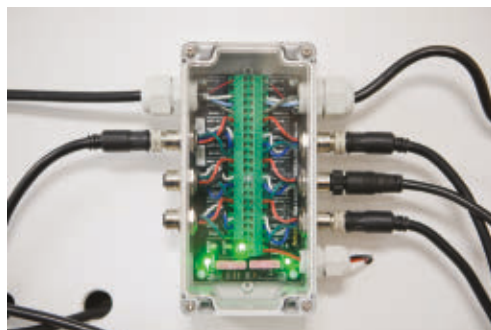
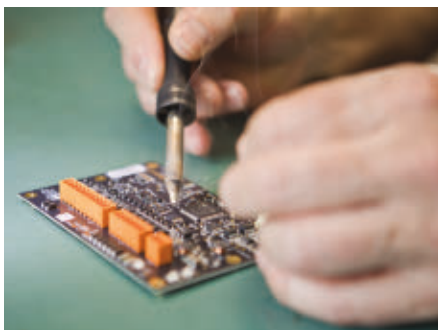
"Aside from growing the business, our focus at Actisense is on growing our people," says Company Director Michele Whitehurst. "We provide regular appraisals and a significant training budget to help our people get to where they want to be. It was a thrill to be recognized for this when we were awarded Employer of the Year at the Maritime UK Awards."

NMEA 2000 training

Solutions Engineer Josh Keets has been commissioned by NMEA to deliver both Basic and Advanced NMEA 2000 Installer training courses in Europe. He will instruct the courses on either side of the Seawork show in Southampton in June (0800 UK time) and METSTRADE in Amsterdam in November. Until now, the Advanced class was only offered in person in the US rather than online due to mandatory hands-on training and skills assessment.

"It's incredibly exciting to be able to bring these valuable NMEA courses to the UK, making them much more accessible to the wider European marine electronics sector," said Keets. "I had the opportunity to deliver the NMEA 2000 Basic and Advanced courses at METSTRADE last year, and I'm thrilled to be back there this year, as well as offering them to those in the UK in the week of Seawork too."

For more information, visit: sales@actisense.com.



Actisense says it spends significant resources on R&D, with extensive in-house hardware and software development teams. Due out soon is the PRO-NDC-1E2K multiplexer, which the company says is the first of its kind that brings three connection points together (serial, M12 and copper ethernet). Shown at right is the QNB-1 network block.

Actisense is a regular exhibitor at the NMEA Conference & Expo, as well as at METSTRADE, WorkBoat and Seawork. Their global distributors also exhibit on their behalf in their respective territories.

Solving dealer and installer challenges

Innes Miller is the Head of Technology and Development. He describes the company's journey of product development: "Actisense

regularly touts installers as the 'heroes of our story.' Over the years, headaches and challenges from installers have created opportunities for the Actisense engineering team to solve these problems and create solutions that have saved countless hours and dollars." Here are a few of those key challenges:

Saving on cable weight and installation time was one of the earliest wins for installers, using Actisense buffers and multiplexers. Rather

than singularly running wires to and from each device, these data splitters and combiners made multi-point connections a reality. These products have evolved over the years and are now Type Approved, a growing requirement for commercial vessels of certain classes. They have also added functionality such as high-speed data transfer over copper ethernet, solving some of the data bandwidth issues previously faced.

Diagnosing issues on a boat's network is another common challenge that Actisense has helped with. The company's NGT-1 NMEA 2000 PC interface has been adopted by some of the industry's leading marine applications creators as their interface of choice. By making it easier to extract and analyze all data on the NMEA 2000 bus, both wired and now wirelessly with their W2K-1 Wi-Fi gateway, installers and boaters can more easily fault-find and make significant efficiency improvements. Getting early signs of when devices aren't performing as expected means that expedited maintenance can be executed and system failures avoided.

Actisense provides an SDK (Software Development Kit) to help make it easier for new applications and solutions to be created by third parties.

Aside from the SDK, Actisense has created several pieces of software to help those in the industry do more with the data on their vessel. Tools like NMEA Reader, EBL Reader and Actisense Toolkit are freely available on their website.

The cables and connector range were brought to the market to solve the regular frustrations of installers about cables either snapping, cross-threading or corroding. Installers now have the option to easily create or extend networks without the fear of needing to regularly replace this core infrastructure onboard. The product range is backed by comprehensive guarantees.

For several years, many installers liaised with the Actisense technical support team to request support for tilt and trim senders. One of the biggest drivers was the desire to reduce drag and improve fuel efficiencies. In February, Actisense released this as a free upgrade for all EMU-1 customers, with the new firmware featuring preconfigured gauge pairings with a library of the most popular tilt and trim gauge manufacturers.

New solutions

Some new challenges that the company is trying to solve include the ability to easily route data from either NMEA 0183 or NMEA

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Actisense (Continued from page 42)

2000 to devices requiring either, as well as ethernet input and output. Their upcoming (Q2 2024) PRO-NDC-1E2K multiplexer is the first of its kind that is also Type Approved, bringing all three connection points together (serial, M12 and copper ethernet). This will mean installers won't need separate data conversion from a multiplexer because this will be built in, a much more cost-effective solution.

Similarly, Actisense is conflating their data conversion, PC interfacing and Wi-Fi capabilities with the upcoming WGX-1. This means that casting of NMEA 0183 and NMEA 2000 data over Wi-Fi becomes even easier and less costly.

Looking to the future, Actisense has some innovative solutions in the development cycle, including a step-change in analog to digital data conversion. They are also working on specific sensor concepts that will change the way that things are measured onboard, a development the company is tight-lipped about for now.

For more information, visit actisense.com.

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Insurance Hotline

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or lead to arbitration of the parties involved with each taking a proportionate share of the liability. Do not interfere with the LE's efforts to investigate the incident. Do not lose your composure and escalate the situation. Do not assume the other parties involved won't claim injuries after the accident and hire legal counsel. Do not assume the accident, even if a fender bender, will not end up with a lawsuit being filed.

Should you at any point receive a phone call from the other parties or their legal counsel, refer them to your insurance claims adjuster. Do not provide a statement to opposing counsel or discuss the matter further; let your insurance claims adjuster handle it on your behalf. If you receive any written demand or legal filings, immediately forward the documents to your insurance adjuster as there is a limited time to respond to the court, and time is of the essence.

Were you hauling a vessel (watercraft) that was in your care, custody, control such as a vessel you were delivering for sea trial or to a customer after repairs made when the accident occurred? If yes, the damage to the vessel most likely will not be covered by your vehicle insurance. This should be covered by your Ship Repairer Legal liability coverage. We will discuss this in the next edition of MEJ.

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The above is for informational purposes only and is not intended to provide legal advice. Please speak with your specialized agent and attorney for your unique situation.

About the author

Alycia N. McGlone is a Certified Marine Insurance Professional and the President/CEO of ANM Maritime Solutions Group, P.A., which manages NMEA's insurance program. She is a continuing education instructor for licensed insurance agents and adjusters and is an authorized OSHA Maritime Outreach Trainer for shipyards, longshoremen and terminal operators, providing 10- and 30-hour courses. McGlone provides expert witness and claims advocacy services in the maritime industry and is a guest speaker and technical writer/advisor on insurance topics.

Fathom e-Power (Continued from page 31)

Power+ controls the power source, whether shoreside or on-water, such as alternator power. On Mercury outboards, it can act as a controller for the output of alternator power to the batteries, even at anchor. There are selectable boost and extend modes that control the RPMs and charge cycle of the outboards, enabling a faster charge in boost mode or extended charges at lower RPM.

Watts On informs the user to make more critical decisions about power capacity and power usage. Winer said, "Sometimes we don't know what is drawing the most power, and so let's give the user the most information they can have to make trade-off decisions of how they want to spend their time on the water. And if they want to extend their time, what are some of the appliances can we turn off?"

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Working with boat builders

Designing a Fathom e-Power system starts at the subcomponent level with "specific engineering that tests and validates every single key component level," says Winer. The focus is on that component's performance and design for its specific application, and then testing begins at the system level. Once complete there, the Navico Connect Team is brought in. It consists of application engineers who work directly with boat builder OEMs to fit and configure the equipment to their specific vessels. The work involves ensuring that the OEM's requirements are met. This is accomplished by working alongside the boat brand's engineers to integrate and customize the system to specific vessels and training their installers to standards developed by the engineering and design teams. After initial training, the Connect Team remains a resource for engineers and installation crews.

Another role assigned to the team is instructing OEMs how to train their network dealers in service and warranty repairs of the system. The team handles all warranty issues at the OEM level.

Nevertheless, there is concern among some servicing dealers outside the Navico family about how they can assist clients with e-Power systems should the need arise. While some individual components are familiar with service information options available, the concern is over access to information or training for a complex and customized system as it ages or needs servicing when OEM dealer support is unavailable. Independent Navico electronics dealers could be part of that training but are not included as of now.

Asked if they've encountered any challenges integrating e-Power systems with other equipment on boats, Winer says, "There are always things that we navigate through during the system validation process. A lot of the hurdles that engineering teams go through, though, we are able to keep within the system design. We're able to test and validate and go through that engineering process before even getting to the OEMs. The things we've worked through with OEMs are scaling battery capacity and any specific automated functionality or load shedding that we need to control for them. So, a lot of things we specifically do with the OEM is supporting them to scale applications, appliances or capacity."

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About the author

Glenn Hayes is a second-generation journalist and photographer whose background in the marine industry spans over three and a half decades and many thousands of miles at sea traveling the world. He writes for several marine and outdoor publications and is a content creator for Aqua Lifestyle (www.aqualifestyle.net).