NATIONAL MARINE ELECTRONICS ASSOCIATION

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Standards Update

From Director of Standards Mark Oslund May 2024

The future of NMEA gateways

Over the years, NMEA has introduced multiple data exchange options for current technologies, and we will start creating specifications for future industry gateways for operations in both local and external vessel networks. This endeavor sets a milestone of force for all NMEA committees (0183, 2000, OneNet) to explore data conversion and application exchange in hopes of standardizing interoperability for NMEA messages in our protocols. Doing so will set our standards on a path to globalize regional innovation for the betterment of all recreational boating enthusiasts.

NMEA's recent efforts to increase subsystem messaging support have provided new opportunities for data-centric companies to promote innovations for information gathering or deploying automation status, eliminating the burden of systematic failures on vessels. That said, we need to look at how we can leverage the innovations within each medium of data exchange and put into practice the process of integrating protocols from chip to networked device in a trusted fashion.

Where the mission is to secure the system or the boat, NMEA's OneNet ethernet standard provides another layer of data exchange and interoperability for the vessel to communicate with a user. Defining safe routines or pathways is the challenge that faces our community. Here, we have created our own industry, including your flagship standard (NMEA 2000), solidifying in-between two technology mediums. Those prior decisions have allowed our protocols to easily integrate into adjacent industries. NMEA can work on combining best practices and our user must-haves and create governance over the managed OSI (Open Systems Interconnection) layers that affect our marine electronics markets.

The marine electronics communities can provide methods to move data through different connection mediums, such as serial, CAN, and ethernet, providing versatility of multi-system integration. Several of our industry interactions led to discussions with key stakeholders who see new challenges we must consider working on with the integrated systems on boats. Recognizing this, our industry needs to come together and develop features for sensitive data networks. This has led us to discovering how many of the features we regularly use have crossed into other industries desperate for a standard with versatile options like ours.

New initiatives

We held several standards meetings at the NMEA conference last September to discuss the state of NMEA 0183, 2000, and OneNet. With the help of new attendees, we learned that we need to expand our focus in areas where data exchange and interoperability can be misused. That led to the creation of new initiatives that help NMEA focus on what we need to build for tomorrow.

New NMEA protocol gateway specifications may require enhanced security options for the connected boat. Until now, gateways have been chiefly a successful method for subsystem integration. Now, NMEA protocols can deliver the data standards for future gateways to provide multi-speed connections using NMEA 0183, 2000, and high-bandwidth OneNet messaging. Gateways can reduce technical deficiencies between all three data standards. The next- generation gateways may even provide a high level of data validation as part of new security mechanisms. Still, implementations must be assessed for security risk levels, especially if an outside vessel connection exists. We hope the NMEA standard can help manufacturers keep their promise of innovation yet offer a place where we work together toward an associative security technology.

Several factors surfaced from the 2023 conference that made it essential for NMEA to create new committees to explore our protocol challenges for the future. The new Cyber Security Committee will work toward identifying, informing, and proposing solutions to marine-targeted cyber security threats. Similar to CISA (Cybersecurity Infrastructure and Security Agency) but not the same, our initiative originates from within. The NMEA technician contingent can raise concerns about new installation challenges and work with members and experts to support this community in reacting quickly against potential issues. Your association will attempt to leverage the certification lists to inform all who ask about the qualities of interoperability of a device in question. With OneNet device secure pairing procedures, users can choose to make two devices interoperate. Over time, we can use the OneNet protocol framework to add new security features that enhance the user's data protection and experience. NMEA thanks the Cyber Security Committee for creating a Public Service Announcement to our industry on “Digitally Securing the Boat.” This compendium of best practices helps raise awareness of risk in networks connected on the boat. As stewards to the connected boat mission, we are responsible for educating and informing.

NMEA hopes to have conversations in 2024 about gateway specifications at our annual conference and meetings. We hope to be convening a new OSI Layer One Committee of veteran installers of NMEA 2000 and ethernet, connection media manufacturers, network power supply experts, IP networking experts, fiber optic installation experts, and networking specialists in router, VLAN, and managed switch implementation.

Remember to visit NMEA.org to review the latest NMEA 2000 published codes and certified devices. Let’s celebrate the manufacturers vested in the mission of the connected boat and make the effort to go through the process. Your association needs your support; email us at Standards@nmea.org to learn more.