NETWORKING 101

Making Sense of Marine Electronics Connections

Today's marine electronics are built for interfacing and/or networking. This is a good thing —the ability for products to "talk" with each other and share information makes for a better navigation experience. Radar targets or AIS data overlaid onto chartplotter displays, and GPS data helping to keep a boat's autopilot steer to a waypoint are just a couple examples.

These same capabilities also provide boaters — especially those who aren't particularly "techie" — with a confusing array of technologies, standards and terms to decipher, such as NMEA 0183, NMEA 2000, Ethernet, CANBus, SeaTalk, SimNet and more. A boater looking to purchase new electronics — whether a single item or an entire new helm — can have a hard time figuring out what it all means.

To help de-mystify this process, the experts at The GPS Store, Inc. have provided the following guide to basic marine electronics communications and networking. "Probably the best thing a consumer can do is to speak with and work with a reputable dealer," said The GPS Store's Brian Rock, a graduate of National Marine Electronics Association (NMEA) installation and networking courses. "In addition to official NMEA standards for networking and communications between electronics, boaters will also hear various "trade names" used by manufacturers to promote their networking systems. This can lead to even more confusion, and a certified dealer who represents all brands can help boaters navigate this maze," added Rock.

NMEA Standards Overview

There are several standards boaters will face when researching marine electronics and how they might interface new and existing systems together.

NMEA 0183 — This NMEA standard for instrument serial data exchange has been around more than two decades, and will continue to be used. In fact, a new, faster version (NMEA 0183HS) was introduced to handle data from increasingly popular AIS

receivers. NMEA0183 specifies data be transmitted by a single device (like a GPS, echosounder, electronic compass) that is the "talker," to multiple pieces of equipment (chartplotter, radar, etc.) that are the "listeners." It allows once device to send information to many other devices, but it isn't really a network, as it's a limited, one-way street.

NMEA 2000 —A digital "backbone" able to connect as many as 50 devices, through which any connected device can transmit data or receive data. A true network, information is prioritized based on its type to ensure that critical information is delivered first. It was developed, in part, to standardize wire, cables and connectors to ensure easy integration of units from different manufacturers. NMEA 2000 is 50 times faster than NMEA0183, but it still too slow for video images (such as radar) and cartography.

Ethernet — Consumers are familiar with Ethernet through our high-bandwidth home and office computer networks, and at about 40 times faster than NMEA2000, it has important applications in marine electronics. Ethernet networks allow connected devices to share large volumes of complex data such as radar images, video feeds and cartography, but it cannot prioritize data. Another important point to remember about Ethernet connections on your marine electronics is that they are designed to connect components of the same brand — not to network machines of different manufacture.

Trade Names — Manufacturers often give "trade names" to their networking technologies and/or use differing connectors that can make true brand-to-brand networking more difficult. Here are a few examples of trade names and standards: Furuno NavNet (Ethernet), Furuno CANbus (NMEA 2000) Garmin Marine Network (NMEA 2000) Raymarine SeaTalk HS (Ethernet), Raymarine SeaTalk NG (NMEA 2000), Simrad SimNet (NMEA 2000).

NMEA OneNet — The NMEA calls this upcoming protocol "NMEA2000 on steroids," because it's designed to transport NMEA 2000 messages over Ethernet. Some manufacturers are already using Ethernet for video, along with proprietary messaging

to add NMEA 2000 messages. Lack of standardization, however, leads to problems with interconnectivity. OneNet is still a future solution for this, slated for late 2014.
If you're getting the idea that marine electronics networking is a moving target, you're right. While the NMEA is constantly working with manufacturers to develop standardization of networking technology, cabling and connectors, manufacturers are primarily concerned with how their products connect and work with one another — and not necessarily those of their competitors. The reality is that boaters will be dealing with a "hodgepodge" of communications technology and networking solutions for some time to come. Today, it's not uncommon to see Multi-Function Displays (MFDs) that provide several different data inputs to accommodate different networking technologies.

"If you are shopping for a new electronics package for your boat, there are some compelling reasons to go all one-brand," said Rock. "Among them is that networking of major components like radars, plotters and sounders will be easier. That said, some boaters prefer to select specific systems from different manufacturers, to save money or take advantage of the best features. If networking is a priority, these boaters should definitely consult a trained dealer to discuss what will be involved in rigging, networking and operating their equipment.

A common question The GPS Store gets is whether or not NMEA 0183 devices can be networked with NMEA 2000 devices. The answer is a qualified "yes" – if you install a NMEA 2000 to NMEA 0183 Gateway device like the one offered by Actisense. This product is very useful for boaters who want to keep existing NMEA 0183 components while incorporating new pieces of NMEA 2000 equipment into their helms.

"The best advice I can give consumers is to do your homework, and work with an NMEA certified dealer you trust," said Rock. The NMEA has a free booklet "A Guide to Boating Electronics" that covers topics including standards for connecting and networking. It is available for download from the NMEA at www.nmea.org. To learn more about marine electronics networking from the experts at The GPS Store, call (800) 477-2611 or visit www.TheGPSStore.com.

Today's modern MFDs feature numerous inputs/outputs for connections and networking

An NMEA 2000 to NMEA 0183 Gateway device allows connection of products with different communication standards

Advice from an NMEA Certified dealer is invaluable when planning a marine electronics network

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