LAN-Based Electronics

A better way to monitor your engine's performance and economy!

Special report by Grant Bennett

When you think about it, the basic information provided by the standard set of speed, trim and tacho gauges that come with many of our new hi-tech outboards is pretty ordinary and hasn't advanced all that much in 20 years. Why isn't it standard by now to get the same sort of info you can get on the dash on many modern cars? You know - trip computers, distance to empty, instant fuel economy and so on.

The thing that bugs me most is in relation to fuel monitoring. Fuel levels and usage are some of the most important bits of information we need on our boats, but standard "float" types of fuel gauges are at best, inaccurate, and at worst, totally misleading. You just can't rely on them. Running out of fuel at sea is not only embarrassing, it is dangerous.

These days, most manufacturers do have hi-tech digital gauges available that show you a much wider range of engine and fuel related data than is available on analogue gauges. But they can be expensive. Sometimes they are standard on larger horsepower engines, but generally they are either not available locally, or are an expensive optional extra that you have to specially order.

There is an alternative, and it's called by a fancy name: an "NMEA Network". This allows you to connect a wide range of compatible modern engines and instruments together and then display information from them on a screen - usually this is done on your sounder or GPS screen. Once on the network, you can also share some data between instruments.

I recently purchased a new Surtees Workmate 5.5 and Suzuki DF115 outboard motor. The motor was supplied from my local dealer with the standard set of analogue Suzuki gauges and the boat came with a typical float-type fuel gauge set into the top of the tank. The first time I filled the tank I found that after a day on the water, the gauge told me that I still had a full tank - strangely enough, and despite the Suzuki's reputation as a fuel miser, I didn't quite believe that!

I decided this was not good enough for me, and so I have now established an NMEA network on my boat that allows me to display all available engine data, including fuel information, on the two Lowrance HDS displays that I have fitted.

The benefits!

Now I've got what I think are the most important bits of information (to me anyway!) overlaid on my GPS screen so I can keep an eye on them – instant fuel economy in kilometres per litre, and fuel remaining in my 100 litre tank. The big advantage of this is that I can trim my engine and adjust my speed to the optimum fuel economy setting, plus I always know exactly how much fuel I have left in the tank.

And in addition, in the "Alarms" menu on the Sounder, there are about 15 different engine parameters that you can select alarms for – I've only selected a few – for example I have an alarm set to go off if the fuel level reaches 10% of capacity, and also if the water pressure drops below a certain level or the temp goes above a certain level. This is a helpful backup to the warnings on the engine gauges.

I can also share some info between the two Lowrance displays – for example I can show digital depth readings that come from the sounder, on the GPS unit's screen. This provides for some redundancy should a screen fail.

How do you set this up?

I thought F&B readers might like to know how easy it is to set up, especially as all this talk about

The central principle here is to research and then order the correct "engine interface cables" from the outboard manufacturer - this is not always possible to do locally with existing engines; sometimes the cables must come in from o/seas.

networks and NMEA 2000 protocols makes it sound like you need to be some kind of computer or electronics nerd to understand it! I assure you, I am far from being a computer guru and I managed to do the job myself without too much drama, thanks to some advice from friends and colleagues.

So while I will base this report on my experience with the Lowrance/Suzuki setup, it is really the same process for other NMEA 2000 compatible outboards and other brands of display screens. So let's get started.

What are the main components needed?

First, you have to think of your sounder or GPS slightly differently - try thinking of it being like a computer screen that you can connect a whole bunch of things to. Provided that it meets NMEA 2000 standards (the old NMEA 0186 isn't compatible), it will almost certainly be able to display engine information on its screen. It will have an NMEA 2000 connection on the back, and if you check the manual you'll quickly see if it meets this standard and can show engine data on-screen.

Most newer displays (around 2008 onwards) from Garmin, Lowrance, Raymarine and Furuno (3D) have this capability. Some of them also have the capability to display engine data from twin or even triple engines - thanks to the Yankee penchant for such installations!

The second thing you need is an engine that can transmit information in NMEA 2000 format, or in a format that can be converted to NMEA 2000. Lots of engines have this capability including:

- Many Suzuki 4 stroke outboards
- Many Yamaha outboards, including Yamaha systems with Command Link
- Many Evinrude outboards
- Any engine with electronic control and a J1939 interface
- Volvo engines with EVC
- Certain models of Yanmar diesel
- Caterpillar engines with CAT displays
- Mercury engines with Smartcraft gauges - recently an interface has been created that will allow Smartcraft to interface with NMEA.

Once you've established that you have a NMEA capable engine and display, then you've got the basics required. Creating the "network" is then pretty easy: it is really just a fancy name for a bunch of special cables and connectors that plug together very easily.

So what makes up the Network?

The starting point is to get the special cable that links your particular brand of engine to the network. These are called "engine interface cables" and are specific to each brand of engine. You will also need enough "T" pieces and extension cables to connect various displays and monitors to the network, and finally, you will need a power cable to power the network.

To establish what the IT types call the "network backbone", you simply have whatever number of T connectors you need plugged together or joined by extension cables, with a power cable plugged into one of the T connectors and