



Total control: Sealines are now sporting a DDC electrical system

# ELECTRICAL EVOLUTION

Are a boat's electrical systems about to get more flexible? Two new systems suggest that they might

It's some years since Tech Talk first got to hear of a totally new approach to the DC wiring of boats, known as 'distributed DC', or DDC for short (Tech Talk, *MBY* February 2001). The idea was to adopt the 'circular' layout of the domestic ring main for the boat's principal wiring, and to do away with the conventional 'radial' method by which looms spread out like spider legs from a central supply point, namely the AC/DC circuit-breaker panel. And now a new system from E-Plex looks set to make these advantages more widely available to small-boat owners.

I remember thinking back in 2001 that within a few years all boats would be wired this way. I was wrong. Things have moved much more slowly than that but solutions

to meet the industry's criteria are finally beginning to emerge, based largely on well-established automotive and industrial practice.

### What E-Plex offers

At its core, E-Plex retains the original concept of localised switching and protection of load-carrying circuits monitored and controlled by a digital network, although the electro/mechanical circuit-breakers of the early days have now been replaced by totally solid-state components. The technique is known as 'multiplexing'. But that's just the start. It can also interface with engine management systems, all types of electrical sensors, navigational systems, tank level senders, hydraulics, heating and air-conditioning etc, more or less

regardless of other electronic protocols.

It's a vastly superior way of controlling and monitoring your boat's various systems, bringing them together as an integrated whole rather than a number of totally unconnected entities. Traditionally, that consists of the wide variety of disparate panels, knobs, buttons, switches and gauges that are an essential part of each electrical or electronic system. Instead you get a single touch-screen control panel.

The idea of having to enter a multi-level, drop-down menu simply to switch on the wipers or sound the horn (yes, it has been done) is obviously ridiculous, but it need not be anything like that. The big advantage with multiplexing is its flexibility. If you want a conventional

switch in a certain place for a certain job, you can have it. You want the bilge pump switches to light up whenever a float level switch activates? You can have that too. You can also have an alarm come up on any number of other screens around the boat. No more trips to the helm to see what's causing that strange buzzing noise. You want to start the generator or reset the entire air-conditioning system without getting out of bed? No problem. Controlling and monitoring everything electrical from multiple locations becomes a simple matter of adding additional screens. And *you* can decide how it's done. You can even have a programmable remote control that will bring the entire boat to life as you walk down the pontoon. Welcoming deck lights

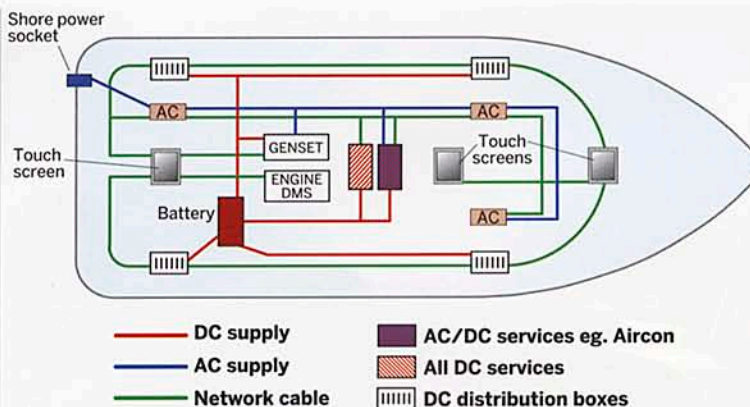
## Why DDC?

DDC is different to conventional thinking in two other important ways. Firstly, the switching and protection components – the DC distribution boxes – are arranged in small groups distributed around the main loop. Each group is contained in a standard box with external terminals. These boxes are then inserted into the 'ring main' at convenient points, close to the electrical loads. For example, one box could look after the saloon and galley, another the master cabin, another the forward accommodation, and so on. Secondly, the switches and breakers inside these boxes are remotely switched by a separate, two-wire digital signalling circuit very similar to a computer network.

The advantages to the boat owner are the removal of the space-hogging central control panel, greater reliability and the integration of all electrical and electronic components with touch-screen control panels. The boatbuilder benefits because the system uses far less expensive copper wiring and offers the opportunity for modular electrical systems across their entire range using standard components, reducing installation time and inventory.

outside and dimmed lights with soft music already playing as you enter the saloon beats fumbling for the battery master switches any day!

And more and more builders are



**On-board DDC: a typical system for controlling everything electrical.**

coming on board. Sealine have quietly implemented the core, distributed DC system plus digital tank monitoring on their past few boats and having proved it in normal service, are looking at expanded functionality on all future models. Aqua-Star adopted a full-house AC/DC system on three models last year and a number of other builders are in active consultation. The first dealer installation appeared on the Sheerline 1020 at Southampton, supplied by Energy Solutions of Rochester, and using a touch-screen for control and monitoring of the entire electrical system.

Such flexibility, of course, can cause confusion, so the manufacturers have put much effort into making E-Plex scaleable. In other words, it can be as simple or as complex as needs be. The primary decision-maker is obviously the boatbuilder, who must decide what he wants the system to do. As boatbuilders become more confident with the system and

touch-screens become more widely acceptable in the recreational boating market, they can expand and add to the system on new models at a pace they – and their customers – are comfortable with. In the semi-custom market, E-Plex allows the boatbuilder to personalise displays and modify functionality to satisfy individual owner's preferences.

### Verdict

After a slow start, it appears that DDC, multiplexing, modular electrics – call it what you will – is now gathering pace. Without a doubt, and despite the slow uptake of the technology, we'll be seeing a lot more touch-screens and far fewer electro-mechanical AC/DC control panels in the future.

**Enquiries:** E-Plex – Wes-Garde Systems. Tel: +44 (0)1562 513960. Website: [www.wesgarde.com](http://www.wesgarde.com); Energy Solutions. Tel: +44 (0)1634 290772. Website: [www.energy-solutions.co.uk](http://www.energy-solutions.co.uk)



**Touch-screen control of the entertainment kit with Energy Solutions' system.**



**Control screens can be located wherever you want around the boat.**