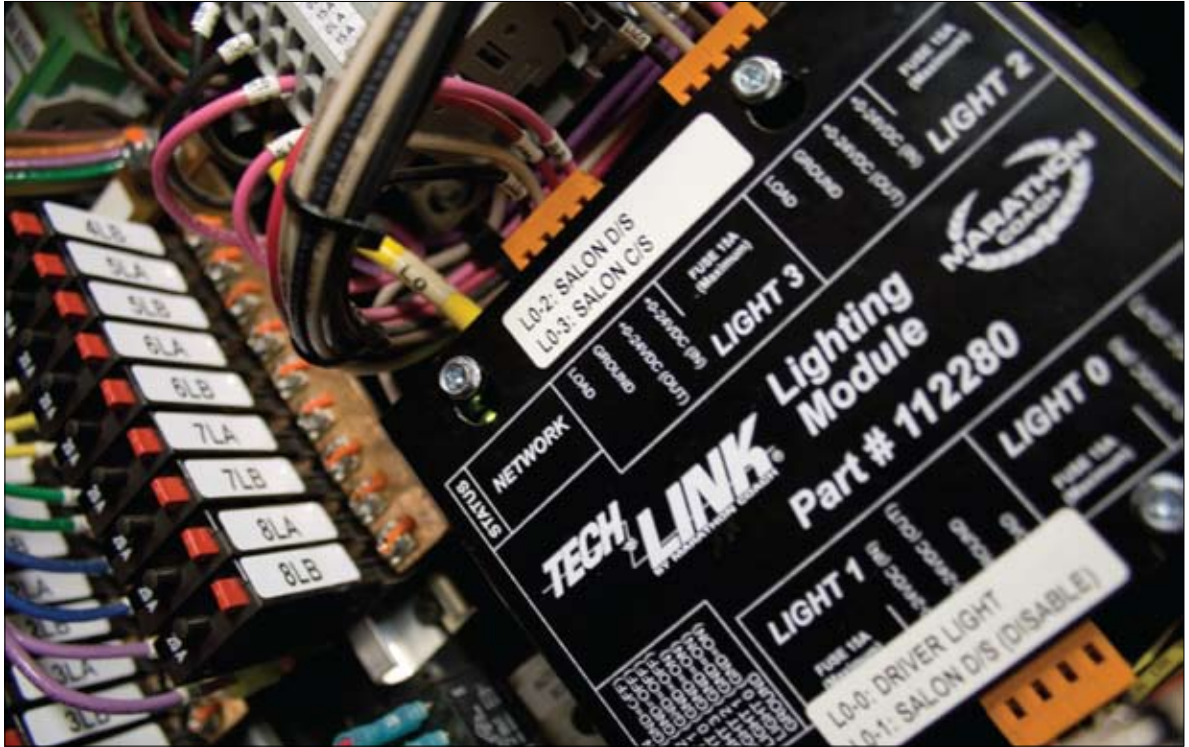


# TechLink: Makes Coaches "Smart"



by Sharleen Nelson

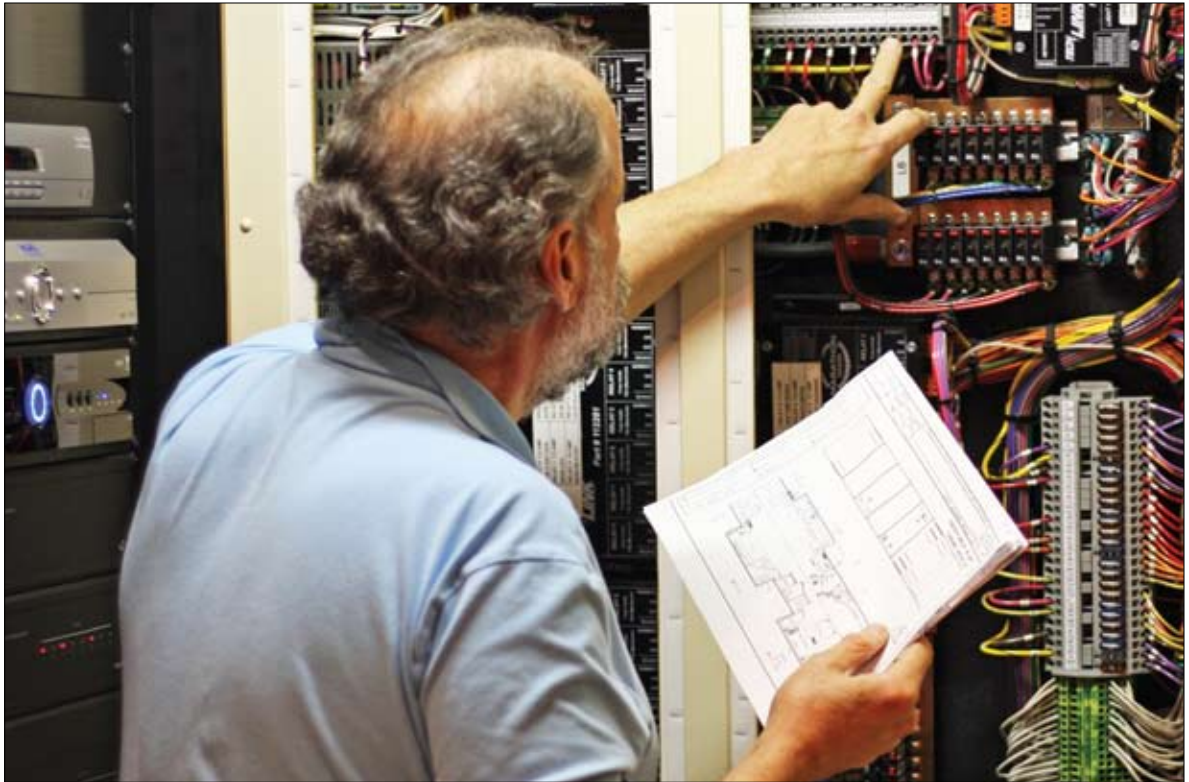
It was the perfect storm—a combination of ever-increasing technology, which required more cable and wiring, with a need for more space to accommodate all of it, not only in residential homes, but also in Marathon coaches that have even more space limitations. In the mid-90s, a single Marathon coach housed the equivalent of six miles worth of wires that ran the length of the coach front to back. According to Engineering Department Manager Jay Graham, engineers literally had to design the coach interior around the huge wire bundles, often moving cabinetry out to accommodate the wires. “We were losing a lot of interior cabinet space because of these big, massive bulks of wire,” he said. Clearly, the writing was on the wall and technology was here to stay. “Customers are never going to want less technology; they’re always going to want more,” said Jay.

In response, in 1997 Marathon introduced TechLink, an ultra-sophisticated “smart” system that controls everything from turning the lights off and on and raising and lowering the blinds, to operating increasingly complex au-

dio/video systems. TechLink had an immediate and significant benefit: wiring in the coach was reduced by half, which made the bundles more compact and freed up valuable space. Each individual ribbon cable replaced 8 wires, reducing the 1,500 individual wire connections to a mere 500 wire connections. “Now days we can almost leave the wiring alone and just reprogram the binds and reallocate what’s going to do what,” said Jay. (“Bind” is a software term for a switch button that has been given a name, such as, “Air Conditioner/Salon.”)

Offered exclusively by Marathon Coach, TechLink’s computerized “brain” allows owners to control the coach’s electrical-based systems from any of the fixed, wired, or remote controls located throughout the coach. Before TechLink, wires were installed from point to point. Each switch and each switch group had to be hard-wired. Now the wires are part of a high-level network switching system that can be programmed to perform specific functions.

The TechLink system comprises smart modules, each equipped with a computer chip pro-



*Electrical Engineering Group Leader John Randleman checks a TechLink system using a detailed engineering schematic.*

grammed to operate some 300 switches in the coach, take in data, make logical comparisons, and provide feedback. Because there is no single main computer, the system's smart module distribution process eliminates the threat of the entire system going down. This innovative design ensures that the coach's electrical system will continue to function in the unlikely event that one component or microprocessor fails, and improves the ability to diagnose and repair electrical problems should they arise. "There are different modules throughout the coach and computer chips in each module," said Jay.

TechLink works behind the scenes in tandem with Crestron, the largest manufacturer and supplier of automation and touchscreen wireless controls. TechLink functions are integrated into the Crestron controller, which allow customers to access feedback information and activate and manipulate operations in the coach. The two systems interact when a button is pressed on the controller. The selection goes through a TechLink smart module, which communicates with a work module to turn on a light or open the blinds, for example. Located throughout the coach are 4 smart modules, 17 switch groups of 10 each, and 15 work modules. Depending on how the coach is designed,

engineers program the custom binds into the smart module as an identifier.

But TechLink doesn't just "make things work." It also has the capacity to provide on-screen, real-time feedback. TechLink tracks essential coach information and displays it on the dash monitor, a bay monitor, or the coach's TV monitors. At the push of a button, customers can view the status of the batteries, fluid levels, and temperatures throughout their coach. "The TechLink system takes into its inputs and monitors some 30 different values, from A/C current use to D/C voltage out and D/C current use," said Electrical Engineering Group Leader John Randleman. "It measures current going both directions from the batteries, so you know exactly how full they are."

Moreover, with more than 700 Marathon coaches now equipped with TechLink, troubleshooting is a snap because the system also has remote diagnostic capabilities that allow service technicians to diagnose and troubleshoot problems via a phone jack to landline. Customers plug their phone line into the phone jack in the bay that is a designated direct line to the TechLink system, and then connect the other end of the phone line to a regular landline phone. A switch located next to the modem activates the system, and diagnostics



*With the push of a button, TechLink tracks the status of batteries, fluid levels, and temperatures throughout the coach and displays them on the dash, bay, and all television monitors.*

can be run and evaluated remotely. Switches can also be reprogrammed remotely. "Before TechLink, if you wanted to change switches you had to physically run wire from one spot to another," Jay said. "Now you can simply reprogram the switch remotely."

According to John, because of TechLink today's

coaches represent the embodiment of sophistication and ease of use for customers. "There are switches that operate things in the system that customers don't even know about," he said. "All the systems are designed to take care of themselves, so no customer interaction is required, except maybe to push the start button." •

## TechLink Benefits

- Greatly reduces complex wiring structures.
- Easy access for customers and service technicians.
- Allows service techs to investigate customer issues 24 hours a day, 7 days a week.
- Accurate monitoring of coach systems are displayed on all monitors.
- The network interfaces and integrates the coach's low-voltage systems.
- Remote diagnostics provide system fault indication, verification, and isolation.
- Is easily expanded and upgraded.
- Integrated automation of coach resources and audio/video systems.
- Specially engineered to control low-voltage resources used in the mobile RV environment.
- Controls the switching and dimming of low-voltage lighting.
- Switches coach resources "on" or "off," and controls resources' behavior.
- Monitors coach resources (battery power, tank levels, etc.), and makes complex decisions based on the information received.
- New technologies can be integrated as they become available.