

Helping to pave the future



(Photo: HED/Carlson)

Replacing analog circuitry by CAN-connectable devices in pavers provided more benefits than adding of displays.

The Pacific Northwest of U.S.A. is known for its rainy climate, and the infamous weather brought Carlson and HED together. Carlson was looking for an electronics solution to solve water ingress problems. Kevin Comer, Carlson's Engineer Manager, saw HED's demonstration of a working display module submerged in water at Conexpo, and encouraged his engineering staff to reach out. After success with a display project, Carlson and HED started to work together, most recently on Carlson's CP-100 and the CP-130.

The CP-100 and CP-130 are commercial class pavers that feature more options than many other machines in their class. They both utilize fully electronic controls with custom legend rocker switches and twin 7-inch color touch displays for operator input. While the most commonly used functions have switches available, almost every function of the machine is accessible through the graphical user interface on the displays.

The CAN controller and software by HED replace the CP-100's original analog circuitry and mechanical engine control. This upgrade provided benefits beyond the addition of the displays. It accommodated the increased needs of the engine control, provided more accurate control over several key functions, and eliminated time consuming calibration procedures from the traction control and steering. EPA Tier 4 legislation requires much more stringent control over the exhaust gas emissions. To accomplish this, additional components, including various actuators and sensing are required. The CAN-based controller allows Carlson to interface with the factory control system for the engine

via the CAN-based SAE J1939 network. Carlson chose this avenue over the much more costly option of having a custom engine calibration created to operate with the previous analog circuitry.

The previous CP-100 system required numerous discrete components that increased failure risks. All of the wiring had to be duplicated on both sides of the machine and joined in a central control box, while avoiding backfeeds and short circuits. The (new system) eliminated redundancies, requiring only a few switches while the software does the rest. Adding auger control functionality eliminated a previous controller that costs U.S.-\$ 2000 per machine. This savings alone justified the cost of purchasing the controllers. Streamlining controllers reduced the number of harnesses and connections for less failure points. The paver went from up to eight harnesses spanning the entirety of each machine down to four dedicated ones.

Not only does the controller communicate with the engine itself, it also lets mechanics connect to system diagnostics with the Conductor software. This makes troubleshooting easier and reduces time for service calls by allowing the technician to view the status of every aspect of the control system from a single concise screen.

By upgrading to an electronic control system using CAN networks, Carlson is staying on pace with industry trends. Furthermore, the upgrades eliminate the need for calibrating the steering control, which saves a minimum of two hours of calibration time per machine, and makes the process more exact. ▶

PC/CAN Interfaces

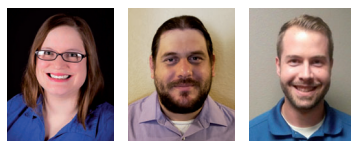


“Reduction of hours for calibrations increases our shop throughput, which in turn increases how much product we can produce,” said Kevin Comer. With a high production rate of machines released per month and ever rising demand for the product, the calibration hours could balloon. The electric steering control prevents that, as the software does its own calibration.

HED understands that a company can have the best technology in the world, but it won't matter if people don't want to use it. That's why HED and Carlson made improving user experience a central goal of the CP-100. By replacing toggle switches and decals on metal plates with 7-inch touch screen displays, improving the accuracy of controls, and simplifying the diagnostic process, HED improved functionality for Carlson's customer.

The CP-100 is far from the end of the HED-Carlson partnership. In the future, the next project is to install on-board telematics onto Carlson's pavers. As with the streamlined CAN controller, adding on-board telematics would have multiple benefits. First, it will help equipment owners understand where each asset is at any time, what it's doing, and how it's being used. Second, HED's remote diagnostics and over-the-air programming (OTAP) telematics will make service calls easier for Carlson's dedicated staff of technicians. Whereas service calls previously required multiple days of travel to customer sites for a diagnosis, a Carlson service tech can solve the problem quickly using HED's remote diagnostics and back office portal tools, reducing the need for a trip to the customer. The OTAP tools facilitate remote software updates, eliminating the need to send modules back and forth.

The final touch that made the CP-100 project successful is HED's approach to system development with their customers. HED incorporates a customer-focused, partnership approach to each project. HED application engineers worked side by side with Carlson's system engineers to define, develop, prototype, troubleshoot, and document the new system. This collaboration streamlines development times, unifies project expectations, and results in the giving the customer an optimized vehicle control solution. Comer reflects that “Carlson and HED has been a good team together developing this platform of products. We look forward to doing future projects and using HED components in the future.”



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