Chetco Digital adds color touch to product line in three weeks

Background

Chetco Digital Instruments designs and manufactures high quality digital instrument panels for marine and automotive applications. Their digital gauges and electronic switches replace old fashioned analog gauges with sealed digital readouts. The digital version puts all gauge data in one place for fast visual checks and adds interface flexibility.

Using marine standard syntax (NMEA 0183) their products interface directly with vessel data systems to monitor multiple engines and on-board systems. Raw data is converted into plain language (for example, fuel is at 35%) and transmitted over USB, Ethernet or an Internet connection then shown graphically on LCD displays in various locations on the vessels.

Although their monochrome products were popular, customers began to ask for color, in part because the monochrome user interface was tough to use. Customers had to scroll through various menus using buttons to find the functions they were seeking. To meet customer demand and improve their user interface, Chetco Digital began to investigate options to add color touch.

Critical Issues

Chetco Digital needed to add color touch capability quickly without incurring high development costs and without wasting a lot of time coming up to speed on the technology.

"At first, the terrain was pretty intimidating. We did not have experience with color touch displays and decided there was just too much R&D to design the whole thing from the ground up," according to Joe Burke, CTO of Chetco Digital.

The Chetco Digital vGaugeG12C multi-function color digital instrument panel comes in a compact sealed design using the Reach 5.7-inch Prime View display module in a Chetco Digital's designed enclosure.

Chetco Digital had several requirements:

1. **Rugged, Sealed Units:** Chetco Digital needed color touch control surfaces built for years of dependable performance in a corrosive marine environment.

2. **Daylight-readable Panels:** Chetco Digital had trouble finding stock LCDs that were bright and rugged enough to meet their outdoor requirements.

3. **Multiple Panel Sizes:** Most Chetco Digital customer installations require multiple displays. Typical customers put a large screen in the helm station, a small screen in a flying bridge, and another small screen in the engine room.

4. **Sophisticated Command Sets:** Other systems Chetco Digital investigated required a lot of up-front work to create an image vault containing one bitmap for each possible gauge reading. For example, to show a GPS heading of 260 degrees NW at 3.3 MPH these systems had to find, copy, and display the appropriate graphic which results in extremely poor performance.

5. **Built In Touch:** Chetco Digital, who did not have a background with touch, wanted to avoid the additional level of difficulty associated with adding touch to an existing panel.

"Reach allowed us to make the transition to color touch we knew we needed to make."
– Joe Burke, Chief Technical Officer, Chetco Digital Instruments

Solution

Chetco Digital chose Reach's 8.4-inch Enclosed Units to use inside main helm stations. Reach worked closely with Chetco Digital to modify the standard product to use a high brightness, high reliability industrial grade NEC panel.
On the flying bridge, and in engine rooms, they use either Reach's 4-inch Enclosed Units, or the Reach 5.7-inch Prime View display module which fit into the Chetco Digital enclosure designed for monochrome screens.

"The 4-inch is rock solid in terms of being used outdoors. It works in a driving rainstorm. Together 8.4-inch and 4-inch panels work out nicely because they look identical except for size giving our customers a nice matched set," according to Burke.

Using standard asynchronous serial ports, Chetco Digital connected their system's microcontrollers to various Reach SLCD controllers to power multiple screens. Simple ASCII commands are used to draw images, text, controls, and other interface elements, on the screen. The built in color touch controls report back over the serial line when they are activated or changed. Images are stored on the SLCD controllers in flash memory. Burke said, "Because the command sets mimicked what we had done for monochrome displays, our migration to color touch was a lot simpler than we expected and expedited the implementation."

Results

Reach color touch display units have made a significant impact on Chetco Digital's business.

Increased Sales

Chetco Digital still sells monochrome units to customers needing direct sunlight readable displays. However, "When customers see that they have a choice, just about everyone is going for color. Having color makes the product much more interesting to them. As a result, revenue has increased five times," said Burke.

Reduced Time to Market

Using Reach's enclosed units dramatically decreased Chetco Digital's time to market. "With the Reach development kit, we were up within a week. After three weeks, two engineers had everything ported and most of that time was spent developing the color graphics," reported Burke.

Reduced Development Costs

In marine industry, enclosures are critical. According to Chetco Digital, companies often spend as much money designing enclosures as they do the electronics that go inside. In this case, Chetco Digital was able to put the stock Reach 8.4-inch and 4-inch enclosed units to work and leverage their existing 5.7-inch monochrome enclosure and wrap it around the Reach 5.7-inch module.

Smooth Production

Chetco Digital purchases units from Reach on an as-needed basis, loads their programs onto the SLCD controller boards, connects them to their units, and sends them to customers.

Revolutionized Usability

Customers see all available functions on a single screen and can control lights, pumps, motors, on-board equipment, and electrical systems with a single touch. Burke says the company is getting a lot of attention from their target audience, "For multi-engine vessels that need to monitor engines, bilge compartments (waste water, ballast for boat), fuel, etc. we are able to cluster eight types of gauges and several switch clusters. This way they can switch to a fuel management screen and see information just related to fuel, then switch to a port or starboard engine screen, or onboard generation screen and get detailed information from one screen." Now Chetco Digital is able to customize products with little effort, states Burke, "We give customers a selection of colors to choose from and construct the gauge clusters the way they want them. We can also modify labels, languages, etc. to meet their specifications."

New Product Development

Chetco Digital is putting Reach displays into several new products. For example they are using the 4.3-inch module in an automotive environment auxiliary gauge cluster that attaches to the windshield to manage fuel for long haul truckers. They are also using the 4.3-inch module in street legal cars that turn into racing vehicles to monitor exhaust temperature, fuel pressure, turbo boost pressure, and other auxiliary data that you would only be interested in when running an engine at its maximum rating.

Want to be insulated from changes in LCD technology and format?

Chetco Digital (using our 8.4-inch, 5.7-inch, 4.3-inch and 4-inch panels) is a good example of how you can standardize on the Reach controller family and easily change to a different panel size or type now or in the future.

Instead of spending valuable time and money doing color touch control surface technology research and development, engineers at Chetco Digital are able to focus on their core competency: collecting information from various systems to display, securely housing the systems for rugged environments, and delivering products customers want.

Using the Reach software application programming interface (API) gives them the flexibility to write code once and make it work with three different panels with two significantly different controller architectures. On the low end, Reach uses a traditional microprocessor for panel control. On the high end, an ARM processor is used to drive larger panels. All of this is transparent to Chetco Digital who only needs to worry about providing: power, a serial connection, and appropriate protocol.

Using Reach products also protects Chetco Digital from technology changes in the future. For example, if Organic LED (OLED) technology becomes cost-effective Reach will develop a controller for that technology. Even though the new panels will not be driven the same way, Reach will do the work so that the same power, serial connection, and protocol is used. This way, Chetco Digital can focus on their core competencies and not spend time researching panels, touch technology, and so forth.