

Wavelength adds USB 2.0 to high-performance controllers, with a hand from Ellisys

Client

Wavelength Electronics

Bozeman, MT

Laser diode drivers
and thermoelectric controllers
www.teamwavelength.com



Challenge

To update products with USB 2.0 ports, as requested by customers.

Solution

To debug hardware and firmware issues, Wavelength used a USB Tracker 110 protocol analyzer from Ellisys.

Benefits

Wavelength quickly resolved all the USB issues with its latest laser diode driver.

Quote

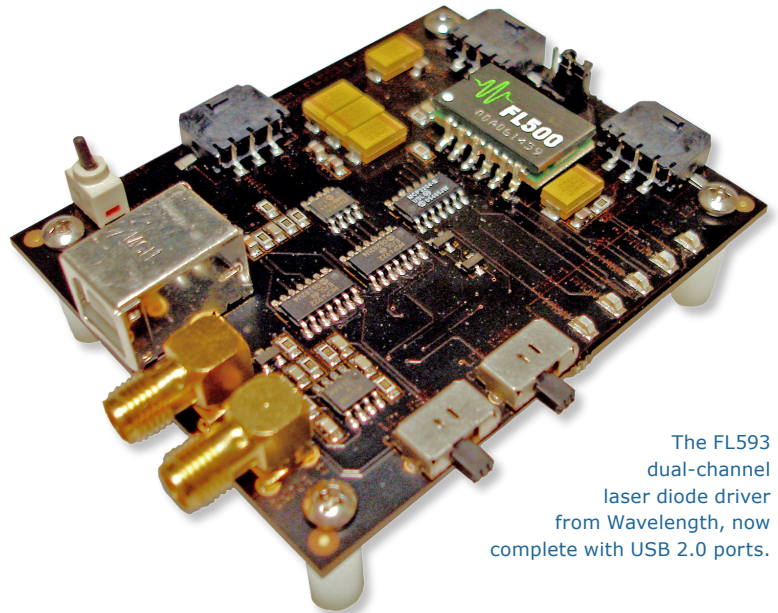
"The bus analyzer performed beautifully. Everything went smoothly right out of the box, and I was able to solve every problem we were having with enumeration in a couple of days."

Jason Tost, Engineer,
Wavelength Electronics

Since 1992, Wavelength Electronics has supplied instrument-grade laser diode drivers and thermoelectric controllers around the world.

Modules from the Montana-based company were always known for high performance. But customers were asking for something more; they wanted USB ports to interface to modern-day PCs. To maintain its edge, Wavelength needed to replace its aging RS-232 interfaces with USB 2.0.

That looked like a steep learning curve for its engineers, on top of buying costly test equipment. Fortunately, Wavelength found an easy-to-use USB protocol analyzer from Ellisys that did everything they needed.



The FL593 dual-channel laser diode driver from Wavelength, now complete with USB 2.0 ports.

Picking the right unit

"USB was definitely at the top of the list of customer requests," says Jason Tost, an engineer at Wavelength who, like many, was quite familiar with using USB, but not developing for it.

After getting the USB spec and wading through it, the Wavelength engineers found a lot of helpful advice in the book "USB Complete" by Jan Axelson — including a list of recommended test equipment.

Knowing that their design and debugging would go much faster with a protocol analyzer, they started evaluating what was on the market.

The first unit they looked at was the SBAE-30 from Catalyst Enterprises.

"But it was well beyond the scope of our needs, and the price reflected that," says Tost. "And in my opinion, the Catalyst software was not as intuitive or easy to understand as the Ellisys software."



Ellisys is a leading supplier of cutting-edge USB, Wireless USB and Ultra-wideband Protocol Analyzers. The company's products help hardware, software and test engineers save development effort, improve quality, and accelerate time to market. Ellisys protocol analyzers range from simple and cost-effective tools to high-end fully-featured equipment.



Based in the heart of the Rockies, Wavelength Electronics is a leading supplier of high-performance thermoelectric controllers and laser diode drivers. Since 1992, Wavelength has provided instrument-grade components to system integrators and researchers in many markets.

“The Ellisys unit worked absolutely beautifully for us. It took only two to three weeks to resolve all the hardware issues.”

When he got his hands on the Ellisys analyzer, he knew he had the right tool for the job.

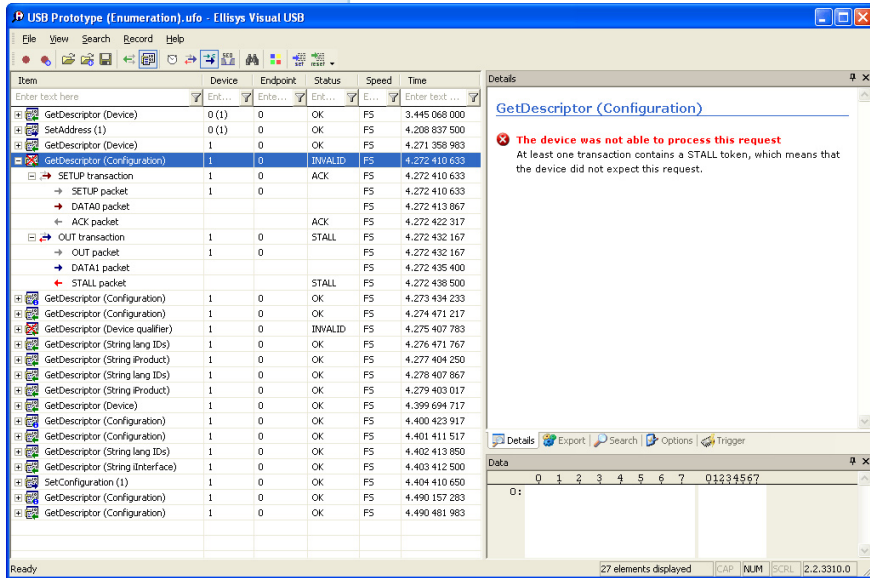
“In the end, I found the unit from Ellisys to be much more intuitive and easier to set up and use. It was very reasonably priced, provided the functionality we needed, and had a much smaller desktop footprint.”

With all this going for it, Wavelength picked the Ellisys protocol analyzer.

Before finding the protocol analyzer, Wavelength faced a tough time troubleshooting. In particular, Tost was having problems around enumeration, the process in which the USB host recognizes a new USB device trying to communicate with it.

“After receiving the Ellisys box, I was able to resolve every problem we were having with enumeration in a couple days,” says Tost. “The Ellisys unit worked absolutely beautifully for us. It took only two to three weeks to resolve all the hardware issues.”

Thanks to the Ellisys test equipment, he was able to wrap up his most pressing design project, and the revamped laser diode controller is now on the market.



Two errors were detected during device enumeration and are highlighted in the Ellisys software

Quick results

Tost was working on a revamped FL593 dual-channel laser diode driver, a module about the size of a business card used for precise applications in everything from spectroscopy to health care.

Although he didn't need the full bandwidth of high-speed, he still went with a USB 2.0 interface to give his customers the most up-to-date design.

“One of the design goals behind this product was to create something tolerant to delays in bus traffic,” he says. That shouldn't be a problem: His final driver typically needs less than 1% of the USB 2.0 bus capacity.

“Because of the lightweight nature of our device protocol, and the number of transfers needed to operate our product, full-speed USB provides more than sufficient bandwidth,” says Tost.

Intuitive software

Such fast results flowed in part from the Ellisys software bundled with the analyzer, which Tost and his colleagues found powerful, yet easy to read.

“The Catalyst GUI does make sense, after you read the manual, and use it for some time. But when you do your data acquisition with the Ellisys, the way that it's presented is extremely intuitive the first time you see it. You know exactly what you're looking at.”

And he likes how he can drill down through the hierarchy on the screen to view more and more data about each signal.

Tost says he can't comment on Ellisys technical support, because he never needed to call.

“Honestly, I didn't have any problems to call about. Everything went smoothly right out of the box,” he says. “The only thing I ever called about was to ask if they were considering doing an Ethernet protocol analyzer.”

The engineers at Wavelength know a lot about designing high-performance products for demanding applications. So they can appreciate how the Ellisys test equipment meets the same high standards: They find it well-designed, easy to use, and a reasonable price for any USB development project.

“I have already recommended it to several colleagues,” notes Tost, the highest praise any engineer can give. ↩️



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