

Automation Speeds Up QC Process

Opto Power Corporation, a division of Spectra-Physics, founded in 1992, is a leading manufacturer of high power diode lasers for medical, industrial, graphics and other direct thermal and illumination applications. These products range from bare diodes on conductive heatsinks, to fiber-coupled single emitters and arrays, to microprocessor-controlled units and fully integrated OEM modules.

In September of 1995, Opto Power joined a growing list of optics companies headquartered in Tucson, Arizona. With its own research, production, and distribution facilities on one site, Opto Power corporation is a leading force in the diode laser industry.

All aspects of production are performed in-house, including epitaxy, processing, packaging, assembly, fiber-coupling, test and burn-in. Great care is taken to ensure that their high-power laser products are "easy to use right out of the box".

The Project

As part of the QC process, each laser is dynamically exercised during the burn-in procedure, an operation that occurs immediately after the lasers come off the manufacturing line. The burn-in process continues over a period of 24 to 48 hours during which time a cyclic pattern of events occurs. Each laser is configured, and turned on and off at precise intervals within the cycle. At the same time, data is collected from each laser at specific times within the cycle. This pattern continues to loop throughout the entire burn-in process.

What Opto Power needed was a software package that would permit the automation of dynamically exercising their laser units during burn-in, and one that would easily lend itself to data collection. There were several prerequisites for the system that would have to be met, with ease of implementation being a mandatory feature.

Ideally, they required a system that would allow them to activate more than one laser at a time. Secondly, the ability to send multiple commands to each laser simultaneously was required, preferably with the added capacity to repeat, delay and pace the commands at variable intervals. Lastly, they required a software package that would collect data, and offer numerous data processing options.

The Solution

Two years ago, an engineer at Opto Power was able to substantially reduce the time required to analyze QC data by implementing Collect™ our Windows®-based data collection software. Collect is designed for those who simply want to turn on their computer and begin collecting data. It is ideal in laboratory and production environments where an easy-to use system is required.

System Factors

The success of the automation rested on several system factors. First, Collect permits data collection from up to 9 instruments at one time. Most computers can support up to 4 standard RS232 COM ports. These are located on the motherboard or an add-on board. Collect works with multi-port boards configured to work under a Windows®-based operating system.

Applying this feature, the software engineer (Mr. Allan Burklund) at Opto Power installed an eight (8) port RS232 card manufactured by Digi® International. This allowed him to connect a single laser unit to each of the eight available ports. The next step was to access the software, and configure each of the eight laser units to work with Collect. This task involved assigning an Instrument Name to each laser, as well as defining the necessary COM port information for each.

A prerequisite of the burn-in process was that each laser had to receive commands from the computer in order for it to start and stop transmitting data. The software allows you to easily define up to twenty bi-directional commands for each laser, which in turn are sent to the laser to control its operation.

In addition, Collect is able to repeat, delay, pace or send commands to each laser at variable intervals by including specific times within the command line. This feature satisfied the requirement of dynamically exercising each laser unit during the burn-in process. Mr. Burklund was able to configure the software to send time cycled commands to each of the eight lasers. Automatically he could now configure the lasers, turn the lasers on and off at specific times within the cycle, and incorporate requisite delays into the cycle. Essentially, he was able to control eight lasers at one time during the burn-in process.

Further success at Opto Power relied strongly on the ability of the Collect software to send data directly to another Windows®-based application, including Excel®, Quattro Pro®, Access®, SigmaPlot® and dBase®. In their case, data from each laser was sent directly to Windows® Excel®. The Excel spreadsheets were automatically updated in real-time with data from all eight lasers. Allowing the technicians to quickly scan the output from each laser for repeated accuracy, the software considerably reduced the time required to analyze QC data. The program can be set up such that the instrument and the application are locked together, so that data from the instrument will always be directed to the specified application upon startup. With the floating command dialog box, you can control any instrument directly from an external Windows® application. All these features helped to streamline instrument startup at Opto Power, saving additional time and making day to day operations more efficient.

To the company seeking a way to automate data collection, Collect can be the right choice for easily and quickly implementing a system which performs bi-directional instrument control and extensive data processing capabilities. The ease with which the software engineer can generate and manipulate the commands sent to the instrument provides an effective extension to the capabilities of a traditional data collection package.