Case Study: Brooks Automation

Company Uses Opto 22 Hardware and Software to Develop "Universal Testing Platform" for Product Qualification

With a mismatch of operating systems, software, and hardware components, testing processes at Brooks Automation were becoming more and more complex to manage—a situation no company wants to face. But for Brooks, there was even more of a concern. Companies in the semiconductor industry tend to be extremely cutting-edge, constantly deploying the latest technologies in order to keep pace with competitors and meet the overwhelming demand for product that began with the technology boom of the 1980's. In order to address this growing issue, Brooks was going to have to reexamine the systems and equipment it was using to test and qualify any product outgoing to OEMs and end-users, update this equipment, and then standardize its methodologies and procedures for these platforms.

Brooks Automation

Founded in 1978, Brooks Automation Inc. specializes in improving efficiency for companies in semiconductor and other manufacturing industries. Brooks accomplishes this by offering best-in-class hardware and software products and services that optimize manufacturing equipment performance, lower operating costs, and enable customers to bring products to market with greater speed and profitability. Towards this end, Brooks factory automation hardware products include wafer transfer robots and wafer transfer platforms for process equipment, automated material handling systems, and other semiconductor related devices.

The Challenge

The decision was made to standardize on Microsoft Windows® XP as an operating system and no longer support workstations running anything other than Windows 2000 or Windows XP. However, some of Brooks test equipment (both hardware and software), was not compatible with these new OS. Thus, the decision was made to begin upgrading existing test platforms to make them fully compatible with Windows XP. Some of these test platforms used the OS2® and Windows NT® operating systems and these were given top priority.

The Solution

In order to meet its new initiative and thereby help automate and streamline production and product qualification, Brooks developed a "universal test stand" used to control airflow, pressure, humidity, and other variables in its testing areas for semiconductor process control devices. Brooks used a combination of Opto 22 hardware, including SNAP Ultimate I/O and B3000 I/O processors, as the core components for this testing platform. Martindale Associates, a

Brooks Automation corporate headquarters

Massachusetts-based distributor and systems integrator for manufacturing execution systems, designed and built an I/O module chassis for Brooks and worked with the company to develop and load individually programmed test sequences in several different configurations based on the system requirements specifications provided to them by Brooks. A standardized front-end application was part of this development effort, allowing the different configurations to be loaded from one main interface.

Thus, what Brooks built is, in essence, an all-purpose process control device testing platform. Fundamentally a portable, utilitarian workstation, the test platform is equipped with all the controllers, input and output modules, and connectors needed to attach to, control, monitor, and capture readings from the sensors, actuators, and probes needed to perform product qualification. The operator need only transport the test platform to the area for the specific product to be qualified, connect it to the standardized interface, then use the integrated PC and front-end application to call the proper test program or strategy.

"We built our test stand using Opto hardware because the company offers modular I/O products that we could easily mix and match, assemble to meet our needs, and update for future considerations," explains Miguel Ezpeleta, Manufacturing Test Engineering Manager at Brooks Automation. "We found this the best approach towards creating a testing platform that we could apply to a number of different product families. Also, the Opto hardware scales up very easily, so on those occasions when we want to interface to new systems or equipment, we can purchase and add what we need without having to worry whether or not it will be compatible with the rest of the platform. Sometimes it's as easy as popping in new modules and simply having our R&D engineers design any new I/O maps needed. ioControl [Opto 22's control programming software] makes this very easy."

Martindale integrated the software for Brooks. Experts in the development and deployment of process control, data acquisition, barcode, RFID, and other systems, Martindale programmed Brooks' new system using ioControl and Brooks soon had all the programs it needed for its testing needs.

"One of the problems Brooks was facing was that when you have multiple testing programs, operators sometimes have trouble understanding which program is used for which test," says Martindale's Juan Peguero.

To solve this, Peguero worked with Brooks and used ioDisplay, Opto 22's Windows-based human machine interface (HMI) development application, to create a collection of easily understood graphics-based interfaces for all testing processes, patterns and sequences. These interfaces all had a common look and feel so operators at Brooks would have no trouble calling them up and
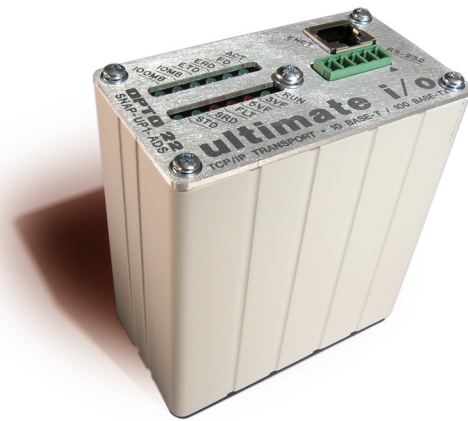
Brooks Automation uses SNAP Ultimate I/O processors as the core component for its new testing platform.

knowing immediately which program and which test they were dealing with.

The Results

Each Brooks test platform has its own preconfigured Opto 22 I/O set. The modular nature of the Opto 22 brand means that Brooks can swap in what they need and adapt to any new instruments or equipment it needs to connect to. From a software perspective, ioControl's flowchart programming makes adjustments to testing profiles, airflow, and other processes simple and straightforward. As Ezpeleta explains, "Our Opto 22-based universal testing platform gives us the ease-of-use, versatility, and the reconfigurability we need to qualify our product to OEMs and other outside companies that we deal with."

About Opto 22

Opto 22 develops and manufactures hardware and software products for applications in industrial automation, remote monitoring, and data acquisition. Using standard, commercially available Internet, networking, and computer technologies, Opto 22's input/output and control systems allow customers to monitor, control, and acquire data from all of the mechanical, electrical, and electronic assets that are key to their business operations. Opto 22's products and services support automation end users, OEMs, and information technology and operations personnel. Founded in 1974 and with over 85 million Opto 22-connected devices deployed worldwide, the company has an established reputation for innovation, quality, and reliability.

Opto 22 products are sold through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at 800-321-6786 (951-695-3000) or visit the website at www.opto22.com.