Compact Ethernet Switch Helps to Sustain Record of High Reliability in Scribing and Breaking Semiconductor Wafers

The semiconductor industry is constantly looking for ways to increase production yields and Loomis Industries in St. Helena, CA, is leading the way with its new LSD-150 Scribe Dicing Machines that use Contemporary Controls’ compact Ethernet switches.

Historically, scribe dicing semiconductor wafers yielded irregular quantities because the tools were not manufactured properly nor accurately positioned in the system. “To address these issues, Loomis Industries developed a process in scribe alignment and accuracy that is unmatched by our competitors,” said Jim Cook, the company’s Production Manager. “We hope to continue with this record of high reliability and productivity with our new LSD-150 scribe and break system. I think that the quality of the Contemporary Controls’ CTRLink® Ethernet switch and the Galil Motion components will help us achieve this goal.”

Loomis Industries had to locate a manufacturer of industrial-grade, small footprint Ethernet components and discovered Contemporary Controls in Downers Grove, IL. “A switch was preferred because the Galil hardware was not designed to be daisy-chained,” said Cook. “A switch was required to link up the Ethernet devices that occupied the limited space in the LSD-150 chassis. “I was looking for a product aimed at giving its users compact size and versatility in connecting Ethernet equipment,” Cook said. “The Contemporary Controls’ EIBA-100T/R switch was a perfect fit.” Why?

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First, the model EIBA5-100T/R switch operates from common low-voltage panel power, AC or DC. Other switches connecting Ethernet equipment have a proprietary plug on the switch housing and a “wall wart” transformer that requires a 120 VAC power outlet. Loomis Industries already had a 24 VDC power supply inside their LSD-150 machine. “With this Ethernet switch we were able to easily energize the switch from our switching power supply,” explained Cook.

The size of the switch was a factor. The EIBA5-100T/R switch is truly compact, measuring 3.3" H x 0.9" W x 3.5" D. “When we decided to use the Galil system we were short on space. The Galil components are much larger than what we had been using. A switch designed for home or office wasn’t an option. The smallest of those are bulky in comparison to the EIBA5-100T/R switch.”

Cook indicated that the EIBA5-100T/R switch has all the features that industrial users require. This five-port 10/100 Mbps switching hub offers low-voltage, wide-range AC or DC power sources and LEDs exist for activity/link, data rate, and power. The activity LEDs face the technician for easing troubleshooting. The unit’s label can be written upon so...
port connections can be documented regarding the location of connected equipment. This device provides easy DIN-rail installation.

The system is comprised of a PC, and the LSD-150 unit, a tabletop machine measuring approximately 3’ x 2’. The LSD-150 is used inside clean rooms that are environmentally controlled. The PC is positioned near the LSD-150 since interaction is required, at times, from the operator via the mouse and the keyboard.

This EIBA5-100T/R switch is DIN-rail mounted inside the LSD-150. Cables from the switch connect to the PC’s Network Interface Card (NIC) and to Galil motion control components, which connect to DC servomotors, 3-phase servos, valves, pressure regulators, and the sensors. A camera interface board (“frame grabber”) in the PC takes video input from the LSD-150’s video microscope.

Once Loomis Industries had connected their system via Ethernet, the company’s machine was able to do complete production runs without any interruptions. “Ethernet is a time-tested technology that has great capability for problem diagnosis and resolution,” Cook said. “Other reasons for Ethernet’s popularity in this application is its speed, flexibility in expansion of generic devices, no need for special cables or connectors, and Ethernet components are not only inexpensive, but they are available worldwide.”

Through the user interface, the PC communicates to the LSD-150 how to process the wafer once it is loaded on the scribe. The PC and the corresponding recipe file dictate scribing air pressure, breaking air pressure (both analog controls), scribing and break speeds, and focus positions.

Cook concluded by saying that it is important to have reliable suppliers. In reference to Contemporary Controls, Cook said the company’s Ethernet switch was a good fit due to its size, construction, and performance. “In addition, these switches are inexpensive; so I can stock several at a time, and I don’t have to wait weeks to get them shipped to me,” he said.

“A reliable supplier benefits not only our company, but also our customers,” Cook explained. “It helps our company to provide quality products and services for our customers on time.”