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## Berkeley Process Control supplies highly automated wafer controller at 300-mm fab

By [Bill McIlvaine](#)  
 Semiconductor Business News  
 (03/14/00, 01:33:08 PM EDT)

RICHMOND, Calif. -- Berkeley Process Control Inc. here today delivered what it said is world's fastest and most reliable 300-mm wafer management system to Semiconductor300, the joint-venture DRAM fab in Dresden, Germany, operated by Motorola Inc. and Infineon Technologies AG.

The system marries a Berkeley Process Control BXi machine controller and 13-station FOUP (front-opening universal pod) buffer with Steag AG's wet chemistry tool, which will be installed in the Dresden fab. According to Berkeley president Paul Sagues, the entire system is run by a single controller with a powerful RISC processor and 100-megabits-per-second Ethernet, and provides remote diagnostics via the Internet. The BXi Controller is connected to the buffer control system through a standard SECS-II/GEM command interface.

"By integrating internal-powered servo motion and logic in a small package and then adding an Ethernet connection, we are able to eliminate a large amount of intricate wiring and unnecessary user integration effort," said Sagues

"Most buffers have control cabinets the size of a refrigerator," said Sagues. Berkeley's is the size of a cigar box, and incorporates Berkeley's patented Autocalibration technology, which rapidly performs electronic mapping of the buffer stations, loadport and pod door opener



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positions. According to Sagues, the BPC system literally reprograms a robot in 90 seconds, using touch technology and laser beam sensors.

"Push one button and the BXi controller 'senses' where everything is on the frontend and programs it within a few minutes," said Sagues.

This eliminates the need for humans to program the system manually, which can take hours. According to Sagues, Berkeley's on-buffer sensors and proprietary touch technology replace obsolete tech-teaching with a powerful algorithm-driven controller that locates buffer stations and robots and teaches them in minutes, instead of hours.

Also in the 300-mm environment, the risk of contamination in the system is higher. "The last thing in the world you want is a super technician climbing around ultra-clean 300-mm tools, contaminating wafers while spending four or more hours with a teaching pendant eyeballing correct positions for wafer handling robots, aligners and FOUPs," Sagues said.

Berkeley introduced the BXi controller last year (see [June 14, 1999, story](#)). The BXi controller is also in use in several processing systems at Sematech's I300I research initiative. The BXi "caught Steag's attention," said Sagues, and Semiconductor300 saw BPC's technology in another industry application. The BXi controller has already handled more than 1.2 million 300-mm wafers at Semiconductor300 without a single incident, according to Sagues.

Semiconductor300 is still a pilot fab but has been producing DRAMs on 300-mm wafers in volume for several months (see [June 9, 1999, story](#)). Sagues said he believed the Steag-BPC system will go into full production at the fab.

Sagues said that semiconductor process tool makers want simple, fast and reliable computerized tool controllers that communicate simultaneously to multiple robots, notch aligners, indexers, FOUPs and other devices on the tool wafer handling frontend. "Berkeley's systems do all of that and more," he said. "We are also borrowing much proven technology from our existing product lines so we are able to meet the market's need for both reliability and price."

The BXi controller offers variable configurations. The buffer can be configured for 12 standard FOUPs carrying 25 wafers or 18 FOUPs carrying 13 wafers, with the entire controls package contained within the compact buffer frame.

All buffer information is available over the Intranet or an intranet, allowing remote monitoring, troubleshooting, and data logging. The buffer control system compares the calibration values to the current operation values of the

mixed-signal engineers.



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buffer robot and other mechanisms and indicates in advance when buffer tool device maintenance should be scheduled to prevent unscheduled downtime.

Overhead and automated guided vehicle delivery configurations are available for maximum flexibility in integrating with fab material transport systems.

Berkeley Process Control has implemented BXi controller in a number of other discrete and process manufacturing industries. The higher requirements for automated control in 300-mm wafer fabs is the perfect entrée for BPC to semiconductor manufacturing, said Sagues.

"Semiconductor300 had the vision to say, 'This is what we're looking for,'" said Sagues. "It gives them a leg up."



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