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“I use Bob as a consultant and educator, and he’s more than happy to do it. He has a ball teaching classes.”

**Better control, more consistent parts**

Akey Manufacturing Inc. replaced difficult-to-obtain technical support with regular, local support when it replaced a critical machine’s old controller, servos and motors with new ones. The Footville, Wis., machine shop also gained greater, more reliable machining accuracy.

Brad Akey, Akey Manufacturing’s owner, decided to replace the machine’s motion control system when he was facing an unpleasant prospect: losing his serviceman. The fellow who serviced Akey’s large, 3-axis punch press/plasma cutting machine was thinking about retiring. The fellow wasn’t local; he had to fly in to maintain Akey’s machine. Lead times for repair could be months. Nonetheless, his service was critical technical support.

Akey already lacked OEM support for his old controller. The company that made it no longer exists. The 12-year-old controller still worked, but like many pieces of older equipment, it had problems. “The last 3 years, I was always nervous something would go wrong,” Akey said.

The machine’s servos and motors

**END USER:** Akey Manufacturing Inc.  
(608) 876-6166

**CHALLENGE:** Ensure proper operation of a critical machine’s motion control system with local technical support.

**SOLUTION:** Replace the older motion control system with new components.

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**SOLUTION PROVIDERS**




**Innalytical Solutions Inc.**  
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**Power Automation America Inc.**  
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Information Services #301

were also outdated, and it was hard getting service for them, too.

Akey’s machine can cut 8’x20’ material weighing up to 1,200 lbs. It processes half of Akey Manufacturing’s parts and uses plasma cutting for 40 percent of its processing. “It’s a key component,” Akey said.

Consequently, Akey upgraded his machine’s motion control system—controller, servos and motors—and obtained more local technical support via control supplier Power Automation America Inc. (formerly MachineMate Inc.), Fond du Lac, Wis., and industrial services company Innalytical Solutions Inc., Janesville, Wis. Innalytical is 5 miles from Akey Manufacturing,

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Information Services #49



**Better support in case of machine problems and greater machining accuracy resulted when Akey Manufacturing replaced its older motion control system with a new system supplied and installed by a local company.**

and Power Automation is 2 hours away by car.

Besides obtaining support, Akey Manufacturing protected and improved the machine's accuracy by updating the motion control system. Power Automation's L2 controller provided the protection with a Sercos interface, which includes digital fiber optic cables connecting the controller, servos and motors. Being fiber optic, the cables are less likely to pick up the plasma generator's "noise"—that is, its stray electrical signals—and transmit it to the controller, servos or motors, causing problems.

For example, noise that enters the controller can cause it to slightly vary the toolpaths that it transmits to the servos. These less accurate toolpaths result in less accurate part features. "Fiber optic cable cannot pick up noise like conventional wire can," said Nyles Priest, Power Automation's president and CEO, adding that "plasma generators are pretty noisy."

The new controller, servos and motors combined to improve the machine's accuracy. For example, the new brushless AC motors start and stop quicker than the old DC motors. The old ones might overshoot a specified location and then overshoot while trying to recover back to it. "There can be several oscillations before it finds its actual commanded position," said Paul Terpstra, who installed the new motion control system and is Innalytical's president.

The machine's improved accuracy is apparent in first-article production, for example. Previously, after measuring a first article, a machine operator might have to adjust the machine's plasma-cutting program so it would cut the job's other workpieces closer to their specified dimensions. Today, Akey finds that operators don't need to adjust the machine as often because of its greater accuracy. He added that before its upgrade, the machine might cut a part's dimension 0.020" larger than its specified size, but would now cut it closer to size, creating the dimension 0.005" larger, for example.

The upgrade improved the machine's repeatability, too. "It holds accuracy much better part to part," Akey said.

After its upgrade, Akey returned the machine to production work, but Terpstra still visited the shop occasionally during the next 2 months to fine-tune the controller's customized M code for the machine's less-used functions. The visits were occasional because Akey would wait for jobs that required those functions then would ask Terpstra to come to adjust the code until the functions operated as Akey wanted.

"We were trying to duplicate the operation of the original machine—or the original controller—as close as possible," Terpstra said. That way, Akey didn't have to change his part programs or post-processor.

## Three to one

Fabcorp Inc. is a Houston job shop that serves military contractors, oil-field operations and various other customers. The company provides CNC machining, CNC robotic welding, custom fabrication services and flame, plasma, waterjet and laser cutting. It also manufactures its own trademarked line of Hippo Hopper self-dumping chip hoppers.

Craig Wahlstrom, Fabcorp's plant manager, said, "We

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*Information Services #2*