



CASE STUDY ARL SERVICE

Improving Proven Technology

For decades, ARL Service has been building custom machinery for almost every industry. They're well known for their ability to equip machines with controls that are flexible and easy to use. When ARL acquired the Wit-O-Matic Company, another machine maker, they inherited a machine used for grinding carbide inserts.

Carbide inserts are cutting tools used to mill parts for anything from automobiles to aviation to appliances. The Wit-O-Matic is highly respected around the world. But ARL Owner Al Lewellen knew it could be improved.

Like many older grinding machines, it used a series of metal cams to control the way the machine cuts and sharpens the carbide inserts. These cams had to be designed, cut, and shaped by an outside specialist who would often take up to two weeks to produce them at a significant cost.

Once the metal cams were ready, setting up the Wit-O-Matic with the new cams could take anywhere from two hours to two days.

A Crazy Idea

Al Lewellen asked a question. "Can we get rid of the physical cams and replace them with digital cams?"

He was answered by one of his programmers who said, "That's crazy." To which Al said, "Great. Let's do it."



MELSERVO-J4 Servo motors and amplifiers provide cutting edge technology for high function and high performance.



The Wit-O-Matic Super Precision Grinder

First, they scrapped the existing controls and removed all the fluid pressure lines to leave just the basic cutting machine. Already the footprint was reduced by half. Then they started to explore their options. To do so they called on Mitsubishi Electric Automation and their local distributor, Shaltz Automation; a team that had provided ARL with controls for many previous projects.

Together they worked up several approaches designed to add digital controls, software, and automation components. This combination would replace the physical cams.

According to Koreen Stratton of Shaltz Automation, "AI was trying to do something crazy; the kind of thing usually done by CNC. So doing it with servos and a simple motion module was going to be a real accomplishment."

One of the things AI insisted on was that the entire system should be extremely flexible and that all aspects of programming must include variables.

Making It Happen

This crazy idea turned out to be more complex than anyone could have imagined and required a tremendous amount of input from the members of the team. According to AI, "When it got down to the real 'nitty-gritty,' the support from Mitsubishi Electric was fantastic."

The crazy idea paid off. Mechanical cams were replaced with virtual cams, which could be designed and programmed right there on the Wit-O-Matic's new control system, using its digital cam generator.

According to AI Lewellen, "We can quickly generate a new virtual cam using the HMI and the system's software. We can do just about any shape. And what's most important, everything is programmable and variable."

Goodbye Cams, Hello Productivity

Once the virtual cam has been programmed, it can be saved as a recipe and called up whenever the operator wants to run a specific carbide insert. And of course, the number of recipes that can be stored is basically without limit. This easy recall means operators can set up for a new part in as little as two minutes, as opposed to two hours or more using metal cams.



As a result, the operator can do smaller batch runs and change them out quickly. In the past, they'd feel obligated to run several thousand parts before a changeover, because setup was so laborious. Now, small runs of 15 or 20 parts are no problem.

If the customer wants to learn to create new cams themselves, it's easy using the HMI's touchscreen.





“The incredible flexibility of digital programming simplifies everything to the point where we can offer this machine at about a third of the cost of something comparable. And it goes without saying that our customers love the support they get with remote diagnostics and repair. I see only good things ahead.”

– Al Lewellen, Owner
ARL Service LLC and ARL Operations LLC

The Improvement Never Stops

And with each new Wit-O-Matic sold by ARL Operations, the customer asked for something special, which always led to an improvement. “We were amazed,” Al said. “That with each machine, we kept finding out just how much more these digital controls could do. So each new machine is better than the one before.”

The customers who received those first machines were delighted, not only with the system, but also with the support. Because the control system is digital, a great deal of service can be delivered over the internet. This can include remote diagnosis, repairs, and upgrades.

New Levels of Service

In addition to all this support, ARL provides a remote service in which they will help the customer create and program a new digital cam, which can then be downloaded right into the customer’s machine. If the customer wants to learn to create new cams themselves, it’s easy using the HMI’s touchscreen.

These virtual cams will always be ready to use and they will never wear out the way the metal cams do. And thanks to support from Mitsubishi Electric Automation, customer productivity will be up and downtime will be at a minimum.

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CS-VH-00174

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