



Metalworking

Mitutoyo's New Linear Gages Raise the Bar for Precision Measurement Tools

James Langford | Apr 19, 2022

When American minting companies produces coins, they measure not only microns of diameter and thickness but the percentage of metals from copper to silver in each one. Meeting such exacting specifications is what *Mitutoyo's* new line of contact-probe displacement sensors and counters is designed to do, both faster and more accurately than existing products.

The metrological equipment-maker's EJ counters and LG100 Series linear gages, introduced in April 2021, combine precision measurement sensors with modular displays roughly the size of a pack of cards.

Capable of connecting, or piggybacking, on to each other, they can provide outputs ideal for programmable logic controllers, or PLCs, which manage electro-mechanical processes in manufacturing equipment from machines to assembly lines.

The probes are adaptable enough not only to deliver a product made to specification and on time but to calibrate the machines used in their manufacture and aid in their setup for particular jobs.

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Mitutoyo

They represent "the next step up from an indicator in not only communication but durability," explains Mike Grosenbach, Mitutoyo's product manager for hand tools and sensors. "People often try to make old gages work in new applications, and they're really not the right things to use. They're pushing it, forcing it, when really they should be using a gage like this that is multiple steps ahead of what people are using now."

Repurposing existing tools is a common challenge for manufacturers who, faced with the expense of upgrading equipment, try to cut costs by using old gages and measuring devices that hinder machines from operating at their full potential.

Generally, it's worth the extra investment to upgrade displacement sensors at the same time as equipment, measurement-equipment producers say.

"They might be using indicators, and they might be trying to communicate with a PLC, but the old indicator doesn't have either the environment resistance or the durable build that a linear gage would," Grosenbach says.

Protection from Oil, Water Contaminants

Linear gages are superior to indicators in a number of ways, from resolution to accuracy, impact resistance, protection from outside contaminants and speed, he explains. Adding the new EJ counter gives the option of modular setup, since the devices snap together—making them ideal for DIN rails used in control cabinets—and one counter can power a whole stack.

Each has two inputs, enabling it to display thickness, and free software for setup and live displays is included.



Up to eight EJ counters can be linked, providing the capacity to connect to 16 gages. (Image courtesy of Mitutoyo)

Designed for inline applications—basically, measurements performed automatically within a manufacturing process—the state-of-the-art equipment consequently delivers data much faster than is possible with so-called manual techniques that require taking a product offline to ensure it meets specifications.

The LG100 Series carries a rating of IP67G on the International Electrotechnical Commission's "Ingress Protection" evaluation standard.

The first number, the 6, indicates the highest ranking on a 0-6 scale measuring insulation from dust, while the second measures water resistance. The number 7 indicates the gages can withstand

immersion in up to 1 meter of water, or about 3 feet, and the letter G signifies that it's oil-resistant as well.

'Not Just for Large Applications'

For a device like the LG100 designed for use near cutting fluids, that resistance is important.

Accuracy is another strength. Mitutoyo's experience in building measuring equipment enables the company to guarantee repeatability—the amount of variation that occurs when using the same gage in the same way on the same object—in both the full measurement range and in narrow-range precision.

"The resolutions for this are 1 micron, 0.5 micron and 0.1 micron," Grosenbach says.

That kind of exactitude has proved alluring to minting companies, which have used the tool and three pairs of probes to measure the thickness of sheets of silver for coins, as well as to customers measuring sapphire disks used in electronic equipment.

Some of Mitutoyo's other precision gages have been used in food production, where accuracy is key in both weights and cooking temperatures. Consistency of thickness is paramount in items from bacon slices to potato chips, for example, and measuring particles of chocolate in chocolate paste can affect whether the sweets in which it's used feel grainy or smooth to consumers.

Versatility is another hallmark of the new system.

"It's not just for large applications," says Patrick Sullivan, strategic distribution sales specialist for Mitutoyo. "Obviously, it can go in fixtures and smart factories with automation, which is where a lot of our measurement equipment is going, but that doesn't mean the guy in the local shop can't use one because he's looking for something faster and more durable and maybe wants to collect data as well."

How are linear gages changing production speeds for your business? Tell us in the comments below.

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