FLUKE®

The new HART of a technician's toolkit

Fluke 709H Loop Calibrator

Application Note

In today's automated workplace, control networks are key to making operations efficient, precise, and cost effective. Major industries—from oil and gas refining to food and beverage, as well as important infrastructure operations like water and wastewater processing and power generation—depend upon control networks to run right.

Made up of transmitters and control panels that communicate through electrical signals, control networks keep process variables like pressure, temperature, and flow within the desired range. If pressure at a valve drops, a transmitter may relay this information to the control system, which then instructs the valve to open enough to restore pressure to the specified level. "It's a pretty advanced art," said Glenn Gardner, product manager for Fluke. Control networks can include thousands of transmitters, each communicating continuously. And just like the processes they monitor, the transmitters themselves need to run accurately.

The technicians who test these transmitters and control loops, and the tools they use, play a central role. Instrument technicians closely monitor and maintain these control devices and networks, ensuring their accuracy and the performance of the entire network. Tools like loop calibrators test device and loop functionality by tracking the electrical signals that transmitters and control panels send and receive.

Richer communication with HART

The information these transmitters are able to communicate is getting more complex. Typical control networks are based on a measurement system that reads 4 to 20 milliamp (mA) analog electrical signals. But companies are increasingly using digital protocols as well. The industry leader in digital protocols is the HART (Highway Addressable Remote Transducer) system.

The HART Protocol layers a low-level digital signal on top of the analog 4 to 20 mA signal. The digital signal is able to provide critical information that analog cannot, such as internal diagnostics, device configuration, and fixed manufacturing parameters. "If there's a problem out there in the system, without the HART protocol, all the technician would know is 'I am or I am not getting 4–20 mA (milliamps) out of my transmitter.' HART gives a lot more information about the transmitter to help troubleshoot the problem," Gardner explained.

The Fluke 709H Precision Loop Calibrator with HART Communications/ Diagnostics was built to be used with one hand; you can scroll quickly through menu options with the central dial.

Fewer techs, more responsibility

While access to more information is a benefit, several issues have created challenges for technicians. Financial pressures across many industries have led to downsizing and decreased maintenance budgets. This means fewer techs to do the job. "The same technician has more workload than he previously had," said Gardner.

In addition, some techs are doing jobs outside their specialization. "We're seeing the rise of a multi-craft technician, what we call the electrical and instrumentation or E&I technician," Gardner continued. "Whereas 10 or 15 years ago there was a clean separation between what an electrician did and what the instrument technician did, a lot of times now you only have one person who covers both." Today, it's not just a matter of what information a technician can access, but how efficiently he can access it.

Many test tools on the market were too specialized to meet the needs of the multi-craft technician. To test any HART-enabled instrument, technicians doing loop calibration needed two separate tools: a loop calibrator and a HART communication device. For a technician with an increased workload, this put precision and efficiency in opposition. On top of that, the HART communication devices were not easy to access, in terms of both functionality and cost. "Normal HART communicators are actually very complicated devices. They have very deep menus, they're hard to learn how to use, and they can cost as much as $5,000," Gardner said.

Designed for today's workplace

Responding to these trends, Fluke developed the 709H Precision Loop Calibrator with HART Communications/Diagnostics. The 709H is the newest member of Fluke's loop calibrator family and an industry first. "This is the first milliamp loop calibrator that includes HART communication ability," Gardner said. It's an effective and much-needed combination.

As a loop calibrator, the 709H is a powerful tool, providing a signal reading accuracy range of 0.01 percent. The 709H is able to generate its own 4 to 20 mA signal to test the control system and transmitter signals and help pinpoint where an error is occurring. The 709H also includes a new valve test function. And while these features make it Fluke's most precise loop calibrator yet, "the big deal here is HART," said Gardner.

But Fluke didn't just add a HART communicator onto a loop calibrator. The company made strategic improvements with the technicians in mind, streamlining the device's HART capability to make it more relevant for the job. "We took out the advanced functionality and stuck with the few critical parameters that a normal instrument technician would want to see. Our goal was that an E&I technician without a lot of depth in digital communications could still easily use this product. Rather than logging in to the product and seeing 100 different menus, we have closer to a dozen," said Gardner.

One tool, multiple functions

Every aspect was designed to make the 709H more user-friendly. Smaller and easier to hold, the 709H was built to be used with one hand. A central dial allows for fast scrolling through menu options. The backlit display screen makes it readable in any lighting environment. And the 709H, like all Fluke products, is built to last, with a rugged and easy-to-see yellow exterior.

From training to on-the-job execution, the 709H enables technicians to be more efficient. "Now, instead of having to master two different tools, there's only one," said Gardner. On the job, the 709H allows technicians to easily access a wide range of critical device information and make immediate adjustments to get devices working properly. The identification of specific device configuration has been a big benefit to technicians. "A lot of guys have said, 'My biggest problem is I have over 5,000 transmitters out there and sometimes at a given spot I just don't know what the heck is installed.' They'll take the 709H and download the configuration," Gardner said.

Compared with other HART communication tools on the market, the 709H is "substantially less expensive," said Gardner. The manageable price helps companies stay within maintenance budgets, while the ease-of-use and robust functionality directly address the needs of today's technicians. Bottom line: in an ever more challenging world, things just got a little bit easier.

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