Testing times

The power of sensing systems today is to be found less in the range of techniques, technologies and hardware designs, and more in their on-board software. Brian Tinham reports

If there is a story to tell across sensor technology, it is not so much that new devices are enabling more precise and repeatable measurement of greater ranges of parameters. Nor is it that miniaturisation and improved manufacturing are packing more punch into smaller envelopes. Both are true, but even more noteworthy is sensors' new intelligence, with software enabling auto-diagnostics and calibration, as well as wireless comms and intuitive HMIs.

The fact is that sensor systems – whether monitoring physical, electrical or chemical parameters – are increasingly now 'plug and play'. On the one hand, that means plant technicians, not only instrument engineers, can handle most aspects, from installation to commissioning and maintenance. On the other, hitherto uneconomical monitoring is becoming feasible. And the result: plant and maintenance operations can run more efficiently.

Auto-sense validation

Take Emerson Process Management's Rosemount 848T temperature transmitter, which is equipped for Foundation fieldbus digital plant communications. The device now sports that company's so-called Measurement Validation diagnostics, which automatically detect measurement and process abnormalities, so allowing users to take preventive action and avoid shutdowns, process inefficiencies and potentially even safety issues.

The point is that thermocouples and RTDs (resistance-temperature detector) degrade over time – particularly under process conditions. So, by using the new transmitter's intelligence to continuously analyse variations in the signal, the diagnostics catch sensor problems long before they become catastrophic. What's neat is they also detect changes due to electronic interference, corroded terminations, loose connections – and, really clever, process upsets. Quite simply, the software calculates the process rate of change, so helping users detect reactions that are starting to run away, before alarm thresholds are transgressed.

But this kind of advance is not restricted to temperature sensing. Endress+Hauser's newly launched Promag 53 flowmeter has an integrated web server and EtherNet/IP for remote and local digital plant connection. Not only that, but configuration, monitoring and diagnostics are all delivered by Rockwell Automation's PlantPAx process system, under the two companies' long-standing development partnership.

As with all electromagnetic flowmeters, this one is designed for electrically conductive liquids and it sports FM/CSA Class I, Division two approval. But just look at the functionality: using EtherNet/IP, up to 10 variables can be configured, including volume flow, mass flow and totalised flow for remote access.

"Promag 53 is engineered to integrate with the PlantPAx system via a downloadable Level 3 add-on profile," explains Jerry Stevens, flow product manager at Endress+Hauser. "The integration is as simple as using a USB stick and ... the integration can be copied and pasted, so that the initial work is done only once."

Talking of USB sticks, many suppliers are now offering these as a preferred storage medium for product and reference data, in place of printed documentation. Fluke, for example, is offering a free USB thermography stick, which it describes as "a gateway to access everything the professional electrician and industrial maintenance technician needs to know about thermal imaging". What that means is videos, a digital copy of Fluke's 72-page booklet 'Principles of Thermography', an ROI (return on investment) calculator, links to online training etc.

As for the future: expect to see more wireless sensors and energy-harvesting devices to power them. The former are already widely adopted in the automotive sector, especially where active RFID sensors are concerned. But mainstream process companies, such as ABB, Emerson, Honeywell and Siemens, are also supporting WirelessHART on a range of process transmitters. PE

Above: Fluke's user's guide to infrared sensing systems
Left: Emerson's Micro Motion ProLink III configuration and diagnostics tool, for its Coriolis flow and density sensors, which automatically identifies faults and prioritises them according to severity
Below: Emerson's Rosemount 848T temperature transmitter, equipped for Foundation fieldbus digital plant communications