The digital industrial revolution has begun

– SMART TEMPERATURE SENSORS FROM PENTRONIC

"Smart sensors with a digital bus can give four to eight times less measurement uncertainty," says Erik Gullqvist, one of the developers behind Pentronic's smart measurement system.

Up to eight times better measurement performance with lower installation costs and simplified maintenance.

That's the effect of Pentronic's smart measurement system.

The system includes temperature sensors with an integrated and system calibrated transmitter, independent transmitter and gateway for a digital solution.

Industrial measurement systems usually work like this: a sensor indicates the measured temperature in the form of voltage or resistance. A transmitter transforms this into a 4-20 mA process signal or into digital information, which is then sent to a superior system.

Each stage of the chain adds measurement error. Without system calibration the final error is about ± 1 °C.

Integrated and system calibrated

Pentronic's experienced engineers have worked with the company's in-house accredited laboratory to develop temperature sensors with an integrated transmitter. The aim was to achieve better performance and lower costs for installation and maintenance.

The first step was a miniaturised high-performance transmitter to be mounted inside the sensor. The transmitter is considerably smaller than existing signal transmitters for terminal heads. The transmitter and sensor are a system calibrated unit with 50 percent less measurement uncertainty at ± 0.4 °C for Pt100 sensors.

"We've been manufacturing this sensor for a number of years," explains Pentronic's sales manager Dan Augustini. "It is built to be robust and about 60,000 units are currently operating."

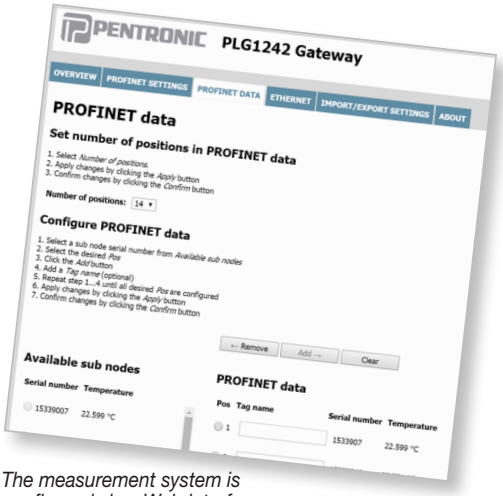
The installation and maintenance are made easier because the units reach the customer already calibrated. No further calibration is required: just mount the unit in place and start it up. However, each sensor still has one cable attached to it, with large installations involving many cables.

Smart systems

"The system features smart sensors with a digital bus," says Erik Gullqvist, one of the developers behind the digital measurement system. "The smart sensors are connected to a gateway that transmits the information via industrial buses such as Profinet or Ethernet/IP.

Pentronic's gateway can handle up to 50 smart sensors. This arrangement removes additional error sources and measurement uncertainty can be reduced to about ± 0.2 °C for Pt100s. This is four to eight times better than conventional measurement systems.

The gateway connected to the superior system is configured via a Web interface. All sensors are connected to one and the same cable. The result is lower costs for installation and maintenance.



The measurement system is configured via a Web interface.