Temperature Transmitters: Warming Up To EDDL

Enhancements to the EDDL IEC 61804-3 standards have improved advanced setup and diagnosis of high-end temperature transmitters. By **Jonas Berge**, senior PlantWeb consultant, Emerson Process Management

Temperature transmitters communicate digitally using protocols such as HART, Foundation fieldbus, and WirelessHART. Supporting this mix of transmitters can be a challenge.

However, modern temperature transmitters diagnose themselves, the sensor wiring, and the temperature element. This allows for more effective maintenance schemes that help keep the loop and plant running with minimum downtime.

Temperature Diagnostics

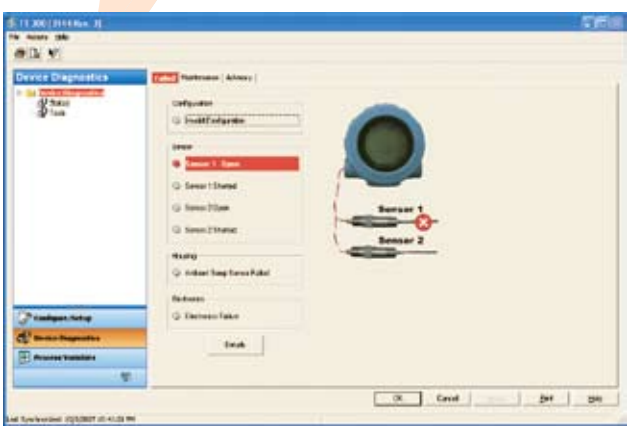
A temperature element may eventually 'burnout', in which case temperature is not measured and control is impossible. This can cause the loop, and perhaps even the unit, to shut down.

Intelligent device management software in modern control systems is permanently networked to continuously monitor field devices. When a sensor fails, the diagnostics pin-point the problem. Using EDDL (Electronic Device Description Language), the device manufacturer can provide image displays, switched dynamically, that illustrate the problem.

High-end temperature transmitters have even more sophisticated diagnostics. Sensor 'drift alert' is one of the diagnostics available. A sensor with dual sensing elements at one measurement point takes two readings that are compared and if a maximum difference is exceeded, the diagnostics determines that drift has occurred.

Another measurement available is 'hot backup'. For this, two sensors measure the same point. In normal operation the reading of one sensor is used, but if the primary sensor fails its value is discarded and the backup sensor reading is used.

The transmitter diagnostics illustration is also helpful and allows the technician undertaking a repair or replacement to know whether it's a field mounted, panel mounted, or head mounted device and what the device looks like.



Temperature transmitter diagnostics indicate sensor failure.

EDDL is the only technology that can display diagnostic detail directly to operator consoles showing failures that affect process operation.

Predictive diagnostics are usually not routed to operators, and only go to maintenance technicians. Handheld field communicators are also based on the same EDDL technology, enabling further troubleshooting in the field while at the transmitter.

Loop Testing Made Easy

Loop testing a HART protocol temperature transmitter typically entails simulating temperature change by generating 4 mA, 20 mA, and 12 mA signals to check that the correct device is wired and system scaling is correct.

Systems and software that fully implement IEC 61804-3 support EDDL wizards that take the technician through required steps to check the temperature transmitter as defined by its manufacturer.

The wizard reminds the technician to inform the operators that a loop test will be performed so the associated control loop can be changed to manual to prevent upsetting the process when temperature is simulated.

After the test, the temperature transmitter is returned to operational mode so measurements can again be transmitted to the control system. With EDDL, a loop test can be undertaken either from a control room computer or a handheld communicator in the field.

Facilities have a mix of different temperature transmitters. Mastering all of them can be a challenge. However, the device manufacturers use EDDL to embed context-sensitive help into the display for parameters, wizards, and diagnostics.

ENQUIRY NO. **4402**