Honeywell | Connected Industrial

SmartLine Temperature Transmitter's Advanced Diagnostic Protect Plant Safety

Solution Note

Challenge

Process plant owners always need to operate their plant in a safe, economical and efficient manner. To accomplish this, temperature measurements are crucial and can be broadly categorized into three areas of usage: monitoring, control and safety.

While reliable temperature monitoring is very important, safety is more important in several applications. Failures in the temperature measuring instrument either due to issues with the measurement device or the external temperature sensor need be detected immediately and corrective action taken before any unsafe conditions arise.

Also related to safety, asset safety is closely linked with the safety of personnel operating and maintaining those assets.

Solution

Smart field devices incorporate diagnostics that constantly monitor device performance. Faults are automatically detected and are generally classified as critical or non-critical.

Advanced HART Diagnostics

- PV (Process Variable) Tracking Diagnostics
- SV (CJ Temperature) Tracking Diagnostics
- ET (Electronics Temperature) Tracking Diagnostics
- Stress Life
- Service Life
- Operating Voltage Tracking Diagnostics
- AVDD (Sensor Supply Voltage) Tracking Diagnostics
- Sensor CPU Temp. Tracking
- Power Up Diagnostics
- Install date

SmartLine® Temperature Transmitters are fully compliant to the latest HART communication standard. In addition, SmartLine features additional Advanced HART Diagnostics to provide additional data to help monitor the health of the transmitter thus avoiding unplanned failures.

FEATURES & BENEFITS

- Burnout feature in the hardware/software indicates the device failure mode
- Burnout jumpers are available on the transmitter module for easy access and allow the output signal to be driven to a higher or lower level depending on the overall control system and application requirement
- Latching function facilitates failsafe output conditions. When enabled, the failure alarm will continue in the same status unless the alarm is cleared and the power is recycled for the device
- The latching function enables additional protection to ensure the failure mode cause is understood and cleared before the device is put back in to the normal working mode
- In very critical applications involving shutdown systems, safety certifications complying with IEC 61508 are available with SmartLine Temperature Transmitters to further reduce the risk.

Standard critical diagnostics include:

- Temperature sensor module failure
- Sensor input 1 failure
- Sensor Input 2 failure
- Communication Module failure
- Sensor communication timeout

Problems detected as critical diagnostics drive the analog output to the programmed burnout level.

Non-critical conditions do not affect the process measurements but need attention to avoid potential critical failures. These include higher ambient temperature, sensor drift or input out-of-specified limits. Critical failures involve bad process measurements which cannot be relied upon; hence action should be initiated immediately. These include device failures or sensor open/ high impedance conditions.

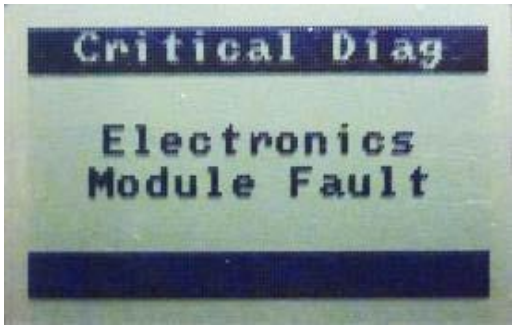
SmartLine Advanced Diagnostics

In addition to the standard set of diagnostics commonly available in all HART devices (for Honeywell this also include DE protocol devices), SmartLine also defines additional Advanced Diagnostics for both Honeywell HART and DE compliant transmitters. SmartLine Advanced Diagnostics provide a finer level of information to further ensure advanced warning of potential failures. Advanced Diagnostics address and cover functional areas such as:

- PV tracking
- SV (CJ) tracking
- Electronics temperature tracking
- Stress life
- Service life
- Sensor CPU temperature tracking

In addition to detecting critical failures, proper action needs to be built into the basic operations of the smart field device. Honeywell SmartLine® Temperature Transmitters readily fit this requirement and features the following functions:

- Burnout feature in the hardware/software indicates the device failure mode
- Burnout jumpers are available on the transmitter module for easy access and allow the output signal to be driven to a higher or lower level depending on the overall control system and application requirement
- An available latching function to facilitate failsafe output conditions. When this function is enabled, the failure output alarm will continue in the same status unless the alarm is cleared and the power is recycled for the device
- The latching function enables additional protection to ensure the failure mode cause is understood and cleared before the device is put back in to the normal working mode
- In very critical applications involving shutdown systems, safety certifications complying with IEC 61508 are available with SmartLine to further reduce the risk.



SmartLine STT850 Temperature Transmitter with Advanced Display showing Critical Diagnostic failure (Electronic Module Fault).

Applications

Below are some applications where the SmartLine Temperature Transmitter safety features offer the best solution.

Power Plant

Generator seal oil temperature is a very important parameter that needs to be monitored and decisions taken in a matter of minutes by the operations personnel in the event of abnormal situation.

Suboptimal generator seal oil temperature leads to reduced seal oil viscosity which in turn causes oil to leak and not protect the seal. Generator seal failure in a hydrogen cooled generator can lead to loss of life and property.

Superheated steam and turbine bearing temperatures are other critical measurements in a power plant. The SmartLine Temperature Transmitter diagnostics effectively ensure these measurements are accurately monitored to prevent overheating or asset failure.

Pulp and Paper Plants

Lube oil temperature measurements help maintain the oil viscosity for lubricating the bearings in twin press and paper machines. These must be accurately maintained, not just for operational success, but also to keep these critical and sometimes very large assets from causing any safety issue.

Cement and Sugar Plants

Similarly, cement and sugar plants maintain large and critical assets such as raw mills or crushing equipment. These also contain bearings and must withstand intense motion and vibrations. The bearing and lube oil temperature must be carefully maintained.

SmartLine Transmitter Family

The SmartLine Pressure, Temperature, Level and Multivariable Transmitters deliver total value across the entire plant lifecycle, from construction to operations to maintenance.

Smart Performance: SmartLine accuracy, stability and response time result in tighter process control, improving product yield and quality.

Smart Design: SmartLine's innovative modular design reduces complexity by allowing quick on-field replacement of parts without taking transmitters out of process and thereby reducing downtime, maintenance costs and spares inventory. SmartLine's universal terminals reduce costly wiring errors, troubleshooting and re-work by allowing loop wiring to be reversed. Rich advanced display and local configuration capabilities enable field operators to more efficiently perform tasks, solve problems and avoid errors with no need for a handheld device.

Smart User Experience: Smart messaging, maintenance and safety features as well as unique integration with Honeywell's Experion® control system reduce design and operator errors and enable faster intervention to avoid process upsets.

SmartLine Support Services

This product comes with worldwide, premium Technical Assistance Center (TAC) support services, which are part of the Total Care Field Instrumentation Services. The TAC services, along with the services provided by the local distributor, are designed to help customers improve and extend the usage of their field instrumentation, providing a safer, more reliable and more efficient operation.

Honeywell's Total Care Services bring 30 years of experience in terminals and the expertise of over 1,000 contracted customers around the world. Backed by the Honeywell Operating System, our support teams deliver greater in-depth domain and product expertise. We'll provide the right solution to critical issues—the first time—for a safer, more reliable and more efficient operation.

For More Information

To learn more about how Honeywell's SmartLine Temperature Transmitter can improve your process plant operations, visit www.honeywellprocess.com/smartline or contact your Honeywell Account Manager, Authorized Distributor or System Integrator.

Honeywell Process Solutions

1250 West Sam Houston Parkway South
Houston, TX 77042

Honeywell House, Arlington Business Park
Bracknell, Berkshire, England RG12 1EB UK

Shanghai City Centre, 100 Zunyi Road
Shanghai, China 200051

www.honeywellprocess.com

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