

# Advanced Diagnostics for HART® Protocol

Rosemount 3051S Scalable Pressure, Flow, and Level Solutions



**Predictive Intelligence for Your Success**

**ROSEMOUNT®**

  
**EMERSON**  
Process Management

## Achieve Superior Plant Performance

More than ever, running a productive and efficient plant requires the right technologies and implementation. The Rosemount 3051S Series of Instrumentation incorporates innovative PlantWeb™ technologies to provide smarter and comprehensive diagnostic coverage to achieve the highest plant performance.



### How can instrumentation optimize my plant?

The Rosemount 3051S Series of Instrumentation combines renowned performance with innovative technology for unprecedented diagnostic coverage to bring you better results.



### Electrical Loop Integrity

Unreliable process information can lead to poor business decisions. The power and communications signal between the device and the automation drives your process. 3051S loop diagnostics detect problems with the signal before they can affect your process operation.



### Expanded Process Insight

Abnormal conditions in the process or equipment can impact many facets of your operation. Process diagnostics from the 3051S provide additional insight to help you detect and prevent these conditions from affecting your results.



### Safety Certified Diagnostics

For the first time ever, Rosemount reliability and advanced diagnostics are available in a safety-certified instrument. The innovative 3051S improves safety compliance while extending diagnostic coverage beyond traditional sensor health monitoring.



### Comprehensive Intelligence

Knowing more about transmitter health and process conditions enable better decision making. The 3051S provides additional data and logging critical to understanding and improving plant performance.

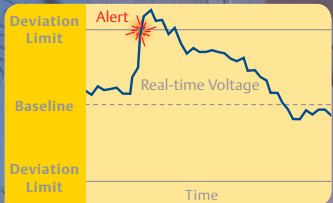
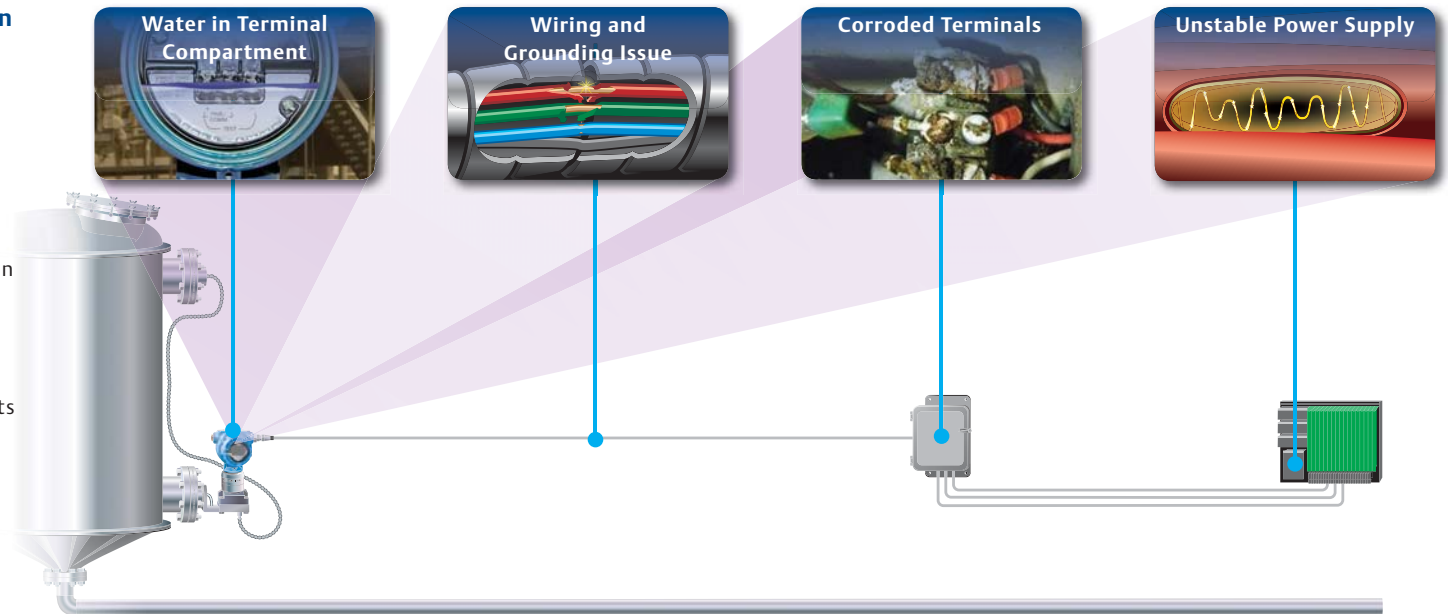


## Ensure Electrical Loop Integrity with Power Advisory

The integrity of the electrical loop from the transmitter to the host system is critical for communicating process information from the field. The Rosemount 3051S provides loop diagnostic coverage to help detect conditions that may jeopardize your operations.

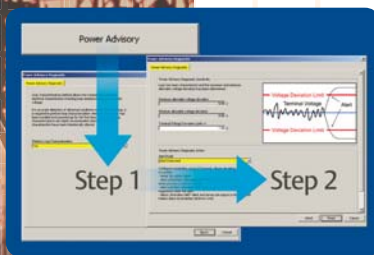
### What's happening in my electrical loop?

The 3051S keeps you ahead of unwanted changing electrical loop conditions such as water in the housing, ground loop issues, or an unstable power supply. If undiagnosed, these conditions may lead to unreliable measurements and unsafe operating conditions.



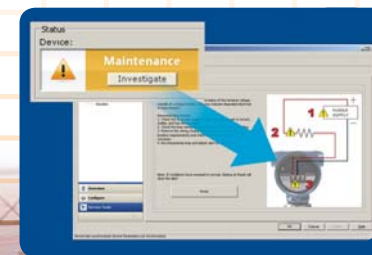
### Proactively Detect Loop Integrity Issues

3051S Power Advisory diagnostic monitors transmitter terminal voltage and sends notifications of unwanted changes on the electrical loop.



### Easy and Intuitive Configuration

In two easy steps, configure the 3051S to detect issues on the electrical loop. It's that simple.



### Detailed Alert with Recommended Actions

Device Dashboard provides one click access to detailed diagnostic information relevant to the situation at hand.

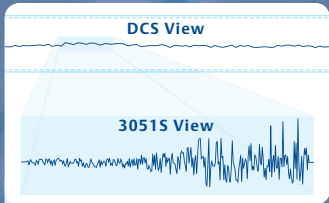


## Increase Plant Productivity with Statistical Process Monitoring (SPM)

All dynamic processes have distinctive characteristics that represent more than just background noise. The Rosemount 3051S turns noise into intelligent process insight to help you uncover abnormal situations in your application. This enables preventative maintenance practices that lead to better quality control and improved productivity.

### What's happening in my process?

Rosemount 3051S tracks changes in process standard deviation, mean, and coefficient of variation to help you diagnose abnormal conditions before they affect product quality and safety.



### Uncover Hidden Process Issues with SPM

The 3051S measures and analyzes process noise at 22 times per second to provide the process insight needed to detect abnormal situations. In the example below, the 3051S tracks changes in process noise to help diagnose abnormal situations such as valve cavitation, distillation column flooding, and furnace flame instability.



DCS

3051S SPM

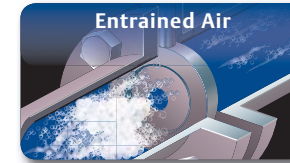
Process Noise



Plugged Line



Agitation Loss



Entrained Air



Process Leakage



Cavitation



Column Flooding



Flame Instability

Valve or pump cavitation can result in pressure shockwaves causing significant damage to equipment. The 3051S detects and alerts you to this condition, helping to extend the life of your assets.

Flooding of the distillation column results in reduced product quality and requires rework. The 3051S detects incipient flooding to help operators take action and avoid deteriorated product.

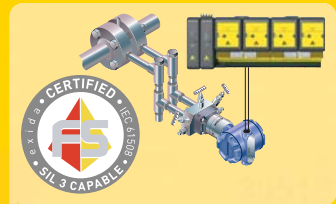
Furnace flameouts can result in unplanned shutdowns and risk of injury to personnel. The 3051S detects unstable burner flames, resulting in reduced risk of flameout and unplanned shutdowns.

Learn about more applications at [Rosemount.com/3051SDiagnostics](http://Rosemount.com/3051SDiagnostics)



## Reduce Risk with Safety Certified Diagnostics

Rosemount 3051S delivers proven reliability with Advanced Diagnostics for Safety Instrumented Systems. Combining the highest safe failure fraction available with the broadest diagnostic coverage improves safety and reduces total cost of ownership.



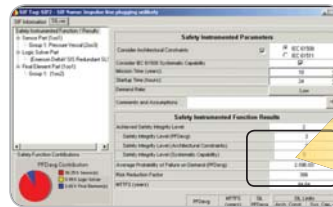
### Expanded Diagnostic Coverage for IEC 61511

Eliminate gaps in safety instrumented systems by detecting failures outside of traditional device electronics. 3051S diagnostics provide coverage from the process to the control room to monitor the electrical loop and process connection.



### How can an instrument improve my safety loop?

3051S Safety Certified Diagnostics detect more than just internal transmitter failures, they also detect previously undetectable process and electrical loop failures to significantly reduce the Safety Instrumented Function PFDavg.



	Traditional Coverage		3051S Advanced Diagnostics
Safety Integrity Level	2	SIL 2 to SIL 3	3
	2		2
	3		3
Probability of Failure on Demand	2.59E-03	Decrease 3X	8.46E-04
Risk Reduction Factor	386	Increase 3X	1182
	84.64		84.64

### exSILentia Improve Overall Safety Levels with Advanced Diagnostics.

Using Exida's exSILentia software tool, safety calculations show a 3X increase in Risk Reduction Factor when using Rosemount 3051S with Advanced HART Diagnostics to detect plugged impulse lines.

### Decrease Cost of Ownership with Less Frequent Proof Tests

With the highest safe failure fraction and broadest diagnostic coverage available, 3051S improves overall safety and lowers total cost of ownership with 10 year proof test intervals.

Existing Sensors – 1 year

Rosemount SIS – 10 year

William

Auditor

on | Version

## Make Better Decisions with Comprehensive Intelligence

Making decisions without adequate information can be challenging. The 3051S provides critical insight to the health of the transmitter and process to allow for better decision making and improved plant performance.

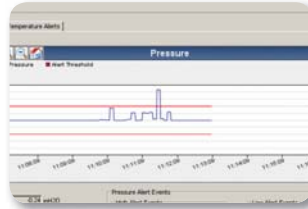


### Unleash Diagnostics from the Field

Knowledge and information is no longer stranded in the field. The fully interoperable 3051S allows seamless integration for wireless, multiple 4-20 mA, and digital communications. Start accessing innovative diagnostics to improve your plant performance.

### How can an instrument help me make better decisions?

The 3051S provides enhanced data logging and timely alerts that increase your awareness of potential issues in the plant.



#### Process Alerts

The 3051S actively monitors process pressure and module temperature values against user-configured settings. When alerts are triggered, the time span is accurately recorded to provide more insight into the process.



#### Variable Log

Rosemount 3051S logs previously unreported extreme pressures and temperatures to help you investigate troublesome process or installation conditions.



#### Service Alerts

Be more productive by scheduling periodic maintenance or work order reminders in the 3051S. When alerts are activated, simple LCD indication helps pinpoint the correct device.



#### Event Log

Instruments are filled with device diagnostics and status alerts but not all systems are capable of recording them. To help you make use of device information for better troubleshooting, the 3051S records a list of status events and when they happened.



Pressure  
Spike

Scheduled  
Maintenance

Unknown Upsets  
and Events

02:31:23

02:31:24

02:31:25

02:31:26

02:31:27

For more information about Rosemount 3051S ask your local Emerson Sales Consultant or visit [Rosemount.com/3051S](http://Rosemount.com/3051S)

# Rosemount Diagnostics are Comprehensive and Unequaled

## 3051S Pressure, Flow, Level

- Statistical Process Monitoring
- Power Advisory
- Diagnostic Status Log
- Variable Logging
- Advanced Process Alerts
- Service Alert



## 8700 Magmeter

- SMART™ Meter Verification
- Tunable™ Coated Electrode Detection
- High Process Noise
- Wiring and Grounding Fault Detection
- Tunable Empty Pipe
- Coil Fault Detection



## 3144P Temperature

- Thermocouple Degradation
- Minimum & Maximum Temp Tracking
- Sensor Drift Alert
- Hot Back-up™
- Statistical Process Monitoring



## 8800 Vortex

- Internal Meter Verification
- Signal Strength
- Electronics Temperature
- Low Voltage Conditions



## 5300 and 5400 Radar Level

- Signal Quality and Strength Monitoring
- Probe Missing and Coating Diagnostics
- Device Error Diagnostics
- Invalid Measurement Alerts
- Configuration Error Alerts
- Advanced Full / Empty Tank Diagnostics
- Echo Curve Availability



## 2160 Level Switches

- Condition Monitoring
- Configurable Alerts
- Self-checking Diagnostics



## 3100 Ultrasonic Level

- Full Tank Alert
- Signal Strength Alerts
- Temperature Monitoring



The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount and the Rosemount logotype are registered trademarks of Rosemount Inc. PlantWeb is a registered trademark of the Emerson Process Management group of companies. All other marks are the property of their respective owners. ©2010 Rosemount Inc. All rights reserved.

**Emerson Process Management  
Rosemount Measurement**  
8200 Market Boulevard  
Chanhassen MN 55317 USA  
Tel (USA) 1 800 999 9307  
Tel (International) +1 952 906 8888  
Fax +1 952 949 7001

**Emerson Process Management**  
Blegistrasse 23  
P.O. Box 1046  
CH 6341 Baar  
Switzerland  
Tel +41 (0) 41 768 6111  
Fax +41 (0) 41 768 6300

**Emerson FZE**  
P.O. Box 17033  
Jebel Ali Free Zone  
Dubai UAE  
Tel +971 4 811 8100  
Fax +971 4 886

**Emerson Process Management Asia  
Pacific Pte Ltd**  
1 Pandan Crescent  
Singapore 128461  
Tel +65 6777 8211  
Fax +65 6777 0947  
Service Support Hotline : +65 6770 8711  
Email : Enquiries@AP.EmersonProcess.com