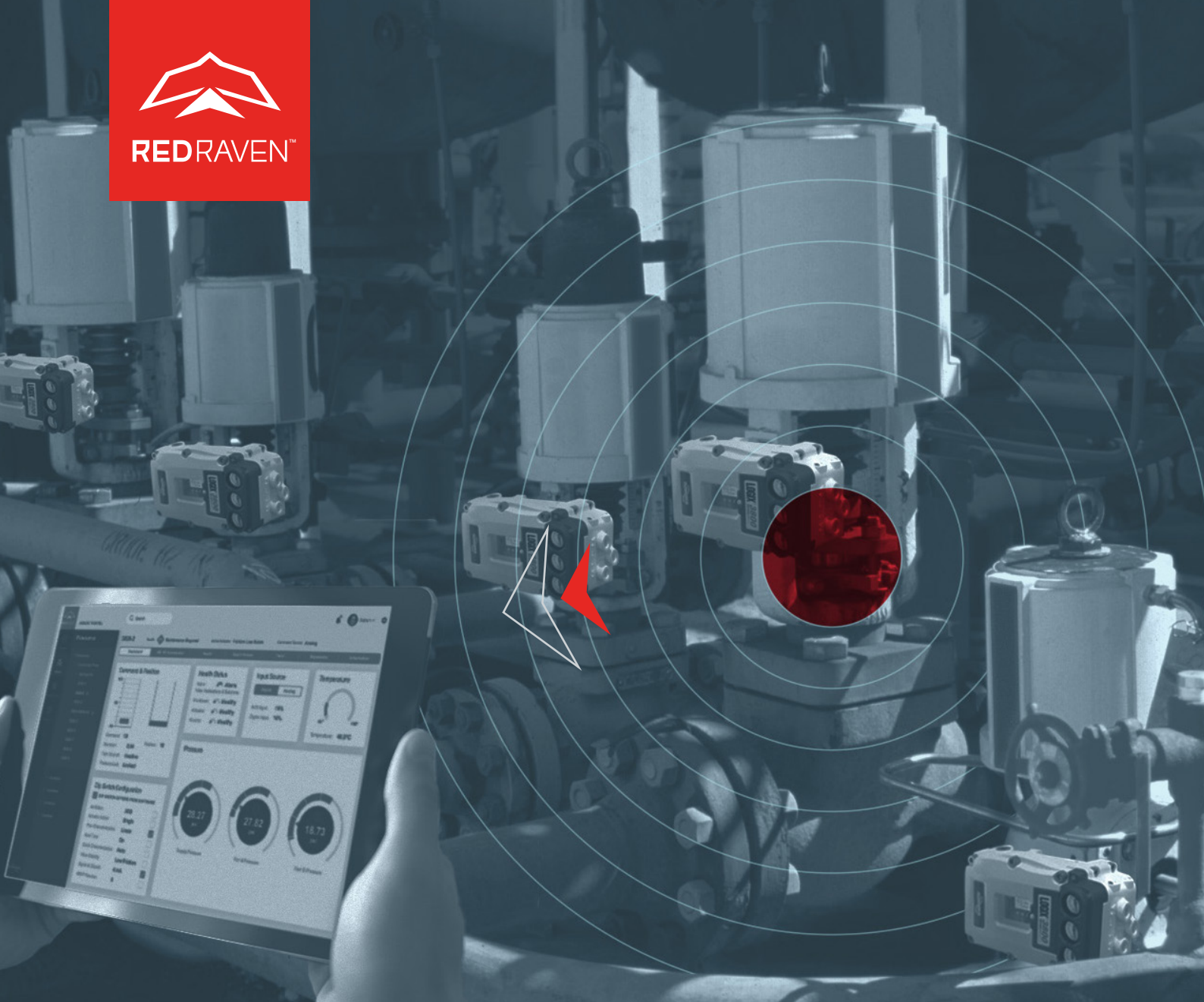




REDRAVEN™



REDRAVEN IOT SOLUTIONS FOR VALVES

Shift from reactive to proactive maintenance



RedRaven IoT Solutions for Valves

The Flowserve approach

Today's plants must maintain production rates, while faced with challenges associated with aging equipment, complex datasets and limited equipment-specific expertise and maintenance personnel. These challenges can lead to equipment failures, unplanned shutdowns, emergency repairs, safety hazards, and lost production and revenue. By being proactive and addressing equipment issues prior to failure, plants can improve uptime, lower maintenance costs, and—most importantly—improve safety and reliability.

RedRaven is an advanced IoT condition monitoring and predictive analytics system from Flowserve. Now, we are bringing this groundbreaking technology to even more of your plant's flow control systems by incorporating valve-specific monitoring capabilities. With RedRaven, you can monitor valve performance trends and proactively identify and address issues before they become failures. RedRaven can work with the flow control equipment you already have and is compatible with your existing plant control systems. Since the technology is flexible, it works with most digital positioners.

Armed with data-enabled insights across multiple locations, you can make significant plant improvements to support initiatives focused on equipment efficiency, sustainability, decarbonization, emissions reductions and utilization of renewable energy. Flowserve understands the challenges you face in constantly monitoring the key equipment and components that matter the most in your plant, but you can rely on RedRaven to notify you of pump or control valve anomalies that could put your plant at risk.



RedRaven benefits

- Prevent equipment failures
- Minimize downtime and improve productivity
- Reduce total cost of ownership (TCO)
- Lower maintenance costs
- Improve safety



RedRaven IoT Solutions for Valves

How RedRaven works

RedRaven works with your existing digital positioners for a comprehensive view of valve health, often without the need to add new sensors. The system is agnostic to platform, OEM and connectivity (via DCS, asset management system, wired, or wireless). In addition to RedRaven's flexible system design, you have the option to seek additional insights from experienced valve professionals at Flowserve.

RedRaven offerings for valves

Insight monitoring: Plants can obtain a detailed view of their valves' health through an online cloud portal and gain access to experienced professionals for analysis.

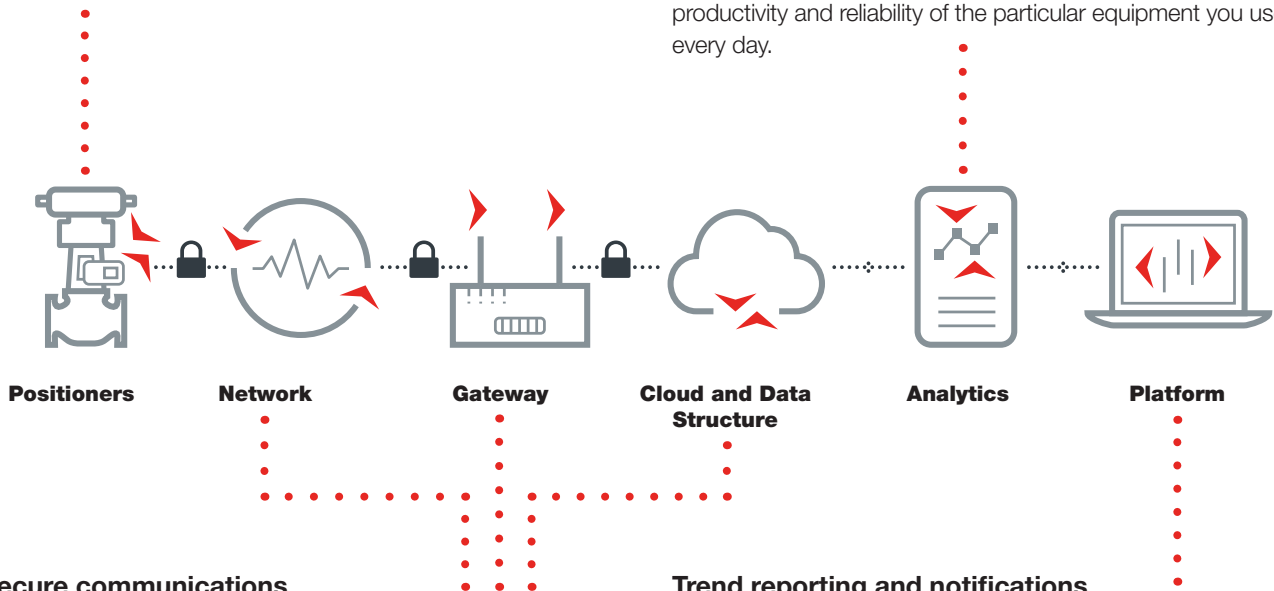
Access monitoring: With this on-premises solution, your plant personnel and Flowserve technical specialists can view aggregated data while on site to make decisions.

Existing positioners or additional sensors

RedRaven works with existing digital positioners or additional wired/wireless sensors to alert you when a valve deviates from normal operating conditions.

Application-specific analysis

Equipment performance data is analyzed with technology designed specifically for pumps, valves and seals, so you can gain a clearer understanding of how to increase the efficiency, productivity and reliability of the particular equipment you use every day.



Secure communications

Our secure system architecture collects data from equipment sensors and transmits it via a secure encrypted network.

Trend reporting and notifications

Trend reports provide insights into equipment performance over time, while emails and alerts inform you when an asset experiences a problem, so you can take immediate action to address it.



RedRaven IoT Solutions for Valves

RedRaven compared to other asset management systems

Feature	RedRaven	Other asset management systems
Data	<ul style="list-style-type: none"> - Resolution intact - Continuous capture and storage 	<ul style="list-style-type: none"> - Loss of resolution with limited parameters captured - Overwritten on a 30-, 60- or 90-day cyclical basis
Visibility	<ul style="list-style-type: none"> - Comprehensive asset health view across multiple sites and asset management systems platforms 	<ul style="list-style-type: none"> - View across a single site with only one asset management system - Incompatible with multiple sites across different asset management systems
Trend/event logs	<ul style="list-style-type: none"> - Detailed historical information captured 	<ul style="list-style-type: none"> - Positioner has limited memory and is overwritten via first in, first out (FIFO) log
Failure detection and analytics	<ul style="list-style-type: none"> - Packing leaks in control valves - Signature comparison 	—
Valve information	<ul style="list-style-type: none"> - Links to birth certificate - IOM 	—
Expertise on demand	<ul style="list-style-type: none"> - Access to experienced professionals for analysis - Failure notification, enabling serviceability - Quick Response Center support 	—
Pumps, valves and seals	<ul style="list-style-type: none"> - Detailed, holistic information on a subprocess 	—

The knowledge to improve plant performance and reliability

Flowserve is unique in this space. We've always led the way in manufacturing and service. Now we are taking the lead in creating new technologies to detect, diagnose and optimize flow-related equipment, giving you end-to-end solutions that improve the overall performance of your operations. With our unmatched service capabilities, we now have the technology to help plant reliability engineers, operators and maintenance personnel detect, diagnose and quickly respond to problems. It is a continuous effort to provide the best possible solutions for you.

