Experion® Cognition

A new generation of automation,
a new way of operating



Honeywell Technologies

Experion® Cognition seamlessly integrates AI capabilities with Experion® PKS Stations to create a digital companion for operators, helping organizations overcome experience gaps, workload challenges, and cognitive limitations to improve uptime, performance and safety.





Improving operator effectiveness with human-autonomy teaming

Operational performance continues to face limitations due to human factors

While today's control systems are highly effective during steady-state conditions, organizations still rely heavily on human expertise to identify, diagnose, and respond to abnormal situations. This dependence leads to performance variation between shifts and up to 40%* of abnormal situations and unplanned downtime currently due to human factors. At the same time, experienced workers are retiring, operator workloads are increasing, and process disruptions continue to impact safety, productivity, and profitability.

Experion® Cognition helps bridge this gap by bringing together operational expertise, contextual guidance, and autonomous assistance, supporting operators to make faster, more informed decisions while maintaining full oversight and control.

Experion® Cognition helps organizations improve uptime, increase efficiency, and move safely toward greater autonomy.

What it is

A digital companion for operators, integrated seamlessly with Experion® PKS Stations, to increase operational effectiveness and help achieve higher performance, efficiency and safety

What it does

- Captures, digitizes and applies operational expertise
- Continuously monitors for abnormal situations
- Detects emerging issues and provides verified responses
- Supports autonomous execution of approved responses
- Helps operators make the right decisions faster with guidance, relevant context and recommended actions

*ASM, Bullemer & Reising, Managing Human Reliability: An ASM Historical Perspective. 2015

Deliver better operational outcomes





Elevate operator expertise
Bridge knowledge gaps by delivering best-practice guidance derived from experienced operators, historical operations, and proven methodologies.

Improve operational consistency
Reduce performance variability across shifts by helping operators make faster, more accurate decisions using contextual guidance and intelligent assistance.

Optimize production uptime
Identify sensor malfunctions, process anomalies, and abnormal situations earlier—enabling corrective action before they lead to process upsets or unplanned downtime.

Enhance operator efficiency
Reduce operator workload by automating routine tasks and operational procedures, allowing personnel to focus on higher-value activities that help improve plant performance.

From operational challenge to outcome

Experion Cognition connects workforce knowledge, situational awareness, and approved actions within the operator workflow

Business outcomes

Help improve profitability, quality, and margins by addressing human factors that limit operational performance



Designed for human-autonomy teaming

Experion Cognition combines trusted operational knowledge, intelligent situational awareness, and autonomous assistance to help reduce operator workload and supports them taking the right actions faster.

Increase operator efficiency
Help reduce manual intervention and operator workload by offloading chosen workflows to Experion Cognition, supporting greater productivity and an expanded scope of responsibility.

Trusted, verified assistance
Experion Cognition delivers assistance based on expert-validated responses and operational best practices. Operators receive consistent, trusted guidance to support safe and reliable operations.

Human-autonomy teaming
Operators remain in control at every stage. They can review recommendations, approve actions, intervene when necessary, or allow approved responses to execute automatically.

Secure, on-premises architecture
Experion Cognition operates within your facility and does not require cloud connectivity, helping protect intellectual property, maintain cybersecurity standards, and support operational resilience.

Seamless Experion integration
Experion Cognition integrates with Experion PKS environments and can be enabled on existing Experion R530* and R600 operator stations, providing a straightforward path to advanced operational intelligence.

Human governace, built in

Supports human in the loop control with all assistance grounded in expert-validated guidance and defined operating practices

Trusted to perform

Maintain the process control safeguards that have made Experion PKS the trusted choice for critical process control for over 50 years

*Requires Server and HMI Feature Pack 3

Key capabilities

Intelligent situation management



Experion Cognition continuously monitors operations to identify abnormal situations and emerging issues before they escalate. When a situation is detected, operators are presented with an intuitive situation view that explains:

- What happened
- Why it happened
- Operational context and trends
- Recommended corrective actions

Operators can choose to execute responses manually or leverage autonomous assistance while maintaining full oversight and control.

Sensor malfunction handling



Experion Cognition continuously monitors sensor health to identify:

- Frozen measurements
- Drifting values
- Invalid sensor readings
- Emerging sensor issues

By detecting anomalies early and substituting with verified values, operation teams can maintain process stability, reduce unnecessary troubleshooting, and prevent potential process disruptions.

Alarm guidance



Help operators respond faster and more consistently to critical alarms.

Alarm Guidance delivers:

- Operational context
- Causal insights
- Recommended actions
- Decision support at the point of need

The result is faster response times, improved consistency, and greater confidence during critical situations.

Predictive alerts



Move from reacting to events to anticipating them.

Predictive Alerts analyze operating conditions and historical patterns to identify potential problems before traditional alarms occur. Early warning provides operators with addition time required to take corrective action sooner and reduce the likelihood of process upsets, downtime, or production losses.

Knowledge capture



AI-powered Knowledge Capture simplifies the creation of guidance, abnormal situation handling and operational responses, reducing implementation effort and helping accelerate time to value.

With minimal effort, it enables organizations to convert:

- Operational expertise
- Engineering knowledge
- Historical best practices
- Standard operating procedures

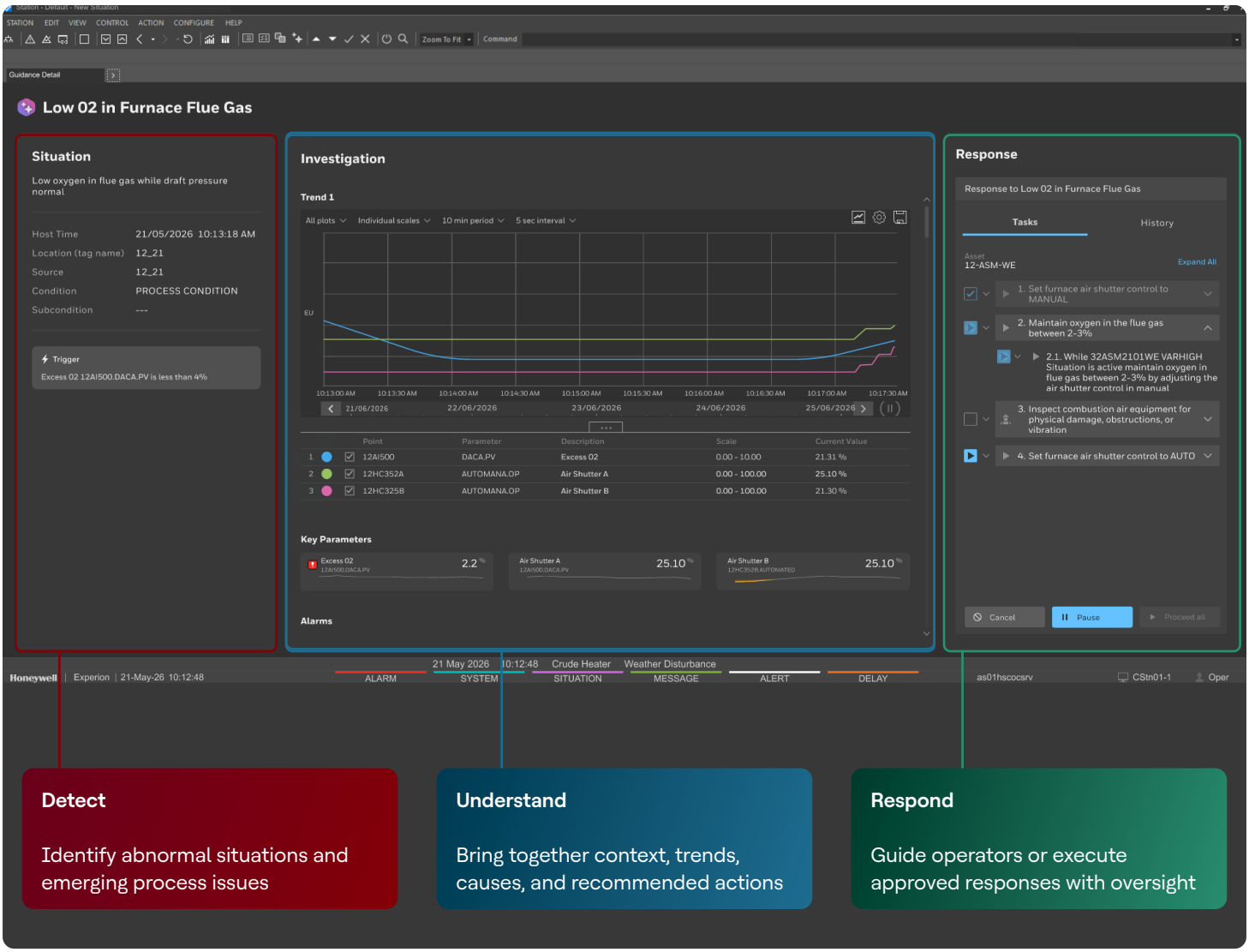
into actionable guidance and automated workflows that can be consistently applied across shifts.

App Hive



A future-ready platform for innovation.

App Hive provides a modular environment for deploying new Experion Cognition capabilities as they become available, helping organizations continuously expand operational intelligence without major system upgrades.



A new way of operating

Human decisions are often based on recognizing patterns from past experience.

In traditional control systems, operators must navigate multiple displays and analyze large volumes of data to detect emerging issues, understand their causes, and respond through manual intervention.

Experion® Cognition transforms this approach by acting as a digital companion to the operator. It continuously monitors the process to detect abnormal situations, provides the context needed to Understand them, and recommends verified actions to respond. Issues are identified sooner, decisions are made faster, and responses can be executed autonomously when appropriate.

The result is improved performance, greater operational effectiveness, and a practical, trusted path to autonomous operations, while keeping humans firmly in control.

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Take the next step in the journey to intelligent, autonomous operations



Honeywell Technologies

Honeywell Technologies
Process Automation
2101 City West Blvd,
Houston, TX 77042

processes.honeywell.com

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