


# **SOLUTIONS FOR THERMAL PROCESSING OEMS FOR IMPROVING PROCESS PERFORMANCE**



A large industrial facility, likely a thermal processing plant, featuring a tall yellow structure with multiple levels of walkways and stairs. A large horizontal pipe is visible on the left side. The background shows a clear blue sky and other industrial equipment.

## Thermal Processing Industry Business Needs

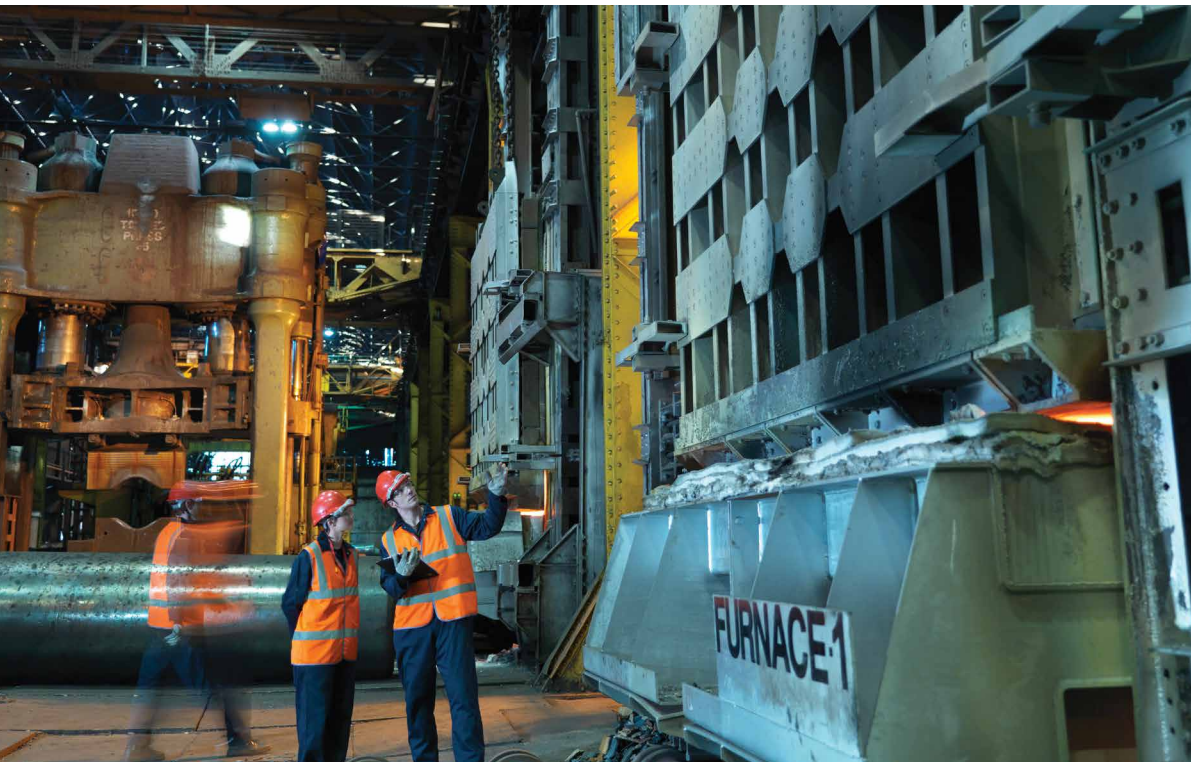
Original equipment manufacturers (OEMs) serving the thermal processing industry face increasing operational and business demands. This includes helping customers meet the challenges of energy savings, emissions control, regulatory compliance, data validation, and increased productivity.

At the same time, there is constant pressure to employ process control technology that is highly robust and reliable. Failure of this equipment can result in higher operating and maintenance costs, as well as a loss of production and revenue.

# Keys to Your Business Success

Today, process OEMs must ensure their equipment is energy efficient, easy to operate and maintain, and environmentally friendly. This not only includes effective automation and control solutions, but also the highly skilled personnel, engineering tools and support resources needed to meet critical performance, customer satisfaction and efficiency requirements.

Thermal processing operations require automation solutions enabling accurate temperature measurement, precise gas and combustion control, and smooth transitions. They also need to optimize energy usage while achieving economic and environmental savings.



## Thermal industry operations must find ways to:

- Ensure the uptime of furnaces and other critical production equipment
- Reduce waste through increased accuracy of furnace controls
- Extend the life of existing assets
- Reduce and eliminate paper trails by utilizing improved data management, archiving and reporting capabilities
- Minimize rework and reduce scrap by improving consistency and repeatability
- Reduce emissions and improve regulatory compliance
- Optimize energy and power usage
- Ensure greater return on technology investments
- Maximize quality of heat-treated parts

# Honeywell A Partner You Can Trust

Now, more than ever, OEMs must choose technology that builds added customer value into their furnace controls in order to gain a business advantage.

Around the world, Honeywell is recognized as a quality brand with a long history of working with process equipment manufacturers. Our control systems are employed in the most demanding industrial applications and are designed to help improve process safety, reliability and efficiency.



## The Right Supplier Makes a Difference

As an OEM, your most important objective is to save money and resources by leveraging proven tools and methods that make your business more profitable. And you need to differentiate yourself in an increasingly competitive global market. Customers want lower costs, as well as innovative equipment to optimize plant performance.

Manufacturers of furnaces, industrial autoclaves and other production equipment not only consider the functional requirements for control equipment, but also its reliability, ease of use and maintainability.

In addition, they seek a control system vendor with good supply chain management, as well as quality training and services, and excellent pre- and post-sales support. It's also important to choose an automation supplier with proven global coverage.

For more than 100 years, Honeywell has been a preferred supplier to OEMs. We deliver the tools and expertise needed to build equipment control solutions that are scalable and reliable, and provide low cost-of-ownership in a wide range of batch and continuous applications.

At every stage in the lifecycle of your equipment, Honeywell is your trusted partner. With our systems, products and services, you can lower your total design and development costs and reduce time to market. We're committed to helping OEMs become more agile in an uncertain economy, while improving your profitability and delivering new and innovative technology across the market.

Honeywell's solutions also enable you to implement sophisticated control strategies with minimal effort, improve your equipment's

flexibility for faster changeovers, and provide seamless access to production data.

Most importantly, Honeywell knows your operators must be as effective as possible. That's why we've designed intuitive, user-friendly interfaces for all of our control solutions. Plus, we've made it easy to migrate your legacy systems to the newest technology – protecting your investments now and into the future.

## The Most Complete Automation Solution

Honeywell offers the industry's broadest product portfolio, ranging from Distributed Control Systems (DCS) and advanced controllers, to best-in-class transmitters, actuators, recorders, sensors and other products for the process environment.

*Expertise and leadership enable us to define and produce superior control solutions. We provide engineering design and support services and products for many applications, including:*

- Gas carburizing furnaces
- Dual hearth retort furnaces
- Vacuum furnaces
- Industrial ovens
- Industrial autoclaves
- Tunnel kilns
- Lehrs
- Incinerators
- Thermal oxidizers



# ControlEdge™ HC900 : Versatile & Scalable Controller

The Honeywell ControlEdge HC900 is a versatile controller with a modular, scalable design sized to meet the automation needs of a wide range of process equipment. Combining analog process control functions and discrete control actions, this controller offers a cost-effective automation solution for thermal control in furnaces, kilns and dryers, as well as a host of single-unit processing applications.

**Both process OEMs and end-users can realize substantial benefits from the ControlEdge HC900 solution:**

- Improve project efficiency for up to 15% savings
- Improve production by up to 12-15%
- Lower total cost of ownership by up to 20-25%
- Save weeks of delay during late-stage design changes

The ControlEdge HC900 is a superior solution for thermal industry applications. It offers a selection of controller CPU modules, multiple I/O rack sizes, and local or remote I/O racks providing a flexible architecture that can accommodate the most demanding application. Modularity, built-in redundancy, versatile I/O configuration and connectivity, plus the ability to configure complete process solutions and archive their program parameters for easy retrieval and implementation, permit customized, pinpoint control.

The ControlEdge HC900 utilizes a secure

engineering software tool that minimizes project development and commissioning time, and helps to protect intellectual property of OEMs. This Windows® based application uses graphic objects to represent function blocks, greatly simplifying control strategy development and improving configuration record keeping. The software is license-free, allowing OEMs to obtain free updates via the Honeywell website at no charge. In addition, Honeywell's PC-based Station Designer software enables fast implementation of the controller HMI.



The ControlEdge HC900 also incorporates several key innovations intended for furnace control applications. For instance, it offers an improved solution for carbon potential by enabling users to control the enrichment gas and dilution air into the furnace. The controller also provides an anti-sooting alarm and automatic probe cleaning. The ControlEdge HC900 uses a dew point function block to calculate dew point based on a carbon probe receiving inputs from an O<sub>2</sub> sensor. A typical example is control of an endothermic atmosphere generator where the user requires a dew point measurement for PV.



The ControlEdge HC900 Controller now supports the 900 Control Station. This touch-screen operator interface provides more than 300 standard preformatted displays for controller monitoring and servicing. Their use shortens design time, reduces engineering costs, and facilitates standardization of operator interaction with the process — all while enhancing the ability to customize easy-to-understand graphic displays replicating the process the operator is monitoring.

The Control Designer software used for controller configuration is a Windows®-based application incorporating graphic objects to represent function blocks, greatly simplifying control strategy development and improving configuration recordkeeping. It is paired with the Station Designer software used for configuration of the operator interface through database import functions, which greatly simplify user interface display development.

**The ControlEdge HC900 includes a number of technology features not commonly offered by automation equipment suppliers. These include:**

- Scalable system configuration for controlling either a single heat treatment furnace or a multiple furnace operation
- Accurate PID control for single- or multi-loop furnaces, as well as support for duplex control for heating/cooling applications with individual sets of tuning constants
- 4608 I/O points
- Universal analog input modules supporting multiple thermocouple types, RTDs, ohms, and voltage or milli-voltage signal designs
- Thermocouple health monitoring ensuring thermocouple integrity
- Setpoint schedulers with multiple ramp/soak outputs and 64-step sequencers
- Run mode configuration changes
- Highest in loop control accuracy due to Honeywell's Accutune auto-tuning and fuzzy logic capabilities
- Robust logic control with typical scan rates of ~25 milliseconds
- Controller-centric database (configuration, communications and text documentation)
- Advanced floating-point math functions
- Assortment of over 100 pre-defined algorithms
- Overshoot suppression to minimize process variable overshoot following a set point change or process disturbance
- Extensive alarm and event monitoring
- Local data archiving to ensure process history is maintained even in the event of a supervisory system or HMI failure
- E-mail alarm notification
- Powerful supervisory control and data acquisition (SCADA) support
- Compact 4, 8 or 12 I/O slot rack sizes
- Open Ethernet network connectivity
- Peer-to-peer data exchange via Ethernet

# Experion HS: Integrated and Cost-effective SCADA

Built upon Honeywell's proven Experion Process Knowledge System (PKS) platform, Experion HS is an integrated and cost-effective SCADA solution that can efficiently fulfill the requirements of small to medium size applications.

It provides the freedom to choose the controller that best suits your application—ensuring greater versatility and potentially reducing costs.

**Experion HS includes a host of industry-leading features:**

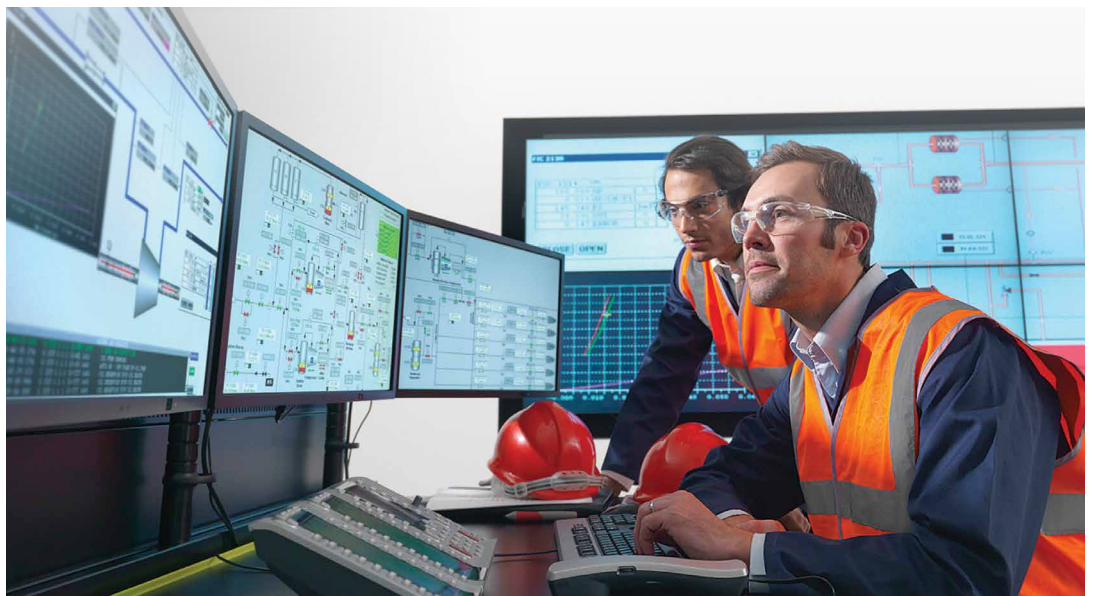
- *Pre-built standard displays (including process group, point detail, trend, alarm and set point programmer displays) to reduce configuration time*
- *Intuitive and flexible HMI meeting even the most demanding requirements for process graphics, display navigation and alarm presentation*
- *User-configurable pull-down menus and toolbars promoting easier, intuitive navigation to process data*
- *Enhanced trending for up to 32 pens simultaneously, and event markers providing operators with a comprehensive view of the plant*
- *On-board historian to collect history and events, enabling instant access to reliable and accurate process data*
- *Open architecture based on commonly used industry standards and the Microsoft Excel™ add-in, which provides greater choice in generating reports from process data*
- *Integrated configuration environment enabling offline and online configuration changes and minimizing process disruption*
- *Integrated server redundancy without the need for expensive third-party, fault-tolerant computing platforms*

Customers implementing Experion HS benefit from years of Honeywell experience gained on large scale automation projects. For example, the system is supplied with pre-built detail displays based on Honeywell's work with the Abnormal Situation Management (ASM®) Consortium to define safe display principals and practices. Honeywell's HMIWeb® solution provides an HMI offering fully integrated data delivery using standard Internet technologies such as HTML and XML. Every HMIWeb graphic follows the same visual and operational conventions as defined by ASM. As a result, the user gets fewer operator errors—with little or no effort—thanks to better, safer HMI graphics.

Experion HS is specifically designed to easily integrate with Honeywell ControlEdge HC900 and MasterLogic controllers. When used with these controllers, highly functional integration software is provided. With this integration software comes the best in terms of performance, diagnostics and ease of engineering.

But Experion HS is also designed for use with controllers from other vendors. It incorporates the robust, industrial strength technology of MatrikonOPC, which provides equipment data connectivity to all vendor control systems based on the OPC standard and extends supervisory control functionality. This open connectivity allows Experion HS to work seamlessly with a host of third-party controllers and devices.

Using the Matrikon Universal PLC Server, you can connect to a long list of controllers and related devices.







# Transmitters, Controllers, Indicators, Programmers and Actuators

## **Temperature Transmitters: Precision devices, proven in the field**

The STT Series of programmable temperature transmitters provides cost-effective solutions for temperature monitoring applications in the thermal industry. Compared to direct-wired temperature sensor monitoring points, the STT transmitters deliver increased accuracy, safety and reliability while also reducing wiring costs. They automatically linearize the temperature output signal bound by upper and lower range values. In addition, the user can program high- or low-limit alarms to activate in the case of sensor failure.

## **Actuators: Smart technology for low ownership costs**

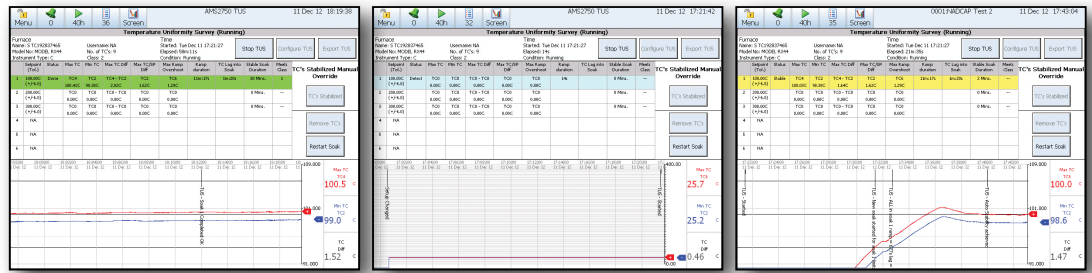
The Herculine family of actuators offers maximum reliability and final control performance for the lowest lifetime ownership cost. Designed for precise positioning of dampers and quarter-turn valves, the actuators perform well in critical applications.

## **Pressure Transmitters: Accurate and reliable measurement**

The ST Series of programmable pressure transmitters lead the industry in reliability, stability and installed process performance. Honeywell sensing technology fully compensates for ambient conditions associated with installation, resulting in exceptional in-process accuracy. Additionally, the Honeywell pressure solution is fully static pressure compensated, ensuring high stability over large spans and large process changes. This solution is ideal for accurate measurement of furnace draft pressure as well as combustion flows.

## **Controllers, Indicators & Programmers: Tailored to your specific needs**

Efficient operation of industrial processes demands solutions enabling accurate control at a competitive price. Honeywell addresses these needs with a line of universal digital controllers, single- and dual-loop PID controllers, universal digital indicators, and single- and dual-channel programmers. We offer temperature controllers with universal outputs for on-off control of ovens and heat-treating furnaces, as well as controllers with analog outputs to position actuators and valves.



## Recorders & Data Acquisition: Designed for improved data management

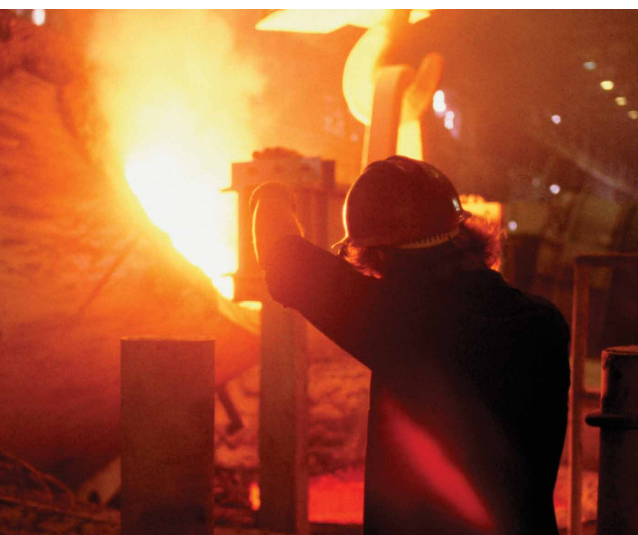
Honeywell offers an extensive array of paperless recorders, circular chart recorders, strip chart recorders, communication software and other data acquisition products to address most industrial recording needs. Direct sensor connections, Ethernet communications capability, customizable displays, advanced math functions and a wide selection of storage media make it easy to set up, use and analyze your process data.

Honeywell's data management solutions also meet National Aerospace and Defense Contractors Accreditation Program (Nadcap), System Accuracy

Test (SAT) and Temperature Uniformity Survey (TUS) requirements for reporting, allowing users to print test results directly from the recorder screen. X-Series recorders support process monitoring and temperature uniformity surveys as detailed by the Aerospace Material Specification AMS2750E. The recorders can be set up to monitor and record thermocouple usages, due dates for the temperature uniformity survey, system accuracy tests, instrument calibration dates and thermocouple usage to ensure compliance to the specification.

# Expertise for Diverse Industries

Continuous innovation within the process industries has positioned Honeywell as a global leader in automation technology, quality and domain expertise, which has been providing innovative solutions for more than 50 years. Everything we invent, across the entire spectrum of process solution lifecycle needs, is geared toward creating real value for our clients.



**Aerospace:** Honeywell is among the leading suppliers to the aerospace industry, including a “who’s who” of major clients around the world. No other supplier has a better understanding of the rigors of aerospace equipment manufacturing. We can provide a full range of control products for thermal processing equipment such as vacuum furnaces and industrial autoclaves. This includes solutions to ensure superior performance in applications involving SAT and TUS pyrometric requirements per the AMS2750E standard.

**Glass:** Honeywell offers global experience and know-how in every major facet of glass manufacturing. We have been involved with glass automation projects for decades doing business with many leading glass companies as well as local glass production facilities. Our control systems are used in float, container, fiber, optical and specialty glass production.

**Metals:** Honeywell is one of the largest automation suppliers serving the metals treating industry. We provide control solutions for common processes such as annealing, austempering, case hardening, conventional hardening, homogenizing, hot isostatic pressing (HIP), martempering, normalizing, precipitation hardening, shot peening, solution treating, spheroidizing, stabilizing, and stress relieving. From standalone instruments and smart sensors to integrated systems, Honeywell offers a comprehensive portfolio of measurement and control solutions for heat treatment applications.

**Cement/Building Materials:** For cement and brick plants, improved kiln control leads to substantial energy savings while maintaining high production of quality clinker. Thanks to Honeywell’s ControlEdge HC900 controller, kiln performance can be monitored continuously to maintain desired stable operation. This is accomplished by monitoring burning zone temperature, preheater/precalciner temperatures and pressures, exit gas analysis, and kiln drive power. Based on changes in these variables, adjustments can be made systematically to optimize kiln operation.

**Ceramics:** Atmosphere monitoring and control are essential in a host of industrial processing applications. For example, ceramics are often sintered or annealed in controlled atmospheres to control grain growth and stoichiometry, prevent oxidation, or to activate sintering. Honeywell hydrogen and oxygen sensors are ideal for these applications.

# Global Support from an Industry Leader

Honeywell understands the unique business requirements of process equipment manufacturers. Our automation solutions can help OEMs maximize revenue, increase profits and reduce design and implementation costs. We also provide comprehensive pre- and post-sales support, as well as value-based solutions that help drive business success.

Honeywell is a pioneer in process control and today, more than 8,000 technicians use collective expertise to work for customers in 67 countries. Our development teams are driven to the highest standards to meet product requirements for ease of use and maintenance.

Honeywell also provides world-class customer support via our Global Technical Assistance Center (TAC). Knowledgeable and highly trained professionals are available on a 24/7/365 basis to deliver expert assistance—no matter where you're located around the world.



## For more information

To learn more about Honeywell's ControlEdge HC900 process controller, visit [www.honeywellprocess.com](http://www.honeywellprocess.com) or contact your Honeywell account manager.

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BR-12-23-ENG | 05/18  
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