

# **THE RIGHT INFORMATION AT THE RIGHT TIME**

Thermal IQ's real-time data and remote monitoring capabilities drive better business outcomes across applications.

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# ABSTRACT

**Thermal processes help make life easier, safer, *better*. Almost all moments, normalcies and systems — your first cup of coffee in the morning, your commute to the office, your city’s next big construction project, to name a few — rely on thermal processes for functional end products and/or consistent, reliable results.**

Often unnoticed, thermal processes are vital. Comprising an extensive list that includes roasting, drying, baking, curing, heat treating and melting, thermal processes help determine countless product characteristics, including quality. Take dairy operations as an example. If raw milk isn’t pasteurized — a thermal process that heats milk to a specific temperature to kill harmful bacteria — it would be un consumable.

Though thermal processes have been documented and practiced for centuries, our world’s current era of digitalization changes how thermal operations can be performed. Using digital technologies with greater connectivity helps thermal enterprises work faster, smarter and more efficiently. These improved characteristics are especially important as this industrial sector faces challenges; thermal processes rely heavily on antiquated equipment, consume considerable amounts of energy and contribute to the growing carbon emissions crisis.

Thermal IQ™ is a powerful, digital thermal management tool from Honeywell Thermal Solutions. Thermal IQ helps reduce the aforementioned challenges and their effects by adding speed, intelligence and efficiency to thermal operations through remote monitoring. Remote monitoring gives thermal engineers and operators complete visibility of thermal assets at an enterprise, site or asset level to drive better business outcomes with real-time analytics.

Find out how Thermal IQ adds value, visibility and versatility to any system or application.

# INTRODUCTION

How we manage thermal processes matters. From small plants to large ones, optimizing the performance of equipment, processes and entire operations remains a high priority for thermal engineers, operators and managers. Honeywell Thermal Solutions' Thermal IQ has and continues to help thermal enterprises achieve these optimizations.

## THE THERMAL INDUSTRY'S DIGITAL TRANSFORMATION

Just 20 years ago, ovens, dryers, roasters, furnaces and other thermal equipment weren't "connected" or considered "smart." But now, they can be. Innovations and the development of new technologies over the last two decades have turned heavy thermal machinery into informative devices that, with the help of digital platforms and wireless connectivity, deliver real-time, data-driven insights.

Thermal personnel no longer have to wonder how equipment performs day after day, month after month. Nor do technicians have to inspect equipment and record findings manually, which reduces the risk of manual errors. The digital transformation in the thermal industry makes it easier than ever to record, access and act on accurate process data anytime, anywhere. Thermal IQ leads the way to this exciting, transformative present.

## UNLEASH THERMAL PROCESS PERFORMANCE WITH THERMAL IQ

Keeping sustainability, efficiency and ease of use top of mind, there are four primary reasons this remote monitoring solution from Honeywell Thermal Solutions helps create better business outcomes:



### IMPROVED RELIABILITY

Once asset insights are gathered, they can be categorized based on anomalies with advanced analytics that help equipment, and thus plants, avoid potential downtime.



### QUICK IMPLEMENTATION

Its hardware-agnostic philosophy and thermal asset library means users can deploy this cloud solution with minimal downtime or disruption and scale with ease.



### PERFORMANCE-DRIVEN METRICS

See combustion performance, learn more about combustion performance. Operational KPIs for many equipment functions can be used to win immediate efficiency gains.



### HONEYWELL EXPERTISE

We are thermal leaders for a reason, and leverage our knowledge, experience and customizable solutions to fill any process gaps and build cost-effective operations.



Thermal IQ is a comprehensive digital platform that collects, analyzes and visualizes massive thermal datasets without significant investment or strain on IT infrastructure. It helps measure, monitor and manage temperatures, flow rates and other indicators of asset health and performance — remotely. This all-in-one solution enables entire enterprises to identify and fix inefficiencies before they damage valuable thermal processes, equipment and performance.

The best part? Thermal IQ is suited for any thermal application. If an enterprise forges metals, roasts coffee beans, manufactures cars or applies heat in any way, Thermal IQ can help. Visualization can be customized, data can be secured, and leaders can be empowered to proactively solve unseen, complex problems. We have case studies with measurable successes to prove it.

### **ACCOMPLISHING WHAT YOU NEED**

The success of and reliance on Thermal IQ isn't an accident. We understand that no plant, business or enterprise is the same. That's why our thoughtfully designed platform has dashboards that can be customized to preferences and operations.

With critical alerts and notifications and a high-level overview of all connected thermal equipment, Thermal IQ's actionable, real-time intelligence is a true difference maker for all who use it. See how six different Honeywell customers leveraged Thermal IQ to tap into powerful, advanced and secure operational improvements.

# FLIP PHONE CONVERTED TO CONNECTED CHAMPION



## SITE AND CHALLENGES

A customer reliant on kilns needed a fast, high-end upgrade. Before enhancements, its system was cumbersome. Many disorganized cabinets and excess wiring around combustion equipment operated at extremely high temperatures. This site lacked connectivity and while most of its equipment was significantly outdated, its legacy Honeywell 7800 SERIES burner flame relay featured a built-in annunciator, air-fuel ratio monitoring and high-temperature limit controls.

## SOLUTION AND RESULTS

The extensive upgrade included a new burner, fuel train and Smartlink valve controls built into the SLATE™ combustion management system, all from Honeywell Thermal Solutions, to help the customer move from antiquated to advanced. The customer handled the overall kiln controls upgrade, connecting individual modules. All data was displayed on a touchscreen located on the front of the operations panel. Within a week, however, an undersized motor starter was blown in the panel.

With precise data and visualization, Honeywell engineers and service teams identified the problem, introduced a resolution strategy via Thermal IQ and had the customer's entire system up and running within four hours. This solution helped the customer avoid significant downtime, which hurts productivity, profitability and performance — and results in wasted energy. Service costs were also minimized. Thermal IQ's remote monitoring capabilities and our expert personnel helped resolve the blown panel in less time with more efficiency.

# STAND-ALONE THERMAL IQ INSTALLATION



## SITE AND CHALLENGES

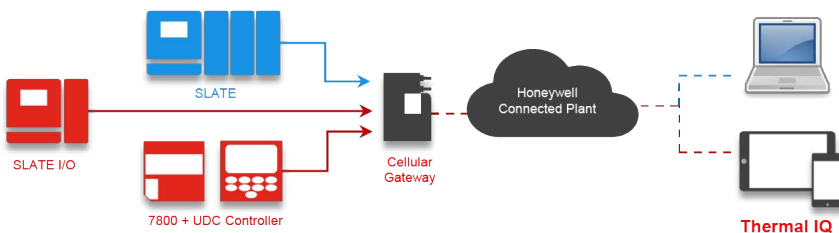
An enterprise's kiln relied on the Honeywell 7800 SERIES burner and two utility data collection (UDC) systems. Site personnel struggled to light the pilot and establish a main flame in the burner, which affected the remaining steps in its thermal process. Instead of attempting to solve the problem themselves, personnel elected to contact their Honeywell service technician to help retune the burner.

## SOLUTION AND RESULTS

Honeywell's team of application engineers accessed site data remotely via Thermal IQ, including burner-specific information that showed the current status and recent history of its flame safeguard. With information and an understanding of operations before arriving onsite, the service technician brought the right tools and components the first time, completing the repair in significantly less time and improving the site's First Time Fix (FTF) metrics.

The swift FTF repair minimized service costs. Resolution on the first visit eliminated the need for extra trips and extra labor costs. This Thermal IQ-driven outcome saved the enterprise approximately \$13,500 in repair and service expenses.

Correcting the burner's flame issue also helped the site avoid downtime, disruption and damage to equipment and products that likely would've been affected by the burner's lack of a main flame.



# UNMANNED OPERATIONS CONCRETE MOLDS FOR METALS



## SITE AND CHALLENGES

A plant in the metals industry uses seven outmoded furnaces to dry concrete molds before they can be used to help cast metal parts. As remediation to this obsolescence, these furnaces rely on Honeywell 7800 SERIES burners as well as UDC controls. To remove friction associated with equipment start-up at the beginning of each week and to ensure adequate heat can be supplied at all times, this plant keeps equipment running 24/7. Its furnaces also must maintain constant, exact temperatures for optimal drying and output.

The antiquated combustion equipment lacked remote access to thermal process information, as well as the staff responsible for monitoring and maintaining the furnaces manually. If they had more information and more staff to act on the insights, it's likely they could've identified the random power trips in their process sooner and saved the approximate \$30,000 lost each month because of them.

## SOLUTION AND RESULTS

Honeywell recommended and implemented Thermal IQ into the plant's existing processes. Via text message, Thermal IQ sent alert notifications to combustion experts that highlighted pilot flame failure during ignition, a cause of the costly power trips. Additionally, the visualization provided by this digital, data-driven platform showed plant engineers and operators how the pilot shutoff valves are located far away from the burners when the trip line fills with air.

The awareness of inefficiencies, thanks to Thermal IQ, enabled the allocation of funds to shift the right systems closer to the burners to avoid excess air in the lines to light. The metals plant has remote, real-time monitoring capabilities for all processes, including ramp and soak profiles.

Reducing the frequency of the power trips at this plant reduced the amount of energy that was typically needed to keep equipment running all day, every day. This efficiency subsequently delivers a handful of sustainable benefits, including a smaller carbon footprint and greater energy conservation..



# QUICK KETTLE UPGRADE FOR A BUILDING MATERIALS PROJECT



## SITE AND CHALLENGES

Thermal processes help dry building materials like wood, veneer, gypsum boards and ceiling tiles. Before its large building materials project was underway, one customer in the construction industry decided to revamp its thermal processes with a new fuel train across systems that included the Honeywell 7800 SERIES burner and UDC temperature controllers.

The new fuel trains created efficiencies and uniform heat during drying operations as soon as the project began. Just beyond the start however, the customer realized something was missing. They wanted to see how the elements of each fuel train performed in real time to measure, monitor and manage its performance, especially when they weren't onsite.

In need of the visibility, control and customization from Thermal IQ, this customer couldn't help but worry about the disruption and downtime the implementation of this digital platform might cause, which could potentially delay the entire project.

## SOLUTION AND RESULTS

Acknowledging the customer's apprehension, Honeywell's expert service team retrofitted the existing system with Thermal IQ, a Modbus data collector and extra sensors in minimal time, with minimal disruption.

This add-on supplied the customer with the visualization of and insights from almost 100 similar systems needed for the project; these elements helped identify and fix potential problems before they started and helped the project stick to its original timeline.

# BOILER HIGH CYCLING



## SITE AND CHALLENGES

A thermal plant with boilers underwent a series of contractor-led upgrades and overhauls, including:

- Repairs and service to a 50-year-old boiler
- The implementation of SLATE combustion management system
- The addition of sensors on active equipment
- A new feed water pump

Upon restart, the boiler fired continuously from high- to low-fire, which wasted energy, decreased the efficiency of the plant's processes and reduced the lifespan of its equipment and controls.

## SOLUTION AND RESULTS

The plant contacted its Honeywell service team and followed the recommended next step: integrating Thermal IQ into its operations to monitor more than 20 data points and identify the cause of high cycling.

After integration, monitoring and analysis application, engineers at Honeywell discovered an abnormally high-feed, water-flow rate. The contractor, during the period of upgrades and overhauls, incorrectly installed an over-capacity motor on the boiler's feed water pump. The Honeywell team undid this installation, reducing the flow rate to 40%. The boiler stopped high cycling immediately and oxygen levels in the exhaust returned to normal. The optimizations were visible to plant personnel and Honeywell teams alike through Thermal IQ.

Reduced thermal high cycling reduced wear on the boiler and its controls. It also helped the plant use less energy, improving its carbon footprint and saving 5% of fuel costs (about \$5,000/year).

# CHANGING THE STATUS QUO ON DIE-CAST PART QUALITY



## SITE AND CHALLENGES

Die-casting for metal part production is an intricate process contingent on thermal equipment. When an enterprise responsible for the casting of commercial valves — parts with no room for error — noticed finished products with poor quality, it knew its operations couldn't continue without intervention and remediation.

The site relied on 40-year-old electric aluminum die-casting equipment with limited automation. While a flashing light alerted a sparse production and maintenance staff that the thermal equipment wasn't operating correctly, they were largely unsure of the issue — and even more unsure of how to fix it. And because most technicians were spread throughout the site, some didn't even know about the upset that caused product variation and errors. The frequency of burrs and exposed metal seams on the control valves often required rework, which slowed production and increased costs.

## SOLUTION AND RESULTS

Remote data access and visibility into equipment operability with Thermal IQ helped the site identify the source of poor part quality. The electric aluminum die-casting equipment experienced intermittent temperature swings during the production of identical equipment. Fluctuations, even of just a few degrees, resulted in defects and unusable valves.

Honeywell service technicians monitored the temperature swings without visiting the site and prescribed a maintenance plan to resolve the issues at the machine level. Because of the detailed data and remote monitoring capabilities provided by Thermal IQ, the site had its equipment serviced exactly as it was needed. Almost immediately, the commercial valves had precise edges and contours.

Instead of replacing equipment, acquiring new-capital and installation costs, slowing production and wasting energy on ineffective products, Thermal IQ helped the site recover — and recover fast — from inefficiencies, changing the status quo on the site's product quality, processes and performance. Sustainability was an added benefit of remediation, too, in the form of fewer metal scraps, and because consistent temperatures consume less energy than those that swing.

# CONCLUSION

**Without Thermal IQ, varying thermal enterprises with important functions and responsibilities wouldn't operate at maximum efficiency.**

When you can see what's happening across your thermal enterprise, you can make fast, effective improvements. Remote monitoring capabilities, accessible, real-time data and timely alerts from Thermal IQ help protect equipment, products, processes and sustainability across applications by limiting errors, enhancing energy efficiency and predicting and preventing failures. It's a connected thermal solution that works exactly how you need it to, with configurations for any condition.



**For more information**

<https://process.honeywell.com/us/en/initiative/tiq>

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