



Hitachi Optimized Factory

Advanced Process Control

Smart Process Control for Manufacturing

A new generation of process control technology is here for the optimized factory. As companies shift from product-driven operations to customer-centric, demand-driven manufacturing, industrial process manufacturers are reformulating their production methodology to keep up. This new approach introduces a greater variety of products, more frequent changeovers, and shorter production runs. In this demanding environment, process manufacturers need advanced process control strategies to monitor and manage multiple product variations and deliver quality products.

Hitachi's Advanced Process Control on Google Cloud Platform combines technology, automation and Machine Learning to significantly improve operational efficiency in factories, production lines and manufacturing facilities. This solution brings artificial intelligence to process control monitoring with automated and intelligent statistical process controls (SPCs). By combining Hitachi's internet of things (IoT) and data science technologies with Google Cloud's machine learning, Hitachi's Advanced Process Control manages complex interactions to reduce process variability and improve operational efficiency and product quality.

Targeting Desired Operating Conditions

Using big data and advanced analytics visualizations, the solution allows process manufacturers to adjust operations for their ideal operating envelope. It flags status changes in process parameters and supports real-time analysis of variance (ANOVA). As a result, manufacturers can proactively identify the effect of maximum and minimum process parameters on product quality and minimize production issues with sensitive or unstable products. For example, cable manufacturers must tightly control for critical-to-quality parameters such as line speed, zonal temperatures and gas pressures in order to manufacture quality surface finishes and concentricity.

Why Hitachi and Google Cloud?

HITACHI
Inspire the Next

- Real-world experience gained from over 100 years in the manufacturing industry, over 50 years in IT
- Pioneer in IoT with over 15,000 IoT patents
- Dedicated IoT data science research lab to drive innovation

 **Google Cloud**

- Enterprise-scale solutions
- Combines data storage, analytics and ML to drive high-accuracy parameter predictions
- Advanced ML quickly addresses changes to part specifications

Together, Hitachi and Google Cloud offer a unique advanced process control solution tailored to your manufacturing environment.

Bring Intelligent Automation to Process Control

Hitachi's Advanced Process Control on Google Cloud

Challenge	Solution	Benefit
<ul style="list-style-type: none">Keep pace with the demand for more varied products while maintaining an optimum production costSupport a greater variety of products, frequent changeovers, and short production runsManage multiple product variations, including product characteristics that are only minimally variedMonitor processes and product variations that require extra attention from operators	<ul style="list-style-type: none">Provides real-time monitoring by ingesting live IoT-enabled production dataUses a trained Google Cloud Machine Learning model to predict the impact on quality parameters and on the maximum and minimum process parameters on product qualityDelivers advanced analytics and custom visualizations so operators can focus on key metrics, allowing for real-time alerts or adjustment recommendations	<ul style="list-style-type: none">Optimize production systems to operate as close to your ideal operating envelope for the many product variations to be manufacturedImprove process efficiency and deliver consistent product qualityAddress changes to product parts specifications quickly to reduce costs and increase productivityMinimize production issues for sensitive or unstable products

Built with Google Cloud



Cloud AutoML



Cloud IoT Core



Cloud IoT Edge



Cloud Pub/Sub



Cloud Functions



Stackdriver



App Engine

Contact Hitachi Consulting

Hitachi Consulting provides consultants, data scientists, engineers and manufacturing specialists to work hand in hand with you and to co-create an advanced process control solution to solve your specific problems. Contact us to get started: info@hitachiconsulting.com

About Hitachi Consulting

Hitachi Consulting is the global solutions and professional services organization within Hitachi, Ltd., a global innovation leader in industrial and information technology solutions and an early pioneer of the Internet of Things. Hitachi Consulting is a business integrator for the IoT era and a catalyst for digital transformation. Using our deep domain knowledge, we strategically collaborate with our clients to help them innovate faster, maximize operational efficiency and realize measurable, sustainable business and societal value. As a consulting-led solutions company, we can help you leverage data as a strategic asset to drive competitive differentiation, customer loyalty and growth. To learn more, visit www.hitachiconsulting.com.