Solution Brief
IBM Predictive Maintenance and Quality* (PMQ*) with ADLINK IoT Gateways Intel® Processors

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ACQUIRE, ANALYZE, AND ACT WITH INNOVATIVE IOT SOLUTIONS



IBM Predictive Maintenance and Quality* (PMQ*) with ADLINK IoT Gateways

Together, IBM and ADLINK enable enterprises to "listen" to the things that make their organizations tick. This integrated solution helps enterprises to:

- Maximize efficiency, utilization, and performance
- Innovate through new monetization services
- Strengthen competitive advantage through a differentiated offering
- Minimize costly downtime

IBM and ADLINK Deliver Greater Insight through Edge Computing, Connectivity, and Analytics

Today's businesses are competing in a tough climate. Capital and operational budgets are tight, and the availability and reliability of assets may lag behind even baseline performance expectations. Breakdowns, ill-timed maintenance, and stoppages due to quality issues can be wasteful, expensive, and inefficient. Asset downtime and poor quality parts can be disastrous to meeting customer demands, and pose potential risks to human safety.

Insight is often difficult to access and assess, given the massive amounts of isolated data stranded in disconnected systems. The explosion of connected devices within the enterprise brings the promise of better insight, but only if the data from these devices can be properly harnessed.

In this landscape of data-driven change, successful companies are optimizing physical assets and operational processes to ensure they are functioning as intended and the return on investment (ROI) is maximized.

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Achieving Optimization

IBM and ADLINK offer an integrated approach for the optimization of physical assets, operations, and processes. The ADLINK IoT Gateway— based on Intel® processors—captures real-time data from instrumented equipment and transfers it to IBM's best-in class Predictive Maintenance and Quality* (PMQ*) analytics platform. The system helps operators monitor, maintain, and optimize assets to improve operational performance. Potential failures can be detected before outages occur, anomalies identified, and interventions initiated to avoid costly downtime.

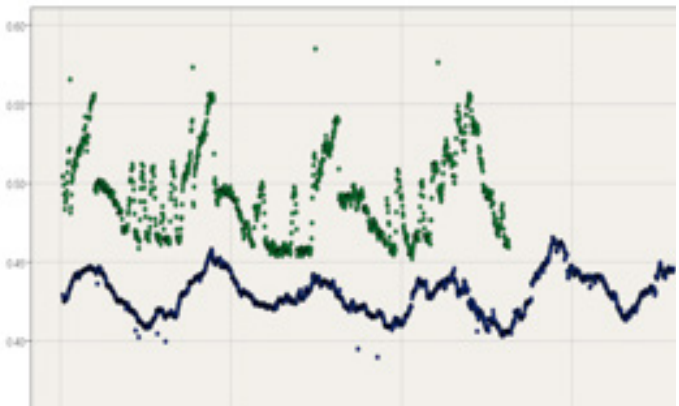
Best of all, this can be delivered either on premise or via the cloud to help speed deployment.

Providing enhanced, secured, and actionable insight at both the edge and the cloud, ADLINK IoT Gateways, rugged embedded Intel processor-based computer and server platforms, and IBM PMQ help asset-intensive businesses. This proven solution proactively detects equipment and system patterns to maximize utilization and performance, while minimizing costly, unscheduled downtime.

Energy efficiency analytics

As an example, consider the importance of a cooling system's efficiency in industrial applications. In the diagram, we compare a running chiller (green dots) to an aggregate history of healthy chillers (blue line). The ADLINK IoT Gateway pulls the data directly from the running chiller and feeds it to the IBM PMQ platform.

Since the performance is operating outside of tolerance—in this case showing high energy consumption—the chiller is not operating well. The solution can notify technicians of the problem and accelerate key system adjustments, thereby improving performance.



Energy efficiency analytics

Connect to Your Devices with the ADLINK IoT Gateway

The ADLINK IoT Gateway is a robust, reliable, and application-ready embedded edge computing device that helps systems and things communicate in accessible ways. It securely connects, aggregates, and filters data from several types of sensors and protocols at the edge, allowing businesses to analyze and act upon information in near real time, while reserving more robust datacenter analysis for enterprise-wide applications. Several processor choices and gateway models allow adjustment for different interface and processing requirements.

Real-Time Data Management

ADLINK IoT Gateways help turn information into action by locally aggregating data from multiple edge devices. Through IBM PMQ, this real-time data is integrated with existing static data and historical profiles to provide optimized, actionable insight to people and systems. ADLINK IoT Gateways are built with a wide range of performance options, including Intel® Quark™, Intel® Atom™, and Intel® Core™ processors.

Predictive Analytics and Business Intelligence

By integrating real-time data, IBM PMQ enables predictive insights to become prescriptive actions. Results are presented in easy-to-navigate interactive dashboards, visualization templates, and reports. They can be delivered to your preferred mobile device, as well as to Enterprise Asset Management (EAM) systems, such as IBM Maximo* EAM, where work orders can be launched based on predictive insights.

Advanced Security for Trusted Data from Edge to Cloud

With integrated security software, ADLINK IoT Gateways, embedded PCs, and Intel® Xeon® processor-based servers combine with an IBM cloud or on-premise solution to enable trusted data and secure, protected infrastructure from the edge to the cloud.

Manageability

ADLINK IoT Gateways are pre-integrated with edge management systems, providing cloud connectivity to facilitate device configuration, file transfers, data capture, and rules-based data analysis and response.

Scalable Architecture

Intel IoT Gateways and Intel Xeon-based servers provide an inherently flexible and scalable infrastructure from the edge to the datacenter. IBM solutions extend scalable architecture and APIs—to link to many systems and types of data sources (i.e., structured and unstructured).

ADLINK IoT Gateway Capabilities	
Aggregate and filter data from several types of sensors, Programmable Logic Controllers (PLCs), and robotics using several protocols at the edge (on the factory floor)	Flexible and scalable infrastructure from the edge to the datacenter
Analyze and act upon critical information in near real time	A cloud-to-device management agent is integrated to facilitate device configuration, file transfers, data capture, and rules-based data analysis and response
Reduce data transmission, storage, and analysis costs by performing some analysis and filtering data at the edge	Supports a wide range of operating systems and ecosystem applications
Tightly integrate the critical hardware-based security of Intel® processors with operating system, application software, and cloud connectivity security	Out-of-the-box support for the IBM Internet of Things Foundation* for data delivery via TCP-IP (wired or Wi Fi) or cellular (3G or 4G/LTE) †
High reliability Industrial IoT Gateway applying designs eliminating fans and internal wiring to maximize robustness and MTBF	**Wide range of connectivity and processor options (Intel® Quark™, Intel® Atom™, and Intel® Core™ processors) to meet different requirements**
IBM Predictive Maintenance and Quality* (PMQ*) Capabilities	
Monitor, maintain, and optimize assets in real time for better availability, utilization, and performance	Effectively predict asset health by integrating data from physical assets, including sensor data from instrumented equipment, historical data stored in multiple databases, and data in EAM systems like IBM Maximo*, as well as real-time streaming data
Enable faster, more informed decisions by connecting relevant sources of data—such as production equipment, plant maintenance logs, supply chain data, and surrounding environmental data—to contribute to the development of predictive models	Provide configurable dashboards and reports to decision makers in real time, including: site overview, process and material quality, real-time and historic performance, quantitative and qualitative KPIs, top failure reasons, and recommendations
Access relevant data sources in real time to determine the assets and operational processes that are at the greatest risk of failure and identify problems before they occur, so your organization can reduce reject rates, improve yield, and maximize uptime	Automatically initiate and manage work orders that include recommendations for deploying maintenance and repair resources, based upon asset health through native integration with IBM Maximo (EAM System)
Early warning analysis: Make appropriate modifications to the production line or eliminate substandard components from the manufacturing process by detecting and prioritizing quality problems and parametric shifts earlier and more definitively than traditional statistical process control methods. This helps to avoid wasted production cycles, reduce unit costs, maintain product quality, and improve margins.	Apply preconfigured or custom predictive models to your organization, including: asset- and industry-specific models, maintenance, sensor health, integrated health, quality early warning system, optimization, custom, automated model refresh

† Contact ADLINK sales for availability



IBM PMQ and the ADLINK IoT Gateway based on Intel® processors provide a comprehensive solution, enabling enterprises to enhance customer satisfaction, reduce total cost of ownership (TCO), and improve vital decision making.

Learn more at **intel.com/iotgateways** and **ibm.biz/BdR6C9.**

ADLINK Technology is a Premier member and IBM is a General member of the Intel® Internet of Things Solutions Alliance. From modular components to market-ready systems, Intel and the 400+ global member companies of the Intel® Internet of Things Solutions Alliance provide scalable, interoperable solutions that accelerate deployment of intelligent devices and end-to-end analytics. Close collaboration with Intel and each other enables Alliance members to innovate with the latest technologies, helping developers deliver first-in-market solutions. Learn more at: intel.com/iotsolutionsalliance

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