Performance Intelligence and the Plant Solution

In today’s highly competitive brewery industry, there is a need to strive continually to improve production performance, reduce costs, and ensure regulatory compliance. Performance intelligence helps customers achieve these goals by combining key technology controls and software capabilities with expert services and support. Performance intelligence is a strategic planning tool that supports the monitoring of critical processes and equipment. These benefits can vary by customer application, but typically include:

- Improving overall production flexibility and efficiency
- Reducing costs attributable to equipment failures and inefficiencies
- Enabling digital systems to assist in optimizing production processes
- Enhancing regulatory compliance and reducing risk

The Digital Plant is a smart digital control and asset optimization solution that supports the monitoring of critical processes and equipment. Using a single, integrated and continuously growing database of the plant’s current and historical performance, it enables users to:

- Monitor key process and equipment performance
- Predict and prevent potential equipment failures
- Optimize production processes for maximum performance
- Improve regulatory compliance and minimize risk

The Digital Plant is designed to capture and analyze data from across the plant, enabling users to make informed decisions that can improve production performance and reduce costs. It is a powerful tool for improving overall plant performance and ensuring regulatory compliance.

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**Optimization Services**

- Start-up, commissioning, tuning, and training
- Construction, equipment installation, and field wiring
- Acceptance testing
- Budget and payback finalization
- Front-end engineering design

**Project Services**

- Process and business goals with lower risk and total
- Management expertise helps you safely align your

**Project Services**

- Process design analysis, and economic evaluations
- Process study (variability and control analysis,
- Cost savings of both process and controls, resulting in reduced
- Control changes that build in sustainable efficiency
- A detailed plant audit can identify design and
- Improvements.

**Services & Support**

- PlantWeb services: Plan for diagnostics-based maintenance
- Integration of PLCs and MIS systems
- Process study (variability and control analysis,
- Detailed plant audits can identify design and

**Utilities**

- Scaling control systems with a
- Access digital intelligence to
- Simplicity, streamlined, and flexible deployment generate digital control and
- Complete life cycle to achieve plant flexibility to produce a wide range of products, and optimizing existing assets to improve plant

**Brewery**

- Increased Production Costs
- Reduced Plant Availability

**Field Intelligence**

- Smart digital control and asset management systems: “Power PlantWeb” by enabling operations and maintenance staff
- Asset monitoring and control “Power PlantWeb” by empowering operations and maintenance staff
- Reusability of data across all plant data
- Reduced plant maintenance costs
- Access digital intelligence to
- Simplicity, streamlined, and flexible deployment generate digital control and

**Central and Asset Optimization**

- With the right intelligence, your field instruments not only give you more precise and reliable information on the process, but they also help you improve and run your field network in a cost-effective manner.
- Asset health diagnostics give you clear direction on which assets – including automation, electrical, mechanical, and other systems that support plant goals – can benefit from improved asset health.
- Automatic field instrument diagnostics, or “Field Web”, gives you real-time visibility into the health of your field instruments across your entire plant.
- Reduce maintenance costs
- Avoid lost production.
- Improve plant flexibility to operate more efficiently, safely, and cost-effectively.

**Emerging Opportunities**

- Better business analytics, data-driven decisions, and better alignment with business objectives.
- Integrating performance and operational data with business intelligence.
- Enabling the design to deliver measurable improvements to the overall efficiency of a brewery.
- Precise measurements at every phase of the
- For new facilities or plant expansions, PlantWeb helps to get you up and running more quickly and at lower risk and cost.

**PlantWeb in Action**

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**Food & Beverage**

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**FOOD & BEVERAGE**

- It provides process control, asset optimization and easy integration.
- It uses open standards at every level of the architecture.
- Predictive intelligence helps detect and avoid potential problems.
- It’s the only digital architecture with proven success in thousands of projects.
- Also self-diagnose their own health and notify you of potential problems.
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**What makes PlantWeb better?**

- Simplified maintenance and troubleshooting.
- Lower cost of ownership.
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With over 60 major sales, project execution, and support locations in more than 81 countries, we are here for you.

### UTILITIES

#### STEAM GENERATION

- Applying proven strategies of optimization, scale, and real-time analytics and applications
- Identifying system performance bottlenecks & inefficiencies, and realistic improvement opportunities
- A broad portfolio of proven, modular technologies to address specific issues, delivering maximum return on investment

#### SERVICES & SUPPORT

- Extensive engineering hours and technical support
- Delays in commissioning
- Batch-to-batch variability
- Inconsistent quality
- Costs and reduced kettle efficiency
- Waste of valuable resources
- A malfunction in critical process equipment
- Beer losses through re-work, product sent to drain or product scrapping

### BREWERY

#### Application Solutions Guide

**THE CHALLENGE**

- Reduced Plant Availability
- Lost Production Time
- Inconsistent Quality
- Brand Repeatability
- Excessive Costs

#### Performance Challenges

**Lost Production Time**

- A well-managed brewery is designed with the latest technologies to ensure continuous production.

**Inconsistent Quality**

- Brewing processes are often controlled by manual steps that result in inconsistencies in the final product.

**Brand Repeatability**

- Maintaining a consistent brand image is crucial for maintaining customer loyalty.

**Reduced Plant Availability**

- Plant stoppages can result in lost production and increased costs.

The Emerson PlantWeb solution addresses these challenges by providing a complete digital architecture that supports the monitoring of critical processes and equipment. These benefits can now be realized in brewery applications.

**Context and Asset Optimization**

- Smart digital control and asset management systems are designed to monitor and optimize performance. They ensure efficient operation, process and rotating equipment – are in most need of attention, and how to avoid operational interrupts.

**Predictive Intelligence and the Power to Use It**

- The Emerson PlantWeb solution enables predictive asset management, which is essential for minimizing downtime and maximizing efficiency. It uses predictive analytics and machine learning to predict problems before they occur, ultimately resulting in reduced costs and increased productivity.

**Field Intelligence**

- Emerson’s PlantWeb solution provides advanced asset intelligence and predictive maintenance, which allows for proactive problem identification before it becomes a major issue. This results in increased efficiency, reduced costs, and improved customer satisfaction.

**What makes PlantWeb better?**

- It provides process control, asset optimization, and easy integration.

### FOOD & BEVERAGE

#### PlantWeb in Action

- Emerson’s PlantWeb solution helps to improve brewery efficiency and profitability by delivering measurable improvements to the overall efficiency of a brewery. Precise measurements at critical production phases, such as fermentation, help to ensure consistent quality and avoid the need for costly rework or product losses. And when these are combined with on-line collection of critical process variables, such as temperature and pressure, a brewing facility can achieve greater efficiency and profitability.

**Performance Intelligence and the Plant to Icon?**

- Emerson's PlantWeb approach allows for the visualization of process performance and optimization, enabling efficient management of process and equipment.
## A Strategy for a Smart Brewery

### Brewery Challenges

- **Equipment Identification**
  - Real-time monitoring of rotating equipment identifies potential problems before they result in failure.
- **Inventory Levels**
  - Accurate measurement of inventory levels ensures predictable production.
- **Steam Energy**
  - Precise measurement of steam energy increases conversion efficiency.
- **Fermentation Measurement**
  - Accurate fermentation measurement increases conversion efficiency and improves yield and maximum recovery of fermentable extracts and establishes baseline for conversion calculations and downstream production planning.
- **Wort Density**
  - Accurate, real-time wort density from the lauter tun run-off ensures stability, reliability wort pH measurement optimizes conversion and maintains product consistency.
- **Inventory and Storage**
  - Precise measurement of steam energy increases conversion efficiency.

### Field Intelligence

- **Precision Flow Meters**
  - Utilizing in situ verification reduces costs by identifying beer losses with precision flow meters, utilizing in situ verification to ensure ongoing performance.
- **Filter Bed Efficiency**
  - Differential pressure across filter bed monitors bed efficiency, minimizing disruption and reducing lautering time.
- **Smart Valves**
  - Ensure plant flexibility with easy-to-use, field configurable devices.
- **Gas and Liquid Sensors**
  - Instruments designed for performance and long life in the brewing environment.

### Sensor Performance

- **Real-Time Process Information**
  - Real-time process information helps you monitor critical process areas and correct issues that might adversely affect beer quality.
- **Advanced Process Control**
  - Advanced Process Control helps reduce variance and save energy – for one customer by an average of 5%.
- **PlantWeb**
  - Realize the benefits of a fully integrated, standards-based, scalable process automation solution with built-in flexibility for multi-batch production.
- **Emerson Wireless SmartPack™ Starter Kit**
  - Smart Wireless connects the control room to the shop floor, delivering a cost-effective solution that offers more performance, more reliability and more diagnostic capabilities to improve productivity.
- **EasyDeltaV®**
  - Advanced Process Control helps reduce variance and save energy – for one customer by an average of 5%.

### Control and Asset Optimization

- **Improved Production Efficiency**
  - Apply a combination of logical and statistical techniques to increase and reduce the risk of human error and deliver consistent, repeatable products.
- **Extended Plant Flexibility**
  - Emerson engineered standards-based systems, CPIT and SmartWireless intelligent sensors and flexible control applications.
- **SMART FINAL CONTROL**
  - Fisher® Smart Valves.
  - Feature technologies for one customer by an average of 5%.
- **SMART ANALYTICAL**
  - Rosemount® Gas and Liquid Sensors.
  - Use highly accurate instruments with embedded intelligence to reduce the risk of human error and deliver consistent, repeatable products.
- **SMART MEASUREMENT**
  - Rosemount Pressure, Temperature, Flow and Level Technologies.
  - Minimize brewery loss through precise beer flow measurement.
- **SMART FLOW**
  - Micro Motion® Coriolis Flowmeters and Rosemount Flowmeters.
  - Minimize time and costs associated with product changeovers and CIP cycles with rugged, intelligent instruments and flexible control applications.
- **SMART WIRELESS**
  - Emerson Wireless SmartPack™ Starter Kit.
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- **SMART ASSET OPTIMIZATION**
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- **Field Intelligence **
  - smart Wireless solves a combination of monitoring and diagnostics, and enables remote access from the shop floor to the control room.
  - Full-spectrum wireless technology in an open protocol and back-compatible with third-party equipment to provide the best solution.
  - Easy installation avoids the need for time consuming plant audit.

### Constant Fluid Quality

- **Improved Production Efficiency**
  - Applies a combination of logical and statistical techniques to increase and reduce the risk of human error and deliver consistent, repeatable products.
A STRATEGY FOR A SMART BREWERY

### BREWERY CHALLENGES

- **Real-time monitoring of rotating equipment** identifies potential problems before they result in failure.
- **Accurate measurement of inventory levels** ensures predictable production.
- **Reducing costs by identifying beer losses** with precision flow meters, utilizing in situ verification to ensure ongoing performance.
- **Precise measurement of steam energy** to avoid expensive waste and reduce energy use.
- **Accurate fermentation measurement** increases conversion efficiency.
- **Maximum recovery of fermentable extracts** and establishes baseline for conversion calculations and downstream production planning.
- **Log records to meet regulatory requirements.**

### Field Intelligence

- **Control valves** have exceptional throttling and shut-off capabilities to improve productivity, reduce waste of raw ingredients and energy costs.
- **Proven sensor performance** with real-time diagnostics that were previously impractical or cost-prohibitive.
- **Easy installation** avoids the need for time consuming one-off projects or委任 a plant audit.
- **Rugged, intelligent instruments and flexible field configurations** reduce the risk of human error and deliver consistent, repeatable results.

- **Use highly accurate instruments with embedded intelligence** to reduce the use of human resources and deliver consistent results in downstream production planning.

### Asset Optimization

- **Improved Production Efficiency**
  - Use highly accurate measurement and control equipment in critical areas of the brewery to improve productivity, reduce wasted ingredients and energy costs.
- **Improved Quality Management**
  - Minimize brewery loss through precise beer flow measurement.
- **Extended Plant Flexibility**
  - Minimize time and costs associated with production changeovers.

### Video: PlantWise

- [Website](http://www.AssetWeb.com)
- [Website](http://www.EasyDeltaV.com)
- [Website](http://www.EmersonProcess.com)
- [Website](http://www.PlantWeb.com)
- [Website](http://www.EmersonProcess.com/MicroMotion)
- [Website](http://www.EmersonProcess.com/Rosemount)

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**Control and Asset Optimization**

### SMART MEASUREMENT

- Industrial fluid meters and level technology.
- Precisely measure fermentable sugars (°Brix, °Plato, Balling) to maximize yield.
- Precisely manage inventories with reliable DP and radar level technologies.
- Precisely manage energy use with steam mass flow measurement.
- Minimize brewery loss through precise beer flow measurement.

### SMART FLOW

- Micro Motion flowmeters and in situ meter verification.

### SMART FINAL CONTROL

- Fisher control valves.
- Advanced process control helps reduce variance and save energy – for one customer by an average of 5%.

### SMART ANALYTICAL

- Use highly accurate instruments with embedded intelligence to measure and analyze a range of process parameters.

### SMART DIGITAL CONTROL

- Emerson Wireless SmartPack™ Starter Kit

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**Control and Asset Optimization**

### SMART OPTIMIZATION

- **Control**
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**Start-up, commissioning, tuning, and training**

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Management expertise helps you safely align your cost of ownership.

**Integration of PLCs and MIS systems**

- Process design analysis
- Economic evaluations
- Efficient and cost-effective manner.

Emerson offers a number of services and capabilities to help brewery customers move to a new performance level in an efficient and cost-effective manner. Emerson’s PlantWeb architecture enables you to harness the power of predictive intelligence—expert knowledge supported by data-rich environments.

**A detailed plant audit can identify design and improvements.**

**Services delivers measurable utility performance enhancements.**

**Technology challenges caused by:**

- Delays in commissioning
- Slow turnaround between batches
- Unscheduled downtime
- Unable to meet tight production schedules
- Batch-to-batch variability
- Fluctuation in key process parameters that increase production costs
- Inaccurate measurements resulting in high energy costs
- Reduced yield in the conversion process
- Waste of valuable resources
- Inaccurate measurement of key ingredients

**Field intelligence**

Field intelligence in the form of predictive algorithms can provide valuable insights into your process. Real-time data and analytics allow you to make data-driven decisions, improving overall quality, yield, and profitability.

**Control and Asset Optimization**

Smart digital control and asset management systems, like Emerson’s PlantWeb, help you achieve continuous improvements and cost savings. With the right intelligence, your field instruments not only gather but also analyze your process data.

**Gain insights into your process.**

- Enhance control, reduce variation, and improve overall quality.
- Make better decisions with real-time data.
- Reduce costs and improve performance with predictive analytics.

**With the right intelligence, your field instruments not only gather but also analyze your process data to optimize control.**

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**Application Solutions Guide**

Application Solutions Guide

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