Honeywell

Application Note

Experion® LX is "Right-Sized" DCS Solution Making Food & Beverage Producers More Agile

With Honeywell's Experion LX solution, sugar production facilities of all sizes can meet their most demanding automation requirements. This flexible Distributed Control System (DCS) boosts the performance of plant operations by enabling improvements to reliability, agility and efficiency.

Food and beverage market demands producers to deliver highest level of plant efficiency, quality, and safety to enable profitability. Sugar production in particular, is a tough business even in a prosperous economy, and under the current conditions, it is more difficult than ever before. Fluctuations in raw material, rising costs, globalization, changing consumer demands and skilled labor shortages place ever-greater pressure on operating companies.

Figure 1. Sugar plants need solutions to improve productivity and reduce costs.

Not only does sugar production involve processes that are dynamic and energy-intensive, but also supply chain issues and rigorous quality requirements complicate business challenges. In this environment, it is essential to keep both human and equipment assets efficient and safe.

Today's Operational Demands

Shortages in cane supply, water and power, not to mention a lack of skilled plant labor, have made it harder for sugar plants to meet production goals and remain profitable. Producers need a solution optimizing the entire manufacturing process and helping them balance cost vs. quality.

Some of the specific demands on sugar companies include:

- Increase plant availability
- Improve the efficiency of boilers and other crucial equipment
- Reduce power and utilities consumption
- Optimize maintenance to enable higher plant availability and lower costs
- Improve stability of operations
- Enhance cane management logistics
- Improve production to manpower ratios
- Enable superior and consistent product quality
- Ensure environmental compliance

Sugar producers must find ways to get more out of each stage of the production process. They need effective technology in all phases of operation — from sugar production through cogeneration and alcohol — to achieve the best performance, quality, reliability and delivery.

Typical Control Requirements

Sugar is multi-faceted industry made up of countless different functions. Integrated control systems and data being generated by processes are critical components in a plant-wide information network. The goal is to give equipment operators in the field as well as plant managers, real-time and interactive access to information needed for planning, managing and optimizing sugar operations.

Typical control applications within sugar production include:

- Milling/crushing
- Condensers
- Sugar boiling/crystallization
- Filtration
- Flotation
- Decantation
- Evaporation
- Decolorization
- Juice stabilization
- Sulfur burning
- Batch pan
- Water treatment
- Cogen operation

The rewards from investing in automation can be substantial, such as considerable increases in productivity and improved safety, with reduced costs. However, there are common industry-wide issues associated with implementing new technology, which can have varying impacts on the success of sugar industry operations.

Choosing the Best Solution

With accurately controlled production processes, sugar plants are able to get a steady yield without any severe deviations. A correctly tuned control system can help the plant achieve maximum throughput.

However, there are key factors in choosing a control solution in the sugar industry. There may be sites that cannot justify the cost and complexity of a full Distributed Control System (DCS). There are also plants that have adopted Programmable Logic Controllers (PLCs) but are actually a better fit for a DCS.

Honeywell is a leading supplier of automation solutions for the Sugar industry, with a worldwide presence and broad application experience. We offer Experion® LX to meet the unique requirements of differently sized sugar production facilities. With this scalable DCS, various system functions and applications aimed at optimizing performance are inherently available in the context of sugar operations. Data from these functions is also presented in an integrated operating environment.

Experion LX is based on Honeywell’s award-winning Experion Process Knowledge System (PKS) with innovatively designed Series 8 I/O modules and cabinets, a validated and wide range of commercially available technology (COTS) options, easy engineering and maintenance capabilities, and integrator-friendly programs and tools.

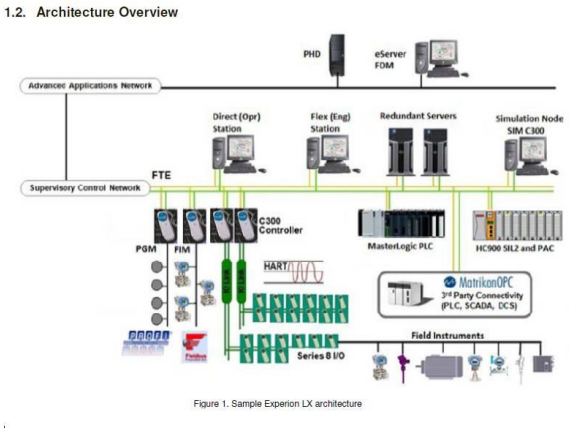

Figure 2. Experion LX architecture.

Experion LX leverages Honeywell’s proven track record in DCS applications, and is a mature system with well-defined function blocks and highly proven technology. It provides a unique automation solution that is superior to traditional PLCs for many operations.

Technology That’s Right for You

Experion LX’s innovative technologies are vital to improved plant performance and better business results, and can be implemented in a way that suits your individual site.

- Tightly integrated DCS and Supervisory Control and Data Acquisition (SCADA)
- Honeywell’s Experion C300 controller for robust and versatile control
- C300 simulation for proving out control strategies
- Honeywell’s patented, high-performance Fault Tolerant Ethernet (FTE) control network
- Optional redundancy at all levels: server, network, C300 controller and Series 8 I/O modules
- Direct Station never loses view or control of field devices
- Honeywell’s patented, revolutionary Profit® Loop algorithm for predictive control
- Unique I/O module design for compact footprint, and efficient installation and maintenance
- Improve accuracy and reduce installation footprint by up to 54% with new TC/RTD module design

- Improve efficiency and reduce configuration time by up to 30% with Honeywell’s enhanced Control Builder and newly styled Human-Machine Interface (HMI)
- IEC 61850 interface enabling integration with the electrical system in a single control/SCADA platform
- IEEE 1588 Precision Time Protocol (PTP) support for system-wide SOE
- Powerful reporting tool for debugging and system maintenance
- Smart device integration through industry-standard protocols such as HART®, FOUNDATION™ fieldbus, PROFIBUS and Modbus®
- Asset management using Honeywell’s integrated Field Device Manager (FDM) software
- Enhanced SCADA features with Pan and Zoom Displays, Equipment Templates, Dynamic Scanning, etc.
- Extensive integration of PLCs, DCSs, Remote Terminal Units (RTUs), drives, safety systems and weigh scales through rich SCADA capability and Matrikon OPC servers
- Honeywell’s flexible Distributed Server Architecture (DSA) for integration of processes across multiple units, control rooms or geographically separated locations for optimum flexibility and system maintenance
- Virtualization solutions intended to improve performance and reliability in the industrial automation domain

Flexible Automation System

Experion LX enables sugar companies to realize the performance advantages of a true distributed control solution at a reduced cost. This purpose-built DCS can be tailored to fit your specific control applications — regardless of their scope — and extended at any time to include personnel and assets, and even to integrate entire business operations.

Built-in Function Blocks: Designed to suit food and beverage applications and DCS requirements with specific function blocks, as well as support Custom Algorithm Blocks for building user-defined algorithms and data structures.

Rich Function Libraries: Easily create control strategies with the single, integrated Control Builder tool for continuous, sequential, batch and model-based control.

Pre-built Templates: Solution pack with a wide range of templates ideal for general control applications

Application Development Toolkit: Develop custom applications that communicate with Experion LX through the Network Application Programming Interface (API), Server API, Open Database Connectivity (ODBC) Data Exchange, Server Automation Object, etc.

FTE: Reliable, industrial-grade network providing multiple communication paths between nodes — thus eliminating all single points of failure — and utilizing commercial Ethernet technology for lower costs.

C300 Controller: The Experion C300 controller operates Honeywell’s deterministic Control Execution Environment (CEE) software, which executes control strategies on a consistent and predictable schedule.

Direct Station: Powerful operator station functions as a client to the Experion LX Engineering Server, and at the same time, allows direct access to the C300 controller for process data, alarms and messages.

Safe Operations: In collaboration with the Abnormal Situation Management (ASM®) Consortium, Honeywell has developed safe operator functions like Procedural Operations to reduce incidents related to improper execution of operating procedures. It has also created alarm handling and display layouts to improve overall operator response to abnormal conditions.

Benefits to Sugar Customers

Because Experion LX is based on the Experion PKS platform, it enables sugar production facilities of all sizes to realize the advantages of a robust and secure DCS solution:

- Improve product quality
- Enhance recovery
- Increase operational efficiency
- Increase plant uptime
- Reduce sugar losses
- Increased extraction efficiency
- Avoid process stoppages
- Ensure plant safety
- Reduce steam and water consumption
- Save electrical power
- Lower maintenance costs
- Minimize equipment wear
- Reduce lifecycle costs
- Minimize engineering effort
- Expedite payback on automation investments

With Experion LX’s tightly integrated architecture, users only need one server or a pair of servers for both DCS and SCADA systems. No additional hardware costs are necessary for integrating SCADA functions or third-party systems.

The Experion LX solution also allows sugar producers to implement centralized or remote control of geographically separated segments of production through its DSA. No additional hardware and networks are required to connect multiple control systems; users can leverage integrated engineering configuration, as well as greater flexibility to implement control where they want it.

Sugar industry plants implementing Honeywell’s patented, model-based Profit® Loop algorithm with Experion LX can achieve optimal control by using a model of the process dynamics to predict effects of control moves on the controlled variable. By anticipating future changes, Profit Loop knows exactly how much to move the process to meet desired control objectives. Experion LX also supports custom algorithm blocks for building user-defined algorithms and data structures for applications like batch pan control.

Honeywell’s Procedural Operations solution delivers automated procedures and operations for all steps of sugar production, helps capture the knowledge of expert operators, and enables consistent and optimized procedures. The solution also increases operating flexibility to allow faster response to business opportunities while reducing the costs of incorrect execution of procedures.

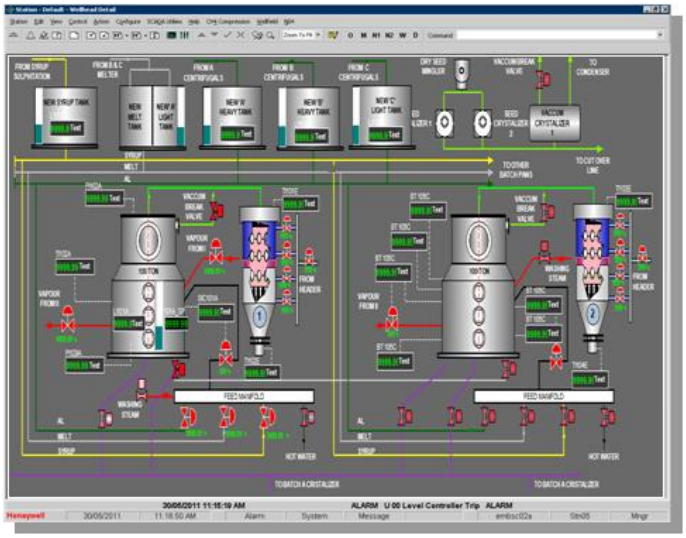

Figure 3. Batch Pan Control HMI.

Lastly, integrating Experion LX with Honeywell’s SmartLine field instruments enables sugar production facilities to get more from their smart devices for a productive, reliable, safe and profitable operation. This approach supports efficient maintenance with instrument messaging for quick identification of devices and required work. Plus, it improves operational safety with effective maintenance mode indicators and tamper reporting. There are fewer inefficiencies and reliability issues with Field Device Manager (FDM) Area Views, not to mention better asset management. Plants also achieve faster, risk-free configuration—the first time and every time—with robust integration testing.

Service and Support Worldwide

Choose Experion LX and know that Honeywell stands behind you over the life of your investment. Our channel partners are fully trained, authorized and experienced to implement and support your project — whether small or large, new or an expansion. You can rely on readily available local service when you need it.

In addition, Experion LX users have full access to Honeywell’s Global Technical Assistance Center (GTAC) for product support and consulting. Our experts can help you resolve issues in a timely manner and keep your system running at peak performance.

For More Information
Learn more about how Honeywell’s Experion LX solution can optimize your performance, visit our website www.honeywellprocess.com or contact your Honeywell account manager.

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