

Application Note

Experion[®] LX: Fit-for-purpose DCS Enables Agility for Mining, Minerals and Metals



Honeywell provides Experion LX to meet the critical automation needs of mining and minerals facilities — no matter their size. This flexible Distributed Control System (DCS) boosts the performance of plant operations by enabling improvements to reliability, agility and efficiency.

Mining and mineral processing is a demanding field in the best of times, and in the current business environment, it is tougher than ever before. Environmental concerns, rising costs, uncertainty over demand, falling commodity prices, strict safety regulations and skilled labor shortages place ever-greater demands on operating companies.



Figure 1. Mining and minerals is a highly complex and multi-dimensional industry.

Not only do mining operations involve processes that are complicated and energy intensive, but also complex material movements and logistical chains add to obstacles in optimizing performance. In this work domain, people, procedures and equipment need to interact safely and efficiently.

Today's Operating Challenges

Diminishing productivity, harsh climates, remote sites, rising energy costs and water scarcity are just some of the demands

faced by the mining and mineral processing industry every day. Producers require a solution enabling the perfect interaction of all assets during extraction, transportation and beneficiation.

Some of the specific challenges for mining firms include:

- Increase throughput with the highest availability and reliability
- Increase product quality, such as through higher quality separation
- Minimize lifecycle costs through improved maintenance, minimized wear and tear, and comprehensive support
- Increase sustainability while complying with Health, Safety and Environment (HSE) regulations
- Minimize energy and water consumption
- Respond quickly and effectively to changing market requirements

Mining companies have to make decisions based on how efficiently their competitors can extract metals and minerals. If these companies want to operate and make money, they need to optimize their operations to improve overall performance and reduce costs.

Typical Automation Requirements

From underground and open pit mining, to ore concentration, processing and refining, mining and minerals is a highly complex and multi-dimensional industry made up of literally thousands of different functions. Integrated control systems and data being generated by processes are critical components in a mine-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 mine operations.

Typical control applications within mining include:

- Crusher level control
- Conveyor load-out
- Inventory monitoring
- Flotation and separation
- Concentration
- Digestion
- Leaching
- Slurry pumping
- Process water
- Smelting and refining
- Blast furnaces
- Coal preparation
- Bulk material handling

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 mining and minerals operations.

Implementing the Right Solution

With accurately controlled minerals processes, mines 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 mining and mineral sector. 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 Mining industry, with a worldwide presence and broad application experience. We offer Experion® LX to meet the unique requirements of differently sized mining and mineral facilities. With this scalable DCS, various system functions and applications aimed at optimizing performance are inherently available in the context of mining 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.

1.2. Architecture Overview

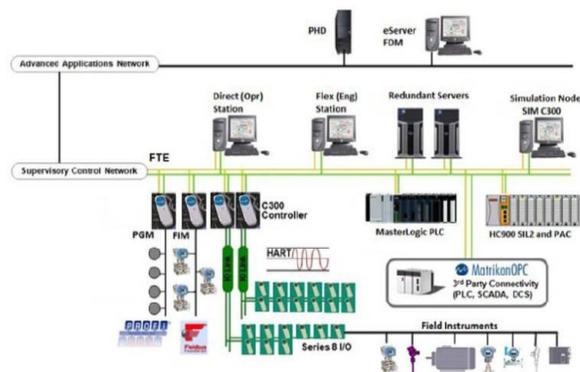


Figure 1. Sample Experion LX architecture

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 to Meet Your Needs

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 Control Performance

Experion LX enables mining and mineral 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 mining 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.



Figure 3. Honeywell's robust Experion C300 controller.

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 Mining and Mineral Customers

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

- Optimize plant production
- Increase uptime
- Improve energy efficiency
- Expedite payback on automation investments
- Decrease process and quality variability
- Improve long-term stability and consistency of operation
- Minimize downtime
- Lower maintenance costs
- Minimize equipment wear
- Reduce lifecycle costs
- Minimize engineering effort

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 mining operations 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.

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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In addition, native CDA integration with Honeywell's OneWireless™ solution provides a number of key benefits, including: lower total cost of ownership (i.e., wiring, engineering, installation, equipment and maintenance costs); reduced engineering effort to design, commission and maintain an ISA 100.11a system; efficient monitoring of remote assets (i.e., additional process and asset data without additional wiring); and easier access for maintenance to plant areas with difficult accessibility.

Mine operators are able to communicate with larger numbers of smart field devices through industry-standard protocols like Profibus DP and FOUNDATION™ Fieldbus. Moreover, they can take advantage of reliable, flexible and low-cost integration of third-party data through a Peer Control Data Interface (PCDI), rather than serial interface modules.

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.

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