

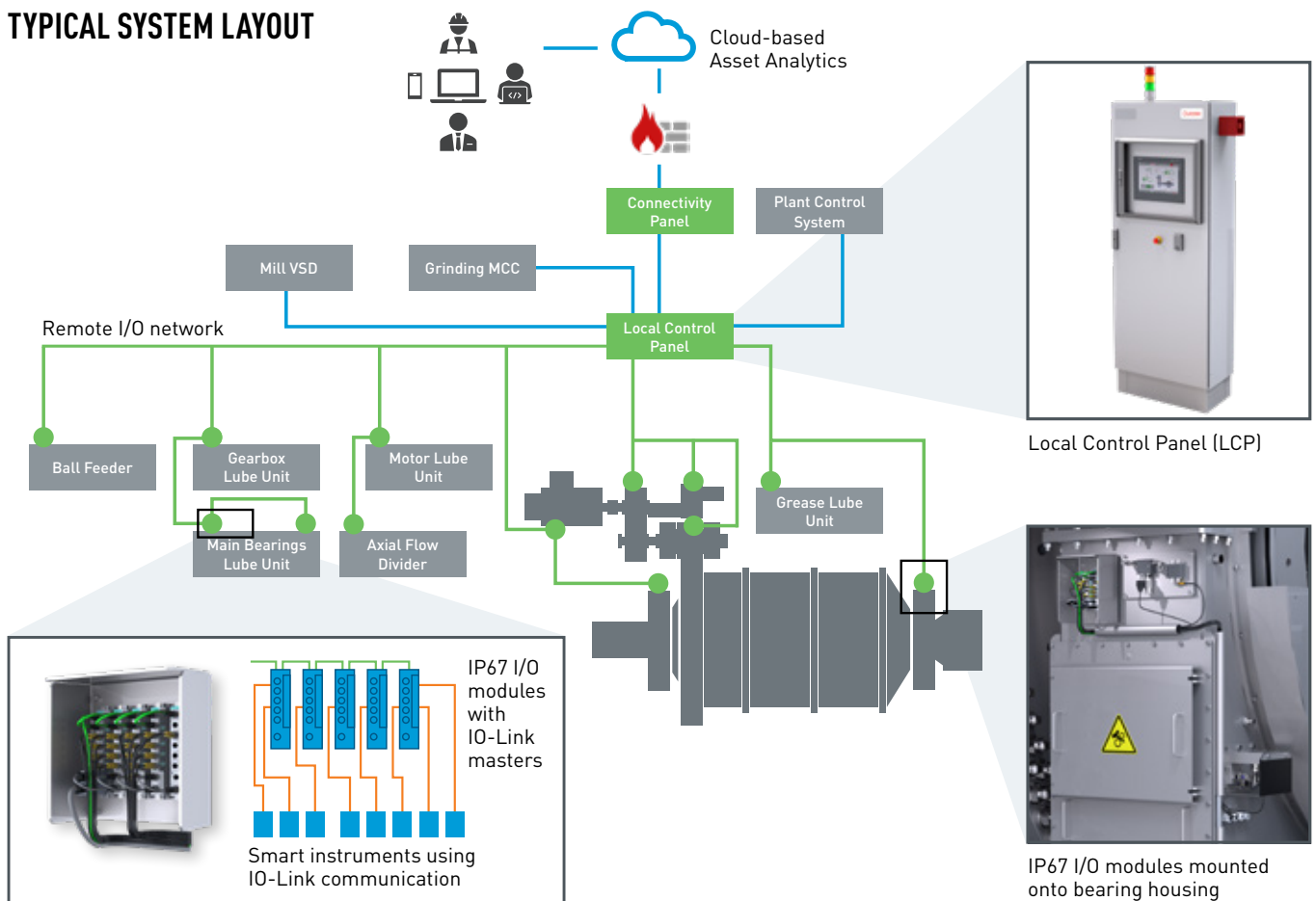
OUTOTEC MILL CONTROL SYSTEM

The Outotec® Mill Control System provides all control functions required for the safe operation of grinding mills and their associated lubrication systems, as well as continuously monitoring the equipment's condition. The system provides the opportunity to implement advanced condition monitoring strategies, including remote expert support, to ensure maximum mill availability.

BENEFITS

- Increased mill availability
- Significantly reduced commissioning time and cost
- Shorter engineering lead time and superior installation quality thanks to simplified wiring and termination design as well as standardized software and hardware modules
- Reduced project risks with complete solution delivery under one contract
- Ensured compliance and reduced risk with state-of-the-art safety-rated hardware

TYPICAL SYSTEM LAYOUT



A safe, reliable solution for increasing mill availability

The Outotec Mill Control System is a modular solution comprising a local control panel with a fail-safe PLC and a large full-color touchscreen interface, as well as a robust distributed I/O network and smart mill instruments.

Increased mill availability

The integrated condition monitoring system proactively detects anomalies to prevent equipment damage. Diagnostic data from the IO-Link instruments are used to determine instrument health and detect installation problems before they cause downtime. Bi-directional communication minimizes instrument replacement time.

Remote connectivity hardware is included as standard, enabling optional plug-and-play connection to Outotec's Connected Services for remote diagnostics and support to resolve equipment-related issues. Plant owners can also take advantage of Outotec's cloud-based Asset Analytics service to gain valuable insights over the condition and performance of their assets. These insights can be used to develop a robust predictive maintenance plan.

The system uses standard hardware and software components that are common across Outotec product lines for improved availability of support resources and spare parts.

Safety compliant as standard

The system meets the requirements of the EU's Machinery Directive and Low Voltage Directive, as well as IEC 60204 and NFPA 79. The fail-safe PLC and safety-rated inputs and outputs are certified according to IEC 61508 for functional safety and are suitable for use in safety-related applications according to ISO 13849. This ensures that all requirements determined in the mill risk assessment are met with minimum effort and wiring.



Significantly reduced commissioning time and cost

The distributed I/O system with IP67 modules allows for the majority of mill instrumentation to be wired up to the I/O modules and tested at the factory, enabling problem-free commissioning. Installation time and cost is also reduced as the majority of site cabling is limited to a single network and power supply cable per instrument group. The robust IP67 modules are protected by specially designed stainless-steel brackets.

Shorter engineering lead time and superior installation quality

The modular control system structure with standardized, configured-to-order local control panel (LCP) options results in a reduced need for project-specific engineering as it is based on proven hardware and software modules. Project risks are mitigated with complete solution delivery under one contract. Standardized wiring and M12 connection interfaces for sensors minimize the need for manual wiring work, resulting in superior installation quality.

IO-Link technology for time and cost savings

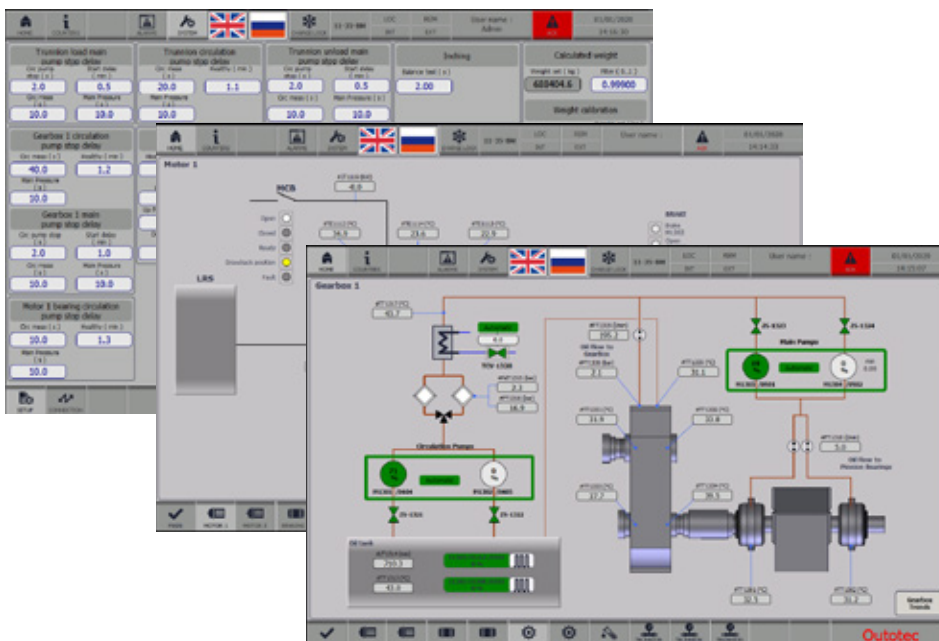
IO-Link is an international standard according to IEC 61131-9 that enables digitalization and smart instruments by allowing for extended diagnosis of sensors and actuators, as well as simple and fast parameter setting with bi-directional communication. The use of IO-Link instruments in the Outotec Mill Control system contributes greatly to time and cost savings. Fewer I/O spares are required thanks to the single interface, while the commissioning process is expedited by fast configuration and parameter setting.

Standard features

- Four standardized and configured-to-order local control panel (LCP) products to suit market area and installation requirements:
 - Indoor or outdoor installation
 - Siemens or Allen-Bradley platform
- Remote connectivity hardware (either integrated in LCP or with separate connectivity panel) and software pre-configured for Outotec's cloud-based Connected Services and Asset Analytics
- Standard interface protocols and safety outputs to plant control system, main drive/starter, upstream switchgear, and motor control center
- Robust IP67-rated I/O modules with IO-Link masters (factory installed, wired to instruments, and tested on all skid-mounted components); specially designed stainless-steel brackets included for module mounting and protection
- Standardized smart mill instruments that use IO-Link communication and meet the required product certifications
- System interface supports English, Russian, Spanish, and Chinese
- Advanced condition monitoring system integrated into LCP (standard with Outotec HSB mills, optional with Outotec MH Series mills)
- Infrared temperature monitoring of pinion gear (standard with Outotec HSB mills, optional with Outotec MH Series mills)

Typical scope

- Local control panel
- Remote I/O modules with mounting accessories and cables to LCP
- Mill instruments and instrument cables
- Engineering, configuration, and factory acceptance testing



Outotec

Outotec develops leading technologies and services for the sustainable use of Earth's natural resources. Our 4,000 top experts are driven by each customer's unique challenges across the world. Outotec's comprehensive offering creates the best value for our customers in the mining, metal, and chemical industries. Outotec had sales of approximately EUR 1.2 billion in 2019, and its shares are listed on NASDAQ Helsinki.

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