

FLSMIDTH
CEMENT

ECS/CONTROLCENTER™ PROCESS CONTROL

COMPLETE AND RELIABLE PLANT AUTOMATION



LIFT PLANT PERFORMANCE WITH **ECS/CONTROLCENTER™** PROCESS CONTROL SYSTEM

Our process control solution is packed with features to efficiently manage and troubleshoot your plant and equipment.

KEY BENEFITS

CyberSecure systems

Hardware agnostic

Easy to engineer and scale

Personalized interfaces
supports user focus

Lifecycle reliability via Plantline
service agreements

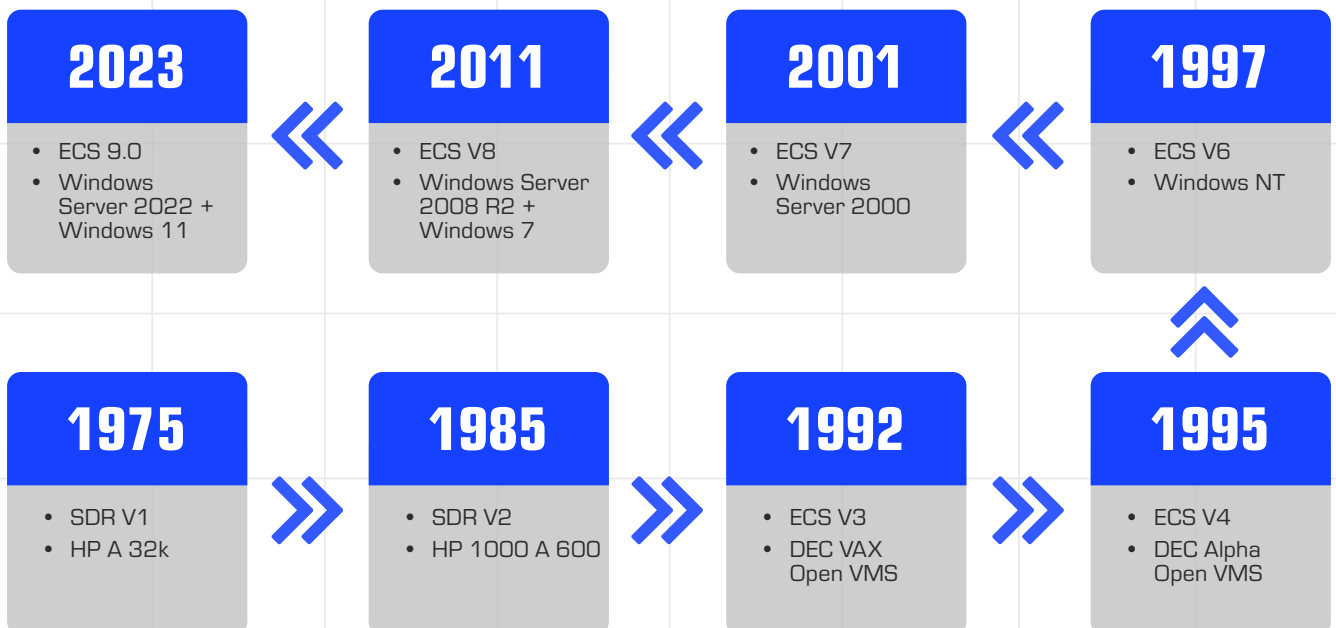
PROCESS CONTROL FROM THE PROCESS EXPERTS

With continuous need to control costs, improve operational efficiency, and reduce environmental impacts, today's process industries need a reliable control system now more than ever. In FLSmidth Cement, you have the ideal solutions provider.

We have been developing specialist automation software for process and quality control since the 1970s. There are currently more than 2000 of our ECS/ControlCenter control systems installed globally, about a quarter of which control complete production lines. Tailored specifically to process industries, the system integrates the in-depth process knowledge and machine-building experience we have gained since delivering our first cement plant in 1887.

ECS/ControlCenter Evolution

Versions and support operating systems at release*



*During an ECS version lifecycle it will typically support 2 OS versions for backwards and forwards compatibility.

RELIABILITY AND SECURITY

Reliability and security

The ECS/ControlCenter solution is designed to be depended upon. Server, network, and PLC redundancy ensures continuous operation, including a unique dual-synchronised redundant server configuration that creates a high-availability cluster and ensures zero downtime with no loss of data in case of a server failure.

Our software adheres to IEC, ISA, and NIST cybersecurity guidelines. A defence-in-depth approach enhances security with access control, tested patch updates, firewalls, network segmentation, and endpoint security. Extensive user access control settings allows granular control of user permissions to prevent unauthorised access and actions, while domain integration enables plant-wide or enterprise-level user authentication and authorisation.

In addition, we can provide lifecycle cybersecurity services, including cybersecurity risk assessments and risk mitigation, monitoring and response, endpoint security, software updates, backups, and disaster recovery planning.



SCALABLE, OPEN ARCHITECTURE THAT'S READY FOR INDUSTRY 4.0

Software-centric architecture

Here at FLSmidth Cement, we develop software solutions, not proprietary hardware. It means our software is designed to be hardware agnostic, supporting best-in-class computer, network, controller, and IO hardware from the complete range of suppliers, such as Dell, Cisco, Siemens, Rockwell, Scheider Electric, Fortinet, Beckhoff, and Phoenix Contact.

Interoperability and AI integration

We have also designed the ECS/ControlCenter software for easy interoperability. It integrates with other systems, both onsite or Cloud-based, via open communications standards, including OPC-UA, MQTT, ethernet/IP, Modbus TCP, and Profinet. Scheduled data export in XML, CSV, Excel, PDF, or SQL queries enable ERP and data historian integration. And there's seamless and reliable integration with open-source AI and data analytics tools using Jupyter Notebook and Python, enhancing process control with predictive insights and advanced diagnostics.

Scalable architecture

The ECS/ControlCenter solution is easily scalable, able to accommodate individual touchscreen HMIs up to complete plants within the same software. This includes integration of multiple production lines into one central control room. It can also be securely extended to remote operations centres for remote monitoring and operations, while a secure ECS Web app enables access to data from any device (mobile, tablet, PC) using secure progressive web app technology.

ENGINEERING, INSTALLATION, AND MAINTENANCE

DCS functionality with PLC flexibility

Based on our ECS/ACESYS™ advanced standard function block library, the ECS/ControlCenter system offers a hybrid solution, combining the benefits of traditional DCS systems with the flexibility of modern PLC/SCADA systems. The ECS programming library is PLC-brand independent, enabling a choice of Tier 1 process automation controllers, such as Siemens S7 400 and 1500, Rockwell ControlLogix and Compact Logix, and Schneider Electric M580. We don't lock you into a proprietary architecture based on your choice of PLC brand.

Within the software, all objects are associated with a faceplate, which allows:

- Direct access to detailed information and diagnostics in real-time
- Remote execution of device-specific commands
- Easy modification of block parameters, such as PID settings, timers, etc.

Standard function blocks

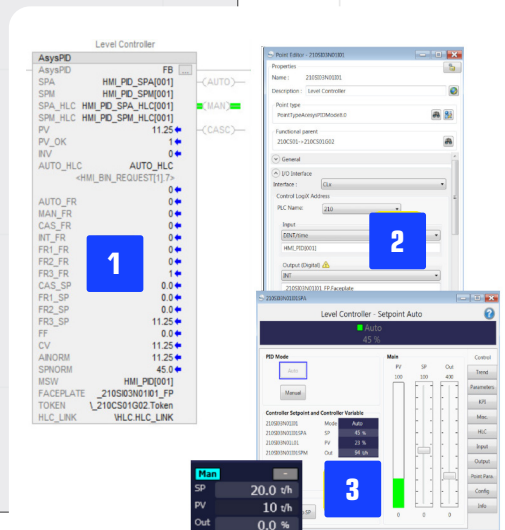
The use of standard function blocks delivers standardised, reliable plant control, allowing for easy parameter changes directly from the interface without the need for specialised programmers. The same user interface is used on touch HMIs, control room clients, servers, and engineering workstations, which reduces maintenance complexity.

Meanwhile, the ECS/ACESYS function blocks are equipped with inbuilt device simulation, allowing full off-line testing of all start/stop sequences, interlocks, and alarm behaviours before installation; it is also used to provide realistic scenarios for operator and engineer training.

Consistent and structured PLC programs

ECS/ControlCenter systems are typically engineered in our Metis high-level engineering system. This automatically generates all PLC programs from set templates to ensure standardisation and consistency, resulting in a much higher level of quality and reliability than can be expected from systems programmed manually.

- 1** Insert an ECS/ACESYS function block in the PLC program and establish interlocks to surrounding devices.
- 2** Create a new tag with the matching object type in ECS/ControlCenter and link it to the PLC address.
- 3** Drag the tag to a mimic diagram and connect the symbol to other process objects with visual lines.



INTELLIGENT AND USER-CENTRIC DESIGN

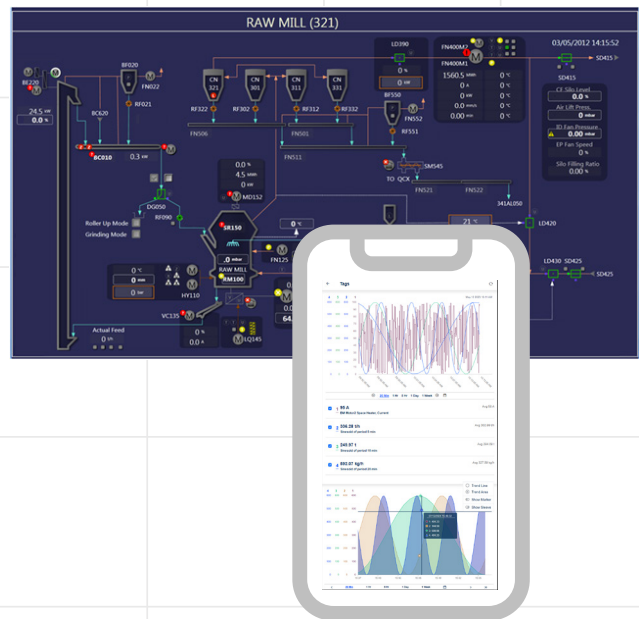
ECS/ControlCenter is built with the end-user in mind. Operators and engineers benefit from an intuitive interface that simplifies complex operations. The system's high-performance HMI allows easy navigation through process mimics using touch or mouse gestures, ensuring that critical information is always within reach. The new dedicated Group Start Panel Bar is an example of this. Providing a superior status overview of the machinery before start-up, the operator gets an at-a-glance view of the health of every device in the group and all the interlocking states.

Personalized role focus

Modern plants are run by small teams where operators handle multiple roles, which can make focus challenging. Our control software addresses this by configuring role responsibilities in the system to keep operators focused. Upon login, operators select a role, and the system adapts accordingly:

- The graphical interface to show relevant departments
- Trend packages for these departments appear at the top.
- Alarm lists filter to show only pertinent alarms.

This role-based focus simplifies the system, preventing information overload in critical situations. User access control configurations define operators' rights, ensuring security by limiting access to privileged users.



Intelligent alarm management

The ISA 18.2-compliant alarm management system helps operators detect and respond to abnormal situations as quickly as possible, with automatic alarm suppression by hierarchy reducing the number of nuisance alarms.

The event historian stores all alarms and events for up to one year and provides advanced analysis tools to help understand event history. Alarms and interlocks can also be traced back to the root cause, by cascading directly from faceplate to faceplate. Each device individually registers what problem caused it to stop and provides a link to the associated device.

DATA MANAGEMENT, VISUALISATION, AND REPORTING

The inbuilt data historian logs all process, alarm, and event data for one year at full resolution, using a 'swinging door' algorithm, which logs data only when it changes to preserve disk space. Longer time horizons are possible with an optional ECS/PlantDataManagement server.

Trend anything any time

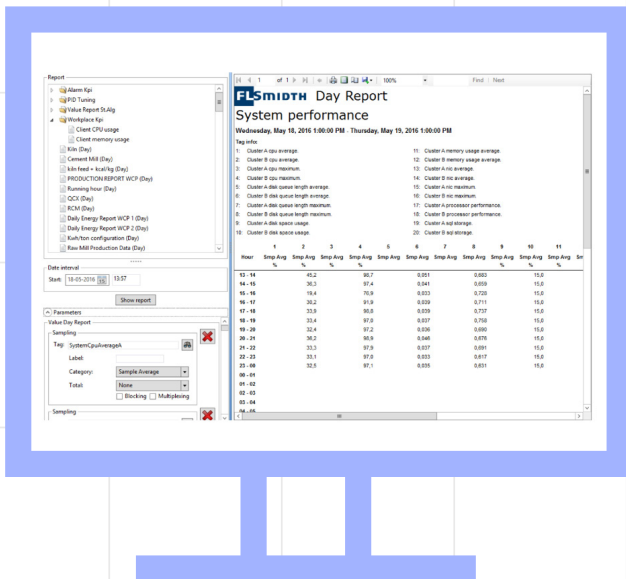
The trend system can be used to analyse any combination of up to 16 analogue or digital tags without an engineer or admin user. Pick from pre-built trend packages, build your own, or simply drag and drop tags onto the trend screen from the HMI. The trend system is responsive, with most trends opening within 1-3 seconds; trend data can also be easily exported to a file for further data analysis.

Simple report configuration

SQL reporting tools are used to provide a simple interface to basic reporting functionalities, including daily, monthly and shift report. The built-in reports can be configured with any analogue value or digital status, and can be scheduled for automatic printing or export as required.

Extensive data export capability

Data queries to export value and event data from the ECS SQL database can be scheduled or triggered on an event with the data exported to common file formats (e.g., CSV, XML). Events can also be used trigger actions, such as sending a SMS, email, or workplace notification, or playing a sound. The database also includes extensive calculate data that can be exported (e.g. analogue value maximum, minimum, average, time for given time period).



LIFECYCLE MAINTENANCE AND SERVICE

We are just as dedicated to ensuring the system can be maintained to be reliable, secure and up to date throughout its lifecycle. Our service and maintenance applications help you monitor system performance with KPIs, manage configuration, update software, and backup or restore the system.

Software updates and information is available on a product support website. We regularly test all software in the active phase of support against Microsoft update patches and provide a listing of tested and approved patches on the website.

We also provide full lifecycle service through PlantLine™ service agreements. Preventative maintenance keeps your system running reliably, with 24/7 phone, chat, or remote service available in emergency situations. Software subscriptions are available to keep your system up to date and security patched, while our cybersecurity services prevent attacks and system downtime.



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