CENTUM CS 3000
Integrated Production Control System
Yokogawa's Enterprise Technology Solutions for Real-Time Business Management

Enterprise
To view the enterprise's objectives through the customer's eyes, and provide management information and control system support to meet these objectives

Technology
Leading-edge Technology

Solutions
Optimum solutions that satisfy the customer's needs and expectations

Yokogawa can provide you with an optimal Enterprise Technology Solution – an enterprise-wide system that integrates management information and real-time control.

In today’s highly competitive global marketplace, real-time information and control helps you to quickly meet changing market needs and remain competitive.

CENTUM CS 3000 is our flagship control-system platform for launching Enterprise Technology Solutions. CENTUM CS 3000 plus Yokogawa's wide application-specific experience can provide the optimum control solution for your enterprise.
CENTUM CS 3000 represents a new era in large-scale Distributed Control Systems (DCS). The new CENTUM CS 3000 integrates the versatility and reliability of its CENTUM series predecessors with the open environment of a personal computer. Easy operation, superior control functions, efficient engineering and cost effectiveness. This new-era DCS will quickly pay for itself in today’s severe business environment. Its open interfaces – for exchanging information with supervisory Enterprise Resource Planning (ERP) and Manufacturing Execution Systems (MES) – make it easy to create a strategic management information system for your enterprise. CENTUM CS 3000 is a scalable, compatible system – designed to work with your existing systems, and grow with your business, reducing Total Cost of Ownership (TCO).
With the CENTUM CS 3000 integrated control system, you can create an enterprise network encompassing everything from ERP and MES supervisory management information systems to the control system and field devices. Such a system can handle everything from total operations management – operation support, process management, and stock management – to production planning; it can save energy, increase automation, and improve product quality and yield. The architecture has the flexibility to handle everything from small-scale to large-scale plants; it can connect to existing control systems such as CENTUM CS, CENTUM-XL, and CENTUM CS 1000, and provide a unified operator interface.

**Human Interface Station (HIS)**
The HIS is mainly used for monitoring and operation – it displays process variables, control parameters, and alarms necessary for users to quickly grasp the operating status of the plant. The HIS can also provide an open environment for engineering.
- **Console-type HIS**
  This high-end human interface station has the same functionality and reliability as the standard HIS and its CENTUM predecessors.
- **Desktop-type HIS**
  This is based on a generic PC (running Windows NT).

**Ethernet**
Ethernet is used to link HIS, ENG and supervisory systems. Communications Gateway Unit (ACG) This connects the V net control system bus to a supervisory computer system or personal computer.
- **V net**
  The V net real-time control system bus links stations such as FCS, HIS, and ACG.

**Field Control Station (FCS)**
- **Standard FCS**
  This FCS has powerful control functions, high reliability, remote I/O and Fieldbus support.
- **Compact FCS**
  This combines control functions, I/O, and interface to subsystems in a compact cabinet.

**Remote I/O Bus (RIO Bus)**
This communications bus links remote I/O units to the FCS control unit.
- **Remote I/O units (nodes)**
  These remote I/O units (nodes) on the RIO bus convert between bus signals – to/from an FCS – and analog, digital and Fieldbus I/O signals.
- **Fieldbus**
  This bidirectional digital Fieldbus links the FCS to fieldbus devices. (We support the FOUNDATION Fieldbus standard.)
Two Types of HIS, to Match Your Needs
The CENTUM CS 3000 HIS runs on Windows NT, which is the de facto standard. For the Operator Station hardware, choose between a generic PC and a conventional Operator Console which provides the same high reliability that you have been used to.

Optimized Operation Environment
CENTUM CS 3000 combines the powerful control functions of a DCS with the ease of operation of a personal computer. The human interface station runs on the familiar Windows NT environment. The optimized operating environment reduces the operator workload involved in plant monitoring and operation.

Two Window Modes Offered
You can choose between two window modes: a mixed multi-Window mode – which will run general office applications side-by-side with control-related windows, and allows you to switch between control-related and general application windows by clicking a “soft key” – or a conventional full-screen dedicated control-related window.

Hierarchical Operation
An operating environment can consist of several hundred to several thousand windows. They are linked hierarchically, to provide an ideal operating environment. The “Navigator window” tree display makes it easy to monitor – and switch between – plant operation and alarm windows. The tree – representing the actual plant hierarchy – has plant overview windows at the top, followed by individual process and unit windows, and individual control instrument and trend windows at the bottom.

Open Interfaces
“Open” interfaces supporting DDE and OPC (OLE for Process Control) are available for the HIS – allowing process data, message information, and tag information to be accessed by other users on the network.

Security Functions
To help minimize operator errors and prevent unauthorized operation, the following types of security are supported:
- User log-on security function
- Restricted view of plant (HIS-specific and user-specific)
- Operations restricted by user type (operator, engineer etc.)
- Tag-specific restrictions (important tag, etc.)
- Hardware ID system (requires option package)

Long-Term Data Archive Package
This is used with the standard trend functions to save long-term process data. It can display real-time data and previously-saved historical data in standard trend windows.
The status of function blocks can be represented by instrument faceplate diagrams – showing setpoints, manipulated output values, and status information. Faceplate diagrams are available in standard and half-height sizes; up to 16 may be displayed per window.

In addition to the graphic functions of previous systems, new overview elements and instrument faceplate elements can easily be added to graphic windows. Realistic dynamic graphics may be used to represent the plant. ActiveX controls can be attached to graphic windows. Generic unit definition templates may be created, and – simply by switching data tables – used to represent multiple units.

32 colored blocks represent plant operation status and alarm status by color changes (red, yellow, green) and flashing. Simply clicking on a block displays the related window. Graphics may also be displayed in overview windows.

The status of function blocks can be represented by instrument faceplate diagrams – showing setpoints, manipulated output values, and status information. Faceplate diagrams are available in standard and half-height sizes; up to 16 may be displayed per window.

Advanced Graphics plus all the Key Data
Versatile, Reliable Control Stations

Field Control Stations (FCS) are designed to provide high reliability and high availability. CENTUM CS 3000 uses our field-proven “Pair and Spare” FCS redundancy – together with bus and I/O redundancy. This is a super-reliable, open system.

Two FCS types for Flexible System Configuration

Two FCS types – a standard FCS, which can be used with remote I/O, and a compact “all-in-one” type with smaller application capacity – to suit your needs.

Compact, Low-Cost Remote I/O Units

Remote I/O units greatly reduce the cost of field wiring, and the space required.
Versatile, Powerful Control Blocks

Regulatory control, batch control, and sequence control blocks are provided. You can freely link regulatory control blocks, calculation blocks, sequence control blocks, and faceplate blocks to configure powerful control functions.

Basic Control Functions

Many types of basic control function blocks are provided and may be combined to meet user needs.

Regulatory Control Blocks

These are for process monitoring and control, and include PID controllers, self-tuning functions, input indicators, manual loaders, and signal selectors.

Sequence Control Blocks

These are used to implement safety interlock sequences, process management sequences, and sequence control blocks to implement general-purpose sequences at the loop instrument level. Sequences may be expressed by sequence tables or logic charts.

Calculation Blocks

Calculation function blocks are used to supplement regulatory control functions and sequence control functions. Calculations may be performed on analog signals and contact (logic) signals. High-speed trend function blocks are also provided.

SFC Blocks

Sequences may be represented by Sequence Function Charts, and these function blocks execute the SFC language. These are based on IEC 61131-3. The SEBOL language may also be used for batch and sequence control.

Subsystem Integration Functions

Sequencers (Programmable Logic Controllers, PLCs) are increasingly being used for monitoring and automating the operation of plant equipment and large electrical machinery. Data from other “intelligent” third-party equipment—such as analyzers and measuring equipment—needs to be transferred to the control system. FCS communication functions are used to integrate these subsystems with the DCS, and provide integrated monitoring and control. Redundant configurations can also be supported.

Batch Control

CS Batch 3000 is an ISA S88 compliant total batch process operation and management package based on Yokogawa’s long experience. For multi-product, variable-volume production, CS Batch 3000 can handle complex batch control and it offers easy operation and a productive engineering environment.

ISA S88 Batch Control Activity Model

Communicates easily with supervisory recipe management and information management systems.
Runs on Generic PC. Special Computers Not Required.
Special, dedicated computers are not required for engineering. You can easily perform engineering on a generic PC. With the familiar Windows NT environment, engineering functions are as easy to use as general office applications.

Easy Engineering

Generic PCs running Windows NT can be used for concurrent engineering; data may be easily shared/reused. Virtual test functions allow engineering and testing to proceed concurrently, greatly reducing time to startup.

Concurrent Engineering
Using the disk sharing functions of Windows NT, a single database can be shared by several engineering stations. You can easily import project engineering data which was created on another generic PC.

Virtual Test Functions
Controller simulation functions which run on a generic PC – controller hardware is not required to test and validate control system operation. You can proceed in parallel with engineering and testing phases. You can even perform testing using a notebook PC, anywhere.

Can Exchange Data with General Office Applications
You can exchange data with many common office applications, such as MS Excel.

Online Documentation
Manuals are provided as Portable Document Format (PDF) electronic documentation. Documents can be referenced and printed as required.

Reusing Engineering Data
Engineering data can be saved in text format, and reused in a different station or project.
Upgrade Your System While Preserving Your Existing System Investment

You can preserve your existing CENTUM-V, CENTUM-XL or CENTUM CS 1000 resources and existing I/O when upgrading to the latest system. Existing CENTUM-V or CENTUM-XL CPU nests can be upgraded to the latest CENTUM CS 3000 CPUs, and the new human interface stations added. You can upgrade your system incrementally, minimizing “down” time and achieving considerable performance improvements at reasonable cost.

The CENTUM CS 3000 era
Efficient, high-reliability plant operation; open systems. Powerful enterprise-wide management information and control systems.
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