YOKOGAWA ◆
Yokogawa Electric Corporation

Integrated Production Control System

CENTUM CS 3000 R3

electronic Realtime Manufacturing

e-RM.
A new production concept from Yokogawa.

Driven by progress in information technology, competition is becoming fiercer, more global, and more regulated. To survive in this changing world, the business model itself must be redesigned. Therefore, companies are restructuring their enterprise information systems, in order to assist corporate decision-making, raise efficiency and react to market changes in real time. But manufacturing systems, too, must use IT(Information Technology) to respond faster to dynamic market demand in real time. New production systems are required to ensure profitable production.

Yokogawa offers a solution, the new IT-based production framework called e-RM (electronic Realtime Manufacturing). e-RM provides:

1) Reaction to market information in real time.
2) Maintaining optimum production efficiency according to changing market needs.
3) Guaranteed quality, cost and delivery.
4) Flexible response to the market.

What is e-RM expected to achieve?

To react to market changes, information systems must be linked up in real time.
The typical e-RM production system,
which can quickly manufacture various products, must support:

1) Integration of processes, from procurement of materials to production and shipment, as well as reduction of waste between processes.
2) Construction of the optimal production system for different products.
3) The ability to produce products on time.
4) The demand to include widely dispersed controlled objects or devices embedded in unit processes, which are outside the scope of conventional control systems.

CENTUM CS 3000 R3, the perfect platform for e-RM

New technology with backward compatibility
Open architecture with unrivaled reliability

Production control systems are evolving thanks to new technology to meet market demand. But even in the e-RM era, the importance of reliability, seamless linking of small to large systems, easy engineering, long-term support and supply of maintenance parts remains unchanged. Yokogawa's latest production control system, the CENTUM CS 3000 R3 for e-RM, features an open architecture, flexibility, and compatibility with existing systems.

CENTUM CS 3000 R3

To offer flexibility of field connections, Yokogawa has developed a new input/output system for R3, which is compatible with field networks such as FOUNDATION Fieldbus. R3 also incorporates a human-machine interface (HMI) that runs on Windows and can be connected easily with information systems in an open and reliable manner. And it provides a smooth migration path from earlier Yokogawa models with ability to preserve investments already made by retaining existing field wiring and I/O systems. Continuous upgrades and enhancements will become available for R3 as market needs evolve.

Wealth of Components for System Configuration

The CENTUM CS 3000 R3 production control system features sophisticated functions and components to meet all production site requirements.

CENTUM CS 3000 R3 System Configuration

The CENTUM CS 3000 R3 is designed to handle everything from small-scale factories to the very largest of plants. And each level—enterprise, business unit, operation, control, and field—is fully interconnected using the latest network technologies. Network communications are used to optimize the overall system, reduce site operations, increase automation, raise productivity, and of course, boost profits. The Human Interface Station (HIS) enables operators to control not only the CENTUM CS 3000 itself, but also older control systems such as CENTUM-XL. And a complete migration path from CENTUM through to CENTUM CS 3000 R3 allows easy upgrading of the system without loss of existing assets.

Human Interface Station (HIS)

Yokogawa provides three types of Human Interface Station (HIS) to match your needs, all of which run under the Microsoft Windows operating system.

▌Enclosed Display Style Console HIS

The enclosed display style console HIS inherits the design of earlier CENTUM operator consoles, allows side-by-side installation, and features stacked CRTs, touch panel, eight-loop operation keys, auxiliary contact inputs/outputs, and more.

▌Open Display Style Console HIS

The open display style console HIS is a new type of HIS featuring an LCD display: the display size and keyboard type can be selected. Touch panel, eight-loop operation keys, and auxiliary contact inputs/outputs are also provided.

▌Desktop HIS

The desktop HIS embodies the HIS functionality in a generic personal computer, and can be used with a dedicated keyboard with dust-proof and drip-proof flat keys.

Engineering Station (ENG)

The ENG is a generic PC with engineering functions such as for system configuration or on-line maintenance. It is often combined with the functionality of an HIS to provide dual functions.

Field Control Station (FCS)

Four types of FCS can be chosen to fit the type or size of your application, so system extension and migration are simple.

Remote Node

The Remote Node is process input/output equipment that's installed in remote locations and communicates with the FCS via a remote I/O bus.
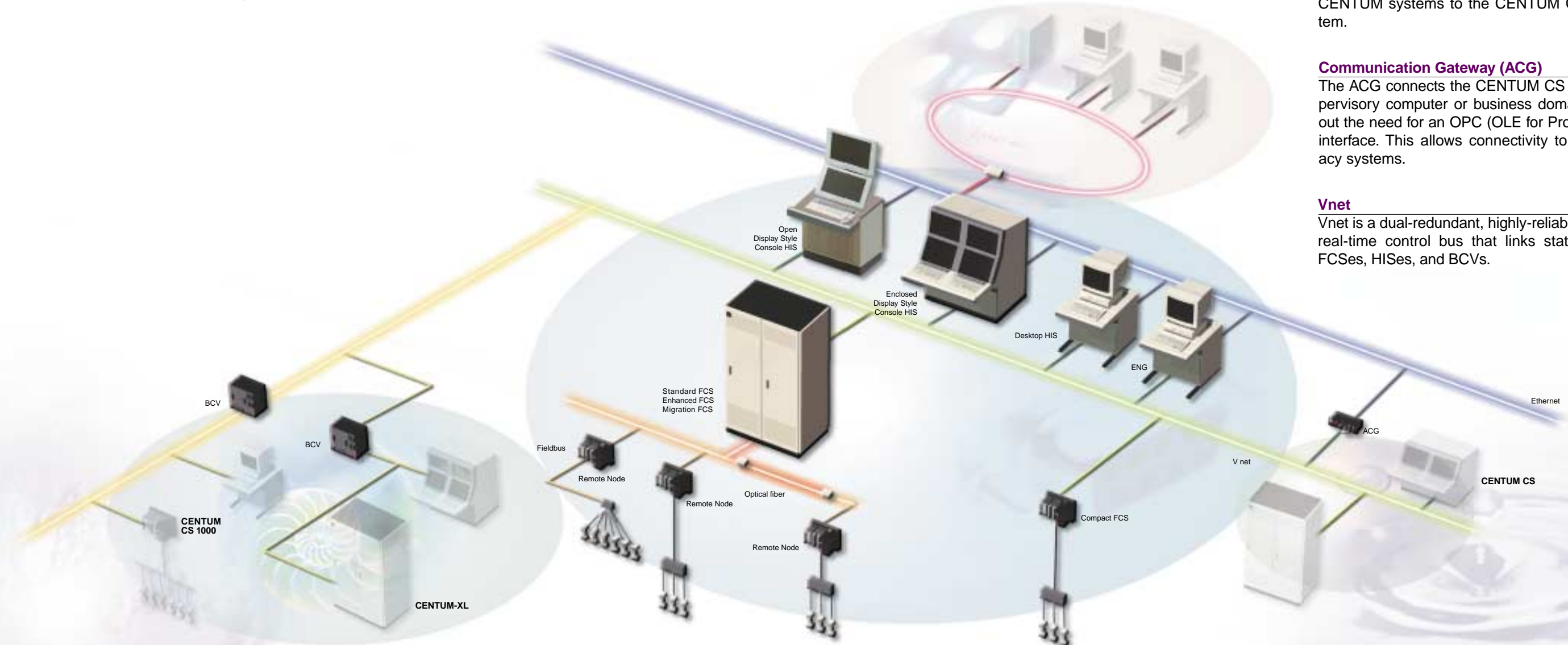
Bus Converter (BCV)

The BCV connects several CENTUM CS 3000 systems, and can also seamlessly connect former CENTUM systems to the CENTUM CS 3000 system.

Communication Gateway (ACG)

The ACG connects the CENTUM CS 3000 to a supervisory computer or business domain PCs without the need for an OPC (OLE for Process Control) interface. This allows connectivity to in-place legacy systems.

Vnet

Vnet is a dual-redundant, highly-reliable, high-speed, real-time control bus that links stations such as FCSes, HISes, and BCVs.

—— enterprise information systems ——

Open Display Style Console HIS

Enclosed Display Style Console HIS

Desktop HIS

ENG

Ethernet

Standard FCS
Enhanced FCS
Migration FCS

BCV

BCV

Fieldbus

Remote Node

Remote Node

Optical fiber

Remote Node

Compact FCS

ACG

V net

CENTUM CS

CENTUM CS 1000

CENTUM-XL

Reliable Hardware for Stable Plant Operation

While providing the openness that's become mandatory, Yokogawa's plant control system still ensures total reliability and stable operation, which are crucial requirements for plants.

Field Control Station (FCS)

The FCS inherits the renowned reliability of the entire CENTUM series. Truly the most reliable FCS in the industry, the availability of the hardware unit is 99.9999%*, achieved by fault avoidance techniques such as parts selection and cooling methods, as well as a fault-tolerant techniques such as dual-redundant configuration and hot swapping. This outstanding availability keeps your plant stable and reduces total cost of ownership.

*: June 93 to July 98 Definition of system failure: simultaneous failure of two or more loops (WIB definition)

Field Control Station

Dual-redundancy for Reliability (Standard FCS)

Processor cards perform control calculations, so duplexing of these cards is essential in preventing loss of control due to a hardware failure. In addition, transient calculation errors are detected by duplexing the CPUs on each processor card.

The CENTUM CS 3000 adopts Pair & Spare technology making it ideal for various plants that demand non-stop, supremely reliable plant control. Meanwhile, the stand-by processor card is always performing computations synchronously, allowing for uninterruptible switching of control (1 ms or less). If the processor card in service fails, control is switched to the stand-by card without loss of continuity.

Pair & Spare technology
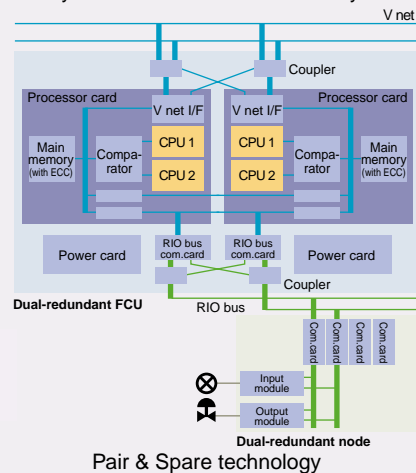
Process I/O Subsystems

Process I/O Subsystems are offered in two main configurations.

- Field network I/O (FIO): A compact, cost-effective, reliable I/O subsystem that has become the next-generation industrial standard I/O.
- Remote I/O (RIO): Yokogawa's extensively field-proven I/O featuring single loop integrity.

FIO

FIO includes various types of I/O modules not only for different types of process signal, but also a range of isolation mechanisms, installation types, and cost. Modules can be flexibly chosen to suit the user's requirements, and all FIO modules can also have a dual configuration to ensure high availability. These options include:

Type of isolation: No isolation, field/system isolation, channel isolation

Type of field connection: Pressure clamp (Weidmuller), dedicated terminal board, MIL cable

Type of installation: Cabinet, or remote installation

Compact

The brand-new design is even more compact for installation where space is limited. When installed in a cabinet, the smaller I/O units reduce the footprint even more.

Open Architecture and High Reliability

The remote I/O cable uses Ethernet, so general network equipment such as repeaters can be used. In addition to this open technology, the quick response required for process control is delivered by Yokogawa's unique communication protocol. Furthermore, redundant I/O modules designed for harsh environments of temperature, corrosive or explosive gases dramatically enhance the reliability of plant control.

RIO

RIOs are process input/output modules with extensively field-proven reliability. RIOs employ field-to-channel and channel-to-channel isolation and M4 screw terminals. M4 screw terminal blocks mountable directly onto individual modules allow wiring without using separate terminal boards.

Processor card

Human Interface Station (HIS)

Choose from three types of HIS hardware to suit the layout of your operation room: office desktop PC, legacy console, or brand-new style LCD console. Whichever you choose, the operating system is MS Windows, the global standard that provides the latest technologies.

Enclose Display Style Console HIS　　　Open Display Style Console HIS

New Style of Console

A generic personal computer is used as the hardware platform, so the user can easily upgrade to a newer models of computers when employing a console or system. Updating to newer models prevents the platform from becoming obsolete as other hardware components such as the keyboard and touch panel can remain unchanged.

Multiple-display Environment

Dual stacked operation, available with the CENTUM series, is now possible under Windows. Use one display for operation, and the other for monitoring alarms. The multiple-display benefit is available not only with the console-type HIS, but also with the desktop-type HIS by putting two displays side by side.

Windows Operating System

All HISs, even the console-type HISs, run under MS Windows, the de-facto global standard. Therefore, the CENTUM CS 3000 HIS enables your plant to coexist with the latest software, networks, and hardware (HIS itself, printer, etc.).

Scalability for Even the Largest Plants

The CENTUM CS 3000 R3 is designed and developed to handle even the very largest of plants. Technologies for huge plants are built into both the hardware and software, and quality is maintained in every detail.

Real-time Control Bus

In large-scale plants, multiple devices such as FCSes and HISes are connected on the control bus. Yet even when the network load is heavy due, for example, by an avalanche of alarms, the control system must respond and communicate among devices in real time. Vnet, the control bus of CENTUM CS 3000 R3, is based on a token passing protocol, so there is no possibility of a communication collision, which causes communication delays. Vnet guarantees real-time communication of process data and alarms.

### Efficient Data Acquisition

Each HIS acquires process data by an event-driven method, in which necessary data is acquired first when the user opens a window. This efficient method reduces the load on each HIS. Furthermore, window refresh rate of one second is assured, even under heavy load such as when numerous alarms occur in rapid succession. Therefore, problems can be dealt with swiftly and securely whenever they occur.

Operation Functions Optimized operation environmemt
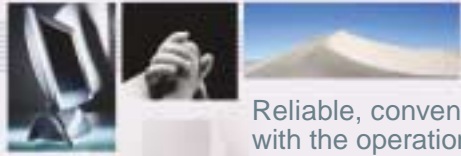
Reliable, convenient operating environment thanks to the latest Windows technologies with the operational functionality of the earlier CENTUM series.
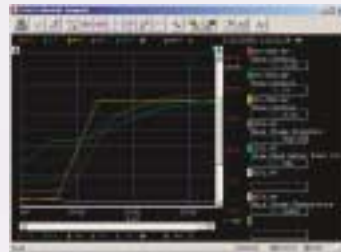
e-RM

Standard Operation Windows

Control Window

Graphic Window

Overview Window

Trend Window

Window Hierarchy

Projects may use hundreds or even thousands of windows for operation and monitoring. Grouping all these windows systematically and hierarchically, just like creating folders to store many files in a PC in the office, eases the window switching process. Just as with office-use computer, where files are accessed via Windows Explorer the HIS of CENTUM CS 3000 R3, windows are accessed from the "Navigator window" that shows the operation and monitoring windows as a hierarchical tree just like Explorer. Hence, windows can be organized by equipment or process for intuitive access, operation and monitoring, without having to remember their names.

Navigator Window

Choice of Screen Mode

Operators can select either the Multiple-window mode like an office PC (popular with process engineers), or the Full-screen mode like the legacy operator stations. The environment is set according to the focus of the type of individual operating the HIS.

Memory of Opened Windows
(Dynamic Window Set Function)

The currently-opened windows can be memorized as a group, so you no longer have to open the same windows again one by one.

FCS

HIS

Trend Graph Display

Both continuous trend graph and batch trend graph are available. You can also display the batch trend reference pattern. The data acquisition period can be selected from 1 sec. real-time to 10 min. historical, according to your needs.

Long-term Data Archive Function

Trend data over the long term and a huge number of historical messages can be stored in the HDD (Hard Disk Drive) of the HIS without having to delete old data. The storage capacity depends only on the available space of the HDD. Additionally, you can archive the stored data to another media, and can refer to it by simply restoring it to the HDD.

Security

To prevent operator errors and other problems and ensure the safety of the system, extensive security can be set, such as prohibiting operations by unauthorized persons, limiting the ranges of operation and monitoring, and restricting operator actions to the system. Such security settings are available for:

- User security
- HIS security
- FCS security
- Tag security
- Window security
- Alarm importance level security
- Alarm color security
- Alarm name security
- Fingerprint authentication

FIO

Multiple-display Function

You can use two monitors for a HIS, not only with a dual-stack console, but also for a desktop HIS. The ability to display more graphic windows at the same time creates a more reliable operating environment, and the layout of monitors is flexible. For example, you can place two monitors side by side, or in combination with a large monitor.

Monitor   Monitor

Ethernet

Vnet

Keyboard

Mouse

Generic PC
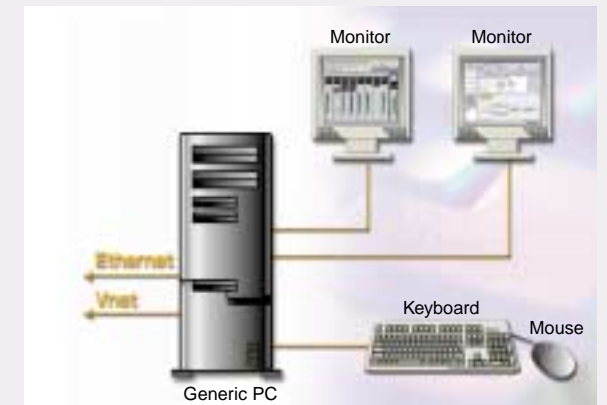
Compliant with 21 CFR Part 11 of FDA

The Food and Drug Administration (FDA) of the United States issued 21 CFR Part 11, the final regulation on "Electronic Records; Electronic Signatures. "21 CFR Part 11 requires users to have a system that protects falsification or unauthorized tampering to assure data integrity. Yokogawa's CENTUM CS 3000 R3 conforms to 21 CFR Part 11 and can manage data directly input from processes, thus guaranteeing the reliability of manufacturing records and operator action logs. By combining this with the security features, users can set the writing permissions to databases in fine detail. In the future, many other industries will be required to adhere to similar standards set for the pharmaceutical industry by 21 CFR Part 11. By incorporating these solutions into the DCS system now, users from other industries can take advantage and reap the benefits of a more secure system.

FDA: Food and Drug Administration

Remote Monitoring

PCs used in an office can view the operation windows and monitor the site statuses of processes though web technologies, allowing the statuses of plants to be seen from anywhere, even overseas. Routine minor changes or problems can thus often be solved immediately without having to visit the site, dramatically saving both time and cost.

CENTUM CS 3000 R3

Control Functions Powerful function blocks achieve high-level controls

In addition to the regulatory control and sequence control blocks that form the basis of control functions, superior sequence control blocks such as unit instrument and Sequential Function Chart (SFC) blocks are provided. A total of 165 types of function block are provided to enable any type of process to be controlled, not just continuous or batch processes.

Control Functions

Regulatory Control Blocks

Regulatory Control Blocks perform computations based on process values for process monitoring and control, and include PID controllers, input indicators, manual loaders, signal selectors, signal setters, and self-tuning controllers.

Calculation Blocks

Calculation blocks assist regulatory and sequence control functions, and perform general-purpose calculations on analog signals and contact (logic) signals.

Configuration of Function Blocks

Subsystem Integration

To meet the growing need for data communications with plant equipment and motors that are equipped with programmable logic controllers (PLCs) for operation and monitoring or automated operation, as well as various "intelligent" equipment such as analyzers and weighing machines, communication functions with subsystems are provided. Redundant communication configurations can also be supported.

Examples include Mitsubishi MELSEC, Allen Bradley PLC-5 and SLC500, Modbus equipment, Siemens SIMATIC, Omron SYSMAC, Yokogawa FA-M3, Darwin, and DAQSTATION.

Subsystem Integration

Sequence Control Blocks

Sequence control blocks are used to implement general-purpose sequences at the loop equipment level, such as safety interlock sequences and process monitoring sequences. The blocks are coded in decision table format and logic chart format using logical operators. Switch instrument, timer, counter, code input/output, and various other blocks are prepared as sequence auxiliary blocks.

SFC(Sequential Function Control)Blocks

SFC blocks are written using SFC description language. SFC blocks conform to IEC standards, and use an open language for sequence control like a flow chart. The operation phase can be displayed visually, which is ideal for operation phase management. For detailed description of unit sequence control, Yokogawa's SEBOL (Sequential Batch-oriented Language), a structured textual based language similar to BASIC can be used as the sequence language.
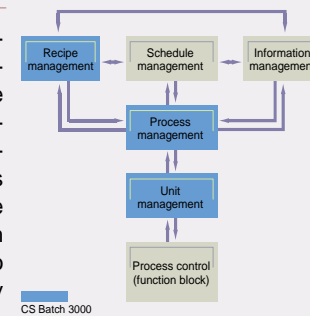
Faceplate Blocks

Faceplate blocks are used to represent two or more function blocks to the operators via a single instrument faceplate. Analog, sequence (discrete), and hybrid faceplate blocks are provided.
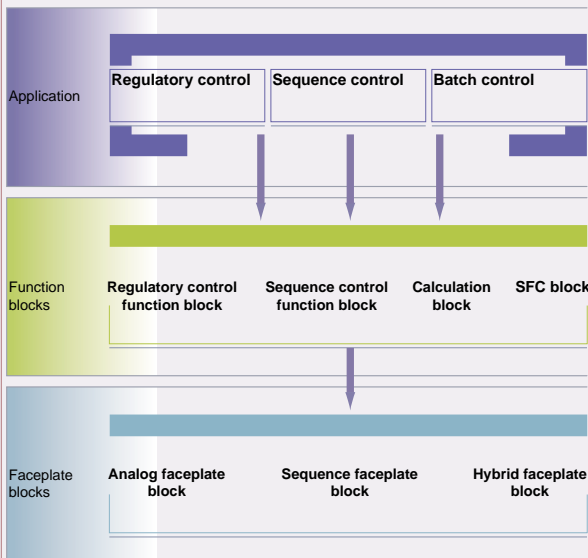
Unit Instrument Blocks

A unit in batch control denotes a set of equipment and control devices for a process. A unit can be operated and monitored using a single unit block. For example, by assigning a unit block to each process unit, operation and monitoring can be performed per unit via a single block, since each unit block can represent an entire process unit. Thus, operating a unit block actually means operating the entire process unit. The unit block method provides the means for unit relativity, where methods and control for one unit can be performed generically and applied to all other units of the same type. This method dramatically simplifies the engineering, operation and monitoring of like equipment whose only difference is different tag names.

Batch Control

CS Batch 3000 is an ISA S88-based total batch process operation and management package that embodies Yokogawa's decades of experience in batch control. CS Batch 3000 provides simple operation and productive engineering for complex batch control. The package can also be easily linked to supervisory scheduling systems and information systems.

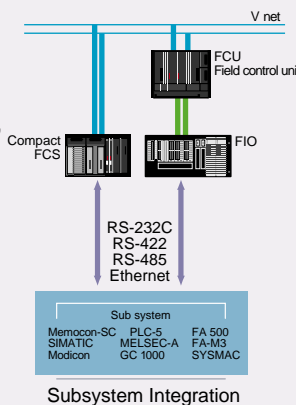ISA S88 Batch Control Activity Model

Engineering Functions Sophisticated engineering on a generic PC

The engineering environment does not require special or expensive platforms; all engineering work including testing and simulation can be performed on a generic PC. Through the "System View" window, (Yokogawa's engineering builder), engineering can be done in exactly the same manner as native Windows programs.

Engineering Functions

System View

Example of Engineering Window(Common Switch)

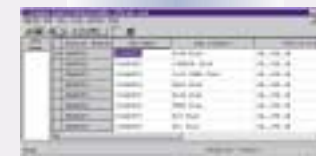Example of Engineering Window(Control Drawing)

Efficient System Configuration

Minimum data entry for definition items simplifies the work of configuring a system. Only detail settings are necessary, and engineering is performed using the option settings window. For productive engineering, all configuration windows provide:

■ Smart default settings to minimize data entry; only changes need be entered.
■ Selection of most entry items from pull-down menus.
■ The same look and feel, for smooth data engineering.

Concurrent Engineering

For productive engineering, concurrent engineering by multiple PCs on a single system database can be performed. Exclusive access control to each database avoids duplicate modification.

On-line Maintenance

FCS applications can be changed without having to stop the FCS. There is no impact on other control functions other than the portion being modified. Application changes are notified to all HISes in real time.

Virtual Test Function

A virtual FCS environment can be prepared on a PC, and so both the control functions and operation of an application can be tested. This enables debugging without FCS hardware. Application testing is dramatically reduced and engineering lead-time is shortened leading to quicken project schedules. For system expansion and modification, the application can be tested and confirmed without any impact on the plant.
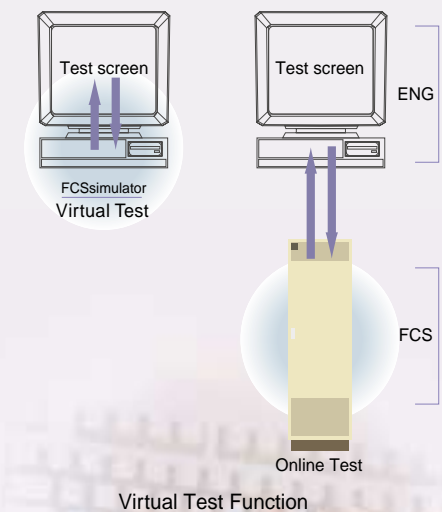
Virtual Test Function

Engineering Database Management

The engineering database is managed in units called a "project" on a PC. This unified data management enables single data backup for both FCSes and HISes, so engineering database management is kept simple.

Online Documentation

All manuals are provided in electronic format. From the configuration window, the related manual for the function being used can be called up online. Specific information can also be easily located online by the smart retrieve function.

Efficient Maintenance with Field Networks

Maintenance of control systems and field devices is essential for plant stability. Recently, predictive maintenance is becoming the norm, which is achieved by field networks such as FOUNDATION Fieldbus. Yokogawa offers the optimum maintenance environment not only for systems but also field devices with software solutions based on a wealth of maintenance and diagnostic information.

Yokogawa's History of Involvement in Field Networks

Yokogawa realized the potential of field networks in a production control system early on and designed its systems with field networks in mind. Yokogawa is committed to the standardization of field communications. Among the many FOUNDATION Fieldbus-enabled products it sells are:

- EJA Series pressure and differential pressure transmitters
- YEWFLO*E vortex flow meters
- ADMAG AE magnetic flow meters
- YTA Series temperature transmitters
- YVP110 valve positioner
- pH meters and conductivity meters
- DAQSTATION networking paper-free recorders.

As to control systems, Yokogawa offers host systems such as CENTUM CS, CS 1000 and CS 3000, which are all compatible with FOUNDATION Fieldbus. The CENTUM CS3000 was the world's first control system, which passed the FOUNDATION Fieldbus "Host Interoperability Support Test (HIST)". This reflects the superiority of the CENTUM series control systems and their support for Fieldbus. In addition, Plant Resource Manager (PRM) combines the benefits of Fieldbus, the control system and PRM to deliver incredibly effective maintenance work.

Integration of FOUNDATION Fieldbus and supremely reliable control system

Integration of Plant Control

A single I/O node accepts signals from legacy non-Fieldbus devices and Fieldbus devices. And it is possible to configure a control loop by combining both devices using the same engineering procedure. New technology is not simply introduced for its own sake; rather, the benefits of Fieldbus are used where applicable with true understanding.
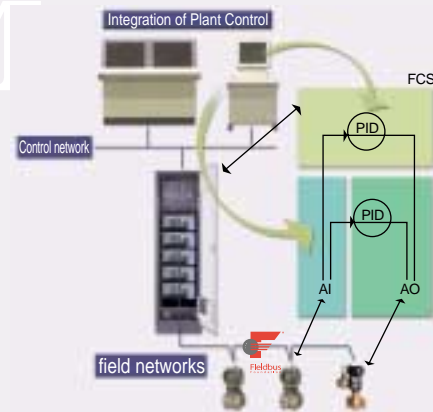
Integration of Plant Control

Integration of Operation and Monitoring

Just like with legacy devices, the HIS operates and monitors the plant including Fieldbus devices. Alarms from Fieldbus devices can be notified in real time, making life easy for operators.

Essential True Redundancy

Even when Fieldbus is used, high availability of plant operation must be kept. CENTUM CS 3000 provides a truly redundant Fieldbus interface module with hot swappable, bump-less switching function. Even if the module is damaged, plant operations are not affected.

Plant Resource Manager

One of the major benefits of Fieldbus is the ability to access rich maintenance and diagnostic device information through the network for effective maintenance. Plant Resource Manager (PRM) is management software that gathers device maintenance information via Field networks, such as FOUNDATION Fieldbus. The database in PRM provides a basis for maintenance scheduling and maintenance parts management. By scheduled predictive maintenance and integrated maintenance on the network and database, Total Cost of Ownership (TCO) is greatly reduced.

Maintenance Information on IT

PRM compiles maintenance information into a database, and uses this to create device master and maintenance schedules. Maintenance personnel can refer to the data via a navigation window in a hierarchical manner.

Audit Trail

Audit trail management is important in both control and maintenance systems. All maintenance work on devices, which are maintained by PRM, is recorded and can be easily referred to.

### Solutions to Non-Fieldbus Devices

PRM can create a database for legacy devices in addition to Fieldbus devices. Maintenance information is recorded and managed in a database for integrated, overall planned maintenance of all devices in the plant.

Online Maintenance

One of the major difficulties of maintenance is the location of a device, which may be located in a dangerous place, far away, or in a relatively inaccessible area. PRM enables online maintenance of such devices via Fieldbus, so visits to the location are minimized. This means far lower maintenance costs and time.

Predictive Maintenance

By integrated management of device management information, the replacement cycle of devices and trend of device troubles can be usefully predicted. This technique minimizes the impact of device problems on plant operation, and maintenance work and parts procurement can also be planned and scheduled.

Solution Base Software

e-RM
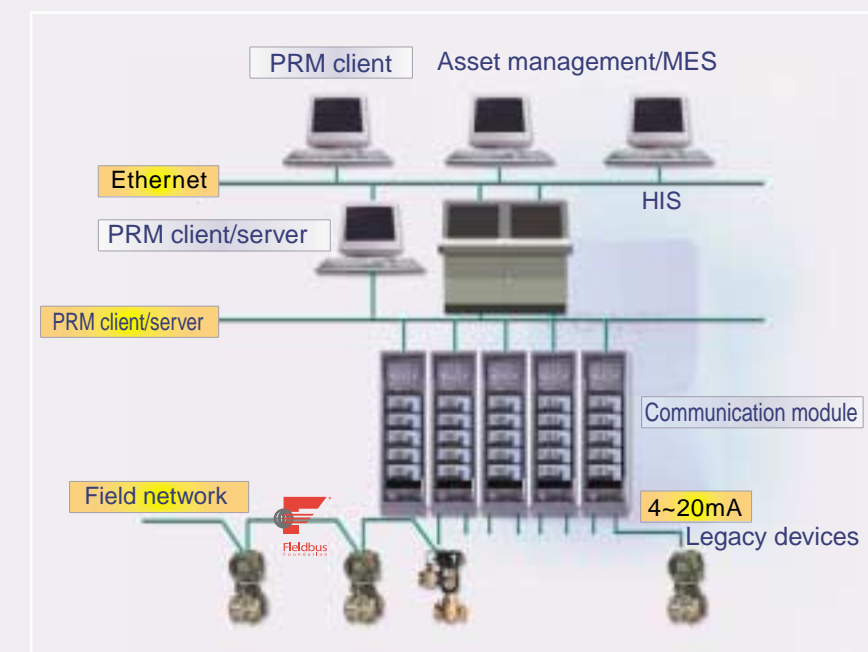
As various industries overhaul their systems utilizing information technology, the process industry too must obtain real-time information from the plant floor. The manufacturing execution system (MES) is an enterprise information system, which links management activities with actual production. Typically, management information systems and production systems have different backgrounds, and are developed and upgraded independently at different times. To provide an interface between these two systems, Yokogawa offers two standard interfaces: the Exaquantum (plant information management package) and Exaopc (interface package for OLE for Process Control (OPC)). Based on these packages, Yokogawa supplies ideal solution packages for MES, thus fully linking the CENTUM CS 3000 production control system with management information systems.

Exaopc OPC Interface Package

Exaopc is an OPC-compliant interface package that enables real time, seamless exchange of data between DCS and MES systems. This package provides the servers for Data Access (DA), Alarm/Event (AE), Historical Data Access (HDA) and Batch Data Access (BDA) for data exchange with other applications.

Exaquantum Plant Information Management System

The large amounts of data in a DCS are critical for making business decisions such as improving operation productivity, quality, and safety. Exaquantum collects, processes, and accumulates such DCS data and provides it to MES-level business applications. Exaquantum also links with data of other systems such as enterprise resource planning (ERP), laboratory information management systems (LIMS), and computerized maintenance management systems (CMMS), and so is crucial for supply chain management for an enterprise.

Advanced Process Control

Exasmoc Multivariable Optimizing Controller

Exasmoc is based upon the SMOC-II algorithm developed by Shell Global Solutions International (SGSI) with its wealth of experience in oil refining and petrochemicals. Exasmoc marries the SMOC-II advanced algorithm with Yokogawa's DCS expertise and integrates it seamlessly with the operating and monitoring functions of production control systems.

Exarqe Robust Quality Estimator

Exarqe is a solution that combines the leading process control technologies of Shell Global Solutions International and Yokogawa for process analysis and property inference. Exarqe infers the final or semi-finished product properties in real time based on process variables, which helps to reduce cost and improve process control.

Advanced Operation Assistance (AOA) Solutions

Advanced Operation Assistance (AOA) packages are for manual operations such as start-up and emergency operations. The solution clearly indicates which points should be improved and the course of problems. The packages offer greatly improved operability.
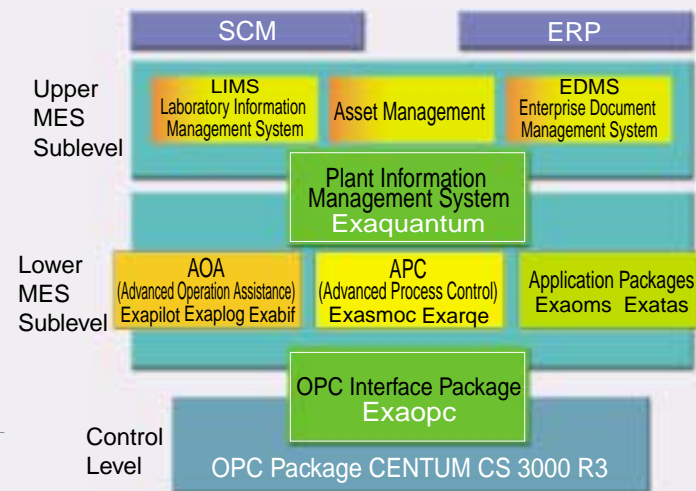
Exaplog Event Analysis Package

Exaplog analyzes plant operations by using a 3W (When, Where, What) filter based on DCS historical message logs. By eliminating unnecessary alarms and poor sequence applications, production efficiency is greatly improved.

Exapilot Improvement Package of Operation Efficiency

Exapilot provides sophisticated, standardized operations based on the know-how of experienced operators for even greater efficiency. By able to automating Standard Operating Procedures (SOPs), even a new operator can perform some tasks as well as the experienced operator.

Exabif Batch Interface Package

Exabif is a batch interface package based upon ISA S88 batch standard. The package links supervisory systems with batch control systems, allowing automated scheduling of recipes. It is ideal for campaign management.

SCM		ERP

Upper MES Sublevel: LIMS (Laboratory Information Management System) | Asset Management | EDMS (Enterprise Document Management System) | Plant Information Management System Exaquantum

Lower MES Sublevel: AOA (Advanced Operation Assistance) Exapilot Exaplog Exabif | APC (Advanced Process Control) Exasmoc Exarqe | Application Packages Exaoms Exatas | OPC Interface Package Exaopc

Control Level: OPC Package CENTUM CS 3000 R3

Solution Base Software

Migration Great expandability of CENTUM CS 3000 R3

FIO

Migration plan for evolution into competitive systems for the 21st-century. Yokogawa offers optimal solutions for minimal investment.

The need for evolution

Yokogawa is proud of the operation and control track record of CENTUM V and CENTUM-XL, but their network functionality is not sufficient for the 21st-century control systems. Adding network capability to your system produces the following benefits:

■ By linking to supervisory information system, dynamic adjustment of operations to meet market demands
■ Productivity improvement by linking to APC (Advanced Process Control)
■ Improvement of operational efficiency by linking to AOA (Advanced Operation Assistance)

Utilization of Existing Assets

Yokogawa offers a phased migration plan for CENTUM. This phased migration is not a simple replacement, but utilizes your existing hardware, software and operation know-how to best effect. The field wiring need not be changed. Control station cabinets can be reused. And application software is also used in the most effective way.

Phased Migration

Phased migration is a three-step upgrade method on a component basis, which reduces the required investment and manpower, and shortens the upgrade period.
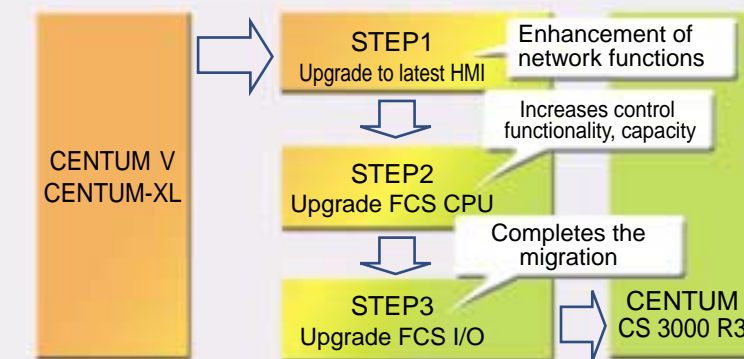
Step 1: Upgrading of HMI
Step 1 brings in the latest HMI environment and network capability, surely one of the most important issues.

Step 2: Upgrading of CPU of FCS
By utilizing the existing field wiring and I/O cards, the latest control functions are provided, while greatly improving performance and application capacity.

Step 3: Upgrading of I/Os
Using existing field wiring, the latest I/Os are provided with full compatibility of functions, interface and cabinet layout. If necessary, signal conditioner cards can be replaced by card.

RIO

CENTUM V CENTUM-XL → STEP1 Upgrade to latest HMI — Enhancement of network functions → STEP2 Upgrade FCS CPU — Increases control functionality, capacity → STEP3 Upgrade FCS I/O — Completes the migration → CENTUM CS 3000 R3

Phased Migration

FCS

Yokogawa provides total support to customers.

Global Service Organization with Full 24-hour Support

Yokogawa has service offices and service representative offices located
around the world offering 24/7 support, enabling it to provide unrivalled service
on a global basis for its ultra-reliable products.
The Response Center, which operates 24 hours a day 365 days a year,
provides immediate support for every eventuality.
With its established long-term support system,
Yokogawa delivers peace of mind with its products.

Various service programs for peace of mind for your system
service menu

■Maintenance Contract
Yokogawa offers a wide range of service programs according to the customer's needs.
Extensive support, from corrective maintenance to preventive maintenance, ensures
customer's systems are kept running smoothly for longer.

■Remote Management Service
Yokogawa's Response Center links up with your system to provide system condition
diagnostics, quick troubleshooting, and problem prevention.

■On-site Services
Yokogawa customer service engineers (CSE) are on standby 24 hours a day around the
globe, ready to fix any trouble.

■Response Center Helpdesk
The Response Center discusses your requirements, and after installation, provides
helpdesk support for your system wherever it may be located.

for peace of mind and a certain future
YOKOGAWA ◆