General Specifications

Production Control System
CENTUM CS 1000
System Overview

CENTUM CS 1000 R3

GS 33S01B10-31E

■ GENERAL

This GS covers the system specifications, components and network specifications of the CENTUM CS 1000 Production Control System.

■ SYSTEM COMPONENTS

The CENTUM CS 1000 Production Control System for real-time control consists of components such as HIS Human Interface Stations and FCS Field Control Stations interconnected by the VLnet token-bus. Software running on HIS and FCS stations implements operation/monitoring and control functions respectively.

1. Human Interface Station (HIS)

An HIS serves as a human interface for operation, monitoring, and engineering. The software packages listed below which are installed in an IBM PC/AT-compatible computer (hereinafter referred to as a general-purpose PC), or in a console HIS (*5) consisting of a general-purpose PC and Open Display Style Console Assembly, implement the respective functions. The user can install and run the operation and monitoring functions together with the engineering functions in the same HIS or in different HISs as necessary.

Operation and Monitoring Software

PHS1101	Standard Operation and Monitoring Function
PHS1130	Console HIS Support Package for Open Display Style (*6)
PHS2410	Open Data Interface Package for DDE
PHS2411	Exaopc OPC Interface Package (for HIS) (*3)
PHS2412	CENTUM Data Access Library
PHS4190	Line Printer Support Package (*3)
PHS4410	Control Drawing Status Display Package (*1)
PHS4420	Logic Chart Status Display Package (*2)
PHS4510	Expert Trend Viewer Package (*4)
PHS6510	Long-term Data Archive Package (*1)
PHS6530	Report Package
PHS6600	CS Batch 1000 Process Management Package (*1)
PHS6710	FCS Data Setting/Acquisition Package (PICOT)
PHS7110	Web Monitoring Package (*2)
SSS7710	Plant Resource Management Client (*5)

*1: Supported by R2 and later
*2: Supported by R2.05 and later
*3: Supported by R2.06 and later
*4: Supported by R2.20 and later
*5: Supported by R3.01 and later

For details of these functions, see the respective GSes.

The operating system of the HIS is Windows 2000 (Professional). If you want to run other third-party software on the HIS, contact our sales people in case there are compatibility issues.

Engineering Software

PHS5100	Builder Function
PHS5120	Control Drawing Builder (*1)
PHS5150	Test Function
PHS5155	Expanded Test Functions (*3)
PHS5156	FCS Simulator Package (*3)
PHS5157	HIS Simulator Package (*3)
PHS5151	Graphic Builder
PHS5160	CS Batch 1000 Builder (*1)
PHS5161	CS Batch 1000 Recipe Management Package (*1)
PHS5490	Self-documentation Function
SSS5700	Foundation Fieldbus Engineering Tool (*2)
SSS6700	Foundation Fieldbus Device Management Tool (*2)
SSS7700	Plant Resource Management Server (*4)
SSS7710	Plant Resource Management Client (*4)
SSS7720	Field Communications Server (*4)

*1: Supported by R2 and later
*2: Supported by R2.05 and later
*3: Supported by R2.10 and later
*4: Supported by R3.01 and later

For details of these functions, see the respective GSes.

Documentation Software

PHS5495	Electronic Instruction Manual

For details, see GS 33S02Q30-31E "Optional Software Packages for Operation and Monitoring Function."

Operation Support Software (for general-purpose PC worked as HIS)

NTPS100	Exaplog Event Analysis Package
NTPS200	Exapilot Operation Efficiency Improvement Package

Note: Supported by R2.10 and later.

For details of the above functions, see GS 36J06A10-01E "NTPS100 Exaplog Event Analysis Package" and GS 36J06B20-01E "Exapilot Operation Efficiency Improvement Package."

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2. Field Control Station (FCS)

The FCS performs process control, and manages communication with subsystems such as PLCs. Standard and enhanced control software options, and versions with capacity for two or five I/O units, are available.

PFCS Field Control Station (19" rack mountable type)
PFCD Duplexed Field Control Station (19" rack mountable type)

Basic Software

PFS1100 Standard Control Function
PFS1120 Enhanced Control Function

For details, see GS 33S03K10-31E.

Subsystem Communication Software

PFS2210 FA-M3 Communication Package for ACM11/ACM12
PFS2211 DARWIN Communication Package for ACM11
PFS2220 YS Instruments Communication Package for ACM12 (*2)
PFS2230 MELSEC-A Communication Package for ACM71 (*2)
PFS2231 FA-M3 Communication Package (for ACM71) (*3)
PFS2510 Foundation Fieldbus Communication Package (*1)
PFS2540 PROFIBUS Communication Package (*2)
PFS9053 Modbus Communication Package for ACM11/ACM12
PFS9054 A&B Communication Package for ACM11/ACM12
PFS9055 Siemens Communication Package for ACM11/ACM12
PFS9062 MELSEC-A Communication Package for ACM11/ACM12
PFS9063 SYSMAC Communication Package for ACM11/ACM12

*1: Supported by R 2.05 and later
*2: Supported by R2.10 and later
*3: Supported by R3.01 and later

For details, see GS 33S03L20-31E.

3. Bus Converter (BCV)

The BCV is used to link the VLnet token bus of CS 1000 to the RL bus of μXL. The BCV is supported by R2.01 and later.

Hardware

ABC11S Bus Converter
ABC11D Dual-Redundant Bus Converter

Software

PBC1270 Standard Bus Converter Function

For details, see GS 33S06H20-31E.

4. Communication Gateway Unit (CGW)

The CGW communication gateway unit connects an Ethernet network to a VLnet bus. The CGW is supported by R2.01 and later.

Hardware

ACG10S Communication Gateway Unit

Software

PGW1240 Text Mode Communication Gateway Unit Function (*1)
PGW1250 Frame Mode Communication Gateway Unit Function (*2)

*1: Supported by release R2.01 and later
*2: Supported by release R2.06 and later

For details, see GS 33S06H10-31E.

5. Peripherals

- YNT511S, YNT511D, YNT521S, and YNT521D Fiber-optic Bus Repeaters (for VLnet)
- YNT512S and YNT512D Bus Repeaters (for VLnet)

Since an HIS runs the Microsoft Windows 2000 operating system, Windows 2000-compatible peripherals, such as a printer, can be used; however, for peripherals usable for an HIS, consult Yokogawa.

■ SYSTEM SPECIFICATIONS

HIS Operation/Monitoring Tags

Maximum of 8,000 tags

Minimum System

A minimum system consists of one HIS and one FCS.

Maximum System

Stations	Max. No. of Stations
HIS FCS BCV (*1) CGW (*1)	A total of up to 24 stations can be connected. Of this, the number of HISes and FCSes must be 8 or fewer and 16 or fewer respectively.

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μXL Communication

A μXL system can be connected via a BCV. μXL Communication is supported by R2.01 and later.
Total number of stations in hierarchical system: Up to 64
Hierarchy: two-level control-bus hierarchy, i.e. two control-bus levels, linked by a bus converter.
Number of HIS-monitored tags: 8,000 tags
Connecting device: Bus Converter

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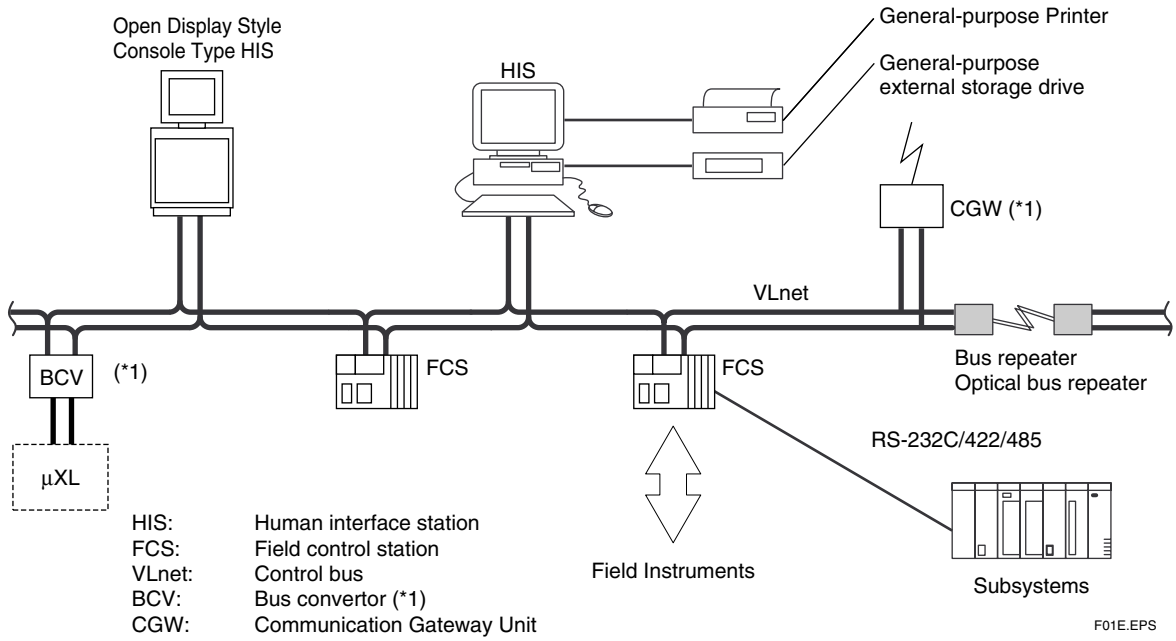

Example of CENTUM CS 1000 System Configuration

*1: Supported by R2.01 and later

Note for System Configuration

A Windows 2000 server is required to store project data in some system configurations.

Count total number of connected PCs using an equation shown below. If the number is more than eight, consult our sales staff for further examination. If the number is eight or smaller, a server PC is not required.

When NOT using Foundation Fieldbus Engineering Tool (SSS5700):
HIS + {(Engineering - 1) x 2} + Exaopc

When using Foundation Fieldbus Engineering Tool (SSS5700):
HIS + {(Engineering - 1) x 2} + Exaopc + 2

When using Expanded Test Functions (PHS5155):
Running PHS5155 on three PCs requires a server computer; consult Yokogawa.

When the PC is connected to CS 3000 as a low-level system.
See the specifications for CENTUM CS 3000 Multiple Project Connection Package (GS 33Q2S10-01E) for details.

Parameters in Equations

HIS: Number of PCs, including console type HISs, in which Standard Operation and Monitoring Function (PHS1101) is installed.
Count the total number of the packages in the project.

Engineering:
Number of PCs, including console type HISs, in which Standard Builder Function (PHS5100) is installed.
Count independently from above "HIS" regardless of whether Standard Operation and Monitoring Function is also installed in one or more of those PCs.

Exaopc: Number of PCs with Exaopc OPC Interface Package (NTPF100, GS 36J02A10-01E)
Do not count Exaopc OPC Interface Package (PHS2411).

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■ NETWORK SPECIFICATIONS

The CENTUM CS 1000 uses a VLnet for communication with the configured stations.

VLnet

- Application
  The VLnet is a real-time process control network which interconnects system components.
- Communication Specifications
  No. of Connectable Stations: 24 per system
  Communication Method: Read/write communication, message communication
  Line Access Control: Token passing method
- Transmission Path Specifications
  Network Topology: Bus type
  Transmission Path Redundancy: Single or redundant
  Transmission Speed: 10 megabits per sec
  Transmission Cable:
  YCB111/YCB141 coaxial cable: Use YCB147 and YCB149 Bus Adapter Unit or YNT512 Bus Repeater to connect a YCB141 cable to a YCB111 cable.
  No. of Bus Adapter Units: Max. 4 units per system
  Optical fiber cable: Use YNT5□1□ Optical Bus Repeater

Transmission Distance:
Coaxial cable:
Transmission distance: Max. 185 m (for YCB141)
To mix YCB111 and YCB141: Length of YCB141 + 0.4 x Length of YCB111 ≦ 185
Extension distance with Bus Repeater: Max. 500 m per repeater. Max. 8 repeaters can be used.
Total transmission distance can be up to 1.6 km.
Optical fiber cable: There are Optical Bus Repeaters for 4 and 15 km. Use 2 repeaters as a set. Up to 4 sets (8 optical repeaters) can be used. The total transmission distance is restricted in consideration of signal transmission delay time. In table below (series connection), the asterisk "*" shows the restricted distance. When combining optical bus repeaters for 4 km and 15 km, the total transmission distance is restricted as well.

For VLnet	Total Transmission Distance Depending on Number of Repeaters			
	One pair (Two repeaters)	Two pairs (Four repeaters)	Three pairs (Six repeaters)	Four pairs (Eight repeaters)
Optical bus repeater for max. 4 km	Max. 4.370 km	Max. 8.555 km	Max. 12.740 km	Max. 16 km *
Optical bus repeater for max. 15 km	Max. 15.370 km	Max. 20 km *	Max. 18 km *	Max. 16 km *

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For VLnet	Total Transmission Distance Depending on Number of Repeaters							
	1	2	3	4	5	6	7	8
With YCB111 cable	Max. 0.37 km	Max. 0.555 km	Max. 0.74 km	Max. 0.925 km	Max. 1.11 km	Max. 1.295 km	Max. 1.48 km	Max. 1.6 km
With YCB141 cable	Max. 0.685 km	Max. 0.87 km	Max. 1.37 km	Max. 1.555 km	–	–	–	–

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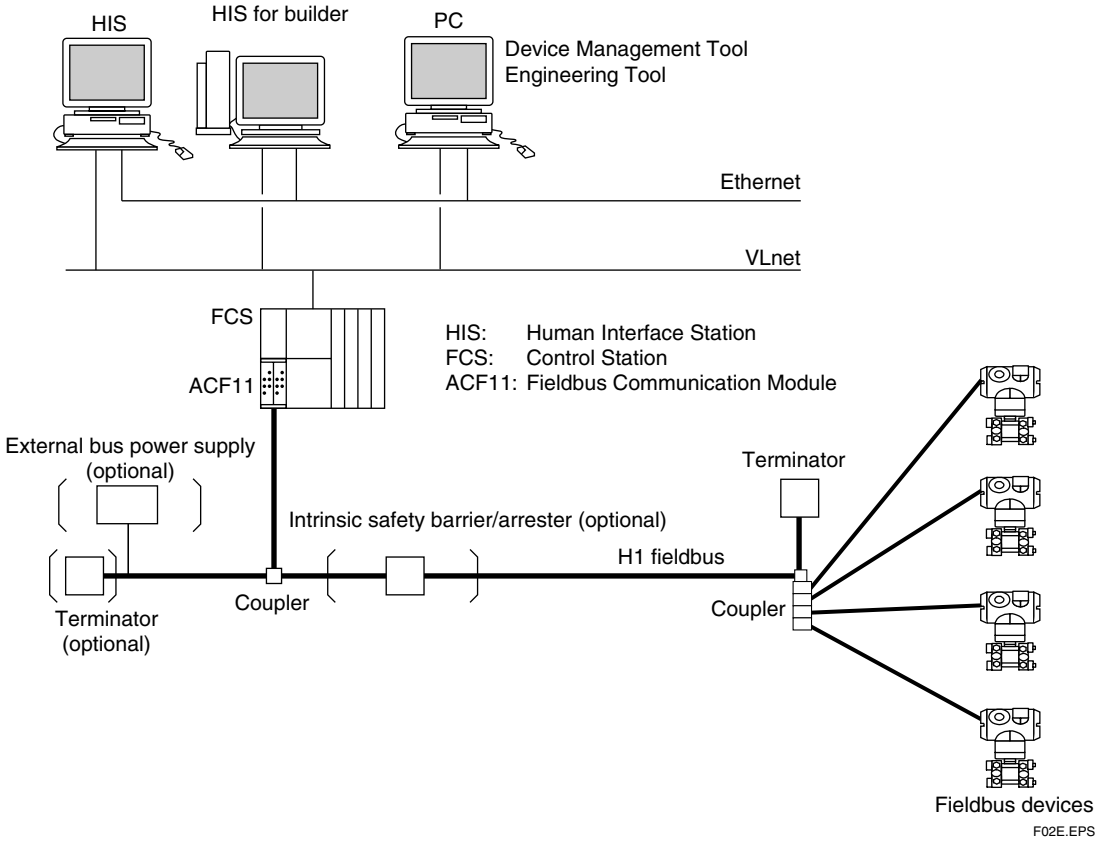
■ FIELDBUS SPECIFICATIONS

An Example of Fieldbus Connection



Fieldbus System Configuration (Tree Type)

Fieldbus Specifications

Compliant to FOUNDATION Fieldbus. For transmission specifications, see General Specifications for Foundation Fieldbus Communication Package (for ACF11), GS 33S03L50-31E.

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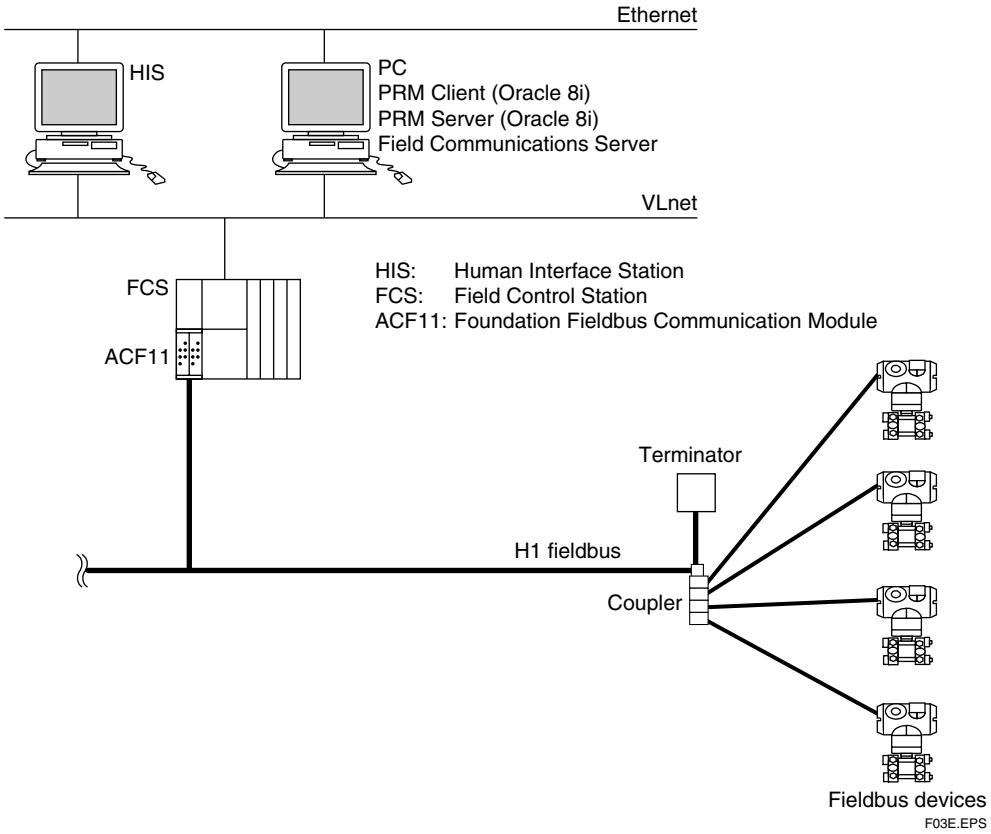
■ PLANT RESOURCE MANAGER (PRM) SPECIFICATIONS

PRM Configuration



System Configuration for Plant Resource Manager

PRM Specifications

For details, see GS 33Y05Q10-31E.

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■ INSTALLATION AND ENVIRONMENTAL CONDITIONS

The following shows the installation and environmental conditions for the CENTUM CS 1000 system components excluding general-purpose PCs and console HISs. For PCs and console HISs, see the respective documentation (GS 33Y06B20-31E for console HISs).

Ambient Temperature:
5 to 40˚C
5 to 35˚C (YAX701 General-purpose Desk)
0 to 50˚C (inside of FCS cabinet)
Ambient Humidity:
20 to 80% RH
10 to 90% RH (inside of FCS cabinet)
No condensation
Temperature Change Rate: ±10˚C per hour
Power Supply:
100-120 V AC Spec: Voltage 100-120 V AC ±10 %;
Frequency 50/60 ±3 Hz
220-240 V AC Spec: Voltage 220-240 V AC ±10 %;
Frequency 50/60 ±3 Hz
24 V DC Spec: Voltage 24 V DC ±10 %
Withstanding Voltage:
100-120 V AC and 220-240 V AC:
1,500 V AC for 1 minute
24 V DC: 500 V AC for 1 minute
Insulation Resistance:
20 MΩ at 500 V DC, 10 MΩ at 500 V DC
(YAX701, YAX211, YPR120)
Grounding: Independent ground of up to 100 Ω
Noise:
Electrical Field: Up to 3 V/m (26 MHz to 1 GHz)
Magnetic Field: Up to 400 A/m
Static: Up to 4 kV (direct discharge)
Continuous Vibration:
Peak-to-peak: Up to 0.5 mm (1 to 14 Hz)
Acceleration: Up to 0.2 G (14 to 100 Hz)

Regulatory Compliance

Specifications of respective devices vary required standards. See the hardware general specifications (GS) of the device for further information.
Safety Standards:
CSA C22.2 No.1010.1 for 100-120 V AC power supply
EN 61010-1 for 220-240 V or 24 V DC power supply
EMC Conformity Standards:
CE MARK (*1)
EN 55011 Group 1 Class A for devices with 220-240 V AC or 24 V DC power supply
EN 50082-2 for devices with 220-240 V AC or 24 V DC power supply (*1)
EN 61000-3-2 for devices with 220-240 V AC or 24 V DC power supply (*2)
EN 61000-3-3 for devices with 220-240 V AC power supply (*3)
C-Tick MARK (*1)
AS/NZS 2064 for devices with 220-240 V AC or 24 V DC power supply
Standards for Hazardous Location Equipment:
CSA Standard C22.2 No. 157-92
CSA Standard C22.2 No. 213-M1987
ISA Standard ISA-S12.12 1994
For 100-120 V AC or 24 V DC power supply

*1: A lightening arrestor or the like is required to meet this surge immunity standard.
*2: An external device such as a power unit with harmonic current neutralizer and an active harmonics conditioner must be connected to meet this harmonic current emission standard.
*3: The specified limits of voltage drop across wiring must be satisfied to meet this standard.

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