

Technical Information

Integrated Production Control System
CENTUM VP
System Overview (HMI Overview)



TI 33K01A11-50E

[Release 5]

Blank Page

Introduction

CENTUM VP is an integrated production control system that manages and controls the operation of plants in a wide variety of industries, including petroleum refineries, chemical, steel, food, power, and so forth.

This manual (System Overview (HMI Overview)) provides a simple overview of the HIS (Human Interface Station) of CENTUM VP HMI (Human Machine Interface). Before reading this manual, first read the separate System Overview (General Overview) manual to understand the overview of the CENTUM VP, and then read this manual. After that, proceed to detailed material, such as General Specifications.

■ Relevant Manual

TI 33K01A10-50E CENTUM VP System Overview (General Overview)

TI 33K01A12-50E CENTUM VP System Overview (FCS Overview)

TI 32R01B10-01E Safety Instrumented System ProSafe-RS System Overview

■ Target Readership for This Manual

This manual is mainly intended for:

- Instrumentation, electric, and computer engineers who are evaluating CENTUM VP for purchase or who will be in charge of installation.

■ None on Figures

Figures described in this manual may be highlighted or simplified, or partially omitted for the convenience of explanation.

■ Trademarks

- “CENTUM”, “ProSafe”, “Vnet/IP”, and “Exaopc” are registered trademarks of Yokogawa Electric Corporation.
- “Windows” is registered trademarks of Microsoft Corporation in United States and/or other countries.
- “Ethernet” is a registered trademark of Xerox Corporation.
- Other product and company names may be registered trademarks of their respective companies (the TM or R mark is not displayed).

Blank Page

Integrated Production Control System

CENTUM VP

System Overview (HMI Overview)

TI 33K01A11-50E 1st Edition

CONTENTS

Introduction	i
1. Overview of CENTUM VP HIS.....	1-1
1.1 Ergonomic Design Concept	1-1
1.2 Consolidated Alarm Management Software (CAMS for HIS).....	1-1
1.3 Remote Operation and Monitoring Functions.....	1-2
1.4 Multiple and Wide Monitor Support	1-2
1.5 High-speed Data Update	1-2
1.6 Succession of Operability	1-2
2. Hardware	2-1
2.1 Desktop Type HIS.....	2-1
2.2 Console Type HIS.....	2-2
2.3 Operation Keyboard	2-3
2.4 Multiple and Wide Monitor Support	2-4
3. Operation and Monitoring Functions.....	3-1
3.1 Overall Operation and Monitoring Functions	3-2
3.1.1 Display Layout	3-2
3.1.2 System Message Banner	3-3
3.1.3 Browser Bar	3-3
3.1.4 HIS Desktop Area	3-4
3.2 Operation and Monitoring Window.....	3-5
3.2.1 Graphic View with Graphic Attribute	3-5
3.2.2 Graphic View with Control Attribute	3-6
3.2.3 Faceplate View (Instrument Faceplates).....	3-7
3.2.4 Trend View	3-9
3.2.5 Tuning View	3-12
3.2.6 CAMS for HIS Message Monitor	3-13
3.3 Operation and Monitoring Support Functions	3-16
3.3.1 Report Function	3-16
3.3.2 Server for Remote Operation and Monitoring Function	3-19
3.3.3 CENTUM Desktop	3-19
3.3.4 Security	3-20
3.3.5 HIS Utility	3-24

3.4	Windows for System Administration	3-26
3.4.1	System Status Overview.....	3-26
3.4.2	System Alarm View	3-27
3.4.3	FCS Status Display View	3-28
3.4.4	HIS Status Display View	3-29
3.4.5	HIS Setup Window.....	3-30

1. Overview of CENTUM VP HIS

CENTUM VP introduces a new human interface station (HIS) that let operators to access information more easily, quickly and intuitively. The HIS inherited the excellent operation methods from traditional CENTUM series, and moreover, it adopts an ergonomic design for effective operating and monitoring environments.



F010001E.ai

Figure Example of HIS Window

1.1 Ergonomic Design Concept

The HIS for CENTUM VP adopts a new design concept "Simple & Intuitive" from the viewpoint of ergonomics. Icons and information allocation based on the above design concept and the latest look-and-feel provide operators with comfortable operation and monitoring environments causing fewer physical and mental burdens on operators.

1.2 Consolidated Alarm Management Software (CAMS for HIS)

Based on the latest alarm management guidelines (*1), Yokogawa developed a Consolidated Alarm Management Software for the process operator in the HIS. This software saves operators from alarm flooding and to deliver only necessary alarms at the right timing.

*1: EEMUA (Engineering Equipment and Materials Users Association) No. 191.

1.3 Remote Operation and Monitoring Functions

Plants can be operated and monitored from a remote location. Remote operation and monitoring can be made from a general purpose PC in an office far from the central control room.

1.4 Multiple and Wide Monitor Support

One HIS supports up to four monitors as well as a widescreen LCD (16:10 aspect ratio). The scope of one operator's responsibility widens, and the amount of information to be processed is increasing. To cope with these demands, the multiple monitors display many pieces of information to improve work effectiveness.

1.5 High-speed Data Update

Data acquisition functions allow display updating as fast as 1 sec. This level of performance is required for manual control of pressure and flow.

1.6 Succession of Operability

The same operability as for a conventional HMI, such as touch operations and eight-control-key operation, 64 function keys, and the like, has been achieved. In addition, when operability changes with a CENTUM evolution, such as CAMS for HIS and Multi-window mode, specific functions following the operability are provided.

2. Hardware

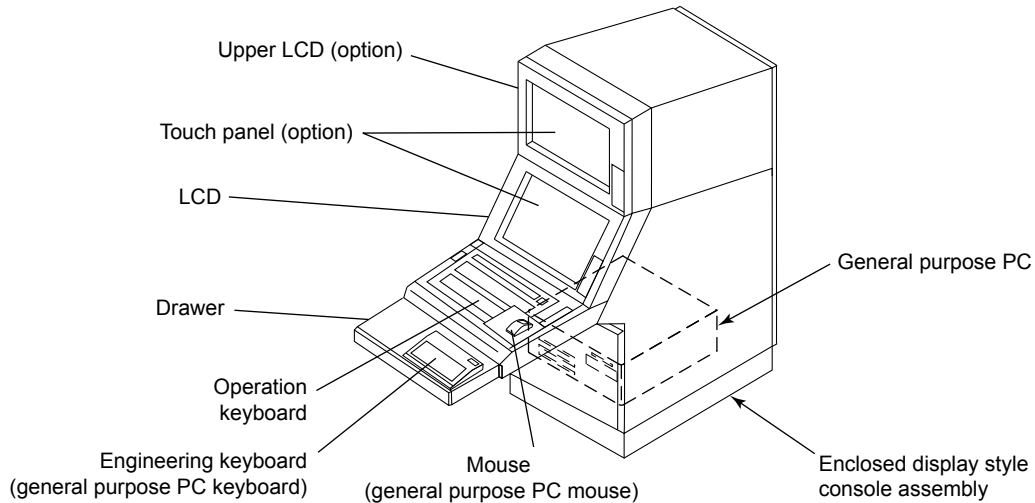
The HIS includes two types: a desktop type HIS with a general purpose PC and a operation keyboard, and a console type HIS incorporating a general PC, monitor and operation keyboard in a dedicated console assembly. An operation keyboard is a one-touch operation-based keyboard succeeding conventional HMI operability. One HIS supports up to four monitors.

2.1 Desktop Type HIS

A desktop type HIS runs on a general purpose PC (IBM PC/AT-compatible machine) with Microsoft Windows installed. The desktop type HIS achieves a simple operation and monitoring environment based on the mouse operation. Moreover, an additional operation keyboard achieves the same operability as a conventional console type HMI excluding partial functions.

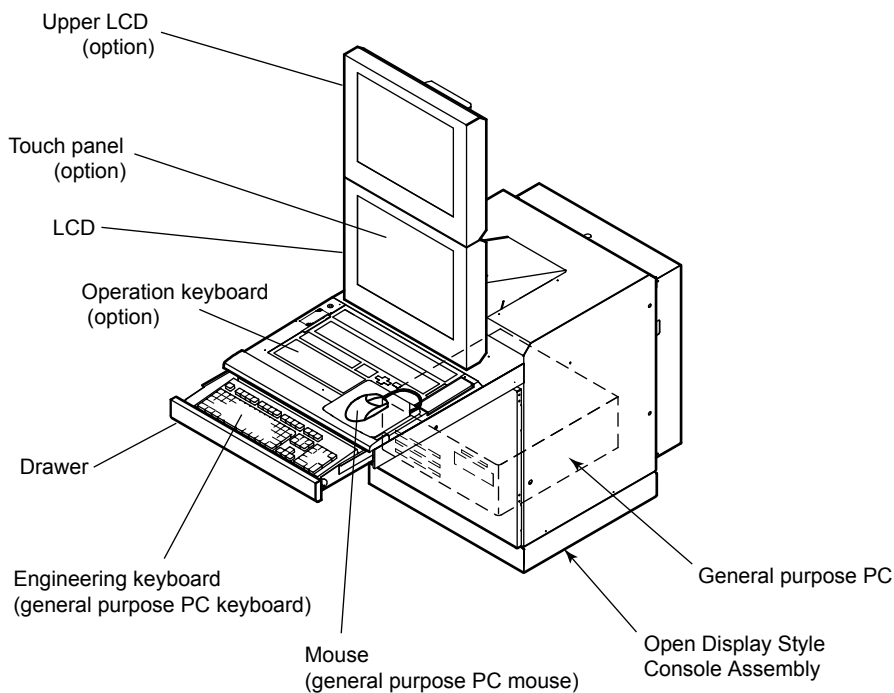
2.2 Console Type HIS

A console type HIS is composed of dual-stacked LCDs, a touch panel function, eight-control-key operation keyboard and auxiliary contact I/Os. A number of console type HISes can be installed in a row. The console type HIS includes two types: an enclosed display style console type provided with a conventional external view, and an open display style console type using LCDs and allowing the selection of monitors and types of keyboards. The following shows external views of a console type HIS.



F020201E.ai

Figure Enclosed Display Style Console Type HIS

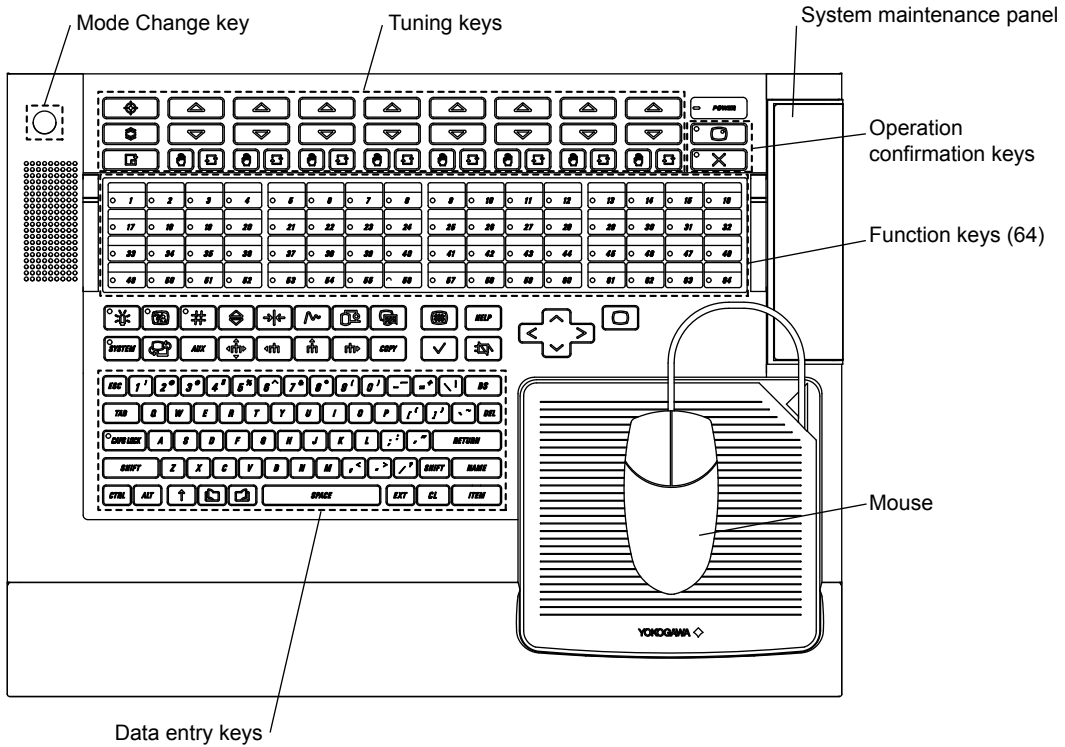


F020202E.ai

Figure Open Display Style Console Type HIS

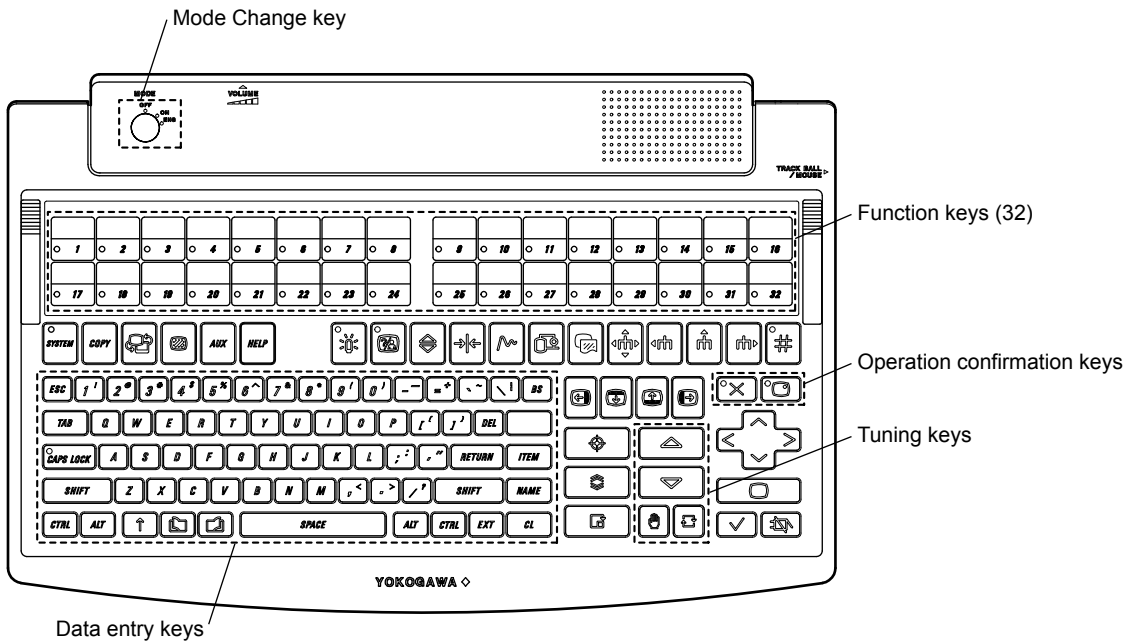
2.3 Operation Keyboard

The operation keyboard uses dust- and drip-proof flat keys with a functional key layout based on a one-touch operation. The operation keyboard includes an eight-control-key operation keyboard usable in a console type HIS and a one-control-key operation keyboard usable in a desktop type HIS.



F020301E.ai

Figure Eight-control-key Operation Keyboard



F020302E.ai

Figure One-control-key Operation Keyboard

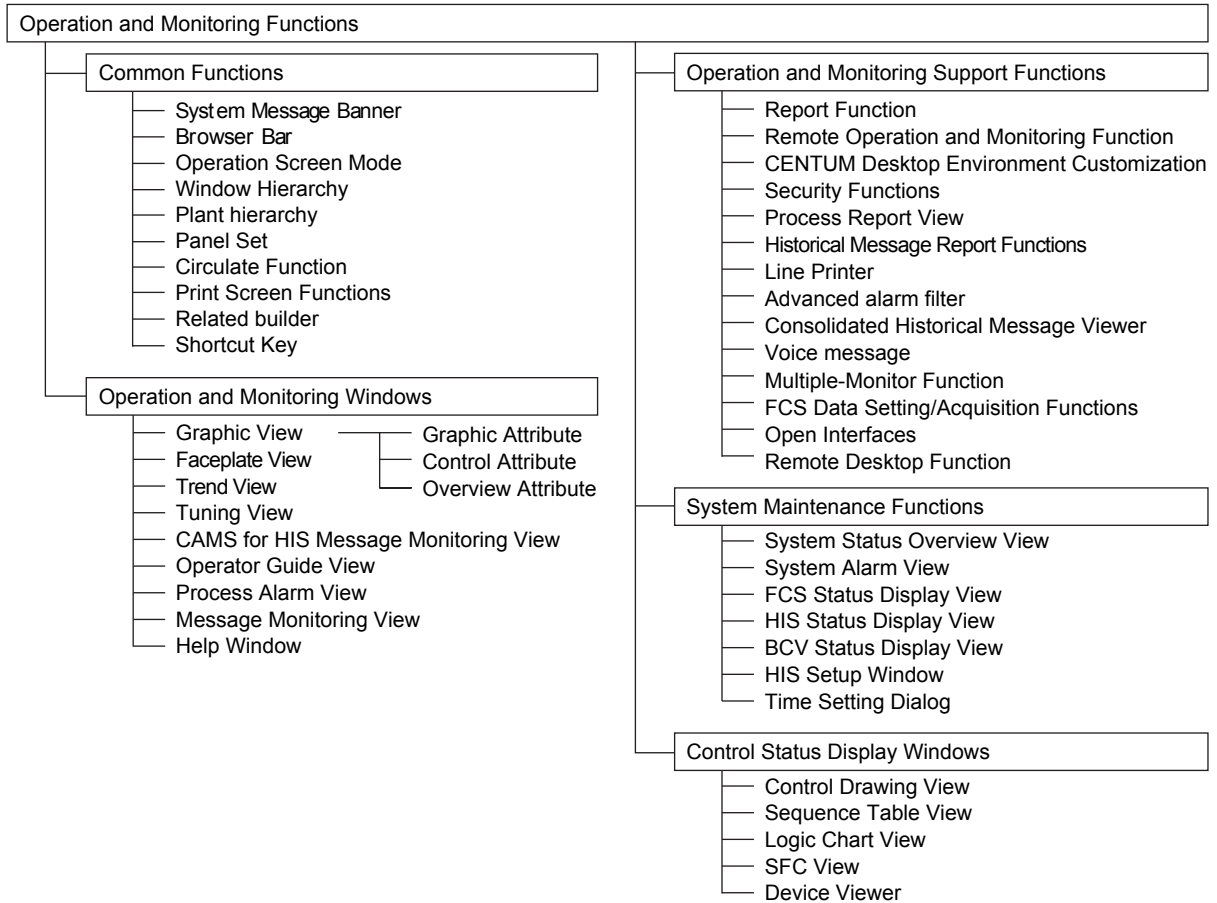
2.4 Multiple and Wide Monitor Support

One HIS supports up to four monitors as well as widescreen flat panels (16:10 aspect ratio). Thus the amount of information displayed with one HIS has increased. (*1)

*1: The console type HIS supports only conventional type (4:3) monitors up to two monitors at maximum.

3. Operation and Monitoring Functions

This chapter describes typical operation and monitoring functions. The following shows the overall configuration of operation and monitoring functions.



F030001E.ai

Figure Operation and Monitoring Functions

3.1 Overall Operation and Monitoring Functions

This section provides the following functions getting involved in overall operation and monitoring functions.

- Display layout
- System message banner
- Browser bar
- HIS desktop area

3.1.1 Display Layout

The HIS display is composed of a system message banner, browser bar and HIS desktop area as shown below.

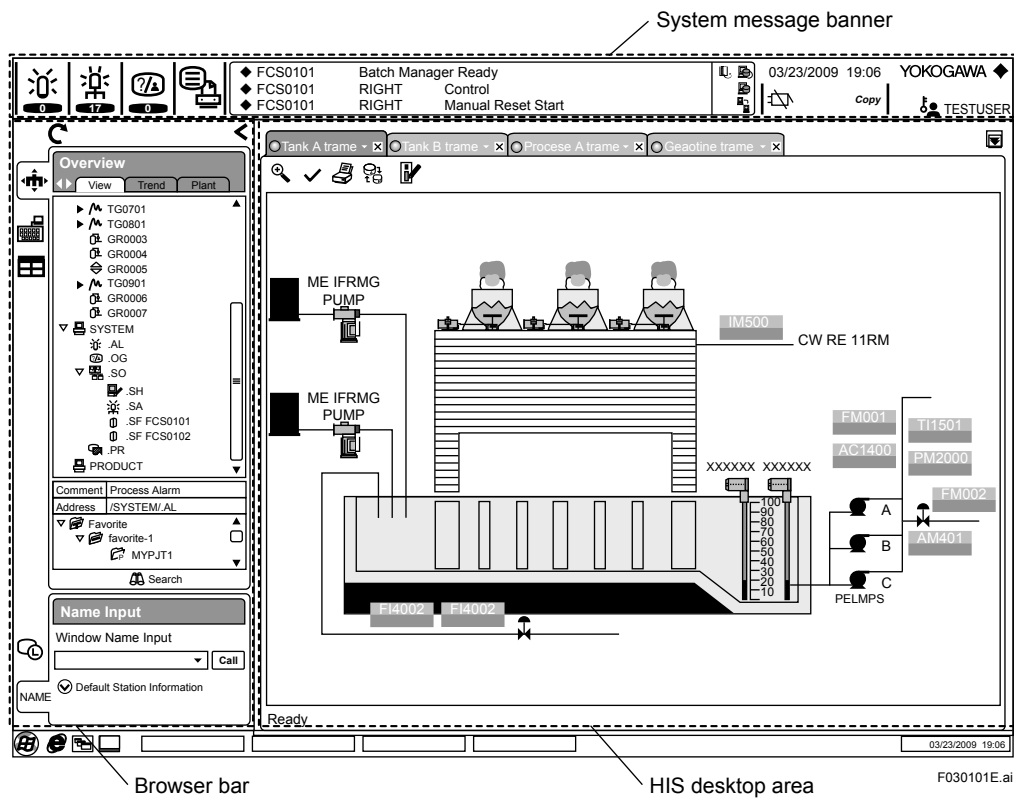
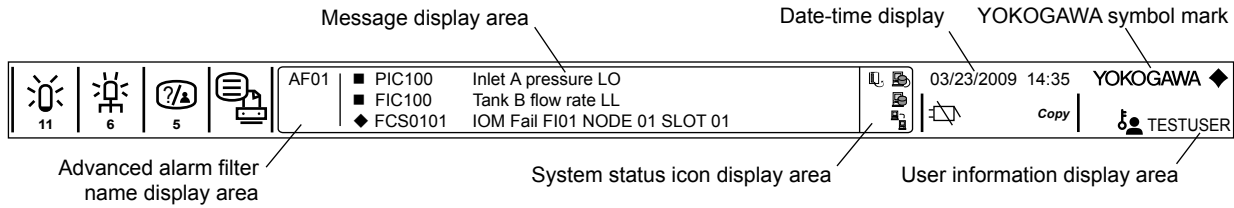


Figure Display Screen

3.1.2 System Message Banner

The System Message Banner expresses the alarm occurrence status visually. The alarm occurrence status is shown by colors and flashing of operation buttons, and the message display. The System Message Banner is always displayed at the top of the display, so will never be hidden behind other windows.

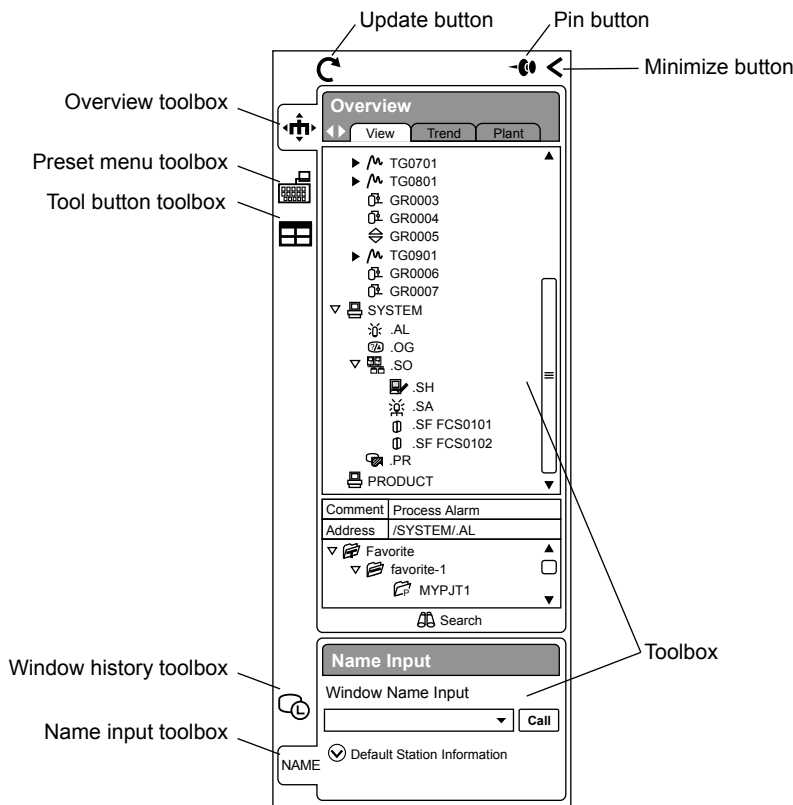


F030102E.ai

Figure System Message Banner

3.1.3 Browser Bar

The browser bar is used to call up operation and monitoring windows. It can display a list of operation and monitoring windows and plant hierarchical structures in a tree-like fashion, allowing the entire system to be easily confirmed. In addition, if the browser bar is not used, its display can be minimized at the end of the screen.

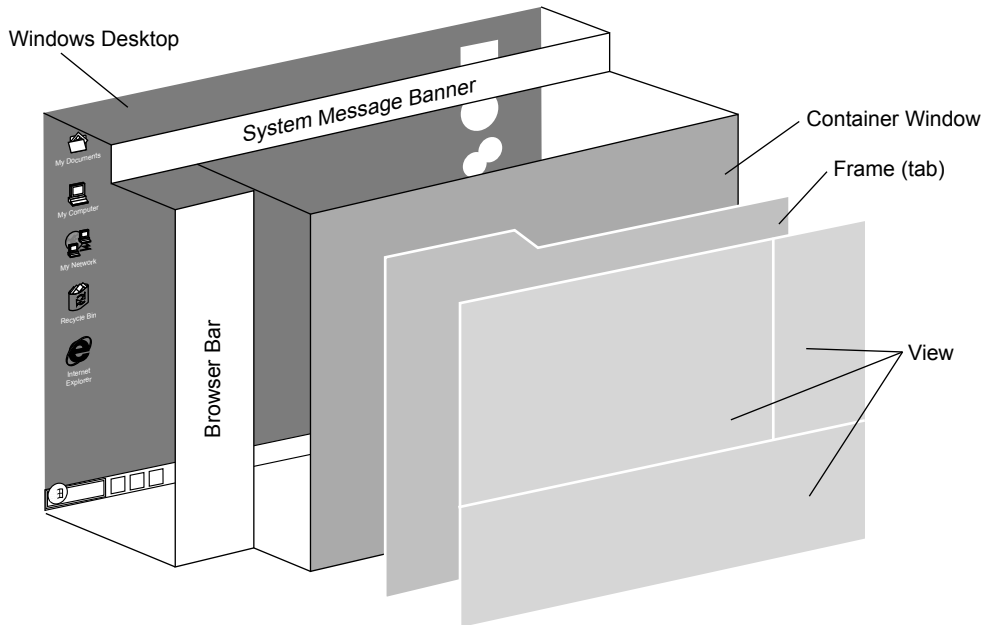


F030103E.ai

Figure Browser Bar

3.1.4 HIS Desktop Area

The HIS desktop area displays various operation and monitoring windows. It is composed of the view, frame and container window as shown below.



E030104E.ai

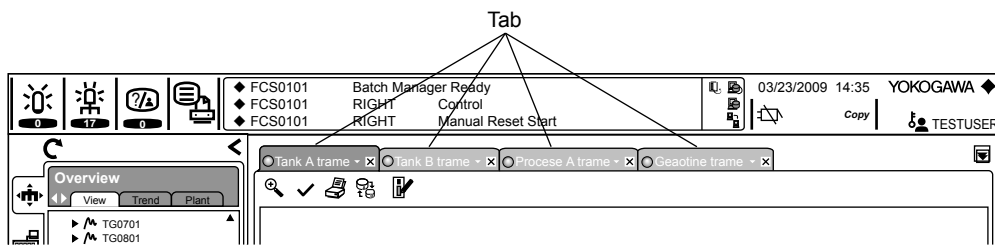
Figure HIS Desktop Area

■ View

Most of the conventional CENTUM operation and monitoring windows such as graphics, trend and tuning windows are handled as views.

■ Frame

The frame offers a framework to arrange several views for a certain function or purpose. One frame can allocate up to four views. Tabs are attached to the frame; these tabs are displayed side by side if multiple frames are called up. Frames can be brought to the front by clicking on a tab.



F030105E.ai

Figure Tabbed Browsing

■ Container Window

The container window is the outermost HIS display area to be a “board” section on which frames are displayed.

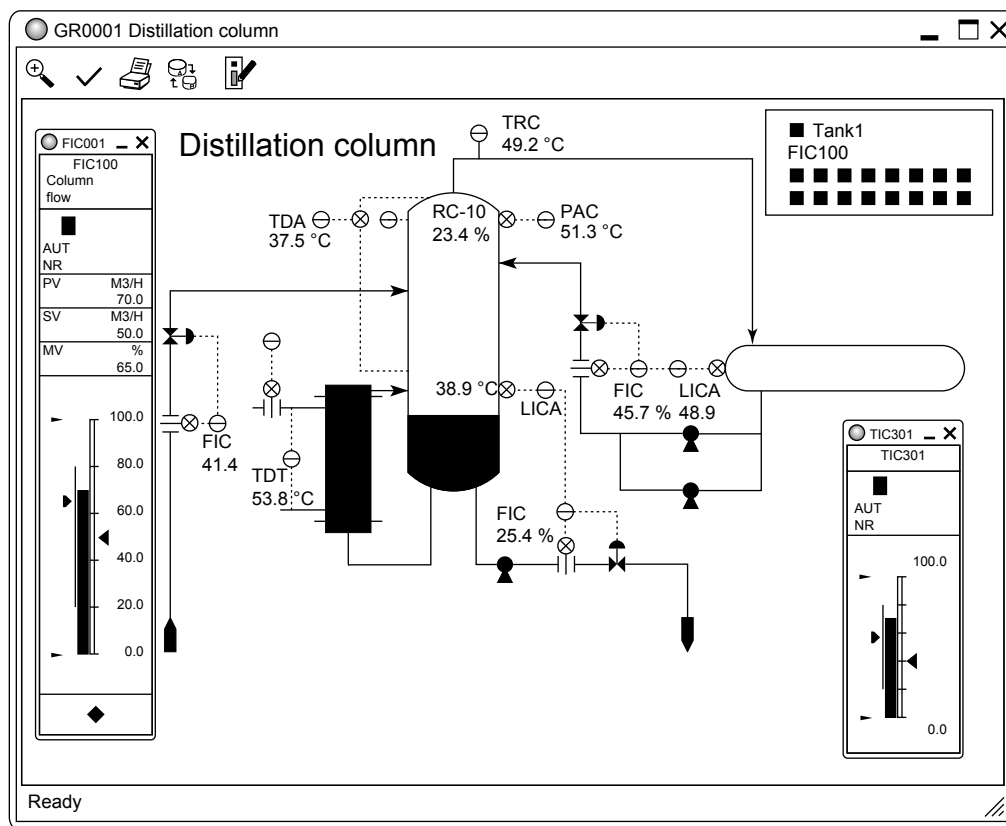
3.2 Operation and Monitoring Window

This section describes the following view for process operation and monitoring.

- Graphic view
- Faceplate view (instrument faceplate)
- Tuning view
- “CAMS for HIS” message monitor view

3.2.1 Graphic View with Graphic Attribute

The graphic view with graphic attribute displays plants in a visually easy-to-understand manner using abundant drawing objects. Plant conditions are graphically displayed and can be intuitively operated and monitored. In addition, various windows can be called up from the graphic view.

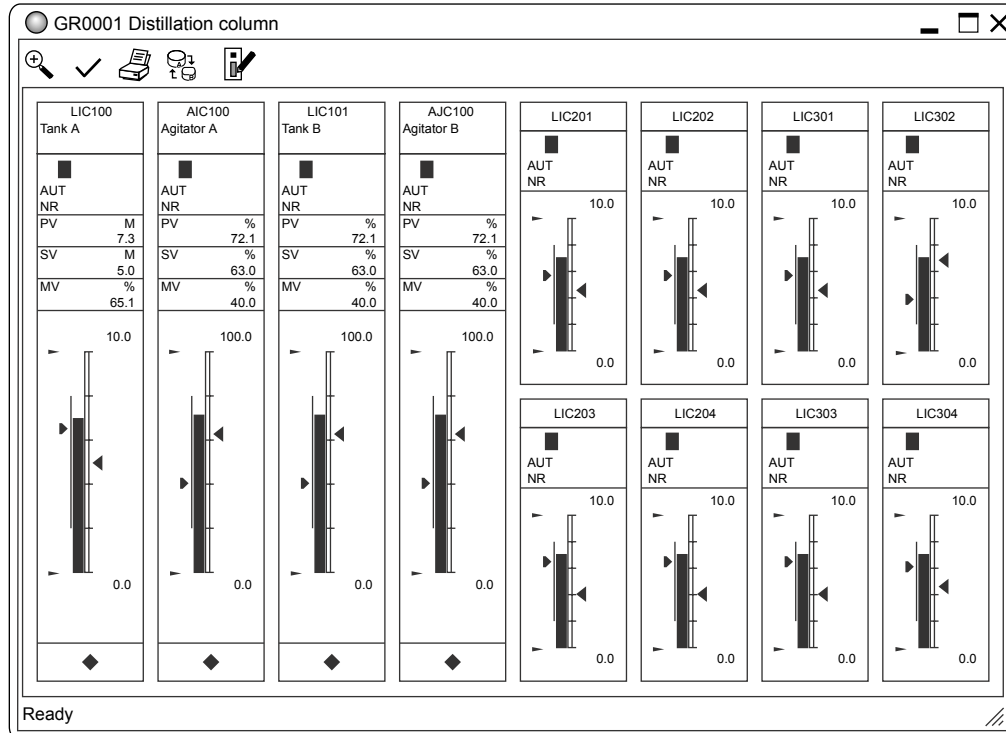


F030201E.ai

Figure Graphic View with Graphic Attribute

3.2.2 Graphic View with Control Attribute

The graphic view with control attribute displays function block statuses using instrument faceplates. Instrument faceplates have two different sizes: Up to eight larger size instrument faceplates can be displayed side by side; while up to 16 smaller size instrument faceplates can be displayed side by side. Both sizes of instrument faceplates can be simultaneously displayed as well.



F030202E.ai

Figure Graphic View with Control Attribute

3.2.3 Faceplate View (Instrument Faceplates)

The faceplate view allows compact and graphical displays of data values, the mode of function blocks, status of contact inputs, and the like.

Some representative faceplate views are shown below.

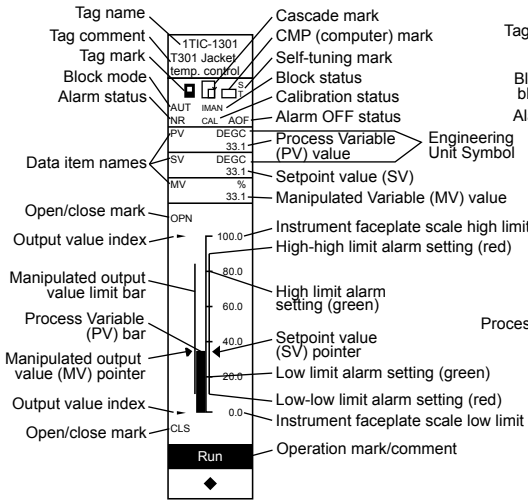


Figure PID Controller Block

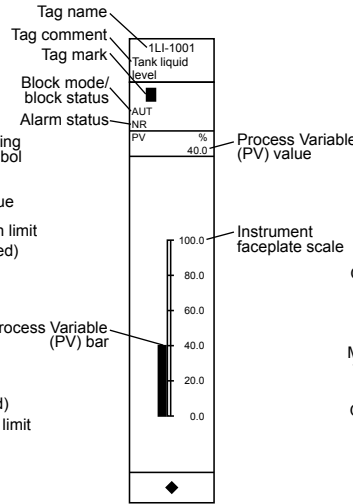


Figure PVI Input Indicator Block

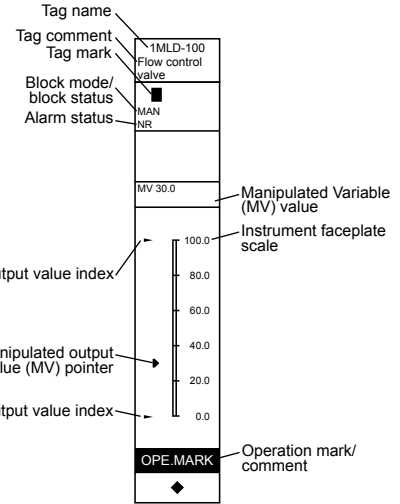


Figure MLD Manual Loader Block

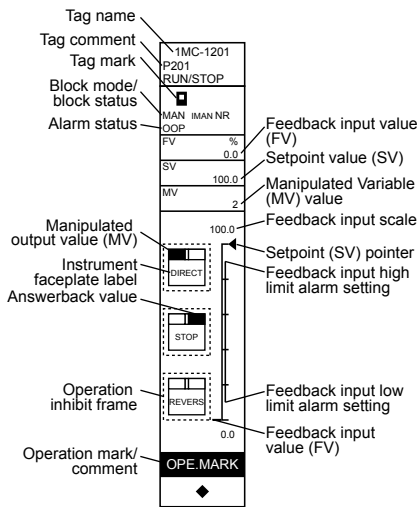


Figure MC-2 Two-Position Motor Control Block

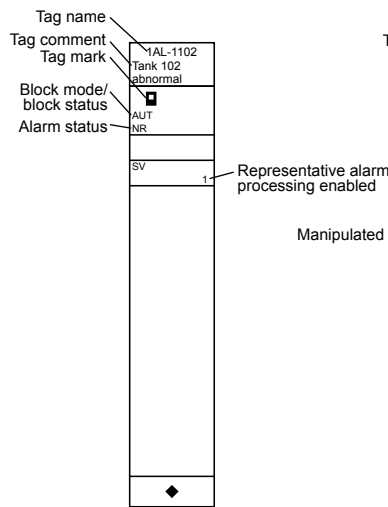


Figure ALM-R Representative Alarm Block

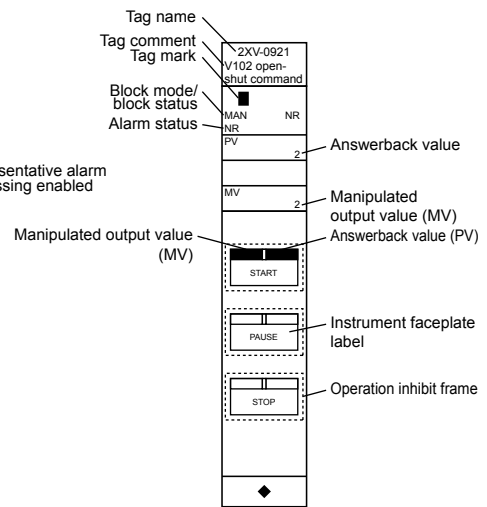


Figure SIO-12 Switch Instrument Block with 1 Input, 2 Outputs

F030203E.ai

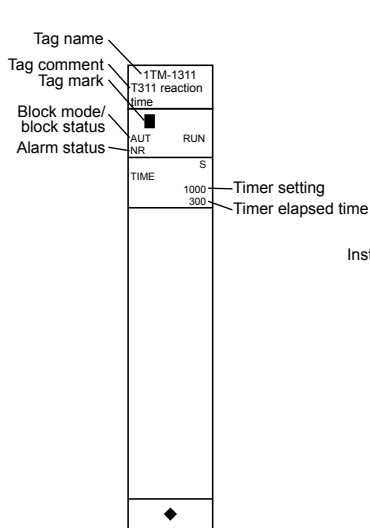


Figure TM Timer Block

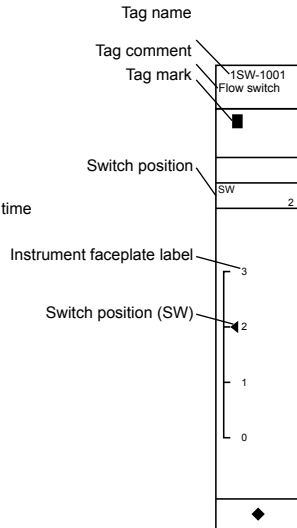


Figure SW-33 Three-Pole Three-Position Selector Switch Block

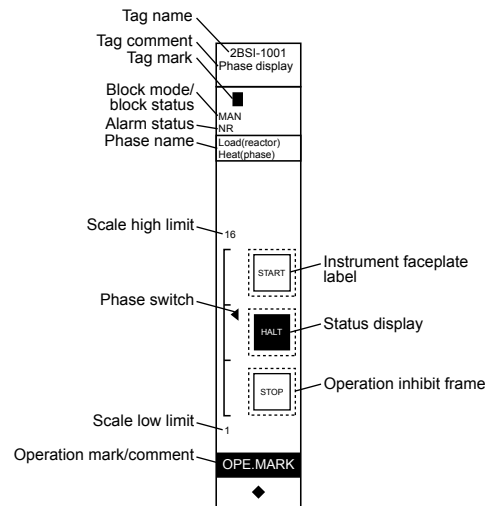


Figure BSI Batch Status Indicator Block

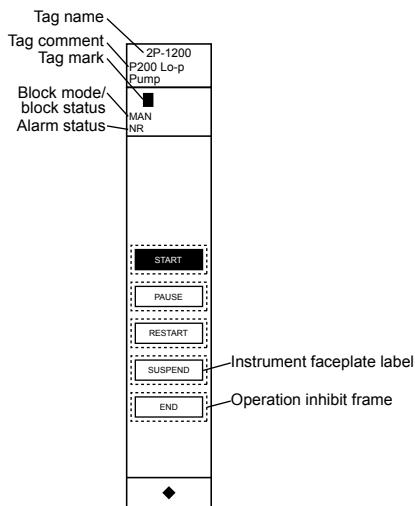


Figure PBS5C Extended 5-Push-Button Switch Block

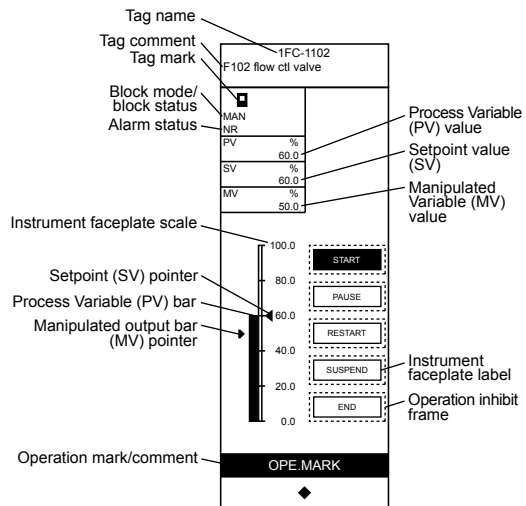
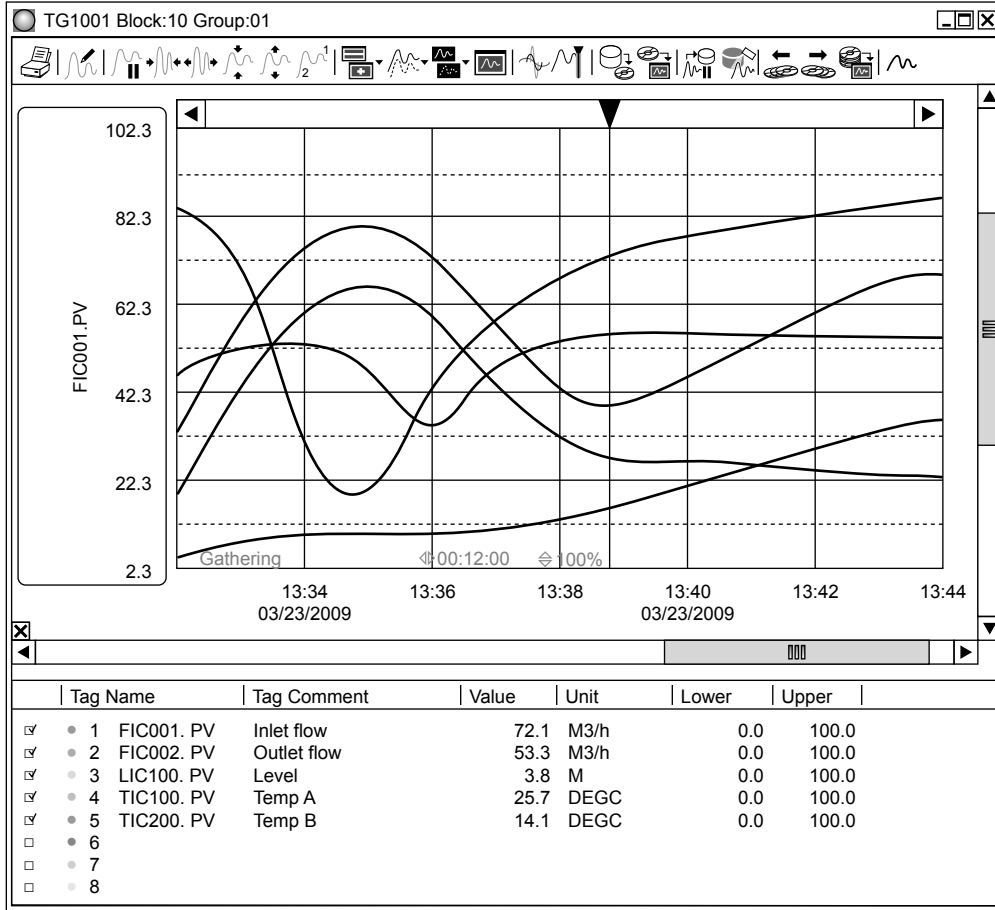


Figure HAS3C Extended Hybrid Manual Station Block

F030204E.ai

3.2.4 Trend View

The trend view graphically displays various process data changes with time. Time-series changes in the process data are called trend data. The trend view allows the selection and display of up to eight pens from multiple trend display modes. In addition, trend data of different sampling periods can be displayed on one trend view. Moreover, the trend data can be easily used in other applications.



F030205E.ai

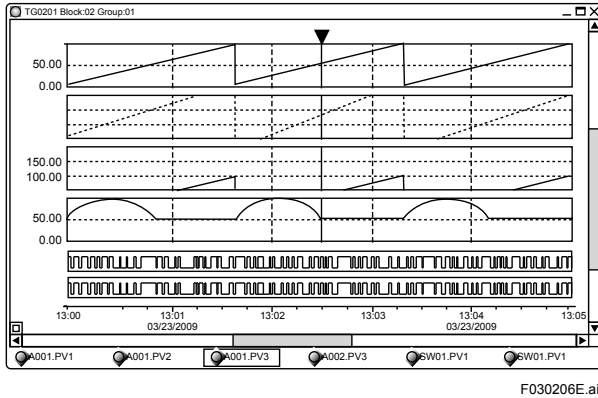
Figure Trend View

Trend Display Mode

In addition to normal trend graph display, trend graphs can be tiled. The normal display mode displays the data of eight pens in one graph. The tile trend modes tiles and displays separately for each pen or data type.

The following shows three types of the tile trend modes.

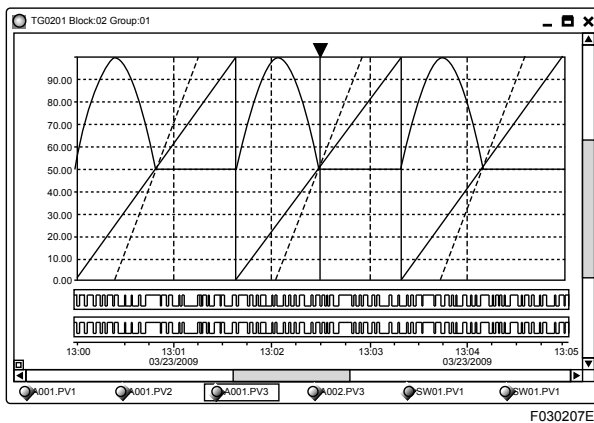
- Pen Split Display



F030206E.ai

Figure Pen Split Display

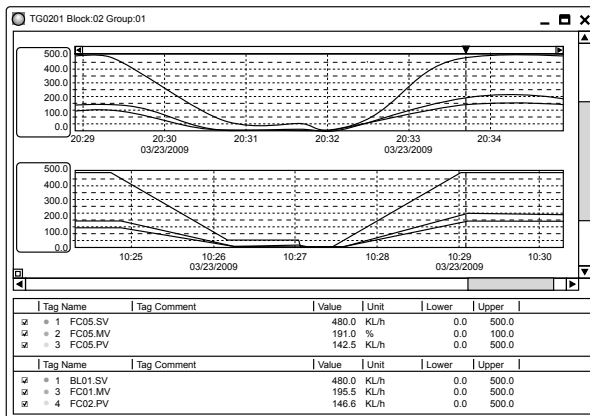
- Analog/Discrete Split Display



F030207E.

Figure Analog/Discrete Split Display

- Trend Data/Reference Pattern Split Display



F030208E.ai

Figure Reference Pattern Split Display

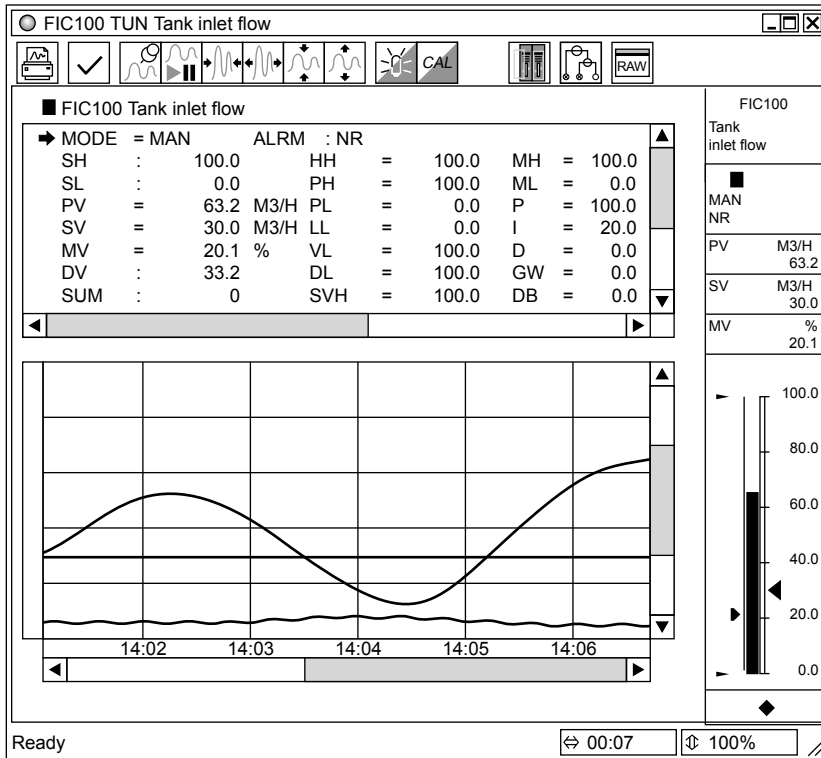
■ Clipboard Copy

Images and numeric data on a graph displayed in the trend view can easily be used in other applications by Copy & Paste operation of Windows.

- Trend view image copy to clipboard
Copies trend view display images. The displayed contents, except the window pane, are copied.
- Trend data copy to clipboard
Copies trend data values displayed in the trend view to the clipboard. Data copied to the clipboard can be used in spreadsheet application software.
The following Information is copied:
For each trend pen: the number of data points, tag name, data item, tag comment, low-limit value, high-limit value, number of decimal point digits, and engineering unit,
For each data points: date and time, data value, and data status.

3.2.5 Tuning View

A tuning view displays the tuning parameters and tuning trend of each instrument. The display magnification of the tuning trend time and data axes can be changed.



F030209E.ai

Figure Tuning View

3.2.6 CAMS for HIS Message Monitor

The CAMS for HIS (Consolidated Alarm Management Software for HIS) message monitor displays consolidated alarms and events from various systems. Setting filter conditions allows the selection and display of necessary alarms and events only. In addition, value-added information can be displayed to help take action for alarms quickly and accurately.

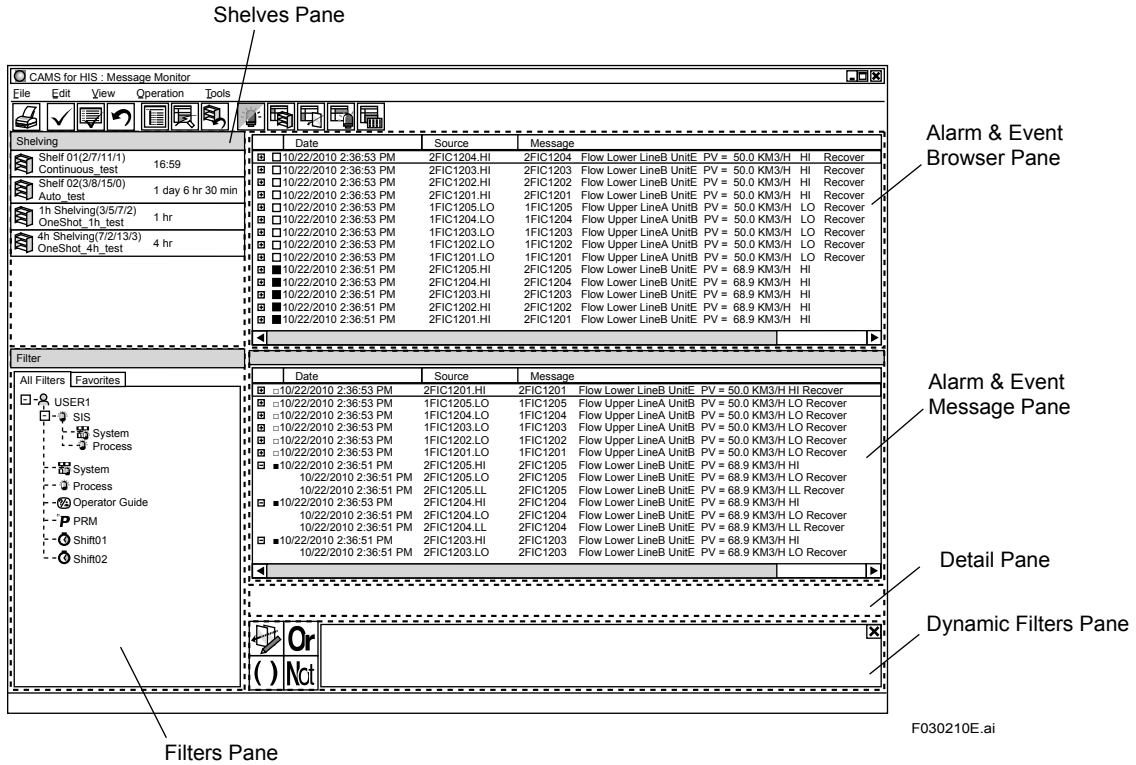


Figure CAMS for HIS Message Monitor

■ Consolidation of Alarms and Events

The CAMS for HIS message monitor displays consolidated CENTUM VP process alarms, system alarms, and operator guide messages on one screen. In addition, Safety Instrumented System ProSafe-RS, Network-based Control Systems STARDOM, and Field Device Management Package (PRM) alarms and events are also consolidated and displayed.

■ Displaying Only Alarms and Events Required

CAMS for HIS provides many functions to deliver the necessary alarms and events to the right person at the right time.

- **Filtering/Sorting**
Alarm messages can be filtered and sorted using basic filters and user-defined filters. Basic filters such as a process alarm filter or a plant-hierarchy filter can be used without configuration. Filters unique to individual users can be defined, and temporary filters can also be created flexibly.
- **Eclipsing**
Alarms and events that are activated repeatedly by the same tag can be integrated and displayed on a single line. Reducing the number of alarm messages displayed on the window will allow operators to reach the critical alarms more quickly and easily.
- **Shelving**
Unnecessary or nuisance alarms can be moved to a temporary area called a shelf in order to “hide” alarms due to special circumstances. Individual unnecessary alarms can be manually moved to the shelf. Chattering alarms or alarms that match user-defined conditions can be automatically moved to the shelf.
- **Load Shedding**
If too many alarms are generated in a short period of time due to an unexpected event, predefined filters can be automatically activated to reduce the operators’ monitoring load.

■ Sorting out Alarms and Adding Value-added Information

Various identifiers for sorting alarms can be defined. In addition, various types of value-added information can be defined for alarms to help users take role-based action for alarms quickly and accurately.

- **Examples of identifiers for providing only necessary alarms**
Purpose of monitoring (safety, environmental protection, economic efficiency)
- **Examples of identifiers for providing an alarm only to the persons who need it**
Target user or user group
- **Examples of identifiers for providing an alarm at the right time**
Allowed response time (urgent, quick, routine), desired degree of consequence (very large, large, medium, small), alarm priority (critical, high, medium, low, logging, reference)
- **Examples of value-added information**
Root cause of alarm occurrence, role-based action to be taken, previous action procedures

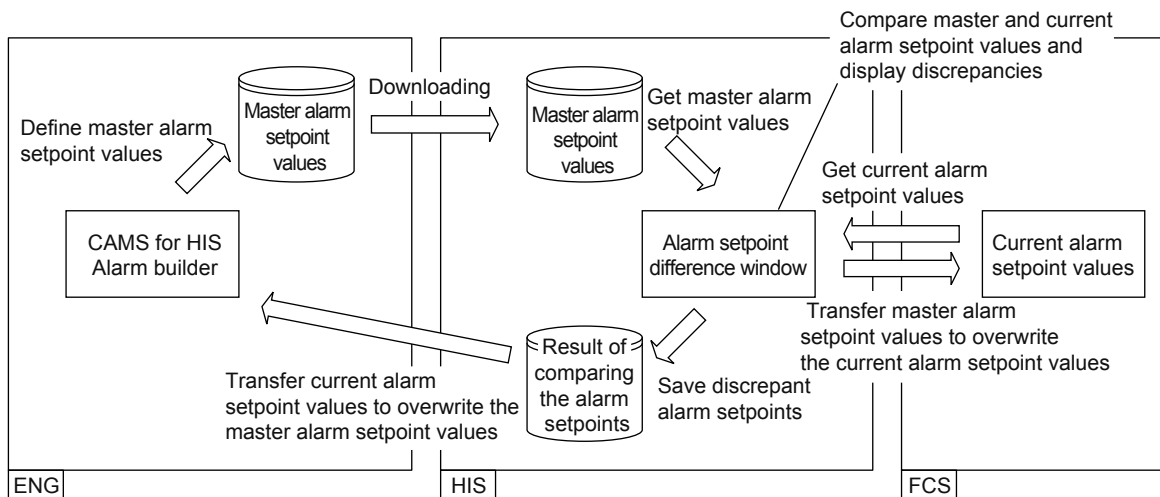
■ Alarm Setpoint Management Function

An alarm setpoint is a threshold value for triggering an alarm. For an instance, the HH or PH is a setting item of alarm setpoint in a function block.

When a plant is running, if the alarm setpoints are not proper, the process alarms may become either excessive or insufficient that the important abnormality may be ignored or delayed, or even resulted into a serious consequence. For safely operating a plant, the alarm setpoints must be properly defined and managed.

CAMS for HIS provides an alarm setpoint management function which consists of the following features:

- Values of the alarm setpoint that engineers set during the system engineering stage are saved as the master setpoints.
- The alarm setpoint management function compares the setpoint values between the master and the current ones, and displays the discrepancies.
- A current setpoint can be overwritten by the master setpoint, if necessary.
- A current setpoint values can be used to set the master setpoint value, if necessary.



F030211E.ai

Figure Alarm Setpoint Management of CAMS for HIS

The alarm master setpoint values are defined on the CAMS for HIS alarm builder. Once the defined master setpoint values are downloaded to the HIS, the differences between the master and the current setpoint values are displayed.

■ Long-Term Data Archive

From CENTUM VP release 5, CAMS for HIS historical data can be saved to the long-term data archive which can be referred to by the CAMS for HIS historical viewer.

3.3 Operation and Monitoring Support Functions

This section describes the following functions supporting operation and monitoring.

- Report function
- Remote operation and monitoring server function
- CENTUM desktop
- Security

3.3.1 Report Function

Daily and monthly reports can be created using the report function. Microsoft Excel is used as the application tool. A report form of daily and monthly reports can be used for report templates. Users can also create new template from scratch. Data that can be read to the report are shown below.

- Closing data (average values, totals, maximums, minimums, etc.)
- Trend data
- Historical message
- Tag information
- Process data (instantaneous value)
- Batch data

The following shows an example of a daily report. The daily report can be created by setting the necessary tag names and process data.

XXXXXX Daily Report				Date : yyyy/mm /dd				
TIC100	TIC200	TIC300	FIC100	FIC200	FIC300	FIC400	FIC500	
PV	PV	PV	PV	PV	PV	SUM	SUM	
Temp.1	Temp.2	Temp.3	Flow1	Flow2	Flow3	Total	Total	
DEGC	DEGC	DEGC	m ³ /h	m ³ /h	m ³ /h	m ³	m ³	
00:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
01:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
02:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
03:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
04:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
05:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
06:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
07:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
08:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
09:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
10:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
11:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
12:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
13:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
14:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
15:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
16:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
17:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
18:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
19:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
20:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
21:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
22:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
23:00	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
Ave.	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
Total				000.0	000.0	000.0	00000.0	00000.0
Max.	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
Min.	00.0	00.0	00.0	00.0	00.0	00.0	00000.0	00000.0
Time for Max.	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
Time for Min.	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00

F030301E.ai

Figure Example of Daily Report Form

■ Printout Start

Printout start methods are shown:

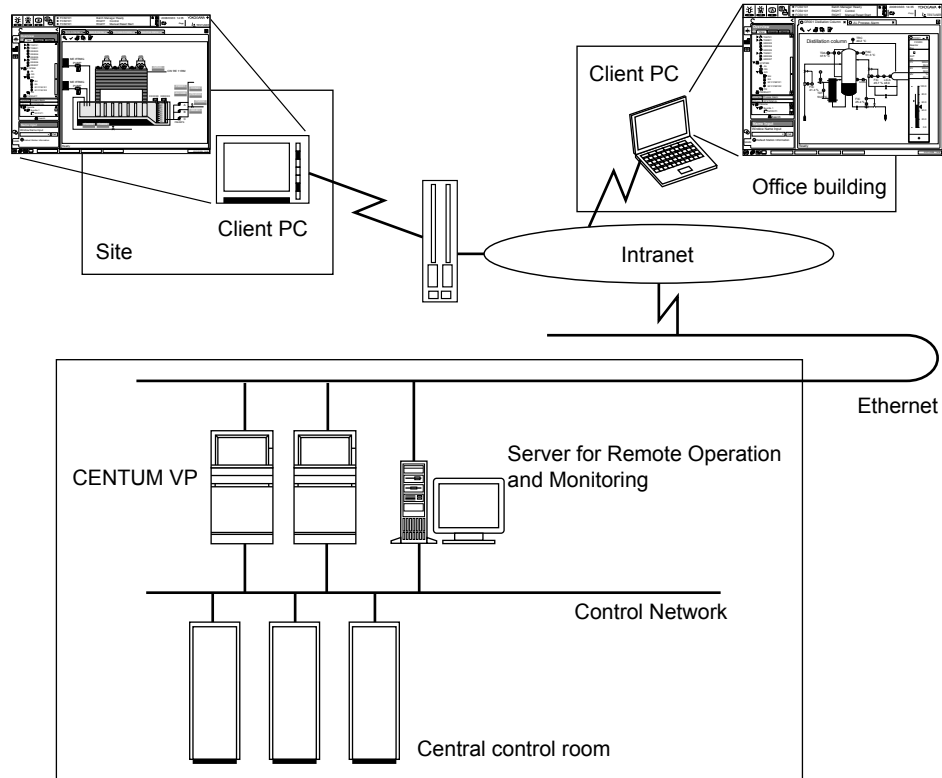
- Automatic printout of pre-selected intervals/specific time
- Automatic printout when sequence messages are received
- Manual printout when a function key (on the operation keyboard) is pressed
- Manual printout when a button on the graphic view is clicked
- Manual printout from Microsoft Excel
- Printout started from the application program (using Visual Basic)

■ Report Printout from Another PC

A report printout is possible using Microsoft Excel on another PC connected to the network.

3.3.2 Server for Remote Operation and Monitoring Function

The server for remote operation and monitoring function allows plant operation and monitoring as well as engineering from a remote PC. Plant operation and monitoring can be made from a remote PC far away from the central control room using the same windows as in HIS, except for some functions.



F030302E.ai

Figure Example of Remote Operation and Monitoring

3.3.3 CENTUM Desktop

The CENTUM desktop is dedicated to HIS operation of CENTUM VP. It provides an optimum operation and monitoring environment by restraining standard Windows functions unnecessary for operation and monitoring.

■ Restrained Items

- All icons (My Computer, Recycle Bin, etc.) on the desktop are hidden.
- Unnecessary items (Explorer, shutdown, etc.) in the Start menu are hidden.

3.3.4 Security

The security settings of CENTUM VP can be categorized into two functions: one is the CENTUM specific security function; and the other is the IT security function based on Windows security feature.

■ CENTUM Specific Security Function

The security function help prevent illegal operations and other problems and ensure the safety of the system. The security function restricts the scope of operation and monitoring permitted for an operator, and masks certain alarms of which the operator need not be notified.

● Overview of Security Functions

When the operator log on, the scope of operation and monitoring and the permission are specified. In addition, security can be defined for each function block and each window. Moreover, advanced security functions, such as an automatic user-out, can be set.

In the operation and monitoring functions, operators have three attributes, including:

- User name
The attribute to identify the user
- User group
The attribute to decide the scope of operation and monitoring
- User Permission
The attribute to decide the authority for operation and monitoring

The following shows the flow of security functions.

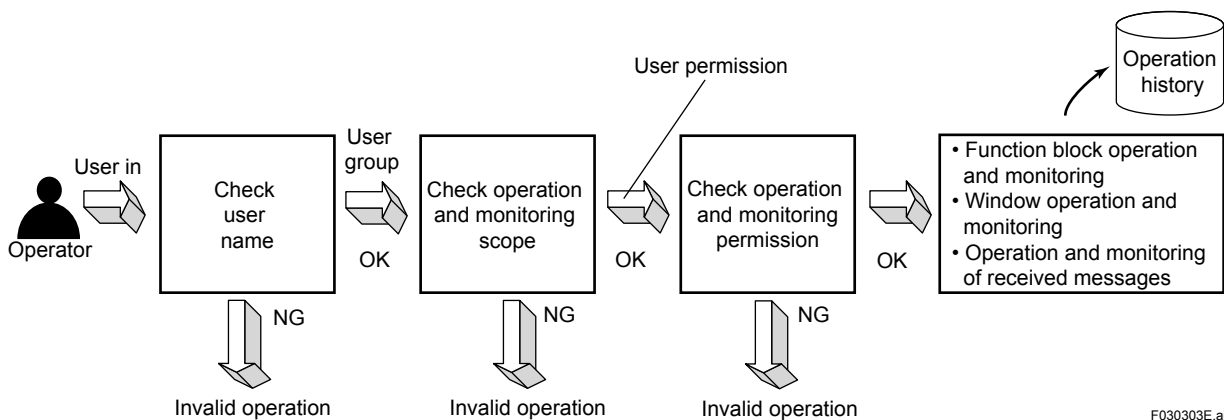


Figure Flow of Security Functions

F030303E.ai

● User name

This is a user-specific user name which uniquely determines who the operator is. Historical (operation) logging and the like will include this user name. A password is associated with each user name.

● User Group

The user group which the user belongs to determines the scope of operation and monitoring functions that can be performed. The user group determines which FCS can be monitored, which FCS can be operated, and which windows can be displayed. You can restrict the items which can be monitored and operated by specifying the corresponding station name and drawing name, for example. You can specify certain groups in certain plants, for example.

● User Permission

You can subdivide a user group into several levels of user permission (restriction): ordinary operator, senior operator, engineering personal, etc. The default is three such levels – S1, S2, and S3 – per user group. The default user permissions for these three levels are as shown below. User-defined user permissions U1 to U7 are also possible.

Table Standard User Permissions

Permission level	Monitoring	Operation	Engineering
S1	Yes	No	No
S2	Yes	Yes	No
S3	Yes	Yes	Yes
U1 to U7	Set by user		

Yes: enabled
No: disabled

● Security on a Per-Function-Block Basis

You can require confirmation when setting data in important function blocks, to prevent inadvertent data entry. Using operation marks, you can also change temporarily the operations are available or not.

For each individual function block, you can specify:

- User restrictions
User restrictions on changing settings such as SV, MV or alarms
- Confirmation of settings
The need for confirmation of settings (to help prevent errors)
- Alarm processing
The type of alarm (blinking, need for acknowledgment, repeat alarms)
- Tag mark
The tag mark corresponding to an individual function block can also be specified by the user, to indicate tag importance (priority).

Table Tag Mark

Tag priority	Tag mark
Important tag	
Ordinary tag	
Auxiliary tag 1	
Auxiliary tag 2	

● Window-based Security

The operation and monitoring authority can be set for each window/view. By setting the operation and monitoring authority on graphic views, changing the instrument faceplate assignment or acknowledging of alarm blinking can be prohibited. On the trend view, the change of trend pens assignment and the start/stop of batch trends can be prohibited. On the HIS setup window, the change of function key assignment definition can also be prohibited.

● Advanced Security

Advanced security is provided to block password leaks and to prevent illegal access and other problems.

- **User Lockout**
The logon attempts with invalid password and user name are monitored. If the attempts are continued for number of times, a system alarm message is initiated to alert for the illegal access. It is possible to lock out the user who attempted logon as an illegal user.
- **Password Expiration**
You can set the expiration period of password. 14 days before the expiration date of a password, a message notifying that the password will soon expire is displayed.
- **Prohibiting Using Previously Used Passwords**
You can make settings so that a user cannot specify the same character string as a previously used password when the user changes the password.
- **Automatic User-Out**
If the keyboard or the mouse has not been touched for a designated time period, the user is automatically user-out.

■ IT Security Function

The IT security function strengthens security for CENTUM VP. CENTUM VP IT environment is hardened by using Windows security functions. For example, by using the Windows access control for users and user groups, accesses to CENTUM VP tools and file folders can be managed. It can be used as a security countermeasure when a person logs in to the PC by Windows user for operator, he can access to the operator displays and tools but not for engineering tools. By Windows Firewall or DCOM setting, it restricts the communication types and communication ports.

● IT Security Setting

CENTUM VP supports the IT security setting using Windows security function. By defining the IT security setting, it hardens the computer and protects it from cyber threats. In Yokogawa system products, cyber threats are categorized as follows:

- (1) Network attacks
- (2) Direct attacks by manipulating computer components (*1)
- (3) Theft of computer components (*1) or important data

*1: The computer component means a Microsoft Windows computer-based Yokogawa system product such as HIS, ENG, and etc.

Three different security models are available to handle these threats. These models flexibly support different system configurations and operations.

Table Security models

Model	Feature
Legacy model	The security is not strengthened. It prioritizes collaboration with legacy products and the products where IT security is not applied.
Standard model	This model focuses on the operations of the relevant systems and collaboration with other systems. It complies with the threats described in the above (1) and (2).
Strengthened model	This model counters all the three threats stated above. (*1)

The table below shows the relationship between the above security model and corresponding countermeasures.

*1: For more information about setting the strengthened model, please contact Yokogawa sales department.

Table Security measures

Security type	Security measure	Security model		
		Legacy	Standard	Strengthened
Access control			Yes	Yes
Personal firewall tuning			Yes	Yes
Stop unused Windows services				Yes
Change IT environment settings	Change Administrator's user name			Yes
	Hide last logon user name	Yes	Yes	Yes
	Apply software restriction policies		Yes	Yes
	Restriction on AutoRun	Yes	Yes	Yes
	Apply StorageDevicePolicies function		Yes	Yes
	Disable USB storage devices		Yes	Yes
	Disable NetBIOS over TCP/IP		Yes	Yes
	Change LAN Manager authentication level		Yes	Yes
	Apply the password policy			Yes
	Apply the audit policy			Yes
	Apply the account lockout policy			Yes
	HDD password function by BIOS			Yes (*1)

CENTUM VP provides a tool that configures the security settings automatically in accordance with the security models. Follow the guide and perform manual configuration for a product without the tool, or models that the tool do not support.

*1: Manual setting is available as the tool is not applicable to set this function.

● Windows Authentication Mode

Windows authentication mode is made of collaborating the CENTUM specific security function and the IT security function. For previous CENTUM systems, users are defined within the CENTUM operation and monitoring functions independently from the Windows user accounts, and access limitations are applied to them. (CENTUM authentication mode)

By using the Windows authentication mode, the Windows accounts and the operation and monitoring users can be integrated, and ensure a secure system within the Windows user management framework. The centralized user management enables the Windows domain configuration, which significantly improves the system usability.

● Single Sign On

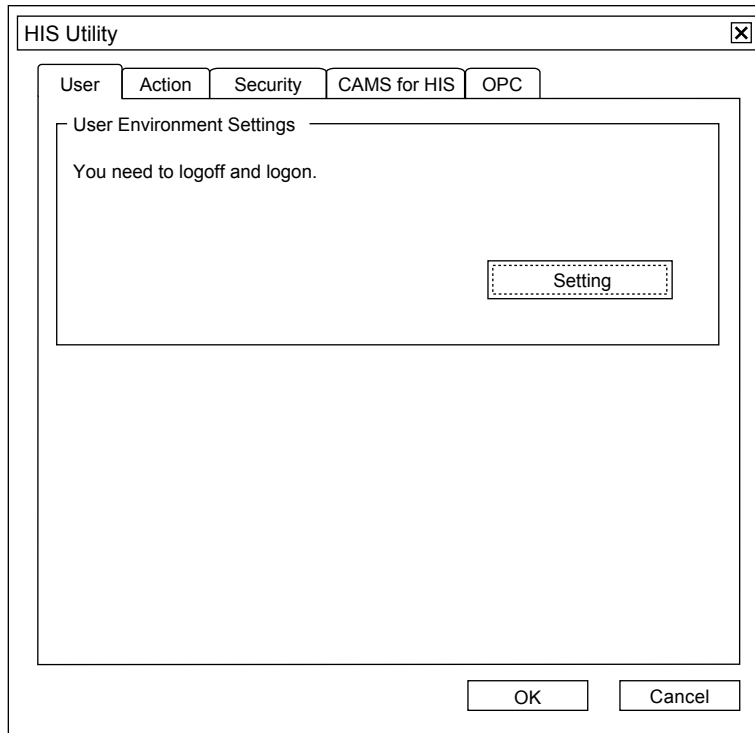
The Windows authentication mode provides the following two methods for making HIS available by performing user authentication only once.

- Windows Type Single Sign On
If a user logs in from the Windows logon dialog box, the user automatically proceeds to the state of user-in to HIS.
- HIS Type Single Sign On
When a PC is started, the user is automatically logged onto Windows, HIS is started with least right (OFFUSER), and the user is placed in the user-out state.

3.3.5 HIS Utility

The HIS utility sets the HIS operational environment such as the users and securities to start the HIS.

The text below explains the items that can be set on HIS Utility.



F030308E.ai

Figure HIS Utility - User Tab

In the HIS utility window, items for setting are listed by the tabs as described below.

● User Tab

Users are added or deleted from the user tab.
user-specific setting can be defined as the following settings.

- Automatic Logon (*1)
- CENTUM Desktop
- HIS Start

*1: Only when the CENTUM authentication mode is applied.

● Action Tab

Operation keyboard, mouse operation and other settings can be performed.

- Configuration Operation Keyboard
- INC/DEC Operation Mode Using Mouse
- Trend Acquisition Pen Assignment

- **Security Tab**

The HIS security policies can be set.

- **CAMS for HIS Tab**

The items specific to the Consolidated Alarm Management Software for HIS can be set.

- **HIS-TSE Tab**

The items specific to the Server for Remote Operation and Monitoring Function can be set. This tab is only displayed when the Server for Remote Operation and Monitoring Function package (LHS1150 or LHM1150) is activated in the computer.

- **OPC Tab**

This tab defines specific settings for the Exaopc OPC interface package (for HIS).

3.4 Windows for System Administration

CENTUM VP has the windows for displaying the abnormalities of the running system and the windows for user's convenience and customization. These windows are explained below.

3.4.1 System Status Overview

The System Status Overview displays the statuses of all stations and the communication devices within the domain in a list (*1). The outline of the System Status Overview will be introduced below.

*1: A domain includes all the stations connected with one segment of control buses. The control bus here means V net or Vnet/IP. When connecting V net to one of our system with a control bus other than V net or Vnet/IP by using Bus Converter (BCV), a virtual V net domain can be defined.

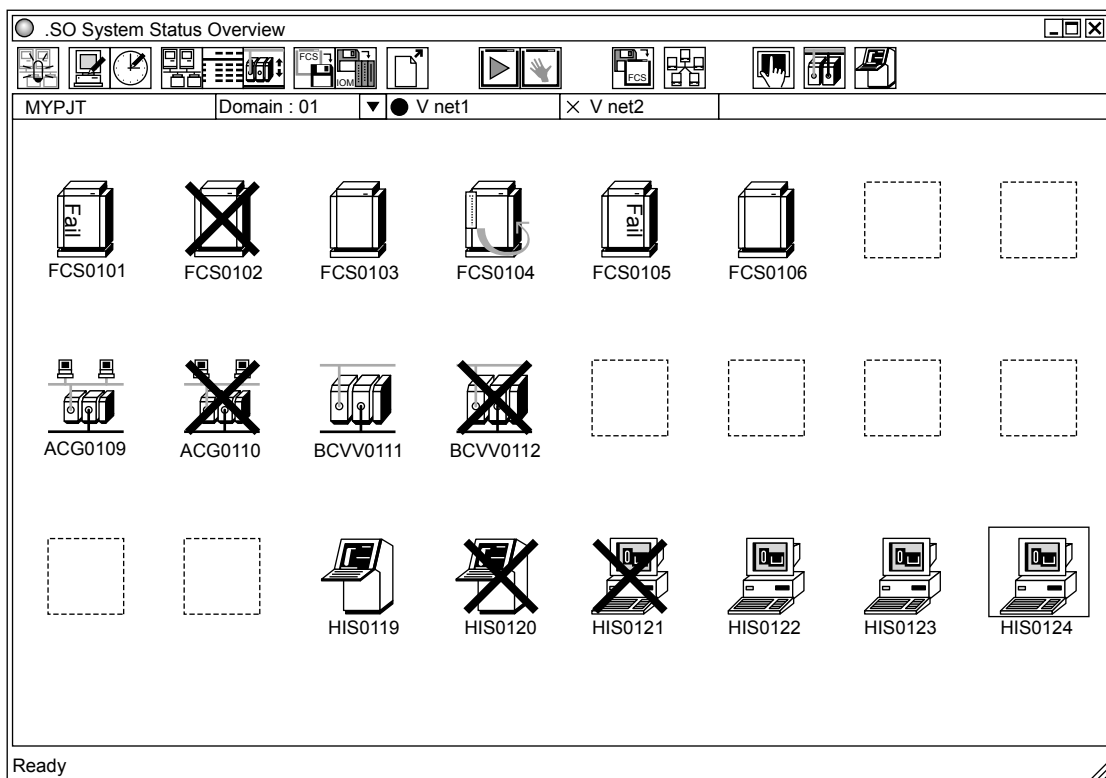


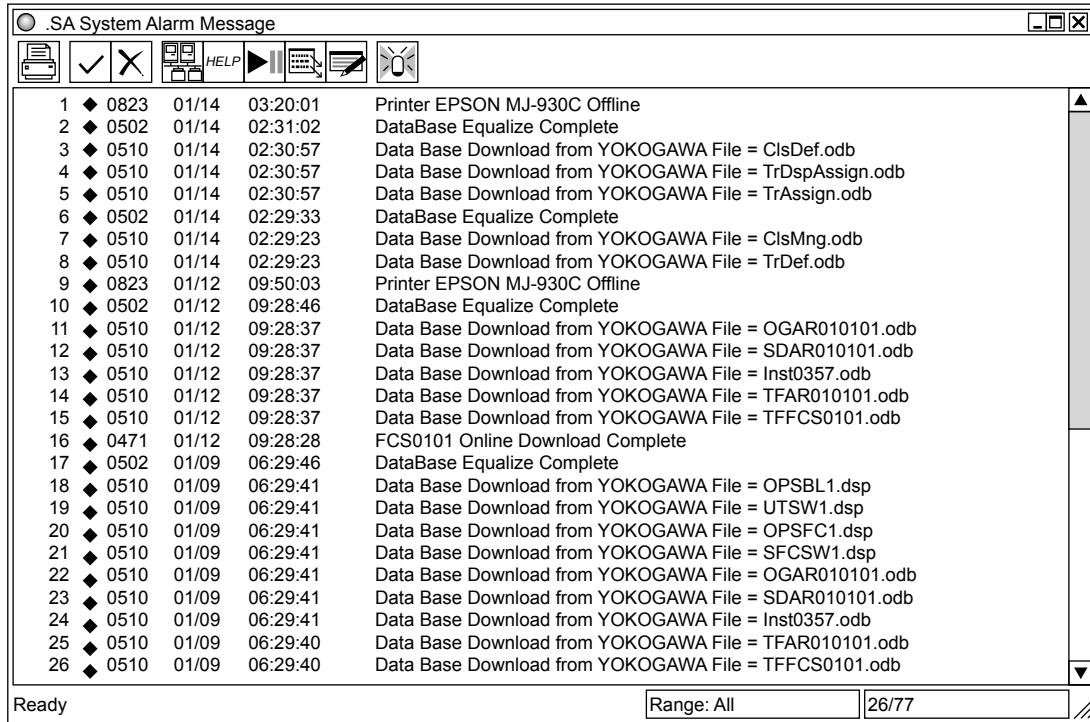
Figure System Status Overview

The System Status Overview displays the statuses of all stations and the communication devices within the domain in details by various icons. From here, the windows of system maintenance can be called up.

3.4.2 System Alarm View

The System Alarm view (*1) is an overview that displays the system alarm messages to notify the user of system hardware errors (FCS fail, module error, etc.) and communication errors.

*1: When the CAMS for HIS is valid, the system alarm view become the CAMS for HIS message monitor.



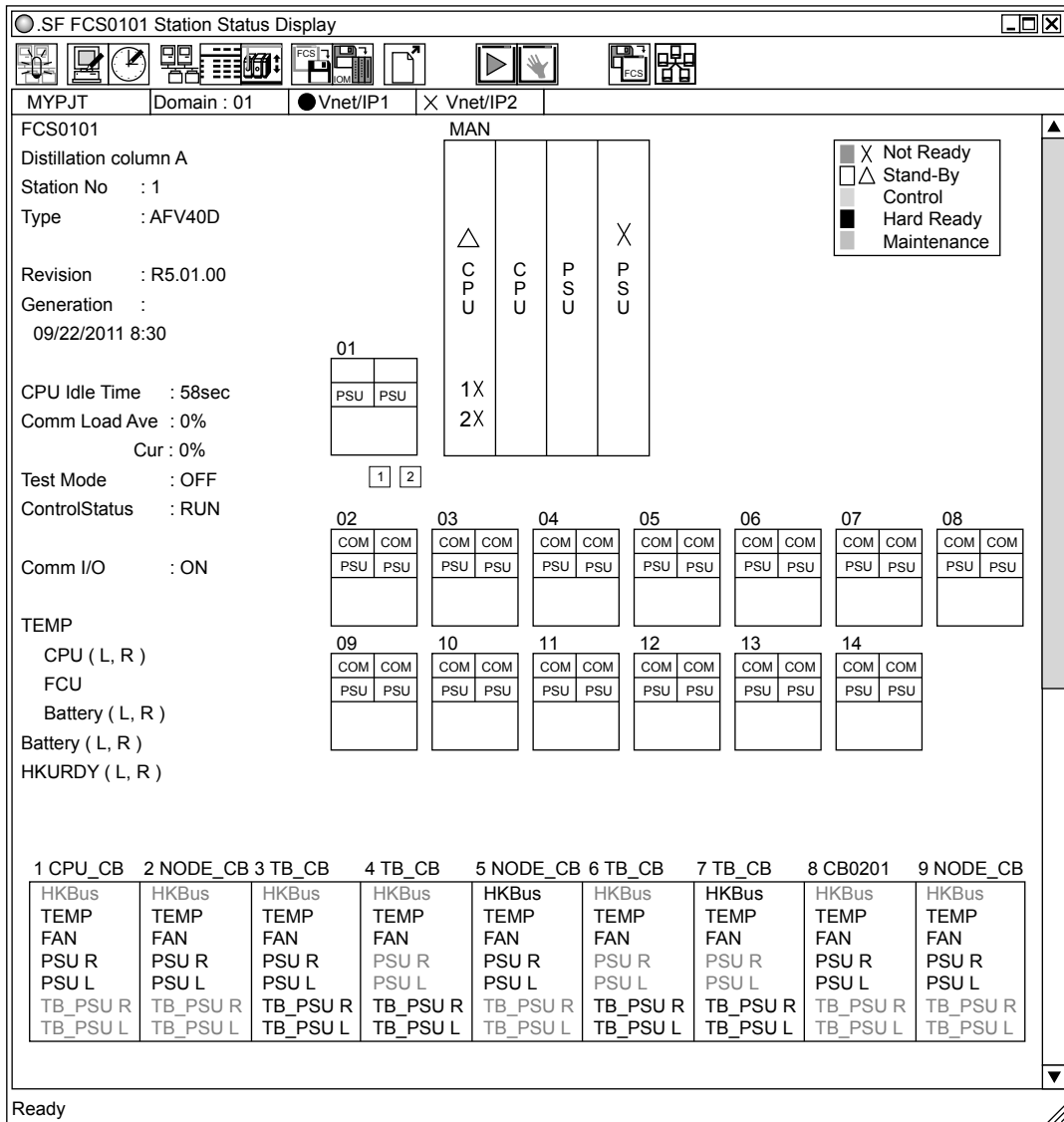
F030402E.ai

Figure System Alarm View

The System Alarm view displays system alarm messages in the order with the most recent ones first. When an alarm occurs, the alarm starts to buzz, and at the same time the button in the System Message banner and the LED for the key on the operation keyboard begin to flash to notify the operator.

3.4.3 FCS Status Display View

FCS Status Display view is for displaying the FCS hardware configurations and FCS running status.



F030403E.ai

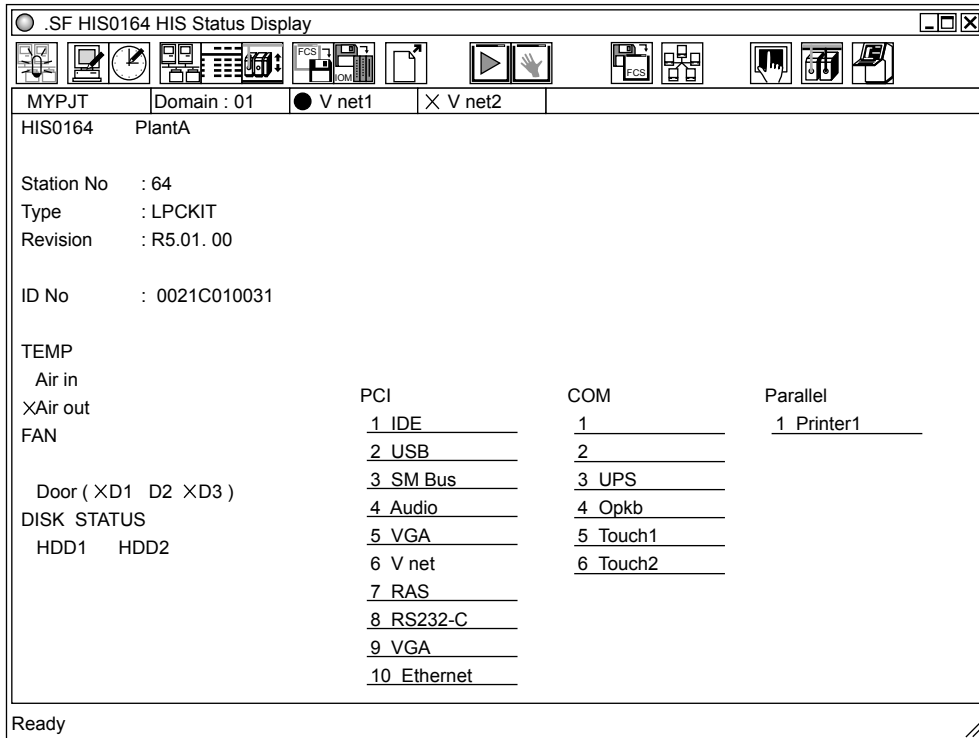
Figure FFCS-V Status Display View (With Cabinet)

The FCS Status Display view displays the FCS' station information, hardware configuration and its status, and whether or not the communication bus status is normal in color, so that users can visually check the system status at a glance. Using the FCS Status Display view, users can start or shut down the control station.

3.4.4 HIS Status Display View

The HIS Status Display view displays an overview of the operation status or each setting of the console type HIS.

The HIS Status Display view can be called up on the console type HIS.



F030404E.ai

Figure HIS Status Display View (An Example of Enclosed Display Style Console HIS)

The HIS Status Display view displays HIS information and hardware configuration, and indicates the hardware status by colors to facilitate the grasp of the HIS status at a glance. This view can also be used to switch the valid/invalid states of the control network (V net or Vnet/IP) and to maintain the touch panel.

3.4.5 HIS Setup Window

The HIS Setup window is used for displaying the current station's information or changing operation settings.

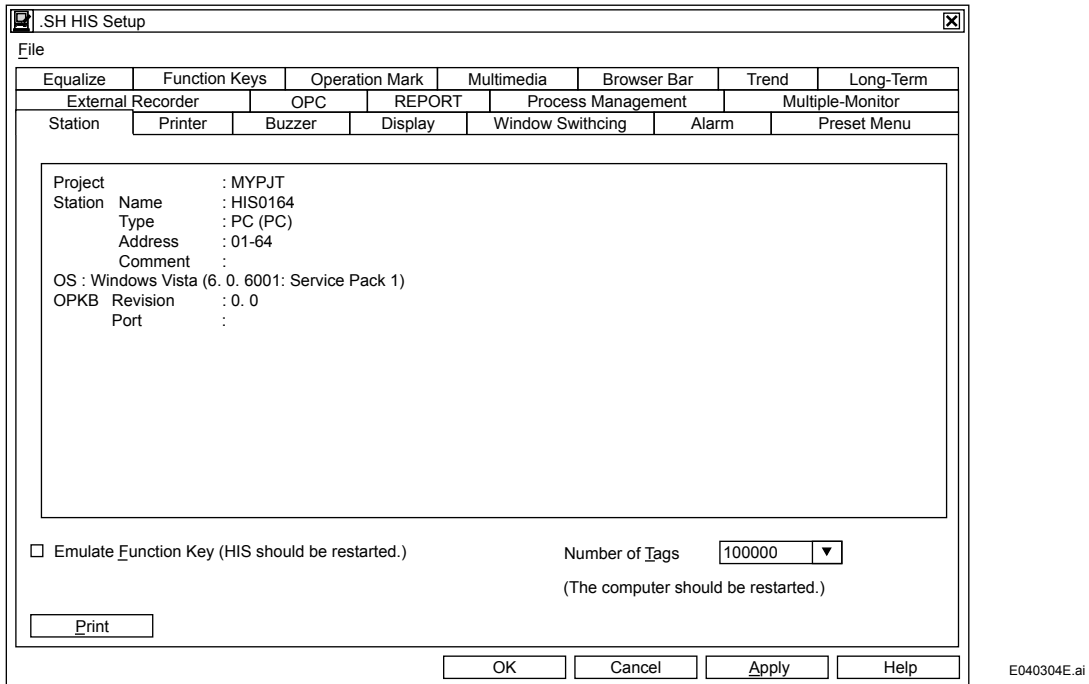


Figure Station Tab in HIS Setup Window

The HIS Setup window can perform settings specific to the HIS such as the operation and monitoring window display size setting, printer setup and operation screen mode setting. The tabs for each setting item in the HIS Setup window are provided.

- **Station**

Displays the project name, station information and OS information.

- **Printer**

Sets printing message and window messages output settings.

- **Buzzer**

Setting of the volume, tone, sound source of a buzzer.

- **Display**

Defines the settings regarding the operation and monitoring windows.

- **Window Switching**

This tab is for the settings regarding the types and actions of the windows called from System Message Banner and the windows popped out by the occurred alarm or event messages.

- **Alarm**

This tab is for the settings regarding the alarm display and acknowledgement actions.

- **Preset Menu**

This tab is for the settings regarding the functions to be simply called by the preset menu.

- **Equalize**

Runs equalization or sets the equalization related settings.

- **Function Keys**

This tab is for the settings regarding the functions assigned to the function keys.

- **Operation Mark**

This tab is for the settings regarding the labels (character strings) and colors assigned to the operation marks.

- **Multimedia**

This tab is for the settings regarding the multimedia usages.

- **Browser Bar**

Defines the settings regarding the Browser Bar.

- **Trend**

Defines the settings regarding the trend display.

- **Long-Term**

This tab is for the settings regarding the long-term trend.

This tab can be displayed only when the Long-Term Data Archive Package (LHS6510) is activated.

- **External Recorder**

This tab is for the settings regarding the external recorders connected to the CENTUM VP system.

This tab can be displayed only when the Output to External Recorder Package (LHS4150) is activated.

- **OPC**

This tab is for the settings regarding the Exaopc OPC Interface package (for HIS).

This tab can be displayed only when the Exaopc OPC Interface Package (for HIS) (LHS2411) is activated.

- **REPORT**

This tab is for the settings regarding the report package.

This tab can be displayed only when the Report Package (LHS6530) is activated.

- **Process Management**

This tab is for the settings of the process management.

This tab can be displayed only when the VP Batch (Batch Management Package) is activated.

- **Multiple-Monitor**

This tab is for the settings regarding the multiple monitors.

This tab can be displayed only when the Multiple-Monitor Support Package (LHS4600) is activated.

Blank Page

Revision Information

- Title : Integrated Production Control System CENTUM VP System Overview (HMI Overview)
- Manual No. : TI 33K01A11-50E

Sep. 2011/1st Edition
Newly published

Written by Yokogawa Electric Corporation

Published by Yokogawa Electric Corporation
2-9-32 Nakacho, Musashino-shi, Tokyo 180-8750, JAPAN
