

Technical Information

Engineering Guide of
CENTUM/STARDOM Integration



TI 34P02K41-01E

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Introduction

■ About this manual

This manual explains how to connect the STARDOM FCN/FCJ Autonomous Controller to the CENTUM VP/CENTUM CS 3000 Integrated Production Control System, both of which are Yokogawa products.

■ Intended readers of this manual

This manual has been prepared for individuals having already had the related documents (IMs) who conduct engineering the STARDOM system and the CENTUM system. In addition, a wider engineer understands the summary of the first half.

■ Related documents

● STARDOM

- GS 34P02Q61-01E: FCN/FCJ OPC Server for Windows
- GS 34P02Q62-01E: Duplexed Network Program for FCN/FCJ OPC Server
- IM 34P02Q91-01E: STARDOM FCN/FCJ Software Installation

● CENTUM VP R5

- GS 33K01A10-50E: Integrated Production Control System CENTUM VP System Overview (Vnet/IP Edition)
- GS 33K20C10-50E: Unified Gateway Station (UGS) Standard Function
- GS 33K05D10-50E: Standard Operation and Monitoring Function, Console HIS Support Package for Enclosed Display Style, Console HIS Support Package for Open Display Style
- GS 33K20C40-50E: OPC Communication Package (for UGS)
- GS 33K20C50-50E: Modbus Communication Package (for UGS)
- GS 33K20C60-50E: EtherNet/IP Communication Package (for UGS)
- IM 33K01C10-50E: CENTUM VP Installation
- IM 33K03R30-50E: Unified Gateway Station Reference

● CENTUM VP R4

- GS 33M01A10-40E: Integrated Production Control System CENTUM VP System Overview
- GS 33M20D10-40E: System Integration OPC Client Package
- GS 33M05D10-40E: Standard Operation and Monitoring Function, Console HIS Support Package for Enclosed Display Style, Console HIS Support Package for Open Display Style
- GS 33M15E20-40E: Modbus Communication Package (for ALE111)
- GS 33M15E10-40E: Modbus Communication Package (for ALR111, ALR121)
- GS 33M20F10-40E: GSGW Generic Subsystem Gateway Package
- GS 33M50G10-40E: Subsystem Communication Module (for FIO)
- IM 33M01A20-40E: CENTUM VP Installation
- IM 33M01A30-40E: Reference (Function Block Details/ Engineering/ Human Interface Station/ System Integration OPC Station)
- GS 33Q02N03-31E: Consolidated Alarm Management Software CAMS for HIS
- GS 33Q05P10-31E: System Integration OPC Client Package
- IM 33S01B30-01E: CS 1000/CS 3000 Reference (Function Block Details/ Engineering/HIS/ System Integration OPC Station)

● Common document

- TI 33Q02C20-31E: Alarm Management Handbook The CAMS Concept

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Engineering Guide of CENTUM/STARDOM Integration PART- A Outline

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A1. Overview

This manual explains how to connect a STARDOM FCN/FCJ Autonomous Controller (hereinafter referred to as "FCN/FCJ") to a CENTUM VP/CENTUM CS 3000 Integrated Production Control System (hereinafter referred to as "CENTUM"), both of which are Yokogawa products.

■ Forms of Connection

There are several ways to connect an FCN/FCJ controller to a CENTUM system. The simplest form of connection integrates the FCN/FCJ data by treating the FCN/FCJ as a Field Control Station (FCS) subsystem of CENTUM. The highest form of connection integrates FCN/FCJ operation, from control and monitoring to alarm management using Human Interface Stations (HIS) of CENTUM. You can select the most appropriate form of connection by considering the usage of FCN/FCJ, the number of monitored I/O points, as well as control and monitoring policies.

■ Comparison of UGS, SIOS and GSGW

UGS (Unified Gateway Station) and SIOS (System Integration OPC Station) are primarily designed for monitoring Yokogawa's FCN/FCJ or PCSs (Process Control System) from other vendors by integrating them into the CENTUM system. Thus, UGS and SIOS handle more data points than GSGW. UGS can also acquire messages directly from FCN/FCJ to the CENTUM system. SIOS supports A&E to acquire messages from FCN/FCJ or the other PCSs to the CENTUM system. On the other hand, GSGW is primarily designed for connecting subsystems. Thus, GSGW handles less data points than UGS and SIOS and provide similar control functions available on FCS. However, GSGW does not have function blocks for control such as the PID block.

Table Comparison of UGS, SIOS and GSGW

Function		UGS	SIOS	GSGW
Engineering		Builder, general-purpose editor	Builder, general-purpose editor	Builder, general-purpose editor
Data acquisition		Available	Available	Available
Data setting		Available	Available	Available
Message		Available	Available *1	Not available
Number of tags		100,000	100,000	6,000
Number of SIOS instruments tag data points		2,000,000 *2	2,000,000 *3	4,000
Control function		Not available	Not available	Available
Maximum number of controllers or OPC Servers that can be connected	Controller	256 units *4	Cannot be connected	Cannot be connected
	DA server	16 units	16 units	4 units
	A&E server	Cannot be connected	16 units *1	Cannot be connected

*1: SIOS allows connection to the A&E Server but connection using CAMS for HIS is recommended when connecting FCN/FCJ to CENTUM.

*2: If only data faceplate blocks or annunciator faceplate blocks are used, the limit on the number of tags (100,000 tags) applies. If FCN/FCJ faceplate blocks or user-defined faceplate blocks are used, the maximum number of tags and maximum data points that can be handled vary depending on the data points used per FCN/FCJ faceplate block or user-defined faceplate block.

*3: If only SIOS tags are used, the limit on the number of tags (100,000 tags) applies. If SIOS instrument tags are used, the maximum number of tags and maximum data points that can be handled vary depending on the data points used per SIOS instrument tag.

*4: Number of OPC Servers is included.

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A2. Data Integration

Data integration connects an FCN/FCJ controller to CENTUM as a subsystem of FCS, and handles FCN/FCJ data in the same way as analog/digital I/O signals of CENTUM.

It allows FCN/FCJs to be connected to CENTUM in the same way as generic PLCs. Two types of connections are available:

- Subsystem connection
- Connection using Generic Subsystem Gateway (GSGW)

● Subsystem Connection

In subsystem connection, FCN/FCJ is connected as a subsystem to the FCS of CENTUM. Two communications protocols are available:

- RTU mode
- Modbus/TCP

In either case, a communication module of FCS is used to communicate with FCN/FCJ. Data of FCN/FCJ connected as a subsystem to FCS are connected to I/O terminals of function blocks and accessed in the same way as analog/digital I/O signals of FCS.

Communications redundancy between FCS and FCN/FCJ is also supported.

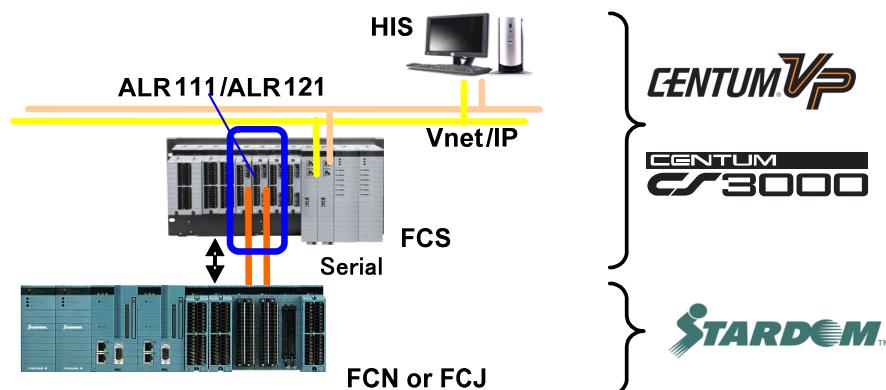


Figure An Example of RTU mode Connection

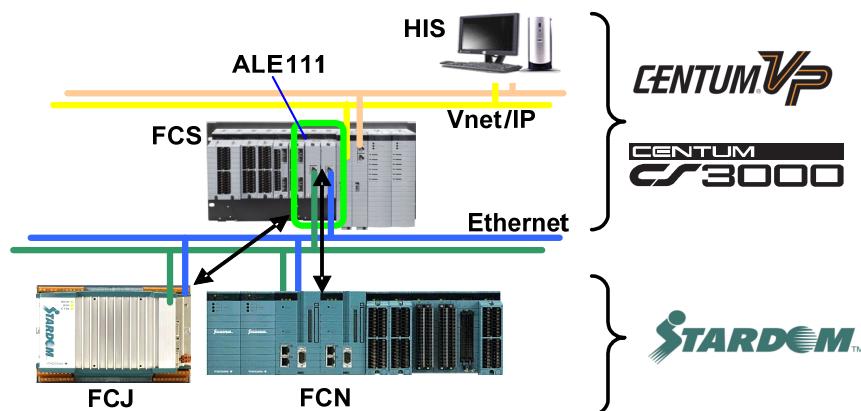


Figure An Example of Modbus/TCP Connection

Table Subsystem Connection

Communications Protocol	System	Connection Port [Documentation]		Optional Software Package [Documentation]	Remarks
RTU mode (Serial communications)	CENTUM	ALR111, ALR121 CENTUM VP: [GS 33M50G10-40E] CS 3000: [GS 33Q06Q46-31E]		Modbus Communication Package (for ALR111, ALR121) CENTUM VP: [GS 33M15E10-40E] CS 3000 : [GS 33Q03L40-33E]	Also supports communications redundancy
		FCN		NFLR111:RS-232-C, NFLR121:RS-422/RS-485 [GS 34P02Q12-01E] [GS 34P02Q36-01E]	
	FCJ	Serial port (2 channels) [GS 34P02Q11-01E]		NT8035J Modbus Communication Portfolio [GS 34P02P21-01E]	
Modbus/TCP (Ethernet communications)	CENTUM	ALE111 CENTUM VP: [GS 33M50G10-40E] CS 3000: [GS 33Q06Q46-31E]		Modbus Communication Package (for ALE111) CENTUM VP: [GS 33M15E20-40E] CS 3000: [GS 33Q03L40-34E]	Also supports communications redundancy
		FCN		Network port (100BASE-TX) [GS 34P02Q12-01E]	
	FCJ	Network port (100BASE-TX) [GS 34P02Q11-01E]		NT8035J Modbus Communication Portfolio [GS 34P02P21-01E]	

- **Connection Using Generic Subsystem Gateway (GSGW)**

Generic Subsystem Gateway (GSGW) is a CENTUM station used for controlling and monitoring a subsystem.

Using a computer as platform, GSGW communicates with a subsystem (FCN/FCJ) via a computer installed with OPC Server (FCN/FCJ OPC Server for Windows, abbreviated hereinafter as "FCN/FCJ OPC Server") according to the general-purpose OPC DA (OPC: OLE for Process Control) interface standard defined by the OPC Foundation.

Data of the subsystem (FCN/FCJ) are allocated to I/O terminals of a GSGW function block, which can be controlled and monitored using HIS just like FCS. GSGW is primarily designed for monitoring subsystem data, and does not have function blocks intended for control (e.g. PID block).

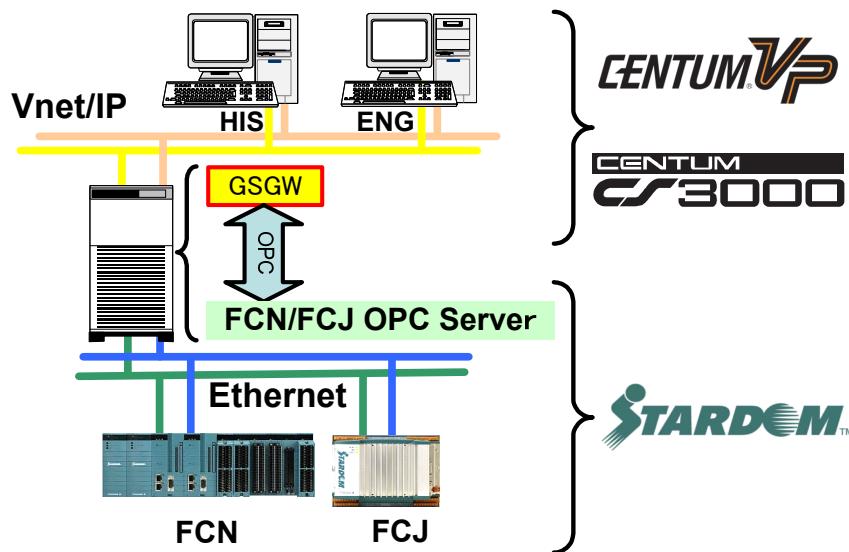


Figure An Example of GSGW Connection

Table Connection Using Generic Subsystem Gateway (GSGW)

Communications Protocol	System	Station/Connection Port [Documentation]	Optional Software [Documentation]	Remarks
OPC communications (Ethernet communications)	CENTUM	Computer installed with GSGW CENTUM VP: [GS 33M20F10-40E] CS 3000: [GS 33Q03P10-31E]	LGS1250 GSGW Generic Subsystem Gateway Package CENTUM VP: [GS 33M20F10-40E] CS 3000: [GS 33Q03P10-31E]	Also supports communications redundancy.
	FCN	Network port (100BASE-TX) [GS 34P02Q12-01E]	FCN/FCJ OPC Server for Windows [GS 34P02Q61-01E]	
	FCJ	Network port (100BASE-TX) [GS 34P02Q11-01E]	Duplexed Network Program for FCN/FCJ OPC Server [GS 34P02Q62-01E]	

A3. Operation Integration

In operation integration, UGS or SIOS is used to connect FCN/FCJ controllers to a CENTUM system so that FCN/FCJ function block data can be presented as one consolidated data on HIS. An FCN/FCJ function block (instrument) mapped to UGS or SIOS can then be controlled and monitored with the same look and feel of a CENTUM function block.

UGS enables management of alarms, generated by FCN/FCJ, on HIS. SIOS hand-in-hand with the Consolidated Alarm Management Software for HIS (abbreviated hereinafter as "CAMS for HIS") enables consolidated management of all alarms, including alarms generated by FCN/FCJ connected systems, on HIS.

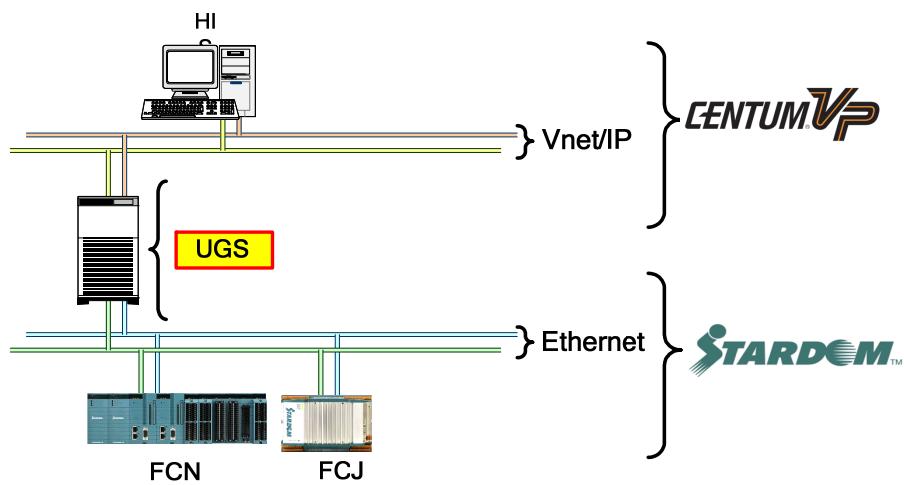


Figure An Example of FCN/FCJs Connected to CENTUM via UGS

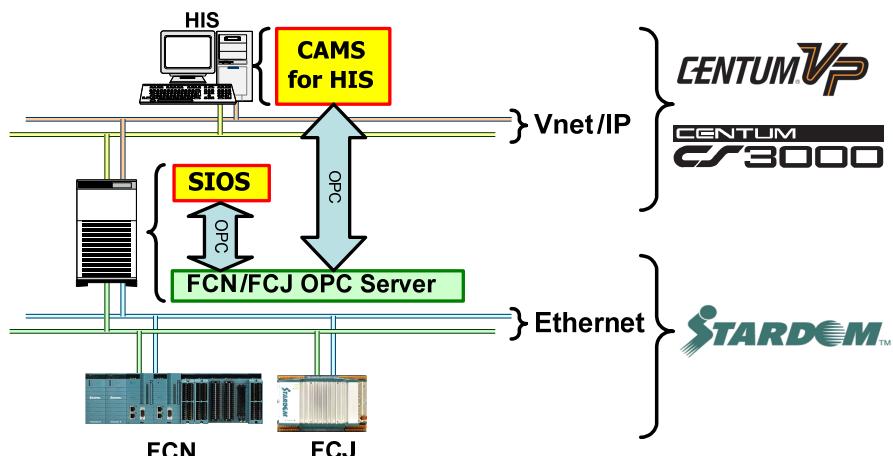


Figure An Example of FCN/FCJs Connected to CENTUM via SIOS

TIP

On CENTUM VP system, CAMS for HIS is included in Standard Operation and Monitoring Function (LHS1100/LHM1101). On CENTUM CS 3000 system, CAMS for HIS is an optional package (LHS4800).

Table Methods for Connecting UGS

Communications Protocol	System	Station/Connection Port [Documentation]		Software [Documentation]	Remarks
Ethernet communications	CENTUM	Computer installed with UGS CENTUM VP: [GS 33K20C10-50E]		Unified Gateway Station (UGS) Standard Function CENTUM VP: [GS 33K20C10-50E]	Also supports communications redundancy except FCN-RTU.
		FCN	Network port (100BASE-TX) [GS 34P02Q12-01E]	-	
		FCN-RTU	Network port (100BASE-TX) [GS 34P02Q13-01E]		
		FCJ	Network port (100BASE-TX) [GS 34P02Q11-01E]		

Table Methods for Connecting SIOS and CAMS for HIS

Communications Protocol	System	Station/Connection Port [Documentation]		Software [Documentation]	Remarks
OPC communications (Ethernet communications)	CENTUM	Computer installed with SIOS CENTUM VP: [GS 33M20D10-40E] CS 3000: [GS 33Q05P10-31E]		System Integration OPC Client Package CENTUM VP: [GS 33M20D10-40E] CS 3000: [GS 33Q05P10-31E]	Also supports communications redundancy.
		HIS installed with CAMS for HIS CENTUM VP: [GS 33M05D10-40E] CS 3000: [GS 33Q02N03-31E]		Consolidated Alarm Management Software CAMS for HIS CENTUM VP: [GS 33M05D10-40E] CS 3000: [GS 33Q02N03-31E]	
		FCN	Network port (100BASE-TX) [GS 34P02Q12-01E]	FCN/FCJ OPC Server for Windows [GS 34P02Q61-01E]	
		FCJ	Network port (100BASE-TX) [GS 34P02Q11-01E]	Duplexed Network Program for FCN/FCJ OPC Server [GS 34P02Q62-01E]	

TIP

- UGS is recommended to use for operation integration of CENTUM VP R5.01 or later.
- Part B and C of this document describe operation integration using the SIOS of CENTUM VP R4.01 as an example. R4.01 and later might differ a little in the image of SIOS engineering window. See the IM come with the product if necessary.

SEE ALSO

- For details on UGS, see "Unified Gateway Station Reference" (IM 33K03R30-50E).
- For details on SIOS, see "Reference (Function Block Details/ Engineering/ Human Interface Station/ System Integration OPC Station)" (IM 33M01A30-40E).

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B1. Overview of Operation Integration

This part of the manual explains the functions and engineering for integrating the operation of FCN/FCJ connected to CENTUM using SIOS and CAMS for HIS.

B1.1 System Configuration of FCN/FCJ and CENTUM

This section describes the system configuration for connecting FCN/FCJs to CENTUM using SIOS and CAMS for HIS.

- **SIOS**

SIOS is a computer-based CENTUM station installed with the basic functions of SIOS. It acts as a gateway between a STARDOM OPC Server (FCN/FCJ OPC Server for Windows, hereinafter referred to as "FCN/FCJ OPC Server") and the CENTUM system. SIOS is connected to the control bus (Vnet/IP) as a CENTUM station. SIOS and FCN/FCJ OPC Server can be configured to run on the same PC, or on separate PCs. In the latter case, they are connected using Ethernet. SIOS exchanges data with other systems via the OPC Server using the OPC DA 2.0 interface standard defined by the OPC Foundation.

- **CAMS for HIS**

CAMS for HIS is available as an optional software package running on HIS. When connected to an FCN/FCJ OPC Server using Ethernet, CAMS for HIS acquires alarms and events of FCN/FCJ in real-time via the FCN/FCJ OPC Server according to the OPC A&E interface standard defined by the OPC Foundation.

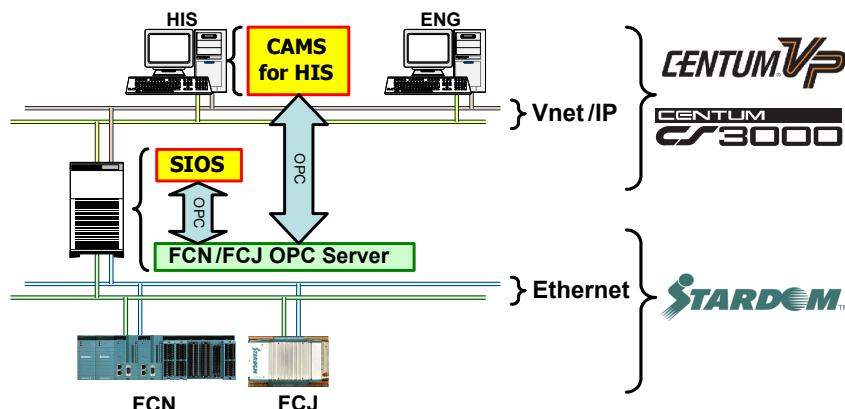


Figure System Configuration with SIOS and FCN/FCJ OPC Server Running on the Same PC

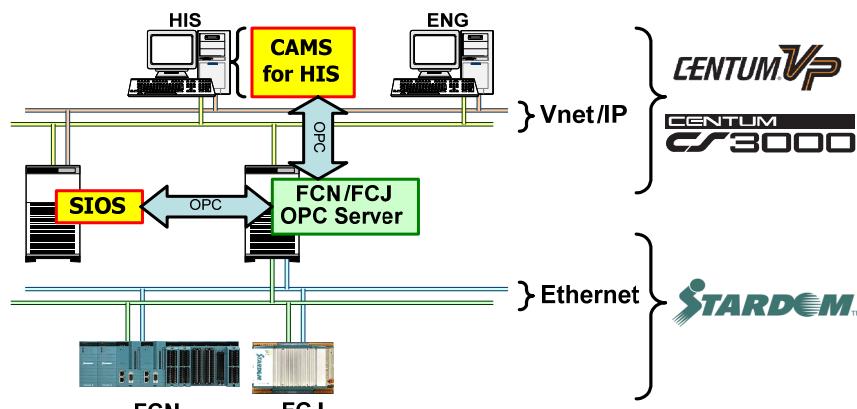


Figure System Configuration with SIOS and FCN/FCJ OPC Server Running on Separate PCs



IMPORTANT

- If SIOS and FCN/FCJ OPC Server are to run on the same PC, the PC must satisfy the operating environment requirements of both SIOS and FCN/FCJ OPC Server.
- HIS and FCN/FCJ Server cannot run on the same PC.

■ Operating Environment

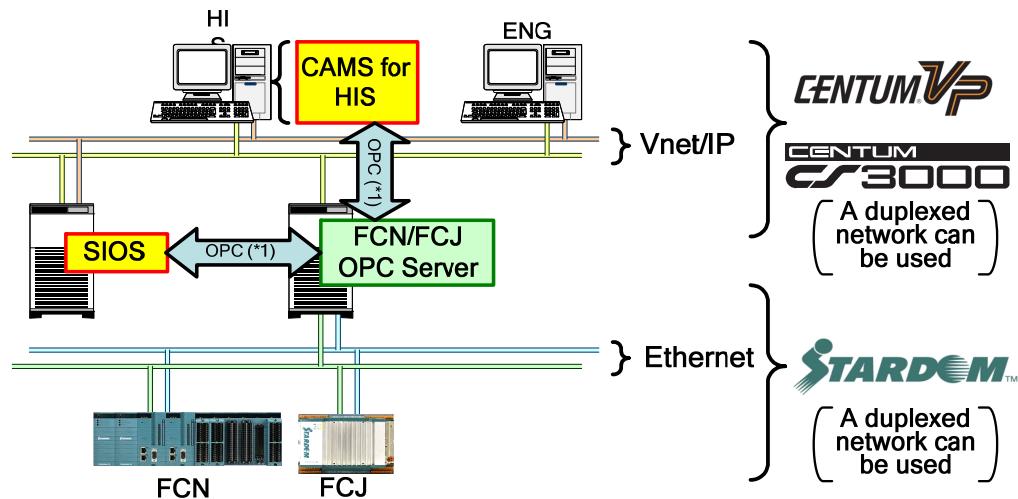
The table below lists the operating environment requirements of FCN/FCJ and CENTUM for running SIOS and CAMS for HIS.

Table Operating Environment

System	Revision
FCN/FCJ	R1.86.01 or later
CENTUM VP	R4.01.00 or later
CENTUM CS 3000	R3.08.10 or later

B1.2 Duplexed Network

A duplexed network can be used within a CENTUM system (HIS, FCS, SIOS, etc.), as well as within a STARDOM system (FCN/FCJ OPC Server, FCN/FCJ).



*1: FCN/FCJ OPC Server and SIOS/CAMS for HIS are connected using a single network.

Figure Connection Using Duplexed Networks

B2. Functions of SIOS

SIOS is a CENTUM station used for integrating FCN/FCJs into a CENTUM system. By mapping FCN/FCJ data to SIOS instrument tags or SIOS tags using OPC, SIOS enables FCN/FCJs to be monitored and controlled from HIS with the same look and feel as CENTUM function blocks.

Moreover, as one tag of FCN/FCJ (equivalent to one NPAS POU) consisting of about 100 data items can be allocated to one tag (SIOS instrument tag) of CENTUM, engineering is simple and less tags may be used.

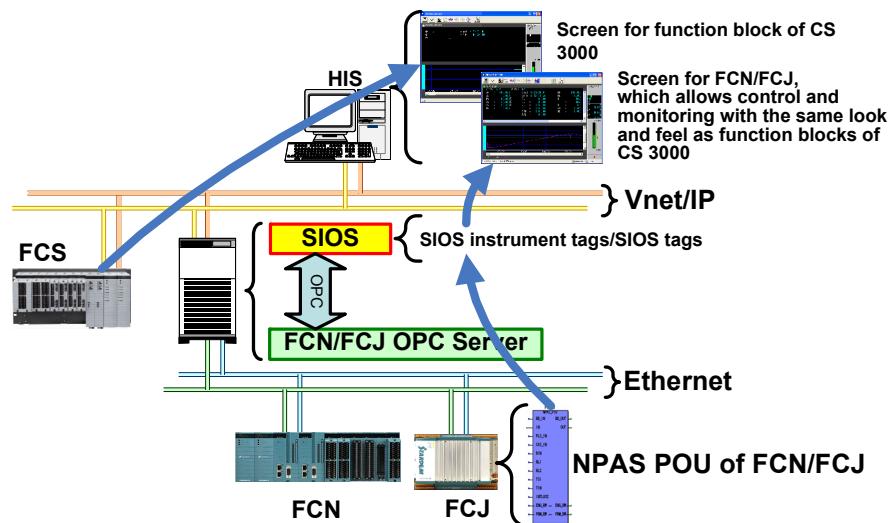


Figure Overview of Functions of SIOS

SEE ALSO

For details on the specifications of a System Integration OPC Station (SIOS), see the following GSs:

- CENTUM VP: System Integration OPC Client Package (GS 33M20D10-40E)
- CS 3000 : System Integration OPC Client Package (GS 33Q05P10-31E)

TIP

SIOS also has a function that relays and reports alarms and events generated by FCN/FCJ to HIS but this function is not used.

Alarms and events generated by FCN/FCJ are reported to CAMS for HIS without going through SIOS.

- Examples of HIS Screens Displayed with FCN/FCJ data

Data of FCN/FCJ can be displayed on HIS with the same look and feel of a function block, as shown in the figures below.

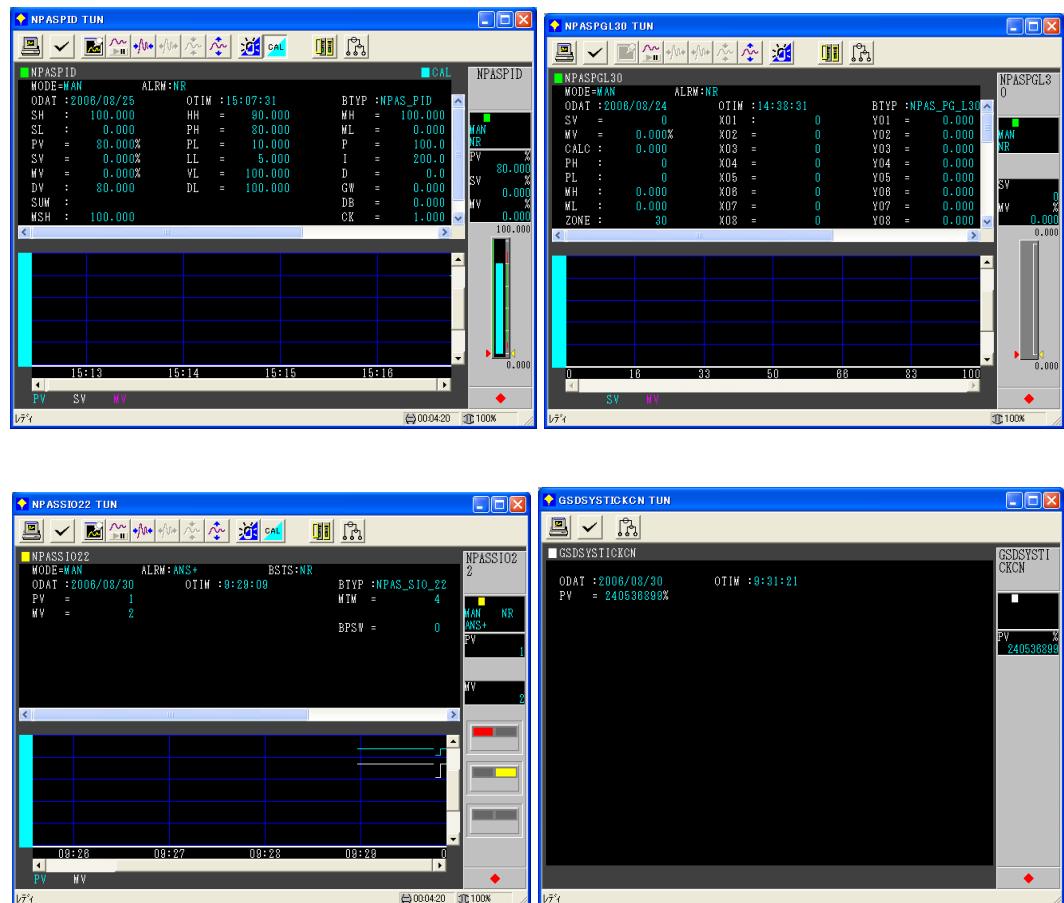


Figure Examples of HIS Screens Displayed with FCN/FCJ data (CS 3000)

B2.1 Tags Handled by SIOS

SIOS supports the following tags:

- SIOS instrument tags
- SIOS tags

This chapter describes FCN/FCJ data that can be allocated to SIOS tags.

B2.1.1 SIOS Instrument Tags

Data of NPAS POUs of FCN/FCJ can be allocated to SIOS instrument tags. Multiple data items in an NPAS POU can be allocated as one tag to one SIOS instrument tag, and handled as such.

The table below lists NPAS POUs that can be accessed using SIOS instrument tags.

Table NPAS POUs which can be accessed as SIOS Instrument Tags

NPAS POU	Description	NPAS POU	Description
NPAS_AS_H	Auto Selector POU	NPAS_PG_L30_BP	30-zone Program Set POU (with bumpless function)
NPAS_AS_L	Auto Selector POU	NPAS_PI_HLD	Sample PI Controller POU
NPAS_AS_M	Auto Selector POU	NPAS_PID	PID Controller POU
NPAS_ASTM1	ASTM Correction (Old JIS) POU	NPAS_PVI	Input Indicator POU
NPAS_ASTM2	ASTM Correction (New JIS) POU	NPAS_RATIO	Ratio Set POU
NPAS_AVE_C	Cumulative-Average POU	NPAS_RATIO_RT	Ratio Set POU (with ratio tracking function)
NPAS_AVE_M	Moving-Average POU	NPAS_SI_1	Switch Instrument
NPAS_BDBUF_R	Real Data Buffer POU	NPAS_SI_2	Switch Instrument
NPAS_BDBUF_T	Time Data Buffer POU	NPAS_SIO_11	Switch Instrument
NPAS_BSET_F	Batch Set POU for Flow Measurement	NPAS_SIO_12	Switch Instrument
NPAS_BSET_LW	Batch Set POU for Weight Measurement	NPAS_SIO_21	Switch Instrument
NPAS_CT	Counter POU	NPAS_SIO_22	Switch Instrument
NPAS_DLAY	Dead-Time POU	NPAS_SO_1	Switch Instrument
NPAS_FFSUM	Feedforward Signal Addition	NPAS_SO_2	Switch Instrument
NPAS_FFSUM_BL	Feedforward Signal Addition with Balance Action	NPAS_SW13	1-pole 3-position Selector Switch POU
NPAS_FOUT	Cascade Signal Distributor POU	NPAS_SW19	1-pole 9-position Selector Switch POU
NPAS_FUNC_VAR	Variable Line-segment Function POU	NPAS_SW31	3-position 1-pole Selector Switch POU
NPAS_LDLAG	Lead/Lag POU	NPAS_SW91	9-position 1-pole Selector Switch POU
NPAS_MLD	Manual Loader POU (without output pushback)	NPAS_T_CFL	Temperature Correction POU
NPAS_MLD_BT	Bias Tracking Type MLD	NPAS_TM	Timer POU
NPAS_MLD_PB	Output Pushback Type MLD	NPAS_TP_CFL	Temperature and Pressure Correction POU
NPAS_ONOFF	2-position ON/OFF Controller POU	NPAS_VELLIM	Velocity Limiter POU
NPAS_ONOFF_G	3-position ON/OFF Controller POU	NPAS_VELLIM_PB	Output Pushback VELLIM
NPAS_P_CFL	Pressure Correction POU	NPAS_XLMT_D	Double Cross-limit POU
NPAS_PG_L30	30-zone Program Set POU	NPAS_XLMT_S	Single Cross-limit POU

B2.1.2 SIOS Tags

FCN/FCJ variables which are accessible from the FCN/FCJ OPC Server can be allocated to SIOS tags as elementary data types (INT, BOOL, etc.) One elementary data type item corresponds to one SIOS tag.

Some examples of elementary data type items of FCN/FCJ that may be handled as SIOS tags include:

- variables
- parameters of POU's that cannot be handled as SIOS instrument tags

Of the user-defined data types of FCN/FCJ, the following data types are automatically disassembled into elementary data types and allocated to SIOS tags:

- STRING type data
- Array type data
- Structure type data (only for certain structures)

■ FCN/FCJ Elementary Data Types Accessible as SIOS Tags

Elementary data types of FCN/FCJ are converted to data types for SIOS tags as shown in the table below, and handled as SIOS tags.

Table Data Types of FCN/FCJ and Data Type of SIOS Tags (Elementary Data Types)

Data of FCN/FCJ			OPC Data Type	CS 3000 Data Type
Elementary Data Type	Description	Size		
BOOL	Boolean	1 Bit	VT_BOOL	I16S
SINT	Short integer	8 Bit	VT_I1	I16S
INT	Integer	16 Bit	VT_I2	I16S
DINT	Double integer	32 Bit	VT_I4	I32S
USINT	Unsigned short integer	8 Bit	VT_UI1	U16S
UINT	Unsigned integer	16 Bit	VT_UI2	U16S
UDINT	Unsigned double integer	32 Bit	VT_UI4	U32S
REAL	Real numbers	32 Bit	VT_R4	F32S
LREAL	Long real numbers	64 Bit	VT_R8	F64S
TIME	Duration	32 Bit	VT_UI4	U32S
BYTE	Bit string of length 8	8 Bit	VT_UI1	U16S
WORD	Bit string of length 16	16 Bit	VT_UI2	U16S
DWORD	Bit string of length 32	32 Bit	VT_UI4	U32S



IMPORTANT

Take note of the following points about FCN/FCJ BOOL-type and TIME-type data.

- BOOL data type
BOOL data type is handled as I16 data type (integer type) in CENTUM, and can be read or set to 1 (TRUE) or 0 (FALSE) on the Tuning window.
- TIME data type
Time data type is handled as U32 data type (unsigned double-precision integer type) in CENTUM, and displayed as duration (in milliseconds) on the Tuning window.

■ FCN/FCJ User-defined Data Types Accessible as SIOS Tags

The following user-defined data types of FCN/FCJ are automatically disassembled into elementary data types and allocated to SIOS tags:

- STRING type data
- Array type data
- Structure type data (only for certain structures)

• STRING type data

STRING type data of FCN/FCJ is converted to SIOS tag of CHR type. User-defined STRING type data of specified length is similarly converted to SIOS tag of CHR type.

Table STRING Type FCN/FCJ Data

FCN/FCJ Data Type	Description	Size	OPC Data type	CENTUM Data Type
STRING	User-defined character string	—	VT_BSTR	CHR

Note: - CENTUM can handle character strings of up to 16 bytes.

- FCN/FCJ OPC Server can process string data length of up to (maximum character string length – 1). For example, up to 7 bytes of data can be processed for a character string defined as 8 characters long.

• Array type data

Arrays of elementary data types are automatically disassembled into individual array elements, which are then allocated to SIOS tags.

- **Structure type data**

Structure type data of FCN/FCJ listed in the table below are automatically disassembled into individual structure members, which are then allocated to SIOS tags.

Other structure type data of FCN/FCJ not listed in the table below cannot be handled as SIOS tags.

To use a structure member variable as SIOS tag, convert each member variable into a separate variable (elementary data type) using an application.

Table Structure Type Data that are Automatically Disassembled into Individual Members

FCN/FCJ Structure Data Type Name	Name of Structure Member	Data Type Name of Structure Member
CData_REAL	Value	REAL
	Status	DWORD
	CInfo	DWORD
	SH	REAL
	SL	REAL
	Unit	IndUnit (BYTE array)
CData_BOOL	Value	BOOL
	Status	DWORD
	CInfo	DWORD
CData_INT	Value	INT
	Status	DWORD
	CInfo	DWORD
CData_DINT	Value	DINT
	Status	DWORD
	CInfo	DWORD
SD_NPSUM_DEF	SUM	LREAL
	DP	INT
	Status	DWORD
	Unit	IndUnit (BYTE array)

B2.2 Integrating Control Stations

SIOS instrument tag data and of SIOS tag data allows integration of other FCS and control stations.

Using this function, FCS can read and set FCN/FCJ data.

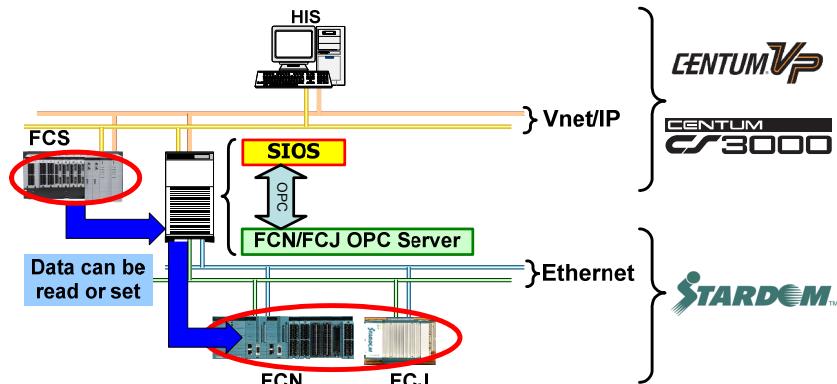
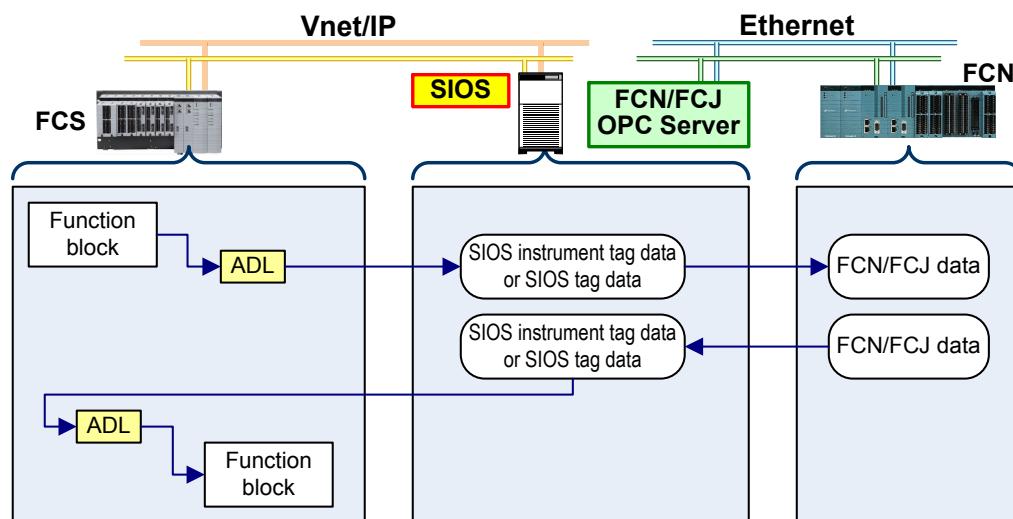


Figure Conceptual Diagram of Joint Control by FCS and FCN/FCJ via SIOS



Note: ADL is an abbreviation for Inter-Station Data Link Block.

Figure An Example of Joint Control by FCS and FCN/FCJ

SEE ALSO

For details on connections between control stations of CENTUM, see the following IMs:

- CENTUM VP : Section C2.4, "Connection between Control Stations" of "Reference Function Block Details Vol1.1" (IM 33M01A30-40)
- CS 3000 : Section C2.4, "Connection between Control Stations" of "CS 1000/CS 3000 Reference Function Block Details" (IM 33S01B30-01E).

B3. Functions of CAMS for HIS

This chapter describes the functions of CAMS for HIS (Consolidated Alarm Management Software).

■ Overview of Functions of CAMS for HIS

CAMS for HIS is an optional software package which runs on HIS of CENTUM. It acquires in real-time various kinds of alarms and events generated in CENTUM, as well as STARDOM and other systems connected to CENTUM. These alarms and events are notified to an operator with identifiers (e.g., purpose, user name, allowable time for response and alarm priority) and value-added information (e.g., cause of alarms and how to handle them). An individual operator sorts by identifier a large variety of alarms and events used at a plant using filter and sort functions of CAMS for HIS so as to receive the right information at the right time in order to deliver safer and more efficient operation.

This package offers an environment for engineering in accordance with EEMUA Publication No.191, "Alarm Systems – A Guide to Design, Management and Procurement."

SEE ALSO

For details on Consolidated Alarm Management Software (CAMS for HIS), see the following:

- CENTUM VP: "Standard Operation and Monitoring Function, Console HIS Support Package for Enclosed Display Style, Console HIS Support Package for Open Display Style " (GS 33M05D10-40)
- CS 3000 : "Consolidated Alarm Management Software CAMS for HIS" (GS 33Q02N03-31E)
- "Alarm Management Handbook – CAM Concept" (TI 33Q02C20-31E)

■ Message Categories of FCN/FCJ

The table below shows the mapping between message categories of FCN/FCJ and event categories of FCN/FCJ OPC Server.

This subsection describes the event categories of FCN/FCJ OPC Server.

Table Mapping between Message Categories of FCN/FCJ and Event Categories of FCN/FCJ OPC Server

Message Category of FCN/FCJ		Event Category of FCN/FCJ OPC Server	Generate/Recover
System alarm		System alarm	Generate only
System event		System event	Generate only
Application alarm	Process alarm	Process alarm	Generate/Recover
	User process alarm (PAS_MSG_UPRCALM)		
	Others	Application alarm	Generate only
Application event		Application event	Generate only
—		OPC Server error ^{**1}	Generate only

*1: These events report errors detected by the OPC Server itself. Such an event may be generated when the OPC Server detects a communications failure with FCN/FCJ.

B3.1 FCN/FCJ Message Handling by CAMS for HIS

CAMS for HIS enables messages of FCN/FCJ to be monitored from HIS.

This chapter explains how messages of FCN/FCJ are handled by the various functions of CAMS for HIS.



IMPORTANT

System behavior of CAMS for HIS may differ from the description given here if the attribute value of a message is modified using CAMS for HIS Configurator.

■ Receiving and Display of Messages

- **Displayed messages**

The table below shows how various messages of FCN/FCJ are displayed in the Message Monitor of CAMS for HIS by default.

Table Displayed FCN/FCJ Messages (default behavior)

FCN/FCJ OPC Server Event Category	SIOS Instrument Tag of Event Source	Display in CAMS for HIS					Remarks
		Alarm Type *2	Time of Message Generation	Message Mark	Buzzer Sound		
System alarm System event	None	System	Time of FCN/FCJ	Default mark *3	No		
Process alarm	Yes *1	Process	Time of FCN/FCJ	Follow setting of SIOS instrument tag	Follow setting of SIOS instrument tag		
	None	Process	Time of FCN/FCJ	Default mark *3	No		
Application alarm Application event	Yes *1	Process	Time of FCN/FCJ	Follow setting of SIOS instrument tag	Follow setting of SIOS instrument tag	Some messages are not displayed	
	None	Process	Time of FCN/FCJ	Default mark *3	No	Some messages are not displayed	
OPC Server error	None	System	Time of OPC Server PC	Default mark *3	No		

*1: Engineering information of the SIOS instrument tag is reflected in the FCN/FCJ message. For details, see the next page.

*2: The classification by the default filter (System, Process) of the Message Monitor of CAMS for HIS is used.

*3: The default mark provided by CAMS for HIS is used.

- **Non-displayed messages**

The table below lists the messages of FCN/FCJ that are not displayed by the Message Monitor of CAMS for HIS, but stored in the history database of CAMS for HIS.

Table FCN/FCJ Messages that are not Displayed by the Message Monitor of CAMS for HIS

FCN/FCJ OPC Server Event Category	FCN/FCJ Message Number	Description
Application alarm	960	All Recovery (NR) message of NPAS POU/PAS POU
Application event	1801	Event messages from PAS_MSG_USREVT
	1802	Alarm OFF change notification message of NPAS POU/PAS POU
	1803	Alarm ON change notification message of NPAS POU/PAS POU
	1804	Block status change notification message of NPAS POU/PAS POU
	1805	Block mode change notification message of NPAS POU/PAS POU

■ Application of CENTUM Engineering Information on FCN/FCJ Messages

- **FCN/FCJ message and instrument faceplate or Tuning window**

Messages of FCN/FCJ are linked to SIOS instrument tags based on engineering information of CENTUM and engineering information of SIOS instrument tags. Using this association, the following operations can be performed in CAMS for HIS:

- Call instrument faceplate or Tuning window from a message sent by NPAS POU and displayed by CAMS for HIS
- Display alarm status of SIOS instrument tag on instrument faceplate or Tuning window
- Generate buzzer sound in accordance with SIOS instrument tag information

SEE ALSO

For details on linked NPAS POU messages and functions of SIOS instrument tags, see Section B3.2, "Linking CAMS for HIS and HIS."

- Processing when CAMS for HIS receives a message from FCN/FCJ**

The table below shows the processing done when CAMS for HIS is notified of a message of FCN/FCJ, which is linked to CAMS for HIS based on engineering information of CENTUM and engineering information of SIOS instrument tags.

Table Engineering Information of CS 3000 Reflected in FCN/FCJ Messages

Message Source	Application of Engineering Information of CENTUM on FCN/FCJ Message
NPAS POU with generated SIOS instrument tag (Message (1) in figure below)	Source information included in the message text received from FCN/FCJ is replaced with the SIOS instrument tag name. In addition, engineering information of the SIOS instrument tag is used for the source, plant hierarchy, alarm priority, message mark, buzzer sound and display flag. However, definition information for alarm names are not used for application alarms as there is no concept of alarm name (OOP, HI, etc.). For instance, the message mark is always displayed in red.
Others (Message (2) in figure below)	Definition of the Plant Hierarchy Builder of CENTUM is used for plant hierarchy information. Security function based on plant hierarchy can be enabled by registering an equipment name using the Plant Hierarchy Builder. Other information included in a message is displayed by CAMS for HIS in accordance with the specifications of FCN/FCJ or FCN/FCJ OPC Server, or the specifications of CAMS for HIS relating to OPC alarms.

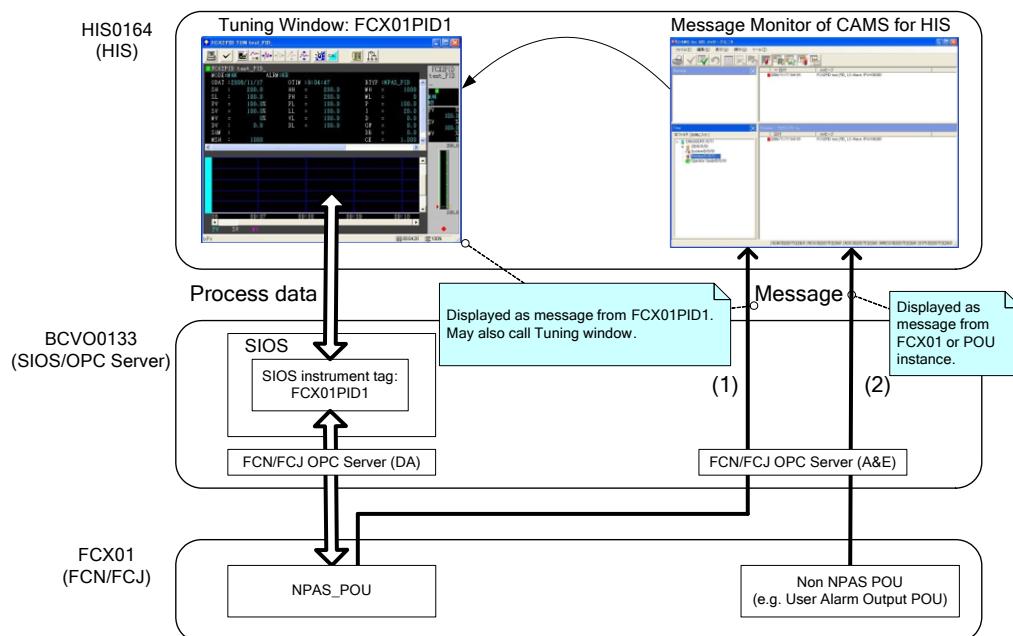


Figure Linking FCN/FCJ Messages and SIOS Instrument Tags

■ Alarm Filtering and Sorting

CAMS for HIS provides various functions for filtering and sorting alarms to avoid overlook of important alarms by operators.

The table below shows how messages of FCN/FCJ are handled by these functions.

Table Handling of Messages of FCN/FCJ by Alarm Filter and Sort Functions

CAMS for HIS Function Name	Handling of FCN/FCJ Messages
Shelving	Can be used in accordance with the specifications of CAMS for HIS.
Filtering	Can be used in accordance with the specifications of CAMS for HIS.
Dynamic filtering	Can be used in accordance with the specifications of CAMS for HIS.
Display of alarm tree	Can be used in accordance with the specifications of CAMS for HIS.
Suppression	Process alarms from NPAS POU's with SIOS instrument tags can be suppressed using alarm groups but not by specifying SIOS station. Other messages of FCN/FCJ cannot be suppressed.

■ Acknowledgment of Alarms

Generated/Recovery status of process alarms of OPC Server for Windows are managed in CAMS for HIS.

ACK management statuses are unified among HIS but not unified between CAMS for HIS and VDS or FAST/Tools. If the same OPC Server for Windows is used to connect multiple OPC A&E clients, ACK statuses are also not propagated to all these clients.

■ Engniring of CAMS for HIS

The engineering of HIS is as follows.

After CENTUM VP R4.02 : CAMS for HIS Bilder

CENTUM CS 3000 or CENTUM VP R4.01 : CAMS for HIS Configurator

About each, please refer to a manual of CENTUM.In CAMS for HIS, a definition of the information for the message of the collection object is possible.

Only the following information can be defined for messages of FCN/FCJ using CAMS for HIS Configurator.

Table Handling of FCN/FCJ Messages by CAMS for HIS Configurator

Messages of FCN/FCJ	How to Perform Definition	Specifications
Process alarms from NPAS POUs with SIOS instrument tags	"<SIOS instrument tag name>.<alarm name>" is automatically displayed under the CENTUM-><Plant Hierarchy> tree. You can perform definition for this item.	Information can be defined in accordance with the specifications of CAMs for HIS.
Other messages	Select OPC, followed by the Program ID Tree of OPC Server for Windows. Specify the source name and perform definition.	Modification of the following attributes are not supported: -alarm priority -Auto Clear flag -users or user groups permitted to perform various alarm operations -alarm group

The table below shows the source name of FCN/FCJ messages for various event categories.

If the same source name is specified, settings are applied to all messages for the source name.

Table Event Category of FCN/FCJ OPC Server and Source Name of FCN/FCJ Message

Event Category of FCN/FCJ OPC Server	SIOS Instrument Tag for Event Source	Source Name
System alarm System event	None	IP address of FCN/FCJ
Process alarm	Yes	SIOS instrument tag name.alarm name (e.g. "FIC001.OOP")
	None	NPAS POU instance name.alarm name (e.g. "Main.NPAS_PID_1.OOP")
Application alarm Application event	Yes	SIOS instrument tag name
	None	NPAS POU instance name
OPC Server error	None	Computer name of OPC Server or IP address of FCN/FCJ

B3.2 Linking CAMS for HIS and HIS

CAMS for HIS and HIS can be operated in tandem using engineering information of SIOS instrument tags.

This section describes how CAMS for HIS and HIS interact.

- **Calling instrument faceplates and Tuning Windows**

SIOS instrument tag windows can be called from messages displayed in the Message Monitor of CAMS for HIS.

- **Displaying alarm statuses of SIOS instrument tags on instrument faceplate and Tuning Window**

Alarm statuses of SIOS instrument tags displayed in the Message Monitor of CAMS for HIS can be reflected on instrument faceplates or Tuning windows.

However, take note of the following points:

- Ack operation is disabled in Tuning windows of SIOS instrument tags.
- Alarm statuses (alarm priority, acknowledgement status, etc.) of alarms belonging to the application alarm event category are not reflected.
Statuses of All Recovery alarms (NR) or LEAK/BDV+/BDV-/BEND/BPRE alarms of NPAS_BSET_F or NPAS_BSET_LW are not reflected on instrument faceplates and Tuning windows.

- **Generating buzzer sound according to SIOS instrument tag information**

Buzzer sound is generated in accordance with SIOS instrument tag information for process alarms from NPAS POU.

No buzzer sound is generated for other messages.

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B4. Engineering

This chapter describes the engineering required for connecting STARDOM to SIOS and CAMS for HIS.

- **Engineering procedure**

Follow the recommended steps below to perform engineering.

1. STARDOM engineering
2. Plant hierarchy engineering
3. SIOS engineering
4. CAMS for HIS engineering

Detailed engineering procedures are described later in this chapter.

TIP

In this chapter, each section describing system engineering has the logo of the corresponding system displayed beside its section heading for easy reference.

Table Logos of Target Systems for Engineering

Target System for Engineering	Logo
CENTUM VP	
CENTUM CS 3000	
STARDOM	

■ Data Names Used in SIOS Connection

When CENTUM and STARDOM are connected via SIOS, the data names and data formats used within individual systems differ.

- Tag name
Tag names are data names used by HIS of FCS of CENTUM to access SIOS. A tag name may consist of up to 16 characters and must be unique within a CENTUM project.
- OPC Item ID
SIOS uses OPC item IDs (hereinafter referred to as item ID) to access data of the FCN/FCJ OPC Server. An item ID is a character string of up to 1024 characters (See number of characters of the item ID table) long, consisting of an FCN/FCJ node identifier, program POU name and a variable name or POU instance name.
- Variable name of FCN/FCJ, POU instance name
FCN/FCJ OPC Server accesses data of FCN/FCJ using the IP address of FCN/FCJ, program POU name, variable name or POU instance name. The variable name of FCN/FCJ for each layer may be up to 30 characters. A NPAS POU instance name of FCN/FCJ may be up to 80 characters.

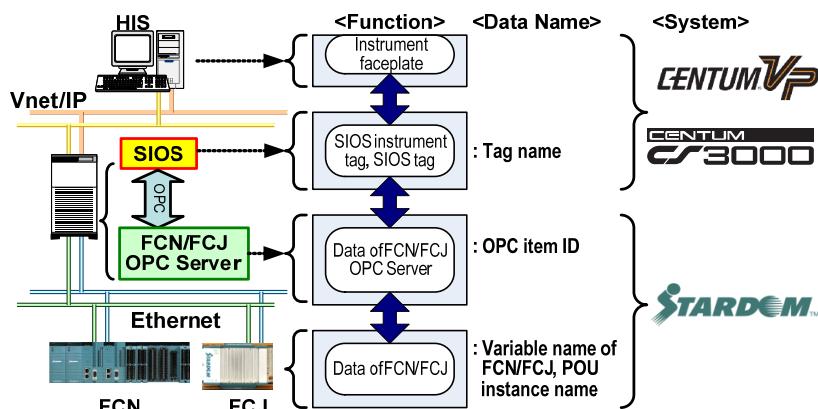


Figure Data Names Used by Individual Functions (Conceptual Diagram)

Table Number of characters of the item ID

System	Revision	Characters
CENTUM VP	R4.01	39
	R4.02 or later	1024
CENTUM CS 3000	R3.08	39
	R3.09 or later	1024

■ Automatic Generation of Tag Names Used by SIOS (SIOS Instrument Tag Names, SIOS Tag Names)

SIOS tag names can be automatically generated from variables names of FCN/FCJ or POU instance names.

Tag names are automatically generated using the following procedure.

1. Browse the FCN/FCJ OPC Server

Item IDs are acquired by browsing the FCN/FCJ OPC Server, which is connected to FCN/FCJ.

An item ID consists of an FCN/FCJ node identifier, program POU name, variable name or POU instance name.

2. Convert using browse file customizing definition file

SIOS instruments tag names or SIOS tag names are automatically generated by converting item IDs acquired from browsing the FCN/FCJ OPC Server using user-defined rules stored in the browse file customizing definition file.

The processing results are stored in the OPC browse file.

The table below shows an example of automatic tag name generation.

Table An Example of Automatic Tag Name Generation

Source item ID for tag name generation	FCX01>Main.AAA.BBB.FIC001				
	↓ The '!' and '.' characters are specified as delimiters. Delimiter=!.				
(Character strings of individual fields, separated by the specified delimiter)	\$1	\$2	\$3	\$4	\$5
	FCX01	Main	AAA	BBB	FIC001
	↓ The tag name format string is specified as "\$1+\$5" TagFormat=\$1+\$5				
Generated tag name	FCX01FIC001				



IMPORTANT

A SIOS instrument tag name or SIOS tag name may consist of up to 16 characters and must be unique within a CENTUM project.

Consider SIOS instrument tag names and SIOS tag names when naming FCN/FCJ variables and POU instances during STARDOM engineering,

SEE ALSO

- For details on FCN/FCJ variable names and POU instance names, see Section B4.1, "STARDOM Engineering."
- For details on SIOS engineering, see Section B4.3, "SIOS Engineering."
- For details on tag names of CENTUM, see the following IMs:
 - CENTUM VP : Section F1.1, "Names" of " Reference- Engineering Vol1" (IM 33M01A30-40E)
 - CS 3000 : Section F2.1, "Names" of "CS 1000/CS 3000 Reference – Engineering" (IM 33S01B30-01E)

B4.1 STARDOM Engineering



Follow the steps given below to perform STARDOM engineering.

1. Create control application
2. Install FCN/FCJ OPC Server
3. Configure FCN/FCJ OPC Server

■ Step 1: Create Control Application

When creating a control application, select NPAS POU instance names and local variable names such that SIOS instrument tag names and SIOS tag names can be automatically generated.

Observe the following guidelines when selecting instance names of NPAS POUs and local variable names.

[Required]

- Use only alphanumeric characters and the underscore ('_') special character.
- When combined with the node identifier, the specified name should allow generation of a unique tag name within 16 characters.

[Recommended]

- Standardize the meaning of all POU instance names and variable names of each layer.
- Keep character strings to be used in tag names on the same layer for all POU instance names and variable names.
- Keep character strings to be used in tag names as short as possible.

The following basic naming rules are recommended:

```
Tag name (up to 16 characters)
    = node identifier + program POU name
    + (NPAS POU instance name or local variable name)
```

TIP

When carrying out structured programming using user-defined function blocks or using POUs with variables accessible from the OPC Server, such as NPAS POUs, Temperature Controller Communication POU, FF-H1 Data Reading and Writing POU, data item names on the lowest layer may be repeated.

If there are duplicate generated tag names, make them unique using the following means:

- Amend the tag name generation rule.
- Amend the generated OPC DA server definition file using a generic text editor.
- Study the generated tag names and review the node identifier, program POU name, instance names of NPAS POUs and local variable names.

■ Step 2: Install FCN/FCJ OPC Server

Install the FCN/FCJ OPC Server.

SEE ALSO

For details on how to install the FCN/FCJ OPC Server, see "FCN/FCJ Software Installation" (IM 34P02Q91-01E).

For detailed setup of the FCN/FCJ OPC Server, see the online help documentation of the FCN/FCJ OPC Server.

■ Step 3 : Configure FCN/FCJ OPC Server

● Node identifier

An FCN/FCJ node identifier (unique name) must be defined in the configuration file (fcxcnf.csv) for the DA function and A&E function of FCN/FCJ OPC Server. When connecting to CENTUM using SIOS or CAMS for HIS, observe the following guidelines for specifying a node identifier.

[Required]

- When using multiple OPC Servers, each node identifier must be unique among all OPC Servers.
- Use only alphanumeric characters and the hyphen ('-') special character in a node identifier.

[Recommended]

- Keep node identifiers within 5 characters. (System defined global variables of FCN/FCJ can be used in the default tag name setting rule.)
- When combined with variable names, the specified node identifier should allow automatic generation of a unique tag name within 16 characters.

B4.2 Plant Hierarchy Engineering

Define the following equipment name (plant hierarchy name) using CENTUM's Plant Hierarchy Builder. You may also register the upper equipment name of equipment name as required.

Table Equipment Name (Plant Hierarchy Name) Definition

Equipment Name	Description	Remarks
Node identifier of FCN/FCJ	The node identifier is used as the upper equipment name of SIOS instrument tags or SIOS tags. It is set as the equipment name in these tags and messages from FCN/FCJ.	
Computer name of FCN/FCJ OPC A&E Server	The computer name is set as the equipment name in OPC Server error messages generated by FCN/FCJ OPC Server.	The default computer name of SIOS ("BCVODdss") is registered as the default equipment name. If the FCN/FCJ OPC Server and SIOS are configured to run on the same computer, there is no need to register the equipment name.*1

*1: If the default equipment name of SIOS has been changed or if the FCN/FCJ OPC Server and SIOS are configured to run on different PCs, the equipment name must be registered.

SEE ALSO

For details on the specifications of plant hierarchy, see the following IMs:

- CENTUM VP : Chapter E7, "Plant Hierarchy" of " Reference Human Interface Station Vol.1" (IM 33M01A30-40E)
- CS3000 : Chapter E10, "Plant Hierarchy" of "CS 1000/CS 3000 Reference – HIS" (IM 33S01B30-01E)

TIP

The computer name of the OPC Server and the node identifier (name given to the FCN/FCJ in the configuration file of the FCN/FCJ OPC Server) are used as the plant hierarchy name (equipment name) in the connection of CENTUM and STARDOM.

- When selecting a node identifier, you should consider its use in the plant hierarchy name.
- If the OPC Server and SIOS are installed on different PCs or if they are installed on the same PC but the default computer name for SIOS ("BCVODdss") is not used as the computer name of the OPC Server, select a computer name, taking into consideration its use in the plant hierarchy name.

B4.3 SIOS Engineering



This section describes the SIOS engineering procedure.

■ Procedure

Perform SIOS engineering according to the flowchart shown below.

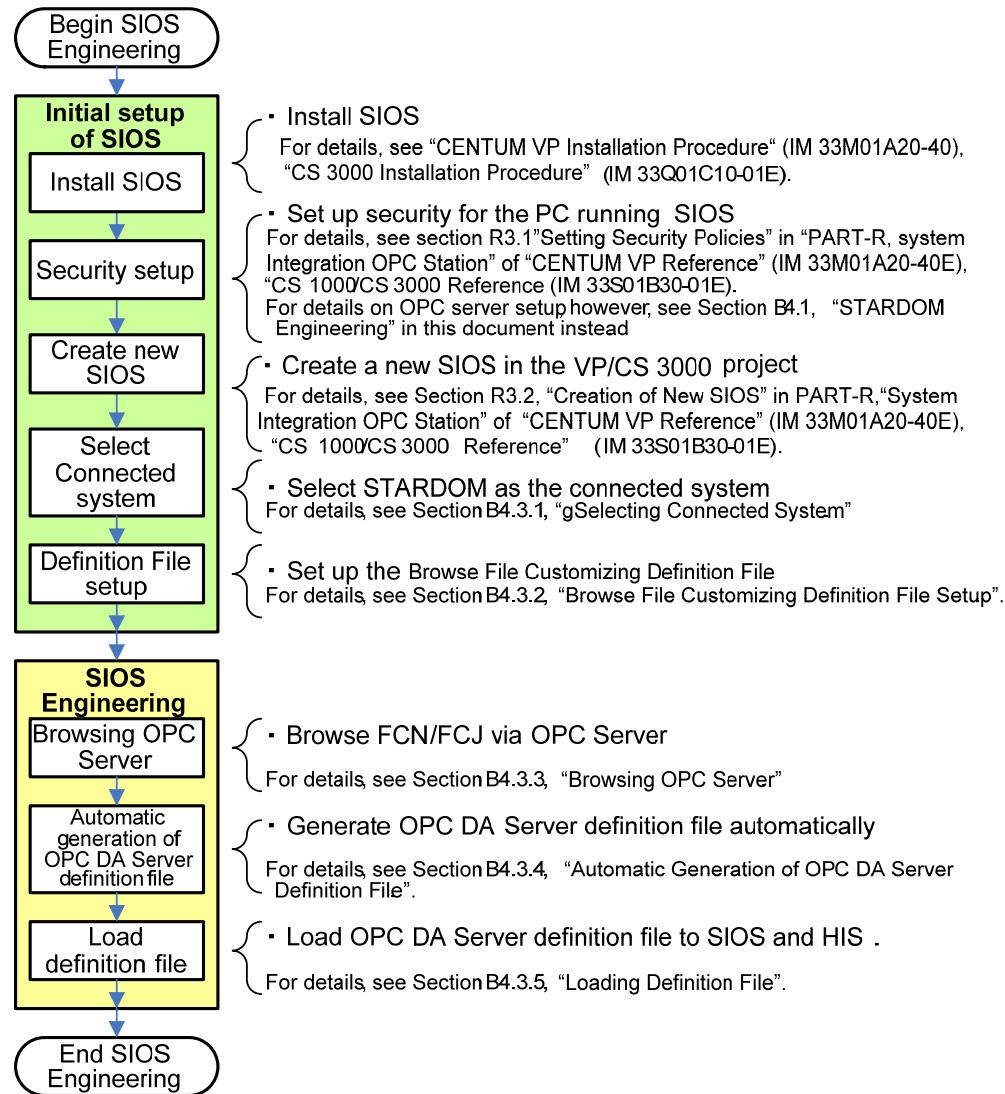
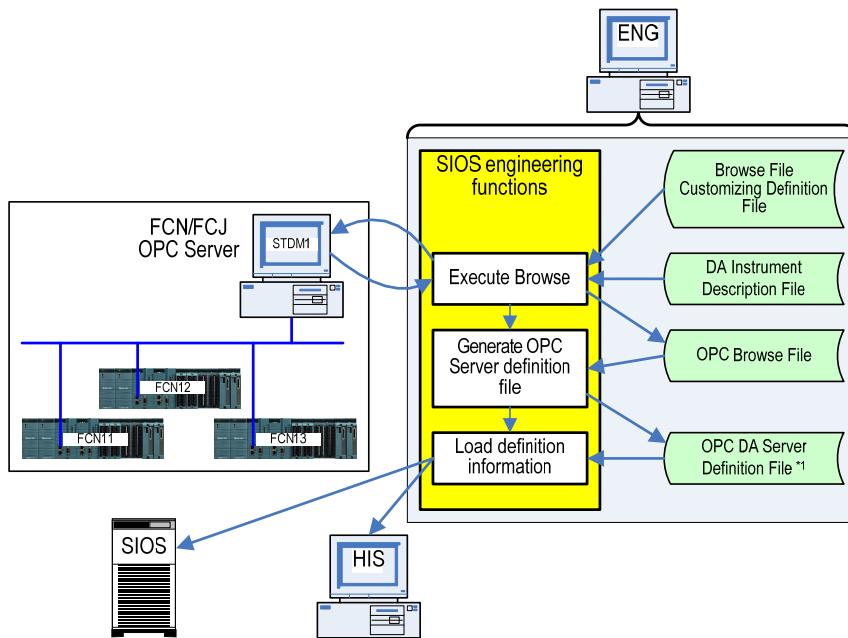


Figure SIOS Engineering Procedure

■ Main Functions and Files Related to SIOS Engineering

The figure below shows the main functions and files related to SIOS engineering.



*1: The OPC DA server definition file is also used in CAMS for HIS Engineering.

Figure Main Functions and Files Related to SIOS Engineering

B4.3.1 Selecting Connected System

Select STARDOM as the destination of the SIOS connection.

■ Engineering Procedure: Select Connected System

Step 1: Open Connection dialog box

On the tree view of System View, select the folder of the SIOS station, followed by the CONFIGURATION folder. Then, double-click [BCV-OPC] to display the Connected System Type Select dialog box.

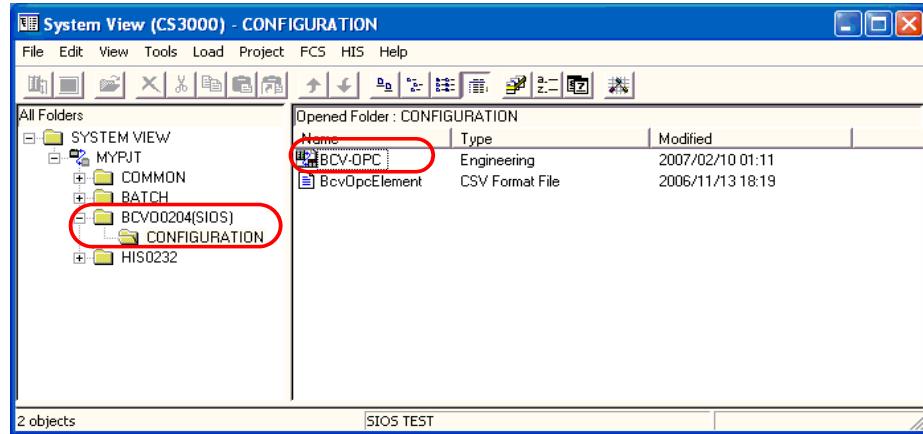


Figure Opening Connected System Type Dialog Box

Step 2: Select STARDOM

On the Connected System Type Select dialog box, select "STARDOM" and click [OK]. The SIOS Engineering window is displayed.

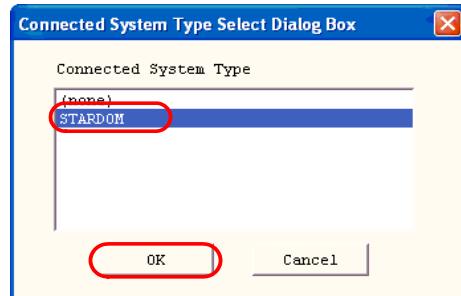


Figure Connected System Type Select Dialog Box

B4.3.2 Browse File Customizing Definition File Setup

Amend the browse file customizing definition file to define conversion rules to be applied during generation of the OPC browse file.

SEE ALSO

For details on how to set up the browse file customizing definition file, see Chapter B5, "Browse File Customizing Definition File Setup."

TIP

The browse file customizing definition file is used to customize information acquired from the OPC Server through browsing of the FCN/FCJ OPC Server in SIOS engineering. The following two functions can be customized using the browse file customizing definition file:

- Unwanted variable exclusion function
 - Tag name setting function
-

B4.3.3 Browsing OPC Server

Browse the tag information of FCN/FCJ via the OPC Server connected to SIOS to generate an OPC browse file.

■ Engineering Procedure: Execute Browse

Step 1: Display OPC Browse List dialog box

On the SIOS Engineering window, click [OPC Browse View...]. The OPC Browse List dialog box is displayed.

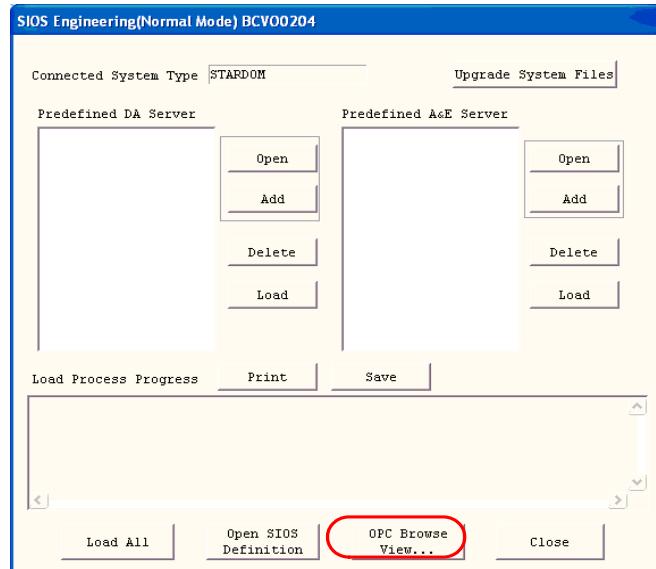


Figure SIOS Engineering Window

Step 2: Display OPC Browse Execute dialog box

Click the [OPC Browse...] button on the OPC Browse List dialog box.
The OPC Browse Execute dialog box is displayed.

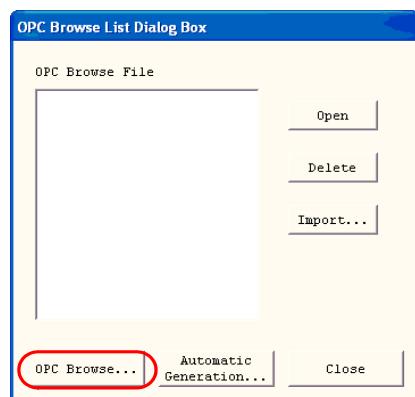


Figure OPC Browse List Dialog Box

Step 3: Select OPC Server Definition

If this is the first time SIOS engineering is performed, select the [Specify Host Name and Program ID, and Browse] radio button on the OPC Browse Execute dialog box, and enter the following settings:

- Server Kind
Select [DA Server] for the OPC Server type.
- Host Name or IP Address
Enter the host name (computer name) or IP address of the target FCN/FCJ OPC Server to be browsed.
- Program ID
After entering the host name or the IP address of the OPC Server to be browsed, a list of program IDs obtained from the browsed OPC Server is created when the cursor is moved to the program ID field.
Select "Yokogawa.ExaopcDASTARDOMFCX.1" from the list if it is displayed. If not, enter "Yokogawa.ExaopcDASTARDOMFCX.1" (program ID of the FCN/FCJ OPC Server).
- DA Instrument Description File
When you click the [Refer] button, a list of DA instrument description files for the connected system that is specified on the SIOS Engineering Window will be displayed.
Select "SRDAInst.csv" from the displayed list as the DA instrument description file for STARDOM.
- OPC Browse Making Name
Enter a filename for storing browsed OPC configuration data. A default filename for the selected OPC server type is displayed but you can modify it.

Click the [Start] button. Browsing of the OPC Server begins.



IMPORTANT

Only FCN/FCJs connected to the OPC Server are browsed.
When browsing an OPC Server, connect all FCN/FCJs to the OPC Server.

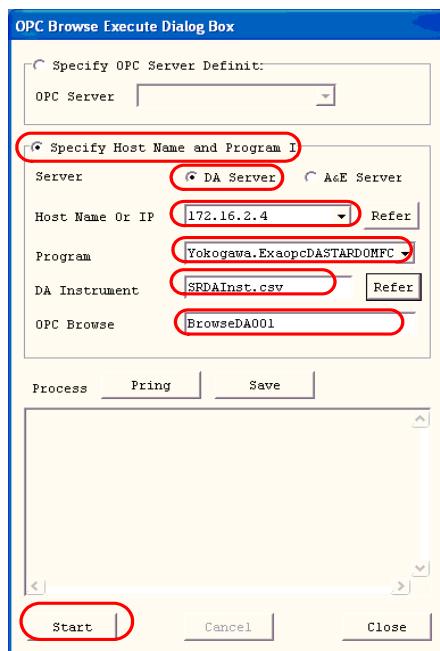


Figure OPC Browse Execute Dialog Box (for Browse New)

TIP

Once an OPC DA server definition file has been created, you will not need to enter the host name and other settings again.

In this case, select the [Specify OPC Server Definition, and Browse] radio box on the OPC Browse Execute dialog box, and specify the created OPC DA server definition file in the [OPC Server Definition] field.

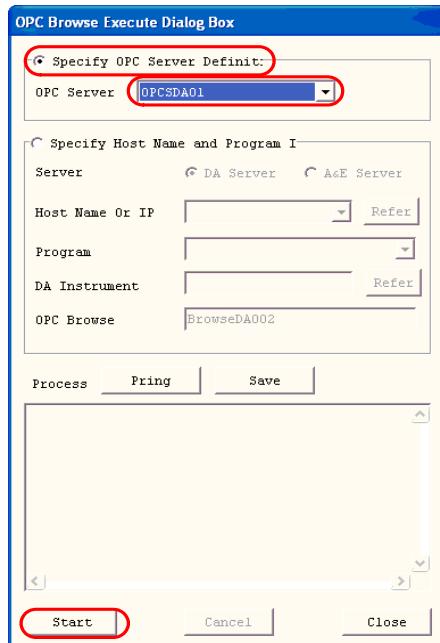


Figure OPC Browse Execute Dialog Box
(for Browsing using a specified OPC DA server definition file)

Step 4: Browse processing

Browsing of the OPC Server begins and progress messages are displayed in the Process area of the OPC Browse Execute dialog box. Browsed information is converted according to rules defined in the browse file customizing definition file and the information in the DA instrument description file, and an OPC browse file is generated.

After browsing is completed, you can either print the processing results or save the result to a file by clicking the [Print] button or the [Save] button.

After all processing is completed, click [Close] to return to the OPC Browse List dialog box.

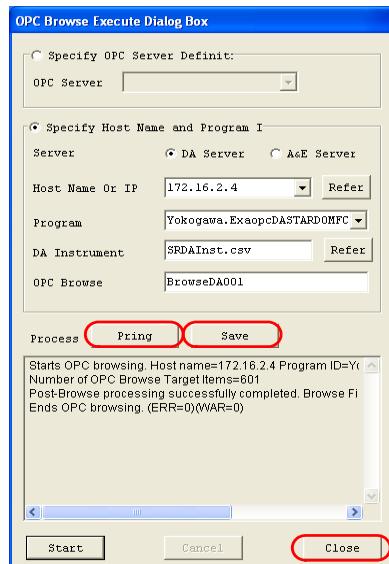


Figure OPC Browse Execute Dialog Box



IMPORTANT

Do not browse the AE Server as CAMS for HIS will be used for message notification.

Step 5: OPC Browse List dialog box

The OPC Browse List dialog box is displayed with the name of the created OPC browse file.

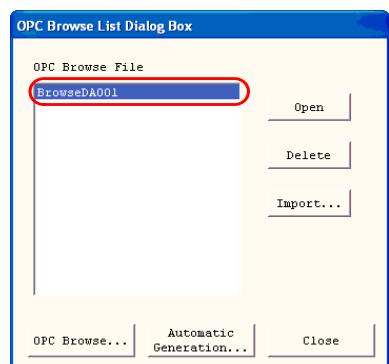


Figure OPC Browse List Dialog Box

B4.3.4 Automatic Generation of OPC DA Server Definition File

Generate the OPC DA server definition file to be downloaded to SIOS or HIS from the OPC browse file.

■ Engineering Procedure: Generate OPC DA server definition file

Step 1: Display Automatic Generation dialog box

Click [Automatic Generation...] on the OPC Browse List dialog box to display the Automatic Generation dialog box.

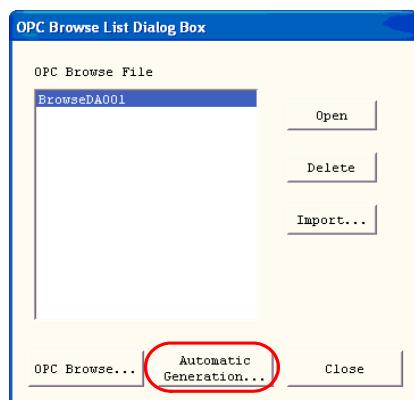


Figure OPC Browse List Dialog Box

Step 2: Automatic Generation dialog box: DA Server Automatic Generation Rule

Click the [DA Server Automatic Generation Rule] tab and set up the following items on the tab sheet.

- [Automatic Generation Source]
Specify the OPC Browse File created from browsing the FCN/FCJ OPC Server.
- [Automatic Generation Target]
Specify a name for the OPC DA server definition file to be generated.
Specifying a file name displayed on the list overwrites the file.
Specifying a file name not displayed on the list creates a new file.
- [Rule of when the automatic generation destination file is saved]
Select [Only Browse information is updated if the same tag is found].
The table below describes the various options available.

Table Rule of when the automatic generation destination file is saved]

DA Server Automatic Generation Rule	Rules of Conversion
[Update All]	Initializes and regenerates the OPC DA server definition file.
[Not updated if the same tag is found]	Tag information defined in the previously created OPC DA server definition file is not updated. New tag information defined in the OPC Browse File is added to the OPC DA server definition file. Tag information that is defined in the previously created OPC DA server definition file but absent in the newly browsed tag information is deleted from the OPC DA server definition file.
[Only Browse information is updated if the same tag is found]	Tag information defined in the previously created OPC DA server definition file is updated in the browsed information. Data items excluded from browsing retain their existing definition information. Tag information that is defined in the previously created OPC DA server definition file but absent in the newly browsed tag information is deleted from the OPC DA server definition file.

Note: For details on [Rule of when the automatic generation destination file is saved], see Chapter C1, "Rules for Automatic Generation of OPC DA Server Definition File."

- [CENTUM Tag Generation Rule]
Select [Specify Each Tag] for [CENTUM Tag Generation Rule].

TIP

When connecting FCN/FCJ to CENTUM, we recommend using a browse file customizing definition file and automatically generating tag names when browsing the FCN/FCJ OPC Server.

In this case, you should select [Specify Each Tag] for the [CENTUM Tag Generation Rule].

If you choose not to define a browse file customizing definition file, you can generate tag names automatically using the [CENTUM Tag Generation Rule] selection.

SEE ALSO

For details on the CENTUM Tag Generation Rule, see the following IMs:

- CENTUM VP : " Reference - System Integration OPC Station" (IM 33M01A30-40E)
- CS 3000 : "CS 1000/CS 3000 Reference - System Integration OPC Station"
(IM 33S01B30-01E)

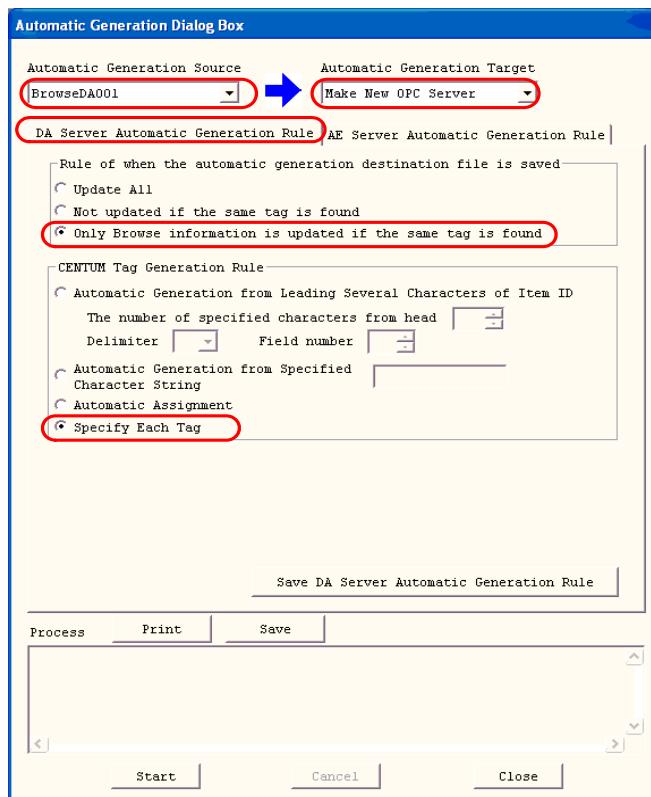


Figure Automatic Generation Dialog Box (DA Server Automatic Generation Rule tab)



IMPORTANT

Do not browse the AE Server as CAMS for HIS will be used for message notification.

Step 3: Automatic Generation Dialog Box: Generation of OPC DA server definition file

Click the [Start] button on the Automatic Generation dialog box. Generation of the OPC DA server definition file begins and progress messages are displayed in the Process area of the dialog box.

After generation of the OPC DA server definition file is completed, you can either print the processing results or save the result to a file by clicking the [Print] button or the [Save] button.

After all processing has been completed, click [Close]. Control returns to the SIOS Engineering window.

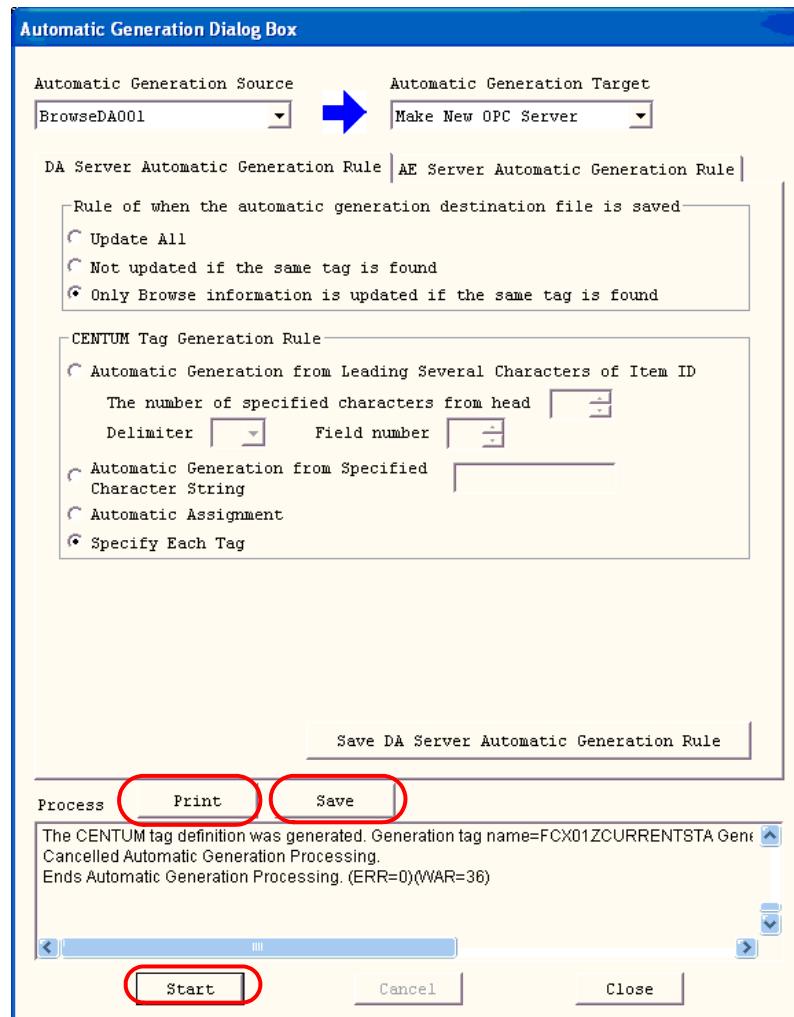


Figure Automatic Generation Dialog Box: Generation of OPC DA Server Definition File



IMPORTANT

The Automatic Generation dialog box can be used to generate both OPC DA server definition file and OPC A&E server definition file.

When connecting FCN/FCJ to CENTUM, however, you only need to generate the OPC DA server definition file.

Step 4: SIOS Engineering window: Display of definition file

The generated OPC DA server definition file is displayed in the [Predefined DA Server] list box in the SIOS Engineering window.

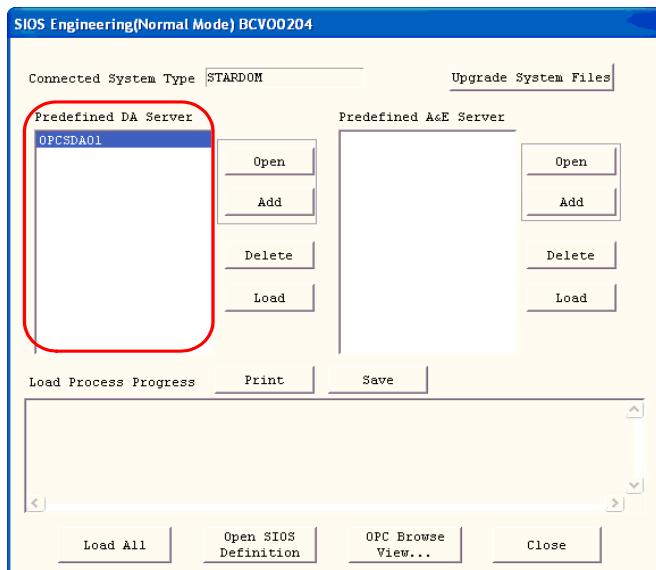


Figure SIOS Engineering window: Display of Definition File

Step 5: Amend OPC DA server definition file

Amend the following information in the OPC DA server definition file using a generic text editor as required.

- Tag information of FCN/FCJ that cannot be browsed via the OPC Server
- Tag information of CENTUM that is absent in the tag information of FCN/FCJ

SEE ALSO

For details on how to set up the OPC DA server definition file, see Section B6.1, "Amending OPC DA Server Definition File."

B4.3.5 Loading Definition File

Load the OPC DA server definition file to SIOS or HIS.

■ Engineering Procedure: Load Definition File

Step 1: SIOS Engineering window: Load

Predefined DA server information can be loaded to SIOS or HIS.

Select an item from the [Predefined DA Server] list and click the [Load] button. The selected information is loaded to SIOS or HIS.

Clicking [Load All] loads all displayed predefined DA server information to SIOS or HIS.

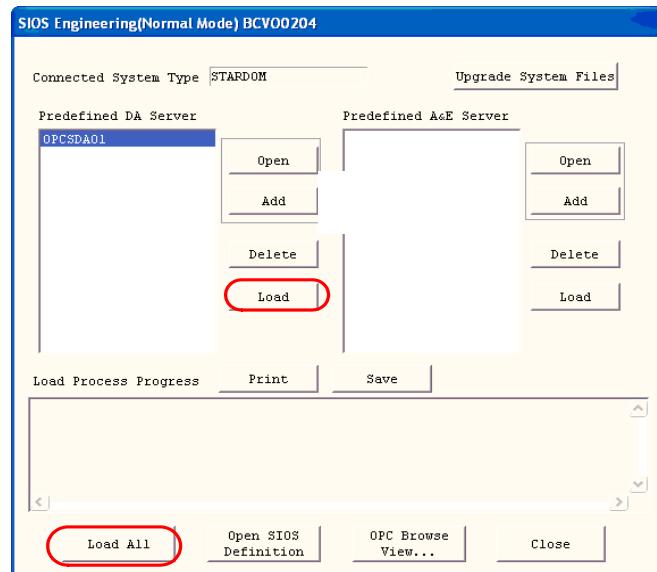


Figure SIOS Engineering window: Load Definition File



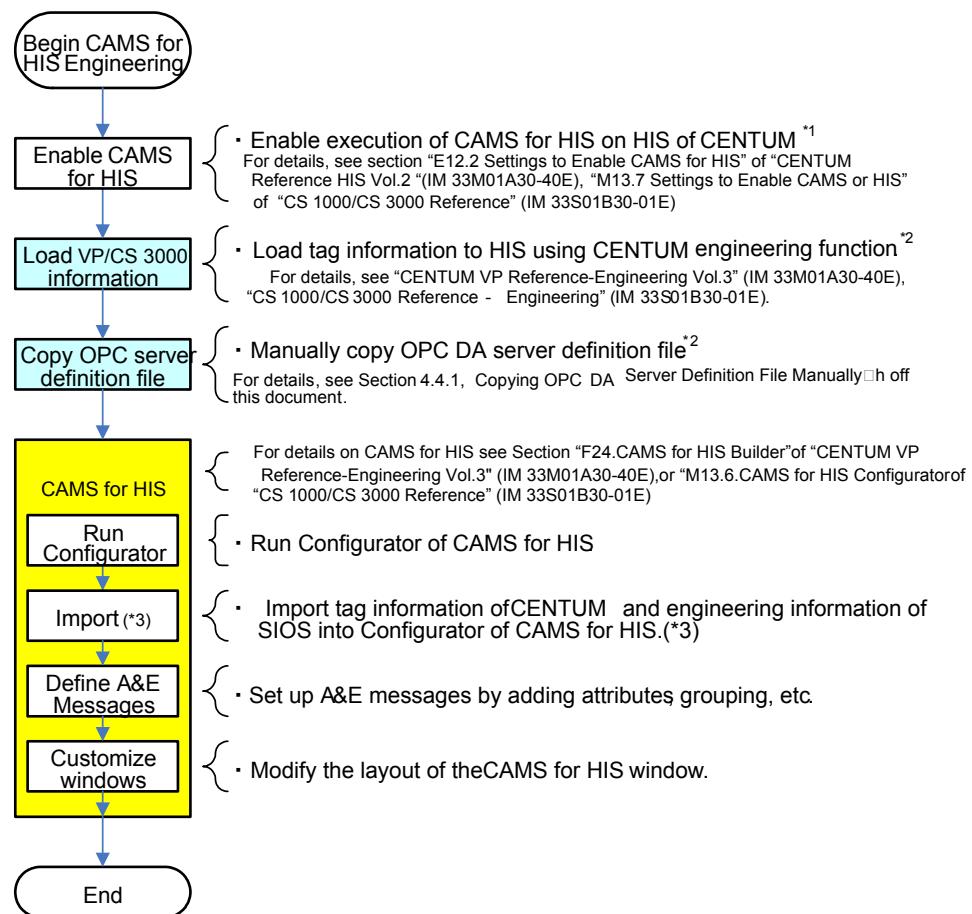
IMPORTANT

If this is the first time SIOS engineering is performed, click [Load All] to load all predefined DA server information to SIOS or HIS.

B4.4 CAMS for HIS Engineering



Perform CAMS for HIS engineering for connecting STARDOM to CENTUM according the flowchart shown below.



*1: Enable CAMS for HIS for all HIS stations on which CAMS for HIS is to be executed.

*2: Load and copy data to the HIS on which Configurator of CAMS for HIS is to be execution.

*3: After CENTUM R4.02, the import work is not necessary.

Figure CAMS for HIS Engineering Procedure



IMPORTANT

When connecting an FCN/FCJ OPC Server, in addition to enabling execution of CAMS for HIS on the HIS of CENTUM, you must also set up OPC A&E server connection.

For details, see the following IMs:

- CENTUM VP : Section E12.2 "Settings to Enable CAMS for HIS" of "Reference Human Interface Station Vol.2" (IM 33M01A30-40E)
- CS 3000 : Section M13.7, "Settings to Enable CAMS for HIS" of "CS 1000/CS 3000 Reference" (IM 33S01B30-01E).

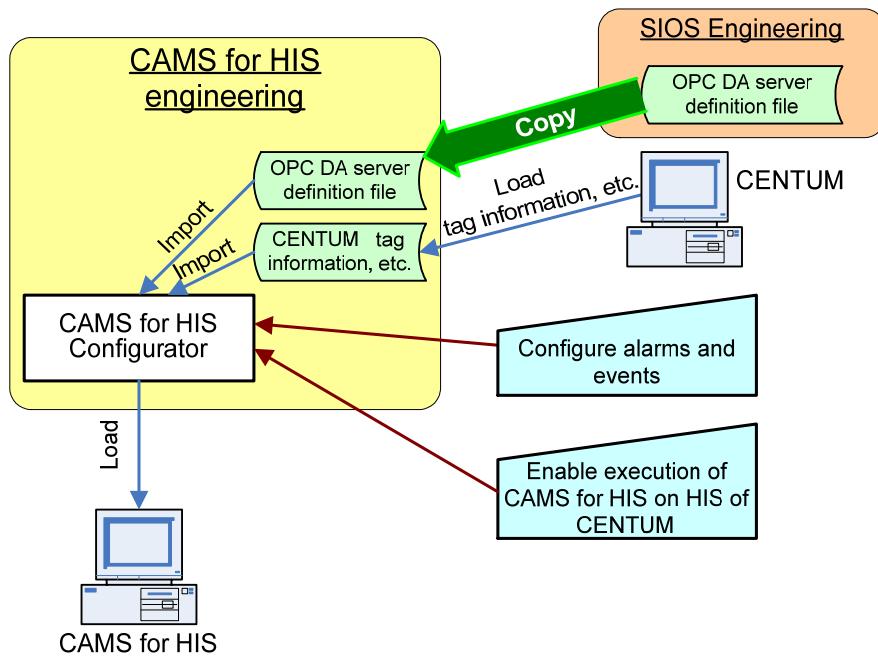


Figure Configuration Using Configurator of CAMS for HIS (Conceptual Diagram)

B4.4.1 Copying OPC DA Server Definition File Manually

Manually copy the OPC DA server definition files from the PC on which SIOS engineering was performed to the PC (installed with the bilder for CAMS for HIS or installed with the Configurator for CAMS for HIS).

You should copy the OPC DA server definition files before executing the Import CENTUM Database command in Configurator for CAMS for HIS.

- **Source files to be copied**

- Source PC: The CENTUM ENG PC where SIOS engineering function was executed.
- Source files to be copied: The group of OPC DA server definition files shown in the figure below.

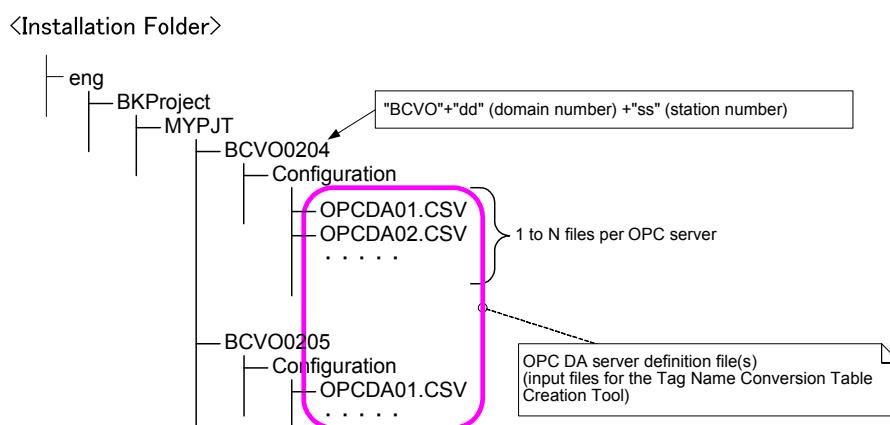


Figure Example: Location of Source Files to be Copied

TIP

You need to copy only the required files below the folder of the SIOS station to be connected to STARDOM. However, it would be alright even if you copy all the SIOS files within the same CENTUM project.

The default installation folder is the "CENTUMCS" for CS 3000 systems, and "CENTUMVP" for CENTUM VP systems.

- **Destination folder**

- Destination PC: HIS running the Configurator of CAMS for HIS
- Destination folder:
 <HIS installed folder of CENTUM VP>\CAMS\configurator\SIOS\source
 or
 <HIS installed folder of CS 3000>\CAMS\configurator\SIOS\source

Copy the group of OPC DA server definition files into the above destination folder. If there are multiple SIOS, there will be duplicate source file names and you will need to manually rename them.

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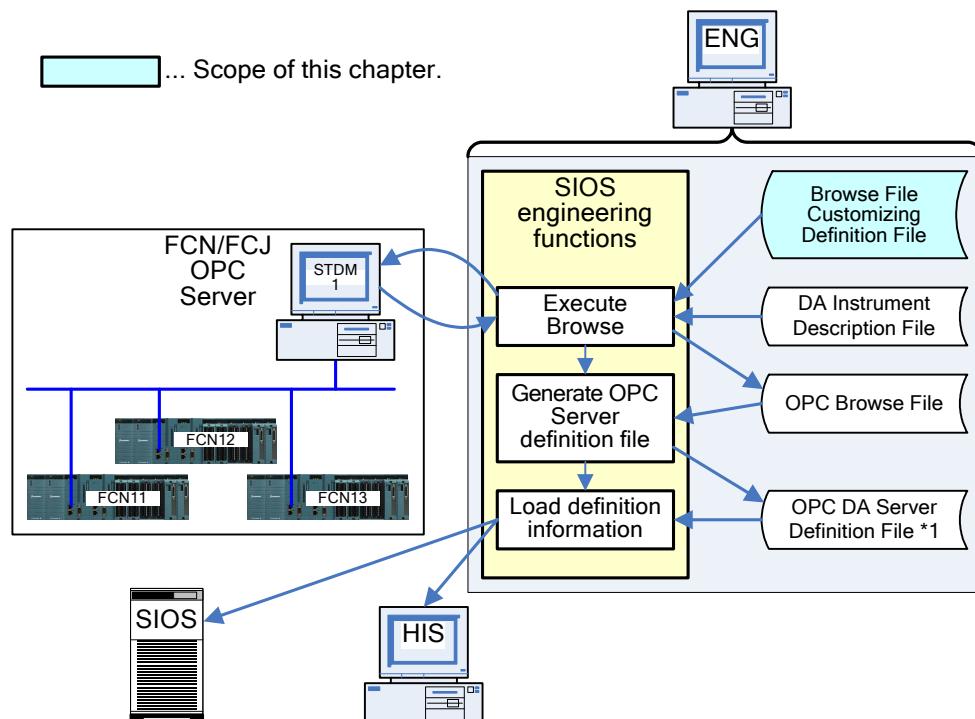
B5. Browse File Customizing Definition File Setup

The browse file customizing definition file can be used to customize information acquired from the OPC Server from browsing.

This chapter describes the browse file customizing definition file.

■ Main Functions and Files Related to SIOS Engineering

The browse file customizing definition file is used when browsing the FCN/FCJ OPC Server as shown in the figure below.



*1: The OPC DA server definition file is also used in CAMS for HIS engineering.

Figure SIOS Engineering: Browse File Customizing Definition File

B5.1 Conversion Function

Using SIOS engineering functions, information acquired from browsing an OPC Server are converted into tag names according to rules contained in the browse file customizing definition file, and an OPC browse file is generated.

The browse file customizing definition file can be used to configure the following functions:

- Unwanted Variable Exclusion Function
- Plant Hierarchy Name Setting Function
- Tag Name Setting Function

B5.1.1 Unwanted Variable Exclusion Function

It is common that of all the FCN/FCJ variables that are accessible via OPC, many do not need to be handled by SIOS.

The Unwanted Variable Exclusion function can be used to delete information of variables not to be handled by SIOS so that only required SIOS instrument tags or SIOS tags are generated. To use this function, define a list of variables not to be handled by SIOS in the browse file customizing definition file.

SEE ALSO

For details on how set up the browse file customizing definition file to exclude unwanted variables, see Section B5.2.1, "How to Specify Unwanted Variables."

• System defined global variables

FCN/FCJ has many system defined global variables (RAS Information, etc.). System defined global variables that are not required for normal monitoring are registered in the browse file customizing definition file and excluded by default.

SEE ALSO

For details on system defined global variables with SIOS tags generated by the default rule, see Section B5.3, "System Defined Global Variables."

• Variables that are OPC target data by default

FCN/FCJ variables that are specified as OPC target data (e.g. Communications POU) and variables that are OPC target data by default do not need to be monitored as SIOS data. You should exclude these variables by editing the excluded variable list in the browse file customizing definition file. Examples of unwanted variables may include the following:

- Variables of OPC target data included in SD_PASPOU_PF
- Variables of OPC target data included in SD_PASFFH1_PF
- Variables to be connected to the I/O terminals of the Modbus TCP Server POU (SD_CMDBSE_BS_OPEN) (variables specified as OPC target data)

B5.1.2 Plant Hierarchy Name Setting Function

The Plant Hierarchy Name Setting function sets the plant hierarchy name of SIOS tags or SIOS instrument tags connected to FCN/FCJ. This function has no setup item in the definition file.

Table Plant Hierarchy Name of SIOS Tags or SIOS Instrument Tags

Target for Name Setting	Setting Value
Plant hierarchy name of SIOS tags or SIOS instrument tags.	Node identifier of FCN/FCJ ^{*1}

*1: This is the identifier defined for each FCN/FCJ in the setup file of the FCN/FCJ OPC Server.

B5.1.3 Tag Name Setting Function

The Tag Name Setting function automatically sets SIOS tags names or SIOS instrument tag names of FCN/FCJ variables or POU instances. It processes item ID strings (identifiers for variables and POU instances) and sets tag names.

SEE ALSO

- For details on how to specify a tag name setting rule, see Section B5.2, "How to Edit Browse File Customizing Definition File."
 - For details on the syntax of item IDs, see the online help documentation of "FCN/FCJ OPC Server."
-
- Item ID example 1: I/O disconnection flag: CN01!@GV.GS_NFIO_DISCONNF
 - Item ID example 2: Local variable of POU: FCN01>Main1.Flag1
 - Item ID example 3: PID of NPAS POU: FCN01>Main1.Unit1.PID001

TIP

In general, you should perform conversion processing of tag names according to browse file customizing definitions.

The SIOS engineering dialog box also provides an automatic tag name generation function during automatic generation of OPC DA Server definition file. You may use that function or this tag name setting function as required.

For details on automatic generation of OPC DA server definition file, see Section B4.3.4, "Automatic Generation of OPC DA Server Definition File."

Table Tag Name of SIOS Tag or SIOS Instrument Tag

Target for Name Setting	Setting Value
SIOS tag or SIOS instrument tag for FCN/FCJ variable or POU instance	Character string up to 16 characters long, generated according to tag name setting rules in the definition file

B5.2 How to Edit Browse File Customizing Definition File

A browse file customizing definition file is a pure text file, which can be edited using any generic text editor. It is divided by function into sections with section names that should not be modified. Each comment line begins with a semi-colon (';') character.

- **Location of browse file customizing definition file**

The browse file customizing definition file named "SRBrowseCustomDef.txt" is located in the folder shown in the figure below.

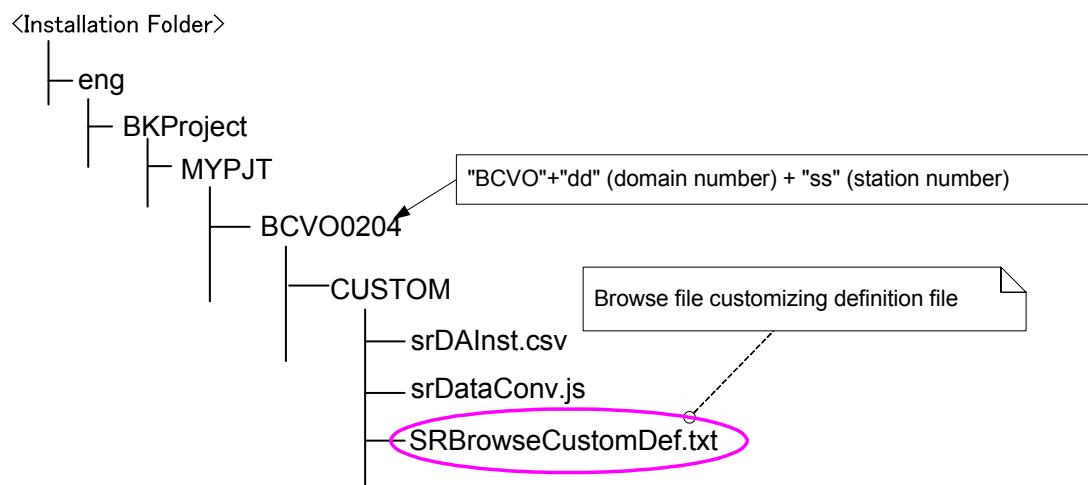
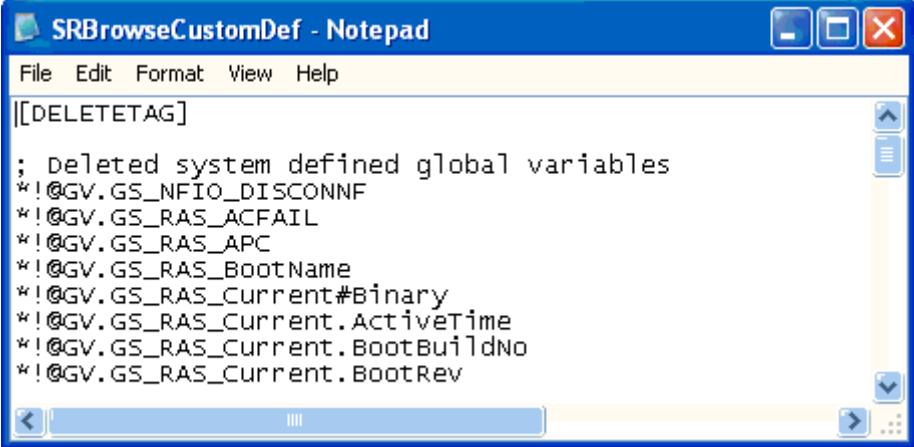


Figure Example: Location of Browse File Customizing Definition File

B5.2.1 How to Specify Unwanted Variables

Specify variables or POU Instance names for which SIOS tags are not to be created below the "[DELETETAG]" section. You may use the "*" and "?" wildcard characters.



```
[[DELETETAG]
; Deleted system defined global variables
*!@GV.GS_NFIO_DISCONNF
*!@GV.GS_RAS_ACFAIL
*!@GV.GS_RAS_AP
*!@GV.GS_RAS_BootName
*!@GV.GS_RAS_Current#Binary
*!@GV.GS_RAS_Current.ActiveTime
*!@GV.GS_RAS_Current.BootBuildNo
*!@GV.GS_RAS_Current.BootRev
```

Figure A Coding Example for Unwanted Variables

B5.2.2 How to Specify Tag Name Setting Rules

Specify tag name setting rules using the syntax "key=value" in the "[CUT-DOWN]" section.

Three types of tag name setting rules can be specified, each for each category of variables and POU instances.

Table Variable and POU Instance Classification and Available Keys

Variable or Instance Categories for Rule Application	Available Key Strings	Method for Classifying Item IDs
Local variables within POU instances	Delimiter TagFormat	Item IDs not belonging to the following two types of global variables.
(User-defined) global variables	DelimiterGV TagFormatGV	Item IDs containing "@GV" but not belonging to system defined global variables.
(System-defined) global variables	DelimiterSysGV TagFormatSysGV	Item IDs containing "@GV.GS_" or "@GV.GSD_"

Table Valid Keys and Values in Tag Name Definition Rules

Key		Value	
Name	Meaning	Valid Characters	Meaning
Delimiter DelimiterGV DelimiterSysGV	These keys specify delimiter characters for dividing an item ID into parts. Each specified character is treated as a delimiter character. Individual substrings (known as fields below) separated by the delimiter characters can be combined to form tag names. Example: Delimiter="!_" means to divide an item ID into fields using '!', '_' and '_'. Up to three delimiter characters can be specified per rule.	alphanumeric characters underscore ('_') hyphen ('-') exclamation mark ('!') at mark ('@') period ('.') comma (',') brackets ('(', ')') pound ('#')	Divide the item ID into fields using the specified character.
TagFormat TagFormatGV TagFormatSysGV	These keys specify rules for generating tag names by combining fields extracted from item IDs and string constants. Example: TagFormat=\$1+Z+\$5+\$6 means to concatenate field 1, "Z", field 5 and field 6 to form a tag name.	\$N (N=1,2,3,...)	Denotes the field number of an item ID field separated by delimiters. Invalid fields (for instance, specifying \$4 when there are only three fields) are ignored.
		\$E	Denotes the last field. It is ignored if it is equivalent to the immediate preceding field (for instance, if "\$1+\$5+\$E" is specified when there are altogether five fields).
		+	Denotes concatenation of fields or character strings.
		alphanumeric characters (in uppercase only) underscore ('_') hyphen ('-')	Denotes insertion of characters between fields.

B5.2.3 Special Processing at Tag Name Generation

The following processing is carried out at tag name generation:

- Lowercase letters are converted to uppercase letters.
- Special characters that are not allowed in tag names ('!', '(', ')', '@', etc.) are deleted.
- Leading '_' and '-' characters are prefixed with 'Z'.
- Characters beyond the maximum length of 16 are truncated and discarded.

TIP

To use the tag name generation function provided by the SIOS engineering function instead of this Tag Name Setting function, do not specify anything for the delimiter or tag name format string.

The table below shows an example of tag name generation according to a specified tag name setting rule.

Table An Example of Tag Name Generation

Source item ID for tag name generation	FCX01>Main.AAA.BBB.FIC001				
	↓ '!' and '.' are specified as delimiter characters. Delimiter=!				
(Individual field strings separated using the specified delimiter)	\$1	\$2	\$3	\$4	\$5
	FCX01	Main	AAA	BBB	FIC001
	↓ Tag name format string is set to "\$1+\$E" TagNameFormat=\$1+\$E				
Automatically generated tag name	FCX01FIC001				

Note: The symbol "\$E" denotes the last field.

To generate tag names as shown in the table above, specify a tag name setting rule as shown in the figure below.

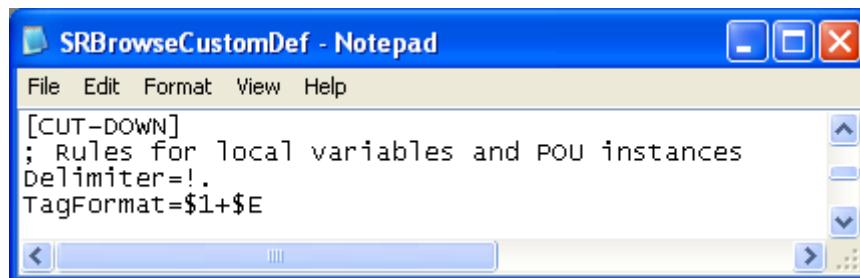


Figure An Example of a Tag Name Setting Rule

B5.3 System Defined Global Variables

The table below lists the system defined global variables with SIOS tags generated according to the default definition for the Unwanted Variable Exclusion function and the Tag Name Setting function.

When using the default definitions, you should keep the node identifier within 5 characters to avoid generation of duplicate tag names. These default definitions can be modified by editing the definition file.

Table System Defined Global Variables with Default Generated SIOS Tags

Variable Name	Comment	Example of SIOS Tag Name (When using the default tag name setting rule for browse file customization)	Remarks
GS_RAS_BootDate	Date of the boot project	FCX01ZBootDate	
GS_RAS_BootName	Boot project name	FCX01ZBootName11	12 tag names are generated, namely, BootName0 to BootName11
GS_RAS_CPUMASK_LEFT	LEFT CPU	FCX01ZCPUMASKLEF	
GS_RAS_CTRL0	CPU Control	FCX01ZCTRL0	
GS_RAS_CTRL1	Opponent CPU Control	FCX01ZCTRL1	
GS_RAS_CpuCapacity	CPU capacity in per cent	FCX01ZCpuCapacit	
GS_RAS_PSU1_ACRDYL	PSU1 Left PSU AC Ready	FCX01ZPSU1ACRDYL	
GS_RAS_PSU1_ACRDYR	PSU1 Right PSU AC Ready	FCX01ZPSU1ACRDYR	
GS_RAS_PSU1_DCRDYL	PSU1 Left PSU DC Ready	FCX01ZPSU1DCRDYL	
GS_RAS_PSU1_DCRDYR	PSU1 Right PSU DC Ready	FCX01ZPSU1DCRDYR	
GS_RAS_PSU1_ERDYL	PSU1 Left PSU Ext. Ready	FCX01ZPSU1ERDYL	
GS_RAS_PSU1_ERDYR	PSU1 Right PSU Ext. Ready	FCX01ZPSU1ERDYR	
GS_RAS_PSU2_ACRDYL	PSU2 Left PSU AC Ready	FCX01ZPSU2ACRDYL	
GS_RAS_PSU2_ACRDYR	PSU2 Right PSU AC Ready	FCX01ZPSU2ACRDYR	
GS_RAS_PSU2_DCRDYL	PSU2 Left PSU DC Ready	FCX01ZPSU2DCRDYL	
GS_RAS_PSU2_DCRDYR	PSU2 Right PSU DC Ready	FCX01ZPSU2DCRDYR	
GS_RAS_PSU2_ERDYL	PSU2 Left PSU Ext. Ready	FCX01ZPSU2ERDYL	
GS_RAS_PSU2_ERDYR	PSU2 Right PSU Ext. Ready	FCX01ZPSU2ERDYR	
GS_RAS_PSU3_ACRDYL	PSU3 Left PSU AC Ready	FCX01ZPSU3ACRDYL	
GS_RAS_PSU3_ACRDYR	PSU3 Right PSU AC Ready	FCX01ZPSU3ACRDYR	
GS_RAS_PSU3_DCRDYL	PSU3 Left PSU DC Ready	FCX01ZPSU3DCRDYL	
GS_RAS_PSU3_DCRDYR	PSU3 Right PSU DC Ready	FCX01ZPSU3DCRDYR	
GS_RAS_PSU3_ERDYL	PSU3 Left PSU Ext. Ready	FCX01ZPSU3ERDYL	
GS_RAS_PSU3_ERDYR	PSU3 Right PSU Ext. Ready	FCX01ZPSU3ERDYR	
GS_RAS_PlMode_Halt	current PLC mode is HALT	FCX01ZPlModeHal	
GS_RAS_PlMode_On	current PLC mode is POWER on	FCX01ZPlModeOn	
GS_RAS_PlMode_Run	current PLC mode is RUN	FCX01ZPlModeRun	
GS_RAS_PlMode_Stop	current PLC mode is STOP	FCX01ZPlModeSto	
GS_RAS_PrjDate	Date of the active project	FCX01ZPrjDate	
GS_RAS_PrjName	Project name	FCX01ZPrjName11	12 tag names are generated, namely, PrjName0 to PrjName11
GS_RAS_RDY0	CPU Ready	FCX01ZRDY0	
GS_RAS_RDY1	Opponent CPU Ready	FCX01ZRDY1	
GS_RAS_REDGY	Running in redundant system	FCX01ZREDCY	
GS_RAS_ZipDate	Date of the zipped project	FCX01ZZipDate	
GS_RAS_ZipName	Zipped project name	FCX01ZZipName11	12 tag names are generated, namely ZipName0 to ZipName11
GS_RETAIN_SV_PG	Retain Data Save Progress	FCX01ZSVPG	
GS_RETAIN_SV_SW	Retain Data Save SW	FCX01ZSVSW	
GS_RAS_Current.CpuTemp	CpuTemp	FCX01ZCurrentCpu	
GS_RAS_Current.KernelRev	KernelRev	FCX01ZCurrentKer	
GS_RAS_Current.SerialNo	SerialNo	FCX01ZCurrentSer	
GS_RAS_Current.StationType	StationType	FCX01ZCurrentSta	

TIP

- The FCN/FCJ OPC Server cannot expand individual variables of the IO RAS Information Variable (@GV.GS_RAS_IOSTat).
 - To use information included in the IO RAS Information Variable in CENTUM, set up the required variable as OPC target data using Logic Designer.
-

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B6. Precautions when Connecting to SIOS

Pay attention to the following points when connecting FCN/FCJ to SIOS.

- Amending OPC DA server definition file
- Difference of NPAS POU Tuning window

B6.1 Amending OPC DA Server Definition File

Amend the OPC DA server definition files using a generic text editor as required for tag information of FCN/FCJ that cannot be browsed via the OPC Server and tag information of CENTUM that is absent in the tag information of FCN/FCJ.

The OPC DA server definition files are located in the folder shown in the figure below on the CS 3000 ENG PC where the SIOS Engineering function was executed.

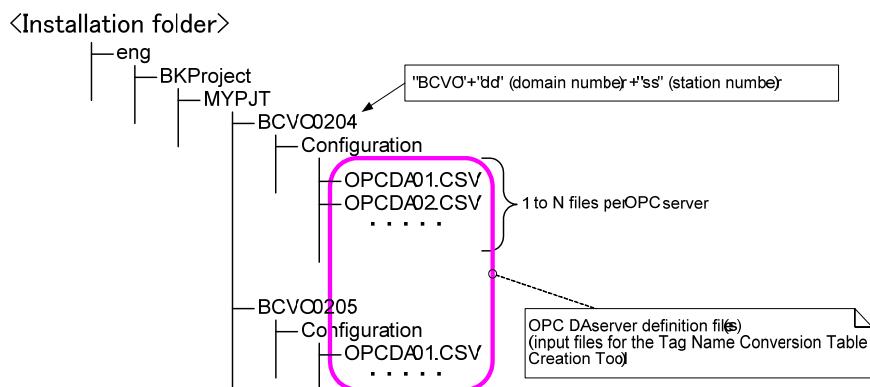


Figure Example: Location of OPC DA Server Definition Files

Table Tag Information (SIOS Instrument: Group Information) (1/2)

Element	Explanation	Remarks
Tag Group ID	The character string after deleting the data item name of an OPC item ID acquired by executing Browse.	
CENTUM tag name	This is automatically generated or the tag name that was specified in the editor will be set.	The CS 3000 tag name automatically generated or set using a text editor (16 characters max.)
Tag comment	The item comment selected through browsing will be set. If it exceeds 24 bytes, the excess will be deleted and a warning message will appear.	The value set to the COMMENT engineering parameter (32 characters max.)
Instrument type	The instrument type selected through browsing will be set.	The value determined by the DA instrument description file
CENTUM instrument block type	CENTUM instrument block type corresponding to Instrument type is set.	
Upper limit of PV (SH)	The SH value selected through browsing will be set. If an SH value cannot be acquired, 100 or 100.0 will be set for analog, and 0 for BOOL.	The SH value of the PV access parameter (PV.SH)
Lower limit of PV (SL)	The SL value selected through browsing will be set. If an SL value cannot be acquired, 0 or 0.0 will be set for analog, and 0 for BOOL.	The SL value of the PV access parameter (PV.SL) The decimal point is determined by SH.
Upper limit of MV (MSH)	The MSH value selected through browsing will be set. If a MSH value cannot be acquired, 100 or 100.0 will be set for analog, and 0 for BOOL.	The SH value of the MV access parameter (MV.SH)

Table Tag Information (SIOS Instrument: Group Information) (2/2)

Element	Explanation	Remarks
Lower limit of MV (MSL)	The MSL value selected through browsing will be set. If a MSL value cannot be acquired, 0 or 0.0 will be set for analog, and 0 for BOOL.	The SL value of the MV access parameter (MV.SL) The decimal point is determined by MSH.
Upper limit of Ratio (RH)	The RH value selected through browsing will be set.	The SH value of the SV access parameter (SV.SH)
Lower limit of Ratio (RL)	The RL value selected through browsing will be set.	The SL value of the SV access parameter (SV.SL) The decimal point is determined by RH.
Decimal point for PV (DP)	This will be set to AUTO with automatic generation. If set to AUTO, the decimal point position is determined from SH/SL when the tag list is generated.	
Decimal point for MV (MV_DP)	This will be set to AUTO with automatic generation. If set to AUTO, the decimal point position is determined from MSH/MSL when the tag list is generated.	
Decimal point for SUM (TP)	This will be set to AUTO with automatic generation. If set to AUTO, this will be the same as the decimal point position of the measured value (DP).	Not linked to the engineering parameter ^{*1}
Decimal point for Ratio (RP)	If set to AUTO, this will be the same as the decimal point position of the measured value (DP).	
Alarm priority level	This will be set to 2 (medium-priority alarm) with automatic generation.	
Security level	This will be set to 4 with automatic generation.	
Upper equipment name	This will be set to empty with automatic generation. ^{*4}	Specify the node identifier using the browse file customizing definition file.
Raw data display	This will be set to NO (none) with automatic generation.	
SUM display	This will be set to NO (none) with automatic generation.	Not linked to the engineering parameter ^{*1}
Reverse-scale display	This will be set to 0 (none) with automatic generation.	
Tag mark	This will be set to 2 (general) with automatic generation.	
Double authentication	This will be set to NO (none) with automatic generation.	
CAS mark	This will be set to NO (none) with automatic generation.	Not linked. ^{*2}
Upper level window	This will be left blank with automatic generation.	
Help number	This will be set to HW0000 with automatic generation.	
EU symbol of PV	This will be set to the engineering unit symbol selected through browsing for analog data. If there is no engineering unit symbol, this will be set to % by default.	Value of the unit of PV (PV.UNIT)
EU symbol of MV	This will be set to the engineering unit symbol selected through browsing for analog data. If there is no engineering unit symbol, this will be set to % by default.	Value of the unit of MV(MV.UNIT)
Switch position label	This will be set to the label that was edited based on the switch position label value selected through browsing.	By default, switch position labels of switch instruments (SIO type) are "Open label, , Close label, Open label". See detailed description of SW instruments. ^{*3} .
Scale-division	With automatic generation: This will be set to AUTO (determine automatically) for analog data. This will be left blank for non-analog data.	
Label format	This will be set to 0 (normal position) with automatic generation.	
Operation mark	For future expansion. Reserved for the operation marks when saving the tuning parameters.	

*1: See the next page for precautions concerning totalization values.

*2: See the next page for precautions concerning the Cascade mark.

*3: See the next page for precautions concerning switch instruments.

*4: If the upper equipment name is empty, the default equipment name (SIOS station name) is assigned.

■ Totalization Values (SUM)

- **Enabling and disabling the use of totalization values (SUM)**

In FCN/FCJ, engineering parameter settings are used to enable or disable the use of totalization values (SUM) and set totalization time. This information, however, cannot be propagated automatically to SIOS.

If one or more NPAS in FCN/FCJ use totalization values (SUM), you should set the corresponding item in the OPC DA server definition file to "YES." This way, the value will be displayed in the totalization value (SUM) of the Tuning window of HIS.

- **Decimal point of totalization values (SUM)**

When the decimal point of a totalization value (SUM) is set using an engineering parameter in FCN/FCJ, the value is written to SUM.DP of the SUM structure data. This information, however, cannot be propagated automatically to SIOS.

On CS 3000, the decimal point (TP) of a totalization value (SUM) is set by default to be the same as the decimal point (DP) of the measured value. If this is different from the FCN/FCJ setting, you should modify the value of the corresponding item in the OPC DA server definition file.

■ Cascade Mark (CAS mark)

In CENTUM, "cascade mark" is displayed on the lower level tag of cascade connection. This is automatically set from connection information at the time of generation. HIS can only change the MODE of tags displayed with the "cascade mark" to "CAS".

Even if a tag is set to cascade connection by engineering in FCN/FCJ, such connection information cannot be sent to SIOS so the "cascade mark" cannot be automatically set.

If you need to change the MODE of a tag to "CAS" from HIS, set the corresponding item to "YES" in the OPC DA server definition file. In this case, "CAS" can be displayed even if the "cascade mark" is not displayed.

■ NPAS that Require Manual Setup

- **NPAS_SW_13, NPAS_SW_31**

The scale display of the instrument faceplates of SW-13 and SW-31 uses the switch position label. By default, the label is displayed as "ON,,OFF,ON" as described in the table captioned "Tag Information (SIOS Instrument: Group Information)" on the previous page. To display the label as "3,2,1,0" in its original form, set the switch position label item in the OPC DA server definition file to "3,2,1,0".

- **NPAS_SW_19, NPAS_SW_91**

The scale display of the instrument faceplates of SW-19 and SW-91 uses the RH/RL scale. As SW instruments of FCN/FCJ have no concept of scale, scale information cannot be set automatically by SIOS.

You should set the RH/RL in the OPC DA server definition file to "9/0" to replace the default value of "100.0/0.0".

B6.2 Precautions when Handling NPAS POU Data in CENTUM

Data of NPAS POU may be handled or displayed somewhat differently in CS 3000. This section describes the differences.

B6.2.1 Different Item Names between NPAS POU and CENTUM

FCN/FCJ items having the same meaning as CENTUM items are handled using item names of CENTUM.

The table below lists FCN/FCJ items that are handled using item names in CENTUM, which are different from their original names in FCN/FCJ.

Table Different Items Names between CENTUM and FCN/FCJ

NPAS POU Name or Function	Item Name in FCN/FCJ	Item Name inCENTUM
NPAS_AS_H, M, L SW instrument	POS POSH POSL PSEL	SW SWH SWL SEL
PAS POU having cascade set value and remote cascade set value	CASV.Value RCASV.Value	CSV RSV
I/O compensation	VNGAIN VNBIAS	CK CB
NPAS_PG_L30, PG_L30_BP	CALCV	CALC
NPAS_PG_L30, PG_L30_BP NPAS_FANC_VAR	ZTH ZTL ZMH ZML PRGTM	PH PL MH ML SV
NPAS_AVE_C	CMDSW	SW
NPAS_CT	CTUPV CTV	PH PV
NPAS_LDLAG, NPAS_DLAY	LAGTM LDTM	I D
NPAS_AVE_M	OLDEST	PREV
NPAS_TPCFL NPAS_T_CFL, NPAS_P_CFL	PRSBS TMPBS	PB TB
NPAS_AVE_M NPAS_DLAY	SMPLTP SMPLN	SMPL NUM
NPAS_TM	TMUPV TMV	PH PV
NPAS_BSET_F, NPAS_BSET_LW	SUMP	SUM1

B6.2.2 Data Items of NPAS POU Structure Data Handled as Array Data

The table below lists data items of structure data of NPAS POUs of FCN/FCJ handled as array data in CENTUM.

Table Data Items of Structure Data of NPAS POU Handled as Array Data in CENTUM

NPAS POU Name	Access Parameter Name of NPAS POU	CS 3000 Name
NPAS_PG_L30	PLOT.Progress	X01 to X31
NPAS_PG_L30_BP	PLOT.OutData	Y01 to Y31
NPAS_FUNC_VAR	PLOT.X PLOT.Y	X01 to X31 Y01 to Y31
BDBUF_R	BDRL.Value BDRL.High BDRL.Low	BV01 to BV20 BH01 to BH20 BL01 to BL20
BDBUF_T	BDTM.Value BDTM.High BDTM.Low	BV01 to BV20 BH01 to BH20 BL01 to BL20

B6.2.3 Data Items that Disallows Writing

The table below lists items that can be written to FCN/FCJ from VDS but cannot be written from HIS.

Table Data Items that cannot be Written From HIS

NPAS POU Name	Data Item Name
NPAS_ASTM1	TMP
NPAS_ASTM2	
NPAS POU with I/O compensation	VN
NPAS_PG_L30	ZONE
NPAS_PG_L30_BP	
NPAS_TP_CFL	TMP, PRS
NPAS_T_CFL	
NPAS_P_CFL	

B6.2.4 Data items Checked by HIS using Different Data Range

The data range used for range check by HIS when it writes data to NPAS POU may differ from the valid data range allowed by NPAS POU for some data items. The table below lists such data items.

Table Data items with Different Data Range Checked by HIS

NPAS POU Name	Data Item of NPAS POU	CENTUM Name	Data Range Check by HIS	Allowable Data Range in NPAS POU
NPAS_AVE_M	SMPLTP	SMPL	0.1 - 10000.0 s	1 ms – 10000 s
NPAS_BDBUF_R	BDRL.Value	BV01 to BV20	Not checked	Checked against BDRL.SH/SL values
NPAS_BDBUF_T	BDTM.Value	BV01 to BV20	0 – 100000 s	Checked against BDTM.SH/SL values
NPAS_DLAY NPAS_LDLAG	LAGTM	I	0.1 - 10000.0 s	0.0 - 10000.0 s
NPAS_PG_L30 NPAS_PG_L30_BP	PRGTM PLOT.X	SV X01 to X31	0 – 100000 s 0 – 100000 s	0 ms – 24 days 0 ms – 24 days
NPAS_PID NPAS_PI_HLD	I	I	0.1 - 10000.0 s	1 ms - 10000 s
NPAS_TM	TMV TMUPV	PV PH	0 – 100000 s	0 ms – 24 days 0 ms – 24 days

B6.2.5 Other Precautions

Other precautions are listed below.

- Components in the Tuning window assume the same form as CENTUM.
- The display position for each alarm in the Tuning window is the same as CENTUM.
- CENTUM has "access levels" for reading and writing each data item, and restricts access according to the access privilege of the HIS log-in user. Although FCN/FCJ does not have this type of access control, the same type of access control as CENTUM is implemented.
- Items not present in CENTUM are not displayed in the Tuning window but can be read or set from data input windows.
- CENTUM has no BOOL data type so U16 data type is used with TRUE=1 and FALSE=0.
- Changing the MODE to "RCAS" from the Tuning window is not allowed. The MODE can be displayed.
- An instrument may be set to an invalid MODE from the Tuning window but will be immediately reverted to its original MODE.

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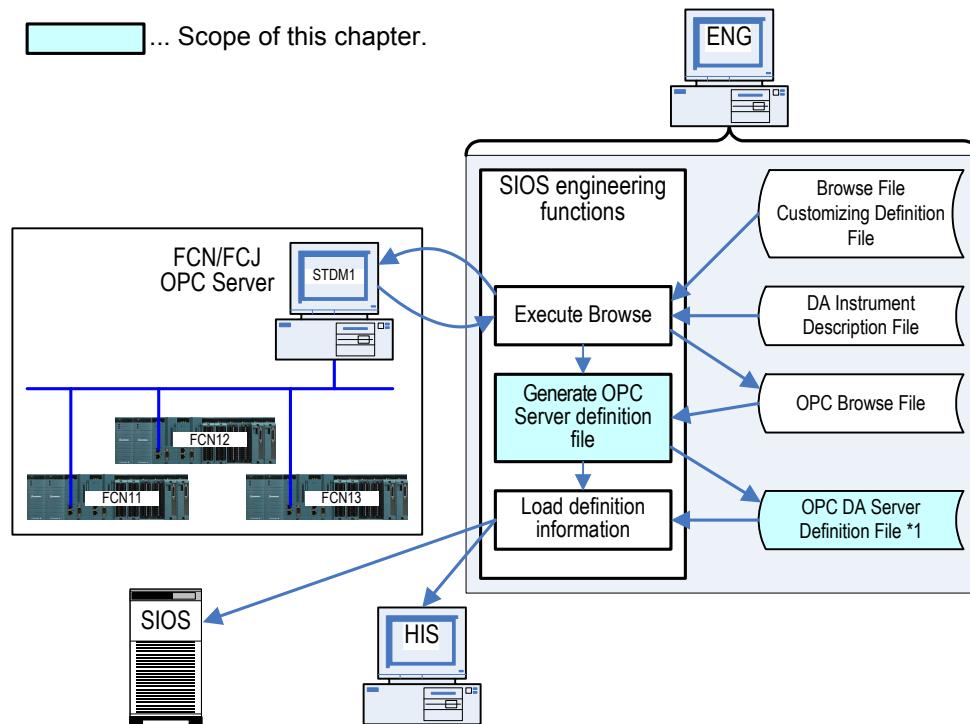
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C1. Rules for Automatic Generation of OPC DA Server Definition File

This appendix describes in detail rules for automatic generation of the OPC DA server definition file.

■ Main Functions and Files Related to Automatic Generation of OPC DA Server Definition File

The figure below shows the main functions and files related to automatic generation of the OPC DA server definition file.



*1: The OPC DA server definition file is also used in CAMS for HIS engineering.

Figure Main Functions and Files Related to Automatic Generation of OPC DA Server Definition File

SEE ALSO

For details on automatic generation of OPC DA server definition file, see Section B4.3.4, "Automatic Generation of OPC DA Server Definition File."

C1.1 Tag Information at Automatic Generation

During automatic generation of the OPC DA server definition file from an OPC browse file, if a previously created OPC DA server definition file is found, tag information is saved in the manner described below.

1. New tags
New tags are generated according to information in the OPC browse file.
2. Tags having the same name
These tags are processed according to the [Rule of when the automatic generation destination file is saved].
(For details, see Section C1.2, "Identical Tag Names at Automatic Generation.")
3. Deleted tags
Tag information that is present only in the previously created OPC DA server definition file is deleted. (Example: Tag C in the figure below)

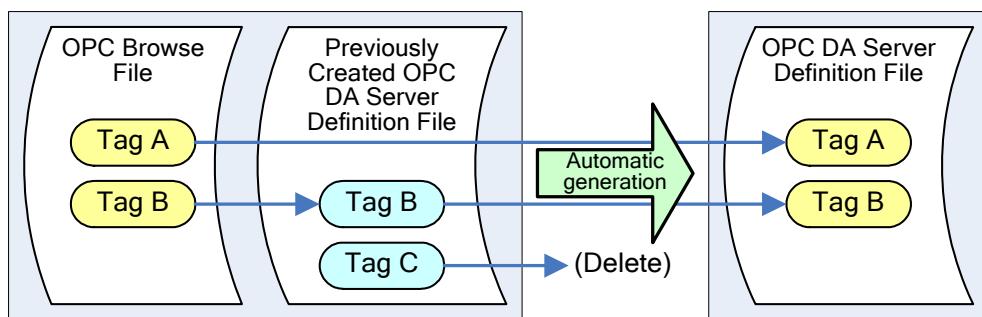


Figure Conceptual Diagram of Automatic Generation of OPC DA Server Definition File

C1.2 Identical Tag Names at Automatic Generation

During automatic generation of the OPC DA server definition file from an OPC browse file, if a previously created OPC DA server definition file is found, tag information is generated in the manner described in Section C1.1, "Tag Information at Automatic Generation."

If a tag of the same name already exists, the selected [Rule of when the automatic generation destination file is saved] is applied.

When performing automatic generation of OPC DA server definition file, the following three rule options are provided for saving to the automatic generation destination file:

- [Update All]
- [Not updated if the same tag is found]
- [Only Browse information is updated if the same tag is found]

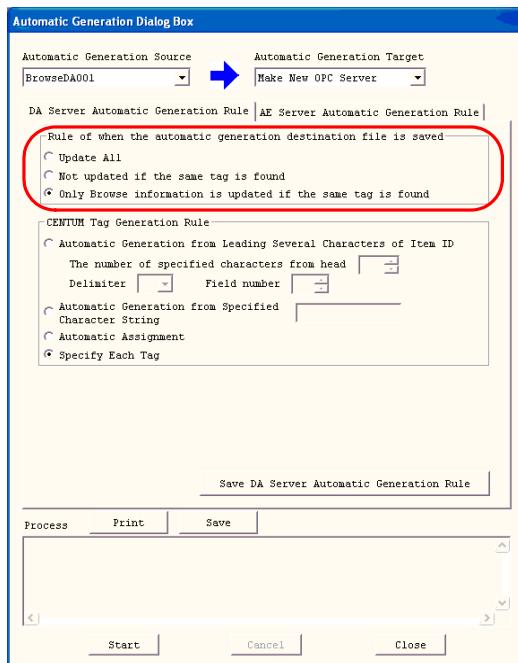


Figure Automatic Generation dialog box (DA Server Automatic Generation Rule tab)

Tag information stored in the OPC DA server definition file may be categorized as follows:

- Information automatically generated from the OPC browse file
- Information automatically generated from the OPC browse file and modified by the user
- Information not present in the OPC browse file (its initial value is defined in the DA instrument description file.)
- Information not present in the OPC browse file and modified by the user

SEE ALSO

For details on customizing the OPC DA server definition file, see Section B6.1, "Amending OPC DA Server Definition File."

The rule for saving to the automatic generation destination file converts tag information in the OPC DA server definition file as shown in the table below.

**Table Update of Tag Information according to
[Rule of when the automatic generation destination file is saved]**

[Rule of when the automatic generation destination file is saved]	Information automatically generated from OPC Browse File	Information automatically generated from OPC Browse File and modified by user	Information not present in OPC Browse File	Information not present in OPC Browse File and modified by user
[Update All]	Information is updated using information generated automatically from the OPC browse file.		Initial values are used.	
[Not updated if the same tag is found]		Information in the previously created OPC DA server definition file is retained.		
[Only Browse information is updated if the same tag is found]	Information is updated using information generated automatically from the OPC browse file.		Information in the previously created OPC DA server definition file is retained.	

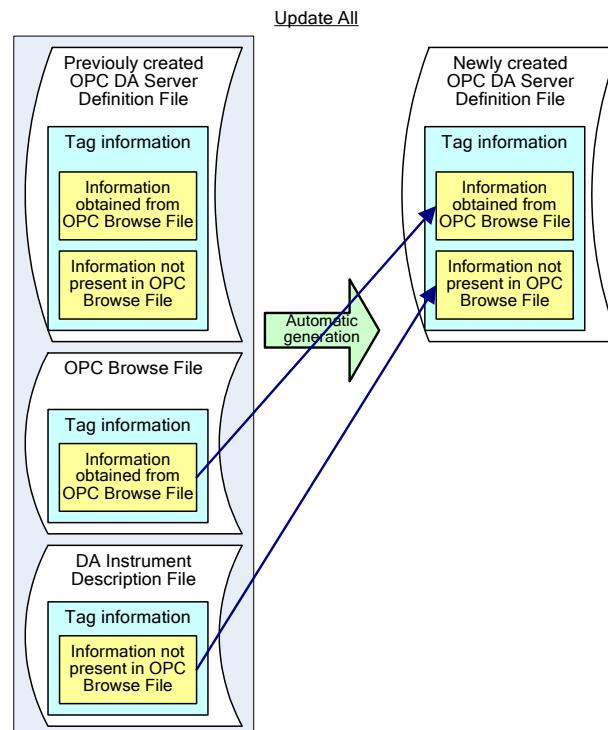


Figure Processing when [Rule of when the automatic generation destination file is saved] is set to [Update All]

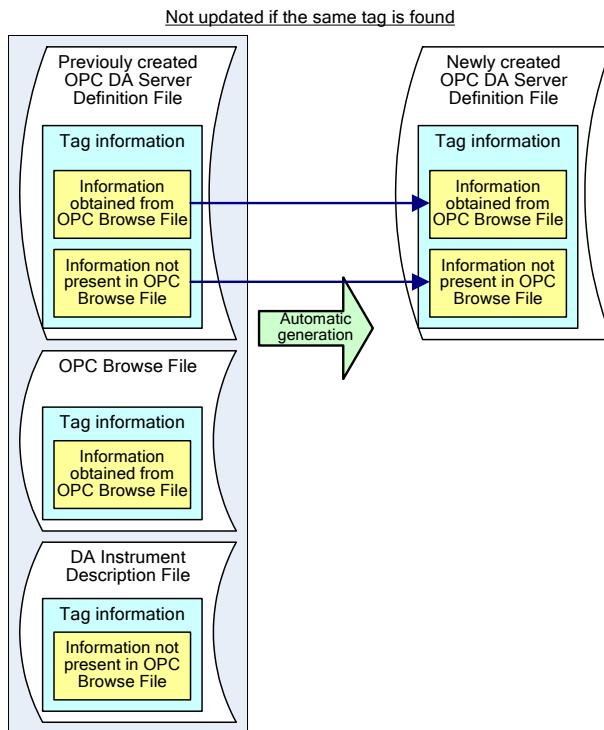


Figure Processing when [Rule of when the automatic generation destination file is saved] is set to [Not updated if the same tag is found]

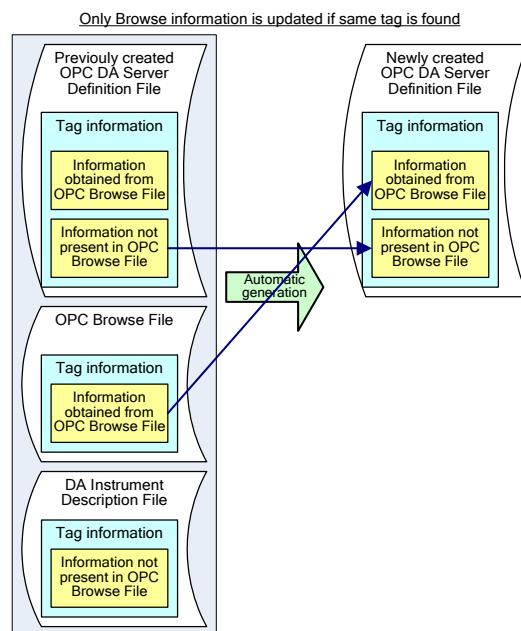


Figure Processing when [Rule of when the automatic generation destination file is saved] is set to [Only Browse information is updated if the same tag is found]

C1.3 Options for Automatic Generation of OPC DA Server Definition File

The automatic generation of OPC DA server definition file function provides an option to retain previously generated tag information.

By default, tag information not found in the OPC browse file is deleted.

If you enable the "Retain automatically generated information" option, information with no corresponding tag name in the OPC browse file is not deleted from the previously created OPC DA server definition file.

TIP

This option is independent of the [Rule of when the automatic generation destination file is saved] selected at automatic generation of OPC DA server definition file.

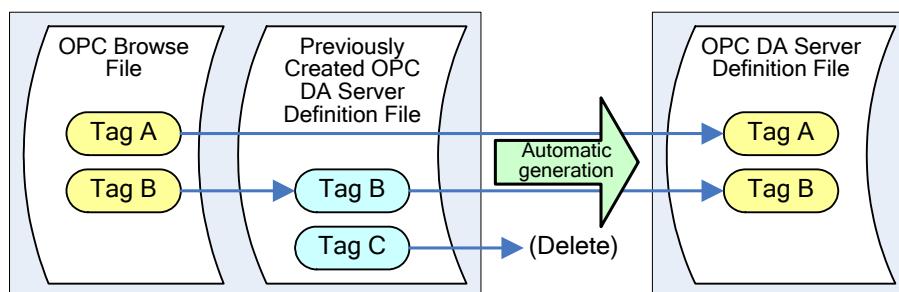


Figure Automatic Generation of OPC DA Server Definition File (default case)

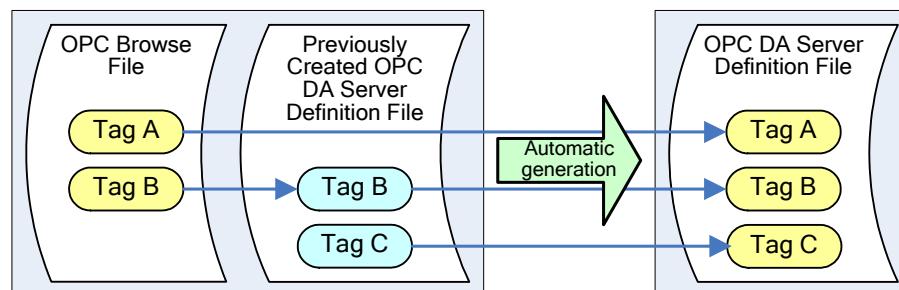


Figure Automatic Generation of OPC DA Server Definition File (with "Retain automatically generated information" option enabled)

■ How to Enable Retain Option

The procedure for enabling the "Retain automatically generated information" option for automatic generation of OPC DA server definition file is described below.

- **Configuration File**

BcvOpcEnv.ini

- **Location of File**

<CENTUM VP installed folder>\eng\BKProject\<project name>
<SIOS station name>\SYSTEM

Or

<CS 3000 installed folder>\eng\BKProject\<project name>
<SIOS station name>\SYSTEM

- **Definition**

The figure below shows the part of the BcvOpcEnv.ini file for configuring automatic generation.

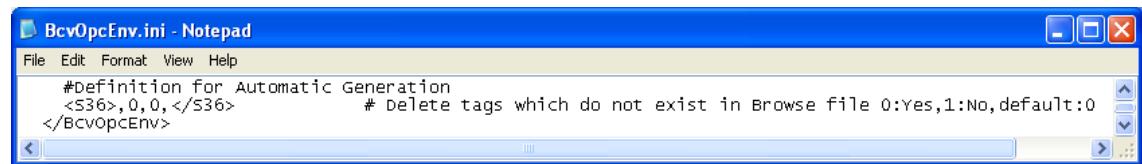


Figure BcvOpcEnv.ini (before enabling Retain option)

You should change the default option value of "Delete" to "Retain" as shown in the figure below.

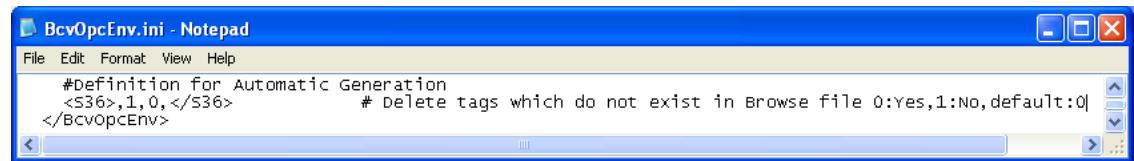


Figure BcvOpcEnv.ini (with Retain option enabled)

Change the first item of <S36> from 0 to 1.

Keep the other items unchanged.

This item can be loaded online. In general, other modifications to the "BcvOpcEnv.ini" file need to be loaded offline.

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C2. Performance

This chapter describes the communication performance.

C2.1 Communication performance between CENTUM and FCN/FCJ

Communication performance depends on the number of packets which FCN/FCJ sends and receives when FCN/FCJ is connected to CENTUM, and the number of packets which FCN/FCJ sends and receives depends on CPU load.

The number of packets is reduced in case of heavy CPU load and increased in case of low CPU load.

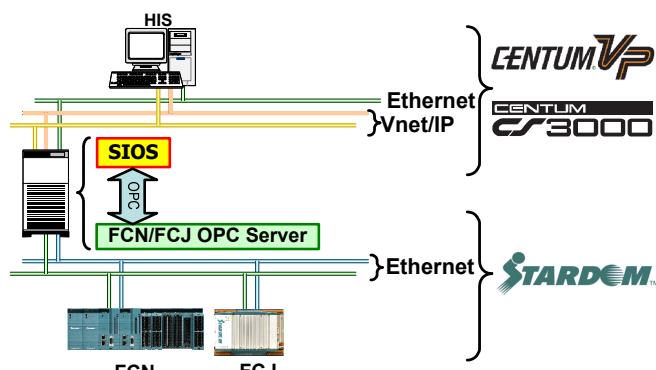


Fig Example of CS 3000 connecting with FCN/FCJ

■ CPU load and communication speed of FCN/FCJ

- **Data Size**

FCN/FCJ sends and receives 2Kbyte data per each communication to FCN/FCJ OPC Server FCN/FCJ.

The total data number, which FCN/FCJ can send and receive, depends on data type.

Table FCN/FCJ data number per each communication

Data Type	Data Size	Data number per each communication
BOOL	4 Byte	512 (*1)
BYTE		
INT		
REAL		
CDataReal	32 Byte	64
NPAS_PVI	124 Byte(*2)	16
NPAS_PID	196 Byte(*2)	10

*1 : The data size, which is less than 2Byte, is expanded to 4 Byte.

*2 : Data size of NPAS POU objects are summation of data acquired in "normal scan". The size of data, which is acquired in "low speed scan" is not included in that data size. Data size of NPAS POU objects differ in data type.

SEE ALSO

Please refer to "VDS Engineering (IM 34P02D02-01E)" "C5. PAS POU Objects" for each NPAS POU object size.

- Communication Speed Depending on CPU Load**

Average responding time , when FCN/FCJ OPC Server reads one packet (2 Kbyte) data from FCN/FCJ, is shown in the following table.

Average responding time is delayed as CPU load becomes heavier.

Table CPU load of FCN/FCJ and average responding time

CPU load	20%	40%	60%
Average responding time	50ms / Packet	70ms / Packet	100ms / Packet

Communication data number is shown in the following table in case of communicating only NPAS POU data.

In case of heavier CPU load, communication data number is reduced.

Table FCN/FCJ CPU load and communication data number

NPAS POU (Data size)	CPU Load		
	20%	40%	60%
NPAS_PVI (124 Byte / Data))	320 data / sec	224data / sec	160data /sec
NPAS_PID (196 Byte / Data))	200 data / sec	140data / sec	100data / sec

NOTE : Communication data number is reduced with other communication.



IMPORTANT

The data in the above table is the maximum communication data number. During configuring systems phase, please consider extra CPU load and communication data.

■ Other Specifications

- SIOS : SIOS can communicate Max. 4480^{(*)1} data /sec with HIS.
- FCN/FCJ OPC Server: OPC Server can communicated with maximum 100 pieces of FCN/FCJ.

*1 : In case that data size is 4 Byte.

■ Performance under the recommended environment

When SIOS and FCN/FCJ OPC Server run on the COTS PC under recommended environment, SIOS and FCN/FCJ OPC Server can communicate approx. 1000 data^{(*)1} per second. Therefore each FCN/FCJ can communicate 200 data per second when five pieces of FCN/FCJ are connected.

*1: Data type is NPAS_PID.

Revision Information

Document name : Engineering Guide of CENTUM/STARDOM Integration
Document No. : TI 34P02K41-01E

Mar. 2007/First Edition

- New publication

Feb. 2008/2nd Edition

- “C3. Performance” was added.

July. 2010/3rd Edition

- “CENTUM VP” was added.

Dec. 2011/4th Edition

- “CENTUM VP UGS” was added.
- The contents of C1. were moved into A1.
- C2. and C3. were renumbered to C1. and C2. respectively.

Written by Process Automation PMK Dept.
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