

General Specifications

eCUBE Unit



GS 34P03A02-01E

■ GENERAL

The eCUBE unit is connected to on-site equipment, collects and stores data from the equipment, and makes a notification in case of alarm issuance.

The eCUBE units constitute the eCUBE remote monitoring and control solution in combination with client PCs and an eCUBE center server system which controls all the units.

■ COMPONENTS

An eCUBE unit is comprised of STARDOM's FCN (Field Control Node) or FCJ (Field Control Junction) autonomous controller and application software that runs on the controller.

Note: Select a single CPU and single network configuration for the controller that is to be used as an eCUBE unit.

■ FEATURES

- Maintenance time and cost can be reduced by adopting highly reliable hardware without moving parts.
- The eCUBE unit can be easily connected with existing equipment through the Ethernet or other means, without changing the equipment's control capability.
- Data display pages and the alarm issuance function are automatically configured by simply allocating data addresses to be monitored, and setting alarm and other conditions.

■ CONNECTIONS TO EQUIPMENT MONITORED

The eCUBE unit and equipment can be connected with the following interfaces two or more of which can be mixed in a system. Equipment data are collected as analog, pulse, or discrete signals for any of the following interfaces:

● Hardware I/O

Data are obtained directly from equipment as analog signals such as 4-20 mA and 1-5 V.

● Ethernet/RS-232-C

The data can be collected from PLCs and equipment of through Ethernet or RS-232-C. In addition, the following driver is built into the eCUBE Unit.

Ethernet

- FA-M3 (PC-Link)
- Mitsubishi Electric's MELSEC (commands compatible with MELSEC-A)
- Equipment for Modbus / TCP

RS-232-C

- OMRON's SYSMAC (C-mode commands)
- Equipment for Modbus RTU mode



Figure eCUBE Units

■ OPERATING ENVIRONMENT

● eCUBE System Development Environment

PC:

Compliant with the operating environment for FCN/FCJ Logic Designer. Please refer to GS 34P02Q75-01E Logic Designer.
CompactFlash reader/writer for USB/PCMCIA connection (*1)

*1: Necessary when using the Off-line Engineering Tool.

● Client PC

PC:

Internet Explorer 6.0 (SP1, SP2) + Sun Java Plug-in 1.4.2_09

■ FUNCTION SPECIFICATIONS

Table Overview of eCUBE Unit Functions

	Item	eCUBE Data Size				Remarks
		L	M	S (*1)	SS	
Data collection	Maximum number of inputs	272	150	80 (272)	32	Total analog, discrete, and pulse inputs (Except event discrete inputs)
	Analog inputs	128	128	80 (128)	32	
	Discrete inputs	128	128	80 (128)	32	
	Pulse inputs	16	16	16 (16)	16	
	Event discrete inputs	512				Only available for event processing (*7).
	Input method	Hardware I/O or PLC communication				Ethernet for FA-M3 , MELSEC and Modbus RS-232-C for SYSMAC (*5) and Modbus
	Collecting interval					
	Analog	100 ms to 20 s (*2)				
	Discrete					
	Pulse	100 ms to 20 s				Use digital input modules. The NFAP 135 pulse input module cannot be used.
Alarm notification	Number of running time and count inputs	16 max				Choose from discrete inputs. (*3)
	Number of Variation/Prediction Warning inputs	16 max				Choose from analog inputs.
	Event discrete	2 s to 20 s				
	Analog alarm handling	6 types (HH, H, H2, L2, L, and LL)				H2 and L2 are provided for equipment manufacturer's preventative (predictive) maintenance.
	Analog variation/prediction alarm handling	4 types (VH, VL, PRH, and PRL)				Choose from analog inputs. (16 max)
	Discrete alarm handling	On or Off				Off signal is output by logic reversal.
	Event discrete alarm handling	On or Off				Off signal is output by logic reversal.
Data storage	Number of alarm masking conditions (concatenation function)	5 types				e.g., constant monitoring or only when the running status is On.
	Event handling	4 types				
	Alarm level	6 types. (5 analog and 6 discrete alarms)				
	e-mail transfer	Up to 10 people can receive each alarm level.				(*8) (*9)
	Storage period for minute data	7 days				All analog, pulse signals, running time and running count
	Storage period for hour data	31 days				All analog, pulse signals, running time and running count
	Number of types of concatenation processing of hourly data	5 types				
Web browser display	Storage period for event data (*4)					
	Fast analog signals	-30 s to +5 s (collected at 100-ms intervals)				Up to 16 analog inputs can be selected.
	Normal analog signals	-240 s to +5 s (collected at 1-s intervals)				All analog signals
	Discrete signals	-30 s to +5 s (collected at 100-ms intervals)				All discrete signals
	Event discrete signals	Unavailable				No data can be saved for event contact signals.
	Number of clients that can be connected simultaneously	5 clients				Clients must be equipped with Internet Explorer and Sun Java Plug-in.
	Data update interval	5 s				If data has to be frequently stored or many events have to be processed, this takes priority over data updating.
Parameter setting	Number of data overview pages that can be displayed	1 max.				
	Number of analog bar pages that can be displayed	24 max.				8 data per page
	Number of alarm setting pages that can be displayed	24 max.				8 data per page
	Number of discrete status display pages that can be displayed	16 max.				32 data per page
	Number of totalized pulse data display pages that can be displayed	4 max.				16 data per page
Parameter setting	Number of running time/count data display pages that can be displayed	4 max.				16 data per page
	Number of trend display pages that can be displayed	64 max.				2 pens per page
	Analog alarm setting					✓
	Concatenation setting					✓
	Event processing code setting					✓
Parameter setting	Concatenation setting on daily report data					✓
	Running time/count data reset					✓

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- *1: When data are collected only through hardware I/O and Yokogawa's FA-M3, up to the same number of inputs as the standard types can be monitored, which is shown in parentheses.
- *2: The collecting interval varies with the connection to PLC and the size of the device to read from.
- *3: Input a 20 ms or longer pulse for both the On state and Off state durations.
(For the NFDV141 and NFDV142 however, input a 200 ms or longer pulse for both the On state and Off state durations.)
- *4: When alarm events occur continuously, up to three events can be saved simultaneously.
- *5: The eCUBE can communicate with only PLC and PLC devices that comply with the applicable communication portfolio's specifications. For details about the communication portfolios, see GS 34P02P20-01E "Application Portfolios for FCN/FCJ."
- *6: Collects device data from the PLC as bits if the data is based on contact signals, as 16-bit unsigned integers if the data is based on analog signals, and as 32-bit unsigned integers if the data is based on pulse signals.
- *7: The optional package eCUBE Event Discrete Input Function is necessary to be able to use the event contact input.
- *8: The SMTP protocol is used to send e-mails.
This function supports the authentication function of SMTP servers (SMTP Authentication/Pop Before SMTP).
- *9: An SMTP server must exist on the network.

Table Input Modules Available for eCUBE Unit (FCN)

Model	Function
NFAI141	Analog Input Module (4 to 20 mA, 16-channel, Non-Isolated)
NFAV141	Analog Input Module (1 to 5 V, 16-channel, Non-Isolated)
NFAV142	Analog Input Module (-10 to +10V, 16-channel, Non-Isolated)
NFAI841	Analog I/O Module (4 to 20 mA input, 4 to 20 mA output, 8-channel input/ 8-channel output, Non-Isolated) (*1)
NFAB841	Analog I/O Module (1 to 5 V input, 4 to 20 mA output, 8-channel input/ 8-channel output, Non-Isolated) (*1)
NFAI143	Analog Input Module (4 to 20 mA, 16-channel, Isolated)
NFAV144	Analog Input Module (1 to 5 V/-10 to 10 V, 16-channel, Non-Isolated)
NFAT141	TC/mV Input Module (16-channel, Isolated)
NFAR181	RTD Input Module (12-channel, Isolated)
NFAI135	Analog Input Module (4 to 20 mA, 8-channel, Isolated channels)
NFAI835	Analog I/O Module (4 to 20 mA, 4-channel input/4-channel output, Isolated channels) (*1)
NFDV151	Digital Input Module (Discrete/Pulse input, 32-channel, 24 V DC, Isolated)
NFDV157	Digital Input Module (Discrete input, 32-channel, 24 V DC, Pressure Clamp Terminal support only, Isolated)
NFDV161	Digital Input Module (Discrete/Pulse input, 64-channel, 24 V DC) (*2)
NFDV141	Digital Input Module (Discrete/Pulse input, 16-channel, 100 V - 120 V AC, Isolated)
NFDV142	Digital Input Module (Discrete/Pulse input, 16-channel, 220 V AC)

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- *1: The 4 to 20 mA output cannot be used for the eCUBE unit.
- *2: The Pulse Input option is only available for channels 1 to 32.

● **Data Collection**

Data are collected from field equipment on a regular basis according to the connection interface. Collected data can be monitored as current values on Web browser.

● **Data Storage**

Collected data are stored in System card on eCUBE units. In addition to periodic storage, data can be saved before and after preset events occur. Data saved can be used for preventative and corrective maintenance.

● **Alarm Notification**

Alarms are issued when preset conditions are met. Alarms can be prompted such incidents as a change of the color of Web browser screens, e-mail transfer to cell phones or other addresses, and notifying the eCUBE center.

● **Web Browser Display**

Current values and alarms can be monitored, and alarm conditions and other settings can be changed with a Web browser. In particular, analog alarm conditions and event masking can be changed with a Web browser without interrupting the system operation.

● **Configuration**

The eCUBE unit eliminates engineering work for configuring logics or Web browser screens. Systems can be configured by simply allocating data addresses to be monitored and setting alarm and other conditions.

Following tools are required for system configuration: the eCUBE System Definition Tool, the eCUBE Configurator and Offline Engineering Tool.

1. eCUBE System Definition Tool

This tool enables users to define the attributes of data collected by eCUBE units – e.g., connected equipment, data types, and collecting and alarm conditions – and then outputs the definition data as a CSV file.

The definition is determined by how the equipment is monitored.

2. eCUBE Configurator

This tool imports a CSV file that has been output from the eCUBE System Definition Tool, and then automatically generates the necessary contents, such as software that runs on eCUBE unit, Web page definition files, and connection information with the eCUBE center.

These automatically generated contents are downloaded to the eCUBE unit using Resource Configurator or Logic Designer.

3. Off-line Engineering Tool

Like the eCUBE Configurator, this tool imports a CSV file that has been output from the eCUBE System Definition Tool, and then automatically generates the necessary contents, such as software that runs on eCUBE unit, Web page definition files, and connection information with the eCUBE center.

Off-line Engineering Tool writes the automatically generated data directly on a general-purpose PC to the FCN/FCJ system cards of the eCUBE unit using the CompactFlash reader/writer.

■ **ITEMS PROVIDED AS eCUBE UNIT**

The table below shows the necessary items to operate the eCUBE unit:

Category	Product	Remarks
FCN/FCJ hardware (*1)	FCN/FCJ autonomous controller	Choose FCN or FCJ according to the number of the hardware I/O.
FCN/FCJ software (*1)	FCN/FCJ basic software license (including Java capability)	—
	Communication portfolio license	When the eCUBE is connected with equipment via PLC, choose a license appropriate to the PLC.
	eCUBE unit portfolio license	Choose the most suitable license from the four types available, depending on the number of data to be monitored.
Development environment	eCUBE configurator license	Necessary to run the eCUBE Configurator and Off-line Engineering Tool. Two options available: single licenses that are necessary for each FCN/FCJ, and site licenses that can be applied to multiple FCNs/FCJs. Choose one depending on the number of eCUBE units purchased.
	FCN/FCJ logic designer license	—
CD-ROM	FCN/FCJ software media	—
	Application portfolio software media	—

*1: All the products are required for each FCN/FCJ.

HARDWARE SPECIFICATIONS

For FCN/FCJ hardware specifications, see the following documents:

- GS 34P02Q11-01E “FCJ Autonomous Controller Hardware”
- GS 34P02Q12-01E “FCN Autonomous Controller Hardware”

Note: that an uninterruptible power supply must be used to avoid potential power failures.

RELATED DOCUMENTS

- GS 34P02Q11-01E “FCJ Autonomous Controller Hardware”
- GS 34P02Q12-01E “FCN Autonomous Controller Hardware”
- GS 34P02Q01-01E “FCN/FCJ Autonomous Controller Functions”
- GS 34P02P20-01E “Application Portfolios for FCN/FCJ”
- GS 34P02Q75-01E “Logic Designer”

MODELS AND SUFFIX CODES

		Description
Model	NT8801J	eCUBE unit portfolio license, SS type
Suffix Codes	-L	License
	W	Issued at Web
	1	Always 1
	1	Always 1
	A	Standard

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		Description
Model	NT8802J	eCUBE unit portfolio license, S type
Suffix Codes	-L	License
	W	Issued at Web
	1	Always 1
	1	Always 1
	A	Standard

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		Description
Model	NT8803J	eCUBE unit portfolio license, M type
Suffix Codes	-L	License
	W	Issued at Web
	1	Always 1
	1	Always 1
	A	Standard

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		Description
Model	NT8804J	eCUBE unit portfolio license, L type
Suffix Codes	-L	License
	W	Issued at Web
	1	Always 1
	1	Always 1
	A	Standard

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		Description
Model	NT8800J	eCUBE configurator single license
Suffix Codes	-L	License
	W	Issued at Web
	1	Always 1
	1	Always 1
	A	Standard

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		Description
Model	NT480FJ	eCUBE configurator site license
Suffix Codes	-L	License
	W	Issued at Web
	1	Always 1
	1	Always 1
	A	Standard

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■ ORDERING INSTRUCTIONS

Specify the model and suffix codes.

For information about the FCN/FCJ application portfolios' software media, see GS 34P02P20-01E "Application Portfolios for FCN/FCJ."

■ TRADEMARKS

- STARDOM is a trademark of Yokogawa Electric Corporation.
- Application Portfolio is a trademark for which the registration is currently under application.
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