MITSUBISHI ELECTRIC
Changes for the Better

FACTORY AUTOMATION

MELSEC iQ-F Series
iQ Platform-compatible PLC
FX5-OPC

CERTIFIED FOR COMPLIANCE OPC FOUNDATION

MELSEC iQ-F series

FX5-OPC
OPERATION ●
SESSION ●
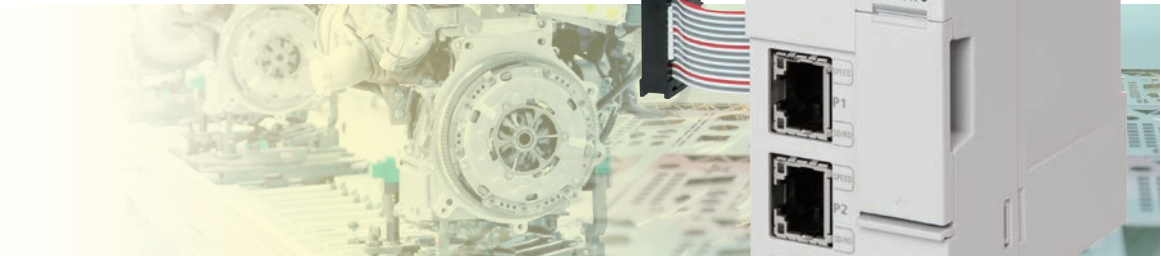D ACCESS ●

POWER ○
RUN ○
ERROR ●

Bridges the worlds of manufacturing and IT

OPC UA® module

OPC UA interface - Compatible for greater application options.

OPA UA module, a new addition to the MELSEC iQ-F series.

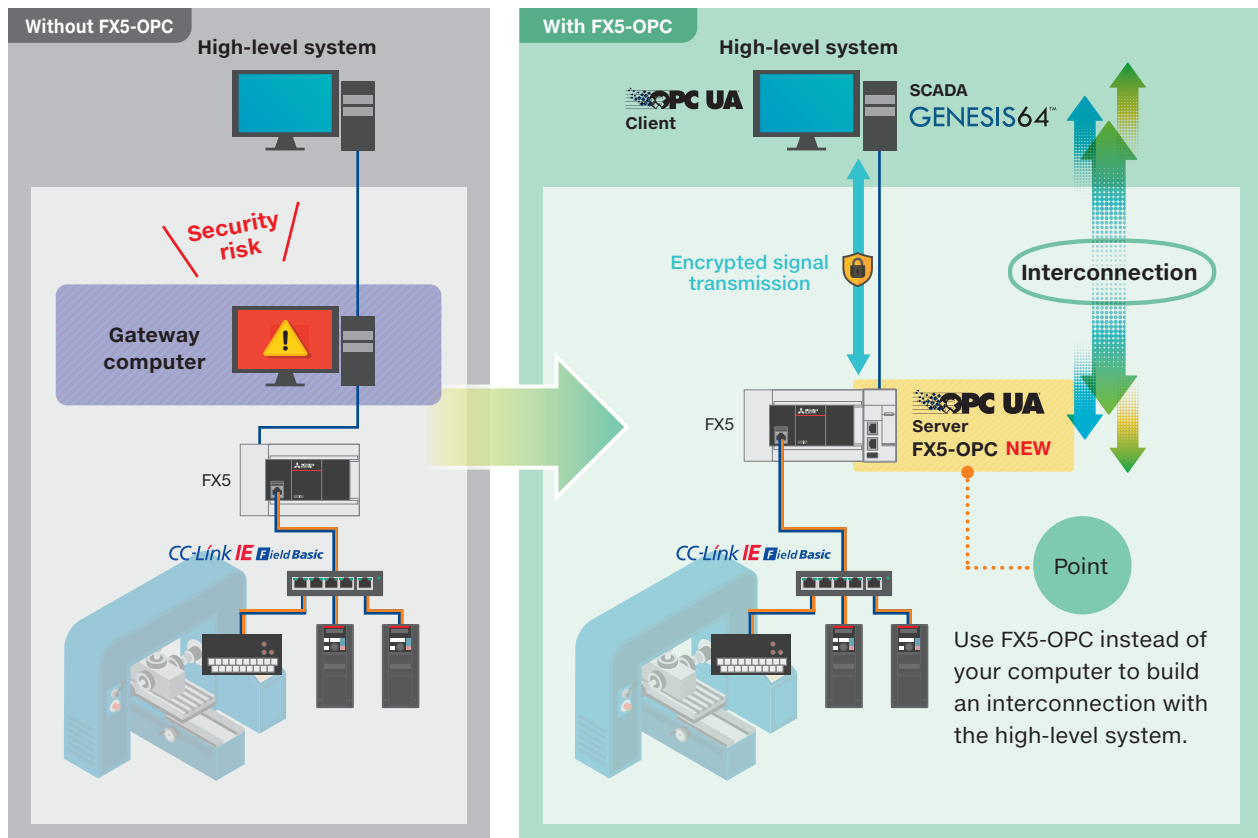## What is OPC Unified Architecture (OPC UA)?

OPC UA is a platform-independent communications standard developed by the OPC foundation, USA. It enables data exchange between vendor and OS neutral products, and offers secure and reliable data communications between manufacturing levels and higher-level IT systems.

OPC UA module

FX5-OPC*

Feature

Use the FX5-OPC as an OPC UA server to access the FX5 programmable controller data. FX5-OPC securely protects confidential information, such as machining information, from unauthorized access and eliminates the need for a gateway computer, reducing the security risk as well as the device cost.

▶ System configuration comparison with and without FX5-OPC

Without FX5-OPC

High-level system

Security risk

Gateway computer

FX5

CC-Link IE Field Basic

With FX5-OPC

High-level system

OPC UA Client

SCADA GENESIS64™

Encrypted signal transmission

Interconnection

FX5

OPC UA Server FX5-OPC NEW

CC-Link IE Field Basic

Point

Use FX5-OPC instead of your computer to build an interconnection with the high-level system.
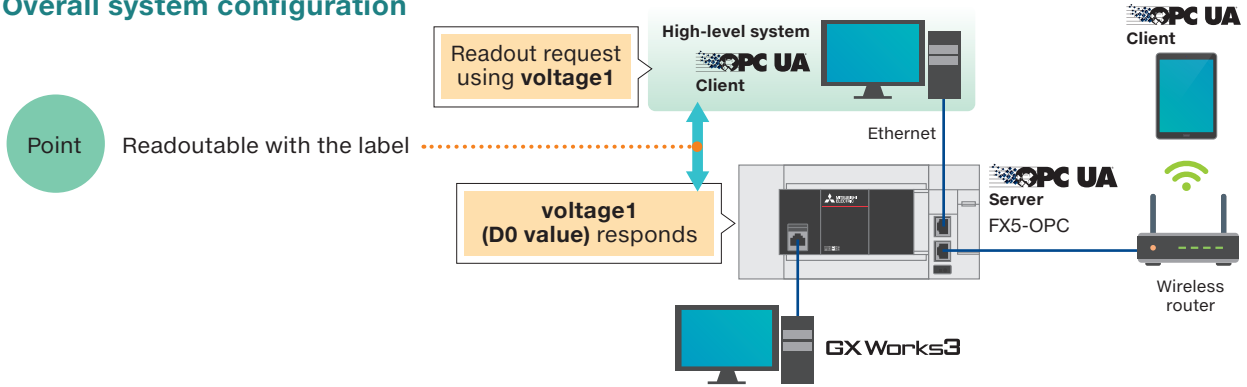
*: Compatible with FX5U/FX5UC CPU module firmware version 1.245 or later

Easy parameter setting

FX5-OPC (OPC UA server) responds to the readout request from the OPC UA client with the labels shown on the address space parameter setting window. Labels can be shown/hidden.

▶ Overall system configuration

Point Readoutable with the label

Readout request using **voltage1**

voltage1 (D0 value) responds

High-level system
OPC UA Client

OPC UA Client

Ethernet

OPC UA Server FX5-OPC

Wireless router
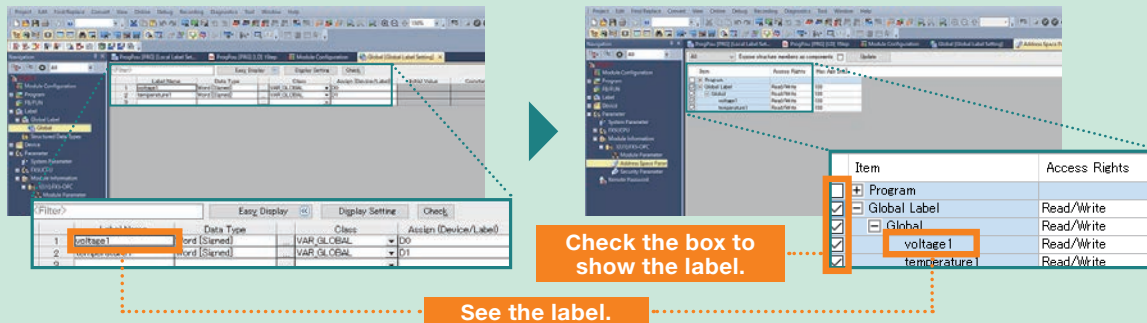
GX Works3

Setting the address space parameters

With GX Works3,[*1] labels can easily be set to the FX5-OPC (OPC UA server) address space.

Example: To set the D0 device label name to voltage1

1. Set the label. (Example: voltage1)

2. Access the address space parameter settings, and select the labels to be shown.
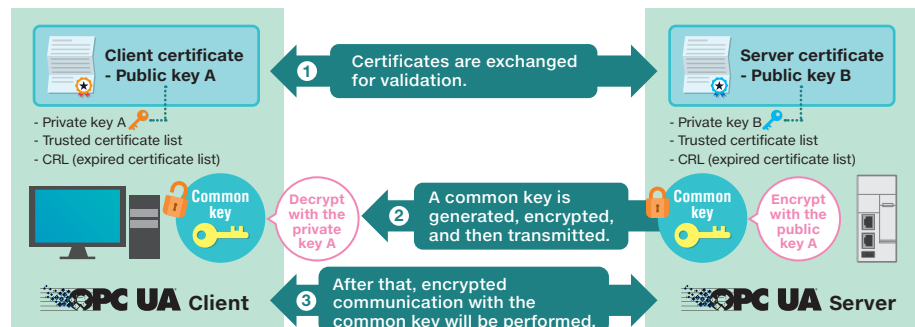

Check the box to show the label.

Item	Access Rights
⊞ Program	
⊟ Global Label	Read/Write
⊟ Global	
voltage1	Read/Write
temperature1	Read/Write

See the label.

Enhanced security

The security of the FX5-OPC is established by using GX Works3[*1] and OPC UA Module Configuration Tool.[*2] Set the security policy and the certificate to define the security level and grant access right to specific clients.

For free | OPC UA Module Configuration Tool | OPC UA Server FX5-OPC
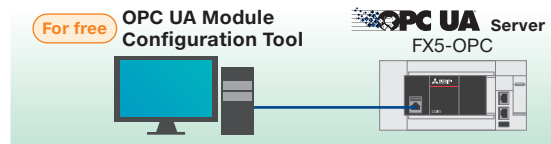
▶ Encrypted communication

FX5-OPC (OPC UA server) generates the common key, which is used to ensure secure communication with OPC UA client. The generated common key is encrypted and transmitted by using the public key included in the certificate and the corresponding private key.

Client certificate - Public key A
- Private key A
- Trusted certificate list
- CRL (expired certificate list)

① Certificates are exchanged for validation.

Server certificate - Public key B
- Private key B
- Trusted certificate list
- CRL (expired certificate list)

Common key
Decrypt with the private key A

② A common key is generated, encrypted, and then transmitted.

Common key
Encrypt with the public key A

③ After that, encrypted communication with the common key will be performed.

OPC UA Client

OPC UA Server

*1: Supported by GX Works3 Ver. 1.077F or later.
*2: OPC UA Module Configuration Tool is a tool for setting the IP addresses and security parameters, managing server certificates, and checking/changing the server status of FX5-OPC. Please contact your local Mitsubishi Electric sales office or representative.

PROGRAMMABLE CONTROLLERS
MELSEC iQ-F Series

■ General specifications

Items	Specifications	
Ambient operating temperature	-20 to 55°C	
Ambient storage temperature	-25 to 75°C	
Dielectric withstand voltage	500 V AC for 1 minute	Between all terminals and ground terminal
Insulation resistance	10 MΩ or higher by 500 V DC insulation resistance tester	

■ Power supply specifications

Items		Specifications
Internal power supply	Power supply voltage	24 V DC
	Current consumption	110 mA

■ Performance specifications

Items			Specifications
OPC UA server	OPC UA version		1.03
	Profile		Micro Embedded Device 2017 Server Profile
	User authentication		User name and password
	Maximum number of parallel sessions		4
	Maximum number of subscriptions per session		2
	Maximum number of monitored items per subscription		500
	Minimum sampling interval of a monitored item		100 ms
	Maximum number of trusted certificates		10
	Network topology		Star topology
Ethernet	Transmission specification	Data transmission speed	100/10 Mbps
		Communication mode	Full-duplex/half-duplex*1
		Transmission method	Base band
		Interface	RJ45 connector
		Maximum segment length	100 m*2
		Number of cascade connections — 100BASE-TX	2 levels maximum*3
		Number of cascade connections — 10BASE-T	4 levels maximum*3
	Hub*1		Hubs with 100BASE-TX or 10BASE-T ports*4 can be used.
	Connection cable*5		100BASE-TX,10BASE-T
	Number of ports		2
Number of occupied I/O points			8 points
Number of connectable modules			1 module

*1: IEEE802.3x flow control is not supported.
*2: For maximum segment length (length between hubs), consult the manufacturer of the hub used.
*3: This number applies when a repeater hub is used. For the number of levels that can be constructed when using a switching hub, consult the manufacturer of the switching hub used.
*4: The ports must comply with the IEEE802.3 100BASE-TX or 10BASE-T standards.
*5: A straight/cross cable can be used.
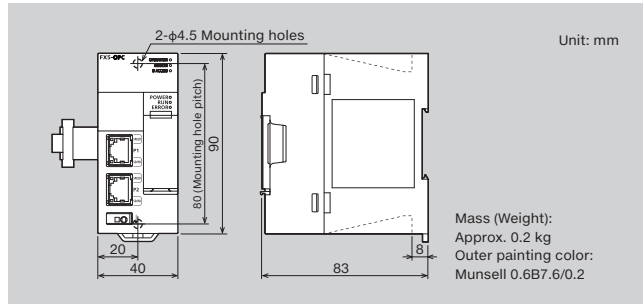
■ Applicable CPU module

Model name	Applicability
FX5U CPU module	Version 1.245 or later
FX5UC CPU module*	Version 1.245 or later

*: FX5-CNV-IFC or FX5-C1PS-5V is necessary to connect an FX5-OPC to an FX5UC CPU module.

■ Applicable software package

Software	Applicability
GX Works3	Version 1.077F or later
OPC UA Module Configuration Tool	Version 1.00A or later

■ External dimensions

2-φ4.5 Mounting holes
Unit: mm
80 (Mounting hole pitch)
90
20
40
83
8

Mass (Weight): Approx. 0.2 kg
Outer painting color: Munsell 0.6B7.6/0.2

■ Security policy

Security policy	Message security mode
None	None
Basic128Rsa15	Sign
	SignAndEncrypt
Basic256	Sign
	SignAndEncrypt
Basic256Sha256	Sign
	SignAndEncrypt

■ Product list

Item	Specifications
FX5-OPC	FX5-OPC OPC UA module
FX5U-U-HW-E	MELSEC iQ-F FX5U User's Manual (Hardware) Model code: 09R536
FX5UC-U-HW-E	MELSEC iQ-F FX5UC User's Manual (Hardware) Model code: 09R558
FX5-U-OPC-E	MELSEC iQ-F FX5 User's Manual (OPC UA) Model code: 09R580

⚠ Safety Warning
· To ensure proper use of the products in this document, please be sure to read the instruction manual prior to use.

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