

Replacing the FC3A OpenNet Controller
with the FC5A MICROSmart Series Programmable Controller

Replacement Guide



MICROSmart
pentra



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■ About this document

This document is a guide for replacing the FC3A OpenNet controller with the FC5A MICROSmart Series Programmable Controller. Refer to this document along with the MICROSmart Series Programmable Controller catalogs and user's manuals.

■ Switching to the FC5A

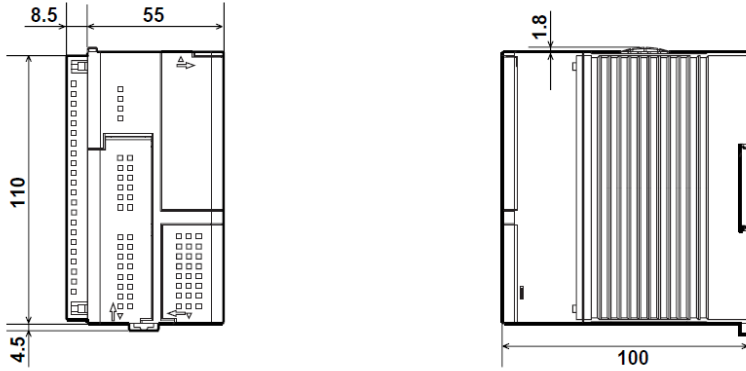
- The dimensions of the FC3A and the FC5A differ. The width, height, and depth of FC5A have all become smaller than those of FC3A. See "Dimensions" section on the following page.
- The size of terminal block or the shape of the connectors of the power supply and I/O terminals differ between the FC3A and the FC5A. Therefore, recommended wires and pole terminals for wiring may differ. See the "Wiring" section.
- The program capacity differs between the FC3A and the FC5A. The FC5A program capacity also differs by each CPU module, so take this point into consideration when selecting the FC5A CPU module.
- The FC5A CPU modules have built-in inputs and outputs ranging 10 to 32 points, depending on each model. Additionally, there are some models that cannot be expanded beyond those built-in inputs and outputs. Take this point into consideration when selecting the CPU module. The maximum number of expansion modules that can be connected to the FC5A depends on the CPU module type. The maximum number of inputs and outputs is determined by the combination of connected expansion modules, so consider this point when selecting the CPU module. See "CPU Module Selection Table".
- If you use a slim type CPU module (FC5A-D*****) with a maximum number of expansion modules mounted, the total I/O numbers can be greater than that of FC3A with a maximum number of expansion modules mounted.
- Even if you use recommended replacement model, the detailed specifications differ in the input impedance, operating voltage, and delay time of the input modules, and the maximum load current and the way to use common terminals of the output modules. See "Expansion Module Selection Table".
- The FC5A does not support negative voltage analog inputs (less than 0V). The FC5A does not provide a remote I/O system using Interbus.

Dimensions

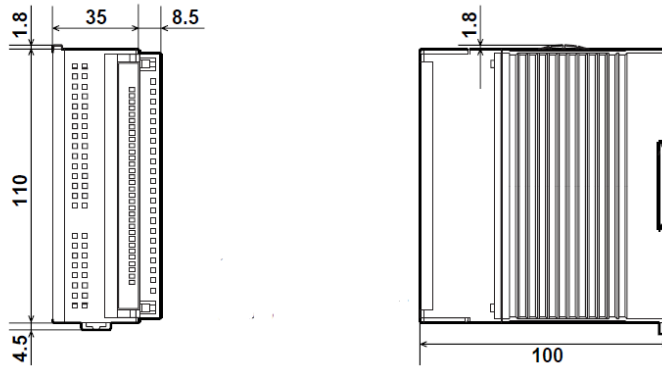
■ FC3A OpenNet Controller dimensions

All dimensions in mm

- CPU module



- I/O modules, remote I/O master modules, and expansion modules



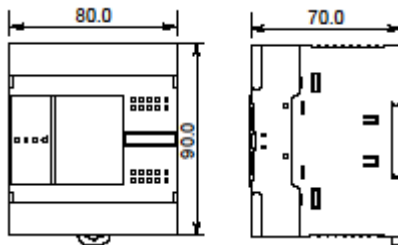
The dimensions of the I/O modules, the remote I/O master modules, and the expansion modules are the same.

■ FC5A Series MICROSmart dimensions

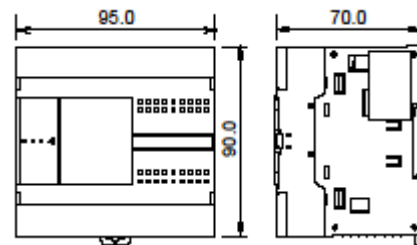
All dimensions in mm

- All-in-one type CPU modules

FC5A-C10R2C/C16R2C

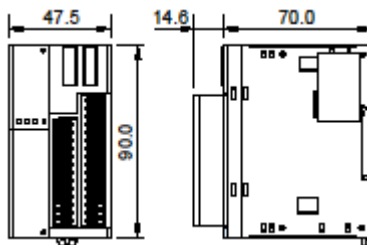


FC5A-C24R2C

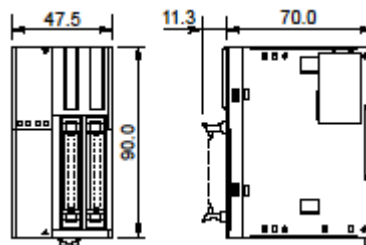


- Slim type CPU modules

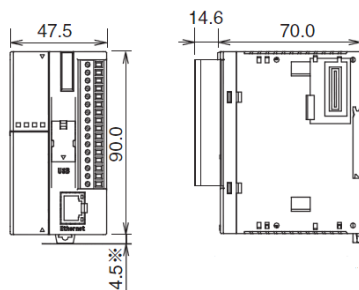
FC5A-D16R*1



FC5A-D32*3



FC5A-D12*1E

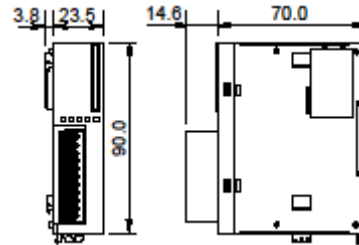


* Dimension when the clamp is pulled out is 8.5 mm.

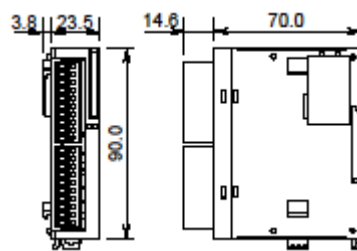
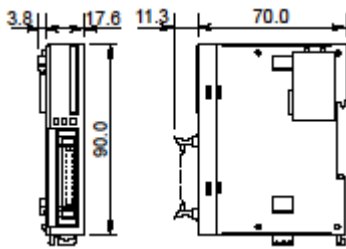
Dimensions

- Expansion modules (Width of the modules differs with each model)

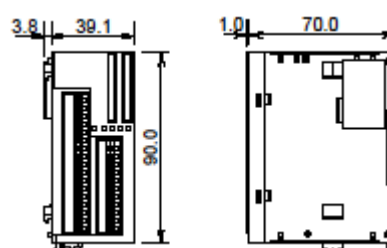
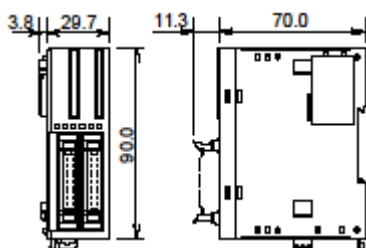
FC5A-SIF2	FC4A-K2C1	FC4A-N08B1
FC5A-SIF4	FC4A-L03A1	FC4A-R081
FC4A-AS62M	FC4A-L03AP1	FC4A-T08K1
FC4A-J2A1	FC4A-M08BR1	FC4A-T08S1
FC4A-K1A1	FC4A-N08A11	FC4A-K4A1



FC4A-N16B3	FC4A-N16B1	FC4A-J8AT1
FC4A-T16K3	FC4A-R161	FC4A-J4CN1
FC4A-T16S3	FC4A-J8C1	

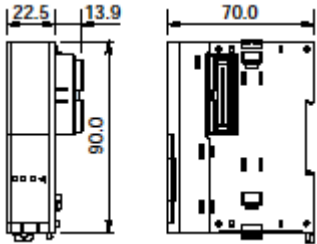


FC4A-N32B3	FC4A-F2MR2
FC4A-T32K3	FC4A-F2M2
FC4A-T32S3	FC4A-M24BR2



• Optional modules

FC4A-HPC1
 FC4A-HPC2
 FC4A-HPC3

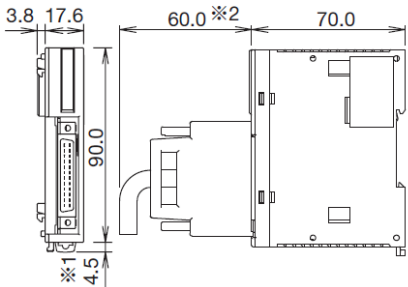


FC4A-HPH1



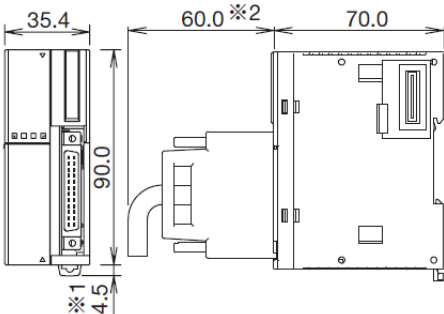
• Expansion interface modules

FC5A-EXM1M



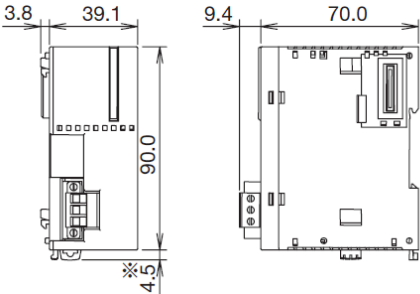
*1 Dimension when the clamp is pulled out is 8.5 mm.
 *2 Rough indication of the length when the cable is bent.

FC5A-EXM1S



*1 Dimension when the clamp is pulled out is 8.5 mm.
 *2 Rough indication of the length when the cable is bent.

FC5A-EXM2



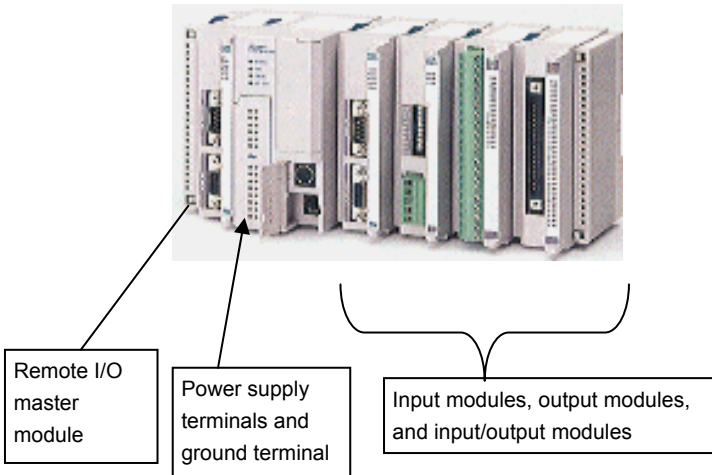
* Dimension when the clamp is pulled out is 8.5 mm.

Wiring

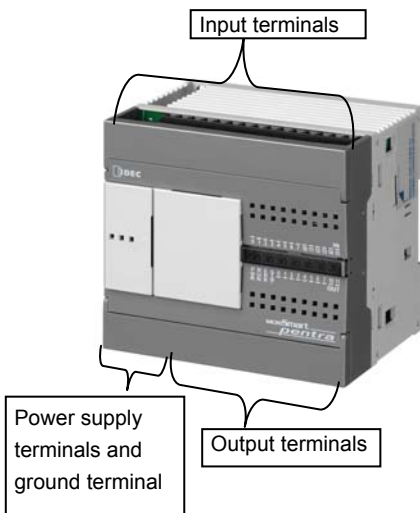
■ Wiring terminals

The wiring terminals of power supply and input/output of FC3A and FC5A are shown below.

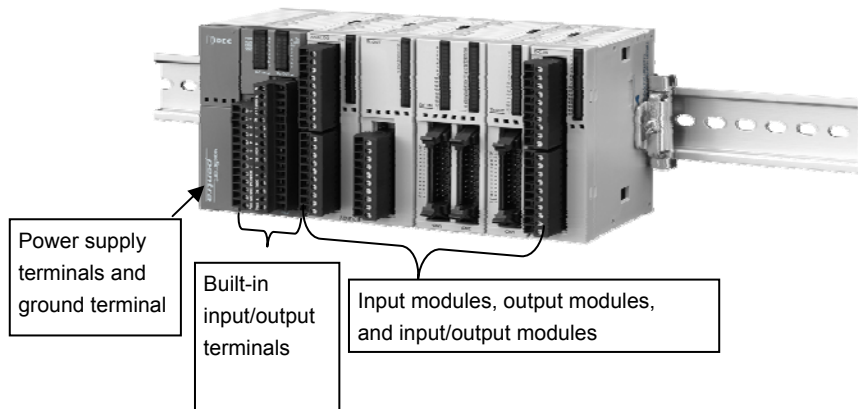
FC3A



FC5A All-in-One CPU Module



FC5A Slim CPU Module



■ Recommend wires and terminals

For the terminal connections to the FC5A power supply, the CPU module's built-in inputs and outputs, and the expansion module inputs and outputs, use the recommended wires and ferrules shown in the table below. However, connector-wired inputs and outputs are excluded.

	Terminals	Recommended Wire [Recommended Ferrule (Phoenix Contact)]	
		FC5A All-in-One CPU Module	FC5A Slim CPU Module
Power Supply	European Terminals	UL1007AWG18 [(1-wire)AI1-8RD, (2-wire)AI-TWIN2×0.75-8GY] UL1015AWG22 [(1-wire)AI0.5-WH, (2-wire)AI-TWIN2×0.5-8WH]	
Grounding		UL1007AWG16 [(1-wire)AI1.5-8BK]	UL1007AWG18 [(1-wire)AI1-8RD, (2-wire)AI-TWIN2×0.75-8GY] UL1015AWG22 [(1-wire)AI0.5-WH, (2-wire)AI-TWIN2×0.5-8WH]
CPU Modules Input / Output		UL1007AWG18 [(1-wire)AI1-8RD, (2-wire)AI-TWIN2×0.75-8GY] UL1015AWG22 [(1-wire)AI0.5-WH, (2-wire)AI-TWIN2×0.5-8WH]	UL1015AWG22 [(1-wire)AI0.5-WH, (2-wire)AI-TWIN2×0.5-8WH]
I/O Modules Input / Output		UL1015AWG22 [(1-wire)AI0.5-WH, (2-wire)AI-TWIN2×0.5-8WH]	

The recommended wire and ferrule for the FC3A are shown in the table below. Depending on the type of each wire and ferrule, currently used wires and ferrules can continue to be used after the replacement.

	Terminals	Recommended Wire [Recommended Ferrule (Phoenix Contact)]
Power Supply	European Terminals	UL1007AWG18 [(1-wire)AI1-8RD, (2-wire)AI-TWIN2×0.5-8WH] UL1015AWG22 [(1-wire)AI0.5-WH, (2-wire)AI-TWIN2×0.5-8WH]
Grounding		UL1007AWG18 [(1-wire)AI1-8RD, (2-wire)AI-TWIN2×0.5-8WH] UL1015AWG22 [(1-wire)AI0.5-WH, (2-wire)AI-TWIN2×0.5-8WH]
Input / Output		UL1007AWG18 [(1-wire)AI1-8RD, (2-wire)AI-TWIN2×0.5-8WH] UL1015AWG22 [(1-wire)AI0.5-WH, (2-wire)AI-TWIN2×0.5-8WH]

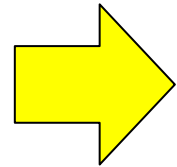
The cross-sectional area conversion table in AWG notation is shown below.

AWG Conversion List	
AWG	Cross Section(mm ²)
16	1.309
18	0.8226
20	0.5174
22	0.3256

The shape and pin layout of the connectors used for inputs and outputs differ between the FC3A and the FC5A. Select suitable connectors for the FC5A.

CPU Module Selection Table

CPU module	FC3A Part No.	Specifications
	FC3A-CP2K FC3A-CP2S	Program capacity equivalent to 16K steps



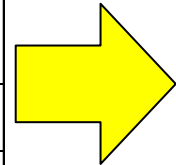
CPU Module Selection Table

Recommended Part No.	Power Supply Voltage	Program Capacity (Steps)	Digital I/O		Notes
			Inputs	Outputs	
FC5A-C10R2C	24 VDC	2.3K	6 inputs 24 VDC	4 relays 2 A / 1 output (3 outputs: COM0) (1 output: COM1)	Terminals No expansion modules can be added
FC5A-C16R2C	24 VDC	4.5K	9 inputs 24 VDC	7 relays 2 A / 1 output (4 outputs: COM0) (2 outputs: COM1) (1 output: COM2)	
FC5A-C24R2C	24 VDC	9K	14 inputs 24 VDC	10 relays 2 A / 1 output (4 outputs: COM0) (4 outputs: COM1) (1 output: COM2) (1 output: COM3)	
FC5A-D16RK1	24 VDC	10.4K	8 inputs 24 VDC	6 relays 2 A / 1 output (3 outputs: COM0) (2 outputs: COM1) (1 output: COM2) 2 transistor sinks 0.3 A / 1 output (2 outputs / 1 common)	Removable Terminals Combined 7 expansion modules and an expansion interface module for +8 modules 496 inputs/outputs in the maximum I/O points configuration
FC5A-D16RS1	24 VDC	10.4K	8 inputs 24 VDC	6 relays 2 A / 1 output (3 outputs: COM0) (2 outputs: COM1) (1 output: COM2) 2 transistor sources 0.3 A / 1 output (2 outputs / 1 common)	
FC5A-D12K1E	24 VDC	21.3K	8 inputs 24 VDC	4 transistor sinks 0.3 A / 1 output 1 A / 1 common (4 outputs / 1 common)	Removable Terminals Combined 7 expansion modules and an expansion interface module for +8 modules 492 inputs/outputs in the maximum I/O points configuration
FC5A-D12S1E	24 VDC	21.3K	8 inputs 24 VDC	4 transistor sources 0.3 A / 1 output 1 A / 1 common (4 outputs / 1 common)	
FC5A-D32K3	24 VDC	10.4K	16 inputs 24 VDC	16 transistor sinks 0.3 A / 1 output 1 A / 1 common (8 outputs / 1 common)	MIL Connector Combined 7 expansion modules and an expansion interface module for +8 modules 512 inputs/outputs in the maximum I/O points configuration
FC5A-D32S3	24 VDC	10.4K	16 inputs 24 VDC	16 transistor sources 0.3 A / 1 output 1 A / 1 common (8 outputs/1 common)	

When multiple communication ports of FC3A CPU module are used, use FC5A communication module/expansion communication modules.

Expansion Module Selection Table

Input/output modules	FC3A Part No.	Specifications
DC input	FC3A-N16B1	16 inputs, 24 VDC input, terminals Input impedance: 3.4 kΩ, 8 inputs / 1 common
	FC3A-N16B3	16 inputs, 24 VDC input, connector Input impedance: 3.4 kΩ, 8 inputs / 1 common
	FC3A-N32B4	32 inputs, 24 VDC input, connector Input impedance: 4.7 kΩ, 32 inputs / 1 common
	FC3A-N32B5	
AC input	FC3A-N08A11	16 inputs, 100 to 120 VAC input, terminals Input impedance: 12 kΩ/60 Hz, 16 inputs / 1 common Rated input current 10 mA / 1 input (120 VAC/60 Hz)
Relay output	FC3A-R161	16 outputs, relay output, terminals Load current: 2 A / 1 output (8 A / 1 common) 4 outputs / 1 common
	FC3A-R162	16 outputs, relay output, connector Load current: 2 A / 1 output (8 A / 1 common) 4 outputs / 1 common
Transistor output	FC3A-T16K1	16 outputs, 24 VDC, Tr sink output, terminals Load current: 0.5 A / 1 output (5 A / 1 common) 16 outputs / 1 common
	FC3A-T16K3	16 outputs, 24 VDC, Tr sink output, connector Load current: 0.5 A / 1 point (5 A / 1 common) 16 outputs / 1 common
Transistor source output	FC3A-T16P1	16 outputs, 24 VDC, Tr protect source output, terminals Load current: 0.5 A / 1 output (3 A / 1 common) 8 outputs / 1 common
Transistor sink output	FC3A-T32K4	32 outputs, 24 VDC, Tr sink output, connector Load current: 0.1 A / 1 output (1.84 A / 1 common) 32 outputs / 1 common
	FC3A-T32K5	32 outputs, 24 VDC, Tr sink output, connector Load current: 0.1 A / 1 point (1.84 A / 1 common) 32 outputs / 1 common
Analog Input module	FC3A Part No.	Specifications
Analog Input	FC3A-AD1261	6 inputs, voltage/current input, terminals Voltage: -10 V to 10 V, current: 4 to 20 mA Resolution: 4000 increments (12 bits)
Analog Output module	FC3A Part No.	Specifications
Analog Output	FC3A-DA1221	2 outputs, voltage/current output, terminals Voltage: -10 V to 10 V, current: 4 to 20 mA Resolution: 4000 increments (12 bits)
Expansion Interface module	FC3A Part No.	Specifications
Expansion Interface module	FC3A-EA1	Number of expandable module with Expansion Interface modules: max 8 modules
OpenNet Remote I/O Master module	FC3A Part No.	Specifications
Remote I/O master	FC3A-SX5SM1	INTERBUS Master module Transmission distance: 400 m (between slaves) 12.8 km (total length) Nodes: 32



Expansion Module Selection Table

Recommended Part No.	Specifications	Notes
FC4A-N08B1	8 inputs, 24 VDC input, Removable terminals Input impedance: 3.4 kΩ, 8 inputs / 1 common	Input delay time is OFF->ON 4 ms, ON->OFF 4 ms.
FC4A-N16B1	16 inputs, 24 VDC input, Removable terminals Input impedance: 3.4 kΩ, 16 inputs / 1 common	No input filter configuration function
FC4A-N16B3	16 inputs, 24 VDC input, MIL connector Input impedance: 4.4 kΩ, 16 inputs / 1 common	Due to the specifications (16 inputs/ 1 common) indicated, so when the common is separately wired, consider using the 8 inputs type. Input delay time is OFF->ON 4 ms, ON->OFF 4 ms. No input filter configuration function
FC4A-N32B3	32 inputs, 24 VDC, MIL connector Input impedance: 4.4 kΩ, 16 inputs / 1 common	Input delay time is OFF->ON 4 ms, ON->OFF 4 ms. No input filter configuration function
FC4A-N08A11	8 inputs, 100 to 120 VAC input, Removable terminals Input impedance: 7 kΩ/60 Hz, 8 inputs / 1 common Rated input current 17 mA / 1 input (120 VAC/60 Hz)	Check the output current of the connected device
FC4A-R081	8 outputs, relay output, Removable terminals Load current: 2 A / 1 output (7 A / 1 common), 4 output / 1 common	Check the current load voltage and current.
FC4A-R161	16 outputs, relay output, Removable terminals Load current: 2 A / 1 point (8 A / 1 common), 8 outputs / 1 common	
FC4A-T08K1	8 outputs, 24 VDC, Tr. sink output, Removable terminals Load current: 0.3 A / 1 output (3 A / 1 common) 8 outputs / 1 common	Check the current load voltage and current.
FC4A-T16K3	16 outputs, 24 VDC, Tr. sink output, MIL connector Load current: 0.1 A / 1 output (1 A / 1 common) 16 outputs / 1 common	
FC4A-T08S1	8 outputs, 24 VDC, Tr. source output, Removable terminals Load current: 0.3 A / 1 point (3 A / 1 common) 8 outputs / 1 common	Check the current load voltage and current. No output protection.
FC4A-T16S3	16 outputs, 24 VDC, Tr. source output, MIL connector Load current: 0.1 A / 1 output (1 A / 1 common) 16 outputs / 1 common	
FC4A-T32K3	32 outputs, 24 VDC, Tr. sink output, MIL connector Load current: 0.1 A/1 output (1 A / 1 common) 16 outputs / 1 common	Check the current load voltage and current.
Recommended Part No.	Specifications	Notes
FC4A-J8C1	8 inputs, voltage/current input, Removable terminals, Voltage: 0 V to 10 V, Current: 4 to 20 mA, Resolution: 50000 increments (16 bits)	The MICROSmart Series has no analog modules that can input a negative voltage.
FC4A-J2A1	2 inputs, voltage/current input, Removable terminals, Voltage: 0 V to 10 V, Current: 4 to 20 mA, Resolution: 4096 increments (12 bits)	
Recommended Part No.	Specifications	Notes
FC4A-K2C1	2 outputs, voltage/current output, Removable terminals Voltage: -10 V to 10 V, Current: 4 to 20 mA Resolution: 50000 increments (16 bits)	
FC4A-K4A1	4 outputs, voltage/current output, Removable terminals Voltage: 0 V to 10 V, current: 4 to 20 mA Resolution: 4096 increments (12 bits)	
Recommended Part No.	Specifications	Notes
FC5A-EXM2	Number of expandable module with Expansion Interface modules: max 8 modules	Only digital I/O modules can be used for expansion. Analog modules cannot be used for expansion.
FC5A-EXM1M	Master for expansion	Use the FC5A-EXM1M (master) and the FC5A-EXM1S (slave) as a set. Only digital I/O modules can be used for expansion. Analog modules cannot be used for expansion.
FC5A-EXM1S	Slave for expansion Number of expandable module with Expansion Interface modules: max 8 modules	
Recommended Part No.	Specifications	Notes
The MICROSmart Series does not support remote I/O systems that use INTERBUS. Consider the use of Modbus communication or data link communications.		

Program Conversion

■ Programming software

The programming software WindLDR can be used for the FC5A as well as FC3A. The WindLDR PLC programming software is included in Automation Organizer (model no.: SW1A-W1C), IDEC's system integration software.

The file to update Automation Organizer to the latest version is made available on the IDEC website. It is highly recommend that you use the latest version of Automation Organizer when converting programs of FC3A to FC5A.

<https://www.idec.com/>

■ Converting programs to the FC5A

The FC3A programs are not 100% compatible with the FC5A programs. Therefore, all programs cannot be completely converted automatically. The program conversion is performed when PLC type is changed in WindLDR. By changing the PLC type, instructions are automatically converted to upper compatible, and functions that require manual replacement and functions that cannot be replaced are left unconverted.

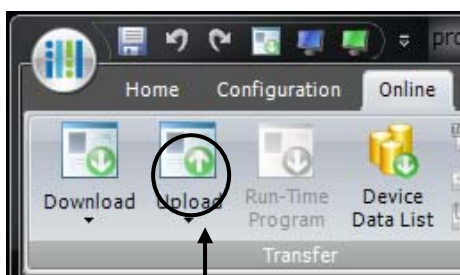
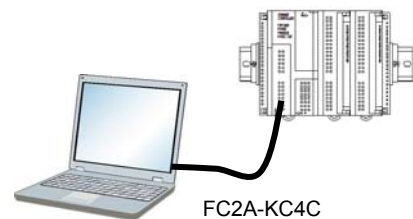
All function area settings are lost when changing the PLC type, so they must be reconfigured after the PLC type is converted.

For details on the compatibility of the functions including input/output allocations and special devices, check the "Compatibility Tables".

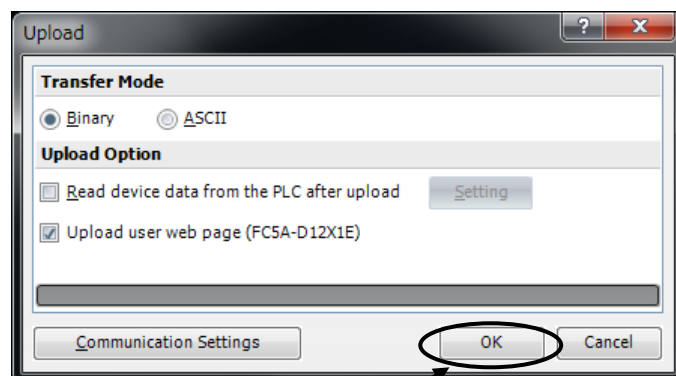
■ Uploading the program

If the FC3A ladder program file is not available, connect a PC (RS-232 I/F) to the FC3A with a computer link cable (FC2A-KC4C) and upload the program. The steps are described below.

- Click **Upload** on the WindLDR **Online** tab.
- The Upload dialog box is displayed. Click **OK** button.



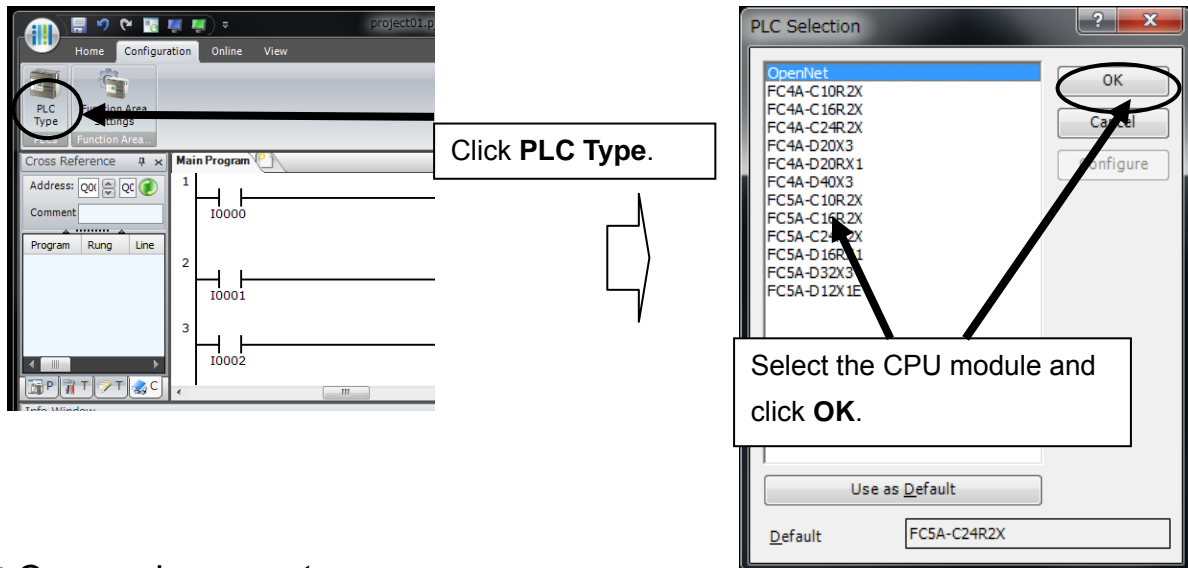
Click **Upload**.



Click **OK**.

■ Conversion steps

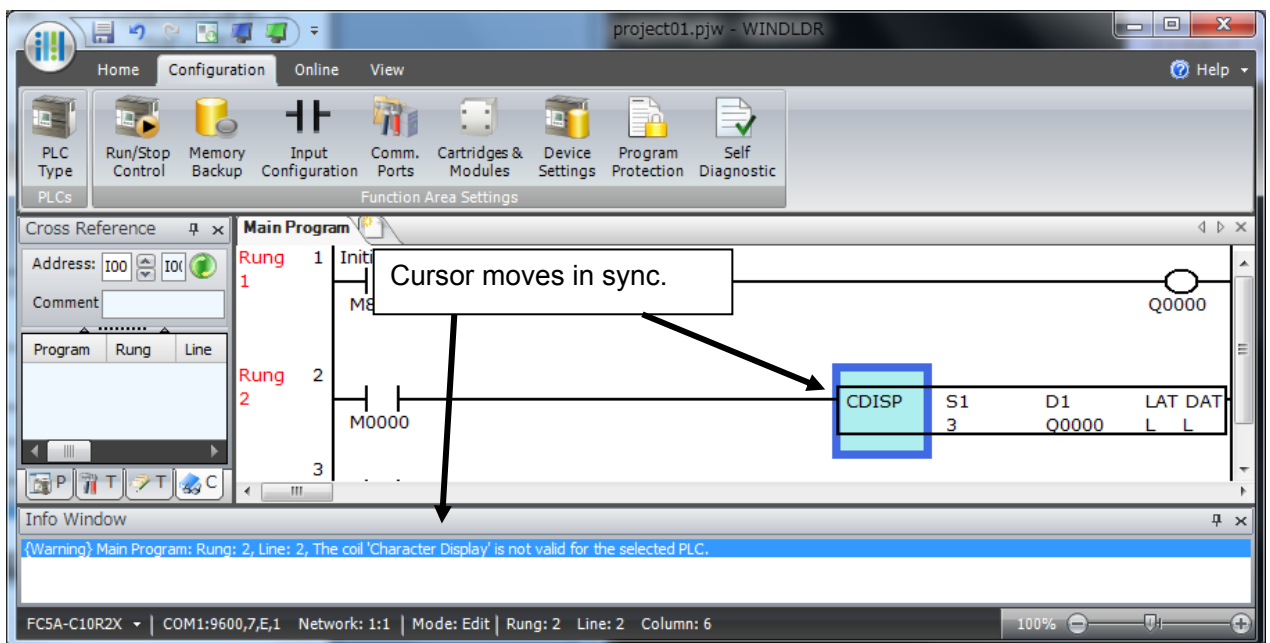
- Open the FC3A program with WindLDR.
- On the **Configuration** tab, click the **PLC Type** button.
- On the PLC Selection dialog box, select the CPU module to use after the conversion and then click **OK** button.



■ Conversion report

When you convert the PLC type by following the conversion steps, a conversion report as shown in the image below is output in the info window.

If you move the mouse cursor on an item in the conversion report in the info window and select it, the cursor of the ladder program moves to the corresponding position.

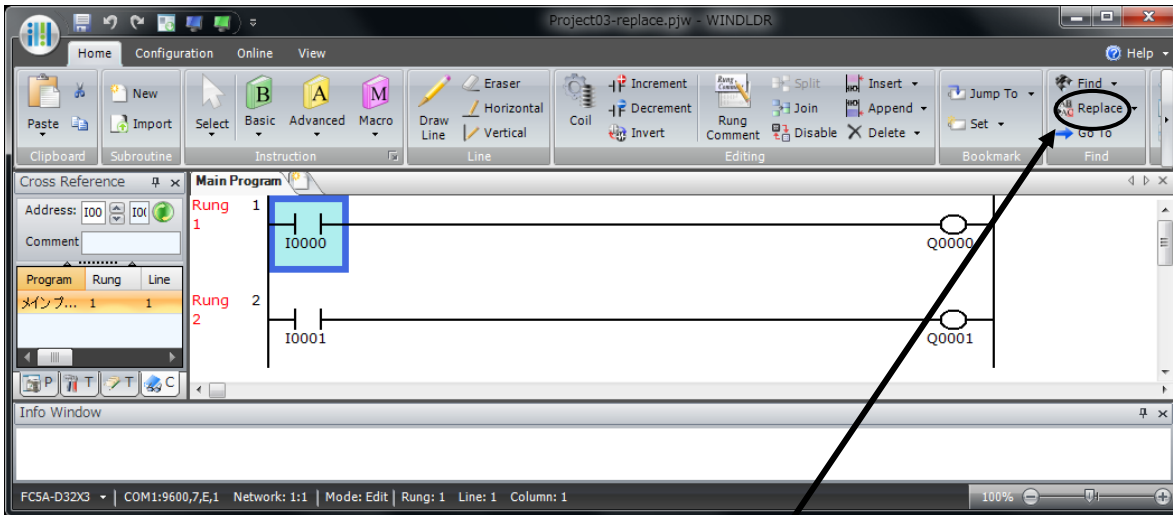


Program Conversion

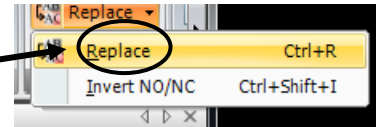
■ Batch replacement of I/O numbers

You can batch replace consecutive I/O numbers. Use this function when not using built-in inputs and outputs of the FC5A CPU module or when skipping the unavailable I/O numbers.

- On the **Home** tab, click **Replace**, and then select **Replace**.



Click **Replace** and then select **Replace**.

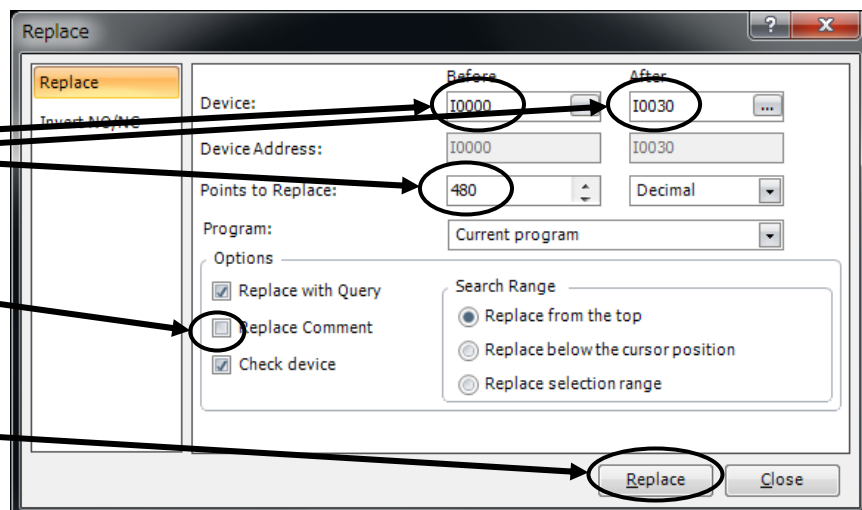


- On the Replace dialog box, enter the I/O numbers before and after conversion in **Device** fields and enter the number of points to convert in **Points to Replace**. If you want to move the comments as well, enable **Replace Comment** option.
- Click **Replace**.

Enter the I/O numbers before and after conversion and enter the number of points to convert.

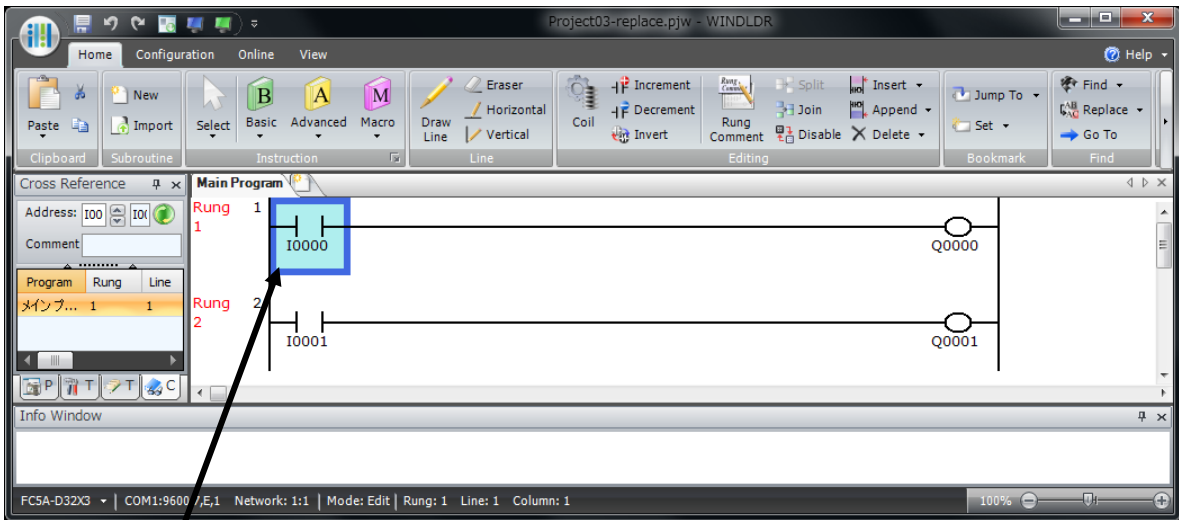
Select **Replace Comment** if necessary.

Click **Replace**.



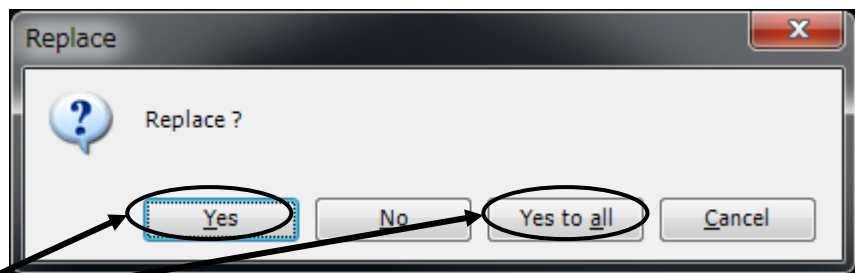
Program Conversion

- The cursor moves to an I/O to convert and a confirmation dialog box is displayed. To replace an I/O one by one, click **Yes**. To convert all the points without confirming them individually, click **Yes to All**.



The cursor moves to an I/O to convert.

Click **Yes** or **Yes to All** on the displayed dialog box.



Compatibility Tables

■ Function area settings

The table on the right shows whether or not the function area settings items can be replaced.

△: Settings that require manual replacement

X: Settings that cannot be replaced

Replace	Function Area Settings
△	Run/Stop
△	Keep
×	Module ID
△	Filter / Catch
△	Data Link
△	Comm Port
×	Open Bus
△	High-Speed Counter
△	Key Matrix Input
△	User Program Protection

■ Basic instructions

The table on the right shows whether or not the basic instructions can be replaced.

○: Instruction that can be automatically replaced

X: Instruction that cannot be replaced

Replace	Instruction
○	A (Normally Open)
○	B (Normally Close)
○	OUT
○	OUTN
○	SET
○	RST
○	TML
○	TIM
○	TMH
○	TMS
○	CNT
○	CDP
○	CUD
○	CC=
○	CC>=
×	TC=
×	TC>=
○	DC=
○	DC>=
○	SFR
○	SFRN
○	SOTU
○	SOTD
○	JMP
○	JEND
○	MCS
○	MCR
○	END

■ Advanced instructions

The table below shows whether or not the advanced instructions can be replaced.

○: Instruction that is compatible and can be automatically replaced

△: Instruction that requires manual replacement

X: Instruction that cannot be replaced

Replace	Instruction	Replace	Instruction
○	MOV	×	ROTL
○	MOVN	×	ROTR
○	IMOV	○	BCDLS
○	IMOVN	○	HTOB
○	BMOV	○	BTOH
○	NSET	○	HTOA
○	NRS	○	ATOH
○	IBMV	○	BTOA
○	IBMVN	○	ATOB
○	XCHG	○	DTDV
○	CMP=	○	DTDB
○	CMP<>	○	DISP
○	CMP<=	○	DGRD
○	CMP>	×	CDISP
○	CMP>=	△(WKTIM)	WKCMP(ON)
○	ICMP>=	△(WKTIM)	WKCMP(OFF)
○	ADD	○	WKTBL
○	SUB	○	TXD
○	MUL	○	RXD
○	DIV	○	LABEL
○	INC	○	LJMP
○	DEC	○	LCAL
○	ROOT	○	LRET
○	SUM	○	DJNZ
○	ANDW	○	XYFS
○	ORW	○	CVXTY
×	NEG	○	CVYTY
○	SFTL	○	AVRG
○	SFTR	○	NOP
○	ROTL	○	PID
○	ROTR		

Compatibility Tables

■ Special devices

The table below shows whether or not special internal relays and data registers can be replaced. The corresponding device number for manual replacement is also described.

○: Device that is compatible and can be automatically replaced

△: Device that requires manual replacement

X: Device that cannot be replaced

• Special internal relays

Replace	Special Internal Relays	Description
○	M8000	Start Control
○	M8001	1-sec Clock Reset
○	M8002	All Outputs OFF
○	M8003	Carry (Cy) or Borrow (Bw)
○	M8004	User Program Execution Error
○	M8005	Data Link Communication Error
○	M8006	Data Link Communication Prohibit Flag (Master Station)
○	M8007	Data Link Communication Initialize Flag (Master Station)
×	M8010	High-speed Counter Comparison Output Reset
△(M8025)	M8011	Maintain Outputs While CPU Stopped
×	M8012	SFR(N) Shifting Flag
-	M8013	— Reserved —
×	M8014	Write Communication Command Execution at Receive Completion
-	M8015 ~ M8017	— Reserved —
○	M8020	Calendar/Clock Data Write Flag
○	M8021	Clock Data Adjust Flag
○	M8022	User Communication Receive Instruction Cancel Flag (RS232C Port 1)
○	M8023	User Communication Receive Instruction Cancel Flag (RS232C Port 1)
-	M8024 ~ M8027	— Reserved —
×	M8030	INTERBUS Master Initialize
-	M8031 ~ M8035	— Reserved —
×	M8036	INTERBUS Master Bus NG (read only)
×	M8037	INTERBUS Master Peripheral Fault (read only)
-	M8040 ~ M8047	— Reserved —
○	M8050	RS232C Port 1 Modem Mode (Originate): Initialization String Start
○	M8051	RS232C Port 1 Modem Mode (Originate): ATZ Start
○	M8052	RS232C Port 1 Modem Mode (Originate): Dialing Start
○	M8053	RS232C Port 1 Modem Mode (Disconnect): Disconnect Line Start
○	M8054	RS232C Port 1 Modem Mode (General Command): AT Command Start
○	M8055	RS232C Port 1 Modem Mode (Answer): Initialization String Start
○	M8056	RS232C Port 1 Modem Mode (Answer): ATZ Start
○	M8057	RS232C Port 1 Modem Mode AT Command Execution
○	M8060	RS232C Port 1 Modem Mode (Originate): Initialization String Completion
○	M8061	RS232C Port 1 Modem Mode (Originate): ATZ Completion
○	M8062	RS232C Port 1 Modem Mode (Originate): Dialing Completion
○	M8063	RS232C Port 1 Modem Mode (Disconnect): Disconnect Line Completion
○	M8064	RS232C Port 1 Modem Mode (Answer): Initialization String Completion
○	M8065	RS232C Port 1 Modem Mode (Answer): Initialization String Completion
○	M8066	RS232C Port 1 Modem Mode (Answer): ATZ Completion
○	M8067	RS232C Port 1 Modem Mode Operational State

Compatibility Charts

Replace	Special Internal Relays	Description
○	M8070	RS232C Port 1 Modem Mode (Originate): Initialization String Failure
○	M8071	RS232C Port 1 Modem Mode (Originate): ATZ Failure
○	M8072	RS232C Port 1 Modem Mode (Originate): Dialing Failure
○	M8073	RS232C Port 1 Modem Mode (Disconnect): Disconnect Line Failure
○	M8074	RS232C Port 1 Modem Mode (General Command): AT Command Failure
○	M8075	RS232C Port 1 Modem Mode (Answer): Initialization String Failure
○	M8076	RS232C Port 1 Modem Mode (Answer): ATZ Failure
○	M8077	RS232C Port 1 Modem Mode Line Connection Status
×	M8080 ~ M8107	RS232C Port 2 Modem Mode Flags
-	M8110 ~ M8117	— Reserved —
○	M8120	Initialize Pulse
○	M8121	1-sec Clock
○	M8122	100-ms Clock
○	M8123	10-ms Clock
○	M8124	Timer/Counter Preset Value Changed
○	M8125	In-operation Output
-	M8126	— Reserved —
-	M8127	— Reserved —
×	M8130	High-speed Counter Up/Down Status
×	M8131	High-speed Counter Comparison ON Status (ON for 1 scan)
×	M8132	High-speed Counter Current Value Zero-clear (ON for 1 scan)
×	M8133	High-speed Counter Current Value Overflow (ON for 1 scan)
×	M8134	High-speed Counter Current Value Underflow (ON for 1 scan)
×	M8135	High-speed Counter Comparison Output Status
-	M8136 ~ M8137	— Reserved —
△(M8080 ~ M8117)	M8140 ~ M8177	Data Link (Separate Refresh) Slave Station 1 to 31 Comm. Completion Relay
-	M8180 ~ M8237	— Reserved —

Compatibility Tables

- Special data registers

Replace	Special Data Registers	Description
○	D8000	System Setup ID (Quantity of Inputs)
○	D8001	System Setup ID (Quantity of Outputs)
×	D8002	System Setup ID (Quantity of Functional Modules)
×	D8003	System Setup ID (Data Link Usage) — 1: Yes, 0: No
×	D8004	System Setup ID (INTERBUS Master Usage) — 1: Yes, 0: No
○	D8005	General Error Code
○	D8006	User Program Execution Error Code
×	D8007	User Program Execution Error Address
○	D8008	Year (Current Data) Read only
○	D8009	Month (Current Data) Read only
○	D8010	Day (Current Data) Read only
○	D8011	Day of Week (Current Data) Read only
○	D8012	Hour (Current Data) Read only
○	D8013	Minute (Current Data) Read only
○	D8014	Second (Current Data) Read only
○	D8015	Year (New Data) Write only
○	D8016	Month (New Data) Write only
○	D8017	Day (New Data) Write only
○	D8018	Day of Week (New Data) Write only
○	D8019	Hour (New Data) Write only
○	D8020	Minute (New Data) Write only
○	D8021	Second (New Data) Write only
○	D8022	Constant Scan Time Preset Value
○	D8023	Scan Time (Current Value)
○	D8024	Scan Time (Maximum Value)
○	D8025	Scan Time (Minimum Value)
×	D8026	Communication Selector Switch Value (0 through 7)
△(D8027, D8028)	D8027	Communication Network Number (0 through 31)
×	D8028	Internal System Program Version
×	D8029	External System Program Version
×	D8030	Protect Transistor Output Error (1st) — 1: Error, 0: No error
×	D8031	Protect Transistor Output Error (2nd) — 1: Error, 0: No error
×	D8032	Protect Transistor Output Error (3rd) — 1: Error, 0: No error
×	D8033	Protect Transistor Output Error (4th) — 1: Error, 0: No error
×	D8034	Protect Transistor Output Error (5th) — 1: Error, 0: No error
×	D8035	Protect Transistor Output Error (6th) — 1: Error, 0: No error
×	D8036	Protect Transistor Output Error (7th) — 1: Error, 0: No error
×	D8037~D8039	— Reserved —
×	D8040	Advanced Instruction Error Address 1
×	D8041	Advanced Instruction Error Address 2
×	D8042	Advanced Instruction Error Address 3
×	D8043	Advanced Instruction Error Address 4
×	D8044	Advanced Instruction Error Address 5
×	D8045	High-speed Counter Current Value
×	D8046	High-speed Counter Reset Value
×	D8047	High-speed Counter Preset Value
-	D8048 ~ D8049	— Reserved —
×	D8050 ~ D8183	Registers for INTERBUS
-	D8184 ~ D8199	— Reserved —

Compatibility Charts

Replace	Special Data Registers	Description
×	D8200	Port 1 RS232C Port Communication Mode Selection
×	D8201	Port 1 Modem Initialization String Selection
-	D8202	— Reserved —
△(D8103)	D8203	Port 1 On-line Mode Protocol Selection
△(note1)	D8204	Port 1 Control Signal Status
△(note1)	D8205	Port 1 DSR Input Control Signal Option
△(note1)	D8206	Port 1 DTR Output Control Signal Option
×	D8207	Port 1 RTS Output Control Signal Option
-	D8208	— Reserved —
△(note 2)	D8209	Port 1 Retry Cycles
△(note 2)	D8210	Port 1 Retry Interval
△(note 2)	D8211	Port 1 Modem Mode Status
-	D8212 ~ D8214	— Reserved —
△(note 2)	D8215 ~ D8229	Port 1 AT Command Result Code
△(note 2)	D8230 ~ D8244	Port 1 AT Command String
△(note 2)	D8245 ~ D8269	Port 1 Initialization String
△(note 2)	D8270 ~ D8299	Port 1 Telephone Number
×	D8300	Port 2 RS232C Port Communication Mode Selection
×	D8301	Port 2 Modem Initialization String Selection
-	D8302	— Reserved —
×	D8303	Port 2 On-line Mode Protocol Selection
△(note 1)	D8304	Port 2 Control Signal Status
△(note 1)	D8305	Port 2 DSR Input Control Signal Option
△(note 1)	D8306	Port 2 DTR Output Control Signal Option
×	D8307	Port 2 RTS Output Control Signal Option
-	D8308	— Reserved —
△(note 2)	D8309	Port 2 Retry Cycles
△(note 2)	D8311	Port 2 Retry Interval
△(note 2)	D8312	Port 2 Modem Mode Status
-	D8312 ~ D8314	— Reserved —
△(note 2)	D8315 ~ D8329	Port 2 AT Command Result Code
△(note 2)	D8330 ~ D8344	Port 2 AT Command String
△(note 2)	D8345 ~ D8369	Port 2 Initialization String
△(note 2)	D8370 ~ D8399	Port 2 Telephone Number
×	D8400	Slave Station 1 Communication Error (at Master Station) Slave Station Communication Error (at Slave Station)
×	D8401 ~ D8430	Slave Station 2 to 31 Communication Error (at Master Station)
-	D8431 ~ D8999	— Reserved —

note 1: Those control signals are supported in ports 2 through 7 of FC5A. (D8104 to D8106)

note 2: The FC5A supports Modem in 1 port only. (D8109 to D8199)

I/O Number Table

The chart below shows the allocation numbers of input and output of the FC3A and the FC5A.

Model	Inputs		Outputs	
	Available Address	Unavailable Address	Available Address	Unavailable Address
FC3A-CP2K/CP2S	I0 - I597	-	Q0 - Q597	-
FC5A-C10R2/C10R2C	I0 - I5	-	Q0 - Q3	-
FC5A-C16R2/C16R2C	I0 - I10	-	Q0 - Q6	-
FC5A-C24R2/C24R2C	I0 - I15	I16 - I27	Q0 - Q11	Q12 - Q27
	I30 - I107		Q30 - Q107	
FC5A-D16RK1/D16RS1	I0 - I7	I10 - I27	Q0 - Q7	Q10 - Q27
	I30 - I627		Q30 - Q627	
FC5A-D32K3/D32S3	I0 - I17	I20 - I27	Q0 - Q17	Q20 - Q27
	I30 - I627		Q30 - Q627	
FC5A-D12K1E/D12S1E	I0 - I7	I10 - I27	Q0 - Q3	Q4 - Q27
	I30 - I627		Q30 - Q627	

The expansion module input numbers start from I30 and the output numbers start from Q30 in the FC5A. I/O numbers smaller than I30 or Q30 are used as built-in inputs and outputs of the CPU module in the FC5A, and depending on the PLC type, some I/O numbers are not used.