

Mitsubishi Programmable Controllers  
MELSEC-A/QnA Series Transition Guide



From MELSEC-A/QnA Series to  
**MELSEC-Q Series**



**Comprehensive, risk-free upgrade solutions**



From MELSEC-A/QnA Series  
➔ MELSEC-Q Series

# Supporting A/QnA Series Upgrades



Mitsubishi Electric offers a carefully engineered combination of hardware, software, and support designed to allow you to upgrade legacy MELSEC-AnS/QnAS Series controller systems to the current MELSEC-L/Q Series with minimum disruption to your plant operations.

# Upgrade Option

## Where to find the related information

P.5

- Technical Bulletin
- Transition Handbook

A → Q

## Replace with the Q Series while utilizing the existing programs

P.7

- A/QnA -> Q Conversion Support Tool

A → Q

MELSOFT

## Replace with the Q Series CPU module while keeping the existing modules

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- QA extension base unit

A → Q

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A → Q

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A → Q

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A → Q

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## **Replace A0J2(H) system with Q Series while utilizing the existing wiring**

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A → Q

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CC-Link

→ MELSECNET/MINI-S3 I/O module wiring conversion adapter

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→ List of products used for upgrade

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→ Models in continuous production

→ Discontinued products

→ Service availability period

## **Support**

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Support

This catalog uses the following terms unless otherwise noted.

- A/QnA Series: Abbreviation for large types of MELSEC-A Series and MELSEC-QnA Series programmable controllers
- Q Series: Abbreviation for MELSEC-Q Series Programmable controller
- AnS/QnAS Series: Abbreviation for small types of MELSEC-A Series and MELSEC-QnA Series programmable controllers

At-a-glance technical overview

# Technical Bulletin

## Large type A/QnA Series

		<Date of discontinuation>	<Technical bulletin No.>
A/QnA (large type)	● CPU module	End of Sep. 2006	T99-0050
	● I/O module	End of Sep. 2006	T99-0050
	● Special function module	End of Sep. 2006	T99-0050
	● Data link module (MELSECNET(II), MELSECNET/B module, etc.)	End of Sep. 2006	T99-0050
	● MELSEC-I/OLINK master module	End of Sep. 2006	T99-0050
	● MELSECNET/MINI-S3 master module	End of Sep. 2008	T99-0050
	● Network module (MELSECNET/10)	End of Sep. 2014	FA-A-0141

## A2C Series

A2C	● CPU module	End of Sep. 2006	T99-0050
	● A2C I/O module	End of Sep. 2008	T99-0070
	● Special function module etc.	End of Sep. 2008	T99-0070

## Network interface board

MELSECNET(II), MELSECNET/B	● MELSECNET(II), MELSECNET/B interface board	End of Sep. 2008	T99-0049
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## AOJ2(H) Series

AOJ2(H)	● CPU module	End of Sep. 2008	T99-0069
	● Power supply module	End of Sep. 2008	T99-0069
	● I/O module	End of Sep. 2008	T99-0069
	● Special function module etc.	End of Sep. 2008	T99-0069

## Remote I/O module

Remote I/O module	● MELSECNET/MINI-S3 I/O module	End of Sep. 2008	T99-0070
	● MELSEC-I/OLINK I/O module	End of Sep. 2014	FA-A-0142

Please refer to the Technical Bulletin "Repair acceptance of discontinued models (FA-A-0049)" for the repair acceptance period of the above discontinued products.

In-depth technical documentation resource

# Transition Handbook

## **Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook**

● Fundamentals

L(NA)08043ENG

● Intelligent Function Modules

L(NA)08046ENG

## **Transition from MELSEC-A/QnA (Large Type) Series, AnS/QnAS (Small Type) Series to Q Series Handbook**

● Network Modules

L(NA)08048ENG

● Communication Modules

L(NA)08050ENG

## **Transition from MELSEC-AOJ2H Series to Q Series Handbook**

L(NA)08060ENG

## **Transition from MELSECNET/MINI-S3, A2C (I/O) to CC-Link Handbook**

L(NA)08061ENG

## **Transition from MELSEC-I/OLINK to AnyWire DB A20 Handbook**

L(NA)08263ENG

## **Transition from MELSEC-I/OLINK to CC-Link/LT Handbook**

L(NA)08062ENG

## **Transition of CPUs in MELSEC Redundant System Handbook (Transition from Q4ARCPU to QnPRHCPU)**

L(NA)08117ENG

## **MELSEC-A/QnA (Large), AnS/QnAS (Small) Transition Examples**

L(NA)08121ENG

- For the products shown in handbooks for transition, catalogs, and transition examples, please refer to the manuals for the relevant products and check the detailed specifications, precautions for use, and restrictions before replacement.

For the products manufactured by Mitsubishi Electric Engineering Co., Ltd., Mitsubishi Electric System & Service Co., Ltd., and other companies, please refer to the catalog for each product and check the detailed specifications, precautions for use, and restrictions before use.

The manuals and catalogs for our products, products manufactured by Mitsubishi Electric Engineering Co., Ltd., and Mitsubishi Electric System & Service Co., Ltd., are shown in Appendix of each handbook for transition.

- Products shown in this handbook are subject to change without notice.

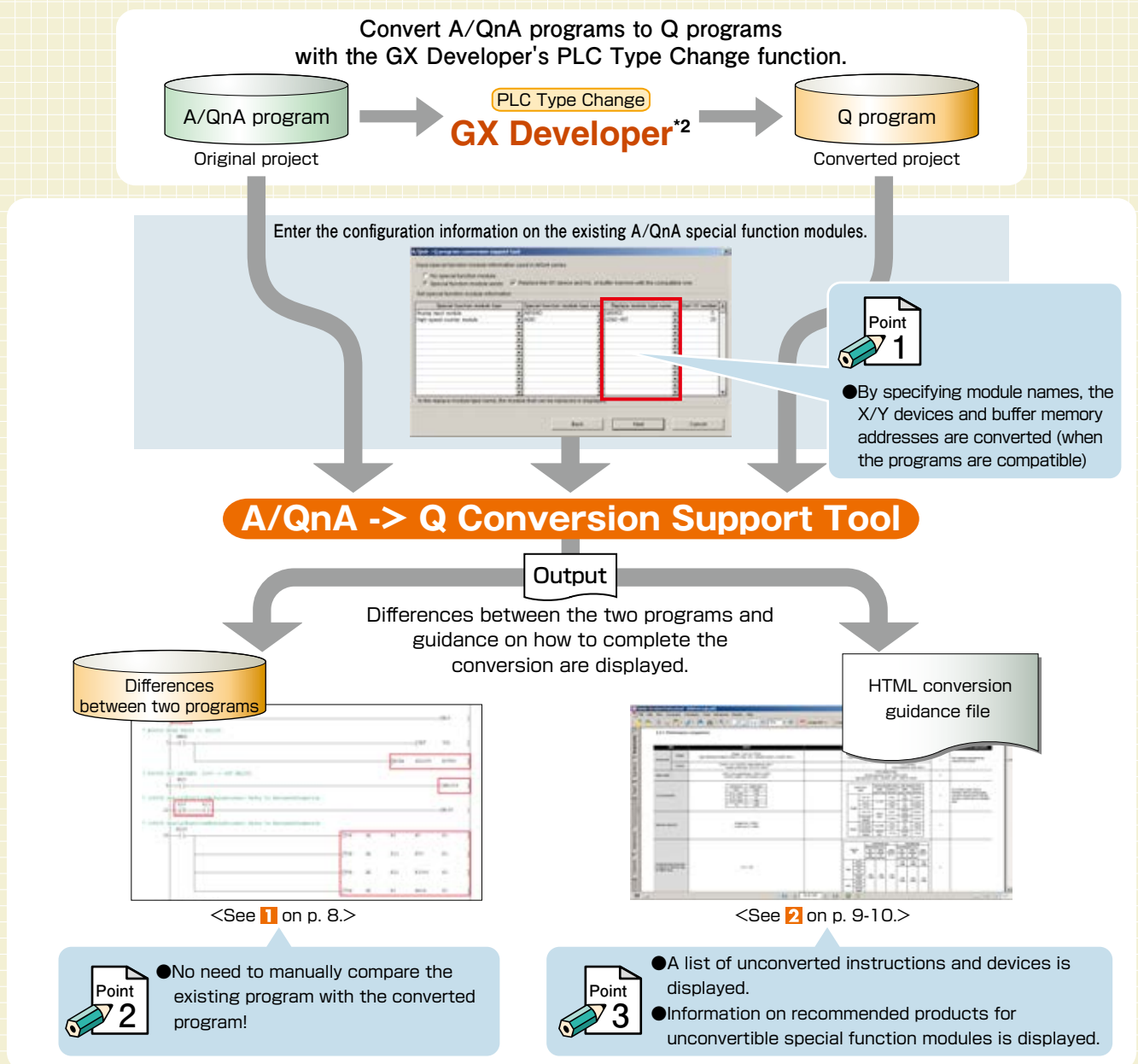


# A/QnA -> Q Conversion Support Tool<sup>\*1</sup>

Minimize program conversion efforts by  
A/QnA -> Q Conversion Support Tool

## A/QnA -> Q Conversion Support Tool

■ Complete conversion from A/QnA program to Q program is supported by this tool. It easily helps to find and correct non-completed conversion parts.



\*1: This support tool applies to ladder programs only.

AnS/Q2AS(H)→Q conversion is also supported.

To perform PLC Type Change to an Universal model QCPU module, the version 1.06 or later is required.

\*2: GX Developer does not support the PLC type change to High-speed Universal model QCPU.

Please change the PLC type by the following application and method.

①GX Developer: Convert PLC type to Universal model QCPU then save the project data.

②A/QnA -> Q Conversion Support Tool: Output "Differences between two programs" and "HTML conversion guidance file".

③GX Developer: Correct "Differences between two programs" referring to "HTML conversion guidance file".

④GX Works2: Open "Differences between two programs"(Project - Open Other data - Open Other project) and change the PLC type to High-speed Universal model QCPU.

Note: For the acquisition of A/QnA -> Q Conversion Support Tool, please contact your local Mitsubishi Electric sales office or sales representative.



## A0J2 Conversion Support Function

- ACPU ladder programs, which are not supported by GX Developer, are converted into the GPPA format. The ACPU ladder programs, which are not supported by GX Developer, are read and converted into the GPPA format, which are supported by GX Developer.

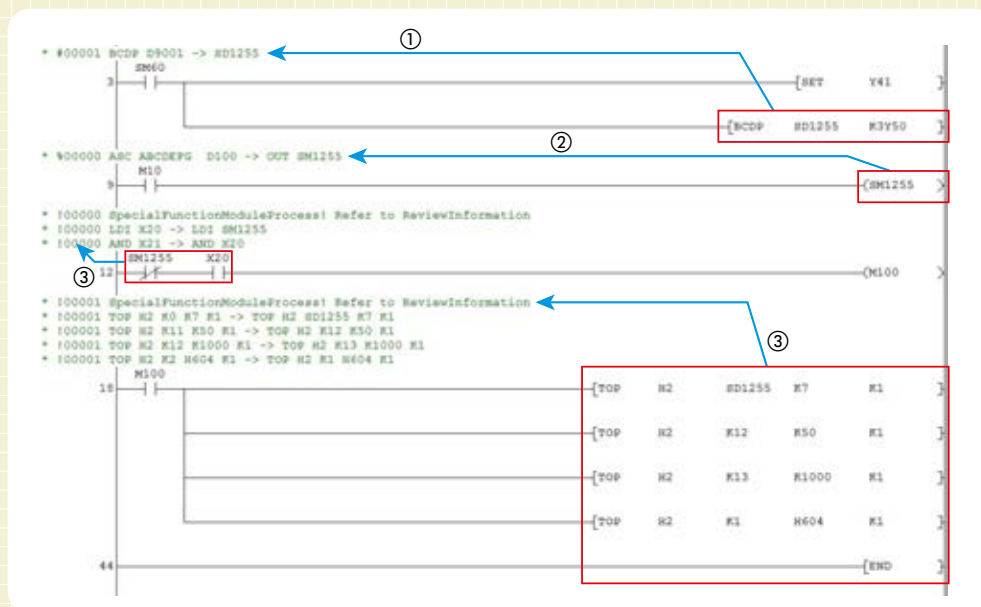
Convert the ACPU ladder programs, which are not supported by GX Developer, into the GPPA format and save.



\*1: A0J2CPU, A1CPU, A2CPU, A52GCPU, A3CPU, A3VCPU, A73CPU, A3HCPU, A3MCPUCPU

## 1 Q programs with differences highlighted

- The differences between two programs can be modified directly. This prevents mistakes and improves the conversion efficiency.



<Differences highlighted>

### ① Statement for unconverted devices—#

The original device and the converted device are displayed as shown below. The devices contained in the circuit block are displayed one line at a time.

[Example] #00001 BCDP D9001 → SD1255 (#00001 is a search keyword from the guidance file.)

### ② Statement of unconverted instructions—%

The original instruction and the converted instruction are displayed as shown below. The instructions contained in the circuit block are displayed one line at a time.

[Example] %00000 ASC ABCDEFG D100 → OUT SM1255 (%00000 is a search keyword from the guidance file.)

### ③ Statement of special function module processes—!

For the special function module instructions (FROM, DFRO, TO, DTO and instructions using X/Y devices), a message requesting a review is displayed. For the X/Y devices and buffer memory addresses, their original and modified statuses are displayed.

[Example] !00001 SpecialFunctionModuleProcess! Refer to ReviewInformation  
(!00001 is a search keyword from the guidance file.)

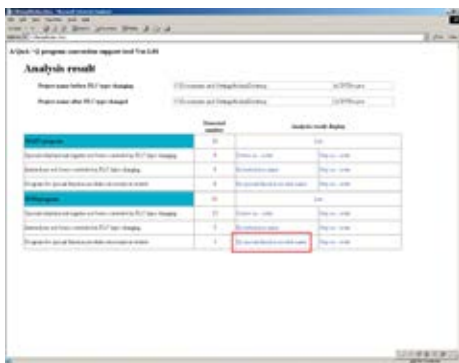
# A/QnA -> Q Conversion Support Tool

## 2 HTML conversion guidance file

Easy comparison of performance specifications before and after a replacement.

Detailed information is displayed hierarchically in your Internet Explorer. Information on the differences between the two programs and the conversion guidance file can be linked together.

[Example] Special function module processes which need to be reviewed



Click "By special function module name" in the "Programs for special function modules necessary in review" row.



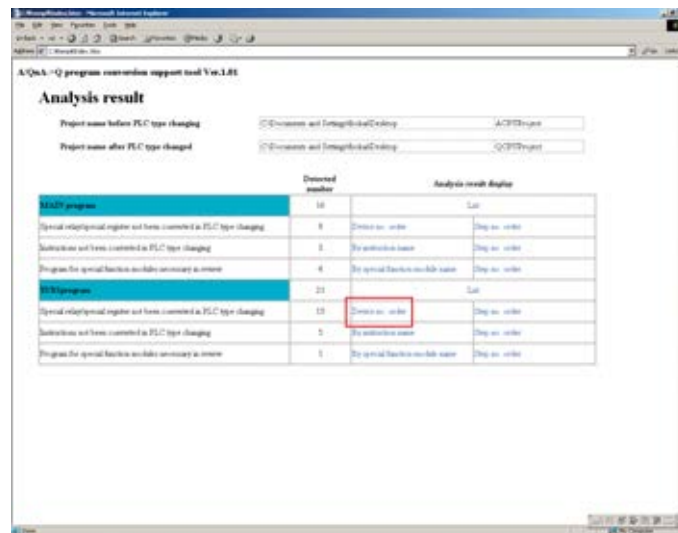
Click the recommended module name next to "The recommended modules that can be replaced."

Item	AD640	AD640V	AD640	Compatibility	Procedures for replacement																														
Analog input	<p>Voltage: +10 to 0 V to +10 VDC (Input resistance: hardware version A, or other: 10 kΩ; hardware version J, or other: 30 kΩ)</p> <p>Current: +4 to +20 mA DC (input resistance: 200 Ω) (*Output current input: 0.5 to 20 mA)</p>	+10 to 0 VDC (Input resistance: about 10 kΩ)	0 to 20 mA DC (input resistance value: 200 Ω)	A	The voltage/current cannot be used for one module.																														
Digital output	<p>ICMU: 1-bit digital output (+20V to +20V) K2CMC: 8-bit digital output (+20V to +20V)</p>	16-bit digital output (Normal resolution mode: +0.5V to +0.5V High resolution mode: +0.25V to +0.25V, +0.5V to +0.5V)																																	
±10 characteristics	<table border="1"> <thead> <tr> <th>Analog input</th> <th>Digital output</th> </tr> </thead> <tbody> <tr> <td>+10 V</td> <td>+20 V</td> </tr> <tr> <td>+5 V</td> <td>+10 V</td> </tr> <tr> <td>0 V</td> <td>0 V</td> </tr> <tr> <td>-5 V</td> <td>-10 V</td> </tr> <tr> <td>-10 V</td> <td>-20 V</td> </tr> </tbody> </table>	Analog input	Digital output	+10 V	+20 V	+5 V	+10 V	0 V	0 V	-5 V	-10 V	-10 V	-20 V	<table border="1"> <thead> <tr> <th>Analog input range</th> <th>Normal resolution mode</th> <th>High resolution mode</th> </tr> </thead> <tbody> <tr> <td>0 V to 10 V</td> <td>0.5 mV</td> <td>0.125 mV</td> </tr> <tr> <td>±10 V</td> <td>±0.5 mV</td> <td>±0.125 mV</td> </tr> <tr> <td>±10 V</td> <td>±0.5 mV</td> <td>±0.125 mV</td> </tr> <tr> <td>±10 V</td> <td>±0.5 mV</td> <td>±0.125 mV</td> </tr> <tr> <td>±10 V</td> <td>±0.5 mV</td> <td>±0.125 mV</td> </tr> </tbody> </table>	Analog input range	Normal resolution mode	High resolution mode	0 V to 10 V	0.5 mV	0.125 mV	±10 V	±0.5 mV	±0.125 mV	±10 V	±0.5 mV	±0.125 mV	±10 V	±0.5 mV	±0.125 mV	±10 V	±0.5 mV	±0.125 mV			As a result of gain value is changed, when to change Digital Converter Module user's manual and then, confirm the ±10 characteristics.
Analog input	Digital output																																		
+10 V	+20 V																																		
+5 V	+10 V																																		
0 V	0 V																																		
-5 V	-10 V																																		
-10 V	-20 V																																		
Analog input range	Normal resolution mode	High resolution mode																																	
0 V to 10 V	0.5 mV	0.125 mV																																	
±10 V	±0.5 mV	±0.125 mV																																	
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±10 V	±0.5 mV	±0.125 mV																																	
±10 V	±0.5 mV	±0.125 mV																																	
Maximum resolution	<p>Voltage (10V): 10 bits Current (20mA): 10 bits</p>	<p>Normal resolution mode: 16 bits High resolution mode: 16 bits</p>	<p>Normal resolution mode: 16 bits High resolution mode: 16 bits</p>																																
Overall accuracy (Accuracy is based on maximum digital output value)	±1% (±20)																																		

The module performance comparison can be confirmed.

- Details of unconverted special relays and registers can be displayed, improving conversion efficiency.

[Example] Special relays and registers which are not converted in the Q program



Click "Device no. order" in the "Special relay/special register not been converted in PLC type changing" row.



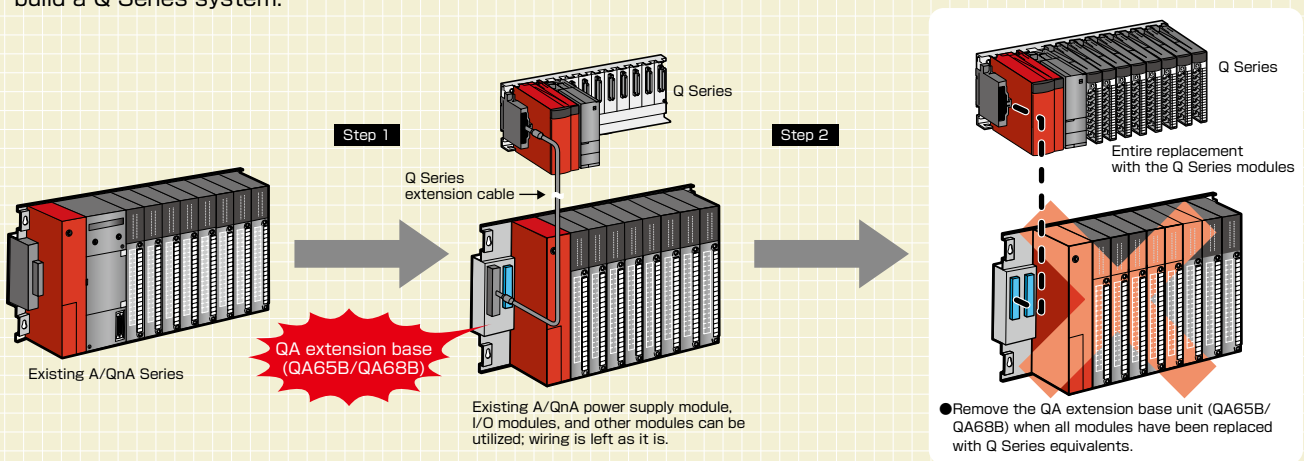
The modified contents can be confirmed.

# QA Extension Base Unit (QA65B/QA68B)

## Replace the A/QnA Series CPU with the Q Series CPU while keeping the existing A/QnA Series modules

### ■ Gradual transition from the A/QnA Series to Q Series (Q mode).

- Construct a new system that is controlled by the Q Series CPU (Q mode) while keeping the existing A/QnA Series modules installed on the QA6□B extension base unit. The A/QnA Series modules can gradually be replaced to fully build a Q Series system.

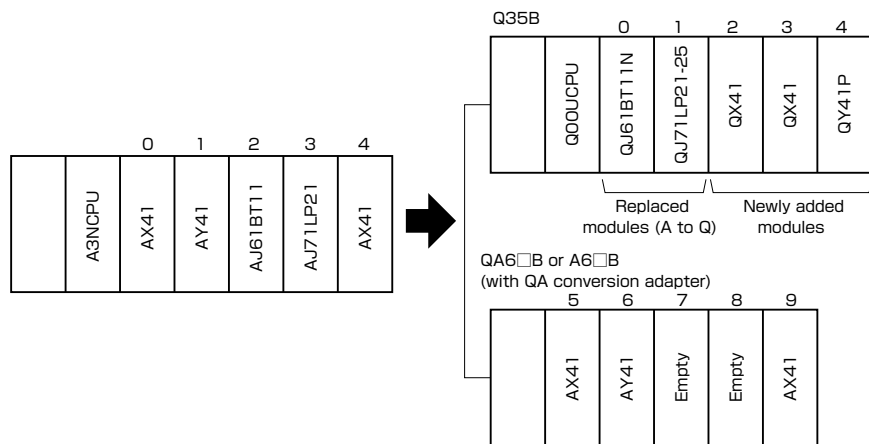


- The QA6□B extension base units are compatible with the Universal model QCPUs\*1 (including High-speed Universal model QCPUs). Process CPUs, redundant CPUs or remote I/O stations are not compatible.
- Please refer to the "QA65B/QA68B Extension Base Unit User's Manual (IB(NA)-0800158)" for details of modules that can be installed onto the QA6□B extension base units.

\*1: Universal model QCPU, whose first 5-digit serial number is 13102 or later, is compatible with the base unit.

### ■ Reduce conversion effort by using the same I/O addresses

When utilizing existing modules with the Q Series CPU, it is not required to change the I/O number of the existing modules. For new module(s) on the main base unit, assign a subsequent number that comes after the existing module numbers in the I/O assignment settings. This can greatly reduce the program modification time.

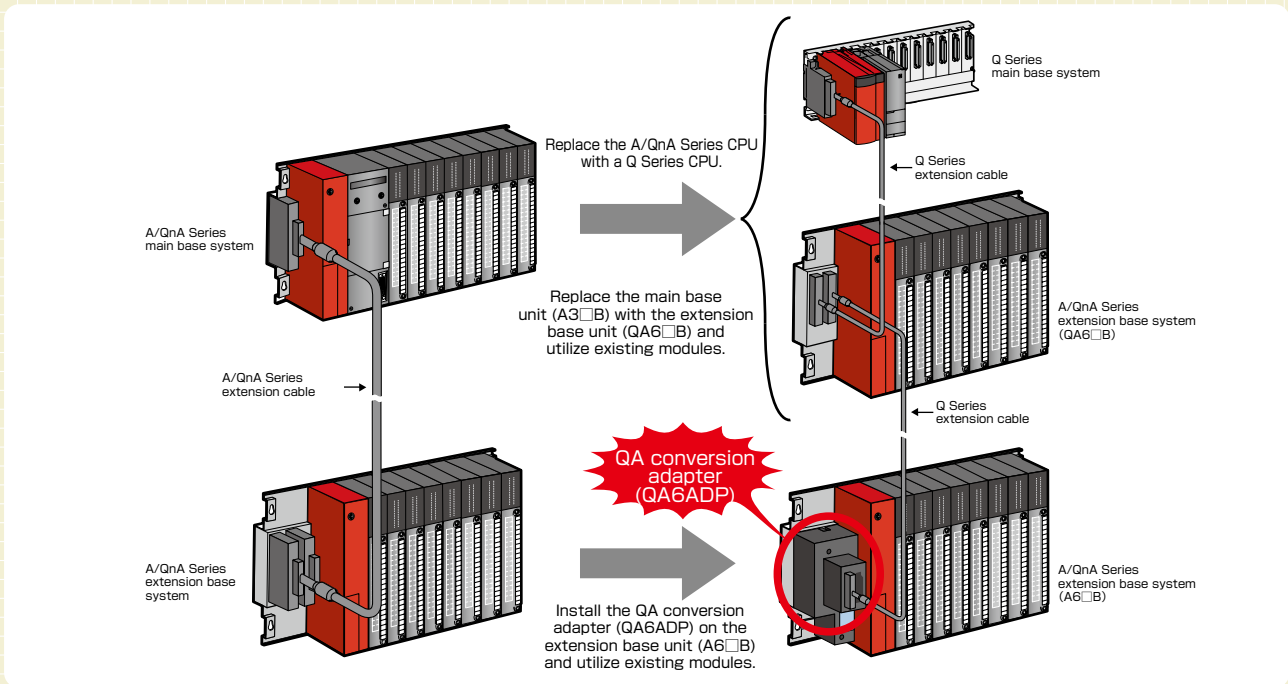


Replace the incompatible A/QnA modules with the Q Series modules.

# QA Conversion Adapter (QA6ADP)

Replace the main base unit with the Q Series while keeping the existing A/QnA extension base unit

■ Install a QA conversion adapter to use the existing A/QnA Series extension base units with a Q Series CPU.



### Notes

- The QA6ADP adapter cannot be connected to a QA1S extension base unit, which is being used to hold small type AnS/Q2AS Series modules.
  - The QA6ADP adapter is compatible with Universal model QCPUs\*1 (including High-speed Universal model QCPUs) only. Process CPUs, redundant CPUs, safety CPUs, and remote I/O stations are not compatible.
  - Modules which can be installed on the extension base unit (A6□B) are the same as when QA6□B is used.
  - An adapter module mounting bracket is required to install the QA6ADP adapter. Follow the instructions in the user's manual for the installation procedure.
  - When an AC input module is installed on the "A5□B" extension base unit (without power supply) using the QA6ADP, either the "A6□B with QA6ADP" or "QA6□B" extension base unit (with power supply) is required in the system.
- \*1: Universal model QCPU, whose first 5-digit serial number is 13102 or later, is compatible with Adapter.

Note: Assign the I/O numbers in the following order: Q Series to A Series or A Series to Q Series. When the order is mixed (i.e., Q Series → A Series → Q Series), an error will occur in the CPU.

### ■ Example of I/O assignment

	Model	Type	Point	Address
Main base unit	0 QJ61BT11N	Intelli.	32 points	100
	1 QJ71LP21-25	Intelli.	32 points	120
	2 QX41	Input	32 points	140
	3 QX41	Input	32 points	160
	4 QY41P	Output	32 points	180

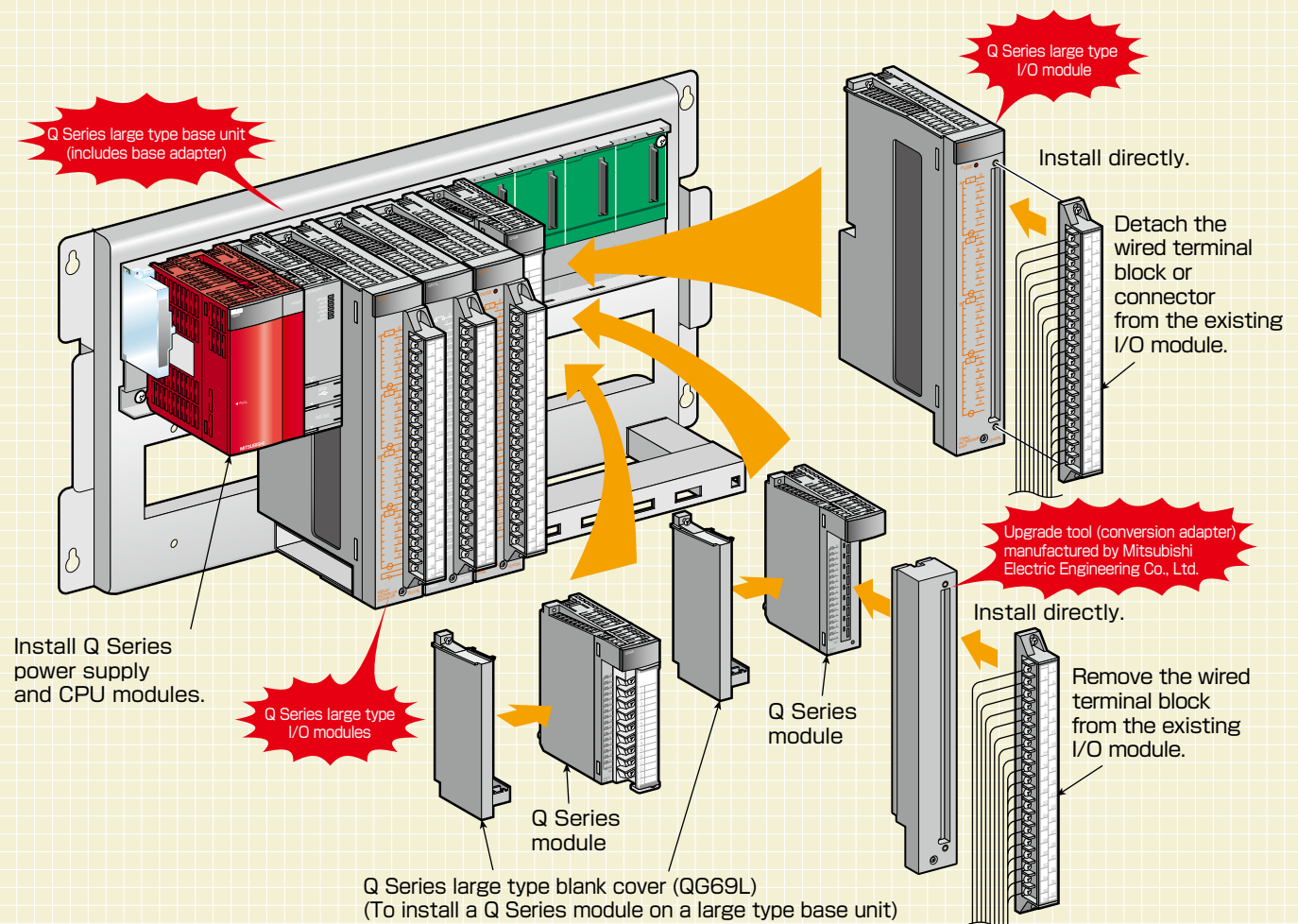
	Model	Type	Point	Address
Extension base unit	5 AX41	Input	32 points	00
	6 AY41	Output	32 points	20
	7 —	Empty	32 points	40
	8 —	Empty	32 points	60
	9 AX41	Input	32 points	80



# Q Series Large Type Base Unit, I/O Module ( Q38BL · Q68BL · QX11L · QY11AL Q35BL · Q65BL · QX21L · QY13L · QG69L ) QY23L · QY51PL

## Upgrade to Q Series with the existing 32-point I/O wiring

- Minimize wiring modifications by utilizing the existing A Series 32-point I/O wiring.
- No need to make new installation holes. The hole size and pitch of the Q Series large type base units are the same as those of A/QnA Series.



- Q Series power supply and CPU modules can be used without any modification (Q Series large type blank cover is not necessary).
- Q Series large type I/O modules can be used with Q Series modules. (Some modules, such as the ones that occupy two slots, cannot be installed. For details, please refer to Q Series Large Type Base Unit User's Manual (IB-0800408).)

### Notes

- Through the use of Upgrade Tool (manufactured by Mitsubishi Electric Engineering Co., Ltd., refer to page 15), terminal block modules that are not compatible with the Q Series large type I/O modules can be installed without rewiring.
- For compatibility of Q Series large type base unit and upgrade tool, refer to page 16.

## ■ Q Series large type base units

Type	Model	Outline
Main base unit	Q38BL	8 slots, 1 power supply module required, Q Series large type I/O module supported
	Q35BL	5 slots, 1 power supply module required, Q Series large type I/O module supported
Extension base unit	Q68BL	8 slots, 1 power supply module required, Q Series large type I/O module supported
	Q65BL	5 slots, 1 power supply module required, Q Series large type I/O module supported
	Q55BL	5 slots, power supply module not required, Q Series large type I/O module supported

## ■ Q Series large type I/O modules

Type	Model		Outline
	Existing A Series module	Q Series large type module	
Input module	AX11	QX11L	32 points; 100 to 120 V AC; rated input current: 10 mA (100 V AC, 60 Hz); response time: 15 ms or less (OFF to ON), 25 ms or less (ON to OFF); 32 points/common; 38-point terminal block
	AX21	QX21L	32 points; 200 to 240 V AC input; rated input current: 10 mA (220 V AC, 60 Hz); response time: 15 ms or less (OFF to ON), 25 ms or less (ON to OFF); 32 points/common; 38-point terminal block
Output module	AY10A AY11A	QY11AL	16-point contact output, 24 V DC/240 V AC, 2 A/point, 16 A/all points, all points independent, 38-point terminal block, surge suppressor (varistor 387 to 473 V)
	AY13	QY13L	32-point contact output, 24 V DC/240 V AC, 2 A/point, 5 A/common, 8 points/common, 38-point terminal block
	AY23	QY23L	32-point triac output, 100 to 240 V AC, 0.6 A/point, 2.4 A/common, 8 points/common, 38-point terminal block
	AY51 AY51-S1	QY51PL	32-point transistor output (Sink), 12/24 V DC, 0.5 A/point, 4 A/common, 16 points/common, 38-point terminal block
Q Series large type blank cover	—	QG69L	Blank cover for installing the existing Q Series module on the Q Series large type base unit

### Note

● The Q Series large type base units and I/O modules are compatible with Universal model QCPUs\*1 (including High-speed Universal model QCPUs), and MELSECNET/H remote I/O stations.

The following CPUs and system are not compatible:

- Process CPUs, redundant CPUs, and safety CPUs
- Q00UJCPU

\*1: Universal model QCPU, whose first 5-digit serial number is 13102 or later, is compatible



# A/Q Upgrade Tool/FA Goods (manufactured by Mitsubishi Electric Engineering Co., Ltd.)

## Replace A/QnA Series system with Q Series system without extensive I/O rewiring

### ■ Upgrade tool

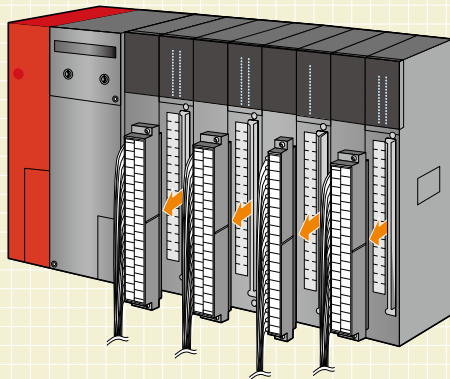
The upgrade tool consists of three components: a conversion adapter, which modifies the existing wiring of the A/QnA Series input/output/analog/high-speed counter modules to correspond to the Q Series modules; a conversion adapter support flange, which supports the conversion adapters from the bottom, and a base adapter, which allows the Q Series base unit to be installed using the installation holes of the A/QnA Series base unit. (The upgrade tool does not include the Q Series base unit. Please prepare it separately.)

- Remove the large type A/QnA Series programmable controllers along with the base unit, install the base adapter in the same position, and install Q Series modules. (New installation holes are unnecessary when installing the base adapter)
- Attach the conversion adapters to the Q Series modules.
- Remove the terminal blocks from the existing large type A/QnA Series modules and attach them to the conversion adapters. (The existing wiring can be used without modification.)
- FA goods may be used for an I/O module that is not available in the Q Series.

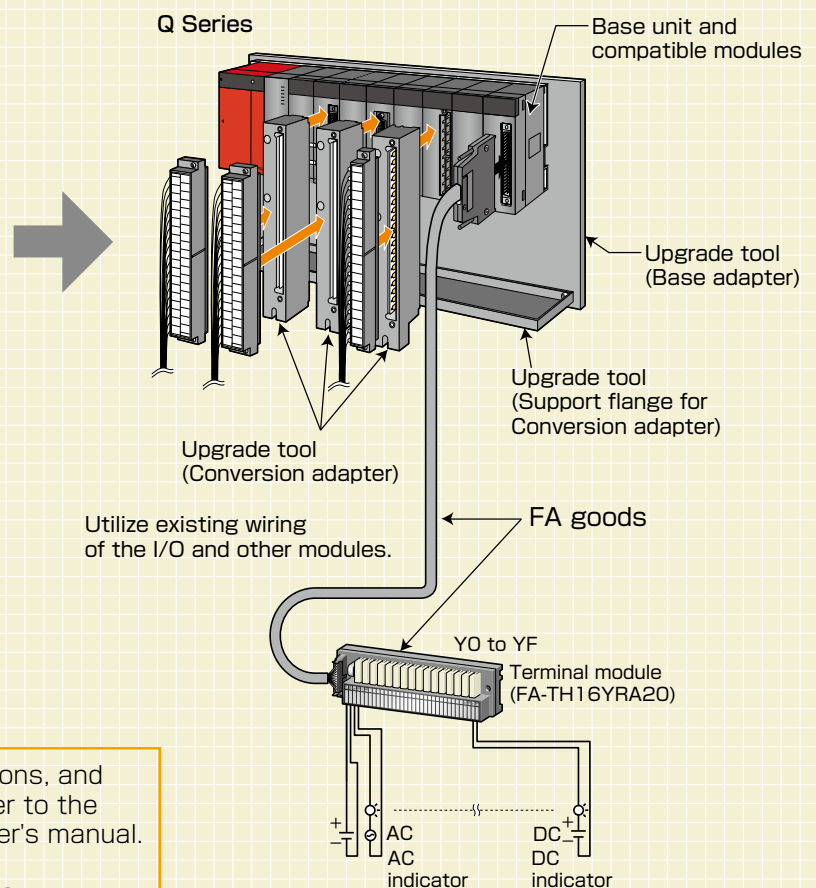
### ■ FA goods

FA goods are useful for system configuration with the Q Series modules. These goods consist of connector/terminal conversion module, terminal module, and positioning module cable, etc. FA goods can be used when a module replacement is not available because of the module's specification, etc.

A/QnA Series



Q Series



For the detailed specifications, precautions, and restrictions of Upgrade Tool, please refer to the brochure (SAN C033E-04Z) and the user's manual.

To obtain the upgrade tool and FA goods, please contact your local Mitsubishi Electric sales office or representative.

When replacing the A/QnA Series I/O module with the Q Series I/O module, the FA goods connector/terminal conversion module and terminal module can also be used.

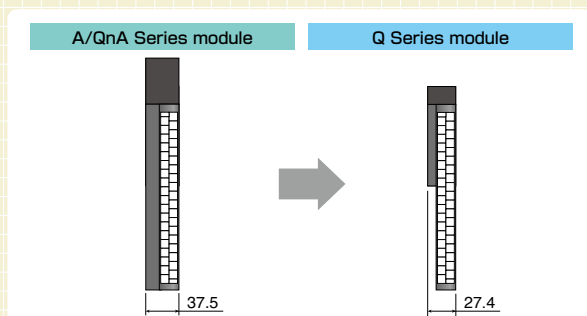
# Compatibility of Q Series large type base unit and Upgrade Tool

## Compatibility of Q Series large base unit and Base Adapter/Conversion Adapter

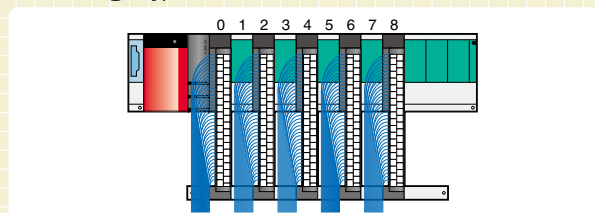
Item		Q Series large type base unit*1	Base adapter/conversion adapter*2
Slot width of base unit*3		Same width as the A/QnA Series base unit (37.5 mm)	Same width as Q Series base unit (27.4 mm)
Installable module	Power supply module	Q Series power supply module	○
	CPU module	Process CPU	×
		Universal model QCPU	○*4
	I/O module Intelligent function module	Q Series large type I/O modules*5	○
		Q Series module (occupies 1 slot)	○*7
Q Series module (occupies 2 slots)		×	
Conversion adapter*6	For terminal block type 16-point I/O module (occupies 1 slot)	○*7	
	For terminal block type 32-point I/O module (occupies 1 slot)	○*7	
	For terminal block type 32-point I/O module (occupies 2 slots)	×	
	For high-speed counter module	○*7	
	For analog module (occupies 1 slot)	○*7	
	For analog module (occupies 2 slots)	×	
Connection of Q/QA/QA1S extension base unit*8		○	○

○: Applicable (installable) △: Applicable with restrictions (installable) ×: Not Applicable (Not installable)

- \*1: Q Series large type base units can be used with Q Series base units.
- \*2: The base adapter manufactured by Mitsubishi Electric Engineering Co., Ltd. is to be installed to the Q Series base unit.
- \*3: Check the installation conditions before using the upgrade tool, because wiring space is reduced due to a decrease in the module's width.

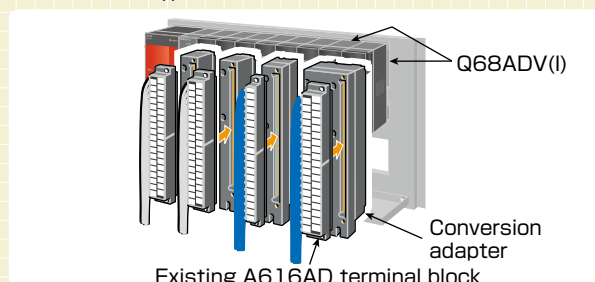


- \*4: Universal model QCPUs<sup>Note</sup> (include High-speed Universal model QCPUs) can be connected to the QA/QA1S extension base unit.
- \*5: The common terminal arrangement and electrical specifications are same as that of large type A Series I/O module.
- \*6: Since the conversion adapters are to be installed onto the Q Series modules, the specifications and functions are same as that of the Q Series modules. (Please check the transition handbook, since the specifications and functions are different from that of large type A Series module)
- \*7: Q Series large type blank cover (QG69L) is required. Some modules are not compatible. (Some exceeds 98 mm height.) For details, please refer to the Q Series Large Type Blank Cover User's Manual (IB-0800408).
- \*8: Universal model QCPUs<sup>Note</sup> (include High-speed Universal model QCPUs) can be connected to the QA/QA1S extension base unit.
- \*9: If the size of cable connected to the terminal block is larger than 1.25 mm<sup>2</sup>, ERNT-AQTX41, AQTY41, AQTX81, AQTY81, AQT68AD, AQT68ADN, AQT68DA, and AQTD61 modules may have a difficulty in installation. In this case, secure wiring space by leaving empty slots in between modules. For example, install modules on slot No. 0, 2, 4, 6, 8, and leave slot No. 1, 3, 5, 7 empty. If the number of slots is insufficient, consider using the Q Series large type base unit.



- \*4: Q00UJCPU is not compatible.
  - \*5: The common terminal arrangement and electrical specifications are same as that of large type A Series I/O module.
  - \*6: Since the conversion adapters are to be installed onto the Q Series modules, the specifications and functions are same as that of the Q Series modules. (Please check the transition handbook, since the specifications and functions are different from that of large type A Series module)
  - \*7: Q Series large type blank cover (QG69L) is required. Some modules are not compatible. (Some exceeds 98 mm height.) For details, please refer to the Q Series Large Type Blank Cover User's Manual (IB-0800408).
- Note: Universal model QCPU, whose first 5-digit serial number is 13102 or later, is compatible with the base units.

- \*10: When using two Q Series modules with the existing wiring terminals using conversion adapters. For example, when replacing an A616AD module with two Q68ADV(I) modules.



# Modules for Easy Replacement

## Plentiful Q Series modules facilitate the replacement

### ■DC input module

DC input modules compatible with 6 mA rated input current are available.

When replacing the A/QnA Series modules and utilizing the external devices as they are, the existing Q Series modules may not receive signals sent from external devices, such as proximity sensors, due to incompatibility with low-rated input current, and thus, external resistors need to be installed.

With the QX41-S2 and QX81-S2 modules, which are compatible with 6 mA rated input current, external resistors are no longer required. (The existing external devices can be utilized after replacing modules.)

#### Comparison of QX41-S2/QX81-S2 with large type A/QnA Series modules

Item		Specification			
		A/QnA Series model		Q Series replacement model	
Model	Positive common type	AX41	AX42	QX41-S2*1	QX41
	Negative common type	AX81	AX82	QX81-S2*1	QX81
Number of input points		32	64	32	32
Rated input current	24 V DC	Approx. 10 mA	Approx. 7 mA	Approx. 6 mA	Approx. 4 mA
	12 V DC	Approx. 4 mA	Approx. 3 mA	(N/A)	(N/A)

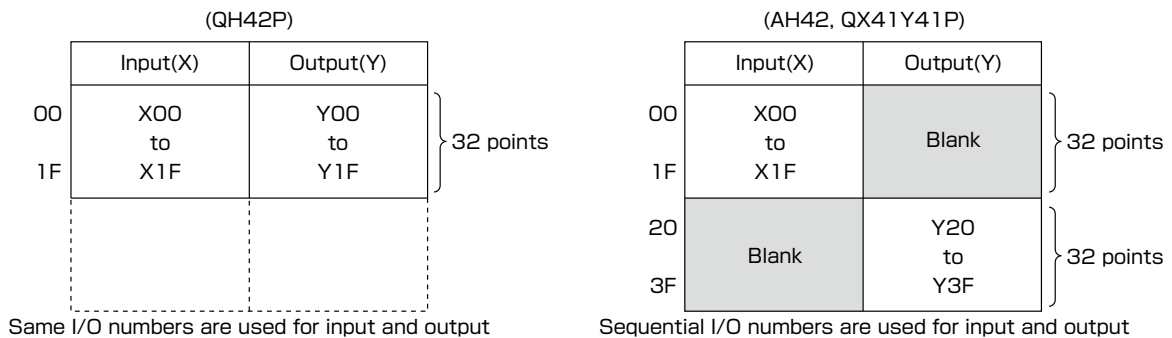
\*1 The pin arrangement is same as that of the existing A/QnA Series connector type module.

Use Conversion Adapter manufactured by Mitsubishi Electric Engineering Co., Ltd. when replacing the A/QnA Series 32-point terminal block module.

### ■I/O combined module \* A module with sequential I/O numbers

QX41Y41P's I/O assignment is the same as that of the A/QnA Series I/O combined module, AH42. This module can be used as the I/O module on the programmable controller side when using AOJ2 Upgrade Tool (manufactured by Mitsubishi Electric System & Service Co., Ltd., refer to page 23) to replace the AOJ2(H)CPU.

It is not necessary to change the programs when replacing AH42 or AOJ2(H)CPU. (Minimize the need to modify programs)



### ■High-speed counter module

These high-speed counter modules are used to replace the A/QnA Series high-speed counter modules (AD61 and AD61-S1) and have the same input filtering system and counting speed.

Modules can be replaced without being restrained by the specifications of existing pulse generators (e.g. an encoder).

Counting speed switch setting	A/QnA Series model	Q Series replacement model
50K PPS	AD61	QD62-H01
10K PPS	AD61-S1	QD62-H02

### ■Analog output positioning module

The positioning module realizes servo motor control with a high-resolution encoder, and is compatible with a 1 Mpps maximum input pulse (x10 compared to the conventional module).

Replace the positioning module while keeping the existing external devices such as servo amplifiers.

Positioning mode	A/QnA Series model	Q Series replacement model
Position control mode	AD70	QD73A1
Speed-position control switch mode		

Note: The number of occupied points may differ between the existing and newly replacing modules.

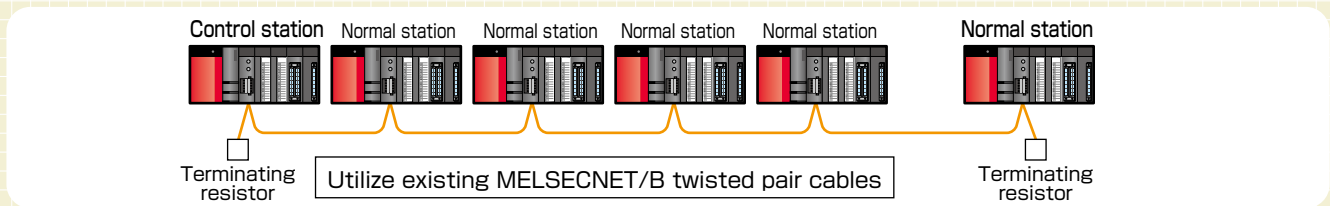
If the number of occupied points differs, set the start I/O number of the replacing module same with the start I/O number of the existing module to utilize the existing programs.

# MELSECNET/H Network Module

## Utilize the existing network cables to build the MELSECNET/H network system

### ■ MELSECNET/H Network module (twisted bus type)

The existing twisted pair cables of the MELSECNET/B data link system can be used to build the MELSECNET/H network system when replacing A/QnA Series modules with Q Series modules. Modules are replaced without modifying the previously laid network cables. Network system with an even higher speed can also be configured by replacing the twisted pair cables with CC-Link cables.

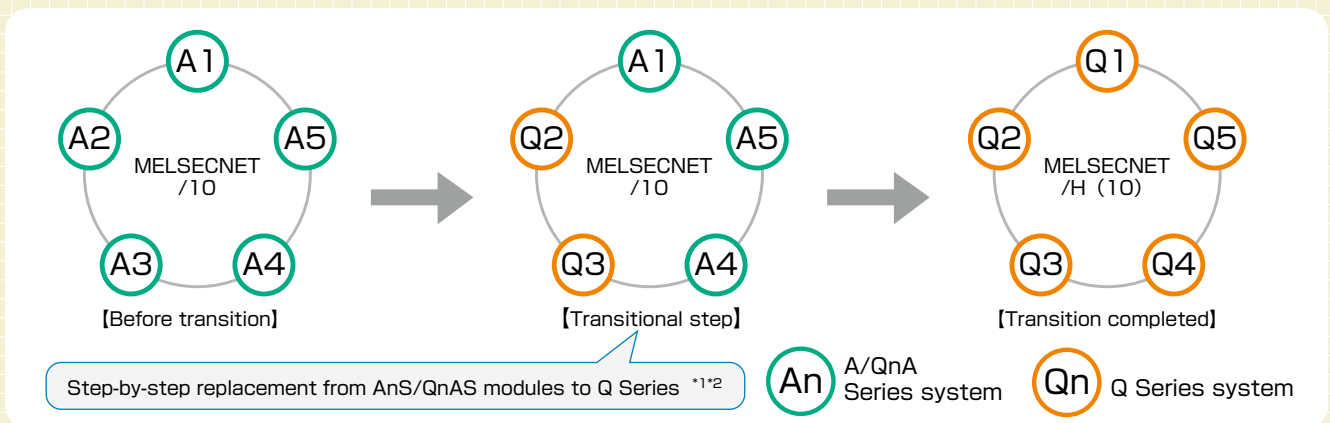


Model	Outline
QJ71NT11B	MELSECNET/H network module (twist bus type)

### ■ MELSECNET/H Network module (optical loop type, coaxial bus type)

Gradual transition from the existing A/QnA modules in MELSECNET/10 network system to Q Series with MELSECNET/H(10) network system is possible.\*1

For both the PLC-to-PLC network and the remote I/O network, the transition can be completed by the step-by-step replacement from A/QnA Series modules to Q Series modules.\*1



#### ● PLC to PLC network, remote I/O network

A/QnA Series model	Q Series equivalent model
AJ71LP21 AJ71QLP21	QJ71LP21-25 *2
AJ71LP21G AJ71QLP21G	QJ71LP21G *2
AJ71QLP21S	QJ71LP21S-25 *2
AJ71BR11 AJ71QBR11 AJ71LR21 *1 AJ71QLR21 *1	QJ71BR11 *2

#### ● Remote I/O network

A/QnA Series model	Q Series equivalent model
AJ72LP25 AJ72QLP25	QJ72LP25-25 *3
AJ72LP25G AJ72QLP25G	QJ72LP25G *3
AJ72BR15 AJ72QBR15 AJ72LR25 *1 AJ72QLR25 *1	QJ72BR15 *3

\*1: The Q Series modules do not support the MELSECNET/10 coaxial loop system; therefore, step-by-step replacement is not possible. The coaxial loop system should be replaced with the coaxial bus system, optical loop system or twisted bus system at once.

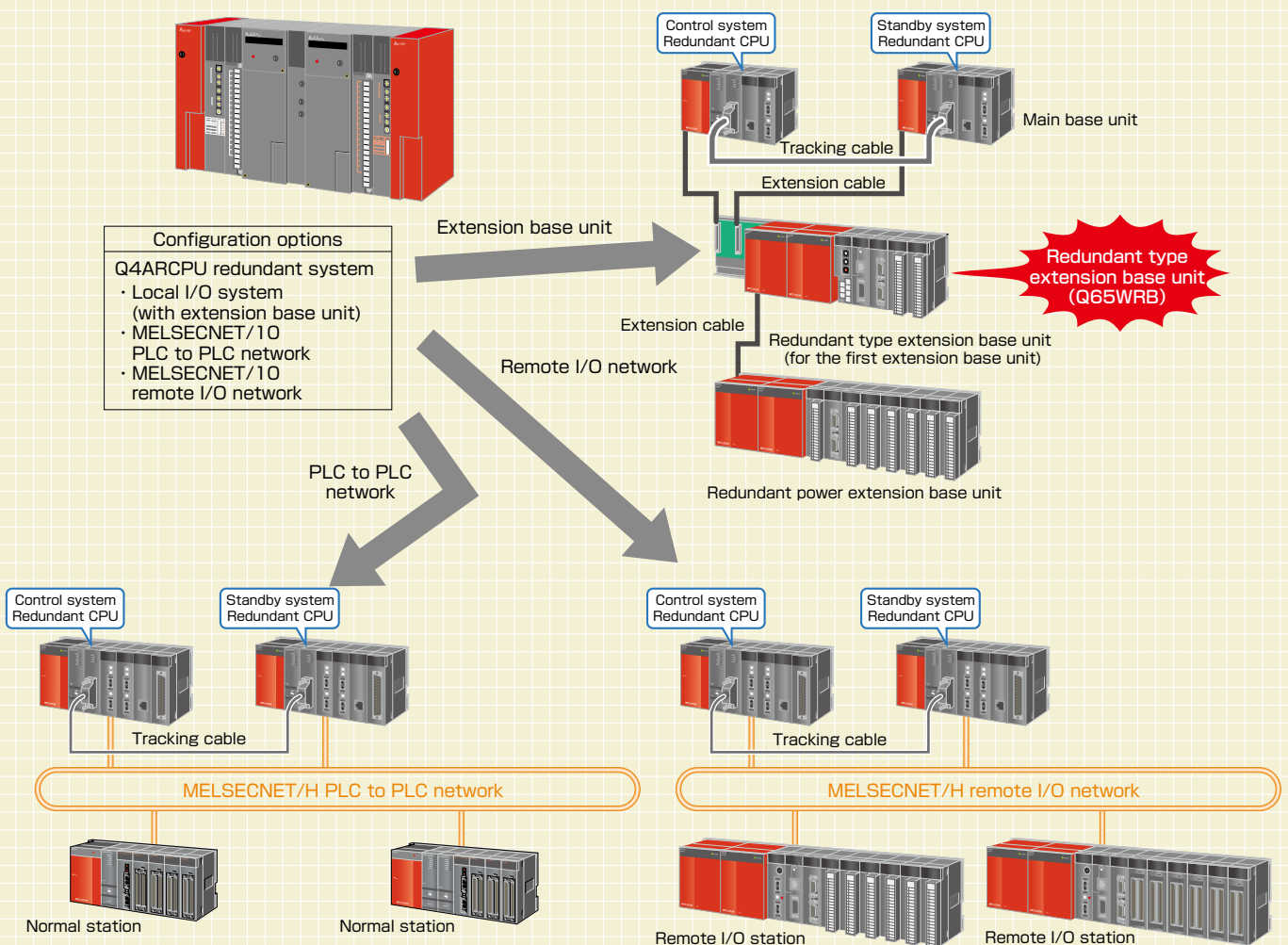
\*2: The Q Series remote master station is not compatible with the A/QnA Series remote I/O stations, and therefore the master station should be replaced with Q Series remote master station after replacing the entire A/QnA Series remote I/O stations with the Q Series stations.

\*3: When mixing the A/QnA Series and Q Series modules on the same network, please use this product whose first 5-digit serial number is 15012 or later.

# Q Series Redundant System

## Select the best Q Series redundant system configuration for the application

■ Easily replace the existing Q4ARCPU redundant system to the QCPU redundant system.



■ Network modules of MELSECNET/H PLC to PLC network and remote I/O network can be installed to the Q Series redundant CPU main base. (They can be used together.)  
A wide variety of system is constructed to suit the needs of the control target.

■ Realizes local I/O system equivalent to Q4ARCPU using the redundant type extension base unit.

■ Up to 63 modules can be installed using the redundant type extension base unit.

■ Fast system switching time at approx. 50 ms in the redundant local I/O system, remarkable improvement compared to the Q4ARCPU redundant system (300 ms + 1 scan time).



For Large Type A/QnA Series

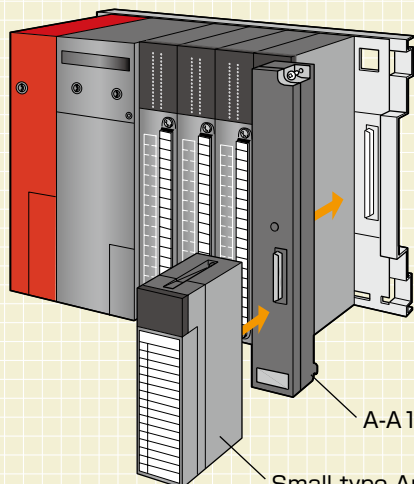
# A-A1S Module Conversion Adapter

(A1ADP-XY: For I/O module  
A1ADP-SP: For special function module)

## Use small type AnS/QnAS Series modules when additional modules are required for the A/QnA system

### ■ For a system with free I/O points and slots

Large type A Series base unit



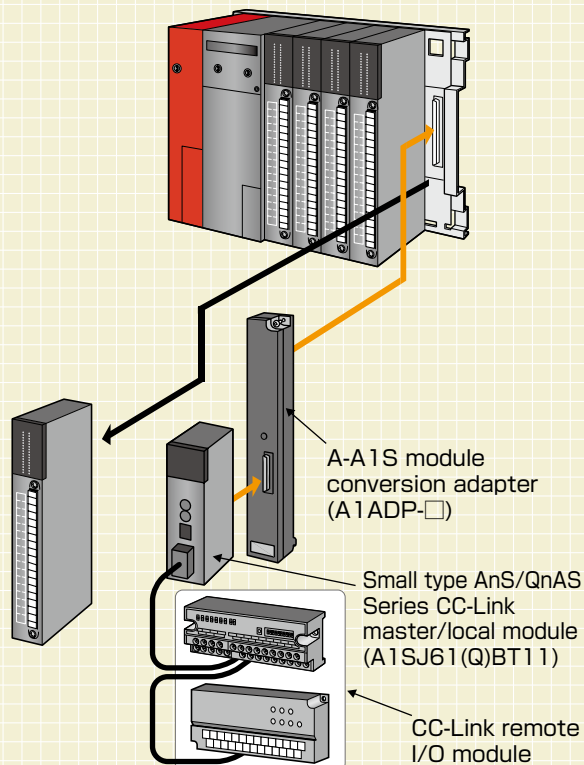
- Select a small type AnS/QnAS module having the required functions.
- Use the A-A1S module conversion adapter to install the small type AnS/QnAS module on the large type A/QnA Series base unit.
- \* Select a small type AnS/QnAS module having the required functions.

### ■ For a system with free I/O points and slots

Large type A/QnA Series base unit

- Select CC-Link modules with equivalent functionality to replace the A/QnA Series module.
- Use an A-A1S module conversion adapter to install a small type AnS CC-Link master/local module on the A Series base unit and add CC-Link modules.

A module in the existing system needs to be removed to install a CC-Link system master/local station when there are no free slots or I/O points. The functionalities of the removed module can be compensated by adding CC-Link remote modules.



- Up to three A-A1S module conversion adapters can be used per base unit.
- A-A1S module conversion adapters are compatible with the QA extension base unit and the large type A Series extension base unit (when QA conversion adapter (QA6ADP) is install).
- For details of applicable CPU modules, installable modules, and supported adapters for each module, refer to the following manual.
  - Product manual: A-A1S Module Conversion Adapter User's Manual (IB-0800352-E or later version)
- The production of the AnS/QnAS (small type) Series was discontinued at the end of September 2014 (except few models including the AnS/QnAS Series CC-Link master/local module).

# A0J2 Renewal Tool

(manufactured by Mitsubishi Electric System & Service Co., Ltd.)

## Replace A0J2(H) system with Q Series system using the existing wiring

### ■A0J2 renewal tool features

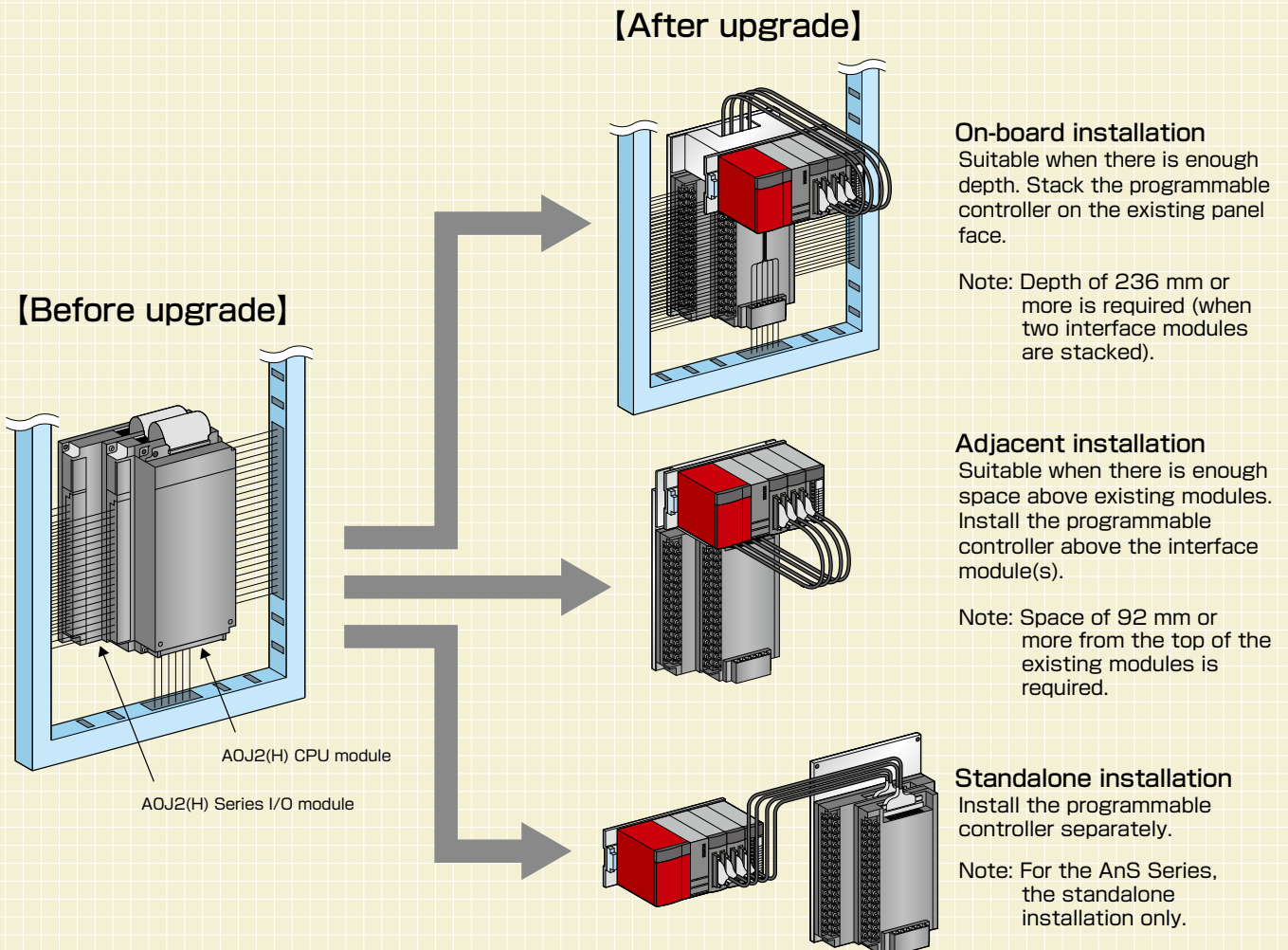
The A0J2 renewal tool is used to replace the A0J2(H) system with Q Series system. It consists of an interface module to which the existing wiring terminal block can be installed, and a base adapter that can be installed using the existing installation holes.

A variety of installation methods is available to fit the installation space.

### ■Interface module features

The interface module has DC to relay output conversion and AC to DC input conversion functions. Hence, replacement is possible together with Q Series connector type DC I/O modules.

Dedicated cables are used to connect the interface module to Q Series I/O modules.

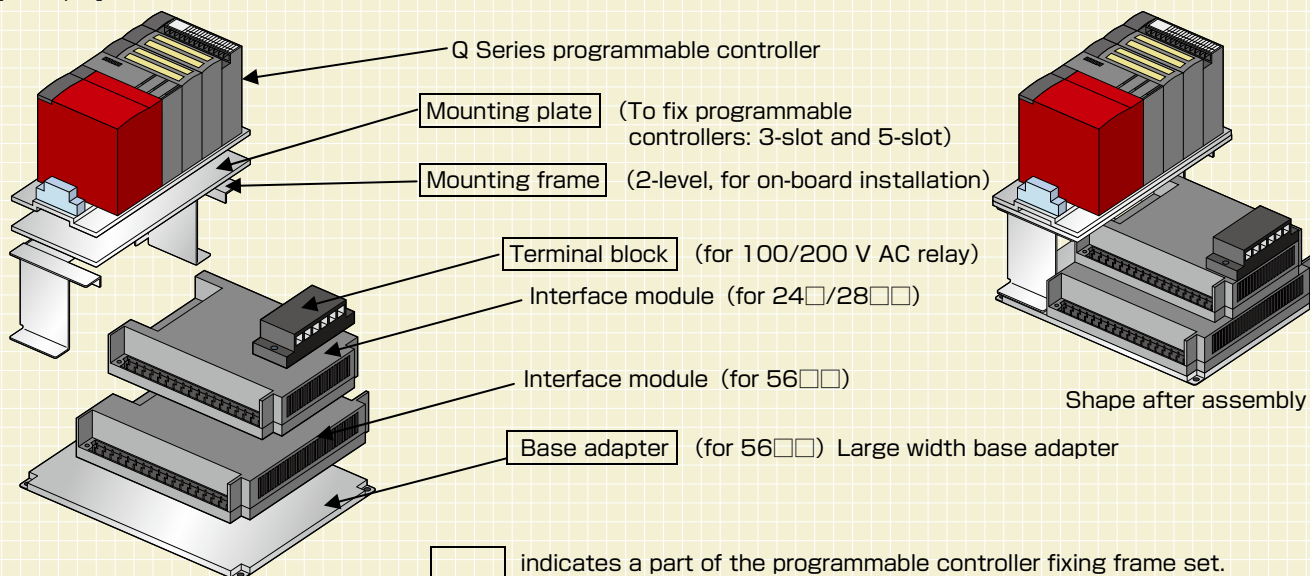


For detailed specifications, precautions, and restrictions of the A0J2 renewal tool, please refer to the brochure (X900904-165) and user's manual. For further information, please contact your local Mitsubishi Electric sales office or sales representative.

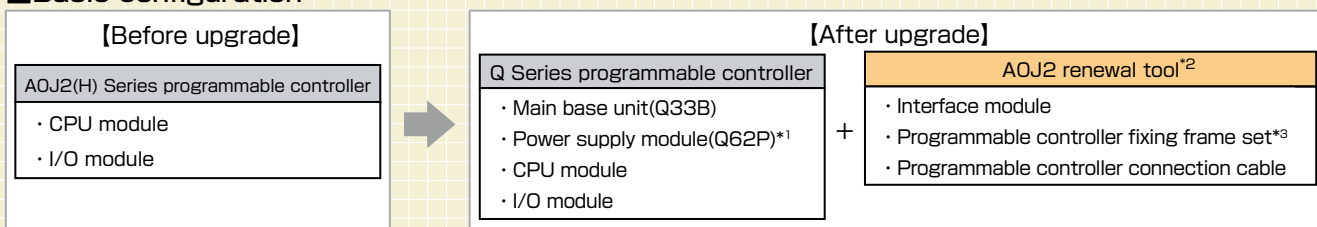


## Structure

[Example] 2-level on-board installation



## Basic configuration



\*1: The interface modules except for some models require 24 V DC power supply. If the Q62P is not used, provide a separate external power supply.

\*2: See the following list for the applicable interface module.

\*3: Includes a base adapter, mounting plate, mounting frame, terminal block, and power supply cable.

Discontinued model		Replacement interface module	Discontinued model		Replacement interface module
Input module	AOJ2-E32A	SC-AOJQIF-32A	I/O module	AOJ2-E28DS	SC-AOJQIF-28DS
	AOJ2-E32D	SC-AOJQIF-32D		AOJ2-E28DT	SC-AOJQIF-28DT
Output module	AOJ2-E24R	SC-AOJQIF-24R		AOJ2-E56AR	SC-AOJQIF-56AR
	AOJ2-E24S	SC-AOJQIF-24S		AOJ2-E56AS	SC-AOJQIF-56AS
	AOJ2-E24T	SC-AOJQIF-24T		AOJ2-E56DR	SC-AOJQIF-56DR
I/O module	AOJ2-E28AR	SC-AOJQIF-28AR		AOJ2-E56DS	SC-AOJQIF-56DS
	AOJ2-E28AS	SC-AOJQIF-28AS	AOJ2-E56DT	SC-AOJQIF-56DT	
	AOJ2-E28DR	SC-AOJQIF-28DR			

1. When upgrading to the Q Series module, programs do not need to be modified if the I/O combined module "QX41Y41P (32-point input for the first half and 32-point output for the second half)" is used. (Refer to page 17)

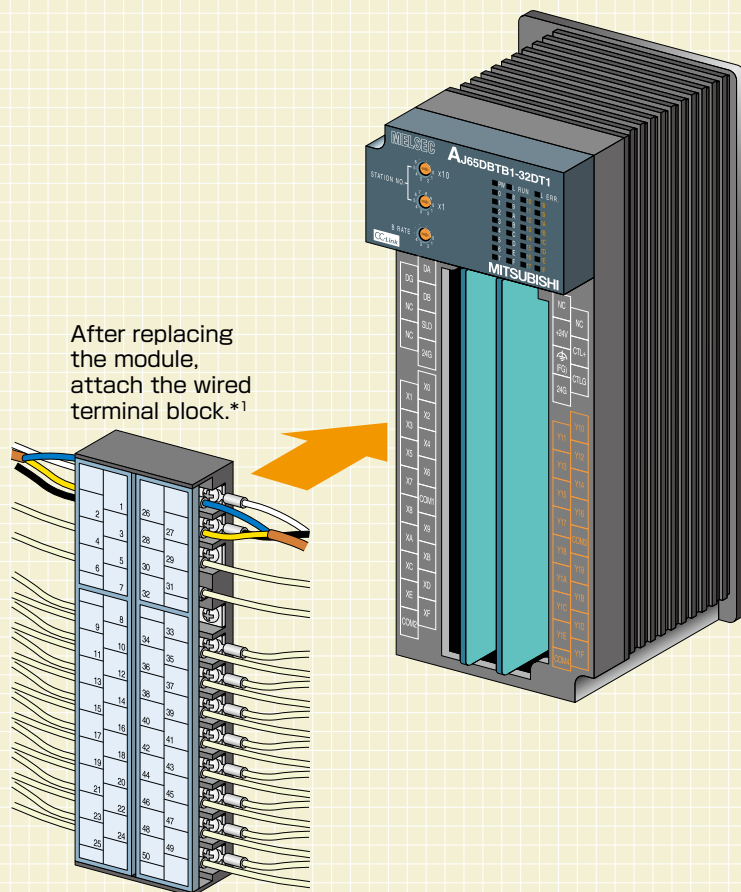
2. The AOJ2 renewal tool can be used to replace MELSECNET/MINI compact type I/O modules (AJ35PTF-□ (such as 28AR and 56DR)) with CC-Link modules.

3. For products that are not described (such as connection cables for programmable controller), please contact your local Mitsubishi sales office or representative

# A2C Shape CC-Link Remote I/O Module

## Replace A2CCPU and NET/MINI-S3 I/O module with CC-Link module using the existing NET/MINI-S3 wiring

- The simple replacement process helps minimize the upgrade time.  
The installation size is the same as that of A2C I/O modules; the existing terminal block can be installed directly.



\*1: The communication cables and power cables need to be rewired.

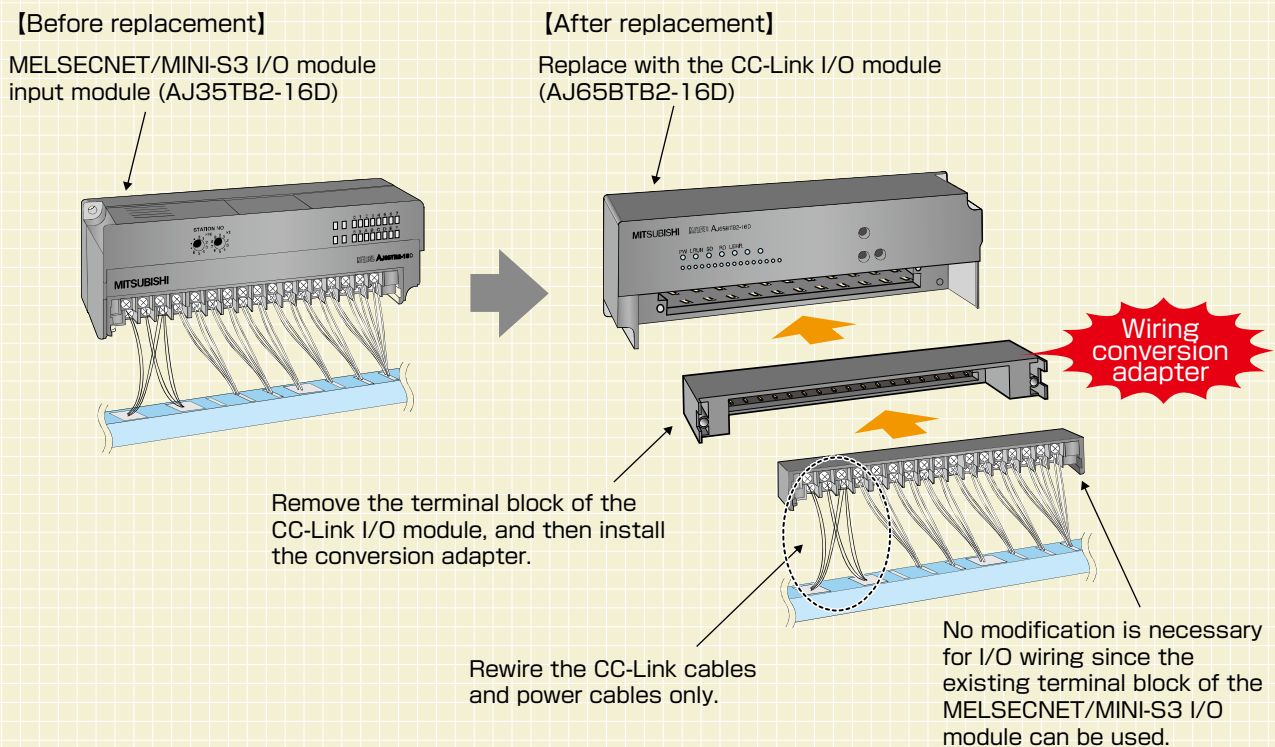
Discontinued model	Alternative model	
	Model	Outline
AX41C AX81C	AJ65DBTB1-32D	Terminal block type, 24 V DC input, 32 points, positive/negative common shared
AY51C	AJ65DBTB1-32T1	Terminal block type, 0.5 A transistor output, 32 points, sink
AX40Y50C	AJ65DBTB1-32DT1	Terminal block type, 24 V DC input, 16 points, positive common 0.5 A transistor output, 16 points, sink
AY13C	AJ65DBTB1-32R	Terminal block type, relay output, 32 points
AX40Y10C AX80Y10C	AJ65DBTB1-32DR	Terminal block type, 24 V DC input, 16 points, positive/negative common shared, relay output, 16 points

# MELSECNET/MINI-S3 I/O Module Wiring Conversion Adapter

Replace NET/MINI-S3 system with CC-Link network system while utilizing the existing NET/MINI-S3 wiring

■Wiring adapter terminal blocks eliminate the need to rewire.

[Example] Replacing AJ35TB2-16D with AJ65BTB2-16D using a 34-pin conversion adapter



Discontinued model		Alternative model		
Type	Model	Model		Remarks (restrictions)
		Alternative module	Conversion adapter	
Input module	AJ35TB1-16D	AJ65BTB1-16D	Wiring conversion adapter for 26-point terminal block*1 A6ADP-1MC16D	*1: The overall size is increased due to addition of the adapter to the alternative module. *2: Additional wiring to CTL+ (External power supply for output) is required.
	AJ35TB2-16D	AJ65BTB2-16D	Wiring conversion adapter for 34-point terminal block*1 A6ADP-2MC16D	
Output module	AJ35TB1-16T	AJ65BTB1-16T	Wiring conversion adapter for 26-point terminal block*1. *2 A6ADP-1MC16T	

# Product List

## List of products used for upgrade

### Extension base unit

Type	Model	Outline
QA(1S) extension base unit	QA1S51B	1 slot, for AnS Series modules (power supply module not required)
	QA1S65B	5 slots, for AnS Series modules
	QA1S68B	8 slots, for AnS Series modules
	QA65B	5 slots, for A Series modules
	QA68B	8 slots, for A Series modules

### QA conversion adapter

Type	Model	Outline
QA conversion adapter	QA6ADP	Adapter for connecting large type A/QnA extension base unit as QCPU extension base unit

### Q Series large type base unit

Type	Model	Outline
Main base unit	Q38BL	8 slots, 1 power supply module required, for the Q Series large type I/O modules
	Q35BL	5 slots, 1 power supply module required, for the Q Series large type I/O modules
Extension base unit	Q68BL	8 slots, 1 power supply module required, for the Q Series large type I/O modules
	Q65BL	5 slots, 1 power supply module required, for the Q Series large type I/O modules
	Q55BL	5 slots, power supply module not required, for the Q Series large type I/O modules

### Q Series large type I/O module

Type	Model	Outline
Input module	QX11L	32 points, 100 to 120 V AC, rated input current: 10 mA (100 V AC, 60 Hz), response time: 15 ms or less (OFF to ON), 25 ms or less (ON to OFF), 32 points/common, 38-point terminal block
	QX21L	32 points, 200 to 240 V AC, rated input current: 10 mA (220 V AC, 60 Hz), response time: 15 ms or less (OFF to ON), 25 ms or less (ON to OFF), 32 points/common, 38-point terminal block
Output module	QY11AL	16-point contact output, 24 V DC/240 V AC, 2 A/point, 16 A/all points, all points independent, 38-point terminal block, surge suppressor (varistor 387 to 473 V)
	QY13L	32-point contact output, 24 V DC/240 V AC, 2 A/point, 5 A/common, 8 points/common, 38-point terminal block
	QY23L	32-point triac output, 100 to 240 V AC, 0.6 A/point, 2.4 A/common, 8 points/common, 38-point terminal block
	QY51PL	32-point transistor output (Sink), 12/24 V DC, 0.5 A/point, 4 A/common, 16 points/common, 38-point terminal block
Q Series large type blank cover	QG69L	Blank cover for installing the existing Q Series module on the Q Series large type base unit

## DC input module

Type	Model	Outline
DC input module	QX41-S2	32 points, 24 V DC, rated input current: approximately 6 mA, positive common type, 32 points/common, response time: 1 ms/5 ms/10 ms/20 ms/70 ms or less (Set by the CPU parameter at the initial setting of 10 ms for both ON to OFF and OFF to ON)
	QX81-S2	32 points, 24 V DC, rated input current: approximately 6 mA, negative common type, 32 points/common, response time: 1 ms/5 ms/10 ms/20 ms/70 ms or less (Set by the CPU parameter at the initial setting of 10 ms for both ON to OFF and OFF to ON)

## I/O combined module

Type	Model	Outline
I/O combined module	QX41Y41P	<p>Input specifications (positive common type)            32 points, 24 V DC, 32 points/common,            response time: 1 ms/5 ms/10 ms/20 ms/70 ms or less            (Set by the CPU parameter at the initial setting of 10 ms for both ON to OFF and OFF to ON)</p> <p>Output specifications (sink type)            32 points, 24 V DC, 0.1 A/point, 2 A/common,            response time: 1 ms or less (OFF to ON), 1 ms or less (ON to OFF, rated load, resistance load)</p> <p>Number of occupied I/O points:            64 points (32-point input for the first half and 32-point output for the second half)</p>

## High-speed counter module

Type	Model	Outline
High-speed counter module	QD62-H01	High-speed counter module for replacing the AD61 (with the same input filtering system and counting speed)
	QD62-H02	High-speed counter module for replacing the AD61-S1 (with the same input filtering system and counting speed)

## Analog output positioning module

Type	Model	Outline
Analog output positioning module	QD73A1	1-axis analog output type Position control mode (positioning control, two-phase trapezoidal positioning control) Speed-position control switch mode

## MELSECNET/H network module

Type	Model	Outline
MELSECNET/H twisted bus type network module	QJ71NT11B	MELSECNET/H twisted pair cable, single bus, for control/normal station

# Product List

## Q Series redundant system extension base unit

Type	Model	Outline
Redundant system extension base unit	Q65WRB	5 slots, for Q Series modules

## A2C shape CC-Link remote I/O module

Type	Model	Outline
CC-Link remote I/O module (Screw/2-piece terminal block, dustproof type)	AJ65DBTB1-32D	Input: 32 points, 24 V DC (positive/negative common [sink/source]), terminal block 1-wire type, response time: 10 ms
	AJ65DBTB1-32T1	Output: 32 points, 12/24 V DC, 0.5 A transistor output (sink), terminal block 1-wire type (low leakage current type)
	AJ65DBTB1-32DT1	Input: 16 points, 24 V DC (positive common), 1-wire type, high-speed response, response time: 10ms Output: 16 points, 24 V DC 0.5A, transistor output (sink) terminal block 1-wire type (low leakage current type)
	AJ65DBTB1-32R	Output: 32 points, 24 V DC/240 V AC 2A relay output, terminal block 1-wire type
	AJ65DBTB1-32DR	Input: 16 points, 24 V DC (positive/negative common [sink/source]), response time: 10 ms Output: 16 points, 24 V DC/240 V AC, 2 A relay output, terminal block 1-wire type

## MELSECNET/MINI-S3-CC-Link wiring conversion adapter

Type	Model	Outline
MELSECNET/ MINI-S3-CC-Link wiring conversion adapter	A6ADP-1MC16D	26-pin wiring conversion adapter, 1-wire type, 16-point input CC-Link module dedicated adapter
	A6ADP-2MC16D	34-pin wiring conversion adapter, 2-wire type, 16-point input CC-Link module dedicated adapter
	A6ADP-1MC16T	26-pin wiring conversion adapter, 1-wire type, 16-point input (with CTL + terminal)CC-Link module dedicated adapter

## A-A1S module conversion adapter

Type	Model	Outline
For I/O modules	A1ADP-XY	Adapter for installing the small type AnS/QnAS Series I/O module on a large type A/QnA base unit and QA extension base unit
For special function modules	A1ADP-SP	Adapter for installing the small type AnS/QnAS Series special function module on a large type A/QnA base unit and QA extension base unit



## Models in continuous production

The production of the A/QnA Series products except the following modules has been discontinued since September 2006.

Note: In accordance with the continuation of production, model names may be changed.

### Power supply module

Type	Model
Large type A/QnA Series power supply module	A61PN*1
	A61RP

If using power supplies other than the above, please consider switching over to one of the above models.

\*1: A61PN is a replacement of A61P/A61PEU/A61P-UL.

### Battery

Type	Model
Battery	A6BAT

Only some models of the MELSEC-A/QnA (Large Type) Series are still in limited production. However, the EN61131-2:2003 certification has expired, so the CE Declaration for models still in production has been withdrawn. (Technical Bulletin No. FA-A-0071)

## Discontinued products

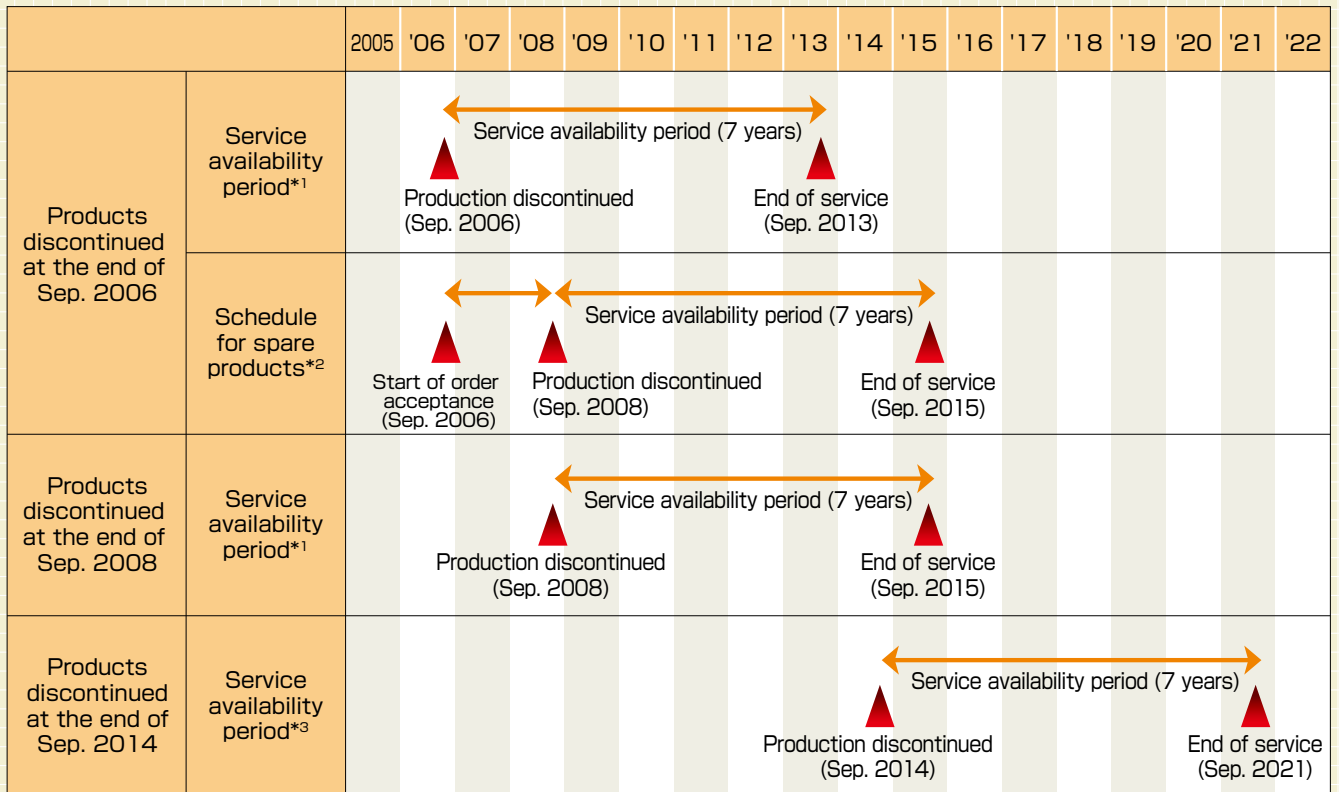
Discontinued products		Date of discontinuation
<b>Large type A Series/ Large type QnA Series</b>	● CPU module ● I/O module ● Special function module ● Data link module (MELSECNET(II), MELSECNET/B module, etc.) ● MELSECNET/MINI-S3 master module ● MELSEC-I/OLINK master module	End of Sep. 2006
	● MELSECNET/10 network module	End of Sep. 2014
<b>A2C Series</b>	● CPU module	End of Sep. 2006
	● A2C I/O module ● Special function module etc.	End of Sep. 2008
<b>Network interface board</b>	● MELSECNET(II), MELSECNET/B interface board	End of Sep. 2008
<b>A0J2(H) Series</b>	● CPU module ● Power supply module ● I/O module ● Special function module etc.	End of Sep. 2008
<b>Remote I/O module</b>	● MELSECNET/MINI-S3 I/O module	End of Sep. 2008
	● MELSEC-I/OLINK I/O module	End of Sep. 2014

Note: The production of the AnS/QnAS Series was also discontinued at the end of September 2014.



# Product List

## Service availability period



\*1: For details of the service availability period of discontinued products, refer to Technical Bulletin No.FA-A-0049.  
 \*2: Production of selected products, which were discontinued at the end of September 2006 (Technical Bulletin No.T99-0050), were extended until end of September 2008 as spare. However, its continued production has ended as of the end of September 2008.  
 \*3: For details of the service availability period of discontinued products, refer to Technical Bulletin No. FA-A-0141 and No. FA-A-0142.

### Precautions before use

This publication explains the typical features and functions of the products herein and does not provide restrictions and other information related to usage and module combinations. Before using the products, always read the product user manuals. Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, or accident compensation, whether foreseeable or not, caused by special factors; damage to products other than Mitsubishi Electric products; and to other duties.

### ⚠ For safe use

- To use the products given in this publication properly, always read the relevant manuals before use.
- The products have been manufactured as general-purpose parts for general industries, and have not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the products for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- The products have been manufactured under strict quality control. However, when installing the products where major accidents or losses could occur if the products fail, install appropriate backup or fail-safe functions in the system.

# Responding to the amenable running of FA systems through an enhanced support system

## Global FA Centers

"Mitsubishi Electric Global FA centers" have been established in various countries around the world to cover the Americas, Europe, and Asia. FA centers help to ensure compliance with the certifications and regulations of different regions, initiate product development in response to local demands, and provide full-time, professional customer service.

### China

#### Shanghai FA Center

##### MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. Shanghai FA Center

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### Thailand

#### Thailand FA Center

##### MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD.

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### India

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### Europe

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#### Germany FA Center

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##### MITSUBISHI ELECTRIC TURKEY A.S Umraniye Branch

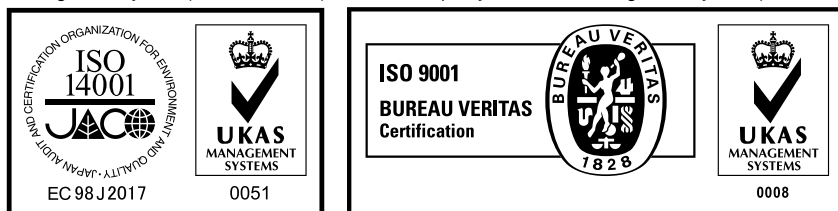
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# Mitsubishi Programmable Controllers

## MELSEC-A/QnA Series Transition Guide

Country/Region	Sales office	Tel/Fax
USA	MITSUBISHI ELECTRIC AUTOMATION, INC. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.	Tel : +1-847-478-2100 Fax : +1-847-478-2253
Mexico	MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch Boulevard Miguel de Cervantes Saavedra 301, Torre Norte Piso 5, Ampliacion Granada, Miguel Hidalgo, Ciudad de Mexico, Mexico, C.P.115200	Tel : +52-55-3067-7512
Brazil	MITSUBISHI ELECTRIC DO BRASIL COMERCIO E SERVICOS LTDA. Avenida Adelino Cardana, 293, 21 andar, Bethaville, Barueri SP, Brasil	Tel : +55-11-4689-3000 Fax : +55-11-4689-3016
Germany	MITSUBISHI ELECTRIC EUROPE B.V. German Branch Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany	Tel : +49-2102-486-0 Fax : +49-2102-486-7780
UK	MITSUBISHI ELECTRIC EUROPE B.V. UK Branch Travellers Lane, UK-Hatfield, Hertfordshire, AL10 8XB, U.K.	Tel : +44-1707-28-8780 Fax : +44-1707-27-8695
Ireland	MITSUBISHI ELECTRIC EUROPE B.V. Irish Branch Westgate Business Park, Ballymount, Dublin 24, Ireland	Tel : +353-1-4198800 Fax : +353-1-4198890
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Taiwan	SETSUYO ENTERPRISE CO., LTD. 6F, No.105, Wugong 3rd Road, Wugu District, New Taipei City 24889, Taiwan	Tel : +886-2-2299-2499 Fax : +886-2-2299-2509
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Thailand	MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD. 12th Floor, SV.City Building, Office Tower 1, No. 896/19 and 20 Rama 3 Road, Kwaeng Bangpongpan, Khet Yannawa, Bangkok 10120, Thailand	Tel : +66-2682-6522 Fax : +66-2682-6020
Vietnam	MITSUBISHI ELECTRIC VIETNAM COMPANY LIMITED Unit 01-04, 10th Floor, Vincom Center, 72 Le Thanh Ton Street, District 1, Ho Chi Minh City, Vietnam	Tel : +84-28-3910-5945 Fax : +84-28-3910-5947
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Australia	MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD. 348 Victoria Road, P.O. Box 11, Rydalmere, N.S.W 2116, Australia	Tel : +61-2-9684-7777 Fax : +61-2-9684-7245

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