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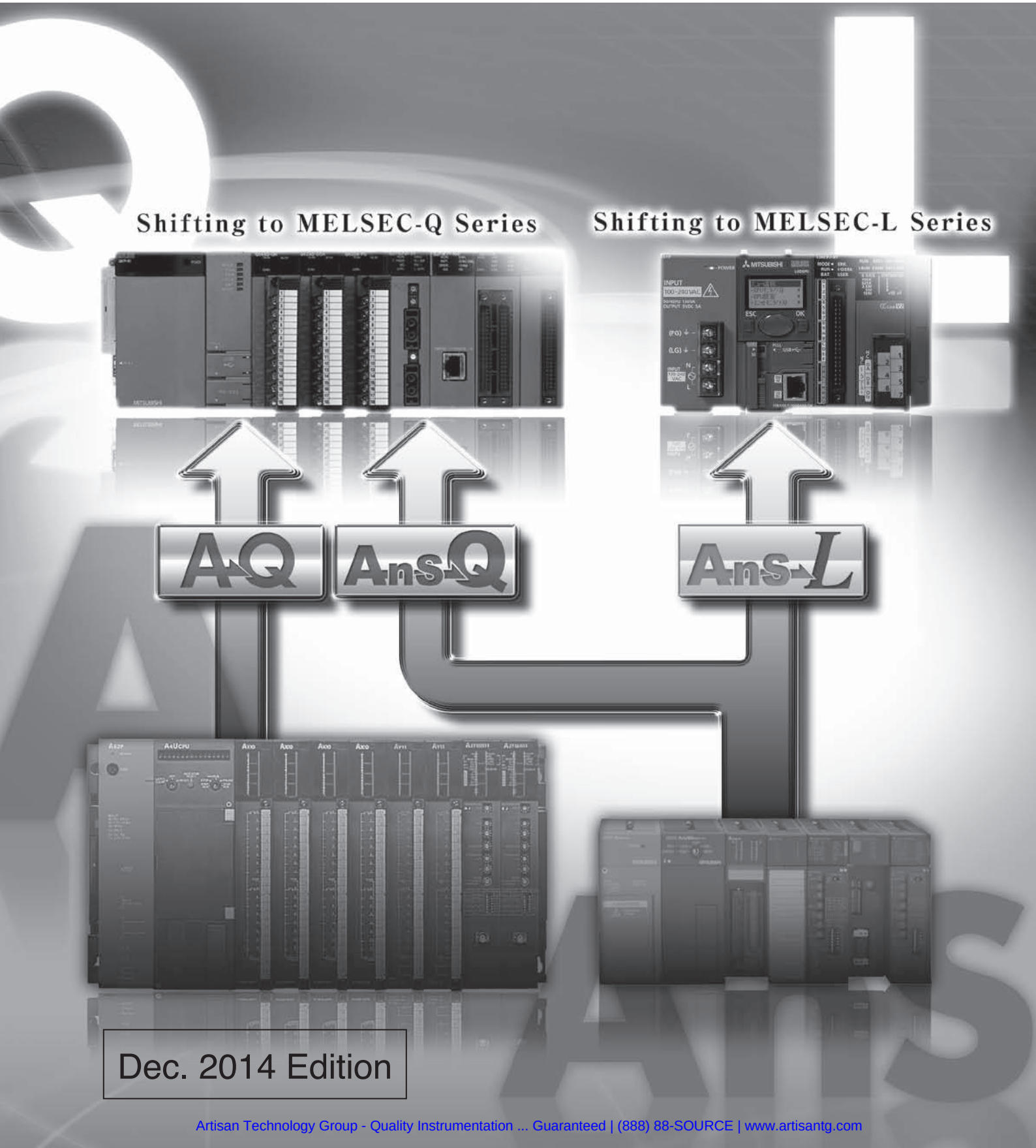
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Mitsubishi General-purpose Programmable Controllers MELSEC-A/QnA (Large), AnS/QnAS (Small) Transition Examples



Dec. 2014 Edition

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Safety Precautions

● When replacing A (Large Type)/AnS (Small Type) Series with Q Series ●

Before using products introduced in this publication, please read this Transition Examples and relevant manuals carefully and pay full attention to safety to handle the product correctly.

In this publication, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION".

⚠ **WARNING**	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ **CAUTION**	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this publication and keep it in a safe place for future reference.

Design Precautions

⚠ WARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.

  (1) Configure external safety circuits, such as an emergency stop circuit, protection circuit, and protective interlock circuit for forward/reverse operation or upper/lower limit positioning.

  (2) The programmable controller stops its operation upon detection of the following status, and the output status of the system will be as shown below.

Status	Q Series Module	A/AnS Series module
Overcurrent or overvoltage protection of the power supply module is activated.	All out puts are turned off.	All out puts are turned off.
The CPU module detects an error such as a watchdog timer error by the self-diagnostic function.	All outputs are held or turned off according to the parameter setting.	All out puts are turned off.

  All outputs may turn on when an error occurs in the part, such as I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller. For a fail-safe circuit example, refer to LOADING AND INSTALLATION in the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

  (3) Outputs may remain on or off due to a failure of an output module relay or transistor. Configure an external circuit for monitoring output signals that could cause a serious accident.

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Design Precautions

⚠ WARNING

- In an output module, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.

- Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.

- For the operating status of each station after a communication failure, refer to relevant manuals for the network.
  Incorrect output or malfunction due to a communication failure may result in an accident.

- When controlling (changing data) the running programmable controller from a peripheral connected to the CPU module or from a personal computer connected to an intelligent function module, configure an interlock circuit in the sequence program to ensure that the entire system will always operate safely.
  For other controls for the running programmable controller (program modification and operating status change (status control)), read relevant manuals carefully, and ensure the safety before operation.
  Especially, in the case of a control from an external device to a remote programmable controller, immediate action cannot be taken for a problem on the programmable controller due to a communication failure.
  Configure an interlock circuit in the sequence program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm (3.94 inches) or more between them.
  Failure to do so may result in malfunction due to noise.

- When a device such as a lamp, heater, or solenoid valve is controlled through an output module, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on.
  Take measures such as replacing the module with one having a sufficient current rating.

- The time for the CPU module to enter the RUN status after the CPU module is powered off and on or reset will vary depending on the system configuration, parameter settings, and/or program size, etc.
  Design the program so that the entire system will operate safely even if the time to reach the RUN status varies.

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Installation Precautions

⚠ CAUTION

- Use the programmable controller in an environment that meets the general specifications in the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
  Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.

- To mount the module, while pressing the module mounting lever located in the lower part of the module, fully insert the module fixing projection(s) into the hole(s) in the base unit and press the module until it snaps into place.
  Incorrect mounting may cause malfunction, failure or drop of the module.
  When using the programmable controller in an environment of frequent vibrations, fix the module with a screw.
  Tighten the screw within the specified torque range.
  Undertightening can cause drop of the screw, short circuit or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.

- When using an extension cable, connect it to the extension cable connector of the base unit securely.
  Check the connection for looseness.
  Poor contact may cause incorrect input or output.

- When using an SD memory card, fully insert it into the SD memory card slot.
  Check that it is inserted completely.
  Poor contact may cause malfunction.

- When using an extended SRAM cassette, fully insert it into the cassette connector on the CPU module.
  Close the cassette cover to keep the extended SRAM cassette inserted completely.
  Poor contact may cause malfunction.

- Shut off the external power supply for the system in all phases before mounting or removing the module.
  Failure to do so may result in damage to the product.
  A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
  Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
  For details, refer to the relevant sections in the QCPU User's Manual (Hardware Design, Maintenance and Inspection) and in the manual for the corresponding module.

- Do not directly touch any conductive part or electronic component of the module, memory card, SD memory card or extended SRAM cassette. Doing so can cause malfunction or failure.

- When using a motion CPU module and a motion module, make sure that proper modules are combined before turning on power. If improper modules are used, they may be damaged. For details, refer to the Motion CPU Module User's Manual.

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Wiring Precautions

⚠ WARNING

- Shut off the external power supply for the system in all phases before mounting or wiring the module.
  Failure to do so may result in electric shock or damage to the product.
- After mounting or wiring, attach the included terminal cover onto the module before turning the power on or starting operation.
  Failure to do so may result in electric shock.

⚠ CAUTION

- Ground the FG and LG terminals to the dedicated conductors for the programmable controller (Class D (Class 3) or higher grounding).
  Failure to do so may result in electric shock or malfunction.
- Use applicable solderless terminals and tighten them within the specified torque range.
  If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.
- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly.
  Inputting voltage different from the rated voltage, connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Connectors for external connection must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered.
  Incomplete connections could result in short circuit, fire, or malfunction.
- Fit the connectors surely to the module. Poor contact may cause malfunction.
- Do not bundle the control cable or communication cable with the main circuit or power wire, or lay them adjacently.
  Separate these by 100 mm or more.
  Failure to observe this could lead to malfunctioning caused by noise.
- When connecting any cable, check the type of the interface to be connected.
  Connecting to an improper interface or incorrect wiring may damage the module and external devices.
- Tightening the terminal screws within the specified torque range.
  Under tightening the terminal screws can cause short circuit, a fire or malfunction.
  Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Prevent foreign matter such as dust or wire chips from entering the module.
  Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring.
  Do not remove the film during wiring.
  Remove it for heat dissipation before system operation.
- When disconnecting any cable from the module, do not pull the cable.
  When disconnecting a cable with a connector, hold the connector of the connecting part of the module.
  Before disconnecting a cable from the terminal block, loosen the terminal screw on the terminal block.
  Pulling the cable with the terminal connected to the module may cause malfunction or damage to the module or cable.
- Mitsubishi programmable controllers must be installed in control panels.
  Connect the main power supply to the power supply module in the control panel through a relay terminal block.
  Wiring and replacement of a power supply module must be performed by maintenance personnel who is familiar with protection against electric shock. (For wiring methods, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection)).

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Startup and Maintenance Precautions

⚠ WARNING

- Do not touch any terminal while power is on.
  Doing so will cause electric shock.

- Correctly connect the battery connector.
  The battery must not be charged, disassembled, heated, thrown into the fire, short-circuited, soldered, wetted with a liquid or exposed to strong shock.
  Doing so will cause the battery to produce heat, explode, or ignite, resulting in injury and fire.

- Shut off the external power supply for the system in all phases before cleaning the module or retightening the terminal screws or module fixing screws.
  Failure to do so may result in electric shock, damage to the module and malfunction.

⚠ CAUTION

- Before performing online operations (especially, program modification, forced output, and operation status change) for the running CPU module from the peripheral connected, read relevant manuals carefully and ensure the safety.
  Improper operation may damage machines or cause accidents.

- Do not disassemble or modify the modules.
  Doing so may cause failure, malfunction, injury, or a fire.

- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm (9.85 inches) away in all directions from the programmable controller.
  Failure to do so may cause malfunction.

- Shut off the external power supply for the system in all phases before mounting or removing the module.
  Failure to do so may cause the module to fail or malfunction.
  A module can be replaced online (while power is on) on any MELSECNET/H remote I/O station or in the system where a CPU module supporting the online module change function is used.
  Note that there are restrictions on the modules that can be replaced online, and each module has its predetermined replacement procedure.
  For details, refer to the relevant sections in the QCPU User's Manual (Hardware Design, Maintenance and Inspection) and in the manual for the corresponding module.

- Connection/disconnection of the module to/from the base unit and the extended SRAM cassette and terminal block to/from the CPU module after the first use of the product shall be limited to 50 times. (Compliant with JIS B 3502)
  Exceeding the limit of 50 times may cause malfunction.

- Connection/disconnection of the SD memory card after the first use of the product shall be limited to 500 times. Exceeding the limit of 500 times may cause malfunction.

- Do not drop or apply shock to the battery to be installed in the module.
  Doing so may damage the battery, causing the battery fluid to leak inside the battery.
  If the battery is dropped or any shock is applied to it, dispose of it without using.

- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Failure to do so may cause the module to fail or malfunction.

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Disposal Precautions

⚠ CAUTION

- When disposing of this product, treat it as industrial waste.
  When disposing of batteries, separate them from other wastes according to the local regulations.
  (For details of the battery directive in EU member states, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).)

Transportation Precautions

⚠ CAUTION

- When transporting lithium batteries, follow the transportation regulations.
  (For details of the regulated models, refer to the QCPU User's Manual (Hardware Design, Maintenance and Inspection).)

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● When replacing AnS (Small Type) Series with L Series ●

Before using products introduced in this publication, please read this Transition Examples and relevant manuals carefully and pay full attention to safety to handle the product correctly.

In this publication, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION".

⚠ **WARNING**	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ **CAUTION**	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this publication and keep it in a safe place for future reference.

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Design Precautions

⚠ WARNING

- Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.
  (1) Configure external safety circuits, such as an emergency stop circuit, protection circuit, and protective interlock circuit for forward/reverse operation or upper/lower limit positioning.
  (2) The mechanical zero return of the positioning function is controlled based on two parameters, zero return direction and zero return speed, and deceleration is started when the near-point dog is turned on. Therefore, if the zero return direction is set incorrectly, the positioning function may continue the operation without deceleration. Configure an interlock circuit for prevention of mechanical damage on the outside of the programmable controller.
  (3) When the CPU module detects an error during operation of the positioning function, the function will decelerate and stop.
  (4) The programmable controller stops its operation upon detection of the following status, and the output status of the system will be as shown below.
    • When the overcurrent or overvoltage protection of the power supply module is activated, all outputs will be turned off.
    • When the CPU module detects an error such as a watchdog timer error by the self-diagnostic function, all outputs will be held or turned off according to the parameter setting.
    All outputs may turn on when an error occurs in the part, such as I/O control part, where the CPU module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller. For a fail-safe circuit example, refer to LOADING AND INSTALLATION in the LCPU User's Manual (Hardware Design, Maintenance and Inspection).
  (5) Outputs may remain on or off due to a failure of a transistor on an output circuit. Configure an external circuit for monitoring output signals that could cause a serious accident.

- In an output circuit, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.

- Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.

- Configure a circuit so that the external power supply is turned off before the programmable controller is turned off.
  If the programmable controller is turned off first, an accident may occur due to an incorrect output or malfunction.

- For the operating status of each station after a network communication failure, refer to relevant manuals for the network. Incorrect output or malfunction due to a communication failure may result in an accident.

- When changing data of the running programmable controller from a peripheral connected to the CPU module, configure an interlock circuit in the program to ensure that the entire system will always operate safely.
  For other controls for the running programmable controller (program modification and operating status change (status control)), read relevant manuals carefully, and ensure the safety before operation.
  Especially, in the case of a control from an external device to a remote programmable controller, immediate action cannot be taken for a problem on the programmable controller due to a communication failure. Configure an interlock circuit in the program, and determine corrective actions to be taken between the external device and CPU module in case of a communication failure.

- If an absolute position is recovered by the positioning function, the servo ON signal may be kept off (the servo may be kept off) for approx. 20 ms, and the motor may operate. If any problem is caused by the motor operation when the servo ON signal is turned off, provide an electromagnetic brake so that the motor will be locked during absolute position recovery.

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Design Precautions

⚠ CAUTION

- Do not bundle the control cable or communication cable with the main circuit or power wire, or lay them adjacently. Separate these by 100 mm or more as a rule.
  Failure to observe this could lead to malfunctioning caused by noise.
- When a lamp load or an inductive load, such as a heater and a solenoid valve, is controlled, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on. Use a module having a sufficient current rating.
- The time for the CPU module to enter the RUN status after the CPU module is powered off and on or reset will vary depending on the system configuration, parameter settings, and/or program size, etc. Design the program so that the entire system will operate safely even if the time to reach the RUN status varies.

Installation Precautions

⚠ WARNING

- Shut off the external power supply for the system in all phases before mounting or removing the module.
  Failure to do so may cause electric shock, damage to the module or malfunction.

⚠ CAUTION

- Use the programmable controller in an environment that conforms to "GENERAL SPECIFICATIONS" in the LCPU User's Manual (Hardware Design, Maintenance and Inspection).
  Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To mount modules, engage their connectors, slide them until the module connecting hook stops, and lock the hook securely.
  Incorrect mounting may cause malfunction, failure or drop of the module.
- Do not directly touch any conductive part or electronic component of any module.
  Doing so can cause malfunction or failure of the module.
- When using an extension cable, connect it to the extension connectors of the branch module and extension module. After connecting, check the connections for looseness.
  Poor contact may cause malfunction.
- When using an SD memory card, fully insert it into the SD memory card slot. Check that it is inserted completely.
  Poor contact may cause malfunction.
- Do not directly touch any conductive part or electronic component of the module or SD memory card.
  Doing so can cause malfunction or failure.

Wiring Precautions

⚠ WARNING

- Shut off the external power supply for the system in all phases before wiring the module.
  Failure to do so may result in electric shock or failure or malfunction of the module.
- After mounting or wiring, attach the included terminal cover onto the module before turning the power on or starting operation.
  Failure to do so may result in electric shock.

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Wiring Precautions

⚠ CAUTION

- Ground the FG and LG terminals to the dedicated conductors for the programmable controller (Class D (Class 3) or higher grounding).
  Failure to do so may result in electric shock or malfunction.

- Use applicable solderless terminals and tighten them within the specified torque range.
  If any spade solderless terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure.

- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly.
  Inputting voltage different from the rated voltage, connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.

- Connectors for external connection must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered.
  Incomplete connections could result in short circuit, fire, or malfunction.

- Fit the connectors surely to the module.

- Do not bundle the control cable or communication cable with the main circuit or power wire, or lay them adjacently. Separate these by 100 mm or more as a rule.
  Failure to observe this could lead to malfunctioning caused by noise.

- The electric wires and cables connected to the module shall be installed in a duct or secured with clamps.
  If such measures are not taken, the cables may sway or move or may be pulled unintentionally, and the module and cables may be damaged, or malfunction may be caused by cable contact failure.

- When connecting any cable, check the type of the interface to be connected.
  Connecting to an improper interface or incorrect wiring may damage the module and external devices.

- Tighten the screws on the terminal block within the specified torque range. Undertightening the screws can cause short circuit, a fire or malfunction.
  Overtightening can damage the screws and/or module, thereby causing fall, short circuit, a fire and malfunction.

- When disconnecting any cable from the module, do not pull the cable. When disconnecting a cable with a connector, hold the connector of the connecting part of the module. Before disconnecting a cable from the terminal block, loosen the terminal screw on the terminal block.
  Pulling the cable with the terminal connected to the module may cause malfunction or damage to the module or cable.

- Prevent foreign matter such as dust or wire chips from entering the module.
  Such foreign matter can cause a fire, failure, or malfunction.

- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring. Do not remove the film during wiring. Remove it for heat dissipation before system operation.

- When using the high-speed counter function, ground the shielded wire on the encoder side (relay box). (Class D (Class 3) grounding or higher)
  Failure to do so may cause malfunction.

- Mitsubishi programmable controllers must be installed in control panels. Connect the main power supply to the power supply module in the control panel through a relay terminal block.
  Wiring and replacement of a power supply module must be performed by maintenance personnel who is familiar with protection against electric shock.
  For wiring methods, refer to the LCPU User's Manual (Hardware Design, Maintenance and Inspection).

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Startup and Maintenance Precaution

⚠ WARNING

- Do not touch any terminal while power is on.
  Doing so will cause electric shock or malfunction.
- Correctly connect the battery connector. The battery must not be charged, disassembled, heated, thrown into the fire, short-circuited, soldered, wetted with a liquid or exposed to strong shock.
  Doing so will cause the battery to produce heat, explode, or ignite, resulting in injury and fire.
- Shut off the external power supply for the system in all phases before cleaning the module or retightening the terminal screws or connector fixing screws.
  Failure to do so may result in electric shock.

⚠ CAUTION

- Before performing online operations (especially, program modification, forced output, and operation status change) for the running CPU module from the peripheral connected, read relevant manuals carefully and ensure the safety.
  Improper operation may damage machines or cause accidents.
- Do not disassemble or modify the modules.
  Doing so may cause failure, malfunction, injury, or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25 cm away in all directions from the programmable controller.
  Failure to do so may cause malfunction.
- Shut off the external power supply for the system in all phases before mounting or removing the module.
  Failure to do so may cause the module to fail or malfunction.
- Tighten the screws on the terminal block and the connector mounting screws within the specified torque range.
  Undertightening the screws may cause fall of parts and wires, short circuit and malfunction.
  Overtightening can damage the screws and/or module, thereby causing fall, short circuiting and malfunction.
- Connection/disconnection of the module (including the display module) and the terminal block after the first use of the product shall be limited to 50 times. (Compliant with JIS B 3502)
  Exceeding the limit of 50 times may cause malfunction.
- Connection/disconnection of the SD memory card after the first use of the product shall be limited to 500 times.
  Exceeding the limit of 500 times may cause malfunction.
- Do not drop or apply shock to the battery to be installed in the module.
  Doing so may damage the battery, causing the battery fluid to leak inside the battery.
  If the battery is dropped or any shock is applied to it, dispose of it without using.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Failure to do so may cause the module to fail or malfunction.
- Before staring the test run of the positioning function, set the speed limit parameter to a low value and make preparations to promptly stop the system in case of a hazardous situation.

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Disposal Precautions

⚠ CAUTION

- When disposing of this product, treat it as industrial waste.
  When disposing of batteries, separate them from other wastes according to the local regulations.
  (For details of the battery directive in EU member states, refer to "Handling of Batteries and Devices with Built-in Batteries in EU Member States" in the LCPU User's Manual (Hardware Design, Maintenance and Inspection).

Transportation Precautions

⚠ CAUTION

- When transporting lithium batteries, follow the transportation regulations.
  (For details of the regulated models, refer to "Precautions for Battery Transportation" in the LCPU User's Manual (Hardware Design, Maintenance and Inspection).)

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Conditions of Use for the Product

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) Where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) Where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

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Revisions

Print Date	Publication Number*	Revision
Jul., 2008	L(NA)08121E-A	First edition
Jan., 2011	L(NA)08121E-B	Addition CONDITIONS OF USE FOR THE PRODUCT, Replacement options and module selection guide, Chapter 4, Section 7.3, Section 8.2, Chapter 11, Chapter 12, Chapter 14, Chapter 15, Chapter 17, Appendix 1, Appendix 2 Partial correction Safety Precautions, Chapters were reorganized and contents were revised(whole)
Sep., 2012	L(NA)08121E-C	Addition Section 1.2, Section 2.4, Section 4.3, Section 4.4, Chapter 5 (5), Section 6.3 Change Chapter 1 –> Section 1.1, Chapter 4 (Title changed), Chapter 6 (Title changed), Section 6.3 –> Section 6.4 Partial correction Safety Precautions, Introduction, Replacement options and module selection guide Chapter 3, Section 5.1, Section 5.2, Section 6.1, Section 10.1, Chapter 14, Appendix 2.2, Appendix 2.6
Sep., 2013	L(NA) 08121E-D	Addition Section 2.2.2, Section 2.3.4, Section 4.6, Section 5.3 Change Table of contents
Dec., 2014	L(NA) 08121E-E	Addition Section 1.3, Section 2.3, Section 3.2.2, Section 6.2, Section 7.5, Section 7.6, Section 8.2, Section 8.3, Section 10.2, Change Table of contents, Section 2.1, Section 2.2.2, Section 2.3.2, Section 4.6, Section 9.1, Section 10.1

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Introduction

This publication describes case examples of transition from the large type MELSEC-A/QnA Series, small type AnS/QnAS Series, A0J2(H) Series, and MELSECNET/MINI-S3 systems to the MELSEC-Q or MELSEC-L Series.
Refer to these examples when considering system configurations and selecting modules during a system upgrade.

This publication is intended to provide system configuration examples as a supplement to the replacement handbooks.
For specifications comparisons between A (Large Type and Small Type) and Q/L Series or precautions for replacement, refer to the following replacement handbooks.

• Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Fundamentals)	08043ENG
• Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Fundamentals)	08219ENG
• Transition from MELSEC-AnS/QnAS (Small Type) Series to L Series Handbook (Fundamentals)	08258ENG
• Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Intelligent Function Modules)	08046ENG
• Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Intelligent Function Modules)	08220ENG
• Transition from MELSEC-AnS/QnAS (Small Type) Series to L Series Handbook (Intelligent Function Modules)	08259ENG
• Transition from MELSEC-A/QnA (Large Type), AnS/QnAS (Small Type) Series to Q Series Handbook (Network Modules)	08048ENG
• Transition from MELSEC-AnS/QnAS (Small Type) Series to L Series Handbook (Network Modules)	08260ENG
• Transition from MELSEC-A/QnA (Large Type), AnS/QnAS (Small Type) Series to Q Series Handbook (Communications)	08050ENG
• Transition from MELSEC-AnS/QnAS (Small Type) Series to L Series Handbook (Communications)	08261ENG
• Transition from MELSEC-A0J2H Series to Q Series Handbook	08060ENG
• Transition from MELSECNET/MINI-S3, A2C (I/O) to CC-Link Handbook	08061ENG
• Transition from MELSEC-I/OLINK to CC-Link/LT Handbook	08062ENG
• Transition from MELSEC-I/OLINK to AnyWire DB A20 Handbook	08263ENG
• Transition of CPUs in MELSEC Redundant System Handbook (Transition from Q4ARCPU to QnPRHCPU)	08117ENG

- Before using the products shown in the transition handbooks, catalogues, and transition examples, refer to the relevant manuals and check the specifications, precautions, and restrictions.
  For information on the products manufactured by Mitsubishi Electric Engineering Co., Ltd., Mitsubishi Electric System & Service Co., Ltd., and other companies, refer to the relevant catalogues and check the specifications, precautions, and restrictions.
  The manuals and catalogues for our products, products manufactured by Mitsubishi Electric Engineering Co., Ltd., and Mitsubishi Electric System & Service Co., Ltd. are shown in Appendix of each transition handbook.
- For details on product compliance with the above standards, please contact your local Mitsubishi Electric sales office or representative.
- Products shown in this handbook are subject to change without notice.

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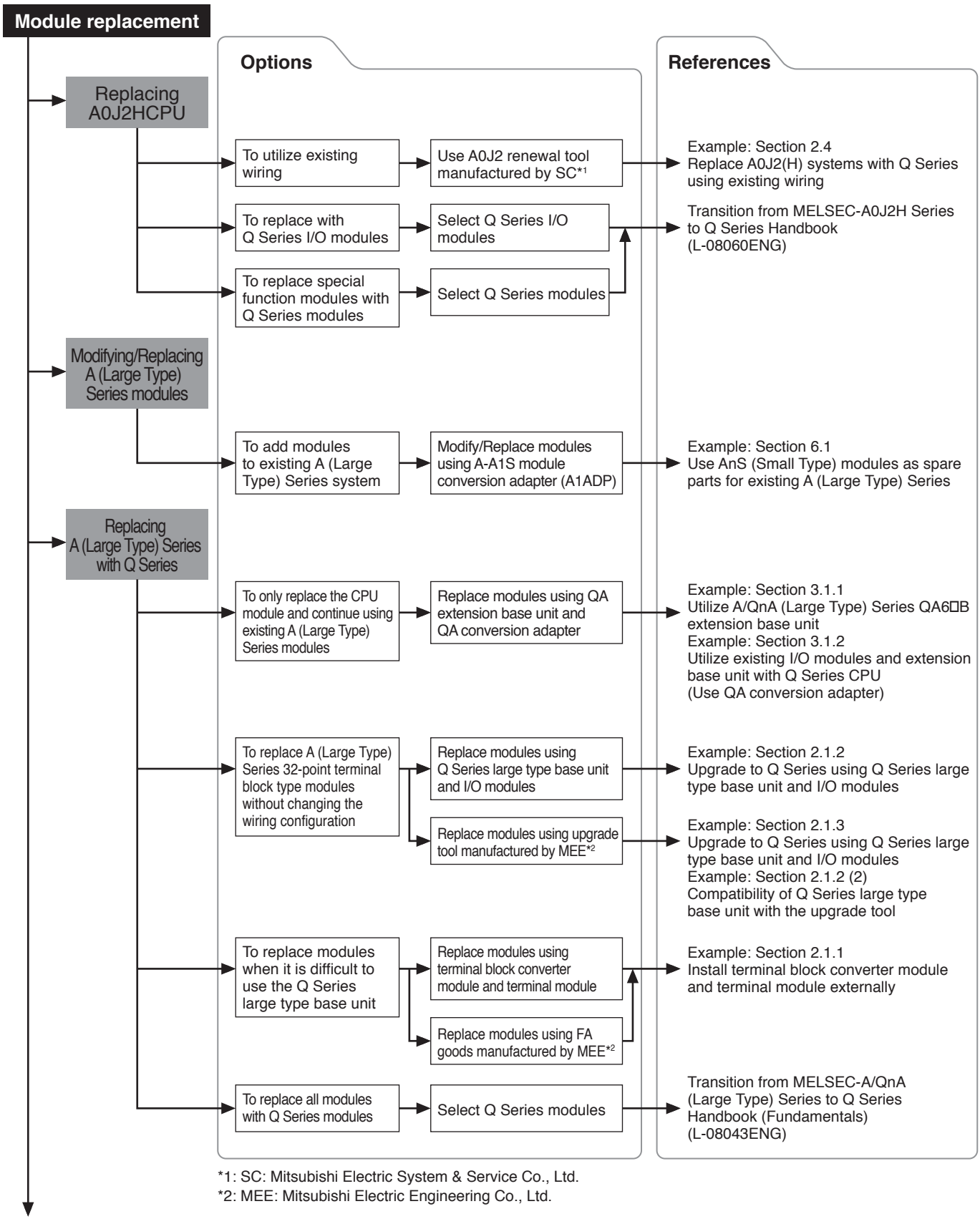
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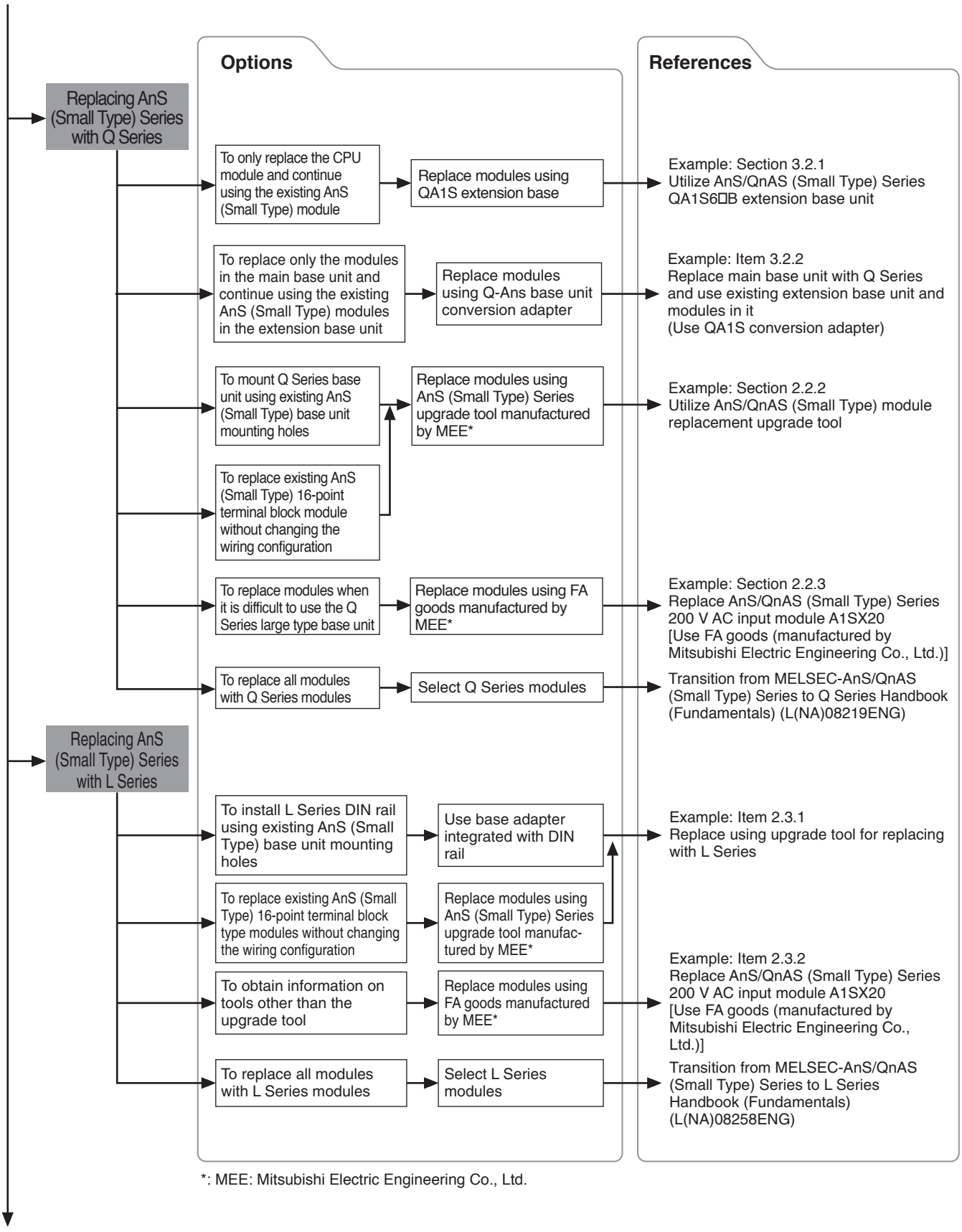
Replacement Options and Module Selection Guide

Specific modules are selected according to the transition procedure (gradually or simultaneously), module configuration, and network configuration when replacing A/QnA (Large Type), AnS/QnAs (Small Type) Series modules with Q/L Series modules.
The following shows module replacement options and references.



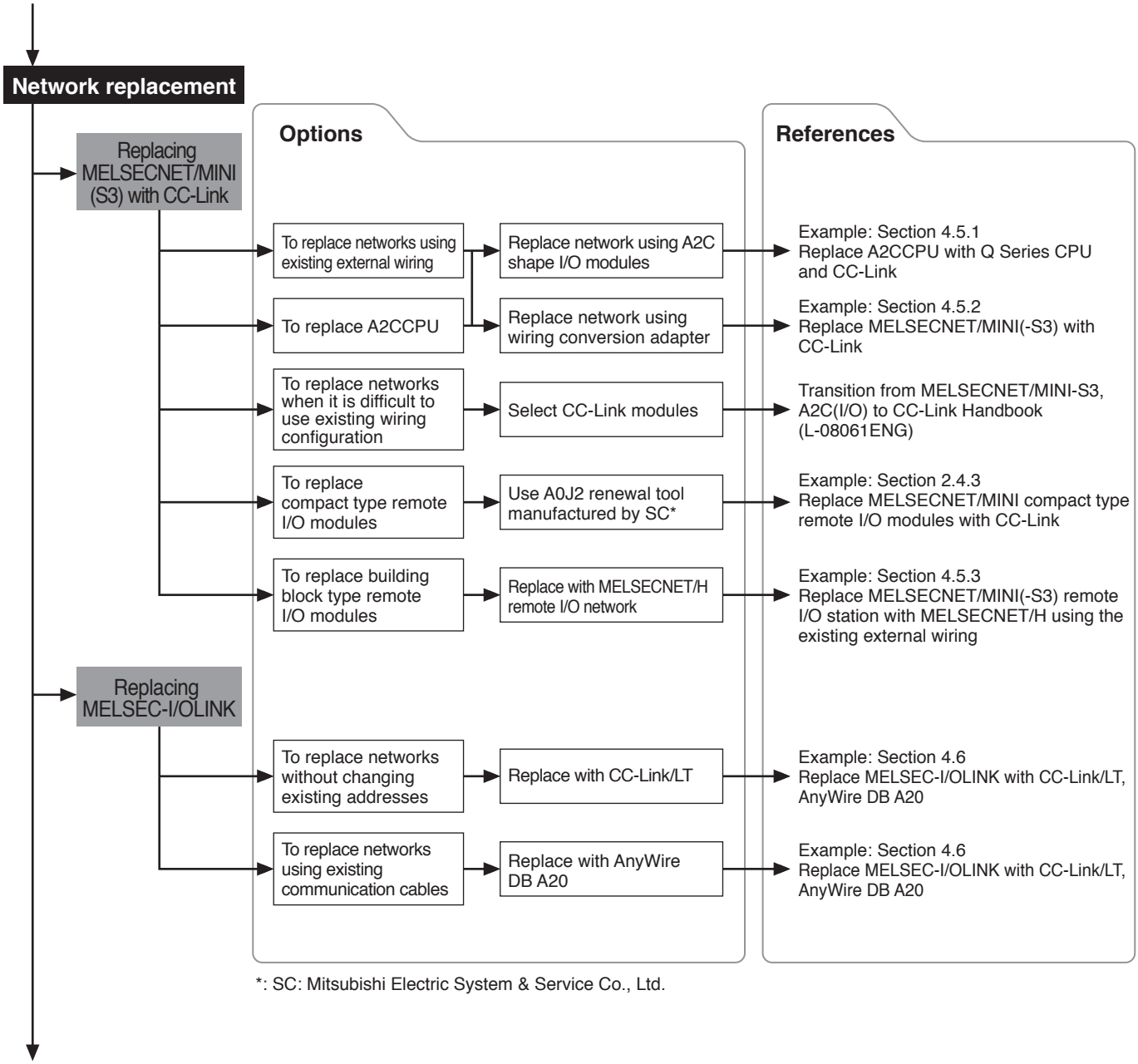
*1: SC: Mitsubishi Electric System & Service Co., Ltd.
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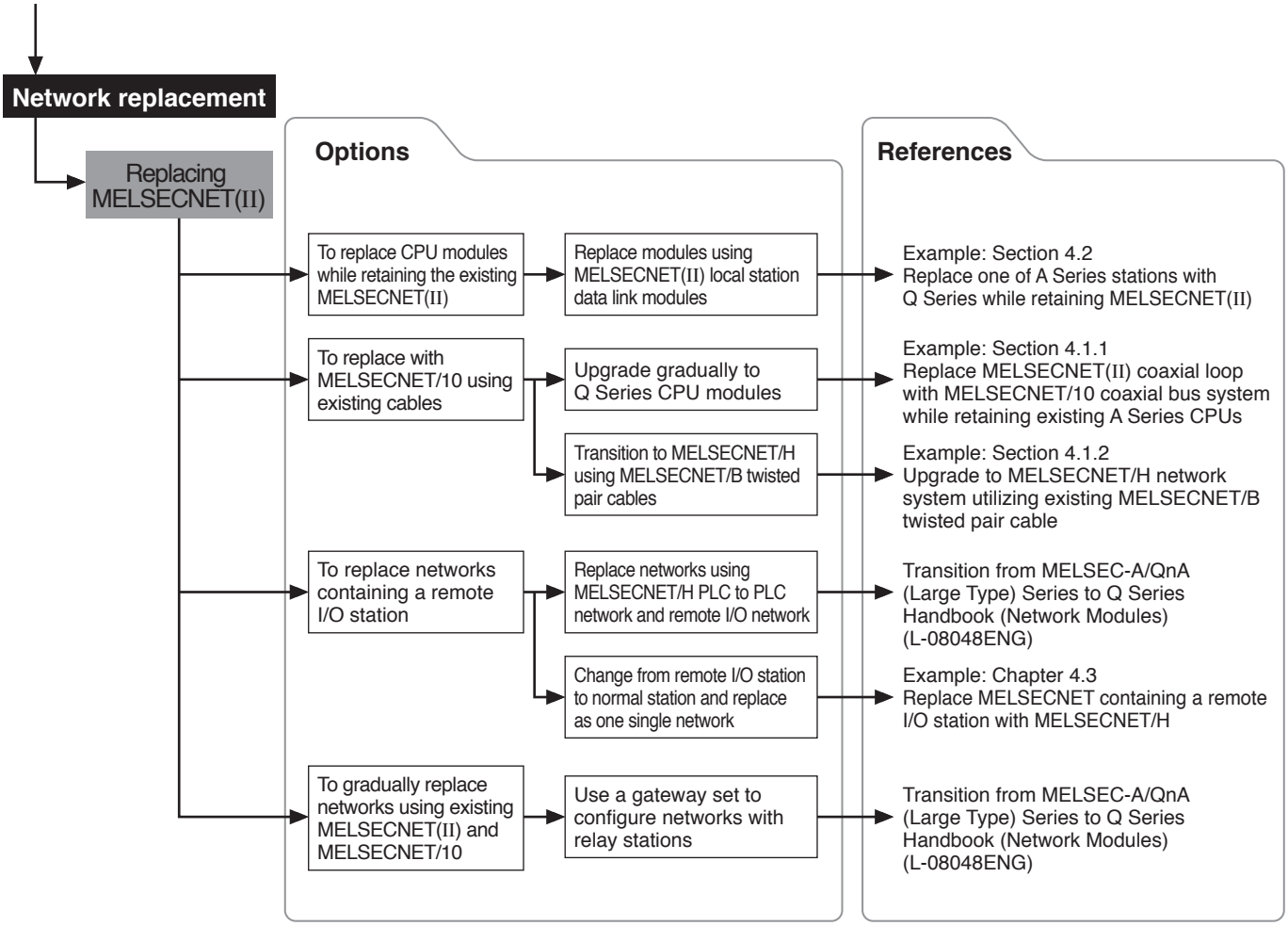
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This section describes the main replacement options. If multiple options are selected or other options are needed, comprehensive consideration is required to configure the system.

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Part Ⅰ: Hardware

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1. Comparison of base mounting area

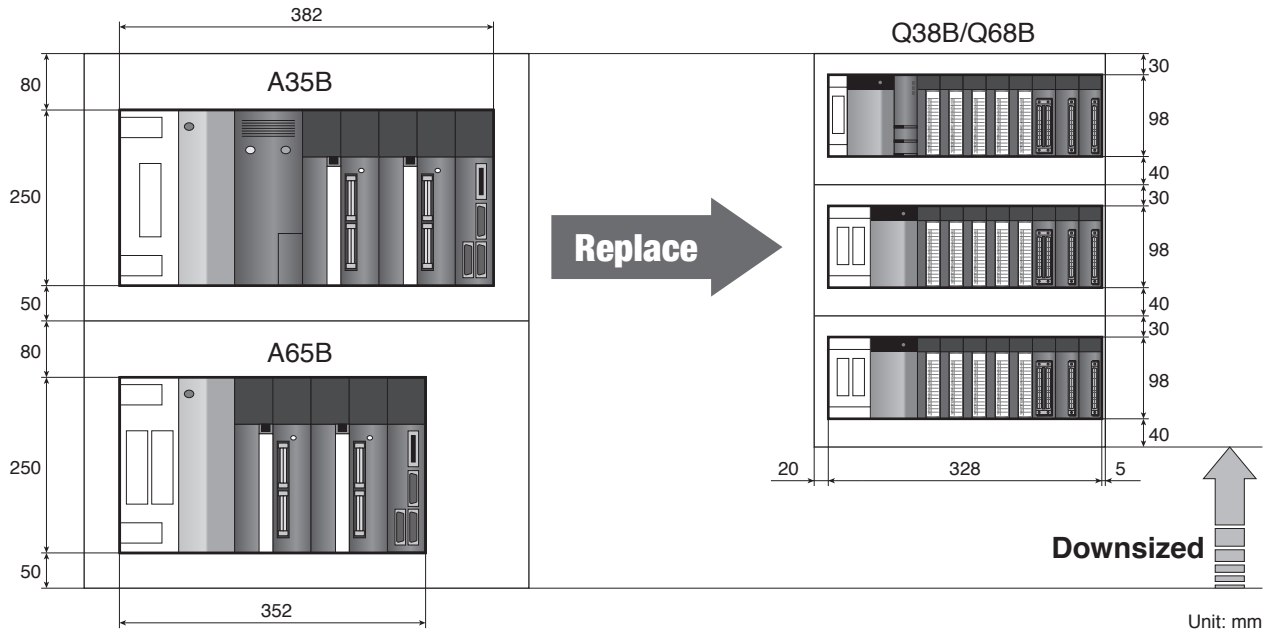
1.1 Comparison of A/QnA (Large Type) Series and Q Series base unit mounting area

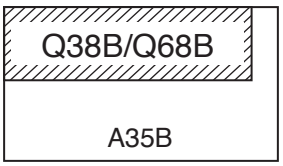
When upgrading existing A/QnA systems, there are cases where the number of modules increases due to specification differences. For instance, to replace an A/QnA (Large Type) Series 32-point terminal block type I/O module, two Q Series 16-point terminal block type I/O modules are used. Despite increase in the number of I/O slots and extension base stages, the Q Series footprint is smaller than that of the A/QnA (Large Type) Series. The following example shows a comparison of the mounting areas when the A/QnA (Large Type) Series system is upgraded to the Q Series.

Solution and Benefit

When replacing each 32-point terminal block type module with two 16-point terminal block type modules, an additional extension base unit is required due to an increase in the number of modules. However, the Q Series system fits inside the existing control panel because it is compact in size.

(1) When the A/QnA (Large Type) Series main base unit A35B and the A65B extension base unit are replaced





Base unit size comparsion

Tip

The A/QnA (Large Type) Series main base unit and extension base unit differ in size:

- A35B main base unit: 382 mm (W) x 250 mm (H)
- A65B extension base unit: 352 mm (W) x 250 mm (H)

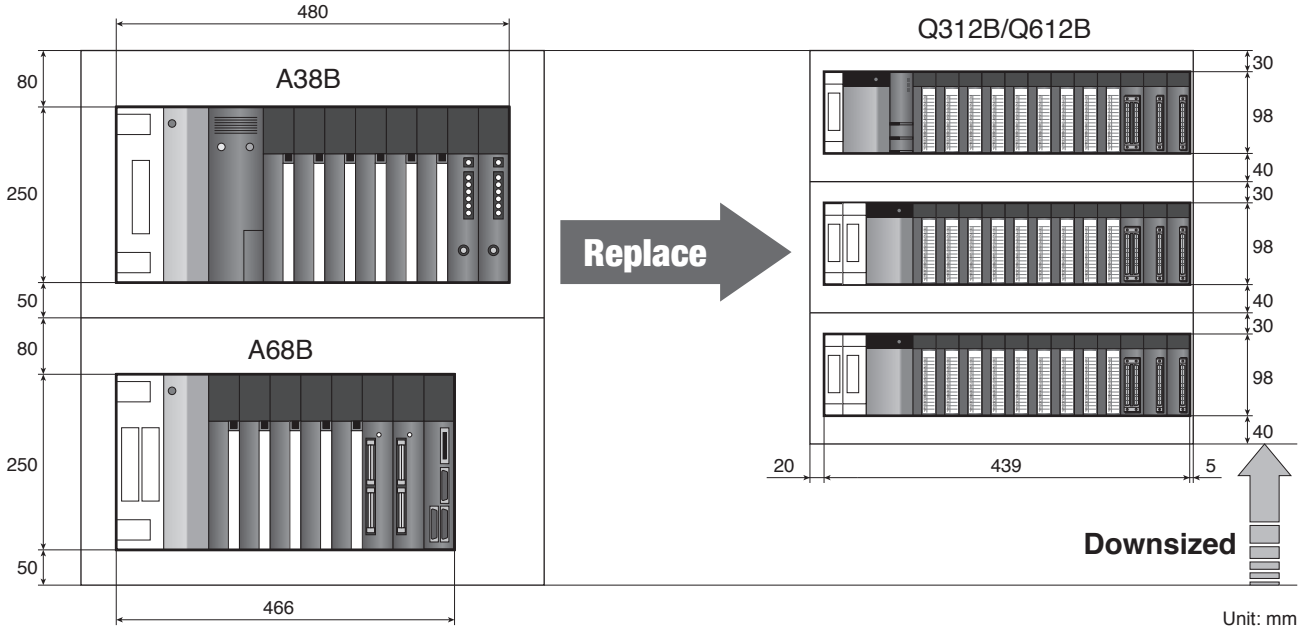
Whereas the Q Series main base unit and extension base unit are the same size:

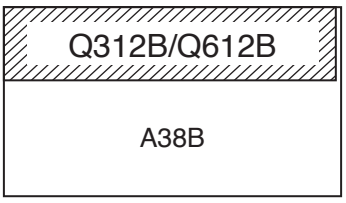
- Q38B main base unit/Q68B extension base unit: 328 mm (W) x 98 mm (H)

Even with the extra I/O slots and base units, the base unit installation area for Q Series is smaller than that for A/QnA (Large Type) Series.

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(2) When the A/QnA (Large Type) Series main base unit A38B and the A68B extension base unit are replaced





Base unit size comparsion

Tip

The A/QnA (Large Type) Series main base unit and extension base unit differ in size:

- A38B main base unit: 480 mm (W) x 250 mm (H)
- A68B extension base unit: 466 mm (W) x 250 mm (H)

Whereas the Q Series main base unit and extension base unit are the same size:

- Q312B main base unit/Q612B extension base unit: 439 mm (W) x 98 mm (H)

Even with the extra I/O slots and base units, the base unit installation area for Q Series is smaller than that for A/QnA (Large Type) Series.

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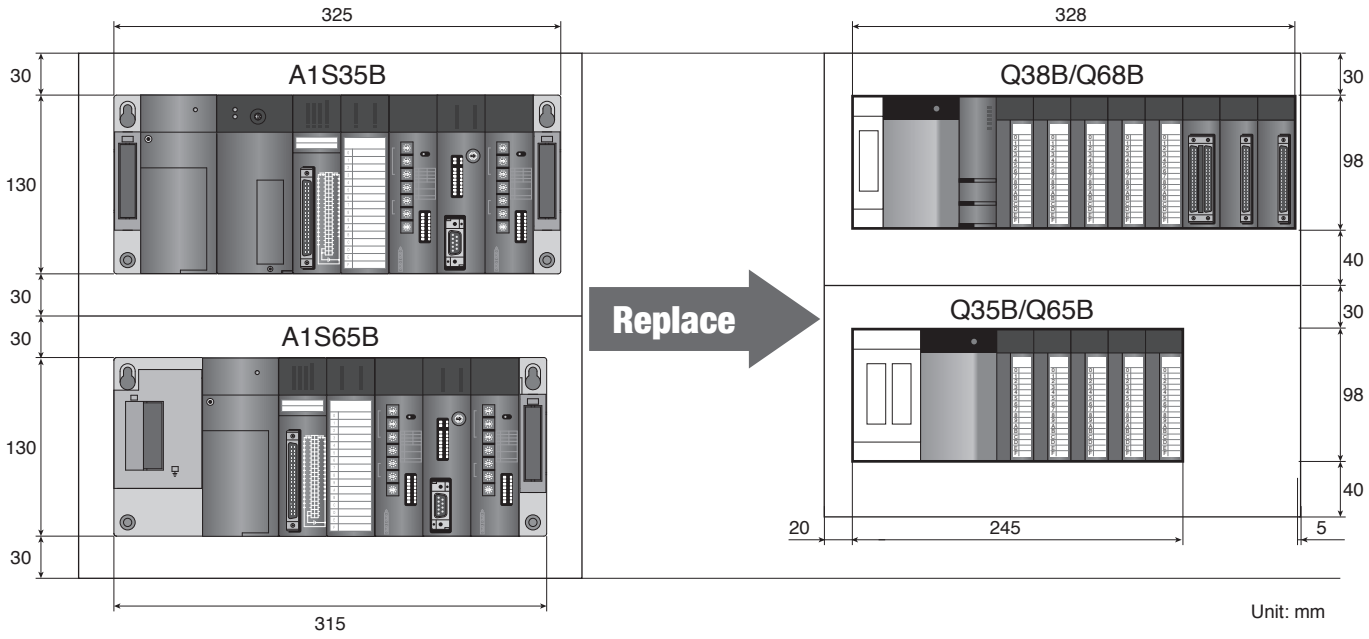
1.2 Comparison of AnS/QnAS (Small Type) Series and Q Series base unit mounting area

The Q Series is compact, and has a smaller mounting area.
It can be mounted within the AnS/QnAS (Small Type) mounting area.
The following example shows a comparison of the mounting areas when the AnS/QnAS (Small Type) Series system is upgraded to the Q Series.

Solution and Benefit

Using the "AnS to Q Series conversion adapter" (manufactured by Mitsubishi Electric Engineering Co., Ltd.), the 16-point terminal block type module can fit into the existing space without changing the wiring.

(1) When the AnS/QnAS (Small Type) Series main base unit A1S35B and the A1S65B extension base unit are replaced





Base unit size comparsion

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Existing base unit		Replacement base unit		Remarks
Model	Outline dimensions	Model	Outline dimensions	
A1S35B	325(W)×130(H)	Q35B	245(W)×98(H)	Width is 80 mm narrower
		Q38B	328(W)×98(H)	Width is 3 mm wider
A1S38B	430(W)×130(H)	Q38B	328(W)×98(H)	Width is 102 mm narrower
		Q312B	439(W)×98(H)	Width is 9 mm wider
A1S65B	315(W)×130(H)	Q65B	245(W)×98(H)	Width is 70 mm narrower
		Q68B	328(W)×98(H)	Width is 13 mm wider
A1S68B	420(W)×130(H)	Q68B	328(W)×98(H)	Width is 92 mm narrower
		Q612B	439(W)×98(H)	Width is 19 mm wider

Tip

The AnS /QnA (Small Type) Series main base unit and extension base unit differ in size:

- A1S35B main base unit: 325 mm (W) x 130 mm (H)
- A1S65B extension base unit: 315 mm (W) x 130 mm (H)

Whereas the Q Series main base unit and extension base unit are the same size:

- Q38B main base unit/Q68B extension base unit: 328 mm (W) x 98 mm (H)

The width will increase if the number of modules increases, i.e., A1S35B to Q68B will increase 3 mm, and A1S38B to Q312B will increase by 9 mm.
However, this increase can be handled. Confirm the in-panel layout and space and determine whether the extra modules can be mounted.

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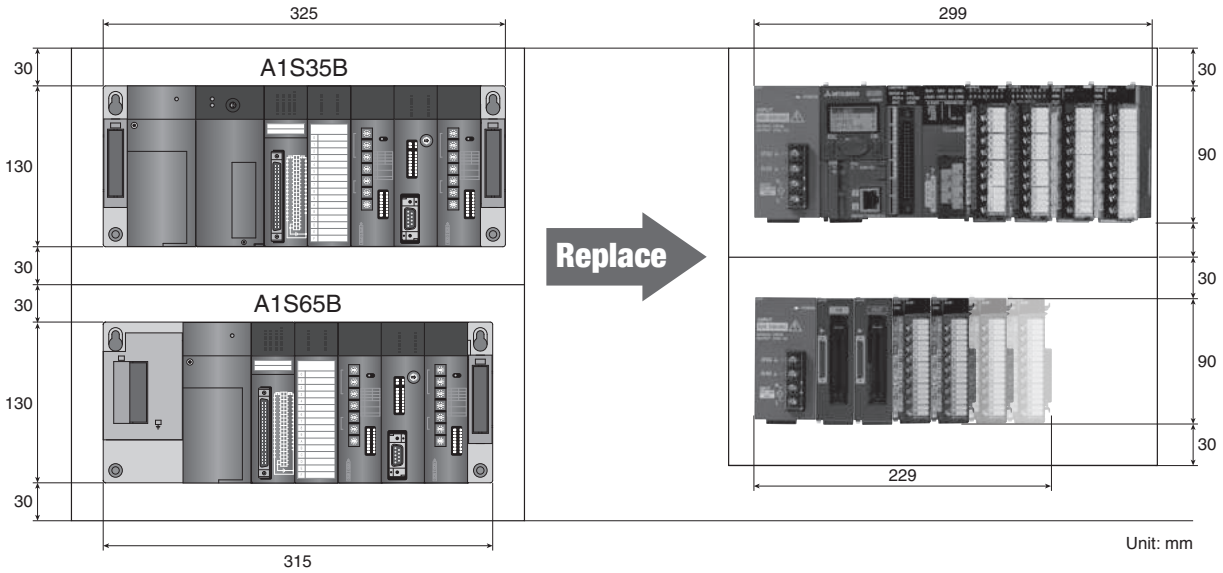
1.3 Comparison of AnS/QnAS (Small Type) Series and L Series mounting area

The L Series modules are designed to be installed directly on the DIN rails. The modules can be mounted freely according to the in-panel space.
When replacing AnS/QnAS (Small Type) Series modules with L Series, examine the mounting method in consideration of the in-panel space.

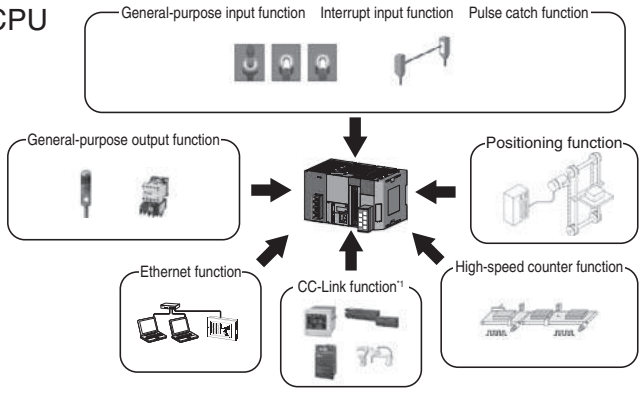
Solution and Benefit

(1) Using the "AnS to L Series conversion adapter" (manufactured by Mitsubishi Electric Engineering Co., Ltd.), the module to be mounted has a wiring connector incompatible with the terminal block of the terminal block type module can fit into the existing space without changing the wiring.
(2) The number of modules to be newly mounted can be reduced by using various built-in functions of the CPU.

(1) When the AnS/QnAS (Small Type) Series main base unit A1S35B and the A1S65B extension base unit are replaced



■ Built-in functions of CPU



*1: The CC-Link function can be used on L26CPU-BT and L26CPU-PBT.

Tip

Although the external dimensions of AnS/QnAS (Small Type) Series are determined by the base unit to be used, the width of L Series varies depending on the number of selected modules.
For the method for calculating the required width, refer to "Transition from MELSEC-AnS/QnAS (Small Type) Series to L Series Handbook."

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2. Utilizing external wiring

2.1 Replace A/QnA (Large Type) Series with Q Series

2.1.1 Install terminal block converter module and terminal module externally

(1) Replace 32-point terminal block type module using connector/terminal block converter module

Solution and Benefit

- **The connector/terminal block converter module can support up to 2mm² wires, allowing the use of existing thick wires without modification.**
- **Using a connector/terminal block converter module, an existing 32-point terminal block type module can be replaced with a 32-point connector type module without increasing the number of modules.**

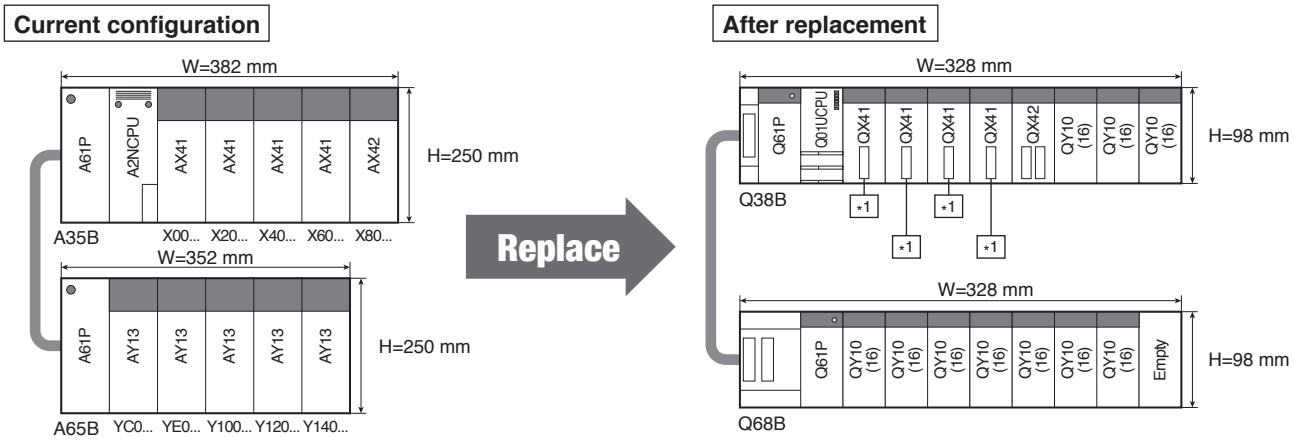
The following is an example of replacing an A/QnA (Large Type) Series system that contains 32-point terminal block type input modules (AX41).

● Instructions

Replace AX41 with QX41, and connect the connector/terminal block converter module.

If QX40 is used instead of QX41, two modules are required to replace each AX41. Also, if existing wires are thicker than the applicable wire size (0.75 mm²), wiring modifications may be necessary.

(a) System configuration example



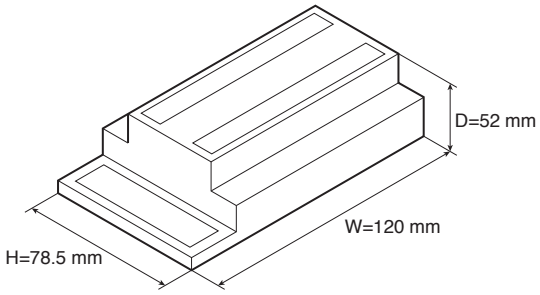
*1: Connector/terminal block converter module (A6TBXY36)

(b) Module selection example

Product name	Existing model		Replacemant model	
Power supply module	A61P	2	Q61P	2
CPU module	A2NCPU	1	Q01UCPU	1
Main base unit	A35B	1	Q38B	1
Extension base unit	A65B	1	Q68B	1
Extension cable	AC06B	1	QC06B	1
Input module	AX41	4	QX41	4
Connector/terminal block converter module	N/A	-	A6TBXY36	4
Connector/terminal block converter module cable	N/A	-	AC□TB	4
Input module	AX42	1	QX42	1
Output module	AY13	5	QY10	10

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Connector/terminal block converter module



A6TBXY36 (for 32 points)

Width
(All models have the same height and depth)

A6TBXY36	120 mm
A6TBXY54	155 mm
A6TBX70	190 mm

Specifications

Model	Outline	Weight	Applicable wire size	Applicable crimping terminal
A6TBXY36	For positive common input modules and sink output modules (standard type)	0.4 kg	0.75 to 2 mm^2	1.25-3.5 (JIS) 1.25-YS3A (J.S.T.) V1.25-M3 (J.S.T.) V1.25-YS3A (J.S.T.) 2-3.5 (JIS) 2-YS3A (J.S.T.) V2-S3 (J.S.T.) V2-YS3A (J.S.T.)
A6TBXY54	For positive common input modules and sink output modules (2-wire type)	0.5 kg		
A6TBX70	For positive common input modules (3-wire type)	0.6 kg		
A6TBX36-E	For negative common input modules (standard type)	0.4 kg		
A6TBX54-E	For negative common input modules (2-wire type)	0.5 kg		
A6TBX70-E	For negative common input modules (3-wire type)	0.6 kg		
A6TBY36-E	For source output modules (standard type)	0.4 kg		
A6TBY54-E	For source output modules (2-wire type)	0.5 kg		

Cables

Model	Outline	Weight	Applicable model
AC05TB	0.5 m, for sink type modules	0.17 kg	A6TBXY36 A6TBXY54 A6TBX70
AC10TB	1 m, for sink type modules	0.23 kg	
AC20TB	2 m, for sink type modules	0.37 kg	
AC30TB	3 m, for sink type modules	0.51 kg	
AC50TB	5 m, for sink type modules	0.76 kg	
AC80TB	8 m, for sink type modules (common current: 0.5 A or lower)	1.2 kg	
AC100TB	10 m, for sink type modules (common current: 0.5 A or lower)	1.5 kg	
AC05TB-E	0.5 m, for source type modules	0.17 kg	A6TBX36-E A6TBY36-E A6TBX54-E A6TBY54-E A6TBX70-E
AC10TB-E	1 m, for source type modules	0.23 kg	
AC20TB-E	2 m, for source type modules	0.37 kg	
AC30TB-E	3 m, for source type modules	0.51 kg	
AC50TB-E	5 m, for source type modules	0.76 kg	

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(2) Replace 32-point contact output type module using "relay terminal module"

Solution and Benefit

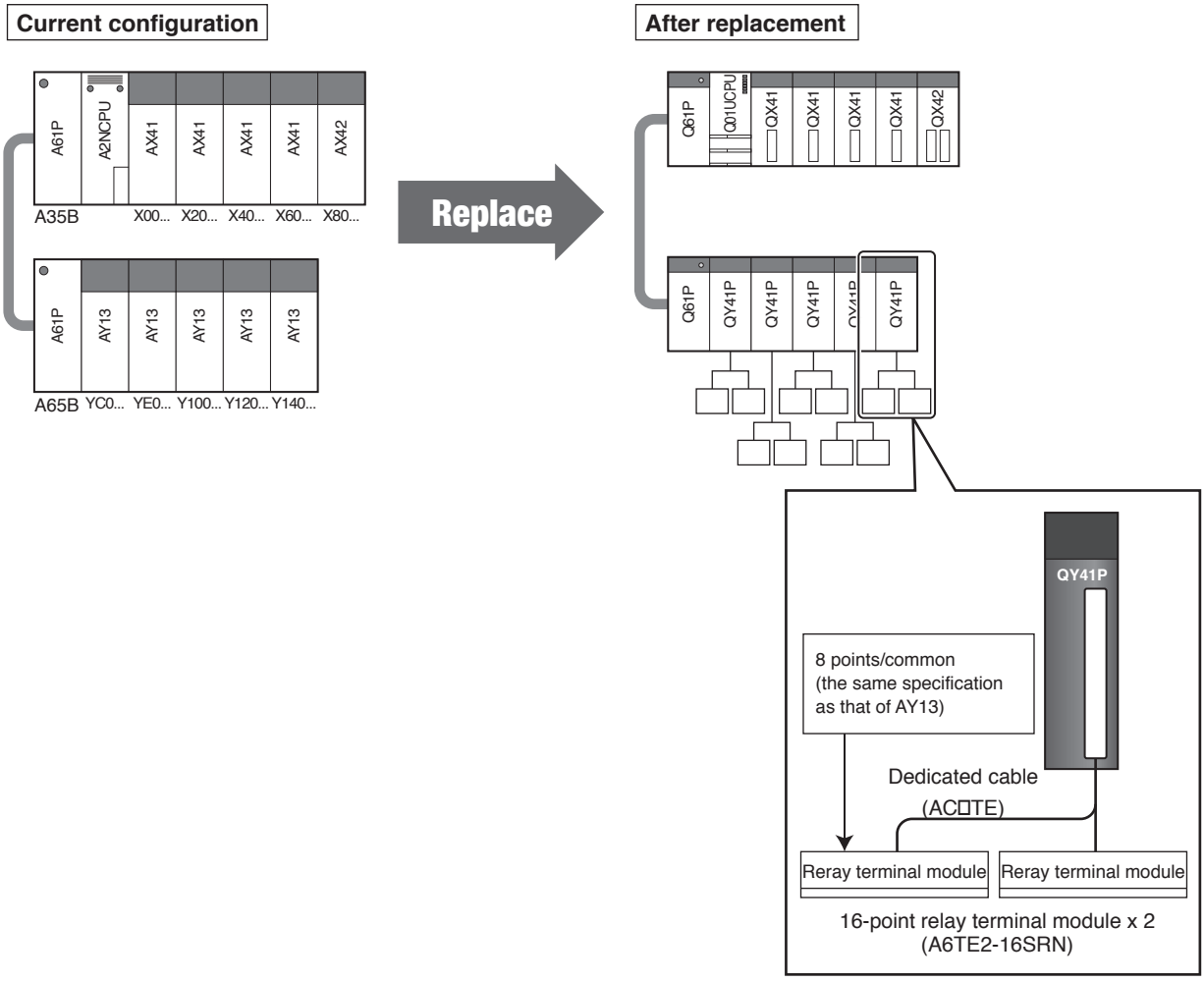
- **Using the relay terminal modules, a large type A (Large Type) Series 32-point contact output module can be replaced while maintaining 8 points/common.**
- **A wide variety of compatible wire sizes are available using the relay terminal module.**
  A (Large Type) Series 32-point contact output module AY13: Max. 2 mm²
  Relay terminal module: Max. 1.25 mm²
  Q Series 16-point contact output module QY10: Max. 0.75 mm²
- **Replacement is possible without the need of additional modules because a module mounted on the base unit becomes compatible with 32-point connector type modules through the use of the "connector/terminal block converter module".**

The following is an example of replacing contact output modules (AY13) with transistor output modules (QY41P) and externally converting transistor outputs into contact outputs.

● Instructions

Replace AY13 with QY41P and connect the relay terminal modules to convert to contact outputs.
With this method, the system can be upgraded without increasing the number of modules on the base unit.
Also, 8 points/common, the same specification as that of the AY13, can be maintained.

(a) System configuration example



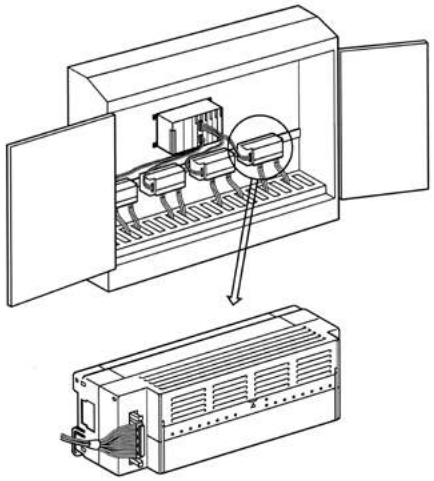
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(b) Module selection example

Product name	Existing model		Replacement model	
Power supply module	A61P	2	Q61P	2
CPU module	A2NCPU	1	Q01UCPU	1
Main base unit	A35B	1	Q38B*	1
Extension base unit	A65B	1	Q68B	1
Extension cable	AC06B	1	QC06B	1
Input module	AX41	4	QX41-S2	4
Connector/terminal block converter module	N/A	-	A6TBXY36	4
Cable (for connector/terminal block converter module)	N/A	-	AC□TB	4
Input module	AX42	1	QX42	1
Output module	AY13	5	QY41P	5
Relay terminal module	N/A	-	A6TE2-16SRN	10
Cable (for relay terminal module)	N/A	-	AC06TE	5

* The Q312 can be used if the control panel is wide enough. With the Q312, the I/O modules can be mounted on one base unit, eliminating the need for the Q68B extension base unit, QC06B extension cable, and one Q61P power supply module.

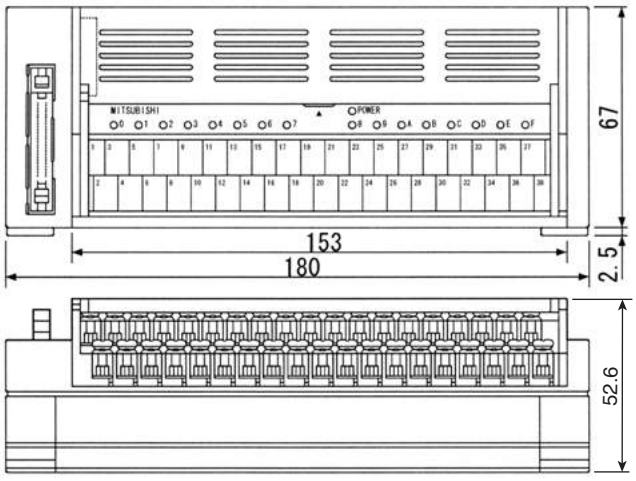
(c) Relay terminal module (A6TE2-16SRN)



Note: The relay terminal module can function as a relay terminal block while performing contact outputs.

(d) External dimensions

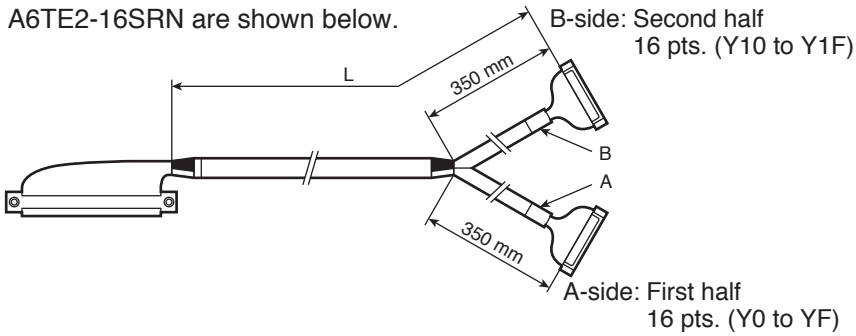
Unit: mm



(e) Cables

The connection cables compatible with A6TE2-16SRN are shown below.

Model	Length (L)
AC06TE	0.6 m
AC10TE	1 m
AC30TE	3 m
AC50TE	5 m
AC100TE	10 m



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(f) Specifications comparison between AY13 and A6TE2-16SRN

○: Compatible, △: Partially changed

Item		AY13	A6TE2-16SRN	Compatibility	Remarks
Number of output points		32 points	16 points	△	Use two A6TE2-16SRN modules when using more than 16 points.
Isolation method		Photocoupler	Relay	△	The isolation method differs, but the isolation performance is equivalent.
Rated switching voltage/current		24 V DC/2 A (resistive load)/point, 240 V AC/2 A (cos Φ =1)/point, 5 A/common	24 V DC/2 A (resistive load)/point, 240 V AC/2 A (cos Φ =1)/point, 8 A/common	○	
Minimum switching load		5 V DC 1 mA	5 V DC 1 mA	○	
Maximum switching voltage		264 V AC 125 V DC	264 V AC 125 V DC	○	
Response time	ON to OFF	10 ms or less	10 ms or less	○	
	OFF to ON	12 ms or less	12 ms or less	○	
Life	Mechanical	20 million times or more	20 million times or more	○	
	Electrical	Rated switching voltage/current load: 200,000 times or more	Rated switching voltage/current load: 100,000 times or more	△	The electrical life of the A6TE2-16SRN is half of the AY13's life. However, the relay for the A6TE2-16SRN can be replaced.
		200 V AC 1.5 A, 240 V AC 1 A (cos Φ =0.7): 200,000 times or more 200 V AC 0.7 A, 240 V AC 0.5 A (cos Φ =0.35): 200,000 times or more 24 V DC 1 A, 100 V DC 0.1 A (L/R=7 ms): 200,000 times or more	200 V AC 1.5 A, 240 V AC 1 A (cos Φ =0.7): 100,000 times or more 200 V AC 0.7 A, 240 V AC 0.5 A (cos Φ =0.35): 100,000 times or more 24 V DC 1 A, 100 V DC 0.1 A (L/R=7 ms): 100,000 times or more	△	
Maximum switching frequency		3600 times/hour	3600 times/hour	○	
Common terminal arrangement		8 points/common (common terminals: TB9, TB18, TB27, TB36)	8 points/common (common terminals: TB19, TB21)	○	
Operation indicator		ON indication (LED)	ON indication (LED)	○	
External power supply	Voltage	24 V DC ±10% Ripple voltage: 4 Vp-p or less	24 V DC ±10% Ripple voltage: 4 Vp-p or less	○	The supplied current value will be larger.
	Current	290 mA (TYP. 24 V DC, all points ON)	350 mA (TYP. 24 V DC, all points ON)	△	
External connections		38-point terminal block connector (M3 × 6 screws)	38-point screw terminal block (M3 screw) (M3 × 6 screws)	△	Wiring modification is required.
Applicable wire size		0.75 to 2 mm^2	0.75 to 1.25 mm^2	△	
Applicable crimping terminal		R1.25-3, R2-3, RAV1.25-3, RAV2-3	R1.25-3, R1.25-MS3, R1.25-B3A, R1.25-C3A, RAV1.25-3, RAV1.25-MS3, RAV1.25-B3A	○	

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(3) Replace A/QnA (Large Type) Series 200 V AC input module AX21
[Use FA goods (manufactured by Mitsubishi Electric Engineering Co., Ltd.)]

Solution and Benefit

- **Use the Q Series large type input module QX21L to replace the modules without changing the wiring.**
  Note that if the Q Series large type base unit cannot be used because of space limitations in the panel or because of the module configuration, etc., replacements can be completed easily by using the FA goods.
- **A dedicated cable is available to connect the programmable controller with the FA goods, so there's no need to prepare cables when making a replacement.**

FA goods

A variety of FA goods, including a terminal block connector conversion module, I/O type converter (AC input -> DC input conversion, DC output signal -> relay output conversion, etc.), are available. Use these convenient products as relays, signal conversions and a means to reduce wiring when compatible modules are not available for replacing from the A/QnA (Large Type) Series to the Q Series.

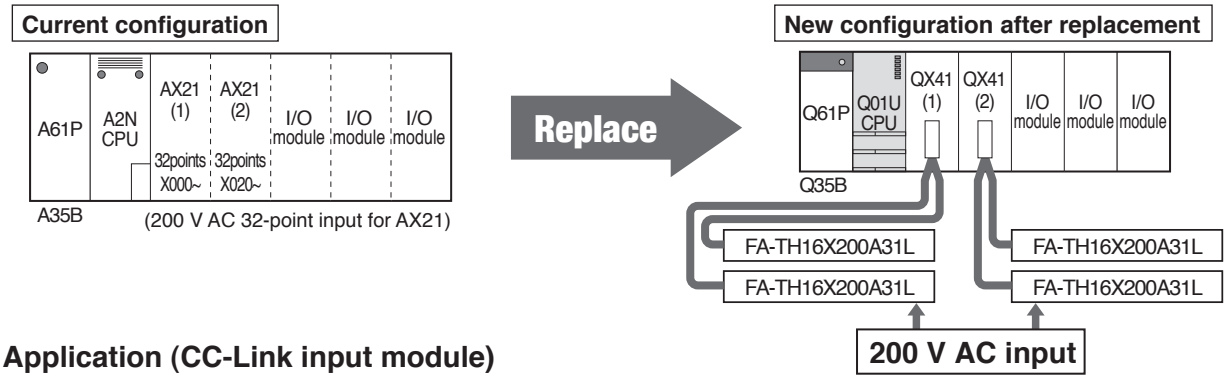
The following is an example of replacing the A (Large Type) I/O module with the Q Series using FA goods.

● Instruction

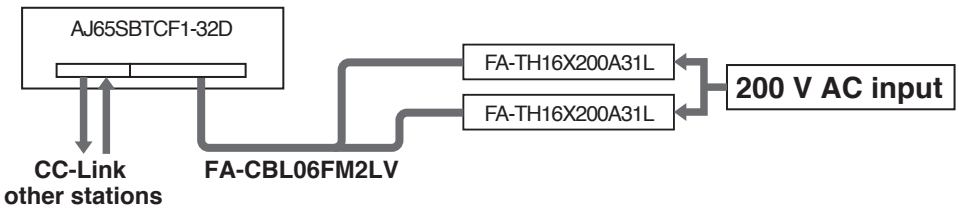
(1) Using the FA goods, convert the 200 V AC input into 24 V DC, and lead it in with QX41, etc.
(2) The external wiring will change, but program does not need to be changed since the I/O address is the same.
(3) The following FA goods are used.

Product name	Model	External connection	Remarks
200 V AC photo coupler insulated input module	FA-TH16X200A31L 	16-point/common 2-wire type	(1) 200 V AC input module insulated with photo coupler (2) Input module on programmable controller side QX41, QX42, QH42 and QX41Y41P (3) CC-Link module AJ65SBTCF1-32D (4) Connection cable FA-CBL□□□FM2V and FA-CBL□□□FM2LV

● System configuration example

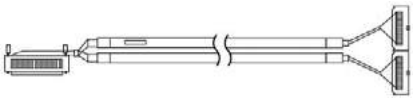


● Application (CC-Link input module)

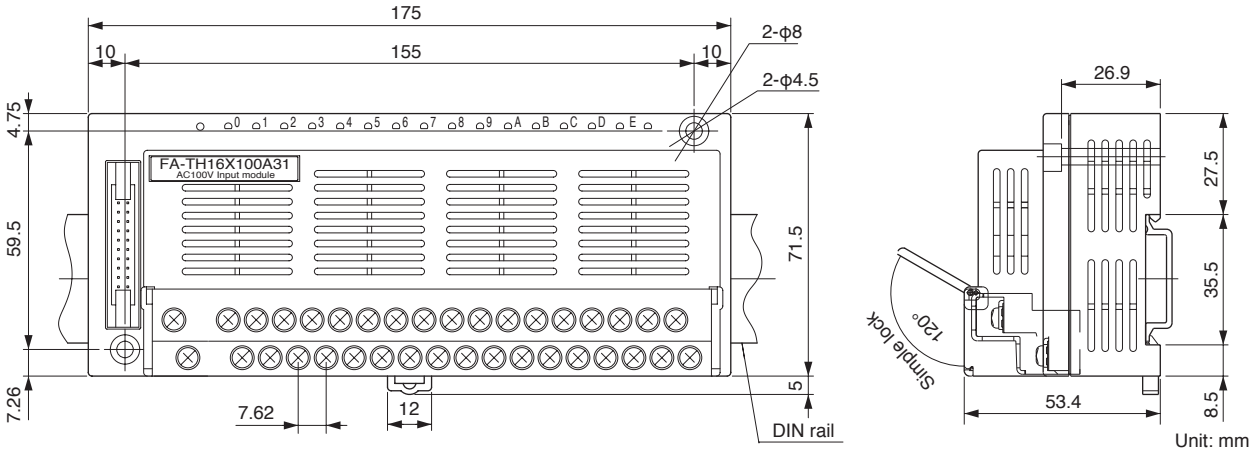


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● Connection cable

Shape	Model	Cable length
	FA-CBL06FM2LV	0.6m
	FA-CBL10FM2LV	1.0m
	FA-CBL20FM2LV	2.0m
	FA-CBL30FM2LV	3.0m
	FA-CBL50FM2LV	5.0m
	FA-CBL100FM2LV	10.0m

● Module external dimensions



● Module selection example

Product name	Existing model		Replacement model	
Power supply module	A61P	1	Q61P	1
CPU module	A2NCPU	1	Q01UCPU	1
Main base unit	A35B	1	Q35B	1
Input module	AX21	2	QX41 or QX42	2/1
FA goods : Input module	N/A	–	FA-TH16X200A31L	4
Connection cable	N/A	–	FA-CBL□□FM2V FA-CBL□□□FM2LV	2

Tip

- The FA goods input module has a function to convert 200 V AC input signal into 24 V DC, so select a 24 V DC input connector type module for the programmable controller side input module.
- The following products are available for the FA goods.
  - ▶Triac large capacity (1 A/point) output module
  - ▶Transistor large capacity (2 A/point) output module
  - ▶Common multi-point I/O module

  The FA goods can be used when replacement using the Q Series large type I/O module conversion adapter is difficult.
  For details on the FA goods manufactured by Mitsubishi Electric Engineering Co., Ltd., please contact your local Mitsubishi sales office or representative.
- To replace using existing external wiring terminal block, use the Q Series large type input module QX21L. Refer to "2.2 Upgrade to Q Series using Q Series large type base unit and I/O modules" for details.

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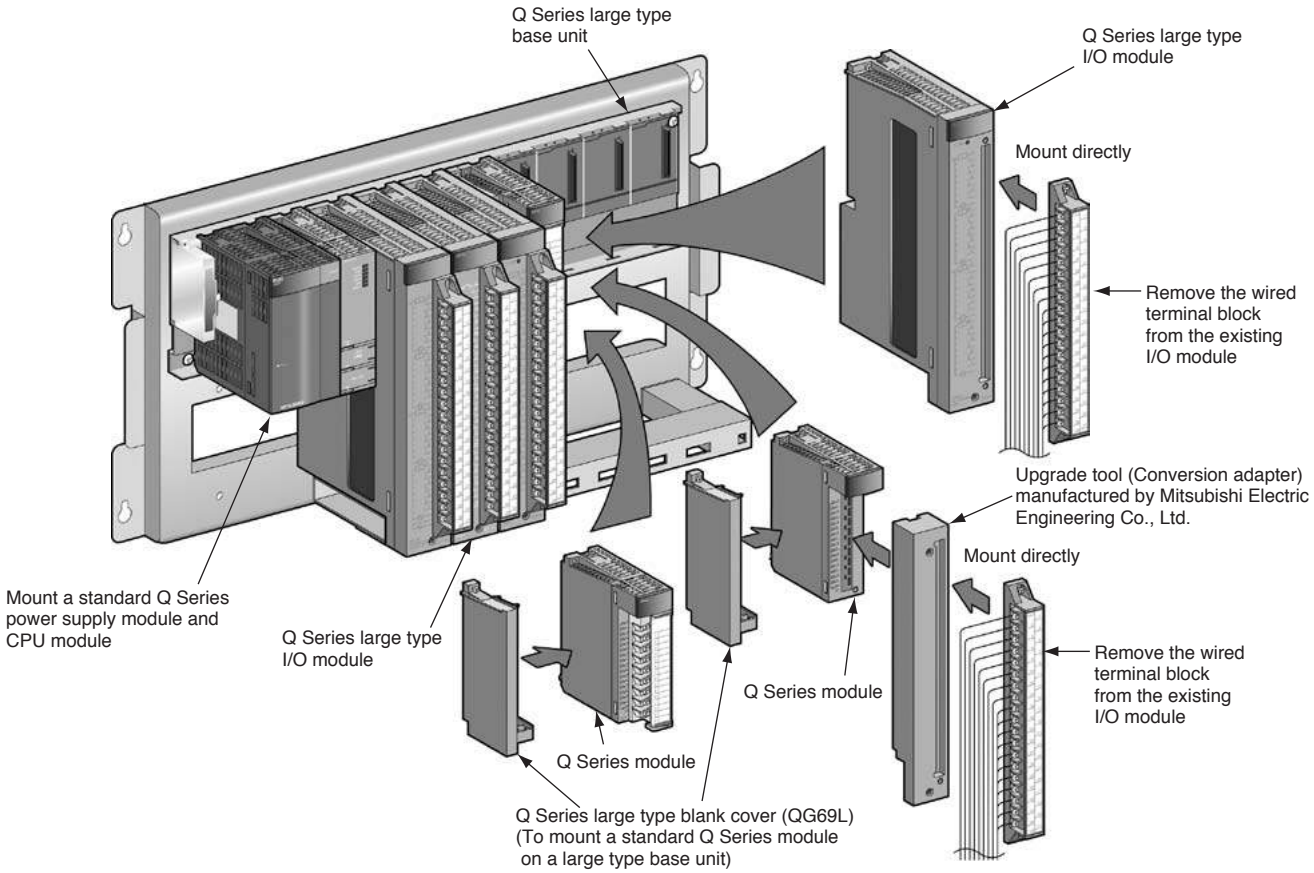
2.1.2 Replace using Q Series large type base unit and Q Series large input/output module

(1) List of Q Series large type base units and Q Series large input/output modules

Solution and Benefit

- **The Q Series large type I/O modules allow the use of existing A/QnA (Large Type) Series 32-point I/O wiring, eliminating the need for rewiring.**
- **Performance specifications of the Q Series large type I/O modules are equivalent to those of the A/QnA (Large Type) Series.**
- **The hole size and pitch of the Q Series large type base units are the same as those of the A/QnA (Large Type) Series, eliminating the need of making new mounting holes.**
- **The Q Series large type I/O modules and standard Q Series modules can be mounted together on the Q Series large type base unit. For the standard Q Series modules, existing A/QnA (Large Type) Series connectors or terminal blocks can be utilized without modification by using a conversion adapter (upgrade tool) manufactured by Mitsubishi Electric Engineering Co., Ltd.**

Wired terminal blocks of the existing A (Large Type) Series I/O modules can be mounted directly without modifying the external wiring.



● Q Series large type base unit options

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

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● Q Series large type I/O module options

Product name	Model		Outline
	Existing A (Large Type) Series module	Q Series 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, 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	QY11AL	16-point contact output, 24 V DC/240 V AC, 2 A/point, 16 A/all points, All points independent common, 38-point terminal block, Surge suppressor (Varistor 387 to 473 V)
	AY11A		
	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
	AY41(P)	QY51PL	32-point transistor output 12 to 24 V DC, 0.5 A/point, 4 A/common, 16-point/common protection function (overheat protection function, overload protection function), 38-point terminal block
	AY51		
	AY51-S1		
Large type blank cover	N/A	QG69L	Blank cover for mounting existing Q Series module on the Q Series large type base unit

● Conversion adapter (upgrade tool) options [manufactured by Mitsubishi Electric Engineering Co., Ltd.]

Product name	Model			External connections (Q Series)
	Existing A (Large Type) Series module	Q Series module	Conversion adapter	
Input module	AX10	QX10	ERNT-AQTX10	Terminal block (18 points)
	AX40, AX40-UL	QX40, QX70	ERNT-AQTX40	
		QX40-S1		
	AX70, AX70-UL	QX70		
	AX50, AX50-S1	QX50		
	AX80, AX80-UL	QX80	ERNT-AQTX80	
	AX41, AX41-UL	QX41, QX41-S2, QX71	ERNT-AQTX41	FCN connector (40P plug)
	AX31-S1	QX41, QX41-S2		
	AX41-S1	QX41-S1		
	AX71	QX71		
	AX81, AX81-S1	QX81, QX81-S2	ERNT-AQTX81	D-Sub connector (37P)
Output module	AY10	QY10	ERNT-AQTY10	Terminal block (18 points)
	AY11, AY11-UL			
	AY11E			
	AY11EEU			
	AY22	QY22	ERNT-AQTY22	
	AY40, AY40P,AY40-UL	QY40P	ERNT-AQTY40	
	AY70, AY70-UL	QY70		
	AY50, AY50-UL	QY50	ERNT-AQTY50	
	AY80	QY80	ERNT-AQTY80	
	AY41, AY41P, AY41-UL	QY41P	ERNT-AQTY41	FCN connector (40P plug)
	AY71	QY71		
	AY81, AY81EP	QY81P	ERNT-AQTY81	D-Sub connector (37P)
Analog input module	A68AD*	Q68ADV Q68ADI	ERNT-AQT68AD	Terminal block (18 points)
	A68AD-S2*			
	A68ADN*		ERNT-AQT68ADN	
Analog output module	A62DA, A62DA-S1	Q62DAN	ERNT-AQT62DA	
	A68DAV	Q68DAVN	ERNT-AQT68DA	
	A68DAI, A68DAI-S1	Q68DAIN		
High-speed counter module	AD61	QD62-H01	ERNT-AQTD61	FCN connector (40P)
	AD61-S1	QD62-H02		

* Voltage input or current input is applicable to replacement Q Series modules.
If the existing A (Large Type) Series module uses a combination of voltage and current input, it cannot be replaced using a Q Series large type base unit and a conversion adapter.
Consider using a conversion adapter (2-slot type) to replace the module with a Q64AD-GH (2 units required). (Refer to Section 2.4 for details)

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Tip

- Existing A (Large Type) Series wiring harness plugs in without modification.
- The Q Series large type base modules are compatible with High Performance Model QCPUs, Universal model QCPU (except Q00UJCPU), and Remote I/O Stations.
  Basic Model QCPUs, Process CPUs, Redundant CPUs, and Safety CPU are not compatible.
- Neither Q Series large type main base unit nor Q Series large type extension base unit can be used in a multiple CPU system.
- The standard Q Series modules can be mounted on the Q Series large type base unit using the Q Series large type blank cover.
- The Q Series large type base units can be used together with the standard Q Series base units.
  (e.g., main base unit: Q312B, extension base unit: Q68BL)
- Some modules, such as modules that occupy two slots, cannot be mounted. Refer to "Q Series Large Type Base Unit/I/O Module/Blank Cover User's Manual" for details.
- After replacing the existing connector with the wiring intact, the 64-point connector type I/O module can be used for the Q Series I/O module.
  A blank cover is required to mount the Q Series large type base unit.
  Note that the connector layout changes from top/bottom to left/right, so the position of the lower connector moves to the upper side.
  Check that the existing wiring is long enough.
- The 8-slot no power supply required type is not available for the Q Series extension base unit.
  When replacing the existing extension base unit to the 8-slot no power supply required type A58B, replace with the power mounted type Q68BL.
  In this case, the mounting width dimensions will increase by 55 mm (411 mm to 466 mm).
  Confirm the mounting space, and that the wiring is long enough to move to the mounting position.
- 2-slot type conversion adapters of the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. cannot be used.
- For details on the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd., please contact your local Mitsubishi sales office or representative.

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(2) Upgrade to Q Series modules using Q Series large type base unit

Solution and Benefit

- **Unlike the QA6□B extension base unit, which is used to directly mount existing A (Large Type) Series I/O modules for a gradual upgrade, the Q Series large type base unit, I/O module, and conversion adapter (upgrade tool) (manufactured by Mitsubishi Electric Engineering Co., Ltd.) enables all modules to be upgraded to the Q Series at once and allows use of existing A Series wiring.**
- **Having the same slot width as A (Large Type) Series base units, the Q Series large type base units permit direct mount of existing 32-point I/O wiring on the Q Series I/O modules. This can shorten the upgrade time.**
- **Performance specifications of the Q Series large type I/O modules are equivalent to those of the A (Large Type) Series, eliminating concerns about compatibility with the connected external devices.**

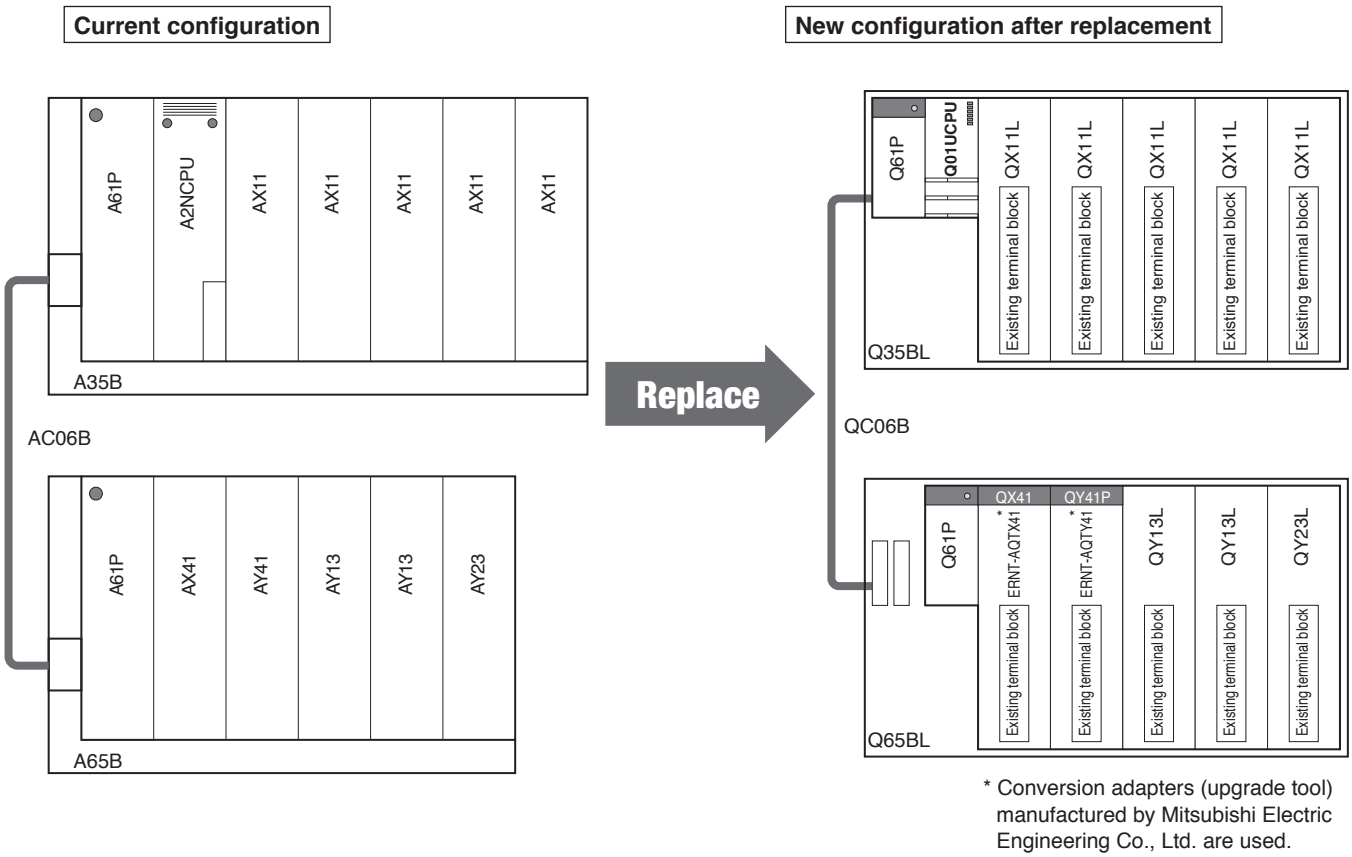
The following is an example of upgrading an A (Large Type) Series system to the Q Series using the Q Series large type base units, I/O modules, and conversion adapters.

● Instructions

(1) Replace the existing 32-point terminal block type I/O modules with Q Series large base units and I/O modules, and use the same terminal blocks to connect with external wiring.

(2) If there is no compatible Q Series large type I/O module, use the conversion adapter (manufactured by Mitsubishi Electric Engineering Co., Ltd.) to replace the existing module with standard Q Series I/O module.

● System configuration example



* Conversion adapters (upgrade tool) manufactured by Mitsubishi Electric Engineering Co., Ltd. are used.

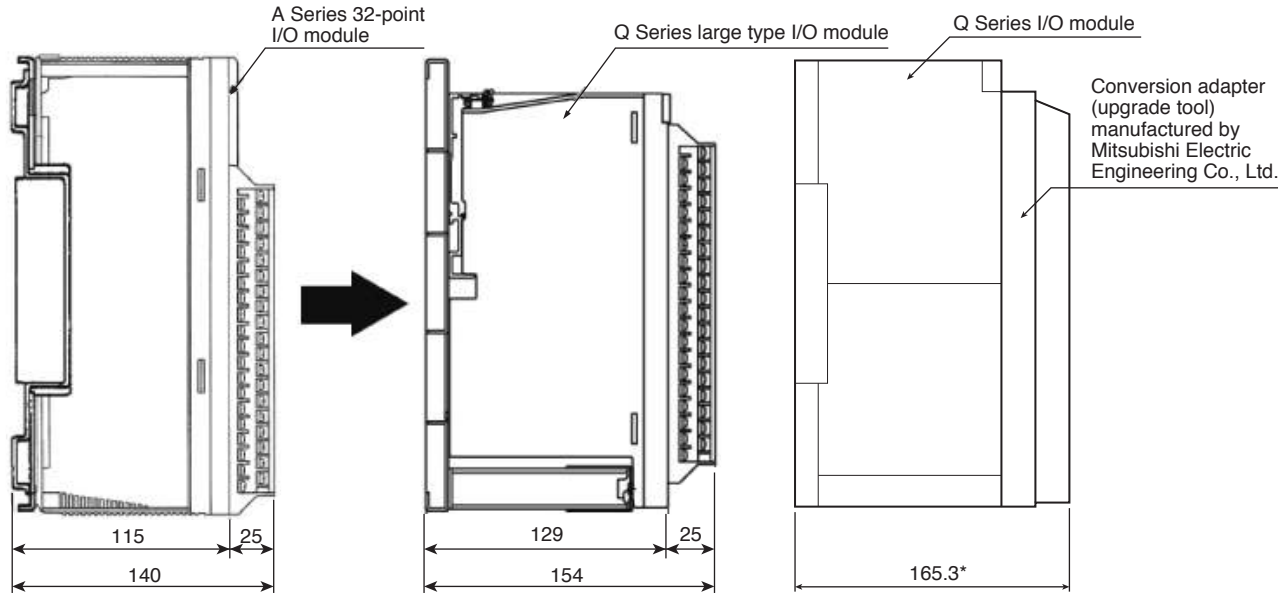
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● Module selection example

Product name	Existing model		Replacemant model	
Main base unit	A35B	1	Q35BL	1
Extension base unit	A65B	1	Q65BL	1
Power supply module	A61P	2	Q61P	2
Extension cable	AC06B	1	QC06B	1
CPU module	A2NCPU	1	Q01UCPU	1
Input module	AX11	5	QX11L	5
	AX41	1	QX41	1
			ERNT-AQTX41 (conversion adapter)	1
Output module	AY13	2	QY13L	2
	AY23	1	QY23L	1
	AY41	1	QY41P	1
			ERNT-AQTY41 (conversion adapter)	1
Q Series large type blank cover	N/A	-	QG69L	2

Tip

- The Q Series power supply and CPU modules can be mounted without a Q Series large type blank cover.
- Always mount a Q Series large blank cover when mixing the Q Series modules. The Q Series I/O module is used when using the Mitsubishi Electric Engineering Co., Ltd. upgrade tool, so the Q Series large blank cover will be required.
- When the Q Series large type base unit is used, the depth is greater than that of the A Series.



Unit: mm

* The depth of ERNT-AQT68DA is 176.2 mm.

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(3) Upgrade to MELSECNET/H (remote I/O network) system using Q Series large type base unit

Solution and Benefit

- **With the Q Series large type base units and I/O modules, an existing MELSECNET remote I/O network system can be upgraded to a MELSECNET/H (remote I/O network) system by utilizing existing wiring. Just remount the existing wired terminal block on the Q Series large type base units, I/O modules. The upgrade time can be greatly reduced.**
- **In addition to the Q Series large type base units, I/O modules, the conversion adapter (upgrade tool) (manufactured by MITSUBISHI Electric Engineering Co., Ltd.) can also be used to further minimize upgrade process.**

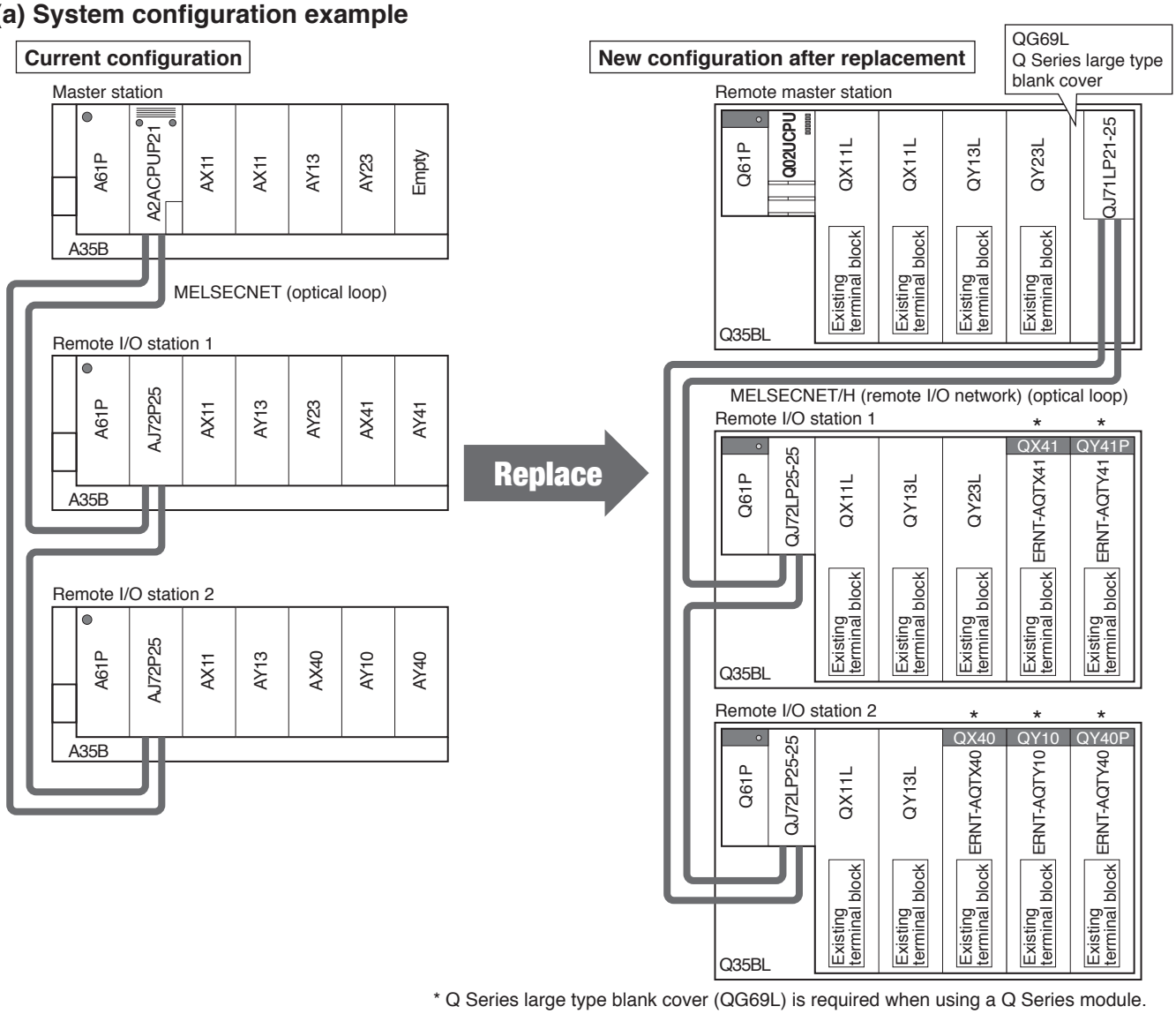
* For the model names of conversion adapters used as upgrade tools, refer to "Conversion adapter (upgrade tool) options [manufactured by Mitsubishi Electric Engineering Co., Ltd.]" in page 37.

The following is an example of upgrading a MELSECNET network system consisting of only remote I/O stations to a MELSECNET/H (remote I/O network) system using the Q Series large type base units, I/O modules, and conversion adapters.

● Instructions

Use Q Series large type base units, I/O modules, and conversion adapters (manufactured by Mitsubishi Electric Engineering Co., Ltd.) to replace the existing MELSECNET remote I/O network system.

(a) System configuration example



* Q Series large type blank cover (QG69L) is required when using a Q Series module.

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● Module selection example

(1) Master station to remote master station

Product name	Existing model		Replacemant model	
Main base unit	A35B	1	Q35BL	1
Power supply module	A61P	1	Q61P	1
CPU module	A2ACPUP21	1	Q02UCPU	1
Network module	N/A	-	QJ71LP21-25	1
Q Series large type blank cover	N/A	-	QG69L	1
Input module	AX11	2	QX11L	2
Output module	AY13	1	QY13L	1
	AY23	1	QY23L	1

(2) Remote I/O station 1

Product name	Existing model		Replacemant model	
Main base unit	A35B	1	Q35BL	1
Power supply module	A61P	1	Q61P	1
Network module	AJ72P25	1	QJ72LP25-25	1
Input module	AX11	1	QX11L	1
Output module	AY13	1	QY13L	1
	AY23	1	QY23L	1
Input module	AX41	1	QX41	1
			ERNT-AQTX41 (conversion adapter)	1
Output module	AY41	1	QY41P	1
			ERNT-AQTY41 (conversion adapter)	1
Q Series large type blank cover	N/A	-	QG69L	2

(3) Remote I/O station 2

Product name	Existing model		Replacemant model	
Main base unit	A35B	1	Q35BL	1
Power supply module	A61P	1	Q61P	1
Network module	AJ72P25	1	QJ72LP25-25	1
Input module	AX11	1	QX11L	1
	AX40	1	QX40	1
			ERNT-AQTX40 (conversion adapter)	1
Output module	AY13	1	QY13L	1
	AY10	1	QY10	1
			ERNT-AQTY10 (conversion adapter)	1
	AY40	1	QY40P	1
			ERNT-AQTY40 (conversion adapter)	1
Q Series large type blank cover	N/A	-	QG69L	3

Tip

- When utilizing existing optical fiber cables, note that the minimum distance between stations may be limited to 200m depending on the type of cables used. Refer to "Q Corresponding MELSECNET/H Network System Reference (remote I/O network)" for details.
  If the distance between stations is less than 200m, the existing optical fiber cables can be utilized without restrictions.
- When replacing the existing ACPU to a CPU with link function, an empty slot is required to mount the network module.
  If no empty slot is available, the extension base unit must be added or the base unit must be changed to one with more slots.

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2.1.3 Replacement utilizing A (Large Type) upgrade tool
(manufactured by Mitsubishi Electric Engineering Co., Ltd.)

(1) Utilize A (Large Type) unit replacement upgrade tool

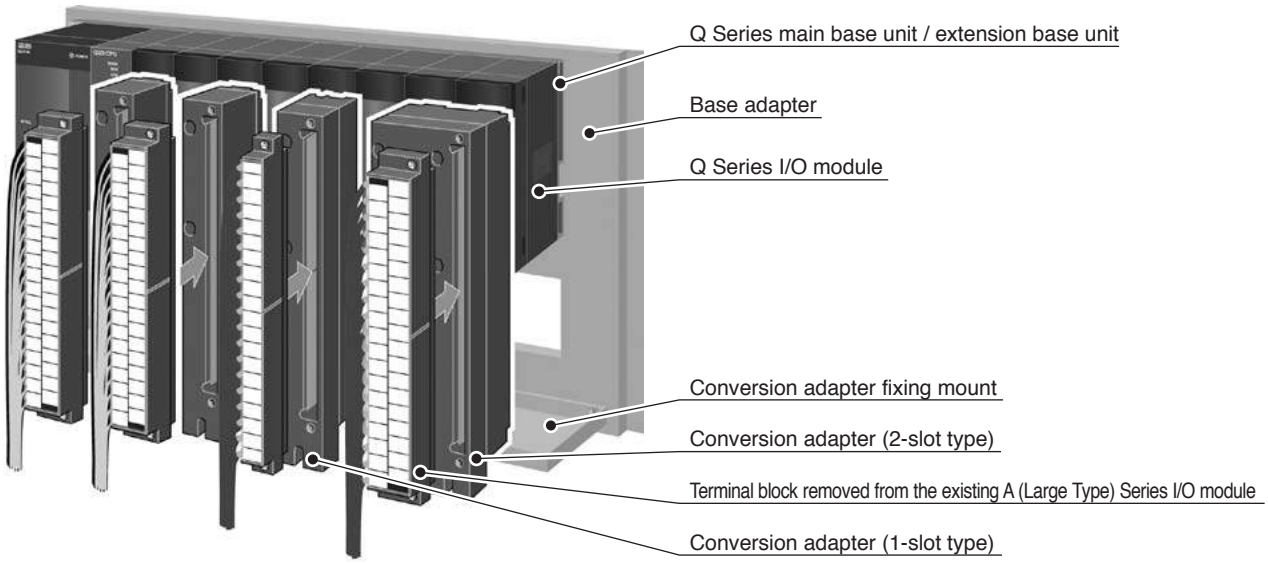
Solution and Benefit

- **When replacing the existing A (Large Type) Series modules, there may be cases in which two replacement modules are needed depending on the specification of the Q Series modules. In such cases, the terminal blocks of the A (Large Type) Series modules do not need to be replaced and can be used through the upgrade tool (base adapter and conversion adapter (2-slot type)) manufactured by Mitsubishi Electric Engineering Co., Ltd. Thus, wiring time is greatly reduced.**
- **The base adapter (upgrade tool) manufactured by Mitsubishi Electric Engineering Co., Ltd. is compatible with the 12-slot main/extension base unit, enabling the expansion of slot numbers if needed.**

Upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd.

The upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. consists of: base adapter, conversion adapter, and conversion adapter fixing mount.
For details on the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd., refer to Section "2.1.2 Upgrade to Q Series using Q Series large type base unit and I/O modules".

- **Base adapter**
  An adapter to mount a Q Series base unit using installation holes of the existing A (Large Type) Series large type base unit.
- **Conversion adapter**
  An adapter to mount an existing A (Large Type) Series module terminal block on the replacement Q Series I/O modules, analog modules, or high speed counter modules. (The existing terminal blocks and wires are utilized.)
  There are two types of conversion adapters: 1-slot type and 2-slot type.
- **Conversion adapter fixing mount**
  A mount to fix the conversion adapters.



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(a) Conversion adapter

1) 1-slot type (Mountable to Q Series large type base unit)
   Separate adapter are available for the I/O module, analog module and high-speed counter module.
   The 1-slot type conversion adapter can also be mounted on the Q Series large base unit.
   Refer to Section "2.1.2 Upgrade to Q Series using Q Series large type base unit and I/O modules".
2) 2-slot type (Not mountable to Q Series large type base unit)
   (a) For I/O module

Input/Output	MELSEC-A Series module model	MELSEC-Q Series module model	Conversion adapter (2-slot type)		
			Model	Shape	
				MELSEC-A Series	MELSEC-Q Series
Input	AX11*1	QX10 x 2 modules	ERNT-AQTX11	Terminal block (38-points)	Terminal block (18-points) x 2 modules
	AX11EU*1				
Output	AY10A*2, AY10A-UL	QY18A x 2 modules	ERNT-AQTY10A		
	AY11A*2				
	AY11AEU*2				
	AY13*3	QY10 x 2 modules	ERNT-AQTY13		
	AY13E*3				
	AY13EU*3				
	AY23*4	QY22 x 2 modules	ERNT-AQTY23		
	AY51*5, AY51-UL	QY50 x 2 modules	ERNT-AQTY51		
	AY51-S1*5				
	AY81*6	QY80 x 2 modules			
	AY81EP*6				

*1: Replaceable with Q Series large type input module QX11L.
*2: Replaceable with Q Series large type output module QY11AL.
*3: Replaceable with Q Series large type output module QY13L.
*4: Replaceable with Q Series large type output module QY23L.
*5: Replaceable with Q Series large type output module QY51PL.
*6: Replaceable with one slot when Q Series output module QY81P is selected and conversion adapter ERNT-AQTY81 is used.
(Q Series large type base unit mountable)

(b) For analog module

Input/Output	MELSEC-A Series module model	MELSEC-Q Series module model	Conversion adapter (2-slot type)		
			Model	Shape	
				MELSEC-A Series	MELSEC-Q Series
Input	A68AD (Voltage/Current mixed input)	Q64AD-GH x 2 modules*	ERNT-AQT68AD-GH	Terminal block (38-points)	Terminal block (18-points) x 2 modules
	A68AD-S2 (Voltage/Current mixed input)				
	A68ADN (Voltage/Current mixed input)				
	A616AD (Voltage input)	Q68ADV x 2 modules	ERNT-AQT616AD		
	A616AD (Current input)	Q68ADI x 2 modules			
Output	A616DAV	Q68DAVN x 2 modules	ERNT-AQT616DA		
	A616DAI	Q68DAIN x 2 modules			

* Replacement when using mixed voltage/current input for existing A (Large Type) Series module.
The 1-slot type conversion adapter can be used when using voltage input only or current input only.

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(b) Base adapter

An adapter is used to mount a Q Series base unit using installation holes of the existing A (Large Type) Series large type base unit.

MELSEC-A Series module model	MELSEC-Q Series module model	Base adapter model	Mountable conversion adapter fixing mount			
			ERNT-AQF12	ERNT-AQF8	ERNT-AQF5	ERNT-AQF3
A38B, A38HB A38B-UL	Q312B, Q312DB	ERNT-AQB38	○	○		
	Q38B, Q38DB	ERNT-AQB38		○		
A68B, A68B-UL	Q612B	ERNT-AQB68	○	○		
	Q68B	ERNT-AQB68		○		
A58B, A58B-UL	Q68B	ERNT-AQB58		○		
A35B, A35B-UL	Q38B, Q38DB	ERNT-AQB35		○	○	
	Q35B	ERNT-AQB35			○	
A65B, A65B-UL	Q68B	ERNT-AQB65		○	○	
	Q65B, Q55B	ERNT-AQB65			○	
A55B, A55B-UL	Q65B, Q55B	ERNT-AQB55			○	
A32B, A32B-UL	Q33B	ERNT-AQB32				○
A62B	Q63B, Q52B	ERNT-AQB62				○
A52B	Q52B	ERNT-AQB52				○

(c) Conversion adapter fixing mount

A mount to fix the conversion adapters.

Conversion adapter fixing mount model	Description	Remarks
ERNT-AQF12	12-slot conversion adapter fixing mount	A conversion adapter fixing mount is required to mount conversion adapters.
ERNT-AQF8	8-slot conversion adapter fixing mount	
ERNT-AQF5	5-slot conversion adapter fixing mount	
ERNT-AQF3	3-slot conversion adapter fixing mount	

Tip

- Tips for using the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd.
  (a) The programmable controller side modules are Q Series modules.
  The specifications and functions may be different from those of the A (Large Type) Series modules. Refer to the specification comparison in the corresponding module's transition handbook to confirm compliance with the specifications and functions of the external device.
  (b) Q Series main/extension base unit can be used with Q Series large type base unit. Select a base unit according to the module configuration after replacement.
  (Example of base unit combination)
  • Main base unit: Q312B (Q Series standard type)
  (Upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. is used.)
  • Extension base unit: Q68BL (Q Series large type base unit)
  Note that only the following CPU types can be used with Q Series large type base unit.
  ▶ High Performance Model QCPU
  ▶ Universal Model QCPU (except for Q00JCPU)
  ▶ MELSECNET/H remote I/O station
  (There are no restrictions on the CPU type if only the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. is used.)
- The 1-slot type conversion adapter may be difficult to mount depending on the existing wire size. In such cases, consider using a Q Series large base unit.

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(2) Compatibility of Q Series large type base unit with the upgrade tool

The following table shows the compatibility of Q Series large type base unit with the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. when replacing existing A (Large Type) Series modules with Q Series modules.

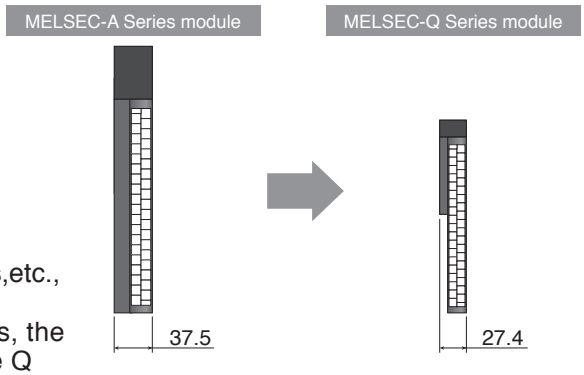
Item			Q Series large type base unit*1	Base adapter, Conversion adapter (Upgrade tool)*2
Slot width of base unit*3			Same width as the A (Large Type) Series base unit (37.5 mm)	Same width as Q Series base unit (27.4 mm)
Mountable module	Power supply module	Q Series standard power supply module	○	○
	CPU module	Basic model QCPU	×	○
		High Performance model QCPU	○	○
		Process CPU	×	○
		Universal model QCPU	○*4	○
	• I/O module • Intelligent function module	Q Series large type I/O modules*5	○	×
		Q Series 1-slot module	○*7	○
		Q Series 2-slot occupying module	×	○
Conversion adapter*6	For terminal block type 16-point I/O module (1-slot type)		○*7	○
	For terminal block type 32-point I/O module (1-slot type)		○*7	△*9
	For terminal block type 32-point I/O module (2-slot type)		×	△*10
	For high-speed counter module		○*7	△*9
	For analog module (1-slot type)		○*7	△*9
	For analog module (2-slot type)		×	△*10
Connection of QA/QA1S extension base unit*8			○	○

○: Applicable (Mountable), △: Applicable with restrictions (Mountable), ×: Not Applicable (Not mountable)

*1: Q Series large type base units can be used with Q Series base units (standard products).

*2: Mount a Q Series base unit (standard product) on the base adapter manufactured by Mitsubishi Electric Engineering Co., Ltd.

*3: Check mounting conditions before using the upgrade tool, because wiring space is reduced due to a decrease in the module's width.



*4: Q00UJCPU is not compatible.

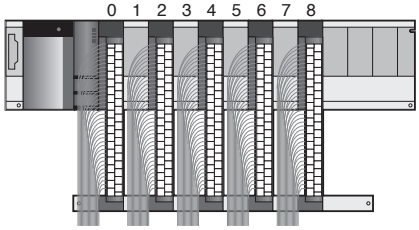
*5: Number of common points and electrical specifications,etc., are same as that of A (Large Type) Series I/O module.

*6: Since the adapters are mounted on Q Series modules, the specifications and functions are same as those of the Q Series modules. (Please check the transition handbook, since the specifications and functions are different from those of A (Large Type) Series module)

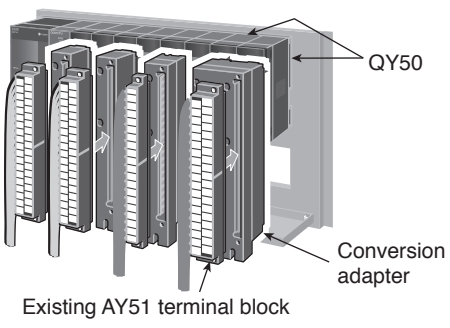
*7: The Q Series large type blank cover (QG69L) is required.

*8: Only High Performance Model QCPUs can be connected to the QA/QA1S extension base unit.

*9: If the size of the copper wire connected to the terminal block is larger than 1.25 mm^2, ERNT-AQTX41, AQTY41, AQTX81, AQTY81, AQT68AD, AQT68ADN, AQT68DA, and AQTD61 modules may be difficult to mount.
In this case, secure wiring space by leaving empty slots in between modules. For example, mount modules on slot No. 0, 2, 4, 6, 8, and leave slot No. 1, 3, 5, 7 empty.
Mount a blank cover QG60 on the empty slots.
If there are not enough slots, consider using the Q Series large type base unit.



*10: Applies when using replacing the existing A (Large Type) module with the two Q Series modules, and using the existing wiring terminal block with the conversion adapter.
(Example) AY51 -> QY50 x 2 modules,
A616AD -> Q68ADV(I) x 2 modules



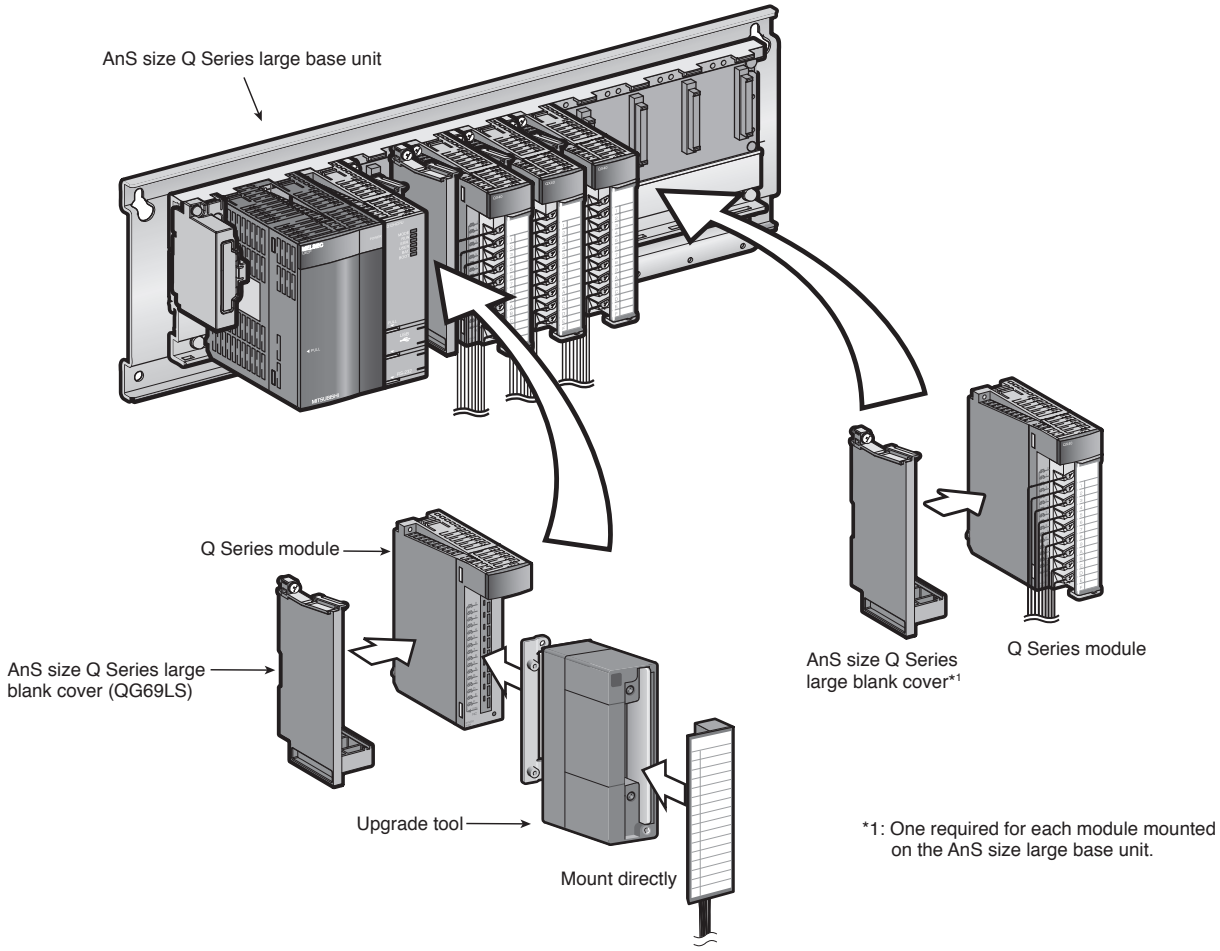
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2.2 Replace AnS/QnAS (Small Type) Series with Q Series

2.2.1 Replace using AnS size Q Series large type base unit

Solution and Benefit

- **The mounting dimensions of the AnS size Q Series large base unit are the same as the A/QnA (Small Type) Series, so there is no need to additionally drill mounting holes.**
- **Both the Q Series with upgrade tool (manufactured by Mitsubishi Electric Engineering Co., Ltd.) and a module without upgrade tool can be mounted on the AnS size Q Series large base unit. The terminal block used with the A/QnA (Small Type) Series can be used on the Q Series module with upgrade tool (manufactured by Mitsubishi Electric Engineering Co., Ltd.) without changing the wire size.**



● List of AnS size Q Series large base units

Product name	Existing AnS/QnAS module	Panel mounting type	DIN rail mounting type*2
Main base unit	A1S35B	Q35BLS	Q35BLS-D
	A1S38B	Q38BLS	Q38BLS-D
Extension base unit	A1S65B	Q65BLS	Q65BLS-D
	A1S68B	Q68BLS	Q68BLS-D
	A1S55B	Q55BLS	Q55BLS-D
AnS size Q Series large blank cover	N/A	QG69LS *3	

*2: The DIN rail mounting adaptor compatible with the base unit is enclosed.
*3: One required for each module mounted on the AnS size large base unit.

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2.2.2 Replace using A (Small Type) upgrade tool
(manufactured by Mitsubishi Electric Engineering Co., Ltd.)

(1) Utilize AnS/QnAS (Small Type) module replacement upgrade tool

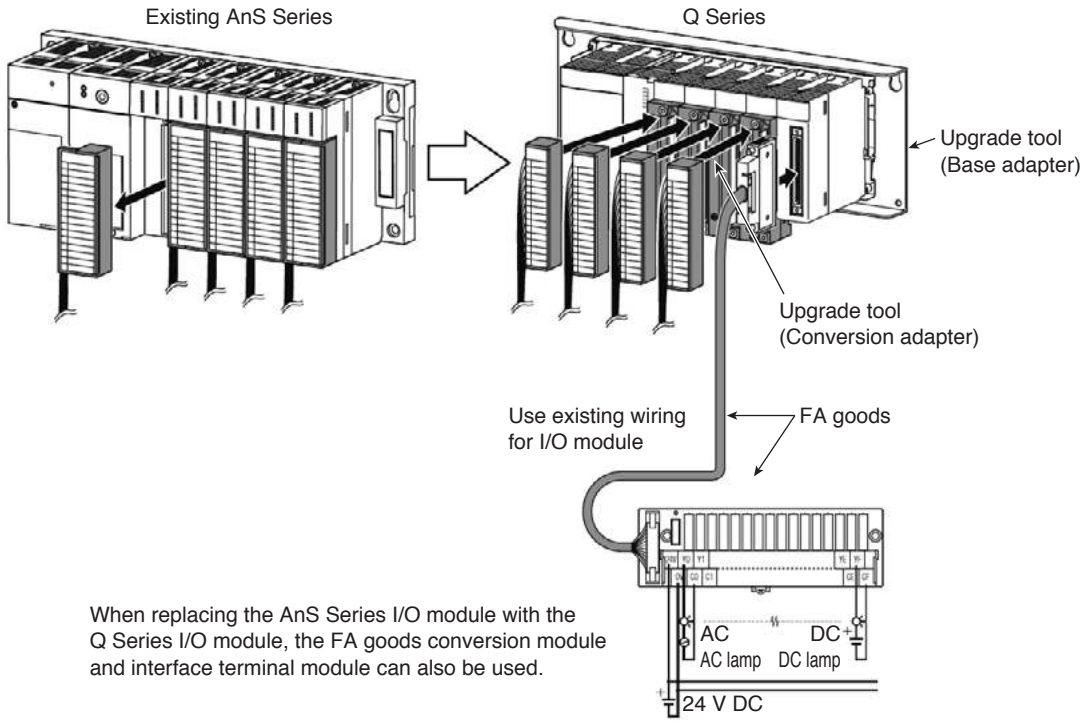
Solution and Benefit

- **The MELSEC-AnS Series/MELSEC-Q Series upgrade tool conversion adapter (manufactured by Mitsubishi Electric Engineering Co., Ltd.) reduces wiring time as the AnS/QnAS (Small Type) Series 16-point terminal block type module's terminal block can be used without modification.**
- **New mounting holes do not need to be drilled as the MELSEC-AnS Series/MELSEC-Q Series upgrade tool base adapter (manufactured by Mitsubishi Electric Engineering Co., Ltd.) can be mounted with the existing main/extension base unit mounting holes.**

MELSEC-AnS Series/MELSEC-Q Series upgrade tool (manufactured by Mitsubishi Electric Engineering Co., Ltd.)

The MELSEC-AnS Series/MELSEC-Q Series upgrade tool (manufactured by Mitsubishi Electric Engineering Co., Ltd.) is comprised of the base adapter and conversion adapter. This tool can be used with just the base adapter or conversion adapter.

- **Base adapter**
  This adapter is used to mount the Q Series base unit using the mounting holes for the existing AnS/QnAS (Small Type) base unit.
- **Conversion adapter**
  This adapter is used to mount the existing AnS/QnAS (Small Type) module's terminal block onto the Q Series I/O module or analog module after replacement.
  (The terminal block and wiring are used in the original state.)



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

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(a) List of conversion adapters

● 1-slot type

Module type	MELSEC-AnS/QnAS Series module model	MELSEC-Q Series module model	Conversion adapter model*1*2
Input	A1SX10, A1SX10EU	QX10	ERNT-ASQTXY10
	A1SX40	QX40, QX70	ERNT-ASQTX40
	A1SX40-S2	QX40	
	A1SX40-S1	QX40-S1	
	A1SX80, A1SX80-S1, A1SX80-S2	QX80	ERNT-ASQTX80
Output	A1SY10, A1SY10EU	QY10	ERNT-ASQTXY10
	A1SY22	QY22	ERNT-ASQTY22
	A1SY40, A1SY40P	QY40P	ERNT-ASQTY40
	A1SY50	QY50	ERNT-ASQTY50
	A1SY80	QY80	ERNT-ASQTY80
Analog input	A1S64AD	Q64AD	ERNT-ASQT64AD
	A1S68AD	Q68ADV	ERNT-ASQT68AD
		Q68ADI	
		Q68AD-G	ERNT-ASQT68AD-G*3
Analog output	A1S62DA	Q62DAN	ERNT-ASQT62DA
	A1S68DAV	Q68DAVN	ERNT-ASQT68DA
	A1S68DAI	Q68DAIN	
Analog input/output	A1S63ADA	Q64AD2DA	ERNT-ASQT63ADA
Thermocouple input	A1S68TD	Q68TD-G-H01	ERNT-ASQT68TD-H01*3
		Q68TD-G-H02	ERNT-ASQT68TD-H02*3
Temperature -measuring resistor input	A1S62RD3(N)	Q64RD	ERNT-ASQT62RD
	A1S62RD4(N)		
High-speed counter module	A1SD61	QD62	ERNT-ASQTD61*3
		QD62-H01	
		QD62-H02	
	A1SD62	QD62	ERNT-ASQTD62*3
	A1SD62E	QD62E	
	A1S62D	QD62D	ERNT-ASQTD62D*3
Temperature control module	A1S64TCTT-S1	Q64TCTTN	ERNT-ASQT64TCTT
	A1S64TCTRT*4		
	A1S64TCRT-S1	Q64TCRTN	ERNT-ASQT64TCRT
	A1S64TCTRT*5		
	A1S62TCTT-S2	Q64TCTTN	ERNT-ASQT62TCTT
	A1S64TCTRT*6		
	A1S62TCRT-S2	Q64TCRTN	ERNT-ASQT62TCRT
	A1S64TCTRT*7		

*1: The module mounting slot position differs, so the wiring length must be adjusted.
*2: If the I/O modules are mounted adjacently using the conversion adapter, mounting may not be possible if the existing wires are thick or there are many wires. If the wires interfere, lift the wires up toward the front so they are out of the way. If the wires still interfere, leave one slot open to ensure space for the wires.
*3: Module with fixing frame. The base adapter ASQB3□N, ASQB6□N, or ASQB5□N must be used.
*4: For standard control by thermocouple input.
*5: For standard control by platinum temperature measuring resistor input.
*6: For heating/cooling control by thermocouple input.
*7: For heating/cooling control by platinum temperature measuring resistor input.
Refer to the "Upgrade Tool General Catalog" issued by Mitsubishi Electric Engineering Co., Ltd. for details.

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● 2-slot type (inapplicable to AnS size Q Series large type base units)

Module type	MELSEC-AnS/QnAS Series module model	MELSEC-Q Series module model	Conversion adapter model
Input	A1SX20	QX28 x 2 modules	ERNT-ASQTX20 *1
	A1SX20EU		
Output	A1SY60	QY68A x 2 modules	ERNT-ASQTY60 *1
	A1SY60E		ERNT-ASQTY60E *1
Temperature control module with wire breakage detection	A1S64TCTTBW-S1	Q64TCTTN	ERNT-ASQT64TCTTBW *2
	A1S64TCTRTBW *3		
	A1S64TCRTBW-S1	Q64TCRTN	ERNT-ASQT64TCRTBW *2
	A1S64TCTRTBW *4		
	A1S62TCTTBW-S2	Q64TCTTN	ERNT-ASQT62TCTTBW *2
	A1S64TCTRTBW *5		
	A1S62TCRTBW-S2	Q64TCRTN	ERNT-ASQT62TCRTBW *2
	A1S64TCTRTBW *6		

*1: The XY address will change because two replacement modules are used. The program must be revised.
Consider using FA goods if not changing the XY address.
*2: Model name of set of 1-slot type conversion adapter ERNT-ASQT64TC□□ and wire breakage detection connector conversion cable.
*3: For standard control by thermocouple input.
*4: For standard control by platinum temperature measuring resistor input.
*5: For heating/cooling control by thermocouple input.
*6: For heating/cooling control by platinum temperature measuring resistor input.

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(b) Base adapter

Module type	MELSEC-AnS/QnAS Series module model	MELSEC-Q Series module model	Base adapter model*1
Main base unit	A1S33B	Q33B	ERNT-ASQB33N
		Q33B+QA1S51B	ERNT-ASQB33-S1*2
	A1S35B	Q35B	ERNT-ASQB35N
		Q35B+QA1S51B	ERNT-ASQB35-S1*3
	A1S38B	Q38B	ERNT-ASQB38N
		Q38B+QA1S51B	ERNT-ASQB38-S1*4
Extension base unit (with power supply)	A1S65B	Q65B	ERNT-ASQB65N
	A1S68B	Q68B	ERNT-ASQB68N
Extension base unit (without power supply)	A1S55B	Q55B	ERNT-ASQB55N
CPU/base unit integrated type	A1SJCPU	Q00JCPU Q00UJCPU	ERNT-ASQB00JN
	A1SJCPU-S3		
	A1SJHCPU		

*1: The conversion adapter with fixing frame cannot be used with the base adapter that does not have "N" after the conventional model.
*2: The width is 36 mm larger, so mounting space must be secured. (No need to additionally drill mounting holes)
*3: The width is 22 mm larger, so mounting space must be secured. (No need to additionally drill mounting holes)
*4: Mountable within existing space (No need to additionally drill mounting holes)

Tip

- External wiring work is eliminated by directly mounting the existing AnS/QnAS (Small Type) I/O module terminal block.
  When using the conversion adapter, the terminal block cover (enclosed with conversion adapter) must be replaced.
- When replacing the AnS/QnAS Series I/O module with connector type external connection method (wiring), the existing wiring can be used. (The connector, with wires attached, can be connected to the Q Series module.) Note that after replacement, the Q Series does not have a D-sub 37-pin connector type I/O module, so the wiring must be changed to a 40-pin connector.
  Note that units with and without the conversion adapter can be used together on the same base unit.
- If replacement is difficult from the existing AnS/QnAS (Small Type) I/O module, the module can be replaced with the FA goods interface terminal module.
  (Example: When A1SX20 is replaced, two QX28 modules will be required. This increases the number of modules and changes the address. By selecting QX40 and providing the FA goods terminal module "FA-TH16X200A31L" externally, the number of modules does not need to be increased, and the address will not change.)
- When replacing a system containing an A Series large type extension base unit connected to the AnS/QnASCPU to the Q Series, the "Q Series large type base unit, Mitsubishi Electric Engineering Co., Ltd. Upgrade Tool" can be used to replace the A Series large type extension base unit and mounted modules. Refer to the following section for tips on selecting the "Q Series large base unit, Mitsubishi Electric Engineering Co., Ltd. Upgrade Tool" in this case.
  ▶Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Fundamentals) L(NA)08043
  ▶MELSEC-A/QnA (Large), AnS/QnAS (Small) Transition Examples L08121 (-B and higher)
  Note that the CPU/base unit integrated CPU type cannot be used with the Q Series large extension base unit.
- For details on the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd., please contact your local Mitsubishi sales office or representative.

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(2) Compatibility of AnS size version Q Series large type base unit with the upgrade tool

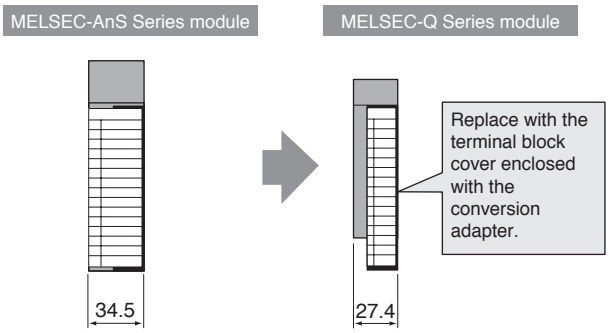
The following table shows the compatibility of AnS size version Q Series large type base unit with the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. when replacing existing A (Small Type) Series modules with Q Series modules.

Item			AnS size version Q Series large type base unit*1	Base adapter (Upgrade tool)*2
Slot width of base unit			Same width as the A (Large Type) Series base unit (34.5 mm)	Same width as Q Series base unit (27.4 mm)
Mountable module*5	Power supply module	Q Series standard power supply module	○	○
	CPU module	Basic model QCPU	×	○
		High Performance model QCPU	○	○
		Process CPU	×	○
		Universal model QCPU	○*3	○
		Multi-CPU configuration	×	○
		MELSECNET/H remote I/O module	○	○
	• I/O module • Intelligent function module	Q Series 1-slot module*4	○*6	○
		Q Series 2-slot occupying module	×	○
Conversion adapter*5	For terminal block type 16-point I/O module (1-slot type)		○*6	○
	For terminal block type 16-point I/O module (2-slot type)		×	○*9
	For high-speed counter module		○*6	○*8
	For analog module (1-slot type)		○*6	○*8
Connection of QA/QA1S extension base unit*7			○	○

○: Applicable (Mountable), ×: Not Applicable (Not mountable)

*1: AnS size version Q Series large type base units, Q Series base units (standard products) and Q Series large base units can be used together.

*2: Mount a Q Series base unit (standard product) on the base adapter manufactured by Mitsubishi Electric Engineering Co., Ltd.



*3: Q00UJCPU is not compatible.

*4: The following modules cannot be used.
- A module whose height is more than 98 mm.
- A module with a bracket on top.
- A module with a protrusion, such as a connector, on the bottom.
- A module onto which Q7BAT-SET is mounted.

* Example
Q66AD-DG, Q66DA-G, Q68AD-G, Q68RD3-G, Q68TD-G-H02, Q64AD2DA, QD75M1, QD75MH1, QD75M2, QD75MH2, QD75M4, QD75MH4, or QJ71WS96 with Q7BAT-SET mounted.

*5: Since the adapters are mounted on Q Series modules, the specifications and functions are same as those of the Q Series modules. (Please check the transition handbook, since the specifications and functions are different from those of A (Small type) Series module)

*6: The AnS size version Q Series large type blank cover (QG69LS) must be mounted.

*7: Only High Performance Model QCPUs can be connected to the QA/QA1S extension base unit. This cannot be used with the MELSECNET/H remote I/O station, etc.

*8: If the size of the copper wire connected to the terminal block is larger than 1.25 mm^2, it may be difficult to mount the conversion adapter.
In this case, secure wiring space by leaving empty slots in between modules. For example, mount modules on slot No. 0, 2, 4, 6, 8, and leave slot No. 1, 3, 5, 7 empty. Mount a blank cover QG60 on the empty slots. If there are not enough slots, consider using the AnS size version Q Series large type base unit.

*9: Applies when using replacing the existing A (Small Type) module with the two Q Series modules, and using the existing wiring terminal block with the conversion adapter.
(Example) A1SX20 -> QX28 x 2 modules, A1SY60(E) -> QY68A x 2 modules

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2.2.3 Replace AnS/QnAS (Small Type) Series 200 V AC input module A1SX20 without changing I/O address

Solution and Benefit

- **An increase in modules and changes to address can be handled easily by using FA goods.**
- **A dedicated cable is available to connect the programmable controller with the FA goods, so there's no need to prepare cables when making a replacement.**

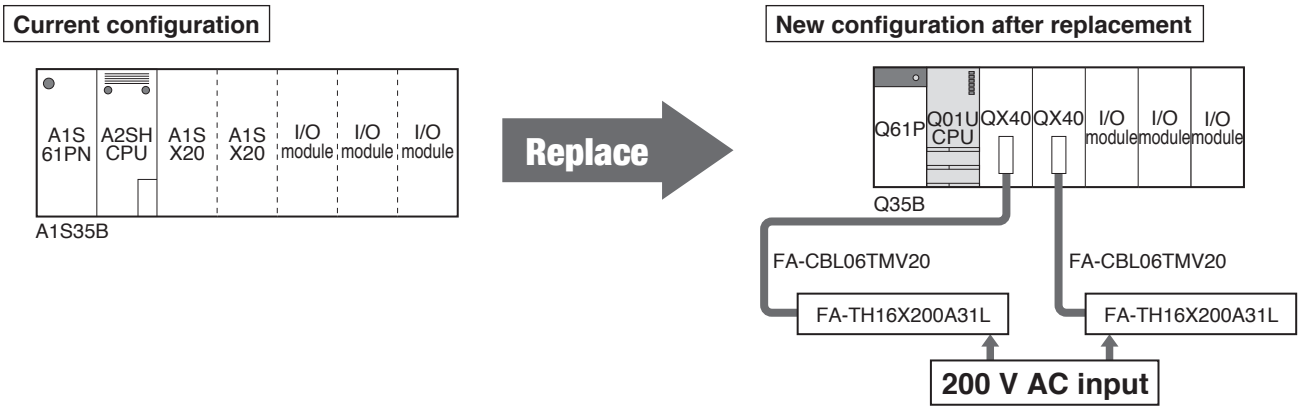
The following is an example of replacing the AnS/QnAS (Small Type) I/O module with the Q Series using FA goods.
When replacing the AnS/QnAS (Small Type) 200 V AC input module A1SX20 (16-input points, 16-occupied points), the Q Series 200 V AC input module is QX28 (8-point input, 16-occupied points), so the number of modules will increase, and the address will change.
By using the FA goods, the modules can be replaced without increasing the number of modules or changing the address.

● Instruction

(1) Using the FA goods, convert the 200 V AC input into 24 V DC, and lead it in with QX40.
(2) The external wiring will change, but program does not need to be changed since the I/O address is the same.
(3) The following FA goods are used.

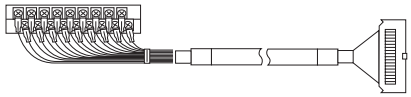
Product name	Model	External connection	Remarks
200 V AC photo coupler insulated input module	FA-TH16X200A31L 	16-point/common 2-wire type	(1) 200 V AC input module insulated with photo coupler (2) Input module QX40 on programmable controller side (3) Connection cable FA-CBL□□□TMV20

● System configuration example



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● Connection cable

Shape	Model	Cable length
	FA-CBL06TMV20	0.6m
	FA-CBL10TMV20	1.0m
	FA-CBL20TMV20	2.0m
	FA-CBL30TMV20	3.0m
	FA-CBL50TMV20	5.0m
	FA-CBL100TMV20	10.0m

● Module selection example

Product name	Existing model		Replacement model	
Power supply module	A1S61PN	1	Q61P	1
CPU module	A2SHCPU	1	Q01UCPU	1
Main base unit	A1S35B	1	Q35B	1
Input module	A1SX20	2	QX40	2
FA goods	N/A	–	FA-TH16X20031L	2
Connection cable	N/A	–	FA-CBL□□□TMV20	2

Tip

- The FA goods input module has a function to convert the 200 V AC input signal into 24 V DC. When replacing a 16-point terminal block type, select a 24 V DC input terminal block type module for the programmable controller side input module. In addition, select a cable that matches the module type.
- The following products are available for the FA goods.
  - Triac large capacity (1 A/point) output module
  - Transistor large capacity (2 A/point) output module
  - Common multi-point I/O module

The FA goods can be used when replacement using a conversion adapter is difficult.
For details on the FA goods manufactured by Mitsubishi Electric Engineering Co., Ltd., please contact your local Mitsubishi sales office or representative. TEL052-723-8058 FAX052-723-8062

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2.3 Replace AnS/QnAS (Small Type) Series with L Series

2.3.1 Replace using A (Small Type) upgrade tool (manufactured by Mitsubishi Electric Engineering Co., Ltd.)

Solution and Benefit

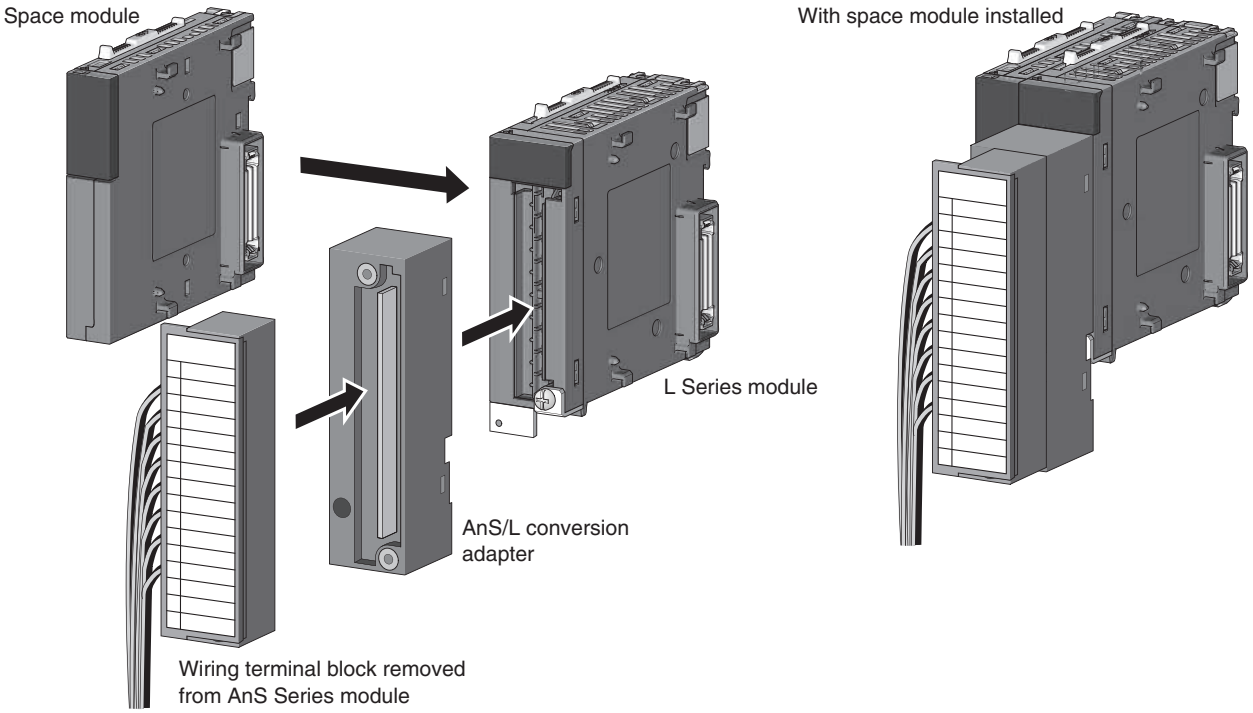
The existing wiring can be used by using the conversion adapter of the upgrade tool (manufactured by Mitsubishi Electric Engineering Co., Ltd.) for replacing MELSEC-AnS Series with MELSEC-L Series. It is unnecessary to drill additional holes, and the man-hour for replacement can be reduced.

■ Conversion adapter

There are available two types of conversion adapters, one for using the existing AnS module terminal block without making changes to the wiring and the other for type conversion for connector type input/output modules with different types of connectors.

■ Space module

If the wires of the existing terminal block are thick and interfere with the adjacent module, the conversion adapter to be used may not be mounted. In this case, the wiring space can be secured to eliminate the interference by installing the space module LG69 on the left of the newly mounted module.

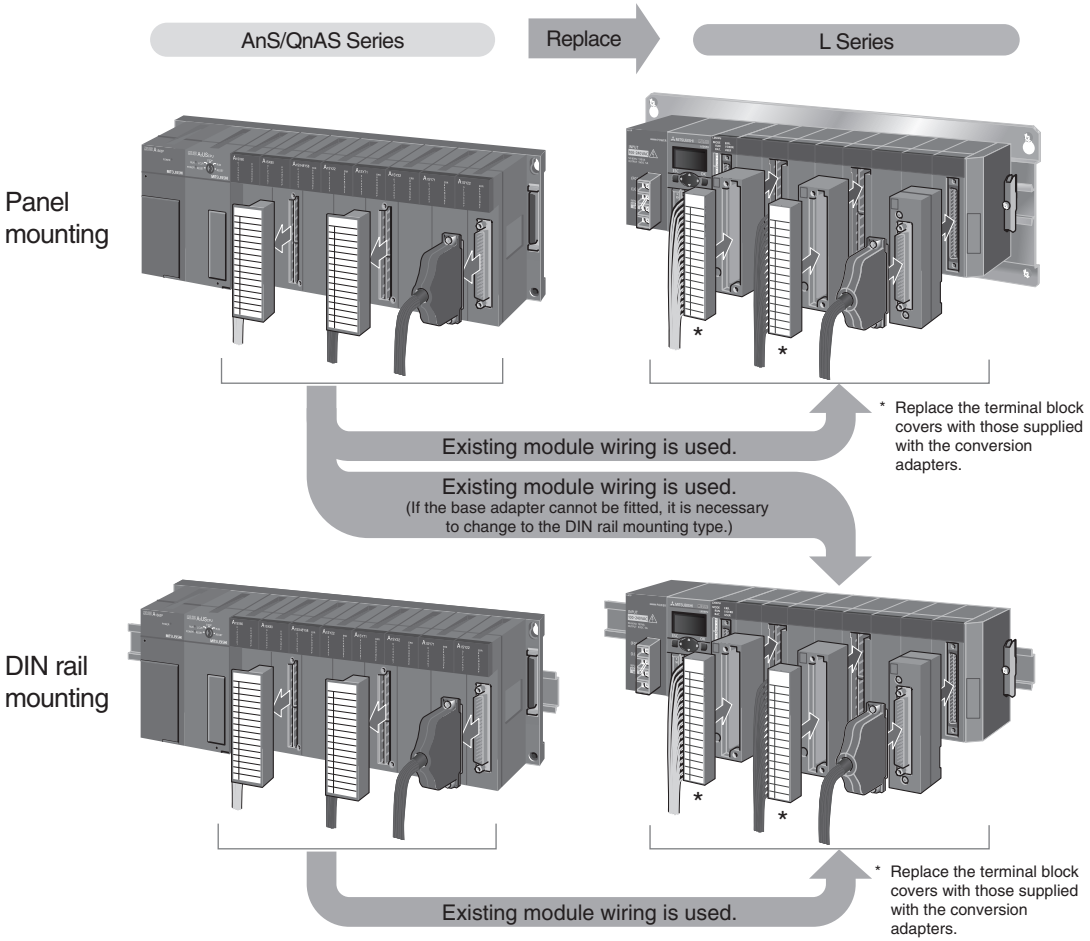


When the space module LG69 is used, the number of modules per block is restricted. For details, refer to "Transition from MELSEC-AnS/QnAS (Small Type) Series to L Series Handbook (Fundamentals)."

■ Base adapter

The base adapter integrated with DIN rail is used to mount the L Series base unit using the existing mounting holes for the AnS/QnAS Series base unit.
When the base adapter is used, it is unnecessary to fit the DIN rail, and the man-hour for replacement can be reduced.

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● List of conversion adapters

Module type	Existing module model	New module model	Conversion adapter model	LG69	Remarks
Input module	A1SX10	LX10	ERNT-ASLTXY10	Usable	The existing wiring can be used.
	A1SX10EU				
	A1SX40	LX40C6	ERNT-ASLTX40		
	A1SX40-S1				
	A1SX40-S2				
	A1SX80		ERNT-ASLTX80		
	A1SX80-S1				
	A1SX80-S2				
	A1SX81	LX41C4	ERNT-ASLCXY81	Unnecessary	The existing wiring can be used by replacing the D-sub 37-pin connector with the 40-pin connector.
	A1SX81-S2				
Output module	A1SY10	LY10R2	ERNT-ASLTXY10	Usable	The existing wiring can be used.
	A1SY10EU				
	A1SY22	LY20S6	ERNT-ASLTY22		
	A1SY40	LY40NT5P	ERNT-ASLTY40		
	A1SY40P				
	A1SY50		ERNT-ASLTY50		
	A1SY80	LY40PT5P	ERNT-ASLTY80		
	A1SY81	LY41PT1P	ERNT-ASLCXY81	Unnecessary	The existing wiring can be used by replacing the D-sub 37-pin connector with the 40-pin connector.
	A1SY81EP				
Analog input module	A1S64AD	L60AD4	ERNT-ASLT64AD	Usable	The existing wiring can be used.
Analog output module	A1S62DA	L60DA4	ERNT-ASLT62DA		
High-speed counter module	A1SD61	LD62	ERNT-ASLTD61	Usable	The existing wiring can be used.
	A1SD62		ERNT-ASLTD62		

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● List of base adapters

Type	Existing model	Base adapter model
Main base unit	A1S32B	ERNT-ASLB32
	A1S33B	ERNT-ASLB33
	A1S35B	ERNT-ASLB35
	A1S38B	ERNT-ASLB38
	A1S38HB	
Extension base unit (with power supply module)	A1S65B	ERNT-ASLB65
	A1S68B	ERNT-ASLB68
Extension base unit (without power supply module)	A1S52B	ERNT-ASLB52
	A1S55B	ERNT-ASLB55
	A1S58B	ERNT-ASLB58
Integrated type	A1SJCPU	ERNT-ASLBJ
	A1SJCPU-S3	
	A1SJHCPU	

For the selection of base adapter, refer to "Transition from MELSEC-AnS/QnAS (Small Type) Series to L Series Handbook (Fundamentals)."

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2.3.2 Replace AnS/QnAS (Small Type) Series 200 V AC input module A1SX20 without changing I/O address

Solution and Benefit

(1) An increase in modules and changes to address can be handled easily by using FA goods.
(2) A dedicated cable is available to connect the programmable controller with the FA goods, so there's no need to prepare cables when making a replacement.

The following is an example of replacing the AnS/QnAS (Small Type) I/O module with the L Series using FA goods.
When replacing the AnS/QnAS (Small Type) 200 V AC input module A1SX20 (16-input points, 16-occupied points), the L Series 200 V AC input module is LX28 (8-point input, 16-occupied points), so the number of modules will increase, and the address will change.
By using the FA goods, the modules can be replaced without increasing the number of modules or changing the address.

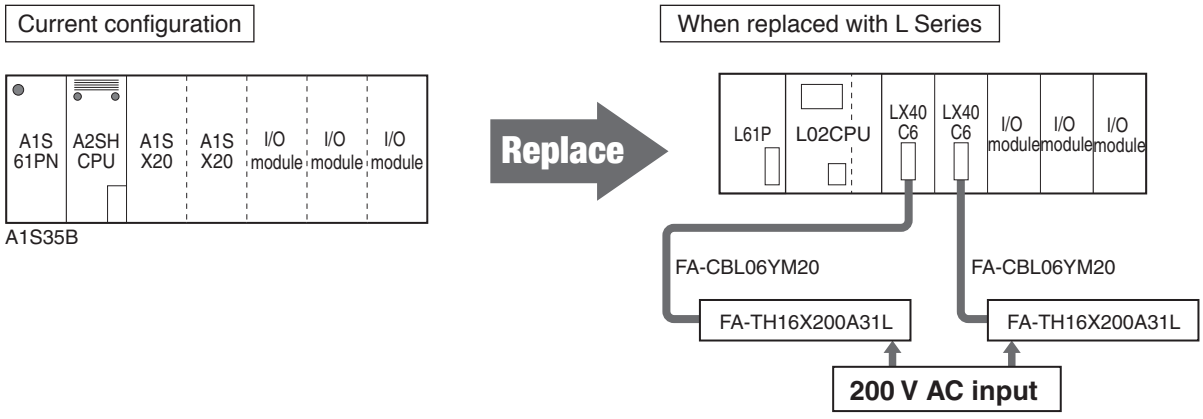
● Instruction

(1) Using the FA goods, convert the 200 V AC input into 24 V DC, and lead it in with LX40C6.
(2) The external wiring will change, but program does not need to be changed since the I/O address is the same.
(3) The following FA goods are used.

Product name	Model	External connection	Remarks
200 V AC photocoupler insulated input module	FA-TH16X200A31L 	16-point/common 2-wire type	(1) 200 V AC input module insulated with photocoupler (2) Input module LX40C6 on programmable controller side (3) Connection cable FA-CBL□□□YM20*1

*1: Wiring work is required on the input module side because the module has unfastened wires with Y terminals.

● System configuration example



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2.4 Replace A0J2 with Q Series

A0J2 upgrade tool

■ A0J2 renewal tool features

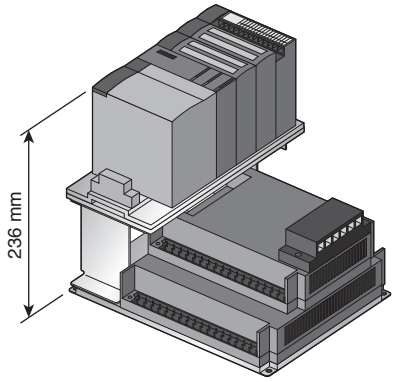
The A0J2 renewal tool is used to replace existing A0J2(H) systems with the Q Series.
It consists of an interface module where the existing wired terminal block can be mounted and a base adapter which enables utilization of the existing installation holes, etc.
A variety of installation methods are available to fit the installation space.

■ Interface module features

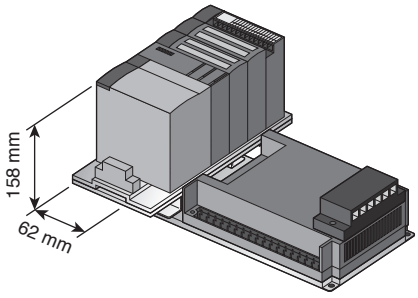
The interface module has DC to relay output conversion and AC to DC input conversion functions. Hence, replacement is possible using the interface module along with Q Series connector type DC I/O modules.
Dedicated cables are used to connect the interface module to Q Series I/O modules.

・Installation types

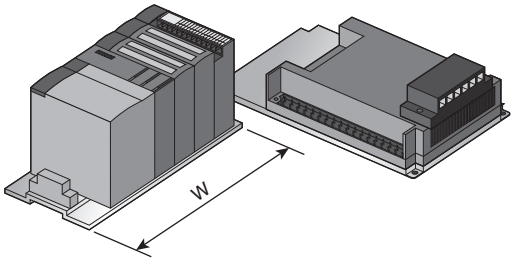
(1) Stackable type
- Existing mounting holes can be used.
- Suitable when there is enough depth.
  (A depth of 195 mm (when one interface module is stacked)/236 mm (when two interface modules are stacked) or more is required.)



(2) Flat mounting type
- Existing mounting holes can be used. However, enough depth and space above the existing modules are required.
  (A space of 62 mm + 30 mm (for heat dissipation) is required above existing modules)
  (A depth of 158mm is required.)
- The required depth is less than that of the stackable type.



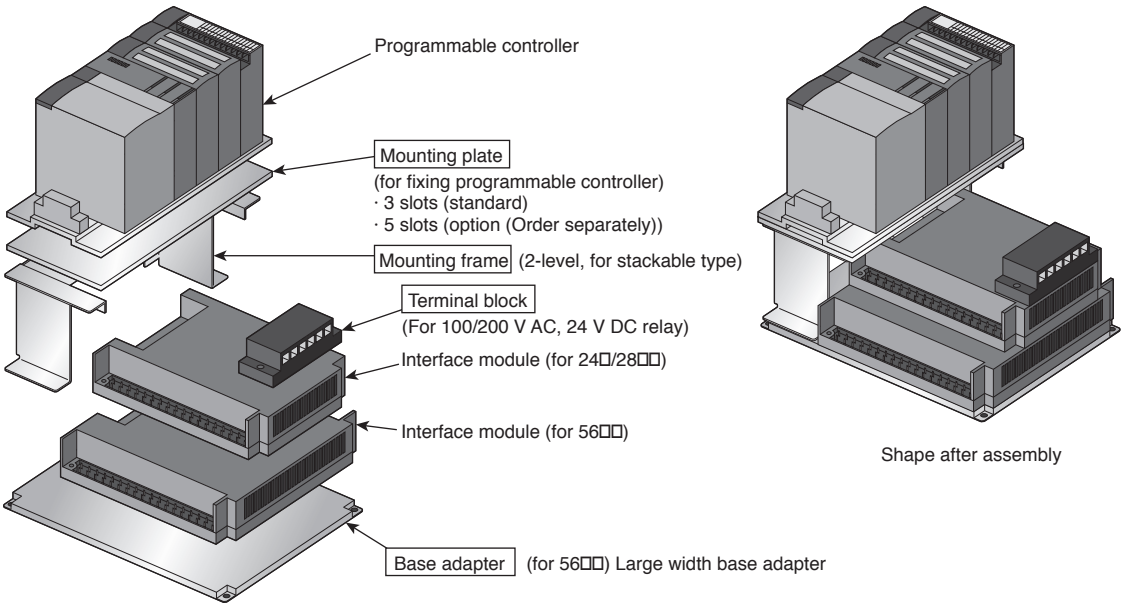
(3) Standalone type
- Although space to install the main base unit separately is needed, a base unit with a larger number of I/O slots can be installed. Suitable when there is not enough space in the existing A0J2(H).
  W = 189 mm (for Q33B: 3 I/O slots),
  245 mm (for Q35B: 5 I/O slots),
  328 mm (for Q38B: 8 I/O slots)



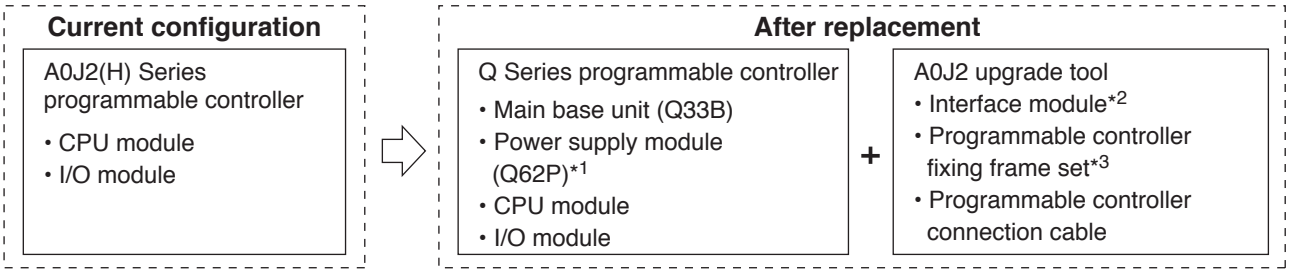
*A depth of A0J2 Series modules is 41 mm per module. (i.e., Total depth of two I/O modules and a CPU is 123 mm.)
A depth of the CPU (A0J2HCPUP21 data link type) is 68 mm.

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(1) Structure



(2) Basic configuration



*1: Prepare a separate external power supply when not selecting the Q62P.
Refer to "E. Interface module power supply" for the required external 24 V DC power supply capacity.

*2: The A0J2 upgrade tool is compatible with the interface modules as shown in the table on the next page.
Refer to the following material from Mitsubishi Electric System & Service Co., Ltd. for details on the "programmable controller fixing frame set", "base adapter" and "mounting plate", etc., that are not described in these examples.
• A0J2 Upgrade Tool Catalog (material No.: X900904-165)

*3: The programmable controller fixing frame set is configured of the "base adapter", "mounting plate", "mounting frame", "terminal block" and "power cable".

*4: The dimensions for the stackable type apply when the programmable controller I/O module is a connector type module, and the programmable controller connection cable SC-A0JQC**M is being used. The dimensions will differ according to the module and wiring connector type being used.

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(3) Compatible interface module list

• Available models

Model to be discontinued		Alternative model			
Product name	Model (A0J2 I/O module / compact type NET/MINI)	Alternative programmable controller I/O module			Interface module
		Q Series	AnS Series	CC-Link	
Intput module	A0J2-E32A/ AJ35PTF-32A	QX41/ QX41Y41P	A1SX41	AJ65SBTCF1-32D	SC-A0JQIF-32A
	A0J2-E32D/ AJ35PTF-32D				SC-A0JQIF-32D
Output module	A0J2-E24R/ AJ35PTF-24R	QY41P/ QX41Y41P	A1SY41P	AJ65SBTCF1-32T	SC-A0JQIF-24R
	A0J2-E24S/ AJ35PTF-24S				SC-A0JQIF-24S
	A0J2-E24T/ AJ35PTF-24T				SC-A0JQIF-24T
I/O module	A0J2-E28AR/ AJ35PTF-28AR	QX41Y41P	A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-28AR
			A1SX41+A1SY41P		
	A0J2-E28AS/ AJ35PTF-28AS		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-28AS
			A1SX41+A1SY41P		
	A0J2-E28DR/ AJ35PTF-28DR		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-28DR
			A1SX41+A1SY41P		
	A0J2-E28DS/ AJ35PTF-28DS		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-28DS
			A1SX41+A1SY41P		
	A0J2-E28DT/ AJ35PTF-28DT		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-28DT
			A1SX41+A1SY41P		
	A0J2-E56AR/ AJ35PTF-56AR		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-56AR
			A1SX41+A1SY41P		
	A0J2-E56AS/ AJ35PTF-56AS		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-56AS
			A1SX41+A1SY41P		
	A0J2-E56DR/ AJ35PTF-56DR		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-56DR
			A1SX41+A1SY41P		
	A0J2-E56DS/ AJ35PTF-56DS		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-56DS
			A1SX41+A1SY41P		
	A0J2-E56DT/ AJ35PTF-56DT		A1SH42	AJ65SBTCF1-32D +AJ65SBTCF1-32T	SC-A0JQIF-56DT
			A1SX41+A1SY41P		

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(4) Programmable controller connection cable
(connecting interface module and programmable controller I/O module)

Model	Specifications*
SC-A0JQC03M	Cable length: 0.35 m (MIL connector - FCN connector)
SC-A0JQC10M	Cable length: 1.0 m (MIL connector - FCN connector)
SC-A0JQC20M	Cable length: 2.0 m (MIL connector - FCN connector)
SC-A0JQC30M	Cable length: 3.0 m (MIL connector - FCN connector)
SC-A0JQC50M	Cable length: 5.0 m (MIL connector - FCN connector)

* For cable length other than described above, please contact your local Mitsubishi sales office or representative.

(5) Interface module power supply

24 V DC must be supplied as the power source for the interface module.
The power can be supplied from the Q Series power supply module Q62P, but the capacity may be insufficient depending on the module configuration.
Prepare an external 24 V DC supply if the Q62P 24 V DC capacity (0.6 A) is insufficient.

Model	Interface module	Module external power supply	Relay drive power supply
Input module	SC-A0JQIF32D	200 mA	—
	SC-A0JQIF32A	210 mA	—
Output module	SC-A0JQIF24R	—	230 mA
	SC-A0JQIF24S	370 mA	—
	SC-A0JQIF24T	70 mA	—
I/O module	SC-A0JQIF28AR	105 mA	125 mA
	SC-A0JQIF28AS	290 mA	—
	SC-A0JQIF28DR	100 mA	125 mA
	SC-A0JQIF28DS	285 mA	—
	SC-A0JQIF28DT	130 mA	—
	SC-A0JQIF56AR	210 mA	230 mA
	SC-A0JQIF56AS	580 mA	—
	SC-A0JQIF56DR	200 mA	230 mA
	SC-A0JQIF56DS	570 mA	—
	SC-A0JQIF56DT	260 mA	—

* The above module external power supply sources include the programmable controller side I/O module external wiring 24 V DC.
However, these do not include the CC-Link I/O module power supply when replacing to the CC-Link.

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2.4.1 Replace A0J2(H) systems with Q Series using A0J2 upgrade tool

Solution and Benefit

- **Existing A0J2 I/O wiring can be mounted on the A0J2 upgrade tool without modification.**
- **The A0J2 upgrade tool takes in AC/DC input and sends these signals to a programmable controller's input module. It also outputs the signals received from a programmable controller's output module to the external devices. Therefore, any A0J2 Series I/O modules can be replaced with QX41Y41P by selecting the appropriate A0J2 upgrade tool.**
- **QX41Y41P, the 64-point I/O combined module (32-point input for the first half and 32-point output for the second half), can be used to replace the A0J2 Series I/O modules without changing the I/O assignment.**
- **The installation size of the A0J2 upgrade tool is the same as that of the A0J2-E56□ I/O modules, eliminating the need of making new holes.**

The following is an example of replacing an A0J2(H) system with Q Series using the A0J2 upgrade tool.

● Instructions

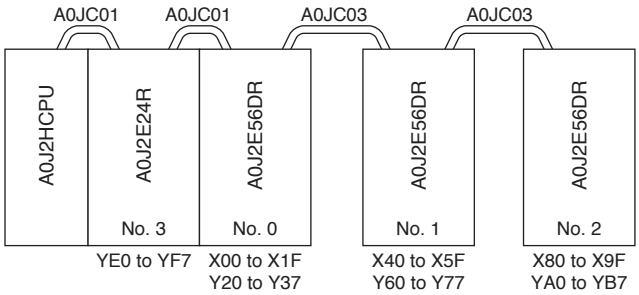
(1) Replace the A0J2H Series CPU with a Q Series CPU and the I/O modules with QX41Y41P.
The existing I/O address can be used for the QX41Y41P, and program modifications can be avoided.

(2) When the A0J2 renewal tool is used to mount the terminal blocks of the existing A0J2 I/O modules, the existing external wiring does not need to be changed.

* The A0J2 renewal tool is not assigned an I/O module number.
The "No.=n" in the new configuration keeps track of the order of connection with the modules on the programmable controller side to avoid changes in I/O addresses.
Check the I/O module number in the current configuration and connect the programmable controller side modules accordingly.

(1) System configuration example

Current configuration

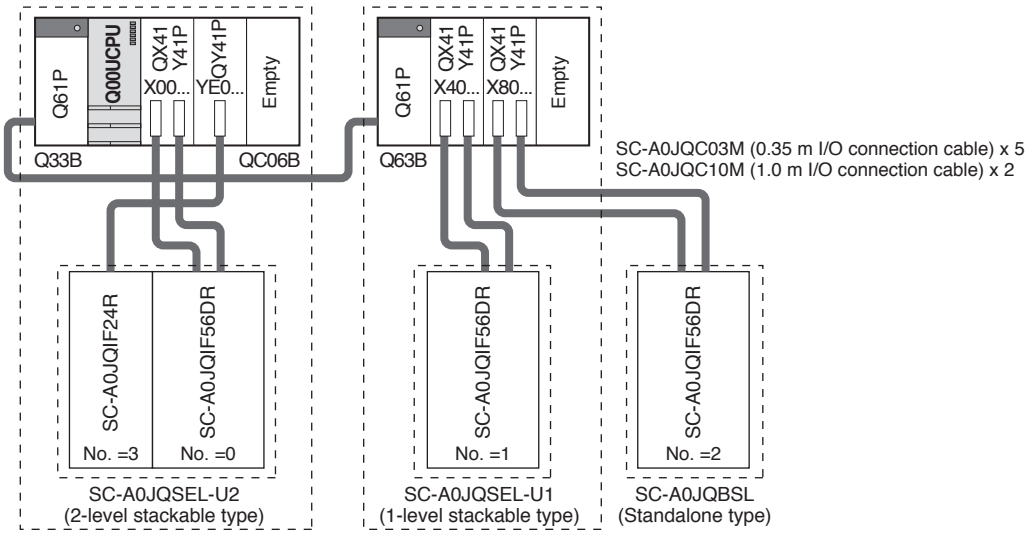


* "n" of No.=n indicates the I/O module number.

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New configuration after replacement

(1) When the stackable type is used ··· With mounting plates for fixing frame set



● Module selection example (Q Series)

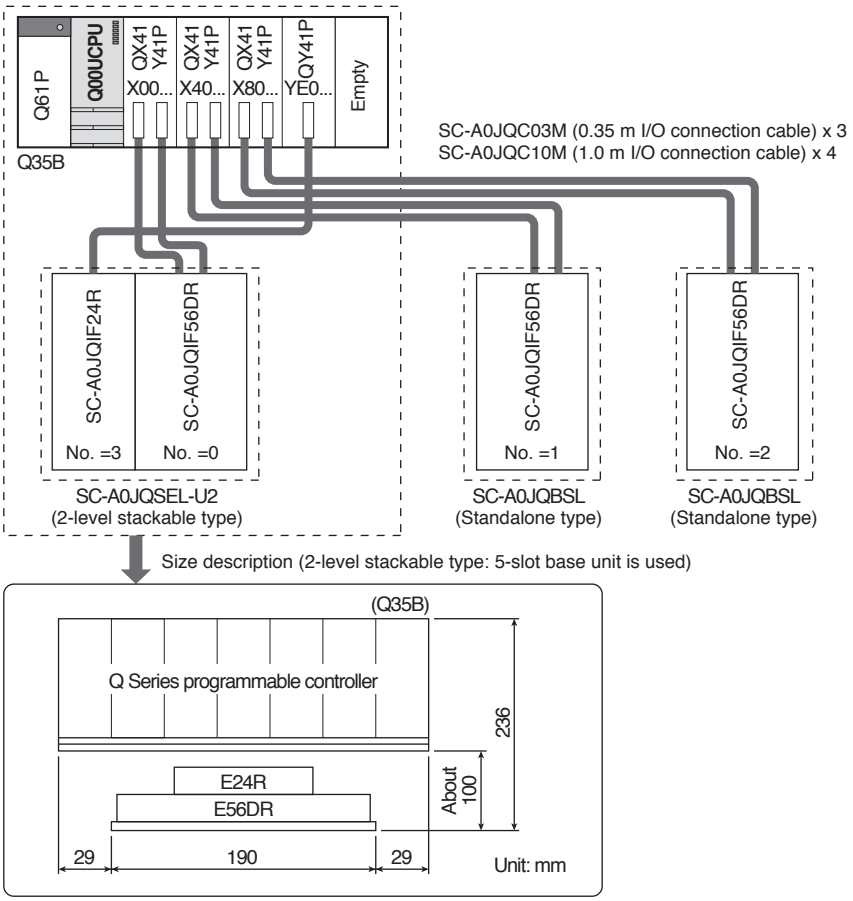
Product name	Existing module		Stackable type replacement module	
Power supply module	A0J2HCPU	1	Q61P	2
CPU module			Q00UCPU	1
Main base unit			Q33B	1
Extension base unit			Q63B	1
I/O module	A0J2-E56DR	3	QX41Y41P	3
Output module	A0J2-E24R	1	QY41P	1
Extension cable	A0JC01/A0JC03	4	QC06B (0.6 m)	1
24 V DC power supply module	(CPU built-in power supply is used.)	-	24 V DC power supply module (Commercially available)	-

● A0J2 upgrade tool

Product name	Stackable type replacement module		Remarks
Interface module	SC-A0JQIF56DR	3	
	SC-A0JQIF24R	1	
Programmable controller fixing frame set (Base adapter + mounting frame)	SC-A0JQSEL-U2	1	
	SC-A0JQSEL-U1	1	
Mounting plate (for Q63B)	SC-A0JQPT3	1	Change the adapter plate for Q33B with the one for Q63B.
Base adapter (for standalone type)	SC-A0JQBSL	1	
Programmable controller connection cable	SC-A0JQC03M	5	Cable length: 0.35 m
	SC-A0JQC10M	2	Cable length: 1.0 m

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(2) When the stackable type is used ··· With a 5-slot base unit



● Module selection example (Q Series)

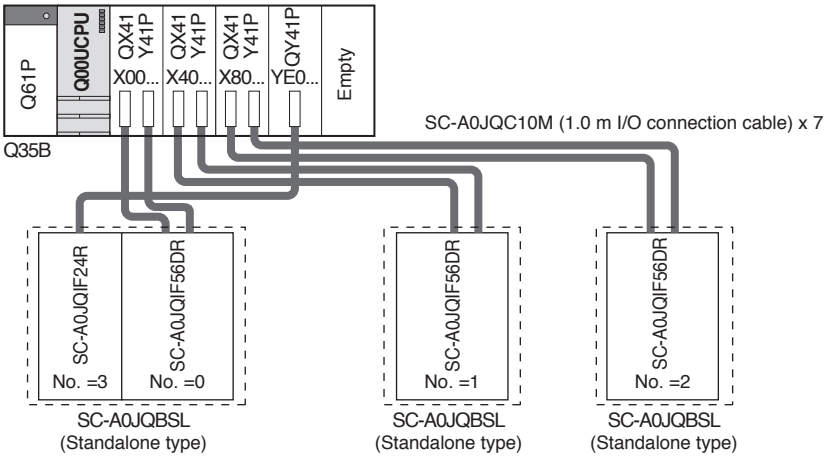
Product name	Existing module		Stackable type replacement module	
Power supply module	A0J2HCPU	1	Q61P	1
CPU module			Q00UCPU	1
Main base unit			Q35B	1
I/O module	A0J2-E56DR	3	QX41Y41P	3
	A0J2-E24R	1	QY41P	1
24 V DC power supply module	(CPU built-in power supply is used.)	-	24 V DC power supply module (Commercially available)	-

● A0J2 upgrade tool

Product name	Stackable type replacement module		Remarks
Interface module	SC-A0JQIF56DR	3	
	SC-A0JQIF24R	1	
Programmable controller fixing frame set (Base adapter + mounting frame)	SC-A0JQSEL-U2	1	
Mounting plate (for Q35B)	SC-A0JQPT5	1	29 mm width increase on both sides as compared to the plate for Q33B. (For replacing the fixing frame set SC-A0JQPT3)
Base adapter (for standalone type)	SC-A0JQBSL	2	For E56 (mounting plate) * Required for standalone type
Programmable controller connection cable	SC-A0JQC03M	3	Cable length: 0.35 m
	SC-A0JQC10M	4	Cable length: 1.0 m

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(3) When the standalone type is used



● Module selection example (Q Series)

Product name	Existing module		Standalone type replacement module	
Power supply module	A0J2HCPU	1	Q61P	1
CPU module			Q00UCPU	1
Main base unit			Q35B	1
Extension base unit			N/A	-
I/O module	A0J2-E56DR	3	QX41Y41P	3
Output module	A0J2-E24R	1	QY41P	1
Extension cable	A0JC01/A0JC03	4	N/A	-
24 V DC power supply module	(CPU built-in power supply is used.)	-	24 V DC power supply module (Commercially available)	-

● A0J2 upgrade tool

Product name	Standalone type replacement module		Remarks
Interface module	SC-A0JQIF56DR	3	
	SC-A0JQIF24R	1	
Base adapter (for standalone type)	SC-A0JQBSL	3	
Programmable controller connection cable	SC-A0JQC10M	7	Cable length: 1.0 m

Tip

- When using the stackable type, check that there is enough depth.
  Also, check the width when using a programmable controller main/extension base unit with 5 slots because it may have increased.
- Select the appropriate cable length between the interface module and the programmable controller (I/O module) depending on the system configuration.
- The I/O addresses (X/Y addresses) of existing A0J2 I/O modules are preset according to the I/O module numbers. Check the I/O module number that has been set for each existing module.
  Connect the A0J2 renewal tool with the I/O modules in a way that the same I/O addresses are used when upgrading to Q Series CPU.
- When an output-only module such as SC-A0JQIF24R is used, selecting QY41P as the programmable controller side module changes the I/O addresses and requires program modification.
  In this case, the start I/O address of the affected slots can be re-assigned in I/O assignment of Q Series CPU parameter in order to avoid changes to the program.
- 24 V DC output power supply of the Q62P can be used as an external power supply for the A0J2 renewal tool. However, depending on the number of modules used, an extra power supply may be needed. In this case, prepare an external 24 V DC power supply.

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2.4.2 Upgrade to MELSECNET/H (remote I/O network) system using A0J2 upgrade tool

Solution and Benefit

- **Using the A0J2 upgrade tool, A0J2R25(P25) remote I/O stations can be replaced with MELSECNET/H remote I/O stations without modifying external wiring.**
- **By making the same network parameter settings as the current ones, program modifications can be avoided.**

The following is an example of upgrading a MELSECNET network system consisting of only remote I/O stations to a MELSECNET/H (remote I/O network) system using the A0J2 upgrade tool.

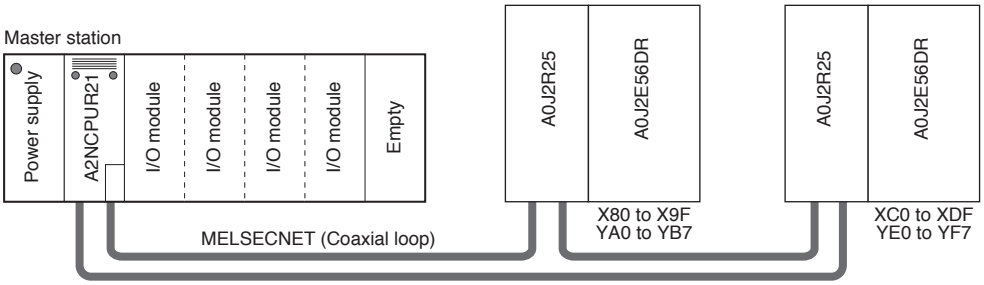
● Instructions

(1) Replace the MELSECNET network system with MELSECNET/H remote I/O network system. The network parameter settings remain the same, and it is not necessary to make changes to the program.

(2) Change the cable system from MELSECNET coaxial loop to MELSECNET/H coaxial bus. New wires are not necessary because the existing coaxial loop cables can be used.

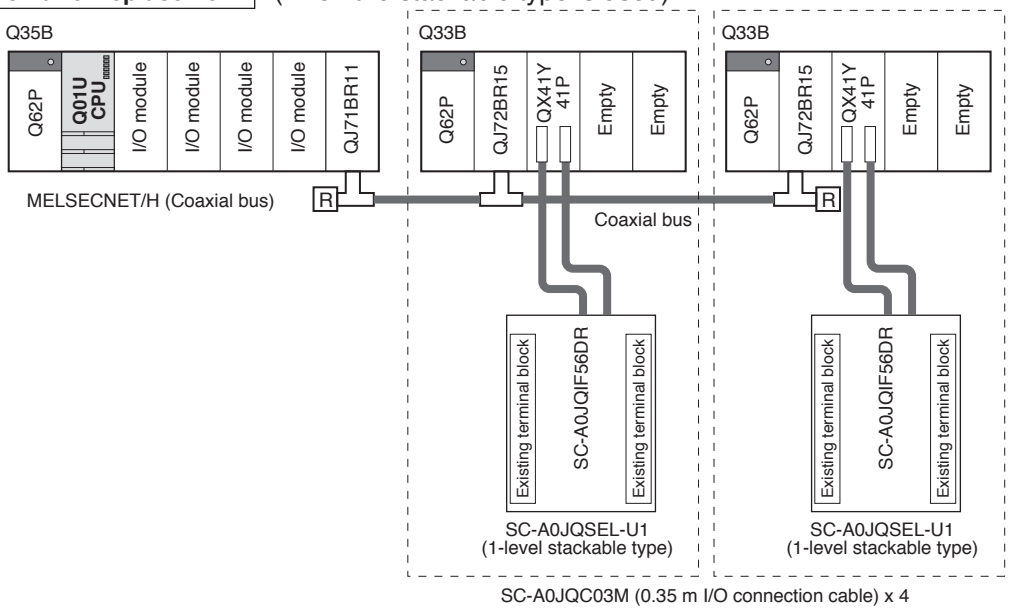
(1) System configuration example

Current configuration



Replace

New configuration after replacement (when the stackable type is used)



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● Module selection example

(1) Programmable controller

Product name	Existing module		Replacemant module	
Power supply module	A62P	1	Q62P (with 24 V DC)	3
CPU module	A2NCPUR21	1	Q01UCPU	1
Main base unit (master station)	A35B	1	Q35B	1
Main base unit (remote I/O station)	N/A	-	Q33B	2
MELSECNET/H master station module	N/A	-	QJ71BR11	1
MELSECNET/H remote I/O station module	A0J2R25	2	QJ72BR15	2
I/O module	A0J2-E56DR	2	QX41Y41P	2
Terminating resistor for coaxial bus link (75 Ω)	N/A	-	A6RCON-R75	2

(2) A0J2 upgrade tool

Product name	Model		Remarks
Interface module	SC-A0JQIF56DR	2	
Programmable controller fixing frame set	SC-A0JQSEL-U1	2	
Programmable controller connection cable	SC-A0JQC03M	4	Cable length (0.35 m)

Tip

- The overall distance of coaxial bus is 500 m (when using 5C2V). Use the following product to extend the distance up to 2.5 km.
  "Repeater Unit for the MELSECNET/10 Coaxial Bus System type A6BR10"
- When upgrading an optical loop network system, use the "QJ71LP21-25 for the master station" and the "QJ72LP25-25 for the remote I/O station" so that the optical loop can be maintained.
  The distance between stations differs depending on the type of optical fiber cables used in the existing system. Refer to "Q Corresponding MELSECNET/H Network System Reference (Remote I/O network)" SH-080124 for details.

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2.4.3 Replace MELSECNET/MINI compact type remote I/O modules with CC-Link

Solution and Benefit

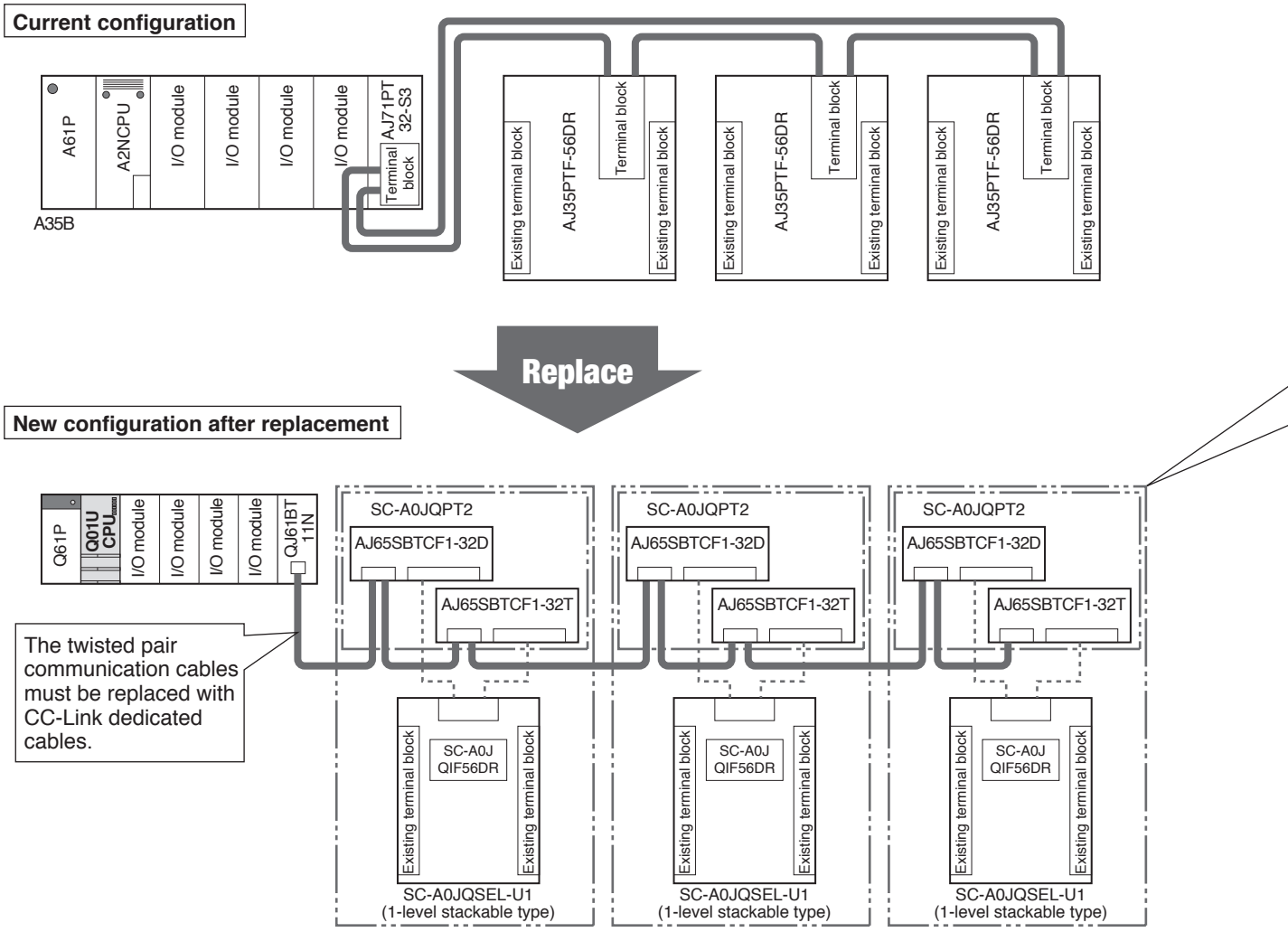
- **By mounting existing terminal blocks on the A0J2 upgrade tool (interface module), the compact type remote I/O modules can be replaced with CC-Link modules without modifying external wiring.**
- **Existing compact type remote I/O modules and A0J2 upgrade tools have the same number of I/O points, realizing the system upgrade without program modification.**
  *** For details on the A0J2 upgrade tool, refer to "Section 2.6 Replace A0J2(H) systems with Q Series using existing wiring".**

The following is an example of replacing MELSECNET/MINI compact type remote I/O modules with CC-Link using the A0J2 upgrade tool.

● Instructions

(1) Select connector type CC-Link I/O modules to allow connection with the A0J2 upgrade tools.
(2) Select a CC-Link I/O module for replacement with a connector type external wiring to enable use of the A0J2 upgrade tool connection dedicated cable.

(1) System configuration example



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● Module selection example

(1) Programmable controller

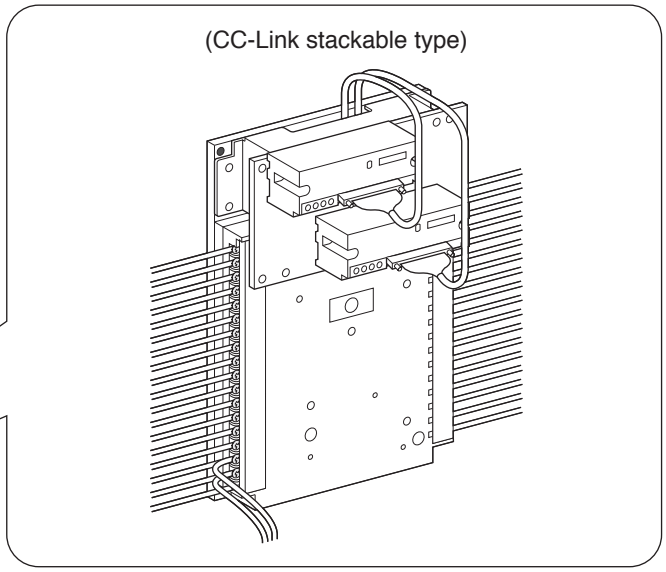
Product name	Existing module		Replacemant module	
Power supply module	A61P	1	Q61P (without 24 V DC)	1
CPU module	A2NCPU	1	Q01UCPU	1
Main base unit	A35B	1	Q35B	1
CC-Link (master module)	AJ71PT32-S3	1	QJ61BT11N	1
CC-Link input module	AJ35PTF-56DR	3	AJ65SBTCF1-32D	3
CC-Link output module			AJ65SBTCF1-32T	3

Note: Select appropriate I/O modules according to specifications of existing modules.

(2) A0J2 upgrade tool

Product name	Model		Remarks
Interface module	SC-A0JQIF56DR	3	
Programmable controller fixing frame set	SC-A0JQSEL-U1	3	For 1-level stackable type
Mounting plate	SC-A0JQPT2	3	For CC-Link I/O modules
Programmable controller connection cable	SC-A0JQC03M	6	Cable length (0.35 m)

(CC-Link stackable type)



Tip

- MELSECNET/MINI twisted pair cables must be replaced with CC-Link dedicated cables.
- CC-Link I/O modules and A0J2 upgrade tools (interface modules) require 24 V DC power supply in addition to power supply for control. Prepare a 24 V DC power supply separately.
- When using the stackable type renewal tool as shown in the example, make sure there is enough depth. (Required depth: 120 mm or more)
  The mounting plate for CC-Link I/O modules is sold separately.
- Also the CPU can be replaced with LCPU.
  When it is replaced with L Series, the CC-Link master module LJ61BT11 or the built-in CC-Link function of the CPU will be used.
  The remote module is common to Q Series and L Series.

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3. Replacement utilizing existing modules

3.1 Replace A/QnA (Large Type) Series with Q Series

3.1.1 Utilize A/QnA (Large Type) Series QA6□B extension base unit

Solution and Benefit

- **The QA6□B extension base unit permits reuse of existing A (Large Type) Series modules, minimizing wiring time.**
- **The system can be upgraded even if Q Series compatible modules do not exist.**

The CPU can be replaced with the QCPU. An example of using a current A (Large Type) module without modification to shorten the re-wiring man-hours is shown below.

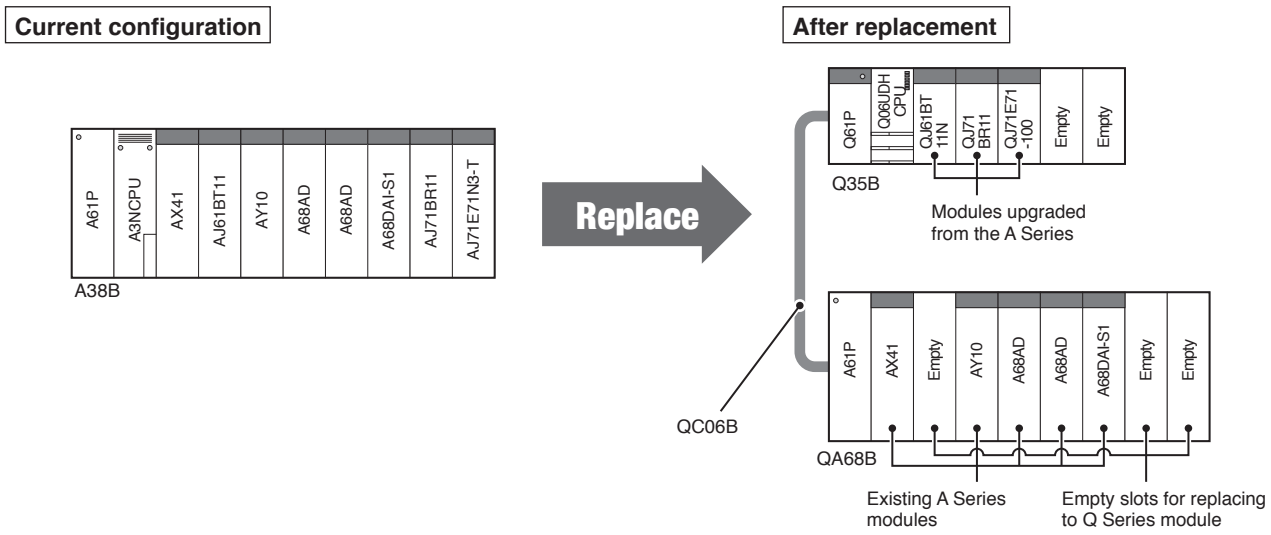
● **Instructions**

(1) Only the CPU is replaced to the Q Series. The current I/O module is used.
Replace the existing A (Large Type) main base A38B to QA68B, and mount the existing module.

(2) If the module must be replaced with the Q Series, select the module and then mount on the Q Series main base unit.

(3) Avoid changing the current I/O assignments.

(1) System configuration example



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(2) Module selection example

Product name	Existing module		Replacement module	
Power supply module (for main base unit)	N/A	-	Q61P	1
CPU module	A3NCPU	1	Q06UDHCPU	1
Main base unit	A38B	1	Q35B	1
CC-Link master module	AJ61BT11	1	QJ61BT11N	1
MELSECNET/10 network module	AJ71BR11	1	QJ71BR11	1
Ethernet module	AJ71E71N3-T	1	QJ71E71-100	1
Extension base unit	N/A	-	QA68B	1
Power supply module (for extension base unit)	A61P	1	Utilize existing module	-
Extension cable	N/A	-	QC06B	1
Input module	AX41	1	Utilize existing module	-
Output module	AY10	1	Utilize existing module	-
Analog input module	A68AD	2	Utilize existing module	-
Analog output module	A68DAI-S1	1	Utilize existing module	-

Tip

- The following A (Large Type) modules cannot be used with QCPU.
  These modules must be replaced with those compatible with QCPU.
  - CC-Link master/local module
  - MELSECNET/10 network module
  - Ethernet module
  - Computer link module etc.
- After replacing the module, use the parameter I/O assignment and set so that the existing module addresses are not changed.
- The QA6□B extension base units and QA1S6□B extension base units are only compatible with High Performance Model QCPU or Universal Model QCPU (first five digits of serial No. "13102" or higher). Basic Model QCPUs, Process CPUs, Redundant CPUs, Safety CPUs, and Remote I/O Stations are not compatible.
- For precautions and restrictions when using QA6□B extension base unit, refer to "QA65B/QA68B Extension Base Unit User's Manual".

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3.1.2 Utilize existing I/O modules and extension base unit with Q Series CPU (Use QA conversion adapter)

Solution and Benefit

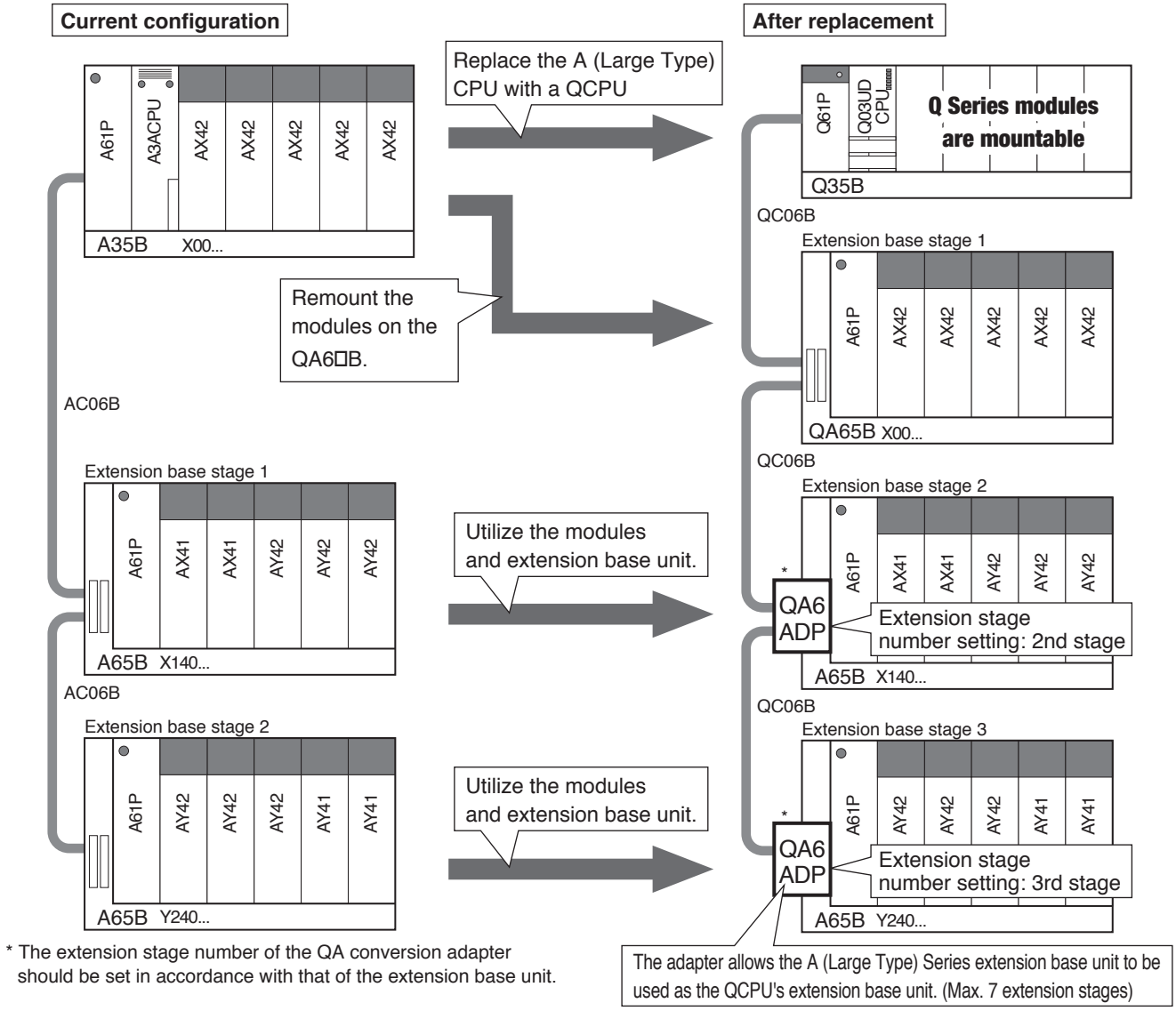
The QA conversion adapter module enables the existing extension base, including the mounted I/O modules, to connect to a Q Series main base unit. This can shorten the installation and wiring modification times.

The following is an example of reusing existing A (Large Type) Series modules with a Q Series CPU using the QA conversion adapter module.

● Instructions

(1) Replace the A (Large Type) Series CPU with the Q Series CPU (Q03UDCPU) and mount it on the Q Series main base unit (Q3□B).
(2) To reutilize I/O modules mounted on the existing A (Large Type) Series main base unit, mount them on the QA6□B extension base unit.
(3) Mount the “QA6ADP” adapter on the connector of each existing extension base unit to allow the use of existing modules.
(4) Connect the base units with the Q Series extension cable (QC□B).

(1) System configuration example



* The extension stage number of the QA conversion adapter should be set in accordance with that of the extension base unit.

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● Module selection example

Product name	Existing module		Replacement module	
Power supply module (Q Series new)	N/A	-	Q61P	1
Power supply module (for extension base unit)	A61P (main/extension base unit)	3	Utilize existing module	-
CPU module	A3ACPU	1	Q03UDCPU*1	1
Main base unit	A35B	1	Q35B*2	1
Extension base unit (1st stage)	N/A	-	QA65B*3	1
Extension base unit	A65B	2	Utilize existing module	-
QA conversion adapter module	N/A	-	QA6ADP	2
Extension cable	N/A	-	QC06B*4	3
Input module	Use existing module in original state			
Output module	Use existing module in original state			

*1: Select the module depending on the existing program capacity and contents.
*2: Used to mount the Q Series CPU.
*3: Used to mount modules on the existing main base unit.
*4: Select the cable length according to the arrangement of base units.

Tip

- The existing A (Large type) Series extension base unit and mounted modules can be utilized without wiring modification.
  The existing A (Large Type) Series extension base unit can be used without modifying the wiring by replacing with the extension base QA6□B, and remounting the mounted modules.
- Program modifications can be minimized by using the same I/O address for the existing units and setting the current I/O addresses with the parameter I/O assignments.
- The following A (Large Type) Series module cannot be used with the Q Series CPU. These must be changed to a Q Series CPU compatible module.
  ▶ CC-Link master/local module
  ▶ MELSECNET/10 network module
  ▶ Ethernet module
  ▶ Ethernet module, computer link module
  etc.
- The A (Large Type) Series A6□B/A5□B extension base unit with the QA6ADP cannot be used together with the QA1S6□B extension base unit.
- When an AC input module is mounted 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.
- Set the stage number for QA6ADP according to the setting of the extension base unit.
- The QA6ADP QA conversion adapter is only compatible with High Performance Model QCPU or Universal Model QCPU (first five digits of serial No. "13102" or higher).
  Basic Model QCPUs, Process CPUs, Redundant CPUs, Safety CPUs, and Remote I/O Stations are not compatible.
- For the precautions and restrictions when using QA conversion adapter, refer to "QA6ADP QA Conversion Adapter Module User's Manual".

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3.2 Replace AnS/QnAS (Small Type) Series with Q Series

3.2.1 Utilize AnS/QnAS (Small Type) Series QA1S6□B extension base unit

Solution and Benefit

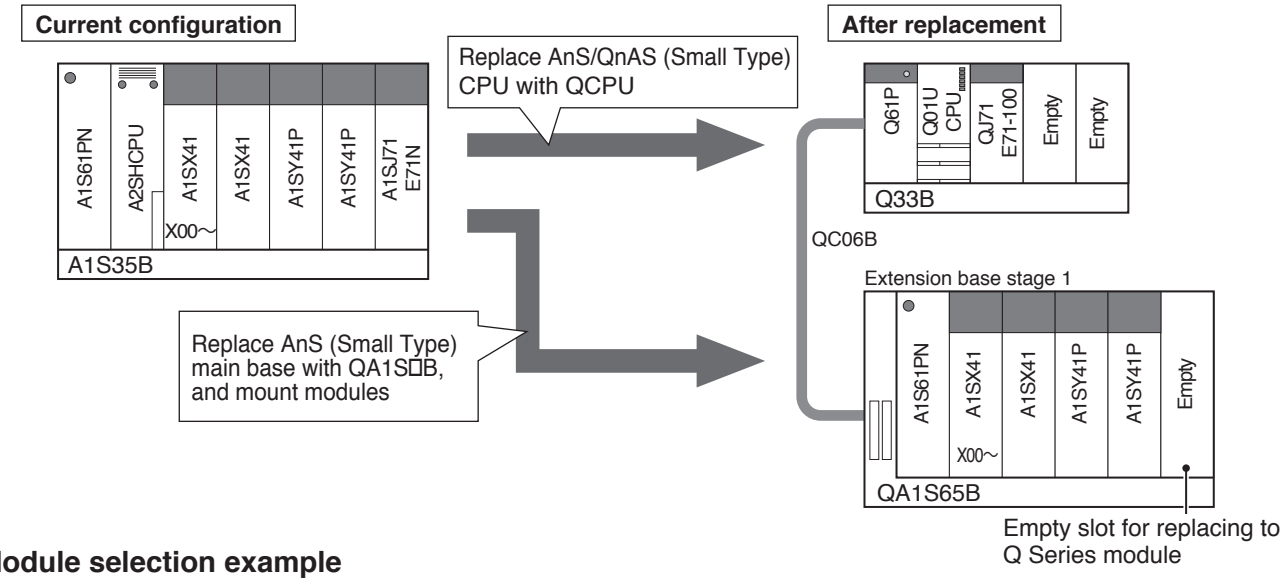
•By using the current AnS/QnAS (Small Type) module, the wiring work during replacement can be reduced. Replacements can be completed in a short time.
•Replacement is possible even if a compatible Q Series module is not available.
•If an extension base unit is connected to the current AnS/QnAS (Small Type) series, it can be used together with the A/QnA (Large Type) QA6□B extension base unit.

The CPU can be replaced with the QCPU. An example of using a current A (Small Type) module without modification to shorten the re-wiring man-hours is shown below.

● **Instructions**

(1) Only the CPU is replaced to the Q Series. The current I/O module is used.
Replace the existing AnS/QnAS (Small Type) main base A1S35B to QA1S65B, and mount the existing module.
(2) If the module must be replaced with the Q Series, select the module and then mount on the Q Series main base unit.
(3) Avoid changing the current I/O assignments.

(1) System configuration example (1)



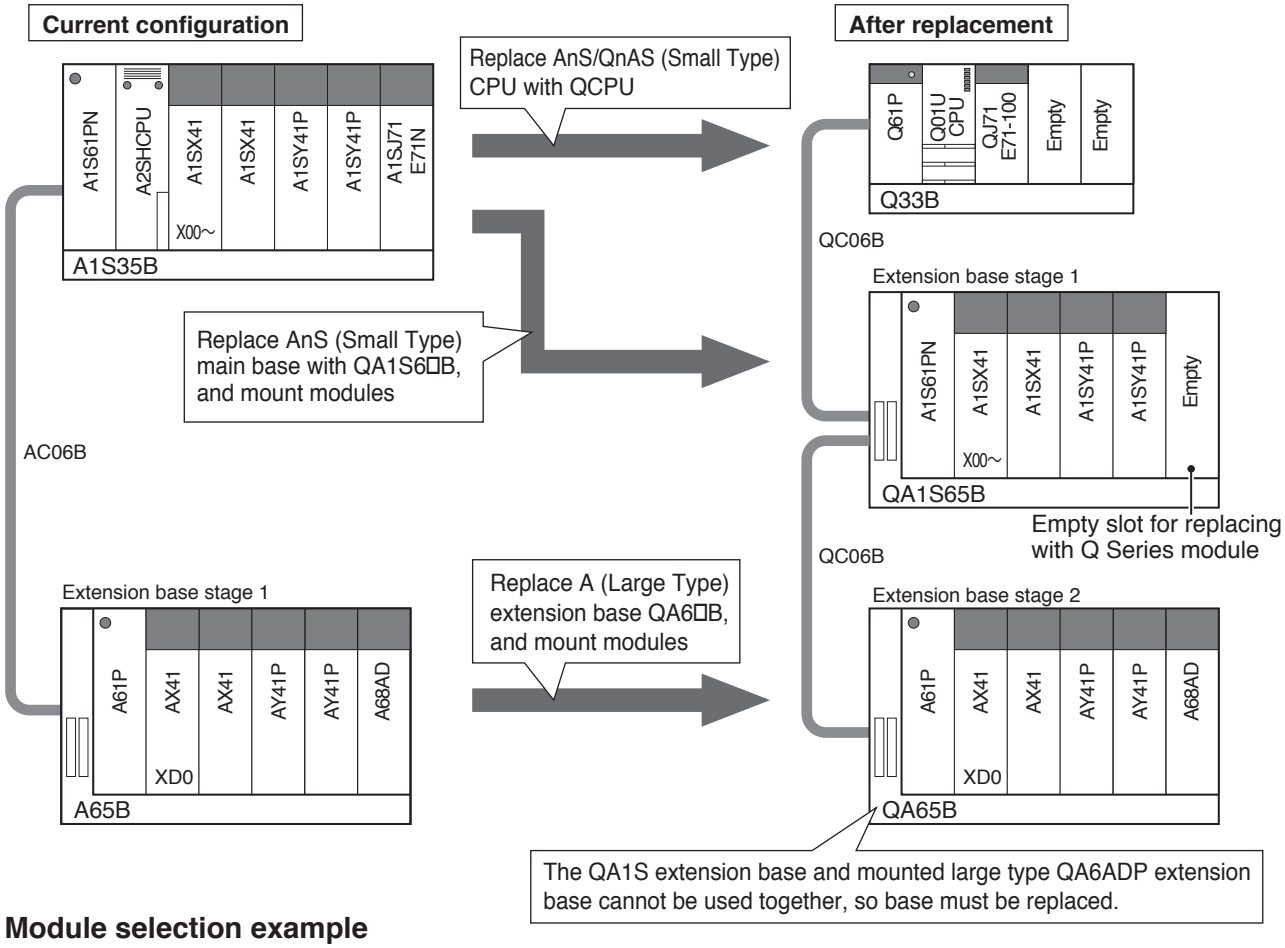
● **Module selection example**

Product name	Existing module		Replacement module	
Power supply module (new)	N/A	—	Q61P	1
Power supply module (for extension base)	A1S61PN	1	Utilize existing module	—
CPU module	A2SHCPU	1	Q01UCPU	1
Main base unit	A1S35B	1	Q33B*1	1
Extension base unit	N/A	—	QA1S65B*2	1
Connection cable	N/A	—	QC06B*3	1
Input module	Use existing module in original state			
Output module	Use existing module in original state			
Ethernet interface module	A1SJ71E71N-T	1	QJ71E71-100*4	1

*1: Used to mount the Q Series CPU.
*2: Used to mount modules on existing main base unit.
*3: Select the cable length according to the arrangement of base units.
*4: Must be replaced with Q Series module.

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(1) System configuration example (2)



● Module selection example

Product name	Existing module		Replacement module	
Power supply module (new)	N/A	—	Q61P	1
Power supply module (for extension base 1st stage)	A1S61PN	1	Utilize existing module	—
CPU module	A2SHCPU	1	Q01UCPU	1
Main base unit	A1S35B	1	Q33B*1	1
Extension base unit (1st stage)	N/A	—	QA1S65B*2	1
Connection cable	N/A	—	QC06B*3	1
AnS (Small Type) input module	Use existing module in original state			
AnS (Small Type) output module	Use existing module in original state			
Ethernet interface module	A1SJ71E71N-T	1	QJ71E71-100*4	1
Power supply module (for extension base 2nd stage)	A61P	1	Utilize existing module	—
Extension base unit (2nd stage)	A65B	1	QA65B*5	1
Connection cable	AC06B	1	QC06B*3	1
A (Large Type) input module	Use existing module in original state			
A (Large Type) output module	Use existing module in original state			
A (Large Type) analog I/O module	Use existing module in original state			

*1: Used to mount the Q Series CPU.
*2: Used to mount modules on existing main base unit.
*3: Select the cable length according to the arrangement of base units.
*4: Must be replaced to Q Series module.
*5: For re-mounting existing A large type extension base unit

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Tip

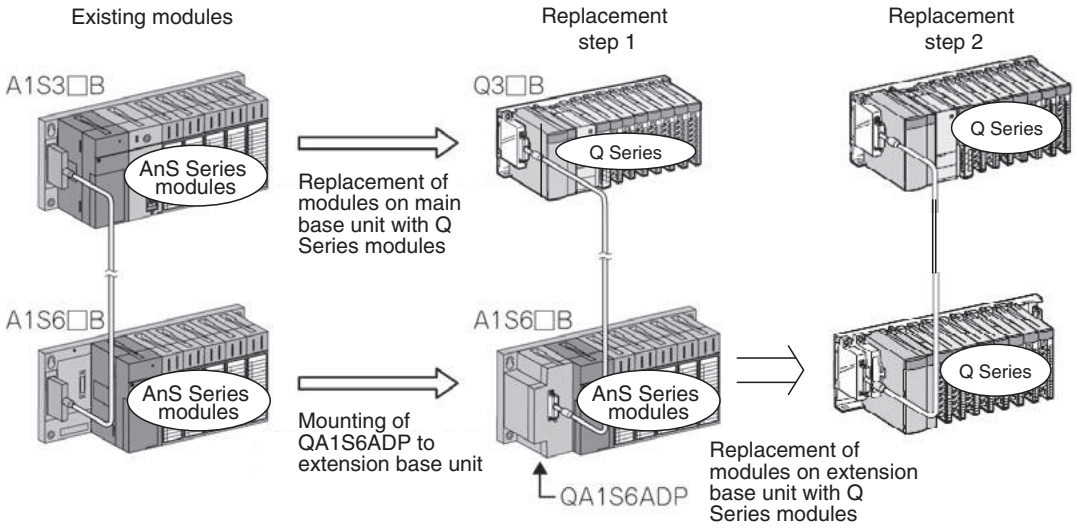
- The existing AnS/QnAS (Small Type) main base unit can be used without modifying the wiring by replacing with the extension base QA1S6□B and remounting the mounted modules.
  The existing A (Large Type) extension base unit can be used without modifying the wiring by replacing with the extension base QA6□B, and remounting the mounted modules.
- The QA1S6□B extension base unit cannot be used together with the A (Large Type) extension base A6□B/A5□B) onto which QA6ADP is mounted.
  When using a module mounted on the existing A (Large Type) extension base unit, replace the base unit with the QA6□B extension base.
- Connect the base units in the following order.
  ▶Q Series main base unit –> Q Series extension base unit –> QA1S6□B extension base –> QA6□B extension base
  The GOT bus cannot be connected when the QA6□B extension base is connected.
  The GOT bus can be connected when only the QA1S6□B extension bus is connected.
- Program modifications can be minimized by using the same I/O address for the existing units and setting the current I/O addresses with the parameter I/O assignments.
- The following A/QnA (Large Type) module and AnS/QnAS (Small Type) module cannot be used with the Q Series CPU.
  These must be changed to a Q Series CPU compatible module.
  ▶CC-Link master/local module
  ▶MELSECNET/10 network module
  ▶Ethernet module, computer link module, etc.
- The QA1S6□B extension base and QA6□B extension base are only compatible with High Performance Model QCPU or Universal Model QCPU (first five digits of serial No. "13102" or higher).
  Basic Model QCPUs, Process CPUs, Redundant CPUs, Safety CPUs, and Remote I/O Stations are not compatible.

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3.2.2 Replace main base unit with Q Series and use existing extension base unit and modules in it (use QA1S conversion adapter)

Solution and Benefit

It is possible to replace the modules including the CPU on the main base unit with Q Series modules and use the existing input/output modules and extension base unit.
This can reduce the working hours for drilling and wiring modification.



List of Q-AnS base unit conversion adapters

Product name	Model
Q-AnS base unit conversion adapter	QA1S6ADP

Tip

1. The extension base unit equipped with QA1S6ADP must be installed in the first extension stage.
   Since QA1S6ADP does not have an extension cable connector (OUT), it cannot be connected to the base unit in the second extension stage or higher.
   Therefore, when QA1S6ADP is used, the system consists of 2 base units, Q Series main base unit and AnS extension base unit equipped with QA1S6ADP.
   To replace only the CPU with Q Series, it is required to use the QA1S extension base unit. Refer to Item 3.2.1.
2. When the existing A/AnS Series modules are used, the program can be used without changing the existing I/O addresses through I/O assignment by parameters.
   For the detailed procedures for setting the I/O addresses through I/O assignment, refer to Section 3.3.
3. The AnS extension base unit equipped with QA1S6ADP can be used with a high performance model QCPU or universal model QCPU (the first 5 digits of the serial number must be "13102" or later).
   The modules which can be installed in the AnS extension base unit equipped with QA1S6ADP are the same as those installed in the QA1S extension base unit. For details, refer to "Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Fundamentals)."

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3.3 Utilize existing A (Large Type) and AnS (Small Type) modules without changing I/O addresses

Solution and Benefit

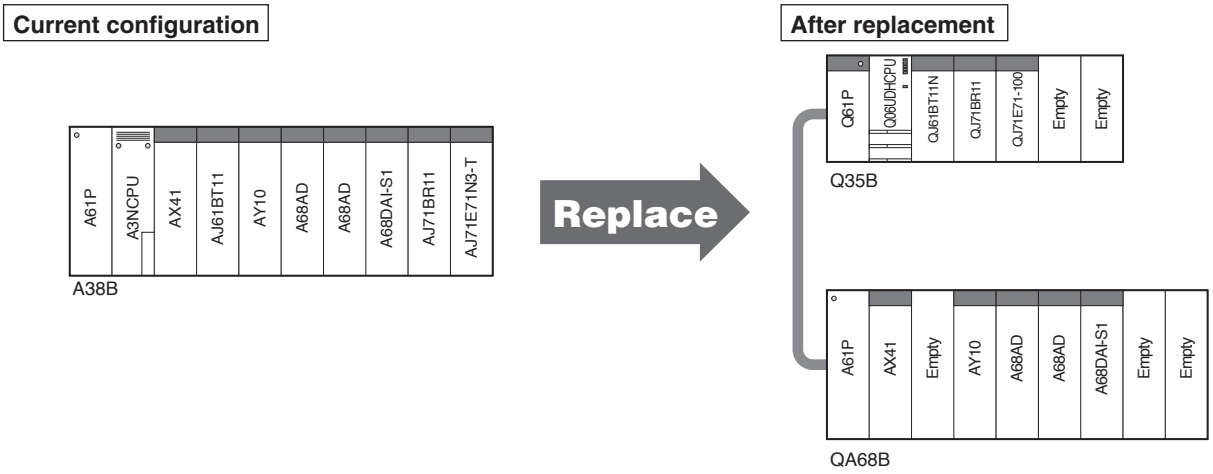
- **The I/O addresses do not need to be changed when reutilizing existing A (Large Type) and AnS (Small Type) modules with Q Series CPU and mounting the modules on QA6□B/A6□B＋QA6ADP or QA1S6□B. This can greatly reduce program modification time.**
- **The A (Large Type) and AnS (Small Type) modules can be used with the same I/O addresses, so there is no need to change the external wiring numbers.**

The following is an example of how to reuse the program without modifying the I/O addresses when replacing the CPU with a Q Series CPU and keeping the existing I/O modules on a QA extension base unit.

(1) I/O assignment example

When utilizing existing A (Large Type) and AnS (Small Type) modules with the Q Series CPU, set the existing modules' I/O addresses to the existing addresses with the PC parameter I/O assignment settings. Assign the addresses for the modules mounted onto the main base unit after the existing module. This will greatly reduce program modification time.

● System configuration example (same as in 3.1.1)



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● Parameter setting example

		Model	Type	Point	Address
Main base unit (Q38B)	0	QJ61BT11N	Intelli	32	100
	1	QJ71BR11	Intelli	32	120
	2	QJ71E71-100	Intelli	32	140
	3	N/A	Empty	16	160
	4	N/A	Empty	16	170

		Model	Type	Point	Address
Extesion base unit (QA68B)	5	AX41	Input	32	00
	6	N/A	Empty	32	20
	7	AY10	Output	16	40
	8	A68AD	Intelli	32	50
	9	A68AD	Intelli	32	70
	10	A68DAI-S1	Intelli	32	90
	11	N/A	Empty	32	B0
	12	N/A	Empty	32	D0

Tip

- 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), the CPU does not start up due to an error.

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4. Replacement of MELSECNET Network System

4.1 Replace MELSECNET(II) with MELSECNET/10

4.1.1 Replace MELSECNET(II) coaxial loop with MELSECNET/10 coaxial bus system while retaining existing A Series CPUs

Solution and Benefit

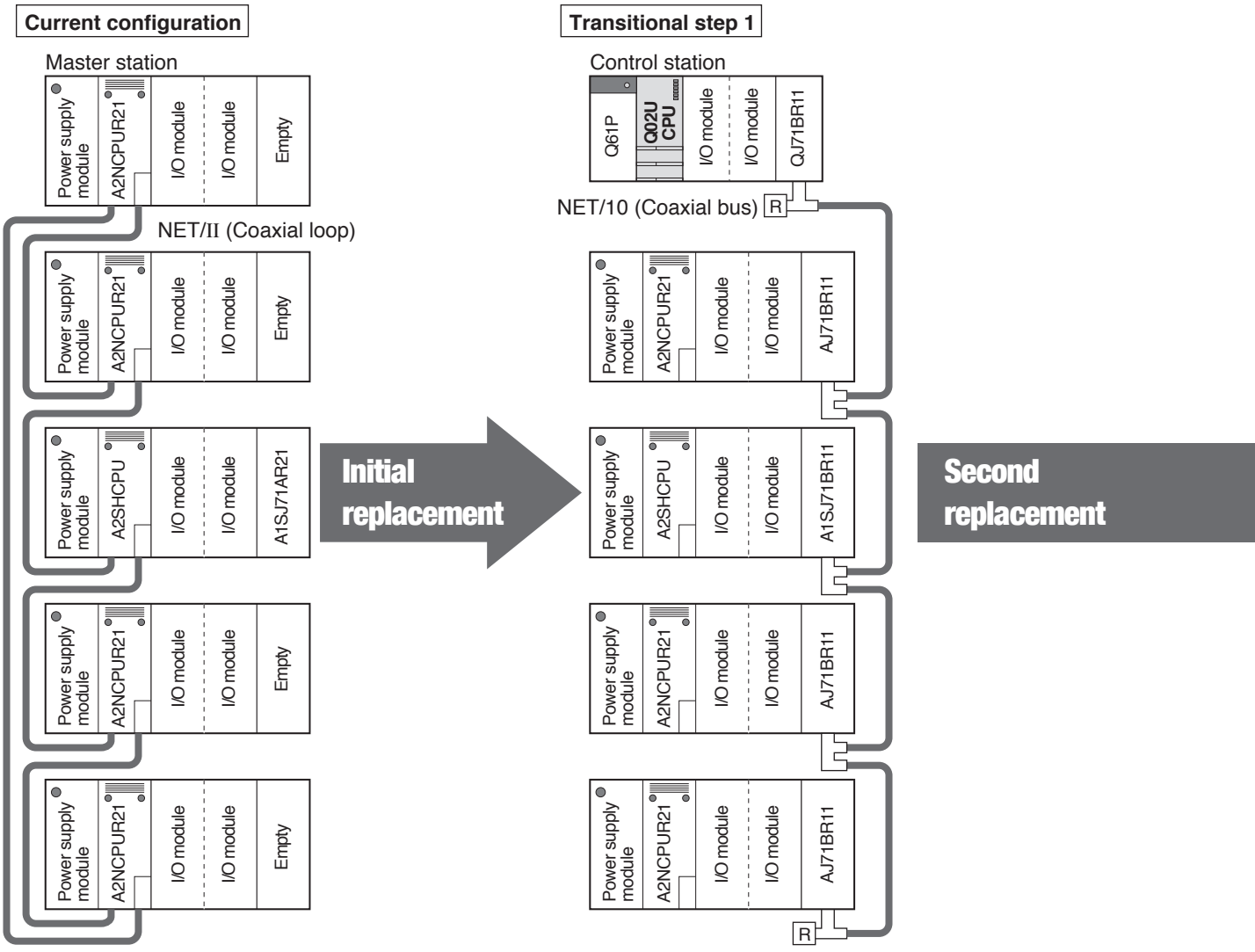
- **When an existing MELSECNET(II) system consists of many stations, the complete network system can be upgraded to MELSECNET/10 while reusing existing cable installations.**
- **By upgrading the entire network at once, the current network parameter settings can be used.**
- **Once the network is updated, A Series stations can be replaced with the Q Series in any order until all the stations are upgraded to the Q Series.**

The following is an example of replacing a MELSECNET(II) coaxial loop system's master station with a Q Series system and upgrading the network to a MELSECNET/10 coaxial bus system.

● **Instructions**

(1) Replace one of the MELSECNET(II) stations with the Q Series.
(2) Replace the complete MELSECNET(II) system with MELSECNET/10 coaxial bus system.
(3) Replace the CPU of each station with Q Series CPU sequentially, and eventually replace all CPUs with Q Series CPUs.
(4) Use the existing settings for the network parameters.

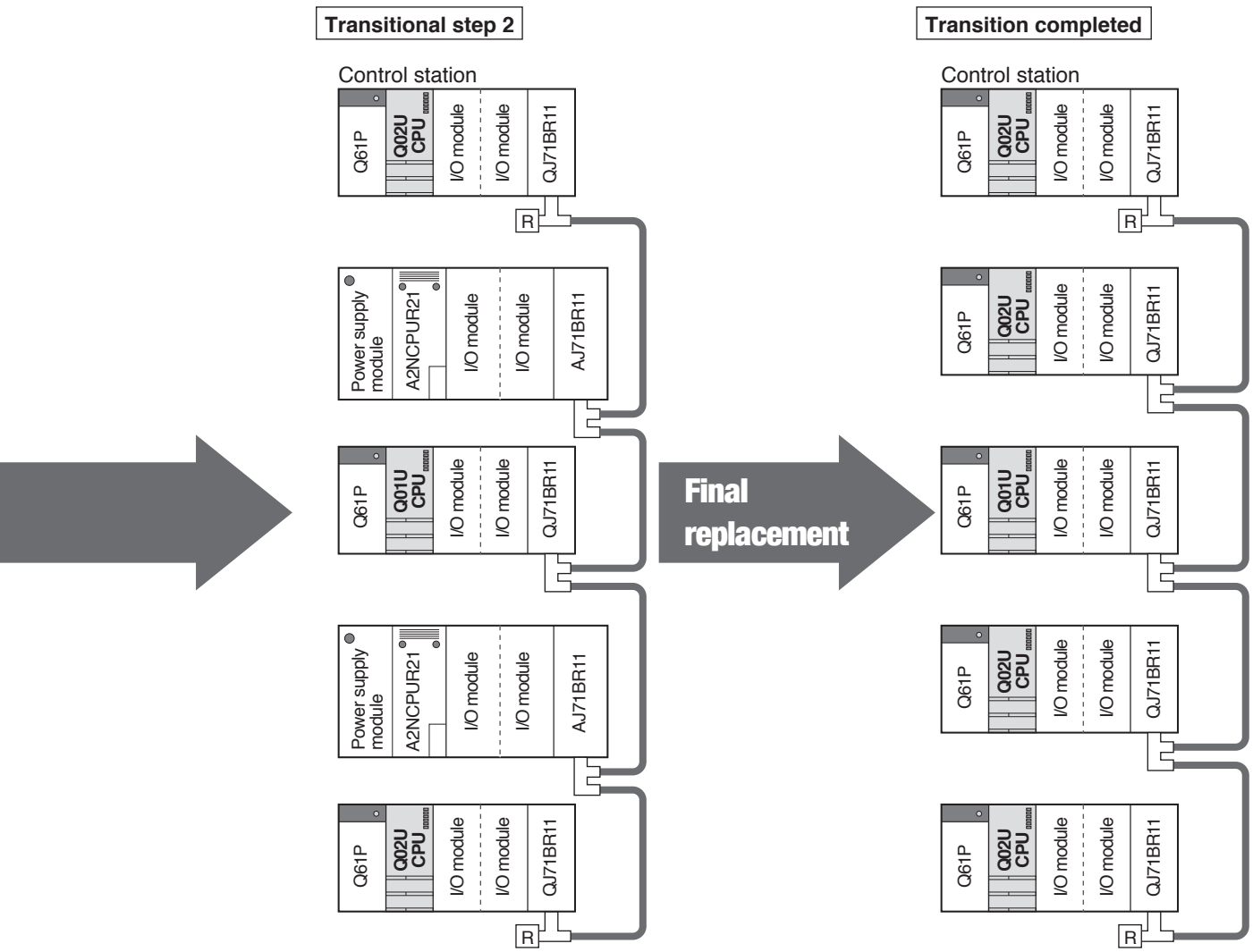
(1) System configuration example



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Tip

Unless the existing network is in MELSECNET mode or MELSECNET II mode and only the first half is set, the network parameter settings need to be changed.
If the second half of settings have been made in the MELSECNET II mode or MELSECNET II composite mode, the B and W station send range must be reset, and the station's inherent parameters must be set, etc.
Furthermore, when AnNCPUs, AnACPUs or AnSCPUs are part of the system, the program should be modified because station inherent parameters cannot be set.
For precautions regarding the existing MELSECNET(II) system configuration, refer to "Transition from MELSEC-A/QnA (Large Type), AnS/QnAS (Small Type) Series to Q Series Handbook (Network Modules)".



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4.1.2 Upgrade to MELSECNET/H network system utilizing existing MELSECNET/B twisted pair cable

Solution and Benefit

When replacing A (Large Type) Series CPU with Q Series CPU in a MELSECNET/B data link system, the network can be effortlessly updated to twisted bus type MELSECNET/H (PLC to PLC network) because the existing MELSECNET/B twisted pair cable can be directly utilized. (New cable installation is not required.)

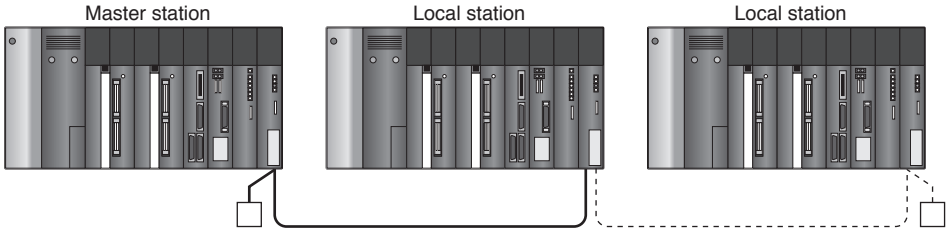
The following is an example of replacing MELSECNET/B with twisted bus type MELSECNET/H (PLC to PLC network) utilizing the existing twisted pair cable.

● Instructions

(1) Replace all A Series CPUs found in the existing MELSECNET/B system with Q Series CPUs.
(2) Utilize the existing MELSECNET/B twisted pair cable.
(3) Modify the terminals of the network modules because the cable connection method has been changed from screw terminal block type to spring clamp terminal block type.

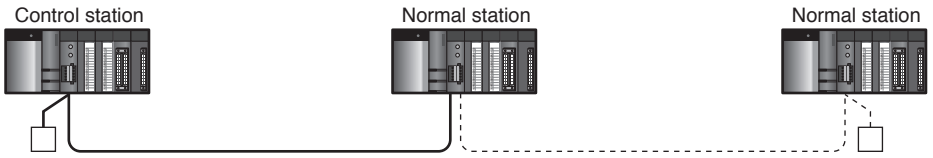
(1) System configuration example

Current configuration Existing MELSECNET/B (ACPU+AJ71AT21B)



Replace Upgrade to Q Series modules

After replacement MELSECNET/H (PLC to PLC network)(QCPU+QJ71NT11B)



* The existing MELSECNET/B twisted pair cable and terminating resistor ar e utilized.
(Terminal modification is required.)

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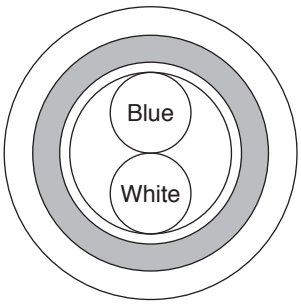
(2) Specifications of MELSECNET/H (PLC to PLC network)

The following table shows the specifications of twisted bus type MELSECNET/H (PLC to PLC network).

<table>
<tr><th colspan="2" rowspan="2">Item</th><th>MELSECNET/H(PLC to PLC network)Twisted bus type</th></tr>
<tr><th>QJ71NT11B</th></tr>
<tr><td rowspan="3">Maximum number of link points per network</td><td>LX/LY</td><td>8192 points</td></tr>
<tr><td>LB</td><td>16384 points</td></tr>
<tr><td>LW</td><td>16384 points</td></tr>
<tr><td colspan="2">Maximum number of link points per station</td><td>•MELSECNET/H mode {(LY + LB) / 8 + (2 × LW)} ≤ 2000 bytes
•MELSECNET/H Extended mode {(LY + LB) / 8 + (2 × LW)} ≤ 35840 bytes</td></tr>
<tr><td colspan="2">Communication speed</td><td>156 kbps/312 kbps/625 kbps/1.25 Mbps/2.5 Mbps/5 Mbps/10 Mbps
(Switched by network parameters)</td></tr>
<tr><td colspan="2">Number of stations per network</td><td>Up to 32 stations (1 control station, 31 normal stations)</td></tr>
<tr><td colspan="2">Connection cable</td><td>Twisted pair cable or CC-Link Ver.1.10-compatible cable</td></tr>
<tr><td colspan="2">Overall distance for one network</td><td>
<table>
<tr><th>Communication speed</th><th>Twisted pair cable</th><th>CC-Link Ver.1.10-compatible cable</th></tr>
<tr><td>156 kbps</td><td>1200 m</td><td>1200 m</td></tr>
<tr><td>312 kbps</td><td>600 m</td><td>900 m</td></tr>
<tr><td>625 kbps</td><td>400 m</td><td>600 m</td></tr>
<tr><td>1.25 Mbps</td><td>200 m</td><td>400 m</td></tr>
<tr><td>2.5 Mbps</td><td rowspan="3">-
(Not applicable)</td><td>200 m</td></tr>
<tr><td>5 Mbps</td><td>150 m</td></tr>
<tr><td>10 Mbps</td><td>100 m</td></tr>
</table>
</td></tr>
</table>

(3) Usable twisted pair cable for twisted bus type (Same specifications as those of MELSECNET/B)

The following table shows the specifications of twisted pair cable that can be used for twisted bus type MELSECNET/H (PLC to PLC network)*.

Item	KNPEV-SB 0.5SQ x 1P (Applicable only when the communication speed is 1.25 Mbps or less.)
Cross section	
Cable	Shielded twisted pair cable
Core	2-core
Conductor resistance (20˚C)	39.4 Ω/km or less
Insulation resistance (20˚C)	10 MΩ/km or more
Dielectric withstand voltage V-min	1000 V AC 1 minute
Capacitance (1 kHz)	70 nF/km or less on average
Characteristic impedance (100 kHz)	110 ± 10 Ω

* The cable terminal (the part where it connects to the module) is a bar solderless terminal. When utilizing MELSECNET/B twisted pair cable, solderless terminals need to be changed to bar solderless terminals. For details on the bar solderless terminal and tools dedicated to it, refer to "Q corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)": SH-080049.

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Tip

- MELSECNET/H (twisted bus type) is compatible with Q Series CPUs only.
  All A Series CPUs connected to the existing MELSECNET/B need to be upgraded to Q Series CPUs at once.
- MELSECNET/H (twisted bus type) is compatible with PLC to PLC network only. It is not compatible with remote I/O network.
  To replace MELSECNET/B with MELSECNET/H (remote I/O network), use optical loop system or coaxial bus system.
  Or, replace MELSECNET/B with MELSECNET/H (PLC to PLC network) and remote I/O stations with normal stations. (Refer to Section 4.3)
- For details on Q Series CPU type to which MELSECNET/H network module (twisted bus type: QJ71NT11B) can be mounted, number of mountable modules per CPU, and network parameter settings, refer to the following manual.
  "Q corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network)" : SH-080049
- MELSECNET/H (twisted bus type) can use CC-Link cables. The maximum communication speed of the network is 10 Mbps.

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4.2 Replace one of A Series stations with Q Series while retaining MELSECNET(II)

4.2.1 Replace A Series local station with Q Series

Solution and Benefit

(1) Using a local station data link module, the Q Series can directly connect to existing MELSECNET(II) network as a local station. When replacing A(Large type/Small type)Series CPU with Q Series CPU, existing wiring can be utilized, and network parameter modification is not required.

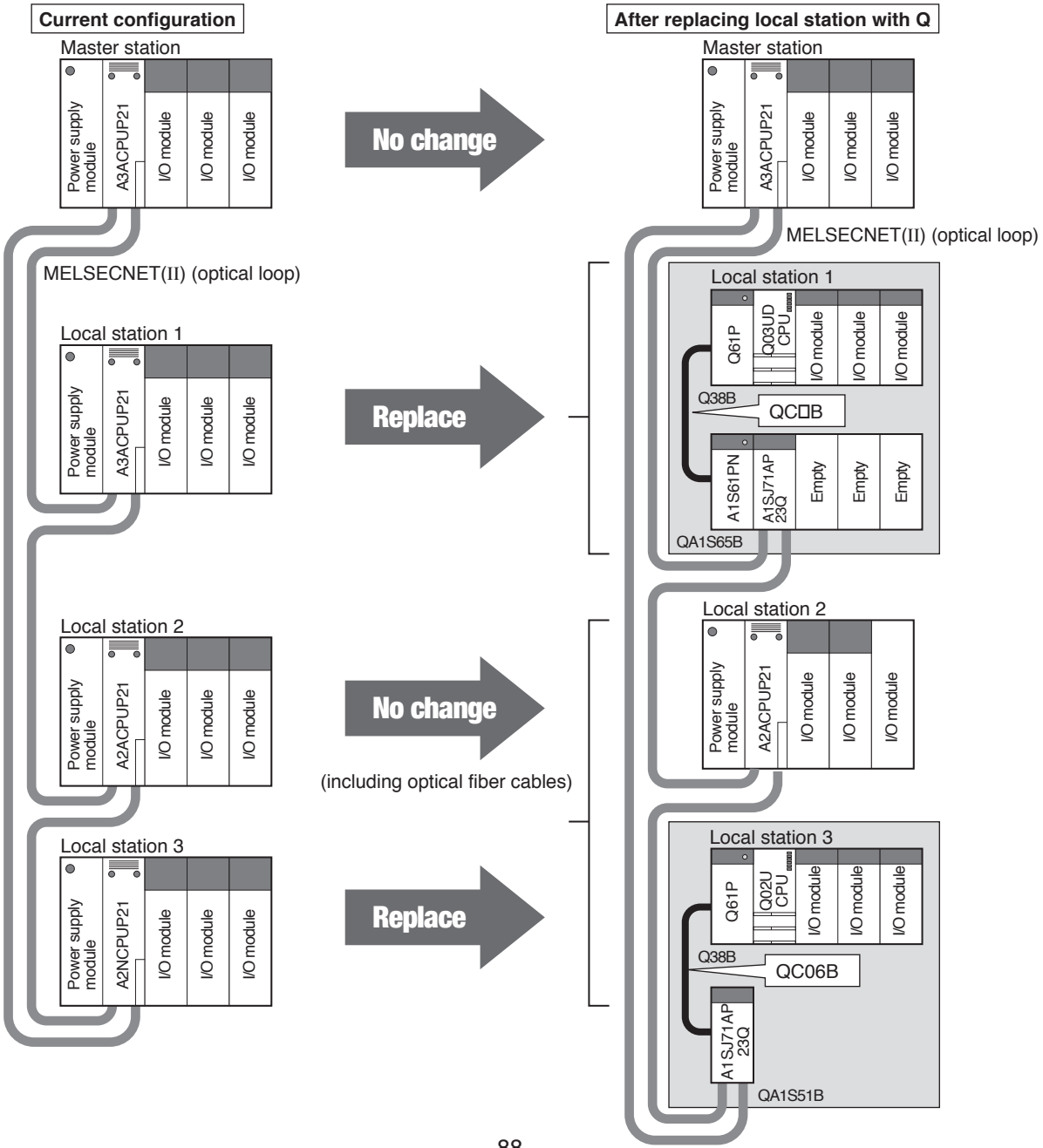
(2) MELSECNET(II) local station data link modules for optical fiber loop, coaxial loop, and MELSECNET/B are provided to support all types of existing networks.

The following is an example of replacing one of A Series local stations with the Q Series.

● **Instructions**

Replace the CPU and other modules on one of the A Series local stations with the Q Series, and mount the MELSECNET(II) or MELSECNET/B local station data link module on the QA1S6□B extension base unit.

(1) System configuration example



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● Module selection example

(Local station 1)

Product name	Existing module		Replacement module	
Power supply module	A61P	1	Q61P	1
CPU module	A3ACPUP21	1	Q03UDCPU	1
Main base unit	A38B	1	Q38B	1
Input module	AX□	—	QX□	—
Output module	AY□	—	QY□	—
MELSECNET(II) local station data link module	Embedded in CPU module	1	A1SJ71AP23Q	1
Extension base (for A1S Series module)	N/A	—	QA1S65B	1
Extension Power supply module (for A1S Series module)	N/A	—	A1S61PN	1
Extension cable	N/A	—	QC06B	1

(Local station 3)

Product name	Existing module		Replacement module	
Power supply module	A61P	1	Q61P	1
CPU module	A2NCPU21	1	Q02UCPU	1
Main base unit	A38B	1	Q38B	1
Input module	AX□□	—	QX□□	—
Output module	AY□□	—	QY□□	—
MELSECNET(II) local station data link module	Embedded in CPU module	—	A1SJ71AP23Q	1
Extension base (for A1S Series module)	N/A	—	QA1S51B*1*2	1
Extension cable	N/A	—	QC06B	1

*1: QA1S51B is an extension base that does not require a power supply, so if the extension cable is long, a voltage drop could prevent the specified voltage from being supplied. Always calculate the voltage drop.

*2: QA1S51B only has an IN type extension connector, so it will be the extension final stage. QA6□B (Large Type) extension base cannot be connected below QA1S51B.

● Local station data link module options

Model	Outline
A1SJ71AP23Q	MELSECNET(II) local station data link module for SI optical fiber cable
A1SJ71AR23Q	MELSECNET(II) local station data link module for coaxial cable
A1SJ71AT23BQ	MELSECNET/B local station data link module for shielded twisted pair cable

Tip

1. Except for the local station replaced with the Q Series, modification to the system configuration and programs are not required.
2. Minimal setup is required, as network parameter settings (excluding link refresh setting) are automatically detected by the local station data link module. FROM/TO instructions within sequence program (refresh program) are required to enable send/receive cyclic data.
   A sample program to enable send/receive of cyclic data can be created by "A/QnA -> Q conversion support tool" (which can be downloaded from the MELFANSweb). (Refer to Section 9.2)
3. If slots are left empty in the replacement Q Series CPU after connecting the A (Large Type) extension base onto which the QA6□B extension base unit or QA conversion adapter QA6ADP is connected, the MELSECNET(II), /B local station data link module can be connected using the A-A1S conversion adapter. QA1S6□B or QA1S51B do not need to be additionally selected in this case.

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4.2.2 Replace A Series master station with Q Series

The following is an example of replacing the A Series master station with Q Series.

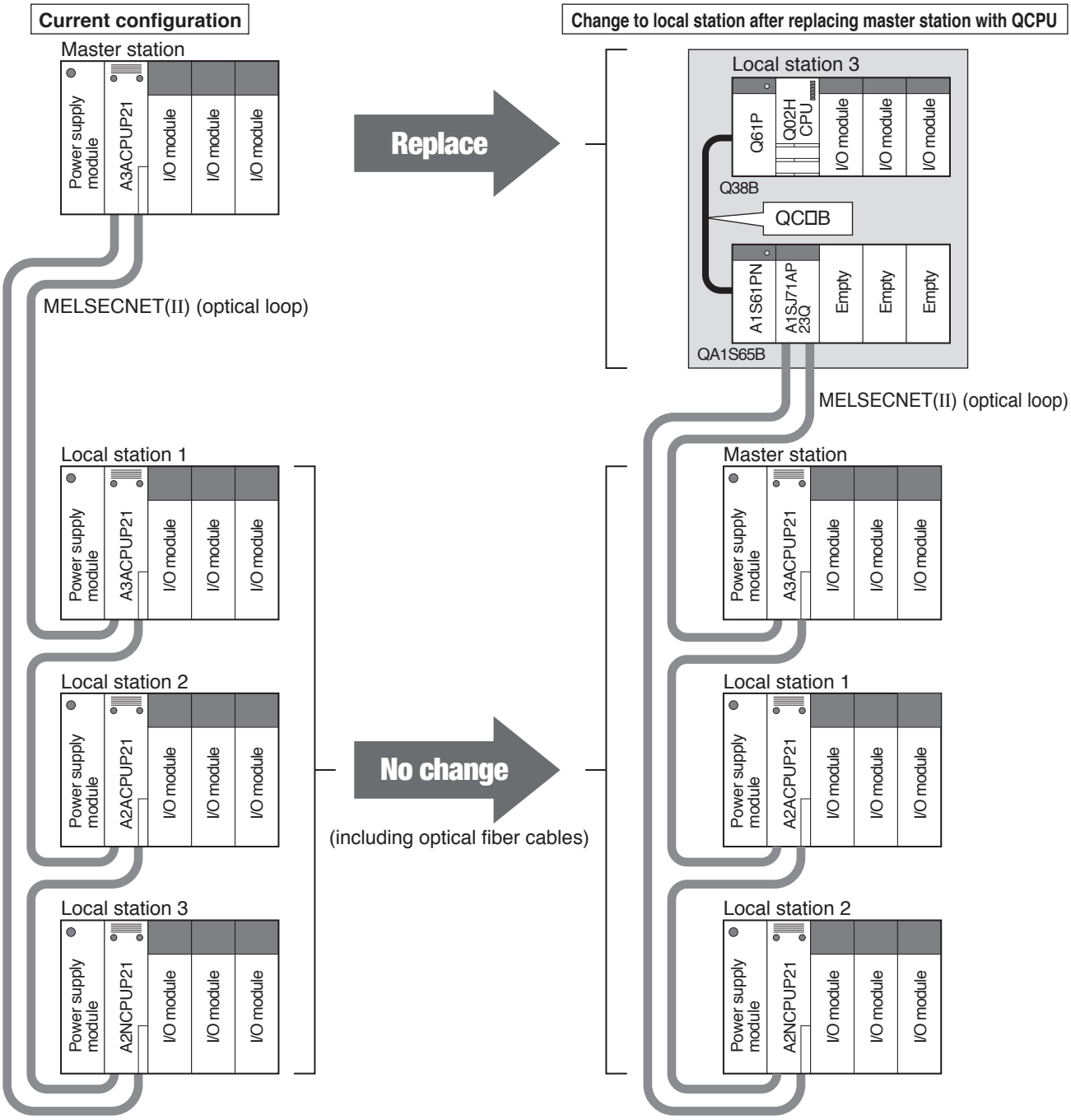
● **Instructions**

(1) Replace the CPU and other modules on the master station with Q Series while maintaining the existing network.

(2) Since a Q Series station cannot be the master station, set Local station 1 as the master station, set the link parameters, and change the station number of the rest of the local stations.

(3) Utilize the existing optical fiber cables.

(1) System configuration example



Note: In MELSECNET(II) mode and MELSECNET(II) composite mode, only AnA, AnU, or QnA CPU can be used for the master station.

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● Module selection example

Product name	Existing model		Replacement model	
Power supply module	A61P	1	Q61P	1
CPU module	A3ACPUP21	1	Q02HCPU	1
Main base unit	A38B	1	Q38B	1
Input module	AX□	—	QX□	—
Output module	AY□	—	QY□	—
MELSECNET(II) local station data link module	Embedded in CPU module	1	A1SJ71AP23Q	1
Extension base (for A1S Series module)	N/A	—	QA1S65B	1
Extension Power supply module (for A1S Series module)	N/A	—	A1S61PN	1
Extension cable	N/A	—	QC06B	1

● Link parameter settings (MELSECNET(II) composite mode)

Station No.	Send range (first half)			Send range (second half)		
	Points	Start	End	Points	Start	End
M	256	000	0FF	256	500	5FF
IIL1	256	100	1FF	256	600	6FF
IIL2	256	200	2FF	256	700	7FF
L3	256	300	3FF	-	-	-

Replace

Station No.	Send range (first half)			Send range (second half)		
Current → New	Points	Start	End	Points	Start	End
IIL1 -> M	256	100	1FF	256	600	6FF
IIL2 -> IIL1	256	200	2FF	256	700	7FF
L3 -> L2	256	300	3FF	-	-	-
M -> IIL3	256	000	0FF	256	500	5FF

Tip

1. The data link module was designed for local stations and cannot be set as master station. For this reason, a local station that is upgraded to Q Series cannot become the master station. Instead, one of the existing A Series local stations should be set as the master station. The station numbers should be changed accordingly, but the I/O address and parameters can remain the same.
2. Minimal setup is required, as network parameter settings (excluding link refresh setting) are automatically detected by the local station data link module. FROM/TO instructions within sequence program (refresh program) are required to enable send/receive cyclic data.
   A sample program to enable send/receive of cyclic data can be created by "A/QnA -> Q conversion support tool" (which can be downloaded from the MELFANSweb). (Refer to Section 9.2)
3. For MELSECNET(II), the station numbers must be assigned in the connecting order starting from the new master station.
4. The QA1S51B extension base without power supply module can be used for the local station data link module mounting base.
   Note that the voltage drop must be calculated if the extension cable is long.

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4.3 Replace MELSECNET containing a remote I/O station with MELSECNET/H

Solution and Benefit

- **Although MELSECNET systems may be a combination of local and remote I/O stations, two separate networks are necessary when upgrading to Q Series. However, if the existing system contains only a few remote I/O stations, only one network is needed if remote I/O stations are replaced with normal (local) stations without changing the cable layout or adding new wiring.**
- **Even when the remote I/O stations are replaced with the normal stations, it is not required to modify the control (master) station's network related programs.**

The following is an example of upgrading a MELSECNET(II) system to MELSECNET/H by replacing both local and remote I/O stations with normal stations.

● Instructions

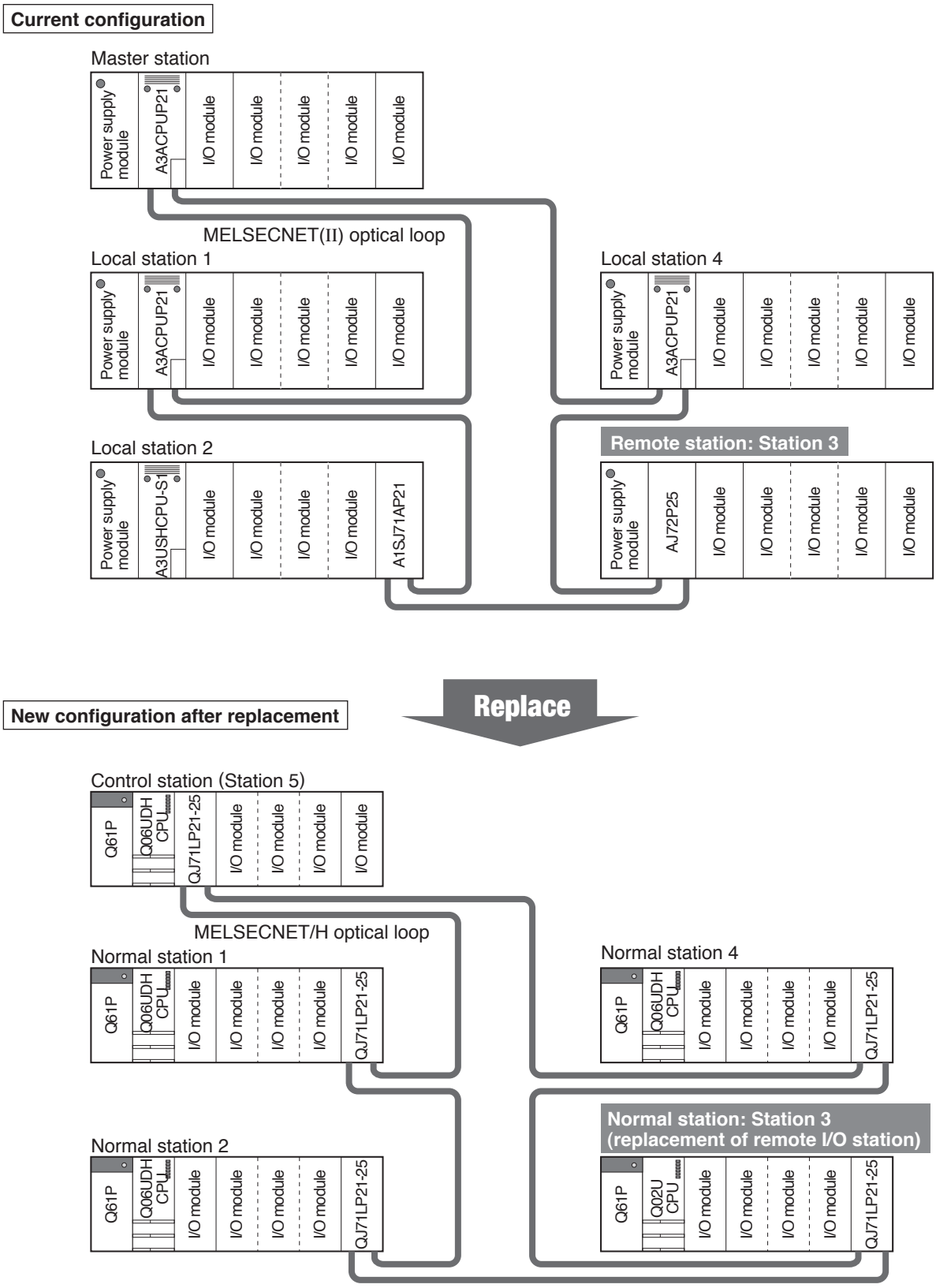
(1) Replace the MELSECNET(II) master station with the MELSECNET/H control station, and the MELSECNET(II) local and remote I/O stations with the MELSECNET/H normal stations to maintain a single network configuration. (This is because the controller network and remote I/O network cannot reside on a single network.)

(2) Add a simple transfer program between LX/LY (link side device) and X/Y (actual I/O device) for the normal station replaced from the remote I/O station. With this program, the normal station receives LY sent from the control station by X and transfers it to actual output address Y; the normal station transfers input X to LY so that the control station can receive it as X.

- MELSECNET(II): I/O signal transfer between master station and remote station
  - Master station input (X) <- Remote station input (X)
  - Master station output (Y) -> Remote station output (Y)
- MELSECNET/H: I/O signal transfer between control station and normal station
  - Control station input (X) <- Normal station output (Y)
  - Control station output (Y) -> Normal station input (X)

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(1) System configuration example



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(2) Network parameter modification example

(1) Parameter settings for existing MELSECNET(II) master station

LBLW Setting								
L/R Station No.		Trans range LB Start	Trans range LB End	Trans range LW Start	Trans range LW End	M sta -> R sta LW Start	M sta -> R sta LW End	M sta <- R sta LW Start	M sta <- R sta LW End
M		[0]	[FF]	[0]	[FF]	———	———	———	———
[L]	1	[100]	[1FF]	[100]	[1FF]	———	———	———	———
[L]	2	[200]	[2FF]	[200]	[2FF]	———	———	———	———
[R]	3	———	———	———	———	[ ]	[ ]	[ ]	[ ]
[L]	4	[300]	[3FF]	[300]	[3FF]	———	———	———	———

LXLY Setting									
L/R Station No.		M sta -> L/R sta LY Start	M sta -> L/R sta LY End	M sta -> L/R sta LX/LY Start	M sta -> L/R sta LX/LY End	M sta <- L/R sta LX Start	M sta <- L/R sta LX End	M sta <- L/R sta LX/LY Start	M sta <- L/R sta LX/LY End
M		———	———	———	———	———	———	———	———
[L]	1	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[L]	2	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
[R]	3	[500]	[5FF]	[0]	[FF]	[500]	[5FF]	[0]	[FF]
[L]	4	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

(2) Parameter settings for MELSECNET/H control station

■ MELSECNET/Ethernet network parameter settings

	Mdl. 1	Mdl. 2	Mdl. 3	Mdl. 4
Network type	MNET/H mode(Ctr Sta)			
Start I/O No.	0100			
Network No.	1			
Total stations	5			
Group No.	0			
Station No.	----------			
Mode	Online			
	Network range alloc.set.exist			
	No sta.inher.para.settings			
	Refresh para. settings exist			
	No interrupt settings			

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■ Network range assignment

LB/LW Settings														Pairing
		Trans range			Trans range			Trans range			Trans range			
		LB			LW			Low speed LB			Low speed LW			
Station No.		Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End	
	1	256	0100	01FF	256	0100	01FF							Disable
	2	256	0200	02FF	256	0200	02FF							Disable
	3													Disable
	4	256	0300	03FF	256	0300	03FF							Disable
Master1	5	16	0000	000F	256	0000	00FF							Disable

LX/LY Settings (1)													
		Trans range (M -> L)						Trans range (M <- L)					
		LY			LX			LX			LY		
Station No.		Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End
	1												
	2												
	3	256	0500	05FF	256	0500	05FF	256	0500	05FF	256	0500	05FF
	4												
Master1	5	----	----	----	----	----	----	----	----	----	----	----	----

■ Refresh parameters

	Link side				PLC side		
	Points	Start	End		Points	Start	End
SB Transfer	512	SB0000	SB01FF	<-->	512	SB0000	SB01FF
SW Transfer	512	SW0000	SW01FF	<-->	512	SW0000	SW01FF
Transfer 1	8192	LB0000	LB1FFF	<-->	8192	B0	B1FFF
Transfer 2	8192	LW0000	LW1FFF	<-->	8192	W0	W1FFF
Transfer 3	256	LX0500	LX05FF	<-->	256	X500	X5FF
Transfer 4	256	LY0500	LY05FF	<-->	256	Y500	Y5FF

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(3) Parameter settings and link data transfer program for the normal station replaced from the remote I/O station

■ MELSECNET/Ethernet network parameter settings

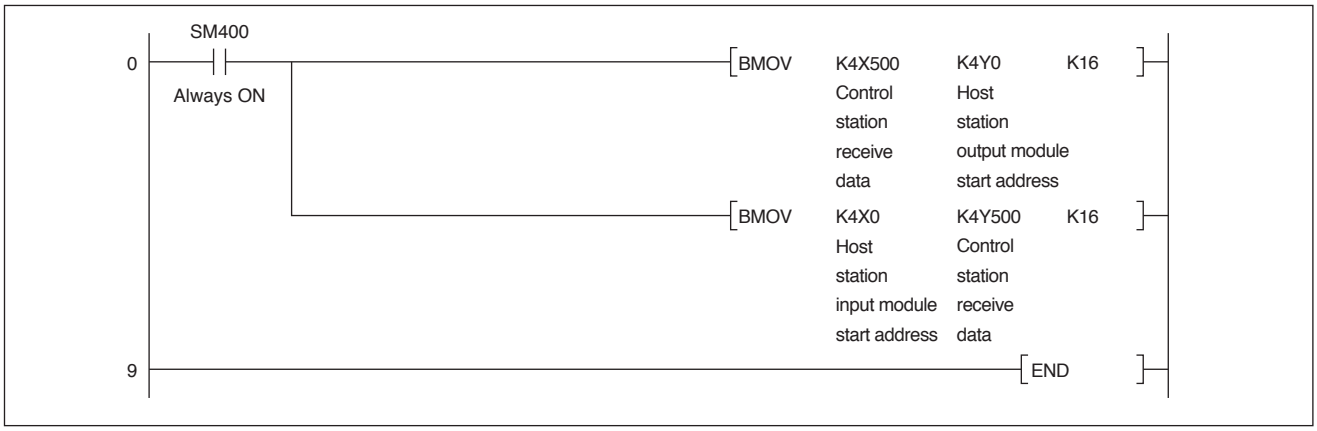
	Mdl. 1	Mdl. 2	Mdl. 3	Mdl. 4
Network type	MNET/H mode(Nor Sta)			
Start I/O No.	0100			
Network No.	1			
Total stations	----------			
Group No.	0			
Station No.	----------			
Mode	Online			

	No sta.inher.para.settings			
	Refresh para. settings exist			
	No interrupt settings			

■ Refresh parameters

	Link side				PLC side		
	Points	Start	End		Points	Start	End
SB Transfer	512	SB0000	SB01FF	<-->	512	SB0000	SB01FF
SW Transfer	512	SW0000	SW01FF	<-->	512	SW0000	SW01FF
Transfer 1	256	LX0500	LX05FF	<-->	256	X500	X5FF
Transfer 2	256	LY0500	LY05FF	<-->	256	Y500	Y5FF

■ Transfer program between link data (LX/LY) and actual I/O (X/Y)



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4.4 Gradual replacement of MELSECNET/10 Remote I/O Net

(Utilize QJ72LP25-25(G), QJ72BR15 (MELSECNET/10 mode))

Solution and Benefit

Replace the remote I/O station only in a station unit to the Q Series remote I/O station while utilizing the current AnU(S)CPU/QnA(S)CPU master station. This allows gradual replacement of the network to the Q Series.

List of MELSECNET/H (MELSECNET/10 mode) remote I/O network modules

<table>
<tr><th></th><th>MELSECNET/10 remote
(current system)</th><th colspan="2">MELSECNET/H (MELSECNET/10 mode)
(gradual replacement)</th><th>MELSECNET/H remote
(final replacement configuration)</th></tr>
<tr><td>Master station CPU module</td><td colspan="3">AnU(S)CPU/QnA(S)CPU</td><td>QCPU</td></tr>
<tr><td>Remote master station module</td><td colspan="3">A(1S)J71(Q)LP21
A(1S)(Q)BR11</td><td>QJ72LP21
QJ72BR11</td></tr>
<tr><td rowspan="2">Remote I/O station network module</td><td rowspan="2">A(1S)J72(Q)LP25
A(1S)J72(Q)LP25G
A(1S)J72(Q)BR15</td><td>A(1S)J72(Q)LP25
A(1S)J72(Q)LP25G
A(1S)J72(Q)BR15</td><td>QJ72LP25-25
QJ72BR15
QJ72LP25G
* Set mode switch to 8</td><td rowspan="2">QJ72LP25-25
QJ72BR15
QJ72LP25G
* Set mode switch to 0</td></tr>
<tr><td colspan="2">Mixing possible</td></tr>
</table>

Tip

- Replace the MELSECNET/10 mode master station CPU
  - ▶The Q Series master station cannot be connected to the A/AnS remote I/O station. When replacing the current master station with the Q Series in the final stage, all remote I/O stations must be Q Series stations.
- Replace the A Series special module with the Q Series intelligent function module
  - ▶The Q Series intelligent function module's buffer memory can be read/written using the current A/QnA Series dedicated instructions.
  - ▶The sequence program must be revised as the number of occupied points, I/O signals and buffer memory address may change.
- Replace master station CPU to Q Series in final step
  - (a) Using only I/O module
    The network can be shifted to the MELSECNET/H remote I/O network by changing the mode switch setting from 8 to 0. There is no need to change the program.
  - (b) Using the intelligent function module
    - The network can be shifted to the MELSECNET/H remote I/O network by changing the mode switch setting from 8 to 0.
    - The Q Series intelligent function module's buffer memory read/write instructions must be changed to Q Series link dedicated instructions. Refer to the "Q Series Compatible MELSECNET/H Remote I/O module reference Manual (MELSECNET/10 Mode Section)" for details on the dedicated instructions.

Note:

This replacement is intended for an existing MELSECNET/10 remote I/O network system.
Replacement from the MELSECNET (II, II mixed) or MELSECNET/B data link system is not supported.

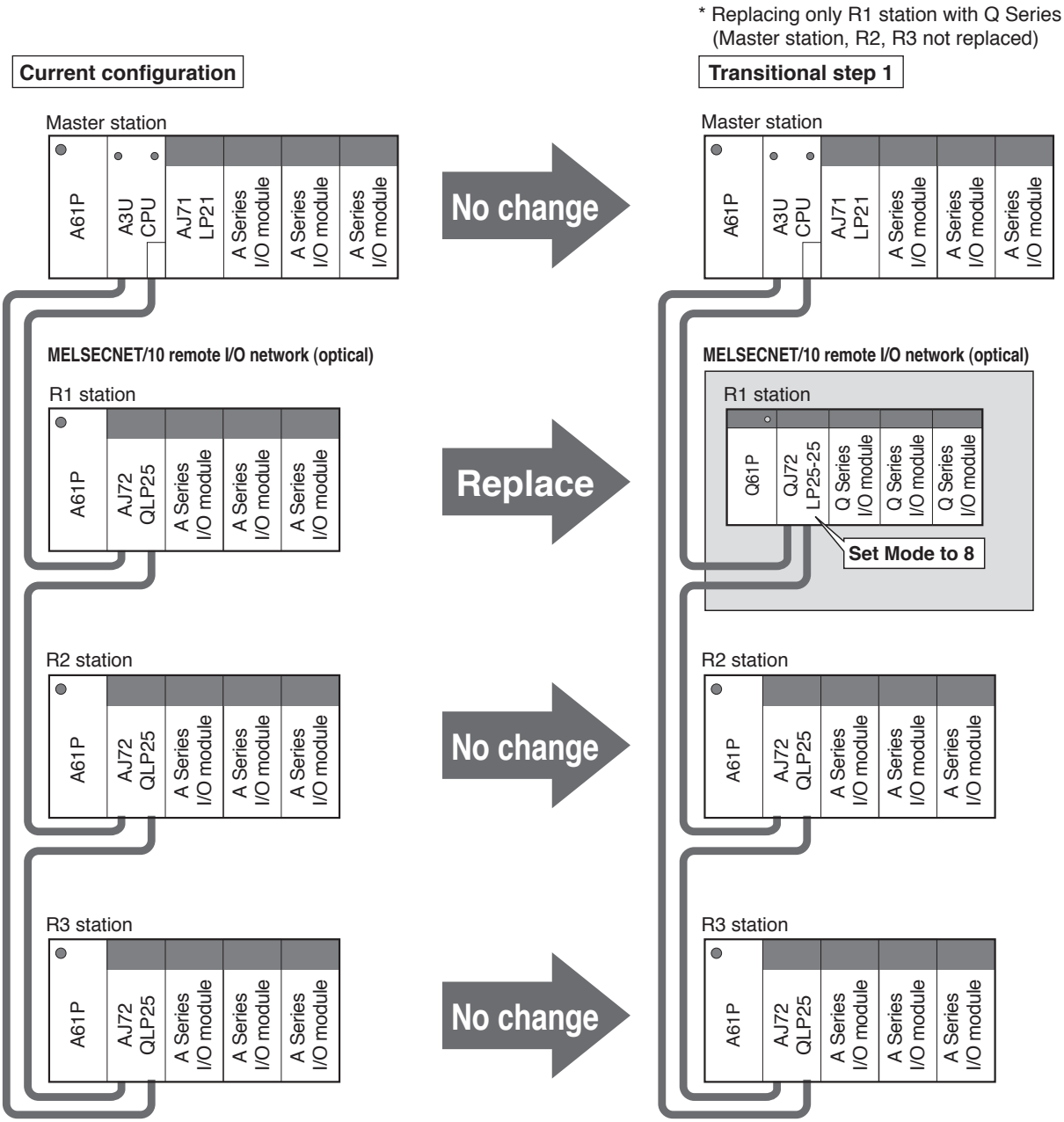
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The method for gradually replacing the existing MELSECNET/10 remote I/O network to the Q Series is explained below.

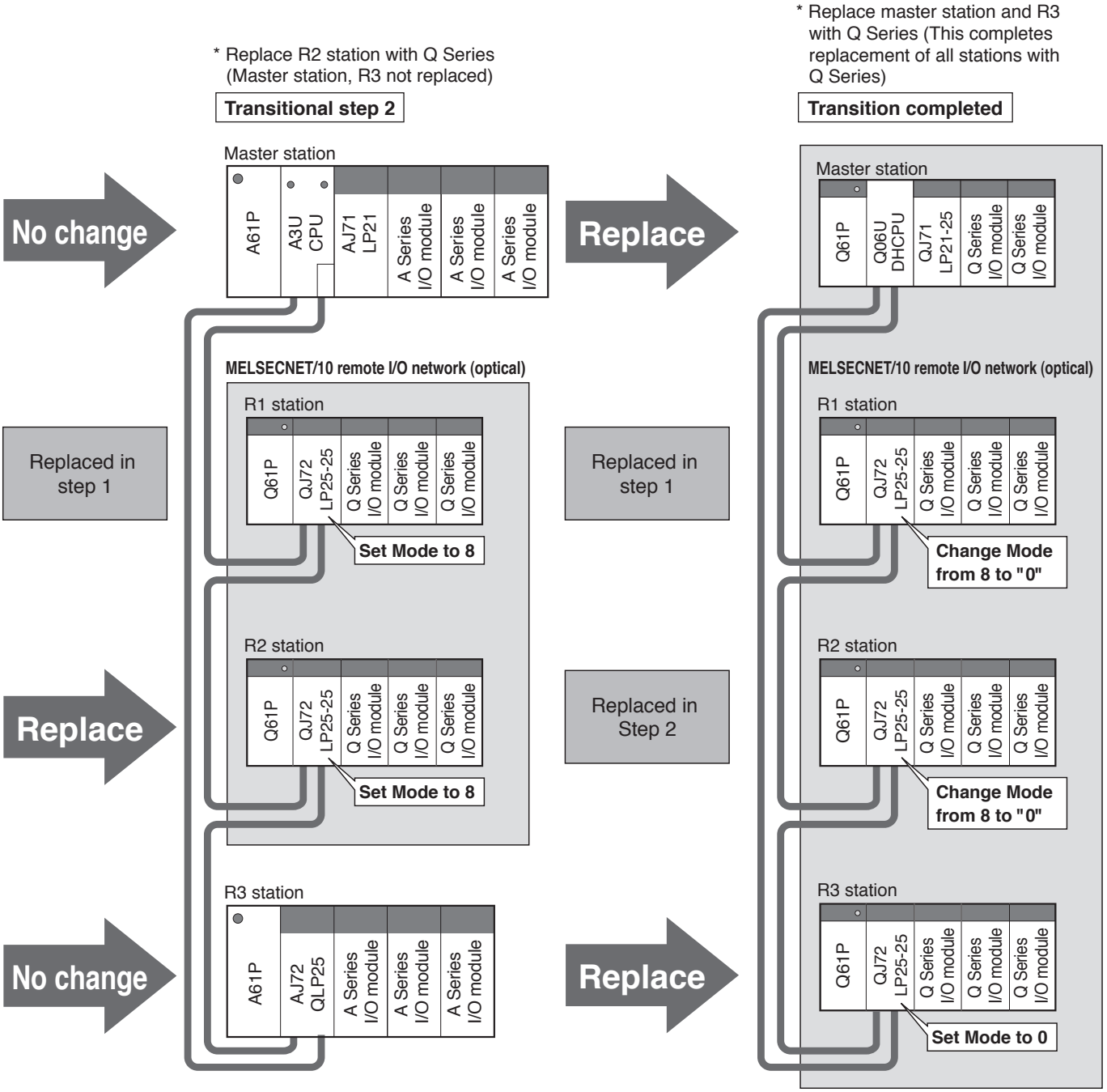
● Flow of replacement

(1) Replace the existing station 1 with the Q Series in Step 1.
(2) Replace a random station with the Q Series in Step 2.
(3) In the final step, replace the master station with the Q Series CPU, and shift to the MELSECNET/H remote I/O network.
At the same time, replace the stations remaining in the existing network as MELSECNET/10 remote I/O network modules to the Q Series.

(1) System configuration example



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4.5 Replace MELSECNET/MINI(-S3) with CC-Link

4.5.1 Replace A2CCPU with Q Series CPU and CC-Link (using A2C shape CC-Link I/O modules)

Solution and Benefit

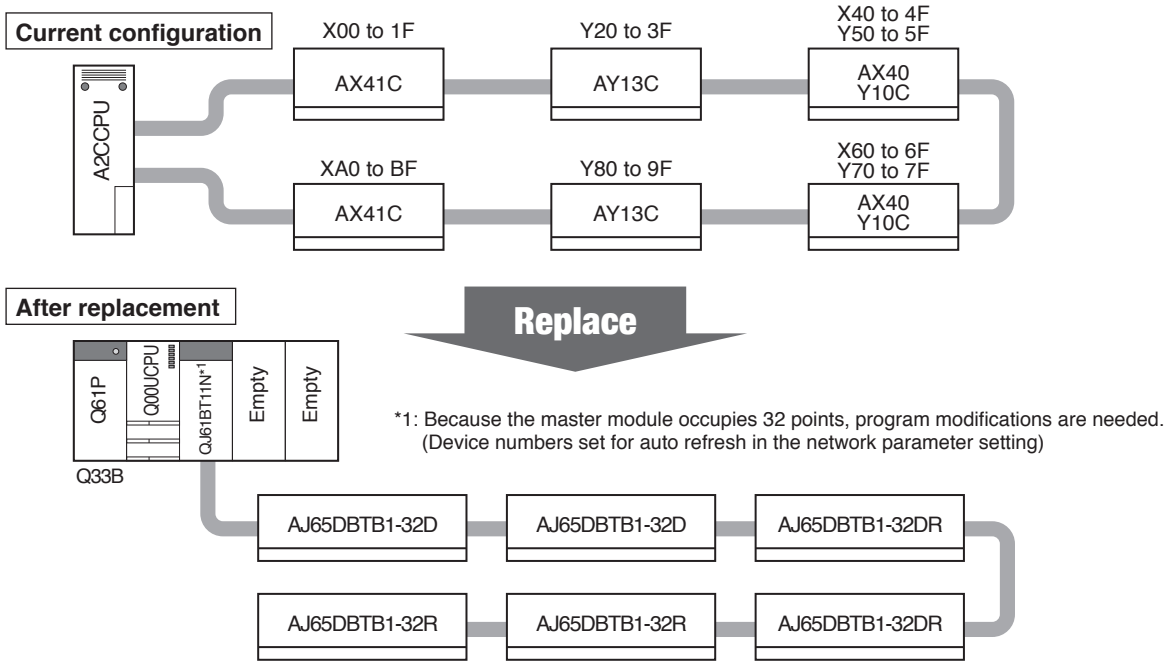
- **A2C shape CC-Link remote I/O modules have been developed to replace MELSECNET/MINI(-S3) systems with CC-Link. Wiring time is reduced because existing terminal blocks can be mounted directly on the A2C shape CC-Link remote I/O module by merely changing the communication and power lines.**
- **Since the mounting size is the same as that of A2C I/O modules, the new modules can be mounted using existing holes.**

The following is an example of replacing an A2CCPU with a Q Series CPU and A2C I/O modules with A2C shape CC-Link remote I/O modules.

● Instructions

(1) Replace the A2CCPU with the building block type Q Series CPU and I/O modules with the A2C shape CC-Link remote I/O modules while maintaining the distributed I/O system.
(2) Utilizing modules sold for upgrading reduces the external wiring man-hours.
(3) Change the communication cables with CC-Link dedicated cables, and rewire the power cables.

(1) System configuration example



*1: Because the master module occupies 32 points, program modifications are needed.
(Device numbers set for auto refresh in the network parameter setting)

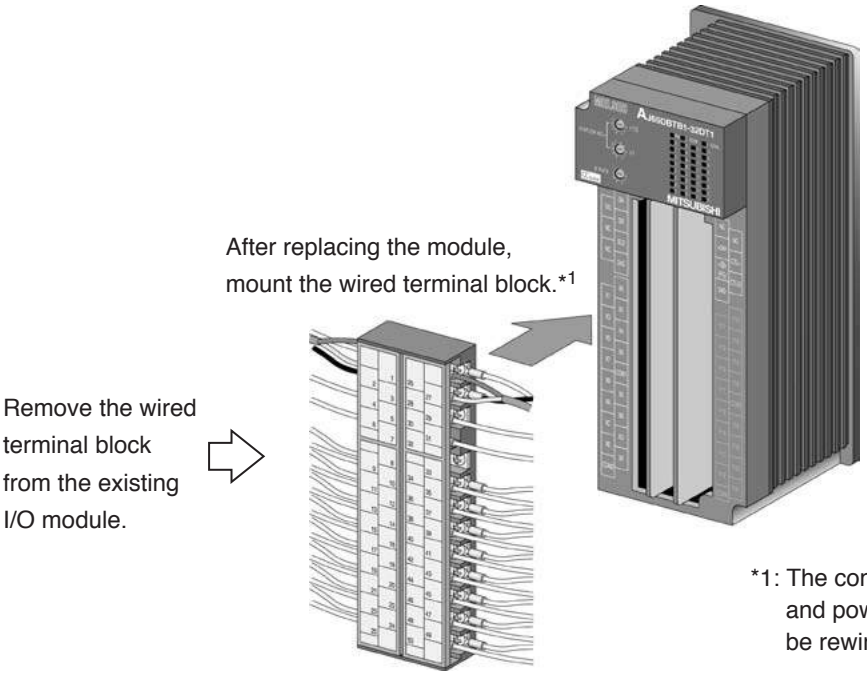
(2) Module selection example

Product name	Existing module		Replacement module	
Power supply module	N/A	-	Q61P	1
CPU module	A2CCPU	1	Q00UCPU	1
Main base unit	N/A	-	Q33B	1
Master module	N/A	-	QJ61BT11N	1
Input module	AX41C	2	AJ65DBTB1-32D	2
Output module	AY13C	2	AJ65DBTB1-32R	2
I/O combined module	AX40Y10C	2	AJ65DBTB1-32DR	2

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A2C shape CC-Link remote I/O modules

CC-Link remote I/O modules are available in the same shape and size as some of the A2C I/O modules to facilitate transition.
New mounting holes are unnecessary and existing wiring can be utilized with minor modifications.



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

■ Model list

Model to be discontinued	Alternative model	
	Model	Outline
AX41C AX81C	AJ65DBTB1-32D	Terminal block type, 24 V DC input, 32 points, sink/source
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, 0.5 A transistor output, 16 points, I/O composite module
AY13C	AJ65DBTB1-32R	Terminal block type, relay output, 32 points
AX40Y10C AX80Y10C	AJ65DBTB1-32DR	Terminal block type, 24 V DC input, sink/source shared, 16 points, relay output, 16 points, composite module

Tip

- The A2C shape CC-Link remote I/O modules can also replace MELSECNET/MINI(-S3) systems consisting of the AJ71PT32(-S3)/A1SJ71PT32(-S3) building block type master module with CC-Link.
  In this case, program modification is not required.
- For replacing compact type remote I/O modules with CC-Link modules, refer to "Section 2.6.3 Replace MELSECNET/MINI compact type remote I/O modules with CC-Link".
- Also the CPU can be replaced with LCPU.
  When it is replaced with L Series, the CC-Link master module LJ61BT11 or the built-in CC-Link function of the LCPU will be used.
  The CC-Link remote module can be connected to any of Q Series and L Series.

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4.5.2 Replace MELSECNET/MINI(-S3) with CC-Link (using wiring conversion adapter)

Solution and Benefit

By selecting modules with equivalent specifications, existing external wiring can be utilized when replacing MELSECNET/MINI(-S3) systems with CC-Link.

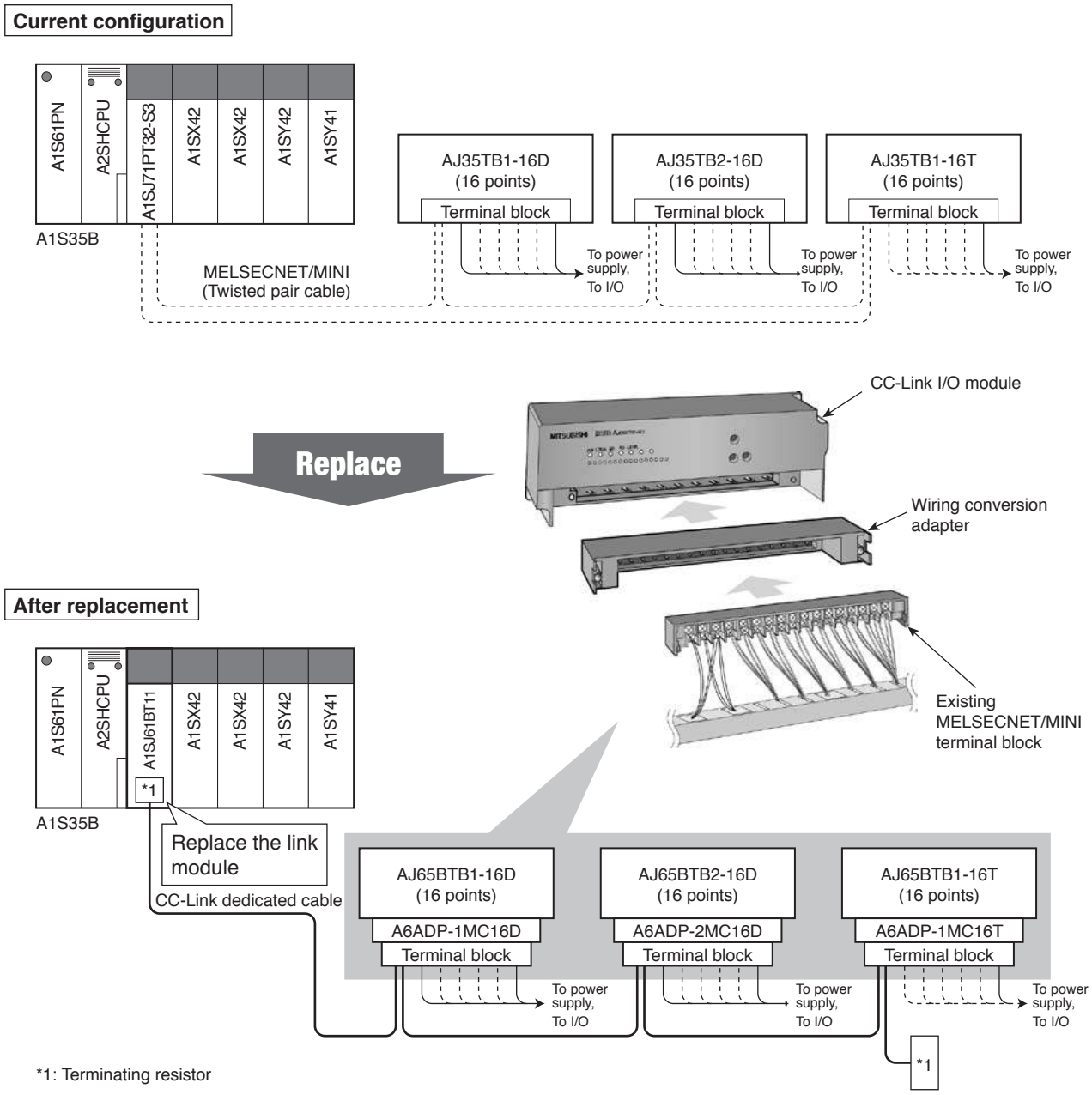
The following is an example of replacing a MELSECNET/MINI(-S3) system with CC-Link using a wiring conversion adapter.

● Instructions

(1) Remove the terminal blocks from existing MELSECNET/MINI(-S3) I/O modules, install them in the wiring conversion adapters, and then mount them on the selected CC-Link remote I/O modules.

(2) Change the MELSECNET/MINI communication cables with CC-Link dedicated cables, and rewire the power cables.

(1) System configuration example



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● Module selection example

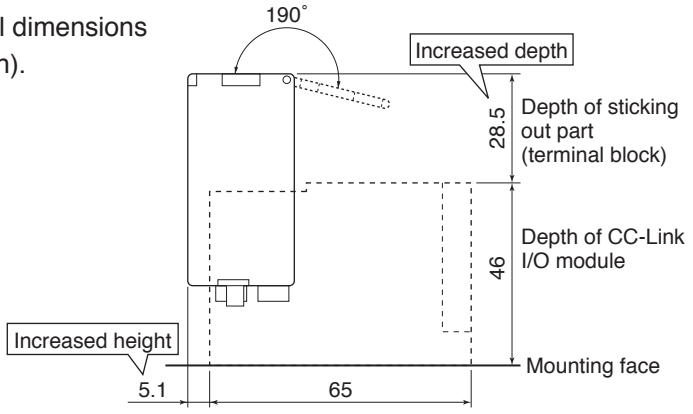
Product name	Existing module		Replacement module	
MELSECNET/MINI(-S3) master module	A1SJ71PT32-S3	1	N/A	-
CC-Link master module	N/A	-	A1SJ61BT11	1
Remote input module	AJ35TB1-16D	1	AJ65BTB1-16D	1
	AJ35TB2-16D	1	AJ65BTB2-16D	1
Remote output module	AJ35TB1-16T	1	AJ65BTB1-16T	1
Wiring conversion adapter (newly added)	N/A	-	A6ADP-1MC16D (for AJ65BTB1-16D)	1
	N/A	-	A6ADP-2MC16D (for AJ65BTB2-16D)	1
	N/A	-	A6ADP-1MC16T (for AJ65BTB1-16T)	1

● Model list

Model to be discontinued		Alternative model		
Product name	Model	Model		Remarks (restrictions)
		Alternative module	Conversion adapter	
Input module	AJ35TB1-16D	AJ65BTB1-16D	26-pin conversion adapter*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	34-pin conversion adapter*1 A6ADP-2MC16D	
Output module	AJ35TB1-16T	AJ65BTB1-16T	26-pin conversion adapter*1, *2 A6ADP-1MC16T	

Tip

- MELSECNET/MINI occupies 8 points/station whereas CC-Link occupies 32 points/station. Therefore, except for modules with a total of 32 points (occupying 4 stations), I/O numbers need to be changed and program modifications are required. Refer to Section 7.5 for details.
- The communication cables must be changed to the CC-Link dedicated cables.
- Specifications differ depending on the alternative model. Refer to "Transition from MELSECNET/MINI-S3, A2C (I/O) to CC-Link Handbook" L(NA)08061ENG for details.
- Due to the wiring conversion adapter, the external dimensions increased by 5.1 mm (height) and 28.5 mm (depth).



Unit: mm

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4.5.3 Replace MELSECNET/MINI(-S3) remote I/O station (building block type: AJ72PT35) with MELSECNET/H using the existing external wiring

Solution and Benefit

- **MELSECNET/H (remote I/O network) can utilize Q Series large type base unit. Wiring time can be reduced by utilizing the external wiring of MELSECNET/MINI remote I/O station, which consists of existing building block type I/O modules.**
- **Program modification is not required because the number of occupied points are the same for each I/O module to be replaced. Therefore, programming time and debugging time after the replacement is reduced.**

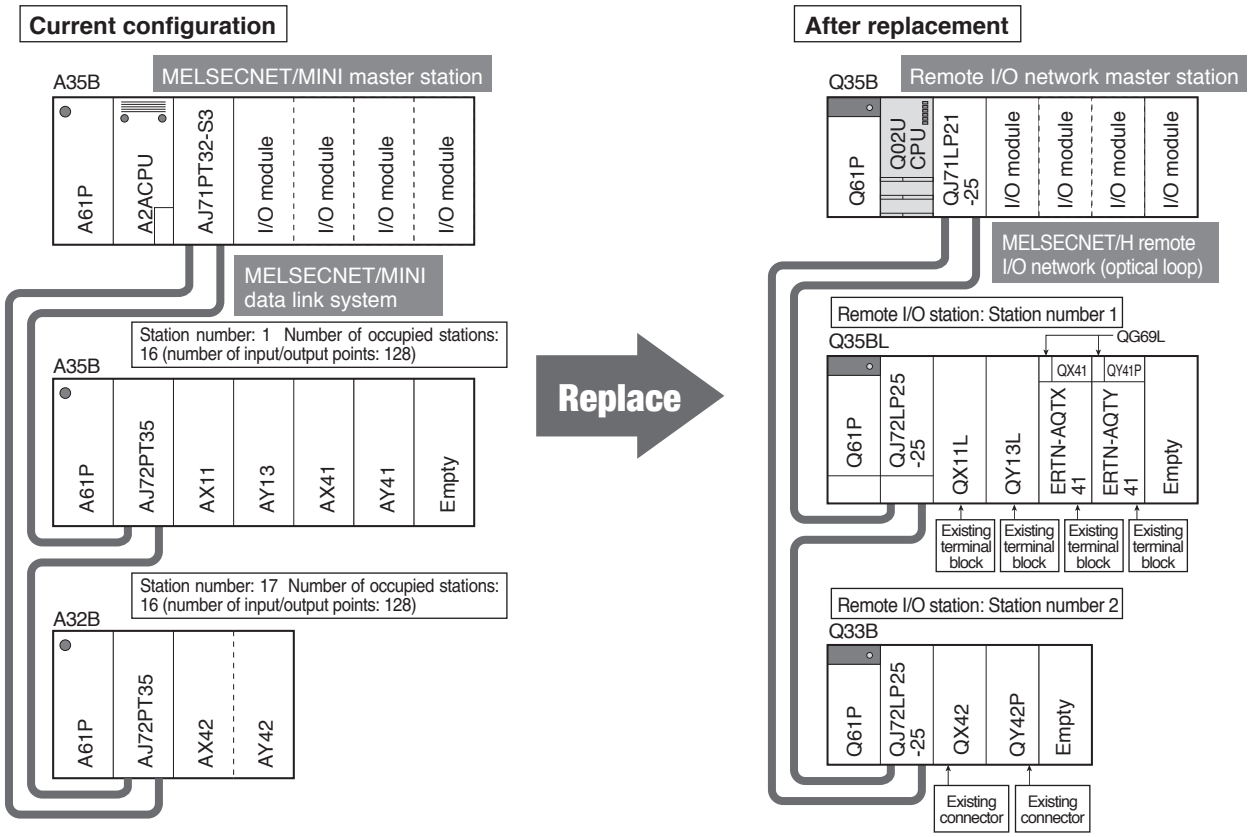
● Instructions

(1) Replace the existing MELSECNET/MINI(-S3) with MELSECNET/H (remote I/O network).
Install new network cables: optical cable (loop) or coaxial cable (bus).
(Optical cables are used for the following example.)

(2) When the I/O module of the existing MELSECNET/MINI(-S3) remote I/O station is of terminal block type, utilize the existing terminal block with the external wiring through a Q Series large type base unit and the following products.
• Q Series large type I/O modules
• Q Series I/O modules + upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd.

(3) In MELSECNET/H (remote I/O network) network parameter, set the master station side devices to be the same as the ones assigned to the existing MELSECNET/MINI in order to avoid program modification.

(1) System configuration example



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(2) Network parameter setting example

The following example shows the network parameter settings of MELSECNET/H (remote I/O network) after replacement in the case where the transmission devices of the existing MELSECNET/MINI(-S3) network were X/Y100 to 1FF.

(1) Existing MELSECNET/MINI(-S3)
Auto refresh parameter

	1
Start I/O No.	0000
Model name	MINI
Station count	32
Batch refresh receive data	X100
Batch refresh send data	Y100
Retry	5
Response	PLC
Error data clear	Clear
Abnormal station detection bit data	
Abnormal communication remote	
Circuit error check	Maintain
STOP time operation	

(2) MELSECNET/H after replacement
Network parameter (common parameter)

	Module 1
Network type	MNET/H(Remote master)
Starting I/O No.	0000
Network No.	1
Total stations	2
Group No.	
Station No.	
Mode	Online
	Network range assignment

(Network range assignment)

Setup common parameters and I/O assignments.

Assignment method: Points/Start / Start/End
Monitoring time: 200 X 10ms
Total slave stations: 2
Parameter name:
Switch screens: XY setting

StationNo.	M station -> R station						M station <- R station					
	Y			Y			X			X		
	Points	Start	End	Points	Start	End	Points	Start	End	Points	Start	End
1	128	0100	017F	128	0000	007F	128	0100	017F	128	0000	007F
2	128	0180	01FF	128	0000	007F	128	0180	01FF	128	0000	007F

(3) Module selection example

(1) Master station

Product name	Existing module		Replacement module	
Power supply module	A61P	1	Q61P	1
CPU module	A2ACPU	1	Q02UCPU	1
Main base unit	A35B	1	Q35B	1
Master module	AJ71PT32-S3 *For MELSECNET/MINI(-S3)	1	QJ71LP21-25 *For MELSECNET/H remote I/O network	1

(2) Remote I/O station: Station number 1

Product name	Existing module		Replacement module	
Power supply module	A61P	1	Q61P	1
Main base unit	A35B	1	Q35BL	1
Data link/Network module	AJ72PT35 *For MELSECNET/MINI(-S3)	1	QJ72LP25-25 *For MELSECNET/H remote I/O network	1
Input module	AX11	1	QX11L	1
	AX41	1	QX41	1
			ERTN-AQTX41	1
			QG69L	1
Output module	AY13	1	QY13L	1
	AY41	1	QY41P	1
			ERTN-AQTY41	1
			QG69L	1

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(3) Remote I/O station: Station number 2

Product name	Existing module		Replacement module	
Power supply module	A61P	1	Q61P	1
Main base unit	A32B	1	Q33B	1
Data link/Network module	AJ72PT35 *For MELSECNET/MINI(-S3)	1	QJ72LP25-25 *For MELSECNET/H remote I/O network	1
Input module	AX42	1	QX42	1
Output module	AY42	1	QY42P	1

Tip

- The installation of MELSECNET/MINI twisted pair cables needs to be modified according to the upgraded network.
  In the example, optical dual loop is selected to loop the network. When the distance between stations or overall distance is short, a coaxial bus cable can be used to reduce cable installation time.
- Some CPUs, such as Basic Model QCPUs (Q00J, Q00, Q01CPU), cannot be set as MELSECNET/H (remote I/O network) master station.
  For selecting CPU type, refer to "Q corresponding MELSECNET/H Network System Reference Manual (Remote I/O network)" SH-080124.
- If modules other than building type I/O modules, such as A2C I/O modules, are mixed in the existing MELSECNET/MINI(-S3) system, the entire system cannot be upgraded to MELSECNET/H (remote I/O network).
  In this case, consider separating the system into MELSECNET/H (remote I/O network) and CC-Link. (Replacement by dividing a network)

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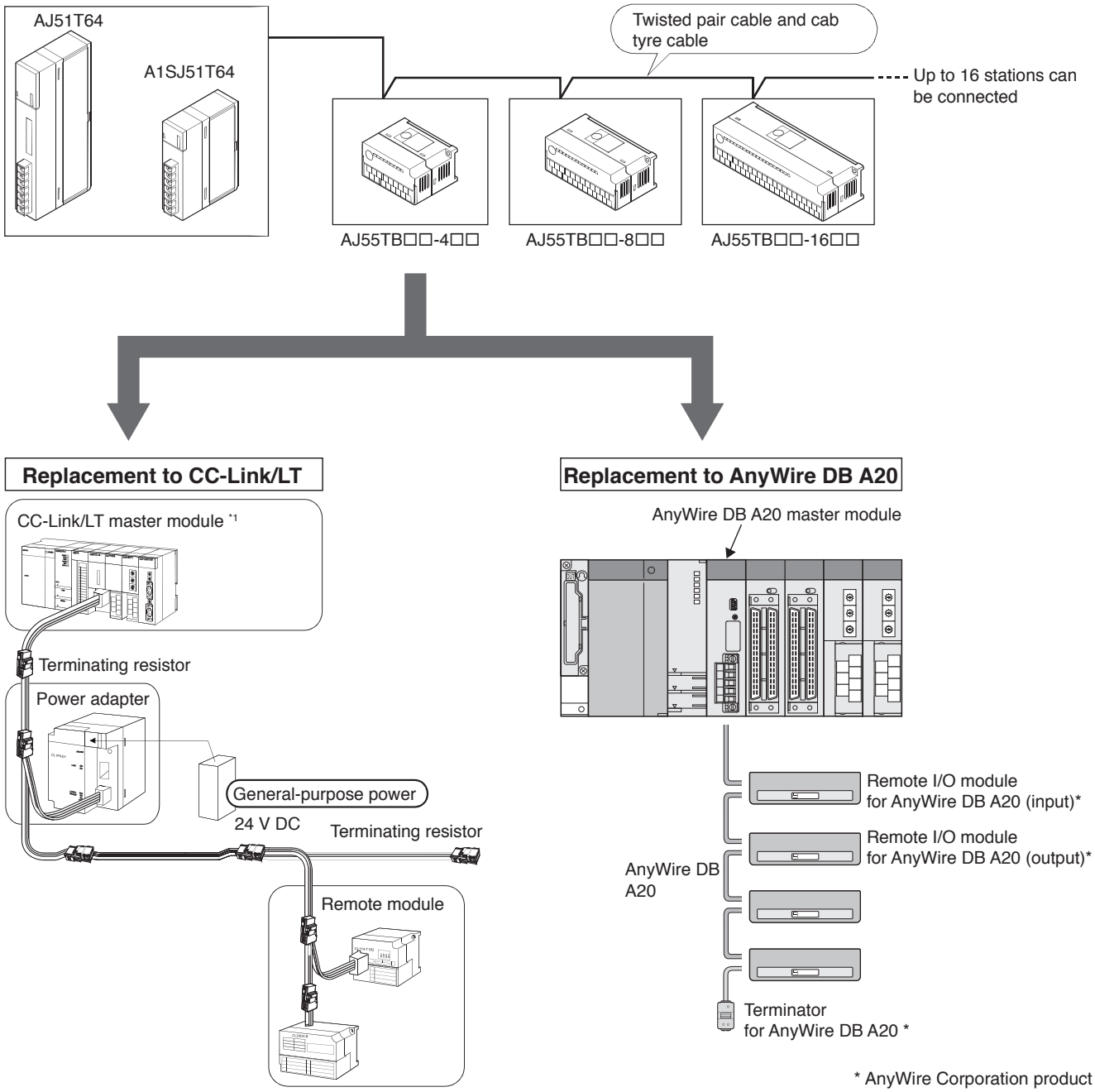
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4.6 Replace MELSEC-I/OLINK with CC-Link/LT, AnyWire DB A20

Solution and Benefit

Replace the MELSEC-I/OLINK remote I/O station to the CC-Link/LT or AnyWire DB A20 to upgrade the remote I/O system.

(1) Replacement configuration example



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(2) Comparison of replacement from MELSEC-I/OLINK to AnyWire DB A20 or CC-Link/LT

A comparison of the main functions when replacing MELSEC-I/OLINK to AnyWire DB A20 or CC-Link/LT is shown below.

○: Compatible, ×: Not compatible

Item	Replacement to AnyWire DB A20 (MELSEC-Q Series/L Series compatible)		Replacement to CC-Link/LT (MELSEC-Q Series compatible)	
	Compatibility	Details	Compatibility	Details
External power supply	○	Existing I/OLINK external power supply can be used	×	Power adapter must be installed
Connection method	○	T-shape branch, tree branch	○	T-shape branch
Connection cable	○	Existing I/OLINK cable can be used	×	Cable must be newly laid
I/O module type	○	4-point, 8-point, 16-point Input module, output module, I/O module	○	2-point, 4-point, 8-point Input module, output module, I/O module
Programming	×	Master module 32-points occupied I/O module address is device designated by FROM/TO instruction	○	Master module's XY address becomes I/O module's XY address Address does not need to be changed (within 64 points)

Tip

- The I/O module specifications differ when replacing MELSEC-I/OLINK with AnyWire DB A20 or CC-Link/LT. Refer to the following guide and select the replacement I/O module.
  ▶Transition from MELSEC-I/OLINK to AnyWire DB A20
  "Transition from MELSEC-I/OLINK to AnyWire DB A20 Handbook: L (NA) 08063ENG"
  ▶Transition from MELSEC-I/OLINK to CC-Link/LT
  "Transition from MELSEC-I/OLINK to CC-Link/LT Handbook: L (NA)08062ENG"
- If the I/O module specifications, etc., make it difficult to replace the MELSEC-I/OLINK with AnyWire DB A20 or CC-Link/LT, consider replacing with "CC-Link".
- AnyWire products are not available in some countries. For details, please consult your local Mitsubishi representative.

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5. Replacing with replacement dedicated modules

5.1 Replace high-speed counter modules (AD61(S1)) with Q Series modules

Solution and Benefit

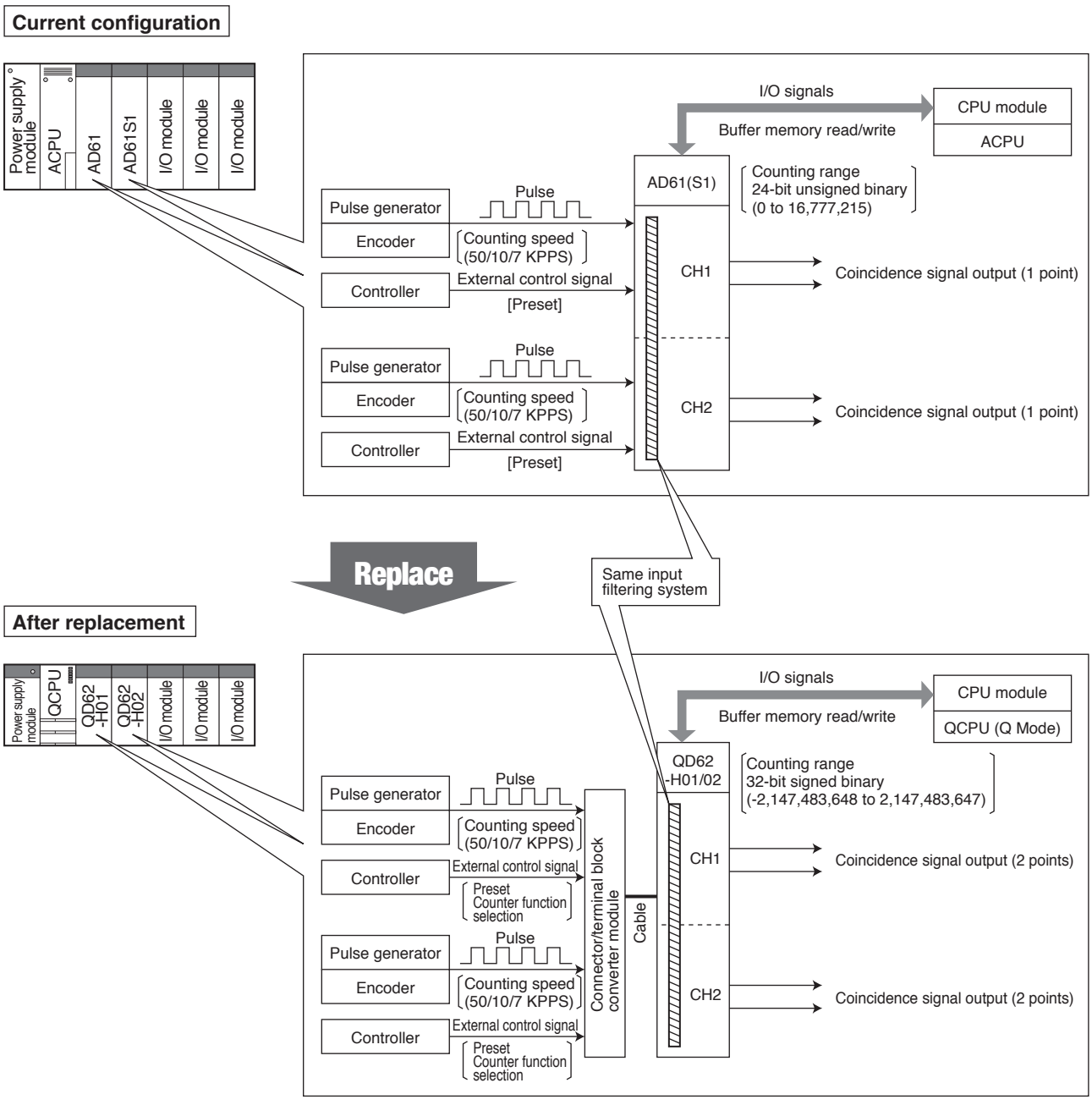
Q Series replacement dedicated modules share the same input filtering system as, and therefore can replace the A Series high-speed counter module AD61 or AD61S1 without restrictions from the specifications of existing pulse generators (e.g. an encoder).

● Instructions

Replace A (Large Type) high-speed counter modules with the following Q Series modules (replacement dedicated module).

- AD61 -> QD62-H01
- AD61S1 -> QD62-H02

(1) System configuration example



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(2) Module wiring

The external wiring method is different between AD61/AD61S1 and QD62-H01/QD62-H02.

- AD61, AD61S1: Use a terminal block
- QD62-H01, QD62-H02: Use a connector

The following are replacement methods in which existing wiring are preserved.

(a) Replacement using a conversion adapter manufactured by Mitsubishi Electric Engineering Co., Ltd.

The existing modules' terminal blocks and wiring can be utilized. For replacement details, refer to the following section.

- Section 2.2 Upgrade to Q Series using Q Series large type base unit and I/O modules
  The existing modules' terminal blocks and wiring can be utilized.
  For replacement details, refer to Item 2.1.2.

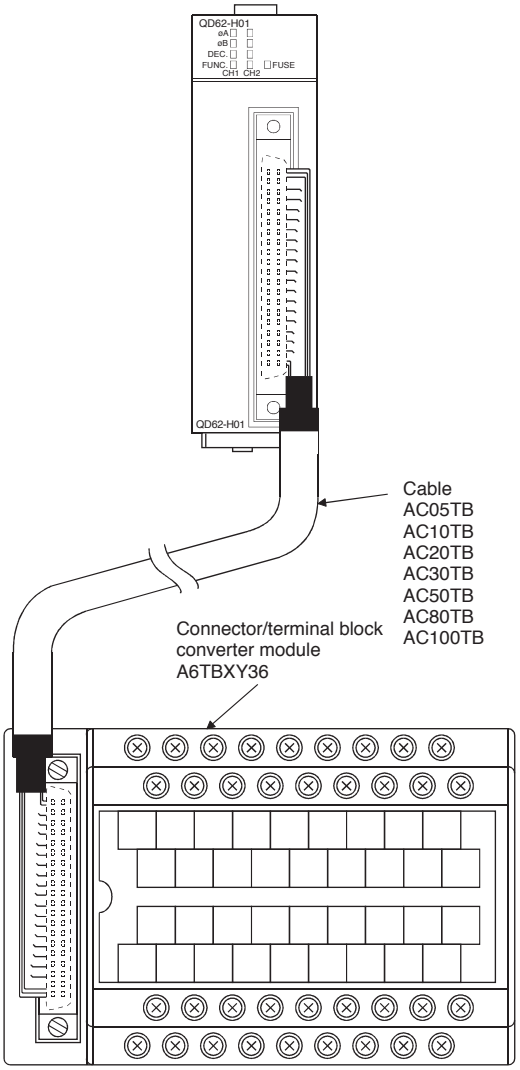
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(b) Replacement using a connector/terminal block converter module

This replacement method is suitable when the Q Series large type base unit and conversion adapter manufactured by Mitsubishi Electric Engineering Co., Ltd. cannot be used due to system configuration and installation location restrictions.

Connect the input/output wires, which include solderless terminals, from the existing module to the connector/terminal block converter module using a dedicated cable. This connection is not restricted by differences in wiring size.

The following shows the wiring configuration when using a connector/terminal block converter module.



Signal name		Connector terminal number	Terminal block side terminal number
CH1	Phase A pulse input 24 V	A20	10
	Phase A pulse input 12 V	B20	0
	Phase A pulse input 5 V	A19	11
	ABCOM	B19	1
	Phase B pulse input 24 V	A18	12
	Phase B pulse input 12 V	B18	2
	Phase B pulse input 5 V	A17	13
	Preset input 24 V	B17	3
	Preset input 12 V	A16	14
	Preset input 5 V	B16	4
	CTRLCOM	A15	15
	Function start input 24 V	B15	5
	Function start input 12 V	A14	16
	Function start input 5 V	B14	6
	EQU 1 (Coincidence output point No.1)	A06	1E
	EQU 2 (Coincidence output point No.2)	B06	E
CH2	Phase A pulse input 24 V	A13	17
	Phase A pulse input 12 V	B13	7
	Phase A pulse input 5 V	A12	18
	ABCOM	B12	8
	Phase B pulse input 24 V	A11	19
	Phase B pulse input 12 V	B11	9
	Phase B pulse input 5 V	A10	1A
	Preset input 24 V	B10	A
	Preset input 12 V	A09	1B
	Preset input 5 V	B09	B
	CTRLCOM	A08	1C
	Function start input 24 V	B08	C
	Function start input 12 V	A07	1D
	Function start input 5 V	B07	D
	EQU 1 (Coincidence output point No.1)	A05	1F
	EQU 2 (Coincidence output point No.2)	B05	F
12/24 V		B02 B01	24 V
0 V		A02 A01	0 V

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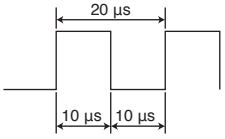
Tip

- The input filtering system and counting speed of replacement Q Series dedicated modules QD62-H01 and QD62-H02 are the same as those of existing A (Large Type) high-speed counter modules AD61 and AD61S1.
  High-speed counter modules can be replaced without being restrained by the specifications of existing pulse generators (e.g. an encoder).
- AD61/AD61S1 and QD62-H01/QD62-H02 have different counting ranges.
  Modify the program in order to use the same counting range as that of the module before replacement.
  - AD61, AD61S1: 0 to 16,777,215 (24-bit unsigned binary)
  - QD62-H01, QD62-H02: -2,147,483,648 to 2,147,483,647 (32-bit signed binary)
- The number of points occupied by the module changes from 32 to16 points, and thus the I/O signal assignment (X/Y) also changes. Due to additional functions, the buffer memory addresses are changed and program modification is necessary. Check the specification at "High-Speed Counter Module User's Manual": SH-080036, and modify the program.

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(3) Comparison of specification between AD61 and QD62-H01

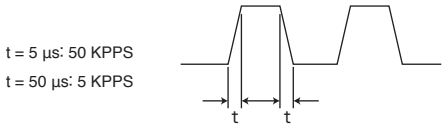
○: Compatible, △: Partial change required

Item			AD61		QD62-H01		Compatibility	Precautions for replacement
Occupied I/O points			32 points (I/O assignment: special 32 points)		16 points (I/O assignment: Intelligent 16 points)		△	*1
Number of channels			2 channel				○	
Counting speed switch settings			-		50 KPPS		○	Set "2" at the intelligent function module switch setting.
Perfomance specifications of 1 channels	Count input signal	Phase	1-phase input, 2-phase input				○	
		Signal level (ϕA, ϕB)	5 V DC 12 V DC 24 V DC } 2 to 5 mA				○	
	Counter	Counting speed (Max.)	1-phase input	50 KPPS	1-phase input	50 KPPS	○	*2
			2-phase input	50 KPPS	2-phase input	50 KPPS		
		Counting range	24-bit unsigned binary (0 to 16,777,215)		32-bit signed binary values (-2,147,483,648 to 2,147,483,647)		△	On QD62-H01, as the value is used with 32-bit signed binary values, change of sequence program is required.
		Type	UP/DOWN preset counter + ring counter function				○	
		Minimum count pulse width (set input rise time to 5 µs or less. Duty ratio: 50%)	(1, 2-phase input)				○	
	Magnitude comparison between CPU and AD61/ QD62-H01	Comparison range	24-bit unsigned binary		32-bit signed binary values		○	
		Comparison result	Set value < count value Set value = count value Set value > count value				○	
	External input	Preset	12/24 V DC 3/6 mA 5 V DC 5 mA		5/12/24 V DC 2 to 5 mA		△	On QD62-H01, as the external input specifications differ, confirm the external devices specifications.
		Count disable	12/24 V DC 3/6 mA 5 V DC 5 mA		-			
		Function start	-		5/12/24 V DC 2 to 5 mA			
	External output	Coincidence output	Transistor (open collector) output 12/24 V DC 0.5 A		Transistor (shinking type) output 2 points/channel 12/24 V DC 0.5 A/1 point 2 A/1 common		○	
Internal current consumption (5 V DC)			0.3 A		0.3 A		○	
Weight			0.5 kg		0.11 kg		○	

*1: A program used before replacement can be utilized by setting the start I/O signal numbers of the modules mounted to the right of the QD62-H01 so that they can be the same as that of the module before replacement.
(Set the start number at "Start XY" of the I/O assignment tab. The number of occupied points of the QD62-H01 cannot be changed.)

*2: The rise/fall time of a pulse affects the counting speed. Countable counting speeds are as follows.
Counting a pulse greater than t = 50 µs may result in a miscount.

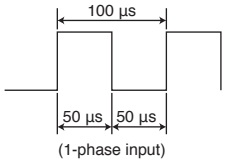
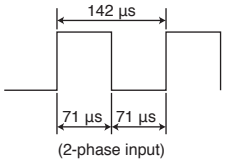
• For the AD61 and QD62-H01 (common for 1-phase input and 2-phase input)



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(4) Comparison of specification between AD61S1 and QD62-H02

○: Compatible, △: Partial change required

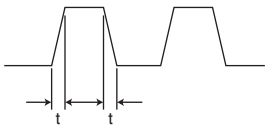
Item			AD61S1		QD62-H02		Compatibility	Precautions for replacement
Occupied I/O points			32 points (I/O assignment: special 32 points)		16 points (I/O assignment: Intelligent 16 points)		△	*1
Number of channels			2 channel				○	
Counting speed switch settings			-		10 KPPS		○	Set "2" at the intelligent function module switch setting.
Perfomance specifications of 1 channels	Count input signal	Phase	1-phase input, 2-phase input				○	
		Signal level (ϕA, ϕB)	5 V DC 12 V DC 24 V DC } 2 to 5 mA				○	
	Counter	Counting speed (Max.)	1-phase input	10 KPPS	1-phase input	10 KPPS	○	*2
			2-phase input	7 KPPS	2-phase input	7 KPPS		
		Counting range	24-bit unsigned binary (0 to 16,777,215)		32-bit signed binary values (-2,147,483,648 to 2,147,483,647)		△	On QD62-H02, as the value is used with 32-bit signed binary values, change of sequence program is required.
		Type	UP/DOWN preset counter + ring counter function				○	
		Minimum count pulse width (set input rise time to 5 µs or less. Duty ratio: 50%)					○	
	Magnitude comparison between CPU and AD61S1/ QD62-H02	Comparison range	24-bit unsigned binary		32-bit signed binary values		○	
		Comparison result	Set value < count value Set value = count value Set value > count value				○	
	External input	Preset	12/24 V DC 3/6 mA 5 V DC 5 mA		5/12/24 V DC 2 to 5 mA		△	On QD62-H02, as the external input specifications differ, confirm the external devices specifications.
		Count disable	12/24 V DC 3/6 mA 5 V DC 5 mA		-			
		Function start	-		5/12/24 V DC 2 to 5 mA			
	External output	Coincidence output	Transistor (open collector) output 12/24 V DC 0.5 A		Transistor (shinking type) output 2 points/channel 12/24 V DC 0.5 A/1 point 2 A/1 common		○	
Internal current consumption (5 V DC)			0.3 A		0.3 A		○	
Weight			0.5 kg		0.11 kg		○	

*1: A program used before replacement can be utilized by setting the start I/O signal numbers of the modules mounted to the right of the QD62-H02 so that they can be the same with that of the module before replacement.
(Set the start number at "Start XY" of the I/O assignment tab. The number of occupied points of the QD62-H02 cannot be changed.)

*2: The rise/fall time of a pulse affects the counting speed. Countable counting speeds are as follows.
Counting a pulse whose rise/fall time is long may result in a miscount.

• For the AD61S1 and QD62-H02

Rise/fall time	1-phase input	2-phase input
t = 5 µs	10 KPPS	7 KPPS
t = 500 µs	500 PPS	250 PPS



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5.2 Replace DC input modules with 6 mA rated input current (QX41-S2, QX81-S2)

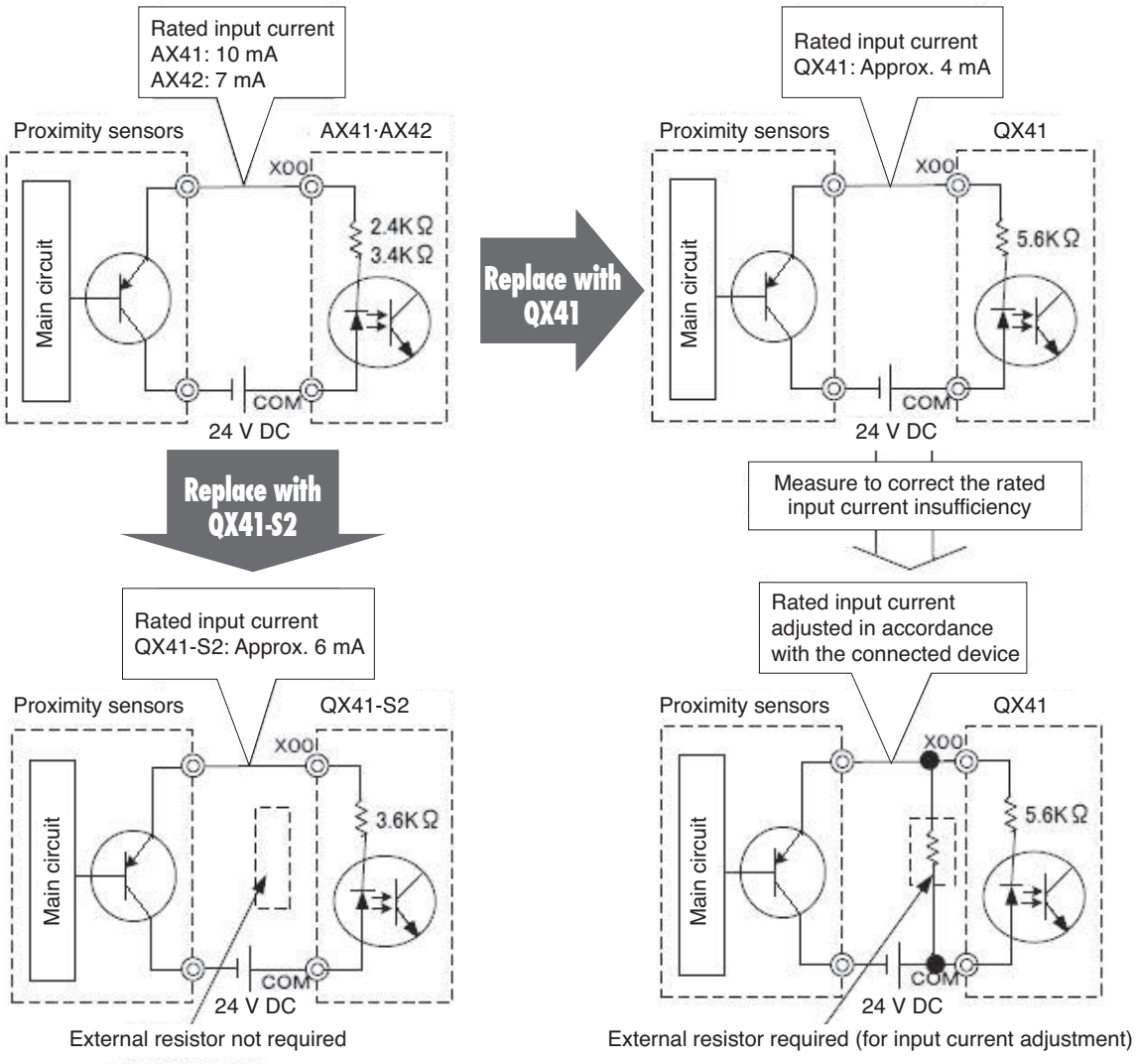
Solution and Benefit

- **When replacing with the existing A Series module, the rated input current of the DC input module becomes smaller.**
  In some cases, the previous Q Series DC input modules were not able to detect input signals from the external devices due to current insufficiency.
  Such issue can be solved by using DC input modules with 6 mA rated input current (QX41-S2 and QX81-S2).
- **The pin arrangement is identical to the existing Q Series DC input module (connector type). The existing external wiring can be utilized to reduce replacement time.**

(1) Image of internal circuit when replacing existing A Series DC input module

The following figures use AX41 and AX42 as an example of how to replace the existing A Series DC input modules (AX41, AX42, AX81, AX82, A1SX41 and A1SX81). The internal circuits show the rated input currents and provide countermeasures for current insufficiency.

* AX41 and AX42 have different common wiring, but the rated input current specifications and the countermeasure of installing an external resistor are the same.



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(2) Specification comparison

(1) Specification comparison of QX41-S2 input module (positive common (sink) type)

Item		Q Series		A (Large Type) Series		A (Small Type) Series
		QX41-S2	QX41	AX41	AX42	A1SX41
Number of input points		32	32	32	64	32
Rated input voltage		20.4 to 28.8 V DC		10.2 to 26.4 V DC		10.2 to 26.4 V DC
Rated input current	24 V DC	Approx. 6 mA	Approx. 4 mA	Approx. 10 mA	Approx. 7 mA	Approx. 7 mA
	12 V DC	(N/A)	(N/A)	Approx. 4 mA	Approx. 3 mA	Approx. 3 mA
Input resistance		Approx. 3.6 kΩ	Approx. 5.6 kΩ	Approx. 2.4 kΩ	Approx. 3.4 kΩ	Approx. 3.3 kΩ
Common terminal arrangement		32 points / common		8 points / common	32 points / common	32 points / common
External connection method		40 pin connector (With solder)		38-point terminal block connector (M3 × 6 screws)	40 pin connector (With solder) × 2	40 pin connector (With solder)

(2) Specification comparison of QX81-S2 input module (negative common (source) type)

Item		Q Series		A (Large Type) Series		A (Small Type) Series
		QX81-S2	QX81	AX81	AX82	A1SX81
Number of input points		32	32	32	64	32
Rated input voltage		20.4 to 28.8 V DC		10.2 to 26.4 V DC		10.2 to 26.4 V DC
Rated input current	24 V DC	Approx. 6 mA	Approx. 4 mA	Approx. 10 mA	Approx. 7 mA	Approx. 7 mA
	12 V DC	(N/A)	(N/A)	Approx. 4 mA	Approx. 3 mA	Approx. 3 mA
Input resistance		Approx. 3.6 kΩ	Approx. 5.6 kΩ	Approx. 2.4 kΩ	Approx. 3.4 kΩ	Approx. 3.3 kΩ
Common terminal arrangement		32 points / common		8 points / common	32 points / common	32 points / common
External connection method		37 pin D-sub connector		38-point terminal block connector (M3 × 6 screws)	37 pin D-sub connector × 2	37 pin D-sub connector

Tip

- The pin arrangement of the A Series connector type DC input module is the same as the Q Series. Since the current module connector's wiring can be used, the replacement can be completed just by switching the modules.
  Note that when using negative common (source) type modules, the A Series DC input module and the connector are reversed. However, connectors of the existing module can be utilized.
- QX41-S2 and QX81-S2 can also be used when Q large type base unit is used in combination with the upgrade tool manufactured by Mitsubishi Electric Engineering Co., Ltd. to connect the existing input module AX41/AX81's terminal block with the external wiring.

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5.3 Replace analog output positioning module (AD70/A1SD70) with Q Series

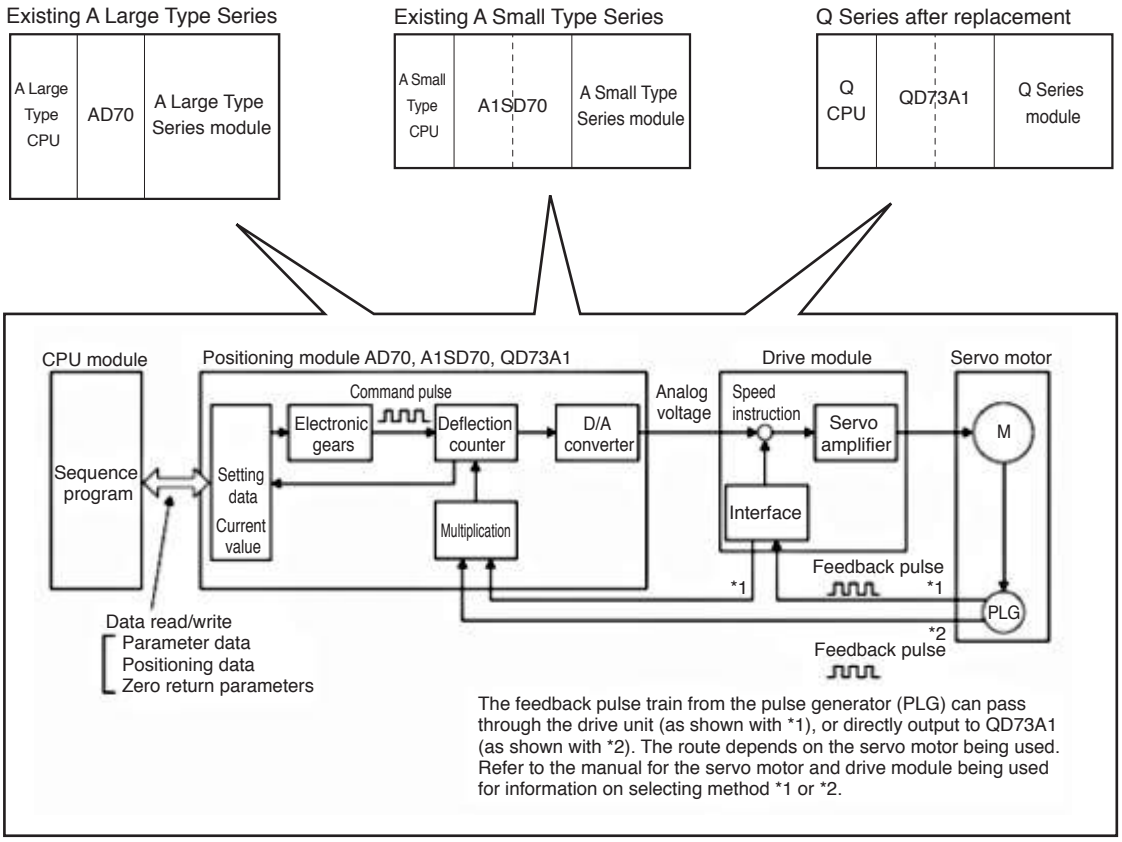
Solution and Benefit

Improve functionality of A Series analog output positioning module AD70, A1SD70 (upward compatibility)
Use the Q Series module positioning unit to replace without concern of the effect onto the machine system.

● Instructions

The existing analog output positioning module AD70/A1SD70 is replaced with the Q Series QD73A1.

(1) System configuration example



(2) Wiring for external device connection

The existing AD70/A1SD70 external device connection connectors can be used, so there is no need to change the wiring.
However, the connector orientation will be reversed when replacing the A1SD70.
The existing AD70/A1SD70 required an external 15 V DC ± current power supply, but the QD73A1 does not need an external power supply.

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○: Compatible, △: Partial change required, ×: Not compatible

Item		Model			Compatibility	Precautions for replacement
		AD70	A1SD70	QD73A1		
No. of control axes		1 axis			○	
Positioning data	Capacity	1 data			○	
	Setting method	Follows sequence program			○	
Positioning	Mode	Position control mode (positioning, 2-speed trapezoid positioning) Speed/position control changeover mode			○	
	Method	Position control mode: absolute method/incremental method Speed/position control changeover mode: incremental method			○	
	Position instruction	-2147483648 to 2147483647 (pulse) (with 32-bit sign)			○	
	Speed instruction	1 to 400,000 (pulse/s)		1 to 4,000,000 (pulse/s)	○	Specifications are enhanced. (Upward compatibility)
	Acceleration/ deceleration	Automatic trapezoid acceleration/deceleration			○	
	Automatic acceleration/ deceleration	Acceleration time: 2 to 9999 ms Deceleration time: 2 to 9999 ms			○	
	In-position range	1 to 2047 pulse		1 to 20479 pulse	○	Specifications are enhanced. (Upward compatibility)
	Backlash compensation	None			○	
	Error compensation function	None			○	
Speed instruction output		0 to ±10 V DC (setting range: +5 V to ±10 V)			○	
Positioning feedback pulse input	Pulse frequency	Open collector: 100 kpulse/s TTL: 100 kpulse/s Differential output: 100 kpulse/s		Open collector: 200 kpulse/s TTL: 200 kpulse/s Differential output: 1 Mpulse/s	○	Specifications are enhanced. (Upward compatibility)
	Connected encoder type	Open collector, TTL, differential output			○	
	Multiplication setting	Number of feedback pulse inputs can be multiplied to 4, 2, 1 or 1/2			○	
Zero return control		Provided (two types)			○	Setting method changes from hardware switch to CPU module parameters. The setting method is different, but the functions are the same.
JOG operation		Provided			○	
Starting time		Absolute method: 4.4 ms *1 Incremental method: 4.5 ms *1 JOG operation: 4.3 ms Zero return (near-point dog type): 4.4 ms Zero point return (count type): 5.1 ms		Absolute method: 1.2 ms*1 Incremental method: 1.2 ms*1 JOG operation: 1.2 ms Zero return (near-point dog type): 1.2 ms Zero point return (count type): 1.2 ms	○	Specifications are enhanced. (Upward compatibility)
M function		None			○	
Internal current consumption		5 V DC 0.3 A		5 V DC 0.52 A	×	The 5 V DC internal current consumption must be re-calculated.
External supply voltage, current terminal block		+ 15 V DC 0.2 A - 15 V DC 0.02 A		—	○	External power supply in not required.
Number of occupied I/O points		32 points (No. of I/O slots: 1 slot occupied) (I/O assignment: 32 points for special function module)	48 points (No. of I/O slots: 2 slots occupied) (I/O assignment: first 16 points for open slot Last 32 points for special function module)	48 points (No. of I/O slots: 2 slots occupied) (I/O assignment: first 16 points for open slot Last 32 points for intelligent function module)	○	
Weight		0.4 kg		0.20 kg	○	

*1: When using the 2-speed trapezoid with AD70/A1SD70, the starting time is 0.2 ms longer. When using the 2-speed trapezoid with QD73A1, the starting time does not increase.

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Tip

• The following points must be observed when making a replacement.

Item	AD70	A1SD70	QD73A1	Precautions
No. of occupied slots	1 slot	2 slots		*1
No. of occupied I/O points	32 points (I/O assignment: 32 points for special function module)	48 points (I/O assignment: first 16 points for open slot Last 32 points for special function module)	48 points (I/O assignment: first 16 points for open slot Last 32 points for intelligent function module)	*2
Buffer memory address	• Some address will change. • New items have been added with the revised specifications.			*3
Mode setting	• Follows hardware switch settings.		Follows CPU module parameter settings. "I/O assignment" -> "switch setting"	*4
LED display	• LED display items have changed.			*5
External wiring	• Current connector can be used without modifying wiring.			*6

*1: Modules occupying two slots cannot be mounted on the Q Series large base unit.
When selecting a Q Series large base to replace modules currently mounted on the same base, the modules must be split into two bases by adding an extension base.

*2: If the first half of the slots are set to "open 0 points" when replacing the existing A1SD70, set the parameter I/O assignment setting as shown below so that the QD73A1 address does not change after replacement.
(1) Set first half slots to "open 0 points"
(2) Set last half slots to same address as existing A1SD70 using the head XY setting
When replacing the existing AD70, set the first half slots to "open 0 points".

*3: The program must be revised and added. Refer to the QD731A Positioning Module User's Guide (Details Section).

*4: The mode setting required for positioning changes from hardware switch to parameter I/O assignment switch settings.
Refer to the QD731A Positioning Module User's Guide (Details Section) and set the switches to the same as the A1SD70.

*5: Each of the LED display items can be confirmed with the QD83A1 I/O signals. If necessary, prepare external lamps, etc., to correspond to the LED displays, and display the I/O input signal ON/OFF status for each item.

*6: The base dimensions for mounting QD73A1 are different, so the module mounting position will change.
The connector orientation will be reversed when replacing A1SD70.

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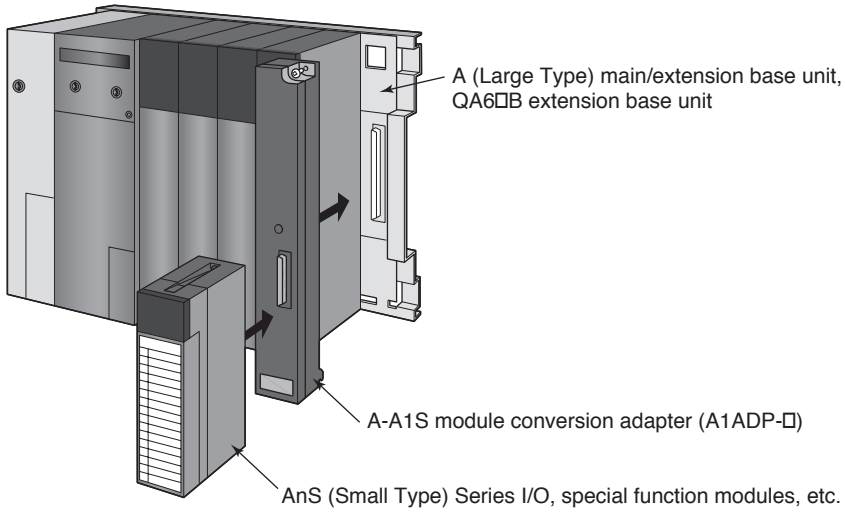
6. Replacement utilizing spare part

6.1 Use AnS (Small Type) modules as spare parts for existing A (Large Type) Series modules

Notice	Production of the AnS/QnAS (Small Type) Series and MELSEC-I/OLINK is scheduled to be discontinued on September 30, 2014. Refer to Technical News "No. FA-D-0142" for details regarding the production discontinuation.

A-A1S module conversion adapter

It allow the use of AnS (Small type) module that A-A1S module conversion adapter with AnS (Small Type) module is mounted on the base unit when A (Large Type) Series spare parts are not available.



Model list

Model	Outline
A1ADP-XY	For mounting I/O modules
A1ADP-SP	For mounting special function modules

Notes:

- Up to three adapters per base unit can be used.
- The A-A1S module conversion adapter can also be used with the QA6□B extension base unit, refer to "Transition from MELSEC-A/QnA (Large Type) Series to Q Series Handbook (Fundamentals)" L(NA)08043ENG or "A-A1S Module Conversion Adapter User's Manual" IB-0800352.
- Specifications differ between the A/QnA and AnS Series modules.
  For a comparison of the specifications, refer to "Transition from MELSEC-A/QnA Large Type Series to AnS/Q2AS Small Type Series Handbook" L(NA)08064ENG.

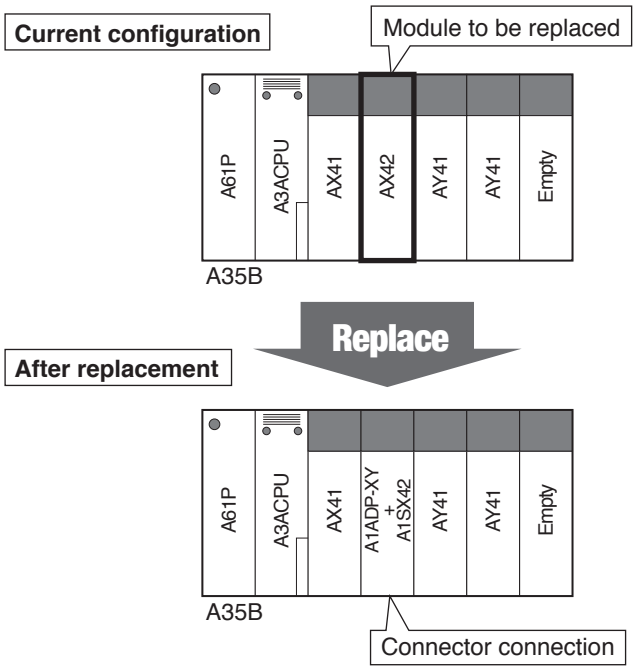
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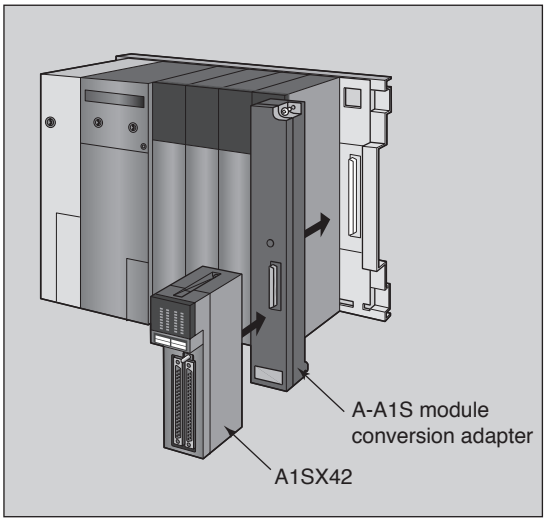
6.1.1 Use AnS (Small Type) I/O modules as spare parts for A (Large Type) input/output modules

Solution and Benefit

- **If the A (Large Type) I/O module malfunctions but replacement is not available, the AnS (Small Type) I/O module can be installed and used as a spare part, allowing the system to recover quickly.**
- **If the A (Large Type) I/O module is not available when the system requires an additional I/O module, the AnS (Small Type) I/O module can be installed and used as a spare part.**

(1) System configuration example





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(2) Module selection example

Product name	Existing module		Replacement module	
Power supply module	A61P	1	Utilize existing module	-
CPU module	A3ACPU	1	Utilize existing module	-
Main base unit	A35B	1	Utilize existing module	-
Input module	AX41	1	Utilize existing module	-
	AX42	1	A1SX42	1
A-A1S module conversion adapter (for A1S)	N/A	-	A1ADP-XY	1
Output module	AY41	2	Utilize existing module	-

Tip

- Replacement is simple because the A1SX42 (AnS (Small Type) module) has the same connector pin arrangement as the AX42 (A (Large Type) module). Reconnect the external wire connectors after replacing the modules.
- Some of the specifications (rated input current etc.) differ between the AX42 and the A1SX42. Refer to "Transition from MELSEC-A/QnA Large Type Series to AnS/Q2AS Small Type Series Handbook" L(NA)08064ENG for details.

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6.1.2 Use AnS (Small Type) module as spare parts for A (Large Type) computer link module

Solution and Benefit

- **If the computer link module malfunctions but A (Large Type) Series spare parts are not available, the AnS (Small Type) computer link module can be installed on the A1ADP adapter and used as a replacement, allowing the system to recover quickly.**
- **If the A (Large Type) computer link module is not available when the system requires an additional module, the AnS (Small Type) computer link module can be installed on the A1ADP adapter and used as a spare part.**

The following is an example of replacing an A (Large Type) computer link module with AnS (Small Type) computer link modules using the A-A1S module conversion adapter.

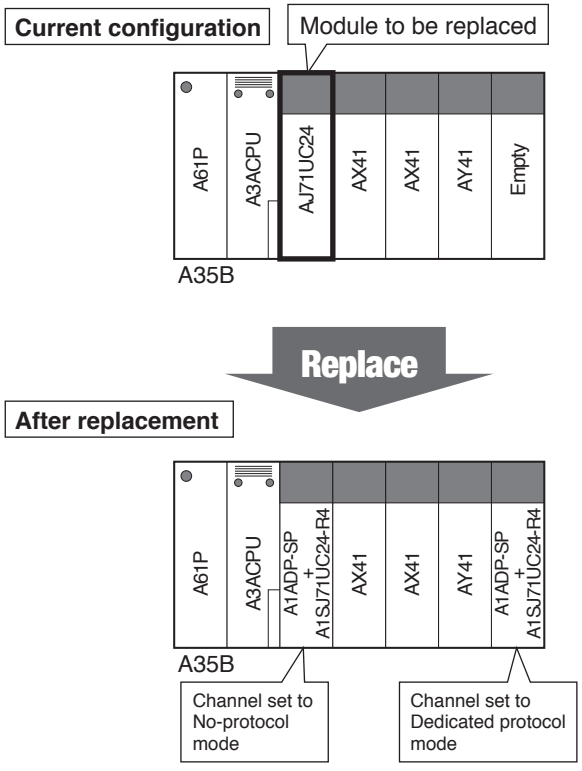
● Instructions

(1) The A (Large Type) computer link modules have two channels (RS232C and RS422), whereas the AnS Series computer link modules only have one. Therefore, if two channels are used, two modules are needed.

(2) A program modification is not required if:

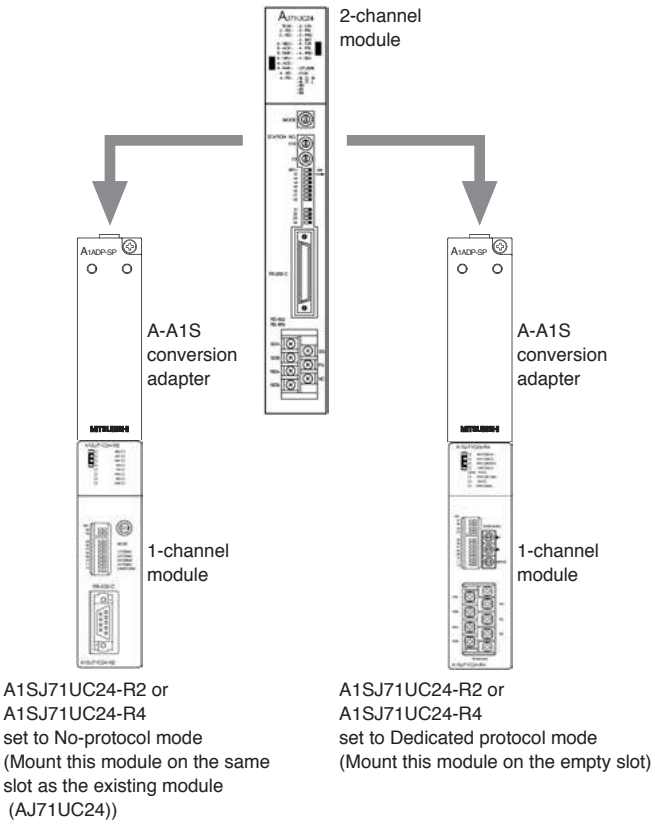
- The AnS module set to the No-protocol mode is mounted on the same slot as the existing module.
- The AnS module set to the Dedicated protocol mode is mounted on the empty slot.
  (This is because the No-protocol mode requires a transmission program but the Dedicated protocol mode does not.)

(1) System configuration example



(1) Computer link module options

Model	Outline
A1SJ71UC24-R2	RS232C: 1 channel
A1SJ71UC24-R4	RS422/485: 1 channel



A1SJ71UC24-R2 or A1SJ71UC24-R4 set to No-protocol mode (Mount this module on the same slot as the existing module (AJ71UC24))

A1SJ71UC24-R2 or A1SJ71UC24-R4 set to Dedicated protocol mode (Mount this module on the empty slot)

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● Module selection example (when two channels are used)

Product name	Existing module		Replacement module	
Power supply module	A61P	1	Utilize existing module	-
CPU module	A3ACPU	1	Utilize existing module	-
Main base unit	A35B	1	Utilize existing module	-
Input module	AX41	2	Utilize existing module	-
A-A1S module conversion adapter (for A1S)	N/A	-	A1ADP-SP	2
Computer link module	AJ71UC24	1	A1SJ71UC24-R2	1
			A1SJ71UC24-R4	1
Output module	AY41	1	Utilize existing module	-

Tip

- The AJ71UC24 and A1SJ71UC24-R2/A1SJ71UC24-R4 have the same buffer memory address and transmission X/Y address assignment for the No-protocol mode.
  Therefore, it is not required to modify the program if the module set to the No-protocol mode is mounted on the same slot as the existing module.
- The module set to the Dedicated protocol mode does not require a programmable controller program. Also, the external device connected to this module can communicate regardless of its slot address-changing the address does not affect communication.
  However, when the "On-demand function" is used, it is required to modify the program due to changes in the designated address for the "TO instruction" and handshake X/Y address.

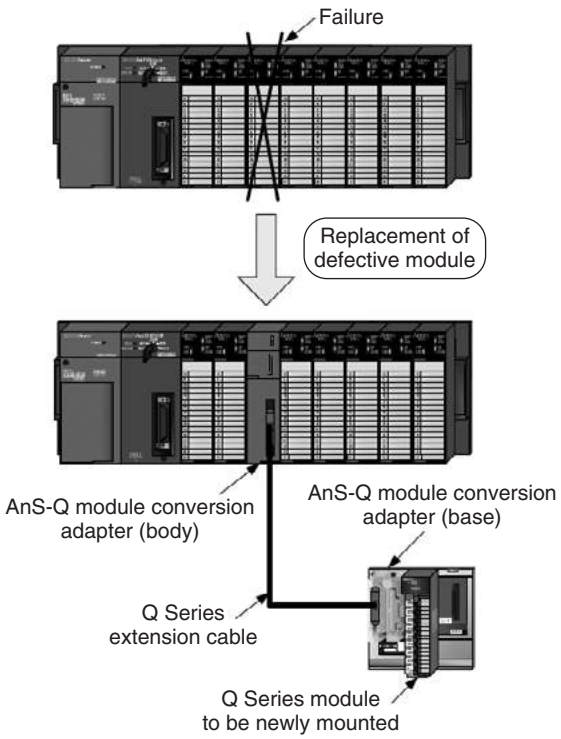
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6.2 Use Q Series modules with AnS/QnAS Series utilizing AnS-Q module conversion adapter

Solution and Benefit

In case of a failure of AnS (Small Type) module, even if a spare of the module is not available, the repair work can be completed quickly by replacing only the defective module with an equivalent Q Series module.

● Example of configuration with AnS-Q module conversion adapter



(1) Model list

Product name	Model	
AnS-Q conversion module adapter A1SADP-Q SET1 (Set of body and 1-slot base)	Body	A1SADP-Q
	Base	A1SADP-Q51B
AnS-Q conversion module adapter A1SADP-Q SET2 (Set of body and 2-slot base)	Body	A1SADP-Q
	Base	A1SADP-Q52B
Q Series extension cable	QC05B, QC06B, QC12B, QC30B	

Tip

1. The existing AnS module and the newly mounted Q Series module may differ in part of the specifications or may not be program compatible. Reconfirm the specifications, or reexamine the program.
2. When an existing AnS module is replaced with a Q Series module, the existing wiring of the AnS module can be used by using a conversion adapter manufactured by MEE. However, conversion adapters with fixing mounts cannot be used.
   For details, refer to "Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Fundamentals)."

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Part Ⅱ: Programming

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7. Precautions for utilizing ACPU programs in QCPU

Pay attention to the following points when executing "Change PLC type" and utilizing the ACPU program with the QCPU.

- The instruction format will change, so the instructions may be switched to a different type when the PLC type is changed.
  Instructions that use an accumulator (A0, A1) with the ACPU do not describe the device name or device No. in the instruction format. However, these are described in the instruction format with the QCPU instruction.
- The instruction specifications will differ, so the program must be corrected.
- There are replacement candidate instructions when executing "Change PLC type", but these will be switched to "SM1255" as instructions that cannot be replaced because of a difference in specifications.

There are several inquires for explaining the specifications of the replacement instructions and for revising the program after replacement.
Matters frequently asked questions when utilizing the QCPU program with the QCPU are explained as precautions.

● Peripheral devices using existing A (Large Type) and A0J2 Series CPU program

The following CPU types are incompatible with GX Developer, so the PLC type must be changed to GX Developer compatible CPU types with the following instructions before the programs can be used.

- **CPUs not compatible with GX Developer**
  AnCPU (including those with link function)
  A3HCPU (including those with link function)
  A3MCPU (including those with link function)
  A0J2CPU (including those with link function)
  A52GCPU, A3VCPU, A73CPU

The CPU types incompatible with GX Developer can be changed to those compatible with GX Developer through "Change PLC type" by using the A/QnA -> Q conversion support tool.
Refer to Section 9.1 for the PLC type change operation by using the A/QnA -> Q conversion support tool.

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7.1 Replace instructions with different QCPU instruction format (excluding AnACPU/AnUCPU dedicated instructions)

7.1.1 Instructions that use accumulators (A0, A1)

Some QCPU operation processing instructions are different from their corresponding ACPU instructions in format.
This section explains the instructions that have different specified formats.

Frequently asked questions regarding the conversion of ACPU to QCPU program

(Inquiry example)

1. Instructions with different format from that of ACPU instructions are used when upgrading to QCPU. Is further program modification necessary?

2. The devices "SD718 and SD719", which were not used in ACPU, are automatically part of the QCPU instructions after replacement. What are these devices for? Is operation affected by these devices?

3. "Change PLC type" executes a direct conversion of several ACPU instructions, such as assignment and saving of operation data, but the instruction format remains similar to that of ACPU instructions. Is it possible to further simplify the QCPU instructions using a similar method?

(Answer)

ACPU instructions that use accumulators (A0 and A1) have different formats when converted to QCPU instructions. These accumulators are replaced by devices SD718 and SD719.
Therefore, the same operation as in ACPU is executed even if the instruction format is different and SD718 and SD719 are used.
In addition, a group of multiple instructions, such as instructions to transfer data to the ACPU accumulators (A0 and A1), can be converted to QCPU instructions and further modified to simplify the program and reduce the number of steps.

(1) Instructions that use accumulators (A0 and A1)

(1) ACPU

Instructions that use accumulators (A0 and A1) can execute operations without explicitly specifying A0 and A1 as the source and destination device. Also, the operation result is stored in the accumulators A0 and A1 without specifying the device in which it is stored in.

(2) QCPU

QCPU instructions need to specify a source and destination device.

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(2) ACPU to QCPU instruction replacement

Replacing ACPU program with QCPU program using "Change PLC type" converts ACPU instructions into QCPU instructions. Therefore, even if the accumulators A0 and A1 are not explicitly specified in the ACPU program, the devices SD718 and SD719 will automatically take over the accumulators' functionalities in the QCPU program.

However, if A0 and A1 are explicitly described in the ACPU program, the devices SD718 and SD719 will directly replace the accumulators.

The program converted through "Change PLC type" will execute normally and modifications are not necessary.

(3) Changing to QCPU instruction format

The automatically converted programs will execute without problems. However, modifying the instructions into QCPU format will significantly simplify the program and reduce the number of steps.

(4) List of instructions that use accumulators (A0 and A1)

Function	QCPU/QnACPU		AnUCPU/AnACPU/AnNCPU	
	Format of instructions	Remarks	Format of instructions	Remarks
Right rotation of 16-bit data	ROR D n	• D: Rotation data	ROR n	• Rotation data is set in A0.*1
	RCR D n	• D: Rotation data • Use SM700 for carry flag	RCR n	• Rotation data is set in A0.*1 • Use M9012 for carry flag.
Left rotation of 16-bit data	ROL D n	• D: Rotation data	ROL n	• Rotation data is set in A0.*1
	RCL D n	• D: Rotation data • Use SM700 for carry flag	RCL n	• Rotation data is set in A0.*1 • Use M9012 for carry flag.
Right rotation of 32-bit data	DROR D n	• D: Rotation data	DROR n	• Rotation data is set in A0, A1.*2
	DRCR D n	• D: Rotation data • Use SM700 for carry flag	DRCR n	• Rotation data is set in A0, A1.*2 • Use M9012 for carry flag.
Left rotation of 32-bit data	DROL D n	• D: Rotation data	DROL n	• Rotation data is set in A0, A1.*2
	DRCL D n	• D: Rotation data • Use SM700 for carry flag	DRCL n	• Rotation data is set in A0, A1.*2 • Use M9012 for carry flag.
16-bit data search	SER S1 S2 D n	• Search result is stored in D, D +1 device	SER S1 S2 n	• Search result is stored in A0, A1.
32-bit data search	DSER S1 S2 D n	• Search result is stored in D, D +1device	DSER S1 S2 n	• Search result is stored in A0, A1.
16-bit data checks	SUM S D	• Check result is stored in D device	SUM S	• Check result is stored in A0.
32-bit data checks	DSUM S D	• Check result is stored in D device	DSUM S	• Check result is stored in A0.

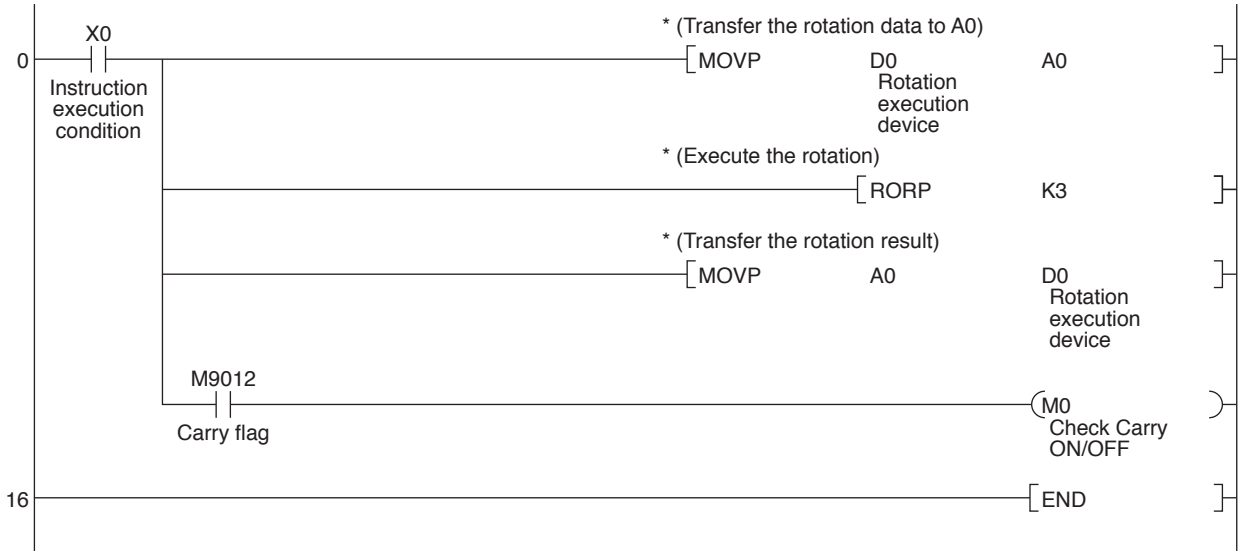
*1 Rotation result is stored in A0.
*2 Rotation result is stored in A0 and A1.

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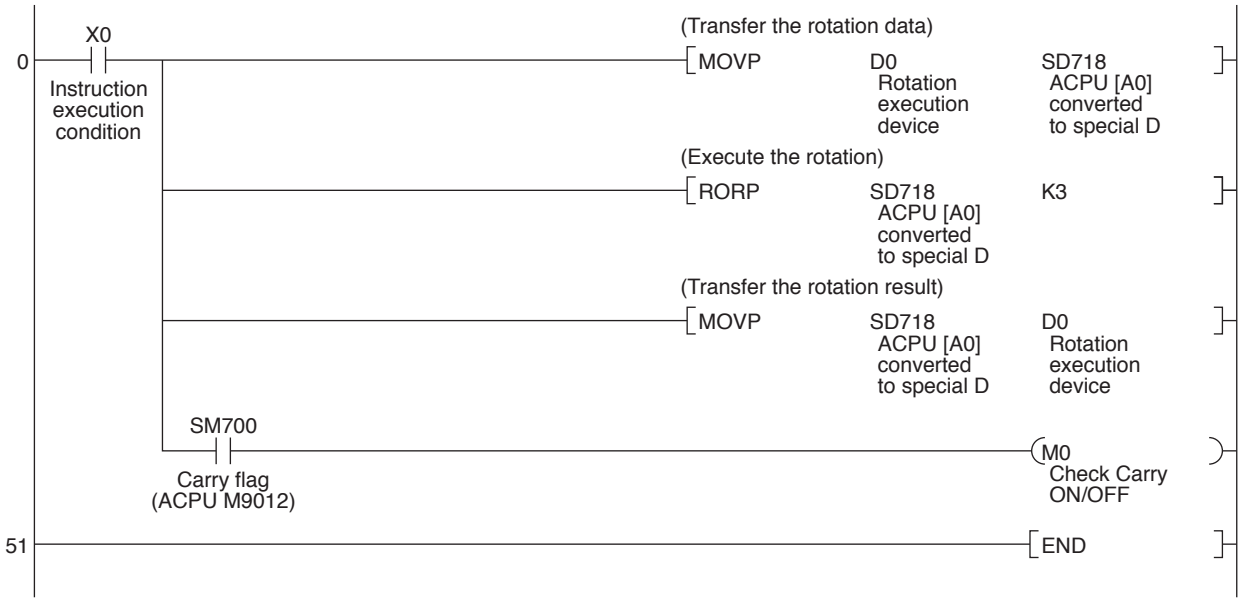
(5) Program replacement example

(1) Right rotation of 16-bit data instruction（ROR）

ACPU program

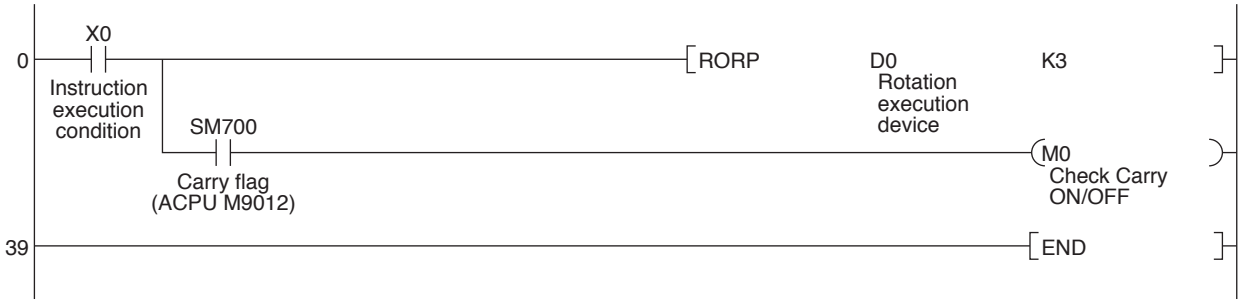


Replacement QCPU program



Equivalent QCPU program in instruction format

Execute rotation of and store the result in the specified device.

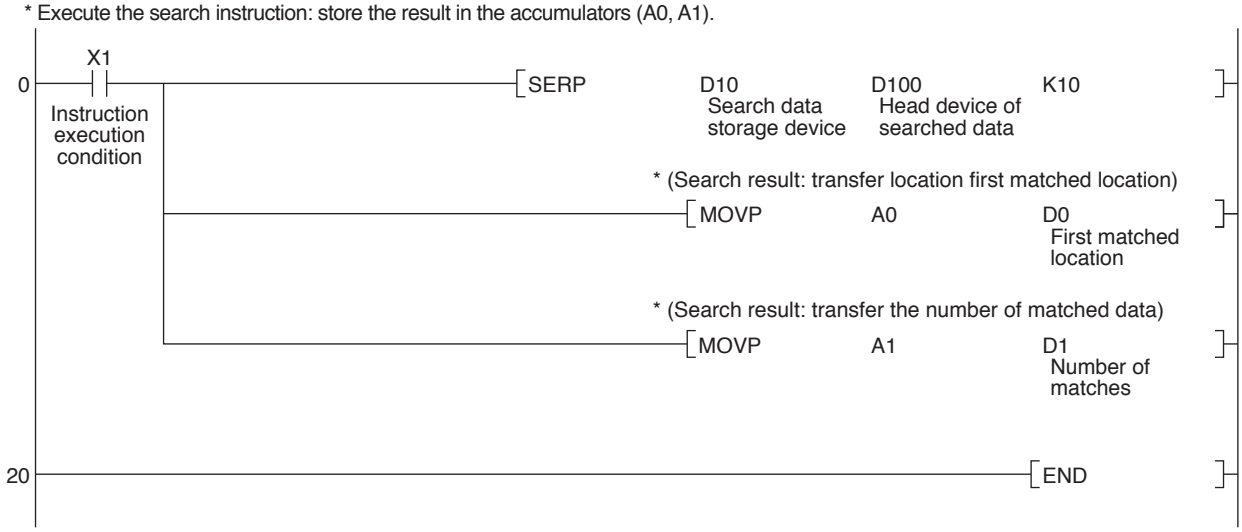


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(2) Search instruction（SER）

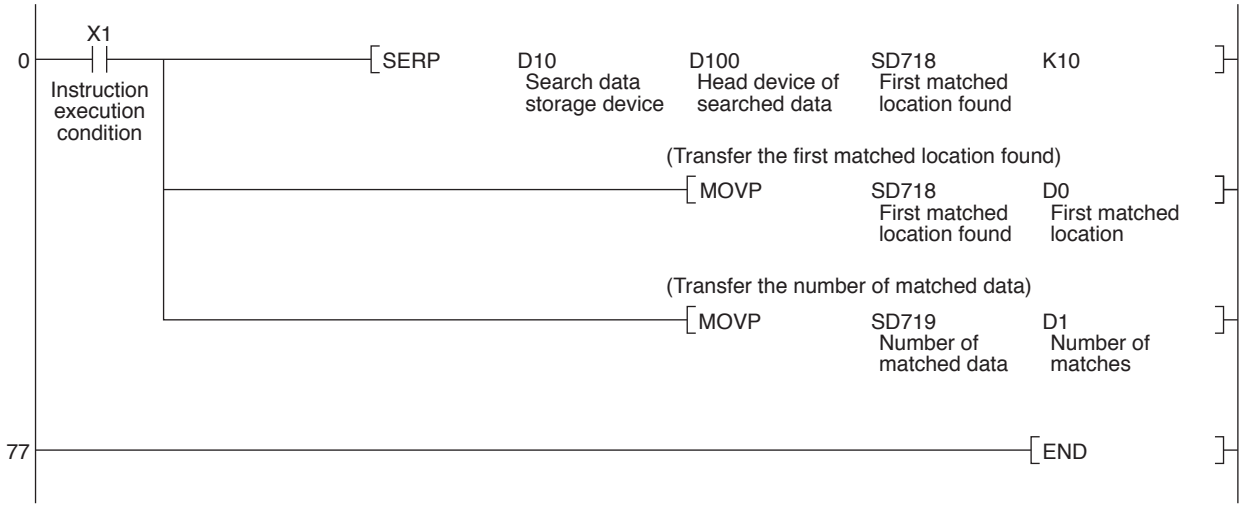
ACPU program

* Execute the search instruction: store the result in the accumulators (A0, A1).



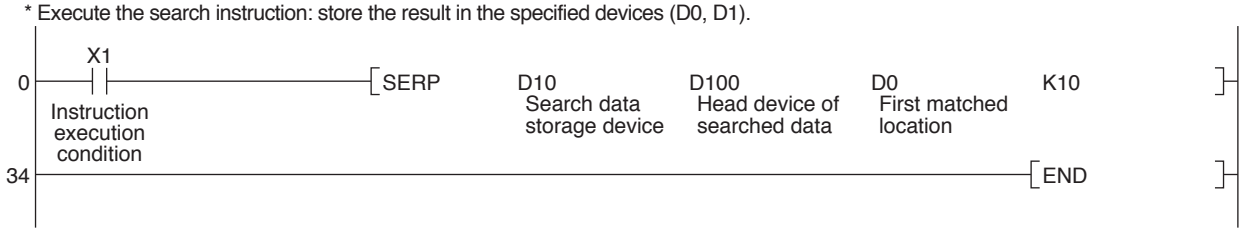
Replacement QCPU program

* Execute the search instruction: store the result in SD718 and SD719, which are replacement for A0 and A1.



Equivalent QCPU program in instruction format

* Execute the search instruction: store the result in the specified devices (D0, D1).



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7.1.2 ASCII code conversion instruction "ASC"

ASCII code conversion instruction is replaced with "SM1255" because it is an unconvertible instruction and its specification is incompatible with QCPU. Modification in accordance with the specifications is needed. (For Basic model QCPUs, it is replaced with "SM999".)
This section explains replacement of the ASCII code conversion instruction "ASC".

Frequently asked questions regarding the conversion of ACPU to QCPU program

(Inquiry example)

1. Instead of the "$MOV" instruction, which has similar functionality, the ASCII code conversion instruction "ASC" is replaced with "SM1255" as an unconvertible instruction. Are the "$MOV" and "ASC" instructions the same?

2. The Transition Handbook (Fundamentals) lists $MOV as a conversion candidate for the "ASC" instruction. Are there any precautions in this modification?

(Answer)

The "ASC" instruction in ACPU, and the "$MOV" instruction in QCPU are slightly different. For this reason, "ASC" is replaced with "SM1255" as an unconvertible instruction. Check the specifications and functions before changing to the "$MOV" instruction.

(1) Specifications of ASCII codes conversion instruction

The following are the ASCII code conversion instruction specifications for ACPU and QCPU

(1) ACPU (Instruction: ASC)

- Converts up to 8 characters.
- When there are 7 characters or less, it is converted and stored as 8 characters (4 words). (space (20H) is stored until reaching 8 characters.)
- "P" is not appended to the instruction, however, the operation is only executed when the execution condition pulses ON.

(2) QCPU (Instruction: $MOV)

- Converts up to 32 characters.
- Device points of storage destination may change (number of characters + 1 byte (rounded up in units of word)).
- Execute the operation as long as the execution condition is ON.
  (To execute the operation only when the condition for instruction execution pulses ON, change the instruction to "$MOVP".)

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(2) Occupied device points

The "ASC" instruction in ACPU occupies 4 words. The number of device points occupied by the "$MOV" instruction in QCPU may change according to the number of characters+1 byte.

When replacing an "ASC" instruction that specifies 8 characters with the "$MOV" instruction in QCPU, the number of occupied points increases because the stored ASCII code occupies 4 devices + 1 word (delimiter "00H"). If the additional device was being used for other purposes, its content will clear to "0000H".

Modification is necessary when the devices used by the "ASC" instruction +1 are used for other operations.

(Example of stored data)

(1) 5 characters

ACPU: (ASC 1234A D0)

QCPU: ($MOV "1234A" D0)

Device	ACPU	QCPU
D0	3231 (H)	3231 (H)
D1	3433 (H)	3433 (H)
D2	2041 (H)	0041 (H)
D3	2020 (H)	No change
D4	No change	No change

(2) 8 characters

ACPU: (ASC 1234ABCD D0)

QCPU: ($MOV "1234ABCD" D0)

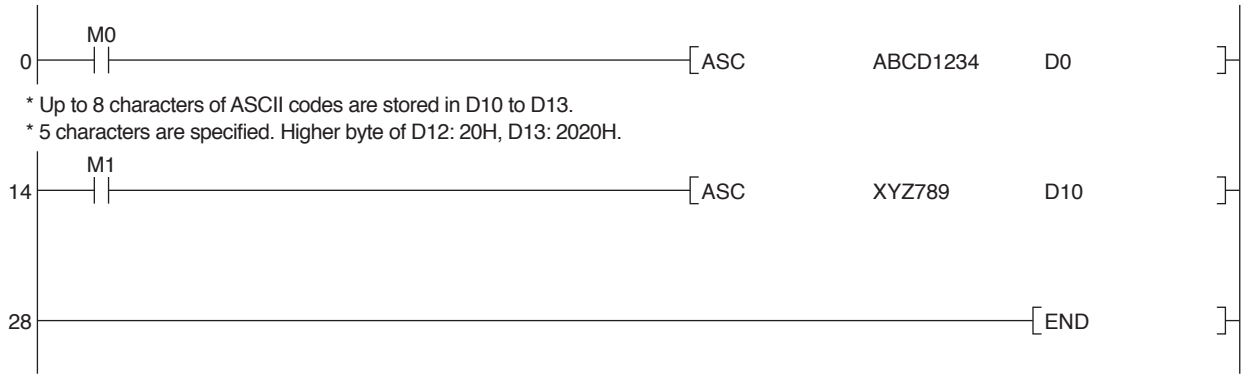
Device	ACPU	QCPU
D0	3231 (H)	3231 (H)
D1	3433 (H)	3433 (H)
D2	4241 (H)	4241 (H)
D3	4443 (H)	4443 (H)
D4	No change	0000 (H)

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(3) Program replacement example

ACPU "ASC" instruction program

* Up to 8 characters of ASCII codes are stored in D0 to D3.



* Up to 8 characters of ASCII codes are stored in D10 to D13.
* 5 characters are specified. Higher byte of D12: 20H, D13: 2020H.

Replacement QCPU program

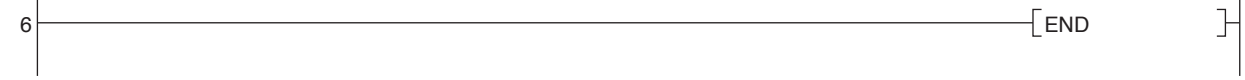
(Unconvertible instructions are replaced with SM1255)

* Conversion to character string instruction, ASC, is unconvertible and replaced with "SM1255".



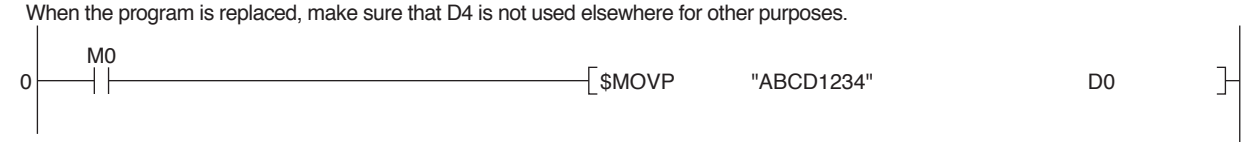
* Conversion to character string instruction, ASC, is unconvertible and replaced with "SM1255".



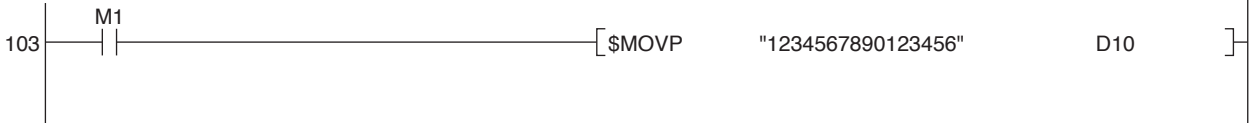


Modified QCPU program using "$MOV" instruction

8 characters are specified, and ASCII codes are stored in D0 to D3.
Since "00H" is added after the last character, "0000H" is stored in D4.
When the program is replaced, make sure that D4 is not used elsewhere for other purposes.



Stores ASCII code of up to 32 characters in D10.
The last occupied device is D25 when 32 characters are specified.
However, "0000H" is stored in D26 because "00H" is added after the last character.





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7.2 Replace AnACPU/AnUCPU dedicated instructions

AnACPU/AnUCPU dedicated instructions can be converted into QCPU instruction format. This section explains the replacement of AnACPU/AnUCPU dedicated instructions.

Frequently asked questions regarding the conversion of ACPU to QCPU program

(Inquiry example)

Several AnACPU/AnUCPU dedicated instructions were used in the program. However, converting the program to QCPU format reduced them to just one instruction. Can this program be executed as it is?

(Answer)

Replacing AnACPU/AnUCPU dedicated instructions with QCPU instructions changes and simplifies the instruction format.

Further modification of the program is not necessary.

(Inquiry example)

Can the AnACPU/AnUCPU dedicated instructions for special function modules also be replaced?

(Answer)

AnACPU/AnUCPU special function modules and QCPU intelligent function modules have different functions, specifications, number of occupied points, etc.

The AnACPU/AnUCPU special function module instructions cannot access the QCPU, therefore, they are replaced with "SM1255" as unconvertible instructions.

Modify the program according to the functions and specifications of QCPU intelligent function modules.

Instructions for extended file registers and data link are also replaced with "SM1255."

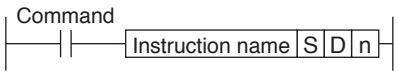
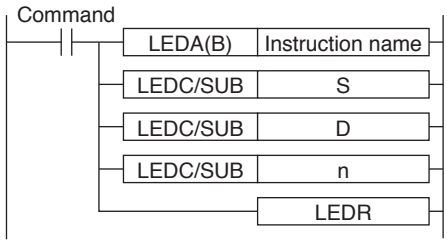
Please modify the instructions in accordance with QCPU functions and specifications.

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(1) Representations of dedicated instruction

The QCPU unifies AnACPU/AnUCPU dedicated instructions- LEDA, LEDB, LEDC, SUB, and LEDR- into one single instruction, which has the same format as the basic and application instructions.

Instructions that do not have a corresponding QCPU instruction are replaced with "OUT SM1255". Replace or delete the instructions that have been converted to "OUT SM1255".

QCPU	AnACPU/AnUCPU
	 S, D, n indicate the data used in the instructions.

(2) Dedicated instructions with changed instruction names

In AnACPU/AnUCPU, dedicated instructions share the same name as basic and application instructions.

In QCPU, instruction names have been changed.

Function	QCPU	AnACPU/AnUCPU
Floating decimal point addition	E+	ADD
Floating decimal point subtraction	E-	SUB
Floating decimal point multiplication	E*	MUL
Floating decimal point division	E/	DIV
Data dissociation	NDIS	DIS
Data linking	NUNI	UNI
Changing check pattern	CHKCIR, CHKEND	CHK, CHKEND

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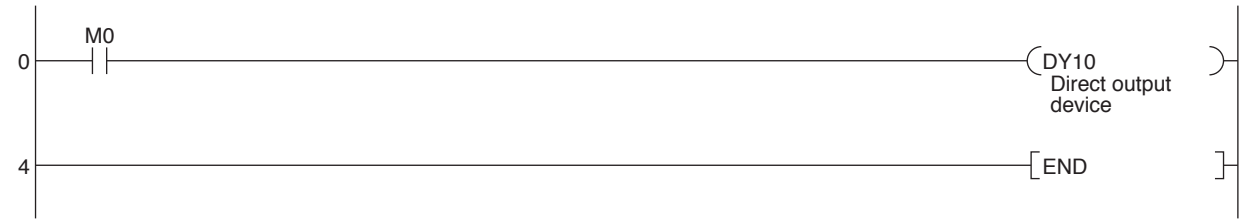
(3) Program replacement example

(1) Direct output instructions

AnACPU/AnUCPU program

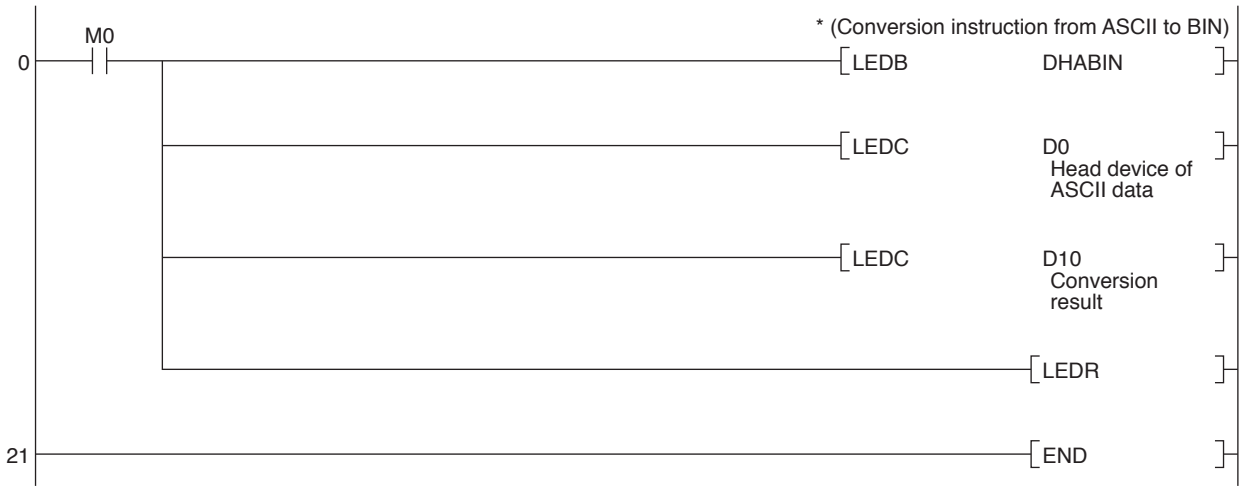


Replacement QCPU program

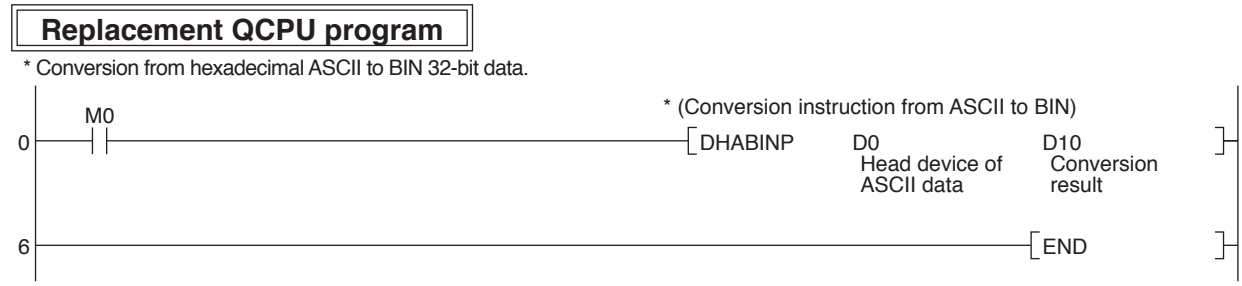


(2) Conversion instruction from hexadecimal ASCII to BIN 32-bit data

AnACPU/AnUCPU program



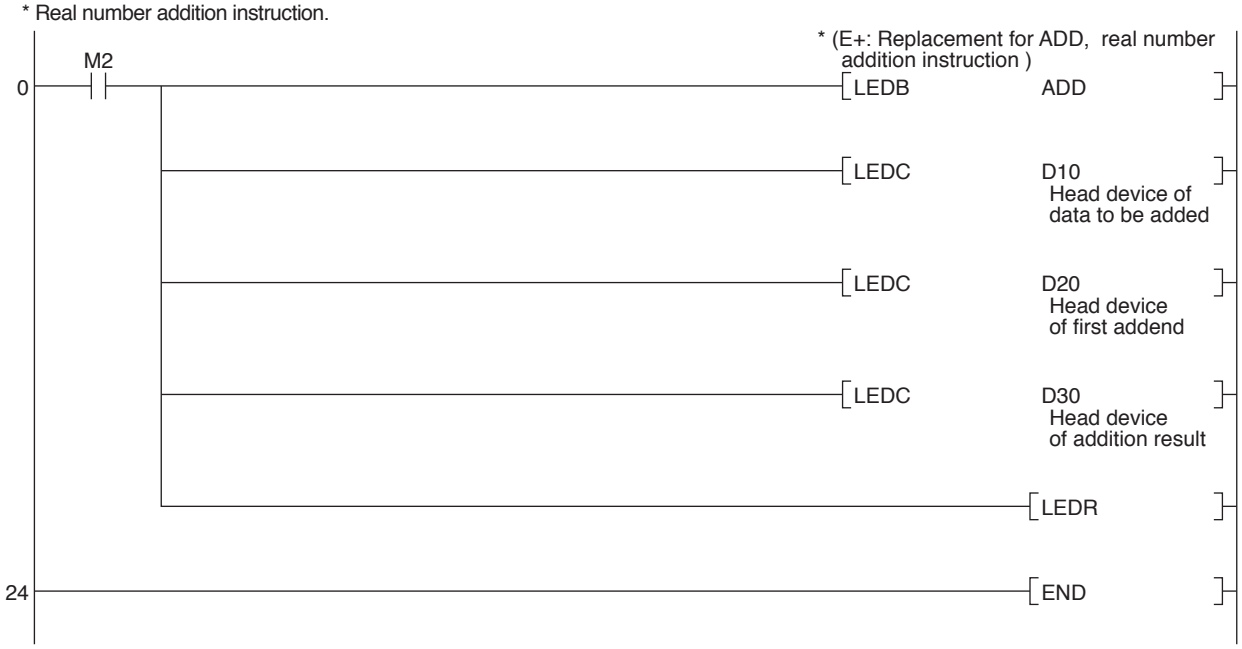
Replacement QCPU program



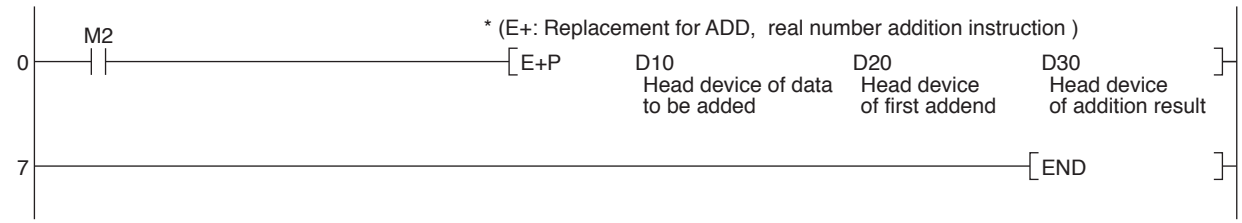
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(3) Addition instruction of floating decimal point type real number

AnACPU/AnUCPU program



Replacement QCPU program



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7.3 Use index register as a 32-bit (2-word) device

After replacing ACPU instructions that use index registers, review and modify the programs because the A Series and Q Series index registers differ in specifications (Z and V are for ACPU, and Z0 to Z15 are for QCPU). The following are precautions for converting ACPU instructions that use index registers.

Frequently asked questions regarding the conversion of ACPU to QCPU program

(Inquiry example)

1. Device modification using index registers resulted in different Z and V device numbers. Which QCPU devices are the Z and V devices in ACPU replaced with?

2. Index registers were used as 32-bit devices (2 words) in ACPU. However, when upgrading to QCPU, the values of the index registers used for other purposes were overwritten.
   Can index registers be used as 32-bit devices (2 words) in QCPU?

(Answer)

The ACPU index registers, Z, Z1 to Z6, V, and V1 to V6, are replaced with Z0 to Z15.
If the index registers were used as 16-bit devices (1 word) in ACPU, the device numbers will change once upgraded to QCPU. However, modification of the program is unnecessary.
If the index registers were used as 32-bit devices (2 words) in ACPU, the combination of Z and V converts to Zn and Zn+1 in QCPU.
The index register numbers are different after replacement and modification of the program is necessary.

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(1) Replacing index register

"Z, Z1 to Z6, V, V1 to V6" and "Z0 to Z15" are used as index register for the ACPU and QCPU, respectively. Therefore, their specifications differ.

"V" is used as edge relay for the QCPU. This device is used to store the PLS/PLF information of the contacts found at the start of the ladder block.

The following table shows how the index registers should be replaced when changing ACPU programs to QCPU programs using "Change PLC type".

ACPU	QCPU
Z	Z0
Z1 to Z6	Z1 to Z6
V	Z7
V1 to V6	Z8 to Z13

Tip

When indexing timer/counter contact instructions, such as "LD T0", the index register limitations do not apply to AnA/AnUCPU.

Due to the specifications, only index registers Z0 and Z1 can be used to index timer/counter contact instructions in QCPU.

If the existing AnA/AnUCPU program uses index registers other than Z and Z1, the instructions are unconvertible and are replaced with SM1255. In this case, it is necessary to modify the program.

(2) Index register 32-bit specification

When using index registers in 32-bit instructions in ACPU, Z register is the low- order 16 bits and the V register, with the same number as Z, is the high-order 16 bits.

Alternatively, the QCPU treats Zn and Zn + 1 as the low-order and high-order 16 bits respectively.

The index registers should be corrected if "Change PLC type" is performed on a program that includes 32-bit index registers.

The following is an example of instructions that have 32-bit operation results.

Instruction	ACPU	QCPU
DMOV D0 Z1	V1, Z1 (High order) (Low order)	Z2, Z1 (High order) (Low order)
/ D0 D1 Z1	Z1(Quotient) V1(Remainder)	Z1(Quotient) Z2(Remainder)

When converting an ACPU program to QCPU using "Change PLC type", the operation result may be stored to an unintended index register number.

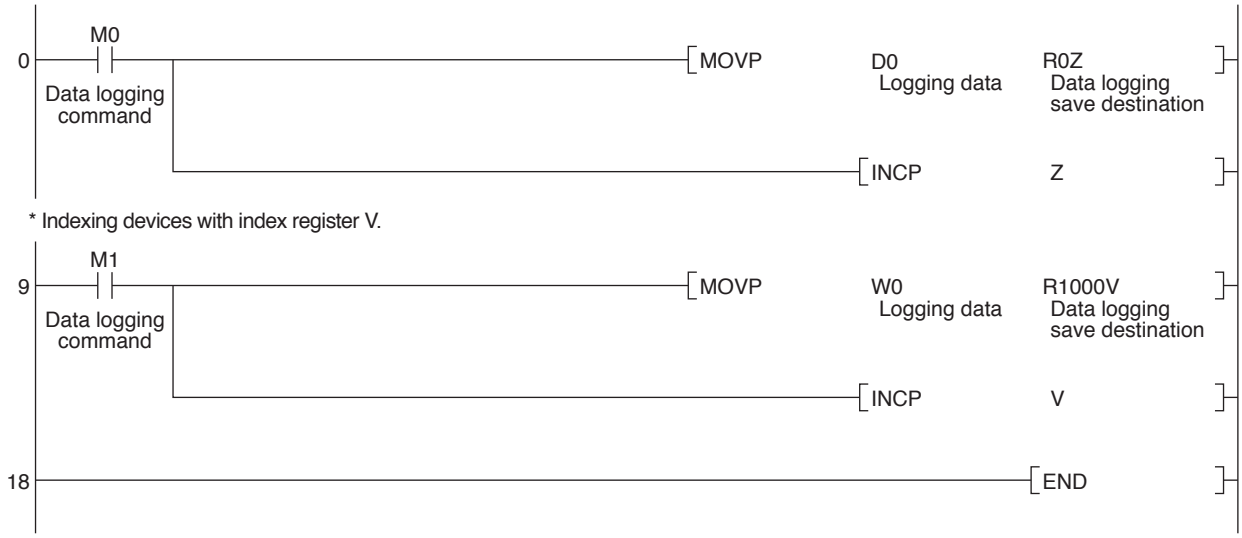
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(3) Program replacement example

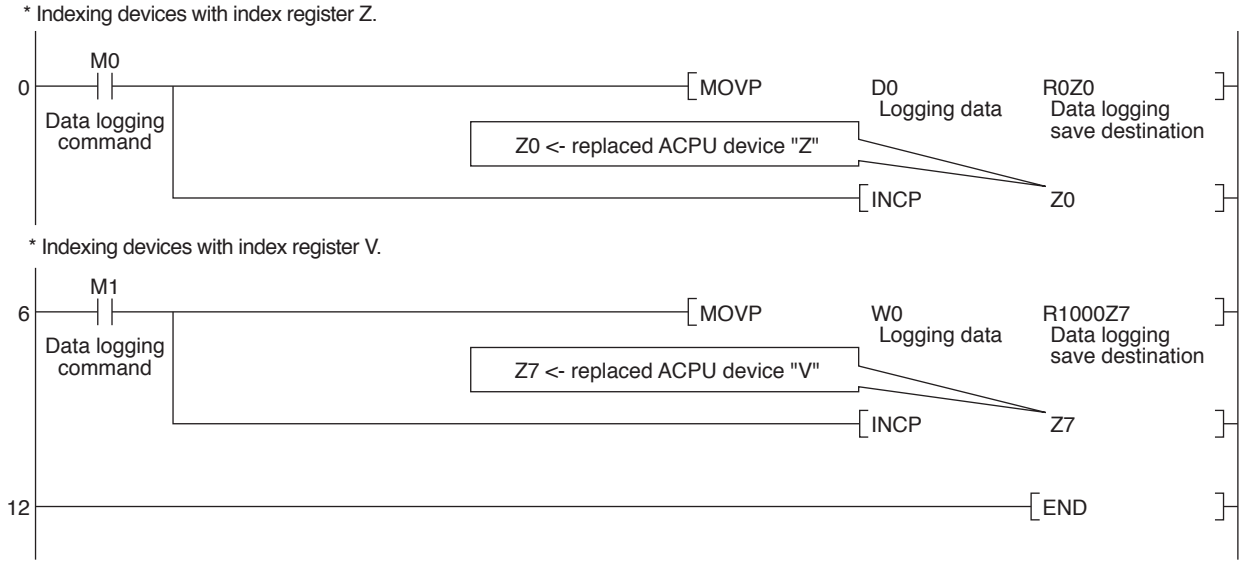
(1) When using index register as 16-bit (1-word) data

The index register numbers will change after converting the ACPU program to QCPU, but it is not necessary to modify the program.

ACPU program



Replacement QCPU program

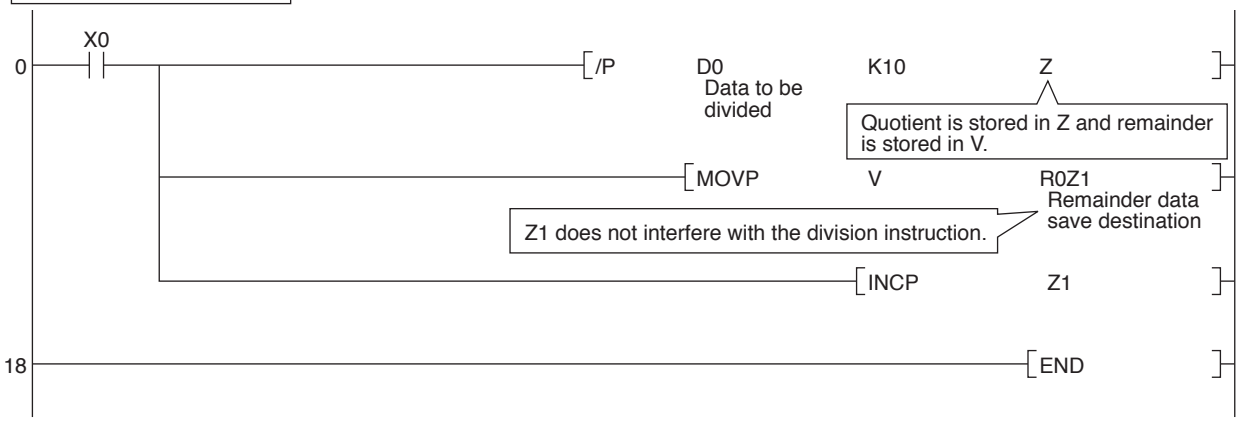


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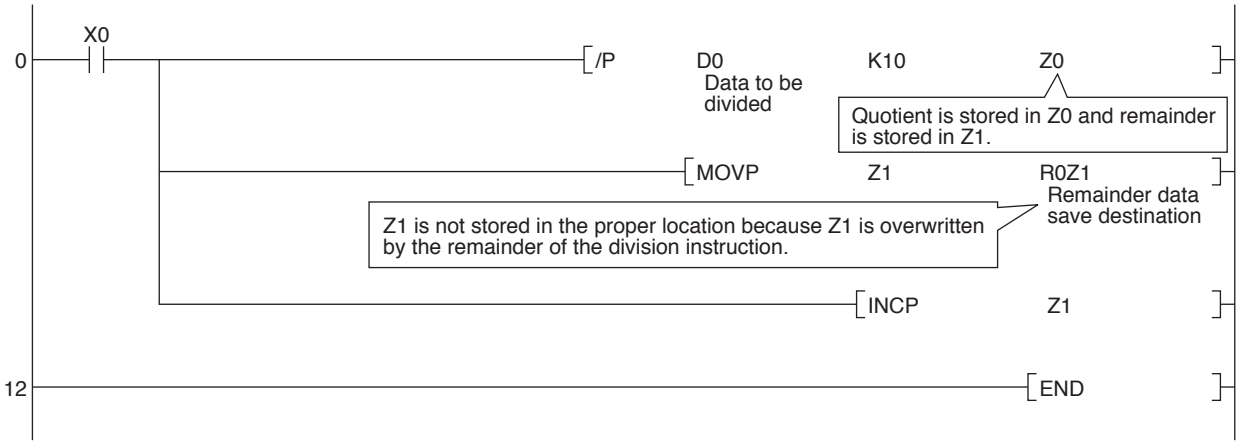
(2) When using index register as 32-bit (2-word) data

The index register numbers and their combination will change after converting the ACPU program to QCPU. It is necessary to modify the program.

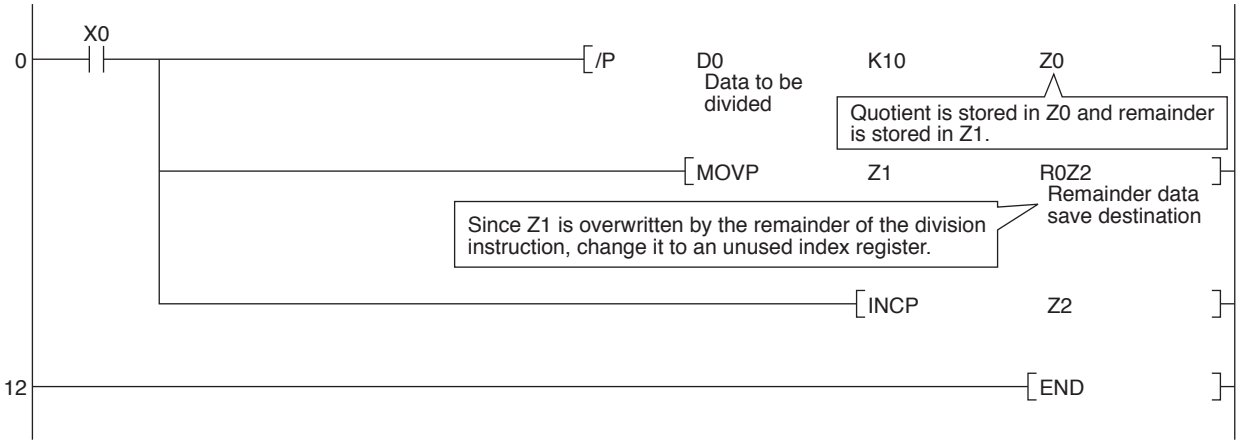
ACPU program



Replacement QCPU program



Modified/corrected QCPU program



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7.4 Utilize SFC programs (Replace MELSAP-II with MELSAP3)

Solution and Benefit

- **The SFC program (MELSAP-II) created in ACPU can be converted to QCPU SFC program (MELSAP3) through "Change PLC type" in GX Developer. This program can be used without further modifications.**
- **SFC program (MELSAP3) has the same specifications in QnACPU as in QCPU. Therefore, it is not necessary to modify the program after executing "Change PLC type" in GX Developer.**
- **SFC programs (MELSAP-II and MELSAP3) created with MS-DOS-compatible programming software (SW□IVD/NX-GPPA and SW□IVD/NX-GPPQ) can be converted and utilized after being imported to GX Developer.**

This chapter explains how to replace SFC programs (MELSAP-II) created in ACPU with SFC programs (MELSAP3) for QCPU and the necessary modifications after the replacement.

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(1) Operation for utilizing SFC program

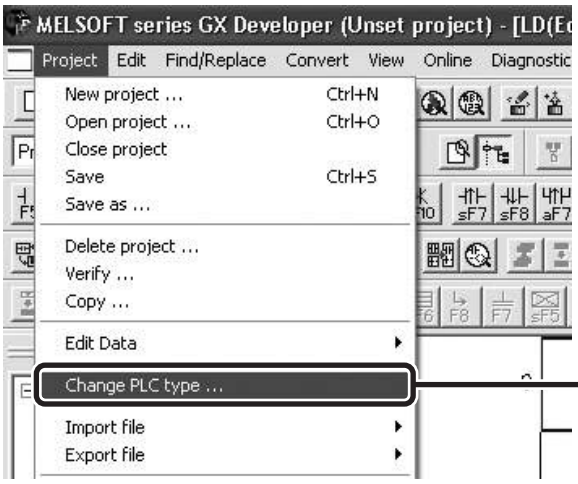
Procedure 1: Changing programmable controller type in GX Developer

"Change PLC type" is a function that changes the target programmable controller type of the data being read through GX Developer. The sequence programs are also automatically converted to comply with the target programmable controller. However, instructions that cannot convert automatically are replaced with the instructions shown below.

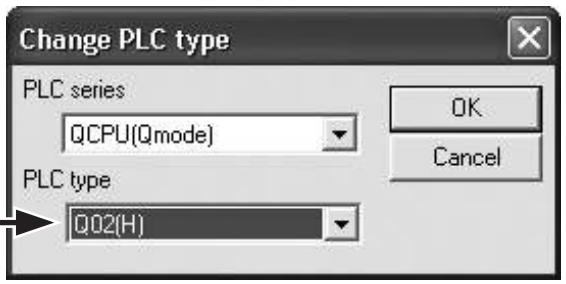
- High Performance Model QCPU: OUT SM1255
- Basic Model QCPU: OUT SM999

Search for these "OUT" instructions or SM1255/SM999 devices and manually modify the converted programs. Additionally, intelligent function modules and network modules may require program and parameter modifications.

(Project menu)



([Change PLC type] window)



* For detail operation instructions, refer to the following manual.
Transition from MELSEC-A/QnA(Large Type)Series to Q Series Handbook(Fundamentals)(L-08043ENG)
[7.1.2 Changing programmable controller type]

Tip

Files in GPPQ/GPPA format, which were created/saved using SW□IVD-GPPA, SW□IVD/NX-GPPQ, should be converted into GX Developer format using "Import file".
Execute "Change PLC type" after the file is imported to GX Developer.

* For detail operation instructions, refer to the following manual.
Transition from MELSEC-A/QnA(Large Type)Series to Q Series Handbook(Fundamentals)(L-08043ENG)
[7.1.4 Reading (Reusing) other format files]

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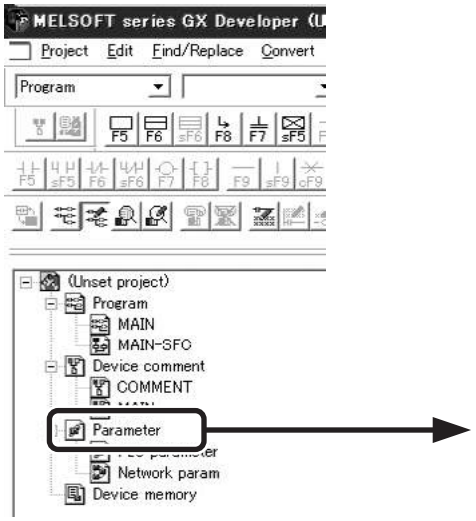
Procedure 2: Program settings in GX Developer

When SFC programs have been created as ACPU program file, they are replaced with the following 2 programs.

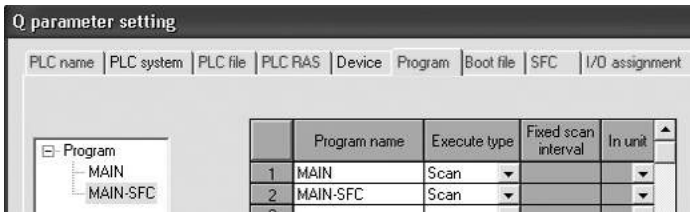
- Ladder instructions: MAIN
- SFC programs: MAIN-SFC

To execute multiple programs, such as "MAIN" and "MAIN-SFC", go to "Program" found in "Parameter" of PLC to set the program name, execution type, and the order of execution during each scan.

(Program file name after changing programmable controller type)



(Program settings window)



* For detail operation instructions, refer to the following manual.
  Transition from MELSEC-A/QnA(Large Type)Series to Q Series Handbook(Fundamentals)(L-08043ENG)
  [7.7.10 Setting method when multiple sequence programs are created]

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(2) Precautions for replacing MELSAP-II with MELSAP3

The basic operation of the MELSAP3 is the same as the MELSAP-II, but the specifications are partially different.

This section provides the precautions for the replacement.

(1) Starting SFC program

The SFC program can be started by using the special relay for starting/stopping the SFC program.

The special relay used for starting/stopping SFC programs changes according to the programmable controller type.

ACPU: M9101 -> QCPU: SM321

Please take the precaution listed below because the specifications of the special relays are different for each CPU.

Specifications		Precautions for replacement
MELSAP-II (M9101)	MELSAP3 (M321)	
Switches on and off with user operation.	SFC program starts up at default, since system is automatically turned on.	When starting/stopping the SFC program according to user conditions, operations such as turning SM321 on/off must be handled in the program.

(2) Block information (SFC information device)

The MELSAP-II and MELSAP3 have different method of executing the "Block START/STOP" and "Reading of the number of active steps and active step numbers" with block information (SFC information device).

Item	Specifications		Precautions for replacement
	MELSAP-II	MELSAP3	
Block START/ STOP methods	[START] Switching the block active bit on executes forced start. [STOP] Switching on the block clear bit stops the block and switching it off executes forced stop.	[START] Switching on the block START/STOP bit forcibly starts the corresponding block. [STOP] Switching off the block START/STOP forcibly stops the corresponding block.	[START] The program does not need adjustments when a SFC program for ACPU is converted to QCPU because the "Block active bit" is replaced with "Block START/STOP" bit. [STOP] The "Block clear bit" resets the "Block START/STOP bit". Add the SFC control instruction "RST BLm" to the program. Delete the program that switches the "Block clear bit" on/off.
The number of active steps and active step numbers reading	Reads the number of active steps in the corresponding block and active step numbers.	Reads only the number of active steps in the corresponding block.	To read the active step numbers, use the "Active step batch readout instructions (MOV, DMOV, BMOV)".

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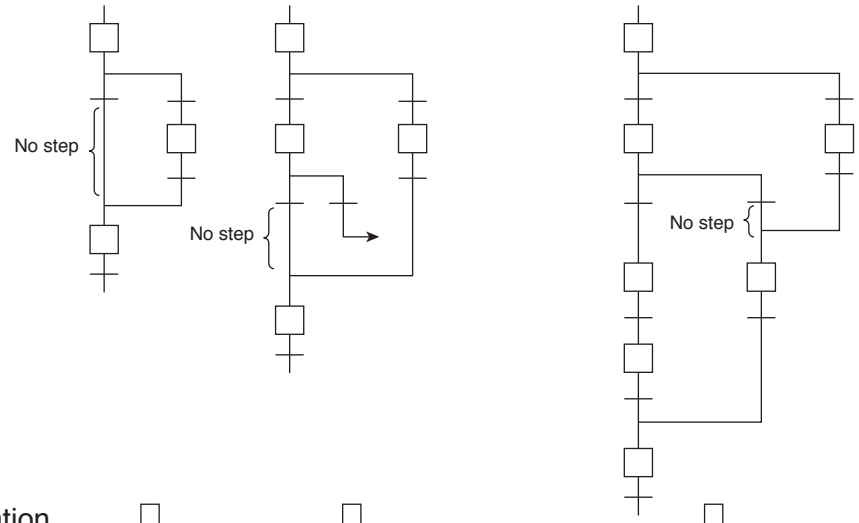
IMPORTANT

Performing the following operations on SFC programs created with SW□IVD/NX-GPPA may result in abnormal SFC chart display and cause creation fault in GX Developer.

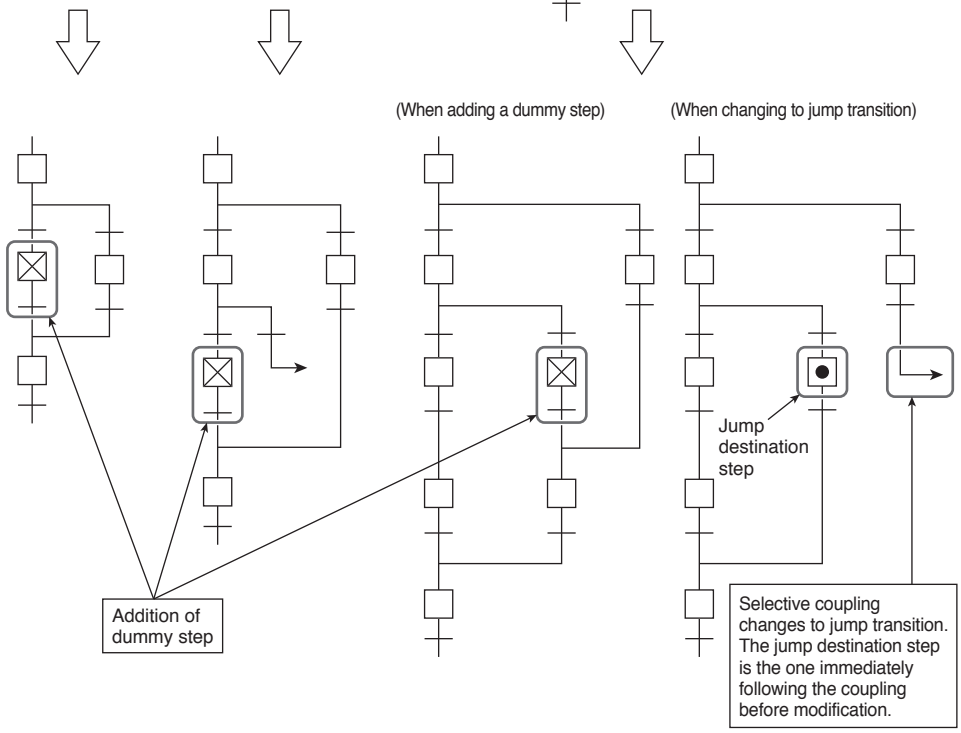
- Executing "Import file" in GX Developer to import an SFC program saved in a personal computer.
- Executing "Read from PLC" in GX Developer to read an SFC program from an ACPU.

If a creation fault occurs in the SFC chart, add a dummy step with SW□IVD/NX-GPPA and import the file to GX Developer.

1. Creation fault examples



2. SFC chart modification examples



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(3) Precautions for modifying SFC chart

(a) Add "☒ (dummy step)" as an additional step
If "□ (step)" is added, the step number + "?" is displayed/printed due to un-programmed operation output.

(b) As shown below, create a transition condition program in the additional step using a series transition (+).



If the transition condition program is not created, the transition condition number + "?" is displayed/printed due to un-programmed transition condition.

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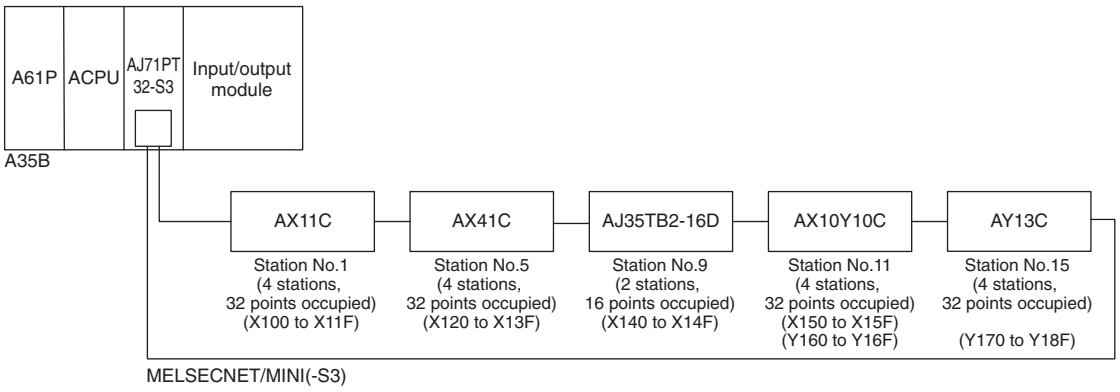
7.5 Method for maintaining existing addresses when replacing MELSECNET/MINI(-S3) with CC-Link

The existing MELSECNET/MINI(-S3) and the CC-Link differ in the number of occupied points per station: the former has 8 points per station, and the latter 32 points.
When the existing and new modules differ in the number of occupied points or the number of the existing modules differs from that of the new modules, it is necessary to change the addresses to be used in the sequence program. However, the existing addresses can be maintained by transferring input/output data using the existing address of each station (module) by FROM/TO instructions without using the CC-Link auto refresh function.

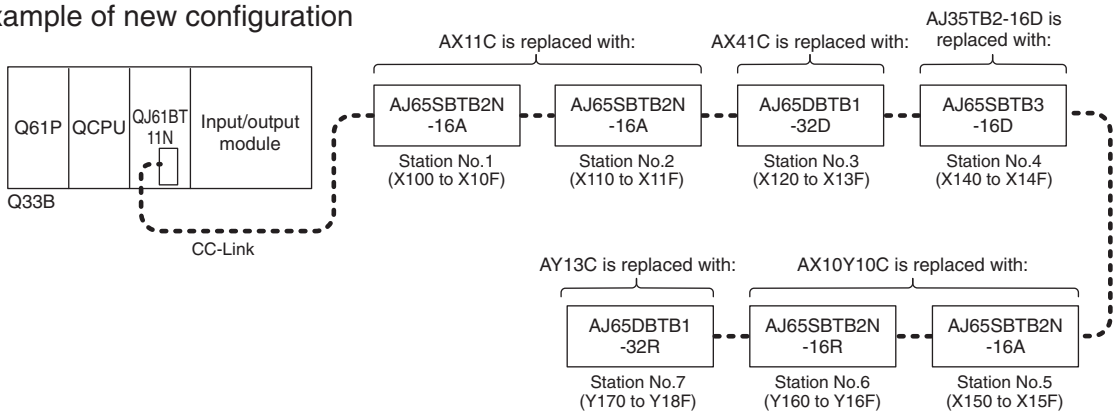
● Replacement example

(1) Number of occupied points per station
The number of occupied points per existing MELSECNET/MINI(-S3) station is 8. A module with more than 8 points requires more than one station.

*Example of existing configuration



*Example of new configuration



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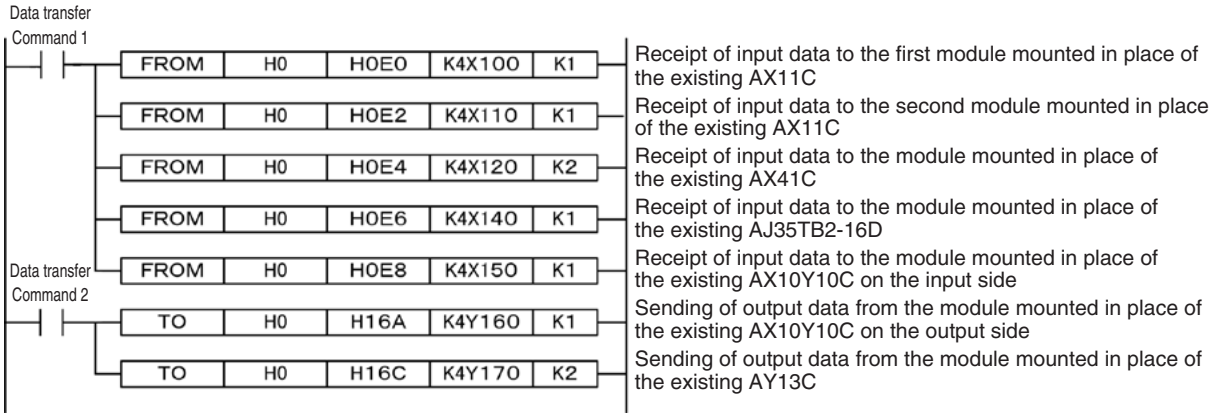
(2) Method for maintaining existing addresses
The existing addresses can be maintained by transferring transmitted and received data by FROM/TO instructions for each station without auto refresh setting.
The CC-Link communication conditions including the station information must be set by the parameters.

(3) FROM/TO instructions sample program for transfer of transmitted and received data

(1) Address allocation table

	Buffer memory address on input side	Buffer memory address on output side	Model name of replacement module	Devices to be used by FROM/TO instructions	Device to be used for auto refresh setting
Station No.1	E0		AJ65SBTB2N-16A	X100 to 10F	X100 to 11F (X110 to 11F: Not in use)
	E1				
Station No.2	E2		AJ65SBTB2N-16A	X110 to 11F	X120 to 13F (X130 to 13F: Not in use)
	E3				
Station No.3	E4		AJ65DBTB1-32D	X120 to 13F	X140 to 15F
	E5				
Station No.4	E6		AJ65SBTB3-16D	X140 to 14F	X160 to 17F (X170 to 17F: Not in use)
	E7				
Station No.5	E8		AJ65SBTB2N-16A	X150 to 15F	X180 to 19F (X190 to 19F: Not in use)
	E9				
Station No.6		16A	AJ65SBTB2N-16R	Y160 to 16F	Y1A0 to 1BF (Y1B0 to 1BF: Not in use)
		16B			
Station No.7		16C	AJ65DBTB1-32R	Y170 to 18F	Y1C0 to 1DF
		16D			

* Sample program



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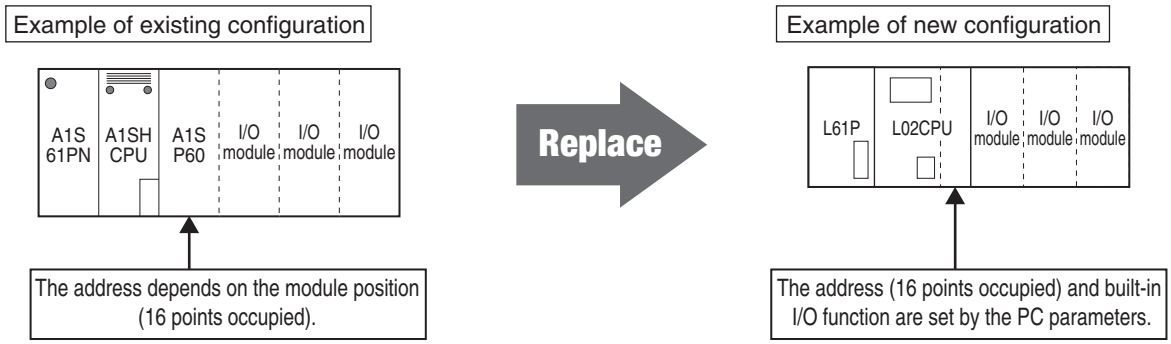
7.6 Replace pulse catch module

There are no available replacement modules for AnS (Small Type) Series pulse catch module A1SP60. Replace it with one of the followings.
• L Series CPU : Built-in I/O pulse catch function
• Q Series CPU: Interrupt module QI60

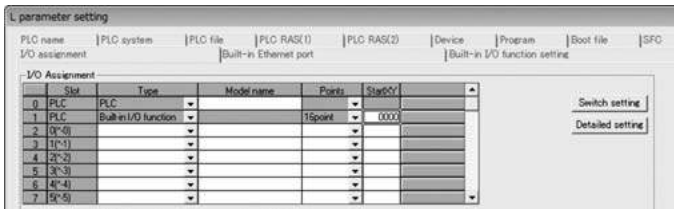
7.6.1 Replace with LCPU built-in I/O pulse catch function

The address of the LCPU built-in I/O pulse catch function is determined by the I/O assignment parameter and the built-in I/O function setting. Therefore, it is necessary to change the existing address Xn to the address set for the LCPU built-in I/O pulse catch function.

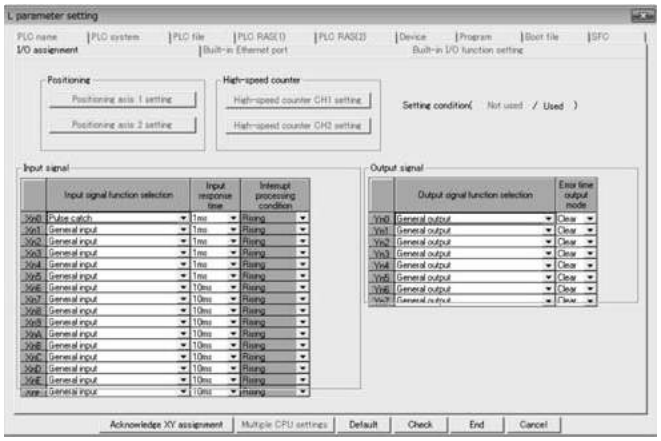
● **Replacement example**



(1) Example of LCPU parameter setting
The following parameters must be set to use the LCPU built-in I/O function.
Select "L parameter setting" -> "I/O assignment setting," and set the first XY to 0.

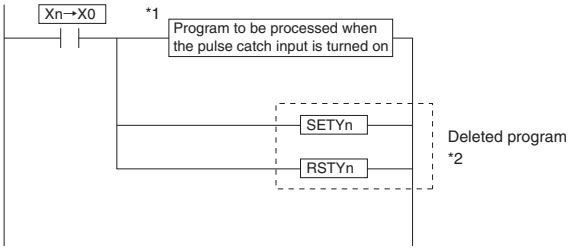


Select "L parameter setting" -> "Built-in I/O function setting," and specify the pulse catch function for the input signal Xn0.



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(2) Example of program modification



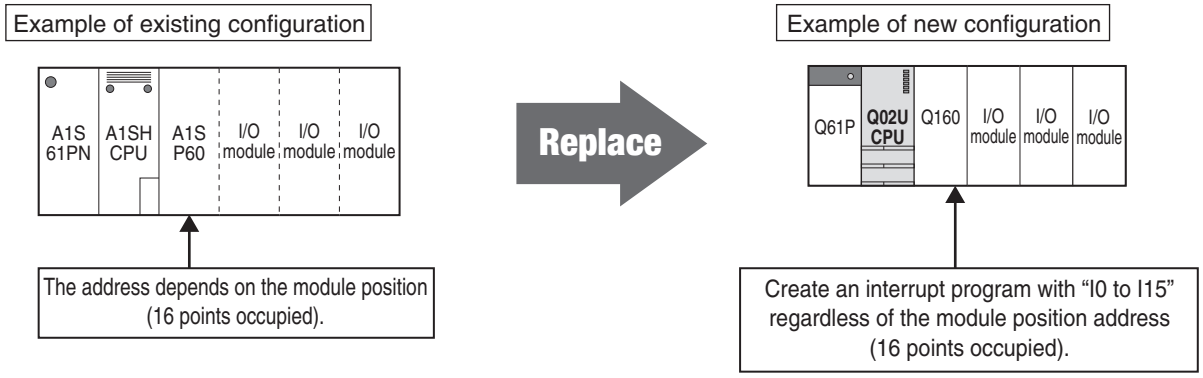
*1: Change the existing pulse catch input Xn to the address set for the built-in I/O function.
*2: Only in the case of direct input/output processing by the existing CPU module

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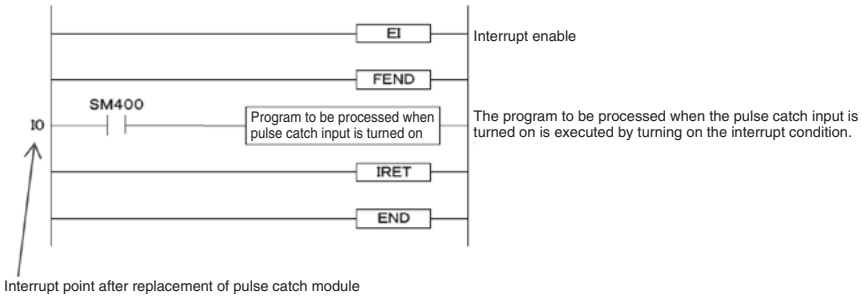
7.6.2 Replace with QCPU interrupt module

It is necessary to change the existing program to an interrupt program.

● **Replacement example**

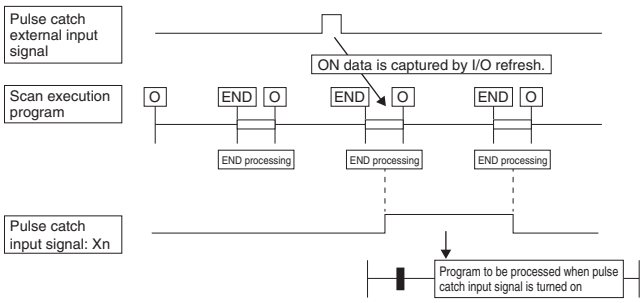


(1) Sample program after replacement

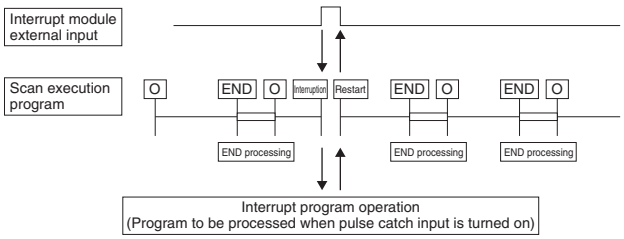


(2) Pulse catch processing procedure

Processing procedure of existing pulse catch module (refresh system)



Processing procedure of newly mounted interrupt module



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Part Ⅲ: Application

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8. Utilize existing ACPU data

8.1 Replace AD75(P/M) with QD75(P/D/M/MH) while utilizing existing positioning parameters and data

Solution and Benefit

- **Existing positioning parameters and data of the AD75(P□(-S3)/M□) can be used for the QD75(P□/D□/M□/MH□) with minimal modifications, reducing upgrade time.**
- **Although the AD75(P□(-S3)/M□) and QD75(P□/D□/M□/MH□) may have different addresses even in the same setting item, mistakes can be prevented because parameters and data can be used without having to worry about buffer memory address.**

The following is an example of replacing an existing A (Large Type) positioning module with the Q Series while utilizing existing parameters and data.

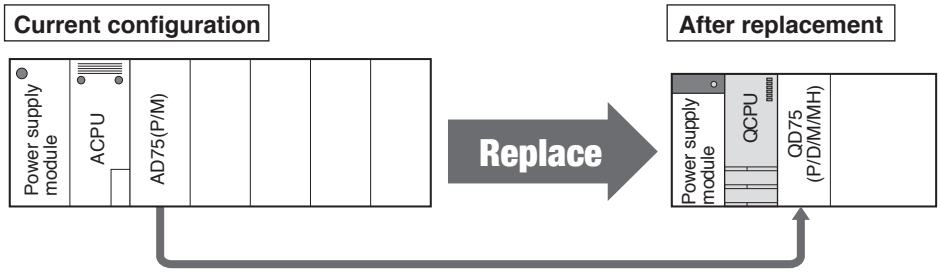
● Instructions

After replacing the A (Large Type) modules with the Q Series, reuse/convert positioning parameters and data of the AD75 using GX Configurator software package for positioning modules.

Software packages to be used are as follows:

- For AD75 models: GX Configurator-AP Version 1 (SW□D5C-AD75P-E)
- For QD75 models: GX Configurator-QP Version 2 (SW□D5C-QD75P-E)

(1) System configuration example



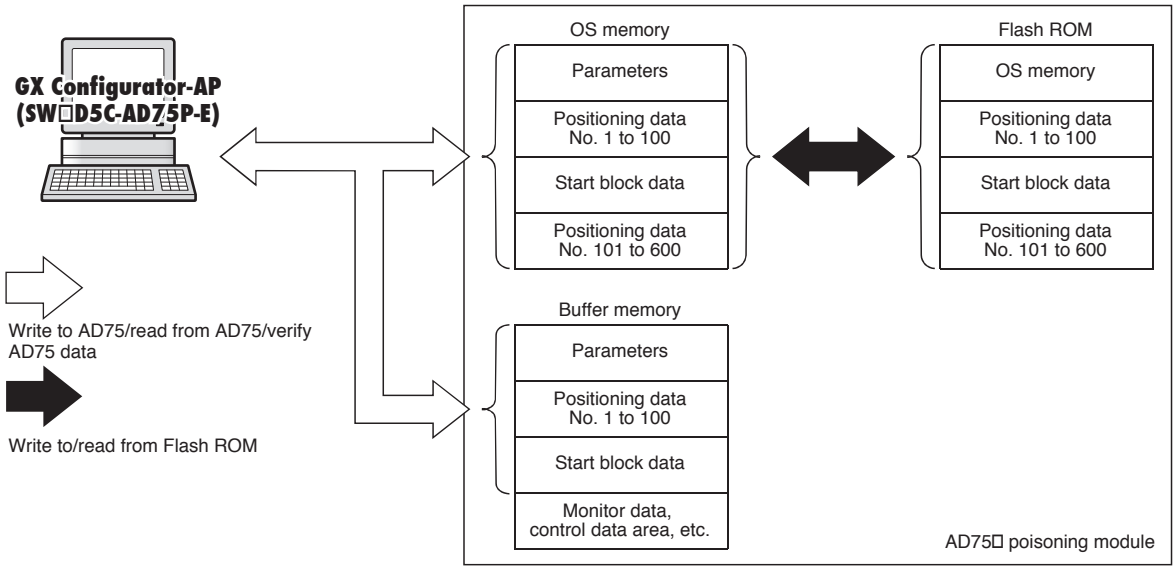
*Utilize existing positioning parameters and data when replacing.

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(2) How to use existing positioning parameters and data

Step 1

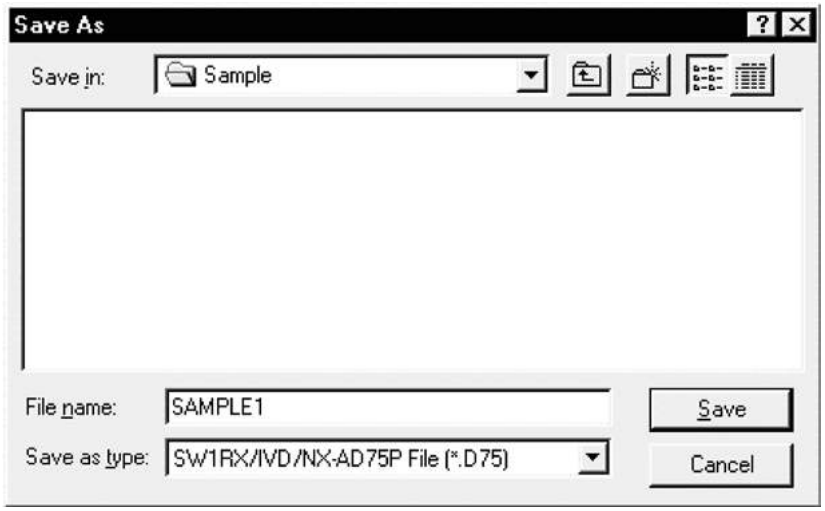
Read positioning parameters and data from the AD75 using "GX Configurator-AP".



Step 2

Save positioning parameters and data using "GX Configurator-AP". (Creating a AD75 file)

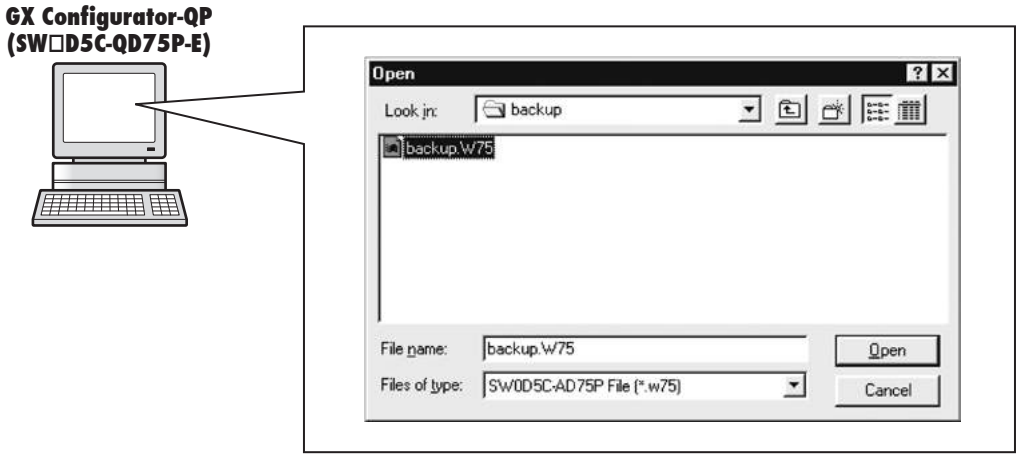
* Save in the file format to be read by "GX Configurator-QP".



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Step 3

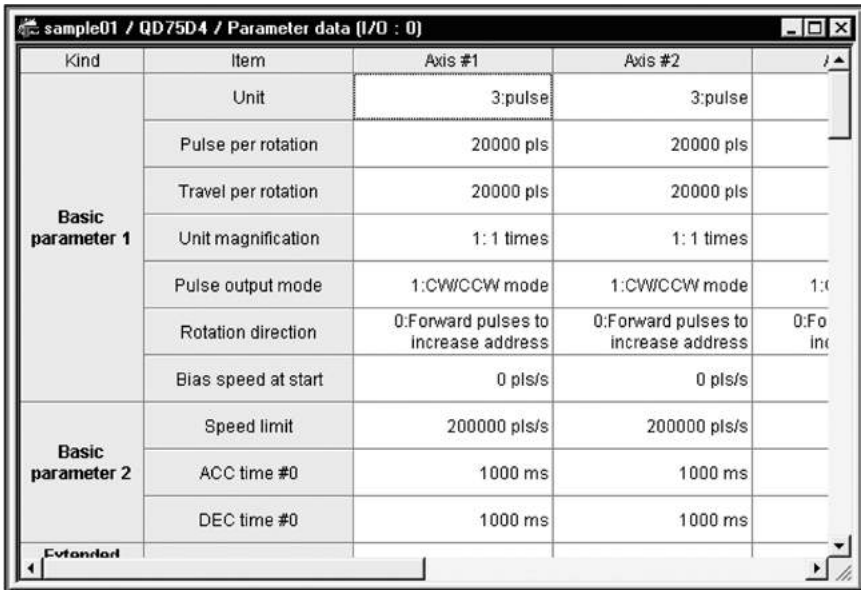
Read the AD75 file using "GX Configurator-QP".



Example of reading a file created with GX Configurator-AP.

Step 4

Specify item(s) that need to be changed in "GX Configurator-QP".

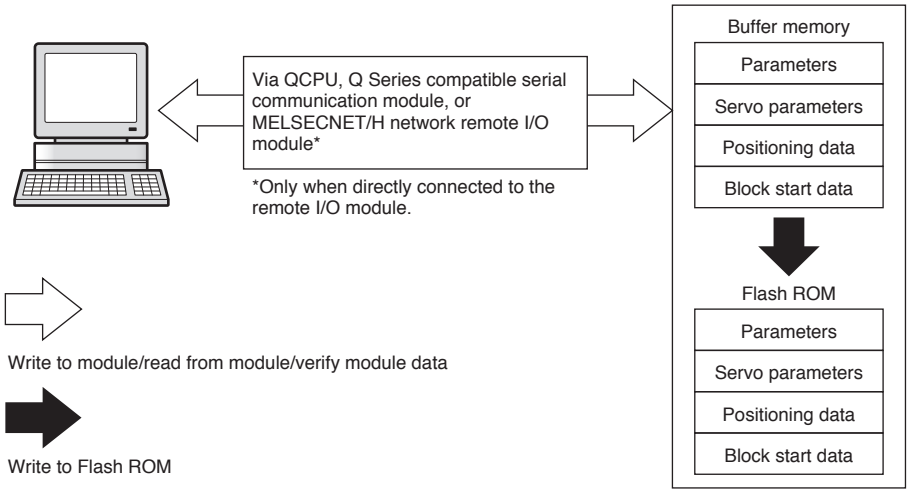


Kind	Item	Axis #1	Axis #2	
Basic parameter 1	Unit	3:pulse	3:pulse	
	Pulse per rotation	20000 pls	20000 pls	
	Travel per rotation	20000 pls	20000 pls	
	Unit magnification	1: 1 times	1: 1 times	
	Pulse output mode	1:CW/CCW mode	1:CW/CCW mode	1:(
	Rotation direction	0:Forward pulses to increase address	0:Forward pulses to increase address	0:Fo inc
	Bias speed at start	0 pls/s	0 pls/s	
Basic parameter 2	Speed limit	200000 pls/s	200000 pls/s	
	ACC time #0	1000 ms	1000 ms	
	DEC time #0	1000 ms	1000 ms	
Extended				

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Step 5

Write all positioning parameters and data, including modified data, to the "QD75 using GX Configurator-QP".



Tip

- To use GX Configurator-AP data in GX Configurator-QP, it is necessary to save the file in a format that can be read by GX Configurator-QP. Files saved in GX Configurator-AP format cannot be read by GX Configurator-QP.
- Due to specification differences between the AD75 and QD75, some positioning parameters may require setting changes. Refer to the related manuals for details on the modifications. Note that positioning data does not require any modifications.
- Related manuals

  (a) AD75

Title	Manual No.
A1SD75P1-S3/P2-S3/P3-S3, AD75P1-S3/P2-S3/P3-S3 Positioning Module User's Manual (Details)	IB-66716
A1SD75M1/M2/M3, AD75M1/M2/75M Positioning Module User's Manual (Details)	IB-66715
GX Configurator-AP Version 1 Operating Manual	IB-66900

  (b) QD75

Title	Manual No.
Type QD75P/QD75D Positioning Module User's Manual (Details)	SH-080058
Type QD75M Positioning Module User's Manual (Details)	IB-0300062
Type QD75MH Positioning Module User's Manual (Details)	IB-0300117
GX Configurator-QP Version 2 Operating Manual	SH-080172

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8.2 Procedures for replacing when file registers are used in blocks

This section explains the procedures for using existing data in the file registers used in more than one block in the ACPU.

8.2.1 When block switch command is used

Solution and Benefit

File registers can be replaced only by modifying commands and using the existing data.

(1) Procedures for using existing ACPU projects
When file registers in more than one block are used in ACPU, it is necessary to save the projects with different names for the blocks.

Step 1: Retrieve the program, parameters and device comment data from ACPU using GX Developer. Retrieve the data to the PC with the specified file register block number, and save the data as a project.

⬇

Step 2: Retrieve the data in another specified file register block number to the PC, and save the data with a project name different from that used in Step 1.

⬇

Step 3: Change the type of the ACPU project file saved in Step 1 to QCPU/LCPU by "Change PLC type."

⬇

Step 4: Open the ACPU project file saved in Step 1, and display the device memory R. Open the QCPU/LCPU project file which has been changed in the PLC type in Step 3, and display the device memory ZR.

⬇

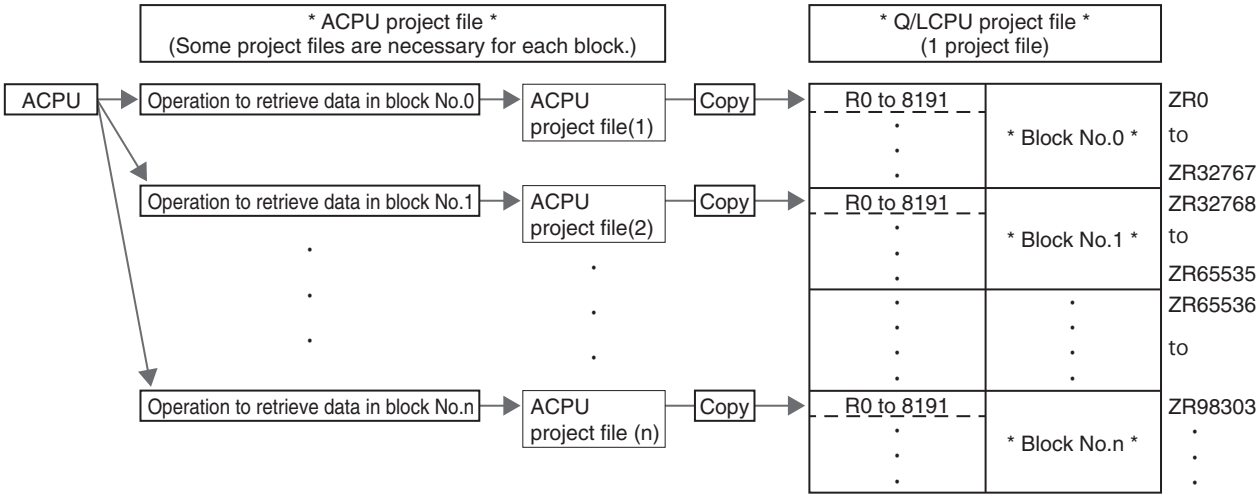
Step 5: Drag the mouse in the device memory R of ACPU to copy all range, and paste it from the beginning of each block in the device memory ZR of QCPU/LCPU.

For the beginning of each block, see "Tip."

⬇

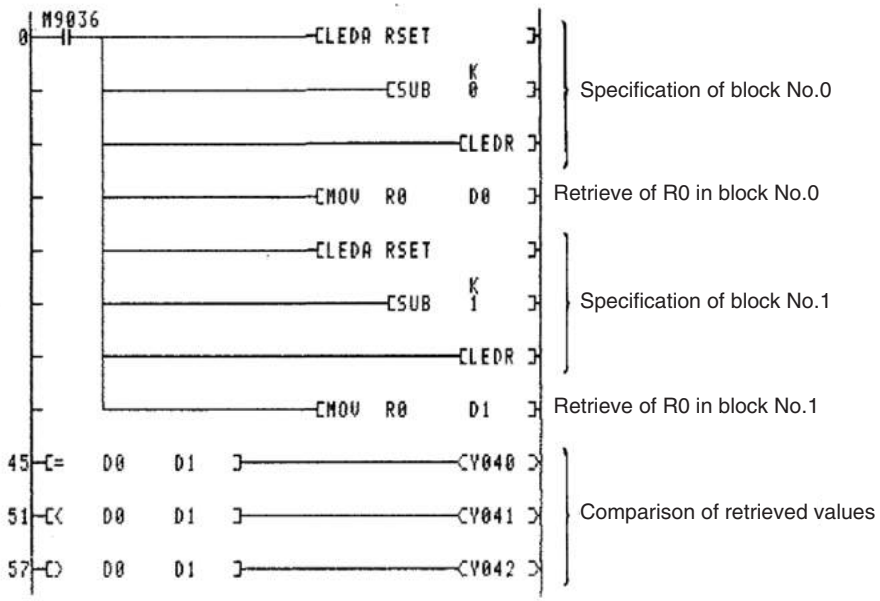
Step 6: Open each project saved in Step 2, copy all range of the file register R, and paste it from the beginning of each block in the device memory ZR of the QCPU/LCPU project created in Step 4.

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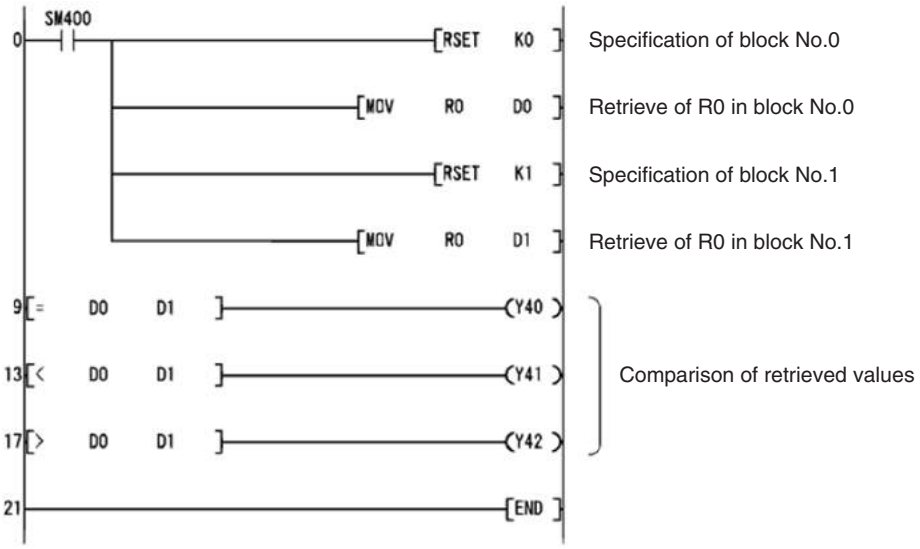
(2) File register block switch command
When executing "Change PLC type" by using GX Developer, the file register block switch command is considered to be unreplaceable and replaced with "SM1255." Therefore, the program must be modified.
Modify the program as shown below.

■ Example of program for comparing R0 in block No.0 and R0 in block No.1
• Program for switching file register block of ACPU (command dedicated to AnA/AnU)



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• Program for switching file register block of QCPU/LCPU



Tip

1. Number of points in one file register block
   ACPU and QCPU/LCPU vary in the number of points in one file register block.
   • ACPU: 8K points (8192 points) per block
   • QCPU/LCPU: 32K points (32768 points) per block
   When copying the data in the ACPU file registers into QCPU/LCPU, display the QCPU/LCPU file registers in the ZR mode, calculate the ZR number corresponding to R0 of each ACPU, and copy the data.
   Examples) • R0 of ACPU block No.0→Position of R0 in QCPU/LCPU
   • R0 of ACPU block No.1→Position of ZR32768 in QCPU/LCPU
   • R0 of ACPU block No.2→Position of ZR65536 in QCPU/LCPU
2. The number of file register blocks which can be handled by QCPU/LCPU Series depends on the memory capacities of the standard RAM and memory card.

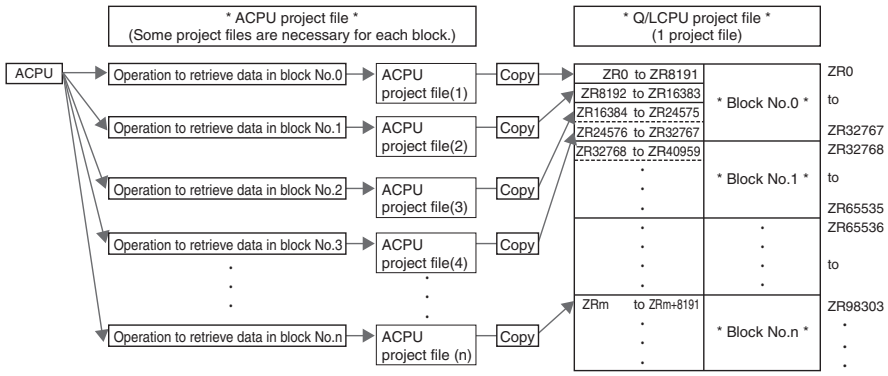
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8.2.2 When file registers are used with consecutive numbers regardless of block numbers

Solution and Benefit

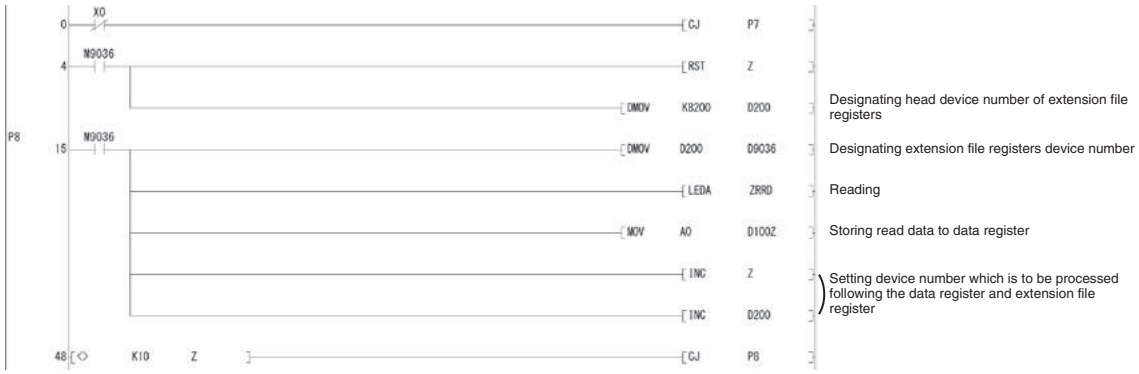
File registers can be replaced only by replacing the devices (R -> ZR) and using the existing data.

(1) Procedures for using data of ACPU
The procedures are the same as in 8.2.1(1).



(2) Example of program for retrieving the contents of R8200 to R8209 (R8 to R17 in block No.1) to D100 to D109

• Program of existing ACPU



• Program of QCPU/LCPU



Tip

1. Number of points in one file register block
   ACPU and QCPU/LCPU vary in the number of points in one file register block.
   • ACPU: 8K points (8192 points) per block
   • QCPU/LCPU: 32K points (32768 points)per block
   When copying the data in the ACPU file registers into QCPU/LCPU, display the QCPU/LCPU file registers in the ZR mode on the device memory screen of GX Developer. Calculate the ZR number of the destination QCPU/LCPU based on the number of points per block of ACPU, and copy the data.
   Examples) • R0 to R8191 in ACPU block No.0 → Positions of ZR0 to ZR8191 in QCPU/LCPU
   • R0 to R8191 in ACPU block No.1 • Positions of ZR8192 to ZR16383 in QCPU/LCPU
   • R0 to R8191 in ACPU block No.0 • Positions of ZR16384 to ZR24575 in QCPU/LCPU
2. The number of file register blocks which can be handled by QCPU/LCPU depends on the memory capacities of the standard RAM and memory card.

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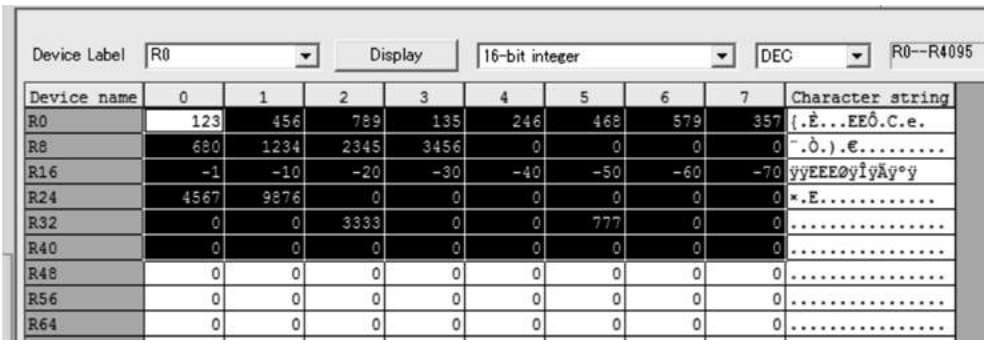
8.3 Copy device memory data

Solution and Benefit

The data in file registers and data registers can be copied between different CPU types, so that the existing data can be used easily.

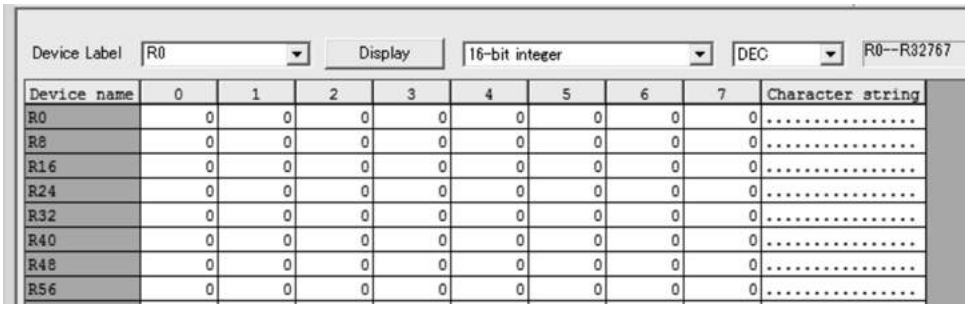
(1) Example of copy operation
The following is an example of operation to copy file register data between different CPU types.

Step 1: Display the device memory R0 in the existing ACPU program file using GX Developer, drag the mouse to select the range to be copied into QCPU after replacement, and store the data in the copy buffer.
To store, select "GX Developer edit menu" -> "Copy" or "Ctrl+C."



Device name	0	1	2	3	4	5	6	7	Character string
R0	123	456	789	135	246	468	579	357	{.È...EEÔ.C.e.
R8	680	1234	2345	3456	0	0	0	0	¯.Ò.).€.....
R16	-1	-10	-20	-30	-40	-50	-60	-70	ÿÿEEEØÿÎÿÃÿ°ÿ
R24	4567	9876	0	0	0	0	0	0	×.E.....
R32	0	0	3333	0	0	777	0	0	.....
R40	0	0	0	0	0	0	0	0	.....
R48	0	0	0	0	0	0	0	0	.....
R56	0	0	0	0	0	0	0	0	.....
R64	0	0	0	0	0	0	0	0	.....

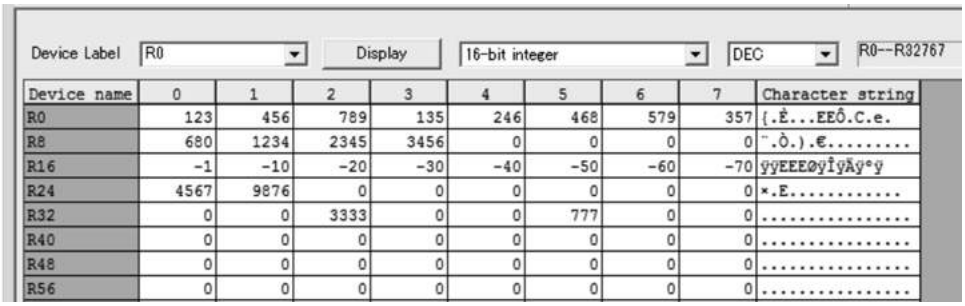
Step 2: Start up GX Developer separately from the existing ACPU program file, display the device memory R0, and specify the top position in QCPU into which the data will be pasted.



Device name	0	1	2	3	4	5	6	7	Character string
R0	0	0	0	0	0	0	0	0	.....
R8	0	0	0	0	0	0	0	0	.....
R16	0	0	0	0	0	0	0	0	.....
R24	0	0	0	0	0	0	0	0	.....
R32	0	0	0	0	0	0	0	0	.....
R40	0	0	0	0	0	0	0	0	.....
R48	0	0	0	0	0	0	0	0	.....
R56	0	0	0	0	0	0	0	0	.....

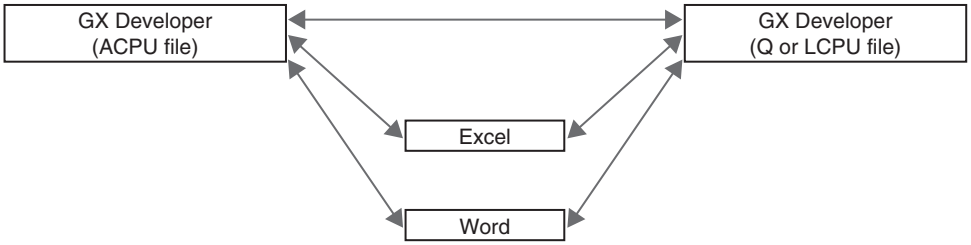
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Step 3: Paste the data in the device memory R0 stored in the copy buffer into the specified position of the device memory of the QCPU.
To paste, select "GX Developer edit menu" -> "Paste" or "Ctrl+V."



Device name	0	1	2	3	4	5	6	7	Character string
R0	123	456	789	135	246	468	579	357	{.È...EEÔ.C.e.
R8	680	1234	2345	3456	0	0	0	0	¨.Ò.).€.....
R16	-1	-10	-20	-30	-40	-50	-60	-70	ÿÿEEEØÿÎÿÃÿ°ÿ
R24	4567	9876	0	0	0	0	0	0	×.E.....
R32	0	0	3333	0	0	777	0	0	.....
R40	0	0	0	0	0	0	0	0	.....
R48	0	0	0	0	0	0	0	0	.....
R56	0	0	0	0	0	0	0	0	.....

(2) Allowable destinations
The data in the device memories can be copied not only between GX Developers, but also between GX Developer and Excel or Word.
However, the number of strings in Excel or Word is the same as that in GX Developer.
The data in the device name field cannot be copied.



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9. Utilize A/QnA -> Q conversion support tool

A/QnA -> Q conversion support tool

This tool is designed to reduce the work load when replacing A/QnA (Larege Type) Series modules with Q Series modules. The tool contains the following functions.

- Extracts parts of the program that were not automatically converted and displays the appropriate modification procedures.
  (Reduces program modification time.)
- Automatically creates link refresh sample program when using MELSECNET(II)/B local station data link module (A1SJ71A□23(B)Q).
  (Program creation is unnecessary as it is automatically generated)
- The PLC type of ACPU parameter programs incompatible with GX Developer can be changed to ACPU.
  (Special peripherals are not required.)

The "A/QnA -> Q conversion support tool" can be downloaded for free from the "MELFANSweb".

9.1 Utilize programs of PC type incompatible with GX Developer

Solution and Benefit

Programs of PC type incompatible with GX Developer can be utilized by using the A/QnA -> Q conversion support tool in accordance with the following procedures.

(1) CPU incompatible with GX Developer

The following CPU types are incompatible with GX Developer.

- A0J2CPU
- A1CPU
- A2CPU(-S1)
- A3CPU
- A3HCPU
- A3MCPU
- A52GCPU
- A3VCPU
- A73CPU

(2) Operation procedures

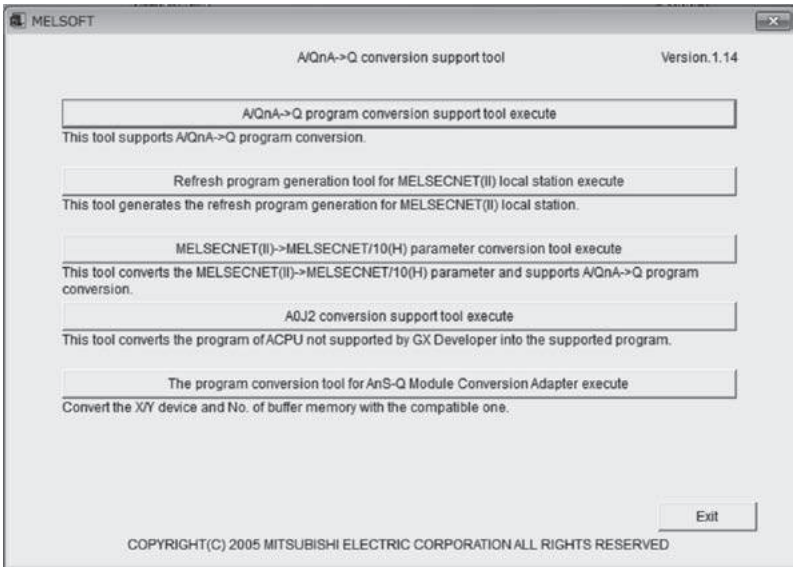
Step 1: Start up



* Click the icon.

Step 2: Menu selection

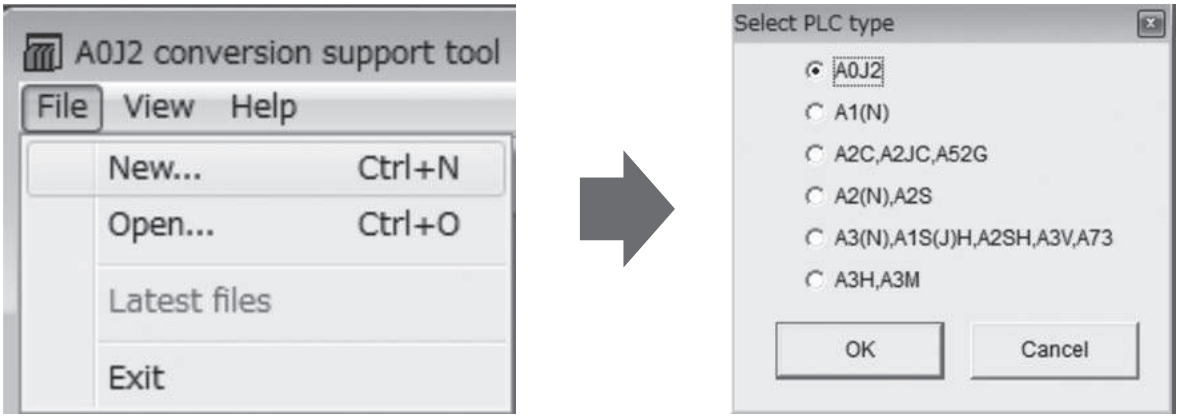
Start the A/QnA -> Q conversion support tool. Select "A0J2 conversion support tool execute."



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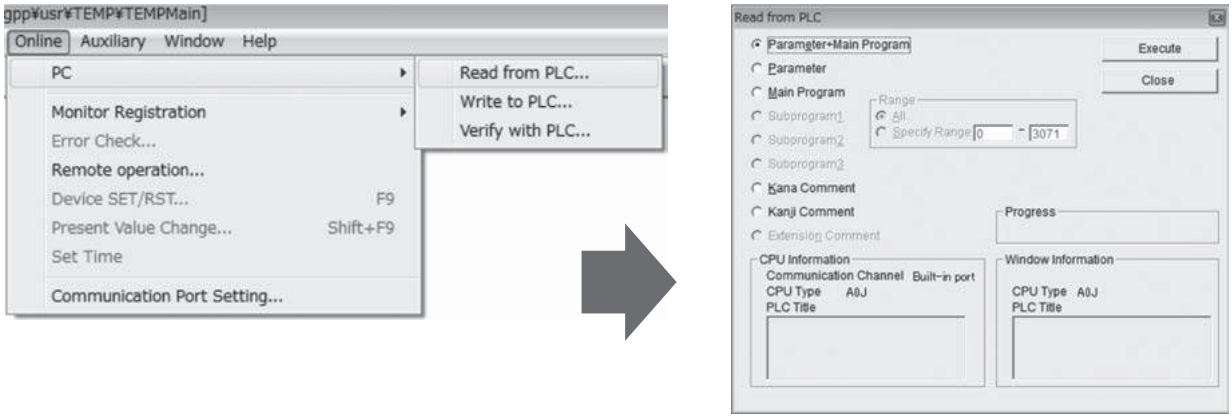
Step 3: Select PLC type

Select "File" -> "New," and select the PLC type.



Step 4: Read from programs

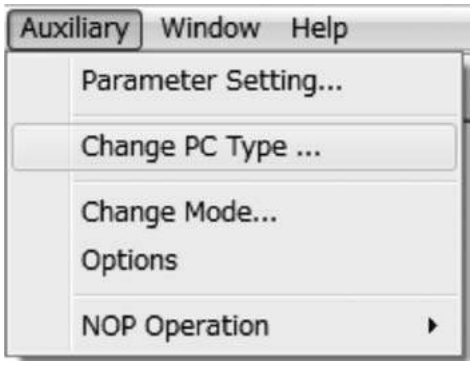
Select "Online" -> "Read from PLC," and the programs in the CPU will be read out.



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Step 5: Change PC type

Select "Auxiliary" -> "Change PC type," and select a PLC type compatible with GX Developer.

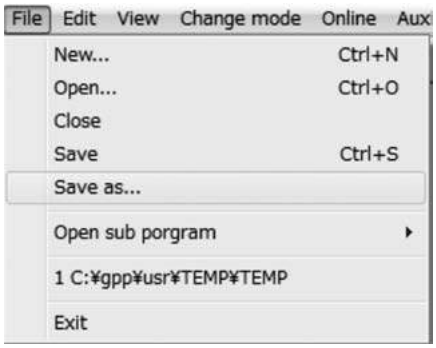


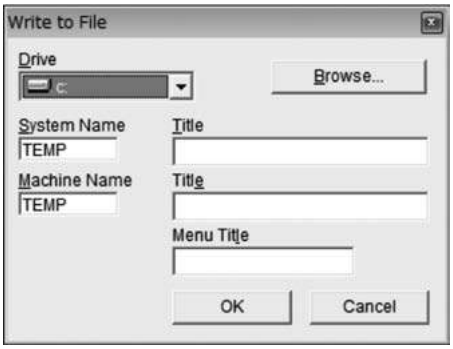


Step 6: Save programs

Select "File" -> "Save As."

The set system name and machine name will be used as the name of the imported file stated at item 7.4.





Tip

・For details, refer to "A/QnA -> Q conversion support tool: A0J2 Conversion Support Tool Operation Guide."
・The "A/QnA -> Q conversion support tool" can be downloaded for free from the "FA Site."

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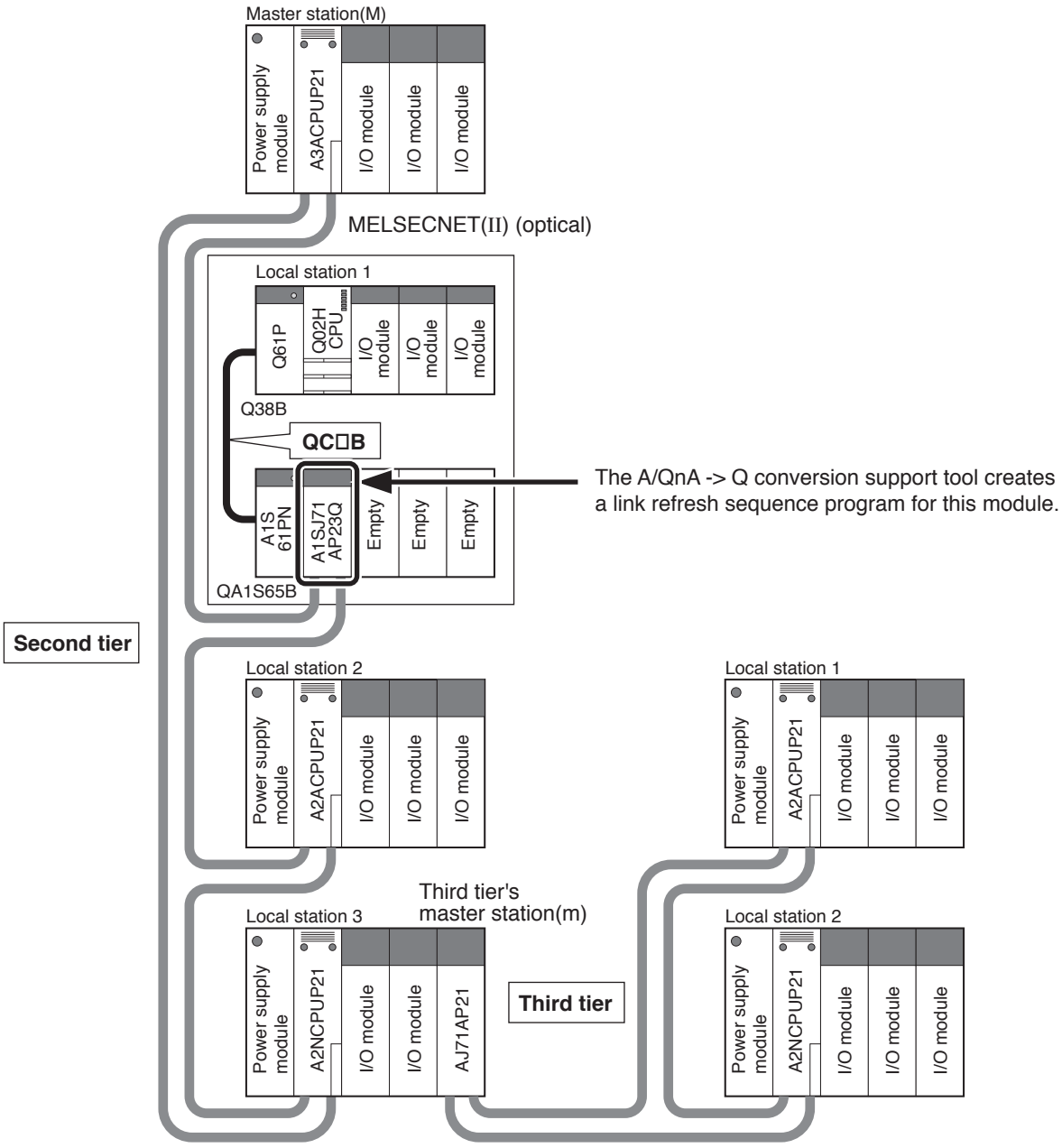
9.2 Create a sample program for MELSECNET(II) or MELSECNET/B link refresh using A/QnA -> Q conversion support tool

Solution and Benefit

A sequence program (sample program) can be created to automatically perform link refresh by entering the existing network conditions in the A/QnA -> Q conversion support tool.

● Conditions for program creation

(1) System configuration example



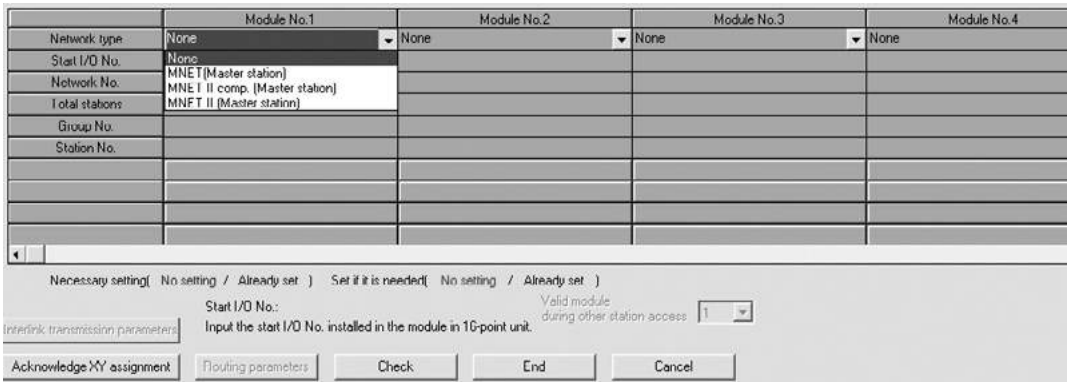
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(2) Master station network parameter (Master station(M) for the second tier)

The following are examples of the master station's network parameters and transient communication program.

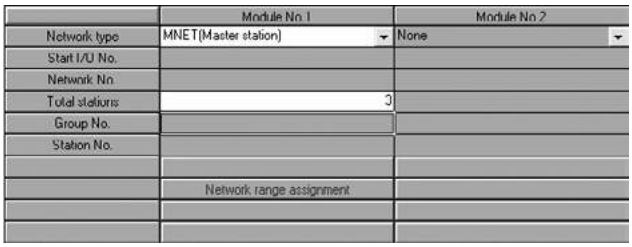
The parameter settings for the master station are the conditions used to create a link refresh sequence program for the local station data link module.

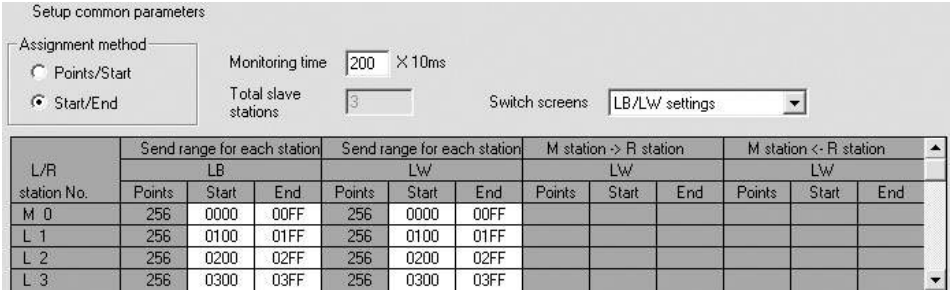
(a) Network type selection



(b) Setting examples for each network type

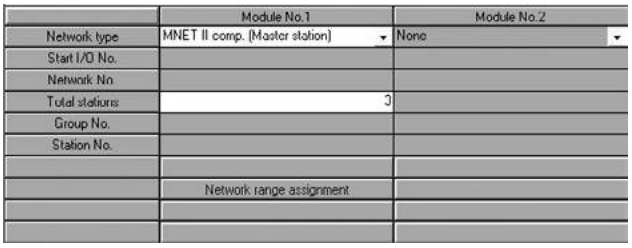
1) MELSECNET mode (Network range assignment: set for the first half only)



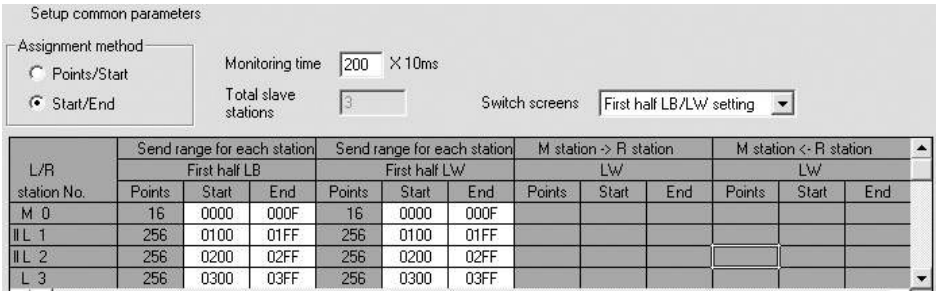


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2) MELSECNET II composite mode (Network range assignment: set for the first half and second half)



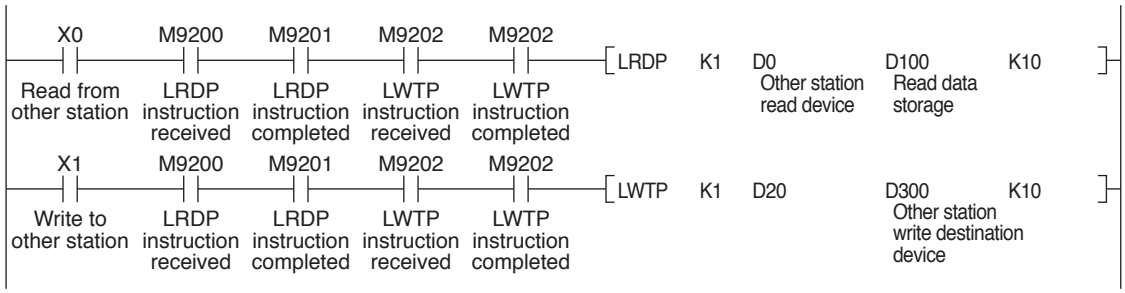




(c) Program example of transient instruction

Transient communication is being performed if the following instructions are in the master station's sequence program.

The use of transient communication is one of the conditions that should be taken into account when creating a link refresh sequence program.



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(3) Procedure for creating link refresh sequence program

The following are the procedures for creating a link refresh sequence program using the A/QnA -> Q conversion support tool.

Step 1: Start up

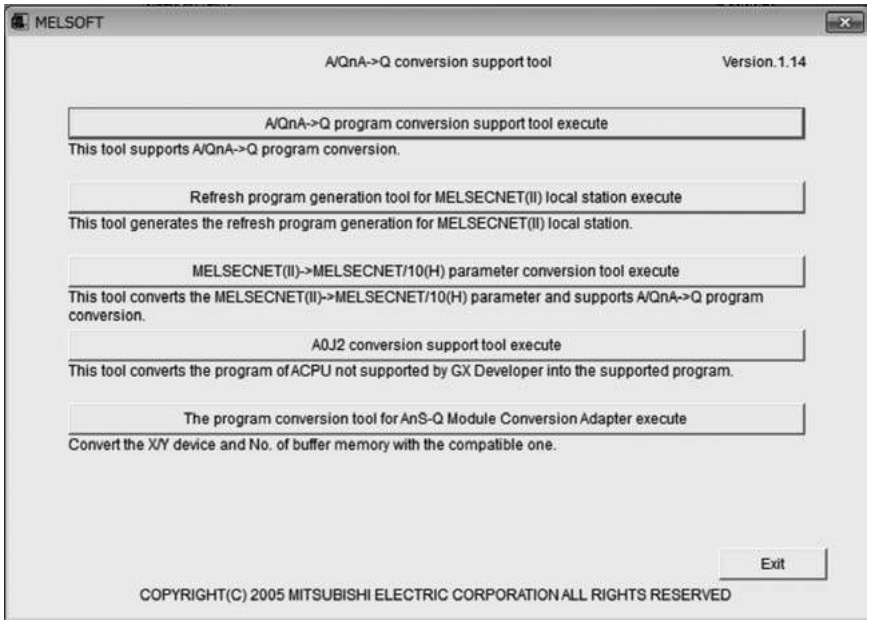
Start the "A/QnA -> Q conversion support tool".

Click the "A/QnA -> Q conversion support tool" icon.



Step 2: Menu selection

Select the "A/QnA -> Q conversion support tool" menu.

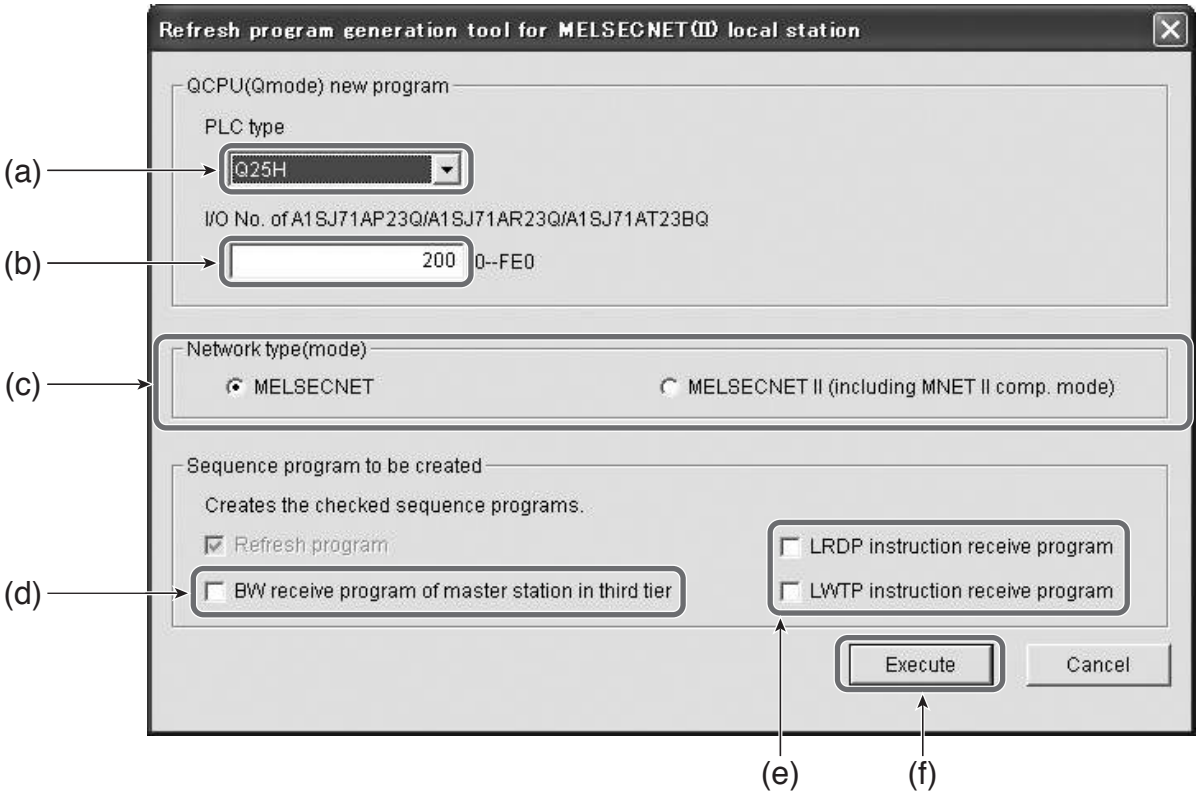


(a) Click "MELSECNET (II) local station refresh program generation tool start" on the Menu screen.

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Step 3: Enter conditions for program creation

Enter conditions for program creation in the "Refresh program generation tool for MELSECNET(II) local station" screen.



(a) Select a Q Series CPU type to which MELSECNET(II) local station module is mounted.
For the case shown in "A. System configuration example", found under "● Conditions for program creation", select "Q02H".

(b) Enter the I/O number of the slot on which MELSECNET(II) local station module is mounted.
This setting determines the start number of the FROM/TO instruction's access target.
Enter the I/O number after checking the actual system.
The CPU may stop if the I/O number differs from the one that is actually mounted.

(c) Set the network type (mode) to match the one set in the master station (M) network parameters.
Refer to "B. Master station network parameter (Master station (M) for the second tier)" under "● Conditions for program creation" for an example.

(d) Check this box if the station which contains the refresh program is a local station in the third tier.

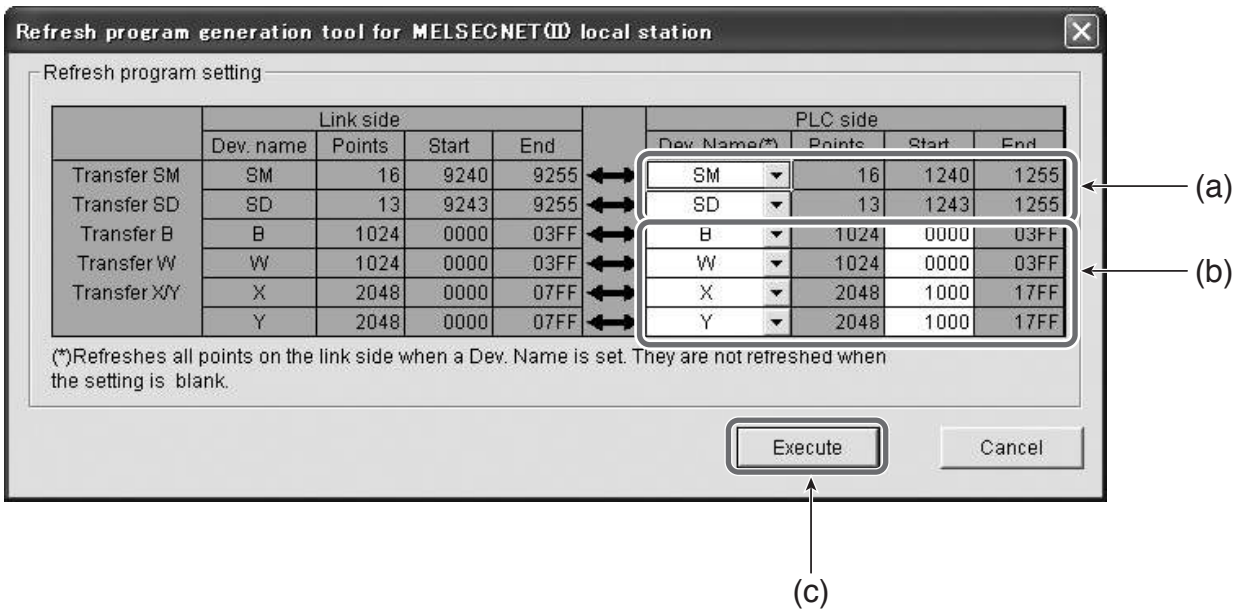
(e) Refer to "(c) Program example of transient instruction" found in section B of "● Conditions for program creation", and select the check boxes if the transient instructions corresponding to "local station data link module mounted station" exist in the master station program.

(f) Select this button to move on to "Step 4", link refresh device setting.
Make sure the settings are correct.

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Step 4: Link refresh device setting

Set link refresh devices for the CPU module side.



(a) Set MELSECNET(II) local station's special link relay and link special registers as the link refresh devices on the CPU module side.
Device numbers are fixed when the device name is SM or SD.
For other device names, device numbers can be specified.
Link refresh is not performed if the "Device name" column is blank.

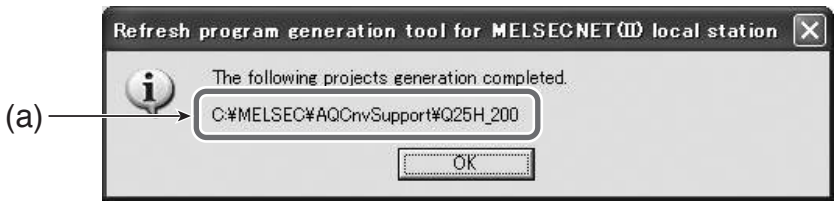
(b) Set link devices to be refreshed on the CPU module side.
When the start number is set, the following points are automatically occupied.
B/W: 1024 points (for MELSECNET mode)
4096 points (for MELSECNET II composite mode)
X/Y: 2048 points
Note that the actual link refresh points are the ones set for "Network range assignment" in the master station (M) network parameter.

(c) Create a link refresh sample program using the settings in "Step 3" and "Step 4".

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Step 5: Save the program

Confirm the save destination for the link refresh sample program.

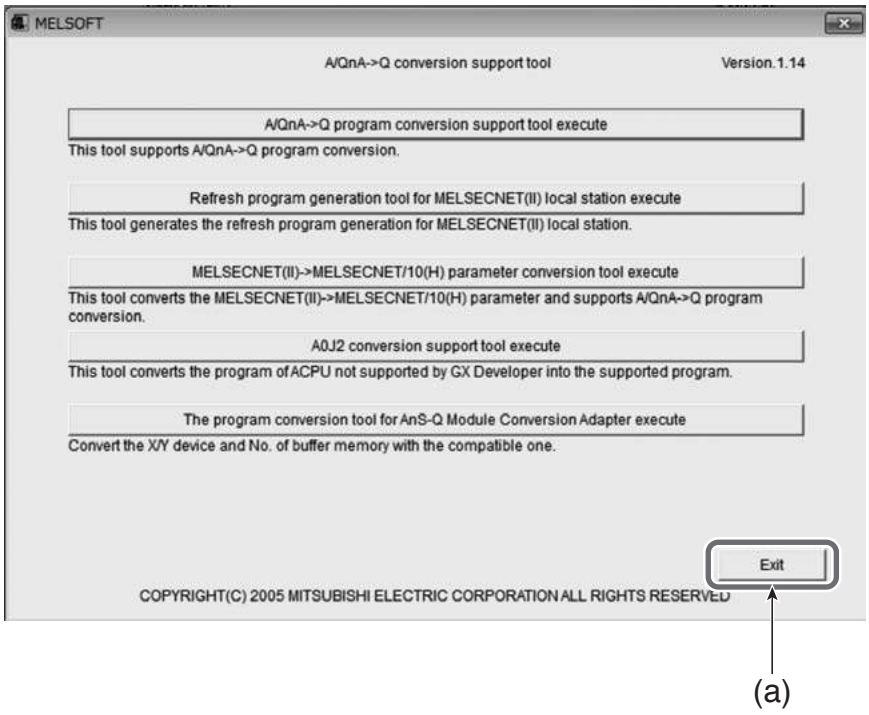


(a) The save destination cannot be specified by the user.
The folder name is created according to "PLC type" and "I/O number" entered in (a) and (b) of "Step 3".
(Example) When the programmable controller type is Q25H, and the I/O number is 200, the folder name is "Q25H_200".
If the same folder name already exists, it is overwritten.

> When creating a link refresh sample program for multiple devices that have the same programmable controller type and I/O number, move the project to a different location, or rename and save the created project using GX Developer.

Step 6: Complete the creation of sample program

End the operation of "A/QnA -> Q conversion support tool".



(a) Select "Exit" to end the operation of the "A/QnA -> Q conversion support tool".
The "A/QnA -> Q conversion support tool" screen will close.

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Step 7: Check the created sample program file

Check the sample program file created by the "A/QnA -> Q conversion support tool".
Open the folder in which the sample program file is stored.
(Example) C:\MELSEC\AQCnvSupport\Q25H_200



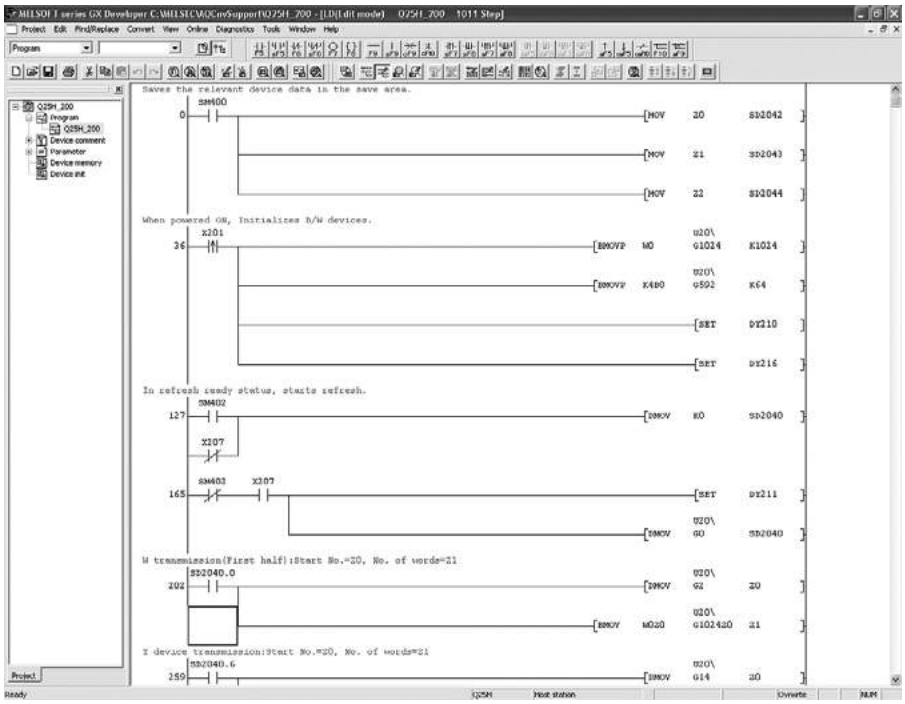
Step 8: Open the created sample program

Start GX Developer, and open the sample program created in the "A/QnA -> Q conversion support tool".
(Example) Click Gppw.gpj in "C:\MELSEC\AQCnvSupport\Q25H_200"



Step 9: Check the sample program

Open the created sample program.
Display the statements through the View menu and check the program.
(Example) Display of program and its statements



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Step 10: Configure and write the sample program to the programmable controller CPU

Perform the following operations using GX Developer.

(a) Rename and save the sample program project.
(b) In order to use the renamed and saved sample program in the specified Q Series CPU's program file, select "Project" -> "Copy", and paste the sample program to the "Program" of the specified Q Series CPU.
(c) Select "PLC parameter" -> "Program", and set the "Execute type" of the added program to "Scan".
(d) Write the parameters and the sequence program to the specified Q Series CPU.

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10. Notes for selection of replacement modules

When selecting a module to be used in place of an existing module, it is necessary to check the specifications. This section explains the notes for selection of replacement modules for major modules.

10.1 Select replacement module for DC input module

When selecting a module to be used in place of an existing DC input module, it is necessary to confirm the working voltage and common terminal arrangement of the existing module.

(1) Rated input voltage

Most of the existing A (Large Type)/A (Small Type) modules have a rated input voltage of 5, 12 or 24 V DC.

The rated input voltage of replacement Q Series modules is 12 V DC (that of part of the modules is 5 or 12 V DC) or 24 V DC, and that of L Series modules is 24 V DC only. Therefore, the module to be selected varies depending on the working condition of the existing module.

When selecting a replacement module, confirm the working condition of the existing module.

(*Excerpt from transition handbook L(NA)-08043ENG)

○: Compatible, △: Partial change required, ×: Incompatible

Specification	AX41	QX41	Compat-ibility	Precautions for replacement
Number of input points	32 points	32 points	○	
Insulation method	Photocoupler	Photocoupler	○	
Rated input voltage	12V/24VDC	24VDC	△	12VDC are not applicable. *1
Rated input current	Approx. 4mA/Approx. 10mA	Approx. 4mA	△	Reduced. *2
Operating voltage range	10.2 to 26.4VDC (Ripple ratio within 5%)	20.4 to 28.8VDC (Ripple ratio within 5%)	△	12VDC are not applicable. *1
Maximum number of	60% (5 point/common)			

(2) Common terminal arrangement

DC input modules are available in two types: positive common and negative common. Some of the existing A (Large Type) and A (Small Type) modules can be shared between these two types.

When selecting a replacement for such a shared type module, a positive common type or negative common type must be selected because shared type modules are not available in Q Series.

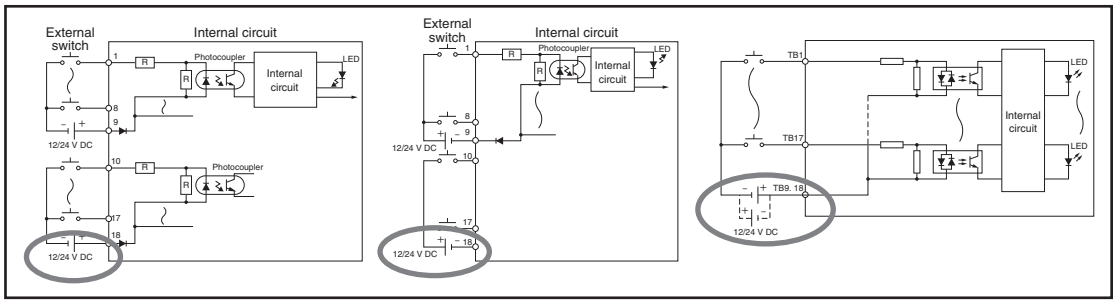
When selecting a replacement, confirm the working condition of the existing module.

Refer to the following handbooks for detailed specifications for each module.

- Transition from MELSEC-AnS/QnAS (Large Type) Series to Q Series Handbook (Fundamentals) : L(NA)-08043ENG
- Transition from MELSEC-AnS/QnAS (Small Type) Series to Q Series Handbook (Fundamentals) : L(NA)-08219ENG
- Transition from MELSEC-AnS/QnAS (Small Type) Series to L Series Handbook (Fundamentals) : L(NA)-08258ENG

Also refer to the I/O Module User's Guide for the relevant module.

(*Excerpt from Building Type I/O Module User's Manual IB-66140 and Small Building Type I/O Module User's Manual IB-66541)



(3) Using existing wiring

(1) Terminal block type module

When replacing a terminal block type module, the existing A (Large Type) or A (Small Type) module's terminal block can be used in the wired state by using the conversion adapter. This eliminates the need to change the wiring.

(2) Connector type module

If the connector type on a connector type module is the same as that on the replacement module (e.g. 40-pin connector and 40-pin connector), the existing wiring can be used.

If the connector type differs (e.g. D-sub 37-pin connector and 40-pin connector), the wiring must be changed.

When the module is replaced with L Series, it is unnecessary to change the wiring if the D-sub 37-pin connector -> 40-pin connector conversion adapter is used.

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(1) Examples of replacement of A (Large Type) modules with Q Series modules

Existing module			Replacement module		Remarks
Module model	Working conditions		Module model	Conversion adapter	
	Working voltage	Common terminal arrangement			
AX40 AX40-UL (Positive common)	24 V	Positive	QX40	ERNT-AQTX40	
	12 V	Positive	QX70		
AX41 (Positive common) AX41-UL (Positive common)	24 V	Positive	QX41	ERNT-AQTX41	• Terminal block -> 40-pin connector • Rated current: Approx. 4 mA
			QX41-S2		• Terminal block -> 40-pin connector • Rated current: Approx. 6 mA
	12 V	Common	QX71		• Terminal block -> 40-pin connector
AX41-S1 (Positive common)	24 V	Positive	QX41-S1	ERNT-AQTX41	• Terminal block -> 40-pin connector • Rated current: Approx. 4 mA
			QX41-S2		• Terminal block -> 40-pin connector • Rated current: Approx. 6 mA
	12 V	Common	QX71		• Terminal block -> 40-pin connector
AX42 (Positive common)	24 V	Positive	QX42	—	
			QX41-S2 (2 modules required)		• Rated current: Approx. 6 mA
	12 V	Positive	QX72		
AX42-S1 (Positive common)	24 V	Positive	QX42-S1	—	
AX50 (Positive common)	48 V	Positive	QX50	ERNT-AQTX40	
AX50-S1 (Shared by positive common and negative common types)		Common			
AX60 (Positive common)	100 V	—	(No replacement model)		• Examine whether to replace with QX40 and FA-TH16X100D31L
AX60-S1 (Shared by positive common and negative common types)					
AX70 (Shared by positive common and negative common types)	24 V	Positive	QX40-S1	ERNT-AQTX40	
		Negative	QX80	ERNT-AQTX80	
	5/12 V	Common	QX70	ERNT-AQTX40	
AX71 (Shared by positive common and negative common types)	24 V	Positive	QX41-S1	ERNT-AQTX41	
		Negative	QX81-S2	ERNT-AQTX81	• Terminal block -> D-sub 37-pin connector
	5/12 V	Common	QX71	ERNT-AQTX41	
AX80 (Negative common) AX80E (Negative common)	24 V	Negative	QX80	ERNT-AQTX80	
	5/12 V	Common	QX70	ERNT-AQTX40	• 5 V DC: AX80 only
AX81 (Negative common)	24 V	Negative	QX81	ERNT-AQTX81	• Rated current: Approx. 4 mA • Terminal block -> D-sub 37-pin connector
			QX81-S2		• Rated current: Approx. 6 mA • Terminal block -> D-sub 37-pin connector
	12 V	Common	QX71	ERNT-AQTX41	• Terminal block -> 40-pin connector
AX81B (Shared by positive and negative common types, with wire breakage detection)	24 V	—	(No replacement model)		• Examine whether to replace with QX81.
AX81-S1 (Shared by positive common and negative common types)	24 V	Positive	QX41-S1	ERNT-AQTX41	• Terminal block -> 40-pin connector
		Negative	QX81	ERNT-AQTX81	• Rated current: Approx. 4 mA • Terminal block -> D-sub 37-pin connector
			QX81-S2		• Rated current: Approx. 6 mA • Terminal block -> D-sub 37-pin connector
	12 V	Common	QX71	ERNT-AQTX41	• Terminal block -> 40-pin connector
AX81-S2 (Negative common)	48 V	Negative	QX50 (2 modules required)	—	
	60 V		(No replacement model)		• Examine whether to replace with QX81 and install an 8.2-kΩ resistor (1 W or more) in series on the external signal line.
AX81-S3 (Negative common)	24 V	Negative	QX81	ERNT-AQTX81	• Rated current: Approx. 4 mA • Terminal block -> D-sub 37-pin connector
			QX81-S2		• Rated current: Approx. 6 mA • Terminal block -> D-sub 37-pin connector
	12 V	Common	QX71	ERNT-AQTX41	• Terminal block -> 40-pin connector
AX82 (Negative common)	24 V	Negative	QX82	—	• Rated current: Approx. 4 mA • D-sub 37-pin connector -> 40-pin connector
			QX81-S2 (2 modules required)		• Rated current: Approx. 6 mA
	12 V	Common	QX72		• D-sub 37-pin connector -> 40-pin connector

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(2) Examples of replacement of A (Small Type) modules with Q Series modules

Existing module			Replacement module		Remarks
Module model	Working conditions		Module model	Conversion adapter	
	Working voltage	Common terminal arrangement			
A1SX30 (Shared by positive common and negative common types)	24 V	Positive	QX40	ERNT-ASQTX40	
		Negative	QX80	ERNT-ASQTX80	
	12 V	Common	QX70	ERNT-ASQTX40	
	12/24 V AC	—	(No replacement model)		Examine whether to input to QX40 after externally rectifying and smoothing 24 V AC.
A1SX40 (Positive common)	24 V	Positive	QX40	ERNT-ASQTX40	
	12 V	Common	QX70		
A1SX40-S1 (Positive common)	24 V	Positive	QX40-S1	ERNT-ASQTX40	
A1SX40-S2 (Positive common)	24 V	Positive	QX40	ERNT-ASQTX40	
A1SX41 (Positive common)	24 V	Positive	QX41	—	• Rated current: Approx. 4 mA
			QX41-S2		• Rated current: Approx. 6 mA
	12 V	Positive	QX71		
A1SX41-S1 (Positive common)	24 V	Positive	QX41-S1	—	
A1SX41-S2 (Positive common)	24 V	Positive	QX41	—	• Rated current: Approx. 4 mA
			QX41-S2		• Rated current: Approx. 6 mA
A1SX42 (Positive common)	24 V	Positive	QX42	—	
			QX41-S2 (2 modules required)		• Rated current: Approx. 6 mA
	12 V	Positive	QX72		
A1SX42-S1 (Positive common)	24 V	Positive	QX42-S1	—	
A1SX42-S2 (Positive common)	24 V	Positive	QX42	—	
			QX41-S2 (2 modules required)		• Rated current: Approx. 6 mA
A1SX71 (Shared by positive common and negative common types)	24 V	Positive	QX41-S1	—	• Rated current: Approx. 4 mA
			QX41-S2		• Rated current: Approx. 6 mA
		Negative	QX81-S2		• 40-pin connector -> D-sub 37-pin connector
	5/12 V	Common	QX71		
A1SX80 (Shared by positive common and negative common types)	24 V	Positive	QX40	ERNT-ASQTX40	
		Negative	QX80	ERNT-ASQTX80	
	12 V	Common	QX70	ERNT-ASQTX40	
A1SX80-S1 and A1SX80-S2 (Shared by positive common and negative common types)	24 V	Positive	QX40	ERNT-ASQTX40	
		Negative	QX80	ERNT-ASQTX80	
A1SX81 (Shared by positive common and negative common types)	24 V	Positive	QX41-S2	—	
		Negative	QX81-S2		
	12 V	Common	QX71		
A1SX81-S2 (Shared by positive common and negative common types)	24 V	Positive	QX41-S2	—	• D-sub 37-pin connector -> 40-pin connector
		Negative	QX81-S2		• Rated current: Approx. 6 mA
A1SX82-S1 (Shared by positive common and negative common types)	24 V	Positive	QX42	—	
		Negative	QX82-S1		

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(3) Examples of replacement of A (Small Type) modules with L Series modules

Existing module			Replacement module		Remarks
Module model	Working conditions		Module model	Conversion adapter	
	Working voltage	Common terminal arrangement			
A1SX30 (Shared by positive common and negative common types)	24 V DC	Positive	LX40C6	—	
		Negative		—	
	12 V DC	Common	(No replacement model)		
	12/24 V AC	—	(No replacement model)		Examine whether to input to LX40C6 after externally rectifying and smoothing 24 V AC.
A1SX40 (Positive common)	24 V DC	Positive	LX40C6	ERNT-ASLTX40	
	12 V DC	—	(No replacement model)		
A1SX40-S1 and A1SX40-S2 (Positive common)	24 V DC	Positive	LX40C6	ERNT-ASLTX40	
A1SX41 (Positive common)	24 V DC	Positive	LX41C4	—	
	12 V DC	Positive	(No replacement model)		
A1SX41-S1 and A1SX41-S2 (Positive common)	24 V DC	Positive	LX41C4	—	
A1SX42 (Positive common)	24 V DC	Positive	LX42C4	—	
	12 V DC	Positive	(No replacement model)		
A1SX42-S1 and A1SX42-S2 (Positive common)	24 V DC	Positive	LX42C4	—	
A1SX71 (Shared by positive common and negative common types)	24 V DC	Common	LX41C4	—	
	5/12 V DC	—	(No replacement model)		
A1SX80 (-S1 and S2) (Shared by positive common and negative common types)	24 V DC	Common	LX40C6	ERNT-ASLTXY80	
	12 V DC	—	(No replacement model)		
A1SX81 (Shared by positive common and negative common types)	24 V DC	Common	LX41C4	ERNT-ASLCXY81	• D-sub 37-pin connector -> 40-pin connector
	12 V DC	—	(No replacement model)		
A1SX81-S1 and A1SX81-S2 (Shared by positive common and negative common types)	24 V DC	Common	LX41C4	ERNT-ASLCXY81	• D-sub 37-pin connector -> 40-pin connector
A1SX82-S1 (Shared by positive common and negative common types)	24 V DC	Common	LX42C4	—	

● Example of selection of replacement for AX71

Although AX71 can be shared by 5/12/24-V DC positive and negative common types, the module to be selected as a replacement varies depending on the working condition.
It is necessary to confirm the current working condition and select an appropriate one.

(1) Comparison of specifications for AX71 and replacement modules

Specification	AX71	QX71	QX41-S2	QX81-S2
Number of input points	32 points	32 points	32 points	32 points
Rated input voltage	5 V DC/12 V DC/24 V DC	5 V DC/12 V DC	24 V DC	24 V DC
Rated input current	3.5 mA/2 mA/4.5 mA (TYP), 5.5 mA/3 mA/6 mA (MAX)	5 V DC: approx. 1.2 mA 12 V DC: approx. 3.3 mA	Approx. 6 mA	Approx. 6 mA
Working voltage range	4.5 to 5.5 V DC (SW ON), 10.2 to 26.4 V DC (SW OFF)	4.5 to 6 V DC (Ripple ratio within 5%) 10.2 to 14.4 V DC (Ripple ratio within 5%)	20.4 to 28.8 V DC (Ripple ratio within 5%)	20.4 to 28.8 V DC (Ripple ratio within 5%)
Common terminal arrangement	Shared by positive and negative common types	Shared by positive and negative common types	Positive common type	Negative common type
	8 points/common terminal	32 points/common terminal	32 points/common terminal	32 points/common terminal
External connection method	38-point terminal block connector (M3 × 6 screws)	40-pin connector (optional)	40-pin connector (optional)	D-sub 37-pin connector (optional)
Conversion adapter *1	—	ERNT-AQTX41	ERNT-AQTX41	ERNT-AQTX81

*1: Wiring conversion adapter manufactured by Mitsubishi Electric Engineering Co., Ltd.
The terminal block for AX71 with the existing wiring can be used by using the conversion adapter.

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10.2 Notes for selection of replacement for Triac output module AY22

Although QY22 can be selected as a replacement module for AY22, the modules partially differ in specifications, and the maximum load current of QY22 is lower. Therefore, it is necessary to confirm whether the existing connected devices meet the maximum load current specification.

(1) Comparison of specifications between AY22 and QY22 (excerpt from transition handbook)

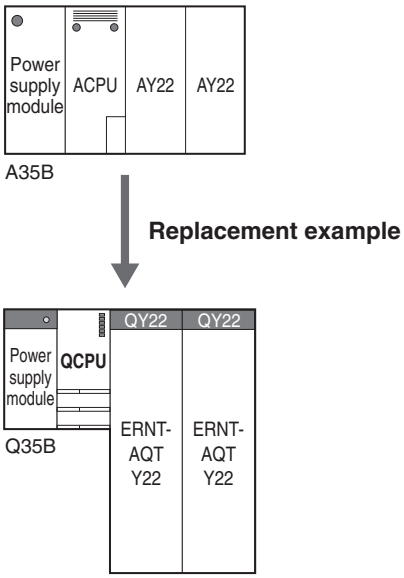
○: Compatible, △: Partially changed, ×: Incompatible

Specification	AY22	QY22	Compatibility	Notes for replacement
Number of output points	16 points	16 points	○	
Insulation method	Photocoupler	Photocoupler	○	
Rated load voltage	100-240 V AC 50/60 Hz ±5%	100-240 V AC 50/60 Hz ±5%	○	
Max. load voltage	264 V AC	264 V AC	○	
Max. load current	2 A/point, 3.3 A/common terminal	0.6 A/point, 4.8 A/common terminal	△	Since the maximum load current per point has been reduced, carefully select the usage load.

(2) Selection examples

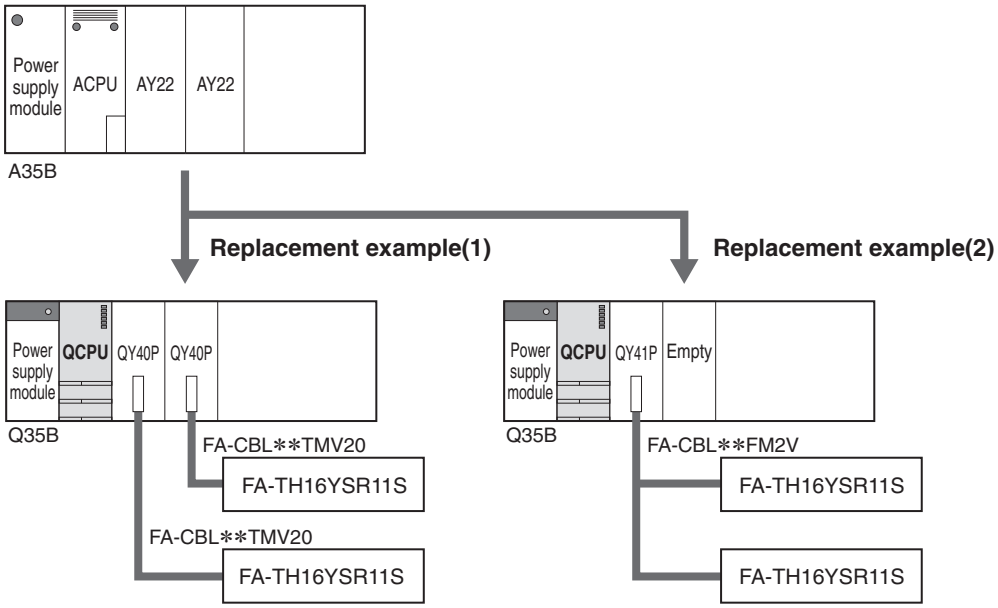
(1) When the load capacity of externally connected device is 0.6 A or less

Select the Triac output module QY22 as a replacement module, and utilize the wiring of the existing module terminal block by using the conversion adapter ERNT-AQTY22.



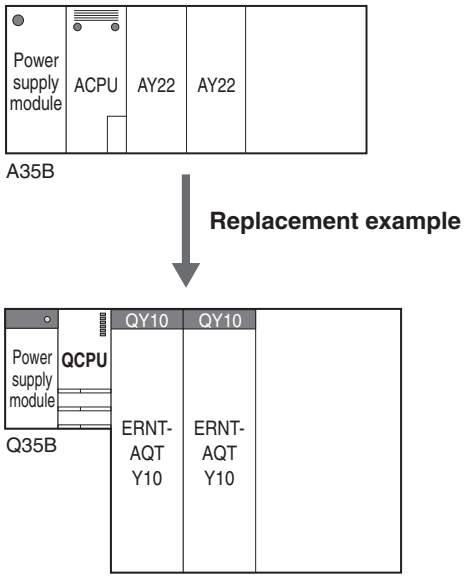
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(2) When the load capacity of externally connected device is 0.6 A to 1 A
Select the transistor output module QY40P/QY41P as a replacement module, and externally provide the FA goods manufactured by Mitsubishi Electric Engineering Co., Ltd. to increase the load capacity.



(3) When the load capacity of externally connected device is 1 A or more and Triac output is necessary for reasons of specifications
Select the transistor output module QY40P/QY41P as a replacement module, and externally provide a commercially available Triac conversion terminal module to increase the load capacity. (We do not introduce any product.)

(4) When the load capacity of externally connected device is 1 A or more and a change to relay output can be made for reasons of specifications
Select QY10 as a replacement module, and use the conversion adapter ERNT-AQTY10 to use the existing module terminal block without modifying the wiring.



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11. Notes for replacement of network (MELSECNET(II))

11.1 CPUs compatible with networks (MELSECNET(II), MELSECNET/10 and MELSECNET/H)

This section shows the CPU types compatible with the network (MELSECNET(II), MELSECNET/10 or MELSECNET/H) to be configured and the combinations of CPU types.

11.1.1 System configuration for MELSECNET/10 and MELSECNET/H (PLC to PLC network)

The following table shows the CPU types that are compatible with MELSECNET/10 and MELSECNET/H (PLC to PLC network) network systems.

Control station		Normal station*1			
		Q (Q Mode)	QnA	AnU, Q (A Mode)	AnA, AnN, AnS(H)
Q (Q Mode)	MELSECNET/10 mode	○	○	○	○*2
	MELSECNET/H mode (10 Mbps)	○	×*3		
	MELSECNET/H mode (25 Mbps)	○	×*3		
QnA (MELSECNET/10 mode)		○	○	○	○*2
AnU, Q (A Mode) (MELSECNET/10 mode)		○	○	○	○*2
AnA, AnN, AnS(H)*4		×			

○: Compatible, ×: Not compatible

*1: Cannot be mixed with a remote I/O station.

*2: Restrictions may apply to the B/W link range depending on the CPU type

AnA : B/W000 to FFF

AnN, AnS(H): B/W000 to 3FF

*3: CPUs other than Q Series CPU (Q mode) cannot be combined because a network system can be configured with Q Series CPU (Q mode) only.

*4: Cannot be a control station.

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11.1.2 System configuration for existing MELSECNET(II) in combination with Q Series CPU

The following table shows combinations of Q Series CPU with the existing MELSECNET(II) data link systems.

Master station		Local station/Remote I/O station				
		Q (High Performance model)	Q (Basic model) Q (Universal model)	QnA, AnU, AnA	AnN, AnS(H)	Remote I/O station (AJ72P25)
Q (High Performance model)*1		×				
Q (Basic model)*1		×				
Q (Universal model)*1		×				
QnA, AnU, AnA	MELSECNET II	△*2	△*3	○		×
	MELSECNET II composite	△*2	△*3	○		○*4
	MELSECNET	△*2	△*3	○		○*4
AnN, AnS(H)	MELSECNET II*5	×				
	MELSECNET II composite*5	×				
	MELSECNET	△*2	△*3	○		○*4

○: Applicable, △: Applicable (with restrictions), ×: Not applicable

*1: Cannot be a master station.
*2: Can be combined with data link system when a local station module (such as A1SJ71AP23Q) is mounted on the extension base unit (QA1S6□B).
*3: Can be combined with data link system when a local station module (such as A1SJ71AP23Q) is mounted on the extension base unit (QA1S6□B).
However, the extension base unit (QA1S6□B) cannot be connected to the basic model QCPU.
*4: A local station and a remote I/O station can be mixed in the data link system.
*5: MELSECNET II mode and MELSECNET II composite mode are not supported.

11.1.3 System configuration for MELSECNET/10 and MELSECNET/H (remote I/O network)

The following table shows the CPU types that are compatible with MELSECNET/10 and MELSECNET/H (remote I/O network) network systems. (The listed network modules are for optical loop. For coaxial loop and coaxial bus, use their respective modules)

Master station		Remote I/O station (compatible network module)			
CPU	Network module/ Data link module	QJ72LP25-25	A(1S)J72QLP25	A(1S)J72LP25	A(1S)J72P25
Q (Other than basic model)	QJ71LP21-25	○	×		×
Q (Basic model)	QJ71LP21-25	×	×		×
QnA	A(1S)J71QLP21	×	○		×
	A(1S)J71AP21*1	×	×		○
AnU, Q (A mode)	A(1S)J71LP21	×*3	○		×
	A(1S)J71AP21*1	×	×		○
AnA, AnN, AnS(H)	A(1S)J71LP21*2	×	×		×
	A(1S)J71AP21*1	×	×		○

○: Compatible, ×: Not compatible

*1: Module for MELSECNET(II) data link system.
*2: Compatible with normal station only.
*3: A module with a five digits of serial No. 15012 or higher can be used by setting it to the MELSECNET/10 mode.

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11.1.4 System configuration for redundant system network

(1) System configuration for MELSECNET/10 and MELSECNET/H (PLC to PLC network) network systems

The following table shows combinations of MELSECNET/10 and MELSECNET/H (PLC to PLC network) network systems with redundant systems.

Control station			Normal station				
			Q		Q4AR		QnA, AnU, AnA, AnN, AnS(H)
			Redundant	Standalone	Redundant	Standalone	
Q	Redundant	MELSECNET/H mode	○	○	×	×	×
		MELSECNET/10 mode	○				
	Standalone	MELSECNET/H mode	○	○	×	×	×
		MELSECNET/10 mode	○				
Q4AR	Redundant		○				
	Standalone		○				
QnA, AnU*1			×	○	×	○	○
AnA, AnN, AnS(H)*2			×				

○: Applicable, ×: Not applicable

*1: Cannot be configured for redundant systems.

*2: Cannot be a control station.

(2) System configuration for MELSECNET/10 and MELSECNET/H (remote I/O network) network systems

The following table shows combinations of MELSECNET/10 and MELSECNET/H (remote I/O network) network systems with redundant systems. (The network modules listed are optical loop modules. For coaxial loop, coaxial bus, and twisted bus, replace with the appropriate modules.)

(Example)

Master station		Remote I/O station (compatible network module)			
CPU	Network module	QJ72LP25-25	A(1S)J72QLP25	A(1S)J72LP25	A(1S)J72P25
QnPRH	QJ71LP21-25	○	×		×
Q4AR	AJ71LP21*1	–			
	AJ71QLP21	×	○		×

○: Applicable, ×: Not applicable

*1: Cannot be combined with Q4ARCPU.

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Warranty

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for three years after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be fourty-two (42) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) As a principle, the primary fault diagnosis must be preformed by the user.
If requested by the client, Mitsubishi or Mitsubishi's service network can perform the work for a fee. In this case, if Mitsubishi is found at fault for the cause of the fault, the service will be performed for free.

(2) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(3) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts designated in the instruction manual had been correctly serviced or replaced.
5. Replacement of consumable parts (battery, relay, fuse, etc.).
6. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
7. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
8. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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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.
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New publication, effective Dec. 2014.
Specifications are subject to change without notice.

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