MITSUBISHI ELECTRIC

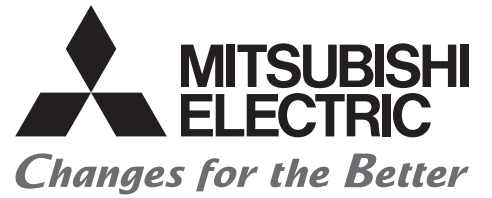**Changes for the Better**

MITSUBISHI ELECTRIC SERVO SYSTEM CONTROLLER

Migration Guide from Positioning Module to Simple Motion Module [QD74MH ⇒ QD77MS]

QD74MH8
QD74MH16

SSCNET III/H
SERVO SYSTEM CONTROLLER NETWORK

QD77MS16

● SAFETY PRECAUTIONS ●

(Please read these instructions before using this equipment.)

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

The precautions given in this manual are concerned with this product only. Refer to the user's manual of the CPU module to use for a description of the PLC system safety precautions.

In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

⚠ DANGER	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 medium or slight personal injury or physical damage.

Depending on circumstances, procedures indicated by ⚠CAUTION may also be linked to serious results. In any case, it is important to follow the directions for usage.

Please save this manual to make it accessible when required and always forward it to the end user.

For Safe Operations

1. Prevention of electric shocks

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⚠DANGER

● Never open the front case or terminal covers while the power is ON or the unit is running, as this may lead to electric shocks.

● Never run the unit with the front case or terminal cover removed. The high voltage terminal and charged sections will be exposed and may lead to electric shocks.

● Never open the front case or terminal cover at times other than wiring work or periodic inspections even if the power is OFF. The insides of the module and servo amplifier are charged and may lead to electric shocks.

● Completely turn off the externally supplied power used in the system before mounting or removing the module, performing wiring work, or inspections. Failing to do so may lead to electric shocks.

● When performing wiring work or inspections, turn the power OFF, wait at least ten minutes, and then check the voltage with a tester, etc. Failing to do so may lead to electric shocks.

● Be sure to ground the module, servo amplifier and servomotor (Ground resistance: 100 Ω or less). Do not ground commonly with other devices.

● The wiring work and inspections must be done by a qualified technician.

● Wire the units after installing the module, servo amplifier and servomotor. Failing to do so may lead to electric shocks or damage.

● Never operate the switches with wet hands, as this may lead to electric shocks.

● Do not damage, apply excessive stress, place heavy things on or sandwich the cables, as this may lead to electric shocks.

● Do not touch the module, servo amplifier, servomotor connector or terminal blocks while the power is ON, as this may lead to electric shocks.

● Do not touch the built-in power supply, built-in grounding or signal wires of the module and servo amplifier, as this may lead to electric shocks.

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2. For fire prevention

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⚠CAUTION

● Install the module, servo amplifier, servomotor and regenerative resistor on incombustible. Installing them directly or close to combustibles will lead to fire.

● If a fault occurs in the module or servo amplifier, shut the power OFF at the servo amplifier's power source. If a large current continues to flow, fire may occur.

● When using a regenerative resistor, shut the power OFF with an error signal. The regenerative resistor may abnormally overheat due to a fault in the regenerative transistor, etc., and may lead to fire.

● Always take heat measures such as flame proofing for the inside of the control panel where the servo amplifier or regenerative resistor is installed and for the wires used. Failing to do so may lead to fire.

● Do not damage, apply excessive stress, place heavy things on or sandwich the cables, as this may lead to fire.

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3. For injury prevention

⚠CAUTION

● Do not apply a voltage other than that specified in the instruction manual on any terminal. Doing so may lead to destruction or damage.

● Do not mistake the terminal connections, as this may lead to destruction or damage.

● Do not mistake the polarity (+ / -), as this may lead to destruction or damage.

● Do not touch the heat radiating fins of module or servo amplifier, regenerative resistor and servomotor, etc., while the power is ON and for a short time after the power is turned OFF. In this timing, these parts become very hot and may lead to burns.

● Always turn the power OFF before touching the servomotor shaft or coupled machines, as these parts may lead to injuries.

● Do not go near the machine during test operations or during operations such as teaching. Doing so may lead to injuries.

4. Various precautions

Strictly observe the following precautions. Mistaken handling of the unit may lead to faults, injuries or electric shocks.

(1) System structure

⚠CAUTION

● Always install a leakage breaker on the module and servo amplifier power source.

● If installation of an electromagnetic contactor for power shut off during an error, etc., is specified in the instruction manual for the servo amplifier, etc., always install the electromagnetic contactor.

● Install the emergency stop circuit externally so that the operation can be stopped immediately and the power shut off.

● Use the module, servo amplifier, servomotor and regenerative resistor with the correct combinations listed in the instruction manual. Other combinations may lead to fire or faults.

● Use the CPU module, base unit, and Simple Motion module with the correct combinations listed in the instruction manual. Other combinations may lead to faults.

● If safety standards (ex., robot safety rules, etc.,) apply to the system using the module, servo amplifier and servomotor, make sure that the safety standards are satisfied.

● Construct a safety circuit externally of the module or servo amplifier if the abnormal operation of the module or servo amplifier differs from the safety directive operation in the system.

● In systems where coasting of the servomotor will be a problem during the forced stop, emergency stop, servo OFF or power supply OFF, use the dynamic brake.

● Make sure that the system considers the coasting amount even when using the dynamic brake.

● In systems where perpendicular shaft dropping may be a problem during the forced stop, emergency stop, servo OFF or power supply OFF, use both the dynamic brake and electromagnetic brake.

● The dynamic brake must be used only on errors that cause the forced stop, emergency stop, or servo OFF. This brake must not be used for normal braking.

● The brake (electromagnetic brake) assembled into the servomotor are for holding applications, and must not be used for normal braking.

⚠CAUTION

- ● The system must have a mechanical allowance so that the machine itself can stop even if the stroke limits switch is passed through at the max. speed.
- ● Use wires and cables that have a wire diameter, heat resistance and bending resistance compatible with the system.
- ● Use wires and cables within the length of the range described in the instruction manual.
- ● The ratings and characteristics of the parts (other than module, servo amplifier and servomotor) used in a system must be compatible with the module, servo amplifier and servomotor.
- ● Install a cover on the shaft so that the rotary parts of the servomotor are not touched during operation.
- ● There may be some cases where holding by the electromagnetic brake is not possible due to the life or mechanical structure (when the ball screw and servomotor are connected with a timing belt, etc.). Install a stopping device to ensure safety on the machine side.

(2) Parameter settings and programming

⚠DANGER

- ● Set the parameter values to those that are compatible with the module, servo amplifier, servomotor and regenerative resistor model and the system application. The protective functions may not function if the settings are incorrect.
- ● The regenerative resistor model and capacity parameters must be set to values that conform to the operation mode and servo amplifier. The protective functions may not function if the settings are incorrect.
- ● Set the mechanical brake output and dynamic brake output validity parameters to values that are compatible with the system application. The protective functions may not function if the settings are incorrect.
- ● Set the stroke limit input validity parameter to a value that is compatible with the system application. The protective functions may not function if the setting is incorrect.
- ● Set the servomotor encoder type (increment, absolute position type, etc.) parameter to a value that is compatible with the system application. The protective functions may not function if the setting is incorrect.
- ● Use the program commands for the program with the conditions specified in the instruction manual.
- ● Set the sequence function program capacity setting, device capacity, latch validity range, I/O assignment setting, and validity of continuous operation during error detection to values that are compatible with the system application. The protective functions may not function if the settings are incorrect.
- ● The input devices and data registers assigned to the link will hold the data previous to when communication is terminated by an error, etc. Thus, an error correspondence interlock program specified in the instruction manual must be used.
- ● Use the interlock program specified in the intelligent function module's instruction manual for the program corresponding to the intelligent function module.

(3) Transportation and installation

⚠CAUTION

- Transport the product with the correct method according to the mass.
- Use the servomotor suspension bolts only for the transportation of the servomotor. Do not transport the servomotor with machine installed on it.
- Do not stack products past the limit.
- When transporting the module or servo amplifier, never hold the connected wires or cables.
- When transporting the servomotor, never hold the cables, shaft or detector.
- When transporting the module or servo amplifier, never hold the front case as it may fall off.
- When transporting, installing or removing the module or servo amplifier, never hold the edges.
- Install the unit according to the instruction manual in a place where the mass can be withstood.
- Do not get on or place heavy objects on the product.
- Always observe the installation direction.
- Keep the designated clearance between the module or servo amplifier and control panel inner surface or the module and servo amplifier, module or servo amplifier and other devices.
- Do not install or operate modules, servo amplifiers or servomotors that are damaged or that have missing parts.
- Do not block the intake/outtake ports of the servo amplifier and servomotor with cooling fan.
- Do not allow conductive matter such as screw or cutting chips or combustible matter such as oil enter the module, servo amplifier or servomotor.
- The module, servo amplifier and servomotor are precision machines, so do not drop or apply strong impacts on them.
- Securely fix the module, servo amplifier and servomotor to the machine according to the instruction manual. If the fixing is insufficient, these may come off during operation.
- Always install the servomotor with reduction gears in the designated direction. Failing to do so may lead to oil leaks.
- Store and use the unit in the following environmental conditions.

Environment	Conditions	
	Module/Servo amplifier	Servomotor
Ambient temperature	According to each instruction manual.	0°C to +40°C (With no freezing) (32°F to +104°F)
Ambient humidity	According to each instruction manual.	80% RH or less (With no dew condensation)
Storage temperature	According to each instruction manual.	-20°C to +65°C (-4°F to +149°F)
Atmosphere	Indoors (where not subject to direct sunlight). No corrosive gases, flammable gases, oil mist or dust must exist	
Altitude	According to each instruction manual	
Vibration	According to each instruction manual	

- When coupling with the servomotor shaft end, do not apply impact such as by hitting with a hammer. Doing so may lead to detector damage.
- Do not apply a load larger than the tolerable load onto the servomotor shaft. Doing so may lead to shaft breakage.

⚠CAUTION

● When not using the module for a long time, disconnect the power line from the module or servo amplifier.
● Place the module and servo amplifier in static electricity preventing vinyl bags and store.
● When storing for a long time, please contact with our sales representative.
  Also, execute a trial operation.
● Make sure that the connectors for the servo amplifier and peripheral devices have been securely installed until a click is heard.
  Not doing so could lead to a poor connection, resulting in erroneous input and output.
● When fumigants that contain halogen materials such as fluorine, chlorine, bromine, and iodine are used for disinfecting and protecting wooden packaging from insects, they cause malfunction when entering our products.
  Please take necessary precautions to ensure that remaining materials from fumigant do not enter our products, or treat packaging with methods other than fumigation (heat method). Additionally, disinfect and protect wood from insects before packing products.
● The module and the servo amplifier must not be used with parts which contain halogen-series flame retardant materials (such as bromine) under coexisting conditions.

(4) Wiring

⚠CAUTION

● Correctly and securely wire the wires. Reconfirm the connections for mistakes and the terminal screws for tightness after wiring. Failing to do so may lead to run away of the servomotor.

● After wiring, install the protective covers such as the terminal covers to the original positions.

● Do not install a phase advancing capacitor, surge absorber or radio noise filter (option FR-BIF) on the output side of the servo amplifier.

● Correctly connect the output side (terminal U, V, W). Incorrect connections will lead the servomotor to operate abnormally.

● Do not connect a commercial power supply to the servomotor, as this may lead to trouble.

● Do not mistake the direction of the surge absorbing diode installed on the DC relay for the control signal output of brake signals, etc. Incorrect installation may lead to signals not being output when trouble occurs or the protective functions not functioning.

For the sink output interface   For the source output interface
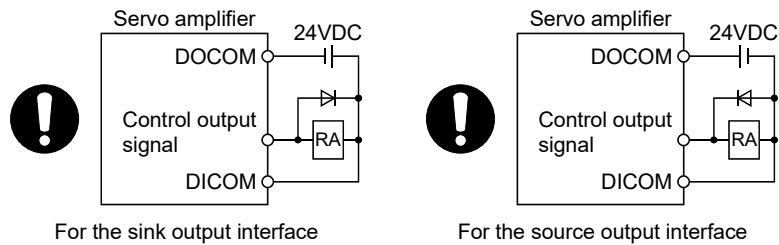
● Do not connect or disconnect the connection cables between each unit, the encoder cable or PLC expansion cable while the power is ON.

● Securely tighten the cable connector fixing screws and fixing mechanisms. Insufficient fixing may lead to the cables combing off during operation.

● Do not bundle the power line or cables.

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

(5) Trial operation and adjustment

⚠CAUTION

● Confirm and adjust the program and each parameter before operation. Unpredictable movements may occur depending on the machine.
● Extreme adjustments and changes may lead to unstable operation, so never make them.
● When using the absolute position system function, on starting up, and when the module or absolute position motor has been replaced, always perform a home position return.
● Before starting test operation, set the parameter speed limit value to the slowest value, and make sure that operation can be stopped immediately by the forced stop, etc. if a hazardous state occurs.
● Before starting the operation, confirm the brake function.

(6) Usage methods

⚠CAUTION

● Immediately turn OFF the power if smoke, abnormal sounds or odors are emitted from the module, servo amplifier or servomotor.
● Always execute a test operation before starting actual operations after the program or parameters have been changed or after maintenance and inspection.
● Do not attempt to disassemble and repair the units excluding a qualified technician whom our company recognized.
● Do not make any modifications to the unit.
● Keep the effect or electromagnetic obstacles to a minimum by installing a noise filter or by using wire shields, etc.
Electromagnetic obstacles may affect the electronic devices used near the module or servo amplifier.
● When using the CE Mark-compliant equipment design, refer to the "EMC Installation Guidelines" (data number IB(NA)-67339) and refer to the corresponding EMC guideline information for the servo amplifiers and other equipment.
● Note that when the reference axis speed is designated for interpolation operation, the speed of the partner axis (2nd axis, 3rd axis and 4th axis) may be larger than the set speed (larger than the speed limit value).
● Use the units with the following conditions.

Item	Conditions
Input power	According to each instruction manual.
Input frequency	According to each instruction manual.
Tolerable momentary power failure	According to each instruction manual.

(7) Corrective actions for errors

⚠CAUTION

● If an error occurs in the self diagnosis of the module or servo amplifier, confirm the check details according to the instruction manual, and restore the operation.

● If a dangerous state is predicted in case of a power failure or product failure, use a servomotor with an electromagnetic brake or install a brake mechanism externally.

● Use a double circuit construction so that the electromagnetic brake operation circuit can be operated by emergency stop signals set externally.
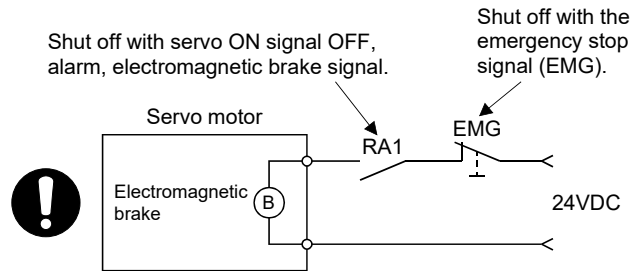
● If an error occurs, remove the cause, secure the safety and then resume operation after alarm release.

● The unit may suddenly resume operation after a power failure is restored, so do not go near the machine. (Design the machine so that personal safety can be ensured even if the machine restarts suddenly.)

(8) Maintenance, inspection and part replacement

⚠CAUTION

● Perform the daily and periodic inspections according to the instruction manual.
● Perform maintenance and inspection after backing up the program and parameters for the module and servo amplifier.
● Do not place fingers or hands in the clearance when opening or closing any opening.
● Periodically replace consumable parts such as batteries according to the instruction manual.
● Do not touch the lead sections such as ICs or the connector contacts.
● Before touching the module, always touch grounded metal, etc. to discharge static electricity from human body. Failure to do so may cause the module to fail or malfunction.
● Do not directly touch the module's conductive parts and electronic components.
 Touching them could cause an operation failure or give damage to the module.
● Do not place the module or servo amplifier on metal that may cause a power leakage or wood, plastic or vinyl that may cause static electricity buildup.
● Do not perform a megger test (insulation resistance measurement) during inspection.
● When replacing the module or servo amplifier, always set the new module settings correctly.

● When the module or absolute position motor has been replaced, carry out a home position return operation using the following method, otherwise position displacement could occur.
 • After writing the servo data to the Simple Motion module using programming software, switch on the power again, then perform a home position return operation.
● After maintenance and inspections are completed, confirm that the position detection of the absolute position detector function is correct.
● Do not drop or impact the battery installed to the module.
 Doing so may damage the battery, causing battery liquid to leak in the battery. Do not use the dropped or impacted battery, but dispose of it.
● Do not short circuit, charge, overheat, incinerate or disassemble the batteries.
● The electrolytic capacitor will generate gas during a fault, so do not place your face near the module or servo amplifier.
● The electrolytic capacitor and fan will deteriorate. Periodically replace these to prevent secondary damage from faults. Please contact with our sales representative.
● Lock the control panel and prevent access to those who are not certified to handle or install electric equipment.
● Do not mount/remove the module and base or terminal block more than 50 times (IEC61131-2-compliant), after the first use of the product. Failure to do so may cause malfunction.
● Do not burn or break a module and servo amplifier. Doing so may cause a toxic gas.

(9) About processing of waste

When you discard module, servo amplifier, a battery (primary battery) and other option articles, please follow the law of each country (area).

⚠CAUTION

- This product is not designed or manufactured to be used in equipment or systems in situations that can affect or endanger human life.
- When considering this product for operation in special applications such as machinery or systems used in passenger transportation, medical, aerospace, atomic power, electric power, or submarine repeating applications, please contact your nearest Mitsubishi sales representative.
- Although this product was manufactured under conditions of strict quality control, you are strongly advised to install safety devices to forestall serious accidents when it is used in facilities where a breakdown in the product is likely to cause a serious accident.

(10) General cautions

- All drawings provided in the instruction manual show the state with the covers and safety partitions removed to explain detailed sections. When operating the product, always return the covers and partitions to the designated positions, and operate according to the instruction manual.

REVISIONS

Print Date	Manual No.	Revision
June, 2018	L(NA)03165ENG-A	First edition

INTRODUCTION

Please read this manual carefully so that equipment is used to its optimum.

CONTENTS

MEMO

1. OVERVIEW OF MIGRATION FROM QD74MH TO QD77MS

1.1 Benefits of Migration

Migrating from the existing system using QD74MH Positioning modules to a new system using MELSEC-Q series Simple Motion module QD77MS16 is recommended. We also recommend migrating servo amplifiers to the MR-J4 series at the same time.

Migrating not only allows the system to run for longer periods, but also has the following advantages.

(1) High functionality of Positioning module (Simple Motion module)

The Simple Motion module achieves further advanced motion control with a wide variety of motion control functions such as synchronous control, in addition to positioning control. The replaced model offers various new auxiliary features including cam detection function and cam auto generation function, helping to reduce programming time further.

→ Increased productivity from higher functionality of the controller

(2) High-speed communication by SSCNETIII/H

Speeding up and improving noise tolerance of servo system network communications are achieved by optical communication. A long distance cable of 100 m can be also used.

→ Increased speeds over the entire facility

(3) Servo amplifier MR-J4 and servo motor

The MR-J4 series achieves high performance operation with a variety of functions including one-touch tuning, a 22-bit high resolution encoder (4194304 pulse/rev), and 2.5 kHz speed frequency response. The product lineup includes multi-axis servo amplifiers that contribute to energy saving, space saving, and reduced wiring of a machine. The MR-J4 series compatible rotary servo motor, HG series enables to output high torque at high speed. Linear servo motors and direct drive motors are also available. Select the motor type according to your application from our extensive product lineup.

→ Increase of applications, improved performance, energy saving, downsizing, and reduced wiring of drive systems

(4) Reliable monitoring functions

With our engineering software, the system status is easily monitored just by selecting monitoring items that your system needs from its wealth of monitoring information. In addition, operation is checked through waveforms and each device data collected by digital oscilloscope and GX Logviewer (when QnUDVCPU is used)

→A strong support for troubleshooting

(5) Lower maintenance cost

After 5 years of usage, the products will need maintenance, such as replacement of the whole circuit board due to the life of components including electrolytic capacitors and memories. To use the system the longest possible, an early migration to the latest model is recommended in terms of performance and quality.

→ Increased equipment longevity

1.2 Main Target Models for Migration

The main target models for replacement described in this section are as follows.

(1) Positioning modules

Product name	Model before migration		Model after migration
SSCNETIII compatible Positioning module	QD74MH8	➡	QD77MS16
	QD74MH16		

(2) Servo amplifiers and servo motors
　　The existing MR-J3 series servo amplifiers can be used in the migrated system with
　　QD77MS16, however, it is strongly recommended to replace them with the MR-J4 series.

(a) Servo amplifiers and rotary servo motors

Before migration from QD74MH				After migration to QD77MS16		
Servo amplifier		Rotary servo motor		Servo amplifier		Rotary servo motor
MR-J3 series	MR-J3-□B MR-J3W-□B MR-J3-□BS MR-J3-□B-RJ006	HF-KP□ HF-MP□ HF-SP□ HF-JP□ HC-LP□ HC-RP□ HC-UP□ HA-LP□	➡	MR-J4 series	MR-J4-□B(-RJ) MR-J4W2-□B MR-J4W3-□B	HG-KR□ HG-MR□ HG-SR□ HG-RR□ HG-UR□ HG-JR□

(b) Servo amplifiers and linear servo motors

Before migration from QD74MH				After migration to QD77MS16		
Servo amplifier		Linear servo motor		Servo amplifier		Linear servo motor
MR-J3 series	MR-J3-□B-RJ004	LM-H2□ LM-F□ LM-K2□ LM-U2□	➡	MR-J4 series	MR-J4-□B(-RJ) MR-J4W2-□B MR-J4W3-□B	LM-H3□ LM-F□ LM-K2□ LM-U2□

(3) Servo system network

Item		SSCNETⅢ	SSCNETⅢ/H
Communications medium		Optical fiber cable	← (same as SSCNETIII)
Communications speed		50 Mbps	150 Mbps
Communications cycle	Send	0.44 ms/0.88 ms	0.22 ms/0.44 ms/0.88 ms
	Receive	0.44 ms/0.88 ms	0.22 ms/0.44 ms/0.88 ms
Number of control axes		Up to 16 axes/line	← (same as SSCNETIII)

Transmission distance		[Standard code for inside panel and standard cable for outside panel]
		  Up to 20 m between stations
		  Maximum overall distance: 320 m (20 m × 16 axes)
			← (same as SSCNETIII)

		[Long distance cable]
		  Up to 50 m between stations
		  Maximum overall distance: 800 m (50 m × 16 axes)
			[Long distance cable]
			  Up to 100 m between stations
			  Maximum overall distance: 1600 m (100 m × 16 axes)

(4) Engineering environment (required)

Product name	Model	Version
MELSOFT GX Works2	SW1DND-GXW2-E	Ver.1.576A or later
MELSOFT MR Configurator2	SW1DNC-MRC2-E	Ver.1.09K or later

1.3 System Configuration

1.3.1 System configuration using QD74MH before migration

Main base unit
  Q3□B
Power supply module
  Q6□P
PLC CPU module
  Qn(H)CPU
Positioning module
  QD74MH

Forced stop input cable
  Q170DEMICBL□M

Forced stop input (24 VDC)

SSCNETIII cable
  MR-J3BUS□M(-A/-B)

Servo amplifier
MR-J3-B

USB communication
cable or RS-232
communication cable

Servo motor
HC/HA/HF series
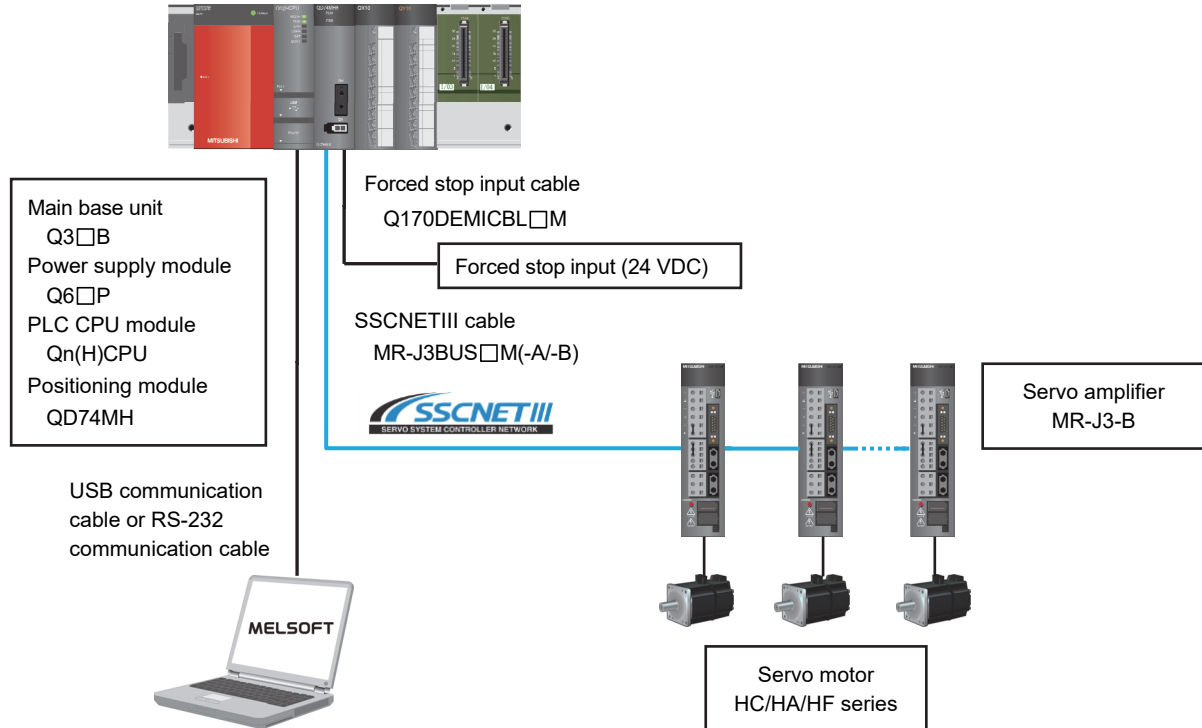
1.3.2 System configuration using QD77MS16 after migration

Main base unit
  Q3□B
Power supply module
  Q6□P
PLC CPU module
  Qn(H)CPU
Simple Motion module
  QD77MS16

External input signal cable (Note-1)

Forced stop input (24 VDC)

SSCNETIII cable
  MR-J3BUS□M(-A/-B)

Servo amplifier
MR-J4-B

USB communication
cable or RS-232
communication cable

Servo motor
HG series
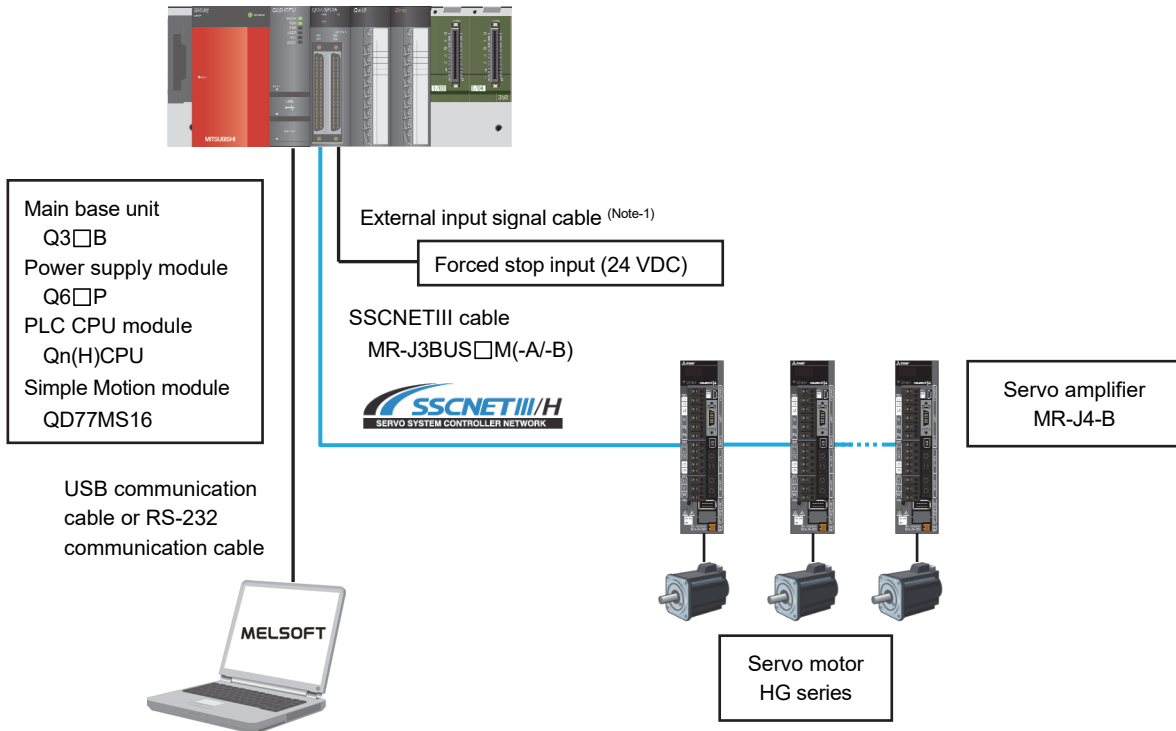
(Note-1): Replace the forced stop input cable for the new controller. (Refer to section 1.4.2)

1.4 Case Study on Migration

The following describes a case study for migrating the existing system using QD74MH.
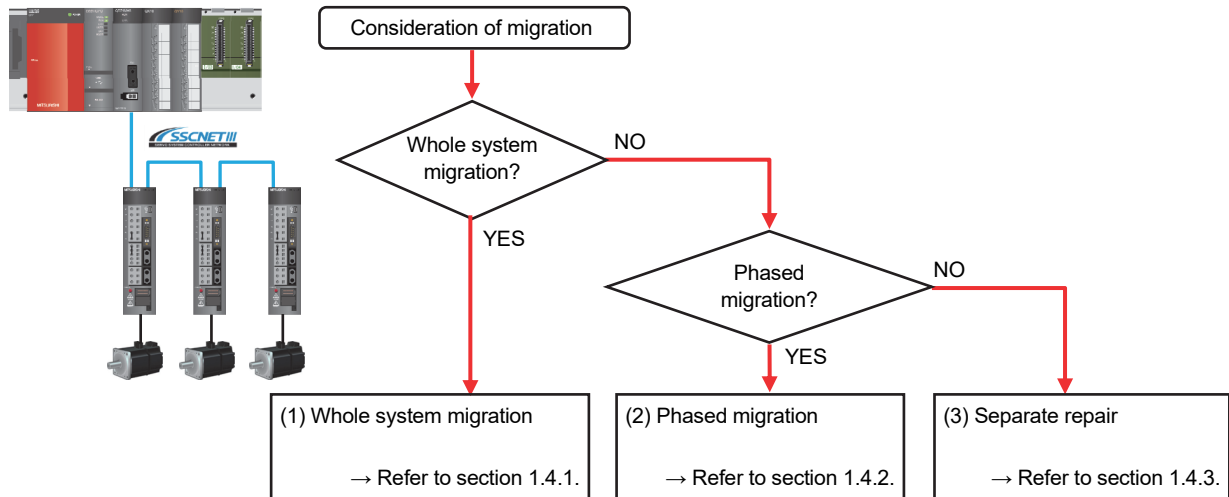
(1) Whole system migration (recommended)
The controller, servo amplifiers, servo motors, and servo system network are replaced simultaneously. Although a large-scale installation is required, the whole system migration allows the system to operate for longer periods. (Refer to section 1.4.1.)

(2) Phased migration (When the whole system migration is difficult due to the installation period and cost.)
The controller is replaced with QD77MS16 in the first phase, and then the MR-J3-B servo amplifiers are gradually replaced with MR-J4-B.
(Refer to section 1.4.2.)

(3) Separate repair
This is a replacement method for when the controller, the servo amplifier, or the servo motor malfunctions.
(Refer to section 1.4.3.)

1.4.1 Whole system migration (recommended)

The following shows the system when the whole system migration takes place.

[Current model] QD74MH   [Model after migration] QD77MS16

Forced stop input   Forced stop input

MR-J3-B   MR-J4-B

HC/HA/HF   HG
servo motor   servo motor

[Changes in the system]

Product name	Model before migration		Model after migration
Positioning module	QD74MH		QD77MS16
Servo amplifier	MR-J3-B		MR-J4-B
Servo motor	HC/HA/HF series		HG series
Forced stop input cable	Q170DEMICBL□M		Fabricate the cable with A6CON□ connector. (Refer to section 2.3.)

1.4.2 Phased migration

The following shows the procedure for the phased migration in which the controller is replaced with QD77MS16 in the first phase, and then the MR-J3-B servo amplifiers are gradually replaced with MR-J4-B in the following phases.
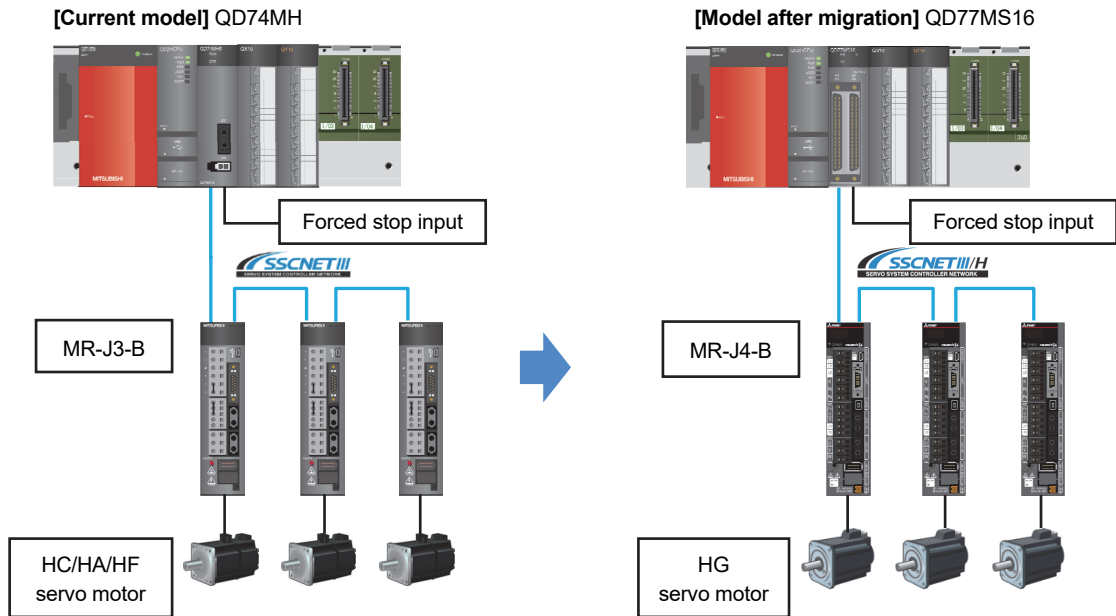
[Current model]
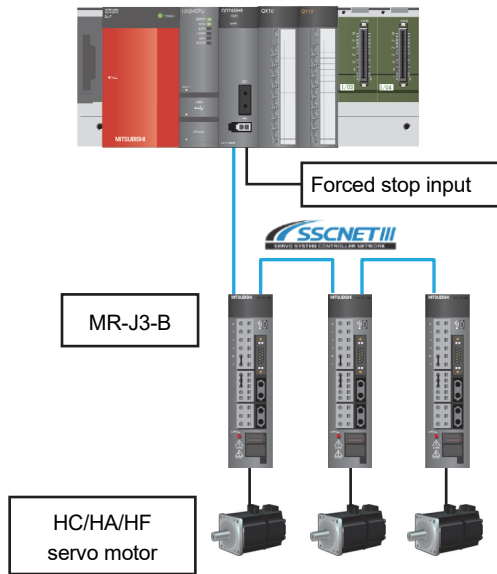
[Replacement - Phase 1]
Replacement of the controller
+ forced stop input cable

QD77MS16

Forced stop input

MR-J3-B

HC/HA/HF servo motor

Forced stop input

MR-J3-B

HC/HA/HF servo motor
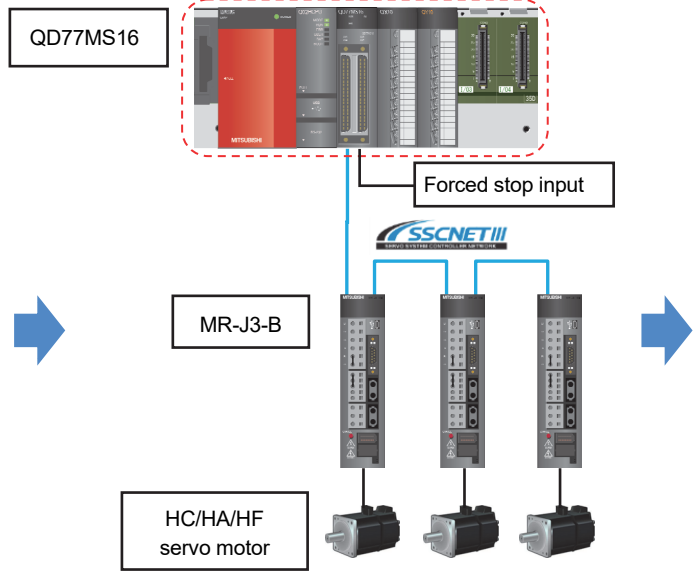
[Replacement - Phase 2]
Servo amplifier and servo motor
replacement for only one axis

Forced stop input

MR-J4-B
(J3 compatibility mode)
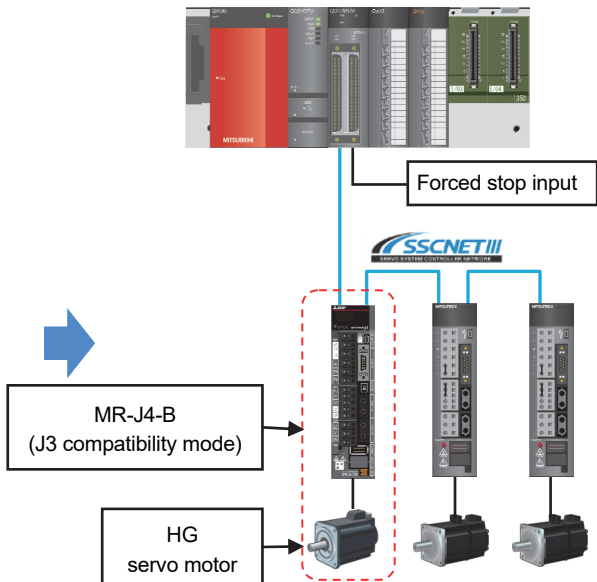
HG servo motor

[Replacement - Phase 3]
Servo amplifier and servo motor replacement for all axes, and servo system network replacement

Forced stop input

MR-J4-B
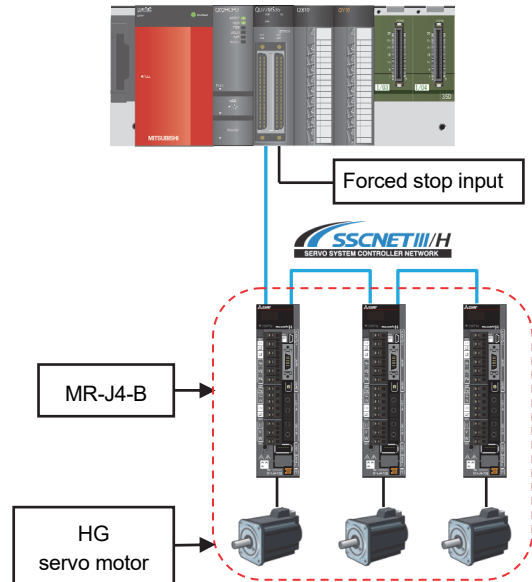
HG servo motor

(Note): For replacing only the servo amplifier or the servo motor, refer to "1.4.3 Separate repair".
(Note): For details of the J3 compatibility mode, refer to "Transition from MELSERVO-J3/J3W Series to J4 Series Handbook".

(Note): When replacing all the servo amplifiers with MR-J4-B, the operation mode can be switched from "J3 compatibility mode" to "J4 mode". The servo system network is also changed from SSCNETIII to SSCNETIII/H.

1.4.3 Separate repair

The following shows the procedure for the separate repair.

(1) When the controller has malfunctioned.
Replace only the controller.

QD77MS16

MR-J3-B

(Note):

MR-J3-B can operate with the replaced controller
The existing servo amplifiers and servo motors can
be used with the new controller.
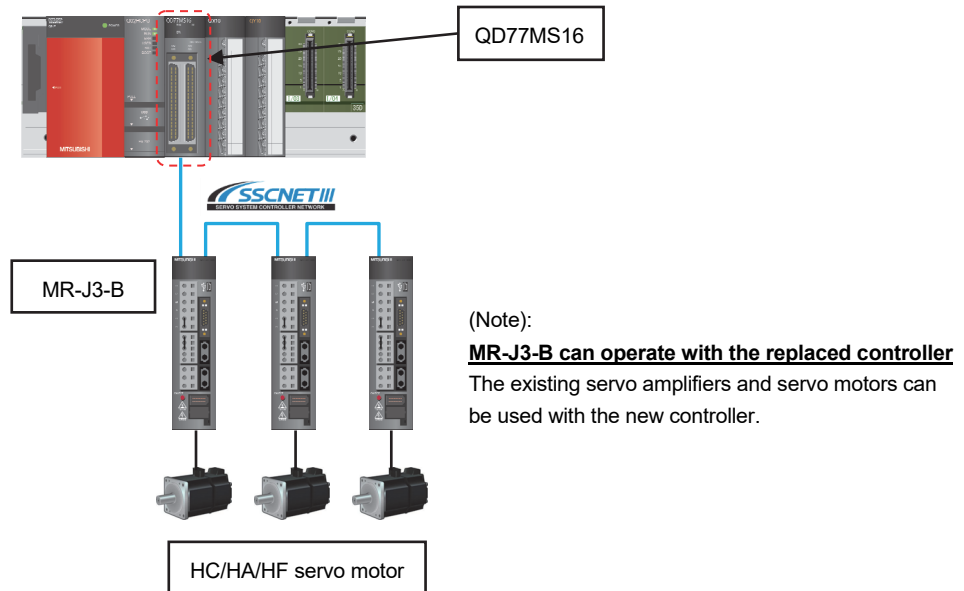
HC/HA/HF servo motor

(2) When the MR-J3-B servo amplifier has malfunctioned.
Replace only the servo amplifier.

Replacement with MR-J4-B
(J3 compatibility mode)

(Note):
For the compatible servo motors, refer to
"Transition from MELSERVO-J3/J3W
Series to J4 Series Handbook".
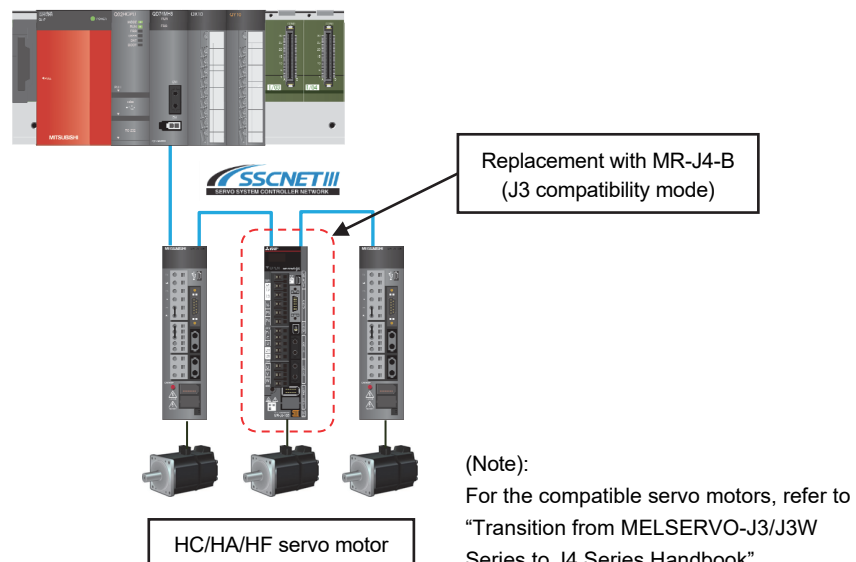
HC/HA/HF servo motor

(3) When the HC/HA/HF servo motor has malfunctioned

Simultaneously replace the servo amplifier and the malfunctioned servo motor.

Replacement with MR-J4-B
(J3 compatibility mode)

Replacement with HG servo motor
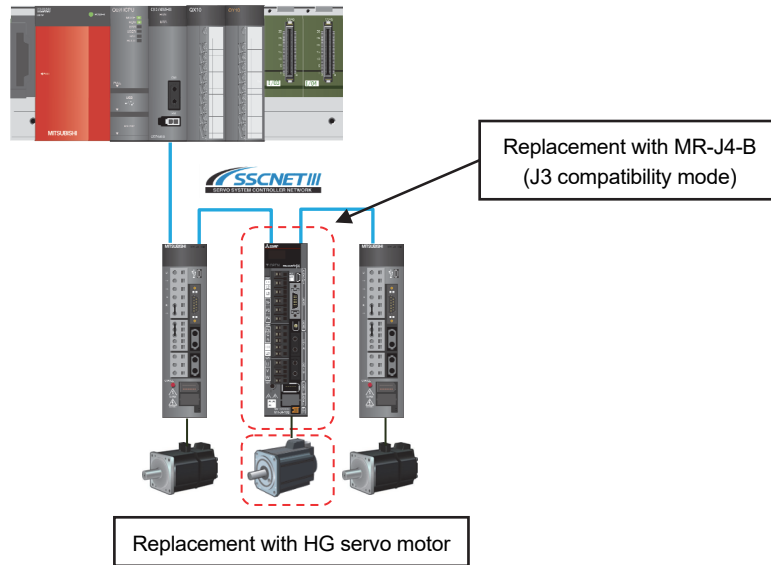
1.5 Project Diversion

The following describes about the project diversion for Qn(H)CPU and QD74MH setting software.

(1) PLC CPU projects
Be sure to recreate sequence programs for the migrated system because the structure of the buffer memory and the control method differs between QD74MH and QD77MS16.
Refer to relevant manuals for details.

(2) Projects of QD74MH setting software (Japanese version only)
Projects in QD74MH setting software are partially divertible.
Refer to "2.4 Project diversion" for the procedure for project diversion.
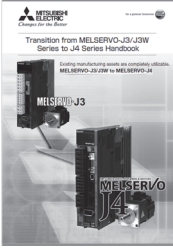
1.6 Relevant Documents

Refer to the following relevant documents for the replacement.

1.6.1 Relevant catalogs

MITSUBISHI ELECTRIC SERVO SYSTEM CONTROLLERS	SERVO AMPLIFIERS & MOTORS MELSERVO-J4
L(NA)03062	L(NA)03058
Transition from MELSERVO-J3/J3W Series to J4 Series Handbook	
L(NA)03127	

1.6.2 Relevant manuals

(1) Simple Motion module

Manual title	Manual No.
MELSEC-Q QD77MS Simple Motion Module User's Manual (Positioning Control)	IB-0300185
QD77MS2/QD77MS4/QD77MS16 Before Using the Product	BCN-B62008-300E

(2) Servo amplifier

Manual title	Manual No.
MR-J4-_B_(-RJ) SERVO AMPLIFIER INSTRUCTION MANUAL	SH-030106
MR-J4 Servo amplifier Instructions and Cautions for Safe Use of AC Servos	IB-0300175E
MELSERVO-J4 Servo amplifier INSTRUCTION MANUAL TROUBLE SHOOTING	SH-030109
MR-J4W2-_B/MR-J4W3-_B/MR-J4W2-0303B6 SERVO AMPLIFIER INSTRUCTION MANUAL	SH-030105

2. DETAILS OF MIGRATION FROM QD74MH TO QD77MS

2.1 Table of Components and Software

Prepare Positioning modules, servo amplifiers, and an engineering environment according to the following tables in this section.

Product name	Model before migration		Model after migration
Positioning module	QD74MH8 QD74MH16		[Simple Motion module] QD77MS16
Forced stop input cable	Q170DEMICBL□M		A6CON1, A6CON2, A6CON4
Connector for forced stop input cable	Q170DEMICON		
SSCNETIII cable(Note-1)	MR-J3BUS□M MR-J3BUS□M-A MR-J3BUS□M-B(Note-2)		←(same as the left)

(Note-1): "□" indicates the cable length.

(015: 0.15m, 03: 0.3m, 05: 0.5m, 1: 1m, 5:5m, 10: 10m, 20: 20m, 30: 30m, 40: 40m, 50: 50m)

(Note-2): For a long distance cable of up to 100 m or an ultra-long bending life cable, contact Mitsubishi Electric System & Service Co., Ltd.

[Sales office] FA PRODUCT DIVISION mail: osb.webmaster@melsc.jp

2.1.1 Servo amplifiers and servo motors

The servo system network is changed from SSCNETIII to SSCNETIII/H.
Select a SSCNETIII/H compatible servo amplifier and a servo motor connectable to the selected servo amplifier.

(1) Servo amplifiers/Rotary servo motors

Before migration from QD74MH				After migration to QD77MS16		
Servo amplifier		Rotary servo motor		Servo amplifier		Rotary servo motor
MR-J3 series	MR-J3-□B MR-J3W-□B MR-J3-□BS MR-J3-□B-RJ006	HF-KP□ HF-MP□ HF-SP□ HF-JP□ HC-LP□ HC-RP□ HC-UP□ HA-LP□		MR-J4 series	MR-J4-□B(-RJ) MR-J4W2-□B MR-J4W3-□B	HG-KR□ HG-MR□ HG-SR□ HG-RR□ HG-UR□ HG-JR□

(2) Servo amplifiers/Linear servo motors

Before migration from QD74MH				After migration to QD77MS16		
Servo amplifier		Linear servo motor		Servo amplifier		Linear servo motor
MR-J3 series	MR-J3-□B-RJ004	LM-H2□ LM-F□ LM-K2□ LM-U2□		MR-J4 series	MR-J4-□B(-RJ) MR-J4W2-□B MR-J4W3-□B	LM-H3□ LM-F□ LM-K2□ LM-U2□

(3) Comparison of servo system network

Item		SSCNETIII	SSCNETIII/H
Communications medium		Optical fiber cable	← (same as SSCNETIII)
Communications speed		50 Mbps	150 Mbps
Communications cycle	Send	0.44 ms/0.88 ms	0.22ms/0.44ms/0.88ms
	Receive	0.44 ms/0.88 ms	0.22ms/0.44ms/0.88ms
Number of control axes		Up to 16 axes/line	← (same as SSCNETIII)
Transmission distance		[Standard code for inside panel and standard cable for outside panel] 　Up to 20 m between stations 　Maximum overall distance: 320 m (20 m × 16 axes)	← (same as SSCNETIII)
		[Long distance cable] 　Up to 50 m between stations 　Maximum overall distance: 800 m (50 m × 16 axes)	[Long distance cable] 　Up to 100 m between stations 　Maximum overall distance: 1600 m (100 m × 16 axes)

2.1.2 Engineering environment (required)

The engineering environment that supports QD77MS16 is as follows.

Product name	Model	Version
MELSOFT GX Works2	SW1DND-GXW2-E	Ver.1.576A or later
MELSOFT MR Configurator2	SW1DNC-MRC2-E	Ver.1.09K or later

2.2 Differences Between QD74MH and QD77MS16

(1) Performance and specifications

▶An item that requires a setting change at migration.

♦: An item in which the axis movement will be changed after migration.

Item \ Model		QD74MH8	QD74MH16	QD77MS16	Points for migration
Number of control axes		8	16	16	−
Operation cycle		0.88ms		0.88ms/1.77ms	▶ The default value differs. Set Pr.96 to "0".
Control method	Synchronous	Not provided		Provided	−
Starting time (1 axis linear interpolation)	Trapezoidal acceleration/ deceleration	6.0ms		1.77ms	−
	S-curve acceleration/ deceleration	6.5ms			
Servo system network		SSCNETIII		SSCNETIII/H or SSCNETIII	▶Select a servo system network which is compatible with the devices to be connected such as servo amplifiers. Pr.97 0: SSCNETIII 1: SSCNETIII/H
Servo amplifier		MR-J3-□B/MR-J3W-□B/ MR-J3-□BS/MR-J3W-□B-RJ006/ MR-J3-□B-RJ004		MR-J4-□B(-RJ)/ MR-J4W2-□B/MR-J4W3-□B	−
Machine home position return (Home position return method)		6 types (Proximity dog method, Data set method, Stopper type, Dog cradle type, Limit switch combined type, Scale origin signal detection type)		6 types (Proximity dog method, Count method1, Count method2, Data set method, Scale home position signal detection method, Driver home position return method (Note-1))	Stopper type, dog cradle type, and limit switch combined type are not available with QD77MS (Note-2).
HP shift function		• The speed during HP shift: the value set in "Pr.56 Creep speed". • Move for the set amount without deceleration, even at zero point signal.		• The speed during HP shift: Select the value with either "Pr.46 HPR speed" or "Pr.47 Creep speed". Decelerate to a stop at zero point signal, and then accelerate again to the specified speed to move for the set shift distance.	▶♦ Set "Pr.56 Speed designation during HP shift" to "1" (Pr.47 Creep speed).
OP search limit function		Provided		Not provided	♦ The OP search limit function is not available with QD77MS (Note-2).
Incremental feed operation		Provided		Provided (Inching operation)	The operation name has been changed.

(Continued)

Model Item	QD74MH8	QD74MH16	QD77MS16	Points for migration

Speed limit value	[Linear interpolation control]
	  Composite speed:
	    Pr.26 Linear interpolation speed limit value
	  Speed for each axis:
	  The limits are set with Pr.10 Speed limit value.
	[Manual control]
	  The limits are set with Pr.10 Speed limit value.
			[Linear interpolation control]
			  Speed for each axis:
			  The limits are set with Pr.8 Speed limit value.
			
			[Manual control]
			  The limits are set with Pr.31 JOG speed limit value.
				♦ The composite speed cannot be used for limiting speed.(Note-2)

Acceleration/deceleration control	Pr.16 S-curve acceleration/deceleration time constant		Not provided	♦ The S-curve acceleration/deceleration time constant is not available with QD77MS (Note-2).
Sudden-stop control	Cd.4 Axis sudden stop		Not provided	♦ The sudden-stop control is not available with QD77MS (Note-2).
Forced stop control	Forced stop is executed by the signal (Y2) from PLC CPU. 0: Forced stop release 1: Forced stop		Cd.158 Forced stop input 0: Forced stop ON (Forced stop) 1: Forced stop OFF (Forced stop release)	▶ When the buffer memory executes the forced stop control, set "Pr.82 Forced stop valid/invalid selection" to "2". ▶ Cannot be used with the forced stop by 24 VDC external input signal.
Pausing function	Cd.5 Pausing		Not provided	♦ The pausing function is not available with QD77MS (Note-2).
Parameter change request	Provided		Not provided	♦ The parameter change function is not available with QD77MS (Note-2).
Torque limit function	Torque limit value: 0.1% unit Controlled by the motor maximum torque.		Torque limit value: 1% unit Controlled by the value set in "Pr.17 Torque limit setting value" or "Cd.101 Torque output setting value" However, when a home position return is being executed, the value set in "Pr.54 HPR torque limit value" is applied.	▶♦ The default value of "Pr.17 Torque limit setting value" is 300[%]. Review the value according to the motor to be used.

Torque change function	Torque limit value: 0.1% unit
	Forward/reverse torque limit value individual setting
	Cd.11 Torque limit request
	Cd.12 Forward rotation torque limit value
	Cd.13 Reverse rotation torque limit value
			Torque limit value: 1% unit
			Forward/reverse torque limit value same setting/individual setting
			Cd.112 Torque change function switching request
			  0: Forward/reverse torque limit value same setting
			  1: Forward/reverse torque limit value individual setting
			Cd.22 New torque value/forward new torque value
			Cd.113 New reverse torque value
				▶♦ The unit of torque limit value differs. Review the settings.
				Set "Cd.112 Torque change function switching request" to "1".

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(Continued)

Item \ Model	QD74MH8	QD74MH16	QD77MS16	Points for migration
Acceleration/deceleration time change function	Cd.18 Acceleration time change request Cd.20 Deceleration time change request		Cd.12 Acceleration/deceleration time change value during speed change, enable/disable 1: Enables modifications to acceleration/deceleration time	►◆The acceleration/deceleration time can be changed by setting Cd.12 .
Engineering environment	MELSOFT GX Works2 QD74MH setting software[Note-3]		MELSOFT GX Works2 (Simple Motion Module Setting Tool)	–

(Note-1): The home position return set in driver (servo amplifier) is used.
(Note-2): Contact your local sales office for details.
(Note-3): Only Japanese version is available for QD74MH setting software.

(2) Exterior dimensions/mass/installation

	QD74MH8	QD74MH16	QD77MS16
Exterior dimensions [mm]			 (Note) The connector for SSCNETIII cable is at the bottom of the module.
	98.0[H]×27.4[W]×90.0[D]		98.0[H]×27.4[W]×90.0[D]
Mass [kg]	0.15		0.16
Internal current consumption (5 VDC) [A]	0.70		0.75
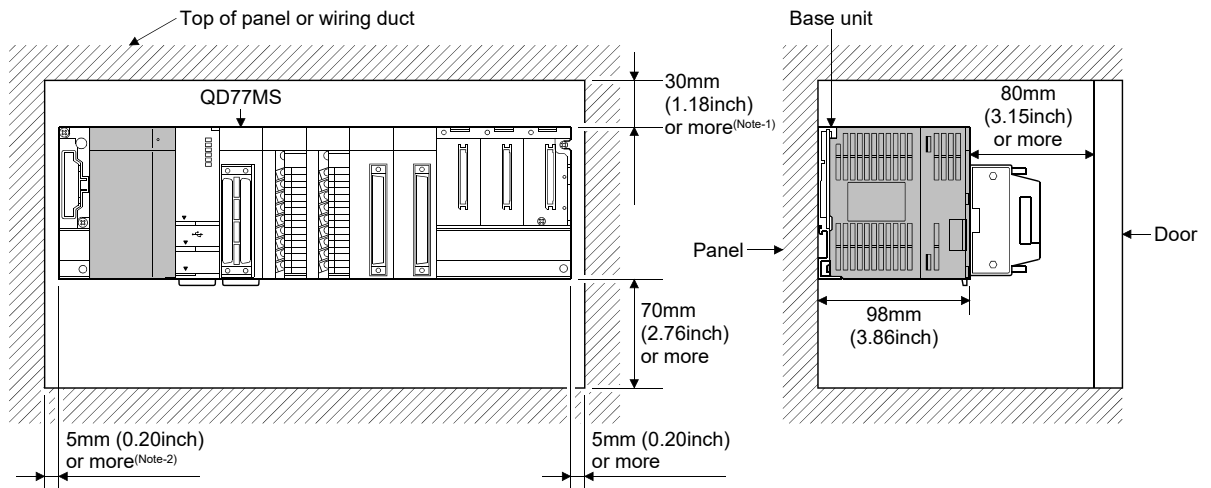
(Note-1): For wiring duct with 50mm (1.97inch) or less height. For other cases, 40mm (1.58inch) or more.

(Note-2): 20mm (0.79inch) or more when the adjacent module is not removed and the extension cable is connected.

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(3) Operation cycle

The operation cycle settings of QD74MH can be imported to QD77MS16 when the projects of QD74MH are diverted to QD77MS16 in MELSOFT GX Works2.

(Refer to section 2.4.1 for details of project diversion.)

However, if the operation cycle is set as default (automatic), the operation cycle will be changed. Set an operation cycle where necessary by following the table below because the change in the operation cycle may change program execution timing.

[Control axes and operation cycle at default]

Item \ Model	QD74MH	QD77MS16
Number of control axes	Up to 16	Up to 16
Operation cycle (default)	0.88ms	1.77ms

[Settable operation cycle]

QD74MH	QD77MS16
0.88ms	0.88ms 1.77ms

(4) Parameter setting

Review the existing settings and sequence programs for the parameters, monitor data, control data which do not exist in QD77MS16.

Refer to manuals of each module for details.

(a) Parameter

►An item that requires a setting change at migration

QD74MH	QD77MS16	Points for migration
Pr.0 Electronic gear numerator (AP) 1 to 32768	Pr.2 Number of pulses per rotation (AP) 1 to 200000000	The setting range has been changed.
Pr.2 Electronic gear denominator (AL) 1 to 32768	Pr.3 Movement amount per rotation (AL) 1 to 200000000	
Pr.4 Software stroke limit upper limit value	Pr.12 Software stroke limit upper limit value	–
Pr.6 Software stroke limit lower limit value	Pr.13 Software stroke limit lower limit value	–
Pr.8 Backlash compensation amount	Pr.11 Backlash compensation amount	–
Pr.10 Speed limit value 1 to 2147 (Unit:×10^6[PLS/s])	Pr.8 Speed limit value 1 to 1000000000	►Set the value multiplied by 10^6. The setting range has been changed.
	Pr.31 JOG speed limit value 1 to 1000000000	►Set the same value as Pr.8 .
Pr.15 Acceleration/deceleration method 0: Linear acceleration/deceleration 1: S-curve acceleration/deceleration	Pr.34 Acceleration/deceleration process selection 0: Trapezoid acceleration/deceleration process 1: S-curve acceleration/deceleration process	–
Pr.16 S-curve acceleration/deceleration time constant	–	–
Pr.17 Sudden stop deceleration time 0 to 20000	Pr.36 Rapid stop deceleration time 1 to 8388608	►If "0" is set, change it to "1".
Pr.20 Command in-position range 0 to 2147483647	Pr.16 Command in-position width 1 to 2147483647	►If "0" is set, change it to "1".
Pr.23 Target position change overrun processing selection	–	–
Pr.25 Interpolation group	–	–
Pr.26 Linear interpolation speed limit value	–	–
Pr.31 External input signal logic selection b0: Upper hardware stroke limit b4: Lower hardware stroke limit b8: Proximity dog	Pr.22 Input signal logic selection b0: Lower limit b1: Upper limit b6: Proximity dog signal	►The layout of signals has been changed.
Pr.50 OPR method 0: Proximity dog 2: Data set 6: Scale origin signal detection	Pr.43 HPR method 0: Proximity dog method 6: Data set method 7: Scale origin signal detection method	►If "Data set method" or "Scale origin signal detection method" are set, change the setting.
Pr.51 OPR direction	Pr.44 HPR direction	–
Pr.52 OP address	Pr.45 HP address	–

(Continued)

QD74MH	QD77MS16	Points for migration
Pr.54 OPR speed 5 to 2147000000	Pr.46 HPR speed 1 to 1000000000	▶ If the current setting is outside of the settable range of QD77MS, review the setting.
Pr.56 Creep speed 5 to 32767	Pr.47 Creep speed 1 to 1000000000	The setting range has been changed.
Pr.58 OPR acceleration time	–	–
Pr.59 OPR deceleration time	–	–
Pr.60 OP shift amount	Pr.53 HP shift amount	–
Pr.62 OP search limit	–	–
Pr.64 Incremental linear scale setting	–	–
Pr.66 Operation setting for incompletion of OPR 0: Not executed 1: Executed	Pr.55 Operation setting for incompletion of HPR 0: Positioning control is not executed 1: Positioning control is executed.	–
Pr.80 JOG speed	–	–
Pr.82 JOG operation acceleration time	–	–
Pr.83 JOG operation deceleration time	–	–
Pr.84 Incremental feedrate	–	–
Pr.101 External forced stop selection	Pr.82 Forced stop valid/invalid selection	–

(b) Monitor data

►An item that requires a setting change at migration

QD74MH	QD77MS16	Points for migration
Md.0 Current feed value	Md.20 Feed current value	–
Md.2 Feedrate	Md.22 Feedrate	–
Md.4 External input signal b0: Upper hardware stroke limit b4: Lower hardware stroke limit b8: Proximity dog	Md.30 External input signal b0: Lower limit signal b1: Upper limit signal b6: Proximity dog signal	The layout of input signals has been changed.
Md.5 Positioning data No. being executed	Md.44 Positioning data No. being executed	–
Md.6 Error code	Md.23 Axis error No.	–
Md.7 Error details	–	–
Md.8 Warning code	Md.24 Axis warning No.	–
Md.9 Status 1 b0: OPR request b1: OPR complete Md.10 Status 2 b0: Positioning complete b1: Command in-position	Md.31 Status b2 : Command in-position flag b3 : HPR request flag b4 : HPR complete flag b15: Positioning complete	"Md.31 Status" is 16-bit data.
Md.26 Real current value	Md.101 Real current value	–
Md.28 Deviation counter value	Md.102 Deviation counter value	–
Md.31 Motor current	Md.104 Motor current value	–
Md.32 Motor rotation speed	Md.103 Motor rotation speed	–
Md.34 Regenerative load ratio	Md.109 Regenerative load ratio/Optional data monitor output 1	–
Md.35 Effective load torque ratio	Md.110 Effective load torque/Optional data monitor output 2	–
Md.36 Peak torque ratio	Md.111 Peak torque ratio/Optional data monitor output 3	–
Md.40 Servo status 1 b0: READY ON b1: Servo ON b7: Servo error (Servo alarm) b12: In-position b13: Torque limit b14: Absolute position lost b15: Servo warning	Md.108 Servo status [High-order 16-bit] b0: READY ON b1: Servo ON b7: Servo alarm b12: In-position b13: Torque limit b14: Absolute position lost b15: Servo warning	"Md.108 Servo status" is 32-bit data
Md.41 Servo status 2 b0: Zero point pass b3: Zero speed	Md.108 Servo status [Low-order 16-bit] b0 : Zero point pass b3 : Zero speed	
Md.100 Axis error status	–	–
Md.101 Axis warning status	–	–
Md.102 Number of write accesses to flash ROM	Md.19 Number of write accesses to flash ROM	–
Md.103 Forced stop input status 0:Forced stop 1:Forced stop release	Md.50 Forced stop input 0: Forced stop input ON (Forced stop) 1: Forced stop input OFF (Forced stop release)	–

(c) Control data

▶An item that requires a setting change at migration

QD74MH	QD77MS16	Points for migration
Cd.0 Axis error reset 0: Not commanded 1: Commanded	Cd.5 Axis error reset 1: Axis error is reset.	Only "1: Axis error is reset" is valid.
Cd.1 Parameter change request	–	–
Cd.2 Start method	–	–
Cd.3 Axis stop 0: Not commanded 1: Commanded	Cd.180 Axis stop 1: Axis stop requested Other than 1: Axis stop not requested	Only "1: Axis stop requested" is valid.
Cd.4 Axis sudden stop	–	–
Cd.5 Pausing	–	–
Cd.8 Forward rotation JOG start 0: Stop 1: Start	Cd.181 Forward run JOG start 1: JOG started Other than 1: JOG not started	Only "1: JOG started" is valid.
Cd.9 Reverse rotation JOG start 0: Stop 1: Start	Cd.182 Forward run JOG start 1: JOG started Other than 1: JOG not started	
Cd.11 Torque limit request	–	–
Cd.12 Forward rotation torque limit value	–	–
Cd.13 Reverse rotation torque limit value	–	–
Cd.15 Speed change request 0: Not requested 1: Requested	Cd.15 Speed change request 1: Executes speed change	Only "1: Change the speed is" valid.
Cd.16 New speed value 5 to 2147000000	Cd.14 New speed value 0 to 1000000000	▶If the current setting is outside of the settable range of QD77MS, review the setting.
Cd.18 Acceleration time change request 0: Not requested 1: Requested	Cd.12 Acceleration/deceleration time change value during speed change, enable/disable 1: Enables modifications to acceleration/deceleration time Other than 1: Disables modifications to acceleration/deceleration time	▶This device sets whether acceleration/deceleration time is allowed to be modified or not when a speed change is executed.
Cd.19 New acceleration time value 0 to 20000	Cd.10 New acceleration time value 0 to 8388608	The setting range has been changed.
Cd.20 Deceleration time change request 0: Not requested 1: Requested	Cd.12 Acceleration/deceleration time change value during speed change, enable/disable 1: Enables modifications to acceleration/deceleration time Other than 1: Disables modifications to acceleration/deceleration time	▶This device sets whether acceleration/deceleration time is allowed to be modified or not when a speed change is executed.

(Continued)

QD74MH	QD77MS16	Points for migration
Cd.21 New deceleration time value 0 to 20000	Cd.11 New deceleration time value 0 to 8388608	The setting range has been changed.
Cd.23 Target position change request 0: Not requested 1: Requested	Cd.29 Target position change request flag 1: Requests a change in the target position	Only "1: requests a change in the target position" is valid.
Cd.24 New target position value	Cd.27 Target position change value (New address)	–
Cd.28 New current value	Cd.9 New current value	–
Cd.30 Each axis servo OFF 0: Not commanded 1: Commanded	Cd.100 Servo OFF command 0: Servo ON 1: Servo OFF Valid only during "servo ON for all axes".	–
Cd.45 Semi/Fully closed loop switching request (When MR-J3-☐B-RJ006 is used)	Cd.133 Semi/Fully closed loop switching request	–
Cd.46 Gain changing request 0: Not requested 1: Requested	Cd.108 Gain switching command flag 0: Gain switching command OFF 1: Gain switching command ON	–
Cd.100 Flash ROM write request 0: Not requested 1: Requested	Cd.1 Flash ROM write request 1: Requests write access to flash ROM.	–
Cd.101 Parameter initialization request 0: Not requested 1: Requested	Cd.2 Parameter initialization request 1: Requests parameter initialization	–

(5) I/O signals

(a) Signal direction: Positioning module (Simple Motion module) → PLC CPU

Device No.	QD74MH		QD77MS16	
	Signal name			
X0	Unit READY		READY	
X1	Error detection(Note-1)		Synchronization flag	
X2	Warning detection(Note-1)			
X3	Synchronization flag			
X4	Unusable		Use prohibited(Note-2)	
X5				
X6				
X7				
X8				
X9				
XA				
XB				
XC				
XD				
XE				
XF				
X10	Axis 1	BUSY	Axis 1	BUSY
X11	Axis 2		Axis 2	
X12	Axis 3		Axis 3	
X13	Axis 4		Axis 4	
X14	Axis 5		Axis 5	
X15	Axis 6		Axis 6	
X16	Axis 7		Axis 7	
X17	Axis 8		Axis 8	
X18	Axis 9		Axis 9	
X19	Axis 10		Axis 10	
X1A	Axis 11		Axis 11	
X1B	Axis 12		Axis 12	
X1C	Axis 13		Axis 13	
X1D	Axis 14		Axis 14	
X1E	Axis 15		Axis 15	
X1F	Axis 16		Axis 16	

(Note-1): These signals are included in the buffer memory "Md.31 Status" in QD77MS16.

(Note-2): There are some devices that will become "Use prohibited" after replacing the existing model with QD77MS16. The device No. with "Use prohibited" are used by system. Therefore, a user cannot use them. In the case of using them, the operation is not guaranteed.

QD77MS16 buffer memory "Md.31 Status"		
Buffer memory address		Signal name
2417+100n	b9	Axis warning detection
	b13	Error detection

n: Axis No.-1

(b) Signal direction: PLC CPU → Positioning module (Simple Motion module)

Device No.	QD74MH		QD77MS16	
	Signal name			
Y0	PLC READY			
Y1	All axis servo ON			
Y2	Forced stop input(Note-1)			
Y3				
Y4				
Y5				
Y6				
Y7				
Y8				
Y9	Unusable		Use prohibited(Note-2)	
YA				
YB				
YC				
YD				
YE				
YF				
Y10	Axis 1		Axis 1	
Y11	Axis 2		Axis 2	
Y12	Axis 3		Axis 3	
Y13	Axis 4		Axis 4	
Y14	Axis 5		Axis 5	
Y15	Axis 6		Axis 6	
Y16	Axis 7		Axis 7	
Y17	Axis 8	Positioning start	Axis 8	Positioning start
Y18	Axis 9		Axis 9	
Y19	Axis 10		Axis 10	
Y1A	Axis 11		Axis 11	
Y1B	Axis 12		Axis 12	
Y1C	Axis 13		Axis 13	
Y1D	Axis 14		Axis 14	
Y1E	Axis 15		Axis 15	
Y1F	Axis 16		Axis 16	

(Note-1): These signals are included in the buffer memory "Cd.158 Forced stop input" in QD77MS16.

(Note-2): There are some devices that will become "Use prohibited" after replacing the existing model with QD77MS16. The device No. with "Use prohibited" are used by system. Therefore, a user cannot use them. In the case of using them, the operation is not guaranteed.

QD77MS16 buffer memory "Cd.158 Forced stop input"	
Buffer memory address	Setting value
5945	Set the forced stop information to the buffer memory. 0: Forced stop ON (Forced stop) 1: Forced stop OFF (Forced stop release) A value other than "1" is regarded as "0".

(6) Items that need a review or a change following the servo system network change

Items	Differences		Change/revision
	QD74MH	QD77MS16	
Electronic gear	–	–	Change "Pr.2 Number of pulses per rotation" and "Pr.3 Movement amount per rotation" of the basic parameter 1 according to the resolution per the connected servo motor rotation.
Positioning data	–	–	Review the positioing data while taking into account the differences in resolution per the connected servo motor rotation and the setting changes in the electronic gear above.

2.3 Forced Stop Input Cable

The forced stop input cable needs to be replaced along with the controller replacement.

(1) Cable replacement (recommended)
The existing forced stop cable (Q170DEMICBL□M) for QD74MH is not compatible with the external input connection connector for QD77MS. To use the forced stop function with QD77MS, fabricate the cable with the following connectors and cables.

(a) Appearance

A6CON1   A6CON2   A6CON4
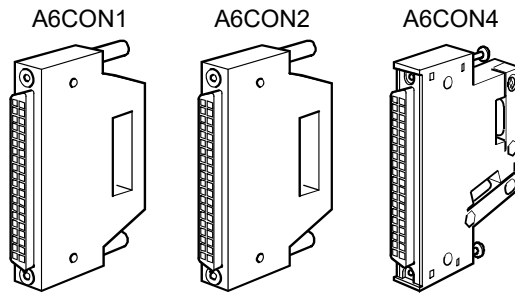
(b) Connector type

Type	Model
Soldering type, useable for straight out	A6CON1
Crimp-contact type, useable for straight out	A6CON2
Soldering type, useable for straight out and diagonal out	A6CON4

(c) Specifications of the connector

Part name	Specification	
Applicable connector	A6CON1, A6CON4	A6CON2
Applicable wire size	0.3 mm^2	AWG28 to 24

(Note): The external input wiring connector is not included. Please purchase them by customer.

[Specialized tool]
- Pressure-bonding tool for A6CON2 (Fujitsu component LTD.):
Model name: FCN-363T-T005/H
Contact: http://www.fujitsu.com/jp/group/fcl/en/

The signal layout for the external input connection connector of QD77MS16 is shown below.

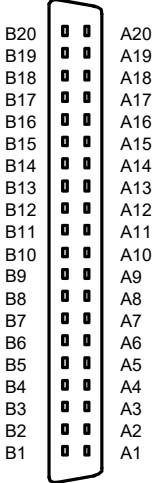| Pin layout		AX4		AX3		AX2		AX1	
		Axis 4 (External input signal 4)		Axis 3 (External input signal 3)		Axis 2 (External input signal 2)		Axis 1 (External input signal 1)	
		Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name	Pin No.	Signal name
		2B20		2A20		1B20	HB[Note-2, 3, 4]	1A20	5V[Note-8]
		2B19		2A19		1B19	HA[Note-2, 3, 4]	1A19	5V[Note-8]
		2B18		2A18		1B18	HBL[Note-2, 3, 5]	1A18	HBH[Note-2, 3, 5]
		2B17		2A17		1B17	HAL[Note-2, 3, 5]	1A17	HAH[Note-2, 3, 5]
		2B16		2A16		1B16	No connect (Note-6)	1A16	No connect (Note-6)
		2B15	No connect (Note-6)	2A15	No connect (Note-6)	1B15	5V[Note-8]	1A15	5V[Note-8]
		2B14		2A14		1B14	SG[Note-8]	1A14	SG[Note-8]
		2B13		2A13		1B13		1A13	
		2B12		2A12		1B12		1A12	
		2B11		2A11		1B11	No connect (Note-6)	1A11	No connect (Note-6)
		2B10		2A10		1B10		1A10	
		2B9		2A9		1B9		1A9	
		2B8		2A8		1B8	EMI.COM	1A8	EMI
		2B7	COM	2A7	COM	1B7	COM	1A7	COM
		2B6	COM	2A6	COM	1B6	COM	1A6	COM
		2B5	DI4[Note-7]	2A5	DI3[Note-7]	1B5	DI2[Note-7]	1A5	DI1[Note-7]
		2B4	STOP[Note-7]	2A4	STOP[Note-7]	1B4	STOP[Note-7]	1A4	STOP[Note-7]
		2B3	DOG[Note-7]	2A3	DOG[Note-7]	1B3	DOG[Note-7]	1A3	DOG[Note-7]
		2B2	RLS[Note-7]	2A2	RLS[Note-7]	1B2	RLS[Note-7]	1A2	RLS[Note-7]
		2B1	FLS[Note-7]	2A1	FLS[Note-7]	1B1	FLS[Note-7]	1A1	FLS[Note-7]

Front view of the module

(Note-1): Pin No. "1_ _ _" indicates the pin No. for the right connector. Pin No. "2_ _ _" indicates the pin No. for the left connector.

(Note-2): Input type from manual pulse generator/incremental synchronous encoder is switched in " Pr.89 Manual pulse generator/ Incremental synchronous encoder input type selection". (Only the value specified against the axis 1 is valid.)
 • 0: Differential-output type
 • 1: Voltage-output/open-collector type (Default value)

(Note-3): Set the signal input form in " Pr.24 Manual pulse generator/Incremental synchronous encoder input selection".

(Note-4): Voltage-output/open-collector type
 Connect the A-phase/PLS signal to HA, and the B-phase/SIGN signal to HB.

(Note-5): Differential-output type
 Connect the A-phase/PLS signal to HAH, and the A-phase/PLS inverse signal to HAL.
 Connect the B-phase/SIGN signal to HBH, and the B-phase/SIGN inverse signal to HBL.

(Note-6): Do not connect to any of the terminal explained as "No connect".

(Note-7): Set the external command signal [DI, FLS, RLS, DOG, STOP] in " Pr.80 External input signal selection" and " Pr.95 External command signal selection" at QD77MS16 use.

(Note-8): Do not use 1A20, 1A19, 1A(B)15, and 1A(B)14 for other than the power supply of manual pulse generator.

When using the forced stop function, wire the terminals of the Simple Motion module forced stop input (1A08/1B08) as shown below. As for the 24VDC power supply, the direction of current can be switched.
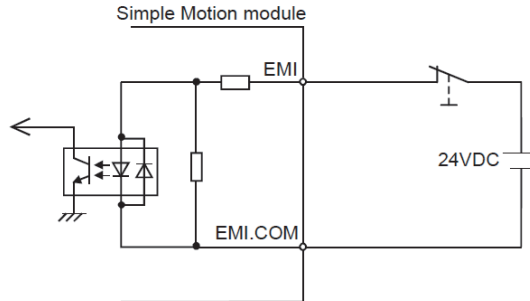
(2) Conversion connector

When using the forced stop input cable (Q170DEMICBL□M) for QD77MS16, fabricate the conversion cable with the A6CON connector and the receptacle below.
Use the cable whose wire size is AWG24.

(a) A6CON connector (QD77MS16 side)
Use the connector in "(1) Cable replacement (recommended)".

(b) Receptacle (Forced stop input cable side)
Fabricate the receptacle by combining the following housing and terminal.

Housing   : 5559-02P-210 (Manufacturer: Molex Incorporated)
Terminal   : 5558PBTL   (Manufacturer: Molex Incorporated)
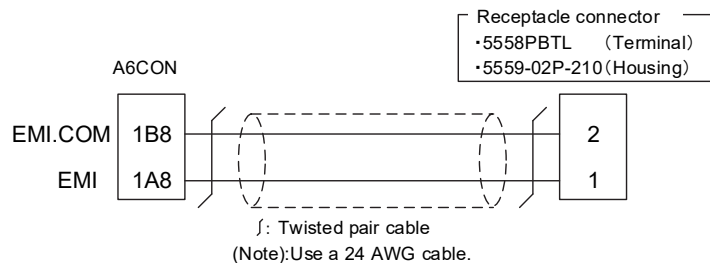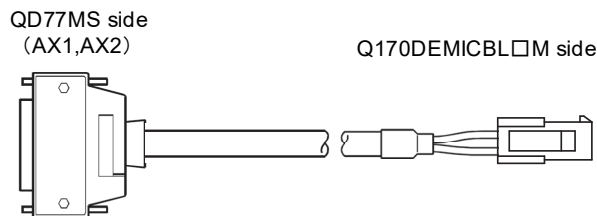
2.4 Project Diversion

2.4.1 Project diversion procedures by engineering environment

(1) Procedures for diversion of QD74MH setting software data by MELSOFT GX Works2

The following shows the diversion procedure.
1) Start MELSOFT GX Works2.

2) Create a new Q-series project. Select [Project] → [Intelligent function module] → [New Module] to open [New Module] window.
Select "Simple Motion Module" for "Module Type" and the replaced Simple Motion module model for "Module Name" (the setting example below: QD77MS16), and then set "Mount Position" and "Title setting" according to your system.
Click "OK".
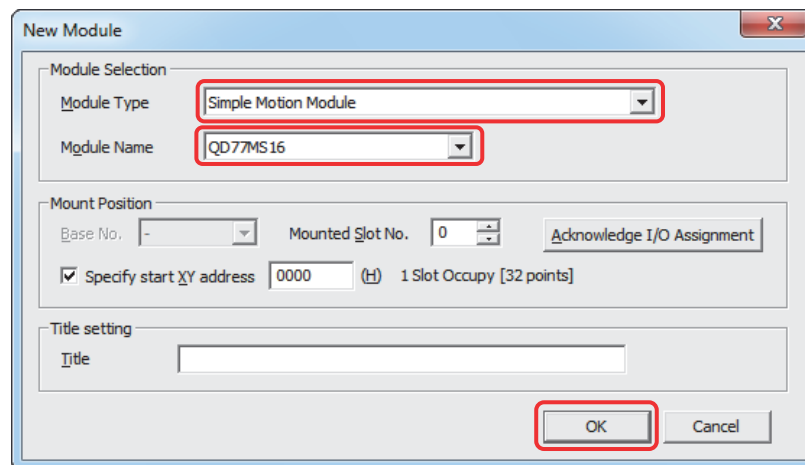
3) Select [Project] → [Intelligent function module], and double click [Simple Motion module setting] to start up the "Simple Motion Module Setting Tool".

The following shows the diversion procedure by the Simple Motion Module Setting Tool.

4) Select [Project] → [Import Other Format Data].

5) Select the project files to be diverted in QD74MH setting software, and click "Open".

6) Set "Mount Position" and "Title Setting" on [New Module] screen, and click "OK".
(Note): "Module Name" cannot be changed from QD77MS16.

```
New Module                                                    [ x ]
┌─Module Selection──────────────────────────────────────┐
│  Module Type     Simple Motion Module            [▼]   │
│                                                        │
│  Module Name     QD77MS16              [▼]             │
└────────────────────────────────────────────────────────┘
┌─Mount Position────────────────────────────────────────┐
│  Specify Start X/Y Address  0000   (H)   1 Slot Occupy [32 points] │
└────────────────────────────────────────────────────────┘
┌─Title Setting─────────────────────────────────────────┐
│  Title         [                                    ]  │
└────────────────────────────────────────────────────────┘
                              [  OK  ]      [ Cancel ]
```

7) Execute the series conversion of the servo amplifier. Select the network to be used for the replaced servo amplifiers (for QD77MS16), and click [OK].

```
MELSOFT Simple Motion Module Setting Tool              [ x ]

Execute the series conversion of servo amplifier.
Confirm the result of the conversion after executing.
┌─Conversion Target Servo Amplifier Setting─────────────┐
│ ┌─SSCNET Setting────────────────────────────────────┐ │
│ │                                                    │ │
│ │   (•) SSCNET III/H                                 │ │
│ │                                                    │ │
│ │   ( ) SSCNET III                                   │ │
│ │                                                    │ │
│ │   [ MR-J4 Series     ▼ ]                           │ │
│ │                                                    │ │
│ └────────────────────────────────────────────────────┘ │
│ ┌────────────────────────────────────────────────────┐ │
│ │  ⚠   Reconsider the following data.                │ │
│ │      - Parameter                                   │ │
│ │      - Servo Parameter                             │ │
│ │      - Input Axis Parameter of Synchronous Control Parameter │ │
│ │                                                    │ │
│ │      For details on replace, press F1 key and refer to the help. │ │
│ └────────────────────────────────────────────────────┘ │
│            [  OK  ]      [ Cancel ]                     │
└────────────────────────────────────────────────────────┘
```
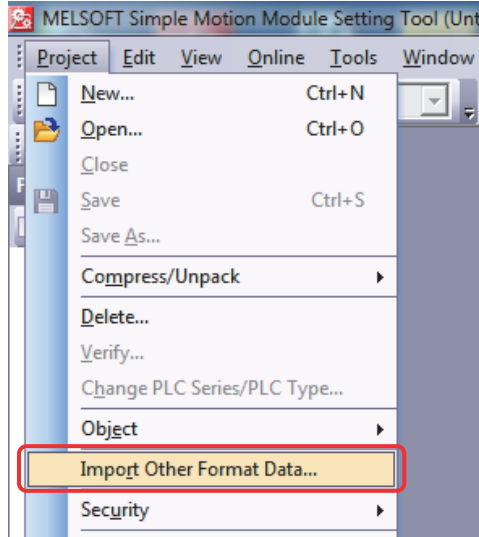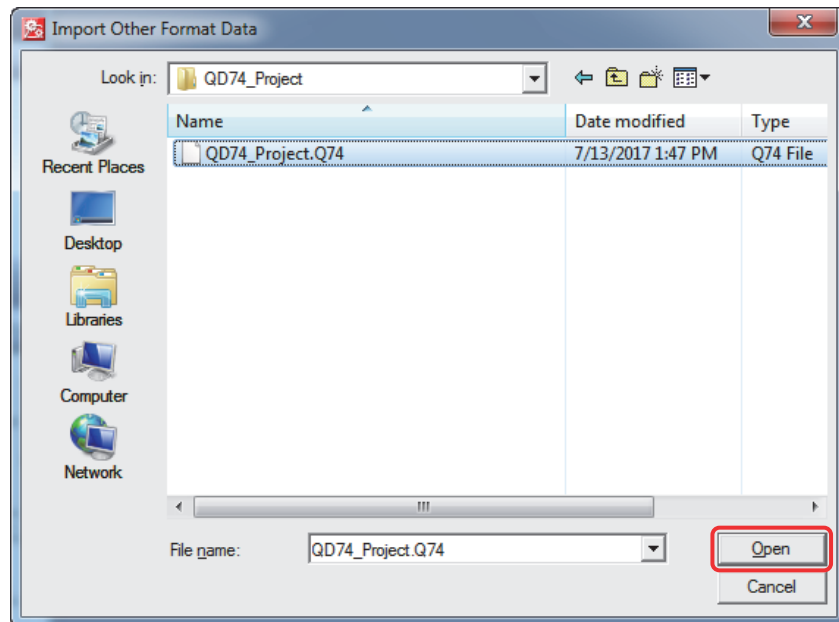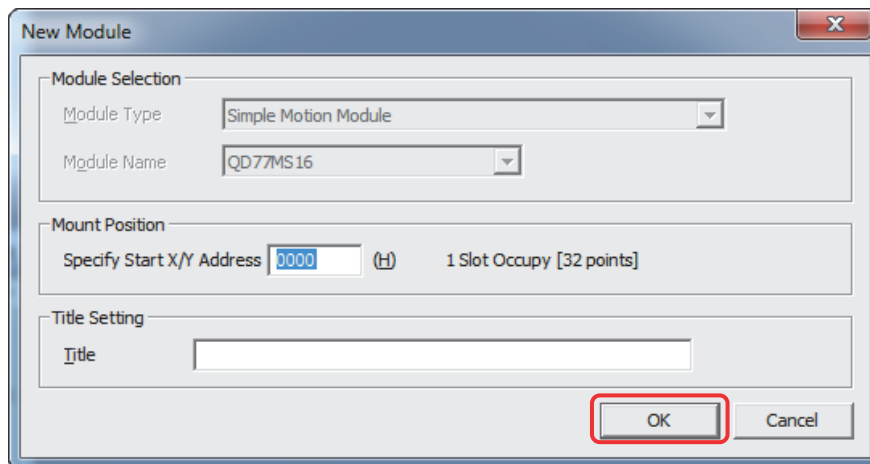
(Note): Refer to "MELSEC-Q QD77MS Simple Motion Module User's Manual (Positioning Control)" for the servo system networks supported by the replaced servo amplifiers and SSCNETIII compatible devices (SSCNETIII or SSCNETIII/H).

(Note): When servo parameters settings are changed from "MR-J3 series" to "MR-J4 series", the parameter conversion is carried out based on conversion rules.
Refer to "Simple Motion Module Setting Help [Appendix] - [Servo parameter conversion]" for the conversion rules.

8) When the project diversion completion message appears, click "OK". Be sure to check the imported data.
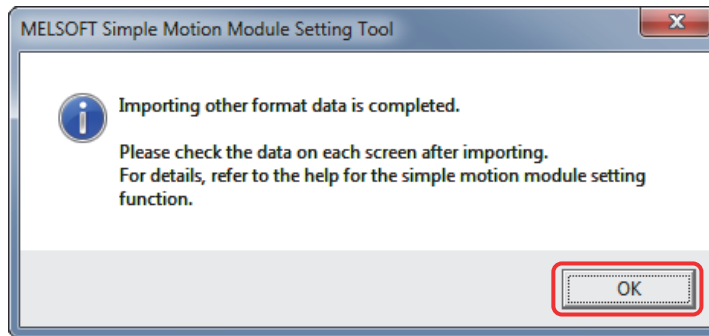
The diversion is completed.
Before writing to the Simple Motion module, be sure to confirm the validity of the diverted parameters.

(2) Sequence programs
The structure of buffer memory and the control method differs between QD74MH and QD77MS.
Be sure to recreate sequence programs for the new system.

2.4.2 List of divertible/not divertible data

(1) Module parameters
The initial values are set for parameters not listed in the table below.

Data name		Divertible or not divertible	Remarks
QD74MH	QD77MS16		
Basic parameters 1			
–	Pr.1 Unit setting	–	"3: pulse" is set.
Pr.0 Electronic gear numerator (AP)	Pr.2 Number of pulses per rotation (AP)	○	–
Pr.2 Electronic gear denominator (AL)	Pr.3 Movement amount per rotation (AL)	○	–
Basic parameters 2			
Pr.10 Speed limit value	Pr.8 Speed limit value	○	The value that multiplies QD74MH setting value by 1000000 is set.
–	Pr.9 Acceleration time 0	○	These acceleration/deceleration time values come from the positioning data. (Refer to (2) in this section)
–	Pr.10 Deceleration time 0	○	
Detailed parameters 1			
Pr.8 Backlash compensation amount	Pr.11 Backlash compensation amount	○	–
Pr.20 Command in-position range	Pr.16 Command in-position width	○	–
Pr.16 S-curve acceleration/deceleration time constant	–	×	–
Pr.23 Target position change overrun processing selection	–	×	–
Pr.25 Interpolation group	–	×	–
Pr.26 Linear interpolation speed limit value	–	×	–
Pr.28 Feed current value update selection during speed-torque control	–	×	–
Pr.31 External input signal logic selection: Lower limit	Pr.22 Input signal logic selection: Lower limit	○	–
Pr.31 External input signal logic selection: Upper limit	Pr.22 Input signal logic selection: Upper limit	○	–
Pr.31 External input signal logic selection: Proximity dog	Pr.22 Input signal logic selection: Proximity dog signal	○	–
–	Pr.80 External input signal selection	–	"1: External input signal of servo amplifier" is set.
Pr.101 External forced stop selection	Pr.82 Forced stop valid/invalid selection	○	–

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(Continued)

Data name		Divertible or not divertible	Remarks
QD74MH	QD77MS16		
	Detailed parameters 2		
–	Pr.25 Acceleration time 1	○	The acceleration time value comes from positioning data. (Refer to (2) in this section)
Pr.82 JOG operation acceleration time	Pr.26 Acceleration time 2	○	–
Pr.58 OPR acceleration time	Pr.27 Acceleration time 3	○	–
–	Pr.28 Deceleration time 1	○	The deceleration time value comes from positioning data. (Refer to (2) in this section)
Pr.83 JOG operation deceleration time	Pr.29 Deceleration time 2	○	–
Pr.59 OPR deceleration time	Pr.30 Deceleration time 3	○	–
Pr.10 Speed limit value	Pr.31 JOG speed limit value	○	The value that multiplies QD74MH setting value by 1000000 is set.
–	Pr.32 JOG operation acceleration time selection	–	"2" is set.
–	Pr.33 JOG operation deceleration time selection	–	
Pr.15 Acceleration/deceleration method	Pr.34 Acceleration/deceleration process selection	○	–
Pr.17 Sudden stop deceleration time	Pr.36 Sudden stop deceleration time	○	–
–	Pr.37 Stop group 1 rapid stop selection	–	"1: Rapid stop" is set.
Pr.80 JOG speed	–	✕	–
Pr.84 Incremental feedrate	–	✕	–

(Continued)

Data name		Divertible or not divertible	Remarks
QD74MH	QD77MS16		
	HPR basic parameters		
Pr.50 OPR method	Pr.43 HPR method	○	The current values are converted as follow. "0"→"0" "2"→"6" "3"→"0" "4"→"0" "5"→"0" "6"→"7" "7"→"0" (Note): The initial values are set for values other than above.
Pr.51 OPR direction	Pr.44 HPR direction	○	–
Pr.52 OP address	Pr.45 HP address	○	–
Pr.54 OPR speed	Pr.46 HPR speed	○	–
Pr.56 Creep speed	Pr.47 Creep speed	○	–
–	Pr.48 HPR retry	–	The OPR settings of QD74MH are diverted as follows according to the value set in " Pr.50 OPR method" "0" or "4" has been set: "1: Retry HPR with limit switch" Other than above: "0: Do not retry HPR with limit switch"
	HPR detailed parameters		
–	Pr.51 HPR acceleration time selection	–	"3" is set.
–	Pr.52 HPR deceleration time selection	–	
Pr.60 OP shift amount	Pr.53 HP shift amount	○	–
Pr.66 Operation setting for incompletion of OPR	Pr.55 Operation setting for incompletion of HPR	○	–
–	Pr.56 Speed designation during HP shift	–	"1: Creep speed" is set.
Pr.62 OP search limit	–	×	–
Pr.64 Incremental linear scale setting	–	×	–

(Continued)

Data name		Divertible or	Remarks
QD74MH	QD77MS16	not divertible	
	Expansion parameters		
–	Pr.96 Operation cycle setting	–	"0: 0.88ms" is set.
–	Pr.97 SSCNET setting	–	The value selected in SSCNET setting at replacement will be set.
Pr.102 Error and warning history selection	–	×	Error and warning histories are automatically saved.

(2) Positioning data

(a) Although QD74MH positioning data is not compatible with QD77MS16, some data can be converted for the new system.
However, **make sure that it is not fully diverted for the new system. The positioning data needs to be reviewed and revised.**

```
                              ┌─────────────┐
                              │    START    │
                              └──────┬──────┘
                                     │
 Linear interpolation                ▼          Other control methods
           ┌──────────────◇ Control method? ◇──────────────┐
           │             Interpolation control              │
           │                     │                          │
           │                     ▼                          │
           │              ┌───────────────┐   No            │
           │          ◇ Has the            ◇────────────┐    │
           │            interpolation group │           │    │
           │            been set?           │           │    │
           │                     │ Yes      │           │    │
    ◇ Has the           ┌───┐    ▼          │    ┌───┐   │    │
      interpolation ──→ │ 1 │ ◇ The reference ◇  │ 1 │   │    │
      group        Yes └───┘   axis setting?  No └───┘   │    │
      been set?            │         │────────┐          │    │
           │ No            │ Yes     ▼         │          │    │
           │               │   ◇ Has the       ◇  No      │    │
           │               │     interpolation │─────────┐│    │
           │               │     axis been set?│         ││    │
           │               │         │ Yes     │         ││    │
           ▼               ▼         ▼         ▼         ▼▼    ▼
   ┌────────────────┐   ┌──────────────────┐   ┌──────────────┐
   │All data is     │   │Only positioning  │   │Not divertible│
   │divertible.     │   │address is        │   └──────────────┘
   └────────────────┘   │divertible.       │
                        └──────────────────┘
```
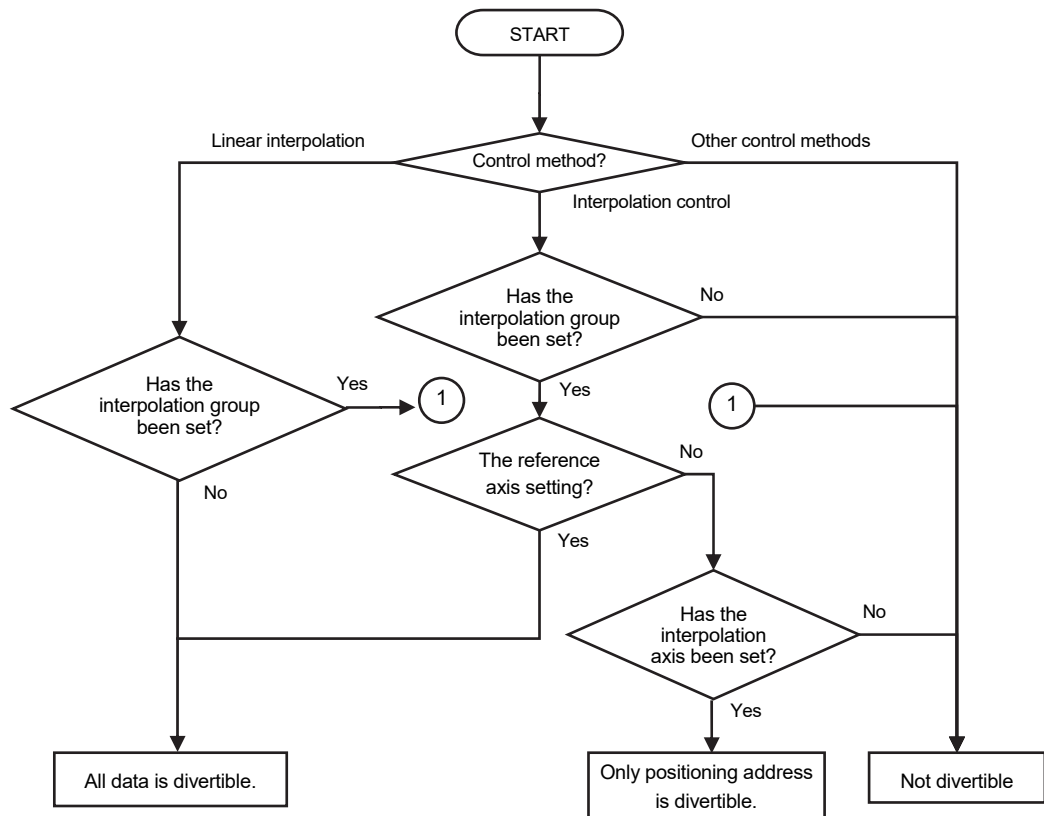
(b) The following shows the details of positioning data diversion.

1) The existing acceleration/deceleration time settings are diverted to "Pr.9 Acceleration time 0", "Pr.25 Acceleration time 1"/"Pr.10 : Deceleration time 0, "Pr.28 Deceleration time 1".

2) The control method "6: Speed-torque" is not divertible. Create a sequence program by referring to "MELSEC-Q QD77MS Simple Motion Module User's Manual (Positioning Control)".

3) When the control method is set as either "2: ABS linear interpolation" or "3: INC linear interpolation", the smallest number axis in the interpolation group will be set as the reference axis.

4) Among the positioning data of axes specified in "Pr.25 interpolation group", only the ones in which "2: ABS linear interpolation" or "3: INC linear interpolation" is set can be diverted.

However, if the control methods do not match among the axes, the positioning data will not be diverted.

Data name		Divertible or not divertible	Remarks
QD74MH	QD77MS16		
Operation pattern	Operation pattern	○	−
Control method	Control method	○	0:ABS linear 1 → 01h:ABS linear 1
−	Interpolation axes	−	1:INC linear 1 → 02h:INC linear 1 2:ABS linear interpolation → (Note-1) 3:INC linear interpolation → (Note-1) 6:Speed-torque → Not diverted
−	Acceleration time No.	−	Refer to (b)-1) above.
Acceleration time/torque time constant	−	✕	−
−	Deceleration time No.		Refer to (b)-1) above.
Deceleration time	−	✕	−
Positioning address/ torque command value	Positioning address	○	−
−	Arc address	−	The initial value is set.
Command speed/speed limit value	Command speed	○	−
Dwell time	Dwell time	○	−
−	M-code	−	The initial value is set.
−	Comments in positioning data	−	
Positioning data No.2 to No.32	Positioning data No.2 to No.32	○	−

○: Divertible, ✕: Not divertible, −: No equivalent parameter exists

(Note-1): These settings are diverted as follows according to the number of axes set in "Pr.25 Interpolation group".
In addition, the interpolation axis No. is diverted to "Axis to be interpolated No." in QD77MS16.

The number of axes in the same interpolation group	Setting value	
	ABS linear interpolation	INC linear interpolation
0 or 1	01h ABS linear 1	02h INC linear 1
2	0Ah ABS linear 2	0Bh INC linear 2
3	15h ABS linear 3	16h INC linear 3
4	1Ah ABS linear 4	1Bh INC linear 4

The following shows the example of interpolation control settings.

[Example 1] ・ Pr.25 Interpolation group (Axis 1 to Axis 3): 1: Group 1
          ・ The control method: the same setting for all axes

Axis No.	Control method	Reference axis	Diversion
Axis 1	2: ABS linear interpolation control	○	○
Axis 2	2: ABS linear interpolation control	–	○
Axis 3	2: ABS linear interpolation control	–	○

[Example 2] ・ Pr.25 Interpolation group (Axis 1 to Axis 3): 1: Group 1
          ・ The control method: A different setting only for axis 1

Axis No.	Control method	Reference axis	Diversion
Axis 1	3: INC linear interpolation control	–	✕
Axis 2	2: ABS linear interpolation control	○	○
Axis 3	2: ABS linear interpolation control	–	○

[Example 3] ・ Pr.25 Interpolation group (Axis 1 to Axis 3): 1: Group 1
          ・ No common settings among the axes

Axis No.	Control method	Reference axis	Diversion
Axis 1	2: ABS linear interpolation control	–	✕
Axis 2	6: Speed-torque	–	✕
Axis 3	3: INC linear interpolation control	–	✕

[Example 4] ・ Pr.25 Interpolation group (Axis 1 to Axis 3): 1: Group 1
          ・ Positioning data control method: No interpolation control setting

Axis No.	Control method	Reference axis	Diversion
Axis 1	0: ABS linear 1	–	✕
Axis 2	0: ABS linear 1	–	✕
Axis 3	0: ABS linear 1	–	✕

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MEMO

MEMO

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 one year 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 eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) 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.

(2) 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 (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
   5. 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.
   6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
   7. 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 to:
(1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
(2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
(3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
(4) 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.

6. Precautions for Choosing the Products

(1) For the use of our Simple Motion module, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in Simple Motion module, and a backup or fail-safe function should operate on an external system to Simple Motion module when any failure or malfunction occurs.
(2) Our Simple Motion module is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used. In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used. We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.

Migration Guide from Positioning Module to Simple Motion Module [QD74MH ⇒ QD77MS]

Country/Region	Sales office	
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Mexico	Mitsubishi Electric Automation, Inc. Mexico Branch Mariano Escobedo #69, Col.Zona Industrial, Tlalnepantla Edo. Mexico, C.P.54030	Tel : +52-55-3067-7512
Brazil	Mitsubishi Electric do Brasil Comercio e Servicos Ltda. Avenida Adelino Cardana, 293, 21 andar, Bethaville, Barueri SP, Brazil	Tel : +55-11-4689-3000
Germany	Mitsubishi Electric Europe B.V. German Branch Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany	Tel : +49-2102-486-0
UK	Mitsubishi Electric Europe B.V. UK Branch Travellers Lane, UK-Hatfield, Hertfordshire, AL10 8XB, U.K.	Tel : +44-1707-28-8780
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Turkey	Mitsubishi Electric Turkey A.S. Umraniye Branch Serifali Mahallesi Nutuk Sokak No:5, TR-34775 Umraniye / Istanbul, Turkey	Tel : +90-216-526-3990
UAE	Mitsubishi Electric Europe B.V. Dubai Branch Dubai Silicon Oasis, P.O.BOX 341241, Dubai, U.A.E.	Tel : +971-4-3724716
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India	Mitsubishi Electric India Pvt. Ltd. Pune Branch Emerald House, EL-3, J Block, M.I.D.C., Bhosari, Pune - 411026, Maharashtra, India	Tel : +91-20-2710-2000
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