



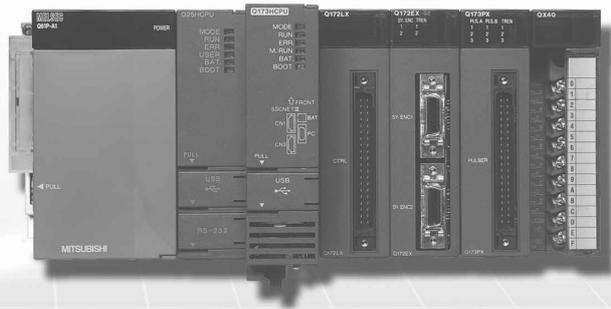
for a greener tomorrow



MITSUBISHI ELECTRIC SERVO SYSTEM CONTROLLER

Migration Guide of Motion Controller [Q17nHCPU(-T) ⇒ Q17nDSCPU]

Q173HCPU(-T)
Q172HCPU(-T)



SSCNET III/H
SERVO SYSTEM CONTROLLER NETWORK
Q173DSCPU
Q172DSCPU

● 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.

These precautions apply only to this product. Refer to the Q173D(S)CPU/Q172D(S)CPU Users manual for a description of the Motion controller safety precautions.

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



Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



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

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 Motion controller 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 Motion controller, 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 Motion controller, 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 Motion controller, servo amplifier or servomotor 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 Motion controller and servo amplifier, as this may lead to electric shocks.

2. For fire prevention

CAUTION

- Install the Motion controller, 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 Motion controller 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.

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 controller 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 Motion controller 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 Motion controller, 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 Motion controller, base unit and 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 Motion controller, servo amplifier and servomotor, make sure that the safety standards are satisfied.
- Construct a safety circuit externally of the Motion controller or servo amplifier if the abnormal operation of the Motion controller or servo amplifier differ 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 dynamic brakes.
- Make sure that the system considers the coasting amount even when using dynamic brakes.
- In systems where perpendicular shaft dropping may be a problem during the forced stop, emergency stop, servo OFF or power supply OFF, use both dynamic brakes and electromagnetic brakes.

CAUTION

- The dynamic brakes must be used only on errors that cause the forced stop, emergency stop, or servo OFF. These brakes must not be used for normal braking.
- The brakes (electromagnetic brakes) assembled into the servomotor are for holding applications, and must not be used for normal braking.
- 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 Motion controller, servo amplifier and servomotor) used in a system must be compatible with the Motion controller, 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 brakes 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.
- To maintain the safety of the programmable controller system against unauthorized access from external devices via the network, take appropriate measures. To maintain the safety against unauthorized access via the Internet, take measures such as installing a firewall.

(2) Parameter settings and programming

CAUTION

- Set the parameter values to those that are compatible with the Motion controller, 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, servo amplifier and servo power supply module. 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.
- Set the servomotor capacity and type (standard, low-inertia, flat, etc.) parameter to values that are compatible with the system application. The protective functions may not function if the settings are incorrect.

CAUTION

- Set the servo amplifier capacity and type parameters to values that are compatible with the system application. The protective functions may not function if the settings are 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.
- Some devices used in the program have fixed applications, so use these with the conditions specified in the instruction manual.
- 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 Motion controller or servo amplifier, never hold the connected wires or cables.
- When transporting the servomotor, never hold the cables, shaft or detector.
- When transporting the Motion controller or servo amplifier, never hold the front case as it may fall off.
- When transporting, installing or removing the Motion controller 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 Motion controller or servo amplifier and control panel inner surface or the Motion controller and servo amplifier, Motion controller or servo amplifier and other devices.
- Do not install or operate Motion controller, servo amplifiers or servomotors that are damaged or that have missing parts.
- Do not block the intake/outtake ports of the Motion controller, 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 Motion controller, servo amplifier or servomotor.

⚠ CAUTION

- The Motion controller, servo amplifier and servomotor are precision machines, so do not drop or apply strong impacts on them.
- Securely fix the Motion controller, 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.

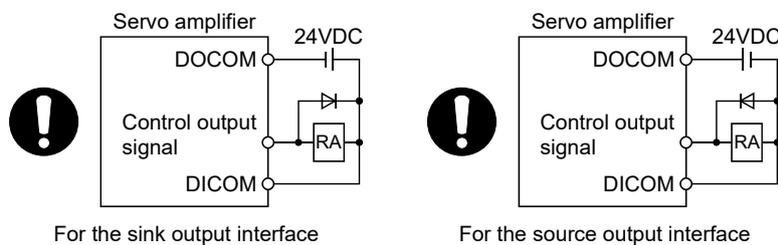
Environment	Conditions	
	Motion controller/Servo amplifier	Servomotor
Ambient temperature	According to each instruction manual.	0°C to +40°C (With no freezing) (32°F to +104°F)
Ambient humidity	According to each instruction manual.	80% RH or less (With no dew condensation)
Storage temperature	According 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 synchronous encoder or 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 synchronous encoder and servomotor shaft. Doing so may lead to shaft breakage.
- When not using the module for a long time, disconnect the power line from the Motion controller or servo amplifier.
- Place the Motion controller 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.
- 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.

(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) and ground. 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.



- 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 coming off during operation.
- Do not bundle the power line or cables.

(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 Motion controller 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.

(6) Usage methods

⚠ CAUTION

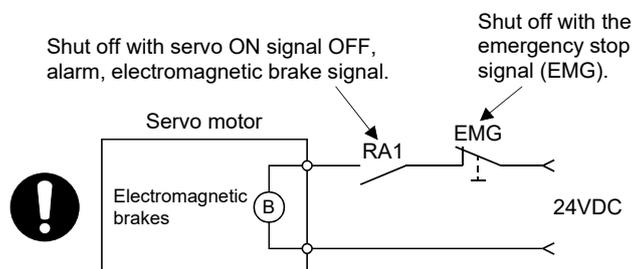
- Immediately turn OFF the power if smoke, abnormal sounds or odors are emitted from the Motion controller, servo amplifier or servomotor.
- Always execute a test operation before starting actual operations after the program or parameters have been changed or after maintenance and inspection.
- Do not 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 Motion controller or servo amplifier.
- When using the CE Mark-compliant equipment, refer to the User's manual for the Motion controllers and refer to the corresponding EMC guideline information for the servo amplifiers, inverters and other equipment.
- 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 Motion controller 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 electromagnetic brakes 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 Motion controller 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 Motion controller 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 Motion controller or servo amplifier, always set the new module settings correctly.
- When the Motion controller or absolute value motor has been replaced, carry out a home position return operation using one of the following methods, otherwise position displacement could occur.
 - 1) After writing the servo data to the Motion controller using programming software, switch on the power again, then perform a home position return operation.
 - 2) Using the backup function of the programming software, load the data backed up before replacement.
- 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 Motion controller or servo amplifier.
- The electrolytic capacitor and fan will deteriorate. Periodically replace these to prevent secondary damage from faults. Replacements can be made by our sales representative.
- Lock the control panel and prevent access to those who are not certified to handle or install electric equipment.
- 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 Motion controller, 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 Electric 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
Apr., 2019	L(NA)03184ENG-A	First edition

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INTRODUCTION

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

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1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.1 Benefits of Migration

Migrating from the existing system using Q173HCPU(-T)/Q172HCPU(-T) Motion controllers to a new system using iQ Platform Motion controllers Q173DSCPU/Q172DSCPU (hereinafter called Q17nDSCPU), which support the programs on the Q173HCPU(-T)/Q172HCPU(-T), 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-speed operation and high functionality of the Motion controller

The Motion controller Q17nDSCPU achieves the maximum operation cycle of 0.22 ms/4 axes, enabling a dramatically fast operation.

The controller also achieves further advanced motion control with a wide variety of motion control functions.

→ Increased productivity from higher speeds and functionality of the Motion 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 servo amplifier 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 line 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 lines.

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

(4) 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. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.2 Main Target Models for Migration

The main target models and operating system software for replacement described in this section are as follows.

If you are using special operating system software or application-specific operating system software, contact your local sales office.

(1) Modules/Cables

Product name	Model before migration		Model after migration
Motion CPU module	Q172HCPU		Q172DSCPU ^(Note-1)
	Q173HCPU		Q173DSCPU ^{(Note-1), (Note-2)}
	Q172HCPU-T		Q172DSCPU ^{(Note-1), (Note-3)}
	Q173HCPU-T		Q173DSCPU ^{(Note-1), (Note-2), (Note-3)}
Battery holder unit	Q170HBATC (Order if necessary)		Unnecessary (A battery is set in the Motion CPU battery holder unit.)
Servo external signals interface module	Q172LX		Q172DLX
Serial absolute synchronous encoder interface module	Q172EX		[Synchronous encoder interface module] Q172DEX
	Q172EX-S1		
	Q172EX-S2		
	Q172EX-S3		
Manual pulse generator interface module	Q173PX		Q173DPX
	Q173PX-S1		
Serial absolute synchronous encoder	MR-HENC		←(same as the left)
	Q170ENC		Q171ENC-W8
Serial absolute synchronous encoder cable ^(Note-4)	MR-JHSCBL□M-H,L (For MR-HENC)		←(same as the left)
	Q170ENCCBL□M (For Q170ENC)		←(same as the left) (For Q171ENC-W8)
Manual pulse generator	MR-HDP01	←(same as the left)	
SSC I/F board	A10BD-PCF	-	
	A30BD-PCF	-	
SSC I/F card	A30CD-PCF	-	
SSCNETIII cable ^(Note-4)	MR-J3BUS□M	← (Same as the left)	
	MR-J3BUS□M-A		
	MR-J3BUS□M-B ^(Note-5)		
SSC I/F board cable ^(Note-4)	Q170BDCBL□M	-	
SSC I/F card cable ^(Note-4)	Q170CDCBL□M	-	

1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(Continued)

Product name	Model before migration		Model after migration
Teaching unit	A31TU-D3K13	➔	-
	A31TU-DNK13		
Cable for teaching unit	Q170TUD3CBL3M		-
	Q170TUDNCBL3M		
	Q170TUDNCBL03M-A		
Short-circuit connector for teaching unit	Q170TUTM		-
	A31TUD3TM		

(Note-1): Q17nDSCPU cannot be used in combination with Q17nHCPU(-T)/Q17nCPUN(-T).

(Note-2): If the number of axes used in the system with Q173HCPU(-T) is 16 or less, Q172DSCPU can be also selected.

(Note-3): Q17nDSCPU does not support teaching units.

(Note-4): "□" 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-5): For a long distance cable of up to 100 m or an ultra-long bending life cable, contact Mitsubishi Electric System & Service Co., Ltd.

OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)

(2) Operating system software

Before migration				After migration		
CPU model	OS Type	OS model		CPU model	OS Type	OS model
Q173HCPU(-T)	SV13	SW6RN-SV13QK	➔	Q173DSCPU	SV13	SW8DNC-SV13QJ
Q172HCPU(-T)		SW6RN-SV13QM		Q172DSCPU		SW8DNC-SV13QL
Q173HCPU(-T)	SV22	SW6RN-SV22QJ		Q173DSCPU	SV22	SW8DNC-SV22QJ
Q172HCPU(-T)		SW6RN-SV22QL		Q172DSCPU		SW8DNC-SV22QL

(Note): The operating system software (SV22) is installed at the time of product purchase.

1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(3) Servo amplifiers/Rotary servo motors

Before migration from Q17nHCPU(-T)				After migration to Q17nDSCPU		
Servo amplifier		Rotary servo motor		Servo amplifier		Rotary servo motor
MR-J3 series	MR-J3-□B	HF-KP□		MR-J4 series	MR-J4-□B(-RJ)	HG-KR□
	MR-J3W-□B	HF-MP□			MR-J4W2-□B	HG-MR□
	MR-J3-□BS	HF-SP□			MR-J4W3-□B	HG-SR□
	MR-J3-□B-RJ006	HF-JP□				HG-RR□
		HC-LP□				HG-UR□
		HC-RP□				HG-JR□
		HC-UP□				
		HA-LP□				

(4) Servo amplifiers/Linear servo motors

Before migration from Q17nHCPU(-T)				After migration to Q17nDSCPU		
Servo amplifier		Linear servo motor		Servo amplifier		Linear servo motor
MR-J3 series	MR-J3-□B-RJ004	LM-H2□		MR-J4 series	MR-J4-□B(-RJ)	LM-H3□
		LM-F□			MR-J4W2-□B	LM-F□
		LM-K2□			MR-J4W3-□B	LM-K2□
		LM-U2□				LM-U2□

(5) Servo amplifiers/Direct drive motors

Before migration from Q17nHCPU(-T)				After migration to Q17nDSCPU		
Servo amplifier		Direct drive motor		Servo amplifier		Direct drive motor
MR-J3 series	MR-J3-□B-RJ080W	TM-RFM□		MR-J4 series	MR-J4-□B(-RJ)	TM-RFM□
					MR-J4W2-□B	
					MR-J4W3-□B	

1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(6) Servo system network

Item		
Communications medium	Optical fiber cable	← (same as SSCNETIII)
Communications speed	50 Mbps	150 Mbps
Communications cycle	Send	0.22 ms/0.44 ms/0.88 ms
	Receive	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] Up to 3 m between stations Maximum overall distance: 48 m (3 m × 16 axes)	[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)
	[Standard cable for outside panel] Up to 20 m between stations Maximum overall distance: 320 m (20 m × 16 axes)	
	[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)

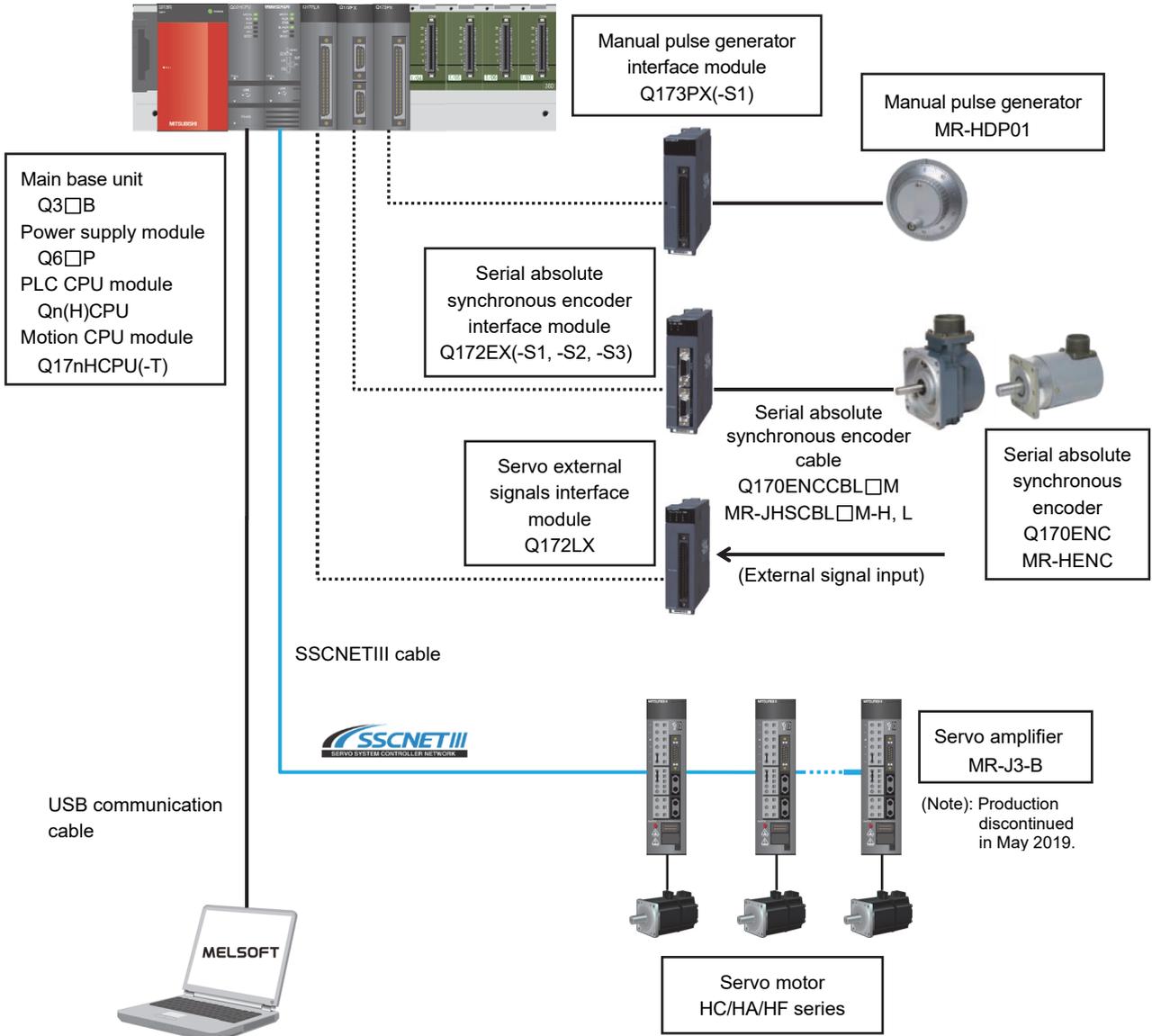
(7) Engineering environment (required)

Product name	Model	Version
MELSOFT MT Works2	SW1DND-MTW2-E	Ver.1.34L or later
MELSOFT GX Works2	SW1DNC-GXW2-E	Ver.1.84N or later
MELSOFT MR Configurator2	SW1DNC-MRC2-E	Ver.1.12N or later

1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

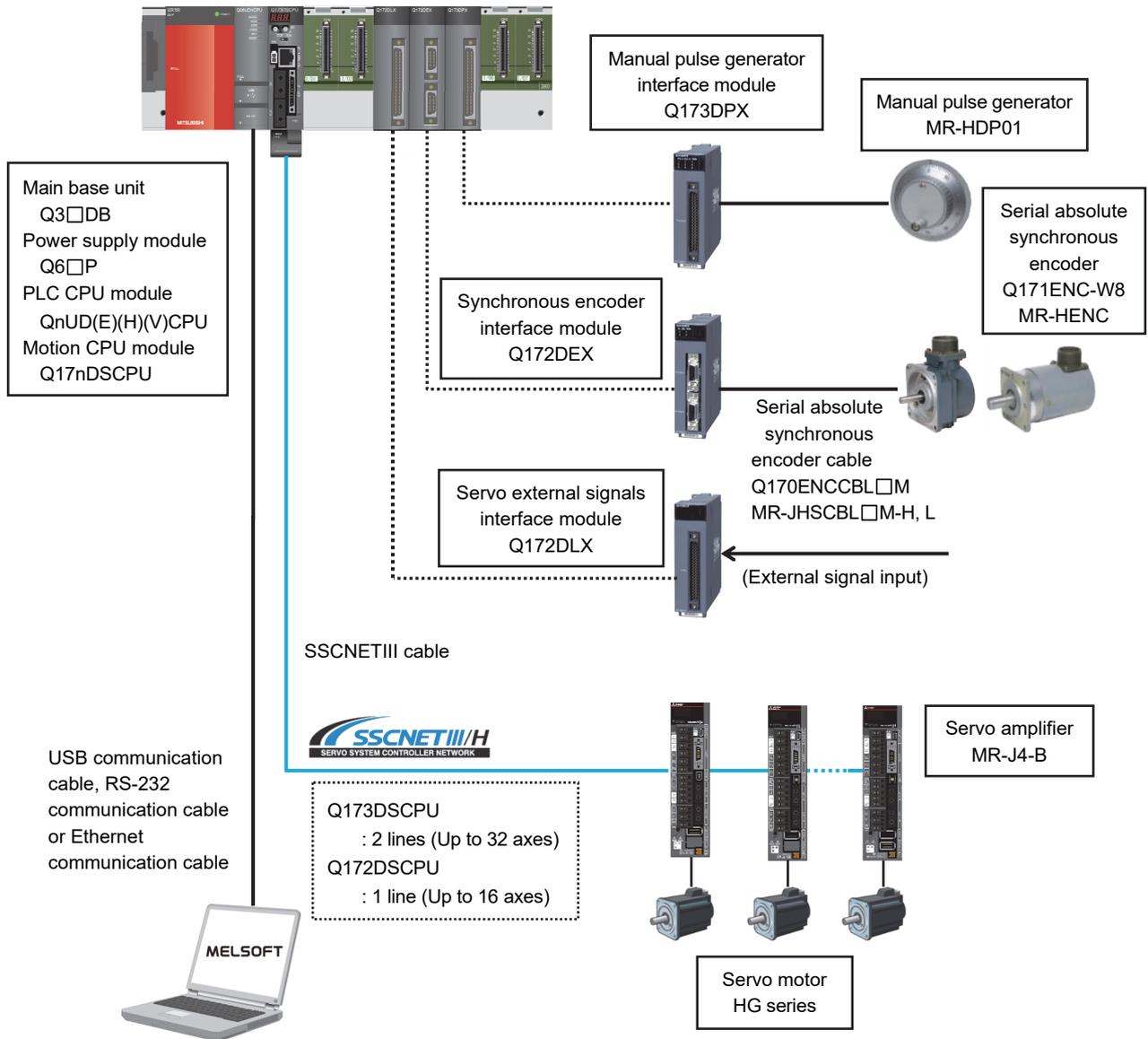
1.3 System Configuration

1.3.1 System configuration using Q17nHCPU(-T) before migration



1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.3.2 System configuration using Q17nDSCPU after migration

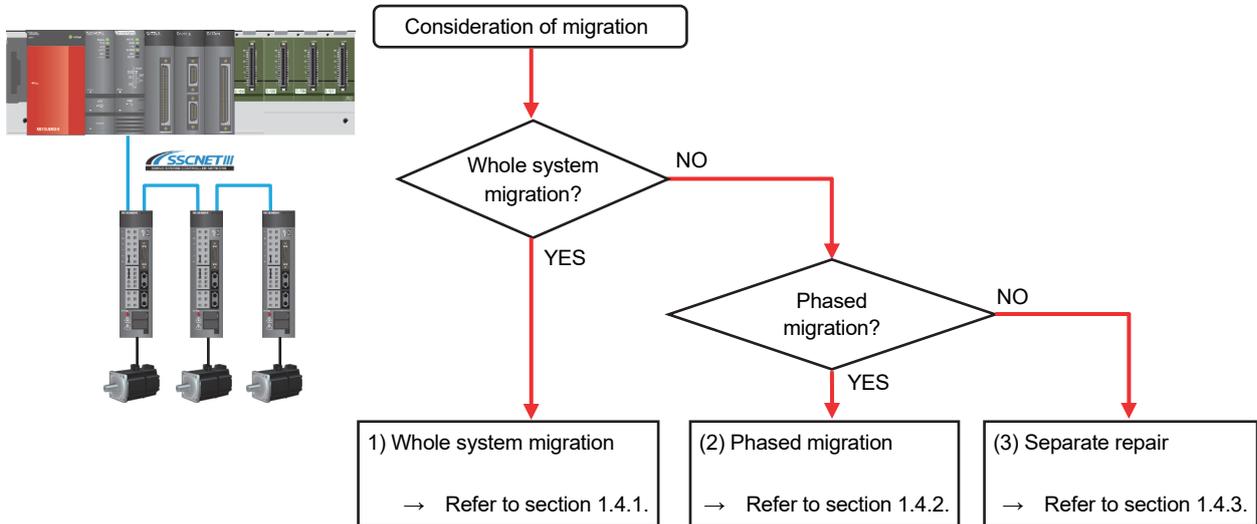


Note) There is a restriction on installation position of Motion modules (Q172DLX, Q172DEX, Q173DPX). Refer to 2.4.2 (3) for details.

1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.4 Case Study on Migration

The following describes a case study for migrating the existing system using Q17nHCPU(-T).



(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 Q17nDSCPU 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.)

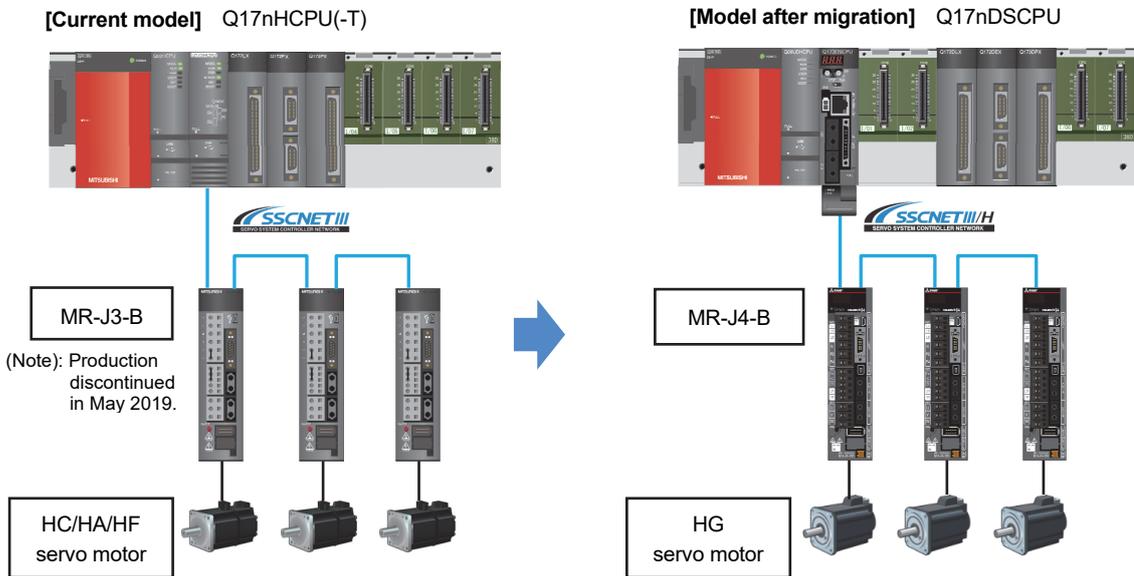
(3) Separate repair

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

1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.4.1 Whole system migration (recommended)

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



[Changes in the system]

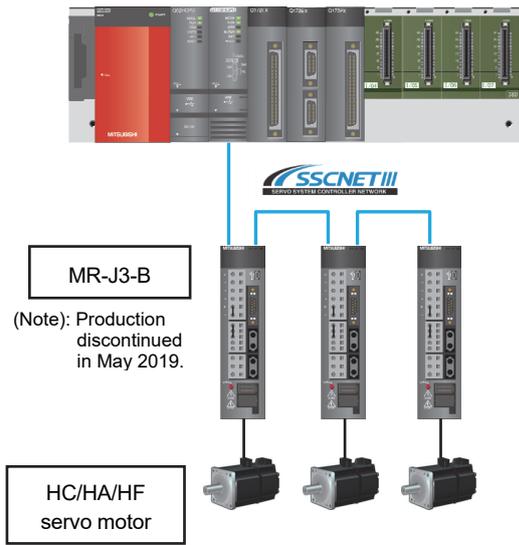
Product name	Model before migration	Model after migration
Main base unit	Q3□B	Q3□DB
PLC CPU module	Qn(H)CPU	QnUD(E)(H)(V)CPU
Motion CPU module	Q17nHCPU(-T)	Q17nDSCPU
Motion modules	Q172LX	Q172DLX
	Q172EX(-S1,-S2,-S3)	Q172DEX
	Q173PX(-S1)	Q173DPX
Servo amplifier	MR-J3-B	MR-J4-B
Servo motor	HC/HA/HF series	HG series

1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

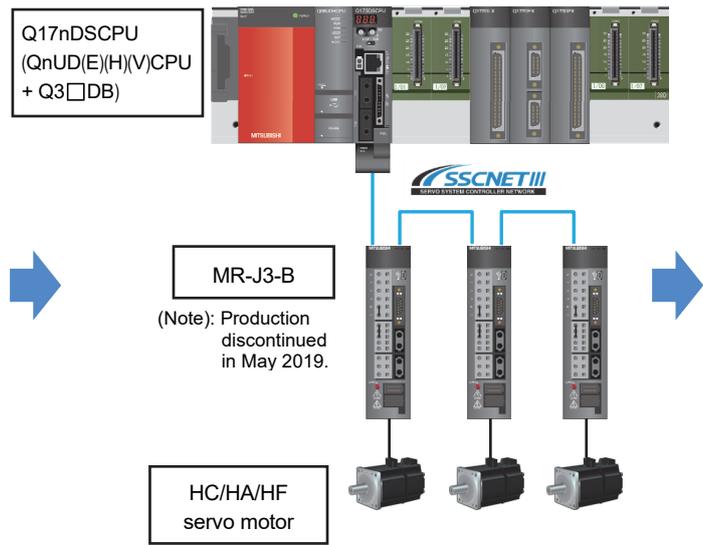
1.4.2 Phased migration

The following shows the procedure for the phased migration in which the controller is replaced with Q17nDSCPU in the first phase, and then the MR-J3-B servo amplifiers are gradually replaced with MR-J4-B in the following phases.

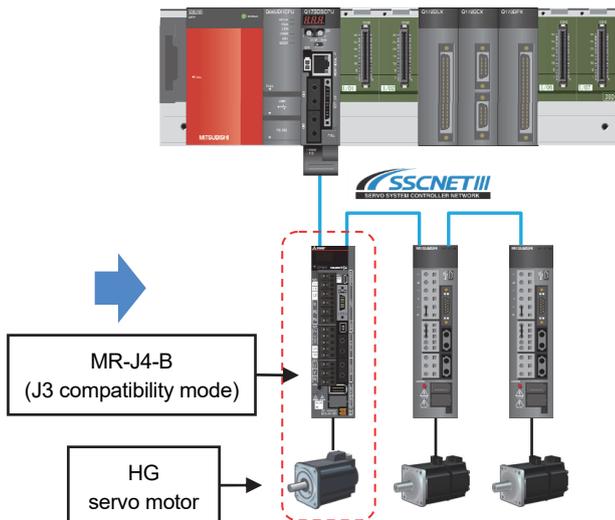
[Current model]



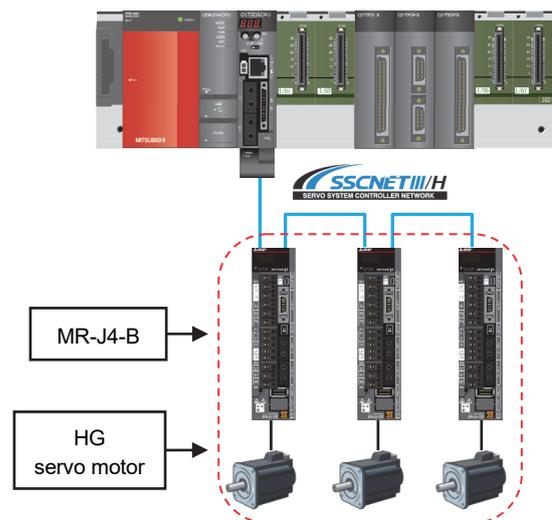
**[Replacement - Phase 1]
Replacement of the controller**



**[Replacement - Phase 2]
Servo amplifier and servo motor replacement for only one axis**



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



(Note): For replacing the servo amplifier or the servo motor, refer to section "1.4.3 Separate repair".
(Note): For details of the J3 compatibility mode, refer to the "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 SSCNET III to SSCNET III/H.

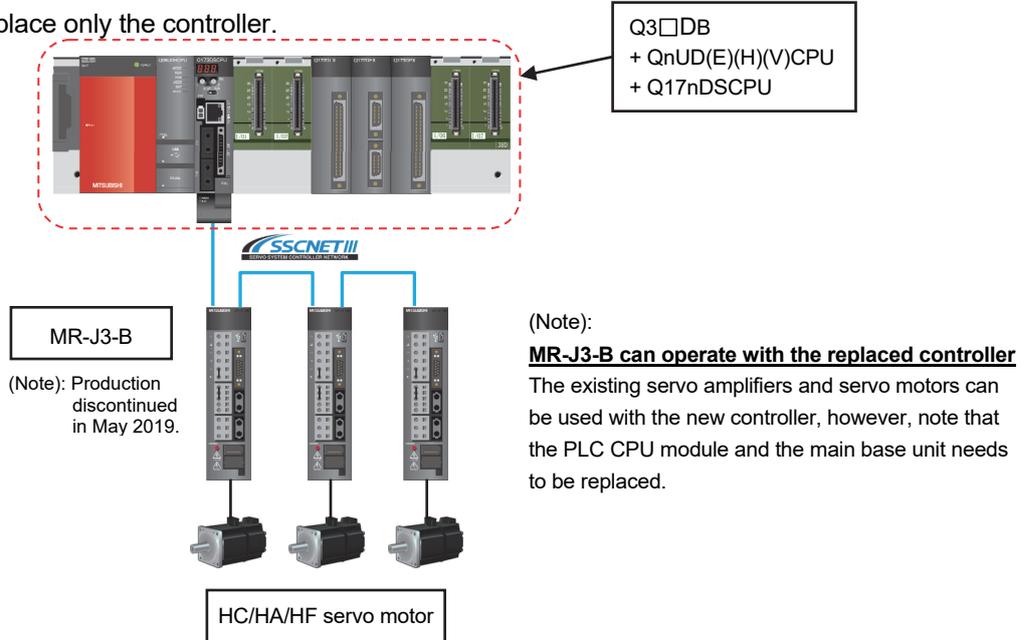
1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.4.3 Separate repair

The following shows the procedure for the separate repair.

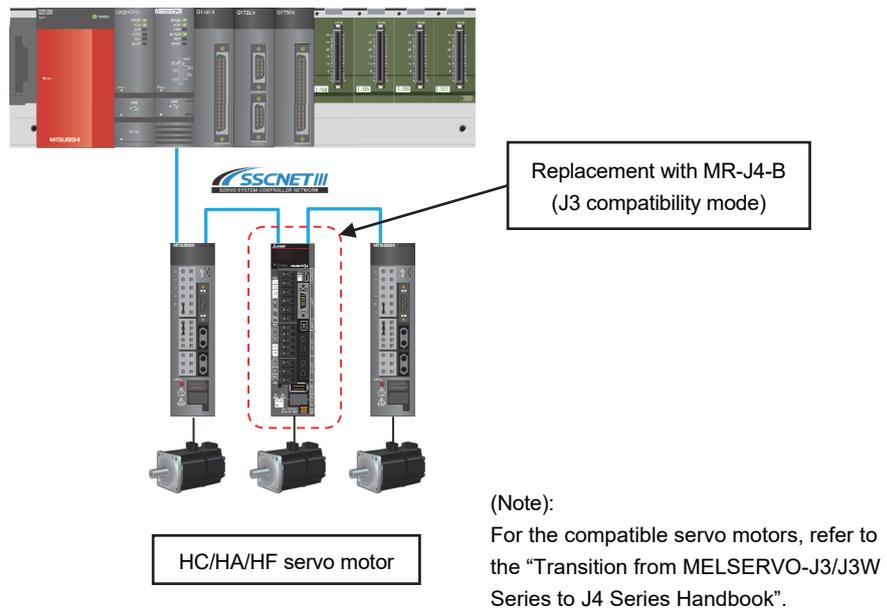
(1) When the controller has malfunctioned.

Replace only the controller.



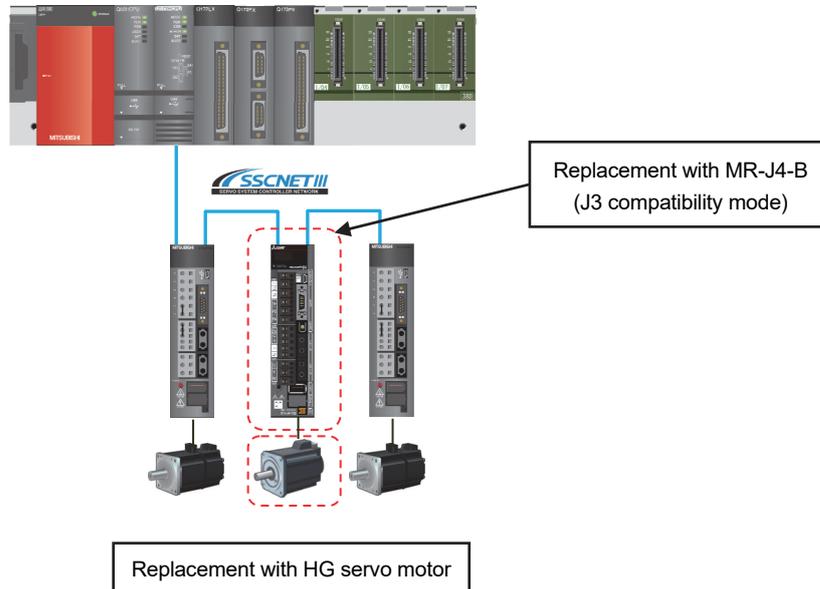
(2) When the MR-J3-B servo amplifier has malfunctioned.

Replace only the servo amplifier.



1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

- (3) When the HC/HA/HF servo motor has malfunctioned
Simultaneously replace the servo amplifier and the malfunctioned servo motor.



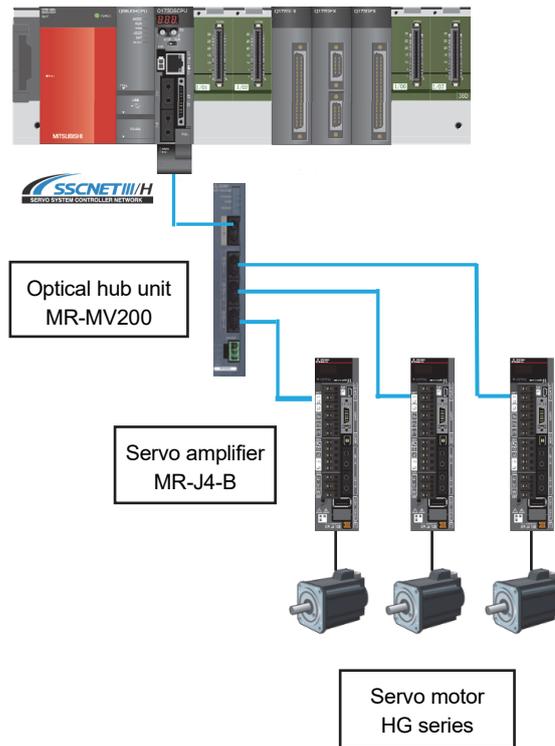
1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.4.4 Precautions for powering off only a desired servo amplifier

Use the SSCNETIII/H compatible MR-MV200 optical hub unit for powering off only a desired servo amplifier.

Refer to section 1.4.5 for details of the MR-MV200 optical hub unit.

The system with the MR-MV200 is shown below.

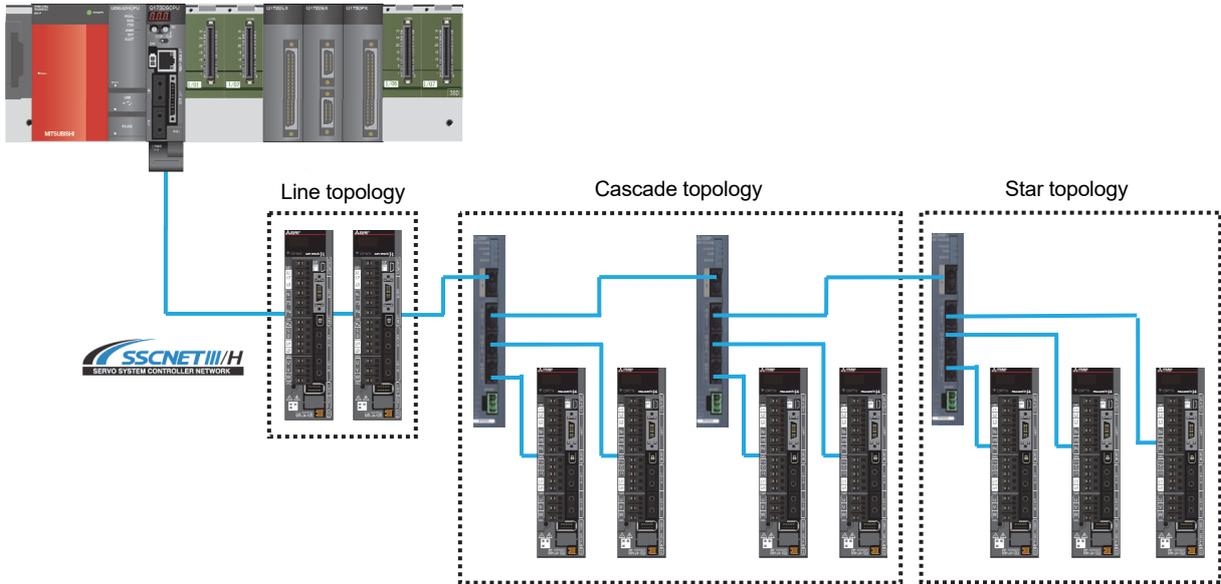


1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.4.5 Configuration when the MR-MV200 optical hub unit is used

The MR-MV200 can branch a single SSCNETIII/H network line in three separate directions (three outputs per one input).

A connection example when using the MR-MV200 and the specifications are shown below.



Item	Description
Input voltage [V]	21.6 to 26.4 VDC (24 VDC \pm 10 %)
Consumption current [A]	0.2
Mass [kg]	0.22
Mounting method	Directly mounted to the control panel or with DIN rail
Cable length [m]	Up to 100
Number of optical hub units	Up to 16 units/line
Number of servo amplifiers	Up to 16 axes/line
Exterior dimensions [mm]	168 (H) x 30 (W) x 100 (D)

1.5 Project Diversion

The following functions can convert the projects of Q17nHCPU(-T) into those of Q17nDSCPU. For the procedure for project diversion, refer to section “2.4.2 Project diversion procedures by engineering environment”.

(1) Motion CPU project

“Project diversion function” and “Change type/OS type function” of MELSOFT MT Works2

“Project diversion function” or “Change Type/OS Type function”



(2) PLC CPU project

“Change PLC type function” of MELSOFT GX Works2

“Change PLC Type function”

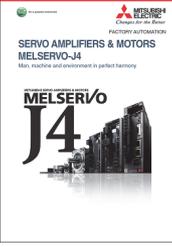
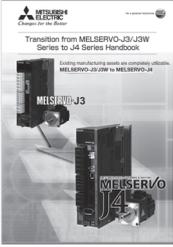
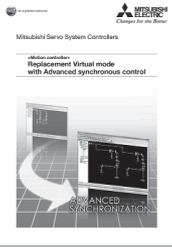


1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.6 Relevant Documents

Refer to the following relevant documents for the replacement.

1.6.1 Relevant catalogs

<p>MITSUBISHI ELECTRIC SERVO SYSTEM CONTROLLERS</p>  <p>L(NA)03062</p>	<p>SERVO AMPLIFIERS & MOTORS MELSERVO-J4</p>  <p>L(NA)03058</p>
<p>Transition from MELSERVO-J3/J3W Series to J4 Series Handbook</p>  <p>L(NA)03127</p>	<p>Replacement of Virtual mode with Advanced synchronous control</p>  <p>L(NA)03123</p>

1. OVERVIEW OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

1.6.2 Relevant manuals

(1) Motion controller

Manual title	Manual No.
Q173D(S)CPU/Q172D(S)CPU Motion Controller User's Manual	IB-0300133
Q173D(S)CPU/Q172D(S)CPU Motion Controller Programming Manual (COMMON)	IB-0300134
Q173D(S)CPU/Q172D(S)CPU Motion Controller (SV13/SV22) Programming Manual (Motion SFC)	IB-0300135
Q173D(S)CPU/Q172D(S)CPU Motion Controller (SV13/SV22) Programming Manual (REAL MODE)	IB-0300136
Q173D(S)CPU/Q172D(S)CPU Motion Controller (SV22) Programming Manual (VIRTUAL MODE)	IB-0300137
Q173DSCPU/Q172DSCPU Motion Controller (SV22) Programming Manual (Advanced Synchronous Control)	IB-0300198

(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 Q17nHCPU(-T) TO Q17nDSCPU

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.1 Table of Components and Software

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

Product name	Model before migration	Model after migration
Motion CPU module	Q172HCPU	Q172DSCPU ^(Note-1)
	Q173HCPU	Q173DSCPU ^{(Note-1), (Note-2)}
	Q172HCPU-T	Q172DSCPU ^{(Note-1), (Note-3)}
	Q173HCPU-T	Q173DSCPU ^{(Note-1), (Note-2), (Note-3)}
PLC CPU module	Qn(H)CPU	QnUD(E)(H)(V)CPU
Main base unit	Q3□B	Q3□B ^(Note-4)
Cable for forced stop input	–	Q170DEMICBL□M ^(Note-5)
Connector for forced stop input cable	–	Q170DEMICON ^(Note-6)
Servo external signals interface module	Q172LX	Q172DLX
Serial absolute synchronous encoder interface module	Q172EX	[Synchronous encoder interface module]
	Q172EX-S1	Q172DEX
	Q172EX-S2	
	Q172EX-S3	
Manual pulse generator interface module	Q173PX	Q173DPX
	Q173PX-S1	
Serial absolute synchronous encoder	MR-HENC	←(same as the left)
	Q170ENC	Q171ENC-W8
Serial absolute synchronous encoder cable ^(Note-7)	MR-JHSCBL□M-H,L (For MR-HENC)	←(same as the left)
	Q170ENCCBL□M (For Q170ENC)	←(same as the left) (For Q171ENC-W8)
Battery holder unit	Q170HBATC (Order if necessary)	Unnecessary (A battery is set in the Motion CPU battery holder unit.)
Battery	Q6BAT (For Motion CPU module)	←(same as the left)
	A6BAT (For synchronous encoder)	←(same as the left)
Manual pulse generator	MR-HDP01	←(same as the left)
SSCNETIII cable ^(Note-7)	MR-J3BUS□M	←(same as the left)
	MR-J3BUS□M-A	
	MR-J3BUS□M-B ^(Note-7)	
Teaching unit	A31TU-D3K13	–
	A31TU-DNK13	

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

Product name	Model before migration		Model after migration
Cable for teaching unit	Q170TUD3CBL3M		-
	Q170TUDNCBL3M		
	Q170TUDNCBL03M-A		
Short-circuit connector for teaching unit	Q170TUTM		-
	A31TUD3TM		

(Note-1): Q17nDSCPU cannot be used in combination with Q17nHCPU(-T)/Q17nCPUN(-T).

(Note-2): If the number of axes used in the system with Q173HCPU(-T) is 16 or less, Q172DSCPU can be also selected.

(Note-3): Q17nDSCPU does not support teaching units.

(Note-4): Only Multiple CPU high speed main base unit (Q3□DB) can be used.

(Note-5): Use the cable for forced stop input (sold separately). The forced stop cannot be released without using it.

(Note-6): A specialized tool is required when fabricating a forced stop input cable by user. Refer to "Q173D(S)CPU/Q172D(S)CPU User's Manual" for details.

(Note-7): "□" 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-8): For a long distance cable of up to 100 m or an ultra-long bending life cable, contact Mitsubishi Electric System & Service Co., Ltd.

OVERSEAS SERVICE SECTION (Email: osb.webmaster@melsc.jp)

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

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 Q17nHCPU(-T)				After migration to Q17nDSCPU		
Servo amplifier		Rotary servo motor		Servo amplifier		Rotary servo motor
MR-J3 series	MR-J3-□B	HF-KP□		MR-J4 series	MR-J4-□B(-RJ)	HG-KR□
	MR-J3W-□B	HF-MP□			MR-J4W2-□B	HG-MR□
	MR-J3-□BS	HF-SP□			MR-J4W3-□B	HG-SR□
	MR-J3-□B-RJ006	HF-JP□				HG-RR□
		HC-LP□				HG-UR□
	HC-RP□			HG-JR□		
	HC-UP□					
	HA-LP□					

(2) Servo amplifiers/Linear servo motors

Before migration from Q17nHCPU(-T)				After migration to Q17nDSCPU		
Servo amplifier		Linear servo motor		Servo amplifier		Linear servo motor
MR-J3 series	MR-J3-□B-RJ004	LM-H2□		MR-J4 series	MR-J4-□B(-RJ)	LM-H3□
		LM-F□			MR-J4W2-□B	LM-F□
		LM-K2□			MR-J4W3-□B	LM-K2□
		LM-U2□				LM-U2□

(3) Servo amplifiers/Direct drive motors

Before migration from Q17nHCPU(-T)				After migration to Q17nDSCPU		
Servo amplifier		Direct drive motor		Servo amplifier		Direct drive motor
MR-J3 series	MR-J3-□B-RJ080W	TM-RFM□		MR-J4 series	MR-J4-□B(-RJ)	TM-RFM□
					MR-J4W2-□B	
					MR-J4W3-□B	

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

[Comparison of servo system network]

Item		
Communications medium	Optical fiber cable	← (same as SSCNETIII)
Communications speed	50 Mbps	150 Mbps
Communications cycle	Send	0.22 ms/0.44 ms/0.88 ms
	Receive	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] Up to 3 m between stations Maximum overall distance: 48 m (3 m × 16 axes)	[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)
	[Standard cable for outside panel] Up to 20 m between stations Maximum overall distance: 320 m (20 m × 16 axes)	
	[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 Operating system software

Use the operating system software for Q17nDSCPU.

Before migration				After migration		
CPU model	OS Type	OS model		CPU model	OS Type	OS model
Q173HCPU(-T)	SV13	SW6RN-SV13QK	→	Q173DSCPU	SV13	SW8DNC-SV13QJ
Q172HCPU(-T)		SW6RN-SV13QM		Q172DSCPU		SW8DNC-SV13QL
Q173HCPU(-T)	SV22	SW6RN-SV22QJ	→	Q173DSCPU	SV22	SW8DNC-SV22QJ
Q172HCPU(-T)		SW6RN-SV22QL		Q172DSCPU		SW8DNC-SV22QL

(Note): The operating system software (SV22) is installed at the time of product purchase.

2.1.3 Engineering environment (required)

The engineering environment that supports Q17nDSCPU is as follows.

Product name	Model	Version
MELSOFT MT Works2	SW1DND-MTW2-E	Ver.1.34L or later
MELSOFT GX Works2	SW1DNC-GXW2-E	Ver.1.84N or later
MELSOFT MR Configurator2	SW1DNC-MRC2-E	Ver.1.12N or later

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.2 Differences Between Q17nHCPU(-T) and Q17nDSCPU

(1) Performance and specifications

▶ An item that requires a setting change at migration.

Items		Models	Q173HCPU(-T)	Q172HCPU(-T)	Q173DSCPU	Q172DSCPU	Points for migration
Number of control axes			Up to 32	Up to 8	Up to 32	Up to 16	-
Operation cycle (default)	SV13		0.44ms/ 1 to 3 axes 0.88ms/ 4 to 10 axes 1.77ms/11 to 20 axes 3.55ms/21 to 32 axes		0.22ms/ 1 to 4 axes 0.44ms/ 5 to 10 axes 0.88ms/11 to 24 axes 1.77ms/25 to 32 axes		▶ If the operation cycle is set as default (automatic), the operation cycle will be changed. Set an operation cycle where necessary because the change in the operation cycle may change program execution timing. (Refer to section 2.2(6).)
	SV22		0.88ms/ 1 to 5 axes 1.77ms/ 6 to 14 axes 3.55ms/15 to 28 axes 7.11ms/29 to 32 axes		0.44ms/ 1 to 6 axes 0.88ms/ 7 to 16 axes 1.77ms/17 to 32 axes		
Control methods			Positioning control, Speed control, Speed/position switching control, Fixed-pitch feed, Constant speed control, Position follow-up control, Speed control with fixed position stop, Speed switching control, High-speed oscillation control, Synchronous control (SV22 (Virtual mode))		Positioning control, Speed control, Speed/position switching control, Fixed-pitch feed, Constant speed control, Position follow-up control, Speed switching control, Speed control with fixed position stop, High-speed oscillation control, Speed-torque control, Tightening & press-fit control, Synchronous control (SV22 (Virtual mode switching method/Advanced synchronous control method))		-
Devices	Internal relays (M)		Total 8192 points		12288 points		Latch relay (L) is integrated into internal relay (M).
	Latch relay (L)				None (Latch for M is possible by latch setting)		Refer to 2.4.2(5) for replacing the latch relay with internal relay. After the replacement, set the latch range in the latch range setting.
	Special relay (M)		256 points		-		Special relay (M)/special register (D) of Q17nHCPU(-T) have been changed to SM/SD devices respectively in Q17nDSCPU. (Refer to 2.3.2, 2.3.3, 2.4.2(5) for details.)
	Special relay (SM)		-		2256 points		
	Special register (D)		256 points		-		
	Special register (SD)		-		2256 points		
	Motion register (#)		8192 points		12288 points		Due to the expansion of Motion devices, device assignments of monitor devices, etc. have been partially changed. (Refer to 2.3.1, 2.4.2(5).)
Multiple CPU area devices (U□\G)		-		Up to 14336 points		-	

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(Continued)

Items		Models				Points for migration
		Q173HCPU(-T)	Q172HCPU(-T)	Q173DSCPU	Q172DSCPU	
Motion dedicated PLC instruction		S(P).DDRD, S(P).DDWR, S(P).SFCS, S(P).SVST, S(P).CHGT, S(P).CHGV, S(P).CHGA, S(P).GINT		D(P).DDRD, D(P).DDWR, D(P).SFCS, D(P).SVST, D(P).CHGT, D(P).CHGT2, D(P).CHGV, D(P).CHGVS, D(P).CHGA, D(P).CHGAS, D(P).GINT		▶ Replace the Motion dedicated PLC instruction S(P).□ with D(P).□. (Refer to “Q173D(S)CPU/ Q172D(S)CPU Motion Controller Programming Manual (COMMON).
Interlock condition		Interlock condition by high speed interrupt accept flag from CPU□ to the self CPU is necessary. □:CPU No.		Multiple instructions are executable continuously without interlock condition by high speed interrupt accept flag from CPU□ to the self CPU. □:CPU No.		The interlock condition is not necessary in the new system, however, there is no problem if the condition remains in the program because the accept flag is always OFF.
Motion module	SV13	Q172LX, Q173PX		Q172DLX, Q173DPX		The Q172DEX can be installed only in the main base unit.
	SV22	Q172LX, Q172EX, Q173PX		Q172DLX, Q172DEX, Q173DPX		
	Installation position	Motion modules can be installed to I/O slot No. 0 to 2.		Motion modules cannot be installed to I/O slot No. 0 to 2.		Change the installation position of Motion modules if they are installed in the I/O slot No.0 to 2. Be sure to install them in I/O slot No.3 or later. (Refer to section 2.4.2(3).)
Servo external signal		Q172LX signal, Amplifier input		Q172DLX signal, Bit device, DI signal, Amplifier input		▶ When the servo external signals are used, review the settings.
Shared CPU memory		H0 to HFFF (4096 words)		H0 to H5F0F (24335 words)		-
CPU shared memory	Access by Multiple CPU shared memory	Unavailable		Possible		-
	Multiple CPU high speed transmission area	None		Provided		The communication area of Q17nHCPU(-T) cannot be used. By changing CPU type in MELSOFT MT Works2, the communication area is automatically changed to high-speed transmission area.
Automatic refresh	Memory	Automatic refresh area in CPU shared memory		Multiple CPU high speed transmission area in CPU shared memory		[Automatic refresh setting] The existing data is automatically changed to the data type for the Multiple CPU high-speed transmission area at Motion CPU project diversion
	Automatic refresh setting	4 range settings possible		32 range settings possible		
	Multiple CPU high speed refresh function	None		Provided		

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(Continued)

Items	Models		Q173DSCPU	Q172DSCPU	Points for migration
	Q173HCPU(-T)	Q172HCPU(-T)			
Cancelling errors of Multiple CPU	[Self-diagnostic error code] • 10000: M2039 OFF • Less than 10000: M9060 OFF→ ON (The error code needs to be stored to the special register of D9060.)		M2039 OFF		Revise the programs.
Self-diagnostic errors	Motion CPU-specific errors →"10000" is stored in the diagnostic error (D9008). At this time, the self-diagnostic error flag (M9008) and the diagnostic error flag (M9010) do not turn ON.		Motion CPU-specific errors →10000 to 10999 are stored in the diagnostic error (SD0) (the stored value varies depending on the error.) Self-diagnostic error flag (SM1) and diagnostic error flag (SM0) turn ON.		
Motion SFC error detection flag (M2039)	It depends on the error whether M2039 is turned ON or not.		M2039 will turn ON for all the errors occurred in the Motion CPU.		
Battery	Install Q6BAT (external battery) if continuous power failure occurs for 1 month or more.		Q6BAT must be installed		The Motion CPU data is not latched without a battery.
Forced stop input	Use the devices set in the forced stop input setting in the system setting.		• Use the EMI terminal of Motion CPU module. • Use the devices set in forced stop input setting in the system setting.		Be sure to use the cable for forced stop input (sold separately). The forced stop cannot be released without using it.
Peripheral I/F	USB (via PLC CPU) / USB/SSCNET (Motion CPU)		USB/RS-232/Ethernet (via PLC CPU) / PERIPHERAL I/F (Motion CPU)		Use a compatible I/F to communicate with peripheral devices. If PC link communication is used, replace it with USB communication. In that case, replace the existing cable with the A-miniB USB cable as well.
System setting	• CPU No.1: Qn(H)CPU • The main base unit: Q3□B.		• CPU No.1: QnUD(E)(H)(V) • The main base unit: Multiple CPU high speed main base unit (Q35DB/Q38DB/Q312DB) must be used.		Use compatible module combination.
Servo system network	SSCNETIII		SSCNETIII/H or SSCNETIII		-
Combination of Motion CPU modules	Possible to use with Q17nCPUN(-T)		Possible to use with Q17nDCPU(-S1)		Use iQ Platform compatible Motion CPU modules.
CPU empty slot	Not settable between CPU modules		Settable between CPU modules		-
RUN/STOP	RUN/STOP switch		RUN/STOP switch, remote operation		-

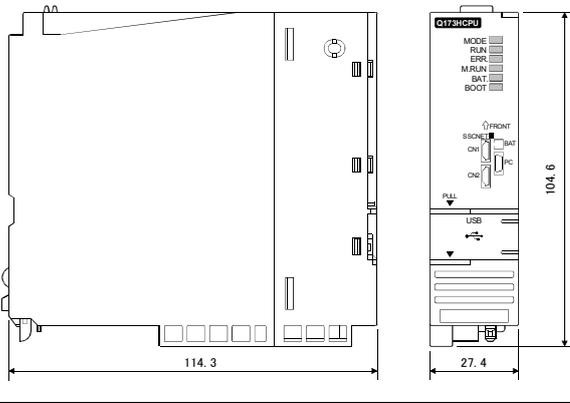
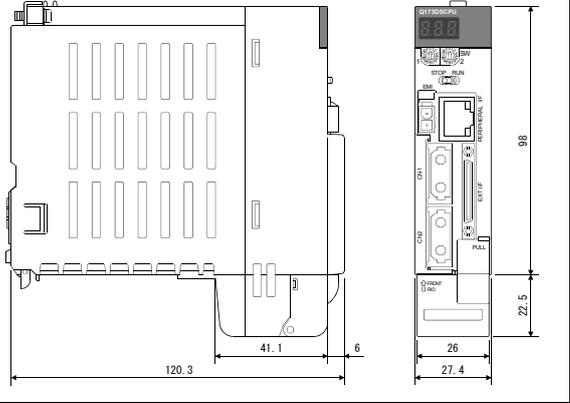
2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(Continued)

Items		Models		Q173DSCPU	Q172DSCPU	Points for migration
		Q173HCPU(-T)	Q172HCPU(-T)			
LED display		MODE, RUN, ERR, M.RUN, BAT, BOOT on LED display		7-segment LED display		-
ROM writing		Rom writing is executed with the installation mode/the mode written in ROM.		<ul style="list-style-type: none"> • ROM writing is executed with the mode operated by RAM. • ROM writing can be executed for the data of MELSOFT MT Works2. 		-
Mode switching		Select a mode with a dip switch.		Select a mode with a rotary switch.		-
Mechanical system program (SV22)		The electronic gear settings for ball screws and rotary table is settable in mechanical system program.		The electronic gear settings for ball screws and rotary table are diverted from the values of fixed parameter "Number of pulses per revolution", and "Movement amount per revolution".		Refer to section 2.4.2(4).
Latch range setting	Latch (1)	Range in which the latch can be cleared with the latch clear		Range in which the latch can be cleared with latch clear (1) and latch clear (1) (2) of remote latch clear		▶ Review the latch settings as needed.
	Latch (2)	Range in which the latch cannot be cleared with the latch clear		Range in which the latch can be cleared with latch clear (1) (2) of remote latch clear		
Latch clear operation		L.CLR switch		Remote operation of MELSOFT MT Works2		
All clear function		Turn OFF PLC ready flag (M2000) and test mode ON flag (M9075) to execute all clear.		Use MELSOFT MT Works2 to execute all clear.		-
Digital oscilloscope function		<ul style="list-style-type: none"> • Word 4CH, Bit 8CH • Real-time display • Sampling points: Up to 8192 		<ul style="list-style-type: none"> • Word 16CH, Bit 16CH • Real-time display • Sampling points: Up to 8192 		-
Security function		Protection by password		<ul style="list-style-type: none"> • Protection by password • Software security key 		-
Operating system software installation method		<ul style="list-style-type: none"> • MELSOFT MT Works2 • MT Developer 		<ul style="list-style-type: none"> • MELSOFT MT Works2 		-

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(2) Exterior dimensions and mass

	Q173HCPU	Q173HCPU-T	Q172HCPU	Q172HCPU-T	Q173DSCPU	Q172DSCPU
Exterior dimensions [mm]						
	104.6[H] × 27.4[W] × 114.3[D]				120.5[H] × 27.4[W] × 120.3[D]	
Internal current consumption (5 VDC) [A]	1.25	1.56	1.14	1.45	1.75	1.44
Mass [kg]	0.23	0.24	0.22	0.23	0.38	

(3) Base unit

When the existing system is migrated to Q17nDSCPU, the main base unit needs to be replaced with “Multiple CPU high-speed transmission main base unit”. With the new main base unit, Motion modules cannot be installed in the CPU slots and I/O slot No. 0 to 2. Be sure to install them in I/O slot No.3 or later.

Due to the changes in Motion modules installation position, the number of Motion modules may exceed the number of available I/O slots for Motion modules depending on the main base unit model. Select the one which provides enough I/O slots for your system.

(In the previous system, the main base unit is available from 3-slot model (Q33B), however, for the Q17nDSCPU, the 5-slot model (Q35DB) is the one with the least slot number.

Therefore, be careful with the installation position and its dimension at migration.)

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

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

Items	Differences		Changes/revisions
	Q17nHCPU(-T)	Q17nDSCPU	
System setting/ SSCNET configuration	Q173HCPU(-T): 2 lines (Up to 16 axes/line)	Q173DSCPU: 2 lines (Up to 16 axes/line)	Set the servo amplifier's rotary switch and connection according to the SSCNET configuration.
	Q172HCPU(-T): 1 line (Up to 8 axes/line)	Q172DSCPU: 1 line (Up to 16 axes/line)	
Electronic gear	-	-	Change "Number of pulses per revolution" and "Movement amount per revolution" of the fixed parameters according to the resolution per the connected servo motor revolution.
Main circuit OFF warning	If the main circuit is turned OFF while the servo OFF command (M3215+20n) is ON, the main circuit OFF warning 2149(E9) will not occur.	If the main circuit is turned OFF while the servo OFF command (M3215+20n) is ON, the main circuit OFF warning 2149(E9) will occur.	The warning occurs when the main circuit is turned OFF while the servo OFF command (M3215+20n) is ON. In order not to turn ON the main circuit OFF warning 2149(E9), change the PC18 servo parameter from "0□□□(H)" to "1□□□(H)".

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(5) Self-diagnostic error and Motion (SFC) error history

Self-diagnostic error code		Error	○: Turns ON or Stores the value ×: Does NOT turn ON or NOT store the value					
Q17nHCPU(-T) (D9008)	Q17nDSCPU (SD0)		Self-diagnostic error flag		Motion (SFC) error history		Motion error detection flag	
			Q17nHCPU(-T) (M9008)	Q17nDSCPU (SM1)	Q17nHCPU(-T) (#8000 + 8n) (Note-1)	Q17nDSCPU (#8640 + 12n) (Note-1)	Q17nHCPU(-T) (M2039)	Q17nDSCPU (M2039)
1 to 9999		Multiple CPU related errors	○	○	×	○	×	○
10000	10003	Minor/major errors	×	○	○	○	○	○
10000	10004	Minor/major errors (Virtual servo motor axis)	×	○	○	○	○	○
10000	10005	Minor/major errors (Synchronous encoder axis)	×	○	○	○	○	○
10000	10007	Servo program setting error	×	○	○	○	○	○
10000	10008	Mode switching error	×	○	○	○	○	○
10000	10009	Manual pulse generator axis setting error	×	○	○	○	○	○
10000	10010	Test mode request error	×	○	○	○	○	○
10000	10011	WDT error	×	○	○	○	○	○
10000	-	PC link communication error ^(Note-2)	×	×	○	×	○	×
10000	10014	System setting error	×	○	×	○	×	○
-	10015	Servo error (MR-J4-□B)	×	○	×	○	×	○
10000	10016	Motion slot fault	×	○	×	○	×	○
10000	10020	Motion SFC control error (F/FS)	×	○	○	○	○	○
10000	10021	Motion SFC control error (G)	×	○	○	○	○	○
10000	10022	Motion SFC control error (K or others (Not F/FS, G))	×	○	○	○	○	○
10000	10023	Motion SFC control error (Motion SFC chart)	×	○	○	○	○	○
-	10030	Motion CPU internal bus error	×	○	×	○	×	○
10000	10040	Inverter error	×	○	○	○	○	○

(Note-1): "n" indicates the corresponding Motion error history (n=0 to 7).

(Note-2): The Q17nDSCPU cannot use SSCNET for the communications between the Motion controller and a personal computer.

Therefore, this error code is not necessary.

(Note-3): When the system setting error (10000) occurs in Q17nHCPU(-T), M2041 turns ON. (M2039 does not turn ON.)

(Note-4): When the Motion slot fault (10000) occurs in Q17nHCPU(-T), M2041 turns ON. (M2039 does not turn ON.)

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(6) Operation cycle

The operation cycle settings of Q17nHCPU(-T) can be imported to Q17nDSCPU when the projects of Q17nHCPU(-T) are diverted to Q17nDSCPU in MELSOFT MT Works2.

(Refer to section 2.4.2(2) 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		Q173HCPU(-T)	Q172HCPU(-T)	Q173DSCPU	Q172DSCPU
		Up to 32	Up to 8	Up to 32	Up to 16
Operation cycle (default)	SV13	0.44ms/ 1 to 3 axes 0.88ms/ 4 to 10 axes 1.77ms/11 to 20 axes 3.55ms/21 to 32 axes		0.22ms/ 1 to 4 axes 0.44ms/ 5 to 10 axes 0.88ms/11 to 24 axes 1.77ms/25 to 32 axes	
	SV22	0.88ms/ 1 to 5 axes 1.77ms/ 6 to 14 axes 3.55ms/15 to 28 axes 7.11ms/29 to 32 axes		0.44ms/ 1 to 6 axes 0.88ms/ 7 to 16 axes 1.77ms/17 to 32 axes	

[Settable operation cycle]

Q17nHCPU(-T)	Q17nDSCPU
0.44ms	0.22ms
0.88ms	0.44ms
1.77ms	0.88ms
3.55ms	1.77ms
7.11ms	3.55ms
14.2ms ^(Note-1)	7.11ms

(Note-1): Operation cycle of 14.2ms is not settable for Q17nDSCPU.

If the operation cycle of 14.2ms is set in the Q17nHCPU(-T) project, the value is changed to the "default value (automatic)" at project diversion. Review the setting as needed.

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.3 Comparison of Devices

2.3.1 Motion registers

(1) Motion registers (Monitor devices)

Device No.		Name	Remarks
Q17nHCPU(-T)	Q17nDSCPU		
#8064 to #8067	#8000 to #8019	Axis 1 monitor device	These monitor devices are automatically converted for the new system at project diversion.
#8068 to #8071	#8020 to #8039	Axis 2 monitor device	
#8072 to #8075	#8040 to #8059	Axis 3 monitor device	
#8076 to #8079	#8060 to #8079	Axis 4 monitor device	
#8080 to #8083	#8080 to #8099	Axis 5 monitor device	
#8084 to #8087	#8100 to #8119	Axis 6 monitor device	
#8088 to #8091	#8120 to #8139	Axis 7 monitor device	
#8092 to #8095	#8140 to #8159	Axis 8 monitor device	
#8096 to #8099	#8160 to #8179	Axis 9 monitor device	
#8100 to #8103	#8180 to #8199	Axis 10 monitor device	
#8104 to #8107	#8200 to #8219	Axis 11 monitor device	
#8108 to #8111	#8220 to #8239	Axis 12 monitor device	
#8112 to #8115	#8240 to #8259	Axis 13 monitor device	
#8116 to #8119	#8260 to #8279	Axis 14 monitor device	
#8120 to #8123	#8280 to #8299	Axis 15 monitor device	
#8124 to #8127	#8300 to #8319	Axis 16 monitor device	
#8128 to #8131	#8320 to #8339	Axis 17 monitor device	
#8132 to #8135	#8340 to #8359	Axis 18 monitor device	
#8136 to #8139	#8360 to #8379	Axis 19 monitor device	
#8140 to #8143	#8380 to #8399	Axis 20 monitor device	
#8144 to #8147	#8400 to #8419	Axis 21 monitor device	
#8148 to #8151	#8420 to #8439	Axis 22 monitor device	
#8152 to #8155	#8440 to #8459	Axis 23 monitor device	
#8156 to #8159	#8460 to #8479	Axis 24 monitor device	
#8160 to #8163	#8480 to #8499	Axis 25 monitor device	
#8164 to #8167	#8500 to #8519	Axis 26 monitor device	
#8168 to #8171	#8520 to #8539	Axis 27 monitor device	
#8172 to #8175	#8540 to #8559	Axis 28 monitor device	
#8176 to #8179	#8560 to #8579	Axis 29 monitor device	
#8180 to #8183	#8580 to #8599	Axis 30 monitor device	
#8184 to #8187	#8600 to #8619	Axis 31 monitor device	
#8188 to #8191	#8620 to #8639	Axis 32 monitor device	

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(2) Each axis monitor devices

Device No. (Note-1)		Name	Remarks
Q17nHCPU(-T)	Q17nDSCPU		
#8064+4n	#8000+20n	Servo amplifier type	These monitor devices are automatically converted for the new system at project diversion.
#8065+4n	#8001+20n	Motor current	
#8066+4n	#8002+20n	Motor speed	
#8067+4n	#8003+20n		

(Note-1): "n" indicates the corresponding axis No. (Axis No.1 to 32: n=0 to 31).

(3) Motion registers (Motion error history)

Device No.		Name	Remarks
Q17nHCPU(-T)	Q17nDSCPU		
#8000 to #8007	#8640 to #8651	Seventh error information in past (Oldest error information)	Check the device status (whether the device is currently used or not) with Cross reference of MELSOFT MT Works2, and then change the device No. for the Q17nDSCPU. Refer to section 2.3.5 for details of Cross Reference.
#8008 to #8015	#8652 to #8663	Sixth error information in past	
#8016 to #8023	#8664 to #8675	Fifth error information in past	
#8024 to #8031	#8676 to #8687	Fourth error information in past	
#8032 to #8039	#8688 to #8699	Third error information in past	
#8040 to #8047	#8700 to #8711	Second error information in past	
#8048 to #8055	#8712 to #8723	First error information in past	
#8056 to #8063	#8724 to #8735	Latest error information	

Device No. (Note-1)		Name	Remarks
Q17nHCPU(-T)	Q17nDSCPU		
#8000+8n	#8640+12n	Error Motion SFC program No.	Check the device status (whether the device is currently used or not) with Cross reference of MELSOFT MT Works2, and then change the device No. for the Q17nDSCPU. Refer to section 2.3.5 for details of Cross Reference.
#8001+8n	#8641+12n	Error type	
#8002+8n	#8642+12n	Error program No.	
#8003+8n	#8643+12n	Error block No./Motion SFC list/ Line No./Axis No.	
#8004+8n	#8644+12n	Error code	
#8005+8n	#8645+12n	Error occurrence time (Year/month)	
#8006+8n	#8646+12n	Error occurrence time (Day/hour)	
#8007+8n	#8647+12n	Error occurrence time (Minute/second)	New device in Q17nDSCPU
-	#8648+12n	Error setting data information	
-	#8649+12n	Unusable	
-	#8650+12n #8651+12n	Error setting data	

(Note-1): "n" indicates the corresponding Motion error history (n=0 to 7).

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.3.2 Special relays

Q17nHCPU(-T)	Device No.		Name	Remarks
	Device assignment for M9000 to M9255	Q17nDSCPU		
M9000/M2320	SM2000	SM60	Fuse blown detection	
M9005/M2321	SM2005	SM53	AC/DC DOWN detection	
M9006/M2322	SM2006	SM52	Battery low	
M9007/M2323	SM2007	SM51	Battery low latch	
M9008/M2324	SM2008	SM1	Self-diagnostic error	
M9010/M2325	SM2010	SM0	Diagnostic error	
M9025/M3136	-	-	Clock data set request	Operated on the No.1 CPU clock data
M9026/M2328	SM2026	SM211	Clock data error	
M9028/M3137	SM2028	SM801	Clock data read request	
M9036/M2326	SM2036	SM400	Always ON	
M9037/M2327	SM2037	SM401	Always OFF	
M9060/M3138	SM2060	-	Diagnostic error reset	Use M2039 for error reset operation.
M9073/M2329	SM2073	SM512	Motion CPU WDT error	The error cause is stored in SD512.
M9074/M2330	SM2074	SM500	PCPU READY complete	
M9075/M2331	SM2075	SM501	Test mode ON	
M9076/M2332	SM2076	SM502	External forced stop input	
M9077/M2333	SM2077	SM513	Manual pulse generator axis setting error	
M9078/M2334	SM2078	SM510	TEST mode request error	
M9079/M2335	SM2079	SM516	Servo program setting error	
M9216/M2345	SM2216	SM528	No.1 CPU MULTR complete	
M9217/M2346	SM2217	SM529	No.2 CPU MULTR complete	
M9218/M2347	SM2218	SM530	No.3 CPU MULTR complete	
M9219/M2348	SM2219	SM531	No.4 CPU MULTR complete	
M9240/M2336	SM2240	SM240	No.1 CPU resetting	
M9241/M2337	SM2241	SM241	No.2 CPU resetting	
M9242/M2338	SM2242	SM242	No.3 CPU resetting	
M9243/M2339	SM2243	SM243	No.4 CPU resetting	
M9244/M2340	SM2244	SM244	No.1 CPU error	
M9245/M2341	SM2245	SM245	No.2 CPU error	
M9246/M2342	SM2246	SM246	No.3 CPU error	
M9247/M2343	SM2247	SM247	No.4 CPU error	

[Point]

When Q17nHCPU(-T) projects are converted into Q17nDSCPU projects by "file conversion", M9000 to M9255 are automatically assigned as shown above in the column of "Device assignment for M9000 to M9255" in the table, however, M2320 to M3139 are not automatically converted.

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.3.3 Special registers

Device No.			Name	Remarks
Q17nHCPU(-T)	Device assignment for D9000 to D9255	Q17nDSCPU		
D9000	SD2000	SD60	Fuse blown No.	
D9005	SD2005	SD53	AC/DC DOWN counter No.	
D9008	SD2008	SD0	Latest self-diagnostic error code	Error codes for errors found by diagnosis are stored as hexadecimal notation data.
D9010	SD2010	SD1	Clock time for diagnostic error occurrence (Year, month)	The clock time information that SD0 data was updated is stored as BIN code.
D9011	SD2011	SD2	Clock time for diagnostic error occurrence (Day, hour)	
D9012	SD2012	SD3	Clock time for diagnostic error occurrence (Minute, second)	
D9013	SD2013	SD4	Error information categories	
D9014	SD2014	SD5	Error common information	New device in Q17nDSCPU
-	-	SD6 to SD15		
-	-	SD16 to SD26	Error individual information	
D9015	SD2015	SD203	Operating status of CPU	
D9017	SD2017	SD520	Scan time	
D9019	SD2019	SD521	Maximum scan time	
D9025	SD2025	SD210	Clock data (Year, month)	The clock data is stored as BIN code.
D9026	SD2026	SD211	Clock data (Day, hour)	
D9027	SD2027	SD212	Clock data (Minute, second)	
D9028	SD2028	SD213	Clock data (Day of week)	
D9060	SD2060	-	Diagnostic error reset error No.	Errors are reset by M2039.
D9061	SD2061	SD395	Multiple CPU No.	
D9182	SD2182	SD510	Test mode request error information	
D9183	SD2183	SD511		
D9184	SD2184	SD512	Motion CPU WDT error cause	
D9185	SD2185	SD513	Manual pulse generator axis setting error	
D9186	SD2186	SD514		
D9187	SD2187	SD515		
D9188	SD2188	SD522	Motion operation cycle	
D9189	SD2189	SD516	Error program No.	
D9190	SD2190	SD517	Error item information	
D9191	SD2191	SD502	Servo amplifier loading information	
D9192	SD2192	SD503		
D9193	SD2193	SD504	Real mode/virtual mode switching error information	
D9194	SD2194	SD505		
D9195	SD2195	SD506		
D9196	SD2196	-	PC link communication error codes	Q17nDSCPU is not compatible with PC link communication.

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(Continued)

Device No.			Name	Remarks
Q17nHCPU(-T)	Device assignment for D9000 to D9255	Q17nDSCPU		
D9197	SD2197	SD523	Operation cycle of the Motion CPU setting	
D9200	SD2200	SD200	State of switch	
D9201	SD2201	-	State of LED	

[Point]

When Q17nHCPU(-T) projects are converted into Q17nDSCPU projects by "file conversion", D9000 to D9255 are automatically assigned as shown above in the column of "Device assignment for D9000 to D9255" in the table.

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.3.4 Other devices

Items		Q17nHCPU(-T)	Q17nDSCPU
Internal relays/ data registers	M2320 to M2399	Special relay allocated devices (Status)	Unusable
	M2400 to M3039	Device area of 9 axes or more is not usable as user devices in Q172HCPU(-T).	Device area of 17 axes or more is usable as user devices in Q172DSCPU.
	M3136 to M3199	Special relay allocated devices (Command signal)	Unusable
	M3200 to M3839	Device area of 9 axes or more is not usable as user devices in Q172HCPU(-T).	Device area of 17 axes or more is usable as user devices in Q172DSCPU.
	D0 to D639		
D640 to D703			
Personal computer link communication error flag		M2034	- (Not compatible with personal computer link communication.)
PCPU ready complete flag		M9074	SM500
Real mode axis information register		D790, D791	SD500, SD501
Home position return re-travel value		D9+20n	D9 + 20n (Data shortened to 1 word) ----- #8006+20n, #8007+20n
Travel value change registers		D16+20n, D17+20n	Optional device (D16+20n and D17+20n are also usable.)
Coasting timer		FT (888μs)	FT (888μs) SD720, SD721 (444μs) ^(Note-1) SD722, SD723 (222μs) ^(Note-1)
Indirect setting devices (Word devices)		D800 to D8191 ----- W0 to W1FFF ----- #0 to #7999 ----- -	D0 to D8191 ----- W0 to W1FFF ----- #0 to #7999 ----- U□\G10000 to U□\G(10000+p-1) ^(Note-2)
Indirect setting devices (Bit devices)		X0 to X1FFF ----- Y0 to Y1FFF ----- M/L0 to M/L8191 ----- M9000 to M9255 ----- B0 to B1FFF ----- F0 to F2047 ----- -	X0 to X1FFF ^(Note-3) ----- Y0 to Y1FFF ----- M0 to M8191 ----- - ----- B0 to B1FFF ----- F0 to F2047 ----- U□\G10000.0 to U□\G(10000+p-1).F ^(Note-2)
High-speed reading function settable devices		D800 to D3069, D3080 to D8191 ----- W0 to W1FFF ----- -	D0 to D8191 ----- W0 to W1FFF ----- U□\G10000 to U□\G(10000+p-1) ^(Note-2)
Optional data monitor function settable devices		D0 to D8191 ----- W0 to W1FFF ----- #0 to #7999 ----- -	D0 to D8191 ----- W0 to W1FFF ----- #0 to #7999 ----- U□\G10000 to U□\G(10000+p-1) ^(Note-2)

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(Continued)

Items		Q17nHCPU(-T)	Q17nDSCPU
Limit switch output data	Output device	X0 to X1FFF	X0 to X1FFF (Note-3)
		Y0 to Y1FFF	Y0 to Y1FFF
		M0 to M8191	M0 to M8191
		L0 to L8191	-
		B0 to B1FFF	B0 to B1FFF
		-	U□\G10000.0 to U□\G(10000+p-1).F ^(Note-2)
	Watch data	D0 to D8191	D0 to D8191
		W0 to W1FFF	W0 to W1FFF
		#0 to #8191	#0 to #9215
		-	U□\G10000 to U□\G(10000+p-1) ^(Note-2)
	ON section setting	D0 to D8191	D0 to D8191
		W0 to W1FFF	W0 to W1FFF
		#0 to #8191	#0 to #9215
		Constant (Hn/Kn) ^(Note-4)	Constant (Hn/Kn) ^(Note-4)
		-	U□\G10000 to U□\G(10000+p-1) ^(Note-2)
	Output enable/disable bit, Forced output bit	X0 to X1FFF	X0 to X1FFF (Note-3)
Y0 to Y1FFF		Y0 to Y1FFF	
M0 to M8191		M0 to M8191	
L0 to L8191		-	
B0 to B1FFF		B0 to B1FFF	
F0 to F2047		F0 to F2047	
M9000 to M9255		SM0 to SM1999	
-		U□\G10000.0 to U□\G(10000+p-1).F ^(Note-2)	
Mechanical system program	Clutch status	M2160 to M2223 (No additional settings required on the mechanical system program)	Optional device (Device settings required on mechanical system program. M2160 to M2223 are also available.)
	Cam axis command signal (Cam/ball screw switching command)	M5488 to M5519 (No additional settings required on the mechanical system program)	Optional device (Device settings required on mechanical system program. M5488 to M5519 are also available.)
	Smoothing clutch complete signal	M5520 to M5583 (No additional settings required on the mechanical system program)	Optional device (Device settings required on mechanical system program. M5520 to M5583 are also available.)

(Note): "n" indicates the corresponding axis No. (Axis No.1 to 32: n=0 to 31).

(Note-1): Special register (SD720 to SD723) have been added for the coasting timer. Read SD720 and SD722 by two words unit.

(Note-2): "p" indicates user setting area points of Multiple CPU high speed transmission area in each CPU.

(Note-3): The range of "PXn+4 to PXn+F" cannot be used (fixed at 0) for the input device (PXn+0 to PXn+F) allocated to the built-in interface in Motion CPU (DI). (n: First input No.)

(Note-4): The setting range varies depending on the unit.

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.3.5 Cross reference

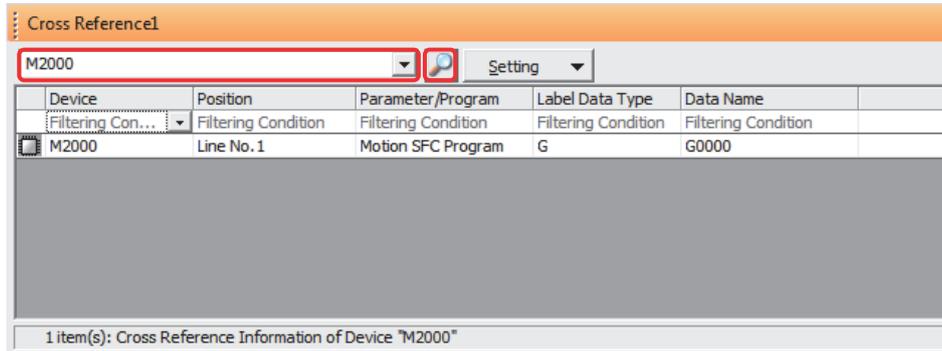
The following shows how to use Cross reference.

- 1) Start MELSOFT MT Works2. Read the project to be diverted.
- 2) Select “Cross Reference” from “Find/Replace” menu.



- 3) Enter the device name to check the device status on the Cross Reference screen. Click [🔍] icon.

When the searched device is currently used, information such as where it is used in the program will be displayed. (If the device is not currently used, no such information will be displayed.)



2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.4 Project Diversion

2.4.1 List of divertible/not divertible data (SV13/SV22)

Q17nHCPU(-T) data name	Divertible/not divertible	Remarks
System settings		
Basic settings		
Base setting	○	
Multiple CPU setting	○	(Note-1)
System basic setting	○	
SSCNET setting	○	(Note-2)
System configuration	○	(Note-3)
SSCNET configuration	○	(Note-4)
High-speed read data	○	
Servo data settings		
Servo data	○	(Note-5)
Servo parameter	○	(Note-6)
Parameter block	○	
Limit output data	○	
Motion SFC programs		
Motion SFC parameter	○	
Motion SFC program	○	(Note-7)
Servo programs		
K mode allocation	○	SV22 only
Servo program	○	
Mechanical system program	○	SV22 only
Cam data (conversion data)	○	SV22 only
Device memory	○	
Backup data	×	
Communication setting	○	(Note-8)

○: Divertible, ×: Not divertible

(Note-1): The automatic refresh setting in Q17nHCPU(-T) will be reflected to that of Multiple CPU high-speed transmission area.

Refer to section 2.4.3 for automatic refresh setting after project diversion.

(Note-2): Select SSCNETIII or SSCNETIII/H at SSCNET setting.

(Note-3): Change the installation position of Motion modules (Q172LX, Q172EX, Q173PX) if they are installed in the I/O slot No.1 to 2. Be sure to install them in I/O slot No.3 or later.

Refer to 2.4.2(3) for system configuration after project diversion.

(Note-4): The existing servo amplifier model is replaced according to the selected communication type (SSCNET) in SSCNET setting. Refer to MELSOFT MT Developer2 Help for servo amplifier replacement.

(Note-5): Review the fixed parameters according to the resolution per servo motor revolution.

(Number of pulses per revolution and movement amount per revolution)

(Note-6): Refer to "MELSOFT MT Developer2 Help" for conversion rules for servo parameters.

(Note-7): When Motion registers (Monitor devices) are used in the program, they need to be changed.

For details of "Batch replacement of device numbers", refer to 2.4.2(5).

(Note-8): When the communication setting of Q17nHCPU(-T) is USB (Motion internal I/F) or SSCNET, review the setting. Use USB via PLC CPU. When connection directly to Q17nDSCPU, use Ethernet communication with "PHERIFERAL I/F".

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.4.2 Project diversion procedures by engineering environment

The following shows the project diversion procedures for PLC CPU and Motion CPU. The contents of this manual are based on the specifications of the engineering environment (MELSOFT GX Works2 Ver.1.578C, MELSOFT MT Works2 Ver.1.150G). Confirm the latest version when replacing.

(1) Procedures for PLC CPU projects diversion by MELSOFT GX Works2

Use the “PLC type change function” of MELSOFT GX Works2.

Refer to “GX Works2 Version 1 Operating Manual (Common)” for restrictions on the programmable controller type changes.

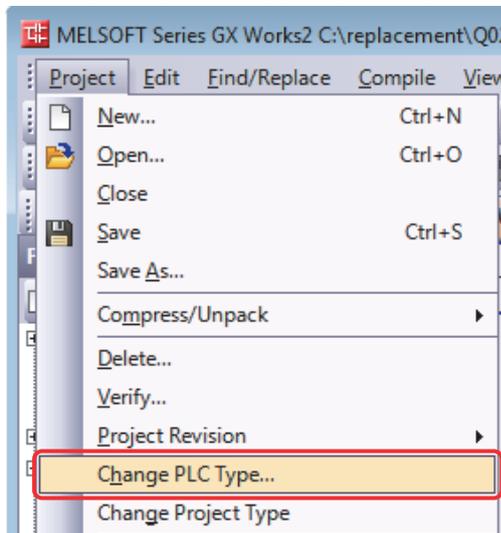
In addition, refer to the following Technical Bulletins for details of the programmable controller type changes.

(Note): Contact your local sales office for details.

- Method of replacing Basic model QCPU with Universal model QCPU (FA-A-0054)
- Method of replacing High Performance model QCPU with Universal model QCPU (FA-A-0001)
- Method of replacing High Performance model QCPU with Universal model QCPU (Introduction) (FA-A-0209)

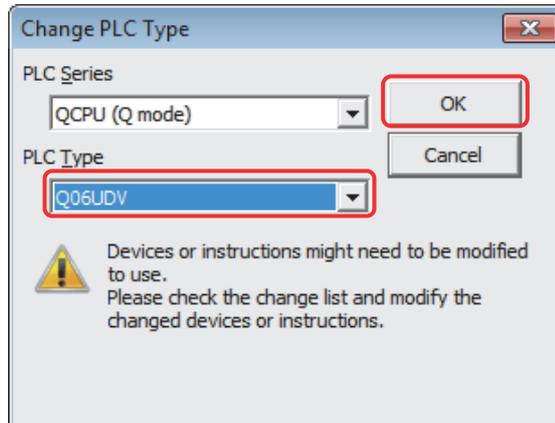
1) Start MELSOFT GX Works2. Read the project to be diverted.

2) Select [Change PLC Type...] in “Project” menu to open “Change PLC Type” screen.

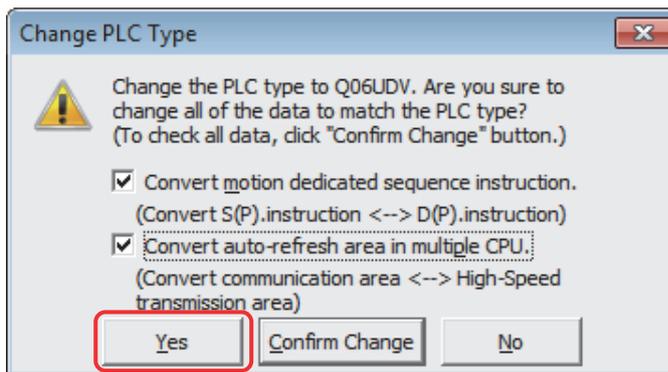


2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

- 3) Select the replaced PLC CPU model for "PLC Type" (the setting example below: Q06UDV). Click "OK".



- 4) At conversion, the screen below appears. Click "Yes".
(Motion dedicated PLC instruction conversion will be executed.)



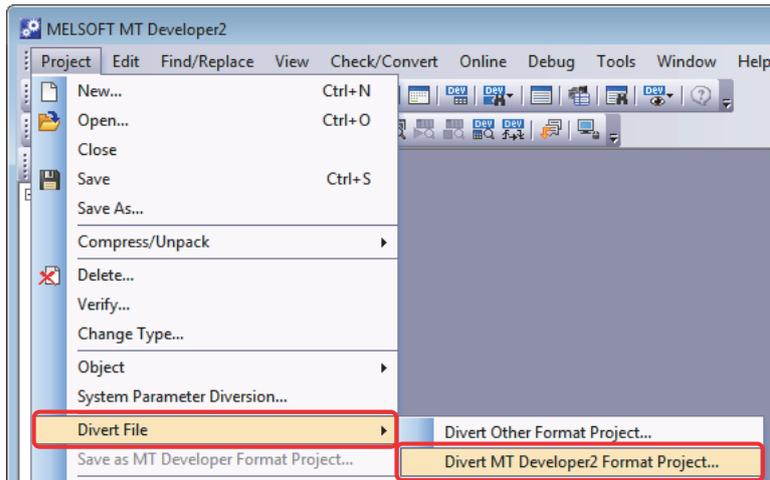
The diversion is complete.

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

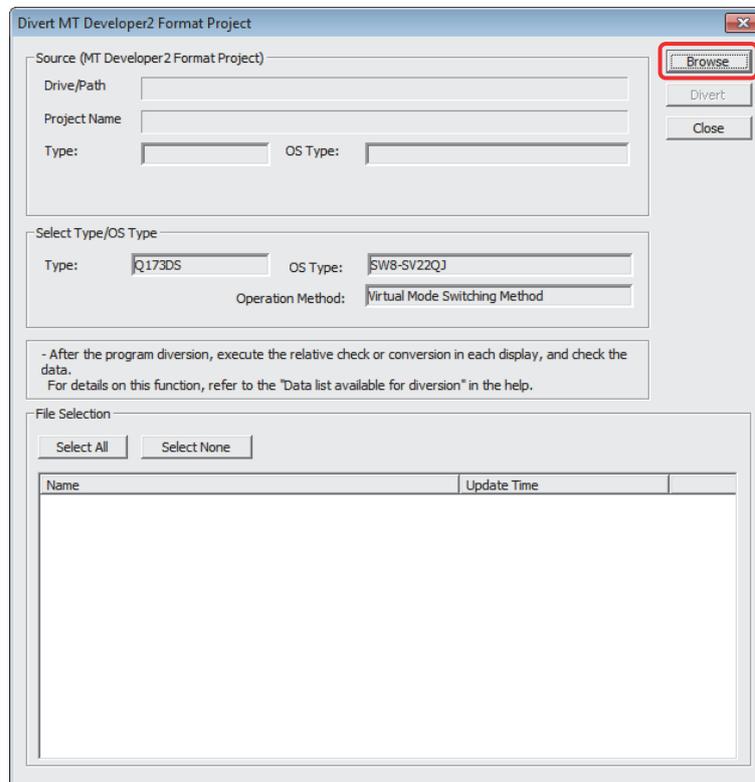
- (2) Procedures for Motion CPU projects diversion by MELSOFT MT Developer2
Motion CPU projects can be diverted by “Project diversion function” or “Change type/OS type function” of MELSOFT MT Developer2. Even if Motion SFC is not used, these functions can be used for project diversion.

(a) Project diversion function

- 1) Start MELSOFT MT Developer2. Select [Divert file] - [Divert MT Developer2 Format Project...] from “Project” menu.

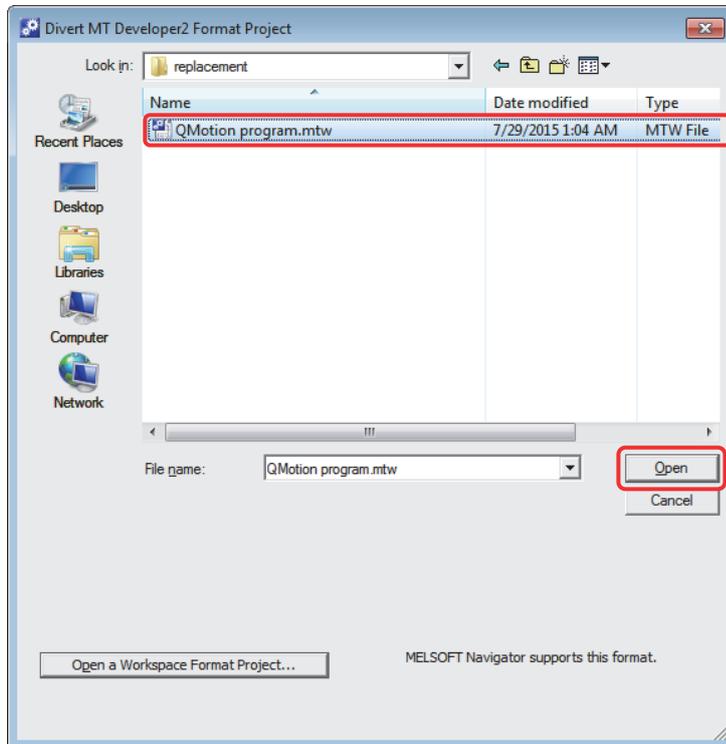


- 2) Click “Browse” on the “Divert MT Developer2 Format Project” screen.



2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

- 3) Select the project to be diverted on the file selection window. Click [Open] to update the selected project (MT Developer2 Format Project).



2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

4) Select the replaced model for [Select Type/OS Type] (the setting example below: Q173DSCPU).

When SV22 is selected for OS type, the "Operation Method" is required to set, however, there is no need to change the original setting because "Virtual Mode Switching Method" is already selected.

(When setting "Advanced synchronous control method", refer to "Replacement of Virtual mode with advanced synchronous control").

Divert MT Developer2 Format Project

Source (MT Developer2 Format Project)

Drive/Path: C:\replacement\

Project Name: Q173H

Type: Q173H OS Type: SW6-SV22QJ

Select Type/OS Type

Type: Q173DS OS Type: SW8-SV22QJ

Operation Method: Virtual Mode Switching Method

- After the program diversion, execute the relative check or conversion in each display, and check the data.
For details on this function, refer to the "Data list available for diversion" in the help.

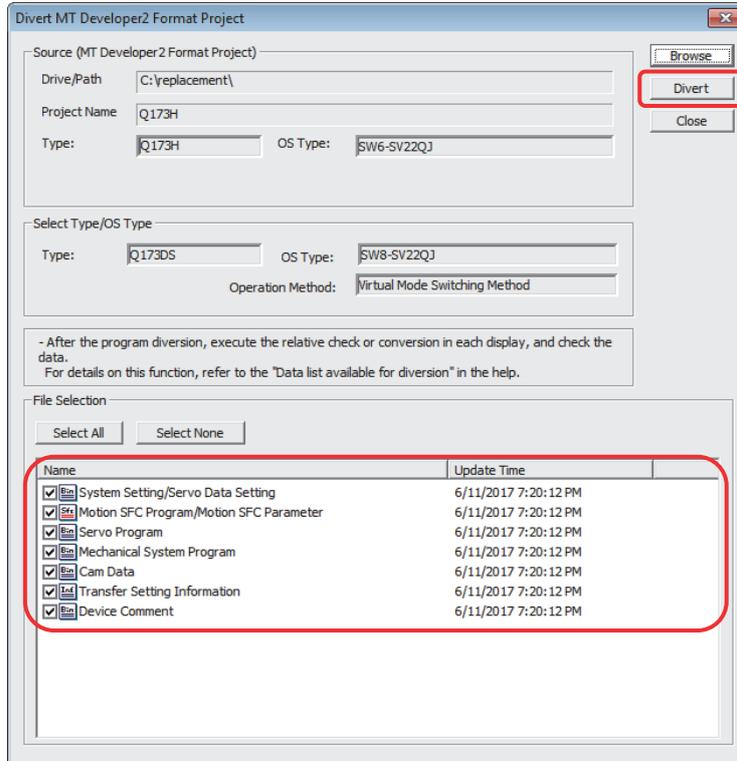
File Selection

Select All Select None

Name	Update Time
<input type="checkbox"/> System Setting/Servo Data Setting	6/11/2017 7:20:12 PM
<input type="checkbox"/> Motion SFC Program/Motion SFC Parameter	6/11/2017 7:20:12 PM
<input type="checkbox"/> Servo Program	6/11/2017 7:20:12 PM
<input type="checkbox"/> Mechanical System Program	6/11/2017 7:20:12 PM
<input type="checkbox"/> Cam Data	6/11/2017 7:20:12 PM
<input type="checkbox"/> Transfer Setting Information	6/11/2017 7:20:12 PM
<input type="checkbox"/> Device Comment	6/11/2017 7:20:12 PM

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

5) Check the box of the data to be diverted in the "File Selection". Click "Divert".



The dialog box is titled "Divert MT Developer2 Format Project". It contains the following sections:

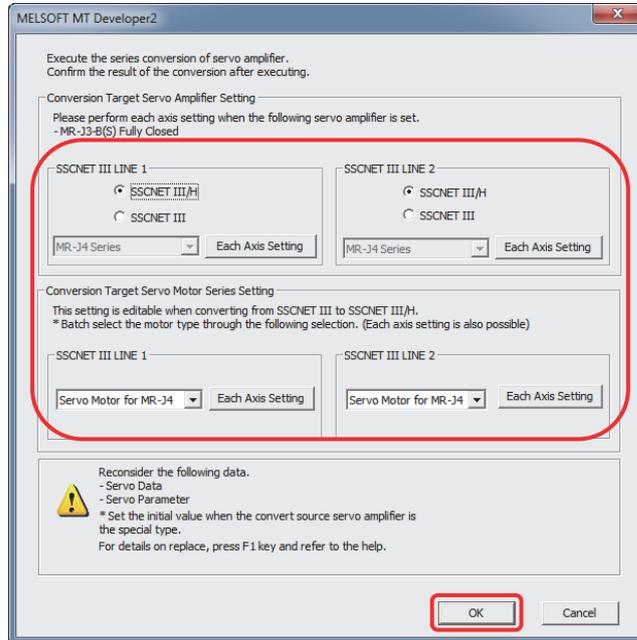
- Source (MT Developer2 Format Project):**
 - Drive/Path: C:\replacement\
 - Project Name: Q173H
 - Type: Q173H
 - OS Type: SW6-SV22QJ
- Select Type/OS Type:**
 - Type: Q173DS
 - OS Type: SW8-SV22QJ
 - Operation Method: Virtual Mode Switching Method
- Instructions:**

- After the program diversion, execute the relative check or conversion in each display, and check the data.
For details on this function, refer to the "Data list available for diversion" in the help.
- File Selection:**
 - Buttons: Select All, Select None
 - Table:

Name	Update Time
<input checked="" type="checkbox"/> System Setting/Servo Data Setting	6/11/2017 7:20:12 PM
<input checked="" type="checkbox"/> Motion SFC Program/Motion SFC Parameter	6/11/2017 7:20:12 PM
<input checked="" type="checkbox"/> Servo Program	6/11/2017 7:20:12 PM
<input checked="" type="checkbox"/> Mechanical System Program	6/11/2017 7:20:12 PM
<input checked="" type="checkbox"/> Cam Data	6/11/2017 7:20:12 PM
<input checked="" type="checkbox"/> Transfer Setting Information	6/11/2017 7:20:12 PM
<input checked="" type="checkbox"/> Device Comment	6/11/2017 7:20:12 PM

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

- 6) When “System Setting/Servo Data Setting” is selected in “File Selection” in 5), execute the series conversion of the servo amplifier. Select the network to be used (SSCNET type) for the replaced servo amplifiers (for Q17nDSCPU), and click [OK].

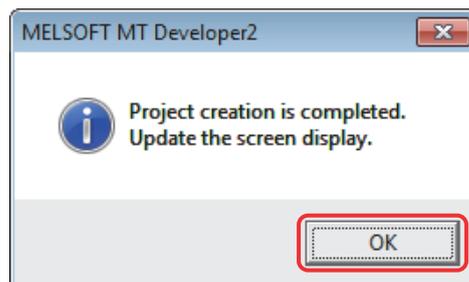


(Note): Refer to “Q173D(S)CPU/Q172D(S)CPU Motion Controller User's Manual” for the servo system networks supported by the replaced servo amplifiers and SSCNETIII compatible devices (SSCNETIII or SSCNETIII/H).

(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 “MELSOFT MT Developer2 Help [Appendix] - [Servo parameter conversion]” for the conversion rules.

- 7) When the project diversion completion message appears, click [OK].



The diversion is completed.

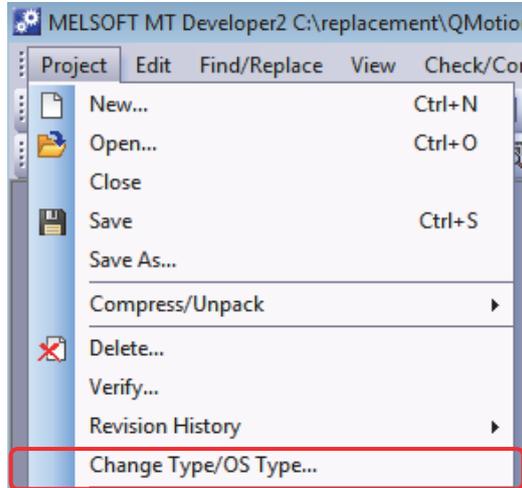
If the operation cycle is set as default (automatic), the operation cycle will be changed. Set an operation cycle where necessary because the change in the operation cycle may change the program execution timing. (Refer to section 2.2(6).)

Though the project has been diverted, conversion of Motion SFC programs and servo programs has not finished yet. Make sure to execute [Project Batch Check/Conversion] before writing to the Motion controller.

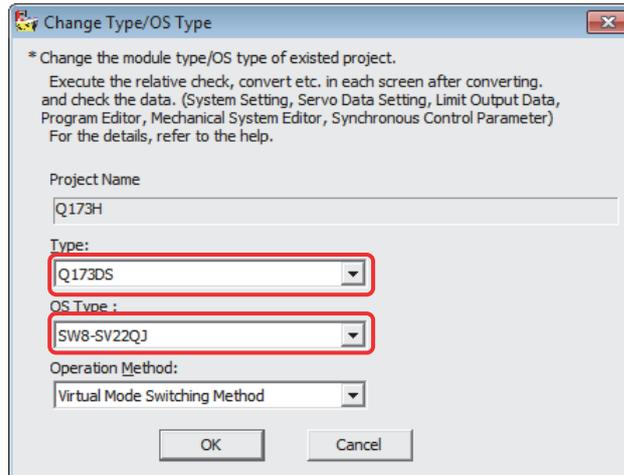
2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(b) Change type/OS type change function

- 1) Start MELSOFT MT Developer2. Select [Change Type/OS Type...] in “Project” menu to open “Change Type/OS Type” screen.

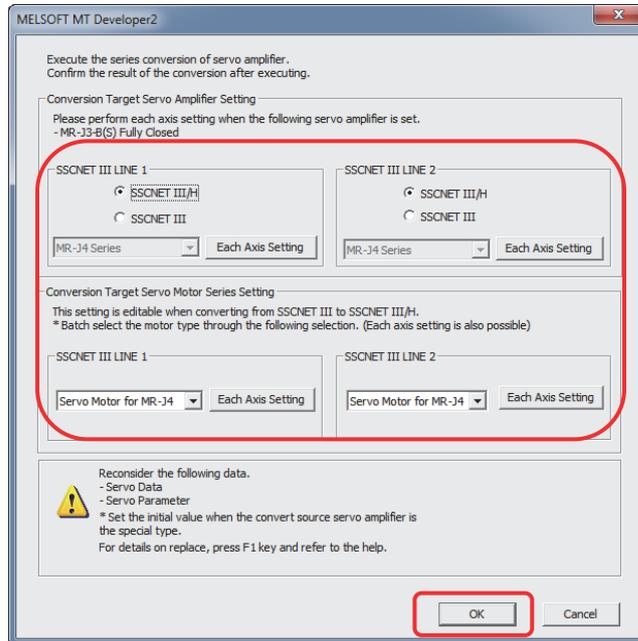


- 2) Select the replaced Motion CPU (the setting example below: Q173DSCPU) for “Type” and the new operating system software type for “OS Type”. Click “OK”.



2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

- 3) Execute the series conversion of the servo amplifier. Select the network to be used (SSCNET type) for the replaced servo amplifiers (for Q17nDSCPU), and click [OK].

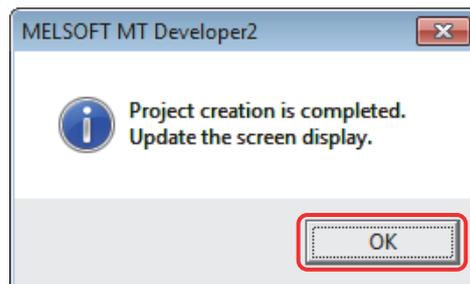


(Note): Refer to “Q173D(S)CPU/Q172D(S)CPU Motion Controller User’s Manual” for the servo system networks supported by the replaced servo amplifiers and SSCNETIII compatible devices (SSCNETIII or SSCNETIII/H).

(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 “MELSOFT MT Developer2 Help [Appendix] - [Servo parameter conversion]” for the conversion rules.

- 4) When the project diversion completion message appears, click [OK].



The diversion is completed.

If the operation cycle is set as default (automatic), the operation cycle will be changed. Set an fixed operation cycle where necessary because the change in the operation cycle may change the program execution timing. (Refer to section 2.2(6).)

Though the project has been diverted, conversion of Motion SFC programs and servo programs has not finished yet. Make sure to execute [Project Batch Check/Conversion] before writing to the Motion controller.

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

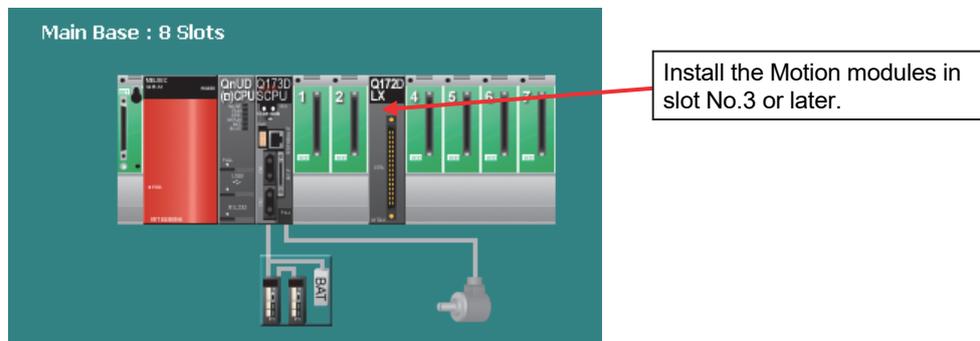
(3) Slot installation position (system setting)

The installation position of Motion modules (Q172LX, Q172EX(-S1, -S2, -S3), Q173PX) will need to change depending on its position.

(For Q17nDSCPU, Motion modules (Q172DLX, Q172DEX, Q173DPX) **cannot be installed in CPU slot and I/O slot No. 0 to 2 of the main base unit.**

When the existing Q17nHCPU(-T) programs are converted to the programs for the new system, the existing Motion modules (Q172LX, Q172EX(-S1, -S2, -S3), Q173PX) are automatically changed to the corresponding modules in the new system (Q172DLX, Q172DEX, Q173DPX), however, the slot installation position is not automatically changed. If the existing Motion modules are installed in slot No.1 to 2, move them into the slot No.3 or later.

Due to the changes of Motion modules installation position, the number of Motion modules may exceed the number of available I/O slots for Motion modules depending on the main base unit model. Select the one which provides enough I/O slots for your system.



2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(4) Mechanical system program

The electronic gear settings of output modules (ball screw, rotary table) on mechanical system program differ between Q17nHCPU(-T) and Q17nDSCPU.

When diverting the mechanical system program in (2) in this section, be sure to check the output module settings after diversion.

The following shows the electronic gear setting of mechanical system program.

Output module	Electronic gear setting	Setting method	
		Q17nHCPU(-T)	Q17nDSCPU
Ball screw	Ball screw pitch, Number of pulses per revolution	Mechanical system program	Fixed parameter "Number of pulses per revolution"
Rotary table	Number of pulses per revolution		"Movement amount per revolution"

[Ex.: When a ball screw is set as the output module in Q173DSCPU (SV22 mechanical system program)]

Parameter Item	Setting Value
Output Axis No.	1
Comment	
Ball Screw Pitch	200000.0[μm]
Number of Pulses per Revolution	4194304[pulse]
Movement Amount per Pulse	0.0[μm]
Permissible Droop Pulse Value	6553500[pulse]
Converted Value	312495.2[μm]
Speed Limit Value	2000.00[mm/min]
Output Unit	mm
Torque Limit	300%
Stroke Limit	
Upper Limit Value	214748364.7[μm]
Lower Limit Value	0.0[μm]
Phase Compensation	Not Set

Check the setting value of "Ball Screw Pitch" and "Number of Pulses per Revolution".

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(5) Batch replacement of devices numbers by MELSOFT MT Developer2

(a) Motion register

The Motion register is expanded and the device assignment is changed when Q17nHCPU(-T) is replaced with Q17nDSCPU. When the Motion register “#8000 to #8191” are used in Q17nHCPU(-T), replace them by referring to “2.3.1 Motion registers”.

(b) Special device

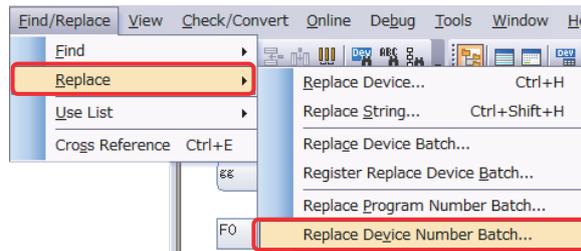
When special devices are used, replace them by referring to “2.3.2 Special relays” and “2.3.3 Special registers” in this document.

Special devices (M9000 to M9255, D9000 to D9255) are replaced with SM devices (SM2000 to SM2255) and SD devices (SD2000 to SD2255).

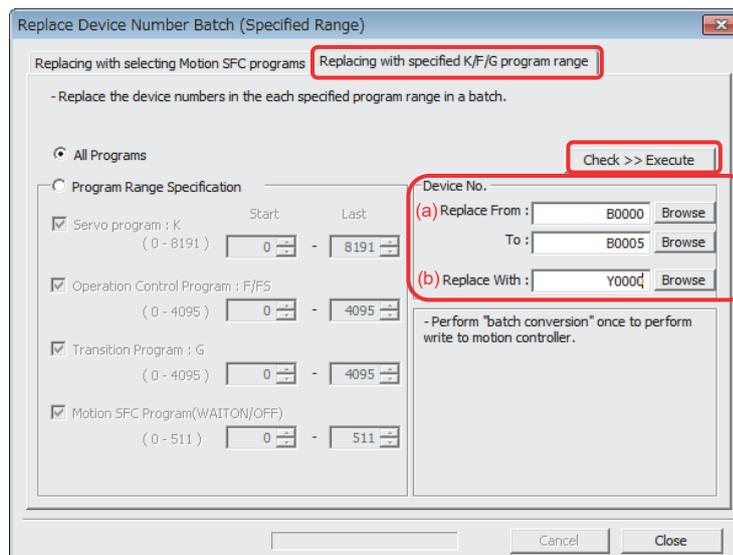
e.g.) M9074 (PCPU READY complete) is automatically converted to SM2074 when the CPU type is changed. Change SM2074 manually to the Q17nDSCPU special relay (SM500).

The following shows the procedure for the batch replacement of the device numbers.

- 1) Start MELSOFT MT Developer2, and select [Replace Device Number Batch...] from “Find/Replace” menu.



- 2) Select “Replacing with specified K/F/G program range” tab. Enter the device numbers in [Replace From:] [To:], and [Replace With:]. Click [Check >> Execute].



(a) Specify the start/end device before replacement.

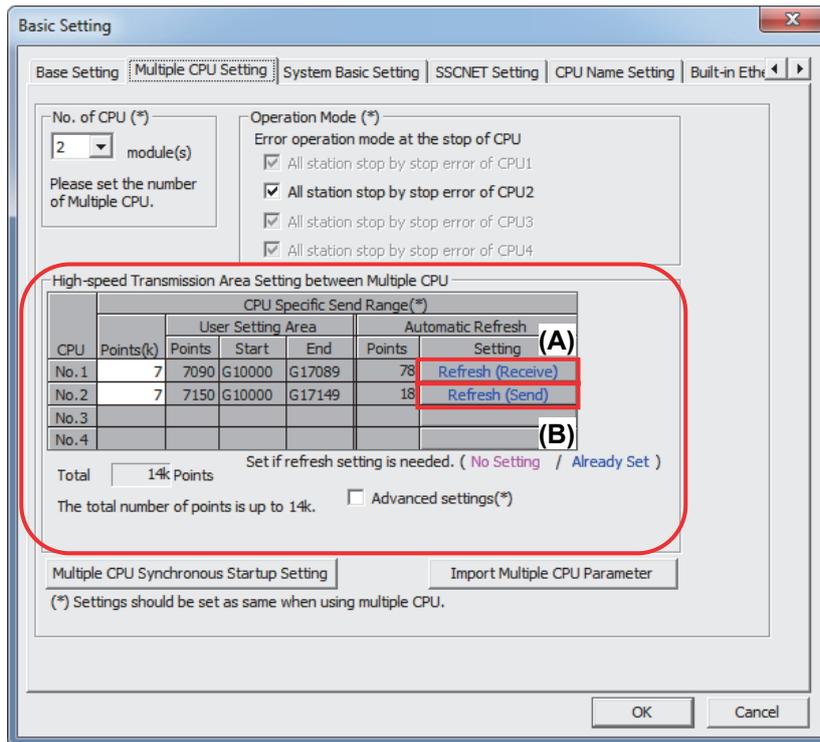
(b) Specify the start device after replacement.

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

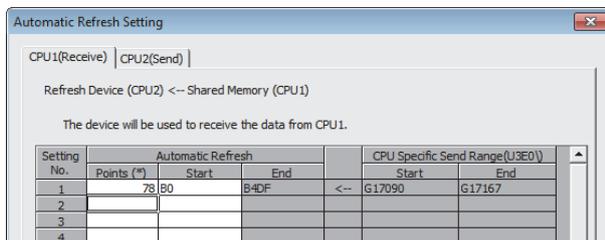
2.4.3 Auto refresh settings after project diversion

The following shows how to check the automatic refresh settings.

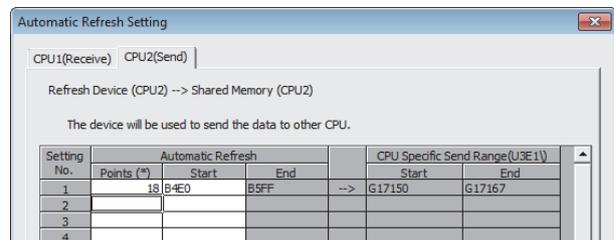
- (1) Auto refresh setting in MELSOFT MT Developer2
 - (a) Select [System Setting] - [Basic Setting] in the project window to open the “Basic Setting” screen. Select [Multiple CPU Setting] tab and confirm the details of “High-speed Transmission Area Setting between Multiple CPU”.



- (b) Click (A) and (B) on the screen above, and check the detailed settings of the automatic refresh.



(A)



(B)

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

(2) Auto refresh setting in MELSOFT GX Works2

- (a) Select [Parameter] - [PLC Parameter] in the project window to open the “Q Parameter Setting” screen. Select [Multiple CPU Setting] tab and confirm the details of “Multiple CPU High-speed Transmission Area Setting”.

Multiple CPU High-Speed Transmission Area Setting | Communication Area Setting (Refresh Setting)

Use Multiple CPU High-Speed Transmission

PLC	CPU Specific Send Range (*1)					
	Points(K)	I/O No.	Points	Start	End	Auto Refresh
PLC No.1	7	U3E0	7090	G10000	G17089	78 Refresh (A)
PLC No.2	7	U3E1	7150	G10000	G17149	18 Refresh (A)
PLC No.3						
PLC No.4						

Total Points Advanced Setting(*1) Assignment Confirmation

The total number of points is up to 14K.

Auto Refresh Setting

PLC No.1 | PLC No.2

Refresh Device --- Shared Memory(PLC No.1)

No.	Points(*1)	Auto Refresh		CPU Specific Send Range (U3E0)	
		Start	End	Start	End
1	78	B0	B4DF	---	G17090 G17167
2					
3					
4					

(A)

Auto Refresh Setting

PLC No.1 | PLC No.2

Refresh Device --- Shared Memory(PLC No.2)

No.	Points(*1)	Auto Refresh		CPU Specific Send Range (U3E1)	
		Start	End	Start	End
1	18	B4E0	B5FF	---	G17150 G17167
2					
3					
4					

(B)

2. DETAILS OF MIGRATION FROM Q17nHCPU(-T) TO Q17nDSCPU

2.4.4 Shared device

The shared device memory of Q17nDSCPU enables high-speed transmission (+ automatic refresh).

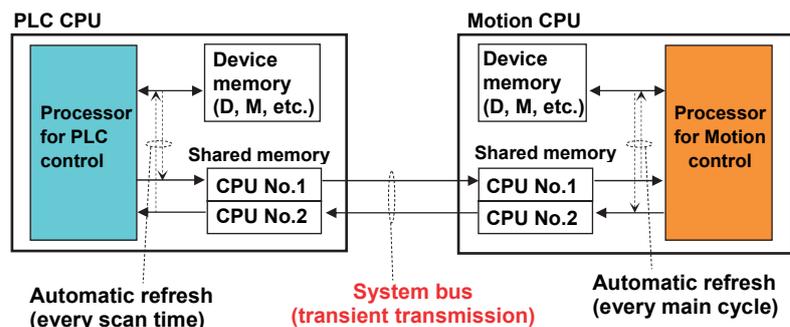
The following shows the main differences.

Items	Q17nHCPU(-T)	Q17nDSCPU
Transmission cycle	Operation cycle (Transient)	0.88ms (Cyclic)
Auto refresh setting	4 range settings	32 range settings
Number of refresh words per CPU	Up to 8k words	Up to 14k words

The Q17nDSCPU is equipped with High-speed transmission bus only, and therefore “Multiple CPU High Speed Transmission Area Setting” needs to be set on PLC CPU side.

Refer to “QCPU User’s Manual (Multiple CPU System)” and “Q173D(S)CPU/Q172D(S)CPU Motion Controller Programming Manual (COMMON)” for details.

[Qn(H)CPU + Q17nHCPU(-T)]

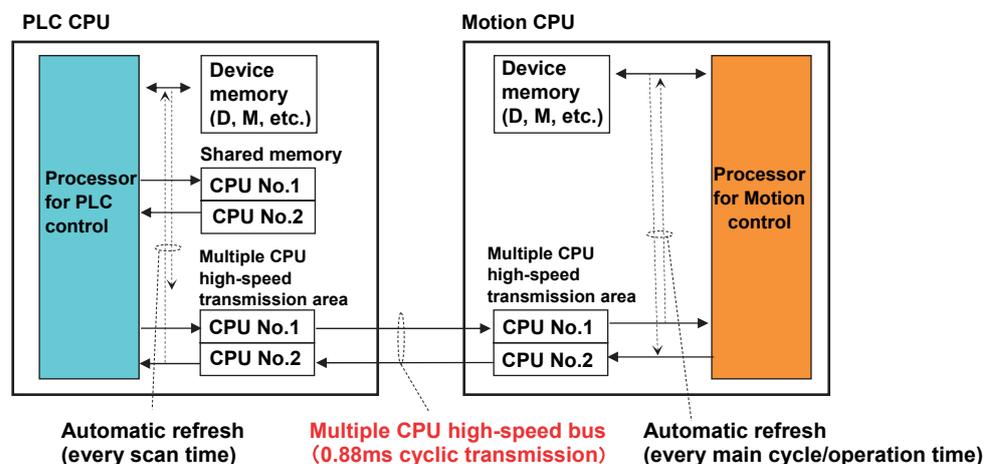


[Features]

- Each CPU module has its own device memory
- Each CPU shares data by mutually check the other CPU shared memory (Automatic refresh is executed by scan time or main cycle)



[QnUD(E)(H)(V)CPU + Q17nDSCPU]



[Features]

- Cyclic transmission per 0.88 ms is possible through multiple CPU high-speed transmission area.
- Automatic refresh can be executed at operation time.

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 Motion controller, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in Motion controller, and a backup or fail-safe function should operate on an external system to Motion controller when any failure or malfunction occurs.
- (2) Our Motion controller 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.

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Ethernet is a registered trademark of Fuji Xerox Corporation in Japan.

The company names, system names and product names mentioned in this document are either registered trademarks or trademarks of their respective companies.

In some cases, trademark symbols such as '™' or '®' are not specified in this manual.

Migration Guide of Motion Controller [Q17nHCPU(-T) ⇒ Q17nDSCPU]

Country/Region	Sales office	
USA	Mitsubishi Electric Automation, Inc. 500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.	Tel : +1-847-478-2100
Mexico	Mitsubishi Electric Automation, Inc. Mexico Branch Boulevard Miguel de Cervantes Saavedra 301, Torre Norte Piso 5, Ampliacion Granada, Miguel Hidalgo, Ciudad de Mexico, Mexico, C.P.11520	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
Italy	Mitsubishi Electric Europe B.V. Italian Branch Centro Direzionale Colleoni - Palazzo Sirio, Viale Colleoni 7, 20864 Agrate Brianza (MB), Italy	Tel : +39-039-60531
Spain	Mitsubishi Electric Europe B.V. Spanish Branch Carretera de Rubi, 76-80-Apdo. 420, E-08190 Sant Cugat del Valles (Barcelona), Spain	Tel : +34-935-65-3131
France	Mitsubishi Electric Europe B.V. French Branch 25, Boulevard des Bouvets, 92741 Nanterre Cedex, France	Tel : +33-1-55-68-55-68
Czech Republic	Mitsubishi Electric Europe B.V. Czech Branch, Prague Office Pekarska 621/7, 155 00 Praha 5, Czech Republic	Tel : +420-255-719-200
Poland	Mitsubishi Electric Europe B.V. Polish Branch ul. Krakowska 50, 32-083 Balice, Poland	Tel : +48-12-347-65-00
Russia	Mitsubishi Electric (Russia) LLC St. Petersburg Branch Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; 195027 St. Petersburg, Russia	Tel : +7-812-633-3497
Sweden	Mitsubishi Electric Europe B.V. (Scandinavia) Hedvig Mollersgata 6, 223 55 Lund, Sweden	Tel : +46-8-625-10-00
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
South Africa	Adroit Technologies 20 Waterford Office Park, 189 Witkoppen Road, Fourways, South Africa	Tel : +27-11-658-8100
China	Mitsubishi Electric Automation (China) Ltd. Mitsubishi Electric Automation Center, No.1386 Hongqiao Road, Shanghai, China	Tel : +86-21-2322-3030
Taiwan	SETSUYO ENTERPRISE CO., LTD. 6F, No.105, Wugong 3rd Road, Wugu District, New Taipei City 24889, Taiwan	Tel : +886-2-2299-2499
Korea	Mitsubishi Electric Automation Korea Co., Ltd. 7F to 9F, Gangseo Hangang Xi-tower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 07528, Korea	Tel : +82-2-3660-9529
Singapore	Mitsubishi Electric Asia Pte. Ltd. 307 Alexandra Road, Mitsubishi Electric Building, Singapore 159943	Tel : +65-6473-2308
Thailand	Mitsubishi Electric Factory Automation (Thailand) Co., Ltd. 12th Floor, SV.City Building, Office Tower 1, No. 896/19 and 20 Rama 3 Road, Kwaeng Bangpongpong, Khet Yannawa, Bangkok 10120, Thailand	Tel : +66-2682-6522 to 6531
Indonesia	PT. Mitsubishi Electric Indonesia Gedung Jaya 8th Floor, JL. MH. Thamrin No.12, Jakarta Pusat 10340, Indonesia	Tel : +62-21-3192-6461
Vietnam	Mitsubishi Electric Vietnam Company Limited Unit 01-04, 10th Floor, Vincom Center, 72 Le Thanh Ton Street, District 1, Ho Chi Minh City, Vietnam	Tel : +84-28-3910-5945
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
Australia	Mitsubishi Electric Australia Pty. Ltd. 348 Victoria Road, P.O. Box 11, Rydalmere, N.S.W 2116, Australia	Tel : +61-2-9684-7777

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS: 1-14, YADA-MINAMI 5, HIGASHI-KU, NAGOYA, JAPAN