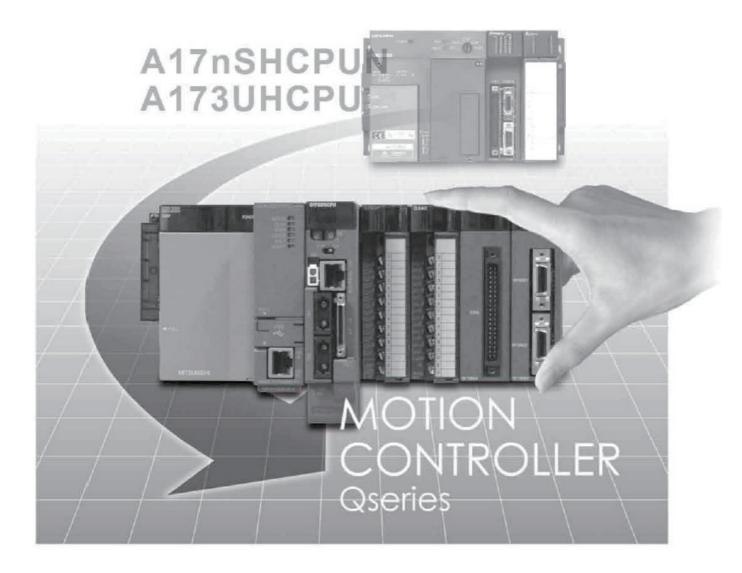


# eco Changes

# Transition from A17nSHCPUN/A173UHCPU Series to Q Series Handbook



# 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 Users manual of the QCPU module to use for a description of the PLC system 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 A 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

- 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

# 

- 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

- 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.

### (2) Parameter settings and programming

- 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.
- 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.

# **≜**CAUTION

- 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

- 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.
- 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.

# **▲**CAUTION

- 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.

<b>E</b> nvironment	Conditions			
Environment	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	1000m (3280.84ft.) or less above sea level			
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.

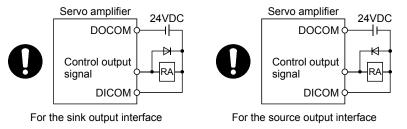
• Place the Motion controller and servo amplifier in static electricity preventing vinyl bags and store.

When storing for a long time, please contact with our sales representative. Also, execute a trial operation.

### (4) Wiring

# 

- 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 combing 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 value 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.

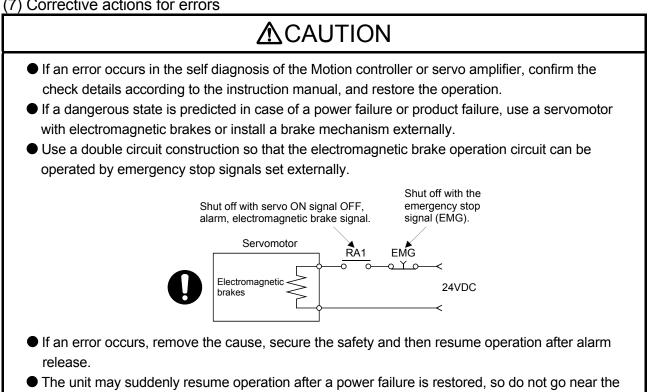
### (6) Usage methods

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- 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 this 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



machine. (Design the machine so that personal safety can be ensured even if the machine restarts suddenly.)

### (8) Maintenance, inspection and part replacement

- 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).

# 

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

### (10) General cautions

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

## REVISIONS

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## < GUIDEBOOK CONFIGURATION >

The guidebook is consist of the documents as follows.

#### Contents

Safety Precautions Guidebook Configuration (Contents)

### **1. OVERVIEW OF A-MOTION REPLACEMENT**

This overview is beginning with the case study about the system replacement used A-Motion. And it will discuss the most suitable method according to the user's system and conditions. After replacement policy have been decided, it is recommended to replace refer to the corresponding parts after section 2 and the relevant catalogs, relevant manuals.

### 2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION

This part describes the replacement from A173UHCPU/A172SHCPUN/A171SHCPUN to Q173DSCPU/Q172DSCPU (operating system software is SV13/SV22).

### 3. REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION

This part describes the replacement from A173UHCPU/A172SHCPUN/A171SHCPUN to Q170MCPU-S1 (operating system software is SV13/SV22).

### 4. REPLACEMENT FROM A-MOTION TO QN-MOTION

This part describes the replacement from A173UHCPU/A172SHCPUN/A171SHCPUN to Q173CPUN/Q172CPUN (QN-Motion) (operating system software is SV13/SV22). However, replacing A-Motion with QN-Motion is not recommended since QN-Motion is not the latest model. In order to use a system for a long time after the replacement, it is recommended to replace A-Motion with QDS-Motion or Stand-alone Motion.

### 5. APPENDIX

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# Memo


# **1. OVERVIEW OF A-MOTION REPLACEMENT**

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### 1. OVERVIEW OF A-MOTION REPLACEMENT HANDBOOK

The following shows the essential replacement overview to renew or lengthen the working life for the system which used A-Motion.

After replacement policy have been decided, it is recommended to replace refer to the corresponding part of continuous replacement handbook, technical sheet and the manual for each model.



Mitsubishi Motion Controller A series (small type) ("A-Motion")

### 2. MAIN REPLACEMENT TARGET MODEL

The main replacement target model is A series (small type) motion controllers and these options. The motion controllers and related models that displayed in the following table have switched to the production to the order already, it is recommended to replace (transit) to the new model.

Product	Model name	Product	Model name
	A171SHCPUN		A30TU
	A172SHCPUN		A30TU-E
CPU module	A173UHCPU <sup>(Note-1)</sup>		A30TU-S1
	AT730HCPU		A30TU-SV42
	A172B		A30TU-SV51
	A175B		A31TU
Main base unit	A178B	Taashing unit	A31TU-E
Main base unit	A178B-S1	Teaching unit	A31TU-KE
	A178B-S2		A31TU-R
	A178B-S3		A31TU-RE
PLC extension base unit	A168B		A31TU-RT
Pulse generator/synchronous encoder	A171SENC		A31TU-RTE
interface module	A172SENC		A31TU-D3KE51
Cable for SSCNET I/F board	A270BDCBLDM		A31TU-D3RKE51
Cable for SSCNET I/F card	A270CDCBLDM	Teaching unit	
		connection cable	A31TUCBL03M
		A31TUCBL using short circuit connector	A31SHORTCON

(Note-1): A173UHCPU-S1 also be shown as A173UHCPU in the article.

\* In addition, the targets are controller OS package used in above products, software tool packages and the customized products which were derived from these products.

### 3. MERITS OF REPLACEMENT

It is recommended to replace A-Motion to the latest iQ Platform Motion CPU Q173DSCPU/Q172DSCPU (the following QDS-Motion) or Stand-alone Motion CPU Q170MSCPU-S1.

As the merits shown below, it is strongly recommended to use the latest module, QDS-Motion and MR-J4 amplifier.

When a servo network cannot be replaced and A-Motion is replaced with Q173CPUN/Q172CPUN (hereafter called QN-Motion), refer to "4. REPLACEMENT FROM A-MOTION TO QN-MOTION". However, replacing A-Motion with QN-Motion is not recommended since QN-Motion is not the latest model. In addition, the production of MR-J2S series servo amplifiers and HC series servo motors will stop in August, 2015. If these products need to be continuously used after the production stoppage, changing the system used to an alternative system will be required. (For details, refer to Section 4.2 to 4.3.)

In order to use a system for a long time with no system modification after the replacement, it is recommended to replace A-Motion with QDS-Motion or Stand-alone Motion.

#### 3.1 Multiple CPU System (QDS-Motion) with Q Series PLC Module

A system with high flexibility and extensibility can be constructed using various iQ Platform-compatible modules. An equipment that match the varied request by extensive products can be selected.

--> Takt time of Production line will be shorten by the equipment capability of expansion and high performance.

#### 3.2 High-speed and High Performance of Motion CPU

The operation speed of a Motion CPU can be significantly improved: a Motion CPU has an operation cycle of up to 0.22ms/4 axes (QDS-Motion SV22) or 0.44ms/4 axes (Stand-alone Motion SV22). And as there are extremely abundant motion control functions, it can support the advanced motion control.

--> Takt time of Production line will be shorten by the high-speed motion control capability and high performance.

## 3.3 High-speed, Noise Free Communication by SSCNET III(/H)

SSCNET III(/H) Servo network communication realizes high-speed response (Communication speed: 150Mbps (simplex)/300Mbps (duplex)) and eliminates the influence of noise by utilizing an optical communication system.

--> The influence of noise by wiring can be suppressed, and the operation of equipment will be stabilized.

### 3.4 MR-J4 Amplifier + HG Servo Motor (QDS-Motion)

The latest MR-J4 series includes various functions such as one-touch tuning and realizes the high performance with speed response frequency of 2.5 kHz and encoder resolution of 22 bits (4194304 pulses/rev). The quantity of rare earth metals is reduced for HG series, the servo motor series appropriate for QDS-Motion.

--> The influence of noise by wiring can be suppressed, and the operation of equipment will be stabilized.

### 3.5 Space Economization (Stand-alone Motion)

A power supply module, a PLC, and a motion controller are integrated without degrading the high performance of iQ Platform, and this contributes cost reduction and downsizing the equipment. Built the mark detection and the synchronous encoder I/F in, and it will support the packing machine system without using special module.

--> Small-size equipment and cost performance will be compatible.



### 3.6 Decrease of Maintenance Cost

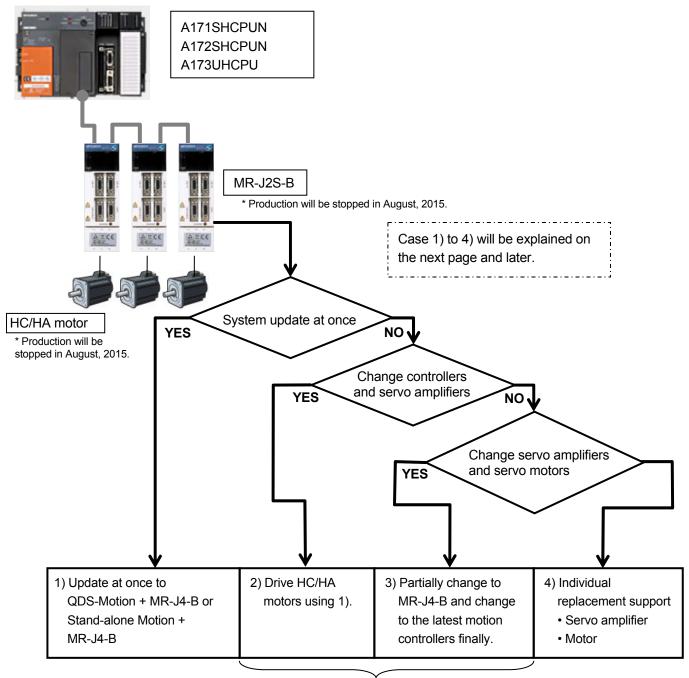
Once the product has been used for more than 5 years, it is necessary to maintain the machine such as partly replacement according to the lifespan, and the maintenance cost for power supply module replacing, electrolytic capacitor and the whole board replacing will be charged. In order to use the system for a long time, and consider the factors like performance and quality, it is recommended to replace to the latest model at early stage.

--> Extend the lifespan of the equipment.

### 4. CASE AND STUDY OF A-MOTION REPLACEMENT

The following shows the replacement case study of the system which used standard A-Motion. Although it will need some major maintenance, it is recommended to carry out the system batch update of 1) to use a system for a long time with no system modification after the maintenance.

If the batch update including the change of servo amplifiers, servo motors, and servo networks is difficult to carry out due to the period and cost of the maintenance, carry out 2) or 3). If any update will not be done, refer to 4) Individual replacement support.

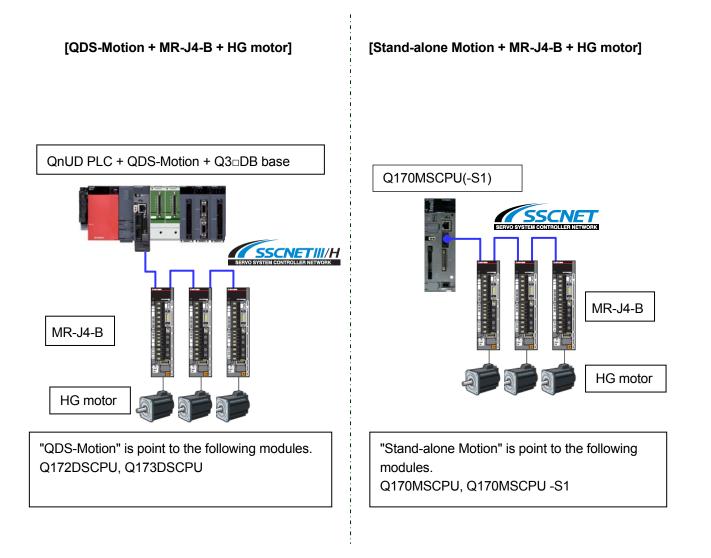


Only when equipment is completely replaced.

\*1. Although it will cost a lot and take a long period for maintenance, once a system is upgraded, the system can be used for a long time after that.

### 4.1 1): Update at once to QDS-Motion/Stand-alone Motion + MR-J4-B

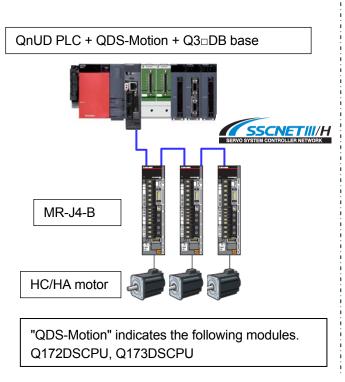
The following shows the systems for the system batch update.



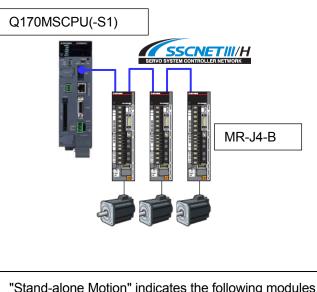
### 4.2 2): When only Controllers and Servo Amplifiers are Changed

The following shows the procedure for updating a system when only controllers and servo amplifiers are changed.

## [QDS-Motion + MR-J4-B + HC/HA motor]



## [Stand-alone Motion + MR-J4-B + HC/HA motor]



"Stand-alone Motion" indicates the following modules. Q170MSCPU, Q170MSCPU-S1

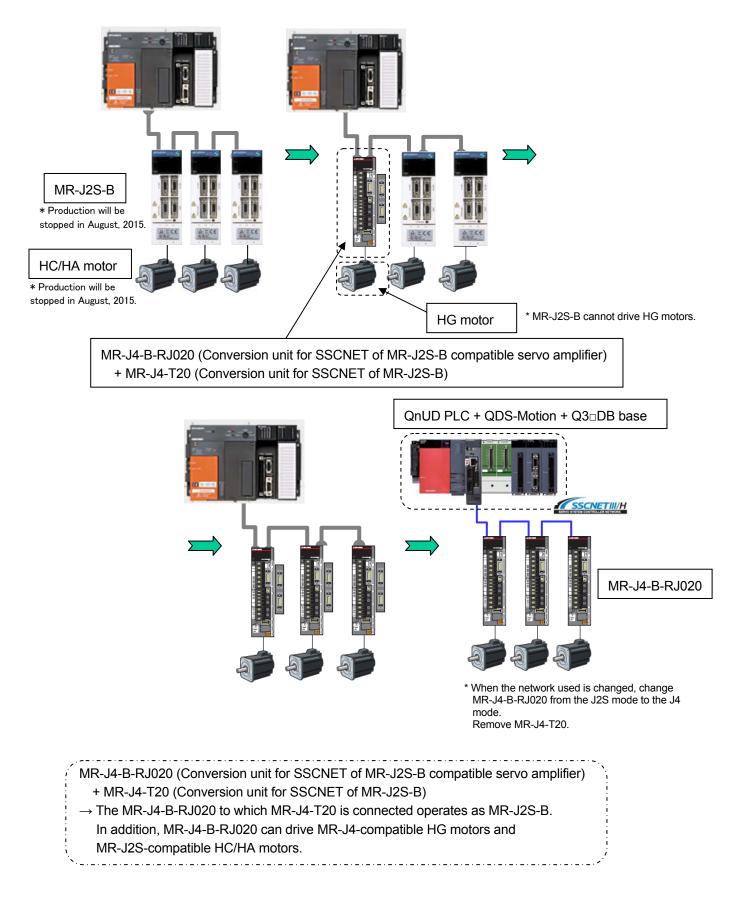
\* Although HC/HA motors can be used without any change, the encoder resolution of the servo amplifier becomes 17 bits.

For the applicable servo motors and servo amplifiers, contact your local sales office.

POINT					
When the following HC/HA motors are used, changing the motors with HG motors and					
		atch is recommended			
		vo amplifiers may nee			
Existin	ng model	Example of replacem	nent models for batch change		
Servo motor	Servo amplifier	Servo motor	Servo amplifier		
HC-LFS52	MR-J2S-60B	HG-JR73	MR-J4-70B		
HC-LFS102	MR-J2S-100B	HG-JR153	MR-J4-200B		
HC-LFS152	MR-J2S-200B	HG-JR353	MR-J4-350B		
HA-LFS15K2(4)(B)	MR-J2S-15KB(4)	HG-JR11K1M(4)(B)	MR-J4-11KB(4)		
HA-LFS22K2(4)(B)	MR-J2S-22KB(4)	HG-JR15K1M(4)(B)	MR-J4-15KB(4)		
HA-LFS30K2(4)	MR-J2S-30KB(4)	HG-JR22K1M(4)	MR-J4-22KB(4)		
HC-KFS46	MR-J2S-70B	HG-KR43	MR-J4-40B		
HC-KFS410	MR-J2S-70B	HG-KR43	MR-J4-40B		
HC-RFS103(B)G2 1/_	MR-J2S-200B	HG-SR102(B)G7 1/_	MR-J4-100B		
HC-RFS203(B)G2 1/_	MR-J2S-350B	HG-SR202(B)G7 1/_	MR-J4-200B		
HC-RFS353(B)G2 1/_	MR-J2S-500B	HG-SR352(B)G7 1/_	MR-J4-350B		
HC-RFS103(B)G5 1/_	MR-J2S-200B	HG-SR102(B)G5 1/_	MR-J4-100B		
HC-RFS203(B)G5 1/_	MR-J2S-350B	HG-SR202(B)G5 1/_	MR-J4-200B		
HC-RFS353(B)G5 1/_	MR-J2S-500B	HG-SR352(B)G5 1/_	MR-J4-350B		
HC-RFS103(B)G7 1/_	MR-J2S-200B	HG-SR102(B)G7 1/_	MR-J4-100B		
HC-RFS203(B)G7 1/_	MR-J2S-350B	HG-SR202(B)G7 1/_	MR-J4-200B		
HC-RFS353(B)G7 1/_	MR-J2S-500B	HG-SR352(B)G7 1/_	MR-J4-350B		

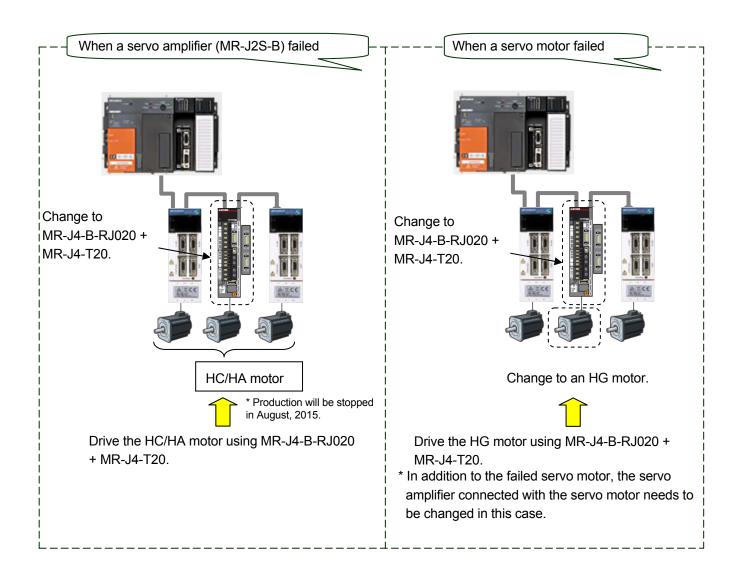
### 4.3 3): Partial Update from MR-J2S-B to MR-J4-B

The following shows the procedure for updating a system partially.



### 4.4 4): Individual Replacement Support

The following shows the system update procedure for the individual replacement.



### 4.5 Others

### 4.5.1 Combination before/after controller replacement

The following table shows combination before/after controller replacement. Please refer to the table when transiting.

<b></b>					1
	QN-Motion	QH-Motion	QD-Motion	QDS-Motion	Stand-alone
	(Q17nCPUN)	(Q17nHCPU)	(Q17nDCPU)	(Q17nDSCPU)	Motion
	· · · · ·	· · · ·	( )	· · · · · ·	(Q170MSCPU)
		SSCNET	SSCNET	SSCNET III/H	SSCNET
	~~~~	SERVO SYSTEM CONTROLLER NETWORK			
	SSCNET	SSCNET III	SSCNET III	SSCNET III/H	SSCNET III/H
A-Motion	$\wedge$	$\sim$	$\cap$	$\cap$	$\cap$
A17nSHCPUN	$\sum_{i \in I}$				
• A173UHCPU	It is	It is	Refer to	Refer to	Refer to
	recommended	recommended	Section 2 in this	Section 2 in this	Section 3 in this
	to transit to	to transit to	document.	document.	document.
	QDS-Motion. <sup>*1</sup>	QDS-Motion.			
Q-Motion			$\left( \right)$	$\left( \right)$	$\cap$
Q17nCPUN	$\mathbf{i}$	X	$\bigcirc$	$\bigcirc$	$\bigcirc$
		It is	Refer to	Refer to	← Same as
		recommended	Technical sheet:	Technical sheet:	QDS-Motion
		to transit to	S0014CB	S0014CB	
	$\backslash$	QDS-Motion.			
QH-Motion			$\bigcirc$	$\cap$	$\cap$
Q17nHCPU					$\cup$
			Refer to	Refer to	← Same as
			Technical sheet:	Technical sheet:	QDS-Motion
			S0013CB	S0013CB	

\*1 Refer to "4. REPLACEMENT FROM A-MOTION TO QN-MOTION" in this document. However, replacing A-Motion with QN-Motion is not recommended since QN-Motion is not the latest model. In order to use a system for a long time with no system modification after the replacement, it is recommended to replace A-Motion with QDS-Motion or Stand-alone Motion.

### 4.5.2 Combination of controller and servo amplifier

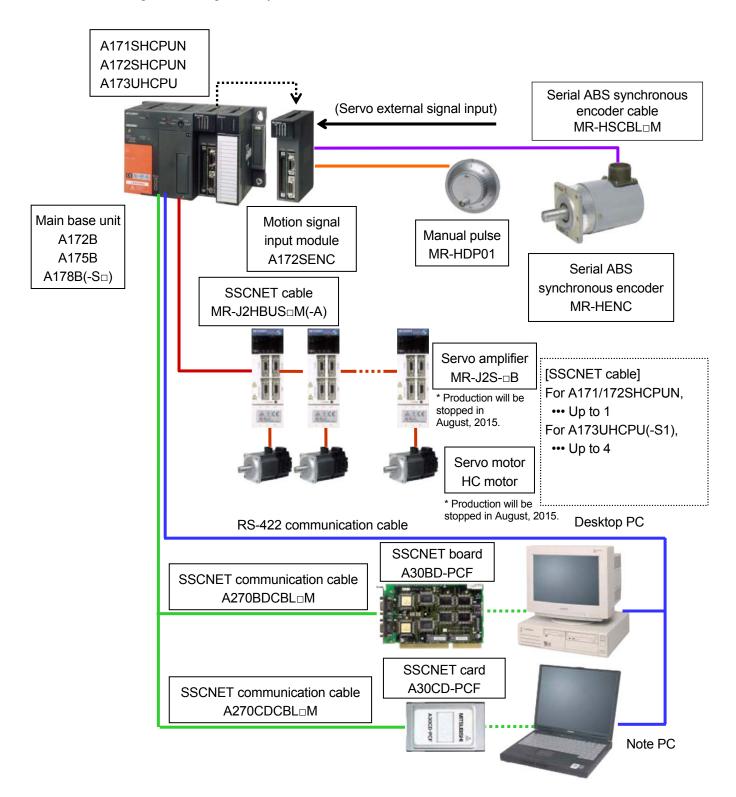
The following table shows combination of controller and servo amplifier. Please refer to the table when transiting.

Controller Servo amplifier	QN-Motion (Q17nCPUN)	QH-Motion (Q17nHCPU)	QD-Motion (Q17nDCPU)	QDS-Motion (Q17nDSCPU)	Stand-alone Motion (Q170MSCPU)
MR-H-BN Production stopped in December, 2005.	$\bigcirc$	X	X	X	Х
MR-J2-B Production stopped in December, 2005.	$\bigcirc$	Х	X	X	X
MR-J2S-B MR-J2M-B Production will be stopped in August, 2015.	0	×	×	×	×
MR-J3-B	×	0	0	(Controller: J3 mode)	(Controller: J3 mode)
MR-J4-B MELSERI/O-J4	(MR-J4-B-RJ020 +MR-J4-T20)	(MR-J3 compatible mode)	(MR-J3 compatible mode)	0	0

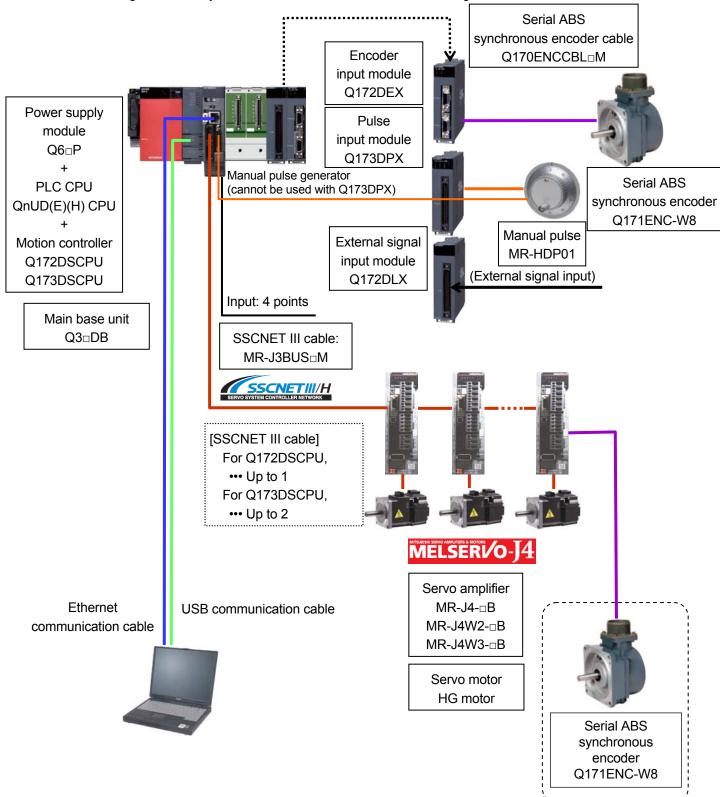
### 5. SYSTEM TRANSITION

### 5.1 Configuration of the System Using A-Motion (before transition)

The following shows the general system chart used A-Motion.



### 5.2 Configuration of the System Using QDS-Motion (after transition)

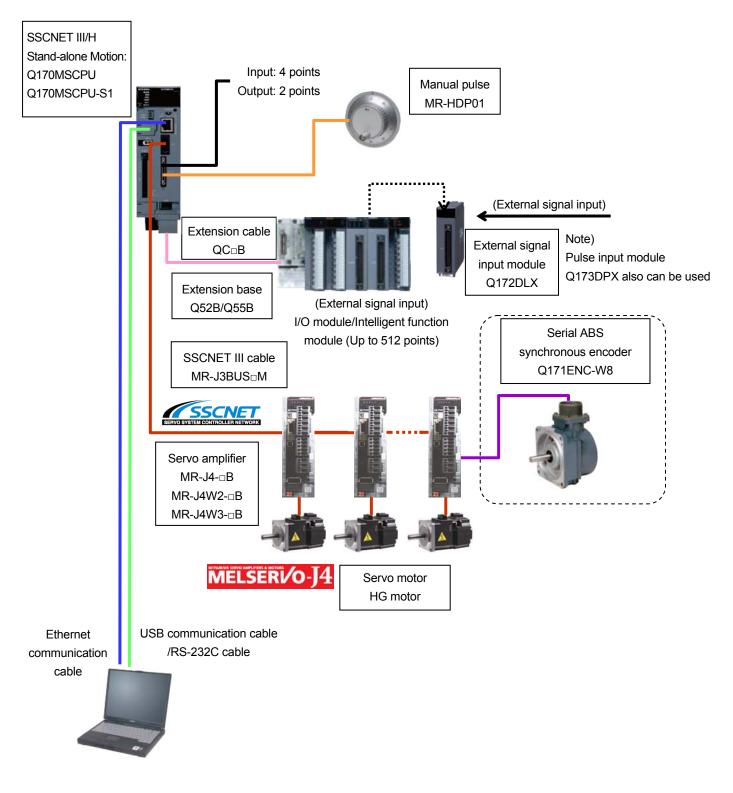


The following shows the system chart used QDS-Motion after transiting.

\* Ethernet is a trademark of Xerox Corporation in the United States.

### 5.3 Replace to Stand-alone Motion

The following shows the system chart used Stand-alone Motion after transiting.



\* Ethernet is a trademark of Xerox Corporation in the United States.

## 5.4 Transition of Other Configurations

#### 5.4.1 Combination of servo amplifier and servo motor

The following table shows the combination of servo amplifier and servo motor. Please refer to the table when transiting.

A17nSHCPUN/A173UHCPU(-S1)			Q17nDSCPU/Q170MSCPU								
AT/IISF		CPU(-51)					Q17nDCPU/Q170MCPU				
Series	Servo amplifier	Servo motor		Series	Servo amplifier	Servo motor	Series	Servo amplifier	Servo motor		
MR-J2S	MR-J2S-□B	HC-KFS□		MR-J4	MR-J4-□B	HG-KR□	MR-J3	MR-J3-□B	HF-KP□		
Series		HC-MFS□		Series	MR-J4W2-□B	HG-MR□	Series	MR-J3W-□B	HF-MP□		
		HC-SFS□			MR-J4W3-□B	HG-SR□		MR-J3-□B-RJ006	HF-SP□		
		HC-LFS□				HG-RR□		MR-J3-□B-RJ004	HF-JP□		
		HC-RFS□	$\rightarrow$			HG-UR□		MR-J3-□BS	HC-LP□		
		HA-LFS□				HG-JR□			HC-RP□		
		HC-UFS□							HC-UP□		
MR-J2M	MR-J2M-□DU	HC-KFS□							HA-LP□		
Series		HC-MFS□									
		HC-UFS□									

#### 5.4.2 Specification comparison of servo system network

The following table shows the specification comparison of servo system network. Please refer to the table when transiting.

Item		SSCNET (A-Motion)			SSCNETIII/H			
Communication cable		Metal cable		Optical fibre cable				
Communic	ation speed	5,6Mbps	1	50Mbps	150Mbps			
Cycle	Send	3.55ms	]	0.44ms/0.88ms	0.22ms/0.44ms/0.88ms			
	Receive	3.55ms	1	0.44ms/0.88ms	0.22ms/0.44ms/0.88ms			
The maximum number of axes of each system		8axes/system		16 axes/system				
	unication tance	Overall length 30m	$\rightarrow$	Standard code for inside panel or Standard cable for outside panel				
				Up to 20m between stations Maximum overall length is 320m (20m × 16 axes)				
				[Long-distance cable] Up to 50m between stations Maximum overall length is 800m (50m×16axes)	[Long-distance cable] Up to 100m between stations Maximum overall length is 1600m (100m×16axes)			

### 5.4.3 Support of operating system software

The following table shows the support of operating system software. Please refer to the table when transiting.

CPU model	OS Type	OS model		CPU model	OS Type	OS model	CPU model	OS Type	OS model
A173UHCPU (-S1)	SV13	SW2SRX-SV13B SW2NX-SV13B SW3RN-SV13B		Q173DSCPU	SV13	SW8DNC-SV13QJ	Q173DCPU (-S1)	SV13	SW8DNC-SV13QB
	SV22	SW2SRX-SV22A SW2NX-SV22A SW3RN-SV22A			SV22	SW8DNC-SV22QJ		SV22	SW8DNC-SV22QA
	SV43	SW2SRX-SV43A SW2NX-SV43A			SV43			SV43	SW7DNC-SV43QA
A172SHCPUN	SV13	SW0SRX-SV13D SW0NX-SV13D SW3RN-SV13D		Q172DSCPU	SV13	SW8DNC-SV13QL	Q172DCPU (-S1)	SV13	SW8DNC-SV13QD
	SV22	SW0SRX-SV22C SW0NX-SV22C SW3RN-SV22C	$\rightarrow$		SV22	SW8DNC-SV22QL		SV22	SW8DNC-SV22QC
	SV43	SW0SRX-SV43C SW0NX-SV43C			SV43			SV43	SW7DNC-SV43QC
A171SHCPUN	SV13	SW0SRX-SV13G SW0NX-SV13G		Q170MSCPU	SV13	SW8DNC-SV13QN	Q170MCPU	SV13	SW8DNC-SV13QG
	SV22	SW0SRX-SV22F SW0NX-SV22F			SV22	SW8DNC-SV22QN		SV22	SW8DNC-SV22QF
	SV43	SW0SRX-SV43F SW0NX-SV43F			SV43			SV43	SW7DNC-SV43QF

\*1 For A-Motion controllers, "Motion SFC-compatible OS" and "Motion SFC non-compatible OS" are different OSs. For the motion controllers of the Q series or later, whether to use the Motion SFC or not can be selected for the same OS.

### 5.4.4 Correspondence of peripheral software

The following table shows the correspondence of peripheral software. Please refer to the table when transiting.

A17nSHCPUN/A173UHCPU(-S1)			Q series	Motion CPU
Class	Туре		Туре	Comment
Motion program	SW2SRX-GSV□ SW2NX-GSV□ SW3RNC-GSV□		<melsoft mt="" works2=""> SW1DNC-MTW2-□</melsoft>	Please use the latest version <sup>(note-2)</sup>
PLC program	GX Developer	$\rightarrow$	<melsoft gx="" works2=""><sup>(note-1)</sup></melsoft>	Please use the latest version <sup>(note-2)</sup>
Servo amplifier	<mr configurator=""> SETUP161</mr>		<mr configurator2=""><sup>(note-3)</sup> SW1DNC-MRC2-□</mr>	Please use the latest version

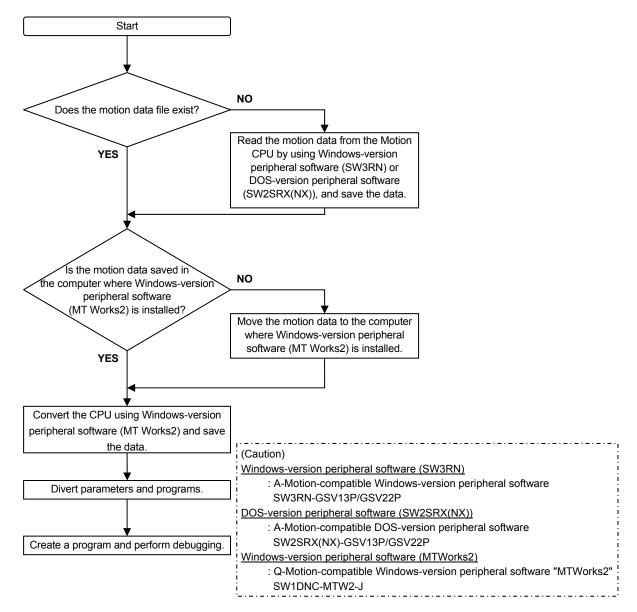
(Note-1) GX Developer is bundled in GX Works2.

(Note-2) As the latest versions of MT Works2 and GX Works2 have been released in Mitsubishi Electric FA Site, update your software to the latest version.

(Note-3) MR Configurator2 is bundled in MT Works2.

### 5.4.5 Outline of the motion data replacement flow

The following flowchart describes the motion data replacement procedure when the data can be diverted.



#### 5.4.6 Precautions for replacing motion data saved with DOS-version peripheral software

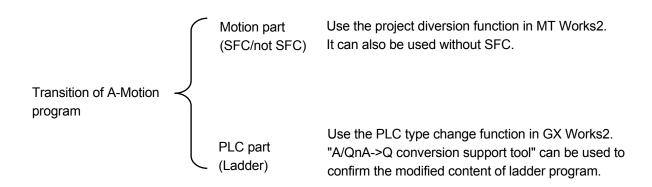
The motion data saved with DOS-version peripheral software (SW2SRX/SW2NX-GSV13P/GSV22P) is stored in "C:\GPP\USR\System name\Machine name". Extract the data from the folder.

#### 5.4.7 Dimensions

Refer to "5. APPENDIX".

## 6. TRANSITION OF THE PROGRAM

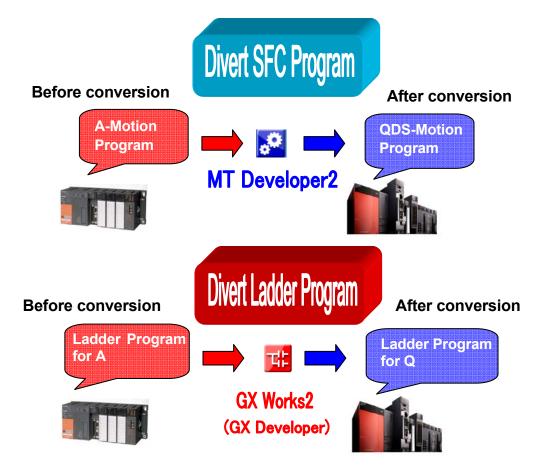
The section shows the content which converts A-Motion to Q17nDS (virtual mode switching type).



When the ladder program A/QnA->Q conversion support tool used

"A/QnA->Q conversion support tool" can be used to confirm the modified content of ladder program. Please download and install A/QnA->Q conversion support tool from Mitsubishi FA Site. For details, please refer to the A/QnA->Q conversion support tool guidebook in the same page.

Although the ladder program has been converted following the procedure, it may not be operated correctly. For the program modifications, please refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION".



#### 6.1 Motion Project Diversion Function in MT Works2

#### 6.1.1 Data list available for diversion or not

The following table shows the overview whether the data can be diverted or not for the diversion function of motion project in MT Works2. The data may not be diverted for the case, but more than half can be diverted.

For details, please refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION".

Dete list eveileble for diversion or not			A171SHCPUN,	A172SHCPUN	A173UHCPU				
Data list	availa	able for diversion or not	SV13	SV22	SV13	SV22			
		System setting data	riangle (Servo amplifier has been converted to MR-J3-B/MR-J4-B after diverting)						
System		High speed reading data	0						
setting		Basic setting		imes (Multiple CPU etc. must be set)					
	в	Fixed parameter		riangle (Change	electronic gear)				
	Axis data	Home position return data	0						
Servo	Axis	JOG operation data			0				
data		Servo parameter		Besides MR-J2	2 <b>S</b> : X, MR-J2S: ()				
setting		Parameter block			0				
		Limit output data	X: Not use Motion SFC O: Use Motion SFC						
	1	Notion SFC parameter	0						
		Motion SFC program	∠ (Device mus	-	0				
Motion SFC	Op	peration control program	∠ (Device mus	∖ t be revised)	0				
program		Transition program	∠ (Device mus	_	0				
		Conversion data	riangle (Data must be converted again)						
	Aut	omatic numbering setting			0				
	Se	rvo program	∠ (Device must	∖ be reviewed)	(	C			
		Mechanical edit data	-	$\bigtriangleup$	-	0			
Mechanio system	1	Mechanical conversion data	riangle (Data must be co		e converted again)				
progran	II	Cam conversion data	-	0	-	0			
		Cam data	0						
Device memory				GSVE only 〇 vice only)					

O: Can be diverted (can be used directly)

 $\triangle$ : Data must be revised

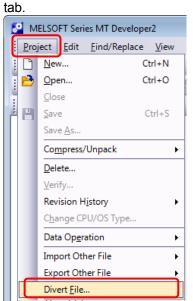
 $\times$ : Must be set again

- : Data does not exist because it has not been used in diversion source (A-Motion).

#### 6.1.2 Motion program diversion procedure in MT Works2

The following describes the procedure for diverting an A173UHCPU/A17nSHCPUN project using MT Works2. For details, refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION". For details, please refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION"

1) Start MT Developer2, and select "Divert File" --> "Diversion of Other Format Project" from the "Project"



2) Specify the CPU type, OS type, and operation method after the replacement in the "Diversion of Other Format Project" dialog box, and select "Browse".

File diversion	<b>—</b> ———————————————————————————————————
Source	Browse
Drive/Path	Divert
Project Name	Close
CPU Type : OS Type :	
CPU/OS selection CPU Type : Q172DS OS Type : SW8-SV13QL	
•	
Omitted below	

10) Input "Workspace Name", "Project Name", and "Title", and select "Save".

Workspace Name :	Q172DS Replacement File
Project Name :	Q172DS Replacement File
<u>T</u> itle:	$A \rightarrow Q$ Converting File
Save as a Single File Format F	Switch the window by clicking this button
	(MELSOFT Navigator does not support this format.)

#### 11) Select "Yes".

MELSOFT Series MT Developer2	- 23
The specified project does not exist. Do you want to create a new project?	,
<u>Y</u> es <u>N</u> o	

Please refer to "4.1 Data list available for diversion or not (SV13/SV22)", and set the data that cannot be diverted if necessary. And for the multiple-CPU parameter setting, please refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION" and the user's manual for the using module.

### 6.2 Ladder Program Diversion Function in GX Works2

#### 6.2.1 Ladder program diversion procedure in GX Works2

This section explains the conversion overview of a ladder program for A-Motion controller (SCPU). For details of ladder program created by GX Developer, please refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION".

1) After starting GX Works2, select "Start GX Developer" from the "Project" tab.

	LSOFT Series GX Works2					
<u>Proj</u>	ect <u>E</u> dit <u>F</u> ind/Replace	<u>C</u> ompile	<u>V</u> iew	<u>O</u> nline	De <u>b</u> ug	<u>D</u> iagnostics
: 🗅	<u>N</u> ew	Ctrl	+N		Dev 🚬	🖙 i 🖛 🦉
1 🖻	<u>O</u> pen	Ctrl	+0			-
1	<u>C</u> lose					
i B	Save	Ctrl	+S			
	Save <u>A</u> s					
4	Co <u>m</u> press/Unpack		•			
	<u>D</u> elete					
	<u>V</u> erify					
	Project Revision		•			
	C <u>h</u> ange PLC Type					
	Change Project Type					
	Obj <u>e</u> ct		•			
	Intelligent <u>F</u> unction Modu	le	_ •			
	Open Othe <u>r</u> Data		۰	Оре	en Othe <u>r</u> I	Project
	Export to GX Developer F	ormat File		Rea	d <u>A</u> SC Fo	rmat File

2) The following shows the conversion of ladder program created by SW3RNC-GSVE. (GPPA file format) After GX Works2/GX Developer is started, select "Import file" --> "Import from GPPA format file" from the "Project" tab.

uie	1 10/0									
🚯 N	IELSOFT :	series GX Develo	per							
<u>P</u> roje	ct <u>E</u> dit	<u>Find/Replace</u>	<u>V</u> iew	<u>O</u> nline	<u>D</u> iag	nostics	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp	
	<u>N</u> ew proj	ject		Ctrl+	+N	1	181 💿		1	
	Open pro	oject		Ctrl+	+O	-	7 54			
	<u>C</u> lose pro	oject								
	<u>S</u> ave			Ctrl	+S	1+ +↓+ 7 _≤F8	내가 내내 aF7 aF8	-171	- 4114 4144 6 saF7 saF8	
	Save <u>a</u> s					Q 3			( <u>북</u> ‡ 물포	町
	<u>D</u> elete pr	oject								
	Ve <u>r</u> ify					莳	sF5 F5	F6 F7	F8 F9 s	F9 <u>c1 c2 c</u>
	Сор <u>у</u>									
	<u>E</u> dit Data				×					
	C <u>h</u> ange l	PLC type								
	<u>I</u> mport fi	le			•	In	nport froi	m GPP <u>Q</u> fo	rmat file	
	Export <u>f</u> il	e			•	In	nport fro	m GPP <u>A</u> fo	rmat file	
	Macro				•	In	nport fro	m <u>F</u> XGP(W	N) format	file
	Function	<u>B</u> lock			•	In	nport fro	m FXGP( <u>D</u> C	DS) format	file



9) Select "Change PLC type" from the "Project" tab in GX Developer.

🚯 MEL	SOFT series GX Developer (Un	nset proje	ct) - [L[	D(Edi
Proj	ject <u>E</u> dit <u>F</u> ind/Replace <u>C</u>	Convert	<u>V</u> iew	<u>O</u> nli
С	New project		Ctrl+N	1
Pro	Open project		Ctrl+C	
-	<u>C</u> lose project			
-1   F5	Save		Ctrl+S	5
	Save <u>a</u> s			
	Delete project			
*	Ve <u>r</u> ify			
	Сор <u>у</u>			
	<u>E</u> dit Data			•
	C <u>h</u> ange PLC type			

10) Specify the PLC series (QCPU(Qmode)) and PLC type (QnUD(E)(H)CPU) after the replacement in the "Change PLC type" dialog box, and select "OK".

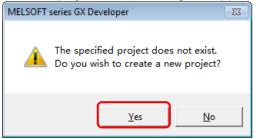
U		<u> </u>
Change PLC type		<b>—</b>
PLC series		OK
QCPV (Qmode)		Cancel
PLC type		
QOEVIDH	<u> </u>	

Omitted below

14) When "Save as" is selected from the "Project" tab, the following dialog box appears. Input "Project name" and "Title", and select "Save".

Save the proje	ect with a nev	v name			<b>X</b>
Project drive	[·c·]	•	<b>£</b>	0-0- 0-0- 0-0-	
120131      2012013     2012013     2012021     2012021     201217_     Source file	- 1 4 GX				
Drive/Path	C:\Users\Me	eiden\Deskto	op∖A Motion	Replace	Save
Project name	201217				Cancel
Title	201217				

15) The new project creation dialog box appears. Select "Yes".



#### 6.2.2 The process after diverting the ladder program in GX Works2

Although the ladder program has been diverted by GX Works2, the dedicated instructions and dedicated devices for A-Motion may not be converted automatically, please correct it manually as follows. And, there is also a tool called" A/QnA->Q conversion support tool" to support the process.

For details, please refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION".

1) Motion dedicated instructions

(SVST, CHGA, CHGV, CHGT, SFCS, ITP)

- --> Convert to SM1255.
- 2) A-Motion dedicated (not included in QDS-Motion)
  - Special relay
  - Special register
  - --> Convert to SM1255 and SD1255.

As it has been converted as above, please remember using content of these devices in the pre-converted program (A-Motion ladder), and change the converted content in SM1255, SD1255 to Q17nDSCPU Motion dedicated instructions and other bit device after converting. (Please refer to the user's manual of each CPU module and the programming manual)

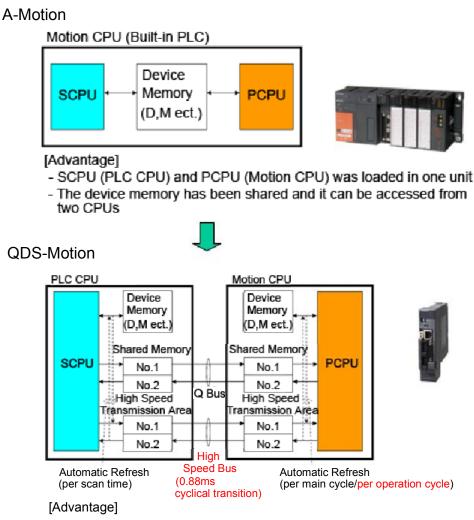
A-Motion (Ladder)		QDS-Motion (Ladder)
<ol> <li>Motion dedicated instructions</li> <li>(SVST, CHGA, CHGV, CHGT, SFCS, ITP)</li> <li>A-Motion dedicated (not included in QDS-Motion)</li> <li>Special relay</li> <li>Special register</li> </ol>	Convert	SM1255 SD1255

As it has been converted as above, please remember using content of these devices in the pre-converted program (A-Motion ladder), and change the converted content in SM1255, SD1255 to Q17nDSCPU Motion dedicated instructions and other bit device after converting.

## 6.3 **Precautions of Program Transition**

## $6.3.1\,$ Precautions of shared device memory transition between SCPU (PLC) and PCPU (Motion CPU)

PLC CPU and Motion CPU are integrated in A-Motion, while these are not integrated in QDS-Motion. And the shared device memory can be used by the Multiple CPU high speed transmission (+ automatic refresh). Therefore it is necessary to execute the automatic refresh setting and allocate to the Motion CPU device which used PLC CPU after the project diversion. Pay attention to the number of automatic refresh block because the limit is 32 in Q173DSCPU/Q172DSCPU.



- 0.88ms cyclical transition can be done in high speed transmission area
- Automatic refresh per operation cycle is possible

## 7. RELEVANT DOCUMENTS

Please refer to the following documents. And it can be downloaded from Mitsubishi Electric FA Site whenever you want.

## http://www.MitsubishiElectric.co.jp/fa/

### 7.1 Relevant Catalogs

Motion Controller Q17nDSCPU/Q170MSCPU, Simple Motion Module QD77MS/QD77GF



L(NA) 03062

#### MELSERVO-J4



L(NA) 03058

Motion Controller

#### Q17nDCPU



L(NA)03036

#### MELSERVO-J2-Super Transition Guide



L(NA)03091

#### 7.2 Relevant Manuals

Q170M(S) Series User's Manual NEWQ170MSCPU User's Manual

#### IB-0300212

Q173D(S)/Q172D(S) Series User's Manual Q173D(S)CPU/Q172D(S)CPU User's Manual

#### IB-0300133

Q173D(S)/Q172D(S) Series Programming Manual Programming Manual (COMMON) [type Q173D(S)/Q172D(S)]

#### IB-0300134

Q173D(S)/Q172D(S) Series Programming Manual SV13/22Programming Manual (Motion SFC) [type Q173D(S)/Q172D(S)]

#### IB-0300135

Q173D(S)/Q172D(S) Series Programming Manual SV13/22Programming Manual (REAL MODE) [type Q173D(S)/Q172D(S)]

#### IB-0300136

Q173D(S)/Q172D(S) Series Programming Manual SV22Programming Manual (VIRTUAL MODE) [type Q173D(S)/Q172D(S)]

#### IB-0300137

Q173D(S)/Q172D(S) Series Programming Manual SV22Programming Manual (Advanced Synchronous Control) [type Q173DS/Q172DS]

#### IB-0300198

NEWMR-J4 Seri	es Transition from MELSERVO-J2-Super/J2M Series to J4 Series Handbook
L(NA)03093	
MR-J4 Series SH-030106	MR-J4B(-RJ) SERVO AMPLIFIER INSTRUCTION MANUAL
MR-J4 Series IB-0300175E	MR-J4 Servo amplifier Instructions and Cautions for Safe Use of AC Servos
MR-J4 Series SH-030109	MELSERVO-J4 Servo amplifier INSTRUCTION MANUAL TROUBLE SHOOTING
MR-J4 Series SH-030105	MR-J4W2B/MR-J4W3B SERVO AMPLIFIER INSTRUCTION MAMUAL
MR-J4 Series SH-030125	Conversion Unit for SSCNET of MR-J2S-B Compatible AC Servo MR-J4_BRJ020/MR-J4-T20 SERVO AMPLIFIER INSTRUCTION MANUAL
MR-J4 Series SH-030127	Instructions and Cautions for Drive of HC/HA Series Servo Motor with MR-J4BRJ020 Servo Amplifier
MR-J4 Series IB-0300204E	Conversion unit for SSCNET of MR-J2S-B MR-J4-T20 Installation Guide
MR-J3 Series SH-030051	MR-J3B SERVO AMPLIFIER INSTRUCTION MANUAL
SH-030051	

## 2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION

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## 1. OVERVIEW

This article explains the change content when replace the system using

A173UHCPU/A172SHCPUN/A171SHCPUN with the system using Q173DSCPU/Q172DSCPU. Please read A173UHCPU as A173UHCPU-S1.

#### 2. EQUIPMENT CONFIGURATION, AVAILABLE SOFTWARE

Please prepare module, servo amplifier, operating system software and engineering environment according to the table in this article.

#### 2.1 Equipment Correspondence

It is necessary to use the supported product in iQ Platform, when using Q173DSCPU/Q172DSCPU.

Product			Use A17nSHCPUN/A173UHCPU		Use Q17nDSCPU		
FIOUUCI			Model name		Model name		
PLC CPU module	PLC CPU module		A173UHCPU     A172SHCPUN		QnUD(E)(H)CPU		
			A171SHCPUN     A173UHCPU	_	Q173DSCPU		
Motion CPU mod	lule		A172SHCPUN     A171SHCPUN		Q172DSCPU		
Main base unit			• A172B • A175B • A178B(-S□)		Q3□DB (high speed main base	Q3□DB (high speed main base unit)	
Forced stop input	t cable		-		Q170DEMICBLDM	Either is	
Connector for for	ced stop i	nput cable	-		Q170DEMICON	necessary	
Servo external si	gnals inte	rface module	A171SENC A172SENC		Q172DLX <sup>(Note-1)</sup>	Use If necessary	
Synchronous end	coder inte	face module			Q172DEX		
Manual pulse ger	nerator inf	erface module			Q173DPX <sup>(Note-2)</sup>		
Serial ABS synch	nronous e	ncoder	MR-HENC	_	<(same as left)		
			-	-	Q171ENC-W8		
Serial ABS synch	nronous	For MR-HENC	MR-HSCBL□M	-	MR-JHSCBLDM		
encoder cable		For Q171ENC	-	_	Q170ENCCBLDM		
Battery		J module	A6BAT is built in CPU module		Q6BAT is built in CPU		
-	For synchronous encoder			_	A6BAT is built in Q172DEX		
Manual pulse generator			MR-HDP01	_	<(same as left)		
SSCNET(III) cable			• MR-HBUS⊡M • MR-J2HBUS□M-A		• MR-J3BUS□M • MR-J3BUS□M-A		
			(cable for SSCNET)		• MR-J3BUS□M-B (cable for SSCNET III)		

(Note-1): Motion CPU built-in I/F (input 4 points) can be used.

(Note-2): Manual pulse/INC synchronous encoder (1 module) in Motion CPU built-in I/F can be used.

<Precautions>

- Main base unit can use Multiple CPU high speed main base unit (Q3 DB) only.
- SSCNET communication between personal computer using SSC I/F servo (A10BD-PCF/A30BD-PCF) and SSC I/F card (A30CD-PCF) and Motion CPU module is not corresponding in Q173DSCPU/Q172DSCPU.
- Q173DSCPU/Q172DSCPU cannot be used to combine with Q173HCPU(-T)/Q172HCPU(-T)/Q173CPUN(-T)/Q172CPUN(-T).
- Q173DSCPU/Q172DSCPU are not compatible with teaching units.

## 2.2 Servo Amplifier Correspondence

The servo system network is changed from SSCNET to SSCNET III or SSCNET III/H. Use a servo amplifier compatible with SSCNET III or SSCNET III/H. Select a servo motor that can be connected with an SSCNET III or SSCNET III/H-compatible servo amplifier.

<Amplifier correspondence>

	Use A17nSHCPUN/A173UHCPU				Use Q17nDSCPU		
	Product	Model name		Product		Model name	
	MR-H series	MR-H-□BN		<u>ب</u>	MD 12 april 2		
mplifier	MR-J2S series	MR-J2S-⊓B	>	olifier	MR-J3 series	• MR-J3(W)-□B(S)	
amp	WIR-J25 Series	MR-J23-DB		amp		• MR-J4(W□)-□B	
\$	MR-J2 series	MR-J2-□B		2	MR-J4 series	* It will operate in MR-J3	
Ser	MR-J2-Jr series MR-J2-03B5	MR-J2-03B5		Ser		compatibility mode when	
	MR-JZ-JF Series MR-JZ-03B5					mixed with MR-J3.	

<Specification compare of servo system network>

Item		SSCNET (A-Motion)		SSCNET III	SSCNET III/H		
Communicatio	on media	Metal cable		Optical fiber cable			
Communicatio	on speed	5.6Mbps		50Mbps	150Mbps		
Communication	Sending	3.55ms		0.44ms/0.88ms	0.22ms/0.44ms/0.88ms		
cycle	Receiving	3.55ms		0.44ms/0.88ms	0.22ms/0.44ms/0.88ms		
Maximum numbe axes per sy		8 axes/system		16 axes	/system		
			>	[Standard code for inside par par Up to 20m bet	nel]		
				Maximum overa (20m x 1	ll length is 320m		
Transmission distance		Overall length is 30m		[Long distance cable] Up to 50m between stations Maximum overall length is 800m (50m x 16 axes)	[Long distance cable] Up to 100m between stations Maximum overall length is 1600m (100m x 16 axes)		

For the communication with servo amplifiers, "SSCNET III" or "SSCNET III/H" must be set for each system in the SSCNET setting of the system setting. For details, refer to MR-J4 SERVO AMPLIFIER INSTRUCTION MANUAL.

### 2.3 Operating System Software Correspondence

Use operating system for Q173DSCPU/Q172DSCPU.

The latest version of SV22 has been installed in Q173DSCPU/Q172DSCPU with shipment.

Download the latest version of operating system besides SV22 from Mitsubishi Electric FA Site for use.

Application	pplication Use A17nSHCPUN/A173UHCPU Model name			Use	e Q17nDSCPU
Application					Vodel name
		SW2SRX-SV13B			
	For A173UHCPU	SW2NX-SV13B		For Q173DSCPU	SW8DNC-SV13QJ
		SW3RN-SV13B			
For conveyor		SW0SRX-SV13D			
assembly (SV13)	For A172SHCPUN	SW0NX-SV13D			
(3113)		SW3RN-SV13D		For Q172DSCPU	SW8DNC-SV13QL
	For A171SHCPUN	SW0SRX-SV13G	>		
	FOLATTISHCPUN	SW0NX-SV13G			
		SW2SRX-SV22A		For Q173DSCPU	
	For A173UHCPU	SW2NX-SV22A			SW8DNC-SV22QJ
		SW3RN-SV22A			
For automatic		SW0SRX-SV22C			SW8DNC-SV22QL
machinery (SV22)	For A172SHCPUN	SW0NX-SV22C			
(3722)		SW3RN-SV22C		For Q172DSCPU	
	For A171SHCPUN	SW0SRX-SV22F			
	FULAT/ ISHCPUN	SW0NX-SV22F			

#### 2.4 Engineering Environment

The following shows the engineering environment supported in Q173DSCPU/Q172DSCPU.

For the following purchase software, the latest version of which can download from Mitsubishi Electric FA Site and update.

Product	Model name	Available version	Remark
MELSOFT MT Works2	SW1DNC-MTW2-□	Ver.1.53F or later	
MR Configurator2 (Note-1) (Note-2)	SW1DNC-MRC2-□	Ver.1.12N or later	
MELSOFT GX Works2 (Note-3)	SW1DNC-GXW2-□	Ver.1.53F or later	Execute the installation of GX Developer when installing GX Works2.

(Note-1): MR Configurator2 is bundled in MT Works2.

(Note-2): MR Configurator2 can be installed after downloading from Mitsubishi Electric FA Site in the personal computer in which GX Works2 or MT Works2 is installed.

(Note-3): GX Developer also can be installed together when install MELSOFT GX Works2.

In "2.4.3 Diversion procedure in PLC CPU side", GX Developer is necessary to convert sequence program.

## 3. DIFFERENCES BETWEEN Q173DSCPU/Q172DSCPU AND A173UHCPU/ A172SHCPUN/A171SHCPUN

# 3.1 Differences between Q173DSCPU/Q172DSCPU and A173UHCPU/A172SHCPUN/A171SHCPUN

## 3.1.1 Differences list

	Iter	m	Q17nDSCPU			A173UHCPU	Points of replacement		
				A171SH	A172S	H A173UH			
Pe	ripheral I/F		<ul> <li>USB/RS-232/Ethernet (Via PLC CPU)</li> <li>PERIPHERAL I/F (Motion CPU manager)</li> </ul>	RS422/SS	SCNET		Communicate with peripheral by corresponding I/F.		
Ba	ttery		Q6BAT is built in (3.0V)	A6BAT is	built in (3.	.6V)	Pay attention to the using battery is different.		
Fo	rced stop ir	nput	Use EMI terminal of Motion CPU module     Use device specified by forced stop input setting in the system setting	Use EMG unit	terminal o	of main base	Always use a forced stop input cable (Please fabricate it by customers.).		
tra dat	•		Included	-			-		
I/O	points		8192 points	2048 poin	ts	8192 points	-		
	Internal rel	ays (M)	12288 points						
	Latch relay	/s (L)	None(M latch can be set in latchsetting)	Total point in shared		Total point is 8192 in shared M,L,S			
	Step relay		-						
	Link relays		8192 points	1024 point		8192 points			
	Timer s (T		-	256 points		2048 points	Left described devices is shared in		
	Counters (	C)	-	256 points		2048 points	A-Motion but not shared in		
	Data regis	ters (D)	8192 points	1024 points		8192 points	QDS-Motion.		
g	Link regist	ers (W)	8192 points	1024 points		8192 points	Execute automatic refresh setting if		
evice	Annunciate	ors (F)	2048 points	256 points		2048 points	necessary.		
	File registe	ers (R)	-	Up to 8193	2 points				
	Special rel	ays (M)	-	256 points		256 points Refer to Sect		Refer to Section 2.5 for details.	
lİ	Special rel		2256 points	-					
	Special reg	gisters (D)	-	256 points	;				
		gisters (SD)	2256 points	-			•		
	Motion reg		12288 points	-	8192 points (Motion SFC OS only)		-		
	Multiple Cl devices (U		Up to 14336 points <sup>(Note-1)</sup>	-	(11000110		-		
	Coasting ti	mers (FT)	1point(888µs)	-			-		
		. ,	D(P).DDRD, D(P).DDWR,	CHGT, CH	IGV, CHO	GA	Replace motion dedicated PLC		
Мс	otion dedica	ted	D(P).SFCS, D(P).SVST, D(P).CHGT, D(P).CHGT2,	SVST (Non Motio			instruction with D(P).*** instruction. (Refer to SV13/22 Programming		
PL	C instructio	'n	D(P).CHGV, D(P).CHGVS <sup>(Note-2)</sup> , D(P).CHGA, D(P).CHGAS <sup>(Note-2)</sup> , D(P).GINT	-	SFCS, I (Motion S	TP SFC OS only)	Manual (Motion SFC) [type Q173D(S)/Q172D(S)].)		
	SV13		Q172DLX, Q173DPX	A171SEN	C, A172S	ENC	Please use Q172DLX, Q172DEX,		
	otion	SV22	Q172DLX, Q172DEX <sup>(Note-3)</sup> , Q173DPX	A171SENC, A172SENC		ENC	Q173DPX for motion module in the system which used Q173DSCPU/Q172DSCPU.		
mc	odule	Installation position	Motion module cannot be installed in I/O slot 0 to 2	Motion module can be installed in motion I/O slot only			motion I/O slot only install motion modul		In the system using Q173DSCPU/Q172DSCPU, please install motion modules on the I/O slot 3 and later.

\* Synchronous encoders can be used via MR-J4- $\square$ B-RJ.

(Note-1): The maximum number of devices varies depending on the system setting.

(Note-2): Only for SV22 advanced synchronous control

(Note-3): It can be mounted main base unit only

	a)						
Item		Q17nDSCPU	A17nS A171SH	HCPUN/A173UHCPU A172SH A173UH	Points of replacement		
		<ul> <li>QnUD(E)(H)CPU will be No.1</li> <li>Use multiple CPU high-speed main base units (Q35DB, Q38DB, Q312DB).</li> </ul>			Use the system combining with available unit.		
Servo syste	m network	SSCNET III/H, SSCNET III	SSCNET				
Teaching ur	nit	Unusable	Usable		-		
CPU shared memory	Multiple CPU high speed transmission area	Provided					
	Use memory	Multiple CPU high speed transmission area of CPU shared memory	Device sha	ared between SCPU and	Assign the device which used in PLC CPU by automatic refresh setting		
Automatic refresh	Automatic refresh setting	Can be set in the range of 32	PCPU		manually to Motion CPU device after project diversion.		
	Multiple CPU high speed refresh function	Provided					
LED display		7-segment LED status display	Each LED	of RUN, ERR	-		
Latch range	Latch (1)	Latch clear (1) of remote latch clear can clear in latch clear (1) (2)	1		Please execute latch clear in MT		
setting	Latch (2)	Can be cleared by latch clear (1) (2) of remote latch clear	Clear by L	.CLR switch.	Works2.		
All clear fun	ction	Execute it by installation mode	None		-		
Self diagnos	sis error	When the error of Motion CPU occurs independently, set it in the range of 10000 to 10999 according to the classification of error in diagnosis error (SD0). At this moment, self diagnosis error flag (SM1) and diagnosis error flag (SM0) are also ON.	Even if the error of PCPU occurs, self diagnosis error will not occur.		Correct the program if necessary.		
Motion error detection flag (M2039)		No matter which error occurs, M2039 will be ON in Motion CPU.	-	Depending on the type of an error that occurred, M2039 is turned ON. (Only when SFC is used)	Correct the program if necessary.		
Latch clear		Remote operation	L.CLR swi	tch	-		
RUN/STOP		Remote operation, RUN/STOP switch	RUN/STO	P switch	-		
ROM writing		<ul> <li>Execute in RAM operation mode/ROM operation mode (installation switch operation of Motion CPU module is not necessary)</li> <li>Data of MT Works2 can be wrote to ROM directly</li> </ul>	None		None		-
ROM operation	tion mode	Select by rotary switch	None		-		
. com opera		colocity rotary ownor					

Item			A17nSH	ICPUN/A173	UHCPU			
		Q17nDSCPU	A171SH	A172SH	A173UH	Points of replacement		
Installation mode		Select by rotary switch	Select by di	p switch		-		
Mechanical system program (SV22)		Ball screw and electronic gear setting of rotary table can be automatically calculated from the setting value of "Number of Pulses/Rev." and "Travel Value/Rev." of fixed parameter.	Ball screw and electronic gear - setting of rotary table are set respectively in mechanical system program.		setting of rotary table are set respectively in mechanical system		set	-
	SV13	0.22ms/1 to 4 axes 0.44ms/5 to 10 axes 0.88ms/11 to 24 axes 1.77ms/25 to 32 axes	3.5ms/1 to 4 axes	3.5ms/1 to 8 axes	3.5ms/1 to 20 axes 7.1ms/21 to 32 axes	When the operation cycle is set as default (automatic), the operation		
Operation cycle (default value)	SV22	0.44ms/1 to 6 axes 0.88ms/7 to 16 axes 1.77ms/17 to 32 axes The operation cycle setting (0.2 [ms]/0.4 [ms]) can be configured. <sup>(Note-1)</sup> (Note-2)	3.5ms/1 to 4 axes	3.5ms/1 to 8 axes	3.5ms/1 to 12 axes	cycle will change. Operation cycle changes as left describing, and the program execution timing will change, so set the fixed operation cycle if necessary.		

(Note-1): The following restrictions are applied when the communication method is "SSCNET III".

• When the operation cycle is 0.2 [ms], set "0 to 3" for the axis select switch setting of the servo amplifier, and configure the system setting.

• When the operation cycle is 0.4 [ms], set "0 to 7" for the axis select switch setting of the servo amplifier, and configure the system setting.

For details, refer to the instruction manual of the servo amplifier.

(Note-2): When MR-J4W3-DB (Software version: A2 or earlier) or MR-J3W-DB is used, set 0.4 [ms] or more for the operation cycle.

## 3.1.2 Difference between self diagnosis error and Motion (SFC) error history

Colfalian	io orror	¥			. /	Ē			
Seit diagnos	sis error code	1	Error flag state O: ON X: OFF Celf diamaging arror flag Motion (SFC) Motion error detection						
			Self diagno	sis error flag	error h		flag		
Q17nDSCPU (SD0)	A17nSHCPN/ A173UHCPU (D9008)	Description	Q17nDSCPU (SM1)	A17nSHCPU N/A173UHCP U (M9008)	Q17nDSCPU (#8640 + 12n)	(SFC version only) A172SHCP UN/A173U HCPU (#8000 + 8n)	Q17nDSCPU (M2039)	(SFC version only) A172SHCP UN/ A173UHCP U (M2039)	
1 to 9999	10 to 84	Self diagnosis error besides Motion CPU independent error	0	0	0	×	0	×	
10002	-	Minor/major error (command generation axis)	0	×	0	×	0	×	
10003	-	Minor/major error	0	×	0	0	0	0	
10004	-	Minor/major error (virtual servo motor axis)	0	×	0	0	0	0	
10005	-	Minor/major error (synchronous encoder axis)	0	×	0	0	0	0	
10006	-	Servo error	0	×	0	0	0	0	
10006	-	Servo warning	0	×	0	0	0	0	
10007	-	Servo program setting error	0	×	0	0	0	0	
10008	-	Mode switching error	0	×	0	0	0	0	
10009	-	Manual pulse axis setting error	0	×	0	0	0	0	
10010	-	Test mode requirement error	0	×	0	0	0	0	
10011	-	WDT error	0	×	0	0	0	0	
-	-	Personal computer link communication error	×	×	×	0	×	0	
10014	-	System setting error	0	×	0	×	0	×	
10015	-	Servo amplifier (MR-J4-□B) servo error	0	×	0	×	0	×	
10016	-	Motion slot error	0	×	0	×	0	×	
10020	-	Motion SFC control error (F/FS)	0	×	0	0	0	0	
10021	-	Motion SFC control error (G)	0	×	0	0	0	0	
10022	-	Motion SFC control error (K or others (not F, FS, G))	0	×	0	0	0	0	
10023	-	Motion SFC control error (Motion SFC chart)	0	×	0	0	0	0	
10030	-	Motion CPU internal bus error	0	×	0	×	0	×	
10042	-	SSCNET III/H head unit error	0	×	0	×	0	×	
10050	-	Safety observation error (alarm) occurrence	0	×	0	×	0	×	
10051	-	Safety observation error (warning) occurrence	0	×	0	×	0	×	

\*: n shows the value (n=0 to 7) corresponding to motion error history.

Difference			
Item	Q17nDSCPU	A17nSHCPUN/ A173UHCPU	Change/Revise content
System setting/SSCNET configuration	configuration Q172DSCPU: 1 system A172SHCPUN: 1 system		Configure the rotary switch setting of the servo amplifier according to the SSCNET configuration.
Electronic gear	Number of pulses per revolution: 1 to 2147483647[pulse] Travel value per revolution: 1 to 2147483647[pulse]	Number of pulses per revolution: 1 to 65535[pulse] Travel value per revolution: 1 to 65535[pulse]	Change the number of pulses per revolution and the travel value per revolution of the fixed parameter according to the resolution per revolution of the connected servo motor.
Connect/disconnect of SSCNET communication when servo amplifier power supply is OFF	When an SSCNET III cable or a servo amplifier in the middle of the SSCNET system is replaced while the multiple CPU system is on, use the connect/disconnect function of the SSCNET communication.	SSCNET cables or servo amplifiers in the middle of the SSCNET system can be replaced while the system is on.	When the power supply servo amplifier is OFF/ON in SSCNET system, use connect/disconnect function of SSCNET communication. For details, refer to Motion controller Q series programming manual (common) (Q173D(S)CPU/Q172D(S)CPU) (IB-0300126) and "4.11.1 Connect/disconnect function of SSCNET communication".
Battery break warning/ battery warning	Servo error code 2102(92): Battery break warning 2116(9F): Battery warning	Servo error code 2102(9F): Battery warning 2103(92): Battery break warning	Correct the program using the left servo error code.

## 3.1.3 Item that is necessary to change/revise with the change of servo system network

## 3.2 Device Comparison

### 3.2.1 I/O device

	Q17nDSCPU	A173UHCPU	A172SHCPUN	A171SHCPUN
X/Y0 X/Y7FF	User device	User device (8192 points)		device points)
X/Y800 X/Y1FFF	(8192 points)			

#### 3.2.2 Internal relay (1) SV13

(1)	SV13					
	Q173DSCPU	Q172DSCPU	A173UHCPU	A172SHCPUN	A171SHCPUN	
MO				User device		
				(1600	points)	
M1600				Status of each axis	Status of each axis	
WITCOO				(20 points x 8 axes)	(20 points x 4 axes)	
M1680					Unusable	
M1680				Unusable	(120 points)	
1011000	User d	evice	User device	(40 points)	(120 points)	
	(2000 p	points)	(2000 points)		Command signal of each	
M1760				Command signal of each	axis	
				axis	(20 points x 4 axes)	
N44000				(20 points x 8 axes)	Unusable	
M1800					(80 points)	
M1880						
M1960						
M2000			Common	Common devi	ce (88 points)	
	Common dovio	a (220 pointa)	device			
M2047	Common devic	e (320 points)	(320 points)			
M2048			(320 points)			
M2320	Linuachia (	90 nainta)	Unusable			
1012320	Unusable (		(80 points)			
M2400		Status of each axis	Status of			
1012400	Status of each axis	(20 points x 16 axes)	each axis			
M2720	(20 points x 32 axes)	User device	(20 points x			
1012720		(320 points)	32 axes)			
M3040	Unusable (	32 points)				
M3072	Common device (	command signal)	Unusable			
1013072	(64 pc	pints)	(160 points)			
M3136	Unusable (	64 points)		/	/	
		Command signal of	Command			
M3200	Command signal of	each axis	signal of			
1013200	each axis	(20 points x 16 axes)	each axis			
	(20 points x 32 axes)		(20 points x			
M3520			32 axes)			
M3840						
	Lloor doutes	User device	Lloor doutes			
	User device	(4671 points)	User device			
	(4351 points)		(4351 points)			
M8191						

(2)	SV22 Real mode	017000000			
N40	Q173DSCPU	Q172DSCPU	A173UHCPU	A172SHCPUN	A171SHCPUN
MO				User device (13	
M1360				Synchronous encoder axis status (4 points x 1 axis)	
M1364				User device (2	
WI1004					
M1600	User d	avice	User device	Status of each axis (20 points x 8 axes)	Status of each axis (20 points x 4 axes)
M1680 M1760	(2000 p		(2000 points)	Unusable	Unusable
M1700 M1800	(	,	()	(40 points)	(120 points)
M1880				Command signal of each axis (20 points x 8 axes)	Command signal of each axis (20 points x 4 axes) Unusable (80 points)
M1960					/
M2000	Common	device	Common device	Common device (88 points)	
M2047	(320 pc	pints)	(320 points)		
M2048					/
M2320	Unusable (8		Unusable (80 points)		/
M2400	Status of each axis	Status of each axis (20 points x 16 axes)	Status of each axis		
M2720	(20 points x 32 axes)	User device (320 points)	(20 points x 32 axes)		
M3040	Unusable (;				
M3072 M3136	Common device (comm		Unusable (160 points)		
M3200	Unusable ( Command signal of each axis	Command signal of each axis (20 points x 16 axes)	Command signal of each axis		
M3520	(20 points x 32 axes)	User device (320 points)	(20 points x 32 axes)		
M3840	Unusable (1	1 /		,	/
M4000	Virtual servo motor axis status <sup>(Note-1)</sup> (20 points x 32 axes)	Virtual servo motor axis status <sup>(Note-1)</sup> (20 points x 16 axes) User device	User device (800 points)		
M4320	(20 points x 02 axes)	(320 points)		/	
M4640	Synchronous encoder axis status (4 points x 12 axes)		Synchronous encoder axis status (4 points x 4 axes)		
M4656				/	
M4688	Unusable (Note-1	)(112 points)		/	
M4800	Virtual servo motor axis command signal <sup>(Note-1)</sup>	Virtual servo motor axis command signal <sup>(Note-1)</sup> (20 points x 16 axes)	User device		
M5120	(20 points x 32 axes)	User device (320 points)	(3536 points)		
M5440	Synchronous encoder (4 points x	axis command signal			
M5488 M8191	User device (2	·			

(Note-1): This device can be used as a user device when used only in the SV22 real mode.

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(3)	SV22 Virtual mode				
	Q173DSCPU	Q172DSCPU	A173UHCPU	A172SHCPUN	A171SHCPUN
M0				User device (1	360 points)
					Virtual servo
					motor axis
M1200				Virtual servo motor	status <sup>(Note-1)(Note-2)</sup>
				axis status	(20 points x
				(20 points x 8 axes)	4 axes)
M1280					User device <sup>(Note-2)</sup>
101200					(80 points)
M1360				Synchronous enco	
WITCOO				(4 points x 1	
M1364				Unusable <sup>(Note-2</sup>	) (36 points)
					Virtual servo
					motor axis
M1400				Virtual servo motor	command
				axis	signal <sup>(Note-1)(Note-2)</sup>
				command signal	(20 points x
	User de	vice	User device	(20 points x 8 axes)	4 axes)
M1480	(2000 po	ints)	(2000 points)		User device <sup>(Note-2)</sup>
					(80 points)
M1560				Synchronous encod	
WITCOO				signal (4 points	x 1 axis) <sup>(Note-2)</sup>
M1564				Unusable (3	6 points)
					Status of each
M1600				Status of each axis	axis (20 points x
				(20 points x 8 axes)	4 axes)
M1680					Unusable
M1760				Unusable (40 points)	(120 points)
					Command signal
M1800				Command signal of	of each axis
101000				each axis	(20 points x
				(20 points x 8 axes)	4 axes)
M1880					Unusable
WITCOO					(80 points)
M1960				Common devic	e (88 points)
M2000	Common device	(320 points)	Common device		
M2048			(320 points)		
M2320	Unusable (80	) points)	Unusable		
1012320			(80 points)		
M2400		Status of each axis			
1012-400	Status of each axis	(20 points x 16 axes)	Status of each axis		
M2720	(20 points x 32 axes)	User device	(20 points x 32 axes)		
1012720		(320 points)			
M3040	Unusable (32	2 points)	Unusable	/	/
M3072	Common device (command signal) (64 points)		(160 points)		
M3136	Unusable (64	4 points)			
		Command signal of			
M3200	Command signal of each	each axis	Command signal of		
	axis	(20 points x 16 axes)	each axis		
Maean	(20 points x 32 axes)	User device	(20 points x 32 axes)		
M3520		(320 points)			
M3840	Unusable (16	0 points)	Unusable (160 points)		

	Q173DSCPU	Q172DSCPU	A173UHCPU	A172SHCPUN	A171SHCPUN
M4000 M4320	Virtual servo motor axis status (Note-1)(Note-3) (20 points x 32 axes)	Virtual servo motor axis status <sup>(Note-1)(Note-3)</sup> (20 points x 16 axes) User device <sup>(Note-3)</sup> (320 points)	Virtual servo motor axis status <sup>(Note-1)(Note-3)</sup> (20 points x 32 axes)		
M4640	Synchronous encoc (4 points x 12 a		Synchronous encoder axis status <sup>(Note-3)</sup> (4 points x 4 axes)		
M4656		- : + - > (Note-3)	Unusable <sup>(Note-3)</sup>		
M4688	Unusable (112 p		(144 points)		
M4800	Virtual servo motor axis command signal <sup>(Note-1), (Note-3)</sup> (20 points x 32 axes)	Virtual servo motor axis command signal (Note-1), (Note-3) (20 points x 16 axes)	Virtual servo motor axis command signal (Note-1)(Note-3)	/	
M5120		User device <sup>(Note-3)</sup> (320 points)	(20 points x 32 axes)		
M5440	Synchronous encoder axis command signal <sup>(Note-3)</sup> (4 points x 12 axes)		Synchronous encoder axis command signal <sup>(Note-3)</sup> (4 points x 4 axes)		
M5456			Unusable <sup>(Note-3)</sup> (32 points)		
M5488 M8191	User device <sup>(Note-4)</sup> (2704 points)		User device <sup>(Note-4)</sup> (2704 points)		

(Note-1): Only the area of axis set by mechanical system program is occupied. The area of unused axis set by mechanical system program can be used by user.

(Note-2): When using virtual mode, do not set latch range as M1200 to M1599.

(Note-3): When using virtual mode, do not set latch range as M4000 to M5487.

(Note-4): Cam axis command signal and smoothing clutch completion signal can be set to any device by parameter.

## 3.2.3 Data register

(1) SV13	
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	Q173DSCPU	Q172DSCPU	A173UHCPU	A172SHCPUN	A171SHCPUN
D0	Monitor device of each axis (20 points x 32 axes)	Monitor device of each axis (20 points x 16 axes)	Monitor device of each axis		
D320	(20 points x 52 axes)	User device (320 points)	(20 points x 32 axes)	User d	evice
D640	Control change register	Control change register (2 points x 16 axes)	Control change register	(800 p	oints)
D672	(2 points x 32 axes)	User device (32 points)	(2 points x 32 axes)		
D704	Common device (comma	nd signal) (54 points)	Common device		
D758	Unusable (42	2 points)	(96 points)		-
D800				Monitor device of each axis (20	Monitor device of each axis (20 points x 4 axes)
D880				points x 8 axes)	Unusable (80 points)
D960	User device (7392 points)		User device (7392 points)	Control change register register (6 points x	-
D984				8 axes)	Unusable (24 points)
D1008				Common devi	ce (16 points)
D1024 D8191					

## (2) SV22 Real mode

(2)					
	Q173DSCPU	Q172DSCPU	A173UHCPU	A172SHCPUN	A171SHCPUN
D0	Monitor device of each axis (20 points x 32 axes)	Monitor device of each axis (20 points x 16 axes)	Monitor device of each axis		
D320		User device (320 points)	(20 points x 32 axes)		(749 pointo)
D640	Control change register	Control change register (2 points x 16 axes)	Control change register	User device	(746 points)
D672	(2 points x 32 axes)	User device (32 points)	(2 points x 32 axes)		
D704					
D748	Common device (co	mmand signal)	Common device	Synchronous enco	oder axis monitor
D752	(54 poin	ts)	Common device (96 points)	dev	ice
D752			(90 points)	(4 points	x 1 axis)
D758	Unusable (42	points)		User device	(48 points)
D800		Virtual servo motor axis			Monitor device
		monitor device		Monitor device of	of each axis
D880		(10 points x 16 axes)		each axis	(20 points x 4
				(20 points x 8	axes)
D960				axes)	Unusable
0000	Virtual servo motor axis				(80 points)
	monitor device		User device		Control change
	(10 points x 32 axes)		(320 points)	Control change	register
D984	(	User device		register	(6 points x
		(160 points)		(6 points x	4 axes)
				8 axes)	Unusable
					(24 points)
D1008				Common device	ce (16 points)
D1024					
			Synchronous encoder		
D1120	Synchronous encoder a		monitor device		
	(10 points x 1	2 axes)	(6 points x 4 axes)		
D1144		I			
		Cam axis monitor		/	/
D1240	Cam axis monitor device	device			
	(10 points x 32 axes)	(10 points x 16 axes)	User device		
D1400			(7048 points)		
D1560		User device			
	User device (6632 points)	(6792 points)			
D8191				$\checkmark$	

## (3) SV22 Virtual mode

Do axis (20 points x 32 axes)         Monitor device of each axis (20 points x 16 axes)         Monitor device of each axis (20 points x 32 axes)         (670 points)           D640         Control change register (2 points x 32 axes)         Control change register (2 points x 32 axes)         Current value after differential gear of vitual servo motor axis monitor device (3 points)         Current value after differential gear of vitual servo motor axis monitor device (3 points)         Current value after differential gear of vitual servo motor axis monitor device (3 points)           D670         Control change register (2 points x 32 axes)         Current value (3 points)         Current value after differential gear of vitual servo motor axis monitor device (3 points)           D678         Control change register (2 points x 32 axes)         Current value (3 points)         Current value after differential gear of vitual servo motor axis axes)           D688         Common device (command signal) (5 points)         Current value of differential gear of vitual servo motor axis monitor device (3 points x 1 axes)         Current value of differential gear of vitual servo motor axis monitor device (3 points x 1 axes)           D760         Unusable (42 points)         Vitual servo motor axis monitor device (3 points x 1 axes)         Common device (3 points x 1 axes)           D760         Unusable (42 points)         Vitual servo motor axis monitor device (3 points x 1 axes)         Control change gear axis monitor device (4 points x 2 axes)         Control change gear axis monitor device (4 points x 3 axes)	(3)	Q173DSCPU	Q172DSCPU	A173UHCPU	A172SHCPUN	A171SHCPUN
D0         Monitor device of each axis (20 points x 32 axes)         Monitor device fach axis (20 points x 4 axes)         Current value affective (20 points x 4 axes)         Current value of differential gear axes)         Current value of differential gear (20 points x 4 axes)         Monitor device axes)         Monitor device (20 points x 4 axes)         Monitor device axes)         Monitor device axes)         Monitor device (20 points x 4 axes)         Monitor device (20 points x 4 axes)         Monitor device (20 points x 4 axes)         Monitor device axes)         Monitor device (20 points x 4 axes)         Monitor device						ATTOLOFUN
adds (20 points x 32 axes)         (20 points x 32 axes)         (20 points x 32 axes)         (27 points x 32 axes)           0540         User device (2 points x 16 axes)         Control change register (2 points x 32 axes)         Corrent value after differential gear of virtual serve motor axis man shaft <sup>(Nerr)</sup> Current value after differential gear of virtual serve motor axis man shaft <sup>(Nerr)</sup> Current value after differential gear of virtual serve motor axis man shaft <sup>(Nerr)</sup> Current value after differential gear of virtual serve motor axis man shaft <sup>(Nerr)</sup> Current value after differential gear of virtual serve motor axis man shaft <sup>(Nerr)</sup> Current value after differential gear of virtual serve motor axis man shaft <sup>(Nerr)</sup> User device (2 points x 32 axes)           0668         Current value of differential gear of virtual serve motor axis motor axis mot	D0					
0.02.00         Outer device (3.01 points)         Control change register (2 points x 16 axes)         Control change register (2 points x 16 axes)         Control change register (2 points x 16 axes)         Control change register (2 points x 32 axes)         Control change register (2 point						
0640         0.672         (2 points x 16 axes)         Current value after differential gear of virtual servo motor axis main shaft <sup>(Nac.)</sup> (2 points x 32 axes)         Current value after differential gear of virtual servo motor axis main shaft <sup>(Nac.)</sup> (2 points x 32 axes)         Current value after differential gear of virtual servo motor axis main shaft <sup>(Nac.)</sup> (2 points x 32 axes)         Current value after differential gear of virtual servo motor axis main shaft <sup>(Nac.)</sup> (2 points x 32 axes)           0668         Control change register (2 points x 32 axes)         Control change register (2 points x 32 axes)         Current value after differential gear of synchronous encoder axis main shaft <sup>(Nac.)</sup> (2 points x 4 axes)           0668         Corrent value change (32 points x 3 axes)         Current value after differential gear of synchronous encoder axis main shaft <sup>(Nac.)</sup> (2 points x 4 axes)         Current value after differential gear of synchronous encoder axis monitor device (86 points)           0760         Common device (command signal) (54 points)         Virtual servo (65 points x 6 axes)         Virtual servo motor axis monitor device (86 points x 6 axes)         Virtual servo (6 points x 4 axes)           0760         Unusable (4 points x 16 axes) (6 points x 16 axes) (6 points x 16 axes) (6 points x 16 axes) (6 points x 3 axes)         Monitor device eech axis <sup>(Nac.)</sup> (6 points x 4 axes) (6 points x 4 axes) (7	D320	(20 points x 32 axes)		(20 points x 32 axes)	(670 p	ooints)
0672         (2 points x 16 axes)         (2 points x 16 axes)         Control change register         Current value gear of virtual gear of virtu	5040				, ,	,
D670         Control change register (2 points x 32 axes)         User device (32 points)         Control change register (2 points x 32 axes)         Current value asis man shaft servo motor axis main shaft <sup>Nue</sup> )         Current value asis man shaft servo motor axis main shaft <sup>Nue</sup> )         Control change register (2 points x 4 axes)         Control change register	D640		(2 points x 16 axes)			
D670         Control change register (2 points x 32 axes)         User device (32 points)         Control change register (2 points x 32 axes)         Current value are of virtual servo motor axs main shaft (2 points x 32 axes)         anter differential gear of virtual servo motor axs main shaft (2 points x 32 axes)           D686         Current value (2 points x 32 axes)         Current value servo motor axs main shaft (2 points x 32 axes)         Anter differential gear of virtual servo motor axis main shaft (2 points x 32 axes)           D688         Current value (2 points x 32 axes)         Current value axes)         Current value axes)           D689         Current value (2 points x 4 axes)         Current value axes)         Current value axes)           D689         Current value (2 points x 4 axes)         Current value (2 points x 4 axes)         Current value (2 points x 4 axes)           D700         Common device (9 points x 4 axes)         Current value (9 points x 4 axes)         Current value (9 points x 4 axes)           D774         Common device (9 points x 4 axes)         Synchronous encource (9 points x 4 axes)         Current value (9 points x 4 axes)         Current value (9 points x 4 axes)           D780         Virtual servo motor axis monitor device (10 points x 1 axes)         Current value (10 points x 4 axes)         Current value (10 points x 4 axes)           D780         Virtual servo motor axis monitor device (10 points x 4 axes)         Contrat chare (20 points x 4 axes)         Co	D672					
D670         Control change register (2 points x 32 axes)         User device (32 points)         Control change register (2 points x 32 axes)         Control change register (2 points x 32 axes)         Control change register (2 points x 32 axes)         (2 points x 4 axes)         gear of virtual gear of virtual gear of virtual servo motor axis main shaft <sup>Nuter</sup> )         (2 points x 4 axes)         gear of virtual gear of virtual g						
D670         Control change register (2 points x 32 axes)         User device (32 points)         Control change register (2 points x 32 axes)         ases)         ases)         ases)         ases)         user device (32 points x 32 axes)         User device (32 points x 32 axes)         Control change register (2 points x 32 axes)         User device (32 points)         User device (32 points)         Control change register (2 points x 32 axes)         User device (3 points)         Unusable         Virtual servo motor axis monitor device (3 points x 4 axes)         Virtual servo monitor device (3 points x 4 axes)         User device (3					Current value	
0670         Control change register (2 points x 32 axes)         User device (32 points x 32 axes)         Control change register (2 points x 32 axes)         axis main shaft (9 conts x 4 axes)         axis main shaft (9 conts x 4 axes)           0686         Control change register (2 points x 32 axes)         Control change register (2 points x 32 axes)         axis main shaft (2 points x 32 axes)         axes)         user device (8 points)           0688         Control change register (2 points x 4 axes)         User device (8 points)         User device (8 points)         User device (9 points)           0700         Common device (command signal) (54 points)         Common device (96 points)         Virtual servo motor axis monitor device (16 points x 1 axes)         Carm axis monitor device (16 points x 1 axes)           0780         Virtual servo motor axis monitor device (16 points x 1 axes)         Virtual servo motor						0
Control change register (2 points x 32 axes)         User device (32 points)         Control change register (2 points x 32 axes)         Serve motor axis main shaft <sup>(Nac.1)</sup> (2 points x 8 axes)         (2 points x 4 axes) axes)           D688	D670				gear of virtual	
Control change register         (2 points x 3         (2 points x 4         (2 points 2)         (2 points x 4 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td></td<>						
0678         (2 points x 3 2 axes)         User device (32 points)         (2 points x 3 2 axes)         (2 points x 3 2 axes)         (2 points x 3 2 axes)         User device (8 points)           D686         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0		Control change register		Control change register		(2 points x 4
D678         (32 points)         (31 points) <td< td=""><td></td><td></td><td>User device</td><td></td><td></td><td></td></td<>			User device			
D686	D679		(32 points)		axes)	User device
D686         synchronous encoder a/s main (2 points ×1 axis)         Unusable (2 points ×1 axis)           D700         Unusable (12 points ×1 axis)         Unusable (12 points ×1 axis)           D700         Virtual servo motor axis monitor device (00er)         User device (24 points)           D724         Unusable (42 points)         Synchronous encoder a/s main monitor device (00er)         User device (24 points)           D752         Unusable (42 points)         Unusable (42 points)         Common device (06 points)         Synchronous encoder a/s monitor device (00er)           D756         Unusable (42 points)         Virtual servo motor axis monitor device (16 points x 4 axes)         Cam axis monitor device (20 points)           D760         Unusable (42 points)         Virtual servo motor axis monitor device (16 points x 4 axes)         Cam axis monitor device of (20 points)         Cam axis monitor device of (20 points)           D800         Virtual servo motor axis monitor device (16 points x 3 axes)         Virtual servo motor axis monitor device of (20 points)         Control change register (16 points x 4 axes)           D980         Virtual servo motor axis monitor device (16 points)         Unusable (24 points)         Control change register (16 points x 4 axes)         Con	D070					(8 points)
De88						-
D688         (2 pints × 1 axis)           D700         Unusable         Unusable           D700         Unusable         Unusable           D700         Common device (command signal)         Virtual servo         montor axis           D724         Common device (command signal)         (6 points × 1 axis)         (6 points × 1 axis)           D724         Common device (command signal)         (6 points × 1 axis)         (6 points × 1 axis)           D724         Common device (command signal)         (6 points × 1 axis)         (6 points × 1 axis)           D752         Common device (a points)         Synchronous encource axis montor device (9 points)         Synchronous encource axis montor device (9 points)           D750         Unusable (42 points)         Cam axis montor device (9 points)         Cam axis           D760         Unusable (42 points)         Cam axis montor device (9 points)         Cam axis           D780         Unusable (42 points × 1 6 axes)         Current value after differential gear 0 virtual servo motor axis axis (20 points)         Cortrol change register (6 po	D686					
D688         Unushle (12 points)         Unushle (12 points)         Witual servo motor axis monitor device (%est)         Mitual servo (%est)         Mitual servo (%est)         Mitual servo (%est)         Mitual servo (%est)           D748         Unusable (42 points)         Virtual servo motor axis monitor device (%est)         Synchronous encoder axis monitor device (4 points)         Synchronous encoder axis monitor device (4 points)         Cam axis monitor (%est)         Synchronous encoder axis monitor device (%est)         Cam axis monitor device (%est)         Synchronous encoder axis monitor device (%est)         Cam axis m						
D688         (12 points)           D700         (6 points x4 motor axis monitor device (6 points x4 axes)         Virtual servo motor axis monitor device (6 points x4 axes)         (6 points x4 axes)         (6 points x4 axes)           D724         (6 points x6 axes)         (7 points x6 motor axis monitor device (24 points)         User device (24 points)           D752         (7 points x6 axes)         Synchronous encoder axis monitor device (24 points)         Synchronous encoder device (4 points x1 axis)           D752         Unusable (42 points)         Synchronous encoder axis monitor device (36 points x6 axes)         Synchronous encoder device (4 points x1 axis)           D760         Unusable (42 points)         Synchronous encoder device (10 points x 4 axes)         Cam axis monitor device (10 points x 4 axes)           D780         Virtual servo motor axis monitor device (16 points x 16 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 16 axes)         Virtual servo motor axis monitor device (16 points x 2 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)^{(Note-1)}         Monitor device (16 points x 4 axes)         Control change register (6 points x 4 axes)           D800         Virtual servo motor axis monitor device (16 points x 16 axes)^{(Note-1)}         Virtual servo motor axis monitor device (16 points x 32 axes) (20 points x 8 axes)         Control change register (6 points x 4 axes)           D8800         Virtual servo motor axis monitor de						
D700         Interview         Virtual servo motor axis monitor device (%0ser)         Virtual servo (%0ser)         Virtual servo (%0ser) <t< td=""><td>D688</td><td></td><td></td><td></td><td></td><td></td></t<>	D688					
D704     Common device (command signal) (54 points)     Image: Common device (command signal) (55 points x 4 axes)     Image: Common device (command signal) (5752     Image: Common device (command signal) (5753     Image: Command signal) (5753     Im	D700					
D704     monitor device (command signal) (54 points )     (6 points x 4 axes)     (6 points x 8 axes)     (6 points x 8 axes)     (6 points x 8 axes)       D724     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.552     0.					Virtual servo	motor axis
D764     Common device (command signal) (54 points)     Common device (command signal) (24 points)     Common device (command signal) (20 points)     Control change (command signal) (20 points)     Monitor device (command signal) (20 points) </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
D724     Common device (command signal) (54 points)     (6 points x 8 axes)     (6 points x 8 axes)     (2 points) x 1 axes)       D748     Common device (24 points)     (2 points)     User device (24 points)       D752     Common device (96 points)     Synchronous encoder axis monitor device (4 points x 1 axis)     Cam axis monitor device (96 points)       D760     Unusable (42 points)     Unusable (42 points)     Cam axis monitor device (16 points x 8 axes)     Cam axis monitor device (96 points)       D780     Unusable (42 points)     Virtual servo motor axis monitor device (16 points x 1 axis)     Monitor device (16 points x 4 axes)       D800     Unusable (42 points)     Virtual servo motor axis monitor device (16 points x 1 axis)     Monitor device (16 points x 4 axes)       D800     Unusable (4 points x 16 axes) current value after differential gear of virtual servo motor axis shaft (4 points x 32 axes)     Virtual servo motor axis monitor device (16 points x 4 axes)       D800     Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)     Virtual servo motor axis monitor device (16 points x 4 axes)       D800     Unusable (4 points x 32 axes)     Control change register (6 points x 4 axes)       D800     Unusable (4 points x 32 axes)     Control change register (6 points x 4 axes)       D800     Unusable (4 points x 32 axes)     Control change register (6 points x 4 axes)       D800     Control change register (6 points x 4 axes) <td>D704</td> <td></td> <td></td> <td></td> <td></td> <td></td>	D704					
D724     Common device (54 points)     Common device (54 points)     User device (24 points)     User device (24 points)       D748     D752     Common device (96 points)     Synchronous encoder axis monitor device (4 points x 1 axis) <sup>(Mode-1)</sup> (5 points x 8 axes)     Unusable (8 points)       D760     Unusable (42 points)     Virtual servo motor axis monitor device <sup>(Mode-1)</sup> (6 points x 16 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)     Virtual servo motor axis monitor device <sup>(Mode-1)</sup> (6 points x 16 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)     Virtual servo motor axis monitor device <sup>(Mode-1)</sup> (6 points x 16 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)     Virtual servo motor axis monitor device <sup>(Mode-1)</sup> (6 points x 32 axes)     Monitor device (a points x 4 axes)     Monitor device (a points x 4 axes)       D880     Virtual servo motor axis monitor device <sup>(Mode-1)</sup> (6 points x 32 axes)     Virtual servo motor axis monitor device <sup>(Mode-1)</sup> (4 points x 32 axes)     Monitor device (a points x 4 axes)     Monitor device (a points x 4 axes)       D884     D984     D984     Unusable     Common device (16 points x 1		Common dovico	(command signal)			• •
D724       (24 points)         D748       (24 points)         D752       (24 points)         D753       (96 points)         D756       (96 points)         D760       Unusable (42 points)         D780       Cam axis monitor device (Note-1) (5 points x 8 axes)         D780       (16 points x 1 axes) (Note-1) (6 points x 16 axes) (Note-1) (6 points x 32 axes)         D800       Virtual servo motor axis main monitor device (Note-1) (6 points x 16 axes) (Note-1) (6 points x 32 axes) (Note-1) (16 points x 32 axes) (Note-1)         D800       Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1) (16 points)         D884       User device (160 points)         D884       D984						,
D748       Common device (96 points)       device (4 points x1 axis) (Moder-1) Unusable (8 points)         D750       Unusable (42 points)       Cam axis monitor device (Moder-1) (5 points x 8 axes)       Cam axis monitor device (Moder-1) (5 points x 8 axes)         D760       Unusable (42 points)       Virtual servo motor axis monitor device (Moder-1) (6 points x 16 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Moder-1)       Virtual servo motor axis monitor device (20 points x 4 axes)       Monitor device (20 points x 4 axes)         D880       Virtual servo motor axis monitor device (Moder-1)       Virtual servo motor axis monitor device (20 points x 4 axes)       Monitor device (20 points x 4 axes)       Monitor device (20 points x 4 axes)         D880       Virtual servo motor axis monitor device (Moder-1)       Virtual servo motor axis monitor device (16 points x 32 axes)       Virtual servo motor axis monitor device (16 points x 32 axes)       Monitor device (20 points x 4 axes)         D880       Virtual servo motor axis main shaft (4 points x 32 axes) (Mote-1)       Unusable (160 points)       Virtual servo motor axis main shaft (4 points x 32 axes)(Mote-1)       Control change register (6 points x 4 axes)       Control change register (6 points x 4 axes)         D984       D1008       Unusable       Common device (16 points)       Common device (16 points)	D724	(0+ p	onto)		,	
D752       Common device       device (4 points x1 axis)       Common device         D758       Unusable (42 points)       (96 points)       Unusable (8 points)       Unusable (8 points)         D760       Unusable (42 points)       Virtual servo motor axis monitor device (Note-1) (5 points x 8 axes)       Carn axis monitor device (Note-1) (5 points x 4 axes)       (5 points x 4 axes)       User device (20 points)         D780       Virtual servo motor axis monitor device (Note-1) (6 points x 16 axes)       (6 points x 16 axes)       Virtual servo motor axis monitor device (Note-1) (6 points x 16 axes)       Monitor device of each axis (20 points x 8 axes)       Monitor device of each axis (20 points x 4 axes)         D880       Virtual servo motor axis monitor device (Note-1) (6 points x 16 axes)       Virtual servo motor axis main shaft (4 points x 32 axes)       Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)       Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)       Unusable (6 points x 4 axes)         D984       D1008       Unusable       User device (16 points)       User device (16 points)       Corntrol change register (6 points x 4 axes)	D749					
D758       Unusable (42 points)       Image: Carr axis monitor device (Note-1) (5 points x 4 axes)       Carr axis monitor device (Note-1) (5 points x 4 axes)         D780       Virtual servo motor axis monitor device (Note-1) (6 points x 16 axes) (Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1) (4 points x 16 axes) (Note-1) (4 points x 32 axes) (Note-1)       Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1) (160 points)       Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1) (160 points)       Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1) (160 points)       Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1) (160 points)       Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1) (160 points)       Virtual servo motor axis main shaft (160 points)       Virtual servo motor axis mai				Common device	device (4 points	s x1 axis) <sup>(Note-1)</sup>
D758     Unusable (42 points)     Virtual servo motor axis monitor device (Note-1) (5 points x 8 axes)     Cam axis monitor device (Note-1) (5 points x 4 axes)     Monitor device (Note-1) (5 points x 4 axes)       D780     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Monitor device of each axis (Note-1) (1 points x 32 axes)     Monitor device of each axis (Note-1) (1 points x 32 axes)       D800     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Virtual servo motor axis monitor device (Note-1) (1 points x 32 axes)     Monitor device of each axis (Note-1) (2 points x 8 axes)     Monitor device of each axis (Note-1) (2 points x 8 axes)       D800     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Monitor device of each axis (Note-1) (2 points x 8 axes)     Unusable (80 points)       D960     Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)     Virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)     Control change register (6 points x 4 axes)     Control change register (6 points x 4 axes)       D984     D1008     Commot device (16 points)     Commot device (16 points)				(96 points)	Unusable	(8 points)
D760     Unusable (42 points)     Image: Additional and the second secon	D758					
D760     Unusable (42 points)     (5 points x 4 axes)     (5 points x 4 axes)       D780     User device (20 points)     User device (20 points)       D800     Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 32 axes)     Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 32 axes)     Monitor device <sup>(Note-1)</sup> (6 points x 32 axes)     Monitor device (20 points)       D800     Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 32 axes)     Virtual servo motor axis monitor device <sup>(Note-1)</sup> (4 points x 16 axes) <sup>(Note-1)</sup> Virtual servo motor axis monitor device <sup>(Note-1)</sup> (4 points x 16 axes) <sup>(Note-1)</sup> Monitor device of each axis <sup>(Note-1)</sup> (6 points x 32 axes)     Unusable (80 points)       D960     Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) <sup>(Note-1)</sup> User device (16 points x 32 axes) <sup>(Note-1)</sup> Control change register (6 points x 4 axes)     Control change register (6 points x 4 axes)       D984     D1008     Unusable     Common device (16 points x 4)     Common device (16 points x 4)						
D780        device (Note-1) (5 points x 8 axes)         (5 points x 4 axes)        D780        virtual servo motor axis monitor device (Note-1) (6 points x 16 axes) Current value after differential gear of virtual servo motor axis main shaft       (4 points x 32 axes)       Current value after differential gear of virtual servo motor axis main shaft       (4 points x 32 axes)       (Vote-1)       (4 points x 16 axes)       (Note-1)       (4 points x 32 axes)       (160 points       (160 poin	D760					
D780     axes)     axes)       D800     Virtual servo motor axis monitor device (Note-1) (6 points x 16 axes)     Virtual servo motor axis monitor device (Note-1) (6 points x 16 axes)     Monitor device of each axis (Note-1) (20 points x 8 axes)     Monitor device of each axis (20 points x 4 axes)       D8800     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)     Monitor device of each axis (Note-1) (20 points x 8 axes)     Unusable (80 points)       D960     Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)     User device (16 points x 32 axes) (160 points)     Control change register (6 points x 8 axes)     Control change register (6 points x 4 axes)       D984     D1008     User device (16 points)     Common device (16 points)     Common device (16 points)		Unusable	(42 points)			(5 points x 4
D780     User device (20 points)       D800     Virtual servo motor axis monitor device (Nole-1) (6 points x 16 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)     Virtual servo motor axis monitor device (Nole-1) (6 points x 16 axes)     Monitor device (of each axis (20 points x 4 axes)       D800     Virtual servo motor axis monitor device (Nole-1) (6 points x 32 axes)     Virtual servo motor axis shaft (4 points x 32 axes)     Monitor device (Nole-1) (20 points x 8 axes)     Monitor device of each axis (Nole-1) (20 points x 8 axes)     Unusable (80 points)       D960     Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Nole-1)     User device (4 points x 32 axes) (Nole-1)     Control change register (6 points x 4 axes)     Control change register (6 points x 4 axes)       D984     D1008     Common device (16 points)     Common device (16 points)     Common device (16 points)						axes)
D800       Virtual servo motor axis monitor device (Note-1) (6 points x 16 axes)       Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)       Monitor device of each axis (20 points x 4 axes)         D8800       Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)       Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)       Monitor device of each axis (20 points x 4 axes)         D8800       Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)       Virtual servo motor axis monitor device (Note-1)       Monitor device of each axis (Note-1)         (6 points x 32 axes)       (4 points x 16 axes) (Note-1)       Virtual servo motor axis monitor device (Note-1)       Virtual servo motor axis monitor device (Note-1)         D9640       Virtual servo motor axis main shaft       User device (160 points)       Virtual servo motor axis main shaft       Servo motor axis main (4 points x 32 axes) (Note-1)       Control change register         D984       D1008       Unusable       Axes)       Unusable	D780				unco)	
D800monitor device (Note-1) (6 points x 16 axes) Current value after differential gear of virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)monitor device (Note-1) (4 points x 16 axes) (Note-1) (4 points x 16 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)Control change register (6 points x 4 axes)Control change register (6 points x 4 axes)D984D1008Image: Control change (160 points)Control change (160 points)Control change (160 points)						
D880Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes)(6 points x 16 axes) Current value after differential gear of virtual servo motor axis main (4 points x 16 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 16 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)Virtual servo motor axis (6 points x 32 axes) (Note-1)Monitor device of each axis (Note-1) (20 points x 8 axes)Unusable (80 points)D984D1008(160 points)User device (16 points)Common device (16 points)Common device (16 points)	0080					
D880Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main (4 points x 16 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main (4 points x 16 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)Virtual servo motor axis monitor device (Note-1) (6 points x 32 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)Monitor device of each axis (Note-1) (20 points x 8 axes)Unusable (80 points)D984D1008Unusable (160 points)Unusable (160 points)Control change (24 points)Control change (24 points)D1008Common device (16 points)Common device (16 points)Common device (16 points)Common device (16 points)	2000					
D880       Virtual servo motor axis monitor device <sup>(Note-1)</sup> servo motor axis main shaft       Virtual servo motor axis main servo motor axis main shaft       Virtual servo motor axis main servo motor axis main shaft       Virtual servo motor axis main servo motor axis main shaft       Virtual servo motor axis main servo motor axis main shaft       Virtual servo motor axis main servo motor axis main servo motor axis main shaft       Control change       register       (6 points x 4         D984       (4 points x 32 axes) (Note-1)       User device       (160 points)       (160 points)       Axees)       Unusable       (24 points)         D1008       Unusable       (16 points)       Unusable       (16 points)       (16 points)       (16 points)						
D880     Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 32 axes)     Servo motor axis shaft (4 points x 16 axes) <sup>(Note-1)</sup> Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 32 axes)     Unusable (80 points)       D960     Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) <sup>(Note-1)</sup> User device (160 points)     Control change register     Control change register       D984     D1008     Control change     Control change (24 points)     Control change (24 points)			_			
monitor device (Note-1)       snatt (4 points x 32 axes)       monitor device (Note-1)       (80 points)         (6 points x 32 axes)       (4 points x 16 axes) (Note-1)       (6 points x 32 axes)       (6 points x 32 axes)         Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) (Note-1)       Lease device (16 points)       Control change register       Control change (6 points x 4 axes)         D984       Lease device (16 points x 32 axes)       (160 points)       Lease device (16 points)       User device (16 points)       User device (16 points)       Unusable (24 points)	D880					
D960     Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) <sup>(Note-1)</sup> Current value after differential gear of virtual servo motor axis main shaft (4 points x 32 axes) <sup>(Note-1)</sup> Control change register (6 points x 4 axes)       D984       D1008					,	(80 points)
D960     differential gear of virtual servo motor axis main shaft (4 points x 32 axes) <sup>(Note-1)</sup> differential gear of virtual servo motor axis main shaft     Control change register (4 points x 32 axes) <sup>(Note-1)</sup> register (6 points x 4 axes)       D984     1     1     1     1       D1008     1     1     1     1				,		
D960     servo motor axis main shaft (4 points x 32 axes) <sup>(Note-1)</sup> servo motor axis main shaft (4 points x 32 axes) <sup>(Note-1)</sup> Control change register (4 points x 32 axes) <sup>(Note-1)</sup> register (6 points x 4 (6 points x 8 axes)       D984     160 points     160 points)       D1008     Common device (160 points)						Control change
bit     shaft (4 points x 32 axes) <sup>(Note-1)</sup> User device (160 points)     shaft (4 points x 32 axes) <sup>(Note-1)</sup> register (6 points x 8 axes)     (6 points x 4 axes)       D984     1100 points     1100 points)     1100 points     1100 points       D1008     1100 points     1100 points     1100 points	D960	-		U U	Control change	-
D984     (160 points)     axes)     Unusable (24 points)       D1008     Common device (16 points)					register	(6 points x 4
D1008 (24 points) Common device (16 points)		(4 points x 32 axes) <sup>(Note-1)</sup>		(4 points x 32 axes) <sup>(Note-1)</sup>		· · · · · ·
D1008 Common device (16 points)	D984		(160 points)		axes)	
U1008 (16 points)					Commor	
	D1008					
	D1024				(10 pc	

	Q173DSCPU	Q172DSCPU	A173UHCPU	A172SHC PUN	A171SHC PUN
D1120	(6 points ) Current value after differential axis ma	er axis monitor device < 12 axes) gear of synchronous encoder ain shaft < 12 axes)	Synchronous encoder axis monitor device <sup>(Note-1)</sup> (6 points x 4 axes) Current value after differential gear of virtual servo motor axis main shaft (4 points x 4 axes)		
D1160			Unusable (80 points)		
D1240	Cam axis monitor device <sup>(Note-1)</sup>	Cam axis monitor device <sup>(Note-1)</sup> (10 points x 16 axes)	Cam axis monitor device <sup>(Note-1)</sup>		
D1400	(10 points x 32 axes)		(10 points x 32 axes)		
D1560 D8191	User device (6632 points)	User device (6792 points)	User device (6632 points)		

(Note-1): Only the areas of axes set with the mechanical system program are occupied. The areas of the axes not used by the mechanical system program can be used by users.

## 3.2.4 Motion register

	Q17nDSCPU		rsion only) /A172SHCPUN	(SFC version only) A171SHCPUN
#0	User device (8000 points)	User device (8000 points)		
#8000			Past 7 times error information (oldest error information)	
#8008			Past 6 times error information	
#8016			Past 5 times error information	
#8024		SFC error history (8 times)	Past 4 times error information	
#8032	Monitor device (640 points)	(64 points)	Past 3 times error information	
#8040			Past 2 times error information	
#8048			Past 1 times error information	
#8056			Latest errors information	
#8064			sable	
#8191		(128)	points)	
#8192				
#8640	Motion error history device (96 points)			
#8736	Product information list device (16 points)			
#8752	System area			/
#12287	(3536 points)			/

## 3.2.5 Special relay

Dev Q17nDSCPU	vice number A17nSHCPUN/ A173UHCPU	Name	Remark
SM60	M9000	Fuse blown detection	
-	M9002	I/O module verification error	
-	M9002	MINI link error	A173UHCPU only
SM53	M9005	AC DOWN detection	Q17nDSCPU: AC/DC DOWN detection
SM52	M9006	Low battery	
SM51	M9007	Low battery latch	
SM1	M9008	Self diagnosis error	
-	M9009	Annunciator detection	
SM0	M9010	Diagnosis error flag	
-	M9011	Operation error flag	
_	M9012	Carry flag	
_	M9012	Data memory clear flag (all data)	
_	M9017	Data memory clear flag (non-latch data)	
-	M9017 M9020	User timing clock No.0	
	M9020	User timing clock No.1	
-	M9021		
-		User timing clock No.2	
-	M9023	User timing clock No.3	
-	M9024	User timing clock No.4	
-	M9025	Clock data set requirement	Clock data of CPU No.1 is operating.
SM211	M9026	Clock data error	
-	M9027	Clock data display	
SM801	M9028	Clock data reading requirement	
-	M9029	Data communication requirement batch processing	A173UHCPU only
-	M9030	0.1 second clock	
-	M9031	0.2 seconds clock	
-	M9032	1 second clock	
-	M9033	2 seconds clock	
-	M9034	1 minute clock	
SM400	M9036	Always ON	
SM401	M9037	Always OFF	
-	M9038	Only 1 scan is ON after RUN	
-	M9039	RUN flag (only 1 scan is OFF after RUN)	
-	M9040	PAUSE enabled coil	
-	M9041	PAUSE status contact	
-	M9042	Stop status contact	
-	M9043	Sampling trace completion	
-	M9044	Sampling trace	
-	M9045	Reset watchdog timer (WDT)	
-	M9046	Sampling trace	A173UHCPU only
-	M9047	Sampling trace preparation	A173UHCPU only
-	M9049	Switch output characters number	
-	M9051	CHG command execution inhibition	A173UHCPU only
-	M9052	Switch SEG command	
-	M9053	Switch EI/DI command	
-	M9054	STEP RUN flag	
_	M9055	Status latch completion	

Dev	vice number	Nama	Domotic
Q17nDSCPU	A17nSHCPUN/	Name	Remark
	A173UHCPU	Main aide D. La atting a security security	
-	M9056	Main side P, I setting requirement	
-	M9057	Sub side P, I setting requirement	
-	M9058	Main side P, I setting completion	
-	M9059	Sub side P, I setting completion	
-	M9065	Partition processing execution detection	
-	M9066	Partition processing requirement flag	
-	M9070	Required search time of A8UPU/A8PUJ	
SM512	M9073	Motion CPU WDT error	
SM500	M9074	PCPU preparation completion	
SM501	M9075	Test mode requirement error	
SM502	M9076	Forced stop input flag	
SM513	M9077	Manual pulse axis setting error flag	
SM510	M9078	Test mode requirement error	
SM516	M9079	Servo program setting error flag	
_	M9081	Communication requirement register area BUSY	
		signal	
-	M9084	Error check	
-	M9091	Command error flag	
-	M9094	I/O exchange flag	
-	M9100	SFC program existence	
-	M9101	Start/stop SFC program	
-	M9102	Start status of SFC program	
-	M9103	Continuous transition existence	
-	M9104	Continuous transition prevention flag	
	N0400	Start step transition monitoring timer (support to	
-	M9108	D9108)	
	140400	Start step transition monitoring timer (support to	
-	M9109	D9109)	
	M0110	Start step transition monitoring timer (support to	
-	M9110	D9110)	
	10444	Start step transition monitoring timer (support to	
-	M9111	D9111)	
		Start step transition monitoring timer (support to	
-	M9112	D9112)	
		Start step transition monitoring timer (support to	
-	M9113	D9113)	
	N0.111	Start step transition monitoring timer (support to	
-	M9114	D9114)	
-	M9180	Active step sampling trace completion flag	
-	M9181	Active step sampling trace execution flag	
-	M9182	Enable active step sampling trace	
-	M9196	Operation output of block stop	
_	M9197		
_	M9198	Fuse blown/I/O verification error display switching	
	1010100		

\* The special relay of Q17nDSCPU is in Motion CPU side.

Refer to the manual of PLC CPU for the special relay in PLC CPU side.

## 3.2.6 Special register

D	evice number	_			
Q17nDSCPU	A17nSHCPUN/	Name	Remark		
QTTIDSCFU	A173UHCPU				
SD60	D9000	Fuse blown			
-	D9002	I/O module verification error			
-	D9004	MINI link error	A173UHCPU only		
SD53	D9005	AC DOWN counter			
SD0	D9008	Self diagnosis error			
-	D9009	Detection of annunciator			
-	D9010	Error step	SD1: Diagnosis error occurrence time (calendar, month)		
-	D9011	Error step	SD2: Diagnosis error occurrence time (date, hour)		
-	D9014	I/O control method	SD5: Error common information		
SD203	D9015	CPU operation status			
-	D9016	A17nSHCPU: ROM/RAM setting A173UHCPU: Program number			
-	D9017	Minimum scan time (10ms unit)	SD520: Current main cycle (1ms unit)		
-	D9018	Scan time (10ms unit)	SD521: Maximum main cycle (1ms unit		
-	D9019	Maximum scan time (10ms unit)	SD524: Maximum operation cycle (1µs unit)		
-	D9020	Constant scan (10ms unit)	A173UHCPU only SD523: Motion setting operation cycle (1µs unit)		
-	D9021	Scan time (1ms unit)	A173UHCPU only SD522: Motion operation cycle (1µs unit)		
-	D9022	Time (1 second unit)	A173UHCPU only		
SD210	D9025	Clock data (calendar, month)			
SD211	D9026	Clock data (date, hour)			
SD212	D9027	Clock data (minute, second)			
SD213	D9028	Clock data (week)			
-	D9035	Expansion file register	A173UHCPU only		
-	D9036	For specifying extended file register device			
-	D9037	number	A173UHCPU only		
-	D9038				
-	D9039	LED display priority order			
-	D9044	For sampling trace	A173UHCPU only		
-	D9049	Work area for SFC	A173UHCPU only		
-	D9050	SFC program error number	A173UHCPU only		
-	D9051	Error block	A173UHCPU only		
-	D9052	Error step	A173UHCPU only		
-	D9053	Error transition	A173UHCPU only		
-	D9054	Error sequence step	A173UHCPU only		
-	D9055	Status latch	A173UHCPU only		
-	D9072	PLC communication check	A173UHCPU only		
-	D9081	Number of communication requirement register free area	A173UHCPU only		
-	D9085	Setting register of time check value	A173UHCPU only		
-	D9090	Number of boards in special function module over	A173UHCPU only		
-	D9091				
-	D9092	Detailed error number			
_	D9094	Exchange I/O start I/O number			

Device number							
Q17nDSCPU	A17nSHCPUN/		Name	Remark			
QT/IDSCPU	A173UHCPU						
-	D9100						
-	D9101						
-	D9102						
-	D9103	]					
-	D9104	Fuse blown module					
-	D9105		A173UHCPU only				
-	D9106						
-	D9107						
-	D9116						
-	D9117						
-	D9118						
-	D9119						
-	D9120	I/O module verification er	ror				
-	D9121			A173UHCPU only			
-	D9122	]					
-	D9123						
-	D9124	Number of annunciator de	etection				
-	D9125						
-	D9126						
-	D9127						
-	D9128						
-	D9129	Annunciator detection nu	mber				
_	D9130						
_	D9131	1					
_	D9132						
-	D9180						
_	D9181	A173UHCPU: Unusable					
SD510	D9182	Q17nDSCPU,	A17nSHCPU:				
SD511	D9183	A173UHCPU: Test mode requirement error	Limit switch output status storage area				
SD512	D9184	P CPU error cause		Q17Ndscpu: PCPU WDT error cause			
SD513	D9185		A17nSHCPU:				
SD514	D9186	Q17nDSCPU,	Servo amplifier classification				
SD515	D9187	A173UHCPU: Manual pulse axis setting error	A17nSHCPU: Manual pulse axis setting error information				
-	D9188	A173UHCPU: Unusable A17nSHCPU: Test mode requirement error					
SD516	D9189	Error program No.					
SD517	D9190	Error item information					
SD502	D9191	Q17nDSCPU, A17nSHCPU: Servo amplifier installation information					
SD503	D9192	A173UHCPU: Servo amplifier installation information	A17nSHCPU: Area for manual pulse (P1) smoothing magnification setting				
-	D9196	Personal computer link co	ommunication error code				

(Continued)						
Device number		4				
Q17nDSCPU	A17nSHCPUN/ A173UHCPU	Name	Remark			
		Q17nDSCPU, A173UHCPU:				
D752	D752	Area for manual pulse 1 (P1)				
		smoothing magnification setting	-			
		Q17nDSCPU, A173UHCPU:	A17nSHCPU:			
D753	D753	Area for manual pulse 2 (P2)	Unusable			
		smoothing magnification setting	-			
D754	D754	Q17nDSCPU, A173UHCPU: Area for manual pulse 3 (P3)				
D754	D754	smoothing magnification setting				
-	D760	shootning magnification setting				
_	D761					
-	D762	-				
_	D763	-				
-	D764					
-	D765					
-	D766					
-	D767	A173UHCPU:				
-	D768	Limit switch output disable setting area				
-	D769	for Axis 1 to 32				
-	D770					
-	D771 D772					
-						
-	D773					
-	D774					
-	D775					
-	D776					
-	D777		A17nSHCPU:			
-	D778		Cam axis monitor device			
-	D779		A172SHCPUN:			
-	D780		5 points x 8 axes			
-	D781		A171SHCPUN:			
-	D782	A173UHCPU:	5 points x 4 axes			
-	D783	Limit switch output status storage area				
-	D784	for Axis 1 to 32				
-	D785					
-	D786	4				
-	D787	-				
-	D788	-				
-	D789	4				
-	D790	4				
-	D791		4			
-	D792	4				
-	D793	4				
-	D794			Q17nDSCPU:		
-	D795	A173UHCPU:		#8000 + 20n (1 axis/word)		
-	D796	Servo amplifier classification		A173UHCPU: D792 to (4 axes/word)		
-	D797	4				
-	D798	4				
-	D799					

 $\ast$  The special register of Q17nDSCPU is in Motion CPU side.

About the special register of PLC CPU side, refer to the manual of PLC CPU.

#### 3.2.7 Other devices

Item	Q17nDSCPU	A173UHCPU	A17nSHCPUN		
Personal computer link communication error flag	-	M2034			
PCPU preparation completion flag	SM500	M9074			
Home position return re-travel value	D9 + 20n <sup>(Note-1)</sup> (data abbreviated to 1 word) #8006 + 20n, #8007 + 20n <sup>(Note-1)</sup> (Referred to at monitoring)	D9 + 20n <sup>(Note-1)</sup>	D811 + 20n <sup>(Note-1)</sup>		
Travel value change register	Any device (enable set D16 + 20n, D17 + 20n) <sup>(Note-1)</sup>	D16 + 20n <sup>(Note-1)</sup> , D17 + 20n <sup>(Note-1)</sup>	D815 <sup>(Note-1)</sup> + 20n		
	D0 to D8191 W0 to W1FFF	D800 to D8191 W0 to W1FFF	D0 to D799 W0 to W3FF		
Indirectly designated device (word device)	#0 to #7999	#0 to #7999 (Motion SFC (real mode) only)	#0 to #7999 (Motion SFC of A172SH (real mode) only)		
	U□\G10000 to U□\G(10000 + p - 1) <sup>(Note-2)(Note-4)</sup>	-	-		
	X0 to X1FFF <sup>(Note-3)</sup> Y0 to Y1FFF M0 to M8191	X0 to X1FFF Y0 to Y1FFF M/L0 to M/L8191	X0 to X7FF Y0 to Y7FF M/L0 to M/L2047		
Indirectly designated device (bit device)	- B0 to B1FFF F0 to F2047	M9000 to M9255 B0 to B1FFF	M9000 to M9255 B0 to B3FF		
	F0 to F2047 U⊡\G10000.0 to U⊡\G(10000 + p - 1).F <sup>(Note-2)(Note-4)</sup>	F0 to F2047 -	F0 to F255 -		
Enable specified device in	D0 to D8191	D800 to D3069, D3080 to D8191	D0 to D799		
high speed reading function	W0 to W1FFF U□\G10000 to U□\G(10000 + p - 1) <sup>(Note-2)(Note-4)</sup>	W0 to W1FFF			

(Note-1): n shows the value (axis No.1 to 32: n=0 to 31) corresponding to axis No.

(Note-2): p is the user free area points of the Multiple CPU high speed transmission area in each CPU.

□: First I/O number of CPU module

(Note-3): In PXn + 0 to PXn + F, the input devices assigned to the motion CPU built-in I/F (DI), PXn + 4 to PXn + F are fixed to 0 and cannot be used.

(Note-4): Setting is available only for the devices of the own CPU.

	Item	Q17nDSCPU	A173UHCPU	A17nSHCPUN
		X0 to X1FFF	X0 to X1FFF	X0 to X7FF
		Y0 to Y1FFF	Y0 to Y1FFF	Y0 to Y7FF
		M0 to M8191	M0 to M8191	M0 to M2047
Οι	utput device		L0 to L8191	L0 to L2047
		B0 to B1FFF	B0 to B1FFF	B0 to B3FF
		U□\G10000.0 to		
		U \G(10000 + p - 1).F (Note-2)(Note-5)	-	-
		D0 to D8191	D0 to D8191	D0 to D1023
		W0 to W1FFF	W0 to W1FFF	W0 to W3FF
		#0 to #9215	#0 to #8191	#0 to #8191
Wa	atch data	U□\G10000 to		
		U□\G(10000 + p - 1) <sup>(Note-2)(Note-5)</sup>	-	-
			Absolute address (H0 to	Absolute address (H0 to
ata		-	HFFFFFFF)	HFFFFFFF)
Limit switch output data		D0 to D8191	D0 to D8191	D0 to D1023
utpr		W0 to W1FFF	W0 to W1FFF	W0 to W3FF
040		#0 to #9215	#0 to #8191	#0 to #8191
S IC	ON section setting	Constant (Hn/Kn) <sup>(Note4)</sup>	Constant (Hn/Kn) <sup>(Note-4)</sup>	Constant (Hn/Kn) <sup>(Note-4)</sup>
nit s		U□\G10000 to		
Lin		U□\G(10000 + p - 1) <sup>(Note-2)(Note-5)</sup>	-	-
		X0 to X1FFF (Note-3)	X0 to X1FFF	X0 to X7FF
		Y0 to Y1FFF	Y0 to Y1FFF	Y0 to Y7FF
		M0 to M8191	M0 to M8191	M0 to M2047
			L0 to L8191	L0 to L2047
-	Output enable/disable	B0 to B1FFF	B0 to B1FFF	B0 to B3FF
		F0 to F2047	F0 to F2047	F0 to F255
bit	t	SM0 to SM1999	M9000 to M9255	M9000 to M9255
Fo	prced output bit	-	TT0 to TT2047	TT0 to TT255
FU		-	TC0 to TC2047	TC0 to TC255
		-	CT0 to CT1023	CT0 to CT255
		-	CC0 to CC1023	CC0 to CC255
		U□\G10000.0 to		
		U□\G(10000 + p - 1).F <sup>(Note-2)(Note-5)</sup>	-	-
				A171SHCPUN:
			M2160 to M2223	M1984 to M1991
Lam	utch status	Any device	(unnecessary to set in	A172SHCPUN:
lo lo	Ciulch status	(M2160 to M2223 can also be set)	mechanical system program)	M1984 to M1999
E E			meenamear system program	(unnecessary to set in
yste				mechanical system program)
g	am axis command			
ju sig	gnal	Any device	-	
S) (Ca	am/ball screw switch	(M5488 to M5519 can also be set.)		
	ommand)			
	moothing clutch	Any device	-	
CO	mpletion signal	(M5520 to M5583 can also be set.)		

(Note-1): n indicates a value corresponding to an axis No. (Axis No.1 to 32: n = 0 to 31)

(Note-2): p is the user free area points of the Multiple CPU high speed transmission area in each CPU.

: Start I/O number of CPU module

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

(Note-5): Setting is available only for the devices of the own CPU.

<sup>(</sup>Note-3): In PXn + 0 to PXn + F, the input devices assigned to the motion CPU built-in I/F (DI), PXn + 4 to PXn + F are fixed to 0 and cannot be used.

## 4. DIVERSION OF PROJECT CREATED BY A173CPUN/A172CPUN

#### 4.1 Data List Available for Diversion or Not (SV13/SV22)

			Motion SFC is not compatible			Motion SFC is compatible					
		A17nSHCPUN		A173UHCPU		A172SHCPUN		A173UHCPU		Remark	
		SV13	SV22	SV13	SV22	SV13	SV22	SV13	SV22		
System	System setting data		$\bigtriangleup$						Note-1		
setting	Hig	h speed reading data				0					
setting	Bas	sic setting data				×					Note-2
		Fixed parameter				Δ					Note-3
Servo	Axis data	Home position return data				0					
data	Ax	JOG operation data				0					
setting		Servo parameter				$\bigtriangleup$					Note-3
	Par	ameter block				0					
	Limit output data			×				(	<u>с</u>		Note-4
Servo progra	m		Δ	2	(	0	۷	2	(	C	Note-5, Note-6
	Motion SFC parameter							(	<u>с</u>		
	Motion SFC program								C	Note-5	
Motion	Operation control program						Δ Ο		C	Note-5	
SFC	Transition program								Note-5		
program	Conversion data									Note-8	
	Automatic numbering setting							(	С		
Mechanical	Ме	chanical edit data		Δ		0		$\triangle$		0	Note-5, Note-7
system program	Mechanical conversion data					Δ		Δ		Δ	Note-8
	Cai	m conversion data		0		0		0		0	
		al mode axis ormation		0		0		0		0	
Cam data			0		0		0		0		
Device memory		○ (SW3RNC-GSVE only)									
Backup data			X					Note-8			
Communication setting			X				Note-8				

O: Can be diverted

 $\triangle$ : Data must be revised

 $\times$ : Must be set again

#### (Note-1) System setting data

- Motion dedicated module of slot 0 to 1 Motion dedicated module cannot be attached to slot 0 to 1 in Q17nDSCPU. Move it slot 3 or later.
- Pulse/synchronous encoder I/F module A172SENC A172SENC module is converted to Q172DLX. Manual pulse/synchronous encoder setting are deleted.
- Set Q172DEX, Q172DLX, or Q173DPX if necessary.
- Limit output module A1SY42 (when Motion SFC is not compatible with OS) Limit output module A1SY42 is not diverted.
- Axis No. setting of external input signal module

Axis No. setting of external input signal module in Q17nDSCPU is moved to servo external signal parameter in servo data.

Servo amplifier setting

The servo amplifier is converted to MR-J4-B when SSCNET III/H is selected, or converted to MR-J3-B when SSCNET III is selected.

Others besides servo amplifier (inverter etc.) are deleted.

#### (Note-2) Basic setting data

It is necessary to set Multiple CPU in QDS-Motion. Set according to system.

(Note-3) Fixed parameter, servo parameter (servo amplifier besides MR-J2S)

Fixed parameter (Number of Pulses/Rev. and Travel Value/Rev.) is not converted. Servo parameter is initialized. Revise parameter with servo amplifier after changing.

(Note-4) Limit output data (when Motion SFC is not compatible with OS) Data is deleted because of incompatibility. Revise the data.

(Note-5) Servo program, Motion SFC program, mechanical system program

Motion dedicated device

Assignment of Motion dedicated device is different between A17nSHCPUN/A173UHCPU and QDS-Motion. Change Motion dedicated device.

(Note-6) Servo program

• Word points of indirect device

There are changes of word points between A17nSHCPUN/A173UHCPU and QDS-Motion. Execute conversion check and revise if necessary.

(Note-7) Mechanical system program

· Unit setting of output axis

Unit settings of fixed parameter and output axis are set respectively in A-Motion, but fixed parameter is set only in Q17nDSCPU. Revise the unit settings when unit settings of fixed parameter and output axis are different.

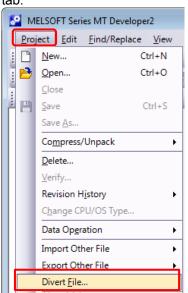
(Note-8) Conversion data, setting data

It cannot be diverted because CPU is different. Convert/set the data again.

#### 4.2 Program Diversion Procedure in Motion CPU Side 4.2.1 Diversion procedure using MT Developer2

The following shows an example of procedures for replacing an A-Motion CPU side project with a QDS-Motion CPU project using MT Developer2. Always backup the project before the program replacement.

1) Start MT Developer2, and select "Divert File" --> "Diversion of Other Format Project" from the "Project" tab.



2) Specify the CPU type, OS type, and operation method after the replacement in the "Diversion of Other Format Project" dialog box, and select "Browse".

File diversion	<b>—</b>
Source Drive/Path Project Name CPU Type : OS Type :	Browse Divert Close
CPU/OS selection CPU Type : Q172DS	

3) Select "Browse" in Save Folder Path and the source project from "Folder List", and click "Open".

older <u>L</u> ist:				
Name	CPU Type	OS Type	Title	
▲ 20217	A172SH	SW3-SV13D(SF	Up C)	
www.				
'orkspace Name :				
roject Name ;	12021	7		
uject Name ;				
tle:				

4) Select data to be converted in "File Selection".

Select All Select None	
Name	Update Time
System Setting/Servo Data Setting	2012-11-21 PM 04:01:04
Eimit Output Data	2012-11-21 PM 04:01:04
Motion SFC Program/Motion SFC Parameter	2012-11-21 PM 04:01:04
Servo Program	2012-11-21 PM 04:01:04

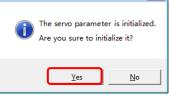
#### 5) Select "Divert".

File diversion	<b>X</b>
Source (MT Developer2 Format Project)       Drive/Path     C:\Users\Meiden\Desktop\A Motion Replacement (SFC)       Project Name     120217       CPU Type :     A172SH       OS Type :     SW3-SV13D(SFC)	Browse Divert Close
CPU/OS Selection CPU Type : Q172DS	
<ul> <li>After the program diversion, execute the relative check or conversion in each display, and check the data.</li> <li>For details on this function, refer to the "Data list available for diversion" in the help.</li> </ul>	

6) Convert the series of the servo amplifier. Select the servo amplifier series and servo system network specification after the replacement, and select "OK".

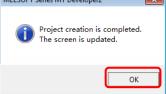
MELSOFT Series MT Developer2					
Execute the series conversion of serv Confirm the result of the conversion a					
Conversion Target Servo Amplifier Se	tting				
SSCNET III LINE 1	SSCNET III LINE 2				
SSCNET III/H	SSCNET III/H				
C SSCNET III	C SSCNET III				
MR-J4 Series 💌					
Reconsider the following of - Servo Data - Servo Parameter For details on replace, pro	data. ess F1 key and refer to the help. Cancel				

7) The servo parameter initialization dialog box appears. To initialize the servo parameters, select "Yes".

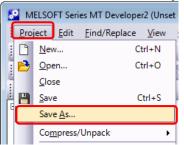


8) The conversion of the project is completed. Select "OK".

After the project conversion, make the cross comparison or check the data on each screen.



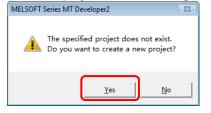
9) Select "Save As" from the "Project" tab to save the project after the conversion.



10) Input "Workspace Name", "Project Name", and "Title", and select "Save".

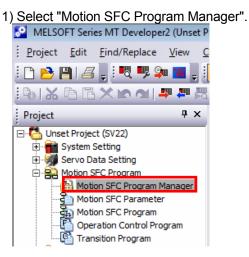
Workspace Name :	Q172DS Replacement File
Project Name :	Q 172DS Replacement File
<u>T</u> itle:	$A \rightarrow Q$ Converting File
	Save Cancel
Save as a Single File Format P	Switch the window by dicking this button when you want to use single file format project. (MELSOFT Navigator does not support this format.)

11) The new project creation dialog box appears. Select "Yes".



#### 4.2.2 Without using SFC

When no SFC program is used in the A-Motion CPU side program (Diversion source) and servo parameters other than SFC programs are diverted, perform the following procedure after the operation of 11).



2-30

2) Select "Unused" for "Motion SFC Program", and select "OK".

No. Program Name	O Used	otion SFC Program Capacity (bytes) ontrol code : 667648 ext : 664032 Cancel
	<ul> <li>Show Existing Only</li> <li>Show All Program</li> </ul>	<ul> <li>Order by Number</li> <li>Order by Name</li> </ul>
	Delete	ting Motion SFC program.
	12   Number Replace     34   Replace the exis	ion SFC programs are deleted. <b>cement</b> ting Motion SFC program No. ecified number and renumber.)
		rams are batch-copied. From other project)

About the file converted by MT Woks2, refer to "2.4.1 Data list available for diversion or not (SV13/SV22)", and then set the data which can not be diverted if necessary. About the setting of Multiple CPU parameter, refer to "2.3 Differences between Q173DSCPU/Q172DSCPU and

A173UHCPU/A172SHCPUN/A171SHCPUN", "QCPU User's Manual (Multiple CPU System) Model Name: SH-080475", "Programming Manual (COMMON) [compatible with Q173D(S)/Q172D(S)] Model Name: 1XB921" and then set.

#### 4.2.3 Precautions for diverting cam data

To edit cam data, read the data directly using "Read Other Type Cam Data".

#### 4.3 Program Diversion Procedure in PLC CPU Side

4.3.1 Conversion procedure of a sequence project for QnUD(E)(H)CPU using GX Works2/ GX Developer

The following describes an example of the procedure for replacing a sequence project using GX Developer. Always backup the project before the replacement.

#### (1) Conversion of sequence program created by SW3RNC-GSVE/SW2D-GSVE

1) After starting GX Works2, select "Start GX Developer" from the "Project" tab.

Start GX Developer( <u>Z</u> )
Exit( <u>Q</u> )

2) The following shows the conversion of a sequence program created by SW3RNC-GSV/SW2□-GSV (GPPA file format).

After GX Developer is started, select "Import file" --> "Import from GPPA format file" from the "Project" tab.

🎲 М	ELSOFT s	eries GX Develo	per								
<u>P</u> roje	ct <u>E</u> dit	<u>Find/Replace</u>	<u>V</u> iew	<u>O</u> nline	<u>D</u> iag	nostics	<u>T</u> ools	<u>W</u> indow	<u>H</u> elp		
1	New proj Open pro Close pro Save Save <u>a</u> s Delete pro Ve <u>r</u> ify Copy	j <b>ect</b> ject		Ctrl- Ctrl- Ctrl	+0	Q 🗾			6 saF7	saF8 <u>a</u> F ≢∓ ≢2	
-	<mark>Edit Data</mark> C <u>h</u> ange P	PLC type			۲						
	Import fil	e			•	In	nport fro	m GPP <u>Q</u> fo	rmat fil	e	
	Export <u>f</u> ile				×	, –		m GPP <u>A</u> fo			
	<u>M</u> acro Function	<u>B</u> lock			+		•	m <u>F</u> XGP(WI m FXGP( <u>D</u> C	- C		

#### Caution 1: Storage location of an execution file

The execution file in the GPPA format is usually stored in the following folder.

• Folder structure <u>"C drive (route drive)" --> "GPP" --> "USR" --> "System name" --> "Machine name (folder which</u> includes the gppa.cnf file)"

#### Caution 2: Name of diversion source project

When name of diversion source project exceeds 8 characters, it can not be read.

Change the name so that the number of characters is within the limit and execute the conversion operation.

#### 3) Select "Browse".

Import from GPPA format file		<b>—</b> ×
Drive/Path C:\GPP\USR		Browse
System name		Execute
Machine name		Close
PLC type		
File selection Common Local	Merge peripheral statement/note	
Param+prog Select all	Cancel all selections	

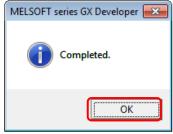
#### 4) Select the conversion target file and select "OK".

Open system nam	ne, machine name	<b>X</b>
Selected drive	[c·] 🔽 🔛 🏢	
■ 120131b ■ ■ 120131 ■ 120131b ■ 20120214		
Drive/Path	C:\GPP\USR\SV13\20120217	
System name	SV13 1201316 OK	
Machine name	20120217 A3N A Motion Cance	3

5) Check the conversion targets (Program/Device comment/Parameter), and select "Execute". Note) Either "Comment 1" or "Comment 2" will be selected for device comment.

Import from GP	PA format file		×	
Drive/Path	C:\GPP\USR\		Browse	
System name	SV13	1201315	Execute	
Machine name	20120217 A Motion			
PLC type	A3N	A3N		
File selection	Common   Loca	Merge peripheral statement/note	1	
Param+prog	Select all	Cancel all selections		
Dev	MAIN ice comment Comment2 Comment1			

6) The conversion completion dialog box appears. Select "OK".



#### 7) Select "Close".

Export to GPPA	format file		×
Drive/Path	C:\GPP\USR		Browse
System name	SV13	120131Б	Execute
Machine name	20120217	A Motion	Close
PLC type	A3N		
File selection	Common   Loca	Merge peripheral statement/note	
Param+prog	Select all	Cancel all selections	

8) Select "Change PLC type" from the "Project" tab in GX Developer.

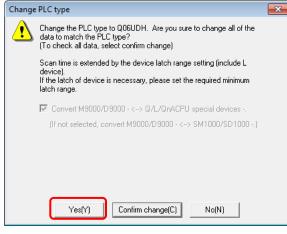
6	MELSOFT series GX Developer (Unset project) - [LD(Edi							
	<u>P</u> roject	<u>E</u> dit	<u>Find/Replace</u>	<u>C</u> onvert	<u>V</u> iew	<u>O</u> nli		
C	<u>N</u>	ew proj	ect		Ctrl+1	N		
Prc	<u>0</u>	pen pro	ject		Ctrl+(	D		
	<u>C</u>	ose pro	ject					
ન   F5	<u>S</u> a	ve	Ctrl+	s				
	Sa	Save <u>a</u> s						
===	D	Delete project						
_	Ve	Ve <u>r</u> ify						
	C	ору						
	E	lit Data				+		
	C	<u>h</u> ange P	LC type					

9) Specify the PLC series (QCPU(Qmode)) and PLC type (QnUD(E)(H)CPU) after the replacement in the "Change PLC type" dialog box, and select "OK".

	71	
Change PLC type		×
PLC series		ок
QCPU (Qmode)	'	Cancel
PLC type	-	
SOCOTIC		

- 10) The "Change PLC type" dialog box appears. Select "Yes".
  - Note) In this replacement handbook, "Yes" is selected because the changes will be checked later by using a support tool.

When the supporting tool is not used, select "Confirm change".



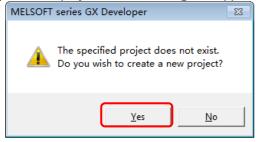
11) The following dialog box appears. Select "OK".

MELSOFT series GX Developer	Some devices cannot be replaced	
Instruction or device unsupported by the current PLC type were found. It was converted to the following device. Please find and correct the program. SM1255, SD1255	properly and are forcibly converted to "SM1255" or "SD1255". Refer to the explanation about the usage of the A/QnA->Q conversion	
	support tool described later and replace those devices with appropriate ones.	

12) When "Save as" is selected from the "Project" tab, the following dialog box appears. Input "Project name" and "Title", and select "Save".

		,			
Save the proj	ect with a new	name			×
Project drive	[-c-]	•	<b>E</b>	0-0- 0-0- 0-0-	
<ul> <li>120131</li> <li></li> <li>2012013</li> <li>2012021</li> <li>2012021</li> <li>2012021</li> <li>201217_</li> <li>Source f</li> </ul>	r1 4 GX				
Drive/Path	C:\Users\Me	iden\Deskta	opVA Motion	Replace	Save
Project name	201217				Cancel
Title	201217				

13) The new project creation dialog box appears. Select "Yes".



Although the sequence program has been converted following this procedure, it may not be operated correctly.

Be sure to refer to the manual after Section 5 for program correction.

(2) Conversion of sequence program for A-Motion created by GX Developer

The following describes an example of the procedure for replacing a sequence project using GX Developer. Always backup the project before the replacement.

1) After starting GX Works2, select "Start GX Developer" from the "Project" tab.

Start GX Developer(Z)
Exit( <u>Q</u> )

- 2) The following shows the conversion of a sequence program for A-Motion created by GX Developer (GPPW file format).
- 3) After GX Developer is started, select "Open project" from the "Project" tab.

MELSOFT series GX Developer						
<u>Project</u> <u>E</u> dit	<u>Find/Replace</u>	<u>V</u> iew	<u>O</u> nline	<u>D</u> iagn		
<u>N</u> ew proje	ect		Ctrl+	N		
Open project Ctrl+O						
<u>C</u> lose proj	ect					
Save	Ctrl+S					
Save <u>a</u> s						

4) Select the file to be converted, and select "Open".

Open projec	t			<b>—</b> ×
Project dri	ve <mark>[-c-]</mark> •		8-8- 8-8- 8-8-	
120217				
	,			
Drive/Path	C:\Users\Meiden\E	)esktopVA Motior	n Replace	Open
Project				Cancel
	,			

For the following conversion operations, refer to (1) SW3RNC-GSVE/SW2<sub>-</sub>-GSVE sequence program conversion procedure after 8).

#### 5. USING A/QnA->Q CONVERSION SUPPORT TOOL IN SEQUENCE PROGRAM

To confirm the converted content of the sequence program, <u>use "A/QnA->Q conversion support tool"</u>. Please download and install the A/QnA->Q conversion support tool from Mitsubishi Electric FA Site. For details, refer to A/QnA->Q conversion support tool guidebook in the same page.

To download the tool, access the Mitsubishi Electric FA Site

(http://www.mitsubishielectric.co.jp/fa/index.html) and as follows.

http://www.mitsubishielectric.co.jp/fa/download/software/search.do?mode=software&kisyu=%2Fplca&lan g=2&select=0&softid=0

#### 5.1 Preparation for Using Support Tool

To use the support tool, prepare the following.

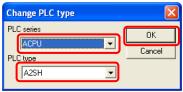
- 1) Source sequence program (for compare)
- 2) Target sequence program (converted program in QnUD(E)(H)CPU)
- 3) "A/QnA->Q conversion support tool" (please get it from Mitsubishi Electric FA Site)
- 4) "A/QnA->Q conversion support tool guidebook" (please get it from Mitsubishi Electric FA Site)
- 5) GX Developer (GX Works2)

#### Caution

Convert 1) into a project whose CPU type is changed to A2SH or A3U and save the project using GX Developer as follows. The conversion method is same as "Section 2.4.3 Program diversion procedure in PLC CPU side"

A171SHCPUN and A172SHCPUN

Select "ACPU" for PLC series and "A2SH" for PLC type in the "Change PLC type" dialog box, and select "OK".

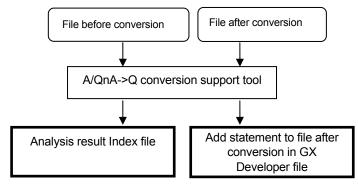


#### A173UHCPU

Select "ACPU" for PLC series and "A3U" for PLC type in the "Change PLC type" dialog box, and select "OK".

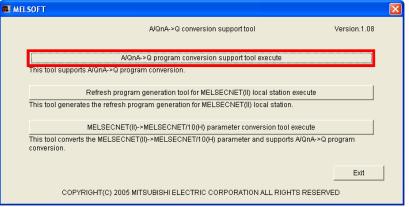


\* This operation is necessary to use A/QnA->Q program conversion support tool.



#### 5.2 Using Procedure of Support Tool

- 1) Click "Start" --> "MELSOFT Application" --> "AQCnvSupport" to start the support tool.
  - Then select "A/QnA->Q program conversion support tool execute".



2) The "A/QnA->Q program conversion support tool" dialog box appears. Specify a source file in the GPPA format, A2SH file, or A3U file for "Project for A/QnA series before PLC type changing". Specify the file converted to the QnUD(E)(H)CPU type file for "Project for Q series after PLC type changed", and select "Next".

A/QnA->Q program conversion support tool			
Select analyzing project Set project name Project for A/QnA series before PLC type changing Drive/path C:\Documents and Settings\Administrator\Desktop	Project name Before replacement A		npare (A2SH) is above, nverted to Q26UDEHCPU
Project for Q series after PLC type changed Drive/path C:\Documents and Settings\All Users\Desktop	Project name After replacement Q	Browse	
	Next	Cancel	

Then execute the operation according to A/QnA->Q conversion support tool guidebook.

#### 3) Created file

Once the operation is completed by following the description in A/QnA->Q Conversion Support Tool Operation Guide, an analysis result Index file (HTML document) and a GX Developer file in which statements of the modifications are embedded are created in the specified folder.

Name 🔺	Size Type
ど Index 🗀 Embedded Files	3 KB HTML Document File Folder

#### 4) Display

#### Index file of analysis result

The following shows an example of the execution results of the analysis result index file. A/QnA $\rightarrow$ Q conversion support tool Version.1.08

### Analyzing result

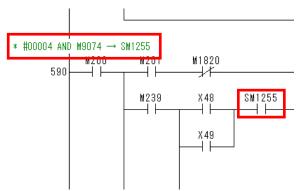
Main program		49		Liet Dieplay	
	D	etection numb	ber	Analyzing result of	display
Project for Q series after PLC type changed	C:\Documents and Settings\All Users\Desktop\ Replacement		s\Desktop\	For replacement tool (A172→Q26UDEH)	
Project for A/QnA series before PLC type changing		C:\Documents and Settings\All Users\Desktop\ Replacement			For replacement tool (A172→A2SH)

Main program	43	List Display		
Special M/D unconverted in PLC type change	20	Device number order	Step number order	
Instruction unconverted in PLC type change	18	According to instruction name	Step number order	
Program for special function module necessary to check	5	According to special function module	Step number order	

#### Statement is embedded in GX Developer file

The following shows an example of the execution results of the GX Developer file in which statements are embedded.

"Statement display" or "Ctrl + F7" displays the contents that need to be modified.



\* In the case described above, the device M9074 has been replaced with the device SM1255. Correct the device to an appropriate one.

#### 5.3 Sequence Program Correction in Created Embedding File

#### 5.3.1 Correction of special relay/special register

The special relay that cannot be converted from A-Motion is converted to "SM1255", and the special register that cannot be converted from A-Motion is converted to "SD1255". Modify the devices according to a between-the-lines statement.

#### 5.3.2 Correction of motion dedicated instructions

A-Motion-dedicated instructions (SVST, CHGA, CHGV, CHGT, SFCS, ITP) are converted to "SM1255". Modify the devices according to a between-the-lines statement.

#### 5.3.3 Others

Confirm the details of user's manual and programming manual in each CPU module and then correct. Or, for use method of GX Developer etc., refer to each product manual.

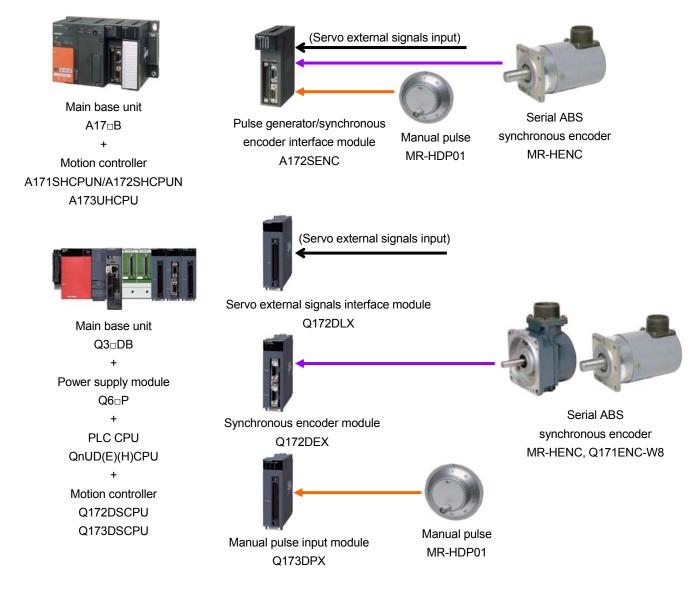
#### 6. POINTS AND PRECAUTIONS OF REPLACEMENT

#### 6.1 Difference of Motion CPU Configuration

#### 6.1.1 System configuration

The differences between basic system of A-Motion and basic system of QDS-Motion are shown in the following chart.

- The PLC function and the motion function are integrated in one A-motion CPU. However, in QDS-motion, they are in different CPUs.
- A-Motion is compatible with SSCNET as a servo system network, but QDS-Motion is compatible with SSCNET III or SSCNET III/H. Servo amplifiers connectable to each motion are also different.
- A motion module A172SENC (Pulse generator/synchronous encoder interface module) is replaced with a motion module Q172DLX (Servo external signal interface module), Q172DEX (Synchronous encoder interface module), or Q173DPX (Manual pulse generator interface module).
- A base unit is changed to a Q series multiple CPU high speed base unit. As a result, motion modules (Q172DLX, Q173DEX, and Q172DPX) cannot be installed in the CPU slot and Slot 0 to 2.
- For the connection between QDS-Motion and a personal computer, RS-422 and SSCNET cannot be used. Connect them with Ethernet (Direct connection to QDS-Motion), USB, RS-232, or Ethernet (Connection via PLC).



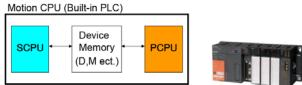
**2**- 41

#### 6.1.2 Shared device

In A-motion, the PLC and Motion functions are integrated in an A-motion CPU. Thus, the both function shares the memory. In QDS-Motion, a PLC CPU and a Motion CPU are divided as different modules. Thus, configuring some settings (assignment to the multiple CPU shared devices/automatic refresh setting) is required to share the memory.

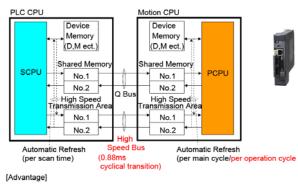
For details, refer to "QCPU User's Manual (Multiple CPU System) Model Code SH-080475", "Programming Manual (COMMON) [compatible with Q173D(S)/Q172D(S)] Model Code: 1XB921".





[Advantage]

 SCPU (PLC CPU) and PCPU (Motion CPU) was loaded in one unit
 The device memory has been shared and it can be accessed from two CPUs



**QDS-Motion** 

0.88ms cyclical transition can be done in high speed transmission area
 Automatic refresh per operation cycle is possible

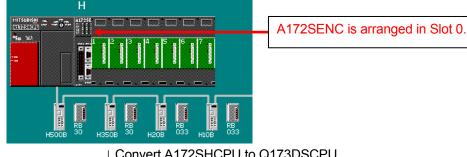
About shared device memory, after diverting the project, execute the automatic refresh setting. It is necessary to distribute the device being used by PLC CPU to the device of Motion CPU.

#### 6.2 Precautions about Replacement

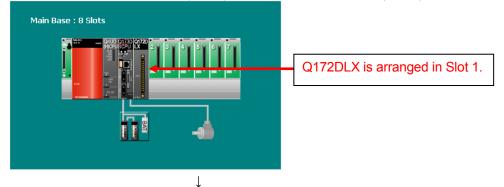
#### 6.2.1 Slot position (system setting)

When the motion module (A172SENC) used in A-Motion is replaced with a QDS-Motion controller, the slot position for installing the motion module will change as follows. (For the QDS-Motion, motion modules (Q172DLX, Q172DEX, Q173DPX) cannot be installed on the CPU slot and the I/O slot 0 to 2.)

Example) Place A172SENC in slot 0 in A-Motion



↓ Convert A172SHCPU to Q173DSCPU A172SHCPU to Q173DSCPU (Slot 0), A172SENC to Q172DLX (Slot 1)

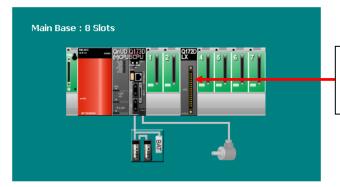


If executing relative check in above screen, the following error will occur.

Checking for Basic Setting/System Structure/SSCNET Structure... Error: System Structure Main Base - Slot 1 Motion Slot Setting - Motion module cannot be set in the CPU slot of main base or I/O slot 0 to 2. Error: System Structure Main Base - Slot 2 Motion Slot Setting - Motion module cannot be set in the CPU slot of main base or I/O slot 0 to 2.

To clear errors, install motion modules (Q172DLX, Q172DEX, Q173DPX) on Slot 3 or later of the main base unit.

When an A program is converted to a Q program, A172SENC is automatically converted to Q172DLX. When Q172DEX or Q173DPX is used with QDS-Motion, change and add modules.

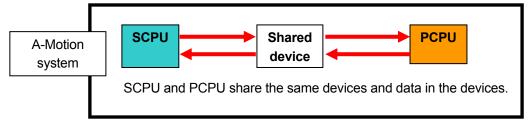


Arrange motion modules to be used on Slot 3 or later of the main base unit.

## 6.2.2 Communication data device between PLC CPU and Motion CPU(1) Shared devices between PLC CPU (SCPU) and Motion CPU (PCPU)

A-Motion

Example) Since both SCPU and PCPU share the same devices, PCPU (SCPU) can use the data that SCPU (PCPU) stored in the devices for some processing.

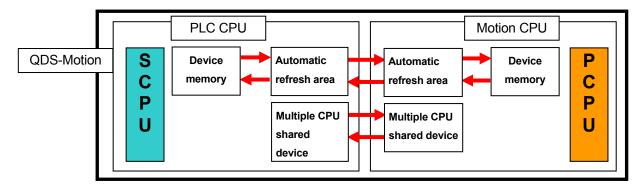


QDS-Motion

Example)

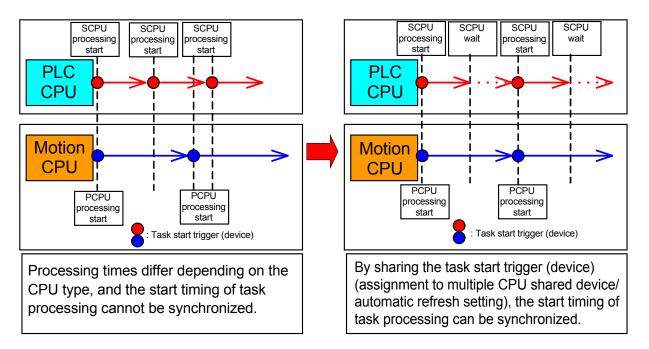
Since a PLC CPU and a Motion CPU operate as different CPUs, some settings (assignment to multiple CPU shared device/automatic refresh setting) are required to share the same devices.

By configuring these settings, both CPUs can share the same data for some processing.



#### (2) Obtain synchrony between SCPU and PCPU

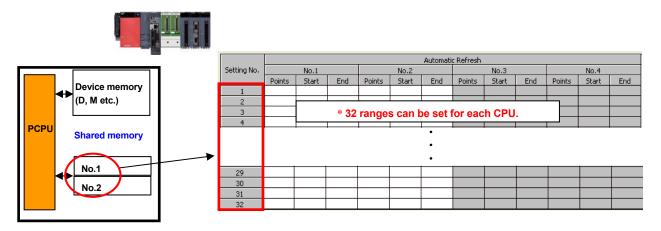
Since QDS-Motion has a PLC CPU and a Motion CPU as different modules, the task processing time differs. To synchronize the start timing of task processing, configure some settings (assignment to multiple CPU shared device/automatic refresh setting) for the task start trigger (device).



For details of (1) and (2), refer to "QCPU User's Manual (Multiple CPU System) Model code: SH-080485ENG" and "Programming Manual (COMMON) [type Q173D(S)/Q172D(S)] Model Code: 1XB928", and set common devices.

#### 6.2.3 Block number of refresh setting and total points number restriction

In QDS-Motion, the automatic refresh function is added as a new function that A-motion does not have. Automatic refresh settings of 32 ranges (total 14K points) can be configured for each CPU.



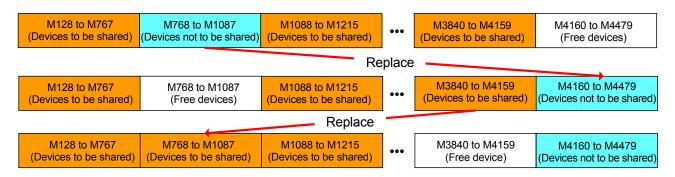
The following explains the replacement method of devices.

#### Example)

The following shows the replacement procedure for when devices 1) to 4) are assigned.

- 1) M128 to M767 (640 points) and M1088 to M1215 (320 points): Device ranges to be shared
- 2) M768 to M1087 (320 points): Device range not to be shared
- 3) M3840 to M4159 (320 points): Device range to be shared
- 4) M4160 to M4479 (320 points): Free device range

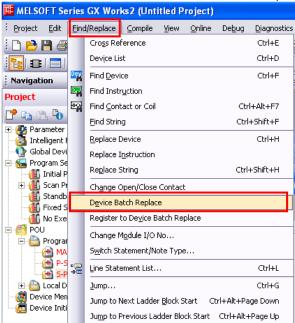
Procedure: Replace 2) devices with 4) devices. --> Replace 3) devices with 2) free devices.



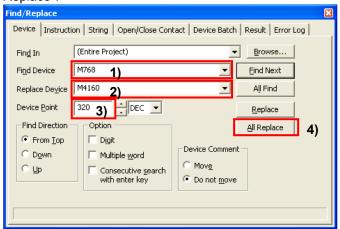
#### Device number batch replacement procedure

The following shows the procedure for replacing devices in a PLC side project using GX Works2. Always backup the project before the replacement of devices.

1) Start GX Works2, and select "Device Batch Replace" from the "Find/Replace" tab.

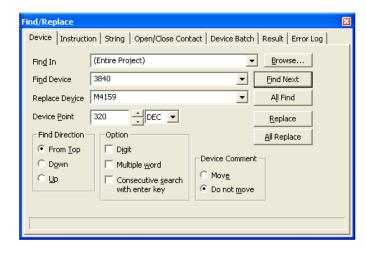


2) Select the "Device" tab, and input "Find Device", "Replace Device", and "Device Point". Select "All Replace".



- 1) Input the start device before the replacement in Find Device.
- 2) Input the start device after the replacement in Replace Device.
- 3) Input device points to replace.

3) Replace "M3840 to M4159" with device numbers of "M768 to M1087" by the same method as 2).



The following shows the procedure for replacing devices in a motion side project using MT Developer2. Always backup the project before the replacement of devices.

1) Start MT Developer2, and select "Replace Device Number Batch" from the "Find/Replace" tab.

MELSOFT Series MT Developer2 (Unset Project) - [Motion SFC 22:Move]						
: <u>P</u> roject <u>E</u> dit	Eind/Replace View Check/Convert Online Debug Tools Window H					
i 🗅 🖻 💾 👔	Eind 💦 왕 🖓 왕 🖓 🍸 🚼 🞲 💥 🚍 🥵 🗸					
Bol X Do D	Replace					
: Project	Use List   Replace Device Number Batch					
🖃 🦰 Unset Proje	Cross Reference Ctrl+E Replace Axis Number Batch					
	7.					

 Select "Replacing with specified K/F/G program range" and input "Replace From:/To:" and "Replace With:" in "Device No.". Select "Check >> Execute".

Replace Device Number Batch	<u> </u>
Replacing with selecting Motion SFC programs	Replacing with specified K/F/G program range
- Replace the device numbers in the each sp	pecified program range in a batch.
	List of Used Device
<ul> <li>All Programs</li> </ul>	Check >> Execute
C Program Range Specification	Device No. 1)
Start Start	Last Replace From : 768 Browse
(0 to 4095) 0 📩 t	to 4095 🛒 To : 1087 Browse
Operation Control Program : F/F5	Replace With : 4160 Browse
(0 to 4095) 0 🛨 t	to 4095 🚊 <b>2)</b>
Transition Program : G	<ul> <li>Perform "batch conversion" once to perform write to motion controller.</li> </ul>
(0 to 4095) 0 👘 t	to 4095 🚔
Motion SFC Program(WAITON/OFF)	to 255 🚎
	Cancel

- 1) Specify the end device from start device before conversion.
- 2) Specify start device after conversion.
- 3) Replace "M3840 to M4159" with device numbers of "M768 to M1087" by the same method as 2).

Replace Device Number Batch	🔀
Replacing with selecting Motion SFC programs Replacing	g with specified K/F/G program range
- Replace the device numbers in the each specified pro	gram range in a batch.
	List of Used Device
All Programs	Check >> Execute
C Program Range Specification	Device No.
Servo program : K	Replace From : 3840 Browse
(0 to 4095) 0 🛫 <b>to</b> 4095	To: 4159 Browse
Operation Control Program : F/F5	Replace With : 768 Browse
(0 to 4095) 0 🛨 <b>to</b> 4095	
🔽 Transition Program : G	- Perform "batch conversion" once to perform write to motion controller.
(0 to 4095) 0 🗾 to 4095	<u> </u>
Motion SFC Program(WAITON/OFF)	
(0 to 255) 0 😴 <b>to</b> 255	
	Cancel Close

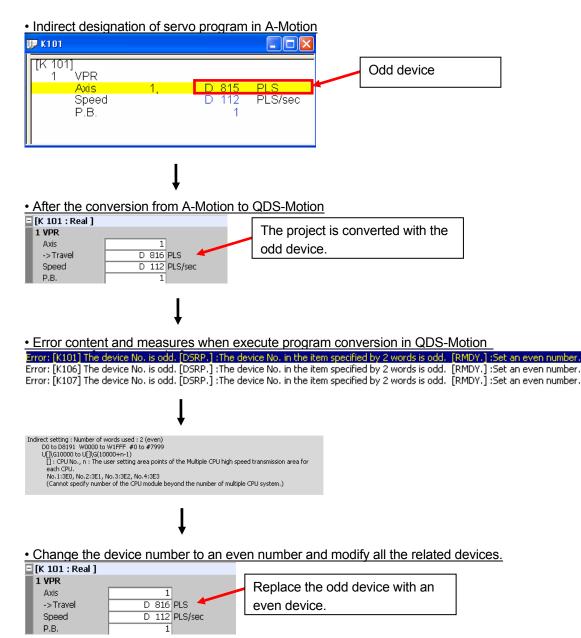
#### 6.2.4 Timer devices and counter devices

In A-Motion, a PLC CPU and a motion PU share T (Timer device) and C (Counter device). However, after the transition to QDS-Motion, T/C cannot be referred to from the Motion CPU. Instead, when the same function is used with the QDS-Motion CPU, the TIME instruction can be used.

When the PLC CPU is synchronized with the Motion CPU using T/C of the PLC CPU, set an interlock by configuring some settings (T/C assignment to multiple CPU shared devices/automatic refresh setting).

#### 6.2.5 Indirect designation of servo program

About indirect designation of servo program, because word length is changed from 16 bit to 32 bit by replacement, use word number should be 2 (even number).



#### 6.2.6 Parameter block

Since QDS-Motion's error check function is improved, errors and warnings may be displayed to the parameter to which A-Motion does not display errors and warnings. Correct the errors according to the content of the errors and warnings.

#### Example) A-Motion

	Block1	Block2		
Interpolation Control Unit	PULSE	PULSE		
Speed Limit Value	100000[PLS/s]	100000[PLS/s]		
Acceleration Time	1000[ms]	500[ms]		
Deceleration Time	1200[ms]	500[ms]		
Rapid Stop Deceleration Time	1200[ms]	500[ms]		

#### After the conversion from A-Motion to QDS-Motion

Item	Block No.1	Block No.2		
- Parameter Block	Set the data such as the acceleration/			
Interpolation Control Unit	3:PLS	3:PLS		
Speed Limit Value	100000[PLS/s]	100000[PLS/s]		
Acceleration Time	1000[ms]	500[ms]		
Deceleration Time	1200[ms]	500[ms]		
Rapid Stop Deceleration Time	1200[ms]	1000[ms]		

#### Error contents and measures

Checking for Parameter Block... Warning: Parameter Block Block No.2 Rapid Stop Deceleration Time - The rapid stop deceleration time exceeds the deceleration time. Rapid Stop Deceleration Time <= Deceleration Time Warning: Parameter Block Block No.6 Rapid Stop Deceleration Time - The rapid stop deceleration time exceeds the deceleration time. Rapid Stop Deceleration Time <= Deceleration Time Warning: Parameter Block Block No.6 Rapid Stop Deceleration Time - The rapid stop deceleration time exceeds the deceleration time. Rapid Stop Deceleration Time <= Deceleration Time Warning: Parameter Block Block No.7 Rapid Stop Deceleration Time - The rapid stop deceleration time exceeds the deceleration time. Rapid Stop Deceleration Time <= Deceleration Time

In the above case, set the sudden stop deceleration time to be equal to the deceleration time setting value (500ms or shorter).

Note that the error check becomes stricter than before the replacement as the above case.

## Memo


## 3. REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION

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## 3. REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

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#### 1. OVERVIEW

This article explains the change content when replace the system using

A173UHCPU/A172SHCPUN/A171SHCPUN with the system using Q170MSCPU(-S1). Besides, about A173UHCPU-S1, it can be read as A173UHCPU in another way. Q170MSCPU-S1 is the capacity expansion version of Q170MSCPU. Refer to the 7th section about the main differences with Q170MSCPU.

#### 2. EQUIPMENT CONFIGURATION, AVAILABLE SOFTWARE

Please prepare module, servo amplifier, operating system software and engineering environment according to the table in this article.

#### 2.1 Equipment Correspondence

It is necessary to use the supported product in iQ Platform, when using Q170MSCPU(-S1).

Product		Use A173UHCPU, A17nSHCPUN		Use Q170MSCPU(-S1)		
FIODUCI		Model name		Model name		
Motion CPU module PLC CPU section		• A173UHCPU • A172SHCPUN • A171SHCPUN		Q170MSCPU (recognized as Q03UDCPU) Q170MSCPU-S1 (recognized as Q06UDHCPU)		
Motion CPU module Motion CPU section		• A173UHCPU     • A172SHCPUN     • A171SHCPUN		Q170MSCPU(-S1)		
Main base unit		• A172B • A175B • A178B(-S□)		-		
Extension base unit		• A1S6□B • A168B • A6□B		Q5⊡B, Q6⊡B	7 units (up to 64 slots) <sup>(Note-1)</sup>	
Power supply modul extension base unit	•	-		Q61P, Q62P, Q63P, Q64PN		
Forced stop input ca		-	>	> Fabricate this cable by customers.		
Connector for forced	stop input cable	-		FK-MCP1.5/3-ST-3.81 (standard accessory)		
Servo external signa	l interface module	A171SENC		Q172DLX <sup>(Note-2)</sup>	Use if	
Manual pulse interfa	ce module	A172SENC		Q173DPX <sup>(Note-3)</sup>	necessary <sup>(Note-2)</sup>	
Serial ABS synchron	ious encoder	MR-HENC	1	Q171ENC-W8 <sup>(Note-4)</sup>		
Serial ABS synchron	ous encoder cable	MR-HSCBL□M (between A-Motion and MR-HENC)		Q170ENCCBL□M-A <sup>(Note-4)</sup> (between MR-J4-□B-RJ and Q171ENC-W8)		
Battery For CPU module For synchronous encoder		Connect A6BAT to the CPU module		Connect Q6BAT to the CPU module Connect MR-BAT6V1SET to MR-J4-□B-RJ <sup>(Note-4)</sup>		
Manual pulse generator		MR-HDP01		< (same as left)		
SSCNET(III) cable		• MR-HBUS□M • MR-J2HBUS□M-A (cable for SSCNET)	• MR-J3BUS□M     • MR-J3BUS□M-A     • MR-J3BUS□M-B     (cable for SSCNET III)		II)	

(Note-1): Use 8 slots as free slots of the main base unit.

(Note-2): Motion CPU built-in I/F (input 4 points) can be used.

(Note-3): Manual pulse/INC synchronous encoder (1 module) in Motion CPU built-in I/F can be used.

<Precautions>

• Q170MSCPU(-S1) is not compatible with teaching units.

<sup>(</sup>Note-4): When a serial ABS synchronous encoder is used with Q170MSCPU(-S1), connect the encoder to the servo amplifier MR-J4-□B-RJ.

#### 2.2 Servo Amplifier Correspondence

The applicable servo system network is changed from SSCNET to SSCNET III or SSCNET III/H. Use servo amplifiers compatible with SSCNET III or SSCNET III/H. Select a servo motor that can be connected with an SSCNET III or SSCNET III/H-compatible servo amplifier.

<Amplifier correspondence>

	Use A17nSHCPUN/A173UHCPU				Use A17nSHCPUN/A173UHCPU				Use Q17nD	SCPU
	Product Model name			Product Model n						
	MR-H series	MR-H-□BN	>		MR-J3 series	• MR-J3(W)-□B(S)				
amplifier	MR-J2S series	MR-J2S-□B		amplifier		• MR-J4(W□)-□B				
Servo a	MR-J2 series	MR-J2-□B			Servo a	MR-J4 series	* Operates in the MR-J3 compatibility mode			
	MR-J2-Jr series	MR-J2-03B5				when mixed with MR-J3.				

#### <Specification compare of servo system network>

Item		SSCNET (A-Motion)		SSCNET III	SSCNET III/H
Communication media		Metal cable		Optical fiber cable	
Communie	cation speed	5.6Mbps		50Mbps	150Mbps
Communicati	Sending	3.55ms		0.44ms/0.88ms	0.22ms/0.44ms/0.88ms
on cycle	Receiving	3.55ms		0.44ms/0.88ms	0.22ms/0.44ms/0.88ms
Maximum number of control axes per system		8 axes/system		16 axes/system	
Transmission distance				Up to 20m be Maximum overa	Standard cable for outside panel] tween stations Il length is 320m 16 axes)
		Overall length is 30m		[Long-distance cable] Up to 50m between stations Maximum overall length is 800m (50m x 16 axes)	[Long-distance cable] Up to 100m between stations Maximum overall length is 1600m (100m x 16 axes)

For the communication with servo amplifiers, "SSCNET III" or "SSCNET III/H" must be set for each system in the SSCNET setting of the system setting.

When "SSCNET III/H" is set, MR-J4(W)- $\square$ B can be used. When "SSCNET III" is set, MR-J3(W)- $\square$ B can be used.

When MR-J4(W) (MR-J3 compatibility mode compatible product) is connected to the system where "SSCNET III" is set, the servo amplifier operates in the MR-J3 compatibility mode (SSCNET III). However, if the MR-J4(W) that was once connected to "SSCNET III/H" is connected to "SSCNET III", an alarm may occur. For details, refer to MR-J4 SERVO AMPLIFIER INSTRUCTION MANUAL.

#### 2.3 Operating System Software Correspondence

Use operating system for Q170MSCPU(-S1).

The latest version of SV22 has been installed in Q170MSCPU(-S1) with shipment.

Download the latest version of operating system besides SV22 from Mitsubishi Electric FA Site for use.

Application	Use A17nSHCPUN/A173UHCPU			Use Q170N	ISCPU(-S1)
Application	Model name			Model	name
		SW2SRX-SV13B			
	For A173UHCPU	SW2NX-SV13B			
_		SW3RN-SV13B			
For conveyor		SW0SRX-SV13D			
assembly (SV13)	For A172SHCPUN	SW0NX-SV13D		For Q170MSCPU(-S1)	SW8DNC-SV13QN
(0110)		SW3RN-SV13D	^		
	For A171SHCPUN	SW2SRX-SV13G			
		SW0NX-SV13G			
	For A173UHCPU	SW2SRX-SV22A		For Q170MSCPU(-S1)	SW8DNC-SV22QN
		SW2NX-SV22A			
<b>–</b> , , , ,		SW3RN-SV22A			
For automatic	For A172SHCPUN	SW0SRX-SV22C			
machinery (SV22)		SW0NX-SV22C			
(0722)		SW3RN-SV22C			
	For A171SHCPUN	SW0SRX-SV22F			
		SW0NX-SV22F			

#### 2.4 Engineering Environment

The following shows the engineering environment supported in Q170MSCPU(-S1).

For the following purchase software, the latest version of which can download from Mitsubishi Electric FA Site and update.

Product	Model name	Available version	Remark
MELSOFT MT Works2	SW1DNC-MTW2-D	Ver.1.56J or later	
MR Configurator2 (Note-1) (Note-2)	SW1DNC-MRC2-□	Ver.1.18U or later	
MELSOFT GX Works2 (Note-3)	SW1DNC-GXW2-□	Ver.1.77F or later	Execute the installation of GX Developer when installing GX Works2.

(Note-1): MR Configurator2 is bundled in MT Works2.

(Note-2): MR Configurator2 can be installed after downloading from Mitsubishi Electric FA Site in the personal computer in which GX Works2 or MT Works2 is installed.

(Note-3): GX Developer also can be installed together when install MELSOFT GX Works2.

In "3.4.3, Diversion procedure in PLC CPU side", GX Developer is necessary to convert sequence program.

#### 3. DIFFERENCES BETWEEN Q170MSCPU(-S1) AND A173UHCPU/A172SHCPUN/A171SHCPUN 3.1 Differences between Q170MSCPU(-S1) and A173UHCPU/A172SHCPUN/A171SHCPUN Differences list

	erences list		_			1
Item		Q170MSCPU(-S1)	A17nSHCPUN/A173UHCPU			Points of replacement
	liem		A171SH	A172SH	A173UH	Tomas of replacement
Peripheral I/F		• USB/RS-232 (Via PLC CPU) • PERIPHERAL I/F (Motion CPU manager)	RS422/SSCNET			Communicate with peripheral by corresponding I/F.
Batte	ery	Q6BAT is built in (3.0V)	A6BAT is built in (3.6V)			Pay attention to the using battery is different.
Forced stop input		<ul> <li>Use EMI connector of Motion CPU module</li> <li>Use device specified by forced stop input setting in the system setting</li> </ul>	Use EMG terminal of main base unit			Always use a forced stop input cable (Please fabricate it by customers). The forced stop cannot be released without using it.
Multiple CPU high speed transmission memory for data transfer between CPU modules		Included	-			-
I/O p	points	8192 points	2048 poir	nts	8192 points	-
	Internal relays (M)	12288 points	Total point is 2048 in shared M,L,S 1024 points 256 points		Total point	
	Latch relays (L)	None (M latch can be set in latchsetting)			is 8192 in shared	The devices on the left are shared in A-Motion but not shared in Stand-alone Motion. Execute automatic refresh setting if necessary. Refer to Section 3.5 for details.
	Step relays (S)	-			M,L,S	
	Link relays (B)	8192 points			8192 points	
	Timers (T)	-			2048 points	
	Counters (C)	-	256 points		2048 points	
	Data registers (D)	8192 points	1024 points8192 points1024 points8192 points256 points2048 pointsUp to 8192 points		8192 points	
	Link registers (W)	8192 points			8192 points	
Device	Annunciators (F)	2048 points			2048 points	
De	File registers (R)	-				
	Special relays (M)	-	256 point	S		
	Special relays (SM)	2256 points	-			
	Special registers (D)	-	256 points			
	Special registers (SD)	2256 points	-			
	Motion registers (#)	12288 points	-	8192 points (Motion SFC	OS only)	-
	Multiple CPU shared devices (U□\G)	Up to 14336 points (Note-1)	-			-
	Coasting timers(FT) 1point(888µ s)					
	on dedicated Jence instruction	D(P).DDRD, D(P).DDWR, D(P).SFCS, D(P).SVST, D(P).CHGT, D(P).CHGT2, D(P).CVGV, D(P).CHGVS <sup>(Note-2)</sup> , D(P).CHGA, D(P).CHGAS <sup>(Note-2)</sup> , D(P).CHGAS <sup>(Note-2)</sup> , D(P).GINT	CHGT, CHGV, CHGA SVST (Non Motion SFC OS only) - SFCS, ITP (Motion SFC OS only)		2	Replace motion dedicated PLC instruction with D(P).*** instruction. Refer to (Q173D(S) CPU/Q172 D(S) CPU Motion controller (SV13/SV22) programming manual (Motion SFC).)

(Continued)

ltem		Q170MSCPU(-S1)	A17nS	HCPUN/A17	3UHCPU	Points of replacement
			A171SH	A172SH	A173UH	
	SV13	Q172DLX, Q173DPX				Please use Q172DLX or
Motion	SV22	Q172DLX, Q173DPX				Q173DPX for motion module in the system which used Q170MSCPU(-S1). <sup>(Note-3)</sup>
module	Loading position	Used in extension base	Only in motion I/O slot			Used in extension base. Refer to Section 3.2.1 Equipment correspondence.

(Note-1): The number of available points differs depending on the system setting.

(Note-2): Only for SV22 advanced synchronous control.

(Note-3): When a serial ABS synchronous encoder is used with Q170MSCPU(-S1), connect the encoder to the servo amplifier MR-J4-D

B-RJ.

 $\mathbf{3}_{\text{.}}$  REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

#### (Continued)

Item			A17nSHCPUN/A173UHCPU	Points of replacement	
		Q170MSCPU(-S1)	A171SH A172SH A173UH		
System setting		<ul> <li>PLC section is Q03UD (when Q170MSCPU is used) or Q06UDH (when Q170MSCPU-S1 is used)</li> <li>Use Q5□B, Q6□B when it is extension base unit.</li> </ul>	<ul> <li>Not corresponding to Multiple CPU</li> <li>Main base unit is A17 B (A172B, A175B, A178B, A178B-S1, A178B-S2, A178B-S3)</li> </ul>	Use the system combining with available unit.	
Servo system i	network	SSCNET III/H, SSCNET III	SSCNET	-	
Teaching unit		Unusable	Usable	-	
CPU shared memory	Multiple CPU high speed transmission area	Provided			
	Use memory	Multiple CPU high speed transmission area of CPU shared memory	Device shared between SCPU and	Assign the device which used in PLC CPU by automatic refresh	
Automatic	Automatic refresh setting	Settable in 32 range	PCPU	setting manually to Motion CPU device after project diversion.	
refresh	Multiple CPU high speed refresh function	Provided			
LED display		7-segment LED display	Each LED of RUN, ERR	-	
Latch range setting Latch (1)		Latch clear (1) of remote latch clear can clear in latch clear (1) (2) Can be cleared by latch clear	Latch range setting is 1 setting only. Clear by L.CLR switch.	Please execute latch clear in MT Works2.	
		(1) (2) of remote latch clear			
Clear all function		Execute by installation mode When the error occurs in the Motion CPU itself, set 10000 to 10999 according to the error type in the diagnosis error (SD0). Both self diagnosis error flag (SM1) and diagnosis error flag (SM0) are ON.	None Even if the error of PCPU occurs, self diagnosis error does not occur.	Correct the program if necessary.	
Motion error detection flag (M2039)		No matter which error occurs, M2039 is ON in Motion CPU.	Errors will not occur but M2039 is ON according to the classification of errors when using SFC.	Correct the program if necessary.	
Latch clear		Remote operation	L.CLR switch	-	
RUN/STOP		Remote operation, RUN/STOP switch	RUN/STOP switch	-	
ROM write		<ul> <li>Execute in RAM operation mode/ROM operation mode (installation switch operation of Motion CPU module is not necessary)</li> <li>Data of MT Works2 can be wrote to ROM directly</li> </ul>	None	-	
Mode operated by ROM		Select by rotary switch Select by rotary switch	None Select by dip switch	-	
Installation mode		OCICCI Dy TOLALY SWILLI		-	

# 3. REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

#### (Continued)

ltem		047014000144040	A17nSHCPUN			
		Q170MSCPU(-S1)	A171SH	A172SH	A173UH	Points of replacement
Mechanical system program (SV22)		Ball screw and electronic gear setting of rotary table can be automatically calculated from the setting value of "Number of Pulses/Rev." and "Travel Value/Rev." of fixed parameter.	Ball screw and electronic gear setting of rotary table are set respectively in mechanical system program.			-
	SV13	0.22ms/1 to 4 axes 0.44ms/5 to 10 axes 0.88ms/11 to 16 axes Possible to set 0.2 [ms] in operation cycle setting <sup>(Note-1)</sup>	3.5ms /1 to 4 axes	3.5ms /1 to 8 axes	3.5ms /1 to 20 axes 7.1ms /21 to 32 axes	When the operation cycle is set as default (automatic), the operation
Operation cycle (default value)	SV22	0.44ms/1 to 6 axes 0.88ms/7 to 16 axes Possible to set 0.2 [ms] in operation cycle setting <sup>(Note-2)</sup>	3.5ms /1 to 4 axes	3.5ms /1 to 8 axes	3.5ms /1 to 12 axes 7.1ms /13 to 24 axes 14.2ms /25 to 32 axes	cycle will change. Operation cycle changes as left describing, and th program execution timing will change, so set the fixed operation cycle if necessary.

(Note-1): The following restrictions are applied when the communication method is "SSCNET III"

• When the operation cycle is 0.2 [ms], set "0 to 3" for the axis select switch setting of the servo amplifier, and configure the system setting.

• When the operation cycle is 0.4 [ms], set "0 to 7" for the axis select switch setting of the servo amplifier, and configure the system setting.

For details, refer to the instruction manual of the servo amplifier.

(Note-2): When MR-J4W3-DB (Software version: A2 or earlier) or MR-J3W-DB is used, set 0.4 [ms] or more for the operation cycle.

#### Difference between self diagnosis error and Motion (SFC) error history

Self diagnos			Error flag status O: ON X: OFF					
			Motion (SEC) Motion error deter					or detection
			Self diagnosis error flag		error history		Flag	
Q170MSCP U(-S1) (SD0)	A17nSHCP UN/ A173UHCP U (D9008)	Description	Q170MSCP U(-S1) (SM1)	A17nSHCP UN/ A173UHCP U(M9008)	Q170MSCP U(-S1) (#8640 + 12n)*	(SFC version only] A172SHCP UN/ A173UHCP U (#8000 + 8n)°	Q170MSCP U(-S1) (M2039)	(SFC version only] A172SHCP UN/ A173UHCP U(M2039)
1 to 9999	10 to 84	Self diagnosis error besides Motion CPU independent error	0	0	0	×	0	×
10002	-	Minor/major error (command generation axis)	0	×	0	×	0	×
10003	-	Minor/major error	0	×	0	0	0	0
10004	-	Minor/major error (virtual servo motor axis)	0	×	0	0	0	0
10005	-	Minor/major error (synchronous encoder axis)	0	×	0	0	0	0
10006	-	Servo error	0	×	0	0	0	0
10006	-	Servo warning	0	×	0	0	0	0
10007	-	Servo program setting error	0	×	0	0	0	0
10008	-	Mode switching error	0	×	0	0	0	0
10009	-	Manual pulse axis setting error	0	Х	0	0	0	0
10010	-	Test mode requirement error	0	×	0	0	0	0
10011	-	WDT error	0	×	0	0	0	0
-	-	Personal computer link communication error	×	×	×	0	×	0
10014	-	System setting error	0	×	0	×	0	×
10015	-	Servo amplifier (MR-J4-⊡B) servo error	0	×	0	×	0	×
10016	-	Abnormal motion slot	0	×	0	×	0	×
10020	-	Motion SFC control error (F/FS)	0	×	0	0	0	0
10021	-	Motion SFC control error (G)	0	×	0	0	0	0
10022	-	Motion SFC control error (K or others (not F, FS, G)	0	×	0	0	0	0
10023	-	Motion SFC control error (Motion SFC chart)	0	×	0	0	0	0
10030	-	Motion CPU internal bus error	0	×	0	×	0	×
10042	-	SSCNET III/H head unit error	0	×	0	×	0	×
10050	-	Safety observation error (alarm) occurrence	0	×	0	×	0	×
10051	-	Safety observation error (warning) occurrence	0	×	0	×	0	×

\*: n shows the value (n= 0 to 7) corresponding to motion error history.

	Difference		
Item	Q170MSCPU(-S1)	A17nSHCPUN/ A173UHCPU	Change/Revise content
System setting/SSCNET configuration	Q170MSCPU(-S1): 1 system (up to 16 axes/system)	A171SHCPUN: 1 system A172SHCPUN: 1 system A173UHCPU: 4 system (up to 8 axes/system)	Execute rotary switch setting of amplifier and the connection of amplifier combining with SSCNET configuration.
Electronic gear	Number of pulses per revolution: 1 to 2147483647[pulse] Travel value per revolution: 1 to 2147483647[pulse]	Number of pulses per revolution: 1 to 65535[pulse] Travel value per revolution: 1 to 65535[pulse]	Change the "Number of Pulses/Rev." and "Travel Value/Rev." of fixed parameter combining with resolution per revolution of the connecting servo motor.
Connect/disconnect of SSCNET communication when servo amplifier power supply is OFF	When an SSCNET III cable or a servo amplifier in the middle of the SSCNET system is replaced while the multiple CPU system is on, use the connect/disconnect function of the SSCNET communication.	SSCNET cables or servo amplifiers in the middle of the SSCNET system can be replaced while the system is on.	When the power supply servo amplifier is OFF/ON in SSCNET system, use connect/disconnect function of SSCNET communication. For details, refer to Motion controller Q series programming manual (common) (Q173D(S)CPU/Q172D(S)CPU) (IB-0300126) and "Connect/disconnect function of SSCNET communication".
Battery break warning/ battery warning	Servo error code 2102(92): Battery break warning 2116(9F): Battery warning	Servo error code 2102(9F): Battery warning 2103(92): Battery break warning	Correct the program using the left servo error code.

#### Item that is necessary to change/revise with the change of servo system network

#### 3.2 Device Comparison

#### 3.2.1 I/O device

	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN
X/Y0 X/Y7FF	User device	User device	User device (2048 points)	
X/Y800 X/Y1FFF	(8192 points)	(8192 points)		

#### 3.2.2 Internal relay (1) SV13

(1) S	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN	
MO			User device (1600 points)		
M1600			Status of each axis (20 points x 8 axes)	Status of each axis (20 points x 4 axes)	
M1680	-		(20 points x o axes)	Unusable	
M1760	User device (2000 points)	User device (2000 points)	Unusable (40 points)	(120 points)	
M1800	(2000 points)	(2000 points)	Command signal of each axis	Command signal of each axis (20 points x 4 axes)	
M1880			(20 points x 8 axes)	Unusable (80 points)	
M1960					
M2000			Common devi	ce (88 points)	
M2047	Common device (320 points)	Common device (320 points)			
M2048	(520 points)	(320 points)		/	
M2320	Unusable (80 points)	Unusable (80 points)			
M2400	Status of each axis (20 points x 16 axes)	Status of each axis			
M2720	User device (320 points)	(20 points x 32 axes)			
M3040	Unusable (32 points)				
M3072	Common device (command signal) (64 points)	Unusable (160 points)			
M3136	Unusable (64 points)				
M3200	Command signal of each axis (20 points x 16 axes)	Command signal of each axis			
M3520		(20 points x 32 axes)			
M3840	User device (4672 points)	User device			
M8191	(+072 points)	(4351 points)			

#### (2) SV22 Real mode

(_/ \				
	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN
M0			User d (1360	
M1360	-		Synchronous encoder axis	
M1364	-		User device	
	-			Status of each axis
M1600			Status of each axis	(20 points x 4 axes)
M1680		lle en deude e	(20 points x 8 axes)	
M1760	User device	User device	Unusable	Unusable
IVI 1760	(2000 points)	(2000 points)	(40 points)	(120 points)
				Command signal of each
M1800			Command signal of each	axis
	_		axis	(20 points x 4 axes)
M1880			(20 points x 8 axes)	Unusable
M1960	-			(40 points)
M1960 M2000	Common device	Common device	Commor (88 pc	
M2000 M2048	(320 points)	(320 points)		/
M2040	Unusable (80 points)	Unusable (80 points)	1	/
IVIZUZU	Status of each axis		1	/
M2400	(20 points x16 axes)	Status of each axis		
	User device	(20 points x 32 axes)		
M2720	(320 points)			
	Unusable			
M3040	(32 points)			
	Common device (command	Linuaghia		
M3072	signal)	Unusable (160 points)		
	(64 points)	(100 points)		
M3136	Unusable			
1110 100	(64 points)		•	
M3200	Command signal of each axis	Command signal of each		
	(20 points x 16 axes)	axis		
M3520	User device	(20 points x 32 axes)		
	(320 points)		/	
M3840	Unusable (160 points)			
	Virtual servo motor axis			
M4000	status <sup>(Note-1)</sup>	User device		
	(20 points x 16 axes)	(800 points)		
	User device			
M4320	(320 points)			
	Quadranese encerter est	Synchronous encoder axis		
M4640	Synchronous encoder axis status	status		
	(4 points x 12 axes)	(4 points x 4 axes)	/	
M4656				
M4688	Unusable <sup>(Note-1)</sup>			
	(112 points)			
	Virtual servo motor axis	User device		
M4800	status <sup>(Note-1)</sup>	(3536 points)		
	(20 points x 16 axes)			
M5120	User device		/	
l	(320 points)	1	V	

(Note-1): This device can be used as a user device when used only in the SV22 real mode.

# 3. REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

(Continued)

	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN
M5440	Synchronous encoder axis command signal (4 points x 12 axes)	User device		
M5488 M8191	User device (2704 points)	(3536 points)		

## 3. REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

#### (3) SV22 Virtual mode

	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN
MO			User de (1360 po	
M1200			Virtual servo motor axis status	Virtual servo motor axis status <sup>(Note-1) (Note-2)</sup> (20 points x 4 axes)
M1280	_		(20 points x 8 axes)	User device <sup>(Note-2)</sup> (80 points)
M1360			Synchronous enco (4 points x 1 a	
M1364			Unusable (36 poi	
M1400			Virtual servo motor axis command signal	Virtual servo motor axis command signal <sup>(Note-1)</sup> (Note-2)
M1480	User device (2000 points)	User device (2000 points)	(20 points x 8 axes)	(20 points x 4 axes) User device <sup>(Note-2)</sup> (80 points)
M1560			Synchronous encoder a (4 points >	axis command signal
M1564	1		Unusable (3	
M1600			Status of each axis	Status of each axis (20 points x 4 axes)
M1680			(20 points x 8 axes)	Unusable
M1760			Unusable (40 points)	(120 points)
M1800			Command signal of each axis	Command signal of each axis (20 points x 4 axes)
M1880			(20 points x 8 axes)	Unusable (80 points)
M1960			Common	device
M2000	Common device	Common device	(88 poi	nts)
M2048	(320 points)	(320 points)		/
M2320	Unusable (80 points)	Unusable (80 points)		
M2400	Status of each axis (20 points x 16 axes)	Status of each axis		
M2720	User device (320 points)	(20 points x 32 axes)		
M3040	Unusable (32 points)			
M3072	Common device (command signal) (64 points)	Unusable (160 points)	/	
M3136	Unusable (64 points)			
M3200	Command signal of each axis (20 points x 16 axes)	Command signal of each axis		
M3520	User device (320 points)	(20 points x 32 axes)		
M3840	Unusable (160 points)	Unusable (160 points)		
M4000	Virtual servo motor axis status (20 points x 16 axes) <sup>(Note-1)(Note-3)</sup>	Virtual servo motor axis status <sup>(Note-1)(Note-3)</sup>		
M4320	User device (320 points) <sup>(Note-1)</sup>	(20 points x 32 axes)		

(Continued)

	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN
M4640	Synchronous encoder axis status (4 points x 12 axes) <sup>(Note-3)</sup>	Synchronous encoder axis status <sup>(Note-3)</sup> (4 points x 4 axes)		
M4656		Unusable		
M4688	Unusable (112 points) <sup>(Note-3)</sup>	(144 points) <sup>(Note-3)</sup>		
M4800	Virtual servo motor axis command signal (20 points x 16 axes) <sup>(Note-1)(Note-3)</sup>	Virtual servo motor axis command signal <sup>(Note-1)</sup> (Note-3)		
M5120	User device (320 points) <sup>(Note-3)</sup>	(20 points x 32 axes)		
M5440	Synchronous encoder axis command signal	Synchronous encoder axis command signal <sup>(Note-3)</sup> (4 points x 4 axes)		
M5456	(4 points x 12 axes) <sup>(Note-3)</sup>	Unusable (32 points) <sup>(Note-3)</sup>		
M5488	User device (2704 points) <sup>(Note-4)</sup>	User device (2704 points) <sup>(Note-4)</sup>		
M8191		(2101 pointo)	$\bigvee$	

(Note-1): Only the area of axis set by mechanical system program is occupied. The area of unused axis set by mechanical system program can be used by user.

(Note-2): When using virtual mode, do not set latch range as M1200 to M1599.

(Note-3): When using virtual mode, do not set latch range as M4000 to M5487.

(Note-4): Cam axis command signal and smoothing clutch completion signal can be set to any device by parameter.

#### 3.2.3 Data register

#### (1) SV13

	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN	
D0	Monitor device of each axis (20 points x 16 axes)	Monitor device of each axis	User device (800 points)		
D320	User device (320 points)	(20 points x 32 axes)			
D640	Control change register (2 points x 16 axes)	Control change register			
D672	User device (32 points)	(2 points x 32 axes)			
D704	Common device (command signal) (54 points)	Common device			
D758	Unusable (42 points)	(96 points)			
D800			Monitor device of each axis	Monitor device of each axis (20 points x 4 axes)	
D880			(20 points x 8 axes)	Unusable (80 points)	
D960	User device	User device	Control change register	Control change register (6 points x 4 axes)	
D984	(7392 points)	(7392 points)	(6 points x 8 axes)	Unusable (24 points)	
D1008 D1023				n device oints)	
D1024					
D8191					

#### (2) SV22 Real mode

	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN
D0	Monitor device of each axis (20 points x 16 axes)	Monitor device of each axis		
D320	User device (320 points)	(20 points x 32 axes)		laviaa
D640	Control change register (2 points x 16 axes)	Control change register	User device (748 points)	
D672	User device (32 points)	(2 points x 32 axes)		
D704				
D748	Common device (54 points)	Common device	Synchronous encode (4 points	er axis monitor device x 1 axis)
D752		(96 points)	Lloor	laviaa
D758	Unusable (42 points)		User device (48 points)	
D800	Virtual servo motor axis monitor device <sup>(Note-1)</sup>		Monitor device of each axis	Monitor device of each axis ( <i>20</i> points x 4 axes)
D880	(10 points x 16 axes)		(20 points x 8 axes)	Unusable (80 points)
D960	_	User device (320 points)	Control change register	Control change register (6 points x 4 axes)
D984	User device (160 points)		(6 points x 8 axes)	Unusable (24 points)
D1008	(100 points)		Commo (16 p	
D1024				
D1120	Synchronous encoder axis monitor device <sup>(Note-1)</sup>	Synchronous encoder axis monitor device (6 points x 4 axes) <sup>(Note-1)</sup>		
D1144	(10 points x 12 axes)			
D1240	Cam axis monitor device <sup>(Note-1)</sup> (10 points x 16 axes)	User device		
D1400	User device	(7048 points)		
D8191	(6792 points)			

(Note-1): Only the area of axis set by mechanical system program is occupied. The area of unused axis set by mechanical system can be used by user.

#### (3) SV22 Virtual mode

(3) 8	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN	
D0	Monitor device of each axis (20 points x 16 axes)	Monitor device of each axis			
D320	User device (320 points)	(20 points x 32 axes)	User device (670 points)		
D640 D670	Control change register (2 points x 16 axes)		Current value after differential gear of virtual servo motor axis main shaft <sup>(Note-1)</sup>	Current value after differential gear of virtual servo motor axis main shaft <sup>(Note-1)</sup> (2 points x 4 axes)	
D678		Control change register (2 points x 32 axes)	(2 points x 8 axes)	User device (8 points)	
D686	User device (32 points)		Current value after synchronous encoder (2 points :	differential gear of axis main shaft <sup>(Note-1)</sup>	
D688			Unus (12 no		
D700		-	(12 pc	Virtual servo motor	
D704	Common device (command signal)	signal)	Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 8 axes)	axis monitor device <sup>(Note-1)</sup> (6 points x 4 axes)	
D724				User device (24 points)	
D748	(54 points)	Common device	Synchronous encoder axis monitor device (4 points x 1 axis)		
D752		(96 points)	Unus	Unusable	
D758	-		(8 po	ints)	
D760	Unusable (42 points)		Cam axis monitor device <sup>(Note-1)</sup>	Cam axis monitor device <sup>(Note-1)</sup> (5 points x 4 axes)	
D780			(5 points x 8 axes)	User device (20 points)	
D800	Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 16 axes)		Manitar davias of each	Monitor device of each axis (20 points x 4 axes)	
D880	Current value after differential gear of virtual servo motor axis main shaft (4 points x 16 axes) <sup>(Note-1)</sup>	Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 32 axes) Current value after differential	Monitor device of each axis (20 points x 8 axes)	Unusable (80 points)	
D960		gear of virtual servo motor axis main	Control obongo register	Control change register	
D984	-	shaft <sup>(Note-1)</sup>	Control change register (6 points x 8 axes)	(6 points x 4 axes) Unusable	
D992	User device	(4 points x 32 axes)	(	(24 points)	
D1008	(160 points)		Common device (16 points)		
D1024	1		(16 pc	nins)	

(Continued)

	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN
D1120	Synchronous encoder axis monitor device (6 points x 12 axes) Current value after differential gear of synchronous encoder axis main shaft	Synchronous encoder axis monitor device <sup>(Note-1)</sup> (6 points x 4 axes) Current value after differential gear of synchronous encoder axis main shaft (4 points x 4 axes)		
D1160	(4 points x 12 axes)	Unusable (80 points)		
D1240	Cam axis monitor device <sup>(Note-1)</sup> (10 points x 16 axes)	Cam axis monitor device <sup>(Note-1)</sup>		
D1400		(10 points x 32 axes)		
D1560	User device (6792 points)	User device		
D8191		(6632 points)		

(Note-1): Only the areas of axes set with the mechanical system program are occupied. The areas of the axes not used by the mechanical system program can be used by users.

#### 3.2.4 Motion register

	Q170MSCPU(-S1)	A173UHCPU	A172SHCPUN	A171SHCPUN
#0	User device	User device		
#7999	(8000 points)	(8000 points)		
#8000		Past 7 times en (oldest error		
#8008	1	Past 6 times en	,	T /
#8016	1	Past 5 times en	ror information	7
#8024	] [	Past 4 times en	ror information	
#8032	Monitor device	Past 3 times en	ror information	
#8040	(640 points)	Past 2 times en	ror information	
#8048		Past 1 time err	or information	
#8056		Latest error	information	
#8064		Unus (128 p		
#8192				
#8640	Motion error history device (96 points)			
#8736	Product information list device (16 points)			
#8752	System area			
#12287	(3536 points)	<u> </u>		/

#### 3.2.5 Special relay

De	vice number		
Q170MSCPU	A17nSHCPUN/	Name	Remark
(-S1)	A173UHCPU		
SM60	M9000	Fuse blown detection flag	
-	M9002	I/O module verification error	
-	M9004	MINI link error	A173UHCPU only
SM53	M9005	AC DOWN detection flag	Q170MSCPU (-S1): AC/DC DOWN detection
SM52	M9006	Low battery flag	
SM51	M9007	Low battery latch flag	
SM1	M9008	Self diagnosis error flag	
-	M9009	Annunciator detection	
SM0	M9010	Diagnosis error flag	
-	M9011	Operation error flag	
-	M9012	Carry flag	
-	M9016	Data memory clear flag (all data)	
-	M9017	Data memory clear flag (not latch data)	
-	M9020	User timing clock No.0	
-	M9021	User timing clock No.1	
-	M9022	User timing clock No.2	
-	M9023	User timing clock No.3	
-	M9024	User timing clock No.4	
-	M9025	Clock data set requirement	Clock data of CPU No.1 is operating.
SM211	M9026	Clock data error	
-	M9027	Clock data display	
SM801	M9028	Clock data reading requirement	
-	M9029	Data communication requirement batch processing	A173UHCPU only
-	M9030	0.1 second clock	
-	M9031	0.2 second clock	
-	M9032	1 second clock	
-	M9033	2 seconds clock	
_	M9034	1 minute clock	
SM400	M9036	Always ON	
SM401	M9037	Always OFF	
-	M9038	Only 1 scan is ON after RUN	
-	M9039	RUN flag (only 1 scan is OFF after RUN)	
	M9040	PAUSE enable coil	
-	M9040	PAUSE status contact	
-	M9042	Stop status contact	
_	M9043	Sampling trace completion	
-	M9044	Sampling trace	
-	M9045	Reset watchdog timer (WDT)	
-	M9046	Sampling trace	A173UHCPU only
-	M9047	Sampling trace preparation	A173UHCPU only
-	M9049	Switch output characters number	
-	M9051	CHG command execution inhibition	A173UHCPU only
-	M9052	Switch SEG command	
_	M9053	Switch EI/DI command	
-	M9054	STEP RUN flag	
	M9055	Status latch completion flag	

# 3. REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

(Continued)

		Namo	Bomork
170MSCPU	A17nSHCPUN/	Name	Remark
(-S1)	A173UHCPU	Main side D. Lostting requirement	
-	M9056	Main side P, I setting requirement	
-	M9057	Sub side P, I setting requirement	
-	M9058	Main side P, I setting completion	
-	M9059	Sub side P, I setting completion	
-	M9065	Partition processing execution detection	
-	M9066	Partition processing requirement flag	
-	M9070	Needed search time of A8UPU/A8PUJ	
SM512	M9073	Motion CPU WDT error flag	
SM500	M9074	PCPU preparation completion flag	
SM501	M9075	Test mode flag	
SM502	M9076	Forced stop input flag	
SM513	M9077	Manual pulse axis setting error flag	
SM510	M9078	Test mode requirement error flag	
SM516	M9079	Servo program setting error flag	
-	M9081	Communication requirement register area BUSY signal	
-	M9084	Error check	
-	M9091	Command error flag	
_	M9094	I/O exchange flag	
_	M9100	SFC program existence	
-	M9101	Start/stop SFC program	
-	M9102	Start status of SFC program	
-	M9103	Continuous transition existence	
-	M9104	Continuous transition prevention flag	
		Start step transition monitoring timer (support to	
-	M9108	D9108)	
-	M9109	Start step transition monitoring timer (support to D9109)	
-	M9110	Start step transition monitoring timer (support to D9110)	
-	M9111	Start step transition monitoring timer (support to D9111)	
-	M9112	Start step transition monitoring timer (support to D9112)	
-	M9113	Start step transition monitoring timer (support to D9113)	
-	M9114	Start step transition monitoring timer (support to D9114)	
_	M9180	Active step sampling trace completion flag	
	M9181	Active step sampling trace execution flag	
	M9181	Enable active step sampling trace	
-	M9196	Operation output of block stop	
-	M9197	Fuse blown/I/O verification error display switching	
-	M9198		

\* The special relay of Q170MSCPU(-S1) is in Motion CPU side.

Refer to the manual of PLC CPU for the special relay in PLC CPU side.

#### 3.2.6 Special register

	vice number		
Q170MSCPU	A17nSHCPUN/	Name	Remark
(-S1)	A173UHCPU		
SD60	D9000	Fuse blown	
-	D9002	I/O module verification error	
_	D9004	MINI link error	A173UHCPU only
SD53	D9005	AC DOWN counter	
SD0	D9008	Self diagnosis error	
-	D9009	Detection of annunciator	
-	D9010	Error step	SD1: Diagnosis error occurrence time (calendar, month)
-	D9011	Error step	SD2: Diagnosis error occurrence time (date, hour)
SD203	D9015	CPU operation status	
-	D9016	A17nSHCPUN: ROM/RAM setting A173UHCPUN: Program number	
-	D9017	Minimum scan time (10ms unit)	SD520: Current main cycle (1ms unit)
-	D9018	Scan time (10ms unit)	SD521: Maximum main cycle (1ms unit)
-	D9019	Maximum scan time (10ms unit)	SD524: Maximum operation cycle (1µs unit)
-	D9020	Constant scan (10ms unit)	A173UHCPU only SD523: Motion setting operation cycle (1µs unit)
-	D9021	Scan time (1ms unit)	A173UHCPU only SD522: Motion operation cycle (1µs unit)
-	D9022	Time (1 second unit)	
SD210	D9025	Clock data (calendar, month)	
SD211	D9026	Clock data (date, hour)	
SD212	D9027	Clock data (minute, second)	
SD213	D9028	Clock data (0, week)	
-	D9035	Expansion file register	A173UHCPU only
-	D9036	For specifying extended file register device number	A173UHCPU only
-	D9037		
-	D9038	LED display priority order	
-	D9039		
-	D9044	For sampling trace	A173UHCPU only
-	D9049	Work area for SFC	A173UHCPU only
-	D9050	SFC program error number	A173UHCPU only
-	D9051	Error block	A173UHCPU only
-	D9052	Error step	A173UHCPU only
-	D9053	Error transition	A173UHCPU only
-	D9054	Error sequence step	A173UHCPU only
-	D9055	Status latch	A173UHCPU only
-	D9072	PLC communication check	A173UHCPU only
-	D9081	Number of communication requirement register free area	A173UHCPU only
-	D9085	Setting register of time check value	A173UHCPU only
-	D9090	Number of boards in special function module over	A173UHCPU only
-	D9091		
-	D9092	Detail error number	
_	D9094	Exchange I/O start I/O number	

### $\mathbf{3}_{\text{.}}$ REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

(Continued)

De	evice number				
Q170MSCPU	A17nSHCPUN/	Na	ame	Remark	
(-S1)	A173UHCPU				
_	D9100				
-	D9101				
-	D9102				
-	D9103				
-	D9104	Fuse blown module			
-	D9105			A173UHCPU only	
-	D9106				
-	D9107				
-	D9116				
-	D9117				
-	D9118				
-	D9119				
-	D9120	I/O module verification er	ror		
-	D9121			A173UHCPU only	
-	D9122				
-	D9123				
-	D9124	Number of annunciator de	etection		
-	D9125				
-	D9126				
-	D9127				
_	D9128				
_	D9129	Annunciator detection nu	mber		
_	D9130				
_	D9131				
_	D9132				
-	D9180				
-	D9181	A173UHCPU: Unusable	A17nSHCPUN: Limit		
SD510	D9182	Q170MSCPU(-S1),	switch output status		
SD511	D9183	A173UHCPU: Test mode requirement error	storage area		
SD512	D9184	PCPU error cause			
SD513	D9185		A17nSHCPUN: Servo		
SD514	D9186	Q170MSCPU(-S1),	amplifier classification		
		A173UHCPU: Manual	A17nSHCPUN: Manual		
SD515	D9187	pulse axis setting error information	pulse axis setting error		
			information		
			A17nSHCPUN: Test		
-	D9188	A173UHCPU: Unusable	mode requirement error		
			information		
SD516	D9189	Error program No.			
SD517	D9190	Error item information	1		
			A17nSHCPUN: Servo		
SD502	D9191	Q170MSCPU(-S1),	amplifier installation		
		A173UHCPU: Servo	information	4	
		amplifier installation	A17nSHCPUN: Area for		
SD503	D9192	information	manual pulse (P1)		
_		smoothing magnificat	smooth		
	50400	Demonstration 1. 11. 1	setting		
-	D9196	Personal computer link co	ommunication error code		

3. REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

(Continued)

	number	-		
Q170MSCPU	A17nSHCPUN/	N	Remark	
(-S1)	A173UHCPU			
		Q170MSCPU(-S1), A173UHCPU:		
D752	D752	Area for manual pulse 1 (P1)		
		smoothing magnification setting		
		Q170MSCPU(-S1), A173UHCPU:		
D753	D753	Area for manual pulse 2 (P2)	A17nSHCPUN:	
		smoothing magnification setting	Unusable	
		Q170MSCPU(-S1), A173UHCPU:		
D754	D754	Area for manual pulse 3 (P3)		
		smoothing magnification setting		
-	D760			
-	D761			
-	D762	]		
-	D763	1		
-	D764	1		
-	D765	1		
	D766	1		
-	D767	A173UHCPU:		
	D768	Limit switch output disable setting		
-		area for Axis 1 to 32		
-	D769			
-	D770			
-	D771			
-	D772			
-	D773			
-	D774			
-	D775		-	
-	D776			
-	D777			
-	D778		A17nSHCPUN:	
-	D779		Cam axis monitor device	
-	D780		• A172SHCPUN: 5 points x 8 axes	
-	D781		• A171SHCPUN: 5 points x 4 axes	
-	D782			
-	D783	A173UHCPU:		
-	D784	Limit switch output status storage		
-	D785	area for Axis 1 to 32		
-	D786	1		
-	D787	1		
-	D788	1		
	D789	1		
-	D789	1		
-	D790 D791	1		
			1	
-	D792	4		
-	D793	4		Q170MSCPU(-S1):
-	D794	4		#8000 + 20n (1 axis/word
-	D795	A173UHCPU:		A17nSHCPUN:
-	D796	Servo amplifier classification		D792 to (4 axes/word)
-	D797			A173UHCPU:
-	D798			D792 to (4 axes/word)
-	D799	1		

\* The special register of Q170MSCPU(-S1) is in Motion CPU side.

About the special register of PLC CPU side, refer to the manual of PLC CPU.

#### 3.2.7 Other devices

Item	Q170MSCPU(-S1)	A173UHCPU	A17nSHCPUN	
Personal computer link communication error flag	-	M203	4	
PCPU preparation completion flag	SM500	M9074	074	
Home position return re-travel value	D9 + 20n <sup>(Note-1)</sup> (data abbreviated to 1 word) #8006 + 20n, #8007 + 20n <sup>(Note-1)</sup> (Referred to at monitoring)	D9 + 20n <sup>(Note-1)</sup>	D811 + 20n <sup>(Note-1)</sup>	
Travel value change register	Any device (enable set D16 + 20n and D17 + 20n) <sup>(Note-1)</sup>	D16 + 20n, D17 + 20n <sup>(Note-1)</sup>	D815 <sup>(Note-1)</sup> + 20n	
	D0 to D8191	D800 to D8191	D0 to D799	
	W0 to W1FFF	W0 to W1FFF	W0 to W3FF	
Indirectly designated device (word device)	#0 to #7999	#0 to #7999 (Motion SFC (real mode) only)	#0 to #7999 (Motion SFC of A172SH (real mode) only)	
	U□\G10000 to U□\G(10000 + p - 1) <sup>(Note-2) (Note-4)</sup>	-	-	
	X0 to X1FFF <sup>(Note-3)</sup>	X0 to X1FFF	X0 to X7FF	
	Y0 to Y1FFF	Y0 to Y1FFF	Y0 to Y7FF	
	M0 to M8191	M/L0 to M/L8191	M/L0 to M/L2047	
Indirectly designated device		M9000 to M9255	M9000 to M9255	
(bit device)	B0 to B1FFF	B0 to B1FFF	B0 to B3FF	
	F0 to F2047	F0 to F2047	F0 to F255	
	U□\G10000.0 to U□\G(10000 + p - 1).F <sup>(Note-2) (Note-4)</sup>	-	-	
	D0 to D8191	D800 to D3069, D3080 to D8191	D0 to D799	
Enable specified device in	W0 to W1FFF	W0 to W1FFF	W0 to W3FF	
high speed reading function	U□\G10000 to U□\G(10000 + p - 1) <sup>(Note-2) (Note-4)</sup>	-	-	

(Note-1): n shows the value (axis No.1 to 16: n= 0 to 15) corresponding to axis No.

(Note-2): p is the user free area points of the Multiple CPU high speed transmission area of each CPU.

□: First I/O number of CPU module

(Note-3): In PXn + 0 to PXn + F, the input devices assigned to the motion CPU built-in I/F (DI), PXn + 4 to PXn + F are fixed to 0 and cannot be used. (n = Start input number)

(Note-4): Setting is available only for the devices of the own CPU.

 $\mathbf{3}_{\text{.}}$  REPLACEMENT PROPOSAL FROM A-MOTION TO STAND-ALONE MOTION TROLLER

(Continued)

Item	Q170MSCPU(-S1)	A173UHCPU	A17nSHCPUN
	X0 to X1FFF	X0 to X1FFF	X0 to X7FF
	Y0 to Y1FFF	Y0 to Y1FFF	Y0 to Y7FF
	M0 to M8191	M0 to M8191	M0 to M2047
Output device	-	L0 to L8191	L0 to L2047
	B0 to B1FFF	B0 to B1FFF	B0 to B3FF
	U□\G10000.0 to		
	U□\G(10000 + p - 1).F <sup>(Note-2) (Note-5)</sup>	-	-
	D0 to D8191	D0 to D8191	D0 to D1023
	W0 to W1FFF	W0 to W1FFF	W0 to W3FF
	#0 to #9215	#0 to #8191	#0 to #8191
Watch data	U□\G10000 to		
	U□\G(10000 + p - 1) <sup>(Note-2) (Note-5)</sup>	-	-
		Absolute address (H0 to	Absolute address (H0 to
ata	-	HFFFFFFF)	HFFFFFFF)
ON section setting	D0 to D8191	D0 to D8191	D0 to D1023
ntbr	W0 to W1FFF	W0 to W1FFF	W0 to W3FF
o 5 ON section setting	#0 to #9215	#0 to #8191	#0 to #8191
	Constant (Hn/Kn) <sup>(Note-4)</sup>	Constant (Hn/Kn) <sup>(Note-4)</sup>	Constant (Hn/Kn) <sup>(Note-4)</sup>
s lit s	U□\G10000 to		
Lin	U□\G(10000 + p - 1) <sup>(Note-2) (Note-5)</sup>	-	-
	X0 to X1FFF <sup>(Note-3)</sup>	X0 to X1FFF	X0 to X7FF
	Y0 to Y1FFF	Y0 to Y1FFF	Y0 to Y7FF
	M0 to M8191	M0 to M8191	M0 to M2047
		L0 to L8191	L0 to L2047
	B0 to B1FFF	B0 to B1FFF	B0 to B3FF
Output enable/disable	F0 to F2047	F0 to F2047	F0 to F255
bit	SM0 to SM1999	M9000 to M9255	M9000 to M9255
Faraad autout hit		TT0 to TT2047	TT0 to TT255
Forced output bit		TC0 to TC2047	TC0 to TC255
		CT0 to CT1023	CT0 to CT255
	-	CC0 to CC1023	CC0 to CC255
	U□\G10000.0 to		
	U□\G(10000 + p - 1).F <sup>(Note-2) (Note-5)</sup>	-	-
c		M2160 to M2223	A171SHCPU: M1984 to M1991
ନ୍ଥ ଅଧି ତା Clutch status	Any device	(unnecessary to set in	A172SHCPU: M1984 to M1999
	(M2160 to M2223 can also be set.)	mechanical system program)	(unnecessary to set in
Cam axis command signal (cam/ball screw switching instruction) Smoothing clutch			mechanical system program)
Cam axis command			
signal	Any device		-
.og (cam/ball screw	(M5488 to M5519 can also be set.)		
switching instruction)			
	Any device		-
completion signal	(M5520 to M5583 can also be set.)		

(Note-1): n shows the value (axis No.1 to 16: n= 0 to 15) corresponding to axis No.

(Note-2): p is the user free area points of the Multiple CPU high speed transmission area of each CPU.

□: Start I/O number of CPU module

(Note-3): In PXn + 0 to PXn + F, the input devices assigned to the motion CPU built-in I/F (DI), PXn + 4 to PXn + F are fixed to 0 and cannot be used.

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

(Note-5): Setting is available only for the devices of the own CPU.

Confirm use status for "cross reference" etc. in MT Works2, and change to the device number of Q170MSCPU(-S1).

#### 4. DIVERSION OF PROJECT CREATED BY A173UHCPU/A172SHCPUN/A171SHCPUN

			Motior	n SFC is r	iot compa	atible	Mot	ion SFC	is compa	tible	
			A17nSH	ICPUN	A173L	JHCPU	A172S	HCPUN	A173L	IHCPU	Remark
			SV13	SV22	SV13	SV22	SV13	SV22	SV13	SV22	
Ourstans	Syste	em setting data				Δ					Note-1
System setting	High	speed reading data				0					
setting	Basic	setting data				×					Note-2
		Fixed parameter				Δ					Note-3
Servo	Axis data	Home position return data				0					
data	Axi	JOG operation data				0					
setting		Servo parameter				Δ					Note-3
	Para	meter block				0					
	Limit output data		×		0			Note-4			
Servo progra	m		$\triangle$	7	(	С	2	4	(	С	Note-5, Note-6
	Motic	n SFC parameter						(	C		
	Motic	n SFC program						4		C	Note-5
Motion	Operation control program			$\square$	$\square$	$\square$		4		С	Note-5
SFC	Transition program			$\square$	$\bigcirc$	$\bigcirc$			C	Note-5	
program	Conv	ersion data		$\bigcirc$	$\bigcirc$	$\bigcirc$		2	2		Note-8
	Autor settin	natic numbering g						(	С		
	Mech	anical edit data		$\triangle$		0		$\triangle$		0	Note-5, Note-7
Mechanical	Mech	anical conversion data		$\triangle$		$\triangle$		$\triangle$		Δ	Note-8
system	Cam	conversion data		0		0		0		0	
program	Real	mode axis information		0		0		0		0	
Cam data				0		0		0		0	
Device memo	ory		○ (SW3RNC-GSVE only)								
Backup data			X				Note-8				
Communicat	on set	ting				×					Note-8

#### 4.1 Data List Available for Diversion or Not (SV13/SV22)

O: Can be diverted

△: Data must be revised

 $\times:$  Must be set again

(Note-1) System setting data

About PLC/motion module

When Q170MSCPU(-S1) is used with PLCs or motion modules, an extension base unit is required.

- Pulse/synchronous encoder I/F module A172SENC
   A172SENC module is converted to Q172DLX. The manual pulse generator/synchronous encoder setting is deleted. Set Q172DLX module or Q173DPX module if necessary. (manual pulse can also be used in internal I/F)
- Limit output module A1SY42 (when Motion SFC is not compatible with OS) Limit output module A1SY42 is not diverted.
- Axis No. setting of external input signal module Axis No. setting of external input signal module in Q170MSCPU(-S1) is moved to servo external signal parameter in servo data.

Servo amplifier setting

The servo amplifier is converted to MR-J4-B when SSCNET III/H is selected, or converted to MR-J3-B when SSCNET III is selected.

Others beside servo amplifier (inverter etc.) are deleted.

(Note-2) Basic setting data

Stand-alone Motion requires the multiple CPU setting. Set according to system.

(Note-3) Fixed parameter, servo parameter (servo amplifier besides MR-J2S)

Fixed parameter (Number of Pulses/Rev. and Travel Value/Rev.) is not converted. Servo parameter is initialized.

Revise parameter with servo amplifier after changing.

(Note-4) Limit output data (when Motion SFC is not compatible with OS) Data are deleted because of incompatibility. Revise the data.

(Note-5) Servo program, Motion SFC program, mechanical system program

Motion dedicated device

The allocation of the motion dedicated device is different between A17nSHCPUN/A173UHCPU and Q-Motion. Change the motion dedicated device.

(Note-6) Servo program

Word point of indirect device

There are changes of word point between A17nSHCPUN/A173UHCPU and Q-Motion.

Execute conversion check and revise if necessary.

(Note-7) Mechanical system program

Unit setting of output axis

Unit settings of fixed parameter and output axis are set respectively in A-Motion, but fixed parameter is set only in Q170MSCPU(-S1). Revise the unit settings when unit settings of fixed parameter and output axis are different.

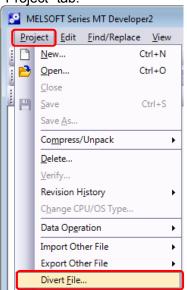
(Note-8) Conversion data, setting data

It can not be diverted because CPU is different. Convert/set the data again.

#### 4.2 Program Diversion Procedure in Motion CPU Side 4.2.1 Diversion procedure using MT Developer2

The following shows an example of procedures for replacing an A-Motion CPU side project with a Stand-alone Motion CPU project using MT Developer2. Always backup the project before the program replacement.

1) Start MT Developer2, and select "Divert File" --> "Diversion of Other Format Project" from the "Project" tab.



2) Select the "Browse" button in the "Diversion of Other Format Project" dialog box.

Diversion of the MT Developer2 Format Project	<b>—</b> X—
Source (MT Developer 2 Format Project)         Drive/Path         C:\User\Meiden\Desktop\Replacement\Relevant BS\A172SHCPUN_SV1         Project Name         MS10X117         CPU Type :         A172SH         OS Type :	Divert Close
CPU/OS Selection CPU Type : Q170M-S1	

3) Select "Browse" in Save Folder Path and the source project from "Folder List", and click "Open".

-				
Name	CPU Type	OS Type	Title	
120217	A 4 70011	0000 00000 (000	Up	
120217	A172SH	SW3-SV13D(SFC	.)	
orkspace Name :				
onopaco ivanio ,	I			
oject Name :	120217			
-,	1			
:le:	,			
le:				
le:				
le;				
le;		_		

4) Select the CPU type and OS type in "CPU/OS Selection".

Update Time	
2012-11-21 PM 04:01:04	
	2012-11-21 PM 04:01:04 2012-11-21 PM 04:01:04 2012-11-21 PM 04:01:04

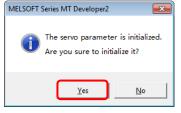
#### 5) Click the "Divert" button.

Diversion of the MT Developer2 Format Project	<b>—</b> ×-
Source (MT Developer 2 Format Project)         Drive/Path       C:\User\Meiden\Desktop\Replacement\Relevant BS\A 172SHCPUN_SV1         Project Name       MS 10X 117         CPU Type :       A172SH         OS Type :       SW0-SV13DM	Divert Close
CPU/OS Selection CPU Type : Q170M-S1	

6) Select "Divert".

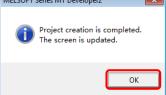
MELSOFT Series MT Developer2						
Execute the series conversion of servo amplifier. Confirm the result of the conversion after executing.						
Conversion Target Servo Amplifier Setting						
SSCNET III LINE 1						
C SSCNET III/H						
SSCNET III						
MR-J3 Series						
Reconsider the following data. - Servo Data - Servo Parameter						
For details on replace, press F1 key and refer to the help.						
OK Cancel						

7) Execute the series conversion of the servo amplifier. Select the servo amplifier series and servo system network specification after the replacement, and select "OK".

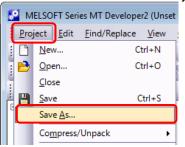


8) The conversion of the project is completed. Select "OK".

After the project conversion, make the cross comparison or check the data on each screen.



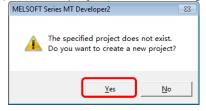
9) Select "Save As" from the "Project" tab to save the project after the conversion.



10) Input "Workspace Name", "Project Name", and "Title", and select "Save".

Workspace Name :	Q172DS Replacement File			
Project Name :	Q172DS Replacement File			
<u>T</u> itle:	A → Q Converting File			
Save Cancel				
Switch the window by clicking this button when you want to use single file format project (MELSOFT Navigator does not support this format.)				

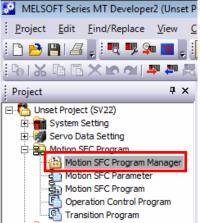
11) The new project creation dialog box appears. Select "Yes".



#### 4.2.2 Without using SFC

When no SFC program is used in the A-Motion CPU side program (Diversion source) and servo parameters other than SFC programs are diverted, perform the following procedure after the operation of 11).

1) Select "Motion SFC Program Manager".



2) Select "Unused" for "Motion SFC Program", and select "OK".

No. Program Name	Motion SFC Program	Motion SFC Program Capacity Select A
	C Used	(bytes) OK
	Our Contract Output Contrac	Text : 684032 Cancel
	Show Existing On	ly Order by Number
	C Show All Program	C Order by Name
	Delete The existin	ng Motion SFC programs are deleted.
		ig notor of a program are deleted
	34 Replace th	Replacement ne existing Motion SFC program No. with specified number and renumber.)

About the file converted by MT Woks2, refer to "Section 3.4.1 Data list available for diversion or not (SV13/SV22)", and then set the data which can not be diverted if necessary. Besides, about the setting of Multiple CPU parameter, refer to "Section 3.3.Difference between Q170MSCPU(-S1) and A173UHCPU/A172SHCPUN/A171SHCPUN", "QCPU User's Manual (Multiple CPU System) Model Name SH-080475", "Programming Manual (COMMOM) [corresponding to Q173D(S)/Q172D(S)] Model Name: 1XB921" and then set.

#### 4.2.3 Precautions for diverting cam data

To edit cam data, read the data directly using "Read Other Type Cam Data".

#### 4.3 Program Diversion Procedure in PLC CPU Side

4.3.1 Conversion procedure of ladder program for QnUD(H)CPU using GX Works2/GX Developer

The following describes an example of the procedure for replacing a sequence project using GX Developer. Always backup the project before the replacement.

#### (1) Conversion of ladder program created by SW3RNC-GSVE/SW2 $_{\Box}$ -GSVE

1) After starting GX Works2, select "Start GX Developer" from the "Project" tab.

Start GX Developer( <u>Z</u> )
Exit( <u>Q</u> )

2) The following shows the conversion of a sequence program created by SW3RNC-GSV/SW2□-GSV (GPPA file format).

After GX Developer is started, select "Import file" --> "Import from GPPA format file" from the "Project" tab.

👘 N	IELSOFT series GX Develo	per		
<u>P</u> roje	ct <u>E</u> dit <u>F</u> ind/Replace	<u>V</u> iew <u>O</u> nline	<u>D</u> iag	nostics <u>T</u> ools <u>W</u> indow <u>H</u> elp
	<u>N</u> ew project	Ctrl+	٠N	1
	<u>O</u> pen project	Ctrl+	0	
	<u>C</u> lose project			
	<u>S</u> ave	Ctrl	+S	1 + +U+ +U1+ +U1+ +37+ +47+ +47+ +42+ +12+ +12+ +2+ +2+ +2+ +2+ +2+ +2+ +2+
	Save <u>a</u> s			
	Delete project			
	Ve <u>r</u> ify			
	Сор <u>у</u>			
	<u>E</u> dit Data		•	
	C <u>h</u> ange PLC type			
	<u>I</u> mport file		•	Import from GPPQ format file
	Export <u>f</u> ile		•	Import from GPP <u>A</u> format file
	Macro		•	Import from <u>FXGP(WIN</u> ) format file
	Function <u>B</u> lock		•	Import from FXGP( <u>D</u> OS) format file

#### Caution 1: Storage location of an execution file

The execution file in the GPPA format is usually stored in the following folder.

#### Folder structure

"C drive (route drive)" --> "GPP" --> "USR" --> "System name" --> "Machine name (folder which includes the gppa.cnf file)"

#### Caution 2: Name of diversion source project

When name of diversion source project exceeds 9 characters, it can not be read.

Change the name so that the number of characters is within the limit and execute the conversion operation.

3) Select "Browse".

Import from GPPA format file						
Drive/Path C:\GPP\USR		Browse				
System name		Execute				
Machine name		Close				
PLC type						
File selection Common Local	Merge peripheral statement/note	1				
Param+prog Select all	Cancel all selections					

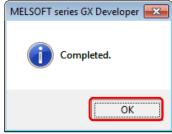
4) Select the conversion target file and select "OK".

Open system name, machine name						
Selected drive	[·c·] •	È	8-6- 8-6- 8-6-			
■ 120131b ■ ■ 120131 ■ 120131b ■ 20120214	20120217					
Drive/Path	C:\GPP\USR\SV13\20	120217				
System name	SV13	120131E	)		ОК	
Machine name	20120217 A3N	A Motion			Cancel	

5) Check the conversion targets (Program/Device comment/Parameter), and select "Execute". Note) Only one of "Comment1" and "Comment2" can be selected for Device comment.

Import from GPPA format file				
Drive/Path	C:\GPP\USR\	Browse		
System name	SV13	1201315	Execute	
Machine name	20120217	A Motion	Close	
PLC type	A3N	A3N		
File selection	Common   Loca	I Merge peripheral statement/note	1	
Param+prog	Select all	Cancel all selections		
	gram MAIN Comment2 Comment1 ameter PLC/Network			

6) The conversion completion dialog box appears. Select "OK".



#### 7) Select "Close".

Export to GPPA format file					
Drive/Path	C:\GPP\USR	C:\GPP\USR			
System name	SV13	1201315	Execute		
Machine name	20120217	A Motion	Close		
PLC type	A3N				
File selection Common Local					
Param+prog	Select all	Cancel all selections			

8) Select "Change PLC type" from the "Project" tab in GX Developer.

6	MELSO	FT series	; GX Developer (	Unset proje	act) - [LD(Edi
	<u>P</u> rojec	t <u>E</u> dit	<u>F</u> ind/Replace	<u>C</u> onvert	<u>V</u> iew <u>O</u> nli
Ľ	1	lew proj	ect		Ctrl+N
Pro	<u>(</u>	) pen pro	ject		Ctrl+0
Jric	<u>(</u>	lose pro	ject		
-    F5	5	ave			Ctrl+S
	S	ave <u>a</u> s			
_	[	elete pro	oject		
*	١	e <u>r</u> ify			
	C	ору			
	Ē	dit Data			×
		: <u>h</u> ange P	LC type		

9) Specify the PLC series (QCPU(Qmode)) and PLC type (Q03UD) after the replacement in the "Change PLC type" dialog box, and select "OK". (For Q170MSCPU-S1, specify "Q06UDH" for the

PLC type.)		
Change PLC type		<b>X</b>
PLC series		ок
QCPU(Qmode)	L	Cancel
PLC type		
Q03UD	-	

10) The "Change PLC type" dialog box appears. Select "Yes".

Note) In this replacement handbook, "Yes" is selected because the changes will be checked later by using a support tool.

When the supporting tool is not used, select "Confirm change".

Change	Change PLC type					
⚠	Change the PLC type to Q06UDH. Are you sure to change all of the data to match the PLC type? (To check all data, select confirm change)					
	Scan time is extended by the device latch range setting (include L device). If the latch of device is necessary, please set the required minimum latch range.					
	Convert M9000/D9000 - <> Q/L/QnACPU special devices (If not selected, convert M9000/D9000 - <> SM1000/SD1000)					
	Yes(Y) Confirm change(C) No(N)					

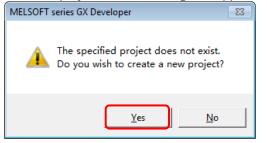
11) The following confirmation dialog box appears. Select "OK".

MELSOFT series GX Developer	×Ì
Instruction or device unsupported by the current PLC type were found. It was converted to the following device. Please find and correct the program. SM1255, SD1255	
ОК	

12) Select "Save as" from the "Project" tab.

Input "Project name" and "Title", and select "Save"						
Save the project v	vith a new	name			<b>—</b> ×	
Project drive	[·c·]	•	Ł	0-0- 0-0- 0-0-		
<ul> <li>120131b</li> <li></li> <li>20120131</li> <li>20120214</li> <li>201217_GX</li> <li>Source file</li> </ul>						
Drive/Path C:	\Users\Me	iden\Deskto	ip\A Motion	Replace	Save	
Project name	1217				Cancel	
Title	1217					

13) The new project creation dialog box appears. Select "Yes".



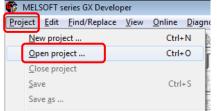
Although the sequence program has been converted by following this procedure, it may not be operated correctly. For the program modifications, refer to Section 5 and later.

To open the file in which CPU has been changed with GX Developer2 again, select "Open Other Data" --> "Open Other Project" from the "Project" tab.

#### (2) Conversion of ladder program for A-Motion created by GX Developer

The following describes an example of the procedure for replacing a sequence project using GX Developer. Always backup the project before the replacement.

1) After starting GX Works2, select "Start GX Developer" from the "Project" tab.



- The following shows the conversion of a sequence program for A-Motion created by GX Developer (GPPW file format).
- 3) After GX Developer is started, select "Open project" from the "Project" tab.
- 4) Select the file to be converted, and select "Open".

For the following conversion operations, refer to (1) SW3RNC-GSVE/SW2\_-GSVE ladder program conversion procedure after 8).

#### 5. USING A/QnA->Q CONVERSION SUPPORT TOOL IN LADDER PROGRAM

To confirm the modified content of ladder program, <u>use "A/QnA->Q conversion support tool".</u> About the explanation, refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION".

#### 6. POINTS AND PRECAUTIONS OF REPLACEMENT

#### 6.1 Difference of Motion CPU Configuration

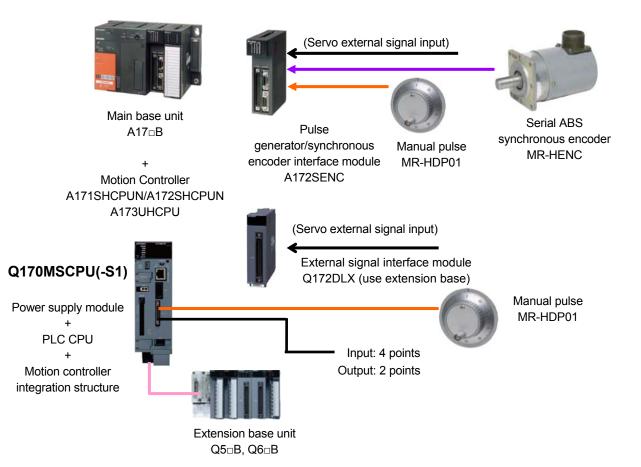
#### 6.1.1 System configuration

In the following chart, the difference between basic system of A-Motion and Q170MSCPU(-S1) is shown. A-Motion corresponds to SSCNET as servo network, but Q170MSCPU(-S1) corresponds to SSCNET III. Accordingly, connectable servo amplifier will be changed.

The system configuration of A-Motion is initialized.

When Q170MSCPU(-S1) is used with PLCs or motion modules, an extension base unit (Q5 $\square$ B or Q6 $\square$ B) is required.

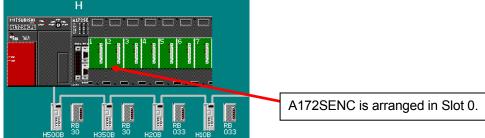
For the connection between Q170MSCPU(-S1) and a personal computer, RS-422 and SSCNET cannot be used. Connect them with USB, RS232, or Ethernet.



#### 6.2 Precautions about Replacement 6.2.1 Slot position (system configuration)

When the motion module (A172SENC) used in A-motion is replaced with Q170MSCPU(-S1), the system configuration of the motion module is initialized as follows. Configure the setting again..

Example) When A172SENC is arranged in Slot 0 of A-Motion



↓ A172SHCPUN is converted to Q170MSCPU(-S1)

The main base unit of A-Motion management is deleted and is converted in initialization status as follows.

After converting A172SHCPUN to Q170MSCPU(-S1), execute as follows.



Execute the setting of extension base by "Basic Setting" --> "Base Setting" as follows.

Basic Setting	
Base Setting Multiple CPU Setting   System Basic Setting   CPU Name Setting   Bulk-in Ethernet ▲ ▲ Main Base Sistes ▼ Extension Base Stage 1 Nothing ▼ Stage 2 Nothing ▼ Stage 3 Nothing ▼ Stage 5 Nothing ▼ Stage 6 Nothing ▼ Stage 7 Nothing ▼ Import Multiple CPU Parameter OK Cancel	Extension Base - Stage 1 : 2 Slots

Next, execute the setting o Motion Slot Setting	f motion module.
Motion Module Servo External Signal Module © Q172DLX MAN-PLS Input Module © Q173DPX	PLC Module C I/O Module C QI60 C Analog Input Module C Analog Output Module
	OK         Cancel

The chart of arranging the motion module is as follows.



About other precautions, refer to "2. REPLACEMENT PROPOSAL FROM A-MOTION TO QDS-MOTION".

#### 7. DIFFERENCE BETWEEN Q170MSCPU AND Q170MSCPU-S1

About the specification of Q170MSCPU-S1, the difference with Q170MSCPU is showed as center. About the content not described in this section, it has the same specification as Q170MSCPU. Operating system software and peripheral software package use the same thing as Q170MSCPU.

#### 7.1 Difference between Q170MSCPU and Q170MSCPU-S1

#### 7.1.1 (1) Motion control specification

Q170MSCPU and Q170MSCPU-S1 have the same specification.

#### 7.1.2 (2) Motion SFC performance specification

Q170MSCPU and Q170MSCPU-S1 have the same specification.

. ...

7.1.3	(3) PLC CPU part cont	rol specification

Item		Specification			
10	em	Q170MSCPU	Q170MSCPU-S1		
PLC CPU part		Q03UDCPU or equivalent	Q06UDHCPU or equivalent		
Program capacity		30k step	60k step		
PLC type in creating program		Q03UD Q06UDH			
Model name displayed by system monitor		Q03UDCPU	Q06UDHCPU		
Processing LD instruction speed (PLC instruction) MOV instruction		0.02µs	0.0095µs		
		0.04µs	0.019µs		
File registers (R, ZR)		98304 points 393216 points			

#### 7.1.4 (4) Power supply specification

Q170MSCPU and Q170MSCPU-S1 have the same specification.

#### 7.1.5 (5) Battery life specification

As the program capacity increases and the processing speed is improved, the data-holding time while the power of Q170MSCPU-S1 is off is about one tenth of the data-holding time of Q170MSCPU. (The data-holding time varies greatly depending on the energization rate and ambient temperature of when data is held. For details, refer to Q170MSCPU/Q170MSCPU-S1 User's Manual.)

Select an appropriate battery for the usage environment.

### 4. REPLACEMENT FROM A-MOTION TO QN-MOTION

	ENT FROM A-MOTION TO QN-MOTION	
	IEW	
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#### 1. OVERVIEW

This article explains the changes when a system using A173UHCPU/A172SHCPUN/A171SHCPUN (A-Motion) is replaced with a system using Q173CPUN/Q172CPUN (QN-Motion). For A173UHCPU-S1, A173UHCPU should be read as A173UHCPU-S1.

#### 2. EQUIPMENT CONFIGURATION, AVAILABLE SOFTWARE

Please prepare modules, operating system software, and engineering environment according to the table in this article.

#### 2.1 Equipment Correspondence

When Q173CPUN/Q172CPUN is used, use the products that support Q series.

		When		When Q17nCPUN is used				
Product		A17nSHCPUN/A173UHCPU is used		Q172CPUN	Q173CPUN			
PLC CPU module	е		• A173UHCPU		QnHCPU			
Motion CPU mod	lule		A172SHCPUN     A171SHCPUN	_	Q173CPUN(-T) Q172CPUN(-T)			
Main base unit			• A172B • A175B • A178B(-S□)		Q3□B			
Servo external si	gnals inf	terface module			Q172LX	Q172LX		
Synchronous end	coder int	erface module	A171SENC A172SENC		Q172EX Q172EX-S2			
Manual pulse ger	nerator i	nterface module			Q173PX			
Serial ABS synch	nonous	encoder	MR-HENC		< (same as left)			
-			-	_	Q170ENC			
Serial ABS synch	nronous		MR-HSCBLDM		MR-JHSCBL□M			
encoder cable	1	For Q170ENC	-	_	Q170ENCCBL□M			
Battery	For Cl	PU module	A6BAT is built in CPU module.		Connect a built-in rechargeable battery or A6BAT from the external battery module (Note-1).			
	For sy	nchronous encoder			A6BAT is built in Q172EX(-S2).			
Manual pulse gei	nerator		MR-HDP01		< (same as left)			
		When MR-H servo amplifier is used	MR-HBUS□M		With external battery         • Q172HBCBL□M-B         Without external         battery         • Q172HBCBL□M	With external battery         • Q173DVCBL□M         + MR-J2HBUS□M         Without external         battery         • Q173HB∆CBL□M		
SSCNET cable <sup>(№</sup>	V	When MR-J2S servo amplifier is used	MR-J2HBUS⊐M-A		With external battery • Q172J2BCBL□M-B Without external battery • Q172J2BCBL□M	With external battery         • Q173DVCBL□M         +         MR-J2HBUS□M-A         Without external         battery         • Q173J2B△CBL□M		

(Note-1): For QN-Motion, the long-term backup is available by using an external battery (A6BAT) in addition to the short-term backup with a built-in rechargeable battery.

When the external battery (A6BAT) is used, use the battery with Q173DV (when Q173CPUN is used) or Q170BAT (when Q172CPUN is used).

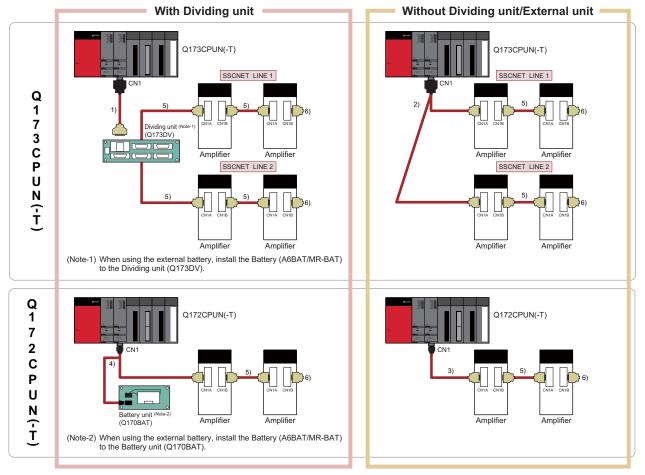
(Note-2): The models of SSCNET cables and others to be used differ depending on whether the external battery is used or not.

<Precautions>

- In addition to USB and RS-232C, SSCNET can also be used for the communication between Q173CPUN/Q172CPUN and a personal computer by using an SSCNET I/F board (A10BD-PCF/A30BD-PCF) or SSCNET I/F card (A30CD-PCF).
- iQ Platform modules cannot be used in the combination of the multiple CPU modules.
- Q173CPUN-T and Q172CPUN-T are compatible with teaching units (A31TU-D3 $\square$ /A31TU-DN $\square$ ).

## 2.2 Equipment Configuration of Q173CPUN/Q172CPUN Motion

Connection method with servo amplifiers



#### SSCNET cable model

/	Application	Cable model	Cable length	Connection details
1)	Q173CPUN(-T) $\leftrightarrow$ Distribution unit	Q173DVCBL□M	0.5m, 1m	• Q173CPUN(-T) $\leftrightarrow$ Distribution unit (Q173DV)
2)	Q173CPUN(-T) $\leftrightarrow$ Servo amplifier (Note-1)	Q173J2B CBL M (Note-3)	0.5m, 1m, 5m	• Q173CPUN(-T) $\leftrightarrow$ Servo amplifier (MR-J2 $\square$ -B <sup>(Note-4)</sup> )
2)	0172CDUN(T) Son a complifier	Q172J2BCBL□M	0.5m, 1m, 5m	• Q172CPUN(-T) $\leftrightarrow$ Servo amplifier (MR-J2 $\square$ -B <sup>(Note-4)</sup> )
3)	Q172CPUN(-T) ↔ Servo amplifier	FR-V5NSCBL	0.5m, 1m, 5m, 10m, 20m	• Q172CPUN(-T) $\leftrightarrow$ FR-V5NS <sup>(Note-5)</sup>
4)	Q172CPUN(-T) ↔ Servo amplifier ↔ Battery module	Q172J2BCBL□M-B	0.5m, 1m, 5m	• Q172CPUN(-T) ↔ Servo amplifier (MR-J2□-B <sup>(Note-4)</sup> ) ↔ Battery module (Q170BAT)
5)	Servo amplifier ↔ Servo amplifier	MR-J2HBUS□M-A	0.5m, 1m, 5m	• Servo amplifier (MR-J2 $\square$ -B <sup>(Note-4)</sup> ) $\leftrightarrow$ Servo amplifier (MR-J2 $\square$ -B <sup>(Note-4)</sup> ) • Distribution unit Q173DV $\leftrightarrow$ Servo amplifier (MR-J2 $\square$ -B <sup>(Note-4)</sup> )
-,	Distribution unit ↔ Servo amplifier	Q172J2BCBL□M	0.5m, 1m, 5m	<ul> <li>Servo amplifier (MR-J2□-B <sup>(Note-4)</sup>) ↔ FR-V5NS <sup>(Note-5)</sup></li> <li>Distribution unit (Q173DV) ↔ FR-V5NS <sup>(Note-5)</sup></li> </ul>
		FR-V5NSCBL	0.5m, 1m, 5m, 10m, 20m	• FR-V5NS $^{(Note-5)} \leftrightarrow$ FR-V5NS $^{(Note-5)}$
6)	Termination resistor	MR-A-TM	-	<ul> <li>Connect to the SSCNET last servo amplifier (MR-J2□-B <sup>(Note-4)</sup>).</li> </ul>

(Note-1) Separated into the number of systems from the connector on the Q173CPUN(-T) side.

(Note-2)  $\square$ : Cable length. When the cable length is 0.5m, specify 0.5 in  $\square$ .

(Note-3) Δ: Number of separated SSCNET systems (None: 1 system, 2: 2 systems, 4: 4 systems)

(Note-4) MR-J2□-B: MR-J2S-□B/MR-J2M-P8B/MR-J2-03B5

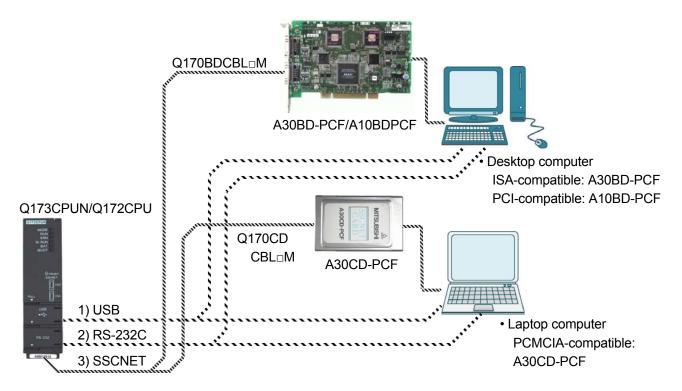
(Note-5) SSCNET communication option for the vector inverter FREQROL-V500 series

Precautions for use:

When Q173DV (External battery-mountable) is used with Q173CPUN, up to four systems (eight axes per system) can be used.

When Q173J2B CBL M is used with Q173CPUN, up to four systems (eight axes per system) can be used.

Connection with personal computers



## When 1) USB or 2) RS-232C is used

Although RS422 is used for A-Motion, RS-232C or USB is used for Q173CPUN/Q172CPUN. Use an appropriate cable for the desktop or laptop computer that is being used.

## When 3) SSCNET is used

Although A270BDCBL $\square$ M and A270CDCBL $\square$ M cables are used for A-Motion, use Q170BDCBL $\square$ M and Q170CDCBL $\square$ M cables.

## (Caution)

Using A30BD-PCF, A10BD-PCF, and A30CD-PCF are not recommended because the number of personal computers with ISA, PCI, or PCMCIA, the interfaces appropriate for them, is decreasing and these models cannot used on Windows7 (64bit) and Windows8.

## 2.3 Operating System Software Correspondence

## Use an operating system for Q173CPUN/Q172CPUN.

Application	When A17nSHCPUN/A173UHCPU is used			When Q17nCPUN is used		
Application	Model			Model		
		SW2SRX-SV13B				
	For A173UHCPU	SW2NX-SV13B		For Q173CPUN	SW6RN-SV13QB	
<b>F</b>		SW3RN-SV13B				
For conveyor assembly		SW0SRX-SV13D				
(SV13)	For A172SHCPUN	SW0NX-SV13D				
(3713)		SW3RN-SV13D	ļ	For Q172CPUN	SW6RN-SV13QD	
	For A171SHCPUN	SW2SRX-SV13G				
	FOI ATT ISHCPUN	SW0NX-SV13G	ļ			
	For A173UHCPU	SW2SRX-SV22A		For Q173CPUN		
		SW2NX-SV22A	→ -		SW6RN-SV22QA	
		SW3RN-SV22A				
For automatic	For A172SHCPUN	SW0SRX-SV22C		For Q172CPUN	SW6RN-SV22QC	
machinery (SV22)		SW0NX-SV22C				
(3722)		SW3RN-SV22C				
	For A171SHCPUN	SW0SRX-SV22F				
	FOLAT/ ISHCFUN	SW0NX-SV22F	1			
	For A173UHCPU	SW2SRX-SV43A		For Q173CPUN	SW5RN-SV43QA	
For automatic		SW2NX-SV43A			SVISKIN-SV45QA	
machinery	For A172SHCPUN	SW0SRX-SV43C				
(SV43)		SW0NX-SV43C	]	For Q172CPUN	SW5RN-SV43QC	
(0,40)	For A171SHCPUN	SW0SRX-SV43F		FULQ 1720PUN	3005KN-3043QC	
		SW0NX-SV43F				

## 2.4 Engineering Environment

The following shows the engineering environment that support Q173CPUN/Q172CPUN.

After the purchase of the following software, download and update to the latest version of them from the Mitsubishi Electric FA Site.

Product	Model	Available version	Remarks
MELSOFT MT Works2	SW1DNC-MTW2-E	Ver.1.52E or later	
MELSOFT GX Works2	SW1DNC-GXW2-E	Ver.1.50C or later	Install GX Developer as well when installing GX Works2 <sup>(Note-1)</sup> .

(Note-1): Install GX Developer together when installing MELSOFT GX Works2.

In "Section 2.4.3 Program Diversion Procedure in PLC CPU Side", GX Developer will be required to convert a sequence program.

## 3. DIFFERENCES BETWEEN Q173CPUN/Q172CPUN AND A173UHCPU/A172SHCPUN/A171SHCPUN

## 3.1 Differences between Q173CPUN/Q172CPUN and A173UHCPU/A172SHCPUN/A171SHCPUN

## 3.1.1 Differences list

_	Ite	m	Q17nCPUN		HCPUN/A17		Points of replacement	
				A171SH	A171SH A172SH A173UH			
Peripheral I/F			• USB/RS-232/SSCNET	RS422/SSCNET			Communicate with peripheral equipment using appropriate I/Fs.	
Battery			Built-in rechargeable battery (If a power failure lasts for one month or longer, add an external battery A6BAT/ MR-BAT.)	A6BAT is built in. (3.6 V)		)		
Forced stop input		nput	Specify a bit device (PX, M) with a parameter (Forced stop terminals of the servo amplifier can be used).	Use EMG terminals of the main base unit.		ne main base	Always use a forced stop input cable (sold separately). Otherwise, the forced stop cannot be canceled.	
I/O p	points		8192 points	2048 point	S	8192 points	-	
	Internal re	elays (M)	9102 points in total of Mand			8192 points		
	Latch rela	ays (L)	8192 points in total of M and L	2048 point	s in total	in total		
	Step relay	ys (S)	-	(shared use of M, L, S) (shared use		(shared use of M, L, S)		
	Link relay	rs (B)	8192 points	1024 points		8192 points		
	Timers (T	)	-	256 points		2048 points	The devices on the left are shared in	
	Counters	(C)	-	256 points 2		2048 points	A-Motion but not shared in Q-Motion. Configure the automatic refresh	
	Data regis	sters (D)	8192 points	1024 points 8		8192 points		
e	Link regis	ters (W)	8192 points	1024 points 8		8192 points		
Device	Annuncia	tors (F)	2048 points	256 points		2048 points	setting if necessary. For details, refer to Chapter 5.	
	File regist	ters (R)	-	Up to 8192 points				
	Special re	elays (M)	256 points	256 points				
	Special re	egisters (D)	256 points	256 points				
	Coasting (FT)	timers	1 point (888µs)	-				
	Motion re	gisters (#)	8192 points	- 8192 points - (Motion SFC OS only)		OS only)		
	Multiple C devices (l	CPU shared U□\G)	Up to 4096 points	-			-	
Motion dedicated sequence instruction		ated	S(P).SFCS, S(P).SVST, S(P).CHGA, S(P).CHGV, S(P).CHGT, S(P).DDRD, S(P).DDWD, S(P).GINT	SVST	CHGT, CHGV, CHGA SVST (Non Motion SFC OS only) - SFCS, ITP (Motion SFC OS only)		Replace motion dedicated PLC instructions with S(P).*** instructions. (Refer to Chapter 3 of SV13/22 Programming Manual (Motion SFC)	
	SV13						[type Q173D(S)/Q172D(S)].) Use motion modules Q172LX,	
Moti mod		SV22	Q172LX, Q172EX-S2 <sup>(Note-1)</sup> , Q173PX	A171SEN	C, A172SENC	2	Q172EX-S2, and Q173PX in the system using Q173CPUN/Q172CPUN.	
	-	Installation	Motion modules can be installed		dules can be	installed in		
		position	in a free slot of CPU.	motion I/O slots only.				

(Note-1): Can be installed to main base units only.

(Continued)

Item			A17nSHCPUN/A173UHCPU				
		Q17nCPUN	A171SH A172SH A173UH			Points of replacement	
System setting		<ul> <li>Qn(H)CPU will be CPU No.1.</li> <li>Use main base units Q33B, Q35B, Q38B, and Q312B.</li> </ul>	<ul> <li>Multiple CPU system is not supported.</li> <li>Main base unit is A17□B.</li> <li>(A172B, A175B, A178B, A178B-S1, A178B-S2, and A178B-S3)</li> </ul>		⊐B. , A178B-S1,	Use appropriate units in combination.	
Servo syste	m network	SSCNET	SSCNET			Refer to Section 3.1.3.	
Teaching ur	nit	Usable	Usable			Use A31TU-D□ series.	
Automatic refresh	Memory to be used Automatic refresh	Multiple CPU transmission area in CPU shared memory For the setting 1 to 4, devices (D/W/#/M/Y/B) of up to 2k	SCPU and devices.	PCPU share	the same	After the project diversion, manually assign the devices used by the PLC CPU to devices in the Motion CPU in the automatic refresh setting.	
LED display	setting	words can be set per CPU. Each LED of RUN, ERR	FachLED	of RUN, ERF	)		
Latch range	Latch (1)	Range that can be cleared with the latch clear key	Latch rang	e setting is 1 is cleared wit	setting only.	-	
setting	Latch (2)	Range that cannot be cleared with the latch clear key	switch.				
All clear fun	ction	All user data and password settings are deleted.	None			-	
Self diagnosis error		Motion SFC error detection flag (M2039) turns on when an error is detected. Self diagnosis error flag (M9008) and Diagnosis error flag (M9010) does not turn on when an error is detected. When a Motion CPU-specific error occurs, the error details are set to D9008.	Even though a PCPU error occurs, a self diagnosis error will not occur.			Correct the program if necessary.	
Motion error detection flag (M2039)		No matter which error occurs, M2039 will be ON in Motion CPU.	Depending on the type of the error that - occurred, M2039 is turned ON (only when SFC is used).		hat 2039 is only when	Correct the program if necessary.	
Latch clear		RESET/L.CLR switch (Note-1)	L.CLR swit	tch		-	
RUN/STOP		RUN/STOP switch	RUN/STO	P switch		-	
ROM writing	]	Execute in the installation/ROM writing mode.	None			-	
ROM opera	tion mode	Select with the DIP switch.	None			-	
Installation r	node		Select with the DIP switch.		ch.	-	

(Note-1): In the multiple CPU system, PLC CPUs/Motion CPUs of No.2 to No.4 cannot be reset individually. The whole multiple CPU system stops. To reset the whole system, reset the PLC CPU of No.1.

(Continued)

ltom	Item		CPUN	A17n	SHCPUN/A173	BUHCPU	Deinte of replacement
Item		Q172CPUN	Q173CPUN	A171SH	A172SH	A173UH	Points of replacement
	SV13	0.88ms/ 1 to 8 axes	0.88ms/ 1 to 8 axes 1.77ms/ 9 to 16 axes 3.55ms/ 17 to 32 axes	3.55ms/ 1 to 4 axes	3.55ms/ 1 to 8 axes	3.55ms/ 1 to 20 axes 7.11ms/ 21 to 32 axes	When the operation cycle is set as default (automatic), the operation cycle will change. The
Operation cycle (Default value)	SV22	0.88ms/ 1 to 4 axes 1.77ms/5 to 8 axes	0.88ms/ 1 to 4 axes 1.77ms/ 5 to 12 axes 3.55ms/ 13 to 24 axes 7.11ms/ 25 to 32 axes	3.55ms/ 1 to 4 axes	3.55ms/ 1 to 8 axes	3.55ms/ 1 to 12 axes 7.11ms/ 13 to 24 axes 14.22ms/ 25 to 32 axes	operation cycle will change. The operation cycle may change as shown on the left, and the program execution timing will change. Set a fixed operation cycle if necessary.

Self diagno	osis error code		Error flag state $\bigcirc:$ ON $\times:$ OFF					
	A17nSHCPUN/		Self diagnos	sis error flag	Motion error detection flag			
Q17nCPUN (D9008)	A173UHCPU (D9008)	Description	Q17nCPUN (M2324/M9008)	A17nSHCPUN/ A173UHCPU (M9008)	Q17nCPUN (M2039)	A172SHCPUN/ A173UHCPU (M2039)		
-	10	INSTRCT CODE ERR.	×	0	×	×		
3001 to 3013	11	PARAMETER ERROR	0	0	×	×		
-	12	MISSING END INS.	×	0	×	×		
-	13	CAN'T EXECUTE (P).	×	0	×	×		
-	14	CHK FORMAT ERR.	×	0	×	×		
-	15	CAN'T EXECUTE (I)	×	0	×	×		
1105	20	RAM ERROR	0	0	×	×		
-	21	OPE. CIRCUIT ERR.	×	0	×	×		
-	22	WDT ERROR	×	0	Х	×		
-	24	END NOT EXECUTE	×	0	×	×		
-	25	WDT ERROR	×	0	X	×		
-	31	UNIT VERIFY ERR.	×	0	×	×		
1300	32	FUSE BREAK OFF	0	0	Х	×		
1413 to 1416	40	CONTROL-BUS ERR.	0	0	×	×		
1401	41	SP.UNIT DOWN	0	0	×	×		
-	43	I/O INT.ERROR"	×	0	×	×		
2121 to 2126	44	SP.UNIT LAY.EROR.	0	0	×	×		
-	46	SP.UNIT ERROR	×	0	Х	×		
-	47	LINK PARA.ERROR	×	0	×	×		
-	50	OPERATION ERROR	×	0	Х	×		
1600 to 1601	70	BATTERY ERROR	0	0	×	×		
1500	-	AC/DC DOWN	0	×	×	×		
7000 to 7003	-	MULTI CPU DOWN	0	×	×	×		
7010	-	MULTI EXE. ERROR	0	×	×	×		
7020	-	MULTI CPU ERROR	0	×	×	×		
10000	-	COUNT.UNIT ERROR	0	×	0	×		

## 3.1.2 Differences between self diagnosis error and Motion (SFC) error history

## 3.1.3 Items required to be changed/revised with the servo system network change

	Differe	nces	
Item	Q17nCPUN	A17nSHCPUN/ A173UHCPU	Change/Revise content
System setting/ SSCNET configuration	Q172CPUN: 1 system Q173CPUN: 4 systems (up to 8 axes/system)	A171SHCPUN: 1 system A172SHCPUN: 1 system A173UHCPU: 4 system (up to 8 axes/system)	Configure the rotary switch setting of servo amplifiers and connect the servo amplifiers considering the SSCNET configuration.
Home position return function	Poximity dog type (2 types), Count type (3 types), Data set type (2 types), Dog cradle type, Stopper type (2 types), Limit switch combined type (with the home position return retry function and home position shift function)	Proximity dog type, Count type, Data set type	Review this item according to the SSCNET configuration.
Manual pulse generator operation function	3 modules can be connected.	A171SHCPUN: 1 module A172SHCPUN: 1 module A173UHCPU(-S1): 3 modules	Review this item according to the SSCNET configuration.
Synchronous encoder operation function	Q172CPUN: 8 modules Q173CPUN: 12 modules	A171SHCPUN: 1 module A172SHCPUN: 1 module A173UHCPU(-S1): 4 modules	Review this item according to the SSCNET configuration.
Electronic gear	Number of pulses per revolution: 1 to 2147483647 Travel value per revolution: 1 to 2147483647 Unit magnification: None (x1)	Number of pulses per revolution: 1 to 65535 Travel value per revolution: 1 to 65535 Unit magnification: x1, x10, x100, x1000	Change the number of pulses per revolution and the travel value per revolution of the fixed parameter according to the resolution per revolution of the connected servo motor.
Forced stop input	Specify a bit device (PX, M) with a parameter (Forced stop terminals of the servo amplifier can be used).	Emergency stop of basic units (Forced stop terminals of the servo amplifier cannot be used)	Review this item because the forced stop method changes.

## 3.2 Device Comparison

#### 3.2.1 I/O device

	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN
X/Y0			User ( (2048	device points)
X/Y7FF X/Y800 X/Y1FFF	User device (8192 points)	User device (8192 points)		

#### 3.2.2 Internal relay (1) SV13

(1) S	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN
MO			User	device points)
M1600	-		Status of each axis (20 points x 8 axes)	Status of each axis (20 points x 4 axes)
M1680 M1760	User device	User device	Unusable (40 points)	Unusable (120 points)
M1800	(2000 points)	(2000 points)	Command signal of each axis	Command signal of each axis (20 points x 4 axes)
M1880			(20 points x 8 axes)	Unusable (80 points)
M1960				
M2000	Common device	Common device	Common dev	ice (88 points)
M2047	(320 points)	(320 points)		
M2048			_	
M2320	Special relay allocation device (80 points)	Unusable (80 points)		
M2400	Status of each axis (20 points x 32 axes)	Status of each axis (20 points x 32 axes)		
M3040	Unusable (32 points)			
M3072	Common device (command signal) (64 points)	Unusable (160 points)		
M3136	Special relay allocation device (64 points)			
M3200	Command signal of each axis (20 points x 32 axes)	Command signal of each axis (20 points x 32 axes)		
M3840				
	User device	User device		
	(4352 points)	(4352 points)		
M8191	1		V	

## (2) SV22 Real mode

	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN	
MO		-	User de		
MO			(1360 pc	pints)	
M1360			Synchronous encoder axis status (4 points x 1 axis)		
M1364			User device (2	36 points)	
M1600			Status of each axis (20 points x 8 axes)	Status of each axis (20 points x 4 axes)	
M1680	User device	User device		Unusable	
M1760	(2000 points)	(2000 points)	Unusable (40 points)	(120 points)	
M1800			Command signal of each axis	Command signal of each axis (20 points x 4 axes)	
M1880			(20 points x 8 axes)	Unusable (80 points)	
M1960			4		
M2000			Common		
M2047	Common device	Common device	(88 poir	nts)	
M2047 M2048	(320 points)	(320 points)		/	
M2320	Special relay allocation device (80 points)	Unusable (80 points)	-		
	Status of each axis	Status of each axis			
M2400	(20 points x 32 axes)	(20 points x 32 axes)	<u> </u>		
M3040	Unusable (32 points)				
M3072	Common device (command signal) (64 points)	Unusable (160 points)			
M3136	Special relay allocation device (64 points)				
M3200	Command signal of each axis (20 points x 32 axes)	Command signal of each axis (20 points x 32 axes)			
M3840	User device (800 points)	User device (800 points)			
M4640	Synchronous encoder axis status (4 points x 12 axes)	Synchronous encoder axis status (4 points x 4 axes)			
M4656	(, , , , , , , , , , , , , , , , , , ,	( p =	1 /		
M4688	User device (752 points)				
M5440	Synchronous encoder axis command signal (4 points x 12 axes)	User device (3536 points)			
M5488	User device (2704 points)				
M8191			V		

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When the virtual mode is used, do not set the latch range as M4000 to M5599.

## (3) SV22 Virtual mode

	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN		
MO			User de	evice		
WIO			(1360 points)			
				Virtual servo motor		
M1200			Virtual servo motor axis	axis status <sup>(Note-1)(Note-2)</sup>		
			status	(20 points x 4 axes)		
M1280			(20 points x 8 axes)	User device <sup>(Note-2)</sup>		
1011200				(80 points)		
M1360			Synchronous enco	oder axis status		
1011300			(4 points x 1 a	axis) <sup>(Note-2)</sup>		
M1364			Unusable	(Note-2)		
1011304			(36 poi	nts)		
				Virtual servo motor		
M1400			Virtual convolmator avia	axis command		
111400			Virtual servo motor axis	signal <sup>(Note-1)(Note-2)</sup>		
			command signal	(20 points x 4 axes)		
M1480	User device	User device	(20 points x 8 axes)	User device <sup>(Note-2)</sup>		
111400	(2000 points)	(2000 points)		(80 points)		
M1560			Synchronous encoder a	ixis command signal		
1011300			(4 points x 1 a	axis) <sup>(Note-2)</sup>		
M1564			Unusa	ble		
1011304			(36 poi	nts)		
M1600			Status of each axis	Status of each axis		
IVI 1000			(20 points x 8 axes)	(20 points x 4 axes)		
M1680				Unusable		
M1760			Unusable	(120 points)		
1011700			(40 points)	(120 points)		
				Command signal of		
M1800			Command signal of each	each axis		
			axis	(20 points x 4 axes)		
M1880			(20 points x 8 axes)	Unusable		
IVI 1880				(80 points)		
M1960			Common	device		
M2000	Common device	Common device	(88 poi	nts)		
M2048	(320 points)	(320 points)	-			
M2320	Special relay allocation device	Unusable				
1012320	(80 points)	(80 points)	-			
M2400	Status of each axis	Status of each axis				
	(20 points x 32 axes)	(20 points x 32 axes)	4			
M3040	Unusable					
	(32 points)					
M3072	Common device (command signal)	Unusable	/	/		
1110072	(64 points)	(160 points)				
M3136	Special relay allocation device					
	(64 points)		4 /			
	Command signal of each axis	Command signal of each				
M3200	(20 points x 32 axes)	axis				
		(20 points x 32 axes)				
M3840	Unusable	Unusable				
1010040	(160 points)	(60 points)				

(Continued)
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	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN
M4000	Virtual servo motor axis status (20 points x 32 axes) (Only mechanical system setting axes uses)	Virtual servo motor axis status <sup>(Note-1)(Note-3)</sup> (20 points x 32 axes)		
M4640	Synchronous encoder axis status (4 points x 12 axes)	Synchronous encoder axis status <sup>(Note-3)</sup> (4 points x 4 axes)		
M4656		Unusable <sup>(Note-3)</sup>		
M4688	Unusable (112 points)	(144 points)		
M4800	Virtual servo motor axis command signal (20 points x 32 axes) (Only mechanical system setting axes uses)	Virtual servo motor axis command signal <sup>(Note-1)(Note-3)</sup> (20 points x 32 axes)		
M5440	Synchronous encoder axis command	Synchronous encoder axis	/	
M5456	signal (4 points x 12 axes)	command signal <sup>(Note-3)</sup> (4 points x 4 axes)		
M5488	Cam axis command signal (1 points x 32 axes) (Only mechanical system setting axes uses)			
M5520	Smoothing clutch completion signal (2 points x 32 axes)	Unusable <sup>(Note-3)</sup>		
M5584	Unusable (16 points)	(32 points)		
M5600	User device			
M8191	(2592 points)			

(Note-1): Only the areas of axes set with the mechanical system program are occupied. The areas of the axes not used by the mechanical system program can be used by users.

(Note-2): When using virtual mode, do not set latch range as M1200 to M1599.

(Note-3): When using virtual mode, do not set latch range as M4000 to M5487.

(Note-4): Cam axis command signal and smoothing clutch completion signal can be set to any device using parameters.

#### 3.2.3 Data register (1) SV13

(.)	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN	
D0	Monitor device of each axis (20 points x 32 axes)	Monitor device of each axis (20 points x 32 axes)			
D640	Control change register (2 points x 32 axes)	Control change register (2 points x 32 axes)	User device (800 points)		
D704	Common device (96 points)	Common device (96 points)			
D800			Monitor device of each axis	Monitor device of each axis (20 points x 4 axes)	
D880			(20 points x 8 axes)	Unusable (80 points)	
D960			Control change register	Control change register (6 points x 4 axes)	
D984	User device	User device	(6 points x 8 axes)	Unusable (24 points)	
D1008 D1023	(7392 points)	(7392 points)		n device oints)	
D1024					
D8191					

#### (2) SV22 Real mode

	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN
D0	Monitor device of each axis (20 points x 32 axes)	Monitor device of each axis (20 points x 32 axes)		
D640	Control change register (2 points x 32 axes)	Control change register (2 points x 32 axes)	User (748 p	
D704				
D748	Common device (96 points)	Common device (96 points)	Synchronous encode (4 points	
D752	(90 points)	(90 points)	User (48 p	
D800			Monitor device of each axis <sup>(Note-1)</sup>	Monitor device of each axis (20 points x 4 axes)
D880			(20 points x 8 axes)	Unusable (80 points)
D960	User device (320 points)	User device (320 points)	Control change register	Control change register (6 points x 4 axes)
D984			(6 points x 8 axes)	Unusable (24 points)
D1008			Commo (16 p	
D1023			(10 p	
D1024			4	
D1120	Synchronous encoder axis monitor device	Synchronous encoder axis monitor device <sup>(Note-1)</sup> (6 points x 4 axes)		
D1144	(10 points x 12 axes)		] /	
D1240	User device	User device (7048 points)		
D8191	(6952 points)			

(Note-1): This device can be used as a user device when used only in the SV22 real mode.

## (3) SV22 Virtual mode

	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN
D0	Monitor device of each axis (20 points x 32 axes)	Monitor device of each axis (20 points x 32 axes)	User (	
D640			(670 g	, 
D670			Current value of differential gear of virtual servo motor axis main shaft <sup>(Note-1)</sup>	Current value of differential gear of virtual servo motor axis main shaft <sup>(Note-1)</sup> (2 points x 4 axes)
D678	Control change register (2 points x 32 axes)	Control change register (2 points x 32 axes)	(2 points x 8 axes)	User device (8 points)
D686			Current value of differen encoder axis n (2 points	nain shaft <sup>(Note-1)</sup>
D688				sable
D700				Virtual servo motor
D704			Virtual servo motor axis monitor device <sup>(Note-1)</sup>	axis monitor device <sup>(Note-1)</sup> (6 points x 4 axes)
D724	Common device		(6 points x 8 axes)	User device (24 points)
D748		Common device	Synchronous encode (4 points x	
D752	(command signal)	(96 points)	Unus	
D758	(96 points)		(8 pc	pints)
D760			Cam axis monitor device <sup>(Note-1)</sup>	Cam axis monitor device <sup>(Note-1)</sup> (5 points x 4 axes)
D780			(5 points x 8 axes)	User device (20 points)
D800			Monitor device of each axis <sup>(Note-1)</sup>	Monitor device of each axis (20 points x 4 axes)
D880			(20 points x 8 axes)	Unusable (80 points)
D960	Virtual servo motor axis monitor devices (6 points x 32 axes) Current value after differential	Virtual servo motor axis monitor device <sup>(Note-1)</sup> (6 points x 32 axes) Current value after differential	Control change register	Control change register (6 points x 4 axes)
D984	gear of virtual servo motor axis	gear of virtual servo motor axis main shaft <sup>(Note-1)</sup>	(6 points x 8 axes)	Unusable (24 points)
D1008	main shaft (4 points x 32 axes)	(4 points x 32 axes)	Commo	
D1023			(16 p	oints)
D1024				
D1119				

(Continued)

	Q17nCPUN	A173UHCPU	A172SHCPUN	A171SHCPUN
D1120	Synchronous encoder axis monitor device (6 points x 12 axes) Current value after differential gear of synchronous encoder axis main shaft	Synchronous encoder axis monitor device <sup>(Note-1)</sup> (6 points x 4 axes) Current value after differential gear of synchronous encoder axis main shaft (4 points x 4 axes)		
D1160	(4 points x 12 axes)	Unusable		
D1192		(80 points)		
D1240	Cam axis monitor device <sup>(Note-1)</sup> (10 points x 32 axes)	Cam axis monitor device <sup>(Note-1)</sup> (10 points x 32 axes)		
D1560 D8191	User device (6632 points)	User device (6632 points)		

(Note-1): Only the areas of axes set with the mechanical system program are occupied. The areas of the axes not used by the mechanical system program can be used by users.

## 3.2.4 Motion register

	Q17nCPUN	Q17nCPUN (SFC version only) A173UHCPU		(SFC version only) A171SHCPUN
#0 #7999	User device (8000 points)	User device (8000 points)		
#8000	Past 7 times error information (oldest error information)		Past 7 times error information (oldest error information)	
#8008	Past 6 times error information		Past 6 times error information	
#8016	Past 5 times error information	SFC	Past 5 times error information	
#8024	Past 4 times error information	Error history (8 times)	Past 4 times error information	
#8032	Past 3 times error information	(64 points)	Past 3 times error information	
#8040	Past 2 times error information		Past 2 times error information	
#8048	Past 1 times error information		Past 1 times error information	
#8056	Latest error information		Latest error information	
#8064	Servo monitor device	Unusable		
#8191	(128 points)	(128 p	oints)	$\backslash$

## 3.2.5 Special relay

	Device nu	imber			
017p	CPUN	A17nSHCPUN/	Name	Remarks	
QIIII	CFUN	A173UHCPU			
M2320	M9000	M9000	Fuse blown detection flag		
	-	M9002	I/O module verification error		
	-	M9004	MINI link error	A173UHCPU only	
M2321	M9005	M9005	AC DOWN detection flag	Q17nCPUN: AC/DC DOWN detection	
M2322	M9006	M9006	Low battery flag		
M2323	M9007	M9007	Low battery latch flag		
M2324	M9008	M9008	Self diagnosis error flag		
	-	M9009	Annunciator detection		
M2325	M9010	M9010	Diagnosis error flag		
	-	M9011	Operation error flag		
	-	M9012	Carry flag		
	-	M9016	Data memory clear flag (all data)		
	-	M9017	Data memory clear flag (non-latch data)		
	-	M9020	User timing clock No.0		
	-	M9021	User timing clock No.1		
		M9022	User timing clock No.2		
	-	M9023	User timing clock No.3		
	-	M9024	User timing clock No.4		
M3136	M9025	M9025	Clock data set requirement		
M2328	M9026	M9026	Clock data error		
	-	M9027	Clock data display		
M3137	M9028	M9028	Clock data reading requirement		
	-	M9029	Data communication requirement batch processing		
	-	M9030	0.1 second clock		
	-	M9031	0.2 second clock		
	-	M9032	1 second clock		
	-	M9033	2 second clock		
	-	M9034	1 minute clock		
M2326	M9036	M9036	Always ON		
M2327	M9037	M9037	Always OFF		
	-	M9038	Only 1 scan is ON after RUN		
	-	M9039	RUN flag (only 1 scan is OFF after RUN)		
	-	M9040	PAUSE enabled coil		
	-	M9041	PAUSE status contact		
	-	M9042	Stop status contact		
	-	M9043	Sampling trace completion		
	-	M9044	Sampling trace		
	-	M9045	Reset watchdog timer (WDT)		
-		M9046	Sampling trace	A173UHCPU only	
	-	M9047	Sampling trace preparation	A173UHCPU only	
	-	M9049	Switch output characters number		
	-	M9051	CHG command execution inhibition	A173UHCPU only	
	-	M9052	Switch SEG command		
	-	M9053	Switch EI/DI command		
	-	M9054	STEP RUN flag		
	-	M9055	Status latch completion flag		

\* Q17nCPUN has only four blocks for automatic refresh. If the number of blocks is insufficient, change the device numbers of special relays to M2000s and use them.

(Continued)

Device number			Nerra	Densedu
Q17nCPUN A173UHCPU		A17nSHCPUN/	Name	Remarks
-	-	M9056	Main side P, I setting requirement	
-	-	M9057	Sub side P, I setting requirement	
-	-	M9058	Main side P, I setting completion	
-	-	M9059	Sub side P, I setting completion	
-	-	M9065	Partition processing execution detection	
-	-	M9066	Partition processing requirement flag	
	•	M9070	Required search time of A8UPU/A8PUJ	
M2329	M9073	M9073	Motion CPU WDT error flag	
M2330	M9074	M9074	PCPU preparation completion flag	
M2331	M9075	M9075	Test mode flag	
M2332	M9076	M9076	Forced stop input flag	
M2333	M9077	M9077	Manual pulse axis setting error flag	
M2334	M9078	M9078	Test mode requirement error flag	
M2335	M9079	M9079	Servo program setting error flag	
-	-	M9081	Communication requirement register area BUSY signal	
-	-	M9084	Error check	
-	-	M9091	Command error flag	
-	-	M9094	I/O exchange flag	
-	-	M9100	SFC program existence	
-	-	M9101	Start/stop SFC program	
-	-	M9102	Start status of SFC program	
-	-	M9103	Continuous transition existence	
-	-	M9104	Continuous transition prevention flag	
	_	M9108	Start step transition monitoring timer	
		100 100	(support to D9108)	
_	_	M9109	Start step transition monitoring timer	
		100 100	(support to D9109)	
-	_	M9110	Start step transition monitoring timer	
		NIG T TO	(support to D9110)	
-	_	M9111	Start step transition monitoring timer	
			(support to D9111)	
	-	M9112	Start step transition monitoring timer	
			(support to D9112)	
	-	M9113	Start step transition monitoring timer	
			(support to D9113)	
- M9114		M9114	Start step transition monitoring timer	
			(support to D9114)	
- M9180			Active step sampling trace completion flag	
- M9181			Active step sampling trace execution flag	
-	-	M9182	Enable active step sampling trace	
-	-	M9196	Operation output of block stop	
	-	M9197	Fuse blown/I/O verification error display switching	
-	-	M9198	ace somme vernication error display switching	
	-	M9199	Data return of online sampling trace status latch	

\* Q17nCPUN has only four blocks for automatic refresh. If the number of blocks is insufficient, change the device numbers of special relays to M2000s and use them.

## 3.2.6 Special register

Devic	e number		
Q17nCPUN	A17nSHCPUN/ A173UHCPU	Name	Remarks
D9000	D9000	Fuse blown	
-	D9002	I/O module verification error	
-	D9004	MINI link error	A173UHCPU only
D9005	D9005	AC DOWN counter	
D9008	D9008	Self diagnosis error	
-	D9009	Annunciator detection	
-	D9010	Error step	D9010: Diagnosis error occurrence time (calendar, month)
-	D9011	Error step	D9011: Diagnosis error occurrence time (date, hour)
-	D9014	I/O control method	D9014: Error information
D9015	D9015	CPU operation status	
		A17nSHCPUN: ROM/RAM setting	
-	D9016	A173UHCPUN: Program number	
-	D9017	Minimum scan time (10ms unit)	SD520: Current main cycle (1ms unit)
-	D9018	Scan time (10ms unit)	SD521: Maximum main cycle (1ms unit)
-	D9019	Maximum scan time (10ms unit)	SD524: Maximum operation cycle (1µs unit)
-	D9020	Constant scan (10ms unit)	A173UHCPU only SD523: Motion setting operation cycle
_	D9021	Scan time (1ms unit)	(1µs unit) A173UHCPU only
	50000		SD522: Motion operation cycle (1µs unit)
-	D9022	Time (1 second unit)	A173UHCPU only
D9025	D9025	Clock data (calendar, month)	
D9026	D9026	Clock data (date, hour)	
D9027	D9027	Clock data (minute, second)	
D9028	D9028 D9035	Clock data (0, week) Expansion file register	A173UHCPU only
-	D9036		
-	D9037	For specifying extended file register device number	A173UHCPU only
-	D9038		
-	D9039	LED display priority order	
	D9044	For sampling trace	A173UHCPU only
	D9049	Work area for SFC	
-			A173UHCPU only
-	D9050	SFC program error number	A173UHCPU only
-	D9051	Error block	A173UHCPU only
-	D9052	Error step	A173UHCPU only
-	D9053	Error transition	A173UHCPU only
-	D9054	Error sequence step	A173UHCPU only
-	D9055	Status latch	A173UHCPU only
_	D9072	PLC communication check	A173UHCPU only
-	D9081	Number of communication requirement register free area	A173UHCPU only
-	D9085	Setting register of time check value	A173UHCPU only
	D9090	Number of boards in special function module over	
-	D9090		A173UHCPU only
-	D9091 D9092	Detailed error number	
-	D9092 D9094	Exchange I/O start I/O number	

(Continued)

# 4. REPLACEMENT FROM A-MOTION TO QN-MOTION

MOTION CONTROLLER

Device	number			
Q17nCPUN	A17nSHCPUN/	Name	9	Remarks
QTHIOLON	A173UHCPU			
-	D9100			
-	D9101			
-	D9102			
-	D9103			
D9104	D9104	Q17nCPUN: Servo parameter reading request axis number	Fuse blown module	A173UHCPU only
-	D9105			
-	D9106			
-	D9107			
-	D9116			
-	D9117			
-	D9118			
-	D9119			
-	D9120	I/O module verification error		
-	D9121			A173UHCPU only
-	D9122			
-	D9123			
-	D9124	Number of annunciator detection		
-	D9125			
-	D9126			
-	D9127			
-	D9128			
-	D9129	Annunciator detection number		A173UHCPU only
-	D9130	-		
-	D9131	-		
	D9132	-		
D9180	D9180			
D9181	D9181	A173UHCPU: Unusable	A17nSHCPUN:	
D9182	D9182	A173UHCPU:	Limit switch output status	
D9183	D9183	Test mode requirement error information	storage area	
D9184	D9184	PCPU WDT error cause		
D9185	D9185		A17nSHCPUN:	
D9185	D9185	Q17nCPUN, A173UHCPU:	Servo amplifier classification	
		Manual pulse axis setting error	A17nSHCPUN:	1
D9187	D9187	information	Manual pulse axis setting	
00107	00107		error information	
			A17nSHCPUN:	
	<b>B0</b> · · · · ·	Q17nCPUN:	Test mode requirement	
D9188	D9188	Motion operation cycle	error information	
			A173UHCPU: Unusable	
D9189	D9189	Error program No.		
D9190	D9190	Error item information		
			A17nSHCPUN:	
D9191	D9191		Servo amplifier installation	
		Q17nCPUN, A173UHCPU:	information	
		Servo amplifier installation A17nSHCPUN:		
D9192	D9192	information	Area for manual pulse 1	
D9192	Dalaz		(P1) smoothing	
			magnification setting	
			A173UHCPU,	
D9193-D9195	D9193-D9195	Q17nCPUN:	A17nSHCPU:	
09190-09190	D9192-D9192	Real/virtual mode switching error	REAL/VIRTUAL mode	
			switching error information	
D9196	D9196	Personal computer link communic	cation error code	

MOTION CONTROLLER

(Continued)

Device	e number			
Q17nCPUN	A17nSHCPUN/	Na	ime	Remarks
	A173UHCPU			
		Q17nCPUN, A173UHCPU:		
D752	D752	Area for manual pulse 1 (P1)		
		smoothing magnification setting		
		Q17nCPUN, A173UHCPU:	A17nSHCPUN:	
D753	D753	Area for manual pulse 2 (P2)	Unusable	
		smoothing magnification setting		
		Q17nCPUN, A173UHCPU:		
D754	D754	Area for manual pulse 3 (P3)		
		smoothing magnification setting		
-	D760			
-	D761			
-	D762			
-	D763			
-	D764			
-	D765			
-	D766			
-	D767	A173UHCPU:		
-	D768	Limit switch output status storage		
-	D769	area for Axis 1 to 32		
	D770			
_	D771			
	D772			
	1			
-	D773			
-	D774			
-	D775		_	
-	D776			
-	D777		A17nSHCPUN:	
-	D778		Cam axis monitor device	
-	D779		• A172SHCPUN:	
-	D780		5 points x 8 axes	
-	D781		• A171SHCPUN:	
-	D782	A173UHCPU:	5 points x 4 axes	
-	D783	Limit switch output status storage		
-	D784	area for Axis 1 to 32		
-	D785			
-	D786			
-	D787			
-	D788			
-	D789			
-	D790			
-	D791			
D792	D792			
D793	D793			
D794	D794			
D795	D795	Q17nCPUN, A173UHCPU:		
D796	D796	Servo amplifier classification		
D797	D797			
D798	D798			
D798 D799	D798			

For the special registers on the PLC CPU side, refer to the manual of the PLC CPU.

## 3.2.7 Other devices

Item	Q17nCPUN	A173UHCPU	A17nSHCPUN	
Personal computer link communication error flag	M2034	M2034		
PCPU preparation completion flag	M9074	M9074		
Home position return re-travel value	D9 + 20n <sup>(Note-1)</sup>	D9 + 20n <sup>(Note-1)</sup>	D811 + 20n <sup>(Note-1)</sup>	
Travel value change register	D16 + 20n, D17 + 20n <sup>(Note-1)</sup>	D16 + 20n <sup>(Note-1)</sup> , D17 + 20n <sup>(Note-1)</sup>	D815 <sup>(Note-1)</sup> + 20n	
	D0 to D8191	D800 to D8191	D0 to D799	
Indiractly designated device	W0 to W1FFF	W0 to W1FFF	W0 to W3FF	
Indirectly designated device (word device)	#0 to #7999	#0 to #7999 (Motion SFC (real mode) only)	#0 to #7999 (Motion SFC of A172SH (real mode) only)	
	X0 to X1FFF	X0 to X1FFF	X0 to X7FF	
	Y0 to Y1FFF	Y0 to Y1FFF	Y0 to Y7FF	
Indirectly designated device	M/L0 to M/L8191	M/L0 to M/L8191	M/L0 to M/L2047	
(bit device)	M9000 to M9255	M9000 to M9255	M9000 to M9255	
	B0 to B1FFF	B0 to B1FFF	B0 to B3FF	
	F0 to F2047	F0 to F2047	F0 to F255	
Enable specified device in	D800 to D3069, D3080 to D8191	D800 to D3069, D3080 to D8191	D0 to D799	
high speed reading function	W0 to W1FFF	W0 to W1FFF	W0 to W3FF	

(Note-1): n indicates a value corresponding to an axis No. (Axis No.1 to 32: n = 0 to 31)

(Continued)

	Item	Q17nCPUN	A173UHCPU	A17nSHCPUN
		X0 to X1FFF	X0 to X1FFF	X0 to X7FF
		Y0 to Y1FFF	Y0 to Y1FFF	Y0 to Y7FF
	Output device	M0 to M8191	M0 to M8191	M0 to M2047
		L0 to L8191	L0 to L8191	L0 to L2047
		B0 to B1FFF	B0 to B1FFF	B0 to B3FF
		D0 to D8191	D0 to D8191	D0 to D1023
		W0 to W1FFF	W0 to W1FFF	W0 to W3FF
	Watch data	#0 to #8191	#0 to #8191	#0 to #8191
		Absolute address	Absolute address	Absolute address
ata		(H0 to HFFFFFFF)	(H0 to HFFFFFFF)	(H0 to HFFFFFFF)
Limit switch output data		D0 to D8191	D0 to D8191	D0 to D1023
utpu		W0 to W1FFF	W0 to W1FFF	W0 to W3FF
эų	ON section setting	#0 to #8191	#0 to #8191	#0 to #8191
wito		Constant (Hn/Kn) <sup>(Note-3)</sup>	Constant (Hn/Kn) <sup>(Note-3)</sup>	Constant (Hn/Kn) <sup>(Note-3)</sup>
nit s		X0 to X1FFF	X0 to X1FFF	X0 to X7FF
Ľ		Y0 to Y1FFF	Y0 to Y1FFF	Y0 to Y7FF
		M0 to M8191	M0 to M8191	M0 to M2047
		L0 to L8191	L0 to L8191	L0 to L2047
	Output enable/disable	B0 to B1FFF	B0 to B1FFF	B0 to B3FF
	bit	F0 to F2047	F0 to F2047	F0 to F255
	Forced output bit	M9000 to M9255	M9000 to M9255	M9000 to M9255
	r orced output bit	<u> </u>	TT0 to TT2047	TT0 to TT255
		<u> </u>	TC0 to TC2047	TC0 to TC255
			CT0 to CT1023	CT0 to CT255
		-	CC0 to CC1023	CC0 to CC255
				A171SHCPUN: M1984 to
_		M2160 to M2223	M2160 to M2223	M1991
ran	Clutch status	(Setting in mechanical system	(Setting in mechanical system	A172SHCPUN: M1984 to
rog	Ciulon Status	program is not required)	program is not required)	M1999
Ë		program is not required)	program is not required)	(Setting in mechanical system
yste				program is not required)
Mechanical system program	Cam axis command			
anic	signal	M5488 to M5519		-
echi	(cam/ball screw switch			
Š	command)			
	Smoothing clutch	M5520 to M5583		-
	completion signal			

(Note-1): n indicates a value corresponding to an axis No. (Axis No.1 to 32: n = 0 to 31)

(Note-2): p indicates the number of the user free area points in the multiple CPU high speed transmission area of each CPU.

: Start I/O number of CPU module

(Note-3): The setting range differs depending on the setting unit.

(Note-4): Setting is available only for the devices of the own CPU.

Confirm the usage conditions using "Cross reference" or others in MT Works2, and change the device numbers to the ones of Q173CPUN/Q172CPUN.

## 4. DIVERSION OF PROJECT CREATED WITH A173CPUN/A172CPUN

## 4.1 List of Available Data for Diversion (SV13/SV22)

			Motic	n SFC no	ot compa	tible	Mo	tion SFC	compati	ble	
			A17nS⊦	CPUN	A173L	JHCPU	A172S	HCPUN	A173L	JHCPU	Remarks
			SV13	SV22	SV13	SV22	SV13	SV22	SV13	SV22	
System	Syste	em setting data				Δ					Note-1
,	High	speed reading data				0					
setting	Basic	setting data				×					Note-2
		Fixed parameter				0	I				
	Axis data	Home position return data				0	I				
Servo data	Axis	JOG operation data				0	1				
setting		Servo parameter				0	1				
	Para	meter block				0	1				0
	Limit	output data		X				(	)		Note-3
Servo progra	m		Δ	7	(	С	4	2	(	С	Note-4, Note-5
	Motic	on SFC parameter						(	C		
	Motic	on SFC program					Z	2	(	С	Note-4
Motion	Oper	ation control program					2	2	(	С	Note-4
SFC	Trans	sition program					4	$\Delta$	(	С	Note-4
program	Conv	ersion data						Z	7		Note-6
	Automatic numbering setting							(	D		
		anical edit data		Δ		0		Δ		0	Note-4
Mechanical	Mech	anical conversion data		Δ		$\triangle$		$\triangle$		$\triangle$	Note-6
system	Cam	conversion data		0		0		0		0	
program	Real	mode axis information		0		0		0		0	
Cam data				0		0		0		0	
Device memo	ory		○ (SW3RNC-GSVE only)								
Backup data						×					Note-6
Communicati	on set	ling				×					Note-6

O: Can be diverted

 $\bigtriangleup$ : Data must be revised

 $\times\!\!:$  Must be set again

#### (Note-1) System setting data

- Pulse generator/synchronous encoder I/F module, A172SENCA172SENC module is converted to Q172LX. Manual pulse generator/synchronous encoder setting is deleted. Set Q172EX-S2 or Q173PX modules if necessary.
- Limit output module A1SY42 (when a motion SFC non-compatible OS is used) The limit output module A1SY42 is not diverted.
- Amplifier setting other than the one for servo amplifiers Any items other than MR-J-B and servo amplifiers (including inverters) are deleted.

#### (Note-2) Basic setting data

Q-Motion requires the multiple CPU setting. Configure the setting according to the system.

- (Note-3) Limit output data (when a motion SFC non-compatible OS is used) This data is deleted because of its incompatibility. Revise the data.
- (Note-4) Servo program, Motion SFC program, mechanical system program
  - Motion-dedicated devices

Assignment of motion-dedicated devices is different between A17nSHCPUN/A173UHCPU and Q-Motion. Change the motion-dedicated devices.

#### (Note-5) Servo program

Number of words in indirect device

There are some areas where the number of words has changed between A17nSHCPUN/A173UHCPU and Q-Motion.

Execute a conversion check and revise the program if necessary.

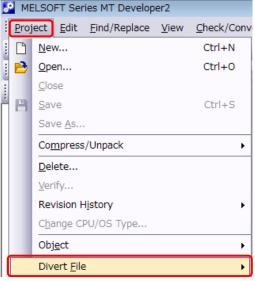
#### (Note-6) Conversion data, setting data

These data cannot be diverted because CPUs are different. Convert and set the data again.

#### 4.2 Program Diversion Procedure in Motion CPU Side 4.2.1 Diversion procedure using MT Developer2

The following shows an example of procedures for replacing an A-Motion CPU side project with a QDS-Motion CPU project using MT Developer2. Always backup the project before the program replacement.

## 1) Start MT Developer2, and select "Divert File" from the "Project" tab.



2) Specify the CPU type and OS type after the replacement in the "Diversion of the MT Developer2 Format Project" dialog box, and select "Browse".

Diversion of the MT Developer2 Format Project	<b>—</b>
Source (MT Developer 2 Format Project) Drive/Path Project Name CPU Type : OS Type : OS Type :	Browse Divert Close
-CPU/OS Selection CPU Type : Q173 ▼ OS Type : SW6-SV13Q8 ▼	

3) Select "Browse" in Save Folder Path and the source project from "Folder List", and click "Open".

version of Other	Format Pro	oject			
ave Folder Path :					
C:¥Users¥BK00242	¥Desktop¥Use	ers¥			Browse
older List :					
Name	CPU Type	OS Type	Operation Method	Titl	e
±				Up	
AMotion	A172SH	SW3-SV13D(SFC	)		
/orkspace Name :	Γ				
un én de Blance -	, 	AMotion			
roject Name :	[	AMOUGH			
tle :					
					_
				Open	Cancel

4) Select data to be converted in "File Selection".

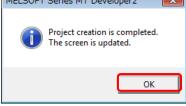
Select None Select None		
Name	Update Time	Ι
System Setting/Servo Data Setting	2014/06/10 14:00:41	
🗹 📴 Limit Output Data	1997/10/30 18:22:24	
Motion SFC Program/Motion SFC Parameter	1997/10/21 5:13:32	
Servo Program	1997/11/08 5:18:04	

#### 5) Select "Divert".

Diversion of Other Format Project	<b>—</b>
Source (Other Format Project)       Drive/Path       C:¥Users¥BK00242¥Desktop¥Users       Project Name       AMotion       CPU Type :       A172SH       OS Type :       SW3-SV13D(SFC)	Browse Divert Close
CPU/OS Selection           CPU Type : Q173           OS Type : SW6-SV13QB	

6) The conversion of the project is completed. Select "OK".

After the project conversion, make the cross comparison or check the data on each screen.



7) Select "Save As" from the "Project" tab to save the project after the conversion.

ELSOF	T Ser	ies MT Develop	er2 (Un	set Project)
ject	<u>E</u> dit	<u>F</u> ind/Replace	<u>V</u> iew	<u>C</u> heck/Conv
<u>N</u> ew.				Ctrl+N
<u>O</u> pen	ı			Ctrl+0
<u>C</u> lose	2			
<u>S</u> ave				Ctrl+S
Save	<u>A</u> s			
	ject <u>N</u> ew. <u>O</u> per <u>C</u> lose <u>S</u> ave	ject <u>E</u> dit <u>N</u> ew <u>O</u> pen <u>C</u> lose <u>S</u> ave	<u>pect</u> <u>E</u> dit <u>F</u> ind/Replace <u>N</u> ew <u>O</u> pen <u>C</u> lose	Open Close Save

8) Input "Workspace Name", "Project Name", and "Title", and select "Save".

Workspace Name :	Change to Q173CPU
Project Name :	Change to Q173CPU
Title :	Change of A to QnCPU
	Save Cancel
Save as a Single File Format	Switch the window by clicking this button Project (MELSOFT Navigator does not support this format.)

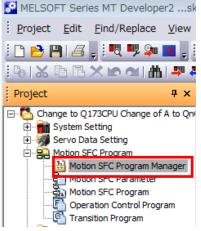
9) The new project creation dialog box appears. Select "Yes".

MELSOFI	Series MT Developer2	~
<u>^</u>	The specified project does not exist. Do you want to create a new project?	
	Yes No	

## 4.2.2 When SFC is not used

When no SFC program is used in the A-Motion CPU side program (Diversion source) and servo parameters and others are diverted, perform the following procedure after the operation of 9).

#### 1) Select "Motion SFC Program Manager".



2) Select "Unused" for "Motion SFC Program", and select "OK".

No. Program Name	Motion SFC Program C Used C Unused	Motion SFC Program Capaci Standard C Extended	ty Select All OK Cancel
	Show Existing Only	Order by Num     Order by Num     Order by Nam	
	Delete The existin	e existing Motion SFC program g Motion SFC programs are del <b>eplacement</b> e existing Motion SFC program ith specified number and renun <b>Copy</b>	eted. No.
		programs are batch-copied.	

For the file converted using MT Works2, refer to "4.1 List of Available Data for Diversion (SV13/SV22)", and set the data that cannot be diverted if necessary. For the multiple CPU parameter setting, refer to "3.Differences between Q173CPUN/Q172CPUN and A173UHCPU/A172SHCPUN/A171SHCPUN", "QCPU User's Manual (Multiple CPU System) Model code: SH-080485ENG", and "Q173CPU(N)/Q172CPU(N) User's Manual Model code: 1XB780".

## 4.2.3 Precautions for diverting cam data

To edit cam data, read the data directly using "Read Other Type Cam Data".

## 4.3 Program Diversion Procedure in PLC CPU Side

#### 4.3.1 Conversion procedure of sequence program for Qn(H)CPU using GX Works2/ GX Developer

The following describes an example of the procedure for replacing a sequence project using GX Developer.

Always backup the project before the replacement.

#### (1) Conversion of a sequence program created by SW3RNC-GSV/SW2D-GSV

1) After starting GX Works2, select "Start GX Developer" from the "Project" tab.

Start GX Developer( <u>Z</u> )
Exit ( <u>Q</u> )

2) The following shows the conversion of a sequence program created by SW3RNC-GSV/ SW2□-GSV (GPPA file format).

After GX Developer is started, select "Import file" --> "Import from GPPA format file" from the "Project" tab.

🎲 MELSOFT series GX D	eveloper		
Project Edit Find/Replace	View Online	Diagnostics Tools	Window Help
New project Open project Close project Save	Ctrl+N Ctrl+O Ctrl+S		*         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •         •
Save as Delete project Verify Copy		9 aF10 sF7 sF8	
Edit Data Change PLC type	•		
Import file Export file	•	Import from GPF	
Macro Function Block	) )	· ·	P(WIN) format file P(DOS) format file

Caution 1: Storage location of an execution file

The execution file in the GPPA format is usually stored in the following folder.

Folder structure

<u>"C drive (route drive)" --> "GPP" --> "USR" --> "System name" --> "Machine name (folder which includes the gppa.cnf file)"</u>

#### Caution 2: Name of diversion source project

When the diversion source project name is 9 characters or more, the project cannot be read.

Change the name so that the number of characters is within the limit and execute the conversion operation.

3) Select "Browse".

Import from G	PPA format file	×
Drive/Path	C:\GPP\USR\	Browse
System name		Execute
Machine name		Close
PLC type		
File selection	Common   Local	
Param+prog	Select all Cancel all selections	

4) Select the conversion target file and select "OK".

Open system n	Open system name, machine name						$\times$
Selected drive	[·c·]	•	E				
A2012021							
Drive/Path	C:\GPP\US	R\SV13\A2012	021				
System name	SV13		12013b			ОК	
Machine name	A2012021	A3N	AMotion			Cancel	

5) Check the conversion targets (Program/Device comment/Parameter), and select "Execute". Note) Only one of "Comment1" and "Comment2" can be selected for Device comment.

Import from GP	PA format file		<b>X</b>			
Drive/Path	C:\GPP\USR\	\GPP\USR\ Browse				
System name	SV13	V13 120131b				
Machine name	20120217	A Motion	Close			
PLC type	A3N	A3N				
File selection	Common   Loca	Merge peripheral statement/note				
Param+prog	Select all	Cancel all selections				
⊡ · 🚏 Devi 	MAIN ice comment Comment2 Comment1					

6) The conversion completion dialog box appears. Select "OK".



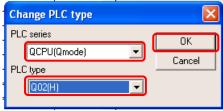
#### 7) Select "Close".

Import from GPPA format file				
Drive/Path	C:\GPP\USR		Browse	
System name	SV13	12013Б	Execute	
Machine name	A2012021	AMotion	Close	
PLC type	A3N			
File selection	Common Loca	Merge peripheral statement/note		
Param+prog	Select all	Cancel all selections		

8) Select "Change PLC type" from the "Project" tab in GX Developer.

-19	MELSOF	- I se	ries GX Deve	eloper C:	wrogr
	Project	Edit	Find/Replace	Convert	View
Г	New p	project	:	Ctrl	+N
-	Open	proje	:t	Ctrl	+0
Pr	Close	proje	t		
-	Save			Ctrl	+S
E	Save	as			
Ē	Delete	e proje	ect		
	Verify	·			
	Сору				
<i>M</i>	Edit D	ata			•
	Chang	ge PLC	type		

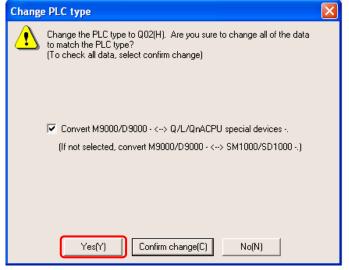
9) Specify the PLC series (QCPU(Qmode)) and PLC type (QnUD(E)(H)CPU) after the replacement in the "Change PLC type" dialog box, and select "OK".



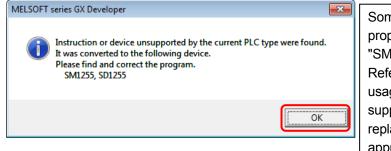
10) The "Change PLC type" dialog box appears. Select "Yes".

Note) In this replacement handbook, "Yes" is selected because the changes will be checked later by using a support tool.

When the supporting tool is not used, select "Confirm change".



11) The following dialog box appears. Select "OK".



Some devices cannot be replaced properly and are forcibly converted to "SM1255" or "SD1255". Refer to the explanation about the usage of the A/QnA->Q conversion support tool described later and replace those devices with appropriate ones.

12) When "Save as" is selected from the "Project" tab, the following dialog box appears. Input "Project name" and "Title", and select "Save".

name and	, 1100 , u				
Save the pr	oject with a	new nam	ie		×
Project drive	[-c-]	•	<b>E</b>		
□ □ Automati □ My Musid □ My Pictu □ Simulatio	res				
Drive/Path	C:\Documen	its and Settin	igs\Adminis	trator\My	Save
Project name	120403 Char	nge			Cancel
Title	120403 Char	nge			

13) The new project creation dialog box appears. Select "Yes".

MELSOFT series GX Developer					
The specified project does not exist. Do you wish to create a new project?					
	Yes	No			

Although the sequence program has been converted by following this procedure, it may not be performed correctly. For the program modifications, refer to Section 5 and later.

#### (2) Conversion of a sequence program for A-Motion created by GX Developer

The following describes an example of the procedure for replacing a sequence project using GX Developer. Always backup the project before the replacement.

1) After starting GX Works2, select "Start GX Developer" from the "Project" tab.

ſ	Start GX Developer( <u>Z</u> )
	Exit ( <u>Q</u> )

2) The following shows the conversion of a sequence program for A-Motion that created by GX Developer (GPPW file format).

3) After GX Developer is started, select "Open project" from the "Project" tab.

🎲 MELSOFT series GX Developer						
Project	Edit	Find/Replace	View	Online	Di	
New p	project		Ctrl+N			
Open	projec	Ctrl+O				
Close	projec	it.				
Save				Ctrl+S		
Save	as					

4) Select the file to be converted, and select "Open".

Open projec	:t					×
Project drive	[·c·]	•	1	5-5- 5-5- 5-5-		
<ul> <li>DNavZer</li> <li>DNavZer</li> <li>EZSockel</li> <li>GPP</li> <li>Gppw</li> <li>GPPw2</li> </ul>		MNavi MSF NNavi PMCNF				
Drive/Path	C:\Program	Files\MELSO	FT		Open	
Project name	20120217				Cancel	

For the following conversion operations, refer to Step 8) and later of (1) Conversion of a sequence program created by SW3RNC-GSV/SW2\_-GSV.

## 5. USING A/QnA->Q CONVERSION SUPPORT TOOL FOR SEQUENCE PROGRAMS

To confirm the converted content of the sequence program, <u>use "A/QnA->Q conversion support tool".</u> Please download and install the A/QnA->Q conversion support tool from Mitsubishi Electric FA Site. For details, refer to A/QnA->Q Conversion Support Tool Operation Guide on the same page.

To download the tool, access the Mitsubishi Electric FA Site

(http://www.mitsubishielectric.co.jp/fa/index.html) and as follows.

http://www.mitsubishielectric.co.jp/fa/download/software/search.do?mode=software&kisyu=%2Fplca&lan g=2&select=0&softid=0

## 5.1 Preparation for Using Support Tool

To use the support tool, prepare the following.

- 1) Diversion source sequence program (for comparison)
- 2) Target sequence program (program converted for Qn(H)CPU)
- 3) A/QnA->Q conversion support tool (Obtain this tool from Mitsubishi Electric FA Site.)
- 4) A/QnA->Q Conversion Support Tool Operation Guide (Obtain this guidebook from Mitsubishi Electric FA Site.)
- 5) GX Developer (GX Works2)

#### Caution

Convert 1) into a project whose CPU type is changed to A2SH or A3U and save the project using GX Developer as follows. The conversion method is the same as the one described in "2.4.3 Program Diversion Procedure in PLC CPU Side".

• For A171SHCPUN and A172SHCPUN

Select "ACPU" for PLC series and "A2SH" for PLC type in the "Change PLC type" dialog box, and select "OK".

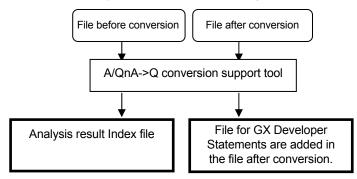
Change PLC type	X
PLC series	ОК
ACPU	Cancel
A2SH 🗨	

• For A173UHCPU

Select "ACPU" for PLC series and "A3U" for PLC type in the "Change PLC type" dialog box, and select "OK".

Change PLC type	
PLC series	ОК
ACPU  PLC type	Cancel
A3U	

\* This operation is necessary to use the A/QnA->Q program conversion support tool.



## 5.2 Using Procedure of Support Tool

- 1) Click "Start" --> "MELSOFT Application" --> "AQCnvSupport" to start the support tool.
  - Then select "A/QnA->Q program conversion support tool execute".

	A/QnA->Q conversion support tool	Version.1.12
	A/QnA->Q program conversion support tool execute	
i nis tool supports AlwnA->w	program conversion.	
Refresh pr	ogram generation tool for MELSECNET(II) local station	execute
This tool generates the refres	sh program generation for MELSECNET(II) local station.	
MELSECN	ET(II)->MELSECNET/10(H) parameter conversion tool a	execute
This tool converts the MELSE conversion.	CNET(II)->MELSECNET/10(H) parameter and supports	; A/QnA->Q program
		Exit

2) The "A/QnA->Q program conversion support tool" dialog box appears. Specify a source file in the GPPA format, A2SH file, or A3U file for "Project for A/QnA series before PLC type changing". Specify the file converted to the QnUD(E)(H)CPU type file for "Project for Q series after PLC type changed", and select "Next".

A/QnA->Q program conversion support tool		×	
Select analyzing project Set project name Project for A/QnA series before PLC type changi Drive/path	ng Project name		or comparison (A2SH) onverted to the one for
C:Documents and SettingsVadministrator	NDesktop Before replacement A	Browse	
Drive/path C:\Documents and Settings\All Users\De	Project name sktop After replacement Q	Browse	
	Next	Cancel	

After this procedure, follow the description in A/QnA->Q Conversion Support Tool Operation Guide.

## 3) Created file

Once the operation is completed by following the description in A/QnA->Q Conversion Support Tool Operation Guide, an analysis result Index file (HTML document) and a GX Developer file in which statements of the modifications are embedded are created in the specified folder.

Name 🔺	Size Type
🚞 Q Series	File Folder
🕘 Index.htm	3 KB HTML Document

## 4) Display

## • Analysis result index file

The following shows an example of the execution results of the analysis result index file. A/QnA $\rightarrow$ Q conversion support tool Version.1.08

## Analyzing result

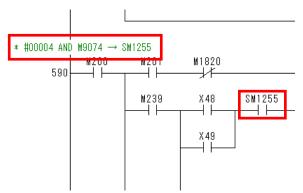
Project for A/QnA series before PLC type changing	C:\Documents and Settings\All Users\Desktop\ Replacement		For replacement tool (A172→A2SH)
Project for Q series after PLC type changed	C:\Documents and Settings\All Users\Desktop\ Replacement		For replacement tool (A172→Q26UDEH)
	Detection num	er Analyzing result display	
Main program	43	List Display	

Special M/D unconverted in PLC type change	20	Device number order	Step number order
Instruction unconverted in PLC type change	18	According to instruction name	Step number order
Program for special function module necessary to check	5	According to special function module	Step number order

## • GX Developer file in which statements are embedded

The following shows an example of the execution results of the GX Developer file in which statements are embedded.

"Statement display" or "Ctrl + F7" displays the contents that need to be modified.



\* In the case described above, the device M9074 has been replaced with the device SM1255. Correct the device to an appropriate one.

### 5.3 Correction of the Sequence Program in Created Embedded File

#### 5.3.1 Correction of special relay/special register

The special relay that cannot be converted from A-Motion is converted to "SM1255", and the special register that cannot be converted from A-Motion is converted to "SD1255". Modify the devices according to a between-the-lines statement.

#### 5.3.2 Correction of motion-dedicated instructions

A-Motion-dedicated instructions (SVST, CHGA, CHGV, CHGT, SFCS, ITP) are converted to "SM1255". Modify the devices according to a between-the-lines statement.

#### 5.3.3 Others

Confirm the details of user's manual and programming manual for each CPU module and correct required items. For the usage of GX Developer and others, refer to manuals of each product.

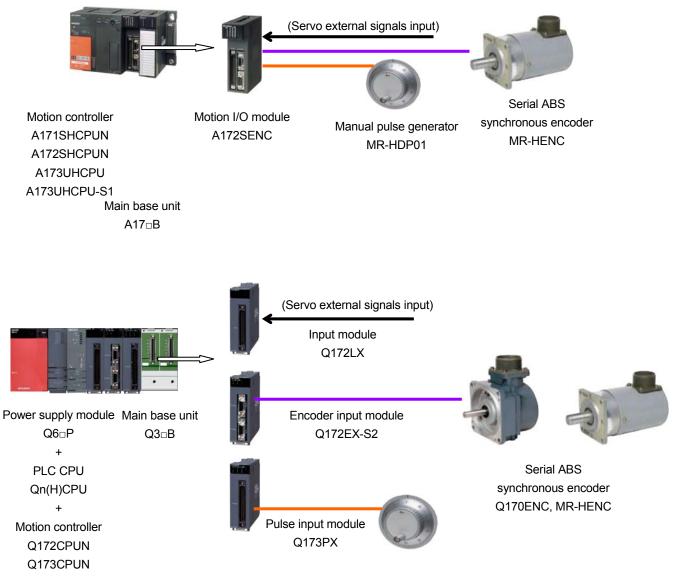
# 6. POINTS AND PRECAUTIONS OF REPLACEMENT

#### 6.1 Difference of Motion CPU Configuration

#### 6.1.1 System configuration

The following figure shows the differences between the basic system of A-Motion and basic system of QDS-Motion.

- The PLC function and the motion function are integrated in one A-motion CPU. However, in QDS-motion, they are in different CPUs.
- A-Motion is compatible with SSCNET as a servo system network, but QDS-Motion is compatible with SSCNET III or SSCNET III/H. Servo amplifiers connectable to each motion are also different.
- A motion module A172SENC (Pulse generator/synchronous encoder interface module) is replaced with a motion module Q172DLX (Servo external signal interface module), Q172DEX (Synchronous encoder interface module), or Q173DPX (Manual pulse generator interface module).
- A base unit is changed to a Q series multiple CPU high speed base unit. As a result, motion modules (Q172DLX, Q173DEX, and Q172DPX) cannot be installed in the CPU slot and Slot 0 to 2.



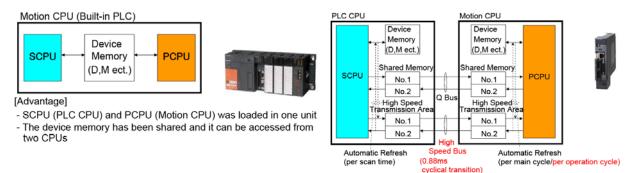
#### 6.1.2 Shared device

In A-motion, the PLC and Motion functions are integrated in an A-motion CPU. Thus, the both function shares the memory. In QDS-Motion, a PLC CPU and a Motion CPU are divided as different modules. Thus, configuring various settings (Assignment to the multiple CPU shared devices/automatic refresh setting) is required to share the memory.

For details, refer to "QCPU User's Manual (Multiple CPU System) Model code: SH-080485ENG", "Programming Manual (COMMON) [type Q173D(S)/Q172D(S)] Model Code: 1XB928".

#### **A-Motion**

#### **QDS-Motion**



[Advantage]

- 0.88ms cyclical transition can be done in high speed transmission area - Automatic refresh per operation cycle is possible

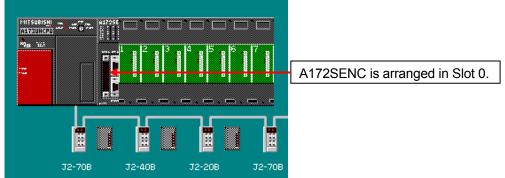
After diverting the project, execute the automatic refresh setting to share the device memory. It is necessary to assign the devices being used by the PLC CPU to the devices of the Motion CPU.

### 6.2 Precautions on Replacement

#### 6.2.1 Slot position (system setting)

When a motion module used in A-Motion is replaced with a Q-Motion module, the slot position will change.

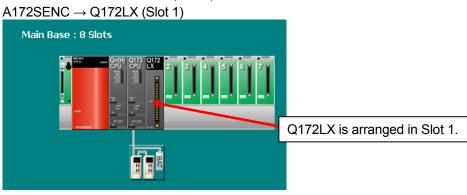
Example) When A172SENC is arranged in Slot 0 in A-Motion



↓ A172SHCPU is converted to Q172CPUN.

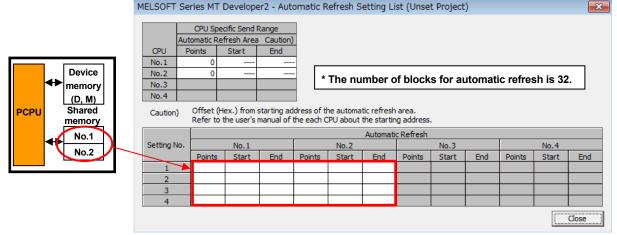
The conversion is executed as follows.

A172SHCPU  $\rightarrow$  Q172CPUN (Slot 0)



#### 6.2.2 Restrictions on the number of blocks and total points in the refresh setting

In Q-Motion, an automatic refresh function is one of the specifications added from A-Motion. The number of blocks for the automatic refresh is limited to 4 blocks in Q173CPUN/Q172CPUN. MELSOFT Series MT Developer2 - Automatic Refresh Setting List (Unset Project)



#### 6.2.3 Timer counter

T (Timer device) and C (Counter device) can be used in A-Motion, but they cannot be used in Q-Motion. When T and C are used on the motion SFC side, use the TIME instruction as an alternative method.

#### 6.2.4 Parameter block

Since the error check function is improved in Q-Motion, errors and warnings will be displayed in the parameter in which errors and warnings were not displayed in A-Motion after the replacement. Correct the errors according to the content of the errors and warnings.

Example) A-Motion						
	Block1	Block2				
Interpolation Ctrl. Unit	PULSE	PULSE				
Sp.Restriction	100000[PLS/sec]	100000[PLS/sec]				
Acceleration Time	1000[msec]	500[msec]				
Deceleration Time	1200[msec]	500[msec]				
Rapid Stop Dec. Time	1200[msec]	1000[msec]				

#### CPU module is changed from A-Motion to Q-Motion using MT2

Item	Block No. 1	Block No.2	
Parameter Block	Set the data such as the acceleration/decelera		
Interpolation Control Unit	3:PLS	3:PLS	
Speed Limit Value	100000[PLS/s]	100000[PLS/s]	
Acceleration Time	1000[ms]	500[ms]	
Deceleration Time	1200[ms]	500[ms]	
Rapid Stop Deceleration Time	1200[ms]	1000[ms]	

#### • Error contents and measures

Checking for Parameter Block..

Warning: Parameter Block Block No.2 Rapid Stop Deceleration Time - The rapid stop deceleration time exceeds the deceleration time. Rapid Stop Deceleration Time <= Deceleration Time Warning: Parameter Block Block No.6 Rapid Stop Deceleration Time - The rapid stop deceleration time exceeds the deceleration time. Rapid Stop Deceleration Time <= Deceleration Time Warning: Parameter Block Block No.7 Rapid Stop Deceleration Time - The rapid stop deceleration time exceeds the deceleration time. Rapid Stop Deceleration Time <= Deceleration Time

In the above case, set the sudden stop deceleration time to be equal to the deceleration time setting value (500ms or shorter).

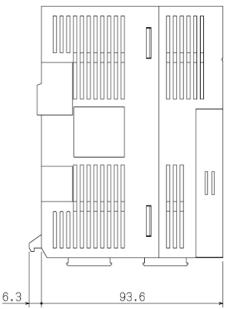
Note that the error check becomes stricter than before the replacement as the above case.

# **5. APPENDIX**

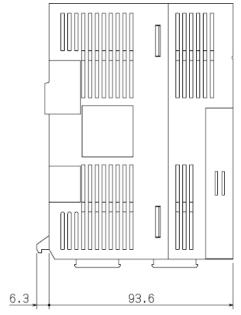
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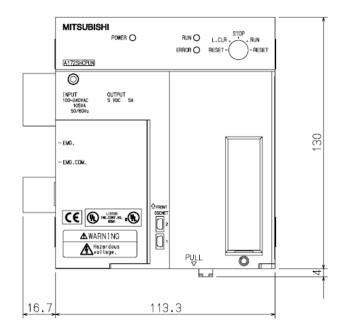
## 1. OUTLINE DIMENSIONS

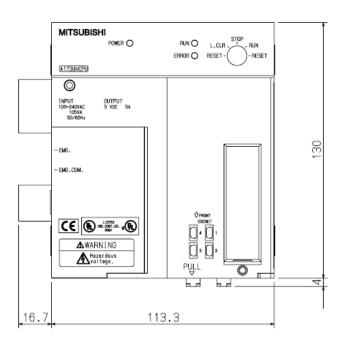
1.1 Outline Dimensions of A Series (small type) 1.1.1 A17nSHCPUN



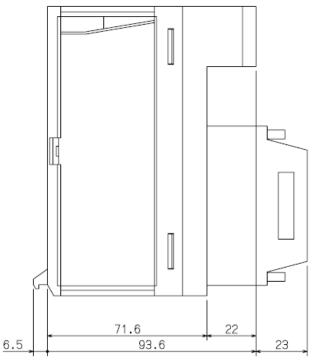
#### 1.1.2 A173UHCPU(-S1)

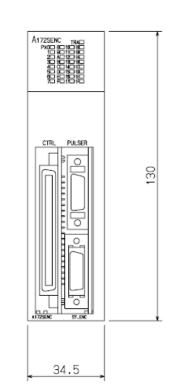




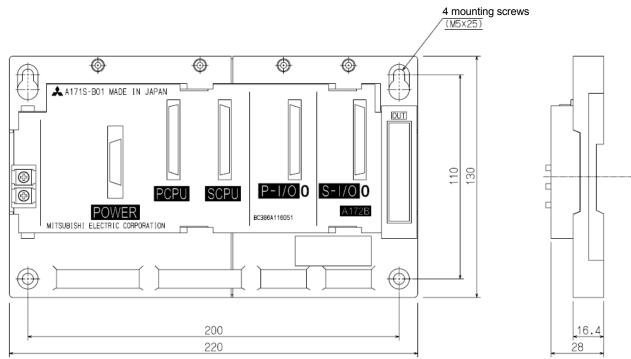


# 1.1.3 A172SENC

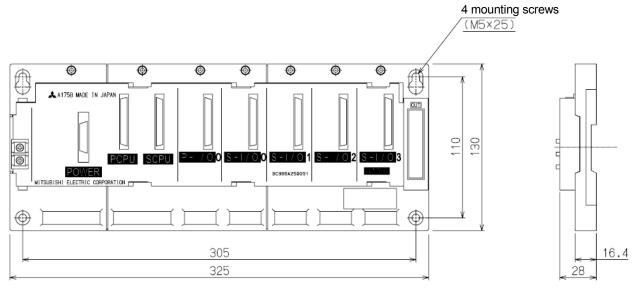




# 1.1.4 A172B

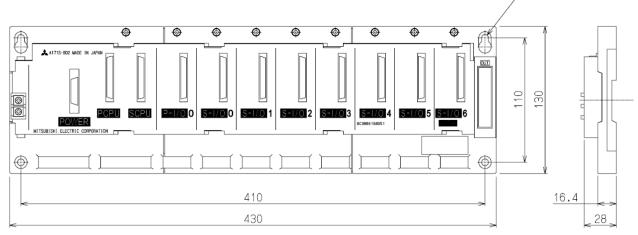


#### 1.1.5 A175B

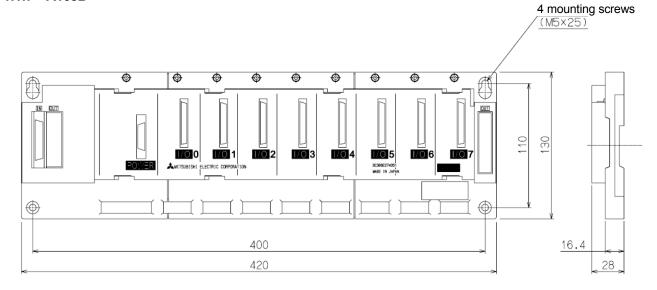


## 1.1.6 A178B(-S□)

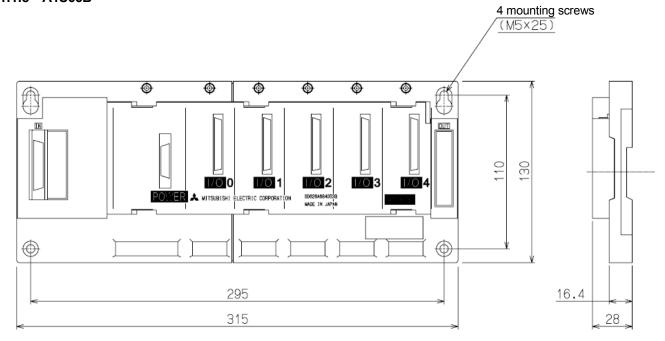
4 mounting screws



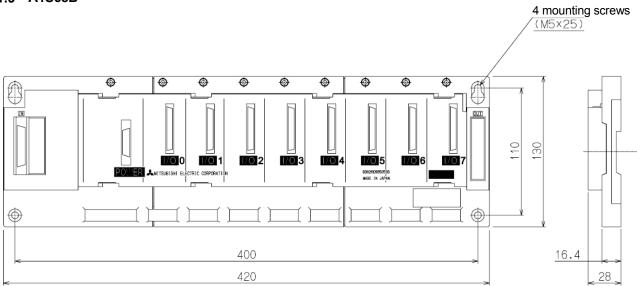
#### 1.1.7 A168B



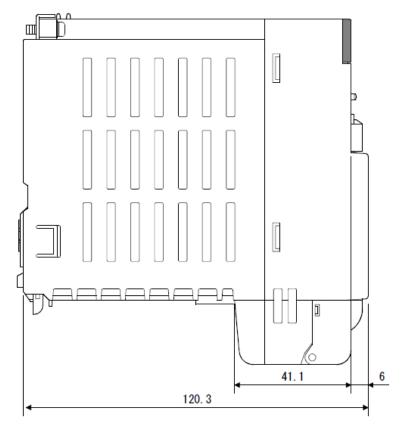
1.1.8 A1S65B

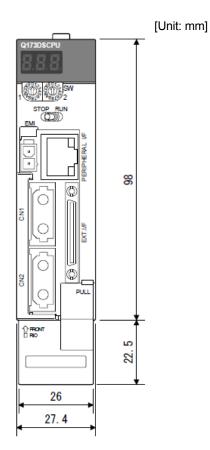


#### 1.1.9 A1S68B

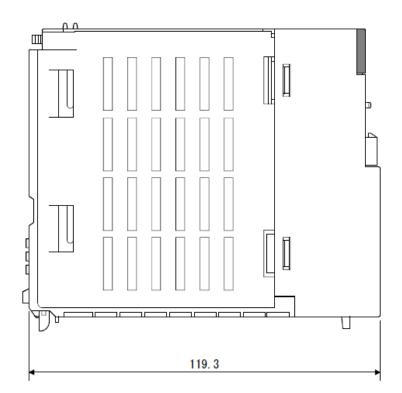


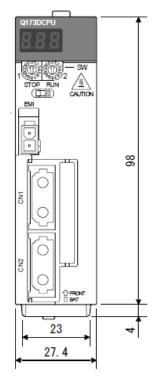
#### 1.2 Outline Dimensions of QD(S) Series 1.2.1 Q17nDSCPU





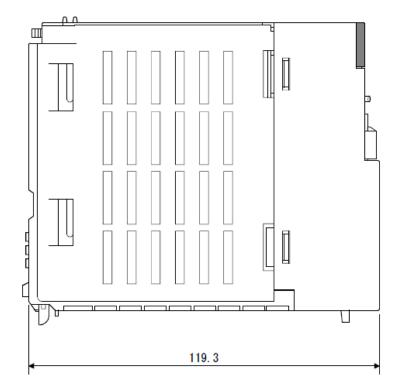
# 1.2.2 Q17nDCPU

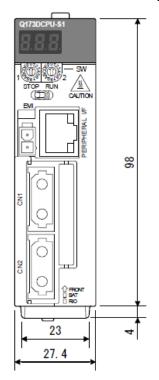




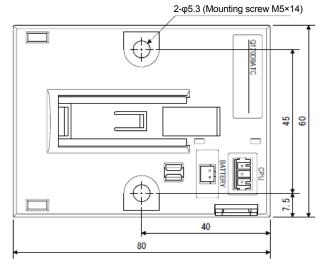
# MOTION CONTROLLER

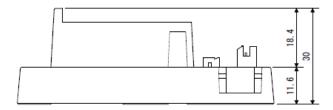
# 1.2.3 Q17nDCPU-S1





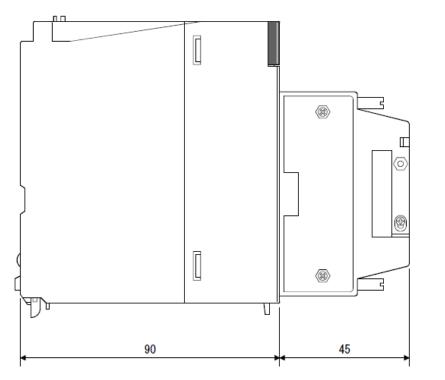
## 1.2.4 Q170DBATC

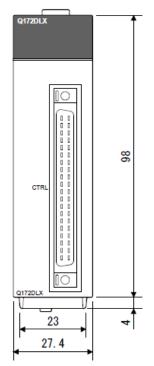




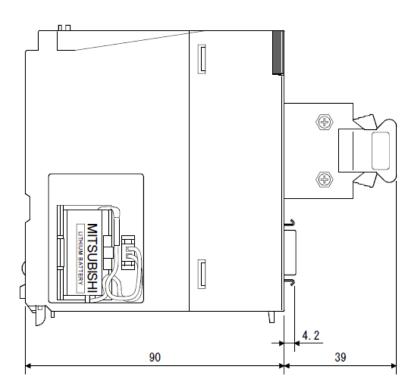
1.2.5 Q172DLX

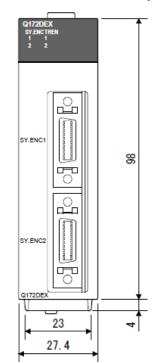
[Unit: mm]



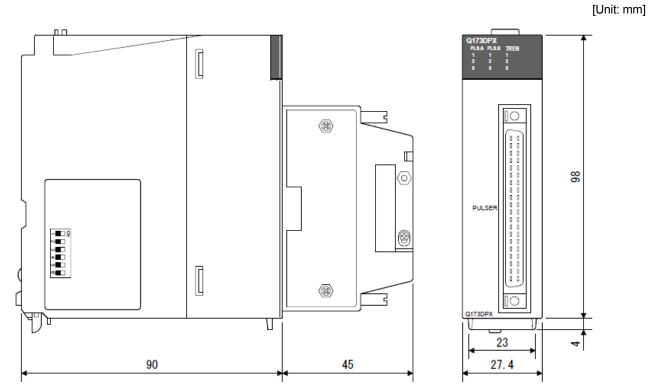


# 1.2.6 Q172DEX

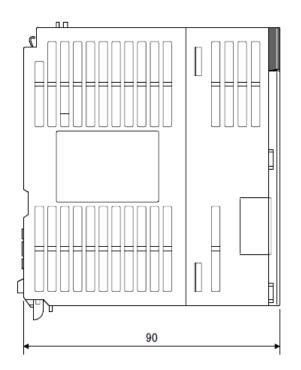


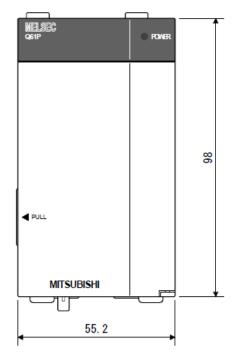


1.2.7 Q173DPX

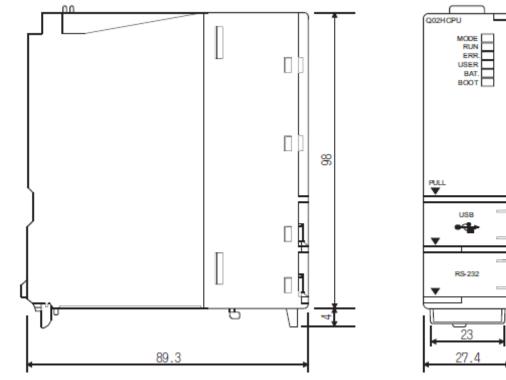


# 1.2.8 Q61P/Q62P/Q63P

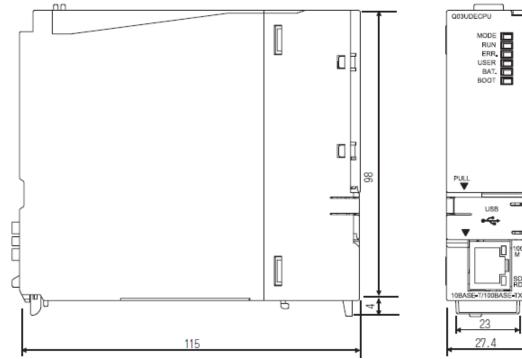




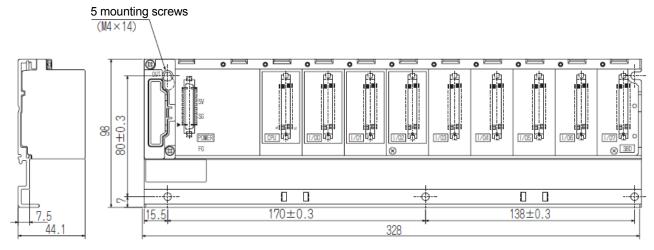
1.2.9 QnHCPU

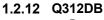


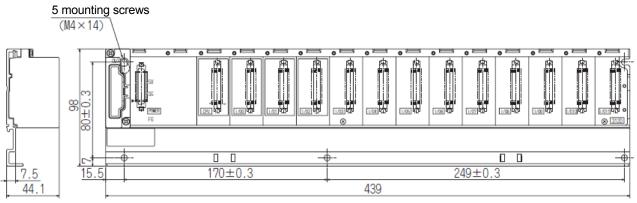




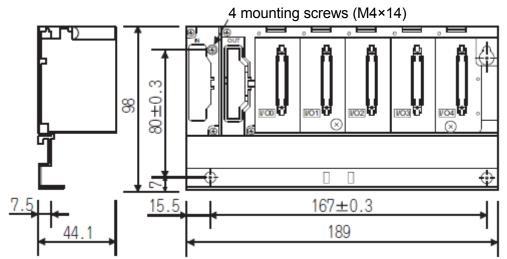
#### 1.2.11 Q38DB



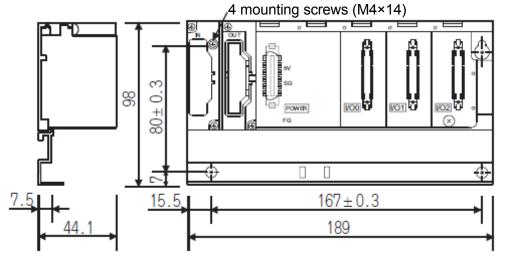




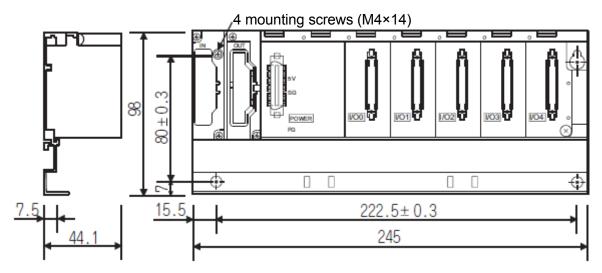
1.2.13 Q55B

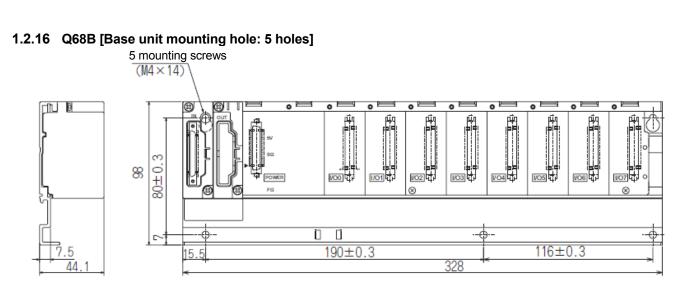


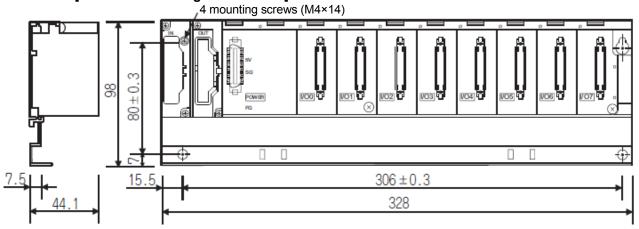
#### 1.2.14 Q63B



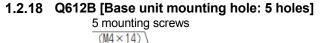
1.2.15 Q65B

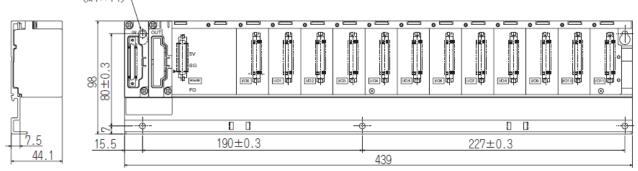




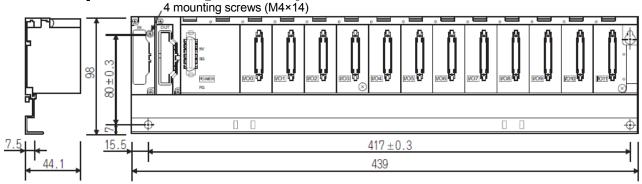


1.2.17 Q68B [Base unit mounting hole: 4 holes]

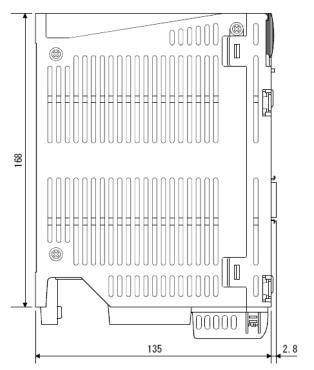


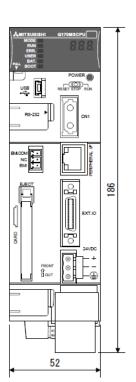


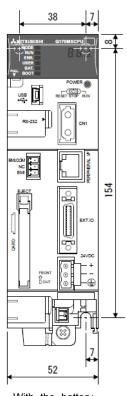
1.2.19 Q612B [Base unit mounting hole: 4 holes]



#### 1.3 Outline Dimensions of Stand-alone Motion 1.3.1 Q170MSCPU(-S1)



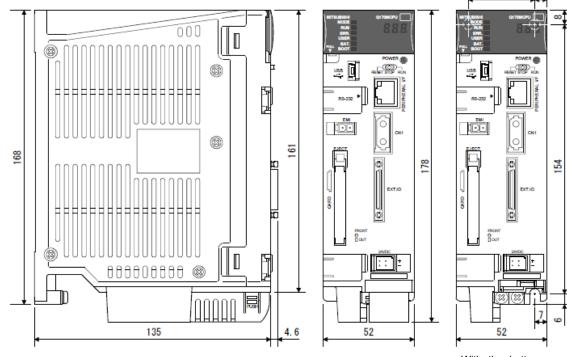




With the battery holder removed

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# 1.3.2 Q170MCPU



With the battery holder removed

# WARRANTY

Please confirm the following product warranty details before using this product.

#### 1. Gratis Warranty Term and Gratis Warranty Range

We will repair any failure or defect hereinafter referred to as "failure" in our FA equipment hereinafter referred to as the "Product" arisen during warranty period at no charge due to causes for which we are responsible through the distributor from which you purchased the Product or our service provider. However, we will charge the actual cost of dispatching our engineer for an on-site repair work on request by customer in Japan or overseas countries. We are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit are repaired or replaced.

#### [Gratis Warranty Term]

The term of warranty for Product is thirty six (36) months after your purchase or delivery of the Product to a place designated by you or forty two (42) months from the date of manufacture whichever comes first "Warranty Period". Warranty period for repaired Product cannot exceed beyond the original warranty period before any repair work.

#### [Gratis Warranty Range]

- (1) You are requested to conduct an initial failure diagnosis by yourself, as a general rule.
  - It can also be carried out by us or our service company upon your request and the actual cost will be charged. However, it will not be charged if we are responsible for the cause of the failure.
- (2) This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and user manual for the Product and the caution label affixed to the Product.
- (3) Even during the term of warranty, the repair cost will be charged on you in the following cases;
  - 1) A failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem
  - 2) A failure caused by any alteration, etc. to the Product made on your side without our approval
  - 3) A failure which may be regarded as avoidable, if your equipment in which the Product is incorporated is equipped with a safety device required by applicable laws and has any function or structure considered to be indispensable according to a common sense in the industry
  - 4) A failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced
  - 5) Any replacement of consumable parts (battery, fan, etc.)
  - 6) A failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning and natural disasters
  - 7) A failure generated by an unforeseeable cause with a scientific technology that was not available at the time of the shipment of the Product from our company
  - 8) Any other failures which we are not responsible for or which you acknowledge we are not responsible for

#### 2. Onerous Repair Term after Discontinuation of Production

- (1) We may accept the repair at charge for another seven (7) years after the production of the product is discontinued.
- The announcement of the stop of production for each model can be seen in our Sales and Service, etc.
- (2) Please note that the Product (including its spare parts) cannot be ordered after its stop of production.

#### 3. Service in overseas countries

Our regional FA Center in overseas countries will accept the repair work of the Product; However, the terms and conditions of the repair work may differ depending on each FA Center. Please ask your local FA center for details.

#### 4. Exclusion of Loss in Opportunity and Secondary Loss from Warranty Liability

Whether under or after the term of warranty, we assume no responsibility for any damages arisen from causes for which we are not responsible, any losses of opportunity and/or profit incurred by you due to a failure of the Product, any damages, secondary damages or compensation for accidents arisen under a specific circumstance that are foreseen or unforeseen by our company, any damages to products other than the Product, and also compensation for any replacement work, readjustment, start-up test run of local machines and the Product and any other operations conducted by you.

#### 5. Change of Product specifications

Specifications listed in our catalogs, manuals or technical documents may be changed without 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.

# Transition from A17nSHCPUN/A173UHCPU Series to Q Series Handbook

# A Safety Warning

To ensure proper use of the products list ed in this catalog, please be sure to read the instruction manual prior to use.

Country/Region	Sales office	Tel/Fax
USA	MITSUBISHI ELECTRIC AUTOMATION, INC.	Tel : +1-847-478-2100
	500 Corporate Woods Parkway, Vernon Hills, IL 60061, U.S.A.	Fax : +1-847-478-2253
Mexico	MITSUBISHI ELECTRIC AUTOMATION, INC. Mexico Branch Mariano Escobedo #69, Col. Zona Industrial, Tlalnepantla Edo, C.P.54030, Mexico	Tel : +52-55-3067-7500 Fax : –
Brazil	MITSUBISHI ELECTRIC DO BRASIL COMÉRCIO E SERVIÇOS LTDA. Rua Jussara, 1750- Bloco B Anexo, Jardim Santa Cecilia, CEP 06465-070, Barueri - SP, Brasil	Tel : +55-11-4689-3000 Fax : +55-11-4689-3016
Germany	MITSUBISHI ELECTRIC EUROPE B.V. German Branch Gothaer Strasse 8, D-40880 Ratingen, Germany	Tel : +49-2102-486-0 Fax : +49-2102-486-1120
UK	MITSUBISHI ELECTRIC EUROPE B.V. UK Branch Travellers Lane, Hatfield, Hertfordshire, AL10 8XB, U.K.	Tel : +44-1707-28-8780 Fax : +44-1707-27-8695
Italy	MITSUBISHI ELECTRIC EUROPE B.V. Italian Branch Centro Direzionale Colleoni - Palazzo Sirio Viale Colleoni 7, 20864 Agrate Brianza(Milano) Italy	Tel : +39-039-60531 Fax : +39-039-6053-312
Spain	MITSUBISHI ELECTRIC EUROPE, B.V. Spanish Branch Carretera de Rubí, 76-80-Apdo. 420, 08173 Sant Cugat del Vallés (Barcelona), Spain	Tel : +34-935-65-3131 Fax : +34-935-89-1579
France	MITSUBISHI ELECTRIC EUROPE B.V. French Branch 25, Boulevard des Bouvets, F-92741 Nanterre Cedex, France	Tel : +33-1-55-68-55-68 Fax : +33-1-55-68-57-57
Czech Republic	MITSUBISHI ELECTRIC EUROPE B.V. Czech Branch Avenir Business Park, Radlicka 751/113e, 158 00 Praha5, Czech Republic	Tel : +420-251-551-470 Fax : +420-251-551-471
Poland	MITSUBISHI ELECTRIC EUROPE B.V. Polish Branch ul. Krakowska 50, 32-083 Balice, Poland	Tel : +48-12-630-47-00 Fax : +48-12-630-47-01
Russia	MITSUBISHI ELECTRIC EUROPE B.V. Russian Branch St. Petersburg office Piskarevsky pr. 2, bld 2, lit "Sch", BC "Benua", office 720; RU-195027 St. Petersburg, Russia	Tel : +7-812-633-3497 Fax : +7-812-633-3499
Sweden	MITSUBISHI ELECTRIC EUROPE B.V. (Scandinavia) Fjelievägen 8, SE-22736 Lund, Sweden	Tel : +46-8-625-10-00 Fax : +46-46-39-70-18
Turkey	MITSUBISHI ELECTRIC TURKEY A.Ş Ümraniye Branch Şerifali Mahallesi Nutuk Sokak No:5, TR-34775 Ümraniye, İstanbul, Türkey	Tel : +90-216-526-3990 Fax : +90-216-526-3995
UAE	MITSUBISHI ELECTRIC EUROPE B.V. Dubai Branch Dubai Silicon Oasis, P.O.BOX 341241, Dubai, U.A.E.	Tel : +971-4-3724716 Fax : +971-4-3724721
South Africa	ADROIT TECHNOLOGIES 20 Waterford Office Park, 189 Witkoppen Road, Fourways, Johannesburg, South Africa	Tel:+27-11-658-8100 Fax:+27-11-658-8101
China	MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. No.1386 Hongqiao Road, Mitsubishi Electric Automation Center, Shanghai, China	Tel : +86-21-2322-3030 Fax : +86-21-2322-3000
Taiwan	SETSUYO ENTERPRISE CO., LTD. 6F, No.105, Wugong 3rd Road, Wugu District, New Taipei City 24889, Taiwan, R.O.C.	Tel : +886-2-2299-2499 Fax : +886-2-2299-2509
Korea	MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD. 7F-9F, Gangseo Hangang Xi-tower A, 401, Yangcheon-ro, Gangseo-Gu, Seoul 157-801, Korea	Tel : +82-2-3660-9510 Fax : +82-2-3664-8372/8335
Singapore	MITSUBISHI ELECTRIC ASIA PTE. LTD. 307, Alexandra Road, Mitsubishi Electric Building, Singapore 159943	Tel : +65-6473-2308 Fax : +65-6476-7439
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 Bangpongpang, Khet Yannawa, Bangkok 10120, Thailand	Tel : +66-2682-6522 to 6531 Fax : +66-2682-6020
Indonesia	PT. MITSUBISHI ELECTRIC INDONESIA Gedung Jaya 11th Floor, JL. MH. Thamrin No.12, Jakarta Pusat 10340, Indonesia	Tel : +62-21-3192-6461 Fax : +62-21-3192-3942
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 : +84-8-3910-5945 Fax : +84-8-3910-5947
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 Fax : +91-20-2710-2100
Australia	MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD. 348 Victoria Road, P.O. Box 11, Rydalmere, N.S.W 2116, Australia	Tel : +61-2-9684-7777 Fax : +61-2-9684-7245

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