Stand-Alone

Ideal for complete machine control!

Plenty of axes!

This is Stand-Alone!

Motion Controller
Start with Stand-Alone.

Power supply, PLC, motion controller; all integrated into a single, compact unit! This is Stand-Alone!

Compact

Even useful for integrating equipment into the manufacturing line.

Got it! For total machine control use Stand-Alone!

Simple!

More than enough axes for total machine control!

Empowered! Panel and equipment size can be reduced!

Empowered! No more model selection worries!

Better space-saving when combined with a 2-axis-in-1 servo amplifier.

Compatible with MELSEC-Q Series modules.

The high-speed control of iQ Platform.

Easy parameter setting.

Use program resources efficiently.

Empowered! Speedy startup! Effortless debugging!

Empowered! System expansion with minimum design costs!

Empowered! Dramatic increases in productivity!

Empowered! Flexible expansion for any control purpose!

Empowered! Increased total machine control!
Three-in-one: Power supply, PLC, and Motion Controller.

No more model selection worries!

The compact Q170MCPU integrates a power supply, PLC, and motion controller and features built-in incremental synchronous encoder and mark detection signal interfaces needed for the packaging equipment industry and others. No need to worry over which model to choose – this unit provides it all!

Case Study
Total machine control, fitting even for machines with only eight-axes. Select Stand-Alone for worry-free model selection.

( Easily introduce a controller into your machine. Which PLC do I choose? Future number of servo axes? Which options units? Which power supply? The integrated Q170MCPU solves all of these questions at once.

( A good choice even if the number of servo axes increases later! The Q170MCPU can accommodate up to 16 axes. Furthermore, the Q170MCPU makes switching pneumatic cylinders and stepping motors to higher performing servos an easy task.

( No need for additional registration mark sensors! The Q170MCPU has built-in inputs for an INC synchronous encoder and up to 4 registration mark sensors. It can be used for packaging equipment without adding extra I/O modules.

Built-in INC synchronous encoder interface

Case Study
Even in a jam-packed panel, the Stand-alone controller makes space-saving design possible.

( Just like this, you can squeeze everything into a packed panel!

( Save even more space by combining with the 2-in-1 servo amplifier!

The 2-in-1 MR-J3W servo amplifier has the same shape and installation area as the Q170MCPU. When comparing against two MR-J3 amps, the J3W can be installed in 25% less space. Combined with the Q170MCPU, an optimum space-saving solution can be realized. Additionally, the 2-slot expansion base is just 106 mm × 98 mm, allowing limited panel and equipment space to be used effectively.

Better space-saving when combined with a 2-axes-in-1 servo amplifier.

Synergistic space-saving!
solution 03

Compatible with MELSEC-Q Series modules.

Empowered!

Flexible expansion for any control purpose!

Select from over 100 different types of Mitsubishi MELSEC-Q Series units and install directly into the Q170MCPU expansion base – no power supply needed. Flexible system expansion is an important Q170MCPU advantage.

Wide selection of MELSEC-Q Series modules

C a s e  S t u d y

No need to do a system redesign every time you want to add or change functions!

Over 100 different types of modules for flexible expansion of functions!

The limitless Q170MCPU
From expanded I/O, A/D conversion, and temperature control to additional network communication units and more. All can be added quickly and easily. No need to redesign the system when adding or changing functions!

Even constructing large systems is incredibly easy!

The open CC-Link IE controller network can be used to develop large scale systems with ease.

solution 04

The high-speed control of iQ Platform.

Empowered!

Dramatic increases in productivity!

Despite being compact, the Q170MCPU contains the same high performance as Mitsubishi’s industry leading iQ Platform controllers. All this performance, yet the stand-alone Q170MCPU motion controller is still easy to use.

The open CC-Link IE controller network can be used to develop large scale systems with ease.

C a s e  S t u d y

High speed and high performance in a small package. Delivering the power to reduce tact time and raise productivity!

Equipped with a high-speed multi-CPU bus, worry not when increasing the number of servo axes!

The Q170MCPU uses the same high-speed multi-CPU communication as iQ Platform. With this, high-speed 0.88 ms data transfer of up to 14kW is made possible between the PLC and motion CPU. High level iQ Platform motion control is made possible without any degradation in performance even in systems with large PLC programs and scan times.

[Increased in-position response speed]
**Easy parameter setting.**

**Empowered!**

**Speedy startup!**

**Effortless debugging!**

In other multi-CPU platforms, lots of configuration must be done before the Motion CPU and PLC CPU can communicate properly. This can result in hours of wasted time for the engineers involved. The Q170MCPU changes the game by seamlessly integrating sequence and motion. Thus, setup is quick and easy without any added steps for multi-CPU settings.

**Case Study**

Setting up multiple CPU’s used to be hard work. Now, start a new project, go into RUN mode. It’s that easy!

Start the CPU in one-shot! Sample data assists startup!

Software for the Q170MCPU comes with sample project data that pre-configures multi-CPU settings and gives the user additional benefits such as automatically adding labels to motion specific devices when used in PLC ladder.

Simple setup using sample data!

Debugging time reduced by using two personal computers!

Two PCs can be connected at the same time, allowing for multiple engineers to simultaneously debug sequence programs and debug motion programs/perform gain adjustment. (Of course, one PC can do everything as well.)

Project files can be directly used with the iQ Platform's Q173DCPU.

**Case Study**

Integrating individual machines into a line soon? Simplify future expansion by easily upgrading the controller!

**Use program resources efficiently.**

**Empowered!**

**System expansion with minimum design costs!**

Can a stand-alone motion controller handle future system expansion? With the Q170MCPU, your doubts are erased. Move to the high-end iQ Platform motion controller with minimum design hours and costs.

**Case Study**

When further system expansion is required, the same MELSOFT MT Works2 engineering tool!

Flexibly integrate machines into your assembly line!

For example, a machine built with the Q170MCPU can be extended quite easily. The Q170MCPU's project files can be directly used with the iQ Platform's Q173DCPU.

Pre-processing by company A

Your company's equipment

Post-processing by company B

The programs, extension modules, and cables stay the same!
### System configuration

![Motion OS software package](image)

Motion OS software package CD-ROM

- Dedicated language
- Machine automation
- For PLC control
- SV13 for motion SFC

![Motion OS software package](image)

Motion OS software package CD-ROM

- Dedicated language
- Machine automation
- For PLC control
- SV12 for motion SFC

### Motion specifications

#### Motion control specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Q170MCPU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of axes</td>
<td>5 axes</td>
</tr>
<tr>
<td>Operation Cycle (default)</td>
<td>0.44 ms: 1 to 4 axes, 0.88 ms: 5 to 12 axes, 1.77 ms: 13 to 16 axes</td>
</tr>
<tr>
<td>Interpretation</td>
<td>Linear interpolation up to 4 axes, arc interpolation 3 axes</td>
</tr>
<tr>
<td>Control</td>
<td>Input-point (PPI) control, speed control, position control</td>
</tr>
<tr>
<td>Acceleration/deceleration processing</td>
<td>Automatic trapezoidal acceleration/deceleration, S-curve acceleration/deceleration</td>
</tr>
<tr>
<td>Connection function</td>
<td>Backlash detection, electronic gears, phase connection (SV22)</td>
</tr>
<tr>
<td>Programing language</td>
<td>Motion SFC, dedicated instruction language, mechanical support language (SV22)</td>
</tr>
<tr>
<td>Number of positioning points</td>
<td>2000 points</td>
</tr>
<tr>
<td>Peripheral equipment interface</td>
<td>USB/RS-232, sequencer CPU, peripheral interface motion CPU control</td>
</tr>
<tr>
<td>Origin return function</td>
<td>Near-point DOG -- 2 types, count -- 3 types, external servo amplifier input signals (DOG) enabled, delayed -- 2 types, dog code, stopper stop -- 2 types, serving also as limit switch</td>
</tr>
<tr>
<td>Operation cycle</td>
<td>Provided</td>
</tr>
<tr>
<td>Manual pulse operation</td>
<td>3 units connectable</td>
</tr>
<tr>
<td>Synchronous encoder operation</td>
<td>8 units connectable when SV22 is used</td>
</tr>
<tr>
<td>M code</td>
<td>Contains M code output function and M code completion wait function</td>
</tr>
<tr>
<td>Limit switch output</td>
<td>Output points: 30</td>
</tr>
<tr>
<td>FMS operation</td>
<td>Provided</td>
</tr>
<tr>
<td>Absolute positioning</td>
<td>Available</td>
</tr>
<tr>
<td>Motion related equipment</td>
<td>SV22 for motion SFC</td>
</tr>
<tr>
<td>Motion related extension units</td>
<td>Q1712D-X: up to 2 can be used</td>
</tr>
<tr>
<td>Motion related extension units</td>
<td>Q1730PXF: up to 3 can be used</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC CPU</td>
<td>Equivalent to Q303DCPU (20k steps)</td>
</tr>
<tr>
<td>Control method</td>
<td>Stand-alone cyclic operation</td>
</tr>
<tr>
<td>Input/output control method</td>
<td>Refresh method</td>
</tr>
<tr>
<td>PLC control language (language dedicated to PLC control)</td>
<td>Relay chart language (diagram), Logix systolic language (vlt), MELSOFT (SFC), MEL-PLC, Structured text (ST)</td>
</tr>
<tr>
<td>Processing speed -- sequence instructions</td>
<td>16 instruction 0.02 µs, 50 instruction 0.025 µs, 100 instruction 0.05 µs, 200 instruction 0.1 µs</td>
</tr>
<tr>
<td>Total instructions</td>
<td>16k</td>
</tr>
<tr>
<td>Read number -- floating-point -- operation instruction</td>
<td>Possible</td>
</tr>
<tr>
<td>Character string processing instruction</td>
<td>Possible</td>
</tr>
<tr>
<td>PID instruction</td>
<td>Possible</td>
</tr>
<tr>
<td>Special function instruction -- trignometric, square root, exponential operation, etc.</td>
<td>Possible</td>
</tr>
<tr>
<td>Constant scanning</td>
<td>0.5 to 2000 ms -- set in 0.5 ms units</td>
</tr>
<tr>
<td>Program capacity</td>
<td>256 steps (16k bytes)</td>
</tr>
<tr>
<td>Shared CPU memory</td>
<td>8k bytes</td>
</tr>
<tr>
<td>High-speed CPU-to-CPU communication</td>
<td>32k bytes</td>
</tr>
<tr>
<td>Input output device points (X/Y)</td>
<td>8192 points</td>
</tr>
<tr>
<td>Input output pulses (X/Y)</td>
<td>512 points</td>
</tr>
</tbody>
</table>

---

*1: Up to 320 input/output unit points can be used per unit point (5 units).
System configuration

### Motion-specific units

<table>
<thead>
<tr>
<th>Product</th>
<th>Model</th>
<th>Description</th>
<th>Applicable version standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion controller</td>
<td>Q170MCPU</td>
<td>Integrated with power supply, PLC CPU, and motion CPU</td>
<td>CE, UL</td>
</tr>
<tr>
<td></td>
<td>Q170DEMCBL5M</td>
<td>Control of up to 16 axes, operation of 0.44 m/s or more, built-in interface for INC synchronous encoder</td>
<td></td>
</tr>
<tr>
<td>Emergency stop input cable *1</td>
<td></td>
<td>2-channel, general input signal detection input signal: 4 points, general signal output: 2 points</td>
<td></td>
</tr>
<tr>
<td>Connector for emergency stop input cable *1</td>
<td></td>
<td>Connector for emergency stop input cable provided with Q170MCPU</td>
<td></td>
</tr>
<tr>
<td>System configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimension drawings</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Devices used in common with MELSEC Q Series PLC

<table>
<thead>
<tr>
<th>Product</th>
<th>Model</th>
<th>Description</th>
<th>Applicable version standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansion base unit</td>
<td>Q52B</td>
<td>24 VDC power supply connector provided with Q170MCPU</td>
<td></td>
</tr>
<tr>
<td>Expansion cable</td>
<td>Q5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion cable</td>
<td>Q52B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Software

#### Motion OS software

- For transfer and assembly (SW100): SWWINC-SV100G
- For automatic equipment (SW02): SWWINC-SV200G

#### Engineering environment

- Motion controller engineering environment MELSOFT MT Works2 SWWINC-MTK2-E Version 1.00 or later
- Additional license: SWWINC-MTK2-EAZ

### Product

<table>
<thead>
<tr>
<th>Product</th>
<th>Model</th>
<th>Description</th>
<th>Applicable version standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC programming software</td>
<td>SW2DOC-GPPW-E</td>
<td>Version 8.70E and after</td>
<td></td>
</tr>
<tr>
<td>MR Configurator</td>
<td>MRZAX3-SETUP021E</td>
<td>Version C2 and after</td>
<td></td>
</tr>
</tbody>
</table>
GLOBAL FA CENTERS

1. Period and scope of warrantee

Should a defect or a failure (hereafter referred to as "failure") occur with the Product due to a reason or a cause attributable to Mitsubishi Electric Corporation (the Manufacturer), the Manufacturer will repair the Product free of charge through its local dealer or supplier.

Should Manufacturer's service engineer need to travel to the site for repair within Japan or overseas, however, the Purchaser shall bear the actual travel expenses. The scope of warrantee shall not cover any readjustment or test operation at the site in relation to replacing the failed Product.

(2) Warranty period

The Manufacturer warrants the Product against a defect or a failure of the Product attributable to the Manufacturer for 36 months from the date of purchase or the date of Product delivery at the purchaser designated site.

Assuming the maximum logistics and/or retail period of six months after shipping the Product from the Manufacturer, the warrantee period shall not exceed 42 months. The warrantee period of the repaired Product shall not be extended beyond the warranty period of the Product before repair.

(3) Scope of warrantee

The Manufacturer or Manufacturer's service representative or agent may perform the primary failure diagnosis for the Purchaser on a separate contract basis if so requested. However, the primary failure diagnosis shall be free of charge should the defect or failure so revealed be attributable to the Manufacturer.

(2) The Manufacturer warrants the Product only if the Product is used correctly and properly under the normal operating conditions and environment in accordance with the conditions, precautions and instructions specified in such means as the operation manual, user’s manual and caution labels affixed to the Product.

3. Repair services outside Japan

(a) The Manufacturer does not provide any parts or spare parts for the Product after the cease of production.

(b) The Manufacturer’s Motion Controllers are for general purposes and designed and manufactured for use in general industry. The Motion Controllers therefore shall not be used for any purposes or applications such as a nuclear power plant or other power plant or the like in which a failure may greatly affect the public interest, any purposes or applications such as for railway companies or public offices where a special quality assurance system is required.

(c) The Motion Controllers shall not be used for any purposes or applications such as a missile power plant or other power plant or the like in which a failure may greatly affect the public interest, any purposes or applications such as for railway companies or public offices where a special quality assurance system is required.

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