C Controller Consolidated Catalog

Highly customizable open platform
C Controller
Open platform controller utilized for production site innovation edge computing

The C Controller and C Intelligent function modules are open platform controllers that can execute C/C++ programs, based on the MELSEC system architecture, and utilize long-term stable supply, high availability, advanced functionality, and flexible features.

High-speed complex processing that is not possible with a ladder program is realized while carrying out MELSEC Series module management and I/O control in C/C++ programs.

Data collected on the shop floor such as control, inspection, monitoring, conveyance, assembly, and communication gateway are primary processed and analyzed to diagnose in real-time. This makes it possible to detect the actual fault occurring at an early stage, thereby enabling prompt troubleshooting, contributing to quality improvements and enhanced productivity.

Various control systems can be configured by combining the C Controller with MELSEC iQ-R/Q Series modules, 3rd party products, open source applications, and customer’s program assets.
Selection points
Select the devices most suitable for your system configuration from the lineup.

VxWorks® version OS

- R12CCPU-V

Linux® version OS

- Q24DHCCPU-V
- Q24DHCCPU-LS

MPU performance

- RD55UP08-V

I/O control

- Q12CCPU-V

Information processing

- Q24DHCCPU-LS

Resolve common drawbacks associated with embedded and industrial computers

■ Embedded and industrial computers

- Discontinued production of board & chips
- Limited developers
- Escalating maintenance costs due to failures
- Large physical space required
- Construction of an environment with network-connected external devices required

Old Platform

- Disrupted product supply due to discontinued production

New Platform

- Highly reliable, long-term stable supply
- Utilization of C/C++ programs
- Significantly reduces maintenance costs
- Reduced equipment size
- Simple construction of a seamless environment with network-connected external devices

- Stable product supply
- Lower maintenance and management costs allow resources to be focused on development

*1 Lineo uLinux ELITE embedded Linux® development environment (Lineo Solutions, Inc. product) is separately required.
Easier to configure various control systems  
Innovative open platform, C Controller

Highly customizable solution enables the integration of partner products, open source applications, and OS-independent capabilities onto a generic open platform. For detailed information about applications, please refer to “iQ Platform C Controller Applications L(NA)08501ENG”.

**Semiconductor manufacturing equipment**

Semiconductor bonding machine can be migrated from computer or microcomputer based system to MELSEC platform system, enabling utilization of existing control programs by the C Controller.

**Injection molding**

High-performance control is realized with the C Controller. Comparing to the prescribed injection patterns, the screw movement amount can be calculated at high speed.

**Semiconductor manufacturing system**

A system realizing SECS communications between a semiconductor manufacturing equipment and the MES server can be constructed using a dedicated software.

**Expressway monitoring and analysis**

Monitors and analyzes expressway vibration and vehicle exhaust gases. With its robust feature, the C Controller can continuously and stably operate in harsh environments.

**Conveyor**

Effective conveyor management and conveyor control utilizing multiple modular feature. Installing in a panel near the conveyor can save space.

**Automated warehouse**

The C Controller can be connected with multiple automated warehouse controllers. Long-term stable supply and robust operation are ensured.
Inspection machine

Replacing a computer with the C Controller and GOT (HMI) increases durability and eliminates computer replacement costs.

Bearing deterioration diagnosis

Bearing deterioration status can be diagnosed. High-speed data analysis processing such as FFT calculations can be realized.

Production data collection

Using “data collection software” realizes management, analysis, and utilization of production site data, assisting in optimization of manufacturing systems with e-F@ctory.

Solar power measurement and display

The C Controller can be used for solar panel measurement unit. Power generation status is measured and displayed on a monitoring screen, etc.

Assembly process data collection

Using the C Controller for communications in the assembly processing system enables smooth coordination with the IT system.
<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>C Controller (standard model) R12CCPU-V</th>
<th>C Intelligent function module RD55UP06-V</th>
<th>C Controller (standard model) Q12DCCPU-V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>Endian format</td>
<td>Little endian</td>
<td>Little endian</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MPU</td>
<td>ARM® Cortex-A9 Dual Core</td>
<td>SH-4A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Working RAM</td>
<td>256 MB</td>
<td>128 MB</td>
<td>128 MB</td>
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<tr>
<td></td>
<td>Standard ROM</td>
<td>16 MB</td>
<td>12 MB</td>
<td>12 MB*1</td>
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<tr>
<td></td>
<td>Built-in SSD</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Backup RAM</td>
<td>4 MB</td>
<td>-</td>
<td>512 MB**</td>
</tr>
<tr>
<td>Software</td>
<td>OS</td>
<td>VxWorks® 6.9** (installed by default)</td>
<td>VxWorks® 6.4** (installed by default)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Programming language</td>
<td>C language (C/C++)</td>
<td>C language (C/C++)</td>
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<tr>
<td></td>
<td>Programming development environment</td>
<td>CW Workbench (SW1DND-CWWR-E/EZ/EVZ)/Wind River® Workbench 3.3***</td>
<td>CW Workbench (SW1DND-CWWRQ12-E/EZ/EVZ)/Wind River® Workbench 2.6.1****</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting/monitoring tool</td>
<td>CW Configurator (SW1DND-RCCPU-E)</td>
<td>GX Works3® (SW1DND-GXW3-E)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication interface</td>
<td>Ethernet**1</td>
<td>2CH (10BASE-T/100BASE-TX/1000BASE-T)</td>
<td>1CH (10BASE-T/100BASE-T)</td>
</tr>
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<td></td>
<td></td>
<td>Memory card</td>
<td>SD memory card (1 slot)</td>
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<td></td>
<td></td>
<td>Display interface</td>
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<td>-</td>
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<tr>
<td></td>
<td>Multiple CPU function</td>
<td>Motion CPU control instruction</td>
<td>-</td>
<td>-</td>
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<td></td>
<td></td>
<td>Interrupt issue to Motion CPU</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>Data communications using CPU shared memory</td>
<td>-</td>
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<td></td>
<td></td>
<td>Synchronous event notification</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>Data communications using multiple CPU high speed transmission area</td>
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<tr>
<td></td>
<td>HMI access function</td>
<td>Connection with device function</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>Monitoring and control function</td>
<td>-</td>
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<td></td>
<td></td>
<td>Self-diagnostic function</td>
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<tr>
<td></td>
<td>Hardware self-diagnostic function</td>
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<td></td>
<td>Cyclical functions feature</td>
<td>Dedicated library function</td>
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<td>Separate complex processing from programmable controller</td>
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<td>Data sampling in each sequence scan</td>
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<tr>
<td></td>
<td></td>
<td>Data analysis library</td>
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<td>SLMP communication</td>
<td>-</td>
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<td></td>
<td></td>
<td>Dot-matrix/7-segment LED display</td>
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<td>MRAM</td>
<td>-</td>
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<td></td>
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<td>Access level hierarchy setting</td>
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<td>Service setting</td>
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<td>Interrupt process function</td>
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<tr>
<td></td>
<td></td>
<td>Dual core</td>
<td>-</td>
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</table>

**1 Specifications when using the extended mode. Extended mode is available with the product with first five serial number digits 15102 or later.
**2 128 KB for products with first five serial number digits 12041 or before, 512 KB to 3.584 KB for products with first five serial number digits 15102 or later.
**3 VxWorks® 6.9, VxWorks® 6.8.1, VxWorks® 6.4, Wind River® Workbench 3.3, Wind River® Workbench 2.6.1 are products of Wind River Systems, Inc. Refer to the Wind River Systems, Inc. product manuals for the service and specifications. Refer to the following web site for contact information of Wind River Systems, Inc.
http://www.windriver.com
**4 Must be separately purchased from Lineo Solutions, Inc.
### MELSEC-Q Series

<table>
<thead>
<tr>
<th>C Controller (high-end model)</th>
<th>C Controller (high-end model)</th>
<th>C Controller (no OS pre-installed model)</th>
<th>C Controller (no OS pre-installed model with expanded memory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q24DHCCPU-V</td>
<td>Q24DHCCPU-VG</td>
<td>Q24DHCCPU-LS</td>
<td>Q26DHCCPU-LS</td>
</tr>
</tbody>
</table>

**Little endian**

<table>
<thead>
<tr>
<th>User CPU: Intel® ATOM™</th>
<th>User CPU: Intel® ATOM™</th>
</tr>
</thead>
<tbody>
<tr>
<td>System CPU: SH-4A</td>
<td>System CPU: SH-4A</td>
</tr>
<tr>
<td>512 MB</td>
<td>1 GB</td>
</tr>
</tbody>
</table>

| 382 MB                  | 512 MB (including OS)   |
| Max. 5 MB (total 5 MB with standard RAM) | 8 GB (including OS) |
| 5 MB                    |                         |

**VxWorks® 6.8.1** (installed by default)

<table>
<thead>
<tr>
<th>C language (C/C++)</th>
<th>C language (C/C++)</th>
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<tbody>
<tr>
<td>VxWorks®</td>
<td>Lineo uLinux®</td>
</tr>
<tr>
<td>C language (C/C++)</td>
<td>Lineo uLinux®</td>
</tr>
<tr>
<td>Workbench 3</td>
<td>Workbench 3.2</td>
</tr>
<tr>
<td>Wind River® Workbench 3.2</td>
<td>Wind River® Workbench 3.2</td>
</tr>
</tbody>
</table>

**SW4PVC-CCPU-E**

- User Ethernet port: 2CH (10BASE-T/100BASE-TX/1000BASE-T)
  - System Ethernet port: 1CH (10BASE-T/100BASE-TX)
  - SD memory card (1 slot)

- Analog RGB D-Sub15pin

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- System CPU: SH-4A
- **ATOM**

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<tr>
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<tr>
<td>System CPU: SH-4A</td>
<td>Lineo uLinux®</td>
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- **ATOM**

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<tr>
<td>System CPU: SH-4A</td>
<td>Lineo uLinux®</td>
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- **ATOM**

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<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>System CPU: SH-4A</td>
<td>Lineo uLinux® ELITE®</td>
</tr>
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</tbody>
</table>

- **ATOM**

**Notes:**

- Type 1 cards are supported. A TYPE 2 card cannot be used. I/O cards such as modem cards cannot be used.
- Please refer to the relevant manufacturer for details on the number of connectable stages when using a switching hub.
- If Lineo uLinux is used, the program is integrated within the GX Works3 engineering software.
- When Lineo uLinux is used, the program is integrated within the GX Works3 engineering software.

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<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>[Image -604x748 to 604x870]</td>
<td>[Image -604x748 to 604x870]</td>
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<table>
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<tr>
<th>1.</th>
<th>2.</th>
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<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
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*1. When Lineo uLinux is used, the program is integrated within the GX Works3 engineering software.
*2. Setting and monitoring of the module is integrated within the GX Works3 engineering software.
*3. Please refer to the relevant manufacturer for details on the number of connectable stages when using a switching hub.
*4. TYPE 1 cards are supported. A TYPE 2 card cannot be used. I/O cards such as modem cards cannot be used.
Features

Productivity

Easily access to MELSEC platform hardware using dedicated functions

Applications handling programmable controller modules such as accessing to the C Controller, I/O modules, intelligent function modules, network modules, programmable controller CPUs, and motion CPUs can be created using dedicated functions. Four functions “CCPU/CITL function”, “QBF function”, “QBF function for ISR (interrupt Service Routine)”, and “MD function” are available.

→Dedicated library function

Complex processing realized in C/C++

The C intelligent function module realizes data processing and numerical analysis processing which are difficult in ladder form. For example, while the standard programmable controller CPU module performs basic control, the C intelligent function module executes complex arithmetic equations. Reduction in the programmable controller CPU load as well as high-speed arithmetic processing are realized.

→Complex processing realized in C/C++

Collect specified device data in real-time

Previously specified device data can be transferred to the C intelligent function module at END processing of every program scan in the programmable controller CPU. Stored data in the temporary area can be retrieved with a dedicated function of the C intelligent function module, then transferred to the user secured memory. The data can be saved in a SD card or transferred to the upper level server at any time.

→Data sampling in each sequence scan
High-speed arithmetic utilizing function library

Complex arithmetic which is difficult in ladder form such as FFT arithmetic*1 and digital filter arithmetic used for vibration analysis are available as function library. Utilizing this data analysis library easily realizes data analysis/judgment processing. Both modules enable high-speed arithmetic as compared with the programmable controller CPU.

→Data analysis library

*1. Fast Fourier Transform: A high-speed processing for converting time-based data into frequency-based data to calculate frequency components in the collected data

Seamless connectivity

Easily connect peripheral devices

SLMP (MC protocol) communication protocol for programmable controllers is supported, accessing devices via Ethernet port is possible. External devices (such as computer, HMI) can communicate with the communication target (C Controller or programmable controller CPU) in the same communication method. In addition, the R12CCPU-V also supports CC-Link IE Field Network Basic. This network realizes cyclic communication with software implementation only, allowing a wide range of peripheral devices to be easily connected.

→SLMP communication function
Easier maintenance

Easily view the system status with the embedded LED display

Debugging, checking of device operating status, and primary diagnostics at an error can be easily done by checking the LED display without a computer. Dot-matrix LED (supported by R12CCPU-V, Q24DHCCPU-V/VG, Q24DHCCPU-LS, Q26DHCCPU-LS) can display alphabets and symbols.

→ Dot-matrix/7-segment LED display

Easier maintenance without battery replacement

Equipped with an MRAM (Magneto-resistive Random Access Memory), battery replacement is unnecessary. Issues related to battery replacement such as recording of replacement date, maintenance scheduling, and checking ERR LED which indicates battery voltage drop can be eliminated.

→ MRAM

Robust security

Prevent unauthorized access by access level hierarchy and lock out setting

Login user setting and account lockout** setting when accessing via the C Controller software, FTP, and Telnet can be made. Unauthorized access can be prevented by having different access levels (administrator, field operator, etc.) corresponding to accessible functions (read, write, execute).

→ Access level hierarchy setting

*1 Setting to limit the number of account verification errors occurs in succession. If the account verification successively fails more than the set number of times, the verification will be denied (locked out) for a set time.
Further increase security by disabling various connection services

Services for the C Controller can be individually set. To increase security, the following service status can be enabled/disabled in the C Controller setting and monitor tool parameter settings.

→Service setting function

Real-time

Polling processing is unnecessary

The C Controller supports event-driven programs, just like its counterpart personal/microcomputers do. The C Controller directly receives an interrupt command from the intelligent function module on the same base, minimizing polling process and accelerating the response speed, while reducing the load on CPU.

→Interrupt processing function

Simultaneously execute two tasks allowing load distribution

Dual core CPU enables to execute two tasks simultaneously. In addition, an interrupt service routine and a task can be executed simultaneously, realizing load distribution of CPU.

→Dual core
CW Workbench supports all of the basic functionality such as a code editor, compiler, debugger, and simulator. When CW-Sim license is purchased, VxWorks® simulation is possible without the C Controller.

CW Workbench has all of the basic functionality such as a code editor, compiler, debugger, and simulator. When CW-Sim license is purchased, VxWorks® simulation is possible without the C Controller.

Reduced installation costs and easier application development
Development environment for embedded system, which is usually expensive, is now easily realized using this tool. CW Workbench has all of the basic functionality such as a code editor, compiler, debugger, and simulator supporting user application development.

Support for multiple languages using plug-in
Based on the Eclipse platform, CW Workbench supports multiple languages and its functionality can be expanded using third-party plug-ins such as source code management.

Simulation without the C Controller
CW-Sim/CW-Sim Standalone enables VxWorks® simulation without the C Controller, allowing to improve program quality and equipment safety before actually operating the equipment. It is useful for debugging of the system configured with multiple C Controllers and providing training.
C Controller setting/monitor tool
• SW4PVC-CCPU-E, SW3PVC-CCPU-E

CW Configurator
• SW1DND-RCCPU-E

Parameter settings without programs

The C Controller system as well as parameters*1 of network modules such as CC-Link IE Field Network*, CC-Link IE Control Network and CC-Link and intelligent function modules managed by the C Controller can be setup without programs.

*1. SW3PVC-CCPU do not support configuration of intelligent function module parameters.
*2. SW3PVC-CCPU do not support configuration of CC-Link IE Field Network parameters.

Diagnostics without programs

Troubleshooting is easy as errors occurred in the C Controller and historical events within the user application can be checked and also cable disconnection and network status can be detected by network diagnostics*3.

*3. SW3PVC-CCPU do not support diagnostics of the CC-Link IE Field Network.

SECS/GEM Communication Simulator
• SW1DNC-SECSSIM-E

Checking CIM host online function before implementing equipment

SECS/GEM communication simulator is Windows® application software enabling simulations of semiconductor communication standard SECS communication. Utilizing either as a host or equipment simulator and for debugging check and on-site testing, necessary works for enabling SECS/GEM communication can be smoothly done, reducing overall development cost.
Wind River® Workbench

Incorporate advanced runtime analysis tools

In addition to basic functions for program editing, compiling, and source code debugging, Wind River® Workbench incorporates advanced run-time analysis tools. When detailed analysis are required, various tools are available for revealing the complex interactions of tasks and interrupts, realizing a far more specified way of analyzing and debugging the application.

Lineo uLinux ELITE

Linux® system development

ELITE is a GUI based development framework consisting of a Linux® kernel, package and tool chain offered as a basic software configuration. This tool is used together with the C Controller compatible “Board Support Package”. By using ELITE, a Linux® based system perfect for the C Controller can be created, whilst enabling editing of source code and debugging. Also, access to the developer’s site exclusive for the C Controller further increases the high-security Linux® based controller’s product life cycle.
**Data Collection Software**

Shop floor data management/analysis/utilization supports optimization of manufacturing

- Data mining is realized at a low cost
- Automatic data collection without programs
- Support various analysis tools necessary for data mining

**SECS/GEM Communication Software**

Realizes SECS/GEM communication with the upper-level server without a computer and programs

- Various data communications are realized without programs
- Reduction of installation and running costs
- SECS based communication interfaces can be implemented easily throughout the factory
Pre-installed products

**GENWARE® 3-VG**

Visual programming style realizes simple and speedy GUI development

- A wide range of user interfaces support GUI development
- Automatic generation of C/C++ program using GUI Development Tool (CI SKETCH)

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**uLinux Station+**

**uLinux Station**

Utilizing the existing Linux® development assets, a computer on the shop floor can be easily replaced with the C Controller

- Using web browser on a computer, start/stop of basic Linux® services and system log check and such can be easily done
- Reports can be displayed or printed directly with the C Controller instead of a computer (uLinux Station+)
MATLAB®/Simulink®

Automatic C/C++ program generation directly from MATLAB®/Simulink®

By using MATLAB®/Simulink®, applications can be developed using high-level language for numerical computation, such as linear algebra, statistics, and Fourier analysis, together with visualization based product development. Simulation and model-based design can be achieved to root out problems and errors at the design stage before commissioning. Overall, a far more efficient C/C++ program can be automatically generated reducing the possibility of human induced errors being introduced.

MathWorks
https://mathworks.com

Vmech®

Development using virtual mechanical models without actual devices

By utilizing 3D-CAD data, a virtual manufacturing line with machines (digital mock-up) can be created and machine performance can be simulated. Software debugging is possible while the product is still in design, enabling front-loading of machine performance verification, thus realizing a shorter development schedule.

In addition, faulty performance verification which is difficult with actual devices can be virtually done helping to improve software quality.

Lattice Technology Co., Ltd.
https://www.lattice3d.com
## General specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series name</td>
<td>MELSEC-Q Series</td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>0…55°C (when a base unit other than an extended temperature range base unit is used)</td>
</tr>
<tr>
<td>Storage ambient temperature</td>
<td>–25…75°C</td>
</tr>
<tr>
<td>Operating ambient humidity</td>
<td>5…95%RH, non-condensing</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>10 times each in X, Y, Z directions</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>Compliant with JIS B 3502 and IEC 61131-2 (147 m/s², 3 times each in directions X, Y, Z)</td>
</tr>
<tr>
<td>Operating atmosphere</td>
<td>No corrosive gases®, no flammable gases, no excessive conductive dust</td>
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<tr>
<td>Operating altitude</td>
<td>0…2000 m**</td>
</tr>
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<td>Inside a control panel</td>
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<td>Overvoltage category**</td>
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<tr>
<td>Pollution degree**</td>
<td>≤</td>
</tr>
<tr>
<td>Equipment class</td>
<td>Class 1</td>
</tr>
</tbody>
</table>

*1. When inserting a commercially available SD memory card or CompactFlash card into the C Controller, follow the lower specifications of the C Controller or the SD memory card/CompactFlash card.

*2. Enables standard MELSEC-Q-R Series modules to support extended operating ambient temperature to 0 to 60°C, ensuring the same performance as the standard operating ambient temperature (0 to 55°C). When requiring to use in an ambient temperature environment higher than 60°C, please consult your local Mitsubishi Electric representative.

*3. The special coated product, which meets the regulation (JIS C 60721-3-3/IEC 60721-3-3C2) related to corrosive gas, is available for the use in a corrosive gas environment. No special coated product is available for Q24DHCPU-V, Q24DHCPU-VG, Q24DHCPU-LS, or Q26DHCPU-LS.

*4. Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0 m. Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi Electric representative.

*5. When used at an altitude higher than 2000 m, the upper limits of the permissible voltage and the operating ambient temperature become lower. Please consult your local Mitsubishi Electric representative.

*6. Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0 m. Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi Electric representative.

*7. This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A representative. This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

## Product List

<table>
<thead>
<tr>
<th>Product</th>
<th>Model</th>
<th>Outing</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Controller CPU</td>
<td>R12CCPU-V</td>
<td>No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: VxWorks® Version 6.9 Work RAM: 256 MB</td>
</tr>
<tr>
<td></td>
<td>Q12DCCPU-V</td>
<td>No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: VxWorks® Version 6.4 Work RAM: 128 MB</td>
</tr>
<tr>
<td></td>
<td>Q24DHCPU-V</td>
<td>No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: VxWorks® Version 6.8.1 Work RAM: 512 MB</td>
</tr>
<tr>
<td></td>
<td>Q24DCPU-VG</td>
<td>No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: VxWorks® Version 6.8.1 Work RAM: 512 MB</td>
</tr>
<tr>
<td></td>
<td>Q24DHCPU-LS</td>
<td>No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: No pre-installed operating system (Operating system installed by user) Work RAM: 512 MB</td>
</tr>
<tr>
<td></td>
<td>Q26DHCPU-LS</td>
<td>No. of I/O points: 4096 points, endian format: little endian, removable storage: SD memory card, OS: No pre-installed operating system (Operating system installed by user) Work RAM: 1 GB</td>
</tr>
<tr>
<td>C intelligent function module</td>
<td>RD55UP06-V</td>
<td>No. of I/O points: 32 points, endian format: little endian, removable storage: SD memory card, OS: VxWorks® Version 6.9 Work RAM: 128 MB</td>
</tr>
</tbody>
</table>

| Pre-installed model | RD55UP06-V-BZ10 | SECS/GEM communication software for NON-GEM |
| | RD55UP06-V-BZ12 | SECS/GEM communication software for GEM |
| | Q12DCPU-V-BZ14 | SECS/GEM communication software for GEM ADVANCED |
| | Q12DCPU-V-BZ14 | SECS/GEM communication software for GEM ADVANCED |
| | SW10DC-SECSIM-E | SECS/GEM communication simulator |
| | R12CCPU-V-BZ18 | Data collection software |
| | Q12DCPU-V-BZ18 | Data collection software Light |
| | Q12DCPU-V-BZ1A | Data collection software Light |
| | Q24DHCPU-VG-8000® | GENWARE®3-VG Runtime License Version |
| | Q24DHCPU-VG-8001® | GENWARE®3-VG Tool License Version |

*8. A separate maintenance contract is required for assistance with software questions.
### Option List

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232 connection converter cable (custom mini-DIN to 9-pin D-sub connector)</td>
<td>Q12DCCPU-CBL**/<strong>/</strong></td>
<td></td>
</tr>
<tr>
<td>Replacement battery</td>
<td>Q6BAT**/<strong>/</strong>/**</td>
<td></td>
</tr>
<tr>
<td>Replacement large-capacity battery</td>
<td>Q7BAT**/<strong>/</strong>/**</td>
<td></td>
</tr>
<tr>
<td>Large-capacity battery with holder for mounting CPU</td>
<td>Q7BAT-SC**/<strong>/</strong>/**</td>
<td></td>
</tr>
<tr>
<td>SD memory card, capacity: 2 GB</td>
<td>NZ1MEM-2GBSD**/<strong>/</strong>/**</td>
<td></td>
</tr>
<tr>
<td>SD memory card, capacity: 4 GB</td>
<td>NZ1MEM-4GBSD**/<strong>/</strong>/**</td>
<td></td>
</tr>
<tr>
<td>SD memory card, capacity: 8 GB</td>
<td>NZ1MEM-8GBSD**/<strong>/</strong>/**</td>
<td></td>
</tr>
<tr>
<td>SD memory card, capacity: 16 GB</td>
<td>NZ1MEM-16GBSD**/<strong>/</strong>/**</td>
<td></td>
</tr>
<tr>
<td>CompactFlash card, capacity: 512 MB</td>
<td>QD81MEM-512MBBC**</td>
<td></td>
</tr>
<tr>
<td>CompactFlash card, capacity: 1 GB</td>
<td>QD81MEM-1GBBC**</td>
<td></td>
</tr>
<tr>
<td>CompactFlash card, capacity: 2 GB</td>
<td>QD81MEM-2GBBC**</td>
<td></td>
</tr>
<tr>
<td>CompactFlash card, capacity: 4 GB</td>
<td>QD81MEM-4GBBC**</td>
<td></td>
</tr>
<tr>
<td>CompactFlash card, capacity: 8 GB</td>
<td>QD81MEM-8GBBC**</td>
<td></td>
</tr>
</tbody>
</table>

*1. For use with Q24DHCCPU-V/-VG.
*2. For use with Q24DHCCPU-LS and Q26DHCCPU-LS.
*3. For use with Q12DCCPU-V.
*4. For use with R12CCPU-V.
*5. For use with RD55UP06-V.

### Engineering tool for C Controller module

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>C Controller/C intelligent function module engineering tool software package, product with license for R12CCPU-V, RD55UP06-V</td>
<td>SW1DND-CWWR-E</td>
<td></td>
</tr>
<tr>
<td>Additional license product for R12CCPU-V, RD55UP06-V</td>
<td>SW1DND-CWWR-EZ</td>
<td></td>
</tr>
<tr>
<td>Update license product for Q24DHCCPU-V/-VG</td>
<td>SW1DND-CWWR-EVZ</td>
<td></td>
</tr>
<tr>
<td>C Controller engineering tool software package, product with license for Q24DHCCPU-V/-VG</td>
<td>SW1DND-CWWRQ24-E</td>
<td></td>
</tr>
<tr>
<td>Update license product for Q24DHCCPU-V/-VG</td>
<td>SW1DND-CWWRQ24-EVZ</td>
<td></td>
</tr>
<tr>
<td>C Controller engineering tool software package, product with license for Q12DCCPU-V</td>
<td>SW1DND-CWWRQ12-E</td>
<td></td>
</tr>
<tr>
<td>Additional license product for Q12DCCPU-V</td>
<td>SW1DND-CWWRQ12-EZ</td>
<td></td>
</tr>
<tr>
<td>Update license product for Q12DCCPU-V</td>
<td>SW1DND-CWWRQ12-EVZ</td>
<td></td>
</tr>
<tr>
<td>VxWorks® simulator for CW Workbench, additional license product for R12CCPU-V, RD55UP06-V</td>
<td>SW1DNC-CWSIMR-E</td>
<td></td>
</tr>
<tr>
<td>VxWorks® simulator for CW Workbench, standalone product for R12CCPU-V, RD55UP06-V</td>
<td>SW1DNC-CWSIMR-EZ</td>
<td></td>
</tr>
<tr>
<td>VxWorks® simulator for CW Workbench, license product for Q12DCCPU-V, Q24DHCCPU-V/-VG</td>
<td>SW1DNC-CWSIMQ12-E</td>
<td></td>
</tr>
<tr>
<td>VxWorks® simulator for CW Workbench, additional license product for Q12DCCPU-V, Q24DHCCPU-V/-VG</td>
<td>SW1DNC-CWSIMQ12-EZ</td>
<td></td>
</tr>
<tr>
<td>VxWorks® simulator for CW Workbench, standalone product for Q12DCCPU-V, Q24DHCCPU-V/-VG</td>
<td>SW1DNC-CWSIMQ12-EVZ</td>
<td></td>
</tr>
</tbody>
</table>

*6. CW Workbench is available as a one-month trial version. For more information, please contact your local Mitsubishi Electric office or sales representative.

### Setting/monitoring tools for C Controller module

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting/monitoring tool for C Controller</td>
<td>SW1DND-RCCPU-E</td>
<td></td>
</tr>
<tr>
<td>A tool for setting/monitoring C Controller module, CC-Link, MELSECNET/H, CC-Link IE Controller network, CC-Link IE Controller network</td>
<td>SW4PVC-CCPU-E</td>
<td></td>
</tr>
<tr>
<td>A tool for setting/monitoring C Controller module, CC-Link, MELSECNET/H, CC-Link IE Controller network</td>
<td>SW3PVC-CCPU-E</td>
<td></td>
</tr>
</tbody>
</table>

### Software selection

<table>
<thead>
<tr>
<th>Module</th>
<th>Programming development environment</th>
<th>Setting/monitoring tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>R12CCPU-V</td>
<td>CW Workbench (SW1DND-CWWR-E/EZ/EVZ)</td>
<td>CW Configurator (SW1DND-RCCPU-E)</td>
</tr>
<tr>
<td>RD55UP06-V</td>
<td>Wind River® Workbench 3.3</td>
<td>Gx Works3 (SW1DND-GXW3-E)</td>
</tr>
<tr>
<td>Q12DCCPU-V</td>
<td>CW Workbench (SW1DND-CWWRQ12-E/EZ/EVZ)</td>
<td>Basic mode: SW3PVC-CCPU-E</td>
</tr>
<tr>
<td>Q24DHCCPU-V</td>
<td>Extended mode: SW4PVC-CCPU-E</td>
<td>SW4PVC-CCPU-E</td>
</tr>
<tr>
<td>Q24DHCCPU-VG</td>
<td>Wind River® Workbench 3.2</td>
<td>SW4PVC-CCPU-E</td>
</tr>
<tr>
<td>Q24DHCCPU-LS</td>
<td>Lineo uLinux ELITE</td>
<td>SW4PVC-CCPU-E</td>
</tr>
<tr>
<td>Q26DHCCPU-LS</td>
<td></td>
<td>SW4PVC-CCPU-E</td>
</tr>
</tbody>
</table>
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Support

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  • Library of downloadable literature
  • Support tools such as online e-learning courses, terminology dictionary, etc.
  • Global sales and service network portal
  • Latest news related to Mitsubishi Electric factory automation

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  These courses are designed to provide education at all levels. Various different features are explained with application examples providing an easy and informative resource for in-house company training.

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- Key features include
  - One-stop database containing all required manuals, with local file cache
  - Included with GX Works3 engineering software
  - Also available in tablet version
  - Easily download manuals all at once
  - Automatic update of manual versions
  - Search information across multiple manuals
  - Visual navigation from hardware diagram showing various specifications
  - Customizable by adding user notes and bookmarks
  - Directly port sample programs within manuals to GX Works3

- MITSUBISHI ELECTRIC FA e-Manual (tablet version)

The e-Manual application is available on iOS and Android™ tablets. e-Manual files are provided as in-app downloads.

<table>
<thead>
<tr>
<th>Supported versions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OS</strong></td>
</tr>
<tr>
<td>iOS</td>
</tr>
<tr>
<td>Android™</td>
</tr>
</tbody>
</table>

*1. When using a tablet not listed above, 7-inch (resolution of 1920 x 1200 dots (WUXGA)) or better is recommended.

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<table>
<thead>
<tr>
<th>OS</th>
<th>OS version</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>iOS</td>
<td>iOS 8.1 or later</td>
<td>Apple iPad 2, iPad (3rd generation), iPad (4th generation), iPad Air, iPad Air 2, iPad mini, iPad mini 2, iPad mini 3, iPad mini 4, iPad Pro (12.9 inch), iPad Pro (9.7 inch)</td>
</tr>
<tr>
<td>Android™</td>
<td>4.3/4.4/5.0</td>
<td>ASUS Nexus7™ (2013)*1</td>
</tr>
</tbody>
</table>

*1. When using a tablet not listed above, 7-inch (resolution of 1920 x 1200 dots (WUXGA)) or better is recommended.

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This publication explains the typical features and functions of the products herein and does not provide restrictions or other information related to usage and module combinations. Before using the products, always read the product user manuals. Mitsubishi Electric will not be held liable for damage caused by factors found not to be the cause of Mitsubishi Electric; opportunity loss or lost profits caused by faults in Mitsubishi Electric products; damage, secondary damage, or accident compensation, whether foreseeable or not, caused by special factors; damage to products other than Mitsubishi Electric products; or any other duties.

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- The products have been manufactured under strict quality control. However, when installing the products where major accidents or losses could occur if the products fail, install appropriate backup or fail-safe functions in the system.
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