## Motion CPUs for the iQ-R Platform

The R16MTCPU, R32MTCPU and R64MTCPU Motion CPUs for the iQ-R Platform provide industry-leading performance for the most demanding motion applications for the Food and Beverage, Packaging, Automotive, and Printing industries. These motion CPUs use standard I/O modules for incremental encoders and high speed inputs, so no special hardware options are required. Serial absolute synchronous encoders are connected through the MR-J4-B-RJ servo drive.

### System Configuration

![System Configuration Diagram](image)

### Motion CPU R64MTCPU/R32MTCPU/R16MTCPU Module Specifications

<table>
<thead>
<tr>
<th>Model Number</th>
<th>R64MTCPU</th>
<th>R32MTCPU</th>
<th>R16MTCPU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stocked Item</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Number of Control Axes</td>
<td>Up to 64 axes</td>
<td>Up to 32 axes</td>
<td>Up to 16 axes</td>
</tr>
<tr>
<td>SSCNET Communication (*1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication Type</td>
<td>SSCNETIII/H, SSCNETIII</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Lines</td>
<td>2 lines (*2)</td>
<td>1 line (*2)</td>
<td></td>
</tr>
<tr>
<td>Distance Between Stations (Maximum) m (ft)</td>
<td>100 (328.08)</td>
<td>50 (164.04)</td>
<td></td>
</tr>
<tr>
<td>Combined Cable Length (Maximum) m (ft)</td>
<td>1600 (5249.30)</td>
<td>800 (2624.70)</td>
<td></td>
</tr>
<tr>
<td>Number of SSCNETIII/H Head Module Connection Stations</td>
<td>Up to 8 stations (Up to 4 stations/line)</td>
<td>Up to 4 stations</td>
<td></td>
</tr>
<tr>
<td>Number of Optical Hub Unit Connections</td>
<td>Up to 32 units (Up to 16 units/line)</td>
<td>Up to 16 units</td>
<td></td>
</tr>
<tr>
<td>Data Transmission Speed</td>
<td>100Mbps/10Mbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERIPHERAL I/F (Ethernet)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication Mode</td>
<td>Full-duplex/Half-duplex (*3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission Method</td>
<td>Base band</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable Length (Maximum) m (ft)</td>
<td>30 (98.43)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory Card Slot</td>
<td>SD/SDHC memory card compatible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memory Capacity</td>
<td>Standard ROM 12MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD Memory Card</td>
<td>Memory card capacity (Up to 32B)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Stages of Extension Base</td>
<td>Up to 7 stages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Current Consumption SVDC (A)</td>
<td>1.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>0.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions mm (inch) (H x W x D)</td>
<td>106.0 x 27.8 x 110.0 (4.17 x 1.09 x 4.33)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

1. Servo amplifiers for SSCNET cannot be used.
2. SSCNETIII and SSCNETIII/H cannot be combined within the same line. For R64MTCPU/R32MTCPU, SSCNETIII and SSCNETIII/H can be set for each line.
3. For half-duplex transmission, response time may be longer depending on the external device. When connecting with an external device via a switching HUB, set to full-duplex transmission.
Motion CPU R64MTCPU/R32MTCPU/R16MTCPU Module Specifications (continued)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>R64MTCPU</th>
<th>R32MTCPU</th>
<th>R16MTCPU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Cycle (Default)</td>
<td>0.222ms/ 1 to 2 axes</td>
<td>0.222ms/ 1 to 2 axes</td>
<td>0.222ms/ 1 to 2 axes</td>
</tr>
<tr>
<td></td>
<td>0.444ms/ 3 to 8 axes</td>
<td>0.444ms/ 3 to 8 axes</td>
<td>0.444ms/ 3 to 8 axes</td>
</tr>
<tr>
<td></td>
<td>0.888ms/ 9 to 20 axes</td>
<td>0.888ms/ 9 to 20 axes</td>
<td>0.888ms/ 9 to 16 axes</td>
</tr>
<tr>
<td></td>
<td>1.777ms/21 to 34 axes</td>
<td>1.777ms/21 to 32 axes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.555ms/39 to 64 axes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interpolation Functions
- Linear interpolation (Up to 4 axes), Circular interpolation (2 axes), Helical interpolation (3 axes)

Control Modes
- PTP (Point to Point) control, Speed control, Speed-position switching control, Fixed-pitch feed, Continuous trajectory control, Position follow-up control, Speed control with fixed position stop, High-speed oscillation control, Speed-torque control, Pressure control (*1), Advanced synchronous control, Machine control

Acceleration/Deceleration Control
- Trapezoidal acceleration/deceleration, S-curve acceleration/deceleration, Advanced S-curve acceleration/deceleration

Compensation
- Backlash compensation, Electronic gear, Phase compensation

Programming Language
- Motion SFC, Dedicated instruction

Servo Program Capacity
- 32k steps

Number of Positioning Points
- 6400 points (Positioning data can be designated indirectly)

Peripheral I/F
- PERIPHERAL I/F

Home Position Return Function
- Proximity dog method (2 types), Count method (3 types), Data set method (2 types), Dog cradle method, Stopper method (2 types), Limit switch combined method, Scale home position signal detection method, Dogless home position signal reference method, Driver home position return method. Home position return re-try function provided, home position shift function provided

JOG Operation Function
- Provided

Manual Pulse Generator Operation Function
- Possible to connect 3 modules (High-speed counter module use)

Synchronous Encoder Operation Function
- Possible to connect 12 modules (Via module (High-speed counter module use) + Via servo amplifier + Multiple CPU advanced synchronous control)

M-Code Function
- M-code output function provided, M-code completion wait function provided

Limit Switch Output Function
- Number of output points 64 points x 2 settings Output timing compensation. Watch data: Motion control data/Word device

ROM Operation Function
- Provided

Multiple CPU Advanced Synchronous Control
- Provided

External Input Signal
- External input signals (FLS/RLS/DOG) of servo amplifier, Bit device

Forced Stop
- Motion controller forced stop (Device), Forced stop terminal of servo amplifier

Number of I/O Points
- Total 4096 points

Mark Detection Function
- Mark Detection Mode Setting
  - Continuous detection mode, Specified number of detection mode, Ring buffer mode

Mark Detection Signal
- High-speed input request signal (bit device, input signal of servo amplifier (O11 to D13)

Mark Detection Setting
- 64 settings

Clock Function
- Provided

Security Function
- Provided

All Clear Function
- Provided

Remote Operation
- Remote RUN/STOP

File Management Function
- Available for program and parameter data, cam data, label data, sampling data etc.

Optional Data Monitor Function
- SSCNETIII/H
  - Up to 14 data/axis (Communication data: Up to 6 points/axis)

Digital Oscilloscope Function
- Motion buffering method (Real-time waveform can be displayed), Sampling data: Word 16CH, Bit 16CH, Offline sampling

Absolute Position System
- Compatible by setting battery to servo amplifier. (Possible to select the absolute data method or incremental method for each axis)

Driver Communication Function (*3)
- Provided

File Transmission at Boot Function
- Provided

Parameter Change Function
- Provided

Event History Function
- Provided

Add-on Function
- Provided

Override Function
- Provided

Vibration Suppression Command Filter
- Provided

Notes:
1. Servo amplifier (MR-J4-, B-LL) only.
2. Servo amplifier (MR-J4-, B-RJ) only.

G-code Control Add-on Library for iQ-R Motion Controllers
The G-code control add-on library provides you with the benefit of running G-code programs within a motion controller and GP servo system.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>License</th>
<th>Stocked Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW10-DND-GCD01</td>
<td>1 user license</td>
<td>S</td>
</tr>
<tr>
<td>SW10-DND-GCD05</td>
<td>5 user license</td>
<td>-</td>
</tr>
<tr>
<td>SW10-DND-GCD10</td>
<td>10 user license</td>
<td>-</td>
</tr>
<tr>
<td>SW10-DND-GCD20</td>
<td>20 user license</td>
<td>-</td>
</tr>
<tr>
<td>SW10-DND-GCD50</td>
<td>50 user license</td>
<td>-</td>
</tr>
</tbody>
</table>

SSCNET III/H Sensing Module MR-MT2000 Series
System Configuration

MR-MT2000 series
## MR-MT2000 Series

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Stocked Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSCNET III/H Head Module MR-MT2010</td>
<td>S</td>
</tr>
<tr>
<td>I/O Module MR-MT2100</td>
<td>S</td>
</tr>
<tr>
<td>Pulse I/O Module MR-MT2200</td>
<td>S</td>
</tr>
<tr>
<td>Analog I/O Module MR-MT2300</td>
<td>S</td>
</tr>
<tr>
<td>Encoder I/F Module MR-MT2400</td>
<td>S</td>
</tr>
</tbody>
</table>

### SSCNET III/H Head Module MR-MT2010
- **Model Number**: MR-MT2010
- **Stocked Item**: S
- **Control Circuit Power Supply Voltage**: 24 VDC
- **Permissible Voltage Fluctuation**: ±10%
- **Current Capacity**: 1.0 A
- **Communications Interface**: SSCNET III/H
- **DI (Number of Input Points)**: 12 points
- **Input Method**: Sink input/source input (photocoupler isolation)
- **Input Response Time**: 0N to OFF: within 1 μs, OFF to 0N: within 1 μs
- **DO (Number of Output Points)**: 2 points
- **Output Method**: Sink output (photocoupler isolation)
- **Output Response Time**: 0N to OFF: within 1 μs, OFF to 0N: within 1 μs
- **Weight**: 0.2

### I/O Module MR-MT2100
- **DI (Number of Input Points)**: 16 points
- **Input Method**: Sink input/source input (photocoupler isolation)
- **Input Response Time**: 0N to OFF: within 1 μs, OFF to 0N: within 1 μs
- **DO (Number of Output Points)**: 2 points
- **Output Method**: Sink output (photocoupler isolation)
- **Output Response Time**: 0N to OFF: within 1 μs, OFF to 0N: within 1 μs
- **Weight**: 0.2

### Pulse I/O Module MR-MT2200
- **Number of Pulse I/O Channels**: Output 2CH, input 2CH, I/O 1CH each
- **Output Signal**: Differential line driver output/open collector output
- **Output Method**: Forward/reverse rotation pulse train, signed pulse train, A-phase/B-phase pulse train
- **Maximum Frequency**: 4M pulse/s (A-phase/B-phase pulse train 4 multiples), 1M pulse/s (forward/reverse rotation pulse train, signed pulse train)
- **Input Signal**: Differential line driver input
- **Input Method**: Forward/reverse rotation pulse train, signed pulse train, A-phase/B-phase pulse train
- **Maximum Frequency**: 4M pulse/s (A-phase/B-phase pulse train 4 multiples), 1M pulse/s (forward/reverse rotation pulse train, signed pulse train)
- **DI (Number of Input Points)**: 7 points per axis (total of 14 points)
- **Input Method**: Sink input/source input (photocoupler isolation)
- **DO (Number of Output Points)**: 5 points per axis (total of 10 points)
- **Output Method**: Sink output (photocoupler isolation)
- **Weight**: 0.2

### Analog I/O Module MR-MT2300
- **Analog Input (Number of Input Channels)**: 4CH
- **Input Voltage Range**: -10 to 10 VDC
- **Resolution**: ±10 V range: 0.334 mV, ±5 V range: 0.167 mV
- **Conversion Accuracy**: ±0.1% (±0°C to ±60°C)
- **Analog Output (Number of Output Channels)**: 4CH
- **Output Voltage Range**: ±10 V DC
- **Resolution**: ±10 V range: 0.319 mV
- **Conversion Accuracy**: ±0.4% (±25°C to ±5% ±0°C to ±60°C)
- **Weight**: 0.2

### Encoder I/F Module MR-MT2400
- **Number of Encoder Channels**: 2CH
- **Supported Encoder Communications**: SSI, EnDat 2.2, HIPERFACE DSL®, Analog Sin/Cos, Mitsubishi Electric serial I/F
- **Weight**: 0.2

### Notes:
1. When the module is used at the temperature exceeding 55 °C and up to 60 °C, keep the number of points turned on simultaneously to be 14 for each DI and DO.
2. Will be supported in the future
3. Two of the five points and the pulse output (open collector output) are mutually exclusive.
4. Different encoder interfaces cannot be inputted for each channel. The same encoder interface should be used for both channels.

### Applicable Controllers
- **Motion CPU Module**: R64MTCPU, R32MTCPU, R16MTCPU
- **Position Board (**)**: MR-MC211, MR-MC210, MR-MC241, MR-MC240
- **C Controller Interface Module (**)**: Q173SCCF

### MR-MT2000 Series Parts List

<table>
<thead>
<tr>
<th>Name</th>
<th>Model Number</th>
<th>Description</th>
<th>Compliance</th>
<th>Stocked Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSCNET III/H Head Module</td>
<td>MR-MT2010</td>
<td>SSCNET III/H communications, input: 12 points, output: 2 points</td>
<td>UL, CE, KC, EAC</td>
<td>S</td>
</tr>
<tr>
<td>I/O Module</td>
<td>MR-MT2100</td>
<td>Input 16 points, output 16 points</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>Pulse I/O Module</td>
<td>MR-MT2200</td>
<td>Total pulse I/O: 2CH</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>Analog I/O Module</td>
<td>MR-MT2300</td>
<td>Analog input: 4CH, analog output: 4CH</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Encoder I/F Module</td>
<td>MR-MT2400</td>
<td>Encoder I/F: 2CH</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

**Note:** Will be applicable soon

---

**Selection Guide Edition 19 • Revised April 1, 2019**