

Motion CPUs and Motion Modules

Product information for five Mitsubishi Electric motion control products

The MELSEC iQ-R series offers two routes to servo motion control. The **Motion CPUs** (R16MTCPU, R32MTCPU, R64MTCPU) run motion programs on a dedicated processor and connect to servo amplifiers over SSCNET III/H. The **Motion Modules** (RD78G4, RD78GHV) control axes over the open CC-Link IE TSN network from the iQ-R base unit.

At a glance

Product	Type	Control axes	Operation cycle	Network
R16MTCPU	Motion CPU	16	0.222 to 7.111 ms	SSCNET III/H, 1 line
R32MTCPU	Motion CPU	32 (16 x 2 lines)	0.222 to 7.111 ms	SSCNET III/H, 2 lines
R64MTCPU	Motion CPU	64 (32 x 2 lines)	0.222 to 7.111 ms	SSCNET III/H, 2 lines
RD78G4	Motion module	4	250 us to 4 ms (Simple Motion)	CC-Link IE TSN (Class B)
RD78GHV	Motion module	128	From 31.25 us	CC-Link IE TSN

Motion CPU features (R16MTCPU, R32MTCPU, R64MTCPU)

- Control modes: positioning, continuous path, follow-up, synchronous, speed-torque, cam and G-code operation
- Interpolation: linear (up to 4 axes), circular (2 axes), helical (3 axes); 6,400 positioning points
- Programming with Motion SFC (flowchart form) and direct positioning start instructions in MELSOFT MT Works2
- Servo amplifiers: MR-J5-B, MR-J5W-B, MR-J4-B, MR-J4W-B and MR-JE-B
- Cam working area 16 MB, device memory 128K words; Servo System Recorder for diagnostics

Motion Module features (RD78G4, RD78GHV)

- CC-Link IE TSN: an open network that carries motion control and IT traffic on the same line
- PLCopen Motion Control function blocks, plus Simple Motion mode on the RD78G4
- Occupy a standard iQ-R base unit slot and work with the iQ-R PLC CPU
- RD78GHV connects MELSERVO-J5 series servo drives

Product profiles

R16MTCPU

Motion CPU, 16 axes

Entry model of the iQ-R Motion CPU range. Runs motion control on its own processor alongside the PLC CPU, driving up to 16 servo axes over one SSCNET III/H line.

- Up to 16 control axes on 1 SSCNET III/H line (150 Mbps full duplex, up to 100 m between stations)
- Operation cycles: 0.222, 0.444, 0.888, 1.777, 3.555 or 7.111 ms
- Servo program capacity 64K steps; 12 MB standard ROM; SD/SDHC card up to 32 GB
- Ethernet and USB connection through the PLC CPU peripheral interface
- 106 x 27.8 x 110 mm (H x W x D); 0.28 kg; 1.20 A at 5 V DC

R32MTCPU

Motion CPU, 32 axes

Mid-range Motion CPU with two SSCNET III/H lines of 16 axes each, for machines that need more axes without adding a second controller.

- Up to 32 control axes: 16 axes per line on 2 SSCNET III/H lines
- Operation cycles from 0.222 ms to 7.111 ms
- Servo program capacity 64K steps*
- Same module size as the other Motion CPUs: 106 x 27.8 x 110 mm (H x W x D); 0.28 kg
- USB and Ethernet connection through the PLC CPU

R64MTCPU

Motion CPU, 64 axes

Top of the Motion CPU range, with 32 axes per line on two SSCNET III/H lines. Up to three R64MTCPU modules can be synchronised for as many as 192 axes.

- Up to 64 control axes: 32 axes per line on 2 SSCNET III/H lines
- Operation cycles from 0.222 ms to 7.111 ms
- Servo program capacity 64K steps; 12 MB standard ROM; SD/SDHC card up to 32 GB
- Synchronous control of up to 192 axes using three R64MTCPU modules
- 106 x 27.8 x 110 mm (H x W x D); 0.28 kg; 1.2 A at 5 V DC

RD78G4

Motion module, 4 axes, CC-Link IE TSN

Compact motion module that controls up to 4 axes over CC-Link IE TSN, working with the iQ-R PLC CPU. Supports both Simple Motion and PLCopen Motion Control FB modes.

- Up to 4 control axes in Simple Motion mode and in PLCopen Motion Control FB mode
- Simple Motion cycles: 250, 500, 1000, 2000 or 4000 us; PLCopen cycles from 62.5 us to 8000 us
- CC-Link IE TSN, Class B, up to 100 m between stations
- Configured through the CPU module (USB, Ethernet); SD/SDHC memory card support
- 1 slot, 32 I/O points; 106 x 27.8 x 110 mm (H x W x D); 0.26 kg; 1.93 A at 5 V DC

RD78GHV

High-performance motion module, 128 axes, CC-Link IE TSN

High-performance motion module for large multi-axis systems, with a multi-core processor that shares the load with the PLC CPUs. Connects MELSERVO-J5 series drives over CC-Link IE TSN.

- Up to 128 control axes; minimum operation cycle 31.25 us
- Positioning, synchronous, speed and torque control; PLCopen motion control function blocks
- Up to 160,000 positioning data points per axis
- Multi-core processor distributes load between the motion module and PLC CPUs
- 106 x 56 x 110 mm (H x W x D)**; 0.44 kg; 1 USB and 1 Ethernet port

Notes and sources

* Mitsubishi Electric's Motion CPU comparison lists 64K steps for all three models. One distributor listing shows 32K for the R32MTCPU, so confirm the figure for your order.

** Mitsubishi Electric's European e-shop lists the RD78GHV at 56 mm wide. One distributor lists 98 mm, which matches the base-unit mounting-side height of iQ-R modules rather than the width.

Compiled from the Mitsubishi Electric Factory Automation product pages and specification search (mitsubishielectric.com/fa, us.mitsubishielectric.com/fa), the Mitsubishi Electric European e-shop, and distributor listings. Specifications can change between hardware and firmware revisions; confirm against the current Mitsubishi Electric manual before quoting or ordering.