

Motion-Capable Controllers

Product information for five Omron machine automation controllers

These Sysmac controllers combine logic and EtherCAT motion control in one unit and are programmed in Sysmac Studio. The range runs from the compact **NX1P2** (4 axes) and **NX102** (8 axes) to the **NJ-series**, from the entry NJ101 up to the NJ501-5300-1, which adds CNC control and up to 32 synchronous axes.

At a glance

Model	Series	Motion capability	Program / variable memory	EtherCAT
NX102-1200	NX1	8 servo + 4 single-axis position (12 total)	5 MB / 32 MB + 1.5 MB retained	64 slaves
NX1P2-1140DT1	NX1P2	4 servo + 4 point-to-point	1.5 MB / 2 MB	16 nodes
NJ301-1200	NJ301	8 real axes (15 axes incl. virtual)	5 MB / 2 MB + 0.5 MB retained	192 slaves**
NJ101-1000	NJ101	2 real axes	3 MB / 2 MB + 0.5 MB retained	64 slaves
NJ501-5300-1	NJ501	32 synchronous axes	20 MB / 6 MB	192 nodes

Common features

- Built-in EtherCAT master for synchronised servo, inverter and remote I/O control
- Built-in EtherNet/IP connectivity
- Programming in Sysmac Studio, with IEC 61131-3 languages and PLCopen function blocks for motion control
- Motion control with linear (up to 4 axes) and circular (2 axes) interpolation on the NJ-series

Product profiles

NX102-1200

NX1 series machine automation controller

Compact modular controller from the NX1 range with built-in EtherCAT master, two EtherNet/IP ports and OPC UA server.

- Motion: 8 servo (synchronous) axes plus 4 single-axis position control axes, 12 axes in total
- Memory: 5 MB program; 32 MB non-retained and 1.5 MB retained variables
- Built-in ports: 2 x EtherNet/IP, 1 x EtherCAT; up to 64 EtherCAT slaves; up to 32 NX units
- EtherCAT cycle 1,000 to 32,000 us; OPC UA server with up to 2,000 monitored items
- 24 V DC supply (20.4 to 28.8 V); 72 x 100 x 90 mm (W x H x D); 390 g max.

NX1P2-1140DT1

NX1P2 series, built-in I/O (24 in / 16 out, PNP)

All-in-one compact controller with built-in digital I/O, EtherCAT master and EtherNet/IP. Suited to small machines that need a few synchronised axes without extra I/O units.

- Motion: up to 4 synchronous EtherCAT axes plus 4 point-to-point axes
- Memory: 1.5 MB program, 2 MB variables
- Built-in I/O: 24 digital inputs (PNP/NPN) and 16 digital outputs (PNP)
- EtherCAT master with up to 16 nodes; dual Ethernet ports (EtherNet/IP, TCP/IP); 2 optional serial ports
- Up to 8 expansion units and 16 remote I/O nodes; primary task cycle 2 ms
- 148 x 100 x 71 mm (W x H x D); approx. 660 g; 20.4 to 28.8 V DC*

NJ301-1200

NJ-series NJ301 CPU unit

Mid-range NJ-series CPU unit that combines sequence and motion control in one controller, with built-in EtherCAT and EtherNet/IP.

- Motion: up to 8 real servo axes; 15 motion control axes counting virtual axes
- Interpolation: linear up to 4 axes and circular 2 axes per axes group
- Memory: 5 MB program; 2 MB non-retained and 0.5 MB retained variables
- Built-in ports: 1 x EtherNet/IP, 1 x EtherCAT, USB peripheral port
- Up to 3 expansion racks; 5 V DC 1.90 A; 90 x 90 x 90 mm; 550 g including end cover

NJ101-1000

NJ-series NJ101 CPU unit

Entry model of the NJ-series for small machines needing integrated logic and a pair of servo axes.

- Motion: up to 2 real axes (servo or encoder axes)
- Memory: 3 MB program; 2 MB non-retained and 0.5 MB retained variables
- Built-in ports: EtherNet/IP, EtherCAT and USB peripheral port; up to 64 EtherCAT slaves
- Up to 3 expansion racks; 5 V DC 1.90 A; 90 x 90 x 90 mm; 550 g including end cover

NJ501-5300-1

NJ-series NC integrated controller (CNC + motion)

High-end NJ-series controller that adds CNC (G-code) control to motion and sequence control in a single unit, for machine tools and complex multi-axis equipment.

- Controller functions: CNC, motion control and sequence control
- Up to 32 synchronous axes (32 servo axes on the built-in EtherCAT master)
- Memory: 20 MB program, 6 MB variables; primary task cycle 0.5 ms
- Built-in EtherCAT (192 nodes in total) and EtherNet/IP; USB port; CJ I/O bus with up to 40 expansion units
- Weight 665.8 g (unpacked)***

Notes and sources

* NX1P2-1140DT1 figures come from distributor listings; Omron's own product page could not be retrieved, so confirm against the Omron datasheet before ordering.

** Omron's NJ301 specification page lists 192 EtherCAT slaves; one datasheet extract showed 64, which is the NJ101 figure.

*** Figures for the NJ501-5300-1 come from Omron Europe's product page. The earlier NJ501-5300 is listed with 16 axes in Omron's specification tables, so check that you are quoting the -1 version.

Compiled from Omron Industrial Automation specification pages and datasheets (ia.omron.com, assets.omron.com, industrial.omron.eu) and distributor listings. Specifications can change between hardware and firmware versions; confirm against the current Omron manual before quoting or ordering.