Sysmac Integrated Platform
Machine Controller with CNC

Complete line control and CNC in one!
Optimized engineering time
Integrated architecture providing high throughput
Sysmac Integrated Platform
Expanded with CNC functionality
Complete line control and CNC in one

Omron brings flexibility and high productivity for today’s manufacturing

The industry is constantly evolving and the market requests more complex products at higher productivity rates. The use of CAD and CAM technologies, the integration of all parts of the production line and high-performance control systems are all vital to meet market expectations.

Omron is constantly evolving and developing new products and functionalities to provide everything that is needed in a control architecture. In order to go one step further, Omron integrates CNC functionality into the Sysmac Automation Platform enabling accurate path-following motion control for standard CNC applications such as XY cutting, milling or lathe among others. This new functionality in combination with the Sysmac platform’s existing motion, safety, vision and robotics capabilities allows complete production line control using G-code and the standard IEC programming languages. The complete integration of all production parts leads to a simplification in development, an increase in productivity and immediate product changeover.

Optimized engineering time
- G-Code and IEC 61131-3 standard programming
- Easy and Intuitive Integrated Development Environment

Integrated architecture providing high throughput
- One machine control: Logic sequence, Motion, Safety, Vision and CNC
Fully integrated. One machine control

Omron provides a fully integrated platform for complete production line control in a single controller. This allows the use of the same standard programming languages for all processes, thus eliminating interlocks between machine operations. Choose between two types of reliable and robust machine controllers: Modular Controller and the Openness of Industrial Panel PC. This high-speed and accuracy controller solution enables the synchronization of all machine devices, maximizing the complete production line throughput.

**CNC operator**
- G-Code File Editor
- Execution monitor Active G/M code display
- Command terminal
- Jogging, homing
- Customizable software allows adding functionality by the users (Requires CNC operator SDK version)

**Machine controller**
- Logic sequence, Motion and CNC in one
- Up to 32 synchronous axes
- 4 axes interpolation per channel
- Import G-Code: SD card and FTP protocol
- Built-in Ethernet and EtherCAT ports

**Integrated safety**
- Simplified safety installation
- Reduction of safety devices
- Safety function built-in: Fail Safe over EtherCAT (FSoE)
- Troubleshooter integrated with Sysmac Studio

☑ **Sysmac CNC enables axis interpolation** for complex path-following which a conventional PLC cannot achieve

☑ **One high-speed and accuracy control** contributes to maximizing the complete production line throughput

☑ **Sysmac Studio** provides a true Integrated Development Environment which is intuitive and easy to use!
Sysmac Studio
Integrated Development Environment

- Possible to handle CNC from PLC program by Function Block. Users can make simple program structures, even for linkage between CNC process and others.

- Open standard IEC 61131-3 programming

- Standard PLCopen Function Blocks for Motion and Safety

- Sysmac Library for fast engineering and optimized machine availability:
  - Application libraries
  - Optimized productivity
  - Predictive maintenance
  - Reduced downtime

Database connection + Motion + Robotics + Vision + Safety + CNC

1S Servo System
Using CNC functionality, the Sysmac machine controller is ideal for XY cutting, milling, lathe and any other path-following application such as dispensing, bending, grinding and forming machines. In addition to the CNC applications, the Sysmac integrated platform offers solutions for multi-purpose machines, integrating all machine operations: loader/unloader and standard machine control including CNC functions.
Fits most diverse CNC applications
Simplicity and versatility

- Sysmac high-end motion control with CNC functionality provides a cost-effective solution for a diverse range of applications

- **High Performance!**
  - Up to 500 µs cycle time including logic sequence, advanced motion and CNC

- **Cutter compensation 2D/3D**
  - Tool diameter and shape compensation, matching the cutting point exactly as specified in G-Code

- **Advanced Block Lookahead**
  - Future instructions are analyzed in advance, movements are blended and optimized for speed and acceleration, providing improved performance

- **Block Retrace for reversing the path**
  - Path can be reversed in order to remove the tool from the cutting area
Product family

### MACHINE CONTROLLER

<table>
<thead>
<tr>
<th>Model</th>
<th>Model NY532-5400-11[2T13][T0]</th>
<th>Model NJ501-5300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>Industrial Panel PC – Intel® Core™ i7-4700EQ processor</td>
<td>Modular controller</td>
</tr>
<tr>
<td>Display</td>
<td>15.4 inch</td>
<td>12.1 inch</td>
</tr>
<tr>
<td>Storage</td>
<td>128 GB</td>
<td>64 GB</td>
</tr>
<tr>
<td>Operating system</td>
<td>Windows Embedded Standard 7 – 64 bit</td>
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<tr>
<td>Task</td>
<td>Multi-tasking program</td>
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</tr>
<tr>
<td>Functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tasking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of axes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. synchronous axis</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>Synchronous axes per channel</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Number of channels</td>
<td>8</td>
<td>4</td>
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<tr>
<td>Fastest cycle time</td>
<td>500 µs</td>
<td>-</td>
</tr>
<tr>
<td>Software tool</td>
<td>Integrated Development Environment</td>
<td>-</td>
</tr>
<tr>
<td>Symsac Studio:</td>
<td>- Ladder, Structured Text, In-Line ST</td>
<td>-</td>
</tr>
<tr>
<td>- IEC61131-3</td>
<td>- PLCopen for Motion Control and Safety</td>
<td>-</td>
</tr>
<tr>
<td>Graphic user interface</td>
<td>CNC operator:</td>
<td>-</td>
</tr>
<tr>
<td>- G, M code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpolation functions</td>
<td>Compensation</td>
<td>Tool Radius/Length, Cross, LeadScrew</td>
</tr>
<tr>
<td>Interpolation</td>
<td>Linear, Circular, Helical, Conical, Spiral</td>
<td>-</td>
</tr>
<tr>
<td>Coordinate system</td>
<td>MCS, WCS, LCS, Mirror, Scaling, Rotation, Plane Selection…</td>
<td>-</td>
</tr>
<tr>
<td>Others</td>
<td>FeedRate Control, Accel/Decel Control, Dry Run, Back Trace…</td>
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<tr>
<td>Memory card</td>
<td>SD and SDHC</td>
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<tr>
<td>Built-in port</td>
<td>Ethernet, EtherNet/IP, EtherCAT, USB 3.0/2.0, DVI</td>
<td>EtherNet/IP, EtherCAT, USB</td>
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<tr>
<td>EtherCAT slaves</td>
<td>192</td>
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<tr>
<td>Mounting</td>
<td>On panel</td>
<td>DIN rail</td>
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<tr>
<td>Global standards</td>
<td>CE, cULus</td>
<td>CE, cULus, NK, LR</td>
</tr>
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</table>
## SOFTWARE

### INTEGRATED DEVELOPMENT ENVIRONMENT

- Sysmac Studio is the Integrated Development Environment to configure, program and maintain all Sysmac Controllers and devices.
- One single project file for the entire machine.
- Intuitive IDE for logic, motion, safety, robotics, drives, vision, HMI, networks and CNC.
- Reduce engineering and maintenance costs by using Omron libraries and IAGs. Develop your own libraries.
- IEC-61131-3 compliant.
- PLCopen FBs for motion and safety.
- G-Code available
- Advanced functions for CAM editing, Drive tuning, 3D simulation, libraries and namespaces, vision algorithms, HMI design and complete machine maintenance.
- Full Digital Machine development environment including: EtherNet/IP, EtherCAT, IO-Link, SQL and FTP.
- Offline Simulation for logic, motion, robotics, safety and vision.
- Advanced security function with 32 digit security password.

### GRAPHIC USER INTERFACE

- G-Code File Editor
- Execution monitor Active G/M code display
- Command terminal
- Jogging, homing
- Customizable software allows adding functionality by the users (Requires CNC operator SDK version)

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<th>CNC Operator</th>
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Omron at a glance

200,000 products ranging Input, Logic, Output & Safety

Sensing, Control Systems, Visualisation, Drives, Robots, Safety, Quality Control & Inspection, Control and Switching Components

6%

Innovation track record of 80 years

1,200 employees dedicated to R&D
12,500 + issued and pending patents

37,500 Employees worldwide

Working for the benefit of society

Industrial automation 39%
Automotive components 16%
Electronic & mechanical components 12%
Healthcare 12%
Other businesses 11%
Social systems, solutions & services 10%

200 Locations worldwide

22 Countries in EMEA

Close to your needs

Technical training & seminars, technical support, Automation Technology Centers, online community (MyOmron), online catalogues and technical documentation, customer service & sales support, inter-operability labs (Tsunagi), safety services, repairs.
“To the machine the work of the machine, to man the thrill of further creation.”

Kazuma Tateisi, founder of Omron
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