

# Sysmac Library

SYSMAC-XR□□□



- Rich lineup of Function Blocks
- Reduce development time with easy-to-obtain Library
- High quality products with reliable global support

# Simplicity for advanced applications

The Sysmac Library is a collection of software functional components that can be used in programs for the NJ/NX Machine Automation Controllers. Packed with Omron's rich technical know-how on control programs, the Sysmac Library makes advanced control easy. Install the Sysmac Library to use it in the Sysmac Studio.



## Rich lineup of Function Blocks

Omron offers Function Blocks for a wide range of applications: advanced control such as vibration suppression and temperature control, motion control such as PID feedforward, and connection to servo drives or sensors.

### Advanced control applications

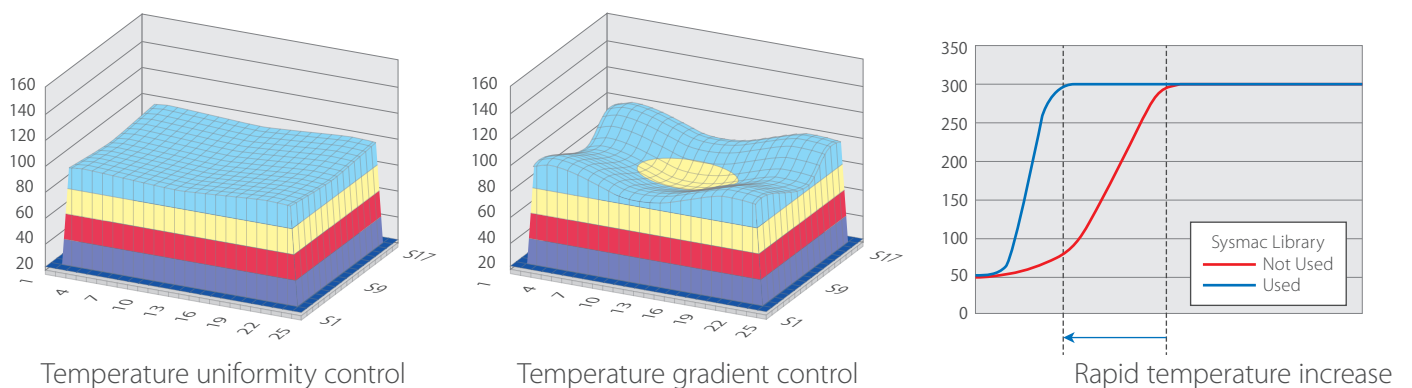
#### • Vibration suppression

Vibration suppression during and after high-speed material handling prevents vibration, slides, and spilling, significantly reducing machine cycle time.



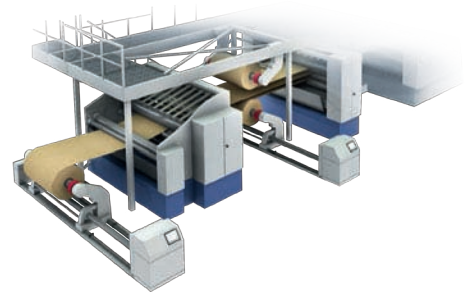
#### • Temperature control

In-furnace temperature variations can be reduced (temperature uniformity control), and the temperature can be distributed unevenly (temperature gradient control). A rapid increase in the temperature (rapid temperature increase) without overshooting stabilizes quality and reduces cycle time.



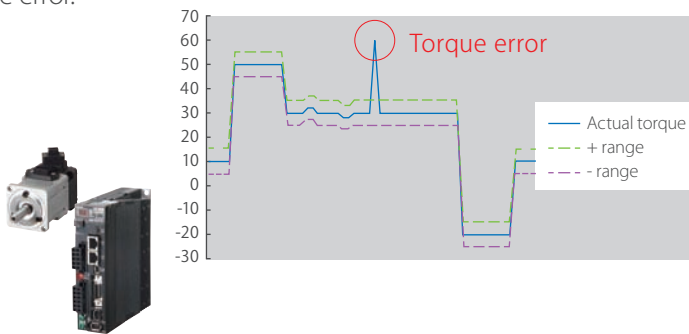
## Various motion control

Integration of the NJ/NX Machine Automation Controller, EtherCAT, and Sysmac Library makes various motion control possible.



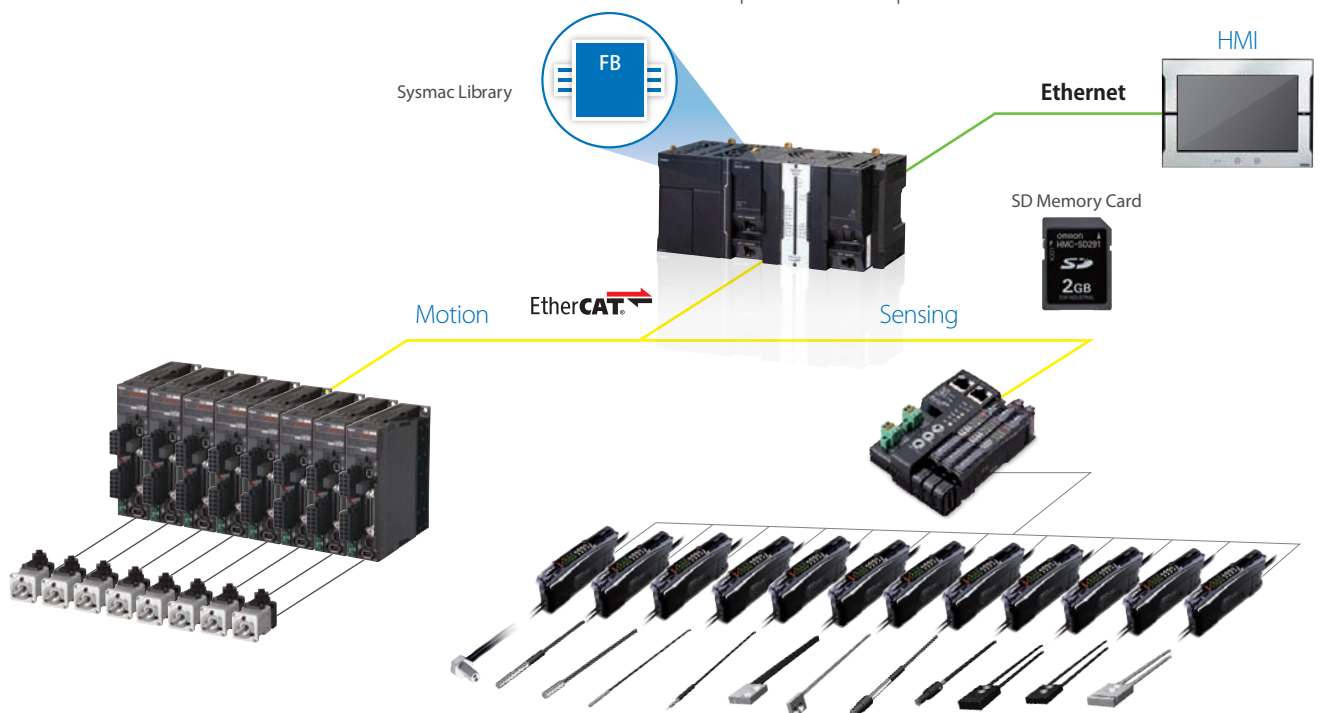
## Reducing equipment downtime with predictive maintenance

You can easily monitor devices such as air cylinders, sensors, and servo drives/servomotors that often cause intermittent stoppages. Detecting deterioration over time or errors of devices prevents machines from stopping suddenly in advance, improving operating efficiency. Recorded status of devices before and after the occurrence of an error allows you to identify the cause of the error.



## Easy access to connected devices

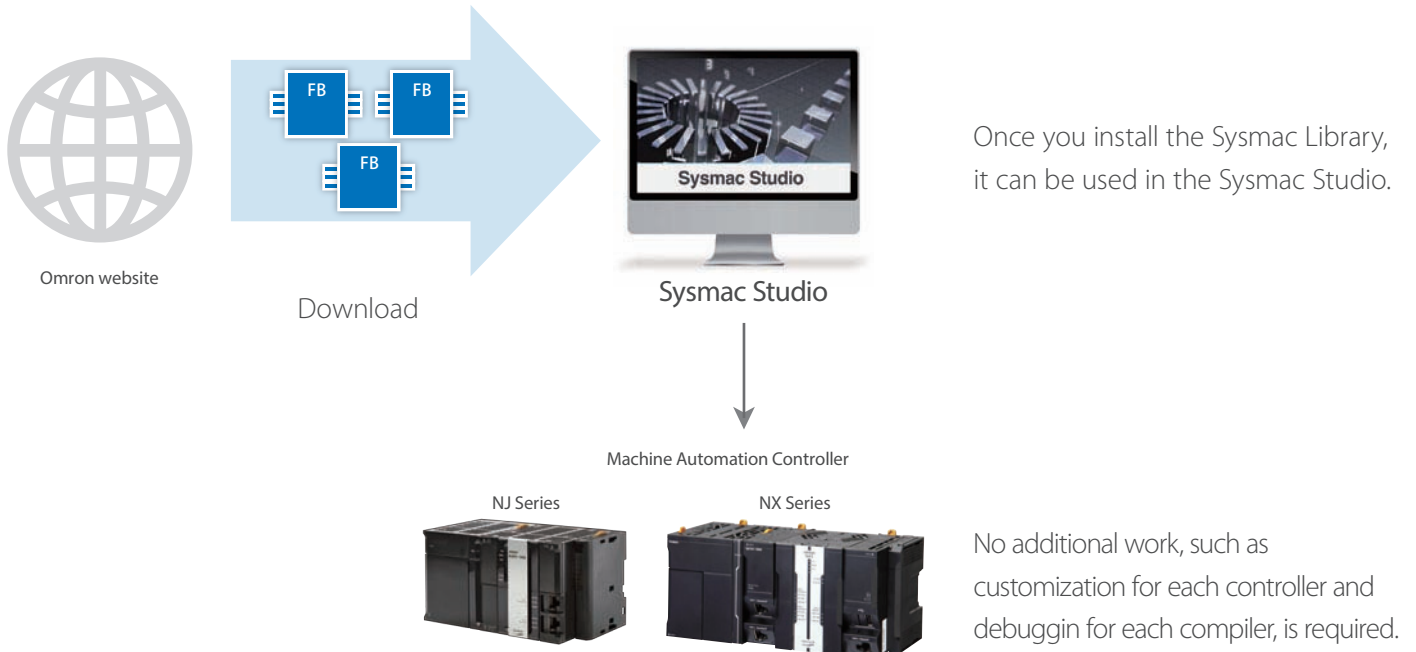
Function Blocks facilitate the connection of devices to the controller and provide Backup and Restoration functions.



## Reduce development time with easy-to-obtain Library

The Sysmac Library is available to download from Omron website.

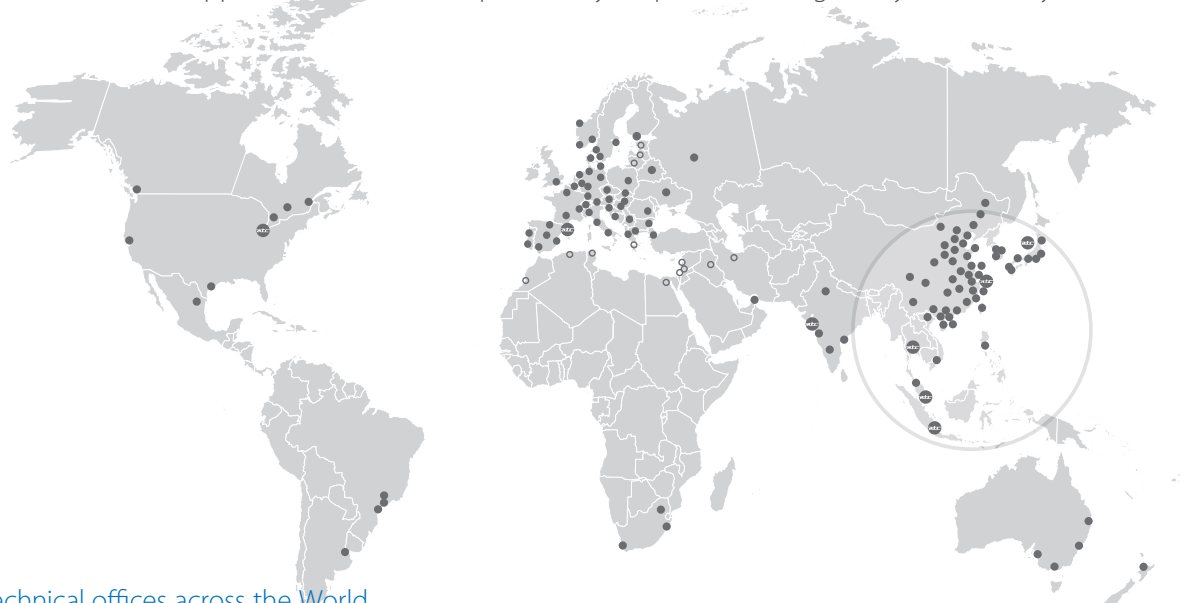
The Function Blocks in the Sysmac Library that are specially designed for the NJ/NX Machine Automation Controller can be used in your programs, cutting programming and debugging time.



## High quality products with reliable global support

With our worldwide network for support, Omron will support you to meet your control requirements and solve your problems by using the Sysmac Library.

We will provide technical support even after the shipment of your products using the Sysmac Library



### OMRON technical offices across the World



Automation Center

Kusatsu(JPN),Shanghai(CHN),Barcelona(ESP),Hoffman Estates IL(USA),  
Mumbai(IND),Jakarta(IDN),Bangkok(THA),Singapore(SGP)

● Technical office

## Sysmac Library for advanced control

The Sysmac Library for the NJ/NX Machine Automation Controller provides Function Blocks packed with know-how that makes advanced control easy.



## Features

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- For a wide range of applications: advanced control such as vibration suppression and temperature control, motion control such as PID feedforward, and connecting to servo drives or sensors.
- Available to download from OMRON's website. Install the library to use in the Sysmac Studio.  
Library specially designed for the NJ/NX Machine Automation Controller reduces programming and debugging time.
- High quality product with reliable global support.



## Ordering Information

### Sysmac Library

Sysmac Library is POU Libraries (Function Block and Function) provided for NJ/NX-series Controller. Please download it from following URL and install to Sysmac Studio.

[http://www.ia.omron.com/sysmac\\_library/](http://www.ia.omron.com/sysmac_library/)

Product	Features	Model	Standards
<b>MC Test Run Library</b>	The MC Test Run Library is used to perform a test run that the MC Function Module is used. In this library, a processing to operate axes that an MPG (i.e. a manual pulse generator) was used is provided. You can use this library to reduce manpower of programming when creating a test run program that an MPG was used.	<b>SYSMAC-XR001</b>	---
<b>MC Command Table Library</b>	The MC Command Table Library is used to continuously perform positioning that the MC Function Module is used. You can use this library together with motion control instructions of the NJ/NX-series Controller. The program that multiple motion control instructions are used will be unnecessary by using this library.	<b>SYSMAC-XR002</b>	
<b>MC Tool box Library</b>	The MC Tool Box Library is used to implement a program to perform motor control in the user program. The processings such as PID processing and filter processing are provided in this library. You can use this library to reduce manpower of programming when creating a program to perform motor control.	<b>SYSMAC-XR003</b>	
<b>EtherCAT G5 Series Library</b>	The EtherCAT G5 Series Library is used to initialize the absolute encoder, back up and restore the parameters for an OMRON G5-series Servo Drive with built-in EtherCAT communications. You can use this library to reduce manpower of programming when implementing the processing for a Servo Drive.	<b>SYSMAC-XR004</b>	
<b>EtherCAT N-Smart Series Library</b>	The EtherCAT N-Smart Series Library is used to back up and restore the parameters for an OMRON E3NW Sensor Communications Unit (an EtherCAT type). You can use this library to reduce manpower of programming when implementing the processing for a Sensor Communications Unit.	<b>SYSMAC-XR005</b>	
<b>Vibration Suppression Control Library</b>	The Vibration Suppression Library is used to suppress residual vibration caused by the operation of machines. You can use this library together with motion control instructions of the NJ/NX-series Controller.	<b>SYSMAC-XR006</b>	
<b>Temperature Control Library</b>	The Temperature Control Library is used to perform a high-level temperature control. You can use this library together with analog control instructions of the NJ/NX-series Controller.	<b>SYSMAC-XR007</b>	
<b>Device Operation Monitor Library</b>	The Device Operation Monitor Library is used to monitor the operation of devices such as air cylinders, sensors, motors, and other devices.	<b>SYSMAC-XR008</b>	
<b>Adept Robot Control Library</b>	The Adept Robot Control Library is used to directly control Adept Robots from NJ/NX-series Controller. You can use this library to control any types of robots like parallel, SCARA and articulated from NJ/NX-series Controller with common instructions and a common programming method.	<b>SYSMAC-XR009</b>	
<b>Weighing Control Library</b>	The Weighing Control Library is used to perform weighing control of raw materials for industrial products with NX-series Load Cell Input Unit NX-RS1201. Also, functions that are used to display and correct measurement values are included. You can use this Weighing Control Library to reduce programming work when you implement processing for weighing in each device.	<b>SYSMAC-XR010</b>	
<b>EtherCAT 1S Series Library</b>	The EtherCAT 1S Series Library is used to initialize the absolute encoder, back up and restore the parameters for an OMRON 1S-series Servo Drive with built-in EtherCAT communications. You can use this library to reduce manpower of programming when implementing the processing for a Servo Drive.	<b>SYSMAC-XR011</b>	
<b>Servo Press Library</b>	The Servo Press Library is used to generate the operation commands and monitor the operations of actuator for servo presses with NX/NJ-series CPU Unit. You can use the Servo Press Library to realize the high-speed and high precision servo press control and reduce programming work.	<b>SYSMAC-XR013</b>	

### Automation Software

Please purchase a DVD and licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. The license does not include the DVD.

Product	Specifications		Model	Standards
	Number of licenses	Media		
<b>Sysmac Studio Standard Edition Ver.1.□□</b>	The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX Series, EtherCAT Slave, and the HMI.  Sysmac Studio runs on the following OS. Windows XP (Service Pack 3 or higher, 32-bit version) / Windows Vista (32-bit version) / Windows 7 (32-bit/64-bit version) / Windows 8 (32-bit/64-bit version) / Windows 8.1 (32-bit/64-bit version) / Windows 10 (32-bit/64-bit version)	---	<b>SYSMAC-SE200D</b>	---
	The Sysmac Studio Standard Edition DVD includes Support Software to set up EtherNet/IP Units, DeviceNet slaves, Serial Communications Units, and Support Software for creating screens on HMIs (CX-Designer). For details, refer to the Sysmac Integrated Catalogue (Cat. No. P072).	1 license *	<b>SYSMAC-SE201L</b>	---

\* Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).

# Sysmac Library

## Version Information

Sysmac Library			Applicable Models					
Product Name	Model	Version	NJ/NX-series CPU Unit				Sysmac Studio	Related Products
			NX701- □□□□	NJ501- □□□□	NJ301- □□□□	NJ101- □□□□		
MC Test Run Library	SYSMAC-XR001	Ver.1.1.0	Ver.1.10 or later	Ver.1.10 or later	Ver.1.10 or later	Ver.1.10 or later *1	Ver.1.14 or higher	<ul style="list-style-type: none"> <li>Incremental Encoder Input Unit (NX-EC□□□□, GX-EC0211/EC0241) Ver.1.1 or later</li> <li>G5-series Servo Drives (R88D-KN□□□□-ECT) Ver.2.10 or later</li> <li>NX-series Pulse Output Unit (NX-PG□□□□) Ver.1.1 or later</li> </ul>
MC Command Table Library	SYSMAC-XR002	Ver.1.1.0	Ver.1.10 or later	Ver.1.10 or later	Ver.1.10 or later	Ver.1.10 or later *1 *2	Ver.1.14 or higher	<ul style="list-style-type: none"> <li>G5-series Servo Drives (R88D-KN□□□□-ECT) Ver.2.10 or later</li> </ul>
MC Tool box Library	SYSMAC-XR003	Ver.1.1.0	Ver.1.10 or later	Ver.1.08 or later	Ver.1.08 or later	Ver.1.10 or later	Ver.1.14 or higher	---
EtherCAT G5 Series Library	SYSMAC-XR004	Ver.1.1.0	Ver.1.10 or later	Ver.1.01 or later	Ver.1.01 or later	Ver.1.10 or later	Ver.1.14 or higher	<ul style="list-style-type: none"> <li>G5-series Servo Drives (R88D-KN□□□□-ECT) Ver.2.10 or later</li> <li>SD Memory Card (HMC-SD□□□□)</li> </ul>
EtherCAT N-Smart Series Library	SYSMAC-XR005	Ver.1.1.0	Ver.1.10 or later	Ver.1.01 or later	Ver.1.01 or later	Ver.1.10 or later	Ver.1.14 or higher	<ul style="list-style-type: none"> <li>N-Smart Sensor Communications Unit (E3NW-ECT) Ver.1.03 or later</li> <li>Distributed Sensor Unit (E3NW-DS)</li> <li>Smart Fiber Amplifier Unit (E3NX-FA0)</li> <li>Smart Laser Amplifier Unit (E3NC-LA0)</li> <li>Smart Laser Amplifier Unit (CMOS type)(E3NC-SA0)</li> <li>Contact-Type Smart Amplifier Unit (E9NC-TA0)</li> <li>SD Memory Card (HMC-SD□□□□)</li> </ul>
Vibration Suppression Control Library	SYSMAC-XR006	Ver.1.0.0	Ver.1.10 or later	Ver.1.10 or later	Ver.1.10 or later	Ver.1.10 or later *1	Ver.1.14 or higher	---
Temperature Control Library	SYSMAC-XR007	Ver.1.0.0	Ver.1.10 or later	Ver.1.02 or later	Ver.1.02 or later	Ver.1.10 or later	Ver.1.14 or higher	---
Device Operation Monitor Library	SYSMAC-XR008	Ver.1.0.0	Ver.1.10 or later	Ver.1.01 or later	Ver.1.01 or later	Ver.1.10 or later	Ver.1.14 or higher	<ul style="list-style-type: none"> <li>G5-series Servo Drives (R88D-KN□□□□-ECT) Ver.2.10 or later</li> <li>N-Smart Sensor Communications Unit (E3NW-ECT) Ver.1.03 or later</li> <li>Distributed Sensor Unit (E3NW-DS)</li> <li>Smart Fiber Amplifier Unit (E3NX-FA0)</li> <li>Smart Laser Amplifier Unit (E3NC-LA0)</li> <li>Smart Laser Amplifier Unit (CMOS type)(E3NC-SA0)</li> <li>Contact-Type Smart Amplifier Unit (E9NC-TA0)</li> <li>SD Memory Card (HMC-SD□□□□)</li> </ul>
Adept Robot Control Library	SYSMAC-XR009	Ver.2.0.0	Ver.1.10 or later	Ver.1.01 or later	Ver.1.01 or later	Ver.1.10 or later	Ver.1.15 or later	<ul style="list-style-type: none"> <li>SCARA Robots</li> <li>Cobra 350 Ver.2.3.C or later</li> <li>eCobra 600/800 Ver.2.3.C or later</li> <li>Parallel Robots</li> <li>Hornet 565 Ver.2.3.C or later</li> <li>Quattro 650H/HS Ver.2.3.C or later, 800H Ver.2.3.C or later</li> <li>Articulated Robots</li> <li>Viper 650/850 Ver.2.3.C or later</li> <li>SmartController EX Ver.2.3.C or later</li> <li>T20 Pendant</li> </ul>
Weighing Control Library	SYSMAC-XR010	Ver.1.0.0	Ver.1.10 or later	Ver.1.05 or later	Ver.1.05 or later	Ver.1.10 or later	Ver.1.16 or later	<ul style="list-style-type: none"> <li>NX-series LoadCell I/F Unit (NX-RS□□□□) Ver.1.0 or later</li> </ul>
EtherCAT 1S Series Library	SYSMAC-XR011	Ver.1.0.0	Ver.1.10 or later	Ver.1.01 or later	Ver.1.01 or later	Ver.1.10 or later	Ver.1.16 or later	<ul style="list-style-type: none"> <li>1S-series Servo Drives (R88D-1SN□□□□-ECT) Ver.1.0 or later</li> <li>SD Memory Card (HMC-SD□□□□)</li> </ul>
Servo Press Library	SYSMAC-XR013	Ver.1.0.0	Ver.1.10 or later	Ver.1.08 or later	Ver.1.08 or later	Ver.1.10 or later *1	Ver.1.16 or later	<ul style="list-style-type: none"> <li>G5-series Servo Drives (R88D-KN□□□□-ECT) Ver.2.10 or later</li> <li>NX-series LoadCell I/F Unit (NX-RS□□□□) Ver.1.0 or later</li> </ul>

\*1. This Library is not available for NJ101-90□□ CPU Units.

\*2. When you use this function block with NJ101-10□□, you can use a maximum of two real servo axes.

**Note:** Refer to each manuals for more information.

## Related Catalogs

Product Name	Models	Cat. No.
MC Test Run Library	SYSMAC-XR001	P093
MC Command Table Library	SYSMAC-XR002	P092
MC Tool box Library	SYSMAC-XR003	P098
EtherCAT G5 Series Library	SYSMAC-XR004	P095
EtherCAT N-Smart Series Library	SYSMAC-XR005	P094
Vibration Suppression Control Library	SYSMAC-XR006	P099
Temperature Control Library	SYSMAC-XR007	P100
Device Operation Monitor Library	SYSMAC-XR008	P101
Adept Robot Control Library	SYSMAC-XR009	P106
Weighing Control Library	SYSMAC-XR0010	P109
EtherCAT 1S Series Library	SYSMAC-XR0011	P110
Servo Press Library	SYSMAC-XR0013	P112



# Sysmac Library

## Related Manuals

The followings are the manuals related to this manual. Use these manuals for reference.

Man.No.	Model number	Manual	Application	Description
W546	SYSMAC-XR001	NJ/NX-series Sysmac Library Instructions Manual for MC Test Run Library	Learning about the specifications of instructions for the function blocks in the MC Test Run Library	Describes the information that is necessary to use the function blocks in the MC Test Run Library.
W545	SYSMAC-XR002	NJ/NX-series Sysmac Library Instructions Manual for MC Command Table Library	Learning about the specifications of instructions for the function blocks in the MC Command Table Library	Describes the information that is necessary to use the function blocks in the MC Command Table Library.
W547	SYSMAC-XR003	NJ/NX-series Sysmac Library Instructions Manual for MC Tool Box Library	Learning about the specifications of instructions for the function blocks in the MC Tool Box Library	Describes the information that is necessary to use the function blocks in the MC Tool Box Library.
W548	SYSMAC-XR004	NJ/NX-series Sysmac Library Instructions Manual for EtherCAT G5 Series Library	Learning about the specifications of instructions for the EtherCAT G5 series Library	Describes the information that is necessary to use the function blocks in the EtherCAT G5 series Library.
W549	SYSMAC-XR005	NJ/NX-series Sysmac Library Instructions Manual for EtherCAT N-Smart series Library	Learning about the specifications of instructions for the function blocks in the EtherCAT N-Smart series Library	Describes the information that is necessary to use the function blocks in the EtherCAT N-Smart series Library.
W550	SYSMAC-XR006	NJ/NX-series Sysmac Library Instructions Manual for Vibration Suppression Library	Learning about the specifications of instructions for the function blocks in the Vibration Suppression Library	Describes the information that is necessary to use the function blocks in the Vibration Suppression Library.
W551	SYSMAC-XR007	NJ/NX-series Sysmac Library Instructions Manual for Temperature Control Library	Learning about the specifications of instructions for the function blocks in the Temperature Control Library	Describes the information that is necessary to use the function blocks in the Temperature Control Library.
W552	SYSMAC-XR008	NJ/NX-series Sysmac Library Instructions Manual for Device Operation Monitor Library	Learning about the specifications of instructions for the function blocks in the Device Operation Monitor Library	Describes the information that is necessary to use the function blocks in the Device Operation Monitoring Library.
W575	SYSMAC-XR009	NJ/NX-series Sysmac Library Instructions Manual for Adept Robot Control Library	Learning about the specifications of instructions for the function blocks in the Adept Robot Control Library	Describes the information that is necessary to use the function blocks in the Adept Robot Control Library
W569	SYSMAC-XR010	NJ/NX-series Sysmac Library User's Manual for Weighing Control Library	Learning about the specifications of instructions for the function blocks in the Weighing Control Library	Describes the information that is necessary to use the function blocks in the Weighing Control Library.
W571	SYSMAC-XR011	NJ/NX-series Sysmac Library User's Manual for EtherCAT 1S Series Library	Learning about the specifications of instructions for the function blocks in the EtherCAT 1S series Library	Describes the information that is necessary to use the function blocks in the EtherCAT 1S series Library.
W573	SYSMAC-XR013	NJ/NX-series Sysmac Library User's Manual for Servo Press Library	Learning about the specifications of instructions for the function blocks in the Servo Press Library	Describes the information that is necessary to use the function blocks in the Servo Press Library.
W501	NX701-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	NJ/NX-series CPU Unit Software User's Manual	Learning how to program and set up an NJ/NX-series CPU Unit Mainly software information is provided.	The following information is provided on a Controller built with an NJ/NX-series CPU Unit. • CPU Unit operation • CPU Unit features • Initial settings • Programming language specifications and programming with the IEC 61131-3 standard. Use this manual together with the <i>NJ-series CPU Unit Hardware User's Manual</i> (Cat. No. W500).
W502	NX701-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	NJ/NX-series Instructions Reference Manual	Learning about the specifications of the instruction set that is provided by OMRON	The instructions in the instruction set (IEC 61131-3 specifications) are described. Use this manual together with the <i>NJ-series CPU Unit Hardware User's Manual</i> (Cat. No. W500) and <i>NJ/NX-series CPU Unit Software User's Manual</i> (Cat. No. W501).
W504	SYSMAC-SE2□□□□	Sysmac Studio Version 1 Operation Manual	Learning about the NJ/NX-series Supports Software and how to use it	An introduction to the Support Software is provided along with information on the installation procedure, basic operations, connection procedures, and procedures for the main features.
W507	NX701-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	NJ/NX-series CPU Unit Motion Control User's Manual	Learning about motion control settings and programming concepts	The settings and operation of the CPU Unit and programming concepts for motion control are described. Use this manual together with the <i>NJ-series CPU Unit Hardware User's Manual</i> (Cat. No. W500) and <i>NJ/NX-series CPU Unit Software User's Manual</i> (Cat. No. W501).
W508	NX701-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	NJ/NX-series Motion Control Instructions Reference Manual	Learning about the specifications of the motion control instructions that are provided by OMRON	The motion control instructions are described. Use this manual together with the <i>NJ-series CPU Unit Hardware User's Manual</i> (Cat. No. W500), <i>NJ/NX-series CPU Unit Software User's Manual</i> (Cat. No. W501) and <i>NJ/NX-series CPU Unit Motion Control User's Manual</i> (Cat. No. W507).
I576	R88M-K□ R88D-KN□-ECT	G5-series AC Servomotors/ Servo Drives (Built-in EtherCAT® Communications) User's Manual	Learning how to use the AC Servomotors/Servo Drives with built-in EtherCAT Communications.	Describes the hardware, setup methods and functions of the AC Servomotors/Servo Drives with built-in EtherCAT Communications.
E429	E3NW-ECT	E3NW-ECT EtherCAT® Digital Sensor Communication Unit Operation Manual	Learning how to use E3NW-ECT EtherCAT® Digital Sensor Communication Unit	Provides the specifications of and describes application methods for E3NW-ECT EtherCAT® Digital Sensor Communication Unit.

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Note: Do not use this document to operate the Unit.

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