Sysmac Library for NJ/NX Machine Automation Controller

SYSMAC-XR009
Adept Robot Control Library

Sysmac Library

✓ **Control robots from the NJ/NX Machine Automation Controller.**

Issue 1   There is no time to learn a new robot programming language.
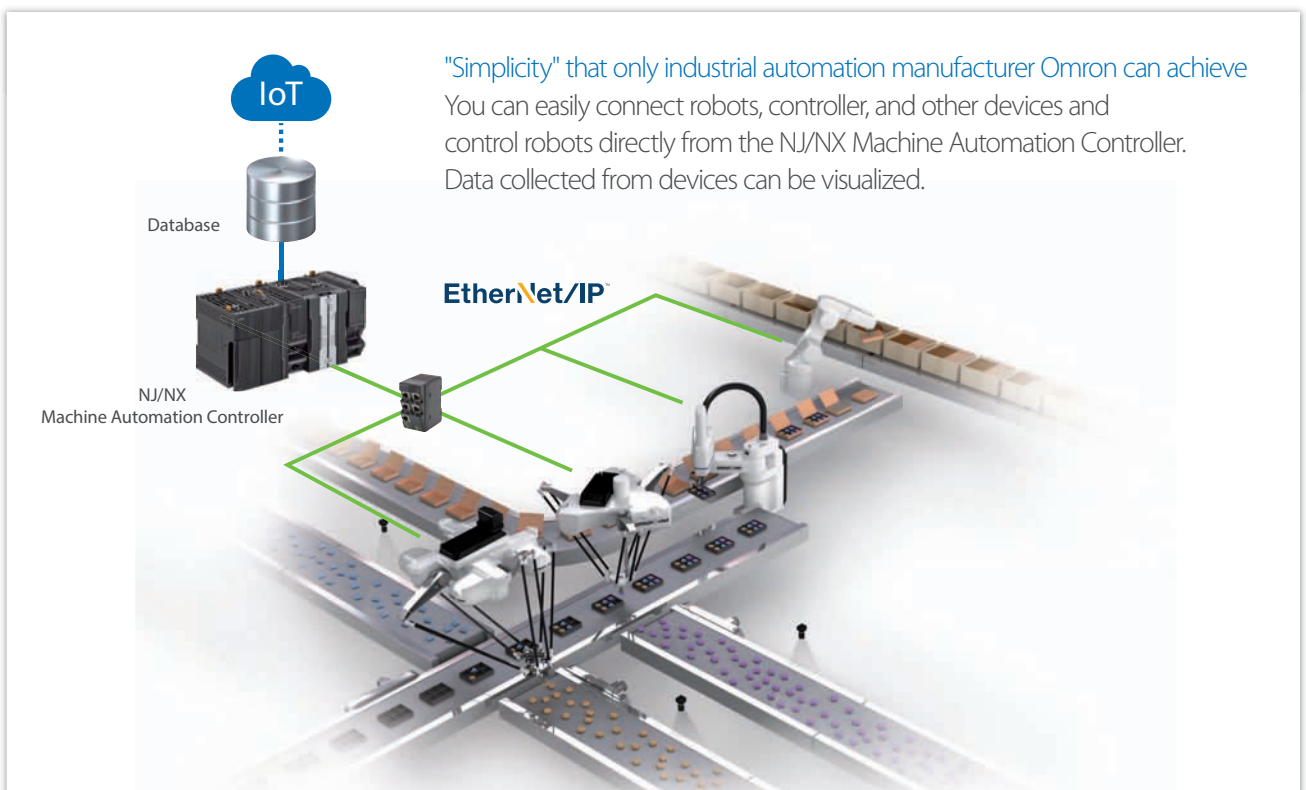
Issue 2   Controller data and robot data are backed up and managed separately.

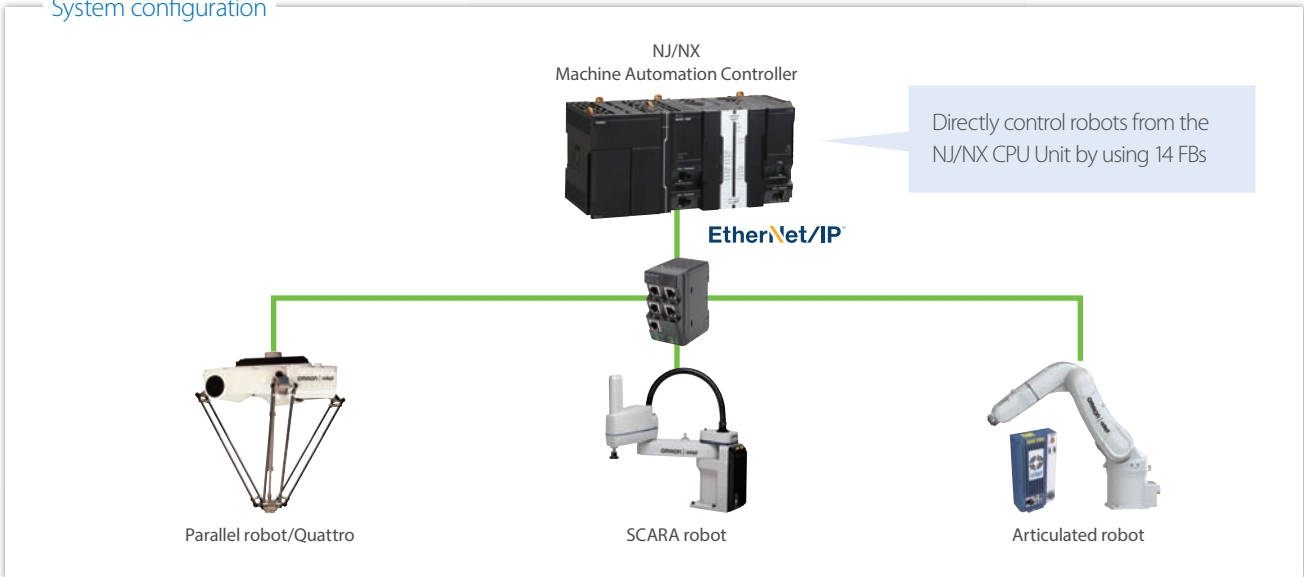## Adept Robot Control Library offers solution!

The Adept Robot Control Library allows parallel, SCARA, and articulated robots manufactured by Omron Adept Technologies Inc. to be controlled directly from the NJ/NX Machine Automation Controller by using the same instructions and programming method as the controller.

Function Blocks in this library enable robot control using Ladder and ST that are the programming languages used for the NJ/NX CPU Unit, eliminating the need to learn a new robot programming language.

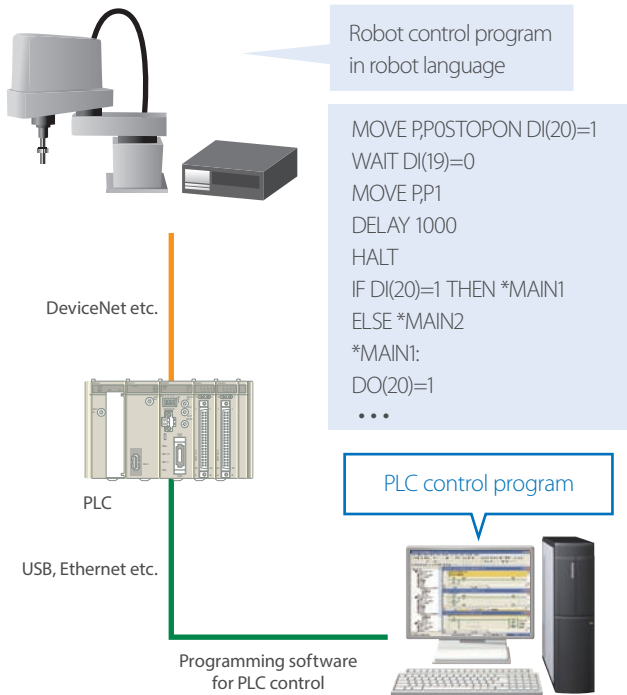The NJ/NX CPU Unit integrates robot system control and data management.

"Simplicity" that only industrial automation manufacturer Omron can achieve
You can easily connect robots, controller, and other devices and control robots directly from the NJ/NX Machine Automation Controller.
Data collected from devices can be visualized.

IoT

Database

EtherNet/IP

NJ/NX
Machine Automation Controller

sysmac
always in control

System configuration

NJ/NX
Machine Automation Controller

Directly control robots from the NJ/NX CPU Unit by using 14 FBs

EtherNet/IP

Parallel robot/Quattro

SCARA robot

Articulated robot

Example of combination of controller and robot

From

Programming requires knowledge of controller and robot.

Robot control program in robot language

```
MOVE P,P0STOPON DI(20)=1
WAIT DI(19)=0
MOVE P,P1
DELAY 1000
HALT
IF DI(20)=1 THEN *MAIN1
ELSE *MAIN2
*MAIN1:
DO(20)=1
•••
```

DeviceNet etc.

PLC

USB, Ethernet etc.

PLC control program

Programming software for PLC control

- Knowledge of both controller and robot
- I/O connection to network used for robot controller
- Separate programming and data backup

To

The same programming language is used for controller and robot control.

EtherNet/IP

NJ/NX
Machine Automation Controller

Ladder/ST program for controller and robot control

Automation Software Sysmac Studio

- Programming only for NJ/NX CPU Unit
- Integrated programming and data management for easy troubleshooting

Compatible Models

Name		Model	Version
Machine Automation Controller NJ/NX CPU Unit		NX701-□□□/NJ101-□□□	Version 1.10 or later
		NJ501-□□□/NJ301-□□□	Version 1.01 or later
Automation Software Sysmac Studio		SYSMAC-SE2□□□	Version 1.15 or higher
Parallel Robot	Hornet 565	1720□-4560□	Version 2.3.C or higher
	Quattro 650H/HS、800H	1720□-26□□□	Version 2.3.C or higher
SCARA Robot	eCobra 600/800	17□□□-1□□00	Version 2.3.C or higher
	Cobra 350	1720□-13000	Version 2.3.C or higher
Articulated Robot	Viper 650/850	1720□-36□000	Version 2.3.C or higher

Function Block (FB) Specifications

Name	FB name	Description
Set Tool Trans	ARB_SetToolTransform	Sets a tool system transformation to the robot.
Reset Tool Transform	ARB_ResetToolTransform	Resets the robot tool which is set to the robot.
Define Location	ARB_DefineLocation	Defines a position in the robot.
Define Pallet	ARB_DefinePallet	Defines all pallet information in the robot.
Reset Error	ARB_ResetRobotError	Resets any existing error in the robot.
Robot Control	ARB_RobotControl	Controls the main robot settings and monitors the robot status.
Teach Position	ARB_TeachPosition	Teaches the current robot position and configuration.
Input Output Signals	ARB_InputOutputSignals	Communicates with the robot through its digital inputs and outputs.
Teach Pendant Control	ARB_TeachPendantControl	Sends and receives information from the manual control pendant attached to the robot.
Read Latch	ARB_ReadLatch	Outputs the current robot position when an external trigger is input.
Move	ARB_MoveCommand	Moves the robot to a target position using a linear interpolation or PTP operation.
Pick And Place	ARB_PickAndPlaceCommand	Moves the robot to a target position in a three-part motion.
Jog	ARB_Jog	Moves the specified joint or axis of the robot.
Align Tool Command*	ARB_AlignToolCommand	Rotates the tool to be aligned with the world coordinate system.
Move Arc Command*	ARB_MoveArcCommand	Moves the robot to the specified target position along arc trajectory.
Move Circular Command*	ARB_MoveCircularCommand	Moves the robot along a circular trajectory, passing specified two positions.
Define Belt*	ARB_DefineBelt	Defines a conveyor belt.
Belt Read Latch*	ARB_BeltReadLatch	Outputs the belt encoder value of the conveyor when an external trigger is input.
Track Belt*	ARB_TrackBelt	Enables tracking a workpiece.

* Supported only by the Adept Robot Control Library version 2.00 or higher.

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

OMRON

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