



Add-on Library Machine Library (Machine Type R3)

User's Manual

BCN-B62005-768-*

User's manual revisions

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Add-on library revisions

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1. Summary

1.1 Summary

This document describes the MELSEC iQ-R series Motion controller compatible add-on library 005 "Machine Library (Machine type R3)".

1.2 Add-on library configuration

1.2.1 Add-on library naming

Application	Model	Add-on library name
3-axis configuration Cartesian Machine type	MCNTYP-R003	McNType003.adm

1.2.2 Add-on module list

There is no add-on module used by the MCFUN instruction in this library.

1.2.3 File size and memory usage

The file size and memory usage of the add-on library is shown below.

Add-on library name	File size [byte]	Memory usage [byte]
McNType003.adm	3726	3840

1.3 Supported software versions

The supported software versions are shown below.

Refer to Section 1.3 of "MELSEC iQ-R Motion Controller User's Manual" for how to check the software version.

1.3.1 Operating system software

The version of the Motion controller operating system software that supports the add-on library is shown below.

Motion CPU	Model	Version
R64MTCPU	SW10DNC-RMTFW	Ver.06 or later
R32MTCPU		
R16MTCPU		

1.3.2 Engineering software

The version of the engineering software that supports the add-on library is shown below.

(1) Motion controller engineering software

Product name	Model	Version
MELSOFT MT Works2 • MT Developer2 • MR Configurator2	SW1DND-MTW2-E	1.120A or later

1.4 Restrictions by the software version

There are restrictions in which functions can be used depending on the version of the add-on library, operating system software, and engineering software.

The combination of each version and a function is shown below.

Function	Add-on Library version		Operating system software version	Engineering software version	
	Major version	Minor version		MELSOFT MT Works2 (MT Developer2)	GX Works3
Machine type R3	01	01	06	1.120A	—

2. Machine type R3

2.1 Performance specifications

(1) In machine type R3, a 3-axis Cartesian robot such as the robot illustrated below is controlled.

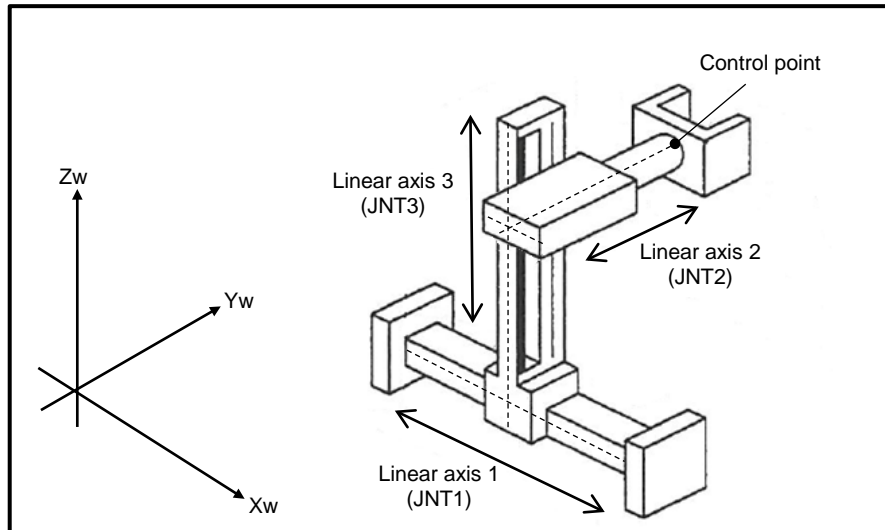


Fig. 2.1 Controlled robot

(2) The specifications for machine type R3 are shown below.

Table 2.1 Machine type R3 specifications

Item		Specifications
Machine type		3
Operating range type		—
Joint axis configuration	Joint axis 1 (JNT1)	Linear axis Operating range: -214748364.8 to 214748364.7 [μm]
	Joint axis 2 (JNT2)	Linear axis Operating range: -214748364.8 to 214748364.7 [μm]
	Joint axis 3 (JNT3)	Linear axis Operating range: -214748364.8 to 214748364.7 [μm]
	Joint axis 4 (JNT4)	—
	Joint axis 5 (JNT5)	—
	Joint axis 6 (JNT6)	—
Machine control	Control unit	mm
	Control coordinate (World coordinate system)	Xw: -214748364.8 to 214748364.7 [μm] Yw: -214748364.8 to 214748364.7 [μm] Zw: -214748364.8 to 214748364.7 [μm] FL1: No attitude flag
Coordinate conversion	Base conversion	Available
	Tool conversion	Available
JOG operation	Joint JOG	JOG operation for each joint axis
	Machine JOG	JOG operation for each coordinate component of the world coordinate system (Xw, Yw, and Zw)

2.2 Robot structure and coordinate system

The structure of the robot controlled in machine type R3 is shown below.

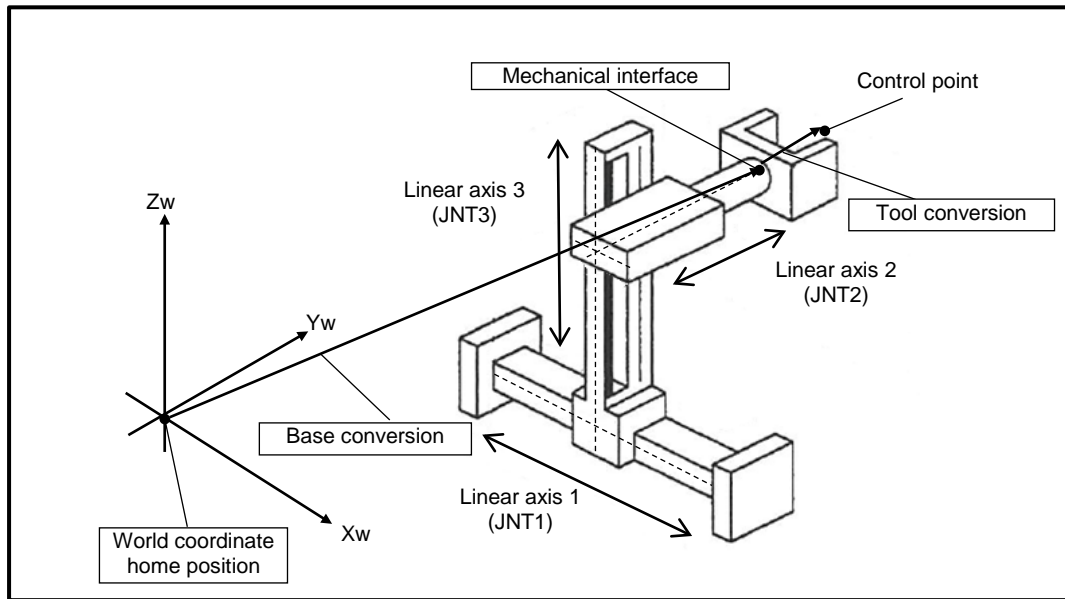


Fig. 2.2 Robot structure

2.2.1 Joint axis configuration

- (1) The robot is a 3-axis (joint axis 1 to 3) configuration Cartesian robot.
- (2) Refer to Table 2.6 for axis units (axis setting parameter).

Table 2.2 Joint axis configuration

Joint axis	Operation	Remarks
Joint axis 1 (JNT1)	Linear axis	Operating range: -214748364.8 to 214748364.7 [μm]
Joint axis 2 (JNT2)	Linear axis	Operating range: -214748364.8 to 214748364.7 [μm]
Joint axis 3 (JNT3)	Linear axis	Operating range: -214748364.8 to 214748364.7 [μm]
Joint axis 4 (JNT4)	—	—
Joint axis 5 (JNT5)	—	—
Joint axis 6 (JNT6)	—	—

2.2.2 Coordinate configuration

(1) The robot is configured by the X, Y, and Z coordinates.

The world coordinate system, base coordinate system, and tool coordinate system are shown in the table below.

Table 2.3 Coordinate configuration

Coordinate axis	Remarks
X	Position of the control point in the X direction. The unit is $\times 10^{-1} \mu\text{m}$.
Y	Position of the control point in the Y direction. The unit is $\times 10^{-1} \mu\text{m}$.
Z	Position of the control point in the Z direction. The unit is $\times 10^{-1} \mu\text{m}$.
A	Not used.
B	Not used.
C	Not used.
FL1	No attitude flag.

Table 2.4 Coordinate system

Coordinate system	Symbol	Remarks
World coordinate system	(Xw, Yw, Zw)	The coordinate system set to the ground or the floor.
Base coordinate system	(Xb, Yb, Zb)	The coordinate system set to the base of the robot. (Base bottom surface: The position where JNT1, JNT2, and JNT3 are 0.0 [μm])
Tool coordinate system	(Xt, Yt, Zt)	The coordinate system with the control point as the home position.

(2) The robot is configured by the X, Y, and Z coordinates.

(3) The mechanical interface is the control point of joint axis 2.

(4) Set the interpolation control unit to [mm].

(Set with the parameter block specified by machine parameter.)

(5) The control point is specified by the X, Y, and Z coordinates of the world coordinate system, base coordinate system, and tool coordinate system.

2.3 Positioning control parameters

The following describes the parameters set in machine type R3.

2.3.1 Machine parameter settings

The following items are set in the machine parameter.

(1) Machine parameters

Table 2.5 Machine parameter

Item			Setting value/range [unit]	Remarks	Reference section	
Machine basic setting	Machine type *1		3	• Set machine type R3.	—	
	Operating range type *1		0	• Set 0.	—	
Joint axis structure *1	J1	1 to 64	0	• Allocate the axis No. to be used for the joint axis 1 to 3. • Joint axes 4 to 6 are not used. Set to 0.	—	
	J2					
	J3					
	J4					
	J5					
	J6					
Arm length setting	L1	0.0 [μm]	• Arm lengths L1 to L6 are not used. The setting values are ignored.	—		
	L2					
	L3					
	L4					
	L5					
	L6					
Machine speed setting	Parameter block designation		1 to 64	• Set the parameter block to be used in machine operation. • Set the interpolation units of the parameter block to [mm].	—	
	Machine JOG speed limit value (mm)		0.01 to 6000000.00 [mm/min]	• Set the maximum speed for machine JOG operation.	—	
	Machine JOG speed limit value (degree)		0.00000 [degree/min]	• Not used. The setting value is ignored.	—	
XYZ stroke limit setting	+X	-214748364.8 to 214748364.7 [μm]	• Set the movable range of the control point in the base coordinate system. When not using, set both + and - to 0.0. • When upper limit ≤ lower limit, the XYZ stroke limit check is not performed.	—		
	-X					
	+Y	-214748364.8 to 214748364.7 [μm]			• Set the base position as viewed from the world coordinates at the power supply ON, or CPU reset. • A, B, and C are not used. The setting values are ignored.	—
	-Y					
	+Z	-214748364.8 to 214748364.7 [μm]				
	-Z					
Base conversion	Bx	-99999999.9 to 99999999.9 [μm]	• Set the base position as viewed from the world coordinates at the power supply ON, or CPU reset. • A, B, and C are not used. The setting values are ignored.	—		
	By	-99999999.9 to 99999999.9 [μm]				
	Bz	-99999999.9 to 99999999.9 [μm]				
	Ba	0.00000 [degree]				
	Bb	0.00000 [degree]				
	Bc	0.00000 [degree]				
Tool conversion	Tx	-99999999.9 to 99999999.9 [μm]	• Set the control point as viewed from the mechanical interface at the power supply ON, or CPU reset.	—		
	Ty	-99999999.9 to 99999999.9 [μm]				
	Tz	-99999999.9 to 99999999.9 [μm]				
Option setting A			H0	• Option settings A1 to A10 are not used. The setting values are ignored.	—	
Option setting B			H0	• Option settings B1 to B10 are not used. The setting values are ignored.	—	

*1: When setting value is outside range, a moderate error (error code: 30FAH) occurs.

2.3.2 Axis setting parameter (fixed parameter) settings

In machine type R3, set the following items in the fixed parameter of axes defined as joint axes.

(1) Fixed parameter

Table 2.6 Fixed parameters

No.	Item	Setting value/range [unit] (setting by peripheral equipment)			Remarks
		Joint axis 1	Joint axis 2	Joint axis 3	
1	Unit setting	mm			• Select [mm] for the unit of the joint axis.
2	Upper stroke limit	-150000000.0 to 150000000.0 [μ m]			• Set the upper/lower stroke limit value of the moving range of the machine. • Make sure the upper/lower stroke limit values are not the same.
3	Lower stroke limit				

2.4 Point data

(1) When using machine type R3, the setting range of point block data are as follows.

Table 2.7 Point data (position type) setting range

Position component	Details	Command range	
		Absolute value command (ABS)	Incremental value command (INC)
X	Position (distance) to move in the X direction	-214748364.8 to 214748364.7 [μ m]	-214748364.7 to 214748364.7 [μ m]
Y	Position (distance) to move in the Y direction	-214748364.8 to 214748364.7 [μ m]	-214748364.7 to 214748364.7 [μ m]
Z	Position (distance) to move in the Z direction	-214748364.8 to 214748364.7 [μ m]	-214748364.7 to 214748364.7 [μ m]
A	Angle to rotate the A coordinate *1	0.00000 [degree]	
B	Angle to rotate the B coordinate *1		
C	Angle to rotate the C coordinate *1		
FL1	Structure flag 1 *1	H0	
FL2	Structure flag 2 *1	H0	

*1: The setting value is ignored.

Table 2.8 Point data (joint type) setting range

Position component	Details	Command range	
		Absolute value command (ABS)	Incremental value command (INC)
J1	Position (distance) for moving JNT1	-214748364.8 to 214748364.7 [μ m]	-214748364.7 to 214748364.7 [μ m]
J2	Position (distance) for moving JNT2	-214748364.8 to 214748364.7 [μ m]	-214748364.7 to 214748364.7 [μ m]
J3	Position (distance) for moving JNT3	-214748364.8 to 214748364.7 [μ m]	-214748364.7 to 214748364.7 [μ m]
J4	Position (distance) for moving JNT4 *1	0	
J5	Position (distance) for moving JNT5 *1		
J6	Position (distance) for moving JNT6 *1		
-	Unusable *1	H0	
-	Unusable *1	H0	

*1: The setting value is ignored.

(2) The structure of structure flag 1 (FL1) is shown below.

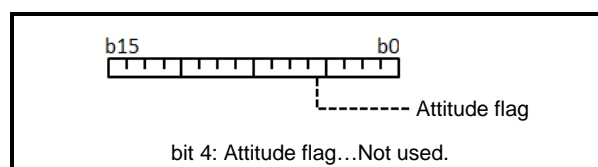


Fig. 2.3 Structure flag 1 (FL1)