Orientalmotor

MRC01・MRC Studio Update Content

MRC01 Ver.4.20 ▶ Ver.5.00
MRC Studio Ver.4.3.0.0 ▶ Ver.5.0.0.0

■ April, 2025

List of Contents

- Support for new robots
- New command “Linear (Tool)”
- “Handed system” and “1st Link rotation angle” parameter for Return-to-origin/ZHOME
- Upper limit of coordinate changed (from ±2,000 to ±5,000 mm)
- Direct-data operation override function
- MRC Studio- Program start function
- MRC Studio- Recommended protective function setting
- Minor modifications

  Reflection timing of simulation mode changed
  Feedback position/Command position switching in implicit communication
  Permission of operation near singularity for end effector commands
  Camera coordinate range for DD operation increased (from 2,000 to 2,000,000 px)

Scheduled to be switched on April 7, 2025

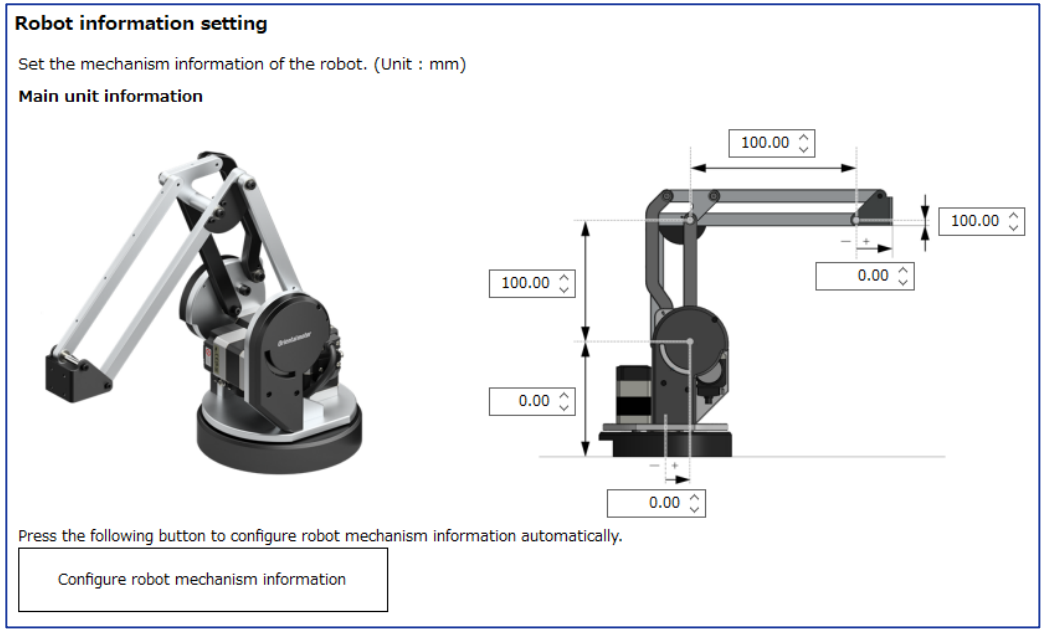
⚠ Compatibility with previous version

Support for new robots（Educational Robot ”Motion System Master”）

MSE3039K1-V
(3-axis)

MSE3039K1-V +Rz
(4-axis)

*Rz axis can be freely provided by customers

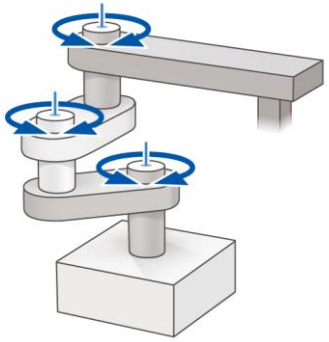
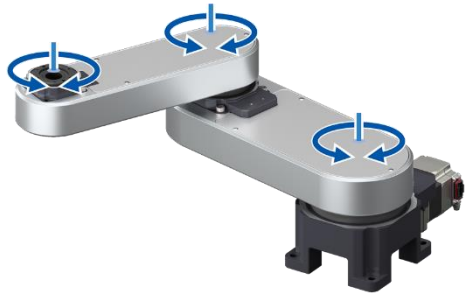
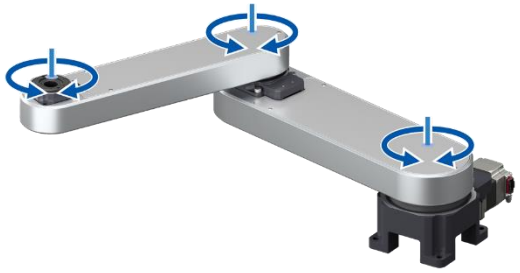
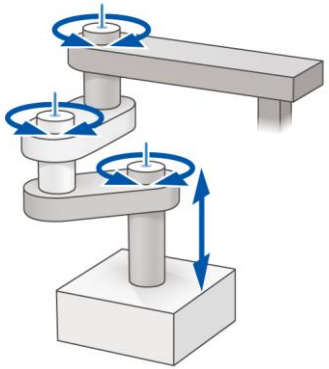
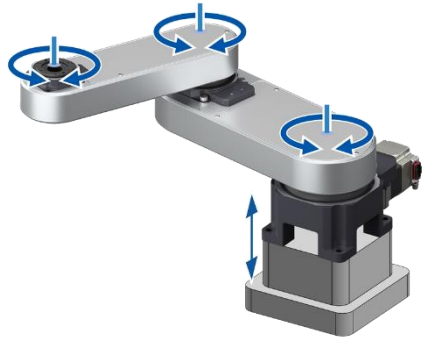
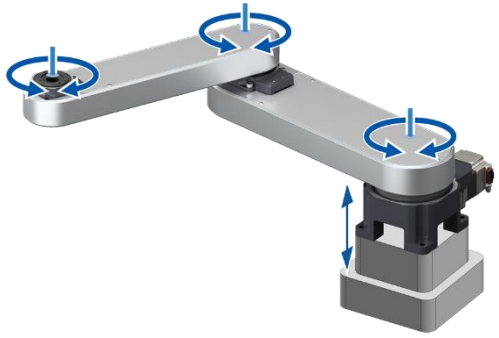


Mechanism setting can be input with 1-Click

*In addition to the number of axes of the robot, plus 2 axes can be controlled as end effectors (additional axes).

Support for new robots（SCARA (360-degree rotation)）

*In addition to the number of axes of the robot, plus 2 axes can be controlled as end effectors (additional axes).

	In-house	OVR	
Stroke	Free	OVR3046K10-V	OVR3070K3-H
Without Up-down			
Base up-down			

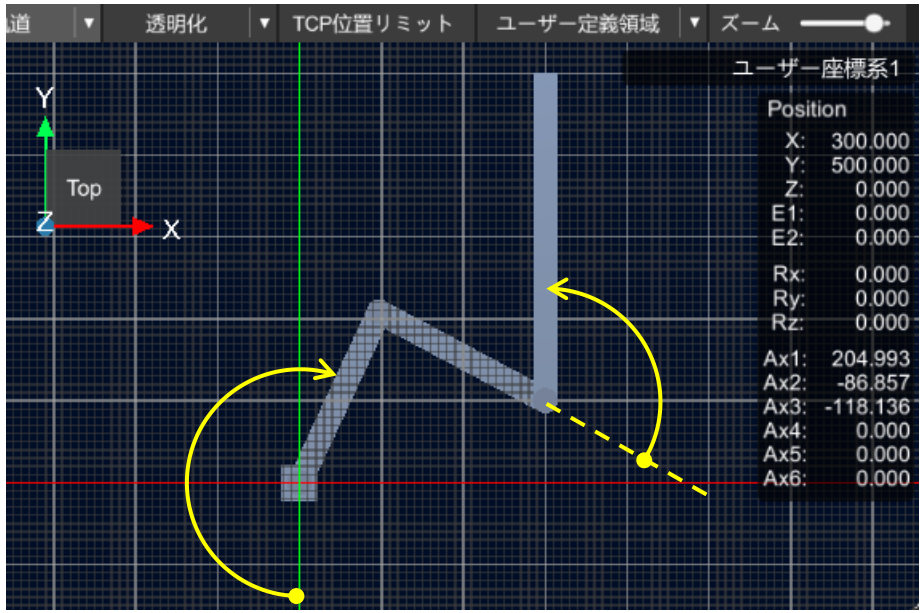
Support for new robots（SCARA (360-degree rotation)）

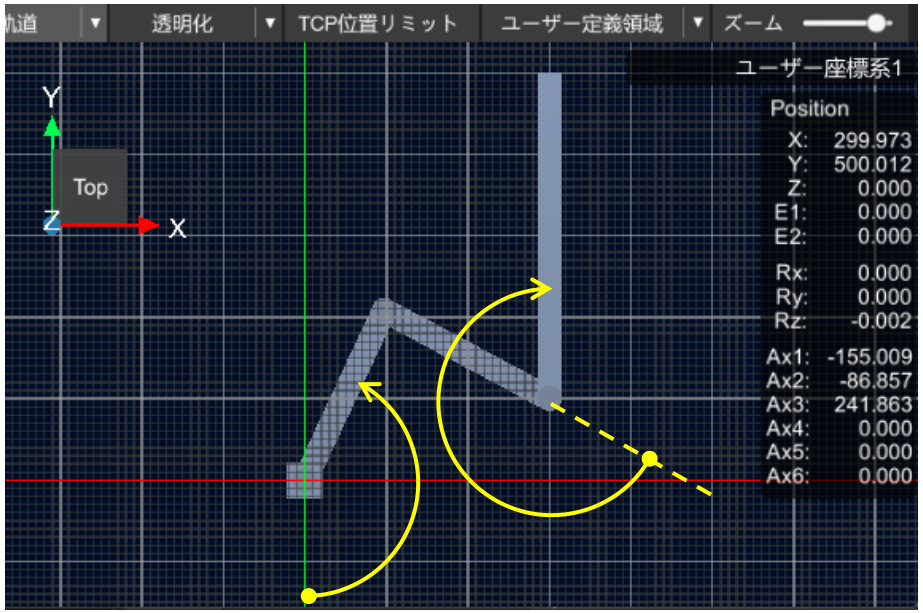
1st Link rotation angle：Command setting items specific to SCARA (360-degree rotation)

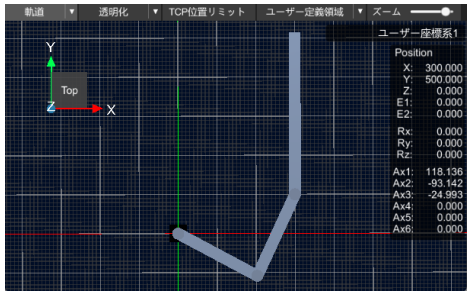
($\theta < -180\text{deg}$ / $-180 \leq \theta \leq +180\text{deg}$ / $\theta > +180\text{deg}$)

SCARA (360-degree rotation) has extended movable range of M1 and M3 to $-360 \leq \theta \leq +360\text{deg}$.

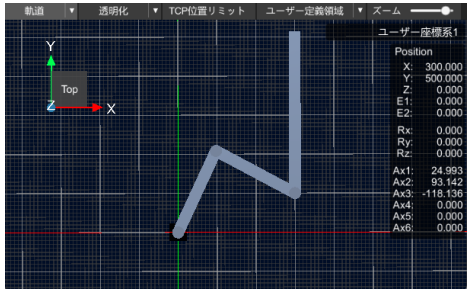
→"1st Link rotation angle" is multi-rotation information to specify the motor angle.







Right-handed



Left-handed

Since $-360 \leq \theta \leq +360\text{deg}$, two patterns can be taken in one posture.

Basically, - $-180 \leq \theta \leq +180\text{deg}$ is sufficient,

but if necessary, select $\theta < -180\text{deg}$ or $\theta > +180\text{deg}$ to execute the operation.

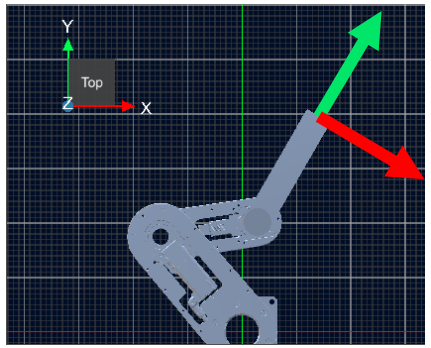
used in the PtoP command as well as the hand system in the standard SCARA.

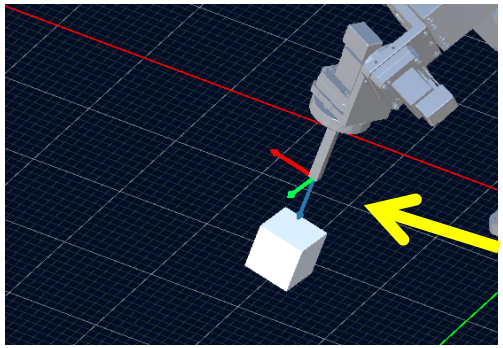
New command “Linear (Tool)”

Command to move relative to the current TCP posture (Rx, Ry, Rz) in the X, Y, Z direction ＝ tool coordinate system

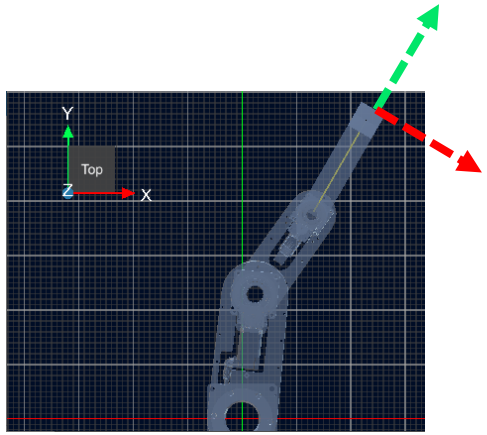
This command is effective when you want to translate TCP without changing its posture.

e.g.) Insertion/withdrawal motion, combination with 3D vision sensor)

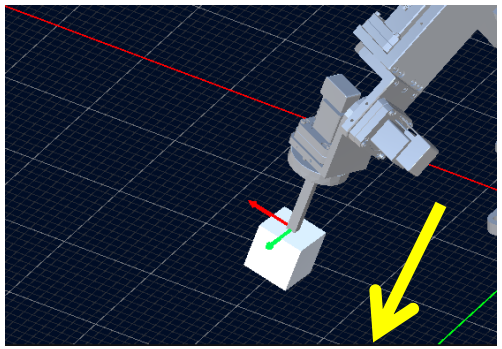




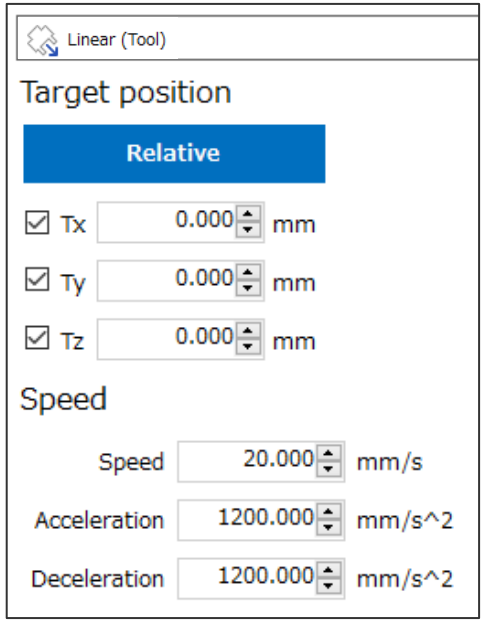
Move to near once
Align posture with workpiece



Toward straightening the link



Keeping the posture
approach in Tz direction



Setting screen

<Specifications>

Relative position only.

Rx, Ry, Rz, E1, E2 are not applicable.

Input in a direction that cannot be moved is not reflected.

.e.g.)

If you execute a Lineat (tool) command with only Tz

on a SCARA without up-down axis,

it does not work and the next command is executed.

“Handed system” and “1st Link rotation angle” parameter for Return-to-origin/ZHOME

parameter for Return-to-origin

14	Return-to-origin operation target coordinates selection	XYZ RxRyRz
15	Return-to-origin operation operation mode	Linear
16	Return-to-origin operation speed [mm/s or deg/s]	10.000
17	Return-to-origin operation acceleration/deceleration [mm/s^2 or deg/s^2]	1,200.000
18	Return-to-origin operation Handed system selection (only PTP)	No change
19	Return-to-origin operation 1st Link rotation angle Setting (only SCARA (Omni-directional) and PTP)	-180deg~+180deg

New addition

parameter for ZHOME operation

25	ZHOME operation mode	Linear
26	ZHOME-ALL operating speed [mm/s]	20.000
27	ZHOME-RB operating speed [mm/s]	10.000
28	ZHOME-E1 operating speed [mm/s or deg/s]	1.000
29	ZHOME-E2 operating speed [mm/s or deg/s]	1.000
30	ZHOME Acceleration/deceleration [mm/s^2]	1,200.000
31	ZHOME Handed system selection (only PTP)	No change
32	ZHOME 1st Link rotation angle Setting (only SCARA (Omni-directional) and PTP)	-180deg~+180deg

New addition

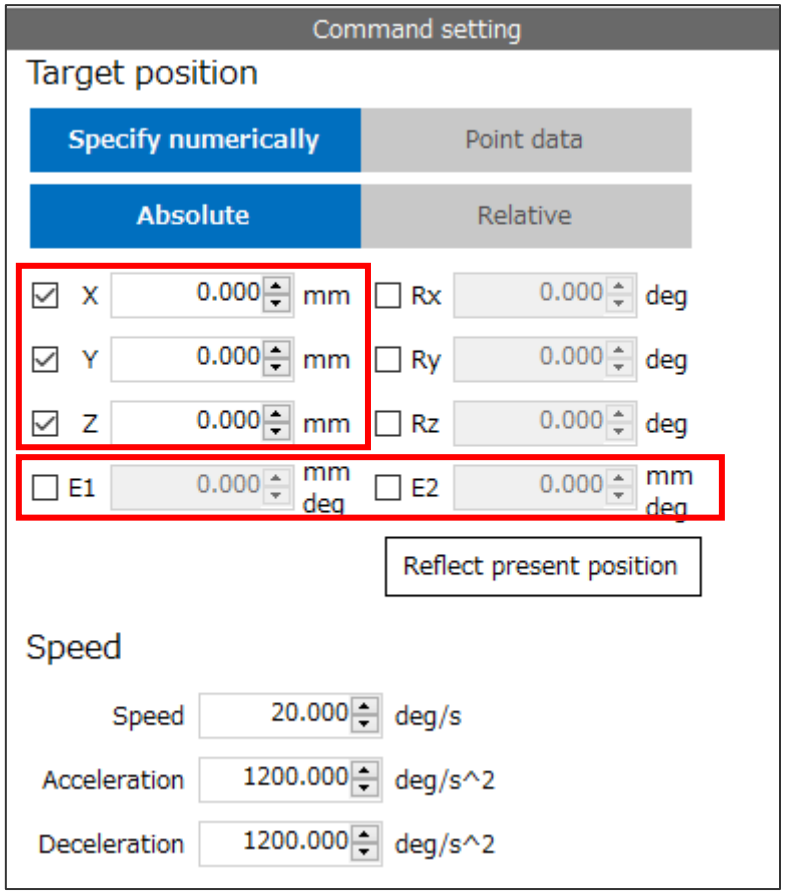
“Handed system” and “1st Link rotation angle” can be set when performing Return-to-origin and ZHOME operation.

- This is applicable only when the operation method is P to P. (Not applicable for linear operation.)
- 1st link rotation angle setting is valid only for SCARA (360-degree rotation). (It has no effect on other robots.)

⇒Command position can be specified accurately.

Upper limit of coordinate changed (from ±2,000 to ±5,000 mm)

The range of coordinate values that can be set for X, Y, Z, E1, and E2 is expanded to -5,000~+5,000 [mm].



<Purpose>

Accommodate long-stroke sliders, etc.

<Applicable for>

- Operation data - Target position
- Operation data - Specified parameters such as circular, arch, etc.
- Point data
- Pallet setting
- Coordinates of mechanism protection setting
- Strokes of Cartesian robots

Direct-data operation override function

Override to the next operation is possible without stopping during operation.

Condition 1

21	Direct data operation Override	Disable

Newly added “Direct data operation Override” parameter is set to “1: Enable” (initial value is “0: Disable”)

Condition 2

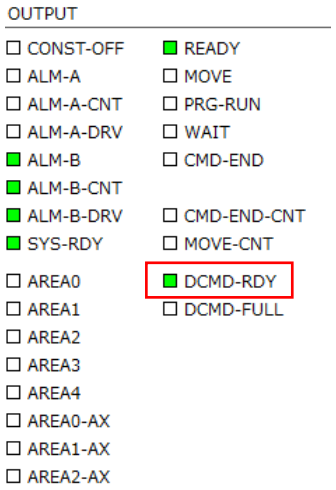
The operation to be overridden must be a DD operation and an interpolated operation (linear, circular, arch, etc.)

⇒Program operation and teaching operation are not allowed.

P to P and Axis moving commands are not allowed even in DD operation.

Condition 3

Only 3 overrides are possible: “Linear (Absolute)”, “Linear (Relative)”, and “Linear (Ref. DD)”.



Example:

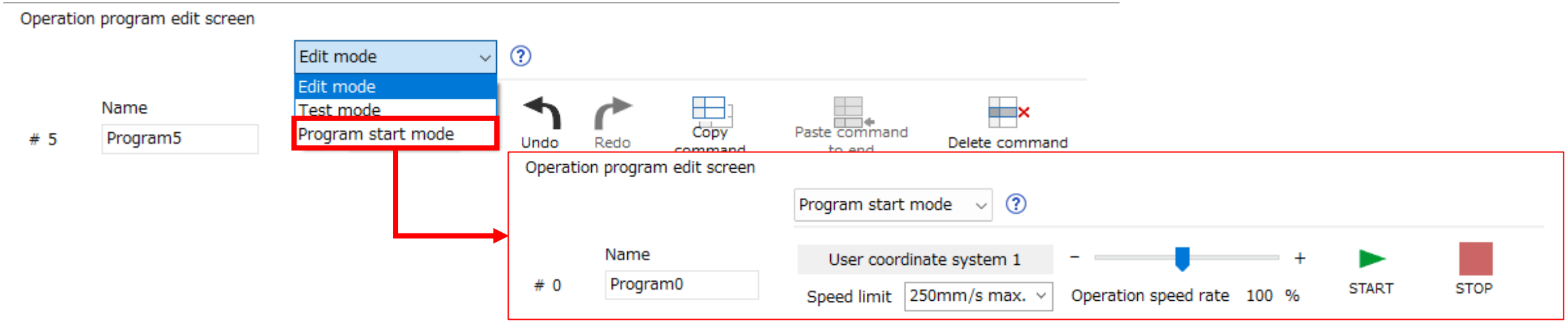
During linear command in DD operation, override with a linear command in DD operation	⇒ OK
During circular command in DD operation, override with a linear command in DD operation	⇒ OK
During circular command in program operation, override with a linear command in DD operation	⇒ Not permitted (Condition 2)
During P to P command in DD operation, override with a linear command in DD operation	⇒ Not permitted (Condition 2)
During linear command in DD operation, override with a circular command in DD operation	⇒ Not permitted (Condition 3)

New DCMD-RDY output signal is added.

⇒Turns ON when DD operation can be started and linear command override is possible.

MRC Studio- Program start function

In addition to the test mode, “program start mode” is added.



<Features>

・Same function as when START input is input to MRC01.

・Unlike the test mode, no waiting time occurs between commands.

・Writes the operation data being edited for synchronization.

Limitations that prevent operation startup from external I/O and implicit communication.

Initial speed limit of 250mm/s

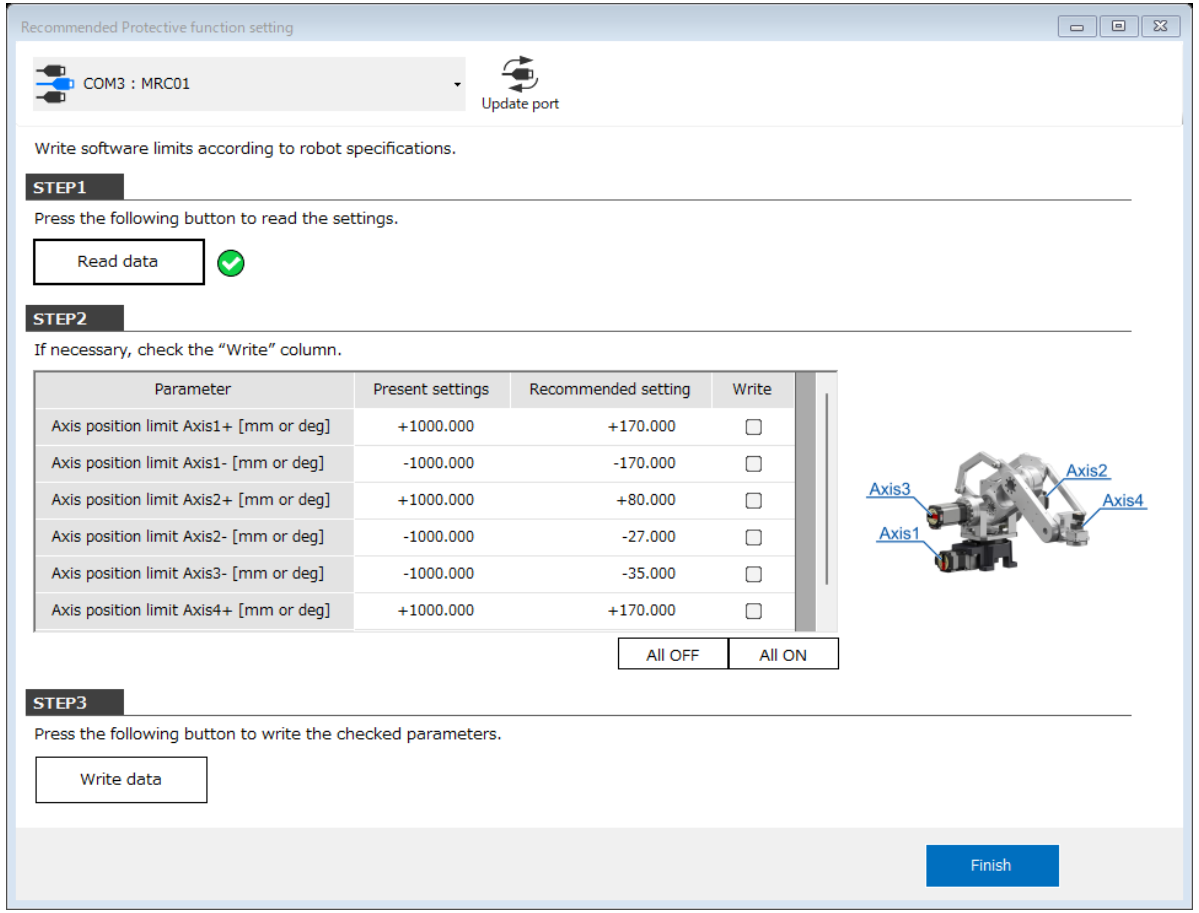
Slider for speed adjustment

are the same specifications as in the test mode.

Final confirmation and demonstration can be performed from MRC studio without I/O

MRC Studio- Recommended protective function setting for OVR robots

Function to easily write in limits for the angular range of the axis when using OVR



<Features>

*Some parameters are different.

Display the range of motion for each axis for each OVR saved in MRC Studio.

You can compare with the current settings, select only the target you want to write, and then execute the write.

Display recommended parameters if any after setup.

Can also be executed from the maintenance menu.

Stop the robot before it hits the stopper of each axis.

Minor modifications

①Timing for reflecting simulation mode has been changed from “Reconnecting power” to “Configuration”.

2	Simulation mode	Disable

You can now easily use the simulation mode without reconnecting power.
(No change in functionality)

②Feedback position and feedback speed monitors in Implicit communication can now be changed to command position and command speed.

25	Encapsulation Inactivity Timeout (attr.13) [s]	120
26	Ethernet Link Object (F6h)	
27	Interface Control (attr.6) (Ethernet Port 1)	Auto-negotiation enable
28	Interface Control (attr.6) (Ethernet Port 2)	Auto-negotiation enable
29	Implicit communication Position / Speed monitor Selection	Feedback position / Feedback speed
30	Controller assignable monitor address 0	1,448
31	Controller assignable monitor address 1	1,247

New addition
(reflect by reconnecting the power)

(DD) TRIG	1	0001
(DD) Status	4	0004
(DD) Operation mode	0	0000
(DD) Axis selection	0	00
(DD) TCP operation target coordinates selection	0	00
Feedback position X [x0.001mm]	81756	00013F5C
Feedback position Y [x0.001mm]	-402285	FFF9DC93
Feedback position Z [x0.001mm]	0	00000000
Feedback position Rx [x0.001deg]	0	00000000
Feedback position Ry [x0.001deg]	0	00000000
Feedback position Rz [x0.001deg]	-3743730	FFC6E00E
Feedback position E1 [x0.001]	0	00000000
Feedback position E2 [x0.001]	0	00000000
TCP Feedback speed [x0.001mm/s]	0	00000000
Handed system	2	0002
Tool offset number	1	0001

In case of “Feedback” (initial value)

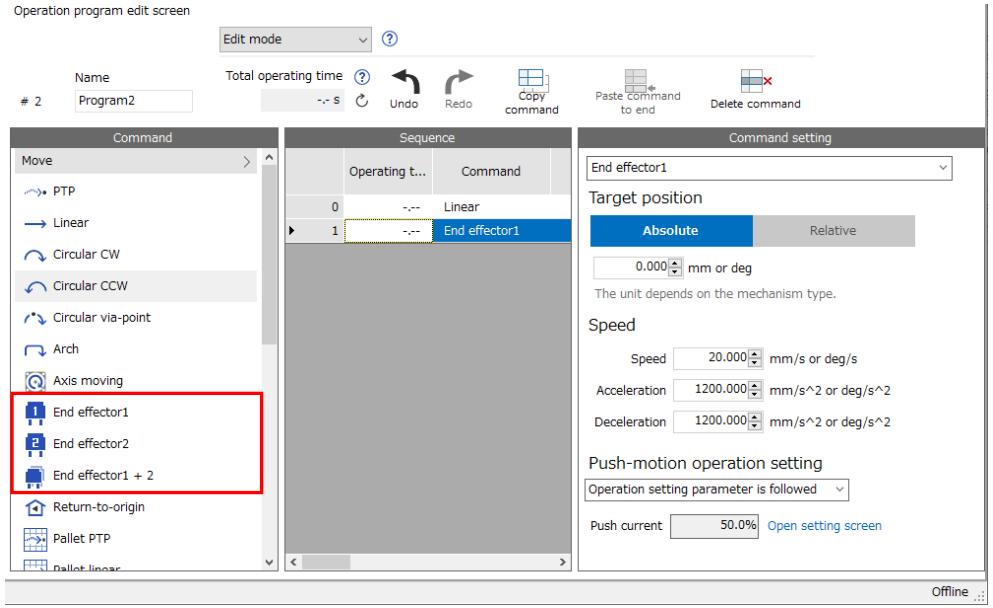
(DD) TRIG	1	0001
(DD) Status	4	0004
(DD) Operation mode	0	0000
(DD) Axis selection	0	00
(DD) TCP operation target coordinates selection	0	00
Command position X [x0.001mm]	81783	00013F77
Command position Y [x0.001mm]	-402306	FFF9DC7E
Command position Z [x0.001mm]	0	00000000
Command position Rx [x0.001deg]	0	00000000
Command position Ry [x0.001deg]	0	00000000
Command position Rz [x0.001deg]	-3743735	FFC6E009
Command position E1 [x0.001]	0	00000000
Command position E2 [x0.001]	0	00000000
TCP Command speed [x0.001mm/s]	0	00000000
Handed system	2	0002
Tool offset number	1	0001

In case of “Command”

Please select “Command” when positioning operation is mainly performed on the host device side such as PLC.

Minor modifications

③Permission of operation near singularity for end effector commands



Until now, Alarm “Near singularity” occurred
when executed near the singularity.

New addition

13	End effector Command Near singularity	Alarm generated

By selecting “Alarm not present”,
the end-effector can be moved even when the arm is extended or folded.

④Camera coordinate range for DD operation increased（from 2,000 to 2,000,000 px）（coordinate X & Y）

- (DD) Camera coordinate X coordinate

Bit	Name	Description	Initial value
0 to 31	Direct data operation camera coordinate X coordinate	This is used to set the X coordinate of the load captured by the camera. [Setting range] −2,000,000 to 2,000,000 (1=0.001 px)	0

- (DD) Camera coordinate Y coordinate

Bit	Name	Description	Initial value
0 to 31	Direct data operation camera coordinate Y coordinate	This is used to set the Y coordinate of the load captured by the camera. [Setting range] −2,000,000 to 2,000,000 (1=0.001 px)	0

±2,000,000⇒±20,000,000

Higher pixel camera can be supported.
(The upper limit has been increased because a high-resolution camera with more than 10 MP could not be used.)

List of newly added parameters

ID	Parameter Name	description	Range	Initial value	Reflect timing
4559 (11CFh)	Direct data operation Override	Enables/disables the override of the linear command for direct-data operation.	0: Disable 1: Enable	0	Immediately
4450 (1162h)	End effector command near singularity	Selects whether or not an alarm is generated when an end effector command is executed near singularity point.	0: Alarm generated 1: Alarm not present	0	Immediately
4446 (115Eh)	Return-to-origin operation Handed system selection	Selects the handed system for Return-to-origin operation.(Valid only when the operation is P to P.)	0: No change 1: Right handed system 2: Left handed system	0	After operation
4447 (115Fh)	Return-to-origin operation 1st Link rotation angle	Selects the 1st link rotation angle for Return-to-origin operation. (Valid only when the operation is P to P and SCARA (360-degree rotation).)	-1: -180deg or less 0: -180deg~+180deg 1: +180deg or over	0	After operation
4448 (1160h)	ZHOME Handed system selection	Selects the handed system for ZHOME operation.(Valid only when the operation is P to P.)	0: No change 1: Right handed system 2: Left handed system	0	After operation
4449 (1161h)	ZHOME 1st Link rotation angle	Selects the 1st link rotation angle for ZHOME operation. (Valid only when the operation is P to P and SCARA (360-degree rotation).)	-1: -180deg or less 0: -180deg~+180deg 1: +180deg or over	0	After operation
4558 (11CEh)	Implicit communication Position / Speed monitor Selection	Select the position and speed that can be monitored by Implicit communication.	0: Feedback position / Feedback speed 1: Command position / Command speed	0	after reconnecting the power

Compatibility with previous version

Compatibility with previous version (MRC01・MRC Studio)

Prev

×

New

Combination not possible

Communication is not possible.

Firmware update is required from MRC Studio.

New

×

Prev

Combination not possible

Communication is possible, but deprecated.

MRC01 data may be changed.

Operation commands and parameters that are newly added or whose setting range is extended cannot be read.

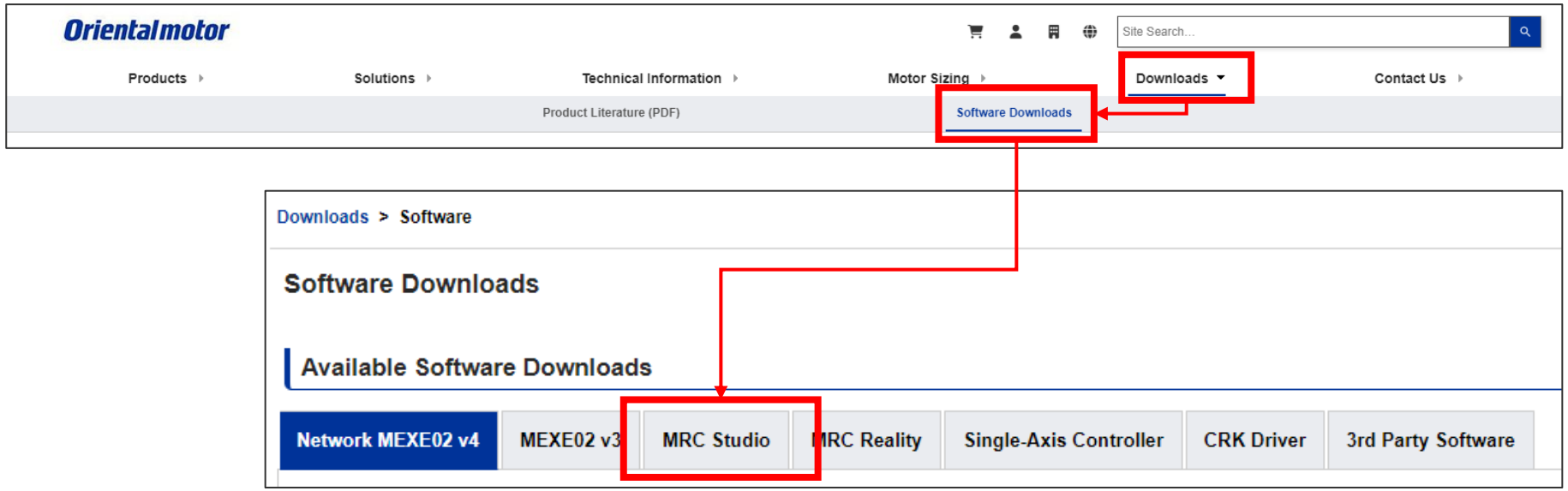
The data in MRC01 will be changed if it is written after being read by previous MRC Studio.

(The data will be set to the initial value.)

Compatibility with previous version (MRC01・MRC Studio)

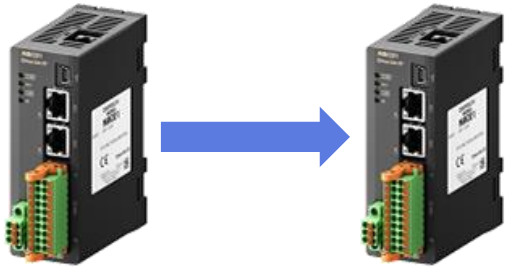
New

The new MRC Studio can be downloaded from our website.

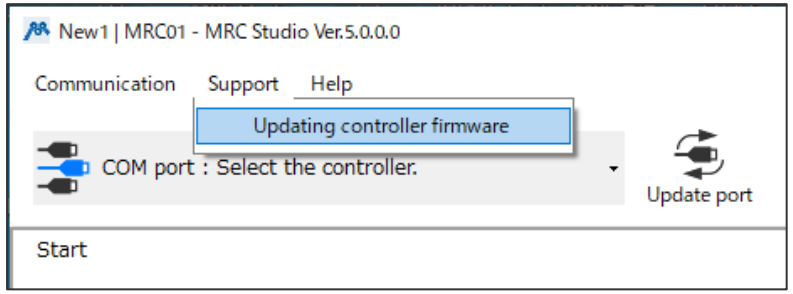


Prev

New



The MRC01 that you have already bought can be updated.



Please run from MRC Studio Ver. 5.0.0.0.

The update will not change the operation.

Oriental motor