

**Motoman NX100 Controller**  
**External Axis**  
**Endless Rotation**  
**Function Manual**

Part Number: 149648-7CD  
Revision: 1



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## Chapter 1

# Introduction

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### 1.1 About This Document

This manual provides instructions for the External Axis Endless Rotation function and contains the following sections:

#### **SECTION 1 - INTRODUCTION**

Provides general information about the structure of this manual, a list of reference documents, and customer service information.

#### **SECTION 2 - SAFETY**

This section provides information regarding the safe use and operation of Motoman products.

#### **SECTION 3 - EXTERNAL AXIS ENDLESS ROTATION INSTRUCTIONS**

Provides detailed information about the External Axis Endless Rotation function.

## 1.2 Reference to Other Documentation

For additional information refer to the following:

- NX100 Controller Manual (P/N 149201-1)
- Concurrent I/O Manual (P/N 149230-1)
- Operator's Manual for your application
- Vendor manuals for system components not manufactured by Motoman

## 1.3 Customer Service Information

If you are in need of technical assistance, contact the Motoman service staff at (937) 847-3200. Please have the following information ready before you call:

- Product Type (External Axis Endless Rotation)
- Robot Serial Number (located on back side of robot arm)
- Robot Sales Order Number (located on back of controller)

## Chapter 2

# Safety

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### 2.1 Introduction

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**It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, or laws relating to safety and safe operating conditions for each installation are met and followed.**

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We suggest that you obtain and review a copy of the ANSI/RIA National Safety Standard for Industrial Robots and Robot Systems. This information can be obtained from the Robotic Industries Association by requesting ANSI/RIA R15.06. The address is as follows:

**Robotic Industries Association**

900 Victors Way

P.O. Box 3724

Ann Arbor, Michigan 48106

TEL: (734) 994-6088

FAX: (734) 994-3338

Ultimately, the best safeguard is trained personnel. The user is responsible for providing personnel who are adequately trained to operate, program, and maintain the robot cell. **The robot must not be operated by personnel who have not been trained!**

We recommend that all personnel who intend to operate, program, repair, or use the robot system be trained in an approved Motoman training course and become familiar with the proper operation of the system.

This safety section addresses the following:

- Standard Conventions (Section 2.2)
- General Safeguarding Tips (Section 2.3)
- Mechanical Safety Devices (Section 2.4)
- Installation Safety (Section 2.5)
- Programming Safety (Section 2.6)
- Operation Safety (Section 2.7)
- Maintenance Safety (Section 2.8)

## 2.2 Standard Conventions

This manual includes information essential to the safety of personnel and equipment. As you read through this manual, be alert to the four signal words:

DANGER!

WARNING!

CAUTION!

*NOTE:*

Pay particular attention to the information provided under these headings which are defined below (in descending order of severity).



**DANGER!**

Information appearing under the **DANGER** caption concerns the protection of personnel from the immediate and imminent hazards that, if not avoided, will result in immediate, serious personal injury or loss of life in addition to equipment damage.



**WARNING!**

Information appearing under the **WARNING** caption concerns the protection of personnel and equipment from potential hazards that can result in personal injury or loss of life in addition to equipment damage.



**CAUTION!**

Information appearing under the **CAUTION** caption concerns the protection of personnel and equipment, software, and data from hazards that can result in minor personal injury or equipment damage.



*Note: Information appearing in a Note caption provides additional information which is helpful in understanding the item being explained.*

## 2.3 General Safeguarding Tips

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. General safeguarding tips are as follows:

- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation of this robot, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this robot system.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the robot cell.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).
- The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- In accordance with ANSI/RIA R15.06, section 6.13.4 and 6.13.5, use lockout/tagout procedures during equipment maintenance. Refer also to Section 1910.147 (29CFR, Part 1910), Occupational Safety and Health Standards for General Industry (OSHA).

## 2.4 Mechanical Safety Devices

The safe operation of the robot, positioner, auxiliary equipment, and system is ultimately the user's responsibility. The conditions under which the equipment will be operated safely should be reviewed by the user. The user must be aware of the various national codes, ANSI/RIA R15.06 safety standards, and other local codes that may pertain to the installation and use of industrial equipment. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety measures are available:

- Safety fences and barriers
- Light curtains
- Door interlocks
- Safety mats
- Floor markings
- Warning lights

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.

## 2.5 Installation Safety

Safe installation is essential for protection of people and equipment. The following suggestions are intended to supplement, but not replace, existing federal, local, and state laws and regulations. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. Installation tips are as follows:

- Be sure that only qualified personnel familiar with national codes, local codes, and ANSI/RIA R15.06 safety standards are permitted to install the equipment.
- Identify the work envelope of each robot with floor markings, signs, and barriers.
- Position all controllers outside the robot work envelope.
- Whenever possible, install safety fences to protect against unauthorized entry into the work envelope.
- Eliminate areas where personnel might get trapped between a moving robot and other equipment (pinch points).
- Provide sufficient room inside the workcell to permit safe teaching and maintenance procedures.

## 2.6 Programming Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Programming tips are as follows:

Any modifications to PART 1 of the NX100 controller PLC can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to PART 1. Making any changes without the written permission of Motoman will VOID YOUR WARRANTY!

Some operations require standard passwords and some require special passwords. Special passwords are for Motoman use only. YOUR WARRANTY WILL BE VOID if you use these special passwords.

Back up all programs and jobs onto a floppy disk whenever program changes are made. To avoid loss of information, programs, or jobs, a backup must always be made before any service procedures are done and before any changes are made to options, accessories, or equipment.

The concurrent I/O (Input and Output) function allows the customer to modify the internal ladder inputs and outputs for maximum robot performance. Great care must be taken when making these modifications. Double-check all modifications under every mode of robot operation to ensure that you have not created hazards or dangerous situations that may damage the robot or other parts of the system.



- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.
- Inspect the robot and work envelope to be sure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Be sure that all safeguards are in place.
- Check the E-STOP button on the teach pendant for proper operation before programming.
- Carry the teach pendant with you when you enter the workcell.
- Be sure that only the person holding the teach pendant enters the workcell.
- Test any new or modified program at low speed for at least one full cycle.

## 2.7 Operation Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Operation tips are as follows:

- Be sure that only trained personnel familiar with the operation of this robot, the operator's manuals, the system equipment, and options and accessories are permitted to operate this robot system.
- Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Inspect the robot and work envelope to ensure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Ensure that all safeguards are in place.
- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the cell.
- The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller, external servo box, and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.

- All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot. This includes controller parameters, ladder parts 1 and 2, and I/O (Input and Output) modifications. Check and test all changes at slow speed.

## 2.8 Maintenance Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Maintenance tips are as follows:

- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.
- Back up all your programs and jobs onto a floppy disk whenever program changes are made. A backup must always be made before any servicing or changes are made to options, accessories, or equipment to avoid loss of information, programs, or jobs.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the cell.
- The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- Be sure all safeguards are in place.
- Use proper replacement parts.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller, external servo box, and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot. This includes controller parameters, ladder parts 1 and 2, and I/O (Input and Output) modifications. Check and test all changes at slow speed.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).

# NX100 OPTIONS INSTRUCTIONS

## FOR EXTERNAL AXIS ENDLESS FUNCTION

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Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

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### MOTOMAN INSTRUCTIONS

MOTOMAN-□□□ INSTRUCTIONS  
NX100 INSTRUCTIONS  
NX100 OPERATOR'S MANUAL  
NX100 MAINTENANCE MANUAL

The NX100 operator's manuals above correspond to specific usage.  
Be sure to use the appropriate manual.





## MANDATORY

- **This manual explains the external axis endless function of the NX100 system and general operations. Read this manual carefully and be sure to understand its contents before handling the NX100.**
- **General items related to safety are listed in Section 1: Safety of the NX100 Instructions. To ensure correct and safe operation, carefully read the NX100 Instruction before reading this manual.**



## CAUTION

- **Some drawings in this manual are shown with the protective covers or shields removed for clarity. Be sure all covers and shields are replaced before operating this product.**
- **The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.**
- **YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.**
- **If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.**
- **YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids your product's warranty.**

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## NOTES FOR SAFE OPERATION

Read this manual carefully before installation, operation, maintenance, or inspection of the NX100.

In this manual, the Notes for Safe Operation are classified as “WARNING”, “CAUTION”, “MANDATORY”, or “PROHIBITED”.



### WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.



### CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.



### MANDATORY

Always be sure to follow explicitly the items listed under this heading.



### PROHIBITED

Must never be performed.

Even items described as “CAUTION” may result in a serious accident in some situations. At any rate, be sure to follow these important items.



To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “CAUTION” and “WARNING”.



## WARNING

- **Before operating the manipulator, check that servo power is turned OFF when the emergency stop buttons on the front door of the NX100 and programming pendant are pressed. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.**

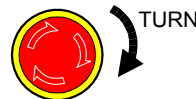
Injury or damage to machinery may result if the emergency stop circuit cannot stop the manipulator during an emergency. The manipulator should not be used if the emergency stop buttons do not function.



Emergency Stop Button

- **Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the manipulator. Then turn the servo power ON.**

Injury may result from unintentional or unexpected manipulator motion.



Release of Emergency Stop

- **Observe the following precautions when performing teaching operations within the working envelope of the manipulator:**
  - **View the manipulator from the front whenever possible.**
  - **Always follow the predetermined operating procedure.**
  - **Ensure that you have a safe place to retreat in case of emergency.**

Improper or unintended manipulator operation may result in injury.

- **Confirm that no person is present in the P-point maximum envelope of the manipulator and that you are in a safe location before:**
  - **Turning ON the NX100 power**
  - **Moving the manipulator with the programming pendant**
  - **Running the system in the check mode**
  - **Performing automatic operations**

Injury may result if anyone enters the P-point maximum envelope of the manipulator during operation. Always press an emergency stop button immediately if there is a problem. The emergency stop buttons are located on the right of the front door of the NX100 and the programming pendant.



## CAUTION

- **Perform the following inspection procedures prior to conducting manipulator teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.**
  - Check for problems in manipulator movement.**
  - Check for damage to insulation and sheathing of external wires.**
- **Always return the programming pendant to the hook on the NX100 cabinet after use.**

The programming pendant can be damaged if it is left in the manipulator's work area, on the floor, or near fixtures.

- **Read and understand the Explanation of Warning Labels in the NX100 Instructions before operating the manipulator.**

## Definition of Terms Used Often in This Manual


The MOTOMAN manipulator is the YASKAWA industrial robot product.

The manipulator usually consists of the controller, the programming pendant, and supply cables.

In this manual, the equipment is designated as follows.

Equipment	Manual Designation
NX100 Controller	NX100
NX100 Programming Pendant	Programming Pendant
Cable between the manipulator and the controller	Manipulator Cable

Descriptions of the programming pendant and playback panel keys, buttons, and displays are shown as follows:

Equipment		Manual Designation
Programming Pendant	Character Keys	The keys which have characters printed on them are denoted with [ ]. ex. [ENTER]
	Symbol Keys	The keys which have a symbol printed on them are not denoted with [ ] but depicted with a small picture. ex. page key  The cursor key is an exception, and a picture is not shown.
	Axis Keys Numeric Keys	"Axis Keys" and "Numeric Keys" are generic names for the keys for axis operation and number input.
	Keys pressed simultaneously	When two keys are to be pressed simultaneously, the keys are shown with a "+" sign between them, ex. [SHIFT]+[COORD]
	Displays	The menu displayed in the programming pendant is denoted with { }. ex. {JOB}

## Description of the Operation Procedure

In the explanation of the operation procedure, the expression "Select . . ." means that the cursor is moved to the object item and the SELECT key is pressed.



<b>1</b>	<b>External Axis Endless Function</b>	
	<b>1.1</b> Endless Rotation .....	1-1
	<b>1.1.1</b> Relative motion and Absolute motion .....	1-1
	<b>1.2</b> Resetting the Rotating Amount .....	1-2
<b>2</b>	<b>Specifying External Axis Continuous Rotation</b>	
<b>3</b>	<b>MRESET Instruction</b>	
<b>4</b>	<b>Display of External Axis Rotation Amount</b>	
<b>5</b>	<b>Resetting the Axis Rotation Amount</b>	
<b>6</b>	<b>Job Example</b>	
<b>7</b>	<b>Restrictions</b>	
	<b>7.1</b> FWD and BACK Operations .....	7-1
	<b>7.2</b> When NWAIT is Specified .....	7-1
	<b>7.3</b> Maximum Endless Rotating Amount .....	7-1
	<b>7.4</b> Execution of MRESET Instruction .....	7-2
	<b>7.5</b> External Axis Position at Teaching .....	7-2
	<b>7.6</b> Display of Rotating Amount .....	7-2
<b>8</b>	<b>Alarm Message List</b>	

# 1 External Axis Endless Function

This function is used for endless rotation of an external axis. In order to prevent the external axis from rotating in the reversed direction for the endless rotating amount when the manipulator moves to the next step after the endless rotation has been performed, a function to reset the endless axis position to a position within one revolution is also available.

The following outlines the function.

## 1.1 Endless Rotation

By specifying “How many times the external axis is to be rotated” for a move instruction (MOVJ), the external axis rotates for “the specified rotating amount + the taught position pulses” during moving to the target position. “How many times the external axis is to be rotated” is specified with “MTE” tag. For the rotating amount, From -32768 to 32767 revolutions can be specified for one move instruction.

<Format>

MOVJ VJ = Speed, MTE = External axis rotating amount

### 1.1.1 Relative motion and Absolute motion

Endless rotation has two types of motion; relative motion and absolute motion.

Relative motion enables the external axis to move to target position from taught position by rotating for the sum of the external axis rotating amount and the rotating amount of start position.

**target position = taught position**

**+ (external axis rotating amount + start position rotating amount)**

To rotate the axis continuously, move instruction (same position) is to be registered consecutively. When emergency stop is executed, and then restart is executed, the target position will be changed, and the external axis moves to the position from taught position by rotating from the sum of the external axis rotating amount and the rotating amount of restart position.

Absolute motion enables external axis to move to target position from taught position by rotating for the external axis rotating amount.

**target position = taught position + external axis rotating amount**

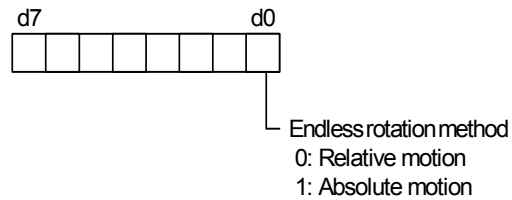
Even in case that the emergency stop is executed during endless rotation, and then the restart is executed, the target position is not changed.

## 1.2 Resetting the Rotating Amount

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### ■ S2C572 External axis endless motion instruction

Motion method for external axis endless function is to be set with this parameter.



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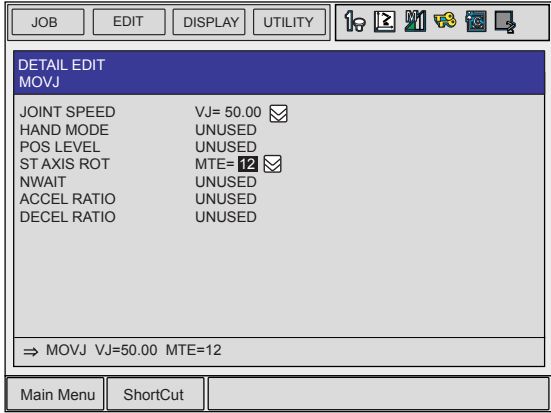
## 1.2 Resetting the Rotating Amount

To perform an interpolation after completion of endless rotation, re-create the external axis current value pulse and the motor feedback pulse at a position within one revolution in one of the following operations.

- Execution of MRESET instruction
- Operation from the programming pendant

## 2 Specifying External Axis Continuous Rotation

The external axis continuous rotation is specified by setting an external axis rotating amount tag "MTE" to a move instruction (MOVJ) for joint motion.

	Operation	Explanation
1	Move the cursor to the instruction area	
2	Move the cursor to the move instruction where an external axis rotating amount is to be registered	
3	Press [SELECT] two times	<p>Press [SELECT] once to display the contents registered in the job in the input buffer line. Press [SELECT] once more to call the detail edit window of the move instruction.</p> 
4	Select "ST AXIS ROT"	
5	Select "MTE="	The contents are displayed in the input buffer line.
6	Press [ENTER] two times	The set contents are registered in the job.

### 3 MRESET Instruction

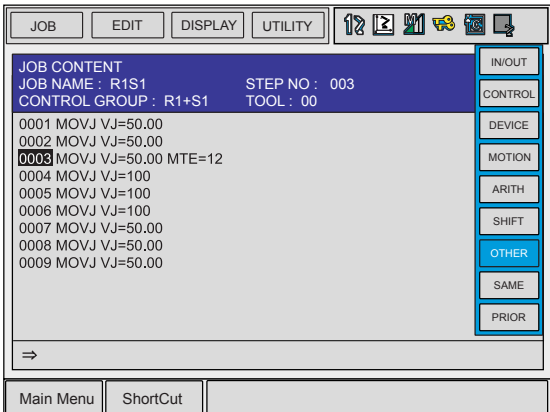
MRESET INST is used to reset the endless axis position to a position within one revolution. When the endless axis to be reset is external axis, an external axis instruction tag (ST) is to be set.

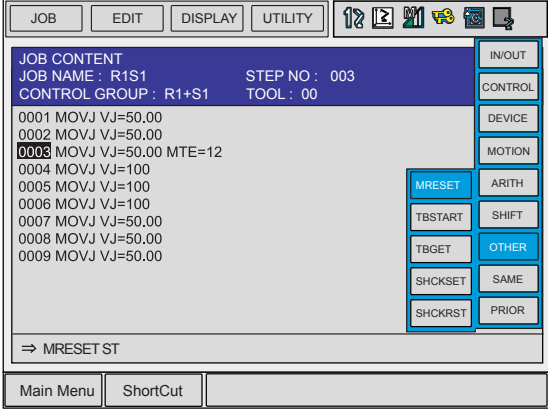
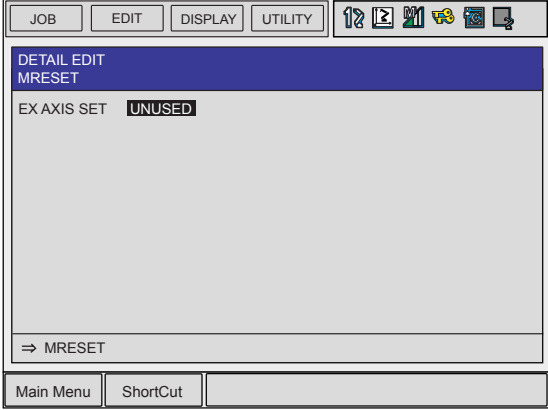
MRESET ST

①

- ① External axis instruction  
Set to reset the external axis rotating amount.

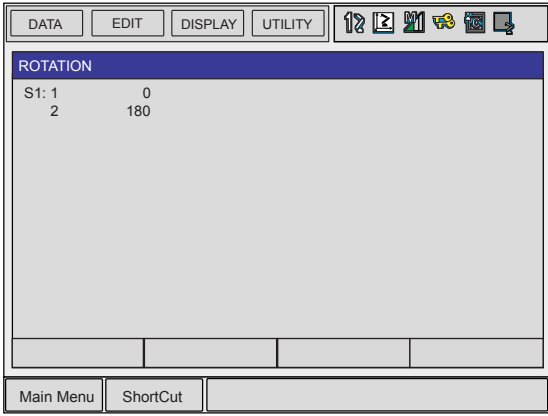
Register a MRESET instruction to reset the rotating amount in the following manner.

	Operation	Explanation
1	Move the cursor to the address area	
2	Move the cursor to the line where a MRESET instruction is to be registered	
3	Press [INFORM LIST]	The instruction list dialog appears. Move the cursor to the instruction list dialog. The cursor in the address area changes to an under-bar.
		
4	Select "OTHER"	

	Operation	Explanation
5	Select "MRESET"	<p>The selected instruction is displayed in the input buffer line.</p> 
6	Press [SELECT]	<p>Detail edit window appears.</p> 
7	Set external axis instruction	<p>Move the cursor to [EX AXIS SET], and press [SELECT] to set [ST] from select dialog.</p>
8	Press [ENTER]	<p>The set contents are registered in the job.</p>

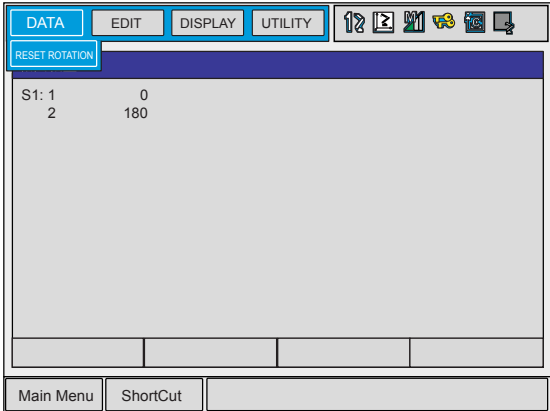
# 4 Display of External Axis Rotation Amount

The external axis rotation amount can be displayed in the rotation display window.

	Operation	Explanation
1	Select {ROBOT} under the main menu	
2	Select {ROTATION}	<p>The rotation display window appears.</p>  <p>The screenshot shows a window titled "ROTATION" with a menu bar containing "DATA", "EDIT", "DISPLAY", and "UTILITY". Below the menu bar are several icons. The main area of the window displays the following text:</p> <pre> S1: 1      0      2     180     </pre> <p>At the bottom of the window, there are two buttons labeled "Main Menu" and "ShortCut".</p>

## 5 Resetting the Axis Rotation Amount

The rotation amount can be reset to “0” on the rotation display window.

	Operation	Explanation																
1	Select {ROBOT} under the main menu																	
2	Select {ROTATION}																	
3	Select {DATA} of the menu	<p>A pull-down menu appears.</p>  <table border="1" data-bbox="774 719 1326 1128"> <thead> <tr> <th>DATA</th> <th>EDIT</th> <th>DISPLAY</th> <th>UTILITY</th> </tr> </thead> <tbody> <tr> <td>RESET ROTATION</td> <td></td> <td></td> <td></td> </tr> <tr> <td>S1: 1</td> <td>0</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>180</td> <td></td> <td></td> </tr> </tbody> </table>	DATA	EDIT	DISPLAY	UTILITY	RESET ROTATION				S1: 1	0			2	180		
DATA	EDIT	DISPLAY	UTILITY															
RESET ROTATION																		
S1: 1	0																	
2	180																	
4	Select {RESET ROTATION}	The external rotation amount is reset to “0”.																



## 6 Job Example

Line	Instruction	Contents
0000	NOP	
0001	MOVJ VJ=25.00	Normal move instruction
0002	MOVL V=500.0	Normal move instruction
0003	MOVJ VJ=25.00	Normal move instruction
0004	MOVJ VJ=25.00 MTE=100	The external axis rotates 100 times until reaching the step 4.
0005	MOVJ VJ=25.00 MTE=100	The external axis rotates 100 times until reaching the step 5. (If endless rotation method is set for absolute motion, it does not rotate.)
0006	MRESET	MRESET instruction is executed to reset the external axis position to a position within one revolution.
0007	MOVL V=500.0	Linear interpolation motion
0008	MOVJ VJ=25.00	Normal move instruction
0009	END	End of the job

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# 7 Restrictions

The restrictions for the external axis endless function are as follows.

## 7.1 FWD and BACK Operations

During FWD and BACK operations, the external axis does not perform a continuous rotation motion.

Also when a playback is executed after having executed the FWD operation until 1 to 3 steps before the step where an endless operation is specified, the external axis does not perform a continuous rotation motion. This is because the status of FWD operation and BACK operation remains. In this case, after having executed the FWD and BACK operation, move the cursor and start the job in play mode. Thus, the external axis performs a continuous rotation motion.

Normally, when the manipulator current value coincides with the reference position value after having reached the target step by FWD or BACK operation, the cursor stops blinking. In FWD or BACK operation after the external axis continuous rotation by using playback operation, the external axis does not have the manipulator current position coincident with the reference position even after having reached the target position. Therefore, the cursor does not stop blinking. In this case, execute a MRESET instruction before FWD or BACK operation so that the cursor stops blinking when the manipulator reaches the target position.

## 7.2 When NWAIT is Specified

Normally, when a move instruction where a NWAIT is added is executed, the instructions that are registered before the next move instruction, are executed sequentially. However, for the MRESET instruction, NWAIT specification is not applied and the MRESET instruction is executed after completion of the move instruction.

## 7.3 Maximum Endless Rotating Amount

The maximum endless rotating amount can be obtained by the following equation. The amount differs depending on the endless axis resolution.

Maximum endless rotating amount =  $\pm 536870912$  (pulse) / Resolution (pulse/revolution)

## **7.4** Execution of MRESET Instruction

Since the execution of MRESET instruction is processed for the manipulator feedback pulse, it is executed in the status that the manipulator is completely stopped. Accordingly, it takes a several seconds to execute the MRESET instruction. In the meantime, the manipulator does not stop and the start lamp is not unlit even by hold or changing mode operation.

## **7.5** External Axis Position at Teaching

In a position where the external axis has rotated more than one time, the teaching is disabled. If teaching is executed in this state, the following error occurs.

Error 2110; Over softlimit

When the above error occurs, reset the axis rotating amount manually.

## **7.6** Display of Rotating Amount

When the sign of the taught position of the MOVJ instruction where a rotating amount is specified and the sign of the rotating amount specification are different, the display value of rotating amount may be one revolution less than the specified rotating amount. For example, when the taught position is at -1000 pulses and the rotating amount is specified to be 100 revolutions, the displayed value of rotating amount is 99 revolutions.

## 8 Alarm Message List

Alarm No.	Message	Cause	Corrective Action
4490	DEFECTIVE TAUGHT POINT (ENDLESS)[1]	Linear interpolation disabled. During playback operation or operation from the programming pendant, a linear interpolation has been attempted without execution of MRESET instruction after completion of continuous rotation.	When this alarm occurs at operation from the programming pendant, reset the alarm and reset the axis rotating amount. When this alarm occurs during playback operation, set a MRESET instruction before execution of MOVL or MOVC instruction.
	DEFECTIVE TAUGHT POINT (ENDLESS)[4]	The reference position of the step where the cursor is, exceeds 536870912 pulses.	Reconsider the teaching positions and the external axis rotating amount.

# NX100 OPTIONS INSTRUCTIONS

## FOR EXTERNAL AXIS ENDLESS FUNCTION

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