

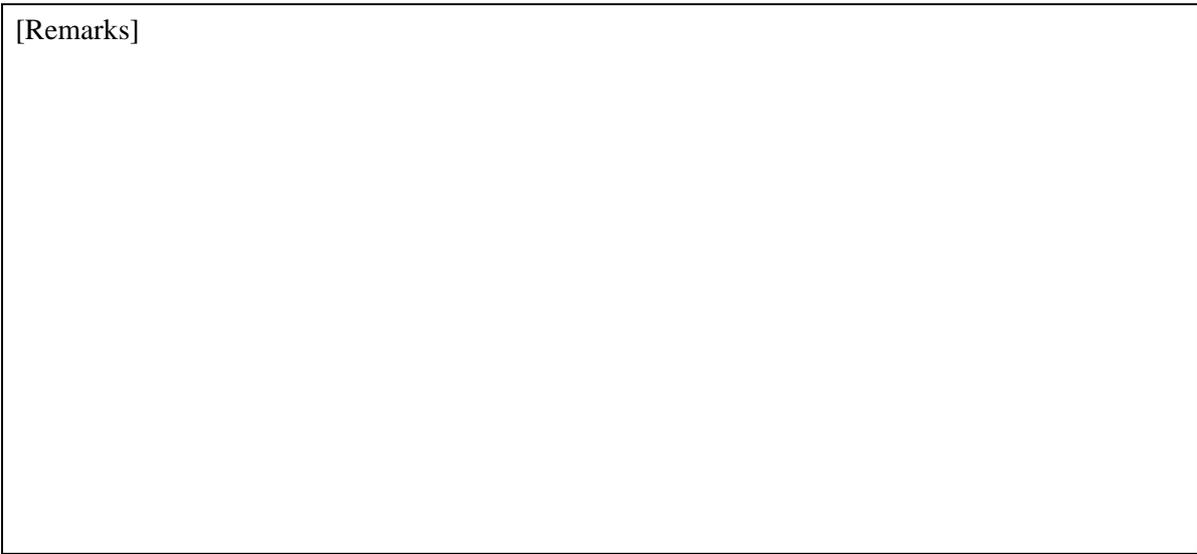
ORiN2 RC8 Provider " Non-Stop motion calculator " Option

User's Guide

Version 1.0.0

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[Remarks]



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1. Introduction

The Non-stop motion calculator option is a function designed for the non-stop inspection applications with DENSO robot. This function calculates motion positions from inspection positions (teaching positions) so that the trajectory of DENSO robot's PASS motion will pass through the inspection positions. The combination of these motion positions with PASS motion and precise area function (option) makes it possible to output a trigger signal at the inspection position precisely, without stopping the robot. As an example, the trigger signal is applied to an external trigger signal for a camera.

1.1. Installing license

To use the Non-stop motion calculator option, you need to install ORiN2 SDK, and also need to input "Non-stop motion calculator" license information in RC8. Please refer "Displaying and Adding/Deleting Function Extension Screen" in DENSO ROBOT USERS MANUALS, in which indicate the method how to add the license in RC8.

2. Outline of function

2.1. Outline

Setting Non-stop motion calculator Option activates related commands in the RC8 Provider. The commands generate non-stop motion positions from the inspection positions. By using the non-stop motion positions with “MOVE P, @P” PCS command, DENSO robot passes through the inspection positions.

DENSO Robot controller RC8 is required to calculate the motion positions, since this function uses the processing function in RC8. Note that this function requires the license of ORiN2 as well.

2.2. Commands

The following command in RC8 Provider is activated after the license input.

- (1) GenerateNonStopPath : Calculate the non-stop motion position

The details of the command is shown at “Appendix D. Non-Stop Motion Calculator - Trajectory Generator Command for Non Stop Inspection” in “RC8 Provider User’s Guide”

2.3. Restrictions

Restrictions of GenerateNonStopPath Command are as follows:

- Maximum number of Inspection Points = 200
- Available for 6-axis robot only
- Area size for additional axis should be assigned in [degree] (for rotational axis) or [mm] (for linear axis) in accordance with the axis setting.
- Unavailable for Unlimited rotation of the Extended-joint
- Unavailable when Auto Speed and Auto Acceleration mode is used
- Payload setting is restricted to the unit of 1,000g.

[Attention]

Make option setting of Addcontroller "Message = False" when connecting to RC8.

This will reduce the load on RC8 and make the robot motion more stable.

3. Sample Program

The program with non-stop motion calculation option can be developed by commercially available programming languages (C/C++, VB, etc.) as same as ORiN programming. The easiest method is to use CaoScript, which is included in ORiN SDK and is a script language based on VBScript. Section 3.1 shows a sample program based on CaoScript. Other samples are shown in section 3.2.

3.1. CaoScript sample program

In this sample, the robot type is assumed as VS-6577G-BA, and the IP address of the target RC8 is 192.168.0.1.

```
' Create CAO Object
Set rc = cao.AddController("RC", "CaoProv.DENSO.RC8", "", "server=192.168.0.1")
Set rob = rc.AddRobot("Robot")
' Set inspection positions Data
redim vntTeachPos(7)

vntTeachPos(0) = Array(300.0, 100.0, 600.0, 180.0, 0.0, 180.0, 5, 0.0, 0.0, 100 * 0.01, 1, 0)
vntTeachPos(1) = Array(300.0, 91.0, 600.0, 180.0, 0.0, -180.0, 5, 0.0, 0.0, 100 * 0.01, 0, 0)
vntTeachPos(2) = Array(310.0, 30.0, 600.0, 180.0, 0.0, -180.0, 5, 0.0, 0.0, 100 * 0.01, 1, 0)
vntTeachPos(3) = Array(315.5, 24.5, 600.0, 180.0, 0.0, -180.0, 5, 0.0, 0.0, 100 * 0.01, 0, 0)
vntTeachPos(4) = Array(300.0, 10.0, 600.0, 180.0, 0.0, 173.0, 5, 0.0, 0.0, 100 * 0.01, 1, 0)
vntTeachPos(5) = Array(300.0, 10.0, 600.0, 180.0, 0.0, 176.0, 5, 0.0, 0.0, 100 * 0.01, 0, 0)
vntTeachPos(6) = Array(300.0, 10.0, 600.0, 180.0, 0.0, 171.0, 5, 0.0, 0.0, 100 * 0.01, 0, 0)
vntTeachPos(7) = Array(300.0, 10.0, 600.0, 180.0, 0.0, -180.0, 5, 0.0, 0.0, 100 * 0.01, 1, 0)
' Area Data for Trigger Signal
redim vntAreaInfo(7)

vntAreaInfo(0) = Array(4, 4, 4, 4, 0, 0)
vntAreaInfo(1) = Array(4, 4, 4, 4, 0, 0)
vntAreaInfo(2) = Array(4, 4, 4, 4, 0, 0)
vntAreaInfo(3) = Array(4, 4, 4, 4, 0, 0)
vntAreaInfo(4) = Array(4, 4, 4, 4, 0, 0)
vntAreaInfo(5) = Array(4, 4, 4, 4, 0, 0)
vntAreaInfo(6) = Array(4, 4, 4, 4, 0, 0)
vntAreaInfo(7) = Array(4, 4, 4, 4, 0, 0)
' Calculate Non-stop motion positions data
vntMovePos = rob.Execute("GenerateNonStopPath", Array(vntTeachPos, vntAreaInfo, Ubound(vntTeachPos) + 1,
100.0 * 0.01, 0.7))
```

3.2. Other Samples

Please refer sample programs stored in the following folder.

<ORiN2>\¥ CAO\¥ProviderLib\¥DENSO\¥RC8\¥Samples\¥NonstopPath

Table 3-1 List of Sample program

Sample	Contents	Language
NonStopPath_RC8.vbs	Sample for VS-6577G-BA	CaoScript
NPManager.exe	Sample application for the generation of the non-stop motion positions from inspection positions with user interface.	Visual Basic 2005

3.3. Using the non-stop motion calculation in the vision inspection application

To use the non-stop motion calculation in the vision inspection robot application, the following two functions are also required.

• Area Function

This function monitors the position and posture of robot, and outputs a trigger signal. The signal is applied as a camera trigger signal.

The related PCS command is “AREA.” The sampling time should be small to get more precise position of the robot.

• High Accuracy Trajectory Control Function

This function improves the accuracy of the robot motion.