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FLEXFEEDER UR PLUG-IN

Quickstart Guide
Multifeeder Example Programs

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INTRODUCTION

This document provides a quick introduction to setting up and configuring the flexfeeder UR plug-in from Flexfactory AG for operating several Flexfactory flexfeeder X units in combination with a UR robot. The example programs for multi-feeder applications supplied with the UR plug-in can be found in the software package in the *"examples"* subdirectory.

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1. INSTALLATION

If necessary, please uninstall an already installed flexfeeder URCap before installing the provided URCap `*flexfeeder-1.1.0.urcap*`.

Once the URCap has been successfully installed, you can set up a maximum of four flexfeeder connections under:
`Installation > URCaps > FFX installation`

The basic setup is the same as for the single-feeder version. (see documentation *"Quickstart & Reference Guide"*)

For the included multifeeder example programs, please use the first two slots in the overview to set up your flexfeeder.

To do this, click on the "+" symbol in lines 1) and 2). Please make sure that the following setup steps have been completed for both flexfeeders:

1. Enter the IP address of the flexfeeder. The port should always be 8082.
    a. Click *"Apply and test connection"*.
    b. If the flexfeeder is accessible, a green tick and *"Flexfeeder is connected"* should appear next to it.

2. Set the *"Above Shaker Position"* and the *"Out of View Position"*.
    a. ***"Above Shaker Position"***:
    After gripping a part from the surface, this robot pose is approached. E.g. teach pose above a corner of the feeder surface. This pose must be accessible without collision from any gripping poses on the feeder.

    b. ***"Out of View Position"***:
    Pose of the robot arm located outside the flexfeeder camera's field of view.
    Note: The gripper and any cables should also be outside the camera's field of view in this pose.

3. Click on *"< Overview"* to return to the overview.

    In the overview, make sure that both flexfeeders are activated (switch to On).

2. CALIBRATION

Create a separate calibration program on the UR for each flexfeeder and execute the calibration for both flexfeeders one after the other. Follow the specifications and instructions described in the *"Quickstart & Reference Guide"* documentation on the subject of calibration.

If you have already performed the calibration for both devices, you can skip this step.

Note: The calibration is needed one time only to know the mapping between the camera and robot coordinate systems.

3. ADJUST THE EXAMPLE PROGRAMS

To run the sample programs for productive operation with multifeeder applications, there are two different sample programs to choose from.

1. Picking a part from two flexfeeders (runtime optimized)
   The same part is picked up from both flexfeeders. The shortest possible cycle times should be realized, whereby there is no requirement as to which of the two flexfeeders the next part should be picked up from. The sequence from which flexfeeder the next part is picked up is therefore only dependent on which of the two flexfeeders can provide a new part the fastest. This example program is primarily used when cycle time optimization is required, as the two flexfeeders can be used to achieve a higher availability of accessible parts.

   Example program:
   „/examples/ ffx_production_example_two_feeder.urp“

2. Alternating picking of two different parts from two flexfeeders
   Two different parts from both flexfeeders are run onto the two flexfeeders. This means that the two different parts are picked up alternately from one of the feeders. The sequence of which flexfeeder is picked up next is fixed and is strictly adhered to. A common application for this example program is the implementation of an assembly task.

   Example program:
   „/examples/ffx_production_example_two_feeder_alternating.urp“

Please load the selected multifeeder UR program:

`*ffx_production_example_two_feeder.urp*`

or

`*ffx_production_example_two_feeder_alternating.urp*`

and complete the following steps to create an executable example program:

1. Teach the `start_pose`

2. The following settings must be completed in the `FFX1 production` node.
    a. Select the feeder job.
    b. Teach the Pick Pose for Feeder 1.

3. In the node `FFX2 production`
    a. Select the feeder job.
    b. Teach the Pick Pose for Feeder 2.

4. In Folder `Pick form feeder 1`
    a. In Folder `Grab tool action`
        i. Implement gripping action.
    b. In Folder `Place part`
        i. Implement the process for placing the part.

5. In Folder `Pick form feeder 2`
    a. In Folder `Grab tool action`
        i. Implement gripping action.
    b. In Folder `Place part`
        i. Implement the process for placing the part.