

Activity 3.1.2h Handshaking

PLTW

HANDSHAKING

☰ Introduction

☰ Procedure

☰ Conclusion

ACTIVITY SUPPORTS

☰ Optional Extension

Introduction

GOALS	MATERIALS	RESOURCES
<ul style="list-style-type: none">• Create a program that simulates communication between a robot and a mill.• Describe how simulation can be used to plan a physical system.		
GOALS	MATERIALS	RESOURCES
<ul style="list-style-type: none">• Computer with intelitek® RoboCell software		
GOALS	MATERIALS	RESOURCES

- **RoboCell Planning**
- **Activity 3.1.2h Handshaking (Downloadable PDF)**

Handshaking is the process of communication that occurs between the robot and mill. The robot can be programmed to load and unload parts to the mill. In this activity you will write a program to simulate communication between the robot and mill.

Procedure

1

Open CellSetup and create the graphics in CellSetup using the following specifications:

- Robot
 - 1.8 mm Slidebase
 - Peripherals tab: slide up to Axis 7

- Table
 - X: 1500 mm
 - Y: 4000 mm

- Feeder
 - Parts: 4
 - Inputs tab: slide up to Input 1
 - Outputs tab: slide up to Output 1
 - Position: 287, 0
 - Rotate: 180°

- Mill: PLM1000
 - Cycle Time: 5 seconds
 - Inputs tab: slide up to Input 2
 - Outputs tab: slide Chuck up to Output 2
 - Outputs tab: slide Cycle up to Output 3
 - Rotate: -90
 - Position: -90, 640

- Rack
 - Position: 300, -600

- Part 4
 - Place one Part 4 onto the Feeder
 - Part4
 - Position: 287, 0

2

Confirm that the cell resembles the final configuration shown in Figure 1.

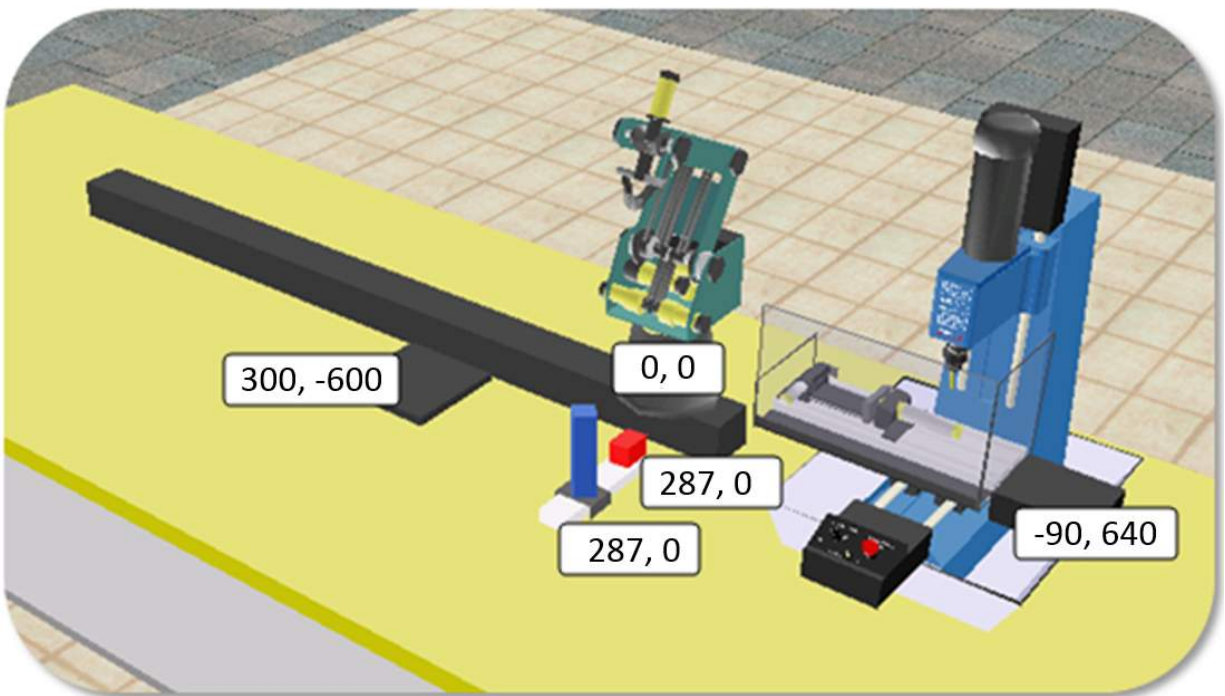
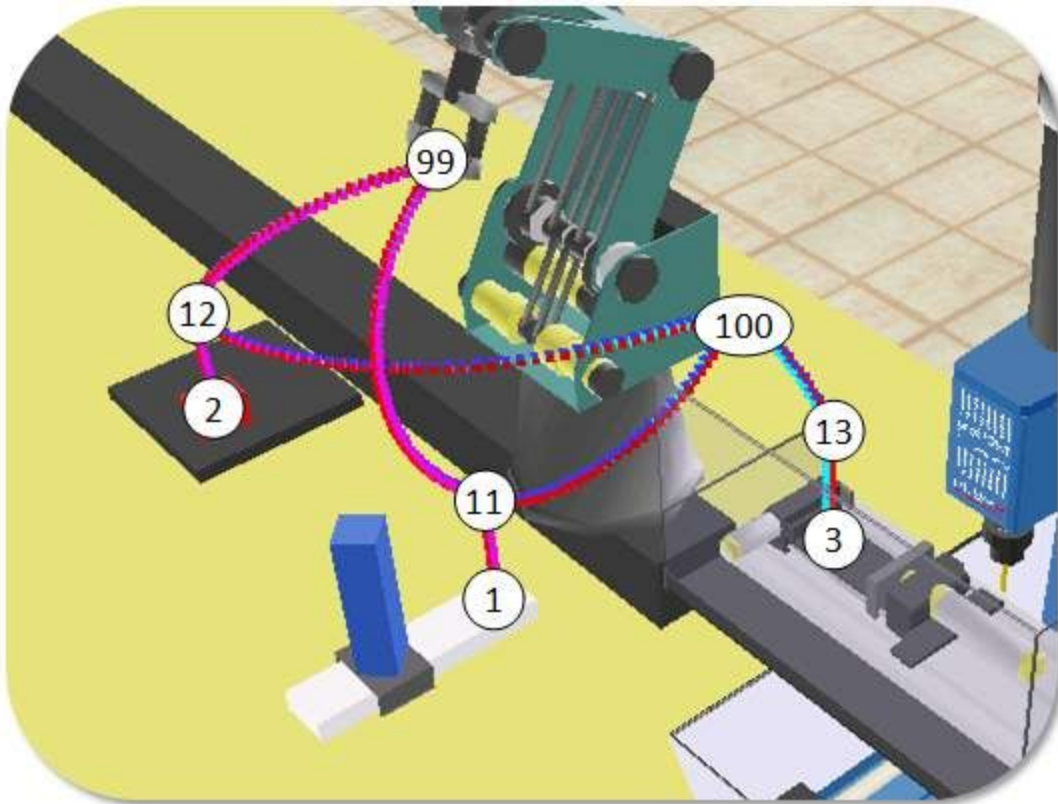


Figure 1. Cell Configuration

3

Use the [RoboCell Planning](#) resource to program the following positions:

- 1 - Pick part from the feeder
- 11 - Above pickup point at feeder
- 2 - Drop-off position at rack
- 12 - Above the drop-off point at rack
- 99 - Home
- 100 - Above shield, safe position
- 3 - At the vise
- 13 - Above vise



4

Program the robot to perform the following functions.

- Robot starts at home with its gripper open.
- Robot sends signal to feeder to push part and recycle.
- Robot picks up a part from the feeder.
- Robot places the cube in the vise.
- Robot sends signal to mill to close the vise.
- Robot moves to safe position.
- Robot sends signal to start cycle.
- Robot waits for mill to finish milling cycle.
- Robot sends signal to open vise.

- Robot picks up part from mill.
- Robot places part on Rack.
- Robot returns to home.

Conclusion

Question 1

Describe a product that could be produced using the operation in this activity.

Optional Extension



As directed by your teacher, develop a more advanced program to complete the following operation.

- Modify the program to loop the current process to mill the remaining three parts from the part feeder.
- Create a process that will allow the robot to palletize the rest of the finished parts onto the rack.