

# Jessica Hudak

## Writing Samples

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While documenting the setup of a lathe-tending workcell in the READY Robotics office, I used SolidWorks to take screenshots of various components.

The attached section demonstrates how I used my mechanical aptitude to write hardware-based documentation.

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After my initial interview for the Technical Writer position at READY Robotics, I was given the challenge of documenting instructions for an in-person demo with ForgeOS 3.x.

The attached section demonstrates how I used my technical communication skills to write software-based documentation.

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ForgeOS 5.x was a complete redesign of the ForgeOS software. I worked with another engineer to rewrite the ForgeOS user manual.

The attached section demonstrates how I used Adobe Illustrator for standardized callouts and used DITA to create PDFs before READY migrated to Docusaurus:  
<https://support.ready-robotics.com/guides/>

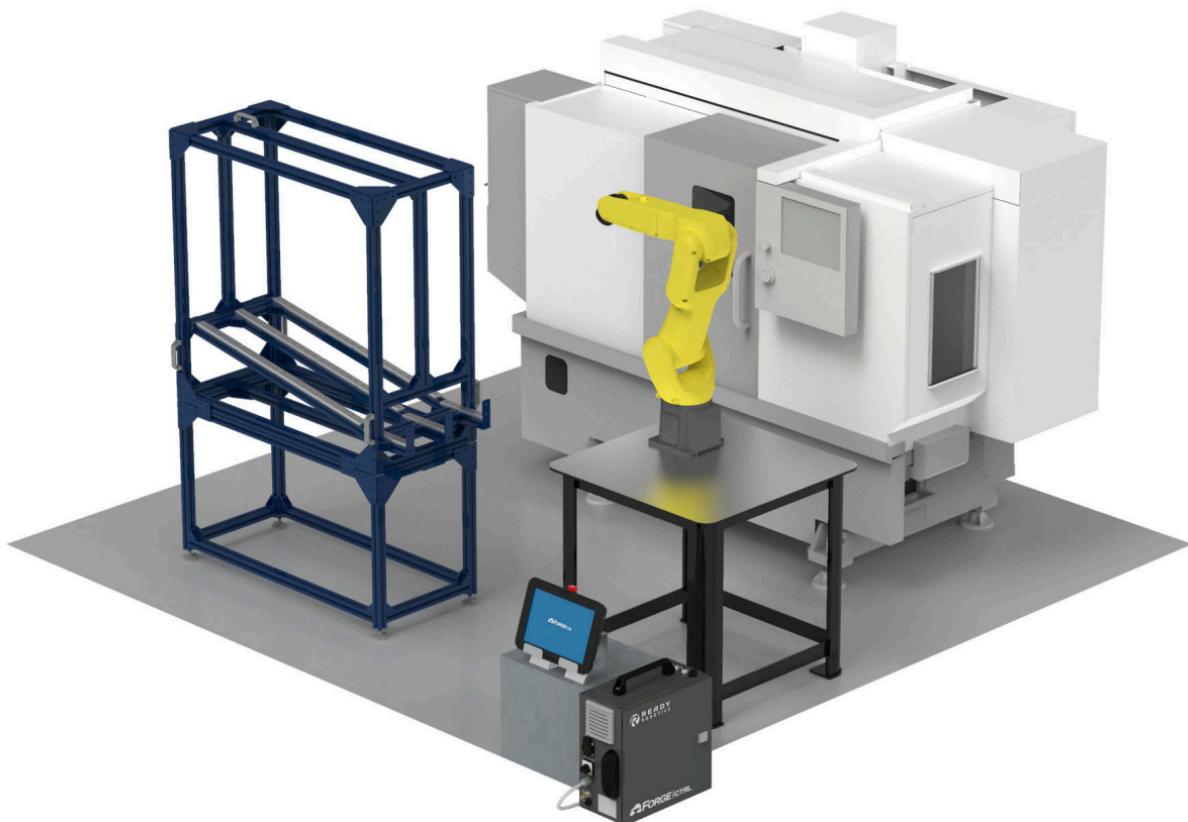
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By switching from DITA to Docusaurus, all content (such as robot setup guides) became easier to navigate.

The attached section demonstrates how I used organizational skills, design skills, and technical skills with tools like GitHub and CSS to create the new layout.

# Setup Guide

## How to Connect a Diffuse Sensor



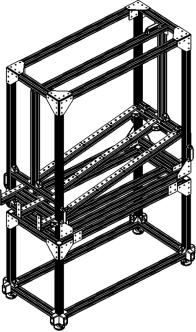
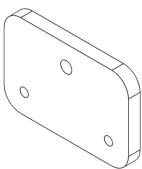
## Overview

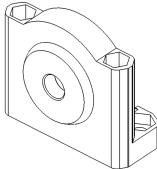
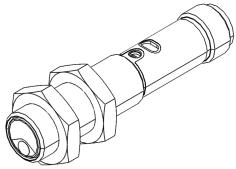
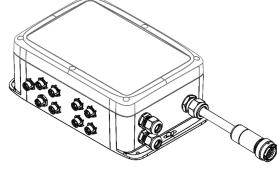
Most robotic automation systems require standardized part presentation for repeatability. If your parts are cylindrical, you may decide to use a **gravity feeder** (e.g., RA-PD-4725 from Vention). Gravity feeders are designed for operators to load parts from one end. The parts then roll down a ramp. When a robot picks the bottom-most part from the other end, the rest of the parts roll down to fill the empty spot.

To make the task robust, you may decide to integrate a **diffuse sensor**. A diffuse sensor can check if a part is present at the pick location. If no part is detected, the task will stop and alert the operator that there is a part jam, a need for a part refill, or some other issue.

This guide will walk you through how to connect a diffuse sensor to a gravity feeder and use it with ForgeOS.

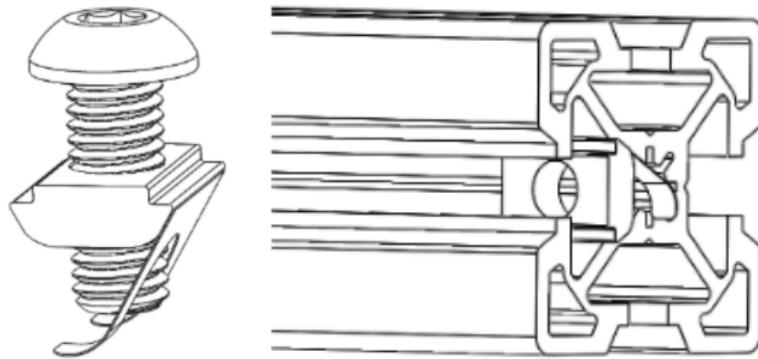
## Equipment

 A 3D line drawing of a multi-tiered metal frame structure with a conveyor belt system inside, used for part feeding.	 A 3D line drawing of a cylindrical nut with a spring tab mechanism for secure fastening.	 A 3D line drawing of a rectangular metal plate with four circular holes, used for mounting components.
<i>Vention Gravity Feeder</i>	<i>Drop-In Spring Tab Nut</i>	<i>Adapter Plate</i>

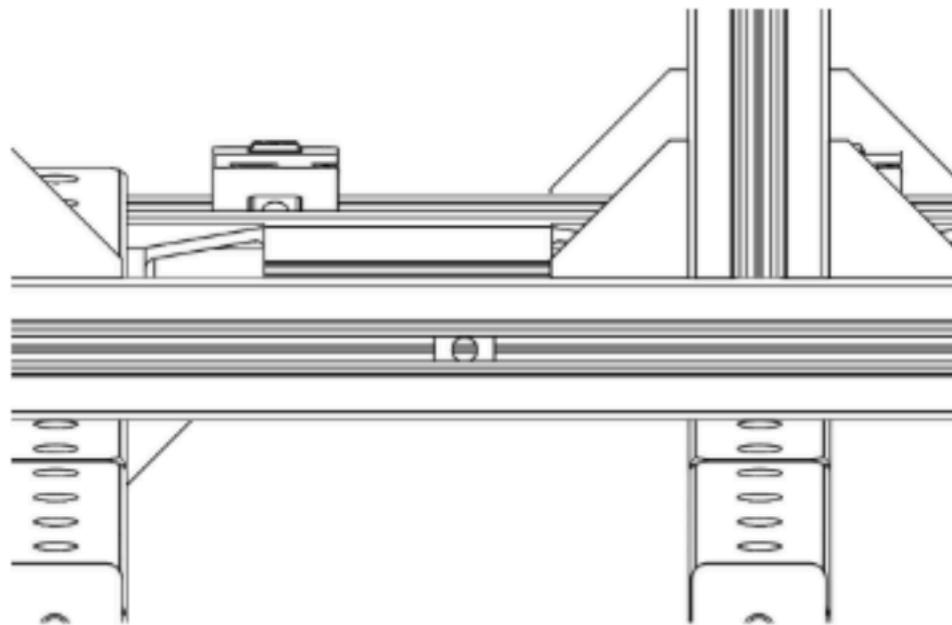
 A 3D line drawing of a bracket with a circular mounting hole and a slot for a sensor.	 A 3D line drawing of a cylindrical sensor probe with a protective housing.	 A 3D line drawing of a rectangular PLC breakout box with multiple connection ports and a handle.
<i>Diffuse Sensor Bracket</i>	<i>Diffuse Sensor</i>	<i>PLC Breakout Box Expansion</i>

## Steps

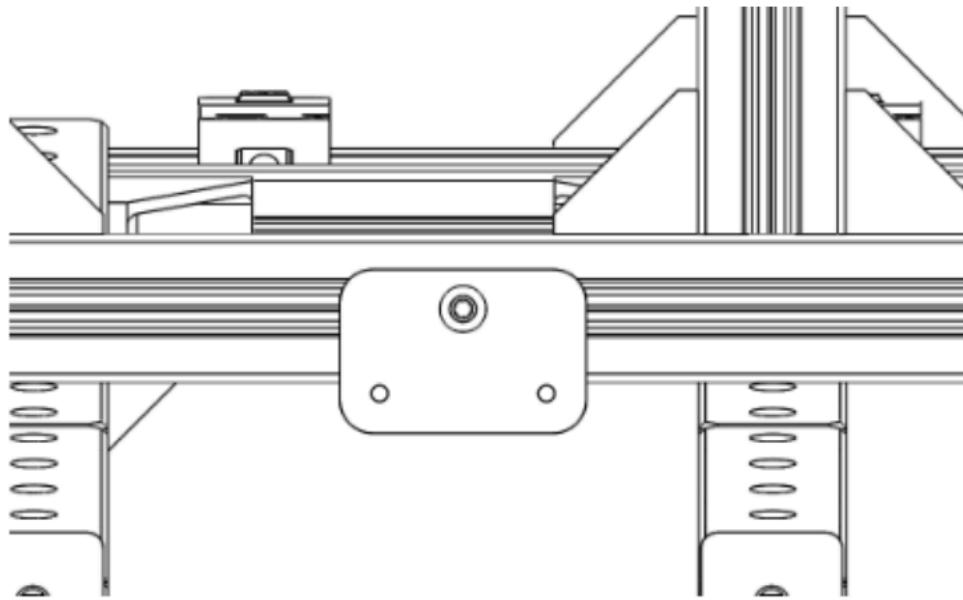
1. Insert a **Spring Tab Nut** into the horizontal rail that is above the part pick location.



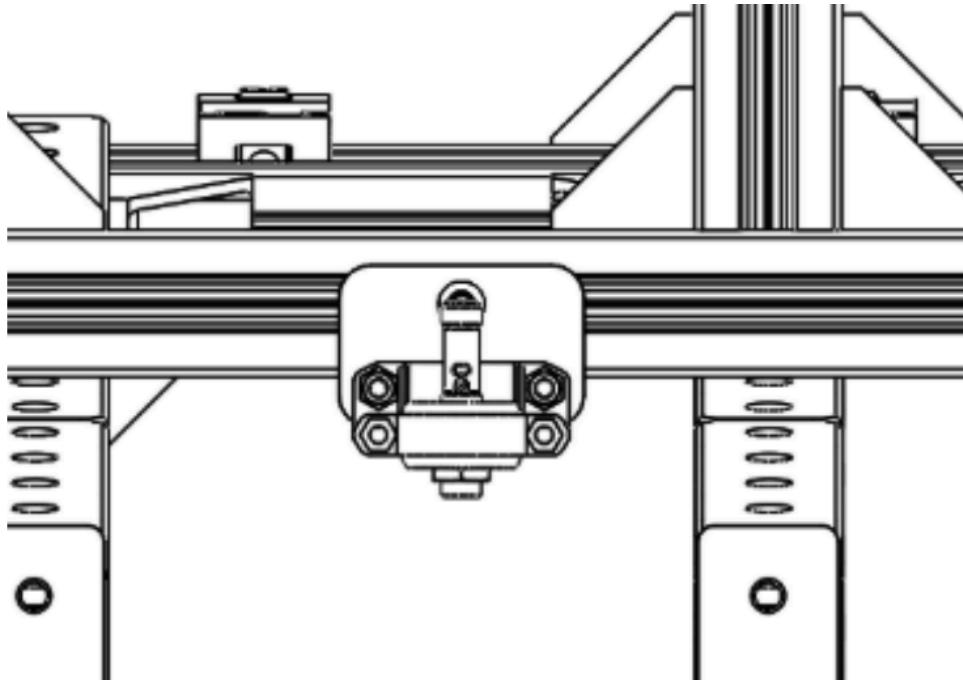
2. Move the Spring Tab Nut until it is about halfway down the rail, but left or right of the middle vertical extrusion.



3. Place the large hole in the **Adapter Plate** over the nut. Insert a **M8 Button Head Screw**.

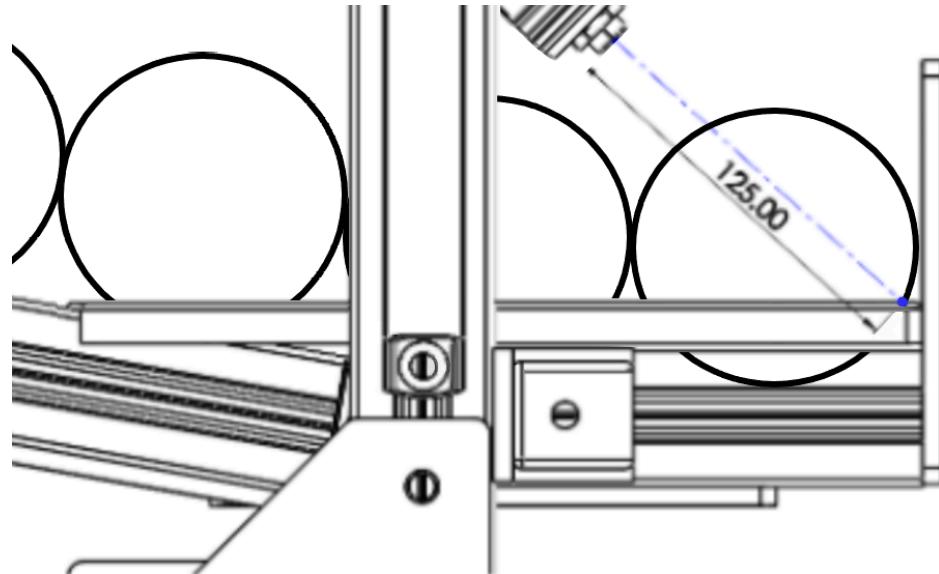


4. Using two **M6 Socket Head Screws**, attach the **Diffuse Sensor Mount** and **Diffuse Sensor** to the Adapter Plate.

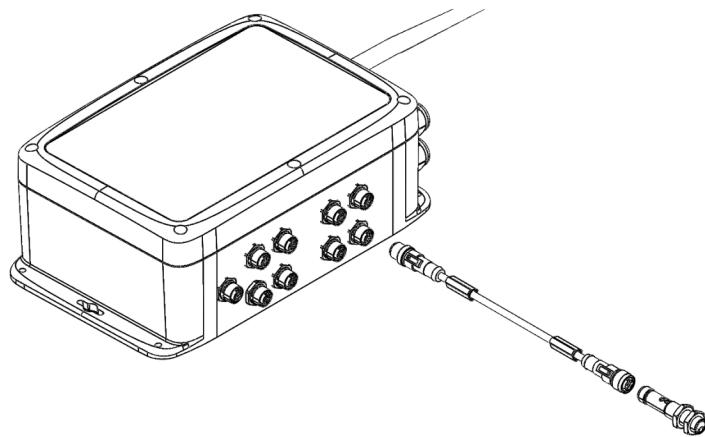


5. Verify that the sensor is the correct distance away from the pick location so that when there is a part at the bottom of the ramp, the sensor detects a disturbance in its emitted light beam.

**Note:** When programming the robot to pick up the parts, be careful not to have the robot collide with the sensor.



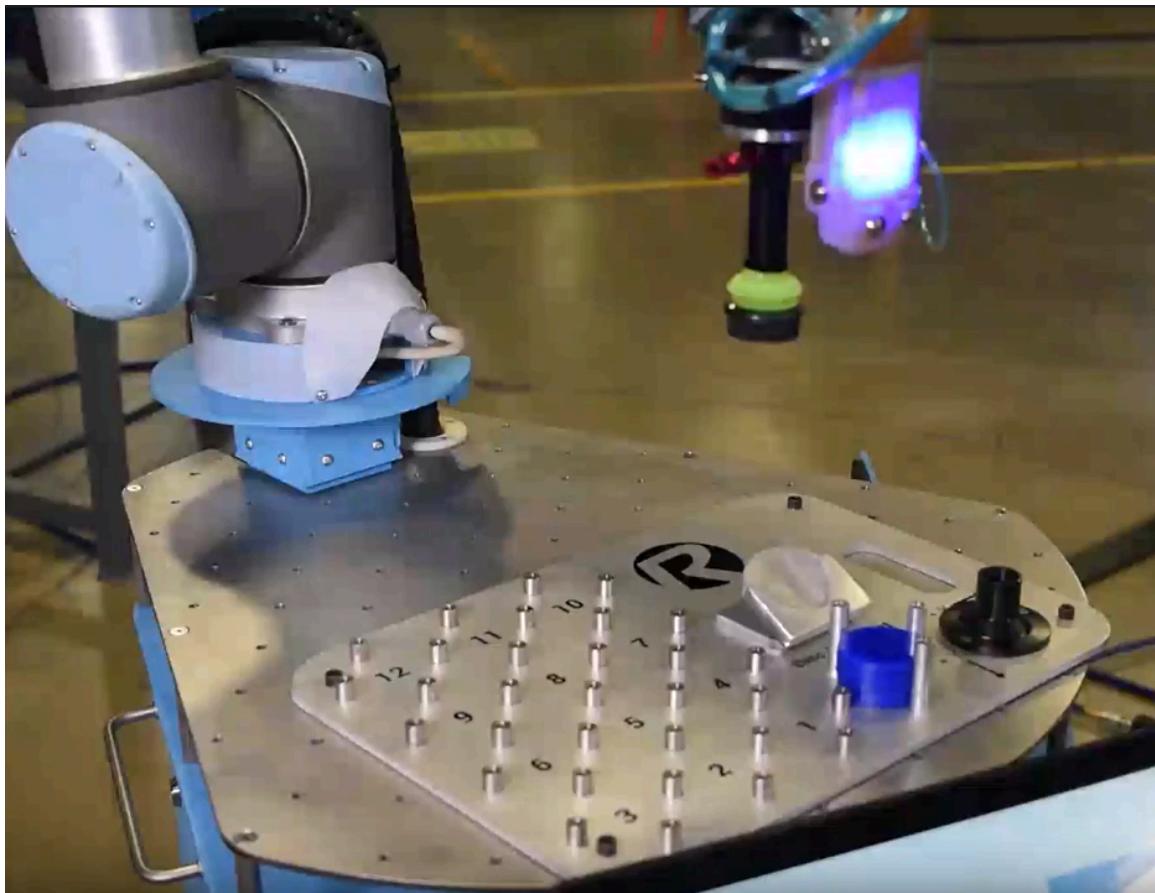
6. Using a **4-pin A-coded Socket Connector Cable**, connect the sensor to **Digital Input 1** on the **PLC Breakout Box Expansion**.





# Application Guide

## How to Program a Pick-and-Place Task

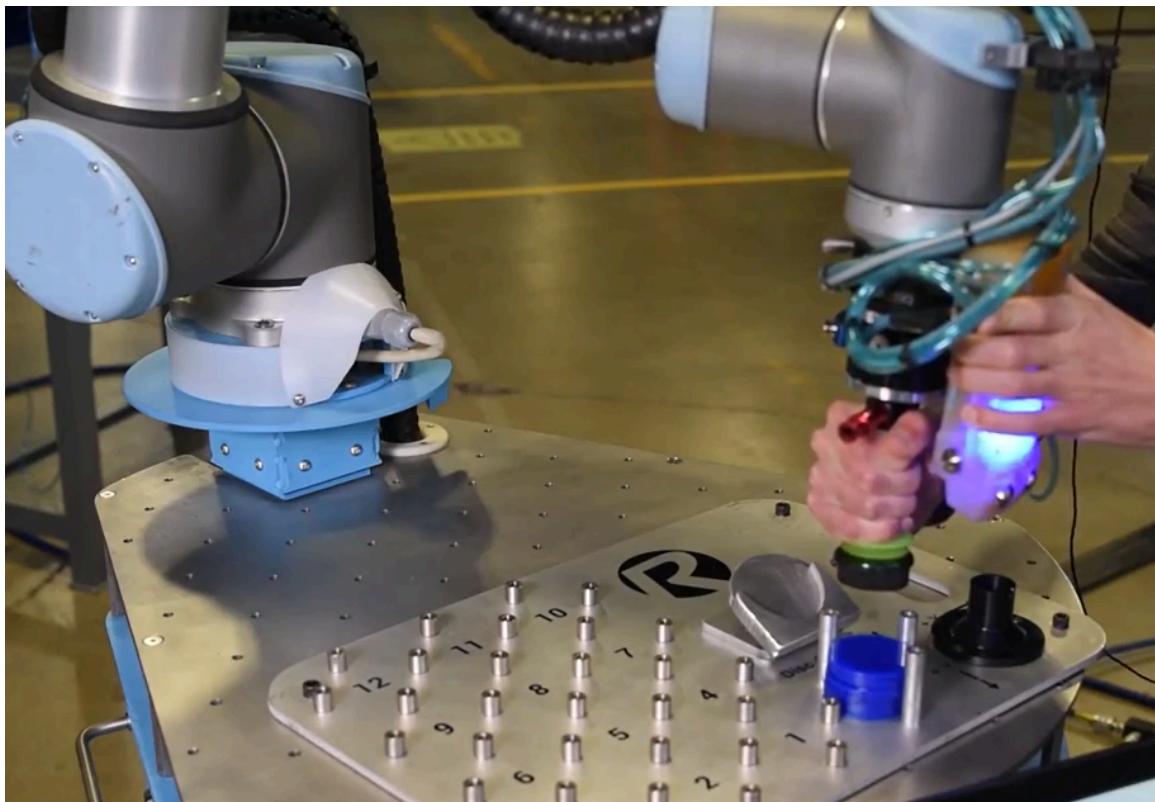


## Overview

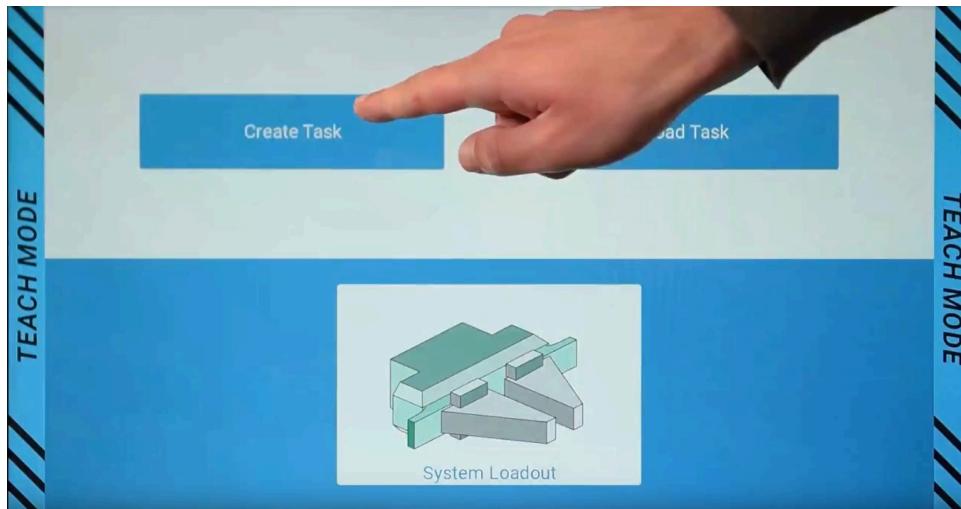
This guide will walk you through how to use ForgeOS to program a UR robot to move disks from a stack to a grid.

## Programming the Task

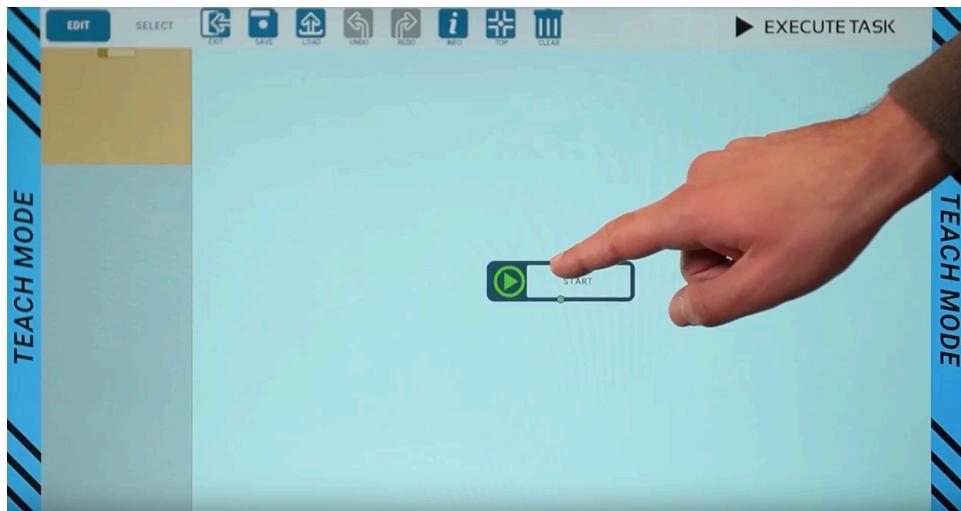
1. Enter **Guide Mode** by pressing buttons **1** and **4** on the Teach Mate. Move the robot so that the suction gripper is centered over the stack of disks, 2 inches above the top disk. Then press buttons **1** and **4** again to exit Guide Mode.



2. In ForgeOS, tap **Create Task**.



3. Select the **START** block.



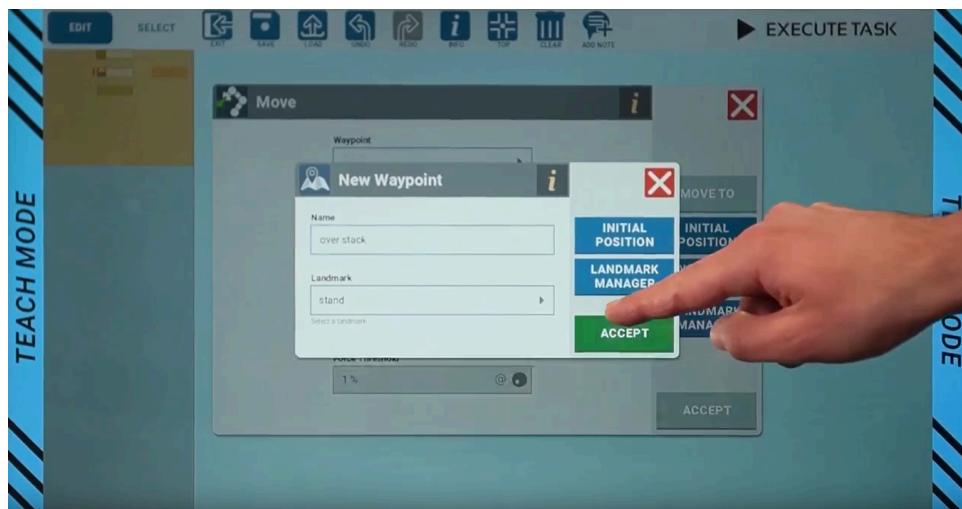
4. Create a block that ensures that the suction gripper is off:

- a. Tap **ADD BLOCK** to open the Block Menu.
- b. In the Block Menu, tap **Tools > Suction Off**.

**Tip:** It is recommended to add blocks such as this to set the initial states of devices (e.g., suction grippers). This way, no matter what states the devices are left in before task execution, they will automatically switch to the desired initial states.

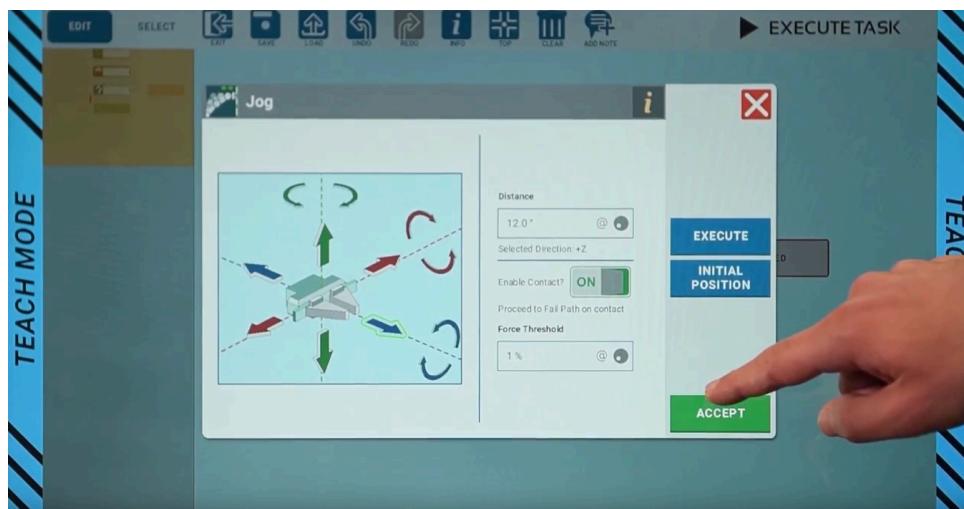


5. Create a block that moves the robot to its current position (2 inches above the full stack of disks):
  - a. Tap the **green SUCTION OFF** button below the last block.
  - b. In the Block Menu, tap **Robot Moves > Move**.
  - c. In the pop-up, tap **Waypoint > New**.
  - d. Type in a name for the current robot position (e.g., “Over Stack”).
  - e. Tap **ACCEPT**.



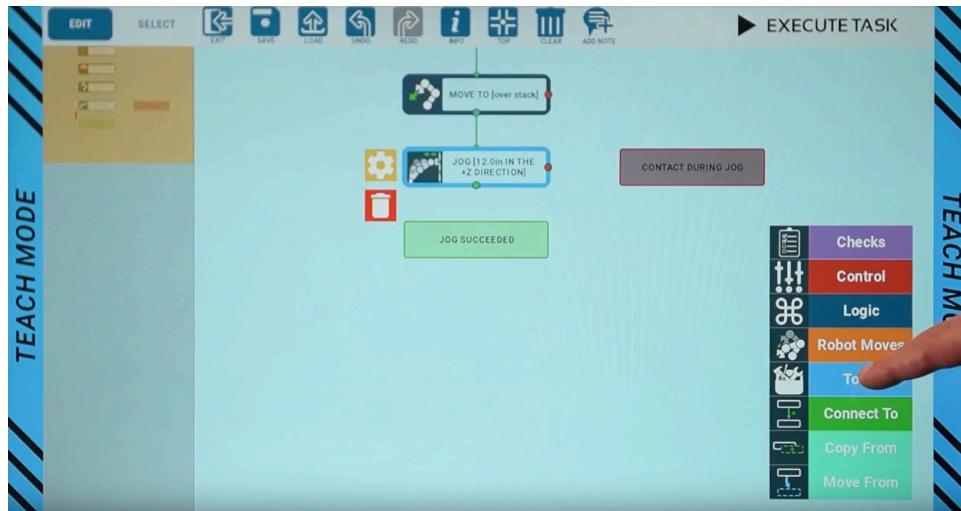
6. Create a block that moves the robot downward (into the stack) until the robot detects an obstacle (e.g., the top disk):

- a. Tap the green **MOVE SUCCEEDED** button below the last block.
- b. In the Block Menu, tap **Robot Moves > Jog**.
- c. In the pop-up, select the blue +Z arrow.
- d. Type in a **Distance** value greater than the current distance between the suction gripper and top disk (e.g., “12 inches”).
- e. Toggle “Enable Contact?” **ON**.
- f. Tap **ACCEPT**.

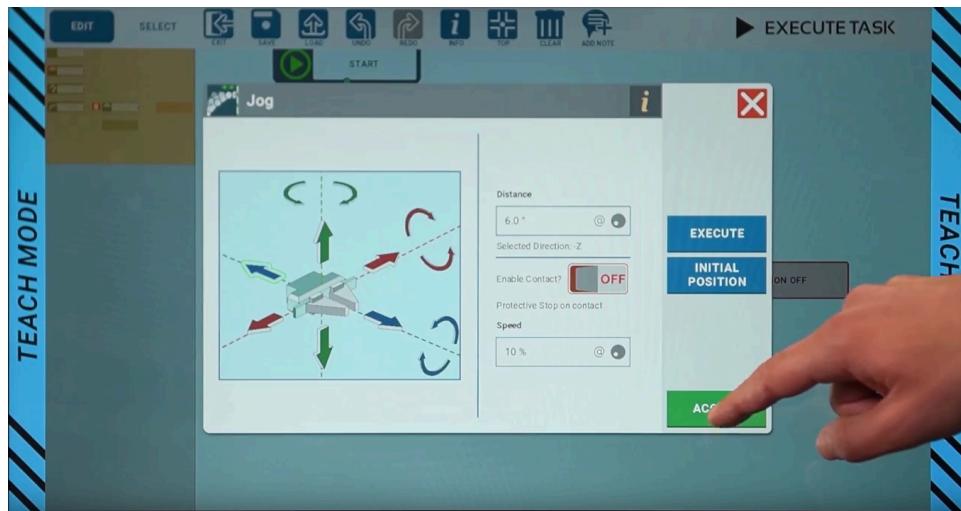


7. Create a block that turns the suction gripper on to pick up the top disk:

- a. Tap the red **CONTACT DURING JOG** button to the right of the last block.
- b. In the Block Menu, tap **Tools > Suction On**.



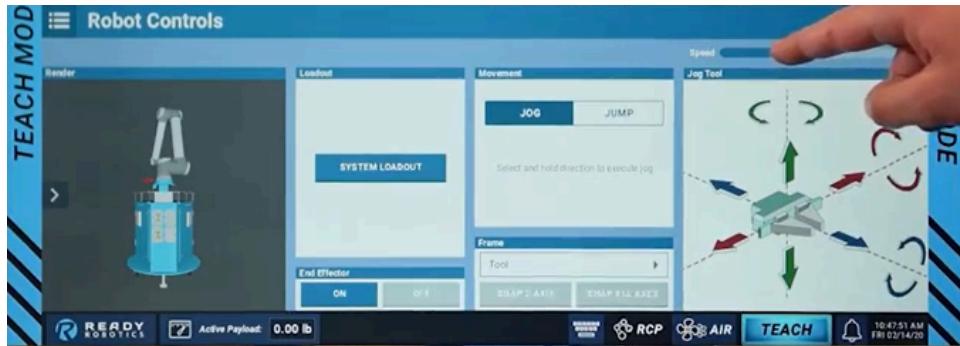
8. Create a block that moves the robot upward (away from the stack) with the top disk:
- Tap the **green SUCTION ON** button below the last block.
  - In the Block Menu, tap **Robot Moves > Jog**.
  - In the pop-up, select the **blue -Z arrow**.
  - Type in a **Distance** value of **6 inches**.
  - Toggle “Enable Contact?” **OFF**.
  - Tap **ACCEPT**.



## Executing the Task

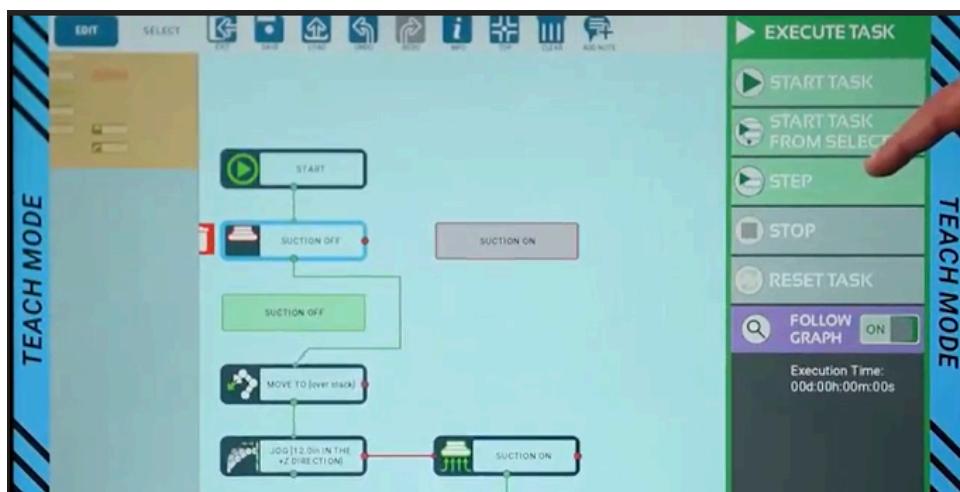
- At the bottom of the screen, tap **RCP**. Drag the speed slider to **10%**.

**Note:** The RCP speed slider affects all motion blocks. It is recommended to use a low speed (such as 10%) the first time you execute a task.



- Select the first block (**SUCTION OFF**). In the top-right corner, open the **EXECUTE TASK** menu. Tap **STEP** to only execute the selected block.

**Result:** If the suction gripper was on before, it will now turn off.



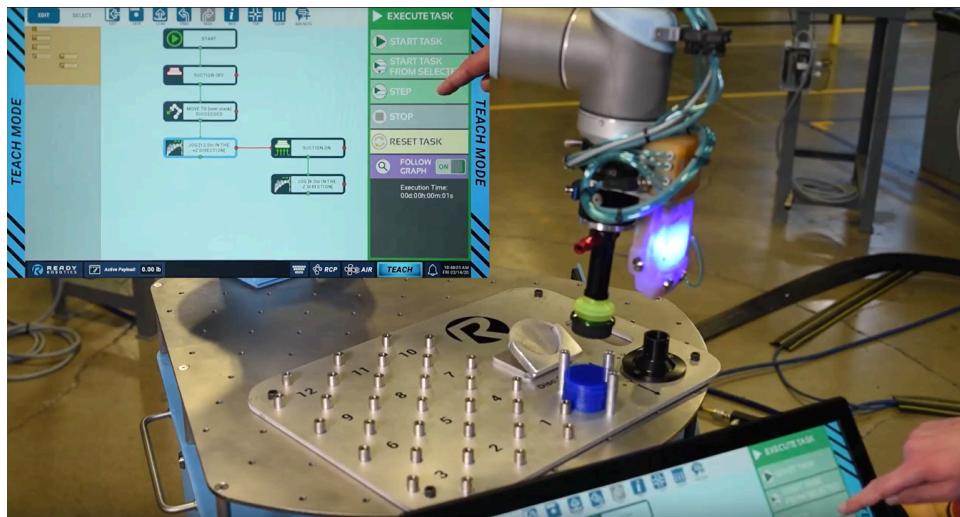
3. Select the next block (**MOVE TO**) and tap **STEP**.

**Result:** The robot will move to be 2 inches above the stack.



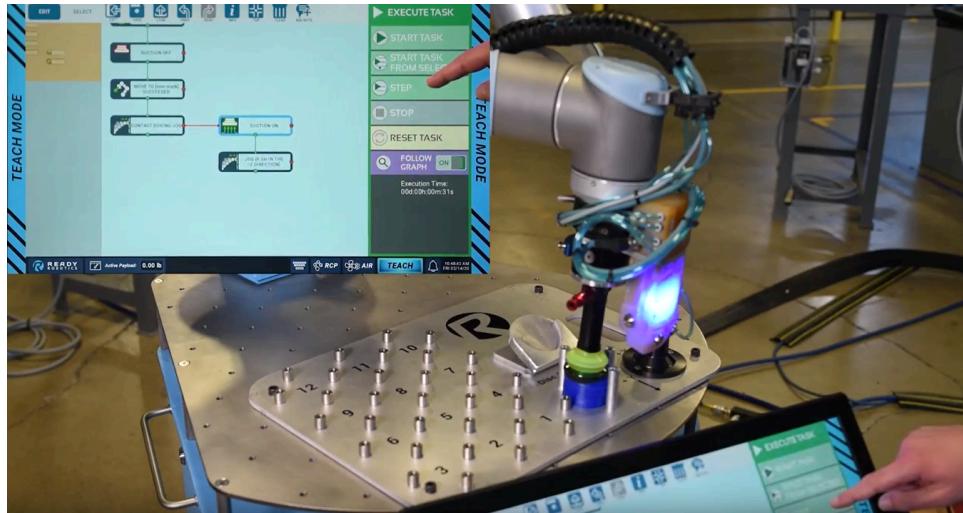
4. Select the next block (**JOG**) and tap **STEP**.

**Result:** The robot will move downward until it reaches the top disk.



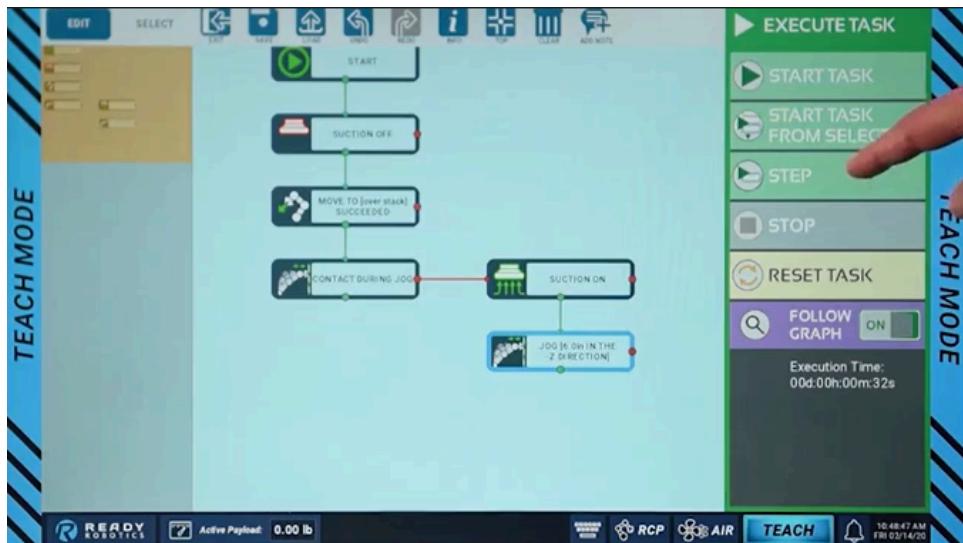
5. Select the next block (**SUCTION ON**) and tap **STEP**.

**Result:** The suction gripper will turn on.



6. Select the next block (**JOG**) and tap **STEP**.

**Result:** The robot will move upward 6 inches with the top disk.



**R**READY



**FORGElos 5**  
User Manual

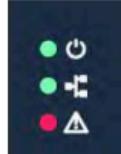
## FUNCTIONALITY

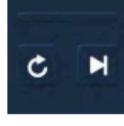
See the images and table below for READY pendant features.

**Note:** The hand strap for holding the pendant is not shown. Set up the strap for either left-handed or right-handed use.

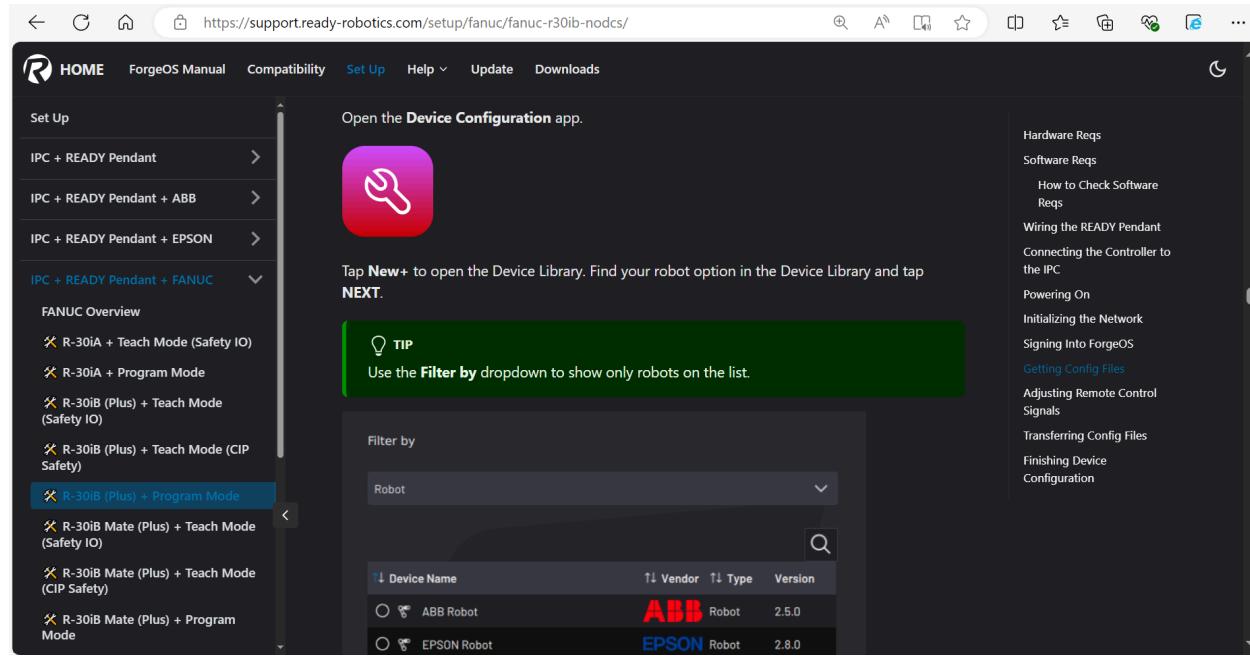




No.	Feature	Description	
1	Emergency Stop Button	Trigger an emergency stop state with this red-yellow button (DPST). Press down to open the safety circuits. This stops the robot and other devices. Twist clockwise to release the button and close the circuits.	
2	Touch Screen	Interact with Forge/OS on this multi-touch display.	
3	Mode Selector Key Switch	Insert the key and turn to select between <b>Run Mode</b> (clockwise) and <b>Teach Mode</b> (counter-clockwise).	
4	Status LEDs	<p>1. <b>Green Power LED</b> - Solid green means the pendant is on.</p> <p>2. <b>Green Network LED</b> - Solid green means a good connection to the IPC.</p> <p>3. <b>Red Error LED</b> - Solid red means there is a device error. Off indicates normal system status.</p>	
5	Jog Buttons	<p>Jog the most recently selected robot in the selected Frame.</p> <p>If you select <b>Linear</b> in the Device Control app, these jog buttons move the robot's TCP in X, Y, Z, RX, RY, and RZ. If you select <b>Joint</b>, the buttons move the robot joints.</p> <p>Holding two buttons in the same row at one time results in no motion.</p>	
6	Speed Control Buttons	<p><b>Decrease Speed</b> (left) and <b>Increase Speed</b> (right).</p> <p>While a task is running, control the runtime speed slider.</p> <p>While a task is not running, control the speed in the Device Control app.</p>	

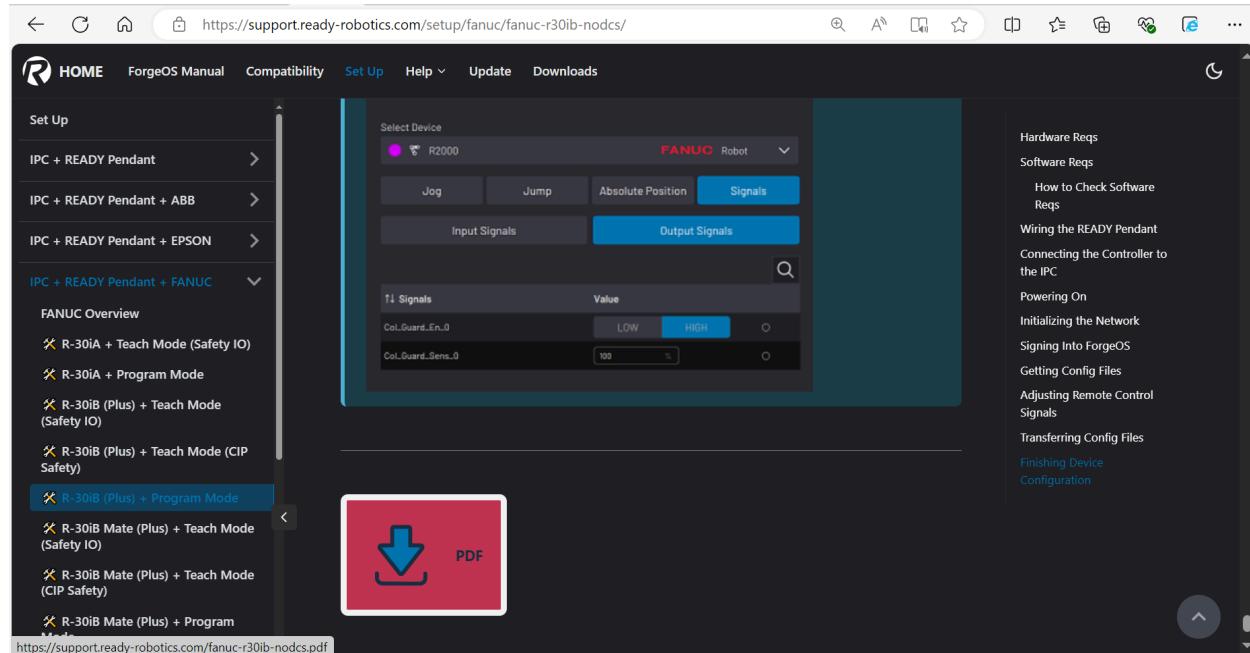
No.	Feature	Description	
7	Start/Stop Buttons	<p><b>Start</b> (left): Use in the Task Canvas app to start the task (Run mode). Use in the Device Control app to execute a jump/absolute position command.</p> <p><b>Stop</b> (right): Stop Task Canvas execution and all robot motions.</p>	
8	Reset/Step Buttons	<p><b>Reset</b> (left): Send a reset signal to all devices to fix errors.</p> <p><b>Step</b> (right): Execute the selected block in Task Canvas.</p>	
9	Three-Position Enabling Switch	<p>Enable robot motion control with this three-position switch (DPDT).</p> <p>Most robots require this enabling device when the READY pendant is in Teach Mode.</p> <p>To use, press the switch into the middle position (ON). If you release or squeeze the switch too tightly in Teach Mode, the robot will not move (OFF).</p>	
10	USB Port	<p>Connect USB devices to the pendant.</p> <p><i>Tip:</i> Connect a USB keyboard to type in fields on the screen.</p>	

# Knowledge Base



The screenshot shows the 'Device Configuration' app setup page. The left sidebar lists various configurations under 'Set Up'. The main area displays a pink icon of a wrench and a tip: 'Tap New+ to open the Device Library. Find your robot option in the Device Library and tap NEXT.' A green box contains a 'TIP' about filtering by robot. Below is a table of device filters:

Device Name	Vendor	Type	Version
ABB Robot	ABB	Robot	2.5.0
EPSON Robot	EPSON	Robot	2.8.0



The screenshot shows the 'Select Device' interface. The left sidebar lists configurations. The main area shows a 'Select Device' dialog with 'R2000' selected. It has tabs for 'Jog', 'Jump', 'Absolute Position', and 'Signals'. The 'Output Signals' tab is active, showing two signals: 'Col.Guard.En.0' (Value: HIGH) and 'Col.Guard.Sens.0' (Value: 100%). A large red button at the bottom right says 'PDF'.