

FANUC 200iD Lesson Book



Please Name your document:

YourName(First and Last)Lesson

Lesson 1-Basics and Jogging the Robot

Summary

In this lesson, you will learn about robot setup and how to move the robot without creating a program. This will help you understand the fundamentals of robot programming.

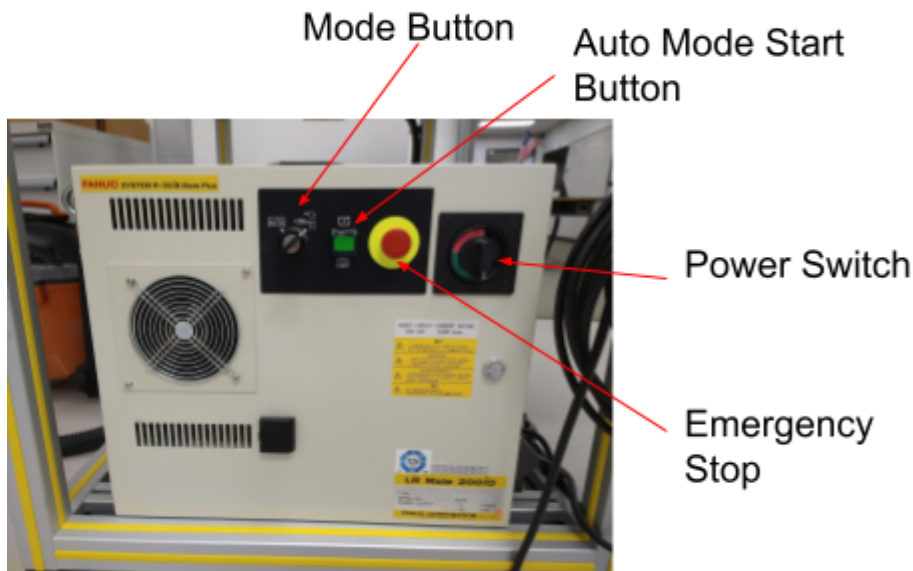
Setup

First, here are some important terms for you to know.

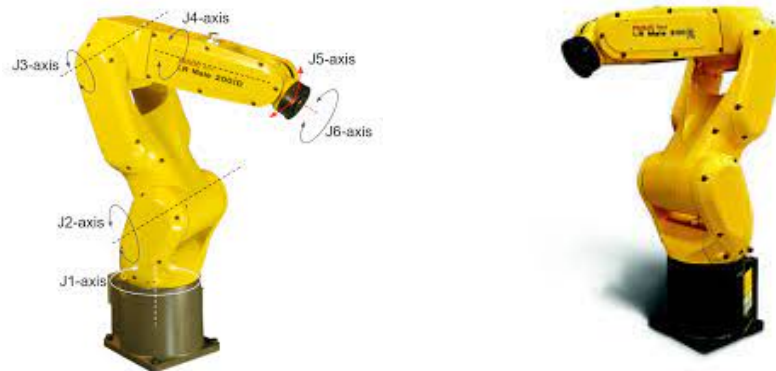
- Teach Pendant (TP)
 - This is what controls the robot. You can either create programs directly on the teach pendant or by using a computer. There are two deadman switches of which one must be pressed at all times for the robot to operate.



- Power Panel
 - The power panel is located underneath the robot. This is where you will set the mode which the robot is in.



- Robot
 - This is what the teach pendant controls. The robot can move in 6 axes and is used for industrial production.



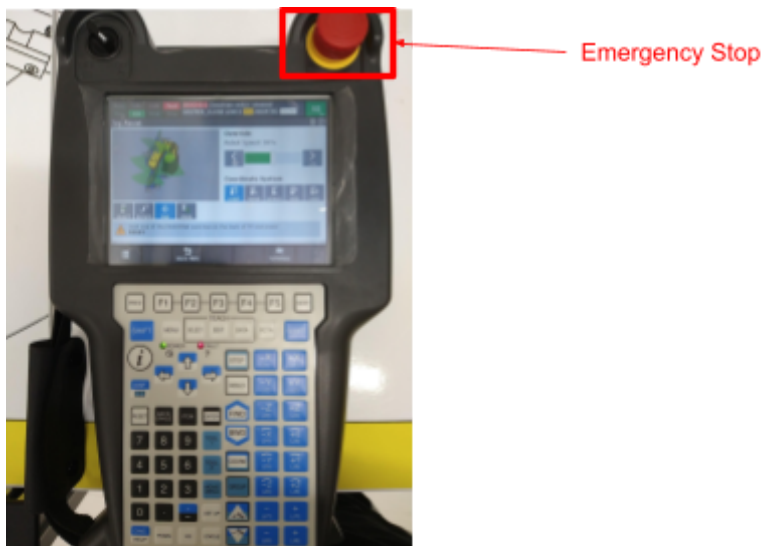
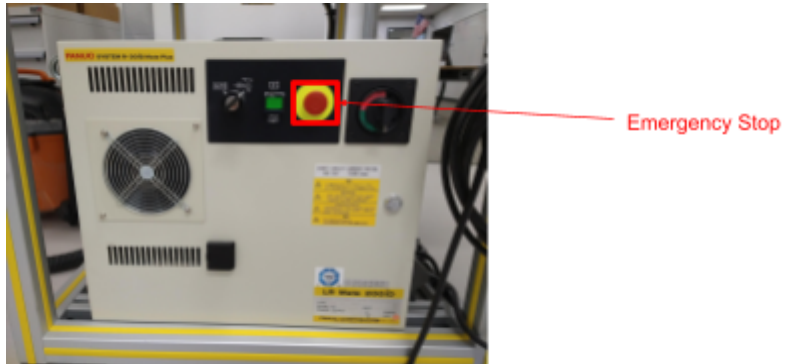
The Robot has 3 different modes that it can move in:

- Joint
 - Uses individual joints to move
- World
 - The entire robot moves (more fluid than joint mode)
- Tool
 - The robots movement is centered on the tool, in this case the gripper

Safety

Ensure to watch the robot while it is in operation in order to ensure that it does not collide with anything.

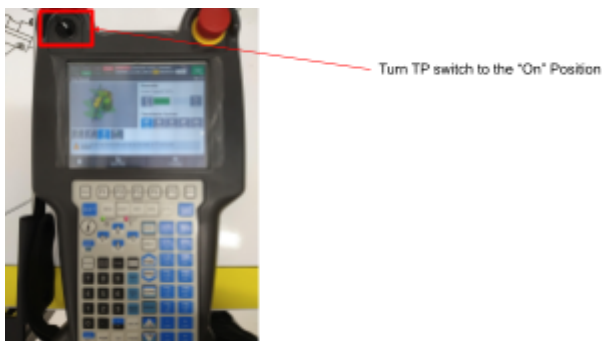
If for any reason you need to stop the robot immediately press the red emergency stop button on either the Power Panel or the Teach Pendant. To reset the button, twist it.



Jogging the Robot

Steps

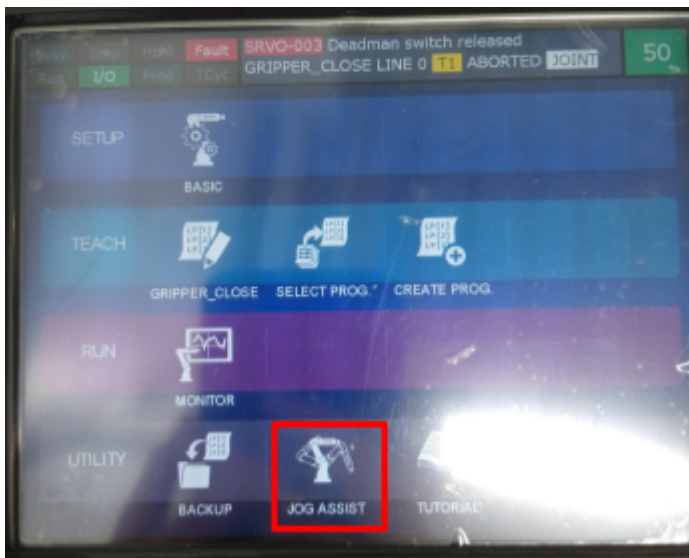
1. Turn the Teach pendant on and the power panel switch to T1, if they are not there already.



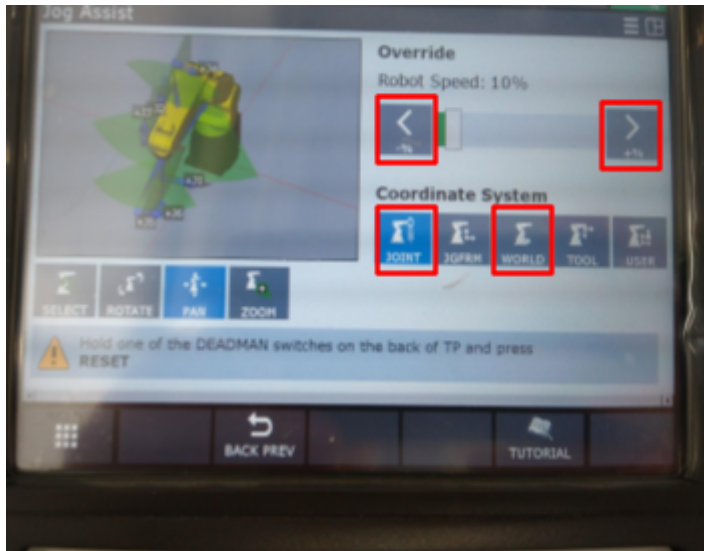


Switch to the T1 Position

2. Go to the main menu of the teach pendant using the grid in the left corner.
3. Click on the Jog Assist button



4. Once inside Jog Assist set Robot Speed to whatever level you desire and set the coordinate system to world (in order to understand what the different modes do, return to the setup section)



5. In order to jog the robot, you need to hold the deadman switches at the back of the robot, shift, and one of the X, Y or Z buttons. Play around with it! **If an error occurs or is already displayed at the top of the screen, press deadman+shift+reset.**



Congratulations, You have successfully Jogged the robot!

Lesson 2-Programming the Robot

Summary

In this lesson, you will learn about robot setup and how to move the robot by creating a program and adding move points. Move points are points that record the robot's position. In order to create a move point, you move the robot to the desired position, and record the point.

Safety

Ensure to watch the robot while it is in operation in order to ensure that it does not collide with anything.

If for any reason you need to stop the robot immediately press the red emergency stop button on either the Power Panel or the Teach Pendant. To reset the button, twist it.



Emergency Stop

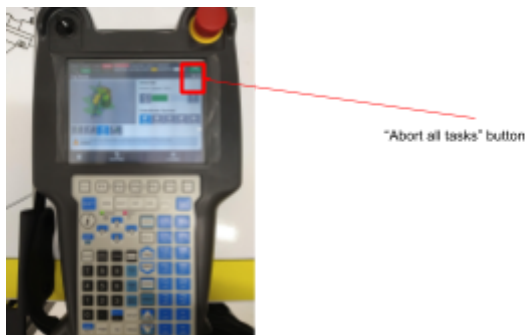
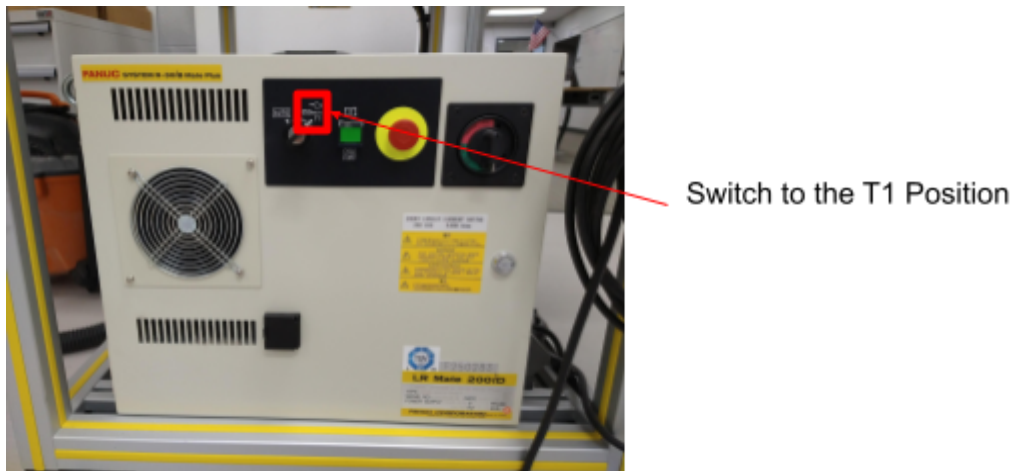
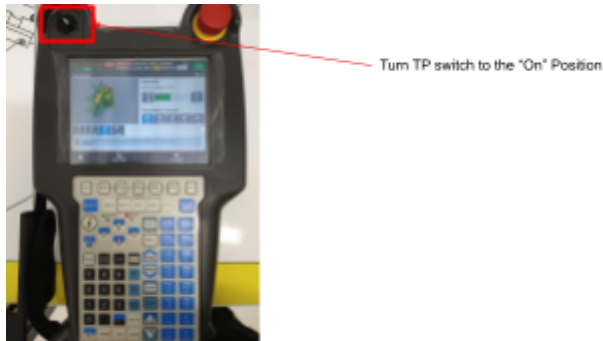


Emergency Stop

Programming the Robot

Steps

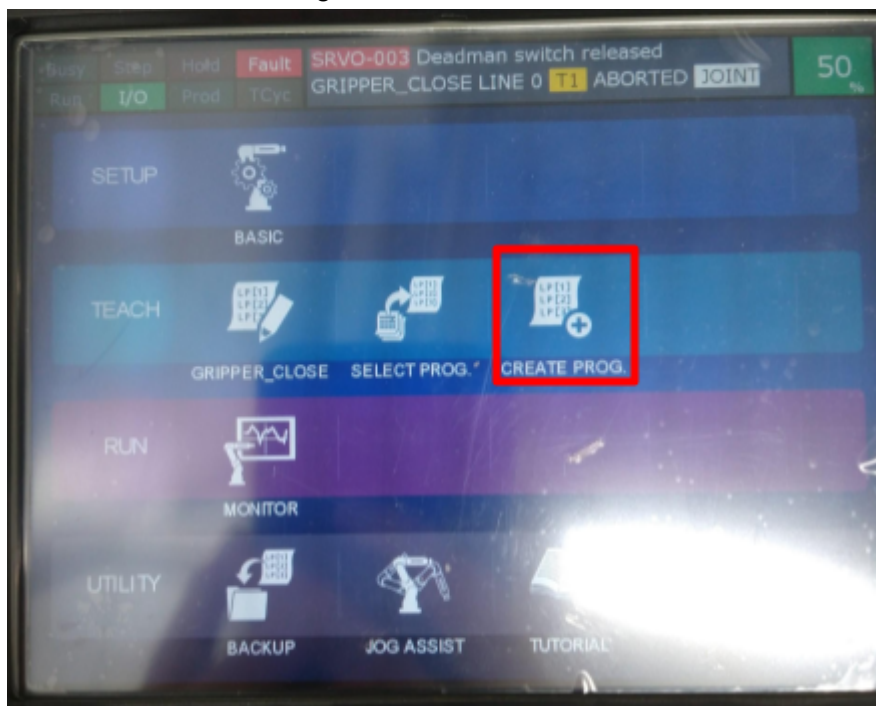
1. Turn the Teach pendant on and the power panel switch to T1, if they are not there already. Set the Robot in Joint mode in the Jog Window, as you learned in the previous lesson. Abort all tasks in the jog window by pressing the three lines in the upper right corner, and click "abort all tasks".



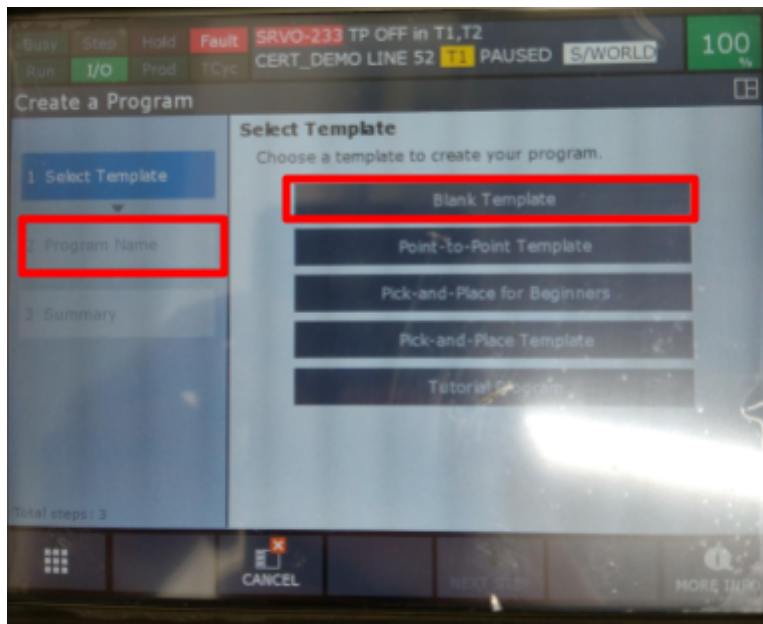
2. Go to the main menu of the Teach Pendant using the grid in the bottom left corner.



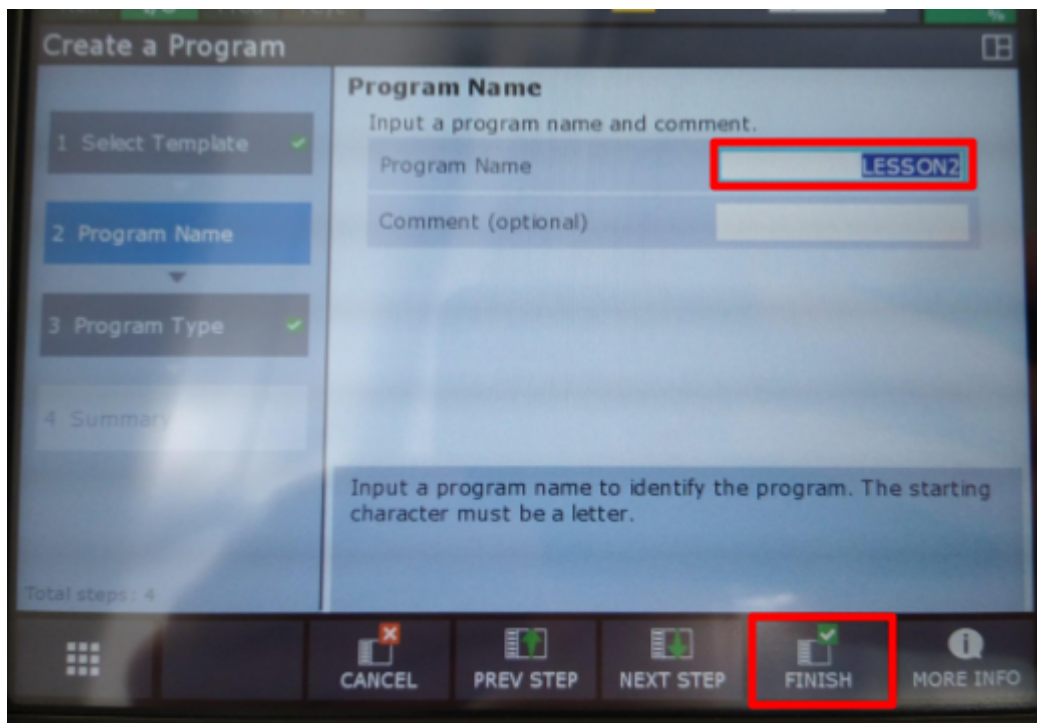
3. Click on the "Create Program" button from the main menu.



4. This screen should Display, select “Blank Template”. After Selecting Blank Template, click “Program Name” on the right side of the Screen.

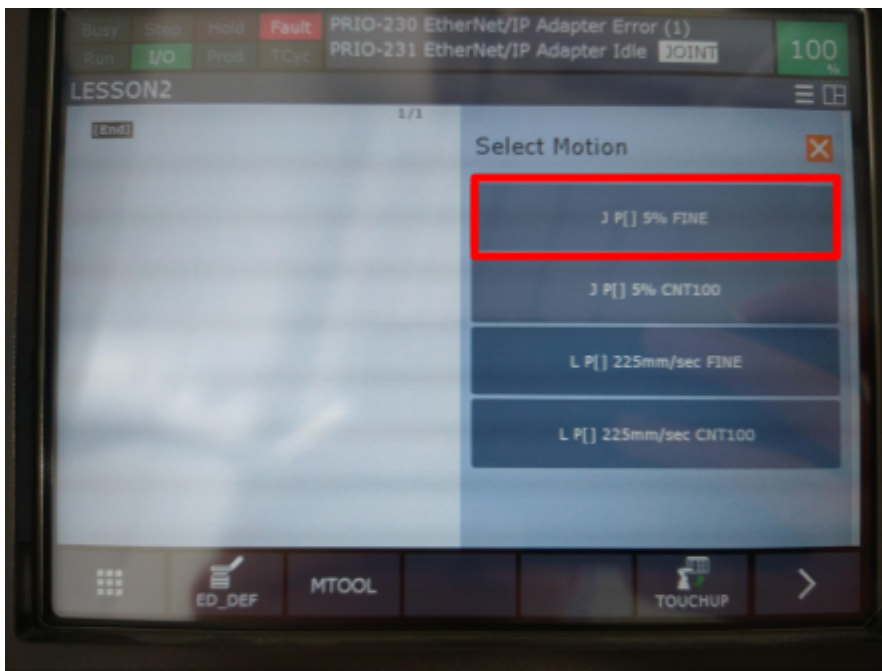
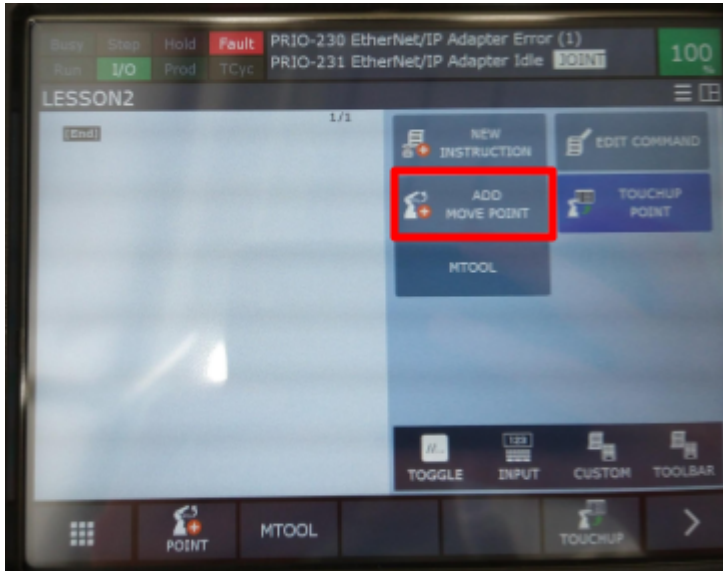


5. Name your program “Lesson2” (**NO SPACE**), and then click “Complete” in the bottom right corner of the screen.

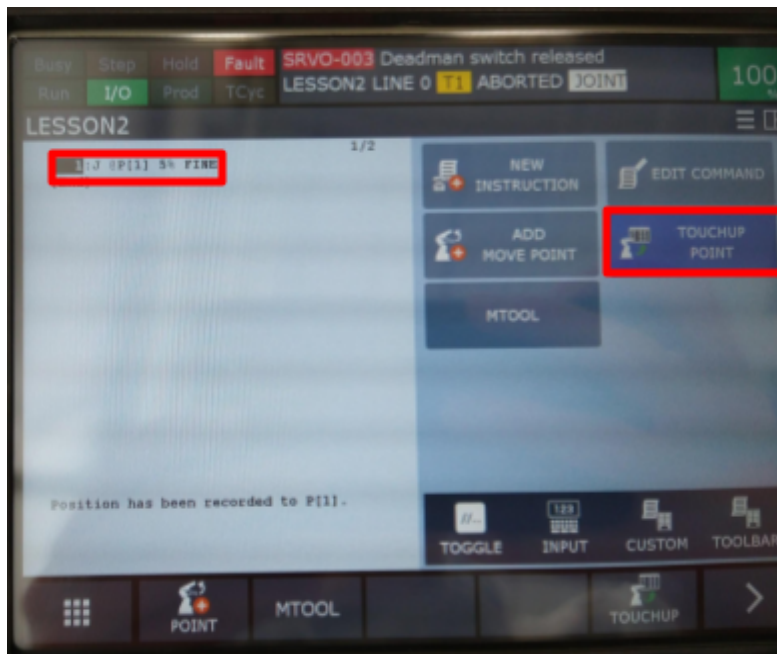


6. Move the robot to whatever position you wish to start in using the skills that you learned in lesson one. **If an error occurs or is already displayed at the top of the screen, press deadman+shift+reset.**

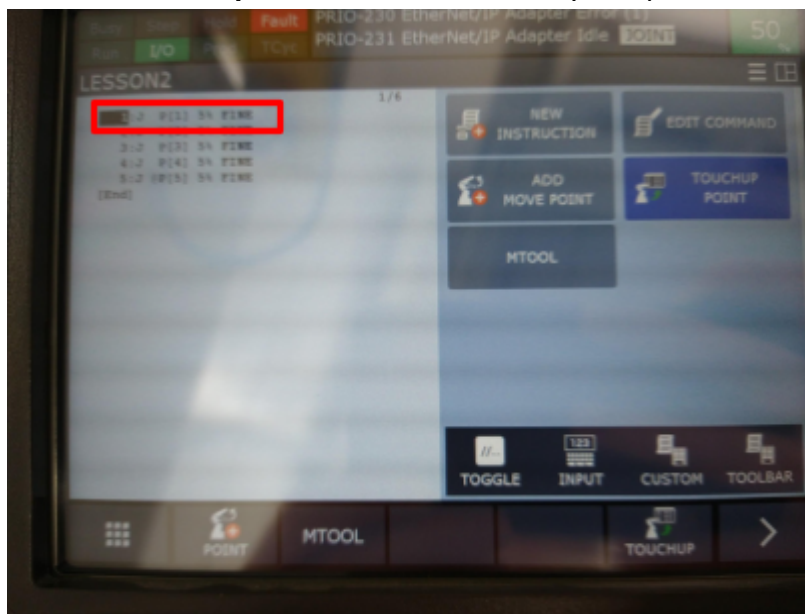
7. Once you have done this, click “Add Move Point”. Once you have done this, click “J P[] 5% FINE”.



8. **Move the robot to the next point, and repeat this process until you have added more than 4 different move points.** If you want to change a move point, move the robot to the desired position, select the line that you want to change, and press “Touchup Point”



9. When you are done, select the first line of the program (**Ensure that the robot is not in STEP mode-refer to important terms document**) and press deadman+shift+forward.



Congratulations, You have successfully programmed the robot!

Lesson 3- Picking up a workpiece

Summary

In this lesson, you will learn about how to pick up a workpiece using the gripper.

Safety

Ensure to watch the robot while it is in operation in order to ensure that it does not collide with anything. **In this lesson, this is especially important.** The robot will stop if it detects it has collided with something.

If for any reason you need to stop the robot immediately press the red emergency stop button on either the Power Panel or the Teach Pendant. To reset the button, twist it.



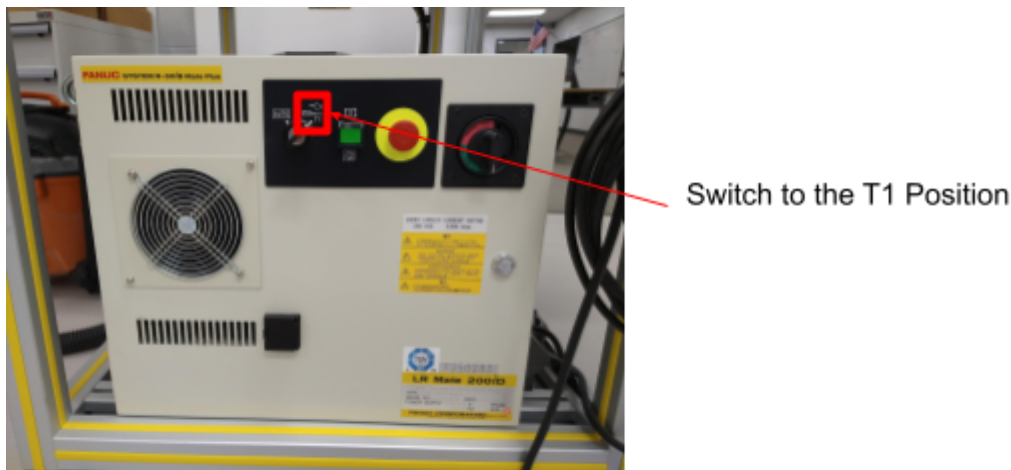
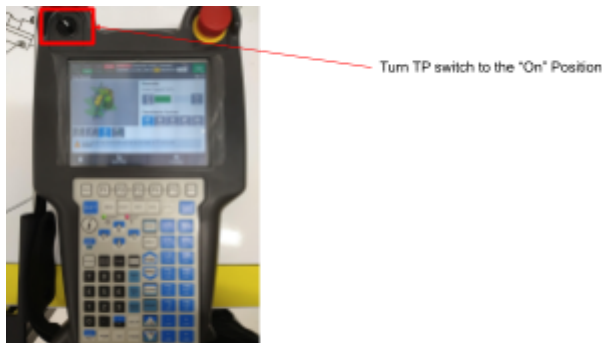
Emergency Stop



Emergency Stop

Steps

1. Turn the Teach pendant on and the power panel switch to T1, if they are not there already. Set the Robot in Joint mode in the Jog Window, as you learned in the previous lesson. Abort all tasks in the jog window by pressing the three lines in the upper right corner, and click “abort all tasks”. Set the Teach Pendant to “Step” mode by pressing the “Step” button



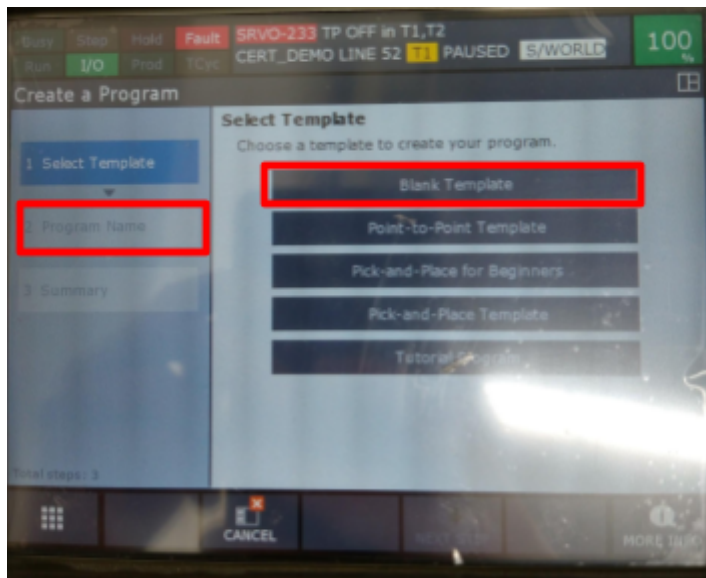
2. Place the piece in the starting Square- This can be wherever you want on the board. Label the Square “L3”.
3. Go to the main menu of the Teach Pendant using the grid in the bottom left corner.



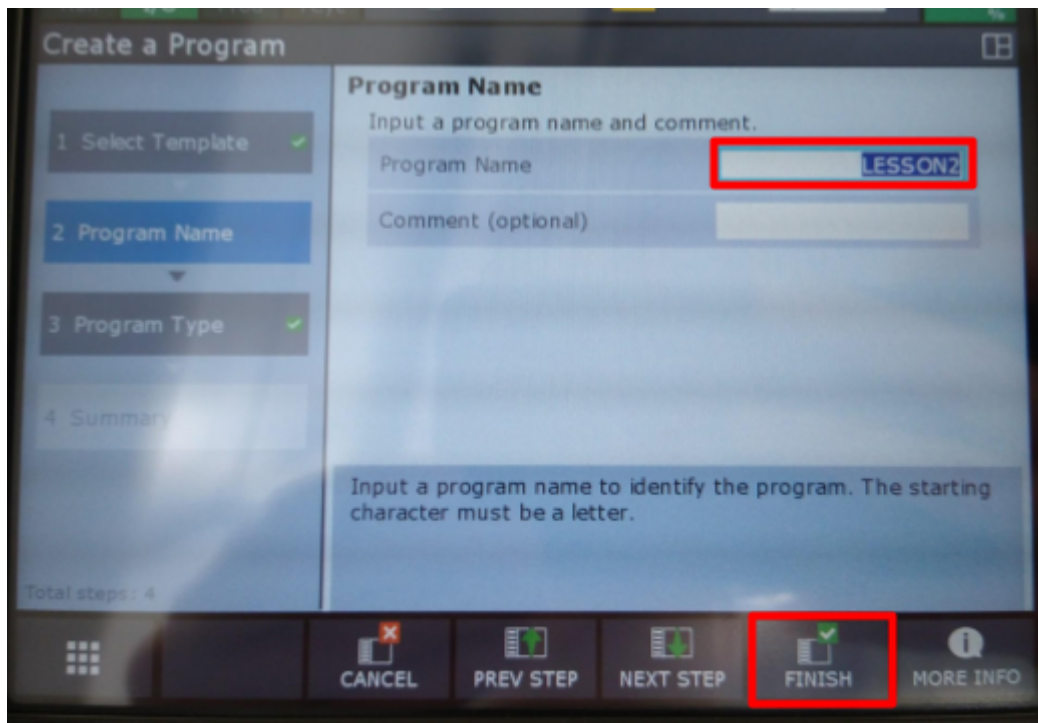
4. Click on the "Create Program" button from the main menu.



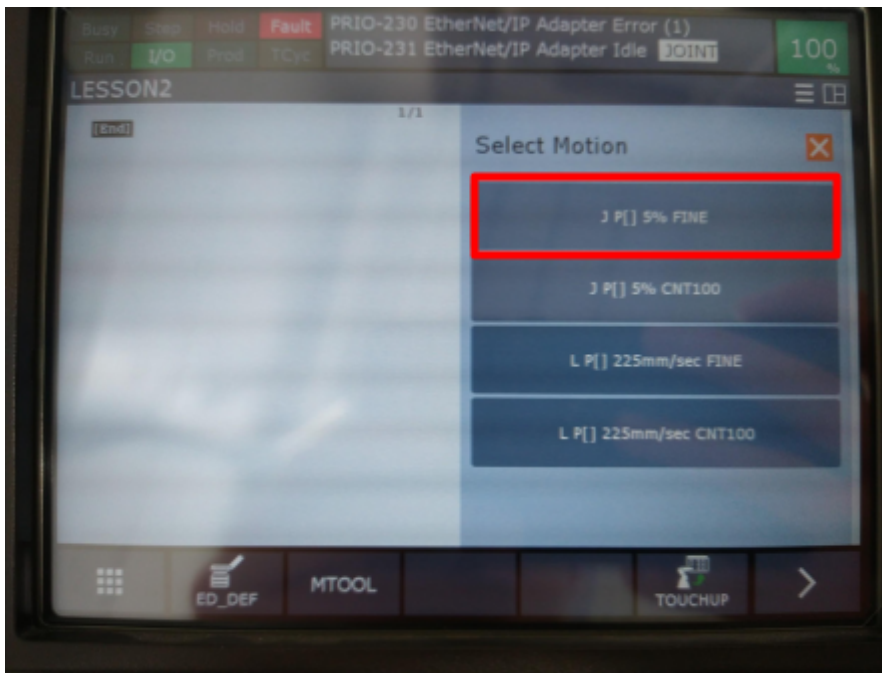
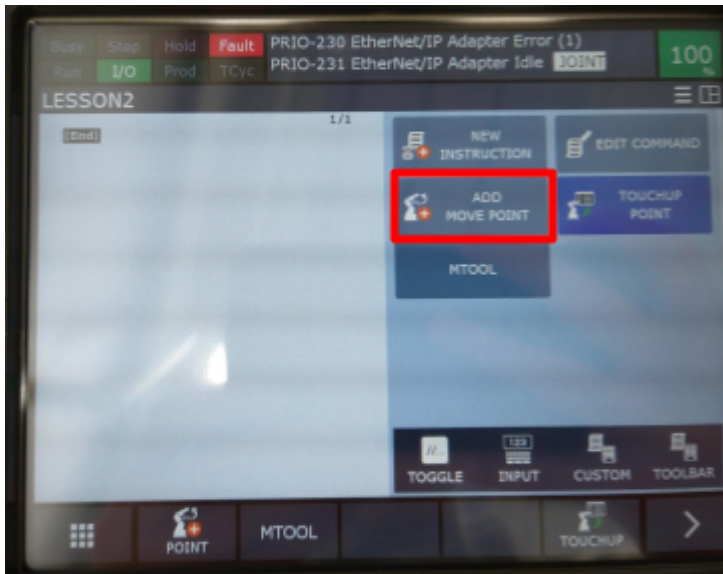
5. This screen should Display, select “Blank Template”. After Selecting Blank Template, click “Program Name” on the left side of the Screen.



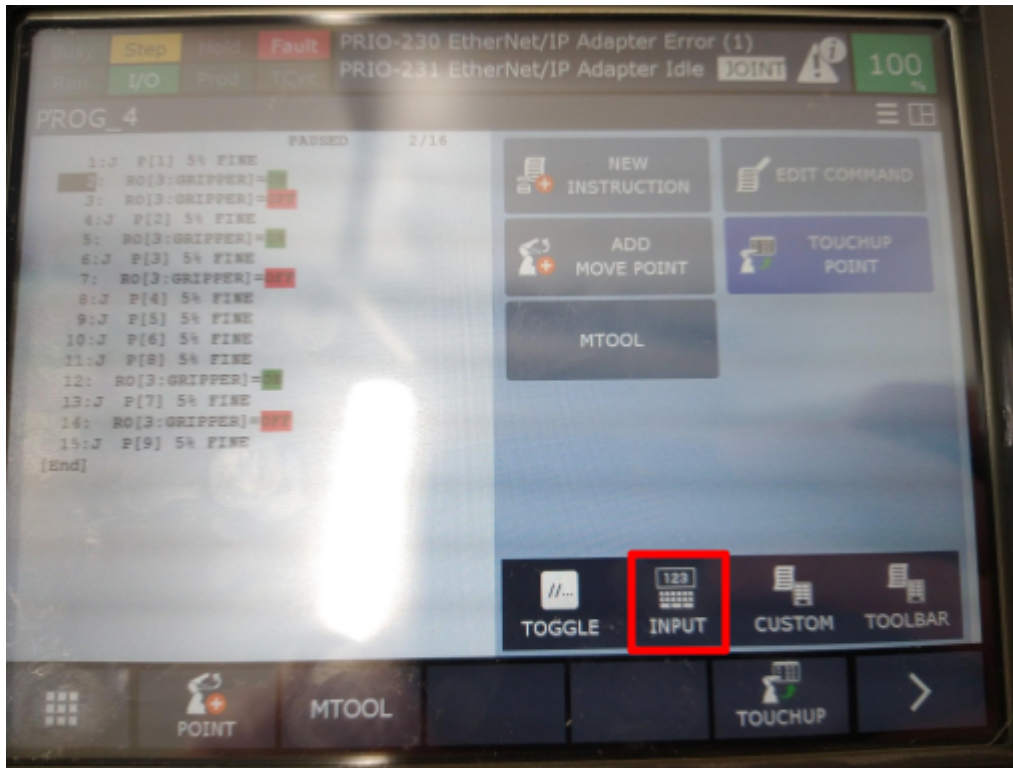
6. Name your program “Lesson3” (**NO SPACE**), and then click “Complete” in the bottom right corner of the screen.



7. Move the robot to whatever position you wish to start in using the skills that you learned in lesson one. **If an error occurs or is already displayed at the top of the screen, press deadman+shift+reset.**
8. Once you have done this, click “Add Move Point”. Once you have done this, click “J P[] 5% FINE”.



9. Move the robot towards the starting box on the board, stopping and recording a point when you are a few inches above the piece.
10. To open the claw, press input and type "R0[3:GRIPPER]=ON" and press "exit" in the upper right hand corner when done. Then, press Deadman+Shift+Forward. This will move the robot to its original position, the position slightly above the workpiece, and open the claw.



11. Slowly move the robot down towards the workpiece until it is encapsulated in the claws. To close the claw, press input and type "R0[3:GRIPPER]=OFF" and press "exit" in the upper right hand corner when done. Then, press Deadman+Shift+Forward. This will move the robot to its original position, the position slightly above the workpiece, and close the claw around the workpiece.
12. Move the robot to its original position, record it and open the claw in order to drop the workpiece by typing "R0[3:GRIPPER]=ON". Turn step mode off and press deadman+shift+forward in order to run the program. Be ready to stop the robot if it does something that you did not expect.

Congratulations, you have successfully picked up a workpiece!

Lesson 4- Creating a pick and place program

Summary

In this lesson, you will learn about how to pick up a workpiece, move it to a point, place it there, and return the piece to its home position.

Safety

Ensure to watch the robot while it is in operation in order to ensure that it does not collide with anything. In this lesson, this is especially important. The robot will stop if it detects it has collided with something.

If for any reason you need to stop the robot immediately press the red emergency stop button on either the Power Panel or the Teach Pendant. To reset the button, twist it.



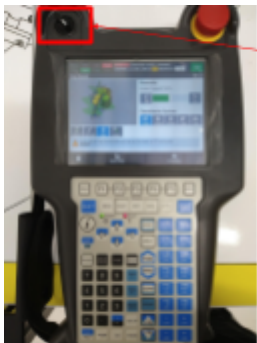
Emergency Stop



Emergency Stop

Steps

1. Turn the Teach pendant on and the power panel switch to T1, if they are not there already. Set the Robot in Joint mode in the Jog Window, as you learned in the previous lesson. Abort all tasks in the jog window by pressing the three lines in the upper right corner, and click “abort all tasks”. Set the Teach Pendant to “Step” mode by pressing the “Step” button



Turn TP switch to the "On" Position



Switch to the T1 Position

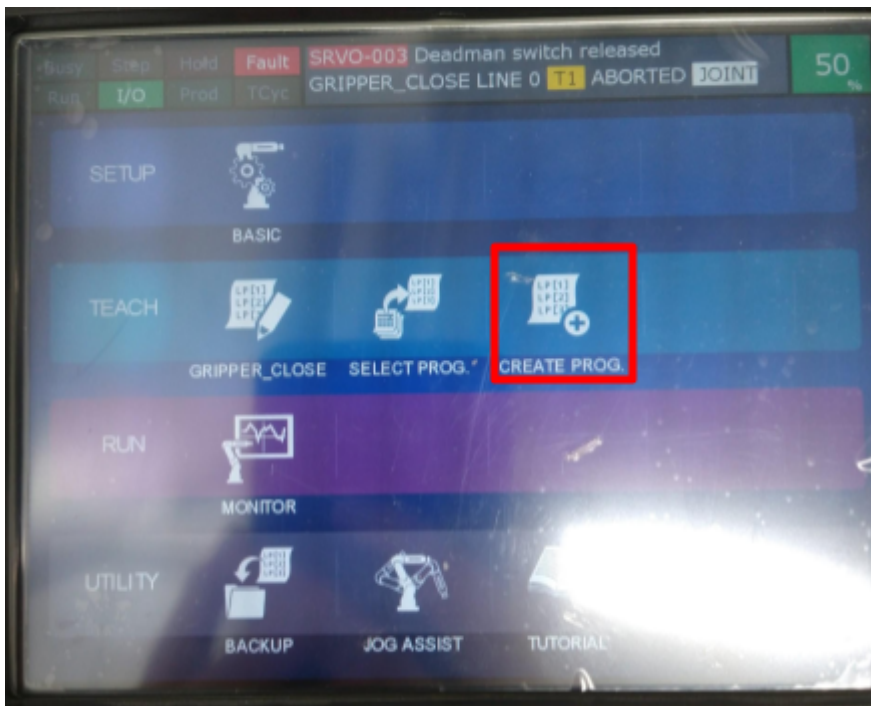


Switch the TP to "Step" mode

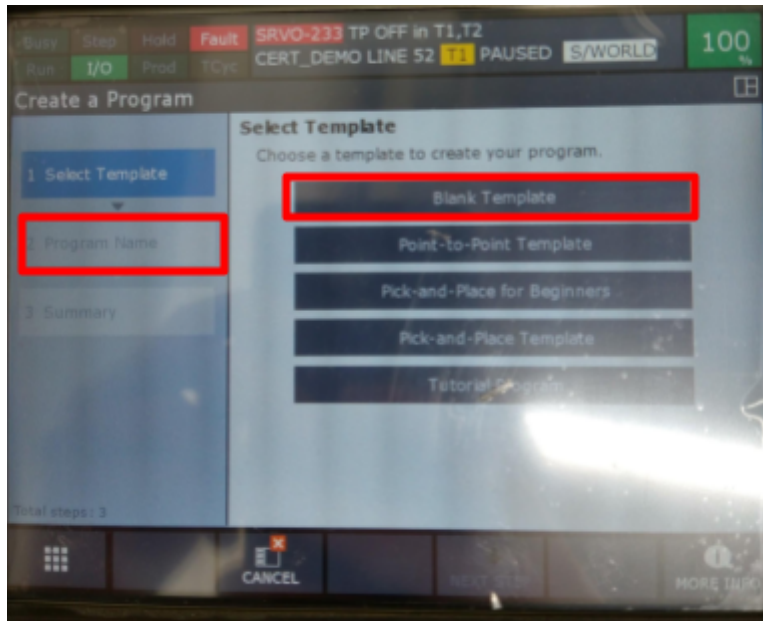
1. Place the piece in the starting Square- This can be wherever you want on the board. Mark the box "L4".
2. Go to the main menu of the Teach Pendant using the grid in the bottom left corner.



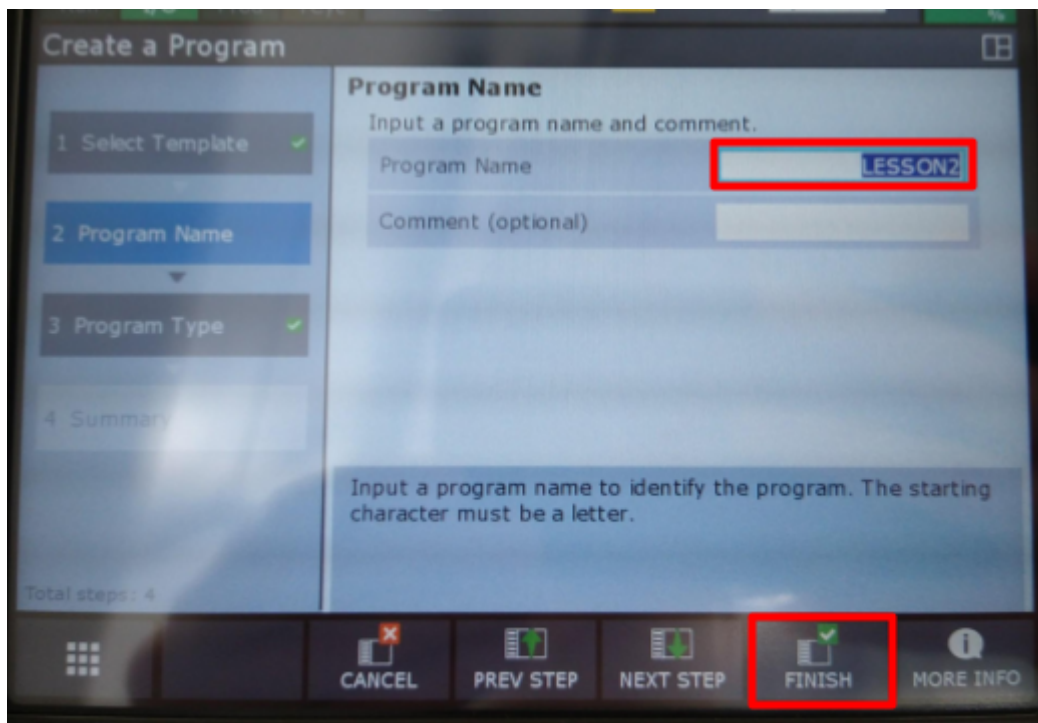
3. Click on the "Create Program" button from the main menu.



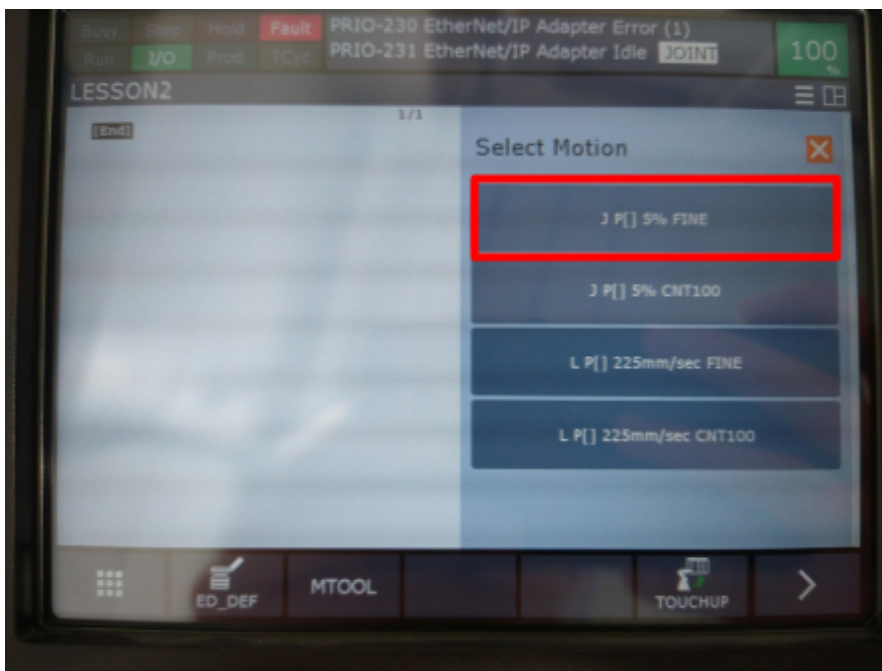
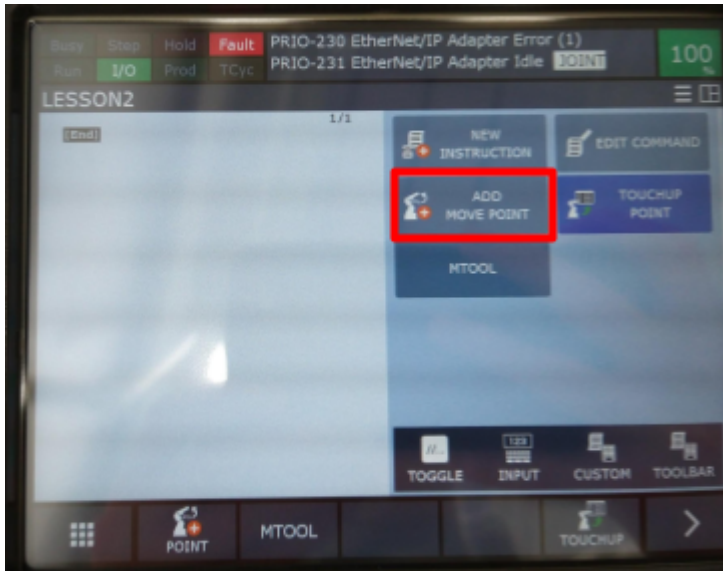
4. This screen should Display, select “Blank Template”. After Selecting Blank Template, click “Program Name on the left side of the Screen.



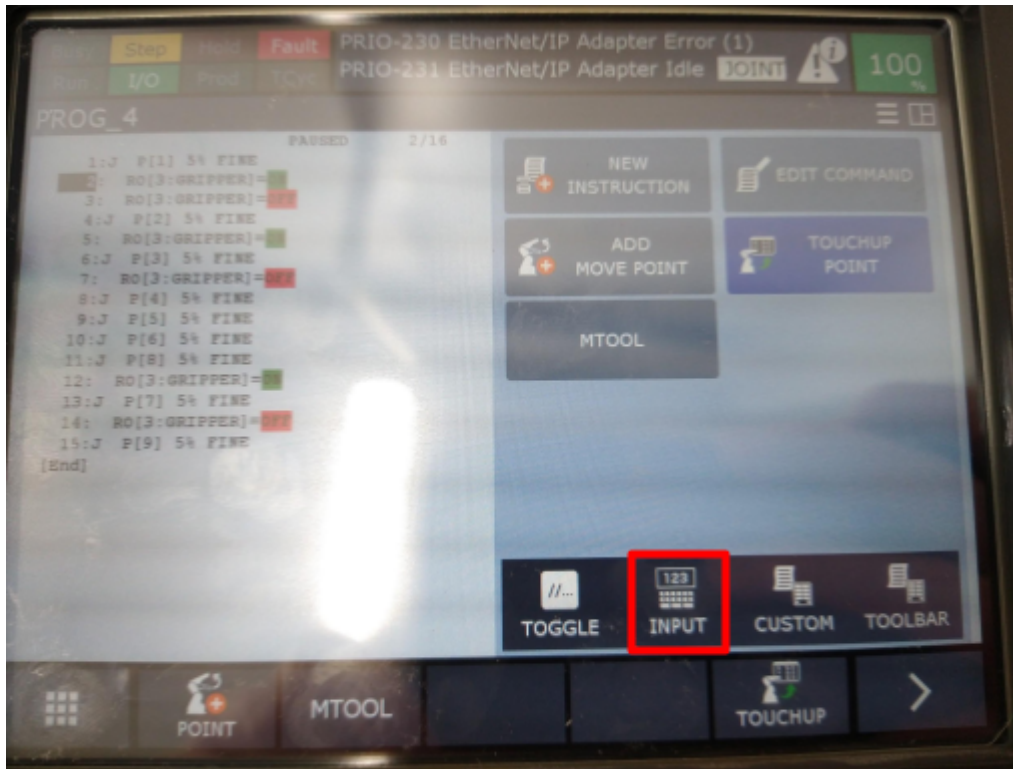
5. Name your program “Lesson4” (**NO SPACE**), and then click “Complete” in the bottom right corner of the screen.



6. Move the robot to whatever position you wish to start in using the skills that you learned in lesson one. **If an error occurs or is already displayed at the top of the screen, press deadman+shift+reset.**
7. Once you have done this, click “Add Move Point”. Once you have done this, click “J P[] 5% FINE”.

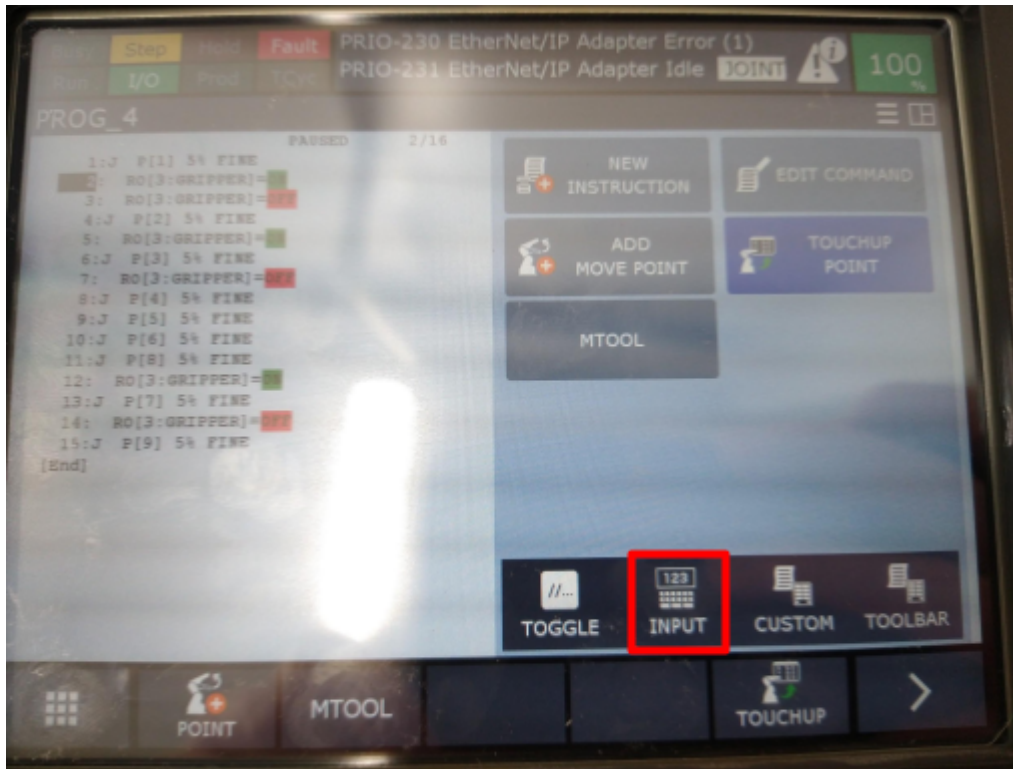


8. Move the robot towards the starting box on the board, stopping and recording a point when you are a few inches above the piece.
9. To open the claw, press input and type “R0[3:GRIPPER]=ON” and press “exit” in the upper right hand corner when done. Then, press Deadman+Shift+Forward. This will move the robot to its original position, the position slightly above the workpiece, and open the claw.



10. Slowly move the robot down towards the workpiece until it is encapsulated in the claws. To close the claw, press input and type "R0[3:GRIPPER]=OFF" and press "exit" in the upper right hand corner when done. Then, press Deadman+Shift+Forward. This will move the robot to its original position, the position slightly above the workpiece, and close the claw around the workpiece.
11. Move the robot to the midpoint between the starting box and the ending box, and record the position.
12. Move the robot until it is just above the ending box and record its position.

13. Move the robot until the workpiece is inside the ending square and record its position. To open the claw, press input and type "R0[3:GRIPPER]=On" and press "exit" in the upper right hand corner when done.



14. Slowly move the robot away from the placed workpiece. When the robot is a few inches above the workpiece, record its position. Move the robot to its home position and record it. Close the gripper using "R0[3:GRIPPER]=OFF".

Congratulations, you have created a pick and place program!