Experiment No: 1

Universal Robot UR10 E-series Collaborative Robot: Module I

UR10 at a glance, prepare a robot task, setting up tool

Outcomes:

Students will be able to

- understand the overall construction of the robot with key components
- understand tool center point, tool orientation, center of gravity and payload
- configure the end effector with the robotic manipulator

Description:

A robotic manipulator is a device used to manipulate materials without direct physical contact by the operator. UR10 robot is used to understand the concept of robotic manipulator. UR10 is the robot having six degrees of freedom and having payload capacity up to 10 kg. All joint in UR10 are rotary joints which can provide rotary motion between two links of robot. An end effector is available at the end of manipulator, which is mainly used for pick and place operation. This operation is immensely used in industries to transfer the product from one place to another. As an engineer, one must have enough knowledge about the working of the robotic system and the procedure to configure the end effector. End effector can be in the form of either gripper or the tool based on the requirements.

Students have to go through the following for the virtual experience of UR10 and also for the completion of eSeries Online Training.

https://academy.universal-robots.com/online-training/e-series-online-training/

Students have to complete the following three modules of the eSeries Core Track Training.

1. FIRST LOOK: THE ROBOT AT A GLANCE
2. PREPARING A ROBOT TASK
3. SETTING UP A TOOL

Exercise:

1. Explain the “Protective Stop” feature of the UR10.
2. What is the use of freedrive?
3. Discuss the term “Tool Center Point” considering at least two different types of end effector.
4. What do you mean by payload capacity of the robotic manipulator? Also give your remark about the weight of the end effector, whether it is include or excluded in the payload.