

Lesson 2 Establish Robotic Arm Coordinate System

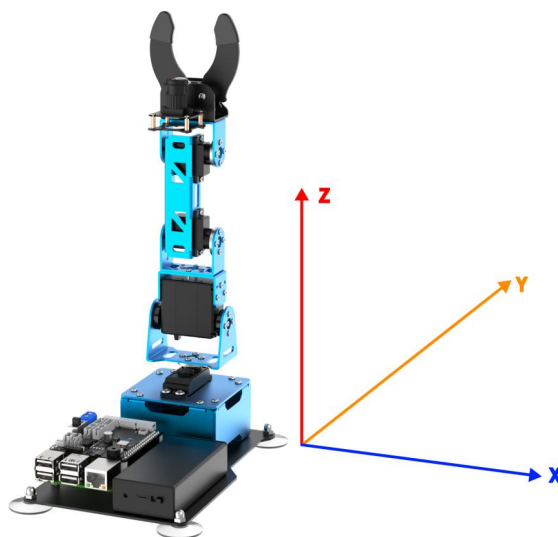
1. Coordinate System Introduction

Most of the descriptions of spatial position, speed and acceleration are in Cartesian coordinate system, which is well known as a coordinate system composed of three mutually perpendicular coordinate axes. When we say how many angles to rotate around a certain axis, the right-hand rule is used to determine the positive direction, as shown below:



2. Establish Space Coordinate System

A coordinate system must be established to describe the motion of an object. ArmPi mini uses x, y and z coordinate system and take the center of the base as origin (0,0,0), as the figure shown below:



Note: When controlling robotic arm, z-axis value must be greater than 0.

After the coordinate system is established, robot arm can be controlled to reach any position in the workspace by specifying the coordinate of the end effector position and using inverse kinematics to calculate the joint angle. The X, Y and Z axes can be controlled at individually or together.

Coordinate axis	Control direction
x	Control the end effector to move left or right. Moving to the right is the positive direction of x axis.
y	Control the end effector to move forward or backward. Moving forward is the positive direction of y axis.
z	Control the end effector to move up and down. Moving up is the positive direction of z axis.

For example, when robot arm moves to the right, x-axis value increases; when robot arm moves forward, y-axis value increase; when robot arm moves up, z-axis value increases.