

6 DOF MOTION PLATFORM SIMULATOR

Overview

Delta Computer System Inc.,'s RMC150E motion controller is capable of controlling a six-degree-of-freedom motion platform, also known as a parallel manipulator, Stewart platform or a Gough-Stewart platform.

An external device must generate the motion profile in x,y,z,roll,pitch, yaw coordinates and continuously send the coordinates to the RMC at a specified interval.

Delta has developed an RMCTools project for the RMC150 that handles communication with an external device, translates the x, y, z, roll, pitch, and yaw coordinates into cylinder positions, and controls the cylinders. This project is available from Delta Computer Systems at no charge.



6 DOF Simulator

Delta has developed a basic 6 DOF simulator system to assist you in developing a 6 DOF system before the physical motion platform is built. The simulator system includes:

- **6DOF Software**
The 6 DOF software is available from Delta at no charge and includes:
 - **6DOF Viewer**
A real-time 6 DOF motion platform rendering.
 - **6DOF Profile Editor**
Provides a way to create, save, and open simple motion profiles, and streams the profile to the RMC150E in real time.
 - **RMC150E Project**
This RMCTools project is ready to simulate six axes and perform the platform motion.
- **RMC150E-S3**
6-axis motion controller with SSI feedback. This is required for the simulation system and is available for purchase from Delta.

Using the 6 DOF Simulator

Required Equipment

- RMC150E-S3
- Ethernet connection to the RMC150E
- 6 DOF software
- RMCTools software

Setup

1. Run **6DOFInstall.exe**.

This will create a **6DOF** folder in the Windows Start menu with two programs: **6DOF Viewer** and **6DOF Profile Editor**. It will also install motion profiles and the RMC150E RMCTools project.

2. In **RMCTools**:

- a. Open **6DOF-Stream.rmcproj** located in **C:\Program Files (x86)\6DOF\Media**
- b. Download the project to the RMC150E, make sure it is in RUN mode, and set the IP address.

3. In the **6DOF Viewer** software:

- a. In the upper right corner, type or browse for the IP address of the RMC150E.
- b. Click **Connect to RMC**.



4. In the **6DOF Profile Editor** software:

- a. Open **RotateWithAngle.6dof** located in **C:\Program Files (x86)\6DOF\ Profiles**.
- b. Click **Connect**, then **Go!** You should now see the platform moving in the 6DOF software.
- c. You can open other profiles, or create your own. Use the + and – buttons to add or delete steps. For each coordinate, enter a value and choose the profile to generate to that point. The Sine and Cosine options generate a quarter wave and when used simultaneously on multiple coordinates, can be used to create circular motion.

Notes

- Any number of 6DOF renderers may be connected, but only 1 profile editor should be sending commands. If the RMC receives commands from multiple sources, it will process them.
- There is a conflict between "Full Screen Mode" and the 6DOF RMC browse window. It's best to browse and connect before toggling Full Screen Mode. Maximizing the window is OK, but Full Screen mode tries to exclusively take over and not cooperate with the browser dialog.