ACROME

STEWART PLATFORM

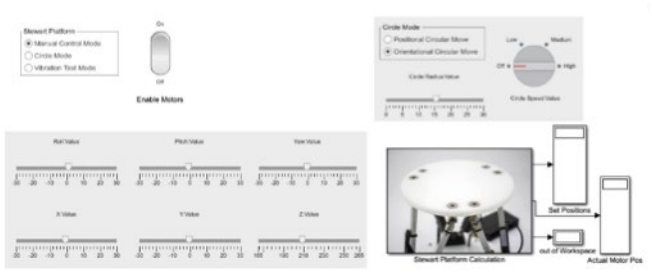
Simulate your motion system with ACROME Stewart Platform!

OVERVIEW

ACROME Stewart Platform can offer realistic simulations at 6-DOF owing to the high sensitivity of linear actuators, gyroscope, and a three-axis accelerometer. With the accesible and user friendly components, it is suitable to simulate real systems such as flight simulators, machine tool technology, crane technology, mechanical bulls, precision platform positioning such as telescopes, antennas, and orthopedic surgery.

OPEN-SOURCE CONTROLLER SOFTWARE

Stewart Platform comes with a ready-to-run open-source software availble for NI LabVIEW or Matlab/Simulink. It is possible for users to implement their own controller algorithms and also implement additional device/software integration for different simulations.



EFFICIENCY ON SIMULATIONS

Every joint of the Stewart platform is independently controllable with the modifiable open-source software and users can understand the effects of different controller types on the system. With a simple and clear user interface and extensive documentation, users have the opportunity to learn essential aspects of robotics and easily cover controller design concepts.

ACROME

FEATURES

Assembled and ready to control plant with the integrated power unit

Open architecture with extensive courseware, suitable for engineering disciplines related to control systems

Fully compatible with MATLAB®/Simulink® and LabVIEW™

Fully documented system models and parameters provided for MATLAB®/Simulink®, LabVIEW™

Parallel manipulator with six independent actuators

Precision-crafted chassis constructed of durable plexiglass

Assembled and ready to control plant with the integrated power unit

Enables students to create their own real-time algorithms.

CURRICULUM

INTRODUCTION
Definition of a Robot
Parallel Manipulators and Stewart Platform
Uses of Stewart Platforms

JOINT SPACE SCHEMES
Cubic Polynomials
Cubic Polynomials for a Path with via Points
Higher Order Polynomials
Linear Function with Parabolic Blends
Linear Function with Parabolic Blends for a Path with via Points

TRAJECTORY GENERATION
Introduction
General Considerations in Path description and Generation
Cartesian Space Schemes
Joint Space Schemes

PARALLEL KINEMATICS
Joint Description
Inverse Kinematics
Mobility of Stewart Platform

PROGRAMMING

GENERAL SPECIFICATIONS

Active Axes	X,Y,Z,θX, θY, θZ
Base Radius	120 mm
Platform Radius	80 mm
Platform Height	165 mm (motors at home position)
Travel Range X,Y	+/- 50 mm
Travel Range Z	100 mm
Travel Range θX, θY	+/- 30°
Travel Range θZ	+/- 30°
Max Speed (No Load)	46mm/s
Max Force Lifted	280 N
Development Platforms	LabVIEW, Matlab/Simulink*

LINEAR DC MOTOR SPECIFICATIONS

Gear Ratio	22:1
Peak Power Point	40N@26mm/s
Peak Efficiency Point	25N @34mm/s
Max Speed (No Load)	46mm/s
Max Force Lifted	50N
Back Drive Force	75N

FEEDBACK LINEARITY Less than 2.00%
VOLTAGE 0-15 VDC. Rated at 12VDC

INPUT
MAXIMUM STATIC FORCE

6 DOF IMU-SENSOR SPECIFICATIONS

Gyro Full Scale Range : ±250/sec

Gyro Sensitivity : 131 LSB/sec

Gyro Rate Noise : 0.005 dps/√Hz

Accel Full Scale Range : ±2 g

Accel Sensitivity : 16384 LSB/g

For more information on the solutions Acrome Offers, please visit the web site at: http://www.acrome.net

MATLAB SIMULINK | LabVIEW