Planar Inverted Pendulum

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The planar inverted pendulum series adopt an open architecture control solution and a modularized experiment platform. Using an XY table and 2-DOF robot arm module as the base platform, adding a 2-DOF ball joint, a one-stage or two-stage inverted pendulum is developed to provide a more challenging research and experiment platform. A planar inverted pendulum simulates more closely the control and visual effect of an inverted handstand of an acrobat or the launching position control of a missile or rocket.

Main Features

Industrial Grade Experiment Platform:

- XY table, 2-DOF robot arm and 2-DOF ball joint are all designed and manufactured according to industrial standards.
- Industrial incremental encoder and AC servo motor

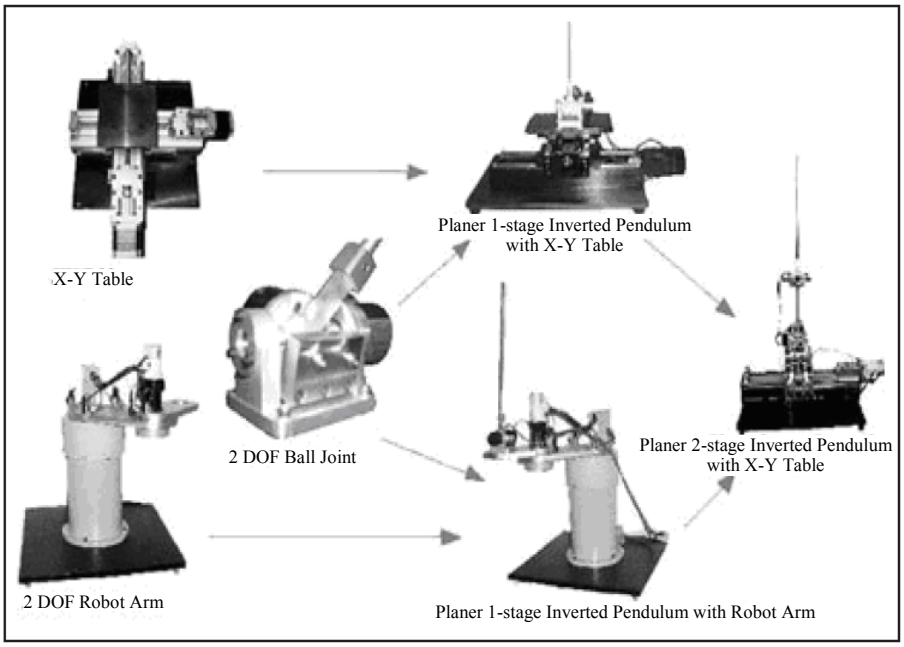
Open Architecture:

- Hardware platform based on PC and DSP-based motion controller
- Experiment verification program (DOS version), with source codes provided.
- Control software in MATLAB® Simulink. Easy for user to implement their own controllers.

User Creativity:

- Develop and test one's own control algorithms.
- Challenge the control problems concerning the two-stage Planar IP control algorithms.

Modularized Experiment Platform



Technical Specifications

Name	Dimension (L x W x H)(mm)	Rod Length (mm)	Rod Weight (Kg)	Universal Joint Weight (Kg)	Rotating Range
Planar 1-stage IP components	102 x 78 x 541	500	0.13	Nil	> ± 20°
Planar 2-stage IP components	102 x 78 x 791	Rod 1: 200 Rod 2: 500	Rod 1: 0.06 Rod 2: 0.13	0.27	> ± 20°
Motion platform parameters	GPIP2000 Series Please refer to GXY3030 platform parameters				
	GPIP2010 Series Please refer to GRB2002 platform parameters				

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Linear Inverted Pendulum

Ordering Guide

Model Number	Model Name	Package
GLIP2001	Planar 1-Stage Inverted Pendulum Based on XY Table	• Specialized XY motion control platform • Planar 1-stage inverted pendulum module • GT-400-SV motion controller • XY table based planar 1-stage inverted pendulum electric control module • 1-stage DOS experiment software (include source code) • Googol Simulink software experiment platform
GPIP2002	Planar 2-Stage Inverted Pendulum Based on XY Table	• GPIP2001 • Planar 2-stage inverted pendulum module • XY table based planar 2-stage inverted pendulum electric control module • 2-stage DOS experiment software (include source code)
GPIP2011	Planar 1-Stage Inverted Pendulum Based on Robotic Arm	• Specialized 2-DOF robotic arm • Planar 1-stage inverted pendulum module • GT-400-SV motion controller • Robotic arm based planar 1-stage inverted pendulum electric control module • 1-stage DOS experiment software (include source code) • Planar 1-stage inverted pendulum module • Googol Simulink software experiment platform
GPIP2012	Planar 2-Stage Inverted Pendulum Based on Robotic Arm	• GPIP2011 • Planar 2-stage inverted pendulum module • Robotic arm based planar 2-stage inverted pendulum electric control module

Suggested Experiments:

- Motor control experiment
- Interpolation experiment
- G code experiment
- Root locus trajectory control experiment
- Frequency response control experiment
- PID control experiment
- State space controller experiment