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Automatic Control Experiment Box

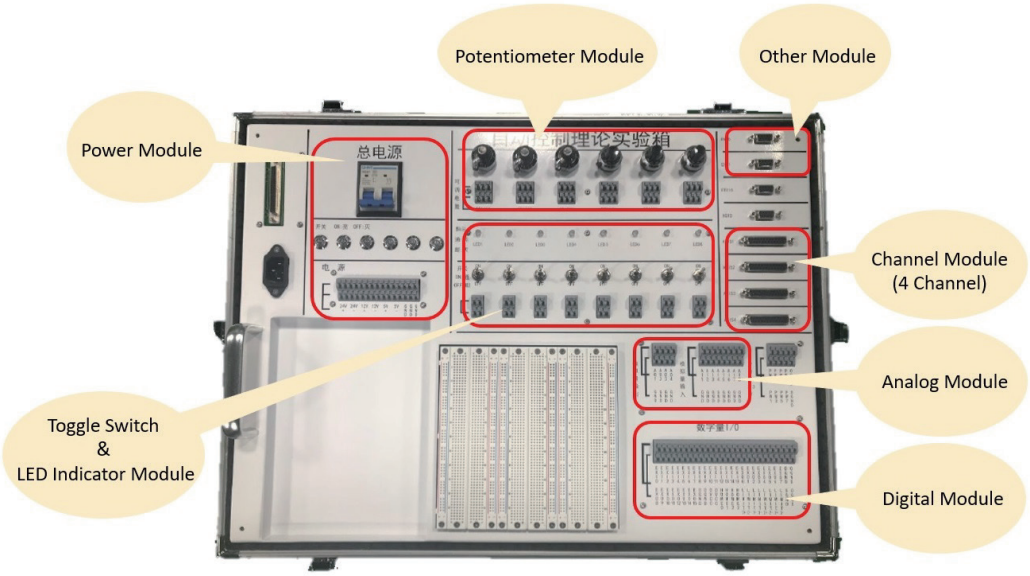
Overview

The automatic control experiment box uses a semi-physical simulation to achieve an understanding of the principles of automatic control. The semi-physical simulation is to connect the mathematical model, the solid model and the actual equipment of the system to form a simulation system. When simulating this system, the physical intervention in the analog loop requires that the simulation be performed on-the-fly. The simulator must acquire dynamic input signals under the conditions of synchronization with the real system and generate dynamic output responses in real time. The experiment box is free to design a variety of circuits with various components, and the MATLAB software platform can be used to simulate experimental phenomena and results in real time. The experimental box design is compact and suitable for large-volume placement in the laboratory to meet the experimental needs of the team.

Main Features

- Support 4 axis motion control experiment
- Motion control functions include:
  - Speed planning for symmetric/asymmetric T-curves and S-curves
  - Support closed loop and open loop control
  - Digital filter: PID + speed feedforward + acceleration feed forward
  - Electronic gear, Jog motion, PT motion (position and time), follow mode (electronic cam)
- Support real-time performance motion control and logic management
- It can be run multiple user programs at the same time.
- Good development environment: Design of control algorithms in MATLAB which can simulate experimental phenomena and results in real time.
- The experimental simulation is realistic and close to the practical application of the industrial field. Through the training of the experimental device, students can quickly adapt to the work on the site.

System Layout



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Specifications

Function	Description
Control Cycle	Adjustable (Max. 1ms)
Power	±24V, ±12V, ±5V
Potentiometer	3 channel 100KΩ multi-turn potentiometer 3 channel 500KΩ single-turn potentiometer
LED Indication	8 way LED indication
Toggle Switch	8 way on/off switch
Analog Quantity Input / Output	8 analog input, range: -10V ~ 10V, 4 analog output
Digital Quantity Input / Output	16 digital inputs, 16 digital outputs
Axis Channel	4 way axis channel
Auxiliary Encoder	2 way quadruple incremental, max. frequency 8MHz
Dimensions	570 x 420 x 265 mm
Weight	15Kg

Applicable Curriculum

- Mechanism Modelling
- Experimental Modelling
- Time Domain Analysis
- Frequency Domain Analysis
- PID Correction
- Root Locus Correction
- Time Domain Correction
- Pole Placement Experiment
- State Feedback Experiment

Ordering Guide

Model No.	Description
GPNSCC-201703*	Automatic Control Experiment Box

Automatic Ctrl Expt Box

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