

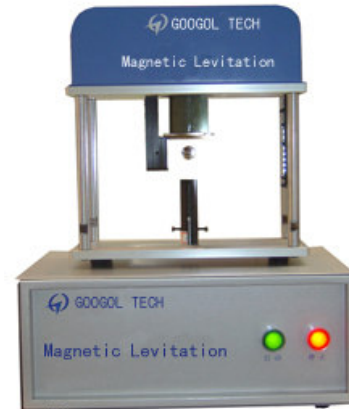


Magnetic Levitation System

Overview

Magnetic Levitation System has gained considerable interests due to its great practical importance in different engineering fields. It can satisfy requirements of many courses designing, such as Automatic Control Principle, Modern Control Theory, Control System, etc.

Magnetic levitation force produced by an electromagnetic coil holds a small steel ball in a steady-state levitation position. Control software running on PC samples steel ball position through data acquisition card installed in PC, calculates control output and drives the electromagnetic coil to work.



The system consists of an electromagnetic coil, a position sensor, a driver circuit, a digital controller and a steel ball. Figure 2 is a control framework of Googol's Magnetic Levitation System.

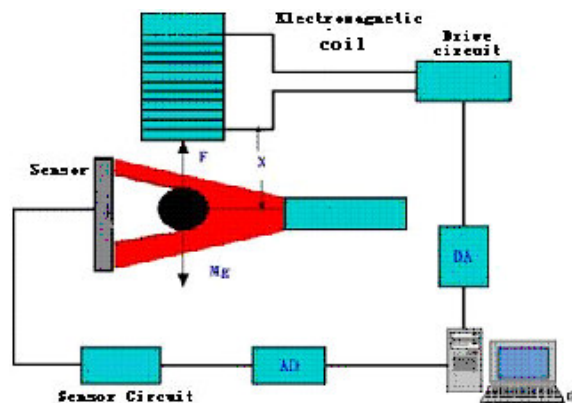


Figure 2. Control framework of Magnetic Levitation System

Components

This system can be divided into three parts: an MLS experiment platform, an electric control box and a data acquisition board. Figure 3 shows the components framework.

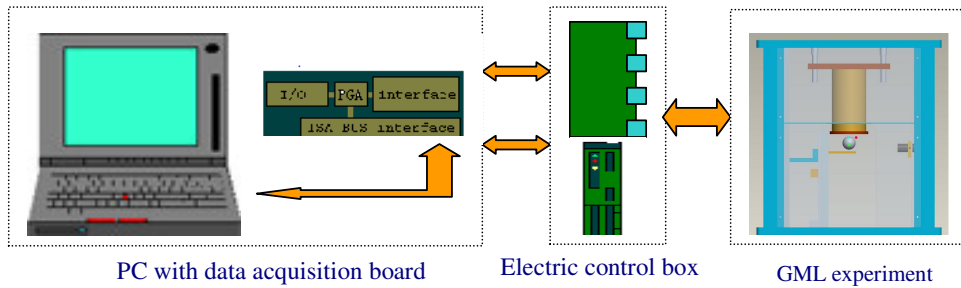


Figure3. Components framework

MATLAB / Simulink Control Environment

Googol's Magnetic Levitation system uses MATLAB/Simulink control environment to design controller and achieve real-time control. Figure 4 shows a real-time control model in MATLAB/Simulink Environment.

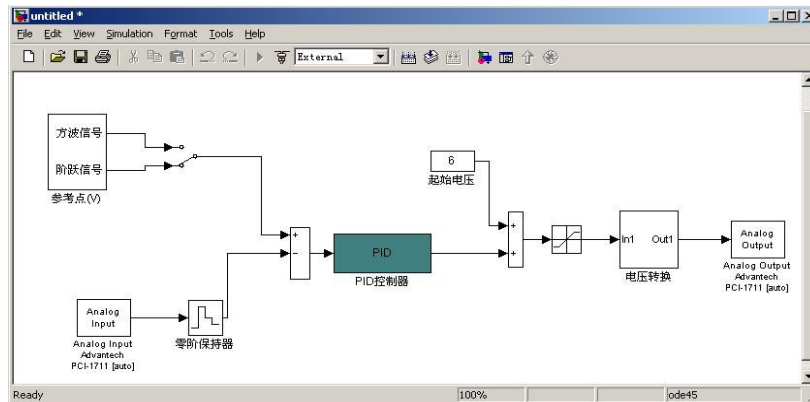


Figure 4. real time control model

Characteristics of MATLAB/Simulink control platform

- Good simulation control interface, quick and convenient to set up control algorithm.
- Graphics interface based on Windows which can meet the need of real-time control.
- Real time and on-line parameters adjustment.
- Easy to observe and record the output on-line.

Applicable Experiment

1. System modeling and simulation.
2. Sensor calibration experiments.
3. PID controller designing.



4. Real-time control in MATLAB / Simulink environment.

Technical Specification

Model	Power	Repeatable Precision	Dimension	Weight
GML1001	AC220V, 50Hz	$\pm 0.1\text{mm}$	270 x 180 x 282 <i>mm</i>	~25kg

Ordering Guide

Model Number	Model Name	Description
GML1001	Magnetic Levitation system	<ul style="list-style-type: none">➤ GML platform;➤ GML control system;➤ data acquisition card for PCI bus➤ MATLAB / Simulink software package