

PC—BASED DC MOTOR POSITION CONTROL SYSTEM USING IEEE—488 INTERFACE

Mao—Fu Lai

ABSTRACT

A Closed-loop DC motor position control system using personal computer (PC) is designed and set up in the laboratory. The connection of PC to the Motor Position Control circuit uses IEEE-488 standard interface. The Programmable Logic Array (PLA) is used to design the IEEE-488 interface circuit for the Motor Position Control circuit.

Motor position control circuit loop uses both velocity feedback and position feedback to achieve high stability and high accuracy. A combination of current and voltage feedback is used to provide velocity feedback. A potentiometer with its shaft coupled to the motor is used to provide position feedback.

The complete set-up is established in the laboratory, and the result is an automatic angular position control system which uses PC in DC motor closed-loop position control with IEEE-488 standard interface.

INTRODUCTION

A computer-control DC motor position control system is designed and is used in an automatic angular position control system as shown in Fig. 1.

IBM PC with IEEE-488 interface board (Tecmar 20030) is used as an IEEE-488 controller. An extra IEEE-488 interface circuit is required in the system to connect the motor position control circuit to the IBM PC. A 12-bit D/A converter is included to provide accurate analog output voltage to motor position-control circuit. This analog voltage (V_i) is the value sent from PC to determine the position of DC motor.

The DC motor is coupled to a rotational wheel which contains 25 holes around its periphery. When the wheel has rotated to the required position, PC will issue a magnet control command to the