

Multi-Tasking and Multi-Axis random positioning control for a Hybrid Stepping motor using a single chip micro-controller

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ABSTRACT

In automatic and control, stepper motors can be a simple control and drive to achieve precise positioning. In the resolution, it depends on the motor structure. Generally two-phase hybrid stepper motors have the 1.8° step-level. The accuracy of the motor relies on machining accuracy. No-load positioning accuracy is about ± 3 arc minutes ($\pm 0.05^\circ$). A hybrid-type stepping motor has high efficiency and high torque performance, it is the most outstanding. In this article, we will use UDN2998 duplex bridge motor driver IC with a bipolar two-phase hybrid stepper motor with two-phase bipolar excitation mode with the driving motor driving method, the current control is a constant current of drive mode, use the LM393 dual comparator IC and sensing resistor voltage comparison, the voltage waveform results will be compared with the highs and lows of change and the current will remain at a fixed value to achieve the pulse-width modulation (PWM) effect. In motor control, we will use the MCS-51 assembly language code to editor motor control to multi-axis control and multi-tasking mode of multiple simultaneously conduct a number of motor steps, speed, reversible control and with sensors to reached a random positioning control. Key Words : Hybrid stepper motor, UDN2998 dual full-bridge motor driver, two-phase excitation, bipolar-driven method, constant current drive, LM393 dual comparator, pulse width modulation, MCS-51 assembly language, multi-axis multi-tasking, random positioning.

Keywords : Hybrid stepper motor、UDN2998 dual full-bridge motor driver、two-phase excitation、bipolar-driven method、constant current drive、LM393 dual comparator、pulse width modulation、MCS-51 assembly language、multi-axis multi-tasking、random positioning

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