

Pengontrolan Motor Stepper Menggunakan Driver DRV 8825 Berbasis Signal Square Wave dari Timer Mikrokontroler AVR

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Abstract	<p>In this research, an electronic circuit system was designed for controlling stepper motors. A stepper motor driver IC was used to implement those control mechanism. A Microcontroller Unit (MCU) is used to generate the square-wave needed for input to motor driver. The circuit was used on two types of stepper motors, namely permanent magnet stepper motor and hybrid stepper motor. Several modes of controls are conducted here, which are full-stepping, half-stepping, and microstepping. Some useful motor movements which are often used in many applications were tried here. Observations were made on the speed of the motor for various input waveform frequencies, on the stepper motor sound for a range of microstepping level, and on the acceleration profile. Some significant results were obtained in that by using higher microstepping levels, a smoother stepper motor movement can be achieved. Another important result is that by applying an acceleration profile in the microcontroller program, we may target a speed which is well above the rated start-on speed of the stepper motor. Keywords : stepper motor, microcontroller unit, stepper motor driver integrated circuit, full-stepping, half-stepping, microstepping</p> <p>Abstrak Pada penelitian ini dirancang suatu rangkaian elektronik untuk mengendalikan motor stepper. Suatu IC kontroler digunakan sebagai piranti kontrolnya. Microcontroller Unit (MCU) digunakan untuk menghasilkan sinyal input. Rangkaian ini dicobakan pada dua jenis motor yaitu motor stepper Permanent Magnet dan motor stepper Hybrid. Berbagai mode stepping dilakukan pada penelitian ini, yaitu full-stepping, half-stepping dan microstepping. Beberapa profil pergerakan motor stepper yang biasa digunakan pada berbagai aplikasi juga dicobakan. Parameter pergerakan motor diamati, seperti besarnya kecepatan motor, seberapa halus suara motor yang dihasilkan, serta profil percepatannya. Hasil yang diperoleh adalah bahwa dengan menggunakan level microstepping yang lebih tinggi menyebabkan suara motor stepper menjadi lebih tidak terdengar. Hasil selanjutnya didapat bahwa dengan mengaplikasikan suatu profil percepatan di dalam program mikrokontroler, maka bisa ditargetkan suatu kecepatan motor stepper yang diperkirakan melebihi kecepatan start-on yang di support oleh motor stepper tersebut. Kata Kunci : stepper motor, microcontroller unit, integrated circuit, microstepping, Permanent Magnet, Hybrid</p>
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