ABSTRACT

DC POWER SUPPLY DESIGN 1V - 20V USING A
MICROCONTROLLER-BASED CONTROL PI

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DC power supply is an electronic device used to convert an Alternating Current AC in to Direct Current (DC) form. Generally, some main components of DC power supply are transformer, dioda and condenser. Commonly DC power supply that is sold produces unstable output voltage, besides, to change the value of that output voltage is not a simply way, because of that the device is not compatible enough to be used in laboratory. Based on this case, the writer try to create a DC power supply using PI control based an microcontroller in purpose to make the voltage setting and maintaining value be come easier.

Problem in this case is how to set power supply in order to obtain some corresponding outputs voltage with given set point. Thus the problem can be solved in two main subjects, that are : subject of hardware and software that able to operate the power supply in digital ways and used as the processing program to obtain desired output data. PI controller is applied in this device so it be able to maintain the voltage value whenever the drop voltage occur as the result of load effect. Microcontroller ATmega 8535 is used in this research as main control device, keypad matrix 4x4 is used as input of setpoint and LCD 2x16 as layer display of power supply, this research is also require CVAVR as software programming.

Results show that deviation average value of power supply system with close loop is smaller (0,06V ; 0,25V for lamp as load ; 0,07V ; 0,13V for motor as load and 0,02V ; 0,34V for two lamp load). This case can be happened as the impact of effort from the closed system improve the value of the output so that result is close to or equal to desired value.

Key words: power supply, PI control, microcontroller, CVAVR software