ABSTRACT

Central Processing Unit (CPU) is one of the most important parts of a computer system, where data processing is done there. Therefore, the temperature in the CPU are higher than other components. The high temperature should be anticipated by using good cooling system to prevent malfunction or permanent damage to the CPU itself. Therefore, in this study made temperature control system using PID control and closed loop liquid cooling system in order to maintain the temperature of the CPU stay safe when full load conditions. On testing the effect of the fan on the liquid cooling system, a system which does not use the fan occur shut down caused by high CPU temperature. The last data recorded by the Arduino UNO connected with thermistor temperature sensors before the system experienced a shut down is the CPU temperature can reach 63^oC, but when testing using a fan on the liquid cooling system, CPU temperature can reach 43^oC. When CPU tested using maximum & minimum PWM, CPU temperature stable at 32ºC (max) and 44ºC (min). When liquid cooling system tested for cooling CPU at 45ºC using maximum PWM, CPU temperature can reach up to 35,9ºC (non-stressing) & 41,4ºC (stressing). When implementing PID control on the system, the authors conducted tests with a variety of set point value that is 30^oC, 32^oC, 35^oC and 40^oC. Results of these tests, when using sets of points 30^oC, 32^oC and 35^oC there is an error of 2^oC, but when using a set point $40°C$, there is no error.

Keyword : *PID, personal computer, temperature, control, liquid cooling system, thermistor*