ABSTRACT

RANCANG BANGUN SISTEM AKUISISI DATA IKLIM MIKRO DALAM GREENHOUSE BERBASIS MIKROKONTROLER ARDUINO

By

HEIDI YANTI ANGGRAENI PUTRI

Micro climate (temperature, humidity and the intensity of Sun's light) plays an important role on growth and development of plants. However, it's difficult to obtain the micro climate data continuously. An automatic data acquisition system is a such promising soluticts to this problem. Micro climate data acquisition system collects temperature, humidity, and the intensity of Sun's light data for specific purposes. This acquisition system is intended to be applicable in the greenhouse. Microcontroller Arduino UNO based acquisition system designed has several inputs, i.e . three *DHT11 temperature and humidity sensors* and a *light dependent resistor* (*LDR*). The outputs of this system are display on the LCD, and display on the PC as well as micro climate data in real time using *laboratory virtual instrument engineering workbench* (*LabVIEW*) software, then the data is stored in Microsoft Excel.

The average error of temperature sensor of each DHT11 compared with *4in1 multi function meter*, were DHT11 (a) 0,37 ^{o}C, (b) 0,2 ^{o}C, and (c) 1,3 ^{o}C. Whereas if compared with alcohol thermometer, DHT11 (a) dan (b) were 0,8 ^{o}C, and DHT11

(c) was 0,2 ^{o}C. When compared with thermometer wet bulb - dry blub, DHT11 had an eror of 0,25 ^{o}C, while DHT11 (b) and DHT11 (c) had 0,375 ^{o}C error. The average error of humidity sensor, when compared with *4in1 multi function meter,* 6,6 %RH *for* DHT11 (a), 10,17 %RH for DHT11 (b), and 4,46 %RH for DHT11 (c). When compared with *termocopel,* the average errors of humidity were 14,625 %RH for DHT11 (a), 16,625 %RH for DHT11 (b), and 11,125 %RH for DHT11 (c). LDR was calibrated by using regression analysis with R=0,9926. When validated with a light meter, the LDR had ±8,98% error.

Key words: data acquisition system, greenhouse, LabVIEW, micro climate, microcontroller Arduino UNO