

ABSTRACT

Hydroponics is a method of plant cultivation that only needed water. Using hydroponic, water pH and TDS must be monitored. Plant growth will be hindered if water pH and TDS (Total Dissolved Solids) are not ideal. Automation in monitoring and controlling water pH and TDS will help users considerably.

This system was designed using Arduino and NodeMCU as microcontrollers and sensors such as pH sensor, TDS sensor, and Ultrasonic sensor. Sensors function is for monitoring pH, TDS, and distance values, so there is no need to monitor them manually. This system uses a mini water pump to pump the solution for controlling the values. Seven different solutions were used for pH and TDS sensors accuracy testing.

Based on the testing, pH sensor has a 2% average difference, and the TDS sensor has a 3.5% average difference. For ultrasonic sensor accuracy testing, used 11 different distances, which have already been measured with a ruler. The result is, the ultrasonic sensor has 100% accuracy. For LED testing, sowing Chinese cabbage and choy sum seed without being exposed to sun, only using LED. From the testing, sowing seed that takes 16 to 18 days could be 11 to 13 days faster. With this system, using hydroponic will be considerably easier for users.

Keywords: *Arduino, Hydroponic, NodeMCU, pH sensor, TDS sensor, ultrasonic sensor*