ABSTRACT

Communication technology nowadays is growing very fast. Many kind of communication devices like smartphone is developed by hardware and software applications. Supervisory Control and Data Acquisition (SCADA) is a control system which can be monitor the value of sensor and actuator and giving a control signal to a plant. All the data is trasmitted to a server to be processed and displayed on a touch screen device called Human Machine Interface (HMI). A HMI is an interface device between human (operator) and machine (plant). With HMI, operator can easily operate and monitor the plant.

This undergradate research project is done by making a simple SCADA system using Arduino as controller and an Android smartphone as HMI. Arduino is applied as the interface between sensor and actuator. The Arduino is connected with temperature sensor (LM35) and light dependent resistor (LDR). The value of each sensor device is displayed on Android smartphone. The Android smartphone can monitor and control some digital outputs and analog output of the Arduino. This SCADA system is tested in Local Area Network (LAN) and Wide Area Network (WAN).

This research analyze the success of the HMI program on Android, Delay Loop that occurs between the Android and Arduino, and the need of power consumption. The HMI program on Android can be manage the Arduino using the data format:"A1" to monitor analog input pins, "D[pin_number][1/0] to control digital output, and "WM[PWM_value] to control analog output. On the test in LAN, the percentage of transmitted data is 100% with average Delay Loop between 0.009 – 0.013 s. This Delay Loop is relatively small. On the test in WAN, the percentage of transmitted data is 99.51% with average Delay Loop between 0,010 – 4,383 s. In this case, occurs a reltively high Delay Loop on one test. This can be affected by the big traffic on the internet, on Telkom Speedy or Telkomsel Gateway, or can be affected by the decreased performance on the computer or smartphone's processor. Power consumption used in this project about in range from 1,010 – 3,345 mW. This means that the power consumption is quite large.

Keywords: SCADA, HMI, Android, Arduino, LAN, WAN