

Abstract

A clock in the functioning of daily use are very much, especially the highly visible usefulness as class schedules determination has been started and completed. The digital clock should also be able to align the time whenever the time in accordance with the rules GMT +7. Hours used by Telkom University campus is an analog clock that has a lot of problems, namely the lack of time synchronization, the time set manually, and the battery power needed will be declining and reducing timeliness. digital clock in this final project will use a WiFi network to be more flexible in its implementation and a digital clock can synchronize the time to accurately match the NTP time server. In addition, is expected to give an alarm as a warning and a lecture has been completed. This clock can also synchronize at the same time according to the time on a computer server for the elapsed time and the time in digital clock is always updated. final testing is done using WiFi networks that already exist on campus and is connected via a point Telkom University Access. There are two models, namely digital clock, Raspberry pi as clock master and ESP 8266 microcontroller as the microcontroller clock slave. the master clock sends a command as a slave as publisher and subscriber will perform a given task, namely, time synchronization and also activate the alarm on. Accuracy is the average time that the master clock for one week was 99.998% with the gap errors generated by 7 seconds, while the clock slave has an accuracy rate on average for the week amounted to 99.918% with the amount of time an error is generated at 493 seconds, or 8.22 minutes. During the 6 hour running time, slave clock will run into inaccuracies of up to 14 seconds, therefore the synchronization process will be conducted every 6 hours or 4 times a day in order to run on the entire time digital clock fixed in accordance with that of the NTP time server.

Keywords: *Synchronization, WiFi, Raspberry pi, ESP8266, NTP, and mosquitto Broker.*