

I. INTRODUCTION

WSN (Wireless sensor network) is a system based on a wireless network in the form of data on a computer. In general, WSN or wireless sensor network is an embedded equipment in which there are one or more sensors and equipped with communication system equipment or can be called sensors that work without using cables. Each point in the WSN is equipped with a radio transceiver as a receiving, sending, or other supporting device. So that WSN is also known as a system that consists of many low-cost sensors that are small and spread over a very large area with one reservoir node to collect the results of other node sensor readings.

Nodes in the Wireless Sensor Network can route the collected data to other adjacent nodes. Each node in the network is usually equipped with a radio transceiver or other wireless communication device, a microcontroller, and a voltage source. Data sent via radio transmission will be forwarded to the Base Station or sink node which is the link between the node and the client. This information can be accessed through various platforms such as tools, internet connections, satellites and so on. Nodes also have their own time data, and each node has a different time to send data. If there is a delay in sending data between nodes, an error will occur, so it is necessary to synchronize the time at the node so that data transmission is correct. This attracts attention to be tested. The method of synchronizing time between nodes is using a consensus method.

Synchronizing clock with the consensus method has been carried out by several researchers such as Yuki Kadowaki and Hideaki Ishii. It was explained that the effective way to equalize time and reach an agreement in a node was done by the consensus method. In addition, as Yik-Chung Wu explained, synchronization is an important key component in the operation of a WSN, because it provides the same time frame for different nodes. It supports functions such as combining voice and video data from different sensor nodes, time-based channel sharing.

Implementation of this time synchronization will be implemented on the ESP32 microcontroller. Utilizing the RTC (Real Time Clock) time contained in the ESP32 microcontroller. Communication between nodes uses the UDP (User Data Protocol) protocol. The first-time data is collected using GPS, after that it is saved to the RTC and will be forwarded by the RTC itself. Next, the node will broadcast date, month, time data. Consensus can be reached after all nodes have received 3 broadcasts and then the time reference will be chosen, which is the fastest to arrive.

The following is part of this paper. Part II literature review. Section III introduces the method used in this paper. Section IV results and discussion of the data in the analysis. Finally, section V summarizes the information provided by this paper.