

## ABSTRACT

The development of communication technology is very rapid. Characterized by increasing speed in information sharing and a wider range of coverage. One of the innovations in communication technology is IoT (internet of things). With the help of cellular data and internet networks as an intermediary medium for controlling robots or machines over long distances. This IoT system can be implemented on an Autonomous Surface Vessel (ASV). ASV is a mini prototype of a ship that can move automatically to the commanded destination point. In addition, it is expected to be able to control the ASV from a distance of 50m. The system must also monitor the ASV while sailing. Of these two problems, researchers designed a GUI (graphical User Interface) system for the Autonomous Surface Vessel system.

In this study, ASV was designed to be able to monitor and control remotely. The method used is teleoperation. This method uses an IoT system with an antares platform, HTTP protocol, and MQTT protocol. In connecting the ASV with the user. Researchers used nodemcu ESP 8266 and smartphones as mobile network providers. The cellular data used is a 4G network. The MQTT protocol as a teleoperation communication line while the HTTP protocol as a monitoring communication line. Monitoring data obtained from antares will be displayed in the Graphical User Interface (GUI). The GUI will display the data sent from the ASV. The data such as ASV coordinates, compass angles, and ASV speed. The result of this study is that ASVs can be controlled from a distance of 50m obtained by an average data transmission time of 5 seconds. The ASV can be monitored from a distance of 50m with an average data transmission time of 2 minutes 53 seconds. The accuracy rate of the compass module is 99.4% and the GPS module has an accuracy rate of 99%. This result was obtained by conducting sensor testing and ASV simulation.

**Kata Kunci:** *Teleoperation, MQTT, HTTP, 4G Celuler & QT*