ABSTRACT

THE TELEMETRY SYSTEM DESIGN ON MINI VESSEL FOR MEASURING THE QUALITY OF WATER ON TEMPERATURE, DISSOLVED OXYGEN, ACIDITY, AND DEEPNESS LEVEL

By

BELLA NURBAITTY SHAFIRA

Water is an essential need for people. However human activity can affect the quality of water which has negative impact to the aquatic environment. Therefore, it needs regular monitoring by using a telemetry system that can monitor the condition of water. Telemetry system can be used to monitor the quality of water automatically and it will be monitored LabVIEW user interface software in long-distance and data can be stored on a computer server. The telemetry system designing which measures the quality of water use D.O Atlas sensor to measure levels of dissolved oxygen, pH SEN0161 sensor to measure the acidity, transducer Airmar DST800 to measure the temperature and depth of water, Arduino Mega is as a data processor, XBee Pro S2B is as transmission data, and mini vessel that uses as a vehicle for the carrier system. The measurement can be done in a real time by using the XBee pro S2B with The distance of data transmission among the instrument's tool and a computer which have baud rate 4800, 57600, and 115200 in non-line of sight (NLOS) as far as ≤ 40 m and line of sight (LOS) ≥ 450 m whereas with a baud rate of 9600 on a non-line of sight (NLOS) as far as ≤ 61 m and line of sight (LOS) as far as ≥ 450 m. The quality of water monitor on the experiment's area is classified as a minor which has the dissolve oxygen range around 5,97-9.15 mg/L, content acidity with range 6,61-9,66 and the quality in alkali with normal temperature around 30,7-31,3^{o}C in depth 0,6 m.

Keywords: Telemetry systems, Xbee Pro S2B, real time, remotely, LabView

ABSTRAK

PERANCANGAN SISTEM TELEMETRI PADA *MINI VESSEL* UNTUK PENGUKURAN KUALITAS PERAIRAN MELIPUTI KADAR KEASAMAN, KADAR OKSIGEN TERLARUT, SUHU, DAN KEDALAMAN

Oleh

BELLA NURBAITTY SHAFIRA

Air merupakan kebutuhan yang sangat penting bagi masyarakat namun adanya aktivitas masyarakat dapat mempengaruhi kualitas perairan yang berdampak negatif bagi lingkungan perairan. Oleh sebab itu dibutuhkan pemantauan secara berkala menggunakan sistem telemetri yang dapat memantau kondisi perairan. Sistem telemetri dapat digunakan untuk pemantauan kondisi perairan secara otomatis dan dipantau secara jarak jauh menggunakan *user interface* perangkat lunak LabVIEW dan data dapat disimpan di komputer server. Perancangan sistem telemetri untuk pengukuran kualitas perairan yaitu menggunakan sensor D.O Atlas untuk mengukur kadar oksigen yang terlarut, sensor pH SEN0161 untuk mengukur kadar keasaman, tranduser Airmar DST800 untuk mengukur suhu dalam air dan kedalaman perairan, Arduino mega sebagai pemroses data, Xbee Pro S2B untuk pengiriman data sensor, dan *mini vessel* yang berfungsi sebagai wahana pembawa sistem. Pengukuran dilakukan secara *real time* menggunakan Xbee pro S2B dengan jarak pengiriman data antara alat ukur dengan komputer yaitu *baud rate* 4800, 57600, dan 115200 pada *non line of sight* (NLOS) sejauh ≤ 40 m dan *line of sight* (LOS) ≥ 450 m sedangkan dengan *baud rate* 9600 pada *non line of sight* (NLOS) sejauh ≤ 61 m dan *line of sight* (LOS) sejauh ≥ 450 m. Pemantauan kondisi perairan di daerah pengujian tergolong ringan dengan kadar oksigen terlarut berkisar antara 5,97-9.15 mg/l, kadar keasaman dengan nilai pH berkisar 6,61-9,66 dan dikatakan bersifat basa dengan suhu normal yaitu antara 30,7-31,3^{o}C di kedalaman 0,6 m.

Kata kunci : Sistem telemetri, xbee pro S2B, *real time*, jarak jauh, LabView