

ABSTRAK

PROTOTYPE SISTEM PEMANTAU DAN PENGENDALI OKSIGEN TERLARUT PADA TAMBAK LOBSTER MENGGUNAKAN SENSOR DISSOLVED OXYGEN (DO) BERBASIS IoT

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Penelitian ini bertujuan untuk membuat *prototype* sistem pemantau dan pengendali oksigen terlarut pada tambak lobster menggunakan sensor *Dissolved Oxygen* (DO) berbasis IoT. Alat ini telah bekerja sesuai rancangan sistem yang telah dibuat, memantau nilai oksigen terlarut dan dapat mengaktifkan saklar kincir air atau aerator secara otomatis menyesuaikan kadar oksigen terlarut pada air tambak lobster.

Rancang bangun sistem dibagi 2 peralatan yaitu bagian pengiriman data sensor DO dan bagian penerimaan data yang akan diproses oleh mikrokontroler Mappi32 . Pengiriman data nilai sensor DO melalui LoRa dan juga menggunakan *Internet of Think* (IoT) untuk mengirimkan data ke *website server Thingspeak*. Data sensor DO yang dikirim menggunakan LoRa, akan diterima oleh *receiver* LoRa. Data tersebut akan diproses oleh Mappi32 yang dapat mengaktifkan modul relay dan kontaktor yang telah terhubung dengan kincir air atau aerator. Dengan alat pemantauan kadar oksigen terlarut maka bisa mendapatkan datanya sesuai kondisi air tambak lobster dan bisa mempertahankan nilai kadar oksigen terlarut selalu normal pada kisaran angka 6-8 mg/L.

Hasil dari penelitian ini adalah terbangunnya *prototype* model fisik sistem pemantau dan pengendali oksigen terlarut pada tambak lobster menggunakan sensor DO berbasis IoT, dengan kadar oksigen terlarut terpantau melalui IoT *Thingspeak*. Modul relay, kontaktor dan kincir air atau aerator dapat bekerja sesuai rancangan sistem yaitu pada saat $DO < 6$ mg/L maka kincir air atau aerator hidup secara otomatis dan pada saat kadar $DO > 8$ mg/L maka kincir air atau aerator akan mati secara otomatis. Dengan selisih, error dan akurasi yang dihasilkan yaitu Sensor DO memiliki selisih nilai rata-rata sebesar 0.24 mg/L dengan rata-rata error sebesar 5.60% dan akurasi rata-rata sebesar 94.39%.

Kata Kunci : *prototype*, sensor *Dissolved Oxygen* (DO), IoT, *Thingspeak*, otomatis

ABSTRACT

PROTOTYPE OF DISSOLVED OXYGEN MONITORING AND CONTROL SYSTEM IN LOBSTER PONDS USING IoT-BASED DISSOLVED OXYGEN (DO) SENSOR

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This research aims to create a prototype of dissolved oxygen monitoring and control system in lobster ponds using IoT-based Dissolved Oxygen (DO) sensor. This tool has worked according to the design of the system that has been made, monitoring the value of dissolved oxygen and can activate the water wheel or aerator switch automatically adjusting the dissolved oxygen levels in the lobster pond water.

The system design is divided into 2 equipment, namely the DO sensor data transmission section and the data reception section which will be processed by the Mappi32 microcontroller. Sending DO sensor value data via LoRa and also using the Internet of Think (IoT) to send data to the Thingspeak server website. The DO sensor data sent using LoRa, will be received by the LoRa receiver. The data will be processed by Mappi32 which can activate the relay and contactor modules that have been connected to the water wheel/aerator. With the dissolved oxygen level monitoring tool, it can get the data according to the condition of the lobster pond water and can maintain the value of dissolved oxygen levels always normal in the range of 6-8 mg/L.

The result of this research is the construction of a prototype physical model of a dissolved oxygen monitoring and control system in lobster ponds using an IoT-based DO sensor. The tool works 100% in accordance with the design of the system made. dissolved oxygen levels can be monitored properly through IoT Thingspeak. The relay module, contactor and water wheel or aerator can work according to the system design, namely when $DO < 6$ mg/L then the water wheel or aerator automatically turns on and when $DO > 8$ mg / L then the water wheel or aerator will automatically turn off. With the resulting difference, error and accuracy, the DO sensor has an average value difference of 0.24 mg/L with an average error of 5.60% and an average accuracy of 94.39%.

Keywords: Prototype, Dissolved Oxygen (DO) sensor, IoT, Thingspeak, automatic