

**DESIGN AND CONSTRUCTION AND ANALYSIS OF  
ELECTRIC BIKES USING 24 VDC DC MOTORS BASED ON IOT  
(INTERNET OF THINGS)**

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**ABSTRACT**

*An electric bicycle is a bicycle integrated with an electric motor that can be used as a means of movement. The main parts of an electric bicycle in general are an electric motor, a control circuit, and a battery. The purpose of this study is to design, create, and find out how an IoT-based electric bicycle system works that is connected to Android. This electric bicycle uses a 24 VDC battery as its energy source that drives a 24 VDC DC motor with a power of 250 watts. This study uses NodeMCU ESP8266 and voltage, current, speed and relay sensors for monitoring on the DC motor via the internet via the Blynk application. The results of the study show that the use of NodeMCU ESP8266 and the Blynk IoT platform for this IoT-based electric bicycle voltage, current, speed and relay monitoring application. The effect of the gas handle range on the rotation of the DC motor, when the gas handle is given a range of 0-24 the motor has not received power supply from the battery, and when the range is 25 the voltage on the motor is read on the measuring instrument as 1 VDC and the gas continues to range 75, the voltage is read on the measuring instrument as 24 VDC, while from the range 76-100 the voltage is read 24.6 VDC. The capacity of the 12 Ah battery can last depending on the size of the load current on the electric bicycle, for example: a load current of 2 A can last for 4.8 hours, a load current of 4 A can last for 2,4 hours, a load current of 6 A electric bicycle can last for 1.6 hours, a load current of 8 A can last for 1,2 hours and if given a load current of 10 A the electric bicycle can last for 57,6 minutes. The battery life is determined by the size of the battery capacity and the amount of current load that is applied to the 24 VDC electric bicycle on the battery. Charging the battery on an electric bicycle with a battery capacity of 12 Ah using a charger with an output current on an electric bicycle charger with a current of 1-2 A takes 6-12 hours to be full and ready to use.*

**Keywords:** *Electric Bike, Battery, NodeMCU ESP8266, Relay, Charger.*