

## ABSTRACT

*PT Lentera Bumi Nusantara (LBN) is the center for the development of new and renewable energy, especially in micro-scale wind turbines. One of its activities is the design and manufacture of blades or wind turbines. In making blades, several parameters are needed to analyse efficiency, one of which is the rotational speed of the generator. Generator rotational speed readings generally use a tachometer or hall sensor. This method requires a direct reading of the generator shaft. The generator in the LBN is already installed and running, so it requires a generator rotational speed measuring instrument that does not read the rotational speed directly on the shaft. The Sky Dancer – 500 is a wind turbine used in LBN with the type of permanent magnet synchronous generator. This type of generator has an output frequency that is directly proportional to the rotational speed. In this research, a synchronous generator speed measuring instrument has been made using a photo-coupling-based frequency sensor. By reading the frequency processed by the microcontroller, the generator rotational speed can be obtained. The photo-coupling-based frequency sensor used in this tool has an average error value of 2.17% with a linear equation  $y = 0.9939x + 0.0553$ . This tool will also be implemented directly at PT Lentera Bumi Nusantara so that it can open research and development opportunities for new renewable energy in micro-scale wind turbines that require generator rotation speed parameters. In this research, a synchronous generator speed measuring instrument has been made using a photo-coupling-based frequency sensor. By reading the frequency processed by the microcontroller, the generator rotational speed can be obtained. The photo-coupling-based frequency sensor used in this tool has an average error value of 2.17% with a linear equation  $y = 0.9939x + 0.0553$ . This tool will also be implemented directly at PT Lentera Bumi Nusantara so that it can open research and development opportunities for new renewable energy in micro-scale wind turbines that require generator rotation speed parameters.*

**Keywords:** *Rotating Speed Generator, Permanent magnet synchronous generator, Photo Coupling, The Sky Dancer – 500.*