

**WIND TUNNEL STATE MONITORING SYSTEM WITH EXTERNAL TERMINAL  
CONTROL FOR CENTRAL PHILIPPINE UNIVERSITY**

A Project Study Report

Presented to

The Faculty of the Department of Electronics Engineering

Central Philippine University

Jaro, Iloilo City, Philippines

In Partial Fulfillment

of the Requirements for the Degree of

Bachelor of Science in Electronics Engineering

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June 2023



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## **ABSTRACT**

The Philippines has been hit by destructive typhoons in recent years, prompting the Department of Science and Technology to establish a wind tunnel facility to test the resiliency of structures to varying wind speeds. However, the current wind tunnel lacks a measuring system for parameters, limiting its capability to serve as a proper facility for wind energy research and wind study. A system for capturing data using appropriate sensors is necessary to enhance the wind tunnel's use and capability for testing objects' reaction to specific wind speeds. This setup requires two or more individuals which operate the VFDs and acquire data, which can be inconvenient. By centralizing the controls, the wind tunnel can be operated by a single person, making the operation more efficient and practical.

To address the absence of a measuring system's Wind Tunnel Facility, an Arduino-based measuring and monitoring device was created. The device centralized control by using an external terminal control for the Variable Frequency Driver, allowing for control of the wind tunnel's motor using a variable resistor and pushbuttons. Three sensors were used to measure different parameters, which were displayed on a P10 LED matrix, allowing for the monitoring of the wind tunnel state and adjustment of the VFD frequency in the control room. The system and device are detachable, maximizing the facility's efficiency and functionality by allowing it to operate with or without them.