Weather Station Project

Components

1. BME280 Sensor

- Function: Measures temperature, humidity, and atmospheric pressure.

- Protocol: I2C.

2. Anemometer

- Function: Measures wind speed. Contains a magnet and reed switch that generates signals detectable by a GPIO pin.

- Protocol: SPI (GPIO).

3. Wind Vane

- Function: Measures wind direction using a rotating magnet and reed switches, producing varying resistance values.

- Protocol: SPI.

4. Rain Gauge

- Function: Measures precipitation using a self-emptying tipping bucket mechanism.

- Protocol: SPI.

5. DS18B20 Thermal Probe

- Function: Measures soil temperature and indicates ice/frost presence.

- Protocol: One-Wire.

Summary

This weather station project integrates multiple sensors (BME280, anemometer, wind vane, rain gauge, and DS18B20) with a Raspberry Pi. These sensors use different communication protocols (I2C, SPI, and One-Wire) to provide comprehensive environmental data, including temperature, humidity, atmospheric pressure, wind speed, wind direction, and precipitation levels.

A desk with headphones and wires

Description automatically generated