

Weather Station

September 25, 2025

Weather Station Parts List

- 1 - Raspberry Pi 4B
- 1 – Raspberry Pi heat sink with dual fan
[Amazon.com: Armor Case for Raspberry Pi 4 - Metal Case with Dual Fan Aluminium Alloy, Pi 4 Heatsink : Electronics](#)
- **1** - ELEGOO 8 Channel DC 5V Relay Module with Optocoupler
[ELEGOO 8 Channel DC 5V Relay Module with Optocoupler Compatible with Arduino UNO R3 MEGA 1280 DSP ARM PIC AVR STM32 Raspberry Pi: Amazon.com: Industrial & Scientific](#)
- 1 – PowerStream TPS-54560 5 Amp AC/DC voltage reducing converter
[24VAC to 5VDC converter, 5V 4A, 25 Watts output
https://www.powerstream.com/24vac-5vdc.htm#:~:text=It%20is%20useful%20for%20powering%205V%20modems%2C,widespread%20because%20the%20low%20voltage%20is%20safe.](#)

Weather Station Parts List (cont.)

- 1 – HiLetgo BMP280 (i2c)

[HiLetgo 5pcs High Precision BMP280-3.3 Atmospheric Pressure Sensor Replace BMP180/BMP186: Amazon.com: Industrial & Scientific](https://www.amazon.com/dp/B07VNDZ6N4?ref=ppx_hzsearch_conn_dt_b_fed_asin_title_1&th=1)

https://www.amazon.com/dp/B07VNDZ6N4?ref=ppx_hzsearch_conn_dt_b_fed_asin_title_1&th=1

- 1 – HiLetgo ADS1115 (i2c)

[HiLetgo ADS1115 16 Bit 16 Byte 4 Channel I2C IIC Analog-to-Digital ADC PGA Converter with Programmable Gain Amplifier High Precision ADC Converter Development Board for Arduino Raspberry Pi: Amazon.com: Industrial & Scientific](https://www.amazon.com/dp/B01DLHKMO2?ref=ppx_hzsearch_conn_dt_b_fed_asin_title_1)

https://www.amazon.com/dp/B01DLHKMO2?ref=ppx_hzsearch_conn_dt_b_fed_asin_title_1

- 1 - AITRIP DHT22/AM2302 Digital Temp./Humidity Sensor Module

[AITRIP 2pcs DHT22/AM2302 Digital Temperature and Humidity Sensor Module Temperature Humidity Monitor Sensor Replace SHT11 SHT15 for Arduino Electronic Practice DIY: Amazon.com: Industrial & Scientific](https://www.amazon.com/dp/B07WP4VZTH?ref=ppx_hzsearch_conn_dt_b_fed_asin_title_1&th=1)

https://www.amazon.com/dp/B07WP4VZTH?ref=ppx_hzsearch_conn_dt_b_fed_asin_title_1&th=1

Weather Station Parts List (cont.)

- 1 – uxcell 4mm to 6mm Bore Rigid Coupling Set

[Amazon.com: uxcell 4mm to 6mm Bore Rigid Coupling Set Screw L20XD12 Aluminum Alloy,Shaft Coupler Connector for RC Airplane Boat, Motor Accessories,Red,2pcs : Industrial & Scientific](#)

- 1 – 5/32"(4mm) Diameter 6061 Aluminum Rod (for WV shaft)

[Amazon.com: Feelers Aluminum Round Rod 5/32"\(4mm\) Diameter 6061 Aluminum Solid Stick for DIY Craft, 12" Length, 10 pcs : Industrial & Scientific](#)

- 1 - 12-Bit Hall Angle Sensor, 0.088° Resolution, 360° Rotation

[12-Bit Hall Angle Sensor, 0.088° Resolution, 360° Rotation, Durable Full-Circle Measurement,0-5V Output: Amazon.com: Industrial & Scientific](#)

- 1 - Weather Meter Kit

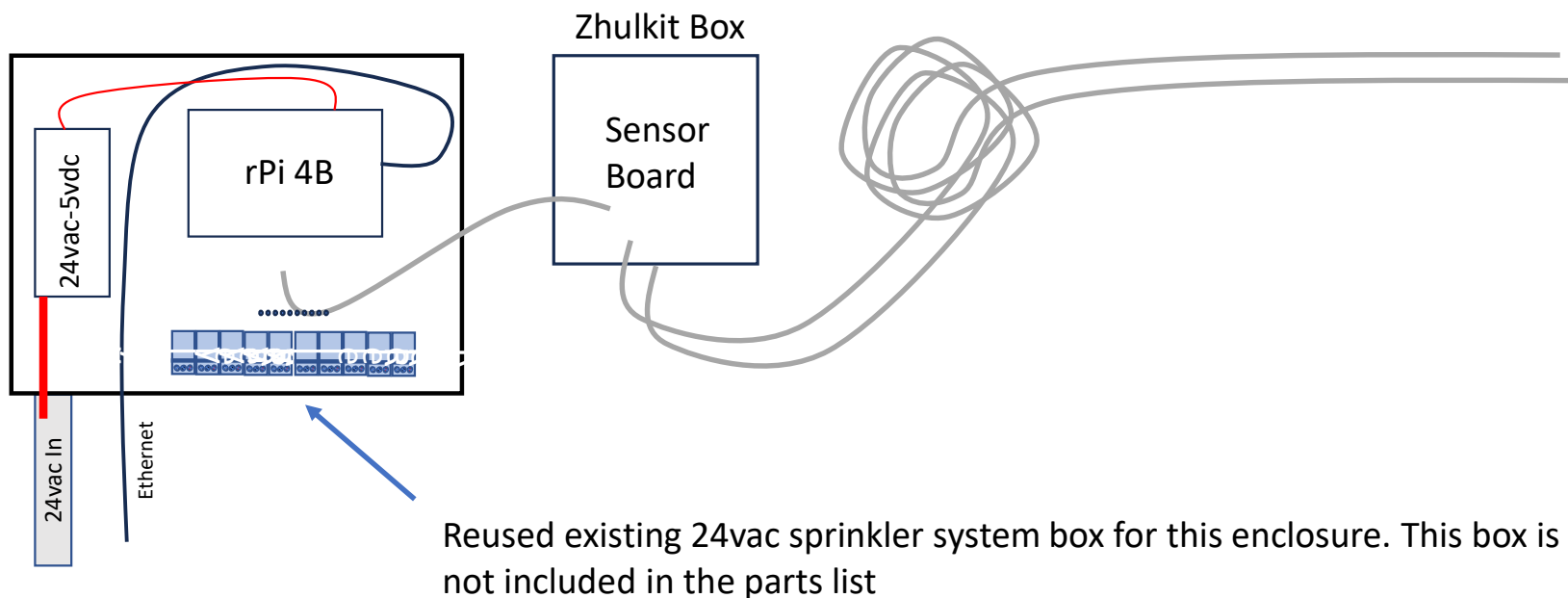
[Amazon.com: Weather Meter Kit - Station Includes Analog sensors Wind Vane Cup Anemometer Tipping Bucket rain Gauge RJ11 terminated Cables : Patio, Lawn & Garden](#)

Weather Station Parts List (cont.)

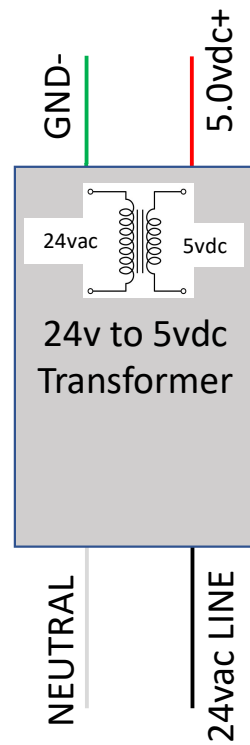
- 3 – 10k Ohm resistors – 2 Pull-Up resistors: 1 for Rain Gauge, 1 Voltage Divider for Weathervane
- 1 – 1k Ohm resistor (for CPU fan control transistor)
- 1 - 47uF 25v Capacitor for 5vdc power line
- Zulkit Project Box Grey 14.96 x 11.02 x 5.12 inch

[Zulkit Junction Box ABS Plastic Dustproof Waterproof IP67 Junction Boxes Universal Electrical Project Enclosure DIY Electronic Project Box Grey 14.96 x 11.02 x 5.12 inch \(380 x 280 x 130 mm\) - Amazon.com](#)

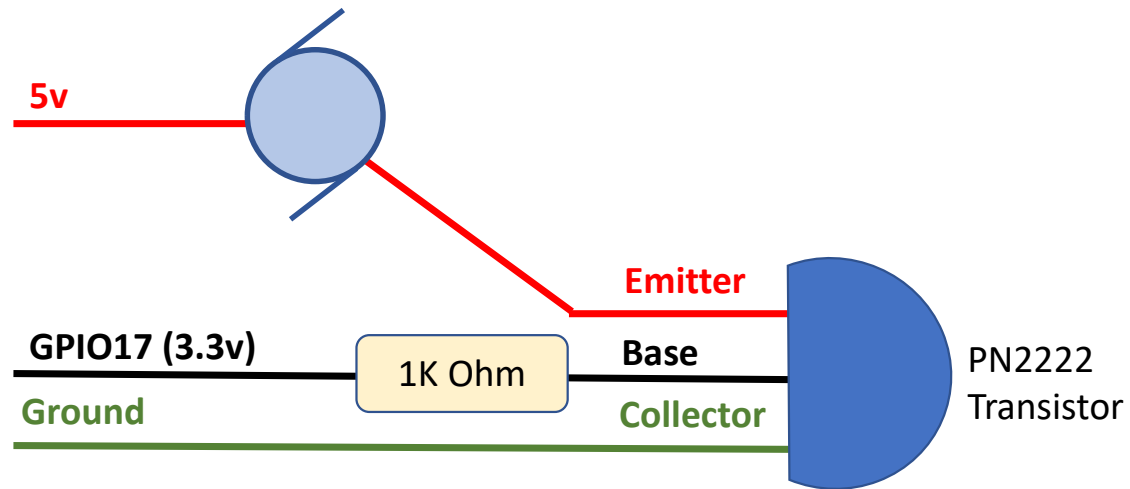
External Connections



24vac to 5vdc Transformer



Transistor Based Fan Control For rPi



Weather Station Board Layout v3.5

rPi-Board
Connecting Cable

Wire Colors

Blue: +5v

Blue-Wh: GND

Brn: GPIO26

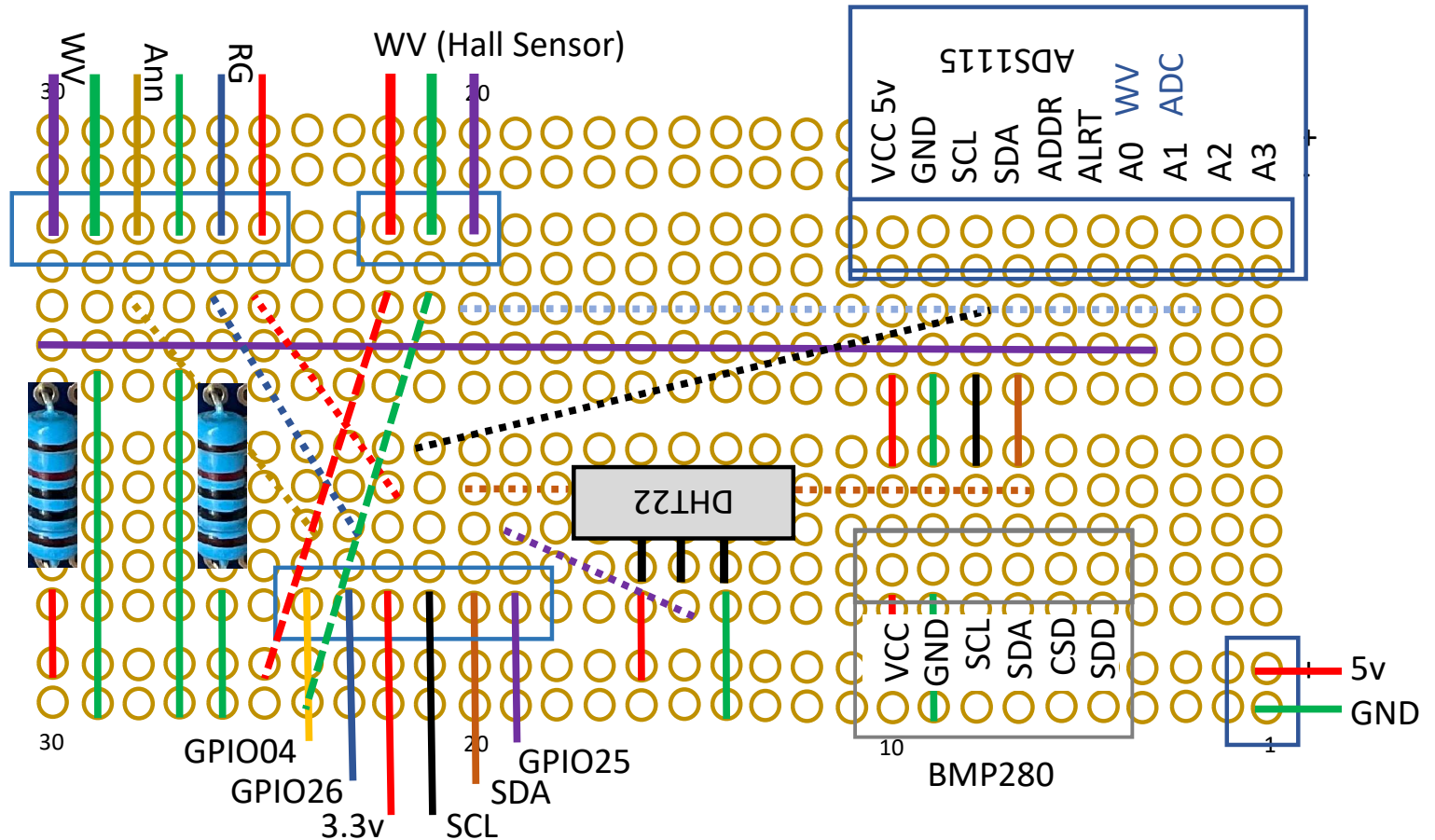
Brn-Wh: GPIO04

Org: +3.3v

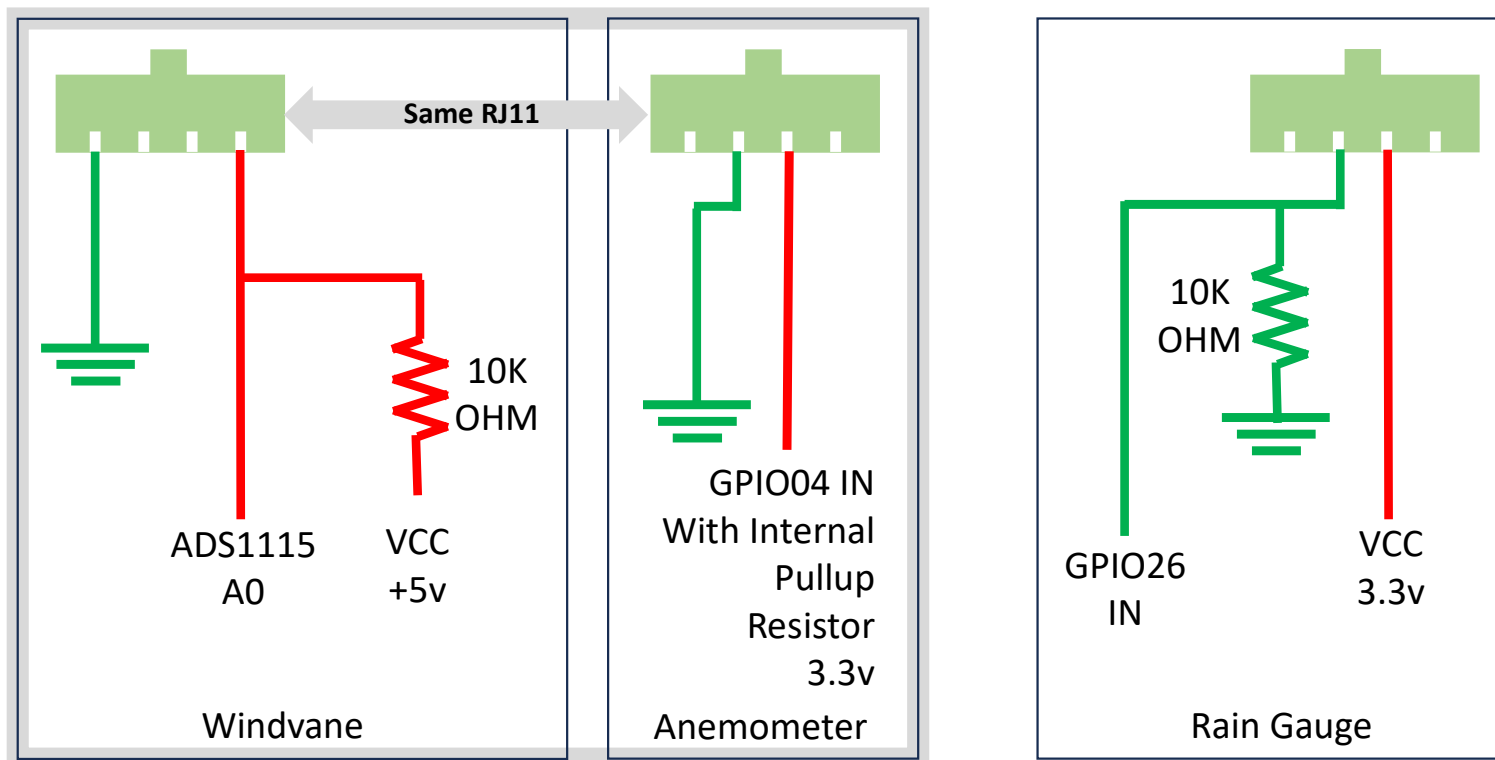
Org-Wh: GPIO25

Grn: SCL

Grn-Wh: SDA

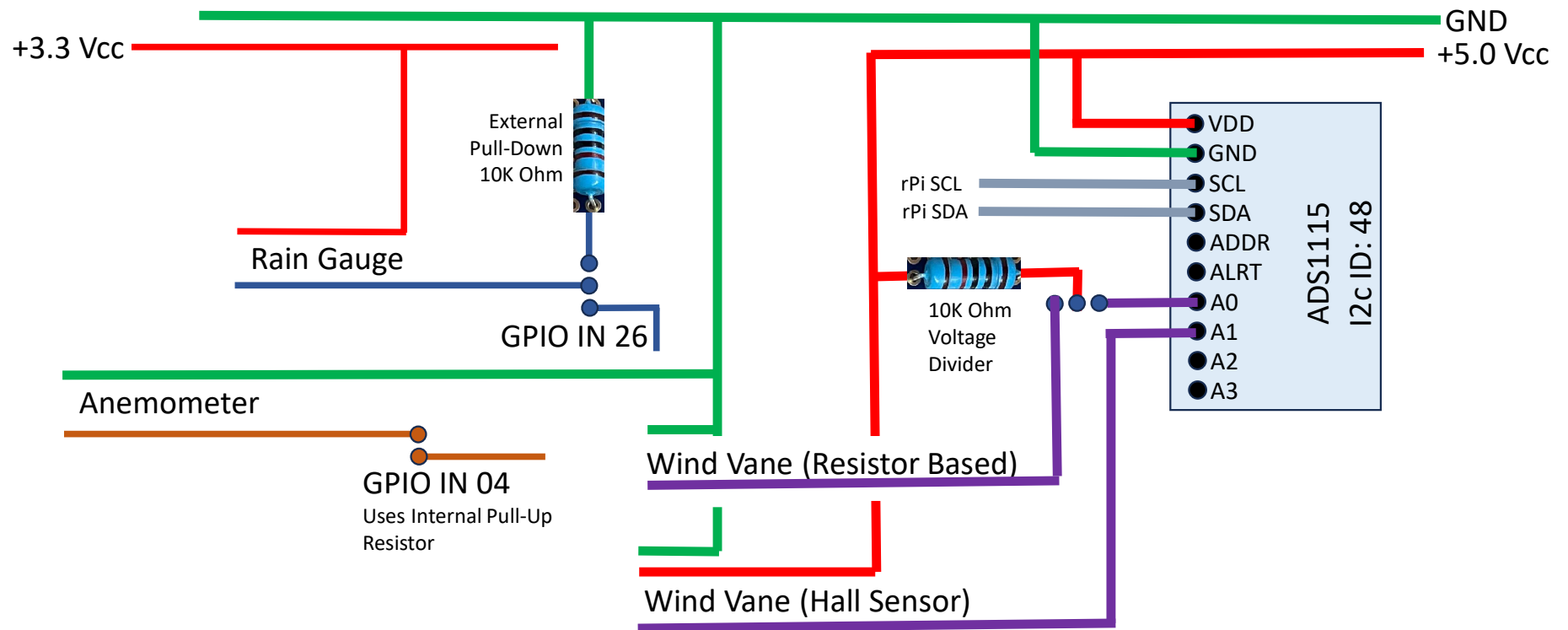


Rain Gauge, Anemometer, Windvane Circuits



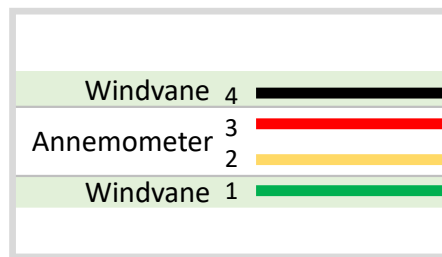
Weather Station: rPi/ADS1115ADS Wiring

Anemometer/Rain Gauge/Wind Vane

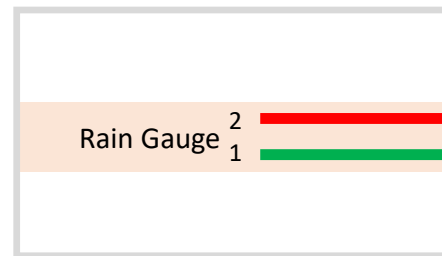


Windvane, Annemometer & Rain Gauge: Y-Split Cable & Board Connections

RJ-45

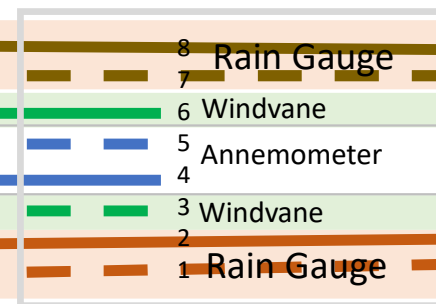


RJ-45

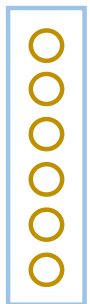


Note: Hall sensor added later, so separate cable not shown used for Hall Sensor. Requires 3 wires

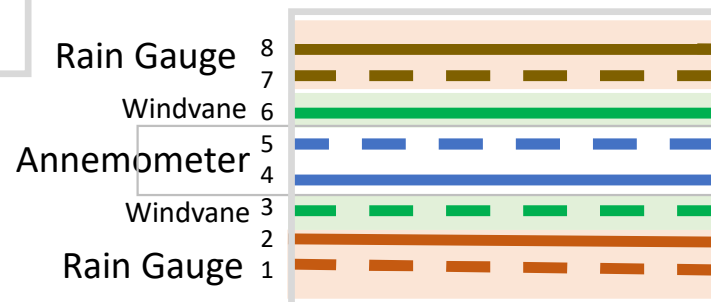
RJ-45



A



RJ-45 Jack



A



Opto-relay pin use and rPi mapping

- GND: (Black) – shared with Fan Transistor
- IN1: GPIO18 (Green)
- IN2: GPIO22 (White)
- IN3: GPIO24 (Orange-White)
- IN4: GPIO05 (Brown-White)
- IN5: GPIO06 (Purple)
- IN6: GPIO13 (Yellow)
- IN7: Unused
- IN8: Unused
- VCC: +5vcc, Pin 2 (Red) – shared with Fan Transistor
- K1: Green: Back Yard
- K2: Red: Front Yard: Gladiolas/Raspberries
- K3: Blue: Front Yard: So. Glads/Orange Tree
- K4: Yellow: Front Yard: So. Planter by House
- K5: Black: Planter Box, Front Yard North
- K6: Brown: Front Porch Planter
- K7: Unused
- K8: Unused

GPIO Pins (1 of 3)

Pin	BCM	Description
01	DC Power 3.3v	Weathervane
03	GPIO02/SDA1 i2c	i2c SDA: BME280, ADS1115
05	GPIO03/SCL1 i2c	i2c SCL: BME280, ADS1115
07	GPIO04/GCLK	Anemometer
09	Ground	Fan Transistor, Opto-Relay
11	GPIO17	Fan Transistor
13	GPIO27	Unused
15	GPIO22	Opto-Relay IN2
17	DC Power 3.3v	Unused

Pin	BCM	Description
02	DC Power 5v	Fan, DHT22, BMP280
04	DC Power 5v	Opto-Relay VCC
06	Ground	Unused
08	GPIO14	Unused
10	GPIO15	Unused
12	GPIO18/ <small>SPI0 CS0, 1-wire</small>	Opto-Relay IN1
14	Ground	Unused
16	GPIO23	Unused
18	GPIO24	Opto-Relay IN3

GPIO Pins (2 of 3)

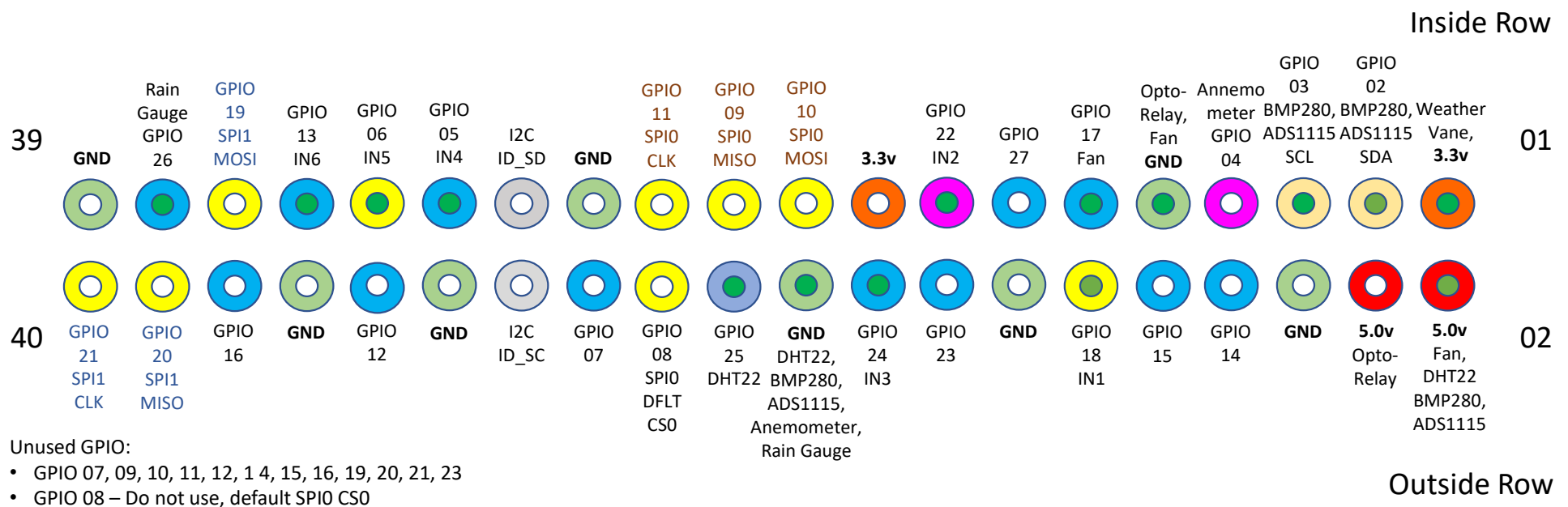
Pin	BCM	Description	Pin	BCM	Description
19	GPIO10/SPI0 MOSI	Unused	20	Ground	Unused
21	GPIO09/SPI0 MISO	Unused	22	GPIO25	DHT22
23	GPIO11/SPI0 CLK	Unused	24	GPIO08/CE0	Unused
25	Ground	Unused	26	GPIO07/CE1	Unused
27	ID_SD/i2c EEPROM	Unused	28	ID_SC/i2c EEPROM	Unused

GPIO Pins (3 of 3)

Pin	BCM	Description
29	GPIO05	Opto-Relay IN4
31	GPIO06/SPI1 CS0	Opto-Relay IN5
33	GPIO13	Opto-Relay IN6
35	GPIO19/SPI1 MOSI	Unused
37	GPIO26	Rain Gauge
39	Ground	Unused

Pin	BCM	Description
30	Ground	Unused
32	GPIO12	Unused
34	Ground	Unused
36	GPIO16	Unused
38	GPIO20/SPI1 MISO	Unused
40	GPIO21/SPI1 CLK	Unused

GPIO Header



NOTE: spi0/1 use CircuitPython which allows use of CS pins other than what is specified by dtoverly (or default) in /boot/config.txt