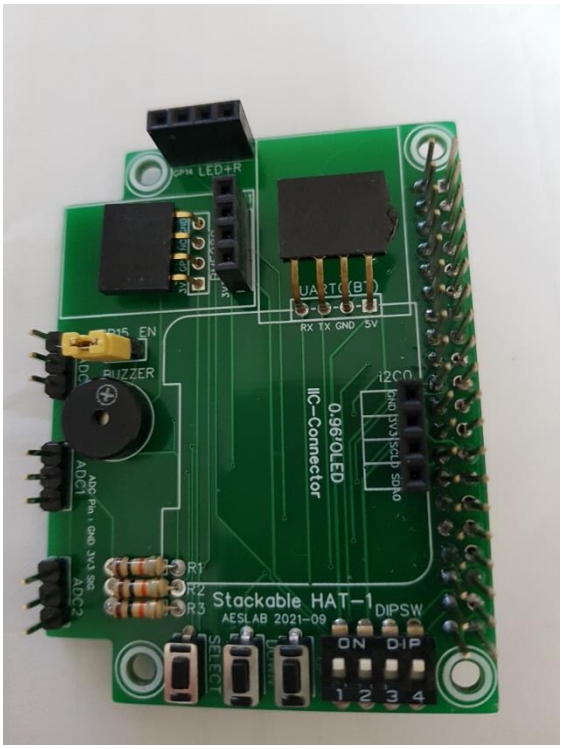
MLS (Multi Layer Stackable) Hat–1 User Guide

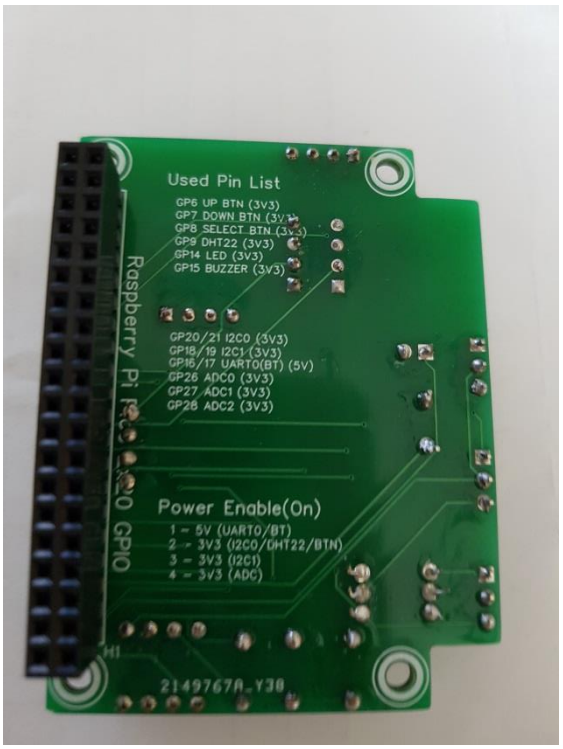
LED	… 1 Port
Buzzer	… 1 Port
DHT22	… 1 Port
BME280/AHT10	… 1 Port
0.96″ 128x64 OLED	… 1 Port
HC-06 Bluetooth Module	… 1 Port
Capacitive Soil Moisture Sensor	… 3 Ports

1. Hardware Setup

a) PCBA (PCB Assembled)



Top Side



Bottom Side

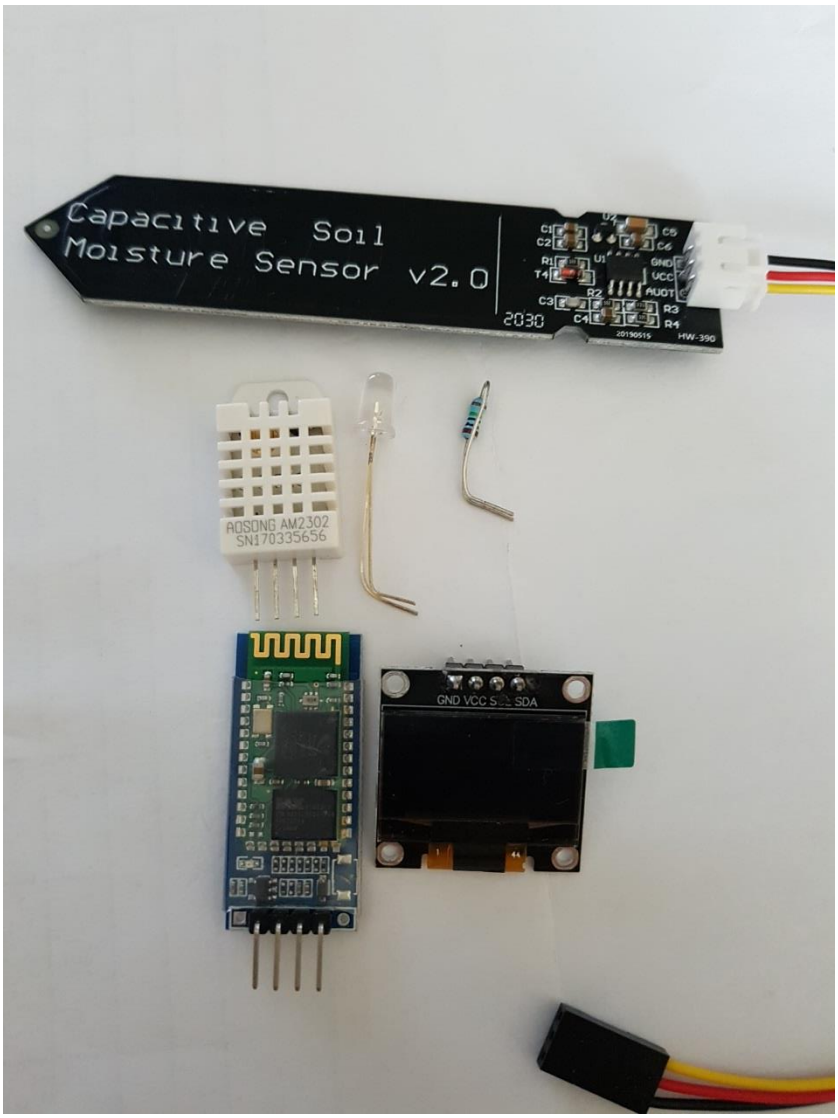
b) Used Pin List

GP6	UP Button
GP7	DOWN Button
GP8	SELECT Button
GP9	DHT22
GP14	LED
GP15	Buzzer with jumper
GP20/21	I2C0/0.96" OLED
GP18/19	I2C1/BME280
GP16/17	UART/BT HC-06
GP26/27/28	ADC0/1/2

c) Power Enable (DIPSW On/Off)

1	5V	UART	Bluetooth HC-06
2	3V3	I2C0	0.96" OLED/DHT22/Button
3	3V3	I2C1	BME280/AHT10
4	3V3	ADC	Capacitive Soil Moisture Sensor 3 EA

d) Set Configuration



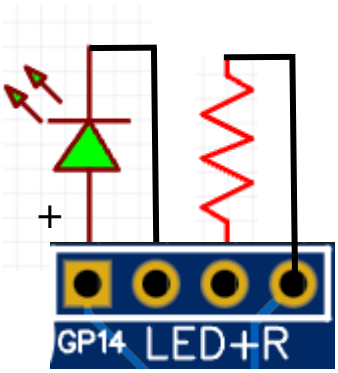
e) Parts

LED	Random Color (Red, Green, Yellow)
LED Resister	150 Ohm
DHT22	Temperature & Humidity Sensor
0.96" I2C OLED	128x64 Pixels
HC-06	Bluetooth Wireless Communication
Capacitive Soil Moisture Sensor	3 EA

f) Parts Setup

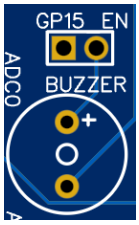
1. LED & Resister (GP14)

Red, Green, Yellow + 270 Ohm : Normal Bright
Red, Green, Yellow + 150 Ohm : More Bright
Blue + 33 Ohm



2. Buzzer (GP15)

2.54mm Jumper Enable or Disable

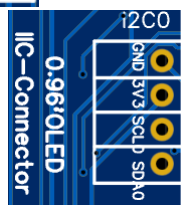


4. DHT22 Temperature & Humidity Sensor (GP9, DIPSW 2 On)

1x4 Female Connector (DHT11/22)

5. 0.96" I2C OLED 128x64 Pixels (GP20/21, I2C0, DIPSW 2 On)

1x4 Female Connector (I2C0)



6. Capacitive Soil Moisture Sensors (GP26/27/28, ADC, DIPSW 4 On)

GND (Black Wire)
3V3 (Red Wire)
SIG (Yellow Wire)

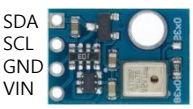
7. HC-06 Bluetooth Wireless Communication (GP16/17, UART, DIPSW 1 On)

1x4 Female Connector (UART0/BT)

8. BM280/AHT10 Temperature & Humidity Sensor (GP18/19, I2C1, DIPSW 3 On)

1x4 Female Connector (I2C1)

SDA
SCL
GND
VIN



SDA
SCL
GND
VIN

Caution, BME280 to left side
AHT10 to right side

2. MicroPython with Thonny IDE

a) MicroPython Class Library

DHT22.py
SSD1306.py

BME280.py

> Stored in Pico

b) MicroPython Unit Test Code

I2C_Sacnner.py
GP6_7_8_Button.py
GP9_DHT22.py
GP14_LED.py
GP15_Buzzer.py
GP17_16_UART0_HC-06.py
GP21_20_I2C0_SSD1306_OLED.py
GP26_27_28_ADC.py
GP26_27_28_ADC_fileSave.py

GP19_18_I2C1_BME280.py
GP19_18_I2C1_AHT10.py

c) MicroPython Application with Hat-1

FlowerPot.py > Store as main.py in Pico.

3. Using Android App : Bluetooth Controller

HC-06 Bluetooth PIN Code : 1234

20 seconds interval measurement and Bluetooth communication in FlowerPot.py

Enter “req” in the “Enter ASCII Command”, Pico respond immediately.