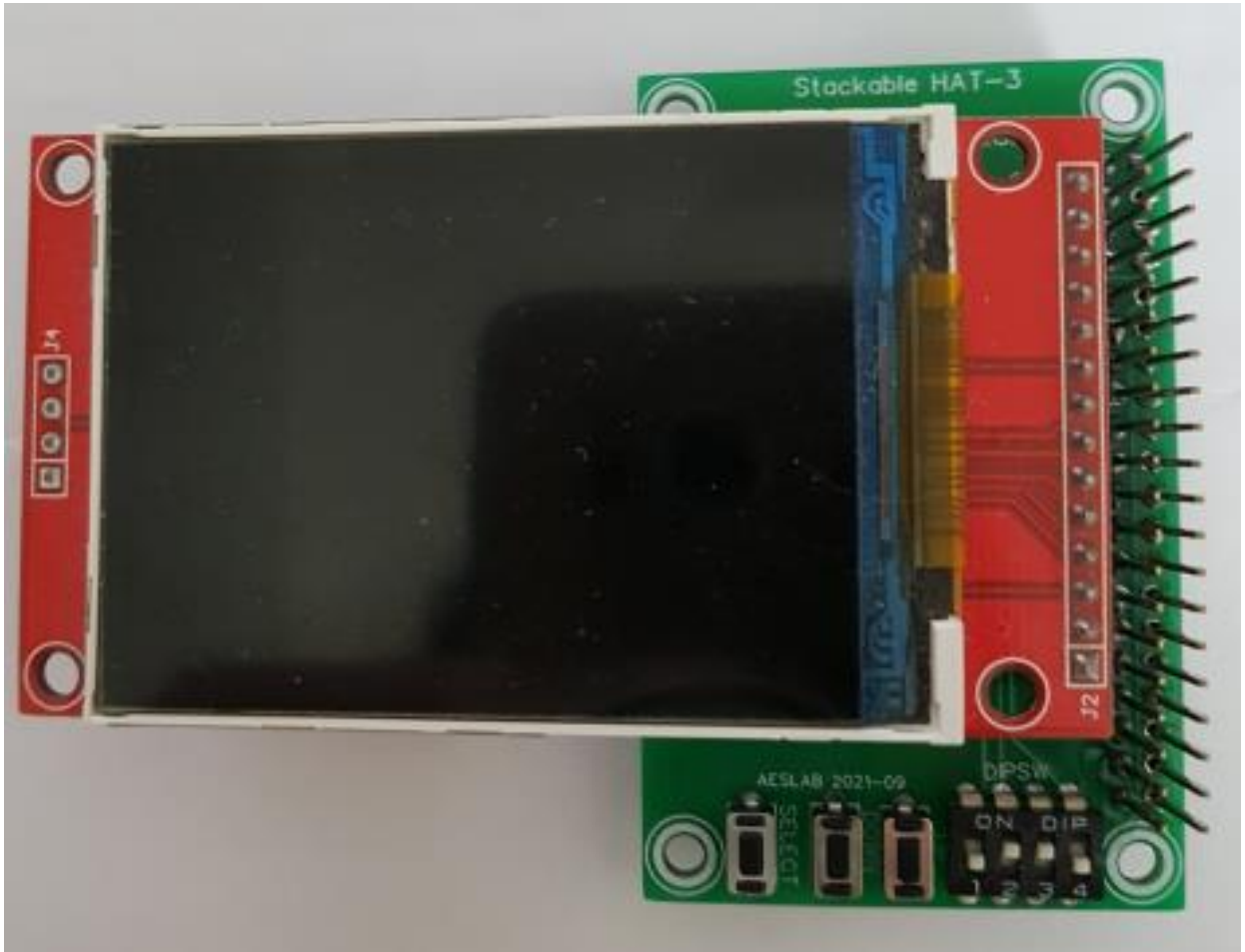# MLS (Multi Layer Stackable) Hat–3 User Guide
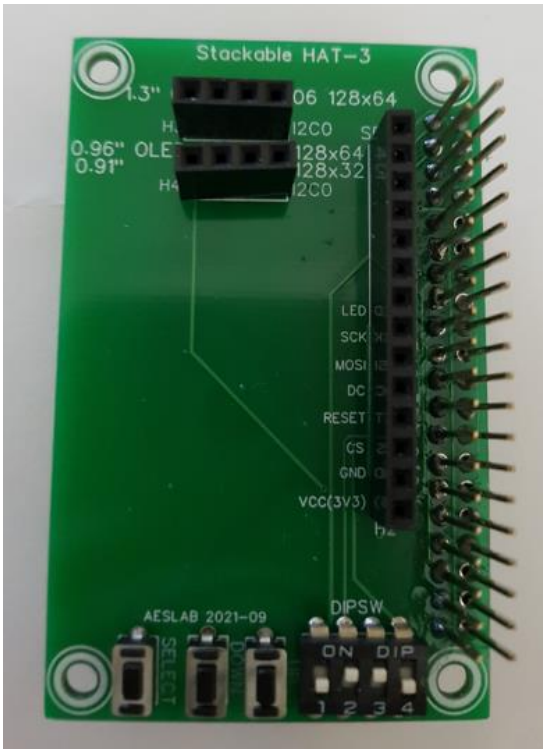

0.96/0.91″ OLED 128x64, 128x32   ... 1 Port
1.3″ OLED 128x64   ... 1 Port
2.4″ ILI9341 TFT 320x240   ... 1 Port
    ST7735 TFT

1. Hardware Setup

a) PCBA (PCB Assembled)

Top Side   Bottom Side

b) Used Pin List

GP0/1/2/3/5	SPI0/TFT
GP6	UP Button
GP7	DOWN Button
GP8	SELECT Button
GP20/21	I2C0/OLED

c) Power Enable (DIPSW On/Off)

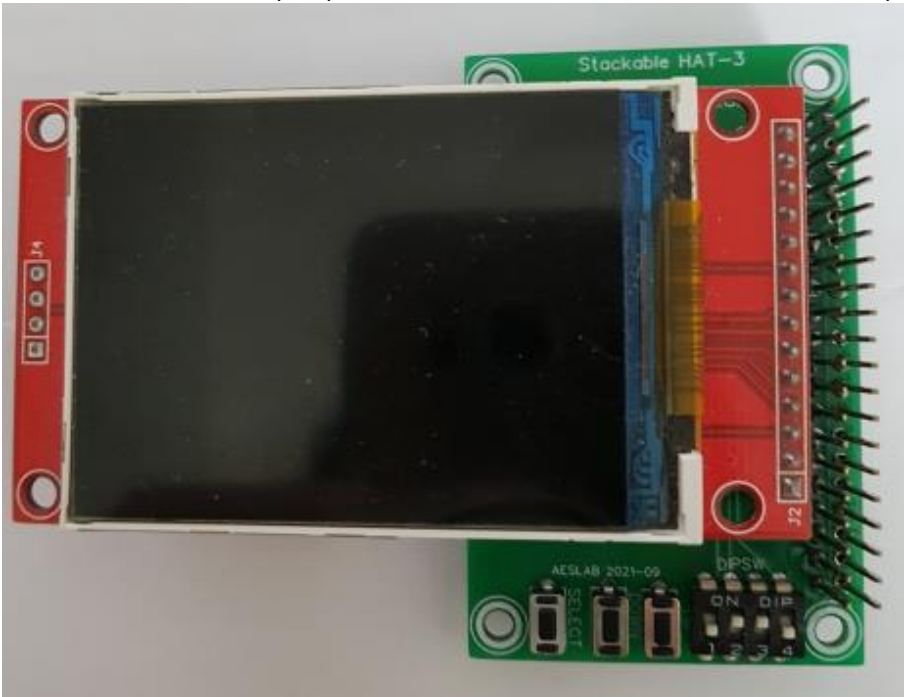|			
1	5V	None	
2	3V3	SPI0	1.44/1.77/1.8/2.2/2.4/2.8" ILI9341/ST7735 TFT
3	3V3	Button	UP/DOWN/SELECT Button
4	3V3	I2C0	1.3", 0.96/0.91" OLED

d) Set Configuration

0.96" 128x64 OLED (I2C)
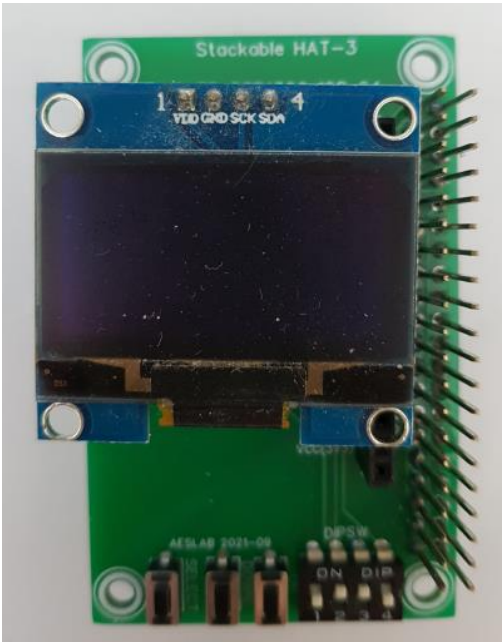
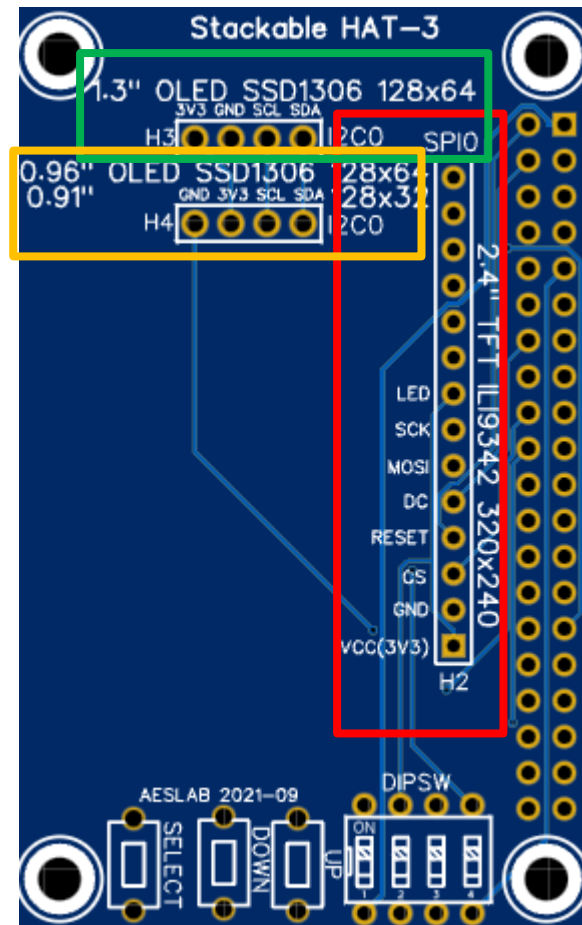1.3" 128x64 OLED (I2C)

2.4" 320x240 ILI9341 TFT (SPI)

e) Parts

2.4" ILI9341 TFT	320x240 Pixels
1.3/0.96" I2C OLED	128x64 Pixels (NOT INCLUDED)

f) Parts Setup

1. 2.4" ILI9341 TFT 320x240 pixels (GP0/1/2/3/5, SPI0, DIPSW2 On)

   Red Rectangle 1x14 2.54mm Female Connector

2. UP/DOWN/SELECT Button (GP6/7/8, DIPSW 3 On)

3. 1.3" OLED 128x64 Pixels (GP20/21, I2C0, DIPSW 4 On)

   Green Rectangle 1x4 Female Connector

   0.96" OLED 128x64 Pixels (GP20/21, I2C0, DIPSW 4 On)
   0.91" OLED 128x32 Pixels (GP20/21, I2C0, DIPSW 4 On)

   Yellow Rectangle 1x4 Female Connector

* Caution : 1.3" OLED and 0.96"/0.91" OLED module has different 3V3, GND Pin
   position..

2. MicroPython with Thonny IDE

a) MicroPython Class Library

ILI9341.py
SSD1306.py

font_to_py.py
glcdfont.py
tt14.py
tt24.py
tt34.py   Very huge size (27KB)
                           Possibly do not use this font

b) MicroPython Unit Test Code

I2C_Sacnner.py
GP6_7_8_Button.py
test_TEXT_ILI9341.py
GP21_20_I2C0_SSD1306_OLED.py

c) MicroPython Application with Hat-3

Menu_demo_ILI9341.py