

UEDX48480021-MD80ESP32_2.1inch-Touch-Knob-Display

1. Describe

UEDX48480021-MD80ESP32_2.1inch-Touch-Knob-Display is a development board with square 2.1-inch 480 * 480 resolution display, based on ESP32S3, suitable for the development of microcontroller projects with display.

2. Module

2.1 MCU

- * Chip: ESP32-S3-R8
- * PSRAM: 8M (Octal SPI)
- * FLASH: 16M
- * For more details, please visit [Espressif ESP32-S3 Datasheet](#)

2.2 Screen

- * Size: 2.1-inch IPS screen
- * Resolution: 480x480px
- * Screen type: IPS
- * Driver chip: ST7701S
- * Compatibility library: ESP32_Display_Panel
- * Bus communication protocol: 3 Wire SPI-RGB 24bits

2.3 Touch

- * Touch Chip: CST826
- * Bus communication protocol: IIC

3. QuickStart

3.1 Software Framework Configuration

Support IDE	Version
ESP-IDF	V5.1/5.2/5.3
Arduino IDE	esp32 >=v3.1.0
Platformio IDE	

3.2 ESP-IDF Framework

- ❖ Supported Versions: v5.1/5.2/5.3
- ❖ Newcomers please refer to the [beginner's tutorial](#).
- ❖ Download the example code from the repository and compile/run it directly.
- ❖ GitHub Repository Address: [examples/ESP-IDF](#)

3.2 Arduino Framework

1. Install [Arduino](#)

- ❖ Choose installation based on your system type.
- ❖ Newcomers please refer to the [beginner's tutorial](#).

2. Install ESP32 SDK

- ❖ Open Arduino IDE
- ❖ Go to 'File' > 'Preferences'
- ❖ Add to 'Additional boards manager URLs':
 - https://espressif.github.io/arduino-esp32/package_esp32_index.json
- ❖ Navigate to 'Tools' > 'Board' > 'Boards Manager'
- ❖ Search for 'esp32' by 'Espressif Systems'
- ❖ select '3.1.0' and above, click the 'INSTALL' button to install

3. Install Required Libraries

'ESP32_Display_Panel' and its dependencies are available in Arduino Library Manager. Install online:

- ❖ In Arduino IDE, go to 'Sketch' > 'Include Library' > 'Manage Libraries...'
- ❖ Search for the 'ESP32_Display_Panel' library and select '1.0.3' and above, click the 'Install' button to install, you will be prompted whether to install its dependencies, please click 'INSTALL ALL' to install all.
- ❖ Install 'LVGL' library (optional), recommended version '8.4.0'.

For manual installation, you can download the required version's '.zip' file from [Github](https://github.com/esp-arduino-libs/ESP32_Display_Panel) or [Arduino Library](https://www.arduino-libraries.info/libraries/esp32_display_panel), then in Arduino IDE navigate to 'Sketch' > 'Include Library' > 'Add .ZIP Library...', select the downloaded '.zip' file and click 'Open' to install.

4. Select and configure board

- ❖ Navigate to 'Tools' > 'Board' > 'esp32' > 'ESP32S3 Dev Module'

5. Open example

- ❖ Navigate to 'File' > 'Examples' > 'ESP32_Display_Panel'
- ❖ Select 'Arduino' > 'gui' > 'lvgl_v8' > 'simple_port'

6. Modify code

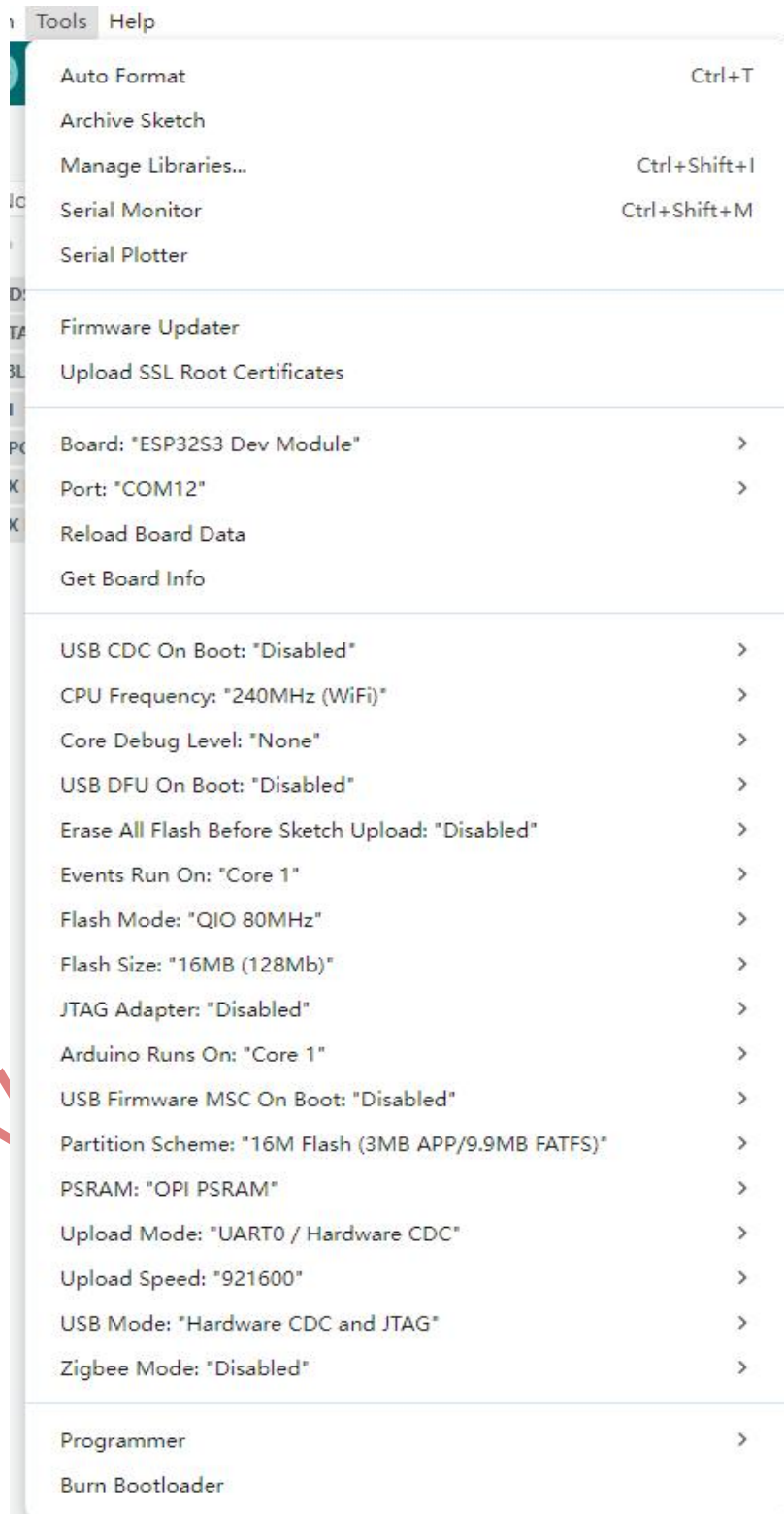
- ❖ Modify macros definitions in `*esp_panel_board_supported_conf.h*` to enable target board.
- ❖ Enable file macro definition: `#define ESP_PANEL_BOARD_DEFAULT_USE_SUPPORTED (0) ---> #define ESP_PANEL_BOARD_DEFAULT_USE_SUPPORTED (1)`
- ❖ Cancel the comment of the corresponding board:
- ❖ `// #define BOARD_VIEWE_UEDX48480021-MD80ET --->#define BOARD_VIEWE_UEDX48480021-MD80ET`
- ❖ here's part of the modified `*esp_panel_board_supported_conf.h*` file:

```
simple_port.ino  README.md  esp_panel_board_supported_conf.h  esp_panel_drivers_conf.h  esp_utils_conf.h **
9      *
10     * This file contains configuration options for various supported development board
11     * Users can select their specific board by uncommenting the corresponding macro d
12     */
13
14     #pragma once
15
16     /**
17     * @brief Flag to enable supported board configuration (0/1)
18     *
19     * Set to `1` to enable supported board configuration, `0` to disable
20     */
21     #define ESP_PANEL_BOARD_DEFAULT_USE_SUPPORTED (1)
22
23     #if ESP_PANEL_BOARD_DEFAULT_USE_SUPPORTED
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133     * - BOARD_VIEWE_UEDX32480035E_WB_A (UEDX32480035E-WB-A): https://github.com/VIEW
134     * - BOARD_VIEWE_UEDX46460015_MD50ET (UEDX46460015-MD50ET): https://github.com/VI
135     * - BOARD_VIEWE_UEDX48270043E_WB_A (UEDX48270043E-WB-A): https://github.com/VIEW
136     * - BOARD_VIEWE_UEDX48480021_MD80E_V2 (UEDX48480021-MD80E(T)): https://github.co
137     * - BOARD_VIEWE_UEDX48480021_MD80E (UEDX48480021-MD80E): https://github.com/VIEW
138     * - BOARD_VIEWE_UEDX48480021_MD80ET (UEDX48480021-MD80ET): https://github.com/VI
139     * - BOARD_VIEWE_UEDX48480040E_WB_A (UEDX48480040E-WB-A): https://viewedisplay.co
140     * - BOARD_VIEWE_UEDX80480043E_WB_A (UEDX80480043E-WB-A): https://viewedisplay.co
141     * - BOARD_VIEWE_UEDX80480050E_AC_A (UEDX80480050E-AC-A): https://viewedisplay.co
142     * - BOARD_VIEWE_UEDX80480050E_WB_A (UEDX80480050E-WB-A): https://viewedisplay.co
143     * - BOARD_VIEWE_UEDX80480050E_WB_A_2 (UEDX80480050E-WB-A): https://viewedisplay.co
144     * - BOARD_VIEWE_UEDX80480070E_WB_A (UEDX80480070E-WB-A): https://viewedisplay.co
145     */
146     // #define BOARD_VIEWE_SMARTRING
147     // #define BOARD_VIEWE_UEDX24240013_MD50E
148     // #define BOARD_VIEWE_UEDX24320024E_WB_A
149     // #define BOARD_VIEWE_UEDX24320028E_WB_A
150     // #define BOARD_VIEWE_UEDX24320035E_WB_A
151     // #define BOARD_VIEWE_UEDX32480035E_WB_A
152     // #define BOARD_VIEWE_UEDX46460015_MD50ET
153     // #define BOARD_VIEWE_UEDX48270043E_WB_A
154     // #define BOARD_VIEWE_UEDX48480021_MD80E_V2
155     // #define BOARD_VIEWE_UEDX48480021_MD80E
156     #define BOARD_VIEWE_UEDX48480021_MD80ET
157     // #define BOARD_VIEWE_UEDX48480028_MD80ET
158     // #define BOARD_VIEWE_UEDX48480040E_WB_A
159     // #define BOARD_VIEWE_UEDX80480043E_WB_A
160     // #define BOARD_VIEWE_UEDX80480050E_AC_A
161     // #define BOARD_VIEWE_UEDX80480050E_WB_A
162     // #define BOARD_VIEWE_UEDX80480050E_WB_A_2
163     // #define BOARD_VIEWE_UEDX80480070E_WB_A
```

[!WARNING]

- ❖ Do not enable both 'ESP_PANEL_BOARD_DEFAULT_USE_SUPPORTED' and 'ESP_PANEL_BOARD_DEFAULT_USE_CUSTOM'
- ❖ You cannot enable multiple boards simultaneously

7. Configure tool options :



8. Select the correct port.

9. compile and download

- ❖ Click "✓" in the upper right corner to compile, If the compilation is correct, connect the microcontroller to the computer, Click "→" in the upper right corner to download.

[!NOTE]

- ❖ LVGL color swap settings, 'SPI' and 'QSPI' screens need to set the macro of 'lv_conf.h' > 'LV_COLOR_16_SWAP' to '1' and the 'RGB' screen to '0', as follows :

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Statement: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radiocommunications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

FCC WARNING

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.