

Connecting the EXT3 to the ESP32 Devkit V1 with Arduino

Scope

This configuration has been tested successfully against

ESP32 Devkit V1 for the screens up to 2.66"

This configuration may also suit other boards with the Arduino form-factor, with the size of the screen adapted to the available SRAM of the MCU.

Software

On the main sketch, set the board to boardESP32, corresponding to the pins defined in the hV_Configuration.h file of the ePaper_EXT3_Basic_Library ([link 1](#), [link 2](#)).

Notes

There are multiple releases of the ESP32 with slight incompatibilities. In this we are using the ESP32 Devkit V1. Setup the ESP32 library in Arduino IDE by following the steps found [here](#).

After downloading the code from the above-mentioned github repository, there are a couple of things that need to be completed before flashing the project to ESP32. First, open up hV.Configuration, and declare the board that will be used, in our case, boardESP32. We have configured this specific pin mapping (remember, the pin number reflects the GPIO pin and not necessarily the physical pin number) so that it is compatible with the example projects in the ePaper_EXT_3_Basic_Library. If the GPIO pins we have mapped conflict with your project specifications, adjust accordingly (See Figure 3 Hardware). Next, whatever example.ino file you decide to use from ePaper_EXT3_Basic_Library, you will need to declare your board in the example.ino file as seen in the Sketch.ino image above. Make sure all other declarations are commented out except for the screen that you will be using. For our 2.66" display, we have selected the declaration with eScreen_EPD_EXT3_266 input. Finally, connect the EXT3 board to ESP32 (See Figure 2 Hardware), flash the selected example.ino project onto your ESP32 from Arduino IDE and make sure the image showing on your display matches the example description.

Issue: Some ESP32 will not flash in the Arduino environment. This happened in this example. The work around is to install a 10uF electrolytic capacitor to make the ESP32 automatically go into boot/flash mode (See Figure 1 in Hardware). After configuring the circuit either by soldering the capacitor to the board, or using a breadboard as seen in the figure below, ESP32 should be able to successfully flash code through Arduino IDE.

Sketch.ino

```
#screen_EPD_EXT3 myScreen(eScreen_EPD_EXT3_266, boardESP32);
```

hV_Configuration.h

```
const pins_t boardESP32 =
{
    .panelBusy = 14, ///< EXT3 pin 3 Red    -> GPIO14 pin 17 (GPIO)
    .panelDC = 27, ///< EXT3 pin 4 Orange  -> GPIO27 pin 16 (GPIO)
    .panelReset = 26, ///< EXT3 pin 5 Yellow-> GPIO26 pin 15 (GPIO)
    .flashCS = 25, ///< EXT3 pin 8 Violet  -> GPIO25 pin 14 (GPIO)
    .panelCS = 33, ///< EXT3 pin 9 Grey    -> GPIO33 pin 13 (GPIO)

    //The below ports are not needed for the 2.66" display base level projects
    //See pin mapping diagram of EXT3 to ESP32 to know if you need any of the below ports
    .panelCSS = NOT_CONNECTED, ///< EXT3 pin 12 Grey2  -> ?
    .flashCSS = NOT_CONNECTED, ///< EXT3 pin 20 Black2  -> ?
    .touchReset = NOT_CONNECTED, ///< Separate touch board
    .touchInt = NOT_CONNECTED, ///< Separate touch board
    .cardCS = NOT_CONNECTED, ///< Separate SD-card board
    .cardDetect = NOT_CONNECTED, ///< Separate SD-card board
};
```

Hardware

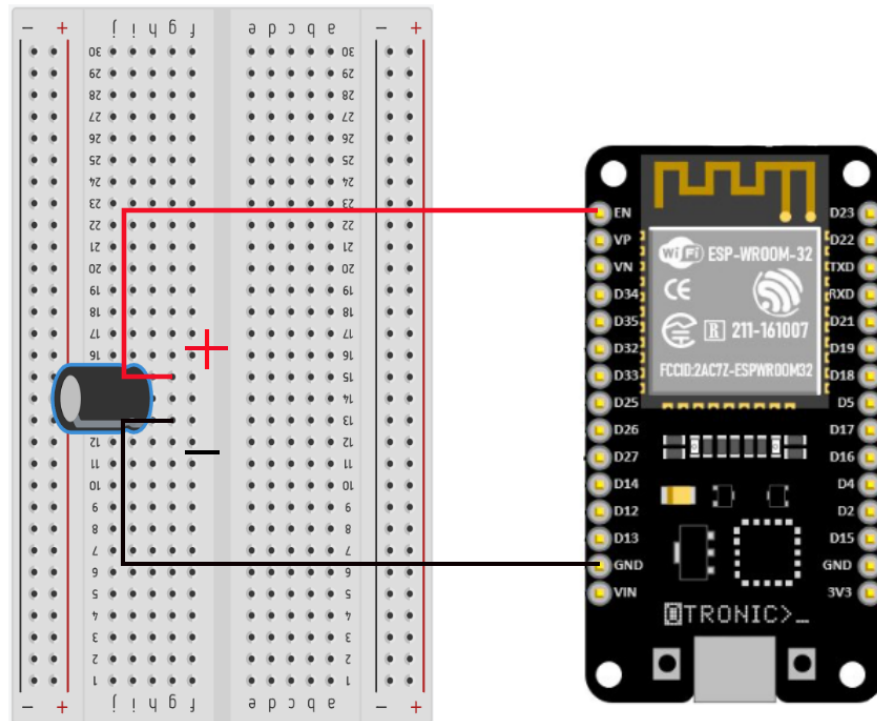


Figure 1: Solution for ESP32 flashing in Arduino IDE (10uf Electrolytic Capacitor)

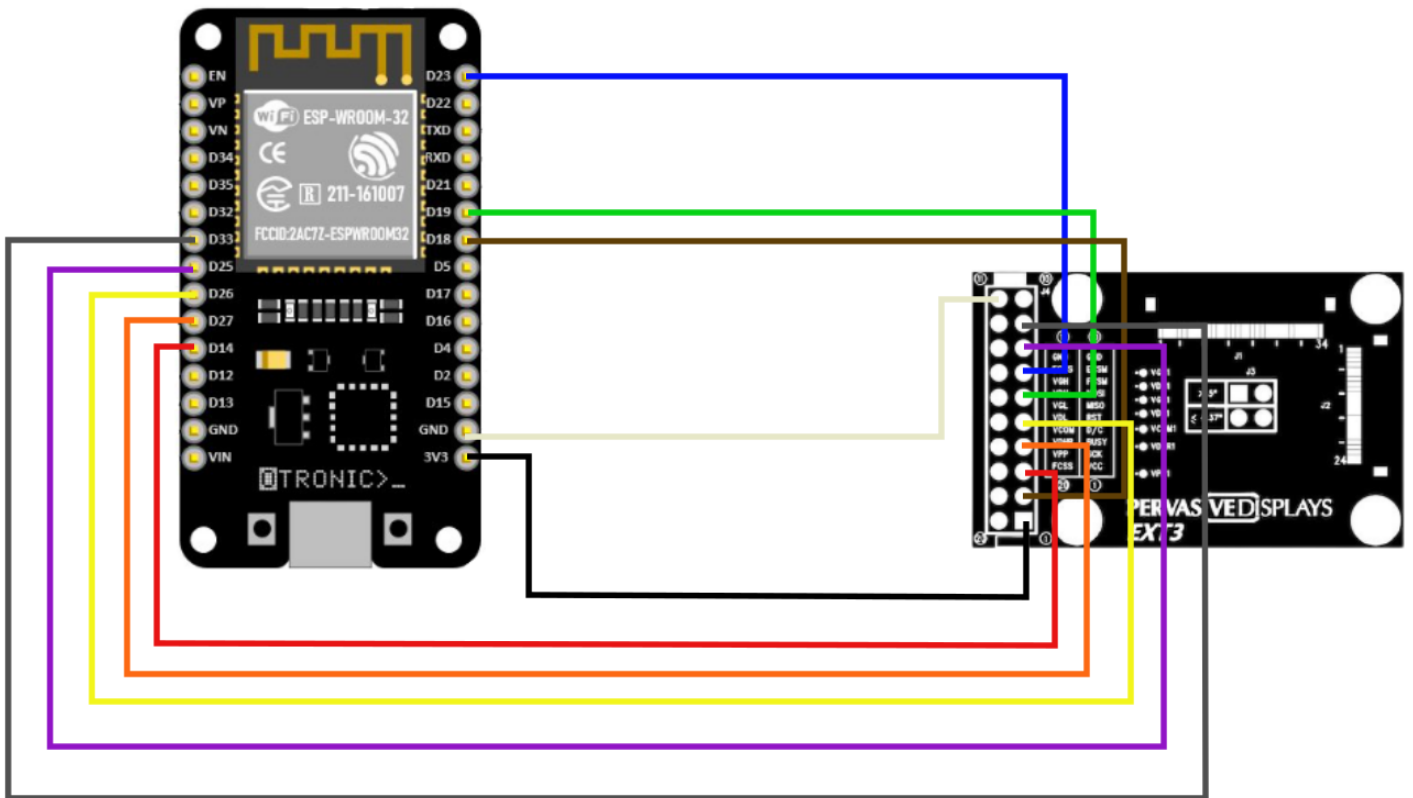
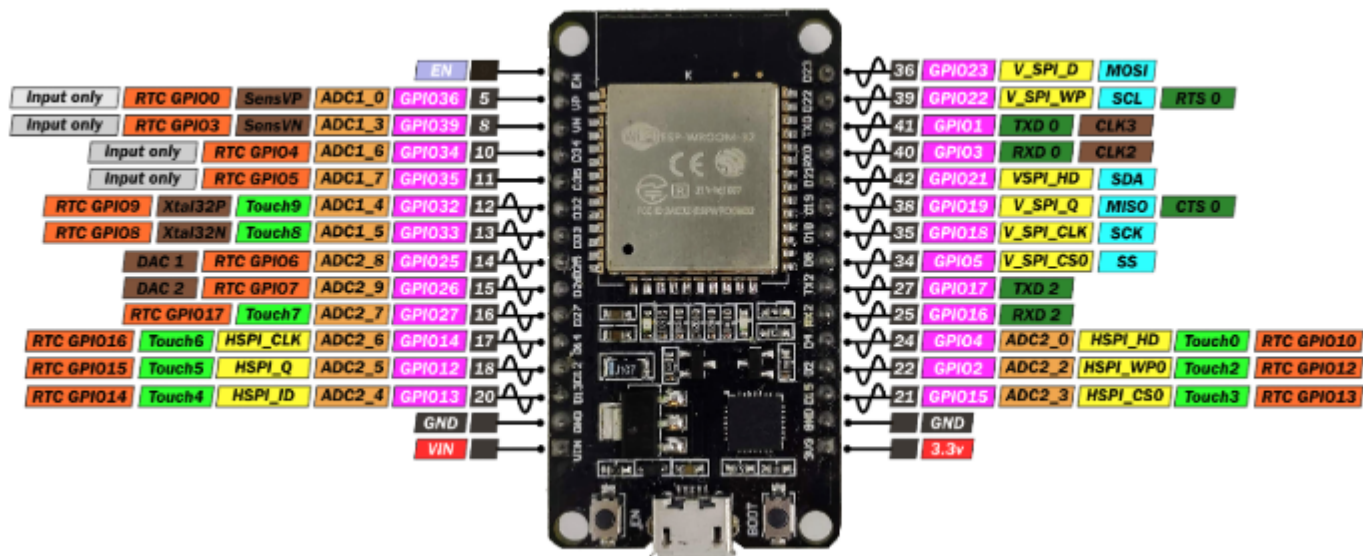


Figure 2: Wiring Diagram for EXT3 board to ESP32 Devkit V1



Options

Large screens 9.7" and 12.2" require panelCSS to be defined and connected.

If the second memory is populated on the EXT3 board, lashCSS needs to be defined and connected. The library will keep lashCSS HIGH to avoid any interferences with the other devices connected to the SPI bus.

ESP32 Image: <https://www.otronic.nl/a-59613972/esp32/esp32-wroom-4mb-devkit-v1-board-met-wifi-bluetooth-en-dual-core-processor/> , Otronic

Pervasive Display EXT3 Image: <https://embeddedcomputing.weebly.com/connecting-the-e-paper-epd-extension-kit-gen-3.html> , REI VILO

ESP32 Pinout Image: <https://www.mischianti.org/wp-content/uploads/2020/11/ESP32-DOIT-DEV-KIT-v1-pinout-mischianti.png> , RENZO MISCHIANI

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