Setup Guide: ESP32 2.8" LCD (CYD) Development

This guide outlines how to configure the **ESP32-2432S028** (2.8" 240x320 LCD) using the **LVGL** graphics library and **Arduino IDE**.

1. Software Requirements

- **Arduino IDE:** Version 2.3.x or higher.
- **ESP32 Core:** Version 3.0.x (by Espressif Systems).
- **Required Libraries** (Install via Library Manager):
    - **TFT_eSPI** by Bodmer.
    - **LVGL** by kisvegabor (**Select version 8.3.11** for best compatibility).

2. Hardware & Arduino IDE Configuration

Connect the board via USB and select the following settings under the **Tools** menu:

- **Board:** ESP32 Dev Module
- **Flash Mode:** QIO
- **Partition Scheme:** Huge APP (3MB No OTA/1MB SPIFFS) — *Required for WiFi/Bluetooth projects.*
- **Upload Speed:** 921600 (or 115200 if connection is unstable).

3. Library Configuration (Mandatory)

Before the screen will display graphics correctly, you must configure the library files on your computer:

- **Configure TFT_eSPI:**
    1. Navigate to your Arduino libraries folder: Documents/Arduino/libraries/TFT_eSPI/.
    2. Open User_Setup.h and ensure only #define ILI9341_DRIVER is active.
    3. Ensure the following pins are defined:
        - TFT_MISO 12, TFT_MOSI 13, TFT_SCLK 14
        - TFT_CS 15, TFT_DC 2, TFT_RST -1
        - TFT_BL 21
- **Configure LVGL:**
    1. Go to Documents/Arduino/libraries/lvgl/.

2. Copy the file lv_conf_template.h and paste it into the main libraries folder (one level up).
3. Rename it to lv_conf.h.
4. Open it and change #if 0 to #if 1 at the very beginning.
5. Verify #define LV_COLOR_DEPTH 16 is set.

4. Important Hardware Note: Backlight Control

This board requires **GPIO 21** to be set to HIGH to enable the screen's backlight. Without this, the screen will remain black even if the code is running correctly. Ensure your code includes:

cpp

pinMode(21, OUTPUT);

digitalWrite(21, HIGH);

5. Test Code to for text and Graphix

Attached