

You

LILYGO® T-Display-S3 ESP32-S3 Touch LCD projects

Copilot

The **LILYGO® T-Display-S3** is an intriguing development board featuring the **ESP32-S3** microcontroller. Let's dive into the details:

1. Overview:

- The **T-Display-S3** is equipped with a **1.9-inch LCD color screen** and two programmable buttons.
- It communicates using the **I8080 interface** and retains the same layout design as the original **T-Display**.
- You can directly use the **ESP32-S3** for **USB communication** or programming.
- The board comes in **soldered** and **non-soldered** versions, with the shell available only for the soldered variants.
- **Compatible with ST7789** display driver.

2. Specifications:

- **MCU:** ESP32-S3R8 (Dual-core LX7 microprocessor)
- **Wireless Connectivity:** Wi-Fi 802.11, BLE 5, and BT mesh
- **Programming Platform:** Arduino IDE, Micropython
- **Flash:** 16MB
- **PSRAM:** 8MB
- **LCD Display:** 1.9" diagonal, full-color TFT (Resolution: 170x320, 8-bit parallel interface)
- **Working Power Supply:** 3.3V
- **Onboard Functions:** Boot, Reset, IO14 Button
- **Connectors:** STEMMA QT / Qwiic JST-SH 1.0mm 4-PIN, JST-GH 1.25mm 2-PIN
- **Sample Code:** Available on [GitHub](#)

3. Use Cases:

- **Car Dashboard/Controller:** Create a custom dashboard or controller interface.
- **Game Development:** Design interactive games.
- **Monitors:** Build small monitoring devices.

4. Getting Started:

- If you're new to the **T-Display-S3**, check out the [step-by-step guide](#) on Instructables.
- You can find all the necessary resources on the [GitHub repository](#).

Remember, the **T-Display-S3** opens up exciting possibilities for your projects! 🚀💡

You

I have a LILYGO T-Display-S3 ESP32-S3 1.9 inch ST7789 Touch LCD Display Development Board. I would like to connect a MAX30102 Oximeter Heart Rate Beat Pulse Sensor to it. But I am lost with the pin connections.

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Certainly! Let's get you started with connecting the **MAX30102 Oximeter Heart Rate Beat Pulse Sensor** to your **LILYGO T-Display-S3** development board. Here are the steps and pin connections you'll need:

1. I2C Communication:

- The **MAX30102** sensor communicates via the **I2C** (Inter-Integrated Circuit) protocol.
- On the **T-Display-S3**, the **JST connector** beside the USB port serves as the I2C port.
- The pinout for I2C communication is as follows:
 - **GND:** Connect to ground (0V).
 - **3.3V:** Connect to the 3.3V power supply.
 - **SDA (Data):** Connect to pin **43** on the T-Display-S3.
 - **SCL (Clock):** Connect to pin **44** on the T-Display-S3.

2. Power Supply:

- The T-Display-S3 can be powered through the **USB-C connector** or a **3.7V LiPo battery pack** attached to the **JST-GH 1.25mm 2-pin connector** on the board.
- Make sure to provide the necessary power to both the T-Display-S3 and the MAX30102 sensor.

3. Wiring Example:

- Here's a simple example of how you might connect the MAX30102 to the T-Display-S3:
 - **MAX30102 VCC:** Connect to 3.3V (from T-Display-S3).
 - **MAX30102 GND:** Connect to GND (from T-Display-S3).
 - **MAX30102 SDA:** Connect to pin 43 (SDA) on the T-Display-S3.
 - **MAX30102 SCL:** Connect to pin 44 (SCL) on the T-Display-S3.

4. Software Setup:

- In your Arduino sketch, include the Wire library (`#include <Wire.h>`).
- Initialize I2C communication using `Wire.begin(43, 44);` in your `setup()` function.
- Use the **Adafruit MAX30102 library** to read data from the sensor.
- You can then access heart rate and pulse oximetry data from the MAX30102 sensor.

Remember to check the **MAX30102 datasheet** and the **T-Display-S3 pinout** for any additional details specific to your setup. Happy prototyping! 🚀🔧🔍

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LILYGO T-Display-S3 pinout

[https://www.bing.com/search?](https://www.bing.com/search?IG=10E8000407264F2B961A77A110EEDE04&IID=SERP.5028&cw=1408&ch=746&dissrchswrite=1&kseed=8500&SFX=4&partnerId=bingchat&tone=Balanced&q=LILYGO-T-Display-S3+pinout&iframid=bee2c24c-4c6a-4e71-a379-d7098683ed10)

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You

This is the touch screen version of the LILYGO T-Display-S3 ESP32-S3 1.9 inch ST7789 Touch LCD Display Development Board. How would I display the data from the sensor on the screen?

Copilot

Certainly! To display data from the **MAX30102 Oximeter Heart Rate Beat Pulse Sensor** on the **touch screen** of your **LILYGO T-Display-S3**, follow these steps:

1. Initialize the Display:

- First, ensure that you've set up the **T-Display-S3** with the **touch screen** functionality enabled.
- Initialize the display using the appropriate library (such as **TFT_eSPI** or **Adafruit ST7789**).

2. Read Data from MAX30102:

- Use the **Adafruit MAX30102 library** to read heart rate and pulse oximetry data from the sensor.
- You can access the raw data (such as infrared and red LED readings) and process it to calculate heart rate and SpO2 levels.

3. Display Data on the Screen:

- Create a user-friendly interface on the touch screen to visualize the data.
- Here are some ideas for displaying the data:
 - **Real-Time Graph:** Plot heart rate and SpO2 values over time.
 - **Numeric Readouts:** Display the current heart rate and SpO2 levels.
 - **Visual Alerts:** Change the screen color or display icons based on specific thresholds (e.g., high heart rate or low SpO2).
 - **Historical Data:** Show historical data in a scrollable list or graph.
 - **Animated Icons:** Use icons (such as a heart or oxygen mask) to represent health metrics.

4. Touch Interaction:

- Utilize the touch screen functionality to allow users to interact with the display.
- For example, users could tap on the screen to switch between different data views or adjust settings.

5. Code Example:

- Below is a simplified example using the **TFT_eSPI** library (make sure you've installed it via the Arduino Library Manager):

```
#include <TFT_eSPI.h>
TFT_eSPI tft = TFT_eSPI(); // Initialize TFT display

void setup() {
  tft.init(); // Initialize TFT
  tft.setRotation(1); // Set screen rotation (adjust as needed)
  tft.fillScreen(TFT_BLACK); // Clear screen
}

void loop() {
  // Read MAX30102 data (heart rate and SpO2)
  float heartRate = readHeartRate();
  float spo2 = readSpO2();

  // Display data on screen
  tft.setTextSize(2);
  tft.setTextColor(TFT_WHITE);
  tft.setCursor(10, 20);
  tft.println("Heart Rate: " + String(heartRate) + " bpm");
  tft.setCursor(10, 50);
  tft.println("SpO2: " + String(spo2) + "%");

  // Add more display elements as needed
}

float readHeartRate() {
  // Implement MAX30102 data reading logic
  // Return heart rate value
}

float readSpO2() {
  // Implement MAX30102 data reading logic
  // Return SpO2 value
}
```

Remember to adapt the code to your specific requirements and customize the display layout according to your preferences. Happy coding! 🌟🇺🇸🔍

You

What are your sources of this code example?

Copilot

I apologize for any confusion. The code example I provided was generated based on my understanding of the **MAX30102 sensor** and the **T-Display-S3** development board. As an AI language model, I don't have direct access to external sources or repositories. Therefore, I recommend referring to official documentation, community forums, or other reliable sources for more detailed and accurate information on integrating the MAX30102 sensor with the T-Display-S3.

For specific implementation details, you can explore the following resources:

1. T-Display-S3 Documentation:

- Check the official documentation or user manual for the T-Display-S3. It should provide pinout details, library recommendations, and usage guidelines.
- Visit the [GitHub repository](#) for the T-Display-S3, where you'll find sample code and examples.

2. MAX30102 Sensor Datasheet:

- Refer to the MAX30102 datasheet for detailed information on its functionality, register settings, and communication protocols.
- You can find the datasheet on the manufacturer's website or other reliable sources.

3. Community Forums and Discussions:

- Explore forums such as the Arduino community, ESP32 forums, or other relevant platforms.
- Search for discussions related to integrating the MAX30102 sensor with ESP32-based boards.

Remember to adapt any code examples to your specific setup and requirements. If you have further questions or need assistance, feel free to ask! 🚀🔍🔧