LILYGO T-Display S3 AMOLED Plus

LILYGO T-Display S3 AMOLED Plus User Manual

1. INTRODUCTION

The LILYGO T-Display S3 AMOLED Plus is a versatile development board featuring an ESP32-S3 dual-core LX7 microprocessor and a vibrant 1.91-inch AMOLED touch display. This board offers robust wireless connectivity with 2.4 GHz Wi-Fi and Bluetooth 5 (LE), making it suitable for a wide range of embedded projects and IoT applications. It supports popular development environments such as Arduino, PlatformIO-IDE, and Micropython.

This manual provides essential information for setting up, operating, and troubleshooting your T-Display S3 AMOLED Plus.

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Video 1: LILYGO T-Display-S3 Product Introduction. This video provides a comprehensive overview of the product, including unboxing, hardware features, and basic functionalities.

2. PRODUCT OVERVIEW

The T-Display S3 AMOLED Plus integrates a powerful ESP32-S3 chip with an AMOLED display, offering a compact and feature-rich platform for developers. It includes onboard functions such as RTC (Real-Time Clock), PMU (Power Management Unit), SD Card support, and a battery holder for portable applications. The 1.91-inch RM67162 IPS AMOLED display boasts a resolution of 240(W) x 536(H) and supports capacitive touch.

Figure 1: Front view of the LILYGO T-Display S3 AMOLED Plus, showcasing its 1.91-inch AMOLED screen displaying time.

MCU: ESP32-S3R8 Dual-core LX7 microprocessor
Wireless Connectivity: 2.4 GHz Wi-Fi & Bluetooth 5 (LE)
Development : Arduino、PlatformIO-IDE、Micropython
Onboard functions: RTC + PMU + SD Card + Battery holder
Flash: 16MB   **PSRAM:** 8MB   (SD Card Type: Fat32)

1.91 inch RM67162 IPS AMOLED:
Resolution: 240(W) x RGB x 536(H)   **Interface:** SPI
Active area: 19.8*44.2mm   **Driver IC:** RM67162
Viewing Angle: IPS Full View Angle

Onboard Function
STEMMA QT/Qwiic
JST-SH 1.0mm 4-PIN
Boot(IO00)
SD Card Holder
JST-GH 1.25mm
14:39
Tue Dec 12 $0.00
Support Capacitive Touch   Reset

Figure 2: Detailed diagram highlighting the MCU, wireless connectivity, display specifications, and onboard functions of the T-Display S3 AMOLED Plus.

3. FEATURES

- **MCU:** ESP32-S3R8 Dual-core LX7 microprocessor.
- **Wireless Connectivity:** 2.4 GHz Wi-Fi and Bluetooth 5 (LE).
- **Development Environments:** Arduino, PlatformIO-IDE, Micropython.

- **Display:** 1.91-inch RM67162 IPS AMOLED, 240(W) x 536(H) resolution, SPI interface, capacitive touch.
- **Memory:** 16MB Flash, 8MB PSRAM.
- **Onboard Functions:** RTC, PMU, SD Card holder (Fat32 support), and battery holder.
- **Interfaces:** Type-C USB, JST-GH 1.25mm 2pin battery interface, JST-SH 1.0mm 4pin interface (STEMMA QT/Qwiic compatible).

4. PACKAGE CONTENTS

The LILYGO T-Display S3 AMOLED Plus package includes:

- Main Board
- USB Cable

Figure 3: Contents of the LILYGO T-Display S3 AMOLED Plus package, including the main board and USB cable.

5. SETUP

5.1. Initial Power-up and Functionality Check

1. Connect the provided USB cable to the T-Display S3 AMOLED Plus and a power source (e.g., computer USB port).
2. The device should power on and display the default firmware interface.
3. To check basic functionality like Wi-Fi and time synchronization, refer to Video 2, starting at 0:58.

5.2. Flashing Firmware

To update or install new firmware, you will need to put the device into download mode and use a flashing tool. Detailed instructions are provided in Video 2.

1. **Enter Download Mode:** Connect the USB cable to the board. Press and hold the **BOOT** button, then press the **RST** button. Release the **RST** button, then release the **BOOT** button. The device is now in download mode. (Refer to Video 2, timestamp 2:38 for visual guide).
2. **Download Flashing Tool:** Obtain the ESP32S3 Flash Download Tool from the LILYGO GitHub repository (github.com/Xinyuan-LilyGO/LilyGo-AMOLED-Series).
3. **Load Firmware:** In the flashing tool, select the correct chip type (ESP32-S3) and load the firmware .bin file.
4. **Flash:** Select the appropriate COM port and click 'START' to begin flashing.

Your browser does not support the video tag.

Video 2: T-DISPLAY-S3 Flash Factory. This video demonstrates the process of flashing new firmware onto the device, including entering download mode and using the flashing tool.

6. OPERATING INSTRUCTIONS

6.1. Basic Navigation

The T-Display S3 AMOLED Plus features a touch screen for interaction. Navigate through menus and applications by tapping and swiping on the display.

6.2. Wi-Fi Connectivity

The device supports 2.4 GHz Wi-Fi. To connect to a Wi-Fi network, access the settings menu on the device. You can configure Wi-Fi credentials through the development environment or a dedicated mobile application (if available). (Refer to Video 1, timestamp 0:58 for Wi-Fi functionality demonstration).

6.3. Time Synchronization

The device can automatically synchronize time when connected to a Wi-Fi network. (Refer to Video 1, timestamp 1:10 for time synchronization demonstration).

6.4. Custom Buttons

The board includes programmable buttons that can be customized for various functions within your applications. (Refer to Video 1, timestamp 1:26 for custom button demonstration).

7. SPECIFICATIONS

Component	Detail
MCU	ESP32-S3R8 Dual-core LX7 microprocessor
Wireless Connectivity	2.4 GHz Wi-Fi, Bluetooth 5 (LE)

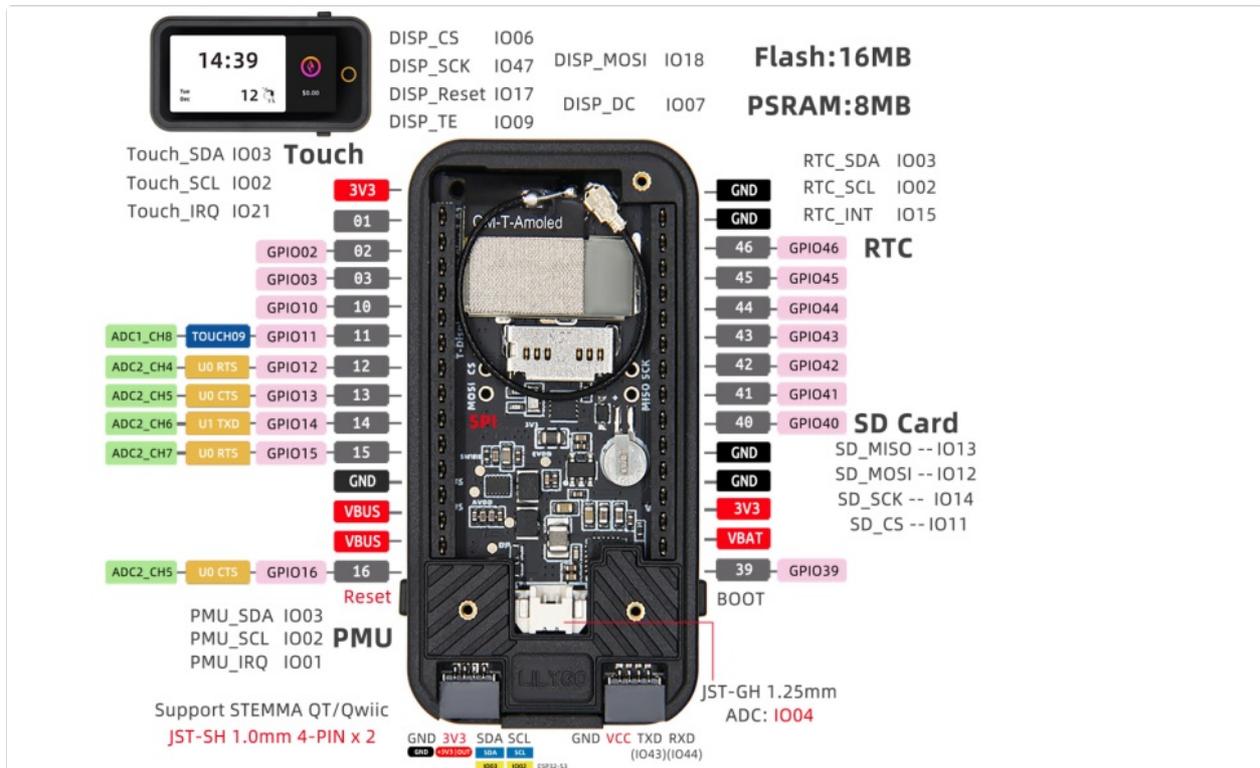|	
Display	1.91-inch RM67162 IPS AMOLED, 240x536 resolution, SPI, Capacitive Touch
RAM	LPDDR4X
Flash	16MB
PSRAM	8MB
Operating System	Linux (supported development environments)
Connectivity Technology	Wi-Fi, Bluetooth 5(LE)
Included Components	Main Board, USB Cable

Figure 4: Pinout diagram for the LILYGO T-Display S3 AMOLED Plus, detailing GPIO assignments and interfaces.

8. TROUBLESHOOTING

- **No Display After Flashing:** If the screen remains blank after flashing, ensure the correct firmware for your specific board version was used. Try re-flashing the factory test firmware to verify hardware functionality.

- **USB Port Not Found:** When attempting to upload firmware, if the COM port is not detected, ensure the USB CDC ON_BOOT configuration is enabled in your development environment. If the port is still not found, try a different USB cable or port.

- **Wi-Fi Connection Issues:** Verify that the Wi-Fi credentials are correct and that you are connecting to a 2.4 GHz network, as 5 GHz networks are not supported.

- **Device Not Responding:** If the device becomes unresponsive, press and hold the RST button to perform a hardware reset.

9. MAINTENANCE

To ensure the longevity of your LILYGO T-Display S3 AMOLED Plus, keep it in a dry environment and avoid exposure to extreme temperatures or humidity. Handle the board with care to prevent physical damage to components or connectors. Regularly check for firmware updates on the official GitHub repository to benefit from the latest features and bug fixes.

10. WARRANTY & SUPPORT

For any questions or suggestions regarding the LILYGO T-Display S3 AMOLED Plus, please contact the seller directly through the platform where you purchased the product. LILYGO is committed to providing prompt assistance and support.