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LILYGO T-Deck Plus

LILYGO T-Deck Plus ESP32-S3 Meshtastic Development Board User Manual

Model: T-Deck Plus with Meshtastic Firmware

1. INTRODUCTION

The LILYGO T-Deck Plus is a versatile development board designed for long-range, low-power LoRa communication, featuring an ESP32-S3 microcontroller, a 2.8-inch display, a QWERTY keyboard, and integrated GPS. This manual provides essential instructions for setting up, operating, and maintaining your T-Deck Plus device, specifically configured with Meshtastic firmware for mesh networking capabilities.

2. PRODUCT OVERVIEW

The LILYGO T-Deck Plus combines several key components into a compact form factor, enabling robust off-grid communication. Key features include:

- ESP32-S3 Microcontroller:** Provides powerful processing for various applications.
- LoRa Transceiver:** Enables long-range, low-power wireless communication.
- GPS Module:** For location tracking and mapping functionalities.
- 2.8-inch Display:** For user interface and information display.
- QWERTY Keyboard:** For text input and device interaction.
- External Antenna:** Enhances signal range and reliability.

2.1. Device Components



Figure 1: Angled view of the LILYGO T-Deck Plus with its external antenna.

This image shows the LILYGO T-Deck Plus from an angled perspective, highlighting its compact design and the attached external antenna, which is crucial for LoRa communication.



Figure 2: Front view of the LILYGO T-Deck Plus, showing the display and QWERTY keyboard.

A direct front view of the device, emphasizing the 2.8-inch display and the full QWERTY keyboard for user interaction.

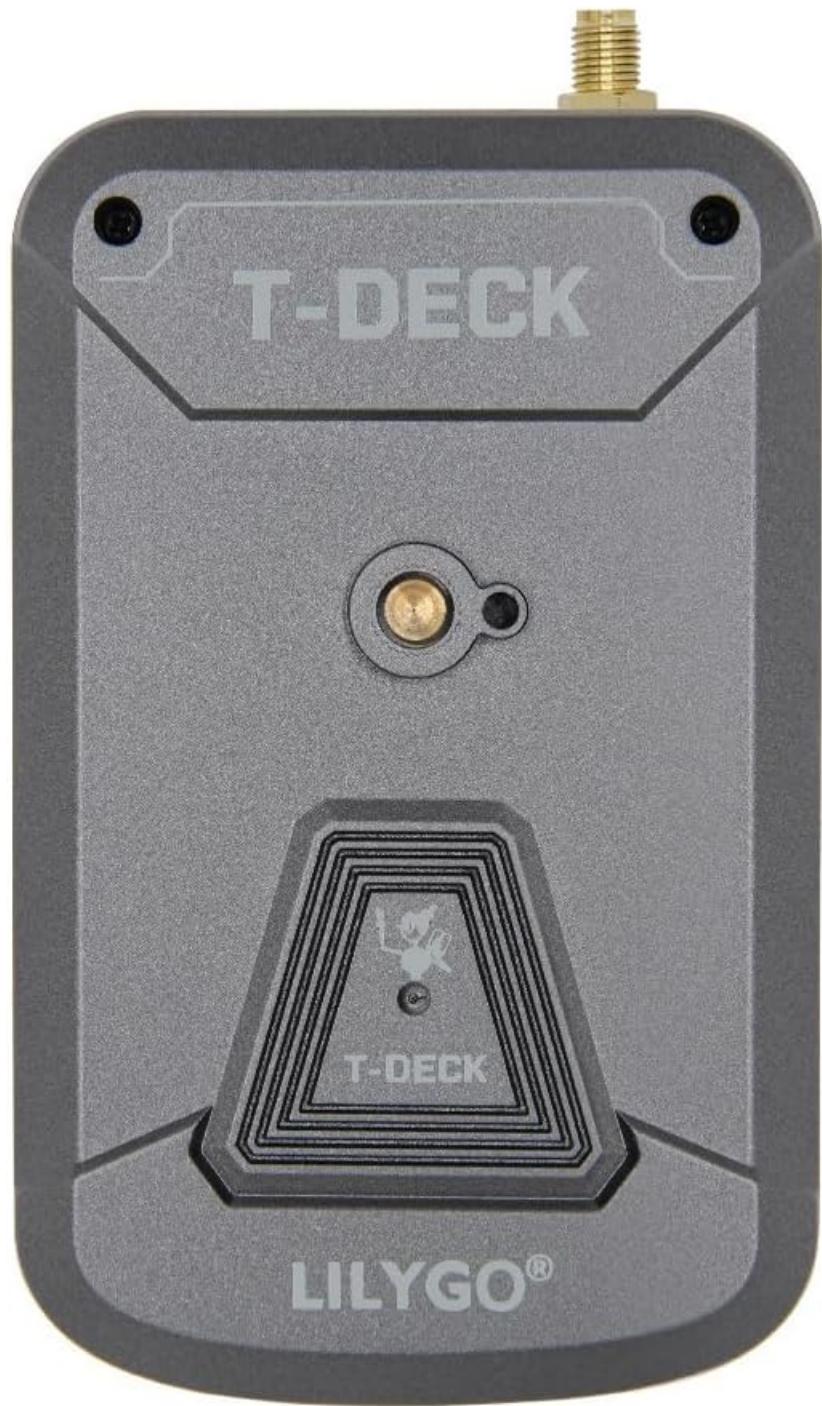


Figure 3: Back view of the LILYGO T-Deck Plus, showing mounting points.

The rear of the device, illustrating the design and potential mounting options.

MCU: **ESP32-S3FN16R8** Dual-core LX7 microprocessor

Wireless Connectivity: 2.4 GHz Wi-Fi & Bluetooth 5 (LE)

Development : Arduino、PlatformIO-IDE、Micropython

Flash: 16MB **PSRAM:** 8MB **Battery ADC PIN:** IO04

Onboard functions: **GPS**, TF Card, Microphone, Speaker

2.8 inch ST7789 SPI Interface IPS LCD:

Resolution: 320 x 240 Full viewing angle

SX1262 LoRa Transceiver:

Transmit power: +22dBm **Frequency Optional:** 433/868/915Mhz

Board Function



Figure 4: Detailed diagram of LILYGO T-Deck Plus features and interfaces.

This diagram provides an exploded view and labels various components such as the MCU, wireless connectivity, development environment, flash memory, onboard functions (GPS, TF Card, Microphone, Speaker), display type, and LoRa transceiver details.

ST7789 320x240 LCD

DC -- IO11 MOSI -- IO41
BL -- IO42 MISO -- IO38
SCK -- IO40 Touch -- IO16

TF Card

ES7210_SCK IO47
ES7210_DIN IO14
ES7210_LRCK IO21
ES7210_MCLK IO48
SCK -- IO40
CS -- IO39

POWER_ON

-- IO10
Capacity: 2000mAH
BAT ADC -- IO04

Microphone



Trackball **Keyboard Color Optional**
UP IO02 Black or White
LEFT IO01 Boot RIGHT IO15

DOWN IO03

LILYGO T-Deck Plus PINMAP
ESP32-S3 + GPS + LoRa + LCD + Mic + Speaker

Figure 5: LILYGO T-Deck Plus pinmap and interface connections.

A comprehensive pinmap diagram detailing the connections for the display, TF card, microphone, speaker, LoRa module, and other interfaces, useful for advanced development.

3. SETUP

3.1. Initial Assembly

1. **Antenna Installation:** Carefully screw the external antenna into the designated port on the device. Ensure it is securely attached before powering on to prevent damage to the LoRa module.
2. **Battery Connection:** Connect the included Lithium Ion battery to the appropriate connector on the board.
3. **Power On:** Press and hold the power button to turn on the device.

3.2. Firmware Installation (Meshtastic)

The LILYGO T-Deck Plus is designed to run Meshtastic firmware, enabling mesh communication. For detailed instructions on flashing the firmware, please refer to the official Meshtastic documentation and GitHub repository. The process typically involves downloading the firmware and using a flashing tool.

- Meshtastic Official Website: meshtastic.org
- LILYGO T-Deck GitHub: github.com/Xinyuan-LilyGO/T-Deck

Your browser does not support the video tag.

Video 1: Guide on installing Meshtastic firmware. While this video specifically mentions the LILYGO T-Echo, the general steps for flashing Meshtastic firmware are applicable to other compatible LILYGO devices like the T-Deck Plus.

This video demonstrates the process of installing Meshtastic firmware onto a LILYGO device. Users should adapt the specific firmware file to their T-Deck Plus model.

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Video 2: Assembly instructions for an ESP32 LoRa board. This video provides a general overview of assembling a LoRa board with a battery and case, which can be helpful for understanding the physical setup of the T-Deck Plus.

This video illustrates the assembly of a similar ESP32 LoRa board, including battery and case installation. Users can refer to this for guidance on physical component integration, noting that the T-Deck Plus has its own specific enclosure.

4. OPERATING INSTRUCTIONS

4.1. Basic Navigation

Use the integrated QWERTY keyboard and navigation buttons to interact with the device's interface. The 2.8-inch display will show menus, messages, and status information.

4.2. Meshtastic Application

To fully utilize the Meshtastic features, install the official Meshtastic application on your smartphone (Android or iOS). The device connects to your phone via Bluetooth, allowing for easier message typing, map viewing, and configuration.

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Video 3: Demonstration of the LILYGO T-LoRa Pager in operation.

This video showcases the LILYGO T-LoRa Pager, a similar device, in action, demonstrating its user interface and basic functionalities. This can provide insight into the operational experience of the T-Deck Plus.

4.3. LoRa Communication

The device uses LoRa technology for long-range communication. Ensure your device is within range of other Meshtastic nodes to form a mesh network. Messages are automatically forwarded through the mesh to reach their destination.

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Video 4: LoRa communication demonstration using an ESP32 LoRa V3 board.

This video provides a detailed demonstration of LoRa communication, illustrating how data is sent and received between two devices. While featuring a different board, the underlying LoRa principles and functionality are relevant to the T-Deck Plus.

4.4. GPS Functionality

The integrated Ulbox GPS module provides location data. This data can be used for mapping within the Meshtastic application or for other location-based services supported by the firmware.

5. MAINTENANCE

- **Battery Charging:** The device is powered by a Lithium Ion battery. Monitor the internal blue light status for charging information. Note that the device does not have a built-in battery meter, so the displayed battery percentage may be inaccurate. This is not a product defect.
- **Firmware Updates:** Regularly check the Meshtastic official website or GitHub repository for the latest firmware updates to ensure optimal performance and access to new features.
- **SD Card Usage:** The device supports TF cards for storing data, such as map tiles. Ensure the SD card is properly inserted and formatted as required by the firmware.

6. TROUBLESHOOTING

- **Inaccurate Battery Display:** As noted, the device lacks a precise built-in battery meter. Rely on the internal blue light for charging status. This is expected behavior.
- **Communication Issues:** If experiencing problems with LoRa communication, verify that the external antenna is securely attached and that other Meshtastic nodes are within range and configured to the same frequency band. Check the Meshtastic app for connection status and node visibility.
- **Device Not Responding:** If the device becomes unresponsive, perform a soft reset by pressing the designated reset button (if available) or by powering the device off and on.

7. SPECIFICATIONS

Feature	Detail
Product Dimensions	4.53 x 2.83 x 0.79 inches
Item Weight	8 ounces
Manufacturer	LILYGO
Item Model Number	Meshtastic Firmware (T-Deck Plus)
Batteries	1 Lithium Ion battery required (included)
Antenna Type	External
Color	Black
Maximum Range	1000 Meters
UPC	717382831107

8. WARRANTY AND SUPPORT

For any questions or suggestions regarding the LILYGO T-Deck Plus, please contact LILYGO customer service. We are committed to providing timely assistance.

Additional resources can be found at:

- LILYGO Wiki: wiki.lilygo.cc/
- LILYGO T-Deck GitHub Repository: github.com/Xinyuan-LilyGO/T-Deck

Related Documents - T-Deck Plus

 <p>T-Deck User Guide LILYGO® Version 1.0 Copyright © 2024</p>	<p><u>LILYGO T-Deck ESP32-S3 User Guide for Arduino Development</u></p> <p>Comprehensive user guide for the LILYGO T-Deck development board, detailing setup of the Arduino IDE, ESP32-S3 configuration, Wi-Fi and LoRa functionality, and SSC command reference for IoT applications.</p>
 <p>T-BEAM-S3 User Guide LILYGO® Version 1.0 Copyright © 2024</p>	<p><u>LILYGO T-BEAM-S3 User Guide: Setup and Development</u></p> <p>This user guide provides comprehensive instructions for setting up the LILYGO T-BEAM-S3 development board. Learn how to configure the software environment using Arduino IDE, connect the board, and utilize its Wi-Fi, BLE, GPS, and LoRa capabilities for IoT projects.</p>
 <p>T3-S3 User Guide LILYGO® Version 1.0 Copyright © 2024</p>	<p><u>LILYGO T3-S3 User Guide</u></p> <p>User guide for the LILYGO T3-S3 development board, covering setup of the Arduino IDE, configuration, testing, and Wi-Fi command reference for the ESP32-S3 module.</p>
 <p>T-Echo User Guide LILYGO® Version 1.0 Copyright © 2024</p>	<p><u>LILYGO T-Echo User Guide: Setup and Development with Arduino</u></p> <p>A comprehensive user guide for the LILYGO T-Echo development board, detailing setup, Arduino IDE integration, and basic development for IoT applications. Covers hardware overview, software installation, configuration, and sketch uploading.</p>
 <p>T-WATCH S3 User Guide LILYGO® Version 1.0 Copyright © 2024</p>	<p><u>LILYGO T-WATCH S3 User Guide: Setup and Development with Arduino</u></p> <p>Learn to develop IoT applications with the LILYGO T-WATCH S3. This guide covers setting up the Arduino IDE, programming the ESP32-S3, and using SSC commands, provided by Xinyuan.</p>



[LILYGO Mini E-Paper-S3 User Guide](#)

Comprehensive user guide for the LILYGO Mini E-Paper-S3 development board. Covers setup, Arduino IDE integration, firmware development, and Wi-Fi command reference for IoT applications.