TTGO T-Beam V1.1

TTGO Meshtastic T-Beam V1.1 User Manual

Model: T-Beam V1.1 (915MHz LoRa, ESP32, GPS, OLED)

1. Introduction

This manual provides comprehensive instructions for the setup, operation, and maintenance of the TTGO Meshtastic T-Beam V1.1. This device is a versatile development board integrating an ESP32 microcontroller, 915MHz LoRa radio for long-range communication, a NEO-6M GPS module for location services, and an OLED display for user interaction. It is designed for applications requiring low-power, long-range wireless communication and location tracking, commonly used with the Meshtastic firmware for off-grid messaging.

2. Components Overview

The TTGO T-Beam V1.1 board features several key components:

- **ESP32 Microcontroller:** Provides Wi-Fi, Bluetooth, and general-purpose computing capabilities.
- **LoRa Module (915MHz):** Enables long-range, low-power wireless communication.
- **NEO-6M GPS Module:** For accurate location tracking.
- **OLED Display:** A small screen for displaying information such as messages, GPS data, and device status.
- **18650 Battery Holder:** For portable power (battery not included).
- **USB-C Port:** For power supply, battery charging, and data communication (firmware flashing).
- **Antenna Connectors:** SMA connector for LoRa antenna, IPX connector for GPS antenna.
- **CH9102F USB-to-Serial Chip:** Facilitates communication with a computer for programming.

Figure 1: TTGO Meshtastic T-Beam V1.1 board. The image shows the main board with the LoRa antenna connected, the OLED display showing "Unpowered...", and various components including the ESP32, LoRa module, and GPS module.

3. Setup Instructions

3.1. Required Components (Not Included)

- 18650 Li-ion battery (flat-top recommended).
- USB-C cable for power and data.
- Computer with internet access.
- Small Phillips screwdriver (for battery holder cover, if applicable).
- Soldering iron and solder (if OLED display is not pre-soldered).

3.2. Hardware Assembly

1. **Install 18650 Battery:** Insert a fully charged 18650 flat-top battery into the battery holder, observing correct polarity. Ensure a secure fit.
2. **Attach LoRa Antenna:** Carefully screw the provided 915MHz LoRa antenna onto the SMA connector on the board. Do not overtighten.
3. **Attach GPS Antenna:** Connect the small GPS antenna to the IPX connector. Ensure it clicks into place.
4. **OLED Display (if not pre-soldered):** If your OLED display is separate, carefully solder its pins to the corresponding headers on the T-Beam board (typically VCC, GND, SCL, SDA). Refer to the board's silkscreen for pin assignments.

3.3. Driver Installation (CH9102F)

Before connecting the T-Beam to your computer, you may need to install drivers for the CH9102F USB-to-Serial chip. These drivers are typically available from the chip manufacturer's website or the TTGO product

page. Install the appropriate driver for your operating system (Windows, macOS, Linux).

3.4. Firmware Flashing (Meshtastic)

The TTGO T-Beam is commonly used with Meshtastic firmware. Follow these general steps to flash the firmware:

1. **Download Meshtastic Flasher:** Obtain the Meshtastic Flasher tool from the official Meshtastic website (meshtastic.org).
2. **Connect T-Beam:** Connect the T-Beam to your computer using a USB-C cable.
3. **Launch Flasher:** Open the Meshtastic Flasher application.
4. **Select Device and Firmware:** Choose your T-Beam model (e.g., T-Beam V1.1) and the desired firmware version.
5. **Flash Firmware:** Follow the on-screen instructions to flash the firmware. This process will erase existing data and install the new firmware.
6. **Verify Installation:** After flashing, the device should reboot, and the OLED display may show initial Meshtastic boot information.

4. Operating Instructions

4.1. Power On/Off

- **Power On:** Ensure a charged 18650 battery is installed or connect the device via USB-C. The device should power on automatically.
- **Power Off:** Disconnect the USB-C cable and remove the 18650 battery. Some versions may have a power button; refer to specific board documentation if present.

4.2. Meshtastic Application Usage

Once Meshtastic firmware is installed, you can interact with the T-Beam using the Meshtastic mobile application (available for Android and iOS) or a web interface.

1. **Install App:** Download and install the Meshtastic app on your smartphone.
2. **Connect via Bluetooth:** Open the app, enable Bluetooth on your phone, and search for your T-Beam device. Pair with the device.
3. **Configure Device:** Use the app to configure device settings, including channel settings, device name, and other preferences.
4. **Send/Receive Messages:** You can now send and receive messages over the Meshtastic mesh network.

4.3. GPS Functionality

The integrated NEO-6M GPS module provides location data. For optimal performance, ensure the GPS antenna has a clear view of the sky. GPS data, including coordinates and altitude, will be displayed on the OLED screen and transmitted over the Meshtastic network.

4.4. OLED Display Information

The OLED display provides real-time information about the device status, including:

- Device ID and name.
- Battery level.
- GPS status (fix, satellites, coordinates).

- Received messages.
- Signal strength (RSSI).

5. Maintenance

5.1. Battery Care

- Use only high-quality 18650 Li-ion batteries.
- Avoid over-discharging or over-charging the battery. The AXP192 charge IC provides protection, but good battery practices are recommended.
- Store the device and battery in a cool, dry place when not in use for extended periods.

5.2. Firmware Updates

Regularly check the official Meshtastic website for firmware updates. Updates often include new features, bug fixes, and performance improvements. Follow the flashing instructions in Section 3.4 to update your device.

5.3. Cleaning

Gently clean the board with a soft, dry brush or compressed air to remove dust. Avoid using liquids or harsh chemicals.

6. Troubleshooting

- **Device Not Powering On:**
  - Ensure the 18650 battery is charged and correctly inserted with proper polarity.
  - Verify the USB-C cable is functional and connected to a power source.
- **OLED Display Blank:**
  - Check if the OLED display is correctly soldered or connected.
  - Ensure the device is powered on.
  - Re-flash the firmware to rule out software issues.
- **GPS Not Getting a Fix:**
  - Ensure the GPS antenna is securely connected and has a clear view of the sky.
  - Allow sufficient time (several minutes) for the GPS module to acquire satellites, especially during the first use or after a long period of inactivity.
- **Bluetooth Connectivity Issues:**
  - Ensure Bluetooth is enabled on your smartphone and the T-Beam.
  - Try restarting both the T-Beam and your smartphone.
  - If pairing issues persist, you may need to reset Bluetooth settings on your phone or re-flash the T-Beam firmware.
- **Firmware Flashing Errors:**
  - Verify that the CH9102F drivers are correctly installed.
  - Try a different USB-C cable or USB port on your computer.
  - Ensure no other applications are using the serial port.

For more detailed troubleshooting and community support, visit the official Meshtastic forums at meshtastic.org/docs/support/.

7. Specifications

Feature	Detail
Microcontroller	ESP32 (REV1)
LoRa Frequency	915MHz (specific model)
GPS Module	NEO-6M
Wireless Connectivity	Wi-Fi, Bluetooth
Flash Memory	4MB
PSRAM	8MB
USB-to-Serial Chip	CH9102F
Battery Holder	18650 (battery not included)
Charging IC	AXP192
Power Input	USB 5V/1A
Operating Voltage	1.8V ~ 3.7V (LoRa module)
Operating Temperature	-40°C to +85°C
Dimensions (LxWxH)	3.98 x 1.29 x 1.02 inches (approx.)
Item Weight	1.76 ounces (approx.)

8. Warranty and Support

This product is typically covered by a standard manufacturer's warranty against defects in materials and workmanship. For specific warranty terms and conditions, please refer to the documentation provided at the time of purchase or contact your retailer.
For technical support, community discussions, and the latest information regarding firmware and usage, please visit the official Meshtastic project website and forums. As this is a development board, extensive community support is available.

Related Documents - T-Beam V1.1

	[TTGO HZ-28ST E-Bike User Manual - Safety, Operation, and Maintenance Guide] Explore the TTGO HZ-28ST electric bicycle with this comprehensive user manual. Learn about safety precautions, proper usage, installation steps, meter functions, battery care, maintenance tips, and warranty information from TTGO.
	[TTGO C2 YY-26ST E-Bike User Manual] A comprehensive guide for the TTGO C2 YY-26ST E-Bike, detailing setup, operation, safety, and maintenance for an optimal riding experience. TTGO offers innovative and quality electric bicycles.
	[TTGO HZ-28ST E-Bike User Manual] Comprehensive user manual for the TTGO HZ-28ST E-Bike, covering safety instructions, bike usage, installation, meter operation, battery charging, maintenance, and warranty information.
	[TTGO ZZ-28ST E-Bike User Manual] Comprehensive user manual for the TTGO ZZ-28ST electric bike, covering safety instructions, general information, bike usage, installation, components, meter operation, battery and charging, maintenance, and warranty.
	[TTGO TG1, TG3, TG6 Remote Transmitter User Manual] This manual provides instructions and warnings for the TTGO TG1, TG3, and TG6 remote transmitters. It covers product description, intended use, operation, battery replacement, disposal, technical specifications, and CE conformity.
	[TTGO F6 Elektrische Vouwfiets: Specificaties en Kenmerken] Gedetailleerde informatie over de TTGO F6 elektrische vouwfiets, inclusief specificaties zoals de 900Wh accu, 25Ah capaciteit en een indrukwekkend bereik tot 80 km.