Manuals+ — User Manuals Simplified.

LILYGO®
T-Deck Arduino Software

LILYGO T-Deck Arduino Software User Guide

Contents

LILYGO®

LILYGO T-Deck Arduino Software

Product Information

Specifications:

- **Product Name**: T-Deck
- **Version:** V1.0
- **Release Date:** 2024.05
- **Hardware:** ESP32 module
- **Software:** Arduino

Product Usage Instructions

Introduction

This guide is designed to assist users in setting up the software development environment for applications using the T-Deck hardware.

- **T-Deck**

  The T-Deck is a hardware platform that supports software development for various applications.

- **Arduino**

  Arduino is the software used for programming the T-Deck hardware.

- **Preparation**

  Prior to starting, ensure you have the necessary components and tools ready for setting up the environment.

Get Started
Follow the instructions provided in this guide to begin setting up the software development environment.

Configure
Configure the software settings based on your project requirements.

Connect

Establish the connection between the T-Deck hardware and your development system.

Test Demo

Run a test demo to ensure the hardware and software setup is functioning correctly.

Upload Sketch

Upload your Arduino sketch to the ESP32 module using the provided instructions.

1. **Build and Flash**

   Compile your Arduino code and flash it to the ESP32 module.

2. **Monitor**

   Monitor the output and behavior of your sketch on the T-Deck hardware.

SSC Command Reference

Refer to the command references for specific operations related to the T-Deck hardware.

op

Description of operation 'op'.

FAQ (Frequently Asked Questions)

What should I do if my upload fails?

If your upload fails, check the connection between your development system and the T-Deck hardware. Ensure all settings are correct and try uploading again.

About This Guide

This document is intended to help users set up the basic software development environment for developing applications using hardware based on the T-Deck. Through a simple example, this document illustrates how to use Arduino, including the menu-based configuration wizard, compiling the Arduino and firmware download to the ESP32 module.

Release Notes

Date	Version	Release notes
2024.05	V1.0	First release.

Introduction

T-Deck

- T-Deck is a development board. It can work independently.
- It consists of ESP32-S3 MCU supporting Wi-Fi + BLE communication protocol and motherboard PCB.
- This product has LCD and LoRa functions. LCD model ST7789 LCD with 320×240 resolution. LoRa chip is SX1262.
- For applications ranging from low-power sensor networks to the most demanding tasks.

- At the core of this module is the ESP32S3 chip.
- ESP32-S3 integrates Wi-Fi (2.4 GHz band) and Bluetooth 5.0 solutions on a single chip, along with dual high-performance cores and many other versatile peripherals. ESP32 provides a robust, highly integrated platform to meet the continuous demands for efficient power usage, compact design, and security.
- Xinyuan provides the basic hardware and software resources that empower application developers to build their ideas around the ESP32-S3 series hardware. The software development framework provided by Xinyuan is intended for rapidly developing Internet-of-Things (IoT) applications, with Wi-Fi, Bluetooth, flexible power management, and other advanced system features.
- The manufacturer is Shenzhen Xin Yuan Electronic Technology Co., Ltd.

Arduino
A set of cross-platform applications written in Java. The Arduino Software IDE is derived from the Processing programming language and the integrated development environment of the Wiring program. Users can develop applications in Windows/Linux/MacOS based on Arduino. It is recommended to use Windows 10. Windows OS has been used as an example in this document for illustration purposes.

Preparation
To develop applications for ESP32-S3 you need:

- PC loaded with either Windows, Linux, or Mac operating system
- Toolchain to build the Application for ESP32-S3
- Arduino essentially contains API for ESP32-S3 and scripts to operate the Toolchain
- CH9102 serial port driver
- The ESP32-S3 board itself and a USB cable to connect it to the PC
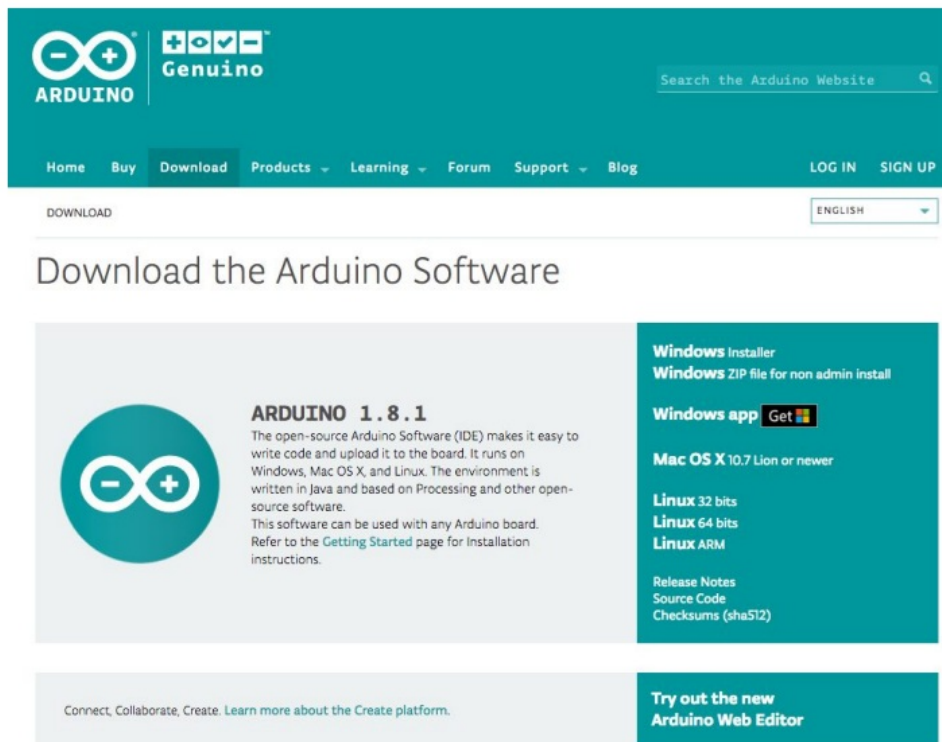
Get Started

Download the Arduino Software

The quickest how to install the Arduino Software (IDE) on Windows machines

Quick Start Guide
The website provides a quick start tutorial

- **Windows:**
  https://www.arduino.cc/en/Guide/Windows
- **Linux:**
  https://www.arduino.cc/en/Guide/Linux
- **Mac OS X:**
  https://www.arduino.cc/en/Guide/MacOSX

Installation steps for Windows platform Arduino

Download the Arduino Software

ARDUINO 1.8.1

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software.
This software can be used with any Arduino board.
Refer to the Getting Started page for Installation instructions.

Windows Installer
Windows ZIP file for non admin install

Windows app Get

Mac OS X 10.7 Lion or newer

Linux 32 bits
Linux 64 bits
Linux ARM

Release Notes
Source Code
Checksums (sha512)

Connect, Collaborate, Create. Learn more about the Create platform.

Try out the new Arduino Web Editor

*Enter the download interface, select **Windows installer** to install directly*
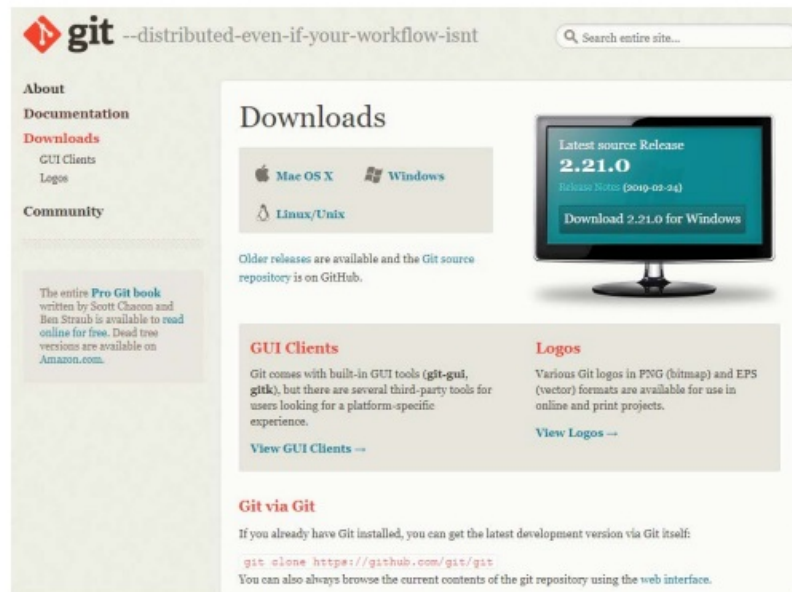
Install the Arduino Software
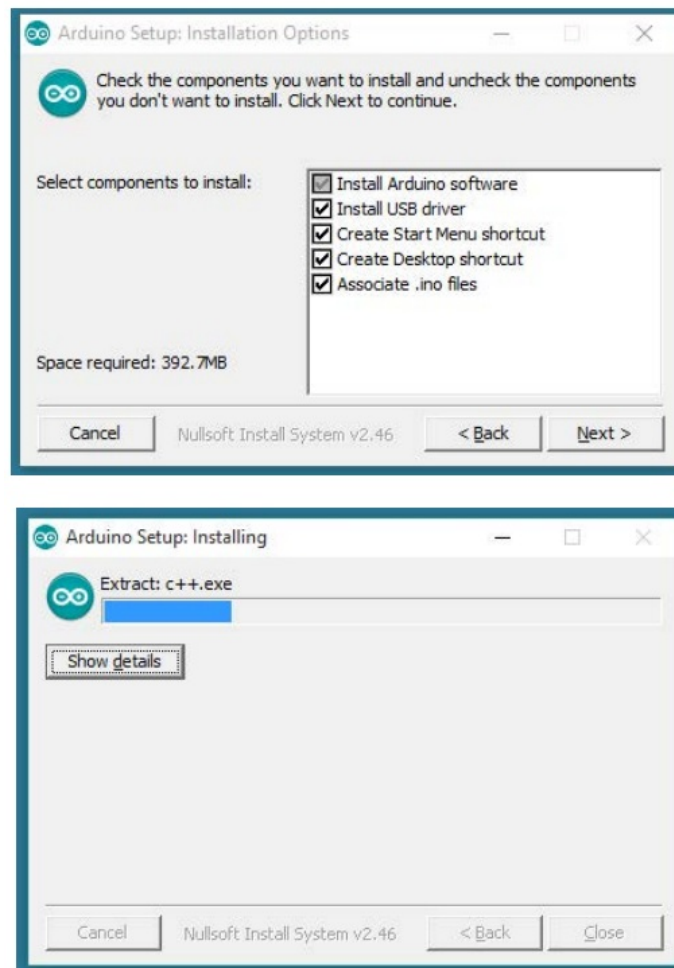
Wait for installation

Configure

Download Git
Download the installation package Git.exe

Pre-build configuration

- Click Arduino icon, then right click and select "Open folder where "
- Select hardware ->
- Mouse ** Right click ** ->
- Click Git Bash Here

Cloning a remote repository

- mkdir espressif
- cd espressif
- git clone –recursive **https://github.com/espressif/arduino-esp32.gitesp32**

Connect

You are almost there. To be able to proceed further, connect ESP32-S3 board to PC, check under what serial port the board is visible and verify if serial communication works.

Test Demo

Select File>>Example>>WiFi>>WiFiScan
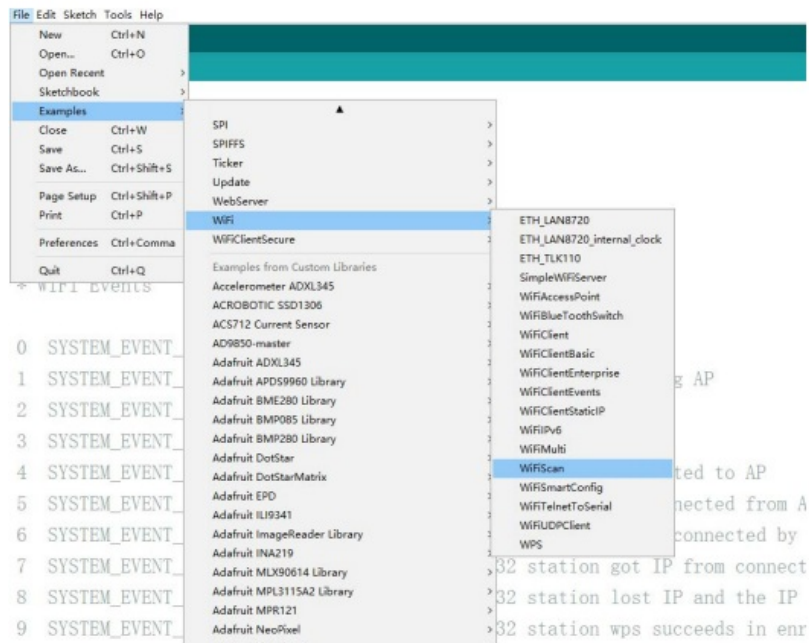
Upload Sketch

Select Board
Tools<<Board<<ESP32S3 Dev Module

Upload
Sketch << Upload

Serial Monitor
Tools << Serial Monitor

SSC Command Reference

Here lists some common Wi-Fi commands for you to test the module.

op

- **Description**

  op commands are used to set and query the Wi-Fi mode of the system.

- **Example**

  ```
  op -Q
  op -S -o wmode
  ```

- **Parameter**

-Q	Query Wi-Fi mode.
-S	Set Wi-Fi mode.
wmode	There are 3 Wi-Fi modes: • mode = 1: STA mode • mode = 2: AP mode • mode = 3: STA+AP mode

sta

- **Description**

  sta commands are used to scan the STA network interface, connect or disconnect AP, and query the connecting status of STA network interface.

- **Example**

  ```
  sta -S [-s ssid] [-b bssid] [-n channel] [-h]
  sta -Q
  sta -C [-s ssid] [-p password]
  sta -D
  ```

- **Parameter**

-s ssid	Scan or connect Access Points with the ssid.
-b bssid	Scan the Access Points with the bssid.
-n channel	Scan the channel.
-h	Show scan results with hidden ssid Access Points.
-Q	Show STA connect stutus.
-D	Disconnected with current Access Points.

ap

- **Description**

ap commands are used to set the parameter of AP network interface.

- **Example**

```
ap -S [-s ssid] [-p password] [-t encrypt] [-n channel] [-h] [-m max_sta]

ap -Q

ap -L
```

- **Parameter**

-S	Set AP mode.
-s ssid	Set AP ssid.
-p password	Set AP password.
-t encrypt	Set AP encrypt mode.
-h	Hide ssid.
-m max_sta	Set AP max connections.
-Q	Show AP parameters.
-L	Show MAC Address and IP Address of the connected station.

mac

- **Description**

mac commands are used to query the MAC address of the network interface.

- **Example**

```
mac -Q [-o mode]
```

- **Parameter**

-Q	Show MAC address.
-o mode	• mode = 1: MAC address in STA mode. • mode = 2: MAC address in AP mode.

dhcp

- **Description**

dhcp commands are used to enable or disable dhcp server/client.

- **Example**

```
dchp -S [-o mode]
dhcp -E [-o mode]
dhcp -Q [-o mode]
```

- **Parameter**

-S	Start DHCP (Client/Server).
-E	End DHCP (Client/Server).
-Q	show DHCP status.
-o mode	- mode = 1 : DHCP client of STA interface. - mode = 2 : DHCP server of AP interface. - mode = 3 : both.

ip

- **Description**

ip command are used to set and query the IP address of the network interface.

- **Example**

```
ip -Q [-o mode]
ip -S [-i ip] [-o mode] [-m mask] [-g gateway]
```

- **Parameter**

-Q	Show IP address.
-o mode	• mode = 1 : IP address of interface STA. • mode = 2 : IP address of interface AP. • mode = 3 : both
-S	Set IP address.
-i ip	IP address.
-m mask	Subnet address mask.
-g gateway	Default gateway.

reboot

- **Description**

  reboot command is used to reboot the board.

- **Example**

```
reboot
```

ram
ram command is used to query the size of the remaining heap in the system.
Example

```
ram
```

FCC Caution

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference

2. this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, under part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used by the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
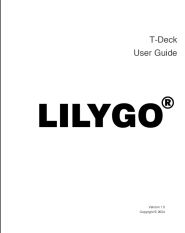
- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

Documents / Resources

T-Deck User Guide **LILYGO®** Version 1.0 Copyright © 2023	**LILYGO T-Deck Arduino Software** [pdf] User Guide T-DECK, TDECK, 2ASYE-T-DECK, 2ASYETDECK, T-Deck Arduino Software, Arduino Software, Software

References

- ∞ **arduino.cc/en/Guide/Linux**
- ∞ **arduino.cc/en/Guide/MacOSX**
- ∞ **arduino.cc/en/Guide/Windows**
- **User Manual**