

LILYGO T-Display S3 Pro 2.33inch Touch Screen LCD Display WIFI Bluetooth



LILYGO T-Display S3 Pro 2.33inch Touch Screen LCD Display WIFI Bluetooth User Guide

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LILYGO T-Display S3 Pro 2.33inch Touch Screen LCD Display WIFI Bluetooth



Product Information

Specifications

- **Product Name:** T-Display-S3 Pro
- **Version:** V1.0
- **Release Date:** 2023.11
- **Processor:** ESP32-S3 module
- **Software Development Environment:** Arduino

Product Usage Instructions

Introduction

- The T-Display-S3 Pro is a hardware platform for developing applications using the ESP32-S3 module with Arduino.

T-Display-S3 Pro

- The T-Display-S3 Pro is designed to facilitate software development for hardware projects.

Arduino

- Arduino is the software development environment used for programming the T-Display-S3 Pro.

Preparation

- Before getting started, ensure you have the necessary software tools installed on your system.

Get Started

- Follow the instructions provided in the user guide to set up the basic software development environment.

Configure

- Configure the settings as per your project requirements using the menu-based configuration wizard.

Connect

- Establish the connection between your development environment and the T-Display-S3 Pro hardware.

Test Demo

- Run a demo to ensure that the hardware and software are functioning correctly.

Upload Sketch

- Upload your code (sketch) to the ESP32-S3 module by following the steps below:

Build and Flash

- Compile your Arduino code and flash it onto the ESP32-S3 module.

Monitor

- Monitor the execution of your code to debug and troubleshoot any issues.

FAQ

Q: What is the purpose of the T-Display-S3 Pro?

- **A:** The T-Display-S3 Pro is designed to assist users in developing applications using the ESP32-S3 module in conjunction with Arduino.

Q: How do I update the firmware on the ESP32-S3 module?

- **A:** To update the firmware, follow the steps outlined in the user guide under the “Upload Sketch” section.

Q: Can I use other software development environments with the T-Display-S3 Pro?

- **A:** The recommended software development environment for the T-Display-S3 Pro is Arduino, as described in this user guide.
- This document is intended to help users set up the basic software development environment for developing apps using hardware based on the T-Display-S3 Pro.

- 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-S3 module.

Release Notes

- **Date Version Release notes**
 - 2023.11 V1.0 First release.

Introduction

T-Display-S3 Pro

- T-Display-S3 Pro is a development board. It can work independently.
- It consists of ESP32-S3 MCU supporting Wi-Fi + BLE communication protocol and motherboard PCB. The screen is a 2.33-inch IPS LCD.
- At the core of this module is the ESP32S3R8 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. Powered by 40 nm technology, ESP32-S3 provides a robust, highly integrated platform to meet the continuous demands for efficient power usage, compact design, security, high performance, and reliability.
- 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 RF frequency range is 2.402 GHz to 2.480 GHz.
- The T-Display-S3 Pro 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
- 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

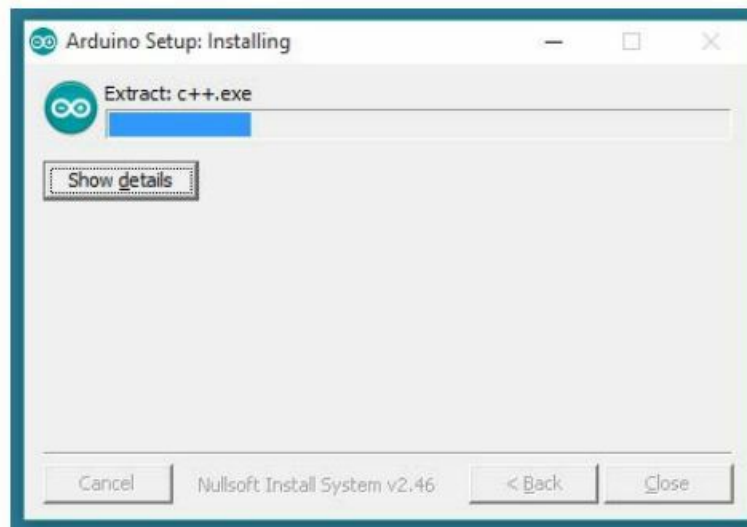
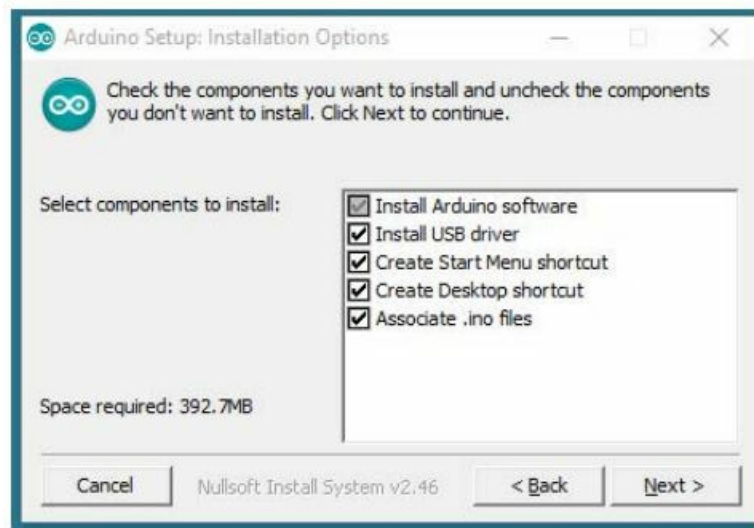
Quick Start Guide

- 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



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

Cloning a remote repository

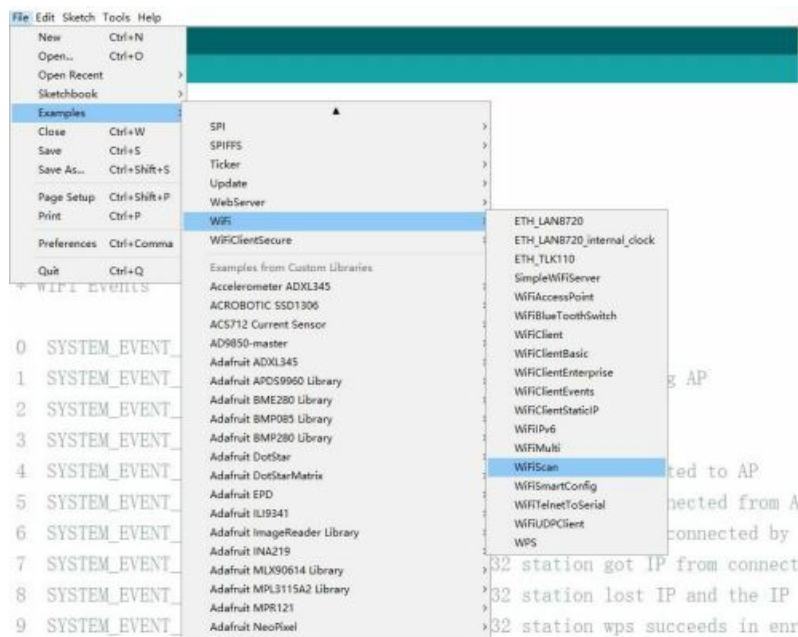
- mkdir espressif
- cd espressif
- git clone --recursive <https://github.com/espressif/arduino-esp32.git>

Connect

You are almost there. To be able to proceed further, connect the 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

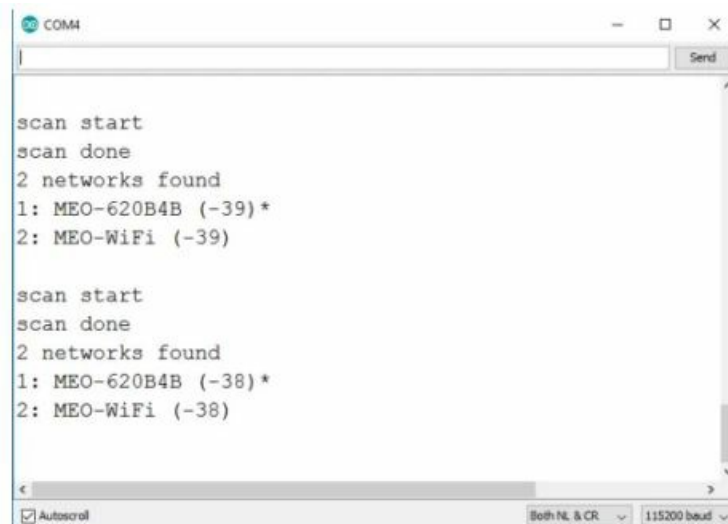


Upload

Sketch -> Upload

Serial Monitor

Tools -> Serial Monitor



SSC Command Reference

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

Description

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

Example

- op -Q
 - op -S -o mode

Parameter

Table 6-1. op Command Parameter

Parameter/Description

-Q	Query Wi-Fi mode.
-S	Set Wi-Fi mode.
mode	There are 3 Wi-Fi modes: <ul style="list-style-type: none">• 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 the STA network interface.

Example

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

Parameter

Table 6-2. sta Command Parameter

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

ap Description

- AP commands are used to set the parameters of the AP network interface.

Example

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

Parameter Table 6-3. ap Command Parameter

Parameter	Description
-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 the 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 Table 6-4. mac Command Parameter

Parameter	Description
-Q	Show MAC address.
-o mode	<ul style="list-style-type: none">• mode = 1: MAC address in STA mode.• mode = 2: MAC address in AP mode.

DHCP Description

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

Example

- **dchp -S** [-o mode]
- **DHCP -E** [-o mode]
- **DHCP -Q** [-o mode]

Parameter Table 6-5. DHCP Command Parameter

-S	Start DHCP (Client/Server).
-E	End DHCP (Client/Server).
-Q	show DHCP status.
-o mode	<ul style="list-style-type: none"> • mode = 1: DHCP client of STA interface. • mode = 2: DHCP server of AP interface. • mode = 3: both.

IP Description

- ip commands 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 Table 6-6. ip Command Parameter

-Q	Show IP address.
-o mode	<ul style="list-style-type: none"> • 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.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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 under 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

<div><div><div>T-Display-S3 Pro User Guide</div><div><div>LILYGO®</div><div><div>ESP32-S3</div><div>ESP32-S3</div></div></div></div></div>	<div><div>LILYGO T-Display S3 Pro 2.33inch Touch Screen LCD Display WIFI Bluetooth [pdf] User Guide</div><div>T-Display S3 Pro 2.33inch Touch Screen LCD Display WIFI Bluetooth, T-Display S3, Pro 2.33inch Touch Screen LCD Display WIFI Bluetooth, Screen LCD Display WIFI Bluetooth, Display WIFI Bluetooth, WIFI Bluetooth</div></div>
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References

- [GitHub - espressif/arduino-esp32: Arduino core for the ESP32](#)
- [arduino.cc/en/Guide/Linux](#)
- [arduino.cc/en/Guide/MacOSX](#)
- [User Manual](#)

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