T-Dongle-S3 User Guide

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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-Dongle-S3**. 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
2023.09	V1.0	First release.

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Introduction

1.1. T-Dongle-S3

T-Dongle-S3 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 0.96 inch IPS LCD ST7735.

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 empowers application developers to build their ideas around the ESP32-S3 series hardware. The software development framework provided by Xinyuan is intended for rapidly developing Internetof-Things (IoT) applications, with Wi-Fi, Bluetooth, flexible power management and other advanced system features.

The RF frequency range is BLE: 2402-2480MHz and 2.4G Wi-Fi: 2412-2462MHz

The T-Dongle-S3 manufacturer is Shenzhen Xin Yuan Electronic Technology Co., Ltd.

1.2. 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.

1.3. 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 that 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

2.1. Download the Arduino Software

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

2.1.1. 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

2.1.2. Installation steps for Windows platform Arduino



Enter the download interface, select Windows installer to install directly

2.2. Install the Arduino Software

Arduino Setup: Installation Check the components y you don't want to install	Options ou want to install a Click Next to cont	and uncheck the inue.	components
Select components to install:	Install Ardu Install USB Create Sta Create Des	iino software driver rt Menu shortcu ktop shortcut ino files	t
Space required: 392.7MB			
Cancel Nullsoft Insta	l System v2,46	< <u>B</u> ack	<u>N</u> ext >

🥺 Arduino Setup: Installing	1. 		×
Extract: c++.exe			
Show details			-1
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Cancel Nullsoft Install System v2.46	< <u>B</u> ack	Glose	

Wait for installation

Configure

3.1. Download Git

Download the installation package Git.exe

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	put states integers prime one put (p). The reaction descriptions for constrained of the pit repetition using the coll determine.		

3.2. Pre-build configuration

Click Arduino icon, then right click and select Open folder where

Select hardware ->

Mouse Right click ->

Click Git Bash Here

3.3. Cloning a remote repository

- \$ mkdir espressif
- \$ cd espressif
- \$ git clone --recursive https://github.com/espressif/arduino-esp32.git esp32

4.

Connect

With screen

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.



After connecting USB to power on. The screen can directly display the electronic label for two seconds.

Without screen

See the label on the product.

Test Demo

The Edit Shatch Tools Help Film Oriets Cal+0 Open... Oper Netern Skind-buck ٠ tranging 124 Cluim Chivity \$24175 Save Calif Ticker Col+Skin+S Lord As-Update Page Setur Oni-Itch-R Webberer Print Cri+F WF ETH:LANATER WRItedate ETH, SANETZE, Immediated Preferences Chila-Commu STR. TLCTID Descripted from Domary (diverse) CHI+C Det SimpleWPServer Accelerometer ADID.345 ALL'S SHOULD William Print ACROBOTIC USET 1996 Millitue1oethiwitch ACI712 Carrent Server stilled. ADMS1-metter 0 SYSTEM EVENT WIRDertham Adallula ADDI.345 WillClassErbergrite SYSTEM EVEST 1.12 Adultuit APD DRIVID Clonery WICLARD Adahsik BME288 Library SYSTEM, EVENT, WitCleythesc# Adahuk BMI085 Library WITING SYSTEM EVENT, Addivit BMF290 Library WIDAK Addrest Dolltar WITTIGHT 4 SYSTEM EVENT. ted to AP Adabah DoritorMatie William Coulds Address 1911 SYSTEM EVENT sected from A Wittelevertcowial Adultuk (URD4) WIR207Clert 6 SYSTEM EVENT Adathak integefleader Library connected by 140% Adabuk mA219 SYSTEM_EVENT. II2 station got IP from comment Adenual MCX90014 Sterry Adahuk MPUTTA2 Ginery 32 station lost IP and the IP 8 SYSTEM EVENT. Addive NEW121 -9 SYSTEM EVENT. Adabuit NeciFiyel 432 station wps succeeds in enr

Select File>>Example>>WiFi>>WiFiScan

6.

Upload Sketch

6.1. Select Board

Tools Board ESP32S3 Dev Module



6.2. Upload

Sketch -> Upload

6.2. Serial Monitor

Tools ->Serial Monitor

COME	- a ×
	Send
scan start	
scan done	
2 networks found	
1: MEO-620B4B (-39)*	
2: MEO-WiFi (-39)	
scan start	
scan done	
2 networks found	
1: MEO-620B4B (-38)*	
2: MEO-WiFi (-38)	
Automai	860 % 8.01 - 115200 bast ~

7. SSC Command Reference

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

7.1. 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

Table 6-1. op Command Parameter

Parameter	Description
-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

7.2. 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

Table 6-2. sta Command Parameter

Parameter	Description
-S scan	Scan Access Points.

Parameter	Description
-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.

7.3. 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

Table 6-3. ap Comn	nand 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 MAC Address and IP Address of the connected station.

7.4. mac

Description

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

Example

mac -Q [-o mode]

Parameter

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

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

7.5. 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

Table 6-5. dhcp Command Parameter

Parameter	Description
-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.

7.6. 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

Parameter	Description
-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.

Table 6-6. ip Command Parameter

7.7. reboot

Description

reboot command is used to reboot the board.

Example

reboot		

7.8. 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, and (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, pursuant to 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 in accordance with 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 receiver.

-Connect the equipment into 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