DownloadTool

Instructions

Version 1.0
Espressif Systems
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About This Document

This document introduces how to use DownloadTool.

Release Notes

Date	Version	Release Notes
2021.05.08	V1.0	Initial release.

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1. Introduction to DownloadTool

1.1. User Interface

The main interface of the DownloadTool developed by Espressif is shown in Figure 1-1. You can configure how to download in this interface. See Chapter 3 for more details.

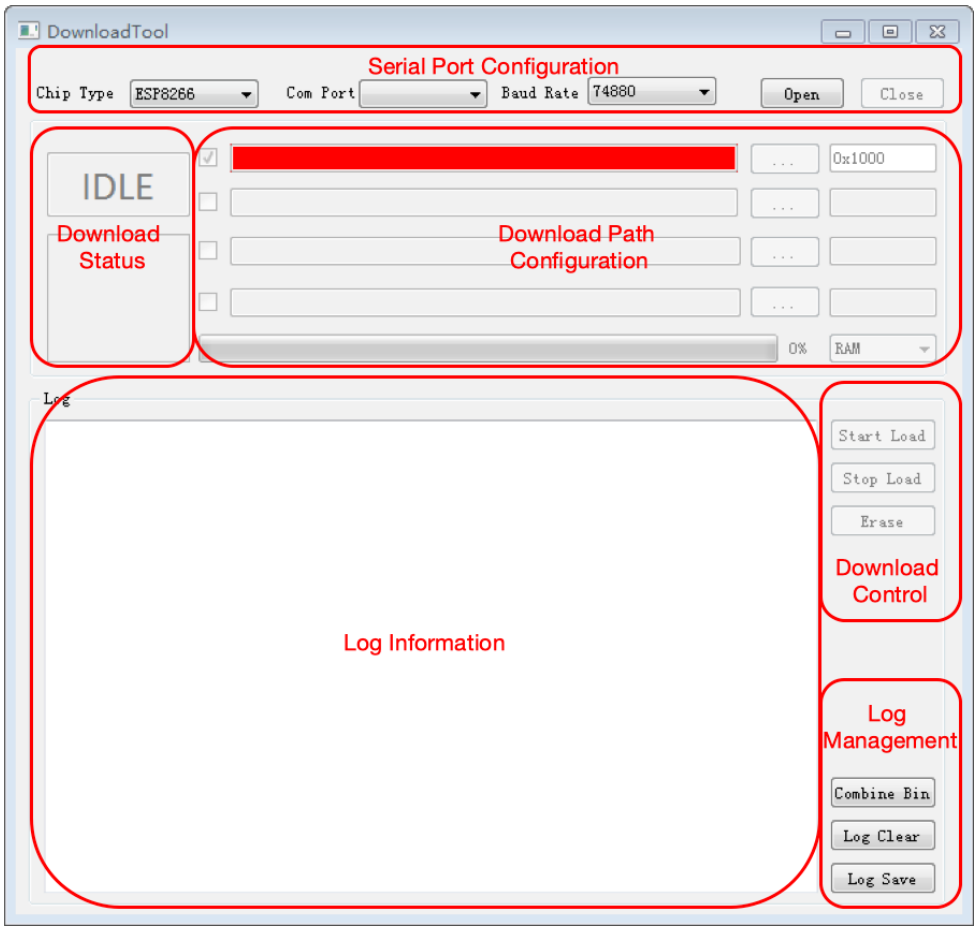


Figure 1-1. DownloadTool Main Interface

1.2. Function Overview

The DownloadTool interface consists of six parts: Serial Port Configuration, Download Path Configuration, Download Status, Download Control, Log Information, and Log Management.

Table 1-1. DownloadTool Function Overview

Function	Description
Serial Port Configuration	The configuration options include chip type, COM port, baud rate, and the status of the serial port.
Download Path Configuration	Select the firmware that needs to be downloaded and enter the download address in hexadecimal format.
Download Status	There are four download statuses: “SYNC”, “LOAD”, “SUCC”, and “FAIL”.
Download Control	Download Control options include “Start Load”, “Stop Load”, and “Erase”.
Log Information	All log information is printed in this area.
Log Management	You can save or clear the log output.

2. Download Mode

2.1. Hardware Setup

Connect your device to a serial converter. Make it enter the download mode. Refer to Table 2-1 for more information about how to set up and configure hardware.

Table 2-1. Hardware Setup and Configuration

Chip	Description
ESP8266/ESP8285	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • Pull MTDO (GPIO15) low • Pull GPIO0 low to make DUT enter the downloading mode
ESP32/ESP32-S2/ESP32-S3	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • Pull GPIO0 low to make DUT enter the downloading mode
ESP32-C3	• Connect 3V3/CH_EN pins to the 3.3 V power supply • Connect RXD/TXD/GND pins to corresponding pins of a serial converter so that PC can communicate with DUT • Pull GPIO9 low and GPIO8 high to make DUT enter the downloading mode

2.2. Log Output

You can check whether the DUT has entered the download mode based on log output. Open a serial port tool and the corresponding serial port. Connect the DUT to the serial converter following the instructions in Table 2-1. Power up the DUT and some log output will be printed in the serial tool. Compare it with the corresponding log output in Table 2-2. If they are consistent, the device is in the download mode.

Table 2-2. Log Output for the Download Mode

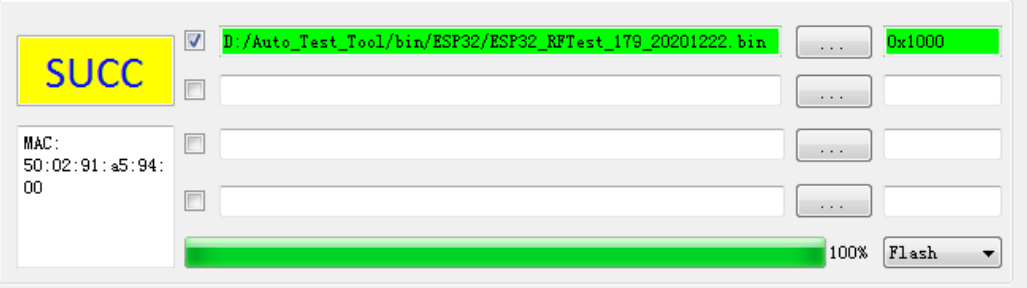
Chip	Baud Rate	Log Output
ESP8266	74880	ets Jan 8 2013,rst cause:1, boot mode☹1,0)
ESP8285	74880	ets Jan 8 2013,rst cause:1, boot mode☹1,2)
ESP32	115200	rst:0x1(POWERON_RESET),boot:0x3(DOWNLOAD_BOOT(UART0/UART1/SDIO_REI_REO_V2)) waiting for download
ESP32-S2	115200	rst:0x1 (POWERON),boot:0x0 (DOWNLOAD(USB/UART0/1/SPI)) waiting for download
ESP32-C3	115200	rst:0x1 (POWERON),boot:0x4 (DOWNLOAD(USB/UART0/1)) waiting for download
ESP32-S3	115200	rst:0x1 (POWERON),boot:0x0 (DOWNLOAD(USB/UART0/1/SPI)) waiting for download

3. Download Instructions

3.1. Serial Port Configuration

- **Chip Type**: Select the corresponding chip.
- **Com Port**: Select the corresponding serial port.
- **Baud Rate**: Baud Rate. The default is 115200.
- **Open**: Open the serial port.
- **Close**: Close the serial port.

3.2. Download Path Configuration



- Download to "**RAM**" or "**Flash**":

  Click the " " button to choose where to download firmware, either "**RAM**" or "**Flash**". The two are different. If the bin file is downloaded to **Flash**, you need to download it only once. To run the downloaded file, you need to switch to Flash operation mode by floating GPIO0 and re-powering the DUT. If the bin file is downloaded to **RAM**, it will run immediately after the download process is completed. But the **RAM** program will be erased as soon as you reboot the DUT. You will have to download the bin file again.

- Select which firmware to download:

  Click " " to select from PC which firmware to download and check the box on the left to download it. **Unchecked firmware will not be downloaded**.

- Enter the download address:

  Enter the download address (hexadecimal format) in the blank box on the right if the firmware is downloaded to **Flash**. If it is downloaded to **RAM**, you cannot, and do not need to do it. Table 3-1 lists the addresses where RF firmware of each chip should be downloaded.

Table 3-1. Download Address for ESP Chips

Chip	Download Address
ESP32/ESP32-S2	0x1000
ESP8266/ESP8285/ESP32-C3/ESP32-S3	0x0

3.3. Download Status

- **SYNC**: The firmware is in sync.
- **Load**: The firmware is being downloaded.
- **SUCC**: The firmware has been downloaded successfully.
- **Fail**: The download failed.

3.4. Download Firmware

- **Start Load**:

  Click the **Start Load** button to start the downloading process. When the green process bar shows 100%, and the status field displays the word "**SUCC**", the download is successful.

- **Stop Load**:

  Stop downloading.

- **Erase**:

  Erase the firmware in flash.

3.5. Log Output

After the download process is completed, float GPIO0 and re-power the DUT, and let it enter the normal working mode. Now you can start testing. You can use a serial tool to check whether the firmware is burned successfully. Figure 3-1 shows the log output of an ESP32 product after RF test firmware is downloaded into it.

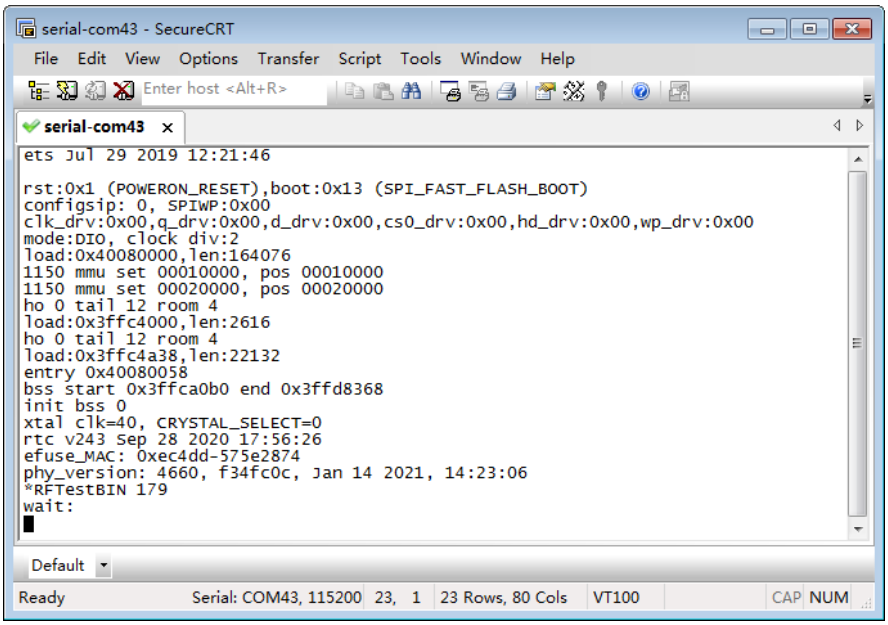


Figure 3-1. Log Information of ESP32 RF Test Firmware

4. FAQ

4.1. Serial Port Issues

Q: I can't find the corresponding serial port in the "Com Port" drop-down list after I open the tool.

A: Please open the device manager to check whether the serial port has been installed successfully. If not, check if there is anything wrong with the driver.

Q: I can't open the serial port.

A: Please check whether the port is occupied by "EspRFTestTool". First exit the "DownloadTool" interface, go back to the "EspRFTestTool" interface, and close the port. Then, try it again. Or, it may be occupied by other threads.

4.2. Download Issues

Q: The DUT cannot enter the download mode.

A: Check whether hardware is set up correctly according to Section 2.1. If your device is a complete machine, please check whether TXD/RXD is occupied by other masters on your device.

Q: The interface suggests that the download is successful but the test still does not go smoothly.

A: Check whether "Chip Type" is consistent with the chip of your device. In addition, two RF test firmwares are developed for ESP8266 and ESP8285. One supports the 26 M crystal oscillator, the other 40 M crystal oscillator. Please distinguish the two.

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