MT2523 Flash Tool v2.1 User's Guide

Version: 1.3

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Document Revision History

Revision	Date	Description
1.0	1st February 2016	Initial version.
1.1	30 June 2016	Refine the images and complement the information of using the flash tool.
1.2	13 September 2016	Fix the library name and add the support Windows 10 platform
1.3	4 November 2016	Add the USB switch tool usage method.

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1. Introduction

MT2523 Flash Tool is a flexible device flashing tool for application development on LinkIt 2523 HDK. It primarily supports downloading, formatting and reading back the binary from a target device. The Flash Tool provides high speed download. It supports the USB 2.0 high-speed serial bus.

This document guides you through the following.

- The download operation. It is used to download the software load to a target, see section 3.1, “Downloading the firmware”.
- The format operation. It is used to erase the flash memory of the target, see section 3.2, “Formatting the flash”.
- The readback operation. It is used to read the data from the target device’s flash memory, see section 3.3, “Reading back the flash”.

2. MT2523 Flash Tool

This section provides an installation guide for the MT2523 Flash Tool and covers the following items:

- The supported environment for installation.
- Installing the Flash Tool.

2.1. Environment

The MT2523 Flash Tool can be used on Microsoft Windows XP (Professional), Windows 7 (32 or 64 bit) and Windows 10 (32 or 64 bit) PC that support USB interface communication.

2.2. Installing the MT2523 Flash Tool

To install the Flash Tool, simply copy the package folder to your Windows computer. No further steps are required.

There are three main components included in the Flash Tool package, `FlashTool.exe`, `DownloadLib.dll` and `Download Agent` (DA) file.

2.2.1. FlashTool.exe

This file launches the graphical user interface (GUI) program for The Flash Tool. The GUI requires a dynamic-link library (`DonwloadLib.dll`) to perform firmware update operations.

2.2.2. DownloadLib.dll

`DownloadLib.dll` is the kernel library for `FlashTool.exe`, to perform Boot ROM (BROM) and DA handshaking operations.

2.2.3. Download Agent

The MT2523 Flash Tool downloads the software binary named DA to target device's internal SRAM and executes it on the target. The DA handshakes with `DownloadLib.dll` to perform download, readback and format operations using a **2523 USB** connecter.

2.3. Installing the USB Driver

To install the MTK USB Port driver for **2523 USB** port on the HDK:

1) Install the MTK USB Port driver from `MS_USB_ComPort_Driver` folder located under the Flash Tool's release folder.

2) Connect the **2523 USB** connector on the LinkIt 2523 HDK to your computer's USB port with a USB cable.

To determine the COM port number corresponding to your device:

1) Open Windows **Control Panel** and click **System** then
   a) On Windows 7 and 8, click **Device Manager**.
   b) On Windows XP, click the **Hardware** tab and then **Device Manager**.

2) In **Device Manager**, navigate to **Ports (COM & LPT)** and locate **MTK USB Port** (**COMx**), as shown in Figure 1.

Note, the driver version must be **1.1032.0** or later; an older driver doesn't guarantee successful download and operation.

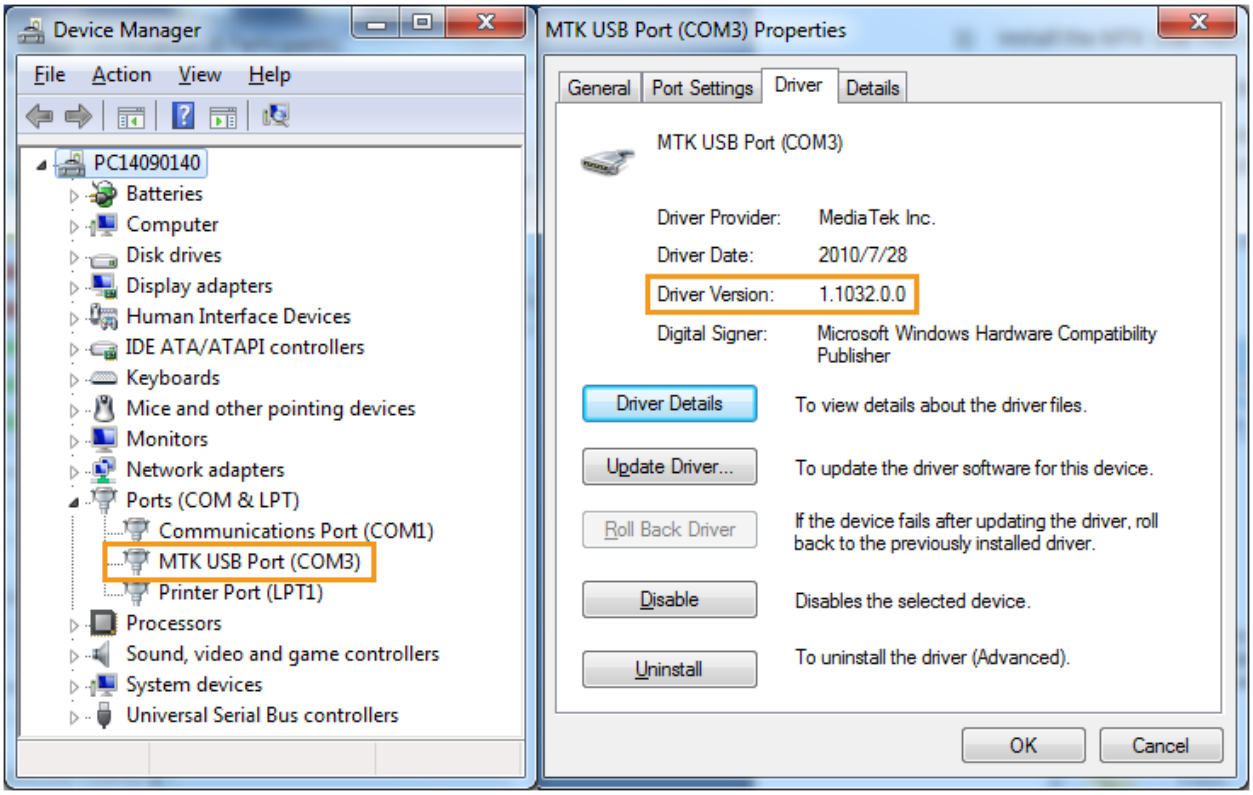

Figure 1. Installing the USB driver

3. Using the MT2523 Flash Tool

The MT2523 Flash Tool is used to download, format and readback images on the flash memory of the target device. The main GUI of the tool is shown in Figure 2. Each item on the main GUI will be described in detail in the following sections.

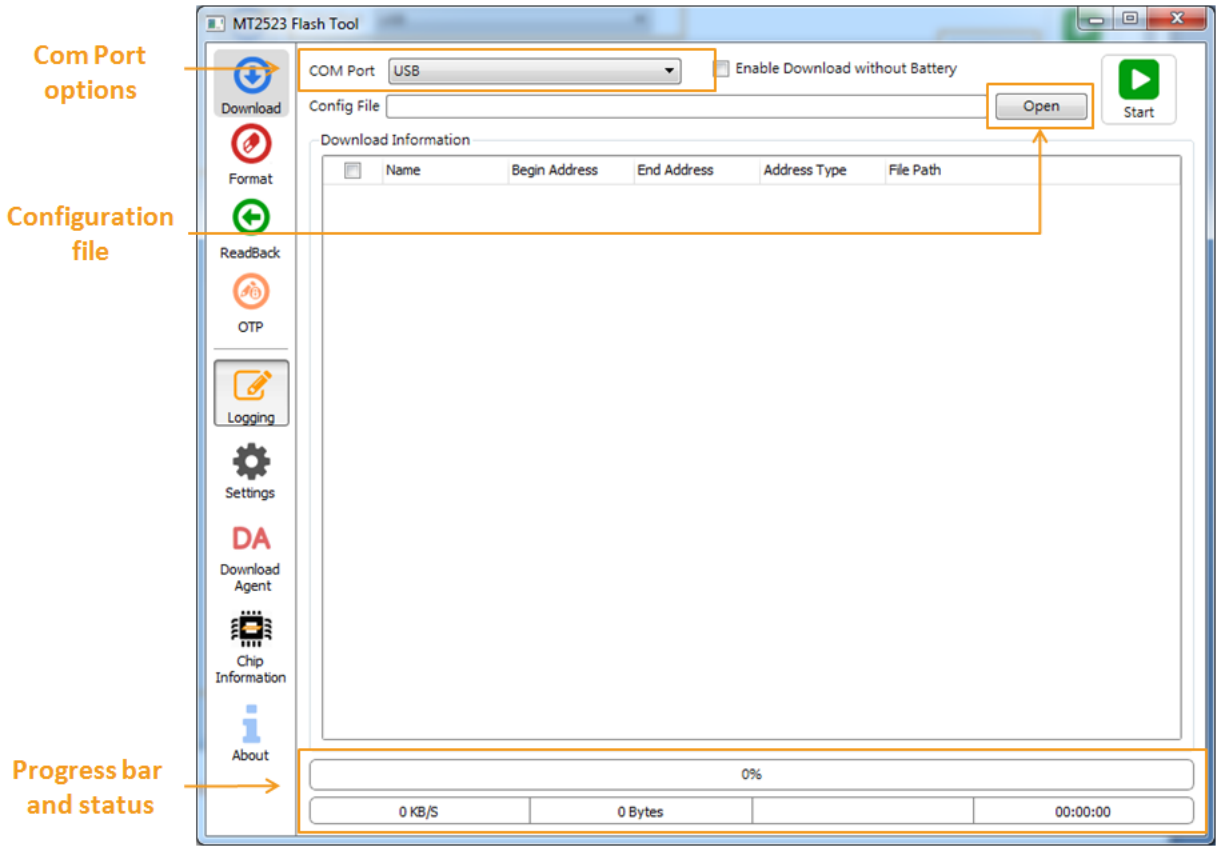

Figure 2. MT2523 Flash Tool's main GUI

3.1. Downloading the firmware

To download the firmware to the target device, use the **2523 USB** interface. If the download operation completes successfully, **Download Information** will be displayed, including **Name**, **Begin Address, End Address, Address Type** and **File Path** of the firmware binary, as shown in Figure 3.

3.1.1. Download the firmware with USB

To complete the download operation using USB (see Figure 3):

1) Power off the target (USB cable must be unplugged).

2) Click **Download** on the left panel of the main GUI.

3) Select **USB** from the **COM Port** drop down menu. If you don't have the adapter or battery, click the **Enable Download without Battery** option**.**

4) Click **Open** to provide the configuration file.

5) Click **Start** to start downloading.

6) Plug in the USB cable to power on the HDK through the **2523 USB** connector and then the process will start automatically.

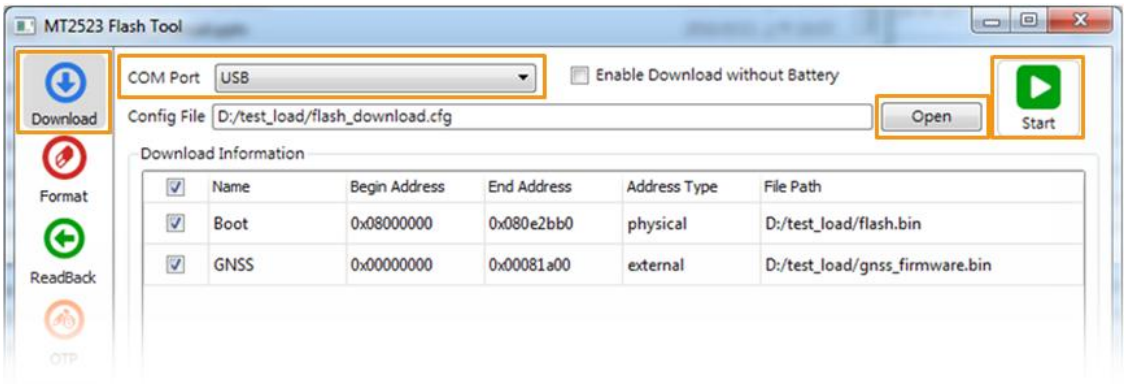

Figure 3. Download the firmware to a target device using USB connection

3.2. Formatting the flash

Similar to download operation, the formatting also can be done through USB connection.

Open the format configuration window by clicking **Format** on the main GUI of the MT2523 Flash Tool, as shown in Figure 4. The **Format Information** section provides formatting options and enables setting the target module to format. The targets to format are specified under **Module Select** drop down menu, **Main**, such as MT2523 chipset and **GNSS**, such as GNSS chipset. The GNSS formatting option is only available if the configuration file loaded on the target device contains decrypted binary software for the GNSS.

To automatically format the whole flash, select **Total Format** option. If **Manual Format** is selected, the Flash Tool will format the flash according to the user-defined settings. The settings contain the address type (**Logical** or **Physical**), **Begin Address** and **Length**. The logical address starts at `0x00000000`. The physical address of the MT2523 starts at `0x08000000`.

3.2.1. Format the flash with USB connection

To complete the format operation using USB connection (see Figure 4):

1) Power off the target (USB cable must be unplugged).

2) Click **Format** on the left panel of the main GUI.

3) Select **USB** from the **COM Port** drop down menu. If don't have the adapter or battery, click the **Enable Download without Battery** option**.**

4) Click **Open** to provide the configuration file.

5) Select format method under **Format Information** section.

6) Click **Start** to start formatting.

7) Plug in the USB cable to power on the HDK through the **2523 USB** connector and then the process starts automatically.

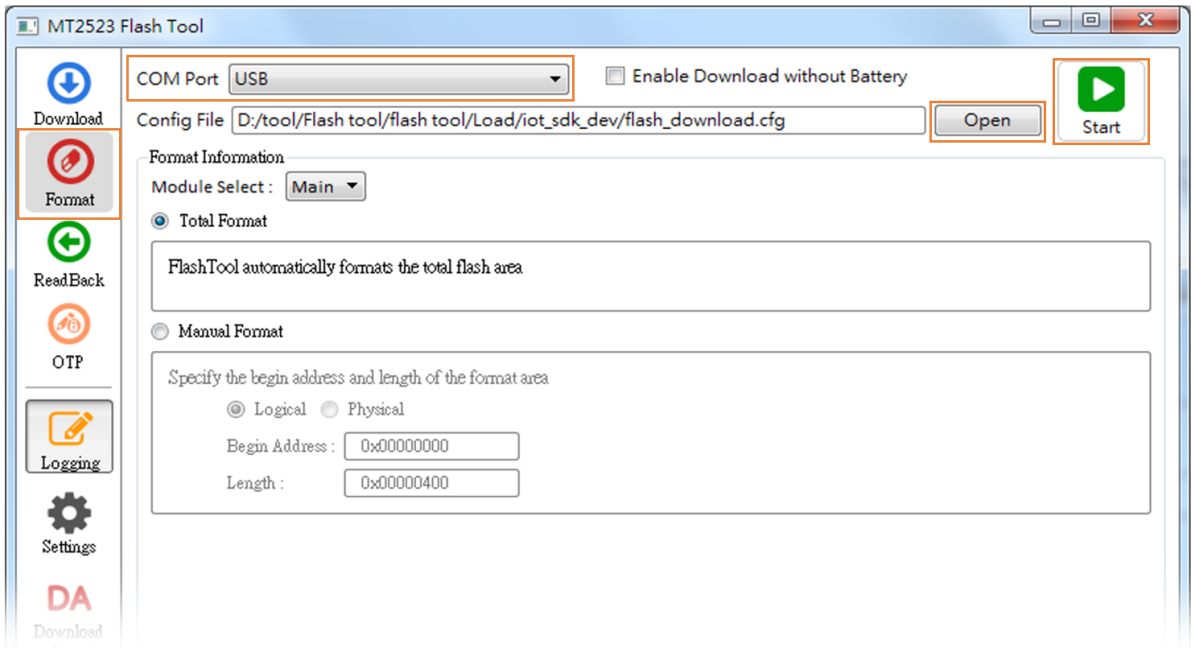

Figure 4. Formatting the flash of a target device using USB connection

3.3. Reading back the flash

To read back the flash, click **ReadBack** on the main GUI to open the configuration settings. The **ReadBack Information** section enables adding or removing flash memory blocks according to the readback file on a specified target. See section 3.2, "Formatting the flash", for more information about **Module Select.**

3.3.1. Adding and removing readback files

To add a readback file:

1) Click **Add** to add a readback file, as shown in Figure 5.

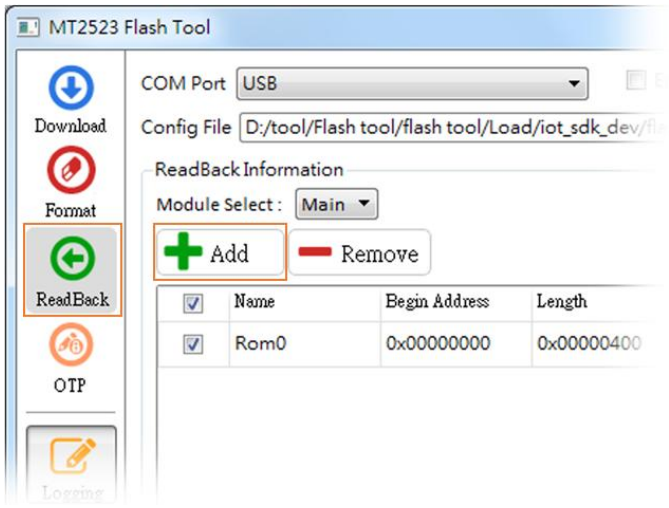

Figure 5. Adding a readback file

2) Click **SAVE** to provide the **File Path** of the readback file, as shown in Figure 6.

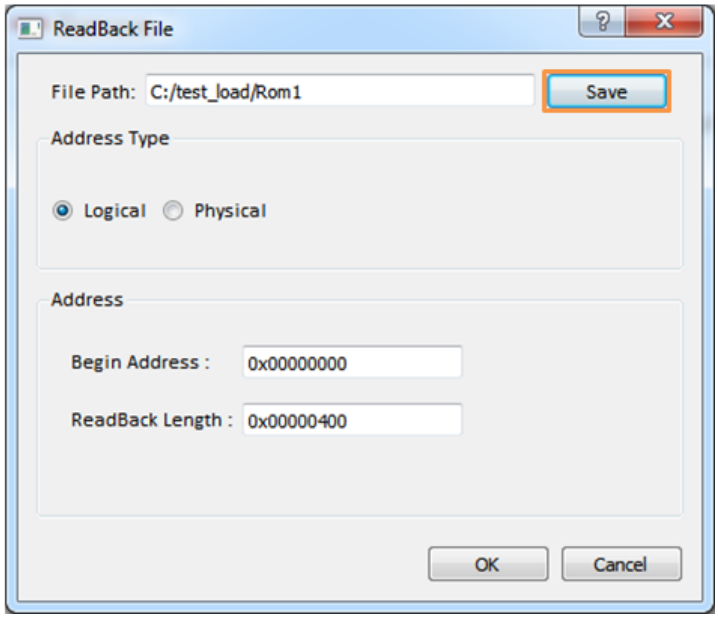

Figure 6. Opening the readback file

3) Choose the **Address Type** of the flash either **Physical** or **Logical**, see section 3.2, "Formatting the flash", for more details about the address type.

4) Provide **Begin Address** and **ReadBack Length** in their corresponding fields under **Address** section (see Figure 6).

To delete an existing readback file, highlight the file and click **Remove**, as shown in Figure 7.

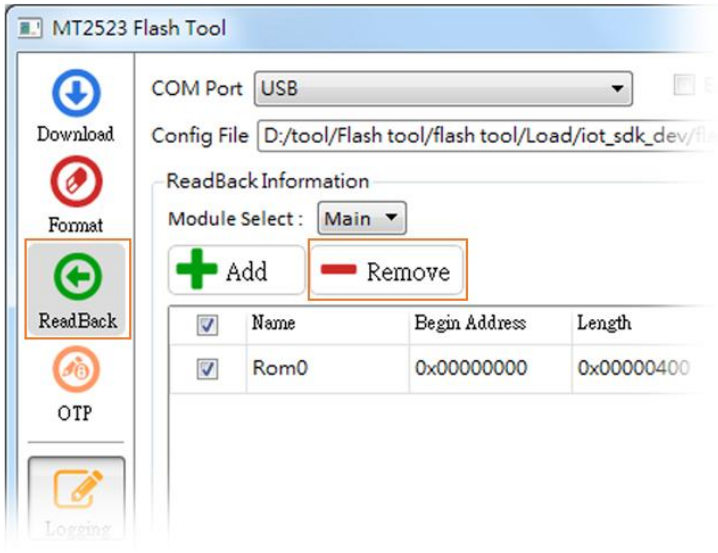

Figure 7. Deleting an existing readback file

3.3.2. Readback a file with USB connection

To complete the readback operation using USB (see Figure 8):

1) Power off the target (USB cable must be unplugged).

2) Click **ReadBack** for further configuration.

3) Select **USB** from the **COM Port** drop down menu. If don't have the adapter or battery, click the **Enable Download without Battery** option.

4) Click **Open** to provide the configuration file to enable the **Module Select**.

5) Click **Add** to assign a readback file with a specified memory range, see section 3.3.1, "Adding and removing readback files" for more details about the add function.

6) Click **Start** to start the readback operation.

7) Plug in the USB cable to power on the HDK through the **2523 USB** connector and then the process starts automatically.

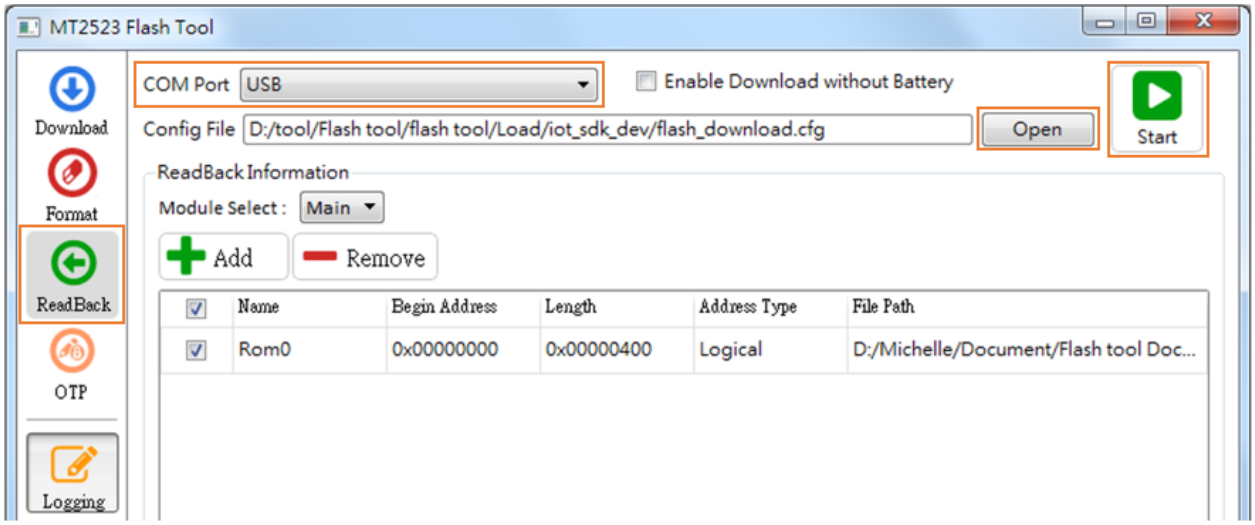

Figure 8. Reading back a file using USB

3.4. One-time programmable memory

One-time programmable (OTP) memory cannot be changed once the application is loaded into the device. The OTP enables to read/write operations with to/from a file with a specific begin address and length. It also enables to lock the OTP area.

To read the OTP flash to a file:

1) Select **Read** option under **OTP Information** to configure the settings for **Begin Address** and **Length** of the read area.

2) Click **Save** to provide the file path to store the settings.

To write a particular OTP flash to a file:

- Select **Write Only**, if **Write and Lock** is selected, you are allowed to write the particular OTP flash which won't be written anymore to a file.

If you select **Lock Only**, the particular OTP flash will be read-only.

3.4.1. One time program a file with USB connection

To complete the OTP flashing operation using USB connection (see Figure 9):

1) Power off the target (USB cable must be unplugged).
2) Click **OTP** on the left panel of the main GUI.
3) Select **USB** from the **COM Port** drop down menu. If don't have the adapter or battery, click the **Enable Download without Battery** option**.**
4) Click **Open** to provide the configuration file.
5) Select OTP method under **OTP Information** section.
6) Click **Start** to start formatting.
7) Plug-in the USB cable to power on the HDK through the **2523 USB** connector and then the process starts automatically.

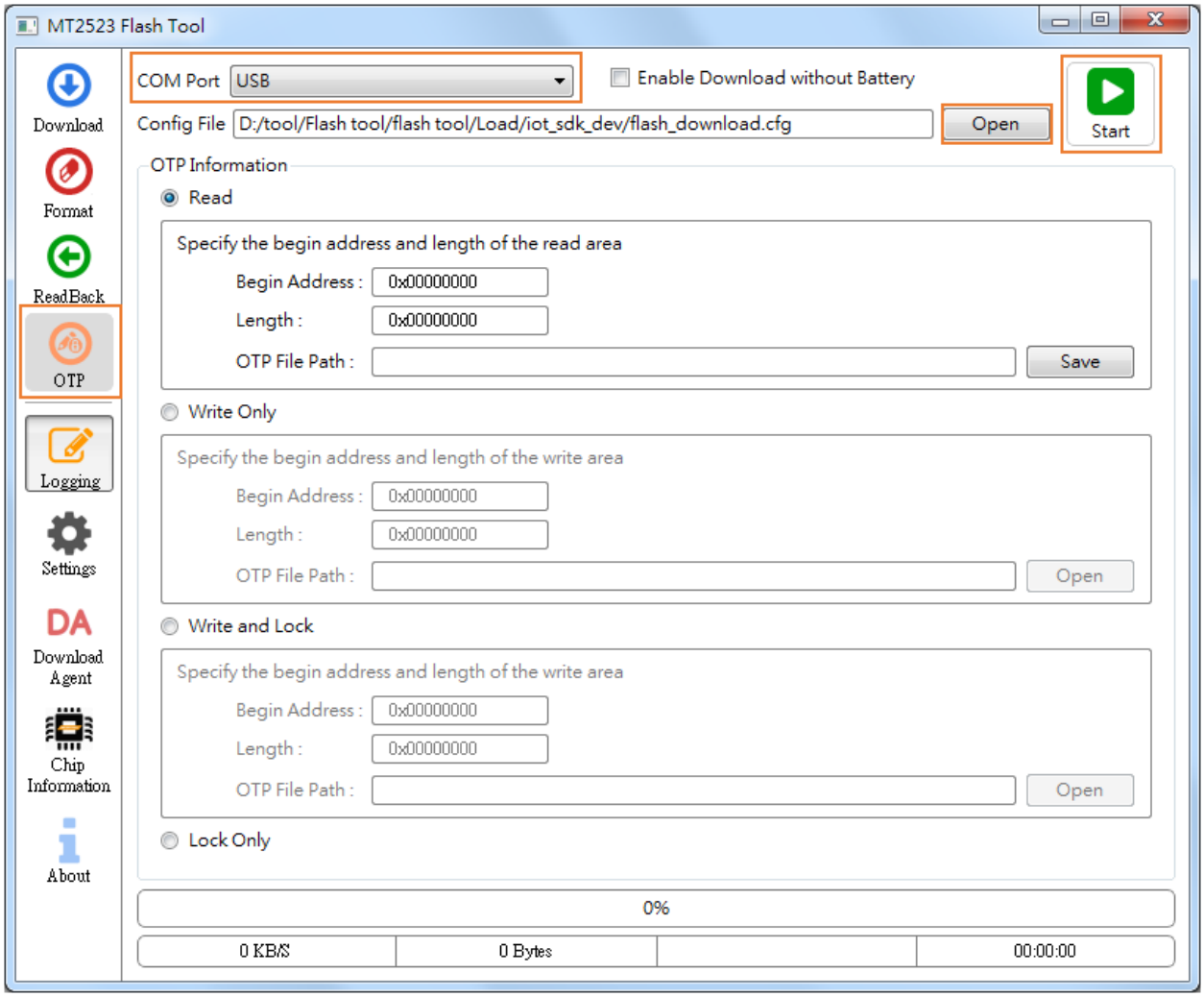

Figure 9. OTP configuration with USB connection

3.5. Logging

Logging is a convenient operation to enable debugging and storing log files for further processing. Click **Logging,** as shown in Figure 10, to automatically save the debug message to the location provided in the **Settings**.

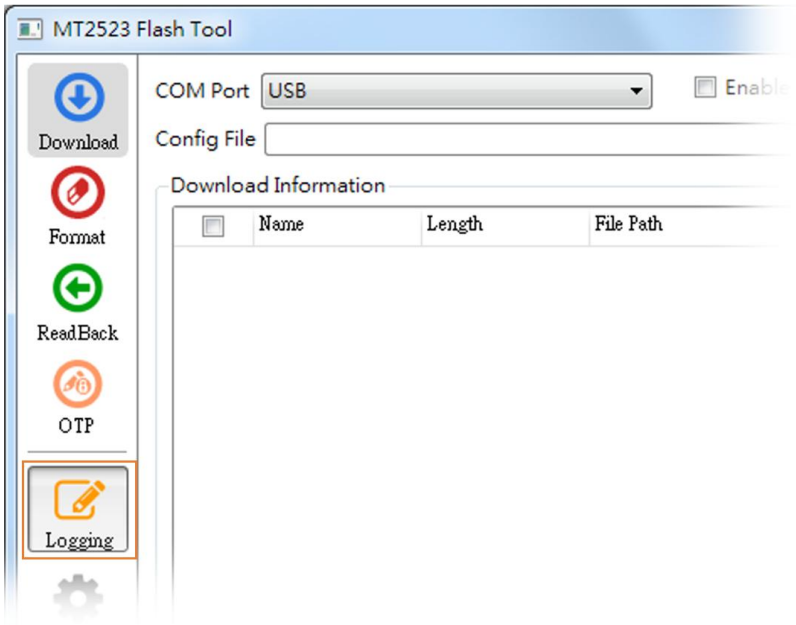

Figure 10. Logging a debugging message into a file

3.6. Settings

The setting option enables configuring the logging and USB interface settings. Click **Settings** on the main GUI of the Flash Tool (see Figure 2) to change the debug log file path under **Logging** setting, as shown in Figure 11.

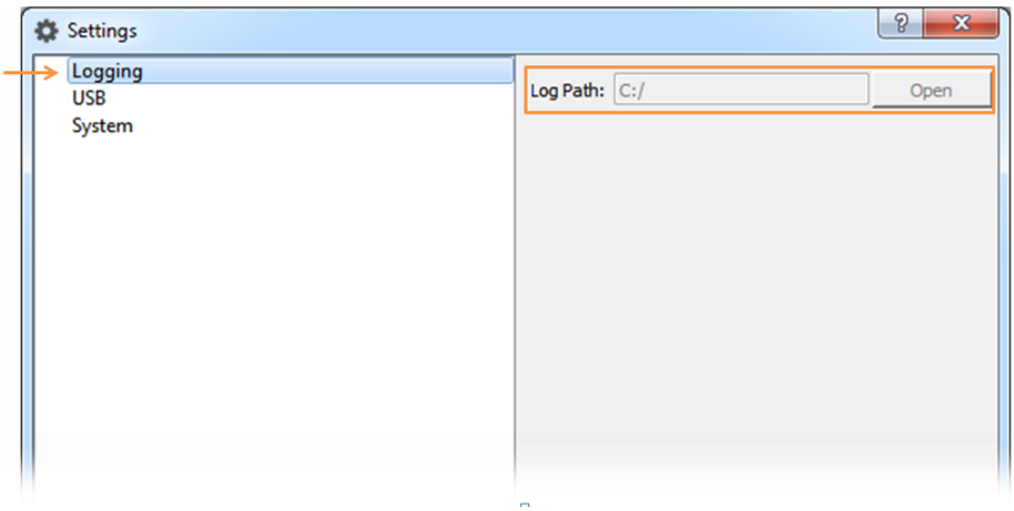

Figure 11. Configure the Logging settings

You can also enable or disable the USB 2.0 connectivity support under USB setting, as shown in Figure 12. This option changes the USB 1.1 full speed support to USB 2.0 high speed.

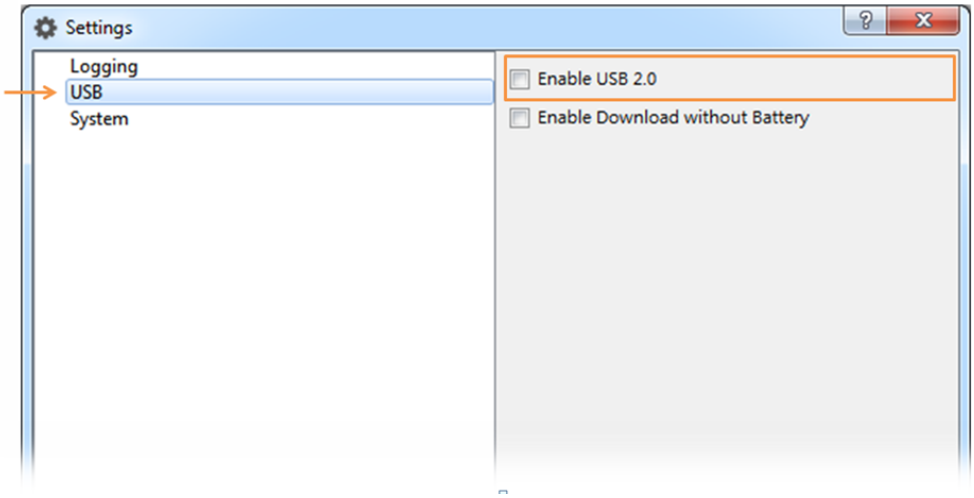

Figure 12. Enabling the high speed USB connectivity support

Enable or disable the download without battery support is also available under **USB** setting, as shown in Figure 13Figure 13. This option changes the charging method of the target. If the option is enabled, the target is powered on through a USB cable.

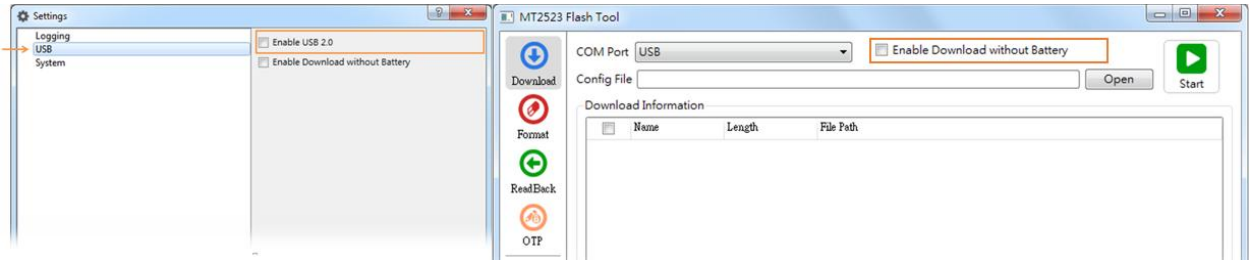

Figure 13. Enabling the download without battery support

Check **Disable the Long-Press Power Key**, as shown in Figure 14, to disable the **PWR key** function on the HDK during the Flash Tool operations of download, format and readback. This option is not applicable if the Flash Tool is not in use.

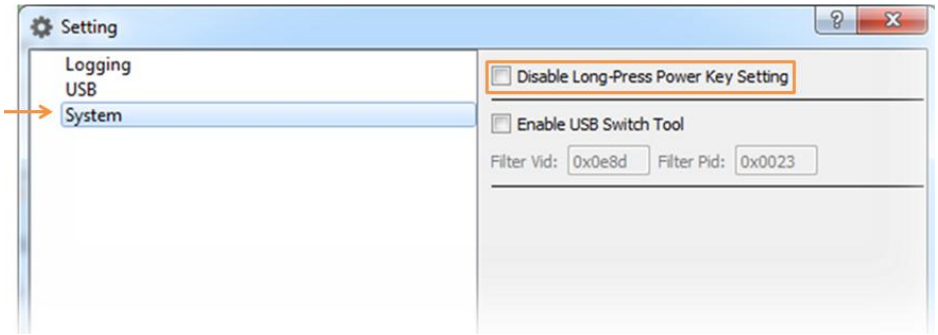

Figure 14. Disable the long press power key setting

Check **Enable USB Switch Tool**, as shown in Figure 15, to enable USB switch tool on the HDK during the Flash Tool operations of download, format and readback. This option is used to enable download port by AT command after target have already boot-up. This option has to be used with SW load released after SDK4.1.0.

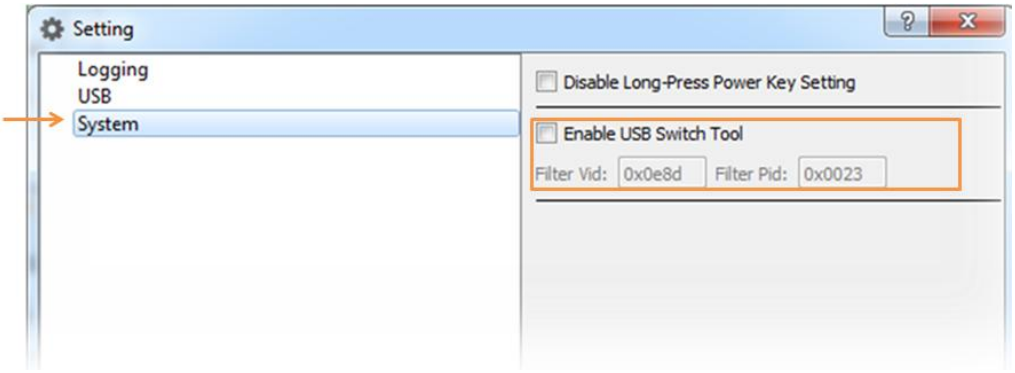

Figure 15. Enable USB Switch Tool Setting

3.7. Download Agent

A dialog window will open once you click **DA Download Agent** on the main GUI of the Flash Tool (see Figure 2). Click **Open** to change the file path to your DA file, as shown in Figure 16. The **Version** and **Build-Date** of the selected download agent will be immediately displayed. For more details on DA see section 2.2.3, "Download Agent".

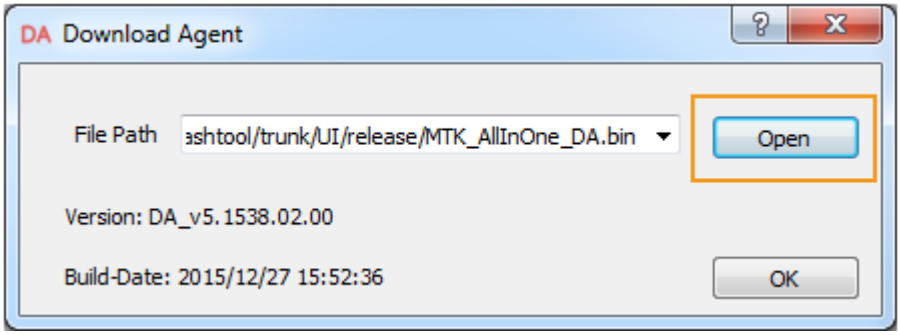

Figure 16. Configuration dialog for the DA

3.8. Chip Information

Click **Chip Information** on the main GUI of the Flash Tool (see Figure 2) to find out more about the target chipset including details on the **Chip ID**, **PSRAM** and **Serial Flash**, as shown in Figure 17.

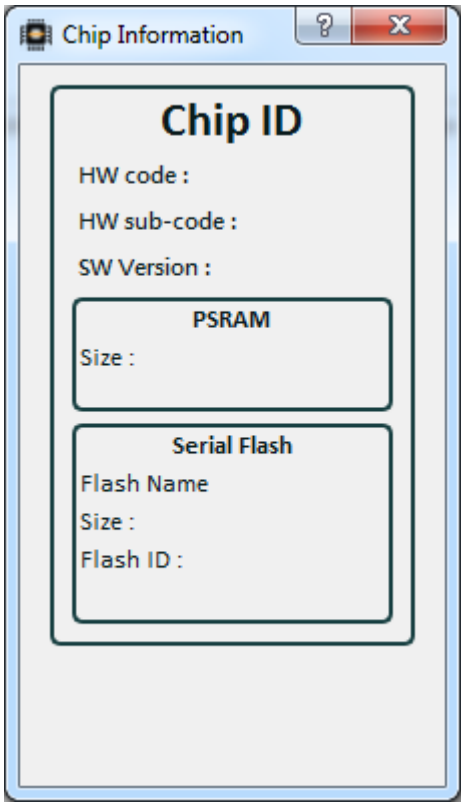

Figure 17. Chip information of a target device

3.9. About

Click **About** on the main GUI of the Flash Tool (see Figure 2) to find more details about the Flash Tool**.**

3.10. Progress and status bar

The progress bar displays the progress of download, format and readback operations, as shown in Figure 18.

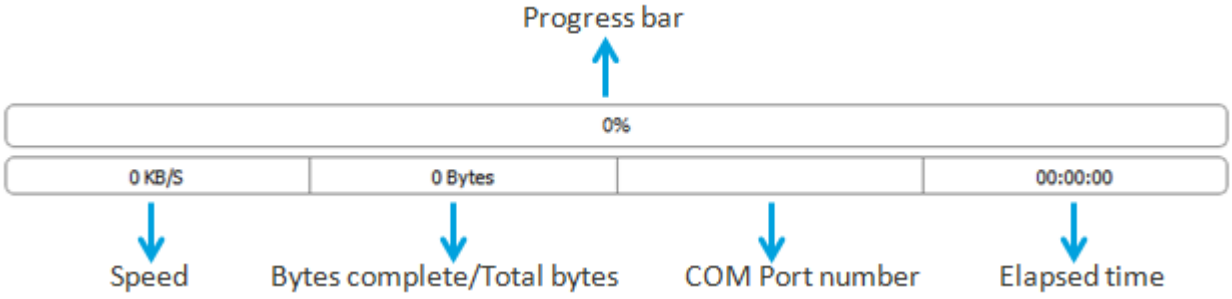

Figure 18. Progress bar and status details