NBIOT Flash Tool User Manual

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Document Revision History

Revision	Date	Description
1.0	1st February 2016	Initial version.
1.1	17 July 2019	Modification for tool version v2.8.3.
1.2	11 September 2019	Modification for tool version v2.8.4, Figure 13.

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1. Introduction

MediaTek NBIOT Flash Tool is a flexible device flashing tool for application development on MT2625 HDK. It primarily supports downloading, formatting and reading back the binary from a target device. The NBIOT Flash Tool provides high speed download. It supports the USB and UART download.

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".

- The backup operation. It is used to backup target's NVDM region to a file or restore NVDM to target from a file, see section 3.4, "Backup/Restore NVDM region"

2. MediaTek NBIOT Flash Tool

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

- The supported environment for installation.

- Installing the NBIOT Flash Tool.

2.1. Environment

The NBIOT Flash Tool can be used on Microsoft Windows XP (Professional) and Windows 7/8/10 (32 or 64 bit) PC that support USB interface communication.

2.2. Installing the NBIOT Flash Tool

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

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

2.2.1. FlashTool.exe

This file launches the graphical user interface (GUI) program for the NBIOT Flash Tool. The GUI invokes coda.exe to perform firmware update operations.

2.2.2. coda.exe

`coda.exe` is a console mode program to perform firmware update operations.

2.2.3. DownloadLib.dll

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

2.2.4. Download Agent

The NBIOT 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 a download, readback and format operations using a USB or UART interface.

2.3. Installing the USB Driver

To install the MTK USB Port driver:

1) Install the MTK USB Port driver under `MS_USB_ComPort_Driver` folder.

2) Plug in the USB cable connected to the target device to your computer's USB port.

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 (COMnn)**, as shown in Figure 1.

Note, the driver version must be **1.1032.0** or later; an older driver does not guarantee the download without problems.
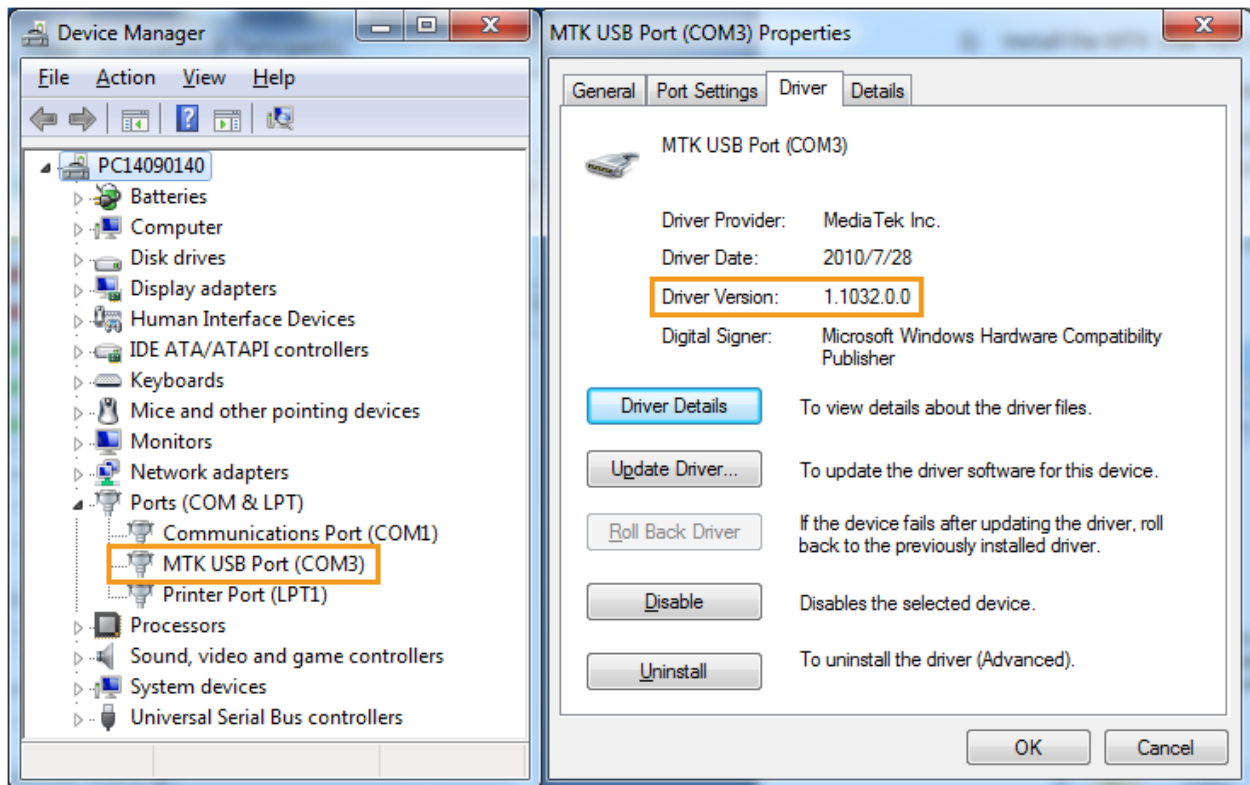
Figure 1. Installing the USB driver

3. Using the NBIOT Flash Tool

The NBIOT 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.
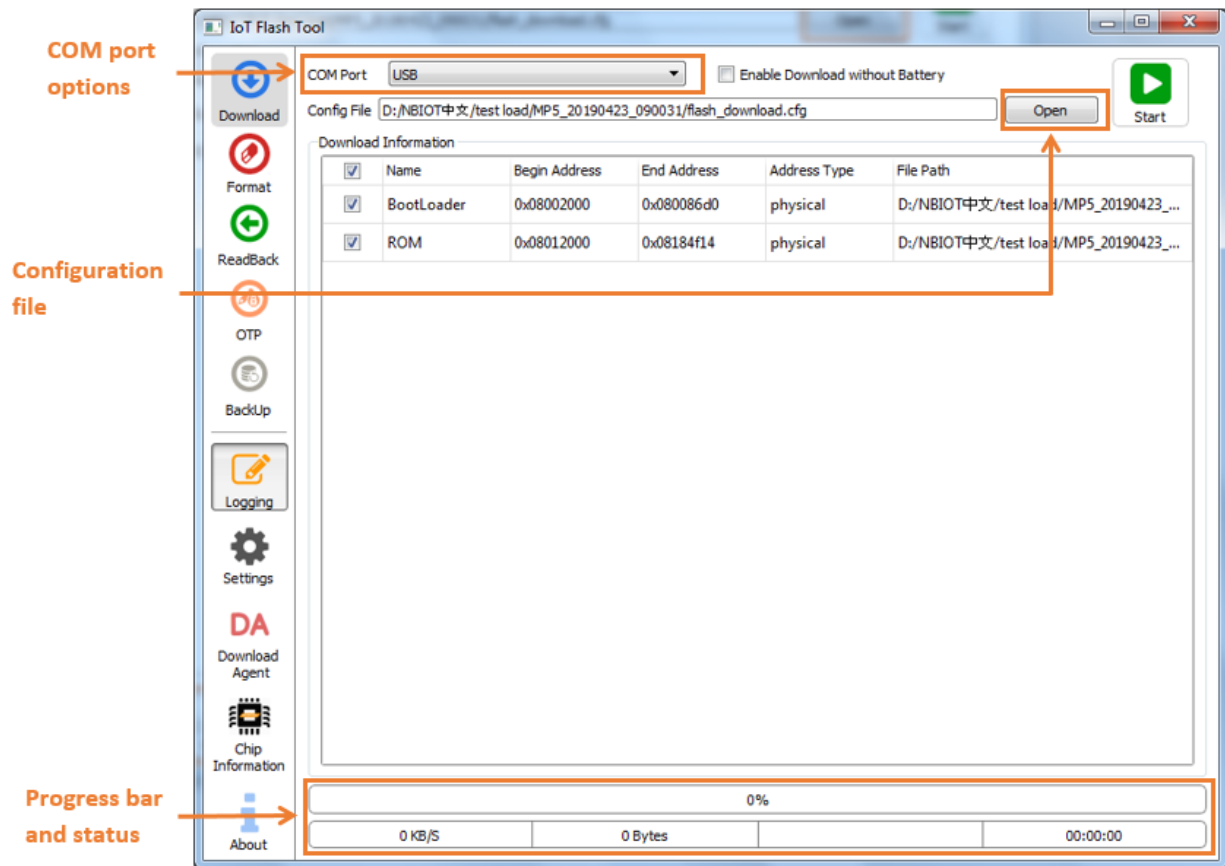

Figure 2. NBIOT Flash Tool GUI

3.1. Downloading the firmware

To download the firmware to the target device, use the USB or UART interface, the UART0 of target device is used for download. After opening the configuration file, **Download Information** will be displayed, including **Name**, **Length** and **File Path** of the firmware binary, as shown in Figure 3.

3.1.1. Download the firmware using 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 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 and press power key to power on the target.
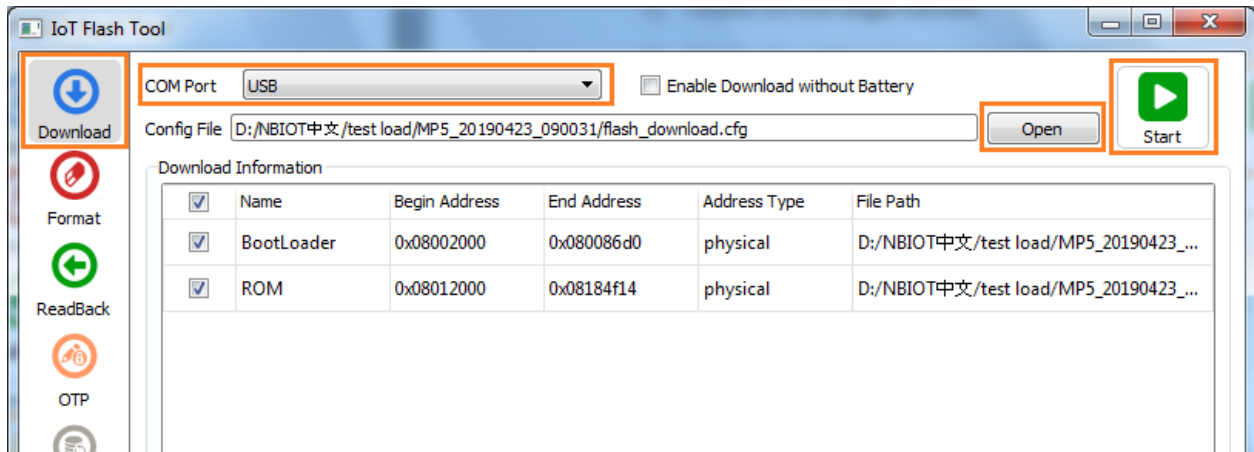

Figure 3. Download the firmware to a target device using USB

3.1.2. Download the firmware using UART

To complete the download operation using UART (see Figure 4):

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

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

3) Select **COMnn** from the **COM Port** drop down menu, press "CTRL" + "U" key to enable the "**UART Baudrate:**" drop down menu selection.

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

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

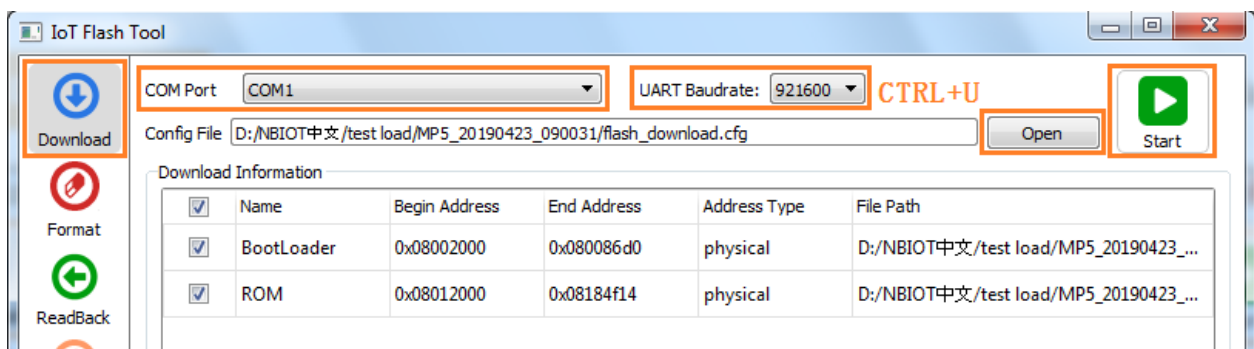6) Press power key to power on the target.

Figure 4. Download the firmware to a target device using UART

3.2. Formatting the flash

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

Open the format configuration window by clicking **Format** on the main GUI of the NBIOT Flash Tool, as shown in Figure 5. 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 MT2625 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 NBIOT Flash Tool will format the flash according to the user settings. The settings contain the address type (**Logical** or **Physical**), **Begin Address** and **Length**. The logical address starts at 0x00000000. The physical address of MT2625 starts at 0x08000000.

3.2.1. Format the flash using USB

To complete the format operation using USB (see Figure 5):

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.

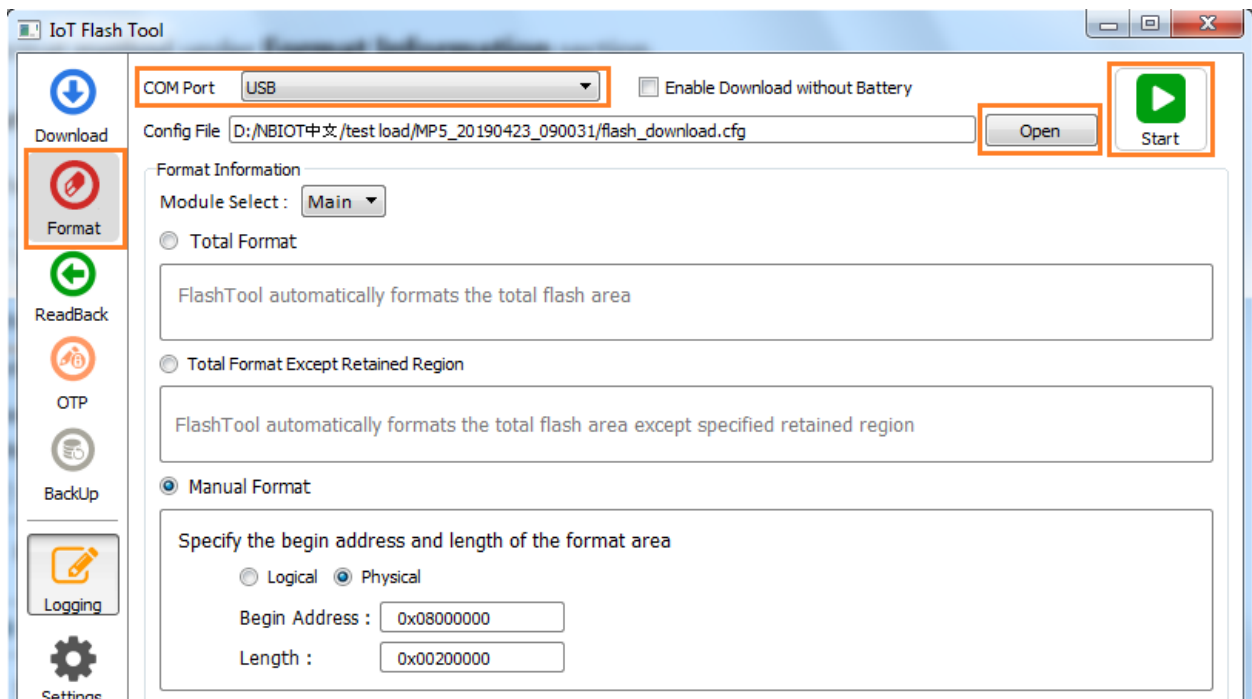7) Plug in the USB cable and press power key to power on the target.

Figure 5. Formatting the flash of a target device using USB

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:

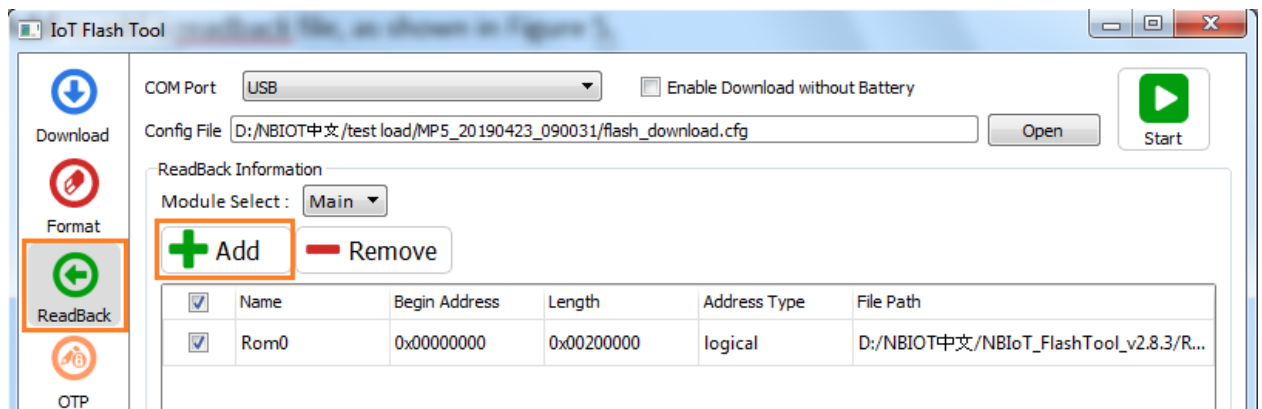1) Click **Add** to add a readback file, as shown in Figure 6.

Figure 6. Adding a readback file

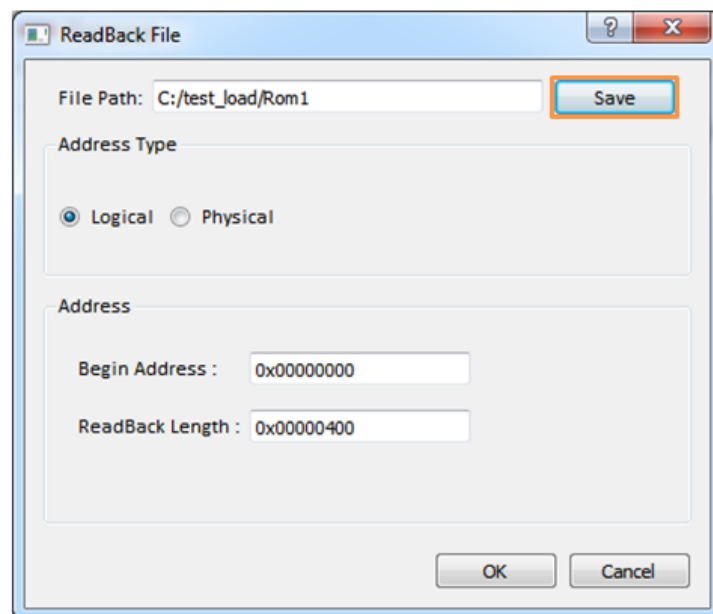2) Click **SAVE** to provide the **File Path** of the readback file, as shown in Figure 7.

Figure 7. 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 7).

To delete an existing readback file, select the file and click **Remove**, as shown in Figure 8.
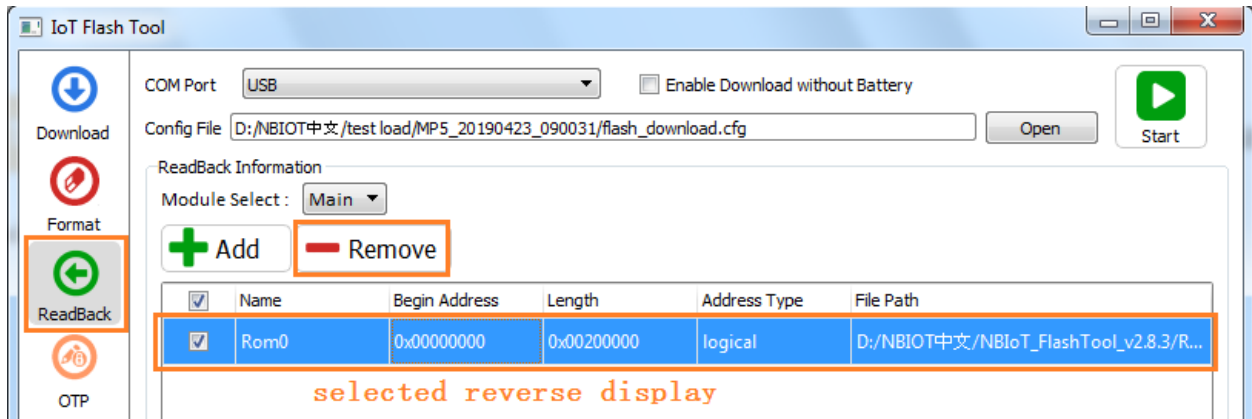

Figure 8. Deleting an existing readback file

3.3.2. Readback a file using USB

To complete the readback operation using USB (see Figure 9):

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 and press power key to power on the target.
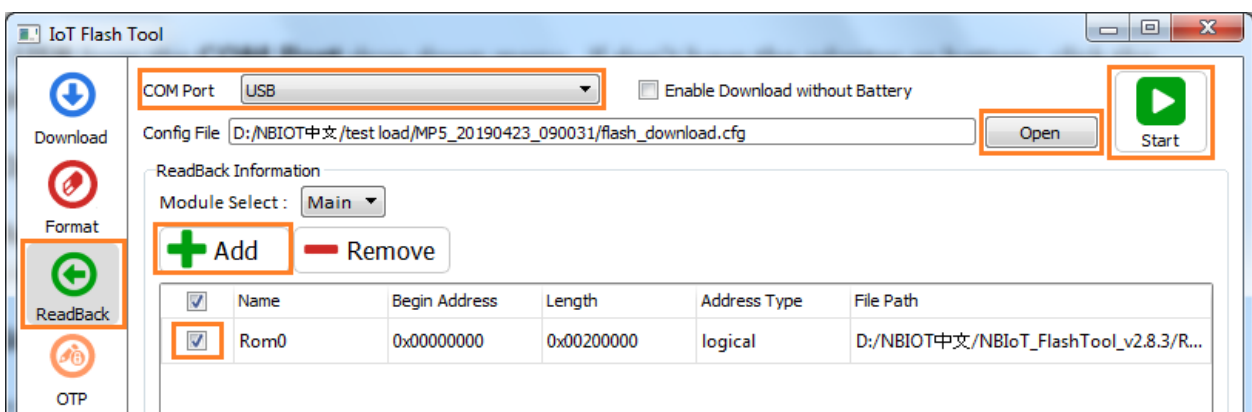
Figure 9. Reading back a file using USB

3.4. Backup/Restore NVDM region

To backup or restore NVDM region, click **BackUp** on the main GUI to open the configuration settings. The **NVDM Information** section enables backuping or restoring NVDM region to or from a local PC file. NVDM region information is described in the "**nvdm_region**" section of configuration file.

3.4.1. Backup NVDM to file

To complete the backup operation using USB (see Figure 10):

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

2) Click **BackUp** 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 backup file, select **Back up** box.

5) Click **Start** to start the backup operation.

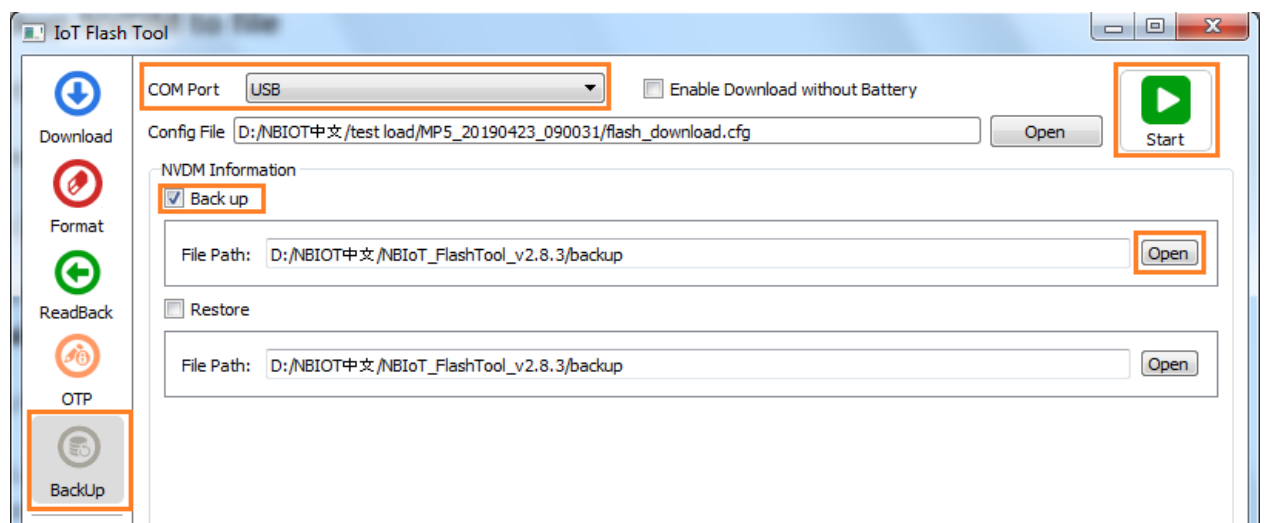6) Plug in the USB cable and press power key to power on the target.


Figure 10. Backup NVDM to file

If the NVDM region is blank in target device, e.g. a total format operation is done before backup operation, then no NVDM data is backuped and the backup file size is zero.

3.4.2. Restore NVDM from file

To complete the restore operation using USB (see Figure 11):

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

2) Click **BackUp** 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 file to be restored from, select **Restore** box.

5) Click **Start** to start the restore operation.

6) Plug in the USB cable and press power key to power on the target.
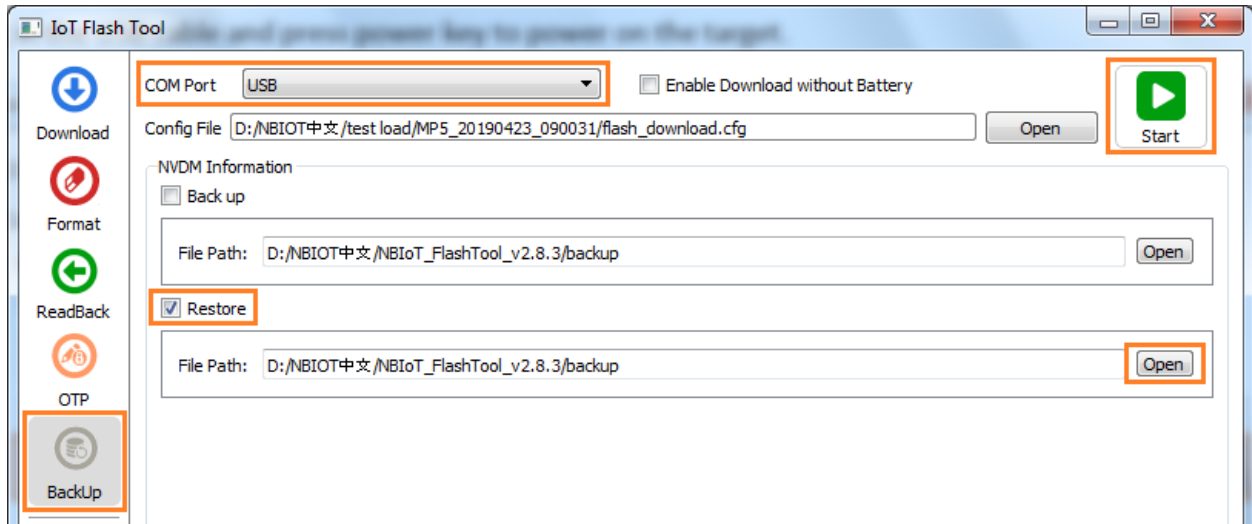
Figure 11. Restore NVDM from file

If target device's NVDM region is not blank and the length is not equal to the length specified in configuration file, or not equal to the length of file, then tool will stop with an error message box.

3.5. Logging

Logging is a convenient operation to enable debugging and storing log files for further processing. Click **Logging,** as shown in Figure 12, to automatically save the debug message to the location provided in the **Settings**.
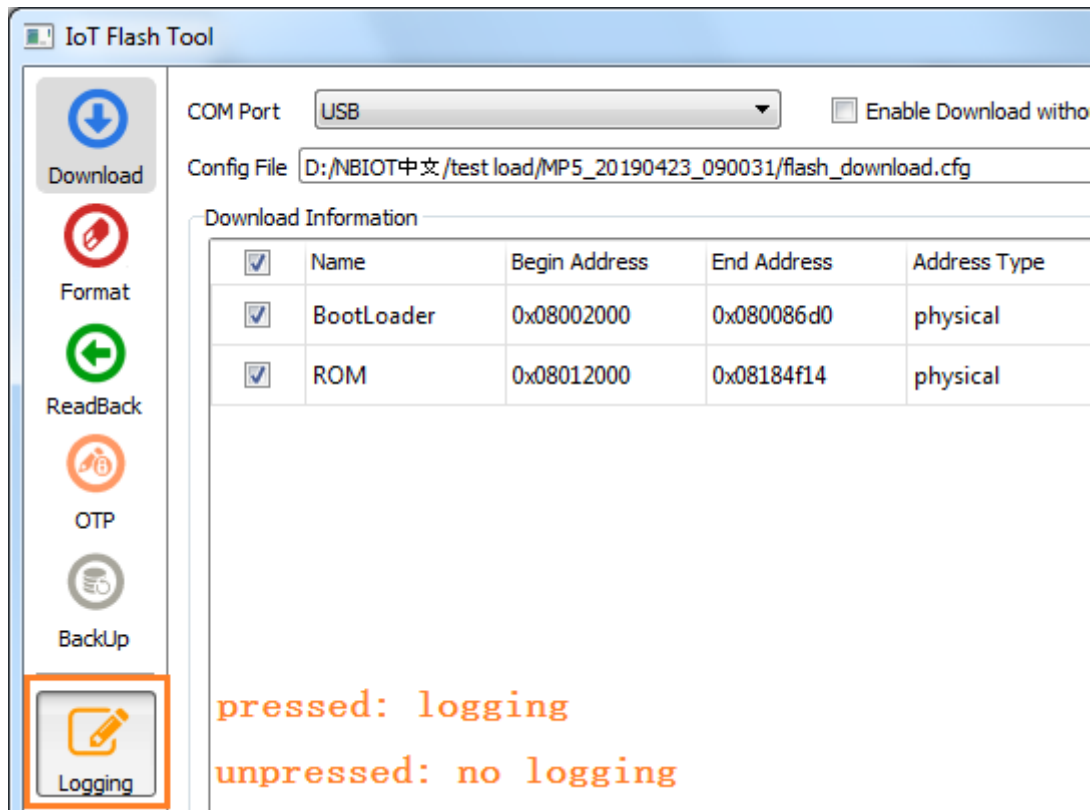
Figure 12. Logging a debugging message into a file

3.6. Settings

The setting option enables configuring the logging and USB interface settings. Click **Settings** on the main GUI of the NBIOT Flash Tool (see Figure 2) to change the debug log file path under **Logging** setting, as shown in Figure 13.
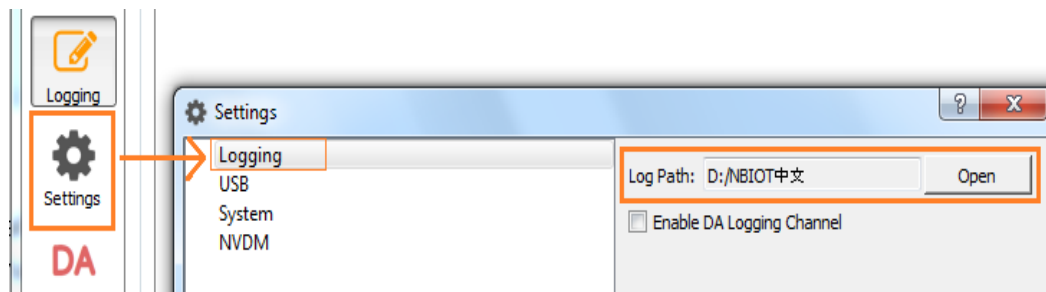

Figure 13. Configure the Logging settings

You can also enable or disable the USB 2.0 connectivity support under USB setting, as shown in Figure 14. This option changes the USB 1.1 full speed support to USB 2.0 high speed.
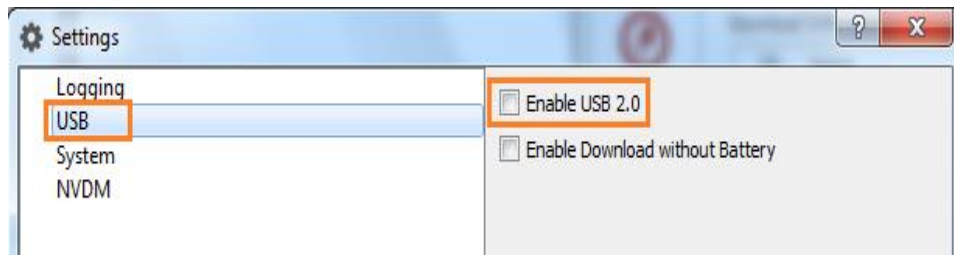NOTE: MT2625 only supports USB 1.1.

Figure 14. Enabling the high speed USB connectivity support

You can also enable or disable the download without battery support under USB setting, as shown in Figure 15. This option changes the charging method of target. Enabling this option, target used the power provided by USB cable.
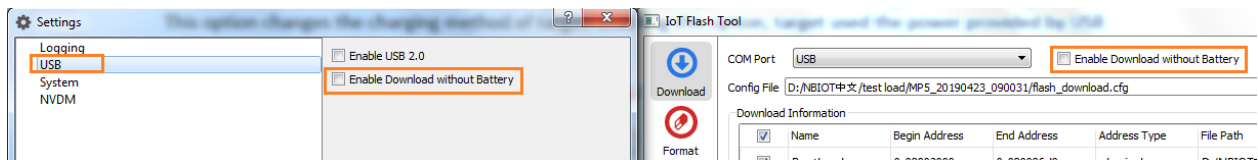

Figure 15. Enabling the download without battery support

You can disable the long-press power key setting, as shown in Figure 16. This option can't disable long-press power key to shutdown target function.
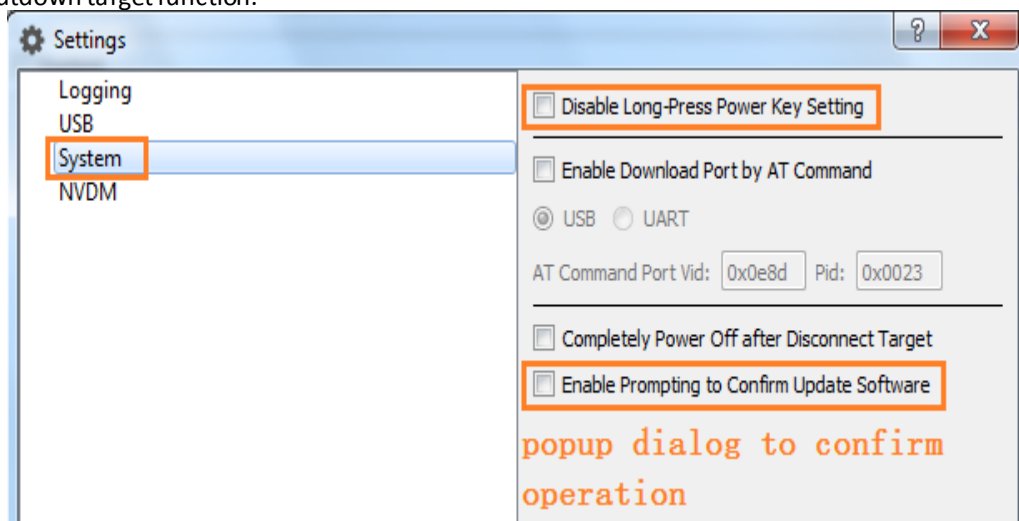

Figure 16. Disable the long press power key setting

3.7. Download Agent

A dialog window will open once you click **DA Download Agent** on the main GUI of the NBIOT Flash Tool (see Figure 2). Click **Open** to change the file path to your DA file, as shown in Figure 17. The **Version** and **Build-Date** of the selected download agent will be immediately displayed. For more details on DA see section 2.2.4, "Download Agent".
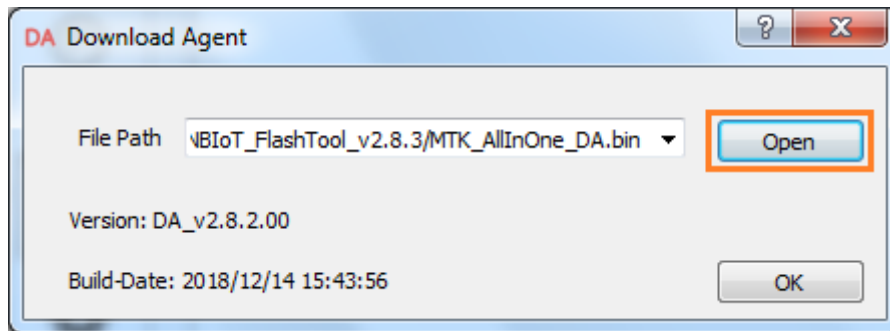
Figure 17. Configuration dialog for the DA

3.8. Chip Information

Click **Chip Information** on the main GUI of the NBIOT 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 18.
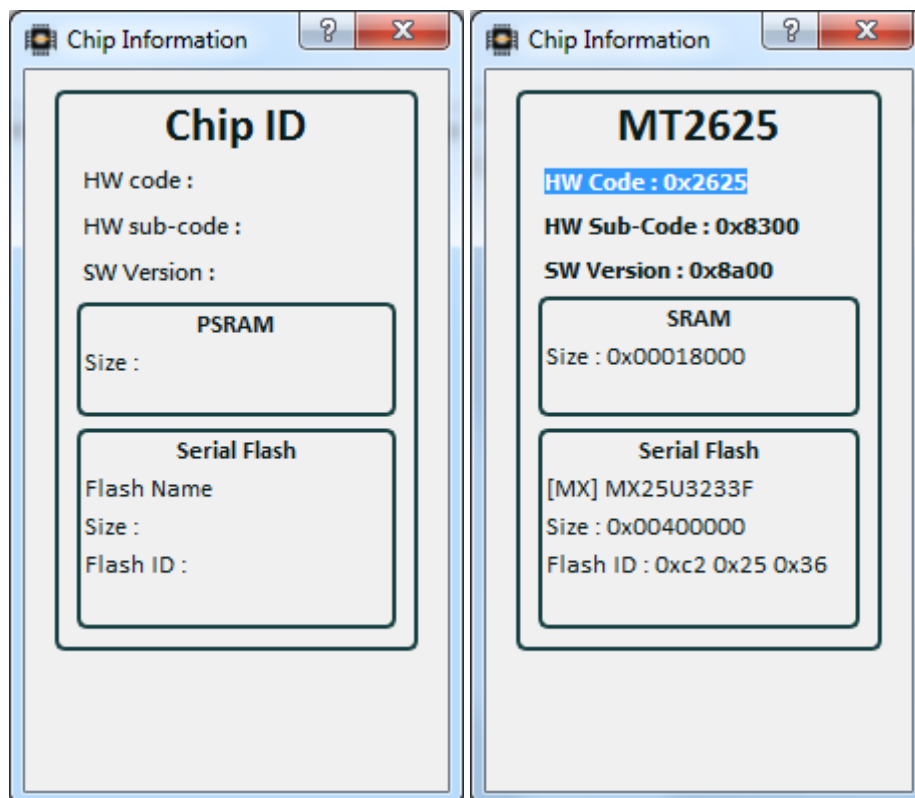

Figure 18. Chip information of a target device

3.9. About

Click **About** on the main GUI of the NBIOT Flash Tool (see Figure 2) to find more details about the NBIOT Flash Tool, as shown in Figure 19.
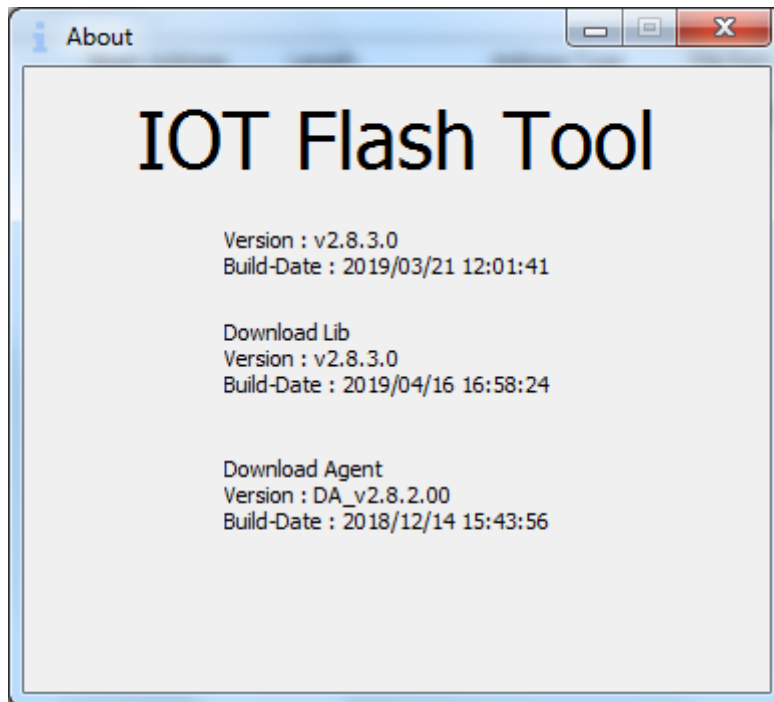
Figure 19. NBIOT Flash Tool's detailed information

3.10. Progress bar and status

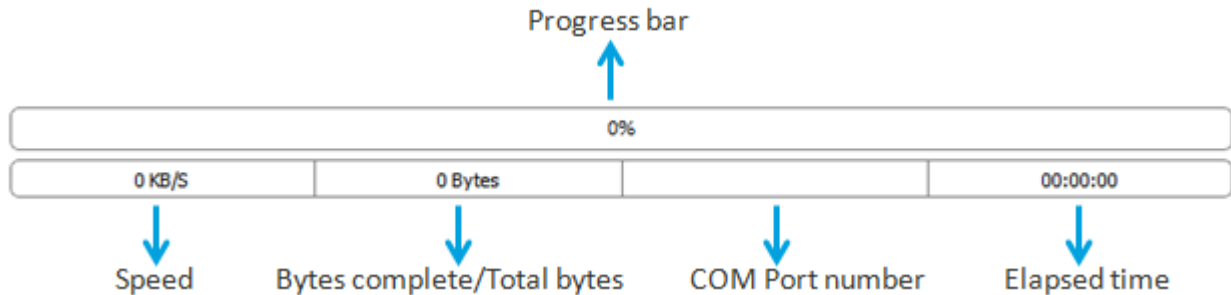The progress bar displays the progress of download, format and readback operations, as shown in Figure 20.

Figure 20. Progress bar and status details