i.MX23 Manufacturing Tool (MfgTool)

Quick Start Guide

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Contents

About This Book

This document explains how to erase and flash the NAND memory of the i.MX23 EVK board using the MFGTool.

Audience

This document is intended for software, hardware, and system engineers who are planning to use the product and for anyone who wants to understand more about the product.

Organization

This document contains the following chapters.

Chapter 1   Introduction

Chapter 2   Erasing the Flash

Chapter 3   Flashing the NAND

References

Chapter 1
Introduction

The Manufacturing Tool is used to update firmware for multiple targets simultaneously, to expedite the programming of boot media when many devices need to be updated. The objective of this document is to provide the steps to clean and update firmware on an IMX23EVK NAND Flash using the Manufacturing Tool. The process described is used for a single NAND chip. In order to use the tool correctly, some setup is needed. In the following section the requirements will be described. This document was created using the mfg-1.6.0.003a.zip release.

1.1   Board Setup and Requirements

In the i.MX23 EVK board some elements are required in order to execute the NAND tasks:

- A Windows PC and an i.MX23 EVK are needed.

- The S14 switch should be set to 5V to enable USB.

- The S36 bootmode switches should be set to 0000.

- Connect a serial cable from the i.MX23 EVK board to the serial port of a PC.

- Do not connect the LCD to the i.MX23 when using the MFG tool.

1.2   MFG Tool Look and Feel

Below is the main screen for the Manufacturing Tool (MFG Tool), the description of each Item and menus is shown below.
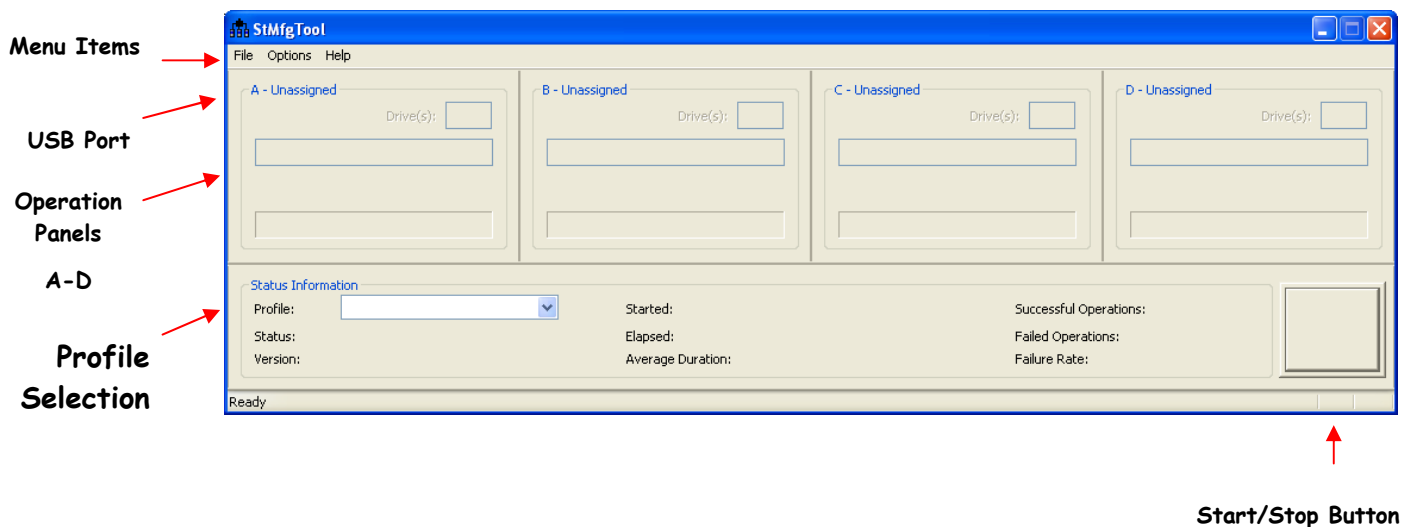
The MFG tool is capable of acting on up to four devices at the same time; this is what the four panels in the main window correspond to. However, this guide will assume only one device (NAND) at a time.

Menu Items: Menu bar containing different menus. The File menu contains a exit option, the Help menu contains information about the tool. The Options Menu contains the options for configuration and clean registry activities.

USB Port: It provides the information of the USB port in use.

Operation Panels: It describes the operation currently running in the panel

Profile Selection: It contains information about the current activity in the panel, like status, version, etc.

Start/Stop Button: The button that initializes an activity (when green), or finishes it (when red).

Chapter 2
Erasing the Flash

This chapter provides the information on how to clean the NAND on the i.MX23 EVK. This may or may not be necessary depending on the state of the NAND flash.

2.1   Tool Setup

2.1.1   Looking for the USB Port

Before starting the erasing process the connection between the PC and the EVK is needed. This connection is made using a USB cable that goes from a standard USB port in the PC to the mini-USB in the EVK.

The board needs to be set according to the requirements provided in section 1.1. Then, the Power cable from the EVK board needs to be connected. At this point the Windows PC should recognize the i.MX23 as a HID device.

In order to set the port inside the MFG Tool, follow the next steps.

1. Execute MfgTool.exe.

2. Select the Options menu, then go to Configuration.
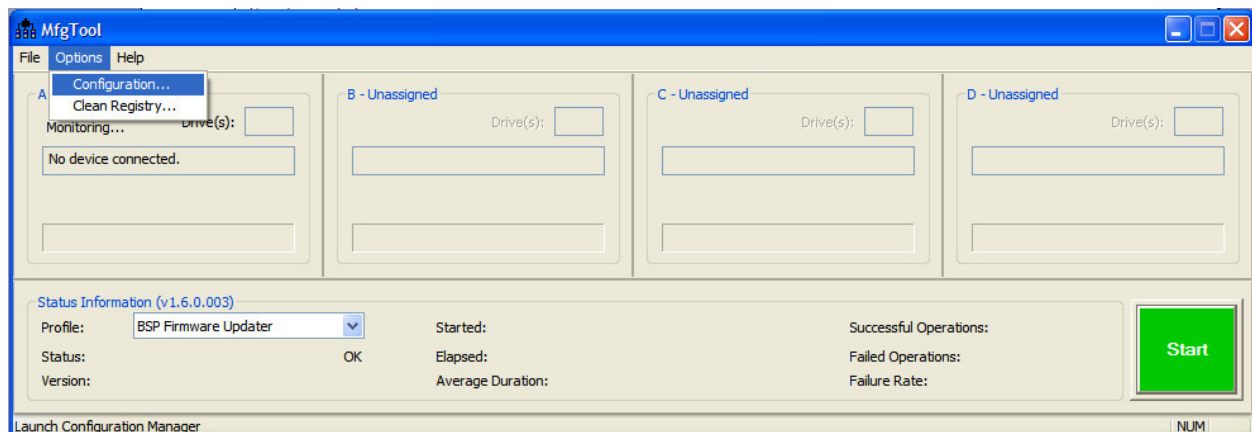
3. In the next Window (MfgTool-Configuration) select the USB Ports Tab and once in there look for a Port that shows an HID-compliant device. At first it might say "No device connected", but it will connect after selecting the appropriate checkbox.
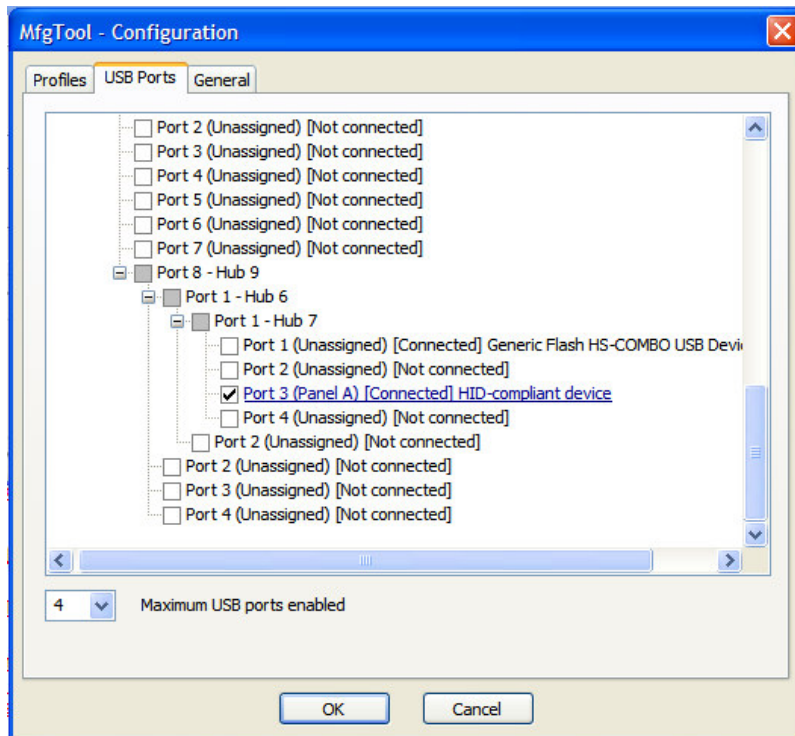
4. Finally click OK and return to the main screen. The USB Port indication in the first panel should look like this
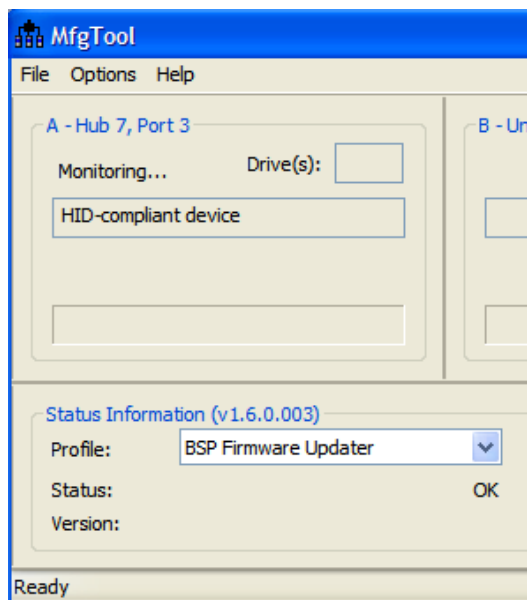
2.2 Erasing Process

Once in the main window, now the erasing process can start.

1. Go to Menu -> Options -> Configuration

2. In the MfgTool – Configuration window in the Profiles Tab locate the cursor in the operations section and press the right click on"Linux Update" -> the select Edit
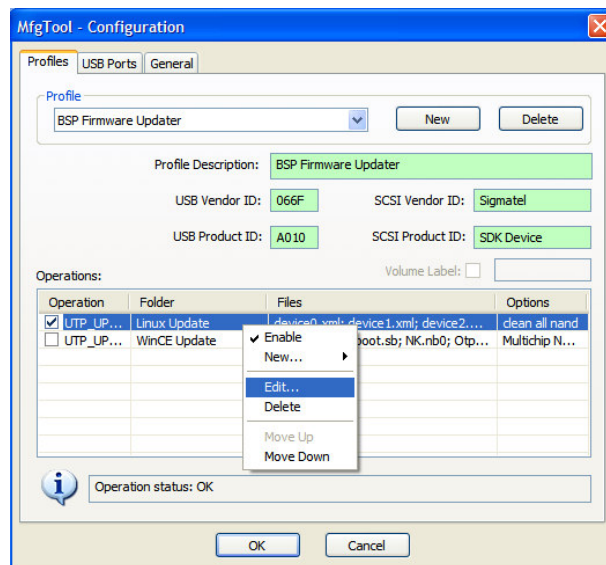
3. A new window will open (UTP Update Operation dialog), go to step3, and choose "clean all nand", then press OK. It will return to the MfgTool – Configuration window. Press OK again.
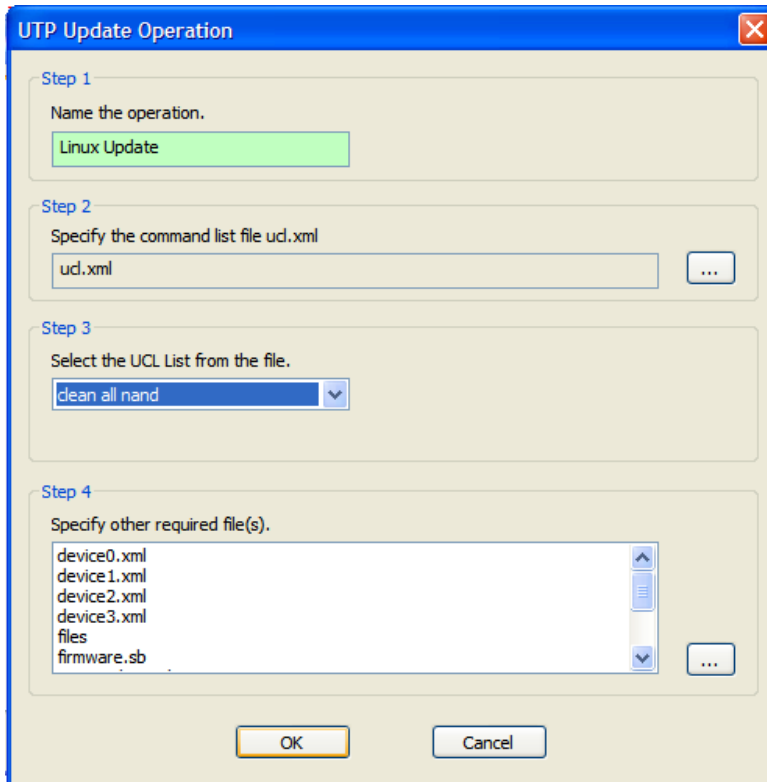
4. Finally in the main Window, press the START button and the clean process will start. NandCleaner.sb will download and run, from the serial port in a terminal (open a serial terminal at 115200 8N1) will print the following:

```
INFO: Start erasing whole NAND space!
INFO: Erasing is 100% complete.
INFO: Erasing whole NAND space completed successfully.
INFO: Please power off the board.
INFO: Spin Forever...
```

Wait for "INFO: Erasing is 100% complete and then reboot board.

Chapter 3
Flashing the NAND

3.1   Requirements

In order to flash the NAND two files are required (actually these are the ones that are flashed into the NAND). The first is the imx233_linux.sb file (bootloader-kernel) and the second one is the rootfs.tar file (filesystem).

- The imx233_linux.sb file is located in: `\mfg-1.6.0.003a\Profiles\BSP Firmware Updater\Linux Update`

- The rootfs.tar file is located in `\mfg-1.6.0.003a\Profiles\BSP Firmware Updater\Linux Update\files`

There are default files in the package; however these can be changed for those that the user generates from LTIB. In the LTIB build, the files can be found in:

- imx23_linux.sb: inside the `/<ltib dir>/rootfs/boot`

- rootfs.tar: This file is made by creating a tar file from the rootfs folder located in `/<ltib dir>/`

Some important elements that were added in the LTIB when building (like special configurations, packages and kernel command line) were:

- Start networking using dhcp

- Added the package mtd-utils

- Changed the default kernel command line to: `console=ttyAM0,115200 root=ubi0:rootfs0 rootfstype=ubifs ssp2=gpmi lcd_panel=lms430 ubi.mtd=1 mem=128M ssp1 enc28j60=0@1,2:3`

- Using NFS filesystem

- Build the imx-bootlet-src to re-generate imx233_linux.sb

For more information on the building process use the i.MX23 EVK Linux User's Guide from the SDK 2009.12

3.2 Flashing Process

Once the files (imx233_linux.sb and rootfs.tar) are located in the proper locations, the flash procedure is similar to the erase procedure.

1. Make the connection between the PC and the EVK and make sure that the USB port gets properly set. Execute MfgTool.exe.

2. Select Menu -> Options -> Configuration

3. In the MfgTool – Configuration window in the Profiles Tab locate the cursor in the operations section and press the right click on"Linux Update" -> then select Edit

4. A new window will open (UTP Update Operation dialog), go to step3, and choose "singlechip NAND" (you can see inside of ucl.xml the logic that corresponds to this profile), then press OK. It will return to the MfgTool – Configuration window, in here press OK as well.
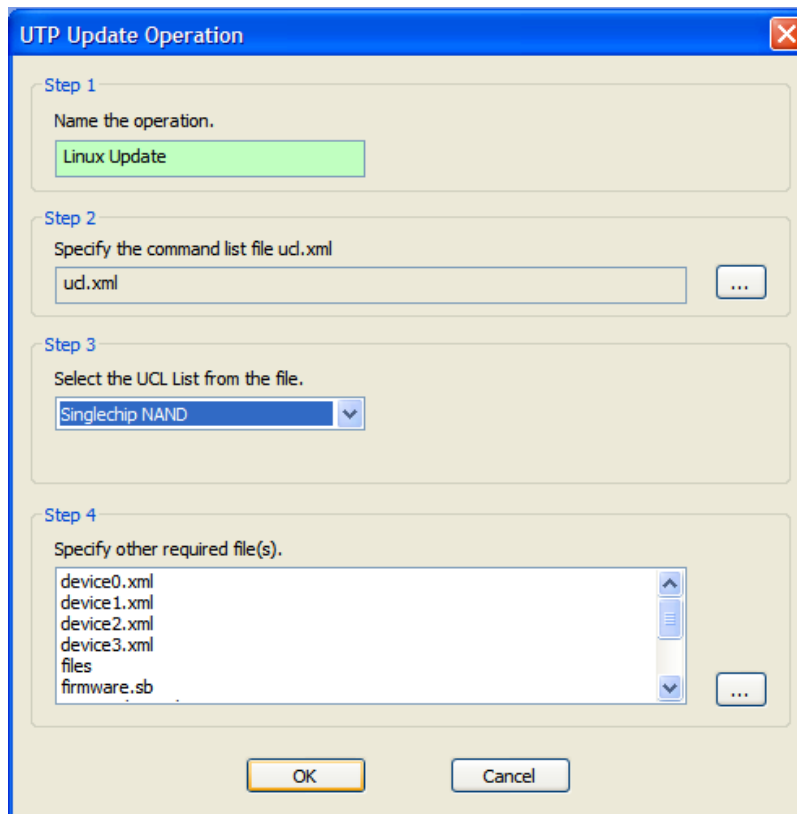
5. Finally in the main Window, press the START button and the flash process will start. When done (the system will say "operation Complete"). Now change the bootmode switch S36 to 0100 for NAND boot, connect the LCD, and reset the board.