



Download Tool v.1.12

Subject: Release Note - Download Tool for using the Download Library

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Version history

Date	Revision	Who	Description
13/01/2011	1	dhkristx	Initial release documentation
27/05/2011	2	dhkristx	Added support for x64 compilation & boost 1.40
10/06/11	3	dhkristx	Major changes: <ul style="list-style-type: none"> - Relay arguments changed - Download parameters added as arguments - Upload & Binary enabled - Added average baud rate during download
07/12/11	4	dhkristx	<ul style="list-style-type: none"> - Debug information bug fix - Default timeouts changed to 1 minute - Added option argument of AT tries with --test-boot & --test-sw-boot <times> - Trace is not stopped before removal of DownloadTool destroy
06/01/12	5	dhkristx	<ul style="list-style-type: none"> - Added a sleep after power off. - Win32 does NOT prompt on exit codes anymore. <p>Instead it only enables prompt when:</p> <ol style="list-style-type: none"> 1. Library fails to load 2. Argument parsing failure 3. Displaying --help
03/12/12	6	dhkristx	<ul style="list-style-type: none"> - Added --mipi-port capability - Argument --comm-port is now required - Changed Phone connect algorithm: <ul style="list-style-type: none"> - Resets device "tries" times - And sends AT to device 8 times in between
04/24/12	7	dhkristx	<ul style="list-style-type: none"> - SMS02534451: Added FlashLess support <ul style="list-style-type: none"> - Setting NVM path: "--flashless-path path" - Erasing NVM parts: "--flashless-erase all" - SMS02446336: Prolific GPIO reset support <ul style="list-style-type: none"> - Enabling: "--prolific-reset GPIO" - Setting port: "--prolific-port port" - Now checking Windows Register if prolific COM ports are existing - Library version is being used to check future Library API functions to report to user. - Better exception handling & few bug fixes
05/08/12	8	dhkristx	<ul style="list-style-type: none"> - SMS02422993: 64bit Linux support



			<ul style="list-style-type: none">- SMS02643483: FlashLess for Linux- SMS02642806: Binary download fix- SMS02667835: Flashless behaviour + SW reset
06/22/12	9	dhkristx	<ul style="list-style-type: none">- SMS02734048: Renamed to DownloadTool- Now bootup is done with an increasing number of tries- Added --boot-port to specify an AT terminal
06/29/12	10	dhkristx	<ul style="list-style-type: none">- SMS02778461: OutOfSession Certificate support

Approved/owner

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1 Introduction

This is the release of the Download Library source code, formerly known as the DownloadDLL. This release note explains how to use the DownloadTool application, that uses the library in order to download, upload or test that a phone device is booting up.

1.1 Getting Started

This package contains three Eclipse projects, the download library, a dependency library, and the application utilizing the library.

Provided are also the pre-compiled binaries build from the projects, which you can use directly from this package.

The projects can be imported directly into Eclipse, which can generate new binaries. If you don't want to use Eclipse you can use the makefiles to build and install.

Running the DownloadTool application without arguments will provide you with a list of options (either install or define the library path in command line “`--library=.`libDownloadTool.so”).

```
ifwd@DWDPPWS262: /media/tmp/xt_dhk/NewStructure/msw_tools/FlashTool/IMCDownload/build
ifwd@DWDPPWS262: /media/tmp/xt_dhk/NewStructure/msw_tools/FlashTool/IMCDownload/build$ ./IMCDownload

Intel Command Line FlashTool v.1.05 (Download Library v.4.85,3.57)

Usage: ./IMCDownload [options] <file to download>

Available Program Options::
  --file arg                Flash image(s) for download/upload (when defining .bin
                             files add --start-addr & --image-length)
  -c [ --comm-port ] arg   e.g. -c /dev/ttyUSB0 for communicating through device port
                             0
  -e [ --erase ]           Defining that an erase is being done instead of a download
                             (Remember to define --start-addr & --image-length)
  -u [ --upload ] arg      e.g. -u image.bin, for uploading from the device, saving
                             the memory in image.bin
  --start-addr arg         Define a starting address in HEX (used with --upload,
                             --erase, & .bin files)
  --length arg             Define an image length in HEX (used with --upload,
                             --erase, & .bin files)
  -b [ --baudrate ] arg (=921600) Set the download baudrate
  -l [ --trace-file ] arg  File name for tracing the Download
  --boot-timeout arg (=30000) Set the boot timeout in microseconds
  --comm-timeout arg (=30000) Set the communication timeout in microseconds
  --em arg (=0)           Erase mode:
                             0=before write,1=erase all,2=nothing,3=all
  --skip-empty-blocks [=arg(=1)] (=0) Skip empty blocks (Faster download)
  --faster-crc [=arg(=0)] (=1) Faster CRC Method
  --skip-checksum [=arg(=1)] (=0) Skip Write Pack Checksum
  --force-pre-erase [=arg(=0)] (=1) Force Pre-erase of written areas
  --force-erase [=arg(=1)] (=0) Force Erase of total area length
  --cond-erase [=arg(=1)] (=0) Conditional Erase of dynamic EEPROM
  --check-signature [=arg(=0)] (=1) Check file signature HW cfg value
  --alternate-boot-speed [=arg(=1)] (=0) Alt. Boot Speed (ES1.0/ES1.1). Use faster speed
  --ban-EEP-write [=arg(=0)] (=0) Ban EEP Mode Write
  --test-mode             Makes phone start in test mode for EEP files
  --library arg          Use an alternative Download Library.
  --test-boot            Testing that the device can boot (via hardware reset).
  --test-sw-boot        Testing that the device can boot (via software reset).
  --reset-switch arg     e.g. -r /dev/ttyACM1,1 for k8090 relay on serial port 1
                             and reset on switch 1
  --power-switch arg     e.g. -p /dev/ttyACM1,3 for k8090 relay on serial port 1
                             and power on switch 3
  -d [ --details ]       Show detailed log (Deprecated, use verbose instead)
  -v [ --verbose ] arg (=0) Verbose output during execution.)
  -h [ --help ]         Display this help and exit.
  -x [ --exit-prompt ]  Prompts before exit.
  --version             Version of both IMCDownload and the loaded Library

*****
Example:
> ./IMCDownload -c /dev/ttyUSB0 -t trace.log test.fl5

Downloading 'test.fl5' using device port /dev/ttyUSB0 for booting
A trace log is saved in 'trace.log' in the home folder
If the boot takes longer than 60 sec it will fail.
*****
```



2 Installation Instructions

2.1 Simple Install

The simple way to install this is to use the pre-compiled binaries.

The make command simply copies the libraries files into the /usr/lib/ directory and the DownloadTool binary into the /usr/bin/ directory. (No sudo needed in Windows)

```
$ sudo make install
```

Now you can run the DownloadTool application from the terminal.

You can also uninstall by typing (No sudo needed in Windows):

```
$ sudo make uninstall
```

2.2 Running without install

The DownloadTool application runs if it can find the required libraries, and if you don't want to do a simple install you can also just define paths to the libraries in the LD_LIBRARY_PATH variable. For example, if the libraries are located in the same folder as the executable:

```
$ export LD_LIBRARY_PATH=.  
OR  
$ ./DownloadTool -library ./libDownloadTool.so
```

Windows Users:

In Windows it will look in the same path as the executable, so just move the IMC_Download.dll to the same directory as the DownloadTool.exe file. Luckily the pre-compiled binaries are already in the same directory.

```
D:\DownloadTool.exe
```

2.3 Building binaries

In order to make a new binary one should either import the workspace into their installed eclipse and press build, or use the /Debug directory with generated makefiles.

To import a project into eclipse just press "File->Import->Existing Projects into Workspace", and select the workspace folder (./Source).

2.4 If you are lucky, you should be able to build by pressing Ctrl+B.

2.5 If not then proceed reading.



2.5.1 Installing dependencies

In order to build the DownloadTool tool you need to have the g++ compiler and the boost library installed. To be sure Ubuntu provides us with a build-essential package that contains the most common build utilities.

```
$ sudo apt-get install libboost-all-dev build-essential
```

Windows Users:

In order to compile we first need the GNU Compiler. Download and install the [MingW](#) package and the [Boost Libraries](#) to get started. Then make sure you have the paths setup in your environment path variable.

3 Running DownloadTool

The main features of this tool is outlined when running the application for the first time. Here is a short description of what is going on under the hood.

If you don't provide the right arguments to the DownloadTool application, you will see the following:

```
Usage: DownloadTool -c device [options] <file to download>
```

This means that you can provide the tool with options, but must provide a comm port and file(s) for download.

The list of available options are then shown.

3.1.1 Comm-port

The comm-port option (-c) needs a single argument, which is the block device for communication. This device can be connected through a valid MIPI, USIF, or USB port.

When you plug in a USB device the device is not present before you reset the phone, and only for a second.

The device should appear as /dev/ttyACMx, /dev/cu.modemserialX or USBx depending on which OS it is running.

The most commonly used devices are shown here:

Windows: USB1 (first USB device)

Linux: /dev/ttyUSB0 (first USIF device)

Mac: /dev/cu.usbserial (first USIF device)

3.1.2 mipi-port

The --mipi-port option (-m) needs a single argument, which is a valid MIPI device for downloading.

3.1.3 Upload

Defining --upload <file.bin> (-u) will upload the area defined to file.bin.

The reference file is still needed in order to boot up the device.

It is required to add the --start-addr and --length tags specifying the start address and length of the erase.

3.1.4 Erase

Defining --erase (-e) will erase the area defined instead of downloading the reference file.

The reference file is still needed in order to boot up the device.

It is required to add the --start-addr and --length tags specifying the start address and length of the erase.

3.1.5 Start-addr & length

Defining the starting address and length of the task at hand. This argument is used when uploading and erasing.



3.1.6 Baudrate

This argument determines the baudrate to use during the download process. The maximum baudrate is defined as 921600.

Default: 921600

3.1.7 Trace-file

When a download goes wrong and you need help from an Intel Mobile Communications supporter, please provide this option and an argument. This will save a trace log for IMC team to examine.

Default: trace.log

3.1.8 Boot-timeout

This argument determines the timeout before dropping a connection during the boot process. This means the phone device was not recognized.

Default: 60 sec

3.1.9 Comm-timeout

This argument determines the timeout for communication. This means the phone device did not respond in time.

Default: 30 sec

3.1.10 Library

An alternative library used for download, can be specified in this argument. If the application does not locate the library this option might be useful.

Default: libDownloadTool.so (from the library path)

3.1.11 Setting Download Parameters

There are different download parameters defined in the download library. In the DownloadTool tool these parameters have the default value like in the older IMC_DL tool. You can change them via the following arguments.

Argument	Default	Text
--em <0-3>	0	Erase mode: 0=before write, 1=erase all, 2=nothing, 3=all
--skip-empty-blocks	false	Skip empty blocks (Faster download)
--faster-crc	true	Forces a faster CRC Method
--skip-checksum	false	Skip Writing Pack Checksums
--skip-pre-erase	true	Skips pre-erase of written areas
--full-erase	false	Force erase of total area length
--cond-erase	false	Conditional erase of dynamic EEPROM
--check-signature	true	Check file signature HW config value
--alternate-boot-speed	false	Alternate boot speed (ES1.0/ES1.1). Using faster speed.



--upload-mbn	false	Upload MBN data
--ban-EEP-write	false	Ban EEP Mode Write
--test-mode	false	Makes phone start in test mode for EEP files

3.1.12 Certificates

You can go into OutOfSession mode via a list of certificate arguments.

When reading or writing certificates you should include an argument for which file is being written or read to. During erase this is not needed.

Here is a table of supported OutOfSession certificates.

Argument	Text
--read-rd-cert arg	Read the injected R&D certificate
--read-cc-cert arg	Read the injected CC certificate
--read-hw-cert arg	Read the injected HW certificate
--read-mi-cert arg	Read the injected Mobile ID certificate
--write-rd-cert arg	Write R&D certificate to the fls file
--write-cc-cert arg	Write CC certificate to the fls file
--write-hw-cert arg	Write HW certificate to the fls file
--write-mi-cert arg	Write Mobile ID certificate to the fls file
--erase-rd-cert	Erase the injected R&D certificate
--erase-cc-cert	Erase the injected CC certificate
--erase-hw-cert	Erase the injected HW certificate
--erase-mi-cert	Erase the injected Mobile ID certificate

3.1.13 FlashLess Disable

When downloading flashless files the DownloadTool tool will automatically generate the flashless parts and inject them in the original file. If you don't want this behavior just add the "--flashless-disable" argument.

3.1.14 FlashLess Erase

You can choose to erase NVM sections with the "--flashless-erase part" and "--flashless-path path" arguments.

Argument "--flashless-erase" takes in a comma separated list of sections to erase. Options are "all", "static", "dynamic", & "calib".

Argument "--flashless-path" is used if an alternate NVM path is used.

Default path: %USERPROFILE%/Intel/NVM_Data

3.1.15 Test-boot & Test-sw-boot

If the --test-boot argument is provided DownloadTool will reboot the device and check if it answers to "AT" commands. This command requires that you've either attached a reset or power switch via a k8090 USB Relay Card or that you manually resets the device after download.



If the device can reset itself you can use the `--test-sw-boot`, which does the same by sending the reset command first.

3.1.16 SW Reset

Reset the device via the `ReqForceHwReset` command. You can still add this to a download, upload or erase command. Then it will just run the reset after the action.

3.1.17 Prolific GPIO Reset

For newer chips the Prolific chip can be used to reset the modem chip during boot.

This is done via the `--prolific-reset GPIO` and `--prolific-port port` arguments.

Argument `--prolific-reset` is used to choose which GPIO [0-3] is used for powering. If more GPIO's are used just add another argument with the second GPIO.

Argument `--prolific-port` is used if the Prolific port is different from the `--comm-port`.

3.1.18 Reset-switch

The `--reset-switch <1-8>` refers to a switch on a connected k8090 relay card. This feature is very specific and only implemented for testing purposes. If a number is provided the default modem port (`/dev/ttyACM0`) is expected and the number defined is the relay port connected to the reset button of the phone device.

Default device: /dev/ttyACM0 (only on Linux)

Default Reset-port: None

3.1.19 Power-switch

The `--reset-switch <1-8>` refers to a switch on a connected k8090 relay card. This feature is very specific and only implemented for testing purposes. If a number is provided the default modem port is expected and the number defined is the relay port connected to the power button of the phone device.

Default device: /dev/ttyACM0 (Only on Linux)

Default Power-port: None

3.1.20 Test-mode

Makes phone start in test mode for EEP files .

Default: Off

3.1.21 Verbose/Details

These two options does the same thing. It provides you with more output during execution.

Default: Off

3.1.22 Exit-prompt

When execution is terminating, this will leave the terminal open until a key is pressed.

Default: Off