

DRA7XX BOOTSWITCH USER GUIDE



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1 Purpose

This document is the user guide of the DRA7xx Bootswitch tool. Bootswitch can be used to

1. Load MLO to a DRA7xx EVM via peripheral boot. (or)
2. Control the boot media from which the DRA7xx EVM boots.

This document uses the term MLO to refer to the first stage bootloader as this tool was developed while working with U-Boot. However it can be used with other first stage boot loaders as well.

This tool runs on Linux and Windows. Linux installation and usage instructions follow. For Windows usage instructions, please refer to the section [Usage on Windows](#).

Please refer to manifest.html for license information.

2 Usage

1. Clone the dra7xx-bootswitch git repository. Run `./install.sh` inside the cloned repository.

```
host $ git clone git://git.ti.com/glSDK/dra7xx-bootswitch.git
host $ cd dra7xx-bootswitch
host $ ./install.sh
Installing dependencies
Building
Build successful
Setting up udev rules
Reloading udev rules
Copying default settings to /tmp/bootsetting.txt
```

The script `install.sh` does the following.

1. Install build dependencies.
 2. Build the software
 3. Setup udev rules to autotrigger bootswitch on detecting a DRA7xx EVM.
 4. Setup default settings in `/tmp/bootsetting.txt`
2. Place the DRA7xx EVM in USB peripheral boot mode.
- ```
SYSBOOT[5:0] = 0b010000.
```
3. Connect a USB cable from the boot USB port(P2) to your PC.
  4. Reboot the EVM. In peripheral boot mode, the EVM waits for a command from the PC to determine how to obtain MLO. bootswitch binary provides this command to the EVM.

The tool expects a configuration file to be found at `/tmp/bootsetting.txt`. If no configuration file is found, the default is to boot the EVM from SD card. The default configuration setup by `install.sh` is also setup for SD boot.

## 3 Controlling the boot

The tool expects configuration file to be found at `/tmp/bootsetting.txt`. This configuration file contains information on how to control the boot. A default should be setup by the `install.sh` script. If not, please copy the sample configuration file `bootsetting.txt` to `/tmp` on the host PC. The file `bootsetting.txt` contains documentation as well. The below commands strips the documentation when copying it to the final location.

```
host $ sed -e '/^#/d' bootsetting.txt > /tmp/bootsetting.txt
```

or create `/tmp/bootsetting.txt` with just the below two lines.

```
0:5
/home/user/u-boot/spl/u-boot-spl.bin
```

This configuration tells the tool that we will not be transferring the binary over USB and that the EVM should boot from the SD card. The second line containing the file path is a dont care. Reboot the EVM and observe it booting from SD card.

To change the boot modes, please refer to the documentation in `bootsetting.txt` in the bootswitch git repository. Please make sure that any setting changes are performed in `/tmp/bootsetting.txt` and not in `./bootsetting.txt`.

## 4 Transferring MLO from PC

To send the first stage boot loader (MLO/SPL) from the PC to the EVM, modify `/tmp/bootsetting.txt` as follows.

```
1:5
/home/user/u-boot/spl/u-boot-spl.bin
```

This setting tells the tool that we are using peripheral boot and that the MLO/SPL binary should be picked up from the described path. The value after `:` on the first line is a dont care when transferring MLO from PC. Please note that the binary to be supplied is `u-boot-spl.bin` and not MLO.

### 4.1 Important points

- a) The binary is loaded to `0x40300000` as per the TRM.
- b) The binary is expected to be in the `.bin` format. For MLO, you need to point to `u-boot-spl.bin` and **not** the MLO.
- c) The size of the binary should be less than 504 KB.

For more information, please refer to the documentation in `bootsetting.txt` in the `bootswitch` git repository.

## 5 Debug traces

The tool generates debug output in `/tmp/bootswitch_log.txt`. Please use this for debugging any issues.

## 6 Usage on Windows

### 6.1 Building the tool

1. Download the latest `libusb` windows binaries from <http://libusb.info/>.
2. Extract the files into a folder called `libusb` underneath the `dra7xx-bootswitch` source directory. At the end of this operation, the below paths must be present under `dra7xx-bootswitch` directory.

1. `./libusb/include/libusb-1.0`
2. `./libusb/MinGW64/static`

3. Install MinGW64 compiler chain from sourceforge. Navigate to <https://sourceforge.net/projects/mingw-w64/files/> and use the online installer to install the tool chain.
4. Ensure `gcc` and `mingw32-make` installed in the above step are available from windows path.
5. Run the below command to build the tool.

```
mingw32-make -f Makefile.win
```

## 6.2 USB Driver setup

To ensure that the EVM can be accessed using libusb, drivers need to be installed correctly.

1. Download zadig from <http://zadig.akeo.ie/>
2. Run zadig.
3. Place the DRA7xx EVM in USB peripheral boot mode.

```
SYSB00T[5:0] = 0b010000.
```

4. Connect a USB cable from the boot USB port(P2) to your PC.
5. Reboot the EVM.
6. The zadig window will show the name **VAYU** briefly. Click the “Install Driver” button as soon as the name is displayed. If the UI does not indicate the driver is installed successfully, repeat steps 5 and 6. You may want to open “Device manager” and uninstall the “VAYU” device before trying again.

## 6.3 Running the tool

Instructions to run the tool are the same as on Linux except for the change in config file paths.

1. Configuration file is now expected at `C:\temp\bootsetting.txt`
2. Log file is now stored at `C:\temp\bootswitch_log.txt`

Windows testing was done with laptop running Windows 10, using libusb-1.0.21 and MinGW GCC version 6.3.0 x86\_64-posix-seh-rev1.

This tool was originally intended to be used from a udev script on Linux. As a result, all the logs are stored in the log file. Please review the log if there are any issues.

## 7 Support

For support, please post any questions to

[https://e2e.ti.com/support/arm/automotive\\_processors/f/1020](https://e2e.ti.com/support/arm/automotive_processors/f/1020)

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