

# Arduino 101 Firmware Update

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# 1 INTRODUCTION

## WARNING!!!!

This firmware is targeted to be built only on Ubuntu 64 bit.  
If your native machine is not as mentioned above you can still perform the firmware building process using an Ubuntu 14 – 64 bit OS in a virtual machine with 15GB of HDD space allocated. We advise against building using a Live-USB or Live CD because step 3 below will fail as it cannot download the required packages.

If you have not configured the Arduino101 board yet, please follow the steps in the link below before downloading the source code. Please verify that you can successfully run a blink sketch to ensure DFU is operating correctly. This is important as it will provide you with the platform to flash the binaries.

(<https://www.arduino.cc/en/Guide/Arduino101>)

# 2 DOWNLOADING THE SOURCE CODE

Please visit (<https://downloadcenter.intel.com/download/25832>) and download the tar-ball located there. When the downloading is complete, move into folder where the tar-ball is saved and execute the following commands:

```
$ tar -xf arduino101_firmware_source-v1.tar.bz2
$ cd arduino101_firmware_source-v1
$ project_directory=$(pwd)/arduino101_firmware/projects/arduino101
```

### 3 INSTALLING ALL PREREQUISITE PACKAGES

Make sure packages from all repositories are up-to-date

```
$ sudo apt-get update
```

Ensure you have all the required packages before compiling. As the target suggests, this is only required the first time you compile.

```
$ sudo make one_time_setup -C $project_directory
```

This installs the following packages:

```
gawk wget git-core diffstat unzip texinfo  
gcc-multilib build-essential chrpath libsdl1.2-dev xterm  
libqtgui4:i386 libtool libc6:i386  
libc6-dev-i386 autoconf libtool pkg-config gperf flex bison
```

### 4 BUILDING THE IMAGES

Perform this step each time you modify the code, to update the images.

```
$ make clean setup image -C $project_directory
```

## 5 CREATING THE FLASHPACK.ZIP

This creates "flashpack.zip" which is used for flashing the board.

```
$ arduino101_flashpack/create_flasher.sh
```

```
building file list ... done
created directory images/firmware
./
Files
bootloader_quark.bin -> /home/test/v1/out/current/quark_se/quark/bootloader/bootlo
bootupdater.bin
quark.0.bin
quark.1.bin
quark.bin
quark.padded.bin

sent 386,860 bytes received 193 bytes 258,035.33 bytes/sec
total size is 386,202 speedup is 1.00
adding: arduino101_flashpack/ (stored 0%)
adding: arduino101_flashpack/drivers/ (stored 0%)
adding: arduino101_flashpack/drivers/rules.d/ (stored 0%)
adding: arduino101_flashpack/drivers/rules.d/99-dfu.rules (deflated 40%)
adding: arduino101_flashpack/images/ (stored 0%)
adding: arduino101_flashpack/images/firmware/ (stored 0%)
adding: arduino101_flashpack/images/firmware/quark.bin (deflated 47%)
adding: arduino101_flashpack/images/firmware/FSRom.bin (deflated 97%)
adding: arduino101_flashpack/images/firmware/quark.1.bin (deflated 100%)
adding: arduino101_flashpack/images/firmware/arc.bin (deflated 41%)
adding: arduino101_flashpack/images/firmware/bootloader_quark.bin (deflated 46%)
adding: arduino101_flashpack/images/firmware/quark.0.bin (deflated 79%)
adding: arduino101_flashpack/images/firmware/quark.padded.bin (deflated 81%)
adding: arduino101_flashpack/images/firmware/bootupdater.bin (deflated 54%)
adding: arduino101_flashpack/utilities/ (stored 0%)
adding: arduino101_flashpack/utilities/fwversion/ (stored 0%)
adding: arduino101_flashpack/utilities/fwversion/readbin.c (deflated 41%)
adding: arduino101_flashpack/utilities/fwversion/README (deflated 7%)
adding: arduino101_flashpack/fwversion.bat (deflated 36%)
adding: arduino101_flashpack/bin/ (stored 0%)
adding: arduino101_flashpack/bin/LICENSE.dfu-util (deflated 62%)
adding: arduino101_flashpack/bin/readbin (deflated 69%)
adding: arduino101_flashpack/bin/libwinpthread-1.dll (deflated 54%)
adding: arduino101_flashpack/bin/dfu-util.32 (deflated 54%)
adding: arduino101_flashpack/bin/readbin.exe (deflated 60%)
adding: arduino101_flashpack/bin/readbin.32 (deflated 64%)
adding: arduino101_flashpack/bin/dfu-util.exe (deflated 66%)
adding: arduino101_flashpack/bin/dfu-util (deflated 61%)
adding: arduino101_flashpack/flash_dfu.bat (deflated 58%)
adding: arduino101_flashpack/create_flasher.sh (deflated 48%)
adding: arduino101_flashpack/bin_osx/ (stored 0%)
adding: arduino101_flashpack/bin_osx/dfu-prefix (deflated 66%)
adding: arduino101_flashpack/bin_osx/LICENSE.dfu-util (deflated 62%)
adding: arduino101_flashpack/bin_osx/readbin (deflated 66%)
adding: arduino101_flashpack/bin_osx/LICENSE.libusb (deflated 65%)
adding: arduino101_flashpack/bin_osx/dfu-util (deflated 58%)
adding: arduino101_flashpack/bin_osx/dfu-suffix (deflated 66%)
adding: arduino101_flashpack/bin_osx/LICENSE (deflated 66%)
adding: arduino101_flashpack/fwversion.sh (deflated 44%)
adding: arduino101_flashpack/flash_dfu.sh (deflated 55%)
```

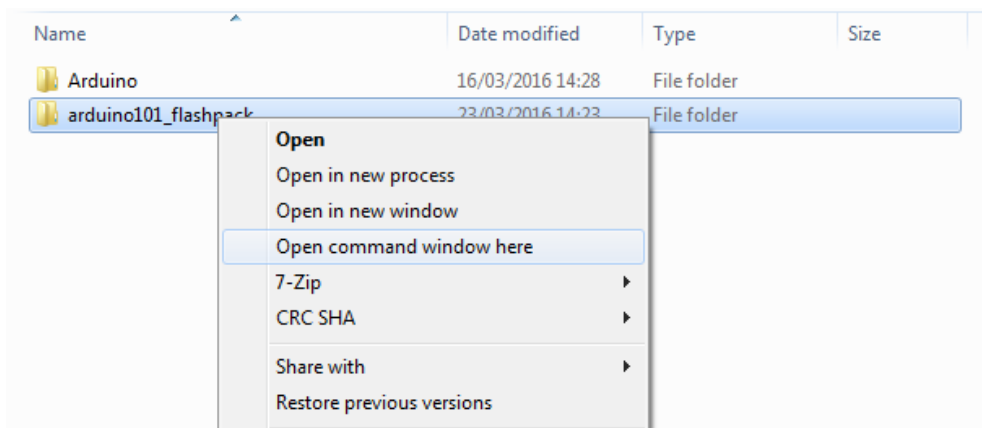
## 6 FLASHING IMAGES TO THE BOARD

Ensure the board is connected via USB.

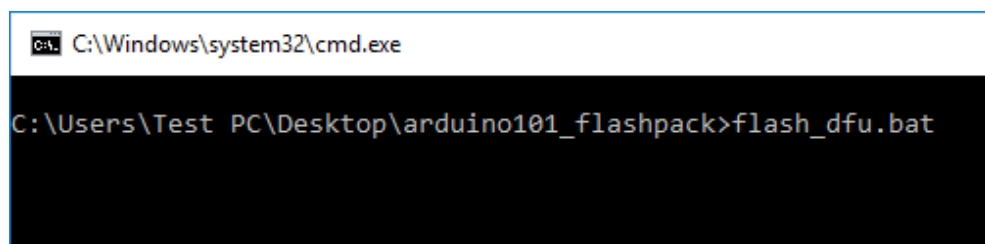
Now move the zip file to a machine where the Arduino IDE is installed and extract there.

### 6.1 Windows

Shift+Ctrl+right click mouse on extracted folder and click “Open command window here”.



Execute command “flash\_dfu.bat”



### 6.2 Linux/Mac

```
$ cd arduino101_flashpack
$ ./flash_dfu.sh
```

Press the reset button on the board to begin the flash process.

```
C:\> flash_dfu.bat

Reset the board before proceeding...
```

Below is an example of a successful flash.

```
C:\> Select flash_dfu.bat

Please report bugs to dfu-util@lists.gnumonks.org

Invalid DFU suffix signature
A valid DFU suffix will be required in a future dfu-util release!!!
Opening DFU capable USB device...
ID 8087:0aba
Run-time device DFU version 0011
Claiming USB DFU Interface...
Setting Alternate Setting #2 ...
Determining device status: state = dfuIDLE, status = 0
dfuIDLE, continuing
DFU mode device DFU version 0011
Device returned transfer size 2048
Copying data from PC to DFU device
Download      [=====] 100%          51680 bytes
Download done.
state(2) = dfuIDLE, status(0) = No error condition is present
Done!
dfu-util 0.8

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Please report bugs to dfu-util@lists.gnumonks.org

Invalid DFU suffix signature
A valid DFU suffix will be required in a future dfu-util release!!!
Opening DFU capable USB device...
ID 8087:0aba
Run-time device DFU version 0011
Claiming USB DFU Interface...
Setting Alternate Setting #7 ...
Determining device status: state = dfuIDLE, status = 0
dfuIDLE, continuing
DFU mode device DFU version 0011
Device returned transfer size 2048
Copying data from PC to DFU device
Download      [=====  ] 89%          30720 bytesEr
can't detach
Resetting USB to switch back to runtime mode

---SUCCESS---
Press any key to continue . . .
```