

Getting Started with ev3dev

Edit on Github (<https://github.com/ev3dev/ev3dev.github.io/edit/master/docs/getting-started.md>)

docs (/docs/) / getting-started

So you're ready to try out ev3dev. Great! Here are step-by-step instructions to help you get ev3dev up and running on your EV3 or Raspberry Pi.

First, here are the things you need before starting:

- A LEGO MINDSTORMS EV3 Intelligent Brick or Raspberry Pi (any model).
- A microSD (https://en.wikipedia.org/wiki/Secure_Digital#SD) or microSDHC (https://en.wikipedia.org/wiki/Secure_Digital#SDHC) card (2GB or larger). microSDXC (https://en.wikipedia.org/wiki/Secure_Digital#SDXC) is not supported on the EV3. **All cards larger than 32GB will not work with the EV3!**
- A computer with an adapter for the SD card. You will need administrator user permissions on this computer.
- A way to communicate.

- For the EV3, this can be one of the following:
- USB cable (the one that comes with the EV3)
 - USB Wi-Fi dongle
 - USB Ethernet (wired) dongle
 - Bluetooth

For Raspberry Pi you will need to use the wired Ethernet connection first. With PiStorms the EV3 options will work too since you have a screen to configure them on.

⚠ The instructions on this page only apply to releases dated December 2015 or later. Older releases are no longer supported. There are many major changes in the December release, so if something seems broken or the documentation seems incorrect, please [open an issue on GitHub \(/support\)](#).

Step 1: Download the latest ev3dev image file

📄 Download for LEGO MINDSTORMS EV3 (<https://github.com/ev3dev/ev3dev/releases/download/ev3dev-jessie-2015-12-30/ev3-ev3dev-jessie-2015-12-30.img.xz>)

Other platforms

Raspberry Pi 1 (<https://github.com/ev3dev/ev3dev/releases/download/ev3dev-jessie-2015-12-30/rpi-ev3dev-jessie-2015-12-30.img.xz>)

Raspberry Pi 2 (<https://github.com/ev3dev/ev3dev/releases/download/ev3dev-jessie-2015-12-30/rpi2-ev3dev-jessie-2015-12-30.img.xz>)

BeagleBone (<https://github.com/ev3dev/ev3dev/releases/download/evb-ev3dev-jessie-2016-01-25/evb-ev3dev-jessie-2016-01-25.img.xz>)

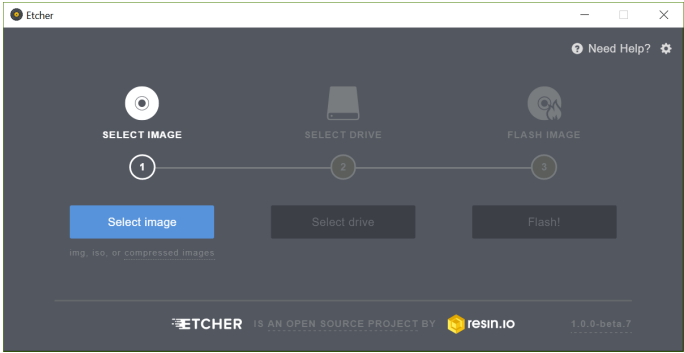
To get started, you will need to download the release corresponding to the platform you are using. If you want the latest and greatest, check out the "nightly" (<https://oss.jfrog.org/list/oss-snapshot-local/org/ev3dev/brickstrap/>) image builds. If you are looking for older releases or other file types, you can check out the GitHub releases page (<https://github.com/ev3dev/ev3dev/releases>).

Step 2: Copy the image on to the SD card

ⓘ This will erase everything on your SD card! Backup your files if you do not want to lose them!

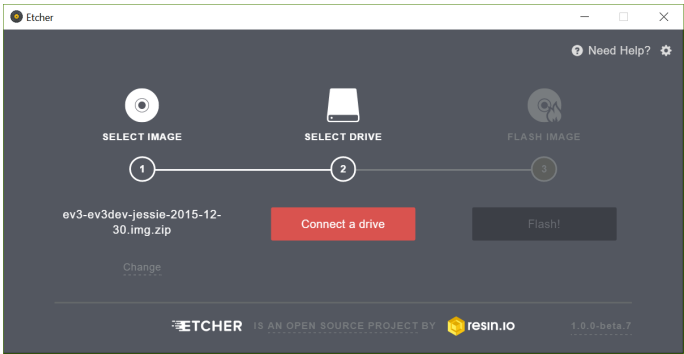
Now it's time to write the image to the card.

1. Download and install Etcher from their website (<http://etcher.io>).
2. Launch Etcher after it has finished installing.



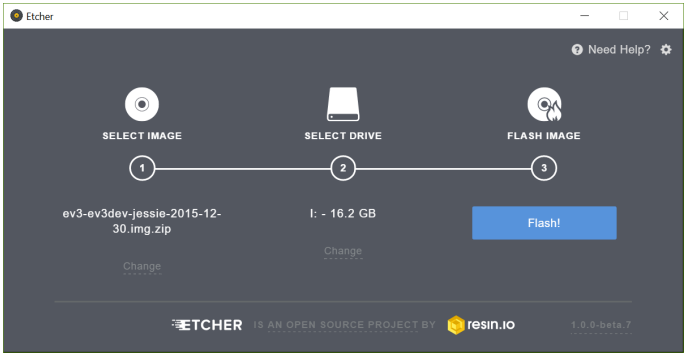
(/images/etcher/home.png)Etcher home screen

3. Click the "Select image" button and browse to the folder where you downloaded an ev3dev release. Select the file that you downloaded. The release can be a .img .zip or .img .xz ; whichever you have will work with Etcher.



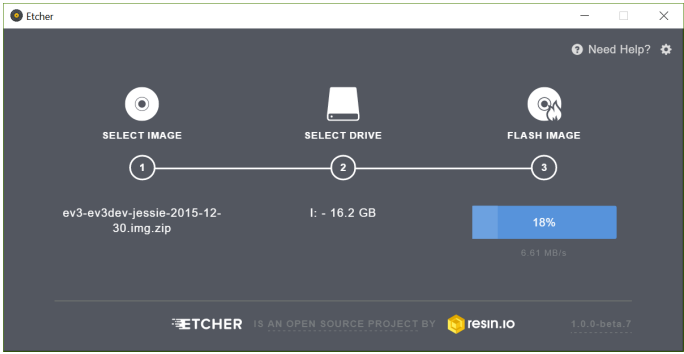
(/images/etcher/image-selected.png)Image chosen in Etcher

4. Plug the SD card into your PC (if your PC doesn't have a micro SD slot, you can use an adapter or external reader). Etcher should detect the new device and display its information under the "Select drive" step. Confirm that the selected drive is correct.



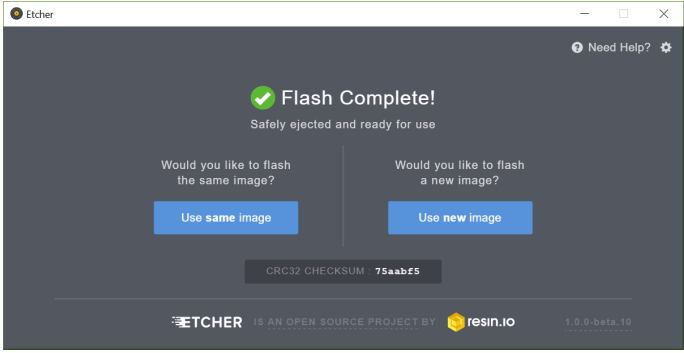
(/images/etcher/drive-selected.png)Drive selected in Etcher

5. If you have multiple removable drives available, you may need to use the “Change” button to select the proper device.
6. When you are confident that you have selected the correct drive, click “Flash!” and wait for the operation to complete.



(/images/etcher/flash-started.png)Etcher flashing the SD card

7. If you arrive at this screen, you have successfully flashed your SD card and are ready to move on to the next step.



(/images/etcher/success.png)Etcher success screen

For more detailed information and more alternatives, check out [our other tutorials](#) ([/docs/tutorials/#group-sd-card-image](#)). You can also check out [this page for RaspberryPi](#) ([http://elinux.org/RPI_Easy_SD_Card_Setup](#)). Much of the information there is applicable to ev3dev.

Step 3 (Raspberry Pi only): Update options in config.txt

⚠ This is for Raspberry Pi only! Users of other platforms can skip this step.

You must make some changes to `config.txt` to enable support for BrickPi or PiStorms before you put your SD card in your Raspberry Pi.

You may have to remove the SD card from your host computer and plug it back in after flashing it in order for it to be detected. In your file browser, open up `EV3DEV_BOOT`. This contains a file named `config.txt`. Open `config.txt` in your favorite text editor and follow the instructions in the file to enable either BrickPi or PiStorms.

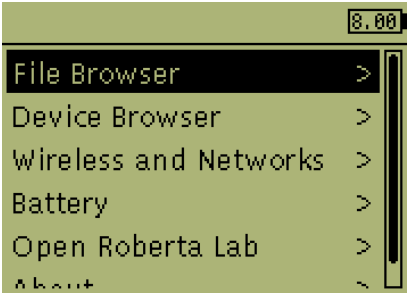
Step 4: Boot ev3dev

Put the SD Card in your EV3 and power it on. At first, you will see the MINDSTORMS boot splash and the red LEDs will be on. This is immediately followed by the ev3dev boot splash and the LEDs changing to orange. The LEDs indicate disk (SD card) activity.

Note: If you are using Raspberry Pi hardware without a screen, just wait for the Activity LED to stop flashing, then go to the next step.

After about one minute, the screen will go blank. This happens on the first boot only. The first boot takes longer than subsequent boots because the EV3 has to create a unique SSH host ids and take care of a few other housekeeping items. After another minute or two, you will see the *brickman loading...* screen. If nothing has happened after five minutes, something is not right - check the troubleshooting tips below.

You will notice the number in the battery in the upper right corner. This displays the remaining voltage of the power supply. It is not possible to calculate an accurate percent value of the remaining energy, so this value is chosen. If the voltage drops below 5V the brick will turn off. All not saved data may be lost. Keep in mind, that it may take a much longer time from 8V to 6.5V than from 6.5V down to 5V!



(/images/brickman/main-menu.png)When the boot is complete, the LEDs will turn green and you will see something like this on the screen

ⓘ Troubleshooting tips if your EV3 won't boot

- Make sure nothing is plugged into the EV3 (USB/sensors/motors/etc.)
- Try writing the image to the SD card again.
- You may have a bad/incompatible SD card - try a different SD card.
- Check the condition of the EV3 batteries.

Step 5: Setup a network connection

There are lots of choices here. Your choice depends on what type of connection you want to use and on the OS of your host computer, so pick the one that applies:

- **Ethernet over USB** (just requires the USB cable that comes with the EV3)
 - Connecting to the Internet ([./tutorials/connecting-to-the-internet-via-usb](#)) tutorial
- **USB Ethernet dongle** (as in the kind with an RJ45 connector)
 - If your network has a DHCP server, this will "just work".
- **USB Wi-Fi Dongle**
 - Setting up Wi-Fi Via the Brickman User Interface (hopefully you can figure this out, but it would be nice if someone made a tutorial)
 - Setting Up Wi-Fi Using the Command Line ([./tutorials/setting-up-wifi-using-the-command-line](#)) (requires another connection type first to get to the command line, but way easier to enter you passphrase this way)
- **Bluetooth**
 - Note: Bluetooth may not work on the first boot. Please reboot if you see "???" after you power on Bluetooth.
 - Connecting to the Internet ([./tutorials/connecting-to-the-internet-via-bluetooth](#)) tutorial

i For Raspberry Pi with no display, you must use the wired Ethernet port to connect for the first time. You can setup additional connections using the `connmanctl` command.

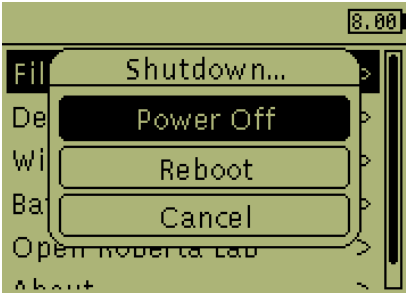
Step 6: Do something awesome

The brick can run almost all programming languages that any other Linux distro can, so your favorite language is probably supported. Language bindings have already been written for many languages. **You can learn more about the available libraries here** ([/docs/libraries](#)).


If the language you want isn't listed, you still can use it, but you'll have to do more of the heavy lifting yourself. You can look at the driver index page ([/docs/drivers/](#)) for information on the interfaces you need to use to control devices. Once you get the hang of it, you can even write your own interface library and have it listed here!

Step 7: Calling it a day

When you are ready to wish your EV3 goodnight, turn it off by pressing the *back* button from the main menu in brickman or pressing and holding the *back* button from any screen in brickman. This will open a dialog where you can select *Power Off* to turn off the EV3. (Running `sudo poweroff` in a terminal works too.)



([/images/brickman/shutdown-menu.png](#))The 'Shutdown...' dialog in Brickman

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Project maintained by Ralph Hempel (<https://github.com/rhempel>) and David Lechner (<https://github.com/dlechner>), with help from the community