



- [Start ↓](#)
 - [About Us](#)
 - [Getting Started](#)
 - [Latest Software Images](#)
 - [Subscribe to Newsletter](#)
- [Discover Boards ↓](#)
 - [▶ BeagleBone Black ◀](#)
 - [SeedStudio BeagleBone Green](#)
 - [BeagleBone Capes](#)
 - [BeagleBone](#)
 - [▶ BeagleBoard-X15 ◀](#)
 - [BeagleBoard-xM](#)
 - [BeagleBoard](#)
- [Learn ↓](#)
 - [Introduction](#)
 - [Books ↗](#)
 - [Wiki ↗](#)
 - [Hardware Support](#)
 - [Software Support](#)
 - [Adafruit Tutorials ↗](#)
 - [BoneScript Library](#)
 - [FAQ](#)
- [Explore ↓](#)
 - [Blog](#)
 - [Projects](#)
 - [Google Summer of Code](#)
 - [Videos](#)
- [Collaborate ↓](#)
 - [Live Chat](#)
 - [Forums](#)
 - [Register Project](#)
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 - [Github ↗](#)
 - [Upverter ↗](#)
 - [Tindie ↗](#)

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[BeagleBoard.org](#) > [getting-started](#)

- **[Step 1:](#)**
[Plug in your Beagle via USB](#)
- **[Step 2:](#)**

[Install drivers](#)

- [Step 3:](#)
[Browse to web server on Beagle](#)
- [Troubleshooting](#)
- [Update to latest software](#)
- [Other software options](#)
- [Hardware documentation](#)
- [Books](#)

Getting Started with BeagleBone & BeagleBone Black

Getting Started wit... ⌚ ➦

Beagle boards are tiny computers with all the capability of today's desktop machines, without the bulk, expense, or noise. Read the step-by-step getting started tutorial below to begin developing with your BeagleBone or BeagleBone Black in minutes.

BeagleBone Black ... ⌚ ➦

For additional getting started information, visit the suport wiki pages:

- [BeagleBoard](#)
- [BeagleBoard-xM](#)
- [BeagleBone](#)
- [BeagleBone Black](#)

Original BeagleBone users: update to the [latest software image](#) to use the instructions below.

Step 1

Plug in your Beagle via USB

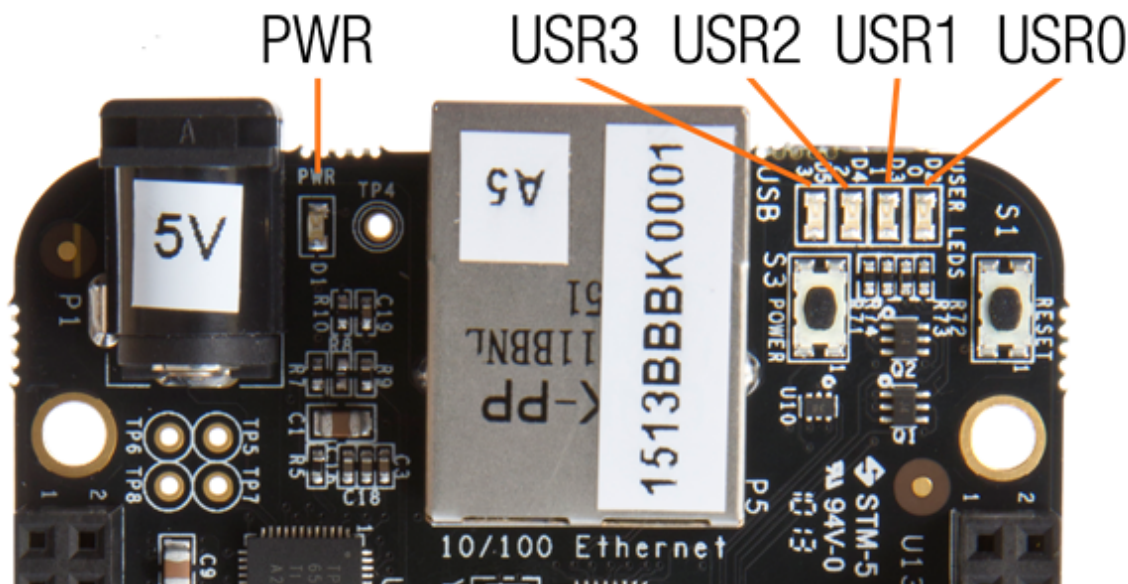
Use the provided USB cable to plug your Beagle into your computer. This will both power the board and provide a development interface. BeagleBone Black will boot Linux from the on-board 2GB or 4GB eMMC. Either BeagleBone Black or original BeagleBone may also boot from a microSD card. Original BeagleBone is provided with a pre-configured 4GB microSD card.

BeagleBone or BeagleBone Black will operate as a flash drive providing you with a local copy of the documentation and drivers. Note that this interface may not be used to re-configure the microSD card with a new image, but may be used to update the boot parameters using the uEnv.txt file.

You'll see the PWR LED lit steadily. Within 10 seconds, you should see the other LEDs blinking in their default configurations.

- USR0 is configured at boot to blink in a heartbeat pattern

- USR1 is configured at boot to light during microSD card accesses
- USR2 is configured at boot to light during CPU activity
- USR3 is configured at boot to light during eMMC accesses



Step 2

Install drivers

Install the drivers for your operating system to give you network-over-USB access to your Beagle. Additional drivers give you serial access to your board.

Operating System	USB Drivers	Comments
Windows (64-bit)	64-bit installer	<p>If in doubt, try the 64-bit installer first.</p> <ul style="list-style-type: none"> • Note #1: Windows Driver Certification warning may pop up two or three times. Click "Ignore", "Install" or "Run" • Note #2: To check if you're running 32 or 64-bit Windows see this: http://support.microsoft.com/kb/827218. • Note #3: On systems without the latest service release, you may get an error (0xc000007b). In that case, please install the following and retry: http://www.microsoft.com/en-us/download/confirmation.aspx?id=13523. • Note #4: You may need to reboot Windows. • Note #5: These drivers have been tested to work up to Windows 10
Windows (32-bit)	32-bit installer	
Mac OS X	Network Serial	Install both sets of drivers.
Linux	mkudevrule.sh	Driver installation isn't required, but you might find a few udev rules helpful.

Note: Additional FTDI USB to serial/JTAG information and drivers are available from <http://www.ftdichip.com/Drivers/VCP.htm>.

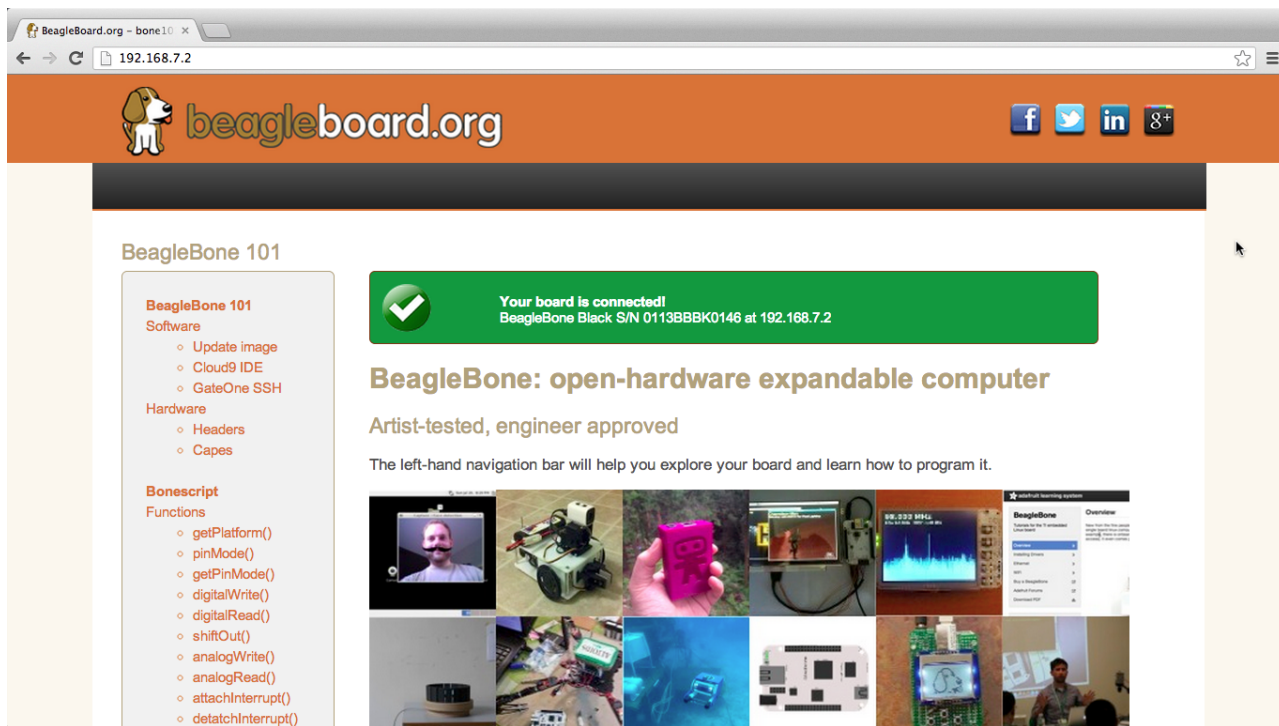
Note: Additional USB to virtual Ethernet information and drivers are available from <http://www.linux-usb.org/gadget/> and <http://joshuawise.com/horndis>.

Step 3**Browse to your Beagle**

Using either [Chrome](#) or [Firefox](#) (Internet Explorer will **NOT** work), browse to the web server running on your board. It will load a presentation showing you the capabilities of the board. Use the arrow keys on your keyboard to navigate the presentation.

- Click here to launch: <http://192.168.7.2>

Older software images require you to EJECT the BEAGLE_BONE drive to start the network. With the latest software image, that step is no longer required.



Troubleshooting

Do not use Internet Explorer.

One option to browse your board is to use this node-webkit based application (currently limited to Windows machines): [beaglebone-getting-started.zip](#).

Virtual machines are not recommended when using the direct USB connection. It is recommended you use only network connections to your board if you are using a virtual machine.

When using 'ssh' with the provided image, the username is 'root' and the password is blank.

Visit beagleboard.org/support for additional debugging tips.

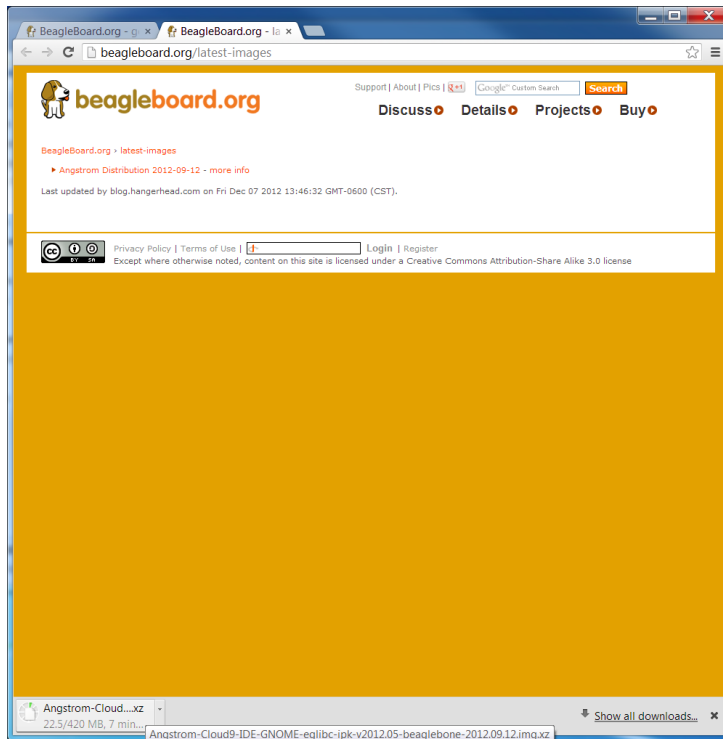
Update board with latest software

Step #1: Download the latest software image

Download the desired image from <http://beagleboard.org/latest-images>.

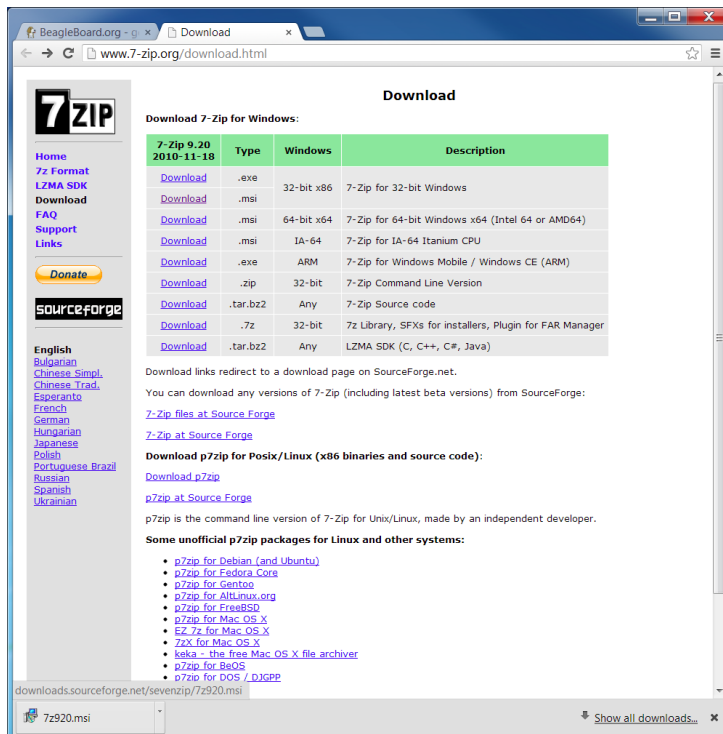
Note: Due to sizing necessities, this download may take 30 minutes or more.

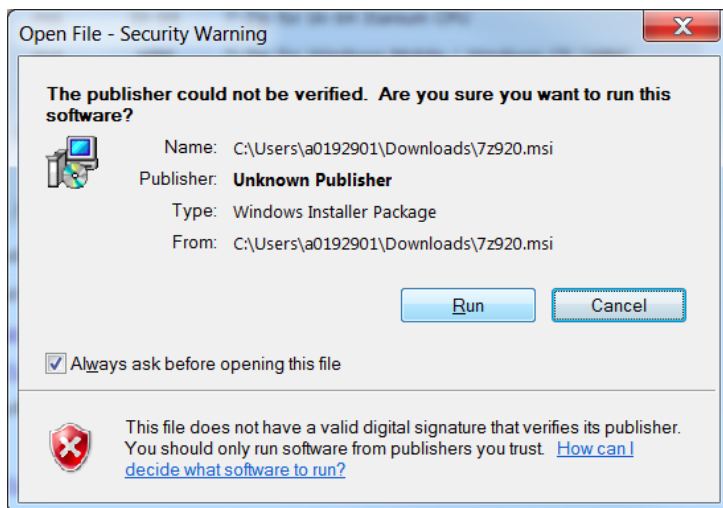
The file you download will have an .img.xz extension. This is a compressed sector-by-sector image of the SD card.



Step #2: Install compression utility

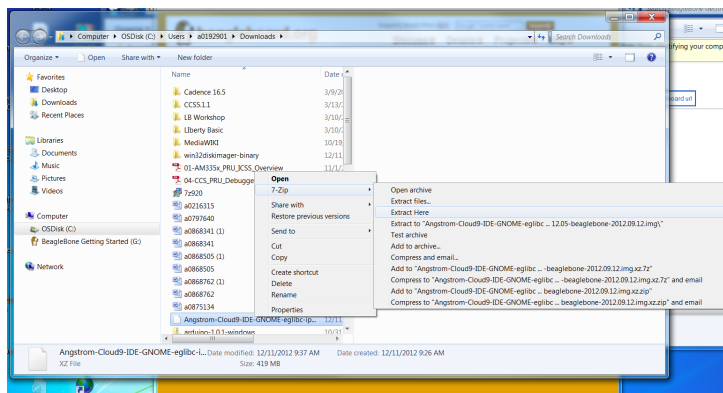
Download and install [7-zip](http://7-zip.org).





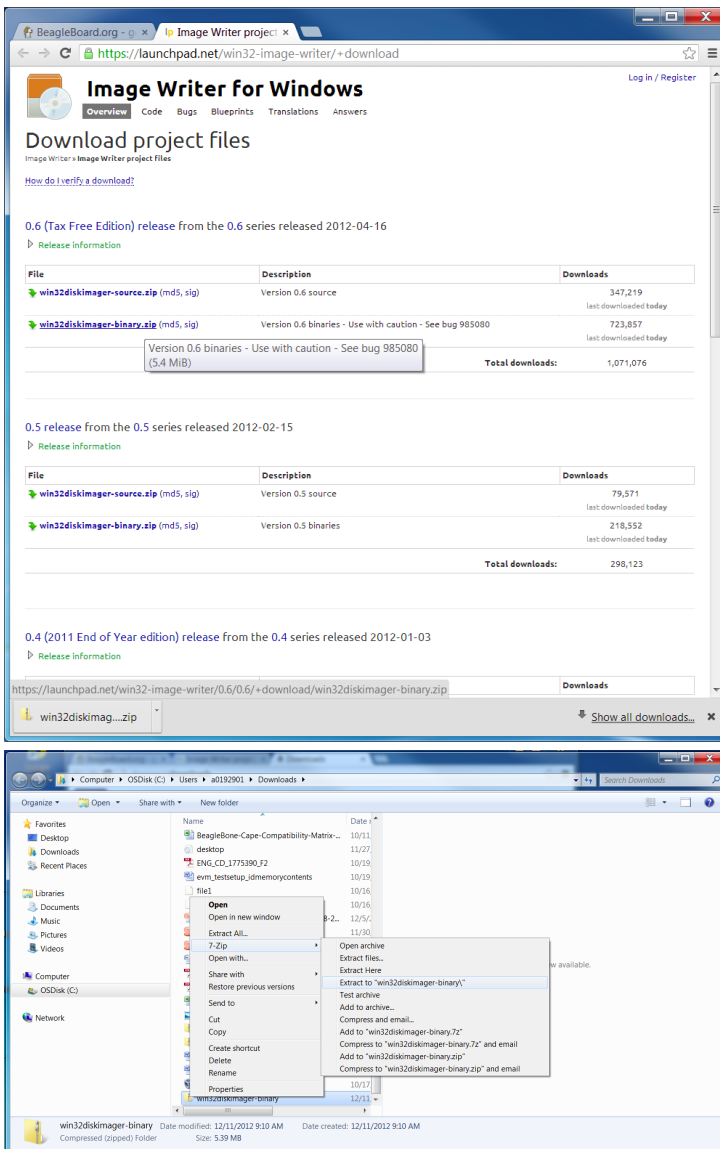
Step #3: Decompress the image

Use 7-zip to decompress the SD card .img file



Step #4: Install SD card programming utility

Download and install [Image Writer for Windows](#). Be sure to download the binary distribution.



Some general help on programming SD cards can be found on the [Ubuntu Image Writer page](#).

Step #5: Connect SD card to your computer

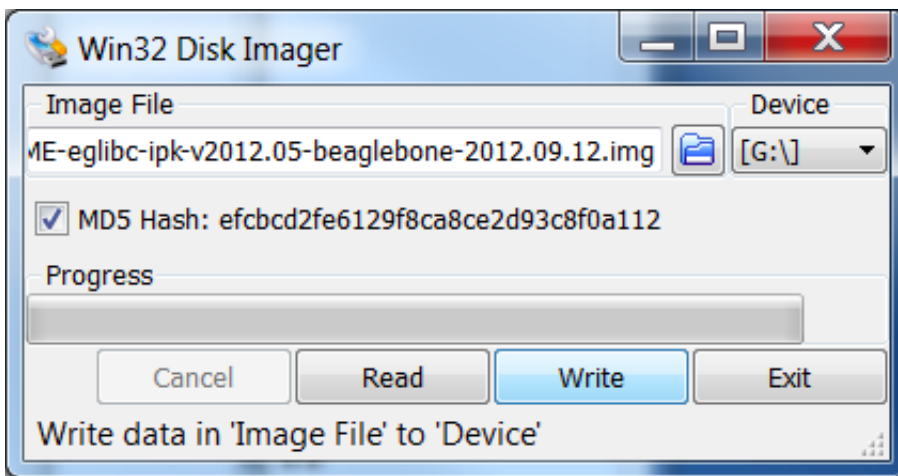
Use the provided microSD card to SD adapter or a USB adapter to connect the SD card to your computer.

Step #6: Write the image to your SD card

Use either the Ubuntu Image Writer or instructions on its page to write the decompressed image to your SD card.

Note: You may see a warning about damaging your device. This is fine to accept as long as you are pointing to your SD card for writing.

Note: You should not have your BeagleBone connected to your computer at this time.



Step #7: Eject the SD card

Eject the newly programmed SD card.

Step #8: Boot your board off of the SD card

Insert SD card into your (powered-down) board, hold down the USER/BOOT button (if using Black) and apply power, either by the USB cable or 5V adapter.

If using an original BeagleBone, you are done.

If using BeagleBone Black and desire to write the image to your on-board eMMC, you'll need to follow the instructions at http://elinux.org/Beagleboard:BeagleBoneBlack_Debian#Flashing_eMMC. When the flashing is complete, all 4 USRx LEDs will be steady on or off. The latest Debian flasher images automatically power down the board upon completion. *This can take up to 45 minutes.* Power-down your board, remove the SD card and apply power again to be complete.

Other currently available software images

Some of the starting images below involve multiple steps to produce an SD card image or otherwise change some of the steps above, so be sure to read all the instructions on their pages. Choose the starting point you want, download or produce the SD card image and follow the steps above.

At the time of release, not all of these distributions support BeagleBone Black, but should soon.

- Texas Instruments releases: [Android](#), [Linux](#), [StarterWare \(no OS\)](#)
- Linux: [Debian](#), [Angstrom Distribution](#), [Ubuntu](#), [ArchLinux](#), [Gentoo](#), [Sabayon](#), [Buildroot](#), [Erlang](#), [Fedora](#)
- Other: [QNX](#), [FreeBSD](#)
- [Projects page](#)

Hardware documentation

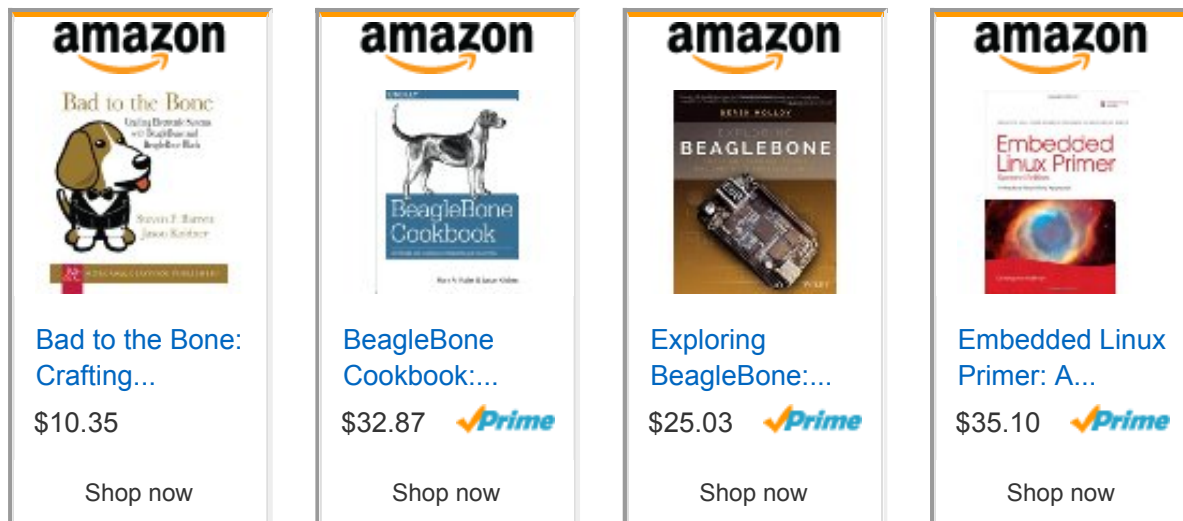
The [BeagleBoneBlack wiki page](#) documents all of the known hardware issues, as well as the latest available software, hardware hardware documentation and design materials.

Time to read that manual and check out the design materials: [BeagleBone Black Docs](#).

Links to design materials for various releases can be found at beagleboard.org/hardware/design.

Books

For a complete list of books on BeagleBone, see <http://beagleboard.org/books>.



Bad to the Bone

Perfect for high-school seniors or freshman university level text, consider using "Bad to the Bone"

BeagleBone Cookbook

A lighter treatment suitable for a bit broader audience without the backgrounders on programming and electronics, consider "BeagleBone Cookbook"

Exploring BeagleBone and Embedded Linux Primer

To take things to the next level of detail, consider "Exploring BeagleBone" which can be considered the missing software manual and utilize "Embedded Linux Primer" as a companion textbook to provide a strong base on embedded Linux suitable for working with any hardware that will run Linux.

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