Localization Cape Manual

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Chapter 1

Notes

1.1 Using this document

All urls and table of contents entries are active. If you click on them they'll take you to the url or document location respectively.

The code view is copy and paste able only on particular pdf viewers. Firefox works.

If you contribute to this document, make sure you add your name to the authors list.

Chapter 2

Beagle Configuration

2.1 Notes

Sometimes you need to reload the udev rules before sshing

```
sudo udevadm control --reload-rules
```

2.2 Hardware

- BeagleBone Black
- Class 10 SD Card

2.3 Configuration

2.3.1 Getting an OS

Retrieve latest IoT (non-GUI) image from: `https://beagleboard.org/latest-images`.

Follow instructions available at `http://beagleboard.org/getting-started` for "Update Board with latest software. You can ignore the start your beagle section.

Configure udev rules for ssh over usb: `http://beagleboard.org/static/Drivers/Linux/FTDI/mkudevrule.sh`. Download and run.

After plugging in the usb cable you should now be able to ssh into the BeagleBone Black

```
ssh debian@192.168.7.2 # password: temppwd
```

2.3.2 Configuring the OS

```
# ssh into the board
ssh debian@192.168.7.2 # password: temppwd

# change default passwords
sudo passwd debian # use brnrmc
sudo passwd root   # use brnrmc

# add nrmc account
sudo useradd -m nrmc
sudo passwd nrmc
sudo chsh -s /bin/bash nrmc
```

2.4 Stuff to look into

Building a custom image with just the stuff we need: `https://github.com/fhunleth/bbb-buildroot-fwup`, `https://elinux.org/BeagleBone_Operating_Systems`

Chapter 3

Localization Cape Requirements

3.1 Power Requirements

3.1.1 Pocket Beagle

Should be the same as the BeagleBone Black. Minimum recommended is 5V @ 1.2A, recommended is 5V @ 2A, which includes room for USB peripherals. See: http://beagleboard.org/support/faq

The actual usage by the BeagleBone Black measured during a test done by Adafruit saw current usage of less than 500mA. Which makes sense since it can operate as a USB device. See: https://learn.adafruit.com/embedded-linux-board-comparison/power-usage. It might actually be lower since there everything is integrated on the pocket beagle.

3.1.2 ELP VGA USB Camera Module

According to the specs available on Amazon this camera doesn't exceed 160mA of power usage. See: https://www.amazon.com/gp/product/B01DRG250Q/ref=oh_aui_search_detailpage?ie=UTF8&psc=1. Since they are USB Devices we can expect no more than 5V @ 500mA.

3.1.3 Dynamixel XL-320

See: http://www.robotis.us/dynamixel-xl-320/ and 6 8.4V