



Android Development and Build Documentation for VCNL40x0 Proximity and Ambient Light Sensor

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1. Introduction

The Beagleboard xM was used as the reference platform for the Android integration modules. This document describes the build setup for compiling the android sources with the VCNL4020 modules for the Beagleboard xM.

2. Reference Sources

The sources available at https://bitbucket.org/sola/android_manifest are used for development. Especially the existing modules *isl29020.c* and *SamsungSensorBase.{h,cpp}* acted as base for the driver and module implementations.

Versions:

- Revision of reference repository: c552d874735a
- Android: 4.0.1 (Kernel 2.6.37)

3. Build Environment

The build environment used for building the VCNL4020 Kernel and HAL (Hardware Abstraction Layer) module is an up-to-date version of Ubuntu Linux 10.04 (lucid). For a complete list of all required packages please read the official documentation located at <http://source.android.com/source/initializing.html>.

3.1. Prepared build environment

To ease the development process a preconfigured virtual machine to build Android for the BeagleBoard is provided.

Local user:

- Username: android
- Password: android
- Location of the Android sources and the build script: */home/android/ics*

4. Compile Sources

In order to compile the sources several commands must be executed. To simplify the build process a build script was created which executes all required steps.

This build script is located at */home/android/ics/build.sh*.

Build script with required steps to build Android:

```
# directory with android sources
export ANDROID_ROOT=/home/android/ics/
```



```
# initialization
cd $ANDROID_ROOT
source build/envsetup.sh # set up environment
lunch full_beagleboard_xm-eng # select target to build

# build android framework
time make -j8

# prepare rootfs
cd $ANDROID_ROOT/out/target/product/beagleboard_xm/
rm -rf rootfs
mkdir rootfs
sudo cp -a ./root/* ./rootfs/
sudo cp -a ./system/* ./rootfs/system/

# build kernel
export ARCH=arm # the beagleboard uses arm architecture
export CROSS_COMPILE=$ANDROID_ROOT/prebuilt/linux-x86/toolchain/arm-eabi-4.4.3/bin/arm-
eabi- # we are building not on an arm system so we need to cross compile
cd $ANDROID_ROOT/board/beagleboard/kernel
time make omap3_beagle_android_vcnl4020_defconfig # actually build the kernel
time make uImage modules -j8 # create boot image

# ensure all partitions of the sd card are unmounted
sudo umount /dev/sdd || true
sudo umount /dev/sdd1 || true
sudo umount /dev/sdd2 || true
sudo umount /dev/sdd3 || true

# partition sd card
cd $ANDROID_ROOT/board/beagleboard/sdcard
sudo LANG=C ./mkcard_sdcard_beagle.sh /dev/sdd

# write boot sector on sd card
cd $ANDROID_ROOT/board/beagleboard/bootscript
./mkbootscr

# wait until partitions are mounted
echo -n "Confirm that SD card is mounted by pressing any key..."
read confirmation

# copy all data to sd card
cd $ANDROID_ROOT
sudo cp -a board/beagleboard/x-loader/MLO /media/boot/
sudo cp -a board/beagleboard/u-boot/u-boot.bin /media/boot/
sudo cp -a board/beagleboard/bootscript/boot.scr /media/boot/
sudo cp -a board/beagleboard/kernel/arch/arm/boot/uImage /media/boot/
cd $ANDROID_ROOT/out/target/product/beagleboard_xm/
sudo cp -a ./rootfs/* /media/rootfs/
sudo cp $ANDROID_ROOT/VCNL40x0-DemoApp.apk /media/rootfs/system/app/
sudo chmod 777 -R /media/rootfs

# unmounts all partitions
sudo umount /dev/sdd1
sudo umount /dev/sdd2
sudo umount /dev/sdd3

echo -n "DONE"
```