Using a BeagleBone: record ADC samples

In order to get more information about raw data from the ADC, a few options exist:

1. One can adapt LuxSenz receiver software to show information on the e-ink screen (often a good option to go for)
2. One can change the LuxSenz receiver software to record short sample traces (less than one second, because memory on the STM32 microcontroller is limited) and send those over UART to a PC
3. One can connect a BeagleBone Black to the ADC and take samples real-time at a higher data rate (e.g. 50 kHz) for a longer period (e.g. 20 seconds), then store the data in a file

This document covers option 3, although it should be preferred to use option 1.

# Connecting the BeagleBone to a laptop

The BeagleBone black can be connected to a laptop using an ethernet cable and a USB-cable. The ethernet cable should be connected before powering the board with the USB-cable. It is important that a laptop is used: when the BeagleBone is recording ADC samples, the laptop’s charger should be disconnected to prevent 50Hz noise leakage from the power grid towards the ADC.

Use any SSH client to login on your BeagleBone Black.

# Taking samples and store those

On the BeagleBone, go to the luxsenz folder and run sudo bash. If you want to adjust the number of samples to be taken (default 1.200.000, but might be changed), it can be set in the script n. Execute the command ./r to set up the BeagleBone for sampling.

Use cd chp13 to go to the folder chp13. If you want to change the sample frequency, you can change PRUADC.c (line 71), save the modified source file and run ./build to compile the new code.

Use the command ./pruadc to let the PRU take samples from the adc. Use ./mem2file 1200000 > output.dat to store 1200000 (number may be adjusted) samples in the file output.dat.