

Laboration 4

This is a real-time app. So it is important that you check how long time the different sections of code needed to execute.

This lab is to use the potentiometer, ADC, TC, USB with CDC task and SD card with FAT file system, to control the logging of potentiometer raw ADC reading to a file in SD card by COM port software interface on PC.

The device USB CDC task is used for communication between COM port software on PC and the AT32UC3A0512. Its function is similar to conventional USART communication. In this lab it should be used without free RTOS.

ADC sampling rate: 50Hz, this means that after logging start, the 2byte long original potentiometer ADC reading should be saved in sequence in a file in a folder on SD card at 50Hz rate. 50Hz logging frequency should be controlled by TC interrupt.

SD card should be accessed through the FAT file system, with the FAT command in ASCII format delivered by device USB CDC task from COM port software on PC.

Two special COM port commands should be defined for ADC logging:

“start” : to start the ADC data logging into the file.

“stop” : to stop the ADC data logging into the file.

for EVK1100:

Initialize the whole microprocessor into the 60MHz.

SD card SPI baudrate should be 12MHz.

After the ADC data is logging into the file, close the file, un-mount SD card, and the power off EVK1100. Then put the SD card into PC to read the file in MATLAB or any other software to plot the raw 50Hz ADC reading into a figure.

Reference:

Drivers:

DRIVERS/ADC

DRIVERS/INTC

DRIVERS/PM

DRIVERS/TC

DRIVERS/SPI

COMPONENTS/MEMORY/SD_MMC/SD_MMC_SPI/

SERVICES/FAT

DRIVERS/USB

Example app:

SERVICES/FAT/FAT_EXAMPLE/fat_example.c

SERVICES/USB/CLASS/CDC/EXAMPLES/cdc_exampl.c