Task_11

ADC, DAC and Serial Communication

Deadline July 22, 2021

Use serial communication to transfer data from MCU-1 to MCU-2 as shown below,

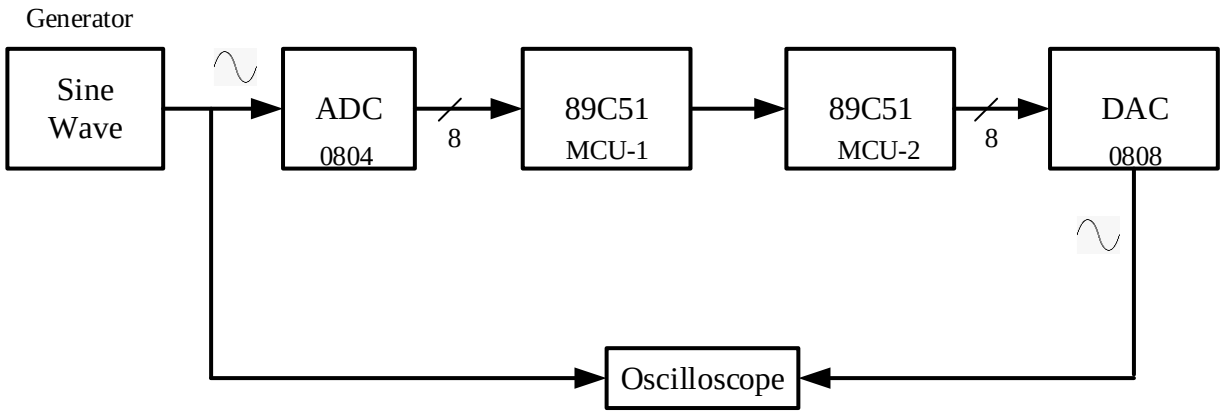

Figure 1: Block diagram of all the components

Implement the project as shown in Figure 1, and submit for grading. Written report (online) has to be submitted as well. No submissions after the deadline will be acceptable. Include the schematic of a circuit in the written report.

Show the original sine wave of signal generator and the final output of DAC on the oscilloscope as shown in figure 1. If you see any distortions in the DAC output, clean them and mention how you did it. Written report must have answers of the questions below,

- Input signal to ADC has a frequency (**f_in)** of 200Hz. How you supplied it.
- What happens if you decrease the sampling rate (**fs**) from 2K, 1K to 0.5K samples per second for ADC?
- What reference voltage (**V_ref**) has been used for ADC?
- What is the relationship of **V_ref** to the amplitude of input signal?
- What will be the step-size?
- What is the input voltage range of ADC?
- Can we increase the frequency of input signal (**f_in)** to 10KHz, if not then why?
- Use a transmission rate of 9600 bps for serial data.
- If transmission rate is increased to 19,200 bps. Is your design able to handle input frequency (f_in) equal to 10KHz, without any loss of information? Assuming **fs** = = 10 x **f_in**.
- What is the limit of DAC, how fast it can work?