Wolfson School of
Mechanical, Electrical and Manufacturing Engineering

Loughborough University

# WSC055 – Laboratory 3

# ADC from a potentiometer

## Introduction

The purpose of this laboratory is to engage the in-built analogue to digital converter (ADC) in the STM32F3 discovery board. This will be tested by using the inbuilt Digital to Analogue Converter (DAC) as a signal generator. You will make use of your previous timer-based interrupt code to read the ADC.

The tasks required to be completed for this laboratory are listed on **page 2.**

During the lab you will have to refer to your lecture notes (or the STM32F303x Reference manual) regarding the bit locations within the registers.

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# Laboratory Tasks

## Task 1: Timer-based Control of ADC input

The task here is to configure the ADC to read an analogue voltage from a potentiometer, and output the an 8-bit value to the LEDs.

1.1. Start with the code from the end of Laboratory 2

1.2. The DAC function and counter is no longer required. Adjust your code so that interrupt sub-routine is used to control the timing of the ADC sample rate.

1.3. Connect a potentiometer to the onboard power supply (5V pin) and GND. The 'signal' connection should go to the input pin of the ADC

## Task 2: Adjusting sample time

2.1. The current sample rate is 1Hz. Using the timer control adjust the sample frequency until the slowest, acceptable sample rate is ascertained

**Questions:**

- How fast do you have to sample in this scenario?
- Comment on the range and accuracy of the digital sampling.

# References

[1] ST, "STM32F3030x Reference Manual," vol. DocID02255, no. April, 2007.
[2] P. D. Hubbard, "Lecture 7 - ADC Interfacing." Loughborough University, 2017.