

ELEC 3300

LAB 6: I²C APPLICATION ON HMC5883L Digital Compass IC

A. OBJECTIVE:

1. To familiarize yourself with the I²C Communication using STM32.
2. To understand the HMC5883L Digital Compass IC module.

B. PRE-LAB ASSIGNMENT:

1. Watch the Video 1 – Part I : Development Environment from the course Canvas.
2. Watch the Video 2 : Intro to CubeIDE from the course Canvas.
3. Study the information about MINI-V3 Development Board from the course Canvas.
4. Study the I2C Section of the Reference Manual of STM32.
5. Study the Tutorial for LAB6.
6. Study the HMC5883L datasheet.

C. LAB SETUP DETAILS

1. According to the information from Tutorial for LAB6, generate a Project for LAB6 Task 1 to Task 2 using CubeIDE.
2. In this LAB, we will use the I2C function from the MINI-V3 development board to communicate to the HMC5883L Digital Compass IC module. For the details, please refer back to Tutorial for LAB6.

D. EXPERIMENT

In this LAB, there are 2 tasks.

Task 1 – Display Compass Result on LCD

Task 2 – Build your 7-segment display circuit according to your student ID and display the last digit of the Digital Compass on the 7-segment display.

E. PROCEDURES

Task 1 – Display Compass Result on LCD

Refer to the information in Tutorial for LAB6, write a program to display angle information from the digital compass. **With the component side facing up**, you should be able to get 0 – 359 degrees reading when the compass is rotating **clockwise**. Below is an example.



You are welcomed to design your own output, say N 20° E, but at least the reading should be consistent.

Show your result to TA.

Task 2 – Build your 7-segment display circuit according to your student ID and display the last digit of the Digital Compass on the 7-segment display.

In order to let you familiar with the board.

You are required to display the last digit using a 7-segment LED.

(e.g. if LCD is displaying 236, the 7-segment LED should display ‘6’)

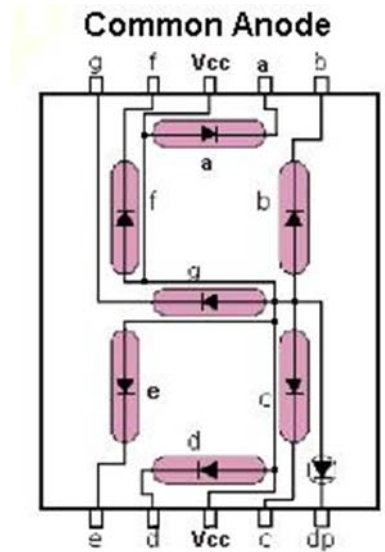
You will be given a Common Anode 7-segment LED

Basically you need to control the 7 pins on and off.

You need to build your own decoding table.

(i.e. how to display 1, 2, 3, 4 ... 0)

Connect the V_{cc} of the 7-segment to 3.3V with a resistor.



Your Student ID _____

Pin Set	Actual Pin Number on STM32	Default Function of the pin on 100pin STM32F103VET6	I/O Function	Alternate Functions	Function on the MINI V3 Development Board	Can use for 7-segment LED?
A						
B						
C						
D						
E						
F						
G						

Show your table, program, hardware and final result to TA.