ELEC 3300

LAB 6: I²C APPLICATION ON GY80

A. OBJECTIVE:

1. To familiarize yourself with the I²C Communication using STM32.
2. To understand the GY-80, four in one sensor module.

B. PRE-LAB ASSIGNMENT:

1. Study the information about MINI-V3 Development Board from the course website.
2. Study the I2C Section of the Reference Manual of STM32.
3. Study the tutorial information related to LAB6.
4. Study the HMC5883L datasheet.

C. LAB SETUP DETAILS

1. Download the LAB6.zip from the course website and unzip it.
2. Open Keil. Go Project → Open Project... Navigate to the project file for this lab, the project file should be under …/LAB6/Project/RVMDK/LAB6.uvprojx.
3. Connect the Fire Debugger according to the information about Fire debugger. Make sure that the Green LED of the Fire Debugger is ON.

D. EXPERIMENT

In this LAB, there are 2 tasks.

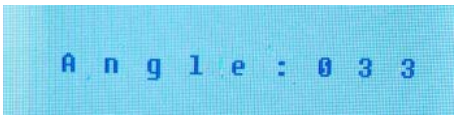
Task 1 – Display Compass Result on LCD
Task 2 – Build your 7-segment display circuit and display the last digit on the 7-segment display

E. PROCEDURES

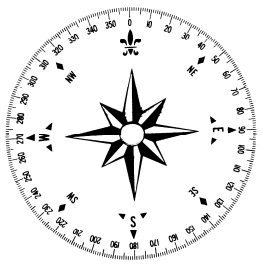
In this LAB, we will use the I²C function from the MINI-V3 development board to communicate to the GY–80. For the details, please refer back to Tutorial 6.

Task 1 – Display Compass Result on LCD

Refer to the information in Tutorial 6, 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.



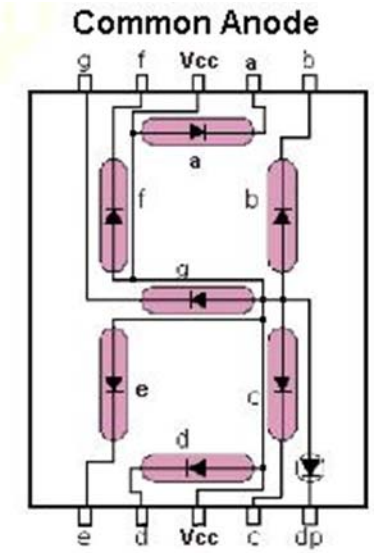
Show your result to TA.

Task 2 – Build your 7-segment display circuit and display the last digit on the 7-segment display
Display Compass Result on LCD

In order to let you familiar with the board.

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

(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 take out 7 pins and control them 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

Connect a resistor to each of a,b,c,d,e,f,g before going to STM32

Please be reminded that the internal LCD and the I^2C used some pins.

You need to find some unused pins for this task.

Show your result to TA.