IoTSSC LAB #2

SENSOR READING WITH I2C*

*Manual based on updated ARM University Program 2014 material and mbed-cli documentation.

OVERVIEW

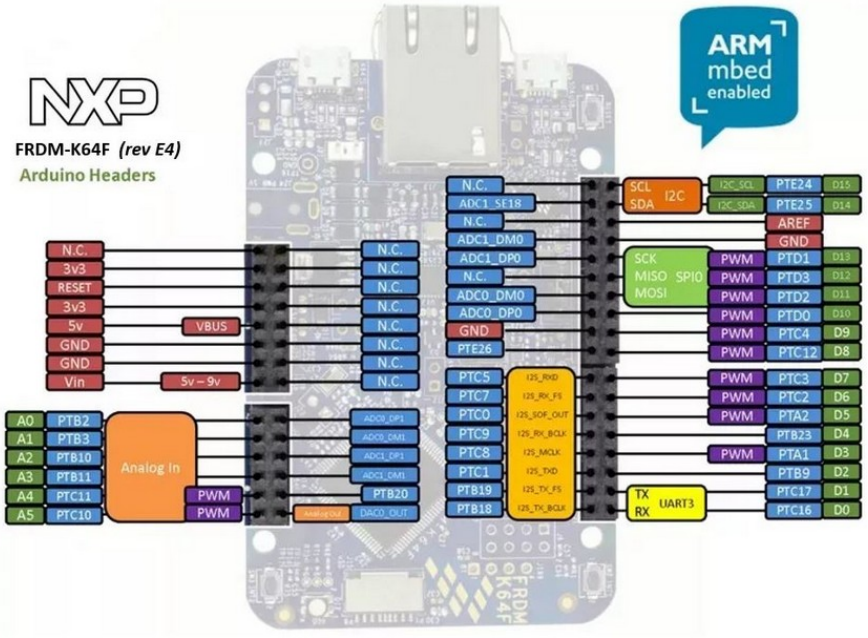
In this lab, you will learn how to perform in practice configuration of an on-board peripheral using the I^2C communication standard. We will connect the board shield with attached accelerometer, wire the shield appropriately and read data readings from the sensor.

IMPLEMENTATION DETAILS

HARDWARE

FRDM-K64F

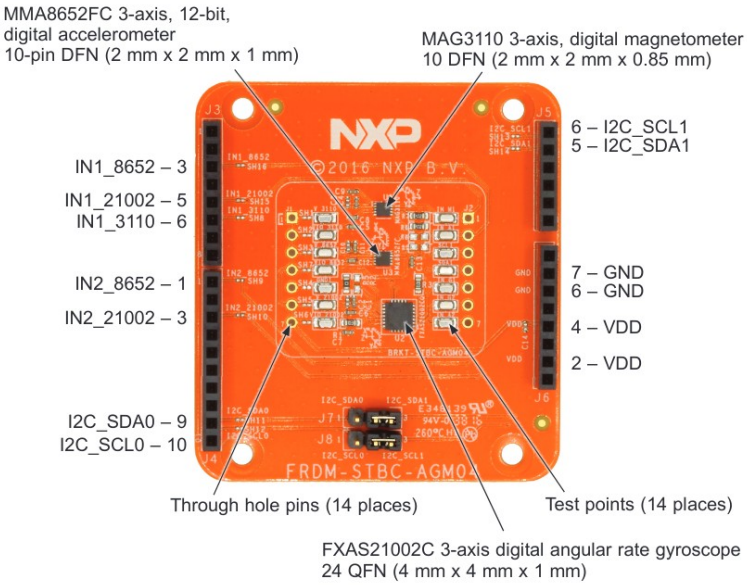
The FRDM-K64F board pin descriptions are shown below:



Note that the pin names used for the mbed API are those outlined in **dark green.**

FRDM-STBC-AGM0

The FRDM-STBC-AGM0 shield pins and sensors are shown below:



The FRDM-STBC-AGM04 shield has an onboard accelerometer, magnometer and gyroscope. In order to connect the shield to the board we must wire the I²C channels together. **Connect the I²C channels together using two of your female to male wires.**

Note that the pins labelled 6 and 5 on the shield correspond to I²C SCL and SDA pins (D15 and D14) on the board above.

SOFTWARE

CREATE A NEW PROJECT

Last time we imported an example project to blink an LED. This time we will create one from scratch using `mbed-cli`. Remember, we are working in a Conda virtual environment. The sequence of commands to get you started would look like this:

```
$ conda activate iotssc
(iotssc) $ mbed new i2c-exercise
(iotssc) $ cd i2c-exercise
```

You can now add to the project the `main.cpp` file provided with these instructions, i.e. copy this file to the project folder.

ADD THE ACCELEROMETER LIBRARY TO THE PROJECT

In order to interface with the accelerometer on the shield we can use the reference library found here. The library can be added to the project with the following command:

```
(iotssc) $ mbed add http://os.mbed.com/teams/NXP/code/MMA8652FC/
```

YOUR APPLICATION CODE

In this lab, you need to perform the following tasks:

- Read the MMA8652 accelerometer library to understand how to initialize and read from the sensor
- Complete the code to read from the accelerometer and print the results to the terminal