**ESE-3014 EMBEDDED SYSTEMS COMMUNICATION PROTOCOLS AND SECURITY**

**LAB 3 Report**

**GROUP No. 2**

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**Introduction:**

In this report, we will explore the i2c interfacing communication for BBB as master and an ADXL345 Accelerometer as a slave device.

**Discussion:**

NOTE: Before going into the Lab activity, we have encountered some issues with the connection between BBB and the host machine via ssh.

We have identified the issue was on the fstab file (from UDEV file for USB mount - lab activity from ESE3005 class). Then we fixing this problem by using the FTDI cable to the BBB via minicom, and then access the fstab file to rewrite the code back to default.

Now we will start these steps in order to interact with i2c device:

First, we should check if the debian machine has the newest update of i2c-tools yet:

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| debian@beaglebone:~$ apt-cache search i2c python-smbus - Python bindings for Linux SMBus access through i2c-dev i2c-tools - heterogeneous set of I2C tools for Linux python3-smbus - Python 3 bindings for Linux SMBus access through i2c-dev debian@beaglebone:~$ sudo apt-get install i2c-tools Reading package lists... Done Building dependency tree  Reading state information... Done i2c-tools is already the newest version (3.1.2-3). 0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded. |

Step 2: Checking the i2c-bus information:

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| debian@beaglebone:~$ i2cdetect Error: No i2c-bus specified! Usage: i2cdetect [-y] [-a] [-q|-r] I2CBUS [FIRST LAST]  i2cdetect -F I2CBUS  i2cdetect -l  I2CBUS is an integer or an I2C bus name  If provided, FIRST and LAST limit the probing range. debian@beaglebone:~$ i2cdetect -l i2c-1 i2c OMAP I2C adapter I2C adapter i2c-2 i2c OMAP I2C adapter I2C adapter i2c-0 i2c OMAP I2C adapter I2C adapter |

Step 3: checking the functions of each i2c:

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| debian@beaglebone:~$ sudo i2cdetect -F 1 Functionalities implemented by /dev/i2c-1: I2C yes SMBus Quick Command no SMBus Send Byte yes SMBus Receive Byte yes SMBus Write Byte yes SMBus Read Byte yes SMBus Write Word yes SMBus Read Word yes SMBus Process Call yes SMBus Block Write yes SMBus Block Read no SMBus Block Process Call no SMBus PEC yes I2C Block Write yes I2C Block Read yes debian@beaglebone:~$ sudo i2cdetect -r 2 WARNING! This program can confuse your I2C bus, cause data loss and worse! I will probe file /dev/i2c-2 using read byte commands. I will probe address range 0x03-0x77. Continue? [Y/n] y  0 1 2 3 4 5 6 7 8 9 a b c d e f 00: -- -- -- -- -- -- -- -- -- -- -- -- --  10: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --  20: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --  30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --  40: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --  50: -- -- -- -- UU UU UU UU -- -- -- -- -- -- -- --  60: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --  70: -- -- -- -- -- -- -- -- |

Step 4: Connect the wires:

ADXL --------> Beaglebone

GND Pin1(GND)

VCC Pin3(VDD\_3.3V)

CS Pin3(VDD)

SCL Pin19(I2C\_2\_SCL)

SDA Pin20(I2C\_2\_SDA)