



Indian Institute Of Technology Palakkad

Microprocessor Systems Design and
Interfacing

Course Project

**Hand gesture recognition using FRDM KL25Z
CORTEX M0+ Processor**

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AIM :

The aim of this project is to recognize hand gestures using FRDM KL25Z board having CORTEX M0+ processor.

COMPONENTS REQUIRED :

- FRDM KL25Z board
- Oscilloscope
- Oscilloscope probes
- Wires

SOFTWARE USED :

- Keil uVision

PROCEDURE :

In this project we aim to detect hand gestures using DRDM KL25Z board. We use Keil uVision which is a comprehensive integrated development environment (IDE) specifically designed for embedded systems development. It provides a complete set of tools and features for writing, compiling, debugging, and deploying software for microprocessors and microcontrollers. We program the board in ARM assembly level language or assembly C. FRDM KL25Z board has inbuilt accelerometer. Here we will be accessing the accelerometer from I2C port of the FRDM board. As we move the board in x,y,z directions, the accelerometer records and displays the values. Then we checks if the accelerometer values meet certain thresholds to identify specific hand movements. And code the processor to turn the internal LEDs to glow red /blue /green colors depending on the directions x,y,z. Now we access output ports and control them using the accelerometer values. Connect the output port to external LEDs, here instead of external LEDs we use oscilloscope.

Then use x, y values of the accelerometer to control output port. Based on the values on the accelerometer, the voltage waveforms yellow and green on the oscilloscope stretch or shrink i.e. increase or decrease in their values. By doing so, we can control external devices using our hand gestures.

Accelerometer on FRDM KL25Z board :

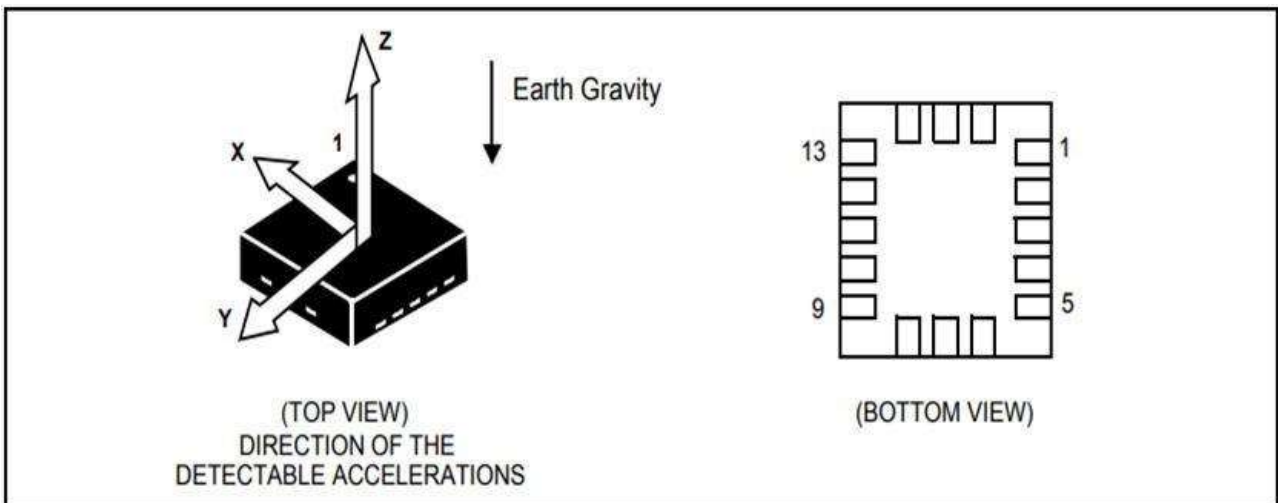
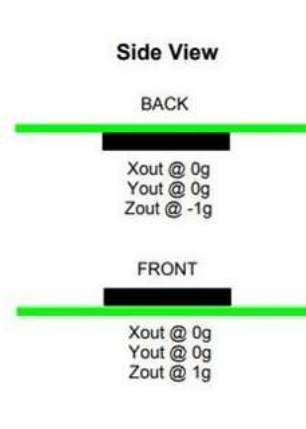
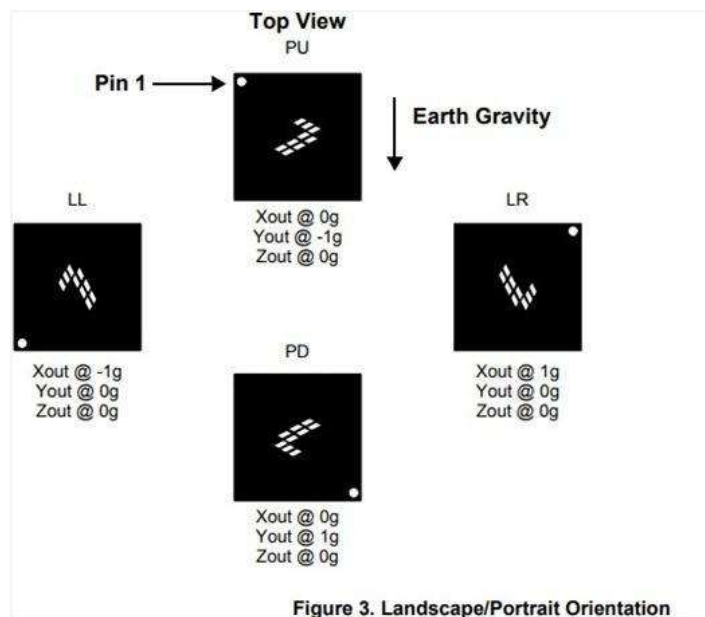
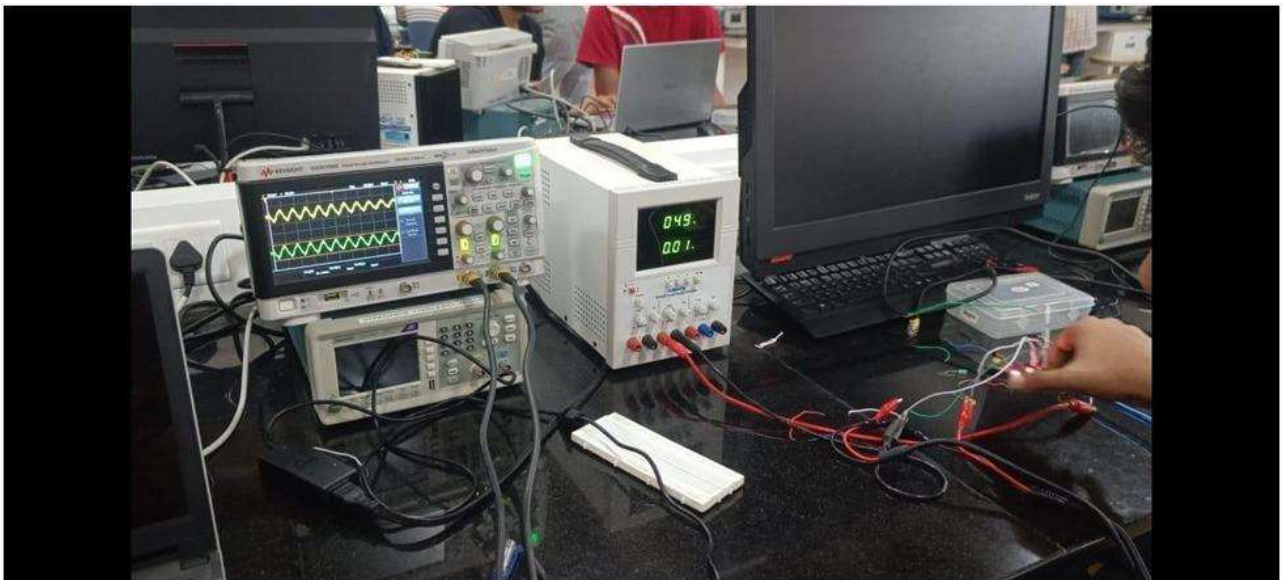


Figure 2. Direction of the Detectable Accelerations

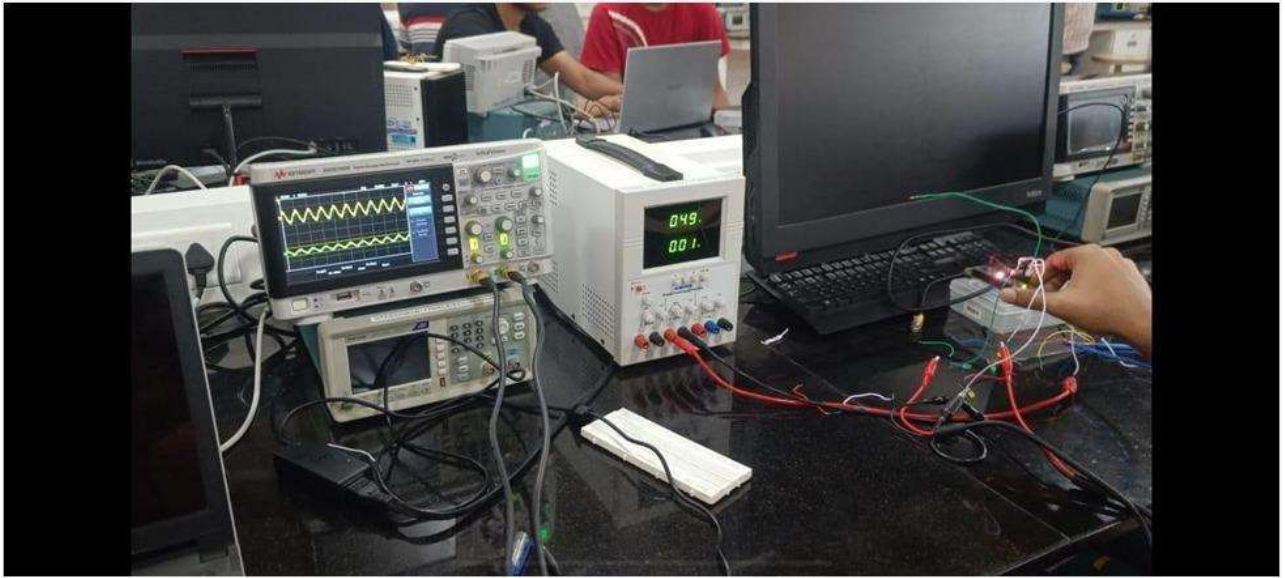




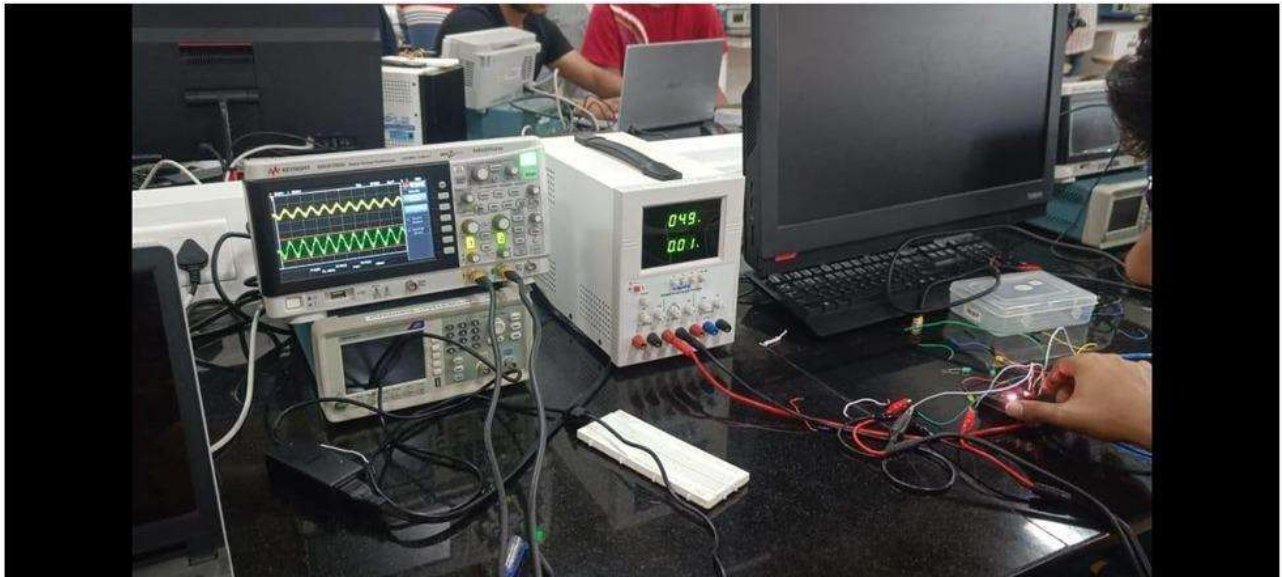
OUTPUT :



When the board is unmoved



When the board is moved in x direction



When the board is moved in y direction