## http://www.digilentinc.com/Data/Products/PMOD-MIC/PmodMIC-obl-400.jpg

This Hands-On session has three exercises

## Exercise 1: Sound Measurement

Goals

* Use the LabVIEW FPGA Toolkit and the NI SPI API to communicate with the microphone
* Simulate the SPI communication before compiling FPGA bitfile to verify functionality
* Plug in the acquisition code into the CompactRIO Waveform Library FPGA Template to handle scaling and data communication between the FPGA and LabVIEW Real-Time

### Part A – Application Description

In this exercise, use LabVIEW and the System on Module to acquire data from a microphone reference board over a SPI bus. Use the build in

### Part B – Code Implementation

#### Step 1

Reviewing the datasheet

1. Figure out Physical Connections
2. Timing and SPI Configuration Settings

#### Step 2

1. Modify the SPI Example with required settings
2. Simulate the VI in Desktop Execution Node

#### Step 3

1. Compile the bitfile and test to see if the VI is operational
3. Step 4

## Exercise 2: Acquire and Process Data

Goals

* Use the CompactRIO Waveform Library to acquire the microphone data from the FPGA
* Use the Sound and Vibration toolkit to obtain meaningful data from the microphone sensor

### Part A – Application Description

### Part B – Code Implementation

#### Step 1

Modify the FPGA code to put into cRIO FPGA Framework for acquisition. Compile the code.

#### Step 2

Modify and test the Real-Time Example to acquire waveforms

#### Step 3

Process the acquired data to analyze frequency content.

## Exercise 3: Develop web service to view in a browser

Goals

* Create a LabVIEW web service to publish the processed data to web server
* Display the processed data to the user with a browser based thin client

### Part A – Application Description

### Part B – Code Implementation

#### Step 1

Creating a Tag set using CVT Web

#### Step 2

#### 3. Step 3