**Team 03**   **8-Channel 10-Bit ADC Sensor Monitoring System**

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EE437 – Intro to Embedded Systems

Instruction Set for Testing Hardware:

* For testing the circuity of the project, a series of steps can be taken to ensure that the circuity is functioning correctly.

1. **If there is no voltage at any component in the circuit,** check all connections in the circuit to make sure that they are stable and can carry voltage at all points. Some reference points can be used to trace back to a broken connection including the output of the sensors, the input/output of the op-amp integrated chip, the input/output of the analog-to-digital converter (ADC) integrated chip, and the input of the liquid-crystal display (LCD) and Bluetooth module. A multimeter can be used to check the output points of the connectors for the desired reference point.
2. **If there is voltage at the input of a component but not at the output,** replace the component with a new one and test the voltage points again to ensure that it is working. If the new component has the same or a similar problem, repeat the process until a working component is found.
3. **If voltage is not being supplied to the circuit,** check the power supply to ensure that there is voltage flowing through the circuit. Reference points for this include the micro-USB port on the Arduino and the 5V port on the Arduino. Similarly, a multimeter can be used to check these points.
4. **If the LCD is not displaying,** this willrequire two points of reference. Check the connections on the 4-pin adapter to ensure that they are properly connected and can carry voltage through them. If the wires are properly connected and can carry voltage, refer to the software to ensure that it is properly setup and can run/configure.
5. **If the LCD values are floating,** check the pull-down resistors at the input of the ADC chip. These pull-down resistors are meant to discharge voltage that is lingering at the input chip.
6. **If the LCD values are wrong,**  refer to the I2C connection points between the ADC chip and Arduino or the Arduino and LCD 4-pin adapter. Test these to ensure that they are properly connected and can carry voltage through them. If the components can properly carry voltage and are connected, check to make sure the software is setup and can run/configure properly.
7. **If the values for the potentiometer are not changing,** check the connection points of the potentiometer. If these points are connected, follow the reference points from the potentiometer to the LCD and check these as well.

User Guide for How to Upload, Download, and Run Installed Programs:

1. Download the application “EE437\_10Bit\_8ChannelADC\_vFinal” to an Android smartphone or tablet.
2. Enable Android Bluetooth and Location Services.
3. Open the application after initializing the Arduino 8Channel ADC.
4. Select the “scan” button.
5. Select the “available devices” button.
6. From the drop-down list, choose the BLE device “EE437\_Team3.”

**\*If the application does not connect in a relatively short time, press the “disconnect” button and try again from step 4\***

1. Select a channel, 1 through 8, for a connected peripheral device by clicking its corresponding button.
2. Select the “start” button from below the graph.
3. To exit, click the “disconnect” button at the top of the screen.