

## **P18026 – Sensor Test Plan**

### **Objective:**

To determine if the sensor is measuring temperature accurately. In order to do this, a second measurement of temperature is required. Measurements are obtained during procedure section and are recorded in the results section. If the results are similar, then the sensor is functioning properly and is acceptable to be used for the project. If the results are not similar, then the sensor is not functioning properly and is therefore not acceptable to be used for the project and a new one must be ordered and retested.

### **Equipment Required:**

- Sensor Chip
- External Sensor (Ex: Thermometer, Indoor Electronics)
- Computer
- MicroController
- LCD screen display
- Program (To Run Code)
- Jumpers
- Multimeter
- Alligator Clips

### **Procedure:**

- Clear a workstation with the additional temperature sensor out of the way but in sight.
- Turn the external temperature sensor on. Monitor the output values for temperature, but do not record the value yet.
- Turn the computer on. Log in. Load the program and code required to test the temperature sensor chip.
- While program and code are loading, connect the multimeter to the temperature sensor chip using alligator clips. Connect the temperature sensor chip to the MicroController using jumpers. Connect the MicroController to the LCD screen display using jumpers. Finally, plug the MicroController into the computer.
- Once set up, run the code on the MicroController.
- The output of the code will display the temperature.
- Record the temperature of both the temperature sensor chip as well as the external temperature sensor in the results section.
- Wait 2 minutes, record measurements again. Repeat until table in the results section is filled.
- Once table in the results section is filled, power down all the components and disconnect the MicroController from the computer.
- Disassemble the set up.

### **Results:**

Temperature Sensor Chip:

| <i>Trial Number</i> | <i>Temperature Reading</i> | <i>Pass/Fail – Why?</i>       |
|---------------------|----------------------------|-------------------------------|
| 1                   | 24.43                      | Pass – Within 1% error margin |
| 2                   | 21.64                      | Pass – Within 1% error margin |
| 3                   | 22.49                      | Pass – Within 1% error margin |
| 4                   | 21.37                      | Pass – Within 1% error margin |
| 5                   | 23.81                      | Pass – Within 1% error margin |
| 6                   | 24.45                      | Pass – Within 1% error margin |
| 7                   | 22.87                      | Pass – Within 1% error margin |

External Temperature Sensor:

| <i>Trial Number</i> | <i>Temperature Reading</i> | <i>Pass/Fail – Why?</i>       |
|---------------------|----------------------------|-------------------------------|
| 1                   | 24.84                      | Pass – Within 1% error margin |
| 2                   | 21.49                      | Pass – Within 1% error margin |
| 3                   | 22.43                      | Pass – Within 1% error margin |
| 4                   | 21.21                      | Pass – Within 1% error margin |
| 5                   | 23.62                      | Pass – Within 1% error margin |
| 6                   | 24.42                      | Pass – Within 1% error margin |
| 7                   | 22.69                      | Pass – Within 1% error margin |

**Notes:**

External Temperature Sensor Used: Thermometer by reism, available in Google App Store

Measurements taken in the EE MSD lab area