DIGITAL MULTIMETER

A digital multimeter is a multimeter that measures variables like current, voltage and resistance on a digital display. Digital multimeters are mostly used nowadays for the measurement of electrical properties in both AC and DC circuits. These multimeters have two probes for the positive and negative terminal which are colour coded as black and red respectively. The black terminal is plugged into the port of a multimeter which is marked as COM, whereas the red is used to touch the various contacts where the measurement of the variable is required.

The digital multimeter has a knob in the centre which can be turned to determine the different range of the measurements required. It also has a screen on which the results of the measurements are displayed.

Features -

- 3³/₄ Digital Multimeter
- 4000 CountsLarge LCD Display with Auto/Manual Range
- No Power-OFF under natural operation
- Data Hold, Max. / Min. Value Hold
- Capacitance, Frequency / Duty Cycle, Temperature and Transistor Test



DM 97

Dimension: 185 (H) X 93(W) X35(D)mm

SPECIAL FUNCTION -

- Diode test-yes
- Transistor testing-yes
- Continuity buzzer- Lower 30Ω±
 10Ω Low Battery display- Lower
 2.4V
- Auto power off 30 mins(approx)
- Function protection-yes
- Input impedance-10 M Ω
- Sampling rate-3 times per second
- AC frequency response-40-400Hz
- Power-F3V AAA

Basic Function	
DC Voltage	
AC Voltage	
DC Current	
AC Current	
Resistance	
Capacitance	
Frequency	
Celsius	
hhFE (NPN or PNP)	

Range	Basic Accuracy
0.1mV 1000V	±(0.5% + 4 digit)
0.1mV 750 V	±(0.8% + 6 digit)
0.1µA 20A	±(1.0% + 5 digit)
0.1µA 20A	±(1.5% + 5 digit)
0.1Ω 40ΜΩ	±(0.8% + 2 digit)
10pF 200µF	±(3.5% + 8 digit)
0.1Hz 30MHz	±(0.5% + 4 digit)
-40°C 1000°C	±(0.8% + 4 digit)
0 100	_

TEMPERATURE SENSOR CALIBRATION PANEL



Anshuman Temperature sensor calibration panel experimental setup is used to calibrate and validate the performance of temperature sensors (such as thermocouples, RTDs, thermistors, etc.) to ensure their accuracy and reliability. Calibration ensures that the sensor provides precise and accurate measurements in real-world applications.

Step-by-Step Experimental Setup Process

1. Set Up the Calibration Panel:

- Place the temperature sensors (sensor under test) and the reference sensor in the calibration setup (e.g., thermal bath or dry-block calibrator).
- Connect both the sensor under test and reference sensor to the data acquisition system.

2.Pre-Test Conditions:

- Ensure the temperature environment (e.g., thermal bath or chamber) is stable and at a known initial temperature.
- Calibrate the reference sensor (if needed) using a certified temperature standard.
- 3. Measure Sensor Output:
 - Gradually vary the temperature in the calibration setup. Record the output of both the reference sensor and the sensor under test at different temperature points (e.g., 0°C, 25°C, 50°C, 100°C, etc.).
 - For thermocouples, ensure the temperature is stable before recording the readings.

4. Data Logging:

- Use the DAQ system and calibration software to record the readings from both the test sensor and the reference sensor.
- Ensure the data includes the measured temperature at each point, as well as the corresponding output from the sensor under test.
- 5. Data Comparison and Adjustment:
 - Compare the readings from the sensor under test with those from the reference standard.
 - If necessary, adjust the sensor under test by using software to correct or offset the readings to match the reference sensor. Alternatively, mechanical or electrical adjustments may be made, depending on the sensor type (e.g., trimming a thermistor or recalibrating the sensor).
- 6. Generate Calibration Curve:
 - Once all data points are recorded, generate a calibration curve that plots the temperature readings from the reference sensor versus the sensor under test. This will show the accuracy and linearity of the sensor.

7.Final Adjustments:

 If the sensor under test has calibration points that are consistently off, adjust the sensor's output using the calibration software, or replace the sensor if it is out of specification