

# Flow & Temperature Laboratory



In this lab, we use bench-mounted Measurement Trainer - Temperature MTT001 and Measurement Trainer - Flow MTF001 from National Instruments. These are programmed using LabVIEW.

**Measurement Trainer - Flow MTF001** is used to teach students how to measure the Flow with four different types of flow meters and comparing between their different characteristics. The flow meters used in MTF001 are; Paddle Wheel flow meter, Magnetic flow meter, Venturi flow meter and Rotameter.

**Measurement Trainer - Temperature MTT001** is used to teach students how to measure temperature with three different types of thermometers, and comparing between their behaviors. The thermometers used in MTT001 are J-type thermocouple, RTD PT-100 and NTC thermistor.

## Experiments

- Paddle Wheel Flowmeter Characteristics
- Magnetic Flowmeter Characteristics
- Venturi Flowmeter Characteristics
- Flowmeters Comparison
- Thermocouple Characteristics
- RTD Characteristics
- Thermistor Characteristics
- Thermometers Comparison

## Major Equipment

- Flow Trainer MTF001
- Temperature Trainer MTT001
- NI PXIe-8133 - 1.73 GHz Quad-Core PXI Express Controller
- NI PXI-8110 - 2.26 GHz Quad-Core PXI Embedded Controller



Temperature Trainer MTT001

1. Glass Thermometer
2. Thermistor Thermometer
3. RTD Thermometer
4. Thermocouple Thermometer
5. Hot Plate
6. Heater Indicator
7. Power
8. Temperature Controller



Flow Trainer MTF001

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|----------------------------|------------------------|
| 1. Electric Control Box    | 7. Magnetic Flow Meter |
| 2. Tank 1                  | 8. Solenoid Valves     |
| 3. Tank 2                  | 9. Flow Control Valve  |
| 4. Rotameter               | 10. Pump               |
| 5. Paddle Flow Wheel Meter | 11. Level Switch       |
| 6. Venturi Flow Meter      |                        |