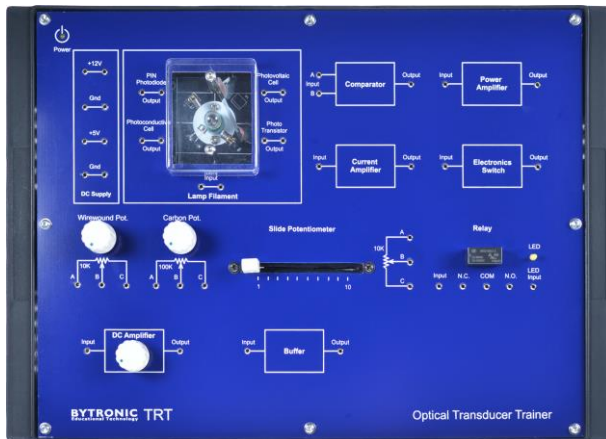


## TRT – Transducer Trainer



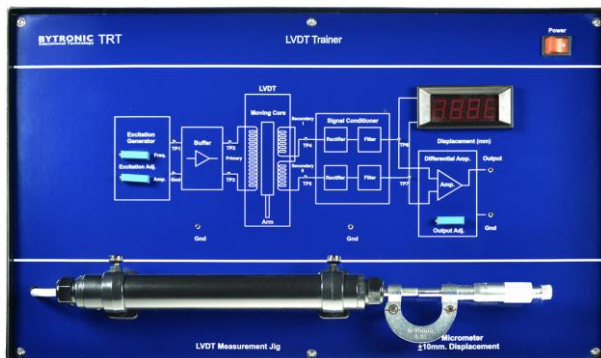
### Optical Transducer Trainer

- Four different optical Transducers
- Study of Transducer controlled switching
- Functional blocks indicated by on-board mimics



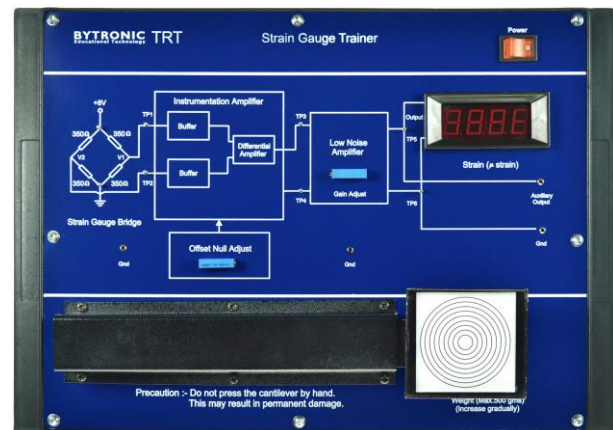
### Temperature Transducer Trainer

- Four different temperature Transducers
- Study of Transducer controlled switching/alarm systems
- On-board signal conditioning circuitry



### LVDT Trainer

- Sensitive, Linear, Stable and Accurate
- 3½ digit LED display with polarity indicator
- LVDT displacement measurement jig with micrometer
- On-board excitation generator
- Amplitude adjustment for excitation generator



### Strain Gauge Trainer

- Test points to observe inputs and outputs
- Onboard gain adjustment
- Offset null adjustment
- 3½ digits LED display
- On-board cantilever arrangement

TRT is a collection of four transducer trainers which include Optical, Temperature, Strain gauge and LVDT. The four different units provide learning capabilities as an introduction to elements of transducers.

The Optical Transducer comprises; Photoconductive, Photovoltaic, Phototransistor and PIN diode sensors.

The Temperature Transducer trainer comprises; NTC Thermistor, Platinum RTD, K Type Thermocouple, IC Temperature sensor.

The LVDT (Linear Variable Differential Transformer) is the most widely used inductive transducer for displacement measurement. LVDT is a secondary transducer which converts the displacement directly into an electrical output proportional to the displacement. The trainers seven-segment LED display shows displacement in mm with a sensitivity of 10mV/mm in the range of 10mm.

The strain gauge trainer uses a cantilever beam arrangement to produce strain, with weights placed on the free end of the cantilever. The seven-segment LED display shows strain in micro strain units. Different weights are provided to perform linearity and sensitivity experiments.

## Experiments

- Characteristics of Filament Lamp
- Characteristics of Photovoltaic Cell
- Characteristics of Photoconductive Cell
- Characteristics of PIN Photodiode
- Characteristics of Phototransistor
- Optically Controlled Switching System
- Characteristics of IC Temperature Sensor
- Characteristics of Platinum RTD
- Characteristics of NTC Thermistor
- Characteristics of NTC Bridge Circuit
- Characteristics of K type Thermocouple
- Input Output Characteristics of a LVDT
- Determination of Linear Range of Operation of LVDT
- Determination of Sensitivity of LVDT
- Measurement of Phase Difference between LVDT Secondary Winding
- Study of Strain Measurement using Strain Gauges and Cantilever Assembly
- Determination of Linear Range of operation of Strain Measurement
- Determination Sensitivity of Trainer
- Temperature controlled Alarm System

## Specifications

### Optical Transducer

Transducers: Photoconductive Cell, Photovoltaic Cell, Phototransistor, PIN Photodiode  
Light Source: Filament Lamp  
Signal Conditioning Circuitry: Power Amplifier, Current Amplifier, DC Amplifier, Comparator, Electronic Switch and Buffer  
Input Circuits: Rotary and Slide Potentiometers  
Output Circuits: Relay and LED  
Power: 100-240V AC, 50/60Hz  
Weight and Dimensions: W326, D252, H52; 1.5Kg approx.

### Temperature Transducer

Transducer: N.T.C. Thermistor, Platinum R.T.D, K Type Thermocouple, IC Temperature Sensor  
Heating Element: Wirewound resistance 47 $\Omega$ , 10W  
Signal Conditioning Circuitry: Instrumentation amplifier, X100 and DC amplifier, comparator and electronic switch  
Input Circuits: Rotary and slide potentiometers  
Output Circuits: Relay and buzzer  
Power: 100-240V AC, 50/60Hz  
Weights and Dimensions: W326, D252, H52; 1.5Kg approx.

### LVDT

Measurement Range: 20mm ( $\pm 10$ mm)  
Excitation Frequency: 4KHz approx.  
Excitation Voltage: 4Vpp approx.  
Sensitivity: 10mV DC/mm  
Linear Range: Full scale  
Signal conditioner output: 0.1V DC or maximum displacement  
Display: 3½ digit LED with polarity indicator  
Micrometer scale: 25mm  
Micrometer least count: 0.01mm  
Power: 110-260V AC, 50/60Hz  
Weights and Dimensions: W326, D252, H52; 1.5Kg

### Strain Gauge

Strain Gauge (350 $\Omega$ ): 4 off  
Gauge factor: 2.1  
Maximum bearable weight: 500gm  
Cantilever material: Stainless steel  
Cantilever Width: 2.5cm  
Cantilever thickness: 0.16cm  
Cantilever length: 20cm  
Bridge voltage: +8V DC  
Bridge configuration: Full bridge  
Display: 3½ digit LED  
Power: 230V  $\pm 10\%$ , 50Hz  
Weights and Dimensions: W340, D240, H105; 3.5kg

## Ordering Information

**Model Number:** TRT  
**Consists of:** Optical Transducer Trainer  
Temperature Transducer Trainer  
LVDT Trainer  
Strain Gauge Trainer  
Manual and set of cables



*Notes. Specification is subject to change without notice. All dimensions are in mm unless otherwise stated*

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