

TK2942 SET

Transducers Kit TK2942

The TK2942 introduces students to the concepts and understanding of common transducer devices and standard signal conditioning methods. The kit consists of a Measurement Package, Power Amplifier and Test Rigs, and three Transducer Kits covering:

Electro-Mechanical Transducers

- Linear Variable Resistor
- Variable Area Capacitor
- Variable Distance Capacitor
- Variable Inductor
- Linear Variable Differential Transducer (LVDT)
- Strain Gauge

Heat Transducers

- Thermistor
- Platinum resistance
- Thermocouple
- Reed Relay
- Bimetallic switch

Light Transducers

- Photoconductive cell
- Photodiode
- Phototransistor
- Photovoltaic cell



Measurements Package

Wheatstone Bridge

With selectable ratio arms of 100 Ω , 1k Ω , 10k Ω , & 100k Ω .

Operational (Differential) Amplifier

With switched gains of 1, 10, 100 and 1000 is used as a general purpose amplifier. The differential input allows it to be used with the Wheatstone Bridge.

Oscillator

Centre frequency 465kHz, used with the inductive and capacitive transducers.

Discriminator

FM discriminator used with the oscillator module. Also included are components for a phase-sensitive rectifier.

Power Amplifier

With unity gain and output capability of 4 watts.

Curriculum Coverage

Electro-Mechanical Transducers

1. Utilising variation in resistance:

- Wheatstone Bridge
- Amplifiers
- Liquid depth & resistivity
- Displacement
- Strain

2. Utilising variation in capacitance:

- Wheatstone Bridge for capacitance
- Variable area & distance capacitive
- Use with an oscillator and discriminator in FM systems

3. Utilising variation in inductance:

- Electromagnetic inductance
- Variable inductance transducer
- Mutual inductance transistor
- Linear variable differential
- Transformer
- Transducer circuits

Heat Transducers

- Heat distribution
- Thermocouples
- Thermistors
- Resistance thermometers
- Temperature control (on/off)
- Temperature control (continuous)

Light Transducers

- The nature of light
- Photoconductive cell
- Semiconductor photodiode
- Photovoltaic cells
- Phototransistor
- Spectral response