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Product Name :	**Product Code :**
Complete training system for Sensors and Actuators	CE184

Description :

Complete training system for Sensors and Actuators

Technical Specification :

Complete training system for Sensors and Actuators
Complete training system for the study of sensors and transducers, with the following characteristics: Curriculum Coverage
Electro-mechanical transducers utilising variation in resistance
Wheatstone bridge
Amplifiers
Liquid depth & resistivity
Displacement
Strain
Electro-mechanical transducers utilising variation in capacitance
Wheatstone bridge
Variable area & distance
Use of an oscillator & discriminator in FM systems
Electro-mechanical transducers utilising variation in inductance
Electromagnetic inductance
Variable inductance transducer
Mutual inductance transistor
Linear variable differential transformer
Transducer circuits
Light transducers

The nature of light
Photoconductive cell
Semiconductor photodiode
Phototransistor
Spectral response
Heat transducers
Heat distribution
Thermocouples
Thermistors
Resistance thermometers
Temperature control

Features:
Bench-top study of transducers
Comprehensive manual includes theory, 28 practical assignments and industrial applications
Uses 14 industrial transducers
Includes a.c. & d.c. instrumentation schemes
Minimal set-up times ensure experimentation time
Comprehensive experiment manual

Technical data:
Dimensions (net): Instrumentation module: width 295 mm x depth 220 mm x height 72 mm,
power amplifier: width 107 mm x depth 107 mm x height 76 mm
Weight (net): Instrumentation module 1.0 kg, power amplifier 0.45 kg
The experiment is complete, with all necessary hardware, software, experimental and device manuals and accessories to perform the experiments.
Each system is composed minimally by the following components:
1x Set of Electrical Mechanic Transducers
Six linear displacement transducers are provided, each of which mounts onto the Test Rig. The Test Rig carries a movable platform which supports a micrometer. This is used to provide the transducer displacement, the whole platform being moved to provide large displacements. The following linear transducers are provided:
Linear Variable Resistor
Variable Area Capacitor
Variable Distance Capacitor
Variable Inductor with sliding rod carrying a ferrite slug core. Linear Variable Differential Transformer (LVDT) - This uses a sliding core similar to the variable inductor and is used in conjunction with a phase-sensitive rectifier housed in the instrumentation module.
1x Straing Gauge
In addition to the linear displacement transducers, a Probe Assembly is provided for liquid depth measurement. This is intended to be used in salt water. Variations in depth or salt concentration vary the resistance between the probes.
The resistive transducers are used either in a Wheatstone Bridge or in the feed- back loop of an operational amplifier.
1x Set of Light Transducers
A light source is provided by a lamp which attaches to the movable platform of the linear transducer test rig. A transducer box contains:
Photoconductive cell
Photodiode
Phototransistor
The mechanical arrangement permits each transducer to be rotated at right angles to the optical axis of the rig so that polar response curves can be obtained for each device. By adjusting the distance between the lamp and transducer, an output voltage/intensity characteristic may be plotted. A set of colour filters is provided. These clip over the window of the transducer box to enable the spectral responses of the various transducers to be

measured. The theory and operation of each device are fully described in the manual.
1x Set of Heat Transducers
The test mount for the temperature transducers consists of a heat bar. This is equipped with a heater at one end and a multi-finned heat sink at the other. The temperature gradient produced along the bar is utilised to explore the characteristics of a number of transducers. These are attached to the bar in the desired position by a clip. Calibration is achieved by means of mercury in glass thermometer dipped into a water tank which may also be clipped to the bar. An auxiliary heater is provided which may be used in conjunction with the power amplifier to perform closed-loop temperature control experiments. Provided for these assignments are:
Thermistor
Platinum resistance
Thermocouple
Bi-metallic switch
The manual explains the use of analogue transducers as temperature measuring devices together with the use of the thermistor in a continuous temperature control system. The switching device is used to demonstrate on-off control of a heater.

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