Product N	lame :					
Complete	training	system	for	Sensors	and	Actuators

Product Code : 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.

## Naugralabequipments

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