

Product Name :
Sensors and transducers

Product Code :
STSS47



Description :

Sensors and transducers -

The Sensor and Transducer Trainer should be a modular training system which covers the theory, fundamental concepts and applications of sensors and transducers. The trainer should have many experimental modules covering a wide range of various types of sensors and transducers including standard signals processing methods, which are required by many applications. The trainer should consist of a base station into which a number of experiment modules can be fitted. A variety of modules should be provided which extensively covers the topics of sensors and transducers.

Educational Objectives:

? Introduction to
Transducers and Sensors.

? Using various signal
conditioning methods in transducer circuits.

? Using instrumentation
amplifiers to amplify transducers output signal.

? Processing transducer
signals to get meaningful reading of the measurements.

? Application of
transducer and signal processing for electronic meters.

? Troubleshooting
Transducer Circuits.

Specification:

a. Base Station

The student base station serves as platform for carrying out the experiments. The experiment modules should be inserted into the base station and inter-connected to the services provided through 2mm sockets and test leads. The base station should provide for all the primary needs of the experiment modules and includes a variety of components such as the following:

Converter : 8
bit ADC/DAC

Switches : 8
SPDT switches

Amplifier :
Instrument amplifier

Potentiometer : 2
Potentiometer

Relays :
Two 12VDC relays

DC Fixed Power : -5V, 0,
+5V, -12V, 0, +12V

DC Variable Power : 0 – 15V

DC Power Overload Indicator

Input Voltage :
220/240 VAC, 1 phase, 50Hz

AC fuse and main power switch

b. Experiment Modules

1. Specialized Electronics Circuits

This should consist of a set of several boards that covers aspects of specialized electronic circuits that are commonly required for the study of sensors and transducers. Topics and circuits should covered include Digital to Analog conversion, Analog to Digital conversion, Voltage to Frequency Conversion, Frequency to Voltage Conversion, Bridge Circuits, various filter circuits, signal amplifiers, signal conditioning linearization.

2. Temperature Sensor Module

Controlled temperature device with precision integrated-circuit temperature sensor which can be used to demonstrate aspects of temperature control as well as provide for a regulated load device for Temperature module.

3. Proximity Sensor Module

Rotational speed module with inductive proximity sensor which can be used to demonstrate aspect of speed control for rotational motion system

4. Pressure Measurement Module

This module covers the main methods of measuring for pressure in various applications. Piezo resistor sensor which can use to read pressure of liquids and gasses

5. Photo Electric Sensors Module

These cover a wide range of devices that can be used for many applications. General photo/light sensor module which can be used to demonstrate aspects of light intensity control for automatic lighting system

6. Position and Displacement Measurement Modules

These modules are offered which are commonly used to detect position and displacement of objects

- LVDT Transducer Module
- Ultrasonic Transducer Module

7. Air Flow Sensors Modules

These modules contain a variety of units that are common to the measurement of air flow.

- Differential Pressure Module

- Paddle Wheel type Flow meter Module

8. Sound Sensors Modules

This modules cover the principles in the reception of sound waves and their signal processes.

- Condenser Microphone
- Dynamic Microphone

9. Strain Gauge (Loadcell) Modules

This module covers a general force transducer that can be used for many applications. Load cell t sensor module which can be used to demonstrate aspects of force and torque measurement as well as the signal conditioning aspects.

Technical Specification :
Sensors and transducers

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