



Standard range of plug-in modules supplied:

Hall effect

Inductive proxy

Linear position sensor

NTC Resistor

Photosensors

Pressure-to-voltage

PT100

Type K Thermocouple

Slotted opto sensor

Strain Gauge

Visible light beam

Wheatstone Bridge



TRANSDUCER TRAINER

ATT-500

Description

Consists of a range of plug-in transducer modules which are compatible with the precision drilled Ultra-High Impact (UHI) acrylic mounting matrix.
A low voltage power supply module (240v to 12/24V AC and DC) is bolted to the side of the steel-frame matrix

A brief description of the standard range of the 12 transducer modules is:

Type K Thermocouple:

Uses a 12 Volt soldering iron to provide a heat source to the thermocouple, which is suitable for a range of temperatures up to 400 degrees Celsius.

Photo Sensor:

Includes a phototransistor, photodiode, photoconductive cell and photovoltaic cell, which are enclosed in a black plastic container with a clear plastic lid, illuminated by a lamp.
The voltage to the lamp filament is controlled by a variable resistor.
The characteristics of each of the 4 sensors can be studied.

Inductive sensor:

Uses an industrially-rated sensor mounted on the same plane as an acrylic bar fitted with a brass machine screw at one end, and a steel machine screw at the other end.
The acrylic bar may be rotated by hand to position either the brass or steel screw close to the sensing face. The devices can be relayed directly.

Strain Gauge:

Consists of a 10mm strain gauge element with a nominal resistance of 120 ohms, which is glued to a length of a spring steel to which a bending force can be applied by an adjustable screw acting via a spring balance calibrated in Newtons.
This transducer uses 2 plug-in modules and is used in conjunction with the indicator unit.



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Resistance Bulb PT- 100

Uses 12v soldering iron to provide a heat source to the PT-100, and is suitable for temperatures up to 200 degrees Celsius.

Wheatstone Bridge:

This is laid out in the traditional configuration, with the 4 terminals at the top of the module providing connecting points for the various elements of the bridge. Two variable resistors (1K and 100K) are provided, but other values may be used.

Slotted Opto:

Uses a slotted opto switch with logic, the beam of which is interrupted by a disc with two slots on its periphery. The disc is driven by a 12v DC motor, the speed of which may be varied. The pulses from the slotted opto drive into a 4017 chip, which provides sequential outputs for nine l.e.d. drives, which in turn drive nine leads mounted above the motor.

NTC Resistor:

Uses an epoxy-coated bead-type thermistor which is embedded in a heat sink, to which a TIP 3055 is attached. A potentiometer feeds a variable base drive to the transistor, which heats up the heat sink as it dissipates the heat generated by up to 0.5A of current flowing through it to a resistive load. Ammeter on the module reads transistor collector current, enabling assessments to be made of the variation in the WTC resistor's resistance versus collector current temperature.

Visible Light Beam:

Uses a cadmium sulphide LDR cell as its sensing element and a 24 volt globe as the light source. The LDR cell receives the light from the globe through a black plastic tube, thus eliminating spurious response from ambient lighting conditions.

Pressure Voltage:

Uses a piezo-resistive gauge which is pressured by a 2.5ml syringe coupled to it via a clear plastic pipe. The gauge has an output of 10mV per PSI. The maximum pressure to which the gauges should be subjected is 5 psi, which represents 0mV output.



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Linear Position:

Uses a 5K linear variable resistor driven by a hand-operated positional screw. This sensor is essentially a variable resistor laid flat with its wiper attached to a plunger, which has a spring-return feature.

Hall Effect:

Uses a Hall Effect chip, which is mounted under the path of a bar magnet fitted so that it is able to be rotated by hand in order to place either the North or South pole over the chip. It has a differential output stage, which provides one O/P, which increases linearly with an increasing magnetic field, over a range of $\pm 40\text{mT}$.

The Indicator Unit/Meter Pod:

This module is used in conjunction with the twelve transducer modules, and consists of an internal Wheatstone Bridge and amplifier, with galvanometer readout. Sensitivity, bridge balance, DC balance and gain are all adjustable via potentiometers on the module.

Additional transducer plug-in modules can be custom-built to customer's requirements.

A comprehensive experiment manual, and a set of stackable silicone banana plug connecting leads are supplied.

Manufacturer : **AMRON**

Tel : (033) 3868309

Fax : (033) 3868556

E MAIL: amron@pixie.co.za

P. O. BOX 2435
Pietermaritzburg
3201

Distributor :

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