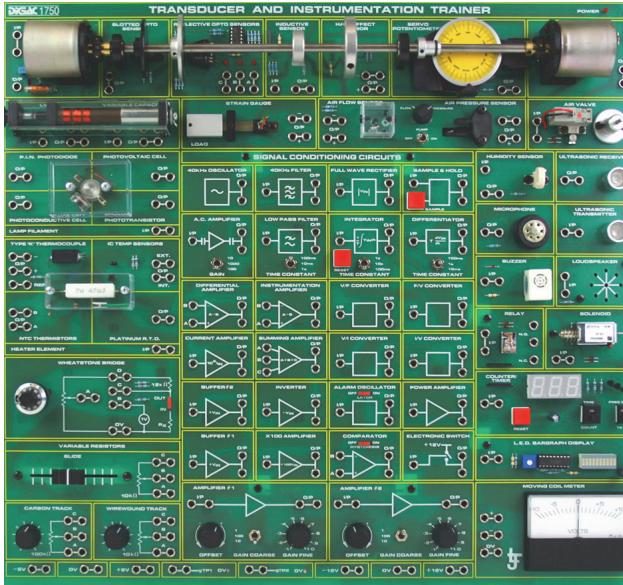


Product Information Sheet

Transducers, Instrumentation & Control Teaching Set



217-50

The Transducers, Instrumentation and Control Teaching Set is a complete training system that includes a hardware trainer, virtual test equipment and curriculum manuals.

The 217-50 hardware trainer introduces students to input sensors, output actuators, signal conditioning circuits, and display devices through a wide range of hands-on practical activities.

Students build their knowledge to a level where they can build complete, working control systems.

The 217-61 data acquisition package allows students to monitor and record control system performance using PC-based test equipment and data acquisition software.

Both the trainer and data acquisition package are supplied with comprehensive curriculum manuals that provide background theory, practical activities, and student assessment questions.

Printable student workbooks allow students to create a personalized record of their work and record practical results as they work through the curriculum materials.

Instructor's guides provide solutions to all questions and practical activities.



217-61

Transducers, Instrumentation and Control topics:

- Electronic switch
- Basic Control Systems Equipment and Terms Used
- Positional Resistance Transducers
- Wheatstone Bridge Measurements
- Temperature Sensors
- Light Measurement
- Linear Position or Force Applications
- Environmental Measurement
- Rotational Speed or Position Measurement
- Sound Measurements
- Sound Output
- Linear or Rotational Motion
- Display Devices
- Signal Conditioning Amplifiers
- Signal Conversions
- Comparators, Oscillators, Filters
- Mathematical Operations
- Control Systems Characteristics
- Practical Control Systems

Data Acquisition topics:

- Control Systems
- Thermal Systems
- Light-Controlled Systems
- Proportional Control
- Proportional-Integral Control
- Proportional-Derivative Control
- PID Control
- Velocity Feedback
- Speed Control Systems

Typical activities:

- Plot the characteristic of a K-type thermocouple.
- Explore the characteristics of a dynamic microphone.
- Test the operation of a humidity transducer.
- Investigate the operation of an ultrasonic transmitter/receiver.
- Build a strain gauge transducer circuit.
- Compare inductive and Hall effect transducers.
- Investigate the operation of an air flow transducer.
- Plot the characteristics of a DC permanent magnet motor.
- Construct an alarm oscillator.
- Use a data logger to monitor the output of an on/off temperature control circuit.
- Compare the characteristics of a platinum RTD transducer and an NTC thermistor.
- Use a virtual oscilloscope to display the response of light operated systems to variation of incident light.
- Explore the step and ramp input response characteristics of a proportional control system.
- Investigate the effect of adding integral and derivative controls to a proportional control system.
- Investigate the effect of adding variable velocity feedback to a proportional control system.

For more information visit www.ljcreate.com

LJ Create -Product Information Sheet (Continued)

Transducers, Instrumentation & Control Teaching Set



217-50 hardware trainer features:

Input Transducers:

- Carbon track
- Wirewound & precision rotary potentiometers
- Slide potentiometers
- NTC thermistors
- Type 'K' thermocouples
- IC temperature sensor
- Photoconductive cell
- Photovoltaic cell
- Phototransistor
- PIN diode
- Linear variable differential transformer
- Linear variable capacitor
- Strain gauge
- Air flow sensor
- Air pressure sensor
- Slotted opto-sensor
- Reflective opto-sensor
- Inductive Proximity Sensor
- Hall Effect sensor
- Precision servo-potentiometer
- Tacho-generator
- Humidity sensor
- Dynamic microphone
- Ultrasonic receiver

Output Devices:

- Heater
- Filament Lamp
- DC Motor
- Solenoid Air Valve
- Ultrasonic transmitter
- Buzzer
- Loudspeaker
- Relay
- Solenoid
- Counter/timer unit with LED display
- Bargraph voltage indicator
- Analog 10V center-zero meter

Signal Conditioning Circuits:

- Buffers
- Inverters
- Comparator with switchable hysteresis
- Amplifiers with gain and offset control
- Current amplifier
- Summing amplifier
- Differential amplifier
- Instrumentation amplifiers
- AC amplifier

Signal Conditioning Circuits (continued):

- Oscillator 40kHz
- Filter 40kHz
- Low-pass filter with switchable time constant
- Precision full-wave rectifier
- Sample and hold circuit
- Integrator with switchable time-constant
- Differentiator with switchable time constant
- V/F and F/V converters
- V/I and I/V converters
- Power amplifier
- Electronic switch

Internal Power Supplies:

- -5V, +5V 1A precision supply
- -12V, +12V 1A regulated supply

Pneumatic Supply:

- Internal Pneumatic pump

Other Features:

- Shaft assembly links DC motor, tacho-generator, slotted and reflective opto-sensors for incremental and absolute position, and a 360° precision potentiometer with indicator dial for closed-loop position control

217-61 data acquisition package features:

Two multimeters:

- Digital display
- Manual range selection
- Voltage, current, resistance ranges
- Continuity and diode test ranges

Storage oscilloscope:

- Two channels at up to 50 MHz sampling rate
- Multiple trigger modes (auto, single, repeat, rapid)
- Spectrum analyzer mode
- Display can be pasted directly into documents

Function generator:

- Frequency range up to 1 MHz
- Sine, square, triangle, ramp, sinc, half sine outputs

Data logger:

- Start/stop using manual input or a trigger condition
- View, graph, and print results

Items Included:

217-50 Transducers, Instrumentation and Control trainer, comprising:

- Hardware trainer
- Circuit connection leads and accessories
- Curriculum manual, student workbook, technical manual, and instructor's manual in PDF format

217-61 Data Acquisition of Control Systems package, comprising:

- Two multimeters
- PC-based data acquisition system incorporating:
 - Dual trace digital storage oscilloscope
 - Spectrum analyzer
 - Signal generator
- Multimeter connection leads
- Oscilloscope probes
- Signal generator connection lead
- Curriculum manual, student workbook, and instructor's manual in PDF format

Other Items Required:

- Windows-based personal computer (PC)

General Information:

217-50 Transducers, Instrumentation and Control trainer:

Dimensions (L x W x H):

500 x 450 x 150 mm

Supply Voltage: 50-60Hz 110-120V AC or 220-240V AC

Packed Volume: 0.109 m³

Packed Weight: 14.9 kg

Order Code: 217-00

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For more information visit www.ljcreate.com