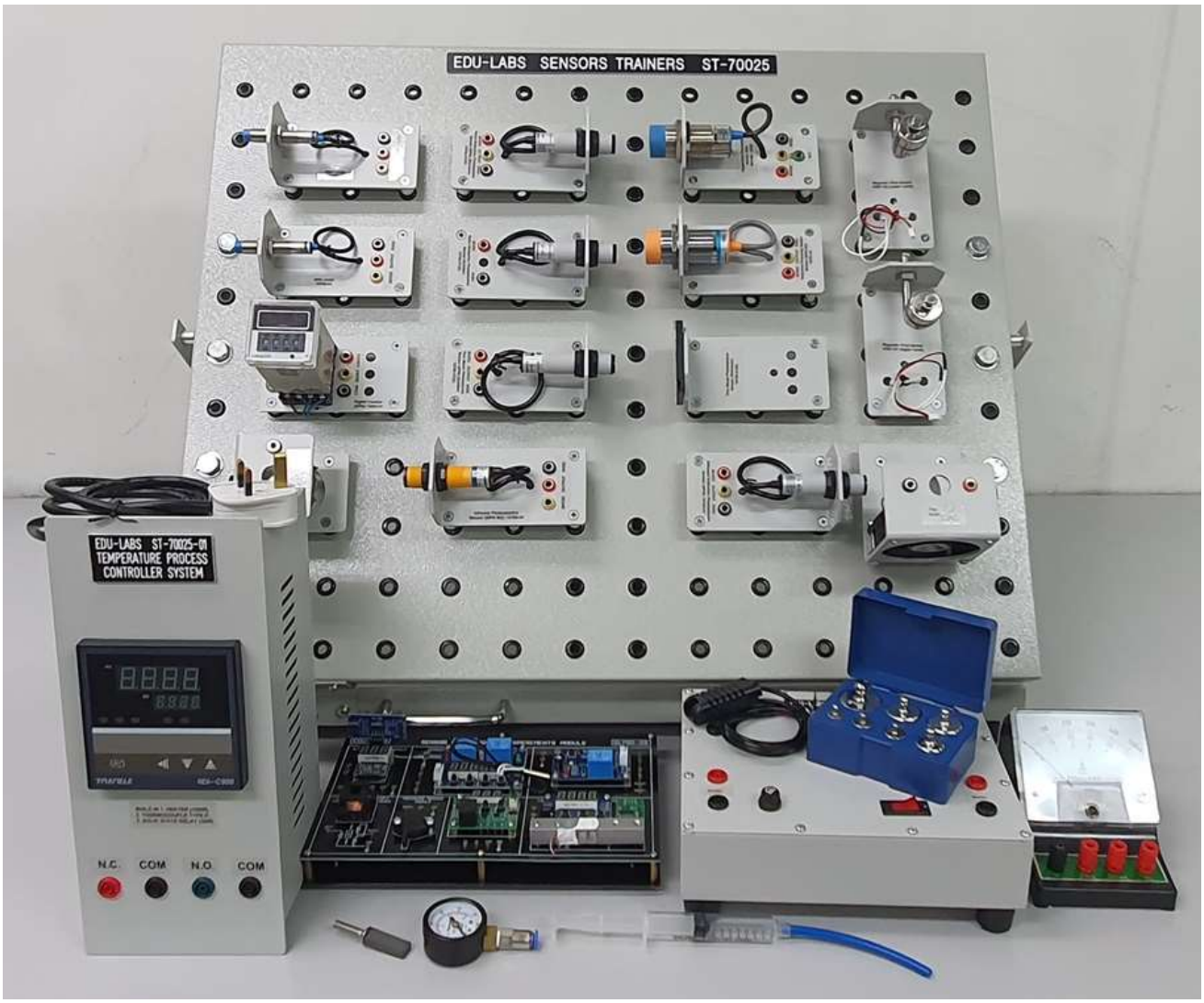
SENSOR TRAINER

ST-70025

EDU-LABS

BUATAN MALAYSIA
MADE IN MALAYSIA



FEATURES

- This educational training system is a versatile, robust and easy to use training system used for teaching and learning sensor and transducer fundamentals and operation.
- This system covers various sensors and transducers such as Temperature Sensor, Pressure Sensor, Proximity Sensor, Photo Sensor, Load Cell, Float Sensor, Diffuse Photoelectric Sensor, Retro-Reflective Photoelectric Sensor, Through-Beam Photoelectric Sensor and etc.
- Modular design allows modifications to suit needs/requirements of the course/students
- Additional modular components can are also available separately should the need arise.
- High quality durable rubber-silicone compound gourmet on the plug-in profile panel ensures that the components stay in place yet smooth enough to ease removal and placement of components.
- Plug-in profile panel comes with various height (tilt) settings

TECHNICAL SPECIFICATION

These modules enable students to investigate a wide range of sensor and transducer syllabus practical topics. Students investigate each topic with hands on experimentation, circuit construction and evaluation tasks which are provided in the experimental manual/workbook. Each module is equipped with clearly labelled block diagram and built-in connection interface and test points.

EXPERIMENT MODULES

1) **PHOTO SENSOR MODULE**
   - Input supply: 12 - 24VDC
   - Output type: NPN open collector
   - Sensing range: 100mm
   - Sensing target: Opaque, translucent material
   - Response time: 1ms (max.)
2) **DIFFUSED REFLECTIVE MODE PHOTOELECTRIC SENSOR MODULE**
   - Input supply: 12 - 24VDC
   - Output type: NPN open collector
   - Sensing range: 100mm
   - Operation mode: Light On/ Dark on (selectable)
   - Sensing target: Opaque, translucent material
   - Response time: 1ms (max.)
   - Diffuse reflective type

3) **RETRO-REFLECTIVE MODE PHOTOELECTRIC SENSOR MODULE**
   - Input supply: 12 - 24VDC
   - Output type: NPN open collector
   - Sensing range: 3m (max.)
   - Operation mode: Light On/ Dark on (selectable)
   - Sensing target: Opaque material of min. Ø75mm
   - Response time: 1ms (max.)
   - Retro reflective type

4) **THROUGH-BEAM MODE PHOTO TRANSMITTER DETECTOR MODULE**
   - Input supply: 12 - 24VDC
   - Output type: NPN open collector
   - Sensing range: 10m (max.)
   - Operation mode: Light On/ Dark on (selectable)
   - Sensing target: Opaque material of min. Ø12mm
   - Response time: 1ms (max.)
   - Through beam mode type

5) **CAPACITIVE PROXIMITY SWITCH (SENSOR) MODULE**
   - Using the capacitance strength (electrostatic fields) to detect the presence or absence of object. It is used to detect both metallic and non-metallic object.
   - Input supply: 12 - 24VDC
   - Sensing range: 15mm
   - Output: NPN
   - Frequency: 50Hz

6) **INDUCTIVE PROXIMITY SWITCH(SENSOR) MODULE**
   - Using the electromagnetic field which produces by the surface of sensor to detect the object is presence or absence. It is use to detect the metal object
   - Input supply: 12 - 24VDC
   - Sensing range: 15mm

- Output: NPN
- Frequency: 200Hz

7) ULTRASONIC SENSOR

- Ultrasonic transmitter & Receiver
- Operation voltage: 5VDC
- Working current: 15mA (typical)
- Frequency: 40kHz (typical)

8) HUMIDITY SENSOR MODULE

- Humidity Sensor:
- Operation voltage: 5VDC
- Adjustable sensitivity
- LM393 comparator
- Analog or digital output mode

9) PRESSURE SWITCH MODULE

- Max Voltage: 250V
- Electrical Rating: 125VAC/20A, 250VAC/10A, 24VDC/64A
- Contact arrangement: SPDT
- Range: -0.2 ~ 7.5 bar
- Differential: 0.7 ~ 4 bar

10) LINEAR VARIABLE DIFFERENTIAL TRANSFORMER (LVDT) MODULE

- A type of transducer that convert the position of solenoid into a proportional electrical signal
- Resistance: 1K +/- 10%
- Maximum Working speed: 5m/s
- Working Temperature: -40 ~ 150 deg. C
- Linear range: 0.05mm
- Operating voltage: 24VDC

11) THERMOCOUPLE TEMPERATURE SENSOR MODULE

- Sensors: 1 x Thermocouple Type K and 1x RTD PT100
- Includes heater element with:
  - Built in heater element
  - Temperature control adjust
  - Power supply: 24Vdc with L/N/E outputs and mains On/Off switch with indicator
  - A/B+/B connectors for RTD100
  - B+/B- connectors for Type K thermocouple

12) BOURDON GAUGE MODULE

- The most common mechanical device that used to measure the air pressure. When the bourdon tube is pressurized, a tube tends to straighten its circular and increase the radius of c-shaped tube. As the result, the pointer will point to the corresponding scale
- Pressure range: 0 ~ 150psi

13) LOAD CELL MODULE

- Used to convert the force energy into electrical energy. The strength of the signal change in proportional to the force applied.
- Rated Load: 6kg
- Rated output: 2.0+/- 0.2mV/V
- Input resistance: 405 +/- 6 ohm
- Output resistance: 350 +/- 3 Ohm
- Works with Load Cell Transmitter (Display) Module

14) LOAD CELL TRANSMITTER (DISPLAY) MODULE

- A meter which used to display the load cell value in millivolt unit. It is used with the Load Cell module.
- Input supply: 24VDC
- Impedance: 100M Ohm
- Display range: -1999~1999
- Input signal: 2.0mV/V
- Contact output: 250V AC/3A
- Analog output: 4 ~ 20 mA or 0 ~ 10V

15) TEMPERATURE PROCESS CONTROLLER MODULE

- Input supply: 220 ~ 240VAC
- Accuracy: +/- 5%FS
- Control Method: PID Control / ON/OFF control
- Alarm Range: Full scale free setting
- Input Method: Thermocouple Type K, J, R, S, B, E, N, T PT100 CU50
- Output Method: PID relay /SSR solid state relay (output simultaneously)

16) MAGNETIC FLOAT SENSOR MODULE

- A kind of sensor that using the magnetic to turn on/off the switch
- Sensor type: Reed Switch
- Use with Level Control module

17) LEVEL CONTROL MODULE

- Used with Magnetic float sensor/switch
- Normally closed type
- The gate of level control will open when 24 VDC is applied
- The float switch acts as gate keeper to control the gate of level control
- Operating voltage: 24VDC

18) DC MILIAMMETER MODULE

- Measurement range: 0 ~ 2 Ampere
- Working environment: - Temp: -10 ~ 50 deg C - Humidity 85%RH
- Operating voltage: 240VAC

19) TEMPERATURE MEASUREMENT MODULE

- Operating voltage: 24VDC
- Temperature Range: -50 °C ~ 110 °C
- Accuracy: 0.1 °C

20) HAND PUMP

- Light weight
- Portable, easy to use
- Pressure range: 0 ~ 100 psi approx.

21) POWER SUPPLY MODULE

- Input: 240VAC/50Hz
- Output: 24VDC via 4mm safety connectors
- Output: 24VDC via 4mm safety connectors
- Mains ON/OFF switch with indicator x1

22) WEIGHT SET

- Object size: 7 sets of different weight object provided as weight load cells
- 200g x 1, 100g x 2, 50g x 1, 20g x 2, 10g x 1

23) DIGITAL COUNTER (24VDC) (NPN)

- Power: DC 24V, contact: 1c-contact, contact load: max.5A, counter pulse: 20ms,
- Display: 4 digits, power consumption: 2.4W
- Add the Counting No by press the Dip Switch before Start Counting
- RESET the counting to zero by touching the COMMON Terminal to RESET Terminal

24) DIGITAL TIMER (24 VDC)

- Power: DC 24V, contact: 2a-2b, contact load: max.5A
- Allowed load: max.100W, delay time: 1-10sec.

25) MODULAR PROFILE PANEL BOARD

- High quality durable rubber-silicone compound gourmet on the plug-in profile panel
- Plug-in profile panel comes with various height (tilt) setting
- 148 Rubber Grommet Profile Plug Points
- Dimension: 600mm X 700mm

EXPERIMENT TOPICS COVERAGE

1. Beam/transmitter envelope/coverage of sensor
2. Beam/transmiter axis effects of sensor
3. Sensing axis of sensor
4. Sensing range of sensor
5. Distance to convergent point of sensor
6. Sensing object
7. Hysteresis of sensor
8. Repetability of sensor sensing
9. Response time of sensor
10. Bourdon Gauge characteristics and operation
11. DC Milliammeter
12. Pressure Switch characteristics and operation
13. Ultrasonic Humidity Sensor operation
14. Load Cell characteristics and operation
15. Load Cell Transmitter characteristics and operation
16. Inductive Proximity Switch characteristics and operation
17. Diffuse Reflective Mode characteristics and operation
18. Retro-Reflective Mode characteristics and operation
19. Thru Beam Sensor characteristics and operation
20. Linear Scale
21. NPN Load, PNP Load
22. Photo Sensor characteristics and operation
23. Magnetic Float characteristics and operation
24. Level Control
25. Low Temperature Unit
26. LVDT (Linear Variable Differential Transformer) operation
27. Temperature Sensor characteristics and operation
28. Capacitive Proximity Sensor characteristics and operation

ACCESSORIES

- Connecting leads 4mm (1 set)
- Mains power cord x1

MANUALS

- Operation Manual x1
- Lab Experiment Manual x1

WARRANTY

- Two (2) years warranty against manufacturing defects covering parts and labor.

Note: Due to products continuous development process, layout and specification may change without prior notices.