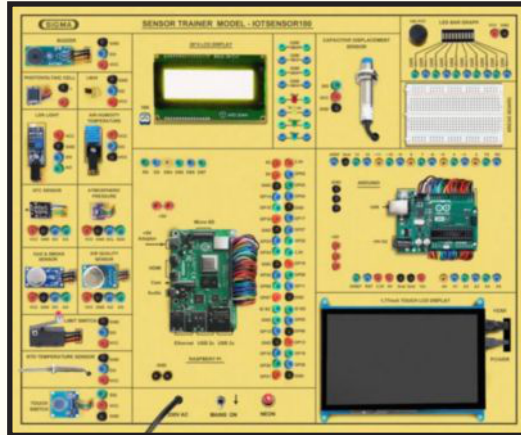




SENSOR TRAINER KIT MODEL - IOTSENSOR100

This trainer has been designed with a view to provide practical and experimental knowledge of Internet of Things (IOT) with Sensors programming with Raspberry IOT Board.



SPECIFICATIONS

1. Hardware

Following Parts are assembled on Single PCB of size - 18 Inch x 15 Inch

1. Raspberry Microcontroller Board – Pi-4

1. Processor : 64bit, ARMv7
2. RAM - 1 GB
3. Memory - 32GB
4. OS: Open Source Linux
5. Connectivity : Dual-Band 2.4/5.0 GHz Wireless LAN
Bluetooth 5.0
USB Interface – USB 2.0 – 2 Ports, USB 3.0 – 2 Ports,
Gigabit Ethernet
6. Video and Sound
2 × micro HDMI Interface ports (up to 4Kp60 supported)
Power - 5V, 3A DC via USB-C Connector

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Dealer:-

2. Sensors:

1. RTD Temperature Sensor - RTD 100
2. NTC Thermistor Sensor
3. LM35 – Temperature Sensor
4. Photovoltaic Cell Sensor
5. Photo Light Sensor LDR
6. Air Humidity and Temperature Sensor – DHT11
7. Gas (Smoke) Detector Sensor - Mq2
8. Air Quality Sensor – Mq135
9. Atmospheric Pressure Sensor BMP180
10. Limit Switch
11. Capacitive Displacement Sensor - Capacitive Proximity Switch

3. Modules and Hardware:

1. 7" TFT LCD Display
2. LED Bar Graph
3. Buzzer
4. Touch Switch
5. 20 X 4 - LCD Display
6. Breadboard - 400 Points for making Amplifiers and Filter circuits as below
Inverting, Non – Inverting, Power, Current, Instrumentation and Differential Amplifier,
F to V, V to F, I to V, V to I Converter, High Pass and Low Pass Filter and Buffer Circuits to be
made on Breadboard.
7. Different Resistors and LEDs
8. 2 mm interconnections

2. Accessories

1. Memory card : 16 GB SD Card
2. USB Cable : 2 No
3. Ethernet Cable : 1 No
4. HDMI Cable : 1 No
5. Power Supply Adaptor : 5V, 3A DC via USB-C Connector
6. Jumper wires : 50 Nos.
7. DAQ Software : 1 No.
8. Pen Drive with Software, Library, Driver, Codes, Soft Copy of Manual & Mobile App : 16 GB
9. Printed Practical Manual : 1 No.
10. E-Books for IOT Subject : 10 Nos. in PDF Format
11. Mp4 Video Class for IOT Subject : 40 Nos
12. Excitation accessories for each sensor : Light source/Torch for photovoltaic and LDR
Cigarette lighter for Gas
Agarbatti and matchbox for smoke

3. Cabinet and PCB

The complete circuit diagram is screen printed on component side of the PCB with circuit and Parts at the same place. The PCB with components on front side is fitted in elegant wooden box having lock and key arrangement. The acrylic cover is fitted on PCB to safeguard parts. It works on 230 V AC Supply.

EXPERIMENTS

A. Theory Experiments for Raspberry PI 4

1. To understand theory and working of Raspberry PI.
2. To understand Operating System for Raspberry PI.
3. To understand Communication Protocols - UART, I2C, SPI and Rs485.
4. To understand USB Interface for Raspberry PI.
5. To understand Ethernet Cable Interface for Raspberry PI
6. To understand micro SD Card Interface for Raspberry PI
7. To understand 20 x 4 LCD Display.
8. To understand 7 Inch Touch LCD Display.

B. Theory Experiments for Sensors

9. To understand theory of RTD
10. To understand theory of NTC Thermistor
11. To understand theory of Lm35
12. To understand theory of Photovoltaic Photo Sensor - Photovoltaic Solar Cell
13. To understand theory of LDR
14. To understand theory of Air Humidity and Temperature Sensor
15. To understand theory of Gas (Smoke) Detector Sensor Mq2
16. To understand theory of Air Quality Sensor Mq135
17. To understand theory of Atmospheric Pressure Sensor BMP180
18. To understand theory of LED Bar Graph
19. To understand theory of Limit Switch
20. To understand theory of Capacitive Displacement Sensor - Proximity Switch
21. To understand theory of Touch Switch
22. To understand Buzzer

C. Practical Experiments

23. To determine temperature using RTD sensor
24. To determine temperature using NTC Thermistor
25. To determine temperature using Lm35
26. To measure Photo Voltaic Voltage using Photovoltaic Solar Cell
27. To detect the presence of Light using Photo Sensor LDR
28. To determine Air Humidity & Temperature using DHT11
29. To detect Gas and Smoke using MQ2 Sensor
30. To measure Air Quality using MQ135 Sensor
31. To determine Atmospheric pressure using BMP180 sensor
32. To control Limit Switch
33. To measure displacement using Capacitive Displacement Sensor Proximity switch
34. To identify the touch using Touch Capacitive Sensor TTP223
35. To make Buzzer buzz
36. To change LED Bar Graph based on changing analog values
37. To carry out experiment of Inverting Amplifier
38. To carry out experiment of Non – Inverting Amplifier
39. To carry out experiment of Power Amplifier
40. To carry out experiment of Current Amplifier
41. To carry out experiment of Instrumentation Amplifier
42. To carry out experiment of Differential Amplifier
43. To carry out experiment of F to V Converter
44. To carry out experiment of V to F Converter
45. To carry out experiment of I to V Converter
46. To carry out experiment of V to I Converter
47. To carry out experiment of High Pass Filter Circuit
48. To carry out experiment of Low Pass Filter Circuit
49. To carry out experiment of Buffer Circuit