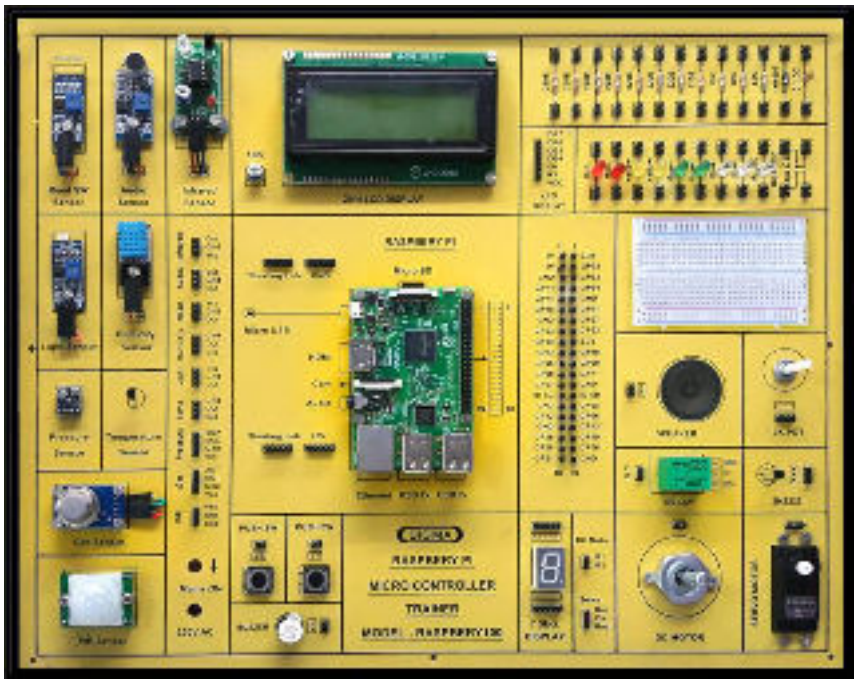
RASPBERRY PI 5 MICRO CONTROLLER TRAINER

MODEL-RASPBERRY100-5

SPECIFICATIONS



This trainer has been designed with a view to provide practical and experimental knowledge of Internet of Things (IOT) with Sensors programing with Raspberry Pi 5 IOT Board.

SPECIFICATIONS

A. Main Specs

1. Following Parts and Modules are assembled on Single PCB of size - 18 Inch x 15 Inch.
2. The complete circuit diagram is screen printed on component side of the PCB with circuit and Parts at the same place.
3. The PCB with components on front side is fitted in elegant wooden box having lock and key arrangement.
4. Modules and Parts should be removable without desodlering for easy repair / replacement
5. The acrylic cover is fitted on PCB to safeguard main parts.

B. Raspberry Microcontroller Board – Pi 5

1.	CPU	: 64-bit Arm Cortex-A76 CPU
2.	Raspberry	: Pi 5 Model 8GB
3.	RAM	: LPDDR4X-4267 8GB SDRAM
4.	Memory	: Micro SD Card- 64 GB
5.	USB Ports	: 2 × USB 2.0 Ports, 2 × USB 3.0 Ports
6.	Ethernet RJ45 Port	: 1 GB
7.	Wifi	: Bluetooth 5.0, USB-C, Wi-Fi + , Bluetooth® Low Energy
8.	PCIe Interface	: PCIe 2.0 x1 interface for fast peripherals
9.	Real-Time Clock	: Powered by an external battery
10.	Video	: 2 × micro HDMI ports (up to 4Kp60 supported)
11.	Sound	: 4-Pole Stereo Audio and Composite Video Port
12.	Multimedia	: H.265 (4Kp60 decode)
13.	GPIO	: Standard 40-pin GPIO Header
14.	Inputs for Analog Voltages	: 6
15.	Outputs for Relay	: 3
16.	Output for Buzzer	: 1
17.	Camera	: 15-pin MIPI Camera Serial Interface
18.	Micro-SD Memory Card	: Push/pull Micro 64 GB - Supports high-speed SDR104 Mode
19.	Wifi	: 802.11 b/g Wireless LAN (Wifi) Dual-Band 2.4/5.0 GHz
20.	Power Supply	: 5V, 2A DC USB Type C Adaptor

C. Sensors:

1. Air Humidity and Temperature DHT11
2. Air Quality - MQ135
3. Soil / Water Temperature Sensor - DS18B20
4. Leaf Wetness Sensor - Rain Detector Sensor
5. Soil Moisture Sensor
6. Ambient Light Sensor - LDR Light Sensor

D. Modules and Hardware:

1. 20 X 4 - LCD Display
2. 1 Channel Relay board
3. DC Motor with Motor Driver board
4. Stepper Motor with Motor Driver board
5. 7 Segment Display
6. Different Resistors
7. Red, Green, Yellow LED
8. 10K Pot
9. Push Switch – 2 Nos
10. Audio Buzzer Board
11. Breadboard - 400 Points
12. 2 mm interconnection Sockets

E. Accessories

1. USB to Square USB Cable : 1 No
2. 2 mm Banana Jack Jumper – Connectors : 30 Nos
3. 9V, 1A Power Adaptor – Barrel 2.1mm : 1 No
4. Pen Drive - 16 GB with All Codes : 1 No
5. Printed Manual : 1 No.
6. Softcopy of Manual – On Pen Drive : 1 No
7. E-Books for IOT Subject – On Pen Drive : 10 Nos. in PDF Format
8. Mp4 Video for IOT Subject – On Pen Drive : 40 Nos

EXPERIMENTS

1. To understand theory and working of Raspberry Pi 4 Board
2. To understand Operating System for Raspberry Pi 4 Board
3. To understand Communication Protocols - UART, I2C, SPI, RS232 and RS485.
4. To understand USB Interface for RaspberryPi 4 Board
5. To understand Ethernet Cable Interface for Raspberry Pi 4 Board
6. To understand micro SD Card Interface for Raspberry Pi 4 Board
7. To understand that how to connect 20 x 4 LCD Display to Raspberry Pi 4 Board

8. To understand theory of Air Humidity and Temperature DHT11
9. To understand theory of Air Quality - MQ135
10. To understand theory of Soil / Water Temperature Sensor
11. To understand theory of Leaf Wetness Sensor - Rain Detector Sensor
12. To understand theory of Soil Moisture Sensor
13. To understand theory of Air Ambient Light Sensor - LDR

14. To understand Active Audio Buzzer
15. To understand 1 Channel Relay Board
16. To understand fundamental of DC motor and its driver
17. To understand fundamental of Stepper Motor and its driver

18. To make LED blink
19. To connect LCD Display
20. To measure Humidity using Humidity - DHT11 Sensor
21. To measure Air Humidity and Temperature using DHT11 Sensor
22. To measure Air Quality using Air Quality Sensor
23. To measure Temperature of Soil using Soil Temperature Sensor - DS18B20
24. To measure wetness of Leaf using Leaf Wetness Sensor - Rain Detector Sensor
25. To measure Moisture of soil using Soil Moisture Sensor
26. To measure Ambient Light using LDR Light Sensor

27. To use Audio buzzer for Output signal Alarm
28. To control 1 Channel Relay
29. To operate DC Motor control
30. To operate Stepper Motor

31. To send Sensors data to Website Cloud page using Wifi and Internet
32. To send Sensors data to MySQL Cloud Server and store them
33. To send Sensors data to Local Host Server and Store them on website html page
34. To send Sensors data to Mobile using GSM Gateway by SMS
35. To send Sensors data to Mobile using Android Mobile App
36. To send and display Sensors Data on website Smart Dashboard on a server

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