



RASPBERRY PI IOT TRAINER

MODEL - RASPBERRYIOT100

This trainer has been designed with a view to provide practical and experimental knowledge of Raspberry IOT server.



SPECIFICATIONS

(1) Hardware

Following Hardware is assembled on Single PCB of size - 18 Inch x 15 Inch

1. Raspberry BoardCard Pi 3
2. 20 X 4 LCD Display
3. Reed Switch Sensor
4. Audio Sensor
5. Infrared Sensor
6. Light Sensor
7. Humidity Sensor.
8. Pressure Sensor.
9. Temperature Sensor.
10. Gas Sensor
11. PIR Sensor
12. Stepper Motor
13. Servo Motor
14. DC Motor
15. Single Channel Relay - 2 Nos
16. Audio Buzzer
17. Push Keys
18. Potentiometer
19. ADC Converter - ADS1115\$ - 2Nos
20. Breadboard - 400 Points
22. Different Resistors
23. Different Color LEDs
24. Diode 1N4007
25. AC 3 Pin Sockets - 3 Nos.

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Dealer:-

(2) Server

- | | | |
|------------------------------------|---|-------------------------------|
| 1. Server Type | : | Physical VPS Server |
| 2. Server Location | : | Dallas or Chicago - USA |
| 3. Server Panel | : | Plesk Panel unlimited Domains |
| 4. Server User Name and FTP Access | : | Maximum 10 |
| 5. Server SQL Database | : | Maximum 10 |

(3) Software

- | | | |
|-----------------------------------|---|--------------------|
| 1. Server Data Uploading Software | : | WINSOCP or CuteFTP |
| 2. Website Making Software | : | MS Frontpage 2003 |
| 3. Raspberry connecting Software | : | Putty |
| 4. SD Card Imaging Software | : | Easeus partition |
| 5. SD Card formatting Software | : | Win32 Disk Imager |

(4) Accessories

- | | | |
|--|---|-----------------------|
| 1. Memory card | : | 16 GB SD Card |
| 2. USB Cable | : | 2 No |
| 3. Ethernet Cable | : | 1 No |
| 4. Power Supply Adaptor - 5V, 2A - ERD | : | 1 No |
| 5. VGA to HDMI Converter Adaptor | : | 1 No. |
| 6. 50 Watt Lamp - Red and Green Color | : | 1 No. each |
| 7. Syska Variable Color Lamp 7.5 Watt | : | 1 No |
| 8. 8 Inch Table Fan | : | 1 No. |
| 9. USB Mouse | : | 1 No. |
| 10. USB Keyboard | : | 1 No. |
| 12. VGA Computer Monitor - 15 Inch | : | 1 No. |
| 13. Jumper wires | : | 30 Nos. |
| 13. Software and Driver CD | : | 1 No. |
| 14. Practical Manual - Printed + Soft Copy | : | 2 No. |
| 15. E-Books for IOT Subject | : | 10 Nos. in PDF Format |
| 16. Mp4 Video Class for IOT Subject | : | 40 Nos |

(5) 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 should work on 230 VAC Supply.

(6) Experiments

Minimum 75 Experiments with .py code files are provided with trainer.

IOT Theory Experiments

01. To understand theory and working of Raspberry PI 3.
02. To understand Operating System for Raspberry PI.3.
03. To understand Communication Protocols-UART,I2C,SPI,and RS485.
04. To understand USB Interface for Raspberry PI.3.
05. To understand Ethernet Cable Interface for Raspberry PI.3.
06. To understand micro SD Card Interface for Raspberry PI.3.
07. To understand 20 x 4 LCD Display.
08. Reed Switch – Magnetic Sensor
09. Audio Sensor
10. Infrared Sensor
11. Ambient Light Sensor - LDR Light Sensor
12. Humidity - DHT11 Sensor
13. Pressure – BMP180 Sensor
14. Temperature - LM 35 Sensor
15. Gas Sensor - M Q 135
16. PIR Sensor
17. To understand Active Audio Buzzer.
18. To understand 1 Channel Relay board.
19. To understand fundamental of Stepper motor and its driver.
20. To understand fundamental of Servo motor.
21. How to add .py file in memory card.
22. To connect LCD Display
23. To understand static and dynamic IP (DHCP) address
23. To understand port forwarding in Wireless Router
24. To understand different ports and protocols in port forwarding
25. To understand IOT server and Web Server
26. To understand flask programming and python Server
27. To understand MQTT (Message Queuing Telemetry Transport) broker protocol
28. To understand MQTT publisher and subscribe
29. To understand Mobile App and .apk and .aia files
30. To understand Java script
31. To understand Front page html program and website page and index page
32. To understand Dedicated, VPS and shared Servers
33. To understand Plesk Panel and Domain Names
34. To understand Server file uploading and downloading programs like winscp and cuteFtp
35. To understand python files .py - making, editing and running
36. To understand Putty connecting method to Raspberry board

IOT Raspberry Basic Experiments

01. To make LED blink.
02. To transmit and receive signals using Infrared Sensor.
03. To detect Sound using Audio Sensor
04. To detect magnet using Reed Switch Sensor
05. To measure Humidity using Humidity - DHT11 Sensor.
06. To detect Light using LDR Light Sensor.
07. To measure Temperature using Temperature - LM 35 Sensor.
08. To measure Pressure using Pressure – BMP180 Sensor
09. To detect Gas using Gas Sensor
10. To detect motion using PIR Sensor
11. To use Audio buzzer for Output signal Alarm
12. To control 1 Channel Relay.
13. To operate Stepper Motor control
14. To operate Servo Motor
15. To operate DC Motor

IOT Experiments

IOT Configuration Experiments

01. To configure Server Plesk panel - IP, Domain Name, User and Password
02. To configure and make Index and web pages using Front page html program
03. To upload index and web pages on server using winscp
04. To test Index page on Internet Explorer or on Chrome Browser
05. To find out static and dynamic IP (DHCP) address of Raspberry
06. To configure port forwarding and ports in Wireless Router
07. To configure Java script on server
08. To download MQTT and configure it
09. To download Flask program and configure it
08. To download Adafruit BMP, DHT and ADS1115 Libraries and install it on raspberry
09. To download Mobile App .apk files from Server and install them on Android Mobile
10. To make python files for different experiments
11. To upload these python files on Raspberry memory SD card
12. To connect circuits on Raspberry IOT Trainer and run them for following experiments

IOT Practical Experiments

01. To display different Sensors data on LCD Display
02. To read different Sensors data on Mobile using Mobile App
03. To view different Sensors data on Website page using IOT Server
04. To control Home Light and Fan ON/OFF using Push Button and a Relay
05. To control Home Light and Fan ON/OFF remotely using Mobile App
06. To control Home Light and Fan remotely using a Website Page using IOT Server
07. To control Stepper Motor using Pot
08. To control Stepper Motor using remotely using Mobile App
09. To control Stepper Motor using remotely using a Website Page using IOT Server
10. To change Brightness of LED Light using POT
11. To change Brightness of LED light remotely using Mobile App
12. To change Brightness of LED Light remotely using a Website Page using IOT Server