# SIGMA

# RASPBERRY PI TRAINER
## MODEL - RASPBERY100

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



## SPECIFICATIONS

**1. Hardware**

| | | | |
|---|---|---|---|
| 1. | Processor | : | Broadcom BCM2835 700MHz ARM1176JZFS |
| 2. | FPU | : | Built-in |
| 3. | GPU | : | Videocore 4 |
| 4. | RAM | : | 512MB |
| 5. | Micro SD-MMC Card | : | 8 GB Micro SD card |
| 6. | LAN Interface | : | 10/100 MHz Wired Ethernet |
| 7. | HDMI Interface | : | HDMI output |
| 8. | USB Interface | : | USB 2.0 x 4 Nos |
| 9. | Audio Interface | : | 4-pole 3.5mm stereo audio jack |
| 10. | CVD | : | Composite Video Output |
| 11. | Powered | : | By 5V Micro USB |
| 12. | Camera Connector | : | 1 No |
| 13. | Expansion Header | : | 40-pin 2.54mm Expansion Pin Header |
| 14. | Other Pin Headers | : | 4 Nos |
| 15. | Display | : | Touch Screen LCD - 5 inch. |
| 16. | UART interface | : | RS232, RS485, USB TO UART etc. |
| 17. | Input / Outputs (I/O) | : | 8 Nos. |
| 18. | SPI Interface | : | 1 No. |
| 19. | I2C Interface | : | 1 No. |
| 20. | Character LCD interface | : | To connect Character LCDs like LCD1602 |
| 21. | USB to Serial Converter | : | CP2102 |
| 22. | Power Indicator | : | By LED |

| 23. | User LEDs | : | 3 Nos |
|-----|-----------|---|-------|
| 24. | User Keys | : | 2 Nos |
| 25. | Potentiometer | : | 1 No for Contrast Adjustment of Display |
| 26. | RTC Battery Holder | : | 1 No |
| 27. | RTC Clock | : | 1 No - PCF8563 |
| 28. | Crystal Frequency | : | 32.768K crystal for RTC |
| 29. | Jumpers | : | CP2102 Jumper, RTC Jumper, User LEDs Jumper, User Keys Jumper |
| 30. | ADC DAC | : | 1 No |
| 31. | L3G4200D | : | 1 No |
| 32. | L3G4200D | : | 1 No |
| 33. | LSM303DLHC | : | 1 No |

## 2. Software

| 1. Controller Driver Software CD | : | 1 No. |
|---|---|---|
| 2. Applications Software CD | : | 1 No. |

## 3. Accessories

| 1. | Practical Manual | : | 1 No. |
|----|------------------|---|-------|
| 2. | Required Cables | : | 1 No. |
| 3. | Software and Driver CD | : | 1 No. |
| 4. | E-Books for Raspberry Subject | : | 10 Nos. in PDF Format |
| 5. | Mp4 Video Class for Raspberry Subject: | | 40 Nos |

## 4. Trainer Board:

The complete circuit diagram should be is screen printed on component side of the PCB with circuit and Parts at the same place. The true value of component is printed on component side. 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 has holes for alignment and repair. The testing points are provided with 1.25" tags to connect CRO probe.

## 5. Note:

**One Computer systems (Pentium IV 1.5 GHz, 160GB HD, 128 MB RAM)  with Windows-7 is required to operate this trainer.**

## EXPERIMENTS

1. To port / To boot from Debian OS
2. To make blinking LED using GPIO Module in python and C programming language
3. To write a C language/Python program for user input switch to blink LED
4. To write a C language/Python program for 1 wire temperature sensor
5. To write a C language/Python program for Analog to Digital Convertor
6. To write a C language/Python program for Digital to Analog Convertor
7. To write a C language/Python program for RTC
8. To write a C language/Python program for SPI protocol to interface L3G4200D - Three Axis Digital Rate Gyroscope
9. To write e a C language/Python program for I2C protocol to interface LSM303DLHC (Ultra-Compact High-Performance Module, 3D  accelerometer and 3D magnetometer
10. To install and configure camera module
11. To write a C language/Python program to capture image and store in SD Card
12. To write C language/Python program to capture Video for 1 minute
13. To write C language/Python program to implement "Press key to take image "
14. To write a C language/Python program for SPI protocol to interface UART - CP2102
15. To write shell script to run application on startup.
16. To write First Device Driver program – "Hello world."
17. To load and unload Kernel Modules.
18. To make Web Server
19. To Make IOT server.
20. To demo Scratch programming