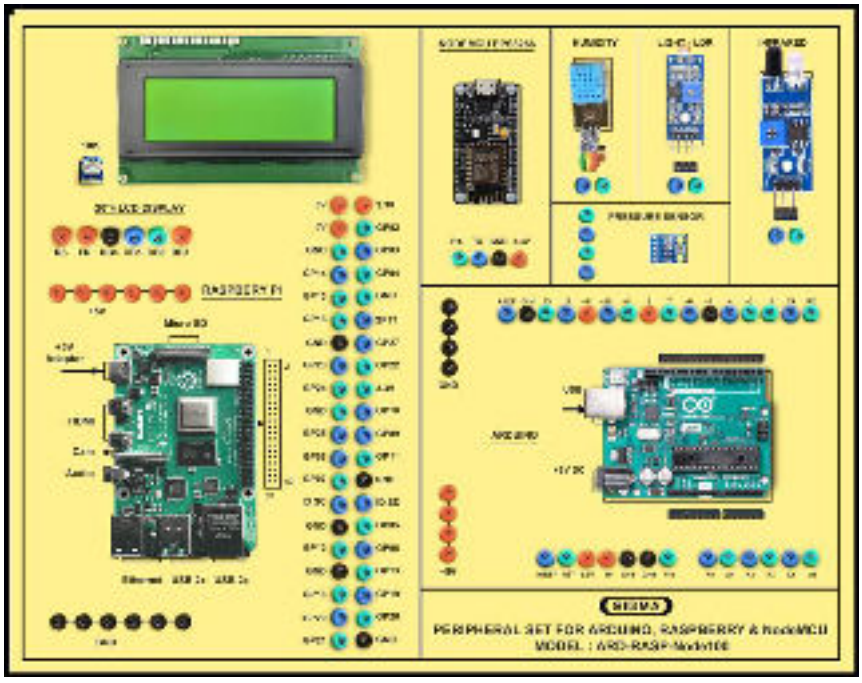
ARDUINO - RASPBERRY – NODEMCU

MICROCONTROLLER TRAINER

MODEL-ARD-RASP-NODE100



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

1. Arduino Uno Microcontroller board based on the ATMEGA328P
2. 14 Digital Input / Output pins
3. 16 MHz Ceramic Resonator
4. USB Port
5. Power Jack – 9V DC, 1A

C. Raspberry Board – Pi-4

1. Processor : 64bit, ARMv7
2. RAM - 1 GB
3. Memory - 32GB
4. 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
5. 2 × micro HDMI Interface ports
6. Power - 5V, 3A DC via USB-C Connector

D. NODEMCU EPS8266 Board

1. Microcontroller Tensilica 32-bit RISC CPU Xtensa LX106
2. Operating Voltage : 3.3V
3. Input Voltage : 7-12V
4. Digital I/O Pins : 16
5. Analog Input Pins (ADC) : 1
6. UART, SPI, I2C
7. Flash Memory : 4 MB
8. SRAM : 64 KB
9. Clock Speed : 80 MHz

E. Sensors:

1. Infrared Obstacle Sensor
2. Light LDR Sensor
3. Temperature & Humidity Sensor
4. Atmosphere Pressure Sensor BMP180
5. Temperature Sensor LM35

F. Modules and Hardware:

1. 20 X 4 - LCD Display
2. LEDs and Different Resistors
3. Breadboard - 400 Points for testing different Sensors and circuits

G. Accessories

1.	Memory Card	: 32 GB SD Card
2.	USB A to B cable	: 2 No
3.	Ethernet Cable	: 1 No
4.	HDMI to Mini HDMI Connector Cable	: 1 No
5.	Male to Male Connecting Wires	: 20 Nos.
6.	Female to Female Connecting wires	: 20 Nos.
7.	Male to Female Connecting Wires	: 20 Nos
8.	Power Supply Adaptor	: +9V DC, 2A, +5V DC, 3A - USB C Connector, 3.3 V DC,12A
9.	Pen Derive with Software, Library, Driver, Codes, Soft Copy of Manual	: 16 GB
10.	Printed Practical Manual	: 1 No.
11.	E-Books for IOT Subject	: 10 Nos. in PDF Format
12.	Mp4 Video Class for IOT Subject	: 40 Nos
13.	Excitation accessories for each sensor	

EXPERIMENTS

A. ARDUINO EXPERIMENTS

1. To understand theory and working of Arduino UNO.
2. To understand theory and working Infrared Obstacle Sensor
3. To understand theory and working Light LDR Sensor
4. To understand theory and working Temperature & Humidity Sensor
5. To understand theory and working Atmosphere Pressure Sensor BMP180
6. To understand theory and working Temperature Sensor LM35
7. To understand 20 x 4 LCD Display
8. To connect Arduino to 20 x 4 LCD Display.
9. To determine the distance of a nearby object using ultrasonic sensor and show it in 20x4 LCD
10. To determine temperature and humidity sensor using DHT11 and show it in 20x4 LCD
11. To determine the environment temperature using LM35 sensor and show it in 20x4 LCD
12. To detect an object using IR object detection sensor and show the results in 20x4 LCD
13. To determine the atmospheric pressure using BMP180 sensor

B. RASPBERRY EXPERIMENTS

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 detect an object using IR object detection sensor
9. To detect light intensity using LDR sensor
10. To determine temperature and humidity sensor using DHT11
11. To determine the atmospheric pressure using BMP180 sensor

C. NODEMCU EXPERIMENTS

1. To understand theory and working of NODEMCU EPS8266.
2. To understand theory and working Infrared Obstacle Sensor
3. To understand theory and working Light LDR Sensor
4. To understand theory and working Temperature & Humidity Sensor
5. To understand theory and working Atmosphere Pressure Sensor BMP180
6. To understand theory and working Temperature Sensor LM35
7. To understand 20 x 4 LCD Display
8. To connect Arduino to 20 x 4 LCD Display.
9. To determine the distance of a nearby object using ultrasonic sensor and show it in 20x4 LCD
10. To determine temperature and humidity sensor using DHT11 and show it in 20x4 LCD
11. To determine the environment temperature using LM35 sensor and show it in 20x4 LCD
12. To detect an object using IR object detection sensor and show the results in 20x4 LCD
13. To determine the atmospheric pressure using BMP180 sensor

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