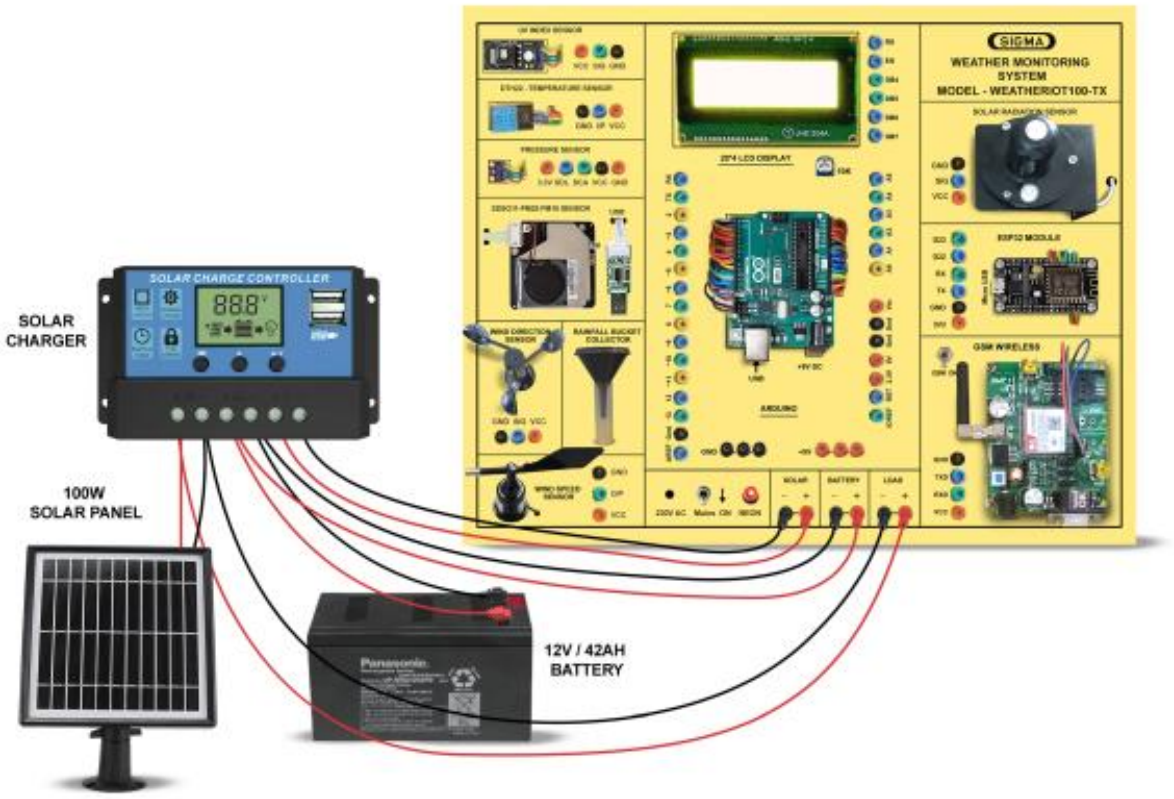
71. WEATHER MONITORING SYSTEM

MODEL-WEATHERIOT100

SPECIFICATIONS



This trainer has been designed with a view to provide practical and experimental knowledge Sensors programing for IoT based Weather Monitoring system with Arduino IOT Board.

SPECIFICATIONS

1. Hardware

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

1. Arduino Microcontroller Board

1. Arduino Uno Microcontroller board based on the ATMEGA328P
2. 14 Digital Input / Output pins (of which 6 provide PWM output)
3. 16 MHz Ceramic Resonator
4. USB Port
5. Power Jack – 9V DC, 1A

2. Sensors & Other Components

1. Temperature and Humidity Sensor DHT22
   Temperature Range : -10°C to 90°C, Relative Humidity Operating Range 0 to 95%
2. Wind Speed Sensor - Speed : 0 to 20m/S Resolution 1m/S
3. Wind Direction Sensor
4. Rainfall Bucket Collector
5. Solar Radiation Sensor – SOS011
6. UV Index Sensor
7. Atmospheric Pressure Sensor - BMP180
8. Air Quality Detection Sensor - PM2.5

3. Modules and Hardware:

1. 20 X 4 - LCD Display
2. GSM Module – 2.4 GHz
3. ESP32 Wifi Module
4. 12 V Solar Charger
5. 2 mm interconnection Sockets

4. Application Software

1. Smart Dashboard for remote monitoring and analysis

2. Accessories

1.	USB Cable	: 2 No
2.	Ethernet Cable	: 1 No
3.	Micro USB to USB cable for ESP32	: 1 No
4.	Power Supply Adaptor	: 9V DC, 1A
5.	Power Supply Battery	: 12V/42AH
6.	Solar Panel	: 100W
7.	Jumper wires	: 50 Nos.
8.	Pen Derive with Software, Library, Driver, Codes, Soft Copy of Manual and 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 Agarbatti and matchbox for smoke to test PM25 and PM10	

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 Arduino Board

1. To understand theory and working of Arduino Operating software.
2. To understand Pin and Connection Diagram of Arduino.
3. To understand USB Interface for Arduino.
4. To understand 20 x 4 LCD Display.

B. Theory of ESP32 and GSM Wireless Module

5. To understand theory and working of ESP32
6. To understand Operating System for ESP32
7. To understand Pin and Connection Diagram of ESP32
8. To understand USB Interface for ESP32
9. To understand theory and working of GSM

C. Theory Experiments for Sensors

10. To understand theory of Temperature and Humidity Sensor DHT22
11. To understand theory of Wind Speed Sensor
12. To understand theory of Wind Direction Sensor
13. To understand theory of Rainfall Bucket Collector
14. To understand theory of Solar Radiation Sensor SOS011
15. To understand theory of UV Index Sensor
16. To understand theory of Atmospheric Pressure Sensor - BMP180
17. To understand theory of Air Pollution Detection sensor PM2.5- PM10 Dust Sensor

D. Practical Experiments

18. To measure Air Temperature and Humidity using sensor DHT22
19. To measure Wind speed using Wind Speed Sensor
20. To observer and display Wind direction using Wind Direction Sensor
21. To measure Rainfall using Rainfall Bucket Gauge Collector
22. To measure Solar Radiation using Solar Radiation Sensor SDS011
23. To measure UV Index of solar rays using Index Sensor
24. To measure Atmospheric Pressure using Atmospheric Pressure Sensor - BMP180

25. To measures Air Pollution Detection using PM2.5-PM10 Dust Sensor
26. To charge Battery using Solar Panel

E. Server, Cloud Configuration, IOT Gateway, Nodes and Mobile App Experiments

27. To send Sensors data by SMS to Mobile using GSM IOT Gateway
28. To send Sensors data using Wifi Wireless Node to Main Base IOT Receiver
29. To send and display Sensors Data on website Smart Dashboard on a server
30. To send and display Sensors Data in a server Web Page using HTTP, Java and PHP Code
31. To send Sensors data to website webpage and store them into MySQL Server
32. To receive and show Sensors data on Android based Mobile App

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