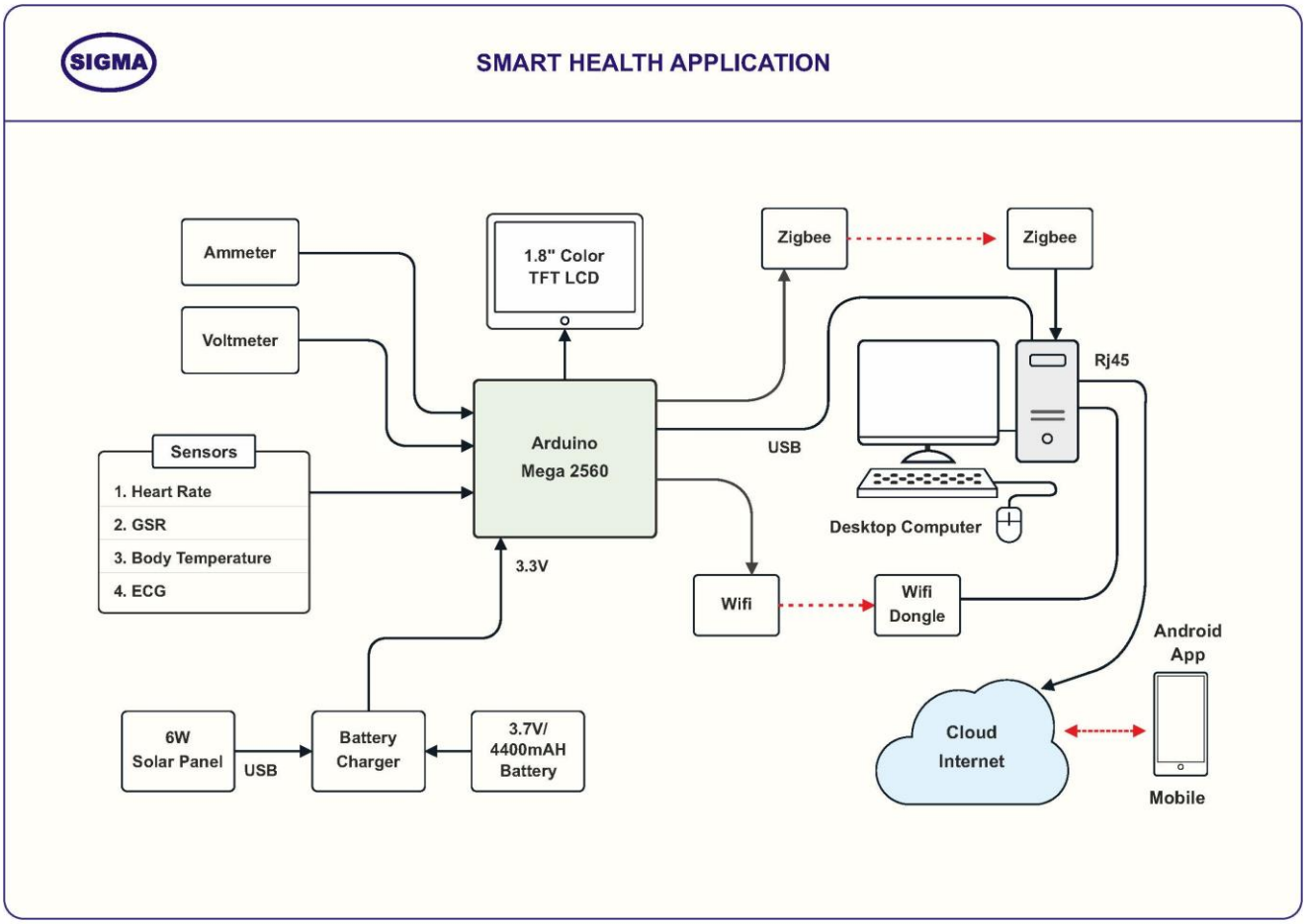
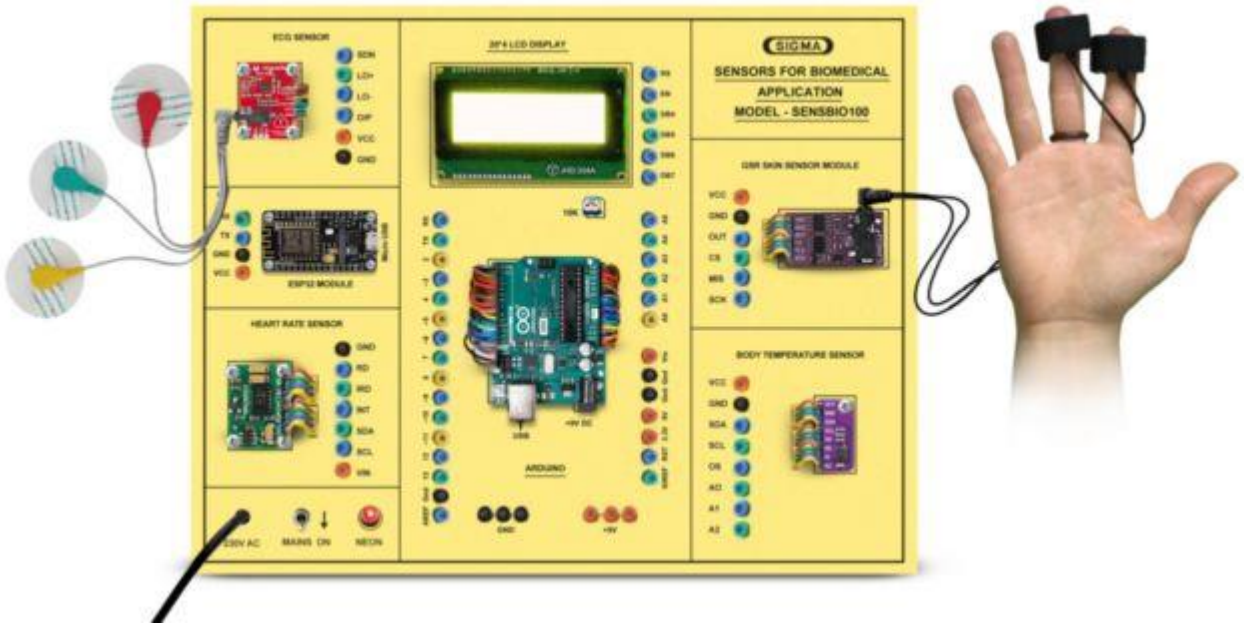
# SMART HEALTH MONITORING SYSTEM TRAINER

## MODEL-SMARTHEALTHIOT100

## SPECIFICATIONS




SIGMA
ZIGBEE
COORDINATOR
Power
+5V
+3.3V
GND
Potentiometer
TFT Display
Voltage and Current Meter
Up
Enter
Down
Voltage
Current
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SIGMA
SMART HEALTH USING IOT WITH SIMULATION SOFTWARE
MODEL-SMARTHEALTHIOT100


SIGMA
SENSORS FOR BIOMEDICAL
APPLICATION
MODEL - SENSBIO100

## INTRODUCTION

This trainer has been designed with a view to provide practical and experimental knowledge Sensors programing for IoT based Smart Health applications with Arduino Board.

## A. Wireless Sensor Gateway

### A. Arduino Atmega 2560 Microcontroller Board

| | | |
|---|---|---|
| 1. | 8 Bit RISC Microcontroller | : Atmega 2560 Arduino Microcontroller board |
| 2. | Flash Memory | : 256 KB, 8KB used by Bootloader |
| 3. | SRAM | : 8 KB |
| 4. | EEPROM | : 4 KB |
| 5. | Clock Speed | : 16 MHz |
| 6. | USB Port | : Mini USB Port |
| 7. | Digital Input / Output pins | : 54 (of which 14 provide PWM output) |
| 8. | Analog input pins | : 16 |
| 9. | UART | : 2 Nos. |
| 10. | I2C | : 1 No |
| 11. | Power Supplies | : 5V and 3.3V |
| 12. | Sensors and Actuator Connectors | : 10 Nos – DIN Connectors |
| 13. | TFT Color LCD - 1.77 inch | : 1 No |
| 14. | Operating Voltage | : 5V DC |

### B. Sensors

| | | |
|---|---|---|
| 1. | ECG Sensor - Analog voltage | : 1 No |
| 2. | Heart Rate Sensor Pulse-Oxi Meter | : 1 No |
| 3. | GSR Sensor - Analog voltage | : 1 No |
| 4. | Body Temperature Sensor - 0 to 100°C | : 1 No |

### C. Zigbee Module

| | | |
|---|---|---|
| 1. | Zigbee Module - 2.4GHz / 63mW | : 1 No |
| 2. | PC Interface | : USB 2.0 |
| 3. | Zigbee Frequency | : 2.4 GHz |

### D. Wifi Module

1. ESP32 Wifi Module : 1 No.
2. Wifi Frequency : 2.4 GHz
3. PC Interface : USB 2.0
4. Wi-Fi connectivity for cloud interface

### E. Battery Setup

1. Supply for Battery Charging : +5V Via USB
2. DC Battery : 3.7V, 4400 mAH
3. Charging and Protection circuit for battery

### F. Switches, Faults and Meters

1. Switch Faults : 30 nos.
2. Signal Test points : 30 nos.
3. Digital Voltmeter 0-25V : 1 No
4. Digital 0 - 10A : 1 No
5. Audio Buzzer : 1 No
6. LED : 1 No
7. Variable Potentiometer – 10K : 1 No
8. Input Output Switches : 3 Nos

## B. Computer System as a Sensor Receiver Station

### 1. Zigbee Dongle – Coordinator

1. Zigbee Dongle - 2.4GHz / 63mW : 1 No
2. PC Interface : USB
3. Zigbee Frequency : 2.4 GHz

### 2. Wifi Dongle

1. Wifi Frequency : 2.4 GHz
2. PC Interface : USB

## C. Softwares

1. Wi-Fi connectivity software and android app for field testing.
2. Software to View sensor's real time graph analysis on PC and mobile.

## D. Accessories

| | | |
|---|---|---|
| 1. | Ethernet Cable | : 1 No |
| 2. | USB to Square-type USB for Zigbee | : 1 No |
| 3. | USB to Mini USB for Zigbee | : 1 No |
| 4. | 9V, 3A DC Adaptor for Arduino | : 1No |
| 5. | SD Memory Card with Codes for All Experiments | : 32 GB - No |
| 6. | 16 GB Pen Derive Software, Library, Drivers, Codes, Soft Copy of Manual & Mobile App | |
| 7. | Printed Practical Manual | : 1 No |
| 8. | E-Books for IOT Subjects | : 10 Nos |
| 9. | Mp4 Video Class for IOT Subjects | : 100 Nos |
| 10. | Power Supply | : 230V AC, 50 Hz |
| 11. | Operating Conditions | : 0-40 °C, 85% RH |
| 12. | Maintenance and Service Support | : 1 Year |

# EXPERIMENTS

1. To understand theory of Arduino Board Sensor Nodes and All sensors
2. To understand theory of Zigbee and Wifi Wireless Gateways

3. To understand theory of ECG Sensor and draw ECG Graph of a Human Body
4. To understand theory of Heart Rate Sensor cum Pulse-Oxi Meter and measure Heart Rate and Oxygen of a Human Body
5. To understand theory of GSR Sensor and measure GSR of a Human Body
6. To understand theory of Body Temperature Sensor and Measure Human Body Temperature

7. To measure all Sensors data simultaneously
8. To send Sensors data from Sensor Node to Computer System using Zigbee IOT Gateway
9. To send Sensors data from Sensor Node to Computer System using Wifi IOT Gateway
10. To send Sensors data to Mobile using Mobile App
11. To send Sensors data to Website Cloud page
12. To send Sensors data to MySQL Cloud Server and store them
13. To send Sensors data to Local Host Server and Store them on website html page
14. To view sensor's Real Time Graph Analysis on PC and Mobile