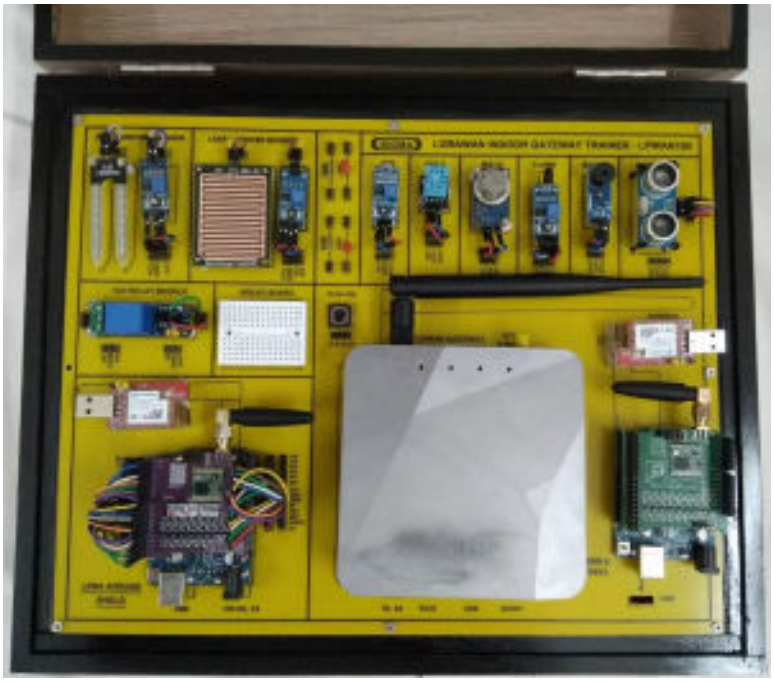
# 10. LORAWAN USB PEER TO PEER COMMUNICATION TRAINER

## MODEL-LORA-USB100

## SPECIFICATIONS



This trainer has been designed with a view to provide practical and experimental knowledge of Internet of Things (IOT) with LoRaWAN Peer to peer Communication Sensors programing with Arduino IOT Boards with LoRaWAN Gateways.

## 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. Micro Controllers

1. Arduino UNO R3 : 2 No
2. 5 dbi LoRa Antenna for 865MHz : 2 No
3. LoraWAN USB Adaptor : 2 No

### C. Sensors

1. Flame Sensor : 1 No
2. Photosensitive LDR Sensor : 1 No
3. Temperature and Humidity Sensor : 1 No
4. Ultrasonic Distance Sensor : 1 No

### D. Features

1. A long range transceiver on an Arduino shield form factor and based on Open source library.
2. The Shield allows the user to send data and reach extremely long ranges at low data-rates. It provides ultra-long range spread spectrum communication and high interference immunity whilst minimising current consumption.

### E. Programming Examples

1. Arduino C Programming

### F. Tools Used

1. Arduino IDE

## G. Features

1. Semtech SX1276 LoRa" IC
2. LoRa" Expansion board direct Compatible with Arduino Uno
3. Interface with Arduino Uno
4. Suitable for LoRaWAN or Peer to Peer LoRa Protocol
5. Compatible with 3.3V or 5V GPIO Pin Arduino Board
6. Frequency Band: IN865
7. Low power consumption
8. External Antenna via SMA Female connector
9. Open-Source LMIC Library
10. LoRaWAN Class A Support
11. LoRaWAN Activation Mode Support: ABP & OTAA

## H. LoRa Module Specification

1. 168 dB maximum link budget
2. +20 dBm - 100 mW constant RF output at 3.3V Supply
3. +14 dBm high efficiency
4. Programmable bit rate up to 300 kbps
5. High sensitivity: down to -148 dBm
6. Bullet-proof front end: IIP3 = -12.5 dBm
7. Excellent blocking immunity
8. Low RX current of 10.3 mA, 200nA register retention
9. Fully integrated synthesizer with a resolution of 61 Hz
10. FSK, GFSK, MSK, GMSK, LoRa" and OOK modulation
11. Built-in bit synchronizer for clock recovery
12. Preamble detection
13. 127 dB Dynamic Range RSSI
14. Automatic RF Sense and CAD with ultra-fast AFC
15. Packet engine up to 256 bytes with CRC

## I. Other Parts

| | | |
|---|---|---|
| 1. | White LED | : 5 Nos. |
| 2. | Audio Buzzer | : 1 No |
| 3. | Relay Module | : 1 No |
| 4. | USB Cables | : 2 No |
| 5. | Jumper Wires Male to Male | : 20 Nos |
| 6. | Jumper Wires Female to Female | : 20 Nos |
| 7. | Jumper Wires Female to Male | : 20 Nos |
| 8. | Push Switch | : 2 No |
| 9. | LEDs | : 2 No |
| 10. | Resistors – 220 Ohm | : 4 No |
| 11. | Breadboard - 400 Points | : 1 No |

## J. Accessories

| | | |
|---|---|---|
| 1. | All Cables and Adaptors | |
| 2. | Pen Drive | : 16 GB with All Codes and Soft copy of Manual |
| 3. | E-Books for IOT Subject | : 100 Nos. in PDF Format |
| 4. | Mp4 Video for IOT Subject | : 100 Nos |
| 5. | Online Cloud/Server Services | : For 1 Years on Cloud Server |
| 6. | Live Training at College | : For 2 Days for 4 Hours per Day |
| 7. | After Sale Training support | : By Online Zoom Meeting or By Whatsapp Video Call |

## EXPERIMENTS

1. To explain theory of All Micro Controller Boards, All Wireless Gateways and All Sensors Parts
2. To measure all Sensors data using Arduino Boards
3. To setup and configure LoRaWAN Cloud Server
4. To send live Sensors Data between two Lora USB Modules using Peer-to-Peer Lora Communication
5. To send live Sensors Data to LoRaWAN Cloud and View on Website Page Dashboard
6. To send live Sensors Data to LoRaWAN Cloud and View on Android Mobile App
7. To send live Sensors Data to LoRaWAN Cloud and save on MySQL Cloud Server and then store and export it in xls file
8. To send Sensors data to Local Host Server, store and export it in xls file
9. To send Sensors data to Local Host Server and Display on website html page

# Contact us

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