## Start Your IoT Journey Today..!

ESP32 essential development features a plug and play design that makes it easy for connections and helps Students, hobbyists, enthusiasts, and professionals to focus more on Program / application development. ESP32 IoT Trainer Kit equipped with on board IO's, communication interfaces & peripherals. It is really easy to design, experiment with, and test circuits without soldering. It's used in many educational institutions and R&D LAB across the world.

# Features:

## Board Features

- On Board Programming.
- Plug & Play Interface Connectivity.
- Professional EMI/RFI Complaint PCB Layout Design
- Modular Block design makes Easy access & quick Prototyping
- FRC connectivity features minimize the connection Error.
- High Quality Grade PCB with wooden Enclosure.
- 8 interfacing LED's.
- 1 * 4 Menu keypad.
- 4* 4 Matrix Keypad.
- RS232, RS485, USB communication port.

- 7 Segment Multiplexed Display.
- 16*2 LCD & OLED Display
- ADC & DAC Card.
- 8 bit 4 port IO.
- On Board WiFi/Bluetooth Connectivity
- 3.3 to 5V Level Converter.
- Power Supply 3.3V and 5V
- SD CARD Interface.
- RTC & EEPROM Interface.
- DC Motor/ Stepper Motor Driver.
- Relay, Buzzer.
- 1xTemperature Sensor.
- 3x Analog Test POT.

## MCU

- ESP32-D0WD-V3 embedded, Xtensa® dual-core 32-bit LX6 microprocessor, up to 240 MHz
- 448 KB ROM for booting and core functions
- 520 KB SRAM for data and instructions
- 16 KB SRAM in RTC
- 4 MB SPI flash

## Wi-Fi

- 802.11b/g/n
- Bit rate: 802.11n up to 150 Mbps
- A-MPDU and A-MSDU aggregation
- 0.4 µs guard interval support
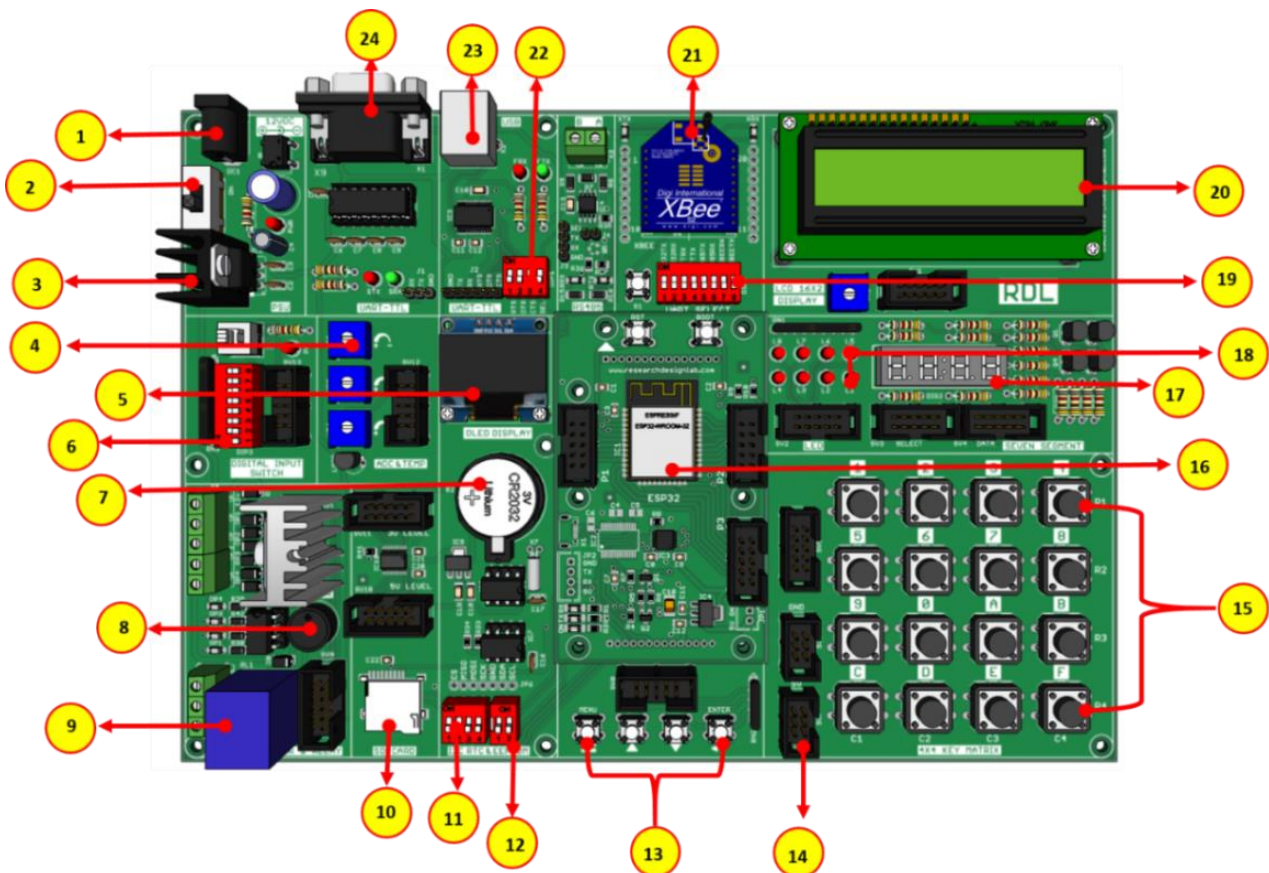- Center frequency range of operating channel: 2412 ~ 2484 MH
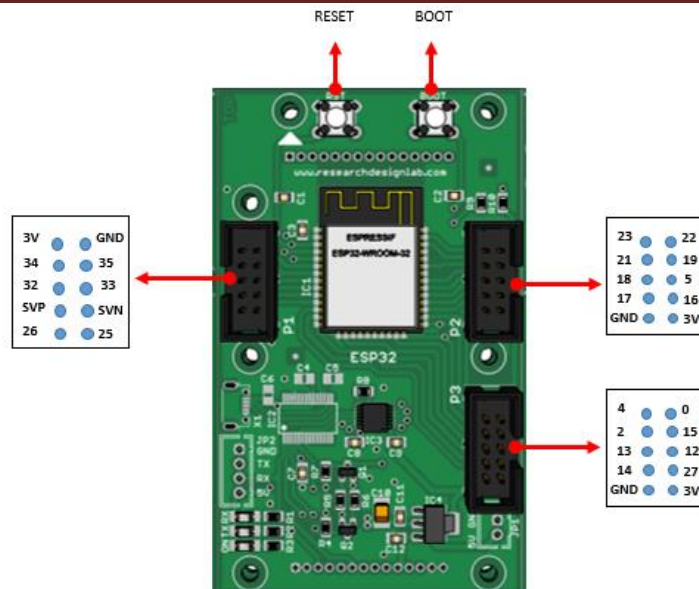
## Bluetooth® / BLE

- Bluetooth V4.2 BR/EDR and Bluetooth LE specification
- Class-1, class-2 and class-3 transmitter
- AFH
- CVSD and SBC

## Hardware

- **Interfaces**: SD card, UART, SPI, SDIO, I2C, LED PWM, Motor PWM, I2S, IR, pulse counter, GPIO, capacitive touch sensor, ADC, DAC, Two-Wire Automotive Interface

- **Communication Interface**: RS232, RS485 (Modbus RTU) , USB , SPI , I2C .

- **On Board Peripheral** : OLED Display , 16x2 LCD Display, Seven Segment Display ,8x LED , 4x4 Hex Keypad , 1x4 Menu Keypad , Xbee Adapter, 3.3 to 5v Level Converter, SD CARD Interface, RTC & EEPROM, DC Motor / Stepper Motor Driver, Relay, Buzzer,1xTemperature Sensor,3x Analog Test POT ,8x Selection DIP Switch

## ESP-32 Board Narration

1. Power Supply
2. Power ON Switch
3. Heat Sink
4. ADC (Variable Resistor POT)
5. OLED Display
6. Digital Input Switch
7. RTC Battery
8. Buzzer
9. Relay
10. SD Card Holder
11. Jumper Settings for I2C RTC
12. Jumper Settings for EEPROM
13. 1*4 Keypad Switches

14. RDL Bus FRC Connector
15. 4*4 Keypad Matrix
16. ESP32 Controller
17. 7 Segment Display
18. 2*4 LED's
19. Jumper Settings for UART Selection Pin
20. 16*2 LCD Display
21. WiFi Module
22. Jumper Settings for UART TTL
23. USB Port
24. DB-9 Serial Female Connector

## Scope of Learning Experiments:

- LED blinking.
- 8 bit LED Left shift, Right shift and counting operation.
- Keypad Interrupt Interface
- 16*2 LCD interface.
- Matrix Keypad Interface.
- ADC& DAC interface.
- Traffic Light Signal Interface.
- 8 bit DIP switch interface.
- 7 Segment interface.
- L298 Driver for DC Motor and Stepper motor interface.

- Elevator Interface.
- Buzzer, Relay interface.
- RS485, RS232 serial communication.
- UART Operation
- RTC DS1307I2C protocol interface.
- AT24C04 EEPROM I2C protocol interface.
- RF/WiFi Communication.
- Temperature Sensor Interface.

## Applications

- Generic Low-power IoT Sensor Hub
- Generic Low-power IoT Data Loggers
- Cameras for Video Streaming
- Over-the-top (OTT) Devices
- Speech Recognition
- Image Recognition
- Mesh Network

- Home Automation
- Smart Building
- Industrial Automation
- Smart Agriculture
- Audio Applications
- Health Care Applications
- Wi-Fi-enabled Toys
- Wearable Electronics
- Retail & Catering Applications

## Package Includes

- Development Board with Wooden Enclosure
- USB Cable
- 12V 2A  Adapter
- FRC Cable

**NOTE:** **XBee module is not included in the package**

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