RDL TECHNOLOGIES

ESP32

IoT TRAINER KIT

PLUG & CODE

OTA / ON BOARD PROGRAMMING

ON BOARD WIFI & BLUETOOTH

DUAL CORE 240MHz

16 MB FLASH

RoHS 2011/65/EU

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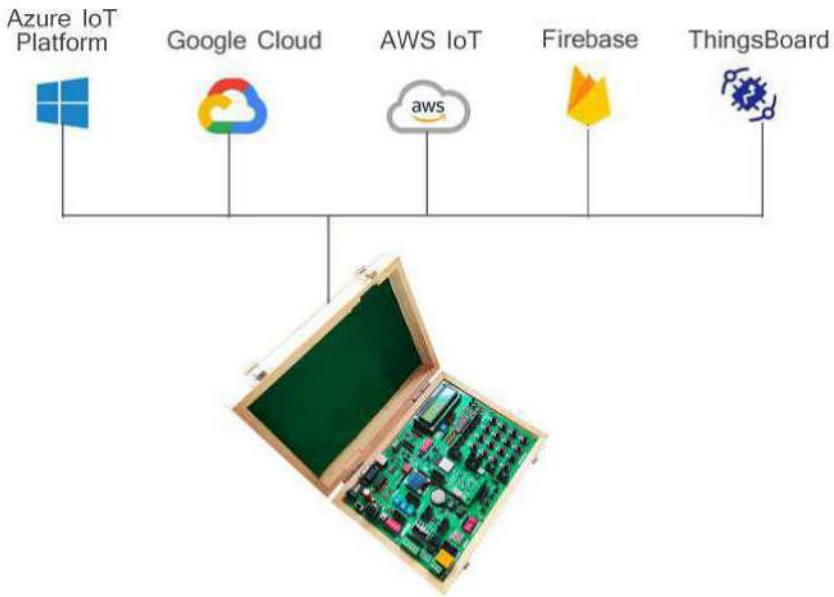
START YOUR IoT JOURNEY TODAY..!

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.

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.
- ROHS Compliant High Quality Grade PCB with wooden Enclosure.
- Open-source Hardware ESP32 dual-core 32-bit up to 240 MHz, Flash 16 MB.
- Supported most of the open-source platforms for Custom Programming
- The device offers multiple industrial protocols like MODBUS RTU, MODBUS TCP, JSON, MQTT, and FTP and supports secure communication SSL.
- Supported most of the cloud platforms including Microsoft Azure & AWS etc
- OTA Firmware upgrade supported
- On Board Programming.
- Plug & Play Interface Connectivity.
- Supported communication over USB, WiFi, Bluetooth, and Modbus RTU and RS232
- Supported DC 12V Power Supply.

SUPPORT MOST OF THE POPULER CLOUD PLATFORM



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
- WiFi enabled Toys
- Wearable Electronics
- Retail & Catering Applications

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Scope of Learning Experiments:

- LED blinking.
- 8 bit LED Left shift, Right shift and counting operation.
- Keypad Interrupt Interface
- 6*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.
- Communication using UART, I2C, & SPI
- Buzzer, Relay interface.
- RS485, RS232 serial communication.
- ESP32 IO Interfacing with different sensor
- RTC DS1307I2C protocol interface.
- AT24C04 EEPROM I2C protocol interface.
- RF/WiFi Communication.
- Temperature Sensor Interface.

Open Source Development Environment

- Multi processing using Dual core ESP32
- Interfacing SD card and handling file system with esp32 using SPI and other method
- Interfacing sensor with & Data parsing using RESTful & Json protocol
- FTP Implementation
- Interfacing sensor with ESP32 and MQTT protocol Implementation Exploring MQTT Features Subscribe & Publish methods
- MQTT SSL certificate implementation - ESP32
- Interfacing RS485 salve using MODBUS protocol
- Interfacing BLE & Data parsing using RESTful/Json/MQTT protocol
- OTA implementation - ESP32
- Implementation of FREE RTOS on ESP32
- Exploring DMA features of ESP32
- Text to speech implementation
- Device control through Speech recognition & Alexa Integration
- Appliance control through cloud platform using MQTT protocol
- Environment data like temp & humidity capturing using cloud platform
- Modbus RTU Communication and accessing data from Industrial PLC
- Wireless TCP/IP socket connection implementation using node and server architecture
- Exploring WiFi- MESH features
- BioMedical sensor kit integration and connecting IoT cloud platform for prediction
- Exploring OPC / UA server and client Implementation
- Implementation of ESP32 WEB server application

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SPECIFICATION

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
- 16 MB SPI flash

BLUETOOTH® / BLE

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

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

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.

DISPLAY INTERFACE

- OLED 0.96"
- 16X2 LCD Display
- Seven Segment Display

KEYPAD INTERFACE

- 4X4 Hex Keypad
- 1X4 1X4 Menu Keypad

MEMORY INTERFACE

- SD Card Interface
- EEPROM AT24C08

DRIVERS, RELAY & BUZZER

- DC Motor/Stepper Motor
- Buzzer

ON BOARD SENSOR, TESTING INPUT POT & SWITCHES

- 1X Temperature Sensor LM35
- 3X Analog Test POT
- 8X Selection DIP Switch

CONVERTER & ADAPTER INTERFACE

- Xbee Adopter
- 3.3V to 5V Level Converter

REAL TIME CLOCK (RTC)

- RTC DS1307

ON BOARD POWER POINTS

5V, 3.3V & GND

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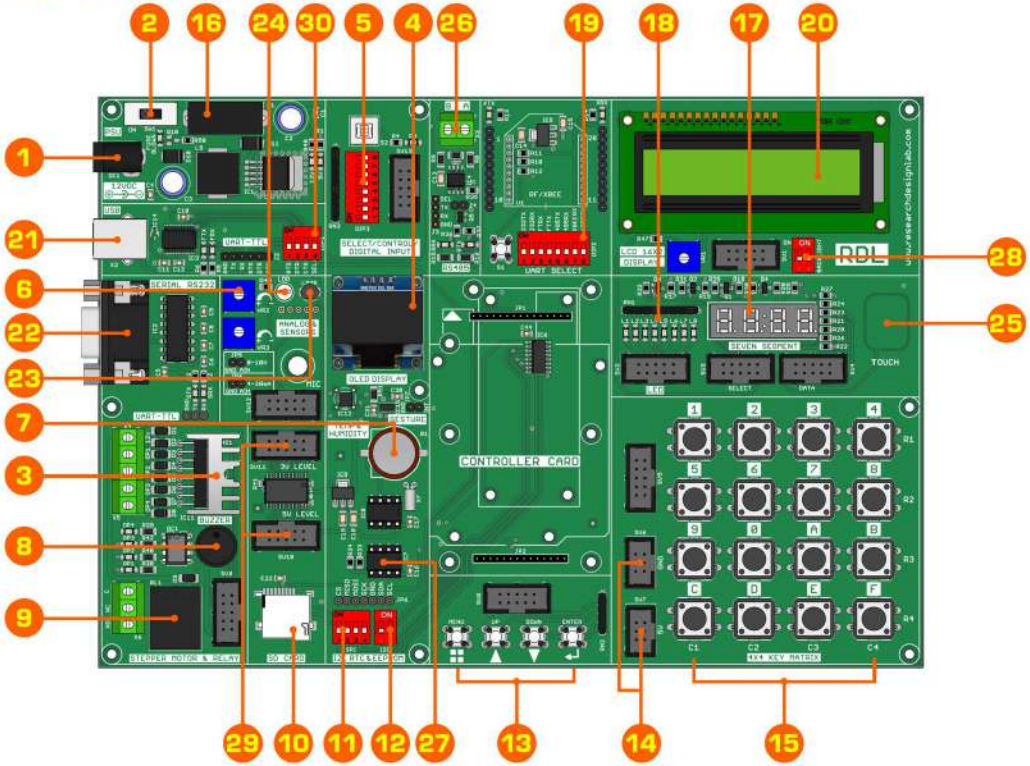
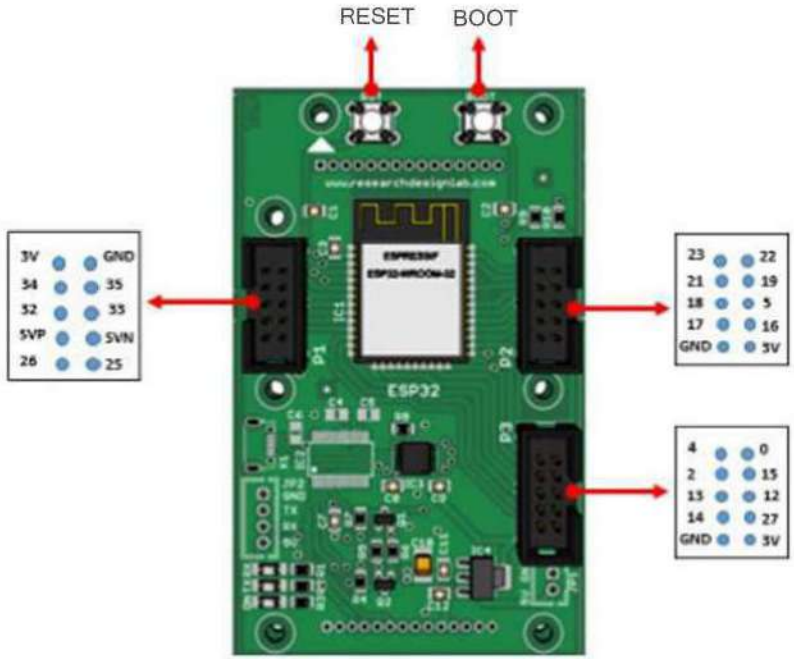
ESP-32 BOARD NARRATION





1. Power Supply
2. Power ON Switch
3. L298 Driver
4. OLED Display
5. Digital Input Switch
6. ADC (Variable Resistor POT)
7. RTC Battery
8. Buzzer
9. Relay
10. SD Card Holder
11. On Off Switch for SPI
12. On Off Switch for I2C
13. 1*4 Keypad Switches
14. RDL Bus FRC 5V & GND Connector
15. 4*4 Keypad Matrix
16. FUSE Holder
17. 7 Segment Display
18. 1*8 LED's
19. Jumper Settings for UART TTL
20. 16*2 LCD Display
21. USB Port
22. DB-9 Serial Female Connector
23. LM35 - Temperature Sensor
24. LDR Sensor
25. Touch
26. RS485
27. EEPROM
28. Backlight On/Off Switch
29. 3.3V to 5V Level Controller
30. Comport Handshaking Signal DIP Switch

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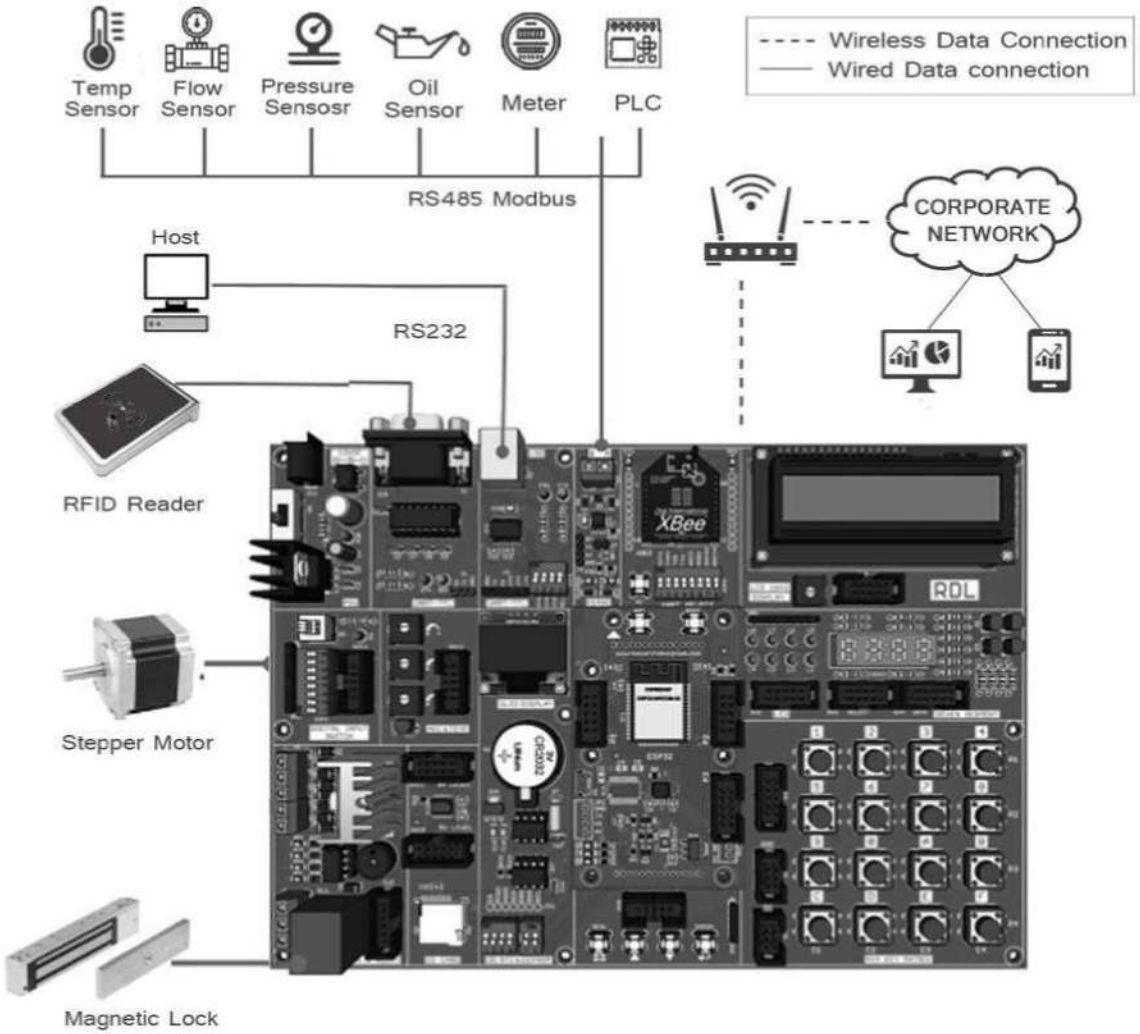
APPLICATION WIRING DIAGRAM



Quick Idea to Proof of Concept (POC)

Idea

Devolopment Kit

Single board IoT edge computing Hardware Platform

Solution

Use familiar Open Source IDE to Build Custom Solution

Package Includes

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

NOTE: XBee module is not included in the package

ACCESSORIES - PROGRAMMABLE ESP32 IoT EDGE IO MODULE

ORDER CODE: RDL869

Features:

- Controller ESP32 Bit Dual Core 32 Bit 240 MHz 16MB
- 8X Isolated Digital Input
- 1X Isolated Ethernet 10/100MBPS
- 1X USB for Programming & Configuring
- 9 to 36V Power Supply
- 16GB SD Card for Event Log
- Real Time Clock
- OnBoard Bluetooth & WiFi

Application:

- ✓ Andon System
- ✓ Hotel Room Automation
- ✓ Smart FeedBack Collecting System
- ✓ Alaram & Automated Task Application
- ✓ Digital Checksheet

ORDER CODE: RDL865

Features:

- Controller ESP32 Bit Dual Core 32 Bit 240 MHz 16MB
- 3x Isolated Digital Input 24V
- 2X Isolated Relay 6A
- 4X Isolated Analog Input 0-10V to 4-20mA
- 1X Isolated RX45 Modbus RTU
- 1X USB for Programming Configuration
- RTC for Realtime Clock
- OnBoard Bluetooth & WiFi
- Supply Voltage 12-36V

Application:

- ✓ Production & Process Monitoring System
- ✓ Removte Monitoring System
- ✓ Condition Monitoring System
- ✓ Utility Monitoring System
- ✓ Greenhouse Monitoring System

ORDER CODE: RDL857

Features:

- Controller ESP32 Bit Dual Core 32 Bit 240 MHz 16MB
- 4X Isolated Digital Input 24V
- 4X Isolated 6AmpsRelay
- 1X Isolated RS485 Modbus RTU
- 1X USB Programming & Configuring
- On Board WiFi & Bluetooth
- Power Supply to 12-36V

Application:

- ✓ Andon System
- ✓ Hotel Room Automation
- ✓ Smart FeedBack Collecting System
- ✓ Alaram & Automated Task Application
- ✓ Digital Checksheet

Note: Additional Accesories need to be Order Seperately. For More Additional Accessories Please Contact us Directly.

ACCESSORIES - PROGRAMMABLE ESP32 IoT EDGE IO MODULE

4G/LTE COMMUNICATION MODULE

ORDER CODE: RDL876

Features:

. 4G/LTE	Max 150Mbs Down link /
	Max 50 Mbps Uplink
. Edge	Max 256kbps Down link /
	Max 236.8 kbps Uplink
. 4G/LTE Chipset	Qualcomm MDM9207,
	ARM Cortex A7 1.3 GHz
. Protocol	TCP / IP, JSON, MQTT,
	SSL, FTP, RESTful
. Security	WFA,WPA/WPA2 and WAPI

Application:

- ✓ Renewable Monitoring System
- ✓ Asset Tracking
- ✓ Automation
- ✓ Digital Signage
- ✓ Smart Grid & Meter
- ✓ Fixed Wireless Access
- ✓ Telehealth
- ✓ Paymeny Terminal

CLOUD PLC

ORDER CODE: RDL826

Features:

- Controller ESP32 Bit Dual Core 32 Bit 240 MHz 16MB
- LX6 Microprocessor 32 bit, with Clock Frequency 240MHz
- 4X Isolated Analog input 0-24V
- 6X isolated Digital input 24V
- 4X Isolated digital output/PWM
- Working Voltage 24V
- 2X Relay (NO & C)
- 1X Isolated RS485
- DS3231 RTC
- 1X WiFi
- UART Programming OTA (Over The Air) Firmware upgrade for WiFi devices
- 16 GB inbuilt storage
- LED indicators to indicate Power

Application:

- ✓ Production and process monitoring.
- ✓ Utilities monitoring.
- ✓ Condition monitoring.
- ✓ Environment monitoring.
- ✓ Industrial Smart grid
- ✓ Leakage detection.
- ✓ Cold storage monitoring.
- ✓ District metering.
- ✓ Water treatment.
- ✓ Generator monitoring.
- ✓ Green House.

WiFi RELAY 30A

ORDER CODE: RDL877

Features:

- Controller ESP32 Bit Dual Core 32 Bit 240 MHz 16MB
- 1X RTC
- 1X Current Sensor
- 1X 30 Amps Relay
- On Board WiFi & Bluetooth
- On Board Power Supply 100-270VAC 50/60Hz

Application:

- ✓ Home Automation
- ✓ Alarms
- ✓ Relay Timer Enabled
- ✓ Open Wall control
- ✓ Vending machine

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ACCESSORIES - DIY IoT DEVOLOPMENT KIT

DIY AUTOMATED PLANT MONITORING SYSTEM

ORDER CODE: RDL878

Package Includes

- ESP32 IoT Trainer Kit with Wooden Enclosure
  USB Cable
- 12V 2A Adapter
- FRC Cable
- 1X IoT Module RDL 865
- 2X Soil Moisure Sensor
- 2X Valve
- 3X 1Meter Drip Irrigation Pipe
- Coupling Accessories 1 Set

DIY CONDITION MONITORING SYSTEM

ORDER CODE: RDL879

Package Includes

- ESP32 IoT Trainer Kit with Wooden Enclosure
- USB Cable
- 12V 2A Adapter
- FRC Cable
- 1X IoT Module RDL 865
- 1X Vibration Sensor
- RS485 RTU Vibration Sensor
- Temprature Sensor 4-20m Amps
- Energy Meter
- CT Coil
- Connecting Accessories

DIY ANDON

ORDER CODE: RDL880

Package Includes

- ESP32 IoT Trainer Kit with Wooden Enclosure
  USB Cable
- 12V 2A Adapter
- FRC Cable
- IoT Edge Io Module RDL857
- 1X Event Input Box
- 1X Tower Light
- Connecting Accessories

Note: Additional Accesories need to be Order Seperately. For More Additional Accessories Please Contact us Directly.

Note:

1. Unless otherwise specified, all parameters in this datasheet were measured at 25°C and 75% humidity.
2. All index testing procedures in this datasheet are based on our company's corporate standards.
3. We can offer product customization; please contact the sales team directly for more information.
4. Specifications are subject to change without prior notice:
5. For additional information on Product please refer to www.rdltech.in
5. Buy online @ www.researchdesignlab.com

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