IoT Discovery Kit

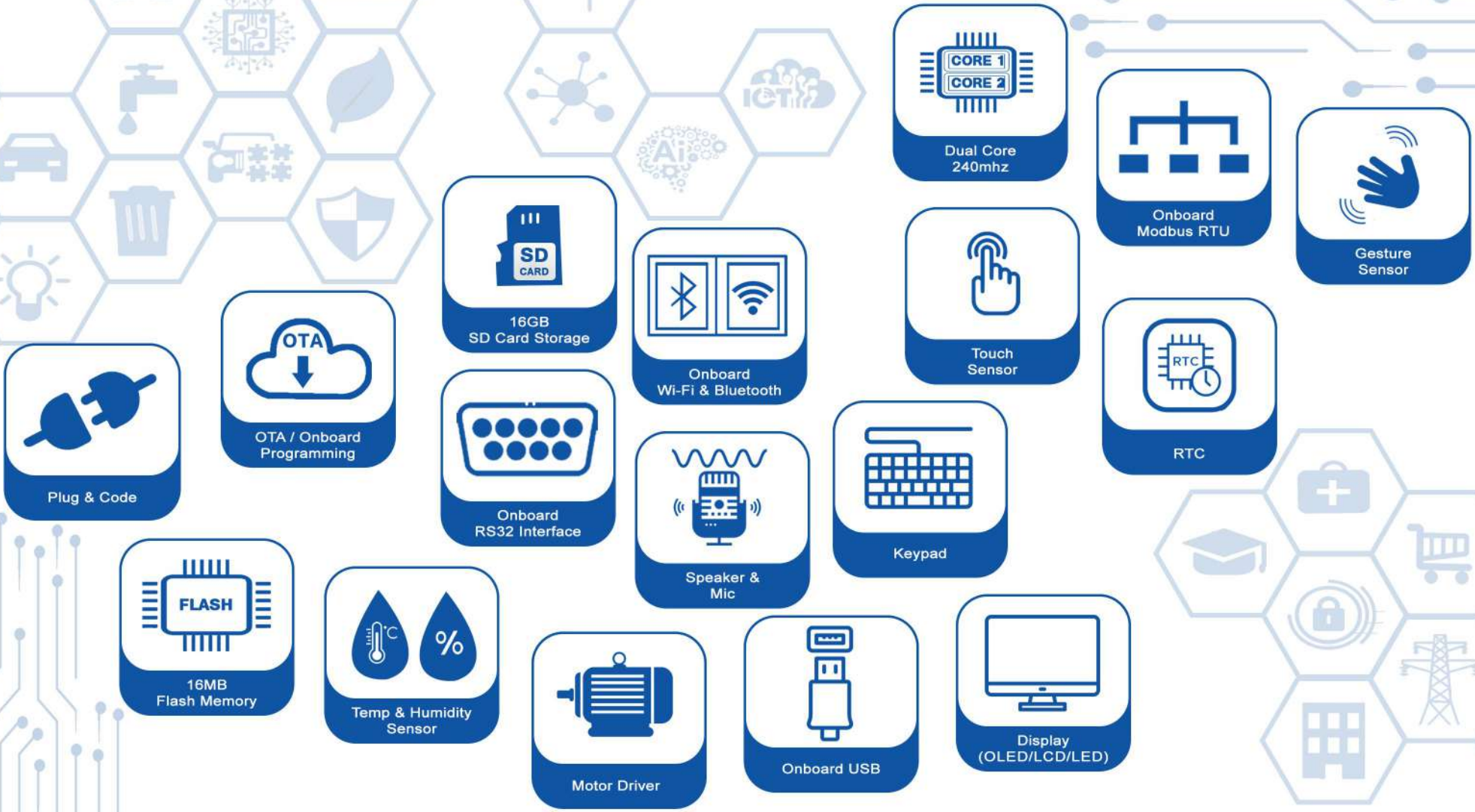
ADVANCED IoT DEVELOPMENT & TRAINING KIT

1000+ HANDS ON EXPERIMENTS

1 YEAR WARRANTY

25 Years Excellence in Educational Kits

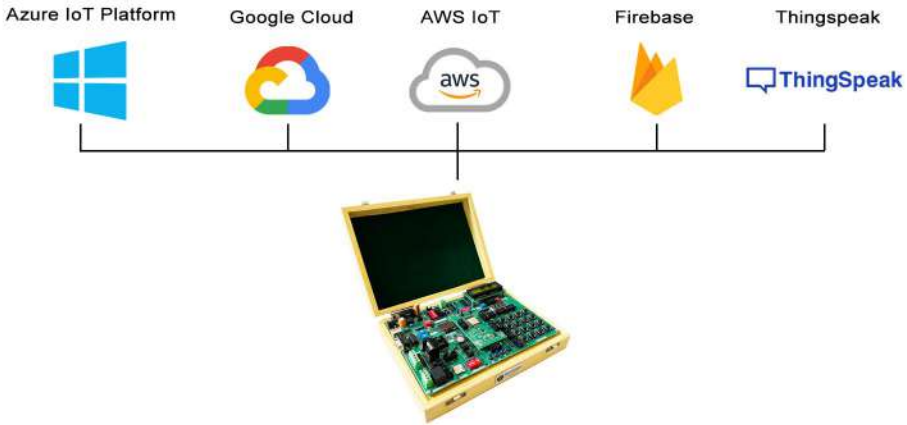
RoHS Compliant



IoT DISCOVERY BOARD

IoT Discovery Board 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. IoT Discovery Board 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.

SUPPORT MOST OF THE POPULAR CLOUD PLATFORM



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.
- Supported communication over USB, WiFi, Bluetooth, Modbus RTU & RS232.
- Supported DC 12V Power Supply.
- High Quality Grade PCB with wooden Enclosure.
- On Board Sensor - LDR, Temperature, Gesture & Sound Sensors.

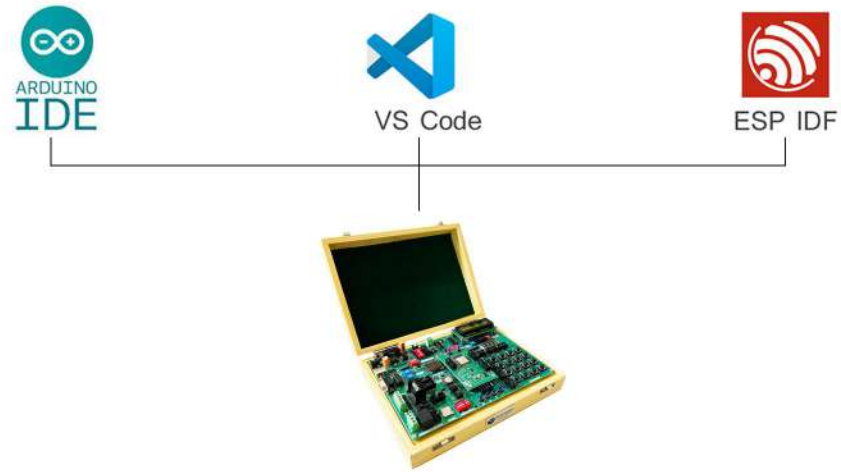
APPLICATIONS

- Generic Low-power IoT Sensor Hubs.
- Cameras for Video Streaming.
- Generic Low-power IoT Data Loggers.
- Over-the-top (OTT) Devices.
- Speech Recognition.
- Image Recognition.
- Home Automation.
- Smart Building.
- Industrial Automation
- Smart Agriculture
- Audio Applications
- Health Care Applications
- WiFi enabled Toys
- Wearable Electronics
- Retail & Catering Applications

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.
- 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.
- Gesture (APDS 9960) & Touch Sensor Implementation.
- Text to speech implementation.
- Device control through Speech recognition & Alexa Integration.
- Exploring WiFi- MESH features.
- BioMedical sensor kit integration and connecting IoT cloud platform for prediction.

Open Source Development Environment



- 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.
- Bluetooth Classic, BLE & Wi-Fi Communication.
- Temperature & Humidity Sensor Interface - AHT21B.
- 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.
- Snake & Starwar game
- Exploring OPC / UA server and client Implementation
- Implementation of ESP32 WEB server application

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.
- 4 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 AT24CO8.

DRIVERS, RELAY & BUZZER

- DC Motor / Stepper Motor.
- Buzzer.

ON BOARD SENSOR, TESTING INPUT POT & SWITCHES

- Light Sensor - LDR
- LM35 Temperature Sensor - SHT30-DIS
- Gesture Sensor - APDS 9960
- Touch Sensor
- Mic & Speaker with builtin ampliefier
- 1X Temperature Sensor LM35.
- 3X Analog Test POT.
- 8X Selection DIP Switch.

CONVERTER & ADAPTER INTERFACE

- Xbee Adapter.
- 3.3V to 5V Level Converter.

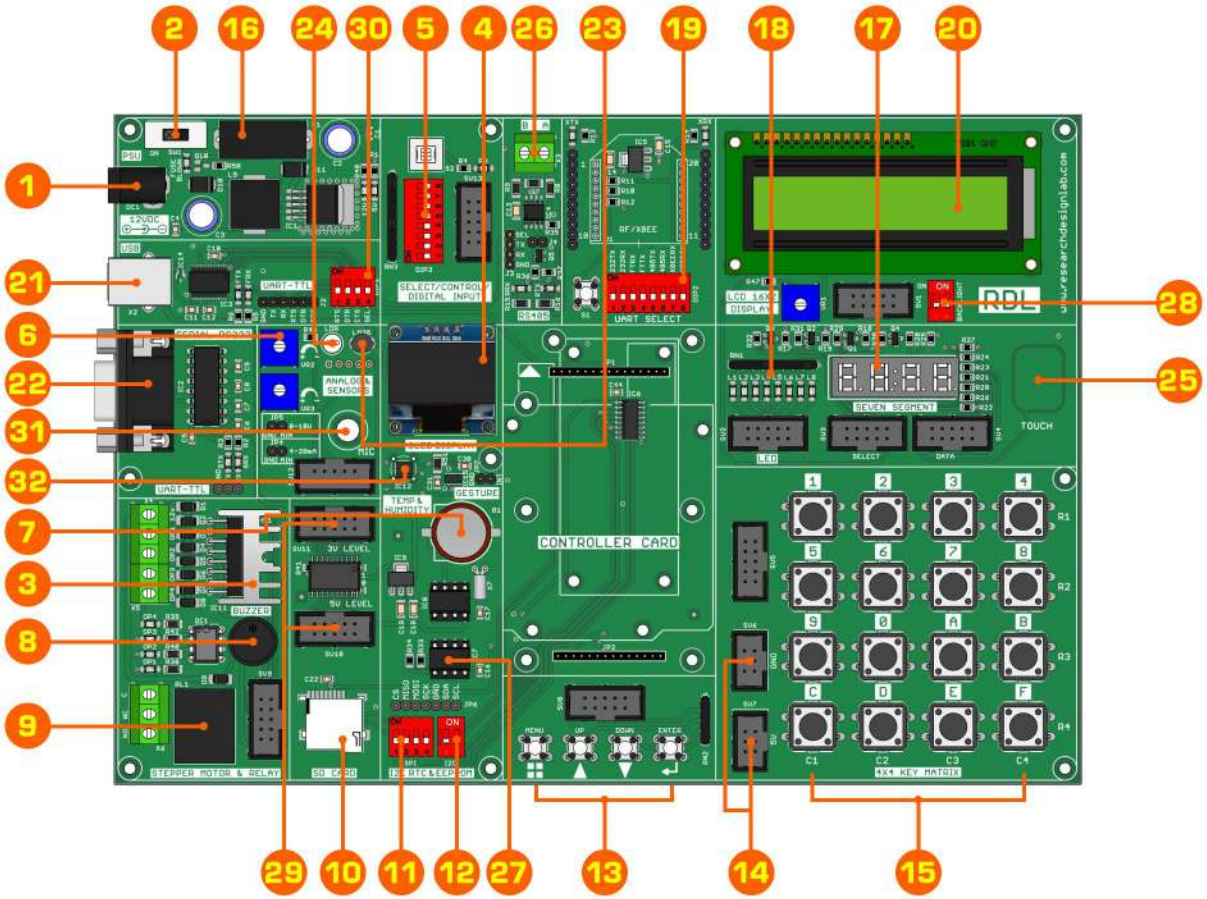
REAL TOME CLOCK(RTC)

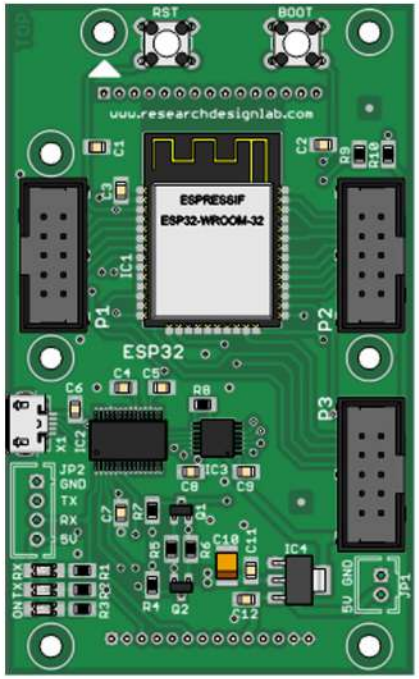
- RTC DS1307.

ON BOARD POWER POINTS

- 5V, 3.3V & GND.

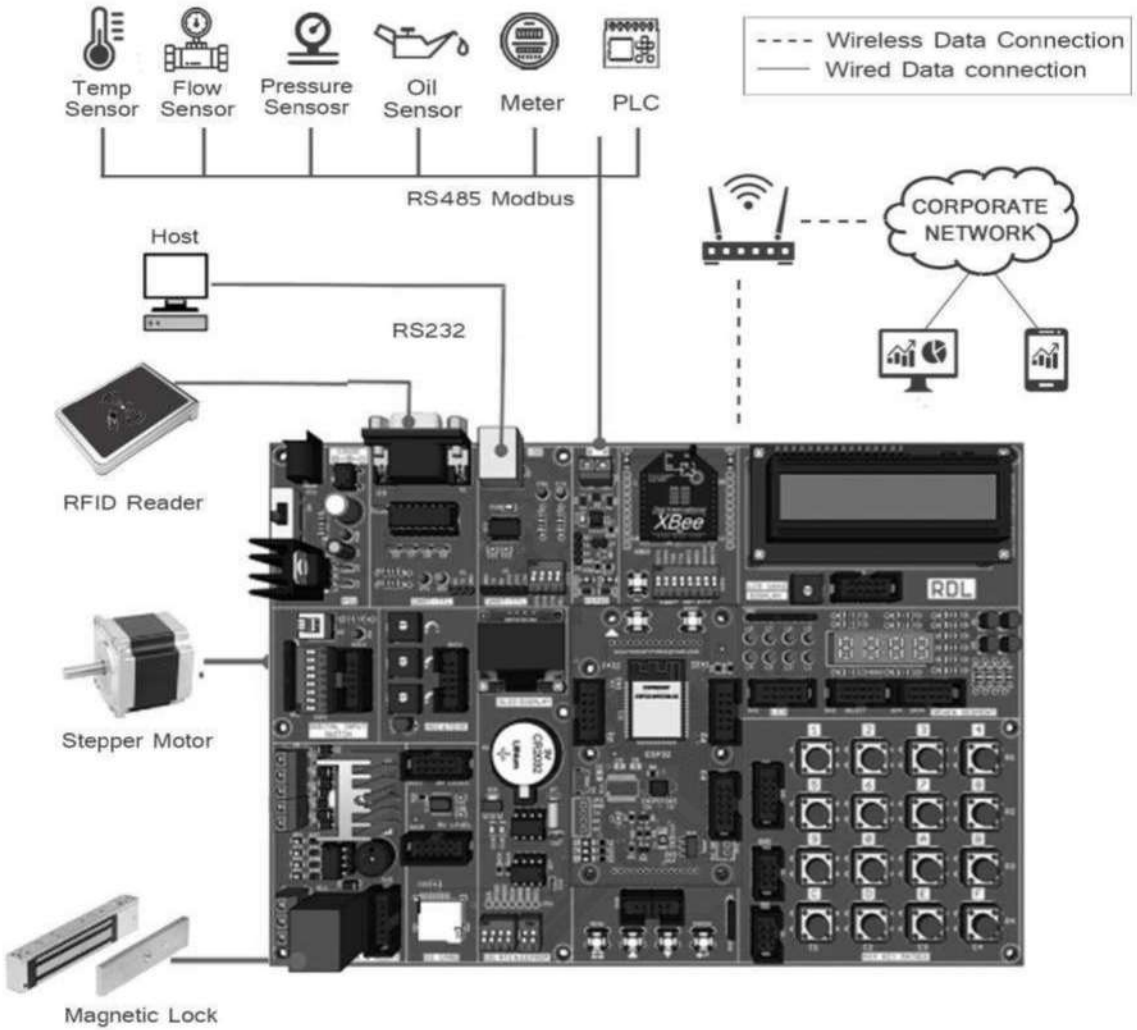
IoT DISCOVERY BOARD NARRATION BOARD





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
31. MIC
32. Temperature & Humidity Sensor

APPLICATION WIRING DIAGRAM



Quick Idea to Proof of Concept (POC)

Idea

Devolopment Kit

Single board IoT edge computing Hardware Platform

Solution

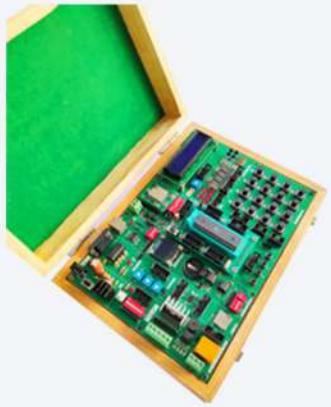
Use familiar Open Source IDE to Build Custom Solution

Package Includes

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

NOTE: XBee module is not included in the package

FREQUENTLY BROUGHT TOGETHER



8051 Development Board - Trainer Kit
Model No. : RDL847

PIC Development Board- Trainer Kit
Model No. : RDL740

ARM Development Board - Trainer Kit
Model No. : RDL742

ESP32 IoT Development Trainer Kit
Model No. : RDL814

Biomedical Sensor Interface Trainer Kit
Model No. : RDL886

Motors, Sensor and Actuators Interface Trainer Kit
Model No. : RDL887

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 offer product customization, OEM and ODM Services; please contact the sales team @ sales@rdltech.in.
4. We Ship Worldwide.
5. Specifications are subject to change without prior notice.
6. For additional information on Product and to buy online @ www.researchdesignlab.com

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