



# PIC

## DEVELOPMENT BOARD-TRAINER KIT





### START YOUR EMBEDDED SYSTEM DESIGN JOURNEY TODAY..!

PIC 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. PIC Development Board 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

- 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.
- On board Programming.
- 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.
- 3x Analog Test POT.
- Power Supply 3.3V and 5V
- SD CARD Interface.
- RTC & EEPROM Interface.
- DC Motor/ Stepper Motor Driver.
- Relay, Buzzer.
- 1xTemperature Sensor.

### ON BOARD DIY PROJECTS

- Digital clock using RTC DS1307 & 16x2LCD
- Digital lock using Hex Keypad & 16x2LCD
- Digital password enabled access control system
- Temperature sensing & controlling relay
- Temperature sensing & speed control of monitor
- Simple pulse input seven segment counter
- Realtime Temperature sensing & Login to SD card
- Data login through RS232 serial interface with # deluminator
- Modbus master / slave communication
- Bluetooth controlled appliance through Relay
- Timer enabled Relay
- LED controlling through PC (USB Interface)
- 4 digit random number generator
- Graphic icon display using OLED
- Menu controller LED chases



### START YOUR EMBEDDED SYSTEM DESIGN JOURNEY..!

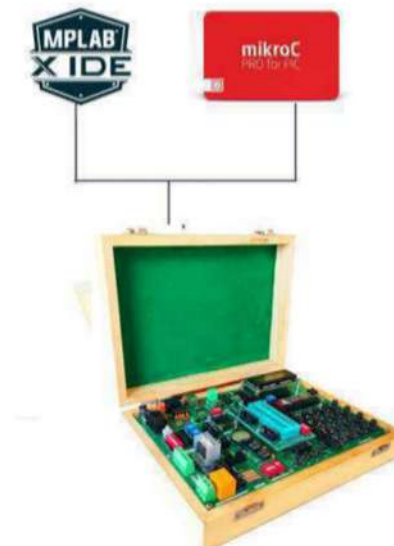
The powerful (200 nanosecond instruction execution) yet easy-to-program (only 35 single word instructions) CMOS FLASH-based 8-bit microcontroller packs Microchip's powerful PIC® architecture into a 40 pin package devices. The PIC16F877A features 256 bytes of EEPROM data memory, self programming, an ICD, 2 Comparators, 8 channels of 10-bit Analog-to-Digital (A/D) converter, 2 capture/compare/PWM functions, the synchronous serial port can be configured as either 3-wire Serial Peripheral interface (SPI™) or the 2-wire Inter-Integrated Circuit (I<sup>2</sup>C™) bus and a Universal Asynchronous Receiver Transmitter (USART). All of these features make it ideal for more advanced level A/D applications in automotive, industrial, and consumer applications.

### SCOPE OF LEARNING EXPERIMENTS

- LED blinking.
- 8 bit LED Left shift, Right shift and counting operation.
- L298 Driver for DC Motor and Stepper motor interface. 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.
- Elevator Interface.

- Buzzer, Relay interface.
- PWM Interface
- UART Operation
- RTC DS1307I2C protocol interface.
- AT24C04 EEPROM I2C protocol interface.
- RF/WiFiCommunication.
- SPI protocol interface
- Temperature Sensor Interface.

### DEVELOPMENT ENVIRONMENT







### MCU

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- PIC 16F877 A, 28pin or 40/44 pin PIC16CXXX and PIC16FXXX microcontrollers
- 448 KB ROM for booting and core functions
- 520 KB SRAM for data and instructions
- 16 KB SRAM in RTC
- 16 MB SPI flash

### HARDWARE

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- Interfaces: SD card, UART, SPI, SDIO, I2C, LED PWM, Motor PWM, I2S, IR, pulse counter, GPIO, capacities touch sensor, ADC, DAC, Two-Wire Automotive Interface.
- Communication Interface: RS232, RS485 (Modbus RTU), USB SPI, I2C

### DISPLAY INTERFACE

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- OLED 0.96\*
- 16x2 LCD Display
- Seven Segment display

### KEYPAD INTERFACE

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- 4X4 Hex Keypad
- 1X1 1X4 Menu Keypad

### CRYSTAL FREQUENCY

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- 11.0592 MHz

### COMMUNICATION PORT

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- USB RS232 and RS485

### POWER SUPPLY

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- 12V.2A

### SUPPORTED IDE

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- Mikro C Pro
- MP Lab, MP Lab X

### MEMORY INTERFACE

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- SD Card Interface
- EEPROM AT24C08

### DRIVERS, RELAY & BUZZER

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- DC Motor / Stepper Motor
- Buzzer

### ON BOARD SENSOR, TEXTING INPUT POT & SWITCHES

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

### CONVERTER & ADAPTER INTERFACE

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- Xbee Adapter
- 3.3V to 5V Level Converter

### REAL TIME CLOCK (RTC)

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- RTC DS1307

### ON BOARD POWER POINTS

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- 5V, 3.3V & GND

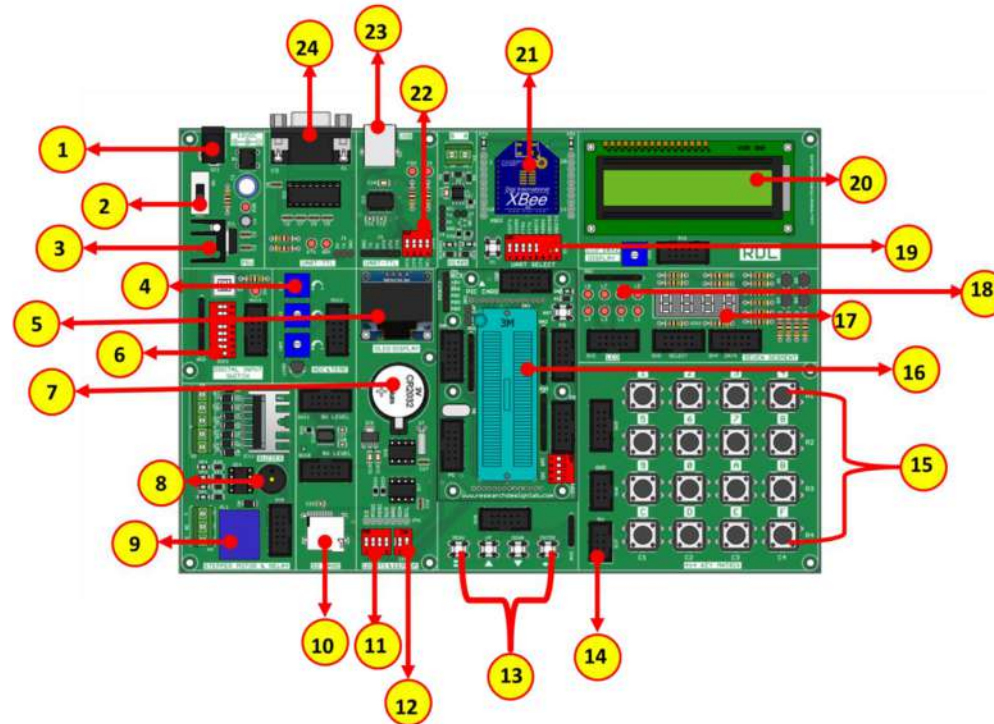
### DIMENSION

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- W 264 X L199 X H 60



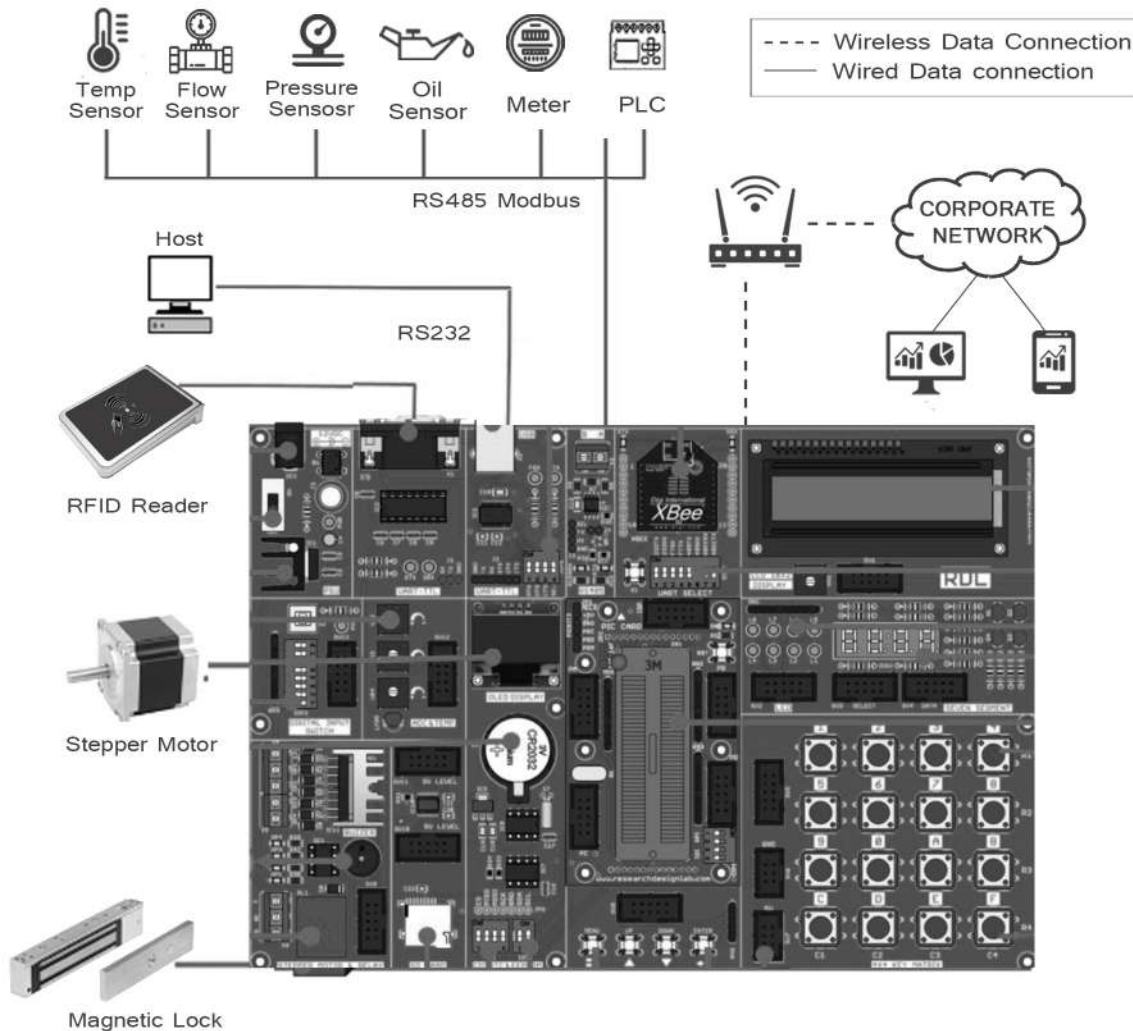
### PIC DEVELOPMENT TRAINER KIT BOARD NARRATION



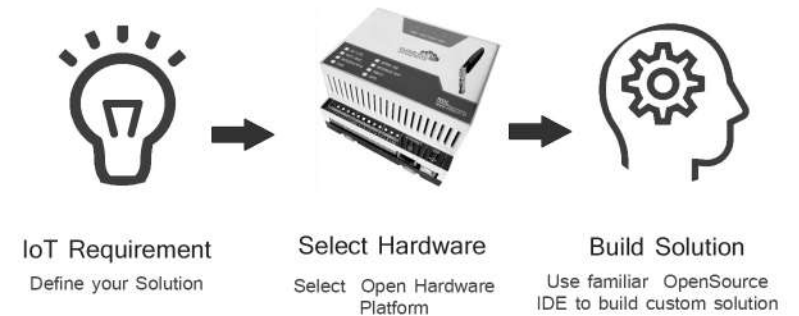
1. Power Supply	9. Relay	17. 7 Segment Display
2. Power ON Switch	10. SD Card Holder	18. 2*4 LED's
3. Heat Sink	11. Jumper Settings for I2C RTC	19. Jumper Settings for UART Selection Pin
4. ADC (Variable Resistor POT)	12. Jumper Settings for EEPROM	20. 16*2 LCD Display
5. OLED Display	13. 1*4 Keypad Switches	21. WiFi Module
6. Digital Input Switch	14. RDL Bus FRC Connector	22. Jumper Settings for UART TTL
7. RTC Battery	15. Keypad Matrix	23. USB Port
8. Buzzer	16. PIC Controller	24. DB-9 Serial Female Connector



### APPLICATION WIRING DIAGRAM



### Idea to Proof of Concept (POC)



### Package Includes

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

**NOTE: Xbee module is not included in the package**  
 Optional OLED & SDCARD module provided on this board. hobbyist / developer can make use of this module with their previous knowledge or open source community support and we do not have the support for the optional modules.



### 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](http://www.rdltech.in)
5. Buy online @ [www.researchdesignlab.com](http://www.researchdesignlab.com)

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