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ATmega328

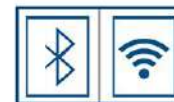## DEVELOPMENT TRAINER KIT

PLUG & CODE | ON BOARD PROGRAMMING | ON BOARD WIFI & BLUETOOTH | ON BOARD MODBUS RTU | ON BOARD SDCARD | RoHS 2011/65/EU

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START YOUR EMBEDDED SYSTEM DESIGN JOURNEY TODAY..!

ATMGEA328 IoT Trainer Kit essential development features a plug and plays design that makes it easy for connections and helps Students, hobbyists, enthusiasts, and professionals to focus more on Program/application development. ATMGEA328 IoT Trainer Kit equipped with onboard 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.
- RS232, RS485, USB communication port.

• On Board WiFi / Bluetooth Connectivity	• DC Motor/ Stepper Motor Driver.
• 8 interfacing LED's.	• Power Supply 3.3V and 5V
• 1 * 4 Menu keypad.	• SD CARD Interface.
• 4* 4 Matrix Keypad.	• RTC & EEPROM Interface.
• 7 Segment Multiplexed Display.	• Relay, Buzzer.
• 16*2 LCD & OLED Display	• 1xTemperature Sensor.
• ADC & DAC Card.	• 3x Analog Test POT.
• 23 general purpose I/O lines	• 3.3 to 5V Level Converter.

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 motor
- Simple pulse input seven segment counter
- Realtime Temperatuure 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
- Motor controlling throught WiFi
- LED controlling through PC (USB Interface)
- 4 digit random number generator
- Graphic icon display using OLED
- Menu controller LED chases
- Dice game using OLE
- Snake game using OLED
- Star war game using OLED
- Pong game using OLED

ABOUT ATmega328 DEVELOPMENT BOARD

Atmega 328 is one of the most commonly used Micro controllers with open source platform amongst many hobbyist and industrial communities. The simplicity and the low power of Atmega 328 helps design many prototype boards which could be used in numerous applications.The Atmega 328 includes 6 analog inputs, 14 digital I/O pins (6 amongst these could be used as PWM outputs), a crystal oscillator with 16MHz frequency.

Scope of Learning Experiments:

· LED blinking.	· L298 Driver – DC Motor and Stepper motor interface.
· 8 bit LED Left shift, Right shift and counting operation.	· Elevator Interface.
· Keypad and Interrupt Interface	· Buzzer, Relay interface.
· 16*2 LCD interface.	· RS485, RS232 serial communication
· Matrix Keypad Interface.	· PWM Interface
· ADC & DAC interface.	· UART Operation
· Traffic Light Signal Interface.	· RTC DS1307 I2C protocol interface.
· 8 bit DIP switch interface.	· AT24C04 EEPROM I2C protocol interface.
· 7 Segment interface.	· RF/WiFi Communication.
· SPI protocol interface	· Temperature Sensor Interface.

Open Source Development Environment

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SPECIFICATION

MCU

- ATmegha328 Microchip 8-bit AVR® RISC-based microcontroller
- 32 KB ISP Flash memory, 1 KB EEPROM, 2 KB SRAM
- Program Memory Type Flash
- Program Memory Size (KB) 32
- CPU Speed (MIPS/DMIPS) 20
- Data EEPROM (bytes) 1024

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, ADC.
- **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, TEXTING INPUT POT & SWITCHES

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

CONVERTER & ADOPTER INTERFACE

- Xbee Adopter
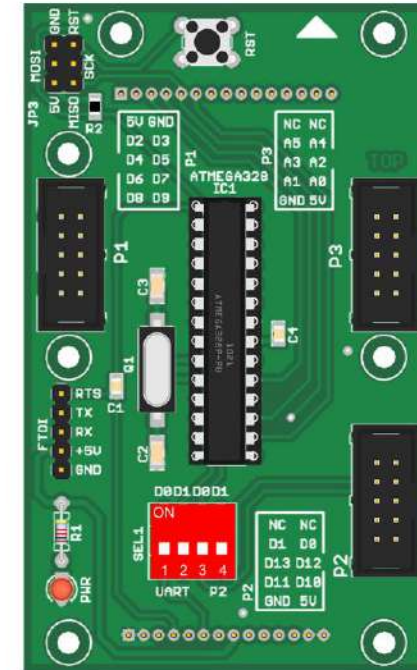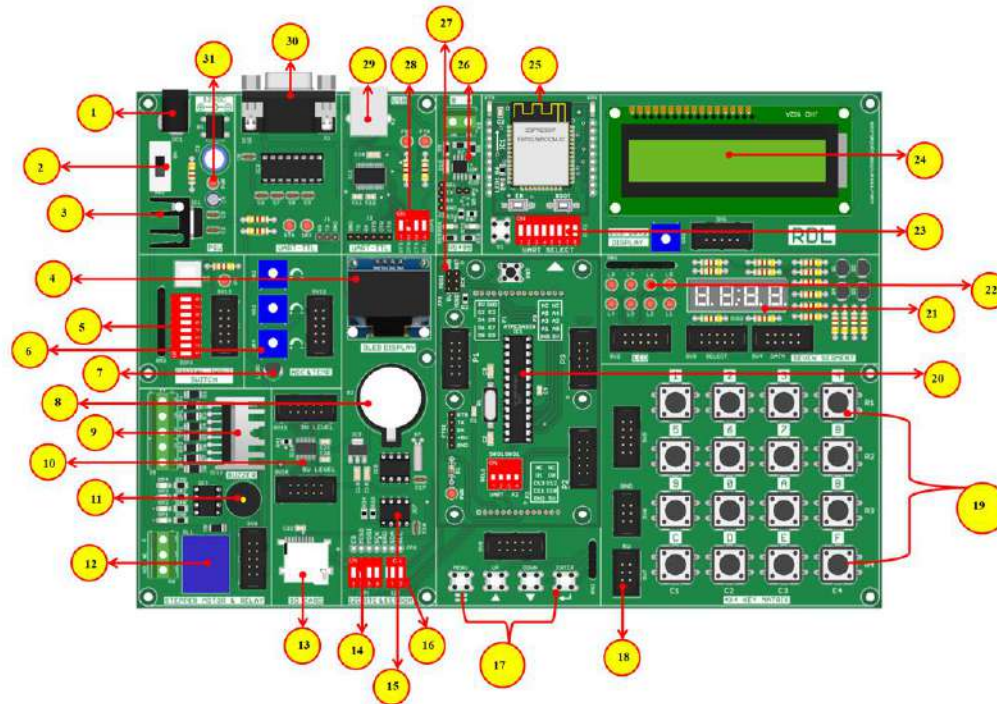- 3.3V to 5V Level Converter

REAL TIME CLOCK (RTC)

- RTC DS1307

### ON BOARD POWER POINTS   5V, 3.3V & GND

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ATmegha328 DEVELOPMENT BOARD NARRATION


1. Power Supply	9. L298 Driver	17. 1*4 Keypad Switches	25. WiFi/XBEE Module
2. Power On Switch	10. Logic Level Converter	18. RDL BUS FRC Connector	26. RS485 Module
3. Voltage Regulator	11. Buzzer	19. 4*4 Keypad Matrix	27. On Board ISP Programmer
4. OLED Display 20.	12. Relay	20. ATMEGA328 Controller	28. Jumper Settings for UART TTL
5. Digital Input Switch 21.	13. SD Card Holder	21. 7 Segment Display	29. USB Port
6. ADC (Variable Resistor POT)	14. Jumper Settings for I2C RTC	22. 2*4 LED's	30. DB9 Serial Female Connector
7. Temperature Sensor LM35 23.	15. EEPROM 31. Power Indicator	23. Jumper Setting for UART Select Pins	31. Power Indicator
8. RTC 24. 16*2 LCD Display	16. Jumper Settings for EEPROM	24. 16*2 LCD Display	

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APPLICATION WIRING DIAGRAM
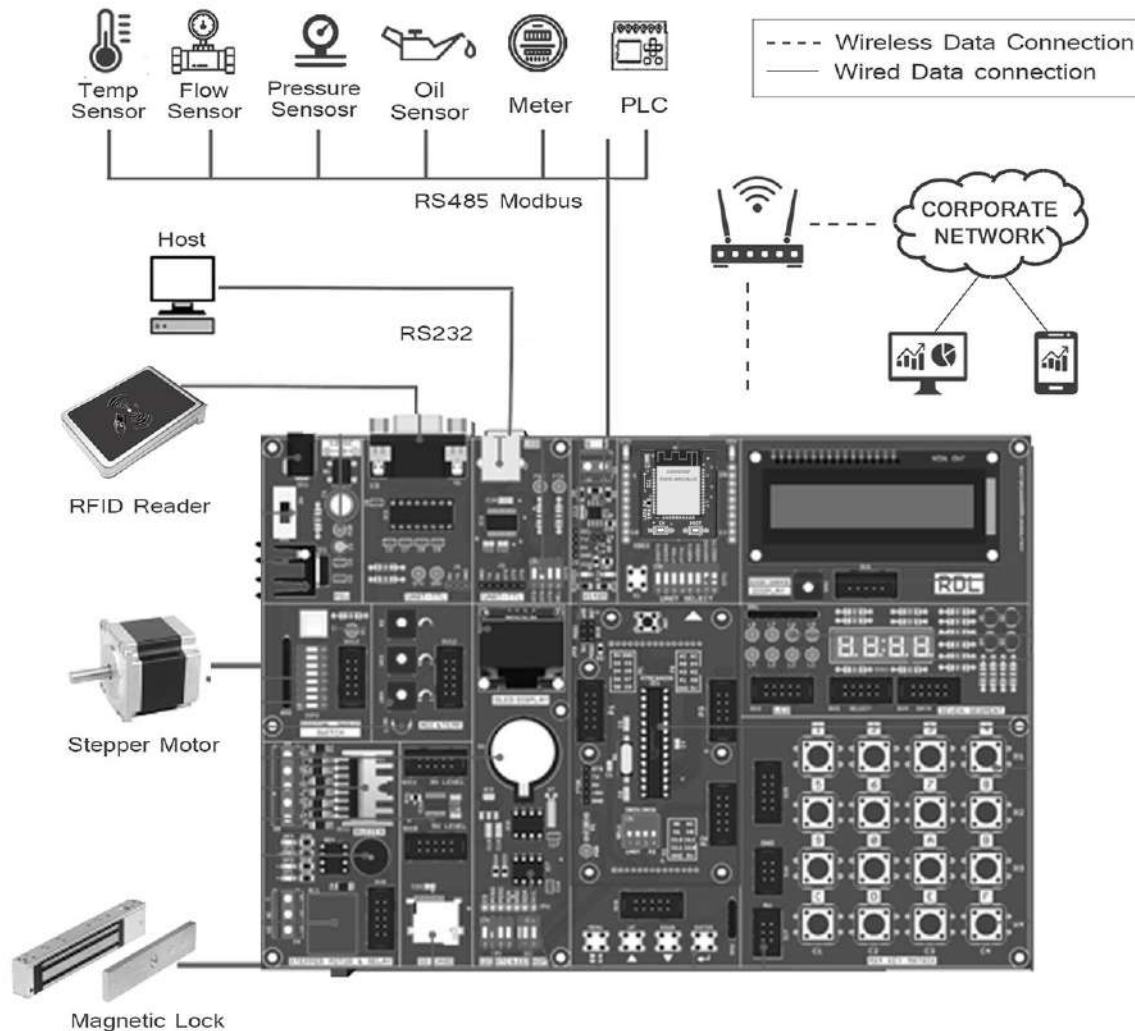
Idea to Proof of Concept (POC)

Idea → Plug & Code → Build Solution
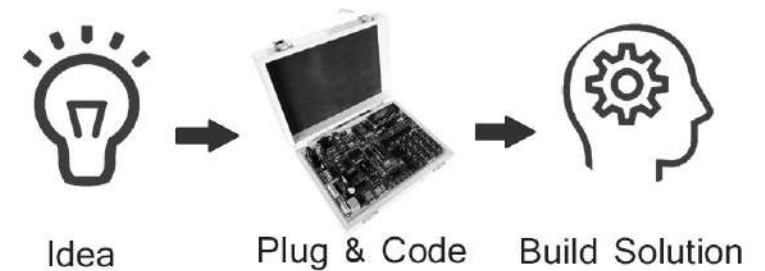
Package Includes

- ✔ Development Board with Wooden Enclosure
- ✔ USB Cable.
- ✔ Atmegha328 Breakout Board
- ✔ 12V 2A Adapter.
- ✔ FRC Cable

NOTE: XBee module is not included in the package

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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

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