



Key Features-

IoT Workbench is designed to provide a seamless plug-and play experience, making it effortless to establish connections and enabling students, hobbyists, enthusiasts, and professionals to focus more on program and application development. Equipped with onboard I/Os, communication interfaces, and peripherals, this workbench is an all-in-one solution for IoT projects, prototyping, and experimentation. It eliminates the need for soldering, allowing users to design, test, and experiment with circuits quickly and efficiently. Widely adopted in educational institutions and R&D labs across the globe, this workbench is the perfect platform for innovation.

Arduino Pro Micro

The Arduino Pro Micro 5V 16M is a compact and versatile microcontroller development board that brings the power of the ATmega32U4 microcontroller to your IoT Workbench. Designed for projects requiring a small form factor and USB connectivity, this board is an excellent choice for hobbyists, students, and professionals alike. Its integration of USB functionality directly into the microcontroller eliminates the need for an external USB-to-serial converter, making it ideal for projects where space and efficiency are critical.

ESP32-S3

The ESP32-S3 is a standout component of this workbench, offering enhanced features for IoT and wireless applications. As the successor to the popular ESP32, it combines Wi-Fi and Bluetooth 5 (LE) capabilities, making it perfect for connected projects. Its dual-core processor

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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ensures efficient multitasking, while its low power consumption makes it suitable for battery-operated devices. With a rich set of peripherals and GPIOs, the ESP32-S3 is a powerhouse for IoT development, enabling seamless integration with sensors, actuators, and cloud platforms.

Raspberry Pi

At the heart of this IoT Workbench is the Raspberry Pi, the Raspberry Pi (32GB card -2GB RAM) is ideal for developing advanced applications, from home automation and multimedia systems to AI and machine learning projects.

List of Experiments

1. Blinking the Onboard LED of ESP32-S3
2. Blinking the Onboard LED of ESP32-S3 and Raspberry Pi
3. Learn basic GPIO control by blinking the built-in LEDs on both microcontrollers.
4. Interfacing the LM35 Temperature Sensor with ESP32-S3
5. Controlling WS2812 RGB LED Matrix with Raspberry Pi
6. Measure ambient temperature and display it on the serial monitor.
7. Dual-Core Processing on ESP32-S3
8. Explore multitasking by running two independent tasks on the dual-core processor
9. Create dynamic lighting patterns using the 5x5 RGB LED matrix.
10. Interfacing the MCP4725 DAC
11. Generate analog signals using the I2C DAC module
12. Reading Analog Signals with ADS1115 16-Bit ADC
13. Measure precise analog inputs using the ADS1115 module.
14. Measure precise analog inputs using the ADS1115 module.
15. Host a simple web server to control GPIO pins remotely.
16. Bluetooth Communication Between ESP32-S3 and Mobile Phone
17. Send and receive data over Bluetooth using the ESP32-S3
18. Interfacing the 20x4 LCD Display with I2C
19. Display sensor data or system information on the LCD.
20. OLED Display with ESP32-S3
21. Show text, graphics, and sensor readings on the Waveshare OLED display.
22. Fingerprint Authentication with R307 Sensor
23. Implement a fingerprint-based security system using the R307 module.
24. RFID-Based Access Control with Rc522
25. Use RFID cards and tags to create an access control system.
26. Stepper Motor Control with ULN2003
27. Control the stepper motor using the ULN2003A driver.
28. Interfacing the HX711 Weight Sensor
29. Use the SG90 servo motor for precise angle control.
30. Measure weight using the HX711 module and a load cell.
31. Real-Time Clock (RTC) with Ds3231
32. Implement a precise clock using the DS3231 module.
33. Human Motion Detection with HLK-LD2420 Radar Sensor
34. Detect human presence using the 24GHz radar sensor.
35. Interfacing the MAX7219 LED Dot Matrix
36. Display scrolling text and patterns on the 4-in-1 LED matrix.
37. Sound Detection with Sound Sensor Module
38. Detect sound levels and trigger actions based on thresholds.
39. MP3 Playback with DFPlayer Mini
40. Play audio files using the DFPlayer Mini module.

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41. Interfacing the pH Sensor for Water Quality Monitoring
42. Measure pH levels using the analog pH sensor kit.
43. TDS Sensor for Water Conductivity Measurement
44. Monitor water quality using the TDS sensor module.
45. Waveform Generation with AD9833 DDS Module
46. Generate sine, square, and triangle waves using the AD9833 module.
47. Interfacing the MAX6675 Thermocouple Sensor
48. Measure high temperatures using the K-type thermocouple.
49. Interfacing the 4x4 Keypad Matrix
50. Interfacing the IR Sensor for Object Detection
51. Detect objects using the infrared sensor module
52. Interfacing the Dry Reed Magnetic Switch
53. Interfacing the LDR Module for Light Sensing
54. Measure light intensity using the digital LDR module.
55. Interfacing the Relay Module for High-Power Control
56. Control AC/DC devices using the 5V 10A relay module.
57. Interfacing the MX1508 Motor Driver
58. Control DC motors using the MX1508 dual H-bridge module.
59. Interfacing the PT Pan/Tilt Camera Platform
60. Control the 2-axis camera platform using servo motors.
61. Use the joystick to control motors or other peripherals.
62. Detect magnetic fields using the Hall effect sensor.
63. 10k Sliding Adjustable Linear Potentiometer.
64. DC-DC Step-Down Buck Converter Power Supply Module 24V 12V 9V to 5V 5A 25W.
65. MAX7219 Digital Tube Display Module Control Module.
66. Techtonics Servo bracket PT pan/tilt camera platform 2-Axis FPV for SG90 MG90.
67. RFID Reader/Writer RC522 SPI S50 with RFID Card and Tag.
68. Hi-Link HLK-LD2420 24Ghz Human Body Micro Motion Sensing Detection Radar Sensor Module HLKLD2410.

Cloud Platform :

- Blynk iot
- Arduino cloud

Accessories

- DSO – 100MHZ
- Mains Lead
- Operating Instruction Manual
- Data Cable
- Hdmi cable
- Lan cable
- Power cable
- SD card – 32 gb

Note: PC is not included.

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