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LAFVIN LA043

LAFVIN ESP32 Basic Starter Kit Instruction Manual

Model: LA043

For ESP32 ESP-32S WiFi IoT Development Board with Tutorial Compatible with Arduino IDE

1. Introduction

This manual provides essential information for setting up, operating, and maintaining your LAFVIN ESP32 Basic Starter Kit. Designed for beginners and enthusiasts, this kit facilitates learning about electronics and programming with the ESP32 development board, compatible with the Arduino IDE. Please read this manual thoroughly before beginning your projects.

1.1. Package Contents

Verify that all items listed below are included in your package:

- 1 X ESP32 Development Board
- 1 X 0.96 inch OLED Display Module
- 1 X 830 Tie-Points Breadboard
- 1 X Obstacle Avoidance Module
- 1 X Photosensitive Resistor Module
- 1 X DHT11 Temperature and Humidity Module
- 1 X HC-SR501 PIR Motion Sensor
- 1 X Potentiometer (10K)
- 1 X Micro USB Cable
- 30 X Resistors (220R/1K/10K assorted)
- 1 X Passive Buzzer
- 1 X Active Buzzer
- 1 X 5V 2-Channel Relay Module
- 6 X Button Switches
- 10 X Female-to-Male Dupont Cables
- 10 X Female-to-Female Dupont Cables
- 10 X Male-to-Male Dupont Cables
- 5 X Red LEDs

- 5 X Yellow LEDs
- 5 X Green LEDs
- 2 X RGB LEDs

Figure 1.1: Overview of all components included in the LAFVIN ESP32 Basic Starter Kit.

2. Setup

2.1. Software Installation

1. **Install Arduino IDE:** Download and install the latest version of the Arduino IDE from the official Arduino website (www.arduino.cc/en/software).
2. **Add ESP32 Board Support:**
   - Open Arduino IDE. Go to **File > Preferences**.
   - In the "Additional Boards Manager URLs" field, add: **https://raw.githubusercontent.com/espressif/arduino-**

esp32/gh-pages/package_esp32_index.json

- Go to **Tools > Board > Boards Manager...** Search for "ESP32" and install the "esp32 by Espressif Systems" package.

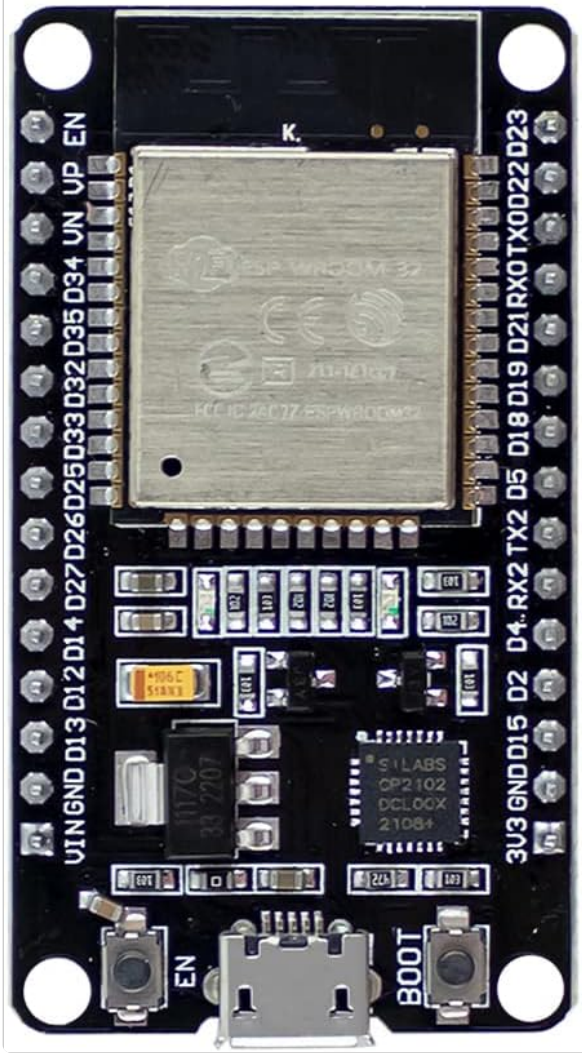
3. **Install Libraries:** Depending on the specific module you are using (e.g., DHT sensor, OLED display), you may need to install additional libraries. Go to **Sketch > Include Library > Manage Libraries...** and search for the required libraries (e.g., "DHT sensor library", "Adafruit SSD1306").

2.2. Hardware Connection Basics

The ESP32 development board features various pins for connecting external components. Always ensure the board is disconnected from power before making or changing connections.

- **Breadboard Usage:** The included breadboard allows for solderless prototyping. Components are inserted into the holes, and connections are made using the Dupont cables.
- **Power Supply:** The ESP32 board is typically powered via the Micro USB cable. Ensure your power source provides stable 5V.
- **Pinout:** Refer to the ESP32 board's pinout diagram for correct connections. Digital pins (GPIO), Analog-to-Digital Converters (ADCs), and communication interfaces (I2C, SPI, UART) are available.

Peripheral Input/Output:



1. Peripheral interface with DMA that Includes capacitive touch
2. ADCs (Analog-to-Digital Converter)
3. DACs (Digital-to-Analog Converter)
4. IIC (Inter-Integrated Circuit)
5. UART (Universal Asynchronous Receiver/Transmitter)
6. SPI (Serial Peripheral Interface)
7. IS (Integrated Interchip Sound)
8. RMII (Reduced Media-Independent Interface)
9. PWM (Pulse-Width Modulation)

Figure 2.1: Detailed view of the ESP32 development board highlighting various peripheral input/output interfaces such as capacitive touch, ADCs, DACs, IIC, UART, SPI, IS, RMII, and PWM.

Figure 2.2: Diagram illustrating how the ESP32 board can wirelessly control and interact with various modules like OLED, DHT11, PIR sensor, and relay, often displaying data on a mobile device.

3. Operating Instructions

3.1. Uploading Your First Program (Blink LED)

A common first step is to upload a simple program to make an LED blink.

1. **Connect ESP32:** Connect your ESP32 board to your computer using the Micro USB cable.
2. **Select Board and Port:** In Arduino IDE, go to **Tools > Board** and select the appropriate ESP32 Dev Module. Then, go to **Tools > Port** and select the serial port connected to your ESP32.
3. **Open Example Sketch:** Go to **File > Examples > 01.Basics > Blink**. This will open a new window with the Blink sketch.
4. **Upload:** Click the "Upload" button (right arrow icon) in the Arduino IDE. The IDE will compile the code and upload it to your ESP32 board. If prompted, press the BOOT button on the ESP32 board during upload.
5. **Observe:** After successful upload, the built-in LED on the ESP32 board should start blinking.

3.2. Using Included Modules

The kit includes various modules for diverse projects. Each module requires specific wiring and code. Refer to the official LAFVIN tutorial for detailed instructions and example code for each component.

- **OLED Display:** Connect via I2C. Used for displaying text, graphics, and sensor data.
- **DHT11 Sensor:** Connect to a digital pin. Used for reading temperature and humidity.
- **PIR Motion Sensor:** Connect to a digital pin. Detects motion.
- **Relay Module:** Connect to a digital pin. Used to control higher voltage devices (exercise caution).
- **Resistors & LEDs:** Fundamental components for basic circuits and visual feedback.

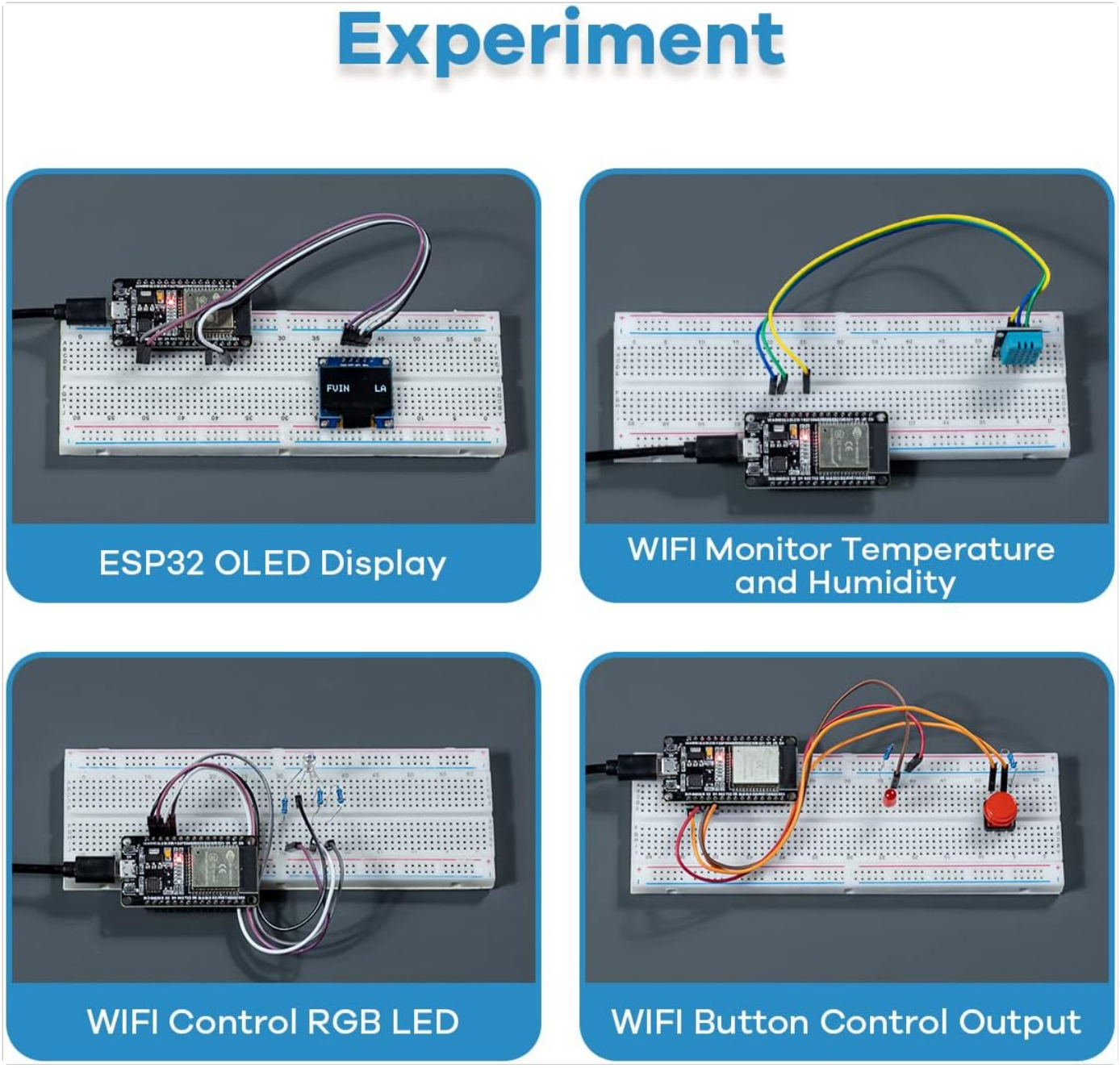


Figure 3.1: Examples of completed experiments on a breadboard, including ESP32 OLED Display, WiFi Monitor Temperature and Humidity, WiFi Control RGB LED, and WiFi Button Control Output.

Figure 3.2: A collection of various modules and components included in the kit, such as the relay, PIR sensor, ESP32 board, OLED, DHT11, potentiometer, and breadboard with jumper wires.

4. Experiments and Tutorials

The LAFVIN ESP32 Basic Starter Kit comes with a comprehensive tutorial that includes codes and lessons. This tutorial is crucial for learning how to assemble and program the various components of the kit. It will guide you through a series of experiments, from basic LED control to more complex sensor readings and IoT applications.
Important: Please download the official tutorial after receiving your kit. This resource provides step-by-step instructions and example code for each module and experiment.

5. Maintenance

Proper care and maintenance will extend the lifespan of your kit components.

- **Storage:** Store components in a dry, cool environment, away from direct sunlight and extreme temperatures. The

original packaging box () is suitable for storage.

- **Handling:** Handle electronic components by their edges to avoid touching pins or sensitive areas, which can be damaged by static electricity or oils from your skin.
- **Cleaning:** Use a soft, dry brush or compressed air to remove dust from boards and modules. Avoid using liquids.
- **Power Off:** Always disconnect power before making or changing any wiring connections.

6. Troubleshooting

If you encounter issues, consider the following troubleshooting steps:

- **Board Not Recognized:**
  - Ensure the Micro USB cable is a **data transfer cable**, not just a charging cable. Some cables only provide power and cannot establish a data connection.
  - Check if the correct USB driver is installed for the ESP32's USB-to-Serial chip (often CP210x or CH340).
  - Verify the correct serial port is selected in the Arduino IDE.
- **Code Not Compiling/Uploading:**
  - Check for syntax errors in your code.
  - Ensure all necessary libraries are installed.
  - During upload, you might need to press and hold the **BOOT** button on the ESP32 board, then press the **EN** (reset) button, release **EN**, and then release **BOOT**.
- **Component Not Working:**
  - Double-check all wiring connections against the tutorial diagrams. Ensure correct polarity for LEDs and other polarized components.
  - Verify the component is receiving adequate power.
  - Ensure the correct code and pin assignments are used for the specific module.
  - Test with a known working component if possible.
- **Power Issues:** Ensure your power supply is stable and provides the correct voltage (5V for the ESP32 board).

7. Specifications

Feature	Specification
Brand	LAFVIN
Model Number	LA043
Series	ESP32
Processor Brand	Espressif
Number of Processors	1
RAM	LPDDR2
Wireless Type	Bluetooth, Wi-Fi

Feature	Specification
Operating System	Linux (compatible)
Item Weight	12.3 ounces
Product Dimensions (LxWxH)	5.51 x 3.35 x 1.42 inches

8. Warranty and Support

LAFVIN products are designed for reliability and performance. For specific warranty information, please refer to the product packaging or the seller's terms of sale.
For technical support, additional resources, or to explore other LAFVIN products, please visit the official LAFVIN store or contact customer service through your purchase platform.
LAFVIN Store: LAFVIN Official Store

Related Documents - LA043

	LAFVIN ESP32 Basic Starter Kit: Projects and Tutorials Explore the LAFVIN ESP32 Basic Starter Kit with this comprehensive guide. Learn about the ESP32 microcontroller by Espressif, its features, and build practical projects using Arduino IDE, sensors, and web servers.