SunFounder ESP32 Ultimate Starter Kit

SunFounder ESP32 Ultimate Starter Kit User Manual

Model: ESP32-WROOM-32E Board

Introduction

The SunFounder ESP32 Ultimate Starter Kit is a comprehensive learning platform designed for individuals interested in electronics, programming, and the Internet of Things (IoT). This kit provides a powerful ESP32-WROOM-32E board, an ESP32 Camera Extension board with battery recharging capabilities, and a wide array of components to facilitate hands-on learning and project development.
It supports multiple programming languages including Arduino C++, MicroPython, and Scratch, making it accessible for various skill levels. The kit includes over 300 high-quality items and is accompanied by extensive online tutorials and video courses to guide users through numerous projects.

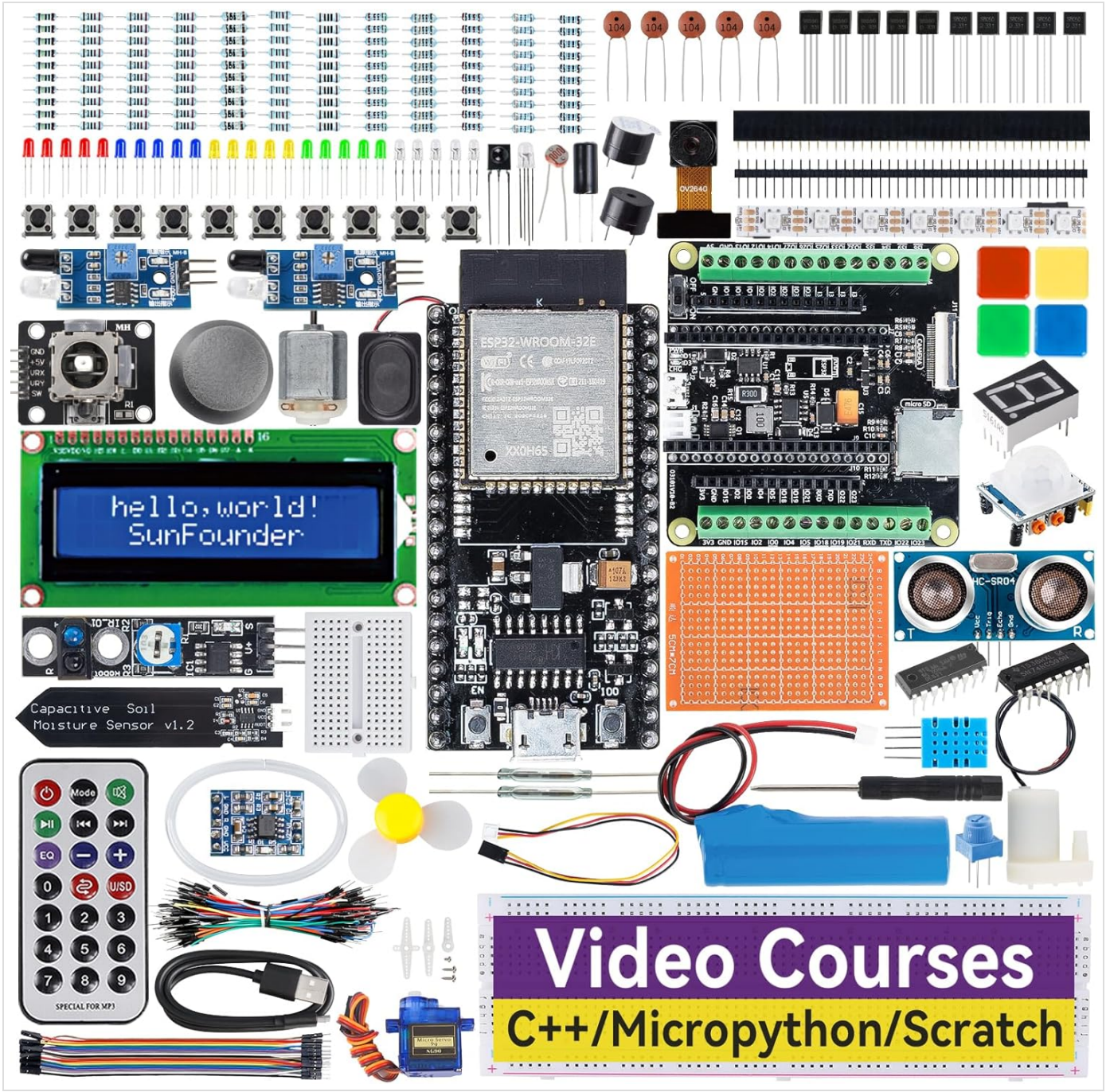
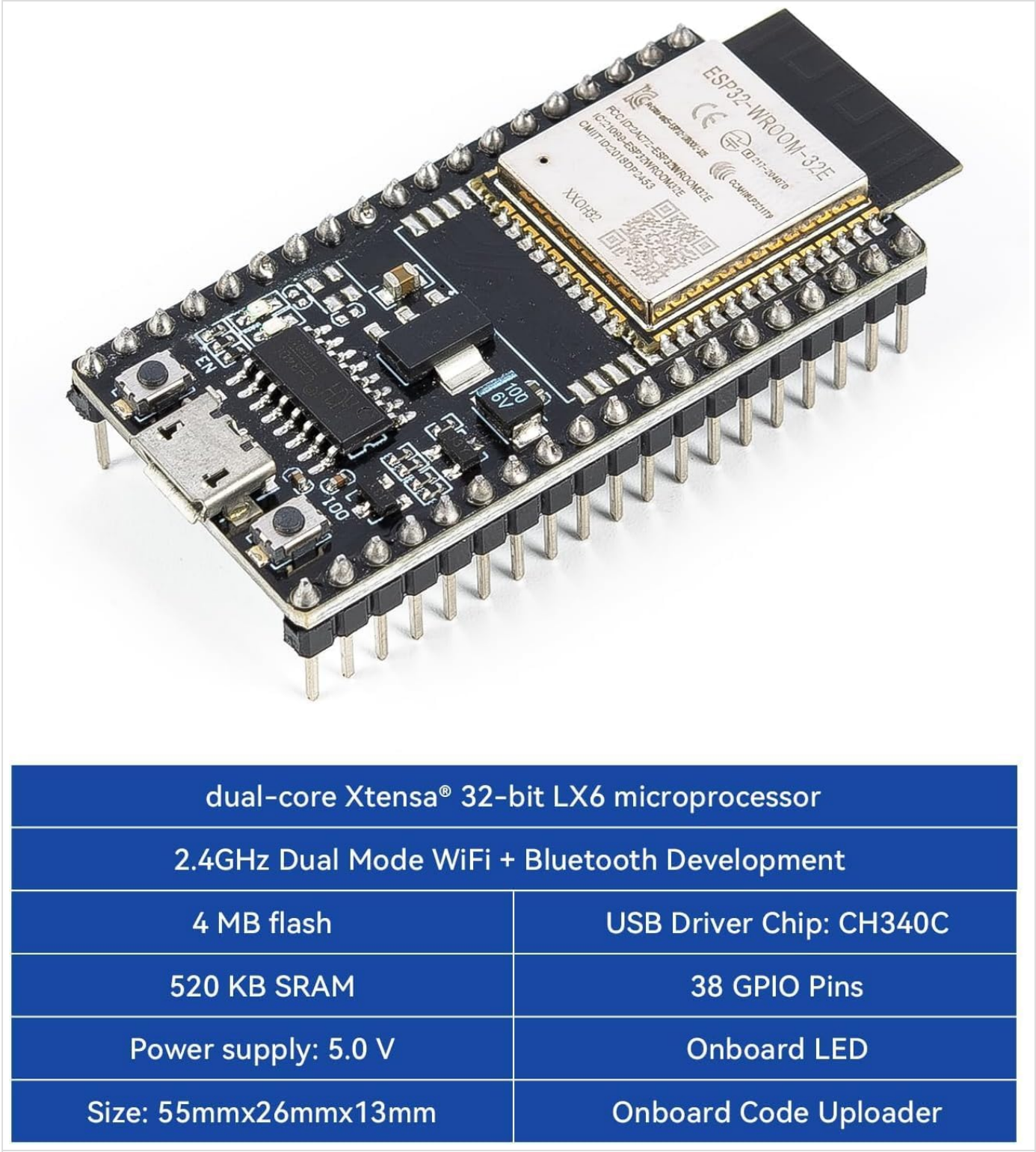


Figure 1: Overview of the SunFounder ESP32 Ultimate Starter Kit components.

Setup

Before embarking on projects, ensure proper setup of your ESP32 board and development environment.

ESP32-WROOM-32E Board Overview



dual-core Xtensa® 32-bit LX6 microprocessor	
2.4GHz Dual Mode WiFi + Bluetooth Development	
4 MB flash	USB Driver Chip: CH340C
520 KB SRAM	38 GPIO Pins
Power supply: 5.0 V	Onboard LED
Size: 55mmx26mmx13mm	Onboard Code Uploader

Figure 2: The ESP32-WROOM-32E board, highlighting its dual-core Xtensa 32-bit LX6 microprocessor, 4 MB flash, 520 KB SRAM, Wi-Fi, Bluetooth, and 38 GPIO pins.

ESP32 Camera Extension Board

The kit includes a powerful ESP32 Camera Extension board that not only supports real-time video streaming and image capture but also features battery recharging for enhanced portability.

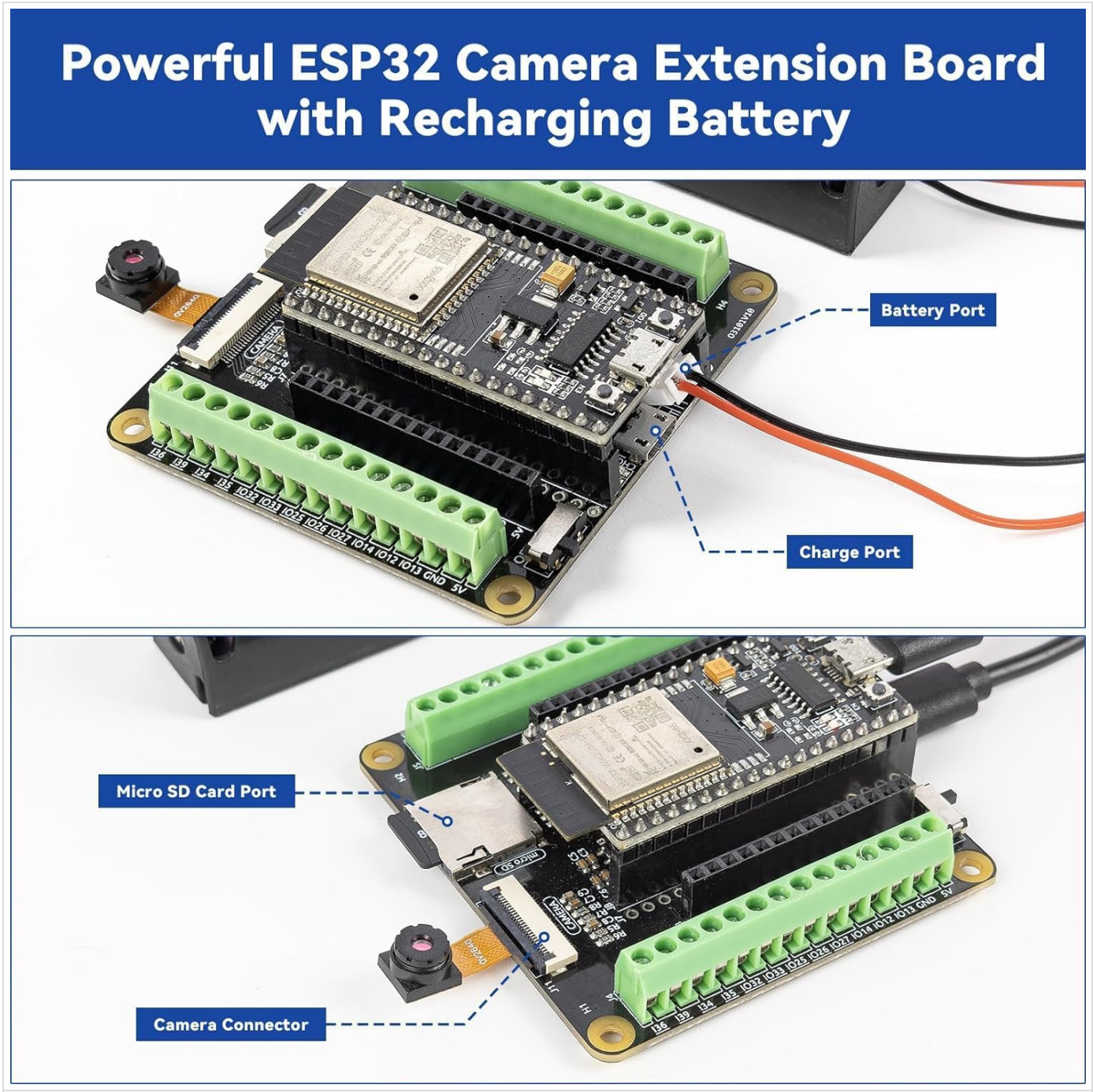


Figure 3: Detailed view of the ESP32 Camera Extension Board, indicating connection points for battery, charging, Micro SD card, and camera.

Programming Environment

The kit supports Arduino C++, MicroPython, and Scratch. Detailed online tutorials are available to guide you through setting up the necessary IDEs and libraries. For MicroPython users, the tutorials cover installation, basic syntax, and practical projects. For Arduino C++ users, the tutorials guide through installing Arduino IDE and uploading code to the Raspberry Pi with Arduino IDE.

Figure 4: The three supported programming languages: MicroPython, Scratch, and C++.

Access detailed online tutorials at: esp32-starter-kit.rtfd.io

Operating

The SunFounder ESP32 Ultimate Starter Kit offers a wide range of projects, from basic electronics to advanced IoT applications. Here are examples of projects you can build and operate:

Basic Projects

Explore fundamental electronic concepts with projects like:

- **Flowing Light:** Control LED sequences.
- **Reversing Aid:** Utilize sensors for distance measurement.
- **Electronic Dice:** Create a digital dice using components.
- **Plant Monitor:** Monitor soil moisture and environmental conditions.

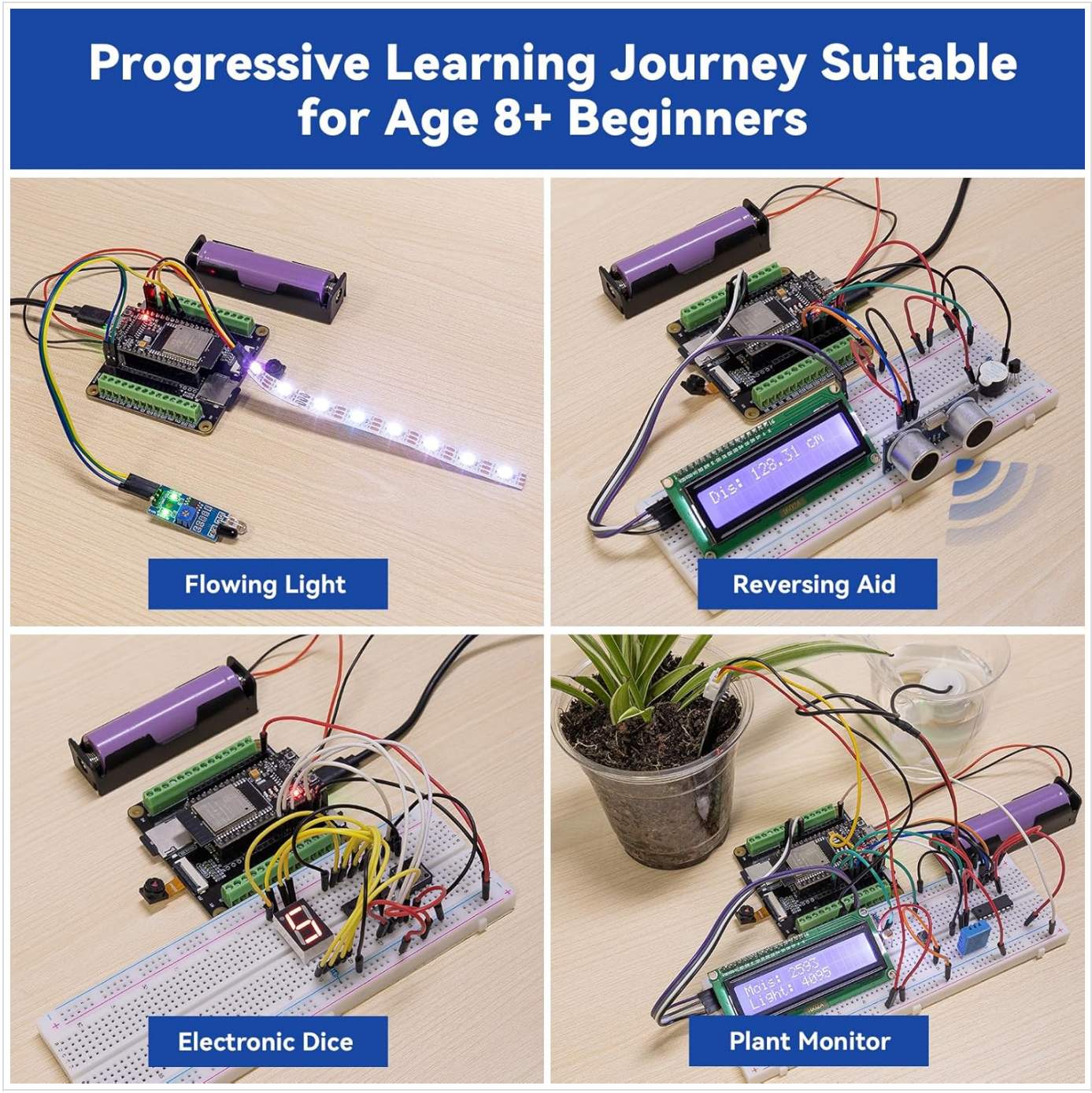


Figure 5: Examples of basic projects that can be built with the kit.

Advanced IoT Projects

Dive into the Internet of Things with projects that connect your ESP32 to the internet:

- **ESP Camera with Telegram Bot:** Control your camera and receive notifications via Telegram.
- **Blynk-based Intrusion Notification System:** Set up a security system with app notifications.
- **Camera with Home Assistant:** Integrate your camera with a smart home platform.
- **Bluetooth Audio Player:** Stream audio wirelessly.

Figure 6: Examples of advanced IoT projects that can be built with the kit.

Smart Gate Assembly

This video demonstrates the assembly process for a Smart Gate project, showcasing how to integrate the servo motor and ultrasonic module with the ESP32 board.

Video 1: Assembly instructions for a Smart Gate project using the kit components.

Oscillating Fan Assembly

Learn to build an oscillating fan using the kit's components, demonstrating control over motors and basic mechanical assembly.

Video 2: Assembly instructions for an Oscillating Fan project.

Smart Car Assembly

This video provides a detailed guide on assembling the smart car, including wiring and mounting hardware, and demonstrates various functionalities like obstacle avoidance and line following.

Video 3: Assembly and demonstration of the SunFounder 3-in-1 IoT/Smart Car/Learning Starter Kit.

Specifications

Feature	Detail
Brand	SunFounder
Model Name	ESP32 Ultimate Starter Kit
Processor Brand	ESP32
CPU Manufacturer	ESP32
RAM	2 GB LPDDR4
Computer Memory Type	DDR SDRAM
Operating System	Linux
Wireless Type	Bluetooth
Connectivity Technology	Bluetooth
Item Weight	0.64 ounces
Product Dimensions	9.8 x 6.5 x 2.5 inches
Batteries	1 Lithium Ion batteries required. (included)

Troubleshooting & Support

For any programming challenges or technical issues, SunFounder provides dedicated technical support and troubleshooting forums. Refer to the online tutorials for detailed guidance and solutions.
Online Tutorials: esp32-starter-kit.rtfd.io