KEYESTUDIO KS5009-2

KEYESTUDIO IOT ESP32 Smart Home Starter Kit User Manual

Model: KS5009-2

Introduction

This manual provides comprehensive instructions for the assembly, programming, and operation of the KEYESTUDIO IOT ESP32 Smart Home Starter Kit, model KS5009-2. Designed for beginners, this kit offers an engaging way to learn about electronics, programming with Arduino and Python, and the fundamentals of smart home automation. It includes components for 13 distinct projects, covering various sensors and control mechanisms.

Product Overview

The KEYESTUDIO IOT ESP32 Smart Home Starter Kit allows users to build a miniature smart home model and explore various IoT functionalities. The kit supports both C language (Arduino IDE) and MicroPython for programming.

Key Features:

- Entry-level coding kit for learning electronics and programming.
- Includes 13 projects to understand basic modules and smart home concepts.
- Multi-functional smart home features: PIR Motion Sensor, Dangerous Gas Alarm, LED module, Temperature and Humidity Sensor, Morse Code door.
- Mobile phone control for various electrical equipment (lights, fans, air conditioning, etc.) via Bluetooth and Wi-Fi.
- Supports C language (Arduino) and MicroPython programming.

Kit Components:

The kit includes a variety of electronic modules and structural components to build the smart home model. A detailed packing list is provided below.

Figure 1: Assembled KEYESTUDIO IOT ESP32 Smart Home Starter Kit.

Figure 2: Diagram illustrating various sensor and control modules included in the kit.

Figure 3: Comprehensive packing list detailing all included parts, such as the ESP32 development board, LCD module, various sensors, wires, and assembly tools.

Setup and Assembly

The KEYESTUDIO IOT ESP32 Smart Home Starter Kit requires assembly. The product is not pre-assembled, and the code is not pre-burned. Detailed online tutorials are available to guide you through the assembly process and code uploading. Please refer to the QR code on the packaging or the official KEYESTUDIO website for these resources.

Power Supply: The kit does not include batteries. You will need to provide 6 AA batteries for independent operation.

Assembly Tips:

- Follow the online instructions carefully for step-by-step assembly of the wooden house structure.
- Ensure all electronic modules are connected correctly to the ESP32 development board as indicated in the diagrams.
- Pay attention to polarity when connecting power and sensor modules.

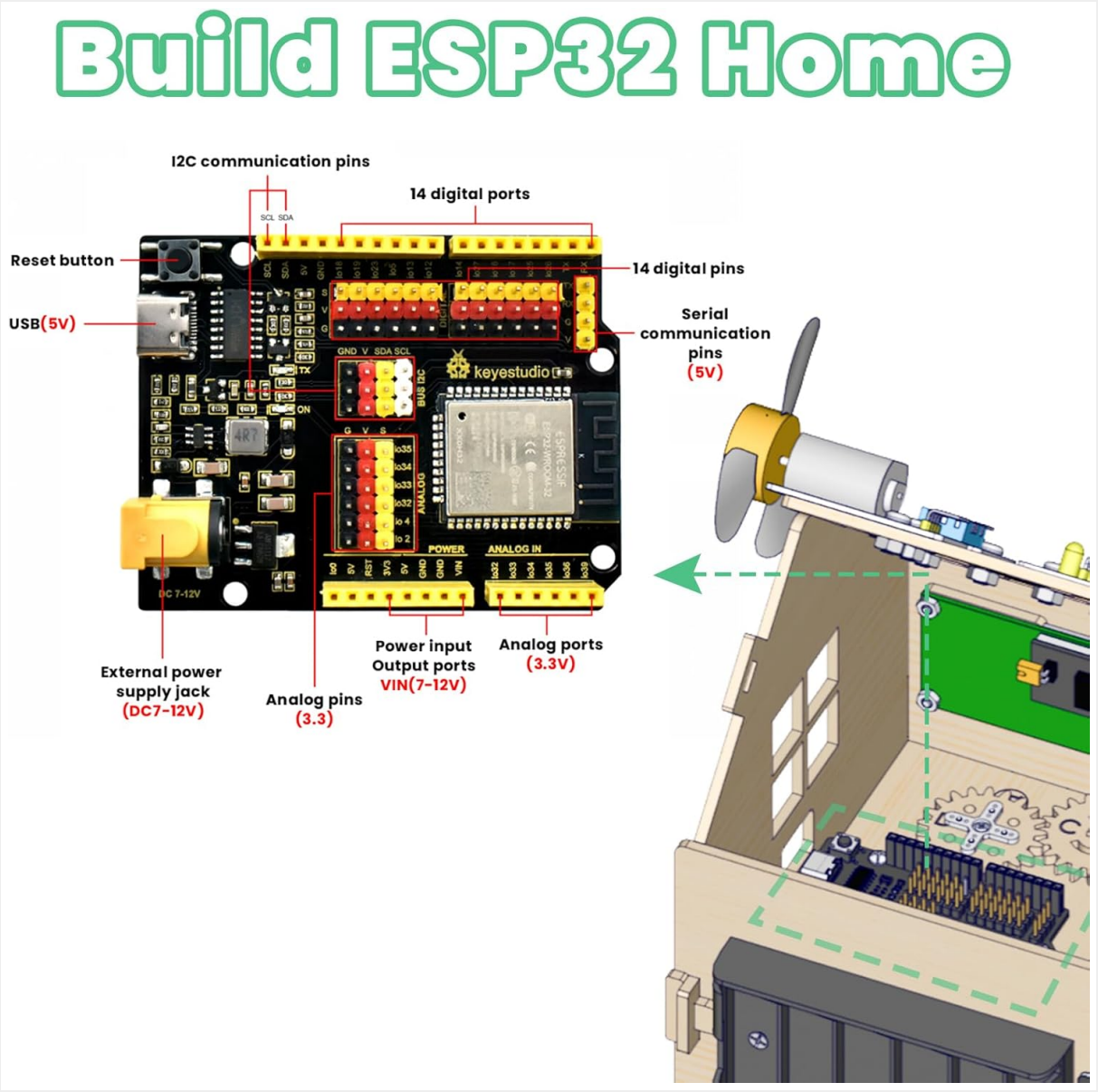


Figure 4: Detailed diagram of the ESP32 development board and its connection points within the smart home structure.

Programming Modes

The KEYESTUDIO IOT ESP32 Smart Home Starter Kit supports two primary programming languages:

- **C Language (Arduino IDE):** Ideal for users familiar with the Arduino ecosystem. The online tutorials provide sketches and guidance for programming the ESP32 board using the Arduino IDE.
- **MicroPython:** Suitable for those who prefer Python. The kit includes support and tutorials for MicroPython, allowing for a more high-level programming approach.

Access the detailed programming tutorials and example code via the online resources provided by KEYESTUDIO. These resources will guide you through setting up your development environment and uploading code to the ESP32 board.

Figure 5: Example code snippets demonstrating C language (Arduino) and MicroPython programming environments.

Operating Instructions

Once assembled and programmed, the smart home kit offers various interactive functionalities. Many features can be controlled via a mobile phone application, connecting through either Bluetooth or Wi-Fi.

Mobile Application Control:

The dedicated mobile application allows you to control various aspects of your smart home model, including lights, fans, and other connected devices. The application provides a user-friendly interface for interaction.

Figure 6: Mobile application interface demonstrating control over smart home functions.

Sensor Functionality:

- **PIR Motion Sensor:** Detects movement within its range, triggering actions such as turning on lights or sounding an alarm.
- **Dangerous Gas Alarm:** Monitors for specific gas levels and activates an alarm if thresholds are exceeded.
- **Temperature and Humidity Sensor:** Provides real-time data on ambient temperature and humidity, which can be displayed on the LCD or accessed via the app.
- **Steam Sensor:** Detects the presence of steam or high humidity, potentially triggering automated responses like closing windows.
- **Morse Code Door:** Allows entry via a programmed Morse code sequence using input buttons.
- **RFID Module:** Enables access control using an RFID card or key fob.
- **LED Module (6812 RGB LED):** Provides customizable lighting effects, controllable via the app.

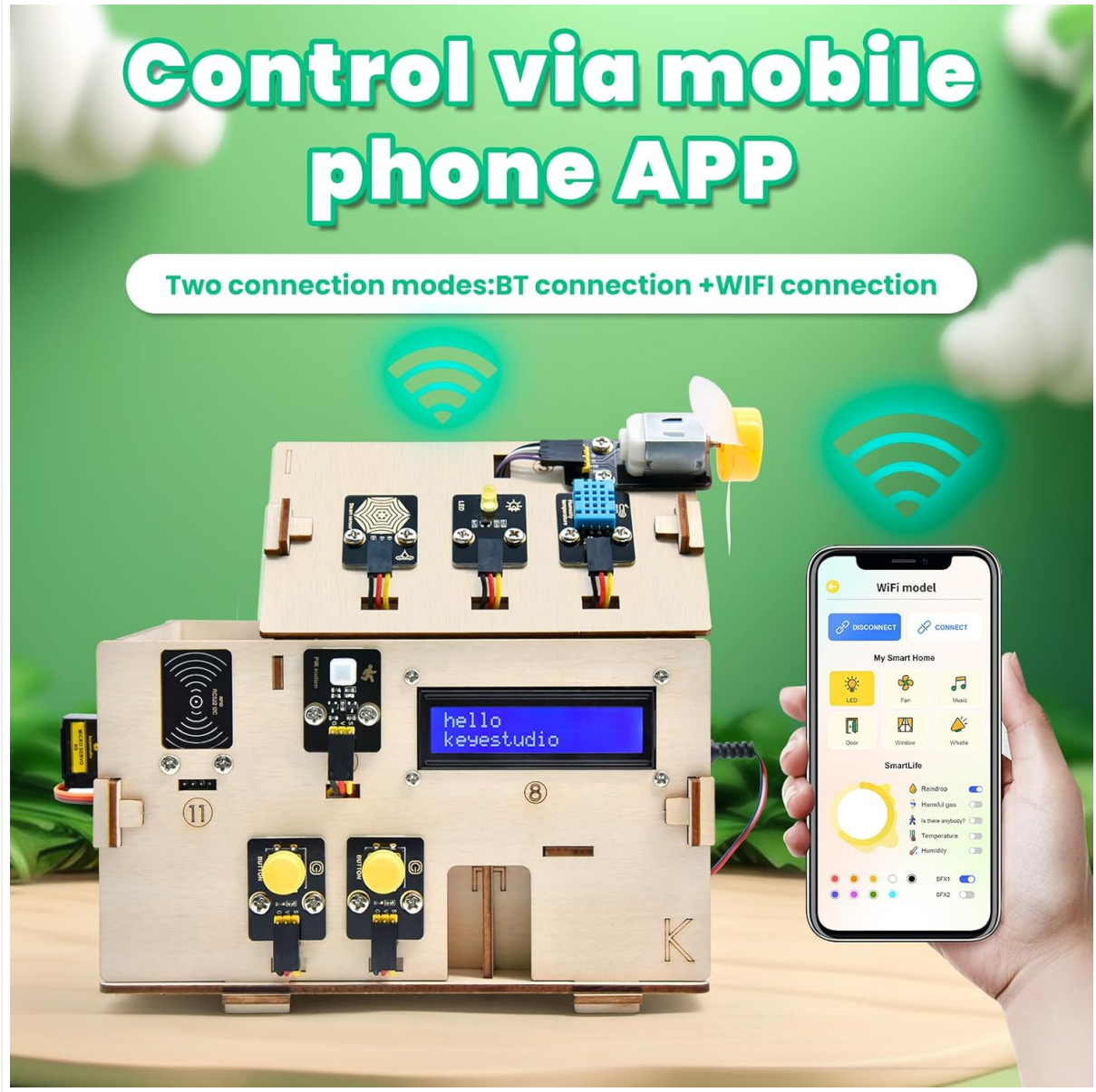


Figure 7: The smart home model displaying customizable RGB LED lighting.

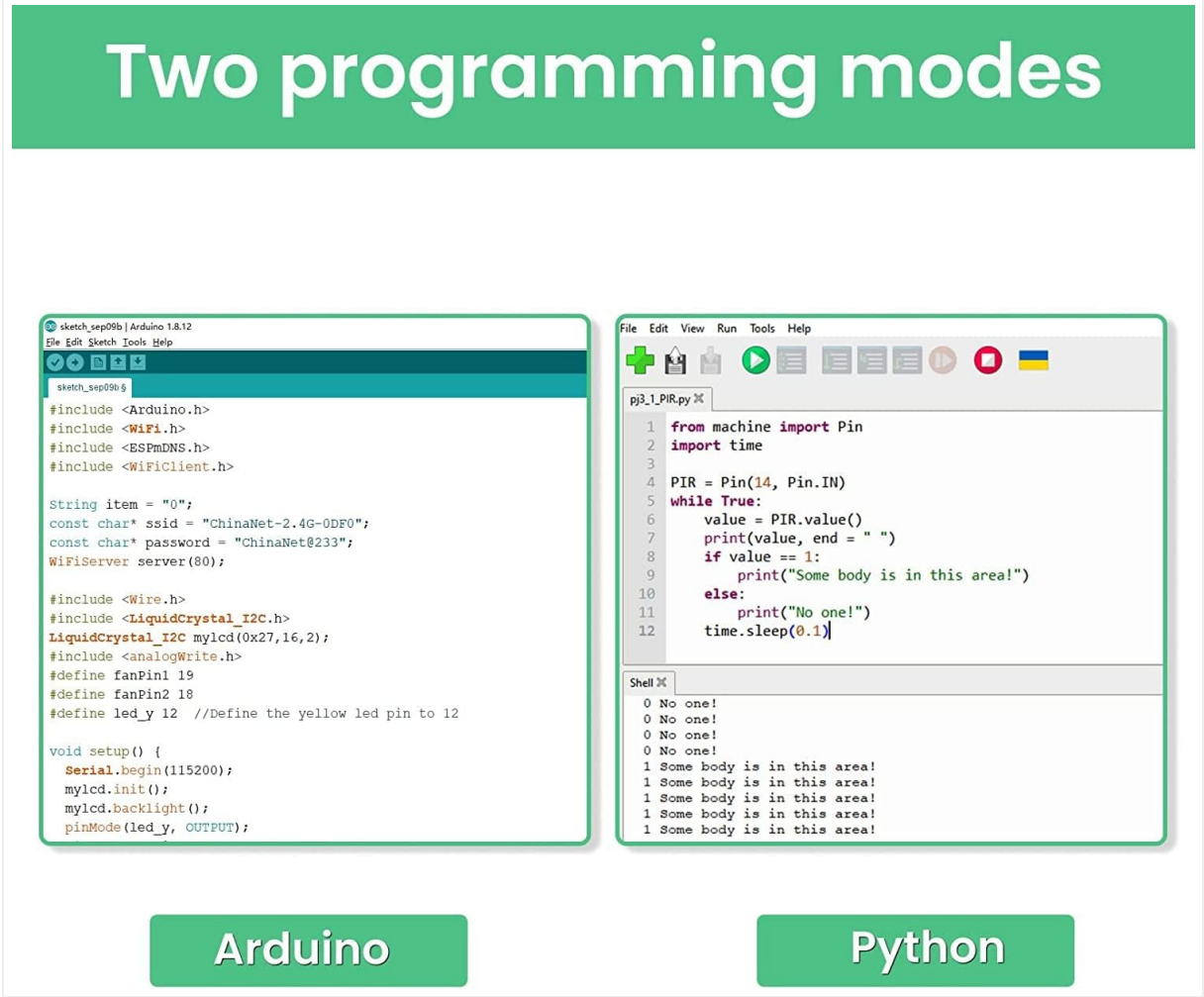


Figure 8: The smart home model demonstrating automatic window closure, potentially triggered by a rain or steam sensor.

Demonstration Video:

[redacted]

Video 1: A demonstration of the KEYESTUDIO IOT Smart Home Kit for ESP32, showcasing various functionalities including APP control, fan operation, door opening via IC card, humidity detection, steam detection, Morse code entry, human motion sensing, CO gas alarm, and colorful lights.

Troubleshooting

This section provides general guidance for common issues. For detailed troubleshooting, please refer to the online tutorials and support resources.

- **Kit not powering on:** Ensure 6 AA batteries are correctly installed and charged, or that the external power supply (DC7-12V) is connected and functional.
- **Modules not responding:** Verify all wiring connections are secure and correctly aligned with the ESP32 board's pins. Check for loose connections or incorrect pin assignments in your code.
- **Code upload issues:** Confirm that the correct board (ESP32) is selected in your Arduino IDE or MicroPython environment. Ensure all necessary libraries are installed. Check USB cable connection.
- **Mobile app connectivity problems:** Verify that the ESP32 board is correctly configured for Wi-Fi or Bluetooth and that your mobile device is connected to the same network (for Wi-Fi) or paired (for Bluetooth).
- **Sensor readings are inaccurate:** Ensure sensors are clean and unobstructed. Calibrate sensors if necessary, following the online tutorial instructions.

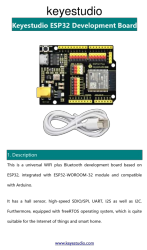
Specifications

Feature	Detail
Brand	KEYESTUDIO
Model Name	KS5009
Item Model Number	KS5009-2
Processor Brand	Espressif Systems
Number of Processors	1
Operating System	FreeRTOS
Connectivity Technology	Bluetooth, Wi-Fi
RAM	LPDDR
Item Weight	2.2 pounds
Package Dimensions	11.1 x 8.27 x 2.52 inches
Power Input	DC7-12V (External Jack), USB (5V)
Battery Requirement	6 AA batteries (not included)

Warranty and Support

For warranty information, technical support, or further assistance with your KEYESTUDIO IOT ESP32 Smart Home Starter Kit, please visit the official KEYESTUDIO website or contact their customer service department. Detailed online resources, including tutorials and FAQs, are available to help you maximize your learning experience with this kit.

Related Documents - KS5009-2

	Keyestudio ESP32 Development Board: Features, Specifications, and Usage Guide Explore the Keyestudio ESP32 Development Board, a versatile WiFi and Bluetooth enabled microcontroller compatible with Arduino. Learn about its features, specifications, pinout, and test code for IoT and smart home projects.

	[KS0428 Keyestudio Mini Tank Robot V2 – Návod a Projekty] Komplexní uživatelský manuál a průvodce projekty pro KS0428 Keyestudio Mini Tank Robot V2. Obsahuje montážní návody, nastavení softwaru a vzdělávací projekty pro Arduino, ideální pro výuku elektroniky a programování.
	[Keyestudio NANO CH340: Development Board Guide and Arduino IDE Setup] A comprehensive guide to the Keyestudio NANO CH340 development board, covering technical specifications, pinouts, and a step-by-step tutorial for setting up the Arduino IDE and uploading code.
	[KEYESTUDIO KS0026 Digital IR Receiver Module for Arduino Projects] Overview of the KEYESTUDIO KS0026 Digital IR Receiver Module for Arduino projects. This module enables IR remote control functionality, featuring a 5V power supply, digital interface, and 38KHz modulation frequency. Find more details and resources on the KEYESTUDIO website.
	[Keyestudio XD-58C Pulse Sensor Module - Product Overview] Learn about the Keyestudio XD-58C Pulse Sensor Module, a device for measuring heart rates, suitable for students, artists, athletes, inventors, and developers. Features include analog interface and compatibility with Arduino.
	[Keyestudio KS0062 I2C LCD2004 Module - Product Overview] Learn about the Keyestudio KS0062, a 20x4 character I2C LCD module with blue background and white backlight, designed for Arduino projects. This module simplifies I/O usage by employing an I2C interface.