KEYESTUDIO KS0085

KEYESTUDIO Smart Home Starter Kit for Arduino Uno R3

Model: KS0085 - User Instruction Manual

1. Introduction

The KEYESTUDIO Smart Home Starter Kit is designed to introduce users to electronics and programming through the construction of a functional smart home model. This kit provides a hands-on learning experience in home automation principles using the Arduino platform. It is suitable for individuals interested in STEM education, DIY electronics, and coding.
The kit allows for the creation of a miniature smart home equipped with various sensors and actuators, enabling control over lights, doors, and environmental monitoring.

2. Kit Components

This kit includes all necessary components to build the smart home model and explore its functionalities. Please verify that all items listed below are present in your package.

Figure 2.1: Overview of all components included in the KEYESTUDIO Smart Home Starter Kit.

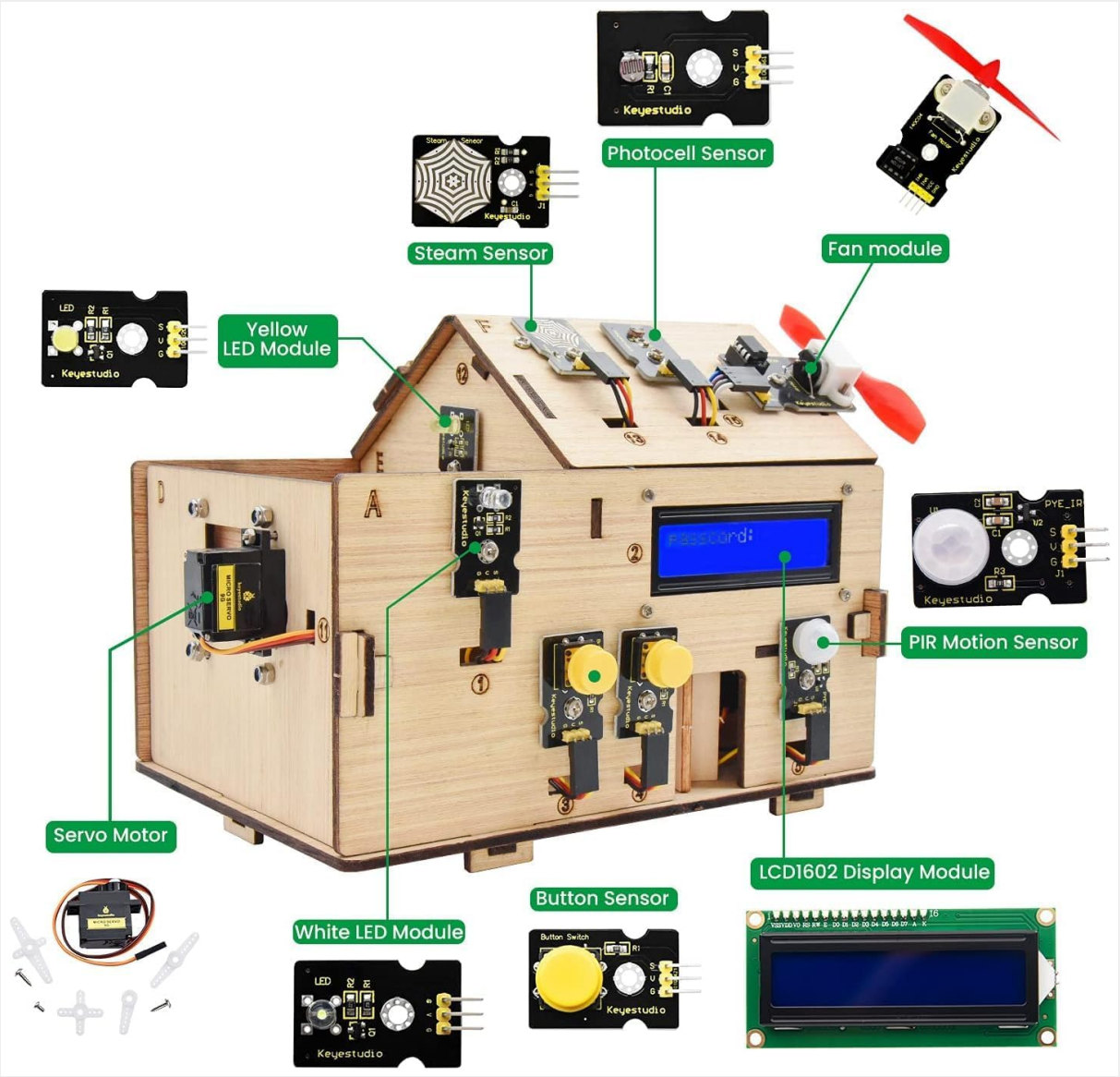

Figure 2.2: Assembled smart home model with key sensors and modules labeled, including photocell, steam sensor, fan module, yellow LED, PIR motion sensor, servo motor, white LED, button sensor, and LCD1602 display.

2.1 Main Components List

- KEYESTUDIO PLUS Controller Board (Arduino Uno R3 compatible)
- Sensor Shield
- Wooden house parts (laser-cut)
- LCD1602 Display Module
- Photocell Sensor
- Human Infrared (PIR) Motion Sensor
- LED Modules (White, Yellow)
- Soil Humidity Sensor
- Gas Sensor
- Steam Sensor
- Bluetooth Module
- Button Sensors
- Servo Motor
- Fan Module (with DC motor and propeller)
- Relay Module

- Buzzer
- Jumper Wires and Cables
- Screws and Fasteners
- USB-C Cable
- Battery Holder (for 6 AA batteries - batteries not included)

Note: 6 AA batteries are required for operation and are not included in the kit.

3. Setup and Assembly

Follow these steps to assemble your smart home model and prepare the control board for programming. Detailed assembly instructions and code examples are available on the official KEYESTUDIO wiki.

3.1 Wooden House Assembly

1. Carefully detach all wooden parts from their sheets.
2. Refer to the online assembly guide for step-by-step instructions on constructing the house frame.
3. Use the provided screws and fasteners to secure the parts.
4. Mount the servo motor, LCD display, and various sensors into their designated slots on the wooden structure as indicated in the guide.

Figure 3.1: The fully assembled KEYESTUDIO Smart Home model, ready for connection and programming.

3.2 Connecting Modules to the Controller Board

1. Attach the Sensor Shield to the KEYESTUDIO PLUS Controller Board.
2. Connect each sensor and actuator module (e.g., photocell, PIR, LEDs, servo, fan, LCD) to the appropriate pins on the Sensor Shield using the provided jumper wires. Ensure correct polarity and

pin assignments as per the online tutorials.

3. Connect the Bluetooth module to its designated serial communication pins.

3.3 Software Setup

1. Download and install the Arduino IDE from the official Arduino website (www.arduino.cc/en/software).
2. Install the necessary drivers for the KEYESTUDIO PLUS Controller Board (CP2102 chipset). These drivers are typically available on the KEYESTUDIO website or through the Arduino IDE's board manager.
3. Add the KEYESTUDIO board definitions to your Arduino IDE.
4. Install any required libraries for the sensors and modules used in the kit. Instructions for library installation are provided in the online tutorials.

3.4 Powering the Kit

- Insert 6 AA batteries into the battery holder.
- Connect the battery holder to the power input jack on the KEYESTUDIO PLUS Controller Board.
- Alternatively, you can power the board via the USB-C cable connected to a computer.

4. Operating Instructions

Once assembled and programmed, the smart home kit offers various interactive functions. The core functionality relies on uploading code to the Arduino board, which then controls the sensors and actuators.

4.1 Initial Program Upload

1. Connect the KEYESTUDIO PLUS Controller Board to your computer via the USB-C cable.
2. Open the Arduino IDE and load the example code provided in the online tutorials for the smart home kit.
3. Select the correct board (KEYESTUDIO PLUS or Arduino Uno) and COM port from the "Tools" menu.
4. Click the "Upload" button to transfer the code to the board.

4.2 Smart Home Functions

- **Light and People Photocell Sensor:** Detects ambient light levels and human presence to control lighting.
- **Human Infrared (PIR) Sensor:** Detects motion, often used for security or automated lighting.
- **LED Modules:** Control the white and yellow LEDs for various indications or lighting effects.
- **Soil Humidity Sensor:** Monitors soil moisture levels, useful for plant care reminders.
- **Gas Leak Alert:** Detects the presence of certain gases, triggering an alert.
- **Steam Sensor:** Detects steam or high humidity levels.
- **Bluetooth Remote App Control:** Control various functions of the smart home using a dedicated mobile application (Android/iOS).
- **Button Control:** Interact with the system using physical buttons, for example, to open doors with a specific sequence (Morse code).
- **Fan Module:** Activates a fan, potentially for ventilation or cooling.
- **Servo Motor:** Controls the movement of elements like doors or windows.

Figure 4.1: Demonstrates the mobile application interface used for remote control of the smart home kit.

Figure 4.2: Illustrates button-controlled interaction, such as opening doors using a Morse code input.

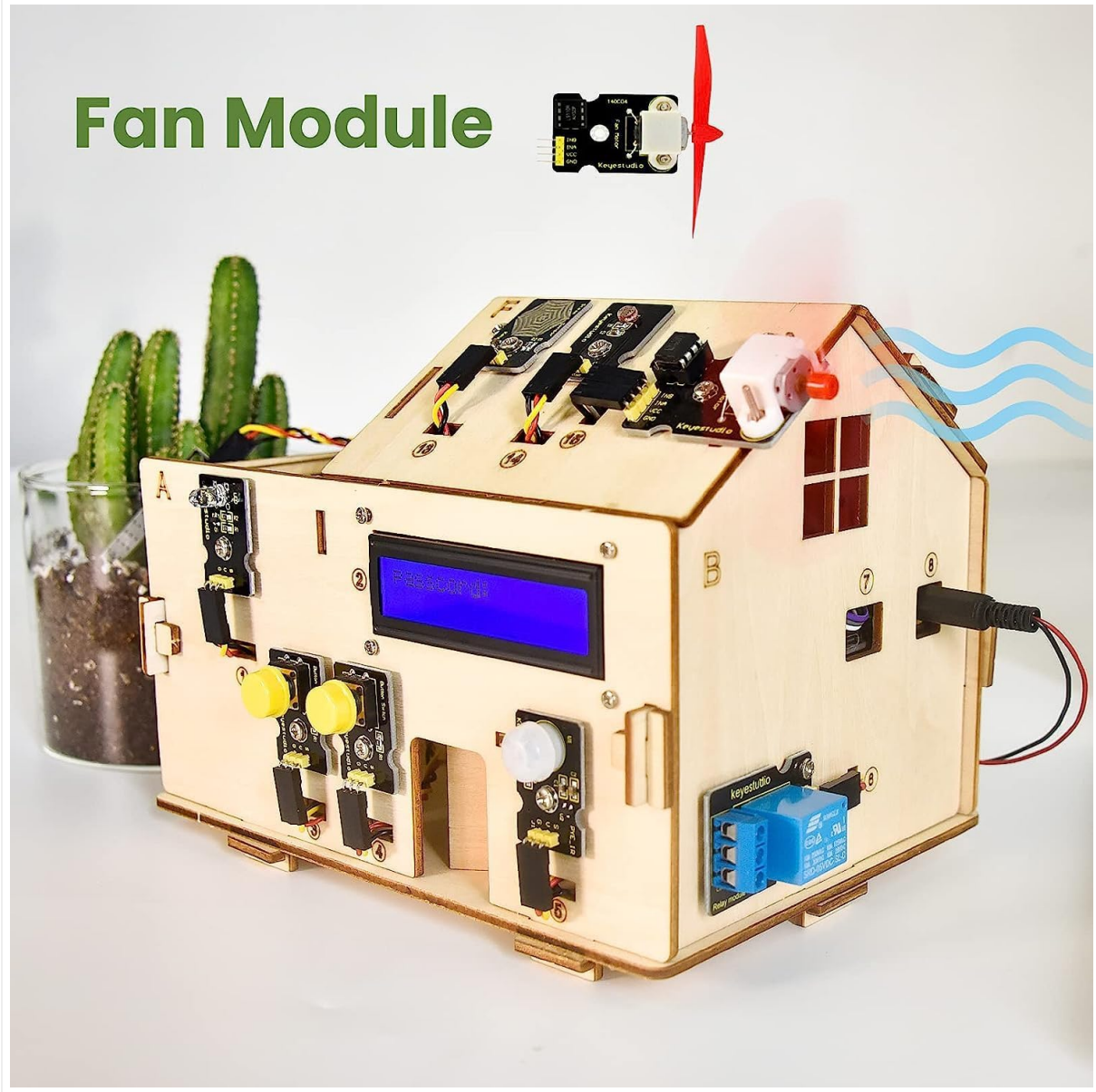

Figure 4.3: The fan module installed on the roof, demonstrating its operation.

Figure 4.4: An LED module blinking, demonstrating basic output control.

5. Maintenance

5.1 Battery Replacement

If the smart home model is powered by batteries, replace the 6 AA batteries when performance degrades or the system becomes unresponsive. Ensure correct polarity when inserting new batteries.

5.2 Cleaning

Gently wipe the wooden surfaces and electronic modules with a dry, soft cloth. Avoid using liquids or abrasive cleaners, as these can damage the electronic components or the wooden structure.

5.3 Software Updates

Periodically check the KEYESTUDIO official website or wiki for updated code examples, libraries, or software drivers to ensure optimal performance and access to new features.

6. Troubleshooting

This section addresses common issues you might encounter during assembly or operation.

- **Issue: Code upload fails.**
  - **Solution:** Ensure the correct board and COM port are selected in the Arduino IDE. Verify that the USB-C cable is securely connected and the necessary drivers (CP2102) are installed.
- **Issue: Mobile app crashes or Bluetooth connection is unstable.**
  - **Solution:** Ensure the Bluetooth module is correctly wired and powered. Try restarting the app and the smart home kit. Check for app updates or alternative compatible Bluetooth control applications.
- **Issue: A specific sensor or module is not responding.**
  - **Solution:** Verify all wiring connections for the module are correct and secure. Check the code to ensure the module is initialized and read/written to properly. Test with a simple example sketch for that specific module.
- **Issue: Servo motor or fan module gets stuck or does not move.**
  - **Solution:** Ensure there are no physical obstructions. Check power supply; motors require sufficient current. Verify the code sends correct control signals and that the module is properly connected.
- **Issue: LCD display shows no text or incorrect characters.**
  - **Solution:** Adjust the potentiometer on the back of the LCD module to control contrast. Ensure the correct LCD library and initialization code are used.

For further assistance, refer to the comprehensive online tutorials and support resources available on the KEYESTUDIO website.

7. Specifications

Feature	Detail
Model Number	KS0085
Controller Board	KEYESTUDIO PLUS (Arduino Uno R3 compatible)
Power Supply	6 AA Batteries (not included) or USB-C
Package Dimensions	8.54 x 6.14 x 3.23 inches (21.7 x 15.6 x 8.2 cm)
Item Weight	1.63 pounds (0.74 kg)
Connectivity	USB-C, Bluetooth
Manufacturer	Shenzhen KEYES DIY Robot Co.,Ltd
First Available Date	July 15, 2020

8. Warranty and Support

For information regarding product warranty, returns, or technical support, please refer to the official KEYESTUDIO website or contact their customer service directly. Online tutorials and a comprehensive wiki

are available to assist with assembly, programming, and project development.
Online Resources: Visit the KEYESTUDIO official website for detailed guides, code examples, and community forums.