M5Stack C008-C

M5Stack Atom Echo Smart Speaker Dev Kit User Manual

Model: C008-C

1. INTRODUCTION

The M5Stack Atom Echo is a compact and portable smart speaker development kit designed for voice interaction and AI capabilities. It integrates a microphone and speaker, enabling functions such as voice control and audio playback. This device is ideal for rapid prototyping in various applications including IIoT, home automation, smart retail, and STEM education.

Key features include:

- **Compact and Portable:** Measuring only 24 x 24 x 17 mm, it is highly convenient for on-the-go use.
- **Voice Interaction and AI Capabilities:** Built-in microphone and speaker support voice control, story-telling, and integration with cloud platforms like AWS and Baidu.
- **Wireless Music Playback:** Utilizes ESP32's BT capabilities for seamless audio streaming from mobile devices.
- **Versatile Connectivity:** Supports 2.4G Wi-Fi IEEE 802.11b/g/n for reliable wireless connection.
- **RGB LED Status Display:** An embedded SK6812 RGB LED provides visual indication of the device's operational status.

Figure 1: M5Stack Atom Echo Smart Speaker Dev Kit, a compact and portable device.

2. PRODUCT COMPONENTS AND DIMENSIONS

The Atom Echo features several key components and a compact design, as detailed below.

Figure 2: Detailed component diagram of the Atom Echo, highlighting the Button (G39), RGB-LED, ESP32 PICO, IR-LED, Reset button, USB-C port, Extension Pins, M2-screw hole, and I2S.Pin.

Figure 3: Dimensions of the Atom Echo, measuring 24mm (0.94in) in width and depth, and 17mm (0.67in) in height.

Figure 4: Size comparison of the Atom Echo next to a US Quarter, illustrating its compact form factor.

3. SETUP AND CONNECTIVITY

The Atom Echo is designed for easy setup and versatile connectivity. It supports both Wi-Fi and Bluetooth for communication.

3.1 Powering On

Connect the Atom Echo to a 5V DC power source using the USB-C port. The device will power on automatically.

3.2 Wireless Connectivity

The device supports 2.4G Wi-Fi (IEEE 802.11b/g/n) and Bluetooth. Specific connection procedures will depend on the firmware loaded onto the device. Refer to the official M5Stack documentation for detailed programming and connection guides.

For detailed tutorials and quick start guides, please visit the official M5Stack website:
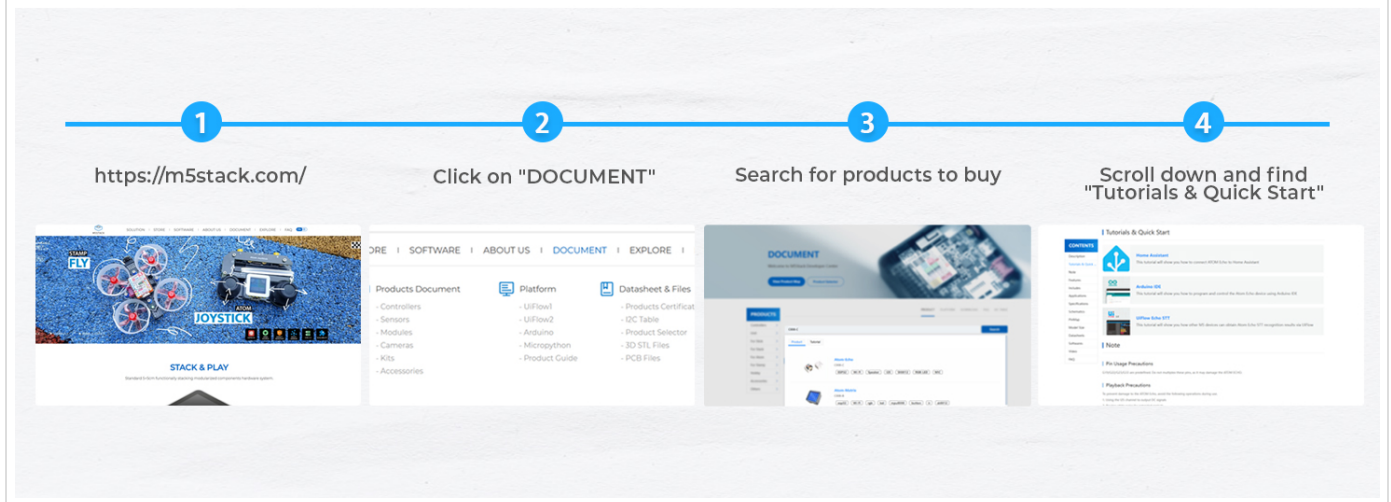
Figure 5: Steps to access tutorials and quick start guides on the M5Stack website (m5stack.com).

4. OPERATING THE ATOM ECHO

The Atom Echo is primarily operated through its programmable button and voice commands, depending on the loaded application.

4.1 Voice Interaction

The built-in microphone allows for voice input. Depending on the programmed functionality, you can use voice commands for control, ask questions, or interact with AI services.

4.2 Audio Playback

The integrated speaker enables audio output. This can be used for playing music wirelessly via Bluetooth, delivering voice responses, or playing system notifications.

4.3 RGB LED Indicator

The RGB LED (SK6812) provides visual feedback on the device's status, such as connection status, active listening mode, or error indications. The specific color patterns and their meanings are defined by the loaded firmware.
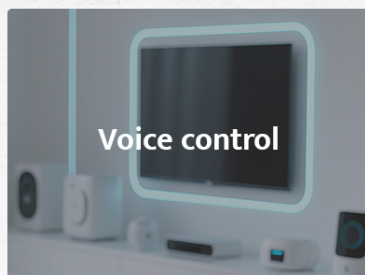
Figure 6: Key features of the Atom Echo, including support for STT services, RGB LED status display, compact and lightweight design, and a GROVE expansion interface.

Scope of Application

5. MAINTENANCE

The M5Stack Atom Echo requires minimal maintenance. Keep the device clean and free from dust and moisture.

- **Cleaning:** Use a soft, dry cloth to clean the exterior of the device. Do not use liquid cleaners or solvents.
- **Storage:** Store the device in a cool, dry place when not in use.
- **Environmental Conditions:** Avoid exposing the device to extreme temperatures, direct sunlight, or high humidity.

6. TROUBLESHOOTING

If you encounter issues with your Atom Echo, consider the following common troubleshooting steps:

- **Device Not Powering On:**

    - Ensure the USB-C cable is securely connected to both the device and a working 5V power source.
    - Try a different USB-C cable or power adapter.

- **No Audio Output:**

    - Verify that the device is properly programmed to output audio.
    - Check the volume settings within your application or connected device.
    - Ensure the speaker is not physically obstructed.

- **Microphone Not Responding:**

    - Confirm that the microphone functionality is enabled and correctly configured in your firmware.
    - Ensure there are no physical obstructions covering the microphone.
    - Test in a quiet environment, as excessive background noise can affect performance.

- **Connectivity Issues (Wi-Fi/Bluetooth):**

    - Ensure the device is within range of your Wi-Fi router or Bluetooth device.
    - Verify Wi-Fi credentials or Bluetooth pairing status in your firmware.
    - Restart the Atom Echo and your router/Bluetooth device.

- **Unexpected Behavior:**

    - Perform a soft reset using the reset button if available, or by power cycling the device.
    - Review your loaded firmware for any programming errors or conflicts.
    - Consult the M5Stack official documentation and community forums for specific programming and debugging assistance.

7. SPECIFICATIONS

Detailed technical specifications for the M5Stack Atom Echo:

Specifications

SPECIFICATION	PARAMETER
SoC	ESP32-PICO-D4, 240MHz, Dual Core, Wi-Fi
Flash	4MB
Interface	1 x IR-TX, 1 x Button, 1 x Reset Button
PinOut	G21/G25/5V/GND, 3V3/G22/G19/G23/G33
RGB LED	SK6812
SPEAKER	0.8W/NS4168 I2S
MIC	SPM1423 PDM
Housing Material	Plastic (PC)

Figure 8: Overview of the Atom Echo's key specifications.

Specification	Value
Input Voltage	5 Volts (DC)
Mounting Type	Wall Mount
Material	Plastic
Model Name	Atom Echo
Speaker Type	Multimedia
Special Feature	Programmable
Recommended Uses	Smart Speaker Development Kit
Compatible Devices	Smartphone, Tablet
Unit Count	1.0 Count
Controller Type	Button
Surround Sound Channel Configuration	2.0
Color	White
Included Components	1x ATOM ECHO
Product Dimensions	0.94"D x 0.94"W x 0.67"H
Age Range (Description)	All Ages
Is Waterproof	False
Warranty Type	Limited
Number of Items	1
Control Method	Voice
Wireless Communication Technology	Bluetooth, Wi-Fi

Specification	Value
Speaker Size	16 Millimeters
Power Source	USB-C
Woofer Diameter	40.2 Millimeters
Water Resistance Level	Not Water Resistant
Customer Package Type	FFP
Audio Driver Type	Dynamic Driver
Bluetooth Range	10 Meters
Number of Microphones	1
Subwoofer Connectivity Technology	Wireless
Connectivity Protocol	Bluetooth, Wi-Fi, USB
Includes MP3 player?	No
Number Of Circuits	1
Number of Power Levels	1
Processor Count	1
Manufacturer	M5Stack Technology Co., Ltd.
Item Weight	1.13 ounces
Item model number	C008-C
Date First Available	June 12, 2023
Country of Origin	China
Brand	M5Stack
Speaker Maximum Output Power	0.5 Watts
Frequency Response	240 Hz
Connectivity Technology	Bluetooth, Wi-Fi, USB, IR
Audio Output Mode	Mono

8. WHAT'S IN THE BOX

The M5Stack Atom Echo package includes the following items:

- 1x ATOM ECHO unit

Figure 9: Visual representation of the Atom Echo unit included in the package.

9. WARRANTY AND SUPPORT

The M5Stack Atom Echo comes with a limited warranty. For specific warranty terms and conditions, please refer to the documentation provided with your purchase or visit the official M5Stack website.

For technical support, additional resources, and community forums, please visit the M5Stack official website:

www.m5stack.com

Related Documents - C008-C

[M5Stack Atom Echo: Compact Programmable Smart Speaker & IoT Device](#)
Discover the M5Stack Atom Echo, a small, ESP32-based smart speaker with Wi-Fi, Bluetooth, Speech-to-Text (STT), and Grove interface. Ideal for voice control, IoT projects, and music playback.

[M5Stack Atom-Echo ESP32 Programmable Smart Speaker](#)
Discover the M5Stack Atom-Echo, a compact, programmable smart speaker powered by ESP32. Learn about its features, specifications, applications, and how to get started with tutorials and software.

	[M5Stack Atom-Lite: Compact ESP32 Development Board | Overview & Specs](#) Discover the M5Stack Atom-Lite (SKU: C008), a compact ESP32-PICO-D4 development board for embedded systems and IoT. Learn about its features, specifications, GPIO, software compatibility (Arduino, UiFlow), and applications.
	[M5Stack Core S3 Development Kit: Features and Programming Guide](#) Explore the M5Stack Core S3 Development Kit with this guide. Learn about its ESP32-S3 processor, features, and how to program it using UIFlow 2.0 and Micropython for your embedded projects.
	[M5STACK Atom EchoS3R: IoT Voice Interaction Controller](#) The M5STACK Atom EchoS3R is a compact and integrated IoT voice interaction controller designed for intelligent voice control and human-computer interaction. It features the ESP32-S3-PICO-1-N8R8 main control chip with Wi-Fi connectivity, 8MB Flash, and 8MB PSRAM. The device includes an ES8311 monaural codec, a high-sensitivity MEMS microphone, and an NS4150B power amplifier for clear audio pickup and high-fidelity output, making it suitable for AI voice assistants and smart home control applications. This document provides a description, technical specifications, and a quick start guide for setting up and using the device with the Arduino IDE, including Wi-Fi and BLE scanning examples.
	[M5STACK STAMPS3 Datasheet and Technical Specifications](#) Explore the M5STACK STAMPS3 development board, featuring the ESP32-S3 chip with Wi-Fi and Bluetooth 5 (LE). This datasheet details its hardware composition, pin descriptions, functional capabilities, and electrical characteristics for IoT projects.