seeed studio Seeed Studio XIAO Expansion Board

Seeed Studio XIAO Expansion Board User Manual

1. Introduction

This user manual provides comprehensive instructions for the Seeed Studio XIAO Expansion Board. It covers product features, setup procedures, operational guidelines, and troubleshooting tips to help you maximize the utility of your expansion board with Seeeduino XIAO microcontrollers. This board is designed to simplify prototyping and expand the capabilities of your XIAO module by integrating various peripherals and connectivity options.

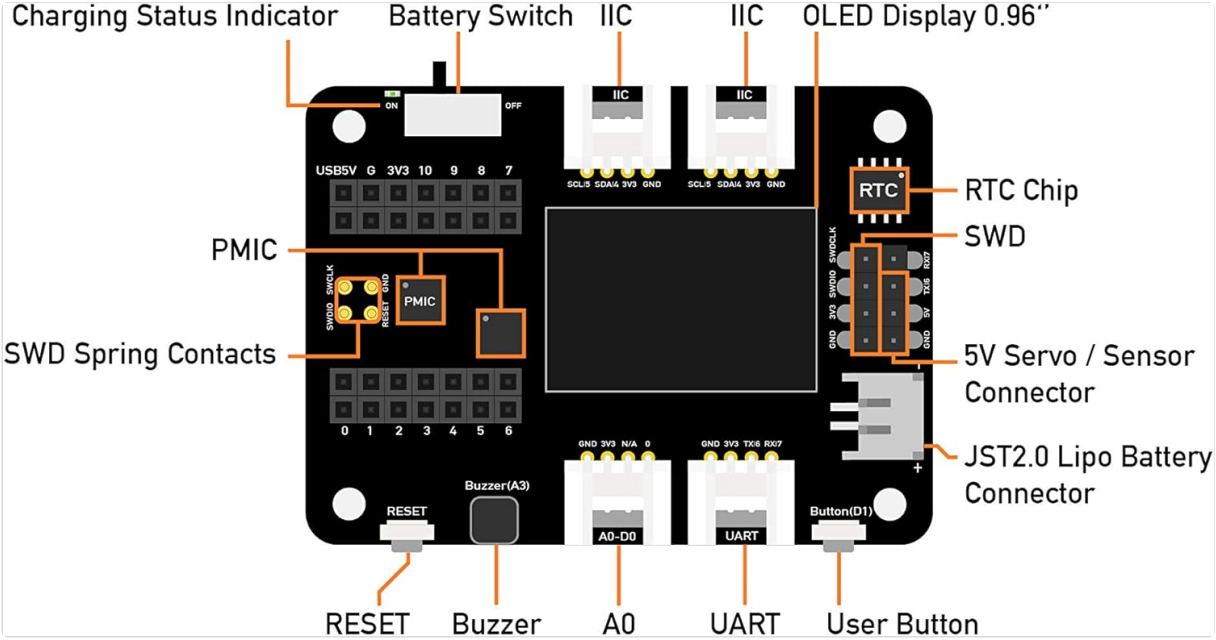
2. Product Overview

2.1 Key Features

- **Quick Prototyping:** Features an integrated 0.96-inch OLED display for visual data output without a PC serial monitor. Includes dedicated debug (SWD) and reset pins for easy development.
- **Rich Peripherals:** Equipped with an onboard OLED, Real-Time Clock (RTC), expandable memory via a mini SD card slot, a passive buzzer, a user-programmable button, and an integrated battery management chip.
- **Solder-Free Connectivity:** All pins are conveniently led out to male headers. Includes plug-and-play Grove connectors supporting multiple data protocols such as IIC, UART, and Analog/Digital.
- **Circuit Python Supported:** Fully compatible with Circuit Python, utilizing the mini SD card slot for expanding memory and accommodating additional libraries required for prototyping and project development.
- **Compact Design:** Its mini size, approximately half that of a Raspberry Pi 4, makes it ideal for tiny and wearable projects.

2.2 Board Components

The Seeed Studio XIAO Expansion Board integrates several key components to enhance the functionality of your XIAO microcontroller. Refer to the diagram below for a visual guide to the board's layout and components.



This diagram illustrates the various components and connectors on the Seeed Studio XIAO Expansion Board, including the OLED display, IIC ports, UART port, SD card slot, battery connector, reset button, user button, buzzer, and SWD pins.

Key components include:

- **0.96" OLED Display:** For visual output of data and status.
- **IIC Grove Connectors:** Two ports for I2C communication with external sensors and modules.
- **UART Grove Connector:** For serial communication.
- **Mini SD Card Slot:** For expandable storage and data logging.
- **JST2.0 LiPo Battery Connector:** For portable power supply.
- **RTC Chip:** Provides real-time clock functionality, often backed by a coin cell battery.
- **Passive Buzzer:** For audio feedback.
- **User Button:** A programmable input button.
- **Reset Button:** To restart the connected XIAO module.
- **SWD Pins:** For advanced debugging and programming.
- **Battery Switch:** To control power from the LiPo battery.
- **Charging Status Indicator:** LED to show battery charging status.

3. Setup Guide

3.1 Package Contents

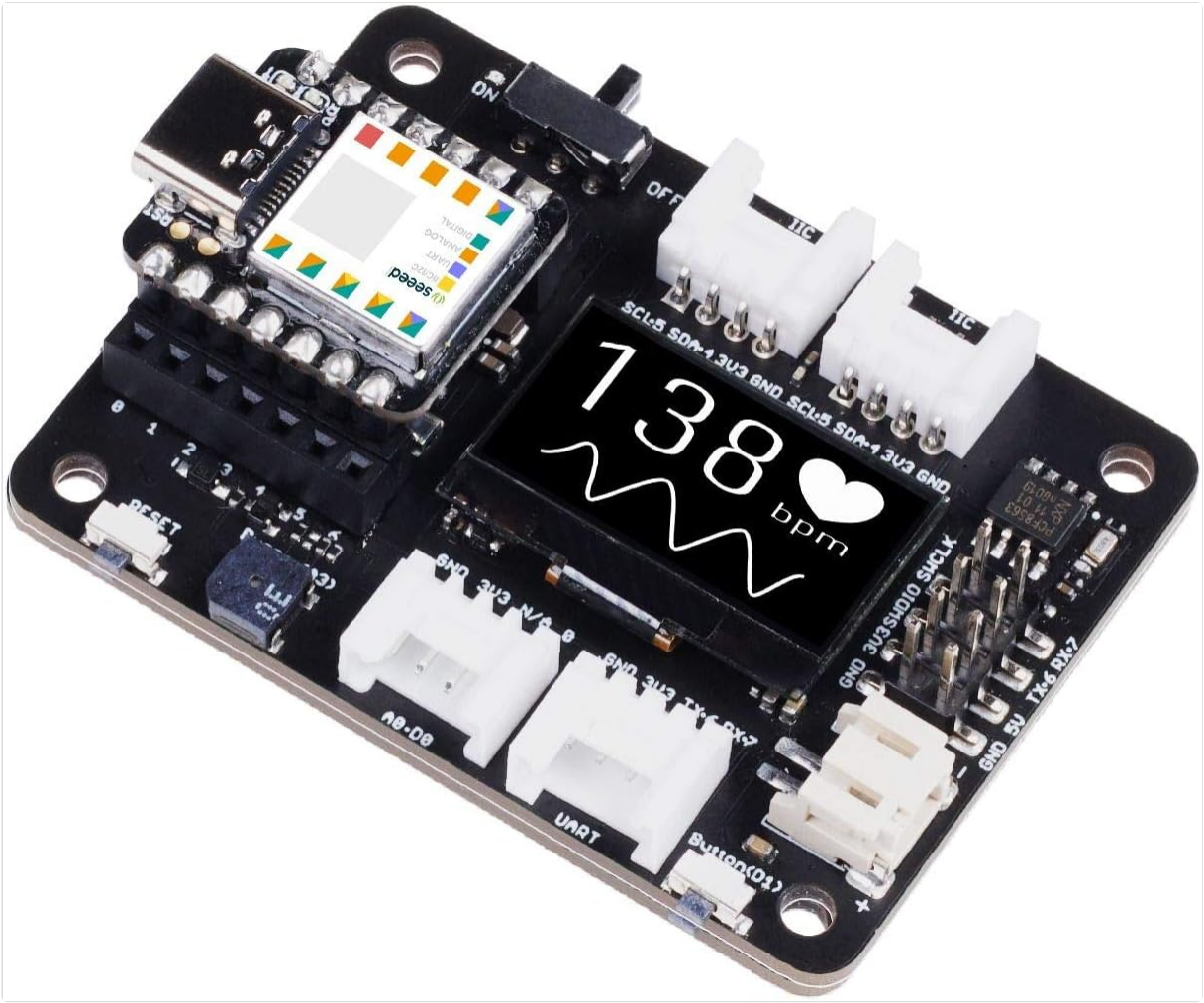
Upon opening the package, please ensure all components are present:

- Seeed Studio XIAO Expansion Board

3.2 Hardware Connection

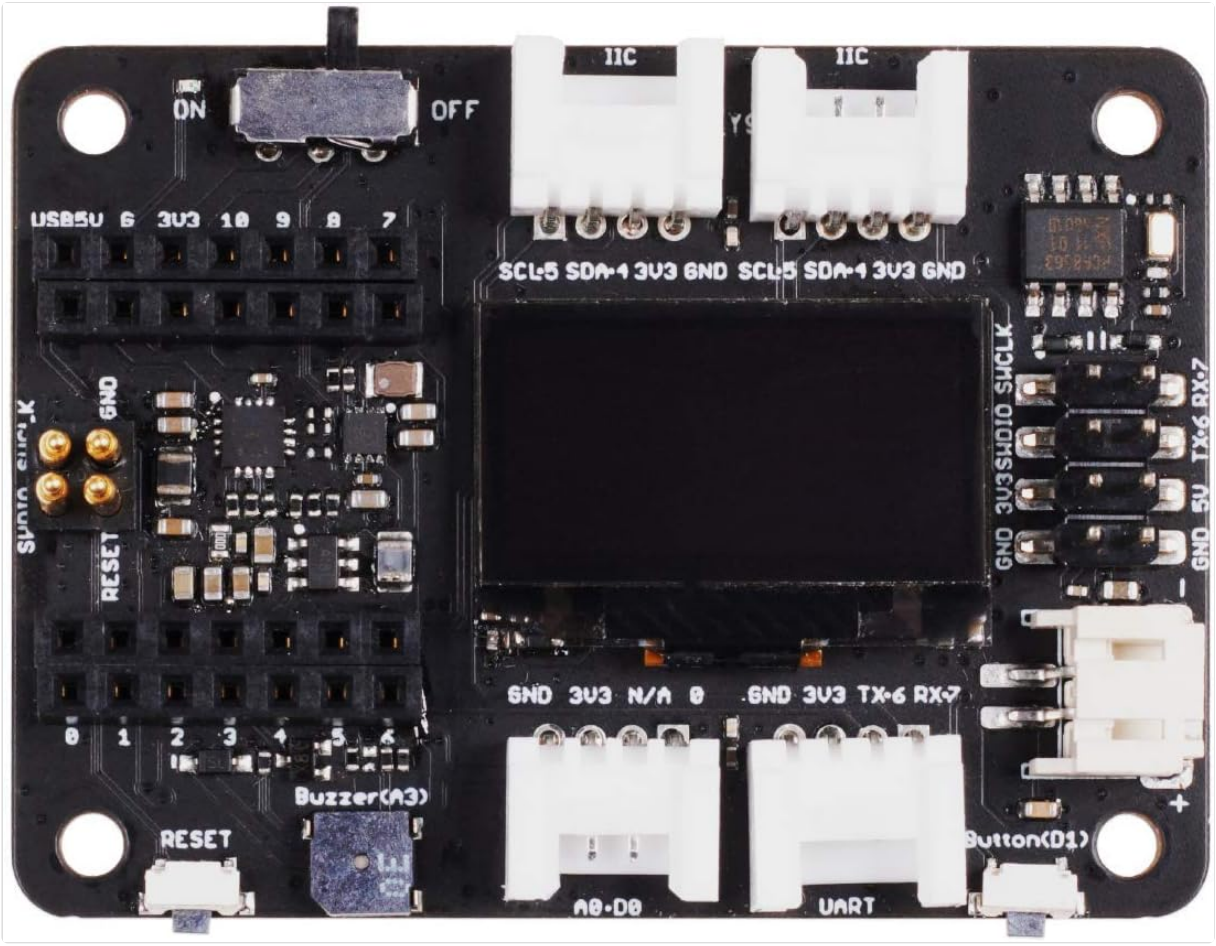
Follow these steps to connect your Seeeduino XIAO microcontroller and other peripherals to the expansion board:

1. **Insert XIAO Module:** Carefully align your Seeeduino XIAO microcontroller with the designated pin headers on the expansion board and gently press it into place. Ensure all pins are correctly seated.

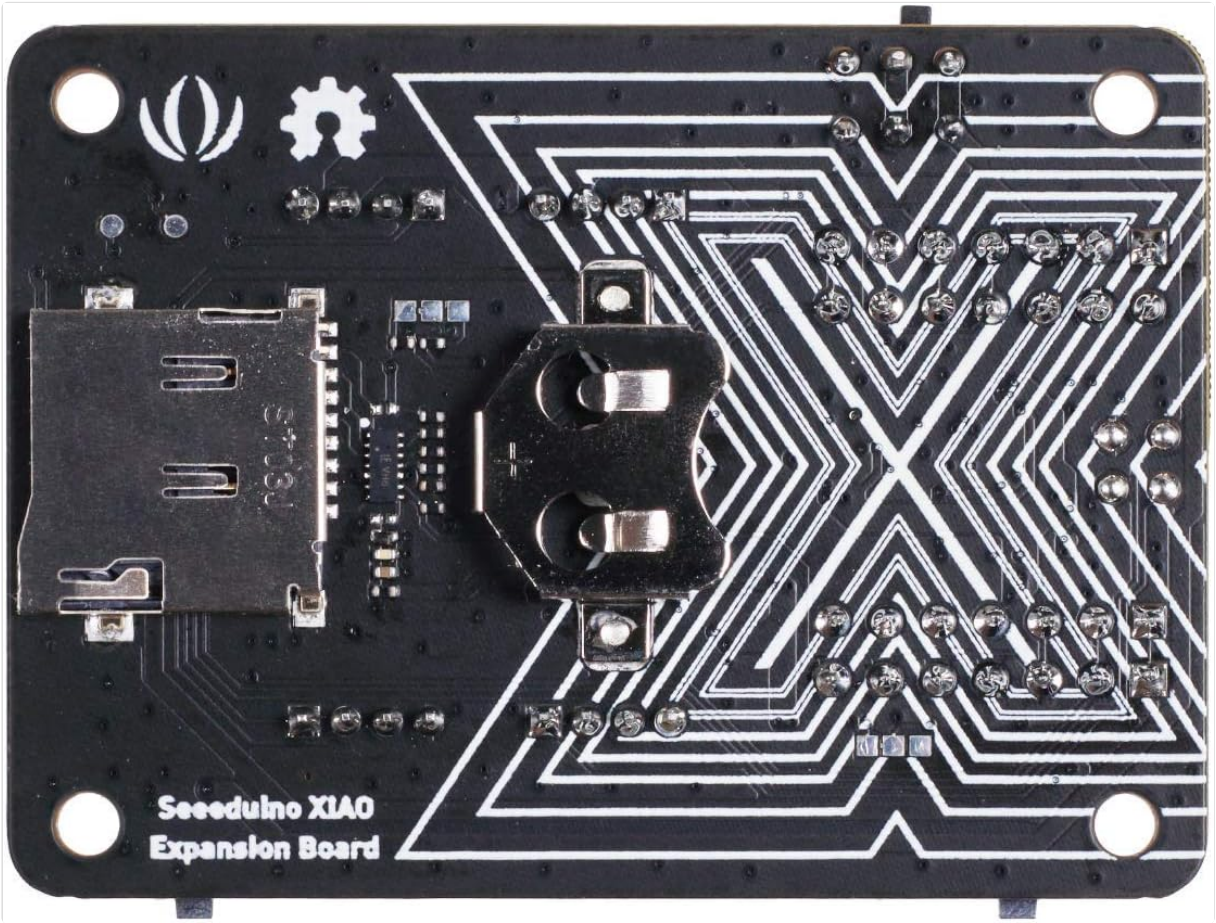


This image shows the Seeed Studio XIAO Expansion Board with a Seeeduino XIAO microcontroller module securely plugged into its designated header, ready for operation. The OLED display shows a heart rate reading.

2. **Connect Peripherals:** Utilize the Grove connectors for IIC, UART, and Analog/Digital devices. These connectors are designed for plug-and-play functionality, eliminating the need for soldering.
3. **Power Supply:** The board can be powered via the USB-C port or a connected LiPo battery using the JST2.0 connector. Ensure the battery switch is in the 'ON' position if using battery power.
4. **SD Card Insertion:** If using, insert a mini SD card into the dedicated slot on the underside of the board.



A top-down view of the Seeed Studio XIAO Expansion Board, highlighting the USB-C port, IIC and UART Grove connectors, OLED display area, and pin headers for the XIAO module.



The underside of the Seeed Studio XIAO Expansion Board, featuring the mini SD card slot for memory expansion and the coin cell battery holder for the Real-Time Clock (RTC) function.

3.3 Software Setup

To program your Seeeduino XIAO with the expansion board, you will typically use the Arduino IDE or Circuit Python. Detailed instructions for setting up your development environment and installing necessary libraries can be found on the official Seeed Studio Wiki and community forums. It is recommended to visit the Seeed Studio Wiki for the most up-to-date software guides and examples.

4. Operating Instructions

4.1 Basic Operation

- **Power On/Off:** Use the slide switch labeled 'ON/OFF' to control power when operating on battery. When powered via USB-C, the board will be active.
- **Reset Button:** Press the 'RESET' button to perform a hardware reset of the connected XIAO module.
- **User Button:** The 'Button(D1)' is a programmable button that can be configured in your code for various functions.

4.2 OLED Display

The 0.96-inch OLED display can be used to visualize data, display status messages, or create simple user interfaces. Libraries for OLED control are available for both Arduino and Circuit Python environments. Refer to the Seeed Studio documentation for specific examples on how to initialize and write to the display.

4.3 Grove Connectors

The Grove connectors provide standardized interfaces for a wide range of sensors and actuators. Simply plug in compatible Grove modules to expand your project's capabilities:

- **IIC (I2C) Ports:** Ideal for connecting multiple I2C devices such as accelerometers, gyroscopes, or environmental sensors.
- **UART Port:** Suitable for serial communication with modules like GPS, Bluetooth, or other serial devices.
- **Analog/Digital Ports:** For connecting analog sensors or digital input/output devices.

4.4 SD Card Functionality

The mini SD card slot allows for data logging, storing configuration files, or expanding the program memory for larger projects. Ensure the SD card is formatted correctly (typically FAT32) before use. Libraries are available to facilitate reading from and writing to the SD card in your code.

5. Advanced Features

5.1 Real-Time Clock (RTC)

The onboard RTC chip provides accurate timekeeping, which is crucial for applications requiring timestamps or scheduled events. The RTC typically requires a small coin cell battery (not included) to maintain time when the main power is off. Consult the Seeed Studio Wiki for instructions on how to set and read the time using the RTC library.

5.2 Circuit Python Integration

The Seeed Studio XIAO Expansion Board fully supports Circuit Python, offering an easy-to-use, high-level programming environment. This allows for rapid development and prototyping, especially when leveraging

the SD card for storing Python scripts and libraries. For detailed guides on installing and using Circuit Python, refer to the official Circuit Python documentation and Seeed Studio resources.

5.3 Debugging (SWD)

The SWD (Serial Wire Debug) pins are exposed on the expansion board, providing an interface for advanced debugging and programming of the connected XIAO microcontroller. This is useful for in-depth code analysis and firmware flashing using compatible debuggers.

6. Maintenance

- **Cleaning:** Use a soft, dry cloth to clean the board. Avoid using liquids or abrasive materials.
- **Storage:** Store the expansion board in a dry, anti-static environment when not in use.
- **RTC Battery Replacement:** If the RTC loses time when power is removed, the coin cell battery (if installed) may need replacement. Refer to the board's specific battery type and replacement procedure.

7. Troubleshooting

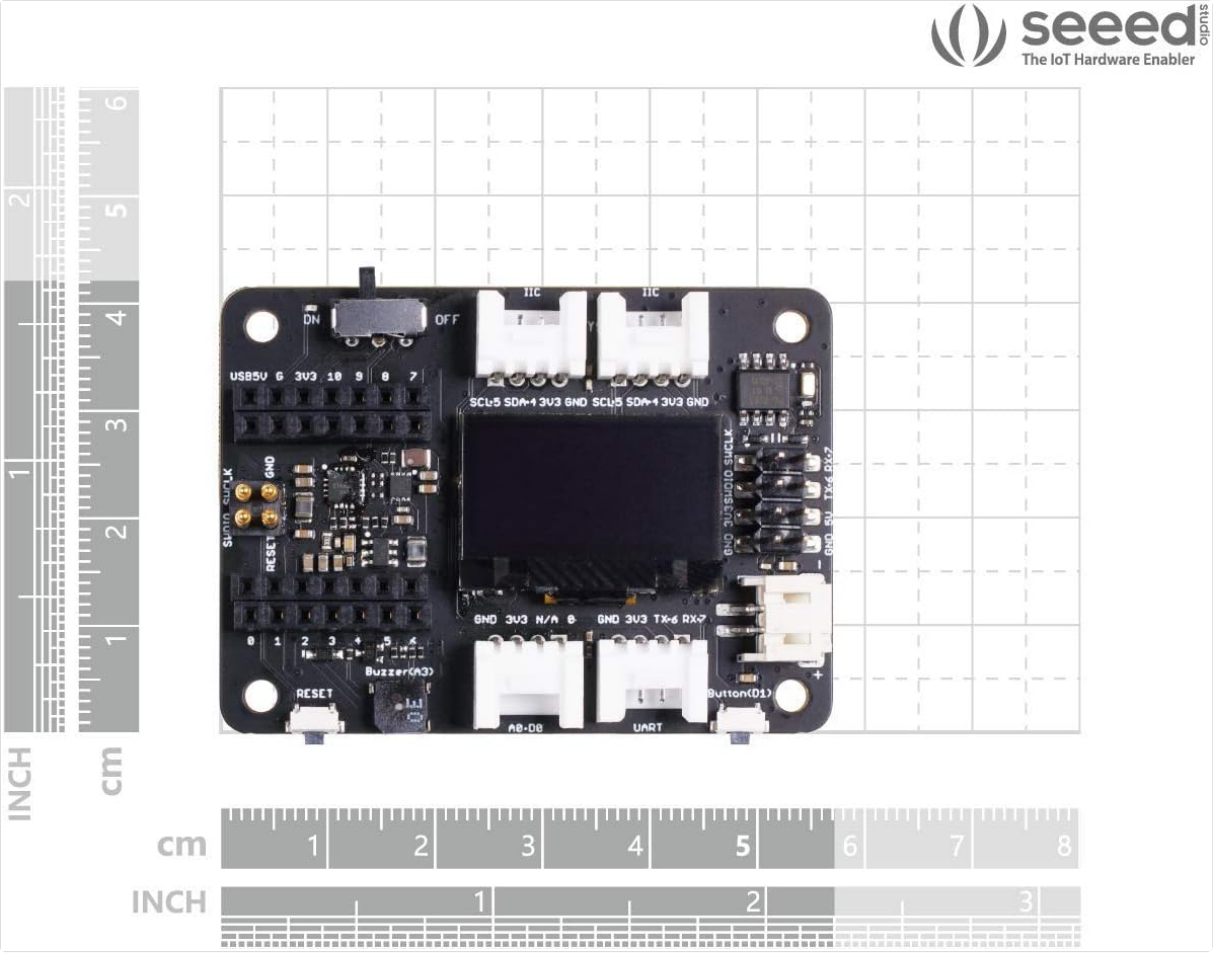
If you encounter issues with your Seeed Studio XIAO Expansion Board, consider the following common problems and solutions:

- **Board Not Powering On:**
  - Ensure the USB-C cable is securely connected and providing power.
  - If using a LiPo battery, check that it is charged and correctly connected to the JST2.0 connector, and the battery switch is in the 'ON' position.
- **OLED Not Displaying:**
  - Verify that the XIAO module is correctly inserted and powered.
  - Check your code for proper OLED initialization and display commands.
  - Ensure necessary OLED libraries are installed and correctly configured.
- **Peripherals Not Responding (Grove Connectors):**
  - Confirm that the Grove modules are securely plugged into the correct ports (IIC, UART, Analog/Digital).
  - Check your code for correct pin assignments and communication protocols for the specific peripheral.
- **SD Card Not Detected:**
  - Ensure the mini SD card is fully inserted into the slot.
  - Verify the SD card is formatted to FAT32.
  - Check your code for correct SD card initialization and file system operations.
- **General Connectivity Issues:**
  - Double-check all physical connections.
  - Ensure your XIAO module's firmware is up to date.
  - Consult the Seeed Studio community forums or documentation for specific error messages or issues.

For further assistance, please visit the official Seeed Studio Forum.

8. Technical Specifications

Parameter	Value
Model Name	Seeed Studio XIAO Expansion Board
Model Number	103030356
Product Dimensions	2.01 x 2.66 x 0.79 inches (51 x 67.5 x 20 mm)
Item Weight	0.704 ounces (20 grams)
Connectivity	I2C, UART, Analog/Digital (via Grove connectors)
Display	0.96" OLED
Storage	Mini SD Card Slot
Power Input	USB-C, LiPo Battery (JST2.0 connector)
Additional Features	RTC, Passive Buzzer, User Button, Reset Button, SWD Debug Pins, Battery Management Chip



This image provides a visual reference for the compact dimensions of the Seeed Studio XIAO Expansion Board, displayed alongside an inch and centimeter ruler.

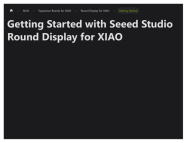
9. Warranty and Support

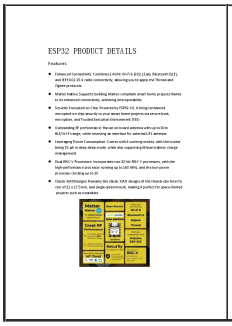
For detailed information regarding the product warranty, please refer to the official Seeed Studio website. Warranty terms and conditions may vary by region and product type. Technical support and additional resources, including tutorials and community forums, are available through the Seeed Studio official channels.

Official Website: www.seeedstudio.com

Support Forum: forum.seeedstudio.com

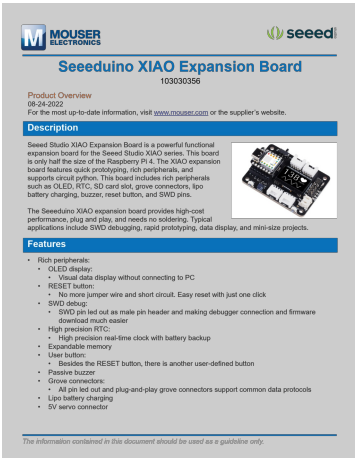
Related Documents - Seeed Studio XIAO Expansion Board

	Seeed Studio BeagleBone Green Eco User Guide Comprehensive user guide for the Seeed Studio BeagleBone Green Eco, detailing its hardware specifications, features, interfaces, power requirements, and pin definitions. Includes information on the AM335x processor, memory, connectivity options, and Grove ecosystem integration.
	Getting Started with Seeed Studio Round Display for XIAO A comprehensive guide to setting up and using the Seeed Studio Round Display for XIAO, covering hardware preparation, software installation, and basic usage for this 1.28-inch touch screen expansion board.
	Guida all'uso del modulo Real Time Clock AZ-Delivery DS3231 Manuale completo per l'utilizzo e la configurazione del modulo Real Time Clock AZ-Delivery DS3231 con Arduino e Raspberry Pi, inclusi schemi di collegamento, codice e spiegazioni.
	How PlatformIO Supports Seeed XIAO Boards A guide detailing how to integrate Seeed XIAO development boards (ESP32C6, RP2040, nRF52840) with the PlatformIO development ecosystem, including configuration steps and necessary links.
	XIAO ESP32C3 Power Consumption Modes and Test Results A comprehensive guide to the power consumption modes of the Seeed Studio XIAO ESP32C3 microcontroller, detailing Active, Modem-sleep, Light-sleep, and Deep-sleep states with corresponding test results and configuration commands.



[Seeed Studio XIAO ESP32C6 Product Details and Getting Started Guide]
Detailed information about the Seeed Studio XIAO ESP32C6, a powerful IoT development board featuring ESP32-C6 SoC, dual RISC-V processors, Wi-Fi 6, Bluetooth 5.3, Zigbee, and Thread. Includes features, specifications, and a getting started guide.

Documents - seeed studio – Seeed Studio XIAO Expansion Board



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Seeeduino XIAO Expansion Board 103030356 Product Overview 08-24-2022 For the most up-to-date information, visit www.mouser.com or the supplier s website. Description Seeed Studio XIAO Expansion Board is a powerful functional expansion board for the Seeed Studio XIAO series. This board is only half t...
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[Seeed Studio XIAO ESP32C3: RISC-V MCU Board for IoT and Wearables]
Detailed overview of the Seeed Studio XIAO ESP32C3, a tiny RISC-V MCU board featuring Wi-Fi, Bluetooth 5.0, low power consumption, and battery charge support. Ideal for IoT, wearable devices, and rapid prototyping.
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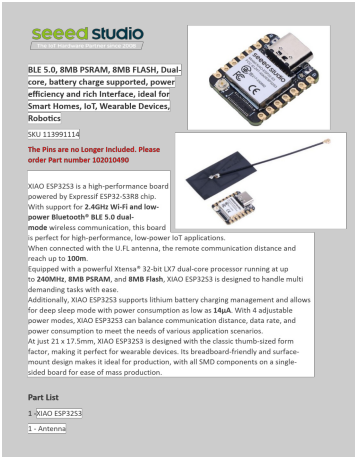

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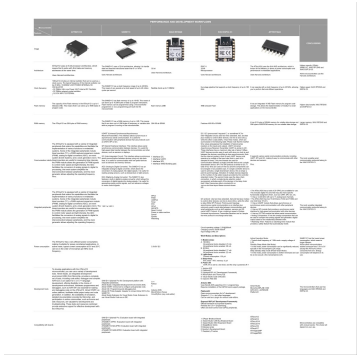

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