Arduino ABX00162

Arduino UNO Q [ABX00162] Hybrid Board User Manual

Model: ABX00162

1. Product Overview

The Arduino UNO Q [ABX00162] is an advanced hybrid development board designed for a wide range of applications, from robotics and IoT to AI vision and voice projects. It integrates a powerful Qualcomm Dragonwing QRB2210 Microprocessor Unit (MPU) with an STM32U585 Microcontroller Unit (MCU), providing a versatile platform for both high-level computing and real-time control.

This board maintains the classic UNO form factor, ensuring compatibility with existing Arduino shields, while introducing enhanced capabilities such as Linux Debian OS support, Wi-Fi 5, Bluetooth 5.1, and an integrated 8x13 LED matrix.

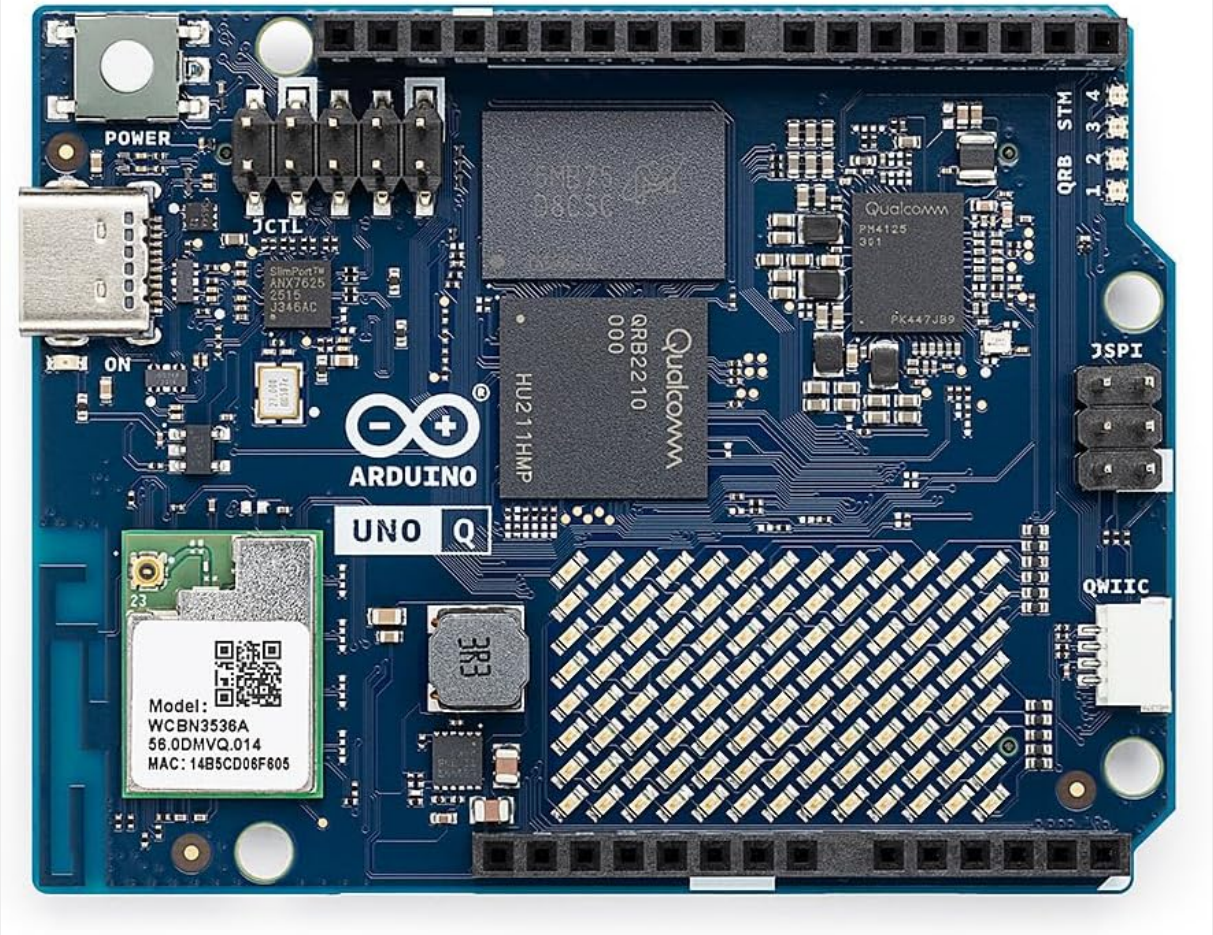

Figure 1: Top view of the Arduino UNO Q board, highlighting the Qualcomm Dragonwing QRB2210 MPU and other integrated circuits. For more information, visit arduino.cc/uno-q.

2. Key Features

- **Dual-Brain Hybrid Power:** Integrates a Qualcomm Dragonwing QRB2210 MPU (Quad-core Arm Cortex-A53 @ 2.0 GHz CPU, Adreno GPU, AI acceleration) and an STM32U585 MCU for advanced applications like object recognition, voice commands, and motion detection.
- **AI & Linux Capabilities:** Supports AI-powered vision and sound solutions, runs Linux Debian OS for Python coding, and is compatible with the Arduino ecosystem, including libraries and Sketches. Quick start available with Arduino App Lab.
- **Advanced Specifications:** Features 2 GB LPDDR4 RAM and 16 GB eMMC built-in storage. Ideal for PC-connected development, running OS, Python scripts, and basic network services (SSH) without a demanding GUI. Suitable for lightweight AI and memory-optimized TinyML applications.
- **Connectivity:** Equipped with dual-band Wi-Fi 5 (2.4/5 GHz), Bluetooth 5.1, and high-speed headers for vision, audio, and display peripherals.
- **Seamless Expansion:** Maintains the classic UNO form factor for shield compatibility, includes an 8x13 LED matrix, and a Qwiic connector for easy expansion with Modulino nodes. Power and connectivity are provided via a USB-C connector.
- **Development Platform:** An ideal platform for prototyping robotics or IoT projects, offering a unified development experience to combine Arduino Sketches, Python scripts, and containerized AI models.

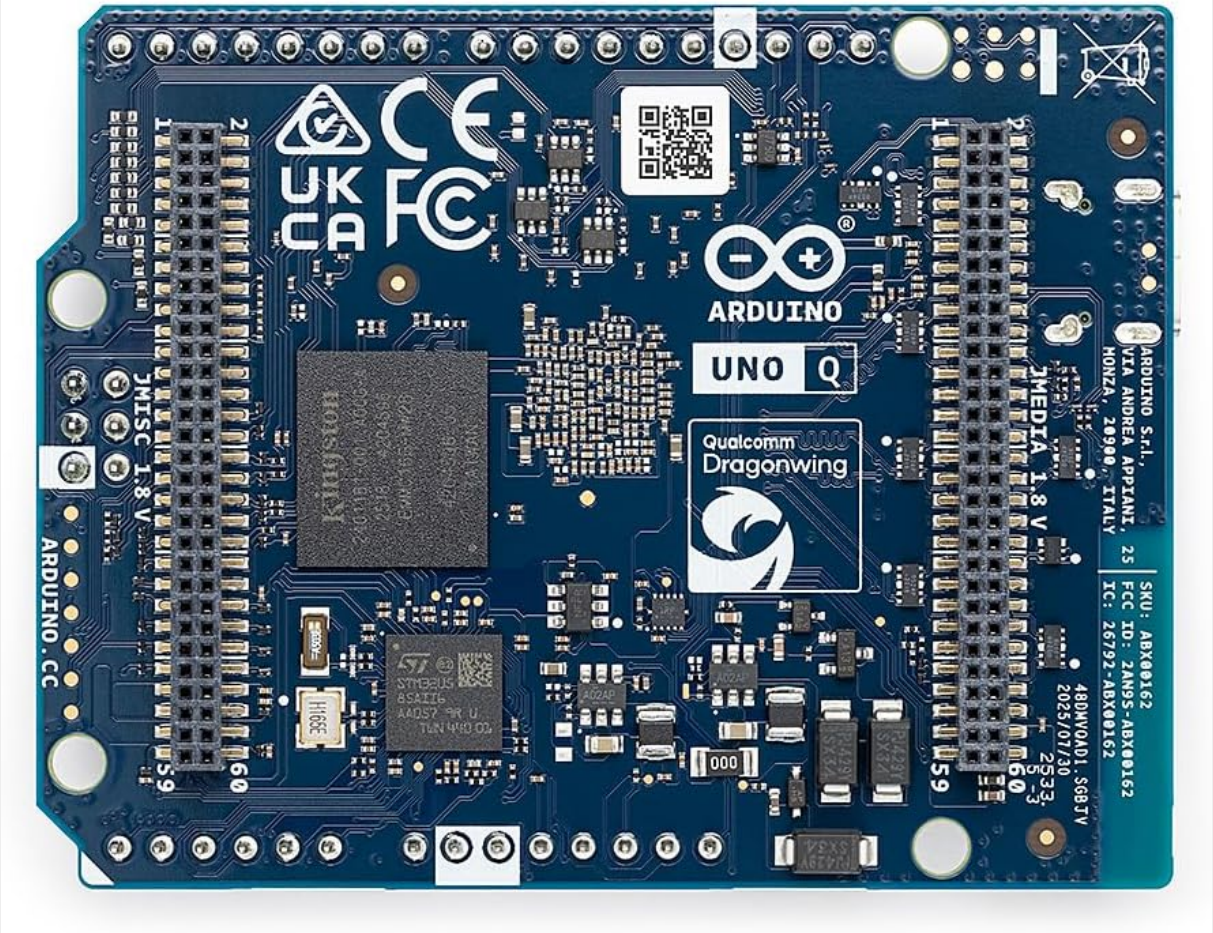

Figure 2: Bottom view of the Arduino UNO Q board, showing the Kingston 16GB memory module and the STM32U585 Microcontroller. For more information, visit arduino.cc/uno-q.

3. Setup Instructions

To begin using your Arduino UNO Q board, follow these steps:

1. **Initial Connection:** Connect the Arduino UNO Q to your computer using a USB-C cable. Ensure the cable is capable of providing sufficient power, as the board can draw up to 2.5 A peak. A powered USB hub is recommended for stable operation, especially during initial setup and heavy use.
2. **Firmware Update:** The board may require a firmware update. Download and install the Arduino CLI software from the official Arduino documentation website. Follow the instructions provided to flash the latest firmware onto your UNO Q board.
3. **Arduino App Lab Setup:** Launch the Arduino App Lab. The application may prompt you to update itself; allow this process to complete, which can take approximately 10 minutes.
4. **User Account Creation:** Create a name and password within the Arduino App Lab when prompted. This will finalize the initial setup.
5. **Operating System (Linux Debian):** The board runs Linux Debian OS. Basic knowledge of Linux commands is highly recommended for advanced development.
6. **Network Connection:** For code development, connecting to the UNO Q via a network is often efficient. Ensure your network settings are configured correctly.

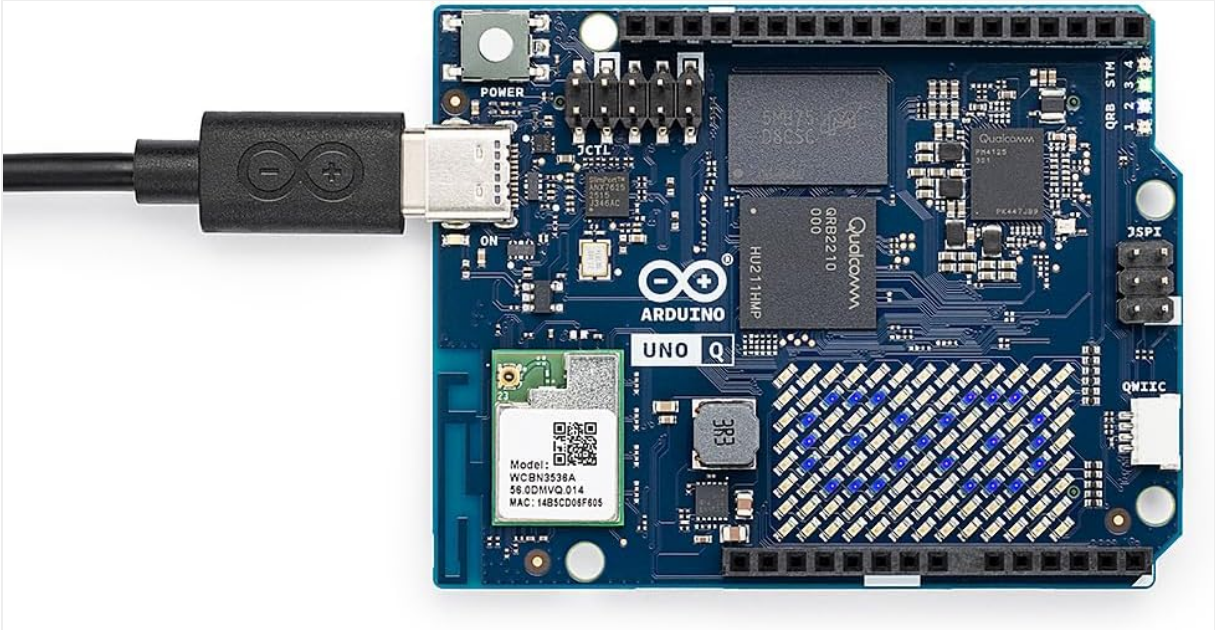

Figure 3: Arduino UNO Q board connected to a power source via USB-C, demonstrating the illuminated 8x13 LED matrix. For more information, visit arduino.cc/uno-q.

> **Note:** The Arduino UNO Q is not intended for absolute beginners without any prior experience in electronics or programming. Familiarity with Linux, Python, and Arduino concepts is beneficial for optimal use.

4. Operating Instructions

The Arduino UNO Q offers a flexible environment for various projects:

- **Programming:** Utilize the Arduino App Lab or Arduino IDE for writing and uploading sketches. The board supports Python scripting on its Linux Debian OS.
- **AI Applications:** Leverage the Qualcomm Dragonwing MPU for AI-powered vision, voice, and machine learning tasks. Explore lightweight AI and TinyML applications.
- **IoT and Robotics:** Connect sensors, motors, and other peripherals using the UNO form factor shields and Qwiic connector to build interactive IoT devices and robotic systems.

- **Network Services:** Run basic network services like SSH for remote access and development.

Refer to the official Arduino documentation atarduino.cc/uno-q for detailed programming guides, examples, and community resources.

Your browser does not support the video tag.

Video 1: An overview of the Arduino UNO Q, demonstrating its unboxing and highlighting key features such as the Qualcomm Dragonwing MPU, STM32U585 Microcontroller, and the 8x13 LED matrix. This video provides a visual introduction to the board's capabilities and components.

5. Maintenance

To ensure the longevity and optimal performance of your Arduino UNO Q board, observe the following maintenance guidelines:

- **Handling:** Always handle the board by its edges to avoid touching components, which can cause damage from static electricity or oils from your skin.
- **Cleaning:** Keep the board clean and free from dust and debris. Use a soft, dry brush or compressed air for cleaning. Avoid using liquids or abrasive materials.
- **Storage:** Store the board in an anti-static bag when not in use, especially for extended periods, to protect it from static discharge and environmental factors.
- **Power Supply:** Always use a stable and appropriate power supply. As noted, a powered USB hub is recommended to prevent power-related issues.

6. Troubleshooting

If you encounter issues with your Arduino UNO Q, consider the following troubleshooting steps:

- **Board Not Powering On / Dead on Arrival (DOA):**
  - Ensure the USB-C cable is fully inserted and functional. Try a different cable and USB port.
  - Use a powered USB hub. The UNO Q can draw significant current (up to 2.5 A peak), which standard PC USB ports may not consistently provide, leading to connection issues or failure to power on.
  - If the board remains unresponsive after trying multiple power sources and cables, it may be defective. Contact Arduino support for assistance.
- **Firmware Update Issues:**
  - Verify that the Arduino CLI software is correctly installed and updated.
  - Follow the firmware flashing instructions precisely. Incorrect steps can lead to issues.
- **Arduino App Lab Problems:**
  - Ensure the App Lab is updated to the latest version. Updates can take time.
  - Check your network connection if using network-based development.
- **Debian OS Update Issues:**
  - If automatic Debian updates fail, try updating manually via the command line using `sudo apt update && sudo apt upgrade`.
- **Connection Instability with PC:**

- As mentioned, high current draw can cause intermittent connection issues. Use a high-quality, powered USB-C hub or an external power supply if available.

7. Specifications

Feature	Detail
Model Number	ABX00162
Product Dimensions	1.18 x 0.87 x 0.2 inches
Item Weight	1.06 ounces
Brand	Arduino
Manufacturer	Arduino S.r.l.
MPU	Qualcomm Dragonwing QRB2210 (Quad-core Arm Cortex-A53 @ 2.0 GHz CPU, Adreno GPU, AI acceleration)
MCU	STM32U585
RAM Memory Technology	2 GB LPDDR4
Memory Storage Capacity	16 GB eMMC
CPU Socket	BGA 437
Operating System	Linux Debian
Wireless Connectivity	Wi-Fi 5 (2.4/5 GHz), Bluetooth 5.1
Connectors	USB-C, Qwiic connector
Compatible Devices	Arduino Shields, Qwiic Sensors, USB-C Peripherals

8. Warranty and Support

For warranty information, technical support, and additional resources, please refer to the official Arduino website. The Arduino community also provides extensive forums and tutorials that can assist with development and troubleshooting.

Official Support Page: arduino.cc/uno-q

Please retain your proof of purchase for any warranty claims.