

## Azurewave AW-AH397

# Azurewave AW-AH397 Dual Band WiFi+BT USB/SDIO SiP Module User Manual

Model: AW-AH397

## 1. INTRODUCTION

This manual provides essential information for the proper installation, operation, and maintenance of the Azurewave AW-AH397 Dual Band WiFi+BT USB/SDIO SiP Module. Please read this manual thoroughly before using the device to ensure optimal performance and safety.

The AW-AH397 is a System-in-Package (SiP) module designed for wireless communication, integrating Dual Band WiFi and Bluetooth 4.0+HS (LE) capabilities. It utilizes the Marvell 8797 chipset and supports 2T x 2R MIMO for enhanced WiFi performance.

## 2. PRODUCT FEATURES

The AW-AH397 module offers a range of features designed for embedded wireless applications:

- **Compact Size:** Small footprint of 15.1mm(L) x 10.2mm(W) x 1.2 mm(H) for space-constrained designs.
- **Multiple Interfaces:** Supports SDIO3.0, G-SPI, and USB interfaces for WLAN, and high-speed UART, PCM/Inter-IC Sound (I2S), SDIO3.0, and USB for Bluetooth.
- **Bluetooth 4.0+HS (LE):** Compliant with Bluetooth 2.1 + Enhanced Data Rate (EDR) for broad compatibility.
- **Audio Codec Interface:** Provides support for audio codec integration.
- **Cellular Phone Co-existence:** Designed to operate effectively alongside cellular phone modules.
- **Power Saving Modes:** Multiple modes for reduced power consumption.
- **Advanced Security:** Supports IEEE 802.11i for robust wireless security.
- **Quality of Service (QoS):** Ensures reliable performance for multimedia applications.
- **Linux Driver Support:** Drip-in WLAN Linux drivers are Android ready and validated on Android-based systems, supporting Linux kernel versions up to 2.6.32.
- **BlueZ Bluetooth Stack:** Supports BlueZ v4.47 Bluetooth profiles stack used in Android Éclair.
- **Simultaneous AP-STA:** Capability for concurrent Access Point and Station modes.
- **Lead-free:** Environmentally compliant design.

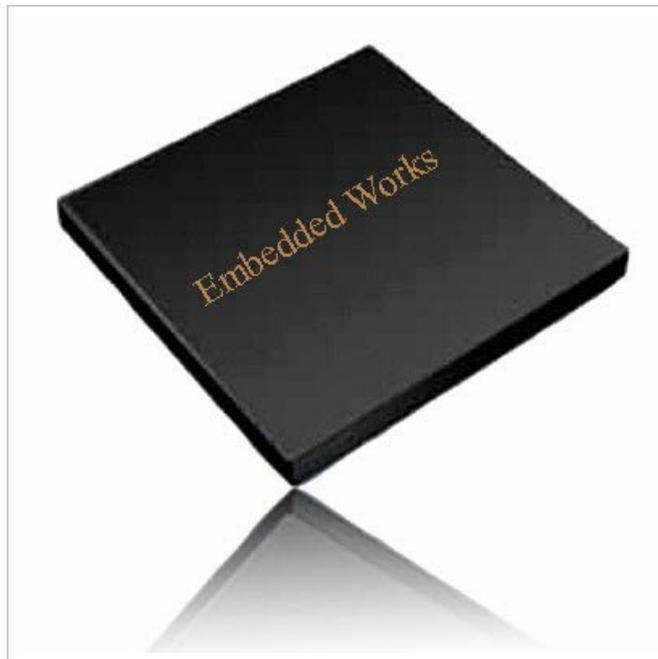


Figure 1: Azurewave AW-AH397 Dual Band WiFi+BT USB/SDIO SiP Module. This image shows the compact form factor of the module, highlighting its small size and integrated components.

### 3. SETUP AND INTEGRATION

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The AW-AH397 is a SiP module intended for integration into host devices. Proper integration requires knowledge of embedded system design and wireless communication protocols.

#### 3.1. Hardware Integration

1. **Power Supply:** Ensure the host system provides a stable power supply within the module's specified voltage range. Refer to the module's datasheet for exact power requirements.
2. **Interface Connections:** Connect the module to the host processor via the appropriate interface (SDIO, USB, G-SPI, UART, I2S) as per your design. Ensure all data and control lines are correctly routed and terminated.
3. **Antenna Design:** Integrate suitable antennas for both WiFi and Bluetooth. Antenna placement and matching are critical for optimal wireless performance. Consult the module's design guide for antenna recommendations.
4. **Thermal Management:** While the module is low power, consider thermal dissipation in compact enclosures to maintain operating temperature within specifications.

#### 3.2. Software Integration

1. **Driver Installation:** Install the appropriate Linux drivers for WLAN and Bluetooth on the host operating system. The module supports drop-in WLAN Linux drivers that are Android ready.
2. **Kernel Compatibility:** Ensure the host Linux kernel version is compatible (up to 2.6.32 for WLAN drivers).
3. **Bluetooth Stack:** For Bluetooth functionality, integrate the BlueZ v4.47 Bluetooth profiles stack or a compatible alternative.
4. **Configuration:** Configure network settings (SSID, password, security protocols) for WiFi and pairing settings for Bluetooth as required by your application.

### 4. OPERATING INSTRUCTIONS

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Once integrated and drivers are installed, the AW-AH397 module operates under the control of the host system's operating system and applications.

## 4.1. WiFi Operation

- **Connecting to a Network:** Use the host system's network manager or command-line tools to scan for available WiFi networks, select the desired SSID, and enter the password.
- **AP Mode:** If configured for Access Point (AP) mode, the module will broadcast its own SSID, allowing other devices to connect to it.
- **Simultaneous AP-STA:** The module supports operating as both an Access Point and a Station concurrently, enabling flexible network configurations.

## 4.2. Bluetooth Operation

- **Pairing Devices:** Enable Bluetooth on the host system. Scan for discoverable Bluetooth devices, select the device to pair with, and follow the on-screen prompts for pairing (e.g., entering a PIN).
- **Connecting to Devices:** After successful pairing, connect to the desired Bluetooth device (e.g., headphones, keyboard, smartphone) to establish a communication link.
- **Bluetooth Low Energy (LE):** The module supports Bluetooth LE for low-power applications, allowing connection to compatible LE devices.

## 5. MAINTENANCE

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The AW-AH397 module is a sealed component and does not require user-level maintenance. Maintenance primarily involves ensuring the host system's environment is suitable for the module's operation.

- **Software Updates:** Regularly update the host system's operating system and drivers to ensure optimal performance, security, and compatibility with the module.
- **Environmental Conditions:** Ensure the module operates within its specified temperature and humidity ranges. Avoid exposure to excessive dust, moisture, or extreme temperatures.
- **Physical Inspection:** Periodically inspect the host device for any signs of physical damage or loose connections that might affect the module's operation.

## 6. TROUBLESHOOTING

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If you encounter issues with the AW-AH397 module, consider the following troubleshooting steps:

- **Module Not Detected:**
  - Verify that the module is correctly integrated into the host system and all connections (SDIO, USB, etc.) are secure.
  - Check the host system's power supply to ensure it meets the module's requirements.
  - Confirm that the necessary drivers are installed and loaded correctly on the host operating system.
- **WiFi Connection Issues:**
  - Ensure the WiFi network SSID and password are correct.
  - Check the signal strength. Move closer to the access point if the signal is weak.
  - Verify that the WiFi drivers are up to date.
  - Restart the host system and the WiFi access point.
- **Bluetooth Pairing/Connection Issues:**
  - Ensure Bluetooth is enabled on both the host system and the target device.
  - Make sure both devices are in pairing mode and within range.

- Remove previous pairings and attempt to pair again.
- Verify that the Bluetooth stack (e.g., BlueZ) and drivers are correctly installed and running.

- **Poor Performance (WiFi/Bluetooth):**

- Check for sources of interference (e.g., other wireless devices, microwaves, large metal objects).
- Ensure proper antenna placement and orientation.
- Update drivers and firmware if available.
- Verify that the host system's resources (CPU, memory) are not overutilized.

If issues persist, consult the technical documentation provided by Azurewave or contact their support for further assistance.

## 7. SPECIFICATIONS

Key technical specifications for the Azurewave AW-AH397 module:

Feature	Description
<b>Model Number</b>	AW-AH397
<b>Chipset</b>	Marvell 8797
<b>Wireless LAN Standard</b>	IEEE 802.11a/b/g/n (Dual Band)
<b>Bluetooth Standard</b>	Bluetooth 4.0 + High Speed (HS) / Low Energy (LE), compatible with Bluetooth 2.1 + EDR
<b>MIMO Configuration</b>	2T x 2R
<b>WLAN Interfaces</b>	SDIO3.0, G-SPI, USB
<b>Bluetooth Interfaces</b>	High speed UART, PCM/I2S, SDIO3.0, USB
<b>Dimensions (L x W x H)</b>	15.1mm x 10.2mm x 1.2mm
<b>Operating System Support</b>	Linux (kernel up to 2.6.32), Android (BlueZ v4.47)
<b>Security</b>	IEEE 802.11i
<b>UPC</b>	795945999587

## 8. WARRANTY AND SUPPORT

Information regarding warranty coverage for the AW-AH397 module is typically provided by the vendor or the manufacturer, Azurewave, at the point of purchase or within the product packaging. As an embedded component, the warranty may be subject to the terms of the end product into which it is integrated.

For technical support, documentation, or inquiries regarding the AW-AH397 module, please refer to the official Azurewave website or contact their authorized distributors. Support resources may include datasheets, application notes, and driver downloads.

*Note: The AW-AH397 is nearing End-Of-Life (EOL). Please check with Azurewave or your supplier for current availability and recommended alternatives.*

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This manual is for informational purposes only. Specifications are subject to change without notice.