

AIW FAQ

Porting AIW-173 Bluetooth driver for RK3588 Debian Linux OS			
Category	AIW	Date	2025/12/17
Keyword	AIW-173HQ-GI1, Bluetooth, Debian, Rockchip RK3588, ASR-A501		
HW model	ASR-A501 (Rockchip RK3588)		
OS version	Debian 12 (Linux kernel version: 6.1.75-rt16) (Image version: DIV110057) BSP version: RK3588_RISC_DIV110057		

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This document guides the porting of the AIW-173HQ-GI1 Bluetooth inbox driver to the Advantech ASR-A501 (RK3588/Debian 12). It covers the complete workflow: setting up the build environment, patching and rebuilding the kernel, and Debian Bluetooth GUI usage.

1. Build Environment on Host

You can have more detail about the compiling environment setup from the [MEMO RK3588 Debian Build Process manual](#). Before proceed the following steps, please make sure you start and enter to the docker environment

2. Configure the Bluetooth inbox driver in the kernel

By default, the inbox driver of RK3588 doesn't support the AIW-173 Bluetooth. It needs to configure the Bluetooth related drivers in the kernel config.

Command and Response	Description
\$ cd ~/BSP/ASRA501A2EG90AIM38DBV110057_2025-04-08 \$ vi kernel/arch/arm64/configs/rk3588_adv_defconfig	Go to the BSP and edit the kernel config file
CONFIG_BT=y CONFIG_BT_BREDR=y CONFIG_BT_RFCOMM=y CONFIG_BT_RFCOMM_TTY=y CONFIG_BT_BNEP=m CONFIG_BT_BNEP_MC_FILTER=y CONFIG_BT_BNEP_PROTO_FILTER=y CONFIG_BT_HIDP=y # CONFIG_BT_HS is not set CONFIG_BT_LE=y CONFIG_BT_RTKBTUSB=m CONFIG_BT_HCIBTUSB=y # CONFIG_BT_HCIBTSDIO is not set # CONFIG_BT_HCIUART is not set # CONFIG_BT_HCIUART_H4 is not set # CONFIG_BT_HCIUART_BCSP is not set CONFIG_BT_HCIUART_ATH3K=y # CONFIG_BT_HCIUART_INTEL is not set # CONFIG_BT_HCIUART_AG6XX is not set # CONFIG_BT_HCIBCM203X is not set # CONFIG_BT_HCIBPA10X is not set CONFIG_BT_HCIBFUSB=y CONFIG_BT_HCIVHCI=y	Revise the kernel config to match the one on the left.

3. Build Kernel Image

After revising the kernel config, it needs to compile the kernel again to generate the inbox drivers.

Command and Response	Description
\$ cd ~/BSP/ASRA501A2EG90AIM38DBV110057_2025-04-08 \$./build.sh clean:kernel \$./build.sh kernel	Clean the kernel and rebuild it again.

4. Flash Image

For image building and flashing , you can refer “4.2 Image building” and “5.3 Flash image” in the [MEMO_RK3588 Debian Build Process manual](#).

5. Firmware downloading and set up [On target device]

It needs to download the AIW-173 driver to copy the Bluetooth FW files to the target device. In order to make sure the Bluetooth FW file can be loaded during bootup, the driver and service re-initial steps need to be integrated.

Command and Response	Description
<pre>\$ sudo git clone ssh://adv_ae@172.22.24.155:/volume1/git-server/AIW_173_driver/etc \$ sudo mkdir -p /lib/firmware/qca \$ cp /etc/AIW_173_driver/AIO/drivers/firmware/BT-firmware/usb/* /lib/firmware/qca/ \$ sudo vi /etc/rc.local</pre>	Download the AIW-173 driver source code. Copy the Bluetooth FW to /lib/firmware/qca
<pre>hciconfig hci0 down sleep 1 hciconfig hci0 up sleep 3 rfkill block bluetooth sleep 1 rfkill unblock bluetooth</pre>	Implement the mechanism on the left into the “rc.local” file to make sure the Bluetooth driver can load the correspond FW file during bootup. Then, reboot the device.
<pre>\$ reboot</pre>	

6. Bluetooth GUI on Debian [On target device]

- Go to “Application” -> “Settings” -> “Bluetooth Adapters”.
- Enable “Always visible” to make the device’s Bluetooth scannable.
- Go to “Application” -> “Settings” -> “Bluetooth Manager” and click “Search” to scan surrounding Bluetooth devices.

