

1. Ai-Thinker PB-04-Kit Flashing Guide

Applicable Model: PB-04

Version: V1.0

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1.2. Overview

This document provides instructions for flashing firmware to the Ai-Thinker **[PB-04-Kit]**.

Development Board Overview:

- **Main Control Chip:** PHY6222
- **Core Architecture:** ARM Cortex-M
- **Flash Size:** 512KB by default, up to 8MB supported
- **Communication Interface:** USB-TTL

Flashing Method:

Method	Interface	Applicable Scenario
Method 1	Type-C	Single-cable flashing, no jumper wires required

1.3. Preparation

1.3.1. Hardware Preparation

No.	Item	Quantity	Remarks
1	PB-04-Kit development board	1 piece	—
2	Type-C data cable	1 cable	Must support data transmission, not charge-only
3	USB-TTL converter	1 piece	Not required if the board has onboard USB-TTL

1.3.2. Software Preparation

No.	Software/File	Description	Download Link
1	Firmware file (.hexf)	Target firmware to be flashed	Compiled and flashed by the user
2	Flashing tool	Sockit.exe	Click to download
3	Serial port driver	CH340	Click to download
4	Factory AT firmware (optional)	Used to restore the factory state	Click to download

1.3.3. Driver Installation

1.3.3.1. CH340/CH341 Driver

1. Download the CH340 driver: [Click to download](#)
2. Extract the package and double-click `CH341SER.EXE` to install it.
3. After installation, connect the development board to the computer.
4. Open **Device Manager** → **Ports (COM & LPT)**, and confirm that a serial port number is detected (e.g., `COM3`).

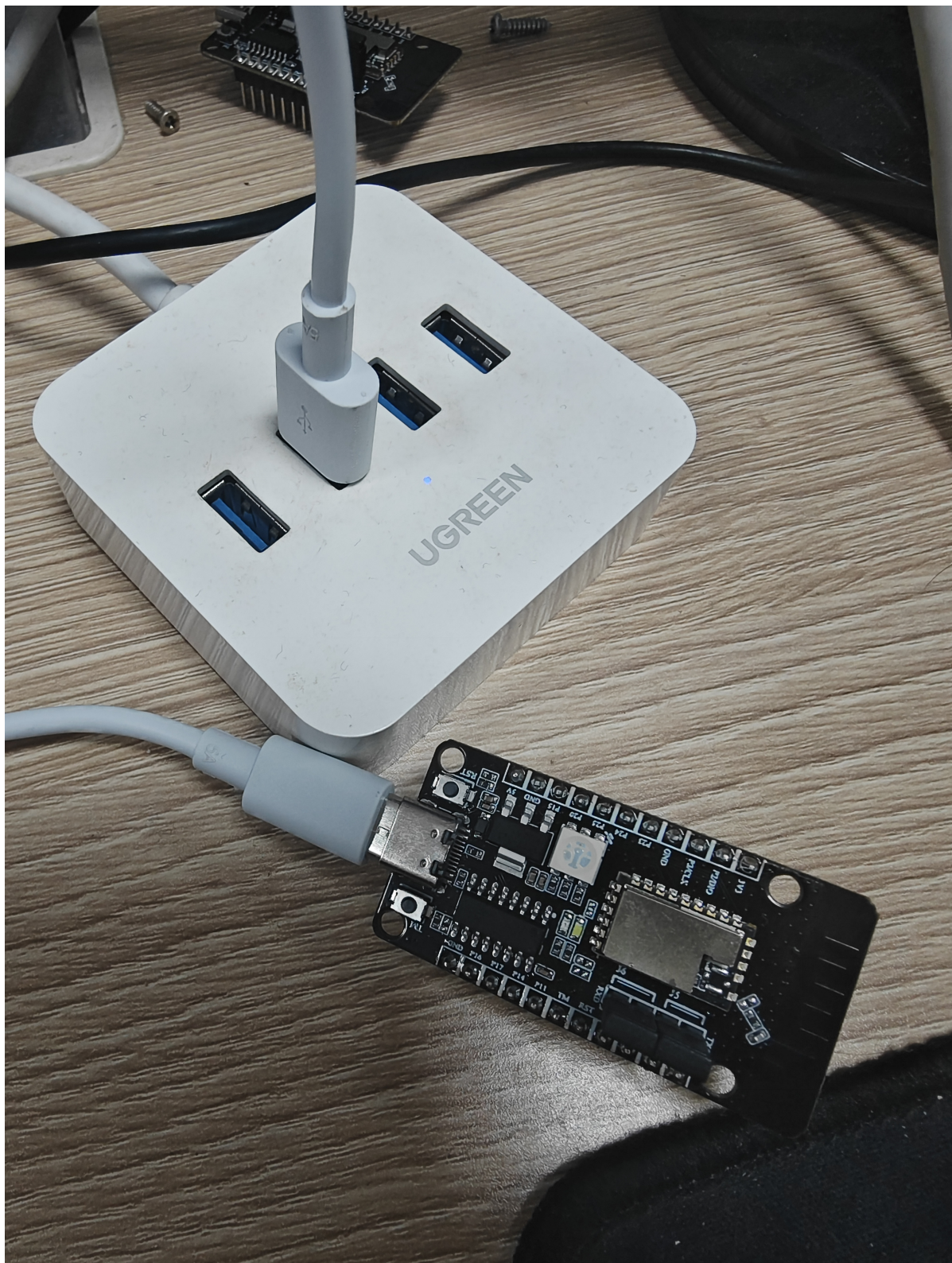
Notes:

- If Device Manager shows a yellow exclamation mark, please reinstall the driver.
- Some systems may require driver signature enforcement to be disabled.

1.4. Hardware Connection

1.4.1. Wiring Diagram

No external USB-TTL converter is required for the development board, as it already has onboard USB-TTL, as shown below.

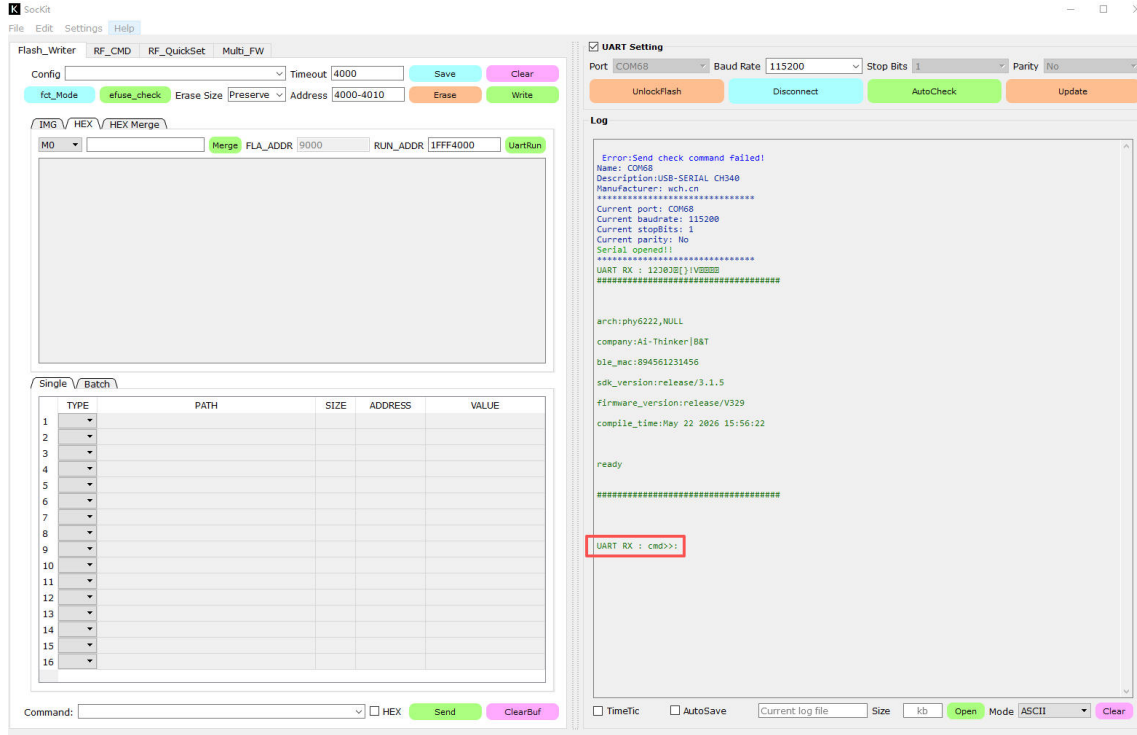


⚠ Important Notes:

1. Make sure to use a **Type-C data cable**. The USB power supply voltage should be **5V**. A voltage higher than 5V may damage the module.
2. Before flashing, **press and hold the TM button**, then **press RST** to make the chip enter download mode.

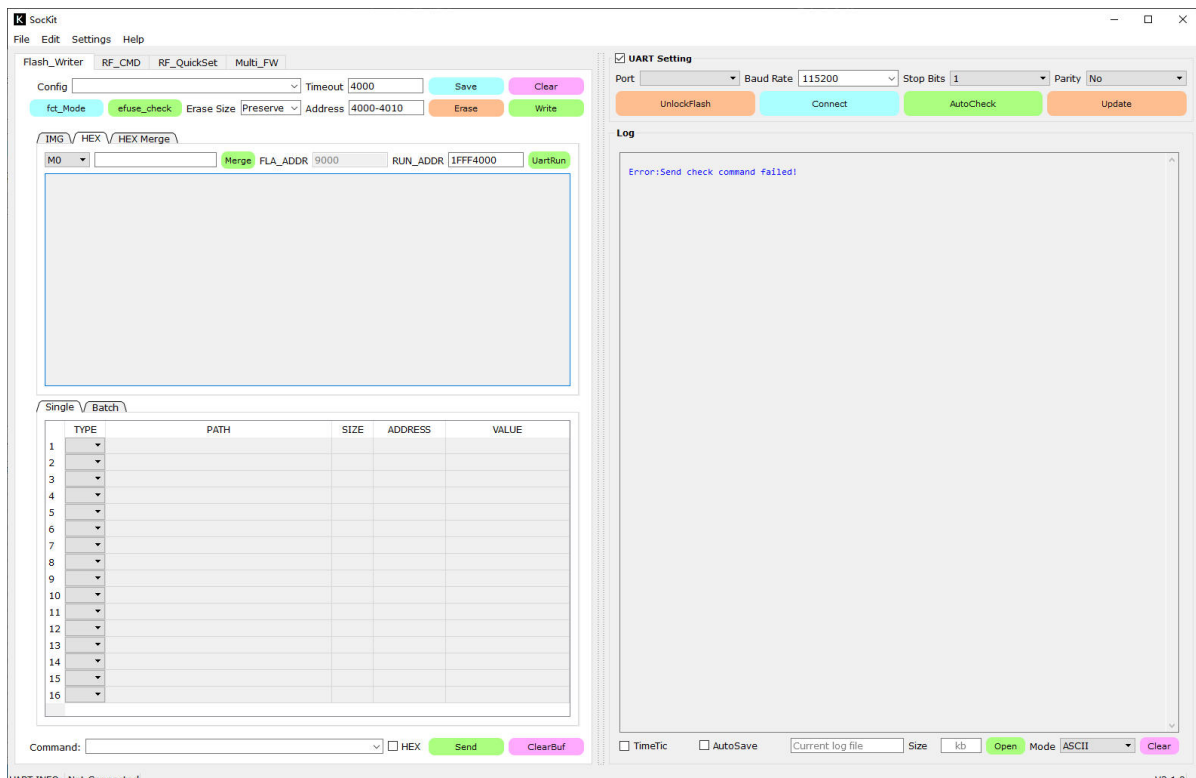
1.4.2. Enter Download Mode (Manual Method)

1. Press and hold the **TM** button on the development board.
2. Press the **RST** button once, then release it.
3. Release the **TM** button.
4. The module will print the following information, as shown in the image below. If this information is printed, it indicates that the module is in flashing mode:



1.5. Flashing Tool Configuration

1.5.1. SockKit Interface Description



Configuration Item	Recommended Value	Description
UART Setting	Enable	Check this option to enable the PC serial debugging assistant
Port	Select the corresponding port according to the connected module	Select the serial port number corresponding to the development board
UnlockFlash	Click to unlock	Unlock the Flash so that firmware can be flashed normally. (must be performed in flashing mode)
Connect	Click to connect	Click to open the serial port
Baud Rate	115200	Only 115200 is supported
Erase Size	Preserve	Select the address range to erase; it is recommended to preserve certain address contents
Address	4000-4010	Enter the Flash address range needs to be preserved
HEX	Click	Check HEX mode to flash the merged firmware
Blank field under HEX	Double-click	Double-click to select the hexf firmware file

1.6. Flashing Procedure

1.6.1. Method 1: Flashing with Sockit

Applicable System: Windows

1. Open the flashing tool

- Double-click `sockit.exe` to run it (Windows)

2. Configure parameters

- Refer to [Flashing Tool Configuration](#)

3. Enter download mode

- Refer to [Enter Download Mode \(Manual Method\)](#)

4. Start flashing

- Click the **Erase** button and wait for the erase process to complete.
- Click the **Write** button and wait for firmware flashing to complete.

5. Flashing complete

- When the log displays "Write images successfully!", firmware flashing is complete.
- Press the RST button to reset, or power cycle the device.

1.7. Flashing Verification

After flashing is complete, verify whether the firmware runs properly by following the steps below:

1.7.1. Serial Port Verification

1. Open the serial debugging assistant. (recommended tools include: [SSCOM, PuTTY, MobaXterm])
2. Configure the serial port parameters:

Parameter	Value
Baud Rate	115200
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None

3. Press the RST button to reset the development board.
4. Observe the serial output. The startup log similar to the following should be viewed:

```
#####  
  
arch:phy6222,NULL  
company: Ai-Thinker|B&T  
ble_mac:894561231456  
sdk_version:release/3.1.5  
firmware_version:release/V329  
compile_time:May 22 2026 15:56:22  
  
ready  
  
#####
```

1.7.2. Function Verification

- Check whether the serial port outputs normal startup logs
- Check whether the BLE function works properly (if applicable).
- Check whether AT commands respond properly (if AT firmware is flashed).
- Check whether the onboard LED status is normal. (if AT firmware is flashed, send AT+LEDTEST=1)

1.8. FAQ

1.8.1. Q1: The serial port cannot be recognized in Device Manager?

A:

1. Confirm the USB data cable supports data transmission.
2. Try another USB port.
3. Reinstall the corresponding serial port driver.
4. Check whether there is an unknown device in Device Manager, and manually update the driver if necessary.

1.8.2. Q2: The message “Waiting for power-on synchronization” appears during flashing?

A:

1. Confirm the module has correctly entered flashing mode (press and hold TM → press RST once → release TM).
2. Confirm the serial port has printed the flashing mode prompt. If not, repeat the operation to enter flashing mode.
3. Check whether the correct serial port number is selected (open Device Manager to confirm the COM port).
4. Unplug and reconnect the Type-C data cable, then try again.

1.8.3. Q3: Flashing fails or is interrupted halfway?

A:

1. Ensure the power supply is stable. It is recommended to use a USB port with independent power supply.
2. Avoid using an excessively long USB cable.
3. Close other software that may be occupying the serial port.

1.8.4. Q4: The device does not respond after flashing succeeds?

A:

1. Confirm flashing has completed and the device has been reset.
2. Check whether the firmware file matches the chip model.
3. Confirm the Flash mode and size are configured correctly.
4. Try flashing the factory default firmware to test whether the hardware is functioning properly.

1.8.5. Q5: How to restore the factory firmware?

A:

1. Download the factory AT firmware for the corresponding model from the Ai-Thinker official website: [Click to download](#)
2. Follow the normal flashing procedure and select the factory firmware for flashing.
3. After flashing is complete, reset the device to restore it to the factory state.

1.9. Appendix

1.9.1. Reference Resources

Resource	Link
Ai-Thinker Official Website	Click to view
Development Resources Download	Click to view
Ai-Thinker Community (Technical Support)	Click to view
PHY62XX SDK	Click to download

1.9.2. Version History

Version	Date	Changes	Author
V1.0	2026-06-08	Initial release	Engineer Wu

1.9.3. Related Documents

- [PB-04 Hardware Design Guide](#)
- [Combo Module General AT Command Set](#)
- [PHY62XX SDK Development Guide](#)

Disclaimer: This document is for reference only. Ai-Thinker reserves the right to modify the product and documentation without prior notice. Please read this document and the related product manuals carefully before performing flashing operations. Any hardware damage caused by improper operation shall be borne by the user.

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