User Guide

GEEHY-LINK

Version：V1.3

1 Introduction

This document provides a brief description of the basic parameters, functions, and usage methods of GEEHY-LINK.

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2 Product Overview

GEEHY-LINK (as shown in Figure 1) is an integrated development tool for debuggers and programmers, which can be used for online debugging and simulation of the entire series of APM32 MCU products in integrated development environments such as Keil. Support various debugging methods such as full speed operation, single step debugging, and breakpoint setting.

Figure 1

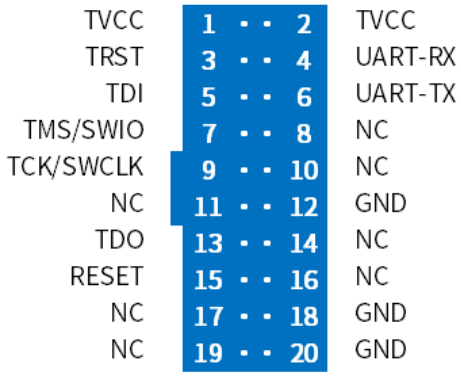
Due to the existence of HID device version and WinUSB device version in GEEHY-LINK, their firmware is based on CMSIS-DAP V1/2 respectively, with some slight differences in application.

Note: The HID device/WinUSB device here is only used to express GEEHY-LINK under different firmware. The outer packaging is the same. The GEEHY-LINK (WinUSB) in the following text refers to GEEHY-LINK that runs the WinUSB firmware based on CMSIS-DAP V2; GEEHY-LINK (HID) refers to GEEHY-LINK that runs the HID firmware based on CMSIS-DAP V1.

3 Port Description

GEEHY-LINK provides a 20PIN port for customers to use. Customers can connect to the target board through a port to complete the corresponding operation. The number and definition of the 20PIN port are shown in Figure 2.

Figure 2



Note: NC indicates that the pin is undefined and does not mean that the pin is short circuited to GND.

4 Performance Characteristics

- Supports Windows 7/8/10, plug-and-play [1]
- Supports code programming for APM32 MCU series
- Supports programming through SWD and JTAG methods
- Supports UART data transmission and reception [2], with a maximum baud rate of 115200
- The operation buttons can provide power to the target board
- USB high-speed communication interface, providing power supply

Note:

(1) Plug-and-play is only supported for GEEHY-LINK (HID) devices. GEEHY-LINK (WinUSB) devices do not support plug-and-play on Windows 7. Please refer to the subsequent content for specific driver installation steps.

(2) UART data transmission and reception are only used by GEEHY-LINK (WinUSB) devices and not supported by GEEHY-LINK (HID) devices.

5 Electrical Parameters

When the input voltage is 5V, the input current ≥ 500mA.

When the output voltage is 3.3V, the output current ≤ 350mA.

6 Operation Steps

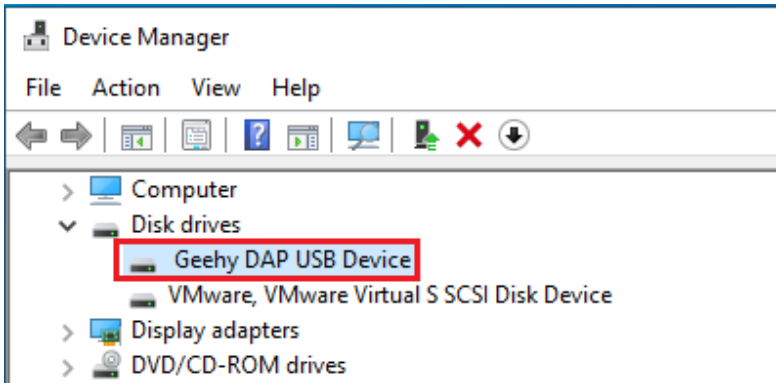
The following describes the GEEHY-LINK (HID) version and GEEHY-LINK (WinUSB) version respectively.

6.1 GEEHY-LINK(HID)

This firmware is based on CMSIS-DAP V1 and will be enumerated using USB as a HID and MSC device.

After successfully connecting to the computer using a USB cable, the device manager will display Geehy DAP USB Device, as shown in Figure 3.

Figure 3

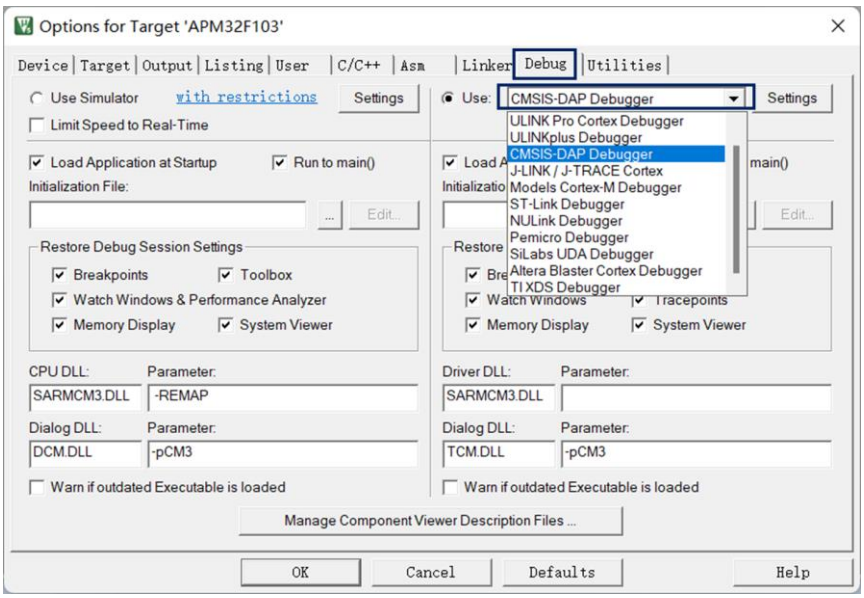


The power supply of the target board can be controlled through the buttons on the tool, and it is not powered by default; Long-press the button for 3 seconds to turn on the red light and supply power to the target board; Long-press the button for another 3 seconds to turn off the red light and stop the power supply.

Configure the Keil software to use either SW mode or JTAG mode.

Click "Options for Target"  , select "Debug" in the open interface, and then select "CMSIS-DAP Debugger", as shown in Figure 4:

Figure 4



Click the "Settings" button to enter the settings interface, select SWD or JTAG mode and frequency, as shown in Figures 5 and 6:

A: Debugger Name

B: Debugger serial number

C: Debugger firmware version

D: SWD and JTAG mode selection (JTAG is only supported in Keil versions V5.22 and above)

E: Maximum frequency: 10M

F: IDCODE displayed after successfully connecting to the target board

Figure 5

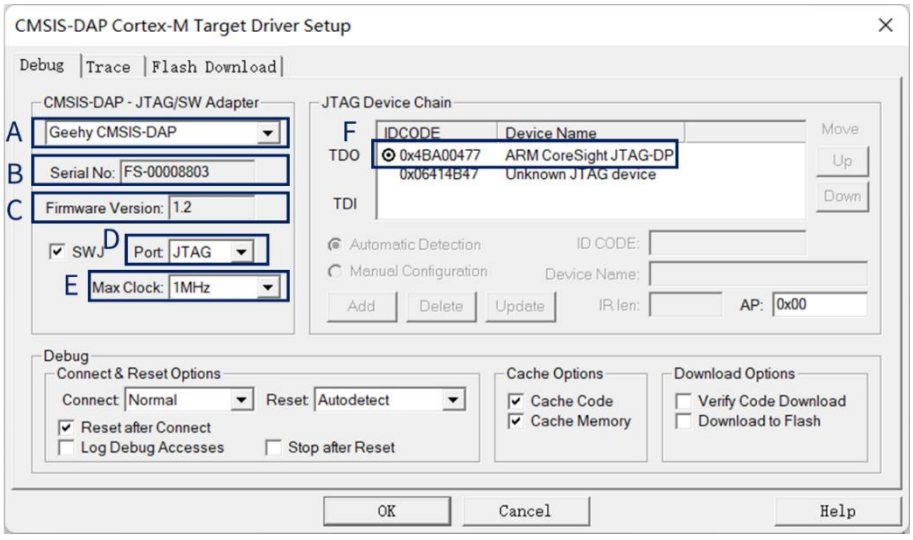
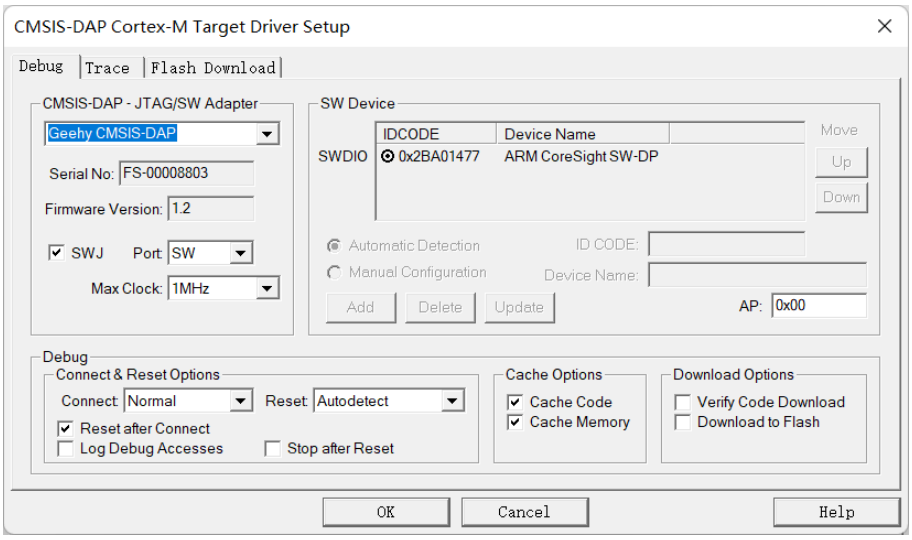
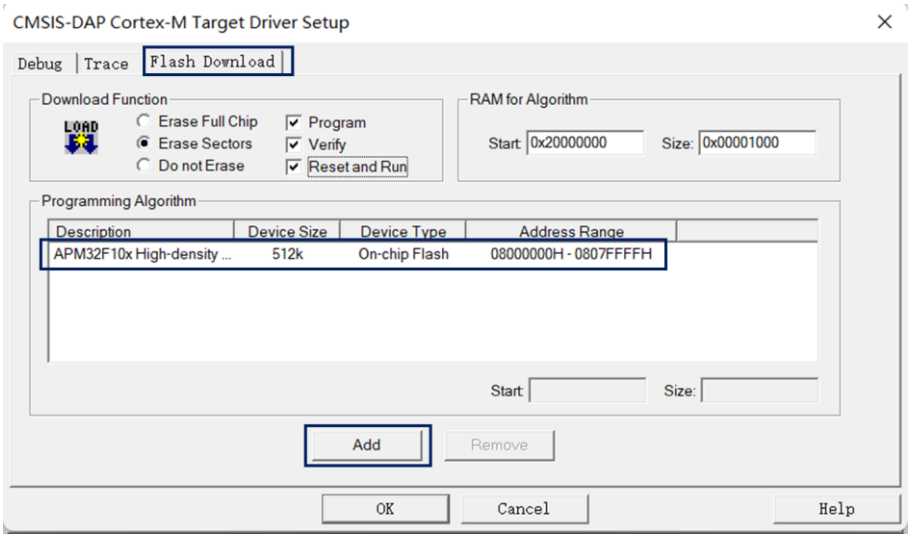


Figure 6



Enter the "Flash Download" interface, select "Programming Algorithm", click the "Add" button, and add the corresponding Flash, as shown in Figure 7:

Figure 7



6.2 GEEHY-LINK (WinUSB)

This firmware is based on CMSIS-DAP V2 and will use USB enumeration to form a WinUSB and CDC device. WinUSB is used for data flow interaction in CMSIS-DAP, and CDC is used for UART data transmission and reception interaction on GEEHY-LINK.

6.2.1 Used on Windows 7 System

Due to the lack of a WinUSB device driver in the Windows 7 system, the Zadig tool needs to be used for installation, along with the installation of the CMSIS-DAP driver.

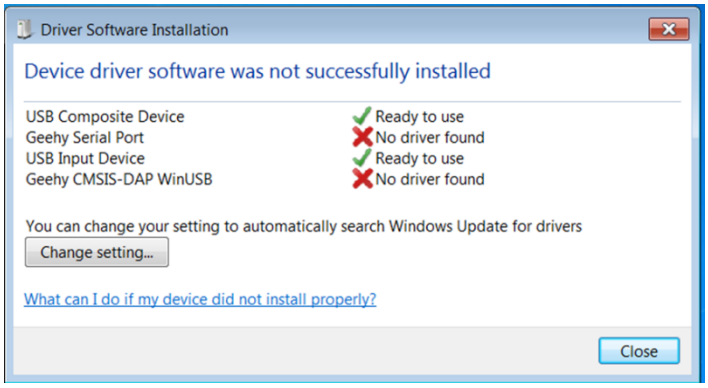
Official download address for Zadig: https://zadig.akeo.ie/#

CMSIS-DAP (WinUSB) driver: GEEHY-LINK(WinUSB)_Windows7.inf (This driver is not digitally signed and requires disabling system digital signature verification).

The installation steps are as follows:

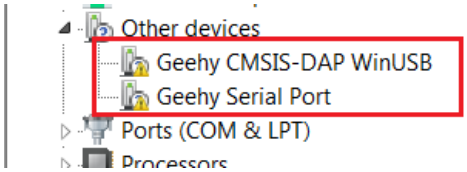
(1) Insert the GEEHY-LINK (WinUSB) into the host, and the Windows 7 system will prompt that the device driver software was not successfully installed.

Figure 8



The device manager will prompt a yellow exclamation mark.

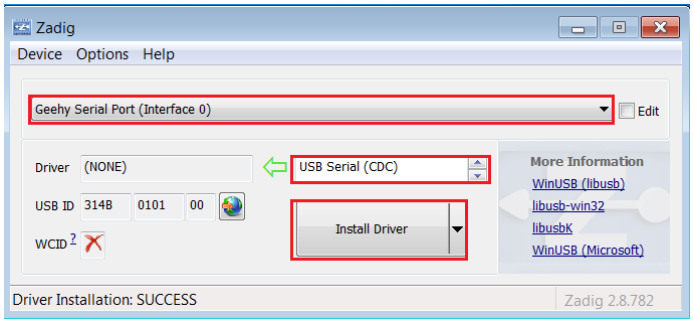
Figure 9



(2) Open the Zadig software and install the relevant drivers.

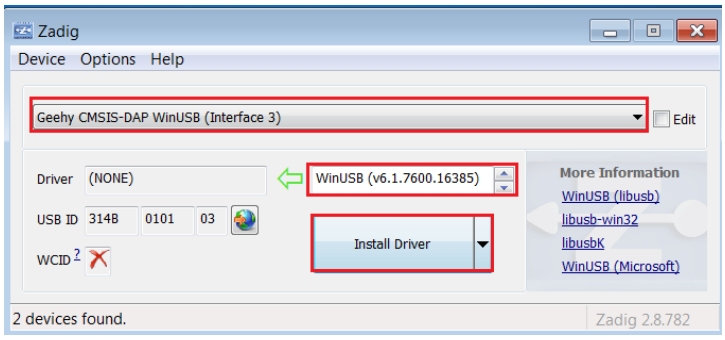
(3) Install the CDC driver. Select the "Geehy Serial Port (Interface 0)" device, then select "USB Serial (CDC)" and click "Install Driver" to install.

Figure 10



(4) Install the WinUSB driver. Select the "Geehy CMSIS-DAP WinUSB (Interface 3)" device, then select "WinUSB (v1.6.7xxx)" and click "Install Driver" to install. Note: (v1.6.7xxx) generally refers to the WinUSB driver version number, which may be different due to different Zadig software versions.

Figure 11

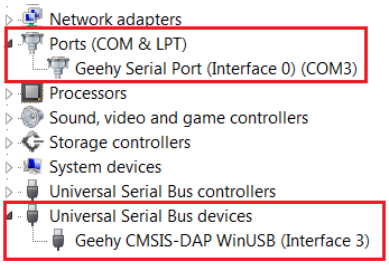


(5) Check the Device Manager. After successful installation, the corresponding devices will be displayed in the Device Manager, such as:

Geehy Serial Port (Interface 0) (COM3)

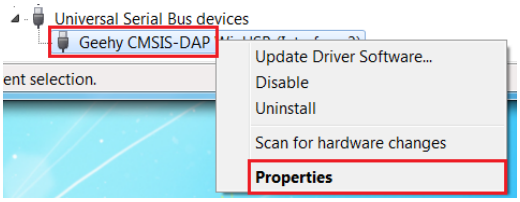
Geehy CMSIS-DAP WinUSB (Interface 3)

Figure 12



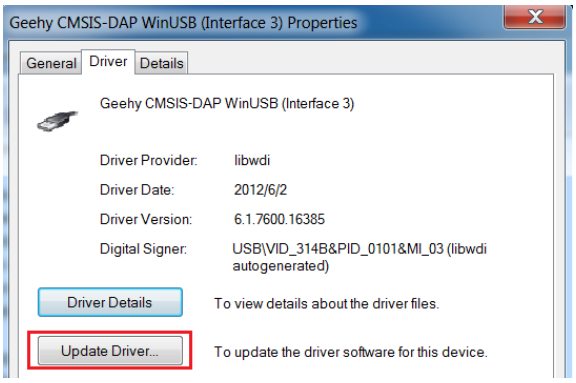
(6) Modify the driver to the CMSIS-DAP driver. Right-click on "Geehy CMISI-DAP WinUSB (interface 3)" and select "Properties".

Figure 13



(7) Select "Update Driver".

Figure 14



(8) Choose to install the driver file from your local machine (my GEEHY-LINK(WinUSB)_Windows7.inf is saved on "C:\Users\Geehy\Desktop", please pay attention to your own file path).

Figure 15

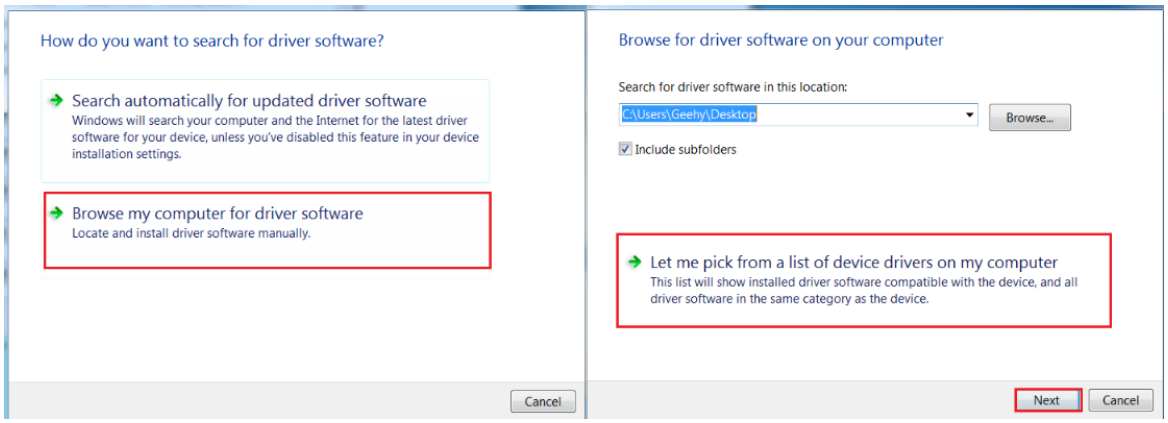
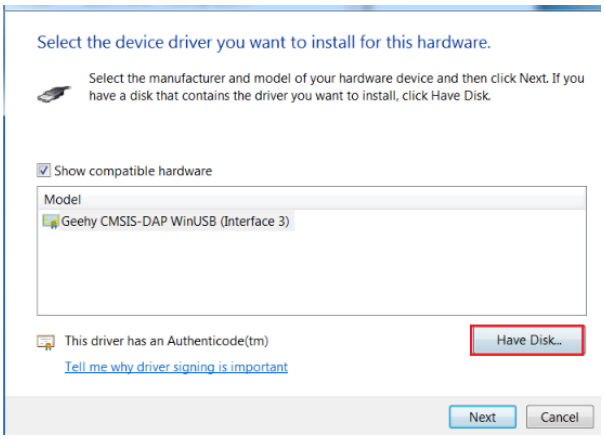
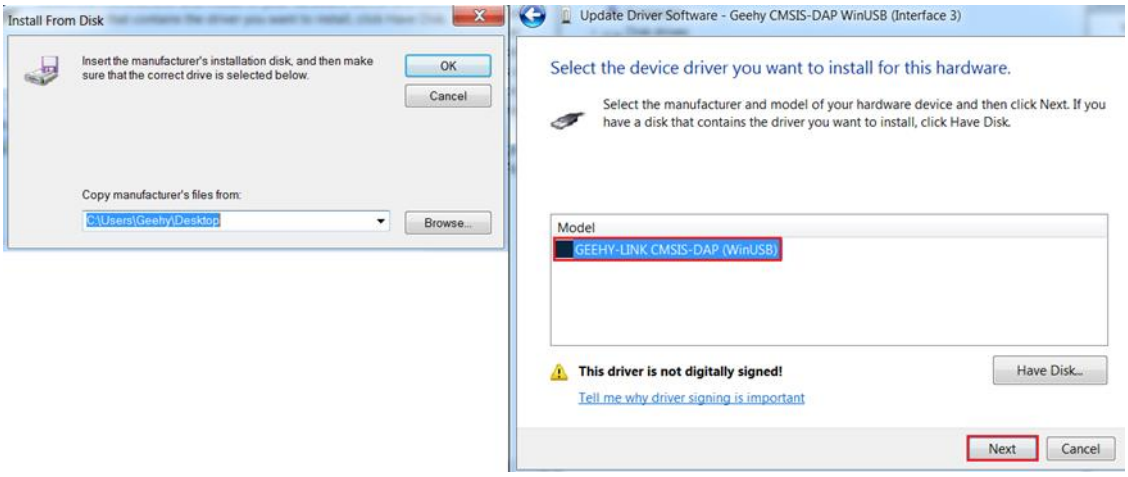


Figure 16



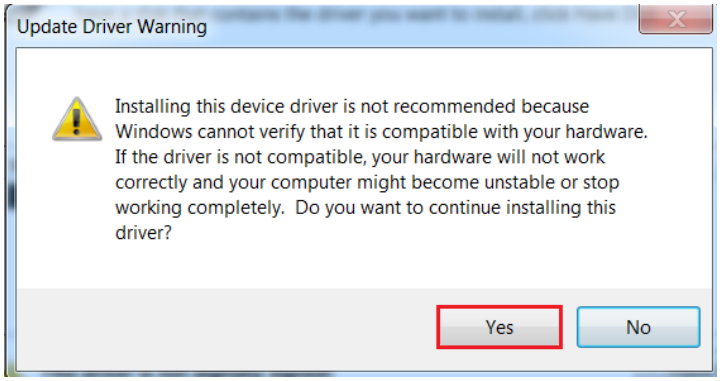
(9) Select the saved driver folder, click on the displayed "GEEHY-LINK CMSIS DAP (WinUSB)", and then click "Next".

Figure 17



(10) Click "Yes" and "Install this driver software any way" in the pop-up prompt window.

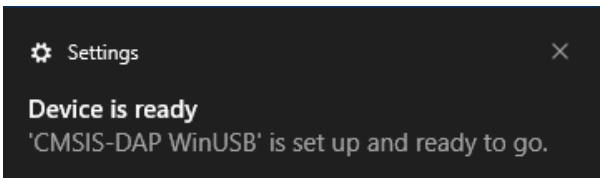
Figure 18



6.2.2 Used on Windows 8 and above systems

Windows 8 and above systems come with WinUSB/CDC device drivers, which are automatically installed when GEEHY-LINK (WinUSB) is inserted into the PC.

Figure 19



After the driver installation is completed, it can be seen in the Device Manager.

Figure 20

6.2.3 Use of Keil MDK

According to the official documentation of Keil MDK, if you are using an older version of Keil MDK (lower than 5.29), you may experience some inconvenience when using GEEHY-LINK WinUSB. The documentation link for reference is:
https://developer.arm.com/documentation/ka003663/latest

Note: The usage of GEEHY-LINK (WinUSB) on Keil MDK is consistent with GEEHY-LINK (HID), please refer to section 6.1 for details.

6.2.4 Use of UART-RX/TX

GEEHY-LINK (WinUSB) supports the use of UART-RX/TX and can be plugged into GEEHY-LINK (WinUSB). Open the serial port assistant and select the corresponding COM port to use, such as COM3.

7 Q&A

Q1: How to distinguish between GEEHY-LINK (HID) and GEEHY-LINK (WinUSB)?

A1: It is different in USB device enumeration, GEEHY-LINK (WinUSB) will be enumerated as a WinUSB, VCP composite device. Customers can distinguish based on this.

Q2: How to upgrade GEEHY-LINK (HID) to GEEHY-LINK (WinUSB)?

A2: The upgrade method is quite complex. If you have any needs, it is recommended to contact our official support FAE@geehy.com. We will provide relevant technical support.

Q3: How does GEEHY-LINK (WinUSB) work on Linux/Mac systems?

A3: GEEHY-LINK WinUSB is a device based on CMSIS-DAP V2. It is recommended that you refer to the instructions for using other devices based on CMSIS-DAP V2.

Q4: Does GEEHY-LINK (HID/WinUSB) support SWO?

A4: Due to hardware design limitations, GEEHY-LINK (HID/WinUSB) does not support SWO.

8 Revision History

Table 1 Document Revision History

Date	Version	Change History
September 25, 2020	1.0	New
October 22, 2021	1.1	Modify description
March 15, 2022	1.2	Modify the debugger name
November 17, 2023	1.3	Modify port definition, and add WinUSB firmware description

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8. Scope of Application

The information in this document replaces the information provided in all previous versions of the document.