

User Guide

GEEHY-LINK

Version: V1.3

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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.





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	
TVCC	1 •• 2	TVCC
TRST	3 • • 4	UART-RX
TDI	5 • • 6	UART-TX
TMS/SWIO	7 • • 8	NC
TCK/SWCLK	9 10	NC
NC	11 • • 12	GND
TDO	13 • • 14	NC
RESET	15 • • 16	NC
NC	17 • • 18	GND
NC	19 • • 20	GND

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 \geq 500mA.

When the output voltage is 3.3V, the output current \leq 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
📇 Device Manager
File Action View Help
(= =) 📰 🖺 🖬 🖳 💺 🗶 🖲
> 💻 Computer
🗸 🚃 Disk drives
🕳 Geehy DAP USB Device
🕳 VMware, VMware Virtual S SCSI Disk Device
> 🏣 Display adapters
> 🚇 DVD/CD-ROM drives

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

evice larget	Output Listing User C/C++ As	M LIIKer De	bug Utilities
○ Use Simulator	with restrictions Settings		S-DAP Debugger Setting:
Limit Speed to	Real-Time		K Pro Cortex Debugger Kplus Debugger
Load Applicat Initialization File:	tion at Startup 🔽 Run to main()	Initializatio Mode	S-DAP Debugger K / J-TRACE Cottex Is Cottex-M Debugger nk Debugger K / Debugger
Breakpoin	Session Settings		os UDA Debugger Blaster Cortex Debugger
	ndows & Performance Analyzer	Watch W	S Debugger Indows I racepoints
Vatch Wir	ndows & Performance Analyzer	Watch W	S Debugger Indows I racepoints
Vatch Wir	ndows & Performance Analyzer isplay Verformance Analyzer	Watch W	S Debugger indows V Tracepoints Display V System Viewer Parameter.
Vatch Wir Memory D CPU DLL: SARMCM3.DLL	ndows & Performance Analyzer Visplay 🔽 System Viewer	Watch W Watch W Memory I Driver DLL:	S Debugger indows V Tracepoints Display V System Viewer Parameter.
Vatch Wir Memory D CPU DLL:	ndows & Performance Analyzer bisplay	WatchW WatchW Memory I Driver DLL: SARMCM3.DLL	S Debugger Indows V Tracepoints Display V System Viewer Parameter.
CPU DLL: SARMCM3.DLL Dialog DLL: DCM.DLL	ndows & Performance Analyzer bisplay	Driver DLL: SARMCM3 DLL: Dialog DLL: TCM.DLL	S Debugger indows V Tracepoints Display V System Viewer Parameter: Parameter:

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

ebug Trace Flash Download	1	
CMSIS-DAP - JTAG/SW Adapter	JTAG Device Chain	
Geehy CMSIS-DAP	F IDCODE Device Name	Move
Serial No: FS-00008803	TDO 0x4BA00477 ARM CoreSight JTAG-DP 0x06414B47 Unknown JTAG device	Up
Firmware Version: 1.2	ты	Down
	Automatic Detection ID CODE:	
▼ swJ ^D Port JTAG ▼	Automatic Detection ID CODE: C Manual Configuration Device Name:	
	C Manual Configuration Device Name:	0x00
WJ Port JTAG	C Manual Configuration Device Name: Add Delete Update IR len: AP:	
SWJ Port JTAG Max Clock: 1MHz	Manuel Configuration Device Name: Add Delete Update IR len: AP: Cache Options Download Op	tions
SWJ Port JTAG Max Clock: 1MHz	C Manual Configuration Device Name: Add Delete Update IR len: AP: Cache Options Download Op	tions de Download

Figure 5





bug Trace Flash Download -CMSIS-DAP - JTAG/SW Adapter	SW Device			
Geehy CMSIS-DAP	IDCODE	Device Name		Move
Serial No: FS-00008803	SWDIO Ox2BA01477	ARM CoreSight SW-DP		Up
			-	Down
Firmware Version: 1.2	ļ			
SWJ Port SW -	Automatic Detection	ID CODE:		
Max Clock: 1MHz 🔻	C Manual Configuration	Device Name:		
	Add Delete	Update	AP: 0x00	
Debug Connect & Reset Options		Cache Options	-Download Options	
	et: Autodetect 💌	Cache Options	Verify Code Downl	and
Reset after Connect		Cache Memory	Download to Flash	
	Stop after Reset			

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

Figure 7

CMSIS-DAP Cortex-M Target Driver Setup	×
Debug Trace Flash Download	
Download Function C Erase Full Chip Image: Program Image: Comparison of the state	
Description Device Size Device Type Address Range APM32F10x High-density 512k On-chip Flash 08000000H - 0807FFFFH	
Start Size:	
Add Remove	
OK Cancel Help	

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.



- (2) Open the Zadig software and install the relevant drivers.
- Install the CDC driver. Select the "Geehy Serial Port (Interface 0)" device, then select "USB Serial (CDC)" and click "Install Driver" to install.







(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.

Options Help			
MSIS-DAP WinUSE	(Interface 3)		▼ [] E
	. ,		
(NONE)	(s	WinUSB (v6.1.7600.16385)	More Information
			WinUSB (libusb)
314B 0101	03 실		libusb-win32
		Install Driver	libusbK
	(NONE)		(NONE) (VG.1.7600.16385) (VG.1.7600.16385)

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)





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



(7) Select "Update Driver".



Figure 14

Seehy CMSIS-DAP WinUSB	(Interface 3) Properties	X
General Driver Details		
Geehy CMSIS-E	DAP WinUSB (Interface 3)	
Driver Provider:	libwdi	
Driver Date:	2012/6/2	
Driver Version:	6.1.7600.16385	
Digital Signer:	USB\VID_314B&PID_0101&MI_03 (libwdi autogenerated)	
Driver Details	To view details about the driver files.	
Update Driver	To update the driver software for this device.	

(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).



How do you want to search for driver software?	Browse for driver software on your computer
Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.	Search for driver software in this location: C\Users\Geehy\Desktop
Browse my computer for driver software Locate and install driver software manually.	Let me pick from a list of device drivers on my computer This list will show installed driver software compatible with the device, and all driver software in the same category as the device.
	ancel Next Cancel



9	have a disk that contains the driver you want to inst	re device and then click Next. If you all, click Have Disk.
/ Sho	ow compatible hardware	
Mode	el	
🙀 Ge	eehy CMSIS-DAP WinUSB (Interface 3)	
= T	his driver has an Authenticode(tm)	Have Disk

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



Figure 17

-	Insert the manufacturer's installation disk, and then make OK Sure that the correct drive is selected below. Cancel		Select the device driver you want to install for this Select the manufacturer and model of your hardware dev have a disk that contains the driver you want to install, cli	rice and then click Next. If you
	Copy manufacturer's files from:	Browse	Model GEEHY-LINK CMSIS-DAP (WinUSB)	
			This driver is not digitally signed! Tell me why driver signing is important	Have Disk_

(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.



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



Figure 20

> 💻	Network adapters
~ 🖗	Ports (COM & LPT)
	🛱 USB Serial Device (COM3)
> 🖻	Print queues
> 🗖	Processors
>	Software devices
>1	Sound, video and game controllers
> 🏠	Storage controllers
> 🛴	System devices
⇒ÿ	Universal Serial Bus controllers
> ₩ ▼ ₩	Universal Serial Bus controllers Universal Serial Bus devices

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 <u>FAE@geehy.com</u>. 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**

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

Table 1 Document Revision History	Table 1	Document Revision History
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8. Scope of Application

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