

# **Application Note**

# Document No.: AN1085 APM32F4xx\_Download Application Note

Version: V1.0

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### 1 Introduction

This application note guides beginners to learn how APM32F4xx series products use the simulator to download programs to the development board.

It mainly contains:

The introduction to the simulator, the hardware connection method, and the description of simulator configuration and download in KEIL and IAR software.

All materials involved in this application note can be obtained and downloaded from the website of <u>www.geehy.com</u>.



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### 2 Use Geehy-Link To Program

#### 2.1 Introduction to simulator

Geehy-LINK is a development tool integrating simulator and programmer, which can debug and simulate the APM32 full-range MCU products online in Keil, IAR and other integrated development environments. Support full-speed operation, single-step debugging, breakpoint setting and other debugging methods. Refer to the document of *GEEHY-LINK User Manual V1.0.0.pdf* on the official website.

#### 2.2 Hardware connection

As shown in Figure 1, connect the interface 2 of the simulator to the USB interface of the computer through the USB cable. If the indicator light of the simulator is on and Geehy DAP USB Device appears on the device manager of the computer, as shown in Figure 2, the simulator is normal. Then connect the interface 1 at the other end of the simulator to the JTAG interface of the development board, and power on the development board through the external power supply. Or power the motherboard through Geehy-Link downloading. Press and hold the middle power supply button until the indicator light turns from green to orange, indicating that the motherboard has been powered by Geehy-Link. Finally, download the program to the development board through the software KEIL or IAR.



Figure 1

🛃 Device Manager				
ile Action View Help				
/ 🛃 XO-6951				
> 🗃 Audio inputs and outputs				
> 💻 Computer				
V Disk drives				
Geehy DAP USB Device				
SAMSUNG MZVLB256HBHQ-000L2				



#### 2.3 Configure and download the program

#### Keil MDK IDE:

a) As shown in Figure 3, open the project file and select "Options for Target" tab.



Figure3

b) As shown in Figure 4, in the "Debug" option, download and select the simulator as "CMSIS-DAP Debugger" and then select "Setting".

🔀 Options for Target 'SysTick'		×
Device   Target   Output   Listing   User   C/C++   Asm	Linker Debug Utilities	
<ul> <li>○ Use Simulator <u>with restrictions</u> Settings</li> <li>□ Limit Speed to Real-Time</li> <li>✓ Load Application at Startup</li> <li>✓ Run to main()</li> </ul>	<ul> <li>● Use: ULINK2/ME Cortex Debugger</li> <li>ULINK2/ME Cortex Debugger</li> <li>ULINK Pro Cortex Debugger</li> <li>ULINK Pro Cortex Debugger</li> <li>✓ Load PCMSIS-DA Deburger</li> </ul>	ettings n()
Initialization File:	Initializatio J-LINK J-1 RACE Coffex Models Cortex-M Debugger ST-Link Debugger NLink Debugger	Edit
Restore Debug Session Settings         Image: Breakpoints       Image: Toolbox         Image: Breakpoints       Image:	Restore       Pemicro Debugger         Image: SiLabs UDA Debugger         Altera Blaster Cortex Debugger         Image: Very State Windows         Image: Very Display         Image: Very Display         Image: Very Display	
CPU DLL: Parameter:	Driver DLL: Parameter:	
SARMCM3.DLL	SARMCM3.DLL	
Dialog DLL: Parameter:	Dialog DLL: Parameter:	
DARMCM1.DLL -pCM0+	TARMCM1.DLL -pCM0+	
Warn if outdated Executable is loaded Manage Component Vie	Warn if outdated Executable is loaded	
OK	cel Defaults	Help

Figure 4

c) As shown in Figure 5, after entering the Settings option configuration, select Debug, select "Geehy CMSIS-DAP" (the old version is "Apex CMSIS-DAP") in the "CMSIS-DAP Cortex-M Driver Setup" interface, check SWJ, and select the SW interface. If the simulator is connected to the computer and the development board, and the development board has been powered on, the simulator will recognize the chip of the development board and display it in SW Device.



Debug Trace   Flash Download	0WD :	
Geehy CMSIS-DAP	DCODE Device Name	Move
Any Geehy CMSIS-DAP	SWDIO Ox0BC11477 ARM CoreSight SW-DP	Up
Firmware Version: 1.2		Down
SWJ Port SW -	Automatic Detection     ID CODE:	
Max Clock: 1MHz 🔻	C Manual Configuration Device Name:	
	Add Delete Update	AP: 0x00
Debug Connect & Reset Options	Add Delete Update	AP: 0x00
Debug Connect & Reset Options Connect Normal V Res	Add Delete Update Cache Options set Autodetect	AP: 0x00 Download Options Verify Code Download
Debug Connect & Reset Options Connect Normal ▼ Res ▼ Reset after Connect ↓ Log Debug Accesses	Add Delete Update Cache Options Set Autodetect Stop after Reset	AP: 0x00 Download Options Verify Code Download Download to Flash

Figure 5

d) As shown in Figure 6, select the Flash Download tab and Erase Sectors. If you select Full Sectors, the erasing process will be slow. Check Reset and Run at the same time, so that the program can run automatically after downloading, not needing manual resetting. Finally, select in the "Programming Algorithm" interface according to the actual model, and click "OK".

Options for Target "APM32F407"
Device   Target   Output   Listing   User   C/C++   Asm   Linker Debug   Utilities
C Use Simulator <u>with restrictions</u> Settings ⊙ Use: CMSIS-DAP Debugger ▼ Settings
CMSIS-DAP Cortex-M Target Driver Setup
Debug   Trace Flash Download
Download Function       Image: Constraint of the sectors       Image: Constra
Device Size Device Type Address Range
APM32F4xx 1MB Flash 1M On-chip Flash 08000000H - 0807FFFFH
Start: Size:
Add Remove
OK Cancel Help

Figure 6



#### e) As shown in Figure 7, check the default configured simulator in the Utilities option configuration

🔣 Options for	Target 'APM32F407'	
Device   Target	Output   Listing   Use	er   C/C++   Asm   Linker   Debug   Utilities
Configure Flash	Menu Command	
Use Target	t Driver for Flash Programm	ning Vise Debug Driver
	Use Debug Driver	Settings 🔽 Update Target before Debugging
Init File:		Edt
C Use Extern	al Tool for Flash Programm	ning
Command:		
Arguments:		
	🗖 Run Independent	
Configure Imag Output File:	e File Processing (FCARM)	): Add Output File to Group:
		CMSIS 👻
Image Files Ro	pot Folder:	Generate Listing
	OK	Cancel Defaults Help

Figure 7

f) As shown in Figure 8, after the previous steps are completed, we can download the compiled program to the development board and run it. In the download process, you only need to directly click the LOAD button in KEIL.



Figure 8

g) After downloading, as shown in Figure 9, you can see Programming Done in the Build Output tab. If "Reset and Run" is checked in the above steps, you will also see Application running... in the tab, which indicates that the program has been downloaded and is running automatically. Experimental phenomena can be observed on the development board. If Application running... does not appear, you need to manually reset the development board.

Build Output
Load "F:\\SVN2021\\UM32401(F407)\\SDK\
Erase Done.
Programming Done.
Verify OK.
Application running
Flash Load finished at 10:10:09
<





IAR EW for Arm IDE:

a) As shown in Figure 10, open the project file and select "Options" tab.



Figure 10

b) As shown in Figure 11, select "CMSIS DAP" simulator in "Debugger" and click "OK".

ategory:			Factory Setting
eneral Ontions			
tatic Analysis			
untime Checking	Cohun D. J. J. J.		
C/C++ Compiler	Setup Download Images N	Aulticore Extra Options F	lugins
Assembler			
Output Converter	Driver	🔽 Run to	
Custom Build			
Build Actions	J-Link/J-Trace V	main	
inker	Simulator	1	
Debugger	CADI		
Simulator	CMSIS DAP		
CADI	GDB Server		
CMSIS DAP	l-jet		
GDB Server	J-Link/J-Trace		
I-jet	TI Stellaris		
J-Link/J-Trace	Nu-Link		
TI Stellaris	PE micro		
Nu-Link	ST-LINK		
PE micro	Third-Party Driver		
ST-LINK	TI MSP-FEI		
Third-Party Driver	TIXDS	debugger\Geehy\APM32	.F003F6.ddf
TI MSP-FET			
TI XDS			
	]		

Figure 11

c) After the previous steps are completed, we can download the compiled program to the



development board and run it. As shown in Figure 12, in the download process, you only need to select Download in the Project option of IAR and click the download active application button to download the program. After resetting the development board, you can see the experimental phenomenon of the routine.

File	Edit	View	Pro	ject	CMSIS-DAP	Tools	Window	Help								
1	Č 🔛			Add	Files				-	<	Q )	> 车 I	E <	¢		
Works	space			Add	Group											
APM32F407				Imp	ort File List											
File	~			Add	Project Con	nection										
	∘ ISvsT	ïck T		Edit	Configurati	ons										
	■ Ap	plicatio ard		Rem	ove											
-⊕	E CM	ISIS		Crea	te New Proj	ect										
	Std	lPeripł tout		Add	Existing Pro	ject										
	_ 04	,pur		Opt	ions		Alt	t+F7								
				Vers	ion Control	System		•								
					0	Mak	e			F7						
	B			Com	pile		Ctr	I+F7								
				Reb	uild All											
				Clea	n											
				Bato	h build			F8								
					n Browse In	formation	n									
					AT Static Ana	alysis		•								
			۵	Stop	Build		Ctrl+B	reak								
Sus	lick Tim	eBase	0	Dow	nload and [	Debug	Ct	rl+D								
0,00			٠	Deb	ug without I	Downloa	ding									
Build				Atta	ch to Runnii	ng Target										
	Messa	ges	G	Mak	e & Restart	Debugge	r Ct	rl+R								
			C	Rest	art Debugge	er	Ctrl+Shi	ft+R					_			
S   F	sysTick Readin	k_Timi a proie		Dow	nload				Download	d activ	e appl	ication				
'	.oc.am	2 0.01		SFR	Setup				Download	file						
0	Cleaning 0 fi								Erase men	nory						

Figure 12



# 3 Version History

#### Table 1 Document Version History

Date Version		Change History
May 31, 2022	1.0	New



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