

WM_W60X_SWD Debugging Guide

V1.4

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V1.4	2018-12-15	Modify W600 to W60X	Ray	

Document History



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1 Introduction

This document describes W60X (Cortex-M3) on-line debug configuration under KEIL IDE.

2 W60X Debug Interface

W600 is QFN32 package:

Pin26 (PB6): SWDIO(TMS)

Pin27 (PB7): SWCLK(TCK)

W601 is QFN64 package:

Pin61 (PB6): SWDIO(TMS)

Pin62 (PB7): SWCLK(TCK)

Connect the SWDIO, SWCLK, GND, VCC pins on W60X to the SWD interface for debugger.

Note: The pins PB6 and PB7 on W60X can be remapped to other functions. Once the two pins are used as other functions, the SWD function will not work, only UART debugging can be used.

3 Flash Driver

3.1 Location of Flash Driver

Flash driver is located at SDK's Doc directory.

本地磁盘 (E:) ▶									
共享 ▼ 新建文件夹									
名称	*	修改日期	类型	大小					
🔊 FlashDev.c		10/23/2018 11:0	C Source	2 KB					
🔊 FlashPrg.c		10/23/2018 11:0	C Source	10 KB					
🔊 Target.lin		8/13/2013 11:37	LIN 文件	1 KB					
W60X_QFlash	h.FLM	12/20/2018 5:55	FLM 文件	15 KB					
W60X_QFlash	h.uvopt	12/20/2018 3:08	UVOPT 文件	6 KB					
🔊 W60X_QFlas	h.uvproj	12/20/2018 3:08	礦ision4 Project	15 KB					

Figure 3-1



3.2 Compilation of Flash Driver

Tips: User can use file W60X_QFlash.FLM directly, just copy it to flash directory under KEIL installation

directory, the Path is Keil/ARM/Flash.

1. Copy W60X_QFlash package to directory Keil/ARM/Flash

本地磁盘 (C:) ▶ Keil ▶ ARM ▶ Flash ▶ W60X_QFlash				
共享 ▼ 新建文件夹				
名称 ^	修改日期	类型	大小	
IlashDev.c	10/23/2018 11:0	C Source	2 KB	
C FlashPrg.c	10/23/2018 11:0	C Source	10 KB	
🗋 Target.lin	8/13/2013 11:37	LIN 文件	1 KB	
W60X_QFlash.uvopt	12/20/2018 5:52	UVOPT 文件	6 KB	
W60X_QFlash.uvproj	12/20/2018 3:08	礦ision4 Project	15 KB	

Figure 3-2

2. Double click W60X_QFlash.uvproj to open project and compile it. Target file will be located in upper directory.

rile Edit View Project Flash L	Debug Peripherals Tools SVCS Window Help	
🗋 💕 😸 🥔 👗 🐴 🛍 🗐) @ 👄 → 巻 豫 豫 豫 譯 譯 //٤ /版 🎯 rdata 🛛 🔍 🗟 🥔 @	1 o o 🔗
🤗 🕮 🎬 🥪 🔜 🛛 🙀 🛛 w60x_0	QFlash 💽 🎊 📥 🗟 🚸 🛞	
roject	₽ 	
Image: Second system Image: Second system Image: Secon	0. Templates	
ild Output		1
ebuild target 'W60X_QFlas ompiling FlashPrg.c ompiling FlashDev.c inking	sh'	
rogram Size: Code=800 RO-	-data=5280 RW-data=12 ZI-data=0 i #1: cmd.exe /C copy W60X.axf\W60X_QFlash.FLM	
ter Build - User command 复制 1 个文件。		
ter Build - User command 复制 1 个文件。 \W60X.axf" - 0 Error(s),	0 Warning(s).	

Figure 3-3

3.3 Configuration of Flash Download

Using target project and turn to page '**JLink Settings -> Flash Download**', Click '**Add**' to display Flash Configuration and select the target flash driver.

See 4.5 Utilities configuration.





- 4 KEIL environment Configuration
 - 4.1 Chipset Select

Choose '*Project->Options for Target*' to open the dialog box, switch to tab '*Device*', then choose 'ARM->Cortex-M3'.



🛛 Options for Target 'flash'
Device Target Output Listing User C/C++ Asm Linker Debug Utilities
Device Database
Vendar: ARM
Device Cortex-M3
Toolset: ARM
Search:
Red Analyze Devices
Contex-M0 Contex-M0 Contex-M0 Contex-M0 Contex-M1 Contex-M1 Contex-M1 Contex-M4
🗈 🌰 Dialag Samiganduatar 🔄 🤇
OK Cancel Defaults Help
Figure 4-1

4.2 Flash and RAM Address Configuration

Choose '*Project->Options for Target*' to open dialog box, switch to tab '*Target*', then configure start address and size of Flash and RAM.

		1			1.000		[-			
1	ARM Cort	ex-M3				Code (Seneration			
				Xtal (MHz):	12.0		achoration			
	Operating	g system:	None		•	Γυ	se Cross-N	Aodule Optimiz	ation	
	System-V	fiewer File	, (.Sfr):			V 🛛	se MicroL	IB	🗌 Big Endian	
	-									
	Use	Cusom S\	/D File							
	-Read/	Only Mema	ry Areas ——			Read/	Write Merr	ory Areas		
	default	off chip	Start	Size	Startup	default	off-chip	Start	Size	Nolni
		R M1:					RAM1:			
1		R M2:		1			RAM2:			
	Г	R M3:	, 	í —			RAM3:	<u> </u>	-í	- n
		on-chip	,)			on-chip	1	1	
	V	IROM1:	0x8010100	0×80000	œ	•	IRAM1:	0×20000000	0x38000	
		IROM2:			0		IRAM2:			- E
			,					,		

Figure 4-2

Note: Configured address range should be less than real size of W60X.



4.3 Optimization Level Setting

Choose '*Project->Options for Target*' to open dialog box, switch to tab '*C/C*++'. If user wants to debug and track program on-line, the optimization level should be set Level 0, otherwise the run-time program may be different from program that is expected.

Options for Target 'Flash'		×
Device Target Output Listing User	C/C++ Asm Linker Debug	Utilities
Preprocessor Symbols Define: Undefine:		
Language / Code Generation	☐ Strict ANSI C	<u>₩</u> arnings:
Optimization: Level 0 (-00)	Enum <u>C</u> ontainer always int	All Warnings 💽
Coptimize for Time	Plain Char is Signed	🗖 Thum <u>b</u> Mode
Split Load and Store Multiple	🔲 Read-Only Position Independent	🔲 No Auto Includes
One ELF Section per Function	<u>Bead-Write Position Independent</u>	C99 Mode
Include Paths Misc Controls Compiler control string	ork\api:\\Src\Network\lwip2.0.3\incl LIBli -g -00apcs=interwork -l\\.Nncl .\Src\Network\lwip2.0.3\include -l\\.	ude:\\Src\Wlan\Drive ude - Src\Wlan\Driver -
OK	Cancel Defaults	Help
	Eigner 4.2	

Figure 4-3

4.4 Debugger Select and Configuration

Create a text file, for example ROM.ini, and enter the following code:



Choose 'Project->Options for Target' to open dialog box, switch to tab 'Debug'.



- 1. Choose 'Use', select emulator from drop-down menu.
- 2. Import ROM.ini file to initialize the start address of SP, PC pointer and exception vector table.

Note: The values such as SP, PC and VTOR are related to the configured start address of

Flash. This chipset doesn't support CODE running in RAM.

🛚 Options for Target 'Flash'		
Device Target Output Listing User C/C++ A	sm Linker Debug Vtilities	
C Use <u>S</u> imulator <u>Settings</u> ☐ Limit Speed to Real-Time		
I Load Application at Startup I Run to main() Initialization File:	✓ Load Application at Startup ✓ Run to main() Initialization File:	
Restore Debug Session Settings Breakpoints I Toolbox Watch Windows & Performance Analyzer Memory Display System Viewer CPU DLL: Parameter: SARMCM3.DLL	Restore Debug Session Settings Image: Setting set	
Dialog DLL: Parameter: DLM.DLL -pCM	Dialog DLL: Parameter: TLM.DLL pCM	
OK	cel Defaults Melp	

Figure 4-4

4.5 Utilities Setting

- 1. Copy W60X Flash driver to Keil/ARM/Flash under KEIL installation directory.
- Choose '*Project->Options for Target*' to open dialog box, switch to tab '*Utilities*'. Below the figure, Tick off label 1 and 2, and select emulator from drop-down menu of label 3, the emulator should be same with tab '*Debug*'.



🛚 Options for Target 'Flash'	
Device Target Output Listing User C/C++ Asm Linker Debug Utilities	
Configure Flash Menu Command	
Use Target Driver for Flash Programming 3 Use Debug Driver 2	
J-LINK / J-TRACE Cortex Settings Vupdate Target before Debugging	
Init File:	
C Use External Tool for Flash Programming	
Command	
Arguments:	
Run Independent	
Configure Image File Processing (FCARM):	
Output File: Add Output File to Group:	
main	
Image Files Root Folder:	
OK Cancel Defaults Help	X

Figure 4-5

Click '*Settings*' above figure 4-5, and the configured RAM/Flash parameters in tab '*Flash Download*' should be same with former configured address. Click '*Add*' button to select the W60X Flash driver.

Debug Tro Download LOAD	ace Flash Download Function C Erase Full C Frase Sector Do not Erase bing Algorithm	 Frogram Verify Reset and Run 	RAM for Algor :art: 0x2000	ithm 0000 ize: 0x200	0
Descri	ption	Device Size	Device Type	Address Ran	79
Winner	Micro 1M Flash V1.0	18	On-chip Flash	080000000 - 0800	FFFFFH
			:art: 0x0800	0000 ize: 0x001	00000
		Add	Remove		

Figure 4-6

Switch to tab '*Debug*', select debugger interface as SW. When W60X is detected, the chipset information will be displayed in dialog box 2.



Cortex JLink/JTrace Target Driver Setup	×
Debug Trace Flash Download	
J-Link / J-Trace Adapter SW Device SN: USB#: Device: J-Link HW: dll: FW: dll: FW: Max Clock: SWD Auto Clk Auto Clk Max Clock: Auto Clk Auto Clk	
Debug Connect & Reset Options Cache Options Download Options Connect: Normal Image: Reset: Autodetect Image: Reset: Download Options Image: Reset after Connect Image: Reset: Autodetect Image: Reset: Download Options Image: Reset after Connect Image: Reset: Autodetect Image: Reset: Download to Flash	
Interface TCP/IP Scan IP-Address State: ready Port (Auto: 0) Autodetect JLink Info	
OK Cancel Help	

Figure 4-7

At last click 'OK' to save all the configuration.

5 Program Debugging

After KEIL environment is configured and the program is compiled correctly, choose menu 'Debug->Start/Stop Debug Session' or press CTRL+F5 to start up the on-line debugging.

6 Note

The pins PB6 and PB7 on W60X can be remapped to other functions. Once the two pins are used as other functions, the SWD function will not work, only UART debugging can be used.