



AP03-研创物联产品固件更新

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注意!静电敏感设备。在使用该产品时请做好预防措施以防止出现永久性损害。

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1 研创物联产品固件更新说明

用户可通过以下几种方式,为研创 UWB 模块进行固件更新,请根据自己所选购的型号,进行相应的下载。

表 1.1 研创开发板系列升级方法一览

	已购源码客户	未购源码的客户
适用硬件	Mini3	Mini3
	Mini3s	Mini3s
	Mini3sPlus	Mini3sPlus
	Mini4sPlus	Mini4sPlus
	Mini4	Mini4
	Mini5	MINI5
	Protag(STM32)	Protag(STM32)
更新方式	通过打开 Keil 工程下载	给模块下载.HEX 文件升级程序
工具与软件	硬件:下载器 ST-LINK	硬件:下载器 ST-LINK
	软件: KEIL	软件: ST-LINK UTILITY
参考相关章节	第4章	第2章

表 1.2 研创商用产品系列升级方法一览

	基站升级	标签升级
适用硬件	基站 ProAnc (STM32)	标签 ProCard (NRF52832)
		标签 Protag (NRF52832)
更新方式	给模块下载.hex 文件升级程序	给模块下载.hex 文件升级程序
工具与软件	硬件:下载器 ST-LINK	硬件:下载器 J-LINK
	软件:ST-LINK Utility	软件: J-FLASH
参考相关章节	第4章	第3章

2 ST-LINK Utility 下载程序

2.1 关于 STM32 ST-LINK Utility

STM32 ST-LINK Utility 软件主要的功能就是量产(批量下载代码的工具)。它也是比较实用的一个工具,当我们需要查看芯片 FLASH 数据时,可以很快定位查找到想要的数据(前提是没有添加保护)。

STM32 ST-LINK Utility 软件包含 ST-Link 驱动。若你安装了 STM32 ST-LINK Utility 软件,你的 ST-Link 就不用单独安装驱动了,可以直接使用(比如 Keil、IAR 在线调试、下载等)。

STM32 ST-LINK Utility 软件除了可以快速读取 FLASH 数据外,还可快速读取 STM32 芯片型号、ID、版本等信息。



图 2.1 STM32 ST-LINK Utility 界面

2.2 软件安装

STM32 ST-LINK Utility 集成开发环境的安装比较简单(基本上就是一路 Next 下去)。以上面下载的"STM32 ST-LINK Utility v3.1.0 setup.exe"软件为例讲述。

1.解压软件,双击 "STM32 ST-LINK Utility v3.1.0.exe",进入准备安装 (解压)过程。



2.进入安装向导,点击"Next"。



3.同意许可, 点击"Yes"。

Elective Agreement	- Contract	
Please read the following license agreement care	efully.	
Press the PAGE DOWN key to see the rest of th	e agreement.	
SOFTWARE LICENSE AGREEMENT		^
By using this Licensed Software, You are agreei conditions of this License Agreement. Do not us read and agreed to the following terms and conc implies automatically the acceptance of the follo indicate your acceptance or NON-acceptance b ACCEPT' as indicated below in the media.	ing to be bound by the terms and the the Licensed Software until You have ditions. The use of the Licensed Software wing terms and conditions. Please by selecting "IACCEPT' or "IDONOT	~
, Do you accept all the terms of the preceding Lice setup will close. To install STM32 ST-LINK Utility	ense Agreement? If you choose No, the y, you must accept this agreement.	
		_
nstallShield		

4.选择安装路径 (这里默认), 点击 "Next"。



hoose Destination Location		and a
Select folder where Setup will install files.		
Setup will install STM32 ST-LINK Utility in t	he following folder.	
To install to this folder, click Next. To install another folder.	I to a different folder, click Bro	wse and select
Destination Folder		
Destination Folder C:\\STMicroelectronics\STM32 ST-LIN	√K Utility∖	Browse
Destination Folder C:\\STMicroelectronics\STM32 ST-LIN	√K Utility\	Browse

5.进入安装过程,不到一分钟时间。

6.安装最后提示"安装驱动",点击"下一步",最后点击"完成"安装完成。 7.点击"Finish"完成上位机软件及 ST-LINK 驱动的安装。

8.查看版本: 打开软件-> Help - > About, 可以看见版本是更新了的。





2.3 更新步骤

2.3.1 硬件连接

Mini3s / Mini3sPlus 硬件连接方式如下图所示。



Mini3/Mini4/Mini5 硬件连接方式如下图所示。



Mini4sPlus 硬件连接方式如下图所示。



壁挂基站与下载器的连接方法:将基站上的螺丝拧开,打开盖子。并将 ST-LINK V2 下载器 通过排线连接到基站主控板的 J-TAG 座上。





防水铸铝外壳基站与下载器的连接方法:将基站铸铝外壳打开,将 ST-LINK V2 下载器通过 排线连接到基站主控板的 J-TAG 座上。因 J-TAG 脚有多种样式,请参考 PCB 上对 J-TAG 脚 的定义,SWD 下载模式,需要用到 VCC SWDIO SWCLK GND。



2.3.2 软件连接

打开 STM32 ST-LINK Utility 软件,连接芯片: Target-> Connect 或直接点击连接快捷按钮 (如下图)。注意:读取 FLASH 信息的前提是没有添加读保护。点击"连接按钮"之前可以 设置读取 FLASH 的起始地址、读取长度和数据显示的宽度。

🖼 STM32 ST	-LINK Utility	E LINK E	E接快捷	方式 lar Hala		- 🗆 ×	
Memory display Address: 0x Device Memory	108000000 ~ 108000000 ~	Size: 0x	(11B98) (11B98) (大度) (11B98)	Data Width: 32 数据	^{bits} →		
Address	0	4	8	С	ASCII	,	
0x0800000	20010000	08007801	08009E51	08009E99	xQ	???	
0x08000010	08009EB9	08009EC1	08009EC9	00000000	??????.		
0x08000020	00000000	0000000	00000000	08009ED1		??	
0x08000030	08009EDD	0000000	08009EE9	08009F15	????.	?	
0x08000040	08007849	08007849	08007849	08009EF5	1x1x1	x??	
0x08000050	08007849	08007849	08009F45	08007849	x x E	?lx	
0x08000060	08007849	08009F59	08007849	08007849	1 x Y ? I :	xlx	
0x08000070	08007849	08007849	08007849	08007849	1x1x1	xlx	
<						>	
20:25:59 : ST-LINK Firmware version : V2317S4 20:25:59 : Connected via SWD. 20:25:59 : Connetion mode : Normal. 20:25:59 : Debug in sleep and stop mode enabled. 20:25:59 : Device ID:0x418 20:25:59 : Device flash Size : 128KBytes 20:25:59 : Device family :STM32F10x Connectivity Line							
pebug in sleep a	nd stop mode e	nabled.	Device ID:0x4	18		Core State : Live Update Disabled	

2.3.3 加载 Hex

在上一步连接好芯片,并正确识别芯片之后,打开需要下载的程序(hex)文件。打开 hex 文件可以从菜单栏 (File -> Open File)打开,也可以直接讲 hex 文件拖动到 FLASH 区域 (就像从电脑复制文件到 U 盘一样)。

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5 STM32 ST	-LINK Utility						-		×
File Edit V	iew Target	ST-LINK	External Load	er Help					
🔒 🖥 🖕	b 🤹 🥠	🥨 👂	swv	打开 he	x 文件				
Memory display	Memory display Device Information								
Address: 0x	Address 0x02000000 v Size 0x7P02 Data Width: 22 bits v								ectivit
Address: UXUSUUUUUU V SIZE: UXL1998 Data Width: 32 Dits V Device ID 0x418									
Device Memory	@ 0~0900000	File SPL h	ex			Revision ID	Rev Z		
COT have added	@ 0x0800000		000001			Flash size	128KBvtes		
[SPI.nex], Addre	ess range: [UXU	8000000 0x080	09898]		1				
Address	0	4	8	С	ASCII				^
0x08000000	20002288	08007A49	0800428D	0800428F	?". lz?B	.?B			
0x08000010	08004291	08004293	08004295	0000000	?B?B?B.				
0x08000020	00000000	0000000	0000000	08004297	···2: 直接#	\$ 文件拖	到这里		
0x08000030	08004299	0000000	0800429B	0800429D	?B ?B	?B			
0x08000040	08007A63	08007A63	08007A63	08007A63	c z c z c z	cz			
0x08000050	08007A63	08007A63	080042B9	08007A63	c z c z ?B .	. c z			
0x08000060	08007A63	080042C9	08007A63	08007A63	c z ?B c z .	. c z			
0x08000070	08007A63	08007A63	08007A63	08007A63	c z c z c z	cz			~
<									>
20:31:24 : [SPI.hex] opened successfully. 20:31:27 : ST-LINK Firmware version : V2J17S4 20:31:27 : Connected via SWD. 20:31:27 : Connection mode : Normal. 20:31:27 : Debug in sleep and stop mode enabled. 20:31:28 : Device ID:0x418 20:31:28 : Device family :STM32F10x Connectivity Line									
Debug in sleep a	nd stop mode e	nabled.	Device ID:0x4	18		iore State : No M	Memory Grid S	elected	

2.3.4 下载 Hex

在上一步打开 hex 文件完成之后,点击"下载"(可以 Taraget -> Program,也可以直接点 击下载快捷按钮,如下图)

			_	
骗 STM32 ST-LINK Utility		-		Х
File Edit View Target ST-LINK External Loader Help				
🖴 🖥 🖕 🗇 🇭 🎯 📼				
Memory display	De	vice Informa	tion	
	Device	STM32F	10x Conne	ectivit
Address: UXU8000000 V Size: UX11998 Data Width: 32 bits V	Device ID	0x418		
The entire	Revision ID	Rev Z		
Device Memory @ 0x08000000 : File : SP1.nex	Flash size	128KBvtes		

弹出信息确认窗口,如 hex 文件路径、验证方式等,确认信息无误后点击"Start"开始下载 程序。如:我将可执行 hex 文件命名为"SPI.hex",位于桌面。

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😼 STM32 ST	-LINK Utility			_		\times
File Edit Vi	iew Target	ST-LINK External Loader Help				
- 🖬 🕯	b 🕼 🥠	🧭 🧝 🔜				
Memory display	/		De	evice Informat	ion	
Address Or	0000000	Citere DevOTOD Devis Wildlife 22 hits and	Device	STM32F1	0x Connec	ctivit
Address: Ux	08000000	Size: 0x9B98 Data Width: 32 bits V	Device ID	0x418		
Device Memory	File · SDT he	v	Revision ID	Rev Z		
Device Memory	The JPINE		Flash size	128KBvtes		
[SPI.nex], Addre	ess range: [Uxi	8000000 0X08009B98]				_
Address	0					^
0x08000000	20002288	Oownload [SPI.hex]	×			_
0x08000010	08004291	0 Start address : 0x08000000				
0x08000020	00000000	0 File path ::ag_4A8T_V1.8.5.2_20180610\0BJ\SPI.hex	Browse			
0x08000030	08004299	0 Click "Program" to start programming.				
0x08000040	08007A63	0 确认上而信自于	误后	占土该均	史印	
0x08000050	08007A63				хтш	
0x08000060	08007A63	0 Start Cancel				
0x08000070	08007A63	00007803 00007803 00007803 022.				~
<						>

下载过程时间长短与程序大小有关,一般都很快,出现"Verification...OK",说明下载成功。



2.4 配置

更新完固件后,还需要使用 AT 命令对 UWB 设备的速率、信道、地址进行配置,模块方可正常使用。具体操作见各个 UWB 设备的用户手册 AT 指令配置方法。

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3 J-FLASH 下载程序

3.1 J-Flash 简介

J-Flash 是 SEGGER (J-LINK 仿真器厂商)发布的一款单独的 Flash ISP 烧写软件,支持将 HEX 和 BIN 格式文件烧写到单片机的 Flash。

J-Flash 集成在 J-LINK 驱动里面,当我们安装了 J-LINK 驱动后,也就安装了 J-Flash。

注: 3.2 节及 3.3 节使用 J-LINK V9.0 下载器进行操作

3.2 安装 J-LINK 驱动

双击 🔛 JLink_Windows_V646^{驱动} ,启动安装,点击 NEXT



图 3.2.1 JLINK 驱动安装

点击【I Agree】继续安装



图 3.2.2 JLINK 驱动安装

设置 J-LINK 驱动的安装选项,推荐默认方式安装,点击【Install】开始安装

🔜 SEGGER - J-Link V6.46	5 Setup		_		×
SEGGER	Choose optional components Choose optional components to be in	nstalled.			J Link
IoT	Install USB Driver for J-Link	安装USB驱动			
	Create entry in start menu	添加快捷键方式			
	Choose destination:	安装目录方式			
Discover SEGGER solutions for the Internet of Things	Destination Folder C:\Program Files (x86)\SEGGER\	lLink	Bro	WSE	
Learn More		< Back	Install	Ca	ncel

图 3.2.3 JLINK 驱动安装

安装过程中弹出如图 3.2.4 所示, 点击【OK】

注:出现"Keil MDK-ARM"勾选项目是因为本计算机中安装了 MDK 开发软件。如若计算机中存在其他开发软件,可能会出现其他勾选项目,可不用勾选。若没有勾选项目也可直接 点击【OK】

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🔜 SEGGER J-Link DLL Updater V6.46	×
1 applications found that can be updated to V6.46 of the J-Link software:	
I Keil MDK-ARM (DLL V6.46 in "C:\Keil_v5\ARM\Segger")	
Select All Select None Select the ones you would like to replace by this version. The previous version will be renamed and kept in the same folder, allowing manual "undo". In case of doubt, do not replace existing DLL(s)	

图 3.2.4 JLINK 驱动安装

点击【Finish】, 完成 J-LINK 驱动的安装



图 3.2.5 JLINK 驱动安装

3.3 使用 J-Flash 下载 Hex 步骤

找到 J-LINK 安装目录, 默认安装位置如图 3.3.1 所示, 双击打开 J-Flash 软件

📕 🕑 📑 =	管理 JLink				- 🗆 ×
文件 主页 共享	查看 应用程序工具				~ 🔞
← → ~ ↑ 🔒 ›	此电脑 > 本地磁盘 (C:) > Program Files (x	B6) > SEGGER > JLink		ٽ ~	
	名称	修改日期	类型	大小	^
	Devices	2020/7/29 10:54	文件夹		
> 🥌 OneDrive	Doc	2020/7/29 10:54	文件夹		
、 🔲 此由時	ETC	2020/7/29 10:54	文件夹		
- 10-604	GDBServer	2020/7/29 10:54	文件夹		
> 💣 网络	RDDI	2020/7/29 10:54	文件夹		
	Samples	2020/7/29 10:54	文件夹		
	USBDriver	2020/7/29 10:54	文件夹		
	🔜 JFlash	2019/5/23 23:55	应用程序	855 KB	
	JFlashLite	2019/5/23 23:55	应用程序	184 KB	
	🛃 JFlashSPI	2019/5/23 23:55	应用程序	562 KB	
	🔒 JFlashSPI_CL	2019/5/23 23:55	应用程序	467 KB	
	🔜 JLink	2019/5/23 23:55	应用程序	293 KB	
	JLink_x64.dll	2019/5/23 23:56	应用程序扩展	14,252 KB	
	JLinkARM.dll	2019/5/23 23:55	应用程序扩展	13,452 KB	
	🔜 JLinkConfig	2019/5/23 23:55	应用程序	443 KB	
	JLinkControlPanel	2019/5/23 23:37	Chrome HTML D	3 KB	
	JLinkDevices	2019/5/23 23:45	XML 文档	148 KB	
	🔜 JLinkDLLUpdater	2019/5/23 23:55	应用程序	140 KB	
	🔜 JLinkGDBServer	2019/5/23 23:55	应用程序	395 KB	
	🔜 JLinkGDBServerCL	2019/5/23 23:55	应用程序	336 KB	
	🔜 JLinkLicenseManager	2019/5/23 23:55	应用程序	92 KB	
	JLinkRDI.dll	2019/5/23 23:55	应用程序扩展	313 KB	
41 个项目 选中 1 个项	页目 854 KB				

图 3.3.1 安装目录

软件启动后会弹出如图 3.3.2 所示,可选择上次保留的 J-Flash 的工程,也可以选择新建一个工程。这里我们选择新建一个工程,然后点击【Start J-Flash】。



图 3.3.2 J-Flash

如图 3.3.3 所示, 点击【…】

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图 3.3.3 J-Flash

然后点击下拉箭头如图 3.3.4 所示,找到 Nordic Semi 如图 3.3.5 所示

Manufacturer Device Unspecified ARM7 ARM7 Flash size RAM size Unspecified ARM9 ARM9 - - Unspecified ARM11 ARM11 - - Unspecified CotexA5 - - - Unspecified CotexA7 CotexA5 - - Unspecified CotexA8 CotexA7 - - Unspecified CotexA12 CotexA3 - - Unspecified CotexA15 - - - Unspecified CotexA17 CotexA15 - - Unspecified CotexA17 CotexA15 - - Unspecified CotexA17 CotexA15 - - Unspecified CotexM0+ - - - Unspecified CotexM3 CotexM0 - - Unspecified CotexM3 - - - Unspecified CotexM3 - - - Unspecified CotexM3 - -		Select device				×	
Manufacturer Device Core Flash size RAM size Unspecified ARM7 ARM7 - - Unspecified ARM9 ARM9 - - Unspecified ARM9 ARM9 - - Unspecified CottexA5 - - Unspecified CottexA7 CottexA7 - Unspecified CottexA7 CottexA8 - Unspecified CottexA8 CottexA9 - Unspecified CottexA12 CottexA12 - Unspecified CottexA17 CottexA17 - Unspecified CottexA17 CottexA17 - Unspecified CottexA17 CottexA17 - Unspecified CottexM1 CottexA17 - Unspecified CottexM1 CottexM1 - Unspecified CottexM3 - - Unspecified CottexM4 CottexM3 - Unspecified CottexM3 - - Unspecified CottexM3 - - Unspecified CottexM3 - - Unspecified CottexM3 - - Unspecified CottexM3 </th <th></th> <th>Manufacturer *</th> <th>•</th> <th></th> <th></th> <th></th> <th></th>		Manufacturer *	•				
Unspecified APM7 APM7 - - Unspecified APM9 APM9 - - Unspecified APM9 APM9 - - Unspecified APM11 APM11 - - Unspecified Cottex-A5 - - - Unspecified Cottex-A7 Cottex-A7 - - Unspecified Cottex-A8 - - - Unspecified Cottex-A9 Cottex-A8 - - Unspecified Cottex-A12 Cottex-A12 - - Unspecified Cottex-A17 Cottex-A15 - - Unspecified Cottex-A17 Cottex-A17 - - Unspecified Cottex-M17 Cottex-M1 - - Unspecified Cottex-M4 Cottex-M1 - - Unspecified Cottex-M3 - - - - Unspecified Cottex-M3 Cottex-M4 - - - Unspecified Cottex-M3 Cottex-M3 -		Manufacturer	Device	Core	Flash size	RAM size	
Unspecified APM9 - - Unspecified APM1 APM1 APM1 Unspecified CottexA5 CottexA5 - Unspecified CottexA7 - - Unspecified CottexA7 - - Unspecified CottexA8 CottexA7 - Unspecified CottexA8 CottexA9 - Unspecified CottexA12 CottexA12 - Unspecified CottexA17 CottexA15 - Unspecified CottexA17 CottexA15 - Unspecified CottexA17 CottexA15 - Unspecified CottexA17 CottexA14 - Unspecified CottexM1 CottexA17 - Unspecified CottexM1 CottexA14 - Unspecified CottexM23 -		Unspecified	ABM7	ABM7	-		
Unspecified APM11 APM11 - - Unspecified CottexA5 CottexA7 - - Unspecified CottexA7 CottexA7 - - Unspecified CottexA7 CottexA7 - - Unspecified CottexA8 CottexA8 - - Unspecified CottexA12 - - - Unspecified CottexA15 CottexA12 - - Unspecified CottexA15 CottexA12 - - Unspecified CottexA15 CottexA17 - - Unspecified CottexA16 CottexA17 - - Unspecified CottexA17 CottexA17 - - Unspecified CottexA14 CottexA17 - - Unspecified CottexA14 CottexA17 - - Unspecified CottexA14 CottexA13 - - Unspecified CottexA3 CottexA33 - <td></td> <td>Unspecified</td> <td>ARM9</td> <td>ARM9</td> <td></td> <td></td> <td></td>		Unspecified	ARM9	ARM9			
Unspecified Cottex-A5 - - Unspecified Cottex-A7 Cottex-A7 - Unspecified Cottex-A8 Cottex-A8 - Unspecified Cottex-A8 Cottex-A9 - Unspecified Cottex-A12 Cottex-A12 - Unspecified Cottex-A15 - - Unspecified Cottex-A17 Cottex-A15 - Unspecified Cottex-A17 Cottex-A16 - Unspecified Cottex-M1 Cottex-M1 - Unspecified Cottex-M1 Cottex-M1 - Unspecified Cottex-M1 Cottex-M1 - Unspecified Cottex-M2 - - Unspecified Cottex-M3 - - Unspecified Cottex-M3 - - Unspecified Cottex-M23 - - Unspecified Cottex-M33 - - Unspecified Cottex-M33 - - Unspecified Cottex-M4 - - Unspecified Cottex-M5		Unspecified	ABM11	ABM11			
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Unspecified Cortex-M1 - - Unspecified Cortex-M3 Cortex-M3 - - Unspecified Cortex-M4 Cortex-M4 - - - Unspecified Cortex-M4 Cortex-M4 - - - - Unspecified Cortex-M4 Cortex-M7 - <		Unspecified	Cortex-M0+	Cortex-M0			
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Unspecified Cottex-M7		Unspecified	Cortex-M4	Cortex-M4			
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Unspecified Cortex-R4 - - Unspecified Cortex-R5 - - Unspecified Cortex-R6 - - Unspecified Cortex-R8 Cortex-R8 - Unspecified RX RX - Unspecified RV2 RISC-V - Unspecified RV32 RISC-V - Unspecified RV64 RISC-V - Unspecified RT5511 RT5511 -		Unspecified	Cortex-M33	Cortex-M33			
Unspecified Cortex+R5 - - Unspecified Cortex+R8 Cortex+R8 - - Unspecified RX RX - - Inspecified RX RISCV - - Inspecified RV32 RISCV - - Inspecified RV64 RISCV - -		Unspecified	Cortex-R4	Cortex-R4			
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Lash V Unspecified PV32 PISCV	cation	Unspecified	RISC-V	RISC-V		•	
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Linspecified BT5511 BT5511 · · · ·	inkam.	Unspecified	RV64	RISC-V		•	
		Unspecified	BT5511	BT5511	· .	. *	
					OK	Cancel	
OK Cancel							

图 3.3.4 J-Flash



	Select device				×	
	Manufacturer *	<u> </u>				
	Liga Manufaatura Hilso	Device	C	Elash size	BAM size [a]	
	Manuracturer Hillsc	ek	Lore	Flash size		
	Unspecified IDT		ABM0		· · · · ·	
	Unspecified Infine	eon	ARM9		· · · ·	
	Unspecified Itron		ARM11 Carbon AE		· · ·	
	Unspecified Mary	vell	Cortex A3	•		
	Unspecified Maxi	m 	Contex-A9			
	Unspecified Mior	al ek	Cortex-A9			
	Unspecified Micro	onas	Cortex-A12			
	Unspecified Micro	osemi	Cortex-A15			
	Unspecified Mind	Motion	Cortex-A17			
	Unspecified Note	lic Semi	Cortex-M0			
	Unspecified Nuv	oton	Cortex-M0			
	Unspecified NXP		Cortex-M1			
	Unspecified UKI	Service and asked	Cortex-M3		•	
	Unspecified Units	semiconductor	Cortex-M4	-	· ·	
	Unspecified Beal	tek	Cortex-M7	-	· ·	
	Unspecified Ben	esas V	Cortex-M23	-	•	
	Unspecified	Lortex-M33	Cortex-M33			
	Unspecified	Cortex-R4	Cortex-R4		· ·	
	Unspecified	Cortex-R5	Cortex-R5		· ·	
00	Unspecified	Cortex-R8	Cortex-R8			
.06	Unspecified	RX	RX	•	· [200
ication	Unspecified	RISC-V	RISC-V	•	· ·	
Tlash V	Unspecified	RV32	RISC-V	•	· ·	
LI IIV ALUIL	Unspecified	HV64	HISC-V		· •	
	Linsnecified	B15511	815511	· .	·	
				I UK	Cancel	

图 3.3.5 J-Flash

点击 Nordic Semi 后 选择 nRF52832_xxAA 芯片,并点击【OK】如图 3.3.6 所示

	Select device				×	
	Manufacturer Nord	ic Semi 💌				
	Manufacturer	Device	Core	Flash size	RAM size	
	Nordic Semi	nBF51422 xxAA	Cortex-M0	256 KB + 1 KB	16 KB	
	Nordic Semi	nBF51422_xxAB	Cortex-M0	128 KB + 1 KB	16 KB	
	Nordic Semi	nRF51422_xxAC	Cortex-M0	256 KB + 1 KB	32 KB	
	Nordic Semi	nRF51801_xxAB	Cortex-M0	192 KB + 1 KB	16 KB	
	Nordic Semi	nRF51802_xxAA	Cortex-M0	256 KB + 1 KB	16 KB	
	Nordic Semi	nRF51822_xxAA	Cortex-M0	256 KB + 1 KB	16 KB	
	Nordic Semi	nRF51822_xxAB	Cortex-M0	128 KB + 1 KB	16 KB	
	Nordic Semi	nRF51822_xxAC	Cortex-M0	256 KB + 1 KB	32 KB	
	Nordic Semi	nRF52810_xxAA	Cortex-M4	192 KB + 4 KB	24 KB	
	Nordio Somi	nRF52911_mAA	Corton M4	192 KB - 4 KB	24 KB	
	Nordic Semi	nRF52832_xxAA	Cortex-M4	512 KB + 4 KB	64 KB	
	Noraic Semi	NHF52832_XXAB	Cortex-M4	206 NB + 4 NB	32 NB	
	Nordic Semi	nHF5284U_xxAA	Lortex-M4	1024 KB + 4 KB	256 KB	
	Nordic Semi	NHF9160	Lortex-M33	1024 KB + 56 Bytes + 760 Bytes	256 KB	
OG						
cation						
Flash V						
inkARM.						
				OK	Cancel	

图 3.3.6 J-Flash





其他不用动,再次点击【OK】,如图 3.3.7 所示

J	SEGGE	R J-Flas	h V6.46				_	\times
File	Edit	View	Target	Options	Window	Help		
						Create New Project X Plec Targel Device Plec Little endian C Targel Interface SwD 4000		
								×
App.	licatio [−Flash [LinkAR	n log s 1 V6.46 M.dll V	tarted (J-Flash 6.46 (DL	compiled 1 L compiled	May 23 2019 May 23 201	17:50:48) 9 17:49:56)		~
<								>
List c	f MCU	device	s read si	uccessfully	(7002 Devi	ces)		

图 3.3.7 J-Flash

出现以下界面,如图 3.3.8 所示

🔜 SEGGER J-Fl	ash V6.46 - [new project *	1			-	_	×
File Edit View	v Target Options Wir	ndow Help					
Name Name Host connection Target interface Int SWD speed SWD speed MCU Core Endian Check core ID Use target RAM Flash memory Base address Flash size	Value Value USB [Device 0] SWD 4000 kHz 4000 kHz Value Value		SEGGER]			
Application log - J.Flash W6.4 - J.LinkARM.dll Creating new pr - New project	started G.J.F.Lash compiled May 2 V6.46 (DLL compiled May oject created successfully	23 2019 17:50:4 23 2019 17:49:	8) 56)				×
Ready							



图 3.3.8 J-Flash

nRF52832 需要下载两个 hex 文件, 分别是 ^① nrf52832_qfaa.hex (应用程序) 和

s132_nrf52_6.1.0_softdevice.hex

下面将介绍整个下载过程。

执行"File->Open data file"找到协议栈 hex 文件,或者将 hex 文件直接拖入 J-Flash 软件中

Name Value Host connection USB [Device 0] Target interface SWD Init SWD speed 4000 kHz SWD speed 4000 kHz SWD speed 4000 kHz Mordic Semi nRF5283 60030 Core Core Context44 Check core ID Yes (0x4BA00477) Use target AMM 64 K8 @ 0x2000000 Flash memory Internal bank 0 Base address 0x0 Flash size 516 KB @0000 2B 000000 Ø0000 2B 000000 Ø0000 2B 000000	_																
000E0 53 000F0 78 00100 A3 00110 A0	132_r 1 04 05 05 06 06 06 06 06 06 06 07 07 07 07 F0	rf52_6.	1.0_scc x1 4 4 9 9 9 9 9 1 0 0 0 0 0 0 0 0 0 0 0 0 0	ftdev \$ 5 08 05 06 06 06 06 06 06 07 07 85 85	vice.h	7 00 00 00 00 00 00 00 00 00 00 00 00 00	8 7D 9B 00 AF 27 4F 77 9F C7 EF 17 3F 67 8F 03 01	9 05 05 05 05 05 06 06 06 06 06 07 07 07 58 00	A 00 00 00 00 00 00 00 00 00 00 00 00 00	B 00 00 00 00 00 00 00 00 00 00 00 00 00	C C9 ØD B9 E1 Ø9 31 59 81 99 21 49 71 99 ØF 40	D 08 00 05 05 06 06 06 06 06 06 06 07 07 07 07 07 00 10	E 00 00 00 00 00 00 00 00 00 00 00 00 00	F 00 00 00 00 00 00 00 00 00 00 00 00 00	ASCII ;E. cm. +5. S1. (· · · · · · · · · · · · · · · · · · ·	 *
And to a And Application log started - J-Flash V0.46 (J-Flash compiled May 23 2019 17:50:48) - JinhARM all V6.46 (BLL compiled May 23 2019 17:49:56) Creating new project - New project created successfully Opening data file BD-Ubskrop(天殿00-4: 評約使用BSF按键 (2 - Data file opened successfully (150740 bytes, 2 ranges, 0 - Data file opened successfully (150740 bytes, 2 ranges, 0	CRC CRC . hex] CRC	A Of dat of dat	32_nrf a = 0x a = 0x	52_6. 9308F 9308F	1.0_ 1994, 1994,	soft CRC CRC	levic of f	za Ne.he Nile Nile	x] = 0x0 = 0x0	670 78271 78271	12 (AE9)	AO	99	DA	•	-	×

图 3.3.9 J-Flash

将 JLINK 插到目标板的下载口上(注:下载线最好不要超过 10cm,下载口的引脚要对应上,目标板必须上电),然后执行 "Target->Connect",若连接成功会显示的内容如图 3.3.10 所示

E SEGGER J-Fl.	ash V6.46 - [new project v Target Options W	*] indow Help																		_			×
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Name	Value	Address:	0x0			-	x1	x2	×4														
Host connection	USB [Device 0]	- ,				_			-									_					
	01-70	Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	ASCI	I			
Target interrace	4000 kHz	00000	30	04	00	20	E9	08	00	00	7D	05	00	00	C9	08	00	00					_
Thit SWD speed	4000 KHZ	00010	87	05	00	00	91	05	00	00	9B	05	00	00	00	00	00	00					
SWD speed	4000 KH2	00020	00	ØØ	ØЙ	ØЙ	ØЙ	ØØ	ØØ	ØØ	ØØ	ØØ	ØØ	ØЙ	ตก	Ø 9	ØØ	ØØ					
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Endian	Little	00040	C3	05	00	00	CD	05	00	00	D7	05	00	00	E1	05	00	00					
Check core ID	Vec (0v4PA00477)	00050	EB	05	00	00	F5	05	00	00	FF	05	00	00	09	06	00	00					
Lise target BAM	64 KB @ 0v20000000	00060	13	06	00	ØØ	1 D	06	00	00	27	06	00	00	31	86	00	00			,	1	
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Flash size	516 KB	00090	8B	06	00	00	95	06	00	00	9F	06	00	00	A9	06	00	00					
		ØØØAØ	B3	Ø6	ØЙ	ØЙ	BD	Ø6	ØЙ	ØЙ	67	Ø6	ØЙ	ØЙ	D1	Ø6	ØЙ	ØØ					
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normili fel fel					-		7																25
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- Connected su	ccesstully																						
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																							с
eady												C	Conn	ecte	d	Со	re Id	: 0x2	BA0147	77	Speed	l: 4000	kH

图 3.3.10 J-Flash

按键快捷键 F4 或者执行"Target->Manual Programming->Erase Chip"进行芯片擦除, 如图 3.3.11 所示,芯片擦除成功,点击确定

ile Edit View	/ Target Options V	Vindow	Help																	
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Name	Value		ddress:	0x0			_	x1	x2	×4										
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SWD speed	4000 kHz	00	0010	87	05	00	00	91	05	00	00	9B	05	00	00	00	00	00	00	
Circ opera	10001112	0	0020	00	00	00	00	00	00	00	00	00	00	00	00	ØD	09	00	00	
MCU	Nordic SeminRF5283	0	0030	A5	05	00	00	00	00	00	00	AF	05	00	00	B9	05	00	00	
Core	Cortex-M4	0	1040	C3	Ø5	ØØ	ЮЙ	CD	Ø5	ЮЙ	ЮЙ	D7	Ø5	ØØ	ØØ	E1	Ø5	ØØ	ØØ	
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Check core ID	Yes (0x4BA00477)		9020	ED	60	00	00	rə 4 b	80	00	99	rr on	80	00	00	07	80	00	00	
Use target HAM	64 KB @ 0x2000000	01	9060	13	ØР	66	99	10	ØР	99	00	27	øь	00	00	31	øь	99	99	
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												1	峭定			99	07	00	00	<i><</i>
															<u> </u>	ØF	00	1F	BD	
		0	0110	00	FØ	ΕØ	BB	1F	B5	6F	FØ	01	00	00	90	40	10	03	90	
		0	A1 9 M	ดว	90	R 1	90	40	DΩ	10	20	00	60	00	ЯD	49	MO	66	τa	n ;
		-																		
TREE LOG																				
- 129 sectors,	2 ranges, UxU - Ux7FFF poring floch programmin	ΥF, Ux10	001000 ·	- 0x1	0001	FFF														
- End of prepa	ring flash programming	rg																		
- Start of det	ermining dirty areas in	n flash	cache																	
- End of deter	mining dirty areas																			
- Start of era	uia not be measurea. sing chin																			
- End of erasi	ng chip																			
- Start of res	toring																			
- Ena of restor	ring ion completed successfu	11v = 0	omplete	d aft	er O	099	sec													

图 3.3.11 J-Flash

<mark>у</mark>сніст



按快捷键 F7 或者执行 "Target->Production Programming"进行烧写协议栈 hex, 如图 3.3.12 所示, hex 下载成功, 点击确定

🔜 SEGGER J-Flash V6.46 - [new project	*]																_		×	r
File Edit View Target Options W	indow Help																			
Project - new p 🗖 🔳 🕱	D:\Deskt	op\s132	_nrf52	2_6.1.0_s	oftde	evice.	hex												3	
Name Value	Address:	0x0		x1	<u>ж2</u>	×4														
Host connection USB [Device 0]	Address	01	2	3 4	5	6	7	8	9	Ĥ	B	С	D	E	F	ASCI	[-	-
Target interface SWD	00000	00 04	00	20 E	08	00	00	7D	05	00	00	C9	08	00	00			·		
SV J-Flash V6.46						Х	00	9B	Ø5	00	00	00	00	00	00	• • • • •			• • •	
м							90	010	92	90	00	D0 ND	05 05	00	00			• • • • •	••••	
Co Target erased programmed	and verified suc	cessfully	- Con	nleted a	fter		00	D7	05	00	00	E1	05	00	00					
Ch 2.789 sec	and vernied suc	cessiony	0011	ipieteu u			00	FF	05	00	00	09	06	00	00					
Us							00	27	06	00	00	31	06	00	00		· · · · '	· 1		
Fla						_	00	4F	06	00	00	59	06	00	00	;E	E0	9Y		
Ba				确	Ē		90	77	106 196	90	99	81	106 106	99	99	с г	n	<i>*</i>	•••	
FIA	оноон	103 00	שש	ומ שש	סש ו	- 00	00	C7	06	00	00	D1	06	00	00					
	000B0	DB 06	00	00 E	5 06	00	00	EF	06	00	00	F9	06	00	00					
	00000	03 07	00	00 01	07	00	00	17	07	00	00	21	07	00	00			!		
	000D0	2B Ø7	00	00 35	5 07	00	00	3F	07	00	00	49	07	00	00	+5	5	?1		
	000E0	53 07	00	00 51	07	00	00	67	07	00	00	71	07	00	00	S1	1	aa		
	000100	18 07	' 00 ' 00	00 8: 00 11	9 197 7 185	90 00	FØ	8F Ø3	07 F8	99 8 N	60 F8	97 97	97 00	1 F	BD	····			•••	
	00110	00 F0	EØ	BB 11	7 B5	6F	FØ	01	00	00	90	40	10	03	90			e		
	00100	ND 00	194	00 11	2 1269	10	20	00	20	99	ΩŊ	40	MO	99	DO		۱	; D	•	1
I.OG																			3 83	η
- Programming range 0x00020000 - 0x000	025FFF (6 Se	ctors, 2	4 KB)																,	~
 End of flash programming Flash programming performed for 1 responses 	ange (155648 bj	ytes)																		
- 0x0000 - 0x25FFF (38 Sectors, 152 H - Start of verifying flash	(B)																			
- End of verifying flash - Start of restoring																				
- End of restoring																				
- De-initialized successfully																				
- larget erased, programmed and verifi	ied successful.	Ly - Com	piete	d after	2. 789	sec														-
<																			> .	.:
Ready									C	onne	ected	I	Cor	e Id	: 0x2	BA0147	7 Si	oeed: 4	000 kH	

图 3.3.12 J-Flash

执行"File->Open data file"找到应用程序 hex 文件,或者将 hex 文件直接拖入 J-Flash 软件中,如图 3.3.13 所示。

SEGGER J-FI	ash V6.46 - [new project	*]																	- 🗆	×
Name Host connection	w p D D Z Value USB [Device 0]	D:\Deskt Address:	op\n 0x260	rf528 100 1	332_d	qfaa. 3	hex x <u>1</u> 4	×2 5	× <u>4</u>	7	8	9	A	B	С	D	E	F	ASCII	×
Target interface Init SWD speed SWD speed	SWD 4000 kHz 4000 kHz	26000 26010	58 E9	60 63	00 02	20 00	DD EB	63 63	02 02	00 00	E5 ED	63 63	02 02	00 00	E7 00	63 00	02 00	00 00	X'ccc	
MCU Core	Nordic SeminRF5283 Cortex-M4	26020	90 F1 93	63 7B	00 02 02	00 00	00 60 F7	00 63	00 00 02	00 00	66 F3 87	63 87	00 02 02	00 00	EF E7 AB	81 81	02 02 02	00 00		
Endian Check core ID Use target RAM	Little Yes (0x4BA00477) 64 KB @ 0x20000000	26050 26060	C3 F7	81 63	02 02	00 00	F7 77	63 85	02 02	00 00	31 91	72 85	02 02	00 00	43 D9	7F 7E	02 02	00 00	C1rCo .cw~	
Flash memory Base address	Internal bank 0 0x0	26070 26080 26090	F7 F7 D7	63 63 81	02 02 02	00 00 00	F7 ED F7	63 7E 63	02 02 02	00 00 00	F7 F7 DF	63 63 81	02 02 02	00 00 00	F7 F7 F7	63 63 63	02 02 02	00 00 00	.ccc	
Flash size	516 KB	260A0 260B0	F7 F7	63 63	02 02 02	00 00	F7 F7	63 63	02 02 02	00 00	AB 00	85 00	02 02 00	00 00	F7 00	63 00	02 00	00 00	.cc	
		260C0 260D0	F7 2F	63 7F	02 02	00 00	F7 F7	63 63	02 02	00 00	F7 F7	63 63	02 02	00 00	F7 00	63 00	02 00	00 00	.ccc /dcc	
		260E0 260F0 26100	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00	00 00 00		
		26110	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00	00 00		•

图 3.3.13 J-Flash

按快捷键 F7 或者执行 "Target->Production Programming"进行烧写应用程序 hex, 如图

3.3.12 所示, hex 下载成功, 点击确定

然后按快捷键 F9 或者执行 "Target->Manual Programming->Start Application" 运行烧 写的程序。

关闭 J-Flash 时,会提示是否保存当前工程,这里我们可以保存本次配置的工程,这样,下 次使用的时候,在欢迎界面直接打开保存的工程就可以了,而不用再次配置工程。

3.4 配置

更新完固件后,还需要使用 AT 命令对 UWB 设备的速率、信道、地址进行配置,模块方可正常使用。具体操作见各个 UWB 设备的用户手册 AT 指令配置方法。

4 Keil 下载程序

4.1 开发软件

需要用到两个软件,分别为 Keil5 安装软件 mdk520 与注册机 Keygen。请注意,企业用户 请购买正版 Keil 软件,如因使用 Keygen 而造成法律纠纷,本公司不承担任何后果。

4.2 安装 KEIL 5

Setup MDK-ARM V5.20	>
Welcome to Keil MDK-ARM Release 5/2016	ARM [®] KEIL [®] Microcontroller Tools
This SETUP program installs: MDK-ARM V5.20 This SETUP program may be used to update a previous product installation. However, you should make a backup copy before proceeding.	
It is recommended that you exit all Windows programs before continuing with SETUP. Follow the instructions to complete the product installation.	

图 4.2.1 mdk520 安装启动界面

将 I agree to all terms of the preceding License Agreement 勾起来, 点击 Next;

etup MDK-ARM V5.20	
License Agreement Please read the following license agreement carefully.	ARM [®] KEIL [®] Microcontroller Tools
To continue with SETUP, you must accept the terms of the License Agreement. To accept	the agreement, click the check box below.
END USER LICENCE AGREEMENT FOR MDK-ARM THIS END USER LICENCE AGREEMENT ("LICENCE") IS A LEC YOU (EITHER A SINGLE INDIVIDUAL, OR SINGLE LEGAL ENTIT FOR THE USE OF THE SOFTWARE ACCOMPANYING THI WILLING TO LICENSE THE SOFTWARE TO YOU ON CONDIT OF THE TERMS IN THIS LICENCE. BY CLICKING "I AGRE OTHERWISE USING OR COPYING THE SOFTWARE YOU IND BE BOUND BY ALL OF THE TERMS OF THIS LICENCE. IF YO	AL AGREEMENT BETWEEN Y) AND ARM LIMITED ("ARM") S LICENCE. ARM IS ONLY ION THAT YOU ACCEPT ALL E" OR BY INSTALLING OR ICATE THAT YOU AGREE TO DU DO NOT AGREE TO THE
Keil MDK-ARM Setup	ack Next>> Cancel

图 4.2.2 mdk520 License Agreement 界面

选择合适的安装路径,对 Keil5 进行安装,如无特殊需求,按默认路径安装。

older Sele	e tion e felder where SETUR will install files	ARI	M [®] KEIL		
Select the	e folder where SETUP will install files.	Microcor	Microcontroller Tools		
Dence Wien		1994			
Press Nex	It to install MUN-AHM to these folders. Press Browse to select	dirrerent rolders for installation.			
Destinat	ion Folders		1		
Core:	C:\Keil_v5	E	Browse		
Pack:	C:\Keil v5\ARM\PACK	E	Browse		
Pack:	C:\Keil_v5\ARM\PACK	E	Browse		
Pack:	C.\KeiLv5\ARM\PACK	E	Browse		
Pack:	C:\KeiLv5\ARM\PACK		Browse		
Pack:	C:\KeiLv5\ARM\PACK	3	3rowse		
Pack:	C.\KeiLv5\ARM\PACK	3	Browse		

图 4.2.3 mdk520 选择安装路径

填入个人信息,该处可随意填写,不需要填写真实信息;

усніст

Setup MDK-ARM V5	20		:
Customer Information Please enter your info	mation.		ARM°KEIL° Microcontroller Tools
Please enter your name	, the name of the company for whom you work and your E	-mail address.	
First Name:			
Last Name:	linlingpeng@live.cn		
Company Name:			
E-mail:			
— Keil MDK-ARM Setup			
		<< Back	Next>>> Cancel

图 4.2.4 mdk520 信息填写界面

直到完成,桌面生成 Keil 快捷方式图标,且自动弹出 Pack 的安装提示;



图 3.2.5 Pack Installer 图

4.3 KEIL 5 Pack 安装

点击 OK,进入包安装界面 (如果没有弹出,请在菜单 🕮 点击)。

File	Edit	View	Project	Flash	Debug	Peripherals	Tools	SVCS	Window	Help	
	<u> </u>		X 🖻 🕻	10	$\ominus 9$		19 19		//= //_R	GetRecSwtich	[]
٩		i 🧼 i		TREK10	00	~ 🕺	📥 🗟 🖣	¢ 🔶 ف	<u>8</u>		

图 4.3.1 Keil 5 菜单栏

在 Pack 一栏,列出了所有单片机的类型,每种单片机的右边都有一个 Install 按钮,要开发 哪种单片机,就点击对应的 Install,会自动安装相应的包。设备硬件采用的单片机,如下表 所示,选择相应的型号。以 STM32F103T8U6 为例,必须下载的工程包有:

YCHIOT



ARM::CMSIS Keil::ARM_Complier Keil::MDK-Middleware Keil::STM32F1xx DFP

表 4.3.1 不同 UWB 设备核心主控单片机一览

型号	主控单片机
Mini3	STM32F103T8U6
Mini3s	STM32F103T8U6
Mini3sPlus	STM32F103T8U6
Mini4sPlus	STM32F103T8U6
Mini4	STM32F103RCT6
MINI5	STM32G070RBT6
基站 PROANC (STM32)	STM32F103RCT6
标签 PROCARD (NRF52832)	NRF52832
标签 PROTAG (NRF52832)	NRF52832
标签 PROTAG(STM32)	STM32F103T8U6

Pack Inc	taller - D'\ Program Files\ Keil5\	ARMADACK					~
Cite De elus	Mindaw, Usla	ANNUACK					`
Pile Packs	window Help	1978					
C Device	e; shinici delectronica - shiniszi ro	3310					
I Devi	ices Boards		4	Packs Examples			
Search:	- ×			Pack	Action	Description	
Device		∕ Summary		Device Specific	2 Packs	STM32F103T8 selected	*
	STM32F103R4	ARM Cortex-M3, 72 MHz, 6 kB RAM, 16 kB ROM	^	Heil::STM32F1xx_DFP	Up to d	STMicroelectronics STM32F1 Series Device Support, Drivers and Ex	a
	STM32F103R6	ARM Cortex-M3, 72 MHz, 10 kB RAM, 32 kB ROM		Keil::STM32NUCLEO_BSP	Up to d	STMicroelectronics Nucleo Boards Support and Examples	
	STM32F103R8	ARM Cortex-M3, 72 MHz, 20 kB RAM, 64 kB ROM		⊟ Generic	20 Packs		
	STM32F103RB	ARM Cortex-M3, 72 MHz, 20 kB RAM, 128 kB ROM		ARM::CMSIS	Up to d.	CMSIS (Cortex Microcontroller Software Interface Standard)	
	STM32F103RC	ARM Cortex-M3, 72 MHz, 48 kB RAM, 256 kB ROM		ARM::CMSIS-Driver_Validation	Install	CMSIS-Driver Validation	
	STM32F103RD	ARM Cortex-M3, 72 MHz, 64 kB RAM, 384 kB ROM		ARM::CMSIS-FreeRTOS		Bundle of FreeRTOS for Cortex-M and Cortex-A	
	STM32F103RE	ARM Cortex-M3, 72 MHz, 64 kB RAM, 512 kB ROM		ARM::CMSIS-RTOS_Validation	Install	CMSIS-RTOS Validation	
	STM32F103RF	ARM Cortex-M3, 72 MHz, 96 kB RAM, 768 kB ROM		⊕ ARM:mbedClient	Install	ARM mbed Client for Cortex-M devices	
	STM32F103RG	ARM Cortex-M3, 72 MHz, 96 kB RAM, 1 MB ROM		■ ARM::mbedTLS	Install	ARM mbed Cryptographic and SSL/TLS library for Cortex-M device	s
	STM32F103T4	ARM Cortex-M3, 72 MHz, 6 kB RAM, 16 kB ROM		ARM::minar	Install	mbed OS Scheduler for Cortex-M devices	
	STM32F103T6	ARM Cortex-M3, 72 MHz, 10 kB RAM, 32 kB ROM		⊕ Huawei::LiteOS	Install	Huawei LiteOS kernel Software Pack	
	STM32E103T8	ABM Cortex-M3, 72 MHz, 20 kB BAM, 64 kB BOM		B-Keil::ARM_Compiler	Up to d	Keil ARM Compiler extensions for ARM Compiler 5 and ARM Comp)i
	STM32E103TB	ARM Cortex-M3, 72 MHz, 20 kB RAM, 128 kB ROM		■ Keil:Jansson	Install	Jansson is a C library for encoding, decoding and manipulating JSC	л –
	STM32F103V8	ARM Cortex-M3, 72 MHz, 20 kB RAM, 64 kB ROM		B Keil:MDK-Middleware	Up to d	Middleware for Keil MDK-Professional and MDK-Plus	
	STM32E103VB	ABM Cortex-M3, 72 MHz, 20 kB RAM, 128 kB ROM			Up to d	IwIP is a light-weight implementation of the TCP/IP protocol suite	_
	STM32E103VC	ARM Cortex-M3, 72 MHz, 48 kB RAM, 256 kB ROM		■ Micrium::RTOS	Install	Micrium software components	
	STM32E103VD	ARM Cortex-M3, 72 MHz, 64 kB RAM, 384 kB ROM		Oryx-Embedded::Middleware	Install	Middleware Package (CycloneTCP, CycloneSSL and CycloneCrypto)	
	STM32E103VE	ARM Cortex-M3 72 MHz 64 kB RAM 512 kB ROM		RealTimeLogic::SharkSSL-Lite	Install	SharkSSL-Lite is a super small and super fast pre-compiled SharkSS	d.
	STM32E103VE	ARM Cortex-M3, 72 MHz, 96 kB RAM, 768 kB ROM		■-RealTimeLogic::SMQ	Install	Simple Message Queues (SMQ) is an easy to use IoT publish subscr	il –
	STM32E103VG	ARM Cortex-M3, 72 MHz, 96 kB RAM, 1 MB ROM		wolfSSL::CyaSSL	Deprec	Light weight SSL/TLS and Crypt Library for Embedded Systems	-
	CT 100510070		•			<u>)</u>	
Output							a ×
Refresh Pack o	descriptions						
Update availal Update availal	ble for Keil::STM32F3xx_DFP (insta ble for Keil::STM32F4xx_DFP (insta	illed: 1.3.0, available: 1.4.0) illed: 2.9.0, available: 2.11.0)					
Ready						ONUME	-
Neavy						ONLINE	- 1

图 4.3.2 固件库安装选型

由于 Keil 服务在国外,部分铁通、网通的用户无法正常更新 Pack Device,可以选择手动安装,找到要开发的单片机型号,Summary 栏就会出现蓝色的字,单击会自动链接到下载网



页。点击 DownLoad 按钮即可下载,双击下载的 Keil.STM32F1xx_DFP.2.1.0,启动安装,与之前的自动安装效果相同。

воокs Links	and nome audio equipment LCD parallel Interface, 8080/6800 modes - 5 V-tolerant I/Os - Timer with quadrature (incremental)	
Contact Information	encoder input - 96-bit unique ID	Device Family Pack
Corporate	Core ARM Cortex-M3, 72 MHz	Support for this device is contained in:
Sales Channels Distributors	Memory 20 kB RAM, 64 kB ROM	STMicroelectronics STM32F1 Series Device Support, Drivers and Examples
	Clock & Power 2.00 V 3.60 V, 72 MHz	
	Communication SPI, I2C, CAN, USART, USB, Device	👱 Download
	Timer/Counter/PWM 4 x 16-bit Timer	
	图 4.3.3 手动安装 Device Pack	

4.4 Keygen 破解

请注意,企业用户请购买正版 Keil 软件,如因使用 Keygen 而造成法律纠纷,本公司不承担 任何后果!!! 以管理员身份打开 Keil5,打开 License Management。

Ws	C:\Users\linli\Desktop\sw_	Mini3s\Mir	ii3s_f103_V1.8_dma_plus_vcp\Nano_f103_V1.8_dma_plus_vcp\USER\SF
File	Edit View Project Flas	h Debug	Peripherals Tools SVCS Window Help
	New	Ctrl+N	📔 隆 🏗 🔃 🎼 🏥 🎼 🎼 🏙 GetRecSwtich 🛛 🖂 🕫
6	Open	Ctrl+O	🗸 🔊 🛔 🗟 🔶 🐡 🌚
	Close		main.c
	Save	Ctrl+S	465
	Save As		466
9	Save All		467 -
	Device Database		468 Display_SwitchInfo(temp_switch); 469 slswitch = Transfer_Byte(temp_switch & 0x7f
	License Management		470 printf(slswitch=%02x\r\n,slswitch); 471 port DispleEVT IE0(): //disple ScenSor IE
	Print Setup		472 led_off(LED_ALL);
3	Print Print Proview	Ctrl+P	474 if (inittestapplication(slswitch) == (uint32
	THILTEVIEW		476 1ed on (IRD AIL) · //to dignlaw error

图 4.4.1 打开 License Management

License Management					
Single-User License Floating License Floating License Administrator FlexLM License	1				
Customer Information	- I				
Name: CID: CHLLI-RAWV8					
Company: Get LIC via Internet	- I				
Email:	-				

图 4.4.2 License Management 界面

将 CID 复制出来,打开破解文件, 🔽 Keil_ARM_MDK_5.00_Keygen_serial_Crack _, 点击 Generate, 产 生一个 Keygen,

🗲 Keil Generic Keygen - EDGE	X
Keil Embedded Horkbench	
CID: CHLLI-RAWV8 Target ARM	
ATTTG-VC0DN-12BLE-5FS33-8EHBS-C3HY1 Generate Exit	

图 4.4.3 注册机使用方法截图

将得到的 Keygen,填入 Keil 的 LIC 中,点击 Add LIC,破解成功。

New License ID Code (LIC):	Add LIC Uninstall
	^
	\checkmark
Close	Help

4.5 打开工程

在 Project->MDK 文件夹下, 打开工程 Project, 界面如下如图所示。

ᢣ үсніот

C:\Users\linli\Desktop\sw_Mini3	s\Mini3s_f103_V1.8_dma_plus_vcp\Nano_f103_V1.8_dma_plus_vcp\USER\SPI.uvprojx - 礦ision			- 🗆	\times
File Edit View Project Flash De	bug Peripherals Tools SVCS Window Help				
n 🖻 🖬 🍠 🐰 🖻 🛍 🤊 🤊	← → 陀 🐘 🐘 🕸 淳 淳 /// //// 🞯 GetRecSwtich 🛛 🔽 🗟 🎤 🍭 ● ○ 🔗 🧶 🔤 🔹	*			
😻 🕮 📾 🥏 📖 🛱 TREK1000	🗸 🔊 📥 🖶 🔶 🗇 🍘				
Project 📮 🗵	main.c				▼ ×
Project SPI TREK1000 Diaplication decadriver platform deca.spic deca.wutexc deca.spic deca.spic device_info.c USER USER USERUID SYSTEM delay.c Sys.c usartc delay.c Sys.c usartc delay.c Sys.c usartc CMSIS USER USER USERUID Sys.c Sys.c	<pre>1 finelade "led.h" 2 finelade "delsy.h" 3 finelade "sys.h" 4 finelade "usart.h" 5 finelade "usart.h" 6 finelade "usart.h" 7 finelade "port.h" 8 finelade "instance.h" 9 finelade "port.h" 1 finelade "syst.h" 10 finelade "device_info.h" 11 finelade "device_info.h" 12 finelade "device_info.h" 13 finelade "device_info.h" 14 finelade "device_info.h" 15 finelade "hw_config.h" 16 17 fidefine SWSI_SHF_MODE 0x02 //short frame mode (6.81M) 18 fidefine SWSI_SHF_MODE 0x03 //achor mode 19 fidefine SWSI_SALMC_MODE 0x03 //achor.tag address Al 21 fidefine SWSI_AA_MODE 0x03 //achor.tag address Al 22 fidefine SWSI_AA_MODE 0x03 //achor.tag address Al 23 fidefine SWSI_SHEPLONDE 0x73 //USB to SPI mode 24 fidefine SWSI_SHEPLONDE 0x73 //USB to SPI mode 25 fidefine SWSI_SHEPLONDE 0x73 //USB to SPI mode 26 file SWSI_SHEPLONDE 0x73 //USB to SPI mode 27 //ISA507812345678' 28 fidefine SWSI_WEPLONE SUS3 //Continuous TX spectrum mode 26 //1234567812345678' 28 fidefine SWSI_WEPLONE SUS3 //OST 1000 Ver. 2.10 TREK* //16 bytes! 29 junt8 slswitch = 0; 20 junt8 slswitch = 0; 21 junt8 slswitch = 0; 22 junt8 slswitch = 0; 23 junt8 slswitch = 0; 24 junt8 slswitch = 0; 25 junt8 slswitch = 0; 26 junt8 slswitch = 0; 27 junt8 slswitch = 0; 28 junt8 slswitch = 0; 29 junt8 slswitch = 0; 20 junt8 slswitch = 0; 20 junt8 slswitch = 0; 20 junt8 slswitch = 0; 21 junt8 slswitch = 0; 23 junt8 slswitch = 0; 24 junt8 slswitch = 0; 25 junt8 slswitch = 0; 26 junt8 slswitch = 0; 27 junt8 slswitch = 0; 28 junt8 slswitch = 0; 29 junt8 slswitch = 0; 20 junt8 slswitch = 0; 20 junt8 slswitch = 0; 20 junt8 slswitch = 0; 21</pre>				^ ``
Build Output					ф <u>×</u>
<					~
		ST-Link Debugger	L:491 C:4 CAI	NUM SCRL OVR	R/W
		55			

图 4.5 开发工程文件界面

4.6 编译与下载

在 Target->Debug 中选择下载器为 ST-LINK Debugger,设置硬件仿真为 ST-Link,点击 Settings, SWD 下载方式,速度为 4M。

Device Target Output Listing User C/C++ Asm Linker	Debug Utilities
O Use Simulator with restrictions Settings	● Use: ST-Link Debugger Settings
Limit Speed to Real-Time	ULINK Pro Cortex Debugger
✓ Load Application at Startup ✓ Run to main()	✓ Load A J-LINK / J-TRACE Cortex Fast Models Debugger Cortex-M main()
Initialization File:	Initializatio ST-Link Debugger
Edit	PEMicro Debugger NULink Debugger Edit

图 4.6.1 下载器设置







5 文档管理信息表

主题	研创物联产品固件更新
版本	V1.1
参考文档	 [1] IEEE802.15.4-2011 or "IEEE Std 802.15.4[™]-2011" (Revision of IEEE Std 802.15.4-2006). IEEE Standard for Local and metropolitan area networks - Part 15.4: Low-Rate Wireless Personal Area Networks (LRWPANs). IEEE Computer Society Sponsored by the LAN/MAN Standards Committee. Available from http://standards.ieee.org/ [2] Qorvo DW3000 Datasheet www.Qorvo.com [3] Qorvo DW3000 User Manual www.Qorvo.com [4] Partron (Now manufactured by Abracon) Dielectric Chip
	Antenna, P/N ACS5200HFAUWB (Now ACA-107-T),
创建时间	2018/06/01
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更改人	日期	文档变更纪录
Lynn	2018-06-01	<u>V1.0</u>
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Lynn	2023-01-01	<u>V1.1</u>
		新增 Mini4/Mini5/PROANC 等多款开发板固件升级方法
		修改格式,研创 23 年全新文档视觉