昇润 CC2640 SDK 应用入门教程二

如何使用昇润 SDK 工具实现简单的蓝牙控制

通过上次的演示说明,相信大家对蓝牙的开发环境及 CC2640 SDK 开发套件已基本熟悉。 那么,这次我们教大家如何使用昇润 SDK 工具实现简单的蓝牙控制,通过 APP 实现 LED 的开、 关和闪烁。

首先上图,目标板:



如上图示,利用开发套件中的HY-264022V1 开发目标板:

1: 接好JTAG调试电缆,请注意方向;

2: 把LED D1的跳线帽接上,该LED是通过DIO0来控制;

3: 外部供电电源的负极接上;

4: 外部供电电源的 1.8 V-3.6 V 电源正极接上;

注: HY-264022V1的原理图在安装好的SDK的说明文档中,如下图所示:

名称	^	修改日期	类型	大小
IC及天线封装者	考	2017/1/20 星期	文件夹	
TI 参考资料		2017/1/20 星期	文件夹	
📓 AndroidBLE_A	。PI使用说明V1.0.pdf	2017/1/17 星期	Foxit Reader PD	871 KE
📓 HY-264022 V	原理图.pdf	2017/1/19 星期	Foxit Reader PD	49 KE
📓 ios ble_api 🕼	吏用说明V1.1.pdf	2017/1/17 星期	Foxit Reader PD	1,013 KE
📓 TTC BLE SDK	CC2640部分硬件特性测试_V1.0.pdf	2017/1/17 星期	Foxit Reader PD	784 KE
📓 TTC SDK_RTC	S简介_V1.0.pdf	2017/1/17 星期	Foxit Reader PD	791 KE
📓 TTC SDK说明_	V1.7.pdf	2017/1/18 星期	Foxit Reader PD	4,090 KE
TTC XDS110	/1.2.pdf	2017/1/17 星期	Foxit Reader PD	791 KB

连接上 TTC XDS110 也就是HY-1 2 9 4 0 0:



打开 IAR ARM 7.7 ,再打开程SDK的从机工程:

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打开工程后,还是先编译蓝牙协议栈,并下载OK!再选择应用的工程1,打开我们将要改

写的 TTCBlePeripheralTask.c 2



改写之前,我们先验证手机与蓝牙模块之前能进行正常的数据传输:先编译蓝牙应用程序、 将程式下载至目标板、全速运行,或是取掉调试器,断开外接电源,重新上电,我们回顾一 下上次的蓝牙联线过程,并验证数发送接收,SDK刚安装好后,原始默认是接收到任何数 据,均返回;

首先打开APP:



扫描,并选择要联线的设备;

提示联接设备;

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关于	使用说明	行	使用说明	自	定义	数传	模组设置

联线成功后,我们在APP中选择:数传,发送1234567890,此时可经看到RX 也会显示1234567890,证实发任何数据,模块会将数据回传回来!

刚才打开的文件中的函数如下:



如果把这条屏蔽掉,就不会回传数据,可以测试看看:



通过修正以下这二个参数,我们可以来控制蓝牙的联线间隔,参数与计算方式大家可以参考注释:

📽 SimpleBLEPeripheral - IAR Embedded Workbench IDI	- ARM 7.70.1 — 🗇 🗡
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DEFAULT_DESIRED_MIN_CONN_INTERVAL

最小连接间隔(单位为 1.25ms, 例如 80 = 100ms), 该参数在蓝牙参数更新使能的情况下 生效

DEFAULT_DESIRED_MAX_CONN_INTERVAL

最大连接间隔(单位为 1.25ms, 例如 800 = 1000ms), 该参数在蓝牙参数更新使能的情况 下生效

连接间隔最大值与最小值之间的差值,依苹果手机的规定,必须大于21,苹果一般情况 下均是选择最大值;因此现在的联线间隔是:80 x1.25 = 100 m S; SDK默认关闭软件加密, 因此每次最大通讯长度是20字节;

为什么将这二个参数更新就会有效呢? 大家可以看一下这里:

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工程在蓝牙初始化时就是.updateParEnable = TRUE, "参数更新使能"

经过上面的验证,我们开始来打开GPIO,通过接收数据来控制IO的状态,我们先找到项

目的可选项:

💥 SimpleBLEPeripheral - IAR Embedded We	orkbench IDE - ARM 7.70.1			- 0 ×
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再打开可选项:

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- 1、先选择 c++ compiler 编译选项;
- 2、再先择 preprocessor 预处理设置;
- 3、找到SDK写好的GPIO宏定议开关项

Category		
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- 4: 我们打开GPIO的宏定议;
- 5:确认OK

我们再编译一下:

🔀 SimpleBLEPeripheral - IAR Embedded Workbench IDE - ARM 7.70.1

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* Messages

进去找到GPIO的初始化部分:

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进入这个函数所在的文档 TTCDriverGPIODemo.c 1步,将下面的全部屏蔽掉 2步:

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lorkspace	TTCBlePeripheralTask.c ICal_startup.c main.c TTCDriverGPI0Demo.c*		f0 💌
FlashROM ~	#include <ti knl="" queue.h="" sysbios=""></ti>		
Files 🔅 📴 🔨	#include (ti/drivers/PIN.h) #include (ti/drivers/pin/PINCC26XX.h)		
CC2540App - ElectrROM	#include "TTCSDKBoard h"		
Analisation V	#include TTUBLeSDRUontig.h		
B Cimele D E Deviehere IT 1981	#include "TTCDriverGPIODemo.h"	1	
TCPIeDevieherelTeek e		1	
TODIa Daviak ava (Task, c	○ /************************************		
I I ColePerpriera i ask.n	· · · · ·		
	static PIN_Handle ioTestHandle;	//0P105/牌句树	
util.n	statie file_state infestistate.		
- Board	//PIN Config iolestoomigi		
	2		
	//static Clock_Struct keyChangeClock;	//定时任务	
- El Clude	//static keysfressedCB t appKeyChangeHandler = NULL;	// *C#	
- PROFILES			
- 🖽 🗀 Startup	/////////////////////////////////////		
-III COLS	1/ 8/		
	//static void TTCDrierDemoIOIsrCallback(PIN_Handle handle, PIN_Id pinId);		
- ITCDriverSPIFlash	//static void IIUSriverDemolOChangeUlockHandler(VArg aU);		
- CDriverSPISRAM		*****	
CC2640SDK_V1.0.7.a	// [4] #] TTCDriverDemoIOInit(keysPressedCB_t appKeyCB) // 1.86 if 1 = TTCDriverDemoIOInit(keysPressedCB_t appKeyCB)		
- STCBeacon.h	//IADSTI ennKeyCB		
- STCBleCentralProcess.h	//[isaby] ž		
- STCBleDevInfoService.h	//【祝 明】 本語指配置1010 9为物出口,配置1010 1为细人口且具备于明初院 // 1010 1444年一次,1010 96并未清释经一次。		
- N TTCBlePeripheral.h	//*************************************	******/	
- S TTCBlePeripheralProcess.h	//void TTCDriverDemoIOInit(keysPressedCB_t eppKeyCB) (
- STCBleProfile.h	// arr = TTCDriverIO(nen(&iclestMendle &iclestState (const PIN Confir #))	inPestConfig)	
- STCBleSDKConfig.h			
- STTCBleSDKManager.h	// if(err /= MANAGER_IMPO_REQUEST_IO_SUCCESS)(//一个10组打开院功 现在这个组里没有10	◆ 五榮拼音 ●
			AL O 20 D
Overview BIM_extflash CC2640App CC2640Stack		Brite des 1	
Massages			~
(Wessages			×
<			>

PIN_Config ioTestConfig[] = {

IOID_0 | PIN_GPIO_OUTPUT_EN | PIN_INPUT_DIS | PIN_GPIO_HIGH,

PIN_TERMINATE

};

在 I O 配置中将, IOID_0 配置为输出态,并输出为高电平,即关闭 L E D;原理如下:



利用SDK GPIO演示代码,我们修改一下:

SimpleBLEPeripheral - IAR Embedded Workbench IDE - ARM 7.70.1 File Edit View Project TI XDS Tools Window Help

D 📂 🖬 🕼 🕌 🐰 🗈 🛍 🗠 🖂	-> - / -> > >
Workspace ×	TTCBlePeripheralTask.c ICall_startup.c main.c TTCDriverGPI0Demo.c *
FlashR0M ~	//1入口参数1 极键码 //1返回参数1 无
Files 2: 0% Application ····································	<pre>//def Milesting Action of the provide stand of the provide action of the provide action of the provide action of the provide action of the provided action</pre>

- 【函 数】 TTCDriverDemoIOInit(keysPressedCB_t appKeyCB)
- 【概 述】 TTCDriver 驱动初始化
- 【入口参数】 appKeyCB
- 【返回参数】 无
- 【说 明】 本函数配置 IOID_0 为输出口

void TTCDriverDemoIOInit(keysPressedCB_t appKeyCB) {

TTCBleSDKManagerInfo_t err;

```
err = TTCDriverIOOpen(&ioTestHandle,&ioTestState,(const PIN_Config
```

```
*)ioTestConfig);
```

```
if(err != MANAGER_INFO_REQUEST_IO_SUCCESS) {
```

```
asm("nop");
```

return;

```
}
```

}

【概 述】 用户的按键处理函数

【入口参数】 按键码

【返回参数】 无

【说 明】 无

void KeyPressHandler(u8 keys) {

if(keys & 0x01) { //取反 IOID_0 脚的状态

TTCDriverIOSetOutputVaule(&ioTestHandle, IOID_0, !TTCDriverIOGetOutputValue(IOID_

0));

}

}

在从机线程文件中,我们把GPIO的初设定改一下:

💥 SimpleBLEPeripheral - IAR Embedded Workbench IDE - ARM 7.70.1			
File Edit View Project TI XDS Tools Window Help			
Workspace	TTCBlePeripheralTask.c ICal_startup.c main.c TTCDriverGPIODemo.c		
FlashROM	·		
Files & B	I ITCSDKDriverInit(void)		
E CC2640App - ElechROM	A IICUriver%20/00/00/27/00		
Application			
日本 国 SimpleBI EPerinheral工程配要			

	static void TTCSDKDriverInit(void) {		
	#ifdef TTCDRIVER ADC		
	Will- C TOPPIUS ICC		
- Board			
He Drivers	# #ifdef TTCDRIVER SPI		
- 🖽 🗀 ICaliBLE	# #ifdef TTCDRIVER TIMER		
- Include			
	Hifdet TTCDRIVER UART		
🗕 🕀 🗀 Startup	#ifdef TTCDRIVER UTC		
HE TOOLS	S HILLS HODAVER DIG		
	#ifdef TTCDRIVER_GPIO		
Here in TTCDriverSPIFlash	// TTCDriverDemoIOInit(KeyPressHandler);		
- ITCDriverSPISRAM	TTCDriverDemoIOInit(NULL);	/	
CC2640SDK_V1.0.7.a	- Wendif	TTCDRIVER_GP10	
TTCBeacon.h	Hifdef TTCRIR WRCHAT		
TTCBleCentralProcess.h	TIChriverDemoWechatInit(%TTCB]ePerinheralTaskCls.%sem.%annWsgQueue.%selfEntity	z) ·	
TTCBleDevInfoService.h	- #endif	TTCBLE WECHAT	
TTCBlePeripheral.h		_	
TTCBlePeripheralProcess.h			
I I I II II CBleProtile.h			
Overview BIM_extflash CC2640App CC2640Stack	S MA STA LILDIHEHEIDDHEALLASKEZUUNATE AU. UATE AL)		
All Moreager			

再打开一个事件:

🔀 SimpleBLEPeripheral - IAR Embedded Workbench IDE -	ARM 7.70.1	– 0 ×
File Edit View Project TI XDS Tools Window He		
Workspace		TTCBlePeripheralTaskInit() 💌 🗙
FlashROM	Incerempneral task.c Inclusion Inclusion	
FashBOM 北 Files た: 時。 日 C2254UApp - FlashROM 日 SimpleBLEPeripheral工程発表 日 SimpleBLEPeripheralTask.c 日 TC3lePeripheralTask.c 日 Julih 日 Orivers 日 Call L 日	<pre>[a k] TTCBleParipheralTaskInit(void) [k] k] k[*******************************</pre>	// 約/控制意从列 //注册AIT每件和IT回应终定 //注册AIT每次 //注册公用函数 //初始化外设管理 //初始化SensarColler //开放OUT程序用 //利始化值开起量
CC2640SDK_V1.0.7.a	#ifdef IMAGE INVALIDATE #ifdef FEATURE OAD	//片内OAD升级使用 //片外OAD升级使用
TCBleCentralProcess.h TCBleDevthoService.h TCBleDevthoService.h TCBleDevthoService.h TCBlePertipheralProcess.h TCBlePertipheralProcess.h TCBlePatibleCollect.h Verview BM_extRath CC2640App CC2640Stack	TTCSDKDriverInit(); [TTCSdkSetEvent(sem, &demoEvents, 0x01); //打开一个事件	//驱动示例初始化
Messages TTCDriverGPIODemo.c Linking Constant POID Derink and American Disk DOM and g < Edit Ambiguous Definitions Find in Files Declarations Debug Lo Build Ambiguous Definitions Find in Files Declarations Debug Lo) References	★ 五梁拼画 ● 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Ready	Errors 0, Warnings 0 Ln 425, Col 5	Chinese Simplified (GB2312)

要把这个变量放出来,测试一下:

💥 SimpleBLEPeripheral - IAR Embedded Workbench IDE -	ARM 7.70.1	
File Edit View Project TI XDS Tools Window Hel	p	
D 🚅 🖬 🕼 🐇 🐘 🛍 🗠 🖂		
Workspace ×	TTCBlePeripheralTask.c ICall_startup.c main.c TTCDriverGPIODemo.c	
FlashROM ~	#endif	//SBP_TASK_STACK_SIZE
Files 2 公 吗, ^ 日日CC2640App - FlashROM / /	<pre>#ifdef FEATURE_OAD #define OAD_PACKET_SIZE #endif</pre> ((OAD_BLOCK_SIZE) + 2)	//FEATURE_OAD
Image: Control of the second secon	<pre> → 大幅安置 * 大炮安置 * tatic ICall_EntityID selfEntity; static ICall_Semaphore sem; static Queue_Bandle appMsgs; static Queue_Bandle appMsgsQueue; //static uid deacEvents; Task_Struct sbpTask; Char sbpTaskStack[SEP_TASK_STACK_SIZE]; </pre>	/Entity ID 用于确认消息来源 //线控信号量,用于映趣线控 //消息石构 //本地等件 //集地等件 //线控度模 //线控模模
PROFILES	static Semaphore_Struct sdkSem;	
Startup Startup TrObleSDK TrObleSDK TrObleSDK TrObleSDK TrObiverSPIFlash TrObiverSPIFlash TrObleCentralProcess.h TrOBleCentralProcess.h TrOBleDevintoService.h TrOBlePeripheral.h TrOBlePeripheralProcess.h TrOBlePeripher	<pre>#ifdef TTCBLE_IEEACON static iBeaconCfgHandle_t iBeaconCfgHandle; static iBeaconParam_t paramId; #endif // / / / / / / / / / / / / / / / / / /</pre>	//定义Ibeacon句柄 //TICBLE_IBEACON
* Messages		
Total number of errors: 1		
Total number of warnings: 0		

在线程处理函数中,增加用户事件:

💥 SimpleBLEPeripheral - IAR Embedded Workbench IDE	- ARM 7.70.1	– a ×
File Edit View Project TI XDS Tools Window H	elp	
Workspace ×	TTCBlePeripheralTasks ICal startup.c main.c TTCDriverGPIODemo.c	TTCBlePeripheralTaskFxn(UArg, UArg) 👻 🗙
FlashROM ~		
FebROM V Files f:2 R0 Application Image: Constraint of the state of the stat	Image: Second	
Overview BIM_extflash CC2640App CC2640Stack	TTCReaconProcessStack(&selfRntity)	
,		

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_

然后在数据接收外理函数中,增加使能用户事件:

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这样我们每发送一次数据,就可以将GIPO0取反一次;

●●●○○ 中国移动 🗢	14	:43	@ 1 \$ 📭
<	ail -	67	清除数据
RX:80Bytes			□ 是否显 示多行
12 34 56 78 90 1	2 34 56 79	90	
TX:90Bytes			
1234567890123	34567990		
✓ 定时发送	间隔 500	ms(20~400	0ms)
□ 是否显示A	SCII码值		
	发送10	0个字节	

自定义	数传	模组设置

在APP中将,设定好数据发送间隔,并使能定时发送,这时LED就按可以闪烁啦! 如果在接收数据那里将接收到的数据进解析,那么就可以防止别人操作啦!