BLEmicro 简要说明文档
BLE micro Simplified Tutorial

一、BLEmicro 简要

BLE micro Introduction

BLEmicro 蓝牙固件是针对低功耗版本的量身定制版，当 cc2540 进入低功耗后，电流在 0.2uA 左右，退出低功耗，如广播状态，在 8mA 左右，适用于数据量小传输、低功耗二次开发项目，解决 bluno 在低功耗方面的不足。缺点是，链接间隔相对 bluno 要长，数据传输量小，**不适合无线下载功能。**

This firmware is aimed to realize power-saving feature for BLE micro, the current drawing is 0.2 uA in power saving mode, 8mA in broadcasting mode. It suits to low-power cost, small amount data transmission project. Its disadvantage is the connection time span is longer than Bluno, not supported for wireless programming since it needs large amount data transmission.

二、使用说明

Usage

数据传输功能类似于 CTS、RTS，当 BLE 芯片接收到无线数据后，会将 P05 拉高，再拉低，做为唤醒 mcu 的中断信号，当 mcu 拉低 P04 后，BLE 芯片才会将数据通过串口传输到 mcu，以保证 mcu 在低功耗模式下时，串口数据不会丢失。当 mcu 想让 BLE 芯片进入低功耗时，需要关闭广播（链接除外）、拉高 P04。

Data transmission function is like CTS/ RTS, when BLE chip receive wireless signal, it will set P05 in HIGH-LOW(right away after HIGH) as a interrupt signal to MCU, when MCU set the P04 as LOW, BLE chip then will transfer the data to MCU through serial port, this ensures that the data won't lost even in power saving mode. When MCU set the P04 as HIGH, it will make the BLE chip go into power saving mode again, meanwhile, it requires the broadcasting mode is shut down.

1、AT 指令的使用方法有两种

　　Two methods to use AT command

第一种：通过串口输入"+++"进入到 AT 模式，进入 AT 模式后，BLE 不会进入低功耗，数据用于 AT 命令设置，不会传入到无线端，当退出 AT 模式后，数据用于透传

Method 1. Send "+++" to enter AT mode through serial port. In AT mode, BLE won't go into power saving mode anymore. All data in AT mode is to set some parameters, but won't be transferred to another wireless module. Once you exist AT mode, the data will be sent out through serial port to another BLE device.
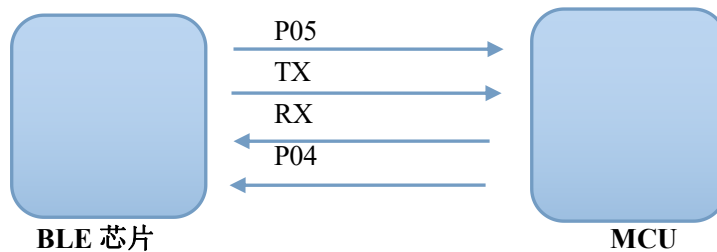
第二中：通过 BLE 无线进入 AT 模式，进入 AT 模式，只需要通过 DFB2 特征值的修改就行了。 （高级用法）

Method 2. Enter AT mode in wireless way as long as you write different DFB2

eigenvalues.

2、图示：

  Explanatory Chart

附表 1：AT 指令/ AT Command list

  Note: command 2- 12 is the same as Bluno, go to Bluno wiki to learn more.

  http://www.dfrobot.com/wiki/index.php/Bluno_SKU:DFR0267#AT_Command_List

1、AT+RESTART\r\n
  重启蓝牙芯片，这里设置了 2s 左右的延时，也就是说，当命令输入 2s 后，重启
  BLE chip will restart after 2 seconds.

2、AT+VERSION=?\r\n
  版本号查询命令，返回 V1.0，功能与 bluno 一致

3、AT+UART=...\r\n
  波特率查询、设置命令，功能与 bluno 一致，设置后存储 flash，默认是 115200

4、AT+CURRUART=...\r\n
  波特率查询、设置命令，功能与 bluno 一致，设置后立即配置，默认是 115200

5、AT+COMDE=...\r\n
  链接模式查询、设置命令，功能与 bluno 一致，设置值 ANYONE 和 UNIQUE，默认
  是 ANYONE

6、AT+BIND=...\r\n
  绑定设备 mac 地址，功能与 bluno 一致

7、AT+MAC=?\r\n
  本金 mac 地址查询，功能与 bluno 一致

8、AT+SN=?\r\n
  查询是否解密，功能与 bluno 一致

9、AT+NAME=...\r\n

设备名称查询、设置命令，功能与 bluno 一致

10、AT+SETTING=...\r\n
设置查询、设置命令，功能与 bluno 一致

11、AT+PASSWORD=?\r\n
密码查询、设置命令，功能与 bluno 一致

12、AT+EXIT\r\n
退出 AT 指令模式，功能与 bluno 一致

13、AT+BLEUPDATA=...?　?????Update 还是 updata
Ble 链接使能查询、设置命令
在开机时，ble 会打开广播，如果想关闭广播，这设置为 OFF，当链接到主机后，想要断开链接，也可以使用 OFF，默认是 ON

BLE link enable state query / set Default: ON

If you want to turn it off, set it as OFF. What's more, you could use it to cut off the connection with another BLE module using this command by set it OFF.

14、AT+LEDENABLE=...?\r\n
LED 使能查询、设置命令，默认是 OFF
用于设置 LED 使能，其中 LED 包括 TX、RX、LINK 灯，并且硬件兼容 bluno，当使能了 LED 后，各个 LED 灯的指示效果同 bluno 一致

LED enable query/ set, default: OFF