

Grove - BLE

Release date: 9/20/2015

Version: 1.0

Wiki: http://www.seeedstudio.com/depot/Grove-EMG-Detector-p-1737.html

Bazaar: http://www.seeedstudio.com/wiki/Grove - EMG_Detector



Document Revision History

Revision	Date	Author	Description
1.0	Sep 21, 2015	Victor.He	Create file



Contents

Doc	ument R	evision History		
1.	Introduc	roduction2		
2.	Specification			
3.	Detailed description4			
	3.1	Pinout4		
	3.2	Features of Design4		
	3.3	AT Commands4		
4.	Software	oftwareSerial Communication7		
	4.1	Demo: BLE Slave7		
	4.2	Demo : BLE Master		
5.	Resourc	es 10		



Disclaimer

For physical injuries and possessions loss caused by those reasons which are not related to product quality, such as operating without following manual guide, natural disasters or force majeure, we take no responsibility for that.

Under the supervision of Seeed Technology Inc., this manual has been compiled and published which covered the latest product description and specification. The content of this manual is subject to change without notice.

Copyright

The design of this product (including software) and its accessories is under tutelage of laws. Any action to violate relevant right of our product will be penalized through law. Please consciously observe relevant local laws in the use of this product.



1. Introduction

Grove - BLE v1 (Grove - Bluetooth Low Energy v1) uses a Low Energy Bluetooth module -- HM-11, based on TI CC2540 chip, which has AT command support. As a Grove product it's convenient to use Grove - BLE with Arduino board via Base Shield.







2. Specification

Specifications	Name
BT Version	Bluetooth Specification V4.0 BLE
Working frequency	2.4GHz ISM band
Modulation method	GFSK(Gaussian Frequency Shift Keying)
RF Power	-23dbm, -6dbm, 0dbm, 6dbm, can modify through AT Command AT+POWE
Speed	Asynchronous: 6K Bytes, Synchronous: 6K Bytes
Sensitivity	≤-84dBm at 0.1% BER
Security	Authentication and encryption
Service	Central & Peripheral UUID FFE0,FFE1
Supply Power	3.3v - 5v
Working temperature	–5 ~ +65 Centigrade
Size	20cm x 10cm
Working Current	< 10 mA
Sourcing Current	< 20 mA
Sleeping Current	< 1 mA

Attention: The supply power of HM-11 is 3.3v, but the Grove - BLE is 3.3v to 5v



3. Detailed description

3.1 Pinout

Grove connector has four wires: GND, VCC, RX, and TX.

3.2 Features of Design

We have used TD6810 chip as the voltage regulator, so the range of the supply power can be 3.3v to 5v. Also, there's a level shift circuit which make sure the accuracy of data transmission.

3.3 AT Commands

1) Query module address

Send: AT+ADDR? Receive: OK+LADD: address

2) Query baud rate

Send: AT+BAUD?

Receive: OK+Get:[para1]

Range : 0~8;0--9600, 1--19200, 2--38400, 3--57600, 4--115200, 5--4800, 6--2400, 7--1200, 8--230400。Default: 0--9600.

Set baud rate

Send: AT+BAUD[para1] Receive: OK+Set:[para1]

e.g. : Send : AT+BAUD1 , Receive: OK+Set:1. The Baud rate has been set to 19200. Note: If setup to Value 7, After next power on, module will not support any AT Commands, until PIOO is pressed, Module will change Baud to 9600.

3) Try connect an address

Send: AT+CON[para1] Receive: OK+CONN[para2] Range : A,E,F

e.g. : Try to connect an device which MAC address is 00:17:EA:09:09:09

Send: AT+CON0017EA090909

May receive a reply: OK+CONNA --> Accept request, connecting ; OK+CONNE --> Connect error ; OK+CONN --> Connected , if AT+NOTI1 is setup ; OK+CONNF --> Connect Failed , After 10 seconds



Notice: Only central role is used. If remote device has already connected to other device or shut down, "OK+CONNF" will received after about 10 Seconds.

4) Clear Last Connected device address

Send: AT+CLEAR Receive: OK+CLEAR

5) Query Module Work Mode

Send: AT+MODE? Receive: OK+Get:[para]

Range: 0~2. 0: Transmission Mode; 1: PIO collection Mode + Mode 0 ; 2: Remote Control Mode + Mode 0 . Default 0.

Set Module Work Mode

Send: AT+MODE[] Receive: OK+Set:[para]

6) Query Module name

Send: AT+NAME?

Receive: OK+NAME[para1]

Set Module name

Send: AT+NAME[para1]

Receive: OK+Set:[para1]

e.g. : Send: AT+NAMESeeed , Receive : OK+Set:Seeed

Notice: Name would change after next power on.

7) Query Pin Code

Send: AT+PASS? Receive: OK+PASS:[para1]

Range : 000000~999999. Default: 000000.

Set Pin Code

Send: AT+PASS[para1]

Receive: OK+Set:[para1]

8) Restore all setup value to factory setup

Send: AT+RENEW



Receive: OK+RENEW

9) Restart module

Send: AT+RESET

Receive: OK+RESET

10) Query Master and Slaver Role

Send: AT+ROLE[para1]

Receive: OK+Set:[para1]

Range : 0~1. 0--Peripheral: 1--Central: Default: 0.

More AT commands please refer to the Date sheet of BLE module.



4. SoftwareSerial Communication



Grove - BLE can be acted as a master or slave, you can use the one via different demos. If you are going to use the following SoftwareSerial program, please refer to the way of connection in the previous pic. TX-->D2, RX-->D3.

Open Arduino IDE, copy the following program and upload it onto the Arduino/Seeeduino board. And then two BLE modules can communicate with each other.

4.1 Demo: BLE Slave

```
#include <SoftwareSerial.h> //Software Serial Port
#define RxD 2
#define TxD 3
#define DEBUG_ENABLED 1
SoftwareSerial BLE(RxD,TxD);
void setup()
{
   Serial.begin(9600);
   pinMode(RxD, INPUT);
```



```
pinMode(TxD, OUTPUT);
   setupBleConnection();
}
void loop()
£
   char recvChar;
   while(1) {
      if(BLE.available()){//check if there's any data sent from the
remote BLE
         recvChar = BLE.read();
          Serial.print(recvChar);
      }
      if(Serial.available()){//check if there's any data sent from the
local serial terminal, you can add the other applications here
          recvChar = Serial.read();
          BLE.print(recvChar);
      }
   }
}
void setupBleConnection()
{
   BLE.begin (9600); //Set BLE BaudRate to default baud rate 9600
   BLE.print("AT+CLEAR"); //clear all previous setting
   BLE.print("AT+ROLE0"); //set the bluetooth name as a slaver
   BLE.print("AT+SAVE1"); //don't save the connect information
}
```

4.2 Demo : BLE Master

```
#include <SoftwareSerial.h> //Software Serial Port
#define RxD 2
#define TxD 3
#define DEBUG_ENABLED 1
SoftwareSerial BLE(RxD,TxD);
void setup()
{
Serial.begin(9600);
```



```
pinMode(RxD, INPUT);
   pinMode(TxD, OUTPUT);
   setupBleConnection();
}
void loop()
{
   char recvChar;
   while(1){
      if(BLE.available()){//check if there's any data sent from the
remote BLE
          recvChar = BLE.read();
          Serial.print(recvChar);
      }
      if(Serial.available()){//check if there's any data sent from the
local serial terminal, you can add the other applications here
          recvChar = Serial.read();
          BLE.print(recvChar);
      }
   }
}
void setupBleConnection()
{
   BLE.begin (9600); //Set BLE BaudRate to default baud rate 9600
   BLE.print("AT+CLEAR"); //clear all previous setting
   BLE.print("AT+ROLE1"); //set the bluetooth name as a master
   BLE.print("AT+SAVE1"); //don't save the connect information
}
```



5. Resources

BLE apk for Android DataSheet of BLE module

Schematic



Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;

- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);

- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;

- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком):

- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный) Факс: 8 (812) 320-03-32 Электронная почта: ocean@oceanchips.ru Web: http://oceanchips.ru/ Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А