



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

Document Revision History	2
1. Introduction	2
2. Specification	3
3. Detailed description	4
3.1 Pinout	4
3.2 Features of Design	4
3.3 AT Commands	4
4. SoftwareSerial Communication	7
4.1 Demo: BLE Slave	7
4.2 Demo : BLE Master	8
5. Resources	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.

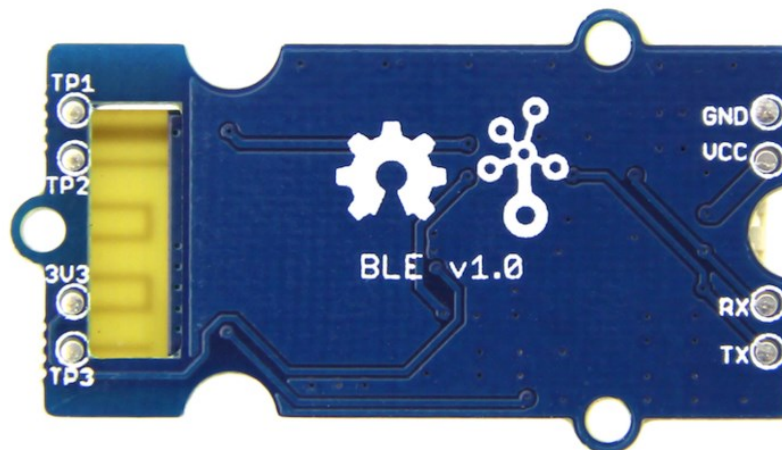
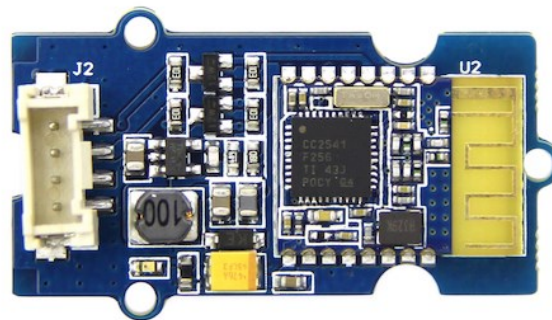
Under the supervision of Seeed Technology Inc., this manual has been compiled and published which covered the latest product description and specification. The content of this manual is subject to change without notice.

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 PIO0 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+CONN" will be 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

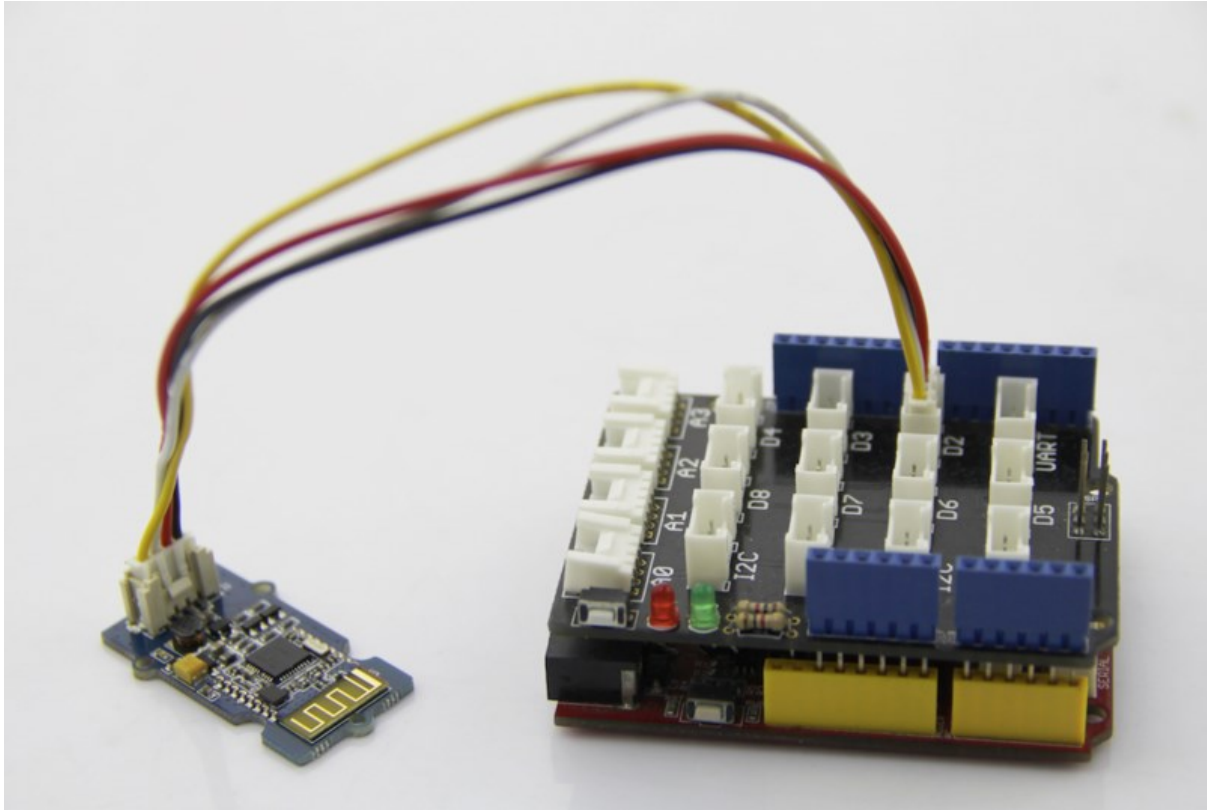
Send: AT+ROLE[para1]

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/Seeeduno 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 «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.