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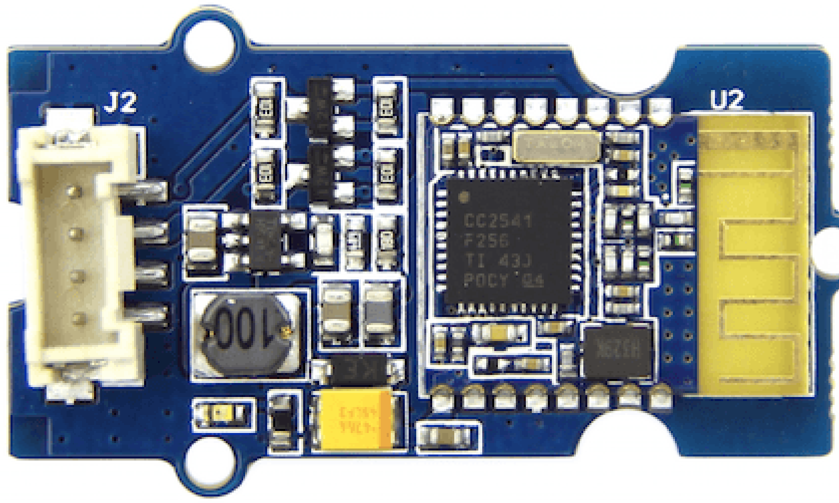
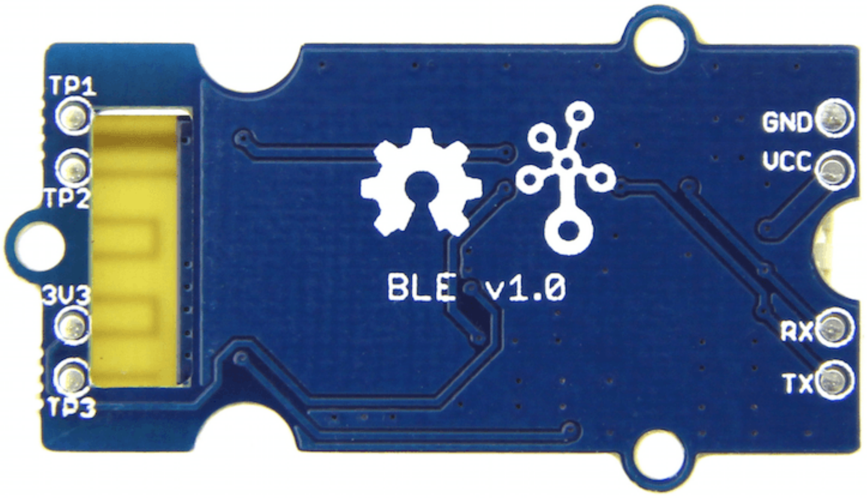
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Grove BLE v1





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.

Parameters

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	40cm x 20cm
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.

Tip

More details about Grove modules please refer to Grove System

Platforms Supported

Arduino	Raspberry Pi	BeagleBone	Wio	LinkIt ONE

Caution

The platforms mentioned above as supported is/are an indication of the module's hardware or theoritical compatibility. We only provide software library or code examples for Arduino platform in most cases. It is not possible to provide software library / demo code for all possible MCU platforms. Hence, users have to write their own software library.

Pinout

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

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.

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]

Ex.：Send ：AT+BAUD1， Receive：OK+Set:1. The Baud rate has been set to 19200

Note
If setup to a 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

Ex.：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

Note
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]

Ex.：Send: AT+NAMESeeed,　Receive : OK+Set:Seeed

Note
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]

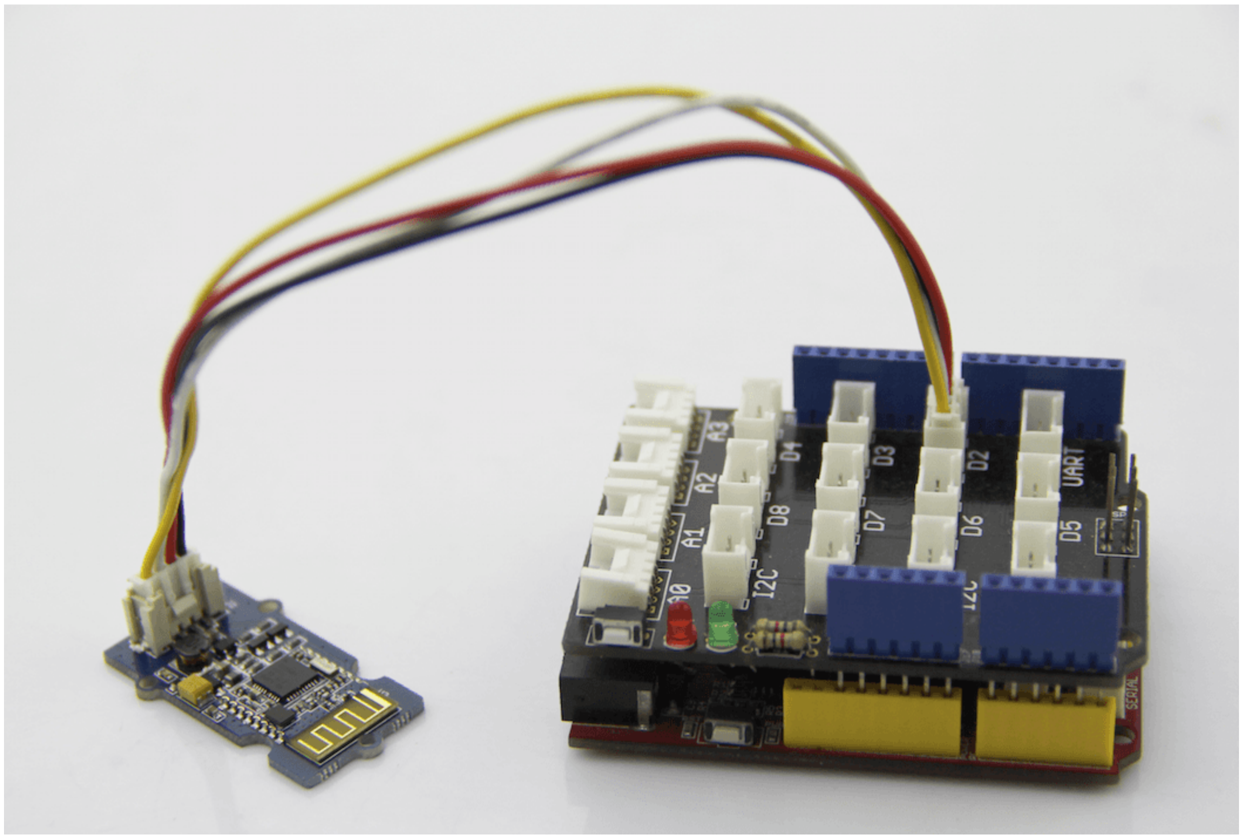
Receive：OK+Set:[para1]

Range : 0~1;

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

More AT commands please refer to the Datasheet of BLE module.

SoftwareSerial Communication



Grove - BLE can be used 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.

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
}
```

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
      }
```