XBee® Shield

From Wiki 来自痴汉的爱

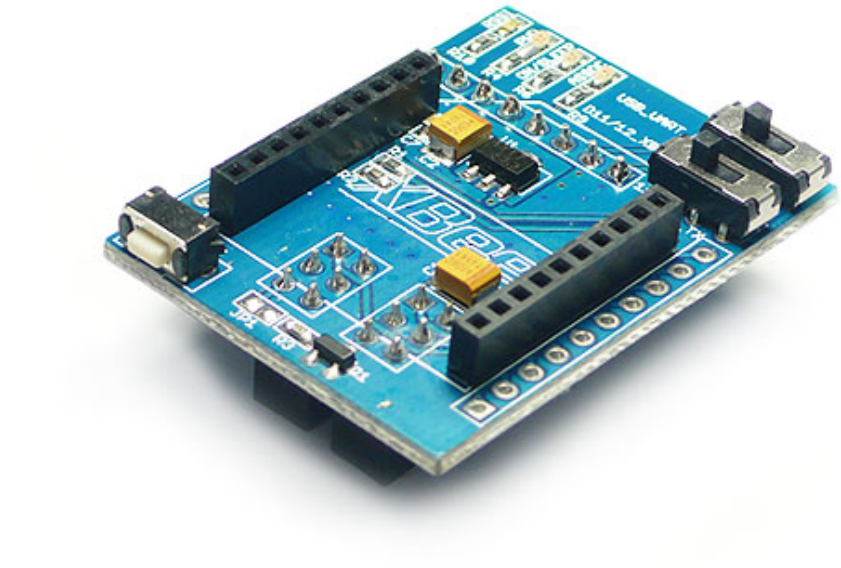
Contents

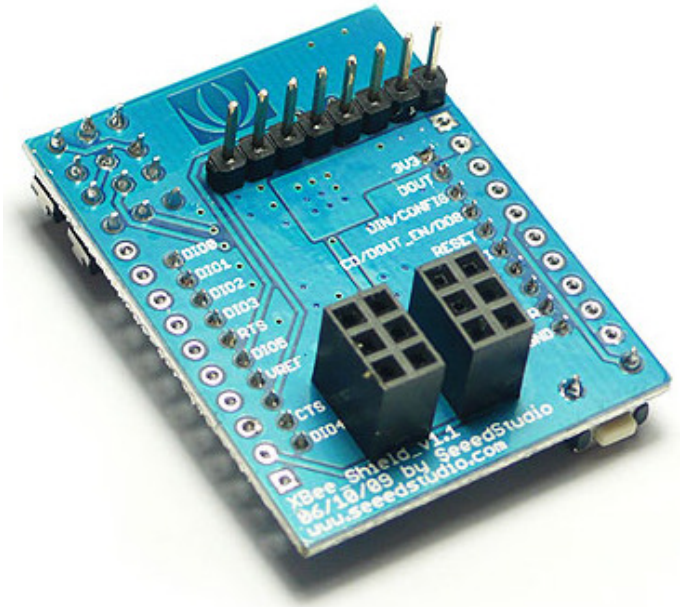
Introduction

A **Xbee shield** allows an Arduino or Seeeduino board to communicate wirelessly using Bee compatible modules (like Zigbee or BlueTooth Bee). It is designed to be used with Xbee module from MaxStream (http://www.maxstream.net/products/xbee/xbee-oem-rf-module-zigbee.php) . It can be used as a **Serial Port / USB replacement.** It is used to connect two **Seeeduinos** using **Zigbee / Bluetooth Bee** or connect a **Seeeduino** with PC Wirelessly. Two toggle switches decides how **Rxd** and **Txd** pins of Bee modules be connected to **Seeeduino** pins. These two switches provides options to connect **RxD** and **TxD** lines of Bee Modules to **Seeduino Hardware Serial Port** or **Digital pins 11** and **12** or **FTDI RxD** and **Txd** Pins.

Model:WLS114A0P (http://www.seeedstudio.com/depot/xbee%C3%82%C2%AE-shield-v11-by-seeedstudio-p-419.html?cPath=104_109)

↑top





Seeed Studio's **XBee®_Shield** is derived from Arduino Xbee shield (http://www.arduino.cc/en/Main/ArduinoXbeeShield) , with following features:

- Smaller form
- SMT package for most of the components
- Low cost

To use X-CTU with Seeeduino, please upload following sketch

```
void setup()
{
  DDRB=0;
  DDRC=0;
  DDRD=0;
}

void loop()
{

}
```

Features

1. 31mm X 41mm board.
2. Communicate with Arduino/Seeeduino
   - Via pin 11, 12 Software Serial Port or
   - Via hardware Serial Port
3. Xbee modules can be configured by X-CTU via USB
4. Breakout of all pins

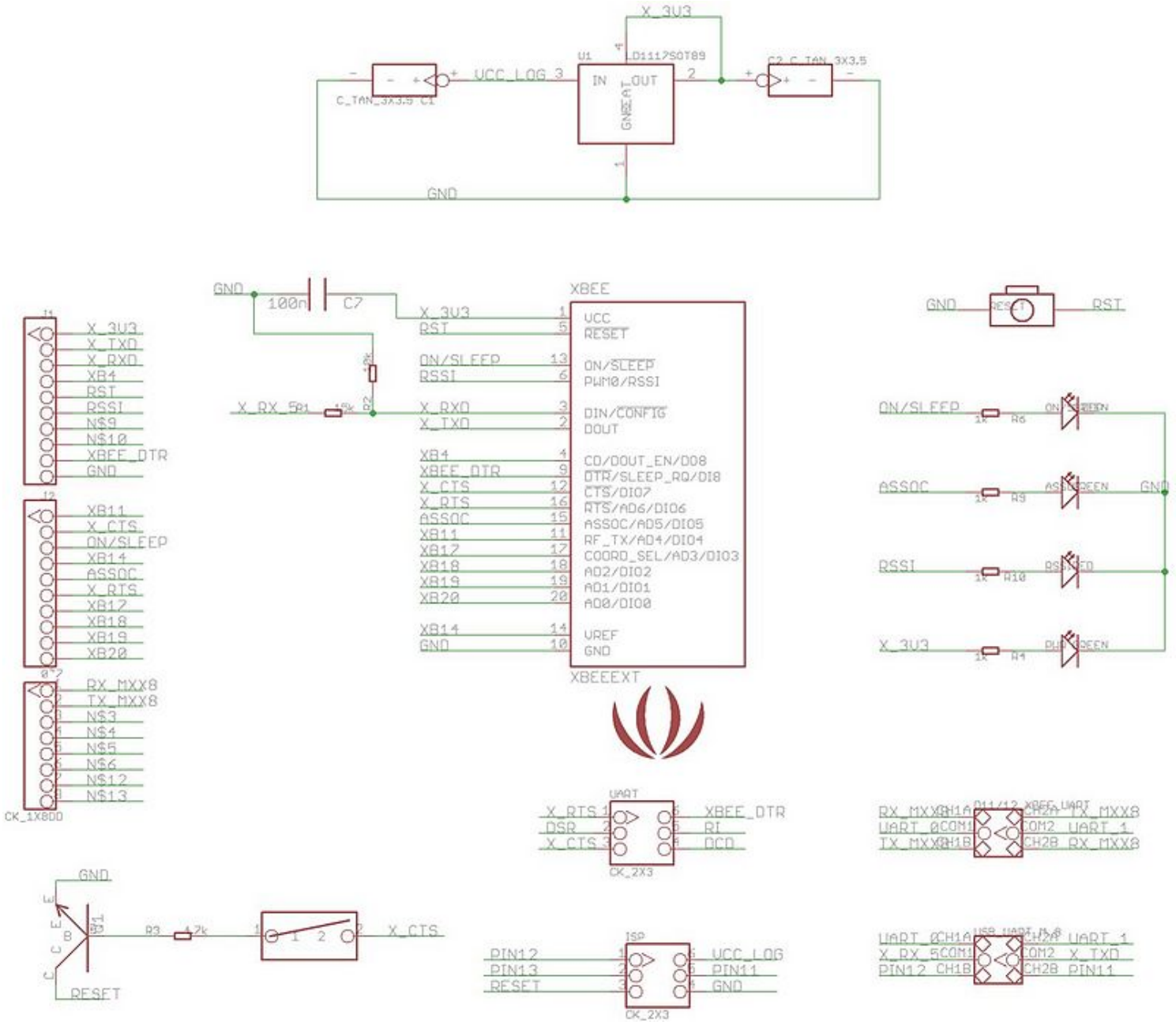
Application Ideas

- Communicate two Seeeduinos / Arduinos Wirelessly using Bee Modules (Xbee,BluetoothBee,RFBee)
- Communicate Seeeduino / Arduino to PC Wirelessly using Bee Modules.
- Connecting GPS Bee to Arduino / Seeeduino

Cautions

- Set the toggle switches to correct position before connecting to Bee Modules or Arduinos.

Schematic



Specification

See features (http://garden.seeedstudio.com/index.php?title=XBee%C2%AE_Shield#Features) above.

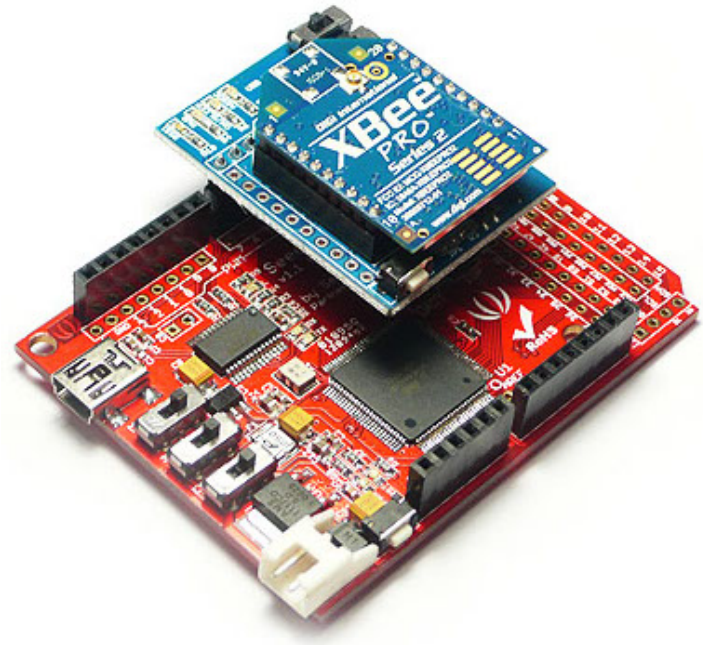
Mechanic Dimensions

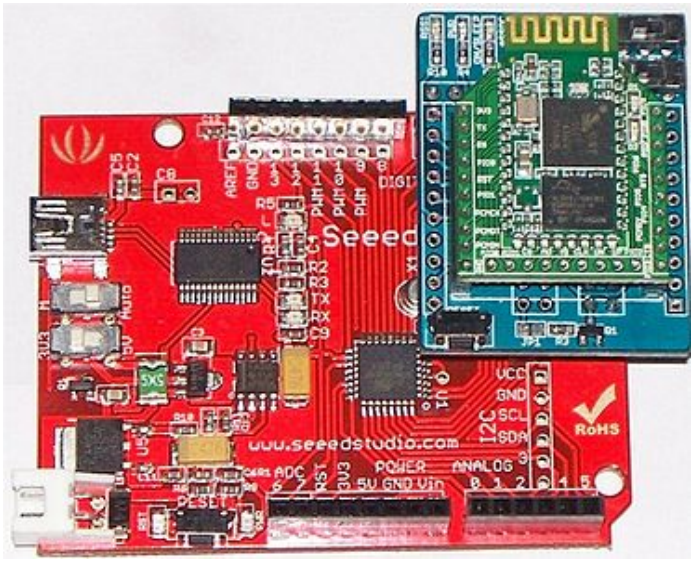
XBee® Shield is of 3.1cm X 4.1cm size.

Usage

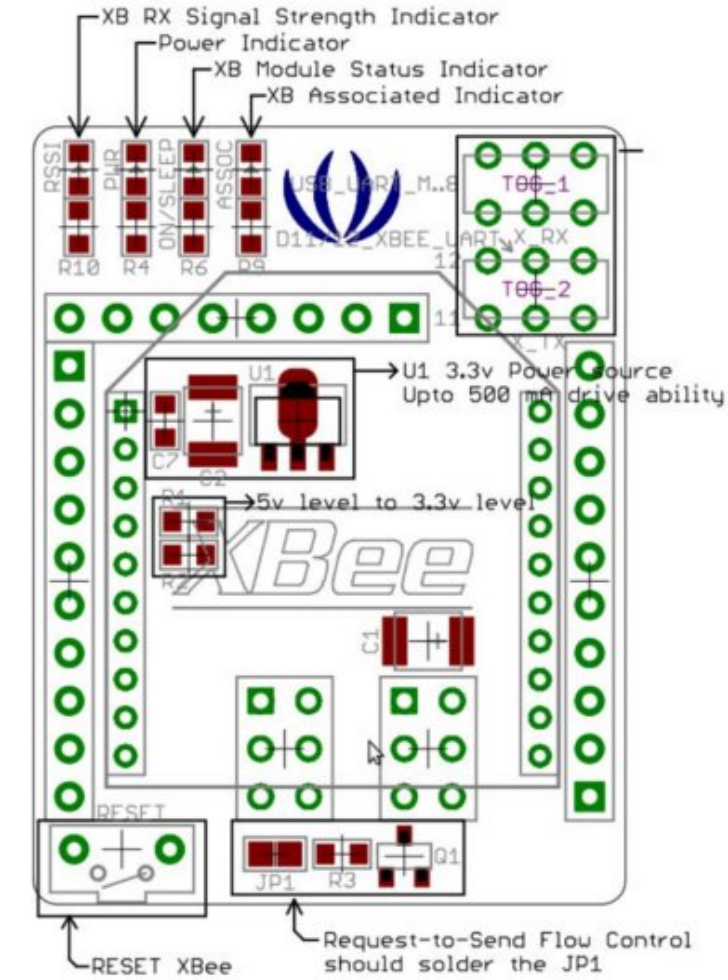
A **Bee module** is connected to Arduino / Seeeduino via the XBee Shield. In case of a Seeeduino, set the operating voltage switch to 3.3V position. Normally the Bee modules are connected via Software Serial Port by setting the toggle switches (**TOG_1** and **TOG_2**)positions to **left-side**. Please refer the below tables for different configuration.

Hardware Installation





Xbee Shield Outline and Toggle Switch Position



Arduino

TOG_1	TOG_2	Xbee Tx Connected to	Xbee Rx Connected to
Left	Left	Digital pin 11	Digital pin 12
Left	Right	FT232 RxD	FT232 TxD
Right	Left	Digital pin 11	Digital pin 12
Right	Right	Atmege RxD	Atmege TxD

Arduino Mega

TOG_1	TOG_2	Xbee Tx Connected to	Xbee Rx Connected to
Left	Left	Digital pin 51	Digital pin 50
Left	Right	FT232 RxD	FT232 TxD
Right	Left	Digital pin 51	Digital pin 50
Right	Right	Atmege RxD0	Atmege TxD0

Testing AT commands on Bees

Create a new sketch with the following code and download it into your Arduino board.

```
//Serial Relay - Arduino will patch a
//serial link between the computer and the Bee Shield
//at 9600 bps 8-N-1
//Computer is connected to Hardware UART
//Bee Shield is connected to the Software UART

#include <NewSoftSerial.h>
#define RxD 11
#define TxD 12

NewSoftSerial mySerial(RxD,TxD);

void setup()
{
    pinMode(RxD, INPUT);
    pinMode(TxD, OUTPUT);
    mySerial.begin(9600);               // the Bee baud rate
    Serial.begin(9600);                 // the terminal baud rate
}

void loop()
{
    if(Serial.available())
    {
       mySerial.print((unsigned char)Serial.read());
     }
    else  if(mySerial.available())
    {
       Serial.print((unsigned char)mySerial.read());
     }

}
```

After this fire up your favorite serial terminal software, choose the COM port for Arduino, set it to operate at default baud rate of your Bee (XBee default is 9600 8-N-1), connect and send the commands. Try sending "+++" (without the quotes) for XBee module, to the Arduino board. The XBee should respond by sending back an "OK".

Send AT Updated Version for V 1.0

The code above may have worked on earlier versions but the SoftwareSerial library is now part of the core. The following code is taken almost directly from the Aruino SoftwareSerial manual. (http://arduino.cc/en/Reference/SoftwareSerial)

```
/*
Example from Arduino SoftwareSerial tutorial
 */
#include <SoftwareSerial.h>

SoftwareSerial mySerial(11, 12); // RX, TX

void setup()
{
  // Open serial communications and wait for port to open:
  Serial.begin(9600);
  mySerial.begin(9600);
}

void loop() // run over and over
{
  if (mySerial.available())
    Serial.write(mySerial.read());
  if (Serial.available())
    mySerial.write(Serial.read());
}
```

Upload this code to the Arudino hosting the Xbee Shield, startup the Serial Monitor and at that point the Arduino serial port will be connected via radio to any other xbee radios currently operating--anything you type in the serial monitor will be sent to the other radios and vise versa.

Programming

The following sketch configures Bluetooth Bee as **Slave Device** and waits for connection request from PC or other master device. Bluetooth Bee is connected to Seeeduino via **XBee®_Shield** as shown above.

```
/*
BluetoothBee Demo Code - Flowcontrol Based Implementation
2010,2011 Copyright (c) Seeed Technology Inc.  All right reserved.

Author: Visweswara R

This demo code is free software; you can redistribute it and/or
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Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA  02110-1301  USA

For more details about the product please check http://www.seeedstudio.com/depot/

Upload this sketch to Seeeduino and press reset*/

#include <NewSoftSerial.h>   //Software Serial Port
#define RxD 11
#define TxD 12
#define DEBUG_ENABLED  1

NewSoftSerial blueToothSerial(RxD,TxD);

void setup()
{
pinMode(RxD, INPUT);
pinMode(TxD, OUTPUT);
setupBlueToothConnection();
}
```

```
void loop()
{
//Typical Bluetoth command - response simulation:
//Type 'a' from PC Bluetooth Serial Terminal
//See Wiki for instructions

  if(blueToothSerial.read() == st0">'a')
  {
    blueToothSerial.println(st0">"You are connected"); //You can     write you BT communication logic here
  }
}

void setupBlueToothConnection()
{
  blueToothSerial.begin(38400); //Set BluetoothBee BaudRate to default baud rate 38400
  delay(1000);
  sendBlueToothCommand(\r\n+STWMOD=0\r\n");
  sendBlueToothCommand(\r\n+STNA=SeeeduinoBluetooth\r\n");
  sendBlueToothCommand(\r\n+STAUTO=0\r\n");
  sendBlueToothCommand(\r\n+STOAUT=1\r\n");
  sendBlueToothCommand(\r\n +STPIN=0000\r\n");
  delay(2000); // This delay is required.
  sendBlueToothCommand(\r\n+INQ=1\r\n");
  delay(2000); // This delay is required.
}


//Checks if the response "OK" is received
void CheckOK()
{
  char a,b;

  while(1)
  {
    if(blueToothSerial.available()) { a = blueToothSerial.read();   if(st0">'O' == a)
    {

      // Wait for next character K. available() is required in some cases, as K is not immediately available.
      while(blueToothSerial.available())
      {
         b = blueToothSerial.read();
         break;
      }

      if('K' == b)
      {
        break;
      }
    }
  }
}

  while( (a = blueToothSerial.read()) sy3">!= sy2">-1)
  {
     //Wait until all other response chars are received
  }
}


void sendBlueToothCommand(char command[])
{
   blueToothSerial.print(command);
   CheckOK();
}
```

See Bluetooth Bee Programming (http://www.seeedstudio.com/wiki/index.php?title=Bluetooth_Bee#Programming) for further information.

FAQ

Please list your question here(if any).

Support

If you have questions or other better design ideas, you can go to our forum (http://www.seeedstudio.com/forum) or wish (http://wish.seeedstudio.com) to discuss.

Version Tracker

Revision	Descriptions	Release Date
XBee® Shield V1.1	new version by Seeedstudio	Jul 06, 2009

Bug Tracker

Bug Tracker is the place where you can sumbit any bugs you think you might have found during use. Please write down what you want to say, your answers will help us improve our products.

Additional Idea

The Additional Idea is the place to write your project ideas about this product, or other usages you've found. Or you can write them on Projects page.

How to buy

Click here to buy : http://www.seeedstudio.com/depot/xbee%C3%82%C2%AE-shield-v11-by-seeedstudio-p-419.html?cPath=104_109

Licensing

See also

- Bluetooth Bee documentation (http://garden.seeedstudio.com/index.php?title=Bluetooth_Bee) demostrating use of **XBee®_Shield**
- Bee series

External Links

Links to external webpages which provide more application ideas, documents/datasheet or software libraries.

Resources

- Product Manual (http://www.maxstream.net/products/xbee/manual_xb_oem-rf-modules_802.15.4.pdf) - Details on configing the Xbee module.
- Outline drawing (http://www.seeedstudio.com/depot/images/product/XBee_shield_v1.11.pdf)
- Arduino Xbee Shield Page (http://www.arduino.cc/en/Main/ArduinoXbeeShield)
- eagle for Xbee_Shield_v1.0 (http://www.seeedstudio.com/wiki/File:Eagle_XBee_Shield_v1.0.zip)
- eagle for Xbee_Shield_v1.1 (http://www.seeedstudio.com/wiki/File:Elage_xbee_shield_v1.1.zip)

Category: MicroControllers

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