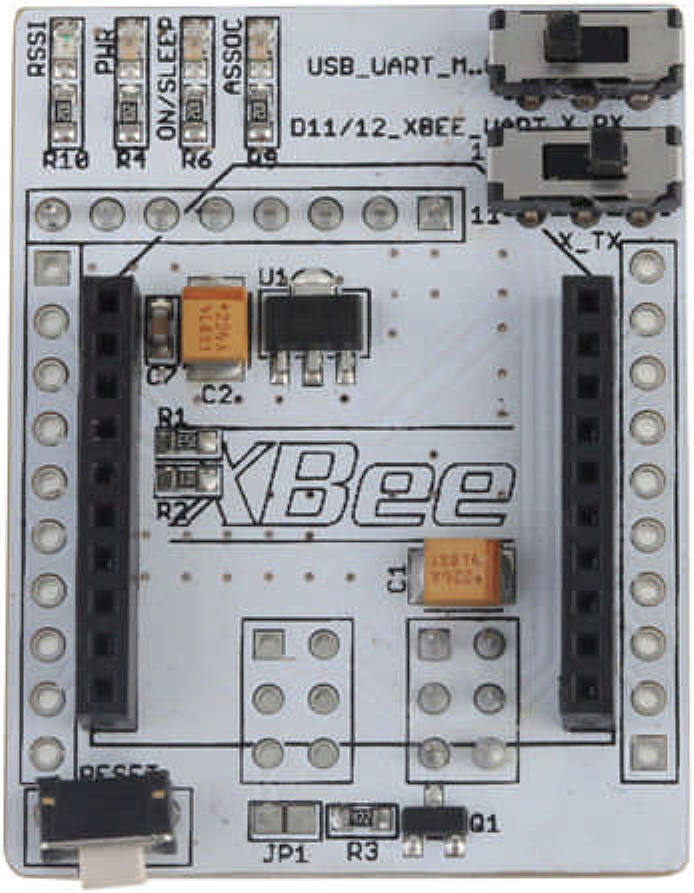
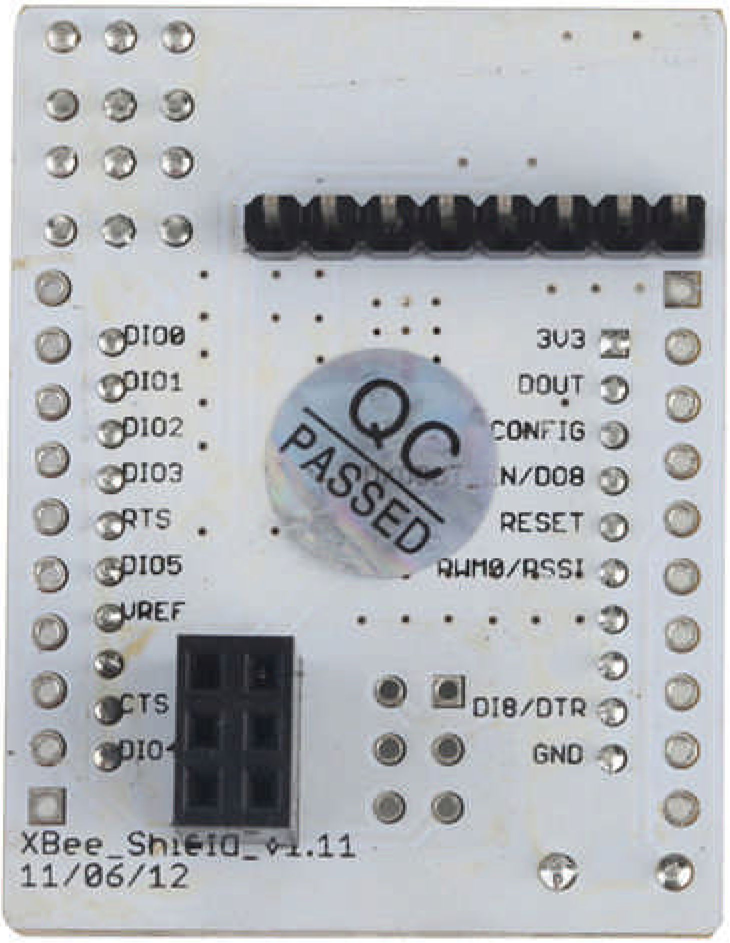
Xbee Shield

Introduction

A **Xbee shield** allows an Arduino board to communicate wirelessly using Bee compatible modules (like Zigbee or BlueTooth Bee). It is designed to be used with Xbee module from MaxStream. It can be used as a **Serial Port** / **USB replacement.** It is used to connect two **Arduino** using **Zigbee** / **Bluetooth Bee** or connect a **Arduino** with PC Wirelessly. Two toggle switches decides how **Rxd** and **Txd** pins of Bee modules be connected to **Arduino** pins. These two switches provide options to connect **RxD** and **TxD** lines of Bee Modules to **Arduino Hardware Serial Port** or **Digital pins 11** and **12** or **FTDI RxD** and **Txd** Pins.





Features

1. 31mm X 41mm board.
2. Communicate with Arduino
   - 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
5. 8 pre-soldered pins are for taking power supply from the Arduino board

Application Ideas

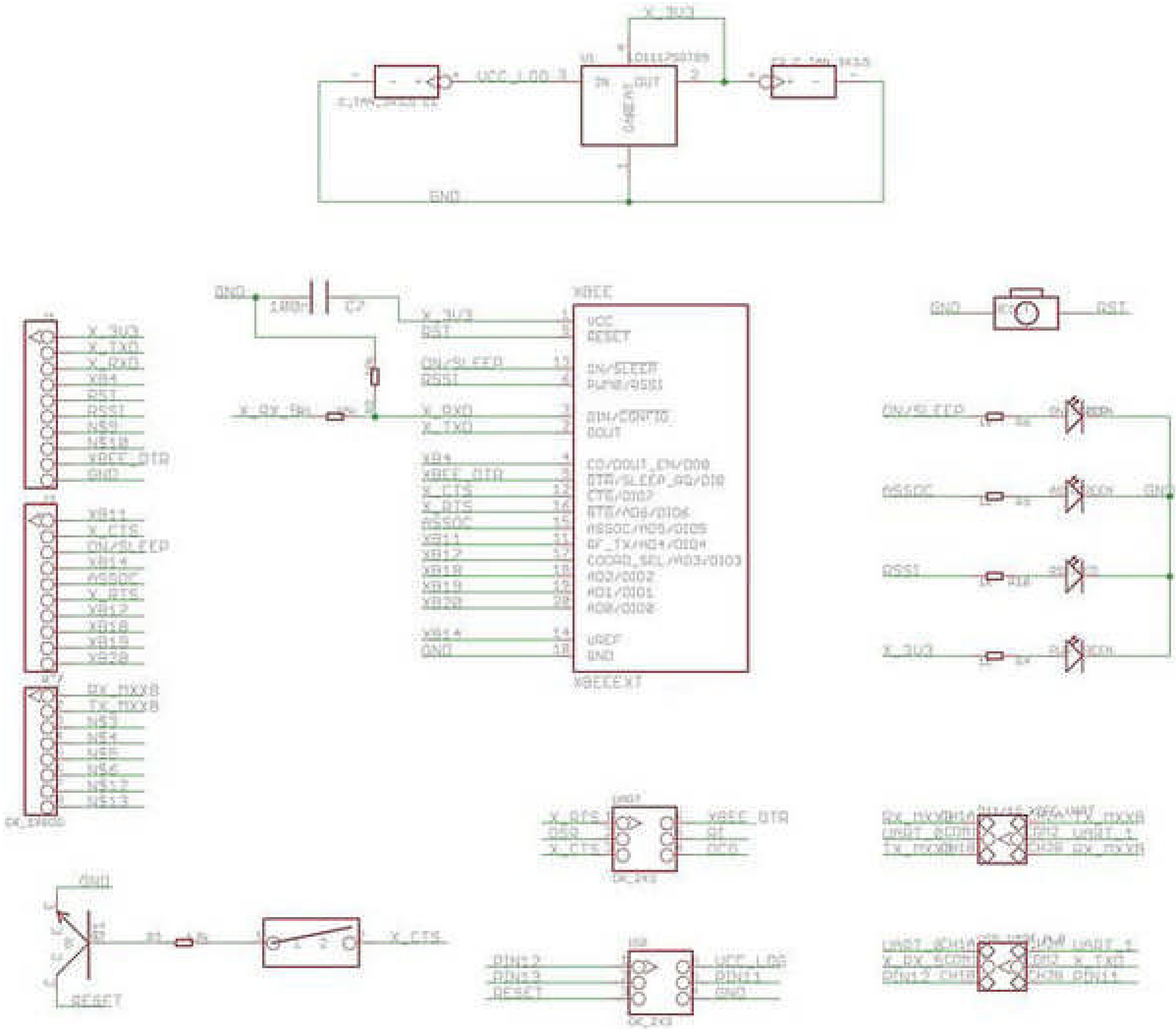
- Communicate two Arduinos Wirelessly using Bee Modules (XBee Pro Series2 RF module|Xbee,Bluetooth Bee|BluetoothBee,RFbee V1.1 - Wireless Arduino compatible node|RFBee)

- Communicate Arduino to PC Wirelessly using Bee Modules.
- Connecting GPS Bee kit (with Mini Embedded Antenna)|GPS Bee to Arduino

Cautions

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

Schematic



Usage

A **Bee module** is connected to Arduino via the XBee Shield. In case of an Arduino, 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".

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 Arduino via XBee®_Shield as shown above.

```
/*

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*/

#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=ArduinoBluetooth\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();
}
```