Revision History

| Revision	Descriptions	Release Date	Author
V3	Initial release	Sep 18, 2011	Steve
V3 r1	1. Change the photos. 2. Change max current to 50mA. 3. Add the shielding case to the Bluetooth module 4. Remove the mega compatibility.	Sep 23, 2011	Steve

Bluetooth Shield (2770069)

1. Introduction

The Bluetooth Shield integrates a Serial Bluetooth module. It can be easily used with Arduino / Seeeduino for transparent wireless serial communication. You can choose two pins from Arduino D0 to D7 as Software Serial Ports to communicate with Bluetooth Shield (D0 and D1 is Hardware Serial Port). The shield also has two Grove connectors (one is Digital, the other is Analog) for you to install Grove modules.
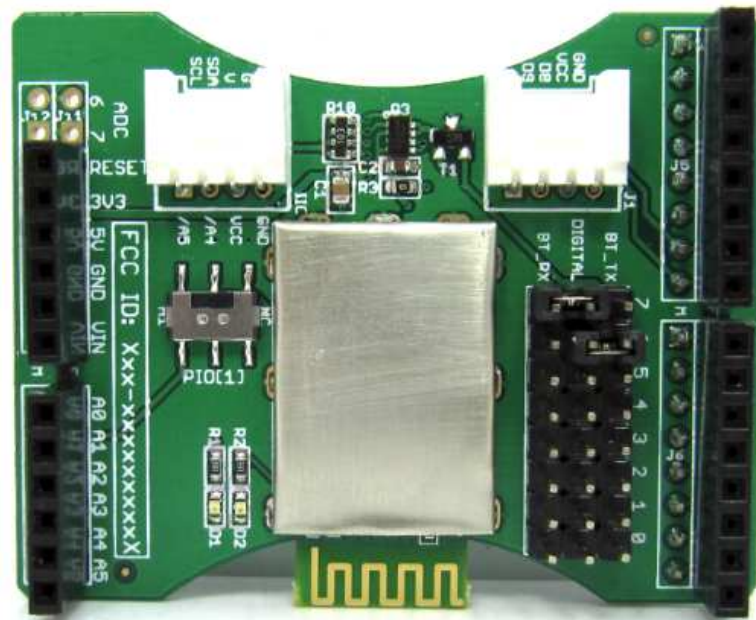
2. Features

- Seeeduino/Arduino compatible
- Up to10m communication distance in house without obstacle
- UART interface (TTL) with programmable baud rate (SPP firmware installed)
- Default Baud rate: 38400, Data bits: 8, Stop bit: 1, Parity: No parity
- Default PINCODE:"0000"
- A full set of configuration commands
- On board PCB Antenna
- FCC ID Certificated

3. Specification

Item	Contents			Unit
	Min	Typical	Max	
Voltage	2.8	3.3	3.5	VDC
Current	3	/	50	mA
Communication Distance(in house)	/	/	10	m
Protocol	Bluetooth V2.0 with SPP firmware			/
Interface	Uart Serial Port(TTL)			/
Supported Baudrate	9600, 19200, 38400, 57600, 115200, 230400, 460800			bps
ESD contact discharge	±4			KV
ESD air discharge	±8			KV
Dimension	57.4x45.3x19.4			mm
Net Weight	10±2			g

4. Interface Function
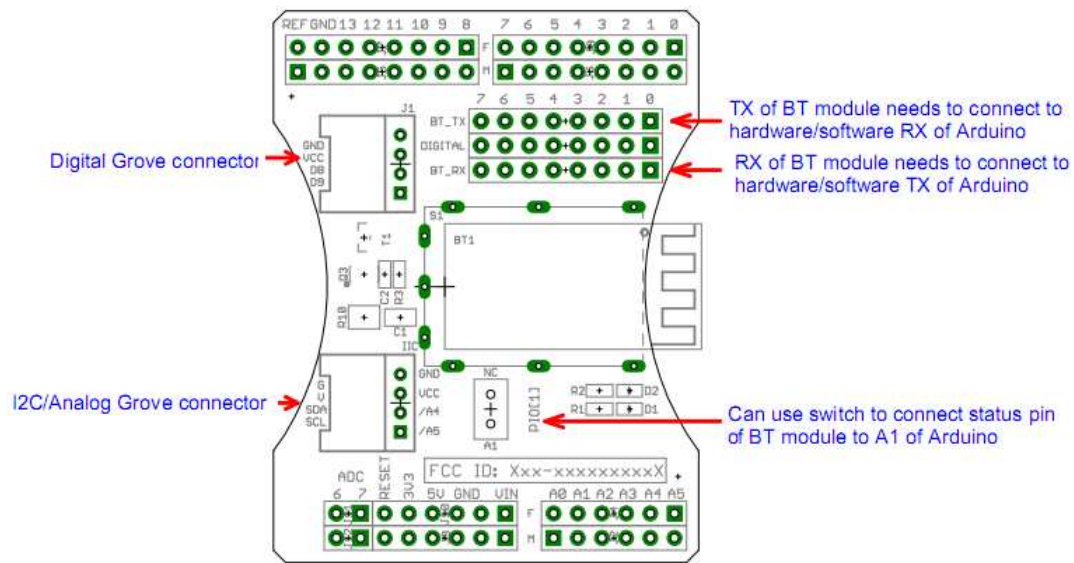
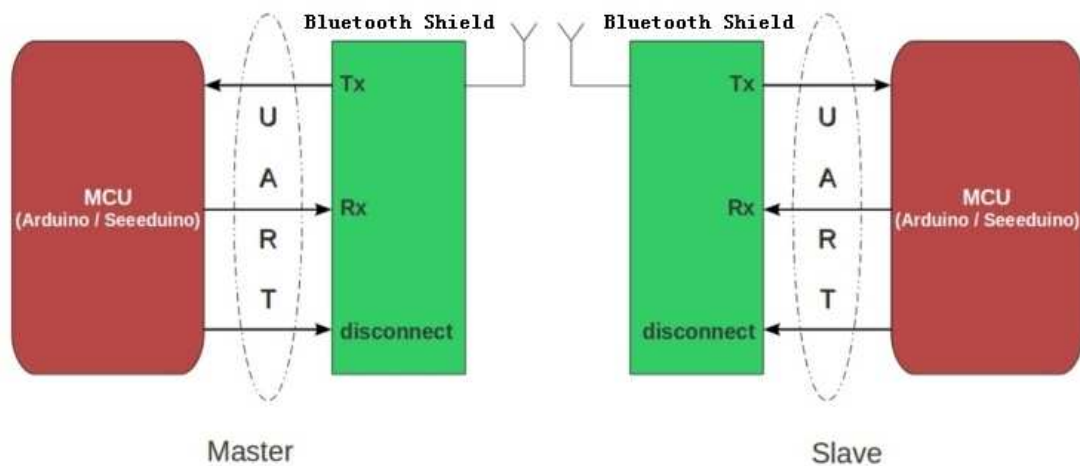| Pad Type	Description
PIO1	Status instruction port of Bluetooth module can be read by Arduino A1 port: low-disconnected, high-connected.
BT_RX	UART Data input of Bluetooth module
BT_TX	UART Data output Bluetooth module
Two Grove connectors	One is Digital (D8 and D9), the other is I2C/Analog (A4 and A5).

5. Usage

5.1 Hardware Installation

Plug the **Bluetooth Shield** onto Arduino/Seeeduino and then connect the board to PC using USB cable.
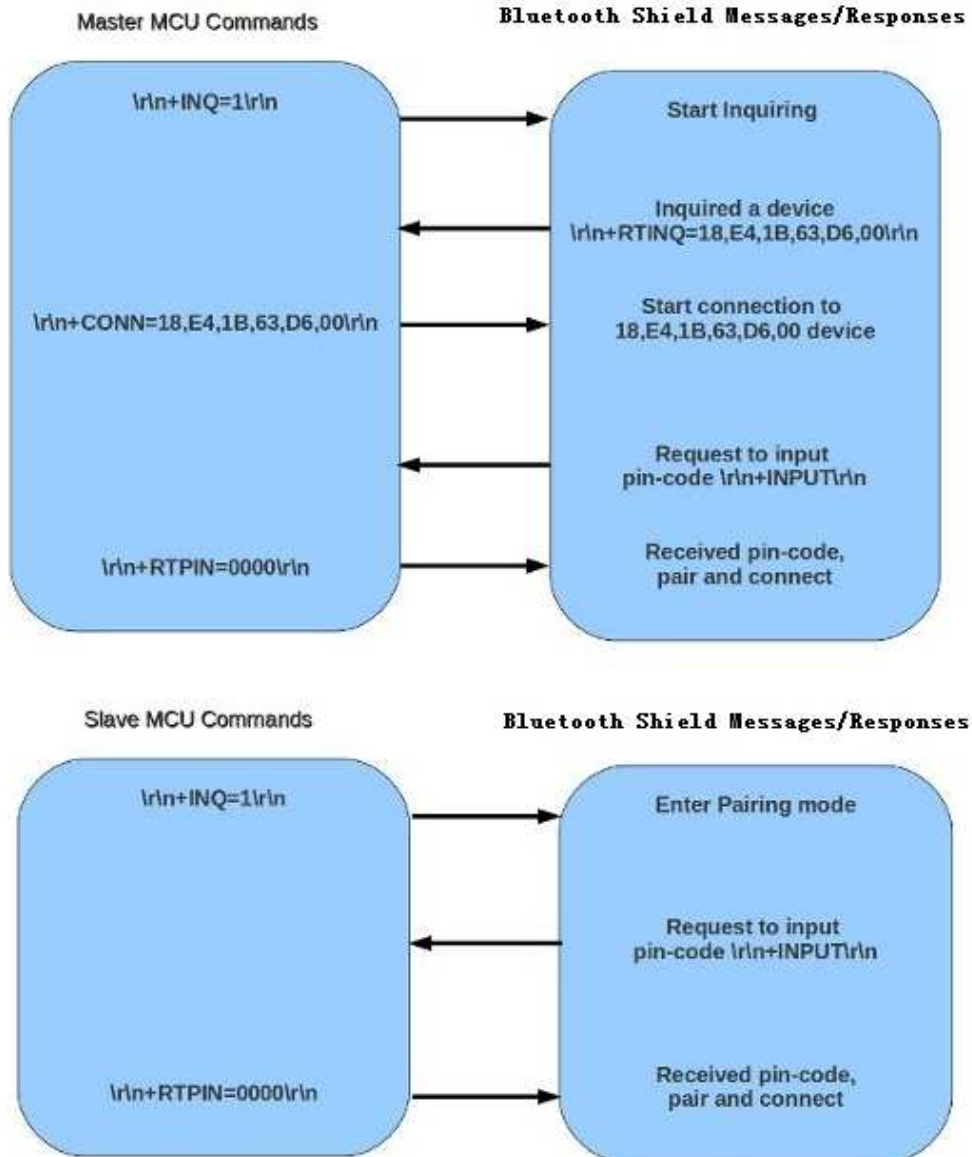
5.2 Software Instruction

Working Sketch Map

The following sketch presents an overview of **Bluetooth Shield** operation in master and slave mode.

The following flowchart gives a quick start guide to **Bluetooth Shield** programming.

Master MCU Commands

Bluetooth Shield Messages/Responses

\r\n+INQ=1\r\n → Start Inquiring

Inquired a device
\r\n+RTINQ=18,E4,1B,63,D6,00\r\n ←

\r\n+CONN=18,E4,1B,63,D6,00\r\n → Start connection to
18,E4,1B,63,D6,00 device

Request to input
pin-code \r\n+INPUT\r\n ←

\r\n+RTPIN=0000\r\n → Received pin-code,
pair and connect

Slave MCU Commands

Bluetooth Shield Messages/Responses

\r\n+INQ=1\r\n → Enter Pairing mode

Request to input
pin-code \r\n+INPUT\r\n ←

\r\n+RTPIN=0000\r\n → Received pin-code,
pair and connect

Commands to change default configuration

1. Set working MODE

\r\n+STWMOD=0\r\n	Set device working mode as client (slave). Save and Rest.
\r\n+STWMOD=1\r\n	Set device working mode as server (master). Save and Rest.

Note: \r\n is necessary for operation and the value of are **0x0D 0x0A** in Hex. **\r** and **\n** represent **carriage-return** and **line-feed** (or next line),

2. Set BAUDRATE

\r\n+STBD=115200\r\n	Set baudrate 115200. Save and Rest.

Supported baudrate: 9600, 19200, 38400, 57600, 115200, 230400, and 460800.

3. Set Device NAME

\r\n+STNA=abcdefg	Set device name as "abcdefg". Save and Rest.

4. Auto-connect the last paired device on power

\r\n+STAUTO=0\r\n	Auto-connect forbidden. Save and Rest.
\r\n+STAUTO=1\r\n	Permit Auto-connect. Save and Rest.

5. Permit Paired device to connect me

\r\n+STOAUT=0\r\n	Forbidden. Save and Rest.
\r\n+STOAUT=1\r\n	Permit. Save and Rest.

6. Set PINCODE

\r\n +STPIN=2222\r\n	Set pincode "2222", Save and Rest.

7. Delete PINCODE(input PINCODE by MCU)

\r\n+DLPIN\r\n	Delete pincode. Save and Rest.

8. Read local ADDRESS CODE

\r\n+RTADDR\r\n	Return address of the device.

9. Auto-reconnect the device when they loss connection.

\r\n+LOSSRECONN=0\r\n	Forbid auto-reconnecting.

\r\n+LOSSRECONN=1\r\n	Permit auto-reconnecting.

Commands for Normal Operation:

1. Inquire

a) Master

\r\n+INQ=0\r\n	Stop Inquiring
\r\n+INQ=1\r\n	Begin/Restart Inquiring

a) Slave

\r\n+INQ=0\r\n	Disable been inquired
\r\n+INQ=1\r\n	Enable been inquired

When **+INQ=1** command is successful, the red and green LEDS blink alternatively.

2. Bluetooth module returns inquiring result

\r\n+RTINQ=aa,bb,cc,dd,ee,ff;name\r\n	Serial Bluetooth device with the address "aa,bb,cc,dd,ee,ff" and the name

3. Connect device

\r\n+CONN=aa,bb,cc,dd,ee,ff\r\n	Connect to a device with address of "aa,bb,cc,dd,ee,ff"

4. Bluetooth module requests inputting PINCODE

\r\n+INPIN\r\n

5. Input PINCODE

\r\n+RTPIN=code\r\n

Example: RTPIN=0000, Input PINCODE which is four zero.

6. Return status \r\n+BTSTA:xx\r\n

xx status:

0 - Initializing

1 - Ready

2 - Inquiring

3 - Connecting

4 - Connected

(Note: This is not a command, but the information returned from the module after every command)

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

❑ Reorient or relocate the receiving antenna.
❑ Increase the separation between the equipment and receiver.
❑ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
❑ Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

OEM Installation Instruction

FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment is installed and operated without distance limited between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This device is intended only for OEM integrators under the following conditions:

 The transmitter module may not be co-located with any other transmitter or antenna.

As long as the condition above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Maximum antenna gain with this device is -1dBi.

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining separate FCC authorizations.

End Product Labeling
The final end product must be labeled in a visible area with the
following: "Contains Transmitter Module FCC ID: Z4T-BTSHIELD" or "Contains FCC ID: Z4T-BTSHIELD" .

Manual Information That Must be Included
The user's manual for end users must include the following in-formation in a prominent location.
IMPORTANT NOTE:
To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

Other notes:
Bluetooth Shield modules have been built or under development for near body exposure applications. Because absorption rate testing (commonly known as SAR or Specific absorption rate) is not modularly transferable for FCC/IC. Thus, if the module is installed in the final device, the end user is still responsible to evaluate RF exposure testing (for USA, please refer to the following):
• FCC Part 1.1307
• FCC Part 2.1091 Mobile Devices
• FCC Part 2.1093 Portable Devices