

BT Shield 2.2

-Bluetooth to Serial Port Module Shield

Overview



BT shield V2.2 is a serial port Bluetooth module (with master and slave mode) breakout board, it's compatible with Arduino and IFlat-32, it can directly plug on Arduino/IFlat-32 board, use UART port for communication with Arduino/IFlat-32 or PC.

Specifications

Microprocessor	CSR BC417
PCB size	53.3mm X 47mm X 1.6mm
Indicators	PWR State
Power supply	5V DC
IO	6
Communication Protocol	UART/Bluetooth 2.0
RoHS	Yes

Electrical Characteristics

Specification		Min	Type	Max	Unit
Power Voltage		4.5	5	5.5	VDC
Input Voltage VH	Target Voltage = 3.3V	3	3.3	3.6	V
	Target Voltage = 5V	4.5	5	5.5	
Input Voltage VL:		-0.3	0	0.5	V
Current Consumption		-	20	40	mA

Hardware

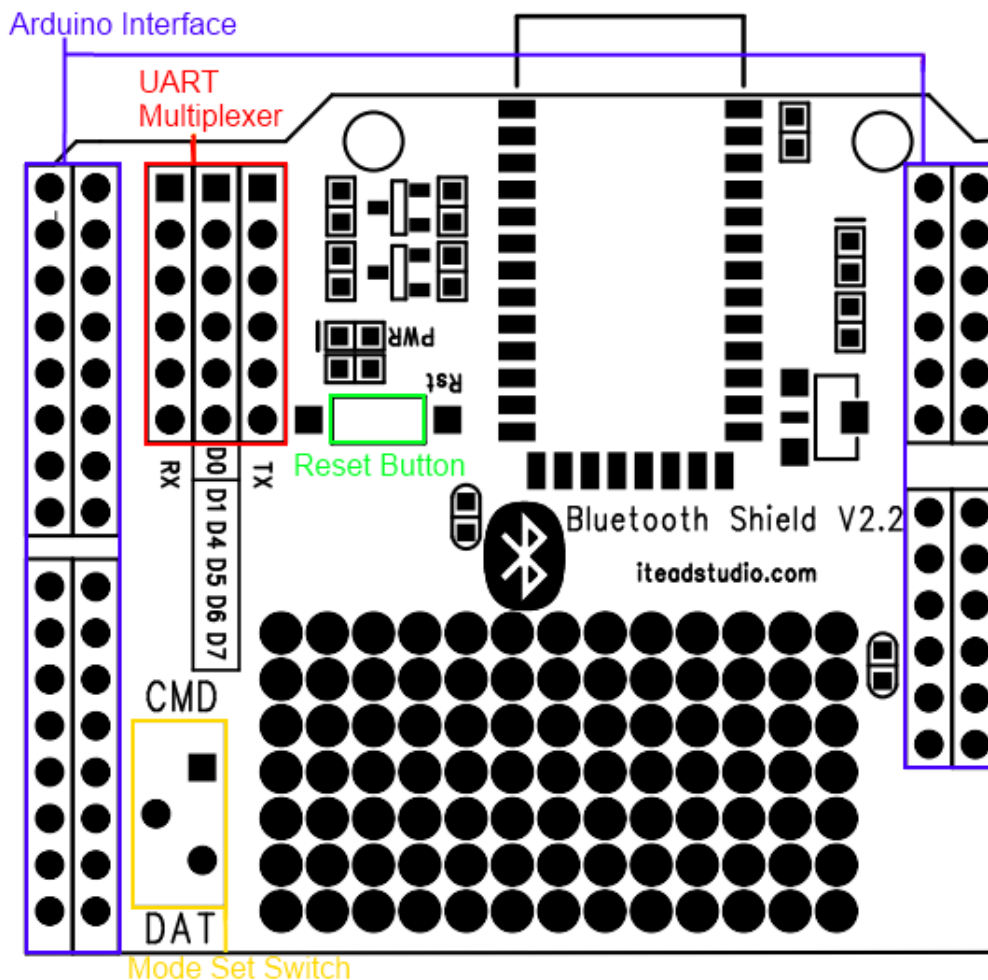


Figure 1 Top view of BT shield V2.2

UART Multiplexer (For free UART connection setting)

You can use the jumper to connect the TXD and RXD pins of HC-05 to D0, D1, D4~D7 pin of Arduino.

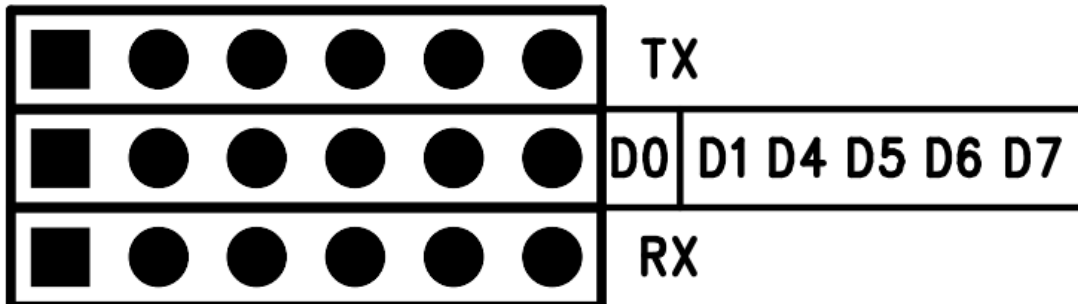


Figure 2 UART Multiplexer

When using the connection as Figure 3, the BT shield connects to the ATmega328 chip on board.

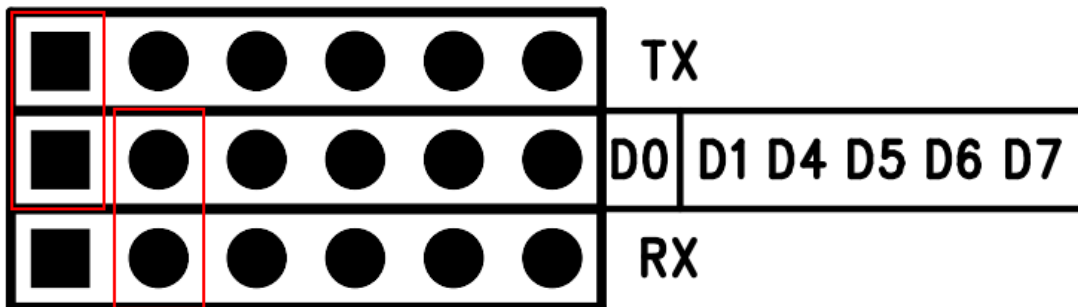


Figure 3 Connect the Arduino board

When using the connection as Figure 4, the HC-05 connects with the FT232RL chip, and the FT232RL connect to PC by USB. With this configuration you can use the serial software on PC to control or configure the HC-05 module.

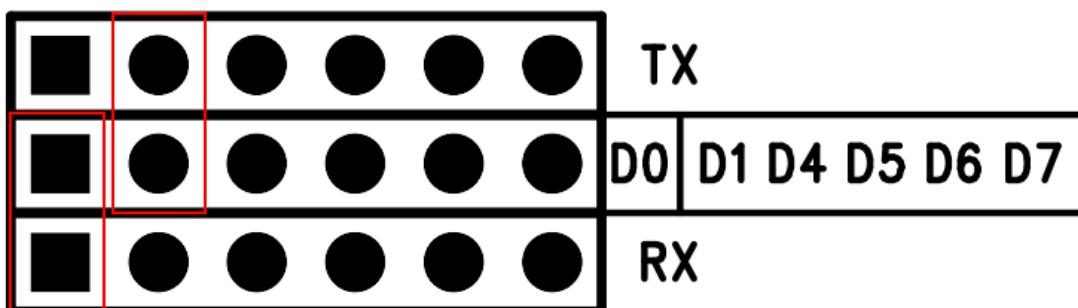


Figure 4 Connect the UART Interface as FT232

Except the 2 configurations above, you can connect the TXD and RXD to any other pins from D4-D7, and using the software-serial library to control the HC-05 module.

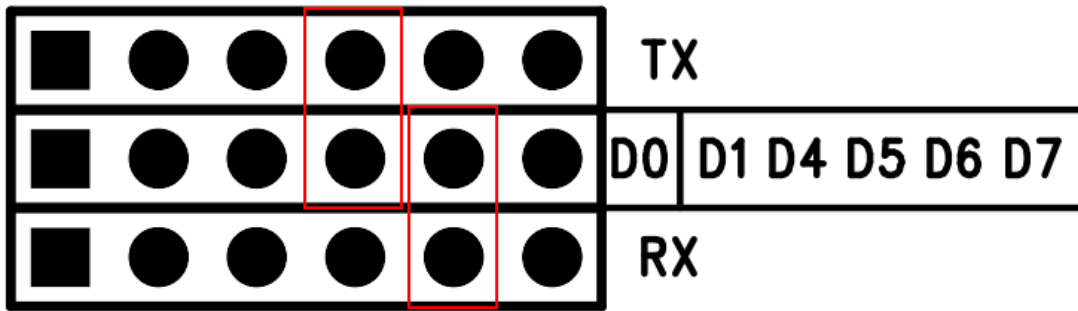


Figure 5 an example for software-serial connection

Mode Switch

The Mode Set Switch is connected to PIO11, when it is pushed to CMD and powered on, the HC-05 enter command mode, HC-05 module can receive and response AT command in this mode. When it is pushed to DATA and powered on. The HC-05 enters data mode and will not accept AT command.

States LED

When power on and disconnect the port, states LED blinks 1time/2s ; when the module connect and open the serial port, states LED blinks 2times/s.

AT COMMAND

1. Test command:

Command	Respond	Parameter
AT	OK	-

2. Reset

Command	Respond	Parameter
AT+RESET	OK	-

3. Get firmware version

Command	Respond	Parameter
AT+VERSION?	+VERSION:<Param> OK	Param : firmware version

Example:

```
AT+VERSION?\r\n
+VERSION:2.0-20100601
OK
```

4. Restore default

Command	Respond	Parameter
AT+ORGL	OK	-

Default state:

Slave mode, pin code :1234, device name: H-C-2010-06-01 ,Baud 38400bits/s.

5. Get module address

Command	Respond	Parameter
AT+ADDR?	+ADDR:<Param> OK	Param: address of Bluetooth module

Bluetooth address: NAP: UAP : LAP

Example:

```
AT+ADDR?\r\n
+ADDR:1234:56:abcdef
OK
```

6. Set/Check module name:

Command	Respond	Parameter
AT+NAME=<Param>	OK	Param: Bluetooth module name (Default :HC-05)
AT+NAME?	+NAME:<Param> OK (/FAIL)	

Example:

```
AT+NAME=HC-05\r\n    set the module name to "HC-05"
OK
AT+NAME=ITeadStudio\r\n
OK
AT+NAME?\r\n
+NAME: ITeadStudio
OK
```

7. Get the Bluetooth device name:

Command	Respond	Parameter
AT+RNAME?<Param1>	1. +NAME:<Param2> OK 2. FAIL	Param1,Param 2 : the address of Bluetooth device

Example: (Device address 00:02:72:od:22:24, name: ITead)

```
AT+RNAME? 0002, 72, od2224\r\n
+RNAME:ITead
OK
```

8. Set/Check module mode:

Command	Respond	Parameter
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AT+ROLE=<Param>	OK	Param: 0- Slave 1-Master 2-Slave-Loop
AT+ ROLE?	+ROLE:<Param> OK	

9. Set/Check device class

Command	Respond	Parameter
AT+CLASS=<Param>	OK	Param: Device Class
AT+ CLASS?	1. +CLASS:<Param> OK 2. FAIL	

10. Set/Check GIAC (General Inquire Access Code)

Command	Respond	Parameter
AT+IAC=<Param>	1.OK 2. FAIL	Param: GIAC (Default : 9e8b33)
AT+IAC	+IAC:<Param> OK	

Example:

```
AT+IAC=9e8b3f\r\n
OK
AT+IAC?\r\n
+IAC: 9e8b3f
OK
```

11. Set/Check -- Query access patterns

Command	Respond	Parameter
AT+INQM=<Param>,<Param2>,<Param3>	1.OK 2. FAIL	Param: 0— inquiry_mode_standard 1— inquiry_mode_rssi Param2: Maximum number of Bluetooth devices to respond to Param3: Timeout (1-48 : 1.28s to 61.44s)
AT+ INQM?	+INQM : <Param>,<Param2>,<Param3> OK	

Example:

```
AT+INQM=1,9,48\r\n
OK
AT+INQM\r\n
```

+INQM:1, 9, 48
OK

12. Set/Check PIN code:

Command	Respond	Parameter
AT+PSWD=<Param>	OK	Param: PIN code (Default 1234)
AT+ PSWD?	+ PSWD : <Param> OK	

13. Set/Check serial parameter:

Command	Respond	Parameter
AT+UART=<Param>, <Param2>,<Param3>	OK	Param1: Baud Param2: Stop bit Param3: Parity
AT+ UART?	+UART=<Param>,<Par am2>,<Param3> OK	

Example:

```
AT+UART=115200, 1,2,\r\n
OK
AT+UART?
+UART:115200,1,2
OK
```

14. Set/Check connect mode:

Command	Respond	Parameter
AT+CMODE=<Param >	OK	Param: 0 - connect fixed address 1 - connect any address 2 - slave-Loop
AT+ CMODE?	+ CMODE:<Param> OK	

15. Set/Check fixed address:

Command	Respond	Parameter
AT+BIND=<Param>	OK	Param: Fixed address (Default 00:00:00:00:00: 00)
AT+ BIND?	+ BIND:<Param> OK	

Example:

```
AT+BIND=1234, 56, abcdef\r\n
OK
AT+BIND?\r\n
+BIND:1234:56:abcdef
OK
```

16. Set/Check LED I/O

Command	Respond	Parameter
AT+POLAR=<Param1, <Param2>	OK	Param1: 0- PIO8 low drive LED 1- PIO8 high drive LED
AT+ POLAR?	+ POLAR=<Param1>,<Pa ram2> OK	Param2: 0- PIO9 low drive LED 1- PIO9 high drive LED

17. Set PIO output

Command	Respond	Parameter
AT+PIO=<Param1>,<Param2>	OK	Param1: PIO number Param2: PIO level 0- low 1- high

Example:

1. PIO10 output high level

AT+PIO=10, 1\r\n

OK

18. Set/Check – scan parameter

Command	Respond	Parameter
AT+IPSCAN=<Param1 >,<Param2>,<Param 3>,<Param4>	OK	Param1: Query time interval Param2 : Query duration
AT+IPSCAN?	+IPSCAN:<Param1>,< Param2>,<Param3>,< Param4> OK	Param3 : Paging interval Param4 : Call duration

Example:

AT+IPSCAN =1234,500,1200,250\r\n

OK

AT+IPSCAN?

+IPSCAN:1234,500,1200,250

19. Set/Check - SHIFF parameter

Command	Respond	Parameter
AT+SNIFF=<Param1> ,<Param2>,<Param3> >,<Param4>	OK	Param1: Max time Param2: Min time Param3: Retry time Param4: Time out
AT+ SNIFF?	+SNIFF:<Param1>,<Param2>,<Param3>,<Param4> OK	

20. Set/Check security mode

Command	Respond	Parameter
AT+SENM=<Param1> ,<Param2>	1. OK 2. FAIL	Param1: 0—sec_mode0+ off 1—sec_mode1+ non_secure 2—sec_mode2_ service 3—sec_mode3_l ink 4—sec_mode_u nknown Param2: 0—hci_enc_mod e_off 1—hci_enc_mod e_pt_to_pt 2—hci_enc_mod e_pt_to_pt_and_b cast
AT+ SENM?	+ SENM:<Param1>,<Param2> OK	

21. Delete Authenticated Device

Command	Respond	Parameter
AT+PMSAD=<Param>	OK	Param: Authenticated Device Address

Example:

AT+PMSAD =1234,56,abcdef\r\n

OK

22. Delete All Authenticated Device

Command	Respond	Parameter
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AT+ RMAAD	OK	-
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23. Search Authenticated Device

Command	Respond	Parameter
AT+FSAD= <Param>	1. OK 2. FAIL	Param: Device address

24. Get Authenticated Device Count

Command	Respond	Parameter
AT+ADCN?	+ADCN: <Param> OK	Param: Device Count

25. Most Recently Used Authenticated Device

Command	Respond	Parameter
AT+MRAD?	+ MRAD: <Param> OK	Param: Recently Authenticated Device Address

26. Get the module working state

Command	Respond	Parameter
AT+ STATE?	+ STATE: <Param> OK	Param: "INITIALIZED" "READY" "PAIRABLE" "PAIRED" "INQUIRING" "CONNECTING" "CONNECTED" "DISCONNECTED" "NUKNOW"

27. Initialize the SPP profile lib

Command	Respond	Parameter
AT+INIT	1. OK 2. FAIL	-

28. Inquiry Bluetooth Device

Command	Respond	Parameter
AT+INQ	+INQ: <Param1> , <Param2>, <Param3> ... OK	Param1: Address Param2 : Device Class Param3 : RSSI Signal strength

Example:

```

AT+INIT\r\n
OK
AT+IAC=9e8b33\r\n
OK
AT+CLASS=0\r\n
AT+INQM=1,9,48\r\n
At+INQ\r\n
+INQ:2:72:D2224,3E0104,FFBC
+INQ:1234:56:0,1F1F,FFC1
+INQ:1234:56:0,1F1F,FFC0
+INQ:1234:56:0,1F1F,FFC1
+INQ:2:72:D2224,3F0104,FFAD
+INQ:1234:56:0,1F1F,FFBE
+INQ:1234:56:0,1F1F,FFC2
+INQ:1234:56:0,1F1F,FFBE
+INQ:2:72:D2224,3F0104,FFBC
OK
  
```

28. Cancel Inquiring Bluetooth Device

Command	Respond	Parameter
AT+ INQC	OK	-

29. Equipment Matching

Command	Respond	Parameter
AT+PAIR=<Param1>,<Param2>	1. OK 2. FAIL	Param1 : Device Address Param2: Time out

30. Connect Device

Command	Respond	Parameter
AT+LINK=<Param>	1. OK 2. FAIL	Param : Device Address

Example:

```

AT+FSAD=1234,56,abcdef\r\n
OK
AT+LINK=1234,56,abcdef\r\n
OK
  
```

31. Disconnect

Command	Respond	Parameter
AT+DISC	1. +DISC:SUCCESS	Param : Device

	OK 2. +DISC:LINK_LOSS OK 3. +DISC:NO_SLC OK 4. +DISC:TIMEOUT OK 5. +DISC:ERROR OK	Address
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32. Energy-saving mode

Command	Respond	Parameter
AT+ENSNIFF=<Param>	OK	Param : Device Address

33. Exerts Energy-saving mode

Command	Respond	Parameter
AT+ EXSNIFF =<Param>	OK	Param : Device Address

Application Example

This is a demo that HC-05 is a master device and communicates to hc-06.

Step 1. Push the mode switch to CMD

Step 2. Power on, module enter command state

Step 3. Using baud rate 38400, send the "AT+ROLE=1\r\n" to module, with "OK\r\n" means setting successes.

Step 4. Send "AT+CMODE=1\r\n", set HC-05 connect to any address, with "OK\r\n" means setting successes.

Revision History

Rev.	Description	Release date
v1.0	Initial version	2011-7-22