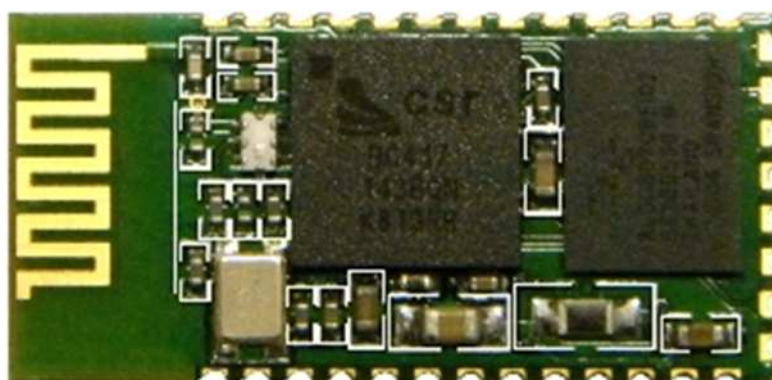


Bluetooth UART Module

[SPP AT Command]

使用手冊



HL-MD08R-C2-AT(v2)



Bluetooth V2.1+EDR

Ver 2.1.B 2013-01

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Welcome

Thanks for your purchase of the Bluetooth UART Module. Featuring Bluetooth wireless technology, the serial adapter provides cable-free Serial connections between your PC or Server & serial devices. Bluetooth Serial Adapter is compliance to Bluetooth V2.1+EDR and you can connect your computer or server and Module devices up to 10 meters away without cables in your working environments

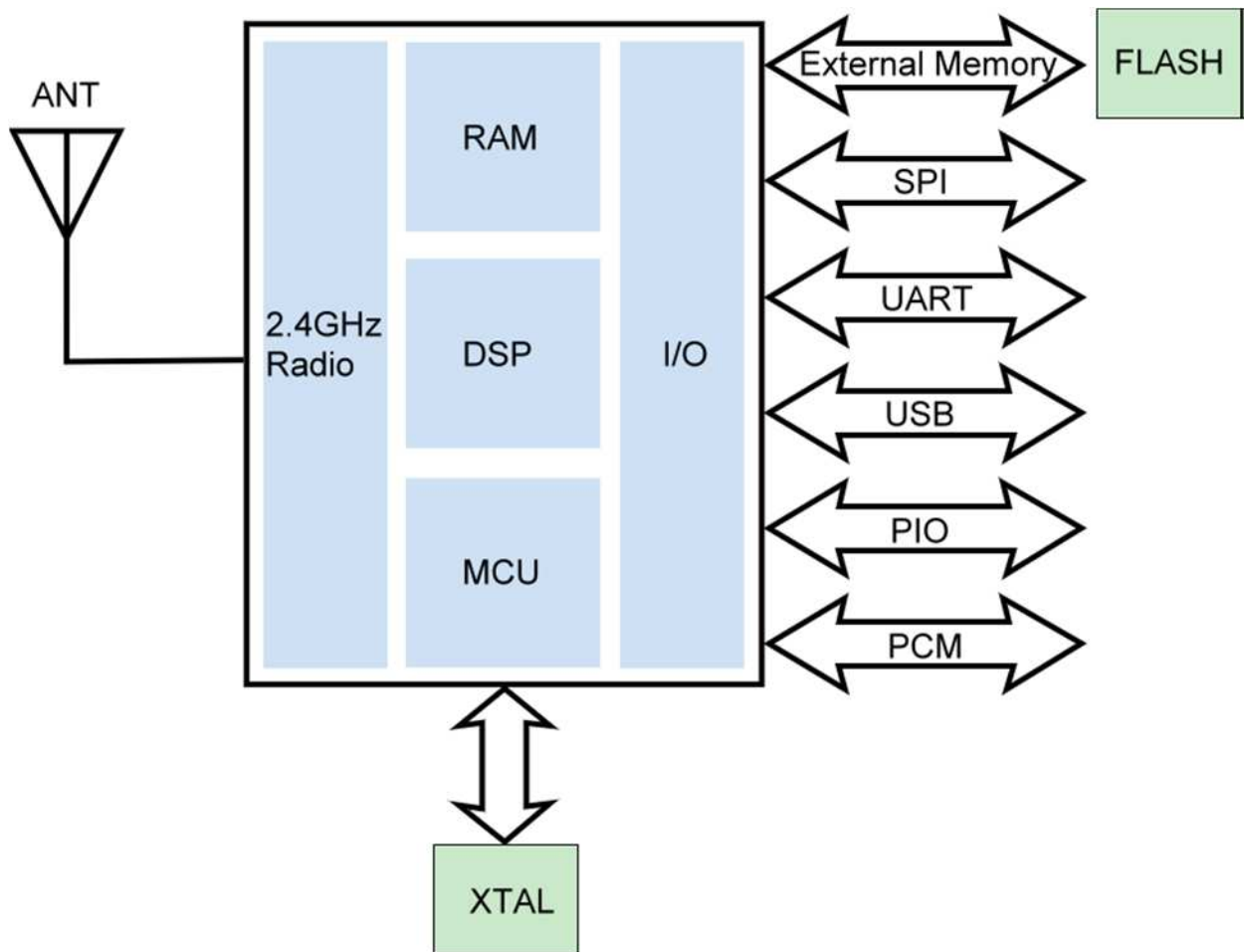
■ 功能簡介

- Bluetooth Specification V2.1+EDR
- CSR BC04 Chipset
- Complete 2.4GHz radio transceiver and baseband
- PCB printed smart antenna and RF interface options available
- Bluetooth Class 2 operation (up to 10 meter range)
- Supports Bluetooth Serial Port Profile (SPP)
- Provides transparent serial cable replacement.
- Supports Baud Rate 1200 to 921600 bps.
- Customized features support for pairing mode, device name, PIN code.
- Supports Bluetooth SPP as a slave or a master.
- Support for 802.11g/b Co-Existence

■ 應用

- Print, Serial Device
- GPS, POS, Barcode Reader
- Domestic and Industrial applications
- Embedded System

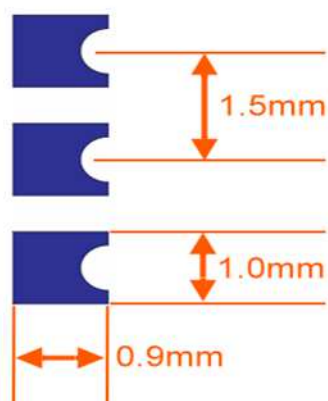
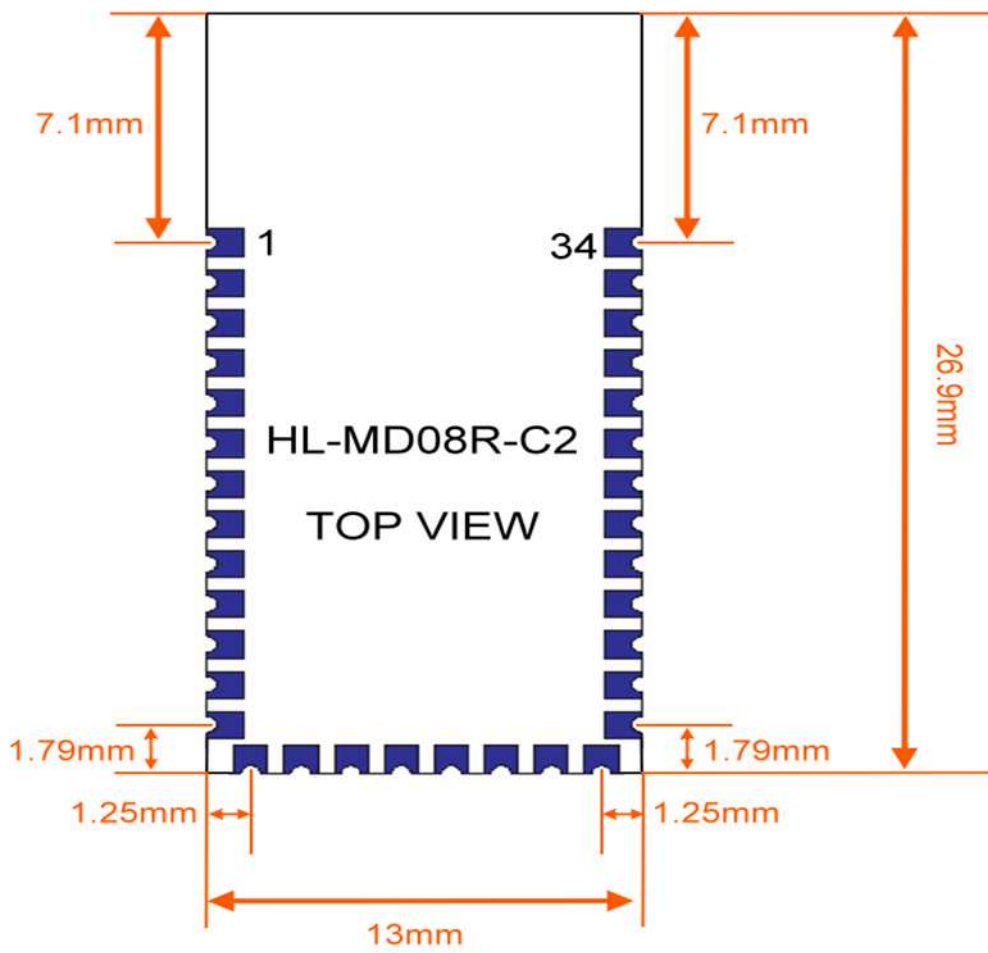
■ 方塊圖



■ 產品規格

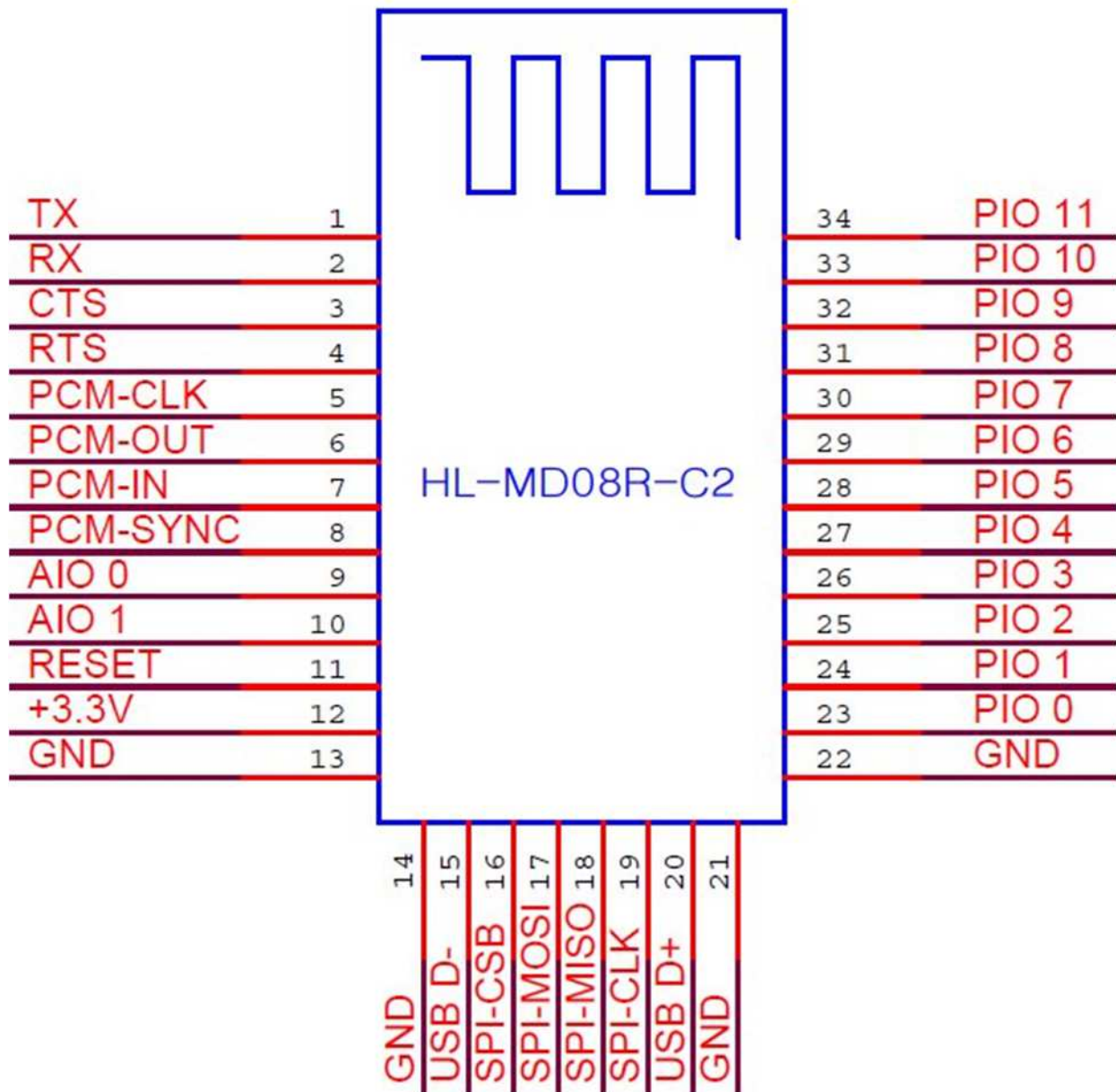
Model Name	HL-MD08R-C2-AT(v2)
Bluetooth Profile	Series Port Profile (Bluetooth SPP)
Standard	Bluetooth specification version 2.1+EDR
Frequency	2.402GHz ~ 2.480GHz unlicensed ISM band
Hopping	1,600/sec, 1 MHz channel space
Modulation Method	GFSK for 1Mbps; $\pi/4$ -DQPSK for 2Mbps; 8-DPSK for 3Mbps
Transfer rates (Max)	Max UART baud rates of 3Mbps
Spread Spectrum	Frequency Hopping Spread Spectrum (FHSS)
Signal	TxD, RxD, GND
Transfer Baud Rate	Supports 1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2/230.4/460.8/921.6kbps
AT Comand Mode	Command mode & data mode
Data Bit	8
Stop Bit	1 , 2
Parity	None , Odd , Even
RF Output Power	Class 2
Tx Power	Max.4 +/-1 dBm
Rx Sensitivity	-80 dBm typical
Antenna	PCB Printed Antenna
Coverage	Up to 10 meter
Current Consumption	Max. 40 mA
Input Power	3.3V DC
Operating Temperature	0 ~ +60°C
Storage Temperature	-10 ~ +70°C
Dimensions	27 x 13 x 2(H)mm

■ 尺寸圖 (Unit : mm)



■ 接腳配置

PIN NO.	NAME	TYPE	FUNCTION
1	UART-TX	CMOS Output	UART Data Output
2	UART-RX	CMOS Input	UART Data Input
3	UART-CTS	CMOS Input	UART Clear to Send
4	UART-RTS	CMOS Output	UART Ready to Send
5	PCM-CLK	Bi-directional	Synchronous Data Clock
6	PCM-OUT	CMOS Output	Synchronous Data Output
7	PCM-IN	CMOS Input	Synchronous Data Input
8	PCM-SYNC	Bi-directional	Synchronous Data Sync
9	AIO(0)	Bi-directional	Programmable I/O line
10	AIO(1)	Bi-directional	Programmable I/O line
11	RESETB	CMOS Input	Reset active low
12	3.3V	POWER	+3.3V Supply
13	GND	GND	Ground
14	GND	GND	Ground
15	USB D-	Bi-directional	USB_DN
16	SPI-CSB	CMOS Input	Chip Select For Synchronous Serial Interface
17	SPI-MOSI	CMOS Input	Serial Peripheral Interface Data Input
18	SPI-MISO	CMOS Output	Serial Peripheral Interface Data Output
19	SPI-CLK	CMOS Input	Serial Peripheral Interface Clock
20	USB D+	Bi-directional	USB_DP
21	GND	GND	Ground
22	GND	GND	Ground
23	PIO(0)	Bi-directional	Programmable I/O line
24	PIO(1)	Bi-directional	Programmable I/O line
25	PIO(2)	Bi-directional	Programmable I/O line
26	PIO(3)	Bi-directional	Programmable I/O line
27	PIO(4)	Bi-directional	Programmable I/O line
28	PIO(5)	Bi-directional	Programmable I/O line
29	PIO(6)	Bi-directional	Programmable I/O line
30	PIO(7)	Bi-directional	Programmable I/O line
31	PIO(8)	Bi-directional	Programmable I/O line
32	PIO(9)	Bi-directional	Programmable I/O line
33	PIO(10)	Bi-directional	Programmable I/O line
34	PIO(11)	Bi-directional	Programmable I/O line

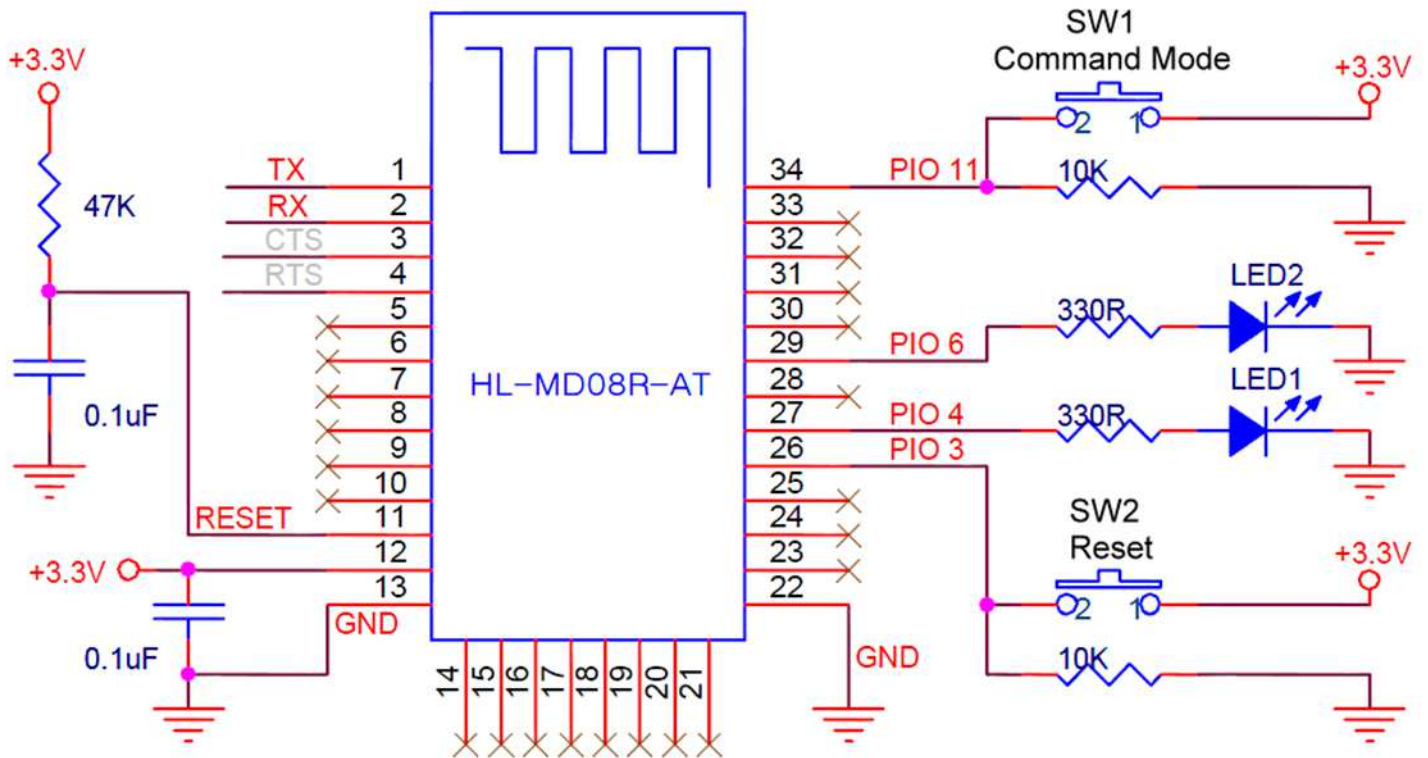


■ 出廠預設值

- Default Device name : **Hotlife AT**
- Default Password : **0000**
- Default Role : **Slave Mode**
- Default RS-232 Parameters : **115200, 8, n, 1**

■ 模組硬體

➢ 電路圖



LED1 藍芽狀態顯示

LED2 連線狀態顯示 (資料模式顯示)

SW1 指令模式切換

SW2 還原預設值

➤ LED 燈號說明

LED Name	Situation	Function
LED1	慢閃	待機模式
LED1	快閃	連線中
LED1	恆亮	連線成功
LED2	熄滅	指令模式
LED2	恆亮	資料模式

➤ 按鍵功能

Button Name	Situation	Function
SW1	短按	指令模式切換
SW2	長按	還原預設值

➤ 模式功能說明

Mode Name	Function
指令模式 (Command Mode)	可以下達 AT 指令.
資料模式 (Data Mode)	藍芽 SPP 正常工作狀態.

■ AT 指令集

➤ 指令模式與資料模式說明

指令模式：未連線前均未指令模式

TX 僅能下達指令

RX 能接收回覆指令

資料模式：藍芽SPP連線成功後，會由指令模式變換為資料模式

➤ 指令模式與資料模式切換

指令模式變換至資料模式方法：藍芽SPP連線成功後，指令模式變換為資料模式。

資料模式變換至指令模式方法：

(1) 中斷藍芽連線

(2) SW1短按(PIO11 輸入高電位) 觸發後，藍芽連線立即中斷，並變換為指令模式

➤ 指令格式

ASCII 時指令結尾應加入Enter送出

HEX 時指令結尾應加入0D送出

➤ 指令模式確認

發送確認指令，以確保模組已經能接受指令。預設速率 Baud rate 為115200, 8, n, 1

下達指令： **AT**

模組回覆： **+OK**

➤ 藍芽設備名稱 Device Name

查詢本機設備名稱,

該名稱是對其他藍芽顯示的設備名稱, 其最大長度為20個字元.

下達指令: **AT+NAME=?**

指令說明: 查詢本機藍芽名稱

模組回覆: **+NAME: Hotlife AT**

變更本機設備名稱

下達指令: **AT+NAME=ABC123**

指令說明: AT+NAME=<Device Name>

模組回覆: **+NAME:ABC123**

➤ 藍芽配對金鑰 PIN Code

查詢本機藍芽驗證碼

當藍芽嘗試配對時需要的驗證PIN碼, PIN碼可以是ASCII字元, 其最大長度為11個字元.

下達指令: **AT+PIN=?**

指令說明: 查詢目前PIN Code

模組回覆: **+PIN:0000**

變更PIN Code

下達指令: **AT+PIN=1234**

指令說明: AT+PIN=<PIN Code>

模組回覆: **+PIN:1234**

➤ 藍芽地址 MAC Address

查詢本設備藍芽地址 Bluetooth Device Address

下達指令: **AT+MAC=?**

指令說明: 查詢本設備MAC地址

模組回覆: **+MAC:001AFF025600**

➤ 鮑率 UART Baud rate

查詢本設備藍芽串列通訊介面鮑率參數.

下達指令: **AT+UART=?**

指令說明: 查詢本設備鮑率參數

模組回覆: **+UART:115200,N,1**

變更UART鮑率參數

下達指令: **AT+UART=9600,N,1**

指令說明: 變更UART鮑率參數, AT+UART=<baud_rate>, <parity>, <stop_bits>

Baud rate: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600;

Parity : N, O, E

Stop bits : 1 or 2

模組回覆: **OK**

注意: UART 參數變更後重開機才能生效. 下達Command 之UART參數也需要同步變更.

➤ 流量控制 UART Flow Control

查詢目前藍芽Flow Control狀態.

下達指令: **AT+FLOW=?**

指令說明: 查詢Flow參數

模組回覆: **+FLOW:0** **+FLOW:0 為 Disable flow control**

+FLOW:1 為 Enable flow control

變更藍芽FLOW, 重開機後才會生效.

下達指令: **AT+FLOW=1**

指令說明: 變更Flow參數 **AT+FLOW=< 1 or 2 >**

模組回覆: **OK** **設定成功, 重開機後生效**

➤ 安全簡易配對 SSP

查詢目前藍芽SSP (Secure Simple Pairing)狀態.

SSP能提供安全且簡易的配對機制, 可以省略通行PIN碼, 但必須雙方都支援SSP功能

下達指令: **AT+SSP=?**

指令說明: 查詢UART參數

模組回覆: **+SSP:1** **+SSP:0 為 Disable SSP**

+SSP:1 為 Enable SSP

變更藍芽SSP, 重開機後才會生效.

下達指令: **AT+SSP=1**

指令說明: 變更SSP參數 **AT+SSP=< 0 or 1 >**

模組回覆: **OK** **設定成功, 重開機後生效**

➤ 搜尋 Inquire

尋找周圍的藍芽設備。搜尋時間的最大值為1~48，換成秒數為 值*1.28秒，

開啟搜尋，列出搜索範圍內的各種設備，最多可顯示16筆裝置資訊。

下達指令： **AT+INQ=10**

指令說明： AT+INQ=<1~48>

模組回覆： **+INQ:001AFF0903B2,Hotlife,001F1F,-10dBm**

+INQ:001AFF0903B3,Hotlife,001F1F,-31dBm

+INQ:<MAC>,<Device Name>,<COD>,<RSSI>

+OK

停止尋找

下達指令： **AT+INQ=STOP**

指令說明： 停止搜尋

模組回覆： **+INQ:001AFF0903B2,Hotlife,001F1F,-10dBm**

+INQ:001AFF0903B3,Hotlife,001F1F,-31dBm

+OK

➤ 配對&連線

主動連線設備，連線成功後即為資料模式。

資料模式無法下達任何指令。

下達指令： **AT+LS+INQ=001aff0903b0**

指令說明： AT+LS+INQ=<MAC>

模組回覆： **+OK**

+CONNECTING=連線中， +CONNECTED=連線成功， +CONNERROR=連線失敗

➤ 中斷連線

無法下達指令中斷藍芽連線, 回到指令模式

中斷藍芽連線方法:

- (1) 由遠端的藍芽設備中斷連線.
- (2) PIO11 輸入高電位觸發後, 藍芽連線立即中斷.

➤ 查詢配對紀錄

查詢已配對設備資訊列表

下達指令: **AT+LSP=?**

指令說明: 查詢已配對的

模組回覆: **+LSP:001AFF0903B3,Hotlife**

+LSP:<MAC>,<Device Name>

+OK

➤ 清除配對紀錄

清除已配對的裝置

下達指令: **AT+DELKEY**

指令說明: 清除配對紀錄

模組回覆: **OK**

➤ 顯示或隱藏裝置 Discoverable

查詢目前藍芽狀態是否可供搜尋

下達指令: **AT+DCV=?**

指令說明: 查詢Discoverable參數

模組回覆: **+DCV=0**

+DCV=0 為顯示藍芽裝置 可供搜尋狀態

+DCV=1 為隱藏藍芽裝置 不可供搜尋狀態

變更藍芽Discoverable狀態

下達指令: **+DCV=0**

指令說明: 變更SSP參數 **+DCV= < 0 or 1 >**

模組回覆: **+OK**

➤ 重開機 RESTART

說明: 變更藍芽角色Role, 重開機後才會生效.

下達指令: **AT+RESTART**

模組立即重開機, 不會回應任何訊息

➤ 還原預設值 DEFAULT

將參數還原為預設值方法:

(1) 下達指令: **AT+DEFAULT**

模組回覆: **OK**

(3) PIO3輸入高電位3秒後觸發

■ Warranty Policy

1. This device is guaranteed against manufacturing defects for one full year from the original date of purchase.
2. This warranty is valid at the time of purchase and is non-transferable.
3. This warranty must be presented to the service facility before any repair can be made.
4. Sales slip or other authentic evidence is required to validate warranty.
5. Damage caused by accident, misuse, abuse, improper storage, and/or uncertified repairs is not covered by this warranty.
6. All mail or transportation costs including insurance are at the expense of the owner.
7. Do not send any product to service center for warranty without a RMA (Return Merchandise Authorization) and proof of purchase. Ensure a trackable method of delivery is used (keep tracking number).
8. Warranty is valid only in the country of purchase.
9. We assume no liability that may result directly or indirectly from the use or misuse of these products.
10. **This warranty will be voided if the device is tampered with, improperly serviced, or the security seals are broken or removed".**

FCC Statement

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. 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.

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.

End Product Labeling

The final end product must be labeled in a visible area with the following sentence:

" Contains FCC ID: QBCHLMD08R-C2"

 **Warning:**

Changes or modifications made to this equipment not expressly approved by Hotlife Electronic Technology Co., Ltd. may void the FCC authorization to operate this equipment.