

Quick Start

Apr. 2017 Version 1.0

tBLE-720 - RS-232/422/485 to Bluetooth Low Energy Converter

Package Contents:



Note:

If any of these items are missed or damaged, contact the local distributors for more information. Save the shipping materials and cartons in case you want to ship in the future.

1. Installing Utility

i. Installing Utility CD: Bluetooth\Utility Web: ftp://ftp.icpdas.com.tw/pub/cd/ble_cd/tble-720/software/utility/

2. Basic Concept Introduction

2.1 Broadcast mode

Broadcast mode is the new feature in the Bluetooth LE. The Broadcaster device broadcasts packets to every device around it. The Bluetooth LE Observer device can receive the information without connection. *Broadcast mode is one-way data communication*.

2.2 Connection mode

In the connection mode, the Slave only can connect to a Master, but the Master can connect to three Slaves. The Slave will not send broadcast packet after link has been established. The Master and Slave could send data after a link has been established.



3. PIN Assignment

3.1 LED Indicator

LED Indicator	LED Color	Description
RF Link	Green	The connection status of Bluetooth LE
Status	Orange	The module status of tBLE-720

The LED had different pattern in the connection and broadcast mode. Refer to user manual for more detail (chapter 2.2.1).

3.2 DIP and Rotary Switch

The DIP switch can change the send mode (refer to user manual 1.3) and role (refer to user manual 1.5). The rotary switch is used to change the baud rate of RS-232/422/485 interface.

DSW1 –DIP Switch for role and connection mode setting				
Pin No.	Description	Location		
1	Polo	ON – Master/Broadcaster		
1	Kole	OFF – Slave/Observer		
2	Connection mode	ON – Advertisement mode		
	Connection mode	OFF – Connection mode		

RSW1 – Rotary Switch for Baud rate setting							
Location	ocation Baud Rate Location Baud Rate Location Baud Rate						
0	115200	2	38400	4	9600		
1	57600	3	19200	5~F	-		

<u>3.3 Power Input Connector</u>

Pin Assignment	Description
+Vs	+10 ~ +30 VDC
GND	Power GND
F.GND	Frame Ground

<u>3.4 Communication Connector</u>



Pin Assignment	Interface	Note
Tx+/D+ Tx-/D-	RS-422/RS-485	
Rx+ Rx-	RS-422	Only one of RS-232, RS- 422 or RS-485 ports can
TxD		be used at the same time.
RxD	RS-232	
GND		

4. Testing Communications

The utility supports two types for the module test. The "connection Mode" is used to test module in the connection mode. The "Broadcast Mode" is used to test the module in the broadcast mode. Refer to user manual for more detail (chapter 4.3).

Connect both the BLE-USB and tBLE-720 to the Host PC via the USB and RS-232. You may need to use two serial port tools to simulate the data transmission.



Figure 4-4-1 the architecture of test

4.1 Connection Mode

It needs two devices in the test. One is the Master; the others are slaves. Make sure the Group ID is same. The device send the data after the link has been established.

The tBLE-720 needs setting before the test. Please follow the procedure below:

<u>Step1</u>: The DIP switch can change the role and connection mode by dip switch. It needs one Master and one slave in the test. The baud rate can change by rotary switch.



Figure 4-2 change the role, connection mode and baud rate

<u>Step2</u>: Change other parameters by the utility in the "Basic Parameter Setting Page"(**Optional**). The description of each parameter refers to the user manual (4.2.1).

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🎏 tBLE-720/BLE-USB Utility	🎏 Basic Parameter Setting	- 🗆 X
Setting Test Firmware Upgrade About Basic Parameter Setting	Step 1 Step 2 Step 3 Step 4 Set COM Port COM Port: COM1 ~	Step 5 Step 6
COM Port: COM1 🗸 🐼 Open Port	Baud Rate: 115200 ~	Close Port
Baud Rate: 115200 V Close Port	Load Configuration	Next

Figure 4-3 change other parameters (Optional)

Step3: open "Connection Mode" page, and choose a COM port and Baud rate.

(2) End with the String
OM1 _ Open Port None O <cr><lf></lf></cr>
○ <cr>(0x0D) ○ <lf><cr></cr></lf></cr>
15200 Close Port O <lf>(0x0A) O ther: 6162 eg: ab = 6162(ASCII)</lf>
0

Figure 4-4 Choose the COM port and baud rate

Step4: send the data on the textbox. The peer device will receive the data and print to the textbox (As shown in the Figure 4-6).

Send String: 0123456789	ABCDEF			Send
Receive				
Send:	Clear Message	Statistics-Send	Receive:	Clear Message
0123456789ABCDEF	^	Length: 16		
		Bytte: 16		
		Clear		
		Statistics-Receive		
		Length: 0		
		Byte: 0		
		Clear		
	\sim	Clear		

Figure 4-5 Send the data to the peer device

Statistics-Send	Receive:	Clear Message
Length: 0	0123456789ABCDEF	^
Byte: 0 Clear		
Statistics-Receive		
Byte: 16		
Clear	r	~

Figure 4-6 receive the data form peer device

4.2 Broadcast Mode

It needs two devices in the broadcast test. One is the Broadcaster; the others are Observers. Make sure the Group ID is same. Broadcast mode is one-way data communication. The Broadcaster sends the advertisement packet, and the Observer receives the advertisement packet.

The tBLE-720 needs setting before the test. Please follow the procedure below:

Step1: The DIP switch can change the role and connection mode by dip switch. It needs one Broadcaster and one Observer in the test.



Figure 4-7 change the role, connection mode and baud rate

<u>Step2</u>: Change other parameters by the utility in the "Basic Parameter Setting Page"(**Optional**). The description of each parameter refers to the user manual (4.2.1).

10 tBLE-720/BLE-USB Utility	🎏 Basic Parameter Setting	- 🗆 X
Setting Test Firmware Upgrade About	Step 1 Step 2 Step 3 Step 4 Step 3	tep 5 Step 6
Basic Parameter Setting	COM Port	Open Port
COM Port: COM1 V 🔅 Open Port	Baud Rate: 115200	Close Port
Baud Rate: 115200 ~ Close Port	Load Configuration	Next

Figure 4-8 change other parameters (Optional)

Step3: open "Broadcast Mode" page, and choose a COM port and Baud rate.

	tble-720/ble-USE	3 Utility		
	Setting Test Fir COM Por Broad	mware Upgrade nection Mode dcast Mode	About	
	COM Port: COM1 Baud Rate: 115200	× \$	Open Port Close Port	
		\mathbf{r}		
🐞 Test module -	Broadcast mode	2		-
Set COM Port			Set Advertising Packet	t
COM Port: COM	122 🗸 🗘	Open Port	ADV Packet: +ADV: The adv	packet of maximum i
Baud Rate: 1152	200 ~	Close Port	Resume	Set Packet

Figure 4-9 Choose the COM port and baud rate

Step4: The Broadcaster can set the advertisement packet as show in the **Figure 4-10**. The max length of advertisement packet is 21 Bytes. The Observer will receive the data after the Broadcaster set the advertisement packet. The Observer will show the advertisement packet in the utility as show in the Figure **4-11**.

🌃 Test module - Broadcast mode \times Set COM Port-Set Advertising Packet Information Message × ADV Packet: +ADV: 0123456789ABCDEF COM Port: COM19 <CR> The adv packet of maximum is 21 Byte The ADV packet is setting. Baud Rate: 115200 Close Port Set Packet 確定 Broadcast Parameter Scan Result Broadcast Role: Broadcaster/Advertiser Clear Message Receive: Figure 4-10 set the advertisement packet 🌃 Test module - Broadcast mode \times Set COM Port Set Advertising Packet ADV Packet: +ADV: <CR> COM Port: COM22 The adv packet of maximum is 21 Byte Baud Rate: 115200 Close Port Scan Result Broadcast Parameter Observer/Scanner Clear Message Broadcast Role: Receive: 15:35:33.3300733- 0123456789ABCDEF 15:35:35.3262785- 0123456789ABCDEF ^ Broadcast Channel: 37,38,39 15:35:36.3271654-0123456789ABCDEF 15:35:37.3403539- 0123456789ABCDEF Broadcast Interval: 1000 ms 15:35:39.3458722-0123456789ABCDEF 15:35:43.3608211- 0123456789ABCDEF Group ID: 0 15:35:46.3606209- 0123456789ABCDEF 15:35:47.3565229- 0123456789ABCDEF 15:35:49.3609926- 0123456789ABCDEF 15:35:50.3629405- 0123456789ABCDEF 000DE06D0001 Device Address: 15:35:52.3612977-0123456789ABCDEF 15:35:53.3713176- 0123456789ABCDEF 15:35:55.3790428- 0123456789ABCDEF Statistics - Receive 15:35:56.3626265- 0123456789ABCDEF 16 Length: 15:35:59.3714960- 0123456789ABCDEF 15:36:00.3890763- 0123456789ABCDEF Clear 15:36:02.3940165- 0123456789ABCDEF 2352 Bvte:

The broadcast interval can change by the "Basic Parameter Setting" page (Refer to the step2).

Figure 4-11 receive the advertisement packet

5. Support

Please contact us if you have any questions about products.

ICP DAS website: http://www.icpdas.com Email: service@icpdas.com