



Bluetooth UART Transparent Transmission

User Guide

MOKO TECHNOLOGY LTD. www.mokosmart.com

Version 1.0

What is

Bluetooth UART Transparent Transmission

The Bluetooth UART Transparent Transmission mode means to set up two-way communication between user MCU and the Bluetooth master device by connecting the module with user MCU through UART. Users can reset the UART baud rate and Bluetooth connection interval, using the specified AT commands. The module will have different data TX & RX capability, as per different UART baud rates, Bluetooth connection intervals and packet intervals.



Figure 1-1

MOKO Bluetooth Module can work in **UART Transparent Transmission mode**.

MOKO Bluetooth module can broadcast automatically, which enables the smart phone or other Bluetooth master device with specific application running to scan and connect it. When connected successfully, the Bluetooth master device will do two-way communication with user MCU via Bluetooth module. The master device can write the module through the Bluetooth module's specific characteristic, and the recorded data will be sent to the user MCU through UART. Then the module will transmit the data packets received from user MCU to the master device automatically through the notify characteristic. To accomplish the development, the user must finish the code design for master MCU, and the code design of application for master device.

Users can also manage and control parameters of Bluetooth module with UART AT commands.

Note: In order to avoid the output level difference between user MCU's IO and module's IO, which will result to high current, a small isolation resistor is suggested to be connected in series in the output signal line TX.

How to use

Bluetooth UART Transparent Transmission

When we use Bluetooth UART Transparent Transmission, The tools we need are USB, nRF Connect for Mobile APP.

We use **USB to TTL UART CP2102 Module Serial Converter** to connect the Bluetooth module to the computer. We need to connect the Tx and RX of the Bluetooth module to the RXD and TXD of the Serial Converter.



Figure 2-1

We use serial tool software to simulate the user MCU. Serial tool software can send and receive data with the Bluetooth module through the Serial Converter.

Port: COM3 - BaudRate: 115200 - Apply DTR RTS	Open Port
DataBits: 8 Parity: None StopBits: 1 No CRC	Pause
Input HEX Show HEX Input ASC Show ASC Ignore Space I New Line I Show Interval	Clear
	(s) Send ▼ by Enter
	^
	~

We use **"nRF Connect for Mobile"**APP to simulate the Bluetooth master device. **nRF Connect for Mobile** is a powerful generic tool that allows you to scan, advertise and explore your Bluetooth devices and communicate with them.

	9:37 \$ 🗵 📚 🗔	
	E Devices SCAN :	
nRF Connect for Mobile	SCANNER BONDED ADVERTISER	
Powerful generic Bluetooth Low Energy scanning and exploration tool RF Connect for Mobile, previously known as nRF Master Control Panel, is a powerful generic tool that allows you to scan and explore your Bluetooth Low Energy devices and communicate with them. nRF Connect for Mobile supports a number of Bluetooth SIG adopted profiles, as well as the Device Firmware Update profile (DFU) from Nordic Semiconductor or Eddystone from Google. Scans for Bluetooth Low Energy devices 9 Press advertisement data 9 Press advertisement data 9 Discovers and parses services and characteristics 9 Discovers and parses services and indications 9 Discovers and method calls 9 Discovers and method calls 9 Support During Foregraps update prefile ublich allows user to unload a page	C9:E1:59:E2:E1:DB NOT BONDED #:73:dBm ++ N/A NA (Physical Web Beacon) CONNECT : FD:C4:51:7F:E1:A5 NOT BONDED #:52:dBm ++ N/A Device type: UNKNOWN Advertising type: Legacy Flags: GeneraDiscoverable, BF:GrNotSupported Complete list of 16-bit Service UUIDs: 0xFEAA Eddystone URL: Frame type: URL <0x10b Tx power at 0m :: 0 dBm URL: https://www.mokosmart.com OPEN CLONE RAW MORE N/A 2C2:E6:59:EB:C1D NOT BONNED	
application over-the-air (DFU OTA) from a HEX or Zip file Additional features of nRF Connect for Android only: • Parses values of most of known characteristics • GATT server configuration Listing pointed devices • Bluetocth Low Energy Advertising (peripheral role) • Simultaneous scanning, advertising and maintaining multiple connections • Full support for Eddystone becoans and liBeacons • Supports Device Firmware Update (DFU) profile	MKTEST CONNECT F6:66:0D:48:8E:0B MC NOT BONDED ▲ 81 dBm Device type: LE only Advertising type: Legacy TA Power Level: 0 dBm Sovice Data: OxF666DD488EDB00666 Complete Local Name: MKTEST	



Step1

Use the USB to TTL UART CP2102 Module Serial Converter to connect the Bluetooth module to the computer. Please pay attention to the correct connection of the power supply ,Tx and Rx.

Step 2

Open the serial port tool software, select the corresponding Port Number, and configure the serial port parameters. Open the Serial Port, you will see the indicator of the Serial Converter is on.





Step 3

Use "nRF Connect for Mobile" APP to scan and connect to the Bluetooth module. Please make sure connected the targeted Bluetooth module. In the APP UI, please refer to the Bluetooth Module AT Command User Manual to find the Service and Characteristic used for data communication.

10:59 🖇 🗵 🗢 🗖	10:59 🕸 🖾 🤤 🖵	14:59 💲 📧 😤 🕫
Devices STOP SCANNING	E Devices DISCONNECT 🕅 :	E Devices DISCONNECT (19) :
SCANNER BONDED ADVERTISER	BONDED ADVERTISER MOKO	BONDED ADVERTISER MOKO X
моко – ×	CONNECTED CLIENT SERVER	CONNECTED CLIENT SERVER
MOKO EB-4E-25-82:A7:A2 NOT BONDED ▲ 92 dBm Homodule Connect to the BLE module MOKO E7:70-D2:E5-2B-AA NOT BONDED ▲ 40 dBm ↔1020 ms	Generic Access UUID: 0x1800 PRIMARY SERVICE Generic Attribute UUID: 0x1801 PRIMARY SERVICE Unknown Service	PRIMARY SERVICE UNID: 0000fee0-0000-1000-8000-00805f9b34fb PRIMARY SERVICE Open the NOTIFY characteristic UNID: 0000fee0-0000-1000-8000-00805f9b34fb Properties: NOTIFY Descriptors: Descriptors:
Device type: LE only Advertising type: Legacy Flags: LimitedDiscoverable, BrEdrNotSupported	UUID: 0000fee0-0000-1000-8000-00805f9b34fb PRIMARY SERVICE	Client Characteristic Configuration
Complete list of 16-bit Service UUIDs: 0xFEE0 Manufacturer data (Bluetooth Core 4.1): Company: Reserved ID <0xDB0C>	Unknown Characteristic UUID: 0000fee0-0000-1000-8000-00805f9b34fb Properties: NOTIFY	Characteristic User Description
Complete Local Name: MOKO CLONE RAW MORE	Descriptors: Client Characteristic Configuration UID: 0x902 Cherostatistic I last Description	UNKnown Characteristic UUID: 0000fee1-0000-1000-8000-00805f9b34fb Properties: WRITE, WRITE NO RESPONSE
() MOKO DC:43:59:3E:B5:BC	UUID: 0x2901	Characteristic User Description 4
NOT BONDED	UUID: 0000fee1-0000-1000-8000-00805f9b34fb Properties: WRITE, WRITE NO RESPONSE Descriptors: Characteristic User Description <u>*</u> <u>*</u>	Unknown Characteristic UUD: 0000fee2/0000-1000-8000-00805f9b34fb Properties: NOTIFY Descriptors: Client Characteristic Configuration
Wireless by Nordic	Unknown Characteristic UUID: 0000fee2-0000-1000-8000-00805f9b34fb Properties: NOTIFY	Characteristic User Description
≡ □ <	≡ □ <	= 0 <

Figure 2-5

- "NOTIFY Property" means that you can automatically obtain the data sent from the user MCU through the Bluetooth module.
- "WRITE Property" means that you can send data from the Bluetooth master device to the user MCU throuth the Bluetooth module.

Step 4

You can write data in the serial port tool window and then send the data to the APP. And you can slide the APP UI right to view the data sent from the serial port tool.

		E Devices DISCONNECT (4) :
		BONDED ADVERTISER MOKO
Port COM3 V Bay Bay 115200 V Apply C DTB C BTS	Close Port	CONNECTED CLIENT SERVER
DataBits: 8 Parity: None StopBits: 1 No CRC	Pause	15:11:49.383 Notification received from 0000fee0- 0000-1000-8000-00805f9b34fb, value: (0x) 41-42-43-44-45-46-47-48-49-4A-4B
Input HEX Show HEX Input ASC Show ASC I Information Informatio Information Information Inf	V Clear	-4C-4D-4E-4F-50-51-52-53-54-55-56-57-5 8-59-5A-30-31-32-33-34-35-36-37-38-39, "ABCDEFGHIJKLMNOPQRSTUVWXYZ01 G
ABCDEFGHIJKIMNOPQRSTUVWXYZ0123456789	(g) Send	Z445b/Z87 15:11:49.38 "(0x) 41-42-43-44-45-46-47-48-49-4A-4B P -4C-4D-4E-4F-50-51-52-53-54-55-56-57-5 8-59-53-43-13-22-33-44-53-56-37-38-39, "ABCDEFGHLIXLINNOPORS TIDMY2Y013/454780"
	~	received

Figure 2-6

Step 5

You can write data in the corresponding Characteristic in the APP, and then send the data to the serial port tool. The data will be displayed in the serial port tool window.



Figure 2-7

Port: COM3 - BaudRate: 115200 - Apply DTR RTS		Close Port
DataBits: 8 Parity: None StopBits: 1 No CRC		Pause
Input HEX Show HEX Input ASC Show ASC Ignore Space I New Line I Show Interval	··· •	Clear
ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789	< >	(<u>s)</u> Send ▼ by Enter
ABCDEFCHIJKLENOPQRSTUVVXYZ0123456789		^
The data received from the APP		

Revision History

Revision	Des cription of changes	Approved	Revision Date
V1.0	Initial Release	Kevin	2020.09.11

The contents of this datasheet are subject to change without prior notice for further improvement. MOKO team reserves all the rights for the final explanation.

Please contact MOKO sales team or visit <u>https://www.mokosmart.com</u> to get more related information if needed.

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