



BlueSoleil™ i40E Module

AT Commands

This document is the AT command definition of BlueSoleil™ module.

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1. Introduction

BlueSoleil™ i40E is a Bluetooth module developed by IVT with SPP Profile. It is used as an alternative to RS232 cable and can achieve the simulation of RS232 serial port. It is easy to integrate Bluetooth technology into the traditional serial communication applications by i40E. BlueSoleil i40E provides the excellent interoperability between various Bluetooth devices.

This document details how to program the module and how to configure the module.

2. Default Setting

There are two modes for i40E, that is, AT command mode and data communication mode. The AT commands is valid when SPP connection does not exist, that is AT command mode. After establishing SPP link, it enters data communication mode.

2.1 UART Default Setting

AT command mode, the UART default setting is: **【9600, 8, N, 1】**

Data communication mode, the UART default setting is: **【9600, 8, N, 1】**

2.2 Default Device Name

The default device name is i40E.

2.3 Default PIN Code

The default PIN Code is 1234.

2.4 Default Device Type

The default device type is 0x001F00 (Unknown Bluetooth device), when i40E is discovered, the device type shown is unknown Device, Device type can be set under the guidance of IVT.

3. AT Command

3.1 Agreement

Module uses the standard AT command format to interact, such as setting Baud Rate, Defined command is: AT+BAUD=9600\r, **NOTE, the command is not the end \r\n, but \r(0x0D).** The response in terms of format are such as \r\nOK\r\n or \r\n+BAUD: 1200\r\n.

3.2 Command List

3.2.1 Test Communication

Command	AT\r
Response	\r\nOK\r\n
Parameter	
Note	

3.2.2 Query Firmware Version

Command	AT+GVER\r
Response	\r\n +GVER:I40E-SPP-STANDARD-mm dd yy\r\n \r\n OK\r\n
Parameter	
Note	

3.2.3 Query Baud Rate of Data Communication mode

Command	AT+BAUD?\r	
Response	\r\n+BAUD:<baudrate>\r\n\r\nOK\r\n	
Parameter	baudrate	9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600, 1382400.
Note	Default: baudrate =9600	

3.2.4 Set Baud Rate of Data Communication mode

Command	AT+BAUD=<baudrate>\r	
Response	Success: \r\nOK\r\n Failure: \r\n ERROR\r\n	
Parameter	baudrate	9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600, 1382400.
Note	Default: baudrate=9600	

3.2.5 Query Serial Communication Parameter of Data Communication Mode

Command	AT+UARTCONFIG?\r	
Response	\r\n+UARTCONFIG:<stop>,<parity>\r\n\r\nOK\r\n	
Parameter	stop	0, 1bit stop bit 1, 2 bit stop bit
	parity	0, No checksum 1, Odd checksum 2, Even checksum
Note	Default: stop=0, parity=0	

3.2.6 Set Serial Communication Parameter of Data Communication Mode

Command	AT+UARTCONFIG=<stop>,<parity>\r	
Response	Success: \r\nOK\r\n Failure: \r\nERROR\r\n	
Parameter	stop	0, 1bit stop bit 1, 2 bit stop bit
	parity	0, No checksum 1, Odd checksum 2, Even checksum
Note	Default: stop=0, parity=0	

3.2.7 Query Bluetooth Scan mode

Command	AT+SCAN?\r	
Response	\r\n+SCAN:<mode>\r\n\r\nOK\r\n	
Parameter	mode	0, No scan; 1, Open the inquiry scan, close the page scan, then the device can be searched, but cannot be connected; 2, Close the query scan, open the page scan, then the device cannot be searched, but can be connected; 3, Open the inquiry and page scan, then the device can be searched and connected
	Note	Default: mode=3. Mode 0 is the best power saving mode.

3.2.8 Set Bluetooth Scan mode

Command	AT+SCAN=<mode>\r	
Response	Success: \r\nOK\r\n Failure: \r\nERROR\r\n	
Parameter	mode	0, No scan; 1, Open the inquiry scan, close the page scan, then the device can be searched, but cannot be connected; 2, Close the query scan, open the page scan, then the device cannot be searched, but can be connected; 3, Open the inquiry and page scan, then the device can be searched and connected
Note	Default: mode=3. Mode 0 is the best power saving mode.	

3.2.9 Discover Bluetooth Device

Command	AT+INQU=<opcode>\r	
Response	\r\n+INQU:<bdaddr1>,<cod1>\r\n \r\n+INQU: <bdaddr2>,<cod2>\r\n \r\nOK\r\n	
Parameter	opcode	1; start 0; stop
Note	Cod, abbreviation for class of device. AT+INQU=0\r can be sent to stop current inquiry procedure.	

3.2.10 Query Local Bluetooth Device Name

Command	AT+NAME?\r	
Response	\r\n+NAME:<name>\r\n\r\nOK\r\n	
Parameter	name	Default setting is : I40E
Note		

3.2.11 Set Local Bluetooth Device Name

Command	AT+NAME=<name>\r	
Response	Success: \r\nOK\r\n Failure: \r\n ERROR\r\n	
Parameter	name	Default : I40E
Note	Name can be up to 31 bytes maximum.	

3.2.12 Query Remote Bluetooth Device Name

Command	AT+RNAME=<bdaddr>\r	
Response	Success: \r\n+RNAME:<bdaddr>,<name> \r\n\r\nOK\r\n Failure: \r\n ERROR\r\n	
Parameter	bdaddr	Remote Bluetooth device address
Note	Bdaddr is 12 hexadecimal characters.	

3.2.13 Query Bluetooth Pin Code

Command	AT+PIN?\r	
Response	\r\n+PIN:<pincode>\r\n\r\nOK\r\n	
Parameter	pincode	Default :1234
Note		

3.2.14 Set Bluetooth Pin Code

Command	AT+PIN=<pincode>\r	
Response	Success: \r\nOK\r\n Failure: \r\n ERROR\r\n	
Parameter	pincode	Default :1234.
Note	Pin code at least one byte, most up to 16 bytes	

3.2.15 Set up SPP Connection

3.2.15.1 Local Device as Initiator

Command	AT+SPPCONN=<bdaddr>\r	
Response	Success: \r\n+SPPCONN:<bdaddr> \r\n \r\nOK\r\n Failure: \r\n+SPPCONN:<bdaddr> \r\n \r\nERROR\r\n	
Parameter	bdaddr	Address of the remote Bluetooth device to connect.
Note	PIO5 can also be used to detect whether the connection is set up or not.	

3.2.15.2 Local Device as Acceptor

Command		
Response	Success: \r\n+SPPCONI:<bdaddr> \r\n \r\nOK\r\n Failure: \r\n+SPPCONI:<bdaddr> \r\n \r\nERROR\r\n	
Parameter		
Note	PIO5 can also be used to detect whether the connection is set up or not.	

3.2.16 Set Class of Device

Command	AT+CLASS=<cod>\r	
Response	Success: \r\nOK\r\n Failure: \r\n ERROR\r\n	
Parameter	cod	Class of device, default: 001F00.
Note	User can set this value under the guidance of IVT.	

3.2.17 Get Local Bluetooth Device Address

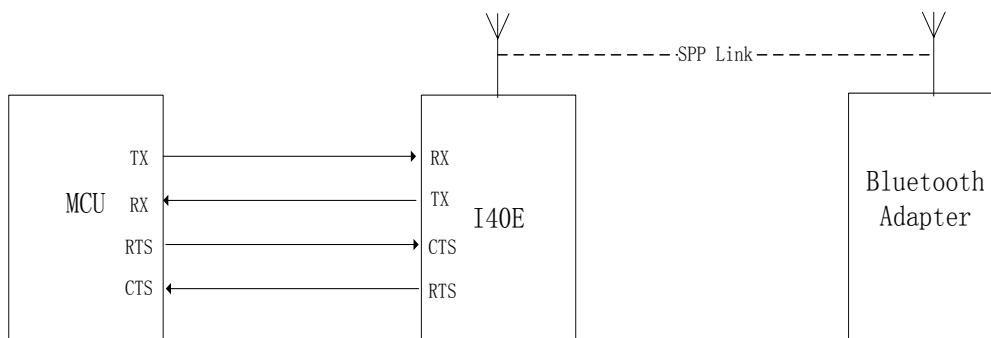
Command	AT+LBDADDR?\r	
Response	\r\n+LBDADDR:<bdaddr>\r\n\r\nOK\r\n	
Parameter	bdaddr	Local Bluetooth device address, Default: 0013EFC1E2FC.
Note		

3.2.18 Clear Paired Devices

Command	AT+CLEARBOND\r
Response	\r\nOK\r\n
Parameter	
Note	After calling this command, the module will not connect the remote device automatically and need to re-pair the remote device to connect.

4. UART Hardware Flow Control

i40E uses the UART Hardware flow control by default. The customer who does not use the Hardware flow control can use 10k resistor connected to UART_RTS and UART_CTS together, this will form a handshake, making the failure of hardware flow control.



As shown above, for the situation of using the hardware flow control, if the MCU cannot receive data for some reason, it will set UART_RTS invalid. i40E firmware will detect the i40E UART_CTS invalid, and this hardware flow control information will be mapped to the SPP connection, then the serial port driver of the Bluetooth Adapter side will detect the CTS of the virtual serial port becomes invalid and application which uses the Bluetooth serial port will stop sending data. **NOTE:** The customer using this feature needs to be under the guidance of IVT.

5. Guidelines

- i40E can discover, pair and connect remote Bluetooth devices. i40E will retain the connection information and connect the last connected device automatically after it starts running.
- When SPP connection is established, the PIO5 is set high. If there is no connection, the PIO5 is set low.
- PIO9 as input. When connection exists, pulling up PIO9 will disconnect the current SPP connection, so PIO5 is set low. When there's no SPP connection, pulling up PIO9 will trigger the initiative to connect the last connected device. If i40E does not connect any device before or the last connected device is out of range, the connection will fail. If connection is successful, PIO5 will be pulled up to inform MCU.