

SKYLAB

SKB369 UART to BLE AT Manual

V1.03

2017-4

Revision History

V1.03	Change FW to support master & slave role	2017-4-5
V1.02	Revise PIN of HW Reset	2017-3-29
V1.01	Initial release	2017-3-20

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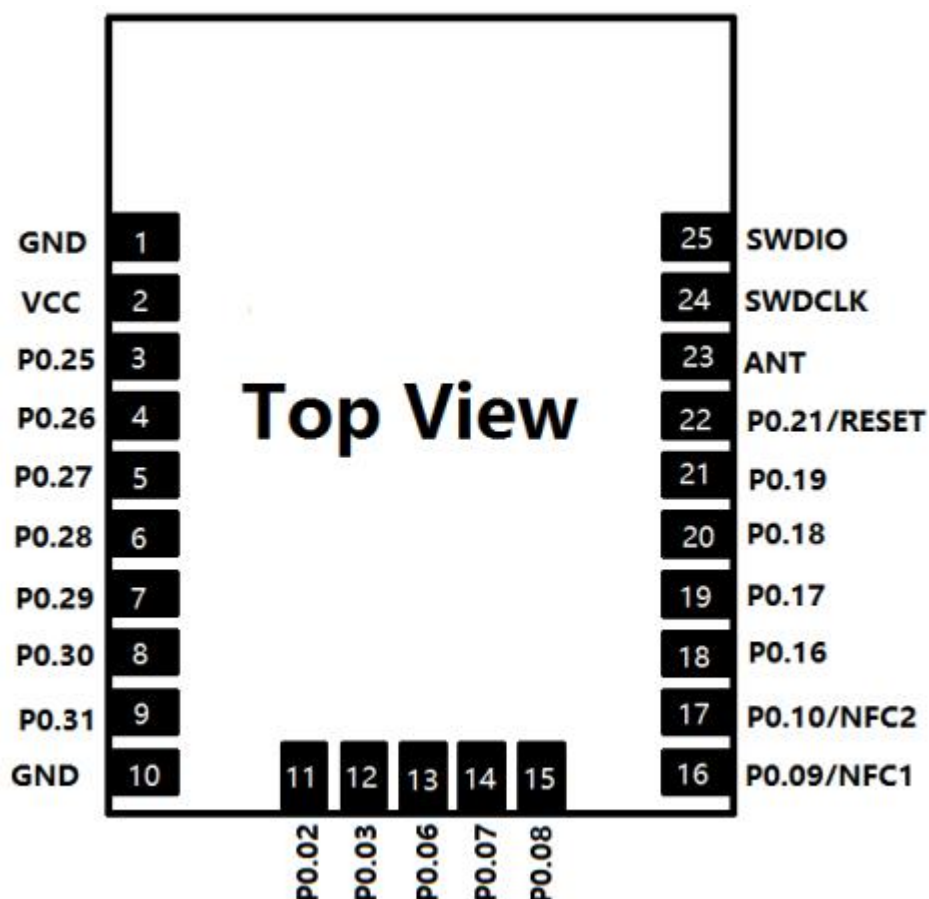
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1. Brief

Name	BLE to UART module
Protocol	Bluetooth 4.2 BLE
Protocol layer	LL/SMP/L2CAP/ATT/GAP/GATT
Range	70 Meters
Interface	UART (TTL 3.3V)
Baudrate	4800/9600/19200/38400/57600/115200/230400
Max of transmit rate	2KB/S

2. PINs

2.1. PINs View



2.2. PINs Function Table

PIN	Name	Type	Descriptions
1/10	GND	Ground	
2	VCC	Power Supply	Power Supply
24/25	SWDIO/SWDCLK	Program Interface	For downloading FW
22	P0.21/Reset	Hardware Reset	
12	P0.03	UART TXD	
13	P0.06	UART RXD	

18	P0.16	Digital Output	High on disconnected state and low on connected state
19	P0.17	Digital Output	Notify enabled if low
20	P0.18	Digital Output	Indicates Advertising , level changes per 500ms
	Others	GPIO or Others	No Used

2.3. Other descriptions

2.3.1.Hardware Reset

Active Reset pin to low more than 100ms, and then pull it to high, module will reset.

3. Default Parameters

3.1. BLE

Device Name: nRF52832

Radio Tx Power: 4dBm

Connection Interval: 20ms~75ms

Advertisement Interval: 100ms

Advertisement switch: on

3.2. UART

Baudrate: 9600 bps

Data Bit: 8

Check Bit: None

Stop Bit: 1

Hardware Flow Control: None

4. GATT Service

UUIDs

Service UUID: 6E400001B5A3F393E0A9E50E24DCCA9E

TX Characteristic UUID :

6E400002B5A3F393E0A9E50E24DCCA9E

RX Characteristic UUID :

6E400003B5A3F393E0A9E50E24DCCA9E

4.2.UUIDs Descriptions

UART Service	Service for BLE to UART
TX Characterist ic	Properties: Write with respond/Write Command, mobile APP data should be sent through this characteristic, and device will dump through TXD.
RX Characterist ic	Properties: Notify, data from RXD will be sent through this characteristic to mobile APP.

5. Work Mode

Every frame of data packet will finish receiving with 10ms, means, If over 10ms no new data come, gets a frame of data done.

5.1. AT Command Mode

All UART data came from RXD will be handled as AT commands. In this mode, device will be advertising for waiting for mobile APP connection.

5.2. Data Transmit Mode

In this Mode, if current data frame is started with “AT+”, module will handle it as an AT command, or it will be sent to mobile APP through RX characteristic.

Log “[DA]Connected\r\n” will be dumped while module is connected from mobile APP or other peer devices.

Log “[DA]Disconnected\r\n” will be dumped while module is disconnected from mobile APP or other peer devices.

6. AT Commands Set

6.1. Command Specification

All commands based on ASCII.

All commands based on upper character.

All commands should be ended with a new line characters(<CR><LF>, 0D 0A in hex, i.e: '\r','\n')

Some of commands have attach reply data.

6.2. Command Format

6.2.1. Command without parameter

AT head	Plus char	Command	New Line chars
AT	+	CMD	\r\n

6.2.2. Command with parameter

AT head	Plus char	Command	equal sign	parameter	New Line chars
AT	+	CMD	=	param	\r\n

6.2.3. Reply

Reply Head	Result	New Line chars
[AT]	OK	\r\n
[AT]	ER	\r\n

6.2.4. Attach data in reply

Attach Head	Attach data	New Line chars
[DA]	content	\r\n

6.3. Commands Set

The following table is a list of AT commands, user should add new

line characters to each command when use them.

<> means command must have a parameter, [] means parameter is optional.

No.	AT command	Descriptions
1	AT?	Get AT help.
2	AT+VER	Get MAC of the module
3	AT+MAC	Get FW version
4	AT+PEER	Get peer device address.
5	AT+RESET	Reset module by software.
6	AT+FACTORY	Restore factory parameters.
7	AT+SAVE	Store parameter to FLASH.
8	AT+STATUS	Get module parameter status.
9	AT+WSTA	Check work state.
10	AT+DISCON[=s/m]	Disconnect to peer.
11	AT+BAUD=<baud rate>	Modify UART baudrate
12	AT+TXPWR=<tx power>	Set Radio Tx Power
13	AT+DEV_NAME=<name>	Set device advertisement name.
14	AT+ADVINTVL=<interval>	Set advertisement interval
15	AT+ADV=start/stop	Switch advertising.
16	AT+GAPINTVL=H/M/L	Set GAP interval parameters
17	AT+SCAN_BLE[=X]	Scan for BLE slave device.

18	AT+CON_MAC=<addre ss>	Connect to a slave device by a given MAC
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6.4. AT operations

The following pictures is a PC comm assistant that connected to module.

6.4.1. AT?

1	AT?	Get AT help.
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6.4.2. AT+VER

2	AT+VER	Get FW version
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6.4.3. AT+MAC

3	AT+MAC	Get MAC of the module
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6.4.4. AT+PEER

4	AT+PEER	Get peer device address.
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00: 00: 00: 00: 00: 00 if there is no peer device connected.



6.4.5. AT+RESET

5	AT+RESET	Reset module by software.
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Log "Start BLE-UART Module.\r\n" will output .



6.4.6. AT+FACTORY

6	AT+FACTORY	Restore factory parameters.
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The parameters will be stored automatically.



6.4.7. AT+SAVE

7	AT+SAVE	Store parameters to FLASH.
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This command will reply after 200ms.

You'd better to save new parameters to Flash.



6.4.8. AT+STATUS

8	AT+STATUS	Get module parameter status.
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Baudrate: 115200bps

Device Name: nRF52832

Advertising Interval: 100ms

Radio TX Power: 4dBm

GAP Interval level: medium(M)

6.4.9. AT+WSTA

9	AT+WSTA	Check work state.
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adv: be advertising

conn: connected

idle: no advertising and no connection

6.4.10. AT+DISCON

10	AT+DISCON[=s/m]	Disconnect to peer.
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If parameter is 's', perform disconnection for slave role.

If parameter is 'm', perform disconnection for master role.

If no parameter given, disconnect to all peer devices.

ER reply code will be dumped if there is no peer device connected.



6.4.11. AT+BAUD

11	AT+BAUD=<baud rate>	Modify UART baudrate
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New baudrate will take effect while reply dumped.

4800/9600/14400/19200/28800/38400/57600/76800/115200/230400



6.4.12. AT+TXPWR

12	AT+TXPWR=<tx power>	Set Radio Tx Power
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Tx Power can be -30/-20/-16/-12/-8/-4/0/4 .



6.4.13. AT+DEV_NAME

13	AT+DEV_NAME=<name>	Set device advertisement name.
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The length of name should be shorter than 20.



6.4.14. AT+ADVINTVL

14	AT+ADVINTVL=<interval>	Set advertisement interval
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Interval can be 20~5000, based on ms unit.



6.4.15. AT+ADV=start/stop

15	AT+ADV=start/stop	Switch advertising
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To slave role ,device will reply OK if on a non-connect state.



6.4.16. AT+GAPINTVL=H/M/L

16	AT+GAPINTVL=H/M/L	Set GAP interval parameters
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Only reply OK on non-connect state, others state will reply ER.



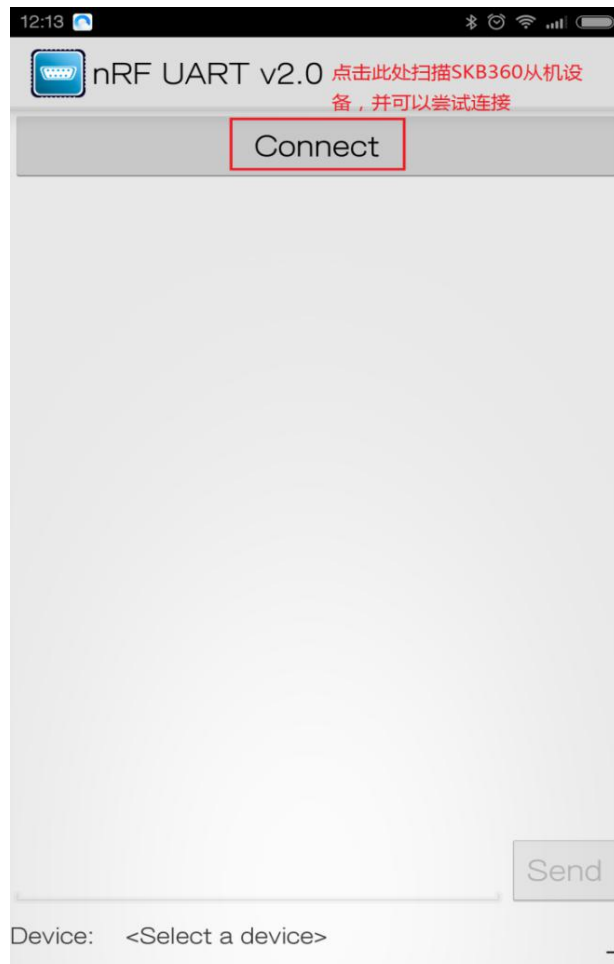
The GAP interval is helpful to improve transmission rate of BLE:

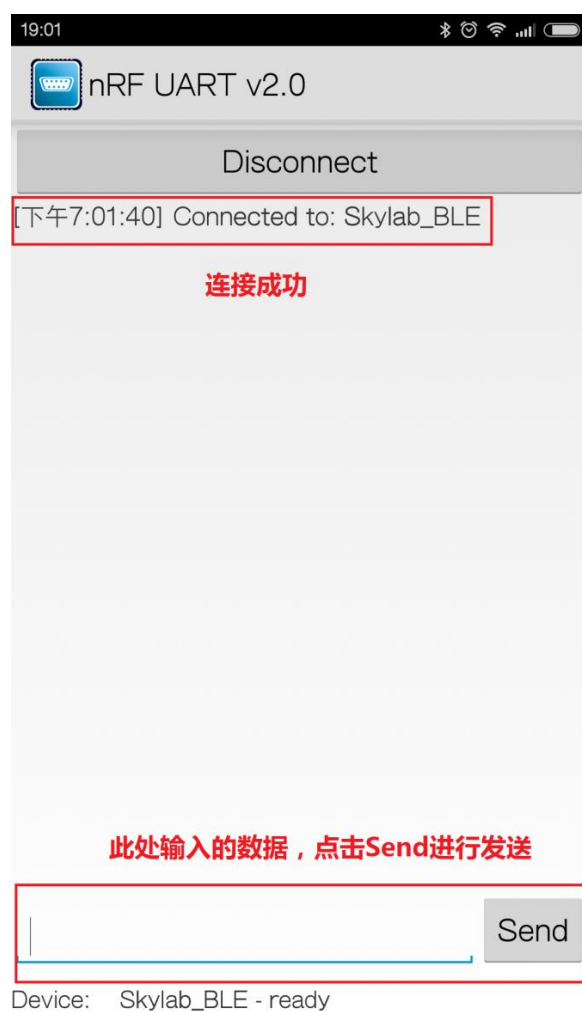
H: 7.5ms~30ms

M: 20ms~75ms

L: 100ms~150ms

7. Test with demo APP





Comm assistant display.



7.1. Transmit data

