

FSC-BT691 user guide

Release 1.0.0



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Chapter 1

Introduction

1.1 Description

This design guide is suitable for engineers developing FSC-BT691 series Bluetooth modules

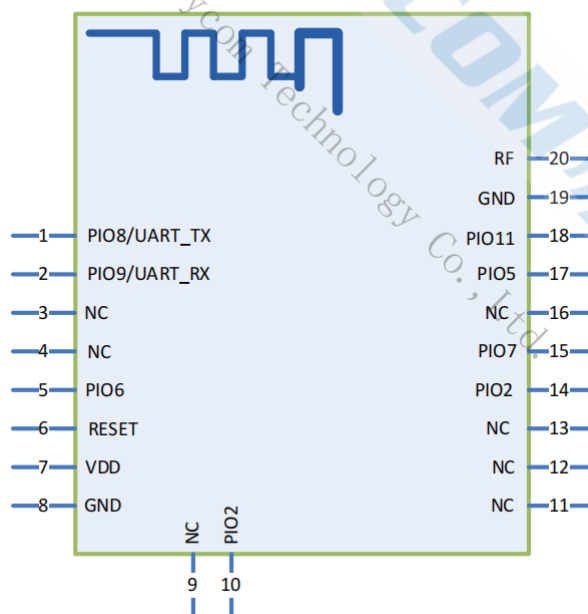
1.2 Module Default Settings

Name	Feasycom
Service UUID	FFF0
Write UUID	FFF2
Notify UUID	FFF1
UART Baudrate	115200/8/N/1

Chapter 2

Hardware Description

2.1 Pin Diagram



2.2 Pin Description

Pin	Pin Name	Type	Pin Descriptions
1	UART_TX	O	UART data output
2	UART_RX	I	UART data input
6	MODE	I	L=throughput mode ,H=command mode
6	RESET	I	External reset input: Active LOW, with an inter an internal pull-up.
7	VDD	Power	Power supply voltage 3.3V, LDO power supply preferred
8	GND	GND	GND
15	DISCON- NECT	I	High-level disconnect (must be connected first)
17	LED	O	Bluetooth not connected output square wave, Bluetooth connection output high level
18	STATUS	O	Bluetooth not connected output low level, Bluetooth connection output high level
20	EXT_ANT	ANT	Changing the 0 ohm resistance near the antenna, it is possible to connect a Bluetooth antenna externally

2.3 Hardware Design Notes

- The simple test of the module only needs to connect VDD/GND/UART_RX/UART_TX to use
- If the MCU needs to obtain the connection status of the Bluetooth module, it needs to be connected to the STATUS pin
- After drawing the schematic diagram, please send it to Feasycom for review, so as to prevent the Bluetooth distance from not reaching the best effect

Chapter 3

Function Description

3.1 GPIO state

MODE PIN is PIN 6

State	Description
Low level	Throughput mode
High level	AT command mode

Note: To use this function, the pin function needs to be enabled using the AT command. Please refer to [AT+PIOCFG](#) for more details.

DISCONNECT PIN is PIN 15

tate	Description
Low level	–
High level	disconnected

Note: To use this function, the pin function needs to be enabled using the AT command. Please refer to [AT+PIOCFG](#) for more details.

LED PIN is PIN 17

State	Description
1Hz square wave	disconnect state
high level	connected state

Connection status PIN is PIN 18

State	Description
low level	disconnect state
high level	connected state

3.2 Mode

Throughput mode	when disconnected, the data received by the serial port is analyzed according to the AT command; when connected, all the data received by the serial port is sent to the remote Bluetooth as it is.
Command mode	when disconnected, the data received by the serial port is analyzed according to the AT command; when connected, The data received by the serial port is still parsed according to the AT command. when it is necessary to send data to the remote end, send AT+LESEND command.

3.3 GATT Throughput Service

type	UUID	Permissions	Description
Service	0xFFF0		GATT Throughput Service
Write	0xFFF2	Write, Write Without Response	APP send data to module
Notify	0xFFF1	Notify	Module send data to remote

Chapter 4

AT command description

4.1 Command description

Throughout this specification:

- Content between { } is optional
- Content behind << represents a **COMMAND** from Host
- Content behind >> represents a **RESPONSE/EVENT** to Host

4.2 Command

The command is the control command sent by the host to the module actively. After receiving the command, the module needs to reply <CR><LF>OK<CR><LF> as a response.

4.3 Command Format

AT+Command{=Param1{,Param2{,Param3...}}}<CR><LF>

- All commands start with **AT**, end with <CR><LF>
- <CR> means “carriage return”, corresponds to hex value 0x0D
- <LF> means “line feed”, corresponds to hex value 0x0A

- If Command has Parameter, Parameter follows behind '='
- If Command has multiple Parameters, Parameter must be separated by ','
- If Command has Response, Response starts with <CR><LF>, ends with <CR><LF>
- The module should always return the result of instruction execution (success returns **OK**, failure returns **ERROR**)

Example:

Read module's name

```
<< AT+VER
```

```
>> +VER=1.0.0,FSC-BT691
```

```
>> OK
```

Write invalid baudrate

```
<< AT+BAUD=0
```

```
>> ERROR
```

4.4 Event

Event is the data that the module actively sends to the host. Generally used to indicate a change of state or data received.

4.5 Event Format

```
<CR><LF>+Indication{=Param1{,Param2{,Param3...}}}<CR><LF>
```

- All Events start with <CR><LF>, end with <CR><LF>
- If Event has Parameter, Parameter follow behind '='
- If Event has multiple Parameters, Parameter must be separated by ','

Example:

Receive data from APP in command mode

>> +DATA=10,1234567890

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Chapter 5

Commands Table

5.1 AT - Serial communication test

Command	AT
Response	OK
Description	When powering on or changing the baud rate, test the UART communication between the host and the module

Example:

<< AT

>> OK

5.2 AT+VER - Get Firmware Version

Command	AT+VER
Response	+VER=Param
Param	Firmware version
Description	Get Firmware Version

Example:

```
<< AT+VER
>> +VER=1.0.0,FSC-BT691
>> OK
```

5.3 AT+ADDR - Get MAC Address

Command	AT+ADDR
Response	+ADDR=Param
Param	Module' s MAC address (12 Bytes ASCII)
Description	Get MAC Address

Example:

```
<< AT+ADDR
>> +ADDR=DC0D30010203
>> OK
```

5.4 AT+NAME - Get/Set Local Name

Command	AT+NAME{=Param1{,Param2}}
Param1	local name(1~29 Bytes ASCII)
Param2	MAC address suffix(0/1,default:0) 0: Disable suffix 1: Enable suffix "XXXX" (lower 4 bytes of MAC address) after local name
Response	+NAME=Param
Param	local name
Description	Write local name if parameter exist, otherwise read current local name

Example:

Read current local name

<< AT+NAME

>> +NAME=Feasycom

>> OK

Change module' s local name to “ABC”

<< AT+NAME=ABC

>> OK

Change module' s local name to “ABC” and enable suffix

<< AT+NAME=ABC,1

>> OK

5.5 AT+BAUD - Get/Set Uart Baudrate

Command	AT+BAUD{=Param}
Param	baudrate(2400/4800/9600/14400/19200/28800/38400/ 57600/115200/230400/460800/500000/921600/1000000, default:115200)
Response	+BAUD=Param
Param	baudrate
Description	Module will change baudrate to target value immediately

Example:

Query baudrate

<< AT+BAUD

>> +BAUD=115200

>> OK

Change baudrate

<< AT+BAUD=9600

>> OK

5.6 AT+TXPOWER - Get/Set TX Power

Command	AT+TXPOWER{=Param}
Param	tx power(default:3)
Response	+TXPOWER=Param
Param	tx power
Description	Get/Set TX Power

Example:

Get tx powe

<< AT+TXPOWER

>> +TXPOWER=3

>> OK

Set tx power to 0dbm

<< AT+TXPOWER=0

>> OK

5.7 AT+LPM - Get/Set low power config

Command	AT+LPM{=Param}
Param	low power mode (0/1, default: 0) 0: disable 1: enable low power and wake up by UART
Response	+LPM=Param
Param	low power mode
Description	Get/Set low power config

Example:

Get low power config

```
<< AT+LPM
```

```
>> +LPM=0
```

```
>> OK
```

Set serial port wakeup mode

```
<< AT+LPM=1
```

```
>> OK
```

5.8 AT+ADVINT - Get/Set advertising interval

Command	AT+ADVINT{=Param}
Param	advertising interval (100~10000 ms, 默认: 687ms)
Response	+ADVINT=Param
Param	advertising interval
Description	Get/Set advertising interval

Example:

Get advertising interval

<< AT+ADVINT

>> +ADVINT=687

>> OK

Set advertising interval to 100ms

<< AT+ADVINT=100

>> OK

5.9 AT+DISC - Disconnect specified connection

Command	AT+DISC
Response	OK
Description	disconnect Bluetooth connection

Example:

disconnect device

<< AT+LEDISC

>> OK

5.10 AT+LECCONN - Initiate a connection to the specified address

Command	AT+LECCONN{=Param1{,Param2{,Param3{,Param4}}}}
Param1	12-byte device address + 1-byte address type
Param2	Communication Service UUID
Param3	Communication UUID with write/write without rsp permission
Param4	Communication UUID with notification permission
Response	OK
Description	Initiate a connection to the specified device, the parameter consists of 12 bytes (device address) and 1 byte (address type), generally the address type is “0” or “1” . address How to get the address type: Send AT+SCAN=1 command, get parameter2. example: +SCAN=0,0,DC0D30001ED4,-65,10,FSC-BT946 Connection command: AT+LECCONN=DC0D30001ED40

Example:

Connect to the specified device, 0 is the address type

```
<< AT+LECCONN=DC0D3000039E0
```

```
>> OK
```

Initiate a connection to the specified address, using FFF0, FFF2, FFF1 for communication

```
<< AT+LECCONN=DC0D3000039E0,FFF0,FFF2,FFF1
```

```
>> OK
```

5.11 AT+SCAN - SCAN for nearby devices

Command	AT+SCAN{=Param1{, Param2{, Param3}}}
Param1	scanning method (0~1) 0: stop scanning 1: Scan nearby devices, filter duplicate addresses, up to 8 devices can be found
Param2	Scan Timeout Setting(200ms~2s,100 is equal to 1000ms)
Param3	Scan Filter Name/MAC (If it' s a 12-digit standardized MAC, filter by MAC; otherwise, filter by name)
Response	+SCAN=Param1,Param2,Param3,Param4,Param5
Param1	MAC Address type (1 byte)
Param2	MAC address (12 bytes)
Param3	RSSI
Param4	Device name length
Param5	Device name
Description	AT+SCAN=1 Commonly used for searching before connecting

Example:

SCAN device

```
<< AT+SCAN=1
```

```
>> +SCAN={
```

```
>> +SCAN=1,70CFC9A98840,-43,24,LE-Bose QuietControl 30
```

```
>> +SCAN=1,DC0D30001ED4,-65,10,FSC-BT946
```

```
>> +SCAN=}
```

Set a 5-second timeout and filter devices with “BT618” in their names.

```
<< AT+SCAN=1,500,BT618
```

```
>> OK
```

```
+SCAN{
```

```
+SCAN=0,dc0d300002f9,-48,9,FSC-BT618
```

```
+SCAN}
```

Set a 5-second timeout and filter devices with the name “70CFC9A98840” .

```
<< AT+SCAN=1,500,BT618
```

```
>> OK
```

```
+SCAN{
```

```
+SCAN=0,70CFC9A98840,-52,9,Feasycom
```

```
+SCAN}
```

5.12 AT+TPMODE - Get/Set throughput mode

Command	AT+TPMODE{=Param}
Param	Mode (0~1, default 1) 0: Command Mode 1: Throughput Mode
Response	+TPMODE=Param
Param	Mode
Description	Command Mode: When bluetooth connected and in throughput mode, the AT command will be de-active. Throughput Mode: every byte received via physical UART will be sent to remote.

Example:

Throughput Mode

```
<< AT+TPMODE=1
```

```
>> OK
```

Command Mode

```
<< AT+TPMODE=0
```

```
>> OK
```

5.13 AT+ADVDATA - Get/Set advertising manufacturer specific data

Command	AT+ADVDATA{=Param}
Param	manufacturer specific data, tag 0xff(len <= 25)
Response	+ADVDATA=Param
Param	manufacturer specific data, tag 0xff
Description	Get/Set advertising manufacturer specific data

Example:

Get advertising manufacturer specific data, \x is hexadecimal data

```
<< AT+ADVDATA
```

```
>> +ADVDATA=\x03\x01\x02
```

```
>> OK
```

Set advertising manufacturer specific data, \x is hexadecimal data

```
<< AT+ADVDATA=\x03\x01\x02
```

```
>> OK
```

5.14 AT+LESEND - Send data to remote device

Command	AT+LESEND{=Param1,Param2}
Param1	Connection index
Param2	data
Response	OK
Description	Send data to remote device

Example:

Send data to the connected device

<< AT+LESEND=4,2022

>> OK

5.15 AT+REBOOT - Soft Reboot

Command	AT+REBOOT
Response	OK
Description	Module release all Bluetooth connections then reboot

Example:

<< AT+REBOOT

>> OK

5.16 AT+RESTORE - Restore Factory Settings

Command	AT+RESTORE
Response	OK
Description	Module restore all factory settings then reboot

Example:

<< AT+RESTORE

>> OK

5.17 AT+PIOCFG - 开关引脚功能

Command	AT+PIOCFG{=param1,param2}
param1	Enable/Disable the function of the mode selection pin(default : 0) 0: Disable 1: Enable
param2	Enable/Disable the disconnect pin function(default : 0) 0: Disable 1: Enable
Response	OK
Description	Query and modify pin function

Example:

<< AT+PIOCFG=1,1

>> OK

Chapter 6

Event Table

6.1 +SCAN - AT+SCAN=1 Scan Result

Indication	+SCAN=Param1,Param2,Param3,Param4,Param5,Param6
Param1	MAC address type (1 byte)
Param2	MAC address (12 Bytes ASCII)
Param3	RSSI
Param4	remote device name len
Param5	remote device name
Description	After the module receives AT+SCAN=1, it will continue to scan, and report through +SCAN after finding the device

Example:

SCAN device

```
<< AT+SCAN=1
```

```
>> +SCAN={
```

```
>> +SCAN=1,70CFC9A98840,-43,24,LE-Bose QuietControl 30
```

```
>> +SCAN=1,DC0D30001ED4,-65,10,FSC-BT946
```

```
>> +SCAN=}
```

6.2 +GATTSTAT - GATT State

Indication	+GATTSTAT=Param1,Param2
Param1	Connection Index
Param2	GATT State (1~3) 1: Standby 2: Connecting 3: Connected
Description	In the command mode, if the connection status of the module changes, it will be actively reported through +GATTSTAT

Example:

Connected

>> +GATTSTAT=0,3

6.3 +DATA - GATT Received Incoming Data

Indication	+DATA=Param1,Param2,Param3
Param1	Payload length
Param2	Payload
Description	In the throughput mode: report data without +DATA header In the command mode: report data with +DATA header +DATA=1,5,12345

Example:

received data 1234567890

>> +DATA=10,1234567890

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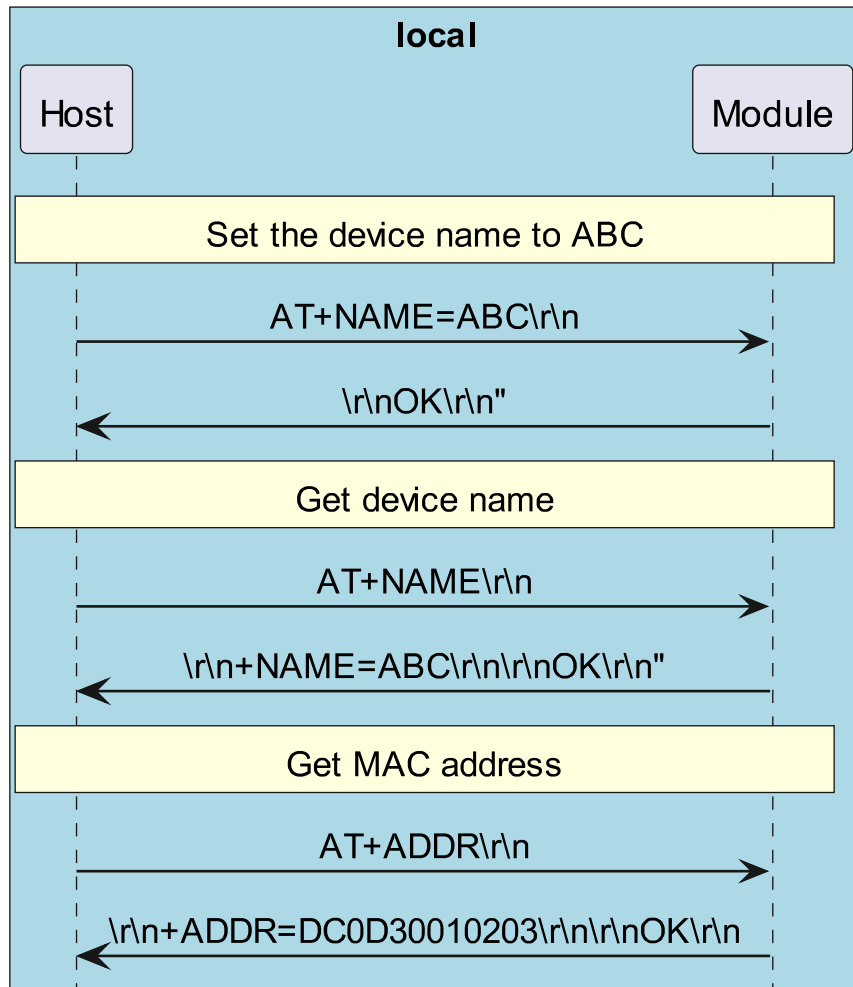
Chapter 7

Application scenarios

7.1 Get/Set the default parameters of the module

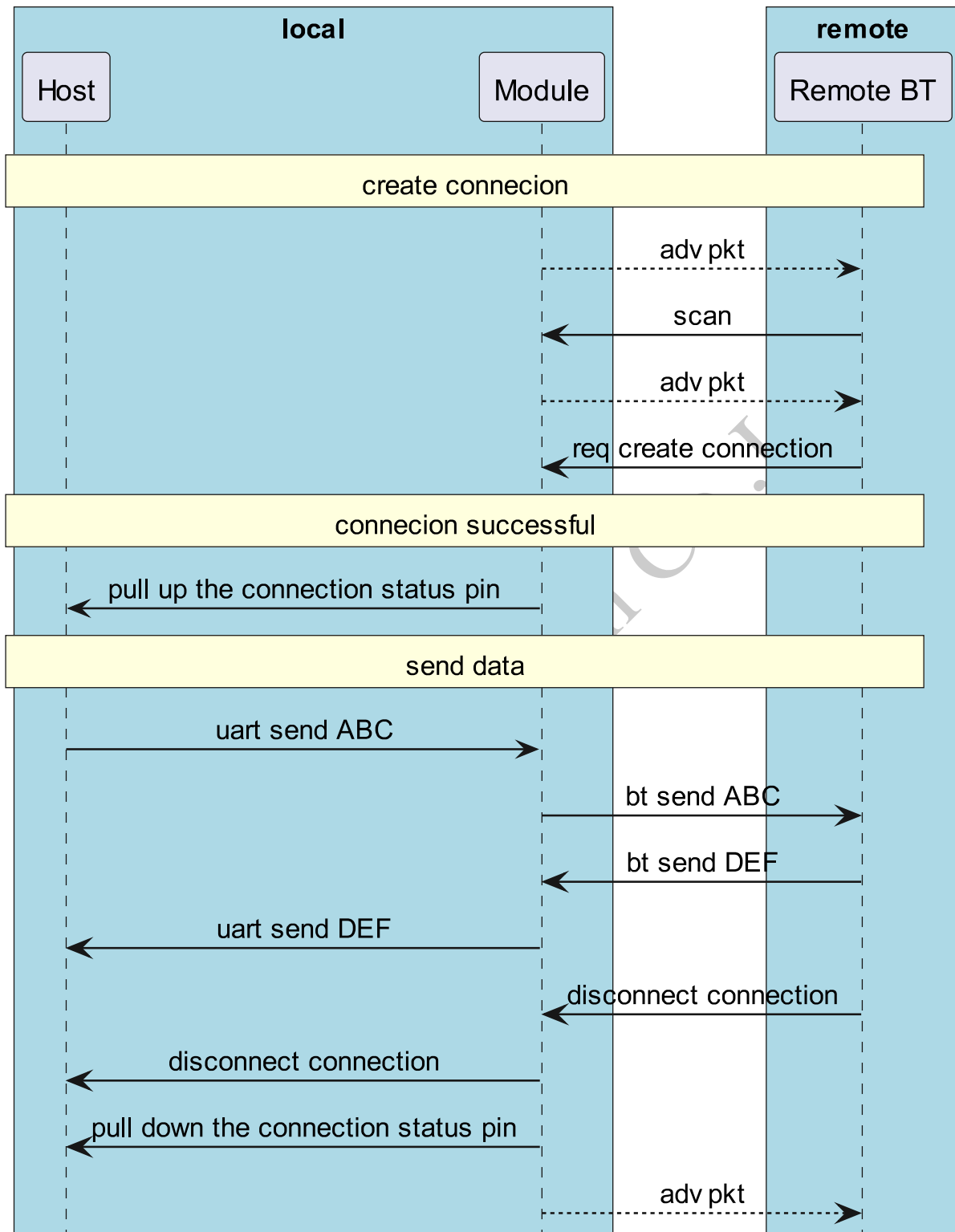
When the module is disconnect state, it will parse the uart data according to the AT command. The host can get and set the default parameters of the module, as shown in the figure below:

1. Set the device name to ABC
2. Get device name
3. Get MAC address



7.2 Process of sending data

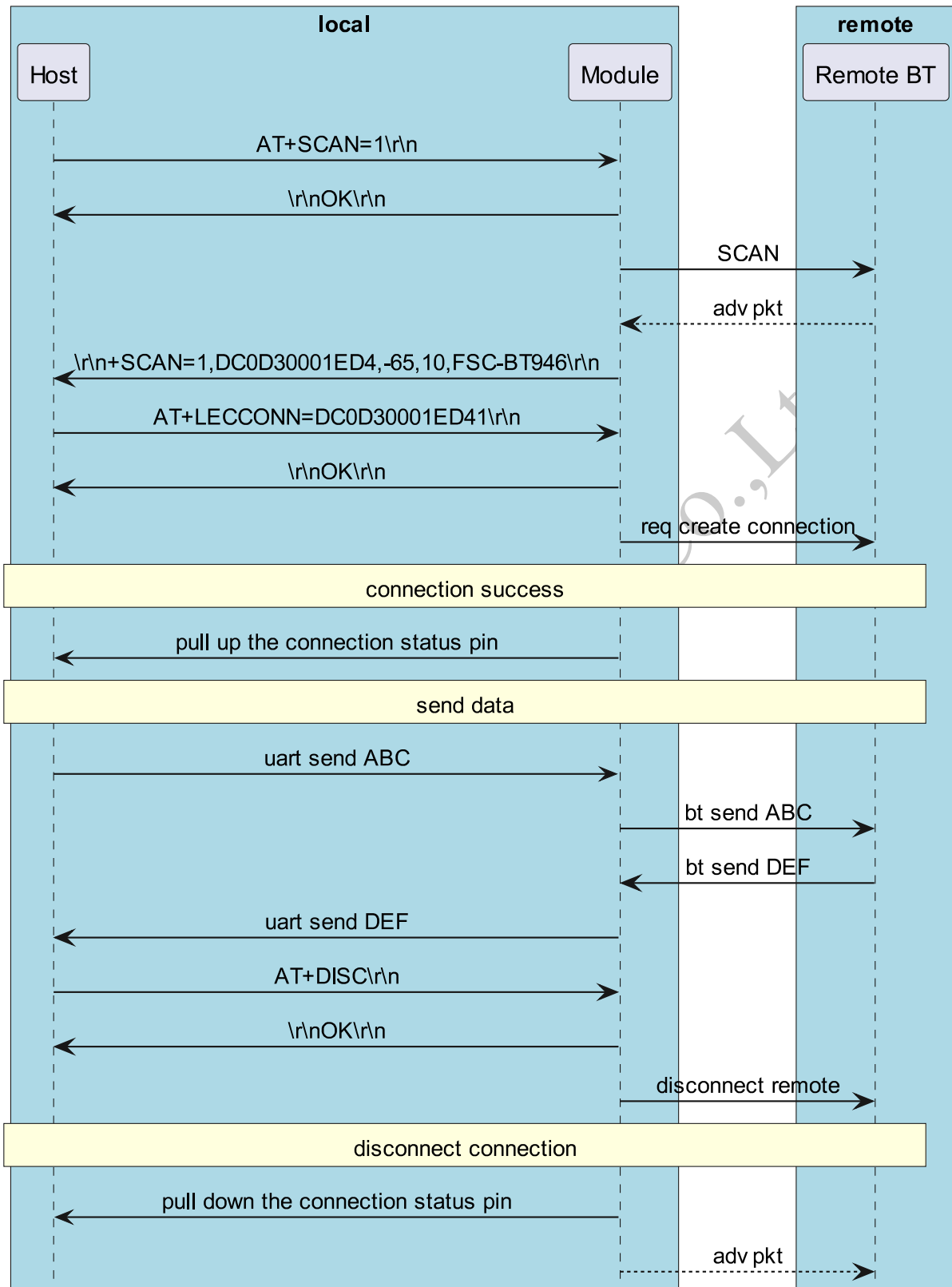
When the module is powered on, it will continue to send advertising data, and the remote device (mobile phone) can scan the advertising packet. And initiate a connection request to the module. After the connection is successful, the module will pull up the connection status pin to notify the host that the Bluetooth connection is successful. The host can send data to the remote device through the Bluetooth module, and the remote device can also send data to the host.



7.3 The module acts as the central to connect to the remote device

The module can be used as a master device to connect to the slave device, and the host can send commands to control the module to scan and connect and disconnect. The figure below shows the process of connecting other devices:

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Chapter 8

Appendix

8.1 Download PDF Document

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