



# **BM77SPP v1.4 Host MCU Programming Guide**

20140225

# Content

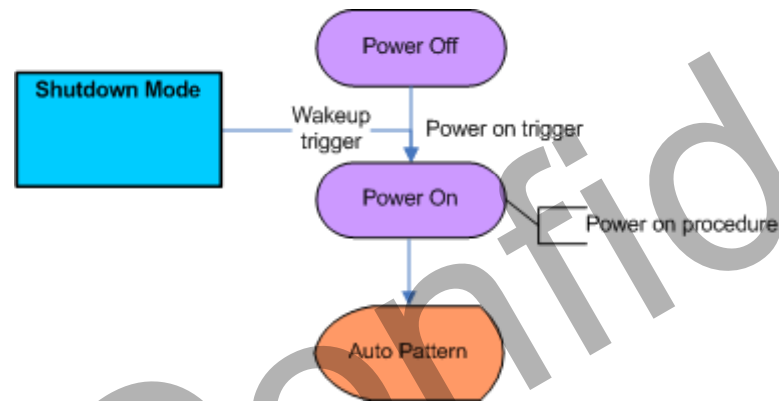
ISSC

- State Machine
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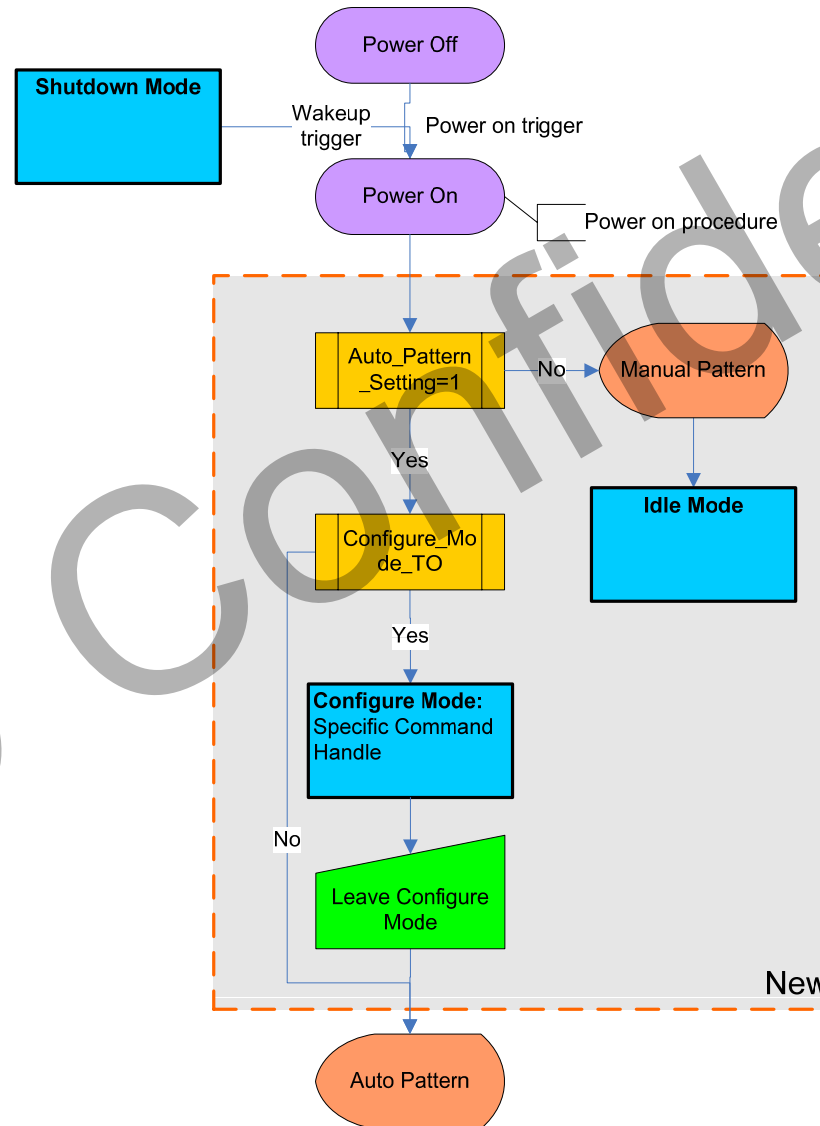
## State Machine

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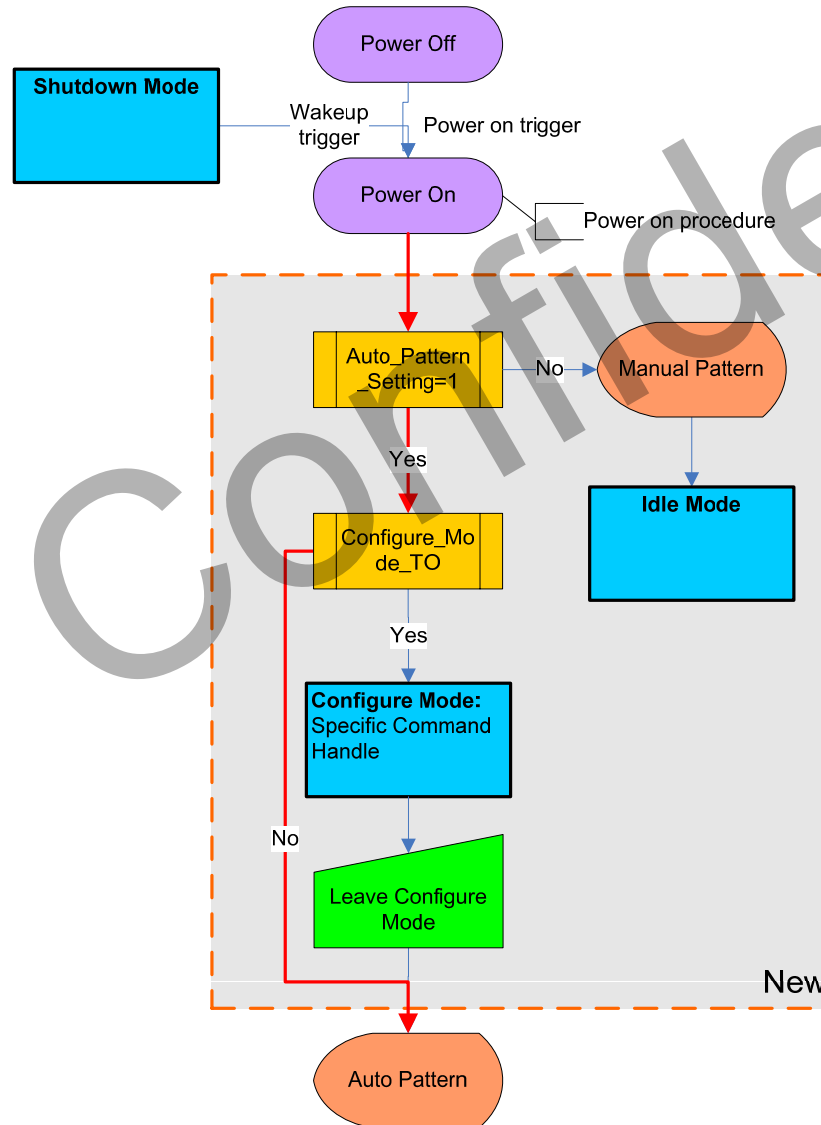
# v1.3 Power On Flow



# v1.4 Power On Flow

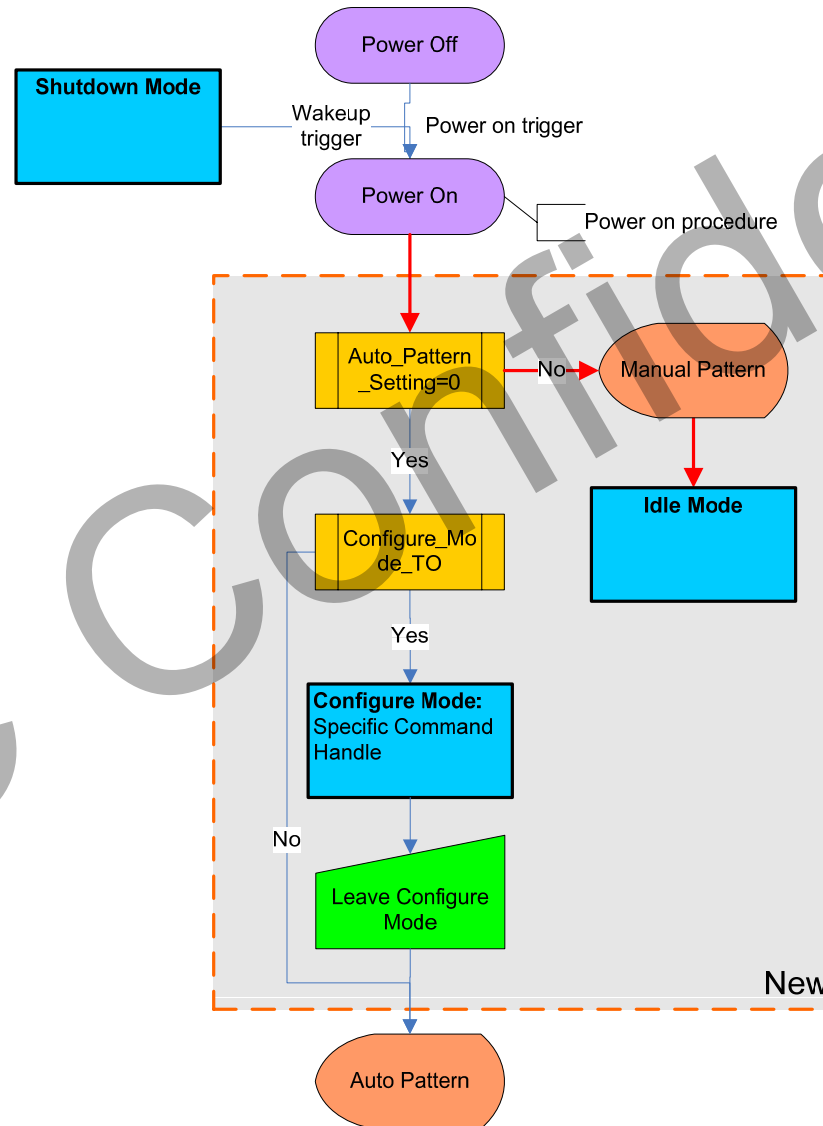


# Auto Pattern w/o Configure Mode





# Manual Pattern



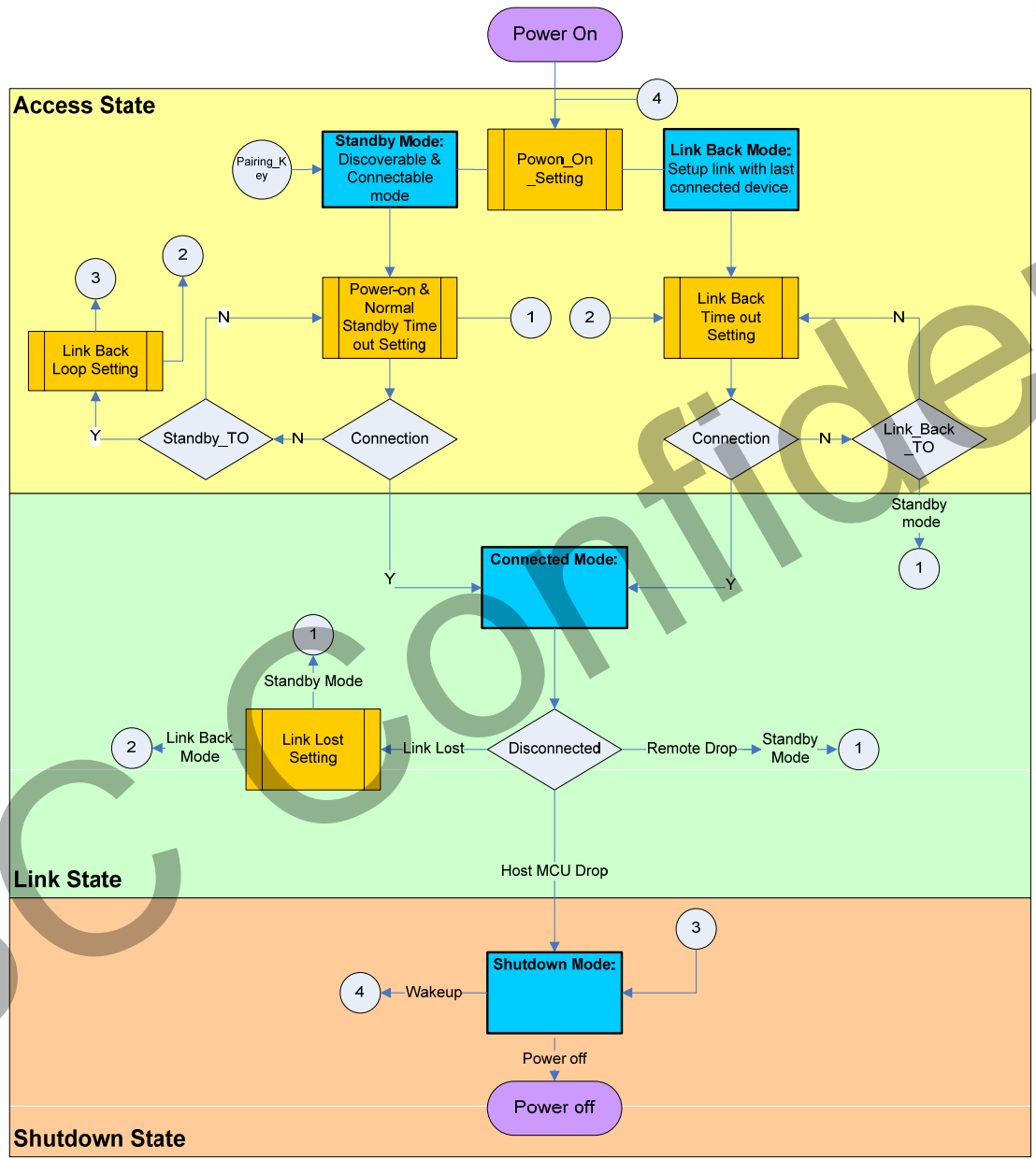


## Pattern Definition

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# Auto Pattern

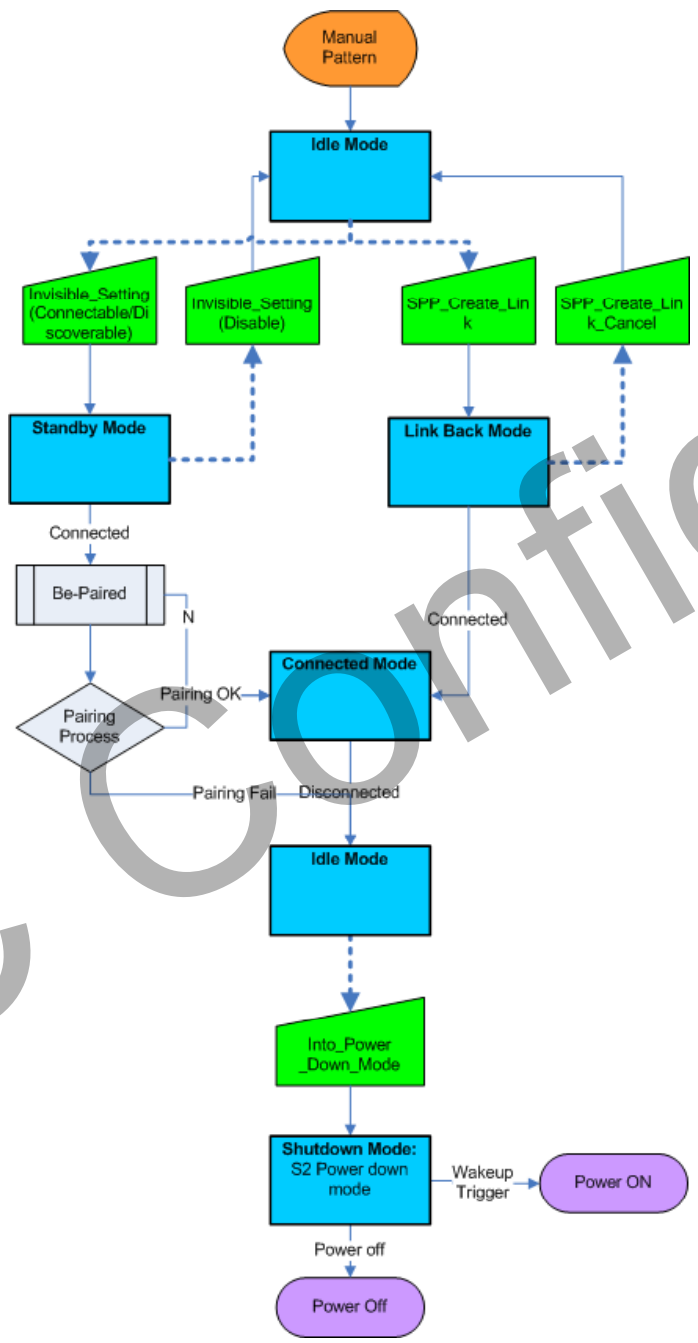
- Executed base on internal state machine
- May into “**Configure Mode**” by UI tool setting
- Some commands are available at “**Configure Mode**” and “**Connected Mode with pairing procedure**” only
- The data pipe is “**Transparent Pipe**”



# Manual Pattern

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- Executed base on MCU command totally
- MCU **must** handle BM77SPP state by correct commands
- The data pipe is “**Protocol Pipe**”



## Mode Definition

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# Shutdown Mode

- BM77 into Power Down Mode
- Command: Into\_Power\_Down\_Mode
- Wakeup Trigger: Wakeup or UART\_Rx\_Ind pins.

## Auto pattern

- Enter into shutdown mode automatically

## Manual pattern

- Enter into shutdown mode by MCU command assign

## Idle Mode

- No any activity of BM77 until MCU assign the new Command

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# Configure Mode

- It is used to configure relative setting before BM77 into **Auto Pattern**

Read\_Local\_Information

Read\_Device\_Name

Write\_Device\_Name

Erase\_all\_Paired\_Device\_Information

Read\_Pairing\_Mode\_Setting

Write\_Pairing\_Mode\_Setting

Read\_All\_Paired\_Device\_Information

Delete\_Paired\_Device

Read\_PIN\_Code

Write\_PIN\_Code

Leave\_Configure\_Mode

# Standby Mode

- BM77 is under Bluetooth discoverable and connectable mode
- It can also be paired by another device in this mode

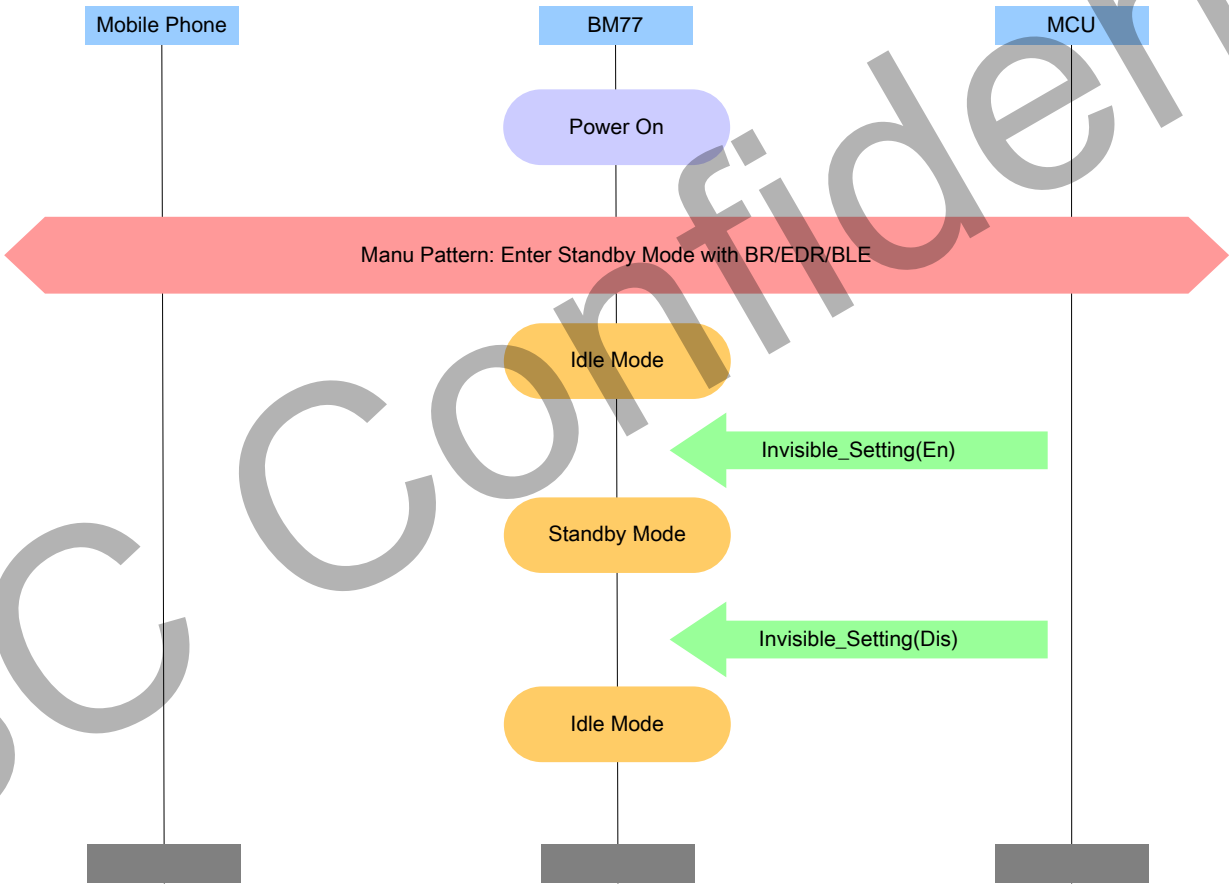
## SPP (BR/EDR)

- Enable the Inquiry Scan and Page Scan in this Mode

## BLE (Bluetooth Low Energy)

- Enable the Undirected Advertising in this Mode

# Standby Mode Scenario



# Link Back Mode

- BM77 tries to create dedicated or last connected Bluetooth SPP link.
- BM77 can still be discoverable and connectable mode as an optional configuration

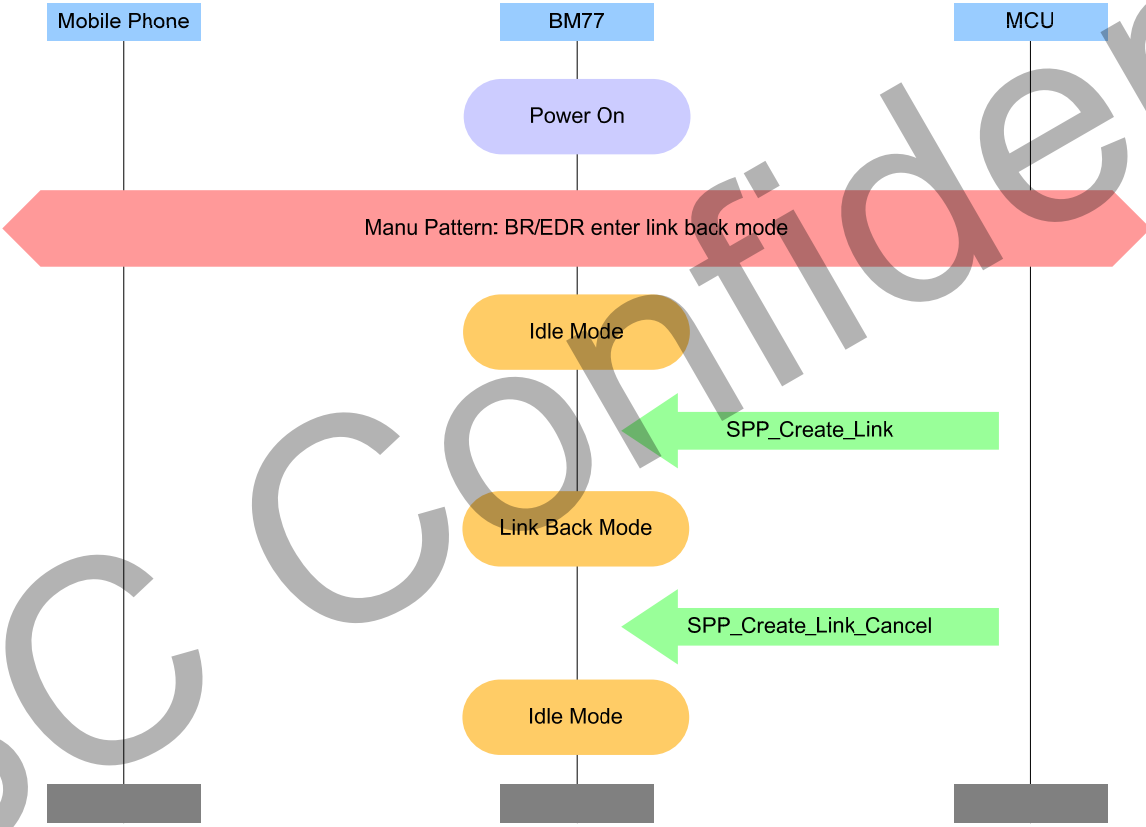
## SPP (BR/EDR)

- Enable Page Procedure to establish Bluetooth SPP Link

## BLE (Bluetooth Low Energy)

- No BLE link back behavior because of iOS limitation.
- Can be in invisible situation.

# Link Back Mode Scenario



# Connected Mode

- Bluetooth connection is established successfully
  - SPP Connected Mode
  - BLE Connected Mode

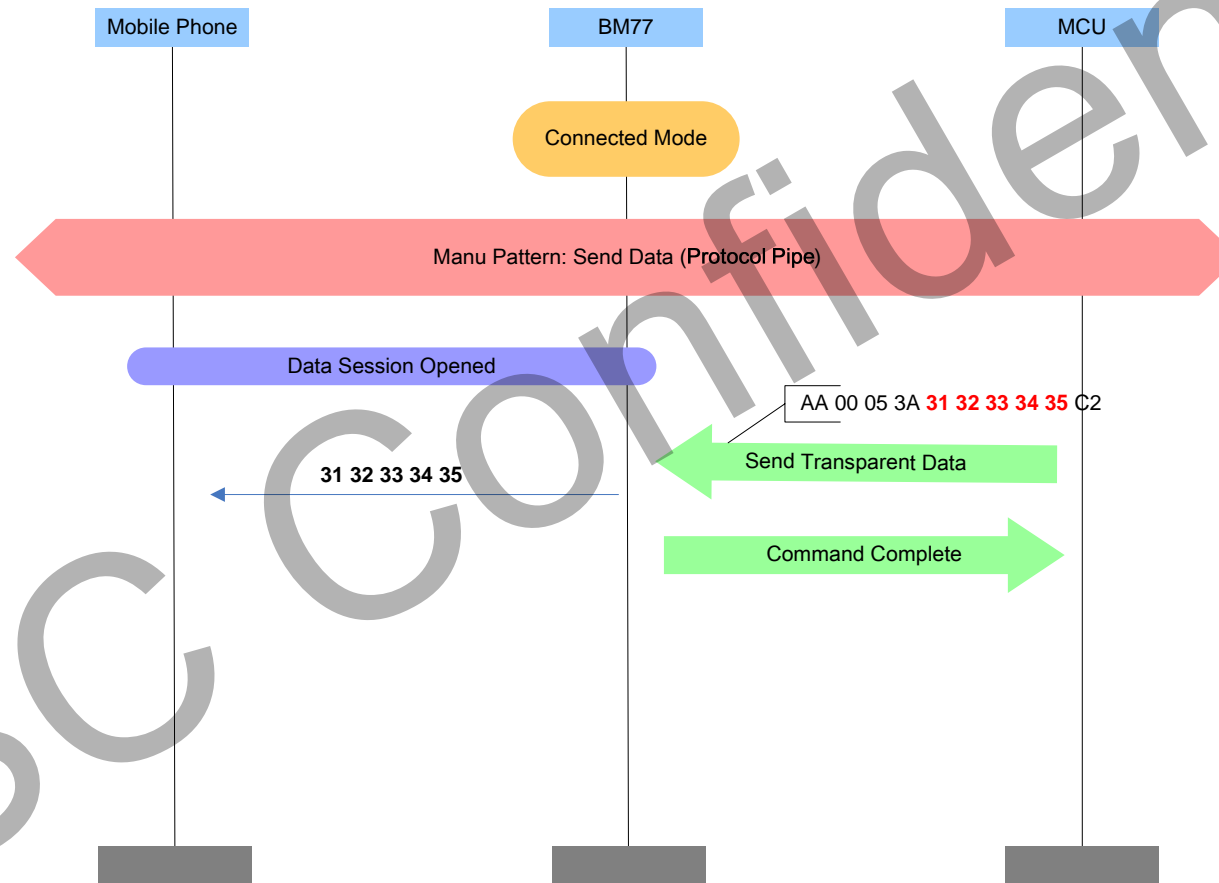
## SPP (BR/EDR)

- Use SPP or iAP protocol to exchange the application data

## BLE (Bluetooth Low Energy)

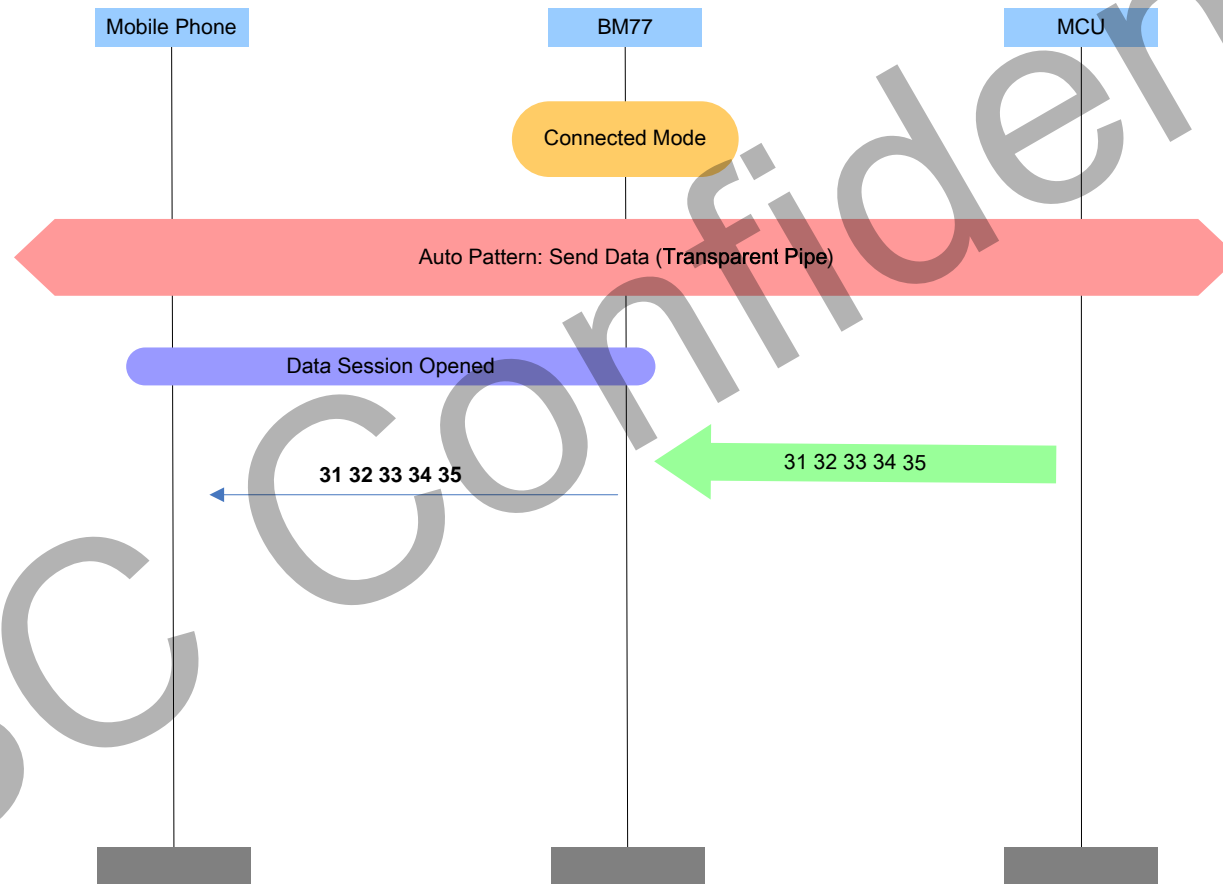
- Use GATT protocol to exchange the application data

# Connected Mode Scenario (1/4)



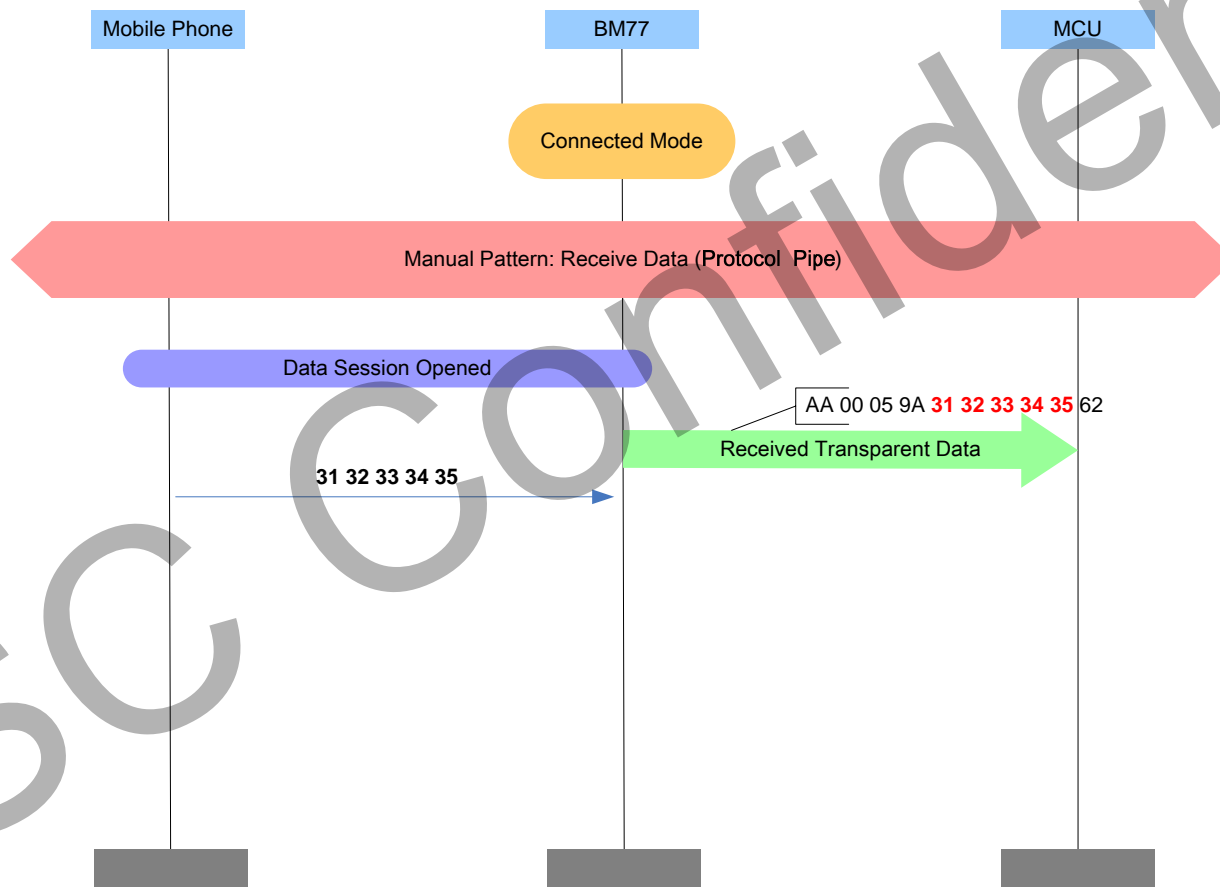
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# Connected Mode Scenario (2/4)

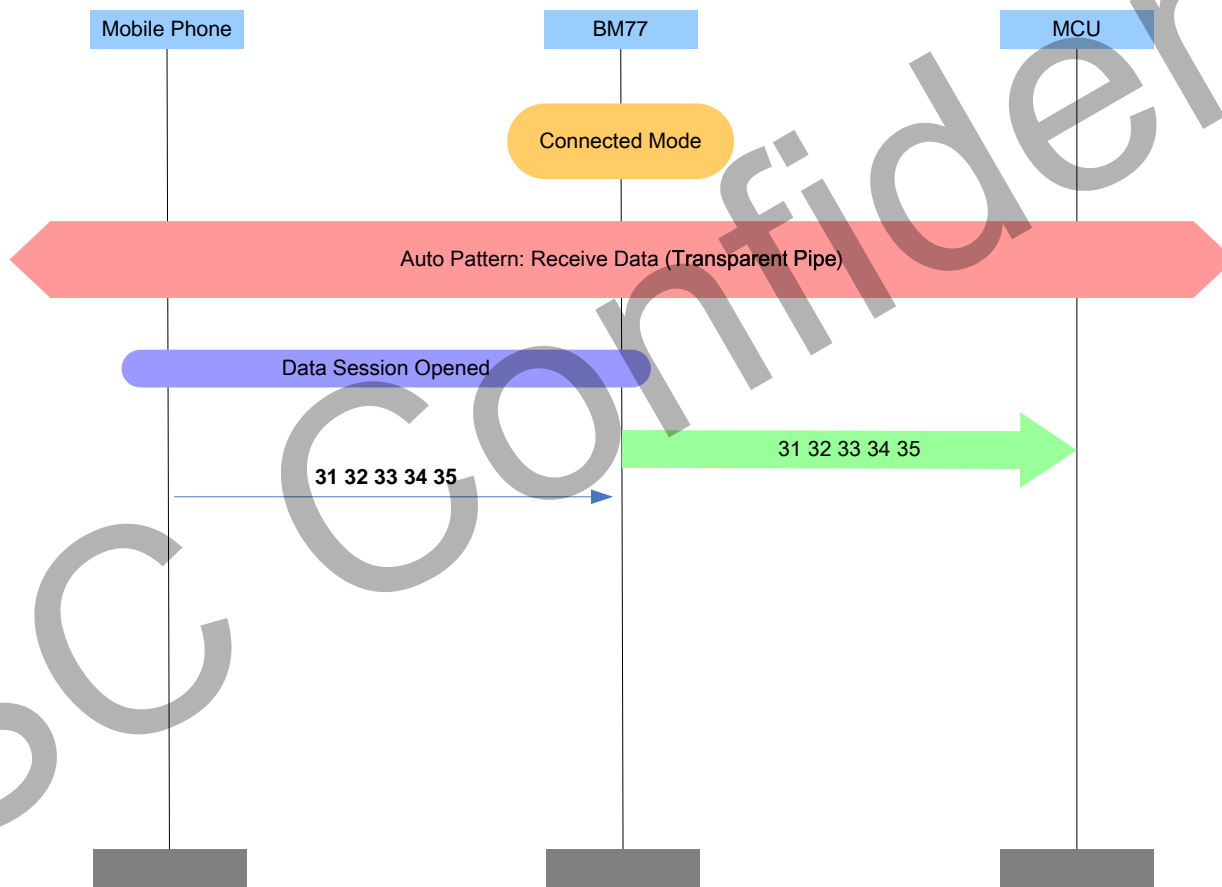




# Connected Mode Scenario (3/4)



# Connected Mode Scenario (4/4)



# UART Protocol

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# UART Packet Format

- LENGTH: Data length includes OP Code and OP code PARAM
- Check SUM Rule : Summation of every byte after SINC WORD (LENGTH, OP Code, OP Code PARAM, CHK SUM) is 0x0100

	HEAD		MID	DATA	CRC
	START	LENGTH	COM/Event.ID	COM/Event PARAM	CHKSUM
BYTE NO	0	1 ~ 2	3	4 ~ XX	Length + 3
SIZE (BYTE)	1	2	1	0 ~	1
VALUE	0xAA	1 ~	COMMAND	DATA	CHK SUM
	SINC WORD	Check sum to be calculated			
		TARGET LENGTH			

# UART Packet Example



Check sum rule: Summation of every byte after START WORD(LENGTH, COM.ID, COM PARAM, CHK SUM) is 0xXX00

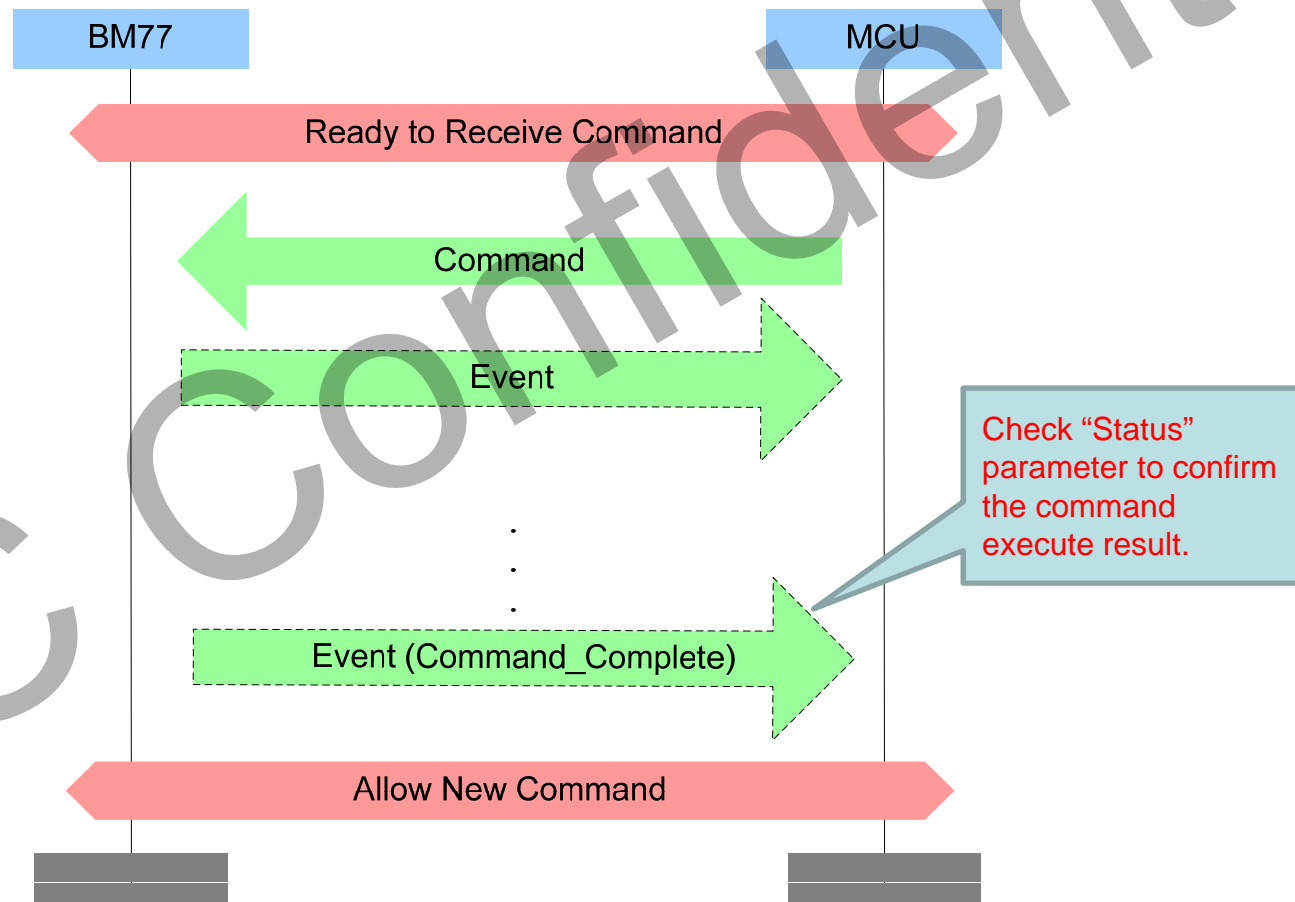
e.g.

	START	LENGTH(H)	LENGTH(L)	ID	PARAM	CHKSUM
BYTE NO	0	1	2	3	4	5
VALUE	0xAA	0x00	0x02	0x01	0x00	0xFD

## **Commend Set Guideline**

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# Rules of MCU Command Assign



# Exceptions (1/2)

- No Command\_Complete Event

Read\_BM77\_Status

- BM77\_Status\_Report

SPP\_Create\_Link

- SPP\_Connection\_Complete

Reset

- BM77\_Status\_Report (Idle Mode)

Disconnect

- Disconnect\_Complete



# Exceptions (2/2)

- Without waiting Command\_Complete event after last command request

SPP\_Create\_Link\_Cancel

Reset

Disconnect

# Relative documents



- BM77SPP Command Set



BM77SPP  
ommand Set v0.9

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# Relative Tool



- MCU Emulator Tool
  - BM77SPP v1.4 Test Tool v0.10 (Manual Pattern)
  - MFi SPP Tool v2.0\_015 (Auto Pattern)

Live Demo