

SKB369 AT 指令集/ SKB369 AT Instruction and Examples

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1 功能引脚/Pin function

PIN	类型/Type	说明/Description
P0.03	TXD	模块数据输出端/Data output end
P0.06	RXD	模块数据输入端/Data entry terminal
P0.16	GPIO	模块从机角色连接状态：未连接时高电平，已连接时低电平 Module slave role connection status: high level when unconnected, low level when connected
P0.17	GPIO	模块主机角色连接状态：未连接时高电平，已连接时低电平 Module host role connection status: High level when unconnected, low level when connected
P0.18	GPIO	模块从机连接状态指示：电平反转表为连接，电平横高为已连接 Module slave connection status indicator: level reversal table is connected, level horizontal height is connected

2 默认参数/Default parameters

2.1 蓝牙默认参数 /Bluetooth Default parameters

广播名称/Name of advertising: nRF52832

发射功率/Transmission power: 4dBm

广播间隔/Advertising interval: 100ms

广播间隔/Advertising interval: 开启/Open

串口状态/serial port state: 开启/Open

GAP 连接/GAP connection interval level: High

2.2 串口默认参数/Serial port Default Parameters

波特率/Baud rate: 115200 bps

引脚/PIN: TX: P0.03 RX: P0.06

数据位/Data bits: 8 位/ 8 bit

校验位/Parity bit: 无/ ON

停止位/Stop bit: 1 位/1 bit

流控/Flow control: 无/ ON

3 蓝牙广播数据解析/Bluetooth broadcast data parsing

长度/Len	类型/Type	类型内容/Value	描述/Describe
2	0x01	0x06	
9	0x09	0x6E52463532383332	蓝牙名称/Bluetooth name
17	0X07	0x9ECADC240EE5A9E093F3A3B50100406E	UUID
11	0xFF	0x11310212DB8342F66728	CoID+0x0212+MAC

4 蓝牙 AT 指令解析/Bluetooth AT Command parsing

4.1 AT 指令格式/AT Command format

指令串由五个部分构成: 指令头、指令、参数连接符、 [参数]、结束符, 指令头为:"AT+"或"AT?", 参数连接符为 "=", 结束符为"\r\n", 参数连接符、参数为可选项(即可以带参数、也可以不带参数), 当指令串携带有参数则表示设置指令, 若不带参数则表示查询指令。

The Command string consists of five parts: Command header, Command, parameter connector, [parameter], and terminator. The Command header is "AT+" or "AT?", the parameter concatenator is "=", and the end character is "\r\n". The parameter concatenator and parameter are optional (either with or without parameters). If the Command string contains parameters, it indicates that the Command is set; if it does not, it indicates that the Command is queried.

注意: 串口数据 20ms 作为一帧数据的超时, AT 指令识别以 AT+或 AT?开头, 后续参数不对(如格式, 参数, 长度等)会返回错误, 反之返回正确(如错误[AT]ER, 正确[AT]OK)。在进行主和(或)从连接后, AT 命令依然识别, 不作为透传数据, 若不以 AT+或 AT?开头则视为透传数据进行转发

Note: Serial port data 20ms as a frame of data timeout, AT Command recognized as AT+ or AT? Error ([AT]ER, correct [AT]OK); error ([AT]ER); After a master and/or slave connection is made, the AT command is still recognized and does not act as passthrough data. If the AT+ or AT? At the beginning, it is regarded as transparent data for forwarding.

举例/For example:

设置广播间隔指令/Sets the broadcast interval command: **AT+ADVINTVL=1000\r\n**

查询广播间隔指令/Query broadcast interval instruction: **AT+ADVINTVL\r\n**

4.2 通用命令/General command

4.2.1 获取所有指令/Get all instructions: AT?

指令/Command	样例/Example	可能返回的结果/Possible results returned	说明/Explain
AT?	AT?\r\n	<pre> ---AT Commands Help--- 1. AT? --Get AT commands help. 2. AT+VER --Show Firmware version. 3. AT+MAC --Get device MAC address. 4. AT+PEER --Get peer device MAC address when in connection. 5. AT+RESET --Reset the module by software. 6. AT+FACTORY --Restore factory parameters. 7. AT+SAVE --Store current parameters to FLASH. 8. AT+STATUS --Get current parameters. 9. AT+WSTA --Get BLE working state. 10. AT+DISCON=[s/m] --Disconnect to peer device when in connection. 11. AT+BAUD=<baudrate> --Set UART's baudrate in bps unit. --Could be 4800/9600/14400/19200/28800/38400/57600/76800/115200/230400. 12. AT+TXPWR=<tx power> --Set Radio TX power in dBm unit. --Could be 4/0/-4/-8/-12/-16/-20/-30. 13. AT+DEV_NAME=<name> --Modify device's name. --Length of name less than 20. 14. AT+ADVINTVL=<interval> --Modify advertisement interval in ms unit. --Interval=[20~5000]. 15. AT+ADV=start/stop --Start or stop advertising if in a right time. --Return ERROR code if OP in connection. 16. AT+GAPINTVL=H/M/L --Set GAP connection interval Level(high/medium/low). --Return ERROR code if OP in connection. 17. AT+CON_MAC=<mac addr> --Connect a peripheral via MAC address 18. AT+SCAN_BLE --Scan for peripherals 19. AT+OTA --Enter OTA mode. 20. MCONN_STA </pre>	获取模块可支持的所有指令集 /Gets all command sets supported by the module

4.2.2 获取固件版本/Obtaining the Firmware Version: AT+VER

指令/Command	样例/Example	可能返回的结果/Possible results returned	说明/Explain
AT+VER	AT+VER\r\n	<pre> [AT]OK [DA]B0064,V2.13,May 7 2022 11:00:38 </pre>	获取模块固件版本信息/Obtain the module firmware version information

4.2.3 获取模块蓝牙 MAC/Get device MAC address: AT+MAC

指令/Command	样例/Example	可能返回的结果/Possible results returned	说明/Explain
AT+MAC	AT+MAC\r\n	<pre> [AT]OK [DA]DD:C6:3A:0A:5A:AD </pre>	获取蓝牙 MAC 地址/Get the Bluetooth MAC address

4.2.4 获取连接模块的设备 MAC 地址/Obtain the MAC address of the connected module: AT+PEER

指令/Command	样例/Example	可能返回的结果/Possible results returned	说明/Explain
AT+PEER	AT+PEER\r\n	未连接设备/Unconnected device: [AT]OK [DA]00:00:00:00:00:00 已连接设备/Connected devices: [AT]OK [DA]5D:70:1F:15:33:F8	返回结果为：模块做从，连接该从机的设备 mac； 如果不存在别的主连接模块从，则默认回复 00:00:00:00:00:00 / The return result is:Module do slave, connect the device MAC of the slave machine; If no other master connection module slave exists, the default reply is 00:00:00:00:00:00

4.2.5 复位模块/Reset the module: AT+RESET

指令/Command	样例/Example	可能返回的结果/Possible results returned	说明/Explain
AT+RESET	AT+RESET\r\n	[AT]OK Start BLE-UART Central&Peripheral Module.	复位蓝牙模块/Reset the Bluetooth module

4.2.6 恢复出厂设置/Factory data reset: AT+FACTORY

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+FACTORY	AT+FACTORY\r\n	[AT]OK	发送这条命令后，需再发送 AT+SAVE, AT+RESET, 才可成功恢复初始值参数/ After sending this command, you need to run the AT+SAVE and AT+RESET commands to restore the initial parameters

4.2.7 将当前参数写入 flash/Write the current parameter to flash: AT+SAVE

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+SAVE	AT+SAVE\r\n	[AT]OK	设置此项后，当前参数配置将在后续重启前与本次一致（除恢复出厂设置）/ After this parameter is set, the current parameter Settings will be the same before the next restart (except factory default Settings).

4.2.8 获取模块状态/Obtaining module status: AT+STATUS

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+STATUS	AT+STATUS\r\n	[AT]OK [DA]115200,nRF52832,100,4,M	波特率，蓝牙名称，广播间隔，发射功率，蓝牙 GAP 连接强度/ Baud rate, Bluetooth name,, broadcast interval, transmission power,GAP connection interval level

4.2.9 获取蓝牙当前工作状态/Gets the current working status of Bluetooth :

AT+WSTA

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+WSTA	AT+WSTA\r\n	1、[AT]OK [DA]adv,idle 2、[AT]OK [DA]conn,conn	参数 1 为模块主机状态： adv 表为连接，且向周围广播 参数 2 为模块从机状态： idle 为空闲状态， conn 表主/从已处于连接中 Parameter 1 indicates the working status of the active role. Parameter 2 indicates the working status of the active role

4.2.10 模块做主以 MAC 连接蓝牙从设备/Connect a peripheral via MAC address:

AT+CON_MAC

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+CON_MAC	AT+CON_MAC=DB: 83:42:F6:67:28\r\n	1. 参数错误/Parameter error: [AT]ER [DA]Invalid MAC 2. 扫描超时/Command error: [AT]OK [DA]Connecting [DA]Timeout 3. 连接成功/Command error: [AT]OK [DA]Connecting [DA]Connected=DB:83:42:F6:67:28 4. 连接失败/Command error: [AT]OK [DA]Connecting [DA]Connected=DB:83:42:F6:67:28 [DA]Disconnected=DB:83:42:F6:67:28	使用 MAC 连接/ Using MAC connection

4.2.11 设置当前波特率/Set UART's baudrate in bps unit: AT+BAUD

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+BAUD	AT+BAUD=115200\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 2、参数及命令正确/ Command or parameter is correct: [AT]OK	参数取值/Parameter choice{4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200, 230400}

4.2.12 主/从断开对等蓝牙设备/Disconnect to peer Bluetooth devices device :

AT+DISCON

断开对等蓝牙设备：AT+DISCON=m/s\r\n m:作为主机断开；s:作为从机断开

AT+DISCON=m/s\r\n m:master role; s:slave role

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+DISCON	AT+DISCON=m/s\r\n	1. 设置成功/Successfully set: [AT]OK [DA]Disconnected=DB:83:42:F6:67:28 [AT]OK [DA]Disconnected=5C:60:9E:20:F8:97 2. 设置失败/Setup failed: [AT]ER	

4.2.13 设置发射功率/Set transmitting power: AT+TXPWR

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+TXPWR	AT+TXPWR=0\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 2、参数及命令正确/ Command or parameter is correct: [AT]OK	设置发射功率/Set transmitting power 设置取值/Set the value { 4, 0, -4, -8, -12, -16, -20}

4.2.14 设置广播名称/Setting the Broadcast Name: AT+DEV_NAME

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+DEV_NAME	AT+DEV_NAME=SKY\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 2、参数及命令正确/ Command or parameter is correct: [AT]OK	长度有效范围 20，超过 20 长度则报错/ The length ranges from 20 to 20. An error message is displayed if the length exceeds 20

4.2.15 设置广播间隔/Setting the Broadcast Interval: AT+ADVINTVL

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+ADVINTVL	AT+ADVINTVL=500\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 2、参数及命令正确/ Command or parameter is correct: [AT]OK	设置范围/rang: 20ms~5000ms

4.2.16 开启/关闭当前模块的蓝牙广播/ Enable/disable Bluetooth broadcast for the current module: AT+ADV

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+ADV	AT+ADV=stop\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 2、参数及命令正确/ Command or parameter is correct: [AT]OK	当模块从机被连接时返回 ER。 / Returns ER when the module slave is connected. start:开启广播/Open the adv stop:关闭广播/Stop the adv

4.2.17 设置蓝牙 GAP 连接强度/Set GAP connection interval level: AT+GAPINTVL

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+GAPINTVL	AT+GAPINTVL=H\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 2、参数及命令正确/ Command or parameter is correct: [AT]OK	当模块从机被连接时返回 ER。 / Returns ER when the module slave is connected. 参数设置/Parameter: H/M/L (High,Medium,Low)

4.2.18 扫描周围蓝牙信息/Scan for peripherals: AT+SCAN_BLE

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+SCAN_BLE	AT+SCAN_BLE\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 2、参数及命令正确/ Command or parameter is correct: [AT]OK [DA]Scanning [1th]FE:34:1D:35:1C:49,GW2.FE341D351C49,-38 [2th]C2:44:1F:F1:A7:D6,VG06,-68 [3th]F6:0E:84:4A:D3:EB,An844AD3EB,-74 [DA]Timeout	返回格式: Mac, name, rssi (存在 name 为 null 的情况)/ Return format: Mac, name, rssi (Name may be null)

4.2.19 进入 OTA 升级模式/The OTA upgrade mode is displayed: AT+OTA

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+OTA	AT+OTA\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 2、参数及命令正确/ Command or parameter is correct: [AT]OK	发送成功后, 周围出现一个 DfuTarg 的蓝牙广播, 其 mac 与原模块 mac 的最后一位相差 1, 如模块 F3:6B:E5:AF:E7:25, 对应 DfuTarg 的 mac 为 F3:6B:E5:AF:E7:26。连接该蓝牙, 进行厂家提供的升级包进行升级/After the transmission is successful, a Bluetooth broadcast of DfuTarg appears around, whose MAC is 1 different from the last bit of the MAC of the original module, for example, the MAC of the module F3:6B:E5:AF:E7:25, and the MAC of the corresponding DfuTarg is

			F3:6B:E5:AF:E7:26. Connect the Bluetooth to the upgrade package provided by the manufacturer
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4.2.20 获取蓝牙主机连接的从机 mac/Get the MAC of the slave connected to the Bluetooth host:AT+MCONN_STA

指令/Command	样例/Example	可能返回的结果/ Possible results returned	说明/Explain
AT+MCONN_STA	AT+MCONN_STA\r\n	1、命令或参数错误/ Command or parameter is incorrect: [AT]ER 3、参数及命令正确/ Command or parameter is correct: [AT]OK [DA]1,DB:83:42:F6:67:28 or [AT]OK [DA]0	当模块主机连接其它从机设备，发送此命令，则返回从机 mac。若未连接则返回 0/ If this command is sent when the module host is connected to another slave device, the slave MAC is returned. If no connection is made, 0 is returned

5 联系方式/Contact information

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