History

|  |  |  |
| --- | --- | --- |
| 日期 | 修改項目和原因 | 備註 |
| 2018/5/11 | 中文第一版釋出 |  |
| 2018/6/22 | ”@@AT+”在Low power UART不易喚醒模組，將”@@AT+”改成”@AT+”，以及增加客需指令 |  |
| 2018/7/06 | 當加入或發送正在處理中Set Command return code “AT\_BUSY\_ERROR”，”@AT+NWKID = <8 hexa separated by:>”。 |  |

LoRaWAN 無線模組之AT命令集列表

所有AT命令集的標準格式都是以“@AT + XXX”組成，其中XXX表示該命令。 有四種可用的命令行為：

• @AT+XXX? 提供簡短的幫助於給定命令, 例如 @AT+DEUI?

• @AT+XXX 用來執行命令, 例如 @AT+JOIN

• @AT+XXX=? 會得到給定命令的價值, 例如 @AT+CFS=?

• @AT+XXX=<value> 提供價值於命令, 例如@AT+SEND=2:Hello

命令的輸出透過UART提供. 輸出格式如下:

<value><CR><LF>

<CR><LF><Status<CR><LF>

Note: *<CR> 代表 “carriage return” 而 <LF> 則為 “line feed”*

無論何時執行“help AT+XXX?” 或 “get AT+XXX=?”, 都會返回<value><CR><LF>輸出

當沒有返回值時，就不會返回<value> <CR> <LF>輸出。

每個命令（用於MCU復位的ATZ除外）都會返回一個狀態字符串，該字符串的前後是<CR><LF> in a .”<CR><LF><Status<CR><LF>”。 可能的狀況為：

**Table 1.**

|  |  |
| --- | --- |
| **Return** | **Status** |
| OK | 命令執行正確 |
| AT\_ERROR | 一般錯誤 |
| AT\_PARAM\_ERROR | 該命令參數錯誤 |
| AT\_BUSY\_ERROR: LoRa® | 網絡忙碌，所以命令無法完成 |
| AT\_TEST\_PARAM\_OVERFLOW | 該參數太長 |
| AT\_NO\_NETWORK\_JOINED: LoRa® | 網絡忙碌尚未加入 |
| AT\_RX\_ERROR | 接收命令期間檢測錯誤 |

請參閱本節更多詳細信息關於每個命令的描述和範例。 請注意以＃開頭的每個命令都是主機向模塊提供的命令，然後刊印於模塊的返回。

1. **一般命令**

本節介紹命令相關之“意思”幫助列表，鏈接控制和CPU AT\_Slave重置有關的命令。

* 1. **@AT: attention**

此命令用於檢查連線是否正常運作 (詳情參閱 *Table 2* ).

**Table 2. Link check command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT | - | - | OK |

* 1. **@AT?: short help**

該命令為所有支持的命令提供簡短的幫助 (詳情參閱*Table 3* ).

**Table 3. Short help command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT? | - | AT+<CMD>?: help on <CMD  AT+<CMD>: run <CMD>  AT+<CMD>=<value>: set the value  AT+<CMD>=?: get the value  <followed by the help of all commands> | OK |

* 1. **@ATZ: MCU reset**

該命令用於觸發模組MCU復位 (詳情參閱*Table 4* ).

**Table 4. MCU reset command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @ATZ? | - | ATZ: triggers a reset of the MCU | OK |
| @ATZ | - | No return value and return code. The MCU is reset. | Void |

1. **Keys, IDs and EUIs 管理**

本節介紹與啟用終端設備相關的命令。

* 1. **@AT+APPEUI: application identifier**

該命令允許用戶存取application identifier (詳情參閱*Table 5* ).

**Table 5. Application identifier command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+APPEUI? | - | AT+APPEUI: get or set the application EUI | OK |
| @AT+APPEUI=? | - | <8 hexa separated by:> | OK |
| @AT+APPEUI=<Param> | <8 hexa separated by:> | - | OK / AT\_PARAM\_ERROR(1) |
| Example @AT+APPEUI= | 01:2:a:FB:A1:CD:4D:20:01 :02:30:40:5a:6b:7f:88 | - | OK |
| Example @AT+APPEUI= | 01:2:a:FB:A1:CD:4D:20:01 :02:30:40:5a:6b:7f | - | AT\_PARAM\_ERROR(1) |
| Example @AT+APPEUI=? | - | 01:02:03:04:05:06:07:08 | OK |

1. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+APPKEY: application key**

該命令允許用戶存取application key (詳情參閱*Table 6* ).

**Table 6. Application key command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+APPKEY? | - | AT+APPKEY: get or set the application key | OK |
| @AT+APPKEY=? | - | <16 hexa separated by:> | OK |
| @AT+APPKEY=<Param> | <16 hexa separated by:> | void | OK/ AT\_PARAM\_ERROR(1) |
| Example @AT+APPKEY= | 01:2:a:FB:A1:CD:4D:20:0 1:02:30:40:5a:6b:7f:88 | - | OK |
| Example @AT+APPKEY= | 01:2:a:FB:A1:CD:4D:20:0 1:02:30:40:5a:6b:7f | - | AT\_PARAM\_ERROR(1) |
| Example @AT+APPKEY=? | - | 2b:7e:15:16:28:ae:d2:a6:ab :f7:15:88:09:cf:4f:3c | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+APPSKEY: application session key**

該命令允許用戶存取application session key (詳情參閱*Table 7* ).

**Table 7. Application session key command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+APPSKEY? | - | AT+APPSKEY: get or set the application session key | OK |
| @AT+APPSKEY=? | - | <16 hexa separated by:> | OK |
| @AT+APPSKEY= <Param> | <16 hexa separated by:> | void | OK / AT\_PARAM\_ERROR(1) |
| Example @AT+APPSKEY= | 01:2:a:FB:A1:CD:4D:20:01:02:30:40:5a:6b:7f:88 | - | OK |
| Example @AT+APPSKEY= | 01:2:a:FB:A1:CD:4D:20:01:02:30:40:5a:6b:7f: | - | AT\_PARAM\_ERROR(1) |
| Example @AT+APPSKEY=? | - | df:bb:02:df:30:eb:7e:07:52:c5:6d:8f:1d:e4:3f:37 | OK |

1. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回  
   1. **@AT+DADDR: device address**

該命令允許用戶存取device address (詳情參閱*Table 8* ).

**Table 8. Device address command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+DADDR? | - | AT+DADDR: get or set the device address | OK |
| @AT+DADDR=? | - | <4 hexa separated by:> | OK |
| @AT+DADDR= <Param> | <4 hexa separated by:> | - | OK / AT\_PARAM\_ERROR(1) |
| Example @AT+DADDR= | 01:2:a:FB:A1:CD:4D:20:01: 02:30:40:5a:6b:7f:88 | - | OK |
| Example @AT+DADDR=? | 11:22:33:44 | 11:22:33:44 | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+DEUI: device EUI**

該命令允許用戶存取device EUI (詳情參閱*Table 9* ).

**Table 9. Device EUI command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+DEUI? | - | AT+DEUI: get or set the device EUI | OK |
| @AT+DEUI=? | - | <8 hexa separated by:> | OK |
| @AT+DEUI= <Param> | <8 hexa separated by:> | - | OK / AT\_PARAM\_ERROR(1) |
| Example @AT+DEUI=? | - | 11:22:33:44:55:66:77:88 | OK |
| Example @AT+DEUI= | 11:22:33:44:55:66:77:88 | - | OK |

1. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+NWKID: network ID**

該命令允許用戶存取network ID (詳情參閱*Table 10* ).

**Table 10. Network ID command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+NWKID? | - | AT+NWKID: get or set the network ID | OK |
| @AT+NWKID=? | - | <4 hexa separated by:> | OK |
| @AT+DEUI= <Param> | <8 hexa separated by:> | - | OK / AT\_PARAM\_ERROR(1) |
| Example @AT+DEUI=? | - | 11:22:33:44:55:66:77:88 | OK |
| Example @AT+DEUI= | 11:22:33:44:55:66:77:88 | - | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+NWKSKEY: network session key**

該命令允許用戶存取network session key (詳情參閱*Table 11* ).

**Table 11. Network session key command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+NWKSKEY? | - | AT+NWKSKEY: get or set the network session key | OK |
| @AT+NWKSKEY=? | - | <16 hexa separated by:> | OK |
| @AT+NWKSKEY= <Param> | <16 hexa separated by:> | - | OK / AT\_PARAM\_ERROR(1) |
| Example @AT+NWKSKEY= | 0:1:2:3:4:5:6:7:8:9:A:B:C:D:E:F | - | OK |
| Example @AT+NWKSKEY=? | - | 00:01:02:03:04:05:06:07:08:09:A:0B:0C:0D:0E:0F | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
2. **加入LoRa® 網絡與發送數據**

本節介紹與入網程序和數據路徑相關命令。

* 1. **@AT+CFM: confirm mode**

該命令允許用戶存取來自網絡收到的數據通知 (詳情參閱*Table 12* ).

**Table 12. Confirm mode command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter or Parmeter** | **Return value** | **Return code** |
| @AT+CFM? | - | AT+CFM: get or set the confirm mode (0-1) | OK |
| @AT+CFM=? | - | 0 or 1 | OK |
| @AT+CFM= <Param> | 0 or 1 | - | OK / AT\_PARAM\_ERROR(1) |
| Example @AT+CFM= | 1 | - | OK |
| Example @AT+CFM=?(2) | - | 1 | OK |

1. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
2. 當確認模式為1時，必須確認每條發送的消息。@AT+CFS=? 允許知道最近發送的消息是否已被確認。
   1. **@AT+CFS: confirm status**

該命令允許用戶存取最後的“發送”命令的狀態 (詳情參閱*Table 13* ).

**Table 13. Confirm status command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+CFS? | - | AT+CFS: get the confirmation status of the last AT+SEND (0-1) | OK |
| @AT+CFS=? | - | 0 or 1 | OK |
| Example @AT+CFS=? | - | 0 | OK |

* 1. **@AT+JOIN: join LoRa® network**

該命令向網絡發出加入請求 (詳情參閱*Table 14* ).

**Table 14. Join LoRa**® **network command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+JOIN? | - | AT+JOIN: join network | OK |
| @AT+JOIN | Void | Void | OK/ AT\_BUSY\_ERROR(1)  Join Fail (2) |
| Example @AT+JOIN | - | - | OK |

1. AT\_BUSY\_ERROR 表示已在加入過程中時返回
2. 入網時最少每個信道入網一次(8信道各1次)，當8個信道都入網失敗時，則停止入網，並顯示”Join Fail”。

這是一個非同步命令，OK表示連接正在執行，加入完成與否必須通過@AT + NJS =？來驗證。

* 1. **@AT+NJM: LoRa® network join mode**

該命令允許用戶存取網絡加入模式 (詳情參閱*Table 15* ).

**Table 15. LoRa**® **network join mode command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+NJM? | - | AT+NJM: get or set the network join mode  (0: ABP, 1: OTAA) | OK |
| @AT+NJM | - | OK/ |  |
| @AT+NJM=<Input> | 0 or 1 | - | OK/ AT\_PARAM\_ERROR(1) |
| Example @AT+NJM=? | - | 0 | OK |
| Example @AT+NJM= | 1 | - | OK |
| Example @AT+NJM= | 2 | - | AT\_PARAM\_ERROR |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回

請留意即使是ABP入網也需要執行@AT + JOIN

* 1. **@AT+NJS: LoRa® network join status**

該命令允許用戶存取LoRa®連結的當前狀態 (詳情參閱*Table 16* ).

**Table 16. LoRa**® **network join status command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+NJS? | - | AT+NJS: get the join status | OK |
| @AT+NJS=? | - | 0 or 1 | OK |
| Example @AT+NJS=? | - | 0 (network not joined) | OK |
| Example @AT+NJS=? | - | 1 (network joined) | OK |

* 1. **@AT+RECV: last received text data**

該命令允許用戶以原始格式存取最近接收到的字串數據 (詳情參閱*Table 17* ).

**Table 17. Last received text data command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+RECV? | - | AT+RECV: print the last received data in raw format | OK |
| @AT+RECV=? | - | raw (string format) | OK |
| Example @AT+RECV=? | - | 45: hello world | OK |

該命令以字串形式返回最後收到的數據以及接收數據的端口。輸出的格式為： <port>:<text data><CR><LF>

<CR><LF>OK<CR><LF>

當兩次呼叫時，在呼叫之間沒有收到新的數據時，第二個@AT + RECV =？返回一個空白值，如下所示：

45:<CR><LF>

<CR><LF>OK<CR><LF>

* 1. **@AT+RECVB: last received binary data**

該命令允許用戶以二進制格式存取上次接收到的字串數據 (詳情參閱*Table 18* ).

如表中所示，二進制數據在端口45上被接收。

**Table 18. Last received binary data command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+RECVB? | - | AT+RECVB: print the last received data in in binary format (with hexadecimal values) | OK |
| @AT+RECVB=? | - | <port>:<binary>, | OK |
| Example @AT+RECVB=? | - | 45:48656c6c6f20576f726c64 | OK |

* 1. **@AT+SEND: send text data**

該命令提供了在專用端口號上發送字串數據的方式 (詳情參閱*Table 19* ).

如表中所示，字串數據在端口12上被接收。

**Table 19. Send text data command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+SEND? | - | AT+SEND: send text data along with the application port | OK |
| @AT+SEND=<input> | port text | - | OK/AT\_PARAM\_ERROR(1)/ AT\_BUSY\_ERROR(2)/ AT\_NO\_NETWORK\_JOINED(3)  Send OK(4) |
| Example @AT+SEND= | 12: hello world | - | OK |

1. AT\_PARAM\_ERROR當<port>:<text>設置的格式不正確時被返回, <port>為一個十進制值
2. AT\_BUSY\_ERROR 當前一次發送未完成時發送 (等待沒有被占用的rx cycle窗口)
3. AT\_NO\_NETWORK\_JOINED網絡尚未加入時返回
4. 當傳送完畢後會return “Send OK”  
   1. **@AT+SENB: send binary data**

該命令提供了在專用端口數字上以二進制格式發送字串數據的方式 (詳情參閱*Table 20* )。二進制數據的每個字節都以兩個字符的形式表示，以十六進製表示。因此二進制數據的長度總是偶數。如表中所示，在端口12上發送8個字節：0xab，0xcd，0xef，0x0（請留意訊息“01”僅表示“1”將失敗），0x23，0x45，0x67和0x89。

**Table 20. Send binary data command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+SENDB? | - | AT+SENDB: send hexadecimal data along with the application port | OK |
| @AT+SENDB=<input> | <port>:<binary>, | - | OK/AT\_PARAM\_ERROR(1)/ AT\_BUSY\_ERROR(2)/ AT\_NO\_NETWORK\_JOINED(3)  Send OK(4) |
| Example  @AT+SENDB= | 12:abcdef0123456789 | - | OK |
| Example  @AT+SENDB= | abcdef0123456789 | - | AT\_PARAM\_ERROR |

1. AT\_PARAM\_ERROR 當<port>:<binary>設置的格式不正確時返回, <port>為一個十進制值,<binary>後面的十六進制格式使用上述2個字符返回.
2. AT\_BUSY\_ERROR 當前一次發送未完成時發送 (等待沒有被占用的rx cycle窗口)
3. AT\_NO\_NETWORK\_JOINED網絡尚未加入時返回
4. 當傳送完畢後會return “Send OK”
5. **LoRa® 網絡管理**

本節提供一組網絡管理命令。

* 1. **@AT+ADR: adaptive rate**

該命令允許用戶存取自適應數據速率 (詳情參閱*Table 21* )，ADR的設定值為1 (啟用)。

**Table 21. Adaptive rate command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+ADR? | - | AT+ADR: get or set the adaptive data rate setting (0: off, 1: on) | OK |
| @AT+ADR? | - | 0 or 1 | OK |
| @AT+ADR=<Input> | 0 or 1 | - | OK |
| Example @AT+ADR= | 0 | - | OK/ AT\_PARAM\_ERROR(1)  AT\_BUSY\_ERROR (2) |
| Example @AT+ADR=? | - | 0 | OK |

1. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
2. AT\_BUSY\_ERROR當加入或發送正在處理中返回##
   1. **@AT+CLASS: LoRa® class**

該命令允許用戶存取LoRaWAN™類別 (詳情參閱*Table 22* ).

**Table 22. LoRa**® **class command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+CLASS? | - | AT+CLASS: get or set the device class | OK |
| @AT+CLASS=? | - | A, B, or C | OK |
| @AT+CLASS=<Input> | A,B or C |  | OK/ AT\_PARAM\_ERROR(2) |
| Example @AT+CLASS=? | - | A | OK |

1. 此版本僅支持A類
2. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
3. AT\_BUSY\_ERROR當加入或發送正在處理中返回
   1. **@AT+DCS: duty cycle settings**

該命令允許用戶存取佔空比參數 (詳情參閱*Table 23* ).

**Table 23. Duty cycle settings command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+DCS? | - | AT+DCS: get or set the ETSI duty cycle setting: 0=disable, 1=enable - only for testing (refer to document *2*) | OK |
| @AT+DCS=? | - | 0 or 1 | OK |
| @AT+DCS=<Input> | 0 or 1 | - | OK/ AT\_PARAM\_ERROR(1)  AT\_BUSY\_ERROR (3) |
| Example @AT+DCS? | - | 1 | OK |
| Example @AT+DCS= | 1 | - | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
2. AT\_BUSY\_ERROR當加入或發送正在處理中返回
   1. **@AT+DR: data rate**

該命令允許用戶存取數據速率 (詳情參閱*Table 24* ).

**Table 24. Data rate command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+DR? | - | AT+DR: get or set the data rate (0-7 corresponding to DR\_X)< | OK |
| @AT+DR=? | - | [0,1,2,3,4,5,6,7] (2) | OK |
| @AT+DR=<Input> | [0,1,2,3,4,5,6,7] | - | OK/ AT\_PARAM\_ERROR(1)  AT\_BUSY\_ERROR (3) |
| Example @AT+DR? | - | 3 | OK |
| Example @AT+DR= | 2 | - | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
2. The value of CN 470 is [0,1,2,3,4,5], and the value of EU 868 is [0,1,2,3,4,5,6,7].
3. AT\_BUSY\_ERROR當加入或發送正在處理中返回
   1. **@AT+FCD: frame counter downlink**

該命令允許用戶存取下行幀計數器 (詳情參閱*Table 25* ).

**Table 25. Data rate command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+FCD? | - | AT+FCD: get or set the downlink frame counter | OK |
| @AT+FCD=? | - | <integer> | OK |
| @AT+FCD=<Input> | <integer> | - | OK/ AT\_PARAM\_ERROR(1)  AT\_BUSY\_ERROR (2) |
| Example @AT+FCD=? | - | 4294967295 | OK |
| Example @AT+FCD=<Input> | 10 | - | OK |

1. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
2. AT\_BUSY\_ERROR當加入或發送正在處理中返回
   1. **@AT+FCU: frame counter uplink**

該命令允許用戶存取上行幀計數器 (詳情參閱 *Table 26* ).

**Table 26. Frame counter uplink command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+FCU? | - | AT+FCU: get or set the uplink frame counter | OK |
| @AT+FCU=? | - | <integer> | OK |
| @AT+FCU=<Input> | <integer> | - | OK/ AT\_PARAM\_ERROR(1)  AT\_BUSY\_ERROR (2) |
| Example @AT+FCU=? | - | 4294967295 | OK |
| Example @AT+FCU=<Input> | 10 | - | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
2. AT\_BUSY\_ERROR當加入或發送正在處理中返回
   1. **@AT+JN1DL: join delay on RX window 1**

該命令允許用戶存取RX窗口1上的延遲加入 (詳情參閱*Table 27* )

**Table 27. Join delay on RX window 1 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+JN1DL? | - | AT+JN1Dl: get or set the joint accept delay between the end of the Tx and the join Rx window 1 in ms | OK |
| @AT+JN1DL=? | - | <integer> | OK/ AT\_BUSY\_ERROR(1) |
| @AT+JN1DL=<input> | <integer> | - | OK /AT\_PARAM\_ERROR(2)AT\_BUSY\_ERROR(1) |
| Example @AT+JN1DL=? | - | 5000 | OK |
| Example @AT+JN1DL= | 10000 | - | OK |

1. AT\_BUSY\_ERROR當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回  
   1. **@AT+JN2DL: join delay on RX window 2**

此命令允許用戶存取RX窗口2上的延遲加入 (詳情參閱*Table 28* ).

**Table 28. Join delay on RX window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+JN2DL? | - | AT+JN2DL: get or set the joint accept delay between the end of the Tx and the join Rx window 2 in ms | OK |
| @AT+JN2DL=? | - | <integer> | OK/ AT\_BUSY\_ERROR(1) |
| @AT+JN2DL=<input> | <integer> | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+JN2DL=? | - | 6000 | OK |
| Example @AT+JN2DL= | 20000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回  
   1. **@AT+PNM: public network mode**

該命令允許用戶存取公共網絡模式 (詳情參閱*Table 29* )

**Table 29. Public network mode command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+PNM? | - | AT+PNM: get or set the public network mode (0:off, 1:on). | OK |
| @AT+PNM=? | - | 0 or 1 | OK |
| @AT+PNM=<input> | 0 or 1 | - | OK/ AT\_PARAM\_ERROR(1) |
| Example @AT+PNM=? | - | 0 | OK |
| Example @AT+PNM= | 1 | - | OK |
| Example @AT+PNM= | 2 | - | AT\_PARAM\_ERROR(1) |

1. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+RX1DL: delay of the received window 1**

此命令允許用戶存取接收到的窗口1的延遲 (詳情參閱*Table 30* ).

**Table 30. Delay of the received window 1 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+RX1DL? | - | AT+RX1DL: get or set the delay between the end of the Tx and the Rx window 1 in ms | OK |
| @AT+RX1DL=? | - | <integer> | OK/ AT\_BUSY\_ERROR(1) |
| @AT+RX1DL=<input> | <integer> | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+RX1DL=? | - | 1000 | OK |
| Example @AT+RX1DL= | 1500 | - | OK |

1. AT\_BUSY\_ERROR當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回  
   1. **@AT+RX2DL: delay of the received window 2**

該命令允許用戶存取接收到的窗口2的延遲 (詳情參閱*Table 31* ).

**Table 31. Delay of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+RX2DL? | - | AT+RX2DL: get or set the delay between the end of the Tx and the Rx window 2 in ms | OK |
| @AT+RX2DL=? | - | <integer> | OK/ AT\_BUSY\_ERROR(1) |
| @AT+RX2DL=<input> | <integer> | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+RX2DL=? | - | 2000 | OK |
| Example @AT+RX2DL= | 2500 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+RX2DR: data rate of the received window 2**

該命令允許用戶存取接收到的窗口2的數據速率 (詳情參閱*Table 32* ).

**Table 32. Data rate of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+RX2DR? | - | AT+RX2DR: get or set the Rx2 window data rate (0-7) corresponding to DR\_X | OK |
| @AT+RX2DR=? | - | [0,1,2,3,4,5,6,7] (3) | OK/ AT\_BUSY\_ERROR(1) |
| @AT+RX2DR=<input> | [0,1,2,3,4,5,6,7] | - | OK/ AT\_PARAM\_ERROR(1) AT\_BUSY\_ERROR(2) |
| Example @AT+RX2DR=? | - | 6 | OK |
| Example @AT+RX2DR= | 5 | - | OK |

1. AT\_BUSY\_ERROR當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
3. The value of CN 470 is [0,1,2,3,4,5], and the value of EU 868 is [0,1,2,3,4,5,6,7].
   1. **@AT+RX2FQ: frequency of the received window 2**

該命令允許用戶存取接收到的窗口2的頻率 (詳情參閱*Table 33* ).

**Table 33. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+RX2FQ? | - | AT+RX2FQ: get or set the Rx2 window frequency | OK |
| @AT+RX2FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+RX2FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+RX2FQ=? | - | 869535000 | OK |
| Example @AT+RX2FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TXP: transmit power**

該命令允許用戶存取發射功率 (詳情參閱*Table 34* ).

**Table 34. Transmit power command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TXP? | - | AT+TXP: get or set the transmit power (0-5) | OK |
| @AT+TXP=? | - | [0,1,2,3,4,5,6,7](2) | OK AT\_PARAM\_ERROR(1) |
| @AT+TXP=<input> | [0,1,2,3,4,5,6,7](2) | - | OK AT\_PARAM\_ERROR(1) |
| Example @AT+TXP=? | - | 1 | OK |
| Example @AT+TXP= | 4 | - | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
2. 0~7代表0: 17dBm, 1: 15dBm, 2: 13dBm, 3: 11dBm, 4: 9dBm, 5: 7dBm, 6: 5dBm, 7: 3dBm
3. **資訊**

本節提供了一組電池級別，RF信號質量和FW版本的命令。

* 1. **@AT+BAT: battery level**

此命令允許用戶存取終端設備的電池電量(此功能為耗電項目，所以先將此功能取消) (詳情參閱*Table 35* ).

**Table 35. Battery level command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value(1)** | **Return code** |
| @AT+BAT? | - | AT+BAT: get the battery level | OK |
| @AT+BAT=? | - | [1, ...254] | OK |
| Example @AT+BAT=? | - | 254 | OK |

1. 電池電量表示為1 to 254, 254 表示充滿電
   1. **@AT+RSSI: RSSI on reception**

該命令允許用戶在接收時存取RSSI (詳情參閱*Table 36* ).

**Table 36. RSSI on reception command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command(1)** | **Input parameter** | **Return value** | **Return code** |
| @AT+RSSI? | - | AT+RSSI: get the RSSI of the last received packet | OK |
| @AT+RSSI=? | - | integer | OK |
| Example @AT+RSSI=? | - | -31 | OK |

1. @At+RSSI=? 提供以dBm為單位的值
   1. **@AT+SNR: signal noise ratio**

該命令允許用戶存取最後收到的SNR數據組 (詳情參閱*Table 37* ).

**Table 37. Signal noise ratio command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command(1)** | **Input parameter** | **Return value** | **Return code** |
| @AT+SNR? | - | AT+SNR: get the SNR of the last received packet | OK |
| @AT+SNR=? | - | integer | OK |
| Example @AT+SNR=? | - | 32 | OK |

1. @At+SNR=? 提供以dBm為單位的值
   1. **@AT+VER: version of the firmware**

該命令允許用戶存取模組韌體版本 (詳情參閱*Table 38* ).

**Table 38. Version of the firmware command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+VER? | - | AT+VER: get the version of the AT\_iSlave FW | OK |
| @AT+VER=? | - | V.x.y | OK |
| Example @AT+VER=? | - | 1.0.0 | OK |

1. **RF 測試**

本節為RF測試管理提供了一組命令。

* 1. **@AT+TRSSI: Start Radio Frequency RSSI Tone test**

該命令允許用戶啟動RF RSSI頻率測試 (詳情參閱 *Table 39* ).

**Table 39. Start Radio Frequency RSSI Tone command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TRSSI? | - | AT+TRSSI: start RF RSSI tone test | OK |
| @AT+TRSSI | Void | Void | OK AT\_BUSY\_ERROR |
| Example  @AT+TRSSI | - | - | OK |

* 1. **@AT+TTONE: Start Radio Frequency Tone test**

此命令允許用戶啟動RF頻率測試 (詳情參閱*Table 40* ).

**Table 40. Start Radio Frequency Tone test command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TTONE? | - | AT+TTONE: start RF tone test | OK |
| @AT+TTONEI | Void | Void | OK AT\_BUSY\_ERROR |
| Example @AT+TTONE | - | - | OK |

* 1. **@AT+TTLRA: Start RF Tx LoRa® test**

該命令允許用戶啟動RF Tx LoRa® 測試 (詳情參閱*Table 41* ).

**Table 41. Start RF Tx LoRa® test command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TTLRA? | - | AT+TTLRA: starts Tx LoRa® test | OK |
| @AT+TTLRA | Void | Void | OK AT\_BUSY\_ERROR |
| Example @AT+TTLRA | - | - | OK |

* 1. **@AT+TRLRA: Start RF Rx LORA test**

該命令允許用戶啟動RF Rx LoRa® 測試 (詳情參閱*Table 42* ).

**Table 42. Start RF Rx LoRa® test command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TRLRA? | - | AT+TRLRA: starts Rx LoRa® test | OK |
| @AT+TRLRA | Void | Void | OK AT\_BUSY\_ERROR |
| Example @AT+TRLRA | - | - | OK |

* 1. **@AT+TCONF: Config LoRa® RF test**

該命令允許用戶存取LoRa®測試設定 (詳情參閱*Table 43* ).

**Table 43. Config LoRa® RF test command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TCONF? | - | AT+TCONF: configure LoRa® RF test | OK |
| @AT+TCONF=? | Void | Void | OK AT\_ERROR |
| @AT+TCONF= <param> | Void | Void | OK AT\_PARAM\_ERROR |
| Example @AT+TCONF? | - | Freq = 868 MHz Power = 14 dbm Bandwidth = 125 KHz SF = 12 CR = 4 / 8 LNA State = 0 PA boost state = 0 | OK |
| Example @AT+TCONF= | 868:12:125:12: 4/8:0:0 | - | OK |
| Example @AT+TCONF= | 868:12:**300**:12: 4/8:0:0 | - | AT\_PARAM\_ERROR  (error on bandwidth setting) |

AT\_PARAM\_ERROR當設置沒有正確的格式(十進制值)或超出要求的設置時，將返回:  
• Bandwidth = {125, 250, 500};  
• SF = {7, 8, 9, 10, 11, 12};  
• CR = {4/5, 4/6, 4/7, 4/8}.

* 1. **@AT+TOFF: Stop ongoing Radio Frequency test**

該命令允許用戶停止正在進行的RF測試 (詳情參閱*Table 44* ).

**Table 44. Stop Radio Frequency test command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TOFF? | - | AT+TOFF: stop ongoing RF test | OK |
| @AT+TOFF | Void | Void | OK |

* 1. **@AT+CERTIF: Set the module in LoRaWAN™ Certification Mode**

該命令允許用戶啟動RF Rx LoRa 測試 (詳情參閱 *Table 45* ).

**Table 45. Set the module in LoRaWAN™ Certification Mode command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+CERTIF? | - | AT+CERTIF: set the module in LoraWAN™ Certification Mode | OK |
| @AT+CERTIF | Void | Void | OK AT\_BUSY\_ERROR |

@AT+CERTIF將處理數據傳輸定時為5秒。

1. **客需命令**

本節介紹客需之命令

* 1. **@AT+TRX: Set the frequency of Rx1 is equal to the frequency of Tx**

該命令允許用戶存取Rx1頻率等於Tx頻率 (詳情參閱*Table 46* ).

**Table 46. LoRa**® **network join mode command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TRX? | - | AT+TRX: get or set the network join mode  (0: ABP, 1: OTAA) | OK |
| @AT+TRX | - | OK/ |  |
| @AT+TRX =<Input> | 0 or 1 | - | OK/ AT\_PARAM\_ERROR(1) |
| Example @AT+TRX =? | - | 0 | OK |
| Example @AT+TRX = | 1 | - | OK |
| Example @AT+TRX = | 2 | - | AT\_PARAM\_ERROR |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+RX1FQ: frequency of the received window 1**

該命令允許用戶存取接收到的窗口1的頻率 (詳情參閱*Table 47*).

**Table 47. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+RX1FQ? | - | AT+RX1FQ: get or set the Rx1 window frequency | OK |
| @AT+RX1FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+RX1FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+RX1FQ=? | - | 869535000 | OK |
| Example @AT+RX1FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TX1FQ: frequency of the transmitted channel 1**

該命令允許用戶存取發射的通道1的頻率 (詳情參閱*Table 48*).

**Table 48. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TX1FQ? | - | AT+TX1FQ: get or set the Rx1 window frequency | OK |
| @AT+TX1FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+TX1FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+TX1FQ=? | - | 869535000 | OK |
| Example @AT+TX1FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TX2FQ: frequency of the transmitted channel 2**

該命令允許用戶存取發射的通道2的頻率 (詳情參閱*Table 49*).

**Table 49. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TX2FQ? | - | AT+TX2FQ: get or set the Rx1 window frequency | OK |
| @AT+TX2FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+TX2FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+TX2FQ=? | - | 869535000 | OK |
| Example @AT+TX2FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TX3FQ: frequency of the transmitted channel 3**

該命令允許用戶存取發射的通道3的頻率 (詳情參閱*Table 50*).

**Table 50. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TX3FQ? | - | AT+TX3FQ: get or set the Rx1 window frequency | OK |
| @AT+TX3FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+TX3FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+TX3FQ=? | - | 869535000 | OK |
| Example @AT+TX3FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TX4FQ: frequency of the transmitted channel 4**

該命令允許用戶存取發射的通道4的頻率 (詳情參閱*Table 51*).

**Table 51. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TX4FQ? | - | AT+TX4FQ: get or set the Rx1 window frequency | OK |
| @AT+TX4FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+TX4FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+TX4FQ=? | - | 869535000 | OK |
| Example @AT+TX4FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TX5FQ: frequency of the transmitted channel 5**

該命令允許用戶存取發射的通道5的頻率 (詳情參閱*Table 52*).

**Table 52. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TX5FQ? | - | AT+TX5FQ: get or set the Rx1 window frequency | OK |
| @AT+TX5FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+TX5FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+TX5FQ=? | - | 869535000 | OK |
| Example @AT+TX5FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TX6FQ: frequency of the transmitted channel 6**

該命令允許用戶存取發射的通道6的頻率 (詳情參閱*Table 53*).

**Table 53. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TX6FQ? | - | AT+TX6FQ: get or set the Rx1 window frequency | OK |
| @AT+TX6FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+TX6FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+TX6FQ=? | - | 869535000 | OK |
| Example @AT+TX6FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TX7FQ: frequency of the transmitted channel 7**

該命令允許用戶存取發射的通道7的頻率 (詳情參閱*Table 54*).

**Table 54. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TX7FQ? | - | AT+TX7FQ: get or set the Rx1 window frequency | OK |
| @AT+TX7FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+TX7FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+TX7FQ=? | - | 869535000 | OK |
| Example @AT+TX7FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TX8FQ: frequency of the transmitted channel 8**

該命令允許用戶存取發射的通道8的頻率 (詳情參閱*Table 55*).

**Table 55. Frequency of the received window 2 command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TX8FQ? | - | AT+TX8FQ: get or set the Rx1 window frequency | OK |
| @AT+TX8FQ=? | - | Frequency in Hz | OK/ AT\_BUSY\_ERROR(1) |
| @AT+TX8FQ=869535000 | Frequency in Hz | - | OK/ AT\_PARAM\_ERROR(2) AT\_BUSY\_ERROR(1) |
| Example @AT+TX8FQ=? | - | 869535000 | OK |
| Example @AT+TX8FQ= | 869535000 | - | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+SAVE: Save the customization configuration**

該命令允許用戶存取客需參數 (詳情參閱*Table 56*).

**Table 56. Save customization configuration command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+SAVE | - |  | OK |
| Example @AT+ SAVE =? | - |  | OK |

1. AT\_BUSY\_ERROR 當加入或發送正在處理中返回
2. AT\_PARAM\_ERROR 表示設置錯誤或格式錯誤的值時會返回
   1. **@AT+TXO: transmit power without limitation by area, such as EU 868.**

該命令允許用戶存取發射功率，且不受區域限制(如EU 868) (詳情參閱*Table 57* ).

**Table 57. Transmit power command**

|  |  |  |  |
| --- | --- | --- | --- |
| **Command** | **Input parameter** | **Return value** | **Return code** |
| @AT+TXO? | - | AT+TXO: get or set the transmit power (0-20) | OK |
| @AT+TXO=? | - | [0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20](2) | OK AT\_PARAM\_ERROR(1) |
| @AT+TXO=<input> | [0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20](2) | - | OK AT\_PARAM\_ERROR(1) |
| Example @AT+TXO=? | - | 1 | OK |
| Example @AT+TXO= | 4 | - | OK |

1. AT\_PARAM\_ERROR表示設置錯誤或格式錯誤的值時會返回
2. 0~20代表0: TXO disable, 1: 1dBm, 2: 2dBm, 以此類推20: 20dBm