

Ra-06 AT command manual

AT Command Introduction

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Version

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V1.0	2019-3-1	ZC	Initial Version
V1.1	2019-3-1	ZC	
V1.3	2019-5-8	ZC	Increase rate rating comparision table

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1. AT Command Grammar

AT command uses the command line based on the ASCII code, command format refer to below:
 Request message format: AT+<CMD>[OPTION][para, ...][\r][\n]. **Available to not add the newline characters(\r\n)!**

< > Must specify content

[] Options

Form 1 AT Request message format

Field	Description
AT+	Command message prefix
CMD	Command string
OPTION	Command operator. Can be following content: “=” : represents setting parameters. “?” : represents the current value of the query parameter. “” : represents an execution instruction “=? ”: represents the request instruction of help usage information
Para	Represents the setting parameter value
\r\n	Enter and Newline, ASCII respectively 0x0d,0x0A

Response message format: +OK\r\n (Command execution succeed)
 +ERROR(-1)\r\n (command execution failed, , AT command error)
 +ERROR(-2)\r\n (command execution failed AT command parameter error)

E.g:

1. Sets the local node address of the module: AT+ADDR=2018
2. Query module local node address : AT+ADDR?
3. Check the help : AT+ADDR=?

2. AT command

2.1 Execution of orders

2.1.1 Query version information

Command	Possible return results	Note
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AT+VER	+OK and version information	
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2.1.2 Restart the system

Command	Possible return results	Note
AT+RST	ID+SBC	Automatically save the setting parameters to the flash before restarting

2.1.3 Restoration of factory settings

Command	Possible return results	Note
AT+FAC	+OK	All user-setting parameters are permanently restored to factory settings and the system is restarted

2.1.4 Print all commands and help information

Command	Possible return results	Note
AT+HELP	+OK	

2.1.5 Query Device Unique Identification Number

Command	Possible return results	Note
AT+UUID	+OK and ID	ID can't change

2.2 System parameters

2.2.1 Equipment operation mode

Type	Command	Value range	Note
Setting command	AT+MODE=<Digital characters Value>	Value: 0: low power consumption operating 1: deep sleep	default low power consumption operating Wake up method
Query	AT+MODE?	2 : deep sleep+CAD receiving	under deep sleep:

command		detection (waked up via wireless) Greater than 100: deep sleep value automatic wake-up in milliseconds	send any data to serial port. To enter CAD receive detection mode, you need to set the CAD interval first, CMD: AT+CSLT
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For example, set the device into deep sleep mode: AT+MODE=1。
 AT+MODE=5000, Automatic wake-up after 5000 ms of deep sleep.

2.2.2 Equipment commissioning grade

Type	Command	Value range	Note
Setting command	AT+DBGL=<Digital characters Value>	Value:	
Query command	AT+DBGL?	0: Print only “+OK” 1: User mode, default 2: Debugging mode	

2.2.3 Serial port parameter setting

Type	Command	Value range	Note
Setting command	AT+UART=<Value1>,<Value2>,<Value3>	Baud rate Value1: 0~9 Parity check Value2: 1~2 Stop Value3: 0~2	The baud rate suggests not to select too small value 。 Greater than 9600bps
Query command	AT+UART?		

Parameter Description:

Buad rate Value1: range 0~9

0: 2400 bps	5: 57600 bps
1: 4800 bps	6: 76800 bps
2: 9600 bps	7: 115200 bps
3: 19200 bps	8: 128000 bps
4: 38400 bps	9: 256000 bps

Parity check Value2: range 1~2

- 1: Odd (Odd check)
- 2: Even (Dual checks)

Stop position Value3: range 0~3

- 0: 1

1: 1.5

2: 2

2.3 Lora Parameter Settings

2.3.1 Frequency setting

Type	Command	Value range	Note
Setting command	AT+FREQ=<Digital characters Value>	Value: 9 characters fixed in length, e.g: 470300000	Node devices with different frequencies can not communicate
Query command	AT+FREQ?		

2.3.2 lora transmission rate

Type	Command	Value range	Note
Setting command	AT+RATE=<Digital characters Value>	Value: 0~9	0~9,rate from low to high. Node devices at different rates can not communicate with each other
Query command	AT+RATE?		

Rate level	0	1	2	3	4	5	6	7	8	9
Corresponding rate(bps)	122	149	407	487	732	867	1302	2278	4557	9114

2.3.3 Local node address

Type	Command	Value range	Note
Setting command	AT+ADDR=<Digital characters Value>	Value: 1~65534	0: retain 65535: broadcast address
Query command	AT+ADDR?		

2.3.4 Target node address

Type	Command	Value range	Note
Setting command	AT+TADDR=<Digital characters Value>	Value: 1~65535	0: retain 65535 : broadcast address
Query	AT+TADDR?		

command			
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2.3.5 lora Transmission power

Type	Command	Value range	Note
Setting command	AT+POWER=<Digital characters Value>	Value: 2~20	
Query command	AT+POWER?		

2.3.6 Lead code length

Type	Command	Value range	Note
Setting command	AT+PRE=<Digital characters Value>	Value: 6~5000 Unit: Symbol	Default value: 8 Advise do not exceed 5000
Query command	AT+PRE?		

2.3.7 Spread spectrum factor SF frequency bandwidth BW coding rate setting

Type	Command	Value range	Note
Setting command	AT+SBC=<Digital characters Value1>,<Value2>,<Value3>	Spread spectrum factor Value1: 6~12	If the command and AT RATE are mutually exclusive, setting this parameter the former will invalidates , in contrast same argument.
Query command	AT+SBC?	Frequency bandwidth Value2: 0~9	
		Coding rate Value3: 1~4	

Spread spectrum factor: 6: 64, 7: 128, 8: 256, 9: 512, 10: 1024, 11: 2048, 12: 4096 chips

Frequency bandwidth: 0: 7.8kHz, 1: 10.4 kHz, 2: 15.6 kHz, 3: 20.8 kHz, 4: 31.2 kHz,

5: 41.6 kHz, 6: 62.5 kHz, 7: 125 kHz, 8: 250 kHz, 9: 500 kHz。

Coding rate: 1: 4/5 2: 4/6 3: 4/7 4: 4/8

E.g: AT+SBC=7,7,2

2.3.8 CAD Interval

Type	Command	Value range	Note
Setting command	AT+CSLT=<Digital characters Value>	Value: 100~ 5000 Unit: ms	Enter CAD receive detection to set this parameter first.
Query command	AT+CSLT?		Default value 200.

2.3.9 Frequency jump cycle

Type	Command	Value range	Note
Setting command	AT+FHSS=<Value>	Value: 0~255	Recommend greater30
Query command	AT+FHSS?	0 : Closed frequency hopping, default	

2.3.10 Setting the frequency hopping list

Type	Command	Value range	Note
Setting command	AT+CH=<Value1>,<Value2>	Value1: Set Network Number	Frequency hopping by number
Query command	AT+CH?	Value2: Frequency value, Unit: Hz	

E.g: AT+CH=0,475000000
 AT+CH=1,475100000
 AT+CH=2,475300000

2.3.11 Setting Network Number

Type	Command	Value range	Note
Setting command	AT+NETID=<Value>	Value: 1~254 Default value: 90	Modules with different network numbers can not communicate with each other
Query command	AT+NETID?		

2.4 Transmission and receiving command

2.4.1 Transmission data

Type	Command	Value range	Note
Setting command	AT+MSG=<Value>	ASCII Characters or binary data	For nodes communication, receive reply message after ACKMSG send
	AT+ACKMSG=<Value> (reponse)		

Query command	No		
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2.4.2 Receiving data

Type	Command	Value range	Note
Setting command	AT+RECV=<Digital characters Value>	Value: 0: Closed reception	CAD interval must be set before entering CAD detection mode (AT+CSLT)
Query command	AT+RECV?	1: Receiving data 2: Enable CAD detection and receive	

2.5 Configure mode

First set the node to working mode, then join the gateway, if it is Plan B mode, join the gateway to synchronize the gateway.

2.5.1 Node join the gateway

Command	Possible return results	Note
AT+JOIN	+OK	Gets the gateway assigned address and communication frequency

2.5.2 Node joining the gateway operating mode

Type	Command	Value range	Note
Setting command	AT+PLAN=<Value>	Value: A,B,C	Plan A: Open reception only after sending data Plan B: Set specific time to receive Plan C: Continue to receive
Query command	AT+PLAN?		

2.5.3 Node and Synchronization Gateway

Type	Command	Value range	Note
Setting command	AT+SYNC=<Value>	Value: 0: Cancel	Request at Plan B mode

Query command	N/A	1: Synchronization	
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2.5.4 Send data to gateway

Type	Command	Data range	Note
Setting command	AT+NETMSG=<Data>		Send message from node to gateway
Query command	N/A		