

M190

LoRaWAN AT Command Manual

V1.0.2

EasyLinkin
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1. AT Command Description

1.1 AT Command Syntax

The AT command is based on ASCII characters. In general, the AT Command starts with the prefix AT and ends with <CR> <LF> (i.e. \r\n). Input and output parameter characters in hexadecimal(that is, 2 characters represent 1 hexadecimal number), the parameter with " " is character data (that is, 1 character represents 1 hexadecimal number).

Below are available command formats:

Item	Command Format	Return Code	Remarks
GET	AT+ <CMD>?	OK+ <CMD>: <P1,P2,...Pn>	command read successfully
		ERR+AT	command error
		INV+AT	invalid command
SET	AT+ <CMD>= <P1,P2,...Pn>	OK + <CMD> or OK / ERR + <CMD>: <P1, P2, ... Pn>	command set success/failure
		ERR + AT	command error
		INV+AT	invalid command
		ERR+PARA	parameter error
RUN	AT+ <CMD>	OK/ERR+ <CMD>	command execution success/failure
		ERR+AT	command error
		INV+AT	invalid command

1.2 AT Command Overview

No.	command	Type of command			Power-off save
		RUN	GET	SET	
1	AT+	√			
2	AT+?		√		
3	AT+VERS		√		
4	AT+SAVE	√			
5	AT+RESET	√			
6	AT+BAUD		√	√	√
7	AT+CONFIRM		√	√	√
8	AT+NBTRIALS		√	√	√
9	AT+ADR		√	√	√
10	AT+CLASS		√	√	√
11	AT+PORT		√	√	√
12	AT+LINK	√			
13	AT+TIME	√	√	√	√
14	AT+SIGNAL		√		
15	AT+DATARATE		√	√	√
16	AT+SEND			√	
17	AT+SETB		√	√	√
18	AT+JOIN		√	√	
19	AT+SLEEP			√	
20	AT+HEART	√	√	√	√
21	AT+BAND		√	√	√
22	AT+CHANNEL		√	√	√
23	AT+RX2DR		√	√	√
24	AT+OTAA		√	√	√
25	AT+DEVEUI		√	√	√
26	AT+APPEUI		√	√	√
27	AT+APPKEY		√	√	√
28	AT+DEVADDR		√	√	√
29	AT+APPSKEY		√	√	√
30	AT+NWKSKEY		√	√	√
31	AT+POWER		√	√	√
32	AT+LBT		√	√	√
33	AT+RX1DL		√	√	√
34	AT+RENEW	√			

"√": indicates that this command supports this items, otherwise not. The input format of different command types can be referred to the format in command description.

"Power-off save": indicates that the command parameter can be written into the EEPROM of the module through the SAVE command after modification, so that it will not be lost after power-off. Other parameters that do not support the power-off save command will be restored to the factory default parameters after the module is restarted. The RESET command needs to be added after the SAVE command to ensure all settings is not lost.

2. Detailed AT Commands

2.1 AT+: attention

This command is used to check that the UART communication link is working properly.

Command	Input Parameter	Return Value	Return Code
AT+	-	-	OK+

2.2 AT+?: all available AT commands

This command is used to show all available AT commands.

Command	Input Parameter	Return Value	Return Code
AT+?	-	all available AT commands	OK+LIST

Example:

No.	Command	Response	Remark
1	AT+?	OK+LIST:SLEEP, JOIN, SEND, ADR, PORT, CONFIRM, NBTRIALS, CLASS, SIGNAL, DATARATE, POWER, HEART, CHANNEL, VERS, DEVEUI, APPEUI, APPKEY, OTAA, DEVADDR, APPSKEY, NWKSKEY, BAUD, LINK, TIME, SETB, SAVE, RESET, RENEW	

2.3 AT+VERS: version of the firmware

This command is used to get the firmware version installed on the device.

Command	Input Parameter	Return Value	Return Code
AT+VERS?	-	UartLoRaWan_AT- <version>, <frequency band>	OK+VERS

Example:

No.	Command	Response	Remark
1	AT+VERS?	OK+VERS:" UartLoRaWan_AT-V1.0.4,CN470"	

2.4 AT+SAVE: save the configuration

This command is used to save configuration parameters that support power-off saving.

Command	Input Parameter	Return Value	Return Code
AT+SAVE	-	-	OK+SAVE

2.5 AT+RESET: restart the device

This command is used to restart module.

Command	Input Parameter	Return Value	Return Code
AT+RESET	-	-	OK+RESET

2.6 AT+BAUD: baud rate setting

This command is used to access and configure the baud rate of the device.

Command	Input Parameter	Return Value	Return Code
AT+BAUD?	-	00,01,02.....or 09	OK+BAUD
AT+BAUD= <Input Parameter>	00,01,02.....or 09	-	OK+BAUD or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+BAUD?	OK+BAUD:00	

2	AT+BAUD=08	OK+BAUD	
3	AT+BAUD=0A	ERR+PARA	

Note:

- ① Parameter length: 1Byte
- ② Value range: 0-9
- ③ Parameters description: 8, N, 1
0-9600, 1-1200, 2-2400, 3-4800, 4-9600
5-19200, 6-38400, 7-57600, 8-115200, 9-9600

2.7 AT+CONFIRM: confirmed payload mode

This command is used to access and configure type of payload of the device.

Command	Input Parameter	Return Value	Return Code
AT+CONFIRM?	-	00(if Unconfirmed) or 01 (if confirmed)	OK+CONFIRM
AT+CONFIRM=<Input Parameter>	00 or 01		OK+CONFIRM or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+CONFIRM?	OK+CONFIRM:01	
2	AT+CONFIRM=00	OK+CONFIRM	
3	AT+CONFIRM=02	ERR+PARA	

Note:

- ① Parameter length: 1Byte
- ② Value range: 0-1
- ③ Parameter description:
0- unconfirmed, no need to get response from NS .
1- confirmed (default), need to get response from NS.

Users can choose reasonably according to different demands, and it is recommended to use unconfirmed if the data uploaded regularly in a short time, for important data using confirmed.

2.8 AT+NBTRIALS: confirmed payload retransmission

This command is used to access and configure the number of retransmission for confirmed payload.

Command	Input Parameter	Return Value	Return Code
AT+NBTRIALS?	-	01,02,03.....or 08	OK+NBTRIALS
AT+NBTRIALS= <Input Parameter>	01,02,03.....or 08	-	OK+NBTRIALS or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+NBTRIALS?	OK+NBTRIALS:02	
2	AT+NBTRIALS=05	OK+NBTRIALS	
3	AT+NBTRIALS=09	ERR+PARA	

Note:

- ① Parameter length: 1Byte
- ② Value range: 1-8

If receiving ack from NS for a confirmed data, the retransmission will be stopped immediately. When retransmissions reaches a certain number, the module will reduce the transmission rate (refer to LoRaWAN protocol for details) to improve the transmission success rate. Besides, the more retransmissions, the longer of the time and the higher power consumption. Users can evaluate according to the data length and data frequency.

The strategy is as follows:

Transmission nb	Data Rate
1(first)	DR
2	DR
3	MAX (DR-1.0)
4	MAX (DR-1.0)
5	MAX (DR-2.0)
6	MAX (DR-2.0)
7	MAX (DR-3.0)
8	MAX (DR-3.0)

2.9 AT+ADR: adaptive data rate

This command is used to access and configure the adaptive data rate of the module.

Command	Input Parameter	Return Value	Return Code
AT+ADR?	-	00 (ADR off) or 01 (ARD on)	OK+ADR
AT+ADR= <Input Parameter>	0 or 1		OK+ADR or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+ADR?	OK+ADR:01	
2	AT+ADR=00	OK+ADR	
3	AT+ADR=02	ERR+PARA	

Note:

- ① Parameter length: 1Byte
- ② Value range: 0-1
- ③ Parameter description:
0- ADR off
1- ADR on(default)

2.10 AT+CLASS: LoRaWAN® class

This command is used to access and configure the the LoRaWAN® class of the module.

Command	Input Parameter	Return Value	Return Code
AT+CLASS?	-	00, 01 or 02	OK+CLASS
AT+CLASS= <Input Parameter>	00, 01 or 02		OK+CLASS or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+CLASS?	OK+CLASS=01	

2	AT+CLASS=00	OK+CLASS	
3	AT+CLASS=02	ERR+PARA	

Note:

- ① Parameter length: 1Byte
- ② Value range: 0-1
- ③ Parameter description:

0- Class A (default)

1- Class C

If module is working in Class A mode, the module is in sleep mode when it is in standby, and needs to be wake up before sending data;

When module switches to Class C mode, the module will not sleep when it is in standby, and will always work in the receiving mode with mA-level working current. Downlink data length is limited by RX2 rate configuration, it is recommended that the maximum should not exceed 51Bytes.

2.11 AT+PORT: data port

This command is used to access and configure uplink data port.

Command	Input Parameter	Return Value	Return Code
AT+PORT?	-	2 to 220	OK+PORT
AT+PORT=<Input Parameter>	2 to 220	-	OK+PORT or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+PORT?	OK+PORT=02	
2	AT+PORT=DC	OK+PORT	
3	AT+PORT=01	ERR+PARA	

Note:

- ① Parameter length: 1Byte
- ② Value range: 0x02-0xDC(2-220), default is 2

2.12 AT+LINK: network link status

This command is used to access device network link status.

Command	Input Parameter	Return Value	Return Code
AT+LINK	-	-	OK+LINK or ERR+LINK

Note:

"AT+LINK" is also sending a null confirmed uplink data from port 0, the uplink frame counter will increase by 1.

2.13 AT+TIME: UTC time request

This command is used to get the UTC time. It only works if the device is in LoRaWAN mode and successfully joined.

Command	Input Parameter	Return Value	Return Code
AT+TIME?	-	current date and time (<year>, <month>, <day>, <hour>, <minute>, <second>, <millisecond>, <unix timestamp>)	OK+TIME
AT+TIME	-	-	OK+TIME or ERR+TIME

Example:

No.	Command	Response	Remark
1	AT+TIME?	OK+TIME:07b2,01,01,08,19,28,00dd,00000604	
2	AT+TIME	OK+TIME OK+SENT:01 OK+RCV:0A,01,00	
3	AT+TIME	OK+TIME ERR+SENT:02	

Note:

With "AT+TIME" command, this also sends a null confirmed uplink data from port 0, the uplink frame counter will increase by 1.

① Parameter description:

Year- 2Byte, High bytes in front, Low bytes in rear

Month- 1Byte

Day- 1Byte

Hour- 1Byte

Minute- 1Byte

Second- 1Byte

Millisecond- 2Byte, High bytes in front, Low bytes in rear

Unix timestamp- 4Byte, High bytes in front, Low bytes in rear

② The time read is Beijing time (Beijing time=GMT+8H), when there is no time synchronization success, the module start time is 1970/01/01 08:00:00

③ If receiving ERR+SENT after time synchronization request, it means synchronization fails. If OK+SENT is received and Bit3 in TYPE is 1 in the RECV information, it means time synchronization is successful; If Bit3 in TYPE is 0, it also means fail.

2.14 AT+ SIGNAL: received signal quality

This command is used to get the RSSI and SNR value of the last packet received.

Command	Input Parameter	Return Value	Return Code
AT+SIGNAL?	-	value of RSSI,value of SNR	OK+SIGNAL

Example:

No.	Command	Response	Remark
1	AT+SIGNAL?	OK+SIGNAL:ff93,f8	Rssi=-109, Snr=-8

Note:

① Parameter description:

RSSI of last received data, 2Byte, signed number

SNR of last received data, 1Byte, signed number

2.15 AT+DATARATE: data transfer rate

This command is used to access and configure data rate settings.

Command	Input Parameter	Return Value	Return Code
AT+DATARATE?	-	0-7 corresponding to DR_X	OK+SIGNAL
AT+DATARATE= <Input Parameter>	0-7 corresponding to DR_X	-	OK+DATARATE or ERR+DATARATE

Example:

No.	Command	Response	Remark
1	AT+DATARATE?	OK+DATARATE:05	
2	(AT+ADR=00) AT+DATARATE=00	(OK+ADR) OK+DATARATE	To configure data rate,disable ADR first.

Note:

This data rate configuration is not effective for join package, and data rate of join package is controlled by other policies.To configure data rate,disable ADR first.(The correspondence of DR level and SF is different in different regions.For details,please refer to LoRaWan Region Parameters V1.0.3)

① Parameter length: 1Byte

② Parameters description:

DR0 (default), DR1, DR2, DR3, DR4, DR5, DR_X (according to description of region, different regions have different upper limits).

2.16 AT+SEND: send payload data

This command is used to send LoRaWAN® payload.

Command	Input Parameter	Return Value	Return Code
AT+SEND= <Input Parameter>	Param1,Param2,Param3	data_length	OK+SEND
	Param1: data type	ERR_NUM (0<unjoined	or ERR+SEND
	Param2: transmission times	network>, 1<communication busy>, 2<data validation	

	Param3: payload data	error> or 3<data length exceeds limit>)	
AT+SEND=<Input Parameter>	payload data	data_length or ERR_NUM	OK+SEND or ERR+SEND

Example:

No.	Command	Response	Remark
1	AT+SEND=1,2,010203	OK+SEND:03 OK+SENT:01 OK+RECV:02,02,00	data sent successfully, and the valid data received by the platform should be 010203
2	AT+SEND=1,4,010203	OK+SEND:03 ERR+SENT:04	data transmission failed after sending maximum 4 times
3	AT+SEND=1,2,"123"	OK+SEND:03 OK+SENT:01 OK+RECV:02,02,00	data sent successfully, the valid data received by the platform side shall be 313233 (hex data)

Note:

① Parameter description:

Data type: 0-1,1Byte, refer to CONFIRM command

Transmission times: 1-8,1Byte, refer to NBTRIALS command

Data payload: nByte, converts its characters into valid hexadecimal data, and supports hexadecimal or string (add "").

② How to judge whether data transmission is successful?

Confirmed type data

Each time data is sent, there will be a corresponding response message from NS. When module does not receive response message for timeout, if the maximum number of sending times is not reached, it will retry again until the maximum number of times that still does not receive downlink message, that is data sending fails, and will show ERR+SENT message. During this period, if the response message is received and the transmission ends, it is successful, and get OK+SENT and OK+RECV messages.

Unconfirmed type data

After sending the data, the downlink response from NS will not be requested. Whether the data transmission is successful or not, after each transmission, OK+SENT message will be returned.

③ Return code

OK+SENT: TX_CNT, data was sent successfully.

TX_CNT: 1Byte, Number of sending data times

ERR+SENT: ERR_NUM, data sending failure.

ERR_NUM: 1Byte, Number of sending data times

OK+RECV:TYPE,PORT,LEN,DATA, data received successfully (response message or downlink data from NS is received)

TYPE: 1Byte, downlink data type

Bit0: 0-unconfirmed, 1-confirmed

Bit1: 0-non-ACK, 1-ACK

Bit2: 0-not carried, 1-carried, indicating whether the LINK command response is carried with downlink data.

Bit3: 0-not carried, 1-carried, indicating whether the TIME command response is carried with downlink data, which only means a successful time synchronization when this bit is 1.

Bit [7:4]: reserved to support Class B application

Bit4: Downlink data type, 0-Multicast, 1-Proprietary

Bit5: ClassB status indication, 0-Class A/C, 1-ClassB

Bit [7:6]: Downlink data receive window

00-Downlink RX1 window, 01-Downlink RX2 window, 10-Class C active downlink window, 11- Class B Pingslot window

PORT: 1Byte, downlink data port

LEN: 1Byte, downlink data length

DATA: nByte, downlink data, this does not exist when LEN=0.

2.17 AT+SETB: UART output delay

This command is used to access and set the delay time of UART output.

Command	Input Parameter	Return Value	Return Code
AT+SETB?	-	00-FA	OK+SETB
AT+SETB=<Input Parameter>	00-FA	-	OK+SETB or ERR+PARA

Example:

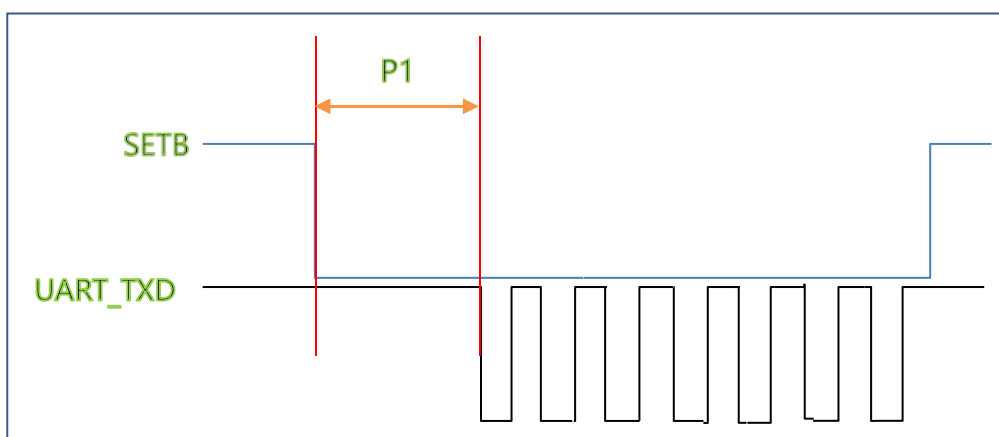
No.	Command	Response	Remark
1	AT+SETB?	OK+SETB=32	
2	AT+SETB=0F	OK+SETB	
3	AT+SETB=FD	ERR+PARA	

Note:

The delay configuration parameter takes effect immediately.

- ① Parameter length: 1Byte
- ② Value range: 0x00-0xFA (default 0x32) in ms
- ③ Parameter description:

When serial port is ready to send data, SETB pulls down to wake MCU of data receiver, after delay P1, the serial port send the data; the default delay time is 50ms, the minimum delay is 0ms and the maximum delay is 250ms.



2.18 AT+JOIN: join LoRaWAN® network

This command is used to join a LoRaWAN network.

Command	Input Parameter	Return Value	Return Code
AT+JOIN?	-	0(unjoin network),1(joining network) or 2(joined network)	OK+JOIN
AT+JOIN= <Input Parameter>	00(stop accessing network) or 01(accessing network)	0,1 or 2 OK+JOINED:JOIN_CNT,JOIN_TOTAL	OK+JOINED or ERR+JOINED

AT+JOIN= <Input Parameter>	<network access control>, <join request times>, <network access interval>, <network initiation interval>	ERR+JOINED:JOIN_CNT,JOIN_TOTAL	OK+JOINED or ERR+JOINED
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Example:

No.	Command	Response	Remark
1	AT+JOIN?	OK+JOIN:02	
2	AT+JOIN=01,03,0A	OK+JOIN:00 ERR+JOINED:0001,0003 ERR+JOINED:0002,0003 ERR+JOINED:0003,0003	
3	AT+JOIN=01,05,05,00	OK+JOIN:00 ERR+JOINED:0001,0005 OK+JOINED:0002,0005	

Note:

① Parameter description:

- Network access control: 0-1,1Byte, the default is 0

0- stop accessing network, valid in the the accessing process .

1- accessing network and will rejoin network if joined.

- Number of join network requests: 2Byte, default is 5.

When it is set to 0, it means that there is no limit to the number of access to the network, and it will automatically rejoin the network after failure; it accesses network in turn in the order of sf7/sf9/sf9/sf12 until the network access is successful. It is recommended to set number of join network requests for each time not less than 4, that is, there is sf12 accesses the network each time to avoid poor signal from being unable to access the network.

The JOIN_TOTAL in the joined response indicates the current number of requests for network access.

- Network access interval: 1Byte, unit in second, value range: 0x0A~0xFF, the default is 10s. It

means that after a network access request fails, wait for P3 seconds before initiating network access request. the number of access requests is controlled by P2 parameters.

- Network initiation interval: 2Byte, unit in minute, is requested by default (the default rule is 16,16,16 16 (decimal, unit hour)).

③ network access status:

OK+JOINED:JOIN_CNT,JOIN_TOTAL join network successfully

ERR+JOINED:JOIN_CNT,JOIN_TOTAL join network failure

JOIN_CNT: the number of join network requests

JOIN_TOTAL: Maximum number of join network requests

2.19 AT+SLEEP: configure module sleep.

This command is used to configure module sleep.

Command	Input Parameter	Return Value	Return Code
AT+SLEEP= <Input Parameter>	00, 01 or 02	00(not sleep) or 01(sleep)	OK+SLEEP

Example:

No.	Command	Response	Remark
1	AT+SLEEP=00	OK+SLEEP:00	
2	AT+SLEEP=02	OK+SLEEP:00	
2	AT+SLEEP=01	OK+SLEEP:00 OK+SLEEP:01	

Note:

① Parameter length: 1Byte

② Value range: 0-2

③ Parameter description:

0- not sleep

1- sleep

2- default mode after power up, and module automatically goes to sleep after about 15s of power-up in Class A mode, and Class C does not sleep.

2.20 AT+HEART: timed heartbeat

This command is used to access and configure timed heartbeat of module.

Command	Input Parameter	Return Value	Return Code
AT+HEART?	-	00(disable heartbeat) or 01(enable heartbeat)	OK+HEART
AT+HEART=<Input Parameter>	00 or 01	-	OK+HEART or ERR+PARA
AT+HEART	-	-	OK+HEART or ERR+HEART

Example:

No.	Command	Response	Remark
1	AT+HEART?	OK+HEART:01	
2	AT+HEART=00	OK+HEART	
3	AT+HEART=02	ERR+PARA	
4	AT+HEART	ERR+HEART	module haven' t joined network or is in data communication

Note:

① Parameter length: 1Byte

② Value range: 0-1

③ Parameter description:

0- Disable heartbeat

1- Enable heartbeat (default)

AT+HEART=<Input Parameter> is used to enable or disable heartbeat request. Generally, this command only needs to be configured once when the module is initialized. If it is executed repeatedly, the heartbeat timer of the module will be reset every time and upload a heartbeat packet each time.

AT+HEART is used to request uploading a frame of heartbeat data from port 223 immediately.

2.21 AT+BAND: regional frequency band

This command is used to access and configure the regional frequency band.

Command	Input Parameter	Return Value	Return Code
AT+BAND?	-	0,1,2,3,4,5,6	OK+BAND
AT+BAND= <Input Parameter>	0,1,2,3,4,5,6	-	OK+BAND or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+BAND?	OK+BAND:01	
2	AT+BAND=00	OK+BAND	
3	AT+BAND=0A	ERR+PARA	

Note:

- ① Parameter length: 1Byte
- ② Value range: 0-5
- ③ Parameter description:

Low frequency bands:

0- EU433

1- CN470

2- AL470

High frequency bands:

3- EU868

4- US915

5- AS923

6- AU915

The default low frequency band is 01(CN470), and the default high frequency band is 03(EU868).

2.22 AT+CHANNEL: frequency of join,TX,RX1 and RX2 window

This command is used to access and configure the frequency of join,TX,RX1 and RX2 window.

Command	Input Parameter	Return Value	Return Code
AT+CHANNEL?	-	<band>,01,<TX frequency> <band>,03,<RX2 frequency>	OK+CHANNEL
AT+CHANNEL=P1,P1,P3-PN	<band>,<type>,<frequency>	-	OK+CHANNEL
	<band>,<type>,<frequency>	ERR_NUM	ERR+CHANNEL

Example:

No.	Command	Response	Remark
1	AT+CHANNEL?	OK+CHANNEL:01,01,0a,0b,0d,0e,0f,10,5f,ff OK+CHANNEL:01,03,19	
2	AT+CHANNEL=00,01,1c26b9e0,1c29c72 0,1c2cd460	OK+CHANNEL	

Note:

① Parameters: P1-Pn

② Parameter description:

P1: Band, 1Byte

0- EU433

1- CN470

2- AL470

3- EU868

4- US915

5- AS923

6- AU915

P2: Configure item, 0-3,1Byte

0- JOIN, network access frequency or channel number

1- TX, uplink frequency or the channel number

2- RX1, downlink window 1 frequency or channel number

3- RX2, downlink window 2 frequency or channel number

P3-Pn: Frequency parameter (ff indicates an invalid frequency point parameter)

(1) EU433,EU868,AS923 directly configure frequency point:

TX (2 or 3 join frequency points) and RX2 (1 point) with configurable range of 433M-923MHz and unit in Hz.

(2) CN470 is configured with channel numbers:

The uplink frequency starts from 470.3M, with 96 channels in 0-95 following: $f=470.3+0.2*n(0\leq n\leq 95)$.

The downlink frequency starts from 500.3M,with 48 channels in 0-47 following: $f=500.3+0.2*n(0\leq n\leq 47)$.

TX (8 channels) and RX2 (1 channel) are both configurable.

(3) AL470 is configured with channel numbers:

Starting point frequency 470.3M, 0-197 with a total of 198 channels, following: $f=470.3+0.2 * n (0\leq n\leq 197)$.

TX (8 channels), RX1 (8 channels), and RX2 (1 channel) are configurable.

The JOIN channel is the same as TX, and is randomly selected one from 8 channels of TX.

(4) US915 is configured with channel numbers:

There are 72 channels in uplink from 0-71, the uplink channel configuration must satisfy to select 8 in 0-63 following: $f=902.3+0.2 * n (0\leq n\leq 63)$ and 1 in 64-71 channels, following: $f=903.0+1.6 * (n-64) (64\leq n\leq 71)$.

There are 8 channels down from 0-7, following: $f=923.3+0.6 * n (n\leq 7)$.

The TX (72 channels) and the RX2 (8 channels) are both configurable.

The module should be reset after the frequency change is saved.

2.23 AT+RX2DR: data rate on RX2 window

This command is used to access and configure the data rate of the RX2 window.

Command	Input Parameter	Return Value	Return Code
AT+RX2DR?	-	00-0F	OK+RX2DR
AT+SETB= <Input Parameter>	00-0F	-	OK+RX2DR or ERR+RX2DR

Example:

No.	Command	Response	Remark
1	AT+RX2DR?	OK+RX2DR:00	
2	AT+RX2DR=01	OK+RX2DR	
3	AT+SETB=A0	ERR+RX2DR	

Note:

① Parameter length: 1Byte

② Parameter description:

0-DR0, 1-DR1, 2-DR2, 3-DR3, 4-DR4, 5-DR5 ..15-DR15

Please refer to LoRaWAN Region Parameters V1.0.3 for different regional frequency band of DR level and SF, and the configuration is only valid before joining network and can't be changed after joined network.

2.24 AT + OTAA: LoRaWAN® network join mode

This command is used to access and configure the activation method of the device either OTAA or ABP.

Command	Input Parameter	Return Value	Return Code
AT+OTAA?	-	00(ABP) or 01(OTAA)	OK+OTAA
AT+OTAA=<Input Parameter>	0 or 1	-	OK+OTAA or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+OTAA?	OK+OTAA=01	
2	AT+OTAA=00	OK+OTAA	
3	AT+OTAA=02	ERR+PARA	

Note:

① Parameter length: 1Byte

② Value range: 0-1

③ Parameter description:

0-ABP, independent activation

1-OTAA (default), over-the-air activation

Parameters required to be reconfigured in ABP mode: DEVADDR, APPSKEY, and NWKSKEY.

Parameters required to be reconfigured in OTAA mode: APPEUI, APPKEY.

2.25 AT+DEVEUI: device EUI or DEVEUI

This command is used to access and configure the device EUI or DEVEUI(DevEUI is a global unique ID like IEEE EUI64, to identify a unique device).

Command	Input Parameter	Return Value	Return Code
AT+DEVEUI?	-	< 8 hex >	OK+DEVEUI
AT+DEVEUI= <Input Parameter>	< 8 hex >	-	OK+DEVEUI or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+DEVEUI?	OK+DEVEUI=004A77012402C433	
2	AT+DEVEUI=004A770124056472	OK+DEVEUI	
3	AT+DEVEUI=004A77012405647233	ERR+PARA	

2.26 AT+APPEUI: application unique identifier

This command is used to access and configure the APPEUI.

Command	Input Parameter	Return Value	Return Code
AT+APPEUI?	-	< 8 hex >	OK+APPEUI
AT+APPEUI= <Input Parameter>	< 8 hex >	-	OK+APPEUI or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+APPEUI?	OK+APPEUI=0102030405060708	
2	AT+APPEUI=2C26C50124194000	OK+APPEUI	

3	AT+DEVEUI=2C26C5012419400011	ERR+PARA	
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2.27 AT+APPKEY: application key

This command is used to access and configure the APPKEY.

Command	Input Parameter	Return Value	Return Code
AT+APPKEY?	-	< 16 hex >	OK+APPKEY
AT+APPKEY= <Input Parameter>	< 16 hex >	-	OK+APPKEY or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+APPKEY?	OK+APPKEY=000102030405060708090a 0b0c0d0e0f	
2	AT+APPKEY=91F9D77F19570785E633C2D 6C5C2592A	OK+APPKEY	
3	AT+APPKEY=91F9D77F19570785E633C2D 6C5C2592A2C	ERR+PARA	

2.28 AT+DEVADDR: device address or DEVADDR

This command is used to access and configure the device address or DEVADDR.

Command	Input Parameter	Return Value	Return Code
AT+DEVADDR?	-	< 4 hex >	OK+DEVADDR
AT+DEVADDR= <Input Parameter>	< 4 hex >	-	OK+DEVADDR or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+DEVADDR?	OK+DEVADDR=00010203	
2	AT+DEVADDR=0A0B0C0D	OK+DEVADDR	
3	AT+DEVADDR=0A0B0C0D0E	ERR+PARA	

2.29 AT+APPSKEY: application session key

This command is used to access and configure the application session key or APPSKEY.

Command	Input Parameter	Return Value	Return Code
AT+APPSKEY?	-	< 16 hex >	OK+APPSKEY
AT+APPSKEY=<Input Parameter>	< 16 hex >	-	OK+APPSKEY or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+APPSKEY?	OK+APPSKEY=000102030405060708090 a0b0c0d0e0f	
2	AT+APPSKEY =d5fed9ab51f30e0aaab852e2b4b5 580c	OK+APPSKEY	
3	AT+APPSKEY =d5fed9ab51f30e0aaab852e2b4b5 580c0d	ERR+PARA	

2.30 AT+NWKSKEY: network session keys

This command is used to access and configure the network session keys or NWKSKEY.

Command	Input Parameter	Return Value	Return Code
AT+NWKSKEY?	-	< 16 hex >	OK+NWKSKEY
AT+NWKSKEY=<Input Parameter>	< 16 hex >	-	OK+NWKSKEY or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+NWKSKEY?	OK+NWKSKEY=00010203040506070 8090a0b0c0d0e0f	

2	AT+NWKSKEY=d5fed9ab51f30e0aaab852e2 b4b5580c	OK+NWKSKEY	
3	AT+NWKSKEY=d5fed9ab51f30e0aaab852e2 b4b5580c0d	ERR+PARA	

2.31 AT+POWER: transmit Power

This command is used to access and configure the transmit power.

Command	Input Parameter	Return Value	Return Code
AT+POWER?	-	0-7 or F0-FF	OK+POWER
AT+POWER= <Input Parameter>	0-7 or F0-FF	-	OK+POWER or ERR+POWER

Example:

No.	Command	Response	Remark
1	AT+POWER?	OK+POWER:00	
2	AT+POWER=FF	OK+POWER	
3	AT+POWER=A0	ERR+POWER	

Note:

The power configuration is not effective for join package. The default join power has been configured according to the requirements of the agreement and cannot be changed.

① Parameter length: 1Byte

② Parameter description:

0- Level 0 (default)

1- Level 1

2- Level 2

3- Level 3

4- Level 4

5- Level 5

6- Level 6

7- Level 7

XX- Level XX (F0-FF)

Level F0-FF: Forced to transmit at the maximum power (not limited by LoRaWAN Region specification, FF is the maximum power value that the module can emit, and the power value of each subsequent level decreases by 1dB);

Level 0-7: The transmission power level is specified for the protocol, and its power value is affected by different frequency band protocols. For details, please refer to the definition in "LoRaWAN Region Parameters V1.0.3".

2.32 AT+LBT: listen before talk

This command is used to access and configure LBT.

Command	Input Parameter	Return Value	Return Code
AT+LBT?	-	0 (Disable LBT) or 1(Enable LBT)	OK+LBT
AT+LBT=<Input Parameter>	0 or 1	-	OK+LBT or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+LBT?	OK+ LBT:01	
2	AT+LBT=00	OK+LBT	
3	AT+LBT=02	ERR+PARA	

Note:

This instruction is currently supported only in AS923 version.

① Parameter length: 1Byte

② Value range: 0-1

③ Parameter description:

0- Disable LBT

1- Enable LBT (default)

When LBT is enable, if the surrounding co-channel interference is severe, there may be multiple failures to join network or send data(return ERR+SEND: 01,0D after AT+SEND command).

2.33 AT+RX1DL: delay on RX1 window

This command is used to access and configure the delay on RX1 window.

Command	Input Parameter	Return Value	Return Code
AT+RX1DL?	-	01-0F	OK+RX1DELAY
AT+RX1DL=<Input Parameter>	01-0F	-	OK+RX1DELAY or ERR+PARA

Example:

No.	Command	Response	Remark
1	AT+RX1DL?	OK+RX1DELAY:05	
2	AT+RX1DL=0A	OK+RX1DELAY	
3	AT+RX1DL=1A	ERR+PARA	

Note:

- ① Parameter length: 1Byte
- ② Value range: 01-0F,unit:s

2.34 AT+RENEW: restore default parameters

This command is used to restore all parameters to the initial default values of the module.

Command	Input Parameter	Return Value	Return Code
AT+RENEW	-	-	OK+RENEW

3. Technical support

If you have any other questions, please contact Easylinkin team to provide after-sales technical support.