manual version	time	illustrate
V1.0	2018/04/02	1st edition manual
V1.1	2018/05/02	Add reset command
V1.2	2018/08/02	none
V1.3	2020/03/02	Fix phase bug
V1.4	2021/01/21	Added restore default settings command and fixed AM BUG
V1.5	2021/04/16	Modify the control description error of FSK
V1.6	2021/10/06	Adjust the command description and fix the bugs of AM and SWEEP
V1.7	2022/11/07	Adjust the frequency sweep command so that the start frequency can be greater than the end frequency
V1.8	2023/02/24	Adjust the upper limit of AM modulation rate
V1.81	2023/05/09	Add 4FSK detailed description

instruction		illustrate	parameter		return	Remark
			scope	unit		
1	AT\r\n	test instructions	none	none	OK	
2	AT+RESET\r\n	reset(This command cannot be sent continuously)	none	none	OK	
3	AT+RESTORE\r\n	Restore default settings (This command cannot be connected Continue to send)	none	none	OK	
4	AT+VERSION\r\n	Query the current version of the module	none	none	+ VERSION=version number OK	
5	AT+CHANNEL<+PRA>\r\n	Channel control	1/2/3/4	none	+ CHANNEL=selected channel	
6	AT+REF<+PRA>\r\n	Reference crystal oscillator frequency setting	10-125	MHz	+ REF = current crystal reference frequency	
7	AT+MULT<+PRA>\r\n	Frequency multiplier setting(20)	1~20	times	+ MULT=current clock multiplier	
8	AT+MODE<+PRA>\r\n	Operating mode(POINT)	POINT/SWEEP/FSK2/FSK4/AM	none	+ MODE=current working mode	
9	AT+FRE<+PRA>\r\n	Dot frequency output(150000000)	1-200,000,000	Hz	+ FRE=current output frequency	Enter frequency mode instructions
10	AT+AMP<+PRA>\r\n	Point frequency amplitude output(1023)	0-1023	none	+ AMP = current output amplitude	
11	AT+PHA<+PRA>\r\n	Point frequency phase output(0)	0-16383 (corresponding to 0-360 degrees)	none	+ PHA = current output phase	
12	AT+STARTFRE<+PRA>\r\n	Sweep start frequency(1000000)	1-ENDFRE	Hz	+ STARTFRE=current sweep start frequency Rate	Enter sweep mode instructions
13	AT+ENDFRE<+PRA>\r\n	Sweep end frequency(10000000)	STARTFRE-200,000,000	Hz	+ ENDFRE=current sweep end frequency	
14	AT+STARTAMP<+PRA>\r\n	Sweep start amplitude(100)	0-1023	none	+ STARTAMP=current sweep start amplitude Spend	
15	AT+ENDAMP<+PRA>\r\n	Sweep end amplitude(1000)	0-1023	none	+ ENDAMP=current sweep end amplitude	
16	AT+TIME<+PRA>\r\n	Sweep interval time(1)	1-9999	ms	+ TMIE=current sweep interval time	
17	AT+STEP<+PRA>\r\n	Sweep interval frequency(10000)	1-200,000,000	Hz	+ STEP=Current sweep interval frequency	
18	AT+SWEEP<+PRA>\r\n	Sweep switch(OFF)	ON/OFF	none	+ SWEEP=Current sweep status	
19	AT+FRE1<+PRA>\r\n	2FSK mode frequency 1(1000)	1-200,000,000	Hz	+ FRE1=currently set frequency	2FSK mode command (all All channels can be set for 2FSK)
20	AT+FRE2<+PRA>\r\n	2FSK mode frequency 2(2000)	1-200,000,000	Hz	+ FRE2=currently set frequency	
twenty one	AT+FRE1<+PRA>\r\n	4FSK mode frequency 1(1000)	1-200,000,000	Hz	+ FRE1=currently set frequency	4FSK instruction (only aisle one and Channel 2 Can be set Set to 4FSK)
twenty two	AT+FRE2<+PRA>\r\n	4FSK mode frequency 2(2000)	1-200,000,000	Hz	+ FRE2=currently set frequency	
twenty three	AT+FRE3<+PRA>\r\n	4FSK mode frequency 3(3000)	1-200,000,000	Hz	+ FRE3=currently set frequency	
twenty four	AT+FRE4<+PRA>\r\n	4FSK mode frequency 4(4000)	1-200,000,000	Hz	+ FRE4=currently set frequency	
25	AT+FRE<+PRA>\r\n	AM carrier frequency(3000)	1-200,000,000	Hz	+ FRE=AM output frequency	AM mode command
26	AT+DEP<+PRA>\r\n	AM debugging depth(50)	0-100	%	+ DEP = current modulation depth	
27	AT+RATE<+PRA>\r\n	AM modulation rate(100)	10-250	Hz	+ RATE=AM modulation rate	
28	AT+AM<+PRA>\r\n	AM switch(OFF)	ON/OFF	none	+ AM=current AM status	

error message	
ERROR	reserve
ERROR_NODEF	undefined directive
ERROR_CMD_OVER_RANGE	Command code exceeds limit
ERROR_DATA_OVER_RANGEM	Data exceeds limit
ERROR_CHANNEL_OVER_RANGEM	Channel setting error
Notice	<> is an optional parameter. The command without this parameter is in query mode.
	() are default parameters

Example

Function	send	return	Remark
Communication test	AT\r\n	OK	
read version	AT+VERSION\r\n	+ VERSION=version OK	
Set the module to work in frequency mode	AT+MODE+POINT\r\n	OK	
The current channel is set to channel one	AT+CHANNEL+1\r\n	OK	

Set current channel amplitude	AT+AMP+1000\r\n	OK	The module works in spot frequency mode. Channels 1, 2, 3, and 4 all output 1000Hz, with the same frequency and frequency. Same frame. (Please pay attention to the currently selected channel when setting parameters)
Set current channel phase	AT+PHA+1023\r\n	OK	
Set frequency value	AT+FRE+1000\r\n	OK	
The current channel is set to channel two	AT+CHANNEL+2\r\n	OK	
Set current channel amplitude	AT+AMP+1000\r\n	OK	
Set current channel phase	AT+PHA+1023\r\n	OK	
Set frequency value	AT+FRE+1000\r\n	OK	
The current channel is set to channel three	AT+CHANNEL+3\r\n	OK	
Set current channel amplitude	AT+AMP+1000\r\n	OK	
Set current channel phase	AT+PHA+1023\r\n	OK	
Set frequency value	AT+FRE+1000\r\n	OK	
The current channel is set to channel four	AT+CHANNEL+4\r\n	OK	
Set current channel amplitude	AT+AMP+1000\r\n	OK	
Set current channel phase	AT+PHA+1023\r\n	OK	
Set frequency value	AT+FRE+1000\r\n	OK	
Set the module to work in sweep mode	AT+MODE+SWEEP\r\n	OK	The 4 channels can be configured as sweep output with different parameters. Each channel can be set once. Can. The module works in frequency sweep mode. Channel 1 starts sweeping from 1KHz, and the frequency increases every 10ms. Add 100Hz and repeat until the end of the 10KHz sweep. (When setting parameters, please pay attention to the The previously selected channel, after adjusting the sweep parameters, you need to use command 18 to update the output)
The current channel is set to channel one	AT+CHANNEL+1\r\n	OK	
Set the sweep start frequency	AT+STARTFRE+1000\r\n	OK	
Set sweep end frequency	AT+ENDFRE+10000\r\n	OK	
Set the sweep start amplitude	AT+STARTAMP+123\r\n	OK	
Set the frequency sweep end amplitude	AT+ENDAMP+1023\r\n	OK	
Set frequency sweep interval time	AT+TIME+10\r\n	OK	
Set sweep interval frequency	AT+STEP+100\r\n	OK	
Start scanning	AT+SWEEP+ON\r\n	OK	
Set the module to work in 2FSK mode	AT+MODE+FSK2\r\n	OK	The 4 channels can be configured as 2FSK with different parameters, and each channel can be set once. The module works in 2FSK mode, and the P1, P2, P3, and P4 pins input high and low levels respectively. Control channel 1, 2, 3, 4 output frequency
The current channel is set to channel one	AT+CHANNEL+1\r\n	OK	
Set 2FSK frequency one	AT+FRE1+1000\r\n	OK	
Set 2FSK frequency two	AT+FRE2+10000\r\n	OK	
Set the module to work in 4FSK mode	AT+MODE+FSK4\r\n	OK	The module works in 4FSK mode, channels 1 and 2, and can be configured as 4FSK with different parameters; P3 and P4 control the output frequency of channel 1, and P1 and P2 control the output frequency of channel 2. When the module works in 4FSK mode, only channels 1 and 2 have frequency output, and channels 3 and 4 have no frequency output. Frequency output, at this time, the output status of channels 3 and 4 is a DC bias voltage of about 1.8V.
The current channel is set to channel one	AT+CHANNEL+1\r\n	OK	
Set 4FSK frequency one	AT+FRE1+1000\r\n	OK	
Set 4FSK frequency two	AT+FRE2+2000\r\n	OK	
Set 4FSK frequency three	AT+FRE3+3000\r\n	OK	
Set 4FSK frequency four	AT+FRE4+4000\r\n	OK	
Set the module to work in AM mode	AT+MODE+AM\r\n	OK	All 4 channels can be configured as AM output, but only one channel can output AM at the same time. The module works in AM mode, channel 1 outputs carrier frequency 1KHz, modulation wave frequency 100Hz, AM waveform with 50% modulation depth (please pay attention to the currently selected channel when setting parameters. Road, after adjusting the AM parameters, you need to use command 28 to update the output)
The current channel is set to channel one	AT+CHANNEL+1\r\n	OK	
Set AM carrier frequency	AT+FRE+1000\r\n	OK	
Set AM modulation depth	AT+DEP+50\r\n	OK	
Set AM modulation rate	AT+RATE+100\r\n	OK	
Start AM modulation	AT+AM+ON\r\n	OK	