

AT Command Manual

For ZTE Corporation's ME3000_V2 Module

Version: V1.5

ZTE CORPORATION

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Preface

Target Readers

This manual is mainly applicable for the following engineers:

- System designing engineers
- Hardware engineers
- Software engineers
- Test engineers

Update History

- **V1.0**
Realize ME3000_V2 module's self-defined AT commands;
- **V1.2**
Add the function of network LED, complete and verify the server's function;
- **V1.3**
Modify the commands of ZPPPCLOSE, ZIPSEND, IFC, IPR, ZDNSGETIP, etc.
Adjust the description of CNMI command;
Add the description of CLCC and CSCS command;
Complete the description of ZIPSETUP(U) command;
- **V1.4**
Modify the format of ZMICGB command;
Delete VTD command;
Support ATD>"ZTK01234568#&\$" and the call of special symbol;
Add pas=1 (not ready, unable to receive AT commands) in CPAS;
Modify the timeout for TCP return succeeded from 20s to 75s;
Prompt of inputting PUK after entering wrong PIN for three times
Do not display the characters transmitted excessively through AT+ZIPSEND command;
- **V1.5**
 1. Add new commands: ZBCCH, ZOPT, ZCALIST & ZBAND
 2. Support baud rate 19200 in IPR command;
 3. Add the command of ztcptimeout and ziptimeout;
 4. Add the function of supporting 3G card;
 5. Modify the server's function and support 2 users connected;

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1 General Description

1.1 Description of AT Commands

ME3000_V2 provides AT command interfaces, through which the module could communicate with the external devices conveniently. The AT commands set provided by ME3000_V2 module not only covers the standard GSM voice call and SMS applications, but adds some other commands based on GSM specification and some ZTE exclusive commands for users to use conveniently.

1.1.1 Type of AT Commands

As a standard interface, the returned values and formats of AT commands are both fixed. As a whole, the AT commands could be divided into four types:

- Non-parameter commands: a type of simple commands with the format of AT[+ | &]<command>, e.g.: AT+CSQ, AT&W
- Query commands: used to inquire the current setting value with the format of AT[+ | &]<command>?, e.g.: AT+CNMI?
- Help commands: used to list the possible parameters of the command with the format of AT[+ | &]<command>=? , e.g.: AT+CMGL=?
- Parameter commands: normally used format which provides strong flexibility with the format of AT[+ | &]<command>=<par1>,<par2>,<par3>...

The returned values of this type of commands are all the same. This will be clarified in details later. The basic frame format of the returned value is:

```
<CR><LF><Response string><CR><LF>
<CR><LF><OK/ERROR>[ERROR INFO]<CR><LF>
```

1.1.2 Returned Format of AT Commands

The following describes the AT commands and returned descriptions supported by ME3000_V2 module:

- AT command returned format:
 - <CR><LF><corresponding strings ><CR><LF>
 - An exceptional case: e.g.: AT+ZPOWEROFF, directly return with "OK"
- AT command status report (OK, ERROR):
 - If there is error in AT command format, return with "ERROR";
 - If AT command executes successfully, return with "OK";

1.1.3 AT Command Format

- AT command starts with "AT" and ends with <CR>;
- After the module runs, the serial port default setting will be: 8-digit data bit, 1-digit stop bit,

no parity check, no CTS/RTS, data rate 115200bps.

1.2 Abbreviations

A		
ADC	Analog-Digital Converter	
AFC	Automatic Frequency Control	
AGC	Automatic Gain Control	
ARFCN	Absolute Radio Frequency Channel Number	
ARP	Antenna Reference Point	
ASIC	Application Specific Integrated Circuit	
B		
BER	Bit Error Rate	
BTS	Base Transceiver Station	
C		
CDMA	Code Division Multiple Access	
CDG	CDMA Development Group	
CS	Coding Scheme	
CSD	Circuit Switched Data	
CPU	Central Processing Unit	
D		
DAI	Digital Audio interface	
DAC	Digital-to-Analog Converter	
DCE	Data Communication Equipment	
DSP	Digital Signal Processor	
DTE	Data Terminal Equipment	
DTMF	Dual Tone Multi-Frequency	
DTR	Data Terminal Ready	
E		
EFR	Enhanced Full Rate	
EGSM	Enhanced GSM	
EMC	Electromagnetic Compatibility	
EMI	Electro Magnetic Interference	
ESD	Electronic Static Discharge	
ETS	European Telecommunication Standard	
F		

FDMA	Frequency Division Multiple Access	
FR	Full Rate	
G		
GPRS	General Packet Radio Service	
GSM	Global Standard for Mobile Communications	
H		
HR	Half Rate	
I		
IC	Integrated Circuit	
IMEI	International Mobile Equipment Identity	
ISO	International Standards Organization	
ITU	International Telecommunications Union	
L		
LCD	Liquid Crystal Display	
LED	Light Emitting Diode	
M		
MCU	Machine Control Unit	
MMI	Man Machine Interface	
MS	Mobile Station	
P		
PCB	Printed Circuit Board	
PCL	Power Control Level	
PCS	Personal Communication System	
PDU	Protocol Data Unit	
PLL	Phase Locked Loop	
PPP	Point-to-point protocol	
R		
RAM	Random Access Memory	
RF	Radio Frequency	
ROM	Read-only Memory	

RMS	Root Mean Square	
RTC	Real Time Clock	
S		
SIM	Subscriber Identification Module	
SMS	Short Message Service	
SRAM	Static Random Access Memory	
T		
TA	Terminal adapter	
TDMA	Time Division Multiple Access	
TE	Terminal Equipment also referred it as DTE	
U		
UART	Universal asynchronous receiver-transmitter	
UIM	User Identifier Management	
USB	Universal Serial Bus	
V		
VSWR	Voltage Standing Wave Ratio	
Z		
ZTE	ZTE Corporation	

2 AT Commands

2.1 Common Commands

2.1.1 A/: repeat

Description	This command is used to repeat the previous command.	
Format	A/	
Example	AT+CSQ	Inquire current signal strength
	A/	Repeat AT+CSQ command
	AT+CMGS="13714393404" >123→	Send a text message
	A/ >123→	Repeat AT+CMGS command

2.1.2 ATA: answer

Description	This command is used to answer a call.	
Format	ATA	
Example	RING	An incoming call rings.
	ATA	Answer the incoming call.

2.1.3 ATD: dial

Description	This command is used to originate a voice call, data and fax call.	
Format	ATD<string>; ATD><mem><n>; ATD><n>; ATD>"name";	
Example	AT+CPBS="SM" ATD13024540756;	Select SIM card phonebook as the current phonebook Search the number from SIM card phonebook and dial
	AT+CPBS="SM" ATD>2; OK	Select SIM card phonebook as the current phonebook Search the second phone number in current phonebook
	ATD>SM1;	Dial the first number in SIM card phonebook
	ATD13714393404;	Directly dial the phone number

	ATD>"name";	Search the phone number with "name" in SIM card and nvram
Parameters	<mem>: phonebook "SM": SIM card phonebook. "ME": local phonebook. "LD": last dialled calls in phonebook. "MC": missed calls "RC": received calls <n>: the n-th option in phonebook. <string>: the number of called party, e.g., *99#.	

2.1.4 ATDL: dial last

Description	This command is used to dial the last outgoing number.	
Format	ATDL	
Example	ATD34394036; OK	Dial 34394036
	ATH OK	Hang up the call
	ATDL	Dial 34394036 again

2.1.5 ATE: enable

Description	This command is used to enable echo display.	
Format	ATE<n>	
Example	ATE0 OK OK	ATE0, don't display input command on the terminal
	ATE1 OK ATE1 OK	ATE1, displays input command on the terminal
Parameters	<n>=0 Disable echo display. <n>=1 Enable echo display.	

2.1.6 ATH: hang up

Description	This command is used to hang up the call.	
Format	ATH	
Example	ATA OK	Answer the call

	ATH	Hang up the call
--	-----	------------------

2.1.7 ATI: Information

Description	This command is used to display the module manufacturer's information.	
Format	ATI	
Example	ATI ZTE Mobile LTD GSM/GPRS Mobile Station Revision: 1.0 OK	display the module manufacturer's information.

2.1.8 ATQ: set whether or not to display the returned value.

Description	This command is used to set whether or not to display the returned value.	
Format	ATQ<n>	
Example	ATQ0 OK ATQ0 OK	Set the terminal displays the returned value
	ATQ1 OK ATQ1ATQ1	Set the terminal doesn't display the returned value.

2.1.9 +++: switch from data mode to command mode

Description	This command is used to switch from data mode to command mode.	
Format	+++	
Example	ATD*99# CONNECT +++ AT OK	Dial to enter data mode Switch from data mode to command mode

2.1.10 ATO: switch from command mode to data mode

Description	This command is used to switch from command mode to data mode.	
Format	ATO	

Example	<pre> ATD*99# CONNECT +++ ATO </pre>	Dial to enter GPRS data connection Switch from data mode to command mode Switch from command mode to data mode
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2.1.11 ATP: pulse

Description	This command is used for pulse dialling.	
Format	ATP	
Example	<pre> ATP OK </pre>	Set pulse dialling method

2.1.12 ATSO: auto answer setting

Description	This command is used to control the module's auto answer mode.	
Format	ATSO=<value>	
Example	<pre> ATSO=2 OK </pre>	Auto answer after ringing twice
	<pre> ATSO? 2 OK </pre>	Check current settings
	<pre> ATSO=0 OK </pre>	Cancel auto answer
Parameter	<value>: ringing times	

2.1.13 +CRC: set ringer type

Description	This command is used to display the type of ringer.	
Format	AT+CRC=<num>	
Example	<pre> AT+CRC=1 OK +CRING:VOICE </pre>	Set RING as ringer type Set CRC as ringer type
	Parameter	<num>: 0: Do not display the type of ringer 1: display the type of ringer Descriptions of ringer type:

	VOICE: Voice GPRS: GPRS service FAX: Fax
--	--

2.1.14+CLVL: volume level

Description	This command is used to set the volume level of the speaker.	
Format	AT+CLVL=<level>	
Example	AT+CLVL=100 OK	Set current receiver volume as 100
Parameters	AT+CLVL? +CLVL:100	Check the current receiver volume
	<level> ranging 0~100, the lower the level is, the smaller the volume is.	

2.1.15+CLIP: Calling Line Identification Presentation

Description	This command is used to set CLIP. The default settings are to disable CLIP.	
Format	AT+CLIP=<mode> +CLIP:<mode>: return from AT+CLIP? +CLIP:<number>,<type>,<> CLIP format	
Example	AT+CLIP=1 OK RING;+CLIP: "130*****",129, "name","",0	Enable CLIP There is an incoming call, incoming number is 130*****
	AT+CLIP=0 OK RING	Disable CLIP No CLIP
Parameters	<mode>: 0: disable CLIP 1: enable CLIP; <number>: incoming number (need apply for relevant service) <type>: 129.	

2.1.16+ZSETMUTE: mute control

Description	This command is used for mute control and it can be used only during the call.	
Format	AT+ZSETMUTE=<Mode>	
Example	AT+ZSETMUTE=? +ZSETMUT: (0-1) OK	check the setting parameters

	AT+ZSETMUTE=1 OK	Mute on
	AT+ZSETMUTE=0 OK	Mute off
Parameters	<Mode>: 0: Turn off mute 1: Turn on mute.	

2.1.17+CGMI: International Mobile Identification

Description	This command is used to read the International Mobile Identification of SIM card and check current PIN.	
Format	AT+CGMI	
Example	AT+CGMI 460030916875923 OK	Check CIMI Return CIMI

2.1.18+CGMR: get product version

Description	This command is used to obtain the module's current product version.	
Format	AT+CGMR	
Example	AT+CGMR=? OK	No meaning
	AT+CGMR +CGMR: Revision: 1.0 OK	Return current module's version

2.1.19+ECHO: echo remove

Description	This command is used to remove the echo.	
Format	AT+ECHO=num	
Example	AT+ECHO? +ECHO:1 OK	Check current echo settings
	AT+ECHO=0 OK	Cancel echo remove
Format	Num: default value 1. 1: set echo remove function 0: cancel echo remove function	

2.1.20+(C)GSN: get current IMEI

Description	This command is used to get the current device's IMEI.
-------------	--

Format	AT+GSN	
Example	AT+GSN N OK	Return current IMEI

2.1.21+ZVERS: get current software version

Description	This command is used to get the current software version.	
Format	AT+ZVERS	
Example	AT+ZVERS +ZVERS: ***.bin OK	get the current software version.

2.1.22+CLCK: lock

Description	This command is used to lock the terminal or network function.	
Format	AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]] +CLCK:<status>	
Example	AT+CLCK=? +CLCK:("PF","SC","AO","OI","OX","AI","IR","AB","AG","AC","FD","PN","PU","PP","PC") OK	
Parameters	<fac>: "SC" SIM card; "AO" all outgoing calls barring; "OI" Outgoing international calls barring; "OX" Outgoing international calls barring except for local; "AI" all incoming calls barring; "IR" Incoming roaming barring; "AB" all services barring; "AG" barring of all outgoing calls; "AC" barring of all incoming calls; "FD" Fixed dial; "PN" Personalized network; "PU" Personalized sub network; "PP" Personalized provider; "PC" Personalized corporate. <mode>: 0 unlock 1 lock 2 check the status <passwd>: password or operation code, character string type "****". <class>: 1 voice call 2 data 4 fax 7 All <status>: 0: Disable 1: Enable	

2.1.23+CCFC: call forwarding number and conditions

Description	This command is used to set call forwarding number and conditions.	
Format	AT+CCFC=<reason>,<mode>[,<number> [, <type>[,<class>[,<subaddr>[,<saytype>[,<time>]]]]]] If mode!=2, setting successfully return: OK; If mode=2, setting successfully return: +CCFC:<status>,<class>	
Example	AT+CCFC=? +CCFC: (0,1,2,3,4,5) OK	Check call forwarding control setting Return reason range.

Parameters	<p><reason>:</p> <p>0: unconditional</p> <p>1: mobile device busy</p> <p>2: No answer</p> <p>3: Can't be connected</p> <p>4: All calls</p> <p>5: all conditions</p> <p><mode>:</p> <p>0: disabled</p> <p>1: enabled</p> <p>2: check status</p> <p>3: register</p> <p>4: delete</p> <p><number>: phone number</p> <p><type>:</p> <p>145: international number</p> <p>129: other number</p> <p><subaddr>: address of character string type</p> <p><saytype>: 128</p> <p><class>:</p> <p>1: voice</p> <p>2: data</p> <p>4: fax</p> <p>7: all</p> <p>Time: 1..20..30 multiplies 5 seconds</p> <p><status>:</p> <p>0: deactivate</p> <p>1: activate</p>
Remarks	Need apply for relevant services.

2.1.24+CCWA: call waiting

Description	This command is used for call waiting.	
Format	AT+CCWA=[<n>] [,<mode> [,<class>]]	
Example	AT+CCWA=?	List all supported <n> +CCWA: (list of supported <n>s) OK
	AT+CCWA?	Read current <n> +CCWA: <n> OK
	AT+CCWA=[<n>] [,<mode> [,<class>]]	Call waiting setting As mode!=2, if successful: OK As mode!=2, return: +CCWA:<status>,<class1>[<CR><LF> +CCWA:<status>,<class2>[...]] OK If there is an error in operation: +CME ERROR: <err> If <n>=1, send the result code of call waiting: +CCWA: <number>,<type>,<class> [,<alpha>][,<CLI validity>] Under the premise of call waiting activated, during the call connection process; As the call terminates in the system, send the result code of call waiting.
Parameters	<n> 0: do not send the result code of call waiting; 1: send the result code of call waiting. <mode> 0: Deactivate call waiting; 1: Actiavte call waiting; 2: Check current state; <class> 1: voice call <status> 0: deactivate; 1: activate. <number> call waiting number, and its format designated by <type>; <type> <number> format <alpha>,<CLI validity>见AT+CLIP	

2.1.25+CHLD: call hold

Description	This command is used to set call held and conference call.	
Format	AT+CHLD=[<n>]	
Example	AT+CHLD=?	Check supported <n> +CHLD: (list of supported <n>s) OK
	AT+CHLD=[<n>]	Set call held and conference call; If the setting is successful: OK If there is an error in operation: +CME ERROR: <err>
Parameters	<p><n></p> <p>0: release all held calls or set a waiting call as UDUB</p> <p>1: Release all activated calls and receive a held or waiting call.</p> <p>1X: Release call X</p> <p>2: Hold all activated calls and receive another held or waiting call.</p> <p>2X: hold all calls except for call X</p> <p>3: Add the held call into the conference call</p>	
Remarks	<ol style="list-style-type: none"> 1. This command is used for telecom service; 2. The range of X value:1~7 3. When there is both held call and waiting call, the process above should be applied for the waiting call. 4. When releasing call, please firstly use AT+CHLD=1 to release the current call, and use ATH to hang up the call. 5. Please refer to the method of conference call provided by the operator when using AT+CHLD=3. 	

2.1.26*TSIMINS: check SIM card status

Description	This command is used to check SIM card status.	
Format	AT*TSIMINS=num, status	
Example	AT*TSIMINS?	Check SIM card status.
	*TSIMINS:0,0 OK	No SIM card.
Parameters	<p>Num: take 0 or 1, no meaning.</p> <p>Status:</p> <p>0: There is no SIM card;</p> <p>1: There is SIM card.</p>	

2.1.27+CPWD: change password

Description	This command is used to change the password.	
Format	AT+CPWD=<fac>,<passwd>,<newpasswd> +CPWD:<fac,length>s	
Example	<pre>AT+CPWD=? +CPWD: ("SC",8),("P2",8),("AO",4),("OI",4),("OX",4), ("AI",4),("IR",4),("AB",4),("AG",4),("AC",4) OK AT+CPWD="SC","1234","2345" OK</pre>	<p>Check the setting range. Return the list of parameters;</p> <p>Change password of SIM card</p>
Parameters	<p>Fac: "SC" SIM card; "AO" all outgoing calls barring; "OI" Outgoing international calls barring; "OX" Outgoing international calls barring except for local; "AI" all incoming calls barring; "IR" Incoming roaming barring; "AB" all services barring; "AG" barring of all outgoing calls; "AC" barring of all incoming calls; "FD" Fixed dial;</p> <p>Passwd: password or operation ocde, character string type "****".</p> <p>newpasswd: new password or operation code, character string type "****".</p> <p>Length: password length supported by fac.</p>	

2.1.28+CGMI: inquire manufacturer's information

Description	This command is used to inquire manufacturer's information.	
Format	AT+CGMI	
Example	<pre>AT+CGMI +CGMI: ZTE Mobile LTD OK</pre>	Inquire manufacturer's information

2.1.29ATZ: reset

Description	This command is used to read the parameter in NVRAM and set it as the current parameter.	
Format	ATZ<n>	
Example	<pre>ATZ0 OK</pre>	Reset the parameter correctly.

2.1.30 +CSCS: character set selection

Description	This command is used to select the type of languages;	
Format	AT+CSCS=<string>	
Example	<pre>AT+CSCS=? +CSCS: "IRA", "GSM", "HEX", "PCCP437", "8859-1", "UCS2", "UCS2_0X81" OK AT+CSCS="IRA" OK AT+CSCS? +CSCS: "IRA" OK</pre>	

2.1.31+CLCC: check call status

Description	This command is used to check the status of current calls or each call;	
Format	<pre>AT+CLCC +CLCC:<id1>,<dir>,<stat>,<mode>,<mpty>,[,<number>,<type> [,<alpha>[,<priority>]]] +CLCC:<id2>,<dir>,<stat>,<mode>,<mpty>,[,<number>,<type> [,<alpha>[,<priority>]]] OK</pre>	
Example	<pre>AT+CLCC OK ATD10086 ; OK AT+CLCC +CLCC: 1,0,2,0,0,"10086",129 OK</pre>	

Parameters	<p><idx>: caller ID</p> <p><dir>: call direction, taking the following value: 0: MO 1: MT</p> <p><stat> call status, taking the following value: 0: activated 1: call held status 2: call originated, dialing 3: call originated, ringing 4: Incoming call ring status 5: call waiting</p> <p><mode>: call type, taking the following value: 0: voice call 1: data call 2: fax</p> <p><mpty>:multi-party call, taking the following value: 0: Non multi-party call 1: Multi-party call</p> <p><number>: call number, ASCII code</p> <p><type>: call number type;</p> <p><alpha>: the text information corresponding to the call number in the phonebook (don't support temporarily, reserve the string)</p> <p><priority>: do not support string temporarily</p>
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2.2 DTMF Command

2.2.1 +VTS: send DTMF

Description	This command is used to send DTMF.	
Format	AT+VTS=<string>	
Example	AT+VTS=? +VTS:(0-9,*#,A,B,C,D),,(1-255) OK	Check +VTS parameter
	ATD*****; AT+VTS="3, 6, 9" AT+VTS=3 AT+VTS=6 AT+VTS=9	Dial Send 369 DTMF
Parameters	String is a combination of characters, separated by comma. The character ranges from 0 to 9,*, #, A-D.	

2.3 Network Service Command

2.3.1 +CREG: network registration and roaming

Description	This command is used to check the module's network registration and roaming status. Note: Need AT&W to save the result when setting 0 or 1.	
Format	AT+CREG=<mode> +CREG :<mode>,<stat> return code	
Example	AT+CREG=0 OK	Disabled network registration and provide result code
	AT+CREG? +CREG: 0,1	Display the module's registration status
	AT+CREG=? +CREG: (0-2) OK	Check status range

Parameter	<p><mode>:</p> <p>0 Disabled network registration and provide result code (default)</p> <p>1 Enabled network registration and provide result code: +CREG: <stat></p> <p>2 Enabled network registration and provide the location information.</p> <p><stat>:</p> <p>0: Not logged on the network yet, currently not searching for new operator</p> <p>1: Already logged on the local network.</p> <p>2: Not logged on the network, currently searching for the BS</p> <p>4: unknown code</p> <p>5: Already logged on the network, under roaming status</p>
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2.3.2 +COPS: network selection

Description	This command is used for network selection.	
Format	AT+COPS=[<mode>[,<format>[,<oper>]]]	
Example	AT+COPS? +COPS=<mode>[,<format>,<oper>] OK	Return current network's registration mode and network
	AT+COPS=[<mode>[,<format>[,<oper>]]] OK	Select and register network
Parameter	<p><mode></p> <p>0 auto select, omit <format> <oper></p> <p>1 manual select, need <format><oper></p> <p>3 not involve network registration, this command is used to set format only; at this point, need <format></p> <p>4 manual/auto; If manual registration fails, auto register</p> <p><format></p> <p>0 format of long character <oper></p> <p>1 ormat of short character <oper></p> <p>2 number format <oper></p> <p><format>:</p> <p>0 long format alpha <oper>,up to 16 character</p> <p>1 short <oper>, up to 8 character</p> <p>2 numeric <oper> (MCC+MNC), default</p> <p><stat></p> <p>0 unknown</p> <p>2 current registered network</p> <p>3 forbidden registered network</p>	

2.4 Mobile Device Control and Status Report

2.4.1 +CPAS: check module's status

Description	This command is used to check the module's work status.	
Format	AT+CPAS	
Example	AT+CPAS +CPAS: 2 OK	Check the module's current work status.
Parameter	<pas> 0: Ready to receive AT command 2: Unknown status (default) 3: Incoming call (ring) 4: In a call <pas>:	

2.4.2 +CFUN: set module's function

Description	This command is used to enable/disable some functions of the module.	
Format	AT+CFUN=<func>,<rst>	
Example	AT+CFUN=? +CFUN(1,4),(0-1) OK	Check the setting range
	AT+CFUN=1,0	Settings validate, invalid after reset
	AT+CFUN=1,1	Settings valid after reset
Parameter	<fun> 1 Full function (default) 4 Disable RF Tx. and Rx. Function <rst> 0 valid after settings 1 valid after restart	

2.4.3 +CMEE: mobile equipment errors

Description	This command is used for mobile equipment's error report.	
Format	AT+CMEE=<n>	
Example	AT+CMEE?	+CMEE:<n> OK Check current error report method
	AT+CMEE=<n>	OK Select error report method

Parameter	<n>
	0 Only ERROR
	1 Provide error's specific number
	2 Provide error's specific number and detailed prompt

2.4.4 +ZPWROFF: power off

Description	This command is used to power off the module.	
Format	AT+ZPWROFF	
Example	AT+ZPWROFF OK	Power off the module

2.4.5 +CPIN: input PIN

Description	This command is used to check PIN status and input PIN. The functions can be used only after the correct PIN is entered.	
Format	AT+CPIN=	
Example	AT+CPIN? +CPIN:READY OK	check PIN status No need to input new PIN
	AT+CPIN? +CPIN:SIM PIN AT+CPIN="****" OK	check PIN status Need input PIN Enter correct PIN
Parameter	AT+CPIN?: check if what passwords need to be entered. +CPIN: READY: don't need to enter any password. +CPIN: SIM PIN: need enter PIN. +CPIN: SIM PUK: PIN unlock password +CPIN: PH-SIM PIN: SIM card bundle password +CPIN: SIM PIN2: PIN2 password +CPIN: SIM PUK2: PIN2 unlock password +CPIN: PH-NET PIN: network password Pin: string value.	

2.4.6 +CSQ: check signal strength

Description	This command is used to check received signal strength indicator(rssi) and bit error rate (ber)	
Format	AT+CSQ	
Example	AT+CSQ +CSQ:<rssi>,<ber>	

parameters	<rssI>: 0-113dbm 1-111dbm 2..30-109..-53dbm 31-51dbm 99: network unavailable <ber>: 0~7: normal 99: network unavailable
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2.4.7 +CCLK: clock management

Description	This command is used to set and check the date/time of real-time clock.	
Format	AT+CCLK=<time>	
Example	AT+CCLK? +CCLK: "04/02/09,17:34:23"	Check current time and date Current network time and date
parameters	AT+CCLK="04/02/09,18:34:23"	Set current date and time
	Time string format: "yy/mm/dd,hh: mm: ss "	

2.5 Message Service Command

2.5.1 +CSCA: SMS center number

Description	This command is used to set SMS center number.	
Format	AT+CSCA=<sca>[,<tosca>]	
Example	AT+CSCA="+861380****500" OK AT+CSCA? +CSCA: "8613800755500", 145 OK	Set SMS center number Check SMS center number
Parameters	<sca>: SMS center address <tosca>: SMS center format	

2.5.2 +CNMA: message acknowledgement

Description	This command is used for message acknowledgement.	
Format	AT+CNMA	
Example	at+cnmi=2,2,0,0,0 OK at+csms=1 +CSMS: 1,1,1 OK +CMT:;60 AT+CNMA OK	Set message indication format Set message service format Message acknowledgement
Parameters	Valid when setting+CNMI=2,2,0,0,0 and +CSMS=1,1,1,1	

2.5.3 +CMGF: SMS mode

Description	This command is used to set SMS input method.	
Format	AT+CMGF=<num>	
Example	AT+CMGF=1 OK AT+CMGF? +CMGF: 1 AT+CMGF=? +CMGF=(0-1) OK	Set the text mode Check current input method Current settings as text mode Check current setting range
Parameters	0: PDU mode 1: Text mode	

2.5.4 +CNMI: message indication

Description	This command is used to set new message indication.	
Format	AT+CNMI=<mode>,<mt>,<bm>,<ds>,<bfr>	
Example	AT+CNMI=? +CNMI: (0-3),(0-3),(0,2,3),(0,1),(0,1) OK	Check current setting range
	AT+CNMI=3,1,0,0,0 OK +CMTI:"SM",19	Set message receiving mode as +CMTI: mem, index Receive new messages
	AT+CNMI=3,2,0,0,0 OK AT+CMGF=1 OK +CMT: "+86130*****", "", "07/02/14, 10:29:04+32" text	Set message receiving mode Set as TEXT mode Received a message TEXT from 130*****
Returned results	+CMTI:<mem>,<index> : receive new message +CMT:,<length><CR><LF><pdu> : directly output message (PDU mode) +CBM:<length><CR><LF><pdu> : directly output cell broadcast message (PDU mode)	

Parameters	<p><mode>: control the method of notifying TE, default 2 0: cache the notice firstly and send it according to <mt> value; 1: notify TE as the data cable is idle, otherwise, do not notify TE; 2: Directly notify TE as the data cable is idle, otherwise cache the notice first and transmit it again as the date cable is idle; 3: Directly notify TE. As the data cable is used, transmit a combined message to TE.</p> <p><mt>: set message storage and notify TE, default 1. 0: received message saved to default memory (including class 3), do not notify TE; 1: received message saved to default memory and notify TE (including class 3). The notice form is: +CMTI: "SM", <index> 2: Save Class 2 message to SIM card and notify TE; as for other class, directly forward message to TE: +CMT: [<alpha>], <length><CR><LF><pdu> (PDU mode) Or +CMT: <oa>, [<alpha>,]<scts>[, <tooa>, <fo>, <pid>, <dcsc>, <sca>, <tosca>, <length>]<CR><LF><data> (text mode)</p> <p>3: as for other class 3, directly forward message to TE: same as <mt>=2; as for other class, the same as <mt>=1.</p> <p><bm>: set cell broadcast 0: don't send cell broadcast 2: new cell broadcast, return +CBM: length;;CR;;LF;;pdu; 3: cell broadcast in Class3 format, use bm=2 format</p> <p><ds>: status report 0: do not send status report 1: new status report, return: +CDS::length;;CR;;LF;;pdu; 2: If new status report is saved to ME, return: +CDSI::mem;;index;</p> <p><brf>: 1: always 1</p>
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2.5.5 +CMGR: message read

Description	This command is used to read the received message.	
Format	AT+CMGR=?	
Example	<pre>AT+CMGF=1 AT+CMGR=1 +CMGR:"REC UNREAD","133*****",, "04/02/25,12 :58 :04+04" ABCD OK</pre>	<pre>+CMTI: "MT": 1 Receive the message, saved at index 1 Set TEXT format Read the first TEXT message</pre>
	<pre>AT+CMGF=0 AT+CMGR=1 +CMGR: 1,,127 0891683108705505F00408A1705581 060008701091905564236E5C0A656C 76845BA26237FF0C60A85DF27ECF62 10529F5F00901A4E86003100300030 51430047005000520053595799104F 1860E04E1A52A1FF0C4ECE00320030 003000375E74003000326708003000 3165E55F0059CB751F654830028C22 8C22FF016DF1573379FB52A8 516C53F8</pre>	<pre>Set PDU mode Read first PDU message</pre>
Returned results	<p>AT+CMGR=<index> Return format: The terminal adaptor would return the message of index saved in mem1</p> <ul style="list-style-type: none"> -if select text mode (+CMGF=1): +CMGR :<stat>,<oa>,<[alpha]>,<scts>[,<toa>,<fo>,<pid>,<dcsc>,<sca>,<tosca>,<length>] <CR><LF> <data> (used to read received message) +CMGR :<stat>,<da>,<[alpha]>[,<toda>,<fo>,<pid>,<dcsc>,<[vp]>,<sca>,<tosca>,<length>] <CR><LF> <data> (used to read transmitted message) --if select PDU mode (+CMGF=0): +CMGR: <stat>,<[alpha]>,<lenth>,<CR>,<LF>,<pdu> OK -if error occurs, prompt: +CMS ERROR:<err> <p>Note: after reading message, the status will change from "REC UNREAD" to "REC READ".</p>	

Parameter	<p><alpha>: the name of corresponding <da> or <oa> on the terminal. <stat>: the message status in memory. <oa>: message original number string <da>: message target string <scts>: message service center time string <lenth>: length of message body <data> <pdu>: ME/TA hex value <stat>: 0:"REC UNREAD" received unread message. 1:"REC READ" received read message. 2:"STO UNSENT" saved unread message. 3:"STO SENT" saved read message 4: "All" all messages</p>
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2.5.6 +CSMS: select SMS service

Description	The command is used to select SMS <service>. Send (SMS-MO) , receive (SMS-MT) , cell broadcast SMS-CB.	
Format	AT+CSMS = <service>	
Example	AT+CSMS? +CSMS:0,1,1,1 OK	Check the current SMS service Support receive/transmit message and cell broadcast
	AT+CSMS=0 +CSMS: 1,1,1 OK AT+CSMS? +CSMS:0,1,1,1 OK	Set current SMS service as GSM Phase 2 Support receive/transmit message and cell broadcast Check the settings Succeed
Parameter	<service> 0: compatible with GSM07.05 Phase 2 version 4.7.0 1: compatible with GSM07.05 Phase 2+ version <mo> 1: support send message <mt> 1: support receive message <bm> 1: support cell broadcast	

2.5.7 +CMGS: message send

Description	<p>This command is used to send the message from the terminal to the network.</p> <p>Return the parameter to the terminal after the message is sent.</p> <p>Note: there is error prompt as the message is sent to illegal number.</p>	
Format	<p>Text mode (AT+CMGF=1) AT+CMGS=<de><CR> <data><Ctrl-Z/ESC></p> <p>PDU mode(AT+CMGF=0) AT+CMGS=<length><CR> <pdu><Ctrl-Z/ESC></p>	
Example	AT+CMGF=1 OK	Set as text mode
	AT+CMGS="13316538879"<CR> ABC<ctrl/Z> OK AT+CMGF=0 OK	Send a "ABC" message to 13316538879
	AT+CMGS=17<CR> 0891683108705505f011000b81312 0882624f700f1ff0361f118<Ctrl-Z> +CMGS:2 OK	Send a "ABC" message to 13028862427
Parameter	<de>: message sending number under text mode <length>: length of bytes in TPDU under PDU mode <data>: message under text mode	

2.5.8 +CPMS: preferred message storage

Description	This command is used for preferred message storage.
Format	AT+CPMS=<mem1>[,<mem2>[<mem3>]] +CPMS=<used1>,<total>

<p>Example</p>	<pre> AT+CPMS="SM","SM","SM" +CPMS:4,50,4,50,4,50 OK at+cpms=? +CPMS: ("SM", "ME", "SM_P", "ME_P", "MT"), ("SM", "ME", "SM_P", "ME_P", "MT"), ("SM", "ME", "SM_P", "ME_P", "MT") OK at+cpms? +CPMS: "SM", 4, 50, "SM", 4, 50, "SM", 4, 50 OK at+cpms="me","me","me" +CPMS: 0, 450, 0, 450, 0, 450 OK at+cpms? +CPMS: "ME", 0, 450, "ME", 0, 450, "ME", 0, 450 OK </pre>	<p>Check message storage in SIM card mem1 total capacity 50 entries, 4 used mem2 total capacity 50 entries, 4 used mem3 total capacity 50 entries, 4 used</p>
<p>Parameters</p>	<p><mem1>: used to read, delete message in SIM card <mem2>: used to write and send message in SIM card <mem3>: used for messages not saved to PC in SIM card <used>: used entries <total>: total number of memory</p>	

2.5.9 +CMGD: message delete

<p>Description</p>	<p>This command is used to delete a message from selected memory.</p>
<p>Format</p>	<p>AT+CMGD=<Index></p>

<p>Example</p>	<pre>AT+CMGF=1 AT+CMGL="all" +CMGL:1,"REC READ","130*****", "", abcdefg +CMGL:2,"REC READ","131*****", "", abcdef +CMGL:3,"STO SENT","1331*****", "" opqrx OK AT+CMGD=2 OK</pre>	<p>Set as text mode List all messages</p> <p>Delete the second message</p>
	<pre>AT+CMGF=0 AT+CMGL=4 +CMGL: 1,3,,21 0891683108705505F0010F0B813 120882624F700 0808738B54084F1F5927 +CMGL: 2,3,,21 0891683108705505F001100B813 120882624F700 0808738B54084F1F5927 +CMGL: 3,3,,21 0891683108705505F001110B8131 20882624F700 0808738B54084F1F5927 OK AT+CMGD=1 OK</pre>	<p>Set as PDU mode List all messages</p> <p>Delete the first message</p>
<p>Parameters</p>	<p><Index>: index of saved message</p>	

2.5.10+CMGL: message list

<p>Description</p>	<p>The command is used to read a kind of messages saved in the selected memory via +CPMS command.</p>
<p>Format</p>	<p>AT+CMGL=<stat></p>

<p>Example</p>	<pre>AT+CMGF=1 OK AT+CMGL="ALL" +CMGL:1,"REC READ","130*****",",", abcdefg +CMGL:2,"REC READ","131*****",",", abcdef +CMGL:3,"STO SENT","1331*****",",", opqrx OK</pre>	<p>Set as text mode</p> <p>Use text mode Check all messages</p>
<p>Returned format</p>	<p>1) text mode as below: +CMGL :<index>,<stat>,<da/oa>,<[alpha]>,<[scts]>[,<tooa/toda>,<length>] <CR><LF><data><CR><LF> +CMGL :<index>,<stat>,<da/oa>,<[alpha]>,<[scts]>[,<tooa/toda>,<length>] <CR><LF><data> [...] (Received/transmitted message list) OK 2)PDU mode as below: +CMGL:<index>,<stat>,<[alpha]>,<length><CR><LF><pdu></p>	
<p>Parameters</p>	<p>1. text mode(+CMGF=1) <stat> REC UNREAD: receive unread message REC READ: receive read message STO UNSENT: store unsent message STO SENT: store sent message ALL: all messages</p> <p>2.PDU Mode (+CMGF=0) <stat> <stat>: 0: received unread message 1: received read message 2: saved unsent message 3: saved unsent message 4: All messages</p> <p><index>: message index <length>: TPDU length in PDU mode <pdu>: binary system in PDU mode <data>: message text in text mode</p>	

2.5.11+CMSS: messages saved in SIM card

Description	This command is used to send the messages saved in SIM card.	
Format	AT+CMSS=<index>[,<da> [,<tda>]] Return format: +CMSS : <mr> 或+CMS ERROR: <err> If the new target number is designated, the new number will replace the number saved in the message.	
Example	AT+CMGF=1 AT+CMGW="1331653****"<CR> (note the phone number should not exceed 20 digits) ABC<ctrl-Z> +CMGW:2 OK	Set as text mode Write a message and send it to 1331653**** The message will be saved in index 2
	AT+CMSS=2 +CMSS:0 OK	Send the messages saved in index 2 Message sent CMSS return initial value 0
	AT+CMSS=2 +CMSS:1 OK	As the message is saved Do not designate the number to send the message Message sent, (send to the address used to save the message CMSS return value 1
	AT+CMSS=2,"1302755****" +CMSS:2 OK	Use number 1302755**** to replace the original number 1331653****, and send a message to new number

2.5.12+ZSMGS: message full indication

Description	This command is used to indicate the message full status.	
Format	+ZSMGS:<status>	
Example	+ZSMGS:FULL OK	+ZSMGS:FULL OK
Parameters	<status>: messages status full	

2.6 Phonebook Command

2.6.1 +CPBS: phonebook storage

Description	This command is used to select phonebook memory.	
Format	AT+CPBS=<type>	
Example	AT+CPBS=? +CPBS: "SM",1,250 OK	Check current phonebook settings Select SIM card as current phonebook
	AT+CPBR=1 +CPBR=1,"130*****",129,"" OK	Check phonebook storage memory
	AT+CPBS=? +CPBS: ("ME", "SM", "LD", "MC", "RC","FD","DC","ON") OK	Select the phonebook saved in SIM card
Parameters	Type: "SM" SIM card "FD" Fixed dial "LD" Last dial "MC" Missed calls "ME" Module memory "DC" Dialed calls "RC" Received calls	

2.6.2 +CPBR: phonebook read

Description	This command is used to read the phonebook information.	
Format	AT+CPBR=<index1>,[<index2>] +CPBR:<index>,<number>,<type>,<text>	
Example	AT+CPBR=? +CPBR: (1-10),40,13 OK	Check current phonebook information
	AT+CPBR=1 +CPBR=1,"130*****",129,"" OK	Read the first number of currently selected phonebook

	<pre>AT+CPBS="SM" OK AT+CPBR=? +CPBR: (1-10),40,13 AT+CPBR=1,3 +CPBR: 1,"8151****",129,"" +CPBR: 2,"8636****",129,"" +CPBR: 3,"8604****",129,""</pre>	<p>Select SIM card phonebook Check SIM card phonebook information Read the contacts information from 1 to 3</p>
Parameters	<p>index1: read phonebook index index2: read the contacts information from index1 to index2 index: index number: phone number type: phone type 129: domestic 145: international text: number's corresponding name</p>	

2.6.3 +CPBW: phonebook write

Description	<p>This command is used to write information into the phonebook. Note: as the number length exceeds 20 digits, the first 20 digits will be saved in one file and the remaining digits saved in another expanded file. The expanded file is smaller than the first file, therefore a number exceeding 20 digits can't be added into SIM card after the expanded file is full.</p>	
Format	<pre>AT+CPBW= <index>,<number>,<type>,<name> +CPBW:(<index>),<length>,<type>,<length></pre>	
Example	<pre>AT+CPBW=? +CPBW: (1-10),40,(129,145, 161,177),13 OK</pre>	<pre>AT+CPBW=? +CPBW: (1-10),40,(129,145, 161,177),13 OK</pre>
	<pre>AT+CPBS="SM" OK AT+CPBW=1,"130*****",129, "john" OK AT+CPBR=1 +CPBR:1,"130*****",129, "john" OK</pre>	<pre>AT+CPBS="SM" OK AT+CPBW=1,"130*****",129,"john" OK AT+CPBR=1 +CPBR:1,"130*****",129,"john" OK</pre>

Parameters	index: index length: number length type: phone type 129: domestic 145: international tlength: length of contact's name Number: phone number Name: number's corresponding name
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2.6.4 +CPBF: phonebook find

Description	This command is used to find the information in phonebook.	
Format	AT+CPBF= <name> +CPBF: <index>,<number>,<type>,<name> +CPBF:<nlength>,<tlength>	
Example	AT+CPBF=? +CPBF:40,13 OK	Check current phonebook information Phone number length 40 Name length 13
	AT+CPBS="SM" OK AT+CPBW=1,"130*****",129, "john" OK AT+CPBR=1 +CPBR:1,"130*****",129, "john" OK AT+CPBF="john" +CPBF: 1,"130*****",129,"john" OK	Select phonebook Write phone information in the first field of current phonebook Read relevant information Search the contacts with the name John
Parameter	index: index nlength: number length type: phone type 129: domestic 145: international tlength: length of contact's name Number: phone number Name: number's corresponding name	

2.6.5 +CNUM: owner's number

Description	This command is used to read the owner's number.	
Format	AT+CNUM	
Example	AT+CNUM +CNUM: "","130*****",129,7,4 OK	Read the owner's number
Parameter	The owner's number can be written into SIM card through AT+CPBS="ON" ;AT+CPBW command and read through AT+CNUM command.	

2.7 Data Compression Command

2.7.1 +IFC: flow control

Description	This command is used to set the flow control between TE-TA.	
Format	AT+IFC=[<mode1 >[,<mode2>]]	
Example	AT+IFC=2,2 OK	Set mode1 of TE-TA flow control as RTS, mode2 as CTS
Parameter	mode1: 0: no flow control. 1: XON/XOFF, don't transmit data; 2: RTS; 3: XON/XOFF, transmit data. mode2: 0: no flow control. 1: XON/XOFF; 2: CTS;	

2.7.2 &D: set DTR mode

Description	This command is used to set DTR mode;	
Format	AT&D[<value>]	
Example	AT&D0 OK	Omit DTR signal
Parameter	value: 0: Omit DTR signal; 1: DTR from OFF to ON; 2: DTR from ON to OFF;	

2.7.3 &C: set DCD mode

Description	This command is used to set DCD mode;	
Format	AT&C[<value>]	
Example	AT&C0 OK	DCD signal is always valid
Parameter	value: 0: DCD signal is always valid; 1: DCD signal is valid if there is data;	

2.7.4 +IPR: set module's baud rate

Description	This command is used to set the module's baud rate and automatically save the current baud rate.	
Format	AT+IPR=<baud rate>	

Example	AT+IPR? +IPR: 115200 OK	Check current module's baud rate
Parameter	AT+IPR=?	Check supported baud rate
	AT+IPR=115200 OK	Set the baud rate as 115200
	It only supports the baud rate higher than 115200 bps under EDGE and 3G platform. If the setting baud rate needs to be saved, use AT&W command; otherwise, it will automatically restore to 115200 baud rate after cut-off.	

2.7.5 &F: restore factory settings

Description	This command is used to restore factory settings.	
Format	AT&F	
Example	AT&F	Restore factory settings

2.7.6 &W: save settings

Description	This command is used to save the current parameter settings.	
Format	AT&W	
Example	AT&W	Save the current parameter settings.

2.8 GPRS Command

2.8.1 +CGDCONT: set PDP format

Description	This command is used to set GPRS PDP format;	
Format	AT + CGDCONT=cid, type, APN[,PDP_ADDR]	
Example	At + CGDCONT=1, "IP","CMNET" ATD*99# Connect	
Parameters	cid: used to mark the number of PDP, minimum 1; type: type pf PDP package; IP: use TCP/IP package; APN: access point network PDP_ADDR: user designated IP address (optional)	

2.8.2 +CGACT: activate/deactivate PDP

Description	This command is used to activate/deactivate PDP settings.	
Format	AT+CGACT= [<state> [, <cid> [, <cid> [...]]]	
Example	At + CGDCONT=1,"IP","CMNET" OK AT+CGACT=1,1 OK	
Parameters	cid: used to mark PDP parameter; state: used to indicate PDP status; 0: deactivate; 1: activate;	

2.8.3 +CGATT: set GPRS service

Description	This command is used to set GPRS service.	
Format	AT+CGATT=[<state>]	
Example	AT+CGATT? +CGATT:0 OK AT+CGATT=1 OK	Check GPRS service status Set GPRS service status
Parameter	state: 0: detach 1: attach	

2.8.4 +CGCLASS : GPRS device class

Description	This command is used to check GPRS device levels.	
Format	AT+CGCLASS=[<class>]	
Example	AT+CGCLASS? +CGCLASS:"B" OK	Check GPRS device levels.
Parameter	class: A: support A level B: support B level CG :support GPRS only CC: support circuit exchange only	

2.9 ZTE Exclusive Commands

2.9.1 +ZGPIO: read/write GPIO

Description	This command is used to set input/output interface and read/write GPIO value.	
Format	AT+ZGPIO=<flag>,<index>,<value>	
Example	AT+ZGPIO=0,5 (read) +ZGPIO: 0 OK	
	AT+ZGPIO=1,22,1 (write) OK	
Parameter	<flag>: 0: read 1: write <index>: Index for GPIO to read/write; <value>: 0: I/O set as 0; 1: I/O set as 1;	
Remarks	Only GPIO5, GPIO22 provided to users for operation.	

2.9.2 +ZSTR: check module's status

Description	This command is used to check the module's operation status;	
Format	AT+ZSTR=<status> +ZSTR: <status>,<value>	
Example	AT+ZSTR=1	Check initialization status
	AT+ZSTR=2	Check network status
	AT+ZSTR=?	Check the list of parameters
Parameters	<status> 1:No meaning, input AT+ZSTR=1, and display ZSTR: 1,2. 2: network status. <value> 0:network unavailable; 1:network available; 2: no meaning.	

2.9.3 +ZGETICCID: set ICCID

Description	Read ICCID in SIM card	
Format	AT+ZGETICCID	
Example	No parameter	
Descriptions of returned	+ZGETICCID:89860042190733578148	Description: ICCID value as 89860042190733578148

values	OK	
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2.9.4 +ZCSQ: set auto display CSQ

Description	<p>This command can be used to set a threshold value <NUM>. As the RSSI is larger than the threshold value, the module will send +CSQ at the COM port.</p> <p>Note:</p> <p>Note: the threshold value <NUM> does not refer to the RSSI. The threshold value is identical to the <rss> displayed by the command AT+CSQ. Besides, the command would effect RI status. Please pay attention and avoid mixing with incoming call indication.</p>	
Format	AT+ZCSQ=<NUM>	
Example	AT+ZCSQ=5	+CSQ: 24,0 OK
	AT+ZCSQ?	5 OK
	AT+ZCSQ=?	+ZCSQ: (0-32) OK
Parameter	<NUM> range: 0~32	
Remarks	<p>As the RSSI is larger than the threshold value <NUM>, the module would pull RI pin (ME3000 Pin15) down 50ms and display the current RSSI value in the format of "+CSQ: <rss>,<ber>" while restoring RI pin's high level.</p> <p>If the threshold value <NUM> is equal to 0, stop reporting the signal quality.</p> <p>If the threshold value <NUM> default value is 0, the module will auto restore to the default settings after restart.</p> <p>When checking RSSI, if return "+CSQ:99,99"; 99 doesn't represent the actual <rss> value, but the valid <rss> value which is not yet obtained.</p>	

2.9.5 +ZEDT: set DTR inspection mode

Description	<p>This command is used to set the inspection mode for DTR pin.</p> <p>There are two inspection modes: A) the module reads DTR pin's level; as DTR pin is at low level, the module think DTR signal is valid, namely the module is effectively connected with DTE device; otherwise, the module is disconnected with DTE device; B) the module doesn't read DTR pin's level; and the DTR signal would be always valid, namely the module will be always connected with DTE device effectively.</p>	
Format	AT+ZEDT=<NUM>	
Example	AT+ZEDT=1	OK

	AT+ZEDT?	+ZEDT: 1 OK
	AT+ZEDT=?	+ZEDT: (0,1) OK
Parameter	<NUM> range: 0~1	
Remarks	<p>The command "+ZEDT" is mainly used to set the module at low power consumption mode; under low power consumption mode; the module could intermittently turn off the RF components, besides, the MCU、DSP、PLL , external clock at digital baseband part can enter dormant mode, and 26MHz main crystal oscillator would enable/disable regularly to reduce the module's power consumption.</p> <p>Whether or not the module can enter low power consumption mode depends on the following factors: 1) Key (including ON/OFF key) event and exception/external interruption; 2) whether or not receive valid DTR signal; 3) OTA event (e.g., receive text message, incoming call, etc.)</p> <p>In order to make the module enter low power consumption mode, please use the command "AT+ZEDT? " to check the module's current settings after start-up; if returning with "+ZEDT: 0", please use the command "AT+ZEDT=1" to change the settings; If you ever use the ON/OFF jumper cap, remove it. Disconnect the COM port---including AT port and debugging port. The module would enter the low power consumption mode after a while (1~3 minutes).</p> <p>The default value of the setting value <NUM> is 0.</p> <p>Besides, the command "+ZEDT" would effect the status LED. After setting AT+ZEDT=1, the status LED would not flash. The status LED will restore normally after changing the settings through the command AT+ZEDT=0 and restarting the module.</p>	

2.9.6 +ZDSLEEP: 32KHz Deep sleep mode

Description	This command is used to enable/disable 32KHz sleep mode.	
Format	AT+ZDSLEEP=<mode>	
Example	AT+ZDSLEEP=1	Enable sleep mode
	AT+ZDSLEEP=0	Disable sleep mode
Parameter	<mode> 0: disable sleep mode 1: enable sleep mode	

2.9.7 +CUSD: send USSD data

Description	Send USSD data (ASCII code)
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Format	AT+CUSD= <i>n</i> ,0," <i>str</i> ", <i>dcs</i>	
Parameter	<p>1. <<i>n</i>> :</p> <ul style="list-style-type: none"> ➤ 0 disable result code presentation in the TA ➤ 1 enable result code presentation in the TA ➤ 2 cancel session <p>2. <<i>str</i>> string type: USSD string (see 3GPP 27.007 for use). Please use ASCII code.</p> <p>3. <<i>dcs</i>> integer type: 3GPP 23.038 Cell Broadcast Data Coding Scheme. Recommended to use 15.</p>	
Description of returned value	<p>+CUSD: <<i>m</i>>[,<<i>str</i>>,<<i>dcs</i>>]</p> <p>OK</p> <p>Among:</p> <ul style="list-style-type: none"> <<i>m</i>> 0 no further user action required 1 further user action required 2 USSD terminated by network 3 other local client has responded 4 operation not supported 5 network time out 	
Example	<p>AT + CUSD=1,0,"*100#",15</p> <p>+CUSD: 1,"6b228fce4f7f75285e7f4e1c79fb52a85feb4fe1003100300030ff01000a003165b095fb59296c14000a003280a17968884c60c5000a00334f1195f29a7f7ad9000a00346c11751f67e58be2000a00357ecf51786d4b8bd5000a0036621176845feb4fe1000a00374f7f75285e2e52a9000a",72</p> <p>OK</p>	<p>Connect *100#, and returned information is within"", and the encoding method is UCS2.</p>
Note	The second parameter must be 0.	

Description	Send USSD data (binary)	
Format	AT+CUSD== <i>n</i> , <i>len</i> , <i>dcs</i>	
Parameter	<p>1. <<i>n</i>> :</p> <ul style="list-style-type: none"> ➤ 0 disable result code presentation in the TA ➤ 1 enable result code presentation in the TA ➤ 2 cancel session <p>2. <<i>len</i>> The length of binary data required, unit: byte</p> <p>3. <<i>dcs</i>> integer type: 3GPP 23.038 Cell Broadcast Data Coding Scheme; Recommended to use 15.</p>	
Description	+CUSD: < <i>m</i> >[,< <i>str</i> >,< <i>dcs</i> >]	

<p>s of returned value</p>	<p>OK Among: <m> 0 no further user action required 1 further user action required 2 USSD terminated by network 3 other local client has responded 4 operation not supported 5 network time out</p>		
<p>Example</p>	<table border="1"> <tr> <td> <p>at+cusd=1,5,15 > OK +CUSD: 1,"6b228fce4f7f75285e7f4e1c79fb52a85feb4fe1003100300030ff01000a003165b095fb59296c14000a003280a17968884c60c5000a00334f1195f29a7f7ad00a00346c11751f67e58be2000a00357ecf51786d4b8bd5000a0036621176845feb4fe1000a00374f7f75285e2e52a9000a",72</p> </td> <td> <p>1. Connect *100#, and returned information is within "", and the encoding method is UCS2. 2. After > appears, you can input any data stream in binary mode, but there is no display.</p> </td> </tr> </table>	<p>at+cusd=1,5,15 > OK +CUSD: 1,"6b228fce4f7f75285e7f4e1c79fb52a85feb4fe1003100300030ff01000a003165b095fb59296c14000a003280a17968884c60c5000a00334f1195f29a7f7ad00a00346c11751f67e58be2000a00357ecf51786d4b8bd5000a0036621176845feb4fe1000a00374f7f75285e2e52a9000a",72</p>	<p>1. Connect *100#, and returned information is within "", and the encoding method is UCS2. 2. After > appears, you can input any data stream in binary mode, but there is no display.</p>
<p>at+cusd=1,5,15 > OK +CUSD: 1,"6b228fce4f7f75285e7f4e1c79fb52a85feb4fe1003100300030ff01000a003165b095fb59296c14000a003280a17968884c60c5000a00334f1195f29a7f7ad00a00346c11751f67e58be2000a00357ecf51786d4b8bd5000a0036621176845feb4fe1000a00374f7f75285e2e52a9000a",72</p>	<p>1. Connect *100#, and returned information is within "", and the encoding method is UCS2. 2. After > appears, you can input any data stream in binary mode, but there is no display.</p>		
<p>Note</p>	<p>1. The second parameter must be larger than 0. 2. There is no data display.</p>		

2.9.8 +ZRINGPINMODE: set RING PIN signal mode

Description	This command is used to set RING PIN signal mode.	
Format	AT+ZRINGPINMODE=<N>	
Parameters	<p><N></p> <ul style="list-style-type: none"> ➤ 0: RING PIN is at original signal mode; The pin is at low level upon incoming call; and is at high level during other time. No change (remaining to be at high level) upon the receipt of text message. ➤ 1: RING Pin is at new signal mode; The PIN generates 1s low level and 4s high level upon an incoming call, until the call is ended or terminated; and is at high level during other time. Generate 1s low level pulse upon the receipt of new messages; maintain high level during other time. 	
Example	AT+ZRINGPINMODE = 0	Set RING pin as original mode
	AT+ZRINGPINMODE = 1	Set RING pin as new signal mode
Descriptions of returned values	No returned value	

2.10 Network Parameter Commands

2.10.1+ZPNUM: set APN, username and password

Description	This command is used to set the operator's APN, username and password.	
Format	AT+ZPNUM=<APN>,<USER>,<PWD>	
Example	AT+ZPNUM="cmnet", "user", "pwd" OK	
	AT+ZPNUM?	Check current APN,USER,PWD settings
Parameter	APN:GPRS APN provided by operator; USER: username PWD: password APN: USER, PWD is a kind of character "string".	

2.10.2+ZPPPOPEN: open GPRS connection

Description	This command is used to open GPRS connection.	
Format	AT+ZPPPOPEN	
Example	AT+ZPNUM="cmnet", "user", "pwd" OK AT+ZPPPOPEN +ZPPPOPEN:CONNECTED OK AT+ZPPPOPEN +ZPPPOPEN: ESTABLISHED OK	

2.10.3+ZPPPCLOSE: close GPRS connection

Description	This command is used to close GPRS connection.	
Format	AT+ZPPPCLOSE	
Example	AT+ZPPPCLOSE OK	
	AT+ZPPPCLOSE +ZPPPCLOSE: DISCONNECTED OK	

2.10.4+ZIPGETIP: check current IP address

Description	This command is used to obtain the IP address.	
Format	AT+ZIPGETIP	
Example	AT+ZIPGETIP +ZIPGETIP: *.*.*.* OK	Obtain the module's IP address
Parameter	* is a value from 0~255;	

2.10.5 +ZDNSSERV: set DNS IP address

Description	This command is used to set the IP address of the DNS.	
Format	AT+ZDNSSERV=<IP1>, <IP2>	
Parameter	<IP1>: the IP address of main DNS; <IP2>: the IP address of sub DNS;	
Example	AT+ZDNSSERV="211.136.20.203","211.136.18.171" OK AT+ZDNSSERV="211.136.20.203", "" OK AT+ZDNSSERV? 211.136.20.203 211.136.18.171 OK	Set DNS IP address Check DNS IP address

2.10.6 +ZDNSGETIP: obtain Internet Domain name's IP address

Description	This command is used to obtain Internet Domain name's IP address.	
Format	AT+ZDNSGETIP=<domain name>	
Parameter	<domain name>; Internet domain name;	
Example	AT+ZDNSGETIP="WWW.163.COM" 202.108.09.32 202.108.09.33 OK	Obtain IP address

2.11 TCP Link Commands

2.11.1 +ZIPSETUP: Set up TCP server link

Description	This command is used to send data to a bundled TCP server.	
Format	AT+ZIPSETUP=<N>,<IP>,<M>	
Example	AT+ZIPSETUP=1,61.144.216.219,2332 +ZIPSETUP:CONNECTED OK	Connect to TCP server.
Parameter	N: the channel No. of TCP links, ranging from 0 to 4; support 5 TCP links with 5 different IP addresses and ports; IP: IP value of one target address, *.*.*.* range: 0~255. M: port number;	

2.11.2 +ZIPSEND: send TCP data to target address

Description	This command is used to connect the target server.	
Format	AT+ZIPSEND= port, length<CR> Send data after prompt with '>'	
Example	AT+ZIPSEND=1,10 >abcdefghij +ZIPSEND:OK OK	Send data to TCP server after successfully connecting the server. Send 10 bytes: abcdefghij
Parameter	port: the channel number of TCP links; length: data length (support up to 1000 bytes, and support 0x00~0xff transmitting).	

2.11.3 +ZPPPSTATUS: check GPRS connection status

Description	This command is used to check GPRS link status.	
Format	AT+ZPPPSTATUS	
Example	AT+ZPPPSTATUS +ZPPPSTATUS: ESTABLISHED OK	Check GPRS link status
	AT+ZPPPSTATUS +ZPPPSTATUS: DISCONNECTED OK	Check GPRS link status

2.11.4 +ZIPCLOSE: close TCP link

Description	This command is used to close TCP link.	
Format	AT+ZIPCLOSE=<N>	
Example	AT+ZIPCLOSE=1 +ZIPCLOSE:OK OK	Close TCP link.
Parameter	N: the number of TCP links and the value is 1;	

2.11.5+ZIPSTATUS: check current TCP link status

Description	This command is used to check the status of current TCP link.	
Format	AT+ZIPSTATUS=<N>	
Example	AT+ZIPSTATUS=1 +ZIPSTATUS: ESTABLISHED OK	Check the current TCP link status
Parameter	ESTABLISHED: TCP link established. DISCONNECTED: TCP link disconnected.	

2.11.6 +ZIPRCV: receive data from current data link

Description	This command is used to receive data asynchronously.	
Format	+ZIPRCV:N,LEN,<DATA>	
Example +ZIPRCV:1,5,abcde Received 5 data abcde from No.1 TCP data link
Parameter	N: the number of TCP links and the value is 1; LEN: length of received data; DATA: received data	

2.12 UDP Link Commands

2.12.1+ZIPSETUPU: set up UDP server link

Description	This command is used to bundle with the UDP server link.	
Format	AT+ZIPSETUPU=<N>,<IP>,<M>	
Example	AT+ZIPSETUPU=1,61.144.216.219,2332 OK	The UDP server's bundled address is 61.144.216.219, with the port no. 2332. Return with bundling succeeded.
Parameter	N: the channel No. of UDP links, ranging from 0 to 4; support 5 UDP links with 5 different IP addresses and ports; IP: IP address of target server; *.*.*. * ranges from 0~255. M: port number.	

2.12.2+ZIPSENDU: send data to UDP server

Description	This command is used to send data to the bundled UDP server.	
Format	AT+ZIPSENDU= port, length<CR> Send data after prompt with '>'.	
Example	AT+ZIPSENDU=1,10 >abcdefghij +ZIPSNEU:OK OK	Send data to UDP server after successfully connecting the server. Send 10 bytes: abcdefghij
Parameter	port: the channel number of UDP links; length: data length (support up to 1000 bytes, and support 0x00~0xff transmitting).	

2.12.3+ZIPSTATUSU: check UDP status

Description	This command is used to check current UDP link status.	
Format	AT+ZIPSTATUSU=<N>	
Example	AT+ZIPSTATUSU=1 +ZIPSTATUSU: ESTABLISHED OK	Check the No. 1 UDP status The No. 1 UDP is in use
Parameter	ESTABLISHED: UDP already ESTABLISHED. DISCONNECTED:UDP already disconnected	

2.12.4+ZIPCLOSEU: close UDP link

Description	This command is used to close the designated UDP link.	
Format	AT+ZIPCLOSEU=<N>	
Example	AT+ZIPCLOSEU=1 +ZIPCLOSE:OK OK	Successfully close the No. 1 UDP link Prompt that the No.1 UDP link closed.
Parameter	N: the channel number of UDP links; representing the channels to be closed, ranging from 0 to 4.	

2.12.5+ZIPRECVU: receive UDP data

Description	This command is used to receive UDP data from UDP server.	
Format	+ZIPRECVU:N,LEN,<DATA>	
Example +ZIPRECVU:1,5,abcde Received 5 data abcde from the No.1 UDP data link
Parameter	N: the channel number of UDP links, ranging from 0 to 4; LEN: received data length; DATA: received data; (The size of each UDP package shall not exceed 1500 bytes, otherwise, error occurs)	

2.13 Server Commands

2.13.1 +ZTCPLISTEN: set port monitoring

Description	This command is used to enable/disable port monitoring function.	
Format	AT+ZTCPLISTEN=<on/off>,<portNum> AT+ZTCPLISTEN?	
Parameter	On/off 1:start listening 2:stop listening portNum the listening port num If <on/off> is 2, please set this parameter as 0.	
Format	AT+ZTCPLISTEN=1,1174 OK	Monitoring port 1174
	at+ztcpisten? +ZTCPLISTEN:1,1174 OK	Check monitoring status
	AT+ZTCPLISTEN=2, 0 OK	Stop monitoring
	+ZTCP(P): INCOMING CONNECT ACCEPTED	Indicating one monitoring to one external connection, and the connection is accepted.
Note	<ol style="list-style-type: none"> One port can be monitored currently, and only two connections are allowed on each port; Prior to the monitoring, please firstly use AT+ZPPPOPEN to open the PPP link; 	

2.13.2 +ZTCPSENDP: send data through passively opened link

Description	This command is used to send data through (monitored) passively opened link.	
Format	AT+ZTCPSENDP=<channel>,<n>	
Parameter	<channel>: the sign of connected client ends; <n>: the length of data to send	
Descriptions of returned value	Input AT command according to the above format, press carriage return to display ">". In this case, you can input the data to transmit. When inputting (size+1) data (it can be any data, 0x0d	

	recommended), it will trigger the transmitting process.	
Example	AT+ZTCPSNDP=10 >1234567890 +ZTCPSND(P):OK OK	Send 10 characters through the monitored link.
Note	Prior to the use of this command, the monitored connection must be established.	

2.13.3 +ZTCPCLOSEP: close monitored connection

Description	This command is used to close the monitored connection.	
Format	AT+ZTCPCLOSEP=<channel>	
Descriptions of returned value	OK: connection closed ERROR: link not existed or other error	
Example	at+ztcpclosep +ZTCPCLOSEP:OK OK	Close the No.1 connection monitored
Note	Prior to the use of this command, the monitored connection must be established.	

2.13.4 +ZTCPRECV(P): receive data report

Description	This command is used to receive data report	
Format	+ZTCPRECV(P):<channel>,<dataLength>,data	
Parameter	Channel: upon multiple connections, mark the connection through which transmits the data. dataLength: the length of received data Data: received data	
Example	+ZTCPRECV(P):1050, 78901234567890123456789012345678901234 56789012345678012345678901234567890123 45678901234567890123456789012345678901 23456789012345678012345678901234567890 12345678901234567890123456789012345678 90123456789012345678012345678901234567 89012345678901234567890123456789012345 67890123456789012345678012345678901234 56789012345678901234567890123456789012 34567890123456789012345678012345678901 23456789012345678901234567890123456789 01234567890123456789012345678012345678 90123456789012345678901234567890123456 78901234567890123456789012345678012345	1050 characters received

	678901234567890123456789012345678901234567890123 4567890123456789012345678901234567890123456789012 345678901234567890123456789012345678901234567890 123456789012345678901234567890123456789012345678 012345678901234567890123456789012345678901234567 890123456789012345678901234567890123456789012345 678012345678901234567890123456789012345678901234 567890123456789012345678901234567890123456789012 345678012345678901234567890123456789012345678901 234567890123456789012345678901234567890123456789 012345678012345678901234567890123456789012345678 901234567890123456789012345678901234567890123456 789012345678012345678901234567890123456789012345 67890123456789012345678	
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2.13.5 +ZTCPSTATUSP: check passively opened link

Description	This command is used to check if there is any passively opened link.	
Format	AT+ZTCPSTATUSP=<channel>	
Descriptions of returned value	+ZTCPSTATUS(P):DISCONNECT +ZTCPSTATUS(P):CONNECT	One passively link not existed one passively link existed
Example	at+ztcpstatusp=0 +ZTCPSTATUS(P):DISCONNECT OK	No passively opened link
	at+ztcpstatusp +ZTCPSTATUS(P):DISCONNECT OK	The current monitoring port does not start working.

2.13.6 +ZIPTIMEOUT: set the timeout for connecting the server & sending data

Description	This command is used to set the timeout for connecting the server and sending data as the module works as the client end.	
Format	AT+ZIPTIOMEOUT=<connect_timeout>,<send_data_timeout>	
Description of parameters	connect_timeout: connection timeout; send_data_timeout: sending data timeout. If the module does not send out the data within the specified time, it might think that there is something wrong with the server or network and close the connection. (The module works as the server and client end)	
Descriptions of returned value	OK setting succeeded ERROR setting failed	
Example	AT+ZIPTIMEOUT=?	Check the range of

	<pre>+ZIPTIMEOUT:(5-120),(5-18000) OK AT+ZIPTIMEOUT=30,60 OK at+ziptimeout? +ZIPTIMEOUT:30,60 OK</pre>	<pre>timeout value Set the timeout Check the range of current timeout</pre>
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2.13.7 +ZTCPTIMEOUT: set the timeout for receiving data

Description	This command is used to set the timeout for receiving data.	
Format	AT+ZTCPTIMEOUT=<recv_data_timeout>	
Description of parameters	If the module does not receive the data within the specified time, it will close the connection, otherwise, the number of connections exceeds the limit, other client-ends can not be connected. The default value is 0 and it means the timeout is no needed.	
Descriptions of returned value	OK Succeeded ERROR Failed	
Example	<pre>at+ztcptimeout=? +ZTCPTIMEOUT:(0-18000) OK at+ztcptimeout=30 OK at+ztcptimeout? +ZTCPTIMEOUT:30 OK</pre>	<p>Check the range of timeout value</p> <p>Set the timeout</p> <p>Check the range of current timeout</p>

2.14 FTP Commands

2.14.1 +ZFTPGET: download data from FTP server

Description	This command is used to download data from the FTP server.
Format	AT+ZFTPGET=<IP>,<PORT>,<username>,<password>,<dir&filename>,<type>,<Content or Info>,<output interval>
Parameter	<p>IP: server's IP address</p> <p>PORT: server's FTP port number, default 21 (Note: recommended to set the port number as 21 according to RFC959;)</p> <p>Username: the username used to log on the FTP;</p> <p>Password: the password used to log on the FTP;</p> <p>Dir&filename: the path and name of the file to read (Note: file path is for FTP's root path)</p> <p>Type: file transmission mode --1 : ASCII --2: Binary</p> <p>Content or Info: specify the file content or file information --1: obtain the file content --2: obtain the file or designated path information</p> <p>output interval: the interval when the module outputs report through the port. The value ranges from 0 to 10, and the unit is second. 0 means there is no interval.</p>
Descriptions of returned value	<p>As long as the format of AT command is correct, the module would return with OK; however, it does not necessarily mean that the data is read successfully. Whether or not the data is read successfully depends on the following information returned by the module:</p> <ol style="list-style-type: none"> +ZFTPGET: Error!Timeout Note: connecting the server timeout or no response to the server. The timeout is 3 minutes. At this moment, the module will disconnect automatically. (the server might block the connection) +ZFTPGET: Ftp Ctrl Link is Closed! Note: the server rejected the connection (The IP address might be wrong) +ZFTPGET: Recv Over.length is n Note: data is read successfully. The length of data read is n and the data will output in the following and start with the mark ">". +ZFTPGET: Error, Unknown Cmd !Ctrl is close! Cmd is n Note: unrecognized FTP command. At this moment, the module will initially disconnect. (the file might not exist (cmd 550) or the server can not open data connection (cmd 425) . This is normal) +ZFTPGET: Error. user logged fail! Note: incorrect username or password. At this moment, the module will initially disconnect.

<p>Example</p>	<p>at+zftpget=121.35.129.237,21,ls,1,ls1\ls68.txt,1,1,0 OK +ZFTPGET: Recv Over.length is 10 1234567890</p>	<p>Read the file ls1\ls68.txt on the server 121.35.129.237. The username is ls, the password is 1 and the method is ASCII mode. The file can be read successfully, and the file content is 1234567890.</p>
	<p>at+zftpget=74.54.16.2,21,ATMgroup,surr ender@123,httpsdocs/ztemt.bin,1,2,0 OK +ZFTPGET: Recv Over.length is 50 01-17-08 11:20AM 100 ztemt.bin</p>	<p>obtain httpsdocs/ztemt.bin file information.</p>
	<p>at+zftpget=74.54.16.2,21,ATMgroup,surr ender@123,httpsdocs/ztemt.txt,1,1,5</p>	<p>obtain httpsdocs/ztemt.bin file information. Out the file content at the interval of 5 seconds.</p>
<p>Notes</p>	<ol style="list-style-type: none"> 1. This command can only be used to read the file not larger than 10240 bytes; if the file is larger than 10240 bytes, the excessive part will be abandoned. 2. The connection times of one same user within certain period of time will be limited due to the settings of the FTP server's software. Therefore, there had better be some interval between each read/write operation. It depends on the settings of your FTP server's software. 3. Prior to the use of module's FTP protocol, please open the PPP link first. 	

2.14.2+ZFTPPUT: upload data to FTP server

<p>Description</p>	<p>This command is used to upload data to FTP server.</p>
<p>Format</p>	<p>AT+ZFTPPUT=<IP>,<PORT>,<username>,<password>,<dir&filename>,<type>,<mode>,<size></p>
<p>Parameter</p>	<p>IP: server's IP address PORT: server's FTP port number, default 21 (Note: recommended to set the port number as 21 according to RFC959;) Username: the username used to log on the FTP server; Password: the password used to log on the FTP server; Dir&filename: the path and name of the file to read; (Note: file path is for FTP's root path) Type: file transmission mode --1 :ASCII --2: Binary</p>

	<p>Mode: operation mode, ranging from 1 to 3. Refer to the following descriptions :</p> <ul style="list-style-type: none"> --1: STOR mode : create a file on the server to write the data. If the file already exists, cover the original file. --2: APPE mode : if the file does not exist on the server, create a file. If the file exists, attach the data at the end of the file. --3: DELE mode: delete a file. At this moment, set the size as 0. After ">" appears, please directly input 0x0d. <p>Size: length of input data. The Max. length does not exceed 1900. Under DELE mode, set as 0.</p>	
<p>Descriptions of returned value</p>	<p>Input AT command according to the above format, press carriage return to display ">". In this case, you can input the data to transmit. When inputting (size+1) data (it can be any data, 0x0d recommended), it will trigger the transmitting process. The user should judge the transmitting status according to the following return information. Note: the input transmitted data have no echo display.</p> <ol style="list-style-type: none"> 1. +ZFTPGET: Error!Timeout Note: connecting the server timeout or no response to the server. The timeout is 3 minutes. At this moment, the module will disconnect automatically. (the server might block the connection) 2. +ZFTPPUT: Ftp Ctrl is Closed! Note: the server rejected the connection (The IP address might be wrong) 3. +ZFTPPUT: Send OK.length is n Note: data is transmitted successfully. The length of data transmitted is n. 4. +ZFTPPUT: Error, Unknown Cmd!Ctrl is close! Cmd is n Note: unrecognized FTP command. At this moment, the module will initially disconnect. 5. +ZFTPPUT: Error.user logged fail! Note: incorrect username or password. At this moment, the module will initially disconnect. 6. +ZFTPPUT:ERROR Note: other unusual case. At this moment, the module will initially disconnect. 7. +ZFTPPUT: Delete File OK Note: delete the file successfully. 	
<p>Example</p>	<pre>at+zftpput=121.35.129.237,21,ls,1,ls1\ls68.txt,2,1,10 > +ZFTPPUT: Send OK. length is 10 OK</pre>	<p>Write the file ls1\ls68.txt on the server 121.35.129.237. The username is ls, the password is 1 and the method is Binary mode. The file can be written successfully.</p>
<p>Note</p>	<p>1. The connection times of one same user within certain period of time will be limited due to the settings of the FTP server's software. Therefore, there had better be some interval between each read/write operation. It</p>	

	<p>depends on the settings of your FTP server's software.</p> <p>2. The data length transmitted each time should not exceed 1900 bytes; if you want to write a large file, please firstly use STOR mode and then use APPE mode.</p> <p>3. Prior to the use of module's FTP protocol, please open the PPP link first.</p>
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2.15 Relevant Audio Commands

2.15.1 +ZCALLTONE: set pick-up tone

Description	Play/pause the pick-up tone.	
Format	AT+ZCALLTONE=<n> AT+ZCALLTONE=? AT+ZCALLTONE?	
Parameter	<n> 0: pause the pick-up tone 1: play 400Hz pick-up tone 2: play 400Hz/25Hz pick-up tone 3: play 400Hz/50Hz pick-up tone	
Descriptions of returned value	OK +ZCALLTONE:<n> OK	
Example	AT+ZCALLTONE=2 OK at+zcalltone? +ZCALLTONE:2 OK AT+ZCALLTONE=0 OK at+zcalltone? +ZCALLTONE:0 OK	Play pickup tone Stop pickup tone

2.15.2 +ZDTMFTONE: set ZDTMF tone

Description	Play/pause the pick-up tone.	
Format	AT+ZDTMFTONE=<n>,<Duration> AT+ZDTMFTONE=? AT+ZDTMFTONE?	
Parameter	<n>	

	<p>0~9: play DTMF tone from 0 to 9; 10~13: play DTMF tone from A to D; 14: play * DTMF tone; 15: play # DTMF tone; 16: stop playing DTMF tone ; <Duration> DTMF playing duration, unit: 20ms. Value range: 0-1000. Set as 0, continue to play</p>	
Descriptions of returned value	<p>OK +ZDTMFONE:<n>, <Duration> OK</p>	
Example	<p>AT+ZDTMFONE=1,0 OK AT+ZDTMFONE? +ZDTMFONE:1,0 OK</p> <p>AT+ZDTMFONE=16,0 OK AT+ZDTMFONE? +ZDTMFONE:16,0 OK</p> <p>AT+ZDTMFONE=2,100 OK</p>	<p>Continue to play DTMF tone of number key 1;</p> <p>Stop playing DTMF tone</p> <p>Play DTMF tone of number key 2 for 2s;</p>

2.15.3+SPEAKER: audio channel switch command

Description	This command is used to switch between the microphone and headset.	
Format	AT+SPEAKER=<mode>	
Example	<p>AT+SPEAKER=0 OK</p>	Switch to microphone
	<p>AT+SPEAKER=1 OK</p>	Switch to headset
	<p>AT+SPEAKER=? +SPEAKER:(0-1) OK</p>	Check status
Parameters	<p><mode> 0: microphone(default) 1: headset</p>	

2.15.4 +ZMICGB: set MIC audio parameters

Description	This command is used to change MIC input channel's audio parameters.
Format	<pre> AT+ZMICGB=<Gain>,<Bias>,<PGA> //set parameters AT+ZMICGB=? //check parameter setting format AT+ZMICGB? //check current parameters </pre>
Parameter	<p>Refer to the definitions of three parameters in MIC output circuit in figure 1.</p> <p>1. Gain: 0 ~ 7. refer to the corresponding relationship between the parameter and the gain;</p> <pre> typedef enum L1BbcMicGainTag { MIC_GAIN_0 = 0, MIC_GAIN_1, MIC_GAIN_2, MIC_GAIN_3, MIC_GAIN_4, MIC_GAIN_5, MIC_GAIN_6, MIC_GAIN_7 } L1BbcMicGain; </pre> <p>2. Bias: 0 ~ 7. refer to the corresponding relationship between the parameter and the current;</p> <pre> typedef enum L1BbcMicBiasTag { MIC_BIAS_CURRENT_500_UA = 0, MIC_BIAS_CURRENT_303_UA, MIC_BIAS_CURRENT_183_6_UA, MIC_BIAS_CURRENT_111_25_UA, MIC_BIAS_CURRENT_67_41_UA, MIC_BIAS_CURRENT_40_85_UA, MIC_BIAS_CURRENT_24_75_UA, MIC_BIAS_CURRENT_15_UA } L1BbcMicBias; </pre> <p>3. PGA: 0 ~ 15. refer to the corresponding relationship between the parameter and the db value;</p> <pre> typedef enum L1BbcInputPgaGainTag { MIC_PGA_0db0 = 0 </pre>

	<pre> , MIC_PGA_1db5 , MIC_PGA_3db0 , MIC_PGA_4db5 , MIC_PGA_6db0 , MIC_PGA_7db5 , MIC_PGA_9db0 , MIC_PGA_10db5 , MIC_PGA_12db0 , MIC_PGA_13db5 , MIC_PGA_15db0 , MIC_PGA_16db5 , MIC_PGA_18db0 , MIC_PGA_19db5 , MIC_PGA_21db0 , MIC_PGA_22db5 } L1BbcInputPgaGain; </pre>	
Descriptions of returned value	OK: parameter settings succeed; ERROR: incorrect parameter format	
Example	AT+ZMICGB=0,3,12	Note: Gain: 0; Bias: 3; PGA: 12

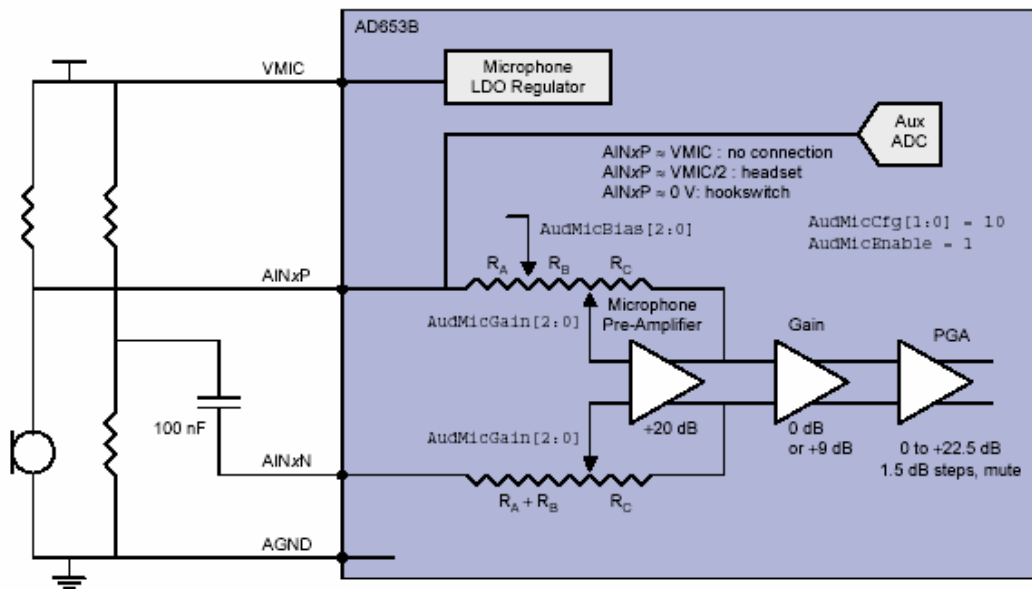


Figure 1

2.16 Relevant Base Station Commands

2.16.1 +CCED: obtain cell information

Description	This command is used to obtain the information of main cell and adjacent cells.
Format	AT+CCED=<mode>,<requested dump>
Parameters	<p><mode></p> <p>0 : respond once now (default)</p> <p>1 : auto output</p> <p>2 : stop auto output</p> <p><requested dump></p> <p>1 : main cell signal source information (default)</p> <p>MCC, MNC, LAC, CI, BSIC, BCCH Freq (absolute), RxLev,RxLev Full, RxLev Sub, RxQual, RxQual Full, RxQual Sub, Idle TS</p> <p>2 : 1 to 6 adjacent cell signal source information:</p> <p>MCC, MNC, LAC, CI, BSIC, BCCH Freq (absolute), RxLev</p> <p>8 : Main cell's signal indication, ranging from 0 to 31 (refer to +CSQ for the response format, which is equal to AT+CSQ)</p> <p>15 : All information output</p> <p>Note:</p> <p>can adopt the hybrid output of multiple modes;</p> <p><value> is the value of ASCII character string (decimal except CI and LAC are hexadecimal)</p> <p>If the value is unavailable, represent with 0;</p> <p>Attach:</p> <p>(IMSI) =MCC+MNC+MSIN</p> <p>MCC: Mobile Country Code, China: 460 ;</p> <p>MNC: Mobile Network Code, used to differentiate China Mobile (00) from China Unicom (01);</p> <p>LAC: location code;</p>

	<p>CI: cell identification BSIC: base station identification code; BCCH: Broadcast channel FREQ: frequency; NCELL: Neighbor cell RxLev: received level (signal reception strength, indicating the signal strength of received BCCH)) RxQual: Rx. quality</p>	
<p>Example</p>	<pre> AT+CCED? +CCED: 0, 1 OK AT+CCED=? +CCED: (0-2), (1, 2, 8, 15) OK AT+CCED=0,1 +CCED: 460,0,247c,f8d,538,56, 43,0,0,0,0,0,0 OK AT+CCED=0,2 +CCED: 460,0,247c,f83,82,50,41 +CCED: 460,0,27a0,fd5,52,46,3 4 +CCED: 460,0,247c,eda,520,48 ,33 +CCED: 460,0,247c,e44,64,57,3 2 +CCED: 460,0,279c,e58,48,50,3 1 +CCED: 460,0,247c,e9c,13,24,2 9 OK </pre>	<p>Check current settings</p> <p>Check parameter range</p> <p>Obtain main cell's information</p> <p>Obtain the information of neighboring six cells</p>

2.16.2 +ZBCCH: lock BCCH

Description	Lock one designated BCCH to achieve the purpose of locking CELL-ID; The inquiry command is used to get the current locked BCCH No. and the corresponding zone bit code, cell ID and operator code; the test command is used to get the strongest 7 BCCH No.	
Format	AT+ ZBCCH =<mode>,<bcch> OK +ZBCCH:LOCK SUCESS ERROR AT+ZBCCH? OK + ZBCCH: <bcch>,<mcc>,<mnc>,<lac>,<cell-id> > AT+SGBCCH=? OK + ZBCCH: <mode list> ,<bcch1>,...<bcchn>	Setting succeeded Failed Check Test
Descriptions of returned value	<mode> 0 Unlock current BCCH 1 lock the designated BCCH <bcch> BCCH No. <mcc> service provider's code 1: 460 <mnc> service provider's code 2: 00/01 <lac> Zone bit code <cell-id> The corresponding cell ID of locked BCCH	

Example	<pre> AT+ZBCCH=? +ZBCCH:(0,1),80,66,68,74,84,72,54,62,64,56,31,28,13,16, 607,594,592,540,532,528,524,522,516,514,512 OK AT+ZBCCH? OK +ZBCCH: 80,MCC:460,MNC:00,LAC:2533,CELL ID:10ba AT+ZBCCH=1,80 OK +ZBCCH:LOCK SUCCESS </pre>
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2.16.3 +ZBAND: lock GSM band

Description	Lock the GSM specified band: 850/900/1800/1900MHZ and currently support 900/1800MHZ only in China. After locking one frequency band, use the setting command to lock another band, then the locked band will be automatically unlocked.	
Format	<pre> AT+ ZBAND =<band> OK +ZBAND:LOCK SUCES ERROR AT+ ZBAND? OK + ZBAND: <band> AT+ZBAND =? + ZBAND: <band list> OK </pre>	Setting succeeded Failed Check Test
Parameters	<band> : 0 Auto select frequency band 1 GSM900MHZ 2 DCS1800MHZ	
Descriptions of returned	OK Succeeded ERROR Failed	

value	
Example	<pre>AT+ZBAND=1 +ZBAND:LOCK SUCCESS OK AT+ZSGBAND? +ZBAND:1 OK AT+ZBAND=? +ZBAND:(0-2),0:auto,1:gsm900,2:dcsl800 OK</pre>

2.16.4 +ZOPT: lock network operator

Description	Lock GSM/GPRS network operator: China Mobile, China Unicom, etc.	
Format	<pre>AT+ ZOPT =<opt> +ZOPT:<state> OK ERROR AT+ ZOPT =? + ZOPT: <opt list> OK</pre>	<pre>Setting succeeded Failed Test</pre>
Parameters	<pre><opt> 0 Auto 1 China Mobile 2 China Unicom <state> current network status</pre>	
Descriptions of returned value	<pre>OK Succeeded ERROR Failed</pre>	
Example	<pre>AT+ZOPT=1 + NET STATE: 0 OK AT+ZOPT=? +OPT:(0-2),0:AUTO,1:China Mobile,2:China Unicom OK</pre>	

2.16.5 +ZCALIST: read carrier wave list

Description	当 BCCH 锁定后，读取的是当前锁定 BCCH 的载波数，当
-------------	---------------------------------

n	BCCH 没有锁定，读取是最强信道的载波数	
Format	AT+ZCALIST +ZCALIST:<ca0>...<ca63> OK	
Parameters	<ca> 0 ~ 63 有效的载波数目	
Descriptions of returned value	OK 成功 ERROR 失败	
Example	AT+ZCALIST +ZCALIST:2,8,19,34,45,80,94 OK	

3 Application Cases and Precautions

3.1 SMS Application Case

Note: The following text marked in red should be entered;

at+cmgf=1

OK

—Set the message's input mode as text mode.

```
at+cmgs="13360504647"<CR>
```

```
hallo<ctrl/Z>
```

```
+CMGS: 1
```

```
OK
```

—Send one message. "13360504647" is the number of message recipient, and hallo is the message text.

```
at+cmgw="13360504647"<CR>
```

```
goodbye<ctrl/Z>
```

```
+CMGW: 1
```

```
OK
```

—write a message in "SM". "13360504647" is the number of message recipient, and goodbye is the message text. From the returned formation +CMGW, we could see that the message is saved to the index 1.

```
at+cpms?
```

```
+CPMS: "SM",1,50,"SM",1,50,"SM",1,50
```

```
OK
```

—Check the current memory. From +CPMS, we know there is a message in "SM", which is the newly composed message.

```
at+cmgr=1
```

```
+CMGR: "STO UNSENT","13360504647",  
goodbye
```

```
OK
```

—Read this message with the index No. From the returned information +CMGR, we know that the message is not sent. ("STO UNSENT").

```
at+cmss=1
```

```
+CMSS: 1
```

```
OK
```

—Send the saved message.

```
at+cmgr=1
```

```
+CMGR: "STO SENT","13360504647",  
goodbye
```

```
OK
```

—Read this message with the index No. From the returned information +CMGR, we know that the message has been sent. ("STO SENT")

at+cnmi=3,2,0,0,0

OK

—Set the status of newly received message as "Directly display but not save"

+CMT: "+8615986672056","OK","07/08/27,13:23:56+32"

WESDDR

—Receive a new message, which is directly displayed but not saved. "+8615986672056" is the number of message recipient, "07/08/27,13:23:56+32" is the sending time and WESDDR is the message text.

at+cnmi=3,1,0,0,0

OK

—" Set the status of newly received message as "Save but not display"

+CMTI: "SM", 28

—Receive a new message, which is saved but not displayed. From +CMTI, we know that the message is saved in the index 28 in "SM".

at+cmgr=28

+CMGR: "REC UNREAD","15986672056","07/08/27,13:36:48+32"

CDFF

OK

—Read this message with the index No. "REC UNREAD" is the status of the message.

"15986672056" is the number of message recipient, "07/08/27, 13:36:48+32" is the sending time and CDFF is the message text.

3.2 Phonebook Application Case

Note: The following text marked in red should be entered;

at+cpbs?

+CPBS:"SM",0,200

OK

—Check the current memory. The default phonebook memory is" SM ". From +CPMS, we know that the current phone memory "SM" is empty.

at+cpbw= 1,"13086672098",129,"john"

OK

—Write a phone entry into current phonebook memory "SM". "1" represents save by auto searching space. "13086672098" is the telephone number, 120 is the type of phone number, and john is the name.

at+cpbs?

+CPBS:"SM",1,200

OK

—Check the current memory. From +CPMS, we know that the entry has been stored at the index 1 in the current phone memory "SM".

`at+cpbr=1`

+CPBR: 1,"13086672098",129,"john"

OK

—Read the phonebook entry.

`atd>1;`

OK

—Dial the index number in the current phonebook.

`atd>"john";`

OK

—Dial the name from the current phonebook.

`ath`

OK

—Use ATH to hang up the call.

`at+cpbs="ME"`

OK

—Select "ME" phonebook memory.

`at+cpbs?`

+CPBS: "ME",0,18

OK

—Check the current memory. From +CPMS, we know that the current phone memory "ME" is empty.

`at+cpbw= 1,"13086672098",129,"john"`

OK

—Write a phone entry into the current phonebook memory "ME". "1" represents save by auto searching space. "13086672098" is the telephone number, 129 is the type of phone number, and john is the name.

`at+cpbs?`

+CPBS:"ME",1,18

OK

—Check the current memory. From +CPMS, we know that the entry has been stored at the index 1 in the current phone memory "ME"

`at+cpbr=1`

+CPBR: 1,"13086672098",129,"john"

OK

——Read this phonebook entry.