M590 AT COMMAND SETS

V3.0

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Clarification

This specification applies to M590/M590E

This specification is for system engineers, research engineers and test engineers.

This specification is, without prior notice, subject to changes and updates as deemed neccesary by Neoway to suit enhancements or changes to the module.

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1 General command

1.1 Get Sequence Number：+CGSN

Description	**This command is to get sequence number, known as IMEI (International Mobile Equipment identity).**	
Format	● AT+CGSN	
Syntax	NULL	
Response	<IMEI> OK Or CME ERROR:<error>	
Example	AT+CGSN 358511020024166 OK	Read the command.
	AT+CGSN CME ERROR：<error>	
NOTE	This code is a 15-digit numeral	

1.2 Get International Mobile Subscriber Identification：+CIMI

Description	**This command is to get IMSI（international mobile subscriber identification）.**	
Format	● AT+CIMI	
Syntax	NULL	
Response	<IMSI> OK Or CME ERROR:<error>	
Example	AT+CIMI 460029202075769 OK	Read the command.
	AT+CIMI CME ERROR：<error>	Read the command ERROR.
NOTE	This code contains 15 figures, starting with three-digit MCC and double-digit MNC, to authenticate SIM-card code.	

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1.3 Get SIM card Identification：+CCID

Description	**This command is to get SIM card ICCID.**	
Format	● AT+CCID	
Syntax	NULL	
Response	<ICCID> OK Or CME ERROR:<error>	
Example	AT+CCID +CCID: 89860002190810001367 OK	Read the command.
	AT+CCID CME ERROR：<error>	Read the command ERROR.
NOTE	ICCID is 20 digits.	

1.4 Get Version：+ getvers

Description	**This command is to get the software version.**	
Format	● at+getvers	
Syntax	NULL	
Response	<version> OK Or CME ERROR:<error>	
Example	at+getvers 1100_C6C30000_V0120n OK	
	at+getvers CME ERROR：<error>	
NOTE		

1.5 Repeat the previous command：A/

Description	**This command is to repeat the previous command, except A/ itself.**
Format	● A/

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Syntax	NULL	
Response	See the example below.	
Example	AT+CGSN 358511020002311 OK A/ 358511020002311 OK	
NOTE	A / command can't repeat the following command: at+getvers/at+audchannel/at+enpwrsave/ ati /at+cgmm	

1.6 Get the Module's model：+CGMM

Description	**This commad is to check the model of the module.**	
Format	● at+cgmm?	
Syntax	NULL	
Response	See the example below.	
Example	at+cgmm? M590 OK	
NOTE		

1.7 Get the module's Information：I

Description	**This command is to check the information of the module，including factory, model and version.**	
Format	● a t i	
Syntax	NULL	
Response	See the example below.	
Example	ati NEOWAY M590 REVISION 01.30e OK	 [factory] model version OK

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NOTE	

1.8 Echo：E

Description	This command is to enable /disable Echo.	
Format	● ATE<n>	
Syntax	<n>：only could be 0 or 1.	
Response	See the example below.	
Example	ATE1 OK AT AT OK	Set Echo Input AT, response echo
	ATE0 OK AT OK	Shut down Echo Input AT, no echo
NOTE	Dial-up and then enter into the command mode, it will automatically forbid Echo. ATE is equal toATE0。	

1.9 Display the current configuration：&V

Description	This command is to display the current configuration and storage documents
Format	● AT&V
Syntax	NULL
Response	See the example below.
Example	AT&V ACTIVE PROFILE: &C1, &D1, &K0, E1, Q0, V1, X0, S00:000, S02:043, S03:013, S04:010, S05:008, S07:255, +CBST:007, 000, 001, +CRLP:061, 061, 048, 006, +CR:000, +CRC:000 STORED PROFILE 0: &C1, &D1, &K3, E1, Q0, V1, X4, S00:000, S02:043, S03:013, S04:010, S05:008, S07:060, +CBST:007, 000, 001, +CRLP:061, 061, 048, 006, +CR:000, +CRC:000 STORED PROFILE 1: &C1, &D1, &K3, E1, Q0, V1, X4, S00:000, S02:043, S03:013, S04:010, S05:008,

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	S07:060, +CBST:007, 000, 001, +CRLP:061, 061, 048, 006, +CR:000, +CRC:000 OK
NOTE	

1.10 Save current configuration：&W

Description	**This command is to save current valid configuration in the specified file (one of the two storage documents)**	
Format	● AT&W[<value>]	
Syntax	<value>: 0: choose document 0 as configuration storage NVRAM, no need to input 0 1: choose document 1 as configuration storage NVRAM	
Response	See the example below.	
Example	AT&W OK	Equal to AT&W0
	AT&W1 OK	To store the current configurationin document 1
NOTE		

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2 Mobile devices control and status report

2.1 Check the module's status：+CPAS

Description	This command is to check the module's current operation status.	
Format	● AT+CPAS	
Syntax	● <pas> This value may be： 0：ready（the module can implement AT commands） 2：unknow（unknown status） 3：ringing（the module can implement AT command，it will be ringing status when there is an incoming call） 4：call in progress（the module can implement AT command, in call connecting or caller ringing status.） 5：asleep（Module is in sleep mode, not ready）	
Response	+CPAS: <pas> OK or CME ERROR: <error>	
Example	AT+CPAS +CPAS：0 OK	
	AT+CPAS CME ERROR：<error>	
NOTE		

2.2 Check network registration status：+CREG

Description	This command is to check network registration status of the module.
Format	● AT+CREG=<mode> ● AT+CREG?
Syntax	● <mode> The value may be： 0：not allow the network registration to provide result code（default settings） 1：allow the network registration to provide result code 2：allow the network registration to provide local information (CELLID, LOCALID) ● <stat> The value may be： 0：not registered, the terminal is not searching new operators

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	1：has been registered local network 2：the registration is refused 3：not registered, the terminal is searching base stations 4：unknown code 5：has been registered, at roaming status	
Response	OK or CME ERROR: <error> +CREG：<mode>,<stat> OK	
Example	AT+CREG=1 OK	Register settings allow the network to provide result code.
	AT+CREG=1 CME ERROR：<error>	
	AT+CREG? +CREG：0,1 OK	Display the module has been registered on the local network.
NOTE		

2.3 Power off：+CPWROFF

Description	This command is to switch off the module.	
Format	● AT+CPWROFF	
Syntax	NULL	
Response	OK or CME ERROR:<error>	
Example	AT+CPWROFF OK	
	AT+CPWROFF CME ERROR：<error>	
NOTE	This instruction is a soft-shutdown, after executing this instruction, do not for ON / OFF pin to operate, otherwise it will cause the module to power on again lead to fail to shutdown.	

2.4 Set module function：+CFUN

Description	This command is to select functions of module by setting <fun>. Only some

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	values of <fun> are allowed.	
Format	● AT+CFUN=<fun> ● AT+CFUN?	
Syntax	<fun>: Optional functions may be: 0: minimum functionality meaning switch off of the MS 1: full functionality meaning start up MS (from offline mode) 4: disable phone both transmit and receive RF circuits (Airplane mode) (GFS21 line and higher) 6: enables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card 7: disables the SIM-toolkit interface and enables fetching of proactive commands by SIM-APPL from the SIM-card 8: disable fetching of proactive commands by SIM-APPL from the SIM-card 15: silent reset (reset MS without resetting the SIM). 16: reset (reset MS with resetting the SIM).	
Response	+CFUN: <power_mode>,<STK_mode> ● <power_mode> The value may be: 1: MS is switched on 2: invalid mode 17: airplane mode ● <STK_mode> The value may be: 0: inactive state 6: enables the SIM-toolkit interface and fetching of proactive commands by SIM-APPL from the SIM-card 7: disables the SIM-toolkit interface and enables fetching of proactive commands by SIM-APPL from the SIM-card 8: disable fetching of proactive commands by SIM-APPL from the SIM-card	
Example	AT+CFUN=1 OK	
	AT+CFUN=1 CME ERROR:<error>	
	AT+CFUN? +CFUN: 1, 0 OK	
NOTE	if the syntaxes +CFUN=0,+CFUN=15 or +CFUN=16 are used, the rest of the command line, placed after that, will be ignored.	

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2.5 Low-power set：+enpwrsave

Description	This command is to set allow the module to enter into power save mode or not.	
Format	● at+enpwrsave=<n> ● at+enpwrsave?	
Syntax	<n>： 0：not allow to enter into power save mode 1：allow to enter into power save mode	
Response	See the example below.	
Example	at+enpwrsave=1 OK	
	at+enpwrsave=1 CME ERROR：<error>	
	at+enpwrsave? +ENPWRSAVE：1 OK	
NOTE	1) the values of <n> are not save when power off 2)after enabling power save mode, the external should drive the DTR signal to low Level and all circuits inside the module are allowed to enter power save mode. At this time, the module can be entered into power save mode.	

2.6 Clock：+CCLK

Description	This set command sets the real-time clock of the module.	
Format	● AT+CCLK=<time> ● AT+CCLK?	
Syntax	< time >： string type value; format is "yy/MM/dd,hh:mm:ss+TZ", wherein characters indicate year, month, day, hour, minute and second. TZ：2 digits number indicates the time difference between local time and GMT. This information is optional, only if when the network supports the information could display.	
Response	See the example below.	
Example	AT+CCLK="08/07/01,14：54：01" OK	
	AT+CCLK="08/07/01,14：54：01" CME ERROR：<error>	
	AT+CCLK? +CCLK："08/07/01,14：54：10"	

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	OK	
NOTE		

2.7 Set the module's baud rate：+IPR

Description	This command is to set the module's baud rate.	
Format	● AT+IPR=<baud rate> ● AT+IPR?	
Syntax	< baud rate >： （2400,4800,9600,14400,19200,28800,38400,57600,115200,230400,460800）	
Response	See the example below.	
Example	AT+IPR=115200 OK	
	AT+IPR=115200 CME ERROR：<error>	
	AT+IPR? +IPR:115200 OK	
NOTE	1、The default baud rate is 115200； 2、The baud rate settings could be saved and no need to reset.	

2.8 Input PIN code：+CPIN

Description	This command is to check PIN status and input PIN code.	
Format	● AT+CPIN=<pin>[,<newpin>] ● AT+CPIN?	
Syntax	<pin>： <newpin> is a string type value.	
Response	+CPIN：<code> ● < code > This value may be： -READY：no need to input any passwords -SIM PIN：need to input PIN code -SIM PUK：need to input PUK code -SIM PIN2：need to input PIN2 code -SIM PUK2：need to input PUK2 code	
Example	AT+COPS=0 ERROR	

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	AT+CPIN="0933" OK AT+COPS=0 OK	
	AT+CPIN? +CPIN:READY OK	
NOTE	Input correct PIN code before using the module, or the module does not work and response ERROR. When inputing PUN or PUK2, it must set up a new PIN code, the new PIN code will replace the old one.	

2.9 PIN enable and check function：+CLCK

Description	This command is to lock, unlock and check MT and network device.
Format	● AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]
Syntax	< fac >： "OI"：outgoing international calls； "AI"：all incoming calls； "IR"：all incoming calls when roaming outside local place； "SC"：SIM card； "AO"：outgoing calls； "OX"：outgoing international calls except local place； "AB"：all call services； "AG"：all outgoing call services； "AC"：all incoming call services； "FD"：SIM card fix dialing memory feature； "PS"：PH-SIM（lock phone to SIM-card）； "PN"：network personalisation； "PU"：network subsystem personalisation； "PP"：service provider personalisation； "PC"：corporate personalization. <mode>： 0：unlock； 1：lock； 2：check status. <passwd>： Password or operation code, string type. <class>： 1：voice 2：data

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	4：fax 8：SMS 16：data circuit sync 32：data circuit async 64：dedicated package access 128：dedicated PAD access	
Response	See the example below.	
Example	AT+CLCK="SC",1,"0933" OK	
	AT+CLCK="SC",1,"0933" CME ERROR：<error>	
NOTE		

2.10 PIN change the password：+CPWD

Description	**This command is to modify the lock password of the module.**	
Format	● AT+CPWD=<fac>,<oldpwd>,<newpwd>	
Syntax	< fac >： "OI"：outgoing international calls; "AI"：all incoming calls; "IR"：all incoming calls when roaming outside local place; "SC"：SIM card; "AO"：outgoing calls; "OX"：outgoing international calls except local place; "AB"：all call services; "AG"：all outgoing call services; "AC"：all incoming call services; "FD"：SIM card fix dialing memory feature; "PS"：PH-SIM（lock phone to SIM-card）; "PN"：network personalisation; "PU"：network subsystem personalisation; "PP"：service provider personalisation; "PC"：corporate personalization. <oldpwd>： Old password or operation code, string type. <newpwd>： New password or operation code, string type.	
Response	See the example below.	
Example	AT+CPWD="SC","0933","0934" OK	
	AT+CPWD="SC","0933","0934"	

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	CME ERROR：<error>	
NOTE		

2.11 Parity check：+ICF

Description	**This command is to set the parity of the module.**	
Format	● AT+ICF=[<format>[,<parity>]] ● AT+ICF?	
Syntax	<format>: 0：auto detect 1：8 data 2 stop 2：8 data 1 parity 1 stop 3：8 data 1 stop 4：7 data 2 stop 5：7 data 1 parity 1 stop 6：7 data 1 stop <parity>: 0：odd 1：even 2：mark 3：space	
Response	See the example below.	
Example	AT+ICF=3,1 OK	
	AT+ICF=3,1 CME ERROR: <error>	
	AT+ICF? +ICF:3,1	
NOTE		

2.12 Multiplexed mode：+CMUX

Description	**This command is to enable the multiplexed protocol control channel defined by GSM07.10. This AT command set the value of control channel. If there is no value input, the default value will take effect. If not supporting automatic baud rate, the user-specified baud rate will take effect. Return code OK or CME ERROR: <error> will return as old interface baud rate, the new set value will take effect only when OK has been sent. If using +CMUX command when the serial is multiplexed, it will return an error code CME_ERROR: operation**

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	not allowed.
Format	● AT+CMUX=<mode>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>[,<T3>[,<k>]]]]]]]
Syntax	<mode>(multiplexer Transparency Mechanism)： 0：Basic option 1：Adcanced option（not support currently） <subset>：this value defined the setting method of the multiplexed control channel. Then a virtual channel will be set, its setting value will be set in accordance with <subset> of control channel before the negociation that how to set the value of virtual channel. 0：UIH frames used only 1：UI frames used only（Not support at present.） 2：I frames used only（Not support at present.） Default value：0 <port_speed>：(transfer rate）Not support any longer，it will response 0 all the time when reading the command. 1：9600 bit/s 2：19200 bit/s 3：38400 bit/s 4：57600 bit/s 5：115200 bit/s 6：230400 bit/s 7：1 Mbit/s（default value） <N1>（the maximum length of frame） 1～32768；at present only support the setting range from 1 to1509. Default value：31（if using Advanced option，the default value should be 64） <T1>（acknowledgement timer，10ms per unit） 1~255，the default value is 10（100ms） <N2>）（the maximum times of re-transfer） 0～100，the default value is 3。At present it only supports value 0～5。 <T2>（respone timer for multiplexer control channel，10ms per unit） 2~255,the default value is 30（300ms） NOTE：T2 must be bigger than T1. <T3>（wake up repone timer，'s' as the unit） 1～255，the default value is 10。Not support at present, response value 0 when reading the command. <k>（window size，to the error-recovery options to do Adcanced operation） 1~7,default value is 2。Not support at present, response value 0 when reading the command.
Response	OK or CME ERROR: <error> or

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	+CMUX: <mode>,[<subset>],,<N1>,<T1>,<N2>,<T2>,<T3>[,<k>]	
Example	AT+CMUX OK	
	AT+CMUX CME ERROR: <error>	
	AT+CMUX? +CMUX: 0,0,0,0,0,0,0,0 OK	Read the command
NOTE		

2.13 Extended ERROR report：+CEER

Description	**After implementing this command, it will return one or more lines of information text <report>. The specific number of rows is determined by the ME manufacturer.**	
Format	● AT+CEER	
Syntax	NULL	
Response	+CMER:<report> ● <report>： ME manufacturer supplies extended reports to TA users with the following reasons: The latest call setup failure(initiation or response) or change in calls; The latest call release; The latest GPRS attach failure or PDP Context Activation; The latest GPRS sepatation or PDP Context dis-activation.	
Example	AT+CEER +CEER: "No report available" OK	
	AT+CEER +CEER:"CC release",16,"Normal call clearing" OK	
NOTE	Inculuding the line terminator, the information text includes at most 2041 characters.	

2.14 Set Error indication message：+CMEE

Description	**This command is to set to disable or enable +CME ERROR: <err> result code**
Format	● AT+CMEE=[<n>]

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	● AT+CMEE?	
Syntax	<n>： Get value： 0：disable result code +CME ERROR:<err>， use ERROR，no need to input 0; 1：enable result code +CME ERROR:<err>，use numeric <err> to get value; 2：enable result code +CME ERROR: <err>，use lengthy <err> to get value.	
Response	See the example below.	
Example	AT+CMEE= OK	Equal to AT+CMEE=0 ATD ERROR
	AT+CMEE=1 OK	ATD +CME ERROR: 3
	AT+CMEE=2 OK	ATD +CME ERROR: operation not allowed
	AT+CMEE? +CMEE: 2 OK	
NOTE	When debugging, it is suggested to set AT+CMEE=2。	

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3 Network services commands

3.1 Signal intensity：+CSQ

<table>
<tr><th>Description</th><th>This command is to check the receiving signal intensity <rssi> and the channel bit error rate <ber></th></tr>
<tr><td>Format</td><td>● AT+CSQ</td></tr>
<tr><td>Syntax</td><td>NULL</td></tr>
<tr><td>Response</td><td>+CSQ:<rssi>,<ber>
● < rssi >
The following is the 'signal'（CSQ）to rssi：
<table>
<tr><td></td><td>signal</td><td>rssi</td></tr>
<tr><td>0</td><td><4 or 99</td><td><-107 dBm or unknown</td></tr>
<tr><td>1</td><td><10</td><td><-93dBm</td></tr>
<tr><td>2</td><td><16</td><td><-71 dBm</td></tr>
<tr><td>3</td><td><22</td><td><-69dBm</td></tr>
<tr><td>4</td><td><28</td><td><-57dBm</td></tr>
<tr><td>5</td><td>>=28</td><td>>=-57 dBm</td></tr>
</table>
● <ber>
<table>
<tr><td>0...7</td><td>Reference on the value of RXQUAL in Table GSM 05.08 8.2.4</td></tr>
<tr><td>99</td><td>Bit error rate can not be measured</td></tr>
</table></td></tr>
<tr><td rowspan="2">Example</td><td>AT+CSQ
+CSQ:27,0

OK</td><td></td></tr>
<tr><td>AT+CSQ
CME ERROR:<error></td><td></td></tr>
<tr><td>NOTE</td><td>Formula：RSSI(dBm) = -113 + 2CSQ.</td></tr>
</table>

3.2 Network selection：+COPS

<table>
<tr><th>Description</th><th>This command is to select and register GSM network</th></tr>
<tr><td>Format</td><td>● AT+COPS=[<mode>[,<format>[,<oper>>[,<AcT>]]]]
● AT+COPS?</td></tr>
<tr><td>Syntax</td><td><mode>：
To select whether the selection is done automatically or is forced by this command to operator <oper> given in the format <format> and may be:
-0: automatic (<per> is ignored)</td></tr>
</table>

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	-1: manual -2: deregister from the network -3: set only <format> -4: manual/ automatic (if manual selection fails, automatic mode is entered) <format> -0: long alphanumeric <oper> (default value) -1: short format alphanumeric <oper> -2: numeric <oper> <oper> string type given in format <format>; this field may be up to 16 characters long for long alphanumeric format, up to 8 characters for short alphanumeric format and 5 characters long for numeric format (MCC/MNC). <AcT> indicates the radio access technology and may be: -0: GSM -1: GSM compact -2: UTRAN	
Response	● <stat> -0: unknown network -1: available network -2: current network -3: forbidden network	
Example	AT+COPS=0,0 OK	
	AT+COPS=0,2 OK	Set to digital mode
	AT+COPS? +COPS：0,0, "CHINA MOBILE" OK or AT+COPS? +COPS:0,0, "**46000**" OK	Query the network operator China Mobile If it is set to digital mode, then get the number 46000
	AT+COPS? +COPS: 0,0,"CHINA UNICOM" OK or AT+COPS? +COPS:0,0, "**46001**" OK	Query the network operator China Unicom If it is set to digital mode, then get the number 46000

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NOTE	1：in the read syntax the parameter <AcT> is displayed only if UMTS is supported in the terminal. 2：if GSM/UMTS dual mode is selected and manual mode is selected, the <AcT> parameter is used to indicate the access technology for the manual attach procedure. 3：in case of automatic mode, the <AcT> parameter will be ignored.

3.3 Set Band：+XBANDSEL

Description	**Set GPRS module band**	
Format	AT+XBANDSEL=<Band900M>[,<Band1800M>] AT+XBANDSEL？	
Syntax	<Band900M>: 900M band,the value is 900 <Band1800M>：1800M band，the value is 1800	
Response		
Example	AT+XBANDSEL=900 OK AT+XBANDSEL？ +XBANDSEL: 900 OK	Forcibly set to 900M Query frequency
	AT+XBANDSEL=1800 OK	Forcibly set to 1800M
	AT+XBANDSEL=900,1800 OK	Set to the default mode, 900M and 1800M automatic switching mode
	AT+XBANDSEL？ +XBANDSEL: 900,1800 OK	Query frequency
NOTE	1）After setting this instruction,web registration will be canceled, then needed to re-register by setting the AT+COPS=0,0 2）Slightly longer response time of AT+COPS=0,0	

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4 SMS service commands

4.1 Choose SMS service：+CSMS

Description	**This command is to support SMS, include：sending（SMS-MO）、receiving（SMS-MT）、cell broadcast(SMS-CB)**	
Format	● AT+CSMS=<service> ● AT+CSMS?	
Syntax	<service>： 0：GSM03.40 and GSM03.41；SMS related AT commands support GSM07.05 Phase 2； 1：GSM03.40 and GSM03.41；SMS related AT commands support GSM07.05 Phase 2+ <mt>,<mo>,<bm>： 0：not support 1：support	
Response	See the example below.	
Example	AT+CSMS=1 +CSMS:1,1,1 OK or CME ERROR：<error>	+CSMS:<mt>,<mo>,<bm> OK or CMS ERROR: <error>
	AT+CSMS? +CSMS:1,1,1,1 OK	 +CSMS:<service>,<mt>,<mo>,<bm> OK
NOTE		

4.2 Primary SMS storage：+CPMS

Description	**This command is to choose primary message storage.**
Format	● AT+CPMS=<mem1>[,<mem2[,<mem3>]] ● AT+CPMS?
Syntax	<mem1>：“SM”SIM card is used to read and delete message storage. <mem2>：“SM”SIM card is used to write and send message storage. <mem3>：“SM” SIM card message storage used when SM is not set to save to PC. <used>：used numbers。 <total>：total storage capacity numbers.
Response	AT+CPMS: <used1>,total1>,<used2>,<total2>,<used 3>,<total3>

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	OK or CMS ERROR: <error> +CPMS: <mem1>,<used1>,total1>,<mem2>,<use d2>,<total2>,<mem3>,<used3>,<total3> OK or CMS ERROR: <error>	
Example	AT+CPMS="SM","SM","BM" +CPMS:49,50,49,50,50,50 OK	
	AT+CPMS="SM","SM","BM" CME ERROR：<error>	
	AT+CPMS? +CPMS:"SM",49,50,"SM",49, 50,"BM",0,5 OK	
NOTE		

4.3 Set SMS mode：+CMGF

Description	This command is to set SMS input mode.	
Format	● AT+CMGF=[<mode>] ● AT+ CMGF?	
Syntax	<mode>： 0: PDU mode 1: text mode	
Response	See the example below.	
Example	AT+CMGF=1 OK	
	AT+CMGF=1 CME ERROR：<error>	
	AT+ CMGF? +CMGF:0 OK	
NOTE	If sending PDU SMS, the code should be set to UCS2; if sending text SMS, the code should be set to GSM.	

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4.4 Set TE character sets: +CSCS

Description	**This command is to set TE character set.**
Format	● AT+CSCS=<chset> ● AT+ CSCS?
Syntax	< chset >: 1、 "GSM": GSM default alphabet (GSM03.38.6.2.1) 2、 "HEX": character strings consist only of hexadecimal numbers from 00 to FF; e.g. "032FE6" equals three 8-bit characters with decimal values 3, 47 and 230; no conversions to the original MT character set shall be done 3、 "IRA": international reference alphabet.(ITU-T T.50). 4、 "PCCP437": PC character set Code Page 437 5、 "8859-1": ISO 8859 Latin 1 character set 6、 "UCS2": 16-bit universal multiple-octet coded character set (USO/IEC10646); UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF. Only the strings found in quotation marks are UCS2 coded, the rest of commands or responses, remains in IRA alphabet.
Response	See the example below.
Example	AT+CSCS="GSM" OK
	AT+CSCS="GSM" CME ERROR: <error>
	AT+ CSCS? +CSCS: "GSM" OK
NOTE	

4.5 Set message indication Format: + CNMI

Description	**This command is to set how to inform the user after receiving new message from the network.**
Format	● AT+CNMI=[<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]] ● AT+CNMI?
Syntax	<mode>: set indication mode of sending to subscriber after receiving short message 0: message indication mode cashed in module, if TA has been full, code can be deposited other place or brush off the oldest code and replace it by the latest receiving code. 1: under On-line State, brush off deposited message indication code and reject new indication code. In other conditions, display the code on terminal equipment

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	directly. 2: under On-line State, message indication code is cashed in module. When processing released, output indication code through serial port. Under its state, display indication code on terminal equipment directly. <mt>: set new message indication code mode, default value is 0. 0: not sending new message indication code. 1: new message indication code mode is +CMTI: "MT", <index>, the message content storaged and don't display directly. 2: new message indication code mode is +CMT: <oa>, <scts>,<tooa>,<lang>,<encod>,<priority> [,<cbn>],<length><CR><LF><data>,message content display directly but not storaged. <bm>: set new cell broadcast indication code mode, default value is 1. 0: not sending new cell broadcast indication information, not storaged. 1: new cell broadcast indication code is +CBMI: "BC", <index>, cell broadcast is storaged. 2: new cell broadcast indication code mode is +CBM: <oa>,[<alphab>,]<scts>[,<tooa>,<length>] <CR><LF><data>, cell broadcast content display directly but not storaged. <ds>: message sending condition report, default value is 1. 0: no message sending condition report 1: message sending condition report code mode is +CDS:<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>, <st> (text mode)， cell broadcast content display directly but not storaged. <bfr>: default value is 0. 0: When <mode>=1 or 3, the code this command difinited which is storaged in TA will be sended to TE, the module will return to OK before processing the code. 1: when <mode>=1or 3, the code this command definited which is storaged in TA will be cleared.	
Response	See the example below.	
Example	AT+CNMI=2,1,0,0,0 OK	
	AT+CNMI=1,1,0,0,0 CME ERROR：<error>	
	AT+CNMI? +CNMI:2,1,0,0,0 OK	+CNMI=<mode>,<mt>,<bm>,<ds>,<bfr> OK
NOTE	Suggested to set to +CNMI: 2,1,0,0,0 or +CNMI: 2,2,0,0,0.	

4.6 Read message：+CMGR

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Description	This command is to read message in current storage (need to set current storage by AT+CPMS in advance)
Format	● AT+CMGR=<index>
Syntax	<index>： Get value in range of 0～400。
Response	Return format: Terminal adapter will return the records numbered "index" short message stored in the memory mem1. ➢ If you select text mode (+ CMGF =1), returned the following format: +CMGR :<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF> <data> (Used to read the received message) +CMGR :<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]<CR><LF> <data> (Used to read the sended message) ➢ If you select PDU mode (+ CMGF =0), returned the following format: +CMGR: <stat>,[<alpha>],<lenth>,<CR>,<LF>,<pdu> OK - Error will be prompted to： +CMS ERROR:<err> Specific parameters have the following meanings： <alpha>：corresponding name of <da> or <oa> with terminal equipment. <stat>：Memory in the short message status. <oa>：SMS source number string. <da>：SMS destination address string. <scts>：Short Message Service Center time string. <lenth>：Text mode instructions <data> body length; When the PDU mode indicates the number of bytes PDU. <pdu>：ME/TA hexadecimal value. <stat>: 0 in PDU mode or "REC UNREAD"in text mode: received unread SMS 1 in PDU mode or "REC READ" in text mode: received read SMS 2 in PDU mode or "STO UNSENT"in text mode: stored unsent SMS 3 in PDU mode or ""STO SENT"in text mode: stored sent SMS 4 in PDU mode or "ALL" in text mode: all SMS's
Example	AT+CMGR=3 +CMGR:0,,154 0891683108705505F00405A10180F600088070629034302 38A5C0A656C768451687403901A5BA262 37FF1A537365E58D7779EF5206554657CE201C59658FD0793C54C1300159658FD06F1451FA5B63201D727960E051516362FF014E3A59658FD052A06CB9FF0100680074007400700003A002F002F006A0066002E006300680069006E0061006D006F00620069006C0065002E0063006F006D30024E2D56FD79FB52A8

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	OK	
	AT+CMGR=3 CMS ERROR：<error>	
NOTE	When the coding method is UCS2 and readingthe message, it will display in hexadecimal; when the coding method is GSM, the messages with the contents of letters or numbers could be directly read.	

4.7 Message list：+CMGL

Description	**This command is to read a certain type of short messages in the storage. The message will be read in the current storage selected by +CPMS command.**
Format	● AT+CMGL[=<stat>]
Syntax	<stat>： 0 ("REC UNREAD")：received unread SMS 1（"REC READ"）： received read SMS 2（"STO UNSENT"）： stored unsent SMS 3（"STO SENT"）： stored sent SMS 4（"ALL"）：all SMS
Response	1) Text mode： +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 / sent SMS list) OK 2)PDU mode: +CMGL:<index>,<stat>,[<alpha>],<length><CR><LF><pdu>
Example	AT+CMGL="ALL" +CMGL：1,"RECREAD","10086","","08/07/26,09：43：03+50" 5C0A656C768451687403901A5BA26237FF1A537365E58 D7779EF5206554657CE201C59658FD0793C54C1300159 658FD06F1451FA5B63201D727960E051516362FF014E3 A59658FD052A06CB9FF0100680074007400700003A002F 002F006A0066002E006300680069006E0061006D006F00 620069006C0065002E0063006F006D30024E2D56FD79F B52A8 OK
NOTE	The function of AT+CMGL="ALL" and AT+CMGL=4 are the same.

4.8 Message sending：+CMGS

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Description	**This command is to send message from the module to network, the network will response reference value <mr> to the module after sending successfully.**	
Format	● Command syntax(text mode)：AT+CMGS=<da><CR><text><ctrl-Z/ESC> ● Command syntax (PDU mode)：AT +CMGS=<length><CR><pdu><ctrl-Z/ESC>	
Syntax	<da>： Send message to target number in text mode <text>： Message content in text mode <length>： The length of message content digits in PDU mode. <mr>： Storage location <CR> ： End character. <ctrl-Z> ： Indicate the end of the message input. <ESC> ： Give up to input message.	
Response	+CMGS: <mr> OK or CMS ERROR: <error>	
Example	AT+CMGS="0171112233"<CR> "This is the text"<ctrl-Z> +CMGS:248 OK	Text mode(+CMGF=1)
	AT+CMGS="0171112233"<CR> "This is the text"<ctrl-Z> CMS ERROR：<error>	Text mode(+CMGF=1)
	AT+CMGS=41<CR> > 0891683108705505F001000B815118585050F40008 1C 6DF157335E02670965B979D16280002D0047005000520 0536A215757<Ctrl+Z> > +CMGS: 7 OK	PDU mode (+CMGF=0)
	AT+CMGS=31<CR> > 0891683108705505F001000B813124248536F30008120040002 6002A535A53D153A653C1532052C7<Ctrl+Z>	PDU mode (+CMGF=0)

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	CMS ERROR: <error>	
NOTE		

4.9 Write message：+CMGW

Description	This command is to input messages to the storage, response location information <index> after saving correctly.	
Format	● Command syntax(text mode)：AT+CMGW=<da><CR><text><ctrl-Z/ESC> ● Command syntax(PDU mode)：AT +CMGS=<length><CR><pdu><ctrl-Z/ESC>	
Syntax	<da>： Send message to target number in text mode. <text>： Message content in text mode <length>： The length of message content digits in PDU mode. <mr>： Storage location <CR> ： End character. <ctrl-Z> ： Indicate the end of the message input. <ESC> ： Give up to input message.	
Response	+CMGW:<index> OK or +CMS ERROR:<err>	
Example	AT+CMGW="091137880"<CR> "This is the text"<Ctrl-Z> +CMGW:15 OK	Text mode（+CMGF=1）
	AT+CMGW="091137880"<CR> "This is the text"<Ctrl-Z> +CMS ERROR：<err>	Text mode（+CMGF=1）
	AT+CMGW=31,<CR>0891683108705505F001000B813124248536F3000812004000260 02A535A53D153A653C1532052C7<Ctrl- Z> +CMGW:1	PDU mode (+CMGF=0)

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	OK	
	AT+CMGW=31,<CR>0891683108705505F001000 B813124248536F3000812004000260 02A535A53D 153A653C1532052C7<Ctrl- Z> +CMS ERROR：<err>	PDU mode (+CMGF=0)
NOTE	Index value from 1 to n are used for 'ME' and from n+1 to n+m are used for 'SM'.	

4.10 Send stored message：+CMSS

Description	**This command is to send essages with location value <index> from the memory storage (SMS-SUBMIT). Reference value <mr> is returned to the terminal after sending the message successfully.**	
Format	● AT+CMSS=<index>	
Syntax	NULL	
Response	See the example below.	
Example	AT+CMSS=2 +CMSS:<mr> OK	Send messages stored in Memory 2
	AT+CMSS=2 CME ERROR：<err>	Send messages stored in Memory 2
NOTE		

4.11 Delete message：+CMGD

Description	**This command is to delete messages from the current storage.**	
Format	● AT+CMGD=<index> [,<delflag>]	
Syntax	<index>： Record number of stored message. <delflag>： Delete flag 0：delete the message specified record number. 1：delete all read message 2：delete all read and sent message 3：delete all read, sent and unsent message 4：delete all messages	
Response	See the example below.	
Example	AT+CMGD=3 OK	Delete the third message
	AT+CMGD=3	Delete the third message

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	CME ERROR：<error>	
NOTE	If this command catches <delflag> parameter, parameter <index> is insignificant, subject to parameter <delflag>.	

4.12 Service center address：+CSCA

Description	**This command is to set the service center address.**
Format	● AT+CSCA=<sca>[,<tosca>] ● AT+CSCA?
Syntax	<sca>： Service center address. <tosca>： Service center address Format. 129 indicates normal number type, 145 indicats international number type (automatically add "+" before the number).
Response	See the example below.
Example	AT+CSCA="0170111000",129 OK
	AT+CSCA="0170111000",129 CME ERROR：<error>
	AT+CSCA? +CSCA:"0170111000",129 OK
NOTE	General operators are pre-configured the SIM card message center number, do not need to set

4.13 Set Text Mode Parameters: +CSMP

Description	**In text mode, select the additional parameter values; set the validity from the moment when received the message from SMSC or definite the absolute time of the termination fo the validity.**
Format	● AT+CSMP=[<fo>[,<vp>[,<pid>[,<dcs>]]]] ● AT+CSMP?
Syntax	<fo>： Depends on the command or result code: the first 8 digits of GSM 03.40 SMS-DELIVER; SMS-SUBMIT (default value is 17); or use integer type SMS-COMMAND (default value is 2). <vp>：

value	Effective time
0-143	(vp+1)*5 minutes
144-167	12 hours+((vp–143)*30

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	<table><tr><td></td><td>minutes)</td></tr><tr><td>168-196</td><td>(vp–166)*1 day</td></tr><tr><td>197-255</td><td>(vp–192)*1 week</td></tr></table><pid>：integer type TP-protocol-ID (default value is 0). <dcs>：integer type cell broadcasting data coding program 0.	
Response	See the example below.	
Example	AT+CSMP=17,167,0,0 OK	
	AT+CSMP? +CSMP:17,167,0,0 OK	
NOTE		

4.14 Display text mode parameter：+CSDH

Description	**This command is to set to display detailed head message or not in result code under text mode**	
Format	● AT+CSDH=[<show>] ● AT+CSDH?	
Syntax	<show>： Get value： 0: not display <sca>、<tosca>、<fo>、<vp>、<pid> and <dcs> (get value from the command +CSCA and +CSMP) in commands +CMT,+CMGL,+CMGR, neither display <length>、<toda> or <tooa> in the result code of SMS-DELIVER and SMS-SUBMIT; to SMS-COMMAND in the result code of +CMGR, not display <pid>、<mn>、<da>、<toda>、<length> <cdata>: no need to input value 0. 1：display these values in result code.	
Response	See the example below.	
Example	AT+CSDH= OK	Equal to AT+CSDH=0 AT+CMGR=14 +CMGR: "REC READ","+86134309815 04","","09/07/17,14:49:00+50" 7B5675655FAE5C0F65F65019 OK
	AT+CSDH=1 OK	AT+CMGR=14 +CMGR: "REC

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		READ","+86134309815 04","","09/07/17,14:49:00+50",145,4,0 ,8,"+8613800755500",145,12 7B5675655FAE5C0F65F65019 OK
	AT+CSDH? +CSDH:0 OK	
NOTE		

4.15 Choose cell broadcast message type：+CSCB

Description	This command is to set CBM type ME received	
Format	● AT+CSCB=[<mode>[,<mids>[,<dcss>]]]	
Syntax	<mode>： Get value： 0：accept the message type specified by <mids> and <dcss>, no need to input value 0； 1：not accept the message type specified by <mids> and <dcss>. <mids>： Chatacter type（eg: 0,1,5,320～478,922）；the combination of all possible CBM message ID（please reference <mid>）. <dcss>： Charater type（eg：0～3,5）； the combination of all possible CBM data coding program（please reference <dcs>）（the default value is empty chatater string）.	
Response	See the example below.	
Example	AT+CSCB=0,"1,5,10-11,40","" OK	
	AT+CSCB? +CSCB:0,"1,5,10-11,40","" OK	
NOTE	If <mode>=0 and <mids> is an empty charater string, it could not accept CB SMS.	

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5 TELEPHONE BOOK COMMANDS

5.1 CHOOSE PHONE BOOK STORAGE:+CPBS

Description	**This command is to choose phone book storage.**	
Format	● AT+CPBS=<storage> ● AT+CPBS?	
Syntax	<storage>: "SM":SIM card storage "FD":SIM card fixed phone book storage "LD":SIM card the last dial-out number "ON":locate number storage	
Response	+CPBS:<storage>[,<used>,<total>]<mode> <used> The used capability which in choosed storage <total> The total capability of choosed storage	
Example	AT+CPBS="SM" OK	Choosethe the phone book storage is "SM"
	AT+CPBS="SM" CME ERROR:<error>	Choose the phone book storage is "SM"
	AT+CPBS? +CPBS:"SM",71,200 OK	Check the phone book storage and total capbility
NOTE		

5.2 READ PHONE BOOK:+CPBR

Description	**This command is to read the information of phone book.**
Format	● AT+CPBR=<index 1>[,<index 2>]
Syntax	<index 1>: Integer type,phone book record nember <index 2>: Integer type,phone book record nember
Response	[+CPBR:<lindex 1>,<number>,<type>,<text><CR> +CPBR:<index 2>,<number>,<type>,<text>] <number>: Character string type, phone number. <type>:

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	Integer type,phone number type. <text>: Character string type, names. <nlength>: Integer type, indicate the maximum length of phone number. <tlength>: Integer,indicate names and maximum length.	
Example	AT+CPBR=1,3 +CPBR:1,"091137880",129,"Comneon" +CPBR:2,"09113788223",129,"MMI" +CPBR:3""09113788328",129,"Test-ro" OK	Read the phone book record of number 1/2/3
	AT+CPBR=1,3 CME ERROR:<error>	Read the phone book record of numbered 1/2/3
NOTE		

5.3 FIND PHONE BOOK:+CPBF

Description	**This command is to find the information of phone book.**	
Format	● AT+CPBF=<findtext>	
Syntax	<findtext>: Character string type, indicate names.	
Response	+CPBF:<index 1>,<number>,<type>,<text> ● <nlength> Integer type, indicate the maximum length of phone number. ● <tlength> Integer, indicate names and maximum length.	
Example	AT+CPBF="Comneon" +CPBF:1,"091137880",129,"Comneon" OK	Read the phone book information of named Comneon
	AT+CPBF="Comneon" CME ERROR:<error>	Read the phone book information of named Comneon
NOTE	AT+CPBF=""It will shows all the phone book record of current storage	

5.4 WRITE PHONE BOOK:+CPBW

Description	**This command is to write the information in phone book.**
Format	● AT+CPBW=<index>,<number>,<type>,<text>
Syntax	<index>:

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	Integer type, the numbers which phone book records. <number>: Character string type,phone numbers. <type>: Integer type,the type of phone numbers. <text>: Character string,names.	
Response	+CPBR:(list if supported <index>s),[<nlength>],(list of supported<type>s),[<tlength>] <nlength>: Integer type,indicate the maximum length of phone numbers. <tlength>: Integer,indicate names and maximum length.	
Example	AT+CPBW=1,"091137880",129,"Comneon" OK	Write phone book record of named Comneon
	AT+CPBW=1,"091137880",129,"Comneon" CME ERROR:<error>	Write phone book record of named Comneon
NOTE	Need to pre-set TE character set,or the name of input will fail.	

5.5 GAIN NATIVE NUMBER:+CNUM

Description	**This command is to find the information of phone book.**	
Format	● AT+CNUM	
Syntax	<alphax>:it can choose the character srting which is relate to <numberx>,+CSCS set the available character set <numberx>:character string type of phone number,number type ensured by<typex> <typex>:number type(129 or 145)	
Response	+CNUM:[<alphal>],<number 1>,<type 1> OK Or CME ERROR:<error>	
Example	AT+CPBS="ON" OK	Choose phone book storage is ON
	AT+CPBS="ON" CME ERROR:<error>	
	AT+CPBW=1,"11111111111",129,"CCH" OK	Write phone recore in "ON" storage
	AT+CPBW=1,"11111111111",129,"CCH" CEM ERROR:<error>	

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	AT+CNUM +CNUM:"CCH","11111111111",129 OK	Check native number
NOTE	1、This command is to check mobile user international number (ISDN). 2、If there are various international number on terminals,each type international number will shows in different lines. 3、Native number need to through AT+CPBS="ON";AT+CPBW connmad write in SIM card, then reads by AT+CNUM.	

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6 SUPPLEMENTARY SERVICE COMMANDS

6.1 CALL DIVERTING:+CCFC

Description	This command is to set confition and number for call diverting.	
Format	● AT+CCFC=<findtext>	
Syntax	<reason>: 0: Unconditional divert (CFU) 1: When busy divert (CFB) 2: Not reply divert (CFNA) 3: Not reachable 4: All call diverting 5: All conditional call diverting <mode>: 0: Forbid 1: Enable 2: Check status 3: Registere 4: Delete <number> Phone number	
Response	See the example below.	
Example	AT+CCFC=0,"123456" OK	Set unconditional divert,divert to number 123456.
NOTE	SIM card need to activate supplementary service.	

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6.2 CALL WAITING:+CCWA

Description	This command is to control call waiting.
Format	● AT+CCWA=<n>,<mode> ● AT+CCWA?
Syntax	<n>: The third calling,if indicate+CCWA:return code 0: Not indicate 1: Indicate <mode>: Call waiting forbid/enable 0: Forbid 1: Enable 2: Check status

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Response	See the example below.	
Example	AT+CCWA=1,1 OK	Set call waiting,indicate +CCWA:return code
	AT+CCWA? +CCWA:0 OK	Currently n values 0
NOTE	SIM card need to activate supplementary service.	

6.3 CALL HOLD and THREE-WAY-CALL:+CHLD

Description	**This command is to realize call hold and three-way-call.**
Format	● AT+CHLD=<n>
Syntax	<n>: 0: Release all the holded call or set a waited call to UDUB(User Deteermined User Busy) 1: Release all the active call and reveive a holded or waited call; 2: Hold all the active call and receive a holded or waited call; 3: Add a holded call to three-way-call.
Response	See the example below.
Example	AT+CHLD=0 OK
NOTE	When releasing calls, AT + CHLD = 1 only release the currently active call, ATH release all calls. SIM card need to open additional business.

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7 GPRS commands

7.1 Set PDPFormat：+CGDCONT

Description	This command is to set GPRS PDP format.
Format	● AT+CGDCONT=<cid>,<type>,<APN>
Syntax	<cid>： To indicate PDP number, minimal value is 1. <type>： PDP packet type, IP: use TCP/IP package. <APN>： Visit network nodes tag.
Response	See the example below.
Example	China Mobile：AT+CGDCONT=1,"IP","CMNET" China Unicom：AT+CGDCONT=1,"IP","UNINET"
NOTE	

7.2 Send USSD data：+CUSD

Description	This command is to send USSD（Unstructured Supplementary Service Data）.
Format	● AT+CUSD=<n>,<str>,<dcs> ● AT+CUSD?
Syntax	<n>： -0：not display back code -1：display back code -2：cancel the request <str>： string type：USSD string，USSD string，please use ASCII code. <dcs>： integer type，it is suggesti to use 15.
Response	See the example below.
Example	AT+CUSD=1,"*100#",15 +CUSD：1," 5FEB4FE10031003000306B228FCE60A8000A0031 00560049005059278D609001000A0032670959567A DE731C002D6D7776D782395BFB5B9D000A00339 ED1624B515A6E17900F004600420049000A003465 E995F45FEB62A5000A00355A314E50604B5427000 A003680A179685F697968000A0037795D798F4E0B 8F7D000A00388D448D398BF4660E ",72

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	OK	
	AT+CUSD=1,"1",15 OK +CUSD : 1,"6210529F63A8835000354F4D4EB253CB514D8D 39988653D679FB52A8554657CE0056004900504F1 A5458670D52A1FF0C53736709673A4F1A8D6253D 60031003051438BDD8D39FF0C8BE689C16D3B52 A88BE660C5000A00317ACB537363A88350000A00 326D3B52A88BE660C5000A003351734E8E005600 490050000A00344E2D595667E58BE2000A00354E0 A67086D3B52A8516C544A000A003800388FD456D E",72	
	AT+CUSD? +CUSD:0 OK	
NOTE		

7.3 Data mode and AT mode switch settings：&D2

Description	This command is to set the switch between data mode and AT mode.	
Format	● AT&D2	
Syntax	NULL	
Response	See the example below.	
Example	AT&D2 OK	
NOTE	This command need to set before the module is connected to the network. Please following the steps below： （1）MODEM power on, then input **AT&D2** before inputing AT+CGDCONT and ATD*99#. （2）set APN, dial-up, then use '+++/ATO' regularly to switch between data mode and AT mode. （3）if you want to disconnect the data link, please switch to AT mode(use +++), then input **AT&D1,** and then switch back to data mode (use ATO)， use +++ command to quit from data mode normally. （4）to re-enter data mode and use +++/ATO command, please input **AT&D2** before dial-up. This command is only used in the external stack.	

7.4 Data mode switch to AT mode：+++

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Description	This command is to set the module switch data mode to AT mode.	
Format	● +++	
Syntax	NULL	
Response	See the example below.	
Example	+++ OK	
NOTE	This command is only used in the external stack.	

7.5 AT mode switched to data mode：O

Description	This command is to set the module switch AT mode to data mode.	
Format	● ATO	
Syntax	NULL	
Response	See the example below.	
Example	ATO CONNECT	
NOTE	This command is only used in the external stack.	

7.6 User Authentication: +XGAUTH

Description	PDP authentication	
Format	● AT+XGAUTH=<cid>,<auth>,<name>,<pwd> ● +XGAUTH:(<cid>s),(<auth>s),lname,lpwd	
Syntax	<cid> PDP context identifier <auth> authentication may be: - 0: meaning authentication protocol not used (NONE: see also 2.1 <APN>) - 1: meaning personal authentication protocol (PAP: see also 2.1 <APN>) - 2: meaning handshake authentication protocol (CHAP: see also 2.1 <APN>) <name> user name as string with length <lname> <pwd> password as string with maximum length <lpwd>	
Response	See the example below.	
Example	AT+XGAUTH=1,1,"gsm","1234"	OK or CME ERROR: <error>
	AT+XGAUTH=?	+XGAUTH: (1-255),(0-1),20,32 20：The maximum length of user name；32：The maximum length of password

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NOTE	1）This instruction should be placed behind the command AT + CGDCONT 2）Usually in the **private network** user authentication is required 3）**User name and password can not be empty, the default is "gsm", "1234"** 4）**Internal and external** protocol stack can use this instruction

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8 TCP/IP AT commands

8.1 Select internal or external protocol stack：+XISP

Description	This command is to select to use internal or external protocol stack.	
Format	● AT+XISP=<n> ● AT+XISP?	
Syntax	<n>： 0：use internal TCP/IP protocol stack 1：use external protocol stack (the default value of the software of the module)	
Response	See the example below.	
Example	AT+XISP=0 OK	Designated to use internal protocol stack
	AT+XISP? +XISP:0 OK	
NOTE	If using internal protocol stack, please set 'AT+XISP=0' in the single board software. The following TCP / IP instruction are for the internal protocol stack	

8.2 Establish PPP link：+XIIC

Description	This command is to establish PPP link.	
Format	● AT+XIIC=<n> ● AT+XIIC?	
Syntax	<n>：1	
Response	See the example below.	
Example	AT+XIIC=1 OK	Request the module to establish PPP link.
	AT+XIIC? **+XIIC: 1, 10.232.165.29** OK	Check the status of PPP link. 1) PPP link successfully, IP is 10.232.165.29. 2) There are four spaces before 1
	AT+XIIC? **+XIIC: 0, 0.0.0.0** OK	Check the status of PPP link: 1) PPP link fail and need check again. 2) There are four spaces before 0
NOTE	1、Before establish PPP link, please use command 'AT+CGDCONT' to set value APN. For example, to the network of China Mobile, we can use the following commands to set APN and other values: AT+CGDCONT=1,"IP","CMNET". 2、Please set AT+XISP=0 before set AT+CGDCONT.	

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	3、Before using AT+XIIC=1 to establish PPP link, please make sure the module has been registered on network. We can use AT+CREG? to confirm the module registered on the network or not. If response +CREG：0,1or +CREG：0,5, it means the module has been registered on the network.

8.3 Establish TCP link：+TCPSETUP

Description	**This command is to establish TCP link.**	
Format	● AT+TCPSETUP=<n>,<ip>,<port>	
Syntax	<n>： Link ID, only could be 0 or 1. <ip>： Target IP address must be input as xx.xx.xx.xx. <port>： Target port number must be decimal ASCII code.	
Response	See the example below.	
Example	AT+TCPSETUP=0,220.199.66.56,6800 OK +TCPSETUP:0,OK	Establish a connection to 220.199.66.56,6800 on Link 0, success.
	AT+TCPSETUP=1,192.168.20.6,7000 OK +TCPSETUP:0,FAIL	Establish a connection to 192.168.20.6,7000 on Link 1, failed.
	AT+TCPSETUP=2,192.168.20.6,7000 +TCPSETUP:Error 2	AT command Format: ERROR
NOTE	1、Before setting up a TCP link, you must ensure that the PPP link has been established, you can use command +XIIC to confirm. 2、After inputing AT command, if the command Format is correct, it will response OK immediately; if the command Format is not correct or the link has been in use, it will response +TCPSETUP：Error 2.	

8.4 Send TCP data：+TCPSEND

Description	**This command is to send TCP data.**	
Format	● AT+TCPSEND=<n>,<length>	
Syntax	<n>： Link ID, only could be 0 or 1 and this link has been already establish TCP link. <length>： The length of on-sent data, get value in range of 1-2000 bytes.	
Response	See the example below.	
Example	AT+TCPSEND=0,10	Send 10 bytes data on Link 0,

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	>1234567890 OK +TCPSEND:0,10	success.
	AT+TCPSEND=0,10 >1234567890 +TCPSEND:Error	Send 10 bytes data on Link 0, this link has not established, failed.
	AT+TCPSEND=0,536 >1234567890… +TCPSEND:Buffer not enough,439 ERROR	Send 536 bytes data on Link 0, the internal buffer is not enough, failed.
	AT+TCPSEND=0,2800 >1234567890… +TCPSEND:Data length error	Send 2800 bytes data on Link 0, exceed the limitation of the length, failed.
NOTE	1、Before sending TCP data, please ensure the TCP link has been established. **2、The sent data ends as 0x0d.** 3、Before sending data, please use AT+IPSTATUS to check the available size of buffer. 4、This command supports the input of binary data of non ASCII code.	

8.5 Receive TCP data：+TCPRECV

Description	**This command is to indicate the received TCP data.**	
Format	+TCPRECV:<n>,<length>,<data>	
Syntax	● <n>: Link ID, only could be 0 or 1. ● <length> Length of received data. ● <data> Received data. Add 0x0d 0x0a at the end. The user can check the end according to the parameter <length>.	
Response	NULL	
Example	+TCPRECV:0,10,1234567890	Receive 10 bytes data on Link 0, the data is 1234567890.
NOTE		

8.6 Close TCP link：+TCPCLOSE

Description	**This command is to close TCP link.**
Format	● AT+TCPCLOSE=<n>

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Syntax	<n>： Link ID, only could be 0 or 1.	
Response	See the example below.	
Example	AT+TCPCLOSE=1 +TCPCLOSE:1,OK	Close TCP link on Link 1, success.
	AT+TCPCLOSE=2 +TCPCLOSE:Error	Link ID is wrong, failed.
	Null +TCPCLOSE:0,Link Closed	TCP link is forced to disconnect.
NOTE		

8.7 Establish UDP link：+UDPSETUP

Description	**This command is to establish UDP link**	
Format	● AT+UDPSETUP=<n>,<ip>,<port>	
Syntax	<n>： Link ID, only could be 0 or 1. <ip>： Target IP address, must be input as xx.xx.xx.xx. <port>： Target port number, must be decimal ASCII code.	
Response	1、Input AT command, if command Format is correct, it will response OK immediately. 2、If the input command Format is not correct or this link has been in use, it will response +UDPSETUP:Error. 3、If the input AT command is correct (response:OK), the UDP link is establish successfully and response: +UDPSETUP:<n>,OK (<n> represents link number). 4、If the input AT command is correct (response:OK), the UDP link is not establish successfully and response:+UDPSETUP:%d,Bind Socket Error or +UDPSETUP:%d,Create Socket Error (<n> represents link number).	
Example	AT+UDPSETUP=1,220.199.66.56,7000 OK +UDPSETUP:1,OK	Establish a link to 220.199.66.56,7000 on Link 1: success.
	AT+UDPSETUP=1,192.168.20.6,7000 OK +UDPSETUP:0,FAIL	Establish a link to 220.199.66.56,7000 on Link 1: failed.
	AT+UDPSETUP=2,192.168.20.6,6800 +UDPSETUP:Error	AT command Format Error
NOTE	Before setting up UDP link, it must ensure PPP link has been established by using AT +XIIC to confirm.	

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8.8 Send UDP data：+UDPSEND

Description	This command is to send UDP data	
Format	● AT+UDPSEND=<n>,<length>	
Syntax	<n>： Link ID, only could be 0 or 1, and this link should been already establish UDP link. <length>： The length of on-sent data, get value in range of 1-2000 bytes.	
Response	1、Input AT command, if the command Format is correct, it will response '>'. 2、If the command Format is wrong or this link has not been established, it will response: +UDPSEND:Error. 3、Input command and waiti for the appearance of '>', then input on-sent data ended with 0x0d. If the data input is correct, it will response OK. 4、If TCP data is sent correctly, it will response + +UDPSEND:<n>,<length>. <length> is the length of sent data.	
Example	at+udpsend=0,10 >1234567890 OK +UDPSEND:0,10	Require to send 10 bytes data on Link0, after the apperace of '>', input the on-sent character ended with 0x0d. AT command: success. Data sent: success.
	at+udpsend=0,2800 +UDPSEND:Data length error	Require to send 2800 bytes data on Link0. AT command Format is wrong.（<length> parameter is illegal.）
NOTE	1、Before using this command, it must establish UDP link. 2、This command supports to send non-ASCII decimal data. 3、**Sent data should be ended with 0x0d.**	

8.9 Receive UDP data：+UDPRECV

Description	This command is to receive UDP data
Format	+UDPRECV:<n>,<length>,<data>
Syntax	● <n>: Link ID, only could be 0 or 1. ● <length> The length of received data. ● <data> Received data. Add 0xod 0xoa at the end. The user can confirm the end with

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	parameter <length>.	
Response	NULL	
Example	+UDPRECV:0,10,1234567890	Receive 10 bytes data on Link0, the data is 1234567890.
NOTE		

8.10 Close UDP link：+UDPCLOSE

Description	This command is to close UDP link	
Format	● AT+UDPCLOSE=<n>	
Syntax	<n>：Link ID, only could be 0 or 1.	
Response	If <n> is illegal, it will response: +UDPCLOSE:Error; Or it will response +UDPCLOSE:<n>,OK。	
Example	AT+UDPCLOSE=1 +UDPCLOSE:1,OK	Close the UDP link on Link1, success.
	AT+UDPCLOSE=2 +UDPCLOSE:Error	Link ID is wrong, faild.
NOTE		

8.11 Check TCP/UDP link status：+IPSTATUS

Description	This command is to check TCP/UDP link status	
Format	● AT+IPSTATUS=<n>	
Syntax	<n>： Link ID, only could be 0 or 1.	
Response	+IPSTATUS：<n>,<CONNECT or DISCONNECT>,<TCP or UDP>, <send-buffer-size> ● <CONNECT or DISCONNECT>： The status of this link, get value: CONNECT or DISCONNECT. ● <TCP or UDP>： Link type, get value: TCP or UDP. ● <send-buffer-size>： The module internal available send buffer size, indicating with decimal ASCII code, a byte per unit.	
Example	AT+IPSTATUS=0 +IPSTATUS:0,CONNECT,TCP,2047	Link0 has been establish TCP link, available buffer size is 2047 bytes.
	AT+IPSTATUS=1 +IPSTATUS:1,DISCONNECT	Link1 has not establish any link.

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NOTE	**If it is UDP link, <send-buffer-size> would response 0 all the time.**

8.12 TCP/IP AT commands NOTE

（1） If use internal protocol, it must set **AT+XISP=0** when the module is initialized. This command should set before the command: AT+CGDCONT;

（2） It must add character **0x0d as end charater** to the end of data pacakage, but this end chatacter shall not be counted to the data length, for example, sending a 10-bytes command is as follows:

AT+TCPSEND=0,10

>

After the sign ">" appeared, it could begin to send data 1234567890 and should add the character 0x0.

（3） After setting up PPP connect, it should check the connect set-up successful or not, get an IP addres, if the address is 0.0.0.0, it indicates that the PPP connect is failed. It needs to re-set the PPP connect until succeed. If the connect is always failed, please check the code is set to be internal protocol or not.

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9 DNS（Domain Name Server）commands

9.1 Check IP address

Description	This command is to check IP address	
Format	AT+DNS=<string>	
Syntax	<string>：be checked website URL, like www.china.com.	
Response	See the example below.	
Example	at+dns="www.china.com" OK +DNS:124.238.253.103 +DNS:124.238.253.102 +DNS:OK	Check "www.china.com" website The module gave two IP address: 124.238.253.103 124.238.253.102
NOTE	1、It must establish PPP link before implementing this command, then the IP address could be detected successfully. (AT+XIIC=1). 2、One URL may correspond to several IP address, these addresses will be listed in back code. The list will be ended with +DNS：OK. 3、There is no need to set DNS server before using DNS to check IP. DNS server would be given by base station during the negotiating of PPP. 4、The length of URL can't exceed 250Bytes.	

9.2 Check or set DNS

Description	This command is to check or set DNS	
Format	AT+DNSSERVER? AT+DNSSERVER=<n>,<dns-ip>	
Syntax	<n>： Dns server number, get value: 1-2. <dns-ip>：DNS server IP address.	
Response	See the example below.	
Example	at+dnsserver? +DNSSERVER:dns1:211.95.193.97;dns2：0.0.0.0	Check DNS server. Dns1is 211.95.193.97; Dns2 is empty.
	at+dnsserver=1,211.65.24.123 +DNSSERVER:OK at+dnsserver? +DNSSERVER:dns1:211.65.24.123;dns2:0.0.0.0	Set dns1 server IP is 211.65.24.123
NOTE	Generally, the user can't set DNS server. During PPP negotiation time, the base station control will give a DNS server IP.	

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10 TCP server AT commands

10.1 Setting the server TCP listener: +TCPLISTEN

Description	**Set the server listening, supporting three master station link.**	
Format	AT+TCPLISTEN=<port> +TCPLISTEN:<socket>,OK	
Syntax	Port: port number Socket: SOCKET number	
Response	See the example below.	
Example	AT+TCPLISTEN=6800 +TCPLISTEN:0,OK or +TCPLISTEN:bind error	Listening port number 6800 Server started listening Bind failed
	AT+TCPLISTEN=6800 Listening...	If the listener has been set, then set it, it will prompt Listening ...
	AT+TCPLISTEN? +TCPLISTEN:listening status	Check the listening state, that is currently in listening.
	AT+TCPLISTEN? +TCPLISTEN:not listening	Check the listening state, that is not currently listening.
	Connect AcceptSocket=1,ClientAddr=119.123.77.133 Received the master station connection requests. AcceptSocket is the established socket between the main station and module, 119.123.77.133 is the IP address of the master station	
NOTE	This instruction must be after successful establishing a working PPP connection Corresponding to the software version: V1.30B above Unicom card or China mobile private network card can be used for debugging, the China mobile public network card can not be used for server debugging	

10.2 Close listening links: +CLOSELISTEN

Description	**Close listening links**
Format	AT+CLOSELISTEN +CLOSECLIENT:<socket>,local link closed
Syntax	Socket: SOCKET number

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Response	See the example below.	
Example	AT+CLOSELISTEN +CLOSELISTEN:0,local link closed	Network anomalies, it will also receive the information;
NOTE	Corresponding to the software version: V1.30B above	

10.3 Close the master station link: +CLOSECLIENT

Description	Close the master station link	
Format	AT+CLOSECLIENT +CLOSECLIENT:<socket>,remote link closed	
Syntax	Socket: SOCKET number	
Response	See the example below.	
Example	AT+CLOSECLIENT +CLOSECLIENT:1,remote link closed	
NOTE	Corresponding to the software version: V1.30B above	

10.4 Receive the data from the main station: +TCPRECV(S)

Description	Receive the data from the main station	
Format	+TCPRECV(S):<SOCKET>,<length>,<data>	
Syntax		
Response	See the example below.	
Example	+TCPRECV(S):1,10,1234567899	
NOTE	1）Mode with the client to receive a slightly different format, extra a symbolic "(S)" 2）It's different with the client's parameters 3）Corresponding to the software version: V1.30B above	

10.5 The data sent to the master station: +TCPSENDS

Description	The data sent to the master station
Format	AT+TCPSENDS=<socket>,<length>
Syntax	<socket>： The value of listening to AcceptSocket which is the socket between main station and the module，refer to AT + TCPLISTEN instruction description.

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	<length>： To send data length which is in bytes,recommended ranging between 1 to 1024	
Response	See the example below.	
Example	AT+TCPSENDS=0,10 >1234567890 OK +TCPSENDS:0,10	In sokcet 0 10 bytes of data sent successfully.
	AT+TCPSENDS=0,536 >1234567890… +TCPSENDS:Buffer not enough,439	In sokcet 0 send 536 bytes of data, lack of internal buffer, failed to send.
NOTE	1、TCP link must has been established before sending TCP data **2、Data sent to 0x0d end.** Corresponding to the software version: V1.30B above	

10.6 Check status of the master station link: +CLIENTSTATUS

Description	**Check status of the master station link**	
Format	AT+CLIENTSTATUS=<socket>	
Syntax	<socket>： The value of listening to AcceptSocket which is the socket between main station and the module，refer to AT + TCPLISTEN instruction description.	
Response	+CLIENTSTATUS：<socket>,<CONNECT or DISCONNECT>,<TCP>,<send-buffer-size> ● <CONNECT or DISCONNECT>： The link status which value is CONNECT or DISCONNECT。 ● <TCP>： Link type，the value is TCP ● <send-buffer-size>： Modules available internal sending buffer size in bytes, decimal ASCII code represents.	
Example	AT+CLIENTSTATUS=0 +CLIENTSTATUS:0,CONNECT,TCP,2048	Master station socket 0 ， TCP connection has been established, the available buffer is 2048 bytes.
NOTE	Corresponding to the software version: V1.30B above	

10.7 Set module signal status: +SIGNAL

Description	**Set module signal status**
Format	AT+SIGNAL=<n>

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Syntax	<n>: 0: One state, Normal Flash Once a second, shows no exception state, or stay lit; 1: One state, connecting GPRS data service on blink once per second, otherwise do not light up; 2: Two States : Flash and slow Flash，GPRS data service 250 milliseconds Flash once, other normal 1 blinks again. 3：Connect to GPRS data service lights stay lit, the other one blink per second; 4：Connect to GPRS data service lights stay lit, otherwise do not light up;	
Response	See the example below.	
Example	AT+SIGNAL=0 OK	
	AT+SIGNAL? +SIGNAL:2 OK	
NOTE	1）If not set, Power-on default value is 2. If it is set, the value can be saved which is subject to the set value. 2）This instruction set, be sure to receive the return value, and then do the other AT instructions. 3）Corresponding to the software version: V1.30B above 4）Status values 3 and 4, corresponding to the software version: **V1.30c** or **V1.20u**	

10.8 Setting external protocol stack light status: +GPRSSTATUS

Description	**Setting external protocol stack light status**	
Format	at+gprsstatus=<status>	
Syntax	<status>: GPRS status 0：Indicates no GPRS connection 1：Indicates GPRS connection	
Response	See the example below.	
Example	at+gprsstatus=1 OK	When the lights will change
NOTE	1)The command only for external protocol stack; When the terminal is connected to GPRS, use this command, you can change the state of the signal, which can distinguish between the state of the module;Disconnect GPRS, and then set back. 2）The command can meet the AT + SIGNAL to operate 3）Corresponding to the software version: **V1.30c** or **V1.20u**	

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11 FTP AT commands

11.1 Login FTP server：+FTPLOGIN

Description	**This command is to login FTP server.**	
Format	AT+FTPLOGIN=<ip>,<port>,<user>,<pwd>	
Syntax	<ip>： FTP server IP. <port>： FTP server port number, usually is 21. <user>： User name to login FTP server, the length can't exceed 100 ASCII code. There should be no comma (',') in the user name. <pwd>： The password to login FTP server, the length can't exceed 100 ASCII code. There should be no comma (',') in the password.	
Response	1、 If the AT command Format is not correct, it will response **+FTPLOGIN: Error <n>**. <n> is a wrong code. 2、 If FTP has been in login status, it will response**+FTPLOGIN:Have Logged In**. 3、 If the last AT command which is related to FTP has not been finished, it will response **+FTPLOGIN:AT Busy**. 4、 If login is success, it will respongse **+FTPLOGIN: User logged in**. 5、 If login is failed as wrong user name or wrong password, it will response **+FTPLOGIN: 530 Not logged in**. 6、 If connecting to FTP server is failed, it will response **+FTPLOGIN: Error Connect Server Fail**. 7、 If the login is failed as the login time is out (the time is over 30s), it will response **+FTPLOGIN: Error TimeOut**.	
Example	At+ftplogin=219.134.179.52,21,user1,pwd2009 OK +FTPLOGIN:User logged in	Login server 219.134.179.52, port 21, user name is user1,password is pwd2009。 Login success.
NOTE	1. FTP and TCP/UDP can't use at same time. 2. The read and write operation of FTP can't be done before login. 3. This command can be used after the opening of PPP link.	

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11.2 Logout FTP server：+FTPLOGOUT

Description	This command is to logout FTP server.	
Format	AT+FTPLOGOUT	
Syntax	NULL	
Response	OK	
Example	AT+FTPLOGOUT OK	Logout FTP server.
NOTE	This command can be used no matter FTP protocol is in any status.	

11.3 Download data from FTP server：+FTPGET

Description	This command is to download data from FTP server.	
Format	AT+FTPGET=<dir&filename>,<type>,<Content or Info>	
Syntax	<Dir&filename> File direct and name. (file direct is compared with FTP root direct.） <Type> data transfer mode: 1：ASCII； 2：Binary。 <Content or Info> is to specify what you need is content of the file or information of the file(file direct): 1：get the file content 2：get the information of file or specified direct.	
Response	1. If the AT command Format is incorrect, it will response:+FTPGET:Error <n>. (<n> is incorrect code.) 2. If FTP is not login status, it will response: +FTPGET:Error Not Login. 3. If the last AT command which is related to FTP has not been finished, it will response:+FTPGET:AT Busy. 4. If the login is failed as the login time is out (the time is over 30s), it will response +FTPLOGIN: Error TimeOut. 5. Response: +FTPGET:<length>,<data>, <length> represents the length of data, <data> represents data content. 6. Response: +FTPGET:OK.total length is <n>, data read is success, reading length of the data is n.	
Example	AT+FTPGET=,1,2 +FTPGET:446,drw-rw-rw- 1 user group 0 Apr 14 15:55 .	Get informations

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	drw-rw-rw- 1 user group 0 Apr 14 15:55 .. -rw-rw-rw- 1 user group 1238528 Jan 14 10:36 1M.doc -rw-rw-rw- 1 user group 10 Jan 15 15:01 test.txt +FTPGET:OK.total length is 446	under root content.
	at+ftpget=test.txt,1,2 +FTPGET:65,-rw-rw-rw- 1 user group 10 Jan 15 15:01 test.txt +FTPGET:OK.total length is 65	Get information of file 'test.txt'.
	at+ftpget=test.txt,1,1 +FTPGET:10,123456780 +FTPGET:OK.total length is 10	Get the content of the file 'test.txt'.
NOTE	There is a time delay from receiving the last data to +FTPGET: OK.total length is <n>, this time delay is to ensure the transimission realibility. Default value is 8s. After the appearance of +FTPGET:OK.total length is <n>, the next FTP operation could work out.	

11.4 Upload data to FTP server: +FTPPUT

Description	This command is to upload data to FTP server.
Format	AT+FTPPUT=<filename>,<type>,<mode>,<size>
Syntax	<filename>: file name of need-to-send file. <type>: file transimission type: -1: ASCII -2: Binary <mode>: operation mode: -1: STOR mode. Establish a document on server to write into data, if a document has been already exist,it will be replaced by the new built one. -2: APPE mode. Establish a document to write into data, if a document has been already exist, the data will be attached at the end of the file. -3: DELE mode. Delete a file, at this time, there need to set parameter 'size' to be 0, then input 0x0d after the appearance of '>'. <size> : the length of data, the maximum data can't exceed 10240.
Response	1) If the AT command Format is incorrect, it will response:+FTPGET:Error <n>. (<n> is incorrect code.) 2) If FTP is not login status, it will response: +FTPGET:Error Not Login. 3) If the last AT command which is related to FTP has not been finished, it will response:+FTPGET:AT Busy. 4) If <length> exceed 10240, it will response +FTPPUT: length overflow.

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	5）Respons: +FTPPUT:OK,<n>，file sent: success, the length of sent file is n. 6）Respons: +FTPPUT:Delete File OK, delete file: success. 7）Respons: +FTPPUT:Error send data error, this FTP command can't be recognized, the module will automatically disconnect at this time.	
Example	at+ftpput=test.txt,1,1,10200 > +FTPPUT:OK,10200 at+ftpput=test.txt,1,2,10200 > +FTPPUT:OK,10200 at+ftpput=test.txt,1,3,0 > +FTPPUT:Delete File OK	Remark: the length of upload file 'test.txt' is10200, transmission mode is ASCII, operation mode is STORE. Remark: the length of upload file 'test.txt' is10200, transmission mode is ASCII, operation mode is APPE. Delete 'test.txt' file.
NOTE	Inputted data without echo.	

11.5 Check FTP status：+FTPSTATUS

Description	**This command is to check FTP status.**	
Format	AT+FTPSTATUS	
Syntax	NULL	
Response	+FTPSTATUS:<status>[,<ip>,<port>] ● <status>: 0：not login FTP server; 1：login FTP server, the server IP and port number are as the following parameter. ● <ip>: Server IP. ● <port>: Server port number.	
Example	AT+FTPSTATUS +FTPSTATUS:1, 219.134.179.521,21	
NOTE		

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12 Appendix（AT command flow chart of commonly used functions）：

12.1 AT command flow chart for setting up TCP connect

```
MODEM：STARTUP                    // after the module power-on, startup response

+PBREADY
…
AT+CCID
+CCID: 89860109247552607598

OK

AT+CREG?
+CREG: 0,1                        // Registered on the GSM network

AT+CSQ                            // After module is powered on, check the signal strength, it is
                                  recommended afer the AT + CREG? command
CSQ:15,3

OK
…
AT+XISP=0                         // set internal protocol stack.
OK
…
at+cgdcont=1,"IP","CMNET"         // set APN

OK
AT+XGAUTH=1,1,"GSM","1234"        // User authentication, private network need to add that the
                                  generalcommand

OK

at+xiic=1                         // establish PPP link

OK
at+xiic?

+XIIC:      1, 10.10.73.214       //    PPP connect has been establish, IP is10.10.73.214

OK

at+tcpsetup=0,220.199.66.56,6800  // establish TCP link
OK

+TCPSETUP：0,OK                   // establish TCP connect: success

at+tcpsend=0,10                   // send data on TCP connect

>0123456789
OK

+TCPSEND：0,10                    //data send: success

at+ipstatus=0
```

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```
+IPSTATUS：0,CONNECT,TCP,2047    //check connect status
at+tcpclose=0                    // close TCP connect on Link0

+TCPCLOSE：0,OK
at+ipstatus=0

+IPSTATUS：0,DISCONNECT
```

Please referece below flow chart (NOTE: every command must add a ENTER 0x0d):

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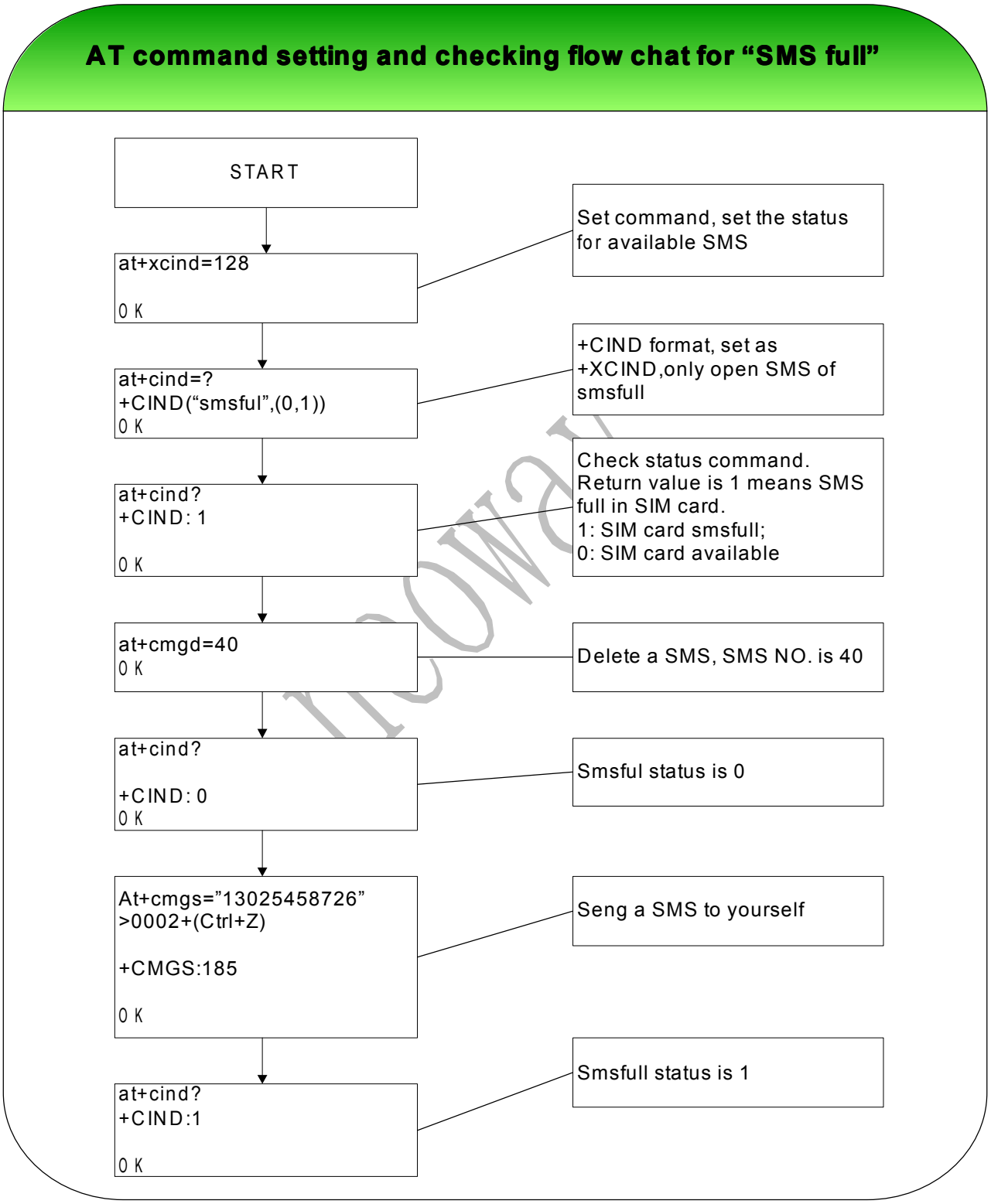
12.2 AT command setting and checking flow chart for 'SMS full'



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12.3 SMS general AT commands

Function	Format	Example	Description
Set text mode	AT+CMGF=1	AT+CMGF=1 OK	AT commands need to set when sending text mode SMS
Select TE character string	AT+CSCS="GSM"	AT+CSCS="GSM" OK	
Set PDU mode	AT+CMGF=0	AT+CMGF=0 OK	AT commands need to set when sending PDU mode SMS
TE hexadecimal	AT+CSCS="UCS2"	AT+CSCS="UCS2" OK	
Send SMS	AT+CMGS="number"	AT+CMGS="13430981508" > Shenzhen neoway +CMGS: 232 OK	AT+CMGS="13430981508" click 'ENTER' to send, when the indicating symbol '>' appears, input SMS content（Shenzhen neoway）, then click **CTRL+Z(corresponding character is 0x1A)** to send.
Indicating method of new SMS	AT+CNMI=2,1,0,0,0	AT+CNMI=2,1,0,0,0 OK （Receive SMS and SMS NO.） +CMTI: "SM",1	CNMI default value is 1,0,0,0,0. As the module must store SMS on SIM card, CNMI must set to be two mode: **2,1,0,0,0** (new SMS content stored into SIM card and not display) or **2,2,0,0,0** (new SMS content display directly and not store into SIM card)
Read SMS	AT+CMGR=n	AT+CMGR=1 +CMGR: "REC READ","10086","","09/04/24,09:07:09+50" ?????????????????????? ???www.gd.chinamobile.com/shenzhen?????????? ?> ?? OK	
Read all SMS	AT+CMGL="ALL"	AT+CMGL="ALL" List all SMS	**NOTE** After displaying all SMS, the unread SMS will change into read SMS.
Delete SMS	AT+CMGD=n	AT+CMGD=3 OK	Delete SMS according to sequence number

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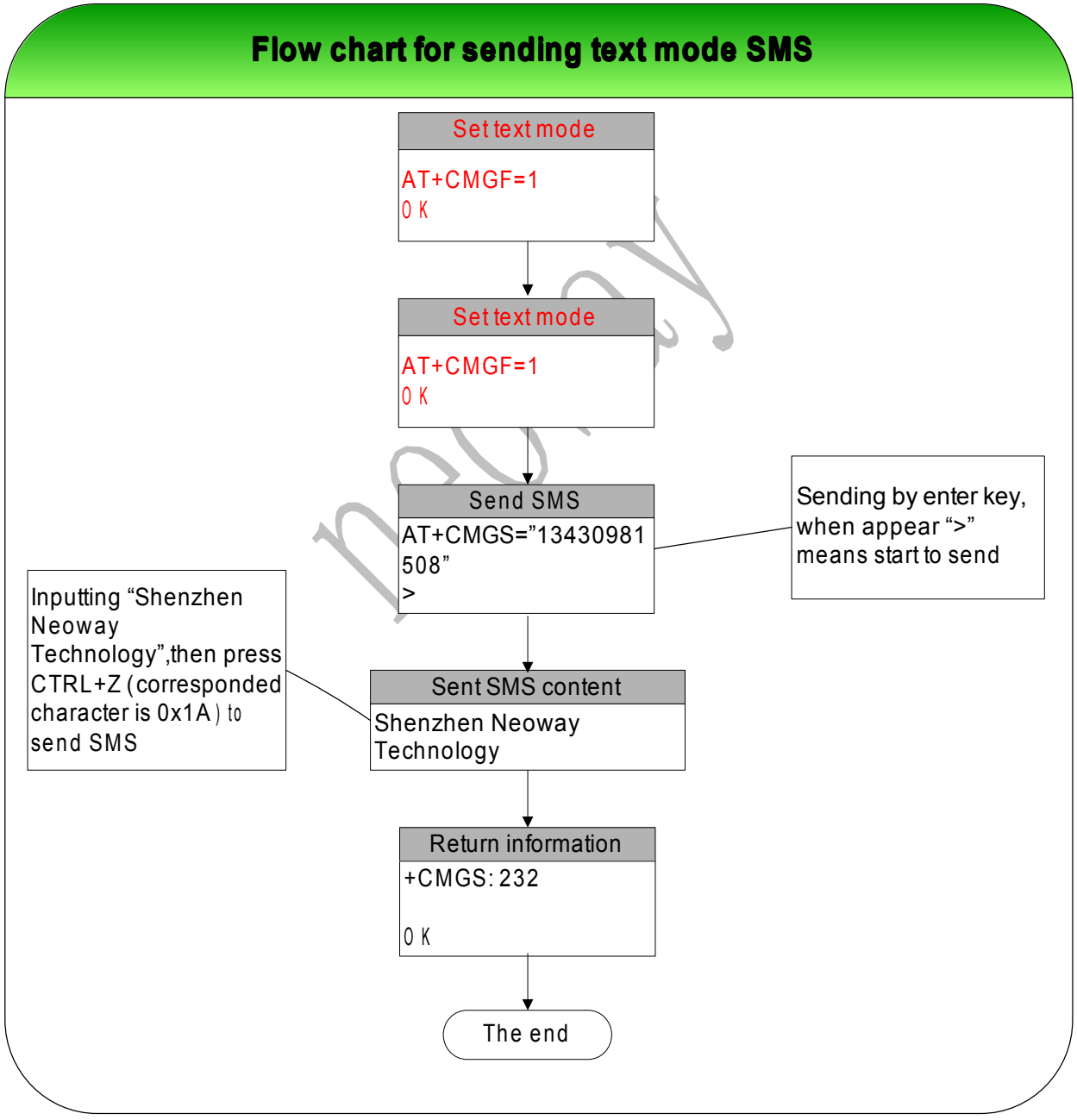
Delete all SMS	AT+CMGD=0,4	AT+CMGD=0,4 OK	Delete SMS, see details in AT commands
Check quantity of SMS	AT+CPMS?	AT+CPMS? +CPMS: "SM",0,20,"SM",0,20,"SM",0,20	0: quantity of SMS 20: capacity of stored SMS

12.3.1 Flow chart for sending text mode SMS



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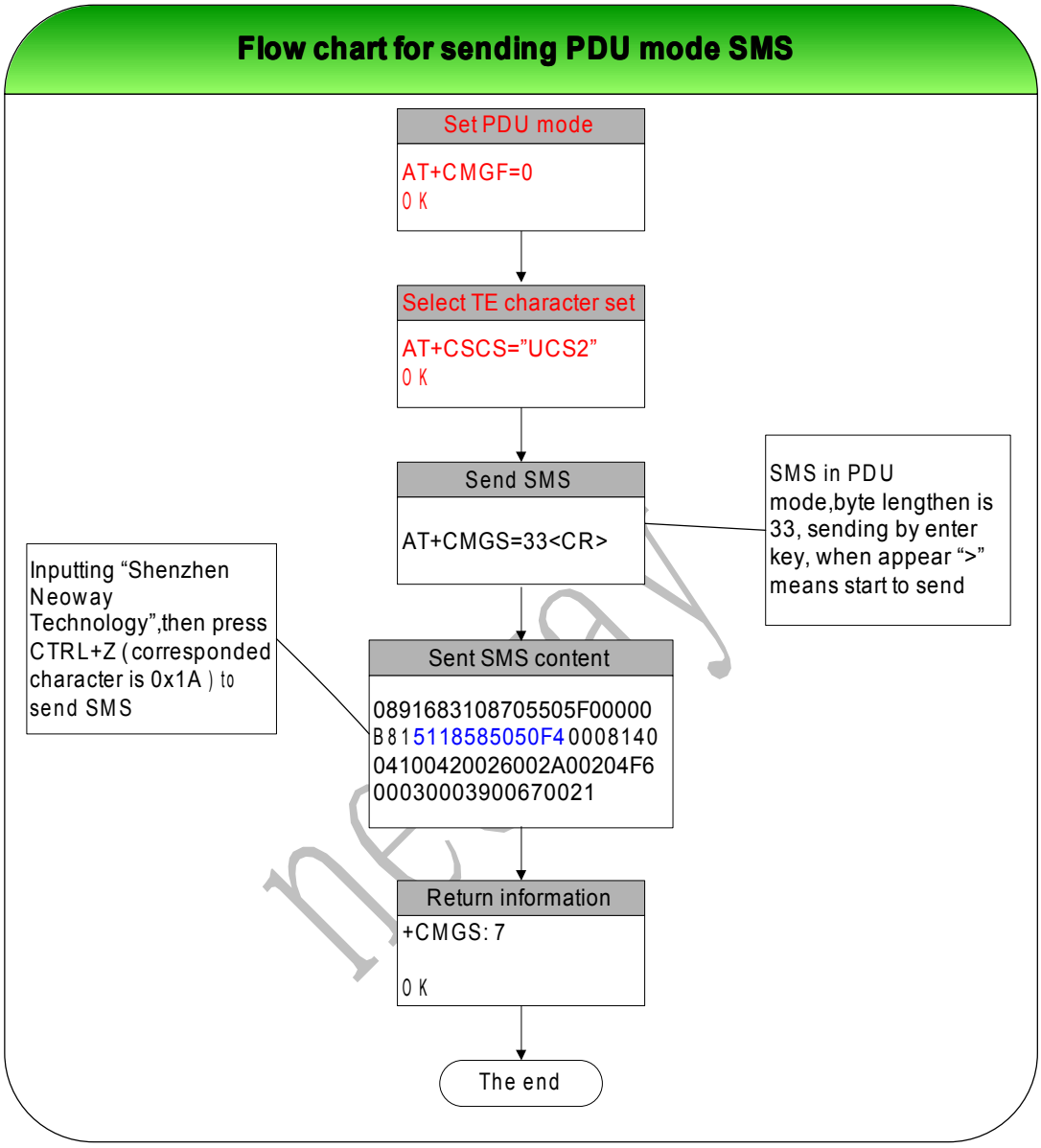
12.3.2 Flow chart for sending PDU mode SMS



12.4 Low Consumption Mode Setting

1) Comfirm DTR is high level(If not,it's need to set high level),then set command at+enpwrsave=1
2) Then set DTR a low level
3) Wait for about 10 seconds,it will enter the low consumption mode

After module enter low consumption mode,when there are calls、SMS、datas,it will exit low consumption mode automaticly,meanwhile it can answer calls 、view SMS、receive and send datas normally uses serial port.After the calls、SMS、datas about 2 seonds,it will enter low consumption mode automaticly.

Automatic arousal:pull DTR to high level,after processing,then pull DTR to low level.

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13 FAQ

Questions	Description	Solution
Serial port problem	1 ） Situation 1: serial port is disconnected or garbled 2）Situation 2：serial port is connected but can't download software	1）the default baud rate of the module is 115200. The serial port is disconnected, usually because the baud rate of single board software and the module are repugnant. The baud rate can be set and save. 2 ） DTR and RTS will switch when updating. Because some USB-Serial port cable performs not so good, especially some bad cable can't be switched normally and leading the module can't download software.
SMS problem	SMS can not be received and sent.	Because not familiar with AT command Format, to the non mode SMS, it must choose character string of TE, details please see Chapter 11.
SMS end symbol	What is 'CTRL+Z' corresponding character?	It's 0x1A.
use AT+TCPSEND to send data: failed.	No response OK +TCPSEND：0,n	The sent data must be ended with **0x0d.**
Power on problem	M590i has no reaction when the module is power on	Siemens module has a 100s time delay when power on, but M590i is different, its pluse is wider than Siemens module, so it need to delay 300ms.
Server disconnected problem	Does the module react when the server is disconnected?	If the server is automatically disconnected, the module could know and response: +TCPCLOSE:0,Link Closed; If the server disconnected abnormal, cause the server has not sent a disconnect AT to the module, the module can't know immediately. It will disconnect in 10 minutes.
Data service and voice	How to deal with incoming call when doing GPRS service?	When there is incoming calls or SMS under GPRS service status, it can switch between data mode and AT mode by +++/ATO. Details please see NOTE in 8.3.
Data service and SMS	How to deal with incoming SMS when doing GPRS service?	

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