



A76XX Series_

AT Command Manual

LTE Module

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Version History

| Version | Date | Chapter | Description |
|---------|-----------|--|-----------------------|
| V1.00 | 2019.5.15 | | New version |
| | 2019.5.20 | 5.2.9 AT+CGEQREQ 5.2.10 AT+CGEQMIN | Modify these commands |
| | 2019.5.22 | 9.2.9 AT+CNMI | |
| | | 14.2.1 AT+CHTPSERV | Modify these commands |
| | | 14.2.3 AT+CNTP | |
| | 2019.6.5 | 2.2.15 AT&W | Modify these commands |
| | | 2.2.16 ATZ | |
| | 2019.6.17 | 2.2.10 AT&V | |
| | | 9.2.4 AT+CSCA | |
| | | 9.2.6 AT+CSMP | |
| | | 8.2.4 AT+CPBW | |
| | | 8.2.5 AT+CNUM | Modify these commands |
| | | 5.2.14 AT+CGCLASS | |
| | | 14.2.1 AT+CHTPSERV | |
| | | 14.2.3 AT+CNTP | |
| | | 8.2.5 AT+CNUM 14.2.3 AT+CNTP | Modify these commands |
| V1.01 | 2019.8.9 | 5.2.17 AT+CPING | Add this command |
| | 2019.8.9 | 2.2.8 ATI 2.2.14 ATX 2.2.18 AT+CGMM 2.2.19 AT+CGMR 4.2.2 AT+COPS 5.2.4 AT+CGACT | |
| | | 5.2.5 AT+CGDCONT | Modify these commands |
| | | 5.2.7 AT+CGTFT | |
| | | 5.2.9 AT+CGEQREQ | |
| | | 5.2.11 AT+CGEQMIN | |
| | | 12.2.1 AT+FSCD | |
| | | 13.2.1 AT+CFTRANRX | |
| | | 13.2.2 AT+CFTRANTX | |
| | | 4.2.2 AT+COPS | Modify this command |
| | | 8.2.5 AT+CNUM | Modify this command |
| | | 4.2.7 AT+CNMP | Modify this command |
| | 2020.3.6 | 5.2.11 AT+CGEQMIN | Modify this command |

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| | 2020.3.11 | 4.2.7 AT+CNMP | Modify this command |
| | 2020.3.23 | 15 AT Commands for TCPIP 16 AT Commands for HTTP(S) 17 AT Commands for FTP(S) 18 AT Commands for MQTT(S) 19 AT Commands for SSL 20 AT Commands for TTS 21 AT Commands for AMR 22 AT Commands for SFOTA | Add Chapter 15/16/17/18/19/21/22/23 and reconstruct the chapters |
| | 2020.4.1 | 7 AT Commands for Call Control | Add Chapter 7 and reconstruct the chapters |
| | 2020.4.10 | 8.2.5 AT+CNUM | Modify this command |
| | 2020.4.20 | 5.2.7 AT+CGTFT | Modify this command |
| | 2020.4.20 | 5.2.1 AT+CGREG | Modify this command |
| | 2020.4.20 | 4.2.2 AT+COPS 4.2.3 AT+CUSD 4.2.4 AT+CSSN 4.2.7 AT+CNMP 4.2.10 AT+CNSMOD 4.2.11 AT+CTZU 4.2.12 AT+CTZR | Modify these commands |
| | 2020.4.26 | 18.2.3 AT+CMQTTACQ 18.2.8 AT+CMQTTCONNECT 18.2.9 AT+CMQTTDISC 18.2.10 AT+CMQTTTOPIC 18.2.11 AT+CMQTPPAYLOAD 18.2.14 AT+CMQTTSUB 18.2.16 AT+CMQTTUNSUB 18.2.17 AT+CMQTTCFG | Modify these commands |
| | 2020.4.26 | 12.2.5 AT+FSDEL 12.2.6 AT+FSRENAME 12.2.8 AT+FSMEM 12.2.9 AT+FSCOPY | Modify these commands |
| | 2020.4.26 | 10.2.10 AT+CFGRI | Modify this command |
| | 2020.4.26 | 10.2.11 AT+CURCD | Modify this command |
| | 2020.4.26 | 21.2.1 AT+CCMXPLAY | Modify this command |
| | 2020.4.27 | 3.2.4 AT+CSQDELT | Modify this command |
| | 2020.4.16 | 12 AT Commands for File System 13AT Commands for File Transmission | Add Notes to these chapters |
| | 2020.4.29 | 10.2.10 AT+CFGRI 17.2.2 AT+CFTPSSTOP 17.2.9 AT+CFTPSPWD 17.2.14 AT+CFTPSPUT 17.2.15 AT+CFTPSSINGLEIP 17.2.17 AT+FTPSTYPE | Modify these commands |

| | | | |
|--|-----------|---|---------------------------------|
| | 2020.5.6 | 21.2.1 AT+CCMXPLAY 21.2.2 AT+CCMXSTOP | Modify these commands |
| | 2020.5.8 | 12.2 Detailed Description of AT Commands for File System | Add description to this section |
| | | 3.2.1 AT+CFUN 3.2.3 AT+AUTOCSQ 3.2.4 AT+CSQDELTA 3.3.10 AT+CCLK 3.3.11 AT+CMEE 4.2.7 AT+CNMP 4.2.9 AT+CPSI 5.2.2 AT+CEREG 5.2.3 AT+CGATT | |
| | 2020.5.11 | 5.2.4 AT+CGACT 5.2.5 AT+CGDCONT 5.2.6 AT+CGDSCONT 5.2.8 AT+CGQREQ 5.2.9 AT+CGEQREQ 5.2.10 AT+CGQMIN 5.2.11 AT+CGEQMIN 5.2.15 AT+CGEREP 5.2.16 AT+CGAUTH 8.2.5 AT+CNUM | Modify these commands |
| | 2020.5.12 | 2.2.5 ATS0 2.2.21 AT+CSCS 6.2.4 AT+CPWD 6.2.7 AT+CRSM 19.2.2 AT+CCERTDOWN 19.2.12 AT+CCHOPEN | Modify these commands |
| | 2020.5.13 | 14.2.1 AT+CHTPSERV 14.2.2 AT+CHTPUPDATE 14.2.3 AT+CNTP 18.2.1 AT+CMQTSTART | Modify these commands |
| | 2020.5.18 | 2.2.5 ATS0 9.2.1 AT+CSMS 9.2.2 AT+CPMS 9.2.3 AT+CMGF 9.2.5 AT+CSCB 9.2.7 AT+CSDH 9.2.9 AT+CNMI 9.2.10 AT+CGSMS 9.2.11 AT+CMGL 9.2.12 AT+CMGR 9.2.13 AT+CMGS 9.2.14 AT+CMSS | Modify these commands |

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| | 9.2.15 AT+CMGW 9.2.16 AT+CMGD 9.2.18 AT+CMVP 9.2.19 AT+CMGRD | |
| 2020.5.19 | 8.2.1 AT+CPBS 8.2.2 AT+CPBR 8.2.4 AT+CPBW | Modify these commands |
| .2020.5.19 | 6.2.11 AT+UIMHOTSWAPON 6.2.11 AT+UIMHOTSWAPLEVEL | Add these commands |
| 2020.5.20 | 18 AT Commands for MQTT(S) | Modify this chapter |
| 2020.5.20 | 3.2.11 AT+CMEE 4.2.4 AT+CSSN 4.2.6 AT+COPN 5.2.7 AT+CGTFT 5.2.15 AT+CGEREP 5.2.16 AT+CGAUTH 5.2.17 AT+CGPIN 8.2.5 AT+CNUM 17.2.16 AT+CFTPSSIZE | Modify these commands |
| 2020.5.22 | 15.2.1 AT+NETOPEN 15.2.3 AT+CIPOOPEN 15.2.5 AT+CIPRXGET 15.2.8 AT+CIPHEAD 15.2.9 AT+CIPSRIPI 15.2.10 AT+CIPMODE 15.2.11 AT+CIPSENDMODE | Modify these commands |
| 2020.5.26 | 21.AT Commands for Audio | Modify this chapter |
| 2020.5.26 | 22.2.3 AT+CREC | Add this command |
| 2020.5.27 | 17.2.16 AT+CFTPSSIZE | Modify this command |
| 2020.5.28 | 5.2.1 AT+CGREG 5.2.2 AT+CEREG | Modify these commands |
| 2020.5.29 | 6.2.2 AT+CPIN 6.2.3 AT+CLK 6.2.4 AT+CPWD | Modify these commands |
| 2020.5.29 | 12.2.9 AT+FSCOPY 13.2.1 AT+CFTRANRX 13.2.2 AT+CFTRANTX | Modify these commands |
| 2020.5.29 | 18.2.9 AT+CMQTTDISC | Modify this command |
| 2020.6.1 | 3.2.1 AT+CFUN 3.2.2 AT+CSQ 3.2.3 AT+AUTOCSQ 4.2.1 AT+CREG 4.2.3 AT+CUSD 4.2.5 AT+CPOL 4.2.11 AT+CTZU | Modify these commands |

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| V1.02 | 2020.6.1 | 4.2.12 AT+CTZR | |
| | | 9.2.1 AT+CSMS | |
| | | 9.2.5 AT+CSCB | |
| | | 9.2.7 AT+CSDH | |
| | | 9.2.8 AT+CNMA | |
| | | 9.2.10 AT+CGSMS | Modify these commands |
| | | 9.2.11 AT+CMGL | |
| | | 9.2.13 AT+CMGS | |
| | | 9.2.16 AT+CMGD | |
| | | 9.2.18 AT+CMVP | |
| | 2020.6.2 | 21.2.1 AT+CCMXPLAY | Modify this command |
| | 2020.6.3 | 11.2.1 AT+CVALARM | |
| | | 11.2.2 AT+CVAUXS | |
| | | 11.2.3 AT+CVAUXV | |
| | | 11.2.6 AT+CMTE | Modify these commands |
| | | 11.2.7 AT+CPMVT | |
| | 2020.6.3 | 11.2.8 AT+CRIIC | |
| | | 11.2.10 AT+CBC | |
| | | 4.2.11 AT+CTZU | |
| | | 5.2.5 AT+CGDCONT | Modify these commands |
| | 2020.6.3 | 5.2.17 AT+CPING | |
| | | 8.2.2 AT+CPBR | |
| | | 16.2.8 AT+HTTPPOSTFILE | Modify these commands |
| | 2020.6.4 | 16.2.9 AT+HTTPREADFILE | |
| | | 12.2.3 AT+FSRMDIR | |
| | | 12.2.4 AT+FSLS | |
| | | 12.2.8 AT+FSMEM | Modify these commands |
| | 2020.6.10 | 12.2.9 AT+FSCOPY | |
| | | 13.2.1 AT+CFTRANRX | |
| | | 5.2.13 AT+CGPADDR | |
| | | 15.2.3 AT+CIPOOPEN | Modify these commands |
| | 2020.6.19 | 15.2.6 AT+CIPCLOSE | |
| | | 15.2.9 AT+CIPSRI | |
| | All | | |
| | 2020.6.28 | 21.2.3 AT+CREC | Modify this command |
| | 2020.6.28 | 17.2.14 AT+CFTPSPUT | Modify this command |
| | 2020.6.28 | 23.3 Summary of CME ERROR codes | Modify this section |
| | 2020.6.29 | 17.2.16 AT+CFTPSSIZE | Modify this command |
| | 2020.6.29 | 19.2.7 AT+CCHSTART | Modify this command |
| | 2020.7.1 | 21.2.3 AT+CREC | Modify this command |
| | 2020.7.2 | 9.1 Overview of AT Commands for SMS | Modify this section |
| | 2020.7.6 | 16.2.8 AT+HTTPPOSTFILE | Modify this command |
| | 2020.7.10 | 23 AT Commands for GPS | Add this chapter |

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| | 10.2.2 AT&C 7.2.10 AT+CLIP 7.2.12 AT+COLP 2.2.11 ATV 2.2.13 ATQ 2.2.14 ATX 2.2.21 AT+CSGS | Modify these commands |
| 2020.7.15 | 21.2.1 AT+CCMXPLAY 21.2.3 AT+CREC | Modify these commands |
| 2020.7.21 | 16.2.8 AT+HTTPREAD | Modify this command |
| | 12.2.1 AT+FSCD 12.2.2 AT+FSMKDIR 12.2.3 AT+FSRMDIR 13.2.1 AT+CFTRANRX 13.2.2 AT+CFTRANTX 3.2.10 AT+CCLK 5.2.2 AT+CEREG 5.2.4 AT+CGACT 4.2.6 AT+COPN 4.2.4 AT+CSSN 18.2.7 AT+CMQTTWILLMSG 5.2.16 AT+CGAUTH 3.2.2 AT+CSQ 3.2.3 AT+AUTOCSQ 3.2.5 AT+CPOF 3.2.6 AT+CRESET 3.2.7 AT+CACM | |
| 2020.8.11 | 15.2.7 AT+IPADDR 15.2.10 AT+CIPMODE 3.2.12 AT+CPAS 15.2.2 AT+NETCLOSE 15.2.3 AT+CIPOPEN 15.2.4 AT+CIPSEND 15.2.6 AT+CIPCLOSE 15.2.15 AT+SERVERSTOP 15.2.16 AT+CIPACK 18.2.9 AT+CMQTTDISC 18.2.15 AT+CMQTTUNSUBTOPIC 4.2.2 AT+CGDCONT 3.2.8 AT+CAMM 3.2.9 AT+CPUC 5.2.4 AT+CGACT 4.2.2 AT+COPS 5.2.15 AT+CGEREP 10.2.3 AT+IPR | Modify these commands |

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| | 10.2.4 AT+IPREX 10.2.10 AT+CFGRI 23.2.8 AT+CGNSSNMEA 23.2.9 AT+CGPSNMEARATE 23.2.13 AT+CGNSSCMD 6.2.4 AT+CPWD 4.2.3 AT+CUSD 10.2.2 AT&C 3.2.12 AT+CPAS 7.2.20 AT+CMICGAIN 7.2.13 AT+VTS 7.2.14 AT+VTD 18.2.1 AT+CMQTTSTART 18.2.5 AT+CMQTTSSLCFG 13.2.1 AT+CFTRANRX 13.2.2 AT+CFTRANTX 23 AT Commands for GNSS 5.2.8 AT+CGQREQ 5.2.6 AT+CGDSCONT 20.2.1 AT+CTTS 20.2.2 AT+CTTSPARAM 7.2.20 AT+CMICGAIN 7.2.20 AT+COUTGAIN 19.2.1 AT+CSSLCFG 5.2.17 AT+CPING 15.2.17 AT+CDNSGIP 15.2.16 AT+CIPACK 15.2.6 AT+CIPCLOSE | |
| 2020.8.11 | 23.2.1 AT+CGNSSPWR 23.2.2 AT+CGPSCOLD 23.2.4 AT+HOT 4.2.9 AT+CPSI 5.2.7 AT+CGTFT 5.2.6 AT+CGDSCONT | Add these commands |
| 2020.8.13 | 23.2.10 AT+CGPSFTM | Modify this command |
| 2020.8.14 | 4.2.7 AT+CNMP 9.2.2 AT+CPMS | Modify these commands |
| 2020.8.18 | 23.2.5 AT+CCONFSAVE | Delete this command |
| 2020.8.18 | 15.2.4 AT+CIPSEND | Add a note |
| 2020.8.19 | 20.2.1 AT+CTTS | Modify this command |
| 2020.8.19 | 24.1 Overview of AT Commands for GNSS 24.2.5 AT+CGNSSIPR 24.2.7 AT+CGNSSNMEA 24.2.8 AT+CGPSNMEARATE | Modify these sections |

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| 2020.8.21 | 5.2.7 AT+CGTFT 5.2.5 AT+CGDCONT | Modify these commands |
| 2020.8.24 | 20.2.9 AT+CTTSPARAM | Modify this command |
| 2020.8.25 | 22 AT Commands for FOTA | Add this chapter |
| 2020.8.25 | 5.2.4 AT+CGACT | Modify this command |
| 2020.8.25 | 7.2.5 AT+CRC 9.2.20 AT+CMGSEX | Modify these commands |
| 2020.8.31 | 3.2.13 AT+SIMEI 16.6.26 AT+HTTPREAD | Modify these commands |
| 2020.9.1 | 25 AT Commands for WIFI | Add this chapter |
| 2020.9.1 | 19.2.11 AT+CCHCFG | Modify this command |
| 2020.9.2 | 16.2.7 AT+HTTPDATA | Modify this command |
| 2020.9.2 | 17.4 Summary of Unsolicited Result Codes | Add this section |
| 2020.9.2 | 10.2.3 AT+IPR 10.2.4 AT+IPREX | Delete these commands |
| 2020.9.3 | 5.2.13 AT+CGPADDR | Modify this command |
| 2020.9.4 | 12.2.7 AT+FSATTRI | Modify this command |
| 2020.9.7 | 4.2.4 AT+CSSN 4.2.8 AT+CNBP | Modify these commands |
| 2020.9.8 | 16.2.8 AT+HTTPPOSTFILE | Modify this command |
| 2020.9.11 | 22.2.2 AT+LFOTA | Add this command |
| 2020.9.11 | 11.2.8 AT+CWIIC 11.2.8 AT+CRIIC | Modify these commands |
| 2020.9.14 | 7.2.4 AT+CRLP 7.2.20 AT+CMICGAIN 7.2.21 AT+COUTGAIN 2.2.3 ATA 5.2.4 AT+CGACT 9.2.8 AT+CNMA 9.2.20 AT+CMGSEX 2.2.14 ATX | Modify these commands |
| 2020.9.15 | 9.2.5 AT+CSCB 9.2.16 AT+CMGD | Modify these commands |
| 2020.9.16 | 22.2.2 AT+LFOTA | Modify this command |
| 2020.9.25 | 20.2.2 AT+CTTSPARAM | Modify this command |
| 2020.9.25 | 16.2.3 AT+HTTPPARA 14.2.1 AT+HTPSERV | Modify these commands |
| 2020.9.29 | 24.2.13 AT+CGNSSPORTSWITCH | Add this command |
| 2020.10.10 | 16.2.6 AT+HTTPREAD 16.2.8 AT+HTTPPOSTFILE | Modify these commands |
| 2020.10.15 | 18.2.15 AT+CMQTTUNSUBTOPIC | Modify this command |
| 2020.10.20 | 16.2.6 AT+HTTPREAD | Modify these command |

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| | 18.2.17 AT+CMQTTCFG | |
| 2020.10.21 | 25.2.2 AT+CWSTASCANEX | Add this command |
| 2020.10.29 | 12.2.9 AT+FSCOPY | Modify this command |
| 2020.10.30 | 2.2.1 A/ | Delete this command |
| 2020.11.2 | 11.2.15 Unsolicited result codes 16.2.3 AT+HTTPPARA 5.2.17 AT+CPING 16.2.8 AT+HTTPPOSTFILE 4.2.2 AT+COPS 4.2.8 AT+CNBP 7.2.8 AT+CCWA 7.2.2 AT+CHUP 7.2.11 AT+CLIR 2020.11.2 22.2.2 AT+LFOTA 11.2.7 AT+CPMVT 5.2.14 AT+CGCLASS 15.2.4 AT+CIPSEND 15.2.5 AT+CIPRXGET 15.2.6 AT+CIPCLOSE 15.2.16 AT+CIPACK 15.2.17 AT+CDNSGIP 23.2.2 AT+CSCFOTA | Modify this section Modify these commands |
| 2020.11.3 | 18.2.9 AT+CMQTTDISC 19.2.13 AT+CCHCLOSE 10.2.6 AT+IFC 24.2.5 AT+CGNSSIPR 24.2.6 AT+CGNSSMODE 24.2.10 AT+CGPSINFO 25.2.1 AT+CWSTASCAN 25.2.2 AT+CWSTASCANEX 16.2.3 AT+HTTPPARA 20.2.1 AT+CTTS 22.2.1 AT+CFOTA 19.2.2 AT+CCERTDOWN 24.2.13 AT+CGNSSPORTSWITCH | Modify these commands |
| 2020.11.7 | 17.2.3 AT+CFTPSLOGIN 17.2.12 AT+CFTPSPUTFILE 17.2.17 AT+CFTPSTYPE 17.2.18 AT+CFTPSSLCFG 21.2.3 AT+CREC 20.2.1 AT+CTTS 20.2.2 AT+CTTSPARAM 21.1 AT Commands for Audio 15.2.4 AT+CIPSEND 24.2.1 AT+CGNSSPWR | Modify these commands |

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| | 7.2.12 AT+COLP 7.2.11 AT+CLIR 3.3.7 AT+CACM 3.3.8 AT+CAMM 4.2.9 AT+CPSI 5.2.14 AT+CGCLASS 15.2.15 AT+SERVERSTOP 24.2.13 AT+CGNSSPORTSWITCH | |
| 2020.11.13 | 15.2.18 AT+CSOCKSETPN 24.2.14 AT+CAGPS | Add these commands |
| 2020.11.13 | 15.2.5 AT+CIPRXGET 15.2.3 AT+CIPOOPEN 8.2.1 AT+CPBS 7.2.11 AT+VTS 7.2.12 AT+COLP 7.2.11 AT+CLIP 10.2.5 AT+ICF 9.2.20 AT+CMGSEX 6.2.3 AT+CLK 6.2.4 AT+CPWD 23.2.1 AT+CAPFOTA 17.2.2 AT+CFTPSSTOP 9.2.9 AT+CNMI 9.2.12 AT+CMGR 6.2.7 AT+CRSM | Modify these commands |
| 2020.11.15 | 24.2.13 AT+CGNSSPORTSWITCH 17.2.12 AT+CFTPSPUTFILE 17.2.18 AT+CFTPSSLCFG 20.2.2 AT+CTTSPARAM 4.2.9 AT+CPSI 15.2.18 AT+CSOCKSETPN 15.2.5 AT+CIPRXGET 9.2.12 AT+CMGR | Modify these commands |
| 2020.11.16 | 3.2.10 AT+CCLK 9.2.8 AT+CNMA 16.2.4 AT+HTTPACTION 16.2.9 AT+HTTPREADFILE 15.2.14 AT+SERVERSTART 5.2.1 AT+CGREG 4.2.7 AT+CNMP 2.2.1 ATD 16.2.8 AT+HTTPPOSTFILE 3.2.4 AT+CSQDELT 3.2.10 AT+CCLK | Modify these commands |
| V1.03 | | |

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| 2020.11.25 | 24.2.7 AT+CGNSSNMEA 10.2.6 AT+IFC | Modify these commands |
| 2020.11.30 | 7.2.13 AT+VTS 7.2.3 AT+CBST 6.2.3 AT+CLK | Modify these commands |
| 2020.12.1 | 7.2.3 AT+CRLP 2.2.2 ATA 4.2.3 AT+CUSD | Modify these commands |
| 2020.12.3 | 6.2.3 AT+CLK | Modify this command |
| 2020.12.4 | 16.2.5 AT+HTTPHEAD | Modify this command |
| 2020.12.7 | 10.2.10 AT+CFGRI | Modify this command |
| 2020.12.14 | 24.2.13 AT+CGNSSPORTSWITCH | Modify this command |
| 2020.12.21 | 4.2.3 AT+CUSD 7.2.3 AT+CBST 10.2.11 AT+CURCD | Modify these commands |
| 2020.12.22 | 20.2.2 AT+CTTSPARAM | Modify this command |
| 2020.12.28 | 1.4 Definitions and Conventions 26.2 Response String of AT+CEER 26.3 Summary of CME ERROR Codes | Modify these sections |
| 2020.12.28 | 9.2.1 AT+CSMS 9.2.2 AT+CPMS 7.2.13 AT+VTS 4.2.11 AT+CTZU | Modify these commands |
| 2020.12.31 | 20.2.3 AT+CDTAM | Add this command |
| 2020.12.31 | 21.2.1 AT+CCMXPLAY | Modify this command |
| 2021.1.7 | 4.2.1 AT+CREG 4.2.4 AT+CSSN 4.2.9 AT+CPSI 5.2.15 AT+CGEREP | Modify these commands |
| 2021.1.8 | 18.2.8 AT+CMQTTCONNECT | Modify this command |
| 2021.1.12 | 7.2.9 AT+CCFC | Modify this command |
| 2021.1.14 | 11.2.5 AT+CADC2 7.2.21 AT+COUTGAIN | Modify these commands |
| 2021.1.15 | 9.2.20 AT+CMGSEX 15.2.18 AT+CSOCKSETPN 15.2.6 AT+CIPCLOSE 5.2.8 AT+CGQREQ | Modify these commands |
| 2021.1.29 | 11.2.7 AT+CPMVT 8.2.4 AT+CPBW 9.2.5 AT+CSCB 9.2.21 AT+CMSSEX 9.2.6 AT+CSMP 21.2.3 AT+CREC | Modify these commands |

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| | All | Add support on A7678 Series |
| 2021.2.3 | 3.2.10 AT+CCLK 7.2.12 AT+COLP | Modify these commands |
| | 24 AT Commands for GNSS | modify this chapter for A7678 Series |
| 2021.3.12 | 18.2.15 AT+CMQTTUNSUBTOPIC | Modify this command |
| 2021.2.4 | 12.2 Detailed Description of AT Commands for File System | Modify this command |
| 2021.3.5 | 14.2.1 AT+CHTPSERV | Modify this command |
| 2021.3.16 | 11.2.7AT+CPMVT Low and high voltage Power Off 4.2.2 AT+COPS Operator selection 15.2.6AT+CIPCLOSE Close TCP or UDP Socket 9.2.15AT+CMGW Write message to memory 14.2.3AT+CNTP rectify parameter range | Modify this command |
| 2021.3.10 | 13.2.3AT+CFTRXBUF 13.1 AT+CFTRANRX 13.1 AT+CFTRANTX 13.1 AT+CFTRXBUF | Add this command |
| 2021.3.26 | 4.2.4 AT+CSSN 25.2.1 AT+CWSTASCAN 25.2.2 AT+CWSTASCANEX 2.2.9 AT&V | Modify this command |
| 2021.3.29 | 14.2.3 AT+CCLK | Modify this command |
| 2021.3.30 | 5.2.2AT+CEREG EPS network registration status | Modify this command |
| 2021.3.30 | 9.2.18AT+CMVP Set message valid period | Modify this command |
| 2021.3.30 | 9.2.10 AT+CGSMS Select service for MO SMS messages | Modify this command |
| 2021.3.30 | 10.2.7 AT+CSCLK | Modify this command |
| 2021.3.30 | 15.2.8 AT+CSOCKSETPN | Modify this command |
| 2021.3.30 | 22.2.1AT+CFOTA | Modify this command |
| 2021.3.31 | 9.2.16 AT+CMGD | Modify this command |
| 2021.3.31 | 16.2.8 AT+HTTPPOSTFILE | Modify this command |
| 2021.4.1 | 26 Added Ble At | Add this chapter |
| 2021.4.14 | 25.2.2 AT+CWSTASCANEX | Modify this command |
| 2021.4.22 | 7.2.3 AT+CBST | Modify this command |

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| | 26.2.19 +BLESRREQ 26.2.20 +BLESWREQ 26.2.21 +BLESCON | Add this command |
| 2021.4.22 | 26.2.9 AT+BLESSTART 26.2.11 AT+BLEADV | Modify this command |
| 2021.4.27 | 20.2.3 AT+CDTAM | Modify this command |
| | 16.2.1 AT+HTTPINIT 16.2.2 AT+HTTPTERM 16.2.3 AT+HTTPPARA 16.2.5 AT+HTTPHEAD 16.2.6 AT+HTTPREAD 16.2.7 AT+HTTPDATA 17.2.1 AT+CFTPSSTART 17.2.2 AT+CFTPSSTOP 17.2.5 AT+CFTPSLIST 17.2.9 AT+CFTPSPWD | Add there Test commands |
| 2021.4.27 | 26.2.1 AT+BLESREG 26.2.21 +BLESCONN | Modify this command |
| 2021.4.28 | 16.2.3 AT+HTTPPARA 16.2.8 AT+HTTPPOSTFILE | Modify this command |
| 2021.4.29 | 20.2.1 AT+CTTS | Modify this command |
| 2021.4.30 | 9.2.21 AT+CMSSEX | Modify this command |
| 2021.4.30 | 2.2.4ATS0 Automatic answer incoming call 22.3 Unsolicited Result Codes 16.2.5 AT+HTTPHEAD | Modify the word |
| 2021.5.7 | 23.2.2 AT+CSCFOTA | Modify the word |
| 2021.5.8 | 11.2.7 AT+CPMVT | Modify the word |
| 2021.5.10 | 21.2.2 AT+CCMXSTOP | Modify this command |
| 2021.5.10 | 17.2.14 AT+CFTPSPUT 26.2.1 AT+BLEPOWER 26.2.10 AT+BLESSCRM 26.2.12 AT+BLESSDRM | Modify this command |
| 2021.5.13 | 26.2.1 AT+BLEPOWER 26.2.5 AT+BLESREG 26.2.7 AT+BLESSAD 26.2.9 AT+BLESCAD | Modify this command |

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| | 26.2.11 AT+BLESSDAD | |
| 2021.5.14 | 7.2.11 AT+CLIR 7.2.12 AT+COLP | Modify these commands |
| 2021.5.17 | 14.2.1 AT+CHTPSERV | Modify the word |
| 2021.5.18 | 9.2.15 AT+CMGW 9.2.20 AT+CMGSEX | Modify these commands |
| 2021.5.19 | 26.2.2 AT+BLESTATUS 26.2.3 AT+BLEHOST 26.2.4 AT+BLEADDRESS 26.2.5 AT+BLESREG 26.2.6 AT+BLESREG 10.2.10 AT+CFGRI 24.2.6 AT+CGNSSIPR 24.2.9 AT+CGPSNMEARATE 24.2.7 AT+CGNSSMODE 21.2.3 AT+CREC | Modify these commands |
| 2021.5.31 | 21.2.3 AT+CREC | Modify this commands |
| 2021.6.1 | 12.1 Overview of AT Commands for File System | Modify the length of actual fully qualified names |
| 2021.6.1 | 12.2.6 AT+FSRENAME | Delete the Note |
| 2021.6.2 | 5.2.4 AT+CGACT 7.2.12 AT+COLP | Modify these commands |
| 2021.6.16 | 6.2.12 AT+SWITCHSIM 6.2.13 AT+DUALSIM 6.2.14 AT+BINDSIM | Add these commands |
| 2021.6.17 | 21.2.3 AT+CREC | Modify this commands |
| 2021.6.29 | 22.2.1 AT+CFOTA | Modify URC report |
| 2021.6.29 | 2.2.1 ATD 2.2.2 ATA 2.2.3 ATH 7.2.2 AT+CHUP 7.2.11 AT+CLIR 7.2.12 AT+COLP 7.2.15 AT+CSTA | Modify these commands |

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| V1.04 | 2021.6.29 | 21.2.3 AT+CREC | Modify comment |
| | 2021.6.30 | 4.2.1 AT+CREG 5.2.1 AT+CGREG 5.2.2 AT+CEREG | Add state |
| | 2021.6.30 | 14.2.1 AT+CHTPSERV 17.2Overview of AT Commands for FTP. | Modify parameter |
| | 2021.6.30 | 20.2.1 AT+CTTS | Modify comment |
| | 2021.7.7 | 21.2.3 AT+CREC | Modify comment |
| | 2021.7.8 | 24.2.6 AT+CGNSSIPR | Add notes |
| | 2021.7.13 | 15.2.18 AT+C SOCKSETPN 21.2.3 AT+CREC | Modify comment |
| | 2021.7.13 | 6.2.12 AT+SWITCHSIM 6.2.13 AT+DUALSIM 6.2.14 AT+BINDSIM | Modify these commands |
| | 2021.7.19 | 7.2.7 AT+CEER 7.2.13 AT+VTS 7.2.15 AT+CSTA 7.2.16 AT+CMOD | Modify these commands |
| | 2021.7.23 | 16.2.5AT+HTTPHEAD 16.2.6AT+HTTPREAD 16.2.7AT+HTTPDATA 16.2.8AT+HTTPPOSTFILE | Modify these commands |
| | 2021.7.23 | 17.2.5 AT+CFTPSLIST 17.2.16 AT+CFTPSSIZE | Modify comment |
| | 2021.7.28 | 15.2.2 AT+NETCLOSE 15.2.18 AT+C SOCKSETPN 24.2.3 AT+CGPSCOLD 24.2.4 AT+CGPSWARM 24.2.5 AT+CGPSHOT 25.2.1 AT+CWSTASCAN 25.2.2 AT+CWSTASCANEX | Modify these commands |
| | 2021.7.28 | 24.2.16 AT+CGNSSPROD | Add this command |
| | 2021.7.29 | 14.2.1 AT+CHTPSERV 11.2.1 AT+CVALARM 11.2.7 AT+CPMVT | Modify these comment |
| | 2021.7.30 | 4.2.11 AT+CTZU | Modify comment |

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| V1.05 | 2021.7.30 | 24.2.2 AT+CGNSSSTST 10.2.11 AT+CURCD | Modify these commands |
| | 2021.8.11 | 17.2.9 AT+CFTPSPWD 17.2.10 AT+CFPSDELE | Modify these commands |
| | 2021.8.13 | 18.2.2 AT+CMQTTSTOP | Modify command |
| | 2021.8.16 | 6.2.10 AT+UIMHOTSWAPON | Modify command |
| | 2021.8.18 | 27.2.1 AT+CTBURST | Add this command |
| | 2021.8.19 | 17.2.3 AT+CFTPSLOGIN 25.2.1AT+CWSTASCAN | Add read command |
| | 2021.8.23 | 3.2.7 AT+CACM 3.2.8AT+CAMM | Change the font |
| | 2021.8.24 | 3.2.2 AT+CSQ | Change the defined values |
| | 2021.8.27 | 18.2.4 AT+CMQTTREL 18.4 Unsolicited Result Codes | Modify command |
| | 2021.8.27 | 15.2.18 AT+C SOCKSETPN 16.2.4 AT+HTTPACTION | Modify command |
| | 2021.9.1 | 5.2.1 AT+CGREG Network registration status 5.2.2 AT+CEREG EPS network registration status | Modify command |
| | 2021.9.1 | 15.2.18 AT+C SOCKSETPN | Modify command |
| | 2021.9.2 | 17.2.9 AT+CFTPSPWD 17.4 Unsolicited Result codes | Modify command |
| | 2021.9.3 | 19.2.1 AT+CSSLCFG 19.2.15 AT+CCHRECV | Modify command |
| | 2021.9.8 | 17.2.6 AT+CFTPSMKD 17.2.7 AT+CFTPSRMD 17.2.8 AT+CFTPSCWD 17.2.10AT+CFPSDELE 17.2.11AT+CFTPSGETFILE 17.2.12AT+CFTPSPUTFILE 17.2.13AT+CFTPSGET | Modify command |
| | 2021.9.9 | 19.2.2 AT+CCERTDOWN | Modify command |
| | 2021.9.23 | 11.2.7 AT+CPMVT | Modify command |

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| V1.06 | 2021.9.27 | 9.2.21 AT+CMSSEX 13.2.3 AT+CFTRXBUF | Modify command |
| | 2021.9.27 | 9.2.16 AT+CMGD 24.2.1 AT+CGNSSPWR | Modify these commands |
| | 2021.9.28 | 18.2.3 AT+CMQTTACCQ 18.2.4 AT+CMQTTREL | Modify command |
| | 2021.9.29 | 17.2.15 AT+CFTPSSINGLEIP | Modify command |
| | 2021.9.29 | 10.2.6 AT+IFC | Modify command |
| | 2021.9.29 | 5.2.9 AT+CGEQREQ | Modify command |
| | 2021.9.29 | 11.2.9 AT+CWIIC | Modify command |
| | 2021.10.8 | 15.2.4 AT+CIPSEND | Modify command |
| | 2021.10.8 | 15.2.3 AT+CIPOPEN | Modify command |
| | 2021.10.8 | 15.2.5 AT+CIPRXGET | Modify command |
| | 2021.10.9 | 19.4 Unsolicited Result Codes | Add URC |
| | 2021.10.18 | 17.2.3 AT+CFTPSLOGIN | Modify command |
| | 2021.10.27 | 12.2.4 AT+FSLS | Modify command |
| | 2021.10.27 | 16.2.8 AT+HTTPPOSTFILE | Modify command |
| | 2021.10.29 | 6.2.12 AT+SWITCHSIM 6.2.13 AT+DUALSIM | Modify commands |
| | 2021.11.3 | 18.2.14 AT+CMQTTSUB 18.2.8 AT+CMQTTCONNECT | Modify commands |
| | 2021.11.9 | 11.2.2 AT+CVAUXS 11.2.2 AT+CVAUXV | Modify commands |
| | 2021.11.11 | 15.2.4 AT+CIPSEND | Modify commands |
| | 2021.11.15 | 6.2.6 AT+CSIM | Modify commands |
| | 2021.11.17 | 12.2.5 AT+FSRENAME | Add Notes |
| | 2021.11.19 | 4.2.11 AT+CTZU | Modify commands |
| | 2021.11.22 | 3.2.13 AT+SIMEI | Add Notes |
| | 2021.11.25 | 10.2.10 AT+CFGRI | Modify commands |
| V1.07 | 2021.11.23 | 15.2.18 AT+CSOCKSETPN | Modify commands |

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| 2021.11.26 | 15.2.2 AT+NETCLOSE | Modify commands |
| 2021.11.29 | 24.2.12 AT+CGNSSINFO | Modify the comment of this command. |
| 2021.12.01 | 12.2.6 AT+FSRENAME | Modify the note of this command. |
| 2021.12.02 | 11.2.2 AT+CVAUXS 11.2.3 AT+CVAUXV | Modify the note of this command. |
| 2021.12.02 | 29 AT Commands for WEBSOCKET | Add command |
| 2021.12.02 | 15.2.7 AT+IPADDR | Modify commands |
| 2021.12.03 | 21.2.4 AT+CRTSWITCH | Add command |
| 2021.12.08 | 25.2.1 AT+CWSTASCNA | Modify commands |
| 2021.12.09 | 11.2.7 AT+CPMVT | Modify commands |
| 2021.12.13 | 15.2.18 AT+CSOCKSETPN | Modify commands |
| 2021.12.13 | 27.3.1 AT+CTBURST | Modify the command description |
| 2021.12.13 | 14.2.3 AT+CNTP | Modify examples |
| 2021.12.13 | 4.2.12 AT+CTZR | Modify the comment of this command. |
| 2021.12.14 | 20.2.2 AT+CTTSPARAM | Modify the comment of this command. |
| 2021.12.14 | 15.2.3 AT+CIPOOPEN | Modify the comment of this command. |
| 2021.12.16 | 19.2.15 AT+CCHRECV | Modify the comment of this command. |
| 2021.12.22 | 9.2.17 AT+CGSMS | Modify the comment of this command. |
| 2021.12.23 | 4.2.10 AT+CPSITD | Add command |
| 2021.12.24 | 30.2.1 AT+LWSTART | |
| | 30.2.2 AT+LWSTOP | |
| | 30.2.3 AT+LWCNF | |
| | 30.2.4 AT+LWOOPEN | |
| | 30.2.5 AT+LWCLOSE | |
| | 30.2.6 AT+LWADDOBJ | |
| | 30.2.7 AT+LWDELOBJ | |
| | 30.2.8 AT+LWREADRSP | |
| | 30.2.9 AT+LWWRITERSP | |
| | 30.2.10 AT+LWEXECUTERSP | |
| | 12.2.10 AT+FSPRESET | |

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| 2021.12.31 | 15.2.3 AT+CIPOOPEN | Modify the comment of this command. |
| 2021.12.31 | 9.2.5 AT+CSCB | Modify the comment of this command. |
| 2022.01.11 | 25.2.3 AT+CWSTASCANSYN | Add the command. |
| 2022.01.12 | 15.2.5 AT+CIPRXGET | Modify the comment of this command. |
| 2022.01.14 | 15.2.19 AT+CTCPKA | Add the commands |
| 2022.1.21 | 18.1 Overview of AT Commands for MQTT(S) | Modify the comment of this command. |
| 2022.1.21 | 27.2 Detailed Description of AT Commands for CTBURST(CAT4) | Modify this chapter |
| 2022.1.21 | 8.2.4 AT+CPBW Write phonebook entry | Modify this command |
| 2022.1.25 | 6.2.15 AT+CENPRX Enable SIM2 URC prefix | Add the command |
| 2022.02.11 | 15.2.20 AT+CDNSCFG 15.2.21 AT+CSOC | Add these commands |
| 2022.02.17 | 9.2.21 AT+CMSSEX | Modify this command |
| 2022.02.21 | 4.2.8 AT+CNBP | Modify this command |
| 2022.02.25 | 21.2.5 AT+CRINGSET | Add this command |
| 2022.03.03 | 4.2.1 AT+CREG | Modify this command |
| 2022.03.04 | 6.1.26 AT+DUALSIMURC Dual card reporting control | Add the command |
| 2022.03.09 | 4.2.10 AT+CPSI | Modify this command |
| 2022.03.17 | 25.2.2 AT+CWSTASCANEX | Modify font color |
| 2022.03.22 | 16.2.8 AT+HTTPPOSTFILE | Modify this command |
| 2022.3.23 | 18.2.9 AT+CMQTTDISC 18.2.12 AT+CMQTPUB | Modify this command |
| 2022.03.24 | 31.2.1 AT+COAPSTART 31.2.2 AT+COAPSTOP 31.2.3 AT+COAPOpen 31.2.4 AT+COAPCLOSE 31.2.5 AT+COAPHEAD | Add command |

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| | 31.2.6 AT+COAPOPTION 31.2.7 AT+COAPSEND 31.2.8 AT+COAPSENDTX | |
| 2022.03.28 | 15.2.21 AT+CSOC | Modify this command |
| 2022.03.30 | 13.2.1 AT+CFTRANRX | Modify this command |
| 2022.03.31 | 12.2.11 AT+FSOPEN 12.2.12 AT+FSREAD 12.2.13 AT+FSWRITE 12.2.14 AT+FSSEEK 12.2.15 AT+FSPOSITION 12.2.16 AT+FSCLOSE | Add these commands |
| 2022.04.01 | 6.2.16 AT+DUALSIMURC | Mdify this command |
| 2022.04.06 | 15.1 Modify directory | Modify directory |
| 2022.04.07 | 6.2.15 AT+CENPRX | Mdify this command |
| 2022.04.11 | 25.2.3 AT+CWSTASCANSYN 26.2.15 AT+BLESSETADVDATA 26.2.17 AT+BLESSETADVPARAM 26.2.24 AT+BLESRSP 26.2.37 AT+BLECGC 26.2.41 AT+BLECRD | Mdify this command |
| 2022.04.15 | 32.2.1 AT+HWVER 32.2.2 AT+AUTOREGCFG | Add these commands |
| 2022.04.19 | 15.2.19 AT+CTCPKA | Mdify this command |
| 2022.04.21 | 17.2.16 AT+CFTPSSIZE | Mdify this command |
| 2022.04.24 | 15.2.20 AT+CDNSCFG | Mdify this command |
| 2022.5.1 | 7.2.3 AT+CBST | Mdify this command |
| 2022.5.7 | 21.1.6 AT+CCODESWITCH | Add new command |
| 2022.5.14 | 2.2.11 AT&F | Mdify this command |
| 2022.5.18 | 26.3.1 AT+BTPOWER 26.3.2 AT+BTHOST 26.3.3 AT+BTADDR 26.3.4 AT+BTSCAN 26.3.5 AT+BTIOCAP 26.3.6 AT+BTPAIR 26.3.7 AT+BTUNPAIR | Add new command |

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| | 26.3.8 AT+BTPAIRED 26.3.9 AT+BTSPPSRV 26.3.10 AT+BTSPPPROF 26.3.11 AT+BTSPPCONN 26.3.12 AT+BTSPPSEND 26.3.13 +BTSPPRECV | |
| 2022.5.18 | 25.2.4 AT+CWMAP 25.2.5AT+CWSSID 25.2.6AT+CWAUTH 25.2.7AT+CWMOCCH 25.2.8AT+CWISO | Add new command |
| 2022.5.19 | 25.1AT+CWSTASCAN | Add new command |
| 2022.5.20 | 21.2.5 AT+CRINGSET | Modify this command |
| 2022.5.25 | 21.2.5 AT+CRINGSET | Modify this command |
| 2022.5.26 | 25.2.9 AT+CWMACADDR 25.2.10 AT+CWLICNT | Add new command |
| 2022.5.26 | 5.2.16 AT+CGAUTH | Modify this command |
| 2022.5.31 | 26.3.2 AT+BTHOST 26.3.3 AT+BTADDR 26.3.4 AT+BTSCAN 26.3.6 AT+BTPAIR 26.3.7 AT+BTUNPAIR 26.3.8 AT+BTPAIRED 26.3.10 AT+BTSPPPROF 26.3.11 AT+BTSPPCONN 26.3.12 AT+BTSPPSEND 26.3.13 +BTSPPRECV | Modify this command |
| 2022.5.31 | 6.2.15 AT+CENPRX | Delete this command |
| 2022.5.31 | 6.2.15 AT+DUALSIMURC | Modify this command |
| 2022.6.6 | 26.2.11 AT+BLESSDAD 26.2.13 AT+BLESSSTART 26.2.14 AT+BLESSSTOP 26.2.18 AT+BLESLSTART 26.2.19 AT+BLESLSTOP | Modify this command |
| 2022.6.22 | 26.3.1 AT+BTPOWER 26.3.2 AT+BTHOST 26.3.3 AT+BTADDR 26.3.4 AT+BTSCAN 26.3.5 AT+BTIOCAP 26.3.6 AT+BTPAIR | Modify this command |

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| | 26.3.7 AT+BTUNPAIR 26.3.8 AT+BTPAIRED 26.3.9 AT+BTSPPSRV 26.3.10 AT+BTSPPPROF 26.3.11 AT+BTSPPCCONN 26.3.12 AT+BTSPPSEND 26.3.13 AT+BTSPPRECV | |
| 2022.7.6 | 15.2.5 AT+CIPRXGET | Modify this command |
| 2022.7.6 | 4.2.8 AT+CNBP 27.3.1 AT+CTBURST | Modify this command |
| 2022.7.7 | 16.2.3 AT+HTTPPARA | Modify this command |
| 2022.7.7 | 15.2.19 AT+CTCPKA | Modify this command |
| 2022.7.8 | 26.2.7 AT+BLESSAD | Modify this command |
| 2022.7.11 | 7.2.13 AT+CHLD | Add this command |
| 2022.7.13 | 26.2.40 AT+BLECWC 26.2.42 AT+BLECWD | Modify this command |
| 2022.7.15 | 19.2.1 AT+CSSLCFG | Modify this command |
| 2022.7.19 | 34.2.1 AT*COMCFG 34.2.2 AT+CPSMS 34.2.3 AT+MEDCR 35.2.1 AT+DIALMODE 35.2.2 AT\$MYCONFIG 35.2.3 AT+USBNETIP 35.2.4 AT+USBNETMAC | Add these commands |
| 2022.7.19 | 4.2.8 AT+CNBP | Modify this command |
| 2022.7.19 | 15.2.21 AT+CSOC | Modify this command |
| 2022.7.21 | 19.2.16 AT+CCERTMOVE | Modify this command |
| 2022.7.25 | 26.3.3 AT+BTADDR 26.3.4 AT+BTSCAN 26.3.11 AT+BTSPPCCONN | Modify this command |
| V1.08 | 2022.8.3 | 19.1 Modify directory 19.2.1 AT+CSSLCFG |
| | 2022.8.4 | 36.2.1 AT+SJDR 36.2.2 AT+SJDCFG |
| | 2022.8.8 | 17.2.11 AT+CFTPSGETFILE 17.2.12 AT+CFTPSPUTFILE 17.2.19 AT+CFTPSMODE |
| | | Modify this command Modify this command Add this command |

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| | 2022.8.9 | 6.2.10 AT+UIMHOTSWAPON | Modify this command |
| | 2022.8.22 | 22.2.2 AT+LFOTA | Modify this command |
| | 2022.8.23 | 17 FTP(S) | Modify this command |
| | 2022.8.26 | 17.2.11 AT+CFTPSGETFILE 19.2.16 AT+CCERTMOVE | Modify this command |
| | 2022.8.30 | 21.2.7 AT+SIMTONE | Add this command |
| | 2022.8.31 | 17.2.11 AT+CFTPSGETFILE | Modify this command |
| | 2022.9.5 | 29.2 websocket(S) 15.2.2 AT+NETCLOSE | Modify this command |
| | 2022.9.8 | 26.2.17 AT+BLESSETADVPARAM | Modify this command |
| | 2022.9.14 | 17.2.5 AT+CFTPSLIST 17.2.9 AT+CFTPSPWD 17.2.16 AT+CFTPSSIZE 17.2.19 AT+CFTPSMODE 17.4 Unsolicited Result codes 19.2.1 AT+CSSLCFG | Modify this command |
| | 2022.9.19 | 15.2.13 AT+CIPCCFG | Modify this command |
| | 2022.9.27 | 4.2.10 AT+CPSITD | Modify this command |
| | 2022.9.29 | 24.2.13 AT+CGNSSCMD | Modify this command |
| | 2022.9.29 | 16.2.5 AT+HTTPHEAD 16.2.6 AT+HTTPREAD 16.2.8 AT+HTTPPOSTFILE | Modify this command |
| | 2022.9.29 | 25.2.1 AT+CWSTASCAN 25.2.2 AT+CWSTASCANEX 25.2.3 AT+CWSTASCANSYN 26.2.4 AT+BLEADDR 26.2.20 AT+BLEADV | Modify this command |
| V1.09 | 2022.10.13 | 21.2.1 AT+CCMXPLAY | Modify this command |
| | 2022.10.13 | 18.2.3 AT+CMQTTDISC | Modify this command |
| | 2022.10.19 | 26.3.6 AT+BTPAIR 26.3.7 AT+BTUNPAIR 26.3.11 AT+BTSPCONN | Modify this command |
| | 2022.10.20 | 26.3.11 AT+BTSPCONN | Modify this command |

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| | 6.2.13 AT+SWITCHSIM 6.2.14 AT+DUALSIM 6.2.15 AT+BINDSIM 6.2.16 AT+DUALSIMURC | Add Note |
| 2022.11.21 | 26.2.3 AT+BLEHOST 26.3.2 AT+BTHOST | Modify these commands |
| 2022.12.26 | 6.2.8 AT+SPIC | Modify this command |
| 2023.01.11 | 4.2.2 AT+COPS | Add Note |
| 2023.01.11 | 3.2.1 AT+CFUN | Modify this command |
| 2023.02.07 | 27.3 AT+CTBURST | Modify this chapter |
| 2023.02.09 | 4.2 AT+CUSD | Modify this chapter |
| 2023.02.10 | 15.2.3 AT+CIPOOPEN | Modify these commands |
| | 15.2.5 AT+CIPRXGET | Modify these commands |
| | 15.2.13 AT+CIPCCFG | Modify these commands |
| | 15.2.22 AT+CIPCFG | Add this command |
| 2023.02.14 | 3.2.1 AT+CFUN | Modify this chapter for example |
| 2023.02.20 | 27.3.1 AT+CTBURST | Modify this chapter for example |
| 2023.03.08 | 9.2.20 AT+CMGSEX | Modify this chapter |
| 2023.03.14 | 7.2.6 AT+CLCC | Modify this command |
| 2023.03.14 | 6.2.15 AT+DUALSIMURC | Modify the Defined Values |
| 2023-03-15 | 9.2.22 AT+CCONCINDEX | Add this command |
| 2023-3-17 | 9.2.10 AT+CGSMS | Modify this command |
| 2023.3.23 | 15.2.17AT+CDNSGIP | Modify this command |
| 2023.3.23 | 2.2.20 AT+CSCS | Modify this command |
| 2023.3.23 | 2.2.16 AT+CGMI | Modify this command |
| 2023.3.27 | 16.2.8 AT+HTTPPOSTFILE | Modify this command |
| 2023.3.27 | 15.2.23AT+CIPSENDSTR | Add this command |
| 2023.3.29 | 12.2.12 AT+FSREAD 12.2.13 AT+FSWRITE | Modify this command |

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| | 12.2.14 AT+FSSEEK | |
| 2023.4.4 | 18.2.17 AT+CMQTTCFG | Modify this command |
| 2023.4.6 | 4.2.3 AT+CUSD | Modify this command |
| 2023.4.10 | 9.2.22 AT+CCONCINDEX | Modify this command |
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1 Introduction

1.1 Scope of the document

This document presents the AT Command Set for SIMCom A76XX Series.

More information about the SIMCom Module which includes the Software Version information can be retrieved by the command ATI. In this document, a short description, the syntax, the possible setting values and responses, and some Examples of AT commands are presented.

Prior to using the Module, please read this document and the Version History to know the difference from the previous document.

In order to implement communication successfully between Customer Application and the Module, it is recommended to use the AT commands in this document, but not to use some commands which are not included in this document.

1.2 Related documents

- [1] A76XX Series_TCPIP_Application_Note
- [2] A76XX Series_HTTP(S)_Application_Note
- [3] A76XX Series_FTP(S)_Application_Note
- [4] A76XX Series_MQTT(S)_Application_Note
- [5] A76XX Series_SSL_Application_Note
- [6] A76XX Series_AUDIO_Application_Note

You can visit the SIMCom Website for more information by the following link:

<http://www.simcom.com>

1.3 Terms and Abbreviations

For the purposes of the present document, the following abbreviations apply:

| Abbreviation | Description |
|---------------|--|
| AT | ATtention; the two-character abbreviation is used to start a command line to be sent from TE/DTE to TA/DCE |
| DCE | Data Communication Equipment |
| DCS | Digital Cellular Network |
| DTE | Data Terminal Equipment |
| DTMF | Dual Tone Multi-Frequency |
| EDGE | Enhanced Data GSM Environment |
| EGPRS | Enhanced General Packet Radio Service |
| GPIO | General-Purpose Input/Output |
| GPRS | General Packet Radio Service |
| GSM | Global System for Mobile communications |
| HSDPA | High Speed Downlink Packet Access |
| HSUPA | High Speed Uplink Packet Access |
| I2C | Inter-Integrated Circuit |
| IMEI | International Mobile station Equipment Identity |
| IMSI | International Mobile Subscriber Identity |
| ME | Mobile Equipment |
| MO | Mobile-Originated |
| MS | Mobile Station |
| MT | Mobile-Terminated; Mobile Termination |
| PCS | Personal Communication System |
| PDU | Protocol Data Unit |
| PIN | Personal Identification Number |
| PUK | Personal Unlock Key |
| SIM | Subscriber Identity Module |
| SMS | Short Message Service |
| SMS-SC | Short Message Service Service Center |
| TA | Terminal Adaptor; e.g. a data card (equal to DCE) |
| TE | Terminal Equipment; e.g. a computer (equal to DTE) |
| UE | User Equipment |
| UMTS | Universal Mobile Telecommunications System |
| USIM | Universal Subscriber Identity Module |
| WCDMA | Wideband Code Division Multiple Access |
| FTP | File Transfer Protocol |

| | |
|------|------------------------------|
| HTTP | Hyper Text Transfer Protocol |
| RTC | Real Time Clock |
| URC | Unsolicited Result Code |

1.4 Definitions and Conventions

1. Definitions

For the purposes of the present document, the following syntactical definitions apply:

- ◆ <CR> Carriage return character.
- ◆ <LF> Linefeed character.
- ◆ <...> Name enclosed in angle brackets is a syntactical element. Brackets themselves do not appear in the command line.
- ◆ [...] Optional subparameter of AT command or an optional part of TA information response is enclosed in square brackets. Brackets themselves do not appear in the command line. If subparameter is not given, its value equals to its previous value or the recommended default value.
- ◆ underline Underlined and defined subparameter value is the recommended default setting or factory setting.
- ◆ Parameter Saving Mode

NO_SAVE: The parameter of the current AT command will be lost if module is rebooted or current AT command doesn't have parameter.

AUTO_SAVE: The parameter of the current AT command will be kept in NVRAM automatically and take in effect immediately, and it won't be lost if module is rebooted.

AUTO_SAVE_REBOOT: The parameter of the current AT command will be kept in NVRAM automatically and take in effect after reboot, and it won't be lost if module is rebooted.

AT&W_SAVE: The parameter of the current AT command will be kept in usersetting_save.nvm by sending the command of "AT&W".

◆ Max Response Time

Max response time is estimated maximum time to get response, the unit is seconds.

2. Document Conventions

- ◆ Generally, the characters <CR> and <LF> are intentionally omitted throughout this document.

- ◆ If command response is ERROR, not list the ERROR response inside command syntax.

NOTE

AT commands and responses in figures may be not following above conventions.

1.5 AT Interface Synopsis

1.5.1 Interface Settings

Between Customer Application and the Module, standardized RS-232 interface is used for the communication, and default values for the interface settings as following:

115200bps, 8 bit data, no parity, 1 bit stop, no data stream control.

1.5.2 AT Commands Syntax

The "AT" or "at" or "aT" or "At" prefix must be included at the beginning of each command line (except A/ and +++), and the character <CR> is used to finish a command line so as to issue the command line to the module. It is recommended that a command line only includes a command.

When Customer Application issues a series of AT commands on separate command lines, leave a pause between the preceding and the following command until information responses or result codes are retrieved by Customer Application, for Examples, "OK" is appeared. This advice avoids too many AT commands are issued at a time without waiting for a response for each command.

The AT Command set implemented by A7600 Series is a combination of 3GPP TS 27.005, 3GPP TS 27.007 and ITU-T recommendation V.25ter and the AT commands developed by SIMCom.

In the present document, AT commands are divided into three categories: Basic Command, S Parameter Command, and Extended Command.

1. Basic Command

The format of Basic Command is "AT<x><n>" or "AT&<x><n>", where "<x>" is the command name, and

"<n>" is/are the parameter(s) for the basic command which is optional. An Examples of Basic Command is "ATE<n>", which informs the TA/DCE whether received characters should be echoed back to the TE/DTE according to the value of "<n>"; "<n>" is optional and a default value will be used if omitted.

2. S Parameter syntax

The format of S Parameter Command is "ATS<n>=<m>", "<n>" is the index of the S-register to set, and "<m>" is the value to assign to it. "<m>" is optional; in this case, the format is "ATS<n>", and then a default value is assigned.

3. Extended Syntax

The Extended Command has several formats, as following table list:

Table 1: Types of AT commands and responses

| | |
|--|---|
| Test Command AT+<x>=? | The mobile equipment returns the list of parameters and value ranges set with the corresponding Write Command or by internal processes. |
| Read Command AT+<x>? | This command returns the currently set value of the parameter or parameters. |
| Write Command AT+<x>=<...> | This command sets the user-definable parameter values. |
| Execution Command AT+<x> | The execution command reads non-variable parameters affected by internal processes in the GSM engine. |

NOTE

The character "+" between the prefix "AT" and command name may be replaced by other character. For Examples, using "#" or "\$" instead of "+".

4. Combining AT commands on the same Command line

You can enter several AT commands on the same line. In this case, you do not need to type the "AT" or "at" prefix before every command. Instead, you only need type "AT" or "at" the beginning of the command line. Please note to use a semicolon as the command delimiter after an extended command; in basic syntax or S parameter syntax, the semicolon need not enter, for Examples:

ATE1Q0S0=1S3=13V1X4;+IFC=0,0;+IPR=115200.

The Command line buffer can accept a maximum of 3071 characters (counted from the first command without "AT" or "at" prefix). If the characters entered exceeded this number then none of the Command will executed and TA will return "ERROR".

5. Entering successive AT commands on separate lines

When you need to enter a series of AT commands on separate lines, please Note that you need to wait the final response (for Examples OK, CME error, CMS error) of last AT Command you entered before you enter

the next AT Command.

1.5.3 Supported character sets

The A7600 Series AT Command interface defaults to the IRA character set. The A7600 Series supports the following character sets:

GSM format

UCS2

IRA

The character set can be set and interrogated using the "AT+CSCS" Command (3GPP TS 27.007). The character set is defined in GSM specification 3GPP TS 27.005.

The character set affects transmission and reception of SMS and SMS Cell Broadcast messages, the entry and display of phone book entries text field and SIM Application Toolkit alpha strings.

2 AT Commands According to V.25TER

2.1 Overview of AT Commands According to V.25TER

| Command | Description |
|-----------------|---|
| ATD | Mobile originated call to dial a number |
| ATA | Call answer |
| ATH | Disconnect existing call |
| ATS0 | Automatic answer incoming call |
| +++ | Switch from data mode to command mode |
| ATO | Switch from command mode to data mode |
| ATI | Display product identification information |
| ATE | Enable command echo |
| AT&V | Display current configuration |
| ATV | Set result code format mode |
| AT&F | Set all current parameters to manufacturer defaults |
| ATQ | Set Result Code Presentation Mode |
| ATX | Set CONNECT Result Code Forma |
| AT&W | Save the user setting to ME |
| ATZ | Restore the user setting from ME |
| AT+CGMI | Request manufacturer identification |
| AT+CGMM | Request model identification |
| AT+CGMR | Request revision identification |
| AT+CGSN | Request product serial number identification |
| AT+CSCS | Select TE character set |
| AT+GCAP | Request overall capabilities |

2.2 Detailed Description of AT Commands for V.25TER

2.2.1 ATD Mobile originated call to dial a number

This command is used to list characters that may be used in a dialling string for making a call or controlling supplementary services.

ATD Mobile originated call to dial a number

| | |
|-----------------------|--|
| | <p>Response</p> <p>Originate a voice call successfully: OK</p> <p>VOICE CALL: BEGIN</p> <p>Originate a data call successfully: CONNECT [<text>]</p> <p>Originate a call unsuccessfully during command execution: ERROR</p> <p>Originate a call unsuccessfully for failed connection recovery: NO CARRIER</p> <p>Originate a call unsuccessfully for error related to the MT: +CME ERROR: <err></p> |
| Execution Command | ATD<n>[<mgsms>][;] |
| Parameter Saving Mode | AT&W_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|------------------------|--|
| <n> | String of dialing digits and optionally V.25ter modifiers dialing digits: 0-9, *, #, +, A, B, C Following V.25ter modifiers are ignored: ,(comma),T,P,!W,@ |
| Emergency call: | |
| <n> | Standardized emergency number 112 (no SIM needed) |
| <mgsms> | String of GSM modifiers: l Actives CLIR (Disables presentation of own number to called party) i Deactivates CLIR (Enable presentation of own number to called party) G Activates Closed User Group invocation for this call only g Deactivates Closed User Group invocation for this call only |
| <;> | The termination character ";" is mandatory to set up voice calls. It must not be used for data and fax calls. |
| <text> | CONNECT result code string; the string formats please refer ATX |

| | |
|-------|---|
| | command. |
| <err> | Service failure result code string; the string formats please refer +CME ERROR result code and AT+CMEE command. |

Examples

ATD10086;

OK

VOICE CALL: BEGIN

NOTE

1. Support several "P" or "p" in the DTMF string but the valid auto-sending DTMF after characters "P" or "p" should not be more than 29.
2. Auto-sending DTMF after character "P" or "p" should be ASCII character in the set 0-9, *, #.

2.2.2 ATA Call answer

This command is used to make remote station to go off-hook, e.g. answer an incoming call. If there is no an incoming call and entering this command to TA, it will be return "NO CARRIER" to TA.

| ATA Call answer | |
|---------------------------------|---|
| Execution Command ATA | <p>Response</p> <p>1)For voice call: OK</p> <p>VOICE CALL: BEGIN</p> <p>2)For data call, and TA switches to data mode: CONNECT</p> <p>3)No connection or no incoming call: NO CARRIER</p> |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Examples

ATA

OK

VOICE CALL: BEGIN

NOTE

If there is an incoming call and not connected,unsolicited result code RING will report every six seconds.

2.2.3 ATH Disconnect existing call

This command is used to disconnect existing call. Before using ATH command to hang up a voice call, it must set AT+CVHU=0. Otherwise, ATH command will be ignored and "OK" response is given only.

This command is also used to disconnect PS data call, and in this case it doesn't depend on the value of AT+CVHU.

ATH Disconnect existing call

| | Response If AT+CVHU=0: OK |
|---------------------------------|--|
| Execution Command ATH | VOICE CALL: END: <time> |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Examples

AT+CVHU=0

OK

ATH

OK

VOICE CALL: END: 000017

2.2.4 ATS0 Automatic answer incoming call

The S-parameter command controls the automatic answering feature of the Module. If set to 000, automatic answering is disabled, otherwise it causes the Module to answer when the incoming call indication (RING) has occurred the number of times indicated by the specified value; and the setting will not be stored upon power-off, i.e. the default value will be restored after restart.

ATS0 Automatic answer incoming call

| | |
|--|--|
| Read Command ATS0? | Response 1) <n> OK 2) ERROR |
| Write Command ATS0=<n> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AT&W_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|------------------|--|
| <n> | <u>000</u> Automatic answering mode is disable. <u>001–255</u> Enable automatic answering on the ring number specified. |
|------------------|--|

Examples

ATS0=003

OK

ATS0?

000

OK

NOTE

The S-parameter command is effective on voice call and data call.

If <n> is set too high, the remote party may hang up before the call can be answered automatically.

2.2.5 +++ Switch from data mode to command mode

This command is only available during a connecting PS data call. The +++ character sequence causes the TA to cancel the data flow over the AT interface and switch to Command Mode. This allows to enter AT commands while maintaining the data connection to the remote device.

+++ Switch from data mode to command mode

| Execution Command | Response |
|-----------------------|-----------|
| +++ | OK |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Examples

+++

OK

NOTE

To prevent the +++ escape sequence from being misinterpreted as data, it must be preceded and followed by a pause of at least 1000 milliseconds, and the interval between two '+' character can't exceed 900 milliseconds.

2.2.6 ATO Switch from command mode to data mode

ATO is the corresponding command to the +++ escape sequence. When there is a PS data call connected and the TA is in Command Mode, ATO causes the TA to resume the data and takes back to Data Mode.

ATO Switch from command mode to data mode

| | |
|---------------------------------|--|
| | Response |
| Execution Command ATO | 1)TA/DCE switches to Data Mode from Command Mode: CONNECT [<baud rate>] 2)If connection is not successfully resumed: NO CARRIER 3) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Examples

ATO
CONNECT 115200

2.2.7 ATI Display product identification information

This command is used to request the product information, which consists of manufacturer identification, model identification, revision identification, International Mobile station Equipment Identity (IMEI)and overall capabilities of the product.

ATI Display product identification information

| | |
|---------------------------------|---|
| Execution Command ATI | Response Manufacturer: <manufacturer> Model: <model> Revision: <revision> IMEI: <sn> +GCAP: list of <name>s |
| | OK |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|-------------------------------------|
| <manufacturer> | The identification of manufacturer. |
| <model> | The identification of model. |

| | |
|-------------------------|--|
| <revision> | The revision identification of firmware. |
| <sn> | Serial number identification, which consists of a single line containing IMEI (International Mobile station Equipment Identity)number. |
| <name> | List of additional capabilities: +CGSM GSM function is supported +FCLASS FAX function is supported +DS Data compression is supported +ES Synchronous data mode is supported. +CIS707-A CDMA data service command set +CIS-856 EVDO data service command set +MS Mobile Specific command set |

Examples

ATI

Manufacturer: INCORPORATED

Model: A7600C

Revision: A7600C_V1.0

IMEI: 351602000330570

+GCAP: +CGSM,+FCLASS,+DS

OK

2.2.8 ATE Enable command echo

This command sets whether or not the TA echoes characters.

ATE Enable command echo

| | |
|--|---|
| Execution Command ATE[<value>] | Response 1)if format is right OK 2) ERROR |
| Parameter Saving Mode | AT&W_SAVE |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|----------------------|-----------------|
| <value> | 0 Echo mode off |
|----------------------|-----------------|

1 Echo mode on

Examples

ATE1

OK

ATE0

OK

2.2.9 AT&V Display current configuration

This command returns some of the base configuration parameters settings.

AT&V Display current configuration

| | Response |
|-----------------------|-------------------|
| Execution Command | 1) <TEXT> |
| AT&V | OK 2) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

<TEXT> All relative configuration information.

Examples

AT&V

```
&C: 1; &D: 0; &F: 0; &W: 0; E: 1; Q: 0; V: 1; X: 0; Z: 0; S0: 0; S2: 43; S3: 13; S4: 10; S5: 8; S6: 2;
S7: 1; S8: 2; S9: 6; S10: 7; S11: 63; S30: 10; +FCLASS: 0; +CSCS: IRA; +CREG: 0; +CGREG: 0;
+CEREG: 0; +CGDCONT:
(1,"IP","ctnet.mnc011.mcc460.gprs","10.13.204.244",0,0,,,), (2,"IP","CMNET");
+CGDSCONT: ;
+CGEQMIN: (1,0,256000,256000,256000,256000,2,1520,"0E0,6E8,",3,150,0,0,0);
+CGQMIN:(1,3,4,5,1,1),(2,3,4,5,1,1); +CGEREP: (2,0); +CGCLASS: "A"; +CGACT: (1,1),(2,0);
```

```
+CGAUTH: (1,0),(2,0); +CPBS: "SM"; +CMEE: 2; +CFUN: 1; +CMGF: 0; +CSCA:  
("+316540942000",145); +CSMP: 33,167,0,0; +CSDH: 0; +CPMS:  
"SM",0,50,"SM",0,50,"SM",0,50;
```

OK

2.2.10ATV Set result code format mode

This parameter setting determines the contents of the header and trailer transmitted with result codes and information responses.

ATV Set result code format mode

| | |
|-----------------------|---|
| Write Command | Response 1)if <value>=0 0 2)If <value>=1 OK |
| Parameter Saving Mode | AT&W_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

<value>

- 0 Information response: <text><CR><LF>
Short result code format: <numeric code><CR>
- 1 Information response: <CR><LF><text><CR><LF>
Long result code format: <CR><LF><verbose
code><CR><LF>

Examples

ATV1

OK

NOTE

In case of using This command without parameter <value> will be set to 1.

2.2.11 AT&F Set all current parameters to manufacturer defaults

This command is used to set all current parameters to the manufacturer defined profile.

AT&F Set all current parameters to manufacturer defaults

| Execution Command | Response |
|--------------------------------|-----------|
| AT&F[<value>] | OK |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|-----------------------|---|
| <value> | 0 Set some temporary TA parameters to manufacturer defaults. The setting after power on or reset is same as value 0. |
| default values | |
| TA parameters | VALUE |
| AT+CATR | 0 |
| AT+CNMP | 2 |
| AT+CTZU | 0 |
| AT+CVAUXV | 2850 |

Examples

AT&F
OK

NOTE

List of parameters reset to manufacturer default can be found in Defined Values, factory default settings restorable with AT&F[<value>].

2.2.12 ATQ Set Result Code Presentation Mode

Specify whether the TA transmits any result code to the TE or not. Text information transmitted in response

is not affected by this setting

ATQ Set Result Code Presentation Mode

| | |
|--------------------------------------|--|
| Write Command ATQ<n> | Response 1)If <n>=0: OK 2)If <n>=1: No Responses |
| Execution Command ATQ | Response 1)Set default value:0 OK 2) No Responses |
| Parameter Saving Mode | AT&W_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|------------------|---|
| <n> | <u>0</u> DCE transmits result code 1 DCE not transmits result code |
|------------------|---|

Examples

```
ATQ0
OK
ATQ
OK
```

2.2.13 ATX Set CONNECT Result Code Format

This parameter setting determines whether the TA transmits unsolicited result codes or not. The unsolicited result codes are <CONNECT><SPEED><COMMUNICATION PROTOCOL>[<TEXT>]

ATX Set CONNECT Result Code Format

| | |
|--|-----------------------------------|
| Write Command ATX<VALUE> | Response 1) OK 2) |
|--|-----------------------------------|

| | |
|---------------------------------|---|
| | ERROR |
| Execution Command ATX | Response 1)Set default value:1 OK 2) ERROR |
| Parameter Saving Mode | AT&W_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|----------------------|---|
| <value> | 0 CONNECT result code returned 1,2,3,4 May be transmits extern result codes. |
|----------------------|---|

Examples

ATX1

OK

ATX

OK

2.2.14 AT&W Save the user setting to ME

This command will save the user settings to ME which set by ATE, ATQ, ATV, ATX, AT&C, AT&D and AT&S0. After restarted, the value saved by AT&W must be restored by ATZ.

AT&W Save the user setting to ME

| | |
|---|--|
| | Response |
| Write Command AT&W<value> | 1) OK 2) ERROR |
| Execution Command AT&W | Response 1)Set default value: 0 OK 2) ERROR |
| Parameter Saving Mode | - |

| | |
|-------------------|---|
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------|--------|
| <value> | 0 Save |
|---------|--------|

Examples

AT&W0

OK

AT&W

OK

2.2.15 ATZ Restore the user setting from ME

This command will restore the user setting from ME which set by ATE, ATQ, ATV, ATX, AT&C, AT&D and ATS0.

ATZ Restore the user setting from ME

| | |
|-----------------------|---|
| Write Command | Response 1) OK 2) ERROR |
| Execution Command | Response 1)Set default value: 0 OK 2) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------|-----------|
| <value> | 0 Restore |
|---------|-----------|

Examples

ATZ0

OK

ATZ

OK

2.2.16 AT+CGMI Request manufacturer identification

This command is used to request the manufacturer identification text, which is intended to permit the user of the Module to identify the manufacturer.

AT+CGMI Request manufacturer identification

Test Command

AT+CGMI=?

Response

OK

Execution Command

AT+CGMI

Response

<manufacturer>

OK

Parameter Saving Mode

-

Max Response Time

-

Reference

-

Defined Values

<manufacturer>

The identification of manufacturer.

Examples

AT+CGMI

SIMCOM INCORPORATED

OK

AT+CGMI=?

OK

2.2.17 AT+CGMM Request model identification

This command is used to requests model identification text, which is intended to permit the user of the Module to identify the specific model.

AT+CGMM Request model identification

| | |
|-----------------------|----------|
| Test Command | Response |
| AT+CGMM=? | OK |
| Execution Command | Response |
| AT+CGMM | <model> |
| | OK |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------|------------------------------|
| <model> | The identification of model. |
|---------|------------------------------|

Examples

AT+CGMM**A7600E**

OK

AT+CGMM=?

OK

2.2.18 AT+CGMR Request revision identification

This command is used to request product firmware revision identification text, which is intended to permit the user of the Module to identify the version.

AT+CGMR Request revision identification

| | |
|-------------------|----------|
| Test Command | Response |
| AT+CGMR=? | OK |
| Execution Command | Response |

| | |
|-----------------------|--------------------------------|
| AT+CGMR | +CGMR: <revision> |
| | OK |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|-------------------------|--|
| <revision> | The revision identification of firmware. |
|-------------------------|--|

Examples

```
AT+CGMR
+CGMR: A35B01A7600C
```

```
OK
```

```
AT+CGMR=?
```

```
OK
```

2.2.19 AT+CGSN Request product serial number identification

This command requests product serial number identification text, which is intended to permit the user of the Module to identify the individual ME to which it is connected to.

| AT+CGSN Request product serial number identification | |
|---|---------------------------------|
| Test Command | Response |
| AT+CGSN=? | OK |
| | Response |
| | <sn> |
| | OK |
| Execution Command | If there is any error, response |
| AT+CGSN | ERROR |
| | or |
| | +CME ERROR :<err> |
| Parameter Saving Mode | - |

| | |
|-------------------|---|
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|-------------------|--|
| <sn> | Serial number identification, which consists of a single line containing the IMEI (International Mobile station Equipment Identity)number of the MT. |
|-------------------|--|

Examples

```
AT+CGSN
351602000330570

OK
AT+CGSN=?
OK
```

2.2.20 AT+CSCS Select TE character set

Write command informs TA which character set <chset> is used by the TE. TA is then able to convert character strings correctly between TE and MT character sets.

Read command shows current setting and test command displays conversion schemes implemented in the TA.

| AT+CSCS Select TE character set | |
|---|---|
| Test Command AT+CSCS=? | Response +CSCS: (list of supported <chset>s) OK |
| Read Command AT+CSCS? | Response +CSCS: <chset> OK |
| Write Command AT+CSCS=<chset> | Response OK or ERROR |
| Execution Command AT+CSCS | Response Set subparameters as default value(IRA): |

| | OK |
|-----------------------|-----------|
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------|---|
| <chset> | Character set, the definition as following: "IRA" International reference alphabet. "GSM" GSM default alphabet; this setting causes easily software flow control (XON /XOFF)problems. "UCS2" 16-bit universal multiple-octet coded character set; UCS2 character strings are converted to hexadecimal numbers from 0000 to FFFF. "HEX" The bytes are expressed in 8 bits, divided into two 4 bits and filled 0 before, and the resulting 8 bits are converted to hexadecimal is HEX code. |
|---------|---|

Examples

```

AT+CSCS="IRA"
OK
AT+CSCS?
+CSCS:"IRA"

OK
AT+CSCS=?
+CSCS: ("IRA","UCS2","GSM")

OK
AT+CSCS
OK

```

NOTE

'HEX' not support baseline below 069(1603 & 1606).
 1803 project only master(062) baseline support 'HEX'.

2.2.21 AT+GCAP Request overall capabilities

Execution command causes the TA reports a list of additional capabilities.

AT+GCAP Request overall capabilities

| | |
|-------------------------------------|--|
| Test Command AT+GCAP=? | Response 1) OK 2) ERROR |
| Execution Command AT+GCAP | Response 1) +GCAP: (list of <name>s) OK 2) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------------------|--|
| <name> | List of additional capabilities. +CGSM GSM function is supported +FCLASS FAX function is supported +DS Data compression is supported +ES Synchronous data mode is supported. +CIS707-A CDMA data service command set +CIS-856 EVDO data service command set +MS Mobile Specific command set |
|---------------------|--|

Examples

AT+GCAP

+GCAP: +CGSM,+FCLASS,+DS

OK

AT+GCAP=?

OK

3 AT Commands for Status Control

3.1 Overview of AT Commands for Status Control

| Command | Description |
|--------------------|-----------------------------------|
| AT+CFUN | Set phone functionality |
| AT+CSQ | Query signal quality |
| AT+AUTOCSQ | Set CSQ report |
| AT+CSQDELTA | Set RSSI delta change threshold |
| AT+CPOF | Power down the module |
| AT+CRESET | Reset the module |
| AT+CACM | Accumulated call meter |
| AT+CAMM | Accumulated call meter maximum |
| AT+CPUC | Price per unit and currency table |
| AT+CCLK | Real time clock management |
| AT+CMEE | Report mobile equipment error |
| AT+CPAS | Phone activity status |
| AT+SIMEI | Set IMEI for the module |

3.2 Detailed Description of AT Commands for Status Control

3.2.1 AT+CFUN Set phone functionality

This command is used to select the level of functionality <fun> in the ME. Level "full functionality" is where the highest level of power is drawn. "Minimum functionality" is where minimum power is drawn. Level of functionality between these may also be specified by manufacturers. When supported by manufacturers, ME resetting with <rst> parameter may be utilized.

AT+CFUN Set phone functionality

| | |
|---|---|
| Test Command AT+CFUN=? | Response +CFUN: (range of supported <fun>s),(range of supported <rst>s) |
| | OK |
| Read Command AT+CFUN? | Response 1) +CFUN: <fun> |
| | OK |
| | 2) |
| | ERROR |
| | 3) |
| | +CME ERROR: <err> |
| Write Command AT+CFUN=<fun>[,<rst>] | Response 1) OK |
| | 2) ERROR |
| | 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------------------|--|
| <fun> | 0 minimum functionality 1 full functionality, online mode 4 disable phone both transmit and receive RF circuits 5 Factory Test Mode 6 Reset 7 Offline Mode 8 Disable SIM |
| <rst> | 0 do not reset the ME before setting it to <fun> power level 1 reset the ME before setting it to <fun> power level. This value only takes effect when <fun> equals 1. |

Examples

```
AT+CFUN=?
+CFUN: (0-1,4-8),(0-1)
```

OK

AT+CFUN?

+CFUN: 1

OK

AT+CFUN=1

OK

NOTE

<fun>=5 only display <Operation Mode> as **Factory Test Mode**, but not has any function.

AT+CFUN=6 must be used after setting AT+CFUN=7. If module in offline mode, must execute AT+CFUN=6 or restart module to online mode.

3.2.2 AT+CSQ Query signal quality

This command is used to return received signal strength indication <rssi> and channel bit error rate <ber> from the ME. Test command returns values supported by the TA as compound values.

AT+CSQ Query signal quality

Test Command

AT+CSQ=?

Response

+CSQ: (range of supported <rssi>s),(range of supported <ber>s)

OK

Response

1)

+CSQ: <rssi>,<ber>

OK

2)

ERROR

Execution Command

AT+CSQ

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

| | |
|--------|---|
| <rssi> | 0 -113 dBm or less 1 -111 dBm 2..30 -109... -53 dBm |
|--------|---|

| | |
|-------|---|
| | 31 -51 dBm or greater 99 not known or not detectable |
| <ber> | (in percent) 0 <0.01% 1 0.01% --- 0.1% 2 0.1% --- 0.5% 3 0.5% --- 1.0% 4 1.0% --- 2.0% 5 2.0% --- 4.0% 6 4.0% --- 8.0% 7 >=8.0% 99 not known or not detectable |

Examples

```
AT+CSQ=?  
+CSQ: (0-31,99),(0-7,99)
```

OK

```
AT+CSQ
```

```
+CSQ: 31,99
```

OK

3.2.3 AT+AUTOCSQ Set CSQ report

This command is used to enable or disable automatic report CSQ information, when automatic report enabled, the module reports CSQ information every five seconds or only after <rssi> or <ber> is changed, the format of automatic report is "+CSQ: <rssi>,<ber>".

AT+AUTOCSQ Set CSQ report

Test Command

```
AT+AUTOCSQ=?
```

Response

```
+AUTOCSQ: (range of supported<auto>s),(range of  
supported<mode>s)
```

OK

Read Command

```
AT+AUTOCSQ?
```

Response

```
+AUTOCSQ: <auto>,<mode>
```

OK

Write Command

Response

| | |
|---|---------------------------------------|
| AT+AUTOCSQ=<auto>[,<mode>] | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | Vendor |

Defined Values

| | |
|---|--|
| <auto> | 0 disable automatic report 1 enable automatic report |
| <mode> | 0 CSQ automatic report every five seconds 1 CSQ automatic report only after <rssi> or <ber> is changed. |
| NOTE: If the parameter of <mode> is omitted when executing write command,<mode> will be set to default value. | |

Examples

```
AT+AUTOCSQ=?
+AUTOCSQ: (0-1),(0-1)
```

```
OK
AT+AUTOCSQ?
+AUTOCSQ: 0,0
```

```
OK
AT+AUTOCSQ=1
OK
```

3.2.4 AT+CSQDELTA Set RSSI delta change threshold

This command is used to set RSSI delta threshold for signal strength reporting.

| AT+CSQDELTA Set RSSI delta change threshold | |
|--|--|
| Test Command AT+CSQDELTA=? | Response +CSQDELTA: (list of supported <delta>s) OK |

| | |
|---|---|
| Read Command AT+CSQDELTA? | Response 1) +CSQDELTA: <delta> |
| | OK 2) ERROR |
| Write Command AT+CSQDELTA=<delta> | Response 1) OK 2) ERROR |
| Execution Command AT+CSQDELTA | Response Set default value(<delta>=5) OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | Vendor |

Defined Values

<delta> Range: from 0 to 5.

Examples

```
AT+CSQDELTA=?
+CSQDELTA: (0-5)
```

```
OK
AT+CSQDELTA?
+CSQDELTA: 5
```

```
OK
AT+CSQDELTA
OK
```

3.2.5 AT+CPOF Power down the module

This command is used to power off the module. Once the AT+CPOF command is executed, The module will store user data and deactivate from network, and then shutdown.

AT+CPOF Power down the module

| | |
|-----------------------|-----------|
| Test Command | Response |
| AT+CPOF=? | OK |
| Execution Command | Response |
| AT+CPOF | OK |
| Parameter Saving Mode | - |
| Max Response Time | 9000ms |
| Reference | Vendor |

Examples**AT+CPOF=?**

OK

AT+CPOF

OK

3.2.6 AT+CRESET Reset the module

This command is used to reset the module.

AT+CRESET Reset the module

| | |
|-----------------------|-----------|
| Execution Command | Response |
| AT+CRESET | OK |
| Test Command | Response |
| AT+CRESET=? | OK |
| Parameter Saving Mode | - |
| Max Response Time | 9000ms |
| Reference | Vendor |

Examples**AT+CRESET=?**

OK

AT+CRESET

OK

3.2.7 AT+CACM Accumulated call meter

This command is used to reset the Advice of Charge related accumulated call meter value in SIM file EFACM.

AT+CACM Accumulated call meter

| | |
|--|---|
| | Response |
| Test Command AT+CACM=? | 1) OK 2) ERROR |
| | Response |
| | 1) +CACM: <acm> |
| Read Command AT+CACM? | OK 2) ERROR 3) +CME ERROR: <err> |
| | Response |
| | 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Write Command AT+CACM=<passwd> | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Execution Command AT+CACM | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----------------------|---|
| <passwd> | String type, SIM PIN2. |
| <acm> | String type, accumulated call meter value similarly coded as <ccm> under +CAOC. |

Examples

AT+CACM=?

OK

AT+CACM?

+CACM: "000000"

OK

AT+CACM="000000"

+CME ERROR: SIM PUK2 required

AT+CACM

+CME ERROR: SIM PIN required

3.2.8 AT+CAMM Accumulated call meter maximum

This command is used to set the Advice of Charge related accumulated call meter maximum value in SIM file EFACMmax.

AT+CAMM Accumulated call meter maximum

| | |
|--|-------------------------|
| | Response |
| Test Command | 1) OK |
| AT+CAMM=? | 2) ERROR |
| | 1) +CAMM: <acmmmax> |
| Read Command | OK |
| AT+CAMM? | 2) ERROR |
| | 3) +CME ERROR: <err> |
| | Response |
| Write Command | 1) OK |
| AT+CAMM=<acmmmax>[,<pas swd>] | 2) ERROR |
| | 3) +CME ERROR: <err> |

| | |
|-------------------------------------|--------------------------------------|
| | 1) OK |
| Execution Command AT+CAMM | 2) ERROR |
| | 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|------------------------|---|
| <acmmmax> | String type, accumulated call meter maximum value similarly coded as <ccm> under AT+CAOC, value zero disables ACMmax feature. |
| <passwd> | String type, SIM PIN2. |

Examples

```

AT+CAMM=?
OK
AT+CAMM?
+CAMM: "000000"

OK
AT+CAMM="000000"
+CME ERROR: SIM PIN required
AT+CAMM
+CME ERROR: SIM PIN required

```

3.2.9 AT+CPUC Price per unit and currency table

This command is used to set the parameters of Advice of Charge related price per unit and currency table in SIM file EF_{PUCT}.

| AT+CPUC Price per unit and currency table | |
|--|---------------------------------------|
| | Response |
| Test Command AT+CPUC=? | 1) OK 2) ERROR |

| | |
|--|---|
| Read Command AT+CPUC? | Response 1) +CPUC: [<currency>,<ppu>] |
| Write Command AT+CPUC=<currency>,<ppu> >[,<passwd>] | OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | Response 1) OK |
| Max Response Time | 2) ERROR |
| Reference | 3) +CME ERROR: <err> |
| | NO_SAVE |
| | 9000ms |
| | 3GPP TS 27.007 |

Defined Values

| | |
|-------------------------|--|
| <currency> | String type, three-character currency code (e.g. "GBP", "DEM"), character set as specified by command Select TE Character Set AT+CSCS. |
| <ppu> | String type, price per unit, dot is used as a decimal separator. (e.g. "2.66"). |
| <passwd> | String type, SIM PIN2 |

Examples

| | |
|-------------------------------------|--|
| AT+CPUC=? | |
| OK | |
| AT+CPUC? | |
| +CPUC: "", "0.000000" | |
| OK | |
| AT+CPUC="1", "0.000000" | |
| +CME ERROR: SIM PIN required | |

3.2.10 AT+CCLK Real time clock management

This command is used to manage Real Time Clock of the module.

AT+CCLK Real time clock management

| | |
|--|---|
| Test Command AT+CCLK=? | Response OK |
| Read Command AT+CCLK? | Response +CCLK: <time> |
| | OK |
| Write Command AT+CCLK=<time> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE NOTE: timezone not save |
| Maximum Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------------------|---|
| <time> | String type value; format is "yy/MM/dd,hh:mm:ss±zz", where characters indicate year (two last digits), month, day, hour, minutes, seconds and time zone (indicates the difference, expressed in quarters of an hour, between the local time and GMT; three last digits are mandatory, range (-96 to 96). E.g. 6th of May 2008, 14:28:10 GMT+8 equals to "08/05/06,14:28:10+32". NOTE: 1.<time> format must be " yy/MM/dd,hh:mm:ss±zz ", Otherwise, it will lead to unpredictable results. 2. For 160X platforms, yy ∈ [1970,2037], for 1803S platforms, yy ∈ [1970,2069]. 3. Time zone is nonvolatile, and the factory value is invalid time zone. 4. Command +CCLK? will return time zone when time zone is valid, and if time zone is 00, command +CCLK? will return "+00", but not "-00". |
|---------------------|---|

Examples

AT+CCLK=?

OK

AT+CCLK?

+CCLK: "14/01/01,02:14:36+08"

OK

AT+CCLK="14/01/01,02:14:36+08"

OK

3.2.11 AT+CMEE Report mobile equipment error

This command is used to disable or enable the use of result code "+CME ERROR: <err>" or "+CMS ERROR: <err>" as an indication of an error relating to the functionality of ME; when enabled, the format of <err> can be set to numeric or verbose string.

AT+CMEE Report mobile equipment error

| | |
|---|--|
| Test Command AT+CMEE=? | Response +CMEE: (list of supported <n>s) |
| | OK |
| Read Command AT+CMEE? | Response +CMEE: <n> |
| | OK |
| Write Command AT+CMEE=<n> | Response 1) OK 2) ERROR |
| Execution Command AT+CMEE | Response OK Note: Set default value |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----|---|
| <n> | 0 Disable result code,i.e. only "ERROR" will be displayed. 1 Enable error result code with numeric values. 2 Enable error result code with string values. |
|-----|---|

Examples

AT+CMEE=?**+CMEE: (0-2)**

OK

AT+CMEE?**+CMEE: 2**

OK

AT+CMEE=2

OK

3.2.12 AT+CPAS Phone activity status

This command is used to return the activity status <pas> of the ME. It can be used to interrogate the ME before requesting action from the phone.

AT+CPAS Phone activity status

Test Command

Response

AT+CPAS=?**+CPAS: (list of supported <pas>s)**

OK

Execution Command

Response

AT+CPAS**+CPAS: <pas>**

OK

Parameter Saving Mode

-

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

<pas>

- 0 ready (ME allows commands from TA/TE)
- 3 ringing (ME is ready for commands from TA/TE, but the ringer is active)
- 4 call in progress (ME is ready for commands from TA/TE, but a call is in progress)

Examples

AT+CPAS=?**+CPAS: (0,3,4)**

OK

AT+CPAS**+CPAS: 0**

OK

NOTE

This command is same as AT+CLCC, but AT+CLCC is more commonly used. So AT+CLCC is recommended to use.

3.2.13 AT+SIMEI Set the IMEI for the module

This command is used to set the module's IMEI value.

AT+SIMEI Set the IMEI for the module

Test Command

AT+SIMEI=?

Response

OK

Response

1)

+SIMEI: <imei>

Read Command

AT+SIMEI?**OK**

2)

ERROR

Response

1)

OK

2)

ERROR

Write Command

AT+SIMEI=<imei>

Parameter Saving Mode

AUTO_SAVE

Max Response Time

9000ms

Reference

Vendor

Defined Values

| | |
|--------|--------------------------|
| <imei> | The 15-digit IMEI value. |
|--------|--------------------------|

Examples

```
AT+SIMEI=?
OK
AT+SIMEI?
+SIMEI: 357396012183175

OK
AT+SIMEI=357396012183175
OK
```

NOTE

Write commands must be executed in factory mode. (except ASR1803S_057_024)

3.2.14 AT+SIGNS Query the antenna's RSRP RSRQ RSSI

Obtain the reference signal received power(RSRP), reference signal received quality(RSRQ) and received signal strength indication(RSSI) of the main antenna and auxiliary antenna.

AT+SIGNS Query the antenna's RSRP RSRQ RSSI

| | |
|-------------------|--|
| Test Command | Response +SIGNS: |
| AT+SIGNS=? | OK |
| Read Command | Response +RSRP0: < RP0> +RSRP1: < RP1> +RSRQ0: < RQ0> +RSRQ1: < RQ1> +RSSI0: < SI0> +RSSI1: < SI1> |
| Execution Command | OK Response +RSRP0: < RP0> +RSRP1: < RP1> +RSRQ0: < RQ0> +RSRQ1: < RQ1> +RSSI0: < SI0> +RSSI1: < SI1> |

| OK | |
|-----------------------|----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------|--|
| < RP0> | Main antenna Reference Signal Receiving Power |
| < RP1> | Auxiliary antenna Reference Signal Receiving Power |
| < RQ0> | Main antenna Reference Signal Receiving Quality |
| < RQ1> | Auxiliary antenna Reference Signal Receiving Quality |
| < SI0> | Main antenna Received Signal Strength Indicator |
| < SI1> | Auxiliary antenna Received Signal Strength Indicator |

Examples

AT+SIGNS

```
+RSRP0: -82  
+RSRP1: -89  
+RSRQ0: -8  
+RSRQ1: -8  
+RSSI0: -36  
+RSSI1: -43
```

OK

AT+SIGNS?

```
+RSRP0: -83  
+RSRP1: -88  
+RSRQ0: -8  
+RSRQ1: -8  
+RSSI0: -37  
+RSSI1: -42
```

OK

AT+SIGNS=?

```
+SIGNS:
```

OK

NOTE

Currently, only ASR1803S_057_030 branch versions are supported.

4 AT Commands for Network

4.1 Overview of AT Commands for Network

| Command | Description |
|------------------|---|
| AT+CREG | Network registration |
| AT+COPS | Operator selection |
| AT+CUSD | Unstructured supplementary service data |
| AT+CSSN | Supplementary service notifications |
| AT+CPOL | Preferred operator list |
| AT+COPN | Read operator names |
| AT+CNMP | Preferred mode selection |
| AT+CNBP | Preferred band selection |
| AT+CPSI | Inquiring UE system information |
| AT+CNSMOD | Show network system mode |
| AT+CTZU | Automatic time and time zone update |
| AT+CTZR | Time and time zone reporting |

4.2 Detailed Description of AT Commands for Network

4.2.1 AT+CREG Network registration

This command is used to control the presentation of an unsolicited result code +CREG: <stat> when <n>=1 and there is a change in the ME network registration status, or code +CREG: <stat>[,<lac>,<ci>] when <n>=2 and there is a change of the network cell.

Read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the ME. Location information elements <lac> and <ci> are returned only when <n>=2 and ME is registered in the network.

AT+CREG Network registration

| | |
|---|--|
| | Response |
| Test Command AT+CREG=? | +CREG: (range of supported <n>s) OK |
| | Response |
| | 1) +CREG: <n>,<stat>[,<lac>,<ci>] |
| Read Command AT+CREG? | OK 2) ERROR 3) +CME ERROR: <err> |
| | Response |
| | 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Write Command AT+CREG=<n> | Response Set default value(<n>=0): OK |
| Execution Command AT+CREG | Response Set default value(<n>=0): OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------|---|
| <n> | 0 disable network registration unsolicited result code. 1 enable network registration unsolicited result code +CREG: <stat>. 2 enable network registration and location information unsolicited result code +CREG: <stat>[,<lac>,<ci>]. |
| <stat> | 0 not registered, ME is not currently searching a new operator to register to. 1 registered, home network. 2 not registered, but ME is currently searching a new operator to register to. 3 registration denied. 4 unknown. 5 registered, roaming. 6 registered for "SMS only", home network (applicable only when E-UTRAN) |

| | |
|-------|---|
| | 7 registered for "SMS only", roaming (applicable only when <AcT> indicates E-UTRAN) |
| <lac> | 11 attached for emergency bearer services only |
| <ci> | Two byte location area code in hexadecimal format(e.g."00C3" equals 193 in decimal). |
| | Cell Identify in hexadecimal format. GSM: Maximum is two byte. WCDMA: Maximum is four byte. |

Examples

AT+CREG=?

+CREG: (0-2)

OK

AT+CREG?

+CREG: 0,1

OK

AT+CREG=1

OK

AT+CREG

OK

4.2.2 AT+COPS Operator selection

Write command forces an attempt to select and register the GSM/UMTS network operator. <mode> is used to select whether the selection is done automatically by the ME or is forced by this command to operator <oper> (it shall be given in format <format>). If the selected operator is not available, no other operator shall be selected (except <mode>=4). The selected operator name format shall apply to further read commands (AT+COPS?)also. <mode>=2 forces an attempt to deregister from the network. The selected mode affects to all further network registration (e.g. after <mode>=2, ME shall be unregistered until <mode>=0 or 1 is selected).

Read command returns the current mode and the currently selected operator. If no operator is selected,<format> and <oper> are omitted.

Test command returns a list of quadruplets, each representing an operator present in the network. Quadruplet consists of an integer indicating the availability of the operator <stat>, long and short alphanumeric format of the name of the operator, and numeric format representation of the operator. Any of the formats may be unavailable and should then be an empty field. The list of operators shall be in order: home network, networks referenced in SIM, and other networks.

It is recommended (although optional) that after the operator list TA returns lists of supported <mode>s and <format>s. These lists shall be delimited from the operator list by two commas.

AT+COPS Operator selection

Test Command

AT+COPS=?

Response

1)

[+COPS: [list of supported (<stat>,long alphanumeric <oper>,short alphanumeric <oper>,numeric <oper>[,<AcT>])s]

[,,(list of supported <mode>s),(list of supported <format>s)]]

OK

2)

ERROR

3)

+CME ERROR: <err>

Response

1)

+COPS: <mode>[,<format>,<oper>[,<AcT>]]

OK

2)

ERROR

3)

+CME ERROR: <err>

Response

1)

OK

2)

ERROR

3)

+CME ERROR: <err>

Read Command

AT+COPS?

Write Command

AT+COPS=<mode>[,<format>[,<oper>[,<AcT>]]]

Parameter Saving Mode

NO_SAVE

Max Response Time

60S

Reference

3GPP TS 27.007

Defined Values

| | |
|--|--|
| <mode> | 0 automatic 1 manual 2 force deregister 3 set only <format> 4 manual/automatic |
| NOTE: if <mode> is set to 1, 4 in write command, the <oper> is | |

| | |
|----------|--|
| | needed. Normally, LTE is default search mode, So, if not in LTE, the <AcT> is needed. |
| <format> | 0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper> |
| <oper> | string type, <format> indicates if the format is alphanumeric or numeric. |
| <stat> | 0 unknown 1 available 2 current 3 forbidden |
| <AcT> | Access technology selected 0 GSM 1 GSM Compact 2 UTRAN 3 GSM w/EGPRS 4 UTRAN w/HSDPA 5 UTRAN w/HSUPA 6 UTRAN w/HSDPA and HSUPA 7 EUTRAN 8 UTRAN HSPA+ |

Examples

AT+COPS=?

```
+COPS: (2,"CHN-UNICOM","UNICOM","46001",7),(1,"CHN-UNICOM","UNICOM",
"46001",2),(1,"CHN-UNICOM","UNICOM","46001",0),(3,"CHINA MOBILE","CMCC",
"46000",7),(3,"CHN-CT","CT","46011",7),(3,"CHINA MOBILE","CMCC","46000",
0),(0,1,2,3,4),(0,1,2)
```

OK

AT+COPS?

```
+COPS: 0,2,"46001",7
```

OK

AT+COPS=0,2,"46001",7

OK

4.2.3 AT+CUSD Unstructured supplementary service data

This command allows control of the Unstructured Supplementary Service Data (USSD). Both network and mobile initiated operations are supported. Parameter <n> is used to disable/enable the presentation of an

unsolicited result code (USSD response from the network, or network initiated operation)+CUSD:
 <m>[,<str>,<dcs>] to the TE. In addition, value <n>=2 is used to cancel an ongoing USSD session.

AT+CUSD Unstructured supplementary service data

| | |
|---|---|
| | Response |
| Test Command AT+CUSD=? | +CUSD: (range of supported <n>s) OK |
| Read Command AT+CUSD? | +CUSD: <n> OK |
| Write Command AT+CUSD=<n>[,<str>[,<dcs>]] | Response 1) OK 2) ERROR 3) +CME ERROR: <err> Response Set default value (<n>=0): OK NOTE: After execute, you must test module whether to support IMS: at*imsrcfg="switch" 1) if supported, the module return: *IMSRCFG: "switch","on" OK In the case, you must execute at*imscfg="switch",off to switch off IMS, otherwise, AT+CUSD will return ERROR. 2) if not supported, the module return: ERROR In the case, you can execute AT+CUSD directly. |
| Execution Command AT+CUSD | NO_SAVE |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-------|---|
| <n> | 0 disable the result code presentation in the TA 1 enable the result code presentation in the TA 2 cancel session (not applicable to read command response) |
| <str> | String type USSD-string. |

| | |
|--------------------|--|
| <dcs> | Cell Broadcast Data Coding Scheme in integer format (default 17). see 3GPP TS 23.038. Refer value: 0,4,8,15,16,17 |
| <m> | 0 no further user action required (network initiated USSD-Notify, or no further information needed after mobile initiated operation) 1 further user action required (network initiated USSD-Request, or further information needed after mobile initiated operation) 2 USSD terminated by network 4 operation not supported 5 network time out |

Examples

AT+CUSD=?

+CUSD: (0-2)

OK

AT+CUSD?

+CUSD: 1

OK

AT+CUSD=0

OK

AT+CUSD

OK

4.2.4 AT+CSSN Supplementary service notifications

This command refers to supplementary service related network initiated notifications. The set command enables/disables the presentation of notification result codes from TA to TE.

When $<n>=1$ and a supplementary service notification is received after a mobile originated call setup, intermediate result code +CSSI: <code1>[,<index>] is sent to TE before any other MO call setup result codes presented in the present document. When several different <code1>s are received from the network, each of them shall have its own +CSSI result code.

When $<m>=1$ and a supplementary service notification is received during a mobile terminated call setup or during a call, or when a forward check supplementary service notification is received, unsolicited result code +CSSU: <code2>[,<index>[,<number>,<type>[,<subaddr>,<satype>]]] is sent to TE. In case of MT call setup, result code is sent after every +CLIP result code (refer command "Calling line identification presentation +CLIP")and when several different <code2>s are received from the network, each of them shall have its own +CSSU result code.

AT+CSSN Supplementary service notifications

| | |
|---|---|
| Test Command AT+CSSN=? | Response 1) +CSSN: (list of supported <n>s),(list of supported <m>s) |
| Read Command AT+CSSN? | OK 2) ERROR |
| Write Command AT+CSSN=<n>[,<m>] | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|----------------------|---|
| <n> | Parameter sets/shows the +CSSI result code presentation status in the TA: 0 disable 1 enable |
| <m> | Parameter sets/shows the +CSSU result code presentation status in the TA: 0 disable 1 enable |
| <code1> | 0 unconditional call forwarding is active 1 some of the conditional call forwarding are active 2 call has been forwarded 3 call is waiting 5 outgoing calls are barred |
| <index> | Refer "Closed user group +CCUG". |
| <code2> | 0 this is a forwarded call (MT call setup) 2 call has been put on hold (during a voice call) 3 call has been retrieved (during a voice call) 5 call on hold has been released (this is not a SS notification)(during |

| | |
|-----------|---|
| | a voice call) |
| <number> | String type phone number of format specified by <type>. |
| <type> | Type of address octet in integer format; default 145 when dialing string includes international access code character "+", otherwise 129. |
| <subaddr> | String type sub address of format specified by <satype>. |
| <satype> | Type of sub address octet in integer format, default 128. |

Examples

```
AT+CSSN=?  
+CSSN: (0-1),(0-1)
```

OK

```
AT+CSSN?  
+CSSN: 1,1
```

OK

```
AT+CSSN=1,1  
OK
```

4.2.5 AT+CPOL Preferred operator list

This command is used to edit the SIM preferred list of networks.

AT+CPOL Preferred operator list

Response

1)

+CPOL: (range of supported <index>s),(range of supported <format>s)

Test Command

```
AT+CPOL=?
```

OK

2)

ERROR

Response

1)

[+CPOL:

<index1>,<format>,<oper1>[<GSM_AcT1>,<GSM_Compact_AcT1>,<UTRAN_AcT1>,<LTE_AcT1>][<CR><LF><CR><LF>

+CPOL:

<index2>,<format>,<oper2>[,<GSM_AcT1>,<GSM_Compact_AcT1>]

Read Command

```
AT+CPOL?
```

| | |
|---|--|
| | <p>1>,<UTRAN_AcT1>,<LTE_AcT1> [..]]</p> <p>OK 2) ERROR</p> |
| Write Command AT+CPOL=<index>[,<format>[,<oper>][,<GSM_AcTn>,<GSM_Compact_AcTn>,<UTRA_AcTn>,<LTE_AcTn>]] NOTE: If using USIM card, the last four parameters must set. | <p>Response 1) OK 2) ERROR 3) +CME ERROR: <err></p> |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------------------|---|
| <index> | Integer type, the order number of operator in the SIM preferred operator list. If only input <index>, command will delete the value indicate by <index>. |
| <format> | 0 long format alphanumeric <oper> 1 short format alphanumeric <oper> 2 numeric <oper> |
| <operX> | String type. |
| <GSM_AcTn> | GSM access technology: 0 access technology not selected 1 access technology selected |
| <GSM_Compact_AcTn> | GSM compact access technology: 0 access technology not selected 1 access technology selected |
| <UTRA_AcTn> | UTRA access technology: 0 access technology not selected 1 access technology selected |
| <LTE_AcTn> | LTE access technology: 0 access technology not selected 1 access technology selected |

Examples

AT+CPOL=?

+CPOL: (1-80),(0-2)

OK

AT+CPOL?

+CPOL: 1,2,"46001"

+CPOL: 2,2,"46001"

+CPOL: 3,2,"46001",0,0,0,1

+CPOL: 4,2,"46009",0,0,0,1

+CPOL: 5,2,"46001",0,0,1,0

+CPOL: 6,2,"46009",0,0,1,0

OK

AT+CPOL=1,2,"46001"

OK

4.2.6 AT+COPN Read operator names

This command is used to return the list of operator names from the ME. Each operator code <numericX> that has an alphanumeric equivalent <alphaX> in the ME memory shall be returned.

AT+COPN Read operator names

Response

1)

OK

2)

ERROR

Response

1)

+COPN: <numeric1>,<alpha1>[<CR><LF><CR><LF>

+COPN: <numeric2>,<alpha2>

[..]

Execution Command

AT+COPN

OK

2)

ERROR

3)

+CME ERROR: <err>

| | |
|-----------------------|----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|------------|--|
| <numericX> | String type, operator in numeric format (see AT+COPS). |
| <alphaX> | String type, operator in long alphanumeric format (see AT+COPS). |

Examples

```

AT+COPN=?
OK
AT+COPN
+COPN: "46000","CMCC"

+COPN: "46001","UNICOM"
.....
OK

```

4.2.7 AT+CNMP Preferred mode selection

This command is used to select or set the state of the mode preference.

| AT+CNMP Preferred mode selection | |
|----------------------------------|--|
| Test Command | Response +CNMP: (list of supported <mode>s) |
| AT+CNMP=? | OK |
| Read Command | Response +CNMP: <mode> |
| AT+CNMP? | OK |
| Write Command | Response 1) OK |
| AT+CNMP=<mode> | 2) If <mode> not supported by module, this command will return ERROR. ERROR |

| | |
|-----------------------|----------------|
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------|--|
| <mode> | 2 Automatic 13 GSM Only 14 WCDMA Only 38 LTE Only |
|--------|--|

Examples

```
AT+CNMP=?  
+CNMP: (2,13,14,38)
```

OK

```
AT+CNMP?  
+CNMP: 2
```

OK

```
AT+CNMP=2  
OK
```

NOTE

- 1 The response will be returned immediately for Test Command and Read Command. The Max Response Time for Write Command is 10 seconds.
- 2 The set value in Write Command will take effect immediately;

4.2.8 AT+CNBP Preferred band selection

This command is used to select or set the state of the band preference.

| AT+CNBP Preferred band selection | |
|---|--|
| Read Command AT+CNBP? | Response +CNBP: <mode>[,<lte_mode>][,<lte_modeExt>][,<saveMode>] |

| | |
|--|---|
| | OK |
| Write Command | Response |
| AT+CNBP=<mode>[,<lte_mode>][,<lte_modeExt>][,<save Mode>] | 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|------------|---|
| <mode> | 64bit number, the value is "1" << "<pos>", then or by bit. |
| <pos> | Value: 0xFFFFFFFF7FFFFFFF Any (any value) 7 GSM_DCS_1800 8 GSM_EGSM_900 9 GSM_PGSM_900 16 GSM_450 17 GSM_480 18 GSM_750 19 GSM_850 20 GSM_RGSM_900 21 GSM_PCS_1900 22 WCDMA_IMT_2000 23 WCDMA_PCS_1900 24 WCDMA_III_1700 25 WCDMA_IV_1700 26 WCDMA_850 27 WCDMA_800 48 WCDMA_VII_2600 49 WCDMA_VIII_900 50 WCDMA_IX_1700 |
| <lte_mode> | 64 bit number, the value is "1" << "<lte_pos>", then or by bit. NOTE: FDD(band1 ~ band32), TDD(band33 ~ band42) |
| <lte_pos> | Value: 0x000007FF3FDF3FFF Any (any value) 0 EUTRAN_BAND1(UL:1920-1980; DL:2110-2170) 1 EUTRAN_BAND2(UL:1850-1910; DL:1930-1990) 2 EUTRAN_BAND3(UL:1710-1785; DL:1805-1880) 3 EUTRAN_BAND4(UL:1710-1755; DL:2110-2155) 4 EUTRAN_BAND5(UL: 824-849; DL: 869-894) |

5 EUTRAN_BAND6(UL: 830-840; DL: 875-885)
 6 EUTRAN_BAND7(UL:2500-2570; DL:2620-2690)
 7 EUTRAN_BAND8(UL: 880-915; DL: 925-960)
 8 EUTRAN_BAND9(UL:1749.9-1784.9;
 DL:1844.9-1879.9)
 9 EUTRAN_BAND10(UL:1710-1770; DL:2110-2170)
 10 EUTRAN_BAND11(UL:1427.9-1452.9; DL:1475.9-1500.9)
 11 EUTRAN_BAND12(UL:698-716; DL:728-746)
 12 EUTRAN_BAND13(UL: 777-787; DL: 746-756)
 13 EUTRAN_BAND14(UL: 788-798; DL: 758-768)
 16 EUTRAN_BAND17(UL: 704-716; DL: 734-746)
 17 EUTRAN_BAND18(UL: 815-830; DL: 860-875)
 18 EUTRAN_BAND19(UL: 830-845; DL: 875-890)
 19 EUTRAN_BAND20(UL: 832-862; DL: 791-821)
 20 EUTRAN_BAND21(UL:1447.9-1462.9; DL: 1495.9-1510.9)
 22 EUTRAN_BAND23(UL: 2000-2020; DL: 2180-2200)
 23 EUTRAN_BAND24(UL: 1626.5-1660.5; DL: 1525 -1559)
 24 EUTRAN_BAND25(UL: 1850-1915; DL: 1930 -1995)
 25 EUTRAN_BAND26(UL: 814-849; DL: 859 -894)
 26 EUTRAN_BAND27(UL: 807.5-824; DL: 852 -869)
 27 EUTRAN_BAND28(703-748; DL: 758-803)
 28 EUTRAN_BAND29(UL:1850-1910 or 1710-1755;
 DL:716-728)
 29 EUTRAN_BAND30(UL: 2305-2315 ; DL: 2350 - 2360)
 30 EUTRAN_BAND31(UL: 452.5-457.4; DL:462.5-467.4)
 32 EUTRAN_BAND33(UL: 1900-1920; DL: 1900-1920)
 33 EUTRAN_BAND34(UL: 2010-2025; DL: 2010-2025)
 34 EUTRAN_BAND35(UL: 1850-1910; DL: 1850-1910)
 35 EUTRAN_BAND36(UL: 1930-1990; DL: 1930-1990)
 36 EUTRAN_BAND37(UL: 1910-1930; DL: 1910-1930)
 37 EUTRAN_BAND38(UL: 2570-2620; DL: 2570-2620)
 38 EUTRAN_BAND39(UL: 1880-1920; DL: 1880-1920)
 39 EUTRAN_BAND40(UL: 2300-2400; DL: 2300-2400)
 40 EUTRAN_BAND41(UL: 2496-2690; DL: 2496-2690)
 41 EUTRAN_BAND42(UL: 3400-3600; DL: 3400-3600)
 42 EUTRAN_BAND43(UL: 3600-3800; DL: 3600-3800)

| | |
|----------------------------|---|
| <lte_modeExt> | 16 bit number, the value is "1" << "<lte_posExt>", then or by bit. NOTE: band65 ~ band76 |
| <lte_posExt> | 7 EUTRAN_BAND72(UL: 451-455.9; DL: 461-465.9) |
| <saveMode> | 0 Save in NVM (default value) 1 Don't save in NVM |

Examples

AT+CNBP?

+CNBP: 0X00000000000000180,0X0000000040080085,0X0080

OK

AT+CNBP=0X00000000000000180,0X0000000040080085,0X0080

OK

4.2.9 AT+CPSI Inquiring UE system information

This command is used to return the UE system information.

AT+CPSI Inquiring UE system information

Test Command

AT+CPSI=?

Response

1)

OK

2)

ERROR

Response

1)If camping on a gsm cell:

+CPSI: <System Mode>,<Operation

Mode>,<MCC>-<MNC>,<LAC>,<Cell ID>,<Absolute RF Ch

Num>,<RxLev>,<Track LO Adjust>,<C1-C2>

OK

2)If camping on a wcdma cell:

+CPSI: <System Mode>,<Operation

Mode>,<MCC>-<MNC>,<LAC>,<Cell ID>,<Frequency

Band>,<PSC>,<Freq>,<SSC>,<EC/IO>,<RSCP>,<Qual>,<RxLev>,

<TXPWR>

Read Command

AT+CPSI?

OK

3)If camping on a lte cell:

+CPSI: <System Mode>,<Operation Mode>[,<MCC>-<MNC>,<TA

C>,<SCellID>,<PCellID>,<Frequency Band>,<earfcn>,<dlbw>,<

ulbw>,<RSRQ>,<RSRP>,<RSSI>,<RSSNR>]

OK

4)If no service:

+CPSI: NO SERVICE, Low Power Mode

OK

5)

| | ERROR |
|-----------------------|----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----------------------------------|---|
| <System Mode> | System mode, values: "NO SERVICE", "GSM", "WCDMA", "LTE" |
| <Operation Mode> | UE operation mode, values: "Unknown", "Online", "Offline", "Factory Test Mode", "Reset", "Low Power Mode", "Flight Mode". |
| <MCC> | Mobile Country Code (first part of the PLMN code) |
| <MNC> | Mobile Network Code (second part of the PLMN code) |
| <LAC> | Location Area Code (hexadecimal digits) |
| <Cell ID> | Service-cell Identify. |
| <Absolute RF Ch Num> | AFRCN for service-cell. |
| <Track LO Adjust> | Track LO Adjust |
| <C1> | Coefficient for base station selection |
| <C2> | Coefficient for Cell re-selection |
| <Frequency Band> | Frequency Band of active set |
| <PSC> | Primary synchronization code of active set. |
| <Freq> | Downlink frequency of active set. |
| <SSC> | Secondary synchronization code of active set |
| <EC/IO> | Ec/lo value |
| <RSCP> | Received Signal Code Power |
| <Qual> | Quality value for base station selection |
| <RxLev> | RX level value for base station selection |
| <TXPWR> | UE TX power in dBm. If no TX, the value is 500. |
| <Cpid> | Cell Parameter ID |
| <TAC> | Tracing Area Code |
| <PCellID> | Physical Cell ID |
| <earfcn> | E-UTRA absolute radio frequency channel number for searching LTE cells |
| <dlbw> | Transmission bandwidth configuration of the serving cell on the downlink |
| <ulbw> | Transmission bandwidth configuration of the serving cell on the uplink |
| <RSRP> | Current reference signal received power in (RSRP report value -140) dBm. Available for LTE |
| <RSRQ> | The signal reception quality is: (RSRQ report value -40)/2 dBm. |
| <RSSNR> | Average reference signal signal-to-noise ratio of the serving cell |
| <SCellID> | String type. cell ID in decimal format for serving cell |
| <RSSI> | Received signal strength indicator value: (RSSI report value -110) |

dBm.

Examples

AT+CPSI?

+CPSI:

LTE,Online,460-01,0x230A,175499523,318,EUTRAN-BAND3,1650,5,0,21,67,255,19

OK

4.2.10 AT+CNSMOD Show network system mode

This command is used to return the current network system mode.

NOTE: Generally, it's applied to the network system mode changed platform to indicate current access network system type.

AT+CNSMOD Show network system mode

Test Command

AT+CNSMOD=?

Response

+CNSMOD: (list of supported <n>s)

OK

Response

1)

+CNSMOD: <n>,<stat>

Read Command

AT+CNSMOD?

OK

2)

ERROR

3)

+CME ERROR: <err>

Response

1)

OK

2)

ERROR

3)

+CME ERROR: <err>

Write Command

AT+CNSMOD=<n>

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

| | |
|--------|--|
| <n> | 0 disable auto report the network system mode information 1 auto report the network system mode information, command: +CNSMOD: <stat> |
| <stat> | 0 no service 1 GSM 2 GPRS 3 EGPRS (EDGE) 4 WCDMA 5 HSDPA only(WCDMA) 6 HSUPA only(WCDMA) 7 HSPA (HSDPA and HSUPA, WCDMA) 8 LTE NOTE: When AT+CNSMOD?, MT maybe return GSM but indication is GSM/GPRS/ EDGE in GSM, or MT maybe return WCDMA but indication is HSDPA / HSUPA / HSPA in WCDMA. |

Examples

AT+CNSMOD=?

+CNSMOD: (0,1)

OK

AT+CNSMOD?

+CNSMOD: 0,8

OK

AT+CNSMOD=0

OK

4.2.11 AT+CTZU Automatic time and time zone update

This command is used to enable and disable automatic time and time zone update via NITZ

AT+CTZU Automatic time and time zone update

| Test Command | Response |
|------------------|---------------------------------------|
| AT+CTZU=? | +CTZU: (range of supported <on/off>s) |

OK

| | |
|--|---|
| Read Command AT+CTZU? | Response +CTZU: <on/off> |
| | OK |
| Write Command AT+CTZU=<on/off> | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

<on/off>

Integer type value indicating:

- 0 Disable automatic time zone update via NITZ.
- 1 Enable automatic time zone update via NITZ.

NOTE: 1. The value of <on/off> is nonvolatile, and factory value is 0.

2. For automatic time and time zone update is enabled (+CTZU=1):
 - If time zone is only received from network and it isn't equal to local time zone (AT+CCLK), time zone is updated automatically, and real time clock is updated based on local time and the difference between time zone from network and local time zone (Local time zone must be valid).
 - If Universal Time and time zone are received from network, both time zone and real time clock is updated automatically, and real time clock is based on Universal Time and time zone from network.

Examples

AT+CTZU=?

+CTZU: (0-1)

OK

AT+CTZU?

+CTZU: 0

OK

AT+CTZU=0

OK

4.2.12 AT+CTZR Time and time zone reporting

This command is used to enable and disable the time zone change event reporting. If the reporting is enabled the MT returns the unsolicited result code +CTZV: <tz>[,<time>][,<dst>] whenever the time zone is changed.

AT+CTZR Time and time zone reporting

Test Command

AT+CTZR=?

Response

+CTZR: (range of supported <on/off>s)

OK

Read Command

AT+CTZR?

Response

+CTZR: <on/off>

OK

Response

1)

OK

2)

ERROR

Execution Command

AT+CTZR

Response

OK

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

<on/off>

Integer type value indicating:

0 Disable time zone change event reportin.

1 Enable time zone change event reporting.

+CTZV:

<tz>[,<time>][,<dst>]

Unsolicited result code when time zone received from network isn't equal to local time zone, and if the informations from network don't include date and time, time zone will be only reported, and if network daylight saving time is present, it is also reported. For Examples:

+CTZV: +32 (Only report time zone)

+CTZV: +32,1 (Report time zone and network daylight saving time)

+CTZV: +32,08/12/09,17:00:00 (Report time and time zone)
+CTZV: +32,08/12/09,17:00:00,1 (Report time, time zone and daylight saving time)

For more detailed informations about time and time zone, please refer 3GPP TS 24.008.

- <tz> Local time zone received from network.
- <time> Universal time received from network, and the format is "yy/MM/dd,hh:mm:ss", where characters indicate year (two last digits), month, day, hour, minutes and seconds.
- <dst> Network daylight saving time, and if it is received from network, it indicates the value that has been used to adjust the local time zone. The values as following:
 - 0 No adjustment for Daylight Saving Time.
 - 1 +1 hour adjustment for Daylight Saving Time.
 - 2 +2 hours adjustment for Daylight Saving Time.

NOTE: Herein,<time> is Universal Time or NITZ time, but not local time.

Examples

AT+CTZR=?

+CTZR: (0-1)

OK

AT+CTZR?

+CTZR: 0

OK

AT+CTZR=0

OK

AT+CTZR

OK

NOTE

The time zone reporting is not affected by the Automatic Time and Time Zone command AT+CTZU.

5 AT Commands for Packet Domain

5.1 Overview of AT Commands for Packet Domain

| Command | Description |
|--------------------|---|
| AT+CGREG | Network registration status |
| AT+CEREG | EPS network registration status |
| AT+CGATT | Packet domain attach or detach |
| AT+CGACT | PDP context activate or deactivate |
| AT+CGDCONT | Define PDP context |
| AT+CGDSCONT | Define Secondary PDP Context |
| AT+CGTFT | Traffic Flow Template |
| AT+CGQREQ | Quality of service profile (requested) |
| AT+CGEQREQ | 3G quality of service profile (requested) |
| AT+CGQMIN | Quality of service profile (minimum acceptable) |
| AT+CGEQMIN | 3G quality of service profile (minimum acceptable) |
| AT+CGDATA | Enter data state |
| AT+CGPADDR | Show PDP address |
| AT+CGCLASS | GPRS mobile station class |
| AT+CGEREP | GPRS event reporting |
| AT+CGAUTH | Set type of authentication for PDP-IP connections of GPRS |
| AT+CPING | Ping destination address |

5.2 Detailed Description of AT Commands for Packet Domain

5.2.1 AT+CGREG Network registration status

This command controls the presentation of an unsolicited result code "+CGREG: <stat>" when <n>=1 and there is a change in the MT's GPRS network registration status.

The read command returns the status of result code presentation and an integer <stat> which shows Whether the network has currently indicated the registration of the MT.

AT+CGREG Network registration status

| | |
|--|--|
| | Response |
| Test Command AT+CGREG=? | +CGREG: (list of supported <n>s) OK |
| Read Command AT+CGREG? | Response +CGREG: <n>,<stat>[,<lac>,<ci>] OK |
| Write Command AT+CGREG=<n> | Response OK |
| Execution Command AT+CGREG | Response Set default value:0 OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------|--|
| <n> | 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CGREG: <stat> |
| <stat> | 0 not registered, ME is not currently searching an operator to register to 1 registered, home network 2 not registered, but ME is currently trying to attach or searching an operator to register to 3 registration denied 4 unknown 5 registered, roaming 6 registered for "SMS only", home network(applicable only when E-UTRAN) 11 attached for emergency bearer services only |
| <lac> | Two byte location area code in hexadecimal format(e.g."00C3" equals 193 in decimal). |
| <ci> | Cell ID in hexadecimal format. GSM: Maximum is two byte. |

WCDMA: Maximum is four byte.

Examples

AT+CGREG=?

+CGREG: (0-2)

OK

AT+CGREG?

+CGREG: 0,1

OK

AT+CGREG=1

OK

AT+CGREG

OK

5.2.2 AT+CEREG EPS network registration status

The set command controls the presentation of an unsolicited result code +CEREG: <stat> when <n>=1 and there is a change in the MT's EPS network registration status in E-UTRAN, or unsolicited result code +CEREG: <stat>[,<tac>,<ci>[,<AcT>]] when <n>=2 and there is a change of the network cell in E-UTRAN; in this latest case <AcT>,<tac> and <ci> are sent only if available.

The read command returns the status of result code presentation and an integer <stat> which shows whether the network has currently indicated the registration of the MT. Location information elements <tac>,<ci> and <AcT>, if available, are returned only when <n>=2 and MT is registered in the network.

AT+CEREG EPS network registration status

Response

1)

+CEREG: (range of supported <n>s)

OK

2)

ERROR

Response

1)

+CEREG: <n>,<stat>[,<tac>,<ci>]

OK

Read Command

AT+CEREG?

| | |
|--|---|
| | 2) ERROR |
| Write Command AT+CEREG=<n> | Response 1) OK |
| | 2) ERROR |
| | 3) +CME ERROR: <err> |
| Execution Command AT+CEREG | Response 1) Set default value (<n>=0): OK |
| | 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 24.008 [8] |

Defined Values

| | |
|---------------------|---|
| <n> | 0 disable network registration unsolicited result code 1 enable network registration unsolicited result code +CEREG: <stat> 2 enable network registration and location information unsolicited result code +CEREG: <stat>[,<tac>,<ci>[,<AcT>]] |
| <stat> | 0 not registered, MT is not currently searching an operator to register to 1 registered, home network 2 not registered, but MT is currently trying to attach or searching an operator to register to 3 registration denied 4 unknown (e.g. out of E-UTRAN coverage) 5 registered, roaming 6 registered for "SMS only", home network (not applicable) 7 registered for "SMS only", roaming (not applicable) 11 attached for emergency bearer services only |
| <tac> | string type; two byte tracking area code in hexadecimal format (e.g. "00C3" equals 195 in decimal) |
| <ci> | string type; four byte E-UTRAN cell identify in hexadecimal format |
| <AcT> | A numeric parameter that indicates the access technology of serving cell 0 GSM (not applicable) 1 GSM Compact (not applicable) |

- | | |
|--|---|
| | 2 UTRAN (not applicable) 3 GSM w/EGPRS (see NOTE 3)(not applicable) 4 UTRAN w/HSDPA (see NOTE 4)(not applicable) 5 UTRAN w/HSUPA (see NOTE 4)(not applicable) 6 UTRAN w/HSDPA and HSUPA (see NOTE 4)(not applicable) 7 E-UTRAN |
|--|---|

Examples

```
AT+CEREG=?
+CEREG: (0-2)
```

OK

```
AT+CEREG?
+CEREG: 0,1
```

OK

```
AT+CEREG=1
```

OK

```
AT+CEREG
```

OK

NOTE

If the EPS MT in GERAN/UTRAN/E-UTRAN also supports circuit mode services and/or GPRS services, the +CREG command and +CREG: result codes and/or the +CGREG command and +CGREG: result codes apply to the registration status and location information for those services.

5.2.3 AT+CGATT Packet domain attach or detach

The write command is used to attach the MT to, or detach the MT from, the Packet Domain service. The read command returns the current Packet Domain service state.

AT+CGATT Packet domain attach or detach

| Test Command | Response |
|-------------------|--|
| AT+CGATT=? | 1) +CGATT: (list of supported <state>s) OK |

| | |
|--|---|
| Read Command AT+CGATT? | 2) ERROR Response 1) +CGATT: <state> |
| Write Command AT+CGATT=<state> | OK 2) ERROR Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|----------------------|--|
| <state> | Indicates the state of Packet Domain attachment: 0 detached 1 attached |
|----------------------|--|

Examples

| | |
|----------------------|--|
| AT+CGATT=? | |
| +CGATT: (0-1) | |
| OK | |
| AT+CGATT? | |
| +CGATT: 1 | |
| OK | |
| AT+CGATT=1 | |
| OK | |

5.2.4 AT+CGACT PDP context activate or deactivate

The write command is used to activate or deactivate the specified PDP context (s).

AT+CGACT PDP context activate or deactivate

| | |
|--|---|
| | Response |
| Test Command AT+CGACT=? | +CGACT: (list of supported <state>s) OK |
| Read Command AT+CGACT? | Response +CGACT: [<cid>,<state>[<CR><LF> +CGACT: <cid>,<state>[<CR><LF> [..]]] OK |
| Write Command AT+CGACT=<state>[,<cid>] | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------|---|
| <state> | Indicates the state of PDP context activation: 0 deactivated 1 activated |
| <cid> | A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). 1...15 |

NOTE: In LTE mode, it's prohibited to active or deactivate default bearer(cid 1) and dedicated bearer(cid 8).

Examples

AT+CGACT=?

+CGACT: (0,1)

OK

AT+CGACT?

+CGACT: 1,1

OK

AT+CGACT=1,1

OK

5.2.5 AT+CGDCONT Define PDP context

The set command specifies PDP context parameter values for a PDP context identified by the (local)context identification parameter <cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the write command (AT+CGDCONT=<cid>)causes the values for context <cid> to become undefined.

AT+CGDCONT Define PDP context

Test Command

AT+CGDCONT=?

Response

1)

+CGDCONT: (range of supported<cid>s),<PDP_type>,,(list of supported <d_comp>s),(list of supported <h_comp>s),(list of <ipv4_ctrl>s),(list of <request_type>s)

OK

2)

ERROR

Response

1)

+CGDCONT:

<cid>,<PDP_type>,<APN>[,<PDP_addr>],<d_comp>,<h_comp>,<ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signalling_Flag_Ind>]<CR><LF>

Read Command

AT+CGDCONT?

+CGDCONT:

<cid>,<PDP_type>,<APN>[,<PDP_addr>],<d_comp>,<h_comp>,<ipv4_ctrl>,<request_type>,<P-CSCF_discovery>,<IM_CN_Signalling_Flag_Ind>]

OK

2)

ERROR

Write Command

AT+CGDCONT=<cid>[,<PDP_type>[,<APN>[,<PDP_addr>[,<d_comp>[,<h_comp>][,<ip

Response

1)

OK

2)

| | |
|---|---|
| v4_ctrl>[,<request_type>]]]]] | ERROR |
|] | Response 1) OK 2) ERROR |
| Execution Command AT+CGDCONT | |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------------------------|---|
| <cid> | (PDP Context Identifier)a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1)is returned by the test form of the command. 1...15 |
| <PDP_type> | (Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack |
| <APN> | (Access Point Name)a string parameter which is a logical name that is used to select the GGSN or the external packet data network. |
| <PDP_addr> | A string parameter that identifies the MT in the address space applicable to the PDP. This parameter will be omitted when PDP_type is PPP type. Read command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using command AT+CGPADDR. |
| <d_comp> | A numeric parameter that controls PDP data compression, this value may depend on platform: 0 off (default if value is omitted) 1 on 2 V.42bis |
| <h_comp> | A numeric parameter that controls PDP header compression, this value may depend on platform: 0 off (default if value is omitted) 1 RFC1144 |
| <ipv4_ctrl> | Parameter that controls how the MT/TA requests to get the IPv4 address information: 0 Address Allocation through NAS Signaling |

| | |
|-----------------------------|---|
| | 1 on |
| <request_type> | <p>integer type; indicates the type of PDP context activation request for the PDP context, see 3GPP TS 24.301 [83] (subclause 6.5.1.2)and 3GPP TS 24.008 [8] (subclause 10.5.6.17). If the initial PDP context is supported (see subclause 10.1.0)it is not allowed to assign <cid>=0 for emergency bearer services. According to 3GPP TS 24.008 [8] (subclause 4.2.4.2.2 and subclause 4.2.5.1.4)and 3GPP TS 24.301 [83] (subclause 5.2.2.3.3 and subclause 5.2.3.2.2), a separate PDP context must be established for emergency bearer services.</p> <p>NOTE 4:If the PDP context for emergency bearer services is the only activated context, only emergency calls are allowed, see 3GPP TS 23.401 [82] subclause 4.3.12.9.</p> <ul style="list-style-type: none"> 0 PDP context is for new PDP context establishment or for handover from a non-3GPP access network (how the MT decides whether the PDP context is for new PDP context establishment or for handover is implementation specific) 1 PDP context is for emergency bearer services 2 PDP context is for new PDP context establishment |
| <P-CSCF_discovery> | <p>integer type; influences how the MT/TA requests to get the P-CSCF address, see 3GPP TS 24.229 [89] annex B and annex L.</p> <ul style="list-style-type: none"> 0 Preference of P-CSCF address discovery not influenced by +CGDCONT 1 Preference of P-CSCF address discovery through NAS signalling 2 Preference of P-CSCF address discovery through DHCP |
| <IM_CN_Signalling_Flag_Ind> | <p>integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not.</p> <ul style="list-style-type: none"> 0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 UE indicates that the PDP context is for IM CN subsystem-related signalling only |

Examples

AT+CGDCONT=?

+CGDCONT: (1-15),"IP",,(0-2),(0-1),(0-1),(0-2)
+CGDCONT: (1-15),"IPV6",,(0-2),(0-1),(0-1),(0-2)
+CGDCONT: (1-15),"IPV4V6",,(0-2),(0-1),(0-1),(0-2)

OK

AT+CGDCONT?

+CGDCONT: 1,"IP",""

OK

AT+CGDCONT=1,"IP","cnnet"

OK

AT+CGDCONT

OK

5.2.6 AT+CGDSCONT Define Secondary PDP Context

The set command specifies PDP context parameter values for a Secondary PDP context identified by the (local)context identification parameter,<cid>. The number of PDP contexts that may be in a defined state at the same time is given by the range returned by the test command. A special form of the set command, AT+CGDSCONT=<cid> causes the values for context number <cid> to become undefined.

AT+CGDSCONT Define Secondary PDP Context

Test Command

AT+CGDSCONT=?

Response

1)

+CGDSCONT: (range of supported <cid>s),(list of <p_cid>s for active primary contexts),<PDP_type>,(list of supported <d_comp>s),(list of supported <h_comp>s), (list of supported <imCnSignallingFlagInd>s)

OK

2)

ERROR

Response

1)

+CGDSCONT: [<cid>,<p_cid>,<d_comp>,<h_comp>,<imCnSignallingFlagInd>

[<CR><LF>+CGDSCONT: <cid>,<p_cid>,<d_comp>,<h_comp>,<imCnSignallingFlagInd>[..]]]

OK

2)

ERROR

Read Command

AT+CGDSCONT?

Response

1)

OK

2)

ERROR

Write Command

AT+CGDSCONT=<cid>[,<p_cid>[,<d_comp>[,<h_comp>[,<imCnSignallingFlagInd>]]]]

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

| | |
|-------------------------|--|
| <cid> | a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value=1)is returned by the test form of the command. NOTE: The <cid>s for network-initiated PDP contexts have values outside the ranges activated by the +CGACT. |
| <p_cid> | a numeric parameter which specifies a particular PDP context definition which has been specified by use of the +CGDCONT command and activated by the +CGACT. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command. |
| <PDP_type> | (Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack |
| <d_comp> | a numeric parameter that controls PDP data compression (applicable for SNDCPonly)(refer 3GPP TS 44.065 [61]) 0 off 1 on (manufacturer preferred compression) 2 V.42bis Other values are reserved. |
| <h_comp> | a numeric parameter that controls PDP header compression (refer 3GPP TS 44.065 [61] and 3GPP TS 25.323 [62]) 0 off 1 RFC1144 Other values are reserved. |
| <imCnSignallingFlagInd> | integer type; indicates to the network whether the PDP context is for IM CN subsystem-related signalling only or not. 0 UE indicates that the PDP context is not for IM CN subsystem-related signalling only 1 UE indicates that the PDP context is for IM CN subsystem-related signalling only |

Examples

AT+CGDSCONT=?

+CGDSCONT: (2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IP",,(0-2),(0-1),(0-1)

+CGDSCONT: (2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IPV6",,(0-2),(0-1),(0-1)

+CGDSCONT: (2,3,4,5,6,7,8,9,10,11,12,13,14,15),(1),"IPV4V6",,(0-2),(0-1),(0-1)

OK

AT+CGDSCONT?

+CGDSCONT:

OK

AT+CGDSCONT=4,2

+CME ERROR: operation not supported

NOTE

Currently, the <imCnSignallingFlagInd> parameter is not supported in 1803 and 1802

5.2.7 AT+CGTFT Traffic Flow Template

This command allows the TE to specify a Packet Filter - PF for a Traffic Flow Template - TFT that is used in the GGSN in UMTS/GPRS and Packet GW in EPS for routing of packets onto different QoS flows towards the TE. The concept is further described in the 3GPP TS 23.060 [47]. A TFT consists of one and up to 15 Packet Filters, each identified by a unique <packet filter identifier>. A Packet Filter also has an <evaluation precedence index> that is unique within all TFTs associated with all PDP contexts that are associated with the same PDP address.

AT+CGTFT Traffic Flow Template

Response

1)

+CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4)/ next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos)(ipv4)and mask / traffic class (ipv6)and mask>s), (list of supported <flow label (ipv6)>s), (list of supported <direction>s)
[<CR><LF>+CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4)/ next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos)(ipv4)and mask / traffic class (ipv6)and mask>s), (list of supported <flow label (ipv6)>s), (list of supported <direction>s)]

Test Command

AT+CGTFT=?

| | |
|-------------------|----------------|
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---|--|
| <cid> | a numeric parameter which specifies a particular PDP context definition (see the AT+CGDCONT and AT+CGDSCONT commands). |
| <PDP_type> | (Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol IPV6 Internet Protocol Version 6 IPV4V6 Dual PDN Stack |
| <packet filter identifier> | a numeric parameter, value range from 1 to 15. |
| <evaluation precedence index> | a numeric parameter. The value range is from 0 to 255. |
| <source address and subnet mask> | string type The string is given as dot-separated numeric (0-255)parameters on the form: "a1.a2.a3.a4.m1.m2.m3.m4" for IPv4 or "a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16", for IPv6. NOTE: subnet mask can't be 0.0.0.0 |
| <protocol number (ipv4)/next header (ipv6)> | a numeric parameter, value range from 0 to 255. |
| <destination port range> | string type. The string is given as dot-separated numeric (0-65535)parameters on the form "f.t". |
| <source port range> | string type. The string is given as dot-separated numeric (0-65535)parameters on the form "f.t". |
| <ipsec security parameter index (spi)> | numeric value in hexadecimal format. The value range is from 00000000 to FFFFFFFF. |
| <type of service (tos)(ipv4)and mask / traffic class (ipv6)and mask> | string type. The string is given as dot-separated numeric (0-255)parameters on the form "t.m". |
| <flow label (ipv6)> | numeric value in hexadecimal format. The value range is from 00000 to FFFFF. Valid for IPv6 only. |
| <direction> | integer type. Specifies the transmission direction in which the packet filter shall be applied. 0 Pre-Release 7 TFT filter 1 Uplink 2 Downlink 3 Up & Downlink |

Examples

AT+CGTFT=?

+CGTFT:

"IP",,(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFFFF),(0-255.0-255),(0-FFF
FF)

+CGTFT:

"IPV6",,(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFFFF),(0-255.0-255),(0-F
FFFF)

+CGTFT:

"IPV4V6",,(1-15),(0-255),,(0-255),(0-65535.0-65535),(0-65535.0-65535),(0-FFFFFFFFFF),(0-255.0-255),(0-
FFFF)

OK

AT+CGTFT?

+CGTFT:

OK

AT+CGTFT=1,1,0,"74.125.71.100.255.255.255.255"

OK

AT+CGTFT

OK

NOTE

If a specified PDP context is deactivate, the corresponding Packet Filter TFT need to be specified again.

5.2.8 AT+CGQREQ Quality of service profile (requested)

This command allows the TE to specify a Quality of Service Profile that is used when the MT sends an Activate PDP Context Request message to the network. A special form of the set command (AT+CGQREQ=<cid>)causes the requested profile for context number <cid> to become undefined.

AT+CGQREQ Quality of service profile (requested)

Response

1)

+CGQREQ: <PDP_type>,(list of supported <precedence>s),(list of supported <delay>s),(list of supported <reliability>s),(list of supported <peak>s),(list of supported <mean>s)

OK

Test Command

AT+CGQREQ=?

| | |
|--|---|
| | 2) ERROR |
| Read Command AT+CGQREQ? | Response 1) +CGQREQ: [<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF><LF> +CGQREQ: <cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[...]]] |
| | OK |
| | 2) ERROR |
| Write Command AT+CGQREQ=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]] | Response 1) OK 2) ERROR |
| Execution Command AT+CGQREQ | Response 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------------------------|---|
| <cid> | A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). The range is from 1 to 15 |
| <PDP_type> | (Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol |
| <precedence> | A numeric parameter which specifies the precedence class: 0 network subscribed value 1 high priority 2 normal priority 3 low priority |
| <delay> | A numeric parameter which specifies the delay class: 0 network subscribed value 1 delay class 1 2 delay class 2 3 delay class 3 |

| | |
|----------------------------|---|
| | 4 delay class 4 |
| <reliability> | <p>A numeric parameter which specifies the reliability class:</p> <ul style="list-style-type: none"> 0 network subscribed value 1 Non real-time traffic,error-sensitive application that cannot cope with data loss 2 Non real-time traffic,error-sensitive application that can cope with infrequent data loss 3 Non real-time traffic,error-sensitive application that can cope with data loss, GMM/-SM, and SMS 4 Real-time traffic,error-sensitive application that can cope with data loss 5 Real-time traffic error non-sensitive application that can cope with data loss |
| <peak> | <p>A numeric parameter which specifies the peak throughput class:</p> <ul style="list-style-type: none"> 0 network subscribed value 1 Up to 1000 (8 kbit/s) 2 Up to 2000 (16 kbit/s) 3 Up to 4000 (32 kbit/s) 4 Up to 8000 (64 kbit/s) 5 Up to 16000 (128 kbit/s) 6 Up to 32000 (256 kbit/s) 7 Up to 64000 (512 kbit/s) 8 Up to 128000 (1024 kbit/s) 9 Up to 256000 (2048 kbit/s) |
| <mean> | <p>A numeric parameter which specifies the mean throughput class:</p> <ul style="list-style-type: none"> 0 network subscribed value 1 100 (~0.22 bit/s) 2 200 (~0.44 bit/s) 3 500 (~1.11 bit/s) 4 1000 (~2.2 bit/s) 5 2000 (~4.4 bit/s) 6 5000 (~11.1 bit/s) 7 10000 (~22 bit/s) 8 20000 (~44 bit/s) 9 50000 (~111 bit/s) 10 100000 (~0.22 kbit/s) 11 200000 (~0.44 kbit/s) 12 500000 (~1.11 kbit/s) 13 1000000 (~2.2 kbit/s) 14 2000000 (~4.4 kbit/s) 15 5000000 (~11.1 kbit/s) 16 10000000 (~22 kbit/s) 17 20000000 (~44 kbit/s) 18 50000000 (~111 kbit/s) |

Examples

AT+CGQREQ=?

+CGQREQ: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)

OK

AT+CGQREQ?

+CGQREQ: 1,3,4,3,9,31

OK

AT+CGQREQ=1,3,4,3,9,31

OK

AT+CGQREQ

OK

5.2.9 AT+CGEQREQ 3G quality of service profile (requested)

The test command returns values supported as a compound value.

The read command returns the current settings for each defined context for which a QOS was explicitly specified.

The write command allows the TE to specify a Quality of Service Profile for the context identified by the context identification parameter <cid> which is used when the MT sends an Activate PDP Context Request message to the network.

A special form of the write command, AT+CGEQREQ=<cid> causes the requested profile for context number <cid> to become undefined.

AT+CGEQREQ 3G quality of service profile (requested)

Test Command

Test Command

AT+CGEQREQ=?

Response

1)

+CGEQREQ: <PDP_type>, (list of supported <Traffic class>s), (list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s), (list of supported <Delivery order>s), (list of supported <Maximum SDU size>s), (list of supported <SDU error ratio>s), (list of supported <Residual bit error Ratio>s), (list of supported <Delivery of erroneous SDUs>s), (list of Supported <Transfer delay>s), (list of supported <Traffic handling

| | |
|---|--|
| | <p>priority>s),(list of supported <Source statistics descriptor>s),(list of supported <Signaling indication flag>s)</p> <p>OK</p> <p>2)</p> <p>ERROR</p> |
| Read Command AT+CGEQREQ? | <p>Response</p> <p>1)</p> <p>+CGEQREQ: [<cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>][<CR><LF><LF></p> <p>+CGEQREQ: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrate DL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>[...]]</p> |
| | <p>OK</p> <p>2)</p> <p>ERROR</p> |
| Write Command AT+CGEQREQ=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrate DL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual bit error ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handling priority>[,<Source statistics descriptor>[,<Signaling indication flag>]]]]]]]]]]] | <p>Response</p> <p>1)</p> <p>OK</p> <p>2)</p> <p>ERROR</p> <p>3)</p> <p>+CME ERROR: <err></p> |
| Execution Command AT+CGEQREQ | <p>Response</p> <p>1)</p> <p>OK</p> |

| | |
|-----------------------|--------------------|
| | 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------------------------------------|--|
| <cid> | Parameter specifies a particular PDP context definition. The parameter is also used in other PDP context-related commands. The range is from 1 to 15 |
| <Traffic class> | <ul style="list-style-type: none"> 0 conversational 1 streaming 2 interactive 3 background 4 subscribed value |
| <Maximum bitrate UL> | This parameter indicates the maximum number of kbit/s delivered to UMTS(up-link traffic)at a SAP. As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQREQ=...,32,...). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640 (except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested. |
| <Maximum bitrate DL> | This parameter indicates the maximum number of kbit/s delivered to UMTS(down-link traffic)at a SAP. As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQREQ=...,32,...). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640 (except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.3600-3800) |
| <Guaranteed bitrate UL> | This parameter indicates the guaranteed number of kbit/s delivered to UMTS(up-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQREQ=...,32,...). The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between |

| | |
|---|---|
| | <p>8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Guaranteed bitrate DL> | <p>This parameter indicates the guaranteed number of kbit/s delivered to UMTS(down-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQREQ=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Delivery order> | <p>This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.</p> <ul style="list-style-type: none"> 0 no 1 yes 2 subscribed value |
| <Maximum SDU size> | <p>This parameter indicates the maximum allowed SDU size in octets. The range is 0, 10 to 1500, 1510, 1520. When the parameter is between 10 and 1510, it should be an integer multiple of 10. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <SDU error ratio> | <p>This parameter indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. As an Examples a target SDU error ratio of 5×10^{-3} would be specified as "5E3"(e.g. AT+CGEQREQ=.,"5E3",...).</p> <ul style="list-style-type: none"> "0E0" subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1" |
| <Residual bit error ratio> | <p>This parameter indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. As an Examples a target residual bit error ratio of 5×10^{-3} would be specified as "5E3"(e.g. AT+CGEQREQ=..., "5E3",.).</p> |

| | |
|---|---|
| | "0E0" subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6" "6E8" |
| <Delivery of erroneous SDUs> | <p>This parameter indicates whether SDUs detected as erroneous shall be delivered or not.</p> <p>0 no 1 yes 2 no detect 3 subscribed value</p> |
| <Transfer delay> | <p>This parameter indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. The range is 0 to 950. When the parameter is between 10 and 150, it should be an integer multiple of 10. When the parameter is between 150 and 950, it should be an integer multiple of 50. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Traffic handling priority> | <p>This parameter specifies the relative importance for handling of all SDUs belonging to the UMTS Bearer compared to the SDUs of the other bearers. The range is from 0 to 3. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Source statistics descriptor> | <p>This parameter indicates profile parameter that Source statistics descriptor for requested UMTS QoS The range is from 0 to 1. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Signaling indication flag> | <p>This parameter indicates Signaling flag. The range is from 0 to 1 The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <PDP_type> | <p>(Packet Data Protocol type)a string parameter which specifies the type of packet data protocol. IP Internet Protocol</p> |

Examples

AT+CGEQREQ=?

+CGEQREQ:

"IP", (0-4), (0-256000), (0-256000), (0-256000), (0-256000), (0-2), (0-1520), ("0E0", "1E1", "1E2", "7E3", "1E

3","1E4","1E5","1E6"),("0E0","5E2","1E2","5E3","4E3","1E3","1E4","1E5","1E6","6E8"),(0-3),(0-95
0),(0-3),(0-1),(0-1)

OK

AT+CGEQREQ?

+CGEQREQ: 1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK

AT+CGEQREQ=1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK

AT+CGEQREQ

OK

5.2.10 AT+CGQMIN Quality of service profile (minimum acceptable)

This command allows the TE to specify a minimum acceptable profile which is checked by the MT against the negotiated profile returned in the Activate PDP Context Accept message. A special form of the set command, AT+CGQMIN=<cid> causes the minimum acceptable profile for context number <cid> to become undefined.

AT+CGQMIN Quality of service profile (minimum acceptable)

Response

1)

+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s), (list of supported <peak>s), (list of supported <mean>s)[<CR><LF>

+CGQMIN: <PDP_type>, (list of supported <precedence>s), (list of supported <delay>s), (list of supported <reliability>s), (list of supported <peak>s), (list of supported <mean>s)[...]]

OK

2)

ERROR

Response

1)

+CGQMIN:

[<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[<CR><LF><LF>]

+CGQMIN:

<cid>,<precedence>,<delay>,<reliability>,<peak>,<mean>[...]]]

OK

Read Command

AT+CGQMIN?

| | |
|--|---|
| | 2) ERROR |
| Write Command AT+CGQMIN=<cid>[,<precedence>[,<delay>[,<reliability>[,<peak>[,<mean>]]]]] | Response 1) OK 2) ERROR |
| Execution Command AT+CGQMIN | Response 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------------|--|
| <cid> | A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). The range is from 1 to 15 |
| <PDP_type> | a string parameter which specifies the type of packet data protocol. IP Internet Protocol |
| <precedence> | A numeric parameter which specifies the precedence class: 0 network subscribed value 1 high priority 2 normal priority 3 low priority |
| <delay> | A numeric parameter which specifies the delay class: 0 network subscribed value 1 delay class 1 2 delay class 2 3 delay class 3 4 delay class 4 |
| <reliability> | A numeric parameter which specifies the reliability class: 0 network subscribed value 1 Non real-time traffic, error-sensitive application that cannot cope with data loss 2 Non real-time traffic, error-sensitive application that can cope with infrequent data loss 3 Non real-time traffic, error-sensitive application that can cope with data loss, GMM/-SM, and SMS 4 Real-time traffic, error-sensitive application that can cope with |

| | |
|--------|--|
| | <p>data loss</p> <p>5 Real-time traffic error non-sensitive application that can cope with data loss</p> |
| <peak> | <p>A numeric parameter which specifies the peak throughput class:</p> <ul style="list-style-type: none"> 0 network subscribed value 1 Up to 1000 (8 kbit/s) 2 Up to 2000 (16 kbit/s) 3 Up to 4000 (32 kbit/s) 4 Up to 8000 (64 kbit/s) 5 Up to 16000 (128 kbit/s) 6 Up to 32000 (256 kbit/s) 7 Up to 64000 (512 kbit/s) 8 Up to 128000 (1024 kbit/s) 9 Up to 256000 (2048 kbit/s) |
| <mean> | <p>A numeric parameter which specifies the mean throughput class:</p> <ul style="list-style-type: none"> 0 network subscribed value 1 100 (~0.22 bit/s) 2 200 (~0.44 bit/s) 3 500 (~1.11 bit/s) 4 1000 (~2.2 bit/s) 5 2000 (~4.4 bit/s) 6 5000 (~11.1 bit/s) 7 10000 (~22 bit/s) 8 20000 (~44 bit/s) 9 50000 (~111 bit/s) 10 100000 (~0.22 kbit/s) 11 200000 (~0.44 kbit/s) 12 500000 (~1.11 kbit/s) 13 1000000 (~2.2 kbit/s) 14 2000000 (~4.4 kbit/s) 15 5000000 (~11.1 kbit/s) 16 10000000 (~22 kbit/s) 17 20000000 (~44 kbit/s) 18 50000000 (~111 kbit/s) 31 optimization |

Examples

AT+CGQMIN=?

+CGQMIN: "IP",(0-3),(0-4),(0-5),(0-9),(0-18,31)

OK

AT+CGQMIN?

+CGQMIN: 1,3,4,5,1,1

```

OK
AT+CGQMIN=1,3,4,5,1,1
OK
AT+CGQMIN
OK

```

5.2.11 AT+CGEQMIN 3G quality of service profile (minimum acceptable)

The test command returns values supported as a compound value.

The read command returns the current settings for each defined context for which a QOS was explicitly specified.

The write command allow the TE to specify a Qualiity of Service Profile for the context identified by the context identification parameter<cid> which is checked by the MT against the negotiated profile returned in the Activate/Modify PDP Context Accept message.

A special form of the write command, AT+CGEQMIN=<cid> causes the requested for context number <cid> to become undefined.

AT+CGEQMIN 3G quality of service profile (minimum acceptable)

| | |
|-------------------------------------|--|
| Test Command AT+CGEQMIN=? | Response 1) +CGEQMIN: <PDP_type>,(list of supported <Traffic class>s),(list of supported <Maximum bitrate UL>s),(list of supported <Maximum bitrate DL>s),(list of supported <Guaranteed bitrate UL>s,(list of supported<Guaranteed bitrate DL>s),(list of supported <Delivery order>s),(list of supported <Maximum SDU size>s),(list of supported <SDU error ratio>s),(list of supported <Residual bit error Ratio>s),(list of supported <Delivery of erroneous SDUs>s),(list of Supported <Transfer delay>s),(list of supported <Traffic handlingpriority>s),(list of supported <Source statistics descriptor>s),(list of supported <Signaling indication flag>s) |
| Read Command AT+CGEQMIN? | OK 2) ERROR Response 1) +CGEQMIN: [<cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate |

UL>,<Guaranteed bitrateDL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>][<CR><LF><LF>+CGEQMIN: <cid>,<Traffic class>,<Maximum bitrate UL>,<Maximum bitrate DL>,<Guaranteed bitrate UL>,<Guaranteed bitrateDL>,<Delivery order>,<Maximum SDU size>,<SDU error ratio>,<Residual bit error ratio>,<Delivery of erroneous SDUs>,<Transfer Delay>,<Traffic handling priority>,<Source statistics descriptor>,<Signaling indication flag>[...]]

OK

2)

ERROR

Write Command

AT+CGEQMIN=<cid>[,<Traffic class>[,<Maximum bitrate UL>[,<Maximum bitrate DL>[,<Guaranteed bitrate UL>[,<Guaranteed bitrateDL>[,<Delivery order>[,<Maximum SDU size>[,<SDU error ratio>[,<Residual biterror ratio>[,<Delivery of erroneous SDUs>[,<Transfer delay>[,<Traffic handlingpriority>[,<Source statistics descriptor>[,<Signaling indication flag>]]]]]]]]]]]]]

Response

1)

OK

2)

ERROR

3)

+CME ERROR: <err>

Execution Command

AT+CGEQMIN

Response

1)

OK

2)

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

<cid>

Parameter specifies a particular PDP context definition. The

| | |
|--------------------------------------|---|
| | <p>parameter is also used in other PDP context-related commands. The range is from 1 to 15.</p> |
| <Traffic class> | <ul style="list-style-type: none"> 0 conversational 1 streaming 2 interactive 3 background 4 subscribed value |
| <Maximum bitrate UL> | <p>This parameter indicates the maximum number of kbit/s delivered to UMTS(up-link traffic)at a SAP.As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQMIN=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Maximum bitrate DL> | <p>This parameter indicates the maximum number of kbit/s delivered to UMTS(down-link traffic)at a SAP.As an Examples a bitrate of 32kbit/s would be specified as 32(e.g. AT+CGEQMIN=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8640 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Guaranteed bitrate UL> | <p>This parameter indicates the guaranteed number of kbit/s delivered to UMTS(up-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQMIN=...,32,...).</p> <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8640 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Guaranteed bitrate DL> | <p>This parameter indicates the guaranteed number of kbit/s delivered to UMTS(down-link traffic)at a SAP(provided that there is data to deliver).As an Examples a bitrate of 32kbit/s would be specified as 32(e.g.AT+CGEQMIN=...,32,...).</p> |

| | |
|---|--|
| | <p>The range is from 0 to 256000. When the parameter is between 64 and 568, it should be an integer multiple of 8; between 568 and 8640(except 8640), it should be an integer multiple of 64; between 8641 and 16000, it should be an integer multiple of 100; between 16000 and 128000, it should be an integer multiple of 1000; between 128000 and 256000, it should be an integer multiple of 2000. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <Delivery order> | <p>This parameter indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.</p> <p>0 no 1 yes 2 subscribed value</p> |
| <Maximum SDU size> | <p>This parameter indicates the maximum allowed SDU size in octets. The range is 0, 10 to 1500, 1510, 1520. When the parameter is between 10 and 1510, it should be an integer multiple of 10. The default value is 0. If the parameter is set to '0' the subscribed value will be requested.</p> |
| <SDU error ratio> | <p>This parameter indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. As an Examples a target SDU error ratio of 5×10^{-3} would be specified as "5E3"(e.g.AT+CGEQMIN=.,"5E3",...).</p> <p>"0E0" subscribed value "1E2" "7E3" "1E3" "1E4" "1E5" "1E6" "1E1"</p> |
| <Residual bit error ratio> | <p>This parameter indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. As an Examples a target residual bit error ratio of 5×10^{-3} would be specified as "5E3"(e.g. AT+CGEQMIN=..., "5E3",..).</p> <p>"0E0" subscribed value "5E2" "1E2" "5E3" "4E3" "1E3" "1E4" "1E5" "1E6"</p> |

| | |
|---|---|
| | "6E8" |
| <Delivery of erroneous SDUs> | This parameter indicates whether SDUs detected as erroneous shall be delivered or not. 0 no 1 yes 2 no detect 3 subscribed value |
| <Transfer delay> | This parameter indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. The range is from 0 to 950, and the parameter is an integer of 10. The default value is 0. If the parameter is set to '0' the subscribed value will be requested. |
| <Traffic handling priority> | This parameter specifies the relative importance for handling of all SDUs belonging to the UMTS Bearer compared to the SDUs of the other bearers. The range is 0 to 3. The default value is 0. If the parameter is set to '0' the subscribed value will be requested. |
| <Source statistics descriptor> | This parameter indicates profile parameter that Source statistics descriptor for requested UMTS QoS The range is from 0 to 1. The default value is 0. If the parameter is set to '0' the subscribed value will be requested. |
| <Signaling indication flag> | This parameter indicates Signaling flag. The range is from 0 to 1. The default value is 0. If the parameter is set to '0' the subscribed value will be requested. |
| <PDP_type> | (Packet Data Protocol type) a string parameter which specifies the type of packet data protocol. IP Internet Protocol |

Examples

AT+CGEQMIN=?

+CGEQMIN:

"IP", (0-4), (0-256000), (0-256000), (0-256000), (0-256000), (0-2), (0-1520), ("0E0", "1E1", "1E2", "7E3", "1E3", "1E4", "1E5", "1E6"), ("0E0", "5E2", "1E2", "5E3", "4E3", "1E3", "1E4", "1E5", "1E6", "6E8"), (0-3), (0-950), (0-3), (0-1), (0-1)

OK

AT+CGEQMIN?

+CGEQMIN: 1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK

AT+CGEQMIN=1,4,0,0,0,0,2,0,"0E0","0E0",3,0,0,0,0

OK

AT+CGEQMIN

OK

5.2.12 AT+CGDATA Enter data state

The command causes the MT to perform whatever actions are necessary to establish communication between the TE and the network using one or more Packet Domain PDP types. This may include performing a PS attach and one or more PDP context activations.

AT+CGDATA Enter data state

| | |
|--|---|
| | Response |
| | 1) +CGDATA: (list of supported <L2P>s) |
| Test Command AT+CGDATA=? | OK 2) ERROR |
| | Response |
| | 1) CONNECT [<text>] 2) NO CARRIER 3) OK 4) ERROR 5) +CME ERROR: <err> |
| Write Command AT+CGDATA=[<L2P>,[<cid>]] | |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------------------|---|
| <L2P> | A string parameter that indicates the layer 2 protocol to be used between the TE and MT. NULL |
| <text> | CONNECT result code string; the string formats please refer ATX command. |
| <cid> | A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). 1...15 |

Examples

AT+CGDATA=?

+CGDATA: ("")

OK

AT+CGDATA="";1

CONNECT

5.2.13 AT+CGPADDR Show PDP address

The write command returns a list of PDP addresses for the specified context identifiers.

AT+CGPADDR Show PDP address

Response

1)

[+CGPADDR: (list of defined <cid>s)]

OK

2)

ERROR

Response

1)

[+CGPADDR: <cid>,<PDP_addr>[<CR><LF>
+CGPADDR: <cid>,<PDP_addr>[..]]]

OK

2)

SIM card supports IPV4V6 type and the PDP_type of the command
"at+cgdcont" defined is ipv4v6:

[+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>]

+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>[..]

OK

3)

ERROR

Response

1)

[+CGPADDR: <cid>,<PDP_addr>]

+CGPADDR: <cid>,<PDP_addr>[..]

Execution Command

AT+CGPADDR

OK
 2)
 SIM card supports IPV4V6 type and the PDP_type of the command "at+cgdcont" defined is ipv4v6:
[+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>]
+CGPADDR: <cid>,<PDP_addr_IPV4>,<PDP_addr_IPV6>[..]

OK
 3)
ERROR
 4)
+CME ERROR: <err>

| | |
|-----------------------|----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|------------------------------|--|
| <cid> | A numeric parameter which specifies a particular PDP context definition (see AT+CGDCONT command). If no <cid> is specified, the addresses for all defined contexts are returned. 1...15 |
| <PDP_addr> | A string that identifies the MT in the address space applicable to the PDP. The address may be static or dynamic. For a static address, it will be the one set by the AT+CGDCONT command when the context was defined. For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>. <PDP_addr> is omitted if none is available. |
| <PDP_addr_IPV4> | A string parameter that identifies the MT in the address space applicable to the PDP. |
| <PDP_addr_IPV6> | A string parameter that identifies the MT in the address space applicable to the PDP when the sim_card supports ipv6. The pdp type must be set to "ipv6" or "ipv4v6" by the AT+CGDCONT command. |

Examples

```
AT+CGPADDR=?
+CGPADDR: (1)

OK
AT+CGPADDR=1
+CGPADDR: 1,10.83.214.110
```

OK

AT+CGPADDR

+CGPADDR: 1,10.83.214.110

OK

5.2.14 AT+CGCLASS GPRS mobile station class

This command is used to set the MT to operate according to the specified GPRS mobile class.

AT+CGCLASS GPRS mobile station class

Test Command

AT+CGCLASS=?

Response

1)

+CGCLASS: (list of supported <class>s)

OK

2)

ERROR

Response

1)

+CGCLASS: <class>

OK

2)

ERROR

Response

1)

OK

2)

ERROR

3)

+CME ERROR: <err>

Response

1)

OK

2)

ERROR

Read Command

AT+CGCLASS?

Write Command

AT+CGCLASS=<class>

Execution Command

AT+CGCLASS

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

| | |
|----------------------|--|
| <class> | A string parameter which indicates the GPRS mobile class (in descending order of functionality) A class A (highest) |
|----------------------|--|

Examples

```
AT+CGCLASS=?  
+CGCLASS: ("A")
```

OK

```
AT+CGCLASS?  
+CGCLASS: "A"
```

OK

```
AT+CGCLASS="A"
```

OK

```
AT+CGCLASS
```

OK

5.2.15 AT+CGEREP GPRS event reporting

The write command enables or disables sending of unsolicited result codes, "+CGEV" from MT to TE in the case of certain events occurring in the Packet Domain MT or the network. <mode> controls the processing of unsolicited result codes specified within this command. <bfr> controls the effect on buffered codes when <mode> 1 or 2 is entered. If a setting is not supported by the MT, ERROR or +CME ERROR: is returned.

Read command returns the current <mode> and buffer settings.

Test command returns the modes and buffer settings supported by the MT as compound values.

AT+CGEREP GPRS event reporting

| | |
|--------------|---|
| Test Command | Response 1) +CGEREP: (list of supported <mode>s),(list of supported <bfr>s) |
| AT+CGEREP=? | OK 2) ERROR |

| | |
|---|---|
| Read Command AT+CGEREP? | Response 1) +CGEREP: <mode>,<bfr> OK 2) ERROR |
| Write Command AT+CGEREP=<mode>[,<bfr>]] | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Execution Command AT+CGEREP | Response 1)Set default value (<mode>=2,<bfr>=0): OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------------------|---|
| <mode> | 0 buffer unsolicited result codes in the MT; if MT result code buffer is full, the oldest ones can be discarded. No codes are forwarded to the TE. 1 discard unsolicited result codes when MT-TE link is reserved (e.g. in on-line data mode); otherwise forward them directly to the TE. 2 buffer unsolicited result codes in the MT when MT-TE link is reserved (e.g. in on-line data mode)and flush them to the TE when MT-TE link becomes available; otherwise forward them directly to the TE. |
| <bfr> | 0 MT buffer of unsolicited result codes defined within this command is cleared when <mode> 1 or 2 is entered. 1 MT buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 or 2 is entered (OK response shall be given before flushing the codes). |

The events are valid for GPRS/UMTS and LTE unless explicitly mentioned.

For network attachment, the following unsolicited result codes and the corresponding events are defined:

| | |
|-------------------------|--|
| +CGEV: NW DETACH | The network has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. |
| +CGEV: ME DETACH | The mobile termination has forced a PS detach. This implies that all active contexts have been deactivated. These are not reported separately. |

For MT class, the following unsolicited result codes and the corresponding events are defined:

| | |
|--------------------------------------|---|
| +CGEV: NW CLASS <class> | The network has forced a change of MT class. The highest available class is reported (see +CGCLASS). The format of the parameter <class> is found in command +CGCLASS. |
| +CGEV: ME CLASS <class> | The mobile termination has forced a change of MT class. The highest available class is reported (see +CGCLASS). The format of the parameter <class> is found in command +CGCLASS. |

For PDP context activation, the following unsolicited result codes and the corresponding events are defined:

| | |
|---|--|
| +CGEV: NW PDN ACT <cid>[,<WLAN_Offload>] | <p>The network has activated a context. The context represents a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.</p> <p><WLAN_Offload>: integer type. An integer that indicates whether traffic can be offloaded using the specified PDN connection via a WLAN or not. This refers to bit 1 (E-UTRAN offload acceptability value)and bit 2 (UTRAN offload acceptability value)in the WLAN offload acceptability IE as specified in 3GPP TS 24.008 [8] subclause 10.5.6.20.</p> <ul style="list-style-type: none"> 0 offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is not acceptable. 1 offloading the traffic of the PDN connection via a WLAN when in S1 mode is acceptable, but not acceptable in Iu mode. 2 offloading the traffic of the PDN connection via a WLAN when in Iu mode is acceptable, but not acceptable in S1 mode. 3 offloading the traffic of the PDN connection via a WLAN when in S1 mode or when in Iu mode is acceptable. |
|---|--|

NOTE

This event is not applicable for EPS.

| | |
|---|--|
| <p>+CGEV: ME PDN ACT</p> <p><cid>[,<reason>[,<cid_other>]]<WLAN_Offload>]</p> | <p>The mobile termination has activated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. This event is sent either in result of explicit context activation request (+CGACT), or in result of implicit context activation request associated to attach request (+CGATT=1). The format of the parameters <cid> and <cid_other> are found in command +CGDCONT. The format of the parameter <WLAN_Offload> is defined above.</p> <p><reason>: integer type; indicates the reason why the context activation request for PDP type IPv4v6 was not granted. This parameter is only included if the requested PDP type associated with <cid> is IPv4v6, and the PDP type assigned by the network for <cid> is either IPv4 or IPv6.</p> <ul style="list-style-type: none"> 0 IPv4 only allowed 1 IPv6 only allowed 2 single address bearers only allowed. 3 single address bearers only allowed and MT initiated context activation for a second address type bearer was not successful. 4 CI_PS_PDP_INVALID_REASON <p><cid_other>: integer type; indicates the context identifier allocated by MT for an MT initiated context of a second address type. MT shall only include this parameter if <reason> parameter indicates single address bearers only allowed, and MT supports MT initiated context activation of a second address type without additional commands from TE, and MT has activated the PDN connection or PDP context associated with <cid_other>.</p> |
|---|--|

NOTE

For legacy TEs supporting MT initiated context activation without TE requests, there is also a subsequent event +CGEV: ME PDN ACT <cid_other> returned to TE.

| | |
|---|--|
| <p>+CGEV: NW ACT</p> <p><p_cid>,<cid>,<event_type>[,<WLAN_Offload>]</p> | <p>The network has activated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <WLAN_Offload> is</p> |
|---|--|

| | |
|---|--|
| | <p>defined above.</p> <p><event_type>: integer type; indicates whether this is an informational event or whether the TE has to acknowledge it.</p> <p>0 Informational event</p> <p>1 Information request: Acknowledgement required. The acknowledgement can be accept or reject, see +CGANS.</p> |
| +CGEV: ME ACT <p_cid>,<cid>,<event_type> [,<WLAN_Offload>] | <p>The network has responded to an ME initiated context activation. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event_type> and <WLAN_Offload> are defined above.</p> |

For PDP context deactivation, the following unsolicited result codes and the corresponding events are defined:

| | |
|--|--|
| +CGEV: NW DEACT <PDP_type>,<PDP_addr>[,<cid>] | <p>The network has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>,<PDP_addr> and <cid> are found in command +CGDCONT.</p> |
| +CGEV: ME DEACT <PDP_type>,<PDP_addr>[,<cid>] | <p>The mobile termination has forced a context deactivation. The <cid> that was used to activate the context is provided if known to the MT. The format of the parameters <PDP_type>,<PDP_addr> and <cid> are found in command +CGDCONT.</p> |
| +CGEV: NW PDN DEACT <cid>[,<WLAN_Offload>] | <p>The network has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The associated <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT. The format of the parameter <WLAN_Offload> is defined above.</p> |

NOTE

Occurrence of this event replaces usage of the event +CGEV: NW DEACT
<PDP_type>,<PDP_addr>[,<cid>].

| | |
|--|---|
| +CGEV: ME PDN DEACT <cid> | <p>The mobile termination has deactivated a context. The context represents a PDN connection in LTE or a Primary PDP context in GSM/UMTS. The <cid> for this context is provided to the TE. The format of the parameter <cid> is found in command +CGDCONT.</p> |
|--|---|

NOTE

Occurrence of this event replaces usage of the event +CGEV: ME DEACT
 <PDP_type>,<PDP_addr>[,<cid>].

+CGEV: NW DEACT
<p_cid>,<cid>,<event_type>
 [,<WLAN_Offload>]

The network has deactivated a context. The <cid> for this context is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameters <event_type> and <WLAN_Offload> are defined above.

NOTE

Occurrence of this event replaces usage of the event +CGEV: NW DEACT
 <PDP_type>,<PDP_addr>[,<cid>].

+CGEV: ME DEACT
<p_cid>,<cid>,<event_type>

The network has responded to an ME initiated context deactivation request. The associated <cid> is provided to the TE in addition to the associated primary <p_cid>. The format of the parameters <p_cid> and <cid> are found in command +CGDSCONT. The format of the parameter <event_type> is defined above.

NOTE

Occurrence of this event replaces usage of the event +CGEV: ME DEACT
 <PDP_type>,<PDP_addr>[,<cid>].

For PDP context modification, the following unsolicited result codes and the corresponding events are defined:

+CGEV: NW MODIFY
<cid>,<change_reason>,<event_type>[,<WLAN_Offload>]

The network has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>,<event_type>, and <WLAN_Offload> are defined above.

<change_reason>: integer type; a bitmap that indicates what kind of

change occurred. The <change_reason> value is determined by summing all the applicable bits. For Examples if both the values of QoS changed (Bit 2)and <WLAN_Offload> changed (Bit 3)have changed, then the <change_reason> value is 6.

NOTE

The WLAN offload value will change when bit 1 or bit 2 or both of the indicators in the WLAN offload acceptability IE change, see the parameter <WLAN_Offload> defined above.

- Bit 1 TFT changed
- Bit 2 Qos changed
- Bit 3 WLAN Offload changed

+CGEV: ME MODIFY

<cid>,<change_reason>,<event_type>[,<WLAN_Offload>]

The mobile termination has modified a context. The associated <cid> is provided to the TE in addition to the <change_reason> and <event_type>. The format of the parameter <cid> is found in command +CGDCONT or +CGDSCONT. The format of the parameters <change_reason>,<event_type> and <WLAN_Offload> are defined above.

For other PDP context handling, the following unsolicited result codes and the corresponding events are defined:

+CGEV: REJECT

<PDP_type>,<PDP_addr>

A network request for context activation occurred when the MT was unable to report it to the TE with a +CRING unsolicited result code and was automatically rejected. The format of the parameters <PDP_type> and <PDP_addr> are found in command +CGDCONT.

NOTE

This event is not applicable for EPS.

+CGEV: NW REACT

<PDP_type>,<PDP_addr>[,<cid>]

The network has requested a context reactivation. The <cid> that was used to reactivate the context is provided if known to the MT. The format of the parameters <PDP_type>,<PDP_addr> and <cid> are found in command +CGDCONT.

NOTE

This event is not applicable for EPS.

Examples

AT+CGEREP=?

+CGEREP: (0-2),(0-1)

OK

AT+CGEREP?

+CGEREP: 2,0

OK

AT+CGEREP=2,0

OK

AT+CGEREP

OK

5.2.16 AT+CGAUTH Set type of authentication for PDP-IP connections of GPRS

This command is used to set type of authentication for PDP-IP connections of GPRS.

AT+CGAUTH Set type of authentication for PDP-IP connections of GPRS

Response

1)

+CGAUTH: (range of supported <cid>s),(list of supported
<auth_type> s),50,50

Test Command

AT+CGAUTH=?

OK

2)

ERROR

3)

+CME ERROR: <err>

Response

1)

+CGAUTH: [<cid>,<auth_type>[,<user>,<passwd>]]

...

OK

| | |
|--|--|
| | 2) ERROR 3) +CME ERROR: <err> |
| Write Command | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| AT+CGAUTH=<cid>[,<auth_type>[,<passwd>[,<user>]]] | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Execution Command | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| AT+CGAUTH | |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------------------------|---|
| <cid> | Parameter specifies a particular PDP context definition. This is also used in other PDP context-related commands. 1...15 |
| <auth_type> | Indicate the type of authentication to be used for the specified context. If CHAP is selected another parameter <passwd> needs to be specified. If PAP is selected two additional parameters <passwd> and <user> need to be specified. 0 none 1 PAP 2 CHAP 3 PAP or CHAP //1803S platform |
| <passwd> | Parameter specifies the password used for authentication. |
| <user> | Parameter specifies the user name used for authentication. |

Examples

```
AT+CGAUTH=?
+CGAUTH: (1-15),(0-2),50,50                                //1803S platform
```

OK

AT+CGAUTH=?

+CGAUTH: (1-15),(0-3),50,50

OK

AT+CGAUTH?

+CGAUTH: 1,0

OK

AT+CGAUTH=1,0

OK

AT+CGAUTH

OK

5.2.17 AT+CPING Ping destination address

This command is used to ping destination address.

AT+CPING Ping destination address

Response

1)

+CPING: IP address,(list of supported

<dest_addr_type>s),(1-5),(4-188),(1000-10000),(10000-100000),(1
6-255)

OK

2)

ERROR

Response

1)

OK

Write Command

**AT+CPING=<dest_addr>,<de
st_addr_type>[,<num_pings
>[,<data_packet_size>[,<inte
rval_time>[,<wait_time>[,<T
TL>]]]]]**

If ping's result_type=1

+CPING:

<result_type>,<resolved_ip_addr>,<data_packet_size>,<rtt>,<TT
L>

If ping's result_type=2

+CPING: <result_type>

If ping's result_type=3>

+CPING:

| | |
|-----------------------|---|
| | <result_type>,<num_pkts_sent>,<num_pkts_recv>,<num_pkts_lost>,<min_rtt>,<max_rtt>,<avg_rtt> |
| | 2) |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------------------|--|
| <dest_addr> | The destination is to be pinged; it can be an IP address or a domain name. |
| <dest_addr_type> | Integer type. Address family type of the destination address 1 IPv4. 2 IPv6(reserved) |
| <num_pings> | Integer type. The num_pings specifies the number of times the ping request (1-5)is to be sent. The default value is 4. |
| <data_packet_size> | Integer type. Data byte size of the ping packet (4-188). The default value is 64 bytes. |
| <interval_time> | Integer type. Interval between each ping. Value is specified in milliseconds (1000ms-10000ms). The default value is 2000ms. |
| <wait_time> | Integer type. Wait time for ping response. An ping response received after the timeout shall not be processed. Value specified in milliseconds (10000ms-100000ms). The default value is 10000ms. |
| <TTL> | Integer type. TTL(Time-To-Live)value for the IP packet over which the ping(ICMP ECHO Request message)is sent (16-255), the default value is 255. |
| <result_type> | 1 Ping success 2 Ping time out 3 Ping result |
| <num_pkts_sent> | Indicates the number of ping requests that were sent out. |
| <num_pkts_recv> | Indicates the number of ping responses that were received. |
| <num_pkts_lost> | Indicates the number of ping requests for which no response was received. |
| <min_rtt> | Indicates the minimum Round Trip Time(RTT). |
| <max_rtt> | Indicates the maximum RTT. |
| <avg_rtt> | Indicates the average RTT. |
| <resolved_ip_addr> | Indicates the resolved ip address. |
| <rtt> | Round Trip Time. |

Examples

AT+CPING=?

+CPING: IP

address,(1,2),(1-5),(4-188),(1000-10000),(10000-100000),(16-255)

OK

AT+CPING="www.baidu.com",1,4,64,1000,10000,255

OK

+CPING: 2

+CPING: 2

+CPING: 2

+CPING: 2

+CPING: 3,4,0,4,0,0,0

6 AT Commands for SIM Card

6.1 Overview of AT Commands for SIM Card

| Command | Description |
|---------------------------|--|
| AT+CICCID | Read ICCID from SIM card |
| AT+CPIN | Enter PIN |
| AT+CLK | Facility lock |
| AT+CPWD | Change password |
| AT+CIMI | Request international mobile subscriber identity |
| AT+CSIM | Generic SIM access |
| AT+CRSM | Restricted SIM access |
| AT+SPIC | Times remain to input SIM PIN/PUK |
| AT+CSPN | Get service provider name from SIM |
| AT+UIMHOTSWAPON | Set UIM hotswap function on |
| AT+UIMHOTSWAPLEVEL | Set UIM card detection level |
| AT+SWITCHSIM | Switch master SIM |
| AT+DUALSIM | Set dual-sim mode |
| AT+BINDSIM | Bind ATP to SIM1 or SIM2 |
| AT+DUALSIMURC | Dual card reporting control |

6.2 Detailed Description of AT Commands for SIM Card

6.2.1 AT+CICCID Read ICCID from SIM card

This command is used to Read the ICCID from SIM card.

AT+CICCID Read ICCID from SIM card

Test Command

Response

| | |
|---------------------------------------|--------------------------------------|
| AT+CICCID=? | OK |
| | Response |
| | 1) +CICCID: <ICCID> |
| Execution Command AT+CICCID | OK |
| | 2) ERROR |
| | 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | Vendor |

Defined Values

| | |
|----------------------|--|
| <ICCID> | Integrate circuit card identity, a standard ICCID is a 20-digit serial number of the SIM card, it presents the publish state, network code, publish area, publish date, publish manufacture and press serial number of the SIM card. |
|----------------------|--|

Examples

```

AT+CICCID
+CICCID: 89860318760238610932

OK
AT+CICCID=?
OK

```

6.2.2 AT+CPIN Enter PIN

This command is used to send the ME a password which is necessary before it can be operated (SIM PIN, SIM PUK, PH-SIM PIN, etc.). If the PIN is to be entered twice, the TA shall automatically repeat the PIN. If no PIN request is pending, no action is taken towards MT and an error message, +CME ERROR, is returned to TE.

If the PIN required is SIM PUK or SIM PUK2, the second pin is required. This second pin,<newpin>, is used to replace the old pin in the SIM.

AT+CPIN Enter PIN

| | |
|---|---|
| Test Command | Response |
| AT+CPIN=? | OK |
| Read Command | Response |
| AT+CPIN? | 1) +CPIN: <code> 2) OK 3) ERROR 4) +CME ERROR: <err> |
| Write Command | Response |
| AT+CPIN=<pin>[,<newpin>] | 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | AUTO_SAVE_REBOOT |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----------------------|---|
| <pin> | String type values. |
| <newpin> | String type values. |
| <code> | Values reserved by the present document: READY ME is not pending for any password SIM PIN ME is waiting SIM PIN to be given SIM PUK ME is waiting SIM PUK to be given PH-SIM PIN ME is waiting phone-to-SIM card password to be given SIM PIN2 ME is waiting SIM PIN2 to be given SIM PUK2 ME is waiting SIM PUK2 to be given PH-NET PIN ME is waiting network personalization password to be given SIM CRASH SIM initialization failed or SIM access encountered a serious error |

Examples

AT+CPIN=?

OK

AT+CPIN?

+CPIN: READY

OK

AT+CPIN=1234

OK

6.2.3 AT+CLCK Facility lock

This command is used to lock, unlock or interrogate a ME or a network facility <fac>. Password is normally needed to do such actions. When querying the status of a network service (<mode>=2)the response line for 'not active' case (<status>=0)should be returned only if service is not active for any <class>.

AT+CLCK Facility lock

Test Command

AT+CLCK=?

Response

+CLCK: (list of supported <fac>s)

OK

Response

1)

OK

2)

When <mode>=2 and command successful:

+CLCK: <status>[,<class1>[

+CLCK: <status>,<class2>

[..]]

OK

3)

ERROR

4)

+CME ERROR: <err>

Write Command

AT+CLCK=<fac>,<mode>[,<passwd>[,<class>]]

Parameter Saving Mode

AUTO_SAVE_REBOOT

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

<fac>

"SC" lock SIM card or USIM card

"AO" Barr All Outgoing Calls

"OI" Barr Outgoing International Calls

| | |
|----------|---|
| | "OX" Barr Outgoing International Calls except to Home Country "AI" Barr All Incoming Calls "IR" Barr Incoming Calls when roaming outside the home country "AB" All Barring services (only for <mode>=0) "AG" All outGoing barring services (only for <mode>=0) "AC" All inComing barring services (only for <mode>=0) "FD" SIM fixed dialing memory feature "PN" Network Personalization "PU" network subset Personalization "PP" service Provider Personalization "PC" Corporate Personalization |
| <mode> | 0 unlock 1 lock 2 query status |
| <status> | 0 not active 1 active |
| <passwd> | Password. string type; shall be the same as password specified for the facility from the ME user interface or with command Change Password +CPWD |
| <class> | It is a sum of integers each representing a class of information (default 7): 1 voice (telephony) 2 data (refers to all bearer services) 4 fax (facsimile services) 8 short message service 16 data circuit sync 32 data circuit sync 64 dedicated packet access 128 dedicated PAD access 255 The value 255 covers all classes |

Examples

```

AT+CLCK="SC",2
+CLCK: 0

OK
AT+CLCK=?
+CLCK:
("SC","AO","OI","OX","AI","IR","AB","AG","AC","FD","PN","PU","PP","PC")

OK

```

6.2.4 AT+CPWD Change password

Write command sets a new password for the facility lock function defined by command Facility Lock AT+CLCK.

Test command returns a list of pairs which present the available facilities and the maximum length of their password.

AT+CPWD Change password

| | |
|---|---|
| Test Command AT+CPWD=? | Response 1) +CPWD: (list of supported (<fac>,<pwdlength>)s) |
| | OK 2) ERROR 3) +CME ERROR: <err> |
| Write Command AT+CPWD=<fac>,<oldpwd>,<newpwd> | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | AUTO_SAVE_REBOOT |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----------------------|---|
| <fac> | Refer Facility Lock +CLCK for other values: "SC" SIM or USIM PIN1 "P2" SIM or USIM PIN2 "AB" All Barring services "AC" All inComing barring services (only for <mode>=0) "AG" All outGoing barring services (only for <mode>=0) "AI" Barr All Incoming Calls "AO" Barr All Outgoing Calls "IR" Barr Incoming Calls when roaming outside the home country "OI" Barr Outgoing International Calls "OX" Barr Outgoing International Calls except to Home Country |
| <oldpwd> | String type, it shall be the same as password specified for the facility |

| | |
|-------------|---|
| | from the ME user interface or with command Change Password AT+CPWD. |
| <newpwd> | String type, it is the new password; maximum length of password can be determined with <pwdlength>. |
| <pwdlength> | Integer type, max length of password. |

Examples

```
AT+CPWD=?
+CPWD:
("AB",4),("AC",4),("AG",4),("AI",4),("AO",4),("IR",4),("OI",4),("OX",4),("SC",8),("P2",8)

OK
AT+CPWD="SC","1234","4321"
OK
```

6.2.5 AT+CIMI Request international mobile subscriber identity

Execution command causes the TA to return <IMSI>, which is intended to permit the TE to identify the individual SIM card which is attached to MT.

AT+CIMI Request international mobile subscriber identity

| | |
|-----------------------|---|
| Test Command | Response 1) OK 2) ERROR |
| Execution Command | Response 1) <IMSI> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------------------|---|
| <IMSI> | International Mobile Subscriber Identity (string, without double quotes). |
|---------------------|---|

Examples

```

AT+CIMI=?
OK
AT+CIMI
460010222028133

OK

```

NOTE

If USIM card contains two apps, like China Telecom 4G card, one RUIM/CSIM app, and another USIM app; so there are two IMSI in it; AT+CIMI will return the RUIM/CSIM IMSI.

6.2.6 AT+CSIM Generic SIM access

This command is used to control the SIM card directly.

Compared to restricted SIM access command AT+CRSM, AT+CSIM allows the ME to take more control over the SIM interface.

For SIM-ME interface please refer 3GPP TS 11.11.

AT+CSIM Generic SIM access

| | |
|--|--|
| Test Command | Response |
| AT+CSIM=? | OK |
| Write Command | Response |
| AT+CSIM=<length>,<comma nd> | 1) +CSIM: <length>,<response> |
| | 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |

| | |
|-------------------|----------------|
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-------------------------|---|
| <length> | Integer type; length of characters that are sent to TE in <command> or <response> |
| <command> | Command passed from MT to SIM card. |
| <response> | Response to the command passed from SIM card to MT. |

Examples

```
AT+CSIM=?
OK
AT+CSIM=10,"A0F2000016"
+CSIM: 4,"6E00"

OK
```

NOTE

The SIM Application Toolkit functionality is not supported by AT+CSIM. Therefore the following SIM commands can not be used: TERMINAL PROFILE, ENVELOPE, FETCH and TEMINAL RESPONSE.

6.2.7 AT+CRSM Restricted SIM access

By using AT+CRSM instead of Generic SIM Access AT+CSIM, TE application has easier but more limited access to the SIM database.

Write command transmits to the MT the SIM <command> and its required parameters. MT handles internally all SIM-MT interface locking and file selection routines. As response to the command, MT sends the actual SIM information parameters and response data. MT error result code +CME ERROR may be returned when the command cannot be passed to the SIM, but failure in the execution of the command in the SIM is reported in <sw1> and <sw2> parameters.

AT+CRSM Restricted SIM access

| | |
|------------------|-----------|
| Test Command | Response |
| AT+CRSM=? | OK |

| | |
|---|--|
| | Response |
| Write Command | 1) +CRSM: <sw1>,<sw2>[,<response>] |
| AT+CRSM=<command>[,<fil eID>[,<p1>,<p2>,<p3>[,<data >]]] | OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | - |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|------------------------|--|
| <command> | Command passed on by the MT to the SIM: 176 READ BINARY 178 READ RECORD 192 GET RESPONSE 214 UPDATE BINARY 220 UPDATE RECORD 242 STATUS 203 RETRIEVE DATA 219 SET DATA |
| <fileID> | Identifier for an elementary data file on SIM, if used by <command>. The following list the fileID hex value, user needs to convert them to decimal. EFs under MF 0x2FE2 ICCID 0x2F05 Extended Language Preferences 0x2F00 EF DIR 0x2F06 Access Rule Reference EFs under USIM ADF 0x6F05 Language Indication 0x6F07 IMSI 0x6F08 Ciphering and Integrity keys 0x6F09 C and I keys for pkt switched domain 0x6F60 User controlled PLMN selector w/Acc Tech 0x6F30 User controlled PLMN selector 0x6F31 HPLMN search period 0x6F37 ACM maximum value 0x6F38 USIM Service table 0x6F39 Accumulated Call meter 0x6F3E Group Identifier Level 0x6F3F Group Identifier Level 2 |

| | |
|--------|---------------------------------------|
| 0x6F46 | Service Provider Name |
| 0x6F41 | Price Per Unit and Currency table |
| 0x6F45 | Cell Bcast Msg identifier selection |
| 0x6F78 | Access control class |
| 0x6F7B | Forbidden PLMNs |
| 0x6F7E | Location information |
| 0x6FAD | Administrative data |
| 0x6F48 | Cell Bcast msg id for data download |
| 0x6FB7 | Emergency call codes |
| 0x6F50 | Cell bcast msg id range selection |
| 0x6F73 | Packet switched location information |
| 0x6F3B | Fixed dialling numbers |
| 0x6F3C | Short messages |
| 0x6F40 | MSISDN |
| 0x6F42 | SMS parameters |
| 0x6F43 | SMS Status |
| 0x6F49 | Service dialling numbers |
| 0x6F4B | Extension 2 |
| 0x6F4C | Extension 3 |
| 0x6F47 | SMS reports |
| 0x6F80 | Incoming call information |
| 0x6F81 | Outgoing call information |
| 0x6F82 | Incoming call timer |
| 0x6F83 | Outgoing call timer |
| 0x6F4E | Extension 5 |
| 0x6F4F | Capability Config Parameters 2 |
| 0x6FB5 | Enh Multi Level Precedence and Pri |
| 0x6FB6 | Automatic answer for eMLPP service |
| 0x6FC2 | Group identity |
| 0x6FC3 | Key for hidden phonebook entries |
| 0x6F4D | Barred dialling numbers |
| 0x6F55 | Extension 4 |
| 0x6F58 | Comparison Method information |
| 0x6F56 | Enabled services table |
| 0x6F57 | Access Point Name Control List |
| 0x6F2C | De-personalization Control Keys |
| 0x6F32 | Co-operative network list |
| 0x6F5B | Hyperframe number |
| 0x6F5C | Maximum value of Hyperframe number |
| 0x6F61 | OPLMN selector with access tech |
| 0x6F5D | OPLMN selector |
| 0x6F62 | HPLMN selector with access technology |
| 0x6F06 | Access Rule reference |
| 0x6F65 | RPLMN last used access tech |
| 0x6FC4 | Network Parameters |
| 0x6F11 | CPHS: Voice Mail Waiting Indicator |

| | |
|--------|--|
| 0x6F12 | CPHS: Service String Table |
| 0x6F13 | CPHS: Call Forwarding Flag |
| 0x6F14 | CPHS: Operator Name String |
| 0x6F15 | CPHS: Customer Service Profile |
| 0x6F16 | CPHS: CPHS Information |
| 0x6F17 | CPHS: Mailbox Number |
| 0x6FC5 | PLMN Network Name |
| 0x6FC6 | Operator PLMN List |
| 0x6F9F | Dynamic Flags Status |
| 0x6F92 | Dynamic2 Flag Setting |
| 0x6F98 | Customer Service Profile Line2 |
| 0x6F9B | EF PARAMS - Welcome Message |
| 0x4F30 | Phone book reference file |
| 0x4F22 | Phone book synchronization center |
| 0x4F23 | Change counter |
| 0x4F24 | Previous Unique Identifier |
| 0x4F20 | GSM ciphering key Kc |
| 0x4F52 | GPRS ciphering key |
| 0x4F63 | CPBCCH information |
| 0x4F64 | Investigation scan |
| 0x4F40 | MExE Service table |
| 0x4F41 | Operator Root Public Key |
| 0x4F42 | Administrator Root Public Key |
| 0x4F43 | Third party Root public key |
| 0x6FC7 | Mail Box Dialing Number |
| 0x6FC8 | Extension 6 |
| 0x6FC9 | Mailbox Identifier |
| 0x6FCA | Message Waiting Indication Status |
| 0x6FCD | Service Provider Display Information |
| 0x6FD2 | UIM_USIM_SPT_TABLE |
| 0x6FD9 | Equivalent HPLMN |
| 0x6FCB | Call Forwarding Indicator Status |
| 0x6FD6 | GBA Bootstrapping parameters |
| 0x6FDA | GBA NAF List |
| 0x6FD7 | MBMS Service Key |
| 0x6FD8 | MBMS User Key |
| 0x6FCE | MMS Notification |
| 0x6FD0 | MMS Issuer connectivity parameters |
| 0x6FD1 | MMS User Preferences |
| 0x6FD2 | MMS User connectivity parameters |
| 0x6FCF | Extension 8 |
| 0x5031 | Object Directory File |
| 0x5032 | Token Information File |
| 0x5033 | Unused space Information File EFs under Telecom DF |
| 0x6F3A | Abbreviated Dialing Numbers |
| 0x6F3B | Fixed dialling numbers |

| | |
|----------------|---|
| | 0x6F3C Short messages 0x6F3D Capability Configuration Parameters 0x6F4F Extended CCP 0x6F40 MSISDN 0x6F42 SMS parameters 0x6F43 SMS Status 0x6F44 Last number dialled 0x6F49 Service Dialling numbers 0x6F4A Extension 1 0x6F4B Extension 2 0x6F4C Extension 3 0x6F4D Barred Dialing Numbers 0x6F4E Extension 4 0x6F47 SMS reports 0x6F58 Comparison Method Information 0x6F54 Setup Menu elements 0x6F06 Access Rule reference 0x4F20 Image 0x4F30 Phone book reference file 0x4F22 Phone book synchronization center 0x4F23 Change counter 0x4F24 Previous Unique Identifier |
| <p1> <p2> <p3> | Integer type; parameters to be passed on by the Module to the SIM. |
| <data> | Information which shall be written to the SIM (hexadecimal character format, refer AT+CSCS). |
| <sw1> <sw2> | Status information from the SIM about the execution of the actual command. It is returned in both cases, on successful or failed execution of the command. |
| <response> | Response data in case of a successful completion of the previously issued command. "STATUS" and "GET RESPONSE" commands return data, which gives information about the currently selected elementary data field. This information includes the type of file and its size. After "READ BINARY" or "READ RECORD" commands the requested data will be returned. <response> is empty after "UPDATE BINARY" or "UPDATE RECORD" commands. |

Examples

AT+CRSM=?

OK

AT+CRSM=242

+CRSM:

144,0,"000000003F00040000FFBB01020000"

OK

6.2.8 AT+SPIC Times remain to input SIM PIN/PUK

This command is used to inquire times remain to input SIM PIN/PUK.

AT+SPIC Times remain to input SIM PIN/PUK

Test Command

AT+SPIC=?

Response

OK

Response

1)

+SPIC: <pin1>,<puk1>,<pin2>,<puk2>

OK

2)

+CME ERROR: <err>

Execution Command

AT+SPIC

Parameter Saving Mode

NO_SAVE

Max Response Time

-

Reference

Vendor

Defined Values

<pin1>

Times remain to input PIN1 code.

<puk1>

Times remain to input PUK1 code.

<pin2>

Times remain to input PIN2 code.

<puk2>

Times remain to input PUK2 code.

Examples

AT+SPIC=?

OK

AT+SPIC

+SPIC: 3,10,0,10

OK

6.2.9 AT+CSPN Get service provider name from SIM

This command is used to get service provider name from SIM card.

AT+CSPN Get service provider name from SIM

| | |
|----------------------------------|--|
| | Response |
| Test Command AT+CSPN=? | 1) OK 2) ERROR |
| | Response |
| | 1) +CSPN: <spn>,<display mode> |
| Read Command AT+CSPN? | OK 2) OK 3) ERROR 4) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | - |
| Reference | Vendor |

Defined Values

| | |
|-----------------------------|---|
| <spn> | String type; service provider name on SIM |
| <display mode> | 0 doesn't display PLMN. Already registered on PLMN. 1 display PLMN |

Examples

```

AT+CSPN=?
OK
AT+CSPN?
+CSPN: "China Telecom",1

OK

```

6.2.10 AT+UIMHOTSWAPON Set UIM Hotswap Function On

AT+UIMHOTSWAPON Set UIM hotswap function on

| | |
|--|---|
| Test Command AT+UIMHOTSWAPON=? | Response 1) +UIMHOTSWAPON: (0-2) |
| | OK 2) ERROR |
| Read Command AT+UIMHOTSWAPON? | Response 1) +UIMHOTSWAPON: <onoff> |
| | OK 2) ERROR |
| Write Command AT+UIMHOTSWAPON=<onof f> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | Vendor |

Defined Values

| | |
|----------------------|---|
| <onoff> | <ul style="list-style-type: none"> <u>0</u> The UIM hotswap function is disabled 1 The UIM hotswap function is enabled(Inserting the SIM card will be recognized immediately, removing it will not) 2 The UIM hotswap function is enabled(Inserting and pulling out the SIM card will be recognized immediately) |
|----------------------|---|

Examples

```
AT+UIMHOTSWAPON=?
+UIMHOTSWAPON: (0-2)
```

OK

```
AT+UIMHOTSWAPON?
+UIMHOTSWAPON: 0
```

```
OK
AT+UIMHOTSWAPON=1
OK
```

6.2.11 AT+UIMHOTSWAPLEVEL Set UIM Card Detection Level

| AT+UIMHOTSWAPLEVEL Set UIM Card Detection Level | |
|--|---|
| Test Command AT+UIMHOTSWAPLEVEL=? | Response 1) +UIMHOTSWAPLEVEL: (0-1) OK 2) ERROR |
| Read Command AT+UIMHOTSWAPLEVEL? | Response 1) +UIMHOTSWAPLEVEL: <level> OK 2) ERROR |
| Write Command AT+UIMHOTSWAPLEVEL=<level> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | Vendor |

Defined Values

| | |
|----------------------|---------------|
| <level> | 0 ACTIVE LOW |
| | 1 ACTIVE HIGH |

Examples

AT+UIMHOTSWAPLEVEL=?

+UIMHOTSWAPLEVEL: (0-1)

OK

AT+UIMHOTSWAPLEVEL?

+UIMHOTSWAPLEVEL: 0

OK

AT+UIMHOTSWAPLEVEL=1

OK

6.2.12 AT+SWITCHSIM Switch master SIM

This command to set mater SIM.Only applied for dual-sim project.

AT+SWITCHSIM Switch master SIM

Response

Test Command

+SWITCHSIM: (0: SIM1, 1: SIM2)

AT+SWITCHSIM=?

OK

Response

Read Command

+SWITCHSIM: <simID>

AT+SWITCHSIM?

OK

Response

1)If the parameter is correct, and the corresponding card has been inserted, response:

Write Command

OK

AT+SWITCHSIM=<simID>

2)Others:

ERROR

Parameter Saving Mode

AUTO_SAVE

Max Response Time

9000ms

Reference

Defined Values

| | |
|---------|----------------------------------|
| <simID> | Integer type 0 SIM1 1 SIM2 |
|---------|----------------------------------|

Examples

AT+SWITCHSIM=?

+SWITCHSIM: (0: SIM1, 1: SIM2)

OK

AT+SWITCHSIM?

+SWITCHSIM: 0

OK

AT+SWITCHSIM=1

OK

NOTE

This command is only supported by specific hardware PN which support DS, for detailed information please contact with SIMCom FAE

6.2.13 AT+DUALSIM Set dual-sim mode

This command to set the dual-sim mode is dual standby or single standby. The SIM2 will register IMS when <dsmode>=3, if it support.

AT+DUALSIM Set dual-sim mode

Response

+DUALSIM: (0: DUAL SIM DUAL STANDBY, 1: DUAL SIM SINGLE STANDBY, 3: DUAL SIM DUAL STANDBY FP)

OK

Response

+DUALSIM: <dsmode>

OK

Response

1) If the parameter is correct, response:

OK

2) Others:

ERROR

Parameter Saving Mode

AUTO_SAVE

Max Response Time

9000ms

Reference

Defined Values

| | |
|----------|---|
| <dsmode> | Integer type 0 Dual SIM dual standby 1 Dual SIM single standby 3 Dual SIM dual standby with extras |
|----------|---|

Examples

```
AT+DUALSIM?  
+DUALSIM: (0: DUAL SIM DUAL STANDBY, 1:  
DUAL SIM SINGLE STANDBY, 3: DUAL SIM  
DUAL STANDBY FP)
```

OK

```
AT+DUALSIM?  
+DUALSIM: 0
```

OK

```
AT+DUALSIM=0  
OK
```

NOTE

This command is only supported by specific hardware PN which support DS, for detailed information please contact with SIMCom FAE

6.2.14 AT+BINDSIM Bind ATP to SIM1 or SIM2

This set command to bind AT channel to SIM card 1 or SIM card 2.Only for AT interface.

AT+BINDSIM Bind ATP to SIM1 or SIM2

Response

Test Command

+BINDSIM: (0: SIM1, 1: SIM2)

AT+BINDSIM=?

OK

Response

Read Command

+BINDSIM: <simID>

AT+BINDSIM?

OK

Write Command

Response

AT+BINDSIM=<simID>

1)If the parameter is correct, response:

OK

2)Others:

ERROR

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------|----------------------------------|
| <simID> | Integer type 0 SIM1 1 SIM2 |
|---------|----------------------------------|

Examples**AT+BINDSIM=?****+BINDSIM: (0: SIM1, 1: SIM2)**

OK

AT+BINDSIM?**+BINDSIM: 0**

OK

AT+BINDSIM=0

OK

AT+CIMI**460003064859756**

OK

AT+BINDSIM=1

OK

AT+CIMI**460012360528428**

OK

NOTE

This command is only supported by specific hardware PN which support DS, for detailed information please contact with SIMCom FAE

6.2.15 AT+DUALSIMURC Dual card reporting control

This set command to choose which SIM card to report, if enable the SIM2 URC, all URC strings are suffixed with "DS".

AT+DUALSIMURC Dual card reporting control

| | |
|---|--|
| | Response |
| Test Command AT+DUALSIMURC=? | +DUALSIMURC: (0:SIM1, 1:SIM2, 2:SIM1&SIM2) |
| | OK |
| Read Command AT+DUALSIMURC? | Response +DUALSIMURC: <opt> |
| | OK |
| Write Command AT+DUALSIMURC=<opt> | Response 1) If the parameter is correct, response: OK 2) Others: ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|--------------------|---|
| <opt> | Integer type 0 SIM1 1 SIM2 2 SIM1 & SIM2 |
|--------------------|---|

Examples

```
AT+DUALSIMURC=?
+DUALSIMURC: (0:SIM1, 1:SIM2, 2:SIM1&SIM2)
```

```
OK
AT+DUALSIMURC?
+DUALSIMURC: 0
```

```
OK
AT+DUALSIMURC=1
OK
```

NOTE

This command is only supported by specific hardware PN which support DS, for detailed information please contact with SIMCom FAE

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7 AT Commands for Call Control

7.1 Overview of AT Commands for Call Control

| Command | Description |
|--------------------|--|
| AT+CVHU | Voice hang up control |
| AT+CHUP | Hang up call |
| AT+CBST | Select bearer service type |
| AT+CRLP | Radio link protocol |
| AT+CRC | Cellular result codes |
| AT+CLCC | List current calls |
| AT+CEER | Extended error report |
| AT+CCWA | Call waiting |
| AT+CCFC | Call forwarding number and conditions |
| AT+CLIP | Calling line identification presentation |
| AT+CLIR | Calling line identification restriction |
| AT+COLP | Connected line identification presentation |
| AT+VTS | DTMF and tone generation |
| AT+VTD | Tone duration |
| AT+CSTA | Select type of address |
| AT+CMOD | Call mode |
| AT+VMUTE | Speaker mute control |
| AT+CMUT | Microphone mute control |
| AT+CSDVC | Switch voice channel device |
| AT+CMICGAIN | Adjust mic gain |
| AT+COUTGAIN | Adjust out gain |

7.2 Detailed Description of AT Commands for Call Control

7.2.1 AT+CVHU Voice hang up control

Write command selects whether ATH or "drop DTR" shall cause a voice connection to be disconnected or not. By voice connection is also meant alternating mode calls that are currently in voice mode.

AT+CVHU Voice hang up control

| | |
|--|---|
| | Response |
| Test Command AT+CVHU=? | +CVHU: (range of supported <mode>s) OK |
| Read Command AT+CVHU? | Response +CVHU: <mode> OK |
| Write Command AT+CVHU=<mode> | Response 1) OK 2) ERROR |
| Execution Command AT+CVHU | Set default value Response OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------|---|
| <mode> | 0 "Drop DTR" ignored but OK response given. ATH disconnects. 1 "Drop DTR" and ATH ignored but OK response given. |
|--------|---|

Examples

AT+CVHU=?

+CVHU: (0-1)

OK

AT+CVHU?

+CVHU: 1

OK

AT+CVHU=0

OK

AT+CVHU

OK

7.2.2 AT+CHUP Hang up call

This command is used to cancel voice calls. If there is no call, it will do nothing but OK response is given. After running AT+CHUP, multiple "VOICE CALL END: " may be reported which relies on how many calls exist before calling this command.

AT+CHUP Hang up call

Test Command

AT+CHUP=?

Response

OK

Execution Command

AT+CHUP

Response

1)

OK

VOICE CALL: END: <time>

2)No Call

OK

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

<time>

Voice call connection time.

Format HHMMSS (HH: hour, MM: minute, SS: second)

Examples

AT+CHUP=?

OK

AT+CHUP

OK

VOICE CALL: END: 000033

7.2.3 AT+CBST Select bearer service type

Write command selects the bearer service <name> with data rate <speed>, and the connection element <ce> to be used when data calls are originated. Values may also be used during mobile terminated data call setup, especially in case of single numbering scheme calls.

AT+CBST Select bearer service type

Test Command

AT+CBST=?

Response

+CBST: (list of supported <speed>s),(list of supported <name>s),(list of supported <ce>s)

OK

Read Command

AT+CBST?

Response

+CBST: <speed>,<name>,<ce>

OK

Write Command

**AT+CBST=<speed>[,<name>]
[,<ce>]]**

Response

1)

+CBST: <speed>,<name>,<ce>

OK

2)

ERROR

Set default value

Response

OK

Execution Command

AT+CBST

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

<speed>

- 0 autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service)
- 1 300 bps (V.21)
- 2 1200 bps (V.22)
- 3 1200/75 bps (V.23)
- 4 2400 bps (V.22bis)
- 5 2400 bps (V.26ter)
- 6 4800 bps (V.32)
- 7 9600 bps (V.32)
- 12 9600 bps (V.34)

| | |
|---------------------|--|
| | 14 14400 bps (V.34) |
| | 15 19200 bps (V.34) |
| | 16 28800 bps (V.34) |
| | 17 33600 bps (V.34) |
| | 34 1200 bps (V.120) |
| | 36 2400 bps (V.120) |
| | 38 4800 bps (V.120) |
| | 39 9600 bps (V.120) |
| | 43 14400 bps (V.120) |
| | 47 19200 bps (V.120) |
| | 48 28800 bps (V.120) |
| | 49 38400 bps (V.120) |
| | 50 48000 bps (V.120) |
| | 51 56000 bps (V.120) |
| | 65 300 bps (V.110) |
| | 66 1200 bps (V.110) |
| | 68 2400 bps (V.110 or X.31 flag stuffing) |
| | 70 4800 bps (V.110 or X.31 flag stuffing) |
| | 71 9600 bps (V.110 or X.31 flag stuffing) |
| | 75 14400 bps (V.110 or X.31 flag stuffing) |
| | 79 19200 bps (V.110 or X.31 flag stuffing) |
| | 80 28800 bps (V.110 or X.31 flag stuffing) |
| | 81 38400 bps (V.110 or X.31 flag stuffing) |
| | 82 48000 bps (V.110 or X.31 flag stuffing) |
| | 83 56000 bps (V.110 or X.31 flag stuffing) |
| | 84 64000 bps (X.31 flag stuffing) |
| | 115 56000 bps (bit transparent) |
| | 116 64000 bps (bit transparent) |
| | 120 32000 bps (PIAFS32K) |
| | 121 64000 bps (PIAFS64K) |
| | 130 28800 bps (multimedia) |
| | 131 32000 bps (multimedia) |
| | 132 33600 bps (multimedia) |
| | 133 56000 bps (multimedia) |
| | 134 64000 bps (multimedia) |
| <name> | <u>0</u> Asynchronous modem <u>1</u> Synchronous modem– PAD Access (asynchronous)(UDI) <u>2</u> Packet Access (synchronous)(UDI) <u>3</u> data circuit asynchronous (RDI) <u>4</u> data circuit synchronous (RDI) <u>5</u> PAD Access (asynchronous)(RDI) <u>6</u> Packet Access (synchronous)(RDI) <u>7</u> Packet Access (synchronous)(RDI) |
| <ce> | <u>0</u> transparent <u>1</u> non-transparent |

- | | |
|--|--|
| | 2 both, transparent preferred 3 both, non-transparent preferred |
|--|--|

Examples

AT+CBST=?

+CBST:

(0,1,2,3,4,5,6,7,12,14,15,16,17,34,36,38,39,43,47,
,48,49,50,51,65,66,68,70,71,75,79,80,81,82,83,8
4,115,116,120,121,130,131,132,133,134),(0-7),(0-
3)

OK

AT+CBST?

+CBST: 0,0,1

OK

AT+CBST=0,2,1

OK

AT+CBST

OK

NOTE

Not all combinations of these subparameters are supported.

7.2.4 AT+CRLP Radio link protocol

Radio Link Protocol(RLP)parameters used when non-transparent data calls are originated may be altered with write command.

AT+CRLP Radio link protocol

Response

+CRLP:(range of supported <iws>s),(range of supported
<mws>s),(range of supported <T1>s),(range of supported
<N2>s)[,<ver>[,(range of supported <T4>s)]]

OK

| | |
|--|---|
| Read Command AT+CRLP? | Response +CRLP:<iws>,<mws>,<T1>,<N2>[,<ver>[,<T4>]] |
| Write Command AT+CRLP=<iws>[,<mws>[,<T1>[,<N2>[,<ver>[,<T4>]]]]] | OK Response 1) OK 2) ERROR |
| Execution Command AT+CRLP | Set default value Response OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------------------|--|
| <ver> | RLP version number in integer format, and it can be 0 or 1; when version indication is not present it shall equal 1. |
| <iws> | IWF to MS window size. |
| <mws> | MS to IWF window size. |
| <T1> | Acknowledgement timer. |
| <N2> | Retransmission attempts. |
| <T4> | Re-sequencing period in integer format. |

Examples

```
AT+CRLP=?
+CRLP:(0-61),(0-61),(39-255),(1-255),(0-1),(3-255)
```

```
OK
AT+CRLP?
+CRLP:61,61,128,255,1,3
```

```
OK
AT+CRLP=61,61,128,255,1,3
OK
AT+CRLP
OK
```

<T1> and <T4> are in units of 10 ms.

7.2.5 AT+CRC Cellular result codes

Write command controls whether or not the extended format of incoming call indication or GPRS network request for PDP context activation is used. When enabled, an incoming call is indicated to the TE with unsolicited result code "+CRING: <type>" instead of the normal RING.

Test command returns values supported by the TA as a compound value.

AT+CRC Cellular result codes

| | |
|---|---|
| Test Command AT+CRC=? | Response +CRC: (list of supported <mode>s) OK |
| Read Command AT+CRC? | Response +CRC: <mode> OK |
| Write Command AT+CRC=<mode> | Response 1) OK 2) +CME ERROR: <err> |
| Execution Command AT+CRC | Set default value Response OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------|--|
| <mode> | 0 disables reporting 1 enables reporting |
| <type> | ASYNC asynchronous transparent SYNC synchronous transparent REL ASYNC asynchronous non-transparent |

| | |
|---------------|--|
| REL SYNC | synchronous non-transparent |
| FAX | facsimile |
| VOICE | normal voice |
| VOICE/XXX | voice followed by data(XXX is ASYNC, SYNC, REL ASYNC or REL SYNC) |
| ALT VOICE/XXX | alternating voice/data, voice first |
| ALT XXX/VOICE | alternating voice/data, data first |
| ALT FAX/VOICE | alternating voice/fax, fax first |

Examples

AT+CRC=?

+CRC: (0,1)

OK

AT+CRC?

+CRC: 0

OK

AT+CRC=1

OK

AT+CRC

OK

7.2.6 AT+CLCC List current calls

This command is used to return list of current calls of ME. If command succeeds but no calls are available, no information response is sent to TE.

AT+CLCC List current calls

Response

Test Command

+CLCC: (range of supported <n>s)

AT+CLCC=?

OK

Response

Read Command

+CLCC: <n>

AT+CLCC?

OK

Response

Write Command

1)

| | |
|-------------------------------------|---|
| | OK 2) ERROR Response 1) +CLCC: <i><id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>][,<priority>][,<CLI validity>]]</i> |
| Execution Command AT+CLCC | OK 2) OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

| URC | Description |
|---|--|
| +CLCC: <i><id1>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>][,<priority>][,<CLI validity>]]]</i> +CLCC: <i><id2>,<dir>,<stat>,<mode>,<mpty>[,<number>,<type>[,<alpha>][,<priority>][,<CLI validity>]]</i> | Note:This can be an indication to list the current call information when <n> set to 1. |

Defined Values

| | |
|---------------------|--|
| <n> | 0 Don't report a list of current calls of ME automatically when the current call status changes. 1 Report a list of current calls of ME automatically when the current call status changes. |
| <idX> | Integer type, call identification number. |
| <dir> | 0 mobile originated (MO)call 1 mobile terminated (MT)call |
| <stat> | State of the call: 0 active 1 held 2 dialing (MO call) 3 alerting (MO call) 4 incoming (MT call) 5 waiting (MT call) 6 disconnect |
| <mode> | bearer/teleservice: 0 voice |

| | |
|----------------|---|
| | 1 data 2 fax 9 unknown |
| <mpty> | 0 call is not one of multiparty (conference)call parties 1 call is one of multiparty (conference)call parties |
| <number> | String type phone number in format specified by <type>. |
| <type> | <p>Type of address octet in integer format;</p> <ul style="list-style-type: none"> 128 Restricted number type includes unknown type and format 145 International number type 161 national number. The network support for this type is optional 177 network specific number,ISDN format 129 Otherwise |
| <alpha> | String type alphanumeric representation of <number> corresponding to the entry found in phonebook; used character set should be the one selected with command Select TE Character Set AT+CSCS. |
| <priority> | integer type parameter indicating the eMLPP priority level of the call, values specified in 3GPP TS 22.067 [54]. |
| <CLI validity> | <p>integer type. This parameter can provide details why <number> does not contain a calling party BCD number (refer 3GPP TS 24.008 [8] subclause 10.5.4.30). The parameter is not present for MO call types.</p> <ul style="list-style-type: none"> 0 CLI valid 1 CLI has been withheld by the originator (refer 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Reject by user") 2 CLI is not available due to interworking problems or limitations of originating network (refer 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Interaction with other service") 3 CLI is not available due to calling party being of type payphone (refer 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Coin line/payphone") 4 CLI is not available due to other reasons (refer 3GPP TS 24.008 [8] table 10.5.135a/3GPP TS 24.008 code "Unavailable") <p>When CLI is not available (<CLI validity>=2, <CLI validity>=3 or <CLI validity>=4), <number> shall be an empty string ("") and <type> value will not be significant. Nevertheless, TA may return the recommended value 128 for <type> (TON/NPI unknown in accordance with 3GPP TS 24.008 [8] subclause 10.5.4.7).</p> <p>When CLI has been withheld by the originator, (<CLI validity>=1) and the CLIP is provisioned with the "override category" option (refer 3GPP TS 22.081 [3] and 3GPP TS 23.081 [40]), <number> and <type> is provided. Otherwise, TA shall return the same setting for <number> and <type> as if the CLI was not available.</p> |

Examples

AT+CLCC=?

+CLCC: (0-1)

OK

AT+CLCC?

+CLCC: 1

OK

AT+CLCC=1

OK

AT+CLCC

OK

AT+CLCC

+CLCC: 1, 0, 0, 0, 0, "13883113271", 129, "",,,0 2G call

OK

AT+CLCC

+CLCC: 1, 0, 0, 0, 0, "13883113271", 129, "" 4G call

OK

NOTE

Parameters after alpha: priority, CLI validity are currently only implemented in 2G calls

7.2.7 AT+CEER Extended error report

Execution command causes the TA to return the information text <report>, which should offer the user of the TA an extended report of the reason for:

1. The failure in the last unsuccessful call setup(originating or answering)or in-call modification.
2. The last call release.
3. The last unsuccessful GPRS attach or unsuccessful PDP context activation.
4. The last GPRS detach or PDP context deactivation.

AT+CEER Extended error report

| | |
|-------------------------------------|--|
| Test Command AT+CEER=? | Response OK |
| Execution Command AT+CEER | Response +CEER: <report> |
| | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----------------------|---|
| <report> | Wrong information which is possibly occurred. |
|-----------------------|---|

Examples

```

AT+CEER=?
OK
AT+CEER
+CEER: "31 Normal unspecified"

OK

```

7.2.8 AT+CCWA Call waiting

This command allows control of the Call Waiting supplementary service. Activation, deactivation and status query are supported. When querying the status of a network service (<mode>=2)the response line for 'not active' case (<status>=0)should be returned only if service is not active for any <class>. Parameter <n> is used to disable/enable the presentation of an unsolicited result code +CCWA: <number>,<type>,<class> to the TE when call waiting service is enabled. Command should be abortable when network is interrogated.

| AT+CCWA Call waiting | |
|----------------------------------|--|
| Test Command AT+CCWA=? | Response +CCWA: (range of supported <n>s),(range of supported <mode>s),(range of supported <class>s) |
| Read Command AT+CCWA? | Response +CCWA: <n> |

| | |
|--|--|
| | OK |
| | Response |
| | 1) When <mode>=2 and command successful: +CCWA: <status>,<class>[+CCWA: <status>,<class>[..]] |
| Write Command AT+CCWA=<n>[,<mode>[,<class>]] | OK 2) OK 3) +CME ERROR: <err> |
| Execution Command AT+CCWA | Set default value Response OK |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|----------|--|
| <n> | Sets/shows the result code presentation status in the TA 0 disable 1 enable |
| <mode> | When <mode> parameter is not given, network is not interrogated: 0 disable 1 enable 2 query status |
| <class> | It is a sum of integers each representing a class of information (default 7) 1 voice (telephony) 2 data (refers to all bearer services) 4 fax (facsimile services) 7 voice,data and fax(1+2+4) 8 short message service 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access 255 The value 255 covers all classes |
| <status> | 0 not active 1 active |
| <number> | String type phone number of calling address in format specified by |

| | |
|--------|---|
| | <type>. |
| <type> | Type of address octet in integer format; 128 Restricted number type includes unknown type and format 145 International number type 161 national number. The network support for this type is optional 129 Otherwise |

Examples

AT+CCWA=?

+CCWA: (0-1),(0-2),(1-255)

OK

AT+CCWA?

+CCWA: 1

OK

AT+CCWA=1

OK

AT+CCWA=1,2,7

+CCWA: 1,1

+CCWA: 0,2

+CCWA: 0,4

OK

AT+CCWA

OK

7.2.9 AT+CCFC Call forwarding number and conditions

This command allows control of the call forwarding supplementary service. Registration, erasure, activation, deactivation, and status query are supported.

AT+CCFC Call forwarding number and conditions

| | |
|------------------|--|
| Test Command | Response +CCFC: (list of supported <reason>s) |
| AT+CCFC=? | OK |
| Write Command | Response |

AT+CCFC=<reason>,<mode>[,<number>[,<type>[,<class>[,<subaddr>[,<satype>[,<time>]]]]]]

1) When <mode>=2 and command successful:

+CCFC:

<status>,<class1>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][

+CCFC:

<status>,<class2>[,<number>,<type>[,<subaddr>,<satype>[,<time>]]][..]

OK

2)

OK

3)

ERROR

4)

+CME ERROR: <err>

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

| | |
|-----------|---|
| <reason> | 0 unconditional 1 mobile busy 2 no reply 3 not reachable 4 all call forwarding 5 all conditional call forwarding |
| <mode> | 0 disable 1 enable 2 query status 3 registration 4 erasure |
| <number> | String type phone number of forwarding address in format specified by <type>. |
| <type> | Type of address octet in integer format: 145 dialing string <number> includes international access code character '+' 129 otherwise |
| <subaddr> | String type sub address of format specified by <satype>. |
| <satype> | Type of sub address octet in integer format, default 128. |
| <classX> | It is a sum of integers each representing a class of information (default 7): 1 voice (telephony) |

| | |
|----------|---|
| | 2 data (refers to all bearer services) 4 fax (facsimile services) 16 data circuit sync 32 data circuit async 64 dedicated packet access 128 dedicated PAD access 255 The value 255 covers all classes |
| <time> | 1..30 when "no reply" is enabled or queried, this gives the time in seconds to wait before call is forwarded, default value 20. |
| <status> | 0 not active 1 active |

Examples

```
AT+CCFC=?  
+CCFC: (0,1,2,3,4,5)
```

```
OK  
AT+CCFC=0,2  
+CCFC: 0,7
```

```
OK
```

7.2.10 AT+CLIP Calling line identification presentation

This command refers to the GSM/UMTS supplementary service CLIP (Calling Line Identification Presentation) that enables a called subscriber to get the calling line identity (CLI) of the calling party when receiving a mobile terminated call.

Write command enables or disables the presentation of the CLI at the TE. It has no effect on the execution of the supplementary service CLIP in the network.

When the presentation of the CLI at the TE is enabled (and calling subscriber allows), +CLIP: <number>,<type>,,[,<alpha>][,<CLI validity>]] response is returned after every RING (or +CRING: <type>; refer sub clause "Cellular result codes +CRC") result code sent from TA to TE. It is manufacturer specific if this response is used when normal voice call is answered.

AT+CLIP Calling line identification presentation

| | |
|------------------|---|
| Test Command | Response +CLIP: (range of supported <n>s) |
| AT+CLIP=? | OK |
| Read Command | Response |

| | |
|--------------------------|---|
| AT+CLIP? | 1) +CLIP: <n>,<m> |
| | OK 2) ERROR 3) |
| | +CME ERROR: <err> |
| Write Command | Response |
| AT+CLIP=<n> | 1) OK 2) ERROR 3) |
| Execution Command | Set default value |
| AT+CLIP | Response OK |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----------------------------|---|
| <n> | Parameter sets/shows the result code presentation status in the TA: 0 disable 1 enable |
| <m> | 0 CLIP not provisioned 1 CLIP provisioned 2 unknown (e.g. no network, etc.) |
| <number> | String type phone number of calling address in format specified by <type> . |
| <type> | Type of address octet in integer format; 128 Restricted number type includes unknown type and format 145 International number type 161 national number.The network support for this type is optional 177 network specific number,ISDN format 129 Otherwise |
| <alpha> | String type alphanumeric representation of <number> corresponding to the entry found in phone book. |
| <CLI validity> | 0 CLI valid 1 CLI has been withheld by the originator |

2 CLI is not available due to interworking problems or limitations of originating network

Examples

AT+CLIP=?

+CLIP: (0-1)

OK

AT+CLIP?

+CLIP: 1,1

OK

AT+CLIP=0

OK

AT+CLIP

OK

7.2.11 AT+CLIR Calling line identification restriction

This command refers to CLIR-service that allows a calling subscriber to enable or disable the presentation of the CLI to the called party when originating a call.

Write command overrides the CLIR subscription (default is restricted or allowed)when temporary mode is provisioned as a default adjustment for all following outgoing calls. This adjustment can be revoked by using the opposite command. If this command is used by a subscriber without provision of CLIR in permanent mode the network will act.

Read command gives the default adjustment for all outgoing calls (given in <n>), and also triggers an interrogation of the provision status of the CLIR service (given in <m>).

Test command returns values supported as a compound value.

AT+CLIR Calling line identification restriction

Response

Test Command

+CLIR: (range of supported <n>s)

OK

Response

1)

+CLIR: <n>,<m>

OK

| | |
|---|--|
| | 2) ERROR 3) +CME ERROR: <err> |
| Write Command AT+CLIR=<n> | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----|--|
| <n> | 0 presentation indicator is used according to the subscription of the CLIR service 1 CLIR invocation 2 CLIR suppression |
| <m> | 0 CLIR not provisioned 1 CLIR provisioned in permanent mode 2 unknown (e.g. no network, etc.) 3 CLIR temporary mode presentation restricted 4 CLIR temporary mode presentation allowed |

Examples

AT+CLIR=?

+CLIR: (0-2)

OK

AT+CLIR?

+CLIR: 0,0

OK

AT+CLIR=1

OK

7.2.12AT+COLP Connected line identification presentation

This command refers to the GSM/UMTS supplementary service COLP(Connected Line Identification Presentation)that enables a calling subscriber to get the connected line identity (COL)of the called party after setting up a mobile originated call. The command enables or disables the presentation of the COL at the TE. It has no effect on the execution of the supplementary service COLR in the network.

When enabled (and called subscriber allows), +COLP: <number>,<type>[,<subaddr>,<satype>[,<alpha>]] intermediate result code is returned from TA to TE before any +CR responses. It is manufacturer specific if this response is used when normal voice call is established.

AT+COLP Connected line identification presentation

| | |
|---|--|
| Test Command AT+COLP=? | Response +COLP: (list of supported <n>s) OK |
| Read Command AT+COLP? | Response 1) +COLP: <n>,<m> OK 2) ERROR 3) +CME ERROR: <err> |
| Write Command AT+COLP=<n> | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Execution Command AT+COLP | Set default value Response OK |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 20S |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----|--|
| <n> | Parameter sets/shows the result code presentation status in the TA: 0 disable |
|-----|--|

| | |
|-----|---|
| <m> | 1 enable 0 COLP not provisioned 1 COLP provisioned 2 unknown (e.g. no network, etc.) |
|-----|---|

Examples

AT+COLP=?

+COLP: (0-1)

OK

AT+COLP?

+COLP: 1,0

OK

AT+COLP=1

OK

AT+COLP

OK

7.2.13 AT+CHLD Call related supplementary services

This command allows the control of the following call related services:

- a call can be temporarily disconnected from the MT but the connection is retained by the network;
- multiparty conversation (conference calls);
- the served subscriber who has two calls (one held and the other either active or alerting) can connect the other parties and release the served subscriber's own connection.

Calls can be put on hold, recovered, released, added to conversation, and transferred similarly as defined in 3GPP TS 22.030 [19].

This is based on the supplementary services HOLD (Call Hold; refer 3GPP TS 22.083 [5] clause 2 and 3GPP TS 24.610 [135]), MPTY / CONF (MultiParty; refer 3GPP TS 22.084 [22] and Conference; refer 3GPP TS 24.605 [133]) and ECT (Explicit Call Transfer; refer 3GPP TS 22.091 [30] and 3GPP TS 24.629 [139]).

AT+CHLD Call related supplementary services

| | |
|--------------------------------------|--|
| Test Command AT+CHLD=? | Response +CHLD: (list of supported <n>s) |
| Write Command | Response OK |

| | |
|--------------------------|---|
| AT+CHLD=<n> | 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 20S |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----|--|
| <n> | integer type; equals to numbers entered before SEND button in 3GPP TS 22.030 [19] clause 6.5.5.1. <ul style="list-style-type: none"> 0 Release all held calls or set user determined user busy (UDUB) for a waiting call. 1 Release all active calls (if any exist) and accept the other (held or waiting) call. 1x Releases a specific active call X. 2 Places all active calls (if any exist) on hold and accepts the other (held or waiting) call. 2x Places all active calls on hold except call X with which communication shall be supported. 3 Add a held call to the conversation (multiparty). 4 Connects the two calls and disconnects the subscriber from both calls (ECT). |
|-----|--|

Examples

```

AT+CHLD=?
+CHLD: (0,1,1x,2,2x,3,4)

OK
AT+CHLD=1
OK

```

7.2.14 AT+VTS DTMF and tone generation

This command allows the transmission of DTMF tones and arbitrary tones which cause the Mobile Switching Center (MSC) to transmit tones to a remote subscriber.

AT+VTS DTMF and tone generation

| | |
|---|---|
| Test Command AT+VTS=? | Response +VTS: (list of supported<dtmf>s) [, <duration>] OK |
| Write Command AT+VTS=<dtmf>[,<duration>]] or AT+VTS=<dtmf-string> | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|----------------------------|--|
| <dtmf> | A single ASCII character in the set 0-9, *, #, A, B, C, D. |
| <duration> | Tone duration in 1/10 seconds. This is interpreted as a DTMF tone of different duration from that mandated by the AT+VTD command, otherwise, the duration which be set the AT+VTD command will be used for the tone (<duration> is omitted). |
| <dtmf-string> | A sequence of ASCII character in the set 0-9, *, #, A, B, C, D, and maximal length of the string is 32. The string must be enclosed in double quotes (""). Each of the tones with a duration which is set by the AT+VTD command. |

Examples

```

AT+VTS=?
+VTS: <DTMF>,(0-65535)

OK
AT+VTS=1,600
OK
AT+VTS="135"
OK

```

NOTE

The END event of voice call will terminate the transmission of tones, and as an operator option, the tone may be ceased after a pre-determined time whether or not tone duration has been reached. For VoLTE, the time range of the sent DTMF 20-1000ms can only be controlled by the VTS command, independent of the setting time of the VTD command.

7.2.15 AT+VTD Tone duration

This refers to an integer <n> that defines the length of tones emitted as a result of the AT+VTS command. A value different than zero causes a tone of duration <n>/10 seconds.

AT+VTD Tone duration

| | |
|--|---|
| Test Command AT+VTD=? | Response +VTD: (range of supported <n>s) [, (range of supported <m>s)] OK |
| Read Command AT+VTD? | Response +VTD: <n>[,<m>] OK |
| Write Command AT+VTD=<n>[,<m>] | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----|--|
| <n> | 300-600,Tone duration of every single tone.(ms) |
| <m> | 0-65535,Tone interval between two single tone.(ms) |

Examples

AT+VTD=?

+VTD: (300-600),(0-65535)

OK

AT+VTD?

+VTD: 300,30

OK

AT+VTD=400

OK

NOTE

VTD indicates the time control range for sending DTMF on Voice call, not the DTMF control range for Volte call.

7.2.16 AT+CSTA Select type of address

Write command is used to select the type of number for further dialing commands (ATD)according to GSM/UMTS specifications.

Read command returns the current type of number.

Test command returns values supported by the Module as a compound value.

AT+CSTA Select type of address

Response

Test Command

+CSTA: (list of supported <type>s)

AT+CSTA=?

OK

Response

Read Command

+CSTA: <type>

AT+CSTA?

OK

Response

1)

OK

2)

ERROR

Write Command

AT+CSTA=<type>

Set default value

Execution Command

AT+CSTA

Response

OK

| | |
|-----------------------|----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------|---|
| <type> | Type of address octet in integer format: 145 when dialling string includes international access code character "+" 161 national number. The network support for this type is optional 177 network specific number,ISDN format 129 otherwise |
|--------|---|

Examples

```
AT+CSTA=?  
+CSTA: (129,145,161,177)
```

OK

```
AT+CSTA?
```

```
+CSTA: 129
```

OK

```
AT+CSTA=145
```

OK

```
AT+CSTA
```

OK

NOTE

Because the type of address is automatically detected on the dial string of dialing command, command AT+CSTA has really no effect.

7.2.17 AT+CMOD Call mode

Write command selects the call mode of further dialing commands (ATD) or for next answering command (ATA). Mode can be either single or alternating.

Test command returns values supported by the TA as a compound value.

| AT+CMOD Call mode | |
|--|---|
| Test Command AT+CMOD=? | Response +CMOD: (list of supported <mode>s) OK |
| Read Command AT+CMOD? | Response +CMOD: <mode> OK |
| Write Command AT+CMOD=<mode> | Response 1) OK 2) ERROR |
| Execution Command AT+CMOD | Set default value: Response OK |
| Parameter Saving Mode | - |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------------------|-------------------------------|
| <mode> | 0 single mode(only supported) |
|---------------------|-------------------------------|

Examples

```
AT+CMOD=?
```

```
+CMOD: (0)
```

```
OK
```

```
AT+CMOD?
```

```
+CMOD: 0
```

```
OK
```

```
AT+CMOD=0
```

```
OK
```

```
AT+CMOD
```

```
OK
```

NOTE

The value of <mode> shall be set to zero after a successfully completed alternating mode call. It shall be set to zero also after a failed answering. The power-on, factory and user resets shall also set the value to zero. This reduces the possibility that alternating mode calls are originated or answered accidentally.

7.2.18 AT+VMUTE Speaker mute control

This command is used to control the loudspeaker to mute and unmute during a voice call or a video call which is connected. If there is not a connected call, write command can't be used. When all calls are disconnected, the Module sets the subparameter as 0 automatically.

AT+VMUTE Speaker mute control

| | |
|---|---|
| Test Command AT+VMUTE=? | Response +VMUTE: (list of supported <mode>s) |
| | OK |
| Read Command AT+VMUTE? | Response +VMUTE: <mode> |
| | OK |
| Write Command AT+VMUTE=<mode> | Response OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------|-------------------------------|
| <mode> | 0 mute off 1 mute on |
|--------|-------------------------------|

Examples

```
AT+VMUTE=?  
+VMUTE: (0-1)
```

```
OK
AT+VMUTE?
+VMUTE: 0
```

```
OK
AT+VMUTE=1
OK
```

7.2.19 AT+CMUT Microphone mute control

This command is used to enable and disable the uplink voice muting during a voice call or a video call which is connected. If there is not a connected call, write command can't be used. When all calls are disconnected, the Module sets the subparameter as 0 automatically.

AT+CMUT Microphone mute control

| | |
|--|---|
| | Response +CMUT: (list of supported <mode>s) |
| Test Command AT+CMUT=? | OK |
| Read Command AT+CMUT? | Response +CMUT: <mode> |
| | OK |
| Write Command AT+CMUT=<mode> | Response OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------------------|-------------------------------|
| <mode> | 0 mute off 1 mute on |
|---------------------|-------------------------------|

Examples

```
AT+CMUT=?
+CMUT: (0-1)
```

OK
AT+CMUT?
+CMUT: 0

OK
AT+CMUT=1
OK

7.2.20 AT+CSDVC Switch voice channel device

This command is used to switch voice channel device. After changing current voice channel device and if there is a connecting voice call, it will use the settings of previous device (loudspeaker volume level, mute state of loudspeaker and microphone, refer to AT+VMUTE, and AT+CMUT).

AT+CSDVC Switch voice channel device

| | |
|-----------------------------|---|
| Test Command | Response +CSDVC: (list of supported <dev>s) |
| AT+CSDVC=? | OK |
| Read Command | Response +CSDVC: <dev> |
| AT+CSDVC? | OK |
| Write Command | Response |
| AT+CSDVC=<dev> | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|--------------------|-------------------------------------|
| <dev> | <u>1</u> handset 3 speaker phone |
|--------------------|-------------------------------------|

Examples

AT+CSDVC=?
+CSDVC: (1,3)

```
OK
AT+CSDVC?
+CSDVC: 1
```

```
OK
AT+CSDVC=3
OK
```

7.2.21 AT+CMICGAIN Adjust mic gain

This command is used to adjust mic gain. If this command was used during call, it will take immediate effect. Otherwise, it will take effect in next call.

| AT+CMICGAIN Adjust mic gain | |
|---|--|
| Test Command AT+CMICGAIN=? | Response +CMICGAIN: (range of supported <value>s) OK |
| Read Command AT+CMICGAIN? | Response +CMICGAIN: <value> OK |
| Write Command AT+CMICGAIN=<value> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|---------|--|
| <value> | Gain value from 0-7, 7 is the max. 4 is the default value. |
|---------|--|

Examples

```
AT+CMICGAIN=?
```

+CMICGAIN: (0-7)

OK

AT+CMICGAIN?

+CMICGAIN: 4

OK

AT+CMICGAIN=7

OK

7.2.22 AT+COUTGAIN Adjust out gain

This command is used to adjust out(speaker/handset)gain. If this command was used during call, it will take immediate effect . Otherwise, it will take effect in next call.

AT+COUTGAIN Adjust out gain

Test Command

AT+COUTGAIN=?

Response

+COUTGAIN: (range of supported <value>s)

OK

Read Command

AT+COUTGAIN?

Response

+COUTGAIN: <value>

OK

Response

1)

OK

2)

ERROR

Write Command

AT+COUTGAIN=<value>

Parameter Saving Mode

AUTO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

<mode>

Gain value from 0-7, 7 is the max. 4 is the default value.

Examples

AT+COUTGAIN=?

+COUTGAIN: (0-7)

OK

AT+COUTGAIN?

+COUTGAIN: 4

OK

AT+COUTGAIN=7

OK

8 AT Commands for Phonebook

8.1 Overview of AT Commands for Phonebook

| Command | Description |
|----------------|---------------------------------|
| AT+CPBS | Select phonebook memory storage |
| AT+CPBR | Read phonebook entries |
| AT+CPBF | Find phonebook entries |
| AT+CPBW | Write phonebook entry |
| AT+CNUM | Subscriber number |

8.2 Detailed Description of AT Commands for Phonebook

8.2.1 AT+CPBS Select phonebook memory storage

This command selects the active phonebook storage, i.e. the phonebook storage that all subsequent phonebook commands will be operating on.

| AT+CPBS Select phonebook memory storage | |
|--|--|
| Test Command | Response +CPBS: (list of supported <storage>s) |
| AT+CPBS=? | OK |
| | Response 1) +CPBS: <storage>[,<used>,<total>] |
| Read Command | OK |
| AT+CPBS? | 2) +CME ERROR: <err> |

| | |
|---|---|
| Write Command AT+CPBS=<storage> | Response 1) OK 2) ERROR 3) +CME ERROR: <err> |
| Execution Command AT+CPBS | Set default value "SM" Response OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|------------------------|---|
| <storage> | Values reserved by the present document: "FD" SIM/USIM fix dialing phonebook. If a SIM card is present or if a UICC with an active GSM application is present, the information in EFFDN under DFTelecom is selected. If a UICC with an active USIM application is present, the information in EFDUSIM is selected. "ON" SIM (or MT)own numbers (MSISDNs)list (reading of this storage may be available through +CNUM also). When storing information in the SIM/UICC, if a SIM card is present or if a UICC with an active GSM application is present, the information in EFMSISDN under DFTelecom is selected. If a UICC with an active USIM application is present, the information in EFMSISDN under ADFUSIM is selected. "SM" SIM/UICC phonebook. If a SIM card is present or if a UICC with an active GSM application is present, the EFADN under DFTelecom is selected. If a UICC with an active USIM application is present, the global phonebook, DFPHONEBOOK under DFTelecom is selected. "AP" Selected application phonebook. If a UICC with an active USIM application is present, the application phonebook, DFPHONEBOOK under ADFUSIM is selected. |
| <used> | Integer type value indicating the number of used locations in selected memory. |
| <total> | Integer type value indicating the total number of locations in selected memory. |

Examples

AT+CPBS=?

+CPBS: ("SM","FD","ON","AP")

OK

AT+CPBS?

+CPBS: "SM",8,500

OK

AT+CPBS="SM"

OK

AT+CPBS

OK

8.2.2 AT+CPBR Read phonebook entries

This command gets the record information from the selected memory storage in phonebook. If the storage is selected as "SM" then the command will return the record in SIM phonebook, the same to others.

AT+CPBR Read phonebook entries

Response

1)

+CPBR: (<minIndex>-<maxIndex>), [<nlength>], [<tlength>]

Test Command

AT+CPBR=?

OK

2)

+CME ERROR: <err>

Response

1)

[+CPBR: <index>,<number>,<type>,<text>[

+CPBR: <index>,<number>,<type>,<text>[...]]]

Write Command

AT+CPBR=<index1>[,<index2>]

OK

2)

ERROR

3)

+CME ERROR: <err>

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

| | |
|------------|--|
| <index1> | Integer type value in the range of location numbers of phonebook memory. |
| <index2> | Integer type value in the range of location numbers of phonebook memory. |
| <index> | Integer type.the current position number of the Phonebook index. |
| <minIndex> | Integer type the minimum <index> number. |
| <maxIndex> | Integer type the maximum <index> number |
| <number> | String type, phone number of format <type>, the maximum length is <nlength>. |
| <type> | Type of phone number octet in integer format, default 145 when dialing string includes international access code character "+", otherwise 129. |
| <text> | String type field of maximum length <nlength>; often this value is set as name. |
| <nlength> | Integer type value indicating the maximum length of field <number>. |
| <tlength> | Integer type value indicating the maximum length of field <text>. |

Examples

```
AT+CPBR=?
+CPBR: (1-500),40,14
```

OK

```
AT+CPBR=3
+CPBR: 3,"1234567890123456789012345678901234567890",129,""
```

OK

8.2.3 AT+CPBF Find phonebook entries

This command finds the record in phonebook (from the current phonebook memory storage selected with AT+CPBS)which alphanumeric field has substring <findtext>.If <findtext> is null, it will lists all the entries.

AT+CPBF Find phonebook entries

| | |
|--------------|----------|
| Test Command | Response |
| AT+CPBF=? | 1) |

+CPBF: [<nlength>],[<tlength>]

OK
 2)
+CME ERROR: <err>
 Response
 1)
[+CPBF: <index1>,<number>,<type>,<text>[
+CPBF: <indexN>,<number>,<type>,<text>[...]]]

Write Command

AT+CPBF=[<findtext>]

OK
 2)
ERROR
 3)
+CME ERROR: <err>

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

| | |
|-------------------------|--|
| <findtext> | String type, this value is used to find the record. Character set should be the one selected with command AT+CSCS. |
| <index> | Integer type values in the range of location numbers of phonebook memory. |
| <number> | String type, phone number of format <type>, the maximum length is <nlength>. |
| <type> | Type of phone number octet in integer format, default 145 when dialing string includes international access code character "+", otherwise 129. |
| <text> | String type field of maximum length <tlength>; often this value is set as name. |
| <nlength> | Integer type value indicating the maximum length of field <number>. |
| <tlength> | Integer type value indicating the maximum length of field <text>. |

Examples

AT+CPBF=?

+CPBF: 40,14

OK

AT+CPBF="Ily"

+CPBF: 500,"1234567890123456789012345678901234567890",129,"Ily"

OK

8.2.4 AT+CPBW Write phonebook entry

This command writes phonebook entry in location number <index> in the current phonebook memory storage selected with AT+CPBS.

AT+CPBW Write phonebook entry

Test Command

AT+CPBW=?

Response

1)

+CPBW: (list of supported <index>s),[<nlength>],(list of supported <type>s),[<tlength>]

OK

2)

+CME ERROR: <err>

Response

1)

OK

2)

ERROR

3)

+CME ERROR: <err>

Write Command

AT+CPBW=[<index>][,<number>[,<type>[,<text>]]]]

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.007

Defined Values

<index>

Integer type values in the range of location numbers of phonebook memory. If <index> is not given, the first free entry will be used. If <index> is given as the only parameter, the phonebook entry specified by <index> is deleted. If record number <index> already exists, it will be overwritten.

<number>

String type, phone number of format <type>, the maximum length is <nlength>. It must be an non-empty string.

<type>

Type of address octet in integer format, The range of value is from 129 to 255. If <number> contains a leading "+" <type>=145

(international) is used. Supported value are:

- 145 when dialling string includes international access code character "+"
- 161 national number. The network support for this type is optional
- 177 network specific number, ISDN format
- 129 otherwise

NOTE: Other value refer TS 24.008 [8] subclause 10.5.4.7.

<text>

String type field of maximum length <tlength>; character set as specified by command Select TE Character Set AT+CSCS.

<nlength>

Integer type value indicating the maximum length of field <number>.

<tlength>

Integer type value indicating the maximum length of field <text>. <text> has a maximum of 14 bytes. PB is eventually stored in the Unicode UCS2 encoding, which is double-byte encoding, so only seven characters can be written

NOTE: If the parameters of <type> and <text> are omitted and the first character of <number> is '+', it will specify <type> as 145(129 if the first character isn't '+')and <text> as NULL.

Examples

AT+CPBW=?

+CPBW: (1-500),40,(129,145,161,177),14

OK

AT+CPBW=493,"12345678901234567890",129,"Ily1"

OK

8.2.5 AT+CNM Subscriber number

Execution command returns the MSISDNs related to the subscriber (this information can be stored in the SIM or in the ME). If subscriber has different MSISDN for different services, each MSISDN is returned in a separate line.

AT+CNM Subscriber number

Test Command

Response

AT+CNM=?

1)

OK

Write Command

Response

AT+CNM=<index>[,<number>[

1)

| | |
|--------------------------------------|--|
| ,<type>[,<text>]] | OK 2) +CME ERROR: <err> |
| Execution Command AT+CNUM | Response 1) [+CNUM: <text>,<number>,<type> +CNUM: <text>,<number>,<type>] |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.007 |

Defined Values

| | |
|-----------------------|--|
| <index> | Integer type values in the range (1, 2). If <index> is given as the only parameter and is 1 or 2, the MSISDN specified by <index> is deleted. If record number <index> already exists, it will be overwritten. |
| <number> | String type phone number of format specified by <type>. |
| <type> | Type of address octet in integer format. Refer to the CPBW <type>. |
| <text> | String type field of maximum length <tlength>; character set as specified by command Select TE Character Set AT+CSCS. |

Examples

```
AT+CNUM=?
OK
AT+CNUM
OK
AT+CNUM
+CNUM: "", "15002314103",129

OK
```

NOTE

CAT1,CAT4 modules do not support Write Command.

9 AT Commands for SMS

9.1 Overview of AT Commands for SMS

| Command | Description |
|----------------------|--|
| AT+CSMS | Select message service |
| AT+CPMS | Preferred message storage |
| AT+CMGF | Select SMS message format |
| AT+CSCA | SMS service centre address |
| AT+CSCB | Select cell broadcast message indication |
| AT+CSMP | Set text mode parameters |
| AT+CSDH | Show text mode parameters |
| AT+CNMA | New message acknowledgement to ME/TA |
| AT+CNMI | New message indications to TE |
| AT+CGSMS | Select service for MO SMS messages |
| AT+CMGL | List SMS messages from preferred store |
| AT+CMGR | Read message |
| AT+CMGS | Send message |
| AT+CMSS | Send message from storages |
| AT+CMGW | Write message to memory |
| AT+CMGD | Delete message |
| AT+CMGMT | Change message status |
| AT+CMVP | Set message valid period |
| AT+CMGRD | Read and delete message |
| AT+CMGSEX | Send message |
| AT+CMSSEX | Send multi messages from storage |
| AT+CCONCINDEX | Report Concatenated SMS Index |

| Command | Description | Supported Modules |
|--|--|-------------------|
| AT+CSCB=<mode>,<mid>,<dcss> | Parameters are not allowed to be omitted | Only CAT1 Modules |
| AT+CMGS | Allow deleting input SMS data in data mode | Only CAT1 Modules |
| AT+CMGSEX | No SMS send URC report, just report a | Only CAT1 Modules |

OK before last SMS input.

9.2 Detailed Description of AT Commands for SMS

9.2.1 AT+CSMS Select message service

This command is used to select messaging service <service>.

AT+CSMS Select message service

Test Command

AT+CSMS=?

Response

+CSMS: (range of supported <service>s)

OK

Read Command

AT+CSMS?

Response

+CSMS: <service>,<mt>,<mo>,<bm>

OK

Response

1)

+CSMS: <mt>,<mo>,<bm>

Write Command

AT+CSMS=<service>

OK

2)

ERROR

3)

+CMS ERROR: <err>

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.005

Defined Values

| | |
|-----------|---|
| <service> | 0 SMS at command is compatible with GSM phase 2. 1 SMS at command is compatible with GSM phase 2+. |
| <mt> | 0 type not supported. 1 type supported. |
| <mo> | 0 type not supported. 1 type supported. |

| | |
|------|--|
| <bm> | 0 type not supported. 1 type supported. |
|------|--|

Examples

AT+CSMS=0

+CSMS: 1,1,1

OK

AT+CSMS?

+CSMS: 0,1,1,1

OK

AT+CSMS=?

+CSMS: (0-1)

OK

9.2.2 AT+CPMS Preferred message storage

This command is used to select memory storages <mem1>,<mem2> and <mem3> to be used for reading, writing, etc.

AT+CPMS Preferred message storage

Test Command

AT+CPMS=?

Response

+CPMS: (list of supported <mem1>s),(list of supported <mem2>s),(list of supported <mem3>s)

OK

Response

+CPMS:

<mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>

OK

Response

1)

+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>

OK

Read Command

AT+CPMS?

Write Command

AT+CPMS=<mem1>[,<mem2>[,<mem3>]]

| | |
|-----------------------|--|
| | 2) ERROR 3) +CMS ERROR: <err> Response 1) Set default value (<mem1>="SM",<mem2>="SM",<mem3>="SM"): +CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3> |
| Execution Command | |
| AT+CPMS | OK 2) ERROR 3) +CMS ERROR: <err> |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|----------|--|
| <mem1> | String type, memory from which messages are read and deleted (commands List Messages AT+CMGL, Read Message AT+CMGR and Delete Message AT+CMGD). <u>"ME"</u> FLASH message storage <u>"SM"</u> SIM message storage |
| <mem2> | String type, memory to which writing and sending operations are made (commands Send Message from Storage AT+CMSS and Write Message to Memory AT+CMGW). <u>"ME"</u> FLASH message storage <u>"SM"</u> SIM message storage |
| <mem3> | String type, memory to which received SMS is preferred to be stored (unless forwarded directly to TE; refer command New Message Indications AT+CNMI). <u>"ME"</u> FLASH message storage <u>"SM"</u> SIM message storage |
| <bm> | Integer type, number of messages currently in <memX>. |
| <totalX> | Integer type, total number of message locations in <memX>. |

Examples

```
AT+CPMS=?
+CPMS: ("ME","SM"),("ME","SM"),("ME","SM")
```

OK

AT+CPMS?

+CPMS: "ME", 0, 180,"ME", 0, 180,"ME", 0, 180

OK

AT+CPMS="SM","SM","SM"

+CPMS: 3,50,3,50,3,50

OK

AT+CPMS

+CPMS: 3,50,3,50,3,50

OK

9.2.3 AT+CMGF Select SMS message format

This command is used to specify the input and output format of the short messages.

AT+CMGF Select SMS message format

Test Command

AT+CMGF=?

Response

1)

+CMGF: (range of supported <mode>s)

OK

2)

ERROR

Response

1)

+CMGF: <mode>

Read Command

AT+CMGF?

OK

2)

ERROR

Response

1)

OK

2)

ERROR

Write Command

AT+CMGF=<mode>

Response

1)

Set default value (<mode>=0):

Execution Command

AT+CMGF

OK

| | |
|-----------------------|--------------------|
| | 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | | | | | |
|---------------------|--|---|----------|---|-----------|
| <mode> | <table border="1"> <tr> <td>0</td><td>PDU mode</td></tr> <tr> <td>1</td><td>Text mode</td></tr> </table> | 0 | PDU mode | 1 | Text mode |
| 0 | PDU mode | | | | |
| 1 | Text mode | | | | |

Examples

AT+CMGF?

+CMGF: 0

OK

AT+CMGF=?

+CMGF: (0-1)

OK

AT+CMGF=1

OK

AT+CMGF

OK

9.2.4 AT+CSCA SMS service centre address

This command is used to update the SMSC address, through which mobile originated SMS are transmitted.

| AT+CSCA SMS service centre address | |
|---|----------------------|
| Test Command | Response |
| AT+CSCA=? | OK |
| | Response |
| | 1) |
| | +CSCA: <sca>,<tosca> |
| Read Command | |
| AT+CSCA? | OK |
| | 2) |
| | ERROR |

| | |
|--|--------------------|
| | Response |
| Write Command | 1) OK |
| AT+CSCA=<sca>[,<tosca>] | 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|----------------------|--|
| <sca> | Service Centre Address, value field in string format, BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set (refer to command AT+CSCS), type of address given by <tosca>. |
| <tosca> | SC address Type-of-Address octet in integer format, when first character of <sca> is + (IRA 43)default is 145, otherwise default is 129. |

Examples

```

AT+CSCA=?
OK
AT+CSCA="+8613012345678"
OK
AT+CSCA?
+CSCA: "+8613010314500", 145

OK

```

9.2.5 AT+CSCB Select cell broadcast message indication

The test command returns the supported <mode>s as a compound value.

The read command displays the accepted message types.

Depending on the <mode> parameter, the write command adds or deletes the message types accepted.

AT+CSCB Select cell broadcast message indication

| | |
|------------------|--|
| Test Command | Response |
| AT+CSCB=? | 1) +CSCB: (range of supported <mode>s) |

| | |
|--|---|
| | OK 2) ERROR Response 1) +CSCB: <mode>,<mids>,<dcss> |
| Read Command AT+CSCB? | OK 2) ERROR Response 1) |
| Write Command AT+CSCB=<mode>[,<mids>[,<dcss>]] | OK 2) ERROR 3) +CMS ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|---------------------|--|
| <mode> | 0 message types specified in <mids> and <dcss> are accepted. 1 message types specified in <mids> and <dcss> are not accepted. |
| <mids> | String type; all different possible combinations of CBM message identifiers. |
| <dcss> | String type; all different possible combinations of CBM data coding schemes. |

NOTE

The Read command for A7600 series return a list of available parameters <mids> and <dcss> with <mode> 0. If no parameters are available, return <mode> 1.

Examples

AT+CSCB=?
+CSCB: (0-1)

OK
AT+CSCB?
+CSCB: 1,"",""

OK
AT+CSCB=0,"15-17,50,86",""
OK

9.2.6 AT+CSMP Set text mode parameters

This command is used to select values for additional parameters needed when SM is sent to the network or placed in storage when text format message mode is selected.

AT+CSMP Set text mode parameters

| | |
|---|--|
| Test Command AT+CSMP=? | Response OK |
| Read Command AT+CSMP? | Response 1) +CSMP: <fo>,<vp>,<pid>,<dcs> OK |
| Write Command AT+CSMP=<fo>[,<vp>[,<pid>[,<dcs>]]] | Response 1) OK 2) ERROR 3) +CMS ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|-------------------|--|
| <fo> | Depending on the Command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2)in integer format. SMS status report is supported under text mode if <fo> is set to 49. |
|-------------------|--|

| | |
|-------|--|
| <vp> | Depending on SMS-SUBMIT <fo> setting: GSM 03.40,TP-Validity-Period either in integer format (default 167), in time-string format, or if is supported, in enhanced format (hexadecimal coded string with quotes),(<vp> is in range 0..255). |
| <pid> | GSM 03.40 TP-Protocol-Identifier in integer format (default 0). |
| <dcs> | GSM 03.38 SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format depending on the command or result code. |

Examples

```
AT+CSMP=17,23,0,244
```

```
OK
```

```
AT+CSMP?
```

```
+CSMP: 17,23,0,244
```

```
OK
```

```
AT+CSMP=?
```

```
OK
```

9.2.7 AT+CSDH Show text mode parameters

This command is used to control whether detailed header information is shown in text mode result codes.

AT+CSDH Show text mode parameters

Test Command

```
AT+CSDH=?
```

Response

```
+CSDH: (range of supported <show>s)
```

OK

Read Command

```
AT+CSDH?
```

Response

```
+CSDH: <show>
```

OK

Write Command

```
AT+CSDH=<show>
```

Response

1)

OK

2)

ERROR

Execution Command

```
AT+CSDH
```

Set default value (<show>=0):

1)

| | |
|-----------------------|---------------------------------|
| | OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

<show>

- 0 do not show header values defined in commands AT+CSCA and AT+CSMP (<sca>,<tosca>,<fo>,<vp>,<pid> and <dcs>) nor <length>,<toda> or <tooa> in +CMT, AT+CMGL, AT+CMGR result codes for SMS-DELIVERs and SMS-SUBMITs in text mode; for SMS-COMMANDs in AT+CMGR result code, do not show <pid>,<mn>,<da>,<toda>,<length> or <data>
- 1 show the values in result codes

Examples

AT+CSDH=?

+CSDH: (0-1)

OK

AT+CSDH?

+CSDH: 0

OK

AT+CSDH=1

OK

AT+CSDH

OK

9.2.8 AT+CNMA New message acknowledgement to ME/TA

This command is used to confirm successful receipt of a new message (SMS-DELIVER or SMS-STATUSREPORT)routed directly to the TE. If ME does not receive acknowledgement within required time (network timeout), it will send RP-ERROR to the network.

AT+CNMA New message acknowledgement to ME/TA

Test Command

Response

AT+CNMA=?

if text mode(AT+CMGF=1):

| | |
|---|---|
| | OK if PDU mode (AT+CMGF=0): +CNMA: (range of supported <n>s) |
| Write Command AT+CNMA=<n> | OK Response 1) OK 2) ERROR 3) +CMS ERROR: <err> 1) OK 2) ERROR 3) +CMS ERROR: <err> |
| Execution Command AT+CNMA | NO_SAVE |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|------------------|--|
| <n> | Parameter required only for PDU mode. 0 Command operates similarly as execution command in text mode. 1 Send positive (RP-ACK)acknowledgement to the network. Accepted only in PDU mode. 2 Send negative (RP-ERROR)acknowledgement to the network. Accepted only in PDU mode. |
|------------------|--|

Examples

AT+CNMI=1,2,0,0,0

OK

+CMT: "1380022xxxx","","","02/04/03,11:06:38+32"

// receive new short message

Testing

AT+CNMA

OK

AT+CNMA

+CMS ERROR:340

//send ACK to the network

//the second time return error, it needs ACK only once

NOTE

The execute / write command shall only be used when AT+CSMS parameter <service> equals 1 (= phase 2+) and appropriate URC has been issued by the module, i.e.:
 <+CMT> for <mt>=2 incoming message classes 0, 1, 3 and none;
 <+CMTI> for <mt>=3 incoming message classes 0;
 <+CDS> for <ds>=1.

9.2.9 AT+CNMI New message indications to TE

This command is used to select the procedure how receiving of new messages from the network is indicated to the TE when TE is active, e.g. DTR signal is ON. If TE is inactive (e.g. DTR signal is OFF). If set <mt>=3 or <ds>=1, make sure <mode>=1, If set <mt>=2, make sure <mode>=1 or 2, otherwise it will return error. The 1803S platform does not have parameter restrictions.

AT+CNMI New message indications to TE

Test Command

AT+CNMI=?

Response

+CNMI: (list of supported <mode>s),(list of supported <mt>s),(list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)

OK

Read Command

AT+CNMI?

Response

+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>

OK

Write Command

AT+CNMI=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]]

Response

1)

OK

2)

ERROR

3)

+CMS ERROR: <err>

Execution Command

AT+CNMI

Set default value:

OK

Parameter Saving Mode

AUTO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.005

Defined Values

| | |
|--------|--|
| <mode> | <p>0 Buffer unsolicited result codes in the TA. If TA result code buffer is full, indications can be buffered in some other place or the oldest indications may be discarded and replaced with the new received indications.</p> <p>1 Discard indication and reject new received message unsolicited result codes when TA-TE link is reserved (e.g. in on-line data mode). Otherwise forward them directly to the TE.</p> <p>2 Buffer unsolicited result codes in the TA when TA-TE link is reserved (e.g. in on-line data mode) and flush them to the TE after reservation. Otherwise forward them directly to the TE.</p> |
| <mt> | <p>The rules for storing received SMS depend on its data coding scheme, preferred memory storage (AT+CPMS) setting and this value:</p> <p>0 No SMS-DELIVER indications are routed to the TE.</p> <p>1 If SMS-DELIVER is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CMTI: <mem3>,<index>.</p> <p>2 SMS-DELIVERs (except class 2 messages and messages in the message waiting indication group (store message)) are routed directly to the TE using unsolicited result code: +CMT: [<alpha>],<length><CR><LF><pdu> (PDU mode enabled); or +CMT: <oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data> (text mode enabled, about parameters in italics, refer command Show Text Mode Parameters AT+CSDH).</p> <p>3 Class 3 SMS-DELIVERs are routed directly to TE using unsolicited result codes defined in <mt>=2. Messages of other data coding schemes result in indication as defined in <mt>=1.</p> |
| <bm> | <p>The rules for storing received CBMs depend on its data coding scheme, the setting of Select CBM Types (AT+CSCB) and this value:</p> <p>0 No CBM indications are routed to the TE.</p> <p>1 New CBMs are routed directly to the TE using unsolicited result code: +CBM: <length><CR><LF><pdu> (PDU mode enabled); or +CBM: <sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data> (text mode enabled)</p> |
| <ds> | <p>0 No SMS-STATUS-REPORTs are routed to the TE.</p> <p>1 SMS-STATUS-REPORTs are routed to the TE using unsolicited result code:</p> |

+CDS: <length><CR><LF><pdu> (PDU mode enabled); or
+CDI: <fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st> (text mode enabled)

2 If SMS-STATUS-REPORT is stored into ME/TA, indication of the memory location is routed to the TE using unsolicited result code: +CDI: <mem3>,<index>.

<bfr>

0 TA buffer of unsolicited result codes defined within this command is flushed to the TE when <mode> 1 to 2 is entered (OK response shall be given before flushing the codes).
1 TA buffer of unsolicited result codes defined within this command is cleared when <mode> 1 to 2 is entered.

Examples

AT+CNMI?

+CNMI: 2,1,0,0,0

OK

AT+CNMI=?

+CNMI: (0,1,2),(0,1,2,3),(0,2),(0,1,2),(0,1)

OK

AT+CNMI=2,1 (unsolicited result codes after received messages.)

OK

AT+CNMI

OK

9.2.10 AT+CGSMS Select service for MO SMS messages

The write command is used to specify the service or service preference that the MT will use to send MO SMS messages.

The test command is used for requesting information on which services and service preferences can be set by using the AT+CGSMS write command

The read command returns the currently selected service or service preference.

AT+CGSMS Select service for MO SMS messages

Test Command

AT+CGSMS=?

Response

+CGSMS: (range of supported <service>s)

OK

| | |
|--|---|
| Read Command AT+CGSMS? | Response +CGSMS: <service> |
| | OK |
| Write Command AT+CGSMS=<service> | Response 1) OK 2) ERROR 3) +CMS ERROR: <err> |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

<service>

A numeric parameter which indicates the service or service preference to be used

- 0 GPRS(value is not really supported and is internally mapped to 2)
- 1 circuit switched(value is not really supported and is internally mapped to 3)
- 2 GPRS preferred (use circuit switched if GPRS not available)
- 3 circuit switched preferred (use GPRS if circuit switched not available)

Examples

AT+CGSMS?

+CGSMS: 3

OK

AT+CGSMS=?

+CGSMS: (0-3)

OK

AT+CGSMS=3

OK

9.2.11 AT+CMGL List SMS messages from preferred store

This command is used to return messages with status value <stat> from message storage <mem1> to the TE.

If the status of the message is 'received unread', the status in the storage changes to 'received read'.

AT+CMGL List SMS messages from preferred store

Test Command

AT+CMGL=?

Response

+CMGL: (list of supported <stat>s)

OK

Response

1) If text mode (AT+CMGF=1), command successful and SMS-SUBMITs and/or SMS-DELIVERS:

+CMGL:

<index>,<stat>,<oa>/<da>,[<alpha>],[<scts>][,<tooa>/<toda>,<f o>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[

+CMGL:

<index>,<stat>,<oa>/<da>,[<alpha>],[<scts>][,<tooa>/<toda>,<f o>,<pid>,<dcs>,<sca>,<tosca>,<length>]<CR><LF><data>[..]]

OK

2) If text mode (AT+CMGF=1), command successful and SMS-STATUS-REPORTs:

+CMGL:

<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[

+CMGL:

<index>,<stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>[..]]

OK

3) If text mode (AT+CMGF=1), command successful and SMS-COMMANDs:

+CMGL: <index>,<stat>,<fo>,<ct>[

+CMGL: <index>,<stat>,<fo>,<ct>[..]]

OK

4) If text mode (AT+CMGF=1), command successful and CBM storage:

+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages>

<data>[

+CMGL: <index>,<stat>,<sn>,<mid>,<page>,<pages>

<data>[..]]

Write Command

AT+CMGL=<stat>[,<mode>]

OK

5) If PDU mode (AT+CMGF=0) and Command successful:

+CMGL: <index>,<stat>,[<alpha>],<length>

<pdu>[

+CMGL: <index>,<stat>,[<alpha>],<length>

<pdu>

[...]]

OK

6)

+CMS ERROR: <err>

| | |
|-----------------------|----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

<stat>

1. Text Mode:

"REC UNREAD" received unread message (i.e. new message)
 "REC READ" received read message
 "STO UNSENT" stored unsent message
 "STO SENT" stored sent message
 "ALL" all messages

2. PDU Mode:

- 0 received unread message (i.e. new message)
- 1 received read message
- 2 stored unsent message
- 3 stored sent message
- 4 all messages

<mode>

0 Changing SMS status

1 The SMS status does not change

<index>

Integer type; value in the range of location numbers supported by the associated memory and start with one.

<oa>

Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>.

<da>

Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <toda>.

<alpha>

String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used

| | |
|-----------------------|---|
| | character set should be the one selected with command Select TE Character Set AT+CSGS. |
| <scts> | TP-Service-Centre-Time-Stamp in time-string format (refer <dt>). |
| <tooa> | TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>). |
| <toda> | TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43) default is 145, otherwise default is 129). The range of value is from 128 to 255. |
| <length> | Integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length) |
| <data> | <p>In the case of SMS: TP-User-Data in text mode responses; format:</p> <ol style="list-style-type: none"> 1. If <dcs> indicates that GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set: <ol style="list-style-type: none"> a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. (e.g. character (GSM 7 bit default alphabet 23) is presented as 17 (IRA 49 and 55)) 2. If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) 3. If <dcs> indicates that GSM 7 bit default alphabet is used: <ol style="list-style-type: none"> a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. 4. If <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. |
| <fo> | Depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2) in integer format. SMS status report is supported under text mode if <fo> is set to 49. |
| <mr> | Message Reference GSM 03.40 TP-Message-Reference in integer format. |
| <ra> | Recipient Address |

| | |
|---------|---|
| | GSM 03.40 TP-Recipient-Address Address-Value field in string format;BCD numbers (or GSM default alphabet characters)are converted to characters of the currently selected TE character set(refer to command AT+CSCS);type of address given by <tora> |
| <tora> | Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>) |
| <dt> | Discharge Time GSM 03.40 TP-Discharge-Time in time-string format:"yy/MM/dd,hh:mm:ss+zz",where characters indicate year (two last digits),month,day,hour,minutes,seconds and time zone. |
| <st> | Status GSM 03.40 TP-Status in integer format 0...255 |
| <ct> | Status GSM 03.40 TP-Status in integer format 0...255 |
| <ct> | Command Type GSM 03.40 TP-Command-Type in integer format 0...255 |
| <sn> | Serial Number GSM 03.41 CBM Serial Number in integer format |
| <mid> | Message Identifier GSM 03.41 CBM Message Identifier in integer format |
| <page> | Page Parameter GSM 03.41 CBM Page Parameter bits 4-7 in integer format |
| <pages> | Page Parameter GSM 03.41 CBM Page Parameter bits 0-3 in integer format |
| <pdu> | In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). |

Examples

AT+CMGL=?

+CMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL")

OK

AT+CMGL="ALL"

+CMGL: 1,"STO UNSENT","+10011",,,145,4

Hello World

OK

NOTE

The AT+CMGL=<stat>[,<mode>] command only applies to 160X series platforms. 180X series platforms still use the AT+CMGL=<stat> command.

9.2.12 AT+CMGR Read message

This command is used to return message with location value <index> from message storage <mem1> to the TE.

AT+CMGR Read message

Test Command

AT+CMGR=?

Response

OK

Response

1) If text mode (AT+CMGF=1), command successful and SMS-DELIVER:

+CMGR:

<stat>,<oa>,[<alpha>],<scts>[,<toda>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]
<data>

OK

2) If text mode (AT+CMGF=1), command successful and SMS-SUBMIT:

+CMGR:

<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]
<data>

OK

3) If text mode (AT+CMGF=1), command successful and SMS-STATUS-REPORT:

+CMGR: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>

OK

If text mode (AT+CMGF=1), command successful and SMS-COMMAND:

+CMGR:

<stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length>]<CR>
<LF><data>

| | |
|-----------------------|---|
| | <p>OK</p> <p>4) If text mode (AT+CMGF=1), command successful and CBM storage:</p> <p>+CMGR:</p> <p><stat>,<sn>,<mid>,<dcs>,<page>,<pages><CR><LF><data></p> |
| | <p>OK</p> <p>5) If PDU mode (AT+CMGF=0) and Command successful:</p> <p>+CMGR: <stat>,[<alpha>],<length><CR><LF><pdu></p> |
| | <p>OK</p> <p>6)</p> <p>+CMS ERROR: <err></p> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|---------|--|
| <index> | Integer type; value in the range of location numbers supported by the associated memory and start with one. |
| <stat> | <p>1. Text Mode:</p> <p>"REC UNREAD" received unread message (i.e. new message) "REC READ" received read message "STO UNSENT" stored unsent message "STO SENT" stored sent message</p> <p>2. PDU Mode:</p> <p>0 received unread message (i.e. new message) 1 received read message 2 stored unsent message 3 stored sent message</p> |
| <oa> | Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters) are converted to characters of the currently selected TE character set, type of address given by <tooa>. |
| <alpha> | String type alphanumeric representation of <da> or <oa> corresponding to the entry found in MT phonebook; implementation of this feature is manufacturer specific; used character set should be the one selected with command Select TE Character Set AT+CSCS. |
| <scts> | TP-Service-Centre-Time-Stamp in time-string format (refer <dt>). |
| <tooa> | TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>). |

| | |
|-----------------------|--|
| <fo> | Depending on the command or result code: first octet of GSM 03.40 SMS-DELIVER, SMS-SUBMIT (default 17), SMS-STATUS-REPORT, or SMS-COMMAND (default 2)in integer format. SMS status report is supported under text mode if <fo> is set to 49. |
| <pid> | Protocol Identifier GSM 03.40 TP-Protocol-Identifier in integer format 0...255 |
| <dcs> | Depending on the command or result code: SMS Data Coding Scheme (default 0), or Cell Broadcast Data Coding Scheme in integer format. |
| <sca> | RP SC address Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <tosca>. |
| <tosca> | RP SC address Type-of-Address octet in integer format (default refer <toda>). |
| <length> | Integer type value indicating in the text mode (AT+CMGF=1)the length of the message body <data> in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length) |
| <data> | In the case of SMS: TP-User-Data in text mode responses; format: 1. If <dcs> indicates that GSM 7 bit default alphabet is used and <fo> indicates that TP-User-Data-Header-Indication is not set: a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. (e.g. character (GSM 7 bit default alphabet 23)is presented as 17 (IRA 49 and 55)) 2. If <dcs> indicates that 8-bit or UCS2 data coding scheme is used, or <fo> indicates that TP-User-Data-Header-Indication is set: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. (e.g. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)) 3. If <dcs> indicates that GSM 7 bit default alphabet is used: a. If TE character set other than "HEX": ME/TA converts GSM alphabet into current TE character set. b. If TE character set is "HEX": ME/TA converts each 7-bit character of the GSM 7 bit default alphabet into two IRA character long hexadecimal numbers. 4. If <dcs> indicates that 8-bit or UCS2 data coding scheme is used: ME/TA converts each 8-bit octet into two IRA character long hexadecimal numbers. |
| <da> | Destination-Address, Address-Value field in string format; BCD |

| | |
|---------|--|
| | numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>. |
| <toda> | TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255. |
| <vp> | Depending on SMS-SUBMIT <fo> setting: TP-Validity-Period either in integer format (default 167)or in time-string format (refer <dt>). |
| <mr> | Message Reference GSM 03.40 TP-Message-Reference in integer format. |
| <ra> | Recipient Address GSM 03.40 TP-Recipient-Address Address-Value field in string format; BCD numbers (or GSM default alphabet characters)are converted to characters of the currently selected TE character set(refer to command AT+CSCS);type of address given by <tora> |
| <tora> | Type of Recipient Address GSM 04.11 TP-Recipient-Address Type-of-Address octet in integer format (default refer <toda>) |
| <dt> | Discharge Time GSM 03.40 TP-Discharge-Time in time-string format:"yy/MM/dd,hh:mm:ss+zz",where characters indicate year (two last digits),month,day,hour,minutes,seconds and time zone. |
| <st> | Status GSM 03.40 TP-Status in integer format 0...255 |
| <ct> | Command Type GSM 03.40 TP-Command-Type in integer format 0...255 |
| <mn> | Message Number GSM 03.40 TP-Message-Number in integer format |
| <sn> | Serial Number GSM 03.41 CBM Serial Number in integer format |
| <mid> | Message Identifier GSM 03.41 CBM Message Identifier in integer format |
| <page> | Page Parameter GSM 03.41 CBM Page Parameter bits 4-7 in integer format |
| <pages> | Page parameter GSM 03.41 CBM Page Parameter bits 0-3 in integer format |
| <pdu> | In the case of SMS: SC address followed by TPDU in hexadecimal format: ME/TA converts each octet of TP data unit into two IRA character long hexadecimal numbers. (eg. octet with integer value 42 is presented to TE as two characters 2A (IRA 50 and 65)). |

Examples

AT+CMGR=?

OK

AT+CMGR=1

+CMGR: "STO UNSENT","+10011",,145,17,0,0,167,"+8613800100500",145,11

Hello World

OK

9.2.13 AT+CMGS Send message

This command is used to send message from a TE to the network (SMS-SUBMIT).

AT+CMGS Send message

Test Command

AT+CMGS=?

Response

OK

Write Command

If text mode(AT+CMGF=1)

AT+CMGS=<da>[,<toda>]

Response

1)If sending successfully:

+CMGS: <mr>

Text is entered.

<CTRL-Z/ESC>

OK

If PDU mode(AT+CMGF=0)

AT+CMGS=<length>

2)If cancel sending:

OK

PDU is entered

<CTRL-Z/ESC>

3)If sending fails

ERROR

4)If sending fails:

+CMS ERROR: <err>

Parameter Saving Mode

NO_SAVE

Max Response Time

40s

Reference

3GPP TS 27.005

Defined Values

<da>

Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>.

<toda>

TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255.

| | |
|-----------------------|---|
| <length> | integer type value indicating in the text mode (AT+CMGF=1) the length of the message body <data> > (or <cdata>) in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not counted in the length) |
| <mr> | Message Reference GSM 03.40 TP-Message-Reference in integer format. |

Examples

AT+CMGS=?

OK //TEXT MODE

AT+CMGS="13012832788"

>ABCD<ctrl-Z/ESC>

+CMGS: 46

OK

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: It is 160 characters if the 7 bit GSM coding scheme is used.

9.2.14 AT+CMSS Send message from storage

This command is used to send message with location value <index> from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND).

AT+CMSS Send message from storage

Test Command Response

AT+CMSS=?

OK

Write Command

**AT+CMSS=<index>[,<da>[,<to
a>]]**

Response

1)

+CMSS: <mr>

OK

2)

ERROR

3) If sending fails:

| +CMS ERROR: <err> | |
|--------------------------------|----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|----------------------|---|
| <index> | Integer type; value in the range of location numbers supported by the associated memory and start with one. |
| <da> | Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>. |
| <mr> | Message Reference GSM 03.40 TP-Message-Reference in integer format. |
| <toda> | TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255. |

Examples

AT+CMSS=?

OK

AT+CMSS=3

+CMSS: 0

OK

AT+CMSS=3,"13012345678"

+CMSS: 55

OK

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: It is 160 characters if the 7 bit GSM coding scheme is used.

9.2.15 AT+CMGW Write message to memory

This command is used to store message (either SMS-DELIVER or SMS-SUBMIT)to memory storage <mem2>.

AT+CMGW Write message to memory

| | |
|--|---|
| Test Command | Response |
| AT+CMGW=? | OK |
| Write Command | Response |
| If text mode(AT+CMGF=1) AT+CMGW=<oa>/<da>[,<tooa>/<toda>[,<stat>]] | 1)If write successfully: +CMGW: <index> |
| Text is entered. <CTRL-Z/ESC> | OK |
| If PDU mode(AT+CMGF=0): AT+CMGW=<length>[,<stat>] | 2)If write fails: ERROR |
| PDU is entered. <CTRL-Z/ESC> | 3)If write fails: +CMS ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 40s |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|-----------------------|--|
| <index> | Integer type; value in the range of location numbers supported by the associated memory and start with one. |
| <oa> | Originating-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <tooa>. |
| <tooa> | TP-Originating-Address, Type-of-Address octet in integer format. (default refer <toda>). |
| <da> | Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>. |
| <toda> | TP-Destination-Address, Type-of-Address octet in integer format. (when first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255. |
| <length> | Integer type value indicating in the text mode (AT+CMGF=1)the length of the message body <data> > (or <cdata>)in characters; or in PDU mode (AT+CMGF=0), the length of the actual TP data unit in octets. (i.e. the RP layer SMSC address octets are not |

counted in the length).

<stat>

1 Text Mode:

"STO UNSENT" stored unsent message

"STO SENT" stored sent message

2 PDU Mode:

2 stored unsent message

3 stored sent message

Examples

AT+CMGW=?

OK //TEXT MODE

AT+CMGW="13012832788"

>ABCD<ctrl-Z/ESC>

+CMGW: 1

OK

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: It is 160 characters if the 7 bit GSM coding scheme is used.

9.2.16 AT+CMGD Delete message

This command is used to delete message from preferred message storage <mem1> location <index>. If <delflag> is present and not set to 0 then the ME shall ignore <index> and follow the rules for <delflag> shown below.

AT+CMGD Delete message

Test Command

AT+CMGD=?

Response

+CMGD: (list of supported <index>s)[,(list of supported <delflag>s)]

OK

Response

Write Command

AT+CMGD=<index>[,<delflag>]

1)

OK

2)

| | |
|-----------------------|-------------------------------------|
| | ERROR |
| Parameter Saving Mode | 3) |
| Max Response Time | +CMS ERROR: <err> |
| Reference | NO_SAVE 9000ms 3GPP TS 27.005 |

Defined Values

| | |
|------------------------|--|
| <index> | Integer type; value in the range of location numbers supported by the associated memory and start with one. |
| <delflag> | <ul style="list-style-type: none"> 0 (or omitted)Delete the message specified in <index>. 1 Delete all read messages from preferred message storage, leaving unread messages and stored mobile originated messages (whether sent or not)untouched. 2 Delete all read messages from preferred message storage and sent mobile originated messages, leaving unread messages and unsent mobile originated messages untouched. 3 Delete all read messages from preferred message storage, sent and unsent mobile originated messages leaving unread messages untouched. 4 Delete all messages from preferred message storage including unread messages. |

Examples

```
AT+CMGD=?  
+CMGD: (1),(0-4)
```

OK

```
AT+CMGD=1
```

OK

NOTE

If set <delflag>=1, 2, 3 or 4, <index> is omitted, such as AT+CMGD=1.

9.2.17 AT+CMGMT Change message status

This command is used to change the message status. If the status is unread, it will be changed read. Other statuses don't change.

AT+CMGMT Change message status

| | |
|-----------------------|--------------------------------|
| Test Command | Response |
| AT+CMGMT=? | OK |
| | Response |
| | 1) |
| | OK |
| | 2) |
| | ERROR |
| | 3) |
| | +CMS ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|----------------------|---|
| <index> | Integer type; value in the range of location numbers supported by the associated memory and start with one. |
|----------------------|---|

Examples

```
AT+CMGMT=?  
OK  
AT+CMGMT=1  
OK
```

9.2.18 AT+CMVP Set message valid period

This command is used to set valid period for sending short message.

AT+CMVP Set message valid period

Test Command

AT+CMVP=?

Response

+CMVP: (list of supported <vp>s)

OK

Read Command

AT+CMVP?

Response

+CMVP: <vp>

OK

Response

1)

OK

2)

ERROR

3)

+CMS ERROR: <err>

Write Command

AT+CMVP=<vp>

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

3GPP TS 27.005

Defined Values

<vp>

Validity period value:

0 to 143 (<vp>+1)x 5 minutes (up to 12 hours)

144 to 167 12 hours + (<vp>-143)x 30 minutes

168 to 196 (<vp>-166)x 1 day

197 to 255 (<vp>-192)x 1 week

Examples

AT+CMVP=?

+CMVP: (0-255)

OK

AT+CMVP=167

OK

AT+CMVP?

+CMVP: 167

OK

9.2.19 AT+CMGRD Read and delete message

This command is used to read message, and delete the message at the same time. It integrate AT+CMGR and AT+CMGD, but it doesn't change the message status.

AT+CMGRD Read and delete message

Test Command

AT+CMGRD=?

Response

OK

Response

1)If text mode(AT+CMGF=1),command successful and SMS-DE-LIVER:

+CMGRD:

<stat>,<oa>,[<alpha>],<scts>[,<tooa>,<fo>,<pid>,<dcs>,<sca>,<tosca>,<length>]
<data>

OK

2)If text mode(AT+CMGF=1),command successful and SMS-SUBMIT:

+CMGRD:

<stat>,<da>,[<alpha>][,<toda>,<fo>,<pid>,<dcs>,[<vp>],<sca>,<tosca>,<length>]
<data>

Write Command

AT+CMGRD=<index>

OK

3)If text mode(AT+CMGF=1),command successful and SMS-STATUS- REPORT:

+CMGRD: <stat>,<fo>,<mr>,[<ra>],[<tora>],<scts>,<dt>,<st>

OK

4)If text mode(AT+CMGF=1),command successful and SMS-CO-MMAND:

+CMGRD:

<stat>,<fo>,<ct>[,<pid>,[<mn>],[<da>],[<toda>],<length>
<data>]

OK

5)If text mode(AT+CMGF=1),command successful and CBM storage:

+CMGRD: <stat>,<sn>,<mid>,<dcs>,<page>,<pages>
<data>

OK
 6) If PDU mode(AT+CMGF=0) and command successful:
+CMGRD: <stat>,[<alpha>],<length>
<pdu>

OK
 7)
ERROR
 8)
+CMS ERROR: <err>

| | |
|-----------------------|----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 40s |
| Reference | 3GPP TS 27.005 |

Defined Values

Refer to command AT+CMGR.

Examples

```
AT+CMGRD=?  

OK  

AT+CMGRD=6  

+CMGRD: "REC  

READ","+8613917787249","06/07/10,12:09:  

38+32",145,4,0,0, "+86138002105 00",145,4  

How do you do  

OK
```

9.2.20 AT+CMGSEX Send message

This command is used to send message from a TE to the network (SMS-SUBMIT).

AT+CMGSEX Send message

| | |
|--------------------|-----------|
| Test Command | Response |
| AT+CMGSEX=? | OK |

| | |
|---|--------------------------------------|
| | Response |
| Write Command | 1) |
| If text mode(AT+CMGF=1): | +CMGSEX: <mr> |
| AT+CMGSEX=<da>[,<toda>][,<mr>,<msg_seg>,<msg_total>] | OK |
| Text is entered. <CTRL-Z/ESC> | 2) ERROR |
| | 3) +CMS ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 40s |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|-------------|---|
| <da> | Destination-Address, Address-Value field in string format; BCD numbers (or GSM 7 bit default alphabet characters)are converted to characters of the currently selected TE character set, type of address given by <toda>. |
| <toda> | TP-Destination-Address, Type-of-Address octet in integer format. (When first character of <da> is + (IRA 43)default is 145, otherwise default is 129). The range of value is from 128 to 255. |
| <mr> | Message Reference GSM 03.40 TP-Message-Reference in integer format. The range of value is from 1 to 255. |
| <msg_seg> | The segment number for long sms |
| <msg_total> | The segment number for long sms, max value is 15. |

Examples

```

AT+CMGSEX=?
OK                                //TEXT MODE
AT+CMGSEX="13012832788",190,1,2
> ABCD<ctrl-Z/ESC>

OK
AT+CMGSEX="13012832788",190,2,2          //TEXT MODE
> EFGH<ctrl-Z/ESC>
+CMGSEX: 190

OK

```

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: For single SMS, it is 160 characters if the 7 bit GSM coding scheme is used; For multiple long sms, it is 153 characters if the 7 bit GSM coding scheme is used. For UCS2 short messages, the maximum length of a single message is 268 characters. The maximum length of a short or long message is 808 characters.

9.2.21 AT+CMSSEX Send multi messages from storage

This command is used to send messages with location value <index1>,<index2>,<index3>... from preferred message storage <mem2> to the network (SMS-SUBMIT or SMS-COMMAND).The max count of index is 13 one time.

AT+CMSSEX Send multi messages from storage

| | |
|--|--|
| Test Command | Response |
| AT+CMSSEX=? | OK |
| | Response |
| | 1) |
| | [+CMSSEX: <mr>[,<mr>[,...]]] |
| Write Command | OK |
| AT+CMSSEX=<index>[,<index>[,...]] | 2) ERROR 3)If sending fails: [+CMSSEX: <mr>[,<mr>[,...]]] |
| | +CMS ERROR: <err> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 40s |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|----------------------|---|
| <index> | Integer type; value in the range of location numbers supported by the associated memory and start with one. |
| <mr> | Message Reference |

Examples

AT+CMSSEX=?

OK

AT+CMSSEX=1,2

+CMSSEX: 239,240

OK

AT+CMSSEX=1,2

+CMSSEX: 241

+CMS ERROR: Invalid memory index

NOTE

In text mode, the maximum length of an SMS depends on the used coding scheme: For single SMS, it is 160 characters if the 7 bit GSM coding scheme is used.

9.2.22 AT+CCONCINDEX Report Concatenated SMS Index

This command is used to list the SMS index numbers of received short and long messages.

AT+CCONCINDEX Report Concatenated SMS Index

Test Command

AT+CCONCINDEX=?

Response

+CCONCINDEX: (0-10),(1-50),...

OK

Response

1)

+CCONCINDEX: N,i,j,k,...

Execution Command

AT+CCONCINDEX

OK

2)

OK

3)

+CMS ERROR: <err>

Parameter Saving Mode

NO_SAVE

Max Response Time

12s

Reference

3GPP TS 27.005

Defined Values

<N>

N is the number of segments that form the whole concatenated SMS.

<i, j, k>

i,j,k are the SMS indexes of each SMS segment

Examples

AT+CCONCINDEX=?

+CCONCINDEX: (0-10),(1-50),...

OK

AT+CCONCINDEX

+CCONCINDEX:3,1,2,3

+CCONCINDEX:2,45

OK

NOTE

If no segment is received, N is 0.

There is no long message on the SIM card or ME, only the OK result code is returned.

10 AT Commands for Serial Interface

10.1 Overview of AT Commands for Serial Interface

| Command | Description |
|----------|--|
| AT&D | Set DTR function mode |
| AT&C | Set DCD function mode |
| AT+IPR | Set local baud rate temporarily |
| AT+IPREX | Set local baud rate permanently |
| AT+ICF | Set control character framing |
| AT+IFC | Set local data flow control |
| AT+CSCLK | Control UART Sleep |
| AT+CMUX | Enable the multiplexer over the UART |
| AT+CATR | Configure URC destination interface |
| AT+CFGRI | Configure RI pin |
| AT+CURCD | Configure the delay time and number of URC |

10.2 Detailed Description of AT Commands for Serial Interface

10.2.1 AT&D Set DTR function mode

This command determines how the TA responds when DTR PIN is changed from the ON to the OFF condition during data mode.

| AT&D Set DTR function mode | |
|----------------------------|----------------|
| Execution Command | Response |
| AT&D[<value>] | 1) OK 2) |

| | ERROR |
|-----------------------|--------------|
| Parameter Saving Mode | AT&W_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------|---|
| <value> | <ul style="list-style-type: none"> 0 TA ignores status on DTR. 1 ON->OFF on DTR: Change to Command mode with remaining the connected call. 2 ON->OFF on DTR: Disconnect call, change to Command mode. During state DTR=OFF is auto-answer off. |
|----------------------|---|

Examples

AT&D1

OK

10.2.2 AT&C Set DCD function mode

This command determines how the state of DCD PIN relates to the detection of received line signal from the distant end.

| AT&C Set DCD function mode | |
|---------------------------------------|-----------------|
| | Response |
| Execution Command | 1) |
| AT&C[<value>] | OK |
| | 2) |
| | ERROR |
| Parameter Saving Mode | AT&W_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------|--|
| <value> | <ul style="list-style-type: none"> 0 DCD line shall always be on. 1 DCD line shall be on only when data carrier signal is present. 2 Setting the DCD line be on just 1 second after the data calls end. |
|----------------------|--|

Examples

AT&C1

OK

10.2.3 AT+IPR Set local baud rate temporarily

This command sets the baud rate of module's serial interface temporarily, after reboot the baud rate is set to value of IPREX.

AT+IPR Set local baud rate temporarily

| | |
|--|--|
| Test Command AT+IPR=? | Response +IPR: (list of supported <speed>s) |
| Read Command AT+IPR? | OK Response +IPR: <speed> |
| Write Command AT+IPR=<speed> | OK Response 1) OK 2) ERROR |
| Execution Command AT+IPR | Response Set the value to boot value: OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------|--|
| <speed> | Baud rate per second: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, <u>115200</u> , 230400, 460800, 921600, 1842000, 3686400. |
|----------------------|--|

Examples

AT+IPR?

+IPR: 115200

OK

AT+IPR=?

+IPR:

(300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,1842000,3686400
)

OK

AT+IPR=115200

OK

10.2.4 AT+IPREX Set local baud rate permanently

This command sets the baud rate of module's serial interface permanently, after reboot the baud rate is also valid.

AT+IPREX Set local baud rate permanently

Test Command

AT+IPREX=?

Response

+IPREX: (list of supported <speed>s)

OK

Read Command

AT+IPREX?

Response

+IPREX: <speed>

OK

Write Command

AT+IPREX=<speed>

Response

1)

OK

2)

ERROR

Execution Command

AT+IPREX

Response

Set default value 115200:

OK

Parameter Saving Mode

AUTO_SAVE

Max Response Time

9000ms

Reference

-

Defined Values

| | |
|----------------------|--|
| <speed> | Baud rate per second: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, <u>115200</u> , 230400, 460800, 921600, 1842000, 3686400. |
|----------------------|--|

Examples

AT+IPREX?

+IPREX: 115200

OK

AT+IPREX=?

+IPREX: (300,600,1200,2400,4800,9600,19200,38400,57600,115200,230400,460800,921600,
1842000,3686400)

OK

AT+IPREX=115200

OK

10.2.5 AT+ICF Set control character framing

This command sets character framing which contains data bit, stop bit and parity bit.

AT+ICF Set control character framing

| | |
|--|---|
| Test Command AT+ICF=? | Response +ICF: (list of supported<format>s),(list of supported<parity>s) |
| Read Command AT+ICF? | OK |
| Write Command AT+ICF=<format>,<parity> | Response +ICF: <format>,<parity> |
| | OK |
| Execution Command AT+ICF | Response Set default value: OK |
| Parameter Saving Mode NO_SAVE | NO_SAVE |

| | |
|-------------------|--------|
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------|--|
| <format> | 1 data bit 8, parity bit 1,stop bit 1. 2 data bit 8, stop bit 1. 3 data bit 7, parity bit 1,stop bit 1. 4 data bit 7, stop bit 1. |
| <parity> | 0 Odd 1 Even 2 none |

Examples

AT+ICF?

+ICF: 2,2

OK

AT+ICF=?

+ICF: (1-4),(0-2)

OK

AT+ICF=2,2

OK

AT+ICF

OK

10.2.6 AT+IFC Set local data flow control

The command sets the flow control mode of the module.

| AT+IFC Set local data flow control | |
|---|---|
| Test Command | Response AT+IFC=? |
| | +IFC: (list of supported<DCE>s),(list of supported<DTE>s) |
| Read Command | Response AT+IFC? |
| | +IFC: <DCE>,<DTE> |

| | |
|--|---|
| | OK |
| Write Command AT+IFC=<DCE>[,<DTE>] | Response 1) OK 2) ERROR |
| Execution Command AT+IFC | Response Set default value: OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-------|--|
| <DCE> | 0 none 1 software RTS XON/XOFF 2 RTS hardware flow control |
| <DTE> | 0 none 1 software CTS XON/XOFF 2 CTS hardware flow control |

NOTE

The hardware flow control is not supported by A7600X(X)-MNSE and A7600E-MASE.

Examples

AT+IFC?

+IFC: 0,0

OK

AT+IFC=?

+IFC: (0-2),(0-2)

OK

AT+IFC=2,2

OK

AT+IFC

OK

10.2.7 AT+CSCLK Control UART Sleep

This command is used to enable UART Sleep or always work. If set to 0, UART always work. If set to 1, ensure that DTR is pulled high and the module can go to DTR sleep. If set to 2, the module will enter RX sleep. RX wakeup directly sends data through the serial port (for example: AT) to wake up.

AT+CSCLK Control UART Sleep

| | |
|---|--|
| Test Command AT+CSCLK=? | Response +CSCLK: (range of supported <status>s) OK |
| Read Command AT+CSCLK? | Response +CSCLK: <status> OK |
| Write Command AT+CSCLK=<status> | Response 1) OK 2) ERROR |
| Execution Command AT+CSCLK | Response Set <status>=0: OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------|-------------|
| <status> | 0 off |
| | 1 DTR sleep |
| | 2 RX sleep |

NOTE

The RX sleep is not supported by 1802S.

Examples

AT+CSCLK?

+CSCLK: 0

OK

AT+CSCLK=?

+CSCLK: (0-2)

OK

AT+CSCLK=1

OK

AT+CSCLK=2

OK

AT+CSCLK

OK

10.2.8 AT+CMUX Enable the multiplexer over the UART

This command is used to enable the multiplexer over the UART, after enabled four virtual ports can be used as AT command port or MODEM port, the physical UART can no longer transfer data directly under this case. By default all of the four virtual ports are used as AT command port. Second serial port is not support this command.

AT+CMUX Enable the multiplexer over the UART

Test Command

Response

+CMUX: (0),(0),(1-8),(1-1500),(0),(0),(2-1000)

AT+CMUX=?

OK

Read Command

Response

+CMUX: <value>,<subset>,<port_speed>,<N1>,<T1>,<N2>,<T2>

AT+CMUX?

OK

Write Command

Response

AT+CMUX=<value>[,<subset>[,<port_speed>[,<N1>[,<T1>[,<N2>[,<T2>]]]]]]

1)

OK

2)

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

-

Defined Values

| | |
|--------------|--|
| <value> | 0 currently only 0 is supported (basic operation mode). |
| <subset> | Currently omitted |
| <port_speed> | Currently omitted, you can set speed before enable multiplexer |
| <N1> | 1-1500 |
| <T1> | Currently omitted |
| <N2> | Currently omitted |
| <T2> | 2-1000 |

Examples

AT+CMUX?

+CMUX: 0,0,5,1500,0,0,600

OK

AT+CMUX=?

+CMUX: (0),(0),(1-8),(1-1500),(0),(0),(2-1000)

OK

AT+CMUX=0

OK

10.2.9 AT+CATOR Configure URC destination interface

This command is used to configure the serial port which will be used to output URCs. We recommend configure a destination port for receiving URC in the system initialization phase, in particular, in the case that transmitting large amounts of data, e.g. use TCP/UDP and MT SMS related AT command.

AT+CATOR Configure URC destination interface

| | |
|-------------------|-------------------------------------|
| Test Command | Response |
| AT+CATOR=? | +CATOR: (list of supported <port>s) |
| Read Command | OK |
| AT+CATOR? | Response |
| Write Command | +CATOR: <port> |
| | OK |
| | Response |

| | |
|-----------------------------|---------------------------------------|
| AT+CATR=<port> | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|---------------------|---|
| <port> | 0 all ports 1 use UART port to output URCs 2 use MODEM port to output URCs 3 use ATCOM port to output URCs 4 use cmux virtual port1 to output URCs 5 use cmux virtual port2 to output URCs 6 use cmux virtual port3 to output URCs 7 use cmux virtual port4 to output URCs |
|---------------------|---|

Examples

AT+CATR?

+CATR: 0

OK

AT+CATR=?

+CATR: (0-7)

OK

AT+CATR=1

OK

10.2.10 AT+CFGRI Configure RI pin

This command configures the time of pulling RI down. These places are going to use it, for Examples: SMS, FTP, NETWORK, PB, CM, OS and so on.

AT+CFGRI Configure RI pin

Test Command

AT+CFGRI=?

Response

+CFGRI: (list of supported<status>),(list of

| | |
|---|--|
| | supported<URC_time>ms), (list of supported<SMS_time>ms) |
| Read Command AT+CFGRI? | OK Response +CFGRI: <status>,<URC_time>,<SMS_time> |
| Write Command AT+CFGRI=<status>[,<URC_time>[,<SMS_time>]] | OK Response 1) OK 2) ERROR |
| Execution Command AT+CFGRI | Response Set default value: OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-------------------------|--|
| <status> | 0 off. 1 on. |
| <URC_time> | a numeric parameter which is number of milliseconds to assert RI delay to reset RI. The range is 10 to 6000, default value is 60ms. |
| <SMS_time> | a numeric parameter which is number of milliseconds to assert RI delay to reset RI. The range is 20 to 6000, default value is 120ms. |

Examples

```
AT+CFGRI?
+CFGRI: 0,60,120
```

```
OK
AT+CFGRI=?
+CFGRI: (0-1),(10-6000),(20-6000)
```

```
OK
AT+CFGRI=0,60,120
OK
AT+CFGRI
OK
```

10.2.11 AT+CURCD Configure the delay time and number of URC

This command is used to configure delay time when output URC and the number of cached URCs. You can control delay time if some URC supports delay output. You can also set size to store URCs, they will output together when the delay time ends. For Examples, if you set delay time to 10ms and set the number of cached URCs to 1, there is only one URC output after 10ms.

AT+CURCD Configure the delay time and number of URC

| | |
|--|---|
| Test Command AT+CURCD=? | Response +CURCD: (range of supported <delay_time>ms),(1) |
| | OK |
| Read Command AT+CURCD? | Response +CURCD: <delay_time>,1 |
| | OK |
| Write Command AT+CURCD=<delay_time>,<cache_size> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------|---------------------------------|
| <delay_time> | 0-10000 the unit is ms |
| <cache_size> | 1 currently only 1 is supported |

Examples

```
AT+CURCD?
+CURCD: 0,1

OK
AT+CURCD=?
+CURCD: (0-10000),(1)

OK
```

AT+CURCD=100,1

OK

NOTE

Currently only support delay time setting, the default cache size for URC is one. This command applies to platform 1601 related projects, such as A7600E, A7600C-C1SE etc.

11 AT Commands for Hardware

11.1 Overview of AT Commands for Hardware

| Command | Description |
|----------------------|---|
| AT+CVALARM | Low and high voltage Alarm |
| AT+CVAUXS | Set state of the pin named VDD_AUX |
| AT+CVAUXV | Set voltage value of the pin named VDD_AUX |
| AT+CADC | Read ADC value |
| AT+CADC2 | Read ADC2 value |
| AT+CMTE | Control the module critical temperature URC alarm |
| AT+CPMVT | Low and high voltage Power Off |
| AT+CRIIC | Read values from register of IIC device |
| AT+CWIIC | Write values to register of IIC device |
| AT+CBC | Read the voltage value of the power supply |
| AT+CPMUTEMP | Read the temperature of the module |
| AT+CGDRT | Set the direction of specified GPIO |
| AT+CGSETV | Set the value of specified GPIO |
| AT+CGGETV | Get the value of specified GPIO |
| AT+CRIICNAU8X | Read values from register of IIC device nau8810 |
| AT+CWIICNAU8X | Write values to register of IIC device nau8810 |

11.2 Detailed Description of AT Commands for Hardware

11.2.1 AT+CVALARM Low and high voltage Alarm

This command is used to open or close the low voltage alarm function.

AT+CVALARM Low and high voltage Alarm

| | |
|--|---|
| Test Command AT+CVALARM=? | Response +CVALARM: (list of supported <enable>s),(list of supported <low voltage>s),(list of supported <high voltage>s) |
| Read Command AT+CVALARM? | OK Response +CVALARM: <enable>,<low voltage>,<high voltage> |
| Write Command AT+CVALARM=<enable>[,<low voltage>],[<high voltage>] | OK Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|-----------------------------|---|
| <enable> | 0 Close 1 Open. If voltage less than <low voltage>, it will report "UNDER-VOLTAGE WARNING" every 10s. If voltage greater than <high voltage>, it will report "OVER-VOLTAGE WARNING" every 10s. |
| <low voltage> | Between 3300mV and 4000mV. Default value is 3300. |
| <high voltage> | Between 4001mV and 4300mV. Default value is 4300. |

Examples

```
AT+CVALARM=1,3400,4300
OK
AT+CVALARM?
+CVALARM: 1,3400,4300

OK
AT+CVALARM=?
+CVALARM: (0,1),(3300-4000),(4001-4300)

OK
```

11.2.2 AT+CVAUXS Set state of the pin named VDD_AUX

This command is used to set state of the pin which is named VDD_AUX.

AT+CVAUXS Set state of the pin named VDD_AUX

| | |
|---|---|
| | Response |
| Test Command AT+CVAUXS=? | 1) +CVAUXS: (list of supported <state>s) |
| | OK |
| Read Command AT+CVAUXS? | Response +CVAUXS: <state> |
| | OK |
| Write Command AT+CVAUXS=<state> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------|---|
| <state> | 0 output of the pin disabled. 1 output of the pin enabled. |
|---------|---|

Examples

```
AT+CVAUXS=?
+CVAUXS: (0,1)
```

OK

```
AT+CVAUXS=1
```

OK

```
AT+CVAUXS?
+CVAUXS: 1
```

OK

For the 1603 platform, This AT command is only applicable to A7600C1_V401 MODULE.

11.2.3 AT+CVAUXV Set voltage value of the pin named VDD_AUX

This command is used to set the voltage value of the pin which is named VDD_AUX.

AT+CVAUXV Set voltage value of the pin named VDD_AUX

| | |
|---|---|
| Test Command AT+CVAUXV=? | Response +CVAUXV: (list of supported <voltage>s) |
| | OK |
| Read Command AT+CVAUXV? | Response +CVAUXV: <voltage> |
| | OK |
| Write Command AT+CVAUXV=<voltage> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|------------------------|---|
| <voltage> | Voltage value of the pin which is named VDD_AUX. The unit is in mv. |
|------------------------|---|

Examples

```

AT+CVAUXV=?
+CVAUXV:
(1200,1250,1700,1800,1850,1900,2500,2600,2700,2750,2800,2850,2900,3000,3100,3300)

OK
AT+CVAUXV=3000
OK
AT+CVAUXV?

```

+CVAUXV: 3000**OK****NOTE**

For the 1603 platform, only A7600C1 series can execute this command. For A7600C1_V301 series models, the valid parameters are (2500, 2600, 2700, 2800, 2850, 2900, 3000, 3100, 3300)

11.2.4 AT+CADC Read ADC value

This command is used to read the ADC value from modem. ME supports 2 types of ADC, which are raw type and voltage type.

AT+CADC Read ADC value

Test Command

AT+CADC=?

Response

+CADC: (range of supported <adc>s)**OK**

Response

1)

+CADC: <value>**OK**

2)

ERROR

Write Command

AT+CADC=<adc>

Parameter Saving Mode

-

Max Response Time

-

Reference

-

Defined Values

<adc>

ADC type:

0 raw type.

2 voltage type(mv).

<value>

Integer type value of the ADC.

Examples

AT+CADC=?**+CADC: (0,2)**

OK

AT+CADC=2**+CADC: 908**

OK

11.2.5 AT+CADC2 Read ADC2 value

This command is used to read the ADC2 value from modem. ME supports 2 types of ADC, which are raw type and voltage type.

AT+CADC2 Read ADC2 value

Test Command

Response

AT+CADC2=?**+CADC2: (range of supported <adc>s)**

OK

Response

1)

+CADC2: <value>

Write Command

OK

AT+CADC2=<adc>

2)

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

-

Defined Values

| | |
|----------------------|---|
| <adc> | ADC2 type: 0 raw type. 2 voltage type(mv) |
| <value> | Integer type value of the ADC2. |

Examples

AT+CADC2=?**+CADC2: (0,2)**

OK

AT+CADC2=2**+CADC2: 904**

OK

11.2.6 AT+CMTE Control the module critical temperature URC alarm

This command is used to control the module whether URC alarm when the module's temperature upon the critical temperature.

AT+CMTE Control the module critical temperature URC alarm

Test Command

AT+CMTE=?

Response

+CMTE: (list of supported<on/off>s)

OK

Read Command

AT+CMTE?

Response

+CMTE: <on/off>

OK

Response

1)

OK

2)

ERROR

Write Command

AT+CMTE=<on/off>

Parameter Saving Mode

-

Max Response Time

-

Reference

-

Defined Values

<on/off>

0 Disable temperature detection

1 Enable temperature detection

Examples

AT+CMTE=?

+CMTE: (0,1)

OK

AT+CMTE=1

OK

AT+CMTE?

+CMTE: 1

OK

11.2.7 AT+CPMVT Low and high voltage Power Off

This command is used to open or close the low and high voltage power off function and set the threshold of power off voltage.

AT+CPMVT Low and high voltage Power Off

Test Command

AT+CPMVT=?

Response

+CPMVT: (list of supported <enable>s),(list of supported <low voltage>s),(list of supported <high voltage>s)

OK

Read Command

AT+CPMVT?

Response

+CPMVT: <enable>,<low voltage>,<high voltage>

OK

Response

1)

OK

2)

ERROR

Parameter Saving Mode

AUTO_SAVE

Max Response Time

-

Reference

-

Defined Values

<enable>

0 Close. 0 is the default value

1 Open. If voltage less than <low voltage>, it will report "UNDER-VOLTAGE WARNING POWER DOWN" and power off the module. If voltage greater than <high voltage>, it will report

| | |
|----------------|--|
| | "OVER-VOLTAGE WARNING POWER DOWN" and power off the module |
| <low voltage> | Between 3200mV and 4000mV. Default value is 3200. |
| <high voltage> | Between 4001mV and 4300mV. Default value is 4300. |

Examples

AT+CPMVT=1,3400,4300

OK

AT+CPMVT?

+CPMVT: 1,3400,4300

OK

AT+CPMVT=?

+CPMVT: (0,1),(3200-4000),(4001-4300)

OK

NOTE

For the 160x platform, low voltage range is 3300mv-4000mv,for 180x platform,low voltage range is 3200mv-4000mv.

11.2.8 AT+CRIICNAU8X Read values from register of IIC device nau8810

This command is used to read values from register of IIC device nau8810.

AT+CRIICNAU8X Read values from register of IIC device nau8810

| | |
|--|--|
| Test Command | Response |
| AT+CRIICNAU8X=? | OK |
| Write Command | Response |
| AT+CRIICNAU8X=<addr>,<r eg>,<len> | 1) +CRIICNAU8X: <data> 2) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|--------|---|
| <addr> | Device address. Input format must be hex, such as FF (do not input "0x"). |
| <reg> | Register address. Input format must be hex, such as FF (do not input "0x"). |
| <len> | Read length. Range:2; unit:byte. |
| <data> | Data read. Input format must be hex, such as 0xFFFF. |

Examples

AT+CRIICNAU8X=34,f,2

+CRIICNAU8X: 0xff

OK

AT+CRIICNAU8X=34,6,2

+CRIICNAU8X: 0x140

OK

11.2.9 AT+CWIICNAU8X Write values to register of IIC device nau8810

This command is used to write values to register of IIC device nau8810.

AT+CWIICNAU8X Write values to register of IIC device nau8810

| | |
|--|----------|
| Test Command | Response |
| AT+CWIICNAU8X=? | OK |
| Write Command | 1) |
| AT+CWIICNAU8X=<addr>,<reg>,<data>,<len> | OK |
| | 2) |
| | ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|--------|--|
| <addr> | Device address. Input format must be hex, such as FF (do not input |
|--------|--|

| | |
|---------------------|--|
| | "0x"). |
| <reg> | Register address. Input format must be hex, such as FF(do not input "0x"). |
| <len> | Read length. Range: 2; unit: byte. |
| <data> | Data written. Input format must be hex, such as 0xFFFF |

Examples

AT+CWIICNAU8X=34,6,141,2

OK

11.2.10 AT+CWIIC Write values to register of IIC device

This command is used to write values to register of IIC device

AT+CWIIC Write values to register of IIC device

| | |
|--|----------|
| Test Command | Response |
| AT+CWIIC=? | OK |
| Write Command | 1) |
| AT+CWIIC=<addr>,<reg>,<d ata>,<len> | OK |
| 2) | ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------------------|--|
| <addr> | Device address. Input format must be hex, such as FF (do not input "0x"). |
| <reg> | Register address. Input format must be hex, such as FF(do not input "0x"). |
| <len> | Read length. Range: 2; unit: byte. |
| <data> | Data written. Input format must be hex, such as 0xFFFF |

Examples

AT+CWIIC=34,6,141,2

OK

11.2.11 AT+CRIIC Read values from register of IIC device

This command is used to read values from register of IIC device .

AT+CRIIC Read values from register of IIC device

| | |
|---|--|
| Test Command | Response |
| AT+CRIIC=? | OK |
| Write Command | Response |
| AT+CRIIC=<addr>,<reg>,<le n> | 1) +CRIIC: <data> 2) OK 3) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------------------|---|
| <addr> | Device address. Input format must be hex, such as FF (do not input "0x"). |
| <reg> | Register address. Input format must be hex, such as FF (do not input "0x"). |
| <len> | Read length. Range:2; unit:byte. |
| <data> | Data read. Input format must be hex, such as 0xFFFF. |

Examples

```
AT+CRIIC=34,f,2
+CRIIC: 0xff
```

OK

```
AT+CRIIC=34,6,2
+CRIIC: 0x140
```

OK

NOTE

AT+CRIIC and AT+CWIIC ; For standard universal iic timing slave devices
 AT+CRIICNAU8X,AT+CWIICNAU8X ;For nau8x series non-standard iic timing slave devices

11.2.12 AT+CBC Read the voltage value of the power supply

This command is used to read the voltage value of the power supply.

AT+CBC Read the voltage value of the power supply

| | |
|-----------------------|--|
| Execution Command | Response 1) +CBC: <vol> |
| AT+CBC | OK 2) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|-------|---------------------------------|
| <vol> | The voltage value, such as 3.8. |
|-------|---------------------------------|

Examples

AT+CBC
+CBC: 3.749V

OK

11.2.13 AT+CPMUTEMP Read the temperature of the module

This command is used to read the temperature of the module.

AT+CPMUTEMP Read the temperature of the module

| | |
|-----------------------|--|
| Execution Command | Response +CPMUTEMP: <temp> |
| AT+CPMUTEMP | OK |
| Parameter Saving Mode | - |
| Max Response Time | - |

Reference

-

Defined Values

| | |
|--------|------------------------------------|
| <temp> | The Temperature value, such as 29. |
|--------|------------------------------------|

Examples

AT+CPMUTEMP
+CPMUTEMP: 15

OK

11.2.14 AT+CGDRT Set the direction of specified GPIO

This command is used to set the specified GPIO to input or output state. If setting to input state, then this GPIO can not be set to high or low value.

AT+CGDRT Set the direction of specified GPIO

Test Command

AT+CGDRT=?

Response

+CGDRT: (list of supported <GPIO>s),(list of supported <gpio_io>s)

OK

Response

1)

+CGDRT: <GPIO>,<gpio_io>

OK

2)

ERROR

Response

1)

OK

2)

ERROR

Write Command

AT+CGDRT=<GPIO>

Write Command

**AT+CGDRT=<GPIO>,<gpio_i
o>**

Parameter Saving Mode

-

Max Response Time

-

Reference

-

Defined Values

| | |
|-----------|--|
| <GPIO> | The value is GPIO ID, different hardware versions have different values. |
| <gpio_io> | 0 in 1 out |

Examples

AT+CGDRT=?

+CGDRT: (1,2,3,6,12,14,16,18,22,41,43,63,77),(0-1)

OK

AT+CGDRT=3,0

OK

AT+CGDRT=3

+CGDRT: 3,0

OK

NOTE

The return value of 'AT+CGDRT=?' applies only to platform 1603. Platform 1601 has different return values.

11.2.15 AT+CGSETV Set the value of specified GPIO

This command is used to set the value of the specified GPIO to high or low.

The direction of specified GPIO must be set as OUT direction by using AT+CGDRT before this AT command, otherwise an error will be returned.

AT+CGSETV Set the value of specified GPIO

| | |
|---------------|---|
| Test Command | Response +CGSETV: (list of supported <GPIO>s),(list of supported <gpio_hi>s) |
| Write Command | AT+CGSETV=<GPIO>,<gpio_hi> Response 1) OK |

| | |
|-----------------------|--------------------|
| | 2) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|------------------------|--|
| <GPIO> | The value is GPIO ID, different hardware versions have different values. |
| <gpio_hi> | 0 low 1 high |

Examples

AT+CGSETV=?
+CGSETV: (1,2,3,6,12,14,16,18,22,41,43,63,77),(0-1)

OK

AT+CGSETV=6,0

OK

NOTE

The return value of 'AT+CGSETV=?' applies only to platform 1603. Platform 1601 has different return values.

11.2.16 AT+CGGETV Get the value of specified GPIO

This command is used to get the value (high or low)of the specified GPIO.

The direction of specified GPIO must be set as IN direction by using AT+CGDRT before this AT command, otherwise an error will be returned.

AT+CGSETV Get the value of specified GPIO

| | |
|--------------------|---|
| Test Command | Response |
| AT+CGGETV=? | +CGGETV: (list of supported <GPIO>s) |

OK

| | |
|-------------------------------|--|
| | Response |
| Write Command | 1) +CGGETV: <GPIO>,<gpio_hi> |
| AT+CGGETV=<GPIO> | OK |
| | 2) |
| | ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|------------------------|--|
| <GPIO> | The value is GPIO ID, different hardware versions have different values. |
| <gpio_hi> | 0 low 1 high |

Examples

```
AT+CGGETV=?
+CGGETV: (1,2,3,6,12,14,16,18,22,41,43,63,77)
```

OK

```
AT+CGGETV=3
+CGGETV: 3,0
```

OK

NOTE

The return value of 'AT+CGGETV=?' applies only to platform 1603. Platform 1601 has different return values.

11.3 Unsolicited Result Codes

| URC | Description | AT Command |
|---------------------------------|---------------------------------|----------------|
| CMTE: <temp_level> | While module's temperature over | AT+CMTE |

| | | |
|---|--|-------------------|
| | the high threshold and below the low threshold, the URC will occur. | |
| UNDER-VOLTAGE WARNING | This is a URC ALARM when Current voltage is UNDER the value which you set. | AT+CVALARM |
| OVER-VOLTAGE WARNING | This is a URC ALARM when Current voltage is OVER the value which you set. | AT+CVALARM |
| UNDER-VOLTAGE WARNING POWER DOWN | This is a URC ALARM when Current voltage is UNDER the value which you set. | AT+CPMVT |
| OVER-VOLTAGE WARNING POWER DOWN | This is a URC ALARM when Current voltage is OVER the value which you set. | AT+CPMVT |

Defined Values

| | |
|---------------------------|--|
| <temp_level> | -2 below -45 celsius degree. -1 (-45,-30] celsius degree. 1 (80,85] celsius degree. 2 over 85 celsius degree. |
|---------------------------|--|

12 AT Commands for File System

12.1 Overview of AT Commands for File System

| Command | Description |
|----------------------|--|
| AT+FSCD | Select directory as current directory |
| AT+FSMKDIR | Make new directory |
| AT+FSRMDIR | Delete directory |
| AT+FSLS | List directories/files in current directory |
| AT+FSDEL | Delete file |
| AT+FSRENAME | Rename file |
| AT+FSATTRI | Request file attributes |
| AT+FSMEM | Check the size of available memory |
| AT+FSCOPY | Copy an appointed file |
| AT+FSPRESET | Move the location of a file |
| AT+FSOPEN | Open a file |
| AT+FSCLOSE | Close a file |
| AT+FSREAD | Read a file |
| AT+FSWRITE | Write a file |
| AT+FSSEEK | Set a file pointer to the specified position |
| AT+FSPOSITION | Get the offset of a file pointer |

| Command | Description | Supported Modules |
|----------------------|---------------------------|------------------------------|
| AT+FSRENAME | D:/ directory file rename | Only Cat1 modules |
| AT+FSOPEN | Open a file | Only ASR1603 standard branch |
| AT+FSCLOSE | | Only ASR1603 standard branch |
| AT+FSREAD | | Only ASR1603 standard branch |
| AT+FSWRITE | | Only ASR1603 standard branch |
| AT+FSSEEK | | Only ASR1603 standard branch |
| AT+FSPOSITION | | Only ASR1603 standard branch |

12.2 Detailed Description of AT Commands for File System

The file system is used to store files in a hierarchical (tree)structure, and there are some definitions and conventions to use the AT commands.

Local storage space is mapped to "C:", "D:" for SD card. (The A7678 does not support SD card).

NOTE: General rules for naming (both directories and files):

- a) The length of actual fully qualified names of files(C:/)can not exceed 115, also include full Dir.
- b) The length of actual fully qualified names of directories and files(D:/)can not exceed 250, also include full Dir.
- c) Directory and file names can not include the following characters: \ / : * ? " < > |
- d) Between directory name and file/directory name, use character "/" as list separator, so it can not appear in directory name or file name.
- e) File names on "C:/" drive cannot begin with "." or "blank" and it also can't end with ".."
- f) {non-ascii} input is only supported when the SD card function is supported. {non-ascii} input is still not allowed when operating external flash and file systems.
- g) The file name in drive D is case-insensitive, but can be displayed in case format.
If the last character of names is period ".": the SD card can support this character, but the compatibility is not good.
- h) Support relative path and absolute path input; ASR1803 does not support directory creation, and disk D does not support renaming.

12.2.1 AT+FSCD Select directory as current directory

This command is used to select a directory. The Module supports absolute path and relative path.

AT+FSCD Select directory as current directory

Test Command

AT+FSCD=?

Response

OK

Read Command

AT+FSCD?

Response

+FSCD: <curr_path>

OK

Write Command

AT+FSCD=<path>

Response

1)If set current directory successfully:

+FSCD: <curr_path>

OK

2)If set current directory failed:

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|-------------|--------------------------|
| <path> | Directory for selection. |
| <curr_path> | Current directory. |

Examples

AT+FSCD=C:

+FSCD: C:/

OK

AT+FSCD=C:/

+FSCD: C:/

OK

AT+FSCD?

+FSCD: C:/

OK

AT+FSCD=D:

+FSCD: D:/

OK

NOTE

If <path> is "..", it will go back to previous level of directory.

12.2.2 AT+FSMKDIR Make new directory in current directory

The Module supports absolute path and relative path. Support "D:" and "C:".

AT+FSMKDIR Make new directory in current directory

| | |
|---------------------|----------|
| Test Command | Response |
| AT+FSMKDIR=? | OK |
| Write Command | Response |

| | |
|-------------------------------|---|
| AT+FSMKDIR=<dir> | 1) If successfully: OK 2) If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|--------------------|---|
| <dir> | Directory name which does not already exist in current directory. |
|--------------------|---|

Examples

AT+FSMKDIR=SIMTech

OK

AT+FSCD?

+FSCD: D:/

OK

AT+FSLS

+FSLS: SUBDIRECTORIES:

SIMTech

OK

NOTE

Support "C:" and "D:".

12.2.3 AT+FSRMDIR Delete directory in current directory

Supports absolute path and relative path. Support "D:" and "C:".

AT+FSRMDIR Delete directory in current directory

Test Command

AT+FSRMDIR=?

Response

OK

| | |
|--|---|
| Write Command AT+FSRMDIR=<dir> | Response 1) If successfully: OK 2) If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|-------|---|
| <dir> | The directory name which already exists in current directory. |
|-------|---|

Examples

```
AT+FSRMDIR=SIMTech
```

```
OK
```

```
AT+FSCD?
```

```
+FSCD: D:/
```

```
OK
```

```
AT+FSLS
```

```
+FSLS: SUBDIRECTORIES:
```

```
OK
```

NOTE

Support "C:" and "D:".

12.2.4 AT+FSLS List directories/files in current directory

This command is used to list informations of directories and/or files in current directory. Support "C:", "D:".

AT+FSLS List directories/files in current directory

| | |
|----------------------------------|--|
| Test Command AT+FSLS=? | Response +FSLS: (list of supported <type>s) |
|----------------------------------|--|

| | |
|--|---|
| | OK |
| Read Command AT+FSLS? | Response +FSLS: SUBDIRECTORIES:<dir_num>,FILES:<file_num> |
| Write Command AT+FSLS=<type> | OK Response [+FSLS: SUBDIRECTORIES: <list of subdirectories>] [+FSLS: FILES: <list of files>] |
| Execution Command AT+FSLS | OK Response [+FSLS: SUBDIRECTORIES: <list of subdirectories>] [+FSLS: FILES: <list of files>] |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|-------------------------|---|
| <dir_num> | Integer type, the number of subdirectories in current directory. |
| <file_num> | Integer type, the number of files in current directory. |
| <type> | 0 list both subdirectories and files 1 list subdirectories only 2 list files only |

Examples

```
AT+FSLS?
+FSLS: SUBDIRECTORIES:2,FILES:2
```

```
OK
AT+FSLS
+FSLS: SUBDIRECTORIES:
FirstDir
```

SecondDir

+FSLS: FILES:

image_0.jpg
image_1.jpg

OK

AT+FSLS=2

+FSLS: FILES:

image_0.jpg
image_1.jpg

OK

12.2.5 AT+FSDEL Delete file in current directory

This command is used to delete a file. Before do that, it needs to use AT+FSCD select the father directory as current directory. Support "C:", "D:".

AT+FSDEL Delete file in current directory

Test Command

AT+FSDEL=?

Response

OK

Write Command

AT+FSDEL=<filename>

Response

1)If successfully:

OK

2)If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

<filename>

String with or without double quotes, file name which is relative and already existing.

Examples

AT+FSDEL=image_0.jpg

OK

NOTE

If <filename> is *.* , it means delete all files in current directory.

12.2.6 AT+FSRENAME Rename file in current directory

This command is used to rename a file. Support "C:", "D:".

AT+FSRENAME Rename file in current directory

Test Command Response

AT+FSRENAME=? **OK**

Write Command Response

1)If successfully:

AT+FSRENAME=<old_name **OK**

>,<new_name>

2)If failed:

ERROR

Parameter Saving Mode -

Max Response Time -

Reference

Defined Values

<old_name> String with or without double quotes, file name which is existed in current directory.

<new_name> New name of specified file, string with or without double quotes.

Examples

AT+FSRENAME=image_0.jpg,image_1.jpg

OK

NOTE

In Cat 4 modules, "D:" does not support AT+FSRENAME.

Cannot rename files that length is 0.

12.2.7 AT+FSATTRI Request file attributes

This command is used to request the attributes of file which exists. Support "C:", "D:".

AT+FSATTRI Request file attributes

Test Command

AT+FSATTRI=?

Response

OK

Write Command

AT+FSATTRI=<filename>

Response

1)If successfully:

+FSATTRI: <file_size>

OK

2)If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

<filename>

String with or without double quotes, file name which is in current directory.

<file_size>

The size of specified file, and the unit is in Byte.

Examples

AT+FSATTRI=image_0.jpg

+FSATTRI: 8604

OK

12.2.8 AT+FSMEM Check the size of available memory

This command is used to check the size of available memory. The response will list total size and used size

of local storage space if present and mounted. Support "C:", "D:".

AT+FSMEM Check the size of available memory

Test Command

AT+FSMEM=?

Response:

OK

Response:

1)If successfully, currently C:/:

+FSMEM: C:(<total>,<used>)

Execution Command

AT+FSMEM

OK

2)If successfully, currently D:/:

+FSMEM: D:(<total>,<used>)

OK

3)If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

<total>

The total size of local storage space.

<used>

The used size of local storage space.

Examples

AT+FSMEM

+FSMEM: C:(11348480, 2201600)

OK

NOTE

The unit of storage space size is in Byte.

12.2.9 AT+FSCOPY Copy an appointed file

This command is used to copy an appointed file on C:/ to an appointed directory on C:/, or C:/ to D:/, the new file name should give in parameter. Support "C:", "D:".

AT+FSCOPY Copy an appointed file

Test Command

AT+FSCOPY=?

Response

OK

Response

1) If successfully, synchronous mode:

+FSCOPY: <percent>

[+FSCOPY: <percent>]

OK

2) If successfully, asynchronous mode:

OK

+FSCOPY: <percent>

[+FSCOPY: <percent>]

Write Command

AT+FSCOPY=<file1>,<file2>[<sync_mode>]

+FSCOPY: END

3) If any error:

SD CARD NOT PLUGGED IN

FILE IS EXISTING

FILE NOT EXISTING

DIRECTORY IS EXISTED

DIRECTORY NOT EXISTED

INVALID PATH NAME

INVALID FILE NAME

SD CARD HAVE NO ENOUGH MEMORY

EFS HAVE NO ENOUGH MEMORY

FILE CREATE ERROR

READ FILE ERROR

WRITE FILE ERROR

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

<file1>

The sources file name or the whole path name with sources file name.

<file2>

The destination file name or the whole path name with destination file name.

| | |
|-------------|---|
| <percent> | The percent of copy done. The range is 0.0 to 100.0 |
| <sync_mode> | The execution mode of the command: 0 synchronous mode 1 asynchronous mode |

Examples

```
AT+FSCOPY=C:/TESTFILE,COPYFILE           //Copy file TESTFILE on C:/ to C:/COPYFILE
+FSCOPY: 0.0

+FSCOPY: 9.7

+FSCOPY: 19.4

...
+FSCOPY: 100.0

OK
```

NOTE

The <file1> and <file2> should give the whole path and name, if only given file name, it will refer to current path (AT+FSCD)and check the file's validity.
 If <file2> is a whole path and name, make sure the directory exists, make sure that the file name does not exist or the file name is not the same name as the sub folder name, otherwise return error.
 <percent> report refer to the copy file size. The big file maybe report many times, and little file report less.
 If <sync_mode> is 1, the command will return OK immediately, and report final result with +FSCOPY: END.

12.2.10 AT+FSPRESET Moves the location of a file

This command is used to move an appointed file on C:/ to C:/simdir/,or from C:/simdir to C:/.

AT+FSPRESET Move the location of a file

| | |
|----------------------|----------|
| Test Command | Response |
| AT+FSPRESET=? | OK |
| Write Command | Response |

| | |
|---|--|
| AT+FSPRESET=<fileName>[,<direction>] | 1) If successfully OK 2) If error ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|--------------------------|---|
| <fileName> | The file name to be moved without the path. |
| <direction> | The direction in which the file was moved 0 from root directory to the user directory 1 from user directory to the root directory |

Examples

| | |
|-------------------------------|---|
| AT+FSPRESET=test.txt,0 | //move file from root directory to the user directory |
| OK | |

NOTE

- 1. Just supported on in the standard branch of ASR1603 and ASR1606.
- 2. When <direction> = 1, If the file already exists in the root directory, delete the file and move it to the root directory.

12.2.11 AT+FSOPEN Open a file

This command opens a file and gets the file handle to be used in commands such as **AT+FSREAD, AT+FSWRITE, AT+FSSEEK, AT+FSPOSITION, AT+FSCLOSE**.

| AT+FSOPEN Open a file | |
|------------------------------------|---|
| Test Command AT+FSOPEN=? | Response +FSOPEN: <filename>[(0-2)] |
| | OK |
| Read Command AT+FSOPEN? | Response OK |
| Write Command | Response |

AT+FSOPEN
=<fileName>[,<mode>]

1) If successfully
+FSOPEN: <filehandle>

OK

2) If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|---------------------------|---|
| <filename> | The file name to be opened with the path. The maximum length is 115 bytes. |
| <filehandle> | The handle of the file. |
| <mode> | <p>The open mode of the file.</p> <p>0 if the file does not exist, it will be created. If the file exists, it will be directly opened. And both of them can be read and written.</p> <p>1 if the file does not exist, it will be created. If the file exists, it will be overwritten and cleared. And both of them can be read and written.</p> <p>2 if the file exists, open it and it can be read only. When the file does not exist, it will respond an error.</p> |

Examples

AT+FSOPEN=C:/test.txt,0

+FSOPEN: 1

OK

12.2.12 AT+FSREAD Read a file

This command reads the data of a file which is specified by the handle. The data starts from the current position of the pointer which belongs to the file handle.

AT+FSREAD Read a file

Test Command

AT+FSREAD=?

Response

+FSREAD: <filehandle>[,<length>]

OK

| | |
|-----------------------|--|
| Write Command | Response 1) If successfully: CONNECT <read_length> TA switches to data mode. When the total size of the data reaches <length> (unit: byte), TA will return to command mode, display the result and then reply the following codes: OK 2) If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|---------------|---|
| <filehandle> | The handle of the file. |
| <length> | The length of the file to be read out and the default is the file length. |
| <read_length> | The actual read length. |

Examples

```
AT+FSREAD=1,10
CONNECT 10
1234567890
```

OK

12.2.13 AT+FSWRITE Write a file

This command writes data into a file. The data starts from the current position of the file pointer which belongs to the file handle.

| AT+FSWRITE Write a file | |
|-------------------------|--|
| Test Command | Response +FSWRITE: <filehandle>[,<length>[,<timeout>]] |
| AT+FSWRITE=? | OK |
| Write Command | Response 1) If successfully: |

<length>,[<timeout>]]

CONNECT

TA switches to data mode. When the total size of the written data reaches <length> (unit: byte) or the time reaches <timeout>, TA will return to command mode and reply the following codes:

+FSWRITE: <written_length>,<total_length>

OK

2)If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

<filehandle>

The handle of the file to be operated.

<length>

The length of the file to be written ,and the default is 10K. The maximum value of this parameter is determined by <freesize> from AT+FSMEM.

<timeout>

The time waiting for data to be inputted to USB/UART. The default value is 5.Unit: s.

<written_length>

The actual written length.

<total_length>

The total length of the file.

Examples

AT+FSWRITE=1,5,10

CONNECT

//input data

+FSWRITE: 0,5

OK

12.2.14 AT+FSSEEK Set a file Pointer to the Specified Position

This command set a file pointer to the specified position. This will decide the starting position of commands such as **AT+FSREAD**,**AT+FSWRITE**, **AT+FSSEEK**,**AT+FSPOSITION**.

AT+FSSEEK Set a file Pointer to the Specified Position

| | |
|--|--|
| Test Command AT+FSSEEK=? | Response +FSSEEK: <filehandle>,<offset>[,<position>] |
| Write Command AT+FSSEEK=<filehandle>,<offset>[,<position>] | OK Response 1) If successfully: OK 2) If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|---------------------------|--|
| <filehandle> | The handle of the file to be operated. |
| <offset> | The number of bytes of the file pointer movement. |
| <position> | Pointer movement mode. 0 The beginning of the file. 1 The current position of the pointer. 2 The end of the file. |

Examples

AT+FSSEEK=1,0,0

OK

12.2.15 AT+FSPOSITION Get the Offset of a File Pointer

This command gets the offset of a file pointer from the beginning of the file.

| AT+FSPRESET Move the location of a file | |
|--|--|
| Test Command AT+FSPOSITION=? | Response +FSPOSITION: <filehandle> |
| Write Command AT+FSPOSITION=<filehandle> | OK Response 1) If successfully: +FSPOSITION: <offset> |

| | |
|-----------------------|---|
| | OK 2)If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|---------------------------|--|
| <filehandle> | The handle of the file to be operated. |
| <offset> | The offset from the beginning of the file. |

Examples

```
AT+FSPOSITION=1
+FSPOSITION: 0                                //move file from root directory to the user directory

OK
```

12.2.16 AT+FSCLOSE Close a file

This command closes a file and ends the operation to the file. After that, the file handle is released and should not be used again, unless the file is opened again by **AT+FSOPEN**.

| AT+FSCLOSE Close a file | |
|--------------------------------------|--|
| Test Command | Response +FSCLOSE: <filehandle> |
| AT+FSCLOSE=? | OK |
| Write Command | Response 1)If successfully: OK 2)If failed: ERROR |
| AT+FSCLOSE=<filehandle> | |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|--------------|--|
| <filehandle> | The handle of the file to be operated. |
|--------------|--|

Examples

```
AT+FSCLOSE=1          //move file from root directory to the user directory  
OK
```

13 AT Commands for File Transmission

13.1 Overview of AT Commands for File Transmission

| Command | Description | |
|--------------------|--|-----------------------------------|
| AT+CFTRANRX | Transfer a file to EFS | |
| AT+CFTRANTX | Transfer a file from EFS to host | |
| AT+CFTRXBUF | Sets the size of the buffer to transfer files to EFS | |
| Command | Description | Supported Project |
| AT+CFTRXBUF | | A7600C1-XXXX(1601) A7678(1603) |

13.2 Detailed Description of AT Commands for File Transmission

13.2.1 AT+CFTRANRX Transfer a file to EFS

This command is used to transfer a file to EFS. Support "C:", "D:".

| AT+CFTRANRX Transfer a file to EFS | |
|--|--|
| Test Command AT+CFTRANRX=? | Response +CFTRANRX: [{non-ascii}]"FILEPATH" |
| | OK |
| Write Command AT+CFTRANRX=<filepath>,<en>[,<reserved>[,<location>]] | Response 1) If successfully: > OK 2) If failed: > |

| | |
|-----------------------|--------------|
| | ERROR |
| | 3)If failed: |
| | ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|------------|--|
| <filepath> | The path of the file on EFS |
| <len> | <p>The length of the file data to send.</p> <p>Because of the system resources, The length could not set too large. If use the UART to send data, it may can set to 3Mb. If use USB to send data, it may just can set to 200Kb. If limit the send speed, it can set larger. The actual size could not ensure. Usually it is safer to set a smaller size.</p> |
| <reserved> | The value is 100. |
| <location> | The position offset from the start of the file. |

Examples

```

AT+CFTRANRX="c:/t1.txt",10
>
OK
AT+CFTRANRX="d:/MyDir/t1.txt",10
>
OK
AT+CFTRANRX="C:/ t2.txt",10,100,0
>
OK

```

NOTE

1. The <filepath> is the name of the file on EFS, make sure that the file name does not exist under the path.
2. If sending file fails, increase the delay time between each 256 byte reach to 50ms, and then try to send file again.
3. Only **Cat4 modules** and SD card support Non-ASCII characters in file path.
4. The <reserved> is used by individual customers and if <location> is not default value,<reserved> will be considered invalid.
- 5.The <location> exceed the file size, the command will return “**ERROR**”.

6. When the <location> is less than the file size, it will write data from <location> .
 7. The <location> is just supported in ASR1603 standard branches , compatible SIM800 branches and ASR1803S standard branches.

13.2.2 AT+CFTRANTX Transfer a file from EFS to host

This command is used to transfer a file from EFS to host.

AT+CFTRANTX Transfer a file from EFS to host

| | |
|--|--|
| Test Command AT+CFTRANTX=? | Response +CFTRANTX: [{non-ascii}]"FILEPATH" |
| | OK |
| | Response 1) If successfully: [+CFTRANTX: DATA,<len> ... +CFTRANTX: DATA,<len> +CFTRANTX: 0 |
| | OK 2) If <transMode> is 1 : >... OK |
| | 3) If failed: ERROR |
| Write Command AT+CFTRANTX=<filepath>[,<location>][,<size>][,<transMode>] | - |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|--------------------------|--|
| <filepath> | The path of the file on EFS |
| <len> | The length of the following file data to output. |
| <location> | The beginning of the file data to output. |
| <size> | The length of the file data to output. |
| <transMode> | Whether there is no urc in data output 0 normal mode 1 data output directly without urc. |

Examples

```
AT+CFTRANTX="c:/t1.txt"
+CFTRANTX: DATA, 11
Testcontent
+CFTRANTX: 0

OK
AT+CFTRANTX="d:/MyDir/t1.txt"
+CFTRANTX: DATA, 11
Testcontent
+CFTRANTX: 0

OK
AT+CFTRANTX="d:/MyDir/t1.txt",1,4
+CFTRANTX: DATA, 4
estc
+CFTRANTX: 0

OK
AT+CFTRANTX="c:/ 1.txt",0,10,1
>123456790
OK
```

NOTE

The <filepath> is the name of the file on EFS.
If not set the size, it means range from location to the end of the file.
If the (size + location) larger than the file size, it means range from location to the end of the file.

13.2.3 AT+CFTRXBUF Sets the size of the buffer to transfer files to EFS

This command is used to set the size of the buffer to transfer files to EFS. Support "C:", "D:".

AT+CFTRXBUF Sets the size of the buffer to transfer files to EFS

Test Command
AT+CFTRXBUF=?

Response
+CFTRXBUF: (list of supported <buffsize_level>s)

| | |
|--|---|
| | OK |
| Read Command AT+CFTRXBUF? | Response +CFTRXBUF: <buffsize_level> |
| Write Command AT+CFTRXBUF=<buffsize_level> | OK Response a) If successfully: OK c) If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|-------------------------------|--|
| <buffsize_level> | The size of the buffer to transfer files to EFS. 0 -- 20Kb(20,480 bytes) 1 -- 40Kb(40,960 bytes) |
|-------------------------------|--|

Examples

AT+CFTRXBUF=0

OK

AT+CFTRXBUF?

+CFTRXBUF: 0

OK

NOTE

The default buffer size is 20KB, which is sufficient for basic file transfer requirements. When transferring large files fails, if you are unwilling to extend the delay time in order to ensure the transfer speed, you can increase the buffer size to 40KB, but this may affect multiple application scenarios.

14 AT Commands for Internet Service

14.1 Overview of AT Commands for Internet Service

| Command | Description |
|----------------------|---------------------------------------|
| AT+CHTPSERV | Set HTP server information |
| AT+CHTPUPDATE | Updating date time using HTP protocol |
| AT+CNTP | Update system time |

14.2 Detailed Description of AT Commands for Internet Service

14.2.1 AT+CHTPCFG Configure the HTP Context

specify PDP context by <cid>.

| AT+CHTPCFG Configure the HTP Context | |
|--|---|
| Test Command AT+CHTPCFG=? | <p>Response +CHTPCFG: "CID",(1-n)</p> <p>OK</p> |
| Write Command /*Configure the cid values of all clients when a connection is created*/ AT+CHTPCFG="CID"[,<cid>] | <p>Response 1) When <cid> is omitted: +CHTPCFG: "CID",<cid></p> <p>OK</p> <p>2) If the <cid> set successfully: OK</p> <p>3) If failed: ERROR</p> |

Defined Values

| | |
|-------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
|-------|--|

Examples

```
AT+CHTPCFG="CID",1
OK
```

14.2.2 AT+CHTPSERV Set HTP server information

This command is used to add or delete HTP server information. There are maximum 16 HTP servers.

AT+CHTPSERV Set HTP server information

Test Command

```
AT+CHTPSERV=?
```

Response

```
+CHTPSERV: "ADD","HOST",,(1-65535),(0-1)[,"PROXY",,(1-65535)]
+CHTPSERV: "DEL",,(0-15)
```

OK

Response

1)

OK

2)

+CHTPSERV:

```
<index><host>,<port>,<http_version>[,<proxy>,<proxy_port>]
```

...

```
+CHTPSERV: <index><host>,<port>[,<proxy>,<proxy_port>]
```

Read Command

```
AT+CHTPSERV?
```

OK

Write Command

```
AT+CHTPSERV=<cmd>,<host_or_idx>[,<port>,<http_version>[,<proxy>,<proxy_port>]]
```

Response

1)If successfully:

OK

2)If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

<cmd>

This command to operate the HTP server list.

| | |
|----------------|---|
| | "ADD" add a HTP server item to the list "DEL" delete a HTP server item from the list |
| <host_or_idx> | If the <cmd> is "ADD", this field is the same as <host>, length is 1-255; If the <cmd> is "DEL", this field is the index of the HTP server item to be deleted from the list. |
| <host> | The HTP server address, length is 1-255. |
| <port> | The HTP server port, the range is (1-65535). |
| <http_version> | The HTTP version of the HTP server: 0 HTTP 1.0 1 HTTP 1.1 |
| <proxy> | The proxy address, length is 1-255. |
| <proxy_port> | The port of the proxy, the range is (1-65535). |
| <index> | The HTP server index. |

Examples

AT+CHTPSERV="ADD","www.google.com",80,1

OK

14.2.3 AT+CHTPUPDATE Updating date time using HTP protocol

This command is used to updating date time using HTP protocol.

AT+CHTPUPDATE Updating date time using HTP protocol

| | |
|------------------------|--|
| Test Command | Response |
| AT+CHTPUPDATE=? | OK |
| Read Command | Response |
| AT+CHTPUPDATE? | +CHTPUPDATE: <status> |
| | OK |
| Execute Command | Response |
| AT+CHTPUPDATE | 1) If successfully: OK +CHTPUPDATE: <err> 2) If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|----------|--|
| <status> | The status of HTP module: Updating HTP module is synchronizing date time NULL HTP module is idle now |
| <err> | The result of the HTP updating |

Examples

AT+CHTPUPDATE

OK

+CHTPUPDATE: 0

14.2.4 AT+CNTPCFG Configure the NTP Context

specify PDP context by <cid>

AT+CNTPCFG Configure the HTP Context

| | |
|--|--|
| Test Command AT+CNTPCFG=? | Response +CNTPCFG: "CID",(1-n) |
| Write Command /*Configure the cid values of all clients when a connection is created*/ AT+CNTPCFG="CID"[,<cid>] | <p>OK</p> <p>Response 1) When <cid> is omitted: +CNTPCFG: "CID",<cid></p> <p>OK</p> <p>2) If the <cid> set successfully: OK</p> <p>3) If failed: ERROR</p> |

Defined Values

| | |
|-------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
|-------|--|

Examples

```
AT+CNTPCFG="CID",1
```

```
OK
```

14.2.5 AT+CNTP Update system time

This command is used to update system time with NTP server.

AT+CNTP Update system time

Test Command

```
AT+CNTP=?
```

Response

```
+CNTP: "HOST",(-96~96)
```

```
OK
```

Read Command

```
AT+CNTP?
```

Response

```
+CNTP: <host>,<timezone>
```

```
OK
```

Write Command

```
AT+CNTP=<host>[,<timezon  
e>]
```

Response

1)If successfully:

```
OK
```

2)If failed:

```
ERROR
```

Execute Command

```
AT+CNTP
```

Response

1)If successfully:

```
OK
```

```
+CNTP: <err>
```

2)If failed:

```
ERROR
```

Parameter Saving Mode

```
-
```

Max Response Time

```
-
```

Reference

Defined Values

<host>

NTP server address, length is 0-255.

<timezone>

Local time zone, the range is (-96 to 96), default value is 32.

Examples

```
AT+CNTP="120.25.115.20",32
```

```
OK
```

```
AT+CNTP
```

```
OK
```

```
+CNTP: 0
```

14.3 Command Result Codes

14.3.1 Description of <err> of HTP

| <err> | Description |
|-------|--------------------------------|
| 0 | Operation succeeded |
| 1 | Unknown error |
| 2 | Wrong parameter |
| 3 | Wrong date and time calculated |
| 4 | Network error |

14.3.2 Description of <err> of NTP

| <err> | Description |
|-------|--------------------------------|
| 0 | Operation succeeded |
| 1 | Unknown error |
| 2 | Wrong parameter |
| 3 | Wrong date and time calculated |
| 4 | Network error |
| 5 | Time zone error |
| 6 | Time out error |

15 AT Commands for TCP/IP

15.1 Overview of AT Commands for TCP/IP

| Command | Description |
|-----------------------|---|
| AT+NETOPEN | Start Socket Service |
| AT+NETCLOSE | Stop Socket Service |
| AT+CIPOPEN | Establish Connection in Multi-Socket Mode |
| AT+CIPSEND | Send data through TCP or UDP Connection |
| AT+CIPRXGET | Set the Mode to Retrieve Data |
| AT+CIPCLOSE | Close TCP or UDP Socket |
| AT+IPADDR | Inquire Socket PDP address |
| AT+CIPHEAD | Add an IP Header When Receiving Data |
| AT+CPSRIP | Show Remote IP Address and Port |
| AT+CIPMODE | Set TCP/IP Application Mode |
| AT+CIPSENDMODE | Set Sending Mode |
| AT+CPTIMEOUT | Set TCP/IP Timeout Value |
| AT+CIPCCFG | Configure Parameters of Socket |
| AT+SERVERSTART | Startup TCP Sever |
| AT+SERVERSTOP | Stop TCP Sever |
| AT+CIPACK | Query TCP Connection Data Transmitting Status |
| AT+CDNSGIP | Query the IP Address of Given Domain Name |
| AT+CSOCKSETPN | Set active PDP context's profile |
| AT+CTCPKA | Conigure TCP heartbeat |
| AT+CDNSCFG | Configure Domain Name Server |
| AT+CSOC | Set some features of the data service |
| AT+CIPCFG | Configure Parameters of Tcp |
| AT+CIPSENDSTR | Send HEX String data |
| AT+CIPSETAPN | Set up the PDP/APN channels to be used |

15.2 Detailed Description of AT Commands for TCP/IP

15.2.1 AT+NETOPEN Start Socket Service

AT+NETOPEN is used to start service by activating PDP context. You must execute AT+NETOPEN before any other TCP/UDP related operations. You can activate the specified PDP context by <cid>.

AT+NETOPEN Start Socket Service

| | |
|---|--|
| Read Command AT+NETOPEN? | Response +NETOPEN: <net_state> |
| | OK |
| | Response 1) If the PDP context has not been activated or the network closed abnormally, response: OK |
| Write Command AT+NETOPEN=<cid> /*activate the specified PDP context by <cid>*/ | +NETOPEN: <err>,<cid> 2) When the PDP context has been activated successfully, if you execute this command again, response: +IP ERROR: Network is already opened |
| | ERROR |
| | 3) other: ERROR |
| | Response 1) If the PDP context has not been activated or the network closed abnormally, response: OK |
| Execute Command AT+NETOPEN | +NETOPEN: <err> 2) When the PDP context has been activated successfully, if you execute AT+NETOPEN again, response: +IP ERROR: Network is already opened |
| | ERROR |
| | 3) other: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | Range: 3000ms-120000ms default: 120000ms |

| | |
|-----------|----------------------------------|
| | (it can be set by AT+CIPTIMEOUT) |
| Reference | 3GPP TS 27.005 |

Defined Values

| | |
|-------------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
| <net_state> | Integer type, indicates the state of PDP context activation. 0 network close (deactivated) 1 network open(activated) |
| <err> | Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 15.3.2 for details |

Examples

AT+NETOPEN?

+NETOPEN: 1

OK

AT+NETOPEN

OK

+NETOPEN: 0

AT+NETOPEN=1

OK

+NETOPEN: 0,1

15.2.2 AT+NETCLOSE Stop Socket Service

AT+NETCLOSE is used to stop service by deactivating PDP context. It can also close all the opened socket connections when you didn't close these connections by AT+CIPCLOSE. You can deactivate the specified PDP context by <cid>.

AT+NETCLOSE Stop Socket Service

| | |
|----------------------|-----------|
| Test Command | Response |
| AT+NETCLOSE=? | OK |
| Write Command | Response |

AT+NETCLOSE=<cid>

/*deactivate the specified PDP context by <cid>*/

1)If the PDP context has been activated, response:

OK

+NETCLOSE: <err>,<cid>

2)If the PDP context has been activated and one connection is in non-transparent mode when service type is TCP, response:

OK

+CIPCLOSE: <link_num>,<err>

+NETCLOSE: <err>,<cid>

3)If the PDP context has been activated and one connection is in transparent mode when service type is TCP, response:

OK

CLOSED

+CIPCLOSE: <link_num>,<err>

+NETCLOSE: <err>,<cid>

4)If the PDP context has been activated and one connection is in non-transparent mode when service type is UDP, response:

+CIPCLOSE: <link_num>,<err>

OK

+NETCLOSE: <err>,<cid>

5)If the PDP context has been activated and one connection is in transparent mode when service type is UDP, response:

CLOSED

+CIPCLOSE: <link_num>,<err>

OK

+NETCLOSE: <err>,<cid>

6)If the PDP context has not been activated, response:

+NETCLOSE: <err>,<cid>

ERROR

7)Others:

ERROR

Response

1)If the PDP context has been activated, response:

OK

Execute Command

AT+NETCLOSE

+NETCLOSE: <err>

2) If the PDP context has been activated and one connection is in non-transparent mode when service type is TCP, response:

OK

+CIPCLOSE: <link_num>,<err>

+NETCLOSE: <err>

3) If the PDP context has been activated and one connection is in transparent mode when service type is TCP, response:

OK

CLOSED

+CIPCLOSE: <link_num>,<err>

+NETCLOSE: <err>

4) If the PDP context has been activated and one connection is in non-transparent mode when service type is UDP, response:

+CIPCLOSE: <link_num>,<err>

OK

+NETCLOSE: <err>

5) If the PDP context has been activated and one connection is in transparent mode when service type is UDP, response:

CLOSED

+CIPCLOSE: <link_num>,<err>

OK

+NETCLOSE: <err>

6) If the PDP context has not been activated, response:

+NETCLOSE: <err>

ERROR

7) Others:

ERROR

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
|-----------------------|---------|

| | |
|-------------------|---|
| Max Response Time | Range: 3000ms-120000ms default: 120000ms (it can be set by AT+CIPTIMEOUT) |
|-------------------|---|

| | |
|-----------|--|
| Reference | |
|-----------|--|

Defined Values

| | |
|-------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
| <err> | Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 15.3.2 for details |

Examples

```
AT+NETCLOSE
OK

+NETCLOSE: 0
AT+ NETCLOSE =1
OK

+NETCLOSE: 0,1
```

15.2.3 AT+CIOPEN Establish Connection in Multi-Socket Mode

You can use AT+CIOPEN to establish a connection with TCP server and UDP server, the maximum of the connections is 10.

Note: If there is other service working in transparent mode, it is not allowed setup transparent connection by cipopen cmd.

AT+CIOPEN Establish Connection in Multi-Socket Mode

| | |
|------------------------------------|--|
| Test Command AT+CIOPEN=? | Response +CIOPEN: (0-9),("TCP","UDP","UDP SERVER") |
| | OK |
| Read Command AT+CIOPEN? | Response +CIOPEN: <link_num>[,<type>,<serverIP>,<serverPort>,<index>] +CIOPEN: <link_num>[,<type>,<serverIP>,<serverPort>,<index>] [...] |
| | OK |

If a connection identified by <link_num> has not been established successfully, only +CIPOEN: <link_num> will be returned.

Response

1)if PDP context has been activated successfully, response:

OK

+CIPOEN: <link_num>,<err>

2)when the <link_num> is greater than 9, response:

+IP ERROR: Invalid parameter

ERROR

3)If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or when AT+CIPMODE=1 is set, the <link_num> is greater than 0, or other errors, response:

+CIPOEN: <link_num>,<err>

ERROR

4)Transparent mode for TCP connection:

When you want to use transparent mode to transmit data, you should set AT+CIPMODE=1 before AT+NETOPEN. And if AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0. if success

CONNECT [<text>]

if failure

CONNECT FAIL

5)Others:

ERROR

1)If PDP context has been activated successfully, response:

+CIPOEN: <link_num>,0

OK

2)When the <link_num> is greater than 9, response:

+IP ERROR: Invalid parameter

Write Command
TCP connection

AT+CIPOEN=<link_num>,"TCP",<serverIP>,<serverPort>[,<localPort>]

Write Command
UDP Connection

AT+CIPOEN=<link_num>,"UDP",,<localPort>

ERROR

3)If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or other errors, response:

+CIPOEN: <link_num>,<err>

ERROR

4)Transparent mode for UDP connection:

When you want to use transparent mode to transmit UDP data, you should set AT+CIPMODE=1 before AT+NETOPEN. And if

| | |
|---|---|
| | <p>AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0. <serverIP> and <serverPort> should be set if AT+CIPMODE=1.</p> <p>If success CONNECT [<text>]</p> <p>if failure CONNECT FAIL</p> <p>5)Others: ERROR</p> |
| Write Command UDP server Connection AT+CIOPEN=<link_num>,"UD P SERVER",,,<localPort> | <p>1)If PDP context has been activated successfully, response: +CIOPEN: <link_num>,0</p> <p>OK</p> <p>2)When the <link_num> is greater than 9, response: +IP ERROR: Invalid parameter</p> <p>ERROR</p> <p>3)If PDP context has not been activated, or the connection has been established, or parameter is incorrect, or other errors, response: +CIOPEN: <link_num>,<err></p> <p>ERROR</p> <p>4)Others: ERROR</p> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | Range: 3000ms-120000ms default: 120000ms (it can be set by AT+CIPTIMEOUT) |
| Reference | |

Defined Values

| | |
|------------|---|
| <link_num> | Integer type, identifies a connection. Range is 0-9. If AT+CIPMODE=1 is set, the <link_num> is restricted to be only 0. |
| <type> | String type, identifies the type of transmission protocol. TCP Transmission Control Protocol UDP User Datagram Protocol UDP SERVER User Datagram Protocol service (Only ASR1603_011_042 version SDK supports UDP SERVER) |
| <serverIP> | String type, identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point, like "AAA.BBB.CCC.DDD". Also the domain name is supported here. |

| | |
|--------------|---|
| <serverPort> | Integer type, identifies the port of TCP server, range is 0-65535. NOTE: When open port as TCP, the port must be the opened TCP port; When open port as UDP, the port may be any port. |
| <localPort> | Integer type, identifies the port of local socket, range is 0-65535. |
| <index> | Integer type, indicates whether the module is used as a client or server. When used as server, the range is 0-3,<index> is the server index to which the client is linked. -1 TCP client 0-3 TCP server index |
| <text> | String type, baud rate, indicates CONNECT result code. |
| <err> | Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 15.3.2 for details |

Examples

AT+CIOPEN=?

+CIOPEN: (0-9),("TCP","UDP","UDP SERVER")

OK

AT+CIOPEN?

+CIOPEN: 0

+CIOPEN: 1,"TCP","183.230.174.137",6031,-1

+CIOPEN: 2

+CIOPEN: 3

+CIOPEN: 4

+CIOPEN: 5,"UDP","183.230.174.137",6031,-1

+CIOPEN: 6

+CIOPEN: 7

+CIOPEN: 8

+CIOPEN: 9

OK

AT+CIOPEN=0,"TCP","183.230.174.137",6031

OK //TCP connection

+CIOPEN: 0,0

AT+CIOPEN=5,"UDP",,6031

+CIOPEN: 5,0 // UDP Connection

OK

//UDP server connection

AT+CIOPEN=2,"UDP SERVER",,8888

+CIOPEN: 2,0

OK

15.2.4 AT+CIPSEND Send data through TCP or UDP Connection

AT+CIPSEND is used to send data to remote side. If service type is TCP, the data is firstly sent to the module's internal TCP/IP stack, and then sent to server by protocol stack. The <length> field may be empty. While it is empty, each <Ctrl+Z> character present in the data should be coded as <ETX><Ctrl+Z>. Each <ESC> character present in the data should be coded as <ETX><ESC>. Each <ETX> character will be coded as <ETX><ETX>. Single <Ctrl+Z> means end of the input data. Single <ESC> is used to cancel the sending.

<ETX> is 0x03, and <Ctrl+Z> is 0x1A,<ESC> is 0x1B.

AT+CIPSEND Send data through TCP or UDP Connection

| | |
|--|---|
| Test Command AT+CIPSEND=? | Response +CIPSEND: (0-9),(1-1500) |
| Read Command AT+CIPSEND? | Response OK |
| Write Command If service type is "TCP", send data with changeable length AT+CIPSEND=<link_num> | <p>Response OK</p> <p>1)If the connection identified by <link_num> has been established successfully, response: > <input data> CTRL+Z OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength> If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully.</p> <p>2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR</p> <p>3)Others: ERROR</p> |
| Write Command If service type is "TCP", send data with fixed length AT+CIPSEND=<link_num>,<len> | <p>Response 1)If the connection identified by <link_num> has been established successfully, response: ></p> |

| | |
|--|--|
| <p>gth></p> | <p><input data with specified length> OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength> If <reqSendLength> is equal <cnfSendLength>, it means that the data has been sent to TCP/IP protocol stack successfully. 2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR 3)Others: ERROR</p> |
| <p>Write Command If service type is "UDP", send data with changeable length</p> <p>AT+CIPSEND=<link_num>,,<serverIP>,<serverPort></p> <p>Response ">", then type data to send, tap CTRL+Z to send data, tap ESC to cancel the operation</p> | <p>Response 1)If the connection identified by <link_num> has been established successfully, response: > <input data> CTRL+Z OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength></p> <p>2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR 3)Others: ERROR</p> |
| <p>Write Command If service type is "UDP", send data with fixed length</p> <p>AT+CIPSEND=<link_num>,<length>,<serverIP>,<serverPort></p> <p>Response ">", type data until the data length is equal to <length></p> | <p>Response 1)If the connection identified by <link_num> has been established successfully, response: > <input data with specified length> OK</p> <p>+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength></p> <p>2)If the connection has not been established, abnormally closed, or parameter is incorrect, response: +CIPERROR: <err></p> <p>ERROR 3)Others: ERROR</p> |

| | |
|-----------------------|--|
| Parameter Saving Mode | NO_SAVE Range: 3000ms-120000ms default: 120000ms (it can be set by AT+CIPTIMEOUT) |
| Max Response Time | |
| Reference | |

Defined Values

| | |
|-----------------|--|
| <link_num> | Integer type, identifies a connection. Range is 0-9. |
| <length> | Integer type, indicates the length of sending data, range is 1-1500. |
| <serverIP> | String type, identifies the IP address of server. The IP address format consists of 4 octets, separated by decimal point, like "AAA.BBB.CCC.DDD". Also the domain name is supported here. |
| <serverPort> | Integer type, identifies the port of TCP server, range is 0-65535. NOTE: When open port as TCP, the port must be the opened TCP port; When open port as UDP, the port may be any port. |
| <reqSendLength> | Integer type, the length of the data requested to be sent |
| <cnfSendLength> | Integer type, the length of the data confirmed to have been sent -1 the connection is disconnected. 0 own send buffer or other side's congestion window are full. Note: If the <cnfSendLength> is not equal to the <reqSendLength>, the socket then cannot be used further. |
| <err> | Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 15.3.2 for details |

Examples

AT+CIPSEND=?

+CIPSEND: (0-9),(1-1500)

OK

AT+CIPSEND=1,5

>12345

// If service type is "TCP", send data with fixed length

OK

+CIPSEND: 1,5,5

AT+CIPSEND=8,5,"183.230.174.137",6031

>12345

// If service type is "UDP", send data with fixed length

OK

+CIPSEND: 8,5,5

NOTE

If you use UDP to send more than 1400 bytes of data when the server does not receive data, this may be the reason for the carrier, in this case please send no more than 1400 bytes of data.

If you use TCP to send data, the instruction can be followed by a comma just like "AT+CIPSEND=0," or "AT+CIPSEND=0,10," without an error, but it doesn't make any sense

15.2.5 AT+CIPRXGET Set the Mode to Retrieve Data

If set <mode> to 1, after receiving data, the module will buffer it and report a URC as "+CIPRXGET: 1,<link_num>" to notify the host. Then host can retrieve data by AT+CIPRXGET.

If set <mode> to 0, the received data will be outputted to COM port directly by URC as "RECV FROM:<IP ADDRESS>:<PORT><CR><LF>+IPD(data length)<CR><LF><data>".

The default value of <mode> is 0.

Note:

1. If the buffer is not empty, and the module receives data again, then it will not report a new URC until all the received data has been retrieved by AT+CIPRXGET from buffer.
2. When <mode> is set to 1 and the 2-4 mode will take effect.

If initially set <mode> to 1, after doing some data transmitting, set <mode> to 0, then the buffered data of the previously established connection will be output to the serial port directly, and the maximum length of output data at one time is 1500.

AT+CIPRXGET Set the Mode to Retrieve Data

Test Command Response
AT+CIPRXGET=? +CIPRXGET: (0-5),(0-9),(1-1500)

Read Command Response
AT+CIPRXGET? OK

Write Command Response
AT+CIPRXGET=<mode> 1)If the parameter is correct, response:
OK

In this case, <mode> can only be 0
or 1 2)If the parameter is incorrect or other error, response:

+IP ERROR: <err_info>

ERROR

3)Others:

ERROR

1)If <len> field is empty, the default value to read is 1500.

If the buffer is not empty, response:

+CIPRXGET: <mode>,<link_num>,<read_len>,<rest_len>
<data>ACSI form

OK

2)If the buffer is empty, response:

+IP ERROR: No data

Write Command

AT+CIPRXGET=2,<link_num>[,<len>]

Retrieve data in ACSI form

ERROR

3)If the parameter is incorrect or other error, response:

+IP ERROR: <err_info>

ERROR

4)Others:

ERROR

Response

1)If <length> field is empty, the default value to read is 750.

If the buffer is not empty, response:

+CIPRXGET: <mode>,<link_num>,<read_len>,<rest_len>
<data>hex form

OK

2)If the buffer is empty, response:

+IP ERROR: No data

Write Command

AT+CIPRXGET=3,<link_num>[,<len>]

Retrieve data in hex form

ERROR

3)If the parameter is incorrect or other error, response:

+IP ERROR: <err_info>

ERROR

4)Others:

ERROR

Response

1)If the parameter is correct, response:

+CIPRXGET: 4,<link_num>,<rest_len>

OK

2)If the parameter is incorrect or other error, response:

+IP ERROR: <err_info>

Write Command

AT+CIPRXGET=4,<link_num>

| | |
|---------------------------------------|--|
| | ERROR 3)Others ERROR Response 1)If the parameter is correct, response: OK 2)If the parameter is incorrect or other error, response: +IP ERROR: <err_info> |
| Write Command AT+CIPRXGET=5 | |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9s |
| Reference | |

Defined Values

| | |
|-------------------------|--|
| <mode> | Integer type, sets the mode to retrieve data 0 set the way to get the network data automatically 1 set the way to get the network data manually 2 read data, the max read length is 1500 3 read data in HEX form, the max read length is 750 4 get the rest data length 5 add IP header reporting based on mode=1, the format is +CIPRXGETIP:<ip>:<port> (Only ASR1603_011_042 version SDK supports 5) |
| <link_num> | Integer type, identifies a connection. Range is 0-9. |
| <len> | Integer type, the data length to be read. Not required, the default value is 1500 when <mode>=2, and 750 when <mode>=3. |
| <read_len> | Integer type, the length of data that has been read. |
| <rest_len> | Integer type, the length of data which has not been read in the buffer. |
| <err_info> | String type, displays the cause of occurring error, please refer to Chapter 15.3.1 for more details. |

Examples

```
AT+CIPRXGET=?
+CIPRXGET: (0-5),(0-9),(1-1500)
```

OK

```
AT+CIPRXGET?
+CIPRXGET: 1
```

OK
AT+CIPRXGET=1
OK
AT+CIPRXGET=2,0
+CIPRXGET: 2,0,6,0
123456

OK
AT+CIPRXGET=3,0
+CIPRXGET: 3,0,6,0
313233343536

OK
AT+CIPRXGET=4,0
+CIPRXGET: 4,0,18

OK
AT+CIPRXGET=5
OK

NOTE

1. When data is received and reported, the maximum length of <data length> is 1500 each time.
2. When AT+CIPRXGET=1, if multiple tcp/udp connections are connected and the server is sending data all the time, it is necessary to read the data sent by the server in time.

15.2.6 AT+CIPCLOSE Close TCP or UDP Socket

AT+CIPCLOSE is used to close a TCP or UDP Socket

AT+CIPCLOSE Close TCP or UDP Socket

Response

Test Command **+CIPCLOSE: (0-9)**
AT+CIPCLOSE=?

OK

Response

Read Command **+CIPCLOSE:**
AT+CIPCLOSE? <link0_state>,<link1_state>,<link2_state>,<link3_state>,<link4_state>,<link5_state>,<link6_state>,<link7_state>,<link8_state>,<link9_state>

OK

Response

1) If service type is TCP and the connection identified by <link_num> has been established, response

OK

+CIPCLOSE: <link_num>,<err>

2) If service type is TCP and the access mode is transparent mode, response:

OK

CLOSED

+CIPCLOSE: <link_num>,<err>

3) If service type is UDP and the connection identified by <link_num> has been established and closed successfully, response:

+CIPCLOSE: <link_num>,0

OK

4) If service type is UDP and access mode is transparent mode, response:

CLOSED

+CIPCLOSE: <link_num>,<err>

OK

5) If the connection has not been established, abnormally closed, or parameter is incorrect, response:

+CIPCLOSE: <link_num>,<err>

ERROR

6) Others:

ERROR

Write Command

AT+CIPCLOSE=<link_num>

Parameter Saving Mode

NO_SAVE

Max Response Time

Range: 3000ms-120000ms

default: 120000ms

(it can be set by AT+CIPTIMEOUT)

Reference

Defined Values

<link_num>

Integer type, identifies a connection. Range is 0-9.

| | |
|---------------|--|
| <linkX_state> | Integer type, indicates state of connection identified by <link_num>. Range is 0-1. 0 disconnected 1 connected |
| <err> | Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 15.3.2 for details |

Examples

AT+CIPCLOSE=?

+CIPCLOSE: (0-9)

OK

AT+CIPCLOSE?

+CIPCLOSE: 0,0,0,0,0,1,0,0,1,0

OK

AT+CIPCLOSE=0

OK

+CIPCLOSE: 0,0

15.2.7 AT+IPADDR Inquire Socket PDP address

AT+IPADDR is used to get active PDP address.

AT+IPADDR Inquire Socket PDP Address

Test Command

AT+IPADDR=?

Response

OK

Response

1) If PDP context has been activated successfully, response

+IPADDR: <ip_address>

Execute Command

AT+IPADDR

OK

2)

+IP ERROR: Network not opened

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

default: 9000ms

Reference

-

Defined Values

| | |
|--------------|--|
| <ip_address> | String type, identifies the IP address of current active socket PDP. |
|--------------|--|

Examples

```
AT+IPADDR
+IPADDR: 10.84.17.161

OK
```

15.2.8 AT+CIPHEAD Add an IP Header When Receiving Data

AT+CIPHEAD is used to add an IP header when receiving data.

AT+CIPHEAD Add an IP Header When Receiving Data

| | |
|---|---|
| Test Command AT+CIPHEAD=? | Response +CIPHEAD: (0-1) |
| Read Command AT+CIPHEAD? | OK |
| Write Command AT+CIPHEAD=<mode> | Response +CIPHEAD: <mode> |
| Execute Command AT+CIPHEAD | OK |
| Parameter Saving Mode | Response Set default value:(<mode>=1) |
| Max Response Time | OK |
| Reference | default: 9000ms |
| | - |

Defined Values

| | |
|---------------------|---|
| <mode> | Integer type, indicates whether adding an IP header or not when receiving data 0 not add IP header 1 add IP header, the format is "+IPD(data length)" |
|---------------------|---|

Examples

```
AT+CIPHEAD=?  
+CIPHEAD: (0-1)
```

OK

```
AT+CIPHEAD?  
+CIPHEAD: 1
```

OK

```
AT+CIPHEAD=1  
OK  
AT+CIPHEAD  
OK
```

15.2.9 AT+CIPSRIP Show Remote IP Address and Port

AT+CIPSRIP is used to set whether to display IP address and port of server when receiving data.

AT+CIPSRIP Show Remote IP Address and Port

| | |
|--------------------------------|--|
| Test Command | Response +CIPSRIP: (0-1) |
| AT+CIPSRIP=? | OK |
| Read Command | Response +CIPSRIP: <mode> |
| AT+CIPSRIP? | OK |
| Write Command | Response 1)If the parameter is correct, response: OK 2) ERROR |
| AT+CIPSRIP=<mode> | |
| Execute Command | Response Set default value:(<mode>=1) |
| AT+CIPSRIP | |

| OK | |
|-----------------------|-----------------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | default: 9000ms |
| Reference | - |

Defined Values

| | |
|--------|---|
| <mode> | Integer type, indicates whether to show IP address and port of server or not when receiving data. 0 not show 1 show, the format is as follows: "RECV FROM:<IP ADDRESS>:<PORT>" |
|--------|---|

Examples

```
AT+CPSRIP=?  
+CPSRIP: (0-1)
```

OK

```
AT+CPSRIP?  
+CPSRIP: 1
```

OK

```
AT+CPSRIP=0  
OK  
AT+CPSRIP  
OK
```

15.2.10 AT+CIPMODE Set TCP/IP Application Mode

AT+CIPMODE is used to select transparent mode(data mode) or non-transparent mode(command mode).The default mode is non-transparent mode.

| AT+CIPMODE Set TCP/IP Application Mode | |
|---|---|
| Test Command | Response +CIPMODE: (0-1) |
| AT+CIPMODE=? | OK |
| Read Command | Response +CIPMODE: <mode> |

| | |
|---|--|
| | OK |
| Write Command AT+CIPMODE=<mode> | <p>Response</p> <p>1)If the parameter is correct, response:</p> OK <p>2)</p> ERROR |
| Execute Command AT+CIPMODE | <p>Response</p> <p>1)Set default value:(<mode>=0)</p> OK <p>2)If failed:</p> ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | default: 9000ms |
| Reference | - |

Defined Values

| | |
|---------------------|--|
| <mode> | Integer type, sets TCP/IP application mode |
| 0 | Non transparent mode |
| 1 | Transparent mode |

Examples

```
AT+CIPMODE=?
+CIPMODE: (0-1)
```

```
OK
AT+CIPMODE?
+CIPMODE: 0
```

```
OK
AT+CIPMODE=1
OK
AT+CIPMODE
OK
```

NOTE

When you want to use transparent mode to transmit data, you should set AT+CIPMODE=1 before AT+NETOPEN.

15.2.11 AT+CIPSENDMODE Set Sending Mode

AT+CIPSENDMODE is used to select sending mode when service type is "TCP".

If set <mode> to 1, when sending data by AT+CIPSEND, the URC "+CIPSEND:

<link_num>,<reqSendLength>,<cnfSendLength>" will not be returned until module receives the server's ACK message to the sent data last time.

If set <mode> to 0, the URC "+CIPSEND: <link_num>,<reqSendLength>,<cnfSendLength>" will be returned If the data has been sent to module's internal TCP/IP protocol stack. In this case, the module doesn't need to wait for the server's ACK message.

The default mode is sending without waiting peer TCP ACK mode.

AT+CIPSENDMODE Set Sending Mode

| | |
|---|---|
| Test Command AT+CIPSENDMODE=? | Response +CIPSENDMODE: (0-1) |
| | OK |
| Read Command AT+CIPSENDMODE? | Response +CIPSENDMODE: <mode> |
| | OK |
| Write Command AT+CIPSENDMODE=<mode> | Response 1)If the parameter is correct, response: OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | default: 9000ms |
| Reference | - |

Defined Values

| | |
|---------------------|--|
| <mode> | Integer type, sets sending mode 0 sending without waiting peer TCP ACK mode 1 sending wait peer TCP ACK mode |
|---------------------|--|

Examples

```
AT+CIPSENDMODE=?
+CIPSENDMODE: (0-1)
```

```

OK
AT+CIPSENDMODE=1
OK
AT+CIPSENDMODE?
+CIPSENDMODE: 1

OK

```

15.2.12 AT+CIPTIMEOUT Set TCP/IP Timeout Value

AT+CIPTIMEOUT is used to set timeout value for AT+NETOPEN/AT+CIPOEN/AT+CIPSEND.

AT+CIPTIMEOUT Set TCP/IP Timeout Value

Read Command

AT+CIPTIMEOUT?

Response

+CIPTIMEOUT:

<netopen_timeout>,<cipopen_timeout>,<cipsend_timeout>

OK

Response

1) If the parameter is correct, response:

OK

2)

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

default: 9000ms

Reference

-

Defined Values

| | |
|-------------------|---|
| <netopen_timeout> | Integer type, timeout value for AT+NETOPEN. default is 120000ms. Range is 3000ms-120000ms. |
| <cipopen_timeout> | Integer type, timeout value for AT+CIPOEN. default is 120000ms. Range is 3000ms-120000ms. |
| <cipsend_timeout> | Integer type, timeout value for AT+CIPSEND. default is 120000ms. Range is 3000ms-120000ms. |

Examples

AT+CIPTIMEOUT?

+CIPTIMEOUT: 120000,120000,120000

OK
AT+CIPTIMEOUT=3000,3000,3000
OK

15.2.13 AT+CIPCCFG Configure Parameters of Socket

AT+CIPCCFG is used to configure parameters of socket.

AT+CIPCCFG Configure Parameters of Socket

Defined Values

| | |
|------------------------|---|
| <NmRetry> | Integer type, number of retransmission to be made for an IP packet. Range is 0-10. The default value is 10. |
| <DelayTm> | Integer type, number of milliseconds to delay to output data of Receiving. Range is 0-1000. The default value is 0. |
| <Ack> | Integer type, it can only be set to 0. It's used to be compatible with |

| | |
|---------------|--|
| | old TCP/IP command set. |
| <errMode> | Integer type, sets mode of reporting <err_info>, default value is 1. 0 error result code with numeric values 1 error result code with string values |
| <HeaderType> | Integer type, select which data header is used when receiving data, it only takes effect in multi-client mode. Default value is 0. 0 add data header, the format is "+IPD<data length>" 1 add data header, the format is "+RECEIVE,<link num>,<data length>" |
| <AsyncMode> | Integer type, range is 0-1. Default value is 0. It's used to be compatible with old TCP/IP command set. |
| <TimeoutVal> | Integer type, set the minimum retransmission timeout value for TCP connection. Range is 500ms-120000ms. Default is 500ms. |
| <udpRecvmode> | Integer type, range is 0-1. Default value is 0. Used to set the mode of udp cache receiving data. This parameter must be set before AT+NETOPEN. 0 Receive by buf 1 Receive by package (Only ASR1603_011_042 version SDK supports this parameter) |

Examples

AT+CIPCCFG=?

+CIPCCFG: (0-10),(0-1000),(0),(0-1),(0-1),(0-1),(500-120000),(0-1)

OK

AT+CIPCCFG?

+CIPCCFG: 10,0,0,1,0,0,500,0

OK

AT+CIPCCFG=2

OK

AT+CIPCCFG

OK

15.2.14 AT+SERVERSTART Startup TCP Sever

AT+SERVERSTART is used to startup a TCP server, and the server can receive the request of TCP client. After the command executes successfully, an unsolicited result code is returned when a client tries to connect with module and module accepts request. The unsolicited result code is +CLIENT:<link_num>,<server_index>,<client_IP>:<port>.

AT+SERVERSTART Startup TCP Sever

Test Command

AT+SERVERSTART=?

Response

+SERVERSTART: (0-65535),(0-3)

OK

Response

1) If the PDP context has not been activated successfully, response:

+CIPERROR: <err>

Read Command

AT+SERVERSTART?

ERROR

2) If there exists opened server, response:

**[+SERVERSTART: <server_index>,<port>
...]**

OK

3) Others:

ERROR

Write Command

AT+SERVERSTART=<port>,<server_index>[,<backlog>]

Response

1) If there is no error, response:

OK

2) If the PDP context has not been activated, or the server identified by <server_index> has been opened, or the parameter is not correct, or other errors, response:

+CIPERROR: <err>

ERROR

3) Others:

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

default: 9000ms

Reference

-

Defined Values

| | |
|-----------------------------|---|
| <port> | Integer type, identifies the listening port of module when used as a TCP server. Range is 0-65535. |
| <server_index> | Integer type, the TCP server index, range is 0-3. |
| <backlog> | Integer type, the maximum connections can be queued in listening queue. Range is 1-3. Default is 3. |

Examples

AT+SERVERSTART=?

+SERVERSTART: (0-65535),(0-3)

OK

AT+SERVERSTART?

OK

AT+SERVERSTART=8080,0

OK

15.2.15 AT+SERVERSTOP Stop TCP Sever

AT+SERVERSTOP is used to stop TCP server. Before stopping a TCP server, all sockets <server_index> of which equals to the closing TCP server index must be closed first.

AT+SERVERSTOP Stop TCP Sever

Response

1)If there exists open connection with the server identified by <server_index>, or the server identified by <server_index> has not been opened, or the parameter is incorrect, response:

+SERVERSTOP: <server_index>,<err>

ERROR

2)If the server socket is closed immediately, response:

+SERVERSTOP: <server_index>,0

OK

(In general, the result is shown as below.)

3)If the server socket starts to close, response:

OK

+SERVERSTOP: <server_index>,<err>

4)Others:

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

default: 9000ms

Reference

-

Defined Values

<server_index> Integer type, the TCP server index, range is 0-3.

<err> Integer type, the result of operation.

0 is success, other value is failure, please refer to Chapter 15.3.2 for details

Examples

AT+SERVERSTOP=0

OK

+SERVERSTOP: 0,0

15.2.16 AT+CIPACK Query TCP Connection Data Transmitting Status

AT+CIPACK is used to query TCP connection data transmitting status.

AT+CIPACK Query Connection Data Transmitting State

Test Command

AT+CIPACK=?

Response

+CIPACK: (range of supported <link_num>s)

OK

Response

1)If the PDP context has not been activated, or the connection identified by <link_num> has not been established, abnormally closed, or the parameter is incorrect, or other errors, response:

+IP ERROR: <err_info>

Write Command

AT+CIPACK=<link_num>

ERROR

2)If the connection has been established, and the service type is "TCP", response:

+CIPACK: <sent_data_size>,<ack_data_size>,<recv_data_size>

OK

Parameter Saving Mode

NO_SAVE

Max Response Time

default: 9000ms

Reference

-

Defined Values

| | |
|-------------------------------|--|
| <link_num> | Integer type, identifies a connection. Range is 0-9. |
| <sent_data_size> | Integer type, the total length of sent data |
| <ack_data_size> | Integer type, the total length of acknowledged data. |
| <recv_data_size> | Integer type, the total length of received data |

| | |
|------------|--|
| <err> | Integer type, the result of operation. 0 is success, other value is failure, please refer to Chapter 15.3.2 for details |
| <err_info> | String type, displays the cause of occurring error, please refer to Chapter 3 for details. |

Examples

AT+CIPACK=?

+CIPACK: (0-9)

OK

AT+CIPACK=0

+CIPACK: 10,10,5

OK

15.2.17 AT+CDNSGIP Query the IP Address of Given Domain Name

AT+CDNSGIP is used to query the IP address of given domain name.

AT+CDNSGIP Query the IP Address of Given Domain Name

Test Command

AT+CDNSGIP=?

Response

OK

Response

1)If the given domain name has related IP, response:

+CDNSGIP: 1,<domain name>,<IP address>

+CDNSGIP: 2,<domain name>,<IP address>

[...]

Write Command

AT+CDNSGIP=<domain name>

OK

2)If the given name has no related IP, response:

+CDNSGIP: 0,<dns error code>

ERROR

3)Others:

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

default: 6s

Reference

-

Defined Values

| | |
|-------------------------------|--|
| <domain name> | String type (string should be included in quotation marks), indicates the domain name. The maximum length of domain name is 254. Valid characters allowed in the domain name area include a-z, A-Z, 0-9, "-" (hyphen)and ". ". A domain name is made up of one label name or more label names separated by "." (eg: AT+CDNSGIP="aa.bb.cc"). For label names separated by ".", length of each label must be no more than 63 characters. The beginning character of the domain name and of labels should be an alphanumeric character. |
| <IP address> | String type, indicates the IP address corresponding to the domain name. |
| <dns error code> | Integer type, indicates the error code. 10 DNS GENERAL ERROR |

Examples

AT+CDNSGIP=?

OK

AT+CDNSGIP="www.baidu.com"

+CDNSGIP: 1,"www.baidu.com","61.135.169.121"

OK

15.2.18 AT+C SOCKSETPN Set active PDP context's profile

This command sets default active PDP context's profile number and type. When we activate PDP by using AT+NETOPEN command, we need use the default profile number and type.,and the context of this profile is set by AT+CGDCONT command.

AT+C SOCKSETPN Set acitive PDP context's profile

| | |
|--------------------------------------|--|
| Test Command | Response +C SOCKSETPN: 1,(1,6) |
| AT+C SOCKSETPN=? | OK |
| Read Command | Response +C SOCKSETPN: <profile_num>,<ip_family> |
| AT+C SOCKSETPN? | OK |
| Write Command | Response 1)If the parameter is correct, response: |
| AT+C SOCKSETPN=<profile_nu | |

| | |
|----------------------------------|---|
| m>[,<ip_family>] | OK 2)If the parameter is wrong, or NETOPEN is already active, response: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Maximum Response Time | default: 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------|--|
| <profile_num> | Packet Data Protocol context's profile number. Range is 1-6. |
| <ip_family> | Packet Data Protocol type 1 IPV4 6 IPV6 |

NOTE

The A7600 series(1601) cannot change the configuration file number of the PDP context; <profile_num> can only be set to 1.

Examples

```
AT+C SOCKSETPN=?  
+C SOCKSETPN: 1,(1,6)
```

OK

```
AT+C SOCKSETPN?  
+C SOCKSETPN: 1,1
```

OK

```
AT+C SOCKSETPN=1,6  
OK
```

15.2.19 AT+CTCPKA Configure TCP heartbeat

This command is used to set TCP heartbeat parameters. Set this up after we activate PDP by using AT+NETOPEN command.

AT+CTCPKA Configure TCP heartbeat

| | |
|---|---|
| Test Command AT+CTCPKA=? | Response OK |
| Read Command AT+CTCPKA? | Response +CTCPKA: <keepalive>,<keepidle>,<keepcount>,<keepinterval> |
| | OK |
| Write Command AT+CTCPKA=<keepalive>,<keepidle>,<keepcount>[,<keepinterval>] | Response 1) If successfully: OK 2) If failed: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Maximum Response Time | default: 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|---|
| <keepalive > | Set TCP keepalive option. 0 Disable TCP keep alive mechanism 1 Enable TCP keep alive mechanism |
| <keepidle> | The unit is minute. If there is no data interaction within this period, the probe is performed. (1-120) |
| <keepcount> | Number of probe retries. If all times out, the connection is considered Invalid.(1-10) |
| <keepinterval> | The unit is minute. Interval for sending probe packets during probe. (1-100) |

Examples

```
AT+CTCPKA=1,2,5,1
```

OK

```
AT+CTCPKA?
```

```
+CTCPKA: 1,2,5,1
```

OK

15.2.20 AT+CDNSCFG Configure Domain Name Server

This command is used to configure Domain Name Server.

AT+CDNSCFG Configure Domain Name Server

| | |
|---|--|
| Test Command AT+CDNSCFG=? | Response +CDNSCFG: ("Primary DNS"),("Secondary DNS"),type |
| | OK |
| Read Command AT+CDNSCFG? | Response 1)If successfully: Primary IPv4 DNS: <pri_dns>,Secondary IPv4 DNS: <pri_dns> Primary IPv6 DNS: <pri_dns>,Secondary IPv6 DNS: <pri_dns> |
| | OK 2)If failed: ERROR |
| Write Command AT+CDNSCFG=<pri_dns>[,<sec_dns>][,<type>] | Response 1)If successfully: OK 2)If failed: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Maximum Response Time | default: 9000ms |
| Reference | - |

Defined Values

| | |
|------------------------|--|
| <pri_dns> | A string parameter which indicates the IP address of the primary domain name server. |
| <sec_dns> | A string parameter which indicates the IP address of the secondary domain name server. |
| <type> | 0 Set the server for the ipv4 network 1 Set the server for the ipv6 network |

Examples

```
AT+CDNSCFG?
Primary IPv4 DNS: 183.230.126.224,Secondary IPv4
DNS: 183.230.126.225
Primary IPv6 DNS: 2409:8060:20EA:101::1,Secondary
IPv6 DNS: 2409:8060:20EA:201::1
```

```
OK
AT+CDNSCFG=183.230.126.224,183.230.126.225,0
OK
```

15.2.21 AT+CSOC Set some features of the data service

This command is used to set some features of the data service. Only supports in Cat1 modules.

AT+CSOC Set some features of the data service

| | |
|---|---|
| Test Command AT+CSOC=? | Response OK |
| Read Command AT+CSOC? | Response +CSOC: "Tcp srxt",<srxt>,<tcp_sync_backoff> +CSOC: "Tcp rxt",<rxt>,<tcp_backoff> +CSOC: "Mss",<mtu> +CSOC: "RecvWin",<win> +CSOC: "DnsTmr",<dnsMaxWaitTime>,<dnsMaxRetry>,<dns_wait_tmr> +CSOC: "SendWin",<send_win> |
| Write Command AT+CSOC="Tcp srxt",<tcp_sync_backoff> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+CSOC="Tcp rxt",<tcp_backoff> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+CSOC="Mss",<mtu> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+CSOC="RecvWin",<win> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+CSOC="DnsTmr",<dns_wait_tmr> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |

| | |
|--|---|
| Write Command AT+CSOC="SendWin",<send_win> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------------------------------|---|
| <srxt> | Maximum number of TCP SYN packets retransmitted. The maximum value is 12. The default is 6. |
| <tcp_sync_backoff> | Set the interval for TCP SYN packet retransmission. tcp_sync_backoff[13]. defaults to {1, 1, 2, 3, 3, 6, 12, 24, 48, 96, 120, 120, 120} |
| <rxt> | Maximum number of TCP data packets retransmitted. The maximum value is 12. The default is 6. |
| <tcp_backoff> | Set the interval for TCP data package retransmission. tcp_backoff_default [13]. defaults to { 1, 1, 2, 2, 3, 4, 5, 6, 7, 7, 7, 7} |
| <mtu> | Integer type, Maximum value 1500, minimum value 640. |
| <win> | TCP Sliding Window. Range is 1460-131070. (Range is 1460-92288 in ASR 1803S) |
| <dnsMaxWaitTime> | Maximum timeout for DNS resolution retries |
| <dnsMaxRetry> | Maximum number of DNS resolution retries Note: The value ranges from 2 to 8. |
| <dns_wait_tmr> | Set the DNS retry interval. Unit is second. Dns_wait_tmr [8] defaults to {2, 3, 4, 8, 8, 8, 8, 8}. Note: The first interval cannot be less than 2 seconds. |
| <send_win> | TCP send buffer Window. |

Examples

```

AT+CSOC?
+CSOC: "Tcp srxt",6,1,1,2,3,3,6,12,24,48,96,120,120,120
+CSOC: "Tcp rxt",6,1,1,2,2,3,4,5,6,7,7,7,7
+CSOC: "Mss",1500
+CSOC: "RecvWin",64240
+CSOC: "DnsTmr",5,2,2,3,4,8,8,8,8,8
+CSOC: "SendWin",11680

```

OK

AT+CSOC="DnsTmr","2,2,0,0,0,0,0,0"

OK

15.2.22 AT+CIPCFG Configure Parameters of TCP

AT+CIPCFG is used to configure parameters of TCP. You can specify the PDP context for links.

AT+CIPCFG Configure Parameters of TCP

| | |
|--|--|
| Test Command AT+CIPCFG=? | Response +CIPCFG:"transwaittm", +CIPCFG:"DATAECHO","ON/OFF" |
| Read Command AT+CIPCFG? | OK Response +CIPCFG: "transwaittm",<transwaittime> +CIPCFG: "DATAECHO",<dataecho> |
| Write Command AT+CIPCFG="transwaittm",<transwaittime> | OK Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+CIPCFG="DATAECHO",<dataecho> | OK Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+CIPCFG="CID",<cid> /*cid for all links.*/ | OK Response 1)If optional parameter are omitted, query the current configuration: +CIPCFG: "CID",<cid> |
| Write Command AT+CIPCFG="SCID",[<link_num>,<cid>] /*cid for the specified link.*/ | OK 2)Specify optional parameters to set cid for TCP(all links use this specified cid): If parameter format is right: OK If parameter format is not right or other errors occur: ERROR Response 1)If only the second optional parameter are omitted, query the current configuration for the specified link: +CIPCFG: "SCID",<link_num>,<cid> |

OK

2) If both the first and the second optional parameters are omitted, query the current configuration for all links:

+CIPCFG: "SCID",0,<cid>

+CIPCFG: "SCID",1,<cid>

...

+CIPCFG: "SCID",9,<cid>

OK

3)Specify optional parameters to set cid for the specified link:

If parameter format is right:

OK

If parameter format is not right or other errors occur:

ERROR

| | |
|-----------------------|---|
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|-----------------|--|
| <transwaittime> | Set the transparent transmission timeout waiting time, integer type. Range 5-1000ms, default value is 100ms. |
| <dataecho> | Set the echo of data content sent by CIPSEND, String type. Default value is ON. ON Turn on echo OFF Turn off echo |
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |

Examples

AT+CIPCFG=?

+CIPCFG:"transwaittm", (5-1000)

+CIPCFG:"DATAECHO","ON/OFF"

OK

AT+CIPCFG?

+CIPCFG: "transwaittm",100

+CIPCFG: "DATAECHO",ON

OK

AT+CIPCFG="DATAECHO",OFF

OK

AT+CIPCFG="SCID",5,2

OK

AT+CIPCFG="SCID",5

+CIPCFG: "SCID",5,2

OK

AT+CIPCFG="SCID"

+CIPCFG: "SCID",0,1

+CIPCFG: "SCID",1,1

+CIPCFG: "SCID",2,1

+CIPCFG: "SCID",3,1

+CIPCFG: "SCID",4,1

+CIPCFG: "SCID",5,2

+CIPCFG: "SCID",6,1

+CIPCFG: "SCID",7,1

+CIPCFG: "SCID",8,1

+CIPCFG: "SCID",9,1

OK

AT+CIPCFG="CID",6

OK

AT+CIPCFG="CID"

+CIPCFG: "CID",6

OK

NOTE

1. Do not mix the configuration of "CID" and "SCID" when configuring the <cid> parameter. Select one of the preceding methods to configure CID parameters.

15.2.23 AT+CIPSENDSTR Send HEX String Data

This command is used to send hex string data, and is not suitable for the "UDP server" and "TCP server" types of Socket services.

AT+CIPSENDSTR Send HEX String Data

| | Response |
|--|--|
| Test Command AT+CIPSENDSTR=? | +CIPSENDSTR: (0-9),<hex_string> |
| | OK |
| Write Command AT+CIPSENDSTR=<link_num> | Response If the data is successfully sent |

| | |
|-----------------------|---|
| >,<hex_string> | OK +CIPSENDSTR: <link_num>,<data_len> Others: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|--------------|--|
| <link_num> | Integer type, identifies a connection. Range is 0-9. |
| <hex_string> | String type, hex string, the max length is 500. |
| <data_len> | Integer type, length of hex_string sent. |

Examples

AT+CIPSENDSTR=?

+CIPSENDSTR: (0-9),<hex_string>

OK

AT+CIOPEN=0,"TCP","183.230.174.137",6044

OK

+CIOPEN: 0,0

AT+CIPSENDSTR=0,"4142434445"

OK

+CIPSENDSTR: 0,5

15.2.24 AT+CIPSETAPN Set up the PDP/APN channels to be used

It can be set at any time. If the relevant functions have been activated, the connection needs to be closed to take effect.

AT+CIPSETAPN Set up the PDP/APN channels

| | |
|--|--|
| Test Command | Response |
| AT+CIPSETAPN=? | OK |
| Write Command | Response |
| AT+CIPSETAPN=<link_num>,<cid> | If set successfully: OK Others: |

| ERROR | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------|--|
| <link_num> | Integer type, identifies a connection. Range is 0-9. |
| <cid> | (PDP Context Identifier)a numeric parameter which specifies a particular PDP context definition. Range is 1-6. |

15.3 Command Result Codes

15.3.1 Description of <err_info>

The fourth parameter <errMode> of AT+CIPCCFG (TODO)is used to determine how <err_info> is displayed.

If <errMode> is set to 0, the <err_info> is displayed with numeric value.

If <errMode>is set to 1, the <err_info> is displayed with string value.

The default is displayed with string value.

| Numeric Value | String Value |
|---------------|------------------------------------|
| 0 | Connection time out |
| 1 | Bind port failed |
| 2 | Port overflow |
| 3 | Create socket failed |
| 4 | Network is already opened |
| 5 | Network is already closed |
| 6 | No clients connected |
| 7 | No active client |
| 8 | Network not opened |
| 9 | Client index overflow |
| 10 | Connection is already created |
| 11 | Connection is not created |
| 12 | Invalid parameter |
| 13 | Operation not supported |
| 14 | DNS query failed |
| 15 | TCP busy |
| 16 | Net close failed for socket opened |
| 17 | Sending time out |

| | |
|----|-----------------------------------|
| 18 | Sending failure for network error |
| 19 | Open failure for network error |
| 20 | Server is already listening |
| 21 | Operation failed |
| 22 | No data |

15.3.2 Description of <err>

| <err> | Description of <err> |
|-------|---------------------------------|
| 0 | operation succeeded |
| 1 | Network failure |
| 2 | Network not opened |
| 3 | Wrong parameter |
| 4 | Operation not supported |
| 5 | Failed to create socket |
| 6 | Failed to bind socket |
| 7 | TCP server is already listening |
| 8 | Busy |
| 9 | Sockets opened |
| 10 | Timeout |
| 11 | DNS parse failed for AT+CIPOEN |
| 12 | Unknown error |

15.4 Unsolicited Result Codes

| URC | Description |
|---|---|
| +CIPEVENT: NETWORK CLOSED UNEXPECTEDLY[,<cid>] | Network is closed for network error(Out of service, etc). When this event happens, user's application needs to check and close all opened sockets, and then uses AT+NETCLOSE to release the network library if AT+NETOPEN? shows the network library is still opened. When the AT+NETOPEN=<cid> command is used to activate a network, |

| | |
|--|---|
| +IPCLOSE: <client_index>,<close_reason> | <p>the URC carries the cid parameter, and each cid link reports an independent URC.</p> <p>Socket is closed passively.</p> <p><client_index> is the link number.</p> <p><close_reason>:</p> <ul style="list-style-type: none">0 Closed by local, active1 Closed by remote, passive2 Closed for sending timeout or DTR off |
| +CLIENT: <link_num>,<server_index>,<client_IP>:<port> | TCP server accepted a new socket client, the index is <link_num>, the TCP server index is <server_index>. The peer IP address is <client_IP>, the peer port is <port>. |

16 AT Commands for HTTP(S)

16.1 Overview of AT Commands for HTTP(S)

| Command | Description |
|------------------------|---|
| AT+HTTPINIT | Start HTTP service |
| AT+HTTPTERM | Stop HTTP Service |
| AT+HTTPPARA | Set HTTP Parameters value |
| AT+HTTPACTION | HTTP Method Action |
| AT+HTTPHEAD | Read the HTTP Header Information of Server Response |
| AT+HTTPREAD | Read the response information of HTTP Server |
| AT+HTTPDATA | Input HTTP Data |
| AT+HTTPPOSTFILE | Send HTTP Request to HTTP(S)server by File |
| AT+HTTPREADFILE | Receive HTTP Response Content to a file |

16.2 Detailed Description of AT Commands for HTTP(S)

16.2.1 AT+HTTPINIT Start HTTP Service

AT+HTTPINIT is used to start HTTP service by activating PDP context. You must execute AT+HTTPINIT before any other HTTP related operations.

| AT+HTTPINIT Start HTTP Service | |
|---------------------------------------|--|
| Test Command AT+HTTPINIT=? | Response +HTTPINIT: (1-n) |
| | OK |
| Execute Command AT+HTTPINIT | Response 1)If start HTTP service successfully: OK |

| | |
|---|--|
| | 2)If failed: ERROR |
| | Response 1) OK |
| Write Command AT+HTTPINIT=<cid> | +HTTPINIT: <errcode>,<cid> 2) ERROR |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|-----------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
| <errcode> | The result of start HTTP(S)service, 0 is success, others are failure. Please refer to errcode list. |

Examples

AT+HTTPINIT

OK

AT+HTTPINIT=1

OK

+HTTPINIT: 0,1

16.2.2 AT+HTTPTERM Stop HTTP Service

AT+HTTPTERM is used to stop HTTP service.

AT+HTTPTERM Stop HTTP Service

Test Command

AT+HTTPTERM=?

Response

+HTTPTERM: (1-n)

| | |
|---|--|
| | OK |
| Execute Command AT+HTTPTERM | <p>Response</p> <p>1) If stop HTTP service successfully: OK</p> <p>2) If failed: ERROR</p> |
| Write Command AT+HTTPTERM=<cid> | <p>Response</p> <p>1) OK</p> <p>+HTTPTERM: <errcode>,<cid></p> <p>2) ERROR</p> |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|------------------------|---|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n, The maximum value n is related to the pdp command of the modem. |
| <errcode> | The result of stop HTTP(S)service, 0 is success, others are failure. Please refer to errcode list. |

Examples

```
AT+HTTPTERM
```

```
OK
```

```
AT+HTTPTERM=1
```

```
OK
```

```
+HTTPTERM: 0,1
```

16.2.3 AT+HTTPPARA Set HTTP Parameters value

AT+HTTPPARA is used to set HTTP parameters value. When you want to access to a HTTP server, you should input <value> like http://server'/path':tcpPort'. In addition, https://server'/path':tcpPort' is used to

access to a HTTPS server.

AT+HTTPPARA Set HTTP Parameters value

| | |
|--|---|
| Test Command AT+HTTPPARA=? | Response OK |
| Write Command AT+HTTPPARA="URL",<url> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+HTTPPARA="CONNECTTO",<conn_timeout> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+HTTPPARA="RECVTO",<recv_timeout> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+HTTPPARA="CONTENT",<content_type> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+HTTPPARA="ACCEPT",<accept_type> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+HTTPPARA="SSLCFG",<ssl_cfg_id> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+HTTPPARA="USERDATA",<user_data> | Response 1)If parameter format is right: OK 2)If parameter format is not right or other errors occur: ERROR |
| Write Command AT+HTTPPARA="READMODE",<readmode> | Response 1)If parameter format is right: OK |

2) If parameter format is not right or other errors occur:

ERROR

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

| | |
|----------------|--|
| <url> | URL of network resource.String,start with "http://" or "https://" a)http://'server' ':'tcpPort' '/path'. b)https://'server' ':'tcpPort' '/path'. "server" DNS domain name or IP address "path" path to a file or directory of a server "tcpPort" http default value is 80,https default value is 443.(can be omitted) |
| <conn_timeout> | Timeout for accessing server, Numeric type, range is 20-120s, default is 120s. |
| <recv_timeout> | Timeout for receiving data from server, Numeric type range is 2s-120s, default is 20s. |
| <content_type> | This is for HTTP "Content-Type" tag, String type, max length is 256, and default is "text/plain". |
| <accept-type> | This is for HTTP "Accept-type" tag, String type, max length is 256, and default is "*/*". |
| <sslcfg_id> | This is setting SSL context id, Numeric type, range is 0-9. Default is 0.Please refer to Chapter 19 of this document. |
| <user_data> | The customized HTTP header information. String type, max length is 256.(For ASR1603 platforms, the maximum length is 600) |
| <readmode> | For HTTPREAD, Numeric type, it can be set to 0 or 1. If set to 1, you can read the response content data from the same position repeatedly. The limit is that the size of HTTP server response content should be shorter than 1M.Default is 0. |

NOTE

When you want to use content-type multipart/form-data to transfer data, you should set AT+HTTPPARA="CONTENT","multipart/form-data" .And we will construct boundary header.

Examples

AT+HTTPPARA="URL","http://www.baidu.com"

OK

www.simcom.com

16.2.4 AT+HTTPACTION HTTP Method Action

AT+HTTPACTION is used to perform a HTTP Method. You can use HTTPACTION to send a get/post request to a HTTP/HTTPS server.

AT+HTTPACTION HTTP Method Action

Test Command

AT+HTTPACTION=?

Response

+HTTPACTION: (0-4)

(in ASR1603_042 the return is

+HTTPACTION: (0-5)

)

OK

Response

1) If parameter format is right:

OK

Write Command

AT+HTTPACTION=<method>

+HTTPACTION: <method>,<statuscode>,<datalen>

2) If parameter format is right but server connected unsuccessfully:

OK

+HTTPACTION: <method>,<errcode>,<datalen>

3) If parameter format is not right or other errors occur:

ERROR

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

| | |
|--------------|--|
| <method> | HTTP method specification: 0 GET 1 POST 2 HEAD 3 DELETE 4 PUT (in ASR1603_042 add method: 5 PATCH) |
| <statuscode> | Please refer to the end of this chapter |
| <datalen> | The length of data received |

Examples

AT+HTTPACTION=?

+HTTPACTION: (0-4)

OK

AT+HTTPACTION=0

OK

+HTTPACTION: 0,200,104220

16.2.5 AT+HTTPHEAD Read the HTTP Header Information of Server Response

AT+HTTPHEAD is used to read the HTTP header information of server response when module receives the response data from server.

AT+HTTPHEAD Read the HTTP Header Information of Server Response

Test Command

AT+HTTPHEAD=?

Response

OK

Response

1) If read the header information successfully:

+HTTPHEAD: <data_len>

<data>

OK

2) If read failed:

ERROR

Execute Command

AT+HTTPHEAD

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

<data_len> The length of HTTP header

<data> The header information of HTTP response

Examples

AT+HTTPHEAD

+HTTPHEAD: 653

HTTP/1.1 200 OK
Content-Type: text/html
Connection: keep-alive
X-Cache: MISS from PDcache-04:opinion.people.com.cn
Date: Tue, 24 Mar 2020 03:12:09 GMT
Powered-By-ChinaCache: HIT from CNC-WB-b-D24
Powered-By-ChinaCache: HIT from CNC-WV-b-D1C
ETag: W/"5b7379f5-57e9"
x-cc-via: CNC-WB-b-D24[H,1], CNC-WV-b-D1C[H,62]
d-cc-upstream: CNC-WV-b-D1C
CACHE: TCP_HIT
Vary: Accept-Encoding
Last-Modified: Wed, 15 Aug 2018 00:55:17 GMT
Expires: Tue, 24 Mar 2020 03:17:09 GMT
x-cc-req-id: f4b9e1793697d1ef2950f530aeeec4519
Content-Length: 22505
Age: 0
Accept-Ranges: bytes
Server: nginx
X-Frame-Options: ALLOW-FROM .
CC_CACHE: TCP_REFRESH_HIT
OK

16.2.6 AT+HTTPREAD Read the response information of HTTP Server

After sending HTTP(S)GET/POST requests, you can retrieve HTTP(S)response information from HTTP(S)server via UART/USB port by AT+HTTPREAD. When the <datalen> of "+HTTPACTION:<method>,<statuscode>,<datalen>" is not equal to 0, You can execute AT+HTTPREAD=<start_offset>,<byte_size> to read out data to port. If parameter <byte_size> is set greater than the size of data saved in buffer, all data in cache will output to port.

AT+HTTPREAD Read the response information of HTTP Server

| | |
|----------------------|---|
| Test Command | Response |
| AT+HTTPREAD=? | OK |
| Read Command | Response 1)If check successfully: +HTTPREAD: LEN,<len> |
| AT+HTTPREAD? | OK 2)If failed (no more data other error): ERROR |
| Write Command | Response |

| | |
|--|--|
| AT+HTTPREAD=[<start_offset>, <byte_size>] | 1) If read the response info successfully: OK +HTTPREAD: <data_len> <data> +HTTPREAD: 0 If <byte_size> is bigger than the data size received, module will only return actual data size. 2) If read failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|-------------------------------------|
| <start_offset> | The start position of reading |
| <byte_size> | The length of data to read |
| <data_len> | The actual length of read data |
| <data> | Response content from HTTP server |
| <len> | Total size of data saved in buffer. |

Examples

```

AT+HTTPREAD?
+HTTPREAD: LEN,22505

OK
AT+HTTPREAD=0,500
OK

+HTTPREAD: 500
\0\0\0\0\0\0\0\0\0\0\0\0<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="content-type" content="text/html;charset=GB2312"/>
<meta http-equiv="Content-Language" content="utf-8" />
<meta content="all" name="robots" />
<title>人民日报钟声:牢记历史是为了更好开创未来--观点--人民网 </title>
<meta name="keywords" content="" />
<meta name="description" content="    日方应在正确对待历史?">
+HTTPREAD: 0

```

NOTE

The response content received from server will be saved in cache, and would not be cleaned up by AT+HTTPREAD.

16.2.7 AT+HTTPDATA Input HTTP Data

You can use AT+HTTPDATA to input data to post when you send a HTTP/HTTPS POST request.

AT+HTTPDATA Input HTTP Data

Test Command

AT+HTTPDATA=?

Response

OK

Response

1)if parameter format is right:

DOWNLOAD

<input data here>

Write Command

AT+HTTPDATA=<size>,<time>

When the total size of the inputted data reaches <size>, TA will report the following code. Otherwise, the serial port will be blocked.

OK

2)If parameter format is wrong or other errors occur:

ERROR

Parameter Saving Mode

Max Response Time

Reference

Defined Values

| | |
|---------------------|---|
| <size> | Size in bytes of the data to post. range is 1- 153600 (bytes) |
| <time> | Maximum time in seconds to input data.range is 10-65535 |

Examples

AT+HTTPDATA=18,1000
DOWNLOAD
Message=helloworld

OK

16.2.8 AT+HTTPPOSTFILE Send HTTP Request to HTTP(S)server by File

You also can send HTTP request in a file via AT+HTTPPOSTFILE command. The URL must be set by AT+HTTPPARA before executing AT+HTTPPOSTFILE command. The parameter <path> can be used to set the file directory. When modem has received response from HTTP server, it will report the following URC:

+HTTPPOSTFILE: <statuscode>,<datalen>

AT+HTTPPOSTFILE Send HTTP Request to HTTP(S)server by File

Test Command

AT+HTTPPOSTFILE=?

Response

+HTTPPOSTFILE: <filename>[,,(1-2)[,(0-4)[,(0-1)]]]

OK

Response

1)if parameter format is right and server connected successfully:

a)if parameter <method> is valid:

OK

+HTTPPOSTFILE: <method>,<statuscode>,<datalen>

b)if parameter <method> is ignored:

OK

+HTTPPOSTFILE: <statuscode>,<datalen>

2)if parameter format is right but server connected unsuccessfully:

a)if parameter <method> is valid:

OK

+HTTPPOSTFILE: <method>,<errcode>,0

b)if parameter <method> is ignored:

OK

+HTTPPOSTFILE: <errcode>,0

3)if parameter format is not right or any other error occurs:

ERROR

Write Command

AT+HTTPPOSTFILE=<filename>[,<path>[,<method>[,<send_header>]]]

Parameter Saving Mode

Max Response Time

Reference

Defined Values

| | |
|---------------|--|
| <filename> | String type, filename, the max length is 112.unit:byte. |
| <path> | The directory where the sent file saved. Numeric type, range is 1-2 1 C:/ (local storage) 2 D:/(sd card) |
| <method> | HTTP method specification: 0 GET 1 POST 2 HEAD 3 DELETE 4 PUT If this value is not provided, it is same to the value described in the post file. |
| <send_header> | Send file as HTTP header and Body or Only as Body. Numeric type, the range is 0-1, the default is 0. 0 Send file as Body 1 Send file as HTTP header and body |
| <statuscode> | Please refer to the end of this chapter |
| <datalen> | The length of data received |

Examples

AT+HTTPPOSTFILE=?

+HTTPPOSTFILE: <filename>[(1-2)[,(0-4)[,(0-1)]]]

OK

AT+HTTPPOSTFILE="getbaidu.txt",1

OK

+HTTPPOSTFILE: 200,14615

AT+HTTPPOSTFILE="getbaidu.txt",1,1,1

OK

+HTTPPOSTFILE: 1,200,14615

16.2.9 AT+HTTPREADFILE Receive HTTP Response Content to a file

After execute AT+HTTPACTION/AT+HTTPPOSTFILE command. You can receive the HTTP server response content to a file via AT+HTTPREADFILE.

Before AT+HTTPREADFILE executed, "+HTTPACTION: <method>,<statuscode>,<datalen>" or "+HTTPPOSTFILE: <statuscode>,<datalen>" must be received. The parameter <path> can be used to set

the directory where to save the file. If omit parameter <path>, the file will be save to local storage.

AT+HTTPREADFILE Receive HTTP Response Content to a File

Test Command

AT+HTTPREADFILE=?

Response

+HTTPREADFILE: <filename>[,,(1-2)]

OK

Response

1)if parameter format is right:

OK

Write Command

AT+HTTPREADFILE=<filename>
>[,<path>]

+HTTPREADFILE: <errcode>

2)if failed:

OK

+HTTPREADFILE: <errcode>

3)if parameter format is not right or any other error occurs:

ERROR

Parameter Saving Mode

Max Response Time

Reference

Defined Values

<filename>

String type, filename, the max length is 112.unit:byte.

<path>

The directory where the read file saved. Numeric type, range is 1-2.

1 C:/(local storage)

2 D:/(sd card)

Examples

AT+HTTPREADFILE=?
+HTTPREADFILE: <filename>[,,(1-2)]

OK

AT+HTTPREADFILE="readbaidu.dat"

OK

+HTTPREADFILE: 0

16.3 Command Result Codes

16.3.1 Description of <statuscode>

| <statuscode> | Description |
|--------------|---------------------------------|
| 100 | Continue |
| 101 | Switching Protocols |
| 200 | OK |
| 201 | Created |
| 202 | Accepted |
| 203 | Non-Authoritative Information |
| 204 | No Content |
| 205 | Reset Content |
| 206 | Partial Content |
| 300 | Multiple Choices |
| 301 | Moved Permanently |
| 302 | Found |
| 303 | See Other |
| 304 | Not Modified |
| 305 | Use Proxy |
| 307 | Temporary Redirect |
| 400 | Bad Request |
| 401 | Unauthorized |
| 402 | Payment Required |
| 403 | Forbidden |
| 404 | Not Found |
| 405 | Method Not Allowed |
| 406 | Not Acceptable |
| 407 | Proxy Authentication Required |
| 408 | Request Timeout |
| 409 | Conflict |
| 410 | Gone |
| 411 | Length Required |
| 412 | Precondition Failed |
| 413 | Request Entity Too Large |
| 414 | Request-URI Too Large |
| 415 | Unsupported Media Type |
| 416 | Requested range not satisfiable |

| | |
|------------|----------------------------|
| 417 | Expectation Failed |
| 500 | Internal Server Error |
| 501 | Not Implemented |
| 502 | Bad Gateway |
| 503 | Service Unavailable |
| 504 | Gateway timeout |
| 505 | HTTP Version not supported |
| 600 | Not HTTP PDU |
| 601 | Network Error |
| 602 | No memory |
| 603 | DNS Error |
| 604 | Stack Busy |

16.3.2 Description of <errcode>

| <errcode> | Meaning |
|------------|---------------------------------------|
| 0 | Success |
| 701 | Alert state |
| 702 | Unknown error |
| 703 | Busy |
| 704 | Connection closed error |
| 705 | Timeout |
| 706 | Receive/send socket data failed |
| 707 | File not exists or other memory error |
| 708 | Invalid parameter |
| 709 | Network error |
| 710 | start a new ssl session failed |
| 711 | Wrong state |
| 712 | Failed to create socket |
| 713 | Get DNS failed |
| 714 | Connect socket failed |
| 715 | Handshake failed |
| 716 | Close socket failed |
| 717 | No network error |
| 718 | Send data timeout |
| 719 | CA missed |

16.4 Unsolicited Result Codes

| URC | Description |
|-------------------------|--|
| +HTTP_PEER_CLOSED | It's a notification message. While received, it means the connection has been closed by server. |
| +HTTP_NONET_EVENT[,cid] | It's a notification message. While received, it means now the network is unavailable. If using AT+HTTPINIT=<cid>to start HTTP, the URC carries the cid parameter |

17 AT Commands for FTP(S)

17.1 Overview of AT Commands for FTP(S)

| Command | Description |
|-------------------------|---|
| AT+CFTPSSTART | Start FTP(S)service |
| AT+CFTPSSTOP | Stop FTP(S)Service |
| AT+CFTPSLOGIN | Login to a FTP(S)server |
| AT+CFTPSLOGOUT | Logout a FTP(S)server |
| AT+CFTPSLIST | List the items in the directory on FTP(S)server |
| AT+CFTPSMKD | Create a new directory on FTP(S)server |
| AT+CFTPSRMD | Delete a directory on FTP(S)server |
| AT+CFTPSCWD | Change the current directory on FTP(S)server |
| AT+CFTPSPWD | Get the current directory on FTP(S)server |
| AT+CFTPSDELE | Delete a file on FTP(S)server |
| AT+CFTPSGETFILE | Download a file from FTP(S)server to module |
| AT+CFTPSPUTFILE | Upload a file from module to FTP(S)server |
| AT+CFTPSGET | Get a file from FTP(S)server to serial port |
| AT+CFTPSPUT | Put a file to FTP(S)server through serial port |
| AT+CFTPSSIZE | Get the file size on FTP(S)server |
| AT+CFTPSSINGLEIP | Set FTP(S)data socket address type |
| AT+CFTPSTYPE | Set the transfer type on FTP(S)server |
| AT+CFTPSSLCFG | Set the SSL context id for FTPS session |
| AT+CFTPSMODE | Set Active or Passive FTP Mode |

17.2 Detailed Description of AT Commands for FTP(S)

17.2.1 AT+CFTPSSTART Start FTP(S)service

AT+CFTPSSTART is used to start FTP(S)service by activating PDP context. You must execute AT+CFTPSSTART before any other FTP(S)related operations.

AT+CFTPSSTART Start FTP(S)service

| | |
|---|---|
| Test Command AT+CFTPSSTART=? | Response +CFTPSSTART: (1-n) |
| | OK |
| Execution Command AT+CFTPSSTART | Response 1) OK +CFTPSSTART: <errcode> 2) ERROR |
| | Response OK |
| Write Command AT+CFTPSSTART=<cid> | +CFTPSSTART: <errcode>,<cid> 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------------------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
| <errcode> | The result of start FTP(S)service, 0 is success, others are failure. Please refer to errcode list. |

Examples

```
AT+CFTPSSTART
OK

+CFTPSSTART: 0
AT+CFTPSSTART=1
OK

+CFTPSSTART: 0,1
```

17.2.2 AT+CFTPSSTOP Stop FTP(S)Service

AT+CFTPSSTOP is used to stop FTP(S)service by deactivating PDP context When you are no longer using the FTP(S)service, use this command.

AT+CFTPSSTOP Stop FTP(S)Service

| | |
|---------------------------------|--|
| Test Command | Response +CFTPSSTOP: (1-n) |
| AT+CFTPSSTOP=? | OK |
| Execution Command | Response 1) OK |
| AT+CFTPSSTOP | Response 2) +CFTPSSTOP: <errcode> |
| | 2) ERROR |
| Write Command | Response 1) OK |
| AT+CFTPSSTOP=<cid> | Response 2) +CFTPSSTOP: <errcode>,<cid> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------------------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
| <errcode> | The result of stop FTP(S)service, 0 is success, others are failure. Please refer to errcode list. |

Examples

AT+CFTPSSTOP

OK

+CFTPSSTOP: 0

AT+CFTPSSTOP=1

OK

+CFTPSSTOP: 0,1

17.2.3 AT+CFTPSLOGIN Login to a FTP(S)server

AT+CFTPSLOGIN is used to login to a FTP(S)server, you can login to a FTP server by set parameter <server_type> to 0, login to an implicit FTPS server by set <server_type> to 3 and login to an explicit FTPS server by set <server_type> to 1 or 2. About <sever_type>, more details please refer to Defined Values <server_type>.

AT+CFTPSLOGIN Login to a FTP(S)server

Response

Test Command

AT+CFTPSLOGIN=?

+CFTPSLOGIN:

"ADDRESS",(1-65535),"USERNAME","PASSWORD"[,(0-3)]

OK

Response

1) If the status is not logged in

+CFTPSLOGIN: 0

Read Command

AT+CFTPSLOGIN?

OK

2) If it is logged in

+CFTPSLOGIN: 1

OK

3)

ERROR

Response

1)

OK

Write Command

AT+CFTPSLOGIN=<host>,<port>,<username>,<password>[<sever_type>]

+CFTPSLOGIN: 0

2)

OK

+CFTPSLOGIN: <errcode>

3)

| ERROR | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------|--|
| <host> | Host address, string type, maximum length is 128 |
| <port> | The host listening port for FTP(S), the range is from 1 to 65535 |
| <username> | FTP(S)user name, string type, maximum length is 128 |
| <password> | The user password, string type, maximum length is 128 |
| <servet_type> | FTP(S)server type, numeric, from 0-3, default is 3 0 FTP server. 1 Explicit FTPS server with AUTH SSL. 2 Explicit FTPS server with AUTH TLS. 3 Implicit FTPS server. |
| <errcode> | The result code of the FTP/FTPS login. 0 is success. Others are failure, please refer to chapter 17.3. |

Examples

```
AT+CFTPSLOGIN=?  
+CFTPSLOGIN:  
"ADDRESS",,(1-65535),"USERNAME","PASSWORD",[,(0-3)]
```

OK

```
AT+CFTPSLOGIN?  
+CFTPSLOGIN: 0
```

OK

```
AT+CFTPSLOGIN="serveraddr",21,"username","password",0  
OK
```

```
+CFTPSLOGIN: 0
```

17.2.4 AT+CFTPSLOGOUT Logout a FTP(S)server

AT+CFTPSLOGOUT is used to logout a FTP(S)sever, make sure you login a FTP(S)sever before you execute AT+CFTPSLOGOUT command.

AT+CFTPSLOGOUT Logout a FTP(S)server

Test Command Response

AT+CFTPSLOGOUT=?

OK

Execute Command

AT+CFTPSLOGOUT

+CFTPSLOGOUT: 0

1)

OK

+CFTPSLOGOUT: <errcode>

2)

OK

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

Defined Values

<errcode>

The result code of the FTP/FTPS logout. 0 is success. Others are failure, please refer to chapter 17.3.

Examples

AT+CFTPSLOGOUT=?

OK

AT+CFTPSLOGOUT

OK

+CFTPSLOGOUT: 0

NOTE

When you want to stop the FTP(S)service,please use AT+CFTPSLOGOUT to log out of the FTP(S)server,then use AT+CFTPSSTOP to stop FTP,if you only use AT+CFTPSSTOP,it will report ERROR.

17.2.5 AT+CFTPSLIST List the items in the directory on FTP(S)server

This command is used to list the items in the specified directory on FTP(S)server. Module will output the items to serial port when list items successfully. Make sure that you have login to FTP(S)server successfully.

AT+CFTPSLIST List the items in the directory on FTP(S)server

Test Command Response

AT+CFTPSLIST=? **OK**

Response

1)

OK

+CFTPSLIST: DATA,<len>

...

+CFTPSLIST: 0

2)

OK

+CFTPSLIST: <errcode>

3)

ERROR

4)

+CFTPSLIST: <errcode>

ERROR

Parameter Saving Mode Response

Max Response Time Response

Reference

Defined Values

| | |
|------------------------|--|
| <dir> | The directory to be created, string type, maximum length is 112. |
| <errcode> | The result of create directory, 0 is success, others are failure, please refer to chapter 17.3 |
| <len> | The server All files and related information in the directory. |

Examples

AT+CFTPSLIST="/"

OK

```
+CFTPSLIST: DATA,175
-rw-r--r-- 1 ftp ftp      121 Mar 11 16:24 124.txt
drwxr-xr-x 1 ftp ftp      0 Jan 13 2020
TEST113
drwxr-xr-x 1 ftp ftp      0 Jan 19 2020
TEST1155

+CFTPSLIST: 0
```

17.2.6 AT+CFTPSMKD Create a new directory on FTP(S)server

AT+CFTPSMKD is used to create a new directory on a FTP(S)server. Please make sure login to the FTP(S)server successfully before create a directory.

AT+CFTPSMKD Create a new directory on FTP(S)server

Test Command

Response

AT+CFTPSMKD=?

+CFTPSMKD: "DIR"

OK

Response

1)

OK

+CFTPSMKD: 0

2)

OK

Write Command

AT+CFTPSMKD=<dir>

+CFTPSMKD: <errcode>

3)

ERROR

4)

+CFTPSMKD: <errcode>

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

Defined Values

<dir>

The directory to be created, string type, maximum length is 112.

| | |
|-----------|--|
| <errcode> | The result of create directory, 0 is success, others are failure, please refer to chapter 17.3 |
|-----------|--|

Examples

AT+CFTPSMKD=?

+CFTPSMKD: "DIR"

OK

AT+CFTPSMKD="test"

OK

+CFTPSMKD: 0

17.2.7 AT+CFTPSRMD Delete a directory on FTP(S)server

AT+CFTPSRMD is used to delete a directory on FTP(S)server, please make sure login to the FTP(S)server successfully before delete a directory.

AT+CFTPSRMD Delete a directory on FTP(S)server

Test Command

AT+CFTPSRMD=?

Response

+CFTPSRMD: "DIR"

OK

Response

1)

OK

+CFTPSRMD: 0

2)

OK

Write Command

AT+CFTPSRMD=<dir>

+CFTPSRMD: <errcode>

3)

ERROR

4)

+CFTPSRMD: <errcode>

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

Defined Values

| | |
|-----------|--|
| <dir> | The directory to be deleted, string type, maximum length is 112. |
| <errcode> | The result of create directory, 0 is success, others are failure, please refer to chapter 17.3 |

Examples

```
AT+CFTPSRMD=?  
+CFTPSRMD: "DIR"  
  
OK  
AT+CFTPSRMD="test"  
OK  
  
+CFTPSRMD: 0
```

17.2.8 AT+CFTPSCWD Change the current directory on FTP(S)server

You can use this command to change the current directory on FTP(S)server. Make sure you have login to FTP(S)server successfully before AT+CFTPSCWD

AT+CFTPSCWD Change the current directory on FTP(S)server

| | |
|---------------|---|
| Test Command | Response +CFTPSCWD: "DIR" |
| AT+CFTPSCWD=? | OK |
| Write Command | Response 1) OK +CFTPSCWD: 0 2) OK +CFTPSCWD: <errcode> 3) ERROR |

4)
+CFTPSCWD: <errcode>

ERROR

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------------------|--|
| <dir> | The directory to be changed, string type, maximum length is 112. |
| <errcode> | The result of create directory, 0 is success, others are failure, please refer to chapter 17.3 |

Examples

```
AT+CFTPSCWD=?  

+CFTPSCWD: "DIR"
```

```
OK  

AT+CFTPSCWD="test"  

OK
```

```
+CFTPSCWD: 0
```

17.2.9 AT+CFTPSPWD Get the current directory on FTP(S)server

This command is used to get the current directory on FTPS server. Before AT+CFTPSPWD, please make sure you have login to FTP(S)server successfully

AT+CFTPSPWD Get the current directory on FTP(S)server

Test Command
AT+CFTPSPWD=?

Response

+CFTPSPWD:

OK

Response

1)

OK

Execute Command
AT+CFTPSPWD

+CFTPSPWD: <dir>

| | |
|-----------------------|---|
| | 2) OK |
| | +CFTPSPWD: <errcode> |
| | 3) ERROR |
| | 4) +CFTPSPWD: <errcode> |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------------------|--|
| <dir> | The directory to be got, string type. |
| <errcode> | The result of create directory, 0 is success, others are failure, please refer to chapter 17.3 |

Examples

AT+CFTPSPWD

OK

+CFTPSPWD: "/"

17.2.10 AT+CFTPSDELE Delete a file on FTP(S)server

You can use AT+CFTPSDELE delete a file on FTP(S)server, please make sure login to the FTP(S)server successfully before delete a file.

AT+CFTPSDELE Delete a file on FTP(S)server

| | |
|--------------------------------------|---|
| Test Command | Response +CFTPSDELE: "FILENAME" |
| AT+CFTPSDELE=? | OK |
| Write Command | Response 1) OK |
| AT+CFTPSDELE=<filename> | |

+CFTPSDELE: 0
2)
OK

+CFTPSDELE: <errcode>
3)
ERROR
4)
+CFTPSDELE: <errcode>

ERROR

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------|--|
| <filename> | The name of the file to be deleted. String type, the maximum length is 112 |
| <errcode> | The result of create directory, 0 is success, others are failure, please refer to chapter 17.3 |

Examples

```
AT+CFTPSDELE=?  
+CFTPSDELE: "FILENAME"  
  
OK  
AT+CFTPSDELE="testfile"  
OK  
  
+CFTPSDELE: 0
```

17.2.11 AT+CFTPSGETFILE Download a file from FTP(S)server to module

You can download a file from FTP(S)server to module, by setting parameter <dir>, you can select the directory where to save the downloaded file. Default the downloaded file will be saved to local storage. Make sure that you have login to FTP(S)server successfully before AT+CFTPSGETFILE.

AT+CFTPSGETFILE Download a file from FTP(S)server to module

Test Command

AT+CFTPSGETFILE=?

Response

+CFTPSGETFILE: "FILEPATH"[,(1-2)]

OK

Response

1)

OK

+CFTPSGETFILE: 0

2)

OK

+CFTPSGETFILE: <errcode>

3)

ERROR

4)

+CFTPSGETFILE: <errcode>

ERROR

Write Command

AT+CFTPSGETFILE=<filepath>[<dir>[,<offset>]]

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

Defined Values

| | |
|------------|---|
| <filepath> | The remote file path. String type, maximum length is 112 |
| <dir> | The directory to save the downloaded file. Numeric type, range is 1-2, default is 1(local storage) 1 C://(local storage) 2 D://(sd card) |
| <offset> | The value for FTP "REST" command which is used for broken transfer when transferring failed last time. If the file is complete, the file length is not increased.Numeric type, the range is from 0 to 2147483647. Note:If offset is not 0,make sure the file already exists, otherwise it will fail. Note: This parameter is only supported on the 1603,1606 and 1803 platforms. |
| <errcode> | The result code of download file from FTP(s)server. 0 is success, others are failure, please refer to chapter 17.3. |

Examples

AT+CFTPSGETFILE=?**+CFTPSGETFILE: "FILEPATH"[,(1-2)]**

OK

AT+CFTPSGETFILE="test.txt",1

OK

+CFTPSGETFILE: 0

17.2.12 AT+CFTPSPUTFILE Upload a file from module to FTP(S)server

You can use this command to upload a file to FTP(S)server from module. By setting parameter <dir> you can select the directory that contains the file to be uploaded. Make sure that you have login to the FTP(S)server successfully before AT+CFTPSPUTFILE.

AT+CFTPSPUTFILE Upload a file from module to FTP(S)server

Response

Test Command

AT+CFTPSPUTFILE=?

OK

Response

1)

OK

+CFTPSPUTFILE: 0

2)

OK

Write Command

AT+CFTPSPUTFILE=<filepath>[**,<dir>[,<rest_size>]]****+CFTPSPUTFILE: <errcode>**

3)

ERROR

4)

+CFTPSPUTFILE: <errcode>

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

Defined Values

| | |
|-------------|--|
| <filepath> | The remote file path. String type, maximum length is 112 |
| <dir> | The directory that contains the uploaded file. Numeric type, range is 1-2, default is 1(local storage) 1 C://(local storage) 2 D://(sd card) |
| <rest_size> | The value for FTP "REST" command which is used for broken transfer when transferring failed last time. If the file is complete, the file length is not increased. Numeric type, the range is from 0 to 2147483647. |
| <errcode> | The result code of download file from FTP(s)server. 0 is success, others are failure, please refer to chapter 17.3. |

Examples

```
AT+CFTPSPUTFILE=?
+CFTPSPUTFILE: "FILEPATH"[,(1-2),(0-2147483647)]
```

```
OK
AT+CFTPSPUTFILE="test.txt",1
OK

+CFTPSPUTFILE: 0
```

17.2.13 AT+CFTPSGET Get a file from FTP(S)server to serial port

You can use this command to get a file from FTP(S)server to serial port.

AT+CFTPSGET Get a file from FTP(S)server to serial port

Test Command

```
AT+CFTPSGET=?
```

Response

```
+CFTPSGET: "FILEPATH"[,<rest_size>]
```

OK

Response

1)

OK

Write Command

```
AT+CFTPSGET=<filepath>[,<re
st_size>]
```

```
+CFTPSGET: DATA,<len>
```

...

```
+CFTPSGET: DATA,<len>
```

...

```
+CFTPSGET: 0
```

| | |
|-----------------------|----------------------------|
| | 2) OK |
| | +CFTPSGET: <errcode> |
| | 3) ERROR |
| | 4) +CFTPSGET: <errcode> |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------|--|
| <filepath> | The remote file path. String type, maximum length is 112. |
| <rest_size> | The value for FTP "REST" command which is used for broken transfer when transferring failed last time. Numeric type, the range is from 0 to 2147483647 |
| <len> | The actual length of the file read. Integer type, the maximum length of each package is 1024. |
| <errcode> | The result code of download file from FTP(s)server. 0 is success, others are failure, please refer to chapter 17.3. |

Examples

```

AT+CFTPSGET=?
+CFTPSGET: "FILEPATH"[,<rest_size>]

OK
AT+CFTPSGET="test.txt"
OK

+CFTPSGET: DATA,3
321
+CFTPSGET: 0

```

17.2.14 AT+CFTPPUT Put a file to FTP(S)server through serial port

You can put a file to FTP(S)server through serial port. Make sure that you have login to FTP(S)server successfully.

AT+CFTPSPUT Put a file to FTP(S)server through serial port

| | |
|--|---|
| Test Command AT+CFTPSPUT=? | Response +CFTPSPUT: "FILEPATH"[,<data_len>[,<rest_size>]] |
| | OK |
| | Response 1)if upload file through serial port successfully: OK |
| | +CFTPSPUT: 0 2)if failed before input data: ERROR |
| Write Command AT+CFTPSPUT=<filepath>[,<dat a_len>[,<rest_size>]] | +CFTPSPUT: <errcode> 3)if failed after input data: OK +CFTPSPUT: <errcode> 4) ERROR 5) +CFTPSPUT: <errcode> ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 600000ms |
| Reference | |

Defined Values

| | |
|--------------------------|---|
| <filepath> | The remote file path. String type, maximum length is 112. |
| <data_len> | Numeric type, The length of the data to send, the maximum length is 2048.if parameter <data_len> is omitted, Each <Ctrl+Z>character present in the data flow of serial port when downloading FTP data will be coded as <ETX><Ctrl+Z>. Each <ETX> character will be coded as <ETX><ETX>. Single <Ctrl+Z> means end of the FTP data. <ETX> is 0x03, and <Ctrl+Z> is 0x1A. |
| <rest_size> | The value for FTP "REST" command which is used for broken transfer when transferring failed last time. Numeric type, the range is from 0 to 2147483647 |
| <errcode> | The result code of download file from FTP(s)server. 0 is success, |

others are failure, please refer to chapter 17.3.

Examples

```

AT+CFTPSPUT=?
+CFTPSPUT:
"FILEPATH"[,<data_len>[,<rest_size>]]

OK
AT+CFTPSPUT="test.txt",4
>
data
OK

+CFTPSPUT: 0

```

17.2.15 AT+CFTPSSINGLEIP Set FTP(S)data socket address type

This command is used to set FTPS server data socket IP address type. For some FTP(S)server, it is needed to set AT+CFTPSSINGLEIP=1. Please make sure to set AT+CFTPSSINGLEIP before AT+CFTPSLOGIN.

AT+CFTPSSINGLEIP Set FTP(S)data socket address type

| | |
|--|---|
| | Response |
| Test Command | +CFTPSSINGLEIP: (0,1) |
| AT+CFTPSSINGLEIP=? | OK |
| Read Command | +CFTPSSINGLEIP: <singleip> |
| AT+CFTPSSINGLEIP? | OK |
| | Response |
| | 1) |
| | OK |
| | 2) |
| Write Command | ERROR |
| AT+CFTPSSINGLEIP=<singleip> | 3) |
| > | +CFTPSSINGLEIP: <singleip> |
| | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |

Reference

Defined Values

| | |
|------------|--|
| <singleip> | The FTPS data socket IP address type: <u>0</u> decided by PORT response from FTPS server 1 the same as the control socket. |
|------------|--|

Examples

```
AT+CFTPSSINGLEIP=?  
+CFTPSSINGLEIP: (0,1)
```

OK

```
AT+CFTPSSINGLEIP?  
+CFTPSSINGLEIP: 0
```

OK

```
AT+CFTPSSINGLEIP=0  
OK
```

17.2.16 AT+CFTPSSIZE Get the file size on FTP(S)server

You can use this command to get the file size on FTP(S)server. Please make sure you have login to FTP(S)server before AT+CFTPSSIZE.

AT+CFTPSSIZE Get the file size on FTP(S)server

Test Command

```
AT+CFTPSSIZE=?
```

Response

```
+CFTPSSIZE: "FILEPATH"
```

OK

Response

1)

OK

Write Command

```
AT+CFTPSSIZE=<filepath>
```

+CFTPSSIZE: <filesize>

2)

ERROR

```
+CFTPSSIZE: <errcode>
```

3)
ERROR
4)
+CFTPSSIZE: <errcode>

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------|---|
| <filepath> | The remote file path on FTP(S)server. String type, max length is 112 |
| <filesize> | Numeric type, size of the remote file on FTP(S)server |
| <errcode> | The result of set type, 0 is success, others are failure, please refer to chapter 4 |

Examples

```
AT+CFTPSSIZE=?  

+CFTPSSIZE: "FILEPATH"  

  

OK  

AT+CFTPSSIZE="test"  

OK  

  

+CFTPSSIZE: 3
```

17.2.17 AT+CFTPSTYPE Set the transfer type on FTP(S)server

This command is used to set the transfer type on FTP(S)server, please make sure you have login to FTP(S)server before AT+CFTPSTYPE.

AT+CFTPSTYPE Set the transfer type on FTP(S)server

| | |
|-----------------------|---------------------------------|
| Test Command | Response |
| AT+CFTPSTYPE=? | +CFTPSTYPE: (A,I) |
| Read Command | OK |
| AT+CFTPSTYPE? | +CFTPSTYPE: <type> |

| | |
|----------------------------------|--|
| | OK |
| | Response |
| | 1) OK |
| | +CFTPSTYPE: 0 |
| | 2) OK |
| | +CFTPSTYPE: <errcode> |
| | 3) ERROR |
| | 4) +CFTPSTYPE: <errcode> |
| | ERROR |
| Write Command | |
| AT+CFTPSTYPE=<type> | |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------------------|--|
| <type> | The type of transferring: A ASCII I Binary |
| <errcode> | The result of set type, 0 is success, others are failure, please refer to chapter 17.3 |

Examples

```
AT+CFTPSTYPE=?
```

```
+CFTPSTYPE: (A,I)
```

```
OK
```

```
AT+CFTPSTYPE?
```

```
+CFTPSTYPE: I
```

```
OK
```

```
AT+CFTPSTYPE=A
```

```
OK
```

```
+CFTPSTYPE: 0
```

17.2.18 AT+CFTPSSLCFG Set the SSL context id for FTPS session

You can use this command to set the SSL context id for FTPS session.

AT+CFTPSSLCFG Set the SSL context id for FTPS session

| | |
|---|---|
| Test Command | Response +CFTPSSLCFG: (0,1),(0-9) |
| AT+CFTPSSLCFG=? | OK |
| Write Command | Response 1) OK 2) ERROR |
| AT+CFTPSSLCFG=<session_id> >,<ssl_id> | |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------------------|--|
| <session_id> | Numeric type, 0 for control session, 1 for data session. |
| <ssl_id> | Numeric type, SSL context ID during 0-9. |

Examples

```
AT+CFTPSSLCFG=?  
+CFTPSSLCFG: (0,1),(0-9)  
  
OK  
AT+CFTPSSLCFG=0,1  
OK
```

17.2.19 AT+CFTPSMODE Set Active or Passive FTP Mode

You can use this command to set Active or Passive FTP Mode.

AT+CFTPSMODE Set Active or Passive FTP Mode

Test Command

AT+CFTPSMODE=?

Response

+CFTPSMODE: (0,1)

OK

Read Command

AT+CFTPSMODE?

OK

Response

1)

OK

2)

ERROR

3)

+CFTPSMODE: <errcode>

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

Defined Values

<mode>

Numeric type

0 Active FTP mode

1 Passive FTP mode

Examples

AT+CFTPSMODE=?

+CFTPSMODE: (0,1)

OK

AT+CFTPSMODE=1

OK

AT+CFTPSMODE?

+CFTPSMODE: 1

OK

NOTE

AT+CFTPSMODE is only supported on the 1603,1606 and 1803 platforms.

17.3 Command Result Codes

17.3.1 Description of <errcode>

| <errcode> | Description |
|-----------|--|
| 0 | Success |
| 1 | SSL alert |
| 2 | Unknown error |
| 3 | Busy |
| 4 | Connection closed by server |
| 5 | Timeout |
| 6 | Transfer failed |
| 7 | File not exists or any other memory error |
| 8 | Invalid parameter |
| 9 | Operation rejected by server |
| 10 | Network error |
| 11 | State error |
| 12 | Failed to parse server name |
| 13 | Create socket error |
| 14 | Connect socket failed |
| 15 | Close socket failed |
| 16 | SSL session closed |
| 17 | File error, file not exist or other error. |
| 421 | Server response connection time out, while received error code 421, you need do AT+CFTPSLOGOUT to logout server then AT+CFTPSLOGIN again for further operations. |

17.4 Unsolicited Result codes

| Unsolicited codes | Description |
|---------------------------|--|
| +CFTPSNOTIFY: PEER CLOSED | When client disconnect passively, URC "+CFTPSNOTIFY: |

| | |
|--------------------------------------|--|
| | PEER CLOSED" will be reported, then user need to execute AT+CFTPSLOGOUT and log in again. |
| +CFTPSNOTIFY: FTPS DISCONNECT | During the FTP client and FTP server is connecting, the net disconnect will report "+CFTPSNOTIFY: FTPS DISCONNECT" to URC, then user need execute AT+CFTPSTART and login again |

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18 AT Commands for MQTT(S)

18.1 Overview of AT Commands for MQTT(S)

| Command | Description |
|---------------------------|---|
| AT+CMQTTSTART | Start MQTT service |
| AT+CMQTTSTOP | Stop MQTT service |
| AT+CMQTTACQ | Acquire a client |
| AT+CMQTTREL | Release a client |
| AT+CMQTTSSLCFG | Set the SSL context (only for SSL/TLS MQTT) |
| AT+CMQTTWILLTOPIC | Input the topic of will message |
| AT+CMQTTWILLMSG | Input the will message |
| AT+CMQTTCONNECT | Connect to MQTT server |
| AT+CMQTTDISC | Disconnect from server |
| AT+CMQTTTOPIC | Input the topic of publish message |
| AT+CMQTTPAYLOAD | Input the publish message |
| AT+CMQTPUB | Publish a message to server |
| AT+CMQTTSUBTOPIC | Input the topic of subscribe message |
| AT+CMQTTSUB | Subscribe a message to server |
| AT+CMQTTUNSUBTOPIC | Input the topic of unsubscribe message |
| AT+CMQTTUNSUB | Unsubscribe a message to server |
| AT+CMQTTCFG | Configure the MQTT Context |

18.2 Detailed Description of AT Commands for MQTT(S)

18.2.1 AT+CMQTTSTART Start MQTT service

AT+CMQTTSTART is used to start MQTT service by activating PDP context. You must execute this command before any other MQTT related operations.

AT+CMQTTSTART Start MQTT service

Test Command

AT+CMQTTSTART=?

Response

+CMQTTSTART: (1-n)

OK

Execute Command

AT+CMQTTSTART

Response

1) If start MQTT service successfully:

OK

+CMQTTSTART: 0

2) If failed:

OK

+CMQTTSTART: <err>

3) If MQTT service have started successfully and you executed

AT+CMQTTSTART again:

ERROR

Write Command

AT+CMQTTSTART=<cid>

Response

1)

OK

+CMQTTSTART: <err>,<cid>

2)

ERROR

Max Response Time

12000ms

Parameter Saving Mode

-

Reference

Defined Values

| | |
|--------------------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
| <err> | The result code, please refer to Chapter 18.3 |

Examples

AT+CMQTTSTART

OK

+CMQTTSTART: 0

AT+CMQTTSTART is used to start MQTT service by activating PDP context. You must execute this command before any other MQTT related operations.

If you don't execute AT+CMQTTSTART, the Write/Read Command of any other MQTT will return ERROR immediately.

18.2.2 AT+CMQTTSTOP Stop MQTT service

AT+CMQTTSTOP is used to stop MQTT service.

AT+CMQTTSTOP Stop MQTT service

Test Command

AT+CMQTTSTOP=?

Response

+CMQTTSTOP: (1-n)

OK

Response

1) If stop MQTT service successfully:

OK

+CMQTTSTOP: 0

2) If failed:

+CMQTTSTOP: <err>

ERROR

3) If MQTT service have stopped successfully and you executed AT+CMQTTSTOP again:

ERROR

Response

1)

OK

+CMQTTSTOP: <err>,<cid>

2)

ERROR

Write Command

AT+CMQTTSTOP=<cid>

Max Response Time

12000ms

Parameter Saving Mode

-

Reference

Defined Values

| | |
|-------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
| <err> | The result code, please refer to chapter 18.3 |

Examples

AT+CMQTTSTOP

OK

+CMQTTSTOP: 0

NOTE

AT+CMQTTSTOP is used to stop MQTT service. You can execute this command after AT+CMQTTDISC and AT+CMQTTREL.

18.2.3 AT+CMQTTACCQ Acquire a client

AT+CMQTTACCQ is used to acquire a MQTT client. It must be called before all commands about MQTT connect and after AT+CMQTTSTART.

AT+CMQTTACCQ Acquire a client

| | |
|---|--|
| Test Command AT+CMQTTACCQ=? | Response +CMQTTACCQ: (0-1),(1-128)[,(0-1)] OK |
| Read Command AT+CMQTTACCQ? | Response +CMQTTACCQ: <client_index>,<clientID>,<server_type> +CMQTTACCQ: <client_index>,<clientID>,<server_type> |
| Write Command AT+CMQTTACCQ=<client_index>,<clientID>[<server_type>] | Response 1)If successfully: OK 2)If failed: +CMQTTACCQ: <client_index>,<err> |

| | |
|-----------------------|--------------|
| | ERROR |
| 3) If failed: | |
| | ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|----------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <clientID> | The UTF-encoded string. It specifies a unique identifier for the client. The string length is from 1 to 128 bytes. |
| <server_type> | A numeric parameter that identifies the server type. The default value is 0. 0 MQTT server with TCP 1 MQTT server with SSL/TLS |
| <err> | The result code, please refer to chapter 18.3 |

Examples

```
AT+CMQTTACCQ=0,"a12mmmm",0
```

OK

```
AT+CMQTTACCQ?
```

```
+CMQTTACCQ: 0,"a12mmmm",0
```

```
+CMQTTACCQ: 1,"",0
```

OK

```
AT+CMQTTACCQ=?
```

```
+CMQTTACCQ: (0-1),(1-128)[,(0-1)]
```

OK

18.2.4 AT+CMQTTREL Release a client

AT+CMQTTREL is used to release a MQTT client. It must be called after AT+CMQTTDISC and before

AT+CMQTTSTOP.

AT+CMQTTREL Release a client

| | |
|--|---|
| Test Command AT+CMQTTREL=? | Response +CMQTTREL: (0-1) |
| Read Command AT+CMQTTREL? | OK Response 1)If successfully: OK 2)if MQTT not start ERROR |
| Write Command AT+CMQTTREL=<client_index> | Response 1)If successfully: OK 2)If failed: +CMQTTREL: <client_index>,<err> ERROR 3)If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|-----------------------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <err> | The result code, please refer to chapter 18.3 |

Examples

```
AT+CMQTTREL=?
+CMQTTREL: (0-1)
```

```
OK
AT+CMQTTREL=0
OK
AT+CMQTTREL?
OK
```

18.2.5 AT+CMQTTSSLCFG Set the SSL context (only for SSL/TLS MQTT)

AT+CMQTTSSLCFG is used to set the SSL context which to be used in the SSL connection when it will connect to a SSL/TLS MQTT server. It must be called before AT+CMQTTCONNECT and after AT+CMQTTSTART. The setting will be cleared after AT+CMQTTCONNECT failed or AT+CMQTTDISC.

AT+CMQTTSSLCFG Set the SSL context (only for SSL/TLS MQTT)

| | |
|---|---|
| Test Command AT+CMQTTSSLCFG=? | Response +CMQTTSSLCFG: (0,1),(0-9) OK |
| Read Command AT+CMQTTSSLCFG? | Response +CMQTTSSLCFG: <session_id>,[<ssl_ctx_index>] +CMQTTSSLCFG: <session_id>,[<ssl_ctx_index>] OK |
| Write Command AT+CMQTTSSLCFG=<session_id>,<ssl_ctx_index> | Response 1)If successfully: OK 2)If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|------------------------------|---|
| <session_id> | The session_id to operate. It's from 0 to 1 |
| <ssl_ctx_index> | The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG |

Examples

```
AT+CMQTTSSLCFG?
+CMQTTSSLCFG: 0,0
+CMQTTSSLCFG: 1,0
```

OK

AT+CMQTTSSLCFG=?

+CMQTTSSLCFG: (0,1),(0-9)

OK

AT+CMQTTSSLCFG=0,1

OK

18.2.6 AT+CMQTTWILLTOPIC Input the topic of will message

AT+CMQTTWILLTOPIC is used to input the topic of will message.

AT+CMQTTWILLTOPIC Input the topic of will message

Test Command

AT+CMQTTWILLTOPIC=?

Response

+CMQTTWILLTOPIC: (0-1),(1-1024)

OK

Response

1) If successfully:

>

<input data here>

OK

2) If failed:

+CMQTTWILLTOPIC: <client_index>,<err>

ERROR

3) If failed:

ERROR

Write Command

AT+CMQTTWILLTOPIC=<client_index>,<req_length>

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|-----------------------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <req_length> | The length of input topic. The will topic should be UTF-encoded string. The range is from 1 to 1024 bytes. |
| <err> | The result code, please refer to chapter 18.3 |

Examples

AT+CMQTTWILLTOPIC=0,10

>

OK

18.2.7 AT+CMQTTWILLMSG Input the will message

AT+CMQTTWILLMSG is used to input the message body of will message.

AT+CMQTTWILLMSG Input the will message

Test Command

AT+CMQTTWILLMSG=?

Response

+CMQTTWILLMSG: (0-1),(1-1024),(0-2)

OK

Response

1) If successfully:

>

<input data here>

OK

2) If failed:

+CMQTTWILLMSG: <client_index>,<err>

ERROR

3) If failed:

ERROR

Write Command

AT+CMQTTWILLMSG=<client_index>,<req_length>,<qos>

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|-----------------------------|---|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <req_length> | The length of input data. The will message should be UTF-encoded string. The range is from 1 to 1024 bytes. |
| <qos> | The qos value of the will message. The range is from 0 to 2. |

Examples

```
AT+CMQTTWILLMSG=0,6,1
```

```
>  
OK
```

18.2.8 AT+CMQTTCONNECT Connect to MQTT server

AT+CMQTTCONNECT is used to connect to a MQTT server.

AT+CMQTTCONNECT Connect to MQTT server

Test Command

```
AT+CMQTTCONNECT=?
```

Response

```
+CMQTTCONNECT:  
(0-1),(9-256),(1-64800),(0-1)[,<user_name>,<pass_word>]
```

OK

Read Command

```
AT+CMQTTCONNECT?
```

Response

```
+CMQTTCONNECT:  
0[,<server_addr>,<keepalive_time>,<clean_session>[,<user_na  
me>[,<pass_word>]]]  
+CMQTTCONNECT:  
1[,<server_addr>,<keepalive_time>,<clean_session>[,<user_na  
me>[,<pass_word>]]]
```

OK

Response

1) If successfully:

OK

```
+CMQTTCONNECT: <client_index>,0
```

2) If failed:

OK

```
+CMQTTCONNECT: <client_index>,<err>
```

3) If failed:

ERROR

```
+CMQTTCONNECT: <client_index>,<err>
```

4) If failed:

```
+CMQTTCONNECT: <client_index>,<err>
```

ERROR

Write Command

```
AT+CMQTTCONNECT=<clien  
t_index>,<server_addr>,<kee  
palive_time>,<clean_session  
>[,<user_name>[,<pass_word  
>]]
```

| | |
|-----------------------|------------------------------|
| | 5)If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|-------------------------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <server_addr> | The string that described the server address and port. The range of the string length is 9 to 256 bytes. The string should be like this "tcp://116.247.119.165:5141", must begin with "tcp://". If the <server_addr> not include the port, the default port is 1883. |
| <keepalive_time> | The time interval between two messages received from a client. The client will send a keep-alive packet when there is no message sent to server after song long time. The range is from 1s to 64800s (18 hours). |
| <clean_session> | <p>The clean session flag. The value range is from 0 to 1, and default value is 0.</p> <p>0 the server must store the subscriptions of the client after it disconnected. This includes continuing to store QoS 1 and QoS 2 messages for the subscribed topics so that they can be delivered when the client reconnects. The server must also maintain the state of in-flight messages being delivered at the point the connection is lost. This information must be kept until the client reconnects.</p> <p>1 the server must discard any previously maintained information about the client and treat the connection as "clean". The server must also discard any state when the client disconnects.</p> |
| <user_name> | The user name identifies the name of the user which can be used for authentication when connecting to server. The string length is from 1 to 256 bytes. |
| <pass_word> | The password corresponding to the user which can be used for authentication when connecting to server. The string length is from 1 to 256 bytes. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |

Examples

```
AT+CMQTTCONNECT=0,"tcp://120.27.2.154:1883",20,1
```

```
OK
```

```
+CMQTTCONNECT: 0,0  
AT+CMQTTCONNECT?  
+CMQTTCONNECT: 0,"tcp://120.27.2.154:1883",20,1  
+CMQTTCONNECT: 1
```

OK

NOTE

AT+CMQTTCONNECT is used to connect to a MQTT server.

If you don't set the SSL context by AT+CMQTTSSLCFG before connecting a SSL/TLS MQTT server by AT+CMQTTCONNECT, it will use the <client_index> (the 1st parameter of AT+CMQTTCONNNECT)SSL context when connecting to the server.

18.2.9 AT+CMQTTDISC Disconnect from server

AT+CMQTTDISC is used to disconnect from the server.

AT+CMQTTDISC Disconnect from server

| | |
|---|---|
| Test Command AT+CMQTTDISC=? | Response: +CMQTTDISC: (0-1),(0,1-180) OK |
| Read Command AT+CMQTTDISC? | Response: +CMQTTDISC: 0,<disc_state> +CMQTTDISC: 1,<disc_state> OK |
| Write Command AT+CMQTTDISC=<client_index>,<timeout> | Response 1)If disconnect successfully: +CMQTTDISC: <client_index>,0 OK 2)If disconnect successfully: OK +CMQTTDISC: <client_index>,0 3)If failed: OK |

+CMQTTDISC: <client_index>,<err>

4) If failed:

ERROR

5) If failed:

+CMQTTDISC: <client_index>,<err>

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|-----------------------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <timeout> | The timeout value for disconnection. The unit is second. The range is 1s to 180s. The default value is 0s (not set the timeout value). |
| <disc_state> | 1 disconnection 0 connection |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |

Examples

AT+CMQTTDISC=0,120

OK

+CMQTTDISC: 0,0

18.2.10 AT+CMQTTTOPIC Input the topic of publish message

AT+CMQTTTOPIC is used to input the topic of a publish message.

AT+CMQTTTOPIC Input the topic of publish message

| | |
|------------------------|--|
| Test Command | Response +CMQTTTOPIC: (0-1),(1-1024) |
| AT+CMQTTTOPIC=? | OK |
| Write Command | Response |

AT+CMQTTTOPIC=<client_index>,<req_length>

1) If successfully:
 >
 <input data here>
 OK
 2) If failed:
+CMQTTTOPIC: <client_index>,<err>
ERROR
 3) If failed:
ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|----------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <req_length> | The length of input topic data. The publish message topic should be UTF-encoded string. The range is from 1 to 1024 bytes. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |

Examples

AT+CMQTTTOPIC=0,9

>

OK

NOTE

The topic will be clean after execute AT+CMQTPUB.

18.2.11 AT+CMQTPAYLOAD Input the publish message

AT+CMQTPAYLOAD is used to input the message body of a publish message.

AT+CMQTPPAYLOAD Input the publish message

Test Command

AT+CMQTPPAYLOAD=?

Response

+CMQTPPAYLOAD: (0-1),(1-10240)

OK

Response

1) If successfully:

>

<input data here>

OK

2) If failed:

+CMQTPPAYLOAD: <client_index>,<err>

ERROR

3) If failed:

ERROR

Write Command

AT+CMQTPPAYLOAD=<client_index>,<req_length>

Parameter Saving Mode

Max Response Time

Reference

Defined Values

| | |
|-----------------------------|---|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <req_length> | The length of input message data. The publish message should be UTF-encoded string. The range is from 1 to 10240 bytes. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |

Examples

AT+CMQTPPAYLOAD=0,6

>

OK

NOTE

The topic will be clean after execute AT+CMQTPPUB.

18.2.12 AT+CMQTPUB Publish a message to server

AT+CMQTPUB is used to publish a message to MQTT server.

AT+CMQTPUB Publish a message to server

| | |
|--|--|
| | Response |
| Test Command AT+CMQTPUB=? | +CMQTPUB: (0-1),(0-2),(1-180),(0-1),(0-1) OK |
| | Response 1)If successfully: OK |
| | +CMQTPUB: <client_index>,0 2)If failed: OK |
| Write Command AT+CMQTPUB=<client_index>,<qos>,<pub_timeout>[,<ratained>[,<dup>]] | +CMQTPUB: <client_index>,<err> 3)If failed: +CMQTPUB: <client_index>,<err> ERROR 4)If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|----------------|---|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <qos> | The publish message's qos. The range is from 0 to 2. 0 at most once 1 at least once 2 exactly once |
| <pub_timeout> | The publishing timeout interval value. Since the client publish a message to server, it will report failed if the client receive no response from server after the timeout value seconds. The range is from 1s to 180s. |
| <ratained> | The retain flag of the publish message. The value is 0 or 1. The default value is 0. When a client sends a PUBLISH to a server, if the retain flag is set to |

| | |
|-------|---|
| | 1, the server should hold on to the message after it has been delivered to the current subscribers. |
| <dup> | The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |

Examples

AT+CMQTPUB=0,1,60

OK

+CMQTPUB: 0,0

NOTE

The topic and payload will be clean after execute AT+CMQTPUB.

18.2.13 AT+CMQTTSUBTOPIC Input the topic of subscribe message

AT+CMQTTSUBTOPIC is used to input the topic of a subscribe message.

AT+CMQTTSUBTOPIC Input the topic of subscribe message

Test Command

AT+CMQTTSUBTOPIC=?

Response

+CMQTTSUBTOPIC: (0-1),(1-1024),(0-2)

OK

Response

1)If successfully:

>

<input data here>

OK

2)If failed:

+CMQTTSUBTOPIC: <client_index>,<err>

Write Command

AT+CMQTTSUBTOPIC=<client_index>,<req_length>,< qos>

ERROR

3)If failed:

ERROR

| | |
|-----------------------|---|
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|----------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <req_length> | The length of input topic data. The publish message topic should be UTF-encoded string. The range is from 1 to 1024 bytes. |
| <qos> | The publish message's qos. The range is from 0 to 2. 0 at most once 1 at least once 2 exactly once |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |

Examples

```
AT+CMQTTSUBTOPIC=0,9,1
```

```
>
```

```
OK
```

NOTE

The topic will be clean after execute AT+CMQTTSUB.

18.2.14 AT+CMQTTSUB Subscribe a message to server

AT+CMQTTSUB is used to subscribe a message to MQTT server.

| AT+CMQTTSUB Subscribe a message to server | |
|--|---|
| Test Command | Response |
| AT+CMQTTSUB=? | +CMQTTSUB: (0-1),(1-1024),(0-2),(0-1) OK |

| | |
|--|---|
| Read Command AT+CMQTTSUB? | Response +CMQTTSUB: [<topic>] OK |
| Write Command /* subscribe one or more topics which input by AT+CMQTTSUBTOPIC*/ AT+CMQTTSUB=<client_index>[,<dup>] | Response 1)If successfully: OK +CMQTTSUB: <client_index>,0 2)If failed: OK +CMQTTSUB: <client_index>,<err> 3)If failed: +CMQTTSUB: <client_index>,<err> ERROR 4)If failed: ERROR |
| Write Command /* subscribe one topic*/ AT+CMQTTSUB=<client_index>,<reqLength>,<qos>[,<dup>] | Response 1)If successfully: > <input data here> OK +CMQTTSUB: <client_index>,0 2)If failed: OK +CMQTTSUB: <client_index>,<err> 3)If failed: +CMQTTSUB: <client_index>,<err> ERROR 4)If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|-----------------------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
|-----------------------------|--|

| | |
|--------------|---|
| <req_length> | The length of input topic data. The message topic should be UTF-encoded string. The range is from 1 to 1024 bytes. |
| <qos> | The publish message's qos. The range is from 0 to 2. 0 at most once 1 at least once 2 exactly once |
| <dup> | The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |
| <topic> | Topics to which you have subscribed |

Examples

```
AT+CMQTTSUB=0,9,1
```

```
>
```

```
OK
```

```
+CMQTTSUB: 0,0
```

```
AT+CMQTTSUB=0,1
```

```
OK
```

```
+CMQTTSUB: 0,0
```

NOTE

The topic will be clean after execute AT+CMQTTSUB.

18.2.15 AT+CMQTTUNSUBTOPIC Input the topic of unsubscribe message

AT+CMQTTUNSUBTOPIC is used to input the topic of a unsubscribe message.

AT+CMQTTUNSUBTOPIC Input the topic of unsubscribe message

| | |
|----------------------|--|
| Test Command | Response |
| AT+CMQTTUNSUBTOPIC=? | +CMQTTUNSUBTOPIC: (0-1),(1-1024) OK |

| | |
|-----------------------|--|
| | <p>Response</p> <p>1) If successfully: > <input data here> OK</p> <p>2) If failed: +CMQTTUNSUBTOPIC: <client_index>,<err></p> <p>ERROR</p> <p>3) If failed: ERROR</p> |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|-----------------------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <req_length> | The length of input topic data. The publish message topic should be UTF-encoded string. The range is from 1 to 1024 bytes. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |

Examples

```
AT+CMQTTUNSUBTOPIC=0,9
```

```
>
```

```
OK
```

NOTE

The topic will be clean after execute AT+CMQTTUNSUB.

18.2.16 AT+CMQTTUNSUB Unsubscribe a message to server

AT+CMQTTUNSUB is used to unsubscribe a message to MQTT server.

AT+CMQTTUNSUB Unsubscribe a message to server

| | |
|------------------------|--|
| | Response |
| Test Command | +CMQTTUNSUB: (0-1),(1-1024),(0-1) |
| AT+CMQTTUNSUB=? | OK |
| | Response |
| | 1)If successfully: |
| | OK |
| | +CMQTTUNSUB: <client_index>,0 |
| | 2)If failed: |
| | OK |
| | +CMQTTUNSUB: <client_index>,<err> |
| | 3)If failed: |
| | +CMQTTUNSUB: <client_index>,<err> |
| | ERROR |
| | 4)If failed: |
| | ERROR |
| | Response |
| | 1)If successfully: |
| | > |
| | <input data here> |
| | OK |
| | +CMQTTUNSUB: <client_index>,0 |
| | 2)If failed: |
| | OK |
| | +CMQTTUNSUB: <client_index>,<err> |
| | 3)If failed: |
| | +CMQTTUNSUB: <client_index>,<err> |
| | ERROR |
| | 4)If failed: |
| | ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|----------------|---|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <req_length> | The length of input topic data. The message topic should be UTF-encoded string. The range is from 1 to 1024 bytes. |
| <dup> | The dup flag to the message. The value is 0 or 1. The default value is 0. The flag is set when the client or server attempts to re-deliver a message. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 18.3. |

Examples

```
AT+CMQTTUNSUBTOPIC=0,9
>

OK
AT+CMQTTUNSUB=0,1
OK

+CMQTTUNSUB: 0,0
```

NOTE

The topic will be clean after execute AT+CMQTTUNSUB.

18.2.17 AT+CMQTTCFG Configure the MQTT Context

AT+CMQTTCFG is used to configure the MQTT context. It must be called before AT+CMQTTCONNECT and after AT+CMQTTACQ. The setting will be cleared after AT+CMQTTREL.

AT+CMQTTCFG Configure the MQTT Context

| | |
|--------------------------------------|---|
| Test Command AT+CMQTTCFG=? | Response +CMQTTCFG: "checkUTF8",(0-1),(0-1) +CMQTTCFG: "optimeout ",(0-1),(20-120) +CMQTTCFG: "aliauth",(0-1),"productkey","devicename","devicesecret" +CMQTTCFG: "version",(0-1),(3-4) +CMQTTCFG: "argtopic",(0-1),(0-1),(0-1) |
|--------------------------------------|---|

| | |
|--|---|
| Read Command AT+CMQTTCFG? | OK Response +CMQTTCFG: 0,<checkUTF8_flag>,<optimeout_val> +CMQTTCFG: 1,<checkUTF8_flag>,<optimeout_val> |
| Write Command /*Configure the check UTF8 flag of the specified MQTT client context*/ AT+CMQTTCFG="checkUTF8",<index>,<checkUTF8_flag> | OK Response 1)If successfully: OK 2)If failed: ERROR |
| Write Command /*Configure the max timeout interval of the send or receive data operation */ AT+CMQTTCFG="optimeout",<index>,<optimeout_val> | OK Response 1)If successfully: OK 2)If failed: ERROR |
| Write Command /*Configure the cid values of all clients when a connection is created*/ AT+CMQTTCFG="CID"[,<cid>] | OK Response 1) When <cid> is omitted: +CMQTTCFG: "CID",<cid> OK 2) If the <cid> set successfully: OK 2)If failed: ERROR |
| Write Command /*Configure the cid value of the specified client when creating a connection*/ AT+CMQTTCFG="SCID"[,<index>][,<cid>] | OK Response 1) When both the <index> and <cid> are omitted: +CMQTTCFG: "SCID",0,<cid> +CMQTTCFG: "SCID",1,<cid> OK 2) When <cid> is omitted: + CMQTTCFG: "SCID",<index>,<cid> OK 3)If successfully: OK 4)If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|--|---|
| <index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <checkUTF8_flag> | The flag to indicate whether to check the string is UTF8 coding or not, the default value is 1. <u>0</u> Not check UTF8 coding. <u>1</u> Check UTF8 coding. |
| <optimeout_val> | The max timeout interval of sending or receiving data operation. The range is from 20 seconds to 120 seconds, the default value is 120 seconds. |
| +CMQTTCFG: "aliauth",(0-1),"productkey" ,"devicename","devicesecr et" | (0-1): A numeric parameter that identifies a client. The range of permitted values is 0 to 1. "productkey": The string is productkey of Alibaba Cloud platform. "devicename": The string is devicename of Alibaba Cloud platform. "devicesecret": The string is devicesecret of Alibaba Cloud platform. |
| +CMQTTCFG: "version",(0-1),(3-4) | (0-1): A numeric parameter that identifies a client. The range of permitted values is 0 to 1. (3-4): Version of MQTT. 3: MQTT 3.1. The default value is 3. 4: MQTT 3.1.1. |
| +CMQTTCFG: "argtopic",(0-1),(0-1),(0-1) | The command is used to configure MQTT AT of extension, please refer to "A76XX Series MQTT EX_Application Note_XXXX.docx". (0-1): A numeric parameter that identifies a client. The range of permitted values is 0 to 1. (0-1):The flag to enable whether to show length of received. <u>0</u> : Not show length of received. 1: Show length of received. (0-1):A numeric parameter that identifies report payload length. <u>0</u> : Notify PUB message without payload length. 1: Notify PUB message with payload length. |
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. If neither <session_id> nor <cid> is set, the cid of all sessions are queried, If <cid> is not set, the cid of the current session is queried, and the default value of cid is 1. |

Examples

```
AT+CMQTTCFG?  
+CMQTTCFG: 0,1,120
```

```
+CMQTTCFG: 1,1,120
```

```
OK
```

```
AT+CMQTTCFG="optimeout",0,24
```

```
OK
```

```
AT+CMQTTCFG="checkUTF8",0,0
```

```
OK
```

```
AT+CMQTTCFG?
```

```
+CMQTTCFG: 0,0,24
```

```
+CMQTTCFG: 1,1,120
```

```
OK
```

NOTE

The setting will be cleared after AT+CMQTTREL.

18.3 Command Result Codes

18.3.1 Description of <err>

| <err> | Description |
|-------|----------------------|
| 0 | operation succeeded |
| 1 | failed |
| 2 | bad UTF-8 string |
| 3 | sock connect fail |
| 4 | sock create fail |
| 5 | sock close fail |
| 6 | message receive fail |
| 7 | network open fail |
| 8 | network close fail |
| 9 | network not opened |
| 10 | client index error |
| 11 | no connection |
| 12 | invalid parameter |

| | |
|----|---|
| 13 | not supported operation |
| 14 | client is busy |
| 15 | require connection fail |
| 16 | sock sending fail |
| 17 | timeout |
| 18 | topic is empty |
| 19 | client is used |
| 20 | client not acquired |
| 21 | client not released |
| 22 | length out of range |
| 23 | network is opened |
| 24 | packet fail |
| 25 | DNS error |
| 26 | socket is closed by server |
| 27 | connection refused: unaccepted protocol version |
| 28 | connection refused: identifier rejected |
| 29 | connection refused: server unavailable |
| 30 | connection refused: bad user name or password |
| 31 | connection refused: not authorized |
| 32 | handshake fail |
| 33 | not set certificate |
| 34 | Open session failed |
| 35 | Disconnect from server failed |

18.4 Unsolicited Result Codes

| URC | Description |
|---|--|
| +CMQTTCONNLOST: <client_index>,<cause> | When client disconnect passively, URC "+CMQTTCONNLOST" will be reported, then user need to connect MQTT server again. |
| +CMQTTNONET | When the network is become no network, the module will report this URC. If received this message, you should restart the MQTT service by AT+CMQTTSTART. |
| +CMQTRXSTART: <client_index>,<topic_total_len>,<payload_total_len> | If a client subscribes to one or more topics, any message published to |

```
+CMQTRXTOPIC: <client_index>,<sub_topic_len>
<sub_topic>
/*for long topic, split to multiple packets to report*/
[<CR><LF>+CMQTRXTOPIC:
<client_index>,<sub_topic_len>
<sub_topic>]
+CMQTRXPAYLOAD: <client_index>,<sub_payload_len>
<sub_payload>
/*for long payload, split to multiple packets to report*/
[+CMQTRXPAYLOAD: <client_index>,<sub_payload_len>
<sub_payload>]
+CMQTRXEND: <client_index>
```

those topics are sent by the server to the client. The following URC is used for transmitting the message published from server to client.

1)+CMQTRXSTART:
<client_index>,<topic_total_len>,<payload_total_len>\r\n

At the beginning of receiving published message, the module will report this to user, and indicate client index with <client_index>, the topic total length with <topic_total_len> and the payload total length with <payload_total_len> after "\r\n".

2)+CMQTRXTOPIC:
<client_index>,<sub_topic_len>\r\n
<sub_topic>

After the command "+CMQTRXSTART" received, the module will report the second message to user, and indicate client index with <client_index>, the topic packet length with <sub_topic_len> and the topic content with <sub_topic> after "\r\n".

For long topic, it will be split to multiple packets to report and the command "+CMQTRXTOPIC" will be send more than once with the rest of topic content. The sum of <sub_topic_len> is equal to <topic_total_len>.

3)+CMQTRXPAYLOAD:
<client_index>,<sub_payload_len>\r\n<sub_payload>

After the command "+CMQTRXTOPIC" received, the module will send third message to user, and indicate client index with <client_index>, the payload packet length with <sub_payload_len> and the payload content with <sub_payload> after "\r\n".

For long payload, the same as "+CMQTRXTOPIC".

| | |
|--|--|
| | 4)+CMQTTRXEND: <client_index> At last, the module will send fourth message to user and indicate the topic and payload have been transmitted completely. |
|--|--|

Defined Values

| | |
|---------------------|--|
| <client_index> | A numeric parameter that identifies a client. The range of permitted values is 0 to 1. |
| <cause> | The cause of disconnection. 1 Socket is closed passively. 2 Socket is reset. 3 Network is closed. |
| <topic_total_len> | The length of message topic received from MQTT server. The range is from 1 to 1024 bytes. |
| <payload_total_len> | The length of message body received from MQTT server. The range is from 1 to 10240 bytes. |
| <sub_topic_len> | The sub topic packet length, The sum of <sub_topic_len> is equal to <topic_total_len>. |
| <sub_topic> | The sub topic content. |
| <sub_payload_len> | The sub message body packet length, The sum of <sub_payload_len> is equal to <payload_total_len>. |
| <sub_payload> | The sub message body content. |

19 AT Commands for SSL

19.1 Overview of AT Commands for SSL

| Command | Description |
|-----------------------|---|
| AT+CSSLCFG | Configure the SSL Context |
| AT+CCERTDOWN | Download certificate into the module |
| AT+CCERTLIST | List certificates |
| AT+CCERTDELETE | Delete certificates |
| AT+CCHSET | Configure the report mode of sending and receiving data |
| AT+CCHMODE | Configure the mode of sending and receiving data |
| AT+CCHSTART | Start SSL service |
| AT+CCHSTOP | Stop SSL service |
| AT+CCHADDR | Get the IPv4 address |
| AT+CCHSSLCFG | Set the SSL context |
| AT+CCHCFG | Configure the Client Context |
| AT+CCHOPEN | Connect to server |
| AT+CCHCLOSE | Disconnect from server |
| AT+CCHSEND | Send data to server |
| AT+CCHRECV | Read the cached data that received from the server |
| AT+CCERTMOVE | Move the cert from file system to cert content |

19.2 Detailed Description of AT Commands for SSL

19.2.1 AT+CSSLCFG Configure the SSL Context

| AT+CSSLCFG Configure the SSL Context | |
|--------------------------------------|------------------------------------|
| Test Command | Response |
| AT+CSSLCFG=? | +CSSLCFG: "sslversion",(0-9),(0-4) |

```
+CSSLCFG: "authmode",(0-9),(0-3)
+CSSLCFG: "ignorelocaltime",(0-9),(0,1)
+CSSLCFG: "negotiatetime",(0-9),(10-300)
+CSSLCFG: "cacert",(0-9),(5-108)
+CSSLCFG: "clientcert",(0-9),(5-108)
+CSSLCFG: "clientkey",(0-9),(5-108)
+CSSLCFG: "password",(0-9),(5-108)
+CSSLCFG: "enableSNI",(0-9),(0,1)
+CSSLCFG: "ignorecertCN",(0-9),(0,1)
```

OK

Response

```
+CSSLCFG:
0,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
+CSSLCFG:
1,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
+CSSLCFG:
2,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
+CSSLCFG:
3,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
+CSSLCFG:
4,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
+CSSLCFG:
5,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
+CSSLCFG:
6,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
+CSSLCFG:
7,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
+CSSLCFG:
```

Read Command

AT+CSSLCFG?

```
4,<sslversion>,<authmode>,<ignoreftime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

```
8,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
+CSSLCFG:
9,<sslversion>,<authmode>,<ignoreltime>,<negotiatetime>,<ca
_file>,<clientcert_file>,<clientkey_file>,<password_file>,<enabl
eSNI_flag>,<ignorecertCN_flag>
```

OK

Response

+CSSLCFG:

```
<ssl_ctxindex>,<sslversion>,<authmode>,<ignoreltime>,<nego
tiatetime>,<ca_file>,<clientcert_file>,<clientkey_file>,<passwor
d_file>,<enableSNI_flag>,<ignorecertCN_flag>
```

OK

Response

1)If successfully:

OK

2)If failed:

ERROR

Response

1)If successfully:

OK

2)If failed:

Write Command

/*Query the configuration of the specified SSL context*/

AT+CSSLCFG=<ssl_ctx_index>

Write Command

/*Configure the version of the specified SSL context*/

AT+CSSLCFG="sslversion",<ssl_ctx_index>,<sslversion>

Write Command

/*Configure the authentication mode of the specified SSL context*/

AT+CSSLCFG="authmode",<ssl_ctx_index>,<authmode>

Write Command

/*Configure the ignore local time flag of the specified SSL context*/

AT+CSSLCFG="ignorelocaltime",<ssl_ctx_index>,<ignoreltime>

Write Command

/*Configure the negotiate timeout value of the specified SSL context*/

AT+CSSLCFG="negotiatetime",<ssl_ctx_index>,<negotiatetime>

Write Command

/*Configure the server root CA of the specified SSL context*/

AT+CSSLCFG="cacert",<ssl_

| | |
|---|---|
| ctx_index>,<ca_file> | ERROR |
| Write Command /*Configure the client certificate of the specified SSL context*/ AT+CSSLCFG="clientcert",<ssl_ctx_index>,<clientcert_file> > | Response 1)If successfully: OK 2)If failed: ERROR |
| Write Command /*Configure the client key of the specified SSL context*/ AT+CSSLCFG="clientkey",<ssl_ctx_index>,<clientkey_file> | Response 1)If successfully: OK 2)If failed: ERROR |
| Write Command /*Configure the password of the specified SSL context*/ AT+CSSLCFG="password",<ssl_ctx_index>,<password_file> > | Response 1)If successfully: OK 2)If failed: ERROR |
| Write Command /*Configure the enableSNI flag of the specified SSL context */ AT+CSSLCFG="enableSNI",<ssl_ctx_index>,<enableSNI_flag> | Response 1)If successfully: OK 2)If failed: ERROR |
| Write Command /*Configure the ignorecertCN flag of the specified SSL context */ AT+CSSLCFG="ignorecertCN",<ssl_ctx_index>,<ignorecertCN_flag> | Response 1)If successfully: OK 2)If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|------------------------------|---|
| <ssl_ctx_index> | The SSL context ID. The range is 0-9. |
| <sslversion> | The SSL version, the default value is 4. 0 SSL3.0 1 TLS1.0 2 TLS1.1 3 TLS1.2 4 All |

| | |
|--------------------------------|---|
| | <p>The configured version should be support by server. So you should use the default value if you are not sure that the version which the server supported.</p> |
| <authmode> | <p>The authentication mode, the default value is 0.</p> <ul style="list-style-type: none"> 0 no authentication. 1 server authentication. It needs the root CA of the server. 2 server and client authentication. It needs the root CA of the server, the cert and key of the client.(If the server does not need to authenticate the client ,it is equivalent to value 1.) 3 client authentication and no server authentication. It needs the cert and key of the client.(If the server does not need to authenticate the client ,it is equivalent to value 0.) |
| <ignoreftime> | <p>The flag to indicate how to deal with expired certificate, the default value is 1.</p> <ul style="list-style-type: none"> 0 care about time check for certification. 1 ignore time check for certification <p>When set the value to 0, it need to set the right current date and time by AT+CCLK when need SSL certification.</p> |
| <negotiatetime> | <p>The timeout value used in SSL negotiate stage. The range is 10-300 seconds. The default value is 300.</p> |
| <ca_file> | <p>The root CA file name of SSL context. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes. If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code).</p> <p>There are two ways to download certificate files to module:</p> <ol style="list-style-type: none"> 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document. |
| <clientcert_file> | <p>The client cert file name of SSL context. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes.</p> <p>If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code).</p> <p>There are two ways to download certificate files to module:</p> <ol style="list-style-type: none"> 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document. |
| <clientkey_file> | <p>The client key file name of SSL context. The file name must have</p> |

| | |
|---------------------|---|
| | <p>type like ".pem" or ".der". The length of filename is from 5 to 108 bytes.</p> <p>If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code).</p> <p>There are two ways to download certificate files to module:</p> <ol style="list-style-type: none"> 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document. |
| <password_file> | <p>The password file name of SSL context.this is used to decrypt the client key. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes.</p> <p>If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code).</p> <p>There are two ways to download certificate files to module:</p> <ol style="list-style-type: none"> 1. By AT+CCERTDOWN. 2. By FTPS or HTTPS commands. Please refer to Chapter 16&17 of this document. |
| <enableSNI_flag> | <p>The flag to indicate that enable the SNI flag or not, the default value is 0.</p> <ul style="list-style-type: none"> 0 not enable SNI. 1 enable SNI. |
| <ignorecertCN_flag> | <p>The flag to indicate that enable the ignorecertCN flag or not, the default value is 0.</p> <ul style="list-style-type: none"> 0 not enable ignorecertCN. 1 enable ignorecertCN. |

Examples

AT+CSSLCFG=?

```
+CSSLCFG: "sslversion",(0-9),(0-4)
+CSSLCFG: "authmode",(0-9),(0-3)
+CSSLCFG: "ignorelocaltime",(0-9),(0,1)
+CSSLCFG: "negotiatetime",(0-9),(10-300)
+CSSLCFG: "cacert",(0-9),(5-108)
+CSSLCFG: "clientcert",(0-9),(5-108)
+CSSLCFG: "clientkey",(0-9),(5-108)
+CSSLCFG: "password",(0-9),(5-108)
+CSSLCFG: "enableSNI",(0-9),(0,1)
```

+CSSLCFG: "ignorecertCN",(0-9),(0,1)

OK

AT+CSSLCFG?

+CSSLCFG: 0,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 1,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 2,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 3,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 4,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 5,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 6,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 7,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 8,4,0,1,300,"","","","","","",0,0
+CSSLCFG: 9,4,0,1,300,"","","","","","",0,0

OK

AT+CSSLCFG="authmode",0,0

OK

AT+CSSLCFG=6

+CSSLCFG: 6,4,0,1,300,"","","","","","",0,0

OK

NOTE

1. When validating a server certificate, ignore the "Hostname does not match certificate's Common Name (CN) field" error.

(In the case of self-signed certificates or in a development environment, there may be an issue where the CN field of the certificate does not match the hostname. In such situations, you can disable the validation of the certificate's CN field by setting the "ignorecertCN" field to 1, which will help avoid connection issues. However, please note that this action introduces certain security risks and should be used with caution.)

2. The <ignorecertCN> field is currently only supported by the 1803S series.

19.2.2 AT+CCERTDOWN Download certificate into the module

AT+CCERTDOWN Download certificate into the module

| | Response |
|-----------------------|-------------------------------|
| Test Command | +CCERTDOWN: (5-108),(1-10240) |
| AT+CCERTDOWN=? | OK |

| | |
|--|---|
| | <p>Response</p> <p>1) If it can be download:</p> <p>></p> <p><input data here></p> <p>OK</p> <p>2) If failed:</p> <p>ERROR</p> |
| Write Command | |
| AT+CCERTDOWN=<filename>,<len> | |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|-------------------------|---|
| <filename> | The name of the certificate/key/password file. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes. If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code). For Examples: If you want to download a file with name "中华.pem" in UTF8, you'd better convert the "中华.pem" to UTF8 coding (中华.pem), then input the hexadecimal (262378344532443B262378353334453B2E70656D) of UTF8 coding. |
| <len> | The length of the file data to send. The range is from 1 to 10240 bytes. User should note than every packet data should be no larger than 3072 bytes. |

Examples

```
AT+CCERTDOWN=?
+CCERTDOWN: (5-108),(1-10240)

OK
AT+CCERTDOWN="ls.pem",1970
>

OK
```

19.2.3 AT+CCERTLIST List certificates

AT+CCERTLIST List certificates

Execute Command

AT+CCERTLIST

Response

[+CCERTLIST: <file_name>

[+CCERTLIST: <file_name>]

...

]

OK

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

<filename>

The certificate/key/password files which has been downloaded to the module.

If the filename contains non-ASCII characters, it will show the non-ASCII characters as UTF8 code.

Examples

AT+CCERTLIST

+CCERTLIST: "ls.pem"

OK

19.2.4 AT+CCERTDELETE Delete certificates

AT+CCERTDELETE Delete certificates

Write Command

AT+CCERTDELETE=<filename>

Response

1) If remove the file successfully:

OK

2) Else

ERROR

Parameter Saving Mode

-

Max Response Time

120000ms

Reference -

Defined Values

| | |
|-------------------------|---|
| <filename> | The name of the certificate/keypassword file. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes. If the filename contains non-ASCII characters, the file path parameter should contain a prefix of {non-ascii} and the quotation mark (The string in the quotation mark should be hexadecimal of the filename's UTF8 code). For Examples: If you want to download a file with name "中华.pem", you should convert the "中华.pem" to UTF8 coding (&x4E2D;&x534E;.pem), then input the hexadecimal (262378344532443B262378353334453B2E70656D) of UTF8 coding. |
|-------------------------|---|

Examples

AT+CCERTDELETE="ls.pem"

OK

19.2.5 AT+CCHSET Configure the report mode of sending and receiving data

AT+CCHSET is used to configure the mode of sending and receiving data. It must be called before AT+CCHSTART.

AT+CCHSET Configure the report mode of sending and receiving data

Response

+CCHSET: (0,1),(0,1)

OK

Response

+CCHSET: <report_send_result>,<recv_mode>

OK

Response

1) If successfully:

OK

2) If failed:

Read Command

AT+CCHSET?

Write Command

**AT+CCHSET=<report_send_res
ult>[,<recv_mode>]**

| ERROR | |
|-----------------------|----------|
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|----------------------|---|
| <report_send_result> | Whether to report result of CCHSEND, the default value is 0: 0 No. 1 Yes. Module will report +CCHSEND: <session_id>,<err> to MCU when complete sending data. |
| <recv_mode> | The receiving mode, the default value is 0: 0 Output the data to MCU whenever received data. 1 Module caches the received data and notifies MCU with +CCHEVENT: <session_id>, RECV EVENT. MCU can use AT+CCHRECV to receive the cached data (only in manual receiving mode). |

Examples

```
AT+CCHSET?  
+CCHSET: (0,1),(0,1)
```

```
OK  
AT+CCHSET?  
+CCHSET: 0,0
```

```
OK  
AT+CCHSET=1,1  
OK
```

19.2.6 AT+CCHMODE Configure the mode of sending and receiving data

AT+CCHMODE is used to select transparent mode (data mode) or non-transparent mode (command mode). The default mode is non-transparent mode. This AT command must be called before calling AT+CCHSTART.

AT+CCHMODE Configure the mode of sending and receiving data

| | |
|--------------|----------|
| Test Command | Response |
|--------------|----------|

| | |
|---|--|
| AT+CCHMODE=? | +CCHMODE: (0,1) |
| Read Command AT+CCHMODE? | OK Response +CCHMODE: <mode> |
| Write Command AT+CCHMODE=<mode> | OK Response 1) If successfully: OK 2) If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

<mode>

The mode value:

- 0 Normal
- 1 Transparent mode

Examples

AT+CCHMODE=?

+CCHMODE: (0,1)

OK

AT+CCHMODE?

+CCHMODE: 0

OK

AT+CCHMODE=1

OK

NOTE

There is only one session in the transparent mode, it's the first session.

19.2.7 AT+CCHSTART Start SSL service

AT+CCHSTART is used to start SSL service by activating PDP context. You must execute AT+CCHSTART before any other SSL related operations.

AT+CCHSTART Start SSL service

Execute Command
AT+CCHSTART

Response

1)If start SSL service successfully:

OK

+CCHSTART: 0

2)If failed:

ERROR

3)If failed:

ERROR

+CCHSTART: <err>

Response

1)If start SSL service successfully:

OK

+CCHSTART: 0

2)If failed:

ERROR

3)If failed:

ERROR

+CCHSTART: <err>

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

| | |
|--------------------|--|
| <err> | The result code, please refer to the end of this chapter. |
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |

Examples

AT+CCHSTART

OK

+CCHSTART: 0

AT+CCHSTART=1

OK

+CCHSTART: 0

19.2.8 AT+CCHSTOP Stop SSL service

AT+CCHSTOP is used to stop SSL service.

AT+CCHSTOP Stop SSL service

Response

1)If stop SSL service successfully:

OK

+CCHSTOP: 0

2)If failed:

ERROR

Response

1)If stop SSL service successfully:

OK

+CCHSTOP: 0

2)If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

| | |
|-------|--|
| <err> | The result code, please refer to the end of this chapter |
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |

Examples

AT+CCHSTOP

OK

+CCHSTOP: 0

AT+CCHSTOP=1

OK

+CCHSTOP: 0

19.2.9 AT+CCHADDR Get the IPv4 address

AT+CCHADDR is used to get the IPv4 address after calling AT+CCHSTART.

AT+CCHADDR Get the IPv4 address

| | | |
|-----------------------|-------------------|--|
| Execute Command | AT+CCHADDR | Response 1)if successfully, response +CCHADDR: <ip_address> |
| | | OK 2)if pdp has not been activated, response ERROR |
| Parameter Saving Mode | | - |
| Max Response Time | | 12000ms |
| Reference | | - |

Defined Values

<ip address>

A string parameter that identifies the IPv4 address after PDP activated.

Examples

AT+CCHADDR

+CCHADDR: 10.43.71.130

OK

19.2.10 AT+CCHSSLCFG Set the SSL context

AT+CCHSSLCFG is used to set the SSL context which to be used in the SSL connection. It must be called before AT+CCHOPEN and after AT+CCHSTART. The setting will be cleared after AT+CCHOPEN failed or AT+CCHCLOSE.

AT+CCHSSLCFG Set the SSL context

Test Command

AT+CCHSSLCFG=?

Response

+CCHSSLCFG: (0,1),(0-9)

OK

Read Command

AT+CCHSSLCFG?

Response

+CCHSSLCFG: <session_id>,[<ssl_ctx_index>]

+CCHSSLCFG: <session_id>,[<ssl_ctx_index>]

OK

Write Command

AT+CCHSSLCFG=<session_id>
,<ssl_ctx_index>

Response

1)If successfully:

OK

2)If failed:

ERROR

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

<session_id>

The session_id to operate. It's from 0 to 1. (CCH supports 3 TLS connections in version 1603 on the 160X baseline, please refer to the A1602 & 1606 Series_AT Command Manual_XXXX.docx for details)

<ssl_ctx_index>

The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG.

Examples

```
AT+CCHSSLCFG=?
+CCHSSLCFG: (0,1),(0-9)
```

OK

AT+CCHSSLCFG?

+CCHSSLCFG: 0,

+CCHSSLCFG: 1,

OK

AT+CCHSSLCFG=0,1

OK

NOTE

If you don't set the SSL context by this command before connecting to SSL/TLS server by AT+CCHOPEN, the CCHOPEN operation will use the SSL context as same as index <session_id> (the 1st parameter of AT+CCHOPEN)when connecting to the server.

19.2.11 AT+CCHCFG Configure the Client Context

AT+CCHCFG is used to set the client session context. It must be called before AT+CCHOPEN and after AT+CCHSTART. The setting will be cleared after AT+CCHOPEN failed or AT+CCHCLOSE.

AT+CCHCFG Configure the Client Context

Response

+CCHCFG: "sendtimeout",(0-1),(60-150)

+CCHCFG: "sslctx",(0-1),(0-9)

Test Command

AT+CCHCFG=?

OK

Response

+CCHCFG: 0,<sendtimeout_val>,<sslctx_index>

+CCHCFG: 1,<sendtimeout_val>,<sslctx_index>

Read Command

AT+CCHCFG?

OK

Write Command

/*Configure the timeout value of
the specified client when sending
data*/

**AT+CCHCFG="sendtimeout",<s
ession_id>,<sendtimeout_val>**

Response

1)If successfully:

OK

2)If failed:

ERROR

Write Command

/*Configure the SSL context index,
it's as same as

Response

1)If successfully:

OK

| | |
|---|--|
| AT+CCHSSLCFG*/ AT+CCHCFG="sslctx",<session_id>,<sslctx_index> | 2)If failed: ERROR |
| Write Command /*Configure the cid values of all clients when a connection is created*/ AT+CCHCFG="CID"[,<cid>] | Response 1) When <cid> is omitted: +CCHCFG: "CID",<cid> OK 2) If the <cid> set successfully: OK 2)If failed: ERROR |
| Write Command /*Configure the cid value of the specified client when creating a connection*/ AT+CCHCFG="SCID"[,<session_id>][,<cid>] | Response 1) When both the <session_id> and <cid> are omitted: +CCHCFG: "SCID",0,<cid> +CCHCFG: "SCID",1,<cid> OK 2) When <cid> is omitted: + CCHCFG: "SCID",<session_id>,<cid> OK 3)If successfully: OK 4)If failed: ERROR |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|--------------------------------|---|
| <session_id> | The session_id to operate. It's from 0 to 1. (CCH supports 3 TLS connections in version 1603 on the 160X baseline, please refer to the A1602 & 1606 Series_AT Command Manual_XXXX.docx for details) |
| <sendtimeout_val> | The timeout value used in sending data stage. The range is 60-150 seconds. The default value is 150. |
| <sslctx_index> | The SSL context ID which will be used in the SSL connection. Refer to the <ssl_ctx_index> of AT+CSSLCFG. |
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. If neither <session_id> nor <cid> is set, the cid of all sessions are queried, If <cid> is not set, the cid of the current session is queried, and the default value of cid is 1. |

Examples

```
AT+CCHCFG=?  
+CCHCFG: "sendtimeout",(0-1),(60-150)  
+CCHCFG: "sslctx",(0-1),(0-9)
```

OK

```
AT+CCHCFG?  
+CCHCFG: 0,150,  
+CCHCFG: 1,150,
```

OK

```
AT+CCHCFG="sendtimeout",0,120
```

OK

```
AT+CCHCFG="sslctx",0,3
```

OK

```
AT+CCHCFG="SCID"
```

```
+CCHCFG: "SCID",0,1  
+CCHCFG: "SCID",1,1
```

OK

```
AT+CCHCFG="SCID",1  
+CCHCFG: "SCID",1,1
```

OK

```
AT+CCHCFG="SCID",0,1
```

OK

```
AT+CCHCFG="CID",1
```

OK

```
AT+CCHCFG="CID"
```

```
+CCHCFG: "CID",1
```

OK

NOTE

1. Do not mix the configuration of “CID” and “SCID” when configuring the <cid> parameter. Select one of the preceding methods to configure CID parameters.

19.2.12 AT+CCHOPEN Connect to server

AT+CCHOPEN is used to connect the server.

AT+CCHOPEN Connect to server

| | |
|---|--|
| Test Command AT+CCHOPEN=? | Response +CCHOPEN: (0,1),"ADDRESS",,(1-65535)[,(1-2)[,(1-65535)]] |
| | OK |
| Read Command AT+CCHOPEN? | Response If connect to a server, it will show the connected information. Otherwise, the connected information is empty. +CCHOPEN: 0,<host>,<port>,<client_type>,<bind_port> +CCHOPEN: 1,<host>,<port>,<client_type>,<bind_port> |
| | OK |
| Write Command AT+CCHOPEN=<session_id>,<host>,<port>[,<client_type>,[<bind_port>]] | Response 1)If connect successfully: OK +CCHOPEN: <session_id>,0 2)If connect successfully in transparent mode: CONNECT [<text>] 3)If failed: OK +CCHOPEN: <session_id>,<err> 4)If failed: ERROR 5)If failed in transparent mode: CONNECT FAIL |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|---------------------------|--|
| <session_id> | The session index to operate. It's from 0 to 1. (CCH supports 3 TLS connections in version 1603 on the 160X baseline, please refer to the A1602 & 1606 Series_AT Command Manual_XXXX.docx for details) |
| <host> | The server address, maximum length is 256 bytes. |
| <port> | The server port which to be connected, the range is from 1 to |

| | |
|---------------|---|
| | 65535. |
| <client_type> | The type of client, default value is 2: 1 TCP client. 2 SSL/TLS client. |
| <bind_port> | The local port for channel, the range is from 1 to 65535. |
| <text> | CONNECT result code string; the string formats please refer ATX command. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 19.3 |

Examples

```
AT+CCHOPEN=?  
+CCHOPEN: (0,1),"ADDRESS",,(1-65535)[,(1-2)[,(1-65535)]]
```

OK

```
AT+CCHOPEN=0,"183.230.174.137",6043,1
```

OK

```
+CCHOPEN: 0,0
```

```
AT+CCHOPEN?
```

```
+CCHOPEN: 0,"183.230.174.137",6043,1,
```

```
+CCHOPEN: 1,"",,,
```

OK

NOTE

If you don't set the SSL context by AT+CCHSSLCFG before connecting a SSL/TLS server by AT+CCHOPEN, it will use the <session_id>(the 1'st parameter of AT+CCHOPEN)SSL context when connecting to the server.

19.2.13 AT+CCHCLOSE Disconnect from server

AT+CCHCLOSE is used to disconnect from the server.

AT+CCHCLOSE Disconnect from server

Write Command

Response

| | |
|---------------------------------------|--|
| AT+CCHCLOSE=<session_id> | 1) If successfully: OK +CCHCLOSE: <session_id>,0 2) If successfully in transparent mode: OK CLOSED 3) If failed: ERROR |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|---------------------------|--|
| <session_id> | The session index to operate. It's from 0 to 1. (CCH supports 3 TLS connections in version 1603 on the 160X baseline, please refer to the A1602 & 1606 Series_AT Command Manual_XXXX.docx for details) |
| <err> | The result code: 0 is success. Other values are failure. Please refer to the end of this chapter. |

Examples

AT+CCHCLOSE=0

OK

+CCHCLOSE: 0,0

19.2.14 AT+CCHSEND Send data to server

| AT+CCHSEND Send data to server | |
|---------------------------------------|--|
| Test Command | Response +CCHSEND: (0,1),(1-2048) |
| AT+CCHSEND=? | OK |
| Read Command | Response +CCHSEND: 0,<unsent_len_0>,1,<unsent_len_1> |
| AT+CCHSEND? | |

| | |
|---|---|
| | OK |
| Write Command | Response |
| AT+CCHSEND=<session_id>,<en> | 1)if parameter is right: > <input data here> When the total size of the inputted data reaches <len>, TA will report the following code. Otherwise, the serial port will be blocked. |
| | OK |
| | 2)If parameter is wrong or other errors occur: |
| | ERROR |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|---|
| <session_id> | The session_id to operate. It's from 0 to 1. (CCH supports 3 TLS connections in version 1603 on the 160X baseline, please refer to the A1602 & 1606 Series_AT Command Manual_XXXX.docx for details) |
| <len> | The length of data to send. Its range is from 1 to 2048 bytes. |
| <unsent_len_0> | The data of connection 0 cached in sending buffer which is waiting to be sent. |
| <unsent_len_1> | The data of connection 1 cached in sending buffer which is waiting to be sent. |

Examples

```
AT+CCHSEND=?
+CCHSEND: (0,1),(1-2048)
```

OK

AT+CCHSEND?

+CCHSEND: 0,0,1,0

OK

AT+CCHSEND=0,121

> GET / HTTP/1.1

Host: www.baidu.com

User-Agent: MAUI htp User Agent

Proxy-Connection: keep-alive

Content-Length: 0

OK

19.2.15 AT+CCHRECV Read the cached data that received from the server

AT+CCHRECV Read the cached data that received from the server

Read Command
AT+CCHRECV?

Response

+CCHRECV: LEN,<cache_len_0>,<cache_len_1>

OK

Response

1)if parameter is right and there are cached data:

OK

[+CCHRECV: DATA,<session_id>,<len>

...

+CCHRECV: DATA,<session_id>,<len>

...]

+CCHRECV: <session_id>,<err>

Write Command
AT+CCHRECV=<session_id>[,<max_recv_len>]

2)if parameter is not right or any other error occurs:

+CCHRECV: <session_id>,<err>

ERROR

3)others:

ERROR

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

| | |
|----------------|---|
| <session_id> | The session id to operate. It's from 0 to 1. (CCH supports 3 TLS connections in version 1603 on the 160X baseline, please refer to the A1602 & 1606 Series_AT Command Manual_XXXX.docx for details) |
| <max_recv_len> | Maximum bytes of data to receive in the current AT+CCHRECV calling. The value ranges from 0 to 2048. 0 means it will receive all data from the current cache. |

| | |
|---------------|---|
| | The default value is 0 and it will receive all of RX data cached for session <session_id>. It will be not allowed when there is no data in the cache. |
| <cache_len_0> | The length of RX data cached for connection 0. |
| <cache_len_1> | The length of RX data cached for connection 1. |
| <len> | The length of data followed. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 19.3 |

Examples

AT+CCHRECV?

+CCHRECV: LEN,3072,0

OK

AT+CCHRECV=0

OK

+CCHRECV: DATA,0,1024

HTTP/1.1 200 OK

Bdpagetype: 1

Bdqid: 0x9821f6dd000060aa

Cache-Control: private

Connection: keep-alive

Content-Type: text/html;charset=utf-8

Date: Tue, 24 Mar 2020 02:27:10 GMT

Expires: Tue, 24 Mar 2020 02:26:31 GMT

P3p: CP=" OTI DSP COR IVA OUR IND COM "

P3p: CP=" OTI DSP COR IVA OUR IND COM "

Server: BWS/1.1

Set-Cookie: BAIDUID=F0CD980BA0927350B147AB1064A3423D:FG=1; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com

Set-Cookie: BIDUPSID=F0CD980BA0927350B147AB1064A3423D; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com

Set-Cookie: PSTM=1585016830; expires=Thu, 31-Dec-37 23:55:55 GMT; max-age=2147483647; path=/; domain=.baidu.com

Set-Cookie: BAIDUID=F0CD980BA0927350739AA64356C3CB13:FG=1; max-age=31536000; expires=Wed, 24-Mar-21 02:27:10 GMT; domain=.baidu.com; path=/; version=1; comment=bd

Set-Cookie: BDSVRTM=0; path=/

Set-Cookie: BD_HOME=1; path=/

Set-Cookie: H_PS_PSSID=30972_1467_21116_30823; path=/; domain=.baidu.com

Traceid

+CCHRECV: DATA,0,1024

: 1585016830040414772210962314397044727978

Vary: Accept-Encoding

Vary: Accept-Encoding

X-UA-Compatible: IE=Edge,chrome=1

Transfer-Encoding: chunked

b5e

```
<!DOCTYPE html><!--STATUS OK--><html><head><meta http-equiv="Content-Type" content="text/html; charset=utf-8"><meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1"><meta content="always" name="referrer"><meta name="theme-color" content="#2932e1"><link rel="shortcut icon" href="/favicon.ico" type="image/x-icon" /><link rel="search" type="application/opensearchdescription+xml" href="/content-search.xml" title="網惧害鏽滅儲" /><link rel="icon" sizes="any" mask href="http://www.baidu.com/img/baidu_85beaf5496f291521eb75ba38eacbd87.svg"><link rel="dns-prefetch" href="http://dss0.bdstatic.com" /><link rel="dns-prefetch" href="http://dss1.bdstatic.com" /><link rel="dns-prefetch" href="http://ss1.bdstatic.com" /><link rel="dns-prefetch" href="http://sp0.baidu.com" /><link rel="dns-prefetch" href="http://sp1.baidu.com" /><link rel="dns-prefetch" href="http://sp2.baidu.com" /><title>網惧害涓€涓?
```

+CCHRECV: DATA,0,1024

```
紅浣犗氨鍙ラ亾</title><style type="text/css" id="css_index" index="index">body,html{height:100%}html{overflow-y:auto}body{font:12px arial;background:#fff}body,form,li,p,ul{margin:0;padding:0;list-style:none}#fm,body,form{position: relative}td{text-align:left}img{border:0}a{text-decoration:none}a:active{color:#f60}input{border:0;padding:0}.clearfix:after{content:'\20';display:block;height:0;clear:both}.clearfix{zoom:1}#wrapper{position: relative;min-height:100%}#head{padding-bottom:100px;text-align:center;*z-index:1}#ftCon{height:50px;position:absolute;text-align:left;width:100%;margin:0 auto;z-index:0;overflow:hidden}#ftConw{display:inline-block;text-align:left;margin-left:33px;line-height:22px;position:relative;top:-2px;*float:right;*margin-left:0;*position:static}#ftConw,#ftConw a{color:#999}#ftConw{text-align:center;margin-left:0}.bg{background-image:url(http://ss.bdimg.com/static/superman/img/icons-5859e577e2.png);background-repeat:no-repeat;_background-image:url(http://ss.bdimg.com/static/superman/img/icon
```

+CCHRECV: 0,0

+CCHEVENT: 0,RECV EVENT

NOTE

If connection is closed by server, the cached data will not be cleaned.

19.2.16 AT+CCERTMOVE Move the cert from file system to cert content

AT+CCERTMOVE Move the cert from file system to cert content

Test Command

AT+CCERTMOVE=?

Response

+CCERTMOVE: "FILENAME"

OK

Response

1)if parameter is right and the file need to move is exist:

OK

Write Command

AT+CCERTMOVE=<filename>

2)if parameter is not right or any other error occurs:

ERROR

3)others:

ERROR

Parameter Saving Mode

-

Max Response Time

120000ms

Reference

-

Defined Values

<filename>

The filename exist in file system,can be found by AT+FSLS. The file name must have type like ".pem" or ".der". The length of filename is from 5 to 108 bytes.

Examples

AT+CCERTMOVE="baidu.der"

OK

19.3 Command Result Codes

19.3.1 Description of <err>

Result codes

Description

| | |
|----|--------------------------|
| 0 | Operation succeeded |
| 1 | Alerting state(reserved) |
| 2 | Unknown error |
| 3 | Busy |
| 4 | Peer closed |
| 5 | Operation timeout |
| 6 | Transfer failed |
| 7 | Memory error |
| 8 | Invalid parameter |
| 9 | Network error |
| 10 | Open session error |
| 11 | State error |
| 12 | Create socket error |
| 13 | Get DNS error |
| 14 | Connect socket error |
| 15 | Handshake error |
| 16 | Close socket error |
| 17 | Nonet |
| 18 | Send data timeout |
| 19 | Not set certificates |

19.4 Unsolicited Result Codes

| URC | Description |
|--------------------------------------|---|
| +CCHEVENT: <session_id>,RECV EVENT | In manual receiving mode, when new data of a connection arriving to the module, this unsolicited result code will be reported to MCU. |
| +CCH_RECV_CLOSED: <session_id>,<err> | When receive data occurred any error, this unsolicited result code will be reported to MCU. |
| +CCHSEND: <session_id>,<err> | When send data faild,error code will be reported. |
| +CCH_PEER_CLOSED: <session_id> | The connection is closed by the server. |
| +CCH: CCH STOP[,<cid>] | CCH stopped caused by network error. When the AT+CCHSTART=<cid> command is used to activate a network, the URC carries the cid parameter, and each cid link reports an independent URC. |

20 AT Commands for TTS

20.1 Overview of AT Commands for TTS

| Command | Description |
|---------------------|--------------------|
| AT+CTTS | TTS operation |
| AT+CTTSPARAM | Set TTS parameters |
| AT+CDTAM | Set TTS Play Path |

20.2 Detailed Description of AT Commands for TTS

20.2.1 AT+CTTS TTS operation

The write command is used to play/decode/pause TTS.

| AT+CTTS TTS operation | |
|--|---|
| Test Command AT+CTTS=? | Response OK |
| Read Command AT+CTTS? | Response +CTTS: <status> |
| | OK |
| Write Command AT+CTTS=<mode>,[<text>],[<filename>] | Response 1)If <mode>is 0, and tts is playing: +CTTS: <err> OK 2)If <mode>is 0, and tts is not playing: OK 3)If <mode>is 1 or 2: +CTTS: |

| | |
|-----------------------|---|
| | <p>OK</p> <p>+CTTS: <err> // transform end</p> <p>4) If <mode> is 3 or 4:</p> <p>+CTTS:</p> |
| | <p>OK</p> <p>+CTTS: <err> // transform end</p> <p>5)</p> <p>ERROR</p> |
| Parameter Saving Mode | - |
| Max Response Time | 120000ms |
| Reference | - |

Defined Values

| | |
|------------|---|
| <status> | 0 NO_WORKING 1 TTS_WORKING |
| <mode> | 0 Stop the speech play 1 Start to synth and play,<text> is in UCS2 coding format. 2 Start to synth and play,<text> is in ASCII coding format, Chineses text is in GBK coding format. 3 TTS To wav format,<text> is in ASCII coding format, Chinese text is in GBK coding format. 4 TTS To wav format,<text> is in UCS2 coding format. |
| <text> | When mode is 1 or 2,the <text> is in ASCII coding format which is synthesized to speed to be played, maximum data length is 512 bytes.(including "").And <text> is in UCS2 coding format, maximum data length is 510 bytes. (including ""),because every four characters correspond to one Chinese character.When mode is 3 or 4,<text> maximum data length is 50 bytes because of the memory. For TOUNGTON TTS Chinese polyphonic characters, pronunciation can be specified. format: 多音字<pinyin=发音读音+ 声调>.For IFLY TTS Chinese polyphonic characters, pronunciation can be specified. format: 多音字[=发音读音+声调]. |
| <filename> | Enter path and filename, if no path is added, save in C: by default. Maximum filename length is 60 bytes. Currently only .wav format file storage is supported. |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 20.3 |

NOTE

1. Lowercase English strings are predicted to be pronounced according to English words. If you want long lowercase strings to be pronounced correctly, please add a space after each letter.
2. When using iFlytek TTS, it is recommended that you input measurement units and combined units in the text in Chinese. English input may not be able to read correctly.

Examples

```
AT+CTTS=?  
OK  
AT+CTTS?  
+CTTS: 0  
  
OK  
AT+CTTS=1,"6B228FCE4F7F75288BED97F3540862107CFB7EDF"  
+CTTS:  
  
OK  
  
+CTTS: 0  
AT+CTTS=2,"去朝<pinyin=chao2>阳, 看朝<pinyin=zhaο1>阳"  
+CTTS:  
  
OK  
  
+CTTS: 0  
AT+CTTS=3,"hello world","C:/12.wav"  
+CTTS:  
  
OK  
  
+CTTS: 0
```

20.2.2 AT+CTTSPARAM Set TTS Parameters for YOUNGTONE TTS

The write command is used to Set TTS Parameters for YOUNGTONE TTS.

AT+CTTSPARAM Set TTS Parameters for YOUNGTONE TTS

Test Command

Response

AT+CTTSPARAM=? **+CTTSPARAM: (0-2),(0-3),(0-3),(0-2),(0-2|10-30),(0-1)**

OK

Response

+CTTSPARAM:

**<volume>,<sysvolume>,<digitmode>,<pitch>,<speed>,<digi
reading>**

Read Command

AT+CTTSPARAM?

OK

Response

1)

OK

2)

ERROR

Write Command

**AT+CTTSPARAM=<volume>[,<s
ysvolume>[,<digitmode>[,<pit
h>[,<speed>[,<digitreading>]]]]]**

Parameter Saving Mode

Just <volume> is AUTO_SAVE

Max Response Time

9000ms

Reference

Ventor

Defined Values

| | |
|-----------------------------|--|
| <volume> | 0 The min volume 1 The normal volume 2 The max volume |
| <sysvolume> | 0 The min system volume 1 The small system volume 2 The normal system volume 3 The max system volume |
| <digitmode> | 0 Read digit based on default mode 1 Read digit based on telephone number 2 Read digit based on digit 3 Read digit based on number |
| <pitch> | 0 The min voice tone 1 The normal voice tone 2 The max voice tone |
| <speed> | Two kinds of speed regulation methods: 1 rough speed regulation. The three grades range from 0 to 2. (0 is the minimum speed, 1 is the general default speed, and 2 is the maximum speed) 2 precision speed regulation. 20 levels range from 10 to 30. (10 is minimum speed, 30 is maximum speed). Just supported on 1601. |
| <digitreading> | 0 Read the numbers in Chinese 1 Read the numbers in English |

Examples

AT+CTTSPARAM=?

+CTTSPARAM: (0-2),(0-3),(0-3),(0-2),(0-2|10-30),(0-1)

OK

AT+CTTSPARAM?

+CTTSPARAM: 1,3,0,1,1,0

OK

AT+CTTSPARAM=2,3,0,1,1,1

OK

AT+CTTSPARAM=2,3,0,1,10,1

OK

20.2.3 AT+CTTSPARAM Set TTS Parameters for IFLY TTS

The write command is used to Set TTS Parameters for IFLY TTS.

AT+CTTSPARAM Set TTS Parameters for IFLY TTS

Test Command

Response

AT+CTTSPARAM=?

+CTTSPARAM: (0-7),(0-2),(0-2),(0-2),(0-2),(0-1)

OK

Read Command

Response

AT+CTTSPARAM?

+CTTSPARAM:

<volume>,<sysvolume>,<digitmode>,<pitch>,<speed>,<ttslib>

>

OK

Write Command

Response

AT+CTTSPARAM=<volume>[,<sysvolume>[,<digitmode>[,<pitch>[,<speed>[,<ttslib>]]]]]

1)

OK

2)

ERROR

Parameter Saving Mode

Just <volume> is AUTO_SAVE

Max Response Time

9000ms

Reference

Ventor

Defined Values

| | |
|-------------|---|
| <volume> | Setting system volume like AT+COUTGAIN, default value is 4. |
| <sysvolume> | <ul style="list-style-type: none"> 0 The min system volume 1 The small system volume 2 The normal system volume |
| <digitmode> | <ul style="list-style-type: none"> 0 Read digit based on default mode 1 Read digit based on digit 2 Read digit based on number |
| <pitch> | <ul style="list-style-type: none"> 0 The min voice tone 1 The normal voice tone 2 The max voice tone |
| <speed> | <ul style="list-style-type: none"> 0 The min voice speed 1 The normal voice speed 2 The max voice speed |
| <ttslib> | <ul style="list-style-type: none"> 0 Support both Chinese and English TTS libraries, and Chinese pronunciation is the best. 1 Support only English TTS library. |

Examples

AT+CTTSPARAM=?

+CTTSPARAM: (0-7),(0-2),(0-2),(0-2),(0-2),(0-1)

OK

AT+CTTSPARAM?

+CTTSPARAM: 1,2,0,1,1,0

OK

AT+CTTSPARAM=2,2,0,1,1,1

OK

AT+CTTSPARAM=7,2,0,1,1,1

OK

NOTE

<ttslib> function is not supporting at present.

20.2.4 AT+CDTAM Set Local or Remote Audio Play

The write command is used to Set TTS Play Path.

AT+CDTAM Set TTS Play Path

| | |
|------------------------------|--|
| Test Command | Response +CDTAM: (0-1) |
| AT+CDTAM=? | OK |
| Read Command | Response +CDTAM: <status> |
| AT+CDTAM? | OK |
| Write Command | Response 1) If <mode> is 0 or 1: OK |
| AT+CDTAM=<mode> | 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|-----------------------|-----------------------------------|
| <status> | 0 Local Player 1 Remote Player |
| <mode> | 0 Local Path 1 Remote Path |

Examples

AT+CDTAM=?

+CDTAM: (0-1)

OK

AT+CDTAM?

+CDTAM: 0

OK

AT+CDTAM=1

OK

20.3 Command Result Codes

20.3.1 Description of <err>

| Result codes | Description |
|--------------|-------------------------|
| 0 | TTS operation succeeded |
| 1 | TTS data malloc failed |
| 2 | FS size not enough |

21 AT Commands for Audio

21.1 Overview of AT Commands for Audio

| Command | Description |
|------------------------|-------------------------------|
| AT+CCMXPLAY | play an audio file |
| AT+CCMXSTOP | stop playing audio file |
| AT+CREC | record audio file |
| AT+CRTSWITCH | close ring tone |
| AT+CRINGSET | set ring file |
| AT+CCODECSWITCH | switch codec type |
| AT+CLDTMF | local DTMF tone generation |
| AT+SIMTONE | generate specifically tone |
| AT+STTONE | play SIM toolkit tone |
| AT+CPCMCLKWB | select the pcm sampling clock |
| AT+CPCMRATION | select the pcm master clock |

21.2 Detailed Description of AT Commands for Audio

21.2.1 AT+CCMXPLAY Play audio file

This command is used to play an audio file.

| AT+CCMXPLAY Play audio file | |
|--------------------------------------|--|
| Test Command AT+CCMXPLAY=? | Response +CCMXPLAY: (list of supported <play_path>s),(list of supported <repeat>s) |
| | OK |
| Write Command | Response |

AT+CCMXPLAY=<file_name>
>,<play_path>,<repeat>

1)
+CCMXPLAY:

OK

+AUDIOSTATE: audio play

+AUDIOSTATE: audio play stop

2)

ERROR

Parameter Saving Mode

Max Response Time

Reference

Defined Values

<file_name>

The name of audio file.

Support audio file format amr, wav ,mp3 and pcm.

Enter path and filename, if no path is added, save in C: by default.

Maximum filename length is 60 bytes.

<play_path>

0 local path

1 remote path (just support voice call)

2 local path and remote path

<repeat>

0 don't play repeat.play only once.

1...255 play repeat times. E.g. <repeat>=1, audio will play twice.

Examples

AT+CCMXPLAY=?

+CCMXPLAY: (0-2),(0-255)

OK

AT+CCMXPLAY="c:/recording.amr",0,255

+CCMXPLAY:

OK

+AUDIOSTATE: audio play

+AUDIOSTATE: audio play stop

AT+CCMXPLAY="c:/recording.wav",0,255

+CCMXPLAY:

OK

+AUDIOSTATE: audio play

+AUDIOSTATE: audio play stop

NOTE

1. support file type: AMR,WAV,MP3,PCM
2. PCM file must have a header to play, otherwise playback is invalid.

21.2.2AT+CCMXSTOP Stop playing audio file

The command is used to stop playing audio file. Execute this command during audio playing. If audio file was played end in the past, when you execute "AT+CCMXSTOP", there is no "+AUDIOSTATE: audio play stop".

AT+CCMXSTOP Stop playing audio file

Test Command

AT+CCMXSTOP=?

Response

OK

Response

1)

+CCMXSTOP:

OK

+AUDIOSTATE: audio play stop

2)

OK

Execution Command

AT+CCMXSTOP

Parameter Saving Mode

Max Response Time

Reference

Examples

AT+CCMXSTOP

+CCMXSTOP:

OK

+AUDIOSTATE: audio play stop

21.2.3AT+CREC Record audio File

This command is used to record a wav/amr audio file. It can record wav/amr file during a call or not, the record file should be put into the "c:/". The supported file format is WAV and AMR. Only SD card support Non-ASCII characters in file path.

AT+CREC Record audio File

Test Command

AT+CREC=?

Response

+CREC: (0-3),[{\non-ascii}]"FILEPATH"

OK

Read Command

AT+CREC?

Response

+CREC: (list current <status>s)

OK

Response

1)

+CREC: 1

OK

2)

+CREC: 2

OK

3)

+CREC: 3

OK

4)

ERROR

Response

1)

+CREC: 0

OK

Write Command

AT+CREC=<record_path>,<file_name>

2)If it is recording:

+CREC: 0

OK

+CREC: crec stop

3)

ERROR

Parameter Saving Mode

Max Response Time

Reference

Defined Values

<record_path>

1 local path

| | |
|-------------|--|
| | 2 remote path (get voice from cs call) 3 mixd (local and remote) |
| <file_name> | The name of wav/amr audio file.(MAX is 60 bytes) Enter path and filename, if no path is added, save in C: by default. |
| <status> | 0 free 1 busy |
| <mode> | 0 stop record |

Examples

AT+CREC=?

+CREC: (0-3),[{\non-ascii}]"FILEPATH"

OK

AT+CREC?

+CREC: 0

OK

AT+CREC=1,"c:/recording.wav"

+CREC: 1

OK

+CREC: file full

AT+CREC=2,"c:/recording.wav"

+CREC: 2

OK

AT+CREC=0

+CREC: 0

OK

+CREC: crec stop

AT+CREC=1,"c:/recording.amr"

+CREC: 1

OK

+CREC: file full

AT+CREC=2,"c:/recording.amr"

+CREC: 2

OK

AT+CREC=0

+CREC: 0

OK

+CREC: crec stop

AT+CREC=3,"c:/recording3.amr"

+CREC: 3

OK

AT+CREC=0

+CREC: 0

OK

+CREC: crec stop

NOTE

- When the file is recording full, Response "+CREC: file full " is displayed.
- Maximum size of wave file is 768KB and maximum size of amr file is 512KB. When the filesystem free size is less than the maximum size of recording file, the maximum size of recording file is file system free size.

21.2.4 AT+CRTSWITCH Close Ring Tone

This command is used to Set ring tone on or off.

AT+CRTSWITCH Close Ring Tone

Test Command

Response

+CRTSWITCH: (0-1)

AT+CRTSWITCH=?

OK

Read Command

Response

+CRTSWITCH: (list current <status>s)

AT+CRTSWITCH?

OK

Write Command

Response

AT+CRTSWITCH=<status>

1)

OK

2)

ERROR

Parameter Saving Mode

Max Response Time

Reference

Defined Values

| | |
|-----------|-----------------------|
| <status > | 0 close Ringtone |
| | 1 open,default value. |

Examples

AT+CRTSWITCH =?

+CRTSWITCH: (0-1)

OK

AT+CRTSWITCH?

+CRTSWITCH: 1

OK

AT+CRTSWITCH=0

OK

NOTE

- And the command just supported on A7678 Series(1603) Standard version .

21.2.5 AT+CRINGSET Set Ring File

This command is used to Select ringtone settings. Support AMR, WAV, MP3 format.

AT+CRINGSET Set Ring File

| | |
|---|--|
| Test Command | Response +CRINGSET: <fileName> |
| AT+CRINGSET=? | OK |
| Read Command | Response +CRINGSET: <fileName> |
| AT+CRINGSET? | OK |
| Write Command | Response 1) OK |
| AT+CRINGSET =<fileName>[,<mode>] | 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | |
| Reference | |

Defined Values

| | |
|--------------------------|--|
| <fileName > | Ringtone file for setting. The default file name is “iPhone_Ring.mp3”. |
| <mode> | Whether the ring function is enable. 1 Enable to play ringtone. 0 Disable to play. |

Examples

```
AT+CRINGSET =?  
+CRINGSET: <fileName>  
  
OK  
AT+CRINGSET?  
+CRINGSET: iPhone_Ring.mp3  
  
OK
```

AT+CRINGSET="C:/ring.amr"

OK

NOTE

- And the command just supported on A7678 Series(1603) Standard version .

21.2.6 AT+CCODECSWITCH Switch codec type

This command is used to Swtich codec type. Our model support built-in codec and externel codec. Built-in codec by ASR chip support, externel codec only support nau8810.

AT+CCODECSWITCH Set codec type

Read Command

Response

+CCODECSWITCH: <type>

AT+CCODECSWITCH?

OK

Response

1)

OK

2)

ERROR

Write Command

AUTO_SAVE_REBOOT:

AT+CCODECSWITCH =<type>

Parameter Saving Mode

Max Response Time

Reference

Defined Values

<type >

Codec type, 0 is external codec,1 is built-in codec

Examples

AT+CCODECSWITCH?

+CCODECSWITCH: 1

OK

AT+CCODECSWITCH=0

OK

NOTE

- And the command just supported on A7678 Series(1603) Standard version . Only supports firmware after 2022.03.21.

21.2.7 AT+CLDTMF Local DTMF Tone Generation

This command is used to play DTMF tone.

AT+CLDTMF Local DTMF Tone Generation

| | |
|---|---|
| Test Command AT+CLDTMF=? | Response +CLDTMF: (1-100),(0-9,A,B,C,D,E,F,*,#),(50-500),(0-2) |
| | OK |
| | Response |
| Execution Command AT+CLDTMF | OK Abort any DTMF tone currently being generated and any DTMF tone sequence |
| | Response |
| | 1) OK |
| Write Command AT+CLDTMF=<n>,<DTMF string>[,<timeBase>][,<path>] | +CLDTMF: 0 // play end 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | |
| Reference | |

Defined Values

| | |
|----------------------------|---|
| <n> | A numeric parameter (1-100) which indicates the duration of all DTMF tones. |
| <DTMF string> | A string parameter (string should be included in quotation marks) which has a max length of 20 chars of form <DTMF>, separated by commas. |
| <timeBase> | timeBase to generate DTMF sound. the DTMF on time is |

| | |
|--------|--|
| | <n>*<timeBase> DTMF off time is timeBase, the default value is 100ms. |
| <path> | 0 local path 1 remote path (just support voice call) 2 both remote and local (just support voice call) |

Examples

```
AT+CLDTMF=?  
+CLDTMF:  
(1-100),(0-9,A,B,C,D,E,F,*,#),(50-500),(0-2)
```

OK

```
AT+CLDTMF=1,"A,B,C,D,E,F,*,#",100,0
```

OK

+CLDTMF: 0

NOTE

- Just supported on ASR1603 standard branch now.
- The total duration of dtmf playback during a call cannot exceed 10s.

21.2.8 AT+SIMTONE Generate Specifically Tone

This command is used to play generate specifically tone.

AT+SIMTONE Generate Specifically Tone

| | |
|---------------------|--|
| Test Command | Response |
| AT+SIMTONE=? | +SIMTONE: (0-1),(20-4000),(50-25500),(0,40-25500),(50-500000) |

| | |
|--|--|
| Write Command | Response |
| AT+SIMTONE=<mode>[,<frequency>][,<periodOn>][,<periodOff>][,<duration>] | 1) OK +SIMTONE: 0 // play end 2) ERROR |

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | |
| Reference | |

Defined Values

| | |
|-------------|--|
| <mode> | 0 Stop playing tone. 1 start to play tone. |
| <frequency> | The frequency of tone to be generated. |
| <periodOn> | The period of generating tone, must be multiple of 50. |
| <periodOff> | The period of stopping tone, must be multiple of 40. |
| <duration> | Duration of tones in milliseconds |

Examples

AT+SIMTONE=?

+SIMTONE:

(0-1),(20-4000),(50-25500),(0,40-25500),(50-5000
00)

OK

AT+SIMTONE=1,1400,200,200,5000

OK

+SIMTONE: 0

AT+SIMTONE=1,1400,200,200,5000

OK

AT+SIMTONE=0

OK

+SIMTONE: 0 //stop simtone with urc.

NOTE

- Stopping the simtone halfway also takes the URC with it.
- Just supported on ASR1603 standard branch now.

21.2.9 AT+STTONE Play SIM Toolkit Tone

This command is used to play SIM toolkit tone.

AT+STTONE Play SIM Toolkit Tone

| | |
|--|--|
| Test Command AT+STTONE=? | Response +STTONE: (0-1),(1-8,16-20),(50-15300000) |
| | OK |
| Write Command AT+STTONE=<mode>[,<tone>][,<duration>] | Response 1) OK 2) +STTONE: 0 // play end ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | |
| Reference | |

Defined Values

| | |
|-------------------------|---|
| <mode> | 0 Stop playing tone. 1 start to play tone. |
| <tone> | Numberic type 1 Dial tone 2 Called Subscriber Busy 3 Congestion 4 Radio Path Acknowledge 5 Radio Path Not Available/Call Dropped 6 Error / Special information 7 Call Waiting Tone 8 Ringing Tone 16 General Beep 17 Positive Acknowledgement Tone 18 Negative Acknowledgement or Error Tone 19 Indian Dial Tone 20 American Dial Tone |
| <duration> | Numeric type, in milliseconds. Max requested value = $255*60*1000 = 15300000\text{ms}$ (supported range = 50-15300000) |

Examples

AT+STTONE=?
+STTONE: (0-1),(1-8,16-20),(50-15300000)

OK
AT+STTONE=1,8,10000

OK
+STTONE: 0 // play end

NOTE

- Just supported on ASR1603 standard branch now.

21.2.10 AT+CPCMCLKWB Select the pcm sampling clock

This command is used to for pcm digital voice only, select different sampling clock

AT+CPCMCLKWB Select the pcm sampling clock

Test Command
AT+CPCMCLKWB=?

Response
+CPCMCLKWB: (0,1)

Write Command
AT+CPCMCLKWB=<value>

Response
 1)
OK

2)
ERROR

Read Command
AT+CPCMCLKWB?

Response
+CPCMCLKWB: <value>

Parameter Saving Mode
AT+CPCMCLKWB?

OK

Max Response Time

Reference

Defined Values

| | |
|----------------------|---|
| <value> | 0 select 8khz fync. 1 select 16khz fync. |
|----------------------|---|

Examples

AT+CPCMCLKWB=?

+CPCMCLKWB: (0,1)

OK

AT+CPCMCLKWB=1

OK

AT+CPCMCLKWB?

+CPCMCLKWB: 1

OK

21.2.11 AT+CPCMRATION Select the pcm master clock

This command is used to for pcm digital voice only, select master clock

AT+CPCMRATION Select the pcm master clock

Test Command

AT+CPCMRATION=?

Response

+CPCMRATION: (0-6)

OK

Response

1)

OK

2)

ERROR

Response

+CPCMRATION: <value>

OK

Read Command

AT+CPCMRATION?

Parameter Saving Mode

Max Response Time

Reference

Defined Values

<value>

0: 32fs

1: 64fs

2: 128fs

3: 256fs
4: 512fs
5: 1024fs
6: 2048fs

Examples

AT+CPCMRATION=?

+CPCMRATION: (0-6)

OK

AT+CPCMRATION=1

OK

AT+CPCMRATION?

+CPCMRATION: 1

OK

NOTE

pcm clock combination mode, the proportion between sampling clock and bit clock, as follows:

Ration=32 if fync=8k, bclk=8*32 ;if fync=16k,bclk=16*32

Ration=64

Ration=28

Ration=256 if fync=8k ,bclk=8*256=2.048Mhz (default)

Ration=512

Ration=1024

Ration=2048

AT+CPCMCLKWB Set sampling clock(fync),AT+CPCMRATION Set the ratio of BCLK to fync, so bclk=fync*ratio .ration has only these fixed values, so different combinations can choose different ration

22 AT Commands for FOTA

22.1 Overview of AT Command for FOTA

| Command | Description |
|-----------------|--------------------------|
| AT+CFOTA | Start FOTA Service |
| AT+LFOTA | Start Local FOTA Service |

NOTE

Currently, only CAT1 modules support at commands for FOTA.

22.2 Detailed Description of AT Command for FOTA

22.2.1 AT+CFOTA Start FOTA service

AT+CFOTA Start FOTA Service

| | |
|---|---|
| Write Command | Response |
| AT+CFOTA=<channel>,<mode>,<destination_ip/url>,<username>,<password>,<https_sni> | 1) <CR><LF>OK<CR><LF> +CFOTA: <err> 2) <CR><LF>ERROR: <err><CR><LF> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------------------------|--|
| <channel> | 0–5 means the channel number |
| <mode> | 0 FTP way 1 HTTP way |
| <destination_ip:port/url> | The remote site server's IP address or URL address. IP address should be in the format of the dotted decimal notation: XXX.XXX.XXX.XXX. URL address should be ASCII characters, the maximum of the length is 256 bytes. NOTE: If <port> are omitted, the default FTP port is 21 and the default HTTP port is 80. |
| <username> | The login user name, it should be ASCII characters, and the maximum of the length is 128 bytes. |
| <password> | The login password, it should be ASCII characters, and the maximum of the length is 128 bytes. |
| <https_sni> | 0 Disable 1 Enable NOTE: Optional parameters, The default is 0, Only baseline 1603 042 and 124 and above are supported. |

Examples

```

AT+CFOTA=0,0,"183.230.174.137:6047/fbf_dfota.bin",simcom,simcom
+CFOTA: FOTA,START

+CFOTA: DOWNLOADING:17

+CFOTA: DOWNLOADING:50

+CFOTA: DOWNLOADING:83

+CFOTA: DOWNLOADING:99

+CFOTA: DOWNLOADING:100
AT+CFOTA=0,1," 183.230.174.137:6022/bin/fbf_dfota.bin",simcom,simcom
+CFOTA: FOTA,START

+CFOTA: DOWNLOADING:17

+CFOTA: DOWNLOADING:50
  
```

+CFOTA: DOWNLOADING:83

+CFOTA: DOWNLOADING:99

+CFOTA: DOWNLOADING:100

22.2.2 AT+LFOTA Start Local Fota Service

AT+LFOTA Start Local Fota Service

Test Command

AT+LFOTA=?

Response

+LFOTA: <0-1>,<File Size>

OK

Response

1)if data pass check

+LFOTA: 1

OK

2)if data doesn't pass check

+LFOTA: 0

OK

3)if data has not transfer yet. It will be initial value -1

+LFOTA: -1

OK

Response

1)If successfully:

>

OK

2)If failed:

>

ERROR

3)If failed:

ERROR

Write Command

**AT+LFOTA=<ops>,<File
Size>**

Parameter Saving Mode

-

Max Response Time

-

Reference

-

Defined Values

| | |
|--------------------------|--|
| <ops> | 0 initial parameters 1 start transfer |
| <File Size> | The bytes of the file data to send. |

Examples

```
AT+LFOTA=0,5358979
```

OK

```
AT+LFOTA=1,5358979
```

>

OK

NOTE

If UART is used for LFOTA, please make sure that the delay time between each 256 byte reach to at least 50ms.

If sending file crash, restart module and increase the delay time between each 256 byte reach to 50ms, and then try to send file again

22.3 Unsolicited Result Codes

| URC | Description |
|--------------|--|
| +CFOTA: 100 | FOTA COMPLETE, it will restart in 8s. |
| +CFOTA: 1001 | FOTA URL is invalid, maybe PDP was active. |
| +CFOTA: 1002 | FOTA timeout |
| +CFOTA: 1003 | FOTA URL is unknown |
| +CFOTA: 1004 | FOTA username or password is error |
| +CFOTA: 1005 | FOTA file is not exist |
| +CFOTA: 1006 | The size of FOTA file is invalid |
| +CFOTA: 1007 | Get file failed |
| +CFOTA: 1008 | Check file error |
| +CFOTA: 1009 | FOTA internal error |
| +CFOTA: 1010 | Fota file too large |
| +CFOTA: 1011 | Fota set flag error |

+CFOTA: 1012

Fota parameter size error

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23 AT Commands for SCFOTA

23.1 Overview of AT Commands for SCFOTA

| Command | Description |
|-------------------|---|
| AT+CAPFOTA | Start / Close FOTA service |
| AT+CSCFOTA | Configure parameters and download upgrade package |

NOTE

Currently, only CAT4 modules support at commands for SCFOTA

23.2 Detailed Description of AT Commands for SCFOTA

23.2.1 AT+CAPFOTA Start / Close FOTA service

AT+CAPFOTA Start / Close FOTA service

| | |
|-------------------------------------|--------------------------------------|
| Test Command AT+CAPFOTA=? | Response +CAPFOTA: (0-1) |
| | OK |
| Read Command AT+CAPFOTA? | Response 1) +CAPFOTA: 0 |
| | OK 2) +CAPFOTA: 1 |

| | |
|---|---|
| | OK |
| Write Command | Response 1)If successfully: OK |
| /*Setting FOTA service status*/ AT+CAPFOTA=<on/off> | 2)If failed: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------|---|
| <on/off> | The service status on/off, the default value is 0. 0 Close FOTA program 1 Active FOTA program The function will take effect immediately. |
|-----------------------|---|

Examples

```
AT+CAPFOTA=?  
+CAPFOTA: (0-1)
```

```
OK  
AT+CAPFOTA?  
+CAPFOTA: 0
```

```
OK  
AT+CAPFOTA=1  
OK
```

23.2.2 AT+CSCFOTA Configure parameters and download upgrade package

AT+CSCFOTA Configure parameters and download upgrade package

| | |
|---|--|
| Write Command | Response 1)If successfully: OK |
| AT+CSCFOTA=<OEM>,<models>,<product ID>,<product Secret>,<target version> | If it can be downloaded: +CSCFOTA: 2 +CSCFOTA: 3 If download partial is finished: |

+CSCFOTA: 0
 If there is no new version detected:
+CSCFOTA: 5
 If detect version failed:
+CSCFOTA: <err>
 If it cannot be downloaded:
+CSCFOTA: <err>
 2)If failed:
ERROR

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-------------------------------|---|
| <OEM> | The name of project design company. This name must be the same as the OEM created on the cloud platform. Otherwise, it will cause upgrade failed. |
| <models> | The name of the device model. This name must be the same as the device model created on the cloud platform. Otherwise, it will cause upgrade failed. |
| <productID> | The product ID that must be the same as the product ID generated on the cloud platform. |
| <productSecret> | The product secret is used to confirm the identity and usage rights of the user. It must be the same as the product secret generated on the cloud platform. |
| <target version> | The version that needs to be upgraded to. This version is published by the cloud platform. |

Examples

```
AT+CSCFOTA="SIMCom","A7600C","1540907004","f9bbb0d76f894da090b6b69253616561","A760C_A39_190327_V1.00"
OK
+CSCFOTA: 2
+CSCFOTA: 3
+CSCFOTA: 0
```

23.3 Command Result Codes

23.3.1 Command Result Report Codes

| Result codes | Description |
|--------------|---------------------------|
| 2 | Check version is finished |
| 3 | Download is finished |
| 4 | Download partial finished |
| 5 | No new version |

23.3.2 Description of <err>

| <err> | Description |
|-------|--|
| 0 | OK |
| 1 | unknown error (contact supplier) |
| 301 | No enough memory |
| 302 | Invalid parameter |
| 303 | Invalid operation |
| 304 | IO failed |
| 305 | IO timeout |
| 306 | Download file verification failed |
| 307 | got canceled |
| 308 | Interface nesting error |
| 401 | Invalid device information |
| 402 | Invalid platform information |
| 403 | Missing device information |
| 404 | Version number is not configured |
| 405 | Internal error (contact supplier) |
| 501 | Invalid URL |
| 502 | Unable to resolve domain name |
| 503 | cannot connect to the server |
| 504 | Invalid request, server returned error |
| 505 | Not in range |
| 506 | HTTP POST request error |
| 507 | Re-download start error |

| | |
|------------|---------------------------------|
| 508 | Operation is aborted |
| 509 | Operation not completed |
| 510 | Too many retargeting times |
| 511 | Unable to get data from SOCKET |
| 512 | Error sending data via SOCKET |
| 513 | Error receiving data via SOCKET |
| 514 | Invalid SOCKET connection |

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24 AT Commands for GNSS

24.1 Overview of AT Commands for GNSS

| Command | Description |
|---------------------------|--|
| AT+CGNSSPWR | GNSS power control and AP-Flash control |
| AT+CGPSCOLD | Cold start GPS |
| AT+CGPSWARM | Warm start GPS |
| AT+CGPSSHOT | Hot start GPS |
| AT+CGNSSIPR | Configure the baud rate of UART3 and GPS module |
| AT+CGNSSMODE | Configure GNSS support mode |
| AT+CGNSSNMEA | Configure NMEA sentence type |
| AT+CGPSNMEARATE | Set NMEA output rate |
| AT+CGPSFTM | Start GPS test mode |
| AT+CGPSINFO | Get GPS fixed position information |
| AT+CGNSSINFO | Get GNSS fixed position information |
| AT+CGNSSCMD | Send command to GNSS |
| AT+CGNSSTST | Send data received from UART3 to NMEA port |
| AT+CGNSSPORTSWITCH | Select the output port for NMEA sentence |
| AT+CAGPS | Get AGPS data from the AGNSS server for assisted positioning |
| AT+CGNSSPROD | Get the production of GNSS |

24.2 Detailed Description of AT Commands for GNSS

24.2.1 AT+CGNSSPWR GNSS power control, AP-Flash control and Dynamic Load control

In ASR1603 and ASR1803, this command can control the GNSS module by pulling up/down the power pin, and it can also control whether the GNSS module can quickly hot start the AP-Flash. If you only want to enable/disable GNSS control, please execute AT+CGNSSPWR=1 or AT+CGNSSPWR=0. If you want to

enable GNSS and want to use AP_Flash fast hot start mode, please execute AT+CGNSSPWR=1,1 or AT+CGNSSPWR=0,1.

When using AP_Flash fast hot start mode, you need to execute AT+CGNSSPWR=0,1 to store the positioning data in the module after the GNSS is set to the upper position for the first time. When AT+CGNSSPWR=1,1 is executed next time, the positioning data will be loaded into GNSS again.

If you want to enable GNSS and want to use GNSS dynamic_load, please execute AT+CGNSSPWR=1,1,1 or AT+CGNSSPWR=1,0,1,The third parameter defaults to 1 and it is optional

In ASR1601, this command can only control the GNSS module by pulling up/down the power pin.

AT+CGNSSPWR GNSS power control and AP-Flash control

| | |
|---|--|
| | <p>Response +CGNSSPWR: <GNSS_Power_status>,<AP_Flash_status>,<GNSS_dynamic_load></p> |
| Test Command AT+CGNSSPWR=? | <p>OK</p> |
| Read Command AT+CGNSSPWR? | <p>Response +CGNSSPWR: <GNSS_Power_status>,<AP_Flash_status>,<GNSS_dynamic_load></p> |
| | <p>OK</p> |
| Write Command AT+CGNSSPWR=<GNSS_Power_status>[,<AP_Flash_status>][,<GNSS_dynamic_load>] | <p>Response 1)If successfully: OK 2)if GNSS can work properly: +CGNSSPWR: READY! 2)If failed: ERROR</p> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------------|--|
| <GNSS_Power_status> | <p>0 Close GNSS 1 Active GNSS The function will take effect immediately.</p> |
| <AP_Flash_status> | <p>0 Close GNSS AP_Flash fast hot start mode 1 Active GNSS AP_Flash fast hot start mode The function will take effect immediately.</p> |
| <GNSS_dynamic_load> | <p>0 Close GNSS_dynamic_load 1 Active GNSS_dynamic_load The function will take effect immediately.</p> |

NOTE

1. In ASR1601, only the GNSS_Power_status field is supported.
2. In ASR1603, GNSS will take about 9 seconds to update the version of GNSS, please see "+CGNSSPWR: READY!" before controlling the GNSS.
3. AP_Flash_status is supported after 27/9/21.
4. "+CGNSSPWR: READY!" is supported after 27/9/21.
5. A7670C-BASS_DTU uses 1601 GPS chip, and the syntax rules are the same as 1601GNSS.
6. In 160X baseline, 1603 module whose GPS chip is ASR5311 only has one parameter of CGNSSPWR. The way to get GPS chip version is to send AT+CGNSSPROD.
7. 1803S module whose GPS chip is ASR5311 has only one parameter which is used to control GNSS power.

Examples

AT+CGNSSPWR=?

+CGNSSPWR: (0,1),(0,1),(0,1)

OK

AT+CGNSSPWR?

+CGNSSPWR: 1,1,1

OK

AT+CGNSSPWR=1,1,1

OK

+CGNSSPWR: READY!

24.2.2 AT+CGNSSTST Send data received from UART3 to NMEA port

AT+CGNSSTST is used to print raw GPS data to the NMEA port.

AT+CGNSSTST Send data received from UART3 to NMEA port

Test Command

Response

AT+CGNSSTST=?

+CGNSSTST: (0,1)

OK

Read Command

Response

AT+CGNSSTST?

+CGNSSTST: <on/off>

| | |
|-----------------------------------|----------------------------------|
| | OK |
| Write Command | Response |
| AT+CGNSSTST=<on/off> | 1) If successfully: OK |
| | 2) If failed: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------|---|
| <on/off> | <u>0</u> Stop sending data received from UART3 to NMEA port. <u>1</u> Start sending data received from UART3 to NMEA port. The function will take effect immediately. If you want to get NMEA data by NMEA port, you should execute AT+CGNSSTST=1 first. |
|-----------------------|---|

Examples

```
AT+CGNSSTST=?  
+CGNSSTST: (0,1)
```

```
OK  
AT+CGNSSTST?  
+CGNSSTST: 0
```

```
OK  
AT+CGNSSTST=1  
OK
```

24.2.3 AT+CGPSCOLD Cold start GPS

This command is valid after the URC reports "+CGNNSPWR: READY!".

AT+CGPSCOLD Cold start GPS

| | |
|-----------------------|-----------|
| Execution Command | Response |
| AT+CGPSCOLD | OK |
| Parameter Saving Mode | NO_SAVE |

| | |
|-------------------|--------|
| Max Response Time | 9000ms |
| Reference | - |

Examples

AT+CGPSCOLD

OK

24.2.4 AT+CGPSWARM Warm start GPS

This command is valid after the URC reports “+CGNNSPWR: READY!”.

AT+CGPSCOLD Warm start GPS

| | |
|-----------------------|----------|
| Execution Command | Response |
| AT+CGPSWARM | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

NOTE

- 1.This command is valid on the ASR1603 projects and ASR1803S projects.
- 2.A7670C-BASS_DTU uses 1601 GPS chip, and the syntax rules are the same as 1601GNSS.

Examples

AT+CGPSWARM

OK

24.2.5 AT+CGPSSHOT Hot start GPS

This command is valid after the URC reports “+CGNNSPWR: READY!”.

AT+CGPSSHOT Hot start GPS

| | |
|--------------------|----------|
| Execution Command | Response |
| AT+CGPSSHOT | OK |

| AT+CGPSHOT | OK |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Examples

AT+CGPSHOT

OK

24.2.6 AT+CGNSSIPR Configure the baud rate of UART3 and GPS module

This command is valid after the URC reports “+CGNSSPWR: READY!”.

| AT+CGNSSIPR Configure the baud rate of UART3 and GPS module | |
|--|--|
| Test Command | Response +CGNSSIPR: (list of supported <baud-rate>s) |
| AT+CGNSSIPR=? | OK |
| Read Command | Response +CGNSSIPR: <baud-rate> |
| AT+CGNSSIPR? | OK |
| Write Command | Response 1) If successfully: OK |
| AT+CGNSSIPR=<baud-rate> | 2) If failed: ERROR |
| Execution Command | Response Set default value |
| AT+CGNSSIPR | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------------------|-------------|
| <baud-rate> | <u>9600</u> |
| | 115200 |

230400

The function will take effect immediately.

NOTE

1. The baud-rate is supported by the ASR1601 projects:
4800,9600,19200,38400,57600,115200
2. In the ASR1603 projects and ASR1803S project, the baud rate defaults to 115200 after GPS dynamic loading and upgrading the firmware, and 9600 without GPS dynamic loading.
3. A7670C-BASS_DTU uses 1601 GPS chip, and the syntax rules are the same as 1601GNSS.
4. 1803S module whose GPS chip is ASR 5311, only 115200 baud rates are supported.

Examples

AT+CGNSSIPR=?

+CGNSSIPR: (9600,115200,230400)

OK

AT+CGNSSIPR?

+CGNSSIPR: 9600

OK

AT+CGNSSIPR=9600

OK

24.2.7 AT+CGNSSMODE Configure GNSS support mode

This command is valid after the URC reports "+CGNNSPWR: READY!".

AT+CGNSSMODE Configure GNSS support mode

Test Command

Response

AT+CGNSSMODE=?

+CGNSSMODE: (1-7)

OK

Read Command

Response

AT+CGNSSMODE?

+CGNSSMODE: <mode>

OK

Write Command

Response

AT+CGNSSMODE=<mode>

1) If successfully:

| | |
|--|--|
| | OK |
| | 2)If failed: ERROR |
| Execution Command AT+CGNSSMODE | Response Set default value 3 OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------|--|
| <mode> | <u>1</u> GPS L1 + BDS B1 + QZSS <u>2</u> BDS B1 <u>3</u> GPS L1+QZSS The mode is supported in foreign module: <u>1</u> GPS L1+SBAS+QZSS <u>2</u> BDS B1 <u>3</u> GPS+GLONASS+GALILEO+SBAS+QZSS <u>4</u> GPS+BDS+GALILEO The function will take effect immediately. |
|--------|--|

NOTE

1.The GPS mode configuration is different from different GPS chip, you can input AT+CGNSSPROD to get the information of GPS chip including UNIC and ASR 5311.

2.The mode is supported by most A7670 projects in foreign module whose GPS chip is UNIC:

- 1 GPS L1+SBAS+QZSS
- 2 BDS B1
- 3 GPS+GLONASS+GALILEO+SBAS+QZSS
- 4 GPS+BDS+GALILEO+SBAS+QZSS

3.The mode is supported in the A7680 project and 7673_V2.01_PCB and 7670_V2.01_PCB whose GPS chip is ASR 5311, and 1803S some projects also use 5311 GPS chip:

- 1 GPS
- 2 BDS
- 3 GPS+BDS
- 4 GLONASS
- 5 GPS+GLONASS
- 6 BDS+GLONASS
- 7 GPS+BDS+GLONASS

Examples

AT+CGNSSMODE=?

+CGNSSMODE: (1-3)

OK

AT+CGNSSMODE?

+CGNSSMODE: 1

OK

AT+CGNSSMODE=1

OK

24.2.8 AT+CGNNSNMEA Configure NMEA sentence type

This command is valid after the URC reports “+CGNNSPWR: READY!”.

AT+CGNNSNMEA Configure NMEA sentence type

Test Command

Response

AT+CGNNSNMEA=?

+CGNNSNMEA: (0-1),(0-1),(0-1),(0-1),(0-1),(0-1),(0-1)

OK

Read Command

Response

AT+CGNNSNMEA?

+CGNNSNMEA: 1,0,1,1,1,0,0,0

OK

Write Command

Response

**AT+CGNNSNMEA=[nGGA,[nGL
L,[nGSA,[nGSV,[nRMC,[nVTG,[
nZDA,[nGST]]]]]]]**

1)If successfully:

OK

2)If failed:

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

-

Defined Values

[nGGA,[nGLL,[nGSA,[nGSV,
[nRMC,[nVTG,[nZDA,[nGST,
]]]]]]]

The range of n is 0-1. It means that the sentence is output every n times, 0 means no output, null means to save the original configuration.

nGGA GGA output rate,default is 1
nGLL GLL output rate,default is 0
nGSA GSA output rate,default is 1
nGSV GSV output rate,default is 1
nRMC RMC output rate,default is 1
nVTG VTG output rate,default is 0
nZDA ZDA output rate,default is 0
nGST GST output rate,default is 0

The function will take effect immediately.

NOTE

The NMEA fields are supported by the ASR1601 projects:

nGGA GGA output rate,default is 1
nGLL GLL output rate,default is 0
nGSA GSA output rate,default is 1
nGSV GSV output rate,default is 1
nRMC RMC output rate,default is 1
nVTG VTG output rate,default is 0
nZDA ZDA output rate,default is 0
nANT ANT output rate,default is 0
nDHV DHV output rate,default is 0
nLPS LPS output rate,default is 0(nonsupport)
res1 reserved,default is 0
res2 reserved,default is 0
nUTC UTC output rate,default is 0(nonsupport)
nGST GST output rate,default is 0

A7670C-BASS_DTU uses 1601 GPS chip, and the syntax rules are the same as 1601GNSS.

Examples

AT+CGNSSNMEA=?

+CGNSSNMEA: (0-1),(0-1),(0-1),(0-1),(0-1),(0-1),(0-1)

OK

AT+CGNSSNMEA?

+CGNSSNMEA: 1,0,1,1,1,0,0,0

OK

AT+CGNSSNMEA=1,0,0,0,0,0,0,0

OK

NOTE

The NMEA fields are supported by the ASR1603 projects and ASR1803S projects:

The range of n is 0-5. It means that the sentence is output every n times, 0 means no output, null means to save the original configuration.

nGGA GGA output rate,default is 1

nGLL GLL output rate,default is 1

nGSA GSA output rate,default is 1

nGSV GSV output rate,default is 1

nRMC RMC output rate,default is 1

nVTG VTG output rate,default is 1

nZDA ZDA output rate,default is 0

nGST GST output rate,default is 0

24.2.9 AT+CGPSNMEARATE Set NMEA output rate

This command is valid after the URC reports “+CGNSSPWR: READY!”.

AT+CGPSNMEARATE Set NMEA output rate

Test Command

Response

+CGPSNMEARATE: (1,2,4,5,10)

AT+CGPSNMEARATE?

OK

Read Command

Response

AT+CGPSNMEARATE?

+CGPSNMEARATE: <rate>

OK

Write Command

Response

AT+CGPSNMEARATE=<rate>

1)If successfully:

OK

2)If failed:

ERROR

Execution Command

Response

AT+CGPSNMEARATE

Set default value 1

OK

Parameter Saving Mode

Response

NO_SAVE

Max Response Time

Response

9000ms

Reference

-

Defined Values

| | |
|--------|---|
| <rate> | 1 1Hz, one anchor point is output per second 2 2Hz, two anchor points is output per second 5 5Hz, five anchor points is output per second The function will take effect immediately. |
|--------|---|

NOTE

1. 1803S module whose GPS chip is ASR 5311, 1-5Hz is supported.

Examples

AT+CGPSNMEARATE=?
+CGPSNMEARATE: (1,2,5)

OK

AT+CGPSNMEARATE?
+CGPSNMEARATE: 1

OK

AT+CGPSNMEARATE=2
OK

24.2.10 AT+CGPSFTM Start GPS test mode

This command is valid after the URC reports "+CGNSSPWR: READY!".

AT+CGPSFTM Start GPS test mode

Test Command Response

AT+CGPSFTM=? OK

Read Command Response

AT+CGPSFTM? **+CGPSFTM: 0/1**

OK

Write Command Response

AT+CGPSFTM=<on/off> 1)If successfully:

OK

| | |
|-----------------------|------------------------------|
| | 2)If failed: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------|--|
| <on/off> | 0 Close test mode 1 Start test mode The function will take effect immediately. |
|----------|--|

NOTE

- 1.GBGSV field will replace BDGSV field after dynamic loading is complete in ASR1603 and ASR1803 Series projects.
2. GAGSV field will supported by the ASR1603 and ASR1803 Series projects after dynamic loading is complete.
3. GLGSV and GAGSV field will supported by the ASR1603 and ASR1803 Series projects in foreign modules after dynamic loading is complete.

Examples

AT+CGPSFTM?
+CGPSFTM: 0

OK

AT+CGPSFTM=1

OK

**+GLGSV,78,20.6,66,25.6,77,21.6,79,21.9,67,26.2,
68,23.6**

**+GPGSV,10,36.3,12,33.5,14,26.5,15,27.0,18,30.6
,20,29.4,21,14.9,24,32.8,25,30.6,31,29.1,32,27.0**

**+BDGSV,201,28.7,204,29.0,206,27.3,207,25.9,20
9,25.0,210,18.5**

24.2.11 AT+CGPSINFO Get GPS fixed position information

This command is valid after the URC reports "+CGNNSPWR: READY!".

AT+CGPSINFO Get GPS fixed position information

| | |
|--|--|
| Test Command AT+CGPSINFO=? | Response +CGPSINFO: (0-255) |
| Read Command AT+CGPSINFO? | OK |
| Write Command AT+CGPSINFO=<time> | <p>Response +CGPSINFO: [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC time>],[<alt>],[<speed>],[<course>]</p> <p>1) If successfully: OK</p> <p>+CGPSINFO: [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC time>],[<alt>],[<speed>],[<course>]</p> <p>2) If <time>=0: OK</p> <p>3) If failed: ERROR</p> |
| Execution Command AT+CGPSINFO | <p>Response +CGPSINFO: [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC time>],[<alt>],[<speed>],[<course>]</p> <p>OK</p> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-------------------------|--|
| <time> | The range is 0-255, unit is second. After setting <time> will report the GPS information every <seconds>. The function will take effect immediately. |
| <lat> | Latitude of current position. Output format is ddmm.mmmmmm. |
| <N/S> | N/S Indicator, N=north or S=south. |
| <log> | Longitude of current position. Output format is dddmm.mmmmmm. |
| <E/W> | E/W Indicator, E=east or W=west. |
| <date> | Date. Output format is ddmmyy. |
| <UTC time> | UTC Time. Output format is hhmmss.ss. |
| <alt> | MSL Altitude. Unit is meters. |
| <speed> | Speed Over Ground. Unit is knots. |
| <course> | Course. Degrees. |

Examples

AT+CGPSINFO=?

+CGPSINFO: (0-255)

OK

AT+CGPSINFO?

+CGPSINFO: 0

OK

AT+CGPSINFO

+CGPSINFO:3113.343286,N,12121.234064,E,250311,072809.33,44.1,0.0,0

OK

24.2.12 AT+CGNSSINFO Get GNSS fixed position information

This command is valid after the URC reports “+CGNNSPWR: READY!”.

AT+CGNSSINFO Get GNSS fixed position information

Test Command

Response

AT+CGNSSINFO=?

+CGNSSINFO: (0-255)

OK

Read Command

Response

AT+CGNSSINFO?

+CGNSSINFO: <time>

OK

Response

1)If successfully:

OK

+CGNSSINFO:

[<mode>],[<GPS-SVs>],[BEIDOU-SVs],[<GLONASS-SVs>],[<GALILEO-SVs>],[<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UT C-time>],[<alt>],[<speed>],[<course>],[<PDOP>],[HDOP],[VD OP]

2)If <time>=0:

OK

3)If failed:

ERROR

Write Command

AT+CGNSSINFO=<time>

| | |
|--|---|
| Execution Command AT+CGNSSINFO | Response +CGNSSINFO: [<mode>],[<GPS-SVs>],[BEIDOU-SVs],[<GLONASS-SVs>],[<GALILEO-SVs>], [<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC-time>],[<alt>],[<speed>],[<course>],[<PDOP>],[HDOP],[VDOP] |
| | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------|--|
| <time> | The range is 0-255, unit is second. after set <time> will report the GNSS information every the seconds. The function will take effect immediately. |
| <mode> | Fix mode 2=2D fix 3=3D fix |
| <GPS-SVs> | GPS satellite visible numbers |
| <BEIDOU-SVs> | BEIDOU satellite visible numbers |
| <GLONASS-SVs> | GLONASS satellite visible numbers |
| <GALILEO-SVs> | GALILEO satellite visible numbers |
| <lat> | Latitude of current position. Output format is dd.ddddd |
| <N/S> | N/S Indicator, N=north or S=south. |
| <log> | Longitude of current position. Output format is ddd.ddddd |
| <E/W> | E/W Indicator, E=east or W=west. |
| <date> | Date. Output format is ddmmyy. |
| <UTC-time> | UTC Time. Output format is hhmmss.ss. |
| <alt> | MSL Altitude. Unit is meters. |
| <speed> | Speed Over Ground. Unit is knots. |
| <course> | Course. Degrees. |
| <PDOP> | Position Dilution Of Precision. |
| <HDOP> | Horizontal Dilution Of Precision. |
| <VDOP> | Vertical Dilution Of Precision. |

Examples

```
AT+CGNSSINFO=?
+CGNSSINFO: (0-255)
```

```
OK
```

AT+CGNSSINFO?

+CGNSSINFO: 0

OK

AT+CGNSSINFO

+CGNSSINFO:

2,09,05,00,3113.330650,N,12121.262554,E,131117,091918.00,32.9,0.0,255.0,1.1,0.8,0.7

OK

AT+CGNSSINFO (if not fix, will report null)

+CGNSSINFO:,,,,,,

OK

NOTE

In the ASR1603 and ASR1803S platforms, the domestic version of +CGNSSINFO reported information as follows: +CGNSSINFO:

[<mode>],[<GPS-SVs>],[BEIDOU-SVs],[<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC-time>],[<alt>],[<speed>],[<course>],[<PDOP>],[HDOP],[VDOP]. [<valid-SVs>]

The information reported by the foreign version of +CGNSSINFO is as follows: +CGNSSINFO:

[<mode>],[<GPS-SVs>], [BEIDOU-SVs], [<GLONASS-SVs>], [<GALILEO-SVs>],[<lat>],[<N/S>],[<log>],[<E/W>],[<date>],[<UTC-time>],[<alt>],[<speed>],[<course>],[<PDOP>],[HDOP],[VDOP].

24.2.13 AT+CGNNSCMD Send command to GNSS

This command is valid after the URC reports “+CGNNSPWR: READY!”.

AT+CGNNSCMD Send command to GNSS

Response

Test Command

+CGNNSCMD: "CmdString"

AT+CGNNSCMD=?

OK

Response

1)If send OK:

OK

2)If send false:

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

-

Defined Values

| | |
|--------------------------|---|
| <CmdString> | Command string, max length of string is 510 or 62 (seen in note) For example: if you want to send "\$PCAS02,1000*2E<CR><LF>" command to GNSS. You can use: AT+CGNSSCMD="\$PCAS02,1000*2E" Or: AT+CGNSSCMD="245043415330322C313030302A3245" |
|--------------------------|---|

Examples

```
AT+CGNSSCMD=?
+CGNSSCMD: "CmdString"

OK
AT+CGNSSCMD="$PCAS02,1000*2E"
OK
```

NOTE

The max length of command string is different from software baseline: 042 baseline is 510, above 110 baseline is 62.

24.2.14 AT+CGNSSPORTSWITCH Select the output port for NMEA sentence

This command is valid after the URC reports "+CGNNSPWR: READY!". AT+CGNSSTST=1 is used to output original NMEA data to USB NMEA port or UART port.

AT+CGNSSPORTSWITCH Select the output port for NMEA sentence

| | |
|---|---|
| Test Command AT+CGNSSPORTSWITCH=? | Response +CGNSSPORTSWITCH: (0,1),(0,1) |
| Read Command AT+CGNSSPORTSWITCH? | Response +CGNSSPORTSWITCH: <parse_data_port>,<nmea_data_port> |

| | OK |
|--|--|
| Write Command | Response 1)If send OK: OK |
| AT+CGNSSPORTSWITCH=<parse_data_port>[,<nmea_data_port>] | 2)If send false: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------------------------|--|
| <parse_data_port> | 0 output the parsed data of NMEA to USB AT port. 1 output the parsed data of NMEA to UART port. |
| <nmea_data_port> | 0 output raw NMEA data to USB NMEA port. 1 output raw NMEA data to UART port. |

Examples

```
AT+CGNSSPORTSWITCH=?
+CGNSSPORTSWITCH: (0,1),(0,1)
```

OK

```
AT+CGNSSPORTSWITCH=0,1
```

OK

24.2.15 AT+CAGPS Get AGPS data from the AGNSS server for assisted positioning

This command is valid after the URC reports "+CGNNSPWR: READY!".

| AT+CAGPS Get AGPS data from the AGNSS server for assisted positioning | |
|---|---|
| Execution Command | Response 1)If successfully: OK |
| AT+CAGPS | +AGPS: success. 2)If failed: ERROR 3)If failed: |

| | |
|-----------------------|----------------------|
| | OK |
| | +AGPS: <error code>. |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------|--|
| <error code> | 101 open socket unsuccessfully. 102 get the AGNSS server unsuccessfully. 103 connect to AGNSS server unsuccessfully. 104 write information to socket unsuccessfully. 105 read AGPS data from socket unsuccessfully. 106 get the AGNSS data unsuccessfully. 107 send the AGNSS data unsuccessfully. |
|--------------|--|

Examples

AT+CAGPS

OK

+AGPS: success.

24.2.16 AT+CGNSSPROD Get the production of GNSS

This command is valid after the URC reports "+CGNSSPWR: READY!".

| AT+CGNSSPROD Get the production of GNSS | |
|---|--|
| Test Command | Response |
| AT+CGNSSPROD=? | OK |
| Execution Command | Response |
| AT+CGNSSPROD | 1)If successfully: PRODUCT: <prodname>,<model>,<vers> OK 2)If the GNSS is power off: ERROR |
| Parameter Saving Mode | NO_SAVE |

| | |
|-------------------|--------|
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|------------|--|
| <prodname> | The production of GNSS, there are CASIC and UNICORECOMM currently. |
| <model> | The product model of GNSS. |
| <vers> | The firewarm version of GNSS. |

Examples

AT+CGNSSPROD=?

OK

AT+CGNSSPROD

PRODUCT: CASIC

OK

AT+CGNSSPROD

PRODUCT: UNICORECOMM,UC6226NIS,R3.2.10.0Build8016

OK

AT+CGNSSPROD

ERROR

25 AT Commands for WIFI

25.1 Overview of AT Commands for WIFI

| Command | Description |
|------------------------|---|
| AT+CWSTASCAN | Scan WIFI network |
| AT+CWSTASCANEX | Scan WIFI network extension command |
| AT+CWSTASCANSYN | Asynchronous control command of scan wifi network |
| AT+CWMAP | Open/Close WIFI |
| AT+CWSSID | SSID setting |
| AT+CWAUTH | Authentication setting |
| AT+CWMODE | 802.11 mode and channel setting |
| AT+CWISO | Client isolation setting |
| AT+CWMACADDR | Get MAC address |
| AT+CWNETCNCT | Query the connection to the network |

25.2 Detailed Description of AT Commands for WIFI

The ASR1803S platform does not support wifi scanning commands: AT+CWSTASCAN, AT+CWSTASCANEX, AT+CWSTASCANSYN.

Wifi scanning function description:

- a) Wifi scanning is not supported in dual-SIM dual-standby mode.
- b) Wifi scanning is a low-priority task, which is executed only in the idle state where there is no phone call, no network search, and no data transmission.

25.2.1 AT+CWSTASCAN Scan WIFI network

AT+CWSTASCAN Scan WIFI network

Test Command

AT+CWSTASCAN=?

Response

+CWSTASCAN: (0-1)

| | |
|--|---|
| | OK |
| Read Command AT+CWSTASCAN? | Response +CWSTASCAN: <flag_show_signal> |
| | OK |
| Write Command AT+CWSTASCAN=<flag_sh ow_signal> | Response 1)if the mode is 0 or 1: OK 2) ERROR |
| Execution Command AT+CWSTASCAN | Response +CWSTASCAN: [<bssid>,<channel_num>,[signal] [.....]] |
| | OK |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|---------------------------------|--|
| <flag_show_signal> | 0 Don't show the signal level. 1 Show the signal level. It's the default value. |
| <bssid> | The MAC address of external wireless network. |
| <channel_num> | The channel number of external wireless network. |
| <signal> | The signal level of external wireless network. |

Examples

```
AT+CWSTASCAN=?
+CWSTASCAN: (0-1)
```

```
OK
AT+CWSTASCAN=1
OK
AT+CWSTASCAN?
+CWSTASCAN: 1
```

```
OK
AT+CWSTASCAN
www.simcom.com
```

+CWSTASCAN:

50:FA:84:AF:C8:B9,11,-61

86:40:BB:00:2E:AD,11,-65

1C:15:1F:55:56:7A,1,-76

B0:D5:9D:AF:57:A1,6,-79

30:7B:AC:6C:F9:B0,1,-81

OK

25.2.2 AT+CWSTASCANEX Scan WIFI network extension command

| AT+CWSTASCANEX Scan WIFI network extension command | |
|--|---|
| Test Command AT+CWSTASCANEX=? | <p>Response +CWSTASCANEX: (0-1),(1-3),(4-10),(0-255),(0-1)</p> <p>OK</p> |
| Read Command AT+CWSTASCANEX? | <p>Response +CWSTASCANEX: <flag_show_signal>,<scan_round_num>,<scan_max_bssid_num>,<scan_timeout>,<scan_priority></p> <p>OK</p> |
| Write Command AT+CWSTASCANEX=<flag_show_signal>[,<scan_round_num>[,<scan_max_bssid_num>[,<scan_timeout>[,<scan_priority>]]]] | <p>Response 1) OK 2) ERROR</p> |
| Execution Command AT+CWSTASCANEX | <p>Response +CWSTASCANEX: [<bssid>,<channel_num>,[signal] [... ...]]</p> <p>OK</p> |
| Parameter Saving Mode | - |

Max Response Time

-

Reference

Defined Values

| | |
|-----------------------------------|--|
| <flag_show_signal> | 0 Don't show the signal level. 1 Show the signal level. It's the default value. |
| <scan_round_num> | The range is 1-3, means the number of rounds of WIFI scan. |
| <scan_max_bssid_num> | The range is 4-10, maximum number of bssid per WIFI scan. |
| <scan_timeout> | The range is 0-255, timeout. |
| <scan_priority> | The range is 0-1, priority. |
| <bssid> | The MAC address of external wireless network. |
| <channel_num> | The channel number of external wireless network. |
| <signal> | The signal level of external wireless network. |

Examples

AT+CWSTASCANEX=?
+CWSTASCANEX: (0-1),(1-3),(4-10),(0-255),(0-1)
OK
AT+CWSTASCANEX=1,3,4,25,0
OK
AT+CWSTASCANEX?
+CWSTASCANEX: 1,3,4,25,0
OK
AT+CWSTASCANEX
+CWSTASCANEX:
08:4F:0A:CA:45:80,6,-64
92:32:4B:9F:E2:EB,1,-66
08:4F:0A:CA:45:40,1,-79
1C:15:1F:FD:C7:6C,6,-83
OK

25.2.3 AT+CWSTASCANSYN Asynchronous control command of scan wifi network

AT+CWSTASCANSYN Asynchronous control command of scan wifi network

| | |
|--|--|
| Test Command AT+CWSTASCANSYN=? | Response +CWSTASCANSYN: (0-1) |
| | OK |
| | Response 1) If op==1 and parameter format is right, response 0 indicates the end of the scan response |
| | OK |
| Write Command AT+CWSTASCANSYN=<op>[,<scan_para>] | [+CWSTASCANSYN: <mac_addr>,<channel_number>,<rssii>,[... ...]] +CWSTASCANSYN: 0 2) If op==0 and parameter format is right, OK 3) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------|--|
| <op> | 0 Stop scan wifi network. 1 Start scan wifi network. |
| <scan_para> | 0 Scan without parameters. 1 Scan with parameters that was set by +CWSTASCANEX. |
| <mac_addr> | The MAC address of external wireless network. |
| <channel_number> | The channel number of external wireless network. |
| <rssii> | The signal level of external wireless network. |

Examples

```
AT+CWSTASCANSYN=?  
+CWSTASCANSYN: (0-1)
```

OK

```
AT+CWSTASCANSYN=1
```

OK

+CWSTASCANSYN: "08:4F:0A:CA:45:80",6,-64

+CWSTASCANSYN: "92:32:4B:9F:E2:EB",1,-66

+CWSTASCANSYN: "1C:15:1F:FD:C7:6C",6,-83

+CWSTASCANSYN: 0

AT+CWSTASCANSYN=0

OK

AT+CWSTASCANEX=1,1,4,25,0

OK

AT+CWSTASCANSYN=1,1

OK

+CWSTASCANSYN: "08:4F:0A:CA:45:80",6,-64

+CWSTASCANSYN: "92:32:4B:9F:E2:EB",1,-66

+CWSTASCANSYN: "1C:15:1F:FD:C7:6C",6,-83

+CWSTASCANSYN: 0

25.2.4 AT+CWMAP Open/Close WIFI

AT+CWMAP Open/Close WIFI

Test Command

AT+CWMAP=?

Response

+CWMAP:(0-1)

OK

Read Command

AT+CWMAP?

Response

+CWMAP:<flag>

OK

Write Command

AT+CWMAP=<flag>

Response

1)if the mode is 0 or 1:

OK

2)

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|---------|-----------------------------|
| <flag > | 0 Close WIFI 1 Open WIFI |
|---------|-----------------------------|

Examples

AT+CWMAP?

+CWMAP:1

OK

AT+CWMAP=0

OK

25.2.5 AT+CWSSID SSID setting

AT+CWSSID SSID setting

Read Command

AT+CWSSID?

Response

+CWSSID:<ssid>

OK

Write Command

AT+CWSSID=<ssid>

Response

OK

or

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|--------|--|
| <ssid> | new ssid string 1. The max length of <ssid> is 128 bytes when the <ssid> include only ASCII characters. The default value is Mrvl-uAP-X-XXX. |
|--------|--|

Examples

AT+CWSSID?

+CWSSID:Mrvl-uAP-X-C7FC

OK

25.2.6 AT+CWAUTH Authentication setting

AT+ CWAUTH Authentication setting

Read Command

AT+CWAUTH=?

Response

+CWAUTH:<auth>,<encrypt>[,<password>]

OK

Write Command

AT+CWAUTH=<auth>,<encrypt>[,<password>]

Response

OK

or

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

<auth>

0 – open/share
1 – open
2 – share
3 – wpa
4 – wpa2
5 – wpa/wpa2

<encrypt>

0 – null
1 – WEP
2 – TKIP
3 – AES

<password>

password string, the length is 5 or between 8 to 64. The char in the password is only allow the ASCII's decimal code between 32 to 126.

NOTE

The parameter need to meet the following conditions:

1. If (auth = 0) then (encrypt = 0)
1. If (auth = 1) then (encrypt = 1)
2. If (auth = 2) then (encrypt = 1)

```
3. If (auth >=3) then (encrypt >=2)
4. If(encrypt = 0) then (password is null)
5. If(encrypt = 1) then
{
    1) password can't be set null
    2) password format: (5 ASCII character) or (10 hexadecimal number) or(13 ASCII character)
       or(26 hexadecimal number)
}
6. if(encrypt >= 2) then
{
    1) password can't be set null
    2) password format: (8~63 ASCII character or 64 hexadecimal number)
}
```

Examples

AT+CWAUTH?

+CWAUTH:0,1, "11111"

OK

AT+CWAUTH?

+CWAUTH:5,4, "12345678"

OK

AT+CWAUTH=0,0

OK //Auth:open/share encrypt:null

AT+CWAUTH=1,1,"11111"

OK //Auth:open encrypt: WEP

AT+CWAUTH=2,1,"12345"

OK //Auth:share encrypt: WEP
//(ASCII character password:12345)

AT+CWAUTH=2,1,"3132333435"

OK //Auth:share encrypt:WEP
//(sixteen hexadecimal number: password 12345)

AT+CWAUTH=5,4,"abcd1234"

OK //Auth:WPA/WPA2 encrypt:TKIP-AES

25.2.7 AT+CWMOCH 802.11 mode and channel setting

AT+CWMAP mode and channel setting

| | |
|--|---|
| Read Command AT+CWMOCH? | Response +CWMOCH:<mode>,<channel> |
| | OK |
| Write Command AT+CWMOCH=<mode>,<channel> | Response OK or ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | | |
|------------------------|---------------------------------|-----------|
| <mode> | 2 – b | 2.4G mode |
| | 3 – b/g | 2.4G mode |
| | 4 – b/g/n | 2.4G mode |
| <channel> | 0 – auto select | |
| | 1~11 – 2.4G mode channel number | |

Examples

```
AT+CWMOCH?
+CWMOCH:4,0
```

OK

```
AT+CWMOCH=3,1
OK
```

25.2.8 AT+CWISO Client isolation setting

AT+CWISO Client isolation setting

| | |
|-----------------------------------|---------------------------------|
| Test Command AT+CWISO=? | Response +CWISO:(0-1) |
|-----------------------------------|---------------------------------|

| | |
|--|---|
| | OK |
| Read Command AT+CWISO? | Response +CWMOCH:<mode>,<channel> |
| | OK |
| Write Command AT+CWISO=<isolation> | Response OK or ERROR |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | | |
|--------------------------|---|-------|
| <isolation> | 0 | Close |
| | 1 | Open |

Examples

```
AT+CWISO?  
+CWISO:1
```

OK

```
AT+CWISO=0  
OK
```

25.2.9 AT+CWMACADDR Get MAC address

AT+CWISO Client isolation setting

| | |
|---------------------------------------|--|
| Test Command AT+CWMACADDR=? | Response [<number>,<mac_addr> [... ...]] |
| | OK |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|------------|---|
| <number> | 0 – host mac addr 1 – client mac addr … – client mac addr |
| <mac_addr> | Device mac address |

Examples

AT+CWMACADDR?

0,00:0A:F5:88:88:8F
1,74:23:44:8f:64:fd

OK

25.2.10 AT+CWCLICNT Get client number connected to the WIFI

AT+CWISO Client isolation setting

| | |
|-----------------------|------------------|
| Read Command | Response |
| AT+CWCLICNT? | +CWCLICNT: <cnt> |
| | OK |
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|-------|--|
| <cnt> | the connected client count, range is from 0 to 32. |
|-------|--|

Examples

AT+CWCLICNT?

+CWCLICNT: 1

OK

26 AT Commands for Bluetooth

26.1 Overview of AT Commands for Bluetooth

| Command | Description |
|---------------------------|--|
| AT+BLEPOWER | Power on/off Ble Device |
| AT+BLESTATUS | Inquiry current BLE connect status |
| AT+BLEHOST | Get or Set host name |
| AT+BLEADDR | Get or Set ble address |
| AT+BLESREG | Register GATT Server |
| AT+BLESDREG | Deregister GATT Server |
| AT+BLESSAD | Add a service |
| AT+BLESSRM | Remove a service |
| AT+BLESSCAD | Add a characteristic to an existed service |
| AT+BLESSCRM | Remove a characteristic |
| AT+BLESSDAD | Add a descriptor to an existed characteristic |
| AT+BLESSDRM | Remove a descriptor |
| AT+BLESSSTART | Start a server |
| AT+BLESSSTOP | Stop a server |
| AT+BLESSETADVDATA | Set advertising package |
| AT+BLESCLRADVDATA | Clear advertising package |
| AT+BLESSETADVPARAM | Set advertising parameters |
| AT+BLESLSTART | Start advertising |
| AT+BLESLSTOP | Stop advertising |
| AT+BLEADV | Set advertising parameters |
| AT+BLEDISCONN | Disconnect BLE connection |
| AT+BLESIND | Send an indication to a client |
| AT+BLESNTY | Send a notice to a client |
| AT+BLESRSP | Send a Response to a Client'S Read or Write Operation |
| | +BLESRREQ Read request received from remote device |
| | +BLESWREQ Write request received from remote device |
| | +BLESCON Notify When a Connection's Status Change |
| | +BLEMTU Exchange mtu request received from remote device |
| AT+BLECREG | Register GATT Client |

| | |
|---------------------|--|
| AT+BLECDREG | Deregister GATT Client |
| AT+BLESCAN | Scan Surrounding BLE Device |
| | +BLESCANRST Notify When Find a BLE Device |
| AT+BLECGDT | Get Device Type |
| AT+BLECCON | Connect GATT Client to Remote LE/Dual-mode Device |
| AT+BLECDISC | Disconnect GATT Client to Remote LE/Dual-mode Device |
| AT+BLECSS | Search Peer's Service |
| AT+BLECGC | Search Peer's Characteristic |
| AT+BLECGD | Search Peer's Characteristic Descriptor |
| AT+BLECRC | Read Peer's Characteristic |
| AT+BLECWC | Write Peer's Characteristic |
| AT+BLECRD | Read Peer's Descriptor |
| AT+BLECWD | Write Peer's Descriptor |
| | +BLECNTY Notify When Get a Notication from Peer's Device |
| | +BLECIND Notify When Get a Indication from Peer's Device |
| AT+BTPOWER | Open/Close BT Device |
| AT+BTHOST | Get/Set BT Device Name |
| AT+BTADDR | Get/Set BT Device Address |
| AT+BTSCAN | Scan BT Device |
| AT+BTIOPCAP | Get/Set BT Device IO Capability |
| AT+BTPAIR | Pair With Other BT Device |
| AT+BTUNPAIR | Unpair With The Paired BT Device |
| AT+BTPAIRED | Get Paired BT Device |
| AT+BTSPPSRV | Active/Deactive Local SPP Service |
| AT+BTSPPPROF | Get Remote BT Device SPP Service Status |
| AT+BTSPPCONN | Establish/Release SPP Connection |
| AT+BTSPPSEND | SPP Send Data |
| | +BTSPPRECV SPP Receive Data |

NOTE

Currently, only A7678 Series support AT commands for BLE. ASR1603_011_051 version SDK support AT command for BT.

26.2 Detailed Description of AT Commands for BLE

The client and server can be created and used at the same time, but only one connection is supported.

26.2.1 AT+BLEPOWER Power on/off Ble Device

AT+BLEPOWER=1 is used to power on ble device. You must execute AT+BLEPOWER=1 before any other ble related operations.

AT+BLEPOWER Power on/off Ble Device

Test Command Response

AT+BLEPOWER=?

OK

Read Command

AT+BLEPOWER?

OK

Or

ERROR

Write Command

AT+BLEPOWER=<op>

Response

OK

Or

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

12000ms

Reference

-

Defined Values

| | |
|----------|--|
| <status> | This parameter has the following two values: 0 the current device is closed. 1 the current device is open. |
|----------|--|

| | |
|------|---|
| <op> | This parameter has the following two values: 0 power off the ble device 1 power on the ble device |
|------|---|

Examples

```
AT+BLEPOWER=?  
OK  
AT+BLEPOWER=1  
OK
```

NOTE

When the Bluetooth is turned off, the client information is cleared and the connection status of the server is reset.

26.2.2 AT+BLESTATUS Inquiry Current BLE Connect Status

AT+BLESTATUS Inquiry Current BLE Connect Status

| | |
|-----------------------|---|
| Test Command | Response |
| AT+BLESTATUS=? | OK |
| Read Command | Response If ble has no connection: OK |
| AT+BLESTATUS? | else: +BLESTATUS: <conn_id>,<gatts_type>,<user_id>,<addr> |
| Parameter Saving Mode | OK |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|---------------------------|---|
| <conn_id> | The connection id of current connection |
| <gatts_type> | The values are as follows: 0 None. 1 Gatt Server. 2 Gatt Client. |
| <user_id> | User id of GATT server, or the name of the GATT server.A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }.Length is 8. |
| <addr> | Address of the peer device. |

Examples

```

AT+BLESTATUS=?
OK
AT+BLESTATUS?
+BLESTATUS: 0,1,ABCDEF00,c0:65:29:48:56:ef
OK

```

26.2.3 AT+BLEHOST Inquiry and Set Host Device Name

AT+BLEHOST Inquiry and Set Host Device Name

| | |
|--------------------------------|----------------------------|
| Test Command | Response |
| AT+BLEHOST=? | OK |
| Read Command | Response |
| AT+BLEHOST? | +BLEHOST: <name>,<address> |
| | OK |
| Write Command | Response |
| AT+BLEHOST=<name> | OK |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------|---|
| <name> | Device name, max length of it is 18 bytes |
| <address> | Device address |

Examples

```
AT+BLEHOST=?  
OK  
AT+BLEHOST?  
+BLEHOST: SIMCOM BLE,"df:45:e6:29:65:c0"  
  
OK  
AT+BLEHOST="SIMCOM BLE"  
OK
```

26.2.4 AT+BLEADDR Inquiry and Set Device Address

AT+BLEADDR Inquiry and Set Device Address

| | |
|---------------------|---------------------|
| Test Command | Response |
| AT+BLEADDR=? | OK |
| Read Command | Response |
| AT+BLEADDR? | +BLEADDR: <address> |

| | |
|-----------------------------------|----------------------------------|
| | OK |
| Write Command | Response |
| AT+BLEADDR=<address> | +BLEADDR: <address> |
| | OK |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------|----------------|
| <address> | Device address |
|-----------|----------------|

Examples

```

AT+BLEADDR=?
OK
AT+BLEADDR?
+BLEADDR: "df:45:e6:29:65:c0"

OK
AT+BLEADDR="C0:00:00:00:00:01"
+BLEADDR: "c0:00:00:00:00:01"

OK

```

26.2.5 AT+BLESREG Register GATT Server

AT+BLESREG Register GATT Server

| | |
|---------------------|---|
| Test Command | Response |
| AT+BLESREG=? | OK |
| | Response |
| | If the server has already been registered, response |
| | +BLESREG: <server_index>,<user_id> |
| Read Command | ... |
| AT+BLESREG? | +BLESREG: <server_index>,<user_id> |
| | OK |
| | else only response |

| | |
|-----------------------|---|
| | OK |
| | Response |
| | +BLESREG: <server_index>,<user_id> |
| Execution Command | |
| AT+BLESREG | OK |
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|---|
| <server_index> | Server index, the number of registered servers is limited to 64. |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |

Examples

```

AT+BLESREG=?
OK
AT+BLESREG
+BLESREG: 0, ABCDEF50

OK
AT+BLESREG?
+BLESREG: 0,ABCDEF50

OK

```

26.2.6 AT+BLESREG Deregister GATT Server

| AT+BLESREG Deregister GATT Server | |
|--|---|
| Test Command | Response |
| AT+BLESREG=? | OK |
| Read Command | Response |
| AT+BLESREG? | OK |
| Write Command | Response |
| AT+BLESREG=<server_index> | +BLESREG: <server_index>,<user_id> |

| | |
|-----------------------|--------------------------|
| > | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|--|
| <server_index> | Server index |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |

Examples

```
AT+BLESDREG=?  
OK  
AT+BLESDREG?  
OK  
AT+BLESDREG=0  
+BLESDREG: 0,ABCDEF00  
  
OK
```

26.2.7 AT+BLESSAD Add a Service

| AT+BLESSAD Add a Service | |
|---------------------------------|---|
| Test Command | Response |
| AT+BLESSAD=? | OK |
| Read Command | Response If the server has already been registered, response +BLESSAD: <service_index>,<user_id>,<uuid>,<is_primary>,<inst>,<service_handle> ... |
| AT+BLESSAD? | +BLESSAD: <service_index>,<user_id>,<uuid>,<is_primary>,<inst>,<service_handle> |

| | |
|---|---|
| | OK else only response |
| | OK Response |
| | +BLESSAD: <service_index>,<user_id>,<uuid>,<is_primary>,<inst>,<service_handle> |
| Write Command | |
| AT+BLESSAD=<server_index>,<uuid>,<num_handles>,<is_primary>,<inst> | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-------------------------------|---|
| <server_index> | Server Index. Generated when the server is created. |
| <service_index> | Service Index, the number of registered services is limited to 64. |
| <user_id> | User id of GATT server, or the name of the GATT server. |
| | A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |
| <uuid> | The uuid of the service. Max length is 32. |
| <num_handles> | Reserve. |
| <is_primary> | The values are as follows: 1 primary service. |
| <inst> | Reserve. |
| <service_handle> | The handle of this service. Dec format. |

Examples

```

AT+BLESSAD=?
OK
AT+BLESSAD=0,"1802",30,1,0
+BLESSAD: 0,ABCDEF50,1802,1,0,0

OK
AT+BLESSAD?
+BLESSAD: 0,ABCDEF50,1802,1,0,0

OK

```

26.2.8 AT+BLESSRM Remove a Service

AT+BLESSRM Remove a Service

| | |
|--|--|
| Test Command AT+BLESSRM=? | Response OK |
| Read Command AT+BLESSRM? | Response OK |
| | Response +BLESSRM: <service_index>,<user_id>,<uuid>,<service_handle> |
| Write Command AT+BLESSRM=<service_index> | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-------------------------------|---|
| <service_index> | Service Index |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |
| <uuid> | The UUID of the service, a string with hex value, length is 4. |
| <service_handle> | The handle of this service. Dec format. |

Examples

```

AT+BLESSRM=?
OK
AT+BLESSRM?
OK
AT+BLESSRM=0
+BLESSRM: 0,ABCDEF50,1802,0

OK

```

26.2.9 AT+BLESSCAD Add a Characteristic to an Existed Service

AT+BLESSCAD Add a Characteristic to an Existed Service

Test Command

AT+BLESSCAD=?

Response

OK

Response

If the server has already been registered, response

+BLESSCAD:

<char_index>,<user_id>,<char_uuid>,<inst>,<prop>,<permis
sion>,<char_handle>

...

+BLESSCAD:

<char_index>,<user_id>,<char_uuid>,<inst>,<prop>,<permis
sion>,<char_handle>

OK

else only response

OK

Response

+BLESSCAD:

<char_index>,<user_id>,<char_uuid>,<inst>,<char_handle>

OK

or

ERROR

Write Command

**AT+BLESSCAD=<service_inde
x>,<char_uuid>,<inst>,<pro
p>,<permission>**

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

-

Defined Values

| | |
|------------------------------|---|
| <service_index> | Service Index |
| <char_index> | Characteristic index, the number of registered characteristics is limited to 64. |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |
| <char_uuid> | The UUID of the characteristic. Max length is 32. |
| <inst> | Not use. |
| <prop> | The characteristic's properties. It should be a combination of the following values: 1 Broadcast 2 Read |

| | |
|----------------------------|--|
| | 4 Write without response 8 Write 16 Notify 32 Indicate 64 Authenticated Signed Writes 128 Extended properties |
| <permission> | Permission of this characteristic. It should be a combination of the following values: Read 1 Write 2 |
| <char_handle> | The handle of this Characteristic. Dec format. |

Examples

```
AT+BLESSCAD=?  
OK  
AT+BLESSCAD=0,"2A06",4,38,3  
+BLESSCAD: 0,ABCDEF50,2A06,4,0

OK  
AT+BLESSCAD?  
+BLESSCAD: 0,ABCDEF50,2A06,4,38,3,0

OK
```

26.2.10 AT+BLESSCRM Remove a Characteristic

| AT+BLESSCRM Remove a Characteristic | |
|--|------------------------------------|
| Test Command | Response |
| AT+BLESSCRM=? | OK |
| | Response |
| | +BLESSCRM: |
| | <char_index>,<user_id>,<char_uuid> |
| Write Command | |
| AT+BLESSCRM=<char_index> | OK |
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------|---|
| <char_index> | Characteristic index |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |
| <char_uuid> | The UUID of the characteristic, a string with hex value, length is 4. |

Examples

AT+BLESSCRM=?

OK

AT+BLESSCRM=0

+BLESSCRM: 0,ABCDEF50,2A06

OK

26.2.11 AT+BLESSDAD Add a Descriptor to an Existed Characteristic

AT+BLESSDAD Add a Descriptor to an Existed Characteristic

Test Command

Response

AT+BLESSDAD=?

OK

Response

If the server has already been registered, response

+BLESSDAD:

<desc_index>,<char_uuid> ,<desc_uuid>,<inst>,<desc_handle>

...

+BLESSDAD:

<desc_index>,<char_uuid> ,<desc_uuid>,<inst>,<desc_handle>

OK

else only response

OK

Response

Write Command

+BLESSDAD:

AT+BLESSDAD=<char_index>,<desc_uuid>,<inst>,<permission>

<desc_index>,<char_uuid> ,<desc_uuid>,<inst>,<desc_handle>

OK

| | |
|-----------------------|--------------|
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------|---|
| <char_index> | Characteristic index |
| <desc_index> | Descriptor Index |
| <char_uuid> | The UUID of the characteristic, max length is 32. |
| <desc_uuid> | The UUID of the descriptor, the rules as follows: 1.can't add multiple the same descriptor to a characteristic. 2.can't add descriptor to a characteristic if server is already active. 3.max length is 32. 4.available value is 2900,2901,2902,2903,2904,2905. |
| <inst> | Not use. |
| <permission> | Permission of this characteristic. Dec format. It should be a combination of the following values: Read 1 Write 2 |
| <desc_handle> | Handle of this descriptor. Dec format. |

Examples

AT+BLEPOWER=1

OK

AT+BLESREG?

OK

AT+BLESREG

+BLESREG: 0,ABCDEF00

OK

AT+BLESSAD?

OK

AT+BLESSAD=0,"1603",30,1,4

+BLESSAD: 0,ABCDEF00,1603,1,4,0

OK

AT+BLESSCAD=0,"8901",4,54,3
+BLESSCAD: 0,ABCDEF00,8901,0,0

OK

AT+BLESSDAD=0,"2901",4,0
+BLESSDAD: 0,8901,2901,0,0

OK

AT+BLESSDAD=0,"2902",4,0
+BLESSDAD: 1,8901,2902,0,0

OK

AT+BLESSDAD=0,"2901",4,0
ERROR

AT+BLEADV=0,1,1,1,0
+BLEADV: ABCDEF00

OK

AT+BLESSSTART=0,0
+BLESSSTART: 0,ABCDEF00,0

OK

AT+BLESSTART=0
+BLESSTART: 0,ABCDEF00

OK

AT+BLESSDAD=0,"2903",4,0
ERROR

26.2.12 AT+BLESSDRM Remove a Descriptor

AT+BLESSDRM Add a Descriptor to an Existed Service

| Test Command | Response |
|----------------------|-----------|
| AT+BLESSDRM=? | OK |

| | |
|--|--|
| | Response +BLESSDRM: <desc_index>,<desc_uuid> |
| Write Command AT+BLESSDRM=<desc_index> | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|---------------------------|---|
| <desc_index> | Descriptor Index |
| <desc_uuid> | The UUID of the descriptor, a string with hex value, length is 4. |

Examples

```
AT+BLESSDRM=?  
OK  
AT+BLESSDRM=0  
+BLESSDRM: 0,0210  
  
OK
```

26.2.13 AT+BLESSSTART Start a Server

| AT+BLESSSTART Start a Server | |
|--|---|
| Test Command AT+BLESSSTART=? | Response OK |
| | Response If no started device: OK |
| Read Command AT+BLESSSTART? | Else +BLESSSTART: <server_index>,<user_id>,<server_ble_link_handle> |
| | OK |
| Write Command AT+BLESSSTART=<server_index>,<transport> | Response +BLESSSTART: <server_index>,<user_id>,<server_ble_link_handle> |

| | |
|-----------------------|--------------------------|
| | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------------------|---|
| <server_index> | Server index. Generated when the server is created. |
| <transport> | Not use. |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |
| <server_ble_link_handle> | The ble link handle of this server. Dec format. |

Examples

```
AT+BLESSSTART=?  
OK  
AT+BLESSSTART=0,0  
+BLESSSTART: 0,ABCDEF50,0  
  
OK
```

26.2.14 AT+BLESSSTOP Stop a Server

| AT+BLESSSTOP Stop a Server | |
|-------------------------------------|---|
| Test Command | Response |
| AT+BLESSSTOP=? | OK |
| Read Command | Response |
| AT+BLESSSTOP? | OK |
| | Response |
| | +BLESSSTOP: |
| Write Command | <server_index>,<user_id>,<server_ble_link_handle> |
| AT+BLESSSTOP=<server_inde | |
| x> | OK or ERROR |

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------------------|--|
| <server_index> | Server index. Generated when the server is created.(server should stop after ble advertising stop) |
| <user_id> | User id of GATT server, or the name of the GATT server.A Hex value string. Each char of it should in set { '0'~'9','a'~'f','A'~'F' }. Length is 8. |
| <server_ble_link_handle> | The ble link handle of this server. Dec format. |

Examples

AT+BLEPOWER=1

OK

AT+BLESREG?

OK

AT+BLESREG

+BLESREG: 0,ABCDEF00

OK

AT+BLESSAD?

OK

AT+BLESSAD=0,"1603",30,1,4

+BLESSAD: 0,ABCDEF00,1603,1,4,0

OK

AT+BLESSCAD=0,"8901",4,54,3

+BLESSCAD: 0,ABCDEF00,8901,0,0

OK

AT+BLESSDAD=0,"2901",4,0

+BLESSDAD: 0,8901,2901,0,0

OK

AT+BLESSDAD=0,"2902",4,0

+BLESSDAD: 1,8901,2902,0,0

OK

AT+BLEADV=0,1,1,1,0

+BLEADV: ABCDEF00

OK

AT+BLESSSTART=0,0

+BLESSSTART: 0,ABCDEF00,0

OK

AT+BLESSTART=0

+BLESSTART: 0,ABCDEF00

OK

AT+BLESSSTOP=0

ERROR

AT+BLESSTOP=0

+BLESSTOP: 0,ABCDEF00

OK

AT+BLESSSTOP=0

+BLESSSTOP: 0,ABCDEF00,0

OK

26.2.15 AT+BLESSETADVDATA Set Advertising Package

This command is incompatible with the +BLEHOST and +BLEADV command. If the above commands are used at same time, only this command will take effect.

AT+BLESSETADVDATA Set Advertising Package

Response

Test Command

+BLESSETADVDATA: <server_index>,<type>,<value>

AT+BLESSETADVDATA=?

OK

| | |
|--|--|
| | Response 1)if <type> and <value> is ignored: +BLESSETADVDATA: [<adv_data>] OK 2)else: OK or ERROR |
| Write Command | |
| AT+BLESSETADVDATA=<server_index>[,<type>,<value>] | |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|---|
| <server_index> | Server index, generated when the server is register. |
| <type> | LE advertising package type, consistent with Bluetooth standard documents. Common values are as follows: 0x01: Flags 0x09: Complete Local Name 0xFF: Manufacturer Specific Data For other types of values, please refer to the description of generic access profile in the standard document |
| <value> | LE advertising package data. String Type, max length is 29. If the format is the same as HEX{DATA}, and DATA is a hexadecimal string, DATA will be transcoded and set. |
| <adv_data> | Advertising package currently set, is a hexadecimal string. |

Examples

```

AT+BLESSETADVDATA=?
+BLESSETADVDATA:
<server_index>,<type>,<value>

OK
AT+BLESSETADVDATA=0
+BLESSETADVDATA:

OK
AT+BLESSETADVDATA=0,1,"HEX{01}"
OK

```

26.2.16 AT+BLESCLRADVDATA Clear Adverting package

This command is only used to clear the advertising package set by +BLESSETADVDATA command.

AT+BLESCLRADVDATA Clear Adverting package

Test Command Response

AT+BLESCLRADVDATA=?

OK

Write Command Response

AT+BLESCLRADVDATA=<server_index>

OK

or

ERROR

Parameter Saving Mode NO_SAVE

Max Response Time 9000ms

Reference -

Defined Values

<server_index>

Service index, generated when the server is register.

Examples

AT+BLESCLRADVDATA=?

OK

AT+BLESCLRADVDATA=0

OK

26.2.17 AT+BLESSETADVPARAM Set Adverting Paramters

AT+BLESSETADVPARAM Set Adverting Parameters

Response

+BLESSETADVPARAM:

<server_index>,<adv_interval_min>,<adv_interval_max>,<adv_type>,<own_address_type>,<peer_address_type>,<peer_address>,<adv_channel_map>,<adv_filter_policy>,<adv_tx_power>

OK

Test Command Response

AT+BLESSETADVPARAM=?

+BLESSETADVPARAM:

<adv_interval_min>,<adv_interval_max>,<adv_type>,<own_address_type>

| | |
|---|--|
| >,<adv_interval_max>[,<adv_type>[,<own_address_type>[,<peer_address_type>,<peer_address>[,<adv_channel_map>[,<adv_filter_policy>[,<adv_tx_power>]]]]]]] | ddress_type>,<peer_address_type>,<peer_address>,<adv_channel_map>,<adv_filter_policy>,<adv_tx_power_dBm> OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------------|--|
| <server_index> | Server index, generated when the server is register. |
| <adv_interval_min> | Hexadecimal number type. Minimum advertising interval for undirected and low duty cycle directed advertising. Range: 0x0020 to 0x4000. Default: 0x0800 (1.28 s). Time = N * 0.625 ms. For example: f0. |
| <adv_interval_max> | Hexadecimal number type. Minimum advertising interval for undirected and low duty cycle directed advertising. Range: 0x0020 to 0x4000. Default: 0x0800 (1.28 s). Time = N * 0.625 ms. For example: f0. Its value is the one of following: 0x00: Connectable and scannable undirected advertising (ADV_IND) (default). 0x01: Connectable high duty cycle directed advertising (ADV_DIRECT_IND, high duty cycle). 0x02: Scannable undirected advertising (ADV_SCAN_IND). 0x03: Non connectable undirected advertising (ADV_NONCONN_IND). 0x04: Connectable low duty cycle directed advertising (ADV_DIRECT_IND, low duty cycle). Other values: Reserved for future use. |
| <adv_type> | Its value is the one of following: 0x00: Public device address (default). 0x01: Random device address. Other values: Reserved for future use. |
| <own_address_type> | Its value is the one of following: 0x00: Public Device Address (default). 0x01: Random Device Address. Other values: Reserved for future use. |
| <peer_address_type> | Its value is the one of following: 0x00: Process scan and connection requests from all devices (i.e., the White List is not in use) (default). 0x01: Process connection requests from all devices and scan requests |
| <peer_address> | String type. Address of the device to be connected. For example: "02:12:65:ef:d5:f0". |
| <adv_channel_map> | Reserved for future use. |
| <adv_filter_policy> | Its value is the one of following: 0x00: Process scan and connection requests from all devices (i.e., the White List is not in use) (default). 0x01: Process connection requests from all devices and scan requests |

| | |
|--------------------|--|
| | <p>only from devices that are in the White List. 0x02: Process scan requests from all devices and connection requests only from devices that are in the White List. 0x03: Process scan and connection requests only from devices in the White List. Other values: Reserved for future use.</p> |
| <adv_tx_power> | <p>Its value is the one of following: 0: set advertising tx power to -12dBm 1: set advertising tx power to -8dBm 2: set advertising tx power to -2dBm <u>3</u>: set advertising tx power to 0dBm 4: set advertising tx power to +6dBm</p> |
| <adv_tx_power_dBm> | <p>Its value is the one of following: 244: indicate that current advertising tx power is -12dBm 248: indicate that current advertising tx power is -8dBm 254: indicate that current advertising tx power is -2dBm <u>0</u>: indicate that current advertising tx power is 0dBm 6: indicate that current advertising tx power is +6dBm</p> |

Examples

AT+BLESSETADVPARAM=?

+BLESSETADVPARAM:

<server_index>,<adv_interval_min>,<adv_interval_max>,<adv_type>,<own_address_type>,<peer_address_type>,<peer_address>,<adv_channel_map>,<adv_filter_policy>,<adv_tx_power>

OK

AT+BLESSETADVPARAM=0

+BLESSETADVPARAM: 0x0800,0x0800,0,0,0,"00:00:00:00:00:00",7,0,0

OK

AT+BLESSETADVPARAM=0,80,f0

+BLESSETADVPARAM: 0x0080,0x00f0,0,0,0,"00:00:00:00:00:00",7,0,0

OK

AT+BLESSETADVPARAM= 0,320,320,0,0,0,"00:00:00:00:00:00",7,0,2

+BLESSETADVPARAM: 0x0320,0x0320,0,0,0,"00:00:00:00:00:00",7,0,254

OK

AT+BLESSETADVPARAM= 0,320,320,0,0,0,"00:00:00:00:00:00",7,0,4

+BLESSETADVPARAM: 0x0320,0x0320,0,0,0,"00:00:00:00:00:00",7,0,6

OK

26.2.18 AT+BLESSTART Start Advertising

AT+BLESSTART Start Advertising

| | |
|---|---|
| Test Command AT+BLESSTART=? | Response OK |
| | Response If no device in advertising. OK |
| Read Command AT+BLESSTART? | Else +BLESSTART: <server_index>,<user_id> |
| | OK |
| | Response +BLESSTART: <server_index>,<user_id> |
| Write Command AT+BLESSTART=<server_index> | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|--|
| <server_index> | Server index. Generated when the server is created.(ble advertising should start after server start) |
| <user_id> | User id of GATT server, or the name of the GATT server.A Hex value string, each char of it should be in set { '0'~'9', 'a'~'f', 'A'~'F' }.Length is 8. |

Examples

```
AT+BLEPOWER=1
```

```
OK
```

```
AT+BLESREG?
```

```
OK
```

```
AT+BLESREG
```

```
+BLESREG: 0,ABCDEF00
```

OK

AT+BLESSAD?

OK

AT+BLESSAD=0,"1603",30,1,4

+BLESSAD: 0,ABCDEF00,1603,1,4,0

OK

AT+BLESSCAD=0,"8901",4,54,3

+BLESSCAD: 0,ABCDEF00,8901,0,0

OK

AT+BLESSDAD=0,"2901",4,0

+BLESSDAD: 0,8901,2901,0,0

OK

AT+BLESSDAD=0,"2902",4,0

+BLESSDAD: 1,8901,2902,0,0

OK

AT+BLEADV=0,1,1,1,0

+BLEADV: ABCDEF00

OK

AT+BESLSTART=0

ERROR

AT+BLESSSTART=0,0

+BLESSSTART: 0,ABCDEF00,0

OK

AT+BESLSTART=0

+BESLSTART: 0,ABCDEF00

OK

26.2.19 AT+BLESSTOP Stop Advertising

AT+BLESSTOP Stop Advertising

| | |
|---|--|
| Test Command | Response |
| AT+BLESSTOP=? | OK |
| Read Command | Response |
| AT+BLESSTOP? | OK |
| | Response |
| | +BLESSTOP: <server_index>,<user_id> |
| Write Command | |
| AT+BLESSTOP=<server_index> | OK |
| > | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|---|
| <server_index> | Server index. Generated when the server is created.(disallow stop advertising if ble link exist) |
| <user_id> | User id of GATT server, or the name of the GATT server.A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }.Length is 8. |

Examples

AT+BLEPOWER=1

OK

AT+BLESREG?

OK

AT+BLESREG

+BLESREG: 0,ABCDEF00

OK

AT+BLESSAD?

OK

AT+BLESSAD=0,"1603",30,1,4

+BLESSAD: 0,ABCDEF00,1603,1,4,0

OK

AT+BLESSCAD=0,"8901",4,54,3
+BLESSCAD: 0,ABCDEF00,8901,0,0

OK

AT+BLESSDAD=0,"2901",4,0
+BLESSDAD: 0,8901,2901,0,0

OK

AT+BLESSDAD=0,"2902",4,0
+BLESSDAD: 1,8901,2902,0,0

OK

AT+BLEADV=0,1,1,1,0
+BLEADV: ABCDEF00

OK

AT+BLESSSTART=0,0
+BLESSSTART: 0,ABCDEF00,0

OK

AT+BLESSTART=0
+BLESSTART: 0,ABCDEF00

OK

+BLESCON: 1,ABCDEF00,7e:c3:ed:71:e5:55,1

AT+BLESSTOP=0

ERROR

+BLESCON: 0,ABCDEF00,7e:c3:ed:71:e5:55,1

AT+BLESSTOP=0

+BLESSTOP: 0,ABCDEF00

OK

26.2.20 AT+BLEADV Set Advertising Parameters

AT+BLEADV Set Advertising Parameters

| | |
|---|---|
| Test Command AT+BLEADV=? | Response OK |
| Write Command AT+BLEADV=<server_index>,<include_flag>,<include_name>,<include_txpower>,<appearance>[,<manufacturer_data>,<service_data>,<service_uuid>] | Response +BLEADV: <user_id> |
| | OK |
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------------|--|
| <server_index> | Server index |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string, each char of it should be in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |
| <include_flag> | Include flag parameter or not 0 Not include 1 Include |
| <include_name> | Include BT name 0 Not include 1 Include |
| <include_txpower> | Include Tx power Level 0 Not include 1 Include |
| <appearance> | Set appearance, 0~16384 |
| <manufacturer_data> | Set manufacturer, A Hex value string ("HEX{data}") or a decimal value string. Max length of it is 56. |
| <service_data> | Set service_data uuid, A Hex value string, each char of it should be in set { '0'~'9', 'a'~'f', 'A'~'F' }. The length of it should be 0 or 4~32. |
| <service_uuid> | Set complete services uuid, A Hex value string, each char of it should be in set { '0'~'9', 'a'~'f', 'A'~'F' }. The length of it should be 0 or 4~32. |

Examples

AT+BLEADV=?

OK

AT+BLEADV=0,1,1,1,0

+BLEADV: ABCDEF50

OK

26.2.21 AT+BLEDISCONN Disconnect BLE Connection

AT+BLEDISCONN Disconnect BLE Connection

| | |
|--------------------------------------|--|
| Test Command | Response |
| AT+BLEDISCONN=? | OK |
| Read Command | Response |
| AT+BLEDISCONN? | OK |
| | Response |
| | OK |
| Write Command | |
| AT+BLEDISCONN=<conn_id> | +BLESConn: <op>,<user_id>,<addr>,<conn_id> or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|------------------------|---|
| <op> | 0 Disconnect 1 Connect |
| <conn_id> | The connection id of current connection |
| <addr> | Address of the peer device. |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |

Examples

AT+BLEDISCONN=?

OK

AT+BLEDISCONN=0

OK

+BLESCON: 0,ABCDEF50,df:45:e6:29:65:c1,0

26.2.22 AT+BLESIND Send an Indication to a Client

AT+BLESIND Send an Indication to a Client

| | |
|--|--|
| Test Command | Response |
| AT+BLESIND=? | OK |
| Write Command | Response |
| AT+BLESIND=<char_index>,<value> | OK |
| | +BLESIND: <result>,<user_id>,<conn_id>,<attr_handle> or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|---------------|---|
| <char_index> | Characteristic index |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Max length of it is 8. |
| <conn_id> | The connection id of current connection. |
| <attr_handle> | The handle of the characteristic value. Dec format. |
| <value> | The value need to be notified. String Type, max length is (MTU – 3). If the format is the same as HEX{DATA}, and DATA is a hexadecimal string, DATA will be transcoded and sent. Please refer to chapter 26.2.27 about MTU. |
| <result> | 0 Success 1 Fail |

Examples

```

AT+BLESIND=?
OK
AT+BLESIND=0,"HEX{123456}"
+BLESIND: 0,ABCDEF00,1,17

OK

```

26.2.23 AT+BLESNTY Send an notice to a Client

AT+BLESNTY Send an Notice to a Client

| | |
|--|---|
| Test Command | Response |
| AT+BLESNTY=? | OK |
| Write Command | Response |
| AT+BLESNTY=<char_index>,<value> | +BLESNTY: <result>,<user_id>,<conn_id>,<attr_handle> |
| | OK |
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|---------------|---|
| <char_index> | Characteristic index |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Max length of it is 8. |
| <conn_id> | The connection id of current connection. |
| <attr_handle> | The handle of the characteristic value. Dec format. |
| <value> | The value need to be notified. String Type, max length is (MTU – 3). If the format is the same as HEX{DATA}, and DATA is a hexadecimal string, DATA will be transcoded and sent. Please refer to chapter 26.2.27 about MTU. |
| <result> | 0 Success 1 Fail. |

Examples

```

AT+BLESNTY=?
OK
AT+BLESNTY=0,"HEX{123456}"
+BLESNTY: 0,ABCDEF00,1,17

```

OK

26.2.24 AT+BLESRSP Send a Response to a Client'S Read or Write Operation

AT+BLESRSP Send a Response to a Client'S Read or Write Operation

| | |
|--|---|
| | Response +BLESRSP: <result>,<user_id>,<conn_id>,<attr_handle> |
| Write Command | |
| AT+BLESRSP=<switch>,<value> | |
| > | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------|---|
| <switch> | 0 Read |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Max length of it is 8. |
| <conn_id> | The connection id of current connection. |
| <attr_handle> | The handle of the characteristic value. Dec format. |
| <value> | The value need to response read request. String Type, max length is (MTU – 3). If the format is the same as HEX{DATA}, and DATA is a hexadecimal string, DATA will be transcoded and sent. Please refer to chapter 26.2.27 about MTU. |
| <result> | 0 Success 1 Fail |

Examples

```
AT+BLESRSP=0,"HEX{123456}"
+BLESRSP: 0,ABCDEF50,1,17
```

OK

26.2.25 +BLESRREQ Read request received from remote device

AT+BLESRREQ Read request received from remote device

URC

if there is incoming a read request:

+BLESRREQ:

<user_id>,<conn_id>,<trans_id>,<addr>,<attr_handle>,<is_lo>

ng>,<offset>

Reference

-

Defined Values

| | |
|----------------------------|---|
| <user_id> | User id of GATT server, or the name of the GATT server.A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }.Max length of it is 8. |
| <conn_id> | The connection id of current connection. |
| <trans_id> | The id of current transaction.0~65535 |
| <addr> | Address of the peer device. |
| <attr_handle> | Handle of attribute. |
| <is_long> | Tell server that the request is one or several requests. |
| <offset> | Offset of the request.0~65535 |

Examples

```
+BLESRREQ:  
ABCDEF50,1,0,"90:f0:6a:3a:4f:41",17,19,0
```

26.2.26 +BLESWREQ Write request received from remote device

AT+BLESWREQ Write request received from remote device

URC

if there is incoming a write request:

+BLESWREQ:

<user_id>,<conn_id>,<trans_id>,<addr>,<attr_handle>,<value>,<need_rsp>,<is_prep>,<offset>

Reference

-

Defined Values

| | |
|-------------------------|---|
| <user_id> | User id of GATT server, or the name of the GATT server.A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }.Max length of it is 8. |
| <conn_id> | The connection id of current connection. |
| <trans_id> | The id of current transaction.0~65535 |
| <addr> | Address of the peer device. |

| | |
|---------------|--|
| <attr_handle> | Handle of attribute. |
| <value> | The value need to be write, Hex format |
| <need_rsp> | Whether client need server's response 1 Yes 0 No |
| <is_prep> | Whether or not server execute request immediately 0 No 1 Yse |
| <offset> | Offset of the request.0~65535 |

Examples

```
+BLESWREQ: ABCDEF50,1,0,"21:e8:5a:c2:8d:47",17,1234,0,0,0
```

26.2.27 +BLESCON Notify When a Connection's Status Change

+BLESCON Notify When a Connection's Status Change

Response

+BLESCON: <op>,<user_id>,<addr>,<conn_id>

Reference

-

Defined Values

| | |
|-----------|--|
| <op> | 0 Disconnect 1 Connect |
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string, each char of it should in set{ '0'~'9', 'a'~'f', 'A'~'F' }. Max length of it is 8. |
| <addr> | Address of the peer device. |
| <conn_id> | The connection id of current connection. |

Examples

```
+BLESCON: 1,ABCDEF50,21:e8:5a:c2:8d:47,1
```

26.2.28 +BLEMTU Exchange mtu request received from remote device

+BLEMTU Exchange mtu request received from remote device

Response

+BLEMTU: <conn_id>,<mtu>

Reference

-

Defined Values

<conn_id> The connection id of current connection.

<mtu> Negotiated MTU Size. The default is 23.

Examples

+BLEMTU: 1,185

26.2.29 AT+BLECREG Register GATT Client

AT+BLECREG Register GATT Client

Test Command

AT+BLECREG=?

Response

OK

Response

If the client has already been registered, response

+BLECREG: <client_index>,<user_id>

...

+BLECREG: <client_index>,<user_id>

OK

else only response

OK

Response

+BLECREG: <client_index>,<user_id>

Execution Command

AT+BLECREG

OK

or

ERROR

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------|---|
| <client_index> | Client index, the number of registered servers is limited to 64. |
| <user_id> | User id of GATT Client. A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |

Examples

```

AT+BLECREG=?
OK
AT+BLECREG
+BLECREG: 0, ABCDEF50

OK
AT+BLECREG?
+BLECREG: 0,ABCDEF50

OK

```

26.2.30 AT+BLECDREG Deregister GATT Client

| AT+BLECDREG Deregister GATT Client | |
|---|-------------------------------------|
| Test Command | Response |
| AT+BLECDREG=? | OK |
| | Response |
| | +BLECDREG: <client_index>,<user_id> |
| Write Command | |
| AT+BLECDREG=<client_index> | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|---|
| <client_index> | Client Index, generated when registering GATT client. |
| <user_id> | User id of GATT Client. A Hex value string. Each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Length is 8. |

Examples

```

AT+BLECDREG=?
OK
AT+BLECDREG?
OK
AT+BLECDREG=0
+BLECDREG: 0,ABCDEF00

OK

```

26.2.31 AT+BLESCAN Scan Surrounding BLE Device

You must execute AT+BLESCAN after power on the device.

| AT+BLESCAN SCAN Surrounding BLE Device | |
|--|--|
| Test Command | Response |
| AT+BLESCAN=? | OK |
| | Response |
| | If has the devices scanned, response |
| | +BLESCAN: |
| | <client_index>,<server_index>,<remote_address> |
| | ... |
| | +BLESCAN: |
| | <client_index>,<server_index>,<remote_address> |
| | OK |
| | else only response |
| | OK |
| Read Command | Response |
| AT+BLESCAN? | OK |
| | or |
| | ERROR |
| Write Command | Response |
| AT+BLESCAN=<client_index>,<operation> | OK |
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|------------------|--|
| <client_index> | Client index, generated when registering GATT client. |
| <server_index> | Remote device index, generated when scan surrounding device. |
| <remote_address> | Remote device address. |
| <operation> | <p>This parameter has the following two values:</p> <p>0 stop scan. If the device is not scanning, the command response error.</p> <p>1 start scan. If the device is scanning currently, the command response error.</p> |

Examples

```
AT+BLESCAN=?
OK
AT+BLESCAN?
OK
AT+BLESCAN=0,1
OK
```

26.2.32 +BLESCANRST Notify When Find a BLE Device

| +BLESCANRST Notify When Find a BLE Device | |
|---|--|
| Parameter Saving Mode | Response |
| Max Response Time | +BLESCANRST: <client_index>,<server_index>,<remote_address>,<rssi>,<adv_data> |
| Reference | NO_SAVE |

Defined Values

| | |
|------------------|--|
| <client_index> | Client index, generated when registering GATT client. |
| <server_index> | Remote device index, generated when scan surrounding device. |
| <remote_address> | Remote device address. |
| <rssi> | Received Signal Strength Indication. |
| <adv_data> | Remote device's advertising data. Hex String Type. |

Examples

```
+BLESCANRST: 0,0,"1f:50:24:38:96:20",197,"02011A020A080BFF4C0010063A"
```

26.2.33 AT+BLECGDT Get Device Type

AT+BLECGDT Get Device Type

Test Command Response

AT+BLECGDT=? OK

Write Command Response

AT+BLECGDT=<server_index> +BLECGDT: <server_index>,<device_type>

OK or

AT+BLECGDT=<server_index> ERROR

Parameter Saving Mode NO_SAVE

Max Response Time 9000ms

Reference -

Defined Values

<server_index> Remote device index, generated when scan surrounding device.

<device_type> This parameter has the following values:

0 Unknown.

1 Classic.

2 Le

3 Dual

Examples

```
AT+BLECGDT=0
```

```
+BLECGDT: 0,2
```

```
OK
```

26.2.34 AT+BLECCON Connect GATT Client to Remote LE/Dual-mode Device

AT+BLECCON Connect GATT Client to Remote LE/Dual-mode Device

| | |
|--|--|
| Test Command AT+BLECON=? | Response OK |
| | Response OK |
| Write Command AT+BLECON=<server_index> | +BLECON: <connect_id>,<remote_address> or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-------------------------------|--|
| <server_index> | Remote device index, generated when scan surrounding device. |
| <connect_id> | The connection id of current connection. |
| <remote_address> | Remote device address. |

Examples

AT+BLECON=0

OK

+BLECON: 0,"2b:3c:42:10:23:58"

26.2.35 AT+BLECDISC Disconnect GATT Client to Remote LE/Dual-mode Device

| AT+BLECDISC Disconnect GATT Client to Remote LE/Dual-mode Device | |
|---|--|
| Test Command AT+BLECDISC=? | Response OK |
| | Response OK |
| Write Command AT+BLECDISC=<connect_id> | +BLECDISC: <connect_id>,<remote_address> or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|------------------|--|
| <connect_id> | The connection id of current connection. |
| <remote_address> | Remote device address. |

Examples

AT+BLECDISC=0

OK

+BLEDISC: 0,"2b:3c:42:10:23:58"

26.2.36 AT+BLECSS Search Peer's Service

| AT+BLECSS Search Peer's Service | |
|--|--|
| Test Command | Response |
| AT+BLECSS=? | OK |
| | Response |
| | If has the services searched, response |
| | +BLECSS: <server_index>,<service_index>,<uuid> |
| | ... |
| Read Command | +BLECSS: <server_index>,<service_index>,<uuid> |
| AT+BLECSS? | |
| | OK |
| | else only response |
| | OK |
| | Response |
| | +BLECSS: <server_index>,<service_index>,<uuid> |
| Write Command | |
| AT+BLECSS=<service_index> | OK |
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------|--|
| <server_index> | Remote device index, generated when scan surrounding device. |
| <service_index> | Remote device's service index, generated when search services. |

| | |
|--------|---|
| <uuid> | The uid of the service. The length is 4 or 32 bytes. Hex String Type. |
|--------|---|

Examples

```
AT+BLECSS?
+BLECSS: 0,0,0x1800
+BLECSS: 0,1,0x1801
+BLECSS: 0,2,0x8900
```

OK

26.2.37 AT+BLECGC Search Peer's Characteristic

AT+BLECGC Search Peer's Characteristic

Test Command

Response

AT+BLECGC=?

OK

Response

If has the services searched, response

+BLECGC:

<service_index>,<characteristic_index>,<propertis>,<uuid>

...

+BLECGC:

<service_index>,<characteristic_index>,<propertis>,<uuid>

OK

else only response

OK

Response

+BLECGC:

<service_index>,<characteristic_index>,<properties>,<uuid>

OK

or

ERROR

Write Command

AT+BLECGC=<characteristic_index>

OK

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

-

Defined Values

| | |
|------------------------|--|
| <service_index> | Remote device's service index, generated when search services. |
| <characteristic_index> | Remote device's characteristic index, generated when search |

| | |
|--------------|---|
| | characteristic. |
| <properties> | The characteristic's properties. It should be a combination of the following values: 1 Broadcast 2 Read 4 Write without response 8 Write 16 Notify 32 Indicate 64 Authenticated Signed Writes 128 Extended properties |
| <uuid> | The uuid of the characteristic. The length is 4 or 32 bytes. Hex String Type. |

Examples

AT+BLECGC?

```
+BLECGC: 0,0,0x2A00
+BLECGC: 0,1,0x2A01
+BLECGC: 0,2,0x2A02
+BLECGC: 0,3,0x2A03
+BLECGC: 0,4,0x2A04
+BLECGC: 1,5,0x2A05
+BLECGC: 2,6,0x8901
```

OK

26.2.38 AT+BLECGD Search Peer's Characteristic Descriptor

AT+BLECGD Search Peer's Characteristic Descriptor

Test Command

Response

AT+BLECGD=?

OK

Response

If has the services searched, response

+BLECGD:

<characteristic_index>,<descriptor_index>,<uuid>

...

+BLECGD:

<characteristic_index>,<descriptor_index>,<uuid>

OK

else only response

OK

| | |
|---|--|
| Write Command | Response +BLECGD: <characteristic_index>,<descriptor_index>,<uuid> |
| AT+BLECGD=<descriptor_index> | OK |
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-------------------------------------|---|
| <characteristic_index> | Remote device's characteristic index, generated when search characteristic. |
| <descriptor_index> | Remote device's descriptor index, generated when search descriptor. |
| <uuid> | The uid of the descriptor. The length is 4 or 32 bytes. Hex String Type. |

Examples

```
AT+BLECGD?
+BLECGD: 6,0,0x2902
```

OK

26.2.39 AT+BLECRC Read Peer's Characteristic

| AT+BLECRC Read Peer's Characteristic | |
|---|--|
| Test Command | Response |
| AT+BLECRC=? | OK |
| | Response |
| | 1) If the server response the read request quickly: OK |
| Write Command | +BLECRC: <characteristic_index>,<value> |
| AT+BLECRC=<characteristic_index> | 2) If send read request successfully and don't receive read response whthin the specified time: OK |
| | 3) An error occurred: ERROR |
| Parameter Saving Mode | NO_SAVE |

| | |
|-------------------|--------|
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|------------------------|--|
| <characteristic_index> | Remote device's characteristic index, generated when search peer's characteristic. |
| <value> | Server response data. Hex String Type. |

Examples

AT+BLECRC=6

OK

+BLECRC: 6,"313233"

26.2.40 AT+BLECWC Write Peer's Characteristic

AT+BLECWC Write Peer's Characteristic

| | |
|--|---|
| Test Command | Response |
| AT+BLECWC=? | OK |
| Write Command | Response |
| AT+BLECWC=<characteristic_index>,<write_type>,<value> | 1) If write the characteristic successfully: OK 2) Other error occurred: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|------------------------|--|
| <characteristic_index> | Remote device's characteristic index, generated when search peer's characteristic. |
| <write_type> | This parameter has the following values: 0 write without response 1 write |
| <value> | The value need to write. String Type, max length is (MTU – 3). If the format is the same as HEX{DATA}, and DATA is a hexadecimal string, DATA will be transcoded and sent. Please refer to chapter 26.2.27 |

| | |
|--------------|-------------------------------|
| | about MTU. |
| <error_code> | Please refer to chapter 26.3. |

Examples

```
AT+BLECWC=6,0,"HEX{123456}"
```

OK

26.2.41 AT+BLECRD Read Peer's Characteristic Descriptor

| AT+BLECRD Read Peer's Characteristic Descriptor | |
|--|---|
| Test Command | Response |
| AT+BLECRD=? | OK |
| | Response |
| | 3) If the server response the read request quickly: |
| | OK |
| Write Command | +BLECRD: <descriptor_index>,<value> |
| AT+BLECRD=<descriptor_index> | 2) If send read request successfully and don't receive read response within the specified time: |
| x> | OK |
| | 3) An error occurred: |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------------|---|
| <descriptor_index> | Remote device's descriptor index, generated when search peer's characteristic descriptor. |
| <value> | Server response data. Hex String Type. |

Examples

```
AT+BLECRD=0
```

OK

```
+BLECRD: 0,"0000"
```

26.2.42 AT+BLECWD Write Peer's Characteristic Descriptor

AT+BLECWD Write Peer's Characteristic Descriptor

| | |
|--|---|
| Test Command AT+BLECWD=? | Response OK |
| Write Command AT+BLECWD=<descriptor_index> x>,<value> | Response 1) If write the characteristic successfully: OK 2) Other error occurred: ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|---------------------------------|---|
| <descriptor_index> | Remote device's descriptor index, generated when search peer's characteristic descriptor. |
| <value> | The value need to write. String Type, max length is (MTU – 3). If the format is the same as HEX{DATA}, and DATA is a hexadecimal string, DATA will be transcoded and sent. Please refer to chapter 26.2.27 about MTU. |
| <error_code> | Please refer to chapter 26.3. |

Examples

```
AT+BLECWD=0,"HEX{0100}"
```

OK

26.2.43 +BLECNTY Notify When Get a Notification from Peer's Device

+BLECNTY Notify When Get a Notification from Peer's Device

| | |
|-----------------------|--|
| Parameter Saving Mode | Response +BLECNTY: <connect_id>,<characteristic_index>,<value> |
| Max Response Time | NO_SAVE |
| Reference | - |

Defined Values

| | |
|------------------------|---|
| <connect_id> | The connection id of current connection. |
| <characteristic_index> | Remote device's characteristic index, generated when search characteristic. |
| <value> | Server response data. Hex String Type. |

Examples

```
+BLECNTY: 0,6,"02011A020A080BFF4C0010063A"
```

26.2.44 +BLECIND Notify When Get a Indication from Peer's Device

| +BLECIND Notify When Get a Indication from Peer's Device | |
|--|---|
| Parameter Saving Mode | Response +BLECIND: <connect_id>,<characteristic_index>,<value> |
| Max Response Time | NO_SAVE |
| Reference | 9000ms |
| | - |

Defined Values

| | |
|------------------------|---|
| <connect_id> | The connection id of current connection. |
| <characteristic_index> | Remote device's characteristic index, generated when search characteristic. |
| <value> | Server response data. Hex String Type. |

Examples

```
+BLECIND: 0,6,"02011A020A080BFF4C0010063A"
```

26.2.45 +BLECSRCHSERV Notify when the discovery for service of server ends

This urc is used to mark the ends of searching service of server. Then you can get the complete information about the service and characteristic with the corresponding commands.

| +BLECSRCHSERV Notify when the discovery for service of server ends | |
|--|----------|
| | Response |

+BLECSRCHSERV: DISCOVER COMPLETION

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Examples

+BLEMTU: 0,185

+BLECSRCHSERV: DISCOVER COMPLETION

26.2.46 AT+BLESSETSCANRESP Set Scan Response
AT+BLESSETSCANRESP Set Scan Response

| | |
|---|---|
| Test Command | Response +BLESSETSCANRESP: <server_index>,<type>,<value> |
| AT+BLESSETSCANRESP=? | OK |
| Write Command | Response 1)if <type> and <value> is ignored: +BLESSETSCANRESP: [<resp_data>] |
| AT+BLESSETSCANRESP =<server_index>[,<type>,<valu e>] | OK 2)else: OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------------|--|
| <server_index> | Server index, generated when the server is register. |
| <type> | LE advertising package type, consistent with Bluetooth standard documents. Common values are as follows: 0x01: Flags 0x09: Complete Local Name 0xFF: Manufacturer Specific Data |

| | |
|-------------|--|
| | For other types of values, please refer to the description of generic access profile in the standard document |
| <value> | LE advertising package data. String Type, max length is 29. If the format is the same as HEX{DATA}, and DATA is a hexadecimal string, DATA will be transcoded and set. |
| <resp_data> | Scan response data currently set, is a hexadecimal string. |

Examples

```
AT+BLESSETSCANRESP=?
+BLESSETSCANRESP:
<server_index>,<type>,<value>
```

OK

```
AT+BLESSETSCANRESP=0
+BLESSETSCANRESP:
```

OK

```
AT+BLESSETSCANRESP=0,1,"HEX{01}"
OK
```

26.2.47 +BLESCANRESPDATA Notify When Get a Scan Response Data

+BLESCANRESPDATA Notify When Get a Response Data

| | |
|-----------------------|--|
| | Response |
| | +BLESCANRESPDATA: |
| | <client_index>,<server_index>,<remote_address>,<rssi>,<scan_resp_data> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|------------------|--|
| <client_index> | Client index, generated when registering GATT client. |
| <server_index> | Remote device index, generated when scan surrounding device. |
| <remote_address> | Remote device address. |
| <rssi> | Received Signal Strength Indication. |
| <scan_resp_data> | Remote device's scan response data. Hex String Type. |

Examples

```
+BLESCANRESPDATA: 0,14,"72:af:f2:80:a4:e8",174,"0816AAFD7265646D69"
```

NOTE

The module initiates scanning and reports the scanning response data received from the corresponding device. This information is not reported every time.

26.2.48 +BLESCCCD Notify Client Characteristic Configuration Status

+BLESCCCD Notify Client Characteristic Configuration Status

| | |
|-----------------------|--|
| | Response |
| | +BLESCCCD: |
| | <user_id>,<conn_id>,<trans_id>,<remote_address>,<attr_handle>,<flag> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | - |
| Reference | - |

Defined Values

| | |
|---------------|---|
| <user_id> | User id of GATT server, or the name of the GATT server. A Hex value string, each char of it should in set { '0'~'9', 'a'~'f', 'A'~'F' }. Max length of it is 8. |
| <conn_id> | The connection id of current connection. |
| <trans_id> | The id of current transaction. 0~65535 |
| <remote_addr> | Address of the peer device. |
| <attr_handle> | Handle of attribute. |
| <flag> | 0 disable 1 notifications enabled 2 indications enabled |

Examples

```
+BLESCCCD: ABCDEF0,6,0,"59:a2:1f:ba:ad:27",4,1
```

26.3 Detailed Description of AT Commands for BT

Following commands are only supported by specific FW, for detailed information please contact with SIMCom FAE

26.3.1 AT+BTPOWER Open/Close BT Device

This command is used to open/close bt device. After opening bt device, bt device can be discovered and connected by other bt device. BT device must in open status before executing AT+BTSCAN, AT+BTPAIR, AT+UNPAIR, AT+BTSPPSRV, AT+BTSPPPROF, AT+BTSPPCONN and AT+BTSPSEND command.

AT+BTPOWER Open/Close BT Device

| | |
|--|---|
| Test Command | Response +BTPOWER: (0-1) |
| AT+BTPOWER=? | OK |
| Read Command | Response +BTPOWER: <status> |
| AT+BTPOWER? | OK |
| Write Command | Response |
| AT+BTPOWER=<flag>[,<debug>] | OK Or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------|--|
| <flag> | This parameter has the following two values: 0 close bt device. 1 open bt device. |
| <debug> | Current not support. |
| <status> | This parameter has the following two values: 0 bt device has been closed. 1 bt device has been opened. |

Examples

```
AT+BTPOWER=?
+BTPOWER: (0-1)
```

OK

AT+BTPOWER?

+BTPOWER: 0

OK

AT+BTPOWER=1

OK

AT+BTPOWER?

+BTPOWER: 1

OK

26.3.2 AT+BTHOST Get/Set BT Device Name

This command is used to get bt device name and bt device address, and can also set bt device name. This command can be executed at any time. The parameter will be saved in flash. If bt device name is set during bt device in open status, then need to reopen bt device by executing AT+BTPOWER command to make bt device name valid, otherwise bt device name inquired by other bt device is the same as previous bt device name.

AT+BTHOST Get/Set BT Device Name

| | |
|--------------------------------------|---|
| Read Command | Response +BTHOST: <bt_name>,<bt_addr> |
| AT+BTHOST? | OK |
| Write Command | Response OK |
| AT+BTHOST=<new_bt_name> | Or ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------|------------------------------------|
| <new_bt_name> | New bt device name.(max 247 bytes) |
| <bt_name> | Current bt device name. |
| <bt_addr> | Current bt device address. |

Examples

AT+BTHOST?

+BTHOST: SIMCOM BT,11:22:23:33:33:80

OK

AT+BTHOST=SIMCOM_BT_DEVICE

OK

AT+BTHOST?

+BTHOST: SIMCOM_BT_DEVICE,11:22:23:33:33:80

OK

26.3.3 AT+BTADDR Get/Set BT Device Address

This command is used to get/set bt device address. This command can be executed at any time. The parameter will be saved in flash. If bt device address is set during bt device in open status, then need to reopen bt device by executing AT+BTPOWER command to make bt device address valid, otherwise bt device address not change.

AT+BTADDR Get/Set BT Device Address

| | |
|--------------------------------------|--------------------------------|
| Read Command | Response +BTADDR: <bt_addr> |
| AT+BTADDR? | OK |
| Write Command | Response OK |
| AT+BTADDR=<new_bt_addr> | Or ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|---------------|----------------------------|
| <new_bt_addr> | New bt device address. |
| <bt_addr> | Current bt device address. |

Examples

AT+BTADDR?

+BTADDR: 38:08:17:26:36:45

OK

AT+BTADDR=112223333380

OK

AT+BTADDR?

+BTADDR: 11:22:23:33:33:80

OK

26.3.4 AT+BTSCAN Scan BT device

This command is used to discover other bt device. BT device must in open status before executing this command.

AT+BTSCAN Scan BT Device

| | |
|--|--|
| Test Command | Response +BTSCAN: (0-1),(0-1),(6-48) |
| AT+BTSCAN=? | OK |
| Write Command | Response +BTSCAN: <scan_status>[,<index>,<bt_name>,<bt_addr>,<rss_i_level>] ... <scan_status>[,<index>,<bt_name>,<bt_addr>,<rss_i_level>] |
| AT+BTSCAN=<flag>[,<mode>[,<timeout>]] | Or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------------------------|--|
| <flag> | This parameter has the following two values: 0 stop scan. 1 start scan. |
| <mode> | This parameter has the following two values: 0 don't hide paired device. 1 hide paired device. |
| <timeout> | Duration of the scan. duration = 1.28s*timeout.(default: 12.8s) |
| <scan_status> | This parameter has the following two values: |

| | |
|--------------|--|
| | 0 scanning. 1 scan end. |
| <index> | The index of discovered bt device.(start with 1) |
| <bt_name> | The name of discovered bt device. |
| <bt_addr> | The address of discovered bt device. |
| <rssi_level> | Received signal strength indication |

Examples

AT+BTPOWER=1

OK

AT+BTSCAN=1,0,20

OK

+BTSCAN: 0,1,Mi Note 3,F4:F5:DB:C9:03:2C,178

+BTSCAN: 0,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F,194

+BTSCAN: 0,3,Honor V10,90:94:97:DA:3C:73,176

+BTSCAN: 0,4,OPPO A91,1C:02:19:8F:8A:7C,180

+BTSCAN: 1

AT+BTSCAN=1,0,20

OK

+BTSCAN: 0,1,Mi Note 3, F4:F5:DB:C9:03:2C,178

+BTSCAN: 0,2,HUAWEI WATCH GT 2-A5F, A0:D8:07:A6:7A:5F,194

+BTSCAN: 0,3,Honor V10,90:94:97:DA:3C:73,176

AT+BTSCAN=0

OK

+BTSCAN: 1

26.3.5 AT+BTIOCAP Get/Set BT Device IO Capalibity

This command is used to get/set bt device io capability. This command can be executed at any time. The parameter will be saved in flash. If bt device io capability is set during bt device in open status, then need to reopen bt device by executing AT+BTPOWER command to make bt device io capability valid, otherwise bt device io capability not change.

AT+BTIOCAP Get/Set BT Device IO Capability

| | Response |
|---------------------|-----------------|
| Test Command | +BTIOCAP: (0-3) |
| AT+BTIOCAP=? | OK |

| | |
|--|--|
| Test Command AT+BTIOPCAP? | Response +BTIOPCAP: <mode> |
| | OK |
| | Response +BTIOPCAP: 1 |
| Write Command AT+BTIOPCAP=<mode> | OK Or ERROR |
| Parameter Saving Mode | SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

<mode>

This parameter has the following four values:

- 0 display only.
- 1 display and yes or no.
- 2 keyboard only.
- 3 no display and no keyboard.

Examples

AT+BTIOPCAP=?

+BTIOPCAP: (0-3)

OK

AT+BTIOPCAP?

+BTIOPCAP: 1

OK

AT+BTIOPCAP=3

+BTIOPCAP: 1

OK

AT+BTIOPCAP?

+BTIOPCAP: 3

OK

26.3.6 AT+BTPAIR Pair With Other BT Device

This command is used to pair with other bt device. After pairing success, the pairing information will be saved in flash and the bluetooth connection will be disconnected actively. You can use AT+BTPAIRED command to query the paired bt device. BT device must in open status before executing this command.

AT+BTPAIR Pair With Other BT Device

| | |
|---|---|
| Test Command AT+BTPAIR=? | Response +BTPAIR: (index) |
| | OK |
| Write Command AT+BTPAIR=0,<index> | Response +BTPAIRING: <mode>,<bt_name>,<bt_addr>[,<key>] Or ERROR |
| Write Command AT+BTPAIR=<mode>,<accept>[,<key>] | Response +BTPAIR: <result>,<bt_name>,<bt_addr> Or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|------------------------|--|
| <mode> | This parameter has the following six values: 1 compare mode. 2 passkey mode. 3 rebond mode.(Current not support) 4 notify mode. (Current not support) 5 just work mode. (Support, but invisible to user, user do nothing) 6 pin code mode. (Current not support) |
| <accept> | When pairing is initiated, it is the index of the remote device;And as a confirmation of the pairing request |
| <key> | Random generation 6-digit verification code.(default: 123456) |
| <index> | AT+BTSCAN command response index. |
| <bt_name> | The name of remote bt device. |
| <bt_addr> | The address of remote bt device. |
| <result> | This parameter has the following two values: 0 pair fail. 1 pair success. |

Examples

AT+BTIOCAP=1

+BTIOCAP: 1

OK

AT+BTPOWER=1

OK

AT+BTSCAN=1,0,20

OK

+BTSCAN: 0,1,Mi Note 3,F4:F5:DB:C9:03:2C,178

+BTSCAN: 0,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F,194

+BTSCAN: 0,3,KK,04:8C:9A:D7:90:4C,180

+BTSCAN: 1

AT+BTPAIR=0,3

OK

+BTPAIRING: 1,KK,04:8C:9A:D7:90:4C,466622

AT+BTPAIR=1,1

OK

+BTPAIR: 1,KK,04:8C:9A:D7:90:4C

AT+BTIOCAP=2

+BTIOCAP: 1

OK

AT+BTPOWER=0

OK

AT+BTPOWER=1

OK

AT+BTSCAN=1,0,20

OK

+BTSCAN: 0,1,Mi Note 3,F4:F5:DB:C9:03:2C,178

+BTSCAN: 0,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F,194

+BTSCAN: 0,3,KK,04:8C:9A:D7:90:4C,180

+BTSCAN: 1

AT+BTPAIR=0,3

OK

+BTPAIRING: 2,peer bt name,04:8C:9A:D7:90:4C //for passkey mode, bt_name fixed as

"peer bt name"

AT+BTPAIR=2,1,123456 // "123456", remote bt device displayed
OK
+BTPAIR: 1,KK,04:8C:9A:D7:90:4C

26.3.7 AT+BTUNPAIR Unpair With The Paired BT Device

This command is used to Unpair with the paired bt device. You should make sure the bluetooth connection is disconnected before unpairing. After unpairing success, the pairing information will be removed from flash. BT device must in open status before executing this command.

AT+BTUNPAIR Unpair With The Paired BT Device

| | |
|----------------------------------|--|
| Test Command | Response +BTUNPAIR: (index) |
| AT+BTUNPAIR=? | OK |
| Write Command | Response +BTUNPAIR: <status> |
| AT+BTUNPAIR=<index> | Or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------|---|
| <index> | AT+BTPAIRED command response index. |
| <status> | This parameter has the following two values: 0 unpair fail. 1 unpair success. |

Examples

AT+BTPOWER=1
OK

AT+BTPAIRED?
OK
+BTPAIRED: 2,1,KK, 04:8C:9A:D7:90:4C

+BTPAIRED: 2,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F

AT+BTPAIR=1

OK

+BTUNPAIR: 1

AT+BTPAIRED?

OK

+BTPAIRED: 1,1,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F

26.3.8 AT+BTPAIRED Get Paired BT Device

This command is used to get paired bt device. This command can be executed at any time.

AT+BTPAIRED Get Paired BT Device

| | |
|-----------------------|---|
| Read Command | Response |
| AT+BTPAIRED? | OK |
| | +BTPAIRED: <paired_num>,<index>,<bt_name>,<bt_addr> |
| | ... |
| | +BTPAIRED: <paired_num>,<index>,<bt_name>,<bt_addr> |
| | Or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|--------------|---------------------------------------|
| <paired_num> | The total number of paired bt device. |
| <index> | The index of paired bt device. |
| <bt_name> | The name of paired bt device. |
| <bt_addr> | The address of paired bt device. |

Examples

AT+BTPAIRED?

OK

+BTPAIRED: 2,1,KK,04:8C:9A:D7:90:4C

+BTPAIRED: 2,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F

26.3.9 AT+BTSPPSRV Active/Deactive Local SPP Service

This command is used to active/deactive local SPP service. BT device must in open status before executing this command.

AT+BTSPPSRV Active/Deactive Local SPP Service

| | |
|--|---|
| Test Command AT+BTSPPSRV=? | Response +BTSPPSRV: (0-1) |
| Rest Command AT+BTSPPSRV? | OK |
| Write Command AT+BTSPPSRV=<flag> | Response +BTSPPSRV: <status> OK Or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------|---|
| <flag> | This parameter has the following two values: 0 deactivate local spp service.(Current not support) 1 active local spp service. |
| <status> | This parameter has the following two values: 0 local not support spp service. 1 local support spp service. |
| <result> | This parameter has the following two values: 0 local spp service is deactivated. 1 local spp service is active. |

Examples

```
AT+BTPOWER=1
```

```
OK
```

```
AT+BTSPPSRV=?
```

```
+BTSPPSRV: (0-1)
```

```
OK
```

AT+BTSPPSRV?**+BTSPPSRV: 1****OK****AT+BTSPPSRV=0****ERROR****AT+BTSPPSRV=1****+BTSPPSRV: 1****OK**

26.3.10 AT+BTSPPPROF Get Remote BT Device SPP Service Status

This command is used to check whether the remote bt device support spp service. BT device must in open status before executing this command.

AT+BTSPPPROF Get Remote BT Device SPP Service Status

| | |
|-----------------------------------|-----------------------------------|
| | Response |
| | OK |
| Write Command | |
| AT+BTSPPPROF=<index> | +BTSPPPROF: <status> |
| | Or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|-----------------------|--|
| <index> | AT+BTPAIRED command response index. |
| <status> | This parameter has the following two values: 0 remote bt device spp service is not active. 1 remote bt device spp service is active.(Current fixed return) |

Examples

AT+BTPOWER=1**OK****AT+BTPAIRED?**

OK

+BTPAIRED: 2,1,KK, 04:8C:9A:D7:90:4C

+BTPAIRED: 2,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F

AT+BTSPPPROF=1

OK

+BTSPPPROF: 1

26.3.11 AT+BTSPPCONN Establish/Release SPP Connection

This command is used to establish/release spp connection. If local bt device which doesn't have pairing information of peer bt device initiate spp connection, then pairing procedure need to be executed before establishing spp connection. The pairing procedure can be triggered manually by AT+BTPAIR command. If local bt device which has pairing information of peer bt device initiate spp connection, then spp connection procedure can be triggered directly by AT+BTSPPCONN command without manually performing pairing procedure again. BT device must in open status before executing this command. If AT+BTCFG="spp_rw_mode" is set,1, the AT channel enters the transparent mode for data transmission after the SPP connection is established. "+++" can temporarily exit transparent mode and restore transparent mode by the ATO command. When the SPP is disconnected, it permanently exits transparent transmission mode.

AT+BTSPPCONN Establish/Release SPP Connection

| | |
|--|--|
| Test Command | Response +BTSPPCONN: (0-1) |
| AT+BTSPPCONN=? | OK |
| Rest Command | Response +BTSPPCONN: <status> |
| AT+BTSPPCONN? | OK |
| Write Command | Response OK |
| AT+BTSPPCONN=<action>[,<index>] | +BTSPPCONN: <result>[,<max_frame_size>,<bt_addr>] Or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

<action>

This parameter has the following two values:

| | |
|-------------------------------|--|
| | 0 release spp connection. 1 establish spp connection. |
| <index> | AT+BTPAIRED command response index.(default: 1) |
| <status> | This parameter has the following two values: 0 spp connection has been release. 1 spp connection has been established. |
| <result> | This parameter has the following two values: 0 spp connection release success. 1 spp connection establish success. |
| <max_frame_size> | Maximum frame size.(unit: byte) |
| <bt_addr> | The address of connected bt device. |

NOTE

When the SPP on the module initiates a connection, the connection may fail and the message "+BTSPCONN: 1,7" is reported. However, it does not affect the subsequent passive connection and other functions.

Examples

AT+BTPOWER=1

OK

AT+BTSCAN=1,0,20

OK

+BTSCAN: 0,1,Mi Note 3, F4:F5:DB:C9:03:2C,178

+BTSCAN: 0,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F,194

+BTSCAN: 0,3,KK,04:8C:9A:D7:90:4C,180

+BTSCAN: 1

AT+BTPAIR=0,3

OK

+BTPAIRING: 1,KK,04:8C:9A:D7:90:4C,466622

AT+BTPAIR=1,1

OK

+BTPAIR: 1,KK,04:8C:9A:D7:90:4C

AT+BTPAIRED?

OK

+BTPAIRED: 1,1,KK,04:8C:9A:D7:90:4C

AT+BTSPCONN=1,1

OK

+BTSPPCONN: 1,990,04:8C:9A:D7:90:4C

AT+BTSPPCONN=0

OK

+BTSPPCONN: 0

26.3.12 AT+BTSPSEND SPP Send Data

This command is used to send data by spp. SPP connection must be established before sending data.

AT+BTSPSEND SPP Send Data

| | |
|---------------------------------|---|
| Write Command | Response OK |
| AT+BTSPSEND=<data> | +BTSPSEND: <result> Or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | - |

Defined Values

| | |
|----------|--|
| <data> | The data to be sent. The following items need to notice: If max_frame_size of +BTSPPCONN event more than 200, then SPP MTU is equal to 200. If max_frame_size of +BTSPPCONN event less than 200, then SPP MTU is equal to max_frame_size. If the format is the same as {non-ascii}"<data>", data is a hexadecimal string, data will be transcoded and sent. The amount of data sent by user should less than or equal to SPP MTU, or return ERROR. |
| <result> | This parameter has the following two values: 0 send fail. 1 send success. |

Examples

AT+BTPOWER=1

OK

AT+BTSCAN=1,0,20

OK

+BTSCAN: 0,1,Mi Note 3,F4:F5:DB:C9:03:2C,178

+BTSCAN: 0,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F,194

+BTSCAN: 0,3,KK,04:8C:9A:D7:90:4C,180

+BTSCAN: 1

AT+BTPAIR=0,3

OK

+BTPAIRING: 1,KK, 04:8C:9A:D7:90:4C,466622

AT+BTPAIR=1,1

OK

+BTPAIR: 1,KK,04:8C:9A:D7:90:4C

AT+BTPAIRED?

OK

+BTPAIRED: 1,1,KK, 04:8C:9A:D7:90:4C

AT+BTSPCONN=1,1

OK

+BTSPCONN: 1,990,04:8C:9A:D7:90:4C

AT+BTSPSEND=003100320033006100620063

OK

+BTSPSEND: 1

AT+BTSPSEND={non-ascii}"003100320033006100620063"

OK

+BTSPSEND: 1

26.3.13 +BTSPPRECV SPP Receive Data

This urc is used to indicate spp has received data. SPP connection must be established before receiving data.

+BTSPPRECV SPP Receive Data

URC

+BTSPPRECV: <data_len>,<data>

Or

+BTSPRECV: ERROR

Reference

-

Defined Values

| | |
|-------------------------|--|
| <data_len> | The length of spp received data. |
| <data> | SPP received data. The following items need to notice: If max_frame_size of +BTSPCONN event more than 200, then SPP MTU is equal to 200. If max_frame_size of +BTSPCONN event less than 200, then SPP MTU is equal to max_frame_size. The amount of data received from remote should less than or equal to SPP MTU, or return +BTSPRECV: ERROR. |

Examples

AT+BTPOWER=1

OK

AT+BTSCAN=1,0,20

OK

+BTSCAN: 0,1,Mi Note 3,F4:F5:DB:C9:03:2C,178

+BTSCAN: 0,2,HUAWEI WATCH GT 2-A5F,A0:D8:07:A6:7A:5F,194

+BTSCAN: 0,3,KK,04:8C:9A:D7:90:4C,180

+BTSCAN: 1

AT+BTPAIR=0,3

OK

+BTPAIRING: 1,KK,04:8C:9A:D7:90:4C,466622

AT+BTPAIR=1,1

OK

+BTPAIR: 1,KK,04:8C:9A:D7:90:4C

AT+BTPAIRED?

OK

+BTPAIRED: 1,1,KK, 04:8C:9A:D7:90:4C

AT+BTSPCONN=1,1

OK

+BTSPCONN: 1,990,04:8C:9A:D7:90:4C

+BTSPPRECV: 24,003100320033006100620063

26.3.14 AT+BTCFG Bluetooth Configuration

This command is used to set Bluetooth configuration.

AT+BTCFG Bluetooth Configuration

Test Command
AT+BTCFG=?

Response
+BTCFG: "spp_rw_mode",(0-1)

OK

Or

ERROR

Read Command
AT+BTCFG?

OK

+BTSPSEND: <result>

Or

ERROR

Write Command
AT+BTCFG=<config>[,<data>]

Response

OK

Or

ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

-

Defined Values

| | |
|----------|--|
| <config> | Bluetooth configuration: "spp_rw_mode" |
| <data> | The data of <config> "spp_rw_mode": 0 normal transmission mode 1 transparent mode. It must be set before SPP connection each time. |

Examples

AT+BTPOWER=1

OK

AT+BTCFG="spp_rw_mode",1

OK

26.4 Description of <error_code>

| Error codes | Description |
|-------------|----------------------------------|
| 1 | Invalid Handle |
| 2 | Read Not Permitted |
| 3 | Write Not Permiited |
| 4 | Invalid PDU |
| 5 | Insufficient Authentication |
| 6 | Request Not Supported |
| 7 | Invalid Offset |
| 8 | Insufficient Authorizaztion |
| 9 | Prepare Queue Full |
| 10 | Attribute Not Found |
| 11 | Attribute Not Long |
| 12 | Insufficient Encryption Key Size |
| 13 | Invalid Attribute Value Length |
| 14 | Unlikely Error |
| 15 | Insufficient Encryption |
| 16 | Unsupported Group Type |
| 17 | Insufficient Resources |
| 18 | Database Out Of Sync |
| 19 | Value Not Allowed |

27 AT Commands for CTBURST

27.1 Overview of AT Commands for CTBURST

| Command | Description |
|-------------------|----------------------|
| AT+CTBURST | The RF TX Burst Test |

NOTE

- 27.2 Supports the 1802 platform.
27.3 Supports the 1601,1603,1606 and 1803 platforms.

27.2 Detailed Description of AT Commands for CTBURST(CAT4)

27.2.1 AT+CTBURST The RF TX Burst Test

| AT+CTBURST The RF TX Burst Test | |
|--|--|
| Test Command AT+CTBURST=? | Response +CTBURST=0-2,0-142,1-65535,-5000-3500, 0-5 OK |
| Write Command AT+CTBURST=<option>, and>,<power>,<gsmband>,<para> | Response 1)LTE RF TX successfully: *RADIOPOWER: 0 OK +CTBURST: 0 |

2)GSM RF TX successfully:

***RADIOPOWER: 0**

+**CTBURST: 0**

***GSMTR:-31355**

OK

RF TX failed:

***RADIOPOWER: 0**

+**CME ERROR: unknown error**

| | |
|-----------------------|---|
| Parameter Saving Mode | - |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|-----------|--|
| <option> | 0 – default. |
| <band> | 1 – LTE frequency = 18300. 2 – LTE frequency = 18900. 3 – LTE frequency = 19500. 4 – LTE frequency = 20175. 5 – LTE frequency = 20525. 6 – LTE frequency = 20700. 7 – LTE frequency = 21100. 8 – LTE frequency = 21625. 17 – LTE frequency = 23790. 20 – LTE frequency = 24300. 38 – LTE frequency = 38000. 39 – LTE frequency = 38450. 40 – LTE frequency = 39150. 101 – GSM TX. |
| <power> | 0 – LTE max power. 1 – LTE 10 dBm. 9 – LTE turn off TX. |
| <gsmband> | 0 – GSM 900. 1 – GSM 1800. 2 – GSM 1900. 3 – GSM 850. 4 – WCDMA band1. |

| | |
|--------|--|
| | 5 – WCDMA band2. 7 – WCDMA band5. 8 – WCDMA band8. 9 – GSM turn off TX. |
| <para> | 0 – GSM TX. 9 – GSM turn off TX. |

Examples

//Example of GSM TX

AT+CFUN=0

+SIMCARD: NOT AVAILABLE

+CGEV: ME DETACH

OK

*RADIOPOWER: 0

AT+CTBURST=0,101,0,1,0

//GSM 1800 MHZ Maximum power emission

*RADIOPOWER: 0

+CTBURST:0

*GSMTR:-31355

OK

AT+CTBURST=0,101,0,9,9

//GSM turn off emission.

*RADIOPOWER: 0

+CTBURST:0

*GSMTR:-31355

OK

//Example of LTE TX

AT+CFUN=0

+SIMCARD: NOT AVAILABLE

+CGEV: ME DETACH

OK

*RADIOPOWER: 0

AT+CTBURST=0,38,0 //B38 Maximum power emission

*RADIOPOWER: 0

OK

+CTBURST:0

AT+CTBURST=0,1,9 //LTE turn off emission.

*RADIOPOWER: 0

OK

+CTBURST:0

NOTE

To test each item, close the previous item first.

When testing LTE, you need to restart the module.

The second and third parameters are mainly for LTE, and the fourth and fifth parameters are mainly for GSM

27.3 Detailed Description of AT Commands for CTBURST(CAT1&CAT4)

27.3.1 AT+CTBURST The TX/RX Burst Test

AT+CTBURST The RF TX Burst Test

| | |
|---|--|
| Test Command AT+CTBURST=? | Response +CTBURST=0-2,0-142,1-65535,-5000-3500, 0-5 |
| Write Command AT+CTBURST=<mode>[,<b and>,<channel>,<power>[,<bandwidth>]] | OK If mode is 0 +CTBURST: TX/RX OFF |
| | OK If mode is 1 +CTBURST: TX ON |

| | |
|-----------------------|---|
| | OK If mode is 2 For gsm/wcdma +CTBURST: RX [rssiValue] |
| | OK For LTE +CTBURST: RX: [mainRssiValue], [secRssiValue] |
| | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | - |
| Reference | |

Defined Values

| | |
|--------|---|
| <mode> | Start/stop TX/RX the burst/waveform 0 – stop RF TX/RX 1 – start RF TX 2 – start RF RX |
| <band> | The band of burst/waveform to be sent 0 – GSM 850 Band 1 – GSM 900 Band 2 – GSM DCS 1800 Band 3 – GSM PCS 1900 Band 10 – WCDMA IMT 2000 Band 11 – WCDMA PCS 1900 Band 12 – WCDMA 800 Band 13 – WCDMA 850 Band 14 – WCDMA 900 Band 101 – LTE 1 Band 102 – LTE 2 Band 103 – LTE 3 Band 104 – LTE 4 Band 105 – LTE 5 Band 106 – LTE 6 Band 107 – LTE 7 Band 108 – LTE 8 Band 109 – LTE 9 Band 110 – LTE 10 Band 111 – LTE 11 Band 112 – LTE 12 Band 113 – LTE 13 Band 114 – LTE 14 Band |

117 – LTE 17 Band
118 – LTE 18 Band
119 – LTE 19 Band
120 – LTE 20 Band
121 – LTE 21 Band
122 – LTE 22 Band
123 – LTE 23 Band
124 – LTE 24 Band
125 – LTE 25 Band
126 – LTE 26 Band
127 – LTE 27 Band
128 – LTE 28 Band
131 – LTE 31 Band
133 – LTE 33 Band
134 – LTE 34 Band
135 – LTE 35 Band
136 – LTE 36 Band
137 – LTE 37 Band
138 – LTE 38 Band
139 – LTE 39 Band
140 – LTE 40 Band
141 – LTE 41 Band
142 – LTE 42 Band
172 – LTE 72 Band

<channel>

Frequency channel, the range is different according to different band
GSM 850: 128~251
GSM 900: 1~124, 975~1023
GSM DCS 1800: 512~885
GSM PCS 1900: 512~810
WCDMA IMT 2000: 9612~9888
WCDMA PCS 1900: 9262~9538
WCDMA 800: 4132~4233, 782~862
WCDMA 850: 4132~4233, 782~862
WCDMA 900: 2712~2863
LTE 1: 18000~18599
LTE 2: 18600~19199
LTE 3: 19200~19949
LTE 4: 19950~20399
LTE 5: 20400~20649
LTE 6: 20650~20749
LTE 7: 20750~21449
LTE 8: 21450~21799
LTE 9: 21800~22149
LTE 10: 22150~22749
LTE 11: 22750~22949

| | |
|-------------------|---|
| | LTE 12: 23010~23179 LTE 13: 23180~23279 LTE 14: 23280~23379 LTE 17: 23730~23849 LTE 18: 23850~23999 LTE 19: 24000~24149 LTE 20: 24150~24449 LTE 21: 24450~24599 LTE 22: 24600~25399 LTE 23: 25500~25699 LTE 24: 25700~26039 LTE 25: 26040~26689 LTE 26: 26690~27039 LTE 27: 27040~27209 LTE 28: 27210~27659 LTE 31: 27760~27809 LTE 33: 36000~36199 LTE 34: 36200~36349 LTE 35: 36350~36949 LTE 36: 36950~37549 LTE 37: 37550~37749 LTE 38: 37750~38249 LTE 39: 38250~38649 LTE 40: 38650~39649 LTE 41: 39650~41589 LTE 42: 41590~43589 LTE 72: 133472~133521 |
| <power> | For LTE:The power between 0~2000apc, the value is different with different band For GSM: The power means afcDac, the value between 0 and 1023. suggested range is (200-700) (too bigger will cause Tx saturated, and equipment could not detect it) |
| <bandwidth> | Rx band width:0~5.if it is WCDMA,this value must be set to 0. 0 1.4M 1 3M 2 5M 3 10M 4 15M 5 20M |
| < rssiValue > | The Rx Power for GSM/WCDMA |
| < mainRssiValue > | The Main ant Rx Power for LTE |
| < secRssiValue > | The Sec ant Rx Power for LTE |

Examples

AT+CFUN=0 // Minimum functionality
OK

AT+CTBURST=1,101,18300,2000 //Start RF TX Power of LTE BAND1 the arfcn is 18300 the power is 2000apc
+CTBURST: TX ON

OK

AT+CTBURST=0 //Close TX/RX CTBURST
+CTBURST: TX/RX OFF

OK

AT+CTBURST=2,101,18300,2000,5 //Start RF RX Power of LTE BAND1 the arfcn is 18300,mainrssi is -60 secrssi is 0
+CTBURST: RX: -60, 0

OK

AT+CTBURST=0 //Close TX/RX CTBURST
+CTBURST: TX/RX OFF

OK

AT+CTBURST=1,10,9750,2000 //Start RF TX Power of WCDMA2000 the arfcn is 9750 the power is 2000apc
+CTBURST: TX ON

OK

AT+CTBURST=0 //Close TX/RX CTBURST
+CTBURST: TX/RX OFF

OK

AT+CTBURST=2,10,9750,2000,0 //Start RF RX Power of WCDMA2000 the arfcn is 9750
+CTBURST: RX: -60

OK

AT+CTBURST=0 //Close TX/RX CTBURST
+CTBURST: TX/RX OFF

OK

NOTE

To test each item, close the previous item first.

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28 Summary of ERROR Codes

28.1 Verbose Codes and Numeric Codes

| Verbose result code | Numeric (V0 set) | Description |
|---------------------|------------------|--|
| OK | 0 | Command executed, no errors, Wake up after reset |
| CONNECT | 1 | Link established |
| RING | 2 | Ring detected |
| NO CARRIER | 3 | Link not established or disconnected |
| ERROR | 4 | Invalid command or command line too long |
| NO DIALTONE | 6 | No dial tone, dialing impossible, wrong mode |
| BUSY | 7 | Remote station busy |
| NO ANSWER | 8 | Connection completion timeout |

28.2 Response String of AT+CEER

| Number | Response string |
|-------------------|-----------------------------|
| CS internal cause | |
| 0 | Unknown |
| 1 | Unassigned number |
| 3 | No route to destination |
| 6 | Channel unacceptable |
| 8 | Operator determined barring |
| 16 | Normal call clearing |
| 17 | User busy |
| 18 | No user responding |
| 19 | User alerting: no answer |
| 21 | Call rejected |
| 22 | Number changed |
| 25 | Preemption |

| | |
|-----|---------------------------------------|
| 26 | Non selected user clearing |
| 27 | Destination out of order |
| 28 | Invalid number format |
| 29 | Facility rejected |
| 30 | Response to STATUS ENQUIRY |
| 31 | Normal unspecified |
| 34 | No circuit/channel available |
| 38 | Network out of order |
| 41 | Temporary failure |
| 42 | Switching equipment congestion |
| 43 | Access information discarded |
| 44 | Requested circuit/channel unavailable |
| 47 | Resource unavailable |
| 49 | QoS unavailable |
| 50 | Requested facility not subscribed |
| 55 | Incoming calls barred within CUG |
| 57 | Bearer capability not authorized |
| 58 | Bearer capability not available |
| 63 | Service not available |
| 65 | Bearer service not implemented |
| 68 | ACM MAX reached |
| 69 | Facility not implemented |
| 70 | Only RDI bearer capability available |
| 79 | Service not implemented |
| 81 | Invalid transaction ID |
| 87 | User not member of CUG |
| 88 | Incompatible destination |
| 91 | Invalid transit network selection |
| 95 | Incorrect message |
| 96 | Invalid mandatory information |
| 97 | Message type non-existent |
| 98 | Message type wrong state |
| 99 | Information element not-existent |
| 100 | Conditional IE error |
| 101 | Message wrong state |
| 102 | Recovery after timer expiry |
| 111 | Protocol error: unspecified |
| 127 | Interworking: unspecified |
| 224 | Call barring |
| 241 | FDN Blocked |

| CS network cause | |
|-------------------------|---|
| 1 | Unassigned/unallocated number |
| 3 | No route to destination |
| 6 | Channel unacceptable |
| 8 | Operator determined barring |
| 16 | Normal call clearing |
| 17 | User busy |
| 18 | No user responding |
| 19 | User alerting, no answer |
| 21 | Call rejected |
| 22 | Number changed |
| 26 | Non selected user clearing |
| 27 | Destination out of order |
| 28 | Invalid/incomplete number |
| 29 | Facility rejected |
| 30 | Response to Status Enquiry |
| 31 | Normal, unspecified |
| 34 | No circuit/channel available |
| 38 | Network out of order |
| 41 | Temporary failure |
| 42 | Switching equipment congestion |
| 43 | Access information discarded |
| 44 | Requested circuit/channel not available |
| 47 | Resources unavailable, unspecified |
| 49 | Quality of service unavailable |
| 50 | Requested facility not subscribed |
| 55 | Incoming calls barred within the CUG |
| 57 | Bearer capability not authorized |
| 58 | Bearer capability not available |
| 63 | Service/option not available |
| 65 | Bearer service not implemented |
| 68 | ACM >= ACMmax |
| 69 | Requested facility not implemented |
| 70 | Only RDI bearer is available |
| 79 | Service/option not implemented |
| 81 | Invalid transaction identifier value |
| 87 | User not member of CUG |
| 88 | Incompatible destination |
| 91 | Invalid transit network selection |
| 95 | Semantically incorrect message |
| 96 | Invalid mandatory information |

| | |
|--------------------------|---|
| 97 | Message non-existent/not implemented |
| 98 | Message type not compatible with state |
| 99 | IE non-existent/not implemented |
| 100 | Conditional IE error |
| 101 | Message not compatible with state |
| 102 | Recovery on timer expiry |
| 111 | Protocol error, unspecified |
| 117 | Interworking, unspecified |
| CS network reject | |
| 2 | IMSI unknown in HLR |
| 3 | Illegal MS |
| 4 | IMSI unknown in VLR |
| 5 | IMEI not accepted |
| 6 | Illegal ME |
| 7 | GPRS services not allowed |
| 8 | GPRS & non GPRS services not allowed |
| 9 | MS identity cannot be derived |
| 10 | Implicitly detached |
| 11 | PLMN not allowed |
| 12 | Location Area not allowed |
| 13 | Roaming not allowed |
| 14 | GPRS services not allowed in PLMN |
| 15 | No Suitable Cells In Location Area |
| 16 | MSC temporarily not reachable |
| 17 | Network failure |
| 20 | MAC failure |
| 21 | Synch failure |
| 22 | Congestion |
| 23 | GSM authentication unacceptable |
| 32 | Service option not supported |
| 33 | Requested service option not subscribed |
| 34 | Service option temporarily out of order |
| 38 | Call cannot be identified |
| 40 | No PDP context activated |
| 95 | Semantically incorrect message |
| 96 | Invalid mandatory information |
| 97 | Message type non-existent |
| 98 | Message type not compatible with state |
| 99 | Information element non-existent |
| 101 | Message not compatible with state |

| | |
|---------------------------------|-------------------------------------|
| 161 | RR release indication |
| 162 | RR random access failure |
| 163 | RRC release indication |
| 164 | RRC close session indication |
| 165 | RRC open session failure |
| 166 | Low level failure |
| 167 | Low level failure no redial allowed |
| 168 | Invalid SIM |
| 169 | No service |
| 170 | Timer T3230 expired |
| 171 | No cell available |
| 172 | Wrong state |
| 173 | Access class blocked |
| 174 | Abort message received |
| 175 | Other cause |
| 176 | Timer T303 expired |
| 177 | No resources |
| 178 | Release pending |
| 179 | Invalid user data |
| PS internal cause lookup | |
| 0 | Invalid connection identifier |
| 1 | Invalid NSAPI |
| 2 | Invalid Primary NSAPI |
| 3 | Invalid field |
| 4 | SNDCP failure |
| 5 | RAB setup failure |
| 6 | No GPRS context |
| 7 | PDP establish timeout |
| 8 | PDP activate timeout |
| 9 | PDP modify timeout |
| 10 | PDP inactive max timeout |
| 11 | PDP lowerlayer error |
| 12 | PDP duplicate |
| 13 | Access technology change |
| 14 | PDP unknown reason |
| PS network cause | |
| 25 | LLC or SNDCP failure |
| 26 | Insufficient resources |
| 27 | Missing or unknown APN |

| | |
|-----|---|
| 28 | Unknown PDP address or PDP type |
| 29 | User Authentication failed |
| 30 | Activation rejected by GGSN |
| 31 | Activation rejected, unspecified |
| 32 | Service option not supported |
| 33 | Requested service option not subscribed |
| 34 | Service option temporarily out of order |
| 35 | NSAPI already used (not sent) |
| 36 | Regular deactivation |
| 37 | QoS not accepted |
| 38 | Network failure |
| 39 | Reactivation required |
| 40 | Feature not supported |
| 41 | Semantic error in the TFT operation |
| 42 | Syntactical error in the TFT operation |
| 43 | Unknown PDP context |
| 44 | PDP context without TFT already activated |
| 45 | Semantic errors in packet filter |
| 46 | Syntactical errors in packet filter |
| 81 | Invalid transaction identifier |
| 95 | Semantically incorrect message |
| 96 | Invalid mandatory information |
| 97 | Message non-existent/not implemented |
| 98 | Message type not compatible with state |
| 99 | IE non-existent/not implemented |
| 100 | Conditional IE error |
| 101 | Message not compatible with state |
| 111 | Protocol error, unspecified |

28.3 Summary of CME ERROR Codes

This result code is similar to the regular ERROR result code. The format of <err> can be either numeric or verbose string, by setting AT+CMEEE command.

Defined Values

| Code of <err> | Meaning |
|---------------|---------|
|---------------|---------|

| | |
|------------|---|
| 0 | phone failure |
| 1 | no connection to phone |
| 2 | phone adaptor link reserved |
| 3 | operation not allowed |
| 4 | operation not supported |
| 5 | PH-SIM PIN required |
| 6 | PH-FSIM PIN required |
| 7 | PH-FSIM PUK required |
| 10 | SIM not inserted |
| 11 | SIM PIN required |
| 12 | SIM PUK required |
| 13 | SIM failure |
| 14 | SIM busy |
| 15 | SIM wrong |
| 16 | incorrect password |
| 17 | SIM PIN2 required |
| 18 | SIM PUK2 required |
| 20 | memory full |
| 21 | invalid index |
| 22 | not found |
| 23 | memory failure |
| 24 | text string too long |
| 25 | invalid characters in text string |
| 26 | dial string too long |
| 27 | invalid characters in dial string |
| 30 | no network service |
| 31 | network timeout |
| 32 | network not allowed - emergency calls only |
| 40 | network personalization PIN required |
| 41 | network personalization PUK required |
| 42 | network subset personalization PIN required |
| 43 | network subset personalization PUK required |
| 44 | service provider personalization PIN required |
| 45 | service provider personalization PUK required |
| 46 | corporate personalization PIN required |
| 47 | corporate personalization PUK required |
| 50 | Incorrect parameters |
| 100 | unknown error |
| 103 | Illegal MESSAGE |
| 106 | Illegal ME |
| 107 | GPRS services not allowed |

| | |
|------------|---|
| 111 | PLMN not allowed |
| 112 | Location area not allowed |
| 113 | Roaming not allowed in this location area |
| 132 | service option not supported |
| 133 | requested service option not subscribed |
| 134 | service option temporarily out of order |
| 148 | unspecified GPRS error |
| 149 | PDP authentication failure |
| 150 | invalid mobile class |
| 151 | AT command timeout |

Examples

```
AT+CPIN="1234","1234"
+CME ERROR: SIM failure
```

28.4 Summary of CMS ERROR Codes

Final result code +CMS ERROR: <err> indicates an error related to mobile equipment or network. The operation is similar to ERROR result code. None of the following commands in the same command line is executed. Neither ERROR nor OK result code shall be returned. ERROR is returned normally when error is related to syntax or invalid parameters. The format of <err> can be either numeric or verbose. This is set with command AT+CMEE.

Defined Values

| Code of <err> | Meaning |
|---------------|-----------------------------|
| 300 | ME failure |
| 301 | SMS service of ME reserved |
| 302 | Operation not allowed |
| 303 | Operation not supported |
| 304 | Invalid PDU mode parameter |
| 305 | Invalid text mode parameter |
| 310 | SIM not inserted |
| 311 | SIM PIN required |
| 312 | PH-SIM PIN required |
| 313 | SIM failure |

| | |
|-----|-----------------------------------|
| 314 | SIM busy |
| 315 | SIM wrong |
| 316 | SIM PUK required |
| 317 | SIM PIN2 required |
| 318 | SIM PUK2 required |
| 320 | Memory failure |
| 321 | Invalid memory index |
| 322 | Memory full |
| 330 | SMSC address unknown |
| 331 | no network service |
| 332 | Network timeout |
| 340 | no +CNMA acknowledgement expected |
| 341 | Buffer overflow |
| 342 | SMS size more than expected |
| 500 | unknown error |

Examples

AT+CMGS=02112345678

+CMS ERROR: 304

29 AT Commands for WEBSOCKET

29.1 Overview of AT Commands for websocket

| Command | Description |
|---------------------|-----------------------------|
| AT+WSSTART | Start websocket service |
| AT+WSSTOP | Stop websocket service |
| AT+WSCONNECT | Connect to websocket server |
| AT+WSDISC | Disconnect from server |
| AT+WSSEND | Publish a message to server |

29.2 Detailed Description of AT Commands for websocket(S)

Webcosket,Currently only 1603,1606 and 1803 is supported.

29.2.1 AT+WSSTART Start websocket service

AT+WSSTART is used to start websocket service by activating PDP context. You must execute this command before any other websocket related operations.

| AT+WSSTART Start websocket service | |
|--|--|
| | Response |
| | 1)If start websocket service successfully: OK |
| Execution Command AT+WSSTART | +WSSTART: 0 2)If failed: OK +WSSTART: <err> 3)If websocket service have started successfully and you executed AT+WSSTART again: |

| | ERROR |
|--|---|
| Write Command AT+WSSTART=<cid> | Response 1)If start websocket service successfully: OK |
| | +WSSTART: 0 |
| | 2)If failed: OK |
| | +WSSTART: <err> |
| | 3)If websocket service have started successfully and you executed AT+WSSTART=<cid> again: ERROR |
| Max Response Time | 12000ms |
| Parameter Saving Mode | - |
| Reference | |

Defined Values

| | |
|--------------------|--|
| <err> | The result code, please refer to Chapter 29.3 |
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |

Examples

```
AT+WSSTART
OK

+WSSTART: 0
AT+WSSTART=1
OK

+WSSTART: 0
```

29.2.2 AT+WSSTOP Stop websocket service

AT+WSSTOP is used to stop websocket service.

AT+WSSTOP Stop websocket service

Response

1)If stop websocket service successfully:

OK

+WSSTOP: 0

Execution Command

AT+WSSTOP

2)If failed:

+WSSTOP: <err>

ERROR

3)If websocket service have stopped successfully and you executed AT+WSSTOP again:

ERROR

Response

1)If stop websocket service successfully:

OK

+WSSTOP: 0

Write Command

AT+WSSTOP=<cid>

2)If failed:

+WSSTOP: <err>

ERROR

3)If websocket service have stopped successfully and you executed AT+WSTSTOP=<cid> again:

ERROR

Max Response Time

12000ms

Parameter Saving Mode

-

Reference

Defined Values

| | |
|--------------------|--|
| <err> | The result code, please refer to chapter 29.3 |
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |

Examples

AT+WSSTOP

OK

+WSSTOP: 0

AT+WSSTOP=1

OK

+WSSTOP: 0

29.2.3 AT+WSCONNECT Connect to websocket server

AT+WSCONNECT is used to connect to a websocket server.

AT+WSCONNECT Connect to Websocket server

Test Command

AT+WSCONNECT=?

Response

+WSCONNECT: (9-256),(1-64800)

OK

Response

1)if connected:

+WSCONNECT:

<connect_status>[,<server_addr>,<server_port>,<server_path>
]

Read Command

AT+WSCONNECT?

OK

2)if not connected:

+WSCONNECT: <connect_status>

OK

Response

1)If successfully:

OK

+WSCONNECT: 0

2)If failed:

OK

+WSCONNECT: <err>

3)If failed:

+WSCONNECT: <err>

ERROR

4)If failed:

ERROR

Write Command

**AT+WSCONNECT=<server_a
ddr>,[time_out]**

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|------------------|--|
| <connect_status> | This parameter has the following two values: 0 the current device is not connected. 1 the current device is connected. |
| <server_addr> | The string that described the server address and port. The range of the string length is 9 to 256 bytes. The string should be like this "ws://116.247.119.165:5141/test", must begin with "ws://". If the <server_addr> not include the port, the default port is 80.If the <server_addr> not include the path, the default path is /. |
| <server_port> | The websocketconnet port, the default port is 80. |
| <server_path> | The websocketconnet path, the default path is /. |
| <time_out> | The timeout value for connect. The unit is second. The range is 60s to 180s. The default value is 120s (not set the timeout value). |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 29.3. |

Examples

```
AT+WSCONNECT="ws://121.40.165.18:8800",120
```

```
OK
```

```
+WSCONNECT: 0
```

```
AT+WSCONNECT?
```

```
+WEBSOCKETCONNECT: 1,"121.40.165.18",8800,"/
```

```
OK
```

29.2.4 AT+WSDISC Disconnect from server

AT+WSDISC is used to disconnect from the server.

AT+WSDISC Disconnect from server

| | |
|---|---|
| Test Command AT+WSDISC=? | Response: +WSDISC:(0, 60-180) |
| Write Command AT+WSDISC=<timeout> | Response 1)If disconnect successfully: |

+WSDISC: 0

OK

2) If disconnect successfully:

OK

+WSDISC: 0

3) If failed:

OK

+WSDISC: <err>

4) If failed:

ERROR

5) If failed:

+WSDISC: <err>

ERROR

Parameter Saving Mode

-

Max Response Time

-

Reference

Defined Values

| | |
|------------------------|---|
| <timeout> | The timeout value for disconnection. The unit is second. The range is 60s to 180s. The default value is 0s (not set the timeout value). |
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 29.3. |

Examples

AT+WSDISC=120

OK

+WSDISC: 0

29.2.5 AT+WSSEND Publish a message to server

AT+WSSEND is publish a message to server.

AT+WSSEND publish a message to server

Test Command

AT+WSSEND=?

Response

+WSSEND: (1-1024),(0-1)

OK

Response

1) If successfully:

>

<input data here>

OK

+WSSEND: 0,<dataLength>

2) If failed:

OK

+WSSEND: <err>

3) If failed:

+WSSEND: <err>

ERROR

4) If failed:

ERROR

Write Command

AT+WSSEND=<dataLength>,<datatype>

Parameter Saving Mode

-

Max Response Time

-

Reference

-

Defined Values

| | |
|---------------------------|--|
| <dataLength> | The length of input topic data. The range is from 1 to 1024 bytes. |
|---------------------------|--|

| | |
|-------------------------|---|
| <datatype> | The publish message's type. The range is from 0 to 1. |
|-------------------------|---|

| | |
|---|--------------|
| 0 | text message |
|---|--------------|

| | |
|---|----------------|
| 1 | binary message |
|---|----------------|

| | |
|--------------------|--|
| <err> | The result code: 0 is success. Other values are failure. Please refer to chapter 29.3. |
|--------------------|--|

Examples

AT+WSSEND=10,1

>

OK

+WSSEND: 0,10

29.3 Command Result Codes

29.3.1 Description of <err>

| <err> | Description |
|-------|------------------------|
| 0 | operation succeeded |
| 1 | failed |
| 2 | Send handshake fail |
| 3 | parsehandshake fail |
| 4 | Read write socket fail |
| 5 | Connect to host fail |
| 6 | invalid parameter |
| 7 | Network have opened |
| 8 | Network no open |

29.4 Unsolicited Result Codes

| URC | Description |
|---------------------------------|--|
| +WSDISC: <cause> | When client disconnect passively, URC "+WSDISC" will be reported, then user need to connect MQTT server again. |
| +WSRECEIVE: <datalen> <data> | While client receive message, URC "+WSRECEIVE" will be reported. |

30 AT Commands for LWM2M

30.1 Overview of AT Commands for LWM2M

| Command | Description |
|------------------------|---------------------------------------|
| AT+LWSTART | Start LWM2M service |
| AT+LWSTOP | Stop LWM2M Service |
| AT+LWCNF | Config the LWM2M |
| AT+LWOPEN | Register to a LWM2M server |
| AT+LWCLOSE | Deregister to LWM2M server |
| AT+LWADDOBJ | Add a LWM2M object |
| AT+LWDELOBJ | Delete a LWM2M object |
| AT+LWREADRSP | Send read response to LWM2M server |
| AT+LWWRITERSP | Send write response to LWM2M server |
| AT+LWEXECUTERSP | Send execute response to LWM2M server |

30.2 Detailed Description of AT Commands for LWM2M

30.2.1 AT+LWSTART Start LWM2M service

AT+LWSTART is used to start LWM2M service by activating PDP context. You must execute AT+LWSTART before any other LWM2M related operations except AT+LWCNF.

| AT+LWSTART Start LWM2M service | |
|--------------------------------|----------|
| Test Command | Response |
| AT+LWSTART=? | OK |
| Execute Command | Response |
| AT+LWSTART | 1) OK |

2)
ERROR

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Examples

AT+LWSTART

OK

30.2.2 AT+LWSTOP Stop LWM2M Service

AT+LWSTOP is used to stop LWM2M service by deactivating PDP context When you are no longer using the LWM2M service, use this command.

AT+LWSTOP Stop LWM2M Service

| | |
|-----------------------|---------------------------------------|
| Test Command | Response |
| AT+LWSTOP=? | OK |
| Execute Command | Response |
| AT+LWSTOP | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Examples

AT+LWSTOP

OK

30.2.3 AT+LWCNF Config the LWM2M

AT+LWCNF is used to config the LWM2M.

AT+LWCNF Config the LWM2M

Test Command

AT+LWCNF=?

Response

+LWCNF: "server",<ipaddress>
 +LWCNF: "serverport",<serverport>
 +LWCNF: "endpointname",<endpointname>
 +LWCNF: "connecttype",,(4,6)
 +LWCNF: "lifetime",<lifetime>
 +LWCNF: "localport",<localport>

OK

Write Command

AT+LWCNF=<server>,<ipaddress>
AT+LWCNF=<serverport>,<serverport>
AT+LWCNF=<endpointname>,< endpointname>
AT+LWCNF=< connecttype>,4 or 6
AT+LWCNF=<lifetime>,<lifetime>
AT+LWCNF=<localport>,<localport>

Response

1)
 OK
 2)
 ERROR

Parameter Saving Mode

NO_SAVE

Max Response Time

9000ms

Reference

Defined Values

| | |
|---------------|---|
| <server> | The LWM2M server address URL or ipaddress. |
| <serverport> | The LWM2M server port,the range is from 0 to 65535. |
| <enpointname> | The LWM2M client device name. |
| <connecttype> | The type of LWM2M server address IPV4 or IPV6. |
| <lifetime> | The connection life time.the max value is 65535. |
| <localport> | The LWM2M client device local port. The range is from 0 to 65535. |

Examples

AT+LWCNF="server","leshan.eclipseprojects.io"

OK

AT+LWCNF="serverport","5683"

OK

AT+LWCNF="endpointname","simcom"

OK

AT+LWCNF="connectiontype","4"

OK

AT+LWCNF="lifetime","800"

OK

AT+LWCNF="localport","56833"

OK

30.2.4 AT+LWOPEN Register to a LWM2M server

AT+LWOPEN is used to register to a LWM2M sever, make sure you register to a LWM2M sever before you execute AT+LWCLOSE command.

AT+LWOPEN Register to a LWM2M server

Test Command Response

AT+LWOPEN=? OK

Execute Command Response

AT+LWOPEN 1)

OK

Parameter Saving Mode NO_SAVE

Max Response Time 9000ms

Reference

Defined Values

<lwm2mId>

The LWM2M session ID.the range is from 0 to 1.

Examples

```
AT+LWOPEN=?
```

```
OK
```

```
AT+LWOPEN
```

```
OK
```

```
+LMOPEN:0
```

30.2.5 AT+LWCLOSE Deregister to a LWM2M server

This command is used to Deregister to a LWM2M server.

AT+LWCLOSE Deregister to a LWM2M server

Test Command Response

```
AT+LWCLOSE=?
```

```
OK
```

Write Command Response

```
AT+LWCLOSE=<lwm2mId>
```

```
1)
```

```
OK
```

```
2)
```

```
ERROR
```

Parameter Saving Mode NO_SAVE

Max Response Time 9000ms

Reference

Defined Values

<lwm2mId>

AT+LWOPEN return the LWM2M session ID.the range is from 0 to 1.

Examples

```
AT+LWCLOSE=0
```

```
OK
```

30.2.6 AT+LWADDOBJ Add a LWM2M object

AT+LWADDOBJ is used to add a LWM2M object.

AT+LWADDOBJ Add a LWM2M object

| Test Command | Response |
|--|---------------------------------------|
| AT+LWADDOBJ=? | OK |
| Write Command | Response |
| AT+LWADDOBJ=<lwm2mId>,<objectld>,<instanceld>,<resourceCnt>,<resourceld>,<resourceld>>.... | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|----------------------------|---|
| <lwm2mId> | AT+LWOPEN return the LWM2M session ID.the range is from 0 to 1. |
| <objectld> | The LWM2M object ID you want to add.the range is from 0 to 65535, But 0-7 has already used. |
| <instanceld> | The LWM2M object instance ID. The range is from 0 to 65535. |
| <resourceCnt> | The LWM2M resource count. The range is from 1 to 15. |
| <resourceld> | The LWM2M resource ID. The range is from 0 to 65535. |

Examples

```

AT+LWADDOBJ=?
OK
AT+LWADDOBJ=0,3303,0,6,5518,5601,5602,5603,5604,5605
OK

```

30.2.7 AT+LWDELOBJ Delete a LWM2M object

AT+LWDELOBJ is used to delete a LWM2M object.

AT+LWDELOBJ Delete a LWM2M object

| Test Command | Response |
|--|---------------------------------------|
| AT+LWDELOBJ=? | OK |
| Write Command | Response |
| AT+LWDELOBJ=<lwm2mId>,<o bjectId> | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------|--|
| <lwm2mId> | AT+LWOPEN return the LWM2M session ID.the range is from 0 to 1. |
| <objectId> | The LWM2M object ID you want to delete.the range is from 0 to 65535. |

Examples

```
AT+LWDELOBJ=?  
OK  
AT+LWDELOBJ=0,3303  
OK
```

30.2.8 AT+LWREADRSP Send read response to LWM2M server

You can use this command to send read response to LWM2M server.

AT+LWREADRSP Send read response to LWM2M server

| Test Command | Response |
|-----------------------|-----------|
| AT+LWREADRSP=? | OK |

| | |
|---|---------------------------------------|
| Write Command | Response |
| AT+LWREADRSP=<lwm2mld>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<valueType>,<valueLen>,<value>,<resourceId>,<valueType>... | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------|--|
| <lwm2mld> | The LWM2M session ID, according to "+LWREAD" returned. |
| <objectId> | The LWM2M object ID, according to "+LWREAD" returned. |
| <instanceId> | The LWM2M object instance ID, according to "+LWREAD" returned. |
| <resourceCnt> | The LWM2M resource count, according to "+LWREAD" returned. |
| <resourceId> | The LWM2M resource ID, according to "+LWREAD" returned. |
| <valueType> | The type of value of response. <ul style="list-style-type: none"> ● I Integer ● F Float ● B Boolean ● D UINT8 array data ● S String |
| <valueLen> | The length of value. |
| <value> | The response value. |

Examples

```
AT+LWREADRSP=?
OK

+LWREAD:0,3303,0,1,5602
AT+LWREADRSP= 0,3303,0,1,5602,"F",5,"15623"
OK
```

NOTE

Must execute this command after URC "+LWREAD" returned. "+LWREAD" see 30.2.11

30.2.9 AT+LWWRITERSP Send response to a LWM2M server

This command is used to send a response to LWM2M server.

AT+LWWRITERSP Send reponse to a LWM2M server

| | |
|---|--|
| Test Command | Response +LWWRITERSP: <lwm2mId>,<result> |
| AT+LWWRITERSP=? | OK |
| Write Command | Response 1) OK 2) ERROR |
| AT+LWWRITERSP=<lwm2mId>,<result> | |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------------------|--|
| <lwm2mId> | The LWM2M session ID,according to "+LWWRITE" returned. |
| <result> | According to "+LWWRITE",return the result, see 30.3 |

Examples

```
+LMWRITE: 0,3335,0,1,5750,S,1,"p"  
AT+LWWRITERSP =0,0  
OK
```

NOTE

Must execute the this command after URC "+LWWRITE" returned."+LWWRITE" see 30.2.12

30.2.10 AT+LWEXECUTERSP Send response to LWM2M server

You can use AT+LWEXECUTERSP send response to LWM2M server.

AT+LWEXECUTERSP Send response to LWM2M server

| Test Command | Response |
|--|---------------------------------------|
| AT+LWEXECUTERSP=? | OK |
| Write Command | Response |
| AT+LWEXECUTERSP=<lwm2ml d>,<result> | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-----------|--|
| <lwm2mId> | The LWM2M session ID,according to "+LWEXECUTE" returned. |
| <result> | According to "+LWEXECUTE",return the result, see 30.3 |

Examples

```
AT+LWEXECUTERSP=?
OK

+LWEXECUTE: 0,3303,0,5605,1,"0"
AT+LWEXECUTERSP=0,0
OK
```

NOTE

Must execute the this command after URC "+LWEXECUTE" returned."+LWEXECUTE" see 30.2.13

30.2.11 +LWREAD LWM2M client response of LWM2M server operate read

LWM2M client response of LWM2M server operate read.

+LWREAD LWM2M client response of LWM2M server operate read

| | |
|-----------------------|--|
| | Response +LWREAD:<lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------|---|
| <lwm2mId> | The LWM2M session ID.the range is from 0 to 1. |
| <objectId> | The LWM2M object ID you want to add.the range is from 8 to 65535. |
| <instanceId> | The LWM2M object instance ID. The range is from 0 to 65535. |
| <resourceCnt> | The LWM2M resource count. The range is from 1 to 15. |
| <resourceId> | The LWM2M resource ID. The range is from 0 to 65535. |

30.2.12 +LWWRITE LWM2M client response of LWM2M server operate write

LWM2M client response of LWM2M server operate write.

+LWWRITE LWM2M client response of LWM2M server operate read

| | |
|-----------------------|--|
| | Response +LWWRITE: <lwm2mId>,<objectId>,<instanceId>,<resourceCnt>,<resourceId>,<valuetype>,<valuelen>,<value>,<resourceId>,<valuetype>... |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-----------|--|
| <lwm2mId> | The LWM2M session ID.the range is from 0 to 1. |
|-----------|--|

| | |
|---------------|---|
| <objectId> | The LWM2M object ID you want to add. The range is from 8 to 65535. |
| <instanceId> | The LWM2M object instance ID. The range is from 0 to 65535. |
| <resourceCnt> | The LWM2M resource count. The range is from 1 to 15. |
| <resourceId> | The LWM2M resource ID. The range is from 0 to 65535. |
| <valuetype> | <p>The type of value of response.</p> <ul style="list-style-type: none"> ● I Integer ● F Float ● B Boolean ● D UINT8 array data <p>S String</p> |
| <valuelen> | The length of value. |
| <value> | The response value. |

30.2.13 +LWEXECUTE LWM2M client response of LWM2M server operate execute

LWM2M client response of LWM2M server operate execute.

+LWEXECUTE LWM2M client response of LWM2M server operate execute

| | |
|-----------------------|---|
| | Response |
| | 1) +LWEXECUTE: <lwm2mId>,<objectId>,<instanceId>,<resourceId>,<len>,<buffer> |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|--------------|---|
| <lwm2mId> | The LWM2M session ID. The range is from 0 to 1. |
| <objectId> | The LWM2M object ID. The range is from 8 to 65535. |
| <instanceId> | The LWM2M object instance ID. The range is from 0 to 65535. |
| <resourceId> | The LWM2M resource count. The range is from 1 to 15. |
| <len> | The response buffer len. |
| <buffer> | The response buffer. |

30.3 Command Result Codes

| <result> | Description |
|----------|-----------------------|
| 0 | No error |
| 1 | Ignore |
| 65 | Created |
| 66 | Deleted |
| 68 | Changed |
| 69 | Content |
| 95 | Continue |
| 128 | Bad request |
| 129 | Unauthorized |
| 130 | Bad option |
| 132 | Not found |
| 133 | Method no allowed |
| 134 | Not acceptable |
| 136 | Req entity incomplete |
| 140 | Precondition failed |
| 141 | Entity too large |
| 160 | Internal server error |
| 161 | Not implemented |
| 163 | Service unavailable |

31 AT Commands for COAP

31.1 Overview of AT Commands for COAP

| Command | Description |
|----------------------|---|
| AT+COAPSTART | Active PDP |
| AT+COAPSTOP | Deactive PDP |
| AT+COAPOpen | Open a COAP server |
| AT+COAPCLOSE | Close a COAP server |
| AT+COAPHEAD | Config the head of COAP |
| AT+COAPOPTION | Config the option of COAP |
| AT+COAPSEND | Send COAP message to the server |
| AT+COAPSENDTX | Send COAP message to the server by transparent transmission |

31.2 Detailed Description of AT Commands for COAP

31.2.1 AT+COAPSTART Active PDP

AT+COAPSTART is used to active PDP context. You must execute AT+COAPSTART before any other COAP related operations.

| AT+COAPSTART Active PDP | |
|-------------------------|---------------------------------------|
| Test Command | Response |
| AT+COAPSTART=? | OK |
| Execute Command | Response |
| AT+COAPSTART | 1) OK 2) ERROR |

| | |
|---------------------------------|--------------------|
| | Response |
| Write Command | 1) OK |
| AT+COAPSTART=<cid> | 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|--------------------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
|--------------------|--|

Examples

```
AT+COAPSTART
OK
AT+COAPSTART=1
OK
```

31.2.2 AT+COAPSTOP Deactive PDP

AT+LWSTOP is used to deactivate PDP context When you are no longer using the COAP service, use this command.

| AT+COAPSTOP Deactive PDP | |
|---------------------------------|---------------------------------------|
| Test Command | Response |
| AT+COAPSTOP=? | OK |
| Execute Command | Response |
| AT+COAPSTOP | 1) OK 2) ERROR |
| Write Command | Response |
| AT+COAPSTOP=<cid> | 1) OK 2) ERROR |

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------|--|
| <cid> | A numeric parameter which specifies a particular PDP context .The range is 1-n,The maximum value n is related to the pdp command of the modem. |
|-------|--|

Examples

```
AT+COAPSTOP
OK
AT+COAPSTOP=1
OK
```

31.2.3 AT+COAPOPEN Open a COAP server

AT+COAPOPEN is used to open a COAP sever, make sure you open a COAP sever before you execute AT+COAPCLOSE command.

AT+COAPOPEN Open a COAP server

| | |
|---|------------------------------------|
| Test Command | Response |
| AT+COAPOPEN=? | OK |
| Write Command | Response |
| AT+COAPOPEN=<server>,<ser verport> | 1) OK +COAPOPEN:<coapId> |

| | |
|-----------------------|--------------------|
| | 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------|--|
| <server> | The COAP server address URL or ipaddress |
| <serverport> | The COAP server port,the range is from 0 to 65535. |
| <coap_sessionId> | The COAP session ID.the range is from 0 to 1. |

Examples

```
AT+COAPOPEN=?  
OK  
AT+COAPOPEN="47.108.134.22",5683  
OK  
COAPOPEN:0
```

31.2.4 AT+COAPCLOSE Close a COAP server

| AT+COAPCLOSE Close a COAP server | |
|--|--------------------------------|
| Test Command | Response |
| AT+COAPCLOSE=? | OK |
| Write Command | Response |
| AT+COAPCLOSE=< coap_sessionId > | 1) OK 2) ERROR |

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------|--|
| <coap_sessionId> | AT+COAPOPEN return the COAP session ID.the range is from 0 to 1. |
|-------------------------------|--|

Examples

AT+COAPCLOSE=0

OK

31.2.5 AT+COAPHEAD Config the head of COAP

AT+COAPHEAD is used to config the head of COAP

AT+COAPHEAD Config the head of COAP

| | |
|---|--------------------------------|
| Test Command | Response |
| AT+COAPHEAD=? | OK |
| Write Command | Response |
| AT+COAPHEAD=<coap_sessionId>,<msgId>,<tkl>,<token> | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------|--|
| <coap_sessionId> | AT+COAPOPEN return the COAP session ID.the range is from 0 to 1. |
| <msgId> | The COAP message ID,the range is 0 to 65535. |
| <tkl> | The length of token,the range is 0 to 8. |
| <token> | The token of COAP message. |

Examples

AT+COAPHEAD=?

OK

AT+COAPHEAD=0,35691,1,"1"

OK

31.2.6 AT+COAPOPTION Config the option of COAP

AT+COAPOPTION is used to config the option of COAP.

AT+COAPOPTION Config the option of COAP

| Test Command | Response |
|--|-------------------------|
| AT+COAPOPTION=? | OK |
| Write Command | Response |
| AT+COAPOPTION=<coap_sessionId>,<opt_count>,<optNum>,<optValue>,<opt_count>..... | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------|---|
| <coap_sessionId> | AT+COAOPEN return the COAP session ID.the range is from 0 to 1. |
| <opt_count> | The num of option you want to config.the range is 0 to 10. |
| <optNum> | The type of option. |
| <optValue> | The value of the option |

Examples

AT+COAPOPTION=?

OK

AT+COAPOPTION=0,1,7,"5683"

OK

31.2.7 AT+COAPSEND Send COAP message to the server

You can use this command to Send COAP message to the server

AT+COAPSEND Send COAP message to the server

| | |
|---|---------------------------------------|
| Test Command | Response |
| AT+COAPSEND=? | OK |
| Write Command | Response |
| AT+COAPSEND=<coap_sessionId>,<type>,<method>,<data_len>,<data> | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------|--|
| <coap_sessionId> | AT+COAOPEN return the COAP session ID.the range is from 0 to 1. |
| <type> | The message type of COAP,it can set "con","non","ack","rst". |
| <method> | The message method of COAP,it can set "get","post","put","delete","fetch","patch","ipatch". |
| <data_len> | The data length of COAP message.the range is 0 to 2000. |
| <data> | The data of COAP message |

Examples

AT+COAPSEND=?

OK

AT+COAPSEND=0,"con","get",5,"12345"

OK

31.2.8 AT+COAPSENDTX Send COAP message to the server by transparent transmission

This command is used to Send COAP message to the server by transparent transmission.

AT+COAPSENDTX Send COAP message to the server by transparent transmission

| | |
|---|---|
| Test Command AT+COAPSENDTX=? | Response +COAPSENDTX: <coap_sessionId>,<result> |
| Write Command AT+COAPSENDTX=<coap_sessionId>,<type>,<method>,<data_len> | OK Response 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------|---|
| <coap_sessionId> | AT+COAOPEN return the COAP session ID.the range is from 0 to 1. |
| <result> | According to "+COAPSENDTX",return the result. |
| <type> | The message type of COAP,it can set "con","non","ack","rst". |
| <method> | The message method of COAP,it can set "get","post","put","delete","fetch","patch","ipatch". |
| <data_len> | The data length of COAP message.the range is 1 to 2000. |

Examples

```
AT+COAPSENDTX=?
OK
AT+COAPSENDTX =0,"con","get",5
>
01234
OK
```

31.2.9 +COAPRECV Receive response message from server

Receive response message from server

+COAPRECV Receive response message from server

| |
|--|
| Response |
| 1) |
| +COAPRECV: <request or response>,from session <coap_sessionId>,<received code>, |

| | |
|-----------------------|-------------------------------|
| | <received tid>[,<len>,<data>] |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-----------------------|---|
| <request or response> | The message type of COAP server response. |
| <coap_sessionId> | The COAP server response which coap session |
| <received code> | The received code of the message |
| <received tid> | The received tid of the message |
| <len> | The response data len. |
| <data> | The response data. |

32 AT Commands for SMTPS

32.1 Overview of AT Commands for SMTPS

| Command | Description |
|-----------------------|---|
| AT+CSMTPSCFG | Configure the SMTP context |
| AT+CSMTPSSRV | Set SMTP server address and port number |
| AT+CSMTPSAUTH | SMTP server authentication |
| AT+CSMTPSFROM | Sender address and name |
| AT+CSMTPSRCPT | Recipient address and name (TO/CC/BCC) |
| AT+CSMTPSSUB | E-mail subject |
| AT+CSMTPSBODY | E-mail body |
| AT+CSMTPSBCH | E-mail body character set |
| AT+CSMTPSFILE | Select attachment |
| AT+CSMTPSSEND | Initiate session and send e-mail |
| AT+CSMTPSTOP | Force to stop sending e-mail |
| AT+CSMTPSCLEAN | Clean mail content and setting |

NOTE

Currently, only ASR1603 and ASR1803S support SMTPS.

32.2 Detailed Description of AT Commands for SMTPS

32.2.1 AT+CSMTPSCFG Config the SMTP context

This command is used to select SMTP ssl context and pdp context. SMTP client will initiate session with the specified context to send an e-mail.

Execution command will set the ssl context and pdp context as default value.

AT+CSMTPSCFG Config the SMTP context

| | |
|---|---|
| Test Command | Response |
| AT+CSMTPSCFG=? | OK |
| | Response |
| | 1)if the "sslCtxId" is default: +CSMTPSCFG: "sslCtxId",<sslCtxId> |
| Write Command | |
| /* select the ssl context */ | |
| AT+CSMTPSCFG="sslCtxId" <b">"[,<sslCtxId>]</b"> | OK |
| | 2) the "sslCtxId" is not default: |
| | OK |
| | 3) error |
| | ERROR |
| | Response |
| | 1)the "pdpCtxId" is default: +CSMTPSCFG: "pdpCtxId",<pdpCtxId> |
| Write Command | |
| /* select the pdp context */ | |
| AT+CSMTPSCFG="pdpCtxId" <b">"[,<pdpCtxId>]</b"> | OK |
| | 2) the "pdpCtxId" is not default: |
| | OK |
| | 3) error |
| | ERROR |
| | Response |
| | 1)the "pdpCtxId" is default: +CSMTPSCFG: "CID",<cid> |
| Write Command | |
| /* select the cid */ | |
| AT+CSMTPSCFG="CID" <b">"[,<cid>]</b"> | OK |
| | 2) the "CID" is not default: |
| | OK |
| | 3) error |
| | ERROR |
| Execution Command | Response |
| AT+CSMTPSCFG | OK |
| | or |
| | ERROR |

| | |
|-----------------------|---------|
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------|--|
| <sslCtxId> | SMTP SSL context id. the default is 0. |
| <pdpCtxId> | SMTP PDP context id. the default is 1. |
| <cid> | The range is 1-n,The maximum value n is related to the pdp command of the modem. |

Example

```

AT+CSMTPSCFG="sslCtxId",0
OK
AT+CSMTPSCFG="sslCtxId"
+CSMTPSCFG: "sslCtxId",0

OK
AT+CSMTPSCFG="CID",
+CSMTPSCFG: "CID",1

OK
  
```

32.2.2 AT+CSMTPSSRV Set SMTP server address and port number

This command is used to set SMTP server address and server's port number. SMTP client will initiate TCP session with the specified server to send an e-mail.

Read command returns current SMTP server address and port number.

Execution command will clear SMTP server address and set the port number as default value.

AT+CSMTPSSRV Set SMTP server address and port number

| | |
|---|--|
| Test Command | Response |
| AT+CSMTPSSRV=? | OK |
| Read Command | Response |
| AT+CSMTPSSRV? | +CSMTPSSRV: <server>,<port>,<server_type> |
| Write Command | Response |
| AT+CSMTPSSRV=<server>,<port>[,<server_type>] | OK or |

| | |
|-----------------------|--------------|
| | ERROR |
| Execution Command | Response |
| AT+CSMTPSSRV | OK |
| | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|----------------------------|---|
| <server> | SMTP server address, non empty string with double quotes, mandatory and ASCII text string up to 127 characters. |
| <port> | Port number of SMTP server in decimal format, from 1 to 65535, and default port is 465 for SMTP. |
| <server_type> | <p>The type of server:</p> <p>1 – SMTP server.</p> <p>2 – SMTPTS server with SSL3.0/TLS1.0/TLS1.1/TLS1.2 supported</p> <p>3 – SMTPTS server with STARTTLS</p> |

Example

```

AT+CSMTPSSRV="smtp.server.
com",425
OK
AT+CSMTPSSRV?
+CSMTPSSRV:
"smtp.server.com",425,2

OK
AT+CSMTPSSRV
OK
AT+CSMTPSSRV?
+CSMTPSSRV: "",465,2

OK

```

32.2.3 AT+CSMTPSAUTH SMTP server authentication

This synchronous command is used to control SMTP authentication during connection with SMTP server. If SMTP server requires authentication while logging in the server, TE must set the authentication control flag and provide user name and password correctly before sending an e-mail.

Read command returns current SMTP server authentication control flag, if the flag is 0, both <user> and <pwd> are empty strings.

Execution Command clears user name and password.

AT+CSMTPSAUTH SMTP server authentication

| | |
|---|--|
| Test Command | Response |
| AT+CSMTPSAUTH=? | +CSMTPSAUTH: (list of supported <flag>s) OK |
| Read Command | Response |
| AT+CSMTPSAUTH? | +CSMTPSAUTH: <flag>,<user>,<pwd> OK |
| Write Command | Response |
| AT+CSMTPSAUTH= <flag>[,<user>,<pwd>] | OK or ERROR |
| Execution Command | Response |
| AT+CSMTPSAUTH | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------------|--|
| <flag> | SMTP server authentication control flag, integer type. 0 – SMTP server doesn't require authentication, factory value. 1 – SMTP server requires authentication. |
| <user> | User name to be used for SMTP authentication, non empty string with double quotes and up to 127 characters. |
| <pwd> | Password to be used for SMTP authentication, string with double |

quotes and up to 127 characters.

NOTE: If <flag> is 0, <user> and <pwd> must be omitted (i.e. only <flag> is present).

Example

```

AT+CSMTPSAUTH?
+CSMTPSAUTH: 0, "", ""

OK
AT+CSMTPSAUTH=1,"username
"password"
OK
AT+CSMTPSAUTH?
+CSMTPSAUTH: 1,"username",
"password"

OK
AT+CSMTPSAUTH
OK
AT+CSMTPSAUTH?
+CSMTPSAUTH: 0, "", ""

OK

```

32.2.4 AT+CSMTPSFROM Sender address and name

This synchronous command is used to set sender's address and name, which are used to construct e-mail header. The sender's address must be correct if the SMTP server requires.

Read command returns current sender's address and name.

Execution command will clear sender's address and name.

AT+CSMTPSFROM Sender address and name

| | |
|--------------------------------------|---|
| Test Command | Response |
| AT+CSMTPSFROM=? | OK |
| Read Command | Response |
| AT+CSMTPSFROM? | +CSMTPSFROM: <saddr>,<sname> |
| | OK |
| Write Command | Response |
| AT+CSMTPSFROM= | OK |
| <saddr>[,<sname>] | or |

| | |
|-----------------------|--------------|
| | ERROR |
| | Response |
| Execution Command | OK |
| AT+CSMTPSFROM | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------|--|
| <saddr> | E-mail sender address (MAIL FROM), non empty string with double quotes, mandatory and ASCII text up to 127 characters. <saddr> will be present in the header of the e-mail sent by SMTP client in the field: "From: ". |
| <sname> | E-mail sender name, string with double quotes, and alphanumeric ASCII text up to 63 characters. <sname> will be present in the header of the e-mail sent by SMTP client in the field: "From: ". |

Example

```

AT+CSMTPSFROM="senderadd
ress@server.com","sendernam
e"
OK
AT+CSMTPSFROM?
+CSMTPSFROM:
"senderaddress@server.com","
sendername"

OK
AT+CSMTPSFROM
OK
AT+CSMTPSFROM?
+CSMTPSFROM: "", ""

OK

```

32.2.5 AT+CSMTPSRCPT Recipient address and name (TO/CC/BCC)

This synchronous command is used to set recipient address/name and kind (TO/CC/BCC). If only the parameter of "kind" is present, the command will clear all recipients of this kind, and if only parameters of

"kind" and "index" are present, the command will clear the specified recipient.

Read command returns current recipient address/name and kind list.

Execution command will clear all recipient information.

AT+CSMTPSRCPT Recipient address and name (TO/CC/BCC)

| | |
|--|---|
| | Response |
| Test Command AT+CSMTPSRCPT=? | +CSMTPSRCPT: (list of supported <kind>s), (list of supported <index>s) OK |
| | Response |
| | [+CSMTPSRCPT: <kind>,<index>,<raddr>,<rname> [<CR><LF>...]] |
| Read Command AT+CSMTPSRCPT? | OK or OK or ERROR |
| Write Command AT+CSMTPSRCPT=<kind>[,<index>[,<raddr>[,<rname>]]] | Response OK or ERROR |
| Execution Command AT+CSMTPSRCPT | Response OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|--------|---|
| <kind> | Recipient kind, the kinds of TO and CC are used to construct e-mail header in the field: "To: " or "Cc: ". 0 – TO, normal recipient. 1 – CC, Carbon Copy recipient. |
|--------|---|

| | |
|---------|---|
| | 2 – BCC, Blind Carbon Copy recipient. |
| <index> | Index of the kind of recipient, decimal format, and from 0 to 4. |
| <raddr> | Recipient address, non empty string with double quotes, and up to 127 characters. |
| <rname> | Recipient name, string type with double quotes, and up to 63 characters. |

Example

```

AT+CSMTPSRCPT=0,0,"rcptadd
ress_to@server.com",
"rcptname_to"
OK
AT+CSMTPSRCPT?
+CSMTPSRCPT:
0,0,"rcptaddress_to@server.co
m","rcptname_to"

OK
AT+CSMTPSRCPT=1,0,"rcptadd
ress_cc@server.com","rcptnam
e_cc"
OK
AT+CSMTPSRCPT?
+CSMTPSRCPT:
0,0,"rcptaddress_to@server.co
m","rcptname_to"
+CSMTPSRCPT:
1,0,"rcptaddress_cc@server.co
m","rcptname_cc"

OK

```

32.2.6 AT+CSMTPSSUB E-mail subject

This synchronous command is used to set the subject of e-mail, which is used to construct e-mail header.
 Read command returns current e-mail subject.
 Execution command will clear the subject.

AT+CSMTPSSUB E-mail subject

| | |
|-----------------------|-----------|
| Test Command | Response |
| AT+CSMTPSSUB=? | OK |
| Read Command | Response |

| | |
|---|--|
| AT+CSMTPSSUB? | +SMTSPSUB: <subject_len>,<subject_character><CR><LF> |
| | [<subject>] |
| | OK |
| | Response |
| Write Command | > |
| AT+CSMTPSSUB=<subject_len>[,<subject_character>] | OK |
| | or |
| | ERROR |
| | Response |
| Execution Command | OK |
| AT+CSMTPSSUB | or |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 120000ms |
| Reference | |

Defined Values

| | |
|----------------------------------|--|
| <subject> | E-mail subject, string with double quotes, and ASCII text up to 511 characters. <subject> will be present in the header of the e-mail sent by SMTSP client in the field: "Subject: ". For write command, it can input any binary data. |
| <subject_len> | The length of subject content |
| <subject_character> | The character set of subject. Default is utf-8. |

Example

```

AT+CSMTPSSUB?
+CSMTPSSUB: 0,"UTF-8"

OK
AT+CSMTPSSUB=19, "utf-8"
>THIS IS A TEST MAIL
OK
AT+CSMTPSSUB?
+SMTSPSUB: 19,"utf-8"
THIS IS A TEST MAIL

```

OK

32.2.7 AT+CSMTPSBODY E-mail body

This command is used to set e-mail body, which will be sent to SMTP server with text format.

Read command returns current e-mail body. If the process of sending an e-mail is ongoing, the command will return “ERROR” directly. Execution command clears email body.

AT+CSMTPSBODY E-mail body

| | |
|---------------------------------------|---------------------------------|
| Test Command | Response |
| AT+CSMTPSBODY=? | OK |
| Read Command | +CSMTPSBODY: <body_len><CR><LF> |
| AT+CSMTPSBODY? | [<body>] OK |
| Write Command | Response |
| AT+CSMTPSBODY=<body_len> | > OK |
| Execution Command | Response |
| AT+CSMTPSBODY | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 120000ms |
| Reference | |

Defined Values

| | |
|------------|-------------------------------------|
| <body> | E-mail body, up to 5120 characters. |
| <body_len> | The length of email body. |

Example

```

AT+CSMTPSBODY=38
>THIS IS A TEST MAIL FROM
SIMCOM MODULE
OK
AT+CSMTPSBODY?
+CSMTPSBODY: 38
THIS IS A TEST MAIL FROM
SIMCOM MODULE

```

OK

32.2.8 AT+CSMTPSBCH E-mail body character set

This synchronous command is used to set the body character set of e-mail.

Read command returns current e-mail body character set.

AT+CSMTPSBCH E-mail body character set

| | |
|--|---|
| Test Command | Response |
| AT+CSMTPSBCH=? | OK |
| Read Command | Response |
| AT+CSMTPSBCH? | +CSMTPSBCH: <charset> OK |
| Write Command | Response |
| AT+CSMTPSBCH=<charset> > | OK or ERROR |
| Execute Command | Response |
| AT+CSMTPSBCH | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------------------|--|
| <charset> | E-mail body character, string with double quotes. By default, it is "utf-8". The maximum length is 19 bytes. |
|------------------------|--|

Example

```
AT+CSMTPSBCH=?
OK
AT+CSMTPSBCH="gb2312"
OK
AT+CSMTPSBCH?
+CSMTPSBCH: "gb2312"
```

OK

32.2.9 AT+CSMTPSFILE Select attachment

The synchronous command is used to select file as e-mail attachment.

Read command returns current all selected attachments with full path.

Execution command will clear the selected attachments

AT+CSMTPSFILE Select attachment

| | |
|---|--|
| Test Command | Response |
| AT+CSMTPSFILE=? | +CSMTPSFILE: (list of supported <index>s) OK |
| Read Command | Response |
| AT+CSMTPSFILE? | [+CSMTPSFILE: <index>,<filename>,<filesize> [<CR><LF>...]] OK |
| Write Command | Response |
| AT+CSMTPSFILE=<index>[,<filename>] | OK or [+CSMTPS: <err>] ERROR |
| Execution Command | Response |
| AT+CSMTPSFILE | OK |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|------------|---|
| <index> | Index for attachments, from 1 to 10. According to the sequence of <index>, SMTP client will encode and send all attachments. |
| <filename> | String type with double quotes, the name of a file which is under current directory (refer to file system commands). SMTP client doesn't allow two attachments with the same file name. (For write command, if the file name contains non-ASCII characters, this parameter should contain a prefix of {non-ascii}. Note: This is only for SD cards) |
| <filesize> | File size in decimal format. The total size of all attachments can't |

| | |
|-------|------------------------|
| | exceed 10MB. |
| <err> | The error information. |

Example

```

AT+CSMTPSFILE=1,"E:/file1.txt"
OK
AT+CSMTPSFILE=1,{non-ascii}"
E6B58BE8AF95E99984E4BBB62
E6A7067"
OK
AT+CSMTPSFILE?
+CSMTPSFILE: 1,"E:/file1.txt"
OK
AT+CSMTPSFILE=2,"U:/ file2.txt
"
OK
AT+CSMTPSFILE?
+CSMTPSFILE: 1, "E:/file1.txt"
+CSMTPSFILE: 2, "U:/file2.txt"

OK

```

32.2.10 AT+CSMTPSEND Initiate session and send e-mail

This asynchronous command is used to initiate TCP/SSL session with SMTP server and send an e-mail after all mandatory parameters have been set correctly.

AT+CSMTPSEND Initiate session and send e-mail

| Test Command | Response |
|-----------------------|-------------------|
| AT+CSMTPSEND=? | OK |
| | Response |
| | OK |
| | +CSMTPSEND: <err> |
| Execution Command | or |
| AT+CSMTPSEND | ERROR |
| | or |
| | +CSMTPSEND: <err> |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |

| | |
|-------------------|--------|
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------|--|
| <err> | The error information. 0 indicates success. Other values indicate failure. |
|-------|--|

Example

AT+CSMTPSEND

OK

+CSMTPSEND: 0

32.2.11 AT+CSMTPSSTOP Force to stop sending e-mail

The synchronous command is used to force to stop sending e-mail and close the TCP/SSL session while sending an e-mail is ongoing. Otherwise, the command will return “ERROR” directly..

AT+CSMTPSSTOP Force to stop sending e-mail

| | |
|------------------------|-------------|
| Test Command | Response |
| AT+CSMTPSSTOP=? | OK |
| | Response |
| Execution Command | OK |
| AT+CSMTPSSTOP | or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Example

AT+CSMTPSSTOP

OK

32.2.12 AT+CSMTPSCLEAN Clean mail content and setting

The synchronous command is used to clean mail content and setting.

AT+CSMTPSCLEAN Clean mail content and setting

| | |
|-------------------|----------|
| Execution Command | Response |
| www.simcom.com | |

| | |
|-----------------------|---------------------------|
| AT+CSMTPSCLEAN | OK or ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Example

```
AT+CSMTPSCLEAN  
OK
```

32.3 Summary of result codes for SMTPS

| Code of <errcode> | Meaning |
|-------------------|---------------------------|
| 0 | SMTPS operation succeeded |
| 600 | Busy |
| 601 | Network error |
| 602 | Socket error |
| 603 | Over size |
| 604 | Duplicate file |
| 605 | Time out |
| 606 | Transfer failed |
| 607 | Memory error |
| 608 | Invalid parameter |
| 609 | EFS error |
| 610 | SMTP server error |
| 611 | Authentication failure |
| 612 | User cancel |
| 655 | Unknown error |

33 AT Commands for Telecom self-registration

33.1 Overview of AT Commands for Telecom self-registration

| Command | Description |
|----------------------|--|
| AT+HWVER | Hardware version number query |
| AT+AUTOREGCFG | Data domain self-registration status query |

33.2 Detailed Description of AT Commands for Telecom self-registration

33.2.1 AT+HWVER Hardware version number query

| AT+HWVER Hardware version number query | |
|--|----------------------------|
| Test Command | Response |
| AT+HWVER=? | OK |
| | Response |
| | 1) |
| | +HWVER: <ver> |
| Execution Command | |
| AT+HWVER | OK |
| | 2) |
| | ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------|-------------------------|
| <ver> | Hardware version number |
|-------|-------------------------|

Examples

AT+HWVER=?

OK

AT+HWVER

+HWVER: V1.02

OK

33.2.2 AT+AUTOREGCFG Data domain self-registration status query

AT+AUTOREGCFG Data domain self-registration status query

Test Command

Response

+AUTOREGCFG: <info>

AT+AUTOREGCFG=?

OK

Response

1)

+AUTOREGCFG: <info>

Read Command

OK

AT+AUTOREGCFG?

2)

ERROR

Write Command

Response

AT+AUTOREGCFG=<domain>[,<state>]

+AUTOREGCFG: <info>

OK

Parameter Saving Mode

AUTO_SAVE

Max Response Time

9000ms

Reference

Defined Values

| | |
|----------|--|
| <info> | The data domain self-registration status |
| <domain> | "CTCC" |
| <state> | "ENABLE" "DISABLE" "CLEANFLAG" |

Examples

AT+AUTOREGCFG =?

+AUTOREGCFG: the switch of auto reg is closed

OK

AT+AUTOREGCFG?

+AUTOREGCFG: the switch of auto reg is closed

OK

AT+AUTOREGCFG="CTCC","ENABLE"

OK

AT+AUTOREGCFG?

+AUTOREGCFG: the switch of auto reg is opened

OK

NOTE

A7630 series authentication instructions, no testing required.

34 AT Commands for PSM

34.1 Overview of AT Commands for PSM

| Command | Description |
|--------------------|------------------------------|
| AT*COMCFG | Enable cat1_1bis |
| AT+CPSMS | PSM mode |
| AT+MEDCR | Set psm time and hw psm |
| AT+CEDRXS | DRX Setting |
| AT+CEDRXRDP | eDRX Read Dynamic Parameters |

34.2 Detailed Description of AT Commands for psm

34.2.1 AT*COMCFG Set cat1_1bis

AT*COMCFG Set cat1_1bis

| AT*COMCFG Set cat1_1bis | |
|---------------------------------------|--|
| Test Command AT*COMCFG=? | <p>Response</p> <p>*COMCFG:<mode>,<tokens> or <UMTS_WB_AMR>,<GSM_WB_AMR>,<VENDOR>,<MANUFACTURE>,<LTE_CATEGORY>,<MULTISLOT_POWERPROFILE>,<LTE_SMS_ONLY>,<EC_SUPPORTED>,<EPCO_SUPPORTED>,<HCCP_SUPPORTED>,<MDRB_SUPPORTED>,<CP_BACKOFF>,<NSLP>,<EAB>,<ROHC>,<attachWoPdn></p> |
| Execution Command AT*COMCFG | <p>OK</p> <p>Response</p> <p>1) OK 2) ERROR</p> |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------------|---|
| <mode> | configure MT info 0 get MT configuration 1 set MT configuration |
| <UMTS_WB_AMR value> | 0 or 1 indicate WB AMR is used in UMTS |
| <GSM_WB_AMR value> | 0 or 1 indicate WB AMR is used in GSM |
| <VENDOR value> | vendor info 0 NONE 1 ATT 2 CMCC, 4 IOT 8 TELCEL 16 H3G 32 VDF 64 SILVER 128 ORG 256 TMObILE 512 VERIZON 1024 HP |
| <MANUFACTURE value> | manufacture info 0 NONE 1 M_SILVER |
| <LTECATEGORY value> | manufacture info 1、Cat1 2、Cat1_bis |
| <attachWoPdn> | Attach without PDN connectivity 0 enable 1 disable Note: supported by CAT 1 baseline 110 or up-to-date |

Examples

AT*COMCFG=0,16

*COMCFG:,,,1

OK

AT*COMCFG=1,,,1

Set lte category cat1

OK

AT*COMCFG=1,,,1

Set lte category cat1_bis

OK

34.2.2 AT+CPSMS Power saving mode setting

AT+CPSMS Power saving mode setting

| AT+CPSMS Power saving mode setting | |
|---|--|
| Test Command AT+CPSMS=? | Response +CPSMS: (0-2) |
| | OK |
| Read Command | Response +CPSMS: <mode>,[<Requested_Periodic-RAU>],[<Requested_GPRS-READY-timer>],[<Requested_Periodic-TAU>],[<Requested_Active-Time>] |
| AT+CPSMS? | OK |
| Execution Command AT+CPSMS= <mode>[,<Requested_Periodic-RAU>[,<Requested_GPRS-READY-timer>[,<Requested_Periodic-TAU>[,<Requested_Active-Time>]]]] | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------------------------------|---|
| <mode> | integer type. Indication to disable or enable the use of PSM in the UE 0 Disable the use of PSM 1 Enable the use of PSM 2 Disable the use of PSM and discard all parameters for PSM or, if available, reset to the manufacturer specific default values. |
| <Requested_Periodic-RAU> | string type; one byte in an 8 bit format. Requested extended periodic RAU value (T3312) to be allocated to the UE in GERAN/UTRAN. The requested extended periodic RAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.060 [47]. The default value, if available, is manufacturer specific. |
| <Requested_GPRS-READY-> | string type; one byte in an 8 bit format. Requested |

| | |
|---------------------------------------|--|
| timer> | <p>GPRS READY timer value (T3314) to be allocated to the UE in GERAN/UTRAN. The requested GPRS READY timer value is coded as one byte (octet 2) of the GPRS Timer information element coded as bit format (e.g. "01000011" equals 3 decihours or 18 minutes). For the coding and the value range, see the GPRS Timer IE in 3GPP TS 24.008 [8] Table 10.5.172/3GPP TS 24.008. See also 3GPP TS 23.060 [47]. The default value, if available, is manufacturer specific.</p> |
| <Requested_Periodic-TAU> | <p>string type; one byte in an 8 bit format. Requested extended periodic TAU value (T3412) to be allocated to the UE in E-UTRAN. The requested extended periodic TAU value is coded as one byte (octet 3) of the GPRS Timer 3 information element coded as bit format (e.g. "01000111" equals 70 hours). For the coding and the value range, see the GPRS Timer 3 IE in 3GPP TS 24.008 [8] Table 10.5.163a/3GPP TS 24.008. See also 3GPP TS 23.682 [149] and 3GPP TS 23.401 [82]. The default value, if available, is manufacturer specific.</p> |
| <Requested_Active-Time> | <p>string type; one byte in an 8 bit format. Requested Active Time value (T3324) to be allocated to the UE. The requested Active Time value is coded as one byte (octet 3) of the GPRS Timer 2 information element coded as bit format (e.g. "00100100" equals 4 minutes). For the coding and the value range, see the GPRS Timer 2 IE in 3GPP TS 24.008 [8] Table 10.5.163/3GPP TS 24.008. See also 3GPP TS 23.682 [149], 3GPP TS 23.060 [47] and 3GPP TS 23.401 [82]. The default value, if available, is manufacturer specific</p> |

Examples

AT+CPSMS=1,,,"01101111","00001111"
OK

Set t3412-ext time 30s, t3324 time 30s

34.2.3 AT+MEDCR Set/Get MDATA COMM RESERVER

AT+MEDCR Set/Get Medata Comm Reserver

| | |
|--|--|
| Test Command | Response +MEDCR |
| AT+MEDCR=? | OK |
| Read Command | Response +MEDCR: <flag>,<position>,<value> |
| AT+MEDCR? | OK |
| Write Command | Response 1) OK 2) ERROR |
| AT+ +MEDCR=<flag>,<position>[,<c onfigVal>] | |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|--------------------------|--|
| <flag> | a numeric parameter which determinates the operation 0: set operation 1: get operation |
| <position> | a numeric parameter, range (0-255) 8: opt for specific IOT without 4G to fasten registration 9: opt for no detach/attach for AT*BAND initated 23G NW mode change 10: opt for limit EF update for StartCS/PS 11: opt for remapping PS cid(default 5) since NW rejects 2nd same APN 12: opt for using invalid KSI(7) in case not power off normally 13: opt for setting LTE initial APN cid map from ebi/nsapi 30: opt for control cell change auto-reporting 46: LTE 47: UMTS 48: GSM |
| <configVal> | a numeric parameter, the configure value of each opt, range (0-255) |

Examples

| | |
|-------------------------|---------------------|
| AT+MDECR=0,71,2 | Set t3412 time 2min |
| OK | |
| AT+MEDCR=0,103,1 | Enable HW psm |
| OK | |

34.2.4 AT+CEDRXS DRX Setting

AT+CEDRXS DRX Setting

| | |
|--|--|
| Test Command AT+ CEDRXS =? | Response +CEDRXS: (0-3),(1-5) |
| | OK |
| Read Command AT+ CEDRXS? | Response +CEDRXS: <eDrxAct>,["<requestedEdrxValue>"] |
| | OK |
| Execution Command AT+ CEDRXS = <mode>[,<eDrxAct>[,<eDrx>]] | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------------|---|
| < mode > | integer type. Indication to disable or enable the use of Drx in the UE 0 Disable the use of Drx 1 Enable the use of Drx 2 Disable the use of Drx and discard all parameters for Drx or, if available, reset to the manufacturer specific default values. 3 Enable the use of eDrx |
| < eDrxAct > | integer type. indicates the type of access technology 0 AcT is not using eDRX 1 EC- GSM-IoT(A/Gb mode) 4 GSM(A/Gb mode) 5 UTRAN(lu mode) 6 E-UTRAN(WB-S1 mode) 7 E-UTRAN(NB-S1 mode) |
| < eDrx > | string type, indicates the type of eDrx |
| < requestedEdrxValue > | requested eDRX value, half a byte in a 4 bit format |

Examples

```
AT+CEDRXS=?
+CEDRXS: (0-3),(1-5)
```

OK

AT+CEDRXS?

+CEDRXS: 4,""

OK

34.2.5 AT+CEDRXRDP eDRX Read Dynamic Parameters

AT+CEDRXRDP eDRX Read Dynamic Parameters

| | |
|-----------------------|--|
| Action Command | Response |
| AT+CEDRXRDP | +CEDRXRDP: <eDrxAct>,["<requestedEdrxValue>"],["<nwProvidedEdrxval ue>"],["<pagingTimerWindow>"] |
| | OK |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-------------------------------------|---|
| < eDrxAct > | integer type. indicates the type of access technology 0 AcT is not using eDRX 1 EC- GSM-IoT(A/Gb mode) 8 GSM(A/Gb mode) 9 UTRAN(Iu mode) 10 E-UTRAN(WB-S1 mode) E-UTRAN(NB-S1 mode) |
| < requestedEdrxValue > | requested eDRX value, half a byte in a 4 bit format |
| <nwProvidedEdrxvalue> | NW-provided eDRX value, half a byte in a 4 bit format |
| <pagingTimerWindow> | NW-provided paing time window, half a byte in a 4 bit format |

Examples

AT+CEDRXRDP

+CEDRXRDP: 4,"","","",""

OK

35 AT Commands for USB

35.1 Overview of AT Commands for USB

| Command | Description |
|---------------------|-----------------------|
| AT+DIALMODE | Config USBNET network |
| AT\$MYCONFIG | Config USBNET mode |
| AT+USBNETIP | Config USBNET ip |
| AT+USBNETMAC | Config USBNET mac |

35.2 Detailed Description of AT Commands for usb

35.2.1 AT+DIALMODE Config USBNET network

AT+DIALMODE Config USBNET network

| AT+DIALMODE Config USBNET network | |
|--|-------------------------|
| Test Command | Response |
| AT+DIALMODE=? | +DIALMODE: (0-1) |
| | OK |
| Read Command | Response |
| AT+DIALMODE? | +DIALMODE:<mode> |
| | OK |
| Write Command | Response |
| AT+DIALMODE=<mode> | 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|--------|---|
| <mode> | The Auto Dial status Enable/Disable, the default value is 1. 0 –Enable USBNET network 1 –Disable USBNET network The function will take effect immediately. |
|--------|---|

Examples

| | |
|----------------------|------------------------|
| AT+DIALMODE=1 | Disable USBNET network |
| OK | |

35.2.2 AT\$MYCONFIG Set RNDIS/ECM Mode

AT\$MYCONFIG Set RNDIS/ECM Mode

| AT\$MYCONFIG Set RNDIS/ECM Mode | |
|---|--|
| Test Command | Response for 1803 |
| AT\$MYCONFIG=? | \$MYCONFIG: "usbnetmode",(0-2),(0,1),<macName> |
| | OK |
| | Response for 1603 and 1606 |
| | \$MYCONFIG: "usbnetmode",(0-1),(0,1) |
| | OK |
| Read Command | Response |
| AT\$MYCONFIG? | \$MYCONFIG: "usbnetmode",<netmode>,<netport> |
| | OK |
| Write Command | Response |
| AT\$MYCONFIG="USBNETMOD E"[,<netmode>[,<netport>][,<macName>]] | 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|-----------|---|
| <netmode> | The RNDIS/ECM mode, the default value is 0. 0 –RNDIS 1 –ECM 2 –AUTO adapt system |
|-----------|---|

| | |
|-----------|---|
| | The function will reset modem then take effect. |
| <netport> | The name of Netcard, the default value is 1 0 –ETH 1 –USB |
| <macName> | Set usbnets name under mac pc |

Examples

| | |
|-------------------------------|---------------|
| AT\$MYCONFIG="USBNETMODE",1,1 | Change to ECM |
| OK | |

35.2.3 AT+USBNETIP Change RNDIS/ECM Private IP to Public IP

AT+USBNETIP Change RNDIS/ECM Private IP to Public IP

AT+USBNETIP Change RNDIS/ECM Private IP to Public IP

Test Command

AT+USBNETIP=?

Response

+USBNETIP: (0-1)[,(0-255)[,(0-255)[,(1-254) [,,(0-2147483647)]]]]

OK

Read Command

AT+USBNETIP?

Response

a) If successfully mode=0:

+USBNETIP:0,tnos,dhcps,dhcpe,leasetime

OK

a) If successfully mode=1:

+USBNETIP:1,,,leasetime

OK

b) If failed:

ERROR

Write Command

AT+USBNETIP=<mode>[,<tnos>[,<dhcps>[,<dhcpe>[,<leasetime>]]]]

Response

1)

OK

2)

+CME ERROR: Incorrect parameters

Parameter Saving Mode

AUTO_SAVE

Max Response Time

9000ms

Reference

Defined Values

| | |
|-------------|--|
| < mode > | 0 –Private Ip(default, 192.168.0.xxx etc.) 1 –Public Ip(the ip from the network)The function will reset modem then take effect. |
| <tpos> | The third position of Gateway Address |
| <dhcps> | Dhcp start value |
| <dhcpe> | Dhcp end value |
| <leasetime> | Dhcp lease time, default value 86400 |

Examples

| | |
|-----------------------------|------------------|
| AT+USBNETIP=0,10,117 | Change usbnet ip |
| OK | |

35.2.4 AT+USBNETMAC Set USBNET MAC Address

AT+USBNETMAC Set USBNET MAC Address

AT+USBNETMAC Set USBNET MAC Address

| | |
|--|--|
| Test Command AT+USBNETMAC=? | Response 1) OK 2) ERROR |
| Read Command AT+USBNETMAC? | Response 1) +USBNETMAC: <mac_display> OK 2) ERROR 3) +CME ERROR: <err> |
| Write Command AT+USBNETMAC=<mac> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | AUTO_SAVE |
| Max Response Time | 9000ms |

Reference

Defined Values

| | |
|-----------------|---|
| < mac > | String type, the MAC address of USBNET, maximum length 12 |
| < mac_display > | String type, display the MAC address of USBNET, split with a '-'. |

Examples

AT+USBNETMAC=?

OK

AT+USBNETMAC?

+USBNETMAC: F0-0C-29-A3-9B-6D

OK

AT+USBNETMAC=AABBCCDDEEFF

OK

36 AT Commands for JammingDetect

36.1 Overview of AT Commands for JammingDetect

| Command | Description |
|------------------|-----------------------|
| AT+SJDR | Enable Jamming Detect |
| AT+SJDCFG | Config Jamming Detect |

36.2 Detailed Description of AT Commands for Jamming Detect

36.2.1 AT+SJDR Enable Jamming Detect

| AT+SJDR Enable Jamming Detect | |
|--|-------------------------------------|
| Test Command AT+SJDR=? | Response +SJDR: (0,1) |
| | OK |
| Read Command AT+SJDR? | Response +SJDR: <mode> |
| | OK |
| Write Command AT+SJDR=<mode> | Response 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------------|---|
| <mode> | to Enable Jamming detect, default close. 0 –Colse Jamming Detect 1 –Enable Jamming Detect The function will take effect immediately. |
|---------------------|---|

Examples

| | |
|------------------|-----------------------|
| AT+SJDR=1 | Enable Jamming Detect |
| OK | |

36.2.2 AT+SJDCFG Config Jamming Detect

| AT+SJDCFG Config Jamming Detect | |
|--|---|
| Test Command | Response |
| AT+SJDCFG=? | +SJDCFG: "period",(0-120) +SJDCFG: "mnl",(0-31) +SJDCFG: "minch",(0-254) +SJDCFG: "detecstat",(0-1) |
| | OK |
| Read Command | Response |
| AT+SJDCFG? | +SJDCFG: "period",<value> +SJDCFG: "mnl",<value> +SJDCFG: "minch",<value> +SJDCFG: "detecstat",<value> |
| | OK |
| Write Command | Response |
| AT+SJDCFG= <type>,<value> | 1) OK 2) ERROR |
| Parameter Saving Mode | NO_SAVE |
| Max Response Time | 9000ms |
| Reference | |

Defined Values

| | |
|---------------------|---|
| <type> | "period" Period of URC of auto jamming detection report. When set to '0', no periodic reporting. Default value: 0. Range: 0-120, unit: s "mnl" The minrxlev threshold (For GSM network only). Defaultvalue: 17. Range:0-31 |
|---------------------|---|

| | |
|---------|---|
| | "minch" The minimum channel number or ARFCN number which is jammed. Default value: 5. Range: 0-254 "detecstat" Enable or disable to report the jamming detection URC when the jamming is changed. Default value is 1 |
| <value> | <value> |

Examples

AT+SJDCFG="period",5

OK

Set Jamming Detect report every 5 seconds